

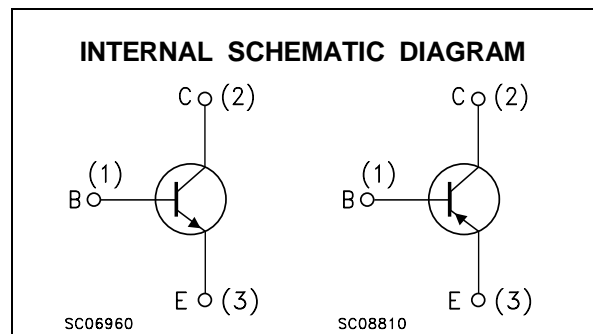
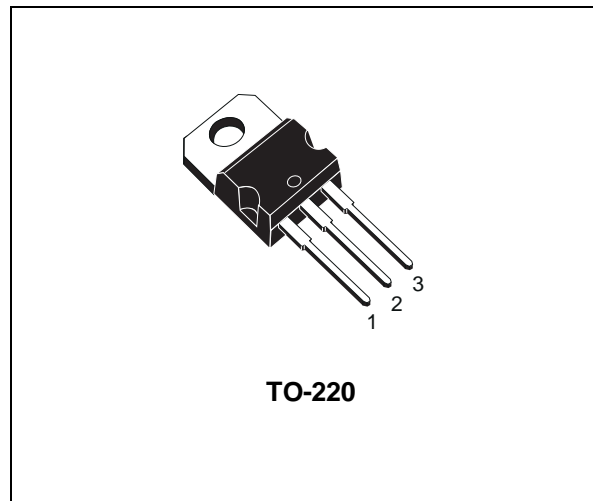
COMPLEMENTARY SILICON POWER TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES

DESCRIPTION

The BD909 and BD911 are silicon Epitaxial-Base NPN power transistors mounted in Jedec TO-220 plastic package. They are intended for use in power linear and switching applications.

The complementary PNP types are BD910 and BD912 respectively.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | Unit | |
|------------|--|-------|------------|------|------------------|
| | | NPN | BD909 | | BD911 |
| | | PNP | BD910 | | BD912 |
| 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_E, I_C | Collector Current | | 15 | | A |
| I_B | Base Current | | 5 | | A |
| P_{tot} | Total Dissipation at $T_c \leq 25^\circ\text{C}$ | | 90 | | W |
| T_{stg} | Storage Temperature | | -65 to 150 | | $^\circ\text{C}$ |
| T_j | Max. Operating Junction Temperature | | 150 | | $^\circ\text{C}$ |

For PNP types voltage and current values are negative.

BD909 / BD910 / BD911 / BD912

THERMAL DATA

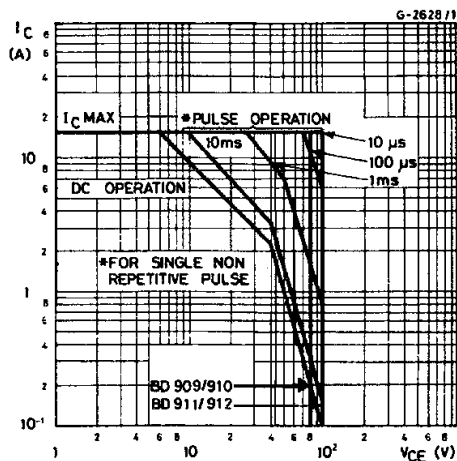
| | | | | |
|-----------------------|----------------------------------|-----|-----|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 1.4 | °C/W |
|-----------------------|----------------------------------|-----|-----|------|

