



# BD136 BD138/BD140

## PNP SILICON TRANSISTORS

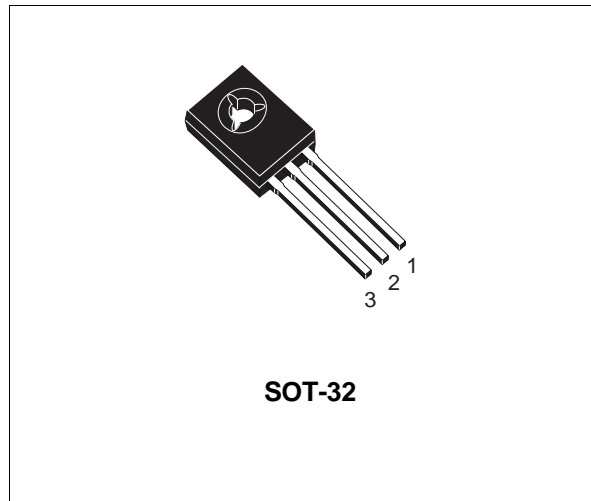
Type	Marking
BD136	BD136
BD136-10	BD136-10
BD136-16	BD136-16
BD138	BD138
BD140	BD140
BD140-10	BD140-10
BD140-16	BD140-16

- STMicroelectronics PREFERRED SALESTYPES
- PNP TRANSISTOR

### DESCRIPTION

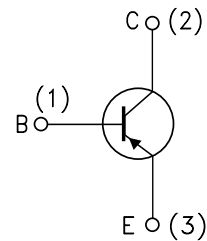
The BD136, BD138 and BD140 are silicon Epitaxial Planar PNP transistors mounted in Jedec SOT-32 plastic package, designed for audio amplifiers and drivers utilizing complementary or quasi-complementary circuits.

The complementary NPN types are the BD135, BD137 and BD139.



SOT-32

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BD136	BD138	BD140	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-45	-60	-80	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-45	-60	-80	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	-5			V
$I_C$	Collector Current	-1.5			A
$I_{CM}$	Collector Peak Current	-3			A
$I_B$	Base Current	-0.5			A
$P_{tot}$	Total Dissipation at $T_c \leq 25^\circ\text{C}$	12.5			W
$P_{tot}$	Total Dissipation at $T_{amb} \leq 25^\circ\text{C}$	1.25			W
$T_{stg}$	Storage Temperature	-65 to 150			$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150			$^\circ\text{C}$

# BD136 / BD138 / BD140

## THERMAL DATA

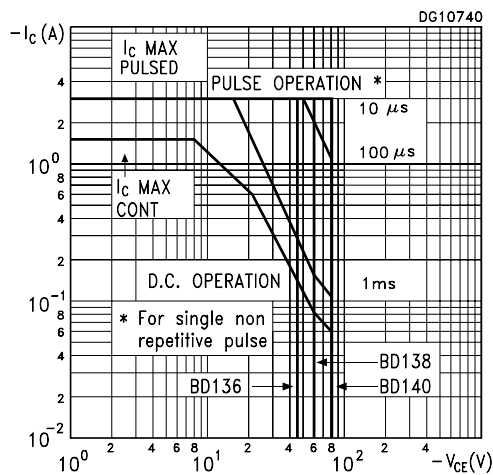
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	10	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = -30 V V <sub>CB</sub> = -30 V T <sub>C</sub> = 125 °C			-0.1 -10	μA μA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = -5 V			-10	μA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -30 mA for <b>BD136</b> for <b>BD138</b> for <b>BD140</b>	-45 -60 -80			V V V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -0.5 A I <sub>B</sub> = -0.05 A			-0.5	V
V <sub>BE*</sub>	Base-Emitter Voltage	I <sub>C</sub> = -0.5 A V <sub>CE</sub> = -2 V			-1	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = -5 mA V <sub>CE</sub> = -2 V I <sub>C</sub> = -150 mA V <sub>CE</sub> = -2 V I <sub>C</sub> = -0.5 A V <sub>CE</sub> = -2 V	25 40 25		250	
h <sub>FE</sub>	h <sub>FE</sub> Groups	I <sub>C</sub> = -150 mA V <sub>CE</sub> = -2 V for <b>BD136/BD140</b> group-10 for <b>BD136/BD140</b> group-16	63 100		160 250	

