

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
BD176,-6,-10,-16
BD180,-6,-10
PLASTIC MEDIUM POWER
SILICON PNP TRANSISTOR

... designed for use in 5.0 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
- BD180 is complementary with BD179
- Available in h_{FE} Groups -6, -10, -16

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	BD176 BD180	V_{CEO} 45 80	Vdc
Collector-Base Voltage	BD176 BD180	V_{CBO} 45 80	Vdc
Emitter-Base Voltage		V_{EBO} 5.0	Vdc
Collector Current		I_C 3.0	Adc
Base Current		I_B 1.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C		P_D 30 240	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	°C

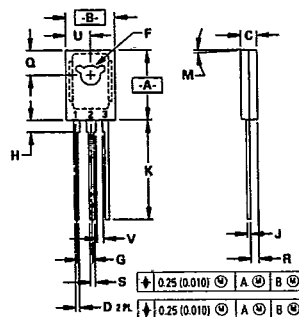
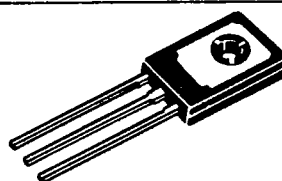
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	4.16	°C/W

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

Characteristic	Symbol	Min	Max	Unit
Collector-Emitter Sustaining Voltage* ($I_C = 0.1$ Adc, $I_B = 0$)	BD176 BD180	$V_{(BR)CEO}$ 45 80	—	Vdc
Collector Cutoff Current ($V_{CB} = 45$ Vdc, $I_E = 0$) ($V_{CB} = 80$ Vdc, $I_E = 0$)	BD176 BD180	I_{CBO} — —	0.1 0.1	mA
Emitter Cutoff Current ($V_{BE} = 5.0$ Vdc, $I_C = 0$)		I_{EBO} —	1.0	mA
DC Current Gain ($I_C = 0.15$ A, $V_{CE} = 2.0$ V) ($I_C = 1.0$ A, $V_{CE} = 2.0$ V)	-6 group -10 -16	h_{FE} 40 63 100 15	100 160 250 —	
Collector-Emitter Saturation Voltage* ($I_C = 1.0$ Adc, $I_B = 0.1$ Adc)		$V_{CE(sat)}$ —	0.8	Vdc
Base-Emitter On Voltage* ($I_C = 1.0$ Adc, $V_{CE} = 2.0$ Vdc)		$V_{BE(on)}$ —	1.3	Vdc
Current-Gain — Bandwidth Product ($I_C = 250$ mA, $V_{CE} = 10$ Vdc, $f = 1.0$ MHz)		f_T 3.0	—	MHz

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

3.0 AMPERES
POWER TRANSISTOR
PNP SILICON
45, 80 VOLTS
30 WATTS


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

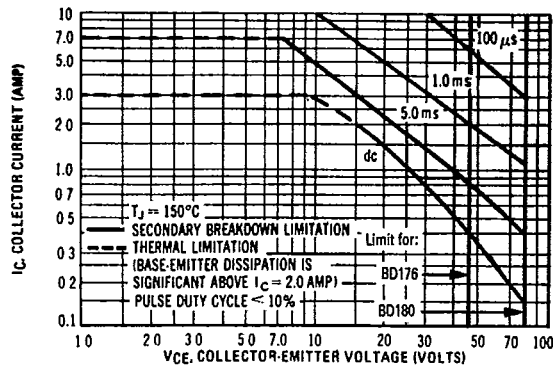
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.80	11.04	0.425	0.435
B	7.50	7.74	0.295	0.305
C	2.42	2.66	0.095	0.105
D	0.51	0.66	0.020	0.026
F	2.93	3.17	0.115	0.125
G	2.29 BSC		0.094 BSC	
H	1.27	2.41	0.050	0.095
J	0.39	0.63	0.015	0.025
K	14.61	16.63	0.575	0.655
M	3° TYP		3° TYP	
Q	3.76	4.01	0.148	0.158
R	1.15	1.39	0.045	0.055
S	0.64	0.88	0.025	0.035
U	3.69	3.93	0.145	0.155
V	1.02	—	0.040	—

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

CASE 77-06
TO-225AA TYPE

BD176,-6,-10,-16, BD180,-6,-10

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

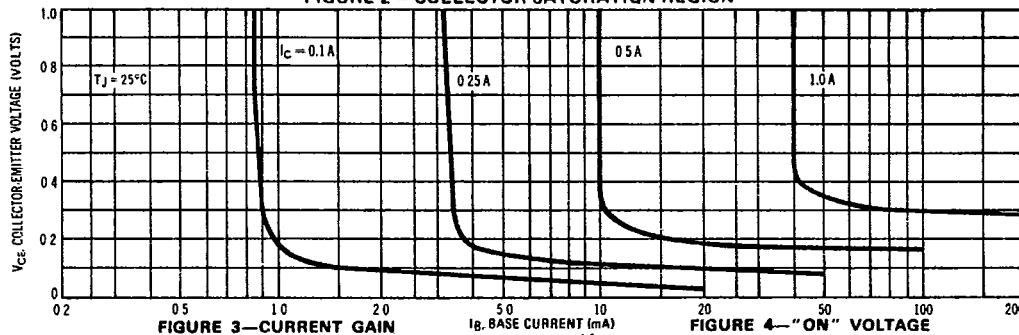


FIGURE 3 - CURRENT GAIN

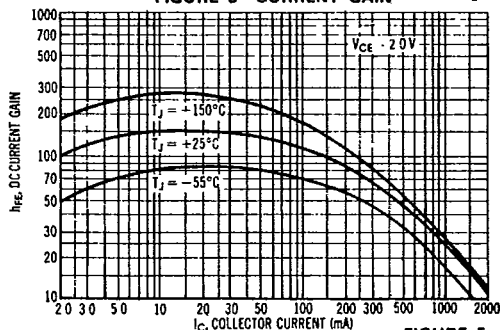


FIGURE 4 - "ON" VOLTAGE

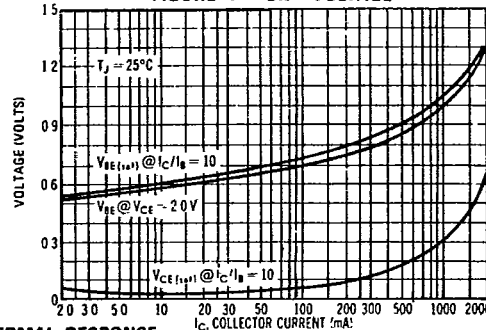


FIGURE 5 - THERMAL RESPONSE

