



**MJD122**  
**MJD127**

## COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

- STMicroelectronics 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

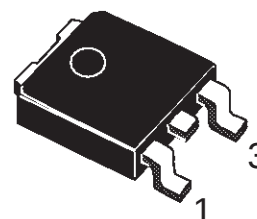
### APPLICATIONS

- GENERAL PURPOSE SWITCHING AND AMPLIFIER.

### DESCRIPTION

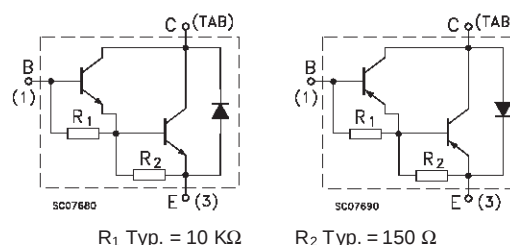
The MJD122 and MJD127 form complementary NPN - PNP pairs.

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



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

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol           | Parameter                                      |     | Value      | Unit |
|------------------|------------------------------------------------|-----|------------|------|
|                  |                                                | NPN | MJD122     |      |
|                  |                                                | PNP | MJD127     |      |
| V <sub>CBO</sub> | Collector-Base Voltage (I <sub>E</sub> = 0)    |     | 100        | V    |
| V <sub>CEO</sub> | Collector-Emitter Voltage (I <sub>B</sub> = 0) |     | 100        | V    |
| V <sub>EBO</sub> | Emitter-Base Voltage (I <sub>C</sub> = 0)      |     | 5          | V    |
| I <sub>C</sub>   | Collector Current                              |     | 5          | A    |
| I <sub>CM</sub>  | Collector Peak Current                         |     | 8          | A    |
| I <sub>B</sub>   | Base Current                                   |     | 100        | mA   |
| P <sub>tot</sub> | Total Dissipation at T <sub>case</sub> ≤ 25 °C |     | 20         | W    |
| T <sub>stg</sub> | Storage Temperature                            |     | -65 to 150 | °C   |
| T <sub>j</sub>   | Max. Operating Junction Temperature            |     | 150        | °C   |

For PNP types voltage and current values are negative.

# MJD122 MJD127

## THERMAL DATA

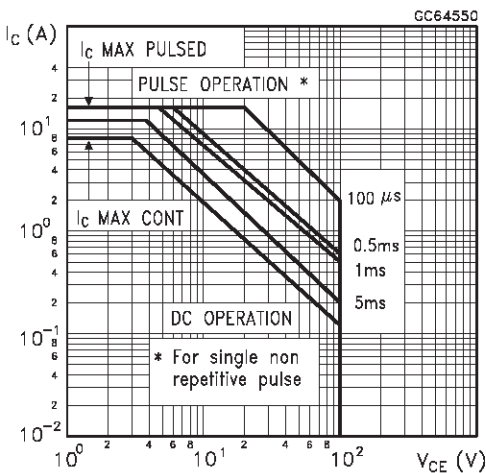
|                       |                                     |     |      |      |
|-----------------------|-------------------------------------|-----|------|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | Max | 6.25 | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | Max | 100  | °C/W |

