chanhvinh.com

BD136G, BD138G, BD140G

Plastic Medium-Power Silicon PNP Transistors

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

- High DC Current Gain
- BD 136, 138, 140 are complementary with BD 135, 137, 139
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage BD136G BD138G BD140G	V_{CEO}	 45 60 80	Vdc
Collector−Base Voltage BD136G BD138G BD140G	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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

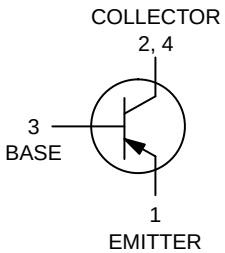
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	10	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	100	°C/W

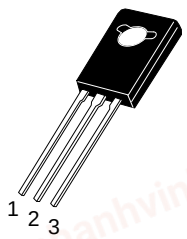
*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor®

http://onsemi.com

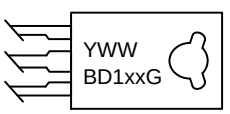
1.5 A POWER TRANSISTORS
PNP SILICON
45, 60, 80 V, 12.5 W





TO−225
CASE 77−09
STYLE 1

MARKING DIAGRAM



Y = Year
WW = Work Week
BD1xx = Device Code
xx = 36, 38, 40
G = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping
BD136G	TO−225 (Pb−Free)	500 Units/Box
BD138G	TO−225 (Pb−Free)	500 Units/Box
BD140G	TO−225 (Pb−Free)	500 Units/Box

© Semiconductor Components Industries, LLC, 2013

chanhvinh.com

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

Characteristic	Symbol	Min	Max	Unit
Collector−Emitter Sustaining Voltage (Note 1) (I_C = 0.03 Adc, I_B = 0) BD136G BD138G BD140G	BV_{CEO}	 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 (Note 1) (I_C = 0.5 Adc, I_B = 0.05 Adc)	$V_{CE(sat)}$*	 −	 0.5	Vdc
Base−Emitter On Voltage (Note 1) (I_C = 0.5 Adc, V_{CE} = 2.0 Vdc)	$V_{BE(on)}$*	 −	 1	Vdc

