

# General purpose transistor (isolated transistor and diode)

## EML6 / UML6N

2SC5585 and RB521S-30 are housed independently in a EMT5 or UMT5 package.

### ●Applications

DC / DC converter  
Motor driver

### ●Features

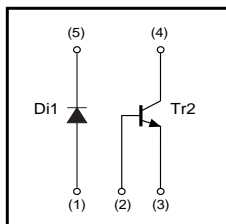
- 1)  $T_r$  : Low  $V_{CE(sat)}$   
Di : Low  $V_f$
- 2) Small package

### ●Structure

Silicon epitaxial planar transistor  
Schottky barrier diode

The following characteristics apply to both Di1 and Tr2.

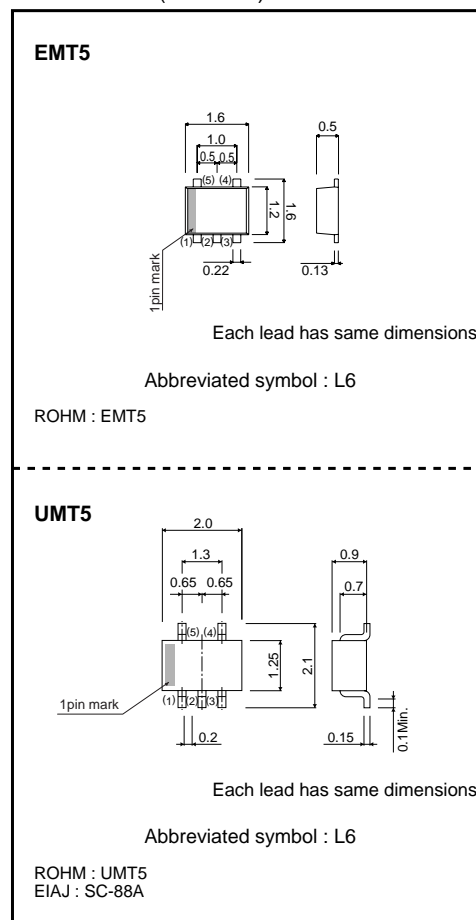
### ●Equivalent circuit (EML6 / UML6N)



### ●Packaging specifications

| Type                         | EML6 | UML6N |
|------------------------------|------|-------|
| Package                      | EMT5 | UMT5  |
| Marking                      | L6   | L6    |
| Code                         | T2R  | TR    |
| Basic ordering unit (pieces) | 8000 | 3000  |

### ●Dimensions (Unit : mm)



## Transistors

## ●Absolute maximum ratings (Ta=25°C)

Di1

| Parameter                             | Symbol           | Limits | Unit |
|---------------------------------------|------------------|--------|------|
| Average rectified forward current     | I <sub>o</sub>   | 200    | mA   |
| Forward current surge peak (60Hz, 1↔) | I <sub>FSM</sub> | 1      | A    |
| Reverse voltage (DC)                  | V <sub>R</sub>   | 30     | V    |
| Junction temperature                  | T <sub>j</sub>   | 125    | °C   |

Tr2

| Parameter                 | Symbol           | Limits | Unit  |
|---------------------------|------------------|--------|-------|
| Collector-base voltage    | V <sub>CB0</sub> | 15     | V     |
| Collector-emitter voltage | V <sub>CEO</sub> | 12     | V     |
| Emitter-base voltage      | V <sub>EBO</sub> | 6      | V     |
| Collector current         | I <sub>c</sub>   | 500    | mA    |
|                           | I <sub>CP</sub>  | 1      | A     |
| Power dissipation         | P <sub>d</sub>   | 120    | mW *1 |
| Junction temperature      | T <sub>j</sub>   | 150    | °C    |

\*1 Each terminal mounted on a recommended.

Di1 / Tr2

| Parameter           | Symbol           | Limits      | Unit |
|---------------------|------------------|-------------|------|
| Power dissipation   | P <sub>d</sub>   | 150         | mW * |
| Storage temperature | T <sub>stg</sub> | -55 to +125 | °C   |

\* Each terminal mounted on a recommended.

