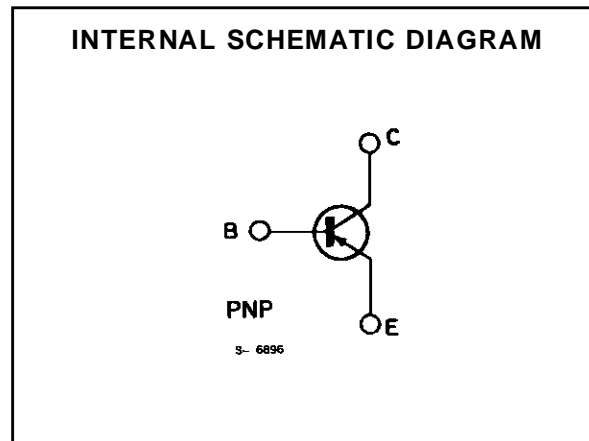
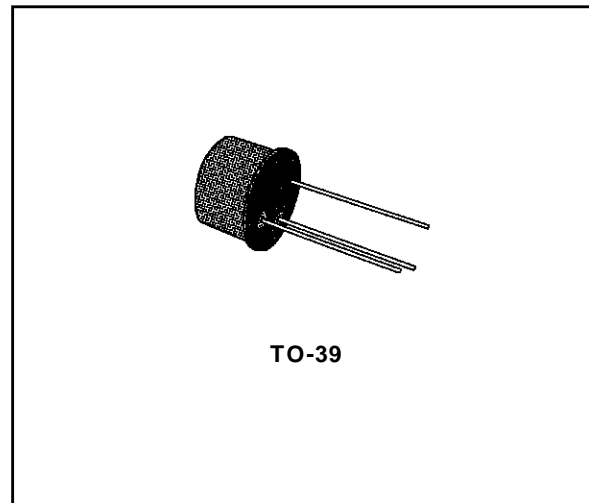


**GENERAL PURPOSE AMPLIFIERS AND SWITCHES**

**DESCRIPTION**

The 2N4030, 2N4031, 2N4032, and 2N4033 are silicon planar epitaxial PNP transistors in Jedec TO-39 metal case primarily intended for large signal, low noise industrial applications.



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value		Unit
		2N4030 2N4032	2N4031 2N4033	
$V_{CBO}$	Collector-base Voltage ( $I_E = 0$ )	- 60	- 80	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )	- 60	- 80	V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )	- 5		V
$I_C$	Collector Current	- 1		A
$P_{tot}$	Total Power Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ at $T_{case} \leq 25\text{ }^\circ\text{C}$	0.8		W
		4		W
$T_{stg}, T_j$	Storage and Junction Temperature	- 65 to 200		$^\circ\text{C}$

