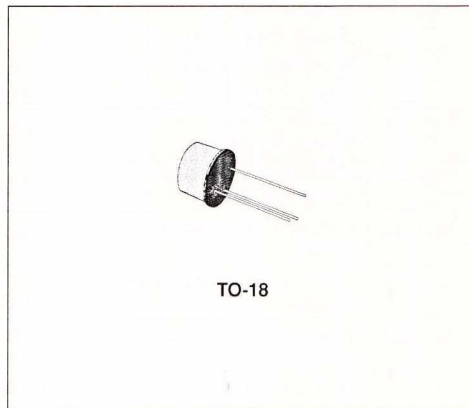


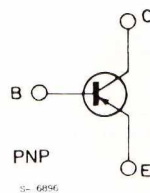
AMPLIFIERS AND SWITCHES

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.



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_{EB0}	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	W
		1.2	W
T_{stg}, T_j	Storage and Junction Temperature	- 65 to 200	$^\circ\text{C}$

THERMAL DATA

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

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\ ^{\circ}C$ 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
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ($I_E = 0$)	$I_C = -10\ \mu A$	-50			V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ($I_B = 0$)	$I_C = -10\ mA$	-40			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = -10\ \mu A$	-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	$I_C = -100\ \mu A$ $f = 100\ Hz$	$V_{CE} = -5\ V$ $R_g = 1\ k\Omega$		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	k Ω k Ω
h_{re}	Reverse Voltage Ratio	$I_C = -1\ mA$ $f = 1\ kHz$	$V_{CE} = -10\ V$ 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	$I_C = -1 \text{ mA}$ $f = 1 \text{ kHz}$	$V_{CE} = -10 \text{ V}$ for 2N3250 for 2N3251	4 10	40 60	μS μS
t_d	Delay Time	$I_C = 10 \text{ mA}$ $I_{B1} = 1 \text{ mA}$	$V_{CC} = 3 \text{ V}$		35	ns
t_r	Delay Time	$I_C = 10 \text{ mA}$ $I_{B1} = 1 \text{ mA}$	$V_{CC} = 3 \text{ V}$		35	ns
t_s	Storage Time	$I_C = 10 \text{ mA}$ $I_{B1} = -I_{B2} = 1 \text{ mA}$	$V_{CC} = 3 \text{ V}$		200	ns
t_f	Fall Time	$I_C = 10 \text{ mA}$ $I_{B1} = -I_{B2} = 1 \text{ mA}$	$V_{CC} = 3 \text{ V}$		50	ns
$r_{bb'}C_{b'e}$	Feedback Time Constant	$I_C = -10 \text{ mA}$	$V_{CE} = -20 \text{ V}$		250	ps

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