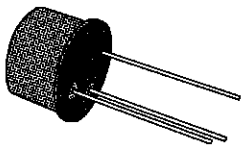
SGS-THOMSON MICROELECTRONICS

2N4030-2N4031
2N4032-2N4033

GENERAL PURPOSE AMPLIFIERS AND SWITCHES

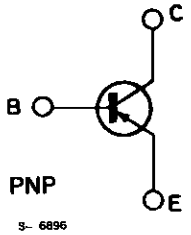
DESCRIPTION

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

THERMAL DATA

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

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °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 °C For **2N4031** and **2N4033** V_{CB} = – 60 V V_{CB} = – 60 V T_{amb} = 150 °C			 – 50 – 50 – 50 – 50	 nA µA nA µA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = – 10 µA 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 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 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 µA 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 °C For **2N4030** and **2N4031** For **2N4032** and **2N4033**	 30 75 40 100 25 70 15 10 40 25 15 40		 120 300	

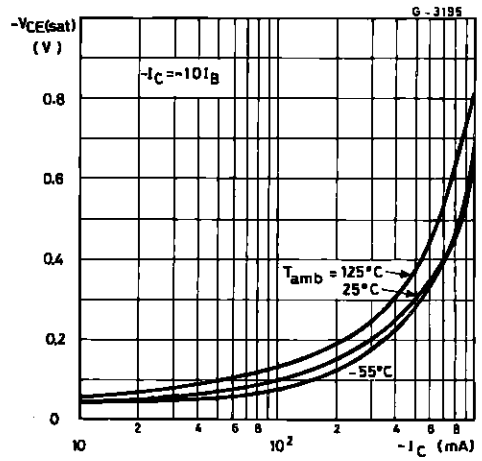
* Pulsed : pulse duration = 300 ms, duty cycle = 1 %.
** See test circuit.

ELECTRICAL CHARACTERISTICS (continued)

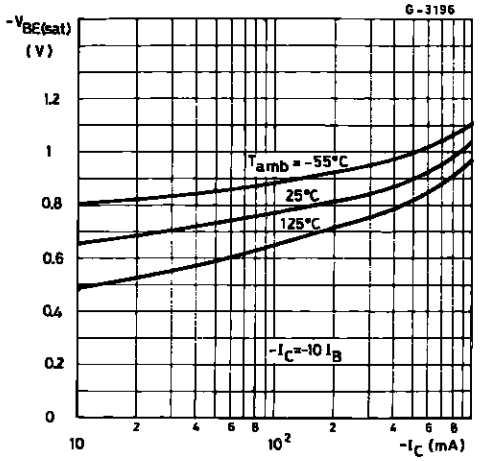
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_T	Transition Frequency	I_C = – 50 mA V_{CE} = – 10 V f = 100 MHz For **2N4030** and **2N4031** For **2N4032** and **2N4033**	 100 150		 400 500	 MHz MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = – 0.5 V f = 1 MHz			110	.pF
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = – 10 V f = 1 MHz			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 ms, duty cycle = 1 %.
** See test circuit.

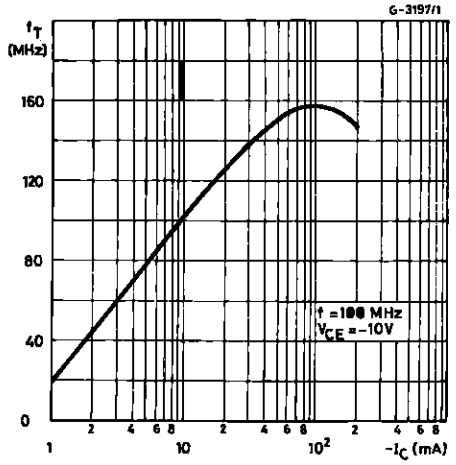
Collector-emitter Saturation Voltage.



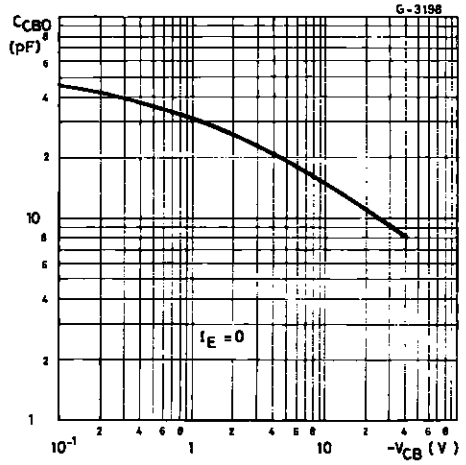
Base-emitter Saturation Voltage.



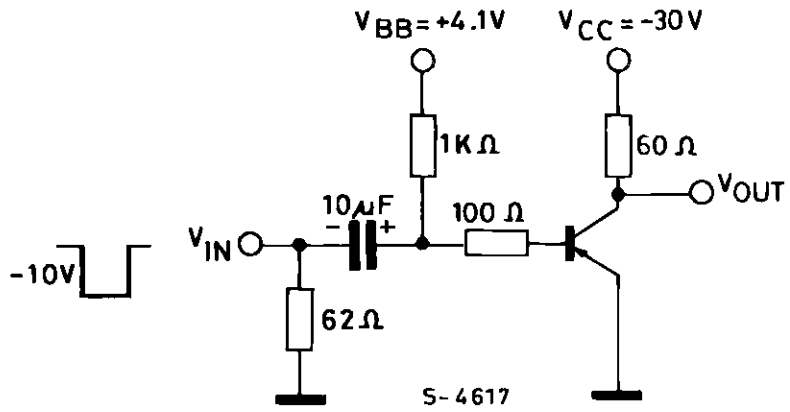
Transition Frequency.



Collector-base Capacitance.



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

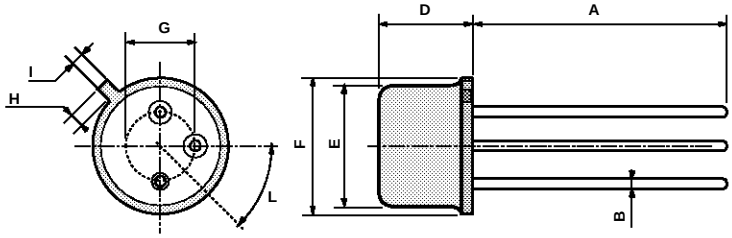


PULSE GENERATOR :
t_r, t_f < 20 ns
PW = 1.0 μs
Z_{IN} = 50 Ω
DC < 2 %

TO OSCILLOSCOPE :
$t_r \approx$ 10 ns
Z_{IN} > 100 KΩ

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^{o} (typ.)					



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