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

TYPICAL CHARACTERISTICS

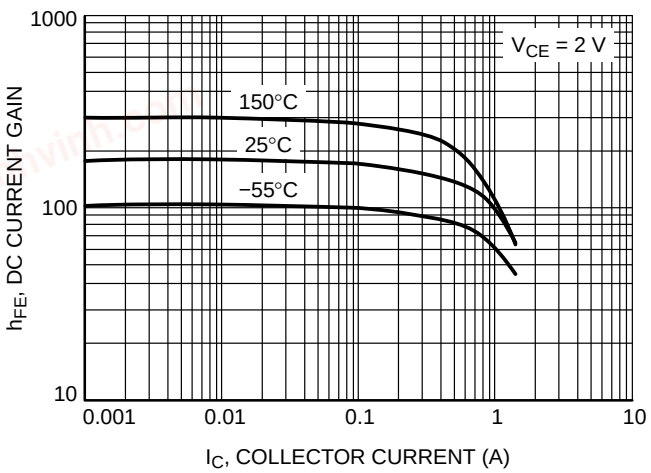


Figure 1. DC Current Gain

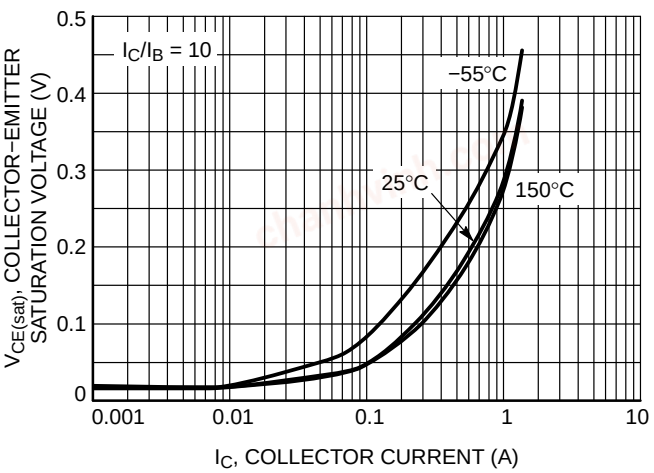


Figure 2. Collector−Emitter Saturation Voltage

chanhvinh.com

TYPICAL CHARACTERISTICS

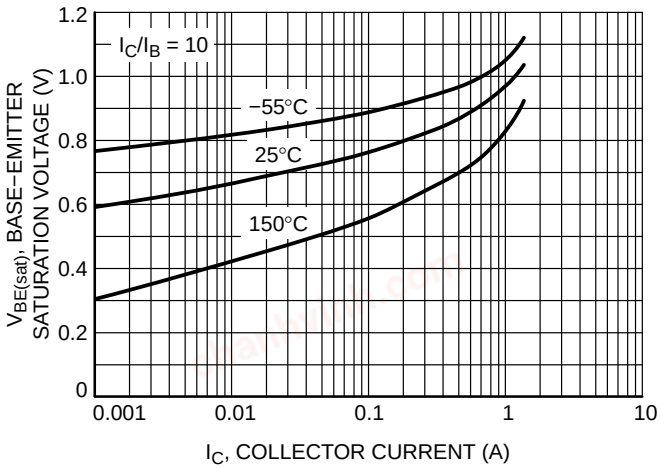


Figure 3. Base−Emitter Saturation Voltage

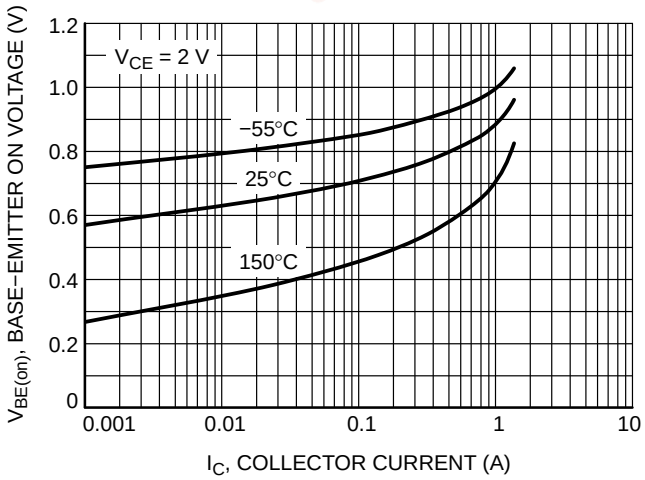


Figure 4. Base−Emitter On Voltage

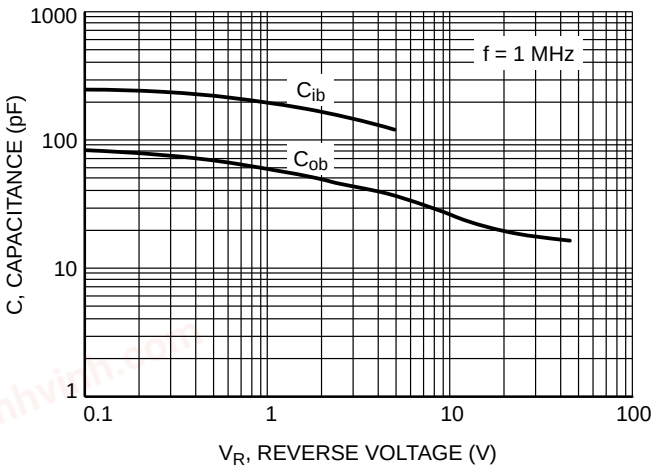


Figure 5. Capacitance

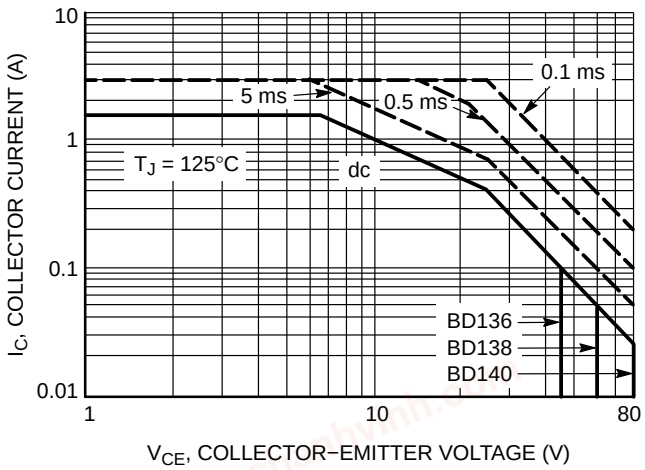


Figure 6. Active−Region Safe Operating Area

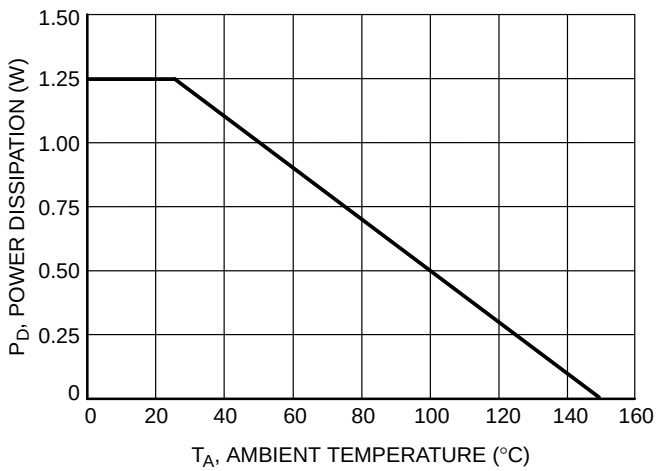
