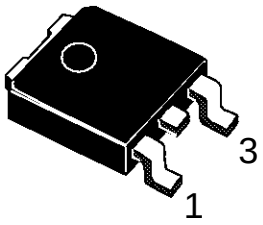
SGS-THOMSON MICROELECTRONICS

# MJD122
# MJD127

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- SGS-THOMSON PREFERRED SALESTYPES
- LOW BASE-DRIVE REQUIREMENTS
- INTEGRATED ANTIPARALLEL COLLECTOR- EMITTER DIODE
- SURFACE-MOUNTING TO-252 (DPAK) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")
- ELECTRICAL SIMILAR TO TIP122 AND TIP127




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

### APPLICATIONS

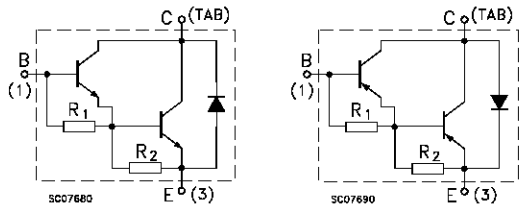
- GENERAL PURPOSE SWITCHING AND AMPLIFIER.

### DESCRIPTION

The MJD122 and MJD127 form complementary NPN - PNP pairs.

They are manufactured using Epitaxial Base technology for cost-effective performance.

**INTERNAL SCHEMATIC DIAGRAM**




$R_1$ Typ. = 10 KΩ  $R_2$ Typ. = 150 Ω

### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| | | NPN | MJD122 | |
| | | PNP | MJD127 | |
| $V_{CBO}$ | Collector-Base Voltage ($I_E$ = 0) | | 100 | V |
| $V_{CEO}$ | Collector-Emitter Voltage ($I_B$ = 0) | | 100 | V |
| $V_{EBO}$ | Emitter-Base Voltage ($I_C$ = 0) | | 5 | V |
| $I_C$ | Collector Current | | 5 | A |
| $I_{CM}$ | Collector Peak Current | | 8 | A |
| $I_B$ | Base Current | | 100 | mA |
| $P_{tot}$ | Total Dissipation at $T_{case} \leq 25\ ^oC$ | | 20 | W |
| $T_{stg}$ | Storage Temperature | | -65 to 150 | $^oC$ |
| $T_j$ | Max. Operating Junction Temperature | | 150 | $^oC$ |

## THERMAL DATA

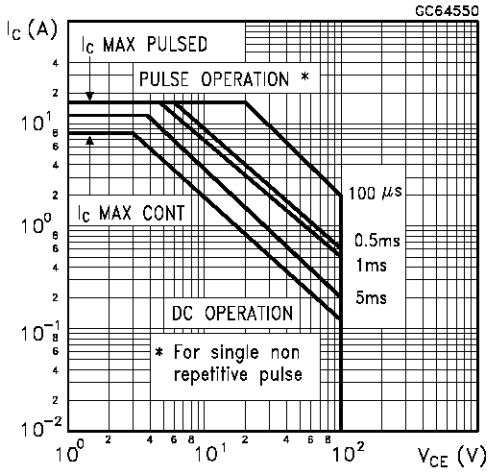
| | | | |
|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-case Max | 6.25 | °C/W |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-ambient Max | 100 | °C/W |

