

6367254 MOTOROLA SC (XSTRS/R F)

96D 80565 DT-33-19

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

BD186
BD188
BD190

PLASTIC MEDIUM POWER SILICON PNP TRANSISTOR

... designed for use in 5 to 10 Watt audio amplifiers utilizing complementary or quasi complementary circuits.

- DC Current— $h_{FE} = 40$ (Min) @ $I_C = 0.5$ Adc
- BD 186, 188, 190 are complementary with BD 185, 187, 189

4 AMPERE POWER TRANSISTOR

PNP SILICON

30, 45, 60 VOLTS
40 WATTS

MAXIMUM RANGS

Rating	Symbol	Type	Value	Unit
Collector-Emitter Voltage	V_{CEO}	BD 186	30	Vdc
		BD 188	45	
		BD 190	60	
Collector-Base Voltage	V_{CBO}	BD 186	40	Vdc
		BD 188	55	
		BD 190	70	
Emitter-Base Voltage	V_{EBO}		5	Vdc
Collector Current	I_C		4.0	Adc
Base Current	I_B		2.0	Adc
Total Device Dissipation $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D		40	Watts
			320	
Operating and Storage Junction Temperature Range	T_J, T_{stg}		-65 to +150	$^\circ\text{C}$

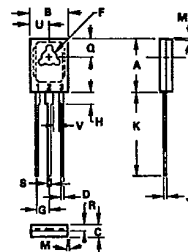
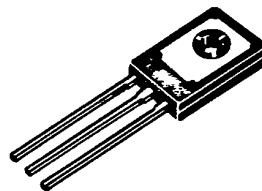
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	3.12	$^\circ\text{C/W}$

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

Characteristic	Symbol	Type	Min	Max	Unit
Collector-Emitter Sustaining Voltage* ($I_C = 0.1$ Adc, $I_B = 0$)	BV_{CEO}	BD 186	30	—	Vdc
		BD 188	45	—	
		BD 190	60	—	
Collector Cutoff Current ($V_{CB} = 40$ Vdc, $I_E = 0$) ($V_{CB} = 55$ Vdc, $I_E = 0$) ($V_{CB} = 70$ Vdc, $I_E = 0$)	I_{CBO}	BD 186	—	0.1	mAdc
		BD 188	—	0.1	
		BD 190	—	0.1	
Emitter Cutoff Current ($V_{BE} = 5.0$ Vdc, $I_C = 0$)	I_{EBO}		—	1.0	mAdc
DC current Gain ($I_C = 0.5$ A, $V_{CE} = 2$ V) ($I_C = 2$ A, $V_{CE} = 2$ V)	h_{FE}		40	—	
			15	—	
Collector-Emitter Saturation Voltage* ($I_C = 2.0$ Adc, $I_B = 0.2$ Adc)	$V_{CE(sat)}$		—	1.0	Vdc
Base-Emitter On Voltage* ($I_C = 2.0$ Adc, $V_{CE} = 2.0$ Vdc)	$V_{BE(on)}$		—	1.5	Vdc
Current-Gain-Bandwidth Product ($I_C = 1.0$ Adc, $V_{CE} = 10$ Vdc, $f = 1.0$ MHz)	f_T		2.0	—	MHz

* Pulse Test: Pulse Width ≤ 300 μs . Duty Cycle $\leq 2.0\%$.



	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.80	11.04	0.425	0.435
B	2.54	2.74	0.100	0.108
C	2.42	2.66	0.095	0.105
D	4.13	4.68	0.163	0.184
E	2.52	2.74	0.100	0.108
F	2.32	2.48	0.091	0.097
G	2.27	2.41	0.089	0.095
H	2.32	2.48	0.091	0.097
I	2.32	2.48	0.091	0.097
J	2.32	2.48	0.091	0.097
K	2.32	2.48	0.091	0.097
L	2.32	2.48	0.091	0.097
M	2.32	2.48	0.091	0.097
N	2.32	2.48	0.091	0.097
O	2.32	2.48	0.091	0.097
P	2.32	2.48	0.091	0.097
Q	2.32	2.48	0.091	0.097
R	2.32	2.48	0.091	0.097
S	2.32	2.48	0.091	0.097
T	2.32	2.48	0.091	0.097
U	2.32	2.48	0.091	0.097
V	2.32	2.48	0.091	0.097
W	2.32	2.48	0.091	0.097
X	2.32	2.48	0.091	0.097
Y	2.32	2.48	0.091	0.097
Z	2.32	2.48	0.091	0.097

