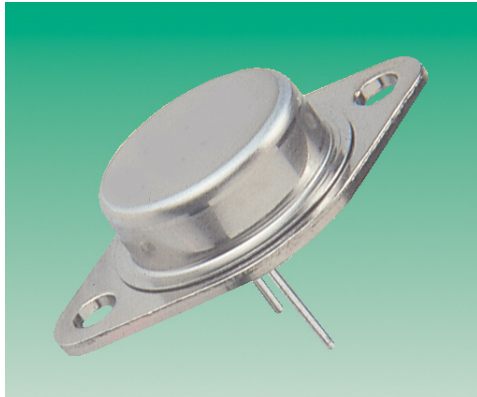


2N5880 & 2N5882



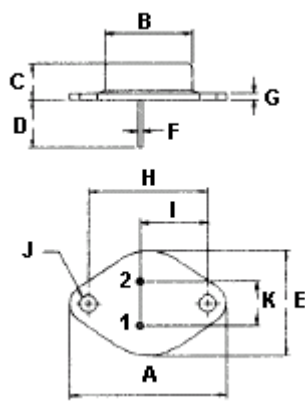
Complementary Power Transistors



General-purpose power amplifier and switching applications.

Features:

- Low Collector-Emitter Saturation Voltage
 $V_{CE(sat)} = 1.0V$ (Maximum) at $I_C = 7.0A$
- Excellent DC current Gain
 $h_{FE} = 20 - 100$ at $I_C = 6.0A$



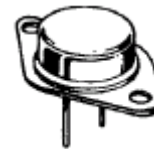
Pin 1. Base
2. Emitter
Collector(Case)

| Dimensions | Minimum | Maximum |
|------------|---------|---------|
| A | 38.75 | 39.96 |
| B | 19.28 | 22.23 |
| C | 7.96 | 9.28 |
| D | 11.18 | 12.19 |
| E | 25.20 | 26.67 |
| F | 0.92 | 1.09 |
| G | 1.38 | 1.62 |
| H | 29.90 | 30.40 |
| I | 16.64 | 17.30 |
| J | 3.88 | 4.36 |
| K | 10.67 | 11.18 |

Dimensions : Millimetres

| PNP | NPN |
|--------|--------|
| 2N5880 | 2N5882 |

15 Ampere
Complementary
Silicon Power
Transistors
80 Volts
160 Watts



TO-3

Maximum Ratings

| Characteristic | Symbol | Rating | Unit |
|--|-------------------|--------------|--------------------|
| Collector-Emitter Voltage | V_{CEO} | 80 | V |
| Collector-Base Voltage | V_{CBO} | | |
| Emitter-Base Voltage | V_{EBO} | 5.0 | |
| Collector Current-Continuous -Peak | I_C I_{CM} | 15 30 | A |
| Base Current | I_B | 5.0 | |
| Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$ | P_D | 160 0.915 | W W/ $^\circ C$ |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | -65 to +200 | $^\circ C$ |

Thermal Characteristics

| Characteristic | Symbol | Maximum | Unit |
|-------------------------------------|-----------------|---------|--------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 1.1 | $^\circ C/W$ |