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

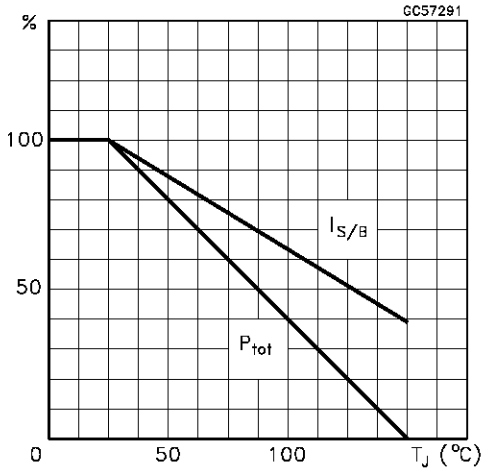
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut-off Current ($I_E$ = 0) | $V_{CB}$ = 100 V | | | 10 | µA |
| $I_{CEO}$ | Collector Cut-off Current ($I_B$ = 0) | $V_{CE}$ = 50 V | | | 10 | µA |
| $I_{CEX}$ | Collector Cut-off Current | $V_{CE}$ = 100 V $V_{BE}$ = -1.5V<br>$V_{CE}$ = 100 V $V_{BE}$ = -1.5V $T_C$ = 125 °C | | | 10<br>500 | µA<br>µA |
| $I_{EBO}$ | Emitter Cut-off Current ($I_C$ = 0) | $V_{EB}$ = 5 V | | | 2 | mA |
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage | $I_C$ = 30 mA | 100 | | | V |
| $V_{CE(sat)}$* | Collector-Emitter Saturation Voltage | $I_C$ = 4 A $I_B$ = 16 mA<br>$I_C$ = 8 A $I_B$ = 80 mA | | | 2<br>4 | V<br>V |
| $V_{BE(sat)}$* | Base-Emitter Saturation Voltage | $I_C$ = 8 A $I_B$ = 80 mA | | | 4.5 | V |
| $V_{BE(on)}$* | Base-Emitter Voltage | $I_C$ = 4 A $V_{CE}$ = 4 V | | | 2.8 | V |
| $h_{FE}$* | DC Current Gain | $I_C$ = 4 A $V_{CE}$ = 4 V<br>$I_C$ = 8 A $V_{CE}$ = 4 V | 1000<br>100 | | 12000 | |

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

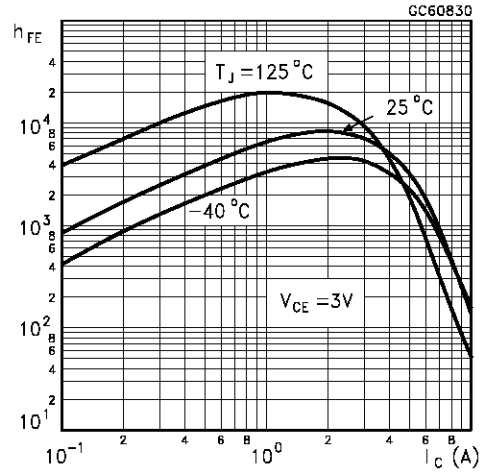
Safe Operating Area




Derating Curve



DC Current Gain (NPN type)

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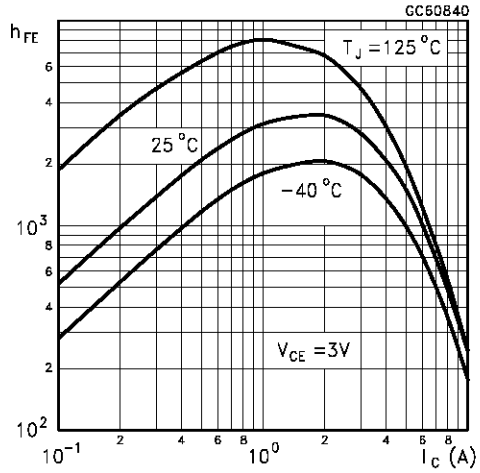
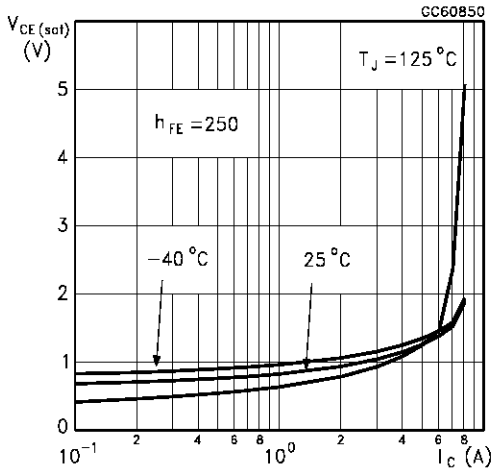



Collector Emitter Saturation Voltage (NPN type)

