## HIGH-POWER PNP SILICON TRANSISTORS

... designed for use in industrial power amplifiers and switching circuit applications.

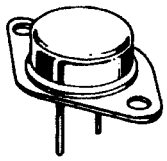
FEATURES:

* High DC Current Gain
  hFE=20-80 @ $I_C$ =10A
  =12 (Min)@$I_C$=25A
* Low Collector-Emitter Saturation Voltage
  $V_{CE(SAT)}$ = 1.0V (Max.) @ $I_C$ = 10 A, $I_B$ = 1.0A
* Complement to 2N6338 thru 2N6340

**Boca Semiconductor Corp**
**BSC**
**http://www.bocasemi.com**

**PNP**
**2N6436**
**2N6437**
**2N6438**

25 AMPERE
POWER TRANSISTOR
PNP SILICON
80-120 VOLTS
200 WATTS



**TO-3**

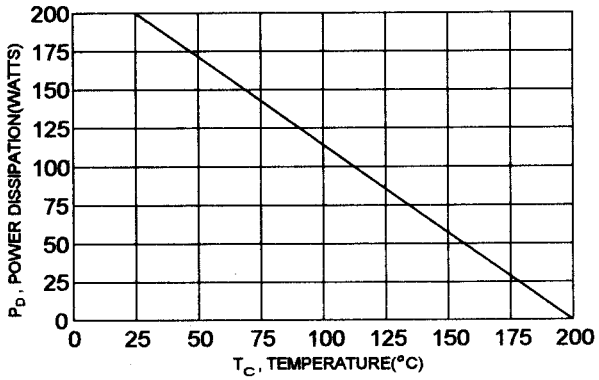
### MAXIMUM RATINGS

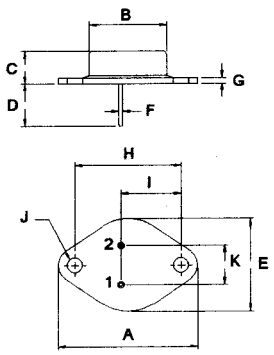
| Characteristic | Symbol | 2N6436 | 2N6437 | 2N6438 | Unit |
|---|---|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 80 | 100 | 120 | V |
| Collector-Base Voltage | $V_{CBO}$ | 100 | 120 | 140 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 6.0 | | | V |
| Collector Current-Continuous<br>-Peak | $I_C$ | 25<br>50 | | | A |
| Base Current | $I_B$ | 10 | | | A |
| Total Power Dissipation @$T_C$=25°C<br>Derate above 25°C | $P_D$ | 200<br>1.14 | | | W<br>W/°C |
| Operating and Storage Junction Temperature Range | $T_J$ , $T_{STG}$ | -65 to +200 | | | °C |

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance Junction to Case | Rθjc | 0.875 | °C/W |

FIGURE -1 POWER DERATING




PIN 1.BASE
2.EMITTER
COLLECTOR (CASE)

| DIM | MILLIMETERS | |
|---|---|---|
| | MIN | MAX |
| 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 |

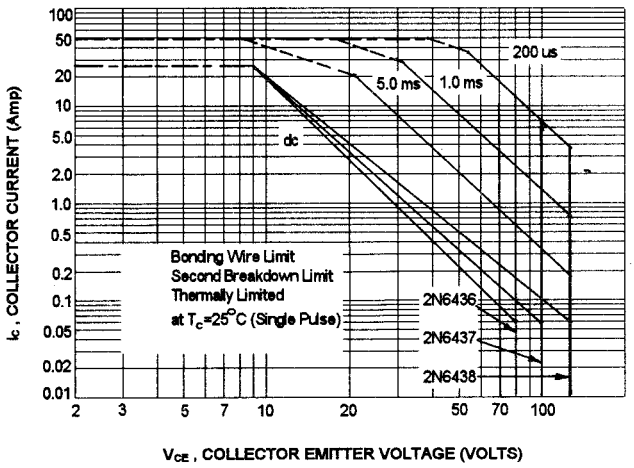
## ELECTRICAL CHARACTERISTICS ( $T_C$ = 25°C unless otherwise noted )