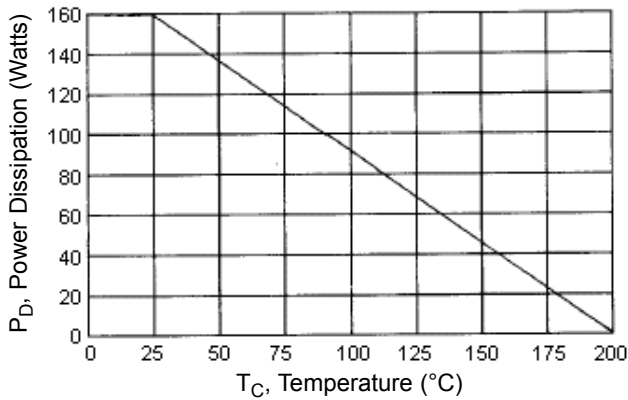


2N5880 & 2N5882



Complementary Power Transistors

Figure-1 Power Derating



Electrical Characteristics ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Minimum | Maximum | Unit |
|---|---------------|-----------------|------------|------|
| OFF Characteristics | | | | |
| Collector-Emitter Sustaining Voltage (1) ($I_C = 200\text{mA}$, $I_B = 0$) | $V_{CE(sus)}$ | 80 | - | V |
| Collector Cut off Current ($V_{CE} = 40\text{V}$, $I_B = 0$) | I_{CEO} | - | 1.0 | mA |
| Collector Cut off Current ($V_{CE} = 80\text{V}$, $V_{BE(off)} = 1.5\text{V}$) ($V_{CE} = 80\text{V}$, $V_{BE(off)} = 1.5\text{V}$, $T_C = 150^\circ\text{C}$) | I_{CEX} | - | 0.5 5.0 | |
| Collector Cut off Current ($V_{CB} = 80\text{V}$, $I_E = 0$) | I_{CBO} | - | 0.5 | |
| Emitter Cut off Current ($V_{EB} = 5.0\text{V}$, $I_C = 0$) | I_{EBO} | - | 1.0 | |
| ON Characteristics (1) | | | | |
| DC Current Gain ($I_C = 2.0\text{A}$, $V_{CE} = 4.0\text{V}$) ($I_C = 6.0\text{A}$, $V_{CE} = 4.0\text{V}$) ($I_C = 15\text{A}$, $V_{CE} = 4.0\text{V}$) | h_{FE} | 35 20 4.0 | 100 | - |
| Collector-Emitter Saturation Voltage ($I_C = 7.0\text{A}$, $I_B = 0.7\text{A}$) ($I_C = 15\text{A}$, $I_B = 3.75\text{A}$) | $V_{CE(sat)}$ | - | 1.0 4.0 | V |
| Base-Emitter On Voltage ($I_C = 6.0\text{A}$, $V_{CE} = 4.0\text{V}$) | $V_{BE(on)}$ | - | 1.5 | |
| Base-Emitter Saturation Voltage ($I_C = 15\text{A}$, $I_B = 3.75\text{A}$) | $V_{BE(sat)}$ | - | 2.5 | |
| Dynamic Characteristics | | | | |
| Current Gain-Bandwidth Product (2) ($I_C = 1.0\text{A}$, $V_{CE} = 10\text{V}$, $f = 1.0\text{MHz}$) | f_T | 4.0 | - | MHz |
| Small-Signal Current Gain ($I_C = 2.0\text{A}$, $V_{CE} = 4.0\text{V}$, $f = 1.0\text{KHz}$) | h_{fe} | 20 | - | - |

(1) Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

(2) $f_T = |h_{fe}| \cdot f_{test}$



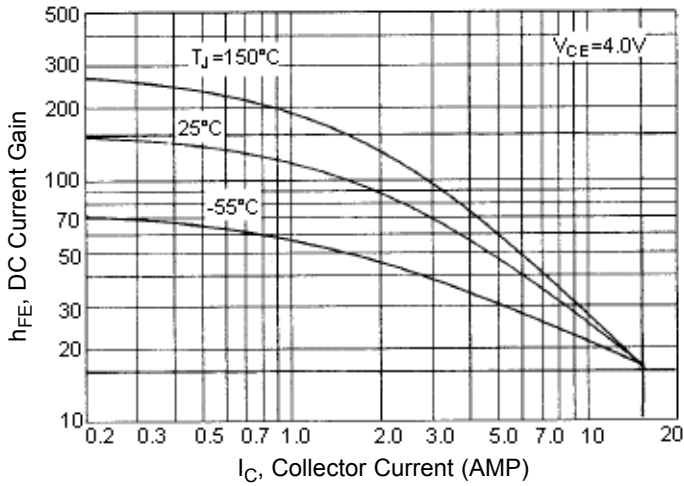
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Complementary Power Transistors



