

## NPN SILICON POWER TRANSISTORS

...designed for use in power amplifier and switching circuits .

### FEATURES:

\*Collector-Emitter Sustaining Voltage-

$$V_{CEO(sus)} = 100 \text{ V (Min)}$$

\* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 1.0 \text{ V (Max.) @ } I_C = 3.0 \text{ A, } I_B = 0.3 \text{ A}$$

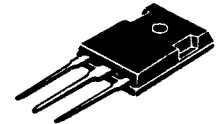
\* Switching Time -  $t_f = 1.0 \text{ us (Max.) @ } I_C = 3.0 \text{ A}$

**NPN  
2SC2908**

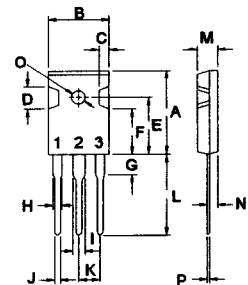
**5.0 AMPERE  
SILICON POWER  
TRANSISTORS  
100 VOLTS  
50 WATTS**

### MAXIMUM RATINGS

| Characteristic  | Symbol         | 2SC2908     | Unit                     |
|---|----------------|-------------|--------------------------|
| Collector-Emitter Voltage   | $V_{CEO}$      | 100         | V                        |
| Collector-Base Voltage  | $V_{CBO}$      | 200         | V                        |
| Emitter-Base Voltage  | $V_{EBO}$      | 12          | V                        |
| Collector Current - Continuous  | $I_C$          | 5.0         | A                        |
| - Peak  | $I_{CM}$       | 10          |                          |
| Base current  | $I_B$          | 2.5         | A                        |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 50<br>0.4   | W<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                   | $T_J, T_{STG}$ | -55 to +150 | $^\circ\text{C}$         |



**TO-247(3P)**



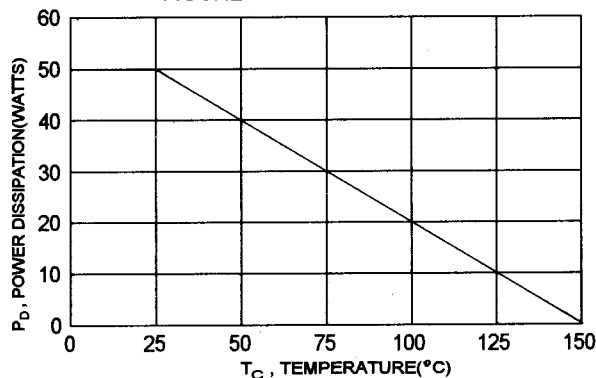
**PIN 1.BASE  
2.COLLECTOR  
3.EMITTER**

### THERMAL CHARACTERISTICS

| Characteristic                      | Symbol          | Max | Unit               |
|-------------------------------------|-----------------|-----|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 2.5 | $^\circ\text{C/W}$ |

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | 20.63       | 22.38 |
| B   | 15.38       | 16.20 |
| C   | 1.90        | 2.70  |
| D   | 5.10        | 6.10  |
| E   | 14.81       | 15.22 |
| F   | 11.72       | 12.84 |
| G   | 4.20        | 4.50  |
| H   | 1.82        | 2.46  |
| I   | 2.92        | 3.23  |
| J   | 0.89        | 1.53  |
| K   | 5.26        | 5.66  |
| L   | 18.50       | 21.50 |
| M   | 4.68        | 5.36  |
| N   | 2.40        | 2.80  |
| O   | 3.25        | 3.65  |
| P   | 0.55        | 0.70  |

**FIGURE -1 POWER DERATING**



ELECTRICAL CHARACTERISTICS (  $T_c = 25^\circ\text{C}$  unless otherwise noted )

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

## OFF CHARACTERISTICS

|   |                |     |    |               |
|---|----------------|-----|----|---------------|
| Collector-Emitter Sustaining Voltage<br>( $I_C = 3.0\text{A}$ , $I_{B1} = 0.3\text{A}$ , $L = 1.0\text{mH}$ ) | $V_{CEO(SUS)}$ | 100 |    | V             |
| Collector Cutoff Current<br>( $V_{CE} = 100\text{V}$ , $V_{BE(OFF)} = -1.5\text{V}$ )                         | $I_{CEX}$      |     | 10 | $\mu\text{A}$ |
| Collector Cutoff Current<br>( $V_{CB} = 100\text{V}$ , $I_E = 0$ )  | $I_{CBO}$      |     | 10 | $\mu\text{A}$ |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{V}$ , $I_C = 0$ )  | $I_{EBO}$      |     | 10 | $\mu\text{A}$ |

## ON CHARACTERISTICS (1)

|   |                         |          |     |   |
|---|-------------------------|----------|-----|---|
| DC Current Gain<br>( $I_C = 0.3\text{A}$ , $V_{CE} = 5.0\text{V}$ ) *<br>( $I_C = 3.0\text{A}$ , $V_{CE} = 5.0\text{V}$ ) | $h_{FE(2)}$<br>$h_{FE}$ | 60<br>40 | 320 |   |
| Collector-Emitter Saturation Voltage<br>( $I_C = 3.0\text{A}$ , $I_B = 300\text{mA}$ )                                    | $V_{CE(sat)}$           |          | 1.0 | V |
| Base-Emitter Saturation Voltage<br>( $I_C = 3.0\text{A}$ , $I_B = 300\text{mA}$ )   | $V_{BE(sat)}$           |          | 1.5 | V |

