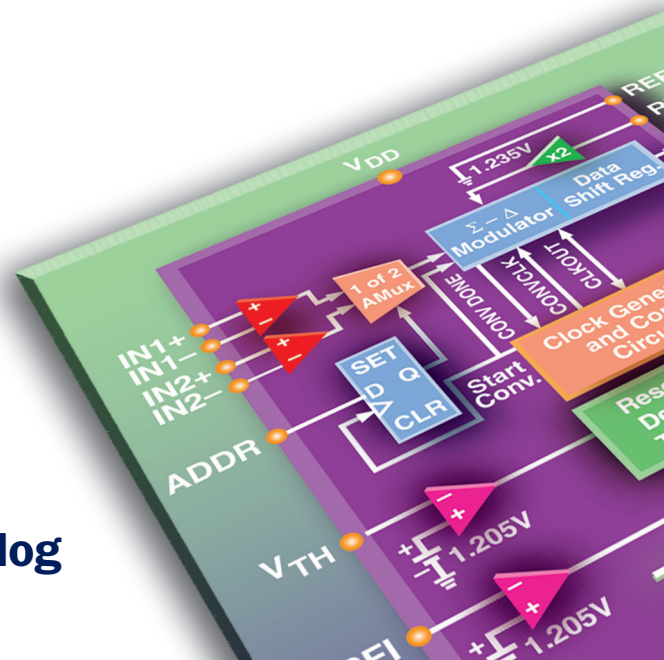
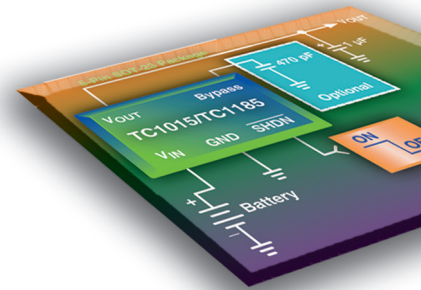
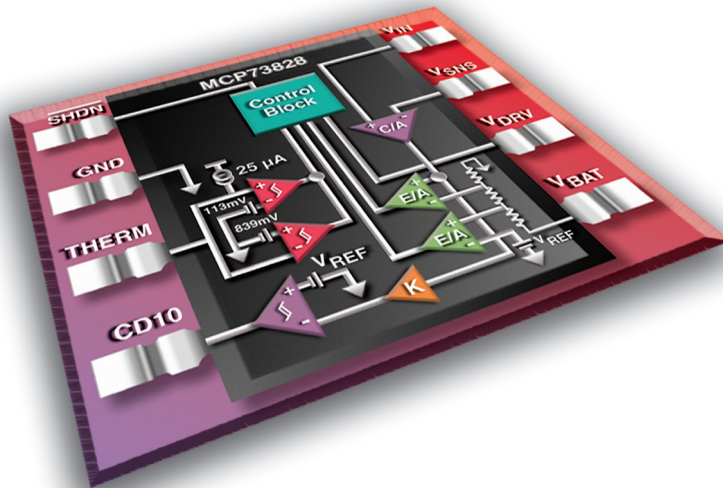




## Analog & Interface Product Selector Guide

*Thermal Management • Motor Driver • Interface Peripherals  
Power Management • Linear & Mixed Signal • Safety & Security*



# Table of Contents

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## Thermal Management

|   |   |
|---|---|
| Temperature Sensors . . . . .                                     | 4 |
| Logic Output Temperature Sensors . . . . .                        | 4 |
| Voltage Output Temperature Sensors. . . . .                       | 4 |
| Serial Output Temperature Sensors. . . . .                        | 4 |
| Brushless DC Fan Controllers and<br>Fan Fault Detectors . . . . . | 5 |

## Motor Drivers

|   |   |
|---|---|
| Stepper Motors, DC Motors and<br>3-Phase BLDC Motors. . . . . | 6 |
|---|---|

## Power Management

|   |    |
|---|----|
| Voltage References . . . . .                                    | 6  |
| Linear Regulators   |    |
| 50–250 mA LDO Linear Regulators . . . . .                       | 6  |
| 300 mA LDO Linear Regulators. . . . .                           | 7  |
| 500–800 mA LDO Linear Regulators . . . . .                      | 8  |
| 1A and > LDO Linear Regulators . . . . .                        | 8  |
| Application Specific LDO Linear Regulators . . . . .            | 8  |
| LDO Regulator Combination Products. . . . .                     | 8  |
| Switching Regulators . . . . .                                  | 9  |
| Switching Regulators Combination Products. . . . .              | 9  |
| PWM Controllers . . . . .                                       | 10 |
| Charge Pump DC-to-DC Converters . . . . .                       | 10 |
| Inverting or Doubling Charge Pumps . . . . .                    | 10 |
| Inverting and Doubling Charge Pumps . . . . .                   | 10 |
| Regulated Charge Pumps . . . . .                                | 10 |
| CPU/System Supervisors . . . . .                                | 10 |
| Voltage Detectors. . . . .                                      | 11 |
| Power MOSFET Drivers . . . . .                                  | 12 |
| Low-Side Drivers, 0.5A to 1.2A Peak<br>Output Current. . . . .  | 12 |
| Low-Side Drivers, 1.5A Peak Output Current. . . . .             | 12 |
| Low-Side Drivers, 2.0A to 12.0A Peak<br>Output Current. . . . . | 13 |
| High-Side/Low-Side Drivers. . . . .                             | 13 |
| Synchronous Buck High-Side Drivers . . . . .                    | 13 |
| Battery Chargers . . . . .                                      | 14 |
| Hot Swap Controllers . . . . .                                  | 14 |

## Linear

|  |    |
|--|----|
| Op Amps . . . . .                            | 15 |
| Zero-Drift Operational Amplifiers . . . . .  | 18 |
| Programmable Gain Amplifiers (PGA) . . . . . | 18 |
| Selectable Gain Amplifiers (SGA). . . . .    | 18 |
| Instrumentation Amplifiers . . . . .         | 18 |
| Comparators . . . . .                        | 19 |

## Mixed Signal

|   |    |
|---|----|
| Successive Approximation Register (SAR)<br>A/D Converters . . . . . | 19 |
| Delta-Sigma A/D Converters . . . . .                                | 20 |
| Energy Measurement ICs . . . . .                                    | 20 |
| Dual-Slope A/D Converters . . . . .                                 | 20 |
| Binary and BCD A/D Converters . . . . .                             | 21 |
| Display A/D Converters . . . . .                                    | 21 |
| Digital Potentiometers . . . . .                                    | 21 |
| Frequency-to-Voltage/Voltage-to-Frequency<br>Converters. . . . .    | 23 |
| D/A Converters . . . . .  | 23 |

## Interface

|  |    |
|--|----|
| Controller Area Network (CAN) Products . . . . .       | 23 |
| Infrared Products . . . . .                            | 24 |
| Ethernet Products . . . . .                            | 24 |
| Passive Access Products . . . . .                      | 24 |
| LIN Transceiver Products. . . . .                      | 24 |
| Serial Peripherals. . . . .                            | 25 |
| IEEE 802.15.4 ZigBee® RF Transceiver Products. . . . . | 25 |
| Stand-alone RF Receiver Products . . . . .             | 25 |
| USB Products. . . . .                                  | 25 |

## Safety & Security

|  |    |
|--|----|
| Photoelectric Smoke Detector ICs . . . . .     | 26 |
| Ionization Smoke Detector ICs. . . . .         | 26 |
| Ionization Smoke Detector Front Ends . . . . . | 26 |
| Piezoelectric Horn Drivers . . . . .           | 26 |

## Analog Design and Development Tools

|   |    |
|---|----|
| Thermal Management. . . . .   | 27 |
| Mixed Signal . . . . .  | 27 |
| Power Management . . . . .  | 28 |
| Interface . . . . .   | 29 |
| Linear . . . . .  | 30 |
| Analog Blank Evaluation Boards . . . . .                            | 30 |
| Miscellaneous Analog Demonstration<br>and Evaluation Tools. . . . . | 30 |

## Featured Analog Development Tools

|                             |    |
|-----------------------------|----|
| Thermal Management. . . . . | 31 |
| Mixed Signal . . . . .      | 31 |
| Power Management . . . . .  | 31 |
| Interface . . . . .         | 32 |
| Linear . . . . .            | 32 |

## Part Number Designations

|   |    |
|---|----|
| Analog Products with “TC” Prefix . . . . .    | 33 |
| Analog Products with “MCP” Prefix . . . . .   | 34 |
| Analog Products with “RE46C” Prefix . . . . . | 35 |

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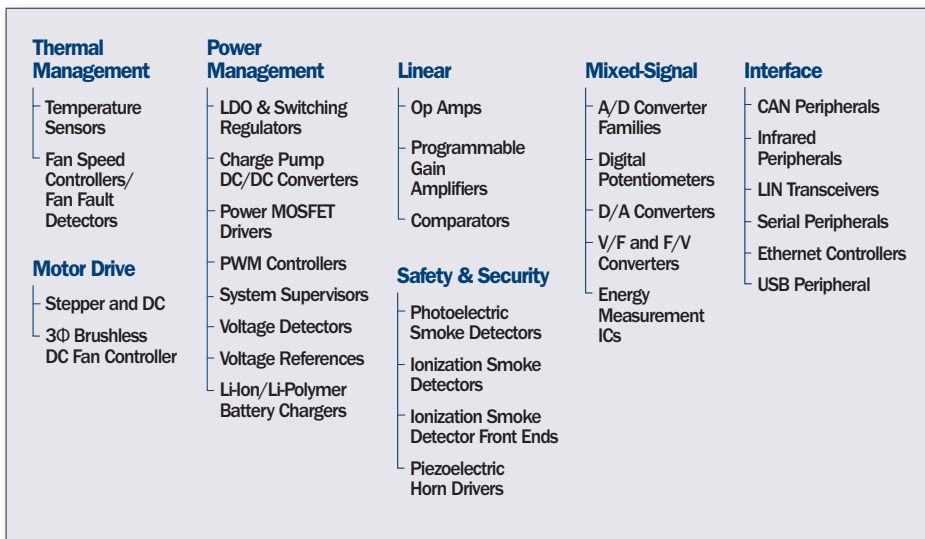
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# THERMAL MANAGEMENT

## THERMAL MANAGEMENT PRODUCTS: Temperature Sensors

| Part #                                    | Typical Accuracy (°C) | Maximum Accuracy @ 25°C (°C) | Maximum Temperature Range (°C) | Vcc Range (V) | Maximum Supply Current (µA) | Features  | Packages                                       |
|---|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|---|--|
| <b>Logic Output Temperature Sensors</b>   |                       |                              |                                |               |                             |   |  |
| TC6501                                    | ±0.5                  | ±3                           | -55 to +125                    | +2.7 to +5.5  | 40                          | Cross to MAX6501, Open-drain  | 5-pin SOT-23A                                  |
| TC6502                                    | ±0.5                  | ±3                           | -55 to +125                    | +2.7 to +5.5  | 40                          | Cross to MAX6502, Push-pull   | 5-pin SOT-23A                                  |
| TC6503                                    | ±0.5                  | ±3                           | -55 to +125                    | +2.7 to +5.5  | 40                          | Cross to MAX6503, Open-drain  | 5-pin SOT-23A                                  |
| TC6504                                    | ±0.5                  | ±3                           | -55 to +125                    | +2.7 to +5.5  | 40                          | Cross to MAX6504, Push-pull   | 5-pin SOT-23A                                  |
| TC620                                     | ±1                    | ±3                           | -40 to +125                    | +4.5 to +18   | 400                         | Two resistor-programmable trip points   | 8-pin PDIP, 8-pin SOIC                         |
| TC621                                     | Note 1                | Note 1                       | -40 to +85                     | +4.5 to +18   | 400                         | Requires external thermistor, resistor-programmable trip points   | 8-pin PDIP, 8-pin SOIC                         |
| TC622                                     | ±1                    | ±5                           | -40 to +125                    | +4.5 to +18   | 600                         | Dual output, TO-220 for heat sink mounting, resistor-programmable trip points   | 8-pin PDIP, 8-pin SOIC; 5-pin TO-220           |
| TC623                                     | ±1                    | ±3                           | -40 to +125                    | +2.7 to +4.5  | 250                         | Two resistor-programmable trip points   | 8-pin PDIP, 8-pin SOIC                         |
| TC624                                     | ±1                    | ±5                           | -40 to +125                    | +2.7 to +4.5  | 300                         | Dual output, resistor-programmable trip points  | 8-pin PDIP, 8-pin SOIC                         |
| MCP9501                                   | ±1                    | ±4                           | -40 to +125                    | +2.7 to +5.5  | 40                          | Active-High, Push-Pull Output, Rising Temperature Switch  | 5-pin SOT-23                                   |
| MCP9502                                   | ±1                    | ±4                           | -40 to +125                    | +2.7 to +5.5  | 40                          | Active-Low, Open Drain Output, Rising Temperature Switch  | 5-pin SOT-23                                   |
| MCP9503                                   | ±1                    | ±4                           | -40 to +125                    | +2.7 to +5.5  | 40                          | Active-High, Push-Pull Output, Falling Temperature Switch   | 5-pin SOT-23                                   |
| MCP9504                                   | ±1                    | ±4                           | -40 to +125                    | +2.7 to +5.5  | 40                          | Active-Low, Open Drain Output, Falling Temperature Switch   | 5-pin SOT-23                                   |
| MCP9509                                   | ±0.5                  | NS                           | -40 to +125                    | +2.7 to +5.5  | 50                          | Resistor-programmable temperature switch  | 5-pin SOT-23                                   |
| MCP9510                                   | ±0.5                  | NS                           | -40 to +125                    | +2.7 to +5.5  | 80                          | Resistor-programmable temperature switch  | 6-pin SOT-23                                   |
| <b>Voltage Output Temperature Sensors</b> |                       |                              |                                |               |                             |   |  |
| MCP9700                                   | ±1                    | ±4                           | -40 to +125                    | +2.3 to +5.5  | 12                          | Linear Active Thermistor® IC, Temperature slope: 10 mV/°C   | 3-pin TO-92, 5-pin SC-70, 3-pin SOT-23         |
| MCP9701                                   | ±1                    | ±4                           | -10 to +125                    | +3.1 to +5.5  | 12                          | Linear Active Thermistor® IC, Temperature slope: 19.53 mV/°C, cross to MAX6612  | 3-pin TO-92, 5-pin SC-70, 3-pin SOT-23         |
| MCP9700A                                  | ±1                    | ±2                           | -40 to +125                    | +2.3 to +5.5  | 12                          | Linear Active Thermistor® IC, Temperature slope: 10 mV/°C   | 3-pin TO-92, 5-pin SC-70, 3-pin SOT-23         |
| MCP9701A                                  | ±1                    | ±2                           | -40 to +125                    | +3.1 to +5.5  | 12                          | Linear Active Thermistor® IC, Temperature slope: 19.53 mV/°C, cross to MAX6612  | 3-pin TO-92, 5-pin SC-70, 3-pin SOT-23         |
| TC1046                                    | ±0.5                  | ±2                           | -40 to +125                    | +2.7 to +4.4  | 60                          | High precision temperature-to-voltage converter, 6.25 mV/°C   | 3-pin SOT-23B                                  |
| TC1047                                    | ±0.5                  | ±2                           | -40 to +125                    | +2.7 to +4.4  | 60                          | High precision temperature-to-voltage converter, 10 mV/°C   | 3-pin SOT-23B                                  |
| TC1047A                                   | ±0.5                  | ±2                           | -40 to +125                    | +2.5 to +5.5  | 60                          | High precision temperature-to-voltage converter, 10 mV/°C   | 3-pin SOT-23B                                  |
| <b>Serial Output Temperature Sensors</b>  |                       |                              |                                |               |                             |   |  |
| MCP9800                                   | ±0.5                  | ±1                           | -55 to +125                    | +2.7 to +5.5  | 400                         | SMbus/I <sup>2</sup> C™ compatible interface, 0.0625°C to 0.5°C adj. resolution, Power-saving one-shot temperature measurement                                      | 5-pin SOT-23                                   |
| MCP9801                                   | ±0.5                  | ±1                           | -55 to +125                    | +2.7 to +5.5  | 400                         | SMbus/I <sup>2</sup> C™ compatible interface, 0.0625°C to 0.5°C adj. resolution, Power-saving one-shot temperature measurement, multi-drop capability               | 8-pin MSOP, 8-pin SOIC                         |
| MCP9802                                   | ±0.5                  | ±1                           | -55 to +125                    | +2.7 to +5.5  | 400                         | SMbus/I <sup>2</sup> C™ compatible interface with time out, 0.0625°C to 0.5°C adj. resolution, Power-saving one-shot temperature measurement                        | 5-pin SOT-23                                   |
| MCP9803                                   | ±0.5                  | ±1                           | -55 to +125                    | +2.7 to +5.5  | 400                         | SMbus/I <sup>2</sup> C™ compatible interface with time out, 0.0625°C to 0.5°C adj. resolution, Power-saving one-shot temperature measurement, Multi-drop capability | 8-pin MSOP, 8-pin SOIC                         |
| MCP9804                                   | ±0.25                 | ±1                           | -40 to +125                    | +2.7 to +5.5  | 400                         | User programmable temperature limits with alert output, 1°C temp. accuracy from -40°C to +125°C   | 8-pin MSOP, 8-pin 2 x 3 DFN                    |
| MCP9805                                   | ±0.5                  | ±1 <sup>(2)</sup>            | -20 to +125                    | +3.0 to +3.6  | 400                         | JEDEC compatible register set, SMBus/I <sup>2</sup> C™ compatible interface, Programmable, Shut-down modes and EVENT output   | 8-pin TSSOP, 8-pin 2 x 3 DFN                   |
| MCP9808                                   | ±0.25                 | ±0.5                         | -40 to +125                    | +2.7 to +5.5  | 400                         | 0.5°C temperature accuracy from -10°C to +100°C   | 8-pin 2 x 3 DFN, 8-pin MSOP                    |
| MCP9843                                   | ±0.5                  | ±1 <sup>(2)</sup>            | -20 to +125                    | +3.0 to +3.6  | 500                         | Compliant to JEDEC TS2002 specification   | 8-pin TSSOP, 8-pin 2 x 3 DFN, 8-pin 2 x 3 TDFN |
| MCP98242                                  | ±0.5                  | ±1 <sup>(2)</sup>            | -20 to +125                    | +3.0 to +3.6  | 400                         | Same temperature sensor as MCP9805 plus integrated DDR2 Serial Presence Detect EEPROM   | 8-pin TSSOP, 8-pin 2 x 3 DFN                   |
| MCP98243                                  | ±1                    | ±3                           | -40 to +125                    | +3.0 to +3.6  | 500                         | Serial output temperature sensor with integrated EEPROM   | 8-pin TSSOP, 8-pin 2 x 3 DFN, 8-pin 2 x 3 TDFN |

Note 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.

2: Maximum accuracy measured at 85°C.



| Serial Output Temperature Sensors (Continued) |                       |                              |                                |               |                             |   |                             |
|---|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|---|-----------------------------|
| Part #  | Typical Accuracy (°C) | Maximum Accuracy @ 25°C (°C) | Maximum Temperature Range (°C) | Vcc Range (V) | Maximum Supply Current (µA) | Features  | Packages                    |
| TC77  | ±0.5                  | ±1                           | -55 to +125                    | +2.7 to +5.5  | 400                         | SPI compatible interface, 0.0625°C temperature resolution   | 5-pin SOT-23A, 8-pin SOIC   |
| TC72  | ±0.5                  | ±1                           | -55 to +125                    | +2.65 to +5.5 | 400                         | SPI compatible interface, Power-saving one-shot temperature measurement, 0.25°C temperature resolution  | 8-pin MSOP, 8-pin 3 × 3 DFN |
| TC74  | ±0.5                  | ±2                           | -40 to +125                    | +2.7 to +5.5  | 350                         | SMBus/I <sup>2</sup> C™ compatible interface, 1°C temperature resolution  | 5-pin SOT-23A, 5-pin TO-220 |
| TCN75A  | ±0.5                  | ±2                           | -40 to +125                    | +2.7 to +5.5  | 500                         | SMBus/I <sup>2</sup> C™ compatible interface, power-saving one-shot temperature measurement, multi-drop capability, 0.0625°C to 0.5°C adjustable temperature resolution | 8-pin MSOP, 8-pin SOIC      |
| TCN75   | ±0.5                  | ±2                           | -55 to +125                    | +2.7 to +5.5  | 1,000 <sup>(3)</sup>        | SMBus/I <sup>2</sup> C™ compatible interface, multi-drop capability, interrupt output, 0.5°C temperature resolution   | 8-pin MSOP, 8-pin SOIC      |

Note 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.

2: Maximum accuracy measured at 85°C.

3: TCN75 idle current is 250 mA. This device also has a Software Shutdown mode that reduces supply current to < 1 mA.

| THERMAL MANAGEMENT PRODUCTS: Brushless DC Fan Controllers and Fan Fault Detectors |                               |                       |                              |                                |               |                             |  |                                    |
|---|-------------------------------|-----------------------|------------------------------|--------------------------------|---------------|-----------------------------|--|------------------------------------|
| Part #  | Description                   | Typical Accuracy (°C) | Maximum Accuracy @ 25°C (°C) | Maximum Temperature Range (°C) | Vcc Range (V) | Maximum Supply Current (µA) | Features   | Packages                           |
| TC642   | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 1,000                       | FanSense™ Fan Monitor, Minimum fan speed control                   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC642B  | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 400                         | FanSense™ Fan Monitor, Minimum fan speed control, Fan auto-restart | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC646   | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 1,000                       | FanSense™ Fan Monitor, Auto-shutdown                               | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC646B  | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 400                         | FanSense™ Fan Monitor, Auto-shutdown, Fan auto-restart             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC647   | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 1,000                       | FanSense™ Fan Monitor, Minimum fan speed control                   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC647B  | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 400                         | FanSense™ Fan Monitor, Minimum fan speed control, Fan auto-restart | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC648   | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 1,000                       | Overtemperature alert, Auto-shutdown                               | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC648B  | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 400                         | Overtemperature alert, Auto-shutdown, Fan auto-restart             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC649   | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 1,000                       | FanSense™ Fan Monitor, Auto-shutdown                               | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC649B  | Fan Manager                   | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 400                         | FanSense™ Fan Monitor, Auto-shutdown, Fan auto-restart             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| TC650   | Fan Manager                   | ±1                    | ±3                           | -40 to +125                    | +2.8 to +5.5  | 90                          | Overtemperature alert  | 8-pin MSOP                         |
| TC651   | Fan Manager                   | ±1                    | ±3                           | -40 to +125                    | +2.8 to +5.5  | 90                          | Overtemperature alert, Auto-shutdown                               | 8-pin MSOP                         |
| TC652   | Fan Manager                   | ±1                    | ±3                           | -40 to +125                    | +2.8 to +5.5  | 90                          | FanSense™ Fan Monitor, Overtemperature alert                       | 8-pin MSOP                         |
| TC653   | Fan Manager                   | ±1                    | ±3                           | -40 to +125                    | +2.8 to +5.5  | 90                          | FanSense™ Fan Monitor, Overtemperature alert, Auto-shutdown        | 8-pin MSOP                         |
| TC654   | Dual SMBus Fan Manager        | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 320                         | FanSense™ Fan Monitor, RPM data                                    | 10-pin MSOP                        |
| TC655   | Dual SMBus Fan Manager        | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 320                         | FanSense™ Fan Monitor, RPM data, Overtemperature alert             | 10-pin MSOP                        |
| TC664   | Single SMBus Fan Manager      | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 320                         | FanSense™ Fan Monitor, RPM data                                    | 10-pin MSOP                        |
| TC665   | Single SMBus Fan Manager      | Note 1                | Note 1                       | -40 to +85                     | +3.0 to +5.5  | 320                         | FanSense™ Fan Monitor, RPM data, Overtemperature alert             | 10-pin MSOP                        |
| TC670   | Predictive Fan Fault Detector | N/A                   | N/A                          | -40 to +85                     | +3.0 to +5.5  | 150                         | FanSense™ Fan Monitor, Programmable threshold                      | 6-pin SOT23                        |

Note 1: These devices use an external temperature sensor. Accuracy of the total solution is a function of the accuracy of the external sensor.

