

## HORIZONTAL DEFLECTION TRANSISTORS

...designed for use in large screen color deflection circuits

### FEATURES:

- \* Collector-Emitter Sustaining Voltage

$$V_{CE(sus)} = 500V(\text{Min})$$

- \* Fast Switching Time

$$t_f = 1.0 \mu s @ I_c = 4.0A$$

- \* Glass Passivated Collector-Base Junction

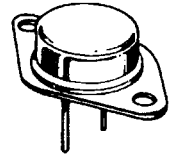
**NPN**

**2SC1358**

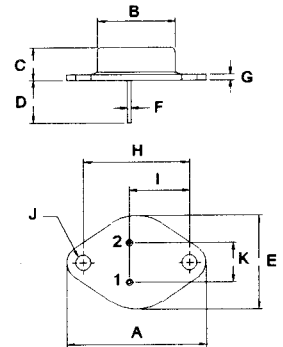
**4.5 AMPERE  
NPN SILICON  
POWER TRANSISTORS  
1400 VOLTS  
50 WATTS**

### MAXIMUM RATINGS

| Characteristic  | Symbol            | 2SC1358     | Unit               |
|---|-------------------|-------------|--------------------|
| Collector-Emitter Voltage   | $V_{CEO}$         | 500         | V                  |
| Collector-Base Voltage  | $V_{CBO}$         | 1400        | V                  |
| Emitter-Base Voltage  | $V_{EBO}$         | 6.0         | V                  |
| Collector Current - Continuous<br>- Peak                                  | $I_c$<br>$I_{CM}$ | 4.5<br>10   | A                  |
| Base current  | $I_B$             | 1.5         | A                  |
| Total Power Dissipation @ $T_c = 25^\circ C$<br>Derate above $25^\circ C$ | $P_D$             | 50<br>0.4   | W<br>W/ $^\circ C$ |
| Operating and Storage Junction<br>Temperature Range                       | $T_J, T_{STG}$    | -65 to +150 | $^\circ C$         |



**TO-3**

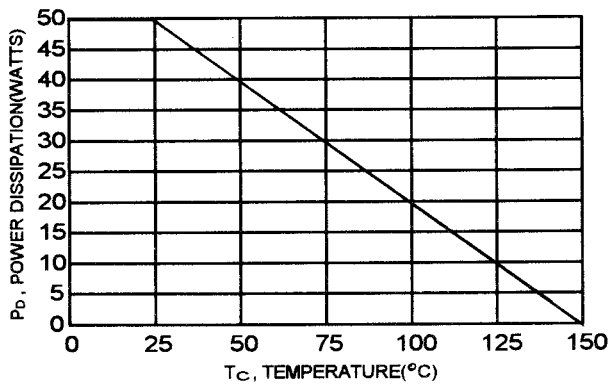


PIN 1.BASE  
2.EMITTER  
COLLECTOR(CASE)

### THERMAL CHARACTERISTICS

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

FIGURE -1 POWER DERATING



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

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

**OFF CHARACTERISTICS**

|  |           |     |     |               |
|--|-----------|-----|-----|---------------|
| Collector-Emitter Voltage<br>( $I_C = 100 \text{ mA}$ , $I_B = 0$ )      | $V_{CE0}$ | 500 |     | V             |
| Collector Cutoff Current<br>( $V_{CE} = 1400 \text{ V}$ , $V_{BE} = 0$ ) | $I_{CES}$ |     | 1.0 | mA            |
| Collector Cutoff Current<br>( $V_{CB} = 1000 \text{ V}$ , $I_E = 0$ )    | $I_{CBO}$ |     | 20  | $\mu\text{A}$ |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0 \text{ V}$ , $I_C = 0$ )       | $I_{EBO}$ |     | 200 | $\mu\text{A}$ |