## 2N4030-2N4031-2N4032-2N4033

### THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	44	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	218	$^{\circ}C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	For <b>2N4030</b> and <b>2N4032</b> $V_{CB} = -50\ V$ $V_{CB} = -50\ V$ $T_{amb} = 150\ ^{\circ}C$ For <b>2N4031</b> and <b>2N4033</b> $V_{CB} = -60\ V$ $V_{CB} = -60\ V$ $T_{amb} = 150\ ^{\circ}C$			- 50 - 50 - 50 - 50	nA $\mu A$ nA $\mu A$
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ( $I_E = 0$ )	$I_C = -10\ \mu A$ For <b>2N4030</b> and <b>2N4032</b> For <b>2N4031</b> and <b>2N4033</b>	- 60 - 80			V V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = -10\ mA$ For <b>2N4030</b> and <b>2N4032</b> For <b>2N4031</b> and <b>2N4033</b>	- 60 - 80			V 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	$I_C = -150\ mA$ $I_B = -15\ mA$ $I_C = -500\ mA$ $I_B = -50\ mA$ $I_C = -1\ A$ $I_B = -100\ mA$ For <b>2N4030</b> and <b>2N4032</b>			- 0.15 - 0.5 - 1	V V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = -150\ mA$ $I_B = -15\ mA$ $I_C = -500\ mA$ $I_B = -50\ mA$ $I_C = -1\ A$ $I_B = -100\ mA$ For <b>2N4030</b> and <b>2N4032</b>			- 0.9 - 1.1 - 1.2	V V V
$h_{FE}^*$	DC Current Gain	$I_C = -100\ \mu A$ $V_{CE} = -5\ V$ For <b>2N4030</b> and <b>2N4031</b> For <b>2N4032</b> and <b>2N4033</b> $I_C = -100\ mA$ $V_{CE} = -5\ V$ For <b>2N4030</b> and <b>2N4031</b> For <b>2N4032</b> and <b>2N4033</b> $I_C = -500\ mA$ $V_{CE} = -5\ V$ For <b>2N4030</b> and <b>2N4031</b> For <b>2N4032</b> and <b>2N4033</b> $I_C = -1\ A$ $V_{CE} = -5\ V$ For <b>2N4030</b> For <b>2N4031</b> For <b>2N4032</b> For <b>2N4033</b> $I_C = -100\ mA$ $V_{CE} = -5\ V$ $T_{amb} = -55\ ^{\circ}C$ For <b>2N4030</b> and <b>2N4031</b> For <b>2N4032</b> and <b>2N4033</b>	30 75 40 100 25 70 15 10 40 25 15 40		120 300	

\* Pulsed : pulse duration = 300 ms, duty cycle = 1 %.

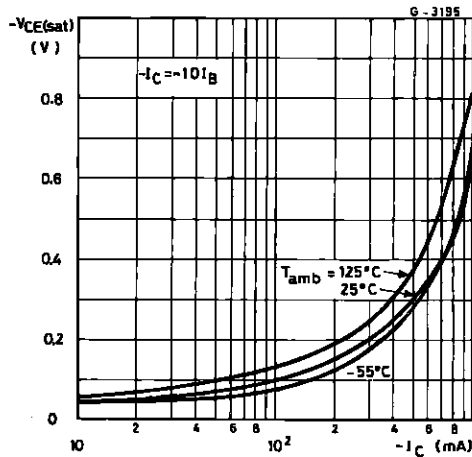
\*\* See test circuit.

ELECTRICAL CHARACTERISTICS (continued)

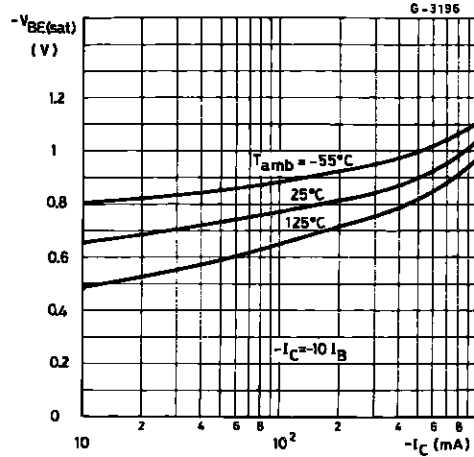
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$f_T$	Transition Frequency	$I_C = -50 \text{ mA}$ $V_{CE} = -10 \text{ V}$ $f = 100 \text{ MHz}$ For <b>2N4030</b> and <b>2N4031</b> For <b>2N4032</b> and <b>2N4033</b>	100		400	MHz
$C_{EBO}$	Emitter-base Capacitance	$I_C = 0$ $V_{EB} = -0.5 \text{ V}$ $f = 1 \text{ MHz}$			110	pF
$C_{CBO}$	Collector-base Capacitance	$I_E = 0$ $V_{CB} = -10 \text{ V}$ $f = 1 \text{ MHz}$			20	pF
$t_s^{**}$	Storage Time	$I_C = -500 \text{ mA}$ $V_{CC} = -30 \text{ V}$ $I_{B1} = -I_{B2} = -50 \text{ mA}$			350	ns
$t_f^{**}$	Fall Time	$I_C = -500 \text{ mA}$ $V_{CC} = -30 \text{ V}$ $I_{B1} = -I_{B2} = -50 \text{ mA}$			50	ns
$t_{on}^{**}$	Turn-on Time	$I_C = -500 \text{ mA}$ $V_{CC} = -30 \text{ V}$ $I_{B1} = -I_{B2} = -50 \text{ mA}$			100	ns

\* Pulsed : pulse duration = 300 ms, duty cycle = 1 %.  
\*\* See test circuit.