## MOTOR DRIVERS

### MOTOR DRIVER PRODUCTS: Stepper Motors, DC Motors and 3-Phase BLDC Motors

| Part #    | Motor Type                                 | Input Voltage Range (V) | Internal/External FETs | Output Current (mA) | Control Scheme   | Motor Speed Output  | Protections   | Temperature Operating Range (°C) | Features  | Packages                     |
|-----------|--|-------------------------|------------------------|---------------------|--|---------------------|---|----------------------------------|---|------------------------------|
| MTD6505   | 3-Phase Brushless DC Motor                 | 2.0 to 5.5              | Internal               | 750                 | Sensorless Sinusoidal                                  | Frequency Generator | Overcurrent, Overvoltage, Short Circuit, Overtemperature, Motor Lock-up | -40 to +125                      | 180° Sinusoidal Sensorless Drive, Direction Control, Programmable BEMF Coefficient Range                          | 10-pin 3 × 3 UDFN            |
| MTS62C19A | One Bipolar Stepper Motor or Two DC Motors | 10.0 to 40.0            | Internal               | 750                 | Direct PWM Input, Current Limit Control, Microstepping | No                  | Overtemperature, Under Voltage  | -20 to +85                       | Dual Full Bridge Motor Driver for Stepper Motors, Pin compatible with Allegro 6219                                | 24-pin SOIC                  |
| MTS2916A  | One Bipolar Stepper Motor or Two DC Motors | 10.0 to 40.0            | Internal               | 750                 | Direct PWM Input, Current Limit Control, Microstepping | No                  | Overtemperature, Under Voltage  | -20 to +85                       | Dual Full Bridge Motor Driver for Stepper Motors, Pin compatible with Allegro 2916                                | 24-pin SOIC                  |
| MTD6501C  | 3-Phase Brushless DC Motor                 | 2.0 to 14.0             | Internal               | 800                 | Sensorless Sinusoidal                                  | Frequency Generator | Short Circuit Overtemperature, Motor Lock-up                            | -30 to +95                       | 3-Phase BLDC Sinusoidal Sensorless Fan Motor Driver, Overcurrent limitation, Output Switching Frequency at 20 kHz | Thermally Enhanced 8-pin SOP |
| MTD6501D  | 3-Phase Brushless DC Motor                 | 2.0 to 14.0             | Internal               | 500                 | Sensorless Sinusoidal                                  | Frequency Generator | Short Circuit Overtemperature, Motor Lock-up                            | -30 to +95                       | 3-Phase BLDC Sinusoidal Sensorless Fan Motor Driver, Overcurrent limitation, Output Switching Frequency at 20 kHz | 10-pin MSOP                  |
| MTD6501G  | 3-Phase Brushless DC Motor                 | 2.0 to 14.0             | Internal               | 500                 | Sensorless Sinusoidal                                  | Frequency Generator | Short Circuit Overtemperature, Motor Lock-up                            | -30 to +95                       | 3-Phase BLDC Sinusoidal Sensorless Fan Motor Driver, Overcurrent limitation, Output Switching Frequency at 23 kHz | 10-pin MSOP                  |
| MTD6502B  | 3-Phase Brushless DC Motor                 | 2.0 to 5.5              | Internal               | 750                 | Sensorless Sinusoidal                                  | Frequency Generator | Short Circuit Overtemperature, Motor Lock-up                            | -40 to +85                       | 3-Phase BLDC Sinusoidal Sensorless Fan Motor Driver, Direction control, Overcurrent limitation                    | 10-pin TDFN 3 × 3            |

## POWER MANAGEMENT

### POWER MANAGEMENT: Voltage References

| Part #  | Vcc Range (V) | Output Voltage (V) | Max. Load Current (mA) | Initial Accuracy (max.%) | Temperature Coefficient (ppm/°C) | Maximum Supply Current (µA @ 25°C) | Packages                   |
|---------|---------------|--------------------|------------------------|--------------------------|----------------------------------|------------------------------------|----------------------------|
| MCP1525 | 2.7 to 5.5    | 2.5                | ±2                     | ±1                       | 50                               | 100                                | 3-pin TO-92, 3-pin SOT-23B |
| MCP1541 | 4.3 to 5.5    | 4.096              | ±2                     | ±1                       | 50                               | 100                                | 3-pin TO-92, 3-pin SOT-23B |

### POWER MANAGEMENT: Linear Regulators

| Part #   | Max. Input Voltage (V) | Output Voltage (V)                                | Output Current (mA) | Junction Temperature Range (°C) | Typical Active Current (µA) | Typical Dropout Voltage @ Max. Iout (mV) | Typical Output Voltage Accuracy (%) | Features  | Packages                    |
|--|------------------------|---|---------------------|---------------------------------|-----------------------------|--|-------------------------------------|---|-----------------------------|
| <b>50 mA to 250 mA Low-Dropout Linear Regulators</b> |                        |   |                     |                                 |                             |  |                                     |   |                             |
| TC2014   | 6.0                    | 1.8, 2.7, 2.8, 3.0, 3.3                           | 50                  | -40 to +125                     | 55                          | 45                                       | ±0.4                                | Ceramic output capacitor stable, Shutdown, Reference bypass input | 5-pin SOT-23A               |
| TC1014   | 6.0                    | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 50                  | -40 to +125                     | 50                          | 85                                       | ±0.5                                | Shutdown, Reference bypass input                                  | 5-pin SOT-23A               |
| TC2054   | 6.0                    | 1.8, 2.7, 2.8, 3.0, 3.3                           | 50                  | -40 to +125                     | 55                          | 45                                       | ±0.4                                | Ceramic output capacitor stable, Shutdown, Error output           | 5-pin SOT-23A               |
| TC1054   | 6.0                    | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 50                  | -40 to +125                     | 50                          | 85                                       | ±0.5                                | Shutdown, Error output  | 5-pin SOT-23A               |
| TC1070   | 6.0                    | 1.23 → VIN  | 50                  | -40 to +125                     | 50                          | 85                                       | -                                   | Shutdown, Adjustable  | 5-pin SOT-23A               |
| TC1072   | 6.0                    | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0      | 50                  | -40 to +125                     | 50                          | 85                                       | ±0.5                                | Shutdown, Reference bypass input, Error output                    | 6-pin SOT-23A               |
| TC1223   | 6.0                    | 2.5, 2.7, 2.8, 3.0, 3.3, 3.6, 4.0, 5.0            | 50                  | -40 to +125                     | 50                          | 85                                       | ±0.5                                | Shutdown  | 5-pin SOT-23A               |
| MCP1790  | 30                     | 3.0, 3.3, 5.0                                     | 70                  | -40 to +125                     | 70                          | 500                                      | ±0.2                                | Ceramic output capacitor stable                                   | 3-pin SOT-223, 3-pin DDPACK |
| MCP1791  | 30                     | 3.0, 3.3, 5.0                                     | 70                  | -40 to +125                     | 70                          | 500                                      | ±0.2                                | Ceramic output capacitor stable, Shutdown, Power good             | 5-pin SOT-223, 5-pin DDPACK |
| TC1016   | 6.0                    | 1.8, 2.7, 2.8, 3.0                                | 80                  | -40 to +125                     | 50                          | 150                                      | ±0.5                                | Ceramic output capacitor stable, Shutdown                         | 5-pin SC-70, 5-pin SOT-23A  |
| TC2015   | 6.0                    | 1.8, 2.5, 2.6, 2.7, 2.8, 2.85, 3.0, 3.3, 5.0      | 100                 | -40 to +125                     | 55                          | 90                                       | ±0.4                                | Ceramic output capacitor stable, Shutdown, Reference bypass input | 5-pin SOT-23A               |
| TC1015   | 6.0                    | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0 | 100                 | -40 to +125                     | 50                          | 180                                      | ±0.5                                | Shutdown, Reference bypass input                                  | 5-pin SOT-23A               |

## 50 mA to 250 mA Low-Dropout Linear Regulators (Continued)

| Part #                                      | Max. Input Voltage (V) | Output Voltage (V)   | Output Current (mA) | Junction Temperature Range (°C) | Typical Active Current (µA) | Typical Dropout Voltage @ Max. I <sub>out</sub> (mV) | Typical Output Voltage Accuracy (%) | Features  | Packages  |
|---|------------------------|--|---------------------|---------------------------------|-----------------------------|--|-------------------------------------|---|---|
| TC2055                                      | 6.0                    | 1.8, 2.7, 2.8, 3.0, 3.3  | 100                 | -40 to +125                     | 55                          | 90   | ±0.4                                | Ceramic output capacitor stable, Shutdown, Error output                               | 5-pin SOT-23A   |
| TC1055                                      | 6.0                    | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0                  | 100                 | -40 to +125                     | 50                          | 180  | ±0.5                                | Shutdown, Error output  | 5-pin SOT-23A   |
| TC1071                                      | 6.0                    | 1.23 → V <sub>IN</sub>   | 100                 | -40 to +125                     | 50                          | 180  | -                                   | Shutdown, Adjustable  | 5-pin SOT-23A   |
| TC1073                                      | 6.0                    | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0                       | 100                 | -40 to +125                     | 50                          | 180  | ±0.5                                | Shutdown, Reference bypass input, Error output  | 6-pin SOT-23A   |
| TC1224                                      | 6.0                    | 2.5, 2.7, 2.8, 3.0, 3.3, 3.6, 4.0, 5.0                             | 100                 | -40 to +125                     | 50                          | 180  | ±0.5                                | Shutdown  | 5-pin SOT-23A   |
| TC1188                                      | 6.0                    | 1.8, 2.8, 2.84, 3.15   | 120                 | -40 to +125                     | 50                          | 130  | ±0.5                                | Shutdown  | 5-pin SOT-23A   |
| TC1189                                      | 6.0                    | 1.8, 2.8, 2.84, 3.15   | 120                 | -40 to +125                     | 50                          | 130  | ±0.5                                | Shutdown  | 5-pin SOT-23A   |
| TC2185                                      | 6.0                    | 1.8, 2.7, 2.8, 3.0, 3.3  | 150                 | -40 to +125                     | 55                          | 140  | ±0.4                                | Ceramic output capacitor stable, Shutdown, Reference bypass input                     | 5-pin SOT-23A   |
| TC1185                                      | 6.0                    | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0                  | 150                 | -40 to +125                     | 50                          | 270  | ±0.5                                | Shutdown, Reference bypass input  | 5-pin SOT-23A   |
| TC2186                                      | 6.0                    | 1.8, 2.7, 2.8, 3.0, 3.3  | 150                 | -40 to +125                     | 55                          | 140  | ±0.4                                | Ceramic output capacitor stable, Shutdown, Error output                               | 5-pin SOT-23A   |
| TC1186                                      | 6.0                    | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0                  | 150                 | -40 to +125                     | 50                          | 270  | ±0.5                                | Shutdown, Error output  | 5-pin SOT-23A   |
| TC1187                                      | 6.0                    | 1.23 → V <sub>IN</sub>   | 150                 | -40 to +125                     | 50                          | 270  | -                                   | Shutdown, Adjustable  | 5-pin SOT-23A   |
| TC1017                                      | 6.0                    | 1.8, 2.6, 2.7, 2.8, 2.85, 2.9, 3.3, 3.4                            | 150                 | -40 to +125                     | 53                          | 285  | ±0.5                                | Ceramic output capacitor stable, Shutdown   | 5-pin SOT-23A, 5-pin SC-70                                  |
| MCP1754                                     | 16                     | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0                  | 150                 | -40 to +125                     | 56                          | 300  | ±2                                  | 70 dB PSRR  | 5-pin SOT-23, 5-pin SOT-89, 5-pin SOT-223, 8-pin 2 x 3 TDFN |
| MCP1754S                                    | 16                     | 1.8, 2.5, 2.7, 2.8, 2.85, 3.0, 3.3, 3.6, 4.0, 5.0                  | 150                 | -40 to +125                     | 56                          | 300  | ±2                                  | 70 dB PSRR  | 3-pin SOT-23, 3-pin SOT-89, 3-pin SOT-223, 8-pin 2 x 3 TDFN |
| MCP1801                                     | 10                     | 0.9, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0, 6.0                             | 150                 | -40 to +85                      | 25                          | 250  | ±0.4                                | Ceramic output capacitor stable, Shutdown, High PSRR                                  | 5-pin SOT-23A   |
| MCP1804                                     | 28                     | 1.8 to 18  | 150                 | -40 to +85                      | 50                          | 1300   | ±2                                  | Shutdown, High PSRR   | 5-pin SOT-23, 5-pin SOT-89, 3-pin SOT-89, 3-pin SOT-223     |
| MCP1700                                     | 6.0                    | 1.2, 1.8, 2.5, 3.0, 3.3, 5.0                                       | 250                 | -40 to +125                     | 1.6                         | 300  | ±0.4                                | 1.0 µF ceramic cap stable, Short-circuit protection                                   | 3-pin TO-92, 3-pin SOT-23A, 3-pin SOT-89                    |
| MCP1701A                                    | 10                     | 1.8, 2.5, 3.0, 3.3, 5.0  | 250                 | -40 to +85                      | 1.6                         | 380  | ±0.5                                | 10V max. input voltage  | 3-pin TO-92, 3-pin SOT-23A, 3-pin SOT-89                    |
| MCP1702                                     | 13.2                   | 1.2, 1.5, 1.8, 2.5, 2.8, 3.0, 3.3, 4.0, 5.0                        | 250                 | -40 to +125                     | 2                           | 650  | ±0.4                                | Ceramic output capacitor stable, Ultra-low ground current, 13.2V V <sub>IN</sub> max. | 3-pin TO-92, 3-pin SOT-23A, 3-pin SOT-89                    |
| MCP1703                                     | 16                     | 1.2, 1.5, 1.8, 2.5, 2.8, 3.0, 3.3, 4.0, 5.0                        | 250                 | -40 to +125                     | 2                           | 650  | ±0.4                                | Ceramic output capacitor stable, Ultra-low ground current, 16V V <sub>IN</sub> max.   | 3-pin SOT-23A, 3-pin SOT-223                                |
| MCP1703A                                    | 16                     | 1.2, 1.5, 1.8, 2.5, 2.8, 3.0, 3.3, 4.0, 5.0                        | 250                 | -40 to +125                     | 2                           | 650  | ±0.4                                | Ceramic output capacitor stable, Ultra-low ground current                             | 3-pin SOT-23A, 3-pin SOT-89, 3-pin SOT-223, 8-pin 2 x 3 DFN |
| <b>300 mA Low-Dropout Linear Regulators</b> |                        |  |                     |                                 |                             |  |                                     |   |   |
| TC1107                                      | 6.0                    | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0                                       | 300                 | -40 to +125                     | 50                          | 240  | ±0.5                                | Shutdown, Reference bypass input  | 8-pin MSOP, 8-pin SOIC                                      |
| TC1108                                      | 6.0                    | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0                                       | 300                 | -40 to +125                     | 50                          | 240  | ±0.5                                | Shutdown, Reference bypass input, Error output  | 3-pin SOT-223   |
| TC1173                                      | 6.0                    | 2.5, 2.7, 2.8, 3.0, 3.3, 5.0                                       | 300                 | -40 to +125                     | 50                          | 240  | ±0.5                                | Shutdown, Reference bypass input, Error output  | 8-pin MSOP, 8-pin SOIC                                      |
| TC1174                                      | 6.0                    | 1.23 → V <sub>IN</sub>   | 300                 | -40 to +125                     | 50                          | 240  | -                                   | Shutdown, Reference bypass input, Adjustable  | 8-pin MSOP, 8-pin SOIC                                      |
| TC1269                                      | 6.0                    | 2.5, 2.8, 3.0, 3.3, 5.0  | 300                 | -40 to +125                     | 50                          | 240  | ±0.5                                | Shutdown, Reference bypass input  | 8-pin MSOP  |
| MCP1802                                     | 10                     | 0.9, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0, 6.0                             | 300                 | -40 to +85                      | 25                          | 250  | ±0.4                                | Ceramic output capacitor stable, Shutdown, High PSRR                                  | 5-pin SOT-23A   |
| MCP1824                                     | 6.0                    | Fixed: 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0<br>Adjustable: 0.8 to 5.0 | 300                 | -40 to +125                     | 120                         | 200  | ±0.5                                | Ceramic output capacitor stable, Shutdown, Power good                                 | 5-pin SOT-223, 5-pin SOT-23                                 |
| MCP1824S                                    | 6.0                    | 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0                                  | 300                 | -40 to +125                     | 120                         | 200  | ±0.5                                | Ceramic output capacitor stable   | 3-pin SOT-223   |

| POWER MANAGEMENT: Linear Regulators (Continued)                     |                        |  |                        |                                 |                             |  |                                     |   |  |
|---|------------------------|--|------------------------|---------------------------------|-----------------------------|--|-------------------------------------|---|--|
| Part #  | Max. Input Voltage (V) | Output Voltage (V)   | Output Current (mA)    | Junction Temperature Range (°C) | Typical Active Current (µA) | Typical Dropout Voltage @ Max. I <sub>out</sub> (mV) | Typical Output Voltage Accuracy (%) | Features  | Packages                                 |
| <b>500 mA to 800 mA Low-Dropout Linear Regulators</b>               |                        |  |                        |                                 |                             |  |                                     |   |  |
| TC1262  | 6.0                    | 2.5, 2.8, 3.0, 3.3, 5.0  | 500                    | -40 to +125                     | 80                          | 350  | ±0.5                                | Overtemperature protection, Overcurrent protection  | 3-pin TO-220, 3-pin DDPAK, 3-pin SOT-223 |
| TC1263  | 6.0                    | 2.5, 2.8, 3.0, 3.3, 5.0  | 500                    | -40 to +125                     | 80                          | 350  | ±0.5                                | Shutdown, Reference bypass input, Error output  | 8-pin SOIC, 5-pin TO-220, 5-pin DDPAK    |
| TC1268  | 6.0                    | 2.5  | 500                    | -40 to +125                     | 80                          | 350  | ±0.5                                | Shutdown, Reference bypass input, Error output  | 8-pin SOIC                               |
| MCP1725   | 6.0                    | 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0                                  | 500                    | -40 to +125                     | 120                         | 210  | ±0.5                                | Ceramic output capacitor stable, Shutdown, C <sub>DELAY</sub> , Power good                            | 8-pin 2x3 DFN, 8-pin SOIC                |
| MCP1825   | 6.0                    | Fixed: 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0<br>Adjustable: 0.8 to 5.0 | 500                    | -40 to +125                     | 120                         | 210  | ±0.5                                | Ceramic output capacitor stable, Shutdown, Power good   | 5-pin TO-220, 5-pin DDPAK, 5-pin SOT-223 |
| MCP1825S  | 6.0                    | 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0                                  | 500                    | -40 to +125                     | 120                         | 210  | ±0.5                                | Ceramic output capacitor stable   | 3-pin TO-220, 3-pin DDPAK, 3-pin SOT-223 |
| TC1264  | 6.0                    | 1.8, 2.5, 3.0, 3.3   | 800                    | -40 to +125                     | 80                          | 450  | ±0.5                                | Overtemperature protection, Overcurrent protection  | 3-pin TO-220, 3-pin DDPAK, 3-pin SOT-223 |
| TC1265  | 6.0                    | 1.8, 2.5, 3.0, 3.3   | 800                    | -40 to +125                     | 80                          | 450  | ±0.5                                | Shutdown, Reference bypass input, Error output  | 8-pin SOIC, 5-pin TO-220, 5-pin DDPAK    |
| TC2117  | 6.0                    | 1.8, 2.5, 3.0, 3.3   | 800                    | -40 to +125                     | 80                          | 600  | ±0.5                                | Overtemperature protection, Overcurrent protection  | 3-pin SOT-223, 3-pin DDPAK               |
| <b>1A and Above Low-Dropout Linear Regulators</b>                   |                        |  |                        |                                 |                             |  |                                     |   |  |
| MCP1726   | 6.0                    | Fixed: 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0<br>Adjustable: 0.8 to 5.0 | 1000                   | -40 to +125                     | 140                         | 300  | ±0.4                                | Ceramic output capacitor stable, Shutdown, C <sub>DELAY</sub> , Power good                            | 8-pin 3 x 3 DFN, 8-pin SOIC              |
| MCP1826   | 6.0                    | Fixed: 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0<br>Adjustable: 0.8 to 5.0 | 1000                   | -40 to +125                     | 140                         | 300  | ±0.5                                | Ceramic output capacitor stable, Shutdown, Power good   | 5-pin TO-220, 5-pin DDPAK, 5-pin SOT-223 |
| MCP1826S  | 6.0                    | 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0                                  | 1000                   | -40 to +125                     | 140                         | 300  | ±0.5                                | Ceramic output capacitor stable   | 3-pin TO-220, 3-pin DDPAK, 3-pin SOT-223 |
| MCP1727   | 6.0                    | Fixed: 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0<br>Adjustable: 0.8 to 5.0 | 1500                   | -40 to +125                     | 140                         | 330  | ±0.5                                | Ceramic output capacitor stable, Shutdown, C <sub>DELAY</sub> , Power good                            | 8-pin 3 x 3 DFN, 8-pin SOIC              |
| MCP1827   | 6.0                    | Fixed: 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0<br>Adjustable: 0.8 to 5.0 | 1500                   | -40 to +125                     | 140                         | 330  | ±0.5                                | Ceramic output capacitor stable, Shutdown, Power good   | 5-pin DDPAK, 5-pin TO-220                |
| MCP1827S  | 6.0                    | 0.8, 1.2, 1.8, 2.5, 3.0, 3.3, 5.0                                  | 1500                   | -40 to +125                     | 140                         | 330  | ±0.5                                | Ceramic output capacitor stable   | 3-pin DDPAK, 3-pin TO-220                |
| <b>Application Specific Low-Dropout Linear Regulators</b>           |                        |  |                        |                                 |                             |  |                                     |   |  |
| TC1266  | 6.0                    | 3.3  | 200                    | -5 to +70                       | 230                         | 200  | ±1.0                                | PCI compliant   | 8-pin SOIC, 8-pin MSOP                   |
| TC1267  | 6.0                    | 3.3  | 400                    | -5 to +70                       | 230                         | 300  | ±1.0                                | PCI compliant   | 5-pin DDPAK                              |
| TC57  | 8                      | 2.5, 3.0, 3.3  | 4,000 <sup>(1)</sup>   | -40 to +85                      | 50                          | 100 <sup>(1)</sup>                                   | ±2.0                                | Shutdown, External transistor   | 5-pin SOT-23A                            |
| TC59  | -10                    | -3.0, -5.0   | 100                    | -40 to +85                      | 3                           | 380  | ±0.5                                | Negative LDO  | 3-pin SOT-23A                            |
| Note 1: Depending on external transistor configuration.             |                        |  |                        |                                 |                             |  |                                     |   |  |
| <b>POWER MANAGEMENT: Low-Dropout Regulator Combination Products</b> |                        |  |                        |                                 |                             |  |                                     |   |  |
| TC1300 <sup>(1)</sup>   | 6.0                    | 2.5, 2.7, 2.8, 2.85, 3.0, 3.3                                      | 300                    | -40 to +125                     | 80                          | 210  | ±0.5                                | Shutdown, Reference bypass input, LDO plus Reset output   | 8-pin MSOP                               |
| TC1301A <sup>(1)</sup>  | 6.0                    | LD01: 1.5-3.3<br>LD02: 1.5-3.3                                     | LD01: 300<br>LD02: 150 | -40 to +125                     | 103                         | LD01: 104<br>LD02: 150                               | ±0.5                                | Dual LDO plus Reset output, Shutdown, Reference bypass, Voltage detect                                | 8-pin MSOP, 8-pin 3 x 3 DFN              |
| TC1301B <sup>(1)</sup>  | 6.0                    | LD01: 1.5-3.3<br>LD02: 1.5-3.3                                     | LD01: 300<br>LD02: 150 | -40 to +125                     | 114                         | LD01: 104<br>LD02: 150                               | ±0.5                                | Dual LDO plus Reset, per channel output shutdown, Reference bypass                                    | 8-pin MSOP, 8-pin 3 x 3 DFN              |
| TC1302A <sup>(1)</sup>  | 6.0                    | LD01: 1.5-3.3<br>LD02: 1.5-3.3                                     | LD01: 300<br>LD02: 150 | -40 to +125                     | 103                         | LD01: 104<br>LD02: 150                               | ±0.5                                | Dual LDO, Output shutdown reference bypass, Voltage detect  | 8-pin MSOP, 8-pin 3 x 3 DFN              |
| TC1302B <sup>(1)</sup>  | 6.0                    | LD01: 1.5-3.3<br>LD02: 1.5-3.3                                     | LD01: 300<br>LD02: 150 | -40 to +125                     | 114                         | LD01: 104<br>LD02: 150                               | ±0.5                                | Dual LDO, per channel output shutdown, Reference bypass   | 8-pin MSOP, 8-pin 3 x 3 DFN              |
| TC1305  | 6.0                    | 2.5, 2.8, 3.0  | 150 <sup>(1)</sup>     | -40 to +125                     | 120                         | 240  | ±0.5                                | Dual LDO plus Reset output, Reference bypass input, Shutdown, Select Mode™ selectable output voltages | 10-pin MSOP                              |

Note 1: Depending on external transistor configuration.



**POWER MANAGEMENT: Low-Dropout Regulator Combination Products (Continued)**

| Part #                | Max. Input Voltage (V) | Output Voltage (V) | Output Current (mA) | Junction Temperature Range (°C) | Typical Active Current (µA) | Typical Dropout Voltage @ Max. Load (mV) | Typical Output Voltage Accuracy (%) | Features  | Packages    |
|-----------------------|------------------------|--------------------|---------------------|---------------------------------|-----------------------------|--|-------------------------------------|---|-------------|
| TC1306                | 6.0                    | 1.8, 2.8, 3.0      | 150 <sup>(1)</sup>  | -40 to +125                     | 120                         | 240                                      | ±0.5                                | Dual LDO plus Reset output, Shutdown, Select Mode™ selectable output voltages | 8-pin MSOP  |
| TC1307 <sup>(1)</sup> | 6.0                    | 1.8, 2.5, 2.8, 3.0 | 150 <sup>(1)</sup>  | -40 to +125                     | 220                         | 200                                      | ±0.5                                | Quad LDO plus Reset output, Shutdown, Select Mode™ selectable output voltages | 16-pin QSOP |

Note 1: LDOs with shutdown (except Power Management Combination Products as indicated) have typical shutdown currents of 0.05 mA.

**POWER MANAGEMENT: Switching Regulators**

| Part #        | Description                | Input Voltage Range (V) | Output Voltage (V)      | Operating Temperature Range (°C) | Control Scheme                 | Switching Frequency (kHz) | Typical Active Current (µA) | Output Current (mA) | Features  | Packages                          |
|---------------|----------------------------|-------------------------|-------------------------|----------------------------------|--------------------------------|---------------------------|-----------------------------|---------------------|---|-----------------------------------|
| MCP1601       | Synchronous Buck Regulator | 2.7 to 5.5              | 0.9V to V <sub>IN</sub> | -40 to +85                       | PFM/PWM/LDO                    | 750                       | 825 (PWM)<br>125 (PFM)      | 500                 | UVLO, Auto-switching, LDO   | 8-pin MSOP                        |
| MCP1602       | Synchronous Buck Regulator | 2.7 to 5.5              | 0.8 to 4.5              | -40 to +85                       | PFM/PWM                        | 2000                      | 35                          | 500                 | PFM, PWM auto-switching, UVLO, Soft start, Power good indicator   | 10-pin MSOP,<br>10-pin 3 x 3 DFN  |
| MCP1603       | Synchronous Buck Regulator | 2.7 to 5.5              | 0.8 to 4.0              | -40 to +85                       | PFM/PWM                        | 2000                      | 45                          | 500                 | Overtemperature and Overcurrent protection  | 5-pin TSOT-23,<br>8-pin 2 x 3 DFN |
| MCP1642       | Synchronous Buck Regulator | 2.7 to V <sub>IN</sub>  | 0.8 to 5.5              | -40 to +85                       | Constant frequency, PWM        | 1400                      | 10,000                      | 1000                | Overall efficiency > 94%, Soft start, Overtemperature and Overcurrent protection  | 8-pin MSOP,<br>8-pin 3 x 3 DFN    |
| MCP1623/4     | Step-up DC/DC Regulator    | 0.65 to 6               | 2.0 to 5.5              | -40 to +85                       | PWM or PFM/PRM                 | 500                       | 19                          | 175                 | Integrated synchronous boost regulator, 0.65V start-up voltage, Soft start, True load disconnect                                  | 6-pin SOT-23,<br>8-pin 2 x 3 DFN  |
| MCP1640/B/C/D | Step-up DC/DC Regulator    | 0.65 to 6               | 2.0 to 5.5              | -40 to +85                       | PWM or PFM/PRM                 | 500                       | 19                          | 350                 | Integrated synchronous boost regulator, 0.65V start-up voltage, Soft start, True load disconnect or input-to-output bypass option | 6-pin SOT-23,<br>8-pin 2 x 3 DFN  |
| MCP1650       | Step-up DC/DC Controller   | 2.7 to 5.5              | 2.5 to ext. tx limited  | -40 to +125                      | Constant frequency             | 750                       | 120                         | 560/440             | 2 duty cycles for min. and max. loads, Shutdown control, UVLO, Soft start   | 8-pin MSOP                        |
| MCP1651       | Step-up DC/DC Controller   | 2.7 to 5.5              | 2.5 to ext. tx limited  | -40 to +125                      | Constant frequency, 2 fixed DC | 750                       | 120                         | 560/440             | 2 duty cycles for min. and max. loads, Shutdown control, low battery detect, UVLO, Soft start                                     | 8-pin MSOP                        |
| MCP1652       | Step-up DC/DC Controller   | 2.7 to 5.5              | 2.5 to ext. tx limited  | -40 to +125                      | Constant frequency, 2 fixed DC | 750                       | 120                         | 560/440             | 2 duty cycles for min. and max. loads, Shutdown control, Power good indicator, UVLO, Soft start                                   | 8-pin MSOP                        |
| MCP1653       | Step-up DC/DC Controller   | 2.7 to 5.5              | 2.5 to ext. tx limited  | -40 to +125                      | Constant frequency, 2 fixed DC | 750                       | 120                         | 560/440             | 2 duty cycles for min. and max. loads, Shutdown control, Power good indicator, UVLO, Soft start                                   | 10-pin MSOP                       |
| MCP16301      | 30V Input Buck Regulator   | 4.0 to 30               | 2.0 to 15               | -40 to +85                       | PWM                            | 500                       | 2000                        | 600                 | Integrated N-channel, UVLO, Soft start, Overtemperature protection  | SOT23-6                           |
| MCP16321      | Synchronous Buck Regulator | 6 to 24                 | 0.9 to 5                | -40 to +125                      | PWM/PRM                        | 1000                      | 2300                        | 1000                | Integrated switches, Internal compensation, Peak current mode control, Soft-start, UVLO, Power good pin                           | 16-pin 3 x 3 QFN                  |
| MCP16322      | Synchronous Buck Regulator | 6 to 24                 | 0.9 to 5                | -40 to +125                      | PWM/PRM                        | 1000                      | 2300                        | 2000                | Integrated switches, Internal compensation, Peak current mode control, Soft-start, UVLO, Power good pin                           | 16-pin 3 x 3 QFN                  |
| MCP16323      | Synchronous Buck Regulator | 6 to 18                 | 0.9 to 5                | -40 to +125                      | PWM/PRM                        | 1000                      | 2300                        | 3000                | Integrated switches, Internal compensation, Peak current mode control, Soft-start, UVLO, Power good pin                           | 16-pin 3 x 3 QFN                  |
| TC105         | Step-down DC/DC Controller | 2.2 to 10               | 3.0, 3.3, 5.0           | -40 to +85                       | PFM/PWM                        | 300                       | 57                          | 1,000               | Low power shutdown mod  | 5-pin SOT-23A                     |
| TC115         | Step-up DC/DC Regulator    | 0.9 to 10               | 3.0, 3.3, 5.0           | -40 to +85                       | PFM/PWM                        | 100                       | 80                          | 140                 | Feedback voltage sensing, Low power shutdown mode   | 5-pin SOT-89                      |
| TC110         | Step-up DC/DC Controller   | 2.0 to 10               | 3.0, 3.3, 5.0           | -40 to +85                       | PFM/PWM                        | 100/300                   | 50/120                      | 300                 | Soft start, Low power shutdown mode   | 5-pin SOT-23A                     |

