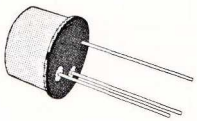
SGS-THOMSON MICROELECTRONICS

2N4030-2N4031 2N4032-2N4033

GENERAL PURPOSE AMPLIFIERS AND SWITCHES

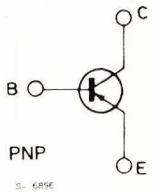
DESCRIPTION

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



ABSOTUTE 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	

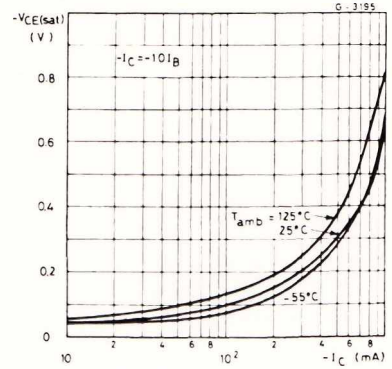
* Pulsed : pulse duration = 300 ms, duty cycle = 1 %.
** See test circuit.

ELECTRICAL CHARACTERISTICS (continued)

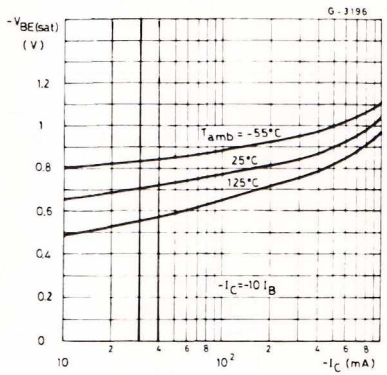
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_T	Transition Frequency	$I_C = -50$ mA $V_{CE} = -10$ V f = 100 MHz For **2N4030** and **2N4031** For **2N4032** and **2N4033**	 100 150		 400 500	 MHz MHz
C_{EBO}	Emitter-base Capacitance	$I_C = 0$ $V_{EB} = -0.5$ V f = 1 MHz			110	.pF
C_{CBO}	Collector-base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

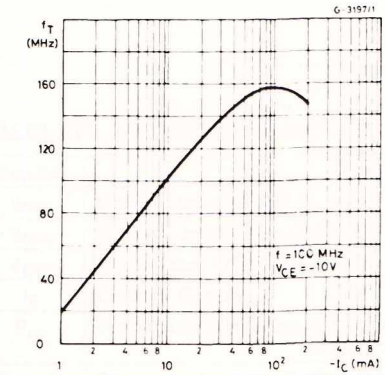
Collector-emitter Saturation Voltage.



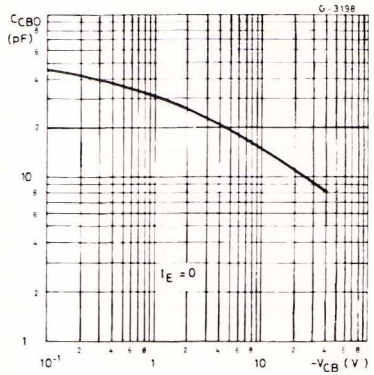
Base-emitter Saturation Voltage.



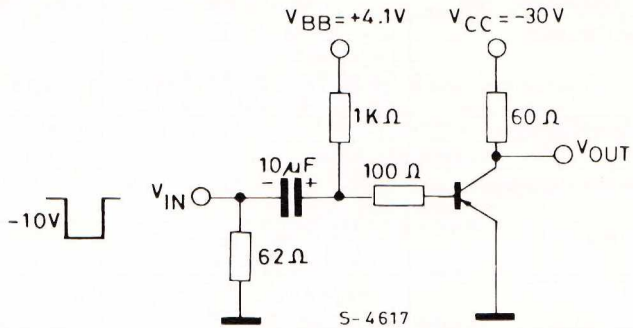
Transition Frequency.



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 ≈ 10 ns
Z_{IN} > 100 KΩ