BD135G, BD137G, BD139G

Plastic Medium-Power Silicon NPN Transistors

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

Features

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

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage BD135G BD137G BD139G	V_{CEO}	 45 60 80	Vdc
Collector−Base Voltage BD135G BD137G BD139G	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.

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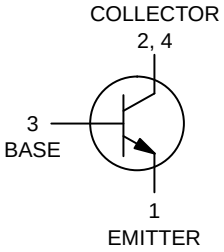
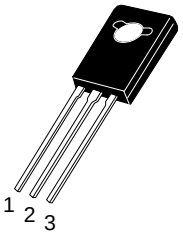
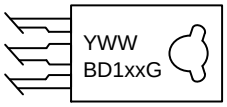
1.5 A POWER TRANSISTORS NPN SILICON 45, 60, 80 V, 12.5 W





TO−225
CASE 77−09
STYLE 1

MARKING DIAGRAM



Y = Year
WW = Work Week
BD1xx = Device Code
xx = 35, 37, 39
G = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping
BD135G	TO−225 (Pb−Free)	500 Units / Box
BD135TG	TO−225 (Pb−Free)	50 Units / Rail
BD137G	TO−225 (Pb−Free)	500 Units / Box
BD139G	TO−225 (Pb−Free)	500 Units / Box

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

Characteristic	Symbol	Min	Max	Unit
Collector−Emitter Sustaining Voltage* (I_C = 0.03 Adc, I_B = 0) BD135G BD137G BD139G	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* (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

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.

