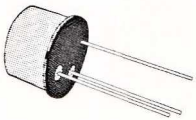
SGS-THOMSON MICROELECTRONICS

2N3107/2N3108 2N3109/2N3110

GENERAL PURPOSE AMPLIFIERS AND SWITCHES

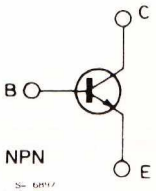
DESCRIPTION

The 2N3107, 2N3108, 2N3109 and 2N3110 are silicon planar epitaxial NPN 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
		2N 3109 2N 3110	2N 3107 2N 3108	
V_{CBO}	Collector-base Voltage (I_E = 0)	80	100	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	40	60	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7		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 5		W W
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200		°C

THERMAL DATA

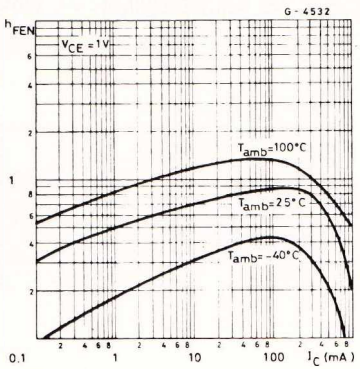
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	35	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	219	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

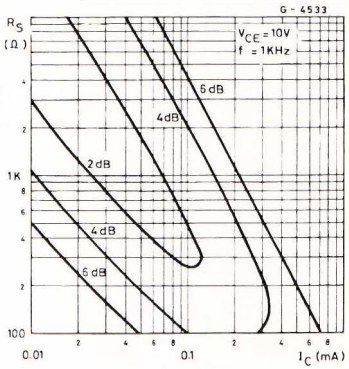
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 60 V T_{amb} = 150 °C			10	μA
I_{CES}	Collector Cutoff Current (V_{BE} = 0)	V_{CE} = 60 V			10	nA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V			10	nA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 100 μA For **2N 3109** and **2N 3110** For **2N 3107** and **2N 3108**	 80 100			 V V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = 30 mA For **2N 3109** and **2N 3110** For **2N 3107** and **2N 3108**	 40 60			 V V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = 100 μA	7			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA I_C = 1 A I_B = 100 mA			0.25 1	V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA I_C = 1 A I_B = 100 mA			1.1 2	V V
h_{FE}*	DC Current Gain	For **2N 3107** and **2N 3109** I_C = 150 mA V_{CE} = 1 V I_C = 0.1 mA V_{CE} = 10 V I_C = 500 mA V_{CE} = 10 V I_C = 150 mA V_{CE} = 10 V T_{amb} = − 55 °C For **2N 3108** and **2N 3110** I_C = 150 mA V_{CE} = 1 V I_C = 0.1 mA V_{CE} = 10 V I_C = 500 mA V_{CE} = 10 V I_C = 150 mA V_{CE} = 10 V T_{amb} = − 55 °C	 100 35 40 30 40 20 25 15		 300 120	
f_T	Transition Frequency	I_C = 50 mA V_{CE} = 10 V f = 20 MHz For **2N 3107** and **2N 3109** For **2N 3108** and **2N 3110**	 70 60			 MHz MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1 MHz			80	pF
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz For **2N 3107** and **2N 3108** For **2N 3109** and **2N 3110**			 20 25	 pF pF
NF	Noise Figure	I_C = 30 μA V_{CE} = 10 V f = 1 kHz R_g = 1 KΩ			8	dB
t_{on}**	Turn-on Time	I_C = 150 mA V_{CC} = 20 V I_{B1} = 7.5 mA			200	ns
t_{off}**	Turn-off Time	I_C = 150 mA V_{CC} = 20 V I_{B1} = − I_{B2} = 7.5 mA			1000	ns

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

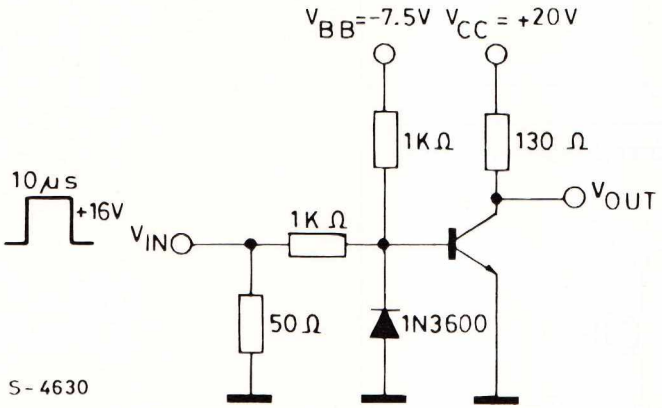
Normalized DC Current Gain.



Contours of Constant Narrow Band Noise Figure.



Test Circuit for t_{on}, t_{off}.



PULSE GENERATOR :
t_r of input pulse < 15 ns
t_f of input pulse < 15 ns

TO OSCILLOSCOPE :
t_r > 15 ns
Z_{IN} ≈ 100 KΩ