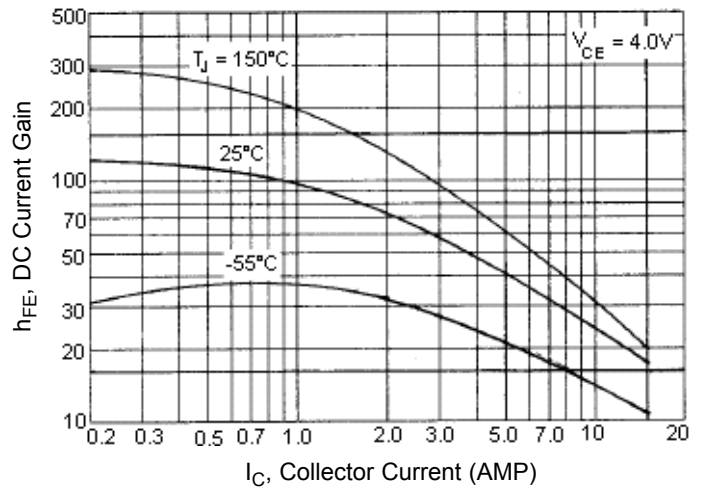
PNP 2N5880

DC Current Gain

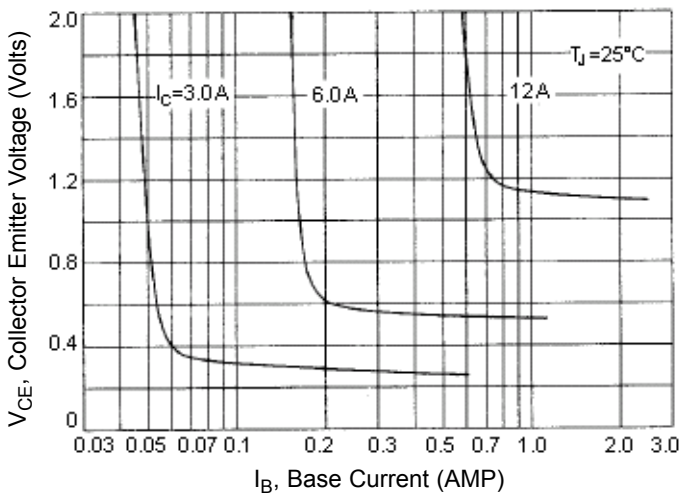


NPN 2N5882

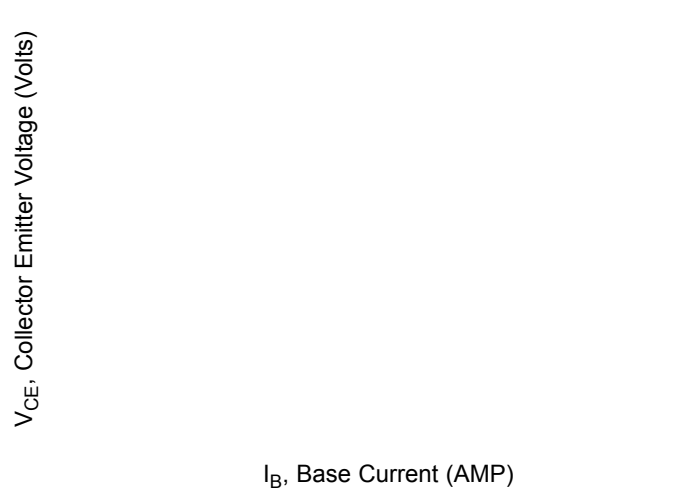
DC Current Gain



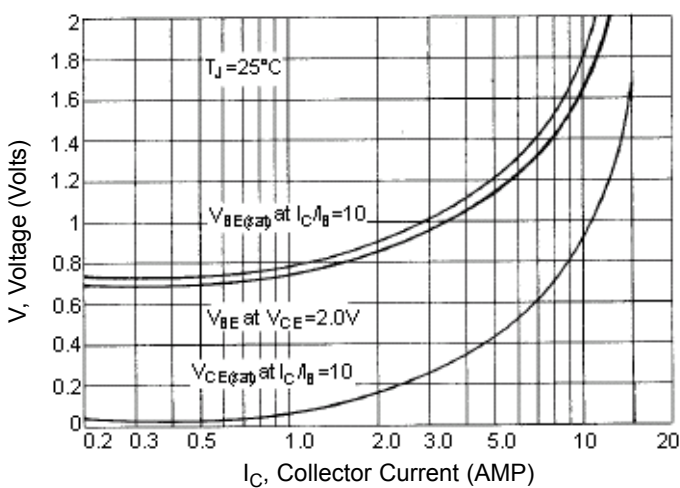
Collector Saturation Region



