



MJD50

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

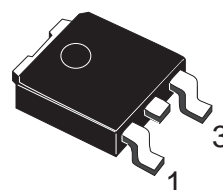
- STMicroelectronics PREFERRED SALESTYPE
- HIGH VOLTAGE CAPABILITY
- SURFACE-MOUNTING TO-252 (DPAK) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")
- ELECTRICALLY SIMILAR TO TIP50

APPLICATIONS

- SWITCH MODE POWER SUPPLIES
- AUDIO AMPLIFIERS
- GENERAL PURPOSE SWITCHING AND AMPLIFIER

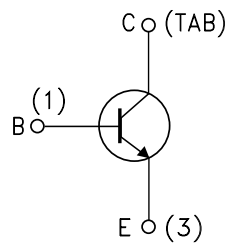
DESCRIPTION

The MJD50 is manufactured using Medium Voltage Epitaxial Planar technology, resulting in a rugged high performance cost-effective transistor.



**DPAK
TO-252**
(Suffix "T4")

INTERNAL SCHEMATIC DIAGRAM



SC07670

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-----------|---|------------|------|
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | 500 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 400 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | 5 | V |
| I_C | Collector Current | 1 | A |
| I_{CM} | Collector Peak Current ($t_p < 5$ ms) | 2 | A |
| I_B | Base Current | 0.6 | A |
| I_{BM} | Base Peak Current ($t_p < 5$ ms) | 1.2 | A |
| P_{tot} | Total Dissipation at $T_c = 25$ °C | 15 | W |
| T_{stg} | Storage Temperature | -65 to 150 | °C |
| T_j | Max. Operating Junction Temperature | 150 | °C |

MJD50

THERMAL DATA

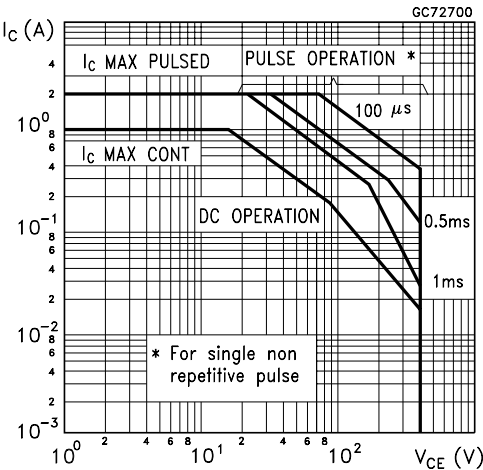
| | | | | |
|-----------------------|-------------------------------------|-----|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 8.33 | °C/W |
| R _{thj-amb} | Thermal Resistance Junction-ambient | Max | 100 | °C/W |

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

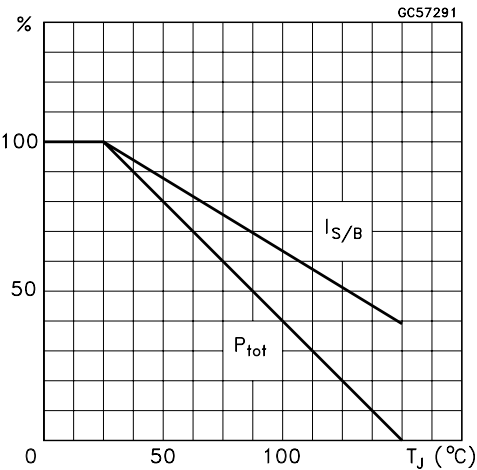
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------|---|--|----------|------|------|------|
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | V _{CE} = 500 V | | | 0.1 | mA |
| I _{CEO} | Collector Cut-off Current (I _B = 0) | V _{CE} = 300 V | | | 0.1 | mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 1 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 30 mA | 400 | | | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 1 A I _B = 0.2 A | | | 1 | V |
| V _{BE(on)*} | Base-Emitter On Voltage | I _C = 1 A V _{CE} = 10 V | | | 1.5 | V |
| h _{FE} * | DC Current Gain | I _C = 0.3 A V _{CE} = 10 V I _C = 1 A V _{CE} = 10 V | 30 10 | | 150 | |
| f _T | Transition Frequency | I _C = 0.2 A V _{CE} = 10 V f=2MHz | 10 | | | MHz |
| h _{fe} | Small Signal Current Gain | I _C = 0.2 A V _{CE} = 10 V f=1kHz | 25 | | | |

* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

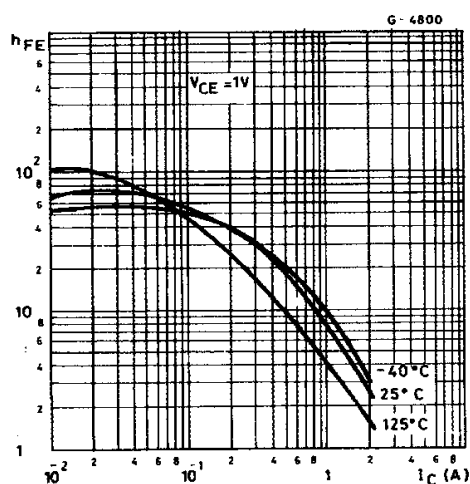
Safe Operating Area



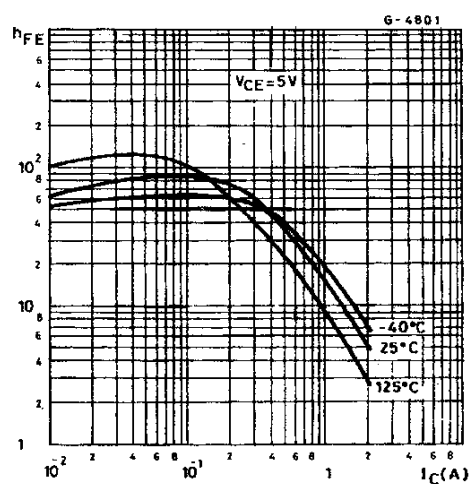
Derating Curves



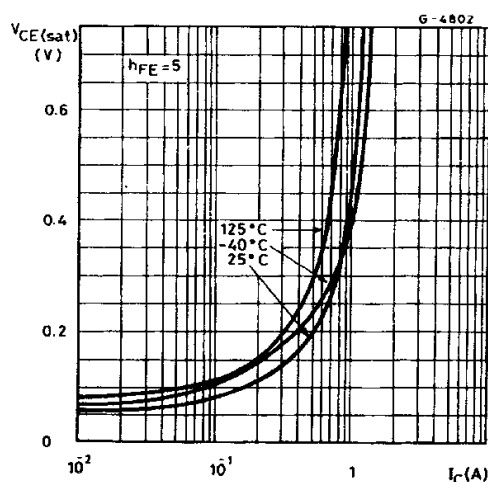
DC Current Gain



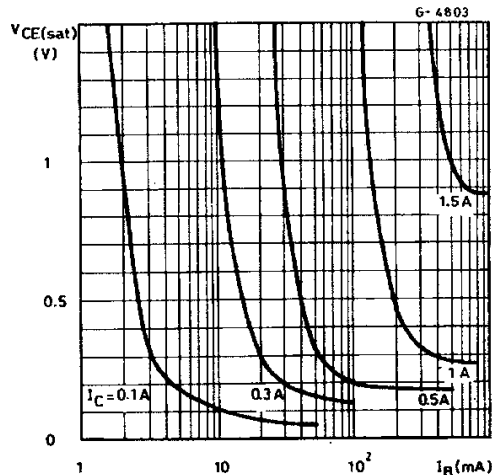
DC Current Gain



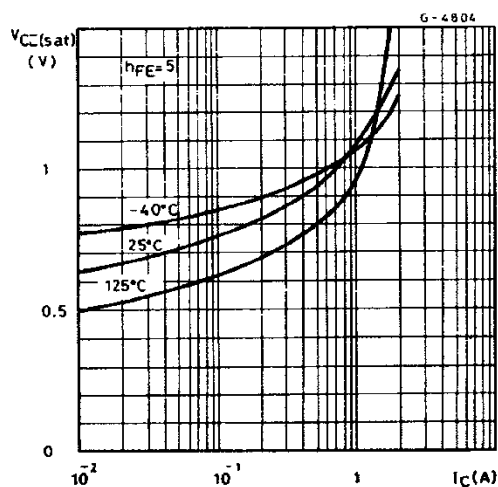
Collector-Emitter Saturation Voltage



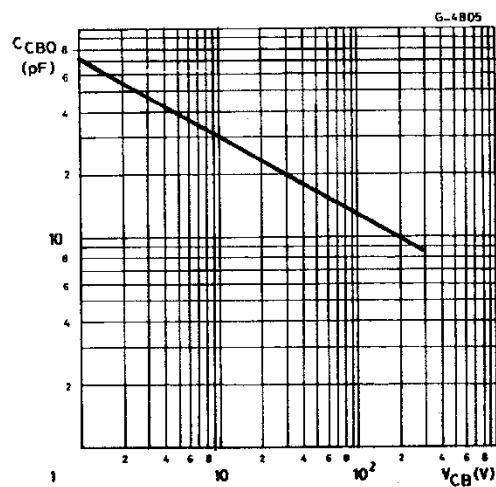
Collector-Emitter Saturation Voltage



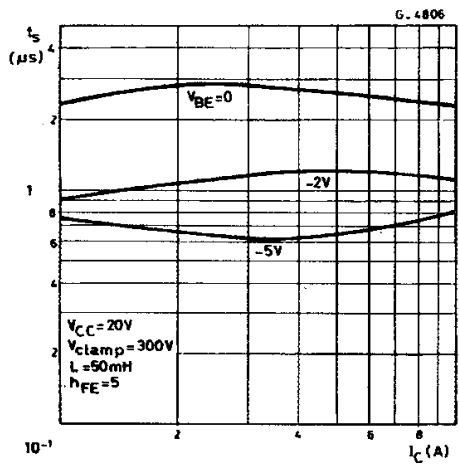
