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TECHNICAL DATA SHEET

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/510

DEVICES

2N6249 **2N6250** **2N6251**
2N6249T1 **2N6250T1** **2N6251T1**

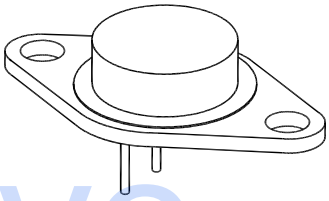
LEVELS

JAN
JANTX
JANTXV
JANS

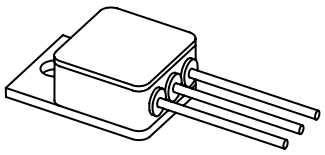
ABSOLUTE MAXIMUM RATINGS ***(T_C = +25°C unless otherwise noted)***

Parameters / Test Conditions	Symbol	2N6249 2N6249T1	2N6250 2N6250T1	2N6251 2N6251T1	Unit
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			
Total Power Dissipation @ T_A = +25°C (1) @ T_C = +25°C (2)	P_T	6.0 175			W
Operating & Storage Junction Temperature	T_{op}, T_{stg}	-65 to +200			°C
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0			°C/W

NOTES:
(1) Derate linearly at 34.2 mW/°C for T_A > +25°C
(2) Derate linearly at 1.0 mW/°C for T_C > +25°C



TO-3 (TO-204AA)



TO-254

ELECTRICAL CHARACTERISTICS ***(T_A = +25°C, unless otherwise noted)***

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
OFF CHARACTERTICS					
Collector-Emitter Breakdown Voltage I_C = 20mAdc; L = 42mH; f = 30 – 60Hz (See Figure 10 of MIL-PRF-19500/510)	2N6249, T1 2N6250, T1 2N6251, T1	$V_{(BR)CEO}$	200 275 350		Vdc
Collector-Emitter Breakdown Voltage I_C = 200mAdc; L = 14mH; f = 30 – 60Hz; R_{BE} = 50Ω (See Figure 10 of MIL-PRF-19500/510)	2N6249, T1 2N6250, T1 2N6251, T1	$V_{(BR)CER}$	225 300 375		Vdc
Emitter-Base Cutoff Current V_{EB} = 6.0Vdc		I_{EBO}		100	µAdc

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ELECTRICAL CHARACTERISTICS ***(T_A = +25°C, unless otherwise noted) CONT.***

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
OFF CHARACTERTICS					
Collector-Emitter Cutoff Current					
V_{CE} = 150Vdc	2N6249, T1	I_{CEO}		1.0	mAdc
V_{CE} = 225Vdc	2N6250, T1				
V_{CE} = 300Vdc	2N6251, T1				
Collector- Emitter Cutoff Current					
V_{CE} = 225Vdc, V_{BE} = -1.5Vdc	2N6249, T1	I_{CEX}		100	µAdc
V_{CE} = 300Vdc, V_{BE} = -1.5Vdc	2N6250, T1				
V_{CE} = 375Vdc, V_{BE} = -1.5Vdc	2N6251, T1				
Collector-Base Cutoff Current					
V_{CB} = 300Vdc	2N6249, T1	I_{CBO}		0.5	mAdc
V_{CB} = 375Vdc	2N6250, T1				
V_{CB} = 450Vdc	2N6251, T1				
ON CHARACTERISTICS (3)					
Forward-Current Transfer Ratio					
I_C = 10Adc, V_{CE} = 3Vdc	2N6249, T1	h_{FE}	10	50	
	2N6250, T1		8	50	
	2N6251, T1		6	50	
Collector-Emitter Saturation Voltage					
I_C = 10Adc, I_B = 1.0Adc	2N6249, T1	$V_{CE(sat)}$		1.5	Vdc
I_C = 10Adc, I_B = 1.25Adc	2N6250, T1				
I_C = 10Adc, I_B = 1.67Adc	2N6251, T1				
Base-Emitter Saturation Voltage					
I_C = 10Adc, I_B = 1.0Adc	2N6249, T1	$V_{BE(sat)}$		2.25	Vdc
I_C = 10Adc, I_B = 1.25Adc	2N6250, T1				
I_C = 10Adc, I_B = 1.67Adc	2N6251, T1				

DYNAMIC CHARACTERISTICS

Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 1.0Adc, V_{CE} = 10Vdc, f = 1MHz	$\|h_{fe}\|$	2.5	15	
Output Capacitance V_{CB} = 10Vdc, I_C = 0, 100 kHz ≤ f ≤ 1.0MHz	C_{obo}		500	pF

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

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SWITCHING CHARACTERISTICS

Turn-On Time V_{CC} = 200Vdc; I_C = 10Adc I_B = 1.0A I_B = 1.25A I_B = 1.67A	 2N6249, T1 2N6250, T1 2N6251, T1	t_{on}		2.0	µs
Turn-Off Time V_{CC} = 200Vdc; I_C = 10Adc I_B = 1.0A I_B = 1.25A I_B = 1.67A	 2N6249, T1 2N6250, T1 2N6251, T1	t_{off}		4.5	µs

