

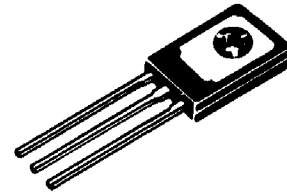
NPN
BD785, BD787
PNP
BD786, BD788

COMPLEMENTARY PLASTIC SILICON ANNULAR[♦]
POWER TRANSISTORS

... designed for low power audio amplifier and low current, high-speed switching applications.

- Low Collector-Emitter Sustaining Voltage –
 V_{CE0} (sus) 45 Vdc (Min) – BD785, BD786
 60 Vdc (Min) – BD787, BD788
- High Current-Gain – Bandwidth Product –
 $f_T = 50$ MHz (Min) @ $I_C = 100$ mAdc
- DC Current Gain Specified at 0.2, 1.0, 2.0 and 4.0 Adc
- Collector-Emitter Saturation Voltage Specified at 0.5, 1.0, 2.0 and 4.0 Adc

4 AMPERE
POWER TRANSISTORS
COMPLEMENTARY SILICON
45, 60VOLTS
15 WATTS

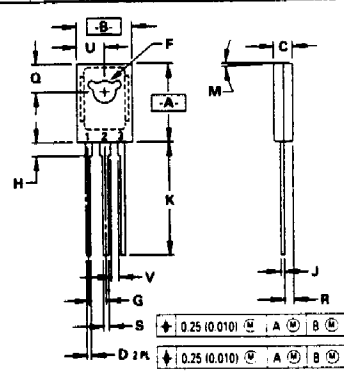
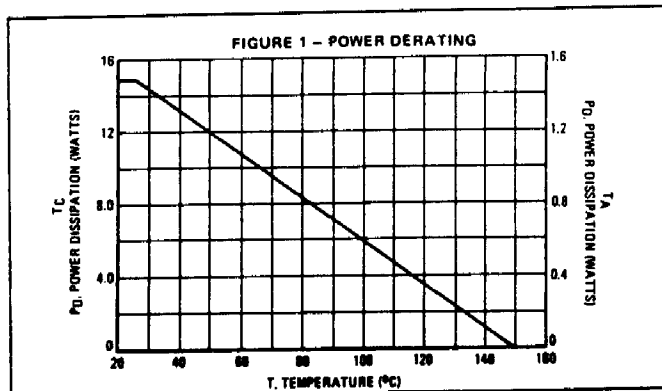


***MAXIMUM RATINGS**

Rating	Symbol	BD785 BD786	BD787 BD788	Unit
Collector-Emitter Voltage	V_{CE0}	45	60	Vdc
Collector-Base Voltage	V_{CB0}	60	80	Vdc
Emitter-Base Voltage	V_{EB0}	6.0		Vdc
Collector Current – Continuous	I_C	4.0	8.0	Adc
– Peak				Adc
Base Current	I_B	1.0		Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	15		Watts
Derate Above 25°C		0.12		W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150		$^\circ\text{C}$

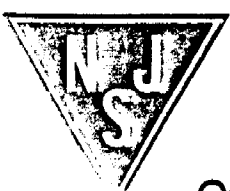
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	8.34	$^\circ\text{C/W}$



NOTES
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH

DIM	MILLIMETERS		INCHES		STYLE 1
	MIN	MAX	MIN	MAX	
A	10.80	11.04	0.425	0.433	PIN 1 EMITTER
B	7.50	7.74	0.295	0.305	
C	2.42	2.66	0.095	0.105	
D	0.51	0.66	0.020	0.026	2 COLLECTOR
F	2.93	3.17	0.115	0.125	
G	2.39 BSC		0.094 BSC		3. BASE
H	1.27	2.41	0.050	0.095	
J	0.39	0.63	0.015	0.025	TO-225AA TYPE
K	14.61	16.63	0.575	0.655	
M	3° TYP		3° TYP		
Q	3.76	4.01	0.148	0.158	
R	1.15	1.39	0.045	0.055	
S	0.64	0.88	0.025	0.035	
U	3.68	3.93	0.145	0.155	
V	1.02	—	0.040	—	