**ON CHARACTERISTICS (1)**

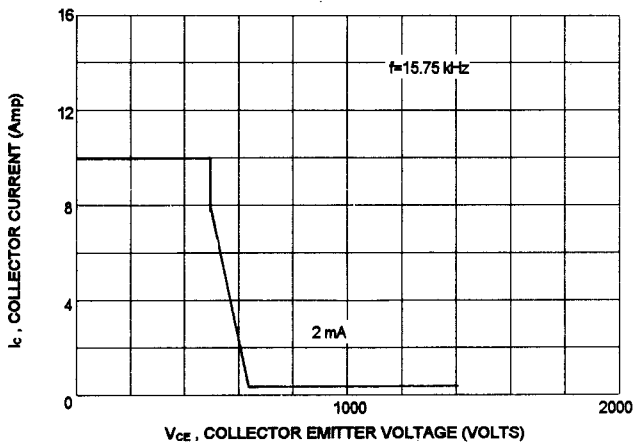
|   |               |           |          |   |
|---|---------------|-----------|----------|---|
| DC Current Gain<br>( $I_C = 0.5 \text{ A}$ , $V_{CE} = 15 \text{ V}$ )<br>( $I_C = 3.0 \text{ A}$ , $V_{CE} = 15 \text{ V}$ ) | $h_{FE}$      | 10<br>5.0 | 45<br>35 |   |
| Collector-Emitter Saturation Voltage<br>( $I_C = 4.0 \text{ A}$ , $I_B = 0.8 \text{ A}$ )                                     | $V_{CE(sat)}$ |           | 10       | V |
| Base-Emitter Saturation Voltage<br>( $I_C = 4.0 \text{ A}$ , $I_B = 0.8 \text{ A}$ )  | $V_{BE(sat)}$ |           | 1.2      | V |

**SWITCHING CHARACTERISTICS**

|              |   |       |     |               |
|--------------|---|-------|-----|---------------|
| Storage Time | $I_C = 4.0 \text{ A}$ , $I_{B1} = -I_{B2} = 1.0 \text{ A}$<br>$PW = 20 \mu\text{s}$ | $t_s$ | 10  | $\mu\text{s}$ |
| Fall Time    |   | $t_f$ | 1.0 | $\mu\text{s}$ |

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

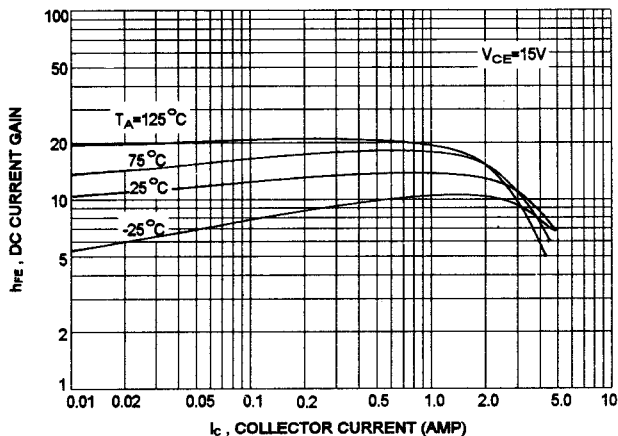
ACTIVE-REGION SAFE OPERATING AREA (SOA)



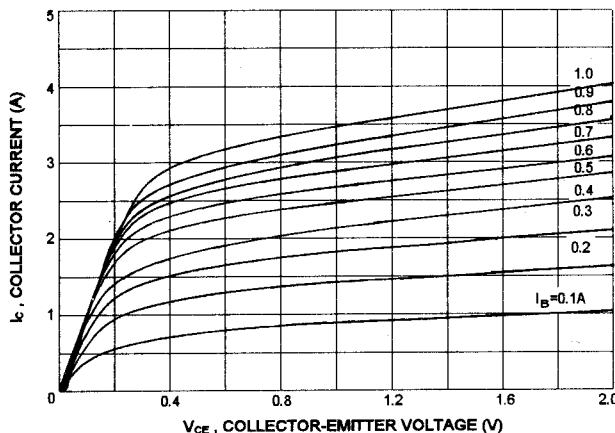
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater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

The data of SOA curve is base on  $T_{J(PK)}=150^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)}\leq 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

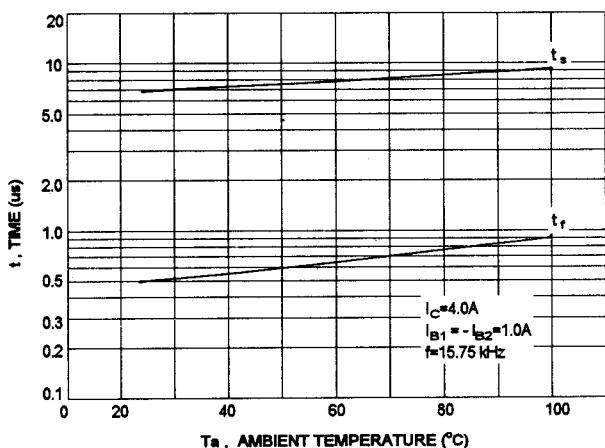
DC CURRENT GAIN



$I_C$  -  $V_{CE}$



SWITCHING TIME- AMBIENT TEMPERATURE



COLLECTOR SATURATION REGION