SAFE OPERATING AREA

DC Tests T_C = +25°C, 1 Cycle, t = 1s (See Figure 12 of MIL-PRF-19500/510) **Test 1** V_{CE} = 17.5Vdc, I_C = 10Adc **Test 2** V_{CE} = 30Vdc, I_C = 5.8Adc **Test 3** V_{CE} = 100Vdc, I_C = 0.3Adc **Test 4** V_{CE} = 200Vdc, I_C = 0.13Adc (For 2N6249, 2N6249T1 only) **Test 5** V_{CE} = 275Vdc, I_C = 0.09Adc (For 2N6250, 2N6250T1 only) **Test 6** V_{CE} = 350Vdc, I_C = 0.065Adc (For 2N6251, 2N6251T1 only)				

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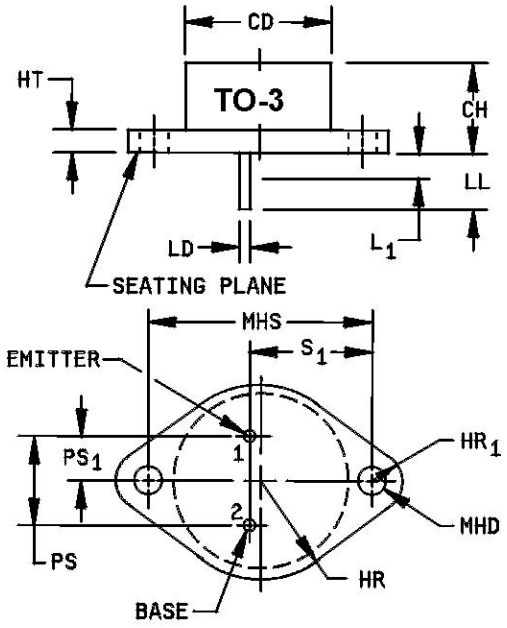
PACKAGE DIMENSIONS



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.250	.450	6.35	11.43	
HR	.495	.525	12.57	13.34	
HR_1	.131	.188	3.33	4.78	
HT	.050	.135	1.27	3.43	
LD	.038	.053	0.97	1.35	3, 5
LL	.312	.500	7.92	12.70	3
L_1		.050		1.27	5
MHD	.151	.161	3.84	4.09	
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	2
PS_1	.205	.25	5.21	6.35	2, 3
S_1	.665	.675	16.89	17.15	2

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. These dimensions shall be measured at points .050 inch (1.27 mm) and .055 inch (1.40 mm) below seating plane. When gauge is not used, measurement will be made at the seating plane.
3. Two leads.
4. Collector shall be electrically connected to the case.
5. LD applies between L_1 and LL maximum. Lead diameter shall not exceed twice LD within L_1.
6. In accordance with ASME Y14.5M, diameters are equivalent to φx symbology.

FIGURE 1. Physical dimensions (similar to TO-3).

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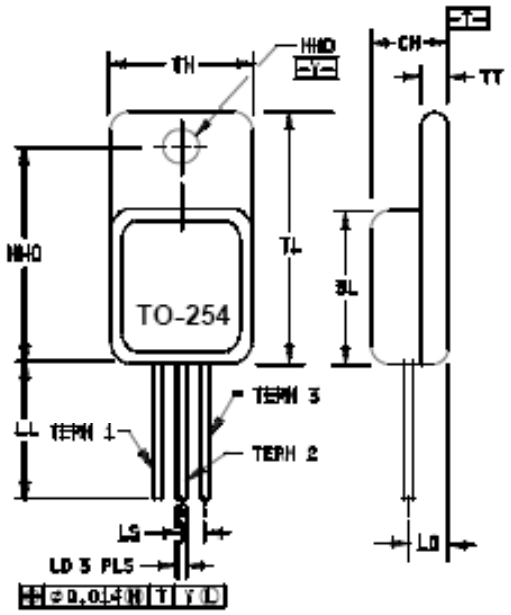

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.535	.545	13.59	13.84
CH	.249	.260	6.32	6.60
LD	.035	.045	0.89	1.14
LL	.530	.550	13.46	13.97
LO	.150 BSC		3.81 BSC	
LS	.150 BSC		3.80 BSC	
MHD	.139	.149	3.53	3.78
MHO	.665	.685	16.89	17.40
TL	.790	.800	20.07	20.32
TT	.040	.050	1.02	1.27
TW	.535	.545	13.59	13.84
TERM 1	BASE			
TERM 2	COLLECTOR			
TERM 3	EMITTER			

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Methods used for electrical isolation of terminals feedthroughs shall employ materials that contain a minimum of 90 percent AL203 (ceramic).
4. In accordance with ASME Y14.5M, diameters are equivalent to φx symbology.

FIGURE 2. Dimensions and configuration 2N6249T1, 2N6250T1, and 2N6251T1 (TO-254AA)