BD777

Plastic Darlington Complementary Silicon Power Transistors

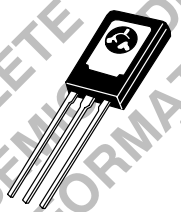
Plastic Darlington complementary silicon power transistors designed for general purpose amplifier and high−speed switching applications.

- High DC Current Gain
  h_{FE} = 1400 (Typ) @ I_C
  = 2.0 Adc
- Collector−Emitter Sustaining Voltage — @ 10 mAdc
  $V_{CEO(sus)}$ = 45 Vdc (Min) — BD776
  = 60 Vdc (Min) — BD777, 778
  = 80 Vdc (Min) — BD780
- Reverse Voltage Protection Diode
- Monolithic Construction with Built−in Base−Emitter output Resistor

ON Semiconductor®

http://onsemi.com

DARLINGTON
4−AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
45, 60, 80 VOLTS
15 WATTS



CASE 77−08
TO−225AA TYPE

MAXIMUM RATINGS

Rating	Symbol	BD776	BD777 BD778	BD780	Unit
Collector−Emitter Voltage	V_{CEO}	45	60	80	Vdc
Collector−Base Voltage	V_{CB}	45	60	80	Vdc
Emitter−Base Voltage	V_{EB}	5.0			Vdc
Collector Current — Continuous Peak	I_C	4.0 6.0			Adc
Base Current	I_B	100			mAdc
Total Device Dissipation T_C = 25°C Derate above 25°C	P_D	15 0.12			W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150			°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	8.34	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	83.3	°C/W

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

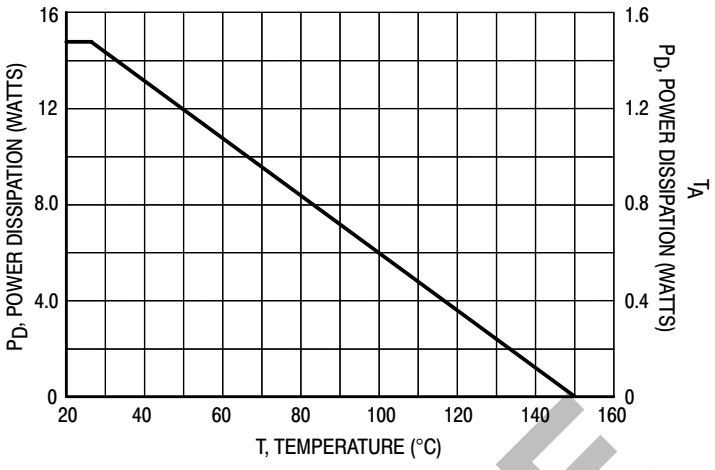


Figure 1. Power Derating

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Sustaining Voltage (1) (I_O = 10 mAdc, I_B = 0)	BD776 BD777, BD778 BD780	$V_{CEO(sus)}$	45 60 80	— — —	Vdc
Collector Cutoff Current (V_{CE} = 20 Vdc, I_B = 0) (V_{CE} = 30 Vdc, I_B = 0) (V_{CE} = 40 Vdc, I_B = 0)	 BD776 BD777, BD778 BD780	I_{CEO}	 — — —	 100 100 100	μAdc
Collector Cutoff Current (V_{CB} = Rated, $V_{CEO(sus)}$, I_E = 0) (V_{CB} = Rated, $V_{CEO(sus)}$, I_E = 0, I_C = 100°C)		I_{CBO}	 — —	 1.0 100	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	1.0	μAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 2.0 Adc, V_{CE} = 3.0 Vdc)		H_{FE}	750	—	
Collector−Emitter Saturation Voltage (I_C = 1.5 Adc, I_B = 6 mAdc)		$V_{CE(Sat)}$	—	1.5	Vdc
Base Emitter Saturation Voltage (I_C = 1.5 Adc, I_B = 6 mAdc)		$V_{BE(Sat)}$	—	2.5	Vdc
Base−Emitter On Voltage (I_C = 1.5 Adc,V_{CE} = 3 Vdc)		$V_{BE(On)}$	—	2.3	Vdc
Output Diode Voltage Drop (I_{EC} = 2.0 Adc)		V_{EC}	—	2.0	Vdc
DYNAMIC CHARACTERISTICS					
Current Gain Bandwidth Product (I_C = 1.0 Adc, V_{CE} = 2.0 Vdc)		f_T	20	—	MHz
		Symbol	**Min**	**Typ**	**Unit**
Turn−On Time (I_C = 250 mA/V_{CE} = 2 V)	BD775−777 BD776−778−780	t_{on}	— —	250 150	ns
Turn−Off Time (I_C = 250 mA, V_{CE} = 2 V)	BD775−777 BD776−778−780	t_{off}	— —	600 400	ns