Base-Emitter Saturation Voltage



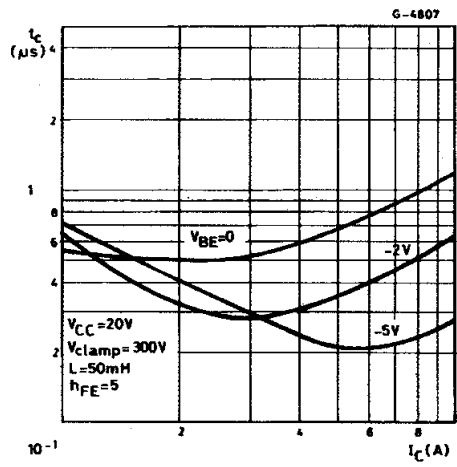
Collector-Base Capacitance



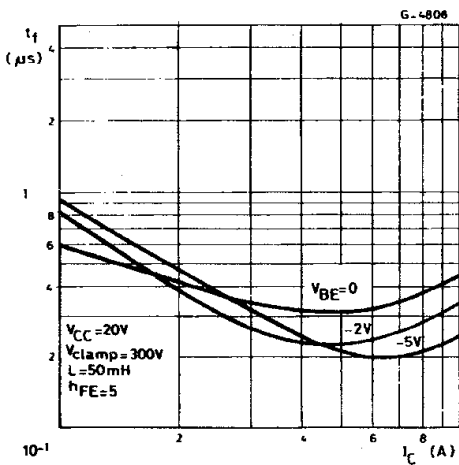
Switching Time Inductive Load



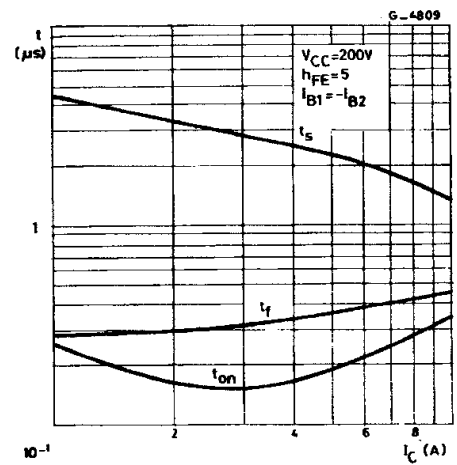
Switching Time Inductive Load



Switching Time Inductive Load

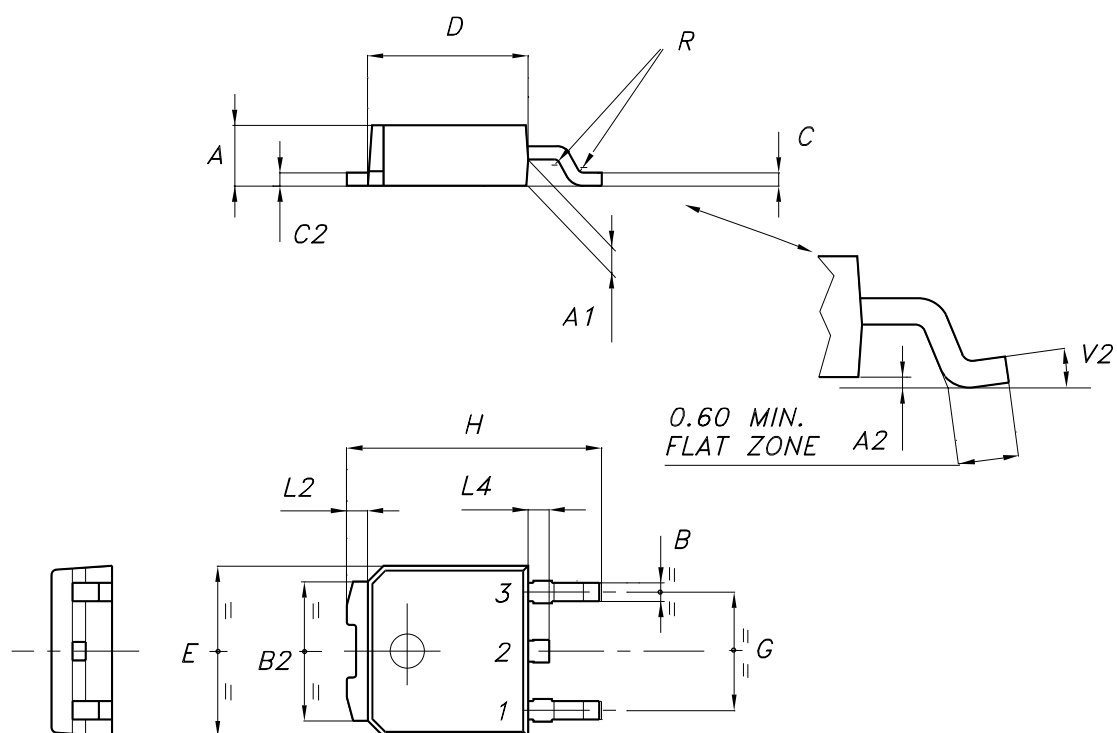


Switching Time Inductive Load



TO-252 (DPAK) MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 2.20 | | 2.40 | 0.087 | | 0.094 |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.043 |
| A2 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| B | 0.64 | | 0.90 | 0.025 | | 0.035 |
| B2 | 5.20 | | 5.40 | 0.204 | | 0.213 |
| C | 0.45 | | 0.60 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.60 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.60 | 0.252 | | 0.260 |
| G | 4.40 | | 4.60 | 0.173 | | 0.181 |
| H | 9.35 | | 10.10 | 0.368 | | 0.398 |
| L2 | | 0.8 | | | 0.031 | |
| L4 | 0.60 | | 1.00 | 0.024 | | 0.039 |
| V2 | 0° | | 8° | 0° | | 0° |



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