

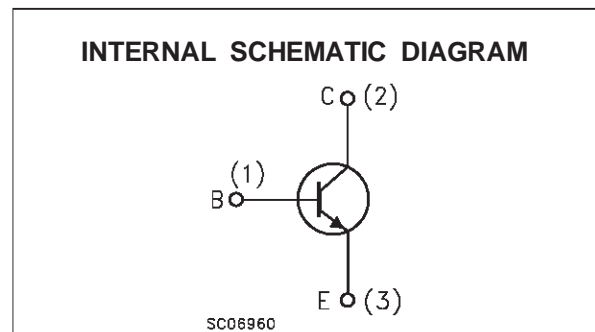
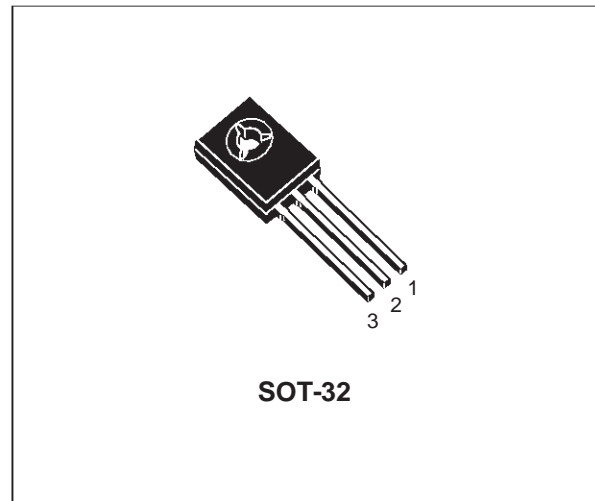
## NPN SILICON TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES

### DESCRIPTION

The BD135 and BD139 are silicon Epitaxial Planar NPN transistors mounted in Jedec SOT-32 plastic package, designed for audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

The complementary PNP types are BD136 and BD140 respectively.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BD135	BD139	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	45	80	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	45	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 $T_c \leq 25\text{ }^\circ\text{C}$	12.5		W
$P_{tot}$	Total Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$	1.25		W
$T_{stg}$	Storage Temperature	-65 to 150		$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150		$^\circ\text{C}$

# BD135 / BD139

## THERMAL DATA

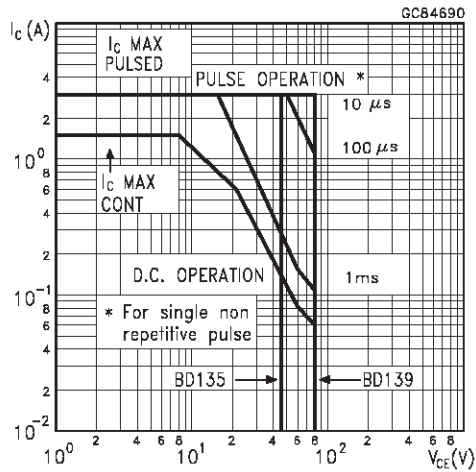
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	10	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

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>BD135</b> for <b>BD139</b>	45 80			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> = 0.5 A V <sub>CE</sub> = 2 V I <sub>C</sub> = 150 mA V <sub>CE</sub> = 2 V	25 25 40		250	
h <sub>FE</sub>	h <sub>FE</sub> Groups	I <sub>C</sub> = 150 mA V <sub>CE</sub> = 2 V for BD139 group 10	63		160	

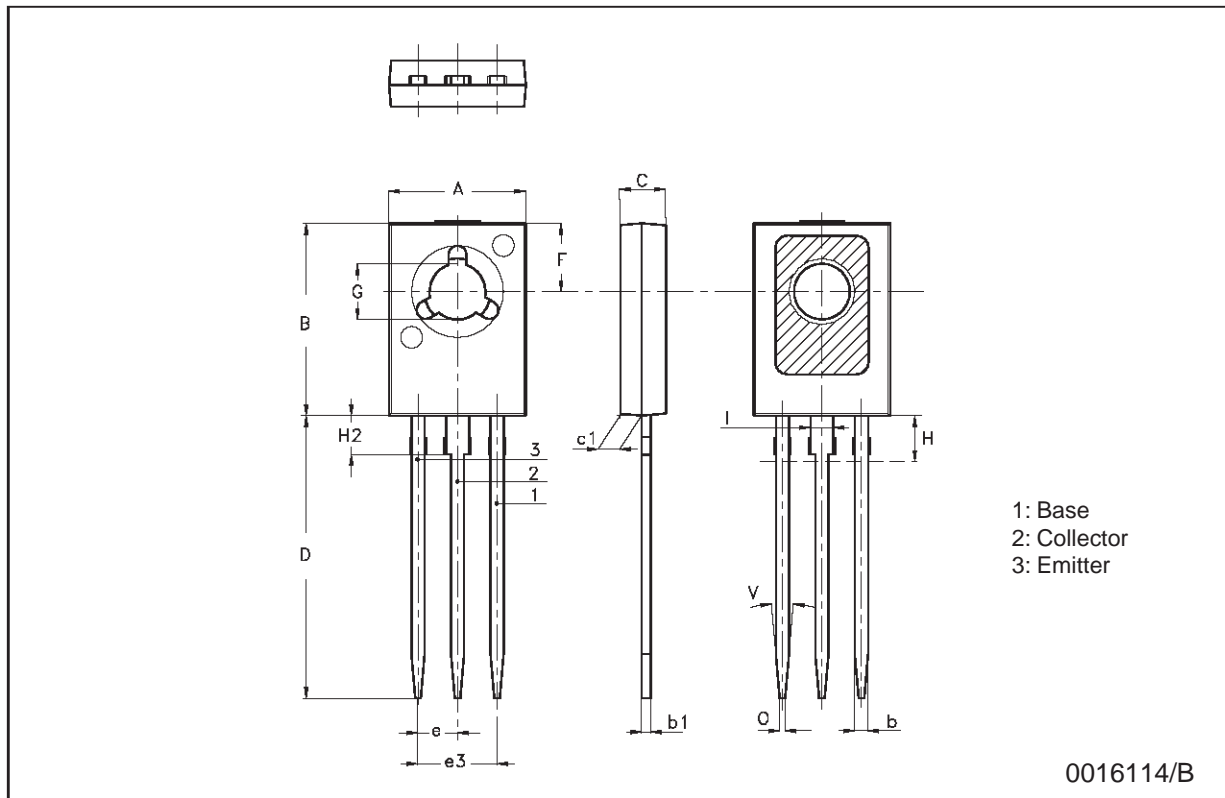
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

## Safe Operating Area



## 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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