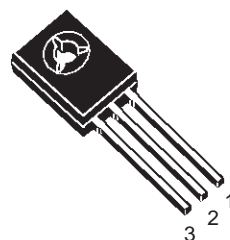


## SILICON NPN TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR

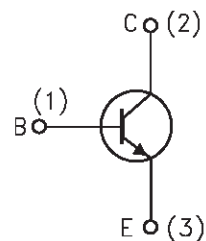
### DESCRIPTION

The 2N5657 is a silicon epitaxial-base NPN transistor in Jedec SOT-32 plastic package. It is intended for use output amplifiers, low current, high voltage converters and AC line relays.



SOT-32

### INTERNAL SCHEMATIC DIAGRAM



SC06960

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	375	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	350	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	6	V
$I_C$	Collector Current	0.5	A
$I_{CM}$	Collector Peak Current	1	A
$I_B$	Base Current	0.25	A
$P_{tot}$	Total Dissipation at $T_c \leq 25^\circ\text{C}$	20	W
$T_{stg}$	Storage Temperature	-65 to 150	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

# THERMAL DATA

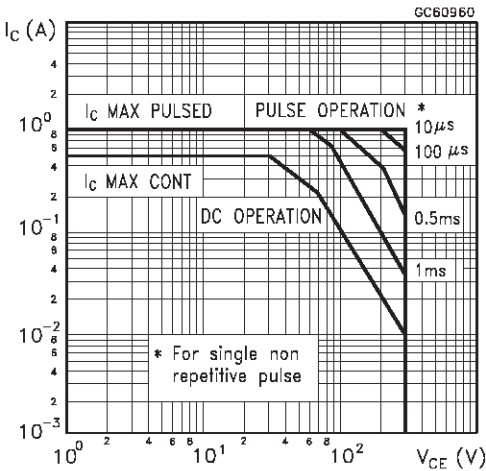
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	6.25	°C/W
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# ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

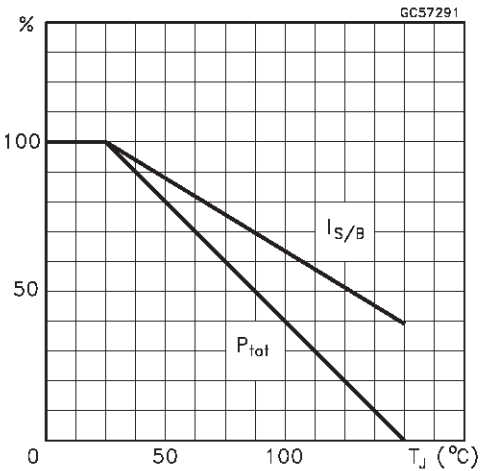
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CE</sub> = 375 V			0.01	mA
I <sub>CEV</sub>	Collector Cut-off Current (V <sub>BE</sub> = -1.5V)	V <sub>CE</sub> = 350 V V <sub>CE</sub> = 250 V T <sub>C</sub> = 100 °C			0.1 1	mA mA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> = 250 V			0.1	mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 6 V			0.01	mA
V <sub>(BR)CEO</sub> *	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 1 mA	350			V
V <sub>CEO(sus)</sub> *	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 100 mA L = 50 mH	350			V
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 0.1 A I <sub>B</sub> = 10 mA I <sub>C</sub> = 0.25 A I <sub>B</sub> = 25 mA I <sub>C</sub> = 0.5 A I <sub>B</sub> = 0.1 A			1 2.5 10	V V V
V <sub>BE</sub> *	Base-Emitter Voltage	I <sub>C</sub> = 0.1 A V <sub>CE</sub> = 10 V			1	V
h <sub>FE</sub> *	DC Current Gain	I <sub>C</sub> = 50 mA V <sub>CE</sub> = 10 V I <sub>C</sub> = 0.1 A V <sub>CE</sub> = 10 V I <sub>C</sub> = 0.25 A V <sub>CE</sub> = 10 V I <sub>C</sub> = 0.5 A V <sub>CE</sub> = 10 V	25 30 15 5		250	
h <sub>fe</sub>	Small Signal Current Gain	I <sub>C</sub> = 0.1 A V <sub>CE</sub> = 10 V f = 1KHz	20			
f <sub>T</sub>	Transition frequency	I <sub>C</sub> = 50 mA V <sub>CE</sub> = 10 V f = 10MHz	10			MHz
C <sub>CBO</sub>	Collector Base Capacitance	V <sub>CB</sub> = 10 V f = 100KHz			25	pF