**POWER MANAGEMENT: Switching Regulators Combination Products**

|        |   |            |                                      |            |         |      |        |                              |   |                                  |
|--------|---|------------|--------------------------------------|------------|---------|------|--------|------------------------------|---|----------------------------------|
| TC1303 | Synchronous Buck Regulator, LDO w/ Power good | 2.7 to 5.5 | DC/DC: 0.8 to 4.5<br>LDO: 1.5 to 3.3 | -40 to +85 | PFM/PWM | 2000 | 65/600 | DC/DC: 500 mA<br>LDO: 300 mA | PFM/PWM auto-switching, Power good output | 10-pin MSOP,<br>10-pin 3 x 3 DFN |
| TC1304 | Synchronous Buck Regulator, LDO               | 2.7 to 5.5 | DC/DC: 0.8 to 4.5<br>LDO: 1.5 to 3.3 | -40 to +85 | PFM/PWM | 2000 | 65/600 | DC/DC: 500 mA<br>LDO: 300 mA | PFM/PWM auto-switching, Power sequencing  | 10-pin MSOP,<br>10-pin 3 x 3 DFN |
| TC1313 | Synchronous Buck Regulator, LDO               | 2.7 to 5.5 | DC/DC: 0.8 to 4.5<br>LDO: 1.5 to 3.3 | -40 to +85 | PFM/PWM | 2000 | 65/600 | DC/DC: 500 mA<br>LDO: 300 mA | PFM/PWM auto-switching                    | 10-pin MSOP,<br>10-pin 3 x 3 DFN |

**POWER MANAGEMENT: PWM Controllers**

| Part #     | Description  | Input Voltage Range (V) | Operating Temp. Range (°C) | Switching Frequency (kHz) | Typical Active Current (mA) | Features   | Packages                                    |
|------------|--|-------------------------|----------------------------|---------------------------|-----------------------------|--|---|
| MCP1630    | Current mode, high-speed PWM to use with PIC® MCUs | 3.0 to 5.5              | -40 to +125                | 1000                      | 2.8                         | UVLO, Short circuit and Overtemperature protection, Integrated MOSFET driver   | 8-pin MSOP, 8-pin 2 x 3 DFN                 |
| MCP1630V   | Voltage mode, high-speed PWM to use with PIC® MCUs | 3.0 to 5.5              | -40 to +125                | 1000                      | 2.8                         | UVLO, Short circuit and Overtemperature protection, Integrated MOSFET driver   | 8-pin MSOP, 8-pin 2 x 3 DFN                 |
| MCP1631    | Current mode, high-speed PWM to use with PIC® MCUs | 3.0 to 5.5              | -40 to +125                | 2000                      | 3.7                         | UVLO, Integrated error, current and voltage sense amplifiers, Overvoltage comparator and MOSFET driver                     | 20-pin SSOP, 20-pin TSSOP, 20-pin 4 x 4 QFN |
| MCP1631HV  | Current mode, high-speed PWM to use with PIC® MCUs | 3.5 to 16               | -40 to +125                | 2000                      | 3.7                         | Integrated 16V LDO, UVLO, integrated error, Current and voltage sense amplifiers, Overvoltage comparator and MOSFET driver | 20-pin SSOP, 20-pin TSSOP                   |
| MCP1631V   | Voltage mode, high-speed PWM to use with PIC® MCUs | 3.0 to 5.5              | -40 to +125                | 2000                      | 3.7                         | UVLO, Integrated error, Current and voltage sense amplifiers, Overvoltage comparator and MOSFET driver                     | 20-pin SSOP, 20-pin TSSOP, 20-pin 4 x 4 QFN |
| MCP1631VHV | Voltage mode, high-speed PWM to use with PIC® MCUs | 3.5 to 16               | -40 to +125                | 2000                      | 3.7                         | Integrated 16V LDO, UVLO, integrated error, Current and voltage sense amplifiers, Overvoltage comparator and MOSFET driver | 20-pin SSOP, 20-pin TSSOP                   |

**POWER MANAGEMENT: Charge Pump DC-to-DC Converters**

| Part #                                     | Input Voltage Range (V) | Output Voltage (V)  | Operating Temp. Range (°C) | Maximum Input Current <sup>(1)</sup> (µA) | Typical Active Output Current (mA) | Features                               | Packages                |
|--|-------------------------|---|----------------------------|---|------------------------------------|--|-------------------------|
| <b>Inverting or Doubling Charge Pumps</b>  |                         |   |                            |   |                                    |  |                         |
| TC1044S                                    | 1.5 to 12               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 160                                       | 20                                 | 85 kHz oscillator, Boost mode          | 8-pin PDIP, 8-pin SOIC  |
| TC7660                                     | 1.5 to 10               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 180                                       | 20                                 | 10 kHz oscillator                      | 8-pin PDIP, 8-pin SOIC  |
| TC7660H                                    | 1.5 to 10               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 1,000                                     | 20                                 | 120 kHz oscillator                     | 8-pin PDIP, 8-pin SOIC  |
| TC7660S                                    | 1.5 to 12               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 160                                       | 20                                 | 45 kHz oscillator, Boost mode          | 8-pin PDIP, 8-pin SOIC  |
| TC7662B                                    | 1.5 to 15               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 180                                       | 20                                 | 35 kHz oscillator, Boost mode          | 8-pin PDIP, 8-pin SOIC  |
| TC1240                                     | 2.5 to 4.0              | V <sub>OUT</sub> = 2 V <sub>IN</sub>  | -40 to +85                 | 900                                       | 40                                 | Shutdown, 160 kHz oscillator           | 6-pin SOT-23A           |
| TC1240A                                    | 2.5 to 5.5              | V <sub>OUT</sub> = 2 V <sub>IN</sub>  | -40 to +85                 | 900                                       | 40                                 | Shutdown, 160 kHz oscillator           | 6-pin SOT-23A           |
| TC7662A                                    | 3.0 to 18               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 200                                       | 40                                 | 12 kHz oscillator                      | 8-pin PDIP, 8-pin SOIC  |
| TC962                                      | 3.0 to 18               | V <sub>OUT</sub> = -V <sub>IN</sub> or V <sub>OUT</sub> = 2 V <sub>IN</sub> | -40 to +85                 | 200                                       | 80                                 | Selectable 12 kHz or 24 kHz oscillator | 8-pin PDIP, 16-pin SOIC |
| <b>Inverting and Doubling Charge Pumps</b> |                         |   |                            |   |                                    |  |                         |
| TC682                                      | 2.4 to 5.5              | V <sub>OUT</sub> = -2 V <sub>IN</sub>                                       | -40 to +85                 | 400                                       | 10                                 | 12 kHz oscillator                      | 8-pin PDIP, 8-pin SOIC  |

**Regulated Charge Pumps**

|         |                              |  |            |     |                                   |   |                               |
|---------|------------------------------|--|------------|-----|-----------------------------------|---|-------------------------------|
| MCP1252 | 2.1/2.7 to 5.5<br>2.0 to 5.5 | Selectable 3.3V or 5.0V or Adjustable 1.5V to 5.5V | -40 to +85 | 120 | 120 mA for V <sub>IN</sub> > 3.0V | Power good output, 650 kHz oscillator       | 8-pin MSOP                    |
| MCP1253 | 2.1/2.7 to 5.5<br>2.0 to 5.5 | Selectable 3.3V or 5.0V or Adjustable 1.5V to 5.5V | -40 to +85 | 120 | 120 mA for V <sub>IN</sub> > 3.0V | Power good output, 1 MHz oscillator         | 8-pin MSOP                    |
| MCP1256 | 1.8 to 3.6                   | 3.3  | -40 to +85 | 100 | 100                               | Power good, Sleep mode                      | 10-pin MSOP, 10-pin 3 x 3 DFN |
| MCP1257 | 1.8 to 3.6                   | 3.3  | -40 to +85 | 100 | 100                               | Sleep mode, Low battery indication          | 10-pin MSOP, 10-pin 3 x 3 DFN |
| MCP1258 | 1.8 to 3.6                   | 3.3  | -40 to +85 | 100 | 100                               | Power good output, Input/output bypass      | 10-pin MSOP, 10-pin 3 x 3 DFN |
| MCP1259 | 1.8 to 3.6                   | 3.3  | -40 to +85 | 100 | 100                               | Low battery indication, Input/output bypass | 10-pin MSOP, 10-pin 3 x 3 DFN |

Note 1: Measured at V<sub>DD</sub> = 5.0V at 25°C and no load.

**POWER MANAGEMENT: CPU/System Supervisors**

| Part # | V <sub>CC</sub> Range (V) | Operating Temp. Range (°C) | Nominal Reset Voltage (V)               | Reset Type | Output         | Typical Reset Pulse Width (ms) | Typical Supply Current (µA) | Additional Features | Packages                                | Bond Options |
|--------|---------------------------|----------------------------|---|------------|----------------|--------------------------------|-----------------------------|---------------------|---|--------------|
| MCP102 | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.9 | Active-Low | CMOS Push-Pull | 120                            | 1                           |                     | 3-pin SOT-23B, 3-pin SC-70, 3-pin TO-92 | N/A          |
| MCP103 | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.9 | Active-Low | CMOS Push-Pull | 120                            | 1                           | Max. 809 Pinout     | 3-pin SOT-23B, 3-pin SC-70, 3-pin TO-92 | N/A          |
| MCP121 | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.9 | Active-Low | Open-Drain     | 120                            | 1                           |                     | 3-pin SOT-23B, 3-pin SC-70, 3-pin TO-92 | N/A          |

**POWER MANAGEMENT: CPU/System Supervisors (Continued)**

| Part #   | V <sub>CC</sub> Range (V) | Operating Temp. Range (°C) | Nominal Reset Voltage (V)                 | Reset Type      | Output                        | Typical Reset Pulse Width (ms) | Typical Supply Current (µA) | Additional Features  | Packages                                | Bond Options |
|----------|---------------------------|----------------------------|---|-----------------|-------------------------------|--------------------------------|-----------------------------|--|---|--------------|
| MCP131   | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.9   | Active-Low      | Open-Drain                    | 120                            | 1                           | 100 kW Internal Pull-up Resistor   | 3-pin SOT-23B, 3-pin SC-70, 3-pin TO-92 | N/A          |
| MCP1319  | 1.0 to 5.5                | -40 to +125                | 4.6, 2.9 <sup>(1)</sup>                   | Active-Low/High | CMOS Push-Pull                | 200                            | 1                           | Manual Reset   | 5-pin SOT-23                            | N/A          |
| MCP1316  | 1.0 to 5.5                | -40 to +125                | 4.6, 2.9 <sup>(1)</sup>                   | Active-Low      | CMOS Push-Pull                | 200                            | 5                           | Watchdog Input (WDI), Time-out = 1.6 sec., Manual Reset  | 5-pin SOT-23                            | N/A          |
| MCP1317  | 1.0 to 5.5                | -40 to +125                | 4.6, 2.9 <sup>(1)</sup>                   | Active-High     | CMOS Push-Pull                | 200                            | 5                           | Watchdog Input (WDI), Time-out = 1.6 sec., Manual Reset  | 5-pin SOT-23                            | N/A          |
| MCP1318  | 1.0 to 5.5                | -40 to +125                | 4.6, 2.9 <sup>(1)</sup>                   | Active-Low/High | CMOS Push-Pull                | 200                            | 5                           | Watchdog Input (WDI), Time-out = 1.6 sec., Manual Reset  | 5-pin SOT-23                            | N/A          |
| MCP1320  | 1.0 to 5.5                | -40 to +125                | 4.6, 2.9 <sup>(1)</sup>                   | Active-Low      | Open-Drain                    | 200                            | 5                           | Watchdog Input (WDI), Time-out = 1.6 sec., Manual Reset  | 5-pin SOT-23                            | N/A          |
| MCP1321  | 1.0 to 5.5                | -40 to +125                | 4.6, 2.9 <sup>(1)</sup>                   | Active-Low      | Open-Drain/<br>CMOS Push-Pull | 200                            | 5                           | Watchdog Input (WDI), Time-out = 1.6 sec., Manual Reset (Active-Low Open-Drain, Active-High Push-Pull) | 5-pin SOT-23                            | N/A          |
| TC1270A  | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63              | Active-Low      | CMOS Push-Pull                | 280                            | 7                           | Manual Reset   | 4-pin SOT-143, 5-pin SOT-23             | N/A          |
| TC1271A  | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63              | Active-High     | CMOS Push-Pull                | 280                            | 7                           | Manual Reset   | 4-pin SOT-143, 5-pin SOT-23             | N/A          |
| TC1270AN | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63              | Active-Low      | Open-Drain                    | 0                              | 7                           | Manual Reset   | 4-pin SOT-143, 5-pin SOT-23             | N/A          |
| TCM809   | 1.2 to 5.5                | -40 to +85                 | 4.63, 4.38, 4.00, 3.08, 2.93, 2.63, 2.32  | Active-Low      | CMOS Push-Pull                | 240                            | 12                          | Manual Reset   | 3-pin SOT-23B, 3-pin SC-70              | N/A          |
| TCM810   | 1.2 to 5.5                | -40 to +85                 | 4.63, 4.38, 4.00, 3.08, 2.93, 2.63, 2.32  | Active-High     | CMOS Push-Pull                | 240                            | 12                          | Manual Reset   | 3-pin SOT-23B, 3-pin SC-70              | N/A          |
| MCP100   | 1.0 to 5.5                | -40 to +85                 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active-Low      | CMOS Push-Pull                | 350                            | 45                          | Manual Reset   | 3-pin TO-92, 3-pin SOT-23B              | D, H         |
| MCP809   | 1.0 to 5.5                | -40 to +85                 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active-Low      | CMOS Push-Pull                | 350                            | 45                          | Manual Reset   | 3-pin SOT-23B                           | N/A          |
| MCP101   | 1.0 to 5.5                | -40 to +85                 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active-High     | CMOS Push-Pull                | 350                            | 45                          | Manual Reset   | 3-pin TO-92, 3-pin SOT-23B              | D, H         |
| MCP810   | 1.0 to 5.5                | -40 to +85                 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active-High     | CMOS Push-Pull                | 350                            | 45                          | Manual Reset   | 3-pin SOT-23B                           | N/A          |
| MCP120   | 1.0 to 5.5                | -40 to +85                 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active-Low      | Open-Drain                    | 350                            | 45                          | Manual Reset   | 3-pin TO-92, 3-pin SOT-23, 8-pin SOIC   | D, G, H      |
| MCP130   | 1.0 to 5.5                | -40 to +85                 | 4.72, 4.62, 4.47, 4.37, 3.075, 2.92, 2.62 | Active-Low      | Open-Drain w/5 kOhm Pull-up   | 350                            | 45                          | Manual Reset   | 3-pin TO-92, 3-pin SOT-23, 8-pin SOIC   | D, F, H      |
| TC1232   | 4.5 to 5.5                | -40 to +85                 | 4.62, 4.37                                | Active-Low/High | Open-Drain                    | 610                            | 50                          | Watchdog Timer   | 8-pin PDIP, 8-pin SOIC, 16-pin SOIC     | N/A          |
| TC32M    | 4.5 to 5.5                | -40 to +85                 | 4.5                                       | Active-Low      | Open-Drain                    | 700                            | 50                          | Watchdog Timer   | 3-pin TO-92, 3-pin SOT-223              | N/A          |

Note 1: Other reset voltage options available: 2.0V to 4.7V in 100 mV increments. Contact local Microchip sales office.

**POWER MANAGEMENT: Voltage Detectors**

| Part # | V <sub>CC</sub> Range (V) | Operating Temp. Range (°C) | Nominal Reset Voltage (V)                | Reset Type | Output                       | Minimum Reset Pulse Width (ms) | Typical Supply Current (µA) | Features     | Packages  |
|--------|---------------------------|----------------------------|--|------------|------------------------------|--------------------------------|-----------------------------|--------------|---|
| MCP111 | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.90 | Active-Low | Open-Drain                   | -                              | 1                           |              | 3-pin SOT-23B, 3-pin TO-92, 3-pin SC-70, 3-pin SOT-89 |
| MCP112 | 1.0 to 5.5                | -40 to +125                | 4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.90 | Active-Low | CMOS Push-Pull               | -                              | 1                           |              | 3-pin SOT-23B, 3-pin TO-92, 3-pin SC-70, 3-pin SOT-89 |
| TC52   | 1.5 to 10                 | -40 to +85                 | 4.5/2.7, 3.0/2.7                         | Active-Low | Open-Drain                   | -                              | 2                           | Dual channel | 5-pin SOT-23A   |
| TC54   | 0.7 to 10                 | -40 to +85                 | 4.3, 4.2, 3.0, 2.9, 2.7, 2.1, 1.4        | Active-Low | CMOS Push-Pull or Open-Drain | -                              | 1                           |              | 3-pin SOT-23A, 3-pin SOT-89, 3-pin TO-92              |

**POWER MANAGEMENT: Power MOSFET Drivers**

| Part #  | Configuration                              | Operating Temp. Range (°C) | Peak Output Current (A) | Output Resistance (R <sub>thj/rcj</sub> ) (Max. W @ 25°C) | Maximum Supply Voltage (V) | Input/Output Delay (to1, to2) <sup>(1)</sup> (ns) | Packages                                      |
|---|--|----------------------------|-------------------------|---|----------------------------|---|---|
| <b>Low-Side Drivers, 0.5A to 1.2A Peak Output Current</b> |  |                            |                         |   |                            |   |   |
| MCP1401   | Single, Inverting                          | -40 to +125                | 0.5                     | 18/16   | 18                         | 40/40   | 5-pin SOT-23                                  |
| MCP1402   | Single, Non-inverting                      | -40 to +125                | 0.5                     | 18/16   | 18                         | 40/40   | 5-pin SOT-23                                  |
| TC1410  | Single, Inverting                          | -40 to +85                 | 0.5                     | 22/22   | 16                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| TC1410N   | Single, Non-inverting                      | -40 to +85                 | 0.5                     | 22/22   | 16                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| TC1411  | Single, Inverting                          | -40 to +85                 | 1.0                     | 11/11   | 16                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| TC1411N   | Single, Non-inverting                      | -40 to +85                 | 1.0                     | 11/11   | 16                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| TC1426  | Dual, Inverting                            | 0 to +70                   | 1.2                     | 18/18   | 16                         | 75/75   | 8-pin PDIP, 8-pin SOIC                        |
| TC1427  | Dual, Non-inverting                        | 0 to +70                   | 1.2                     | 18/18   | 16                         | 75/75   | 8-pin PDIP, 8-pin SOIC                        |
| TC1428  | Dual, Inverting and Non-inverting          | 0 to +70                   | 1.2                     | 18/18   | 16                         | 75/75   | 8-pin PDIP, 8-pin SOIC                        |
| TC4467  | Quad, Inverting                            | -40 to +85                 | 1.2                     | 15/15   | 18                         | 40/40   | 14-pin PDIP, 16-pin SOIC (W)                  |
| TC4468  | Quad, Non-inverting                        | -40 to +85                 | 1.2                     | 15/15   | 18                         | 40/40   | 14-pin PDIP, 16-pin SOIC (W)                  |
| TC4469  | Quad, Non-inverting                        | -40 to +85                 | 1.2                     | 15/15   | 18                         | 40/40   | 14-pin PDIP, 16-pin SOIC (W)                  |
| <b>Low-Side Drivers, 1.5A Peak Output Current</b>         |  |                            |                         |   |                            |   |   |
| MCP1415   | Single, Inverting                          | -40 to +125                | 1.5                     | 7.5/5.5   | 18                         | 50/55   | 5-pin SOT-23                                  |
| MCP1416   | Single, Non-inverting                      | -40 to +125                | 1.5                     | 7.5/5.5   | 18                         | 50/55   | 5-pin SOT-23                                  |
| TC4403  | Single, Non-inverting Floating Load Driver | -40 to +85                 | 1.5                     | 5/5   | 18                         | 33/38   | 8-pin PDIP                                    |
| TC4404  | Dual, Inverting                            | -40 to +85                 | 1.5                     | 10/10   | 18                         | 15/32   | 8-pin PDIP, 8-pin SOIC                        |
| TC4405  | Dual, Non-inverting                        | -40 to +85                 | 1.5                     | 10/10   | 18                         | 15/32   | 8-pin PDIP, 8-pin SOIC                        |
| TC4426A   | Dual, Inverting                            | -40 to +125                | 1.5                     | 9/9   | 18                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| TC4427A   | Dual, Non-inverting                        | -40 to +125                | 1.5                     | 9/9   | 18                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| TC4428A   | Dual, Inverting and Non-inverting          | -40 to +125                | 1.5                     | 9/9   | 18                         | 30/30   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| TC4426  | Dual, Inverting                            | -40 to +125                | 1.5                     | 10/10   | 18                         | 20/40   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN, 8-pin MSOP |
| TC4427  | Dual, Non-inverting                        | -40 to +125                | 1.5                     | 10/10   | 18                         | 20/40   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN, 8-pin MSOP |
| TC4428  | Dual, Inverting and Non-inverting          | -40 to +125                | 1.5                     | 10/10   | 18                         | 20/40   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN, 8-pin MSOP |
| TC426   | Dual, Inverting                            | -40 to +85                 | 1.5                     | 15/10   | 18                         | 50/75   | 8-pin PDIP, 8-pin SOIC                        |
| TC427   | Dual, Non-inverting                        | -40 to +85                 | 1.5                     | 15/10   | 18                         | 50/75   | 8-pin PDIP, 8-pin SOIC                        |
| TC428   | Dual, Inverting and Non-inverting          | -40 to +85                 | 1.5                     | 15/10   | 18                         | 50/75   | 8-pin PDIP, 8-pin SOIC                        |
| TC1412  | Single, Inverting                          | -40 to +85                 | 2                       | 6/6   | 16                         | 35/35   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| TC1412N   | Single, Non-inverting                      | -40 to +85                 | 2                       | 6/6   | 16                         | 35/35   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| MCP14E6   | Dual, Inverting                            | -40 to +125                | 2                       | 2.2/2.8   | 18                         | 45/45   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| MCP14E7   | Dual, Non-inverting                        | -40 to +125                | 2                       | 2.2/2.8   | 18                         | 45/45   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| MCP14E8   | Dual, Inverting and Non-inverting          | -40 to +125                | 2                       | 2.2/2.8   | 18                         | 45/45   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| MCP14E9   | Dual, Inverting                            | -40 to +125                | 3                       | 2.2/2.8   | 18                         | 75/75   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| MCP14E10  | Dual, Non-inverting                        | -40 to +125                | 3                       | 2.2/2.8   | 18                         | 75/75   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |
| MCP14E11  | Dual, Inverting and Non-inverting          | -40 to +125                | 3                       | 2.2/2.8   | 18                         | 75/75   | 8-pin PDIP, 8-pin SOIC, 8-pin DFN             |

**Note 1:** to1 = delay time from input low-to-high transition to output transition. to2 = delay time from input high-to-low transition to output transition.

