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# FJB5555

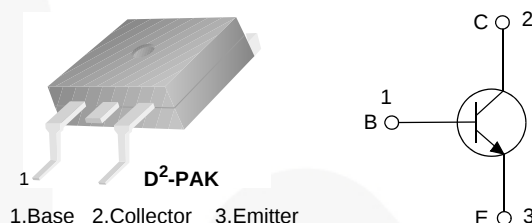
## NPN Silicon Transistor

### Features

- Fast Speed Switching
- Wide Safe Operating Area
- High Voltage Capability

### Application

- Electronic Ballast
- Switched Mode Power Supplies



### Ordering Information

| Part Number | Marking | Package | Packing Method |
|-------------|---------|---------|----------------|
| FJB5555TM   | J5555   | D2-PAK  | Tape & Reel    |

### Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol     | Parameter                          | Value        | Units            |
|------------|------------------------------------|--------------|------------------|
| $BV_{CBO}$ | Collector-Base Voltage             | 1050         | V                |
| $BV_{CEO}$ | Collector-Emitter Voltage          | 400          | V                |
| $BV_{EBO}$ | Emitter-Base Voltage               | 14           | V                |
| $I_C$      | Collector Current (DC)             | 5            | A                |
| $I_{CP}$   | Collector Current (Pulse)          | 10           | A                |
| $I_B$      | Base Current (DC)                  | 2            | A                |
| $I_{BP}$   | Base Current (Pulse)               | 4            | A                |
| $T_J$      | Junction Temperature               | 150          | $^\circ\text{C}$ |
| $T_{STG}$  | Storage Junction Temperature Range | - 55 to +150 | $^\circ\text{C}$ |

### Thermal Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol                          | Parameter                               |                       | Value | Units |
|---------------------------------|-----------------------------------------|-----------------------|-------|-------|
| P <sub>D</sub>                  | Total Device Dissipation                | T <sub>A</sub> = 25°C | 1.6   | W     |
|                                 |                                         | T <sub>C</sub> = 25°C | 100   | W     |
| R <sub>θja</sub> <sup>(1)</sup> | Thermal Resistance, Junction to Ambient |                       | 77.75 | °C/W  |
| R <sub>θjc</sub> <sup>(2)</sup> | Thermal Resistance, Junction to Case    |                       | 1.25  | °C/W  |

#### Notes:

1. Device mounted on FR-4 PCB, board size= 101.5 mm x 114.5 mm.
2.  $R_{\theta jc}$  test fixture under infinite cooling condition.

**Electrical Characteristics<sup>(3)</sup>**Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol        | Parameter                            | Conditions                                                                                                                  | Min. | Typ. | Max. | Units         |
|---------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------|------|------|---------------|
| $BV_{CBO}$    | Collector-Base Breakdown Voltage     | $I_C = 500\ \mu\text{A}, I_E = 0$                                                                                           | 1050 |      |      | V             |
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage  | $I_C = 5\ \text{mA}, I_B = 0$                                                                                               | 400  |      |      | V             |
| $BV_{EBO}$    | Emitter-Base Breakdown Voltage       | $I_E = 500\ \mu\text{A}, I_C = 0$                                                                                           | 14   |      |      | V             |
| $h_{FE}$      | DC Current Gain                      | $V_{CE} = 5\ \text{V}, I_C = 10\ \text{mA}$                                                                                 | 10   |      |      |               |
|               |                                      | $V_{CE} = 3\ \text{V}, I_C = 0.8\ \text{A}$                                                                                 | 20   |      | 40   |               |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 1\ \text{A}, I_B = 0.2\ \text{A}$                                                                                    |      | 0.17 | 0.50 | V             |
|               |                                      | $I_C = 3.5\ \text{A}, I_B = 1.0\ \text{A}$                                                                                  |      |      | 1.5  | V             |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_C = 3.5\ \text{A}, I_B = 1.0\ \text{A}$                                                                                  |      |      | 1.2  | V             |
| $C_{ob}$      | Output Capacitance                   | $V_{CB} = 10\ \text{V}, f = 1\ \text{MHz}$                                                                                  |      | 45   |      | pF            |
| $t_{ON}$      | Turn-On Time                         | $V_{CC} = 125\ \text{V}, I_C = 0.5\ \text{A},$<br>$I_{B1} = 45\ \text{mA}, I_{B2} = -0.5\ \text{A},$<br>$R_L = 250\ \Omega$ |      |      | 1.0  | $\mu\text{s}$ |
| $t_{STG}$     | Storage Time                         |                                                                                                                             |      |      | 1.2  | $\mu\text{s}$ |
| $t_F$         | Fall Time                            |                                                                                                                             |      | 0.3  |      | $\mu\text{s}$ |
| $t_{ON}$      | Turn-On Time                         | $V_{CC} = 250\ \text{V}, I_C = 2.5\ \text{A},$<br>$I_{B1} = 0.5\ \text{A}, I_{B2} = -1.0\ \text{A},$<br>$R_L = 100\ \Omega$ |      |      | 2.0  | $\mu\text{s}$ |
| $t_{STG}$     | Storage Time                         |                                                                                                                             |      |      | 2.5  | $\mu\text{s}$ |
| $t_F$         | Fall Time                            |                                                                                                                             |      |      | 0.3  | $\mu\text{s}$ |
| EAS           | Avalanche Energy                     | $L = 2\ \text{mH}$                                                                                                          | 6    |      |      | mJ            |

