

6367254 MOTOROLA SC (XSTRS/R F)

96D 80573 D
T-33-09

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

BD233
BD235
BD237

PLASTIC MEDIUM POWER
SILICON NPN TRANSISTOR

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

- DC Current Gain— $h_{FE} = 40$ (Min) @ $I_C = 0.15$ Adc
- BD 233, 235, 237 are complementary with BD 234, 236, 238

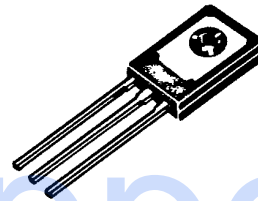
2 AMPERE
POWER TRANSISTOR

NPN SILICON

45, 60, 80 VOLTS
25 WATTS

MAXIMUM RATINGS

Rating	Symbol	Type	Value	Unit
Collector-Emitter Voltage	V_{CEO}	BD 233 BD 235 BD 237	45 60 80	Vdc
Collector-Base Voltage	V_{CBO}	BD 233 BD 235 BD 237	45 60 80	Vdc
Emitter-Base Voltage	V_{EBO}		5	Vdc
Collector Current	I_C		2.0	Adc
Base Current	I_B		1.0	Adc
Total Device Dissipation $T_C = 25^\circ\text{C}$	P_D		25	Watts
Operating and Storage Junction Temperature Range	T_J, T_{stg}		55 to +150	$^\circ\text{C}$



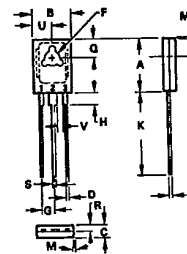
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	50	$^\circ\text{C/W}$

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 233 BD 235 BD 237	45 60 80	—	Vdc
Collector Cutoff Current ($V_{CB} = 45$ Vdc, $I_E = 0$) ($V_{CB} = 60$ Vdc, $I_E = 0$) ($V_{CB} = 80$ Vdc, $I_E = 0$)	I_{CBO}	BD 233 BD 235 BD 237	—	0.1 0.1 0.1	mAdc
Emitter Cutoff Current ($V_{BE} = 5.0$ Vdc, $I_C = 0$)	I_{EBO}		—	1.0	mAdc
DC current Gain ($I_C = 0.15$ A, $V_{CE} = 2$ V) ($I_C = 1$ A, $V_{CE} = 2$ V)	h_{FE1} h_{FE2}		40 25	—	
Collector-Emitter Saturation Voltage* ($I_C = 1$ Adc, $I_B = 0.1$ Adc)	$V_{CE(sat)}$		—	0.6	Vdc
Base-Emitter On Voltage* ($I_C = 1$ Adc, $V_{CE} = 2.0$ Vdc)	$V_{BE(on)}$		—	1.3	Vdc
Current-Gain-Bandwidth Product ($I_C = 250$ mAdc, $V_{CE} = 10$ Vdc, $f = 1.0$ MHz)	f_T		3.0	—	MHz

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



MILLIMETERS		INCHES		
DIM	MIN	MAX	MIN	MAX
A	1.90	1.95	0.075	0.078
B	1.50	1.55	0.059	0.061
C	1.42	1.48	0.056	0.059
D	0.51	0.56	0.020	0.022
E	0.80	0.85	0.031	0.033
F	0.70	0.75	0.028	0.029
G	0.70	0.75	0.028	0.029
H	1.27	1.32	0.050	0.052
J	0.70	0.75	0.028	0.029
K	1.61	1.66	0.063	0.065
L	0.70	0.75	0.028	0.029
M	0.70	0.75	0.028	0.029
N	0.70	0.75	0.028	0.029
O	1.15	1.20	0.045	0.047
P	1.15	1.20	0.045	0.047
Q	1.15	1.20	0.045	0.047
R	1.15	1.20	0.045	0.047
S	1.15	1.20	0.045	0.047
T	1.15	1.20	0.045	0.047
U	1.15	1.20	0.045	0.047
V	1.15	1.20	0.045	0.047

STYLE 1
PIN 1: GATE
PIN 2: COLLECTOR
PIN 3: BASE

NOTES
1. LEAD 1 - MAIN TERMINAL
2. LEADS MUST BE POSITIONED WITHIN 0.25 mm (0.010") DIA TO DIM A & B AT MAXIMUM MATERIAL CONDITION

CASE 77-05
TO-126

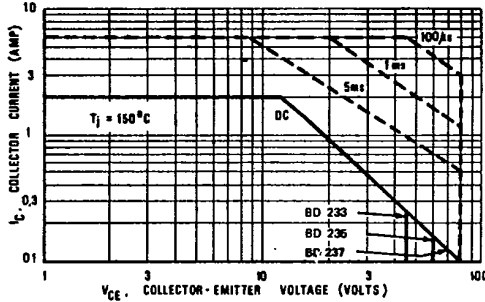
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BD233, BD235, BD237

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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

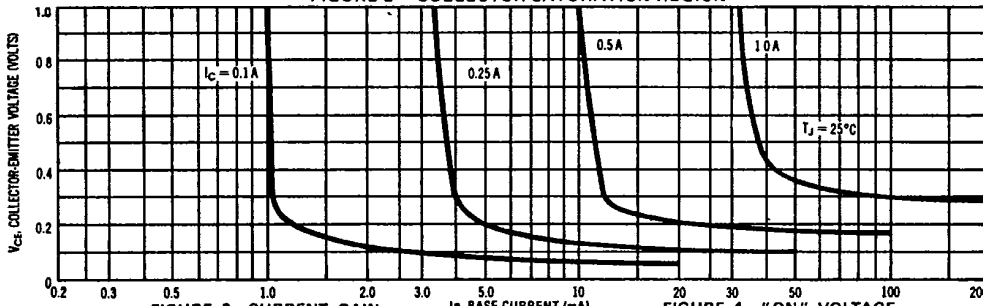


FIGURE 3 - CURRENT GAIN

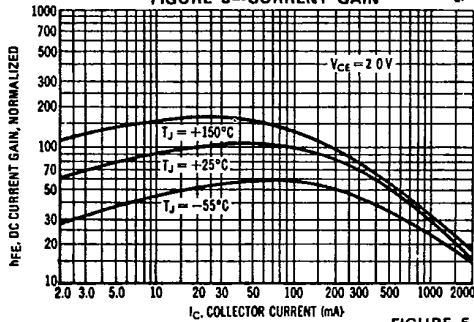


FIGURE 4 - "ON" VOLTAGE

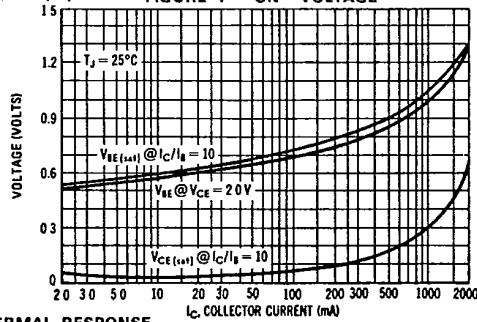


FIGURE 5 - THERMAL RESPONSE

