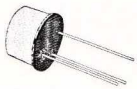
SGS-THOMSON
MICROELECTRONICS

2N3250
2N3251

AMPLIFIERS AND SWITCHES

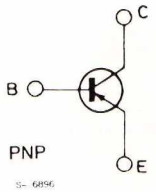
DESCRIPTION

The 2N3250 and 2N3251 are silicon planar epitaxial PNP transistors in Jedec TO-18 metal case. They are suited for switching and amplifier applications.



TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	– 50	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	– 40	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	– 5	V
I_C	Collector Current	– 200	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	0.36 1.2	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	146	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	487	°C/W

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

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CEX}	Collector Cutoff Current (V_{BE} = 3 V)	V_{CE} = – 40 V				– 20	nA
I_{BEX}	Base Cutoff Current (V_{BE} = 3 V)	V_{CE} = – 40 V				– 50	nA
$V_{(BR)CBO}$	Colllector-base Breakdown Voltage (I_E = 0)	I_C = –10 μA		– 50			V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = – 10 mA		– 40			V
$V_{(BR)\ EBO}$	Emittter-base Breakdown Voltage (I_C = 0)	I_E = – 10 μA		– 5			V
$V_{CE\ (sat)}$*	Collector-emitter Saturation Voltage	I_C = – 10 mA I_C = – 50 mA	I_B = – 1 mA I_B = – 5 mA			0.25 0.5	V V
$V_{BE\ (sat)}$*	Base-emitter Saturation Voltage	I_C = – 10 mA I_C = – 50 mA	I_B = – 1 mA I_B = – 5 mA	0.6		0.9 1.2	V V
h_{FE}*	DC Current Gain	for **2N3250** I_C = – 0.1 mA I_C = – 1 mA I_C = – 10 mA I_C = – 50 mA for **2N3251** I_C = – 0.1 mA I_C = – 1 mA I_C = – 10 mA I_C = – 50 mA	 V_{CE} = – 1 V V_{CE} = – 1 V V_{CE} = – 1 V V_{CE} = – 1 V V_{CE} = – 1 V V_{CE} = – 1 V V_{CE} = – 1 V V_{CE} = – 1 V	 40 45 50 15 80 90 100 30		 150 300	
h_{fe}	Small Signal Current Gain	I_C = – 1 mA f = 1 kHz	V_{CE} = – 10 V for **2N3250** for **2N3251**	 50 100		 200 400	
f_T	Transition Frequency	I_C = – 10 mA f = 100 MHz	V_{CE} = – 20 V for **2N3250** for **2N3251**	 250 300		 	 MHz MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 f = 1 MHz	V_{EB} = – 1 V			8	pF
C_{CBO}	Collector-base Capacitance	I_E = 0 f = 1 MHz	V_{CB} = – 10 V			6	pF
NF	Noise Figure	I_C = – 100 μA f = 100 Hz	V_{CE} = – 5 V R_g = 1 kΩ			6	dB
h_{ie}	Input Impedance	I_C = – 1 mA f = 1 kHz	V_{CE} = – 10 V for **2N3250** for **2N3251**	 1 2		 6 12	 kΩ kΩ
h_{re}	Reverse Voltage Ratio	I_C = – 1 mA f = 1 kHz	V_{CE} = – 10 V for **2N3250** for **2N3251**			 10^{-3} $2x10^{-3}$	

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

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{oe}	Output Admittance	$I_C = -1$ mA $V_{CE} = -10$ V f = 1 kHz for **2N3250** for **2N3251**	 4 10		 40 60	 µS µS
t_d	Delay Time	$I_C = 10$ mA $V_{CC} = 3$ V $I_{B1} = 1$ mA			35	ns
t_r	Delay Time	$I_C = 10$ mA $V_{CC} = 3$ V $I_{B1} = 1$ mA			35	ns
t_s	Storage Time	$I_C = 10$ mA $V_{CC} = 3$ V $I_{B1} = -I_{B2} = 1$ mA			200	ns
t_f	Fall Time	$I_C = 10$ mA $V_{CC} = 3$ V $I_{B1} = -I_{B2} = 1$ mA			50	ns
$r_{bb'}C_{b'c}$	Feedback Time Constant	$I_C = -10$ mA $V_{CE} = -20$ V			250	ps

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