

2N5671 & 2N5672



NPN High Power Silicon Transistor

Rev. V2

Features

- Available in JAN, JANTX, JANTXV and JANS per MIL-PRF-19500/488
- TO-3 (TO-204AA) Package
- Designed for Use in High Current Fast Switching Applications



Electrical Characteristics ($T_A = +25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = 200 \text{ mA dc}$, 2N5671 $I_C = 200 \text{ mA dc}$, 2N5672	$V_{(BR)CEO}$	V dc	90 120	—
Collector - Base Cutoff Current	$V_{CE} = 120 \text{ V dc}$, 2N5671 $V_{CE} = 150 \text{ V dc}$, 2N5672	I_{CBO}	mA dc	—	25 25
Emitter - Base Cutoff Current	$V_{EB} = 7.0 \text{ V dc}$	I_{EBO}	mA dc	—	10
Collector - Emitter Cutoff Current	$V_{CE} = 110 \text{ V dc}$, $V_{BE} = 1.5 \text{ V dc}$, 2N5671 $V_{CE} = 135 \text{ V dc}$, $V_{BE} = 1.5 \text{ V dc}$, 2N5672	I_{CEX1}	$\mu\text{A dc}$	—	250 250
Collector - Emitter Cutoff Current	$V_{CE} = 80 \text{ V dc}$	I_{CEO}	mA dc	—	10
Forward Current Transfer Ratio	$V_{CE} = 2.0 \text{ Vdc}$; $I_C = 15 \text{ A dc}$ $V_{CE} = 5.0 \text{ Vdc}$; $I_C = 20 \text{ A dc}$	h_{FE}	-	20 20	100
Collector - Emitter Saturation Voltage	$I_C = 15 \text{ A dc}$; $I_B = 1.2 \text{ A dc}$ $I_C = 30 \text{ A dc}$; $I_B = 6.0 \text{ A dc}$	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	0.75 5.0
Emitter - Base Saturation Voltage	$I_B = 1.2 \text{ A dc}$; $I_C = 15 \text{ A dc}$	$V_{BE(SAT)}$	V dc	—	1.5
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CE} = 100 \text{ V dc}$, $V_{BE} = -1.5 \text{ V dc}$, 2N5671 $V_{CE} = 100 \text{ V dc}$, $V_{BE} = -1.5 \text{ V dc}$, 2N5672	I_{CEX2}	mA dc	—	15 10
Forward-Current Transfer Ratio	$T_A = -65^\circ\text{C}$ $V_{CE} = 2.0 \text{ V dc}$; $I_C = 15 \text{ A dc}$	h_{FE3}	-	10	
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}$; $I_C = 2.0 \text{ A dc}$; $f = 5.0 \text{ MHz}$	$ h_{fe} $		10	40
Open Circuit Output Capacitance	$V_{CB} = 10 \text{ V dc}$; $I_E = 0$; $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{obo}	pF	—	900

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

Ratings	Symbol	Value
Collector - Emitter Voltage 2N5671 2N5672	V_{CEO}	90 V dc 120 V dc
Collector - Base Voltage 2N5671 2N5672	V_{CBO}	120 V dc 150 V dc
Emitter - Base Voltage	V_{EBO}	7.0 V dc
Base Current	I_B	10 V dc
Collector Current	I_C	30 A dc
Total Power Dissipation @ $T_A = +25^\circ\text{C}^1$ @ $T_C = +25^\circ\text{C}^2$	P_T	6.0 W 140 W
Operating & Storage Temperature Range	T_J, T_{STG}	-65°C to $+200^\circ\text{C}$

1. Derate linearly @ 34.2 mW / $^\circ\text{C}$ for $T_A = 25^\circ\text{C}$
2. Derate linearly @ 800 mW / $^\circ\text{C}$ for $T_C = 25^\circ\text{C}$

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.25 $^\circ\text{C}/\text{W}$
Switching Characteristics	Symbol	Max. Value
$V_{CC} = 30 \pm 2$ V dc; $I_C = 15$ A dc; $I_{B1} = 1.2$ A dc	t_{on}	0.5 μs
$V_{CC} = 30 \pm 2$ V dc; $I_C = 15$ A dc; $I_{B1} = I_{B2} = 1.2$ A dc	t_{off}	1.5 μs

Safe Operating Area

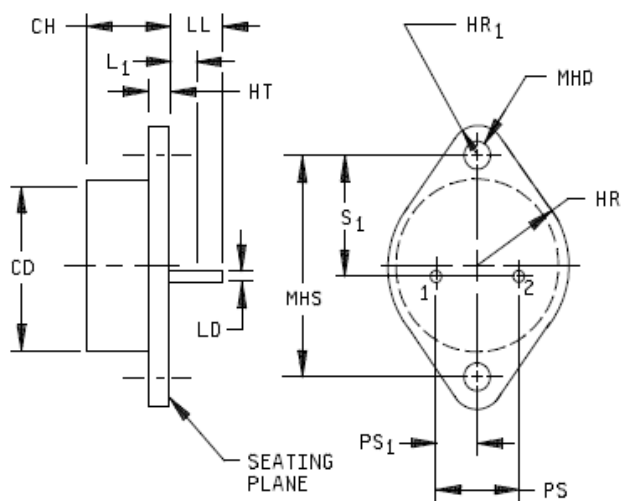
DC Tests:	$T_C = +25^\circ\text{C}$; 1 Cycle; $t = 1.0$ s
Test 1:	$I_C = 5.8$ A dc; $V_{CE} = 24$ V dc
Test 2:	$I_C = 0.9$ A dc; $V_{CE} = 45$ V dc
Test 3:	$I_C = 30$ A dc; $V_{CE} = 4.67$ V dc
Test 4:	$I_C = 0.19$ A dc; $V_{CE} = 90$ V dc 2N5671
Test 5:	$I_C = 0.11$ A dc; $V_{CE} = 120$ V dc 2N5672

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Outline Drawing (TO-3)



Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.250	.450	6.35	11.43	
HT	.050	.135	1.27	3.43	
HR	.495	.525	12.57	13.34	
HR1	.131	.188	3.33	4.78	
LD	.038	.043	0.97	1.09	2
LL	.312		7.92		
L1		.050		1.27	
MHD	.151	.161	3.84	4.09	
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	4
S1	.205	.225	5.21	5.72	4
s1	.655	.675	16.64	17.15	

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. LD applies between L₁ and LL. Lead diameter shall not exceed twice LD within L₁.
3. Terminal 1, emitter; terminal 2, base; case, collector.
4. These dimensions should be measured at points .050 – .055 inch (1.27 – 1.40 mm) below seating plane. When gauge is not used, measurement will be made at the seating plane.
5. The seating plane of the header shall be flat within .004 inch (0.10 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 .006 inch (0.15 mm) concave to .006 inch (0.15 mm) convex overall.
6. Collector shall be electrically connected to the case.
7. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 1. Physical dimensions of TO-204AA (similar to TO-3).

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