

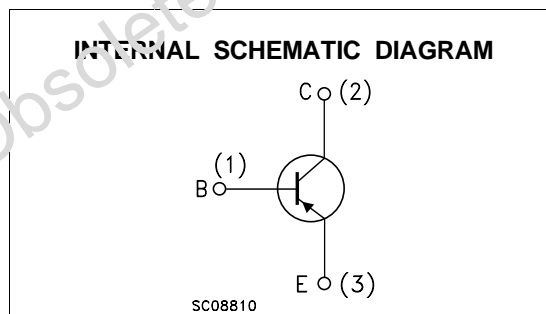
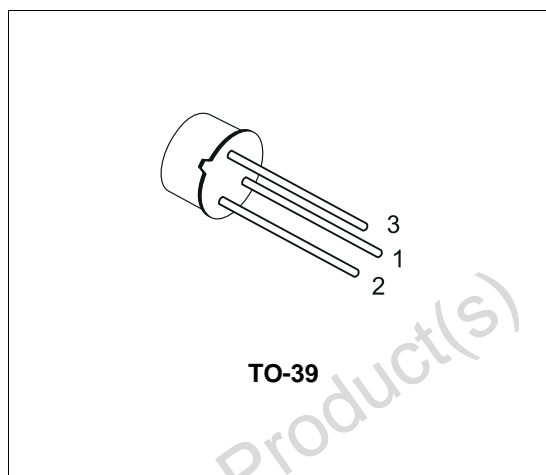


2N4033

## 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

$R_{thj-case}$	Thermal Resistance Junction-Case	Max	37.5	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	187.5	$^{\circ}C/W$

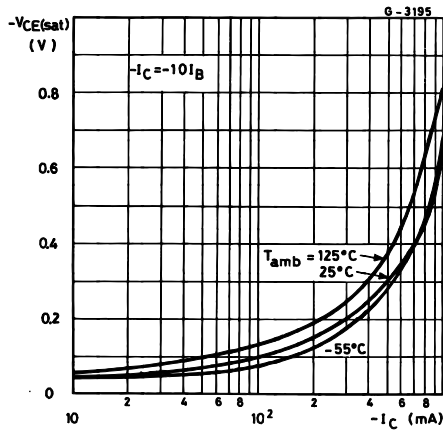
ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CE} = -60 V$ $V_{CE} = -60 V$ $T_C = 150^{\circ}C$			-50 -50	nA $\mu A$
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = -10 \mu A$	-80			V
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = -10 mA$	-80			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_E = -10 \mu A$	-5			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = -150 mA$ $I_B = -15 mA$ $I_C = -500 mA$ $I_B = -50 mA$			-0.15 -0.5	V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = -150 mA$ $I_B = -15 mA$ $I_C = -500 mA$ $I_B = -50 mA$			-0.9 -1.1	V V
$h_{FE}^*$	DC Current Gain	$I_C = -100 \mu A$ $V_{CE} = -5 V$ $I_C = -100 mA$ $V_{CE} = -5 V$ $I_C = -500 mA$ $V_{CE} = -5 V$ $I_C = -1 A$ $V_{CE} = -5 V$ $I_C = -100 mA$ $V_{CE} = -5 V$ $T_{amb} = -55^{\circ}C$	75 100 70 25 40		300	
$f_T$	Transition Frequency	$I_C = -50 mA$ $V_{CE} = -10 V$ $f = 100 MHz$	150		500	MHz
$C_{EBO}$	Emitter-Base Capacitance	$I_E = 0$ $V_{EB} = -0.5 V$ $f = 1 MHz$			110	pF
$C_{CBO}$	Collector-Base Capacitance	$I_C = 0$ $V_{CB} = -10 V$ $f = 1 MHz$			20	pF
$t_s^{**}$	Storage Time	$I_C = -500 mA$ $V_{CC} = -30 V$ $I_{B1} = -I_{B2} = -50 mA$			350	ns
$t_f^{**}$	Fall Time	$I_C = -500 mA$ $V_{CC} = -30 V$ $I_{B1} = -I_{B2} = -50 mA$			50	ns
$t_{on}^{**}$	Turn-on Time	$I_C = -500 mA$ $V_{CC} = -30 V$ $I_{B1} = -I_{B2} = -50 mA$			100	ns