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

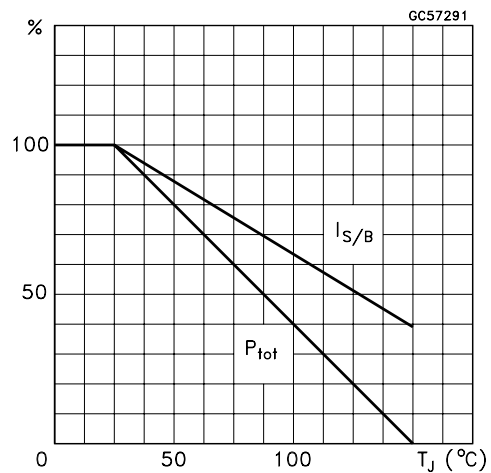
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------|---|--|---------------|------|----------------------|----------------------|
| I _{CBO} | Collector Cut-off Current (I _E = 0) | for BD909/910 V _{CB} = 80 V for BD911/912 V _{CB} = 100 V T _{case} = 150 °C for BD909/910 V _{CB} = 80 V for BD911/912 V _{CB} = 100 V | | | 500 500 5 5 | μA μA mA mA |
| I _{CEO} | Collector Cut-off Current (I _B = 0) | for BD909/910 V _{CE} = 40 V for BD911/912 V _{CE} = 50 V | | | 1 1 | mA 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 = 100 mA for BD909/910 for BD911/912 | 80 100 | | | V V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 5 A I _B = 0.5 A I _C = 10 A I _B = 2.5 A | | | 1 3 | V V |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | I _C = 10 A I _B = 2.5 A | | | 2.5 | V |
| V _{BE*} | Base-Emitter Voltage | I _C = 5 A V _{CE} = 4 V | | | 1.5 | V |
| h _{FE*} | DC Current Gain | I _C = 0.5 A V _{CE} = 4 V I _C = 5 A V _{CE} = 4 V I _C = 10 A V _{CE} = 4 V | 40 15 5 | | 250 150 | |
| f _T | Transition frequency | I _C = 0.5 A V _{CE} = 4 V | 3 | | | MHz |

* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %
For PNP types voltage and current values are negative.

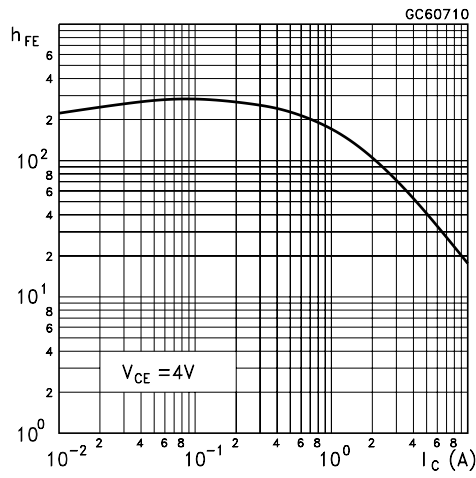
Safe Operating Area



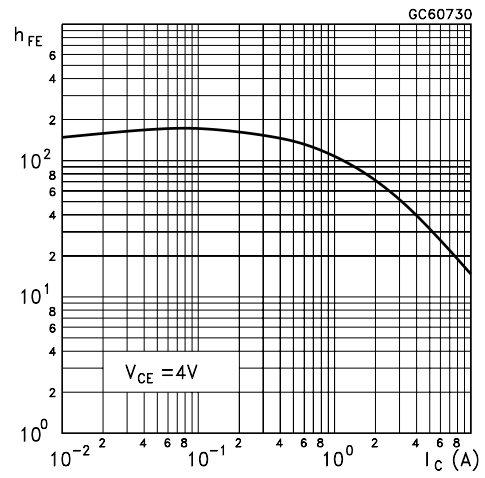
Derating Curves



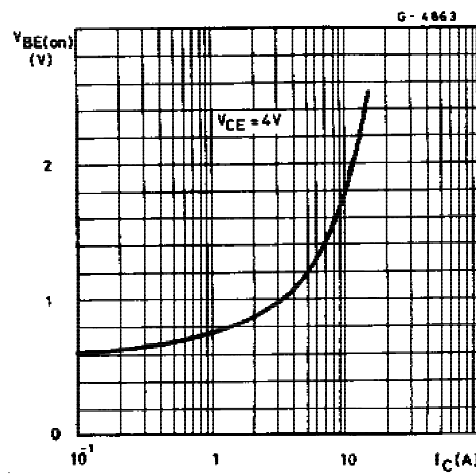
DC Current Gain (NPN type)



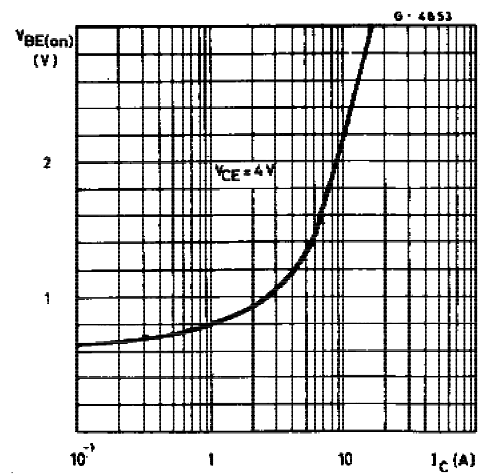
DC Current Gain (PNP type)



