

COMPLEMENTARY SILICON POWER DARLINGTON TRANSISTORS

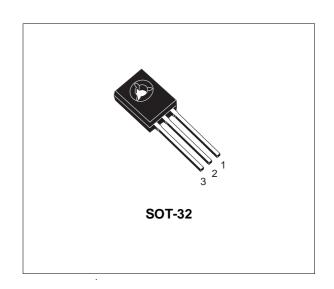
- 2N6036 IS A STMicroelectronics PREFERRED SALESTYPE
- COMPLEMENTARY PNP NPN DEVICES
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

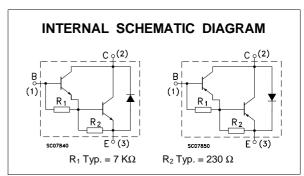
APPLICATIONS

- GENERAL PURPOSE SWITCHING
- GENERAL PURPOSE AMPLIFIER

DESCRIPTION

The 2N6036 and 2N6039 are complementary silicon power Darlington transistors mounted in Jedec SOT-32 plastic package.





ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit | |
|------------------|--|-----|------------|------|--|
| | | PNP | 2N6036 | | |
| | | NPN | 2N6039 | | |
| V _{CBO} | Collector-Base Voltage (I _E = 0) | | 80 | V | |
| V _{CEO} | Collector-Emitter Voltage (I _B = 0) | | 80 | V | |
| V _{EBO} | Emitter-Base Voltage (I _C = 0) | | 5 | V | |
| Ic | Collector Current | | 4 | А | |
| I _{CM} | Collector Peak Current | | 8 | А | |
| Ι _Β | Base Current | | 0.1 | Α | |
| P _{tot} | Total Dissipation at T _c ≤ 25 °C | | 40 | W | |
| T _{stg} | Storage Temperature | | -65 to 150 | °C | |
| Tį | Max. Operating Junction Temperature | | 150 | °C | |

For PNP types voltage and current values are negative.

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THERMAL DATA

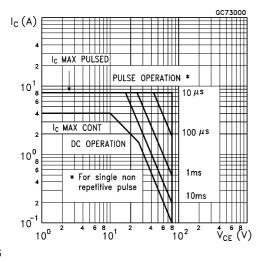
| R _{thj-case} | Thermal Resistance Junction-case | Max | 3.12 | °C/W |
|-----------------------|-------------------------------------|-----|------|------|
| $R_{thj-amb}$ | Thermal Resistance Junction-ambient | Max | 83.3 | °C/W |

ELECTRICAL CHARACTERISTICS ($T_{case} = 25$ $^{\circ}C$ unless otherwise specified)

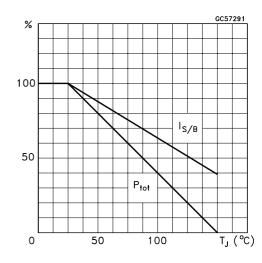
| Symbol | Parameter | Test Conditions | Min. | Тур. | Max. | Unit |
|------------------------|--|--|-------------------|------|------------|----------|
| I _{CEX} | Collector Cut-off Current (V _{BE} = -1.5V) | V_{CE} = rated V_{CEO} V_{CE} = rated V_{CEO} T_c = 125 $^{\circ}$ C | | | 0.1 0.5 | mA mA |
| Ісво | Collector Cut-off Current (I _E = 0) | V _{CE} = rated V _{CBO} | | | 0.1 | mA |
| I _{CEO} | Collector Cut-off Current (I _B = 0) | $V_{CE} = rated V_{CEO}$ | | | 0.1 | mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 2 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage | I _C = 100 mA | 80 | | | V |
| V _{CE(sat)} * | Collector-Emitter Saturation Voltage | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | | | 2 3 | V V |
| V _{BE(sat)} * | Base-Emitter Saturation Voltage | $I_C = 4 \text{ A}$ $I_B = 40 \text{ mA}$ | | | 4 | V |
| V _{BE} * | Base-Emitter Voltage | I _C = 2 A V _{CE} = 3 V | | | 2.8 | V |
| h _{FE} * | DC Current Gain | | 500 750 100 | | 15000 | |
| h _{fe} | Small Signal Current Gain | $I_C = 0.75 \text{ A} V_{CE} = 10 \text{ V} \qquad f = 1 \text{KHz}$ | 25 | | | |
| Ссво | Collector Base Capacitance | eq:lemma:equation: lemma:equation: lemma:equation: lemma:equation: lemma:equation: f = 1 MHz for NPN types for PNP types | | | 100 200 | pF pF |

