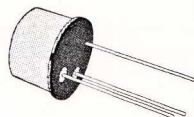


GENERAL PURPOSE AMPLIFIERS AND SWITCHES

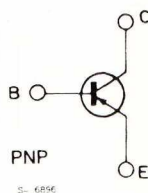
DESCRIPTION

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.



TO-39

INTERNAL SCHEMATIC DIAGRAM



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_{EB0}	Emitter-base Voltage ($I_C = 0$)	- 5		V
I_C	Collector Current	- 1		A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25^\circ\text{C}$ at $T_{case} \leq 25^\circ\text{C}$	0.8 4		W W
T_{stg}, T_j	Storage and Junction Temperature	- 65 to 200		$^\circ\text{C}$

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 2N4030 and 2N4032 $V_{CB} = -50\ V$ $V_{CB} = -50\ V$ $T_{amb} = 150^{\circ}C$ For 2N4031 and 2N4033 $V_{CB} = -60\ V$ $V_{CB} = -60\ V$ $T_{amb} = 150^{\circ}C$			- 50 - 50 - 50 - 50	nA μA nA μA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ($I_E = 0$)	$I_C = -10\ \mu A$ For 2N4030 and 2N4032 For 2N4031 and 2N4033	- 60 - 80			V V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ($I_B = 0$)	$I_C = -10\ mA$ For 2N4030 and 2N4032 For 2N4031 and 2N4033	- 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 2N4030 and 2N4032			- 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 2N4030 and 2N4032			- 0.9 - 1.1 - 1.2	V V V
h_{FE}^*	DC Current Gain	$I_C = -100\ \mu A$ $V_{CE} = -5\ V$ For 2N4030 and 2N4031 For 2N4032 and 2N4033 $I_C = -100\ mA$ $V_{CE} = -5\ V$ For 2N4030 and 2N4031 For 2N4032 and 2N4033 $I_C = -500\ mA$ $V_{CE} = -5\ V$ For 2N4030 and 2N4031 For 2N4032 and 2N4033 $I_C = -1\ A$ $V_{CE} = -5\ V$ For 2N4030 For 2N4031 For 2N4032 For 2N4033 $I_C = -100\ mA$ $V_{CE} = -5\ V$ $T_{amb} = -55^{\circ}C$ For 2N4030 and 2N4031 For 2N4032 and 2N4033	30 75 40 100 25 70 15 10 40 25 15 40		120 300	

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

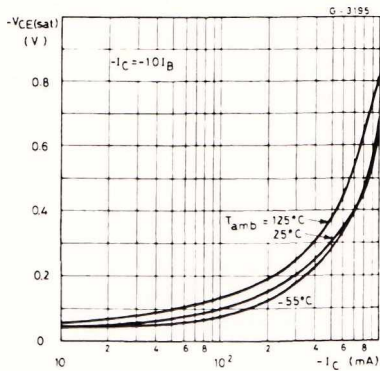
** See test circuit.

ELECTRICAL CHARACTERISTICS (continued)

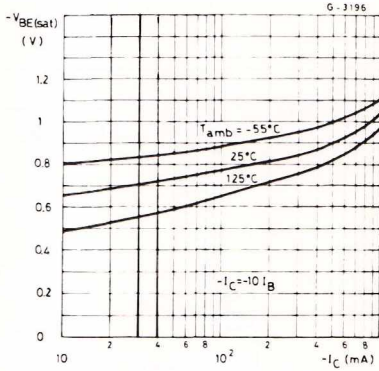
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_T	Transition Frequency	$I_C = -50\text{ mA}$ $V_{CE} = -10\text{ V}$ $f = 100\text{ MHz}$ For 2N4030 and 2N4031 For 2N4032 and 2N4033	100 150		400 500	MHz MHz
C_{EBO}	Emitter-base Capacitance	$I_C = 0$ $V_{EB} = -0.5\text{ V}$ $f = 1\text{ MHz}$			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.

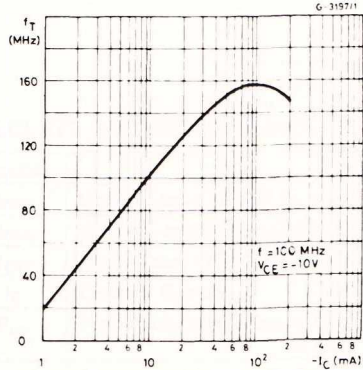
Collector-emitter Saturation Voltage.



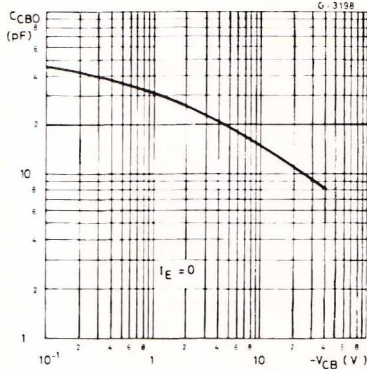
Base-emitter Saturation Voltage.



Transition Frequency.



Collector-base Capacitance.



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

