GLYN
High-Tech Distribution

RENESAS

Power Devices

PowerMOSFET & IPD

Renesas Electronics
www.renesas.eu

2014.02

NP-series – our hotheads can take the heat

Renesas' PowerMOSFET NP-series has been designed to meet the special requirements of the European power-electronics market, which is steadily growing at remarkable growth rates.

With a temperature stability up to 175 °C the NP-series matches perfectly to automotive applications, but also is showing great performance at other fields like communication or industrial.

To improve efficiency in high performance switching applications the new ANL2 technology reduces gate charge significantly keeping the ultra-low on-resistance already known from previous trench technology.

The new HSON-8 package follows the trend to provide highest electrical and thermal performance combined with small mounting area for both N- and P-channel automotive PowerMOSFETs.

- AEC-Q101 and RoHS compliant
- Super high current capability
- Super low $R_{DS(on)}$ down to 1.05 mΩ
- Small HSON-8 package
- Popular THD and SMD packages
- Standard maximum T_{CH} = 175 °C
- ANL2 technology: Combine low $R_{DS(on)}$ with low Q_G

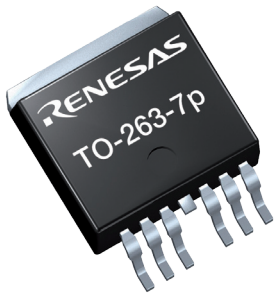
RoHS compliant

Target market and applications

» Automotive
- Electric power steering
- Anti-lock brakes
- Automatic gearbox
- DC/DC converter
- Dashboard
- Battery switch
- Water-/ oil- and fuel pump
- HVAC
- Power seat, heater
- Reverse battery protection

» Communication
- DC/DC converter
- Switch mode power supplies

» Industrial
- DC/DC converter
- AC/DC converter
- DC/AC inverter
- Uninterruptible power supplies
- Power tools
- Motor drives



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N-Channel NP-series in ANL2

V_{DSS} [V]	$R_{DS(on)max}$ [mΩ]		$I_{D(DC)}$ [A]	$P_T@T_C=25℃$ [W]	$R_{th(ch-C)}$ [℃/W]	SMD				THD	
	$V_{GS}=10$ V	$V_{GS}=4.5$ V				TO-252 ZP	TO-263ZP	TO-263-7p	HSON-8	TO-220M	TO-262N
40	1.05		180	348	0.43			NP180N04TUK			
	1.25		180	288	0.52			NP179N04TUK**			
	1.4		110	348	0.43		NP110N04PUK				
	1.5		160	250	0.60			NP160N04TUK			
	1.75		110	250	0.60		NP109N04PUK				
	1.95		120	288	0.52						NP120N04NUK**
	2.15		120	250	0.60						NP119N04NUK**
	2.3		100	176	0.85		NP100N04PUK				
	2.8		90	147	1.02	NP90N04VUK					
	2.8	6.0	90	147	1.02	NP90N04VDK					
	2.8	6.0	90	147	1.02	NP90N04VLK**					
	2.8		90	176	0.85					NP90N04MUK	
	2.8		90	176	0.85						NP90N04NUK
	2.95	6.2	90	147	1.02		NP89N04PDK				
	2.95		90	147	1.02		NP89N04PUK				
	3.3		90	147	1.02					NP89N04MUK	
	3.3		90	147	1.02						NP89N04NUK
	3.3		75	138	1.09				NP75N04YUK		
	3.85		60	105	1.43	NP60N04VUK					
	3.95	8.8	60	105	1.43		NP60N04PDK				
	3.85	8.6	60	105	1.43	NP60N04VDK**					
	3.85	8.8	60	105	1.43	NP60N04VLK**					
	4.3	9.6	60	105	1.43					NP60N04MLK**	
	4.3		60	105	1.43					NP60N04MUK	
	4.3		60	88	1.70						NP60N04NUK
	4.8		50	97	1.55				NP50N04YUK		
	5.7		75	75	2.00	NP75N04VUK					
	5.7	12.6	75	75	2.00	NP75N04VDK					
55	1.4		180	348	0.43			NP180N055TUK			
	1.75		180	288	0.52			NP179N055TUK**			
	1.75		110	348	0.43		NP110N055PUK				
	2.1		160	250	0.60			NP160N055TUK			
	2.2		110	250	0.60		NP109N055PUK				
	3.25		100	176	0.85		NP100N055PUK				
	3.8		90	176	0.85					NP90N055MUK	
	3.8		90	176	0.85						NP90N055NUK
	3.85		90	147	1.02	NP90N055VUK					
	4.0		90	147	1.02		NP89N055PUK				
	4.4		90	147	1.02					NP89N055MUK	
	4.4		90	147	1.02						NP89N055NUK
	4.5		75	138	1.09				NP75N055YUK		
	5.5		60	105	1.43	NP60N055VUK					
	6.0		60	105	1.43					NP60N055MUK	
	6.0		60	105	1.43						NP60N055NUK
	6.7		35	97	1.55				NP35N055YUK		
60	4.5	8.2	90	147	1.02		NP90N06PDK**				
	4.6	8.2	90	147	1.02	NP90N06VDK**					
	4.6	8.2	90	147	1.02	NP90N06VLK**					
	6.6	12.0	60	105	1.43		NP60N06PDK**				
	6.6	12.0	60	105	1.43		NP60N06PLK**				
	6.6	12.8	60	105	1.43					NP60N06MLK**	
	6.6	12.0	60	105	1.43	NP60N06VDK**					
	6.6	12.0	60	105	1.43	NP60N06VLK**					
	9.6		45	75	2.00		NP45N06PUK				
	9.6		45	75	2.00	NP45N06VUK					
	10.0	22.0	45	75	2.00	NP45N06VDK**					

