

6367254 MOTOROLA SC (XSTRS/R F)

96D 80607 D

T-33-07

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

**BD525
BD527
BD529**

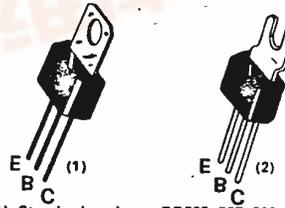
NPN SILICON ANNULAR AMPLIFIER TRANSISTORS

... 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



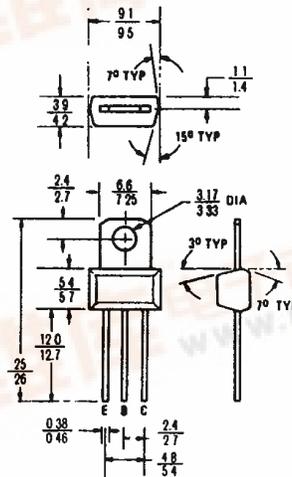
(1) Standard package: BD525, 527, 529
 (2) Tab formed for flat mounting. BD525-1, 527-1, 529-1
 Also available with leads formed to TO-5 configuration: BD525-5, 527-5, 529-5

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°C	P_D	—	1.0	—	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	—	10	—	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	θ_{JC}	12.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	θ_{JA}	125	$^\circ\text{C/W}$



All dimensions in millimeters
Collector connected to tab

CASE 152



6367254 MOTOROLA SC (XSTRS/R F)

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BD525, BD527, BD529

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

Characteristic	Symbol	Min	Typ	Max	Unit	
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}, I_B = 0$)	BD525 BD527 BD529	BV_{CEO}	60 80 100	— — —	— — —	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{Adc}, I_C = 0$)		BV_{EBO}	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_{CBO}	— — —	— — —	100 100 100	nAdc
ON CHARACTERISTICS						
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_{FE}	60 30	115 95	— —	—
Collector-Emitter Saturation Voltage(1) ($I_C = 250 \text{ mAdc}, I_B = 10 \text{ mAdc}$) ($I_C = 250 \text{ mAdc}, I_B = 25 \text{ mAdc}$)		$V_{CE(sat)}$	— —	0.18 0.1	0.5 —	Vdc
Base-Emitter On Voltage (1) ($I_C = 250 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$)		$V_{BE(on)}$	—	0.74	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain-Bandwidth Product ($I_C = 250 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 100 \text{ MHz}$)		f_T	50	150	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 100 \text{ kHz}$)		C_{ob}	—	6.0	12	pF

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

FIGURE 1 — TYPICAL DC CURRENT GAIN

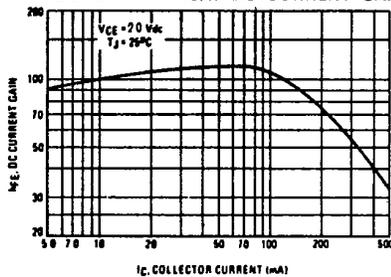


FIGURE 2 — "SATURATION" AND "ON" VOLTAGES

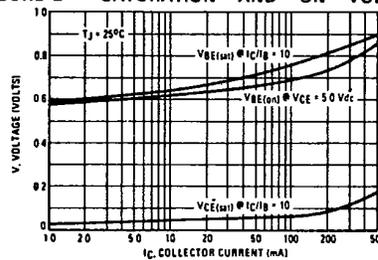
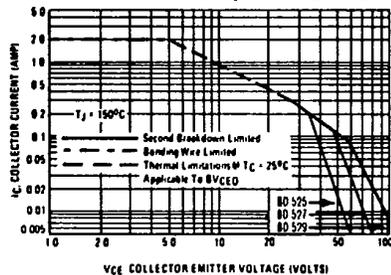
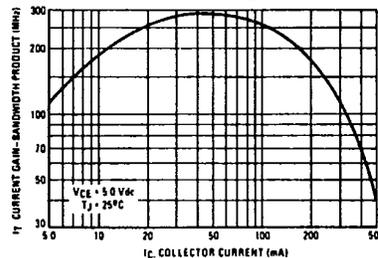


FIGURE 3 — SAFE OPERATING AREA



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.