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

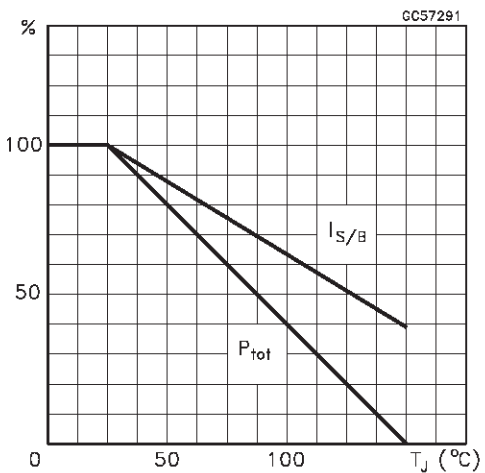
| Symbol                | Parameter                                      | Test Conditions                                                                                                           | Min.        | Typ. | Max.      | Unit     |
|-----------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------|------|-----------|----------|
| I <sub>CBO</sub>      | Collector Cut-off Current (I <sub>E</sub> = 0) | V <sub>CB</sub> = 100 V                                                                                                   |             |      | 10        | μA       |
| I <sub>CEO</sub>      | Collector Cut-off Current (I <sub>B</sub> = 0) | V <sub>CE</sub> = 50 V                                                                                                    |             |      | 10        | μA       |
| I <sub>CEX</sub>      | Collector Cut-off Current                      | V <sub>CE</sub> = 100 V V <sub>BE</sub> = -1.5V<br>V <sub>CE</sub> = 100 V V <sub>BE</sub> = -1.5V T <sub>C</sub> = 125°C |             |      | 10<br>500 | μA<br>μA |
| I <sub>EBO</sub>      | Emitter Cut-off Current (I <sub>C</sub> = 0)   | V <sub>EB</sub> = 5 V                                                                                                     |             |      | 2         | mA       |
| V <sub>CEO(sus)</sub> | Collector-Emitter Sustaining Voltage           | I <sub>C</sub> = 30 mA                                                                                                    | 100         |      |           | V        |
| V <sub>CE(sat)*</sub> | Collector-Emitter Saturation Voltage           | I <sub>C</sub> = 4 A I <sub>B</sub> = 16 mA<br>I <sub>C</sub> = 8 A I <sub>B</sub> = 80 mA                                |             |      | 2<br>4    | V<br>V   |
| V <sub>BE(sat)*</sub> | Base-Emitter Saturation Voltage                | I <sub>C</sub> = 8 A I <sub>B</sub> = 80 mA                                                                               |             |      | 4.5       | V        |
| V <sub>BE(on)*</sub>  | Base-Emitter Voltage                           | I <sub>C</sub> = 4 A V <sub>CE</sub> = 4 V                                                                                |             |      | 2.8       | V        |
| h <sub>FE*</sub>      | DC Current Gain                                | I <sub>C</sub> = 4 A V <sub>CE</sub> = 4 V<br>I <sub>C</sub> = 8 A V <sub>CE</sub> = 4 V                                  | 1000<br>100 |      | 12000     |          |

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

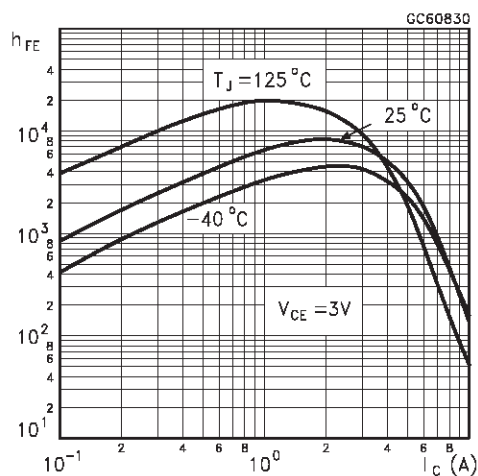
## Safe Operating Area



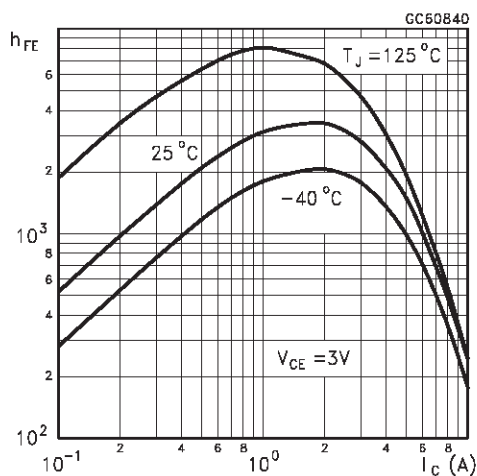
## Derating Curve



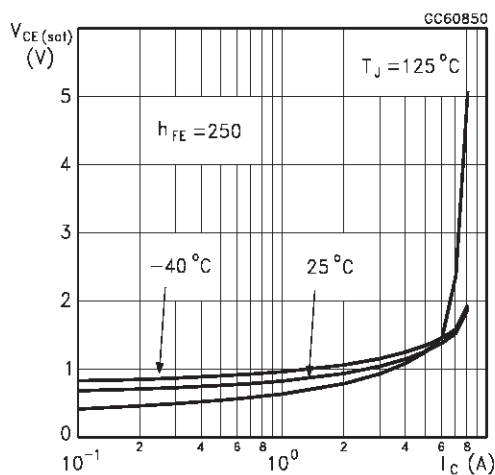
DC Current Gain (NPN type)



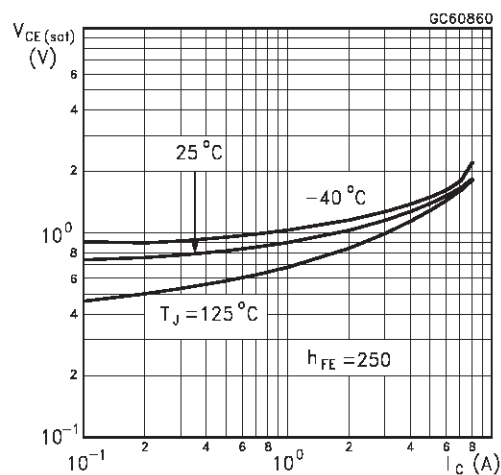
DC Current Gain (PNP type)



