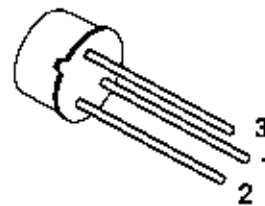


GENERAL PURPOSE AMPLIFIER AND SWITCH

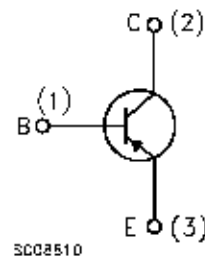
DESCRIPTION

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



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 $T_{amb} \leq 45^\circ\text{C}$ at $T_{case} \leq 45^\circ\text{C}$	0.8 4	W W
T_{stg}	Storage Temperature	-55 to 200	$^\circ\text{C}$
T_j	Max. Operating Junction Temperature	200	$^\circ\text{C}$

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-Case	Max	44	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	218	$^{\circ}C/W$

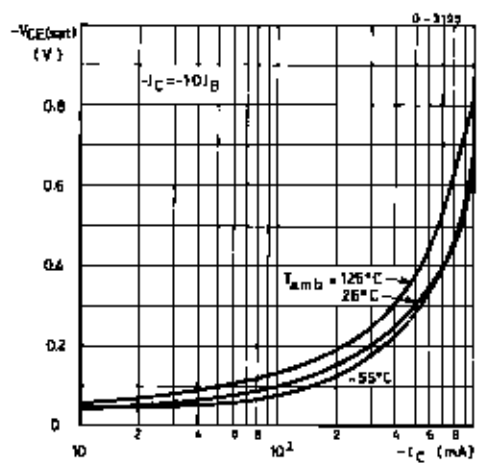
ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

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

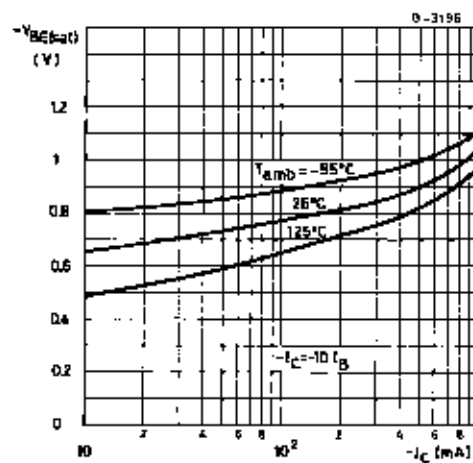
* Pulsed: Pulse duration = 300 μs , duty cycle $\leq 1\%$

** See Test Circuit

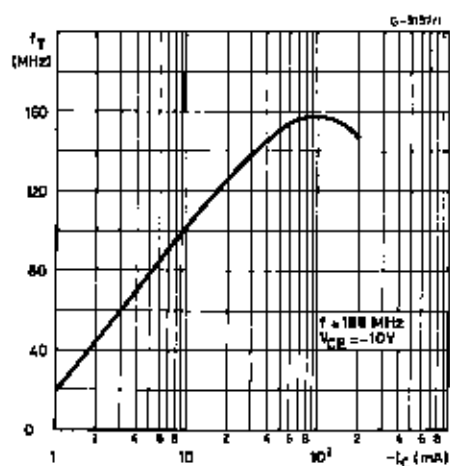
Collector-emitter Saturation Voltage.



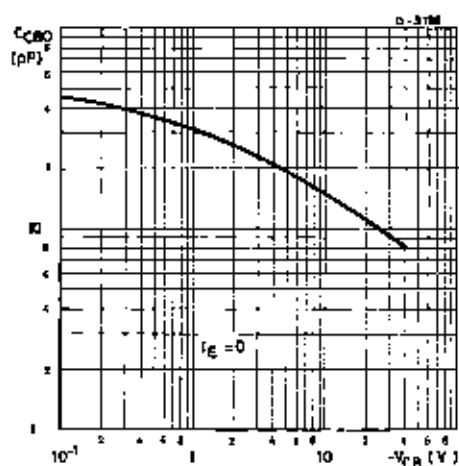
Base-emitter Saturation Voltage.