** Product under development and part number/parameter might be changed without notification

N-Channel NP-series in UMOS-4

V_{DSS} [V]	$R_{DS(on)max}$ [mΩ]		$I_{D(DC)}$ [A]	$P_T@T_C$=25°C [W]	$R_{th(ch-C)}$ [°C/W]	SMD				THD	
	V_{GS} = 10 V	V_{GS} = 4.5 V				TO-252ZK/ZP	TO-263ZK/ZP	TO-263-7p	HSON-8	TO-220M	TO-262N
30	1.5		110	288	0.52		NP110N03PUG				
	2.4	3.9	88	200	0.75		NP88N03KDG				
	2.8		82	143	1.05		NP82N03PUG				
	3.2	8.0	90	105	1.43	NP90N03VLG					
	3.2		90	105	1.43	NP90N03VHG					
	4.8		60	88	1.70		NP60N03KUG				
	5.0		55	77	1.95	NP55N03SUG					
40	1.5		180	288	0.52			NP180N04TUG			
	1.8	3.2	110	288	0.52		NP110N04PDG				
	1.8		110	288	0.52		NP110N04PUG				
	2.0	5.4	160	220	0.68			NP160N04TDG			
	2.0		160	220	0.68			NP160N04TUG			
	2.3		110	220	0.68		NP109N04PUG				
	2.9		88	200	0.75		NP88N04KUG				
	3.0		90	217	0.69					NP90N04MUG	
	3.4		88	200	0.75						NP88N04NUG
	3.5	8.0	82	143	1.05		NP82N04PDG				
	3.5		82	143	1.05		NP82N04PUG				
	4.0		90	105	1.43	NP90N04VUG					
	4.2		82	143	1.05						NP82N04NUG
	4.5	8.7	80	115	1.30		NP80N04PLG				
	4.5		80	115	1.30		NP80N04PUG				
	4.8		75	138	1.09				NP75N04YUG		
	5.5		75	120	1.25				NP74N04YUG		
	6.1		60	88	1.71		NP60N04KUG				
	6.3		60	88	1.70					NP60N04MUG	
	6.5		55	77	1.95	NP55N04SUG					
	6.5	15.0	55	77	1.95	NP55N04SLG					
	9.7	15.0	35	77	1.95				NP35N04YLG		
	10.0		35	77	1.95				NP35N04YUG		
	25.0		16	36	4.20				NP16N04YUG		
55	2.4		110	288	0.52		NP110N055PUG				
	3.9		88	200	0.75		NP88N055KUG				
	5.2		82	143	1.05		NP82N055PUG				
	6.9	11.2	80	115	1.30						NP80N055NDG
	9.4		60	88	1.70		NP60N055KUG				
	9.5	12.0	55	77	1.95	NP55N055SDG					
	10.0		55	77	1.95	NP55N055SUG					
	14.0		52	56	2.68	NP52N055SUG					
60	6.7	8.5	82	143	1.05		NP82N06PLG				
	6.7	8.5	82	143	1.05		NP82N06PDG				
	7.8	12.5	90	105	1.43	NP90N06VLG					
	8.3	13.0	80	115	1.30		NP80N06PLG				
	8.6	13.3	80	115	1.30					NP80N06MLG	
	14.0	20.0*	33	97	1.55				NP33N06YDG		
	17.5	25.0	52	56	2.68	NP52N06SLG					
	27.0	37.0*	23	60	2.50				NP23N06YDG		