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

Safe Operating Area

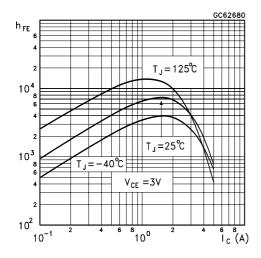


Derating Curve

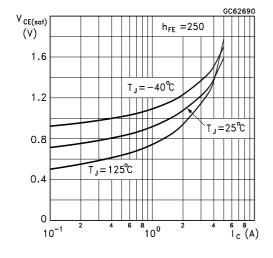


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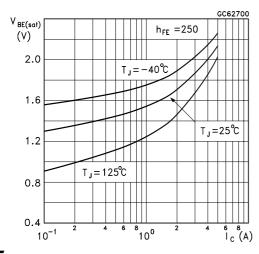
DC Current Gain (NPN type)



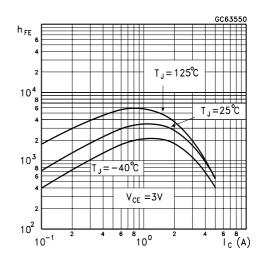
Collector Emitter Saturation Voltage (NPN type)



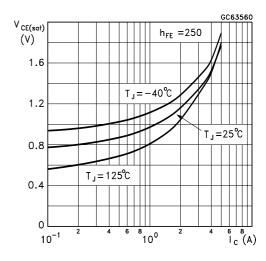
Base Emitter Saturation Voltage (NPN type)



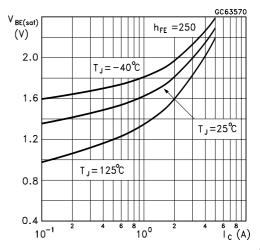
DC Current Gain (PNP type)



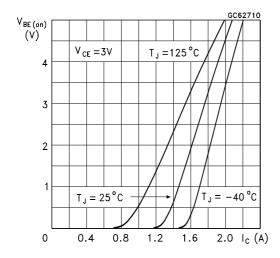
Collector Emitter Saturation Voltage (PNP type)



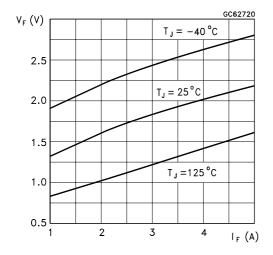
Base Emitter Saturation Voltage (PNP type)



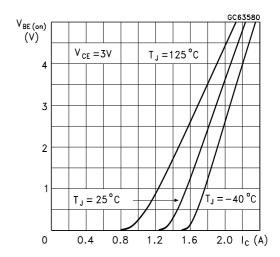
Base-Emitter On Voltage (NPN type)



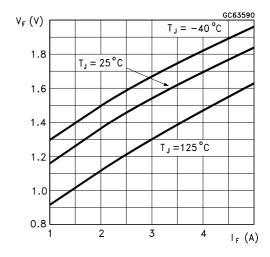
Freewheel Diode Forward Voltage (NPN type)



Base-Emitter On Voltage (PNP type)



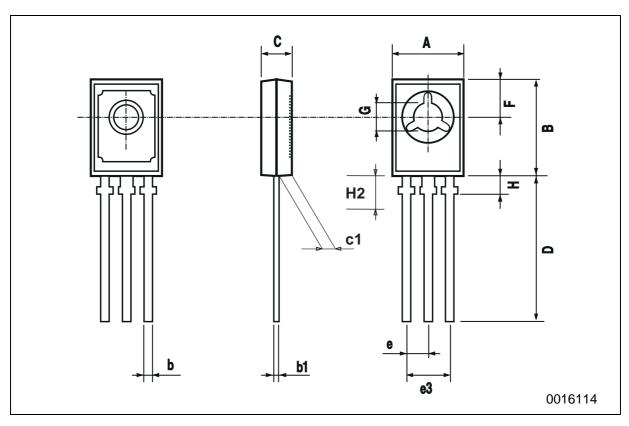
Freewheel Diode Forward Voltage (PNP type)



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SOT-32 (TO-126) MECHANICAL DATA

| DIM. | mm | | | inch | | | |
|------|------|------|------|-------|-------|-------|--|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. | |
| А | 7.4 | | 7.8 | 0.291 | | 0.307 | |
| В | 10.5 | | 10.8 | 0.413 | | 0.445 | |
| b | 0.7 | | 0.9 | 0.028 | | 0.035 | |
| b1 | 0.49 | | 0.75 | 0.019 | | 0.030 | |
| С | 2.4 | | 2.7 | 0.040 | | 0.106 | |
| с1 | 1.0 | | 1.3 | 0.039 | | 0.050 | |
| D | 15.4 | | 16.0 | 0.606 | | 0.629 | |
| е | | 2.2 | | | 0.087 | | |
| e3 | 4.15 | | 4.65 | 0.163 | | 0.183 | |
| F | | 3.8 | | | 0.150 | | |
| G | 3 | | 3.2 | 0.118 | | 0.126 | |
| Н | | | 2.54 | | | 0.100 | |



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