

## COMPLEMENTARY SILICON POWER TRANSISTORS

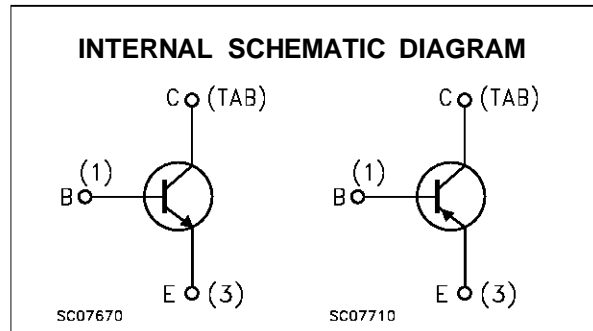
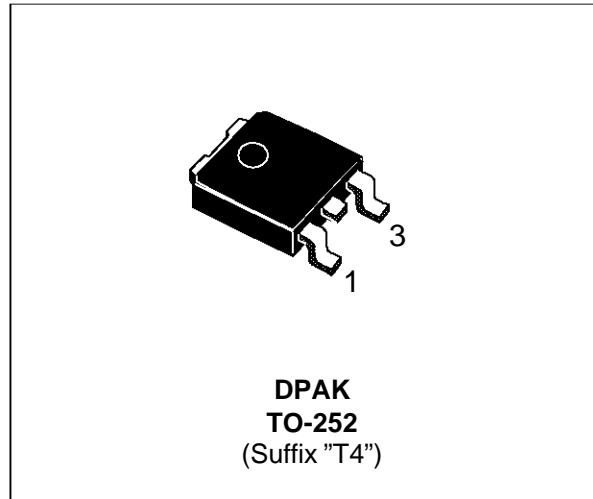
- SGS-THOMSON PREFERRED SALESTYPES
- SURFACE-MOUNTING TO-252 (DPAK) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")
- ELECTRICAL SIMILAR TO TIP31B/C AND TIP32B/C

### APPLICATIONS

- GENERAL PURPOSE SWITCHING AND AMPLIFIER TRANSISTORS

### DESCRIPTION

- The MJD31B and MJD31C and the MJD32B and MJD32C form complementary NPN-PNP pairs. They are manufactured using Epitaxial Base technology for cost-effective performance.



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                     | Value      |            | Unit             |
|-----------|---|------------|------------|------------------|
|           |   | MJD31B/32B | MJD31C/32C |                  |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )          | 80         | 100        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )       | 80         | 100        | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )            | 5          |            | V                |
| $I_C$     | Collector Current                             | 3          |            | A                |
| $I_{CM}$  | Collector Peak Current                        | 5          |            | A                |
| $I_B$     | Base Current                                  | 1          |            | A                |
| $P_{tot}$ | Total Dissipation at $T_c = 25^\circ\text{C}$ | 15         |            | W                |
| $T_{stg}$ | Storage Temperature                           | -65 to 150 |            | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature           | 150        |            | $^\circ\text{C}$ |

# MJD31B/31C - MJD32B/32C

## THERMAL DATA

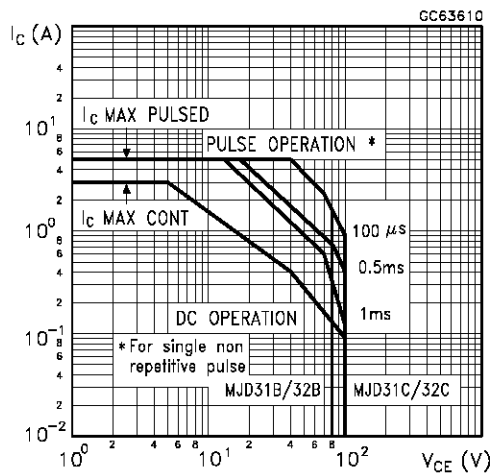
|                       |                                     |     |      |      |
|-----------------------|-------------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | Max | 8.33 | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | Max | 100  | °C/W |

## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

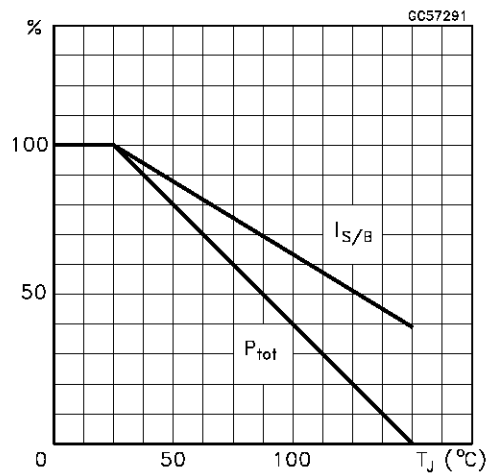
| Symbol                | Parameter                                       | Test Conditions  | Min.      | Typ. | Max. | Unit   |
|-----------------------|---|--|-----------|------|------|--------|
| I <sub>Ces</sub>      | Collector Cut-off Current (V <sub>bE</sub> = 0) | V <sub>CB</sub> = Max Rating   |           |      | 20   | μA     |
| I <sub>CEO</sub>      | Collector Cut-off Current (I <sub>B</sub> = 0)  | V <sub>CB</sub> = 60 V   |           |      | 50   | μA     |
| I <sub>EBO</sub>      | Emitter Cut-off Current (I <sub>C</sub> = 0)    | V <sub>EB</sub> = 5 V  |           |      | 0.1  | mA     |
| V <sub>CEO(sus)</sub> | Collector-Emitter Sustaining Voltage            | I <sub>C</sub> = 30 mA<br>for <b>MJD31B/32B</b><br>for <b>MJD31C/32C</b>   | 80<br>100 |      |      | v<br>V |
| V <sub>CE(sat)*</sub> | Collector-Emitter Saturation Voltage            | I <sub>C</sub> = 3 A    I <sub>B</sub> = 375 mA  |           |      | 1.2  | V      |
| V <sub>BE(on)*</sub>  | Base-Emitter Voltage                            | I <sub>C</sub> = 3 A    V <sub>CE</sub> = 4 V  |           |      | 1.8  | V      |
| h <sub>FE*</sub>      | DC Current Gain                                 | I <sub>C</sub> = 1 A    V <sub>CE</sub> = 4 V<br>I <sub>C</sub> = 3 A    V <sub>CE</sub> = 4 V                                 | 25<br>10  |      | 50   |        |
| h <sub>fe</sub>       | Dynamic Current Gain                            | I <sub>C</sub> = 0.5 A    V <sub>CE</sub> = 10 V    f = 1 KHZ<br>I <sub>C</sub> = 0.5 A    V <sub>CE</sub> = 10 V    f = 1 MHZ | 20<br>3   |      |      |        |

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2 %  
For PNP type voltage and current values are negative.