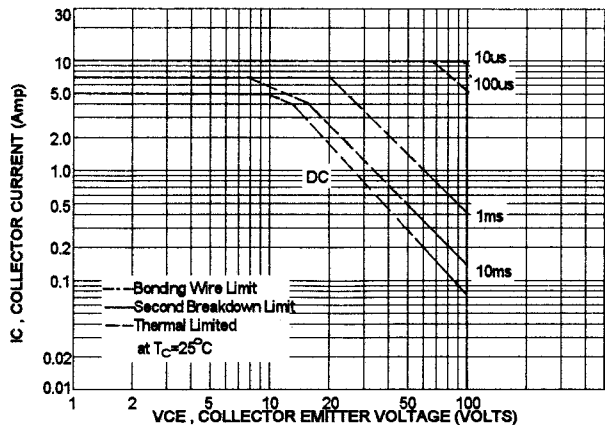
## SWITCHING CHARACTERISTICS

|              |  |          |     |               |
|--------------|--|----------|-----|---------------|
| Turn-on Time | $V_{CC} = 30\text{V}$ , $I_C = 3.0\text{A}$<br>$I_{B1} = -I_{B2} = 300\text{mA}$<br>$R_L = 10\text{ohm}$ | $t_{on}$ | 0.5 | $\mu\text{s}$ |
| Storage Time |  | $t_s$    | 2.0 | $\mu\text{s}$ |
| Fall Time    |  | $t_f$    | 1.0 | $\mu\text{s}$ |

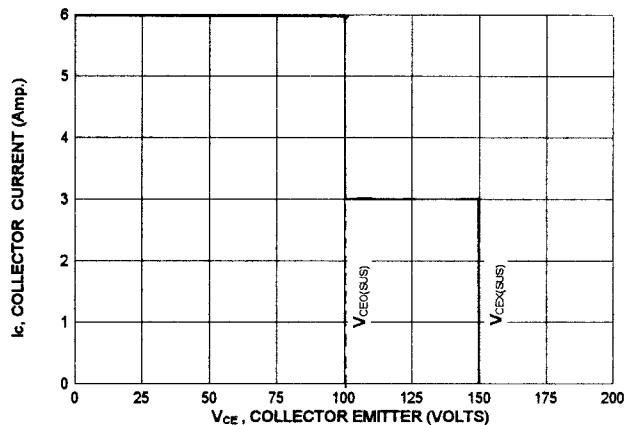
(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ \*  $h_{FE(2)}$  Classification :

|    |   |     |     |   |     |     |   |     |
|----|---|-----|-----|---|-----|-----|---|-----|
| 60 | M | 120 | 100 | L | 200 | 160 | K | 320 |
|----|---|-----|-----|---|-----|-----|---|-----|

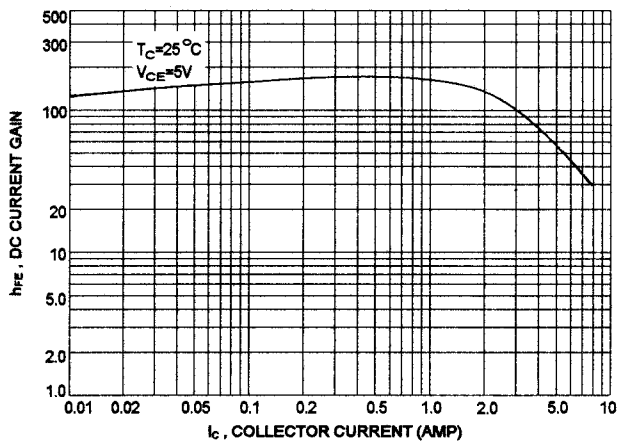
SAFE OPERATING AREA



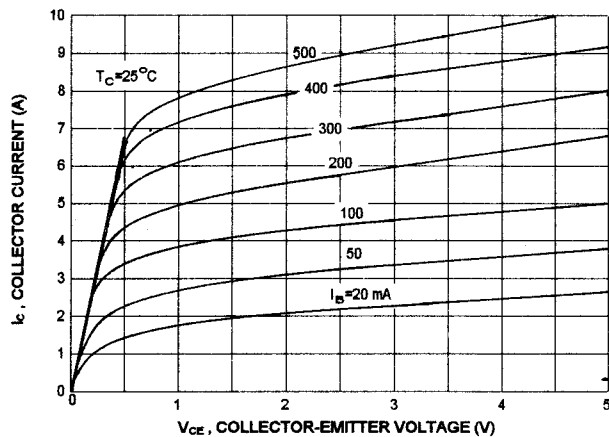
REVERSE BIASE SAFE OPERATING AREA



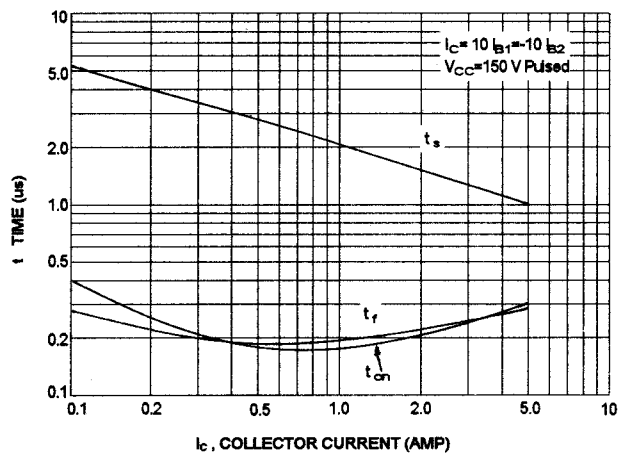
DC CURRENT GAIN



$I_C - V_{CE}$



SWITCHING TIME



"ON" VOLTAGES

