

# 2N6274, 2N6277



## NPN High Power Silicon Transistor

Rev. V3

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/514
- TO-3 (TO-204AA) Package
- Designed for Use in Hi-Reliability Power Amplifier and Switching Circuit Applications



### Electrical Characteristics ( $T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = 50 \text{ mA dc}$ , 2N6274 $I_C = 50 \text{ mA dc}$ , 2N6277	$V_{(BR)CEO}$	V dc	100 150	—
Collector - Base Cutoff Current	$V_{CB} = 120 \text{ V dc}$ , 2N6274 $V_{CB} = 180 \text{ V dc}$ , 2N6277	$I_{CBO}$	$\mu\text{A dc}$	—	10 10
Emitter - Base Cutoff Current	$V_{EB} = 6.0 \text{ V dc}$	$I_{EBO}$	$\mu\text{A dc}$	—	100
Collector - Emitter Cutoff Current	$V_{CE} = 120 \text{ V dc}$ , $V_{BE} = -1.5 \text{ V dc}$ , 2N6274 $V_{CE} = 180 \text{ V dc}$ , $V_{BE} = -1.5 \text{ V dc}$ , 2N6277	$I_{CEX1}$	$\mu\text{A dc}$	—	10 10
Collector - Emitter Cutoff Current	$V_{CE} = 50 \text{ V dc}$ , 2N6274 $V_{CE} = 75 \text{ V dc}$ , 2N6277	$I_{CEO}$	$\mu\text{A dc}$	—	50 50
Forward Current Transfer Ratio	$V_{CE} = 4.0 \text{ V dc}$ ; $I_C = 1.0 \text{ A dc}$ $V_{CE} = 4.0 \text{ V dc}$ ; $I_C = 20 \text{ A dc}$ $V_{CE} = 4.0 \text{ V dc}$ ; $I_C = 50 \text{ A dc}$	$h_{FE}$	-	50 30 10	120
Collector - Emitter Saturation Voltage	$I_C = 20 \text{ A dc}$ ; $I_B = 2.0 \text{ A dc}$ $I_C = 50 \text{ A dc}$ ; $I_B = 10 \text{ A dc}$	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	1.0 3.0
Emitter - Base Saturation Voltage	$I_C = 20 \text{ A dc}$ ; $I_B = 2.0 \text{ A dc}$	$V_{BE(sat)}$	V dc	—	1.8
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CE} = 120 \text{ V dc}$ , $V_{BE} = -1.5 \text{ V dc}$ , 2N6274 $V_{CE} = 180 \text{ V dc}$ , $V_{BE} = -1.5 \text{ V dc}$ , 2N6277	$I_{CEX2}$	$\text{mA dc}$	—	10 10
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $V_{CE} = 4.0 \text{ V dc}$ ; $I_C = 20 \text{ A dc}$	$h_{FE4}$	-	10	
<b>Dynamic Characteristics</b>					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}$ ; $I_C = 1.0 \text{ A dc}$ ; $f = 10 \text{ MHz}$	$ h_{fe} $		3.0	12
Output Capacitance	$V_{CB} = 10 \text{ V dc}$ ; $I_E = 0$ ; $f = 1.0 \text{ MHz}$	$C_{obo}$	pF	—	600

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### Absolute Maximum Ratings ( $T_C = +25^\circ\text{C}$ unless otherwise specified)

Ratings	Symbol	Value
Collector - Emitter Voltage 2N6274 2N6277	$V_{CEO}$	100 V dc 150 V dc
Collector - Base Voltage 2N6274 2N6277	$V_{CBO}$	120 V dc 180 V dc
Emitter - Base Voltage	$V_{EBO}$	6 V dc
Base Current	$I_B$	20 A dc
Collector Current	$I_C$	50 A dc
Total Power Dissipation @ $T_C = +25^\circ\text{C}$ <sup>(1)</sup> @ $T_C = +100^\circ\text{C}$ <sup>(1)</sup>	$P_T$	250 W 143 W
Operating & Storage Temperature Range	$T_J, T_{STG}$	-65°C to +200°C

(1) Derate linearly @ 1.43 W / °C between  $T_C = +25^\circ\text{C}$  and  $T_C = +200^\circ\text{C}$

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.7°C/W

Switching Characteristics	Symbol	Max. Value
$V_{CC} = 80\text{ V dc}; I_C = 20\text{ A dc}; I_{B1} = 2.0\text{ A dc}$	$t_{on}$	0.5 $\mu\text{s}$
$V_{CC} = 80\text{ V dc}; I_C = 20\text{ A dc}; I_{B1} = I_{B2} = 2.0\text{ A dc}$	$t_{off}$	1.05 $\mu\text{s}$

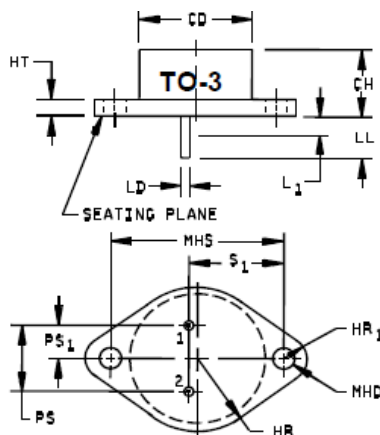
### Safe Operating Area

DC Tests:	$T_C = +25^\circ\text{C}; 1\text{ cycle}; t = 1.0\text{ s}$
Test 1:	$V_{CE} = 5\text{ V dc}; I_C = 50\text{ A dc}$
Test 2:	$V_{CE} = 86\text{ V dc}; I_C = 165\text{ mA dc}$
Test 3:	$V_{CE} = 8\text{ V dc}; I_C = 29\text{ A dc},$ 2N6274
Test 4:	$V_{CE} = 120\text{ V dc}; I_C = 110\text{ mA dc}$ 2N6277

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Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.22	3
CH	.250	.328	6.35	8.33	
HR	.495	.525	12.57	13.34	
HR <sub>1</sub>	.131	.188	3.33	4.78	6
HT	.060	.135	1.52	3.43	
LD	.057	.063	1.45	1.60	5, 9
LL	.312	.500	7.92	12.70	4, 5, 9
L <sub>1</sub>		.050		1.27	5, 9
MHD	.151	.161	3.84	4.09	7
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	
PS <sub>1</sub>	.205	.225	5.21	5.72	5
S <sub>1</sub>	.655	.675	16.64	17.15	

### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Body contour is optional within zone defined by CD.
4. These dimensions shall be measured at points .050 inch (1.27 mm) to .055 inch (1.40 mm) below seating plane. When gauge is not used, measurement shall be made at seating plane.
5. Both terminals.
6. At both ends.
7. Two holes.
8. Terminal 1 is the emitter, terminal 2 is base. The collector shall be electrically connected to the case.
9. LD applies between L<sub>1</sub> and LL. Lead diameter shall not exceed twice LD within L<sub>1</sub>.
10. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.
11. The seating plane of the header shall be flat within .001 inch (0.03 mm) concave to .004 inch (0.10 mm) convex inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.

FIGURE 1. Physical dimensions (TO-3).

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