| Characteristic | | Symbol | Min | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector -Emitter Sustaining Voltage (1)<br>( $I_C$ =50 mA, $I_B$= 0 ) | 2N6436<br>2N6437<br>2N6438 | $V_{CEO(sus)}$ | <br>80<br>100<br>120 | | V |
| Collector Cutoff Current<br>( $V_{CE}$= 40 V, $I_B$= 0 )<br>( $V_{CE}$= 50 V, $I_B$= 0 )<br>( $V_{CE}$= 60 V, $I_B$= 0 ) | <br>2N6436<br>2N6437<br>2N6438 | $I_{CEO}$ | | <br>50<br>50<br>50 | uA |
| Collector Cutoff Current<br>($V_{CB}$= Rated $V_{CB}$, $I_E$= 0 ) | | $I_{CBO}$ | | <br>10 | uA |
| Emitter Cutoff Current<br>($V_{EB}$= 6.0 V, $I_C$= 0 ) | | $I_{EBO}$ | | <br>100 | uA |
| **ON CHARACTERISTICS** (1) | | | | | |
| DC Current Gain<br>( $I_C$= 0.5 A, $V_{CE}$= 2.0V )<br>( $I_C$= 10 A, $V_{CE}$= 2.0V )<br>( Ic= 25 A, $V_{CE}$= 2.0V ) | | hFE | <br>30<br>20<br>12 | <br><br>80 | |
| Collector-Emitter Saturation Voltage<br>( $I_C$ =10 A, $I_B$=1.0A )<br>( $I_C$= 25 A, $I_B$= 2.5A ) | | $V_{CE(sat)}$ | | <br>1.0<br>1.8 | V |
| Base-Emitter Saturation Voltage<br>($I_C$= 10 A, $I_B$= 1.0A )<br>($I_C$= 25 A, $I_B$= 2.5A ) | | $V_{BE(sat)}$ | | <br>1.8<br>2.5 | V |
| **DYNAMIC CHARATERISTICS** | | | | | |
| Current-Gain Bandwidth Product (2)<br>($I_C$= 1.0 A,$V_{CE}$= 10 V, f= 10MHz ) | | $f_T$ | <br>40 | | MHz |
| Output Capacitance<br>($V_{CB}$= 10 V, $I_E$= 0, f= 0.1MHz ) | | $C_{ob}$ | | <br>700 | pF |
| **SWITCHING CHARACTERISTICS** | | | | | |
| Rise Time | $V_{CC}$= 80 V, $I_C$= 10 A<br>$I_{B1}$= -$I_{B2}$= 1.0 A,<br>$V_{BE(off)}$= 6.0 V | $t_r$ | | 0.3 | us |
| Storage Time | | $t_s$ | | 2.0 | us |
| Fall Time | | $t_f$ | | 0.4 | us |

(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≦ 2.0%

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

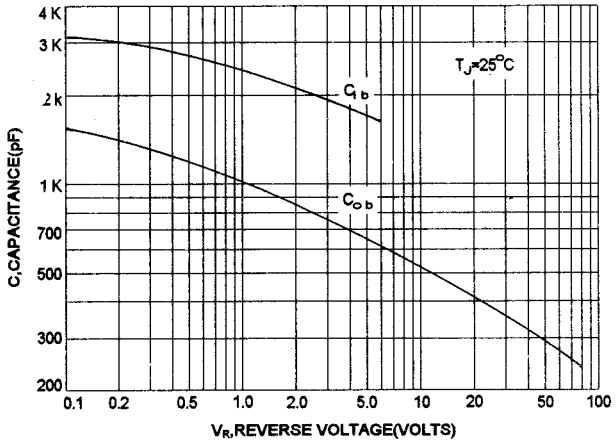
## ACTIVE-REGION SAFE OPERATING AREA (SOA)



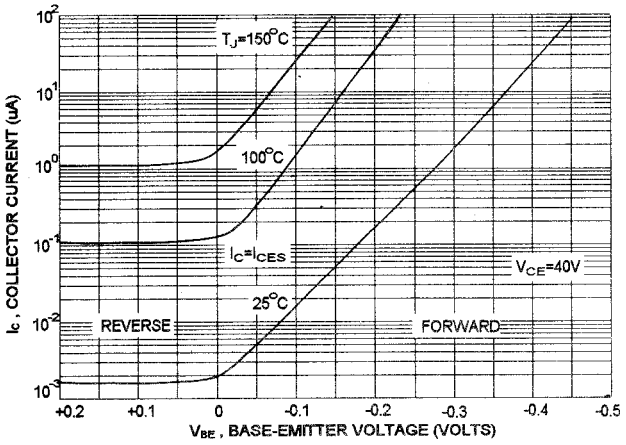

There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate $I_C$-$V_{CE}$ limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