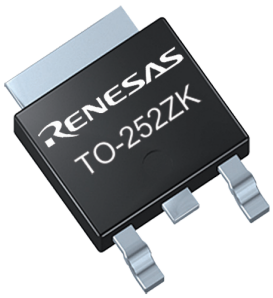
N-Channel NP-series in UMOS-3

V_{DSS} [V]	$R_{DS(on)max}$ [mΩ]		$I_{D(DC)}$ [A]	$P_T@T_C$=25°C [W]	$R_{th(ch-C)}$ [°C/W]	SMD			
	V_{GS} = 10 V	V_{GS} = 4.5 V				TO-252ZK/ZP	TO-263ZK/ZP	TO-263-7p	HSON-8
75	28.0	32.0	33	88	1.70				NP33N075YDF
100	15.0		82	150	1.00		NP82N10PUF		
	20.0		70	120	1.25		NP70N10KUF		
	25.0	36.0	40	120	1.25				NP40N10YDF
	26.0	37.0	40	120	1.25	NP40N10VDF			
	27.0	38.0	40	120	1.25		NP40N10PDF		
	55.0	68.0*	20	73	2.06				NP20N10YDF

N-Channel NP-series in SuperJunction1

V_{DSS} [V]	$R_{DS(on)max}$ [mΩ]		$I_{D(DC)}$ [A]	$P_T@T_C$ = 25 °C [W]	$R_{th(ch-C)}$ [°C/W]	SMD		THD
	V_{GS} = 10 V	V_{GS} = 4.5 V				TO-263ZP	TO-263-7p	TO-262N
40	1.5		180	288	0.43		NP180N04TUJ	
	2.0		160	220	0.60		NP160N04TUJ	
	2.3		110	220	0.68	NP109N04PUJ		
	3.0		100	227	0.66			NP100N04NUJ
55	2.1		180	288	0.52		NP180N055TUJ	
	2.4		110	288	0.52	NP110N055PUJ		
	3.0		160	220	0.60		NP160N055TUJ	
	3.2		110	220	0.68	NP109N055PUJ		

