

# 2N6674 & 2N6675



## NPN High Power Silicon Transistor

Rev. V3

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/537
- TO-3 (TO-204AA) Package
- Designed for High Voltage, High Speed Switching Applications
- Ideal for Regulators, Inverters and Deflection Circuits



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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = 200 \text{ mA dc}$ 2N6674 2N6675	$V_{(BR)CEO}$	Vdc	300 400	—
Collector - Emitter Cutoff Current	$V_{CE} = 450 \text{ Vdc}; V_{BE} = -1.5 \text{ V dc}, 2\text{N}6674$ $V_{CE} = 650 \text{ Vdc}; V_{BE} = -1.5 \text{ V dc}, 2\text{N}6675$	$I_{CEX1}$	mA dc	—	0.1
Emitter - Base Cutoff Current	$V_{EB} = 7 \text{ V dc}$	$I_{EBO}$	mA dc	—	2.0
Collector - Base Cutoff Current	$V_{CB} = 450 \text{ V dc}, 2\text{N}6674$ $V_{CB} = 650 \text{ V dc}, 2\text{N}6675$	$I_{CBO}$	mA dc	—	1.0
Forward Current Transfer Ratio	$V_{CE} = 3 \text{ V dc}; I_C = 1 \text{ A dc}$ $V_{CE} = 2 \text{ V dc}; I_C = 10 \text{ A dc}$	$h_{FE}$	-	15 8	40 20
Collector - Emitter Voltage (Saturated)	$I_C = 10 \text{ A dc}; I_B = 2 \text{ A dc}$ $I_C = 15 \text{ A dc}; I_B = 5 \text{ A dc}$	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	1.0 5.0
Base - Emitter Saturation Voltage	$I_C = 10 \text{ A dc}; I_B = 2 \text{ A dc}$	$V_{BE(sat)}$	V dc	—	1.5
Collector - Emitter Cutoff Current	$T_A = +125^\circ\text{C}$ $V_{CE} = 450 \text{ Vdc}; V_{BE} = -1.5 \text{ V dc}, 2\text{N}6674$ $V_{CE} = 650 \text{ Vdc}; V_{BE} = -1.5 \text{ V dc}, 2\text{N}6675$	$I_{CEX2}$	mA dc	—	1.0
Collector - Emitter Voltage (Saturated)	$T_A = +125^\circ\text{C}$ $I_C = 10 \text{ A dc}; I_B = 2 \text{ A dc}$	$V_{CE(sat)3}$	V dc	—	2.0
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $V_{CE} = 2 \text{ V dc}; I_C = 10 \text{ A dc}$	$h_{FE3}$	-	4	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 10 \text{ Vdc}; I_C = 1 \text{ A dc}; f = 5 \text{ MHz}$	$ h_{FE} $	-	3	10
Output Capacitance	$V_{CB} = 10 \text{ V dc}; I_E = 0; 100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{obo}$	pF	150	500

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Switching Characteristics</b>					
Delay Time	See figure 3 of MIL-PRF-19500/537	$t_d$	$\mu\text{s}$	—	0.1
Rise Time		$t_r$			0.6
Storage Time		$t_s$			2.5
Fall Time		$t_f$			0.5
Cross-Over Time		$t_c$			0.5

### Absolute Maximum Ratings

Ratings	Symbol	2N6674	2N6675	Units
Collector - Emitter Voltage	$V_{CEO}$	300	400	V dc
Collector - Base Voltage	$V_{CBO}, V_{CBX}$	450	650	V dc
Emitter - Base Voltage	$V_{EBO}$	7		V dc
Collector Current	$I_C$	15		A dc
Base Current	$I_B$	5		A dc
Total Power Dissipation <sup>(1)</sup> @ $T_A = +25^\circ\text{C}$ @ $T_A = +25^\circ\text{C}$	$P_T$	6 175	6 175	W
Operating & Storage Temperature Range	$T_{OP}, T_{STG}$	-65 to +200		$^\circ\text{C}$

(1) Derate linearly @ 1.0 mW/ $^\circ\text{C}$  for  $T_C > 25^\circ\text{C}$ .  
Derate linearly @ 34.2 mW/ $^\circ\text{C}$  for  $T_A > 25^\circ\text{C}$ .

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	$1^\circ\text{C/W}$

Safe Operating Area	
DC Tests:	$T_C = +25^\circ\text{C}$ , 1 Cycle, $t = 1.0$ s (see figure 4 of MIL-PRF-19500/537)
Test 1:	$V_{CE} = 11.7$ Vdc, $I_C = 15$ A dc
Test 2:	$V_{CE} = 30$ Vdc, $I_C = 5.9$ A dc
Test 3:	$V_{CE} = 100$ Vdc, $I_C = 0.25$ A dc
Test 4:	$V_{CE} = 25$ Vdc, $I_C = 7$ A dc
Test 5:	$V_{CE} = 300$ Vdc, $I_C = 20$ mA dc, (for 2N6674) $V_{CE} = 400$ Vdc, $I_C = 10$ mA dc, (for 2N6675)