**POWER MANAGEMENT: Power MOSFET Drivers (Continued)**

| Part #   | Configuration                     | Operating Temperature Range (°C) | Peak Output Current (A) | Output Resistance (R <sub>thj/rcj</sub> ) (Max. W @ 25°C) | Maximum Supply Voltage (V)          | Input/Output Delay (to1, to2) <sup>(1)</sup> (ns) | Packages  |
|--|-----------------------------------|----------------------------------|-------------------------|---|-------------------------------------|---|---|
| <b>Low-Side Drivers, 2.0A to 12.0A Peak Output Current</b> |                                   |                                  |                         |   |                                     |   |   |
| TC1413   | Single, Inverting                 | -40 to +85                       | 3                       | 4/4   | 16                                  | 35/35   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP                                  |
| TC1413N  | Single, Non-inverting             | -40 to +85                       | 3                       | 4/4   | 16                                  | 35/35   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP                                  |
| TC4423A  | Dual, Inverting                   | -40 to +125                      | 3                       | 3 (typ)/4 (typ)   | 18                                  | 40 (typ)/40 (typ)                                 | 8-pin PDIP, 8-pin SOIC, 8-pin DFN                                   |
| TC4424A  | Dual, Non-inverting               | -40 to +125                      | 3                       | 3 (typ)/4 (typ)   | 18                                  | 40 (typ)/40 (typ)                                 | 8-pin PDIP, 8-pin SOIC, 8-pin DFN                                   |
| TC4425A  | Dual, Inverting and Non-inverting | -40 to +125                      | 3                       | 3 (typ)/4 (typ)   | 18                                  | 40 (typ)/40 (typ)                                 | 8-pin PDIP, 8-pin SOIC, 8-pin DFN                                   |
| TC4423   | Dual, Inverting                   | -40 to +125                      | 3                       | 5/5   | 18                                  | 33/38   | 8-pin PDIP, 16-pin SOIC (W), 8-pin DFN                              |
| TC4424   | Dual, Non-inverting               | -40 to +125                      | 3                       | 5/5   | 18                                  | 33/38   | 8-pin PDIP, 16-pin SOIC (W), 8-pin DFN                              |
| TC4425   | Dual, Inverting and Non-inverting | -40 to +125                      | 3                       | 5/5   | 18                                  | 33/38   | 8-pin PDIP, 16-pin SOIC (W), 8-pin DFN                              |
| MCP14E3  | Dual, Inverting                   | -40 to +125                      | 4.0                     | 3.5/3.0   | 18                                  | 55/55   | 8-pin PDIP, 8-pin SOIC, 8-pin 6 x 5 DFN                             |
| MCP14E4  | Dual, Non-inverting               | -40 to +125                      | 4.0                     | 3.5/3.0   | 18                                  | 55/55   | 8-pin PDIP, 8-pin SOIC, 8-pin 6 x 5 DFN                             |
| MCP14E5  | Dual, Inverting and Non-inverting | -40 to +125                      | 4.0                     | 3.5/3.0   | 18                                  | 55/55   | 8-pin PDIP, 8-pin SOIC, 8-pin 6 x 5 DFN                             |
| MCP1403  | Dual, Inverting                   | -40 to +125                      | 4.5                     | 3/3.5   | 18                                  | 48/48   | 8-pin PDIP, 8-pin SOIC, 8-pin 6 x 5 DFN, 16-pin SOIC                |
| MCP1404  | Dual, Non-inverting               | -40 to +125                      | 4.5                     | 3/3.5   | 18                                  | 48/48   | 8-pin PDIP, 8-pin SOIC, 8-pin 6 x 5 DFN, 16-pin SOIC                |
| MCP1405  | Dual, Inverting and Non-inverting | -40 to +125                      | 4.5                     | 3/3.5   | 18                                  | 48/48   | 8-pin PDIP, 8-pin SOIC, 8-pin 6 x 5 DFN, 16-pin SOIC                |
| MCP1406  | Single, Inverting                 | -40 to +125                      | 6                       | 1.8 (typ)/2.0 (typ)                                       | 18                                  | 30/30   | 5-pin TO-220, 8-pin PDIP, 8-pin 6 x 5 DFN, 8-pin SOIC               |
| MCP1407  | Single, Non-inverting             | -40 to +125                      | 6                       | 1.8 (typ)/2.0 (typ)                                       | 18                                  | 30/30   | 5-pin TO-220, 8-pin PDIP, 8-pin 6 x 5 DFN, 8-pin SOIC               |
| TC429  | Single, Inverting                 | -40 to +85                       | 6                       | 2.5/2.5   | 18                                  | 53/60   | 8-pin PDIP, 8-pin DFN, 8-pin SOIC                                   |
| TC4420   | Single, Non-inverting             | -40 to +125                      | 6                       | 2.8/2.5   | 18                                  | 55/55   | 8-pin PDIP, 8-pin SOIC, 5-pin TO-220, 8-pin DFN                     |
| TC4429   | Single, Inverting                 | -40 to +125                      | 6                       | 2.8/2.5   | 18                                  | 55/55   | 8-pin PDIP, 8-pin SOIC, 5-pin TO-220, 8-pin DFN                     |
| TC4421   | Single, Inverting                 | -40 to +125                      | 9                       | 1.4 (typ)/1.7   | 18                                  | 30/33   | 8-pin PDIP, 5-pin TO-220, 8-pin DFN                                 |
| TC4421A  | Single, Inverting                 | -40 to +125                      | 9                       | 1.25 (typ)/1.5  | 18                                  | 38/42   | 8-pin PDIP, 8-pin SOIC, 5-pin TO-220, 8-pin 6 x 5 DFN               |
| TC4422   | Single, Non-inverting             | -40 to +125                      | 9                       | 1.4 (typ)/1.7   | 18                                  | 30/33   | 8-pin PDIP, 5-pin TO-220, 8-pin DFN                                 |
| TC4422A  | Single, Non-inverting             | -40 to +125                      | 9                       | 1.25 (typ)/1.5  | 18                                  | 38/42   | 8-pin PDIP, 8-pin SOIC, 5-pin TO-220, 8-pin 6 x 5 DFN               |
| TC4451   | Single, Inverting                 | -40 to +125                      | 12                      | 0.6 (typ)/1.5   | 18                                  | 15/15   | 8-pin SOIC, 8-pin PDIP, 8-pin 6 x 5 DFN, 5-pin TO-220, 5-pin DDDPAK |
| TC4452   | Single, Non-inverting             | -40 to +125                      | 12                      | 0.6 (typ)/1.5   | 18                                  | 15/15   | 8-pin SOIC, 8-pin PDIP, 8-pin 6 x 5 DFN, 5-pin TO-220, 5-pin DDDPAK |
| <b>High-Side/Low-Side Drivers</b>                          |                                   |                                  |                         |   |                                     |   |   |
| TC4626   | Single, Inverting                 | -40 to +85                       | 1.5                     | 15/10   | 6                                   | 35/45   | 8-pin PDIP, 16-pin SOIC (W)   |
| TC4627   | Single, Non-inverting             | -40 to +85                       | 1.5                     | 15/10   | 6                                   | 35/45   | 8-pin PDIP, 16-pin SOIC (W)   |
| TC4431   | Single, Inverting                 | -40 to +85                       | 1.5                     | 10/10   | 30                                  | 62/78   | 8-pin PDIP, 8-pin SOIC  |
| TC4432   | Single, Non-inverting             | -40 to +85                       | 1.5                     | 10/10   | 30                                  | 62/78   | 8-pin PDIP, 8-pin SOIC  |
| <b>Synchronous Buck High-Side Drivers</b>                  |                                   |                                  |                         |   |                                     |   |   |
| MCP14628   | Dual, Non-inverting               | -40 to +85                       | 2                       | 2.5/2.5   | 5 (V <sub>DD</sub> ), 36 (Boot Pin) | 18/20   | 8-pin SOIC, 8-pin 3 x 3 DFN   |
| MCP14700   | Dual, Non-inverting               | -40 to +125                      | 2                       | 2.5/2.5   | 5 (V <sub>DD</sub> ), 36 (Boot Pin) | 25/25   | 8-pin SOIC, 8-pin 3 x 3 DFN   |

Note 1: to1 = delay time from input low-to-high transition to output transition. to2 = delay time from input high-to-low transition to output transition.



**POWER MANAGEMENT: Battery Chargers**

| Part #     | Mode   | Cell Type         | # of Cells | Vcc Range (V) | Cell Voltage (V)    | Maximum Charging Current (mA)   | Max. Voltage Regulation (%) | Int/Ext FET | Features  | Packages                      |
|------------|--------|-------------------|------------|---------------|---------------------|---------------------------------|-----------------------------|-------------|---|-------------------------------|
| MCP73113   | Linear | Li-Ion/Li-Polymer | 1          | 4 to 16       | 4.1, 4.2, 4.35, 4.4 | 1100                            | ±0.5                        | Int         | 6.5V Overvoltage Protection   | 10-pin 3 x 3 DFN              |
| MCP73114   | Linear | Li-Ion/Li-Polymer | 1          | 4 to 16       | 4.1, 4.2, 4.35, 4.4 | 1100                            | ±0.5                        | Int         | 5.8V Overvoltage Protection   | 10-pin 3 x 3 DFN              |
| MCP73123   | Linear | LiFePO4           | 1          | 4 to 16       | 3.6                 | 1100                            | ±0.5                        | Int         | 6.5V Overvoltage Protection, LiFePO4 charging   | 10-pin 3 x 3 DFN              |
| MCP73213   | Linear | Li-Ion/Li-Polymer | 2          | 4 to 16       | 8.2, 8.4, 8.7, 8.8  | 1100                            | ±0.6                        | Int         | 13V Overvoltage Protection  | 10-pin 3 x 3 DFN              |
| MCP73223   | Linear | LiFePO4           | 2          | 4 to 16       | 7.2                 | 1100                            | ±0.6                        | Int         | 13V Overvoltage Protection, LiFePO4 charging  | 10-pin 3 x 3 DFN              |
| MCP73826   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 5.5    | 4.1, 4.2            | N/A                             | ±1.0                        | Ext         | Small size, charge current set by external FET  | 6-pin SOT-23                  |
| MCP73827   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 5.5    | 4.1, 4.2            | N/A                             | ±1.0                        | Ext         | Mode indicator, Charge current monitor, Charge current set by external FET  | 8-pin MSOP                    |
| MCP73828   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 5.5    | 4.1, 4.2            | N/A                             | ±1.0                        | Ext         | Temperature monitor, Charge current set by external FET   | 8-pin MSOP                    |
| MCP73841   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 12     | 4.1, 4.2            | N/A                             | ±0.5                        | Ext         | Safety charge timers, Temperature monitor, Charge current set by external FET   | 10-pin MSOP                   |
| MCP73842   | Linear | Li-Ion/Li-Polymer | 2          | 8.7 to 12     | 8.2, 8.4            | N/A                             | ±0.5                        | Ext         | Safety charge timers, Temperature monitor, Charge current set by external FET   | 10-pin MSOP                   |
| MCP73843   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 12     | 4.1, 4.2            | N/A                             | ±0.5                        | Ext         | Safety charge timers, Charge current set by external FET  | 8-pin MSOP                    |
| MCP73844   | Linear | Li-Ion/Li-Polymer | 2          | 8.7 to 12     | 8.2, 8.4            | N/A                             | ±0.5                        | Ext         | Safety charge timers, Charge current set by external FET  | 8-pin MSOP                    |
| MCP73811   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2                 | 500                             | ±1.0                        | Int         | Selectable charge current (100 mA, 500 mA), Charge enable input   | 5-pin SOT-23                  |
| MCP73812   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2                 | 500                             | ±1.0                        | Int         | Programmable charge current (100 mA, 500 mA), Charge enable input   | 5-pin SOT-23                  |
| MCP73830/L | Linear | Li-Ion/Li-Polymer | 1          | 3.75 to 6.0   | 4.2                 | 1000/200                        | ±0.75                       | Int         | Soft-start, Charge enable pin   | 6-pin 2 x 2 TDFN              |
| MCP73831   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2, 4.35, 4.4, 4.5 | 500                             | ±0.75                       | Int         | UVLO, Thermal regulation, Programmable charge current, Tri-state STAT pin   | 5-pin SOT-23, 8-pin 2 x 3 DFN |
| MCP73832   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2, 4.35, 4.4, 4.5 | 500                             | ±0.75                       | Int         | UVLO, Thermal regulation, Programmable charge current, Open-drain STAT pin  | 5-pin SOT-23, 8-pin 2 x 3 DFN |
| MCP73853   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 5.5    | 4.1, 4.2            | 500                             | ±0.5                        | Int         | USB control, Safety charge timers, Temperature monitor, Thermal regulation  | 16-pin 4 x 4 QFN              |
| MCP73855   | Linear | Li-Ion/Li-Polymer | 1          | 4.5 to 5.5    | 4.1, 4.2            | 500                             | ±0.5                        | Int         | USB control, Safety charge timers, Thermal regulation   | 10-pin 3 x 3 DFN              |
| MCP73833   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2, 4.35, 4.4, 4.5 | 1000                            | ±0.75                       | Int         | UVLO, Thermal regulation, Thermistor input, LDO Test mode, Multiple VREG outputs, Safety timer, Power good output     | 10-pin 3 x 3 DFN, 10-pin MSOP |
| MCP73834   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2, 4.35, 4.4, 4.5 | 1000                            | ±0.75                       | Int         | UVLO, Thermal regulation, Thermistor input, LDO Test mode, Multiple VREG outputs, Safety timer, Timer enable input    | 10-pin 3 x 3 DFN, 10-pin MSOP |
| MCP73837   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2, 4.35, 4.4, 4.5 | 1000                            | ±0.75                       | Int         | Dual input (USB, DC input from adapter) auto-switching, UVLO, Thermal regulation, Thermistor input, Power good output | 10-pin 3 x 3 DFN, 10-pin MSOP |
| MCP73838   | Linear | Li-Ion/Li-Polymer | 1          | 3.7 to 6.0    | 4.2, 4.35, 4.4, 4.5 | 1000                            | ±0.75                       | Int         | Dual input (USB, DC input from adapter) auto-switching, UVLO, Thermal regulation, Timer enable input                  | 10-pin 3 x 3 DFN, 10-pin MSOP |
| MCP73871   | Linear | Li-Ion/Li-Polymer | 1          | 3.75 to 6.0   | 4.1, 4.2, 4.35, 4.4 | 1500 (A/C Adapter)<br>500 (USB) | ±0.5                        | Int         | Simultaneous charging of load and battery, Load-dependent charging, Multiple programmable charge currents             | 20-pin 4 x 4 QFN, 20-pin SSOP |

**POWER MANAGEMENT: Hot Swap Controllers**

| Part #   | Number of Outputs | V <sub>POS</sub> to V <sub>NEG</sub> Differential Voltage (V) | Junction Temperature Range (°C) | OVLO       | UVLO       | Power good | Int/Ext FET | Applications                        | Packages    |
|----------|-------------------|---|---------------------------------|------------|------------|------------|-------------|-------------------------------------|-------------|
| MCP18480 | 1                 | -0.3 to +15.0   | -40 to +85                      | Adjustable | Adjustable | Adjustable | Ext         | -48V Telecom/Datacom, Bus/Backplane | 20-pin SSOP |

**LINEAR: Op Amps**

| Part #  | # per Package | GBWP    | I <sub>Q</sub> Typical (µA) | V <sub>OS</sub> Max (mV) | Typical Input Bias Current (pA) | Input Voltage Noise Density (nV/√Hz) | Operating Voltage (V) | Temperature Range (°C) | Features  | Packages   |
|---------|---------------|---------|-----------------------------|--------------------------|---------------------------------|--------------------------------------|-----------------------|------------------------|---|--|
| MCP6441 | 1             | 9 kHz   | 0.45                        | 4.5                      | 1                               | 190 <sup>(1)</sup>                   | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 5-pin SOT-23 <sup>(S)</sup> , 5-pin SC-70 <sup>(S)</sup>   |
| MCP6442 | 2             | 9 kHz   | 0.45                        | 4.5                      | 1                               | 190 <sup>(1)</sup>                   | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 TDFN   |
| MCP6444 | 4             | 9 kHz   | 0.45                        | 4.5                      | 1                               | 190 <sup>(1)</sup>                   | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin SOIC, 14-pin TSSOP  |
| MCP6031 | 1             | 10 kHz  | 0.9                         | 0.15                     | 1                               | 165 <sup>(1)</sup>                   | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN, 5-pin SOT-23  |
| MCP6032 | 2             | 10 kHz  | 0.9                         | 0.15                     | 1                               | 165 <sup>(1)</sup>                   | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin MSOP   |
| MCP6033 | 1             | 10 kHz  | 0.9                         | 0.15                     | 1                               | 165 <sup>(1)</sup>                   | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output, Chip select                | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN  |
| MCP6034 | 4             | 10 kHz  | 0.9                         | 0.15                     | 1                               | 165 <sup>(1)</sup>                   | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin SOIC, 14-pin TSSOP  |
| MCP6041 | 1             | 14 kHz  | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 5-pin SOT-23 <sup>(S)</sup>  |
| MCP6042 | 2             | 14 kHz  | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP6043 | 1             | 14 kHz  | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, Chip select                | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 6-pin SOT-23 <sup>(S)</sup>  |
| MCP6044 | 4             | 14 kHz  | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP6141 | 1             | 100 kHz | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, G > 10 stable              | 5-pin SOT-23 <sup>(S)</sup> , 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP6142 | 2             | 100 kHz | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, G > 10 stable, Chip select | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP6143 | 1             | 100 kHz | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, G > 10 stable, Chip select | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 6-pin SOT-23 <sup>(S)</sup>  |
| MCP6144 | 4             | 100 kHz | 0.6                         | 3                        | 1                               | 170 <sup>(1)</sup>                   | 1.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, G > 10 stable              | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP606  | 1             | 155 kHz | 19                          | 0.25                     | 1                               | 38 <sup>(1)</sup>                    | 2.5 to 6.0            | -40 to +125            | Rail-to-Rail Output                                   | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP, 5-pin SOT-23 <sup>(S)</sup>   |
| MCP607  | 2             | 155 kHz | 19                          | 0.25                     | 1                               | 38 <sup>(1)</sup>                    | 2.5 to 6.0            | -40 to +85             | Rail-to-Rail Output                                   | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP  |
| MCP608  | 1             | 155 kHz | 19                          | 0.25                     | 1                               | 38 <sup>(1)</sup>                    | 2.5 to 6.0            | -40 to +85             | Rail-to-Rail Output, Chip select                      | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP  |
| MCP609  | 4             | 155 kHz | 19                          | 0.25                     | 1                               | 38 <sup>(1)</sup>                    | 2.5 to 6.0            | -40 to +85             | Rail-to-Rail Output                                   | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP616  | 1             | 190 kHz | 19                          | 0.15                     | 15000                           | 32 <sup>(1)</sup>                    | 2.3 to 5.5            | -40 to +85             | Rail-to-Rail Output, PNP input                        | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP617  | 2             | 190 kHz | 19                          | 0.15                     | 15000                           | 32 <sup>(1)</sup>                    | 2.3 to 5.5            | -40 to +85             | Rail-to-Rail Output, PNP input                        | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP618  | 1             | 190 kHz | 19                          | 0.15                     | 15000                           | 32 <sup>(1)</sup>                    | 2.3 to 5.5            | -40 to +85             | Rail-to-Rail Output, Chip select, PNP input           | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP619  | 4             | 190 kHz | 19                          | 0.15                     | 15000                           | 32 <sup>(1)</sup>                    | 2.3 to 5.5            | -40 to +85             | Rail-to-Rail Output, PNP input                        | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP6231 | 1             | 300 kHz | 20                          | 5                        | 1                               | 52 <sup>(1)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 TDFN, 5-pin SC-70 <sup>(S)</sup> , 5-pin SOT-23 <sup>(S, R, U)</sup> |
| MCP6232 | 2             | 300 kHz | 20                          | 5                        | 1                               | 52 <sup>(1)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 TDFN   |
| MCP6234 | 4             | 300 kHz | 20                          | 5                        | 1                               | 52 <sup>(1)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP6051 | 1             | 385 kHz | 30                          | 0.15                     | 1                               | 34 <sup>(2)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin 2 x 3 DFN, 5-pin SOT-23(S)   |
| MCP6052 | 2             | 385 kHz | 30                          | 0.15                     | 1                               | 34 <sup>(2)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin 2 x 3 DFN  |
| MCP6054 | 4             | 385 kHz | 30                          | 0.15                     | 1                               | 34 <sup>(2)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin SOIC, 14-pin TSSOP  |
| MCP6241 | 1             | 550 kHz | 50                          | 5                        | 1                               | 45 <sup>(1)</sup>                    | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 TDFN, 5-pin SC-70 <sup>(S)</sup> , 5-pin SOT-23 <sup>(S, R, U)</sup> |
| MCP6242 | 2             | 550 kHz | 50                          | 5                        | 1                               | 45 <sup>(1)</sup>                    | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP6244 | 4             | 550 kHz | 50                          | 5                        | 1                               | 45 <sup>(1)</sup>                    | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP6061 | 1             | 730 kHz | 60                          | 0.15                     | 1                               | 25 <sup>(2)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin 2 x 3 DFN, 5-pin SOT-23 <sup>(S)</sup>   |
| MCP6062 | 2             | 730 kHz | 60                          | 0.15                     | 1                               | 25 <sup>(2)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin SOIC, 8-pin 2 x 3 DFN  |
| MCP6064 | 4             | 730 kHz | 60                          | 0.15                     | 1                               | 25 <sup>(2)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 14-pin SOIC, 14-pin TSSOP  |
| MCP6001 | 1             | 1 MHz   | 100                         | 4.5                      | 1                               | 28 <sup>(1)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 5-pin SOT-23 <sup>(S, R, U)</sup> , 5-pin SC-70 <sup>(R)</sup>   |
| MCP6002 | 2             | 1 MHz   | 100                         | 4.5                      | 1                               | 28 <sup>(1)</sup>                    | 1.8 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN  |

Legend: S = Standard Pinout; R = Reverse Pinout; U = Alternative Pinout

Note 1: Values are typical at 1 kHz

2: Values are typical at 10 kHz

**LINEAR: Op Amps (Continued)**

| Part #  | # per Package | GBWP    | I <sub>Q</sub> Typical (μA) | V <sub>OS</sub> Max (mV) | Typical Input Bias Current (pA) | Input Voltage Noise Density (nV/√Hz) | Operating Voltage (V)                                | Temperature Range (°C) | Features  | Packages  |
|---------|---------------|---------|-----------------------------|--------------------------|---------------------------------|--------------------------------------|--|------------------------|---|---|
| MCP6004 | 4             | 1 MHz   | 100                         | 4.5                      | 1                               | 28 <sup>(1)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP6401 | 1             | 1 MHz   | 45                          | 4.5                      | 1                               | 28 <sup>(1)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 5-pin SOT-23 <sup>(S,R,U)</sup> , 5-pin SC-70 <sup>(R)</sup>                              |
| MCP6402 | 2             | 1 MHz   | 45                          | 4.5                      | 1                               | 28 <sup>(1)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin SOIC, 8-pin 2 × 3 TDFN  |
| MCP6404 | 4             | 1 MHz   | 45                          | 4.5                      | 1                               | 28 <sup>(1)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin SOIC, 14-pin TSSOP   |
| MCP6L01 | 1             | 1 MHz   | 85                          | 5                        | 2                               | 24 <sup>(2)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 5-pin SOT-23 <sup>(S,R,U)</sup> , 5-pin SC-70 <sup>(S)</sup>                              |
| MCP6L02 | 2             | 1 MHz   | 85                          | 5                        | 2                               | 24 <sup>(2)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin SOIC, 8-pin MSOP  |
| MCP6L04 | 4             | 1 MHz   | 85                          | 5                        | 2                               | 24 <sup>(2)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin SOIC, 14-pin TSSOP   |
| MCP6071 | 1             | 1.2 MHz | 110                         | 0.15                     | 1                               | 19 <sup>(2)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin SOIC, 8-pin 2 × 3 DFN, 5-pin SOT-23 <sup>(S)</sup>                                  |
| MCP6072 | 2             | 1.2 MHz | 110                         | 0.15                     | 1                               | 19 <sup>(2)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin SOIC, 8-pin 2 × 3 DFN   |
| MCP6074 | 4             | 1.2 MHz | 110                         | 0.15                     | 1                               | 19 <sup>(2)</sup>                    | 1.8 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin SOIC, 14-pin TSSOP   |
| MCP6H01 | 1             | 1.2 MHz | 135                         | 3.5                      | 10                              | 35 <sup>(1)</sup>                    | Single Supply: 3.5 to 16<br>Dual Supply: ±1.75 to ±8 | -40 to +125            | Rail-to-Rail Output   | 8-pin SOIC, 8-pin 2 × 3 TDFN, 5-pin SOT-23 <sup>(S)</sup> ,<br>5-pin SC-70 <sup>(S)</sup> |
| MCP6H02 | 2             | 1.2 MHz | 135                         | 3.5                      | 10                              | 35 <sup>(1)</sup>                    | Single Supply: 3.5 to 16<br>Dual Supply: ±1.75 to ±8 | -40 to +125            | Rail-to-Rail Output   | 8-pin SOIC, 8-pin 2 × 3 TDFN  |
| MCP6H04 | 4             | 1.2 MHz | 135                         | 3.5                      | 10                              | 35 <sup>(1)</sup>                    | Single Supply: 3.5 to 16<br>Dual Supply: ±1.75 to ±8 | -40 to +125            | Rail-to-Rail Output   | 14-pin SOIC, 14-pin TSSOP   |
| MCP6271 | 1             | 2 MHz   | 170                         | 3                        | 1                               | 20 <sup>(1)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 5-pin SOT-23 <sup>(S,R)</sup>                         |
| MCP6272 | 2             | 2 MHz   | 170                         | 3                        | 1                               | 20 <sup>(1)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6273 | 1             | 2 MHz   | 170                         | 3                        | 1                               | 20 <sup>(1)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output, Chip select  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 6-pin SOT-23 <sup>(S)</sup>                           |
| MCP6274 | 4             | 2 MHz   | 170                         | 3                        | 1                               | 20 <sup>(1)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP6275 | 2             | 2 MHz   | 150                         | 3                        | 1                               | 20 <sup>(1)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output,<br>Dual connected, Chip select                       | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6L71 | 1             | 2 MHz   | 150                         | 4                        | 1                               | 19 <sup>(2)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin SOIC <sup>(S)</sup> , 8-pin MSOP <sup>(S)</sup> , 5-pin SOT-23 <sup>(S,R)</sup>     |
| MCP6L72 | 2             | 2 MHz   | 150                         | 4                        | 1                               | 19 <sup>(2)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin SOIC, 8-pin MSOP  |
| MCP6L74 | 4             | 2 MHz   | 150                         | 4                        | 1                               | 19 <sup>(2)</sup>                    | 2.0 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin SOIC, 14-pin TSSOP   |
| MCP601  | 1             | 2.8 MHz | 230                         | 2                        | 1                               | 29 <sup>(1)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output   | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP, 5-pin SOT-23 <sup>(S,R)</sup>                        |
| MCP602  | 2             | 2.8 MHz | 230                         | 2                        | 1                               | 29 <sup>(1)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output   | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP   |
| MCP603  | 1             | 2.8 MHz | 230                         | 2                        | 1                               | 29 <sup>(1)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output, Chip select  | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP, 6-pin SOT-23 <sup>(S)</sup>                          |
| MCP604  | 4             | 2.8 MHz | 230                         | 2                        | 1                               | 29 <sup>(1)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output   | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP6L1  | 1             | 2.8 MHz | 200                         | 3                        | 1                               | 21 <sup>(2)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output   | 8-pin SOIC <sup>(S)</sup> , 8-pin MSOP <sup>(S)</sup> , 5-pin SOT-23 <sup>(S,R)</sup>     |
| MCP6L2  | 2             | 2.8 MHz | 200                         | 3                        | 1                               | 21 <sup>(2)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output   | 8-pin SOIC, 8-pin MSOP  |
| MCP6L4  | 4             | 2.8 MHz | 200                         | 3                        | 1                               | 21 <sup>(2)</sup>                    | 2.7 to 6.0   | -40 to +125            | Rail-to-Rail Output   | 14-pin SOIC, 14-pin TSSOP   |
| MCP6281 | 1             | 5 MHz   | 445                         | 3                        | 1                               | 16 <sup>(1)</sup>                    | 2.2 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 5-pin SOT-23 <sup>(S,R)</sup>                         |
| MCP6282 | 2             | 5 MHz   | 445                         | 3                        | 1                               | 16 <sup>(1)</sup>                    | 2.2 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6283 | 1             | 5 MHz   | 445                         | 3                        | 1                               | 16 <sup>(1)</sup>                    | 2.2 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output, Chip select  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 6-pin SOT-23 <sup>(S,R)</sup>                         |
| MCP6284 | 4             | 5 MHz   | 445                         | 3                        | 1                               | 16 <sup>(1)</sup>                    | 2.2 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP6285 | 2             | 5 MHz   | 400                         | 3                        | 1                               | 16 <sup>(1)</sup>                    | 2.2 to 6.0   | -40 to +125            | Rail-to-Rail Input/Output, Dual<br>connected, Chip select                       | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6286 | 1             | 3.5 MHz | 540                         | 1.5                      | 1                               | 5.4 <sup>(2)</sup>                   | 2.2 to 5.5   | -40 to +125            | Rail-to-Rail Output, Low noise  | 5-pin SOT-23 <sup>(S,R)</sup>   |
| MCP6021 | 1             | 10 MHz  | 1000                        | 0.5                      | 1                               | 8.7 <sup>(2)</sup>                   | 2.5 to 5.5   | -40 to +125            | Rail-to-Rail Input/Output, 1/2 V <sub>CC</sub> V <sub>REF</sub>                 | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP, 8-pin MSOP,<br>5-pin SOT-23 <sup>(S,R)</sup>         |
| MCP6022 | 2             | 10 MHz  | 1000                        | 0.5                      | 1                               | 8.7 <sup>(2)</sup>                   | 2.5 to 5.5   | -40 to +125            | Rail-to-Rail Input/Output   | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP   |
| MCP6023 | 1             | 10 MHz  | 1000                        | 0.5                      | 1                               | 8.7 <sup>(2)</sup>                   | 2.5 to 5.5   | -40 to +125            | Rail-to-Rail Input/Output, Chip select,<br>1/2 V <sub>CC</sub> V <sub>REF</sub> | 8-pin PDIP, 8-pin SOIC, 8-pin TSSOP   |
| MCP6024 | 4             | 10 MHz  | 1000                        | 0.5                      | 1                               | 8.7 <sup>(2)</sup>                   | 2.5 to 5.5   | -40 to +125            | Rail-to-Rail Input/Output   | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |

