2N6249, 2N6250, & 2N6251

NPN Darlington Power Silicon Transistor

Rev. V1

Features

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

Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	I_C = 20 mAdc, L = 42 mH, 30 - 60 GHz (see figure 10 of MIL-PRF-19500/510) 2N6249 2N6250 2N6251	$V_{(BR)CEO}$	Vdc	—	 200 275 350
Collector - Emitter Breakdown Voltage	I_C = 20 mAdc, L = 42 mH, 30 - 60 GHz (see figure 10 of MIL-PRF-19500/510) 2N6249 2N6250 2N6251	$V_{(BR)CER}$	Vdc	—	 225 300 375
Emitter - Base Cutoff Current	V_{EB} = 6 Vdc	I_{EBO}	µAdc	—	100
Collector - Emitter Cutoff Current	V_{CE} = 150 Vdc, 2N6249 V_{CE} = 225 Vdc, 2N6250 V_{CE} = 225 Vdc, 2N6251	I_{CEO}	mAdc	—	1.0
Collector - Emitter Cutoff Current	V_{CE} = 225 Vdc, V_{BE} = -1.5 Vdc, 2N6249 V_{CE} = 300 Vdc, V_{BE} = -1.5 Vdc, 2N6250 V_{CE} = 375 Vdc, V_{BE} = -1.5 Vdc, 2N6251	I_{CEX}	µAdc	—	100
Collector - Base Cutoff Current	V_{CE} = 300 Vdc, 2N6249 V_{CE} = 325 Vdc, 2N6250 V_{CE} = 450 Vdc, 2N6251	I_{EBO}	mAdc	—	1.0
On Characteristics[1]					
Forward Current Transfer Ratio	I_C = 10 Adc, V_{CE} = 3 Vdc 2N6249 2N6250 2N6251	H_{FE}	-	 10 8 6	 50 50 50
Collector - Emitter Sustaining Voltage	I_C = 10 Adc, I_B = 1.0 Adc, 2N6249 I_C = 10 Adc, I_B = 1.25 Adc, 2N6250 I_C = 10 Adc, I_B = 1.67 Adc, 2N6251	$V_{CE(SAT)}$	Vdc	—	1.5
Base - Emitter Saturation Voltage	I_C = 10 Adc, I_B = 1.0 Adc, 2N6249 I_C = 10 Adc, I_B = 1.25 Adc, 2N6250 I_C = 10 Adc, I_B = 1.67 Adc, 2N6251	$V_{BE(SAT)}$	Vdc	—	2.25

1. Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤2.0%.

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Dynamic Characteristics					
Small-Signal Short-Circuit Forward Current Transfer Ratio	I_C = 1 Adc, V_{CE} = 10 Vdc, f = 1 kHz	$\lvert H_{FE} \rvert$	-	2.5	15.0
Output Capacitance	V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1 MHz	C_{OBO}	pF	—	500
Switching Characteristics					
Turn-On Time	V_{CC} = 200 Vdc; I_C = 1 Adc; I_B1 = 1.0 Adc, 2N6249 I_B1 = 1.25 Adc, 2N6250 I_B1 = 1.67 Adc, 2N6251	T_{ON}	µs	—	2.0
Turn-Off Time	V_{CC} = 200 Vdc; I_C = 1 Adc; I_B1 = 1.0 Adc, 2N6249 I_B1 = 1.25 Adc, 2N6250 I_B1 = 1.67 Adc, 2N6251	T_{OFF}	µs	—	4.5
Safe Operating Area					
DC Tests:	T_C = +25 °C, I Cycle, t = 1.0 s (see figure 12 of MIL-PRF-19500/371)				
Test 1:	V_{CE} = 17.5 Vdc, I_C = 10 Adc				
Test 2:	V_{CE} = 30 Vdc, I_C = 5.8 Adc				
Test 3:	V_{CE} = 100 Vdc, I_C = 0.3 Adc				
Test 4:	V_{CE} = 200 Vdc, I_C = 0.13 Adc, (for 2N6249 only)				
Test 5:	V_{CE} = 275 Vdc, I_C = 0.09 Adc, (for 2N6250 only)				
Test 3:	V_{CE} = 350 Vdc, I_C = 0.09 Adc, (for 2N6251 only)				

