

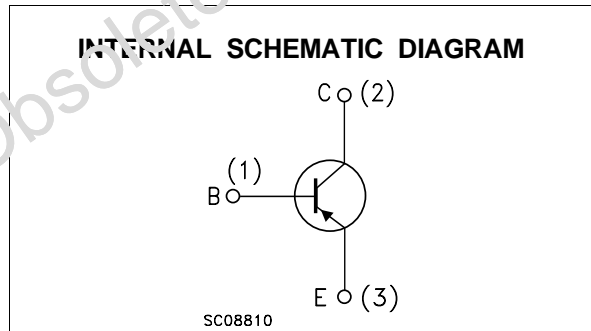
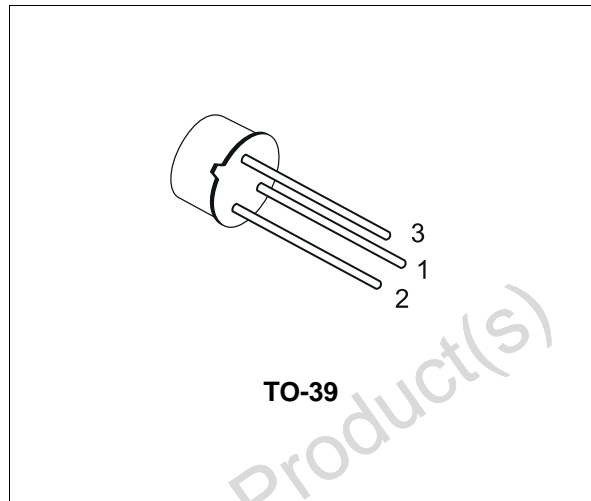


**2N4033**

## SMALL SIGNAL PNP TRANSISTOR

### DESCRIPTION

The 2N4033 is a silicon Planar Epitaxial PNP transistor in Jedec TO-39 metal case primary intended for large signal, low noise industrial applications.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-80	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-80	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	-5	V
$I_C$	Collector Current	-1	A
$P_{tot}$	Total Dissipation at $T_{amb} \leq 45\text{ }^\circ\text{C}$ at $T_C \leq 45\text{ }^\circ\text{C}$	0.8 4	W W
$T_{stg}$	Storage Temperature	-55 to 175	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	175	$^\circ\text{C}$

## THERMAL DATA

R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	37.5	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	187.5	°C/W

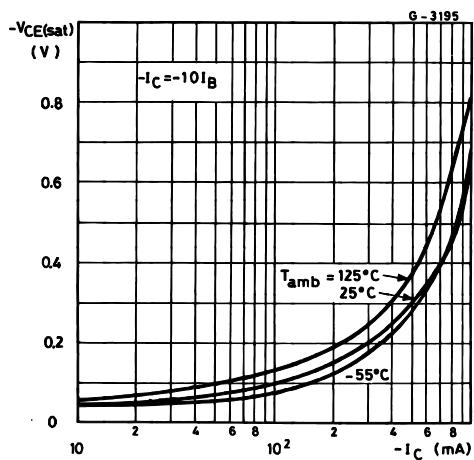
ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

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> = -60 V V <sub>CE</sub> = -60 V T <sub>C</sub> = 150 °C			-50 -50	nA μA
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = -10 μA	-80			V
V <sub>(BR)CEO*</sub>	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -10 mA	-80			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = -10 μA	-5			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -150 mA I <sub>B</sub> = -15 mA I <sub>C</sub> = -500 mA I <sub>B</sub> = -50 mA			-0.15 -0.5	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = -150 mA I <sub>B</sub> = -15 mA I <sub>C</sub> = -500 mA I <sub>B</sub> = -50 mA			-0.9 -1.1	V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = -100 μA V <sub>CE</sub> = -5 V I <sub>C</sub> = -100 mA V <sub>CE</sub> = -5 V I <sub>C</sub> = -500 mA V <sub>CE</sub> = -5 V I <sub>C</sub> = -1 A V <sub>CE</sub> = -5 V I <sub>C</sub> = -100 mA V <sub>CE</sub> = -5 V T <sub>amb</sub> = -55 °C	75 100 70 25 40		300	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = -50 mA V <sub>CE</sub> = -10 V f = 100 MHz	150		500	MHz
C <sub>EBO</sub>	Emitter-Base Capacitance	I <sub>E</sub> = 0 V <sub>EB</sub> = -0.5 V f = 1MHz			110	pF
C <sub>CBO</sub>	Collector-Base Capacitance	I <sub>C</sub> = 0 V <sub>CB</sub> = -10 V f = 1MHz			20	pF
t <sub>s**</sub>	Storage Time	I <sub>C</sub> = -500 mA V <sub>CC</sub> = -30 V I <sub>B1</sub> = -I <sub>B2</sub> = -50 mA			350	ns
t <sub>r**</sub>	Fall Time	I <sub>C</sub> = -500 mA V <sub>CC</sub> = -30 V I <sub>B1</sub> = -I <sub>B2</sub> = -50 mA			50	ns
t <sub>on**</sub>	Turn-on Time	I <sub>C</sub> = -500 mA V <sub>CC</sub> = -30 V I <sub>B1</sub> = -I <sub>B2</sub> = -50 mA			100	ns

