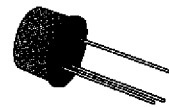


AMPLIFIERS AND SWITCHES

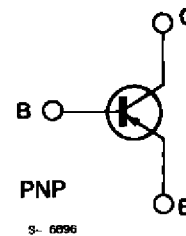
DESCRIPTION

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 $T_{amb} \leq 25\text{ }^{\circ}\text{C}$ at $T_{case} \leq 25\text{ }^{\circ}\text{C}$	0.36 1.2	W W
T_{stg}, T_j	Storage and Junction Temperature	- 65 to 200	$^{\circ}\text{C}$

2N3250-2N3251

THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	146	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	487	°C/W

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\ ^\circ\text{C}$ unless otherwise specified)

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

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

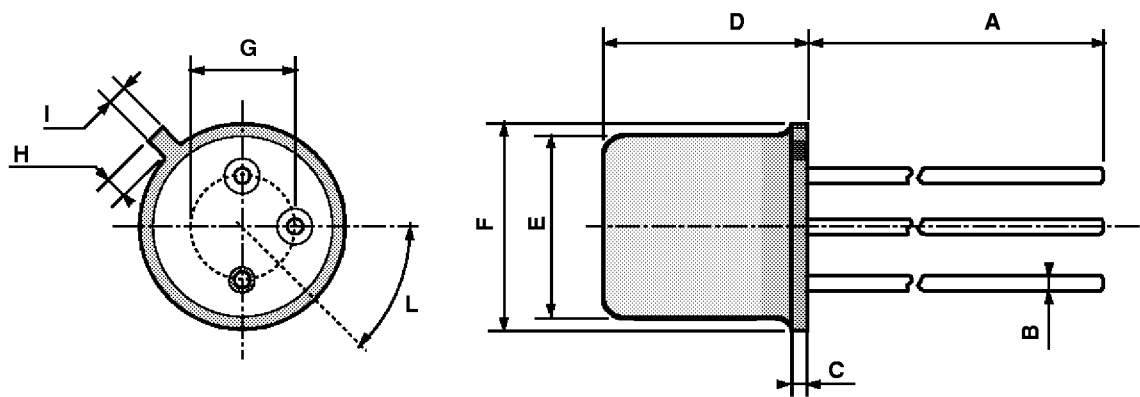
ELECTRICAL CHARACTERISTICS (continued)

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

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

TO-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45°			45°		



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