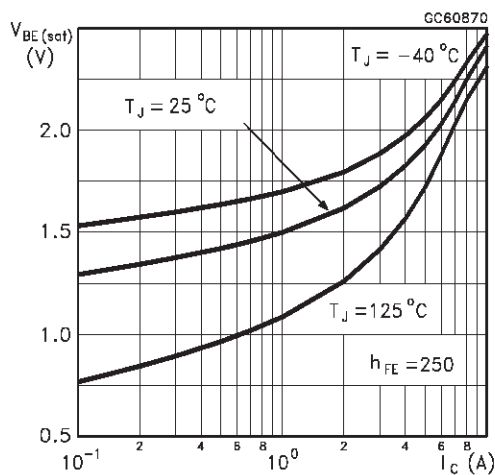
Collector Emitter Saturation Voltage (NPN type)



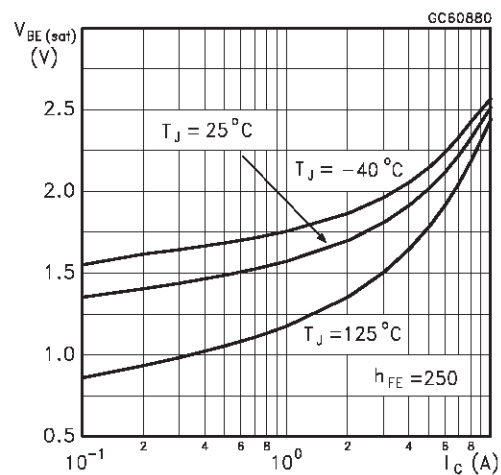
Collector Emitter Saturation Voltage (PNP type)



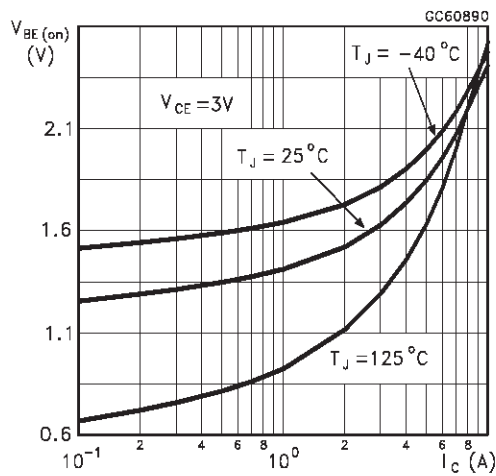
Base Emitter Saturation Voltage (NPN type)



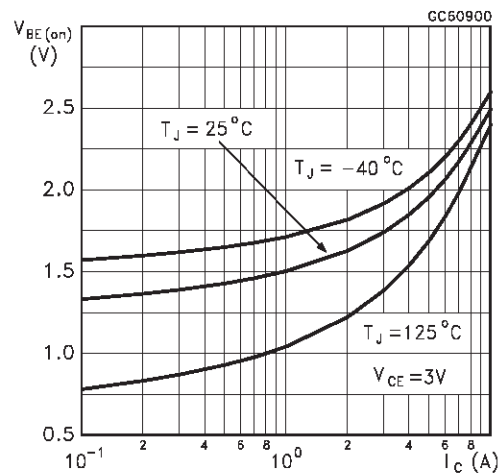
Base Emitter Saturation Voltage (PNP type)



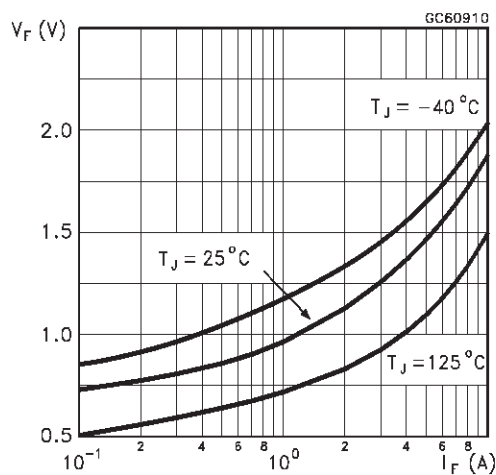
Base Emitter On Voltage (NPN type)