Absolute Maximum Ratings

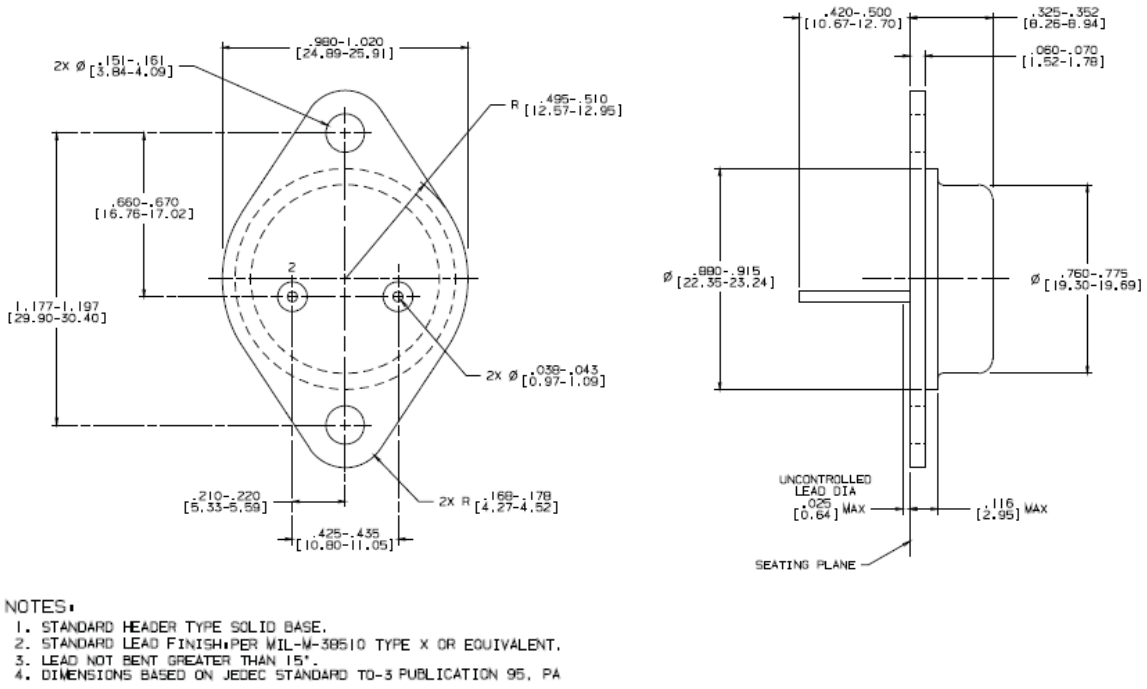
Ratings	Symbol	2N6249	2N6250	2N6251	Units
Collector - Emitter Voltage	V_{CEO}	200	275	350	Vdc
Collector - Base Voltage	V_{CBO}	300	375	450	Vdc
Emitter - Base Voltage	V_{EBO}	6			Vdc
Collector Current	I_C	10			Adc
Base Current	I_B	5			Adc
Total Power Dissipation @ T_A = +25°C[2] @ T_A = +25°C[3]	P_T	6 175			W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65 to +200			°C

2. Derate linearly @ 34.2 mW / °C for T_A >25°C.
3. Derate linearly @ 1.0 mW / °C for T_C >27°C.

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.25°C/W

Outline Drawing



NOTES:
1. STANDARD HEADER TYPE SOLID BASE.
2. STANDARD LEAD FINISH: PER MIL-M-38510 TYPE X OR EQUIVALENT.
3. LEAD NOT BENT GREATER THAN 15°.
4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA