



# NPN High Power Silicon Transistors

## 2N6249, 2N6250, 2N6251

### Features

- Available in JAN, JANTX, and JANTXV per MIL-PRF-19500/371
- TO-3 (TO-204AA) Package



### Maximum Ratings

Ratings	Symbol	2N6249	2N6250	2N6251	Units
Collector - Emitter Voltage	$V_{CEO}$	200	275	350	Vdc
Collector - Base Voltage	$V_{CBO}$	300	375	450	Vdc
Emitter - Base Voltage	$V_{EBO}$	6.0			Vdc
Collector Current	$I_C$	10			Adc
Base Current	$I_B$	5.0			Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ (1) @ $T_A = +25^\circ\text{C}$ (2)	$P_T$	6.0			W
		175			W
Operating & Storage Temperature Range	$T_{OP}, T_{stg}$	-65 to +200			$^\circ\text{C}$

### Thermal Characteristics

Characteristics	Symbol	Maximum	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.25	$^\circ\text{C}/\text{W}$

1) Derate linearly @ 34.2 mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$

2) Derate linearly @ 1.0 mW/ $^\circ\text{C}$  for  $T_C > +75^\circ\text{C}$

### Electrical Characteristics

OFF Characteristics	Symbol	Minimum	Maximum	Units	
Collector-Emitter Breakdown Voltage $I_C = 20 \text{ mAdc}, L = 42 \text{ mH}, f = 30\text{-}60 \text{ GHz}$ (See Figure 10 of MIL-PRF-19500/510)	2N6249 2N6250 2N6251	$I_{(BR)CEO}$	---	200 275 350	Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, L = 14 \text{ mH}, f = 30\text{-}60 \text{ GHz}$ (See Figure 10 of MIL-PRF-19500/510)	2N6249 2N6250 2N6251	$I_{(BR)CER}$	---	225 300 375	Vdc
Emitter-Base Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$		$I_{EBO}$	---	100	$\mu\text{Adc}$
Collector-Emitter Cutoff Current $V_{CE} = 150 \text{ Vdc}$ $V_{CE} = 225 \text{ Vdc}$ $V_{CE} = 225 \text{ Vdc}$	2N6249 2N6250 2N6251	$I_{CEO}$	---	1.0	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 225 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$ $V_{CE} = 300 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$ $V_{CE} = 375 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$	2N6249 2N6250 2N6251	$I_{CEX}$	---	100	$\mu\text{Adc}$

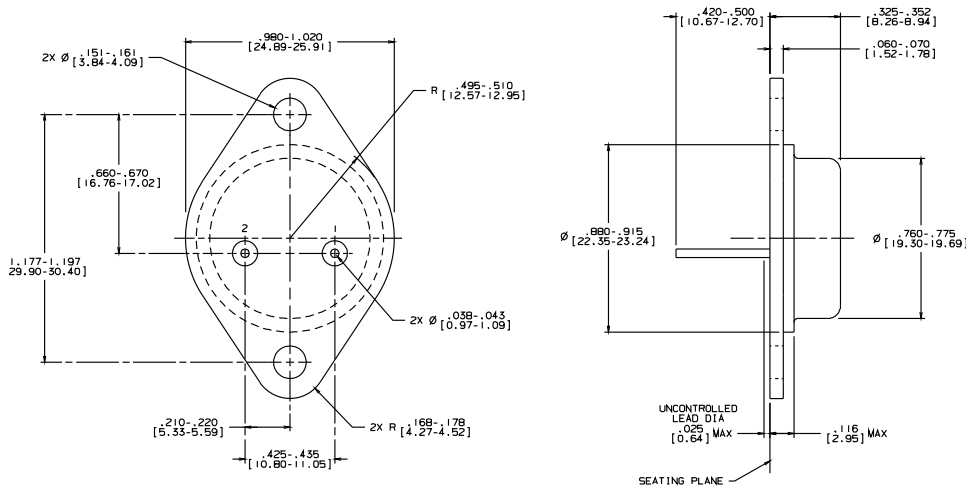


**Electrical Characteristics -con't**

<b>OFF Characteristics (con't)</b>	Symbol	Minimum	Maximum	Unit
Collector-Base Cutoff Current V <sub>CE</sub> = 300 Vdc 2N6249 V <sub>CE</sub> = 325 Vdc 2N6250 V <sub>CE</sub> = 450 Vdc 2N6251	I <sub>CBO</sub>	---	1.0	mAdc
<b>ON Characteristics (2)</b>				
Forward Current Transfer Ratio I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 3.0 Vdc 2N6249 2N6250 2N6251	H <sub>FE</sub>	10 8 6	50 50 50	
Collector - Emitter Sustaining Voltage I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.0 Adc 2N6249 I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.25 Adc 2N6250 I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.67 Adc 2N6251	V <sub>CE(sat)</sub>	---	1.5	Vdc
Base-Emitter Saturation Voltage I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.0 Adc 2N6249 I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.25 Adc 2N6250 I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.67 Adc 2N6251	V <sub>BE(sat)</sub>	---	2.25	Vdc
<b>DYNAMIC Characteristic</b>				
Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 10 Vdc, f = 1 MHz	h <sub>fe</sub>	2.5	15	
Output Capacitance V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz	C <sub>obo</sub>	---	500	pF
<b>Switching Characteristic</b>				
Turn-On Time V <sub>CC</sub> = 200 Vdc, I <sub>C</sub> = 1.0 Adc, I <sub>B1</sub> = 1.0 Adc 2N6249 I <sub>B1</sub> = 1.25 Adc 2N6250 I <sub>B1</sub> = 1.67 Adc 2N6251	t <sub>on</sub>	---	2.0	μs
Turn-Off Time V <sub>CC</sub> = 200 Vdc, I <sub>C</sub> = 1.0 Adc, I <sub>B1</sub> = 1.0 Adc 2N6249 I <sub>B1</sub> = 1.25 Adc 2N6250 I <sub>B1</sub> = 1.67 Adc 2N6251	t <sub>off</sub>	---	4.5	μs
<b>SAFE OPERATING AREA</b>				
<b>DC Tests:</b>	T <sub>C</sub> = +25 °C, 1 Cycle, t = 1.0 s (See Figure 12 of MIL-PRF-19500/371)			
<b>Test 1:</b>	V <sub>CE</sub> = 17.5 Vdc, I <sub>C</sub> = 10 Adc			
<b>Test 2:</b>	V <sub>CE</sub> = 30 Vdc, I <sub>C</sub> = 5.8 Adc			
<b>TEST 3:</b>	V <sub>CE</sub> = 100 Vdc, I <sub>C</sub> = 0.3 Adc			
<b>TEST 4:</b>	V <sub>CE</sub> = 200 Vdc, I <sub>C</sub> = 0.13 Adc (For 2N6249 only)			
<b>TEST 5:</b>	V <sub>CE</sub> = 275 Vdc, I <sub>C</sub> = 0.09 Adc (For 2N6250 only)			
<b>TEST 6:</b>	V <sub>CE</sub> = 350 Vdc, I <sub>C</sub> = 0.09 Adc (For 2N6251 only)			

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

Outline Drawing



- NOTES:
1. STANDARD HEADER TYPE SOLID BASE.
  2. STANDARD LEAD FINISH PER MIL-M-58510 TYPE X OR EQUIVALENT.
  3. LEAD NOT BENT GREATER THAN 15°.
  4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA

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