

## PNP SILICON SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/323

### Devices

2N3250A

2N3251A

### Qualified Level

JAN  
JANTX  
JANTXV

### MAXIMUM RATINGS

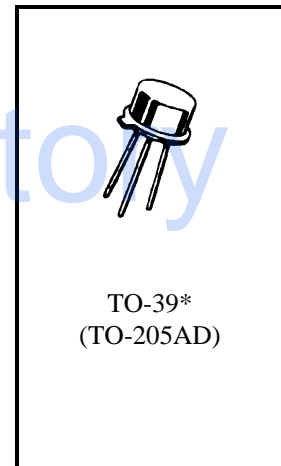
Ratings	Symbol	Value	Units
Collector-Emitter Voltage	$V_{CEO}$	60	Vdc
Collector-Base Voltage	$V_{CBO}$	60	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current	$I_C$	200	mAdc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ <sup>(1)</sup> @ $T_C = +25^{\circ}\text{C}$ <sup>(2)</sup>	$P_T$	0.36	W
		1.2	W
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +175	$^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$ <sup>(1)(2)</sup>	417	$^{\circ}\text{C}/\text{W}$

1) Derate linearly 2.4 W/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$

2) Derate linearly 8.0 W/ $^{\circ}\text{C}$  for  $T_C > +25^{\circ}\text{C}$



\*See appendix A for package outline

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 10 \text{ mAdc}$	$V_{(BR)CEO}$	60		Vdc
Collector-Emitter Cutoff Voltage $V_{BE} = 3.0 \text{ Vdc}, V_{CE} = 40 \text{ Vdc}$	$I_{CEX}$		20	$\eta\text{Adc}$
Collector-Base Cutoff Current $V_{CB} = 60 \text{ Vdc}$ $V_{CB} = 40 \text{ Vdc}$	$I_{CBO}$		10	$\mu\text{Adc}$
			20	$\eta\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$	$I_{EBO}$		10	$\mu\text{Adc}$
Collector-Emitter Cutoff Voltage $V_{BE} = 3.0 \text{ Vdc}, V_{CE} = 40 \text{ Vdc}$	$I_{CEX}$		50	$\eta\text{Adc}$

**2N3250A, 2N3251A JAN SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
<b>DC CHARACTERISTICS <sup>(3)</sup></b>				
Forward-Current Transfer Ratio I <sub>C</sub> = 0.1 mA <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub>	2N3250A	40		
	2N3251A	80		
I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub>	2N3250A	45		
	2N3251A	90		
I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub>	2N3250A	50	150	
	2N3251A	100	300	
I <sub>C</sub> = 50 mA <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub>	2N3250A	15		
	2N3251A	30		
Collector-Emitter Saturation Voltage I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 1.0 mA <sub>dc</sub>	V <sub>CE(sat)</sub>		0.25	V <sub>dc</sub>
I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 5.0 mA <sub>dc</sub>			0.50	
Base-Emitter Voltage I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 1.0 mA <sub>dc</sub>	V <sub>BE(sat)</sub>	0.60	0.90	V <sub>dc</sub>
I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 5.0 mA <sub>dc</sub>			1.20	

**DYNAMIC CHARACTERISTICS**

Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f = 1.0 kHz	2N3250A	h <sub>fe</sub>	50	200	
	2N3251A		100	400	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 20 V <sub>dc</sub> , f = 100 MHz	2N3250A	h <sub>fe</sub>	2.5	9.0	
	2N3251A		3.0	9.0	
Output Capacitance V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz		C <sub>obo</sub>		6.0	pF
Input Capacitance V <sub>EB</sub> = 1.0 V <sub>dc</sub> , I <sub>C</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz		C <sub>ibo</sub>		8.0	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time V <sub>CC</sub> = 3.0 V <sub>dc</sub> ; I <sub>C</sub> = 10 mA <sub>dc</sub> ; I <sub>B1</sub> = 1.0 mA <sub>dc</sub>		t <sub>on</sub>		70	ns
Turn-Off Time V <sub>CC</sub> = 3.0 V <sub>dc</sub> ; I <sub>C</sub> = 10 mA <sub>dc</sub> ; I <sub>B1</sub> = I <sub>B2</sub> = 1.0 mA <sub>dc</sub>	2N3250A	t <sub>off</sub>		250	ns
	2N3251A			300	

(3) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.