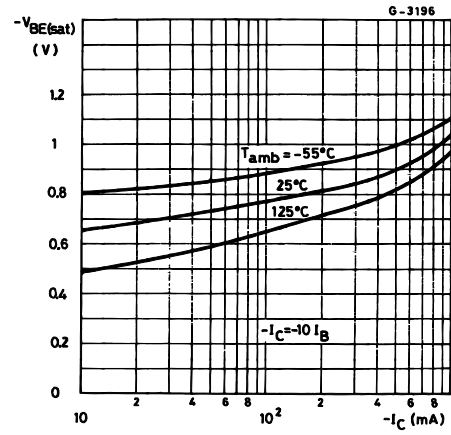
\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle  $\leq 1\%$ 

\*\* See Test Circuit

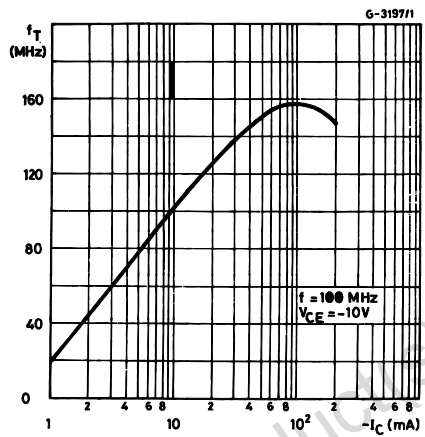
Collector Emitter Saturation Voltage.



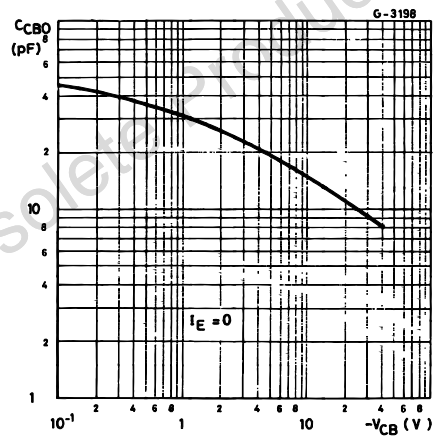
Base Emitter Saturation Voltage.



Transition Frequency.