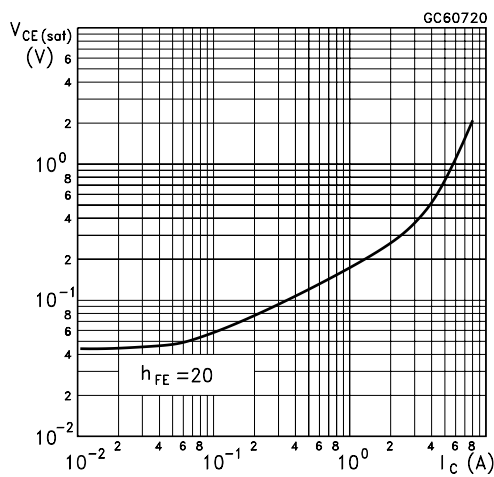
DC Transconductance (NPN type)



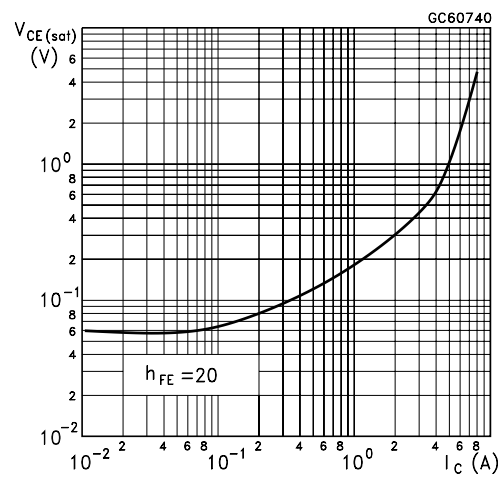
DC Transconductance (PNP type)



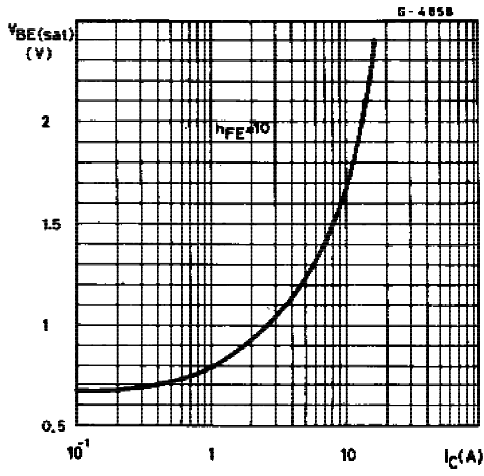
Collector-Emitter Saturation Voltage (NPN type)



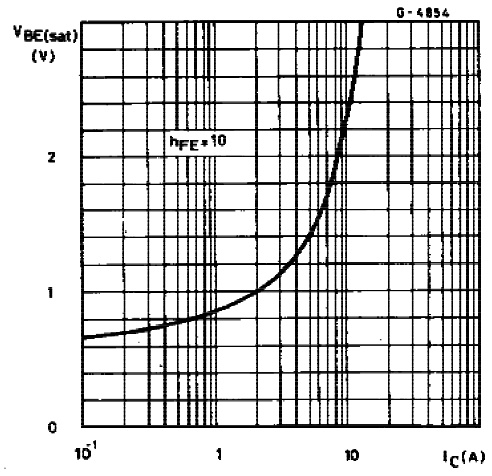
Collector-Emitter Saturation Voltage (PNP type)



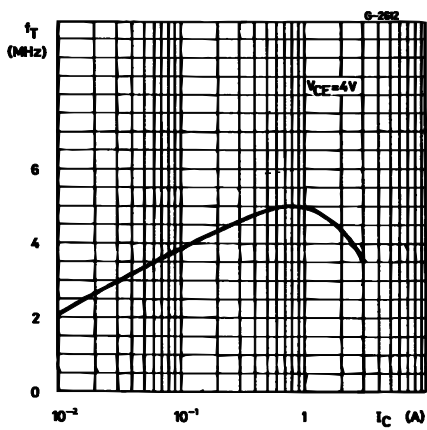
Base-Emitter Saturation Voltage (NPN type)



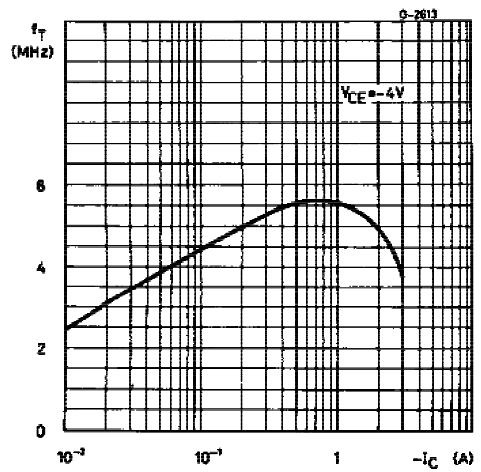
Base-Emitter Saturation Voltage (PNP type)