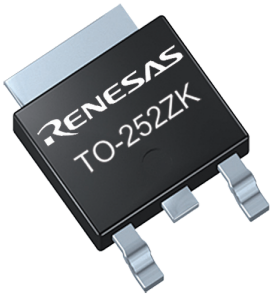
*@V_{GS} = 5 V



P-Channel NP-series in UMOS-4

V_{DSS} [V]	$R_{DS(on)max}$ [mΩ]		$I_{D(DC)}$ [A]	P_T @ T_C = 25 °C [W]	$R_{th(ch-C)}$ [°C/W]	SMD		
	V_{GS} = 10 V	V_{GS} = 4.5 V				TO-252ZK	TO-263ZK / ZP	HSON-8
-30	6.2	10.3*	75	138	1.09			NP75P03YDG
	9.0	15.0	50	102	1.47			NP50P03YDG
-40	3.5	5.1	100	200	0.75		NP100P04PDG	
	3.7	5.1	100	200	0.75		NP100P04PLG	
	5.3	8.0	83	150	1.00		NP83P04PDG	
	9.6	15.0	50	90	1.78	NP50P04SDG		
	10.0	15.0	50	90	1.67		NP50P04KDG	
	10.7	13.0*	75	138	1.09			NP75P04YLG
	17.0	23.5	36	56	2.68		NP36P04KDG	
	17.0	23.5	36	56	2.68	NP36P04SDG		
	25.0	38.0	20	38	3.90	NP20P04SLG		
	40.0	60.0	15	30	5.00	NP15P04SLG		
-60	6.0	7.8	100	200	0.75		NP100P06PLG	
	6.0	7.8	100	200	0.75		NP100P06PDG	
	8.8	12.0	83	150	1.00		NP83P06PDG	
	16.5	23.5	50	90	1.78	NP50P06SDG		
	17.0	23.0	50	90	1.67		NP50P06KDG	
	29.5	37.5	36	56	2.68		NP36P06KDG	
	30.0	40.0	36	56	2.68	NP36P06SLG		
	48.0	64.0	20	45	3.90	NP20P06SLG		
	49.0	64.0	20	67	2.24			NP20P06YLG
	70.0	95.0	15	30	5.00	NP15P06SLG		

*@V_{GS} = 5 V



Part numbering system

NP 110 N 055 P U K

- NP — PowerMOSFET
- 110 — $I_{D(DC)}$
- N — **Polarity**: N: N-ch., P: P-ch.
- 055 — V_{DSS}
- P — **Package Code**: K TO-263ZK JEDEC; M TO-220M JEDEC; N TO-262N JEDEC; P TO-263ZP; S TO-252ZK JEDEC; T TO-263-7p; V TO-252ZP; Y HSON-8
- U — **Drive Type**: D Logic, no G-S protection diode; H Non-logic, G-S protection diode; L Logic, G-S protection diode; U Non-logic, no G-S protection diode
- K — **Process**: F UMOS-3; G UMOS-4; J SJ1; K ANL2

IPD – Intelligent Power Devices

Intelligent Power devices (IPD) are power devices designed for load switching in automotive applications. Renesas Electronics is offering high-side switches corresponding to the most common type used in the automotive area. IPDs can drive any type of load, designed to drive even one of the most severe automotive loads, the filament lamps.

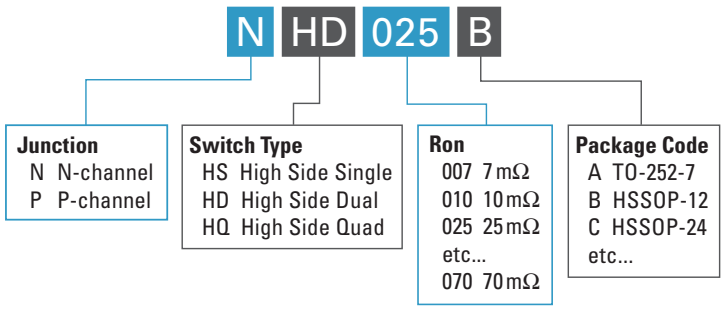
- High-side switches with integrated protection features
  - High robustness
  - Low noise
  - High Quality
- AEC-Q100 compliant (including AEC-Q100-012)
- RoHS compliant

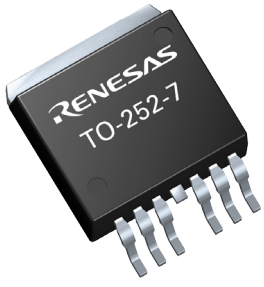
Intelligent Power Devices designed for car lighting, fitting all types of grounded load