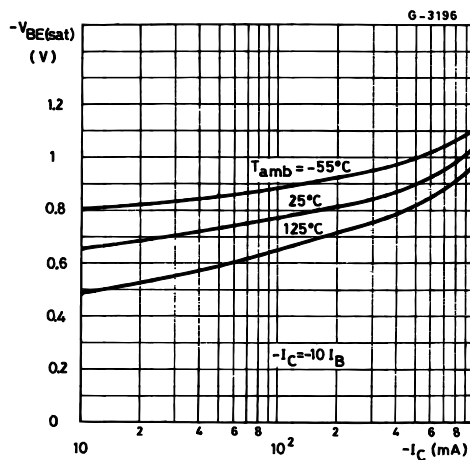
\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1 %

\*\* See Test Circuit

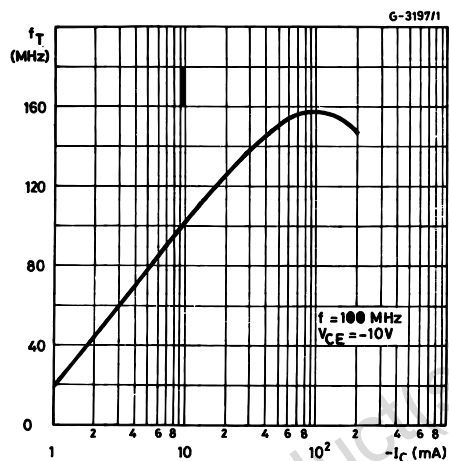
Collector Emitter Saturation Voltage.



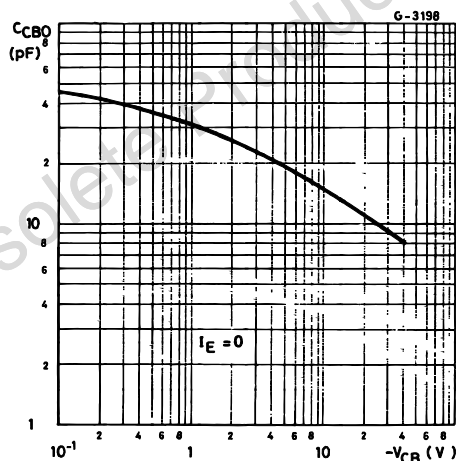
Base Emitter Saturation Voltage.



Transition Frequency.

