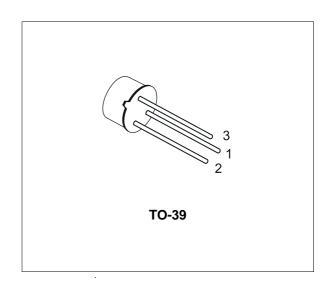
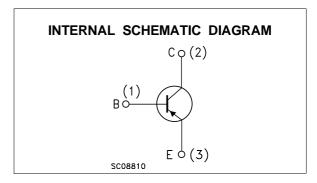


# SMALL SIGNAL PNP TRANSISTOR

#### **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 <sub>CBO</sub>	Collector-Base Voltage (I <sub>E</sub> = 0)	-80	V
$V_{CEO}$	Collector-Emitter Voltage (I <sub>B</sub> = 0)	-80	V
$V_{EBO}$	Emitter-Base Voltage (I <sub>C</sub> = 0)	-5	V
Ic	Collector Current	-1	Α
P <sub>tot</sub>	Total Dissipation at $T_{amb} \le 45$ °C at $T_{C} \le 45$ °C	0.8 4	W
T <sub>stg</sub>	Storage Temperature	-55 to 175	°C
Tj	Max. Operating Junction Temperature	175	°C

September 2002

#### THERMAL DATA

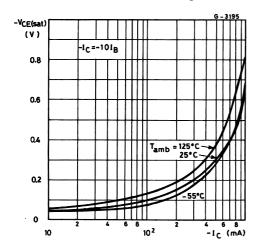
R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	37.5	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	187.5	°C/W

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

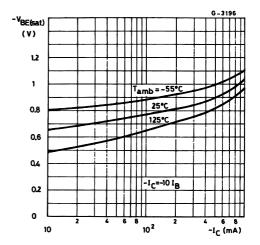
Symbol	Parameter	Test Conditions	onditions Min.			Unit	
Ісво	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CE</sub> = -60 V V <sub>CE</sub> = -60 V T <sub>C</sub> = 150 °C			-50 -50	nΑ μΑ	
V <sub>(BR)</sub> CBO	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = -10 μA	-80			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 (Ic = 0)	I <sub>E</sub> = -10 μA	-5			V	
$V_{CE(sat)^*}$	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -150 mA			-0.15 -0.5	V V	
V <sub>BE(sat)</sub> *	Base-Emitter Saturation Voltage	I <sub>C</sub> = -150 mA			-0.9 -1.1	V V	
h <sub>FE</sub> *	DC Current Gain	$\begin{split} I_{C} &= -100 \; \mu A & V_{CE} &= -5 \; V \\ I_{C} &= -100 \; mA & V_{CE} &= -5 \; V \\ I_{C} &= -500 \; mA & V_{CE} &= -5 \; V \\ I_{C} &= -1 \; A & V_{CE} &= -5 \; V \\ I_{C} &= -100 \; mA & V_{CE} &= -5 \; V \\ T_{amb} &= -55 \; ^{\circ}C \end{split}$	75 100 70 25		300		
f⊤	Transition Frequency	I <sub>C</sub> = -50 mA V <sub>CE</sub> = -10 V f = 100 MHz	150		500	MHz	
СЕВО	Emitter-Base Capacitance	$I_E = 0$ $V_{EB} = -0.5 \text{ V}$ $f = 1\text{MHz}$			110	pF	
ССВО	Collector-Base Capacitance	$I_C = 0$ $V_{CB} = -10 \text{ V}$ $f = 1\text{MHz}$			20	pF	
t <sub>s</sub> **	Storage Time	$I_{C} = -500 \text{ mA}$ $V_{CC} = -30 \text{ V}$ $I_{B1} = -I_{B2} = -50 \text{ mA}$			350	ns	
t <sub>f</sub> **	Fall Time	$I_{C}$ = -500 mA $V_{CC}$ = -30 V $I_{B1}$ = - $I_{B2}$ = -50 mA			50	ns	
t <sub>on</sub> **	Turn-on Time	$I_C = -500 \text{ mA}$ $V_{CC} = -30 \text{ V}$ $I_{B1} = -I_{B2} = -50 \text{ mA}$			100	ns	

<sup>\*</sup> Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1 % \*\* See Test Circuit

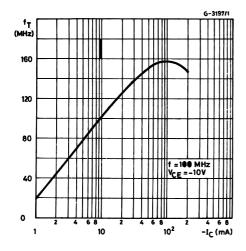
#### Collector Emitter Saturation Voltage.



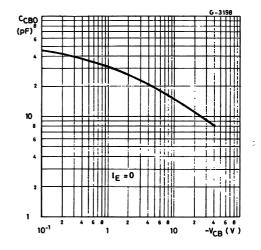
### Base Emitter Saturation Voltage.



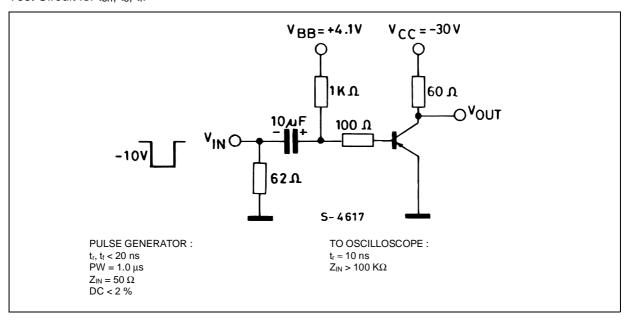
### Transition Frequency.



#### Collector Base Capacitance.

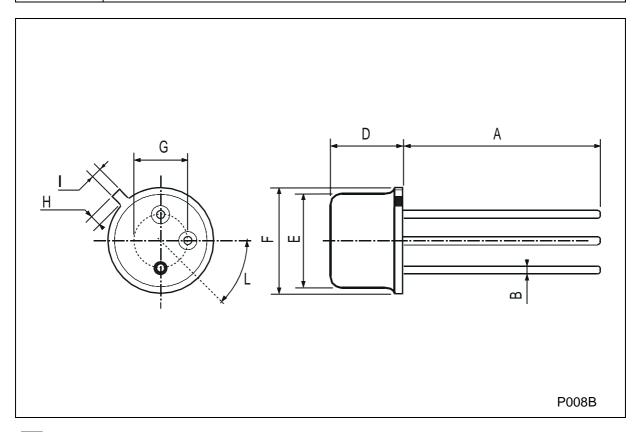


### Test Circuit for $t_{\text{on}},\,t_{\text{s}},\,t_{\text{f}}.$



## **TO-39 MECHANICAL DATA**

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



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