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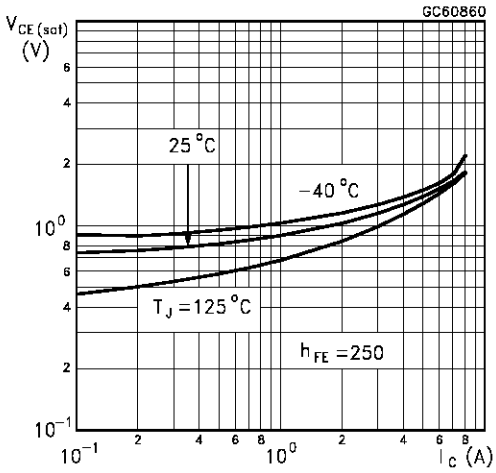
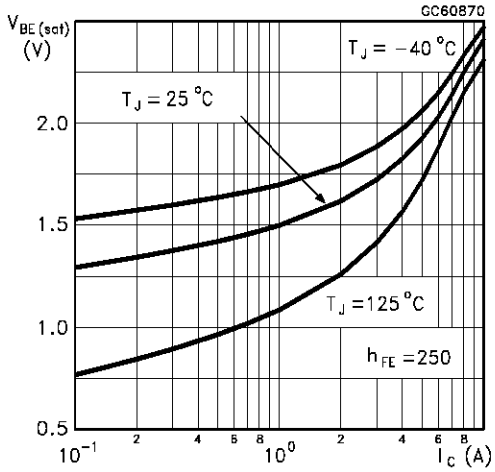



Base Emitter Saturation Voltage (NPN type)

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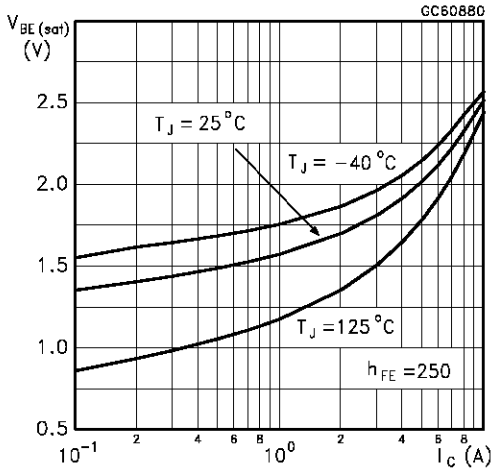
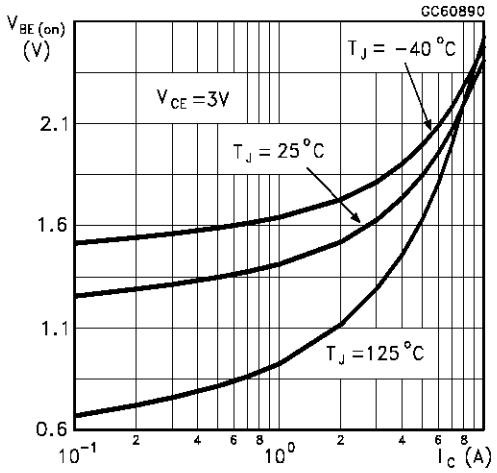


Base Emitter On Voltage (NPN type)

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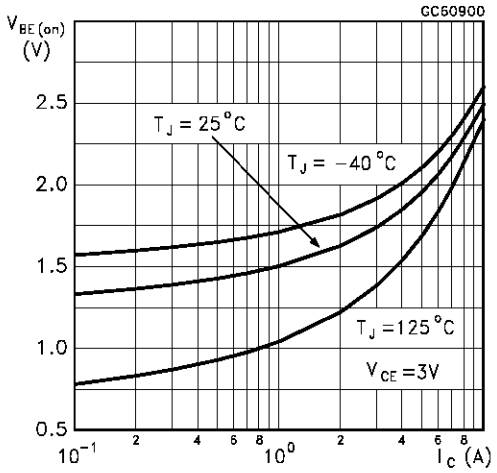
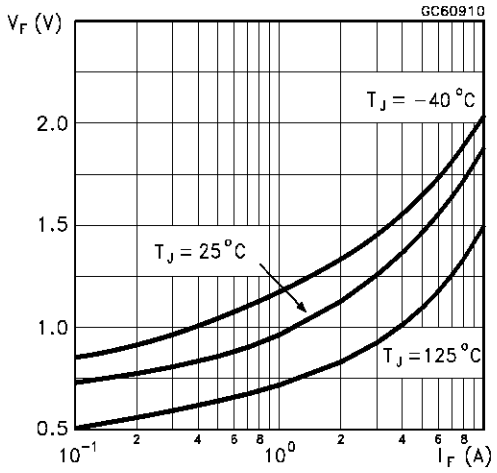



Freewheel Diode Forward Voltage (NPN type)