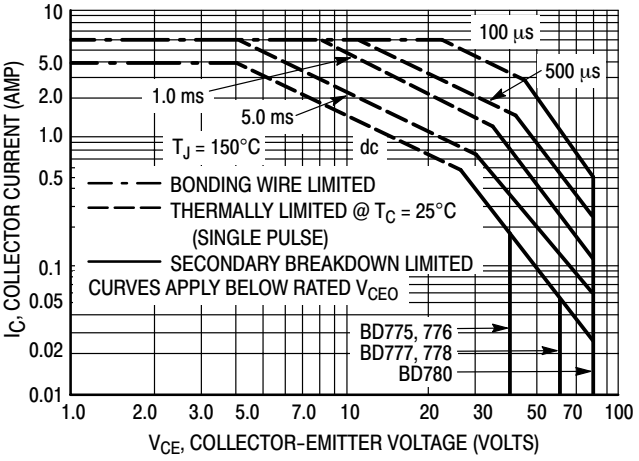


Figure 2. Active Region Safe Operating Area

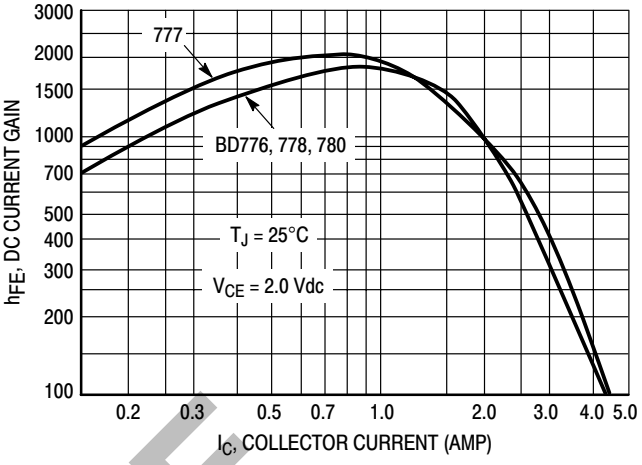


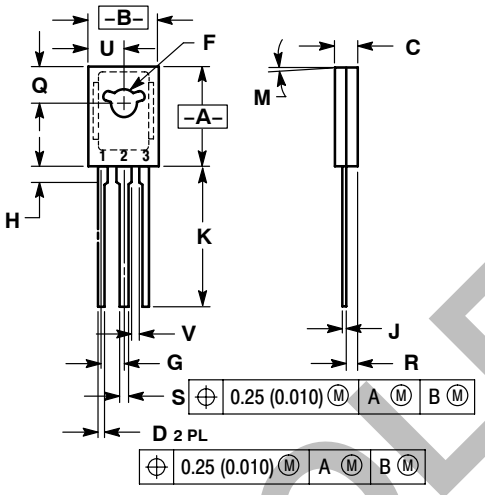
Figure 3. Typical DC Current Gain

Figure 4. Darlington Circuit Schematic

BD777

PACKAGE DIMENSIONS

CASE 77−08
TO−225AA TYPE
ISSUE V



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

	INCHES		MILLIMETERS	
DIM	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	0.055	1.15	1.39
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:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

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