

# General purpose transistor (50V, 0.15A)

## 2SC2412K / 2SC4081 / 2SC4617 / 2SC5658 / 2SC1740S

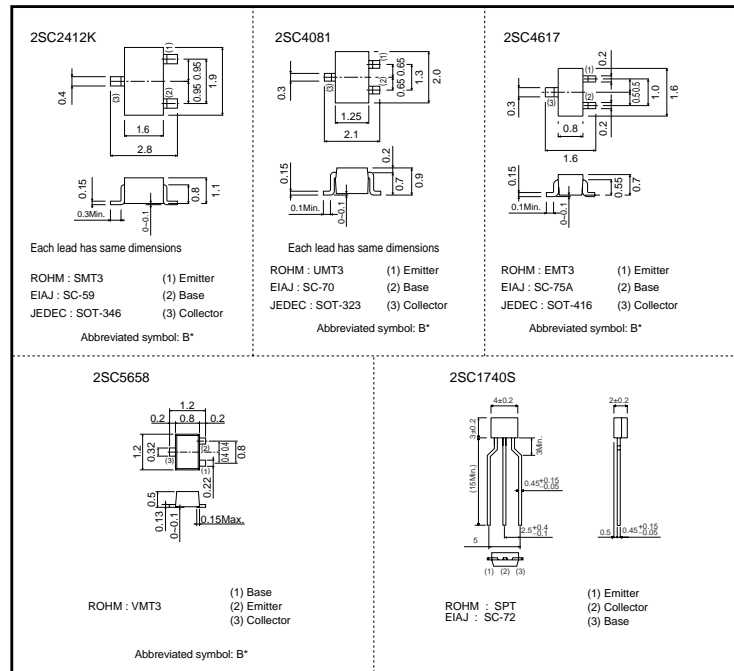
### ●Features

- 1) Low Cob.  
Cob=2.0pF (Typ.)
- 2) Complements the 2SA1037AK /  
2SA1576A / 2SA1774H /  
2SA2029 / 2SA933AS.

### ●Structure

Epitaxial planar type  
NPN silicon transistor

### ●External dimensions (Units : mm)



\* Denotes hFE

### ●Absolute maximum (Ta=25°C)

| Parameter                   | Symbol            | Limits   | Unit |
|-----------------------------|-------------------|----------|------|
| Collector-base voltage      | V <sub>CB0</sub>  | 60       | V    |
| Collector-emitter voltage   | V <sub>CE0</sub>  | 50       | V    |
| Emitter-base voltage        | V <sub>EB0</sub>  | 7        | V    |
| Collector current           | I <sub>c</sub>    | 0.15     | A    |
| Collector power dissipation | 2SC2412K, 2SC4081 | 0.2      | W    |
|                             | 2SC4617, 2SC5658  | 0.15     |      |
|                             | 2SC1740S          | 0.3      |      |
| Junction temperature        | T <sub>j</sub>    | 150      | °C   |
| Storage temperature         | T <sub>stg</sub>  | -55~+150 | °C   |

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## Transistors

### ●Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit | Conditions   |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-base breakdown voltage     | BV <sub>CBO</sub>    | 60   | –    | –    | V    | I <sub>c</sub> =50μA                                 |
| Collector-emitter breakdown voltage  | BV <sub>CEO</sub>    | 50   | –    | –    | V    | I <sub>c</sub> =1mA                                  |
| Emitter-base breakdown voltage       | BV <sub>EBO</sub>    | 7    | –    | –    | V    | I <sub>E</sub> =50μA                                 |
| Collector cutoff current             | I <sub>CBO</sub>     | –    | –    | 0.1  | μA   | V <sub>CB</sub> =60V                                 |
| Emitter cutoff current               | I <sub>EBO</sub>     | –    | –    | 0.1  | μA   | V <sub>EB</sub> =7V                                  |
| DC current transfer ratio            | h <sub>FE</sub>      | 120  | –    | 560  | –    | V <sub>CE</sub> =6V, I <sub>c</sub> =1mA             |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | –    | –    | 0.4  | V    | I <sub>c</sub> /I <sub>B</sub> =50mA/5mA             |
| Transition frequency                 | f <sub>T</sub>       | –    | 180  | –    | MHz  | V <sub>CE</sub> =12V, I <sub>E</sub> =–2mA, f=100MHz |
| Output capacitance                   | C <sub>ob</sub>      | –    | 2    | 3.5  | pF   | V <sub>CE</sub> =12V, I <sub>E</sub> =0A, f=1MHz     |

