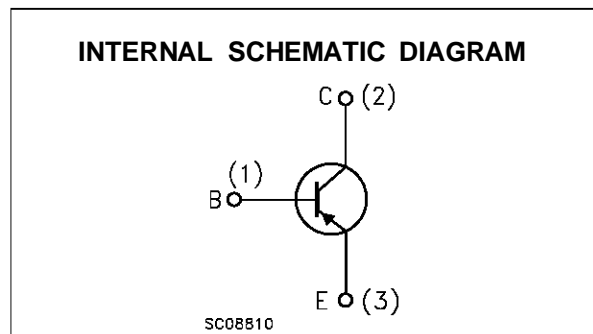
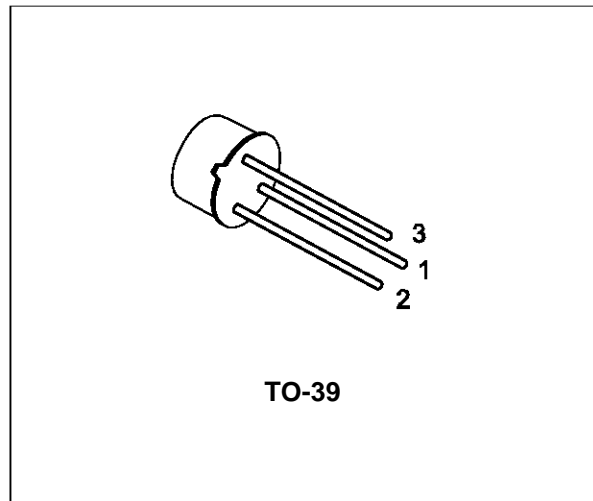


**GENERAL PURPOSE AMPLIFIER AND SWITCH**

**DESCRIPTION**

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



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>CB0</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)	-80	V
V <sub>CEO</sub>	Collector-Emitter Voltage (I <sub>B</sub> = 0)	-80	V
V <sub>EBO</sub>	Emitter-Base Voltage (I <sub>C</sub> = 0)	-5	V
I <sub>C</sub>	Collector Current	-1	A
P <sub>tot</sub>	Total Dissipation at T <sub>amb</sub> ≤ 45 °C at T <sub>case</sub> ≤ 45 °C	0.8	W
		4	W
T <sub>stg</sub>	Storage Temperature	-55 to 200	°C
T <sub>j</sub>	Max. Operating Junction Temperature	200	°C

**THERMAL DATA**

R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	44	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	218	°C/W

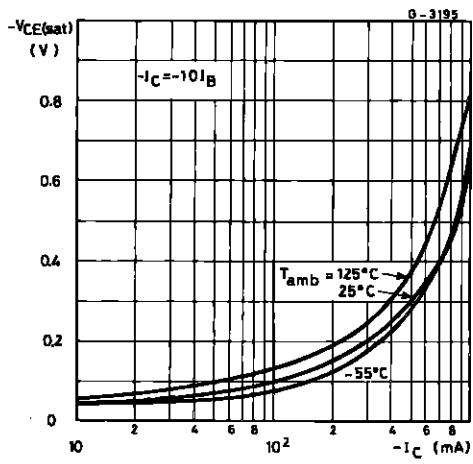
**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

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>amb</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>E</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>CE</sub> = -30 V I <sub>B1</sub> = -I <sub>B2</sub> = -50 mA			350	ns
t <sub>f</sub> **	Fall Time	I <sub>C</sub> = -500 mA V <sub>CE</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>CE</sub> = -30 V I <sub>B1</sub> = -I <sub>B2</sub> = -50 mA			100	ns

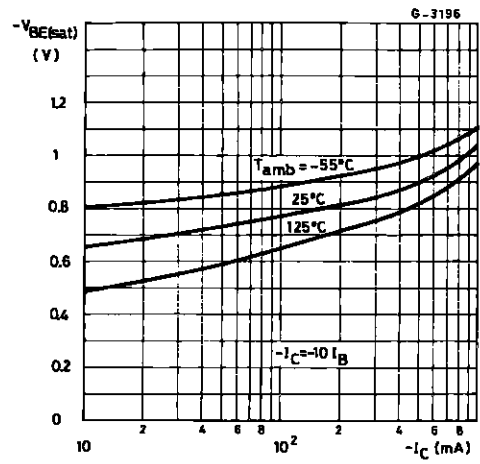
\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1 %

\*\* See Test Circuit

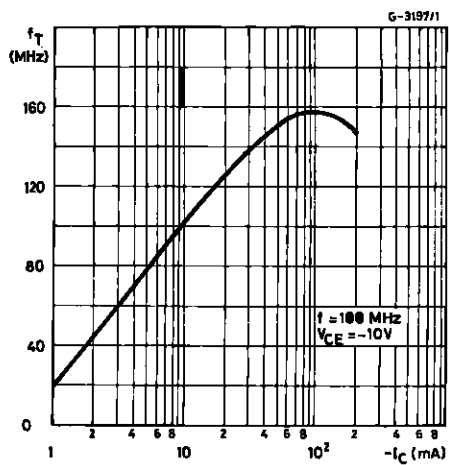
Collector-emitter Saturation Voltage.



