BD136, BD138, BD140

Plastic Medium Power Silicon PNP Transistor

This series of plastic, medium−power silicon PNP transistors are designed for use as audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

Features

- Pb−Free Packages are Available*
- DC Current Gain − h_{FE} = 40 (Min) @ I_C = 0.15 Adc
- BD 136, 138, 140 are complementary with BD 135, 137, 139

ON Semiconductor®

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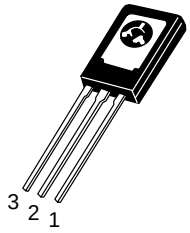
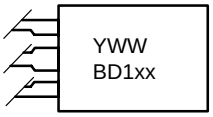
1.5 A POWER TRANSISTORS PNP SILICON 45, 60, 80 V, 12.5 W



TO−225AA
CASE 77
STYLE 1

MARKING DIAGRAM



xx = 36, 38, 40
Y = Year
WW = Work Week

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Collector−Emitter Voltage	BD136 BD138 BD140	V_{CEO}	45 60 80	Vdc
Collector−Base Voltage	BD136 BD138 BD140	V_{CBO}	45 60 100	Vdc
Emitter−Base Voltage		V_{EBO}	5.0	Vdc
Collector Current		I_C	1.5	Adc
Base Current		I_B	0.5	Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C		P_D	1.25 10	Watts mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C		P_D	12.5 100	Watts mW/°C
Operating and Storage Junction Temperature Range		T_J, T_{stg}	−55 to +150	°C

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.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	θ_{JC}	10	°C/W
Thermal Resistance, Junction−to−Ambient	θ_{JA}	100	°C/W

ORDERING INFORMATION

Device	Package	Shipping†
BD136	TO−225AA	500 Units/Box
BD136G	TO−225AA (Pb−Free)	500 Units/Box
BD138	TO−225AA	500 Units/Box
BD138G	TO−225AA (Pb−Free)	500 Units/Box
BD140	TO−225AA	500 Units/Box
BD140G	TO−225AA (Pb−Free)	500 Units/Box

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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

Characteristic	Symbol	Type	Min	Max	Unit
Collector−Emitter Sustaining Voltage* (I_C = 0.03 Adc, I_B = 0)	BV_{CEO}	BD 136 BD 138 BD 140	45 60 80	– – –	Vdc
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0) (V_{CB} = 30 Vdc, I_E = 0, T_C = 125 °C)	I_{CBO}		– –	0.1 10	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)	I_{EBO}		–	10	μAdc
DC Current Gain (I_C = 0.005 A, V_{CE} = 2 V) (I_C = 0.15 A, V_{CE} = 2 V) (I_C = 0.5 A, V_{CE} = 2 V)	h_{FE}*		25 40 25	– 250 –	–
Collector−Emitter Saturation Voltage* (I_C = 0.5 Adc, I_B = 0.05 Adc)	$V_{CE(sat)}$*		–	0.5	Vdc
Base−Emitter On Voltage* (I_C = 0.5 Adc, V_{CE} = 2.0 Vdc)	$V_{BE(on)}$*		–	1	Vdc

*Pulse Test: Pulse Width ≦ 300 μs, Duty Cycle ≦ 2.0%.

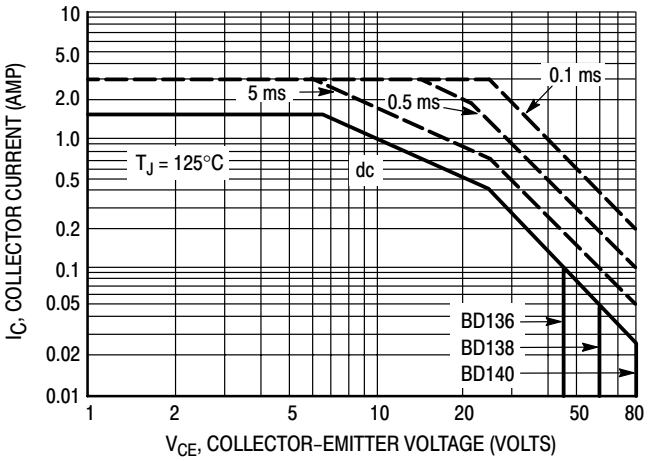
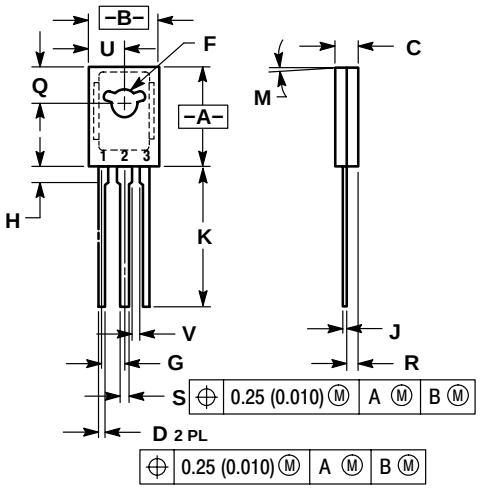


Figure 1. Active−Region Safe Operating Area

PACKAGE DIMENSIONS

TO−225AA
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.

	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	0.065	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:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
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ON Semiconductor Website: http://onsemi.com

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For additional information, please contact your local Sales Representative.

BD136/D