**Legend:** S = Standard Pinout; R = Reverse Pinout; U = Alternative Pinout  
**Note 1:** Values are typical at 1 kHz  
**Note 2:** Values are typical at 10 kHz

**LINEAR: Op Amps (Continued)**

| Part #  | # per Package | GBWP   | I <sub>o</sub> Typical (µA) | V <sub>os</sub> Max (mV) | Typical Input Bias Current (pA) | Input Voltage Noise Density (nV/√Hz) | Operating Voltage (V) | Temperature Range (°C) | Features   | Packages   |
|---------|---------------|--------|-----------------------------|--------------------------|---------------------------------|--------------------------------------|-----------------------|------------------------|--|--|
| MCP6291 | 1             | 10 MHz | 1000                        | 3                        | 1                               | 8.7 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                              | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 5-pin SOT-23 <sup>(S, R)</sup>                     |
| MCP6292 | 2             | 10 MHz | 1000                        | 3                        | 1                               | 8.7 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                              | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP6293 | 1             | 10 MHz | 1000                        | 3                        | 1                               | 8.7 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, Chip select                 | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 6-pin SOT-23 <sup>(S)</sup>                        |
| MCP6294 | 4             | 10 MHz | 1000                        | 3                        | 1                               | 8.7 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                              | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP   |
| MCP6295 | 2             | 10 MHz | 1100                        | 3                        | 1                               | 8.7 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output, Dual connected, Chip select | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP   |
| MCP6L91 | 1             | 10 MHz | 850                         | 4                        | 1                               | 9.4 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                              | 8-pin SOIC <sup>(S)</sup> , 8-pin MSOP <sup>(S)</sup> , 5-pin SOT-23 <sup>(S, R)</sup> |
| MCP6L92 | 2             | 10 MHz | 850                         | 4                        | 1                               | 9.4 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                              | 8-pin SOIC, 8-pin MSOP   |
| MCP6L94 | 4             | 10 MHz | 850                         | 4                        | 1                               | 9.4 <sup>(2)</sup>                   | 2.4 to 6.0            | -40 to +125            | Rail-to-Rail Input/Output                              | 14-pin SOIC, 14-pin TSSOP  |
| MCP621  | 1             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 8-pin SOIC, 8-pin 2 x 3 TDFN   |
| MCP621S | 1             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, mCal Technology                   | 5-pin SOT-23 <sup>(S)</sup>  |
| MCP622  | 2             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, mCal Technology                   | 8-pin SOIC, 8-pin 3 x 3 DFN  |
| MCP623  | 1             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 6-pin SOT-23 <sup>(S)</sup>  |
| MCP624  | 4             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, mCal Technology                   | 14-pin SOIC, 14-pin TSSOP  |
| MCP625  | 2             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 10-pin MSOP, 10-pin 3 x 3 DFN  |
| MCP629  | 4             | 20 MHz | 2500                        | 0.2                      | 5                               | 13 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 16-pin 4 x 4 QFN   |
| MCP631  | 1             | 24 MHz | 2500                        | 8                        | 4                               | 10 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 8-pin SOIC, 8-pin 2 x 3 TDFN, 5-pin SOT-23 <sup>(S)</sup>                              |
| MCP632  | 2             | 24 MHz | 2500                        | 8                        | 4                               | 10 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 8-pin SOIC, 8-pin 3 x 3 DFN  |
| MCP633  | 1             | 24 MHz | 2500                        | 8                        | 4                               | 10 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select                       | 8-pin SOIC, 6-pin SOT-23   |
| MCP634  | 4             | 24 MHz | 2500                        | 8                        | 4                               | 10 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 14-pin SOIC, 14-pin TSSOP  |
| MCP635  | 2             | 24 MHz | 2500                        | 8                        | 4                               | 10 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select                       | 10-pin MSOP, 10-pin 3 x 3 DFN  |
| MCP639  | 4             | 24 MHz | 2500                        | 8                        | 4                               | 10 <sup>(3)</sup>                    | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select                       | 16-pin 4 x 4 QFN   |
| MCP651  | 1             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 8-pin SOIC, 8-pin 2 x 3 TDFN   |
| MCP651S | 1             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, mCal Technology                   | 5-pin SOT-23 <sup>(S)</sup>  |
| MCP652  | 2             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, mCal Technology                   | 8-pin SOIC, 8-pin 3 x 3 DFN  |
| MCP653  | 1             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 6-pin SOT-23 <sup>(S)</sup>  |
| MCP654  | 4             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, mCal Technology                   | 14-pin SOIC, 14-pin TSSOP  |
| MCP655  | 2             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 10-pin MSOP, 10-pin 3 x 3 DFN  |
| MCP659  | 4             | 50 MHz | 6000                        | 0.2                      | 6                               | 7.5 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select, mCal Technology      | 16-pin 4 x 4 QFN   |
| MCP660  | 3             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 14-pin SOIC, 14-pin TSSOP  |
| MCP661  | 1             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 8-pin SOIC, 8-pin 2 x 3 TDFN, 5-pin SOT-23 <sup>(S)</sup>                              |
| MCP662  | 2             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 8-pin SOIC, 8-pin 3 x 3 DFN  |
| MCP663  | 1             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select                       | 8-pin SOIC, 6-pin SOT-23   |
| MCP664  | 4             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output                                    | 14-pin SOIC, 14-pin TSSOP  |
| MCP665  | 2             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select                       | 10-pin MSOP, 10-pin 3 x 3 DFN  |
| MCP669  | 4             | 60 MHz | 6000                        | 8                        | 6                               | 6.8 <sup>(3)</sup>                   | 2.5 to 5.5            | -40 to +125            | Rail-to-Rail Output, Chip select                       | 16-pin 4 x 4 QFN   |

Legend: S = Standard Pinout; R = Reverse Pinout; U = Alternative Pinout

Note 1: Values are typical at 1 kHz

2: Values are typical at 10 kHz

3: Values are typical at 1 MHz

**LINEAR: Zero-Drift Operational Amplifiers**

| Part #   | # per Package | GBWP    | I <sub>o</sub> Max (mA) | V <sub>os</sub> Max (μV) | V <sub>os</sub> Drift Max (μV/°C) | Operating Voltage (V) | Temperature Range (°C) | Features                               | Packages  |
|----------|---------------|---------|-------------------------|--------------------------|-----------------------------------|-----------------------|------------------------|--|---|
| MCP6V11  | 1             | 80 kHz  | 0.011                   | 8                        | 0.05                              | 1.6 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 5-pin SOT-23, 5-pin SC-70, 5-pin SOT-23 <sup>(S, U)</sup> , 5-pin SOT-70 <sup>(H)</sup> |
| MCP6V31  | 1             | 300 kHz | 0.034                   | 8                        | 0.05                              | 1.6 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 5-pin SOT-23, 5-pin SC-70, 5-pin SOT-23 <sup>(S, U)</sup> , 5-pin SOT-70 <sup>(H)</sup> |
| TC7652   | 1             | 0.4 MHz | 3                       | 5                        | 0.05                              | 5 to 16               | 0 to +70               | Single and Split Supply, Low Noise     | 8-pin PDIP, 14-pin PDIP   |
| MCP6V01  | 1             | 1.3 MHz | 0.4                     | 2                        | 0.05                              | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 8-pin SOIC, 8-pin 2 x 3 TDFN  |
| MCP6V02  | 2             | 1.3 MHz | 0.4                     | 2                        | 0.05                              | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 8-pin SOIC, 8-pin 4 x 4 DFN   |
| MCP6V03  | 1             | 1.3 MHz | 0.4                     | 2                        | 0.05                              | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output, Chip select | 8-pin SOIC, 8-pin 2 x 3 TDFN  |
| MCP6V06  | 1             | 1.3 MHz | 0.4                     | 3                        | 0.05                              | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 8-pin SOIC, 8-pin 2 x 3 TDFN  |
| MCP6V07  | 2             | 1.3 MHz | 0.4                     | 3                        | 0.05                              | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 8-pin SOIC, 8-pin 4 x 4 DFN   |
| MCP6V08  | 1             | 1.3 MHz | 0.4                     | 3                        | 0.05                              | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output, Chip select | 8-pin SOIC, 8-pin 2 x 3 TDFN  |
| TC913A/B | 2             | 1.5 MHz | 1.1                     | 15                       | 0.15/0.30                         | 7 to 16               | 0 to +70               | Single and Split Supply                | 8-pin PDIP, 8-pin SOIC  |
| TC7650   | 1             | 2 MHz   | 3.5                     | 5                        | 0.05                              | 4.5 to 16             | 0 to +70               | Single and Split Supply                | 8-pin PDIP, 14-pin PDIP   |
| MCP6V26  | 1             | 2 MHz   | 0.8                     | 2                        | 0.05                              | 2.3 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 TDFN  |
| MCP6V27  | 2             | 2 MHz   | 0.8                     | 2                        | 0.05                              | 2.3 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output              | 8-pin SOIC, 8-pin MSOP, 8-pin 4 x 4 DFN   |
| MCP6V28  | 1             | 2 MHz   | 0.8                     | 2                        | 0.05                              | 2.3 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output, Chip select | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 TDFN  |

**LINEAR: Programmable Gain Amplifiers (PGA)**

| Part #  | Channels | -3dB BW (MHz) | I <sub>q</sub> Typ. (mA) | V <sub>os</sub> (μV) | Operating Voltage (V) | Temperature Range (°C) | Features  | Packages                               |
|---------|----------|---------------|--------------------------|----------------------|-----------------------|------------------------|---|--|
| MCP6S21 | 1        | 2 to 12       | 1.1                      | 275                  | 2.5 to 5.5            | -40 to +85             | SPI, 8 Gain steps, Software shutdown                                    | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP     |
| MCP6S22 | 2        | 2 to 12       | 1.1                      | 275                  | 2.5 to 5.5            | -40 to +85             | SPI, 8 Gain steps, Software shutdown                                    | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP     |
| MCP6S26 | 6        | 2 to 12       | 1.1                      | 275                  | 2.5 to 5.5            | -40 to +85             | SPI, 8 Gain steps, Software shutdown                                    | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP |
| MCP6S28 | 8        | 2 to 12       | 1.1                      | 275                  | 2.5 to 5.5            | -40 to +85             | SPI, 8 Gain steps, Software shutdown                                    | 16-pin PDIP, 16-pin SOIC               |
| MCP6S91 | 1        | 1 to 18       | 1.0                      | 4000                 | 2.5 to 5.5            | -40 to +125            | SPI, 8 Gain steps, Software shutdown, V <sub>REF</sub>                  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP     |
| MCP6S92 | 2        | 1 to 18       | 1.0                      | 4000                 | 2.5 to 5.5            | -40 to +125            | SPI, 8 Gain steps, Software shutdown                                    | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP     |
| MCP6S93 | 2        | 1 to 18       | 1.0                      | 4000                 | 2.5 to 5.5            | -40 to +125            | SPI, 8 Gain steps, Software shutdown, V <sub>REF</sub> , S <sub>O</sub> | 10-pin MSOP                            |

**LINEAR: Selectable Gain Amplifiers (SGA)**

| Part #  | Channels | -3dB BW (kHz) | I <sub>q</sub> (μA) | V <sub>os</sub> (mV) | Operating Voltage (V) | Temperature Range (°C) | Gain Steps (V/V) | Features                           | Packages  |
|---------|----------|---------------|---------------------|----------------------|-----------------------|------------------------|------------------|------------------------------------|---|
| MCP6G01 | 1        | 900           | 110                 | 4.5                  | 1.8 to 5.5            | -40 to +125            | 1, 10, 50        | Tri-State control pin              | 8-pin SOIC, 8-pin MSOP, 5-pin SOT-23 <sup>(S, R, U)</sup> |
| MCP6G02 | 2        | 900           | 110                 | 4.5                  | 1.8 to 5.5            | -40 to +125            | 1, 10, 50        | Tri-State control pin              | 8-pin SOIC, 8-pin MSOP                                    |
| MCP6G03 | 1        | 900           | 110                 | 4.5                  | 1.8 to 5.5            | -40 to +125            | 1, 10, 50        | Tri-State control pin, Chip select | 8-pin SOIC, 8-pin MSOP                                    |
| MCP6G04 | 4        | 900           | 110                 | 4.5                  | 1.8 to 5.5            | -40 to +125            | 1, 10, 50        | Tri-State control pin              | 14-pin SOIC, 14-pin TSSOP                                 |

**LINEAR: Instrumentation Amplifiers**

| Part #  | # Per Package | GBWP    | I <sub>q</sub> Max (mA) | Max V <sub>os</sub> (μV) | V <sub>os</sub> Drift Max (μV/°C) | Operating Voltage (V) | Temperature Range (°C) | Features                                   | Packages                     |
|---------|---------------|---------|-------------------------|--------------------------|-----------------------------------|-----------------------|------------------------|--|------------------------------|
| MCP6N11 | 1             | 500 kHz | 1.1                     | 350                      | 2.7                               | 1.8 to 5.5            | -40 to +125            | Rail-to-Rail Input/Output, mCal Technology | 8-pin SOIC, 8-pin 2 x 3 TDFN |

Legend: S = Standard Pinout; R = Reverse Pinout; U = Alternative Pinout



## LINEAR: Comparators

| Part #   | # per Package | V <sub>REF</sub> (V) | Typical Propagation Delay (μs) | I <sub>O</sub> Typical (μA) | V <sub>OS</sub> Max (mV) | Operating Voltage (V) | Temperature Range (°C) | Features  | Packages  |
|----------|---------------|----------------------|--------------------------------|-----------------------------|--------------------------|-----------------------|------------------------|---|---|
| MCP6541  | 1             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output                    | 5-pin SOT-23 <sup>(S,R,U)</sup> , 5-pin SC-70 <sup>(S,U)</sup> , 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| MCP6542  | 2             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output                    | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6543  | 1             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output, Chip select       | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6544  | 4             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output                    | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP6546  | 1             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Open-drain, 9V, Rail-to-Rail Input/Output               | 5-pin SOT-23 <sup>(S,R,U)</sup> , 5-pin SC-70 <sup>(S,U)</sup> , 8-pin PDIP, 8-pin SOIC, 8-pin MSOP |
| MCP6547  | 2             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Open-drain, 9V, Rail-to-Rail Input/Output               | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6548  | 1             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Open-drain, 9V, Rail-to-Rail Input/Output, Chip select  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP  |
| MCP6549  | 4             | -                    | 4                              | 1                           | 5                        | 1.6 to 5.5            | -40 to +125            | Open-drain, 9V, Rail-to-Rail Input/Output               | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP65R41 | 1             | 1.21/2.4             | 4                              | 2.5                         | 10                       | 1.8 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output, V <sub>REF</sub>  | 6-pin SOT-23  |
| MCP65R46 | 1             | 1.21/2.4             | 4                              | 2.5                         | 10                       | 1.8 to 5.5            | -40 to +125            | Open Drain, Rail-to-Rail Input/Output, V <sub>REF</sub> | 6-pin SOT-23  |
| MCP6561  | 1             | -                    | 0.047                          | 100                         | 10                       | 1.8 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output                    | 5-pin SOT-23 <sup>(S,R,U)</sup> , 5-pin SC-70 <sup>(S)</sup>  |
| MCP6562  | 2             | -                    | 0.047                          | 100                         | 10                       | 1.8 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output                    | 8-pin SOIC, 8-pin MSOP  |
| MCP6564  | 4             | -                    | 0.047                          | 100                         | 10                       | 1.8 to 5.5            | -40 to +125            | Push-Pull, Rail-to-Rail Input/Output                    | 14-pin SOIC, 14-pin TSSOP   |
| MCP6566  | 1             | -                    | 0.047                          | 100                         | 10                       | 1.8 to 5.5            | -40 to +125            | Open-Drain, Rail-to-Rail Input/Output                   | 5-pin SOT-23 <sup>(S,R,U)</sup> , 5-pin SC-70 <sup>(S)</sup>  |
| MCP6567  | 2             | -                    | 0.047                          | 100                         | 10                       | 1.8 to 5.5            | -40 to +125            | Open-Drain, Rail-to-Rail Input/Output                   | 8-pin SOIC, 8-pin MSOP  |
| MCP6569  | 4             | -                    | 0.047                          | 100                         | 10                       | 1.8 to 5.5            | -40 to +125            | Open-Drain, Rail-to-Rail Input/Output                   | 14-pin SOIC, 14-pin TSSOP   |

Legend: S = Standard Pinout; R = Reverse Pinout; U = Alternative Pinout

## MIXED SIGNAL

### MIXED SIGNAL: Successive Approximation Register (SAR) A/D Converters

| Part #  | Resolution (bits) | Maximum Sampling Rate (ksamples/sec) | # of Input Channels | Input Type   | Interface         | Input Voltage Range (V) | Max. Supply Current (μA) | Max. INL | Temperature Range (°C) | Packages  |
|---------|-------------------|--------------------------------------|---------------------|--------------|-------------------|-------------------------|--------------------------|----------|------------------------|---|
| MCP3021 | 10                | 22                                   | 1                   | Single-ended | I <sup>2</sup> C™ | 2.7 to 5.5              | 250                      | ±1 LSB   | -40 to +125            | 5-pin SOT-23A                                   |
| MCP3001 | 10                | 200                                  | 1                   | Single-ended | SPI               | 2.7 to 5.5              | 500                      | ±1 LSB   | -40 to +85             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin TSSOP |
| MCP3002 | 10                | 200                                  | 2                   | Single-ended | SPI               | 2.7 to 5.5              | 650                      | ±1 LSB   | -40 to +85             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin TSSOP |
| MCP3004 | 10                | 200                                  | 4                   | Single-ended | SPI               | 2.7 to 5.5              | 550                      | ±1 LSB   | -40 to +85             | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP          |
| MCP3008 | 10                | 200                                  | 8                   | Single-ended | SPI               | 2.7 to 5.5              | 550                      | ±1 LSB   | -40 to +85             | 16-pin PDIP, 16-pin SOIC                        |
| MCP3221 | 12                | 22                                   | 1                   | Single-ended | I <sup>2</sup> C™ | 2.7 to 5.5              | 250                      | ±2 LSB   | -40 to +125            | 5-pin SOT-23A                                   |
| MCP3201 | 12                | 100                                  | 1                   | Single-ended | SPI               | 2.7 to 5.5              | 400                      | ±1 LSB   | -40 to +85             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin TSSOP |
| MCP3202 | 12                | 100                                  | 2                   | Single-ended | SPI               | 2.7 to 5.5              | 550                      | ±1 LSB   | -40 to +85             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin TSSOP |
| MCP3204 | 12                | 100                                  | 4                   | Single-ended | SPI               | 2.7 to 5.5              | 400                      | ±1 LSB   | -40 to +85             | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP          |
| MCP3208 | 12                | 100                                  | 8                   | Single-ended | SPI               | 2.7 to 5.5              | 400                      | ±1 LSB   | -40 to +85             | 16-pin PDIP, 16-pin SOIC                        |
| MCP3301 | 13                | 100                                  | 1                   | Differential | SPI               | 2.7 to 5.5              | 450                      | ±1 LSB   | -40 to +85             | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin TSSOP |
| MCP3302 | 13                | 100                                  | 2                   | Differential | SPI               | 2.7 to 5.5              | 450                      | ±1 LSB   | -40 to +85             | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP          |
| MCP3304 | 13                | 100                                  | 4                   | Differential | SPI               | 2.7 to 5.5              | 450                      | ±1 LSB   | -40 to +85             | 16-pin PDIP, 16-pin SOIC                        |

**MIXED SIGNAL: Delta-Sigma A/D Converters**

| Part #     | Resolution (bits) | Maximum Sampling Rate (samples/sec) | # of Input Channels | Interface         | Supply Voltage Range (V) | Typical Supply Current (µA) | Typical INL (ppm) | Temperature Range (°C) | Features  | Packages                                |
|------------|-------------------|-------------------------------------|---------------------|-------------------|--------------------------|-----------------------------|-------------------|------------------------|---|---|
| MCP3421    | 18 to 12          | 4 to 240                            | 1 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 155                         | 10                | -40 to +125            | PGA, V <sub>REF</sub>   | 6-pin SOT-23A                           |
| MCP3422    | 18 to 12          | 4 to 240                            | 2 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 145                         | 10                | -40 to +125            | PGA, V <sub>REF</sub>   | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN |
| MCP3423    | 18 to 12          | 4 to 240                            | 2 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 145                         | 10                | -40 to +125            | PGA, V <sub>REF</sub> , Selectable I <sup>2</sup> C™ addressing | 10-pin MSOP, 10-pin 3 x 3 DFN           |
| MCP3424    | 18 to 12          | 4 to 240                            | 4 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 145                         | 10                | -40 to +125            | PGA, V <sub>REF</sub> , Selectable I <sup>2</sup> C™ addressing | 14-pin SOIC, 14-pin TSSOP               |
| MCP3425    | 16 to 12          | 15 to 240                           | 1 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 155                         | 10                | -40 to +125            | PGA, V <sub>REF</sub>   | 6-pin SOT-23A                           |
| MCP3426    | 16 to 12          | 15 to 240                           | 2 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 145                         | 10                | -40 to +125            | PGA, V <sub>REF</sub>   | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN |
| MCP3427    | 16 to 12          | 15 to 240                           | 2 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 145                         | 10                | -40 to +125            | PGA, V <sub>REF</sub> , Selectable I <sup>2</sup> C™ addressing | 10-pin MSOP, 10-pin 3 x 3 DFN           |
| MCP3428    | 16 to 12          | 15 to 240                           | 4 Diff              | I <sup>2</sup> C™ | 2.7 to 5.5               | 145                         | 10                | -40 to +125            | PGA, V <sub>REF</sub> , Selectable I <sup>2</sup> C™ addressing | 14-pin SOIC, 14-pin TSSOP               |
| MCP3550-50 | 22                | 13                                  | 1 Diff              | SPI               | 2.7 to 5.5               | 120                         | 2                 | -40 to +125            | 50 Hz rejection   | 8-pin SOIC, 8-pin MSOP                  |
| MCP3550-60 | 22                | 15                                  | 1 Diff              | SPI               | 2.7 to 5.5               | 140                         | 2                 | -40 to +125            | 60 Hz rejection   | 8-pin SOIC, 8-pin MSOP                  |
| MCP3551    | 22                | 14                                  | 1 Diff              | SPI               | 2.7 to 5.5               | 120                         | 2                 | -40 to +125            | Simultaneous 50/60 Hz rejection                                 | 8-pin SOIC, 8-pin MSOP                  |
| MCP3553    | 20                | 60                                  | 1 Diff              | SPI               | 2.7 to 5.5               | 140                         | 2                 | -40 to +125            |   | 8-pin SOIC, 8-pin MSOP                  |

**MIXED SIGNAL: Energy Measurement ICs**

| Part #   | Dynamic Range     | Typical Accuracy | ADC Channels | Gain Selection | Output Type            | Typical Voltage Reference Drift (ppm/°C) | Typical Supply Current (mA) | Analog Voltage Range (V) | Digital Voltage Range (V) | Temperature Range (°C) | Features                                      | Packages                      |
|----------|-------------------|------------------|--------------|----------------|------------------------|--|-----------------------------|--------------------------|---------------------------|------------------------|---|-------------------------------|
| MCP3901  | 24-bit resolution | 91 dB SINAD      | 2            | up to 32       | SPI                    | 12                                       | 2.6                         | 4.5 to 5.5               | 2.7 to 5.5                | -40 to +125            | Phase correction, Programmable data rate      | 20-pin SSOP, 20-pin 4 x 4 QFN |
| MCP3903  | 24-bit resolution | 91 dB SINAD      | 6            | up to 32       | SPI                    | 5  | 8.3                         | 4.5 to 5.5               | 2.7 to 3.6                | -40 to +125            | Phase correction, Programmable data rate      | 28-pin SSOP                   |
| MCP3905A | 500:1             | 0.1%             | 2            | up to 16       | Active power pulse     | 15                                       | 3.9                         | 4.5 to 5.5               | 4.5 to 5.5                | -40 to +125            | Active power calculation                      | 24-pin SSOP                   |
| MCP3905L | 500:1             | 0.1%             | 2            | up to 16       | Active power pulse     | 15                                       | 3.9                         | 4.5 to 5.5               | 4.5 to 5.5                | -40 to +125            | Active power calculation, Reduced pulse-width | 24-pin SSOP                   |
| MCP3906A | 1000:1            | 0.1%             | 2            | up to 32       | Active power pulse     | 15                                       | 3.9                         | 4.5 to 5.5               | 4.5 to 5.5                | -40 to +125            | Active power calculation                      | 24-pin SSOP                   |
| MCP3909  | 1000:1            | 0.1%             | 2            | up to 16       | Active power pulse/SPI | 15                                       | 3.9                         | 4.5 to 5.5               | 4.5 to 5.5                | -40 to +125            | Active power calculation                      | 24-pin SSOP                   |
| MCP3911  | 24-bit resolution | 94.5 dB SINAD    | 2            | up to 32       | SPI                    | 7  | 1.7                         | 2.7 to 3.6               | 2.7 to 3.6                | -40 to +125            | Phase correction, Programmable data rate      | 20-pin SSOP, 20-pin 4 x 4 QFN |

**MIXED SIGNAL: Dual Slope A/D Converters**

| Part #  | Supply Voltage (V) | Input Voltage Range                              | Resolution            | Sampling Rate (Conv/s) | Input Channels | Data Interface          | Temperature Range (°C) | Features   | Packages                              |
|---------|--------------------|--|-----------------------|------------------------|----------------|-------------------------|------------------------|--|---------------------------------------|
| TC500   | ±4.5 to ±7.5       | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.5V | Up to 16 bits         | 4 to 10                | 1              | 3-Wire                  | 0 to +70               | Differential input range, Programmable resolution/conversion time                              | 16-pin PDIP, 16-pin SOIC              |
| TC500A  | ±4.5 to ±7.5       | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.5V | Up to 17 bits         | 4 to 10                | 1              | 3-Wire                  | 0 to +70               | Differential input range, Programmable resolution/conversion time                              | 16-pin PDIP, 16-pin SOIC              |
| TC510   | +4.5 to +5.5       | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.5V | Up to 17 bits         | 4 to 10                | 1              | 3-Wire                  | 0 to +70               | Differential input range, Programmable resolution/conversion time, Charge pump (-V) output pin | 24-pin PDIP, 24-pin SOIC              |
| TC514   | +4.5 to +5.5       | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.5V | Up to 17 bits         | 4 to 10                | 4              | 3-Wire                  | 0 to +70               | Differential input range, Programmable resolution/conversion time, Charge pump (-V) output pin | 28-pin PDIP, 28-pin SOIC              |
| TC520A  | +4.5 to +5.5       | -  | -                     | -                      | -              | Serial port             | 0 to +70               | Optional serial interface adapter for TC500/500A/510/514                                       | 14-pin PDIP, 16-pin SOIC              |
| TC7109  | ±4.5 to ±5.5       | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.0V | 12 bits plus sign bit | 2 to 10                | 1              | Parallel or Serial port | -25 to +85             | Differential input range   | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7109A | ±4.5 to ±5.5       | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.0V | 12 bits plus sign bit | 2 to 10                | 1              | Parallel or Serial port | -25 to +85             | Differential input range   | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |