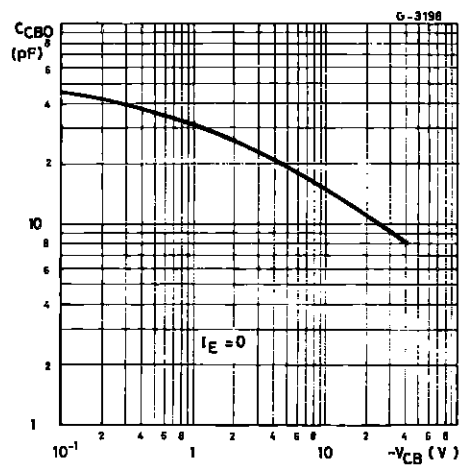
Base-emitter Saturation Voltage.



Transition Frequency.

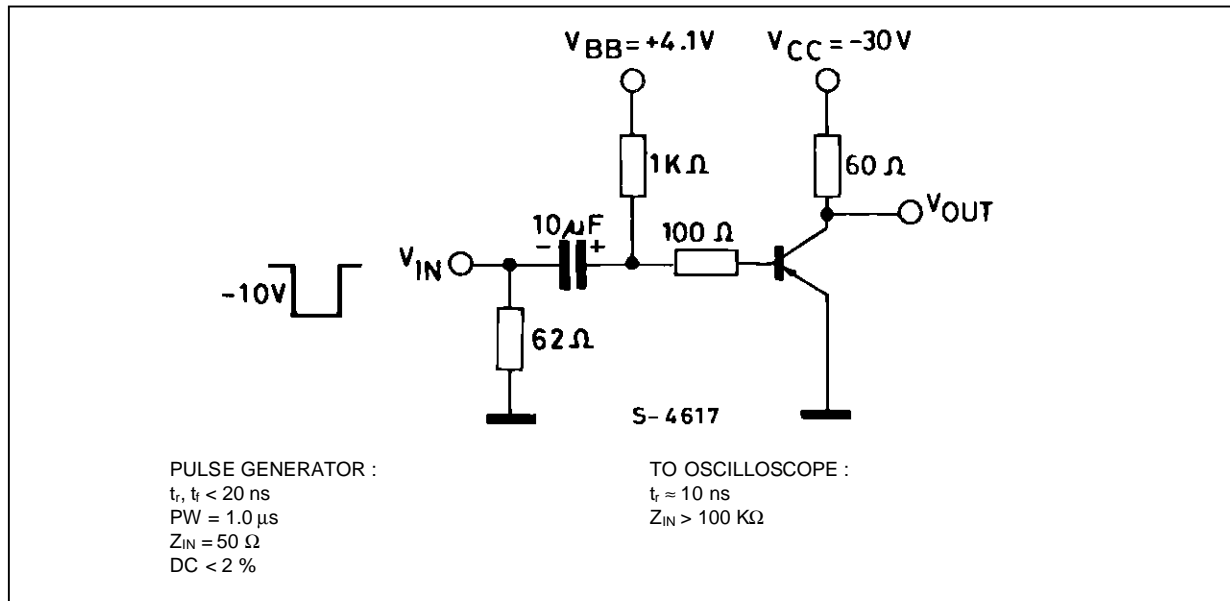


Collector-base Capacitance.



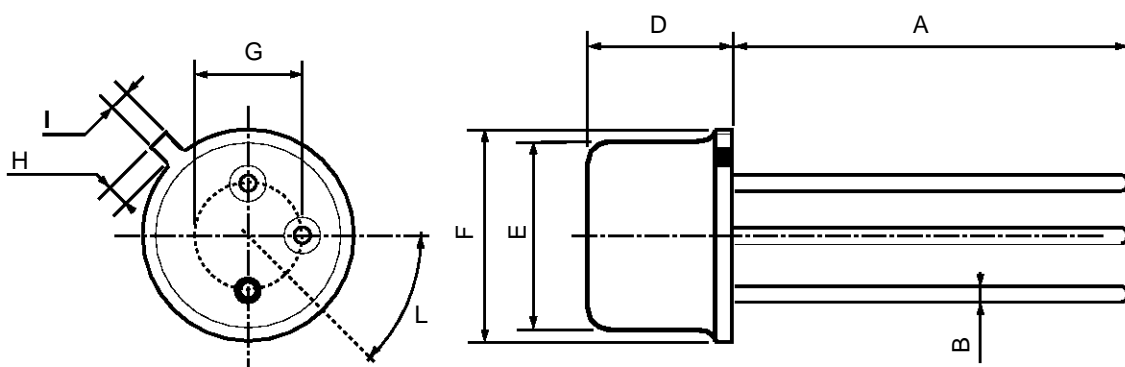
## 2N4033

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.)					



P008B

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