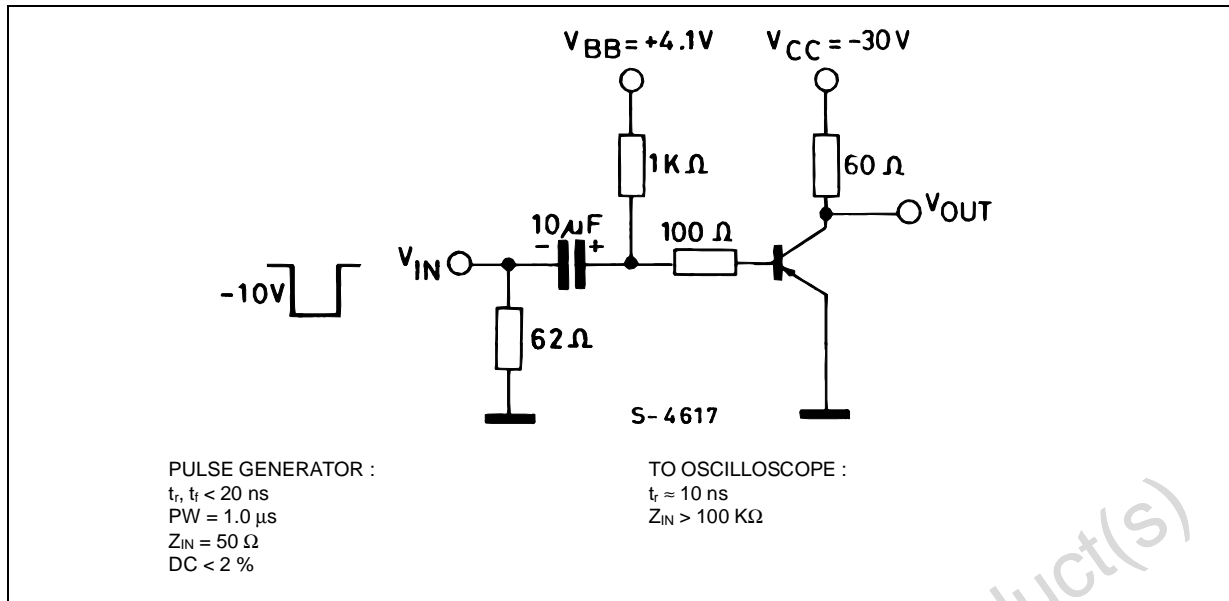


Collector Base Capacitance.



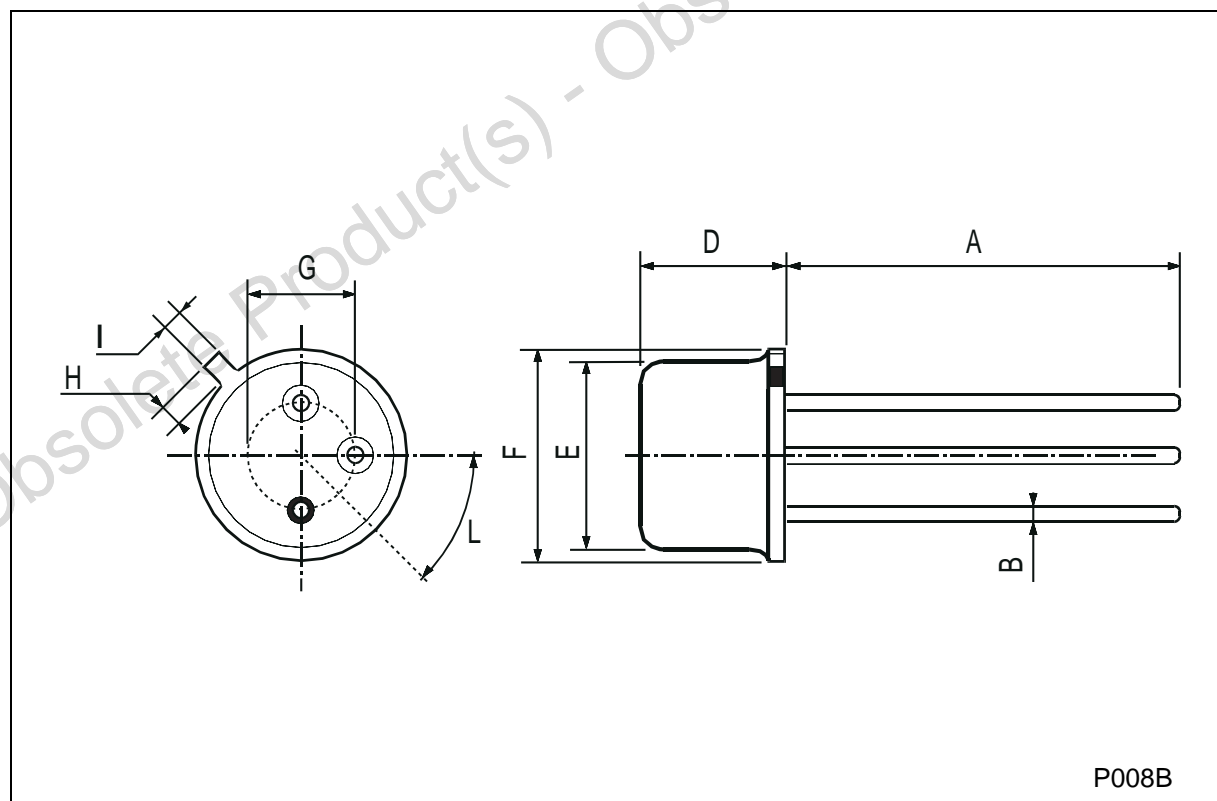
## 2N4033

Test Circuit for  $t_{on}$ ,  $t_s$ ,  $t_f$ .



## TO-39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45° (typ.)					



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