**MIXED SIGNAL: Binary and BCD A/D Converters**

| Part #   | Description | Supply Voltage (V) | Input Voltage Range                              | Resolution (Digits) | Resolution (Counts) | Max Power (mW) | Data Interface | Temperature Range (°C) | Features                               | Packages                              |
|----------|-------------|--------------------|--|---------------------|---------------------|----------------|----------------|------------------------|--|---------------------------------------|
| TC850    | Binary A/D  | ±5                 | V <sub>SS</sub> + 1.5V to V <sub>DD</sub> - 1.5V | 15-bit              | ±32,768             | 35             | 8-bit parallel | -25 to +70             | Highest conversion speed (40 conv/sec) | 44-pin PLCC, 40-pin PDIP              |
| TC14433  | BCD A/D     | ±4.5 to ±8         | ±199.9 mV to 1.999V                              | 3½                  | ±2,000              | 20             | MUXed BCD      | -40 to +85             | For DMM, DPM, Data loggers             | 24-pin SOIC, 24-pin PDIP, 28-pin PLCC |
| TC14433A | BCD A/D     | ±4.5 to ±8         | ±199.9 mV to 1.999V                              | 3½                  | ±2,000              | 20             | MUXed BCD      | -40 to +85             | For DMM, DPM, Data loggers             | 24-pin PDIP, 28-pin PLCC              |

**MIXED SIGNAL - DISPLAY A/D CONVERTERS**

| Part #  | Display Type | Supply Voltage (V) | Resolution (Digits) | Resolution (Counts) | Power (mW) | Temperature Range (°C) | Features                               | Packages                              |
|---------|--------------|--------------------|---------------------|---------------------|------------|------------------------|--|---------------------------------------|
| TC7106  | LCD          | 9                  | 3½                  | ±2,000              | 10         | -25 to +85             | For DMM, DPM, Data logger applications | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7106A | LCD          | 9                  | 3½                  | ±2,000              | 10         | -25 to +85             | For DMM, DPM, Data logger applications | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7107  | LED          | ±5                 | 3½                  | ±2,000              | 10         | -25 to +85             | For DMM, DPM, Data logger applications | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7107A | LED          | ±5                 | 3½                  | ±2,000              | 10         | -25 to +85             | For DMM, DPM, Data logger applications | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7116  | LCD          | 9                  | 3½                  | ±2,000              | 10         | -25 to +85             | Hold function                          | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7116A | LCD          | 9                  | 3½                  | ±2,000              | 10         | -25 to +85             | Hold function                          | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7117  | LED          | ±5                 | 3½                  | ±2,000              | 10         | -25 to +85             | Hold function                          | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7117A | LED          | ±5                 | 3½                  | ±2,000              | 10         | -25 to +85             | Hold function                          | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7126  | LCD          | 9                  | 3½                  | ±2,000              | 0.5        | -25 to +85             | Low-power TC7106                       | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7126A | LCD          | 9                  | 3½                  | ±2,000              | 0.5        | -25 to +85             | Low-power TC7106                       | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |
| TC7129  | LCD          | 9                  | 4½                  | ±20,000             | 4.5        | 0 to +70               | Lowest noise ±3 mV sensitivity         | 40-pin PDIP, 44-pin PLCC, 44-pin MQFP |

**MIXED SIGNAL: Digital Potentiometers**

| Part #   | Number of Taps | Memory      | Number per Package | Interface         | Resistance (kOhms) | INL (max) | DNL (max) | Temperature Range (°C) | Comments  | Packages   |
|----------|----------------|-------------|--------------------|-------------------|--------------------|-----------|-----------|------------------------|---|--|
| MCP4011  | 64             | Volatile    | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Potentiometer mode  | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN                  |
| MCP4012  | 64             | Volatile    | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Rheostat mode   | 6-pin SOT-23   |
| MCP4013  | 64             | Volatile    | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Potentiometer to V <sub>SS</sub>                              | 6-pin SOT-23   |
| MCP4014  | 64             | Volatile    | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Rheostat to V <sub>SS</sub>                                   | 5-pin SOT-23   |
| MCP4017  | 128            | Volatile    | 1                  | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | 7-bit, Volatile, I <sup>2</sup> C digital potentiometer       | 6-pin SC-70  |
| MCP4018  | 128            | Volatile    | 1                  | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | 7-bit, Volatile, I <sup>2</sup> C digital potentiometer       | 6-pin SC-70  |
| MCP4019  | 128            | Volatile    | 1                  | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | 7-bit, Volatile, I <sup>2</sup> C digital potentiometer       | 6-pin SC-70  |
| MCP40D17 | 128            | Volatile    | 1                  | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | 7-bit, Volatile, I <sup>2</sup> C digital potentiometer       | 6-pin SC-70  |
| MCP40D18 | 128            | Volatile    | 1                  | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | 7-bit, Volatile, I <sup>2</sup> C digital potentiometer       | 6-pin SC-70  |
| MCP40D19 | 128            | Volatile    | 1                  | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | 7-bit, Volatile, I <sup>2</sup> C digital potentiometer       | 5-pin SC-70  |
| MCP4021  | 64             | Nonvolatile | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Potentiometer mode, Shutdown, WiperLock™ Technology           | 8-pin SOIC, 8-pin MSOP, 8-pin 2 x 3 DFN                  |
| MCP4022  | 64             | Nonvolatile | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Rheostat mode, Shutdown, WiperLock™ Technology                | 6-pin SOT-23   |
| MCP4023  | 64             | Nonvolatile | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Potentiometer to V <sub>SS</sub> , WiperLock™ Technology      | 6-pin SOT-23   |
| MCP4024  | 64             | Nonvolatile | 1                  | Up/Down           | 2.1, 5, 10, 50     | 0.5       | 0.5       | -40 to +125            | Rheostat to V <sub>SS</sub> , Shutdown, WiperLock™ Technology | 5-pin SOT-23   |
| MCP4141  | 128            | Nonvolatile | 1                  | SPI               | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, Shutdown                                  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4142  | 128            | Nonvolatile | 1                  | SPI               | 5, 10, 50, 100     | 0.8       | 0.25      | -40 to +125            | Rheostat mode, Shutdown                                       | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4241  | 128            | Nonvolatile | 2                  | SPI               | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, Shutdown, WiperLock™ Technology           | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP, 16-pin 4 x 4 QFN |
| MCP4242  | 128            | Nonvolatile | 2                  | SPI               | 5, 10, 50, 100     | 0.8       | 0.25      | -40 to +125            | Rheostat mode, Shutdown                                       | 10-pin MSOP, 10-pin 3 x 3 DFN                            |

MIXED SIGNAL: Digital Potentiometers (Continued)

| Part #   | # of Taps | Memory      | # per Package | Interface         | Resistance (kOhms) | INL (max) | DNL (max) | Temperature Range (°C) | Comments  | Packages   |
|----------|-----------|-------------|---------------|-------------------|--------------------|-----------|-----------|------------------------|---|--|
| MCP4131  | 128       | Volatile    | 1             | SPI               | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, Shutdown  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4132  | 128       | Volatile    | 1             | SPI               | 5, 10, 50, 100     | 0.8       | 0.25      | -40 to +125            | Rheostat mode, Shutdown   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4231  | 128       | Volatile    | 2             | SPI               | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, Shutdown, WiperLock™ Technology                 | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP, 16-pin 4 x 4 QFN |
| MCP4232  | 128       | Volatile    | 2             | SPI               | 5, 10, 50, 100     | 0.8       | 0.25      | -40 to +125            | Rheostat mode, Shutdown   | 10-pin MSOP, 10-pin 3 x 3 DFN                            |
| MCP41010 | 256       | Volatile    | 1             | SPI               | 10                 | 1         | 1         | -40 to +85             | Potentiometer mode, Shutdown  | 8-pin PDIP, 8-pin SOIC                                   |
| MCP41050 | 256       | Volatile    | 1             | SPI               | 50                 | 1         | 1         | -40 to +85             | Potentiometer mode, Shutdown  | 8-pin PDIP, 8-pin SOIC                                   |
| MCP41100 | 256       | Volatile    | 1             | SPI               | 100                | 1         | 1         | -40 to +85             | Potentiometer mode, Shutdown  | 8-pin PDIP, 8-pin SOIC                                   |
| MCP4151  | 256       | Volatile    | 1             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode, Shutdown  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4152  | 256       | Volatile    | 1             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode, Shutdown   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4161  | 256       | Nonvolatile | 1             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode, Shutdown  | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP4162  | 256       | Nonvolatile | 1             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode, Shutdown   | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin 3 x 3 DFN      |
| MCP42010 | 256       | Volatile    | 2             | SPI               | 10                 | 1         | 1         | -40 to +85             | Potentiometer mode, Shutdown  | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP                   |
| MCP42100 | 256       | Volatile    | 2             | SPI               | 100                | 1         | 1         | -40 to +85             | Potentiometer mode, Shutdown  | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP                   |
| MCP4251  | 256       | Volatile    | 2             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode, Shutdown, WiperLock™ Technology                 | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP, 16-pin 4 x 4 QFN |
| MCP4252  | 256       | Volatile    | 2             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode, Shutdown   | 10-pin MSOP, 10-pin 3 x 3 DFN                            |
| MCP4261  | 256       | Nonvolatile | 2             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode, Shutdown, WiperLock™ Technology                 | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP, 16-pin 4 x 4 QFN |
| MCP4262  | 256       | Nonvolatile | 2             | SPI               | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode, Shutdown   | 10-pin MSOP, 10-pin 3 x 3 DFN                            |
| MCP4341  | 129       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | 7-bit, Volatile potentiometer with an I <sup>2</sup> C interface    | 20-pin TSSOP, 20-pin 4 x 4 QFN                           |
| MCP4342  | 129       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | 7-bit, Volatile potentiometer with an I <sup>2</sup> C interface    | 14-pin TSSOP   |
| MCP4361  | 257       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | 8-bit, Nonvolatile potentiometer with an I <sup>2</sup> C interface | 20-pin TSSOP, 20-pin 4 x 4 QFN                           |
| MCP4362  | 257       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | 8-bit, Nonvolatile rheostat with an I <sup>2</sup> C interface      | 14-pin TSSOP   |
| MCP4331  | 129       | Volatile    | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | 7-bit, Volatile potentiometer with an I <sup>2</sup> C interface    | 20-pin TSSOP, 20-pin 4 x 4 QFN                           |
| MCP4332  | 129       | Volatile    | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | 7-bit, Volatile rheostat with an I <sup>2</sup> C interface         | 14-pin TSSOP   |
| MCP4351  | 257       | Volatile    | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | 8-bit, Nonvolatile potentiometer with an I <sup>2</sup> C interface | 20-pin TSSOP, 20-pin 4 x 4 QFN                           |
| MCP4352  | 257       | Volatile    | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | 8-bit, Non-volatile rheostat with an I <sup>2</sup> C interface     | 14-pin TSSOP   |
| MCP4441  | 129       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, WiperLock™ Technology                           | 20-pin TSSOP, 20-pin 4 x 4 QFN                           |
| MCP4442  | 129       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 101     | 0.8       | 0.375     | -40 to +125            | Rheostat mode, WiperLock™ Technology                                | 14-pin TSSOP   |
| MCP4461  | 257       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 102     | 1         | 0.5       | -40 to +125            | Potentiometer mode, WiperLock™ Technology                           | 20-pin TSSOP, 20-pin 4 x 4 QFN                           |
| MCP4462  | 257       | Nonvolatile | 4             | I <sup>2</sup> C™ | 5, 10, 50, 103     | 1         | 0.5       | -40 to +125            | Rheostat mode, WiperLock™ Technology                                | 14-pin TSSOP   |
| MCP4531  | 128       | Volatile    | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode  | 8-pin MSOP   |
| MCP4631  | 128       | Volatile    | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode  | 14-pin TSSOP, 16-pin 4 x 4 QFN                           |
| MCP4541  | 128       | Nonvolatile | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, WiperLock™ Technology                           | 8-pin MSOP   |
| MCP4641  | 128       | Nonvolatile | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.5       | 0.25      | -40 to +125            | Potentiometer mode, WiperLock™ Technology                           | 14-pin TSSOP, 16-pin 4x4 QFN                             |
| MCP4551  | 256       | Volatile    | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode  | 8-pin MSOP   |
| MCP4651  | 256       | Volatile    | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode  | 14-pin TSSOP, 16-pin 4 x 4 QFN                           |
| MCP4561  | 256       | Nonvolatile | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode, WiperLock™ Technology                           | 8-pin MSOP   |
| MCP4661  | 256       | Nonvolatile | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Potentiometer mode, WiperLock™ Technology                           | 14-pin TSSOP, 16-pin 4 x 4 QFN                           |
| MCP4532  | 128       | Nonvolatile | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | Rheostat mode   | 8-pin MSOP, 8-pin 3 x 3 DFN                              |
| MCP4632  | 128       | Nonvolatile | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | Rheostat mode   | 10-pin MSOP, 10-pin 3 x 3 DFN                            |
| MCP4542  | 128       | Nonvolatile | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 0.8       | 0.375     | -40 to +125            | Rheostat mode, WiperLock™ Technology                                | 8-pin MSOP, 8-pin 3 x 3 DFN                              |
| MCP4552  | 256       | Nonvolatile | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode   | 8-pin MSOP, 8-pin 3 x 3 DFN                              |
| MCP4652  | 256       | Nonvolatile | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode   | 10-pin MSOP, 10-pin 3 x 3 DFN                            |
| MCP4562  | 256       | Nonvolatile | 1             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode, WiperLock™ Technology                                | 8-pin MSOP, 8-pin 3 x 3 DFN                              |
| MCP4662  | 256       | Nonvolatile | 2             | I <sup>2</sup> C™ | 5, 10, 50, 100     | 1         | 0.5       | -40 to +125            | Rheostat mode, WiperLock™ Technology                                | 10-pin MSOP, 10-pin 3 x 3 DFN                            |

**MIXED SIGNAL: Frequency-to-Voltage/Voltage-to-Frequency Converters**

| Part # | Frequency Range (kHz) | Full Scale (ppm FS/°C) | Non-linearity (%FS) | Temperature Range (°C) | Packages                 |
|--------|-----------------------|------------------------|---------------------|------------------------|--------------------------|
| TC9400 | 100                   | ±40                    | ±0.05               | -40 to +85             | 14-pin PDIP, 14-pin SOIC |
| TC9401 | 100                   | ±40                    | ±0.02               | -40 to +85             | 14-pin PDIP, 14-pin SOIC |
| TC9402 | 100                   | ±100                   | ±0.25               | -40 to +85             | 14-pin PDIP, 14-pin SOIC |

**MIXED SIGNAL: D/A Converters**

| Part #  | Resolution (Bits) | DACs per Package | Interface         | VREF                | Output Settling Time (µs) | DNL (LSB) | Typical Standby Current (µA) | Typical Operating Current (µA) | Temperature Range (°C) | Packages                                      |
|---------|-------------------|------------------|-------------------|---------------------|---------------------------|-----------|------------------------------|--------------------------------|------------------------|---|
| TC1320  | 8                 | 1                | SMBus             | Ext                 | 10                        | ±0.8      | 0.1                          | 350                            | -40 to +85             | 8-pin MSOP, 8-pin SOIC                        |
| TC1321  | 10                | 1                | SMBus             | Ext                 | 10                        | ±2        | 0.1                          | 350                            | -40 to +85             | 8-pin MSOP, 8-pin SOIC                        |
| MCP4706 | 8                 | 1                | I <sup>2</sup> C™ | Ext                 | 6                         | 0.05      | 0.06                         | 210                            | -40 to +125            | 6-pin SOT-23                                  |
| MCP4716 | 10                | 1                | I <sup>2</sup> C™ | Ext                 | 6                         | 0.188     | 0.06                         | 210                            | -40 to +125            | 6-pin SOT-23                                  |
| MCP4725 | 12                | 1                | I <sup>2</sup> C™ | V <sub>DD</sub>     | 6                         | 0.75      | 1                            | 210                            | -40 to +125            | 6-pin SOT-23                                  |
| MCP4726 | 12                | 1                | I <sup>2</sup> C™ | Ext                 | 6                         | 0.75      | 0.06                         | 210                            | -40 to +125            | 6-pin SOT-23                                  |
| MCP4728 | 12                | 4                | I <sup>2</sup> C™ | Int/V <sub>DD</sub> | 6                         | 0.75      | 0.04                         | 800                            | -40 to +125            | 10-pin MSOP                                   |
| MCP4801 | 8                 | 1                | SPI               | Int                 | 4.5                       | 0.5       | 0.3                          | 330                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin DFN |
| MCP4802 | 8                 | 2                | SPI               | Int                 | 4.5                       | 0.5       | 3.3                          | 415                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| MCP4811 | 10                | 1                | SPI               | Int                 | 4.5                       | 0.5       | 0.3                          | 330                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin DFN |
| MCP4812 | 10                | 2                | SPI               | Int                 | 4.5                       | 0.5       | 3.3                          | 415                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP            |
| MCP4821 | 12                | 1                | SPI               | Int                 | 4.5                       | 1         | 0.3                          | 330                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin DFN |
| MCP4822 | 12                | 2                | SPI               | Int                 | 4.5                       | 1         | 3.3                          | 415                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin DFN |
| MCP4901 | 8                 | 1                | SPI               | Ext                 | 4.5                       | 0.5       | 3.3                          | 175                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin DFN |
| MCP4902 | 8                 | 2                | SPI               | Ext                 | 4.5                       | 0.5       | 0.3                          | 350                            | -40 to +125            | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP        |
| MCP4911 | 10                | 1                | SPI               | Ext                 | 4.5                       | 0.5       | 3.3                          | 175                            | -40 to +125            | 8-pin DFN, 8-pin MSOP, 8-pin PDIP, 8-pin SOIC |
| MCP4912 | 10                | 2                | SPI               | Ext                 | 4.5                       | 0.5       | 0.3                          | 350                            | -40 to +125            | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP        |
| MCP4921 | 12                | 1                | SPI               | Ext                 | 4.5                       | 0.75      | 3.3                          | 175                            | -40 to +125            | 8-pin PDIP, 8-pin SOIC, 8-pin MSOP, 8-pin DFN |
| MCP4922 | 12                | 2                | SPI               | Ext                 | 4.5                       | 0.75      | 0.3                          | 350                            | -40 to +125            | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP        |

Note: The analog output is voltage.

**INTERFACE**

**INTERFACE: Controller Area Network (CAN) Products**

| Part #                 | Operating Voltage (V) | Temperature Range (°C) | Tx Buffers | Rx Buffers | Filters | Masks | Interrupt Output | Unique Features   | Packages                               |
|------------------------|-----------------------|------------------------|------------|------------|---------|-------|------------------|---|--|
| MCP2510 <sup>(1)</sup> | 2.7 to 5.5            | -40 to +125            | 3          | 2          | 6       | 2     | Yes              | CAN 2.0B Active controller with SPI interface to MCU, 3 transmit buffers, 2 receive buffers, HW and SW message triggers | 18-pin PDIP, 18-pin SOIC, 20-pin TSSOP |
| MCP2515                | 2.7 to 5.5            | -40 to +125            | 3          | 2          | 6       | 2     | Yes              | MCP2510 pin compatible upgrade with enhanced features including higher throughput and data byte filtering               | 18-pin PDIP, 18-pin SOIC, 20-pin TSSOP |
| MCP25020               | 2.7 to 5.5            | -40 to +125            | 3          | 2          | 2       | 1     | N/A              | CAN 2.0B Active I/O Expander, Configurable I/O, 2 PWM outputs   | 14-pin PDIP, 14-pin SOIC               |
| MCP25025               | 2.7 to 5.5            | -40 to +85             | 3          | 2          | 2       | 1     | N/A              | CAN 2.0B Active I/O Expander, Configurable I/O, 2 PWM outputs, One-wire CAN option                                      | 14-pin PDIP, 14-pin SOIC               |
| MCP25050               | 2.7 to 5.5            | -40 to +125            | 3          | 2          | 2       | 1     | N/A              | Mixed-Signal CAN 2.0B Active I/O Expander, Configurable I/O, 4 1.0-bit ADCs, 2 PWM outputs                              | 14-pin PDIP, 14-pin SOIC               |
| MCP25055               | 2.7 to 5.5            | -40 to +85             | 3          | 2          | 2       | 1     | N/A              | Mixed-Signal CAN 2.0B Active I/O Expander, Configurable I/O, 4 1.0-bit ADCs, 2 PWM outputs, One-wire CAN option         | 14-pin PDIP, 14-pin SOIC               |
| MCP2551                | 4.5 to 5.5            | -40 to +125            | n/a        | n/a        | n/a     | n/a   | N/A              | High-speed CAN Transceiver (1.1 Mbps max. CAN bus speed), ISO11898 compatible, Industry standard pinout                 | 8-pin PDIP, 8-pin SOIC                 |

Note 1: Not recommended for new designs.



**INTERFACE: Infrared Products**

| Part #   | Operating Voltage (V) | Operating Temp. Range (°C) | Max. Baud Rate (Kbaud)    | Unique Features  | Packages                              |
|----------|-----------------------|----------------------------|---------------------------|--|---------------------------------------|
| MCP2120  | 2.5 to 5.5            | -40 to +85                 | 325                       | UART to IR encoder/decoder with both hardware and software baud rate selection                             | 14-pin PDIP, 14-pin SOIC              |
| MCP2122  | 1.8 to 5.5            | -40 to +85                 | 16x less than clock input | UART to IR encoder/decoder   | 8-pin PDIP, 8-pin SOIC                |
| MCP2140A | 2.0 to 5.5            | -40 to +85                 | 9.6                       | IrDA® Standard protocol handler plus bit encoder/decoder, Fixed baud rate, Low-cost                        | 18-pin PDIP, 18-pin SOIC, 20-pin SSOP |
| MCP2150  | 3.0 to 5.5            | -40 to +85                 | 115.2                     | IrDA® Standard protocol handler plus bit encoder/decoder on one chip for DTE applications, Programmable ID | 18-pin PDIP, 18-pin SOIC, 20-pin SSOP |
| MCP2155  | 3.0 to 5.5            | -40 to +85                 | 115.2                     | IrDA® Standard protocol handler plus bit encoder/decoder on one chip for DCE applications, Programmable ID | 18-pin PDIP, 18-pin SOIC, 20-pin SSOP |

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**INTERFACE: Ethernet Products**

| Part #     | Operating Voltage (V) | Operating Temp. Range (°C) | MAC | PHY          | TX/RX RAM | Interface  | Features  | Packages   |
|------------|-----------------------|----------------------------|-----|--------------|-----------|--|---|--|
| ENC28J60   | 3.1 to 3.6            | -40 to +85                 | Yes | 10Base-T     | 8 KB      | SPI  | <ul style="list-style-type: none"> <li>10Base-T Ethernet controller, IEEE 802.3™ compliant</li> <li>Loopback test modes, Auto-polarity detection</li> <li>Clock out pin with programmable frequencies</li> </ul>  | 28-pin SOIC, 28-pin SSOP, 28-pin 6 x 6 QFN, 28-pin SPDIP |
| ENC424J600 | 3.0 to 3.6            | -40 to +85                 | Yes | 10/100Base-T | 24 KB     | <ul style="list-style-type: none"> <li>SPI</li> <li>8-bit multiplexed parallel interface</li> </ul>                            | <ul style="list-style-type: none"> <li>10/100 Ethernet controller, IEEE 802.3(TM) compliant</li> <li>Cryptographic Security Engines: MD5, SHA-1, AES, RSA</li> <li>Preprogrammed unique MAC address</li> <li>Loopback test modes, Auto-polarity detection</li> <li>Clock out pin with programmable frequencies</li> </ul> | 44-pin TQFP, 44-pin QFN                                  |
| ENC624J600 | 3.0 to 3.6            | -40 to +85                 | Yes | 10/100Base-T | 24 KB     | <ul style="list-style-type: none"> <li>SPI</li> <li>8-bit or 16-bit multiplexed or demultiplexed parallel interface</li> </ul> | <ul style="list-style-type: none"> <li>10/100 Ethernet controller, IEEE 802.3(TM) compliant</li> <li>Cryptographic Security Engines: MD5, SHA-1, AES, RSA</li> <li>Preprogrammed unique MAC address</li> <li>Loopback test modes, Auto-polarity detection</li> <li>Clock out pin with programmable frequencies</li> </ul> | 64-pin TQFP  |

**INTERFACE: Passive Access Products**

| Part #  | Operating Voltage (V) | Operating Temp. Range (°C) | Bus Type | RF Carrier Frequency | Data Format | Features  | Packages                               |
|---------|-----------------------|----------------------------|----------|----------------------|-------------|---|--|
| MCP2030 | 1.8 to 3.6            | -40 to +85                 | SPI      | 125 kHz              | NRZ         | Three axis signal conditioning devices for passive access applications, High-sensitivity, Configurable smart wake-up filter | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP |

**INTERFACE: LIN Transceiver Products**

| Part #   | Description  | V <sub>RES</sub> Output Voltage (V) | Operating Temp. Range (°C) | V <sub>RES</sub> Output Current (mA) | V <sub>CC</sub> Range (V) | Max Baud Rate | LIN Specification Supported       | Packages                                |
|----------|--|-------------------------------------|----------------------------|--------------------------------------|---------------------------|---------------|-----------------------------------|---|
| MCP2003A | Stand-alone LIN Transceiver (industry standard pinout)       | None                                | -40 to +125                | None                                 | 6 to 27 <sup>(1)</sup>    | 20 Kbaud      | Revision 1.3, 2.0, 2.1, SAE J2602 | 8-pin PDIP, 8-pin SOIC, 8-pin 4 x 4 DFN |
| MCP2004A | Stand-alone LIN Transceiver with TXE/Fault I/O               | None                                | -40 to +125                | None                                 | 6 to 27 <sup>(1)</sup>    | 20 Kbaud      | Revision 1.3, 2.0, 2.1, SAE J2602 | 8-pin PDIP, 8-pin SOIC, 8-pin 4 x 4 DFN |
| MCP2021A | LIN Transceiver with integrated V <sub>RES</sub>             | 5.0 ± 3%, 3.3 ± 3%                  | -40 to +125                | 70                                   | 6 to 18 <sup>(1)</sup>    | 20 Kbaud      | Revision 1.3, 2.0, 2.1, SAE J2602 | 8-pin PDIP, 8-pin SOIC, 8-pin 4 x 4 DFN |
| MCP2022A | LIN Transceiver with integrated V <sub>RES</sub> , RESET pin | 5.0 ± 3%, 3.3 ± 3%                  | -40 to +125                | 70                                   | 6 to 18 <sup>(1)</sup>    | 20 Kbaud      | Revision 1.3, 2.0, 2.1, SAE J2602 | 14-pin PDIP, 14-pin SOIC, 14-pin TSSOP  |
| MCP2050  | LIN Transceiver with integrated V <sub>RES</sub> , WWDT      | 5.0 ± 3%, 3.3 ± 3%                  | -40 to +125                | 70                                   | 6 to 18 <sup>(1)</sup>    | 20 Kbaud      | Revision 1.3, 2.0, 2.1, SAE J2602 | 14-pin PDIP, 14-pin SOIC, 20-pin QFN    |

Note 1: Can withstand 40V load dump.