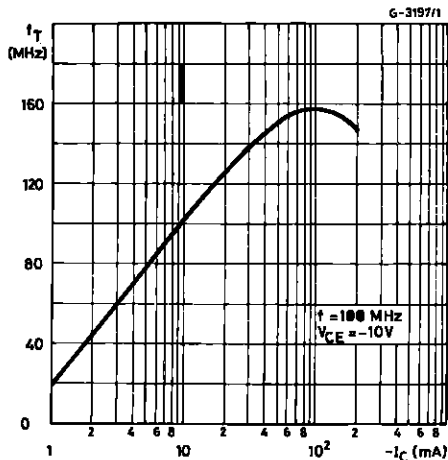
Collector-emitter Saturation Voltage.



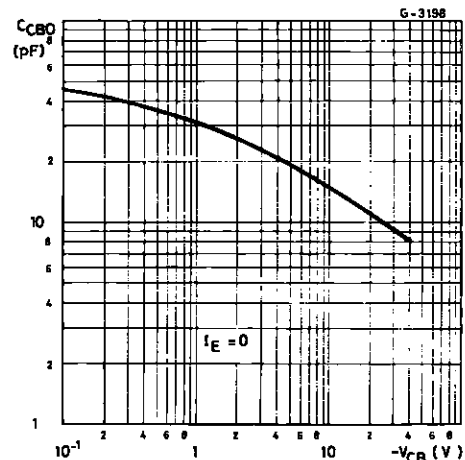
Base-emitter Saturation Voltage.



Transition Frequency.