Order Code	Part Number	Package	Channels	Channel Type	$R_{DS(ON)}$ max (mΩ @ 25 °C)	Supply Voltage (V)	Current Sense	Sense Ratio typ.	Diagnostic	Overtemperature URE Protection	Overcurrent Protection	Control
RoSa Standard IPDs												
µPD166033	NHS006A	TO-252-7p	1	N	6	4.5 – 28.0	✓	12500	✓	Autorestart	Latch and current/power limitation	Voltage (3.3 V – 5.0 V)
µPD166034	NHS008A				8			9400				
µPD166031	NHS010A				10			7500				
µPD166032	NHS012A				12			6250				
µPD166023	NHS012B	HSSOP-12										
µPD166024	NHD012C	HSSOP-24	2									
µPD166025	NHS016B	HSSOP-12	1		16			5800				
µPD166026	NHD016C	HSSOP-24	2									
µPD166038	NHD020B	HSSOP-12	2		20			3400				
µPD166037	NHD030B	HSSOP-12	2		30							
µPD166027	NHD035B	HSSOP-12	2		35							
µPD166028	NHQ035C	HSSOP-24	4									
µPD166029	NHD070B	HSSOP-12	2		70			1400				
µPD166030	NHQ050C	HSSOP-24	4									
SEIYA IPDs for 2-Wheeler Flasher Application												
RAA290001	–	TO252-3	1	N	40	9.0 – 28.0	NA	NA	NA	Autorestart	Current limitation	NA
RAA290002	–				20							

All devices are qualified according to AEC-Q100 and AEC-Q100-012 flow. All devices are RoHS compliant.

Part numbering system





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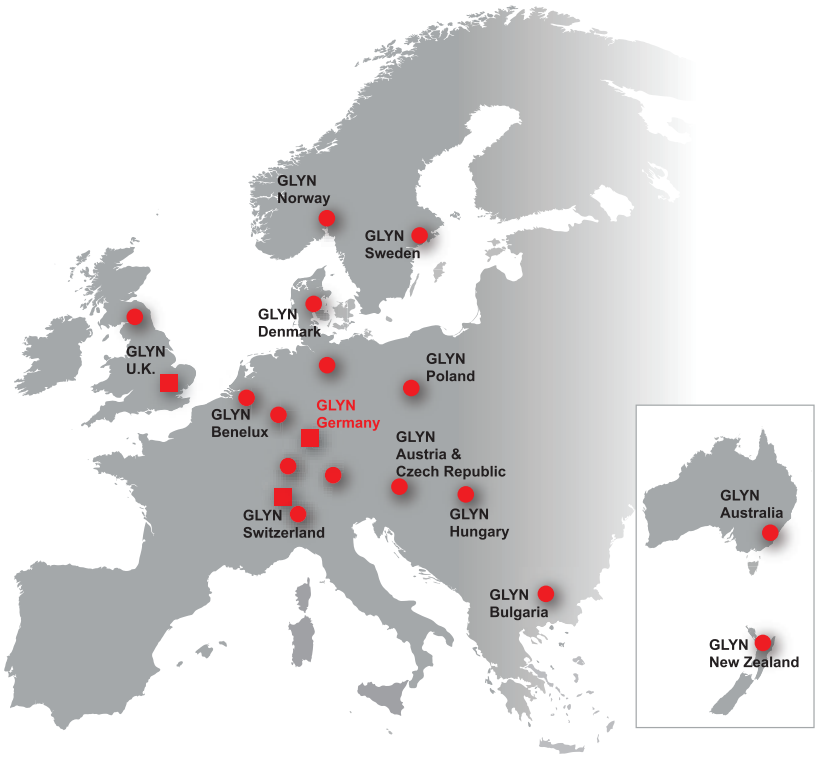

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Attention!
With this overview we only present a selection of our product portfolio.
With some manufacturers we may have special regulations and/or restrictions for some European countries.

FIRST CLASS PREMIUM SUPPORT

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