**Note:**3. Pulse test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

## Typical Performance Characteristics

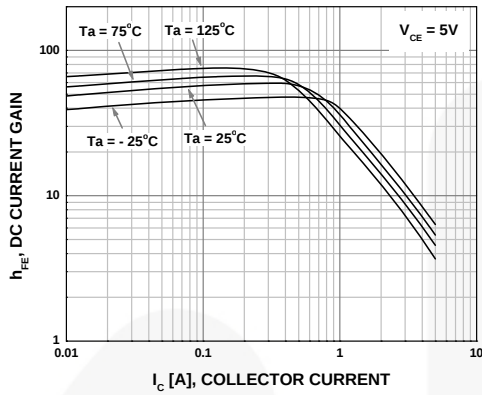


Figure 1. DC Current Gain

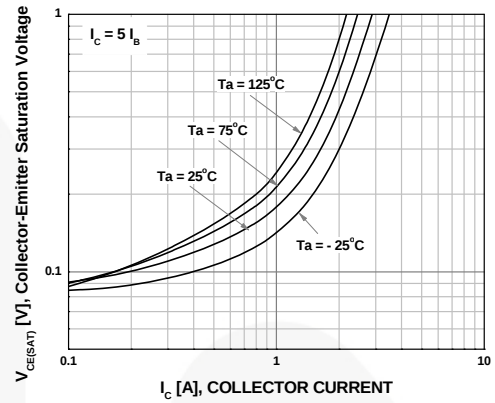


Figure 2. Saturation Voltage

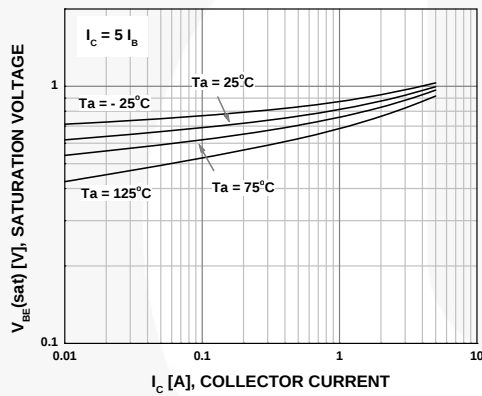


Figure 3. Saturation Voltage

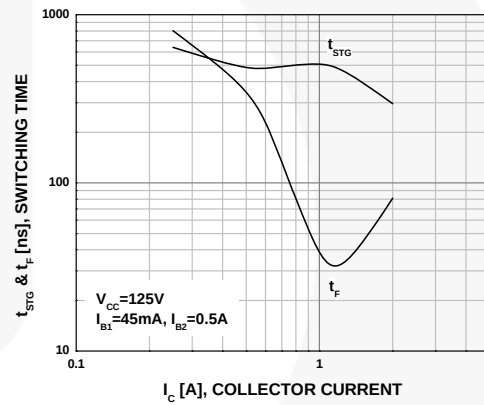


Figure 4. Resistive Load Switching

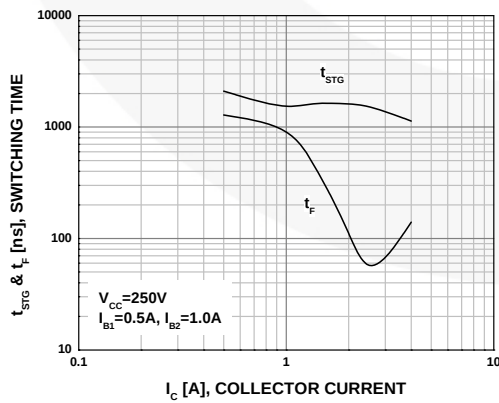


Figure 5. Resistive Load Switching

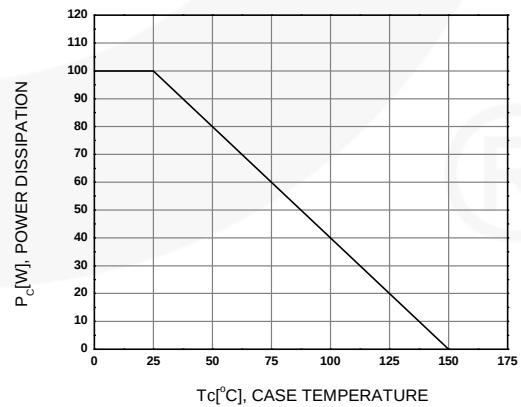
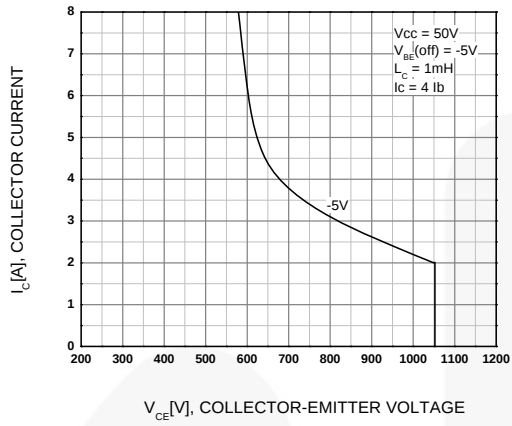


Figure 6. Power Derating

## Typical Performance Characteristics (Continued)



**Figure 7. Reverse Bias Safe Operating**

## Physical Dimensions

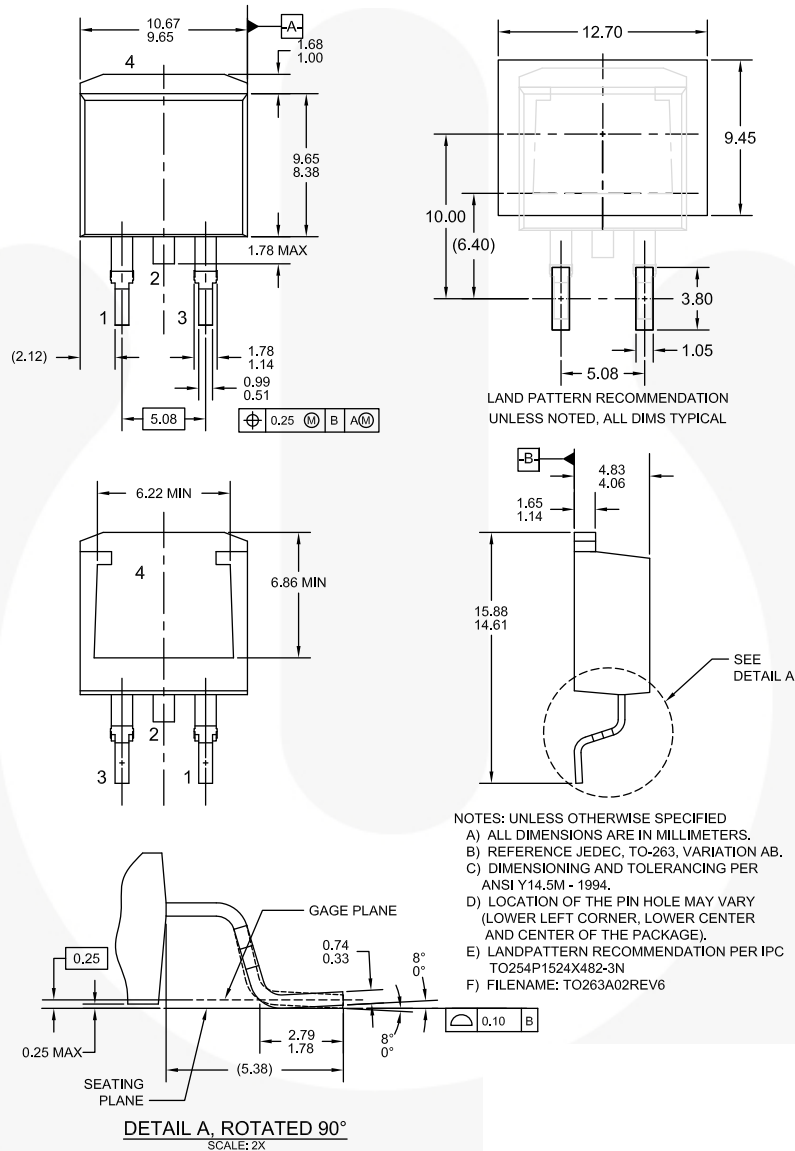
D<sup>2</sup>-PAK

Figure 8. 2-LEAD, TO263, SURFACE MOUNT (ACTIVE)

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| CROSSVOLT™                                                                        | Gmax™                                          | RapidConfigure™                                                                   | TinyPower™                                                                          |
| CTL™                                                                              | GTO™                                           |  | TinyPWM™                                                                            |
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| FastvCore™                                                                        | OPTOLOGIC®                                     | SyncFET™                                                                          | XS™                                                                                 |
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