Transition Frequency.

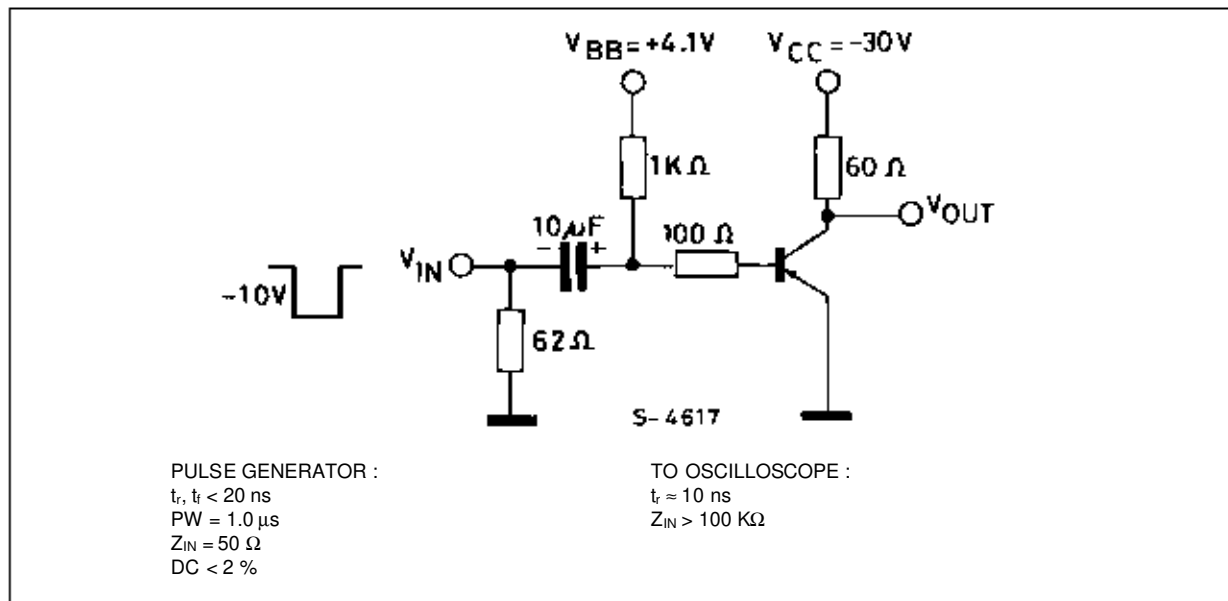


Collector-base Capacitance.



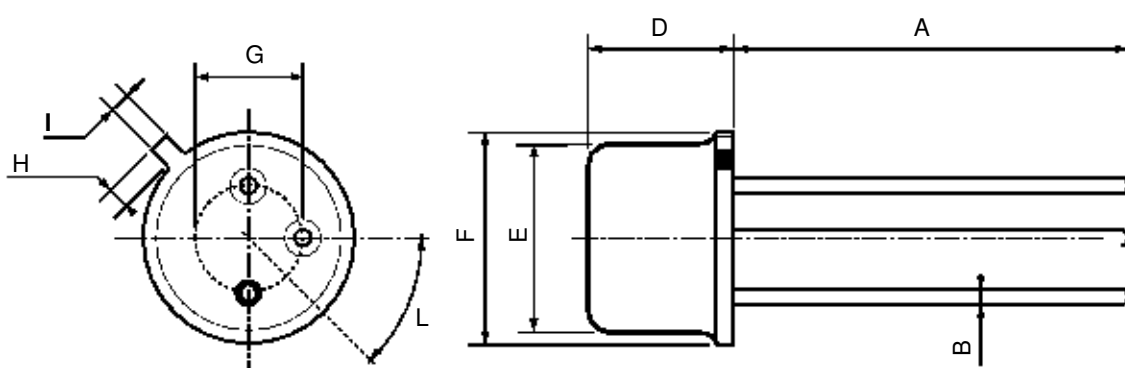
2N4033

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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