Transition Frequency (NPN type)

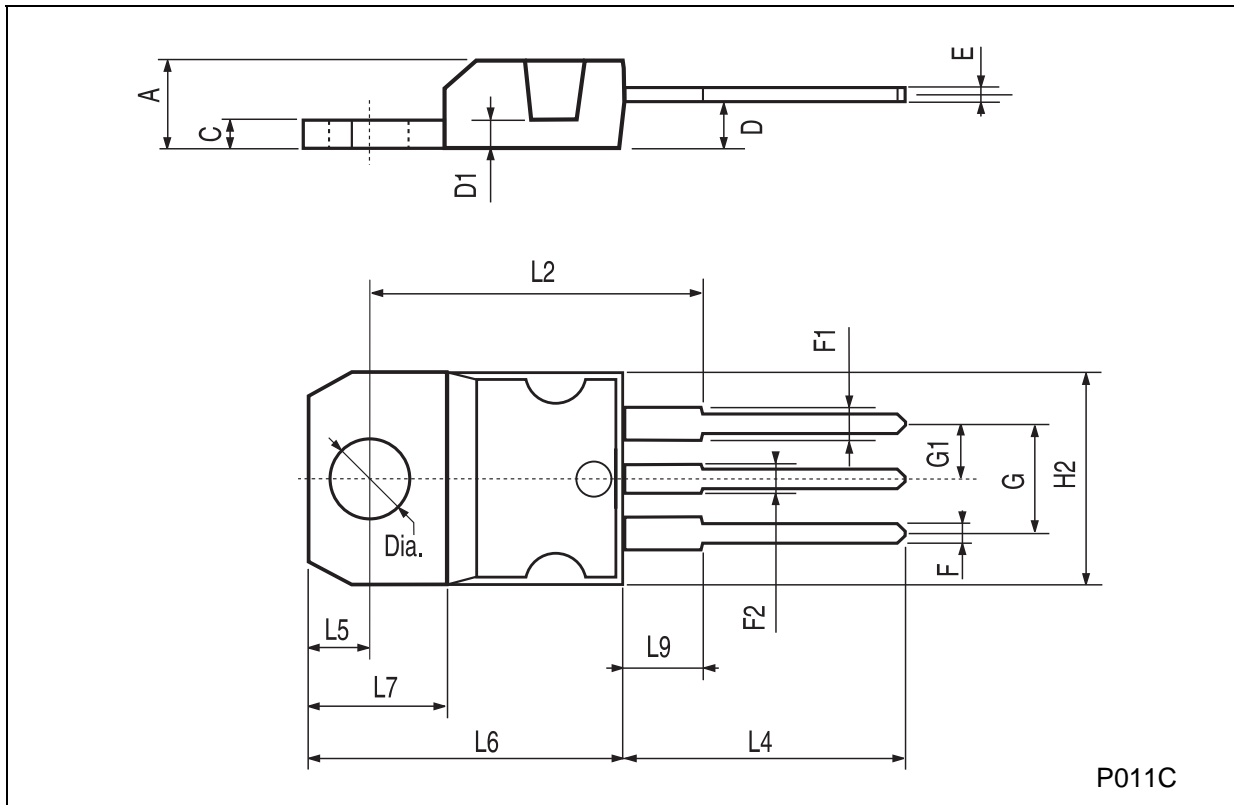


Transition Frequency (PNP type)



TO-220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| C | 1.23 | | 1.32 | 0.048 | | 0.051 |
| D | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D1 | | 1.27 | | | 0.050 | |
| E | 0.49 | | 0.70 | 0.019 | | 0.027 |
| F | 0.61 | | 0.88 | 0.024 | | 0.034 |
| F1 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| F2 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| G | 4.95 | | 5.15 | 0.194 | | 0.203 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H2 | 10.0 | | 10.40 | 0.393 | | 0.409 |
| L2 | | 16.4 | | | 0.645 | |
| L4 | 13.0 | | 14.0 | 0.511 | | 0.551 |
| L5 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| L6 | 15.25 | | 15.75 | 0.600 | | 0.620 |
| L7 | 6.2 | | 6.6 | 0.244 | | 0.260 |
| L9 | 3.5 | | 3.93 | 0.137 | | 0.154 |
| DIA. | 3.75 | | 3.85 | 0.147 | | 0.151 |



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