PNP Epitaxial Silicon Transistor

BD136 Series

BD136 / BD138 / BD140

Applications

- Complement to BD135, BD137 and BD139 Respectively
- These are Pb−Free Devices

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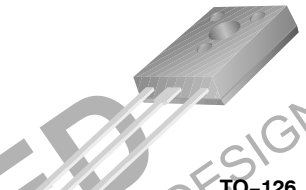

TO−126
CASE 340AS

1 2 3

1 Emitter
2 Collector
3 Base

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Rating	Symbol	Max	Unit
Collector−Base Voltage BD136 BD138 BD140	V_{CBO}	 −45 −60 −80	V
Collector−Emitter Voltage BD136 BD138 BD140	V_{CEO}	 −45 −60 −80	V
Emitter−Base Voltage	V_{EBO}	−5	V
Collector Current (DC)	I_C	−1.5	A
Collector Current (Pulse)	I_{CP}	−3.0	A
Base Current	I_B	−0.5	A

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

Rating	Symbol	Max	Unit
Collector Dissipation	P_C	12.5	W
Collector Dissipation (T_A = 25°C)	P_C	1.25	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	−55~150	°C

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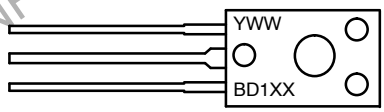
MARKING DIAGRAM



Y = Year
WW = Work Week
BD1XX = Specific Device Code
XX = 36, 38, 40

ORDERING INFORMATION

Device	Package	Shipping
BD13610STU	TO−126 (Pb−Free)	60 Units/ Tube
BD13610S		500 Units/ Bulk Box
BD13616STU		60 Units/ Tube
BD13616S		500 Units/ Bulk Box
BD13810STU		60 Units/ Tube
BD13816STU		60 Units/ Tube
BD14010STU		60 Units/ Tube
BD14016STU		60 Units/ Tube
BD14016S		500 Units/ Bulk Box

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V_{CEO}(sus)	Collector−Emitter Sustaining Voltage (Note 1) BD136 BD138 BD140	I_C = −30 mA, I_B = 0	 −45 −60 −80			V
I_{CBO}	Collector Cut−off Current	V_{CB} = −30 V, I_E = 0			−0.1	μA
I_{EBO}	Emitter Cut−off Current	V_{EB} = −5 V, I_C = 0			−10	μA
h_{FE1}	DC Current Gain (Note 1)	V_{CE} = −2 V, I_C = −5 mA	25			
h_{FE2}		V_{CE} = −2 V, I_C = −150 mA BD13610/BD13810/BD14010 BD13616/BD13816/BD14016	 63 100		 160 250	
h_{FE3}		V_{CE} = −2 V, I_C = −500 mA	25			
V_{CE}(sat)	Collector−Emitter Saturation Voltage (Note 1)	I_C = 500 mA, I_B = 50 mA			−0.5	V
V_{BE}(on)	Base−Emitter ON Voltage (Note 1)	V_{CE} = −2 V, I_C = −0.5 A			−1	V

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: PW = 350 μs, duty Cycle = 2% Pulsed

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TYPICAL PERFORMANCE CHARACTERISTICS