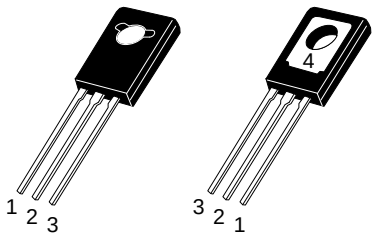


Figure 7. Power Derating

chanhvinh.com

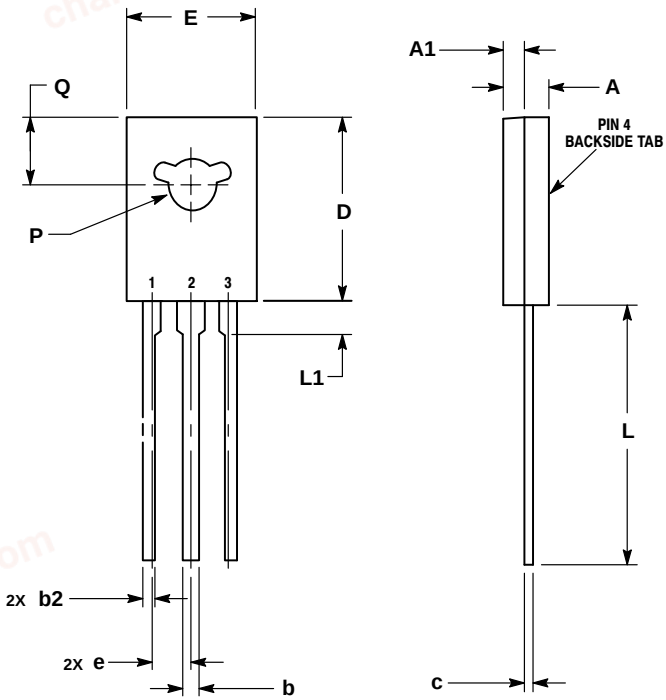
BD136G, BD138G, BD140G

PACKAGE DIMENSIONS



FRONT VIEW BACK VIEW

TO−225
CASE 77−09
ISSUE AC



FRONT VIEW SIDE VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. NUMBER AND SHAPE OF LUGS OPTIONAL.

	MILLIMETERS	
DIM	MIN	MAX
A	2.40	3.00
A1	1.00	1.50
b	0.60	0.90
b2	0.51	0.88
c	0.39	0.63
D	10.60	11.10
E	7.40	7.80
e	2.04	2.54
L	14.50	16.63
L1	1.27	2.54
P	2.90	3.30
Q	3.80	4.20

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

ON Semiconductor and ON are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

BD136/D