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

TYPICAL CHARACTERISTICS

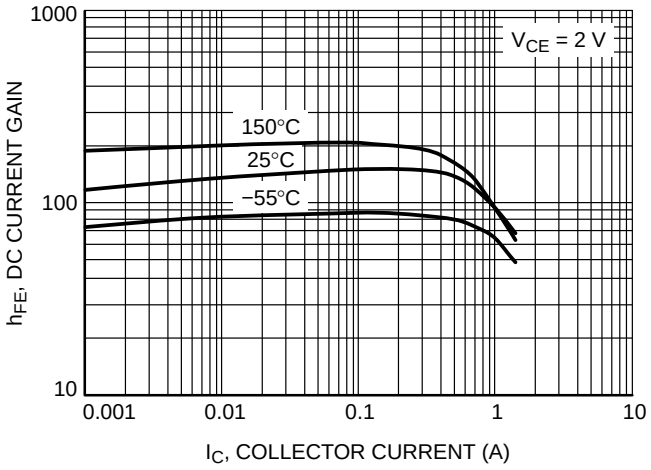


Figure 1. DC Current Gain

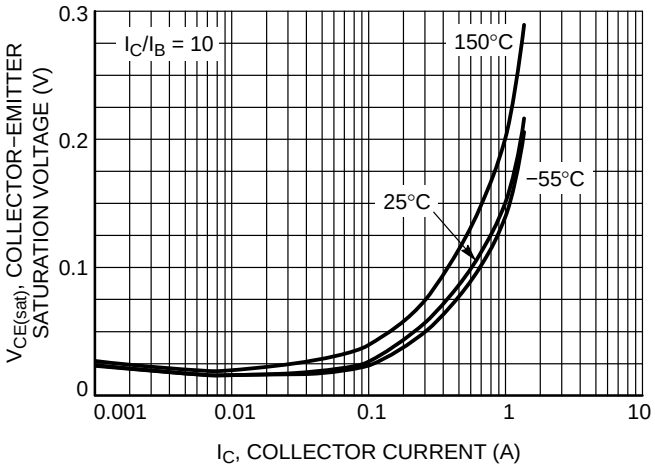


Figure 2. Collector−Emitter Saturation Voltage

TYPICAL CHARACTERISTICS

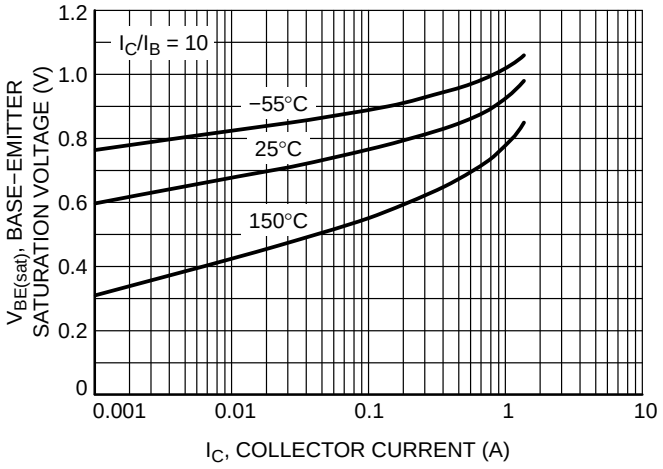


Figure 3. Base−Emitter Saturation Voltage

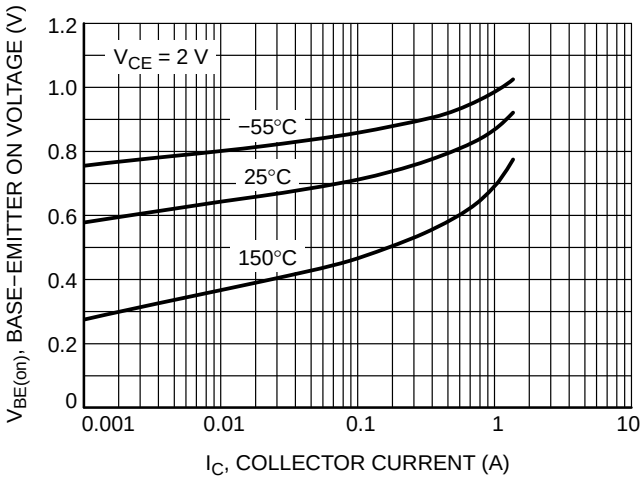


Figure 4. Base−Emitter On Voltage

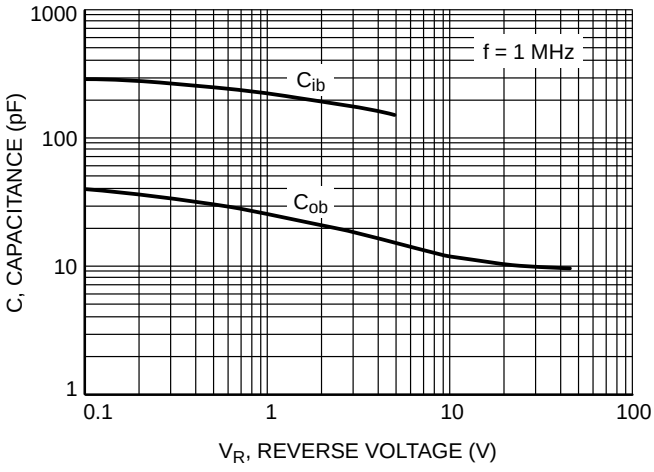


Figure 5. Capacitance

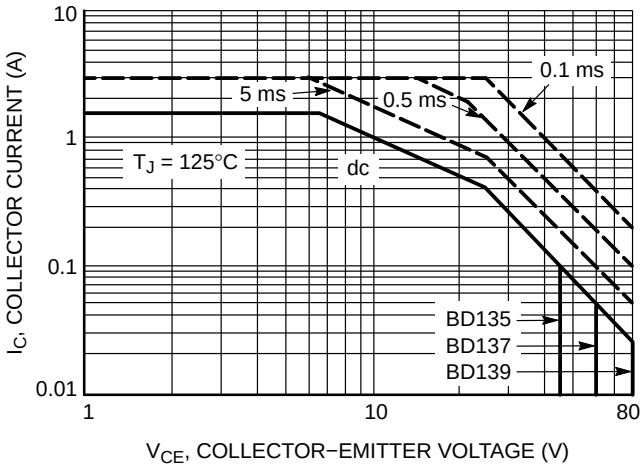


Figure 6. Active−Region Safe Operating Area

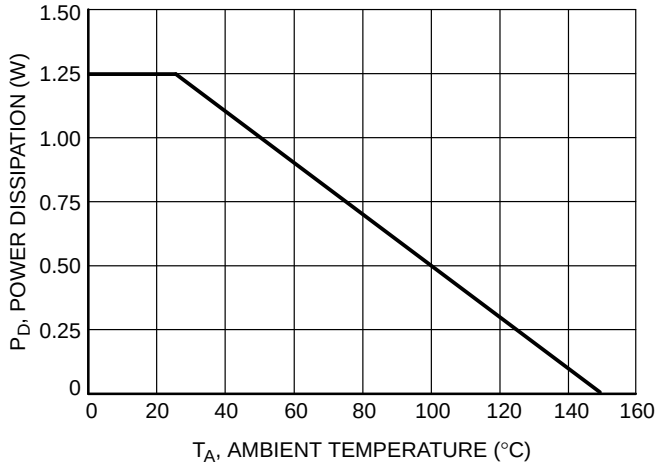


Figure 7. Power Derating

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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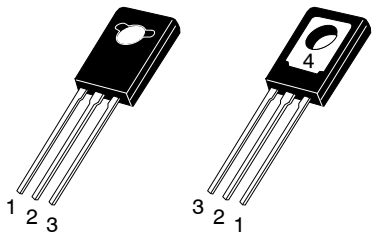
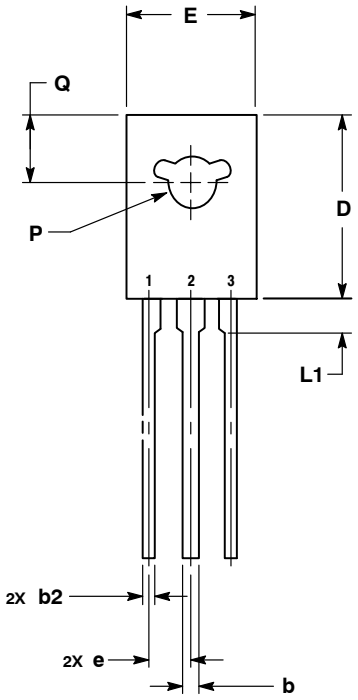
DATE 25 MAR 2015