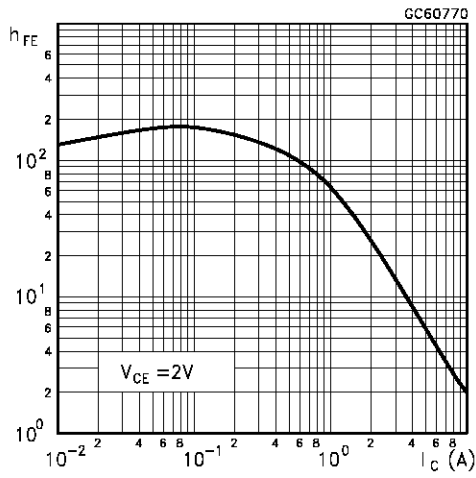
## Safe Operating Area



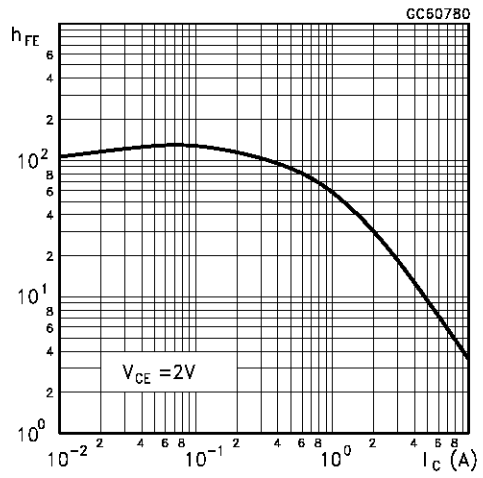
## Derating Curves



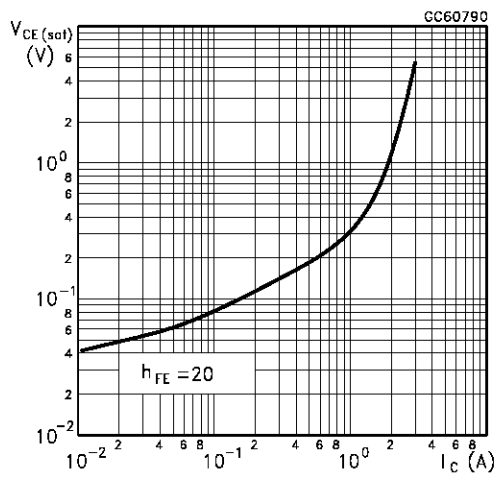
DC Current Gain (NPN type)



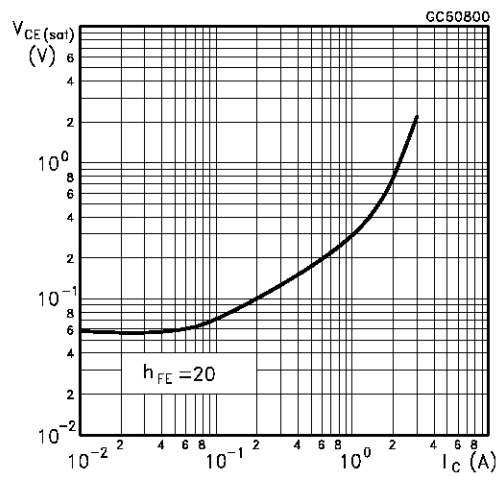
DC Current Gain (PNP type)



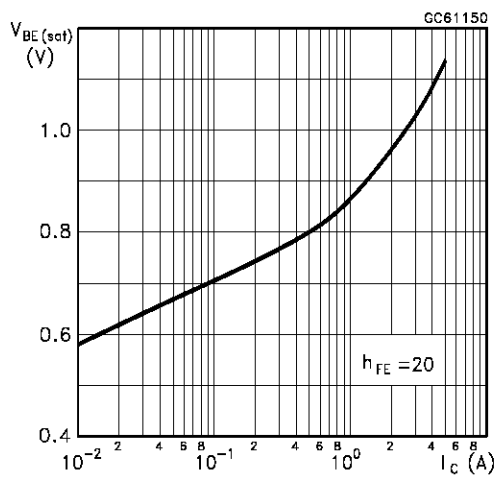
Collector-Emitter Saturation Voltage (NPN type)



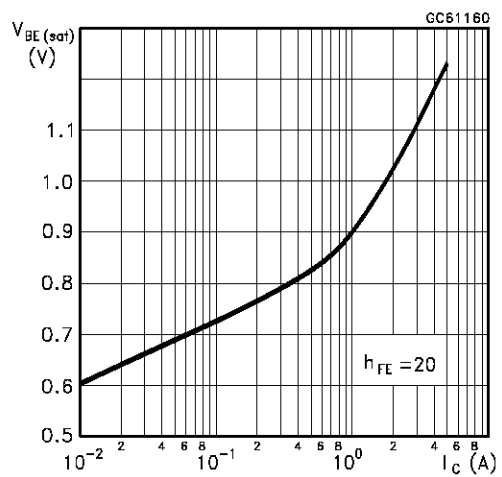
Collector-Emitter Saturation Voltage (PNP type)



Base-Emitter Saturation Voltage (NPN type)

