

6367254 MOTOROLA SC (XSTRS/R F)

96D 80603 D

T-33-07

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

BD515
BD517
BD519

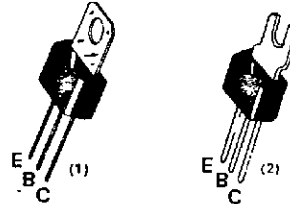
**NPN SILICON ANNULAR
AMPLIFIER TRANSISTORS**

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

- High Collector-Emitter Breakdown Voltage —
 $V_{CE0} = 45 \text{ Vdc (Min) @ } I_C = 1 \text{ mAdc} \text{ — BD515}$
 $60 \text{ Vdc (Min) @ } I_C = 1 \text{ mAdc} \text{ — BD517}$
 $80 \text{ Vdc (Min) @ } I_C = 1 \text{ mAdc} \text{ — BD519}$
- High Power Dissipation — $P_D = 10 \text{ W @ } T_C = 25^\circ\text{C}$
- Complements to BD516, BD518, BD520

**NPN SILICON
AMPLIFIER TRANSISTORS**

45 - 60 - 80 VOLTS
10 WATTS



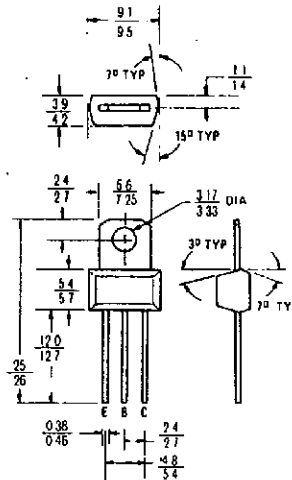
(1) Standard package BD515, 517, 519
 (2) Tab formed for flat mounting BD515-1, 517-1, 519-1
 Also available with leads formed to TO-5 configuration BD515-5, 517-5, 519-5

MAXIMUM RATINGS

Rating	Symbol	BD515	BD517	BD519	Unit
Collector-Emitter Voltage	V_{CE0}	45	60	80	Vdc
Collector-Base Voltage	V_{CB}	45	60	80	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
		8.0			mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ — Derate above 25°C	P_D	10			Watts
		80			mW/°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	θ_{JC}	12.5	°C/W
Thermal Resistance, Junction to Ambient	θ_{JA}	125	°C/W



All dimensions in millimeters
 Collector connected
 to tab

CASE 152

6367254 MOTOROLA SC (XSTRS/R F)

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BD515, BD517, BD519

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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit	
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I _C = 1.0 mAdc, I _B = 0)	BD515 BD517 BD519	BV _{CEO}	45 60 80	— — —	— — —	Vdc
Emitter-Base Breakdown Voltage (I _E = 100 μAdc, I _C = 0)		BV _{EB0}	4.0	—	—	Vdc
Collector Cutoff Current (V _{CB} = 30 Vdc, I _E = 0) (V _{CB} = 40 Vdc, I _E = 0) (V _{CB} = 60 Vdc, I _E = 0)	BD515 BD517 BD519	I _{CBO}	— — —	— — —	100 100 100	nAdc
ON CHARACTERISTICS						
DC Current Gain (1) (I _C = 10 mAdc, V _{CE} = 2.0 Vdc) (I _C = 150 mAdc, V _{CE} = 2.0 Vdc) (I _C = 500 mAdc, V _{CE} = 2.0 Vdc)		h _{FE}	— 60 25	115 125 55	— 350 —	—
Collector-Emitter Saturation Voltage (1) (I _C = 500 mAdc, I _B = 50 mAdc) (I _C = 500 mAdc, I _B = 25 mAdc)		V _{CE(sat)}	— —	0.18 0.24	0.5 —	Vdc
Base-Emitter On Voltage (1) (I _C = 500 mAdc, V _{CE} = 2.0 Vdc)		V _{BE(on)}	—	0.74	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain-Bandwidth Product (I _C = 200 mAdc, V _{CE} = 5.0 Vdc, f = 100 MHz)		f _T	50	160	—	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 100 kHz)		C _{ob}	—	6.0	12	pF

(1) Pulse Test. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

FIGURE 1 — TYPICAL DC CURRENT GAIN

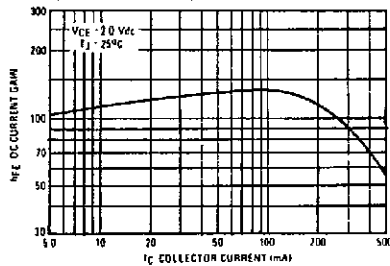


FIGURE 2 — "SATURATION" AND "ON" VOLTAGES

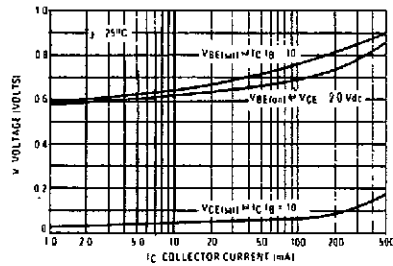
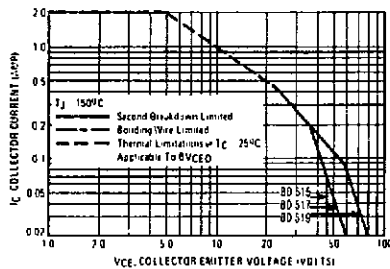
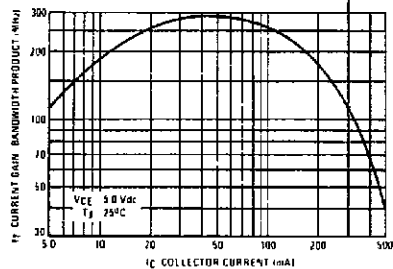


FIGURE 3 — DC SAFE OPERATING AREA



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°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.