### ●Packaging specifications and h<sub>FE</sub>

| Type     | h <sub>FE</sub> | Package                      | Taping |      |      |      | Bulk |
|----------|-----------------|------------------------------|--------|------|------|------|------|
|          |                 | Code                         | T146   | T106 | TL   | T2L  | TP   |
|          |                 | Basic ordering unit (pieces) | 3000   | 3000 | 3000 | 8000 | 5000 |
| 2SC2412K | QRS             | ○                            | –      | –    | –    | –    |      |
| 2SC4081  | QRS             | –                            | ○      | –    | –    | –    |      |
| 2SC4617  | QRS             | –                            | –      | ○    | –    | –    |      |
| 2SC5658  | QRS             | –                            | –      | –    | ○    | –    |      |
| 2SC1740S | QRS             | –                            | –      | –    | –    | ○    |      |

h<sub>FE</sub> values are classified as follows :

| Item            | Q       | R       | S       |
|-----------------|---------|---------|---------|
| h <sub>FE</sub> | 120~270 | 180~390 | 270~560 |

### ●Electrical characteristic curves

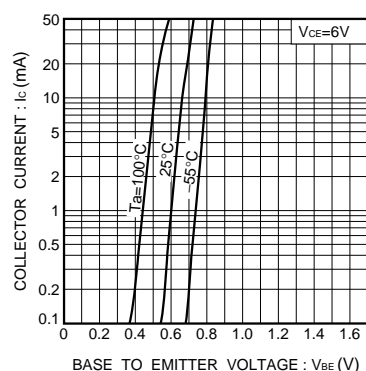


Fig.1 Grounded emitter propagation characteristics

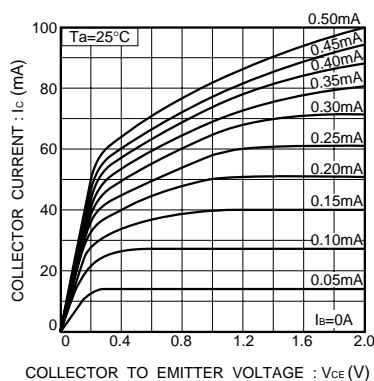


Fig.2 Grounded emitter output characteristics ( I )

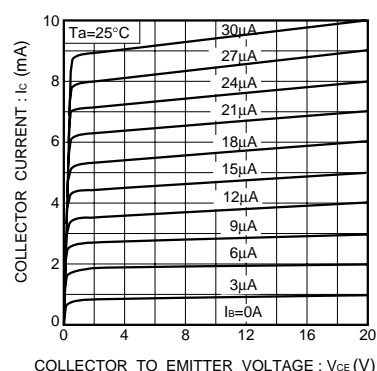


Fig.3 Grounded emitter output characteristics ( II )

Transistors

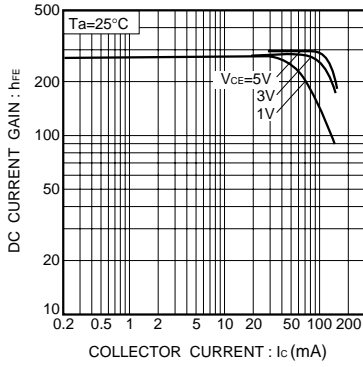


Fig.4 DC current gain vs. collector current ( I )