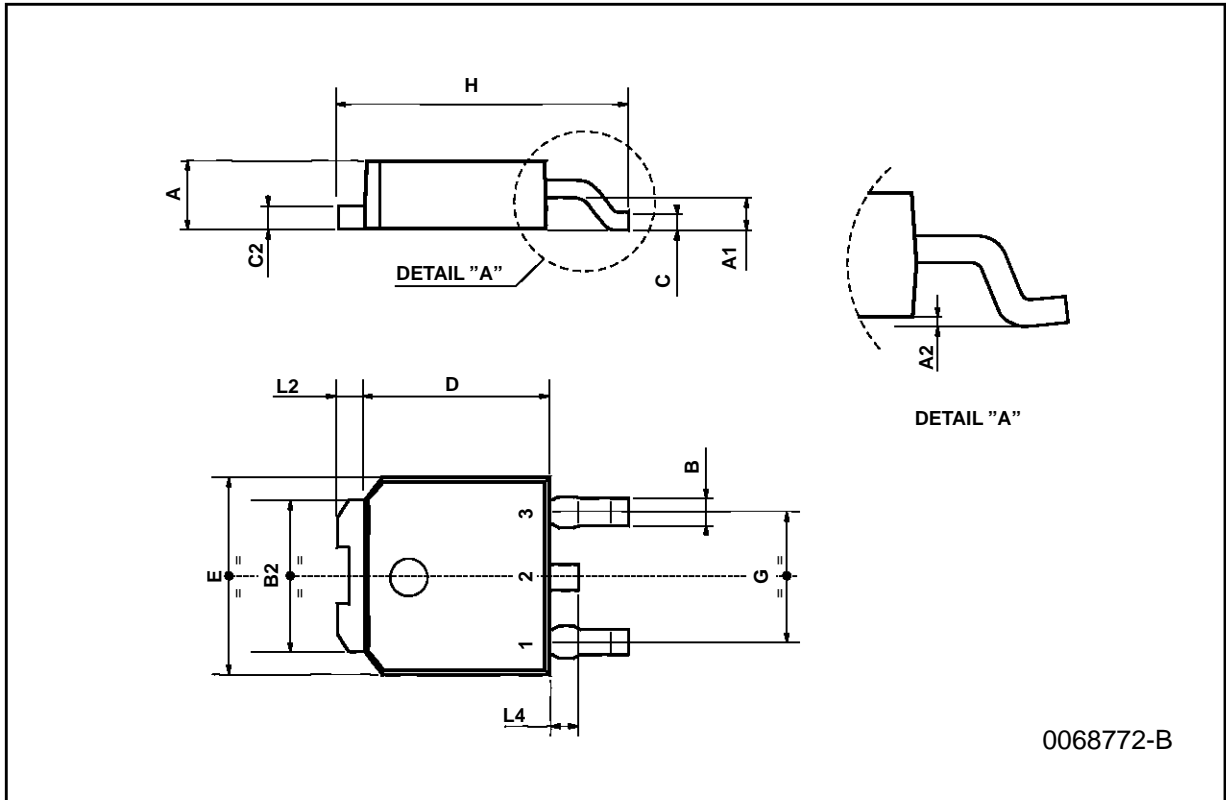


Collector-Base Capacitance (PNP type)



**TO-252 (DPAK) MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 2.2  |      | 2.4  | 0.086 |       | 0.094 |
| A1   | 0.9  |      | 1.1  | 0.035 |       | 0.043 |
| A2   | 0.03 |      | 0.23 | 0.001 |       | 0.009 |
| B    | 0.64 |      | 0.9  | 0.025 |       | 0.035 |
| B2   | 5.2  |      | 5.4  | 0.204 |       | 0.212 |
| C    | 0.45 |      | 0.6  | 0.017 |       | 0.023 |
| C2   | 0.48 |      | 0.6  | 0.019 |       | 0.023 |
| D    | 6    |      | 6.2  | 0.236 |       | 0.244 |
| E    | 6.4  |      | 6.6  | 0.252 |       | 0.260 |
| G    | 4.4  |      | 4.6  | 0.173 |       | 0.181 |
| H    | 9.35 |      | 10.1 | 0.368 |       | 0.397 |
| L2   |      | 0.8  |      |       | 0.031 |       |
| L4   | 0.6  |      | 1    | 0.023 |       | 0.039 |



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