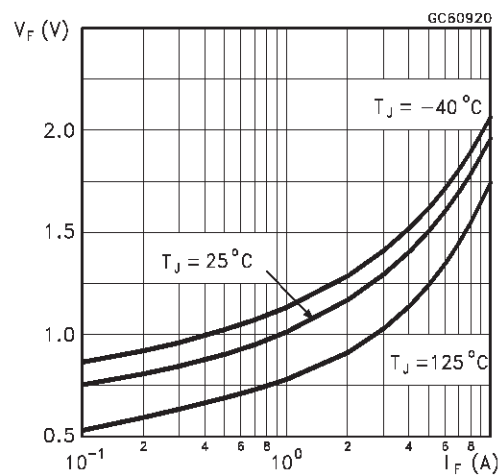
Base Emitter On Voltage (PNP type)



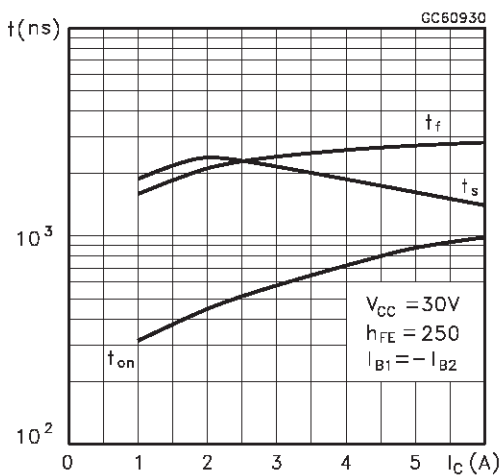
Freewheel Diode Forward Voltage (NPN type)



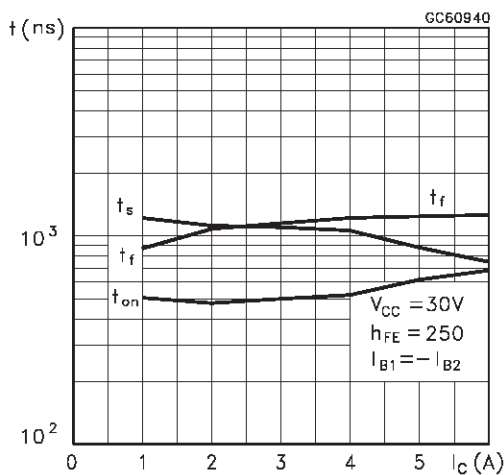
Freewheel Diode Forward Voltage (PNP type)



Switching Time Resistive Load (NPN type)

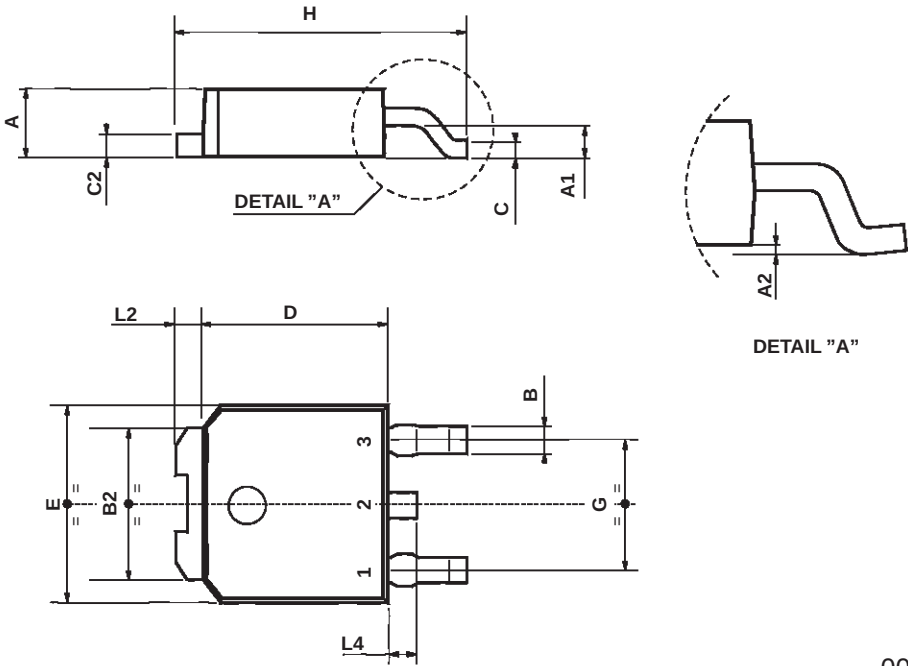


Switching Time resistive Load (PNP type)



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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