**BD785, BD787 NPN
 BD786, BD788 PNP**

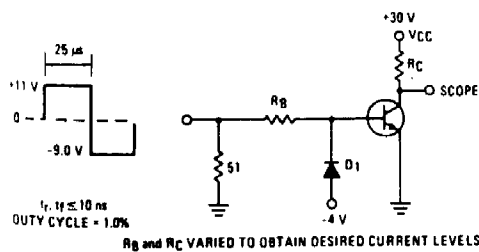
***ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)**

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (1) (I _C = 10 mA _{dc} , I _B = 0)	V _{CE(sus)}	45 60	- -	V _{dc}
Collector Cutoff Current (V _{CE} = 20 V _{dc} , I _B = 0) (V _{CE} = 30 V _{dc} , I _B = 0)	I _{CEO}	- -	100 100	μA _{dc}
Collector Cutoff Current (V _{CE} = 60 V _{dc} , V _{BE(off)} = 1.5 V _{dc})	I _{CEx}	-	1.0	μA _{dc}
(V _{CE} = 80 V _{dc} , V _{BE(off)} = 1.5 V _{dc})		-	1.0	
(V _{CE} = 30 V _{dc} , V _{BE(off)} = 1.5 V _{dc} , T _C = 125°C)		-	0.1	mA _{dc}
(V _{CE} = 40 V _{dc} , V _{BE(off)} = 1.5 V _{dc} , T _C = 125°C)		-	0.1	
Emitter Cutoff Current (V _{EB} = 6.0 V _{dc} , I _C = 0)	I _{EBO}	-	1.0	μA _{dc}
ON CHARACTERISTICS (1)				
DC Current Gain (I _C = 200 mA _{dc} , V _{CE} = 3.0 V _{dc}) (I _C = 1.0 A _{dc} , V _{CE} = 3.0 V _{dc}) (I _C = 2.0 A _{dc} , V _{CE} = 3.0 V _{dc}) (I _C = 4.0 A _{dc} , V _{CE} = 3.0 V _{dc})	h _{FE}	40 25 20 5.0	250 - - -	-
Collector-Emitter Saturation Voltage (I _C = 500 mA _{dc} , I _B = 50 mA _{dc}) (I _C = 1.0 A _{dc} , I _B = 100 mA _{dc}) (I _C = 2.0 A _{dc} , I _B = 200 mA _{dc}) (I _C = 4.0 A _{dc} , I _B = 800 mA _{dc})	V _{CE(sat)}	- - - -	0.4 0.6 0.8 2.5	V _{dc}
Base-Emitter Saturation Voltage (I _C = 2.0 A _{dc} , I _B = 200 mA _{dc})	V _{BE(sat)}	-	2.0	V _{dc}
Base-Emitter on Voltage (I _C = 2.0 A _{dc} , V _{CE} = 3.0 V _{dc})	V _{BE(on)}	-	1.8	V _{dc}
DYNAMIC CHARACTERISTICS				
Current-Gain - Bandwidth Product (I _C = 100 mA _{dc} , V _{CE} = 10 V _{dc} , f = 10 MHz)	f _T	50	-	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _C = 0) f = 0.1 MHz	C _{ob}	- -	50 70	pF
Small-Signal Current Gain (I _C = 200 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz)	h _{fe}	10	-	-

*Indicates JEDEC Registered Data.

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

FIGURE 2 - SWITCHING TIME TEST CIRCUIT



R_B and R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS

D₁ MUST BE FAST RECOVERY TYPE, eg.
 MBD5300 USED ABOVE I_B ≈ 100 mA
 MSD6100 USED BELOW I_B ≈ 100 mA

FOR PNP TEST CIRCUIT, REVERSE ALL POLARITIES

FIGURE 3 - TURN-ON TIME