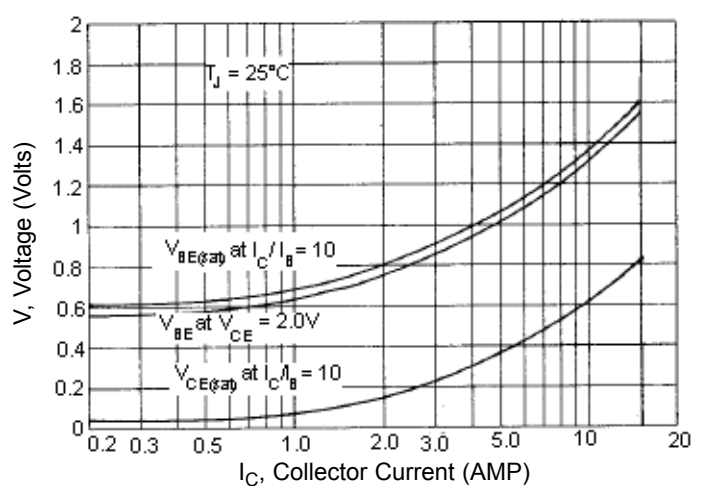
Collector Saturation Region



"ON" Voltages



"ON" Voltages

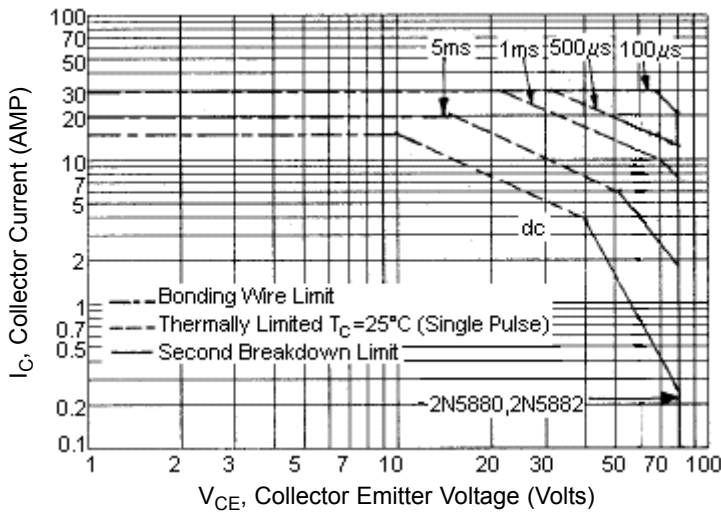


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Complementary Power Transistors

