

6367254 MOTOROLA SC (XSTRS/R F)

96D 80601 D
T-33-17

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

**BD506
BD508
BD510**

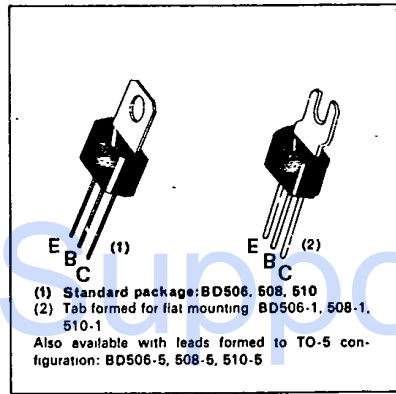
PNP SILICON AUDIO TRANSISTORS

20 - 30 - 40 VOLTS
10 WATTS

PNP SILICON ANNULAR TRANSISTORS

... designed for complementary symmetry audio circuits

- Excellent Current Gain Linearity — 1.0 mAdc to 1.0 Adc
- Low Collector-Emitter Saturation Voltage — $V_{CE(sat)} = 0.7 \text{ Vdc (Max) @ } I_C = 1.0 \text{ Adc}$
- Complements to NPN BD505, BD507, BD509
- Uniwatt^A Package for Excellent Thermal Properties —
1.0 Watt @ $T_A = 25^\circ\text{C}$
10.0 Watts @ $T_C = 25^\circ\text{C}$

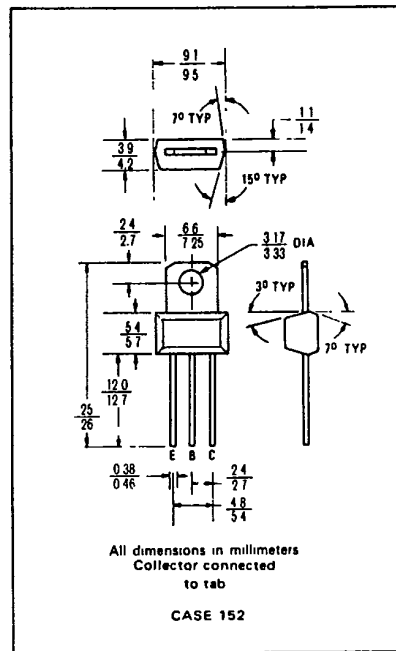


MAXIMUM RATINGS

Rating	Symbol	BD506	BD508	BD510	Unit
Collector-Emitter Voltage	V_{CEO}	20	30	40	Vdc
Collector-Base Voltage	V_{CB}	30	40	50	Vdc
Emitter-Base Voltage	V_{EB}	5.0			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 8.0			Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°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	θ_{JC}	125	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	θ_{JA}	125	$^\circ\text{C/W}$



6367254 MOTOROLA SC (XSTRS/R F)

96D 80602 D

BD506, BD508, BD510

T-33-17

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 mA, I _B = 0)	BD506 BD508 BD510	BV _{CEO}	20 30 40	— — —	Vdc
Emitter-Base Breakdown Voltage (I _E = 100 μA, I _C = 0)		BV _{EBO}	5.0	—	Vdc
Collector Cutoff Current (V _{CB} = 20, 30, 40 Vdc, I _E = 0)	BD506 BD508 BD510	I _{CBO}	— — —	100 100 100	nAdc
ON CHARACTERISTICS					
DC Current Gain (1) (I _C = 250 mA, V _{CE} = 2.0 Vdc) (I _C = 1.0 A, V _{CE} = 2.0 Vdc)		h _{FE}	60 40	135 90	—
Collector-Emitter Saturation Voltage(1) (I _C = 1.0 A, I _B = 0.1 A)		V _{CE(sat)}	—	0.40	0.7
Base-Emitter On Voltage (1) (I _C = 1.0 A, V _{CE} = 1.0 Vdc)		V _{BE(on)}	—	0.92	1.2
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain-Bandwidth Product (I _C = 50 mA, V _{CE} = 5.0 Vdc, f = 100 MHz)		f _T	50	180	—
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 100 kHz)		C _{ob}	—	—	30

(1) Pulse Test Pulse Width ≤ 300 μs, Duty Cycle ≤ 20%

FIGURE 1 — DC CURRENT GAIN

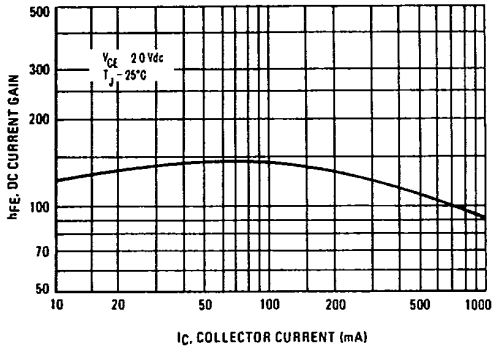


FIGURE 2 — "ON" VOLTAGES

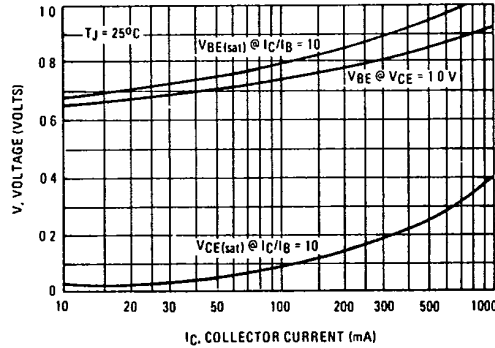
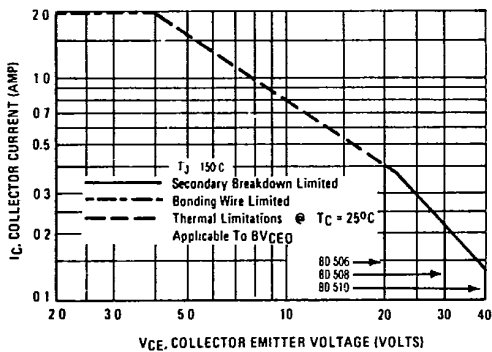


FIGURE 3 — DC SAFE OPERATING AREA



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.

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.