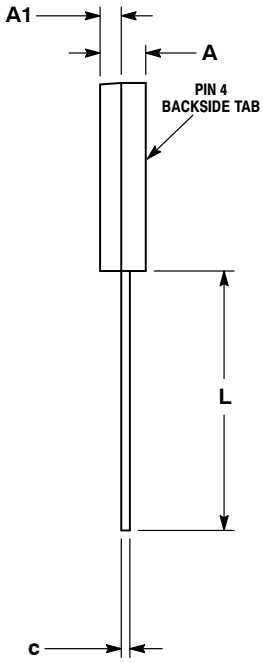


FRONT VIEW **BACK VIEW**

SCALE 1:1



FRONT VIEW

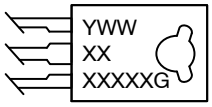


SIDE VIEW

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

GENERIC MARKING DIAGRAM*



Y = Year
WW = Work Week
XXXXX = Device Code
G = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

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

STYLE 2:
PIN 1. CATHODE
2., 4. ANODE
3. GATE

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

STYLE 4:
PIN 1. ANODE 1
2., 4. ANODE 2
3. GATE

STYLE 5:
PIN 1. MT 1
2., 4. MT 2
3. GATE

STYLE 6:
PIN 1. CATHODE
2., 4. GATE
3. ANODE

STYLE 7:
PIN 1. MT 1
2., 4. GATE
3. MT 2

STYLE 8:
PIN 1. SOURCE
2., 4. GATE
3. DRAIN

STYLE 9:
PIN 1. GATE
2., 4. DRAIN
3. SOURCE

STYLE 10:
PIN 1. SOURCE
2., 4. DRAIN
3. GATE

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