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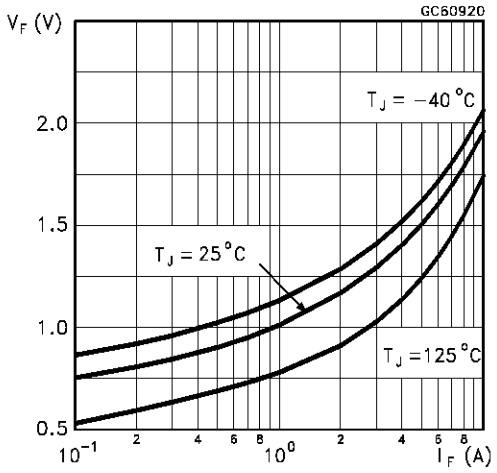
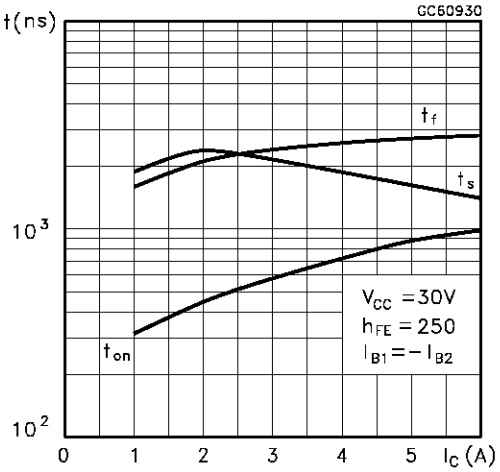



Switching Time Resistive Load (NPN type)

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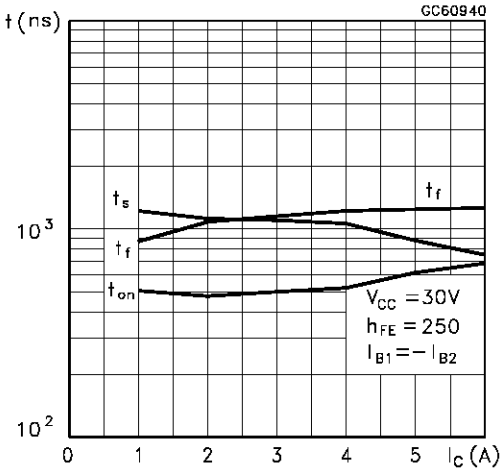
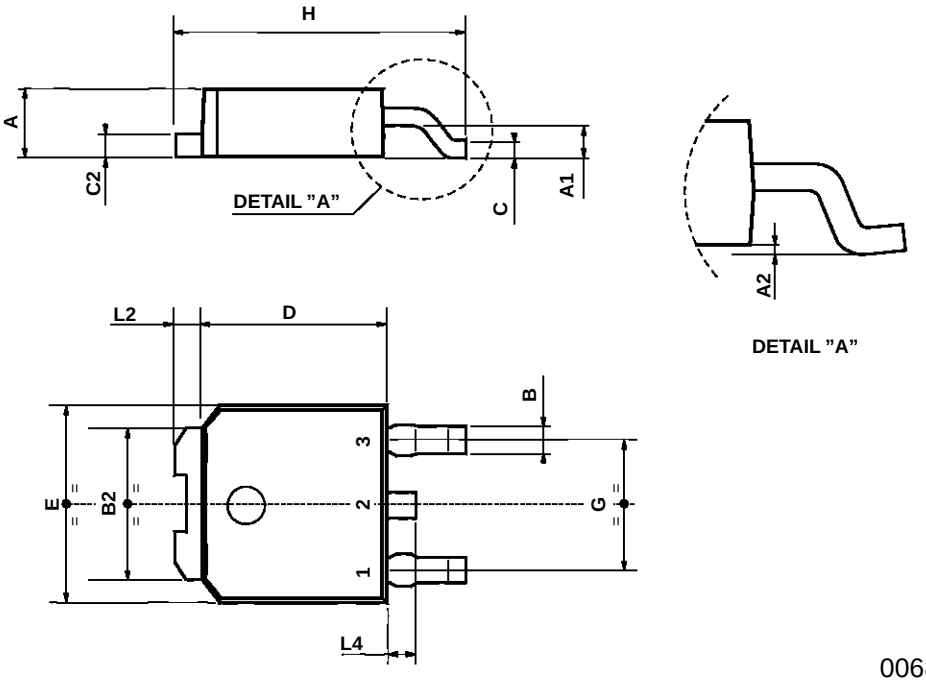


## TO-252 (DPAK) MECHANICAL DATA

| 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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