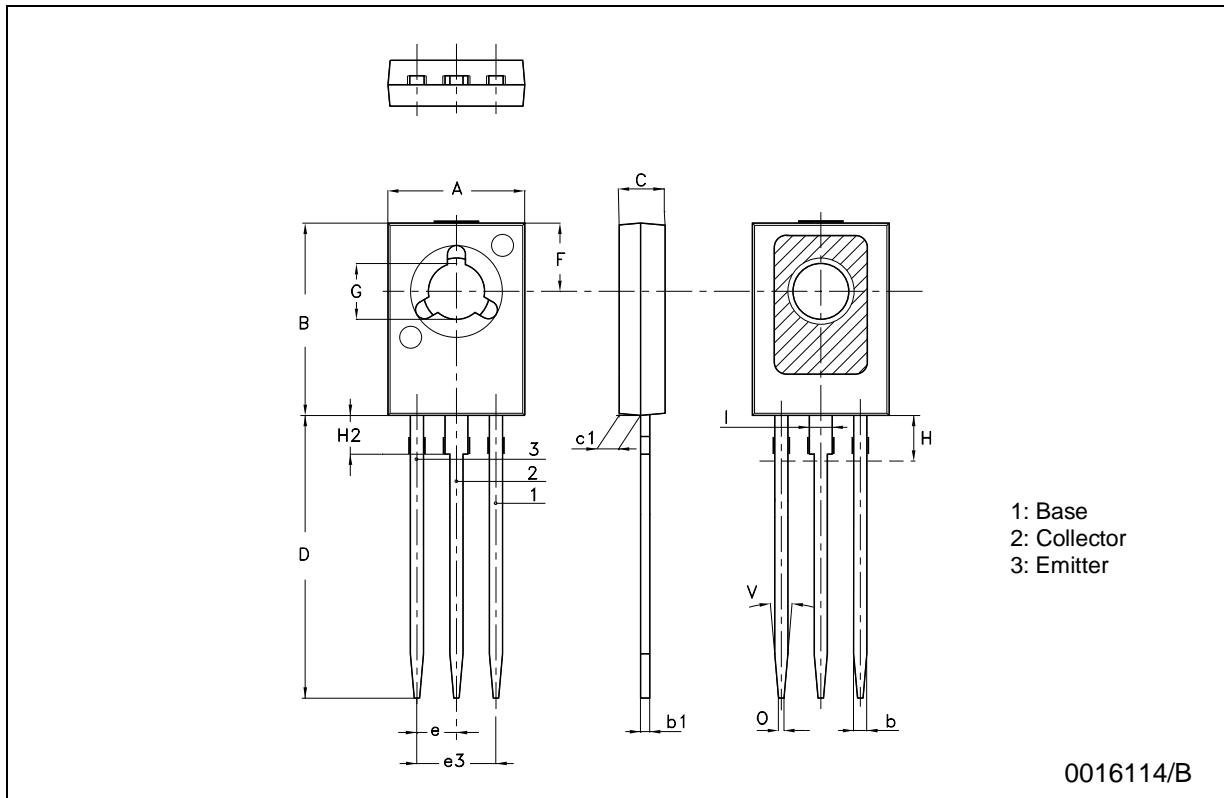
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

## Safe Operating Areas



**SOT-32 (TO-126) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.40		0.65	0.015		0.025
C	2.4		2.7	0.094		0.106
c1	1.0		1.3	0.039		0.051
D	15.4		16.0	0.606		0.630
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100
H2		2.15			0.084	
I		1.27			0.05	
O		0.3			0.011	
V		10°			10°	



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