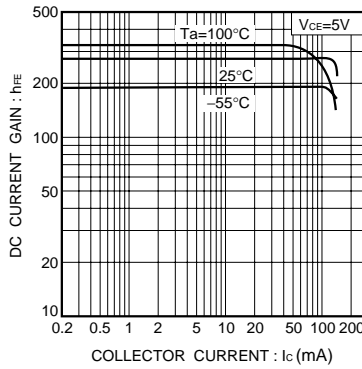


Fig.5 DC current gain vs. collector current ( II )

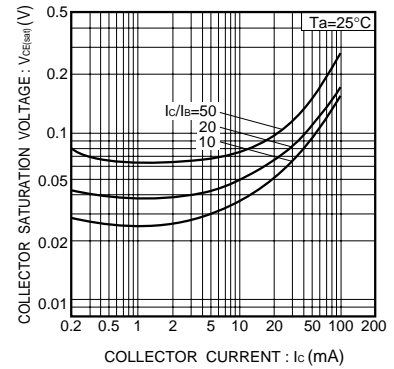


Fig. 6 Collector-emitter saturation voltage vs. collector current

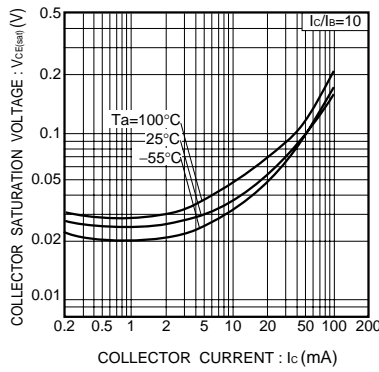


Fig.7 Collector-emitter saturation voltage vs. collector current ( I )

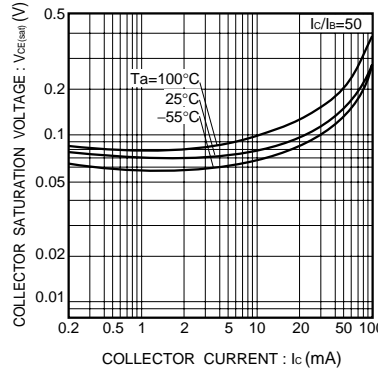


Fig.8 Collector-emitter saturation voltage vs. collector current (II)

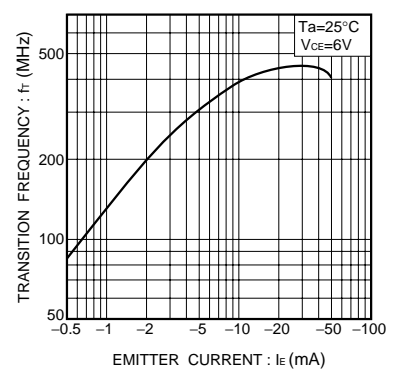


Fig.9 Gain bandwidth product vs. emitter current

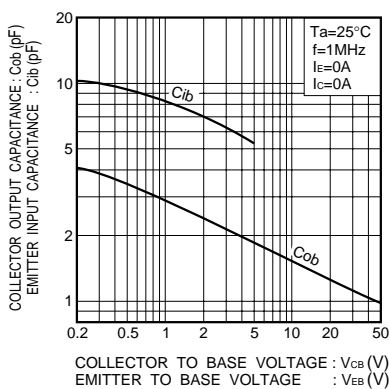


Fig.10 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

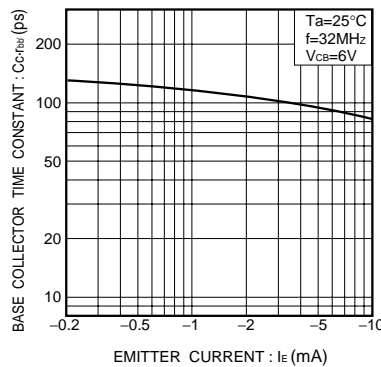


Fig.11 Base-collector time constant vs. emitter current