MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

BD515
BD517
BD519

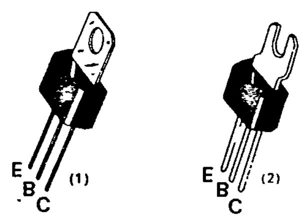
NPN SILICON ANNULAR AMPLIFIER TRANSISTORS

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

- High Collector-Emitter Breakdown Voltage —
  BV_{CEO} = 45 Vdc (Min) @ I_C = 1 mAdc — BD515
  60 Vdc (Min) @ I_C = 1 mAdc — BD517
  80 Vdc (Min) @ I_C = 1 mAdc — BD519
- High Power Dissipation — P_D = 10 W @ T_C = 25°C
- Complements to BD516, BD518, BD520

NPN SILICON AMPLIFIER TRANSISTORS

45 - 60 - 80 VOLTS
10 WATTS



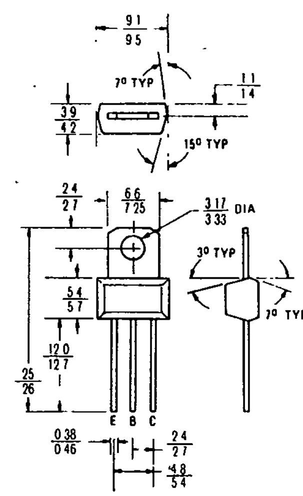
(1) Standard package BD515, 517, 519
(2) Tab formed for flat mounting BD515-1, 517-1, 519-1
Also available with leads formed to TO-5 configuration BD515-5, 517-5, 519-5

MAXIMUM RATINGS

Rating	Symbol	BD515	BD517	BD519	Unit
Collector-Emitter Voltage	V_{CEO}	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°C Derate above 25°C	P_D	1.0 8.0			Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	10 80			Watts 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

BD515, BD517, BD519

T-33-07

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_{EBO}	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

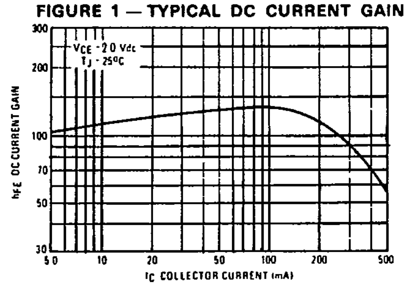


FIGURE 2 — "SATURATION" AND "ON" VOLTAGES

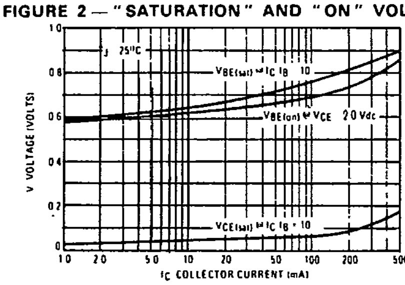


FIGURE 3 — DC SAFE OPERATING AREA

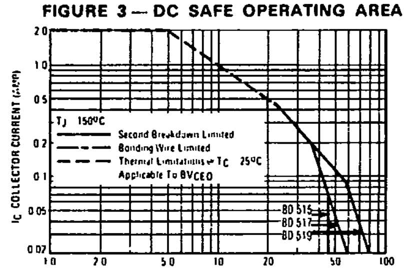
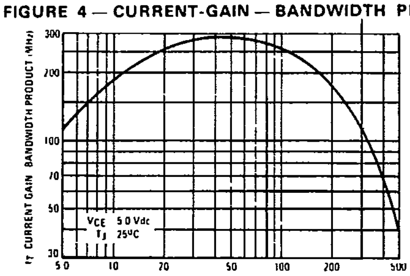


FIGURE 4 — CURRENT-GAIN — BANDWIDTH PRODUCT



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

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