STYLE 1
1. Emitter
2. Collector
3. Base

NOTES:
1. M1 - MAIN TERMINAL
2. LEADS TRUE POSITIONED WITHIN 8 DEGREE B.C.H.
DUE TO DIM A & B AT MAXIMUM MATERIAL
CONDITION.

CASE 77-05
TO-126

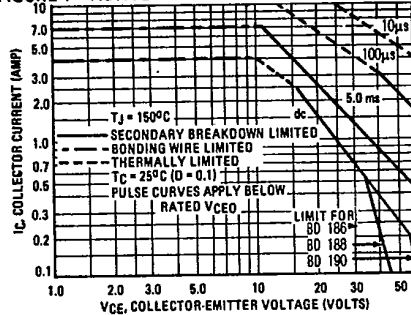
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BD186, BD188, BD190

T-33-19

FIGURE 1 - ACTIVE-REGION SAFE OPERATING AREA



The Safe Operating Area Curves indicate I_C - V_{CE} limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J , power-temperature derating must be observed for both steady state and pulse power conditions.

FIGURE 2 - COLLECTOR SATURATION REGION

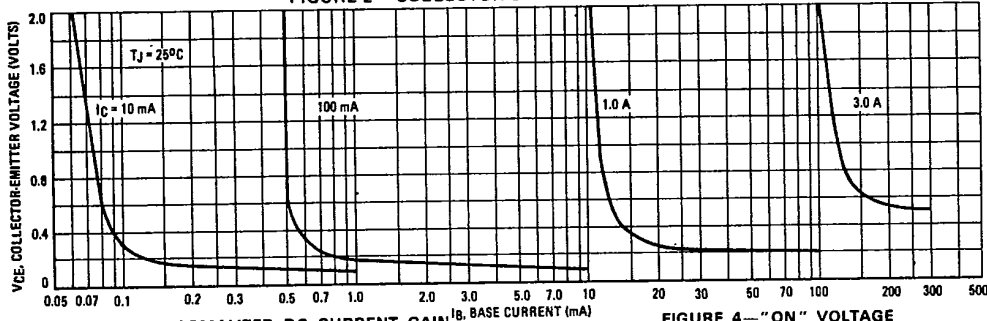


FIGURE 3 - NORMALIZED DC CURRENT GAIN

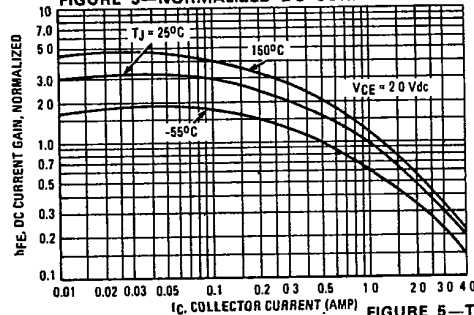


FIGURE 4 - "ON" VOLTAGE

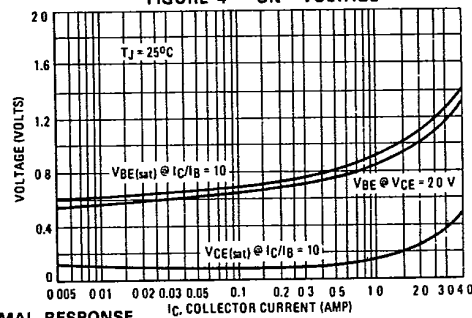


FIGURE 5 - THERMAL RESPONSE

