

# BD237 (NPN), BD238 (PNP)

Preferred Devices

## Plastic Medium Power Silicon NPN Transistor

Designed for use in 5.0 to 10 W audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

- DC Current Gain –  
 $h_{FE} = 40 \text{ (Min) @ } I_C = 0.15 \text{ A dc}$
- Epoxy Meets UL94, VO @ 1/8"
- ESD Ratings: Human Body Model, 3B; >8000 V  
 Machine Model, C; >400 V

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	80	Vdc
Collector–Base Voltage	$V_{CBO}$	100	Vdc
Emitter–Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current	$I_C$	2.0	A dc
Base Current	$I_B$	1.0	A dc
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	$R_{\theta JC}$	5.0	$^\circ\text{C/W}$

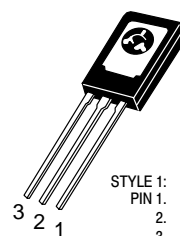
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



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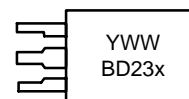
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**2.0 AMPERES  
 POWER TRANSISTORS  
 NPN SILICON  
 80 VOLTS  
 25 WATTS**



STYLE 1:  
 PIN 1. EMITTER  
 2. COLLECTOR  
 3. BASE

### MARKING DIAGRAM



**CASE 77–09  
 TO–225**

x = 7 or 8  
 Y = Year  
 WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
BD237	TO–225	500 Units/Box
BD238	TO–225	500 Units/Box

**Preferred** devices are recommended choices for future use and best overall value.

# BD237 (NPN), BD238 (PNP)

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

Characteristic	Symbol	Min	Max	Unit
Collector–Emitter Sustaining Voltage* ( $I_C = 0.1 \text{ Adc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	80	–	Vdc
Collector Cutoff Current ( $V_{CB} = 100 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	0.1	mAdc
Emitter Cutoff Current ( $V_{BE} = 5.0 \text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	1.0	mAdc
DC Current Gain ( $I_C = 0.15 \text{ A}$ , $V_{CE} = 2.0 \text{ V}$ ) ( $I_C = 1.0 \text{ A}$ , $V_{CE} = 2.0 \text{ V}$ )	$h_{FE1}$ $h_{FE2}$	40 25	– –	–
Collector–Emitter Saturation Voltage* ( $I_C = 1.0 \text{ Adc}$ , $I_B = 0.1 \text{ Adc}$ )	$V_{CE(sat)}$	–	0.6	Vdc
Base–Emitter On Voltage* ( $I_C = 1.0 \text{ Adc}$ , $V_{CE} = 2.0 \text{ Vdc}$ )	$V_{BE(on)}$	–	1.3	Vdc
Current–Gain – Bandwidth Product ( $I_C = 250 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )	$f_T$	3.0	–	MHz

\*Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

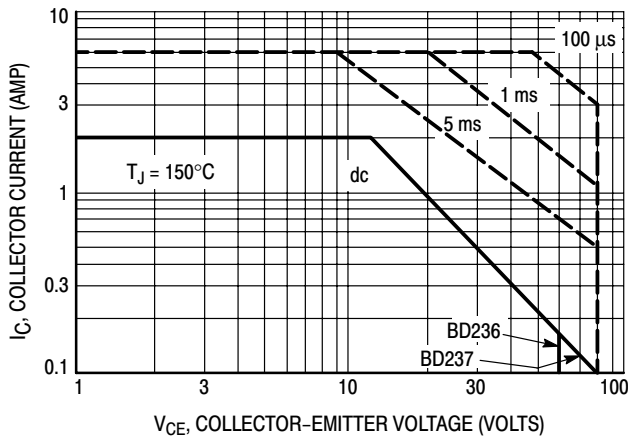


Figure 1. Active Region Safe Operating Area

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.