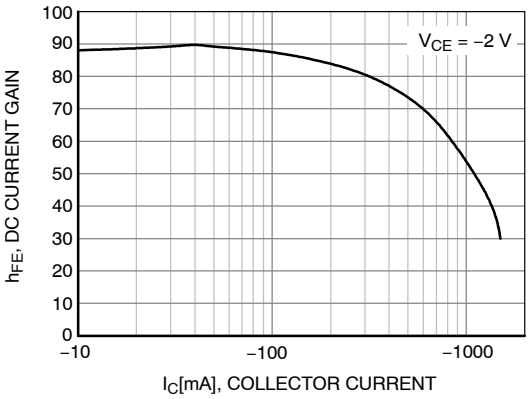

Figure 1. DC Current Gain

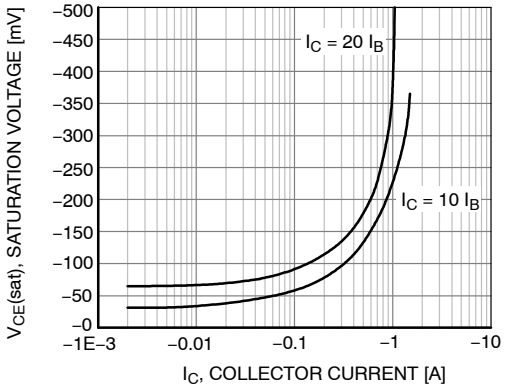

Figure 2. Collector−Emitter Saturation Volatage

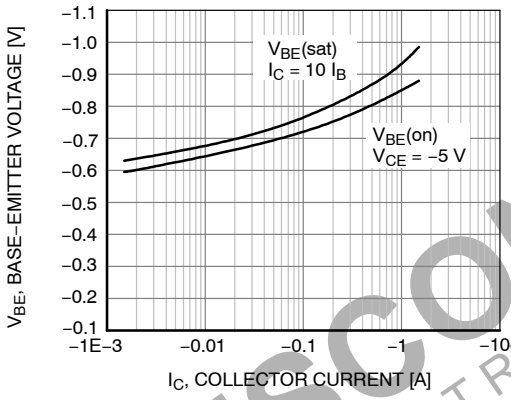

Figure 3. Base−Emitter Voltage

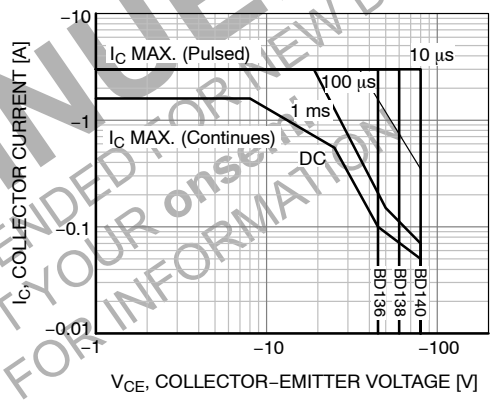

Figure 4. Safe Operating Area

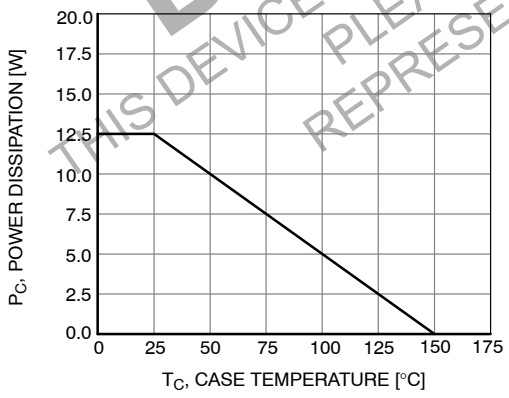

Figure 5. Power Derating

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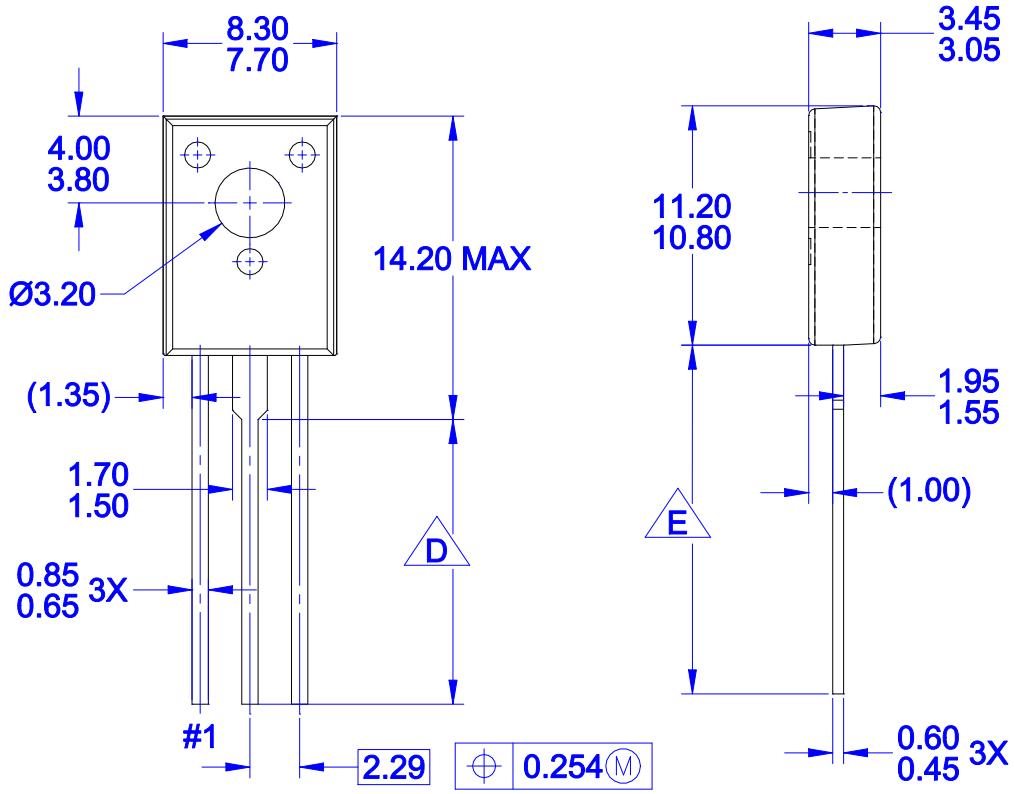
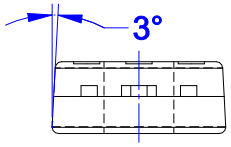


TOP VIEW

SIDE VIEW



FRONT VIEW

PRODUCTION CODE	TERMINAL LENGTH "D"	TERMINAL LENGTH "E"
TSSTU	3.45 - 4.05	6.45 - 7.45
TSTU	2.36 - 2.96	5.36 - 6.36
NONE (STD LENGTH)	12.76 - 13.36	15.76 - 16.76

NOTES:

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B. ALL DIMENSIONS ARE IN MILLIMETERS
C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS

D FOR TERMINAL LENGTH "D", REFER TO TABLE

E FOR TERMINAL LENGTH "E", REFER TO TABLE

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