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

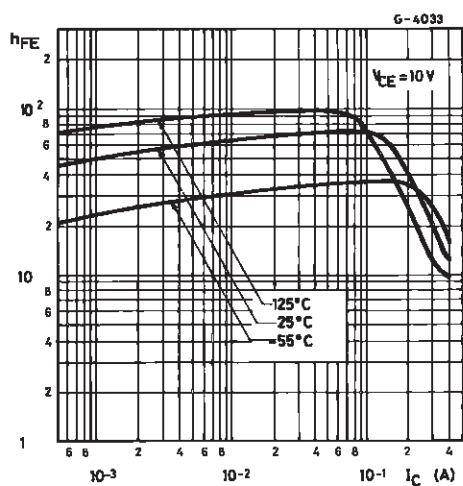
## Safe Operating Area



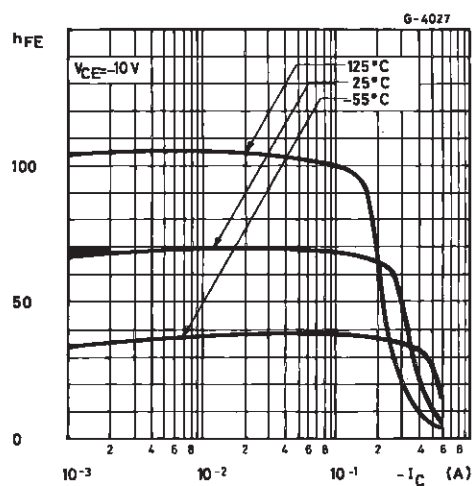
## Derating Curve



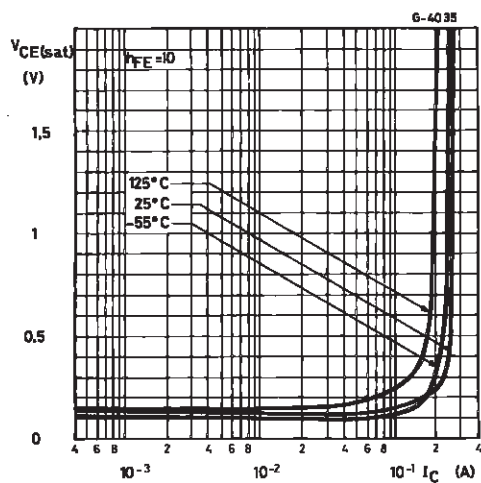
DC Current Gain (NPN type)



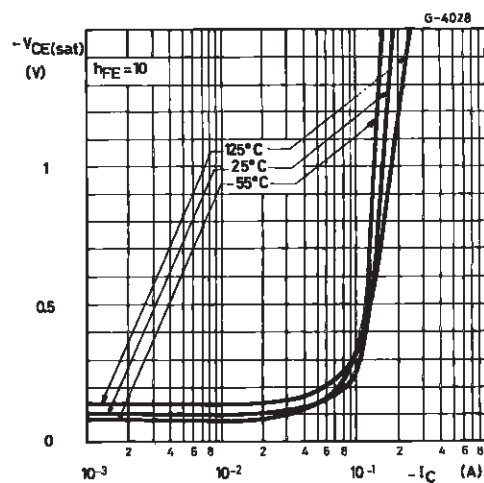
DC Current Gain (PNP type)



Collector Emitter Saturation Voltage (NPN type)

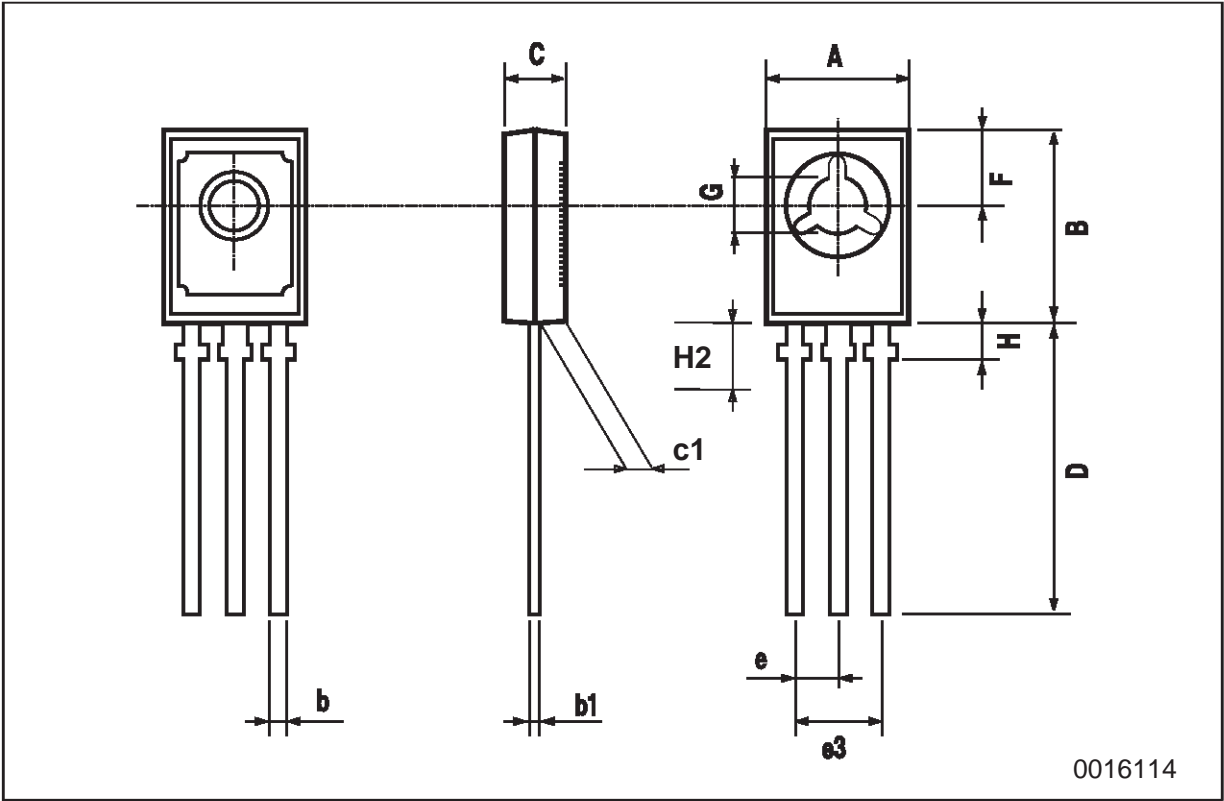


Collector Emitter Saturation Voltage (PNP type)



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		0.445
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.040		0.106
c1	1.0		1.3	0.039		0.050
D	15.4		16.0	0.606		0.629
e		2.2			0.087	
e3	4.15		4.65	0.163		0.183
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100



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