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

Di1

| Parameter       | Symbol         | Min. | Typ. | Max. | Unit | Conditions            |
|-----------------|----------------|------|------|------|------|-----------------------|
| Forward voltage | V <sub>F</sub> | –    | 0.40 | 0.50 | V    | I <sub>F</sub> =200mA |
| Reverse current | I <sub>R</sub> | –    | 4.0  | 30   | μA   | V <sub>R</sub> =10V   |

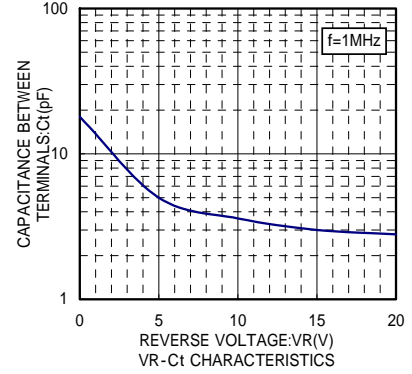
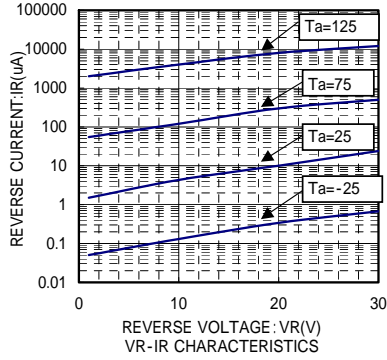
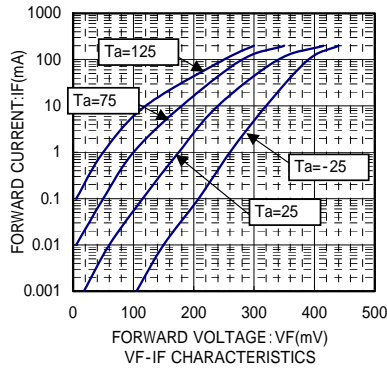
Tr2

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit | Conditions   |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-emitter breakdown voltage  | BV <sub>CEO</sub>    | 12   | –    | –    | V    | I <sub>c</sub> =1mA                                  |
| Collector-base breakdown voltage     | BV <sub>CB0</sub>    | 15   | –    | –    | V    | I <sub>c</sub> =10μA                                 |
| Emitter-base breakdown voltage       | BV <sub>EBO</sub>    | 6    | –    | –    | V    | I <sub>E</sub> =10μA                                 |
| Collector cut-off current            | I <sub>CB0</sub>     | –    | –    | 100  | nA   | V <sub>CB</sub> =15V                                 |
| Emitter cut-off current              | I <sub>EBO</sub>     | –    | –    | 100  | nA   | V <sub>EB</sub> =6V                                  |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | –    | 90   | 250  | mV   | I <sub>c</sub> =200mA, I <sub>B</sub> =10mA          |
| DC current gain                      | h <sub>FE</sub>      | 270  | –    | 680  | –    | V <sub>CE</sub> =2V, I <sub>c</sub> =10mA            |
| Transition frequency                 | f <sub>T</sub>       | –    | 320  | –    | MHz  | V <sub>CE</sub> =2V, I <sub>E</sub> =–10mA, f=100MHz |
| Collector output capacitance         | C <sub>ob</sub>      | –    | 7.5  | –    | pF   | V <sub>CB</sub> =10V, I <sub>E</sub> =0mA, f=1MHz    |