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

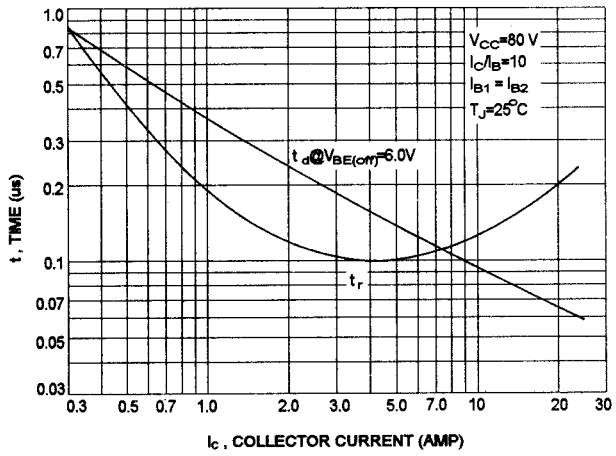
## CAPACITANCES



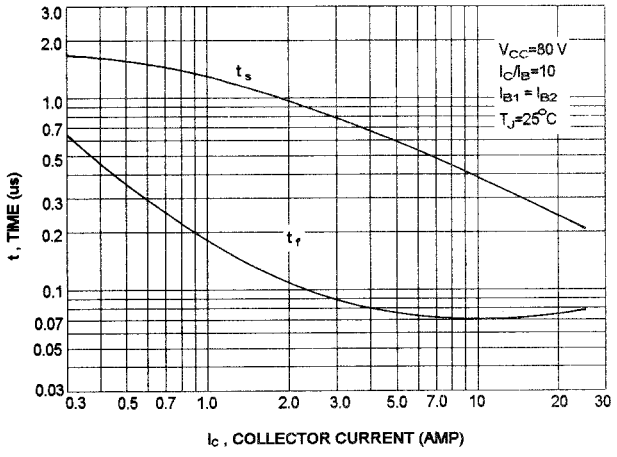

## COLLECTOR CUT-OFF REGION



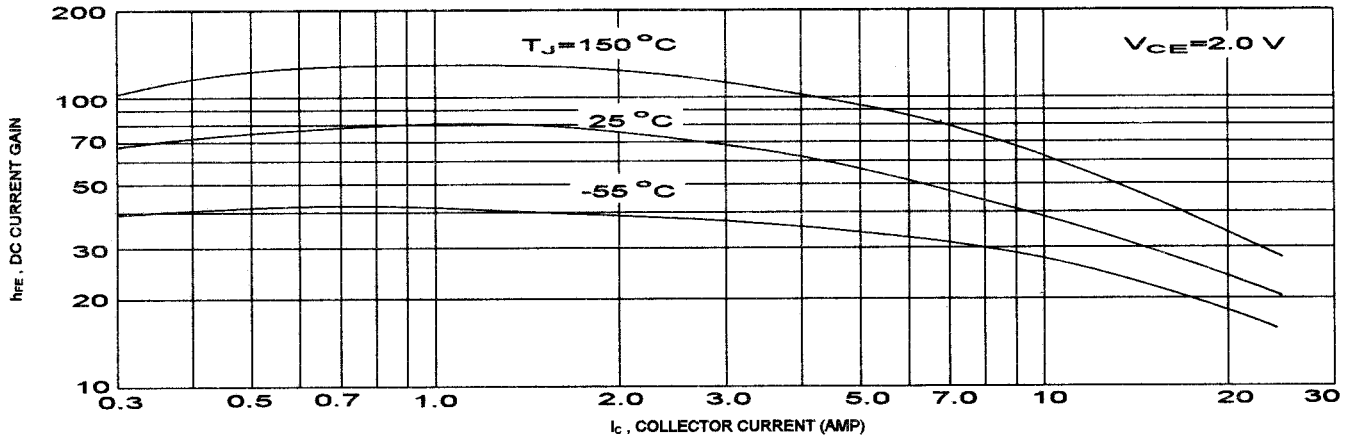

## TURN-ON TIME



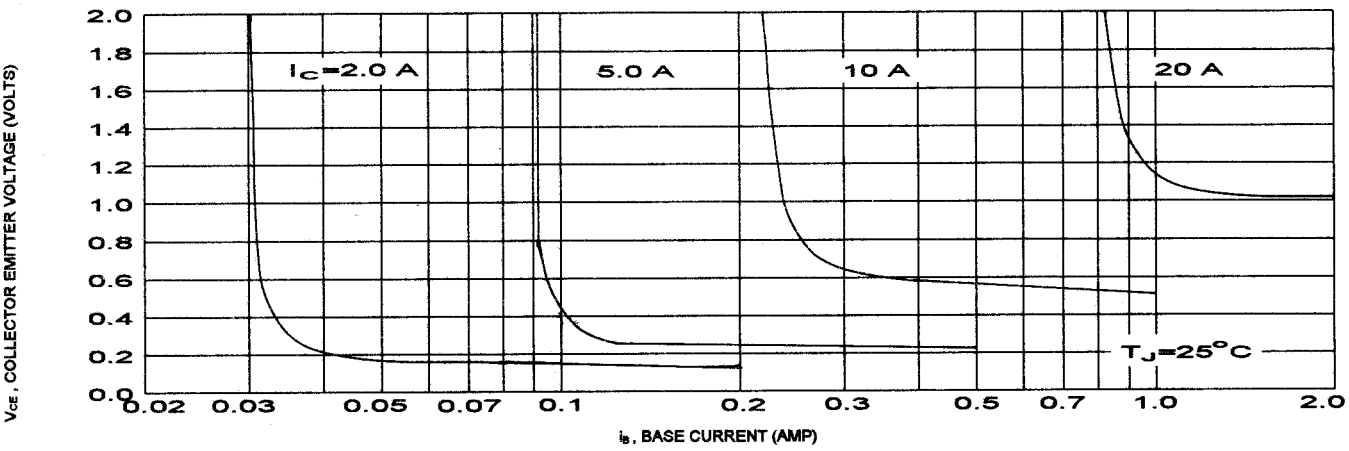

## TURN-OFF TIME



DC CURRENT GAIN




COLLECTOR SATURATION REGION




"ON"VOLTAGES