**INTERFACE: Serial Peripherals**

| Part #   | Description              | Operating Voltage (V) | Operating Temp. Range (°C) | Bus Type          | Max. Bus Frequency (kHz) | Features   | Packages  |
|----------|--------------------------|-----------------------|----------------------------|-------------------|--------------------------|--|---|
| MCP23008 | 8-bit I/O Port Expander  | 1.8 to 5.5            | -40 to +85                 | I <sup>2</sup> C™ | 1700                     | 3 HW address pins, HW interrupt, 25 mA source/sink capability per I/O  | 18-pin PDIP, 18-pin SOIC, 20-pin SSOP, 20-pin 4 x 4 QFN |
| MCP23S08 | 8-bit I/O Port Expander  | 1.8 to 5.5            | -40 to +85                 | SPI               | 10000                    | 2 HW address pins, HW interrupt, 25 mA source/sink capability per I/O  | 18-pin PDIP, 18-pin SOIC, 20-pin SSOP, 20-pin 4 x 4 QFN |
| MCP23009 | 8-bit I/O Port Expander  | 1.8 to 5.5            | -40 to +125                | I <sup>2</sup> C™ | 3400                     | 1 HW address pin, HW interrupt, 25 mA source/sink per I/O, 100 kHz, 400 kHz and 3.4 MHz I <sup>2</sup> C™ supported      | 18-pin PDIP, 18-pin SOIC, 20-pin SSOP                   |
| MCP23S09 | 8-bit I/O Port Expander  | 1.8 to 5.5            | -40 to +125                | SPI               | 10000                    | HW interrupt, 25 mA source/sink per I/O  | 18-pin PDIP, 18-pin SOIC                                |
| MCP23016 | 16-bit I/O Port Expander | 2.0 to 5.5            | -40 to +85                 | I <sup>2</sup> C™ | 400                      | 3 HW address inputs, HW interrupt, 25 mA source/sink capability per I/O  | 28-pin PDIP, 28-pin SOIC, 28-pin SSOP, 28-pin 6 x 6 QFN |
| MCP23017 | 16-bit I/O Expander      | 1.8 to 5.5            | -40 to +125                | I <sup>2</sup> C™ | 1700                     | 3 HW address pins, 25 mA sink/source per I/O, 100 kHz, 400 kHz and 3.4 MHz I <sup>2</sup> C™ supported, interrupt output | 28-pin PDIP, 28-pin SOIC, 28-pin SSOP, 28-pin QFN       |
| MCP23S17 | 16-bit I/O Expander      | 1.8 to 5.5            | -40 to +125                | SPI               | 10000                    | 3 HW address pins, 25 mA sink/source per I/O, interrupt output   | 28-pin PDIP, 28-pin SOIC, 28-pin SSOP, 28-pin QFN       |
| MCP23018 | 16-bit I/O Port Expander | 1.8 to 5.5            | -40 to +125                | I <sup>2</sup> C™ | 3400                     | 1 HW address pin, 2 HW interrupts, 25 mA source/sink per I/O, 100 kHz, 400 kHz and 3.4 MHz I <sup>2</sup> C™ supported   | 24-pin SSOP, 28-pin SOIC, 28-pin SDIP                   |
| MCP23S18 | 16-bit I/O Port Expander | 1.8 to 5.5            | -40 to +125                | SPI               | 10000                    | 2 HW interrupts, 25 mA source/sink per I/O   | 28-pin SOIC, 28-pin SDIP                                |

**INTERFACE: IEEE 802.15.4 ZigBee® RF Transceiver Products**

| Part #     | Frequency Range (GHz) | Sensitivity (dBm) | Power Output (dBm) | RSSI | TX Power Consumption (mA) | RX Power Consumption (mA) | Clock (MHz) | Sleep | MAC | MAC Features | Encryption | Interface  | Pin Count | Packages     |
|------------|-----------------------|-------------------|--------------------|------|---------------------------|---------------------------|-------------|-------|-----|--------------|------------|------------|-----------|--------------|
| MRF24J40   | 2.405 to 2.48         | -95               | 0                  | Yes  | 18                        | 22                        | 20          | Yes   | Yes | CSMA-CA      | AES128     | 4-wire SPI | 40        | 40-pin QFN   |
| MRF24J40MA | 2.405 to 2.48         | -95               | 0                  | Yes  | 23                        | 19                        | 20          | Yes   | Yes | CSMA-CA      | AES128     | 4-wire SPI | 12        | Module       |
| MRF24J40MB | 2.405 to 2.48         | -102              | 20                 | Yes  | 120                       | 25                        | 20          | Yes   | Yes | CSMA-CA      | AES128     | 4-wire SPI | 12        | Module       |
| MRF49XA    | 433/868/915           | -110              | 7                  | Yes  | 15                        | 11                        | -           | Yes   | -   | -            | -          | 4-wire SPI | 16        | 16-pin TSSOP |

**INTERFACE: Stand-alone RF Receiver Products**

| Part #   | Modulation   | Data Rate (kbps) | Frequency Range (MHz) | Sensitivity (dBm) | IF Frequency Range (MHz) | Operating Voltage (V) | RSSI | Selectable LNA Gain | Packages    |
|----------|--------------|------------------|-----------------------|-------------------|--------------------------|-----------------------|------|---------------------|-------------|
| rRXD0420 | ASK, FSK, FM | 80               | 300 to 450            | -111              | 0.455 to 21.4            | 2.5 to 5.5            | Yes  | Yes                 | 32-pin LQFP |
| rRXD0920 | ASK, FSK, FM | 80               | 800 to 930            | -109              | 0.455 to 21.4            | 2.5 to 5.5            | Yes  | Yes                 | 32-pin LQFP |

**INTERFACE: USB Products**

| Part #  | USB Speed  | PHY | MCU Interface | Tx/Rx Buffer Size (bytes) | Number of GPIO | Operating Voltage (V) | Packages                              |
|---------|--|-----|---------------|---------------------------|----------------|-----------------------|---------------------------------------|
| MCP2200 | Full-Speed USB (12 Mb/s), Low-Speed USB (1.5 Mb/s) | Yes | UART          | 128/128                   | 8              | 2.7 to 5.5            | 20-pin SOIC, 20-pin TSSOP, 20-pin QFN |
| MCP2210 | Full-Speed USB (12 Mb/s), Low-Speed USB (1.5 Mb/s) | Yes | SPI           | 64                        | 9              | 3.3 to 5.5            | 20-pin SOIC, 20-pin TSSOP, 20-pin QFN |

# SAFETY & SECURITY

## SAFETY & SECURITY: Photoelectric Smoke Detector ICs

| Part #   | Horn Driver Alarm Pattern        | Alarm Memory | Low Battery Detection | Chamber Test | Alarm Interconnect | Sensitivity Timer | Internal POR | Alternate Diagnostic Mode | Operating Temp. Range (°C) | Packages                 |
|----------|----------------------------------|--------------|-----------------------|--------------|--------------------|-------------------|--------------|---------------------------|----------------------------|--------------------------|
| RE46C140 | NFPA Temporal                    | No           | Yes                   | Yes          | Yes                | Yes               | Yes          | -                         | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C141 | NFPA Temporal                    | No           | Yes                   | Yes          | Yes                | -                 | Yes          | -                         | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C143 | Continuous Tone                  | No           | Yes                   | Yes          | Yes                | -                 | Yes          | -                         | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C144 | Continuous Tone                  | No           | Yes                   | Yes          | Yes                | Yes               | Yes          | -                         | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C145 | NFPA Temporal                    | No           | Yes                   | Yes          | Yes                | Yes               | Yes          | Yes                       | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C165 | NFPA Temporal                    | Yes          | Yes                   | Yes          | Yes                | Yes               | Yes          | Yes                       | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C166 | Continuous Tone                  | Yes          | Yes                   | Yes          | Yes                | Yes               | Yes          | Yes                       | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C167 | NFPA Temporal                    | Yes          | Yes                   | Yes          | Yes                | Yes               | Yes          | Yes                       | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C168 | Continuous Tone                  | Yes          | Yes                   | Yes          | Yes                | Yes               | Yes          | Yes                       | -25 to +75                 | 16-pin PDIP, 16-pin SOIC |
| RE46C190 | NFPA Temporal or Continuous Tone | Yes          | Yes                   | Yes          | Yes                | Yes               | Yes          | -                         | -10 to +60                 | 16-pin SOIC              |

## SAFETY & SECURITY: Ionization Smoke Detector ICs

| Part #   | Horn Driver Alarm Pattern        | Alarm Memory | Low Battery Detection | Reverse Battery Protection | Alarm Interconnect | Hush Timer | Power-up Low Battery Test | Operating Temp. Range (°C) | Packages                 |
|----------|----------------------------------|--------------|-----------------------|----------------------------|--------------------|------------|---------------------------|----------------------------|--------------------------|
| RE46C120 | NFPA Temporal or Continuous Tone | No           | Yes                   | Yes                        | -                  | -          | -                         | -10 to +60                 | 16-pin PDIP              |
| RE46C121 | NFPA Temporal                    | No           | Yes                   | Yes                        | Yes                | -          | -                         | -10 to +60                 | 16-pin PDIP              |
| RE46C122 | NFPA Temporal                    | No           | Yes                   | Yes                        | Yes                | Yes        | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C126 | Continuous Tone                  | No           | Yes                   | Yes                        | Yes                | -          | -                         | -10 to +60                 | 16-pin PDIP              |
| RE46C127 | Continuous Tone                  | No           | Yes                   | Yes                        | Yes                | Yes        | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C128 | NFPA Temporal                    | No           | Yes                   | Yes                        | Yes                | -          | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C129 | Continuous Tone                  | No           | Yes                   | Yes                        | Yes                | -          | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C152 | NFPA Temporal or Continuous Tone | No           | Yes                   | Yes                        | Yes                | Yes        | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C162 | NFPA Temporal or Continuous Tone | Yes          | Yes                   | Yes                        | Yes                | Yes        | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C163 | NFPA Temporal or Continuous Tone | Yes          | Yes                   | Yes                        | Yes                | Yes        | Yes                       | -10 to +60                 | 16-pin PDIP              |
| RE46C180 | NFPA Temporal or Continuous Tone | Yes          | Yes                   | No                         | Yes                | Yes        | Yes                       | -10 to +60                 | 16-pin PDIP, 16-pin SOIC |

## SAFETY & SECURITY: Ionization Smoke Detector Front Ends

| Part #   | Microprocessor Compatible Output |    | Output Options  |   | Typical Application       |                   | Operating Temperature Range (°C) |            | Packages   |
|----------|----------------------------------|----|---|---|---------------------------|-------------------|----------------------------------|------------|------------|
|          | Yes                              | No | V <sub>OUT</sub> 1/4 of V <sub>DD</sub> or V <sub>OUT</sub> 1/4 of Detect Input | V <sub>OUT</sub> 1/2 of V <sub>DD</sub> or V <sub>OUT</sub> 1/2 of Detect Input | 3V or 3.3V Microprocessor | 5V Microprocessor | -10 to +60                       | -10 to +60 |            |
| RE46C112 | Yes                              | No | V <sub>OUT</sub> 1/4 of V <sub>DD</sub> or V <sub>OUT</sub> 1/4 of Detect Input | V <sub>OUT</sub> 1/2 of V <sub>DD</sub> or V <sub>OUT</sub> 1/2 of Detect Input | 3V or 3.3V Microprocessor | 5V Microprocessor | -10 to +60                       | -10 to +60 | 8-pin PDIP |
| RE46C114 | Yes                              | No | V <sub>OUT</sub> 1/4 of V <sub>DD</sub> or V <sub>OUT</sub> 1/4 of Detect Input | V <sub>OUT</sub> 1/2 of V <sub>DD</sub> or V <sub>OUT</sub> 1/2 of Detect Input | 3V or 3.3V Microprocessor | 5V Microprocessor | -10 to +60                       | -10 to +60 | 8-pin PDIP |

## SAFETY & SECURITY: Piezoelectric Horn Drivers

| Part #   | Operating Voltage (V) | Piezoelectric Horn Driver | LED Driver | Voltage Regulator (V) | Low Battery Detection | Interconnect | Power good | Operating Temp. Range (°C) | Packages                 |
|----------|-----------------------|---------------------------|------------|-----------------------|-----------------------|--------------|------------|----------------------------|--------------------------|
| RE46C100 | 6 to 16               | Yes                       | -          | -                     | -                     | -            | -          | -40 to +85                 | 8-pin PDIP, 8-pin SOIC   |
| RE46C101 | 6 to 16               | Yes                       | Yes        | -                     | -                     | -            | -          | -40 to +85                 | 8-pin PDIP, 8-pin SOIC   |
| RE46C104 | 4 to 8                | Yes                       | -          | -                     | -                     | -            | -          | 0 to +50                   | 14-pin PDIP, 14-pin SOIC |
| RE46C105 | 6 to 12               | Yes                       | Yes        | 3.3 or 5              | Yes                   | -            | -          | -40 to +85                 | 14-pin PDIP, 14-pin SOIC |
| RE46C107 | 2 to 5                | Yes                       | Yes        | 3 or 3.3              | Yes                   | -            | -          | 0 to +50                   | 16-pin PDIP, 16-pin SOIC |
| RE46C108 | 6 to 12               | Yes                       | -          | 3.3 or 5              | -                     | -            | -          | -40 to +85                 | 8-pin PDIP, 8-pin SOIC   |
| RE46C109 | 6 to 12               | Yes                       | -          | 3                     | Yes                   | Yes          | Yes        | -40 to +85                 | 16-pin PDIP, 16-pin SOIC |
| RE46C117 | 2 to 5                | Yes                       | -          | -                     | -                     | -            | -          | 0 to +50                   | 8-pin PDIP, 8-pin SOIC   |
| RE46C119 | 6 to 12               | Yes                       | -          | 3                     | Yes                   | Yes          | Yes        | -40 to +85                 | 16-pin PDIP, 16-pin SOIC |

# Analog Design Development Tools

| Evaluation, Demonstration and Development Kits               |   |  |
|--|---|--|
| Order #  | Description   | Devices Supported  |
| <b>Thermal Management Demonstration and Evaluation Tools</b> |   |  |
| ADM00345   | MTD6505 3-Phase BLDC Sensorless Fan Controller Demonstration Board    | MTD6505  |
| MCP9700DM-PCTL   | MCP9700 Temperature-to-Voltage Converter PICtail™ Demonstration Board | MCP9800  |
| MCP9700DM-TH1  | MCP9700 Thermistor Demonstration Board                                | MCP9700, MCP6S92   |
| MCP9800DM-PCTL   | MCP9800 Temperature Sensor PICtail™ Demonstration Board               | MCP9800  |
| MCP9800DM-TS1  | MCP9800 Temperature Sensor Demonstration Board                        | MCP9800  |
| MCP9800DM-DL   | MCP9800 Temperature Data Logger Demonstration Board                   | MCP9800  |
| MCP9800DM-DL2  | MCP9800 Temperature Data Logger Demonstration Board 2                 | MCP9800, MCP101, PIC10F202, 24LC16B                              |
| TC1047ADM-PICTL  | TC1047A Temperature-to-Voltage Converter PICtail™ Demonstration Board | TC1047A  |
| TC642DEMO  | TC64X/64XB Fan Speed Controller Demonstration Board                   | TC642, TC646, TC647, TC648, TC649                                |
| TC650DEMO  | TC650 Fan Controller Demonstration Board                              | TC650  |
| TC652DEMO  | TC652 Fan Controller Demonstration Board                              | TC652  |
| TC72DM-PICTL   | TC72 Digital Temperature Sensor PICtail™ Demonstration Board          | TC72   |
| TC74DEMO   | TC74 Serial Digital Thermal Sensor Demonstration Board                | TC74   |
| TC77DM-PICTL   | TC77 Thermal Sensor PICtail™ Demonstration Board                      | TC77   |
| TMPSENS-RTD1   | PT100 RTD Evaluation Board  | MCP6S26, MCP3301, MCP6024, MCP41010, PIC18F2550, TC1071, MCP6002 |
| TMPNSRD-RTD2   | RTD Reference Design Board  | MCP3551, MCP9804   |
| TMPNSRD-TCPL1  | Thermocouple Reference Design   | MCP9804, MCP3421   |
| <b>Mixed Signal Demonstration and Evaluation Tools</b>       |   |  |
| ADM00310   | MCP3903 ADC Evaluation Board for 16-bit MCUs                          | MCP3903, MCP2200, PIC24, dsPIC33                                 |
| ADM00317   | MCP47X6 PICtail™ Plus Daughter Board                                  | MCP4726, MCP4716, MCP4706  |
| ADM00333   | PIC18F87J72 Evaluation Board  | PIC18F87J72  |
| ADM00398   | MCP3911 ADC Evaluation Board for 16-bit MCUs                          | MCP3911  |
| ARD00280   | PIC18F87J72 Single Phase Energy Meter Reference Design                | N/A  |
| ARD00330   | PIC18F87J72 Energy Monitoring PICtail™ Plus Daughter Board            | N/A  |
| ARD00342   | MCP3901 and PIC18F65J90 Shunt Meter Reference Design                  | MCP3901, PIC18F65J90   |
| DV3201A  | MCP3XXX Single/Dual ADC MXDEV® Daughter Board                         | MCP3001, MCP3002, MCP3201, MCP3202                               |
| DV3204A  | MCP3204/08 MXDEV® Daughter Board                                      | MCP3004, MCP3008, MCP3204, MCP3208                               |
| DV42XXX  | MCP42XXX Digital Potentiometer Evaluation Board                       | MCP42010, MCP42050, MCP42100                                     |
| DVMCPA   | MXDEV® Analog Evaluation System                                       | MCP3001/02, MCP3004/08, MCP3201/08, MCP3204/08                   |
| MCP2030DM-TPR  | MCP2030 Bidirectional Communications Demonstration Kit                | MCP2030, MCP3421, PIC16F636, TC4421, PIC18F4680                  |
| MCP3221DM-PCTL   | MCP3221 PICtail™ Demonstration Board                                  | MCP3221  |
| MCP3421EV  | MCP3421 SOT-23-6 Evaluation Board                                     | MCP3421  |
| MCP3421DM-BFG  | MCP3421 Battery Fuel Gauge Demonstration Board                        | MCP3421, MCP73831, MCP1702, PIC18F4550                           |
| MCP3421DM-WS1  | MCP3421 Weight Scale Demonstration Board                              | MCP3421, MCP6V07, PIC18F4550                                     |
| MCP3422EV  | MCP3422 Evaluation Board  | MCP3422  |
| MCP3423EV  | MCP3423 Evaluation Board  | MCP3423  |
| MCP3424EV  | MCP3424 Evaluation Board  | MCP3424  |
| MCP3425EV  | MCP3425 SOT 23-6 Evaluation Board                                     | MCP3425  |
| MCP3551DM-PCTL   | MCP3551 Delta-Sigma ADC Demonstration Board                           | MCP3551  |
| MCP355XDV-MS1  | MCP355X Sensor Application Developer's Board                          | MCP3551, MCP3553, MCP3550-50, MCP3550-60                         |
| MCP355XDM-TAS  | MCP355X Tiny Application Sensor Demonstration Board                   | MCP3551, MCP3553, MCP3550-50, MCP3550-60                         |
| MCP3901EV-MCU16  | MCP3901 ADC Evaluation Board for 16-bit MCUs                          | MCP3901, PIC24F, PIC24H, dsPIC33, PIC18F86J55                    |
| MCP3905EV  | MCP3905 Energy Meter Evaluation Board                                 | MCP3905  |

# Analog Design Development Tools

| Evaluation, Demonstration and Development Kits                     |   |  |
|--|---|--|
| Order #  | Description   | Devices Supported  |
| <b>Mixed Signal Demonstration and Evaluation Tools (Continued)</b> |   |  |
| MCP3905RD-PM1  | MCP3905 Energy Meter Reference Design                                       | MCP3905  |
| MCP3909EV-MCU16  | MCP3909 ADC Evaluation Board for 16-bit MCUs                                | MCP3909  |
| MCP3909RD-3PH1   | MCP3909 3-Phase Energy Meter Reference Design                               | MCP3909, PIC18F2520, PIC18F4550  |
| MCP3909RD-3PH3   | MCP3909 and dsPIC33F 3-Phase Energy Meter Reference Design                  | MCP3909, dsPIC33FJ128GP706   |
| MCP3909RD-1PH1   | MCP3909 and PIC18F85J90 Single Phase Energy Meter Reference Design          | MCP3909, PIC18F85J90   |
| MCP401XEV  | MCP401X Evaluation Board  | MCP40D18, MCP4017, MCP4018, MCP4019, MCP40D17, MCP40D19                |
| MCP4XXXDM-DB   | MCP4XXX Digital Potentiometer Daughter Board                                | MCP4011, MCP4021, MCP42XXX   |
| MCP402XEV  | MCP402X Non-Volatile Digital Potentiometer Evaluation Board                 | MCP4021, MCP4022, MCP4023, MCP4024                                     |
| MCP42XXDM-PTPLS  | MCP42XX PICtail™ Plus Daughter Board  | MCP4231, MCP4232, MCP4241, MCP4242, MCP4251, MCP4252, MCP4261, MCP4262 |
| MCP42XXEV  | MCP42XX Evaluation Board  | MCP4231, MCP4241, MCP4251, MCP4261                                     |
| MCP43XXEV  | MCP43XX Evaluation Board  | MCP4331, MCP4341, MCP4351, MCP4361                                     |
| MCP46XXDM-PTPLS  | MCP46XX PICtail™ Plus Daughter Board  | MCP4631, MCP4641, MCP4651, MCP47652, MCP4661, MCP4662                  |
| MCP46XXEV  | MCP46XX Evaluation Board  | MCP4631, MCP4641, MCP4651, MCP4661                                     |
| MCP4725EV  | MCP4725 SOT 23-6 Evaluation Board   | MCP4725  |
| MCP4725DM-PTPLS  | MCP4725 PICtail™ Plus Daughter Board  | MCP4725  |
| MCP4728EV  | MCP4728 Quad DAC Evaluation Board   | MCP4728  |
| MXSIGDM  | Mixed Signal PICtail™ Demonstration Board                                   | TC132X, MCP330X, MCP320X, MCP482X, MCP492X, MCP3221, MCP3021, MCP1525  |
| <b>Power Management Demonstration and Evaluation Tools</b>         |   |  |
| ADM00360   | MCP16301 High Voltage Buck Converter 300 mA D2PAK Demo Board                | MCP16301   |
| ADM00414   | MCP16321 Evaluation Board   | MCP16321   |
| ADM00423   | MCP16322 Evaluation Board   | MCP16321, MCP16322   |
| ADM00427   | MCP16323 Evaluation Board   | MCP16321, MCP16322, MCP16323   |
| ARD00386   | MCP1640 12V/50 mA Two Cell Input Boost Converter Reference Design           | MCP1640  |
| MCP1252DM-BKLT   | MCP1252 Charge Pump Backlight Demonstration Board                           | MCP1252  |
| MCP1256/7/8/9EV  | MCP1256/7/8/9 Charge Pump Evaluation Board                                  | MCP1256, MCP1257, MCP1258, MCP1259                                     |
| MCP1601EV  | MCP1601 Buck Regulator Evaluation Board                                     | MCP1601  |
| MCP1602EV  | MCP1602 Evaluation Board  | MCP1602  |
| MCP1603EV  | MCP1603 Buck Converter Evaluation Board                                     | MCP1603  |
| MCP1603RD-TNY  | MCP1603 Tiny Reference Design   | MCP1603  |
| MCP1612EV  | MCP1612 Synchronous Buck Regulator Evaluation Board                         | MCP1612  |
| MCP1630RD-DDBK1  | MCP1630 +12V in Dual Output Buck Converter Reference Design                 | MCP1630  |
| MCP1630RD-DDBK3  | MCP1630 Bidirectional 4-Cell Li-Ion Charger Reference Design                | MCP1630V, PIC16F88, MCP6022  |
| MCP1630RD-NMC1   | MCP1630 Low-Cost NiMH Battery Charger Reference Design                      | MCP1630, PIC12F683, MCP6292, MCP1702                                   |
| MCP1630DM-DDBK1  | MCP1630 1A Bias Supply Demonstration Board                                  | MCP1630  |
| MCP1630DM-DDBS1  | MCP1630 Automotive Input Boost Converter Demonstration Board                | MCP1630, PIC12F683   |
| MCP1630DM-LED2   | MCP1630 Boost Mode LED Driver Demonstration Board                           | MCP1630V, PIC12F683, MCP1702   |
| MCP1630RD-LIC1   | MCP1630 Li-Ion Multi Bay Battery Charger Reference Design                   | MCP1630  |
| MCP1630RD-LIC2   | MCP1630 Low Cost Li-Ion Battery Charger Reference Design                    | MCP1630  |
| MCP1630RD-SALED  | MCP1630 SEPIC Automotive LED Driver Reference Board                         | MCP16301   |
| MCP1630DM-NMC1   | MCP1630 NiMH Battery Charger Demonstration Board                            | MCP1630  |
| MCP1630DM-DDBS2  | MCP1630 Coupled Inductor Boost Demonstration Board                          | MCP1630, PIC12F683   |
| MCP1630DM-DDBK4  | MCP1630 Automotive Input, Triple Output Converter Demonstration Board       | MCP1630, PIC12F683   |
| MCP1631RD-DCPC1  | MCP1631HV Digitally Controlled Programmable Current Source Reference Design | MCP1631HV, PIC16F616   |

# Analog Design Development Tools

| Evaluation, Demonstration and Development Kits                         |  |   |
|--|--|---|
| Order #  | Description  | Devices Supported   |
| <b>Power Management Demonstration and Evaluation Tools (Continued)</b> |  |   |
| MCP1631RD-MCC1   | MCP1631HV Multi-Chemistry Battery Charger Reference Design             | MCP1631HV, PIC16F883  |
| MCP1631RD-MCC2   | MCP1631HV Multi-Chemistry Battery Charger Reference Design             | MCP1631HV, PIC16F883  |
| MCP1640EV-SBC  | MCP1640 Sync Boost Converter Evaluation Board                          | MCP1640   |
| MCP1640RD-4ABC   | MCP1640 Single Quad-A Battery Boost Converter Reference Design         | MCP1640, PIC12F617  |
| MCP1650DM-LED1   | MCP1650 3W White LED Demonstration Board                               | MCP1650   |
| MCP1650DM-LED2   | MCP1650 Multiple White LED Demonstration Board                         | MCP1650   |
| MCP1650EV  | MCP1650 Boost Controller Evaluation Board                              | MCP1650   |
| MCP1650DM-DDSC1  | MCP1650 SEPIC Power Supply Demonstration Board                         | MCP1650   |
| MCP1726EV  | MCP1726 1A LDO Evaluation Board  | MCP1726   |
| MCP73113EV-1SOVP   | MCP73113 OVP Single Cell Li-Ion Battery Charger Evaluation Board       | MCP73113, MCP73114  |
| MCP73213EV-2SOVP   | MCP73213 OVP Dual Cell Li-Ion Battery Charger Evaluation Board         | MCP73213  |
| MCP73X23EV-LFP   | MCP73X23 OVP Lithium Iron Phosphate Battery Charger Evaluation Board   | MCP73123, MCP73223  |
| MCP73871DM-VPCC  | MCP73871 Demonstration Board with Voltage Proportional Current Control | MCP73871  |
| MCP7381XEV   | MCP7381X Low-Cost Li-Ion Battery Charger Evaluation Board              | MCP73811, MCP73812  |
| MCP7382XEV   | MCP7382X Li-Ion Battery Charger Evaluation Board                       | MCP7382X  |
| MCP73831EV   | MCP73831 Evaluation Kit  | MCP73831  |
| MCP73833EV   | MCP73833 Li-Ion Battery Charger Evaluation Board                       | MCP73833, MCP73834  |
| MCP7383XEV-DIBC  | MCP73837/8 AC/USB Dual Input Battery Charger Evaluation Board          | MCP73837, MCP73838  |
| MCP7383XRD-PPM   | MCP7383X Li-Ion System Power Path Management Reference Design          | MCP73831, MCP73832, MCP73833, MCP73834                      |
| MCP7384XEV   | MCP7384X Li-Ion Battery Charger Evaluation Board                       | MCP7384X  |
| MCP73855EV   | MCP73855 Li-Ion Battery Charger Evaluation Board                       | MCP73855  |
| MCP7386XEV   | MCP7386X Li-Ion Battery Charger Evaluation Board                       | MCP7386X  |
| MCP73871EV   | MCP73871 Evaluation Board  | MCP73871  |
| SOT23-3EV-VREG   | SOT23-3 Voltage Regulator Evaluation Board                             | MCP1701A, MCP1702, MCP1703                                  |
| SOT223-3EV-VREG  | SOT223-3 Voltage Regulator Evaluation Board                            | MCP1791, MCP1824, MCP1825, MCP1826                          |
| SOT89-3EV-VREG   | SOT89-3 Voltage Regulator Evaluation Board                             | MCP1700, MCP1701A, MCP1702, MCP1703                         |
| SOT23-5EV-VREG   | SOT23-5 Voltage Regulator Evaluation Board                             | MCP1801, MCP1802, TC1014/1015/1185, and other SOT23-5 LDOs  |
| SOT223-5EV-VREG  | SOT223-5 Voltage Regulator Evaluation Board                            | MCP1790, MCP1824, MCP1825, MCP1826                          |
| TO263-3EV-VREG   | TO220-3/TO263-3 Voltage Regulator Evaluation Board                     | MCP1790, MCP1825S, MCP1826S, MCP1827S                       |
| TO263-5EV-VREG   | TO220-5/TO263-5 Voltage Regulator Evaluation Board                     | MCP1790, MCP1791, MCP1825, MCP1826, MCP1827                 |
| TC110DM  | TC110 Boost Converter Demonstration Board                              | TC110, MCP73832   |
| TC115EV  | TC115 PFM/PWM Boost Converter Evaluation Board                         | TC115   |
| TC1016/17EV  | TC1016/17 LDO Linear Regulator Evaluation Board                        | TC1016/17   |
| TC1303BDM-DDBK1  | TC1303B Demonstration Board  | TC1303B   |
| TC1303DM-DDBK2   | TC1303 DFN Adjustable Output Demonstration Board                       | TC1303C   |
| <b>Interface Products Demonstration and Evaluation Tools</b>           |  |   |
| ADM00419   | MCP2210 Breakout Module  | MCP2210   |
| ADM00421   | MCP2210 Evaluation Kit   | MCP2210   |
| DV251001   | MCP2510/2515 CAN Developer's Kit                                       | MCP2515, MCP2510  |
| DV250501   | MCP250XX CAN I/O Expanders Developer's Kit                             | MCP25020, MCP25025, MCP25050, MCP25055                      |
| GPIO DM-KPLCD  | GPIO Expander Keypad and LCD Demonstration Board                       | MCP23008, MCP23S08, MCP23017, MCP23S17, PIC18F4550, MCP1702 |
| MCP212XDM  | MCP2120/22 Developer's Board   | MCP2120, MCP2122  |
| MCP212XEV-DB   | MCP212X Developer's Daughter Board                                     | MCP212X   |