Transistors

●Electrical characteristic curves

Di1



Tr2

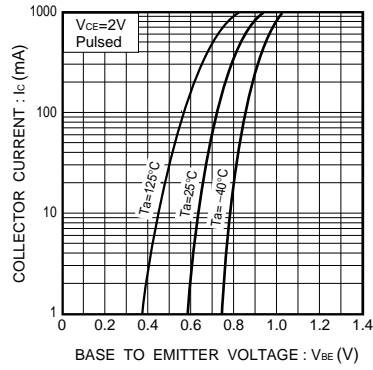


Fig.3 Grounded emitter propagation characteristics

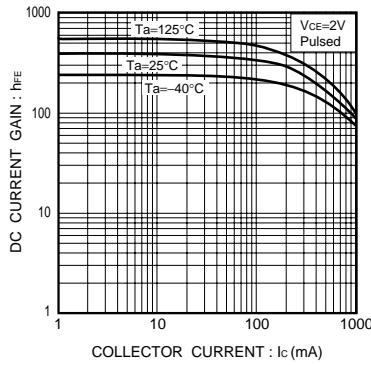


Fig.4 DC current gain vs. collector current

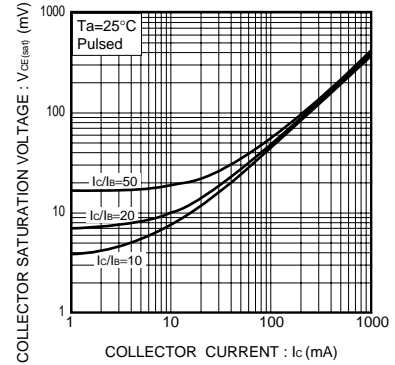


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

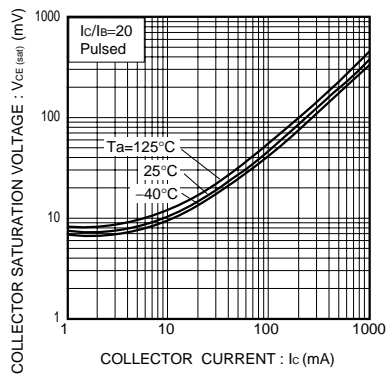


Fig.6 Collector-emitter saturation voltage vs. collector current ( II )

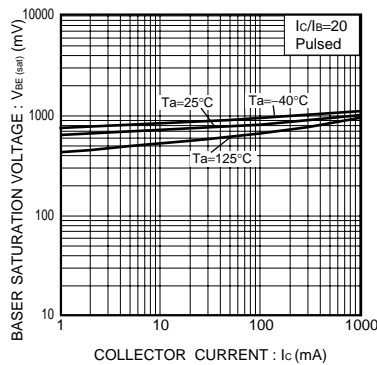


Fig.7 Base-emitter saturation voltage vs. collector current

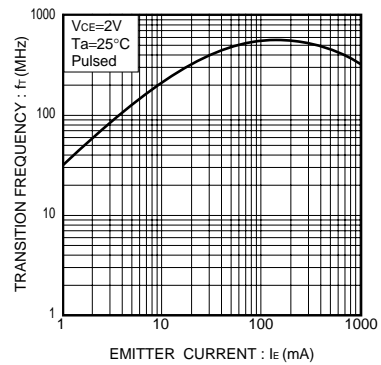


Fig.8 Gain bandwidth product vs. emitter current

Transistors

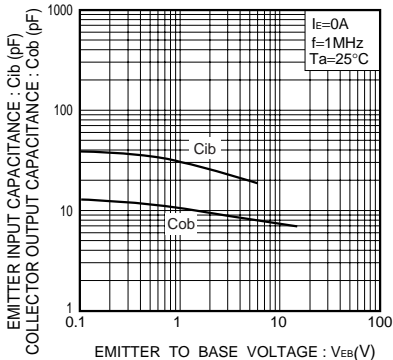


Fig.9 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

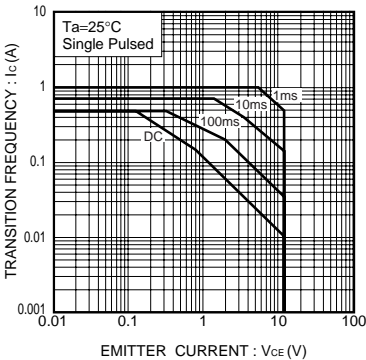


Fig.10 Safe operation area

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