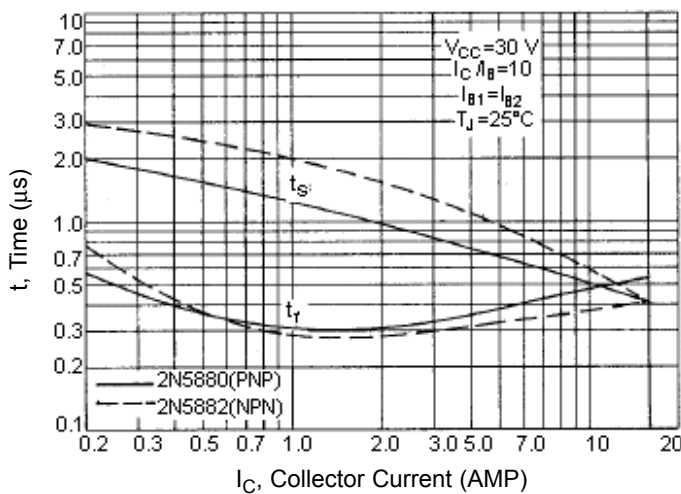
Active-Region Safe Operating Area (SOA)



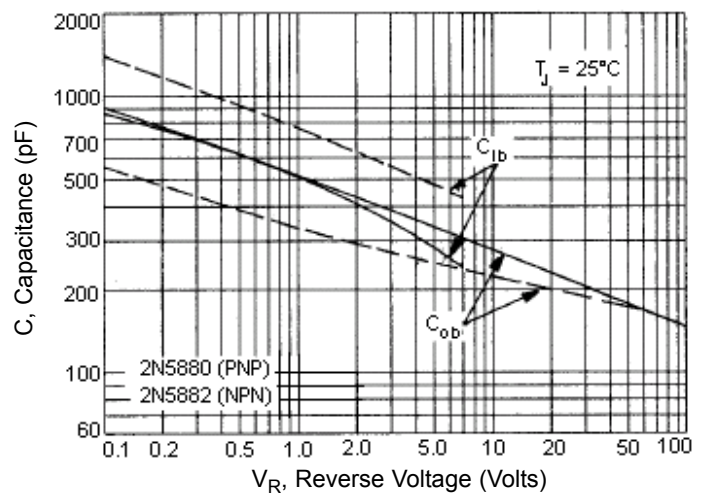
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of SOA curve is based on $T_{J(PK)} = 200^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 200^\circ\text{C}$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

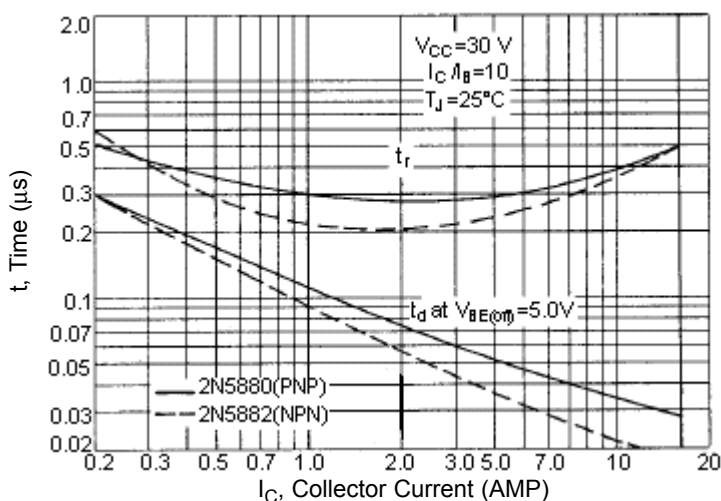
Turn-Off Time



Capacitances



Turn-On Time



2N5880 & 2N5882



Complementary Power Transistors

Specifications

| $I_{C(av)}$ maximum (A) | V_{CEO} maximum (V) | h_{FE} minimum at $I_C = 6A$ | P_{tot} at 25°C (W) | Package | Type | Part Number |
|-------------------------------|-----------------------------|--------------------------------------|-----------------------------|---------|------|-------------|
| 15 | 80 | 20 | 160 | TO-3 | NPN | 2N5882 |
| | | | | | PNP | 2N5880 |

2N5880 & 2N5882



Complementary Power Transistors

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