

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 @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾ @ $T_C = +25^{\circ}\text{C}$ ⁽²⁾	P_T	0.36 1.2	W 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	$R_{\theta JA}$ ⁽¹⁾⁽²⁾	417	$^{\circ}\text{C/W}$

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 $T_C > +25^{\circ}\text{C}$



TO-39*
(TO-205AD)

*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	ηAdc
Collector-Base Cutoff Current $V_{CB} = 60 \text{ Vdc}$ $V_{CB} = 40 \text{ Vdc}$	I_{CBO}		10 20	μAdc ηAdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$	I_{EBO}		10	μAdc
Collector-Emitter Cutoff Voltage $V_{BE} = 3.0 \text{ Vdc}, V_{CE} = 40 \text{ Vdc}$	I_{CEX}		50	ηAdc

2N3250A, 2N3251A JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio I _C = 0.1 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3250A 2N3251A	h _{FE}	40		
I _C = 1.0 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3250A 2N3251A		80		
I _C = 10 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3250A 2N3251A		45		
I _C = 10 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3250A 2N3251A		90		
I _C = 10 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3250A 2N3251A		50	150	
I _C = 50 mA _{dc} , V _{CE} = 1.0 V _{dc} 2N3250A 2N3251A		100	300	
Collector-Emitter Saturation Voltage I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc} I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc}	V _{CE(sat)}		0.25 0.50	V _{dc}
Base-Emitter Voltage I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc} I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc}	V _{BE(sat)}	0.60	0.90 1.20	V _{dc}

DYNAMIC CHARACTERISTICS

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

SWITCHING CHARACTERISTICS

Turn-On Time V _{CC} = 3.0 V _{dc} ; I _C = 10 mA _{dc} ; I _{B1} = 1.0 mA _{dc}	t _{on}		70	ns
Turn-Off Time V _{CC} = 3.0 V _{dc} ; I _C = 10 mA _{dc} ; I _{B1} = I _{B2} = 1.0 mA _{dc} 2N3250A 2N3251A	t _{off}		250 300	ns

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

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