

## NPN SILICON MEDIUM POWER TRANSISTORS

- For Power Output Stages and Line Driver in Television Receivers

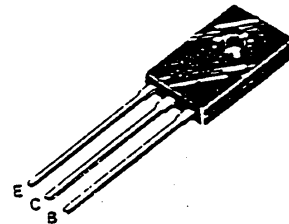
0.5 AMPERES

### NPN SILICON POWER TRANSISTOR

300 VOLTS  
20 WATTS

#### MAXIMUM RATINGS

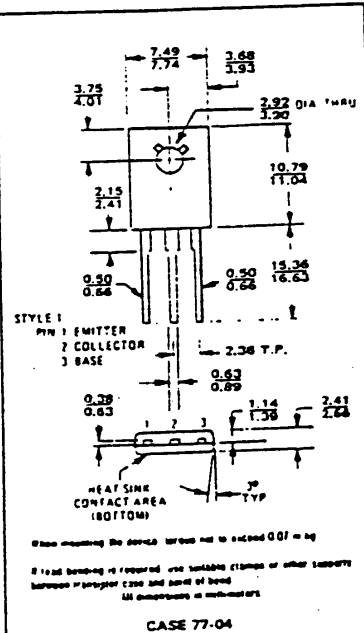
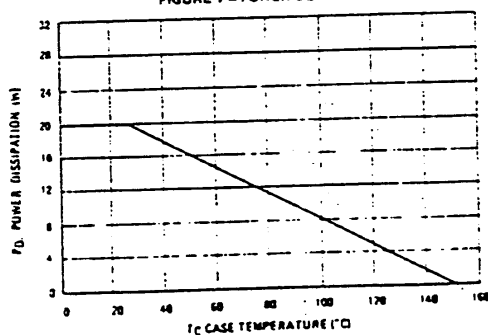
Rating	Symbol	Value	Unit*
Collector-Emitter Voltage	$V_{CE0}$	300	Vdc
Collector-Emitter Voltage	$V_{CES}$	500	Vdc
Emitter-Base Voltage	$V_{EBO}$	5	Vdc
Collector Current - Continuous	$I_C$	0.5	Adc
Base Current	$I_B$	0.25	Adc
Total Device Dissipation @ $T_c = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	20	Watts W/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to 150	°C



#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	6.25	°C/W

FIGURE 1 - POWER DERATING

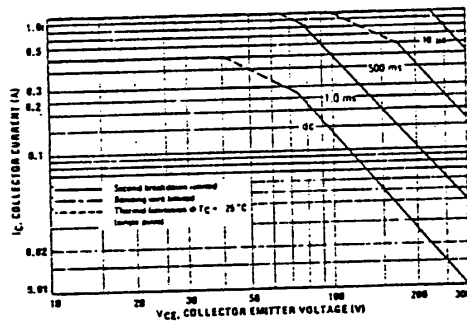


359-282

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

Characteristic	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS (1)</b>				
Collector-Emitter Sustaining Voltage ( $I_C = 10 \text{ mA dc}, I_B = 0$ )	$V_{CE(sus)}$	300	-	Vdc
Collector Cutoff Current ( $V_{CE} = 500 \text{ Vdc}, V_{BE} = 0$ )	$I_{CES}$	-	0.1	mA dc
Base-Emitter Voltage ( $V_{CE} = 5 \text{ Vdc}, I_C = 150 \text{ mA}$ )	$V_{BE}$	-	1.0	Vdc
DC Current Gain ( $V_{CE} = 5 \text{ V}, I_C = 50 \text{ mA}$ ) ( $V_{CE} = 5 \text{ V}, I_C = 150 \text{ mA}$ )	$h_{FE}$	25 20	150	
Collector-Emitter Saturation Voltage ( $I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ )	$V_{CE(sat)}$	-	1.0	Vdc

FIGURE 2 - ACTIVE REGION SAFE OPERATING AREA



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 figure 6 is based 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  $T_{J(pk)} \leq 150^\circ\text{C}$ .  $T_{J(pk)}$  may be calculated from the data in figure 7. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415A)

FIGURE 3 - "ON" VOLTAGES

