



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	6.0 175			W 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	$^\circ\text{C/W}$

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	μAdc
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	μAdc

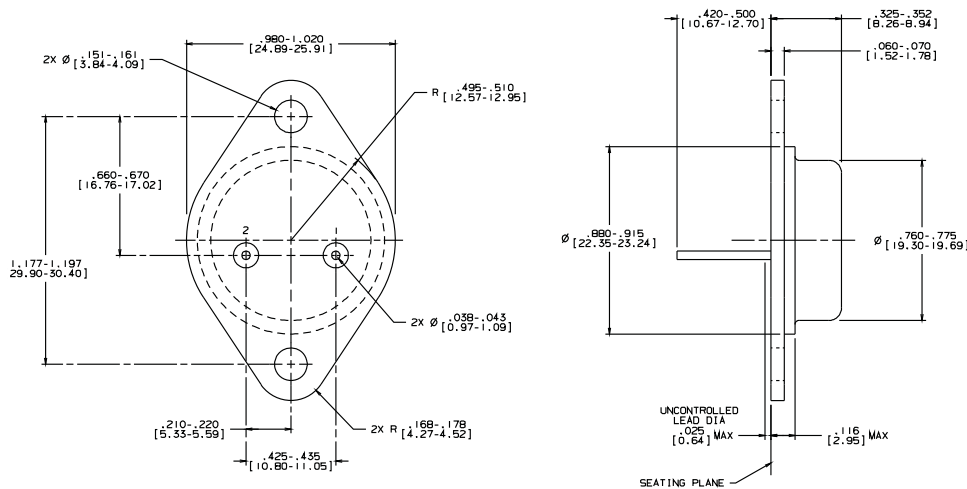


Electrical Characteristics -con't

OFF Characteristics (con't)		Symbol	Minimum	Maximum	Unit
Collector-Base Cutoff Current		I_{CBO}	- - -	1.0	mAdc
$V_{CE} = 300 \text{ Vdc}$	2N6249				
$V_{CE} = 325 \text{ Vdc}$	2N6250				
$V_{CE} = 450 \text{ Vdc}$	2N6251				
ON Characteristics (2)					
Forward Current Transfer Ratio		H_{FE}	10 8 6	50 50 50	
$I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$	2N6249				
	2N6250				
	2N6251				
Collector - Emitter Sustaining Voltage		$V_{CE(sat)}$	- - -	1.5	Vdc
$I_C = 10 \text{ Adc}, I_B = 1.0 \text{ Adc}$	2N6249				
$I_C = 10 \text{ Adc}, I_B = 1.25 \text{ Adc}$	2N6250				
$I_C = 10 \text{ Adc}, I_B = 1.67 \text{ Adc}$	2N6251				
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	- - -	2.25	Vdc
$I_C = 10 \text{ Adc}, I_B = 1.0 \text{ Adc}$	2N6249				
$I_C = 10 \text{ Adc}, I_B = 1.25 \text{ Adc}$	2N6250				
$I_C = 10 \text{ Adc}, I_B = 1.67 \text{ Adc}$	2N6251				
DYNAMIC Characteristic					
Small-Signal Short-Circuit Forward Current Transfer Ratio		$ h_{fe} $	2.5	15	
$I_C = 1.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1 \text{ MHz}$					
Output Capacitance		C_{obo}	- - -	500	pF
$V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$					
Switching Characteristic					
Turn-On Time		t_{on}	- - -	2.0	μs
$V_{CC} = 200 \text{ Vdc}, I_C = 1.0 \text{ Adc},$					
$I_{B1} = 1.0 \text{ Adc}$	2N6249				
$I_{B1} = 1.25 \text{ Adc}$	2N6250				
$I_{B1} = 1.67 \text{ Adc}$	2N6251				
Turn-Off Time		t_{off}	- - -	4.5	μs
$V_{CC} = 200 \text{ Vdc}, I_C = 1.0 \text{ Adc},$					
$I_{B1} = 1.0 \text{ Adc}$	2N6249				
$I_{B1} = 1.25 \text{ Adc}$	2N6250				
$I_{B1} = 1.67 \text{ Adc}$	2N6251				
SAFE OPERATING AREA					
DC Tests:	$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$ (See Figure 12 of MIL-PRF-19500/371)				
Test 1:	$V_{CE} = 17.5 \text{ Vdc}, I_C = 10 \text{ Adc}$				
Test 2:	$V_{CE} = 30 \text{ Vdc}, I_C = 5.8 \text{ Adc}$				
TEST 3:	$V_{CE} = 100 \text{ Vdc}, I_C = 0.3 \text{ Adc}$				
TEST 4:	$V_{CE} = 200 \text{ Vdc}, I_C = 0.13 \text{ Adc}$ (For 2N6249 only)				
TEST 5:	$V_{CE} = 275 \text{ Vdc}, I_C = 0.09 \text{ Adc}$ (For 2N6250 only)				
TEST 6:	$V_{CE} = 350 \text{ Vdc}, I_C = 0.09 \text{ Adc}$ (For 2N6251 only)				

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

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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