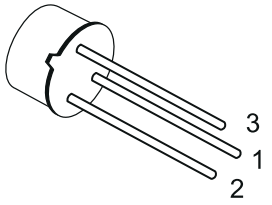
2N4033

SMALL SIGNAL PNP TRANSISTOR

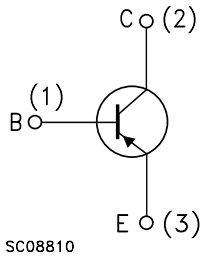
DESCRIPTION

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



TO-39

INTERNAL SCHEMATIC DIAGRAM



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 $T_{amb} \leq 45\ ^oC$ at $T_C \leq 45\ ^oC$	0.8 4	W W
T_{stg}	Storage Temperature	-55 to 175	^oC
T_j	Max. Operating Junction Temperature	175	^oC

THERMAL DATA

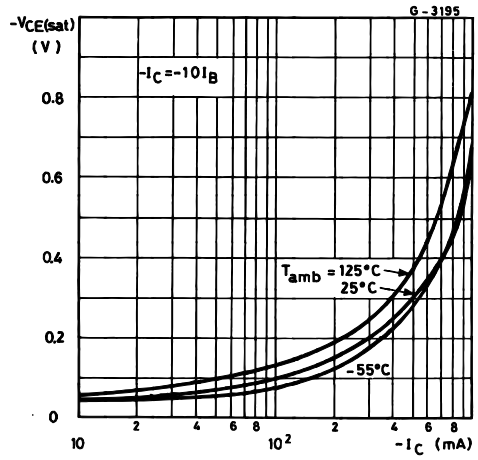
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	37.5	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient	Max	187.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

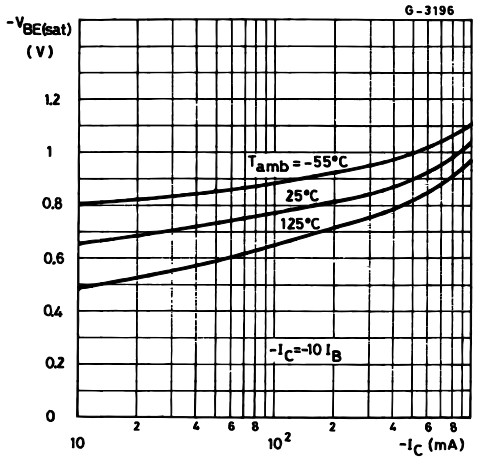
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CE} = -60 V V_{CE} = -60 V T_C = 150 °C			-50 -50	nA µA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (I_E = 0)	I_C = -10 µA	-80			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = -10 mA	-80			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = -10 µA	-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 µA 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 °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 = 1MHz			110	pF
C_{CBO}	Collector-Base Capacitance	I_C = 0 V_{CB} = -10 V f = 1MHz			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 µs, duty cycle ≤ 1 %
** See Test Circuit

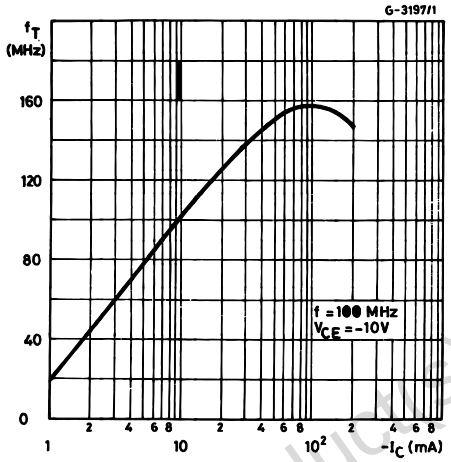
Collector Emitter Saturation Voltage.



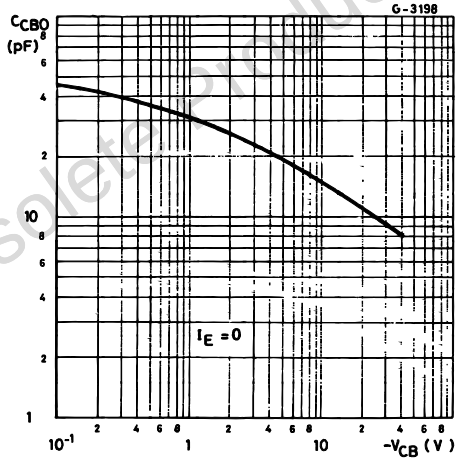
Base Emitter Saturation Voltage.



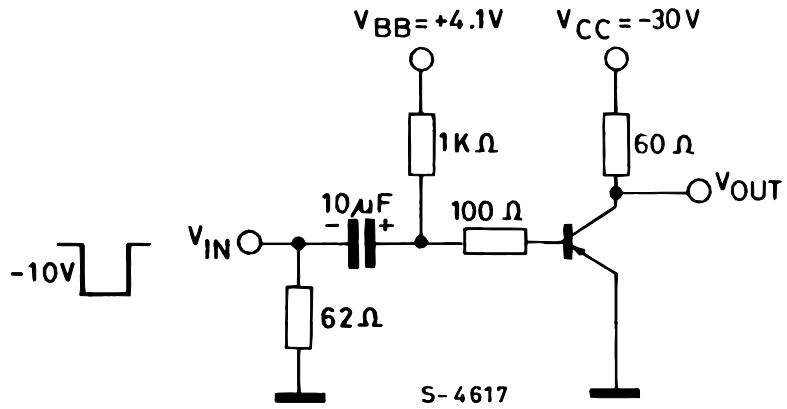
Transition Frequency.



Collector Base Capacitance.



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

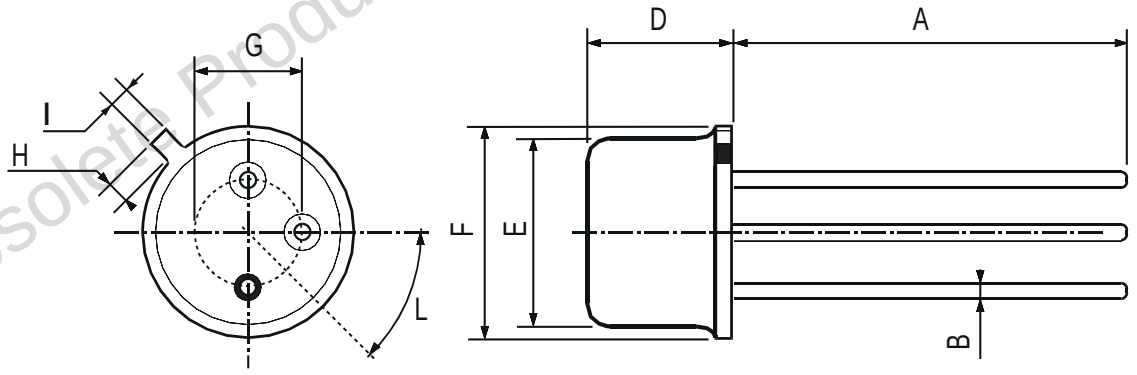


PULSE GENERATOR :
t_r, t_f < 20 ns
PW = 1.0 µs
Z_{IN} = 50 Ω
DC < 2 %

TO OSCILLOSCOPE :
t_r ≈ 10 ns
Z_{IN} > 100 KΩ

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^{o} (typ.)					



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