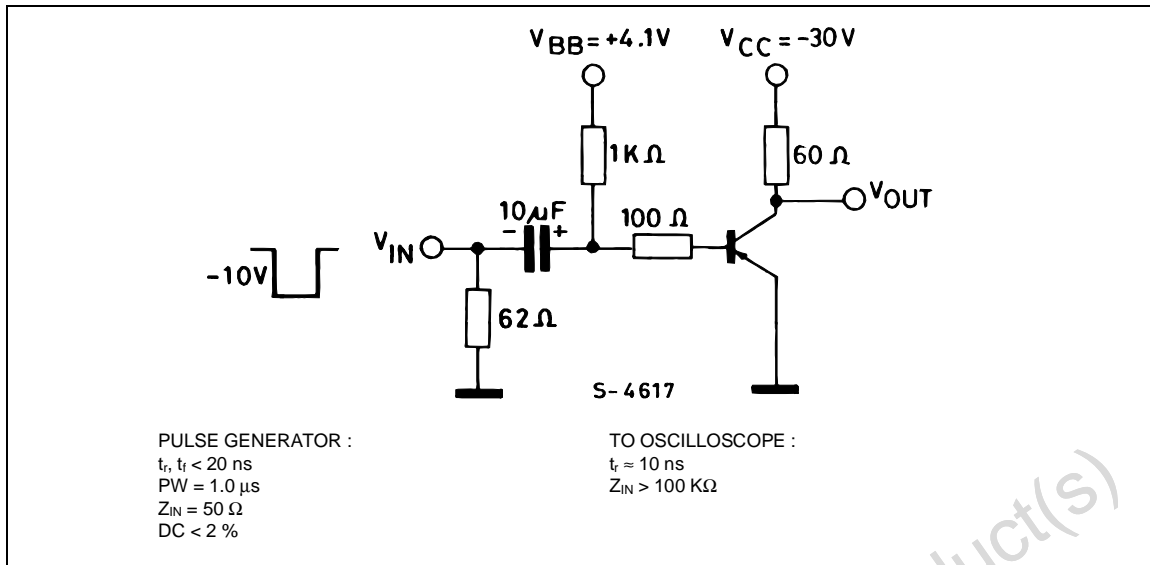


Collector Base Capacitance.



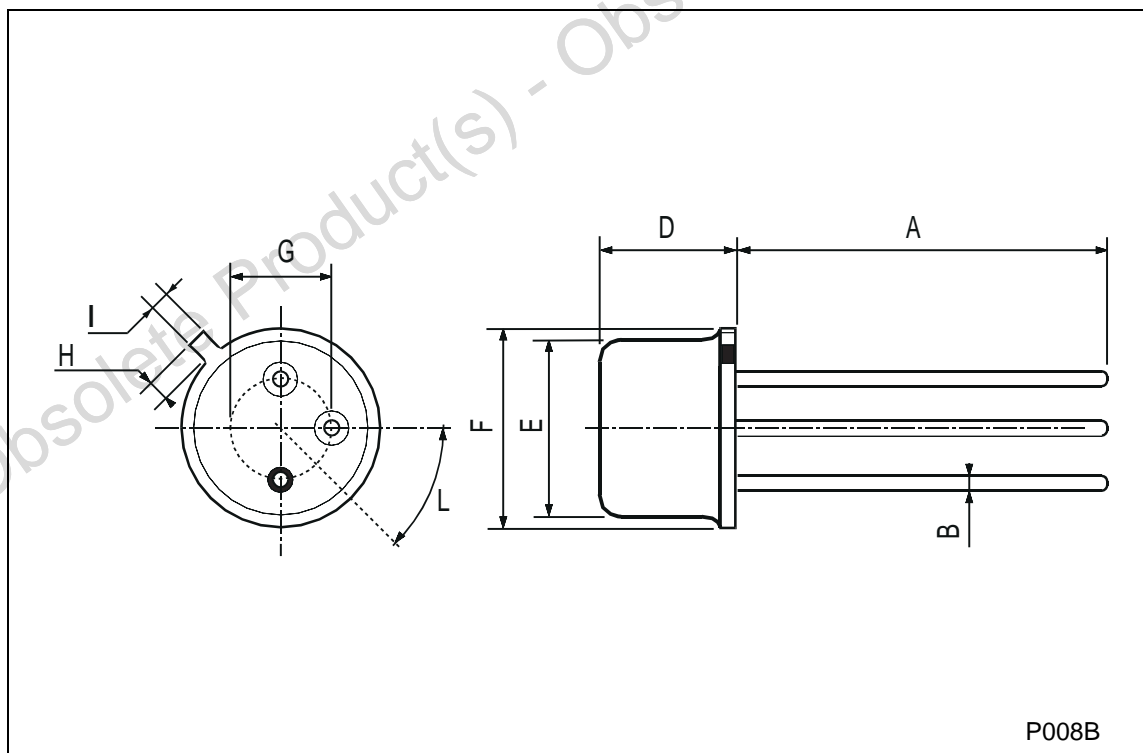
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Test Circuit for  $t_{on}$ ,  $t_s$ ,  $t_f$ .



## 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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