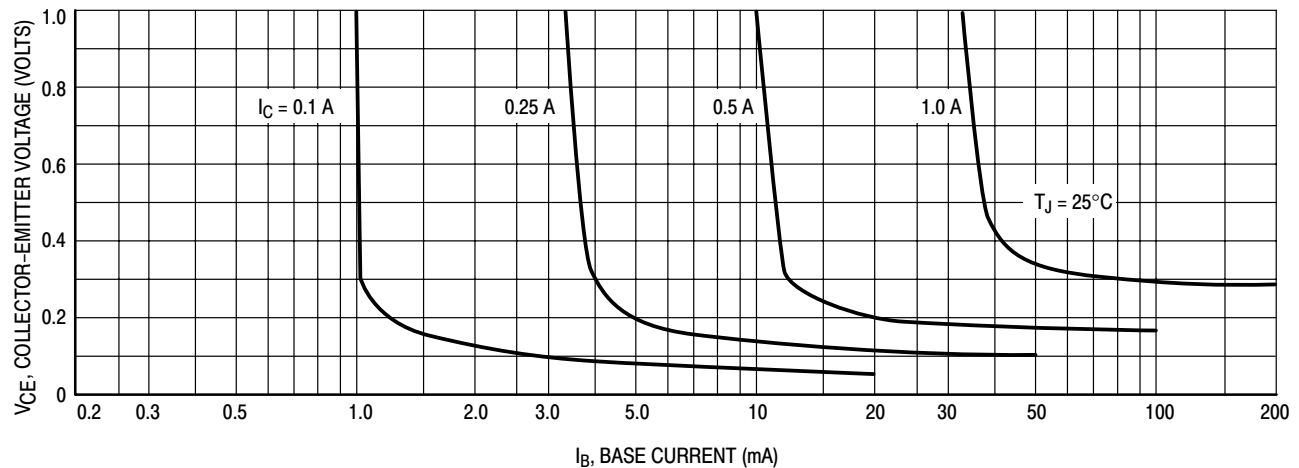


Figure 2. Collector Saturation Region

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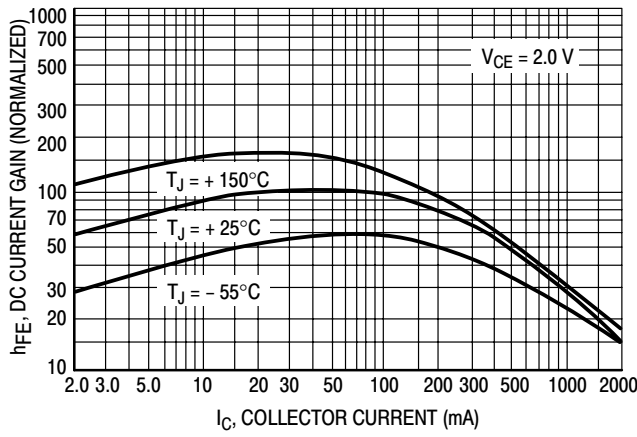


Figure 3. Current Gain

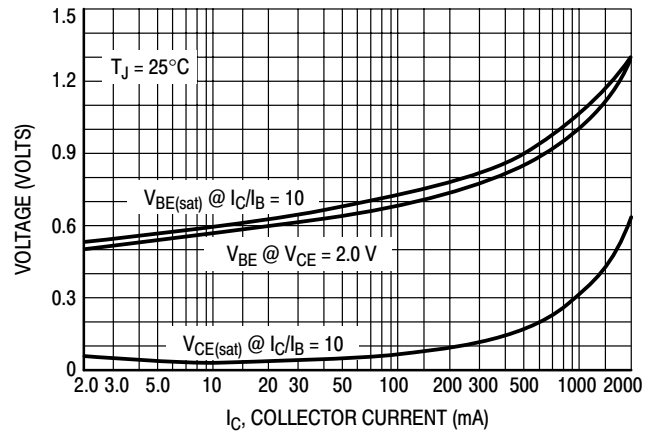


Figure 4. "On" Voltages

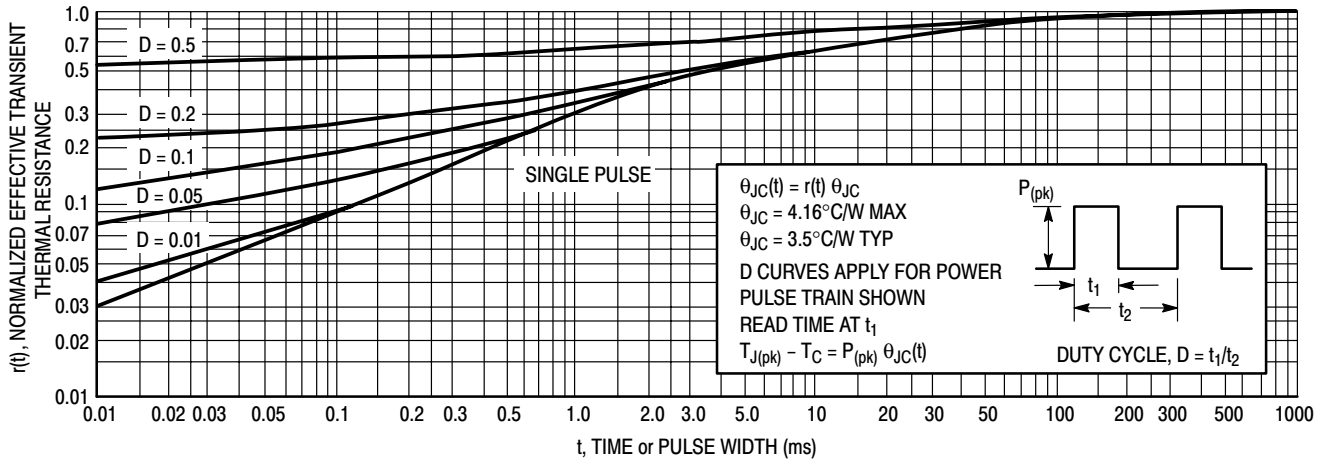
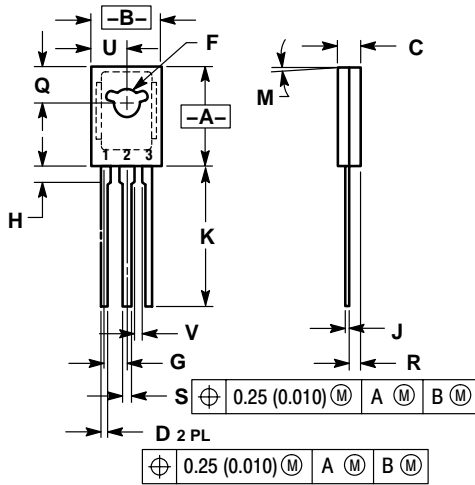


Figure 5. Thermal Response

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## PACKAGE DIMENSIONS

TO-225  
CASE 77-09  
ISSUE Z



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077-01 THRU -08 OBSOLETE, NEW STANDARD 077-09.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	---	1.02	---

### STYLE 1:

1. EMITTER
2. COLLECTOR
3. BASE

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