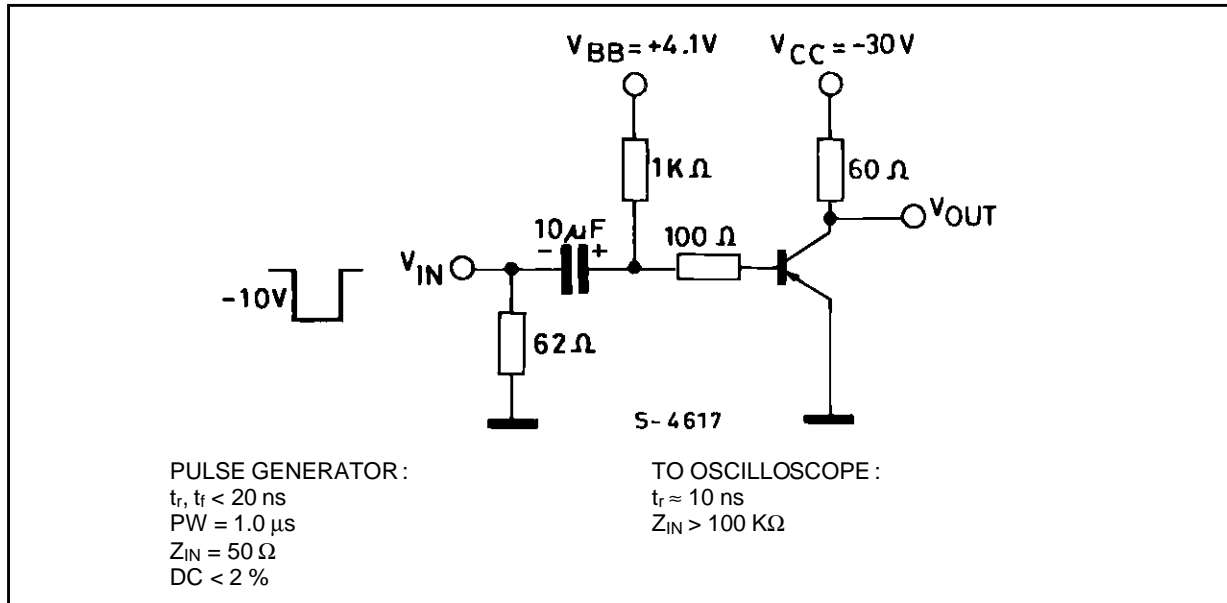


Collector-base Capacitance.



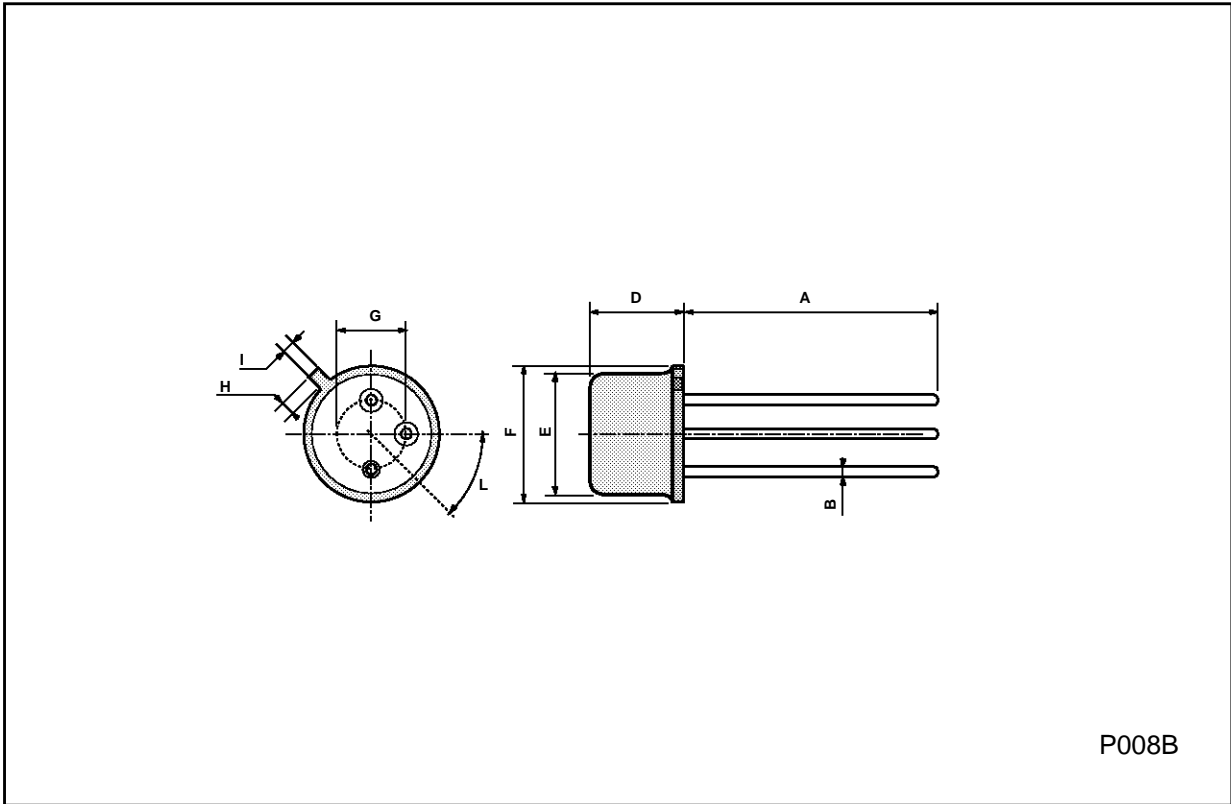
## 2N4030-2N4031-2N4032-2N4033

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



**TO39 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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