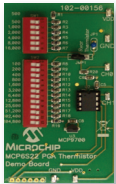
# Analog Design Development Tools

| Evaluation, Demonstration and Development Kits                           |   |   |
|--|---|---|
| Order #  | Description   | Devices Supported   |
| <b>Interface Products Demonstration and Evaluation Tools (Continued)</b> |   |   |
| MCP2140DM-TMPSNS   | MCP2140 IrDA® Wireless Temp Demonstration Board                 | MCP2140   |
| MCP215X/40EV-DB  | MCP215X/40 Developer's Daughter Board                           | MCP2140, MCP2150/55   |
| MCP215XDM  | MCP215X Data Logger Demonstration Board                         | MCP2150/55  |
| MCP2150DM  | MCP2150 Developer's Board                                       | MCP2150, MCP2155  |
| MCP2200EV-VCP  | MCP2200 USB to RS232 Demonstration Board                        | MCP2200   |
| MCP23X08EV   | MCP23X08 8-bit GPIO Expander Evaluation Board                   | MCP23008, MCP23S08  |
| MCP23X17EV   | MCP23X17 16-bit GPIO Expander Evaluation Board                  | MCP23017, MCP23S17  |
| MCP2515DM-BM   | MCP2515 CAN Bus Monitor Demonstration Board                     | MCP2515, MCP2551  |
| MCP2515DM-PCTL   | MCP2515 CAN Controller PICtail™ Demonstration Board             | MCP2515   |
| MCP2515DM-PTPLS  | MCP2515 PICtail™ Plus Daughter Board                            | MCP2515, MCP2551  |
| PKSERIAL-I2C1  | PICkit™ Serial I <sup>2</sup> C™ Demonstration Board            | 24LC02B, MCP9801, MCP3221, TC1321, MCP23008                   |
| PKSERIAL-SPI1  | PICkit™ Serial SPI Demonstration Board                          | 25LC020A, TC77, MCP3201, MCP4822, MCP41010, MCP6S92, MCP23S08 |
| <b>Linear Demonstration and Evaluation Tools</b>                         |   |   |
| ADM00375   | MCP6H04 Evaluation Board  | MCP6H04   |
| ARD00354   | MCP6N11 and MCP6V2X Wheatstone Bridge Reference Design          | MCP6N11, MCP6001, MCP6V26, MCP6V27, PIC18F2553                |
| MCP6031DM-PTPLS  | MCP6031 Photodiode PICtail™ Plus Demonstration Board            | MCP6031   |
| MCP651EV-VOS   | MCP651 Input Offset Evaluation Board                            | MCP651  |
| MCP661DM-LD  | MCP661 Line Driver Demonstration Board                          | MCP661, MCP662, MCP665  |
| MCP6S22DM-PICTL  | MCP6S22 PGA PICtail™ Demonstration Board                        | MCP6S22   |
| MCP6S2XEV  | MCP6S2X PGA Evaluation Board                                    | MCP6S2X   |
| MCP6SX2DM-PCTLPD   | MCP6SX2 PGA Photodiode PICtail™ Demonstration Board             | MCP6S22/92  |
| MCP6SX2DM-PCTLTH   | MCP6SX2 PGA Thermistor PICtail™ Demonstration Board             | MCP6S22/92  |
| MCP6V01DM-VOS  | MCP6V01 Input Offset Demonstration Board                        | MCP6V01, MCP6V03, MCP6V06, MCP6V08                            |
| MCP6V01RD-TCPL   | MCP6V01 Thermocouple Auto-Zeroed Reference Design               | MCP6V01   |
| MCP6XXXEV-AMP1   | MCP6XXX Amplifier Evaluation Board 1                            | MCP6021   |
| MCP6XXXEV-AMP2   | MCP6XXX Amplifier Evaluation Board 2                            | MCP6021   |
| MCP6XXXEV-AMP3   | MCP6XXX Amplifier Evaluation Board 3                            | MCP6021   |
| MCP6XXXEV-AMP4   | MCP6XXX Amplifier Evaluation Board 4                            | MCP6021   |
| MCP6XXXDM-FLTR   | Active Filter Demonstration Board Kit                           | MCP6271   |
| PIC16F690DM-PCTLHS   | Humidity Sensor PICtail™ Demonstration Board                    | MCP6291, PIC16F690  |
| <b>Analog Blank Evaluation Boards</b>                                    |   |   |
| SC70EV   | SC70-6 and SOT-23-6/8 to DIP-8 Evaluation Board                 | SC70-6/5/3, SOT-23-8/6/5/3, and DIP-8 Devices                 |
| SOIC8EV  | SOIC/MSOP/TSSOP/DIP 8-pin Evaluation Board                      | 8-pin SOIC, MSOP, TSSOP, DIP Devices                          |
| SOIC14EV   | SOIC/TSSOP/DIP 14-pin Evaluation Board                          | 14-pin SOIC, TSSOP, DIP Devices                               |
| TSSOP20EV  | 20-pin TSSOP and SSOP Evaluation Board                          | TSSOP-20/16/14/8 and SSOP-20                                  |
| VSUPEV   | SOT-23-3 Voltage Supervisor Evaluation Board                    | SOT-23-3 Devices  |
| VSUPEV2  | SOT-23-5/6 Voltage Supervisor Evaluation Board                  | SOT-23-5, SOT-23-6 Devices                                    |
| <b>Miscellaneous Analog Demonstration and Evaluation Tools</b>           |   |   |
| ADM00308   | MTS2916A Dual Full-Bridge Stepper Motor Driver Evaluation Board | MTS2916A  |
| ADM00344   | RE46C190 Demonstration Board                                    | RE46C190  |
| EFIELDDEV  | Electrical Field Evaluation Board                               | N/A   |
| HFIELDDEV  | Magnetic Field Evaluation Board                                 | N/A   |
| INTRFCEV   | PSRR and Digital Noise Evaluation Board                         | N/A   |

# Featured Analog Development Tools

## Thermal Management Products

### MCP9700 Thermistor Demo Board (MCP9700DM-TH1)



The MCP9700 Thermistor Demo Board contains the analog circuitry to measure temperature. The board uses BC Components' 232264055103 NTC thermistor to convert temperature to resistance. The thermistor is placed in a voltage divider which converts resistance to voltage. This voltage is filtered and placed at the MCP6S22 Programmable Gain Amplifier's (PGA) CHO input. The PGA gains and buffers the thermistor.

### PT100 RTD Evaluation Board (TMPSNS-RTD1)



This board demonstrates how to bias a Resistive Temperature Detector (RTD) and accurately measure temperature. Up to two RTDs can be connected.

The RTDs are biased using constant current source and the output voltage is scaled using a differential amplifier. The output is then connected to a 12-bit differential Analog-to-Digital Converter (ADC) MCP3301. The ADC outputs serial data to a PIC18F2550 device using a Serial Peripheral Interface (SPI). The data is transmitted to a PC using a USB interface. A Microsoft Excel® macro is used as a Graphical User Interface (GUI) to acquire the data. The acquired data is stored in an Excel worksheet and graphed as a real-time strip chart display.

### MCP9800 Temperature Data Logger Demo Board (MCP9800DM-DL)



Allows users to store up to 128,000 temperature readings from the MCP9800 sensor to the 24LC1025, Microchip's 1024 Kbit EEPROM.

A PIC16F684 MCU communicates with the sensor and EEPROM. In addition, the PIC MCU interfaces to a PC using the PICKit™ 1 Flash Starter Kit and transfers the temperature readings from the EEPROM to the PC. Microsoft Excel® can be used to view the data.

## Mixed Signal Products

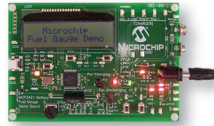
### MCP3901 and PIC18F65J90 Shunt Meter Reference Design (ARD00342)



The MCP3901 and PIC18F65J90 Energy Meter Reference Design is a fully functional IEC Class 0.5 compliant single-phase meter. This low-cost design does not use any transformers and requires few external components. The PIC18F65J90 directly

drives the LCD and includes both an isolated USB connection for meter calibration and access to the device power calculations. The system calculates active energy, active power, RMS current, RMS voltage, reactive energy, reactive power, apparent power, and other typical power quantities.

### MCP3421 Battery Fuel Gauge Demonstration Board (MCP3421DM-BFG)



This board is used to demonstrate the MCP3421 18-bit delta-sigma ADC for battery fuel gauging applications. It includes two MCP3421 devices, MCP73831 (single cell Li-Ion/

Li-Polymer Charger) and PIC18F4550 MCU. The board measures: (1) the battery voltage and (2) the current coming out from the battery in the discharging mode and into the battery in the charging mode using the ADC device (if charging mode is enabled (optional)). It calculates the total fuel used and also fuel remaining.

### MCP4725 PICtail Plus Daughter Board (MCP4725DM-PTPLS)



This daughter board demonstrates the MCP4725 (12 bit DAC with non-volatile memory) features using the Explorer 16 Development Board and the PICKit Serial Analyzer.

### MCP42XX PICtail Plus Daughter Board (MCP42XXDM-PTPLS)



The MCP42XX PICtail Plus Daughter Board is used to demonstrate the operation of the MCP42XX Digital Potentiometers. The operation of the

MCP41XX devices is similar to the MCP42XX devices. Therefore, this demo board can be used as a development platform for either device family. This board is designed to be used in conjunction with either the PIC24 Explorer 16 Demo Board or the PICKit Serial Analyzer.

## Power Management Products

### MCP1631HV Multi-Chemistry Battery Charger Reference Design (MCP1631RD-MCC1)



This reference design is a complete stand-alone constant current battery charger for NiMH, NiCd or constant current/constant voltage for Li-Ion battery packs. When charging NiMH or NiCd batteries, the reference design is capable of charging one,

two, three or four batteries connected in series and one or two series batteries for Li-Ion. This board utilizes the MCP1631HV (high-speed PIC MCU PWM TSSOP-20) and PIC16F883 (28-pin SSOP).

### MCP73871 Demo Board with Voltage Proportional Current Control (MCP73871DM-VPCC)



The MCP73871 Demo Board with Voltage Proportional Current Control is designed to demonstrate Microchip's stand-alone linear Li-Ion battery charger with system power path and load sharing management control

solution. The MCP73871 integrates the required elements to meet design challenges when developing new Li-Ion/ Li-Polymer battery powered products.

# Featured Analog Development Tools

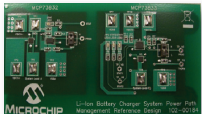
## MCP73X23 OVP Lithium Iron Phosphate Battery Charger Evaluation Board (MCP73X23EV-LFP)



The MCP73X23 Lithium Iron Phosphate Battery Charger Evaluation board demonstrates the features of Microchip's MCP73123 and MCP73223

Lithium Iron Phosphate (LiFePO<sub>4</sub>) Battery Charge Management Controller with Input Overvoltage Protection.

## MCP7383X Li-Ion System Power Path Management Reference Design (MCP7383XRD-PPM)



This reference design is developed to assist product designers in reducing product design cycle and time by utilizing Microchip's stand-alone Li-Ion battery charge management controllers

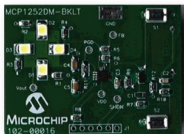
with system power path management. Due to the natural characteristics of Li-Ion/Li-Polymer batteries, they are the most popular power sources for mobile devices, however, extra care in design is always important. System Power Path Management allows end-users to charge their batteries without interruption.

## MCP1640 Sync Boost Converter Evaluation Board (MCP1640EV-SBC)



The MCP1640 Synchronous Boost Converter Evaluation board demonstrates the MCP1640 in two boost-converter applications with multiple output voltages. It can be used to evaluate both package options (SOT-23-6 and 2 × 3-8 DFN). This board was developed to help engineers reduce the product design cycle time.

## MCP1252 Charge Pump Backlight Demo Board (MCP1252DM-BKLT)



The MCP1252 board demonstrates the use of a charge pump device in an LED application and acts as a platform to evaluate the MCP1252 device in general. Light intensity is

controlled uniformly through the use of ballast resistors. A PIC10F206 MCU provides an enable signal to the MCP1252 and accepts a push-button input that allows the white LEDs to be adjusted to five different light intensities.

## Interface Products

### MCP2515 CAN Bus Monitor Demo Board (MCP2515DM-BM)



The MCP2515 CAN Bus Monitor Demo board kit contains two identical boards which can be connected together to create a simple two node Controller Area Network (CAN) bus, which can be

controlled and/or monitored via the included PC interface. The board(s) can also be connected to an existing CAN bus.

## LIN Serial Analyzer (APGDT001)



The LIN Serial Analyzer development system enables a Personal Computer (PC) to communicate with a LIN (Local Interface Network) bus. The PC program uses a graphical user interface to enter and display message frames occurring on the target bus.

## USB to UART Converter Evaluation Board (MCP2200EV-VCP)



The USB to UART Converter Eval board allows users to store up to 128,000 temperature readings from the MCP9800 sensor to the 24LC1025, Microchip's 1024 Kbit EEPROM. A PIC16F684 MCU communicates with the sensor and EEPROM. In addition, the PIC MCU interfaces to a PC using the PICkit 1 Flash Starter Kit and transfers the temperature readings from the EEPROM to the PC. Microsoft Excel can be used to view the data.

## Linear Products

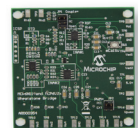
### MCP6V01 Thermocouple Auto-Zeroed Ref Design Board (MCP6V01RD-TCPL)



The MCP6V01 design board demonstrates how to use a difference amplifier system to measure Electromotive Force (EMF) voltage at

the cold junction of thermocouple in order to accurately measure temperature of the thermocouple bead. This can be done by using the MCP6V01 auto-zeroed op amp because of its ultra low offset Voltage (VOS) and high Common Mode Rejection Ratio (CMRR).

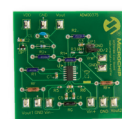
### MCP6N11 and MCP6V2X Wheatstone Bridge Reference Design (ARD00354)



This board demonstrates the performance of Microchip's MCP6N11 instrumentation amplifier (INA) and a traditional three op amp INA using Microchip's MCP6V26 and MCP6V27 auto-zeroed op amps. The

input signal comes from an RTD temperature sensor in a Wheatstone bridge. Real world interference is added to the bridge's output, to provide realistic performance comparisons. Data is gathered and displayed on a PC, for ease of use.

### MCP6H04 Evaluation Board (ADM00375)



The MCP6H04 Evaluation Board is intended to support an instrumentation amplifier and show the capability of the MCP6H04 operational amplifier. It uses a quad op amp in a difference amplifier configuration with

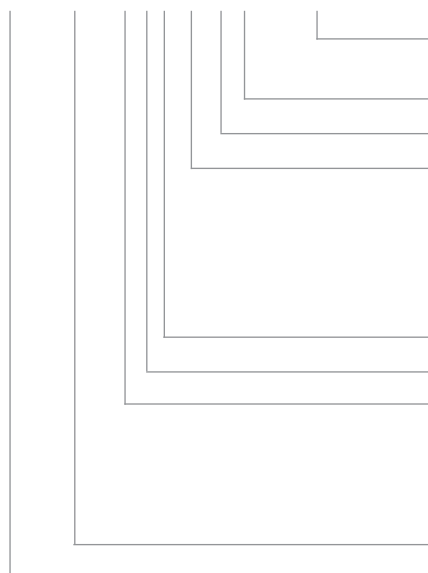
input buffers and voltage reference. The test points for the power supply, ground, input signals, output signals, and voltage reference allow lab equipment to be connected to the board.

# Analog Product Part Numbers

## Part Number Suffix Designations

Ordering Information for all Microchip Analog Products beginning with “TC” prefix (formerly TelCom Semiconductor Products)

TC 7106 A-60 1 C P L 713



### Taping Direction:

TR or 713: Standard Taping, blank: no tape and reel

### Number of Package Pins (See specific data sheet)

### Package Type

### Operating Temperature Range:

C: Commercial Range (0°C to +70°C)

E: Extended Industrial Range (-40°C to +85°C)

I: Industrial Range (-25°C to +85°C)

M: Military Range (-55°C to +125°C)

V: See Data Sheet for Specific Temperature Range

### (Extra Feature Code and/or Tolerance)\* (See specific data sheet)

### (Output Voltage or Detect Voltage)\* (If applicable, see specific data sheet)

### Electrical Performance Grade Option (Variation/Option)\*

(If applicable, see specific data sheet)

A: Test Selection Criteria (See specific data sheet)

B:

R: Reversed Pin Layout

### Product Part Number (2 to 6 characters, see specific data sheet)

### Product Prefix

NOTE: ( )\* Used for voltage regulators and detectors.

| Package | Description     | # of Pins |
|---------|-----------------|-----------|
| AB      | TO-220          | 3         |
| AK      | TO-220          | 7         |
| AT      | TO-220          | 5         |
| AV      | TO-220 (Formed) | 5         |
| BB      | TO-220B         | 3         |
| CB      | SOT-23A         | 3         |
| CH      | SOT-23A         | 6         |
| CT      | SOT-23A         | 5         |
| DB      | SOT-223         | 3         |
| EB      | DDPAK           | 3         |
| EK      | DDPAK           | 7         |
| ET      | DDPAK           | 5         |
| HA      | SOP             | 8         |
| JA      | CDIP (N)        | 8         |
| JD      | CDIP (N)        | 14        |
| JE      | CDIP (N)        | 16        |
| JG      | CDIP (W)        | 24        |
| JI      | CDIP (W)        | 28        |
| JL      | CDIP (W)        | 40        |
| KU      | MQFP            | 64        |
| KW      | MQFP            | 44        |
| LB      | SC-70           | 3         |
| LI      | PLCC            | 28        |
| LS      | PLCC            | 68        |
| LT      | SC-70           | 5         |
| LW      | PLCC            | 44        |

| Package | Description | # of Pins |
|---------|-------------|-----------|
| MB      | SOT-89      | 3         |
| MF      | DFN (3 × 3) | 8         |
| MT      | SOT-89      | 5         |
| NB      | SOT-23B     | 3         |
| OA      | SOIC (N)    | 8         |
| OD      | SOIC (N)    | 14        |
| OE      | SOIC (W)    | 16        |
| OG      | SOIC (W)    | 24        |
| OI      | SOIC (W)    | 28        |
| OR      | SOIC (N)    | 16        |
| PA      | PDIP (N)    | 8         |
| PD      | PDIP (N)    | 14        |
| PE      | PDIP (N)    | 16        |
| PF      | PDIP (N)    | 24        |
| PG      | PDIP (W)    | 24        |
| PI      | PDIP (W)    | 28        |
| PJ      | PDIP (W)    | 28        |
| PL      | PDIP (W)    | 40        |
| QR      | QSOP (N)    | 16        |
| RC      | SOT-143     | 4         |
| SI      | SSOP (W)    | 28        |
| UA      | MSOP        | 8         |
| UN      | MSOP        | 10        |
| VB      | DPAK        | 3         |
| ZB      | TO-92       | 3         |
| ZM      | TO-92       | 2         |

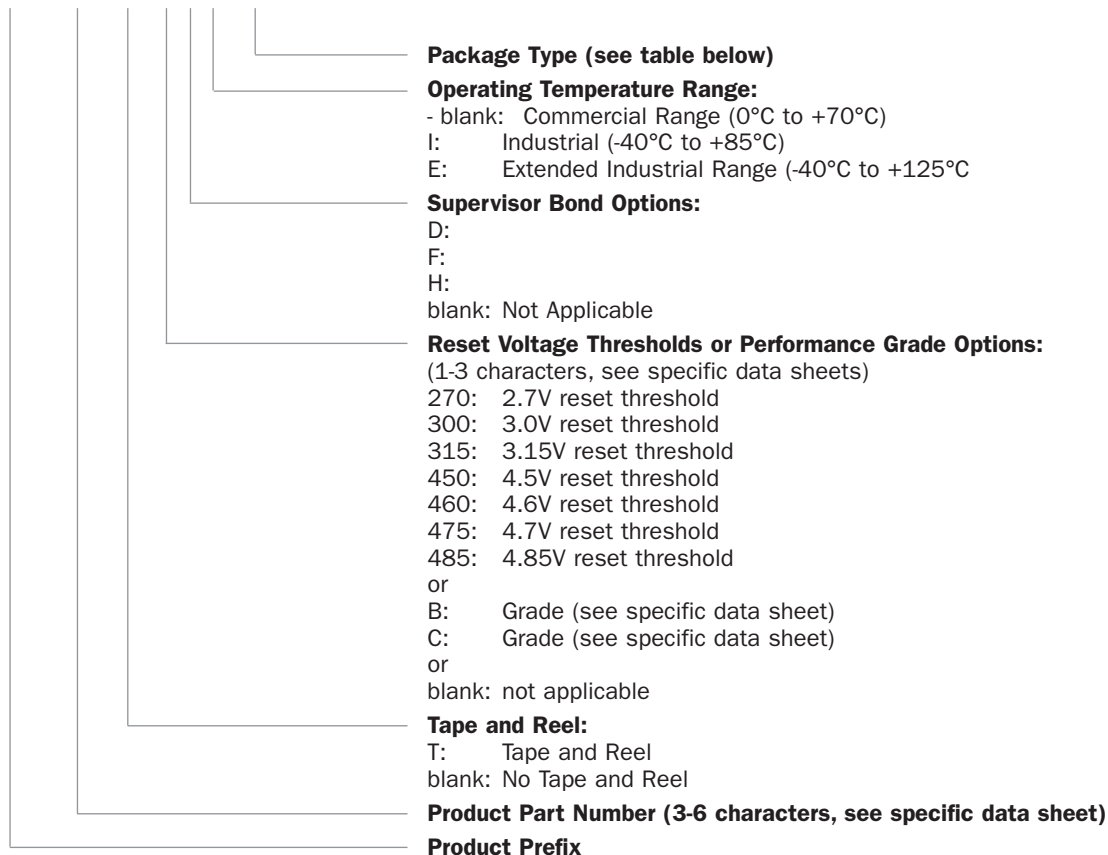


# Analog Product Part Numbers

## Part Number Suffix Designations

Ordering Information for all Microchip Analog Products beginning with “MCP” prefix

MCP xxxxx T - yyy z h / qq



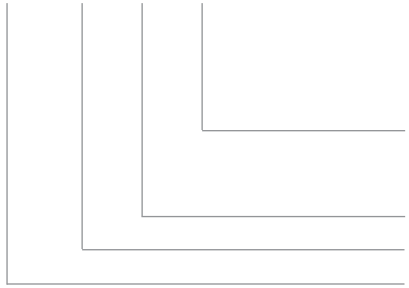
| Package | Description         | # of Pins | Tube/Bag Qty. | Reel Qty. |
|---------|---------------------|-----------|---------------|-----------|
| TO      | TO-92               | 3         | 1000          | N/A       |
| TT      | SOT-23              | 3         | N/A           | 3000      |
| OT      | SOT-23              | 5         | N/A           | 3000      |
| P       | PDIP                | 8         | 60            | N/A       |
| SN      | SOIC                | 8         | 100           | 3300      |
| ST      | TSSOP               | 8         | 100           | 2500      |
| MS      | MSOP                | 8         | 100           | 2500      |
| MF      | DFN (2 × 3)         | 8         | N/A           | 3300      |
| MF      | DFN (3 × 3)         | 8         | 50            | 3300      |
| MF      | DFN (3 × 3, 10-Pin) | 10        | 120           | 3300      |
| ST      | TSSOP               | 14        | 96            | 2500      |
| P       | PDIP                | 14        | 30            | N/A       |
| SL      | SOIC                | 14        | 57            | 2600      |
| P       | PDIP                | 18        | 25            | N/A       |
| SO      | SOIC                | 18        | 42            | 1100      |
| ST      | TSSOP               | 20        | 74            | 2500      |
| SS      | SSOP                | 20        | 67            | 1600      |
| ML      | QFN (6 × 6)         | 28        | 50            | 1600      |
| ML      | QFN (4 × 4)         | 16        | 91            | 3300      |

# Analog Product Part Numbers

## Part Number Suffix Designations

Ordering Information for all Microchip Analog Products beginning with “RE46C” prefix

RE46C xxx yyyy zz



**Tape and Reel:**

TF: Tape and Reel  
F: No Tape and Reel

**Package Type (2 to 4 characters, see table below)**

**Product Part Number (3 characters, see specific data sheet)**

**Product Prefix**

| Package | Description    | # of Pins | Tube/Bag Qty. | Reel Qty. |
|---------|----------------|-----------|---------------|-----------|
| E8      | PDIP           | 8         | 60            | N/A       |
| S8      | SOIC           | 8         | 100           | 3300      |
| E14     | PDIP           | 14        | 30            | N/A       |
| S14     | SOIC           | 14        | 57            | 2600      |
| E16     | PDIP           | 16        | 30            | N/A       |
| S16     | SOIC           | 16        | 50            | 2600      |
| SW16    | SOIC (300 mil) | 16        | 47            | 1000      |



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