

6367254 MOTOROLA SC (XSTRS/R F)

96D 80607 D  
T-33-07

**MOTOROLA  
SEMICONDUCTOR  
TECHNICAL DATA**

**BD525  
BD527  
BD529**

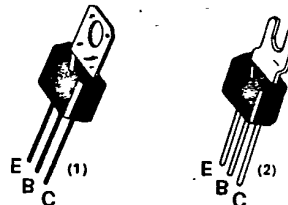
**NPN SILICON ANNULAR  
AMPLIFIER TRANSISTORS**

... designed for general-purpose, high-voltage amplifier and driver applications.

- High Collector-Emitter Breakdown Voltage —  
 $V_{CEO} = 60 \text{ Vdc (Min) @ } I_C = 1.0 \text{ mAdc — BD525}$   
 $80 \text{ Vdc (Min) @ } I_C = 1.0 \text{ mAdc — BD527}$   
 $100 \text{ Vdc (Min) @ } I_C = 1.0 \text{ mAdc — BD529}$
- High Power Dissipation —  $P_D = 10 \text{ W @ } T_C = 25^\circ\text{C}$
- Complements to PNP BD526, BD528, BD530

**NPN SILICON  
AMPLIFIER TRANSISTORS**

60 - 80 - 100 VOLTS  
10 WATTS



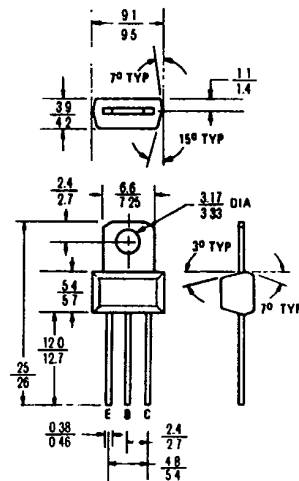
(1) Standard package: BD525, 527, 529  
 (2) Tab formed for flat mounting. BD525-1, 527-1, 529-1  
 Also available with leads formed to TO-5 configuration: BD525-5, 527-5, 529-5

**MAXIMUM RATINGS**

Rating	Symbol	BD525	BD527	BD529	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	80	100	Vdc
Collector-Base Voltage	$V_{CB}$	60	80	100	Vdc
Emitter-Base Voltage	$V_{EB}$	—	4.0	—	Vdc
Collector Current - Continuous	$I_C$	—	2.0	—	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	—	1.0	8.0	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	—	10	80	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150			$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	12.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$\theta_{JA}$	125	$^\circ\text{C/W}$



All dimensions in millimeters  
 Collector connected  
 to tab

CASE 152



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96D 80608 D

BD525, BD527, BD529

T-33-07

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage ( $I_C = 1.0 \text{ mAdc}, I_B = 0$ )	BD525 BD527 BD529	BV <sub>CEO</sub>	60 80 100	— — —	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 100 \mu\text{Adc}, I_C = 0$ )		BV <sub>EBO</sub>	4.0	—	Vdc
Collector Cutoff Current ( $V_{CB} = 40 \text{ Vdc}, I_E = 0$ ) ( $V_{CB} = 60 \text{ Vdc}, I_E = 0$ ) ( $V_{CB} = 80 \text{ Vdc}, I_E = 0$ )	BD525 BD527 BD529	I <sub>CBO</sub>	— — —	— — —	nAdc
<b>ON CHARACTERISTICS</b>					
DC Current Gain (1) ( $I_C = 50 \text{ mAdc}, V_{CE} = 2.0 \text{ Vdc}$ ) ( $I_C = 250 \text{ mAdc}, V_{CE} = 2.0 \text{ Vdc}$ )		h <sub>FE</sub>	60 30	115 95	—
Collector-Emitter Saturation Voltage(1) ( $I_C = 250 \text{ mAdc}, I_B = 10 \text{ mAdc}$ ) ( $I_C = 250 \text{ mAdc}, I_B = 25 \text{ mAdc}$ )		V <sub>CE(sat)</sub>	— —	0.18 0.1	0.5
Base-Emitter On Voltage (1) ( $I_C = 250 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$ )		V <sub>BE(on)</sub>	—	0.74	1.0
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current-Gain-Bandwidth Product ( $I_C = 250 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 100 \text{ MHz}$ )		f <sub>T</sub>	50	150	—
Output Capacitance ( $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 100 \text{ kHz}$ )		C <sub>ob</sub>	—	6.0	12

(1) Pulse Test Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 20\%$

FIGURE 1 — TYPICAL DC CURRENT GAIN

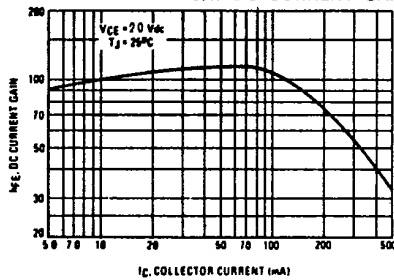


FIGURE 2 — "SATURATION" AND "ON" VOLTAGES

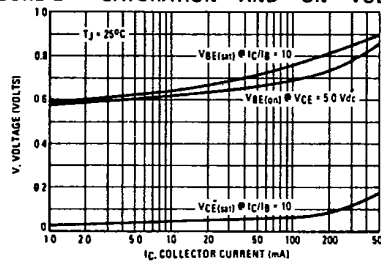
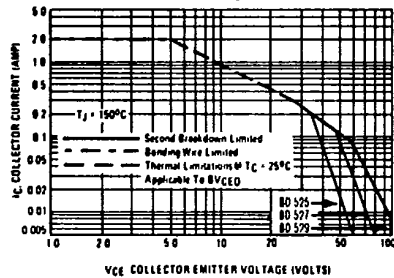
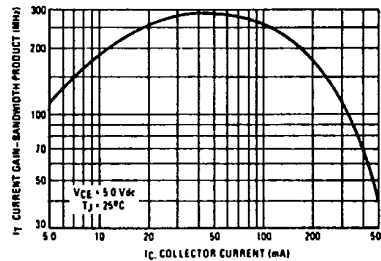


FIGURE 3 -- SAFE OPERATING AREA



There are two limitations on the power handling ability of a transistor junction temperature and secondary 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.

FIGURE 4 CURRENT-GAIN BANDWIDTH PRODUCT



The data of Figure 3 is based on  $T_J(pk) = 150^\circ\text{C}$ ,  $T_C$  is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by secondary breakdown.