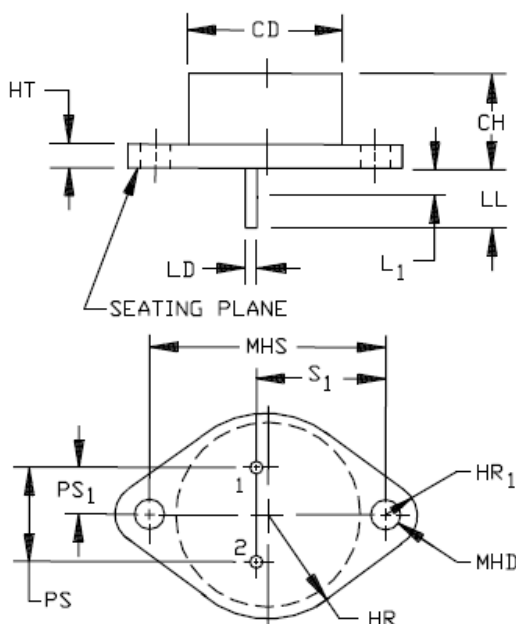
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### Outline Drawing (TO-3)

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.270	.380	6.86	9.65	
HR	.495	.525	12.57	13.34	3
HR <sub>1</sub>	.131	.188	3.33	4.78	3
HT	.060	.135	1.52	3.43	
LD	.038	.053	0.97	1.35	3, 4
LL	.312	.500	7.92	12.70	
L <sub>1</sub>		.050		1.27	4
MHD	.151	.165	3.84	4.19	3
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	5, 6
PS <sub>1</sub>	.205	.225	5.21	5.72	5,6
S <sub>1</sub>	.655	.675	16.64	17.15	



#### NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Pin out: Terminal 1 = base, terminal 2 = emitter, case = collector. The collector shall be internally connected to the case.
3. Two places.
4. Lead diameter shall not exceed twice LD within L<sub>1</sub>.
5. These dimensions should be measured at points .050 - .055 inch (1.27 mm - 1.40 mm) below seating plane. When gauge is not used, measurement will be made at seating plane.
6. The seating plane of the header shall be flat within .001 inch (0.03 mm) 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.
7. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.

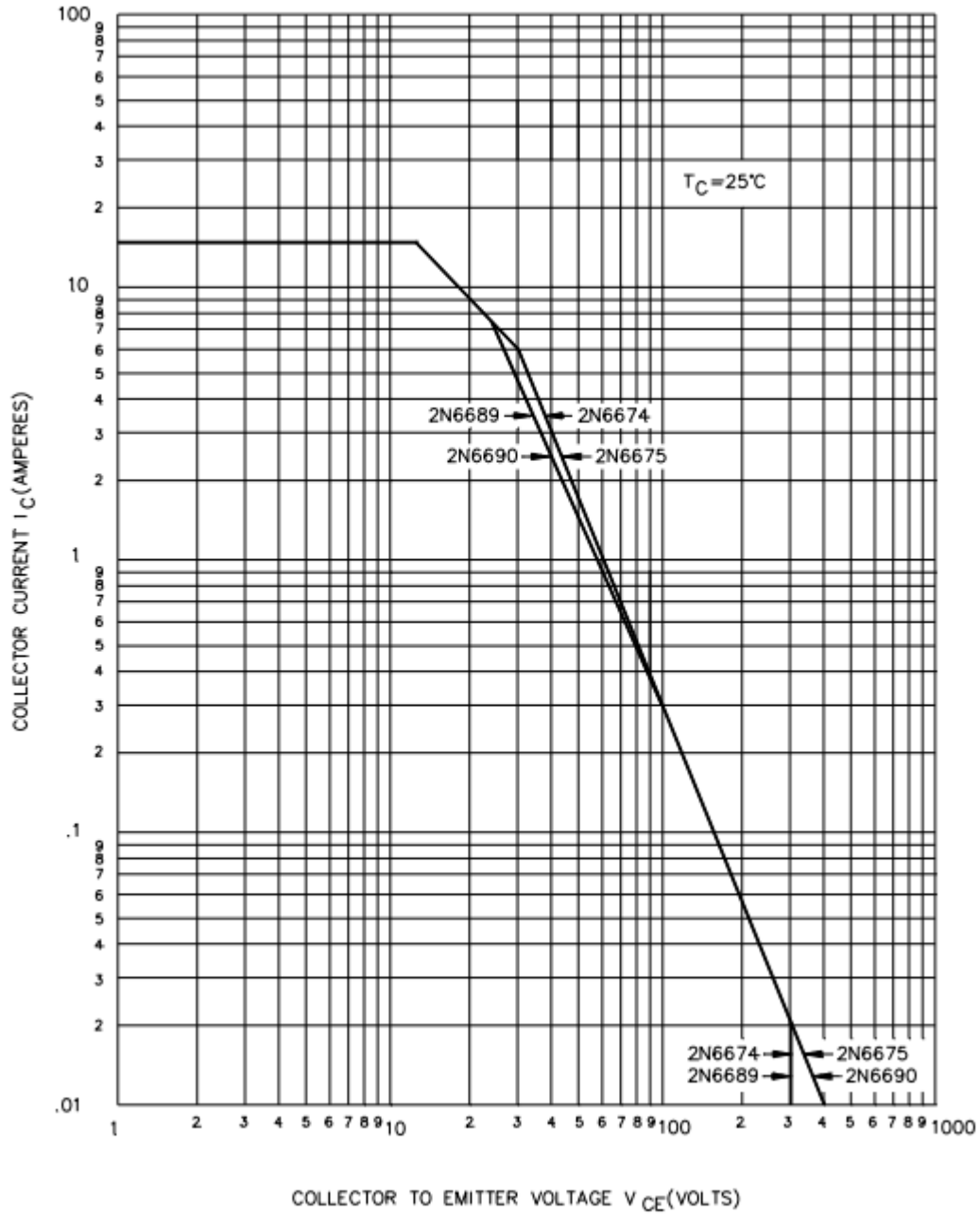
FIGURE 1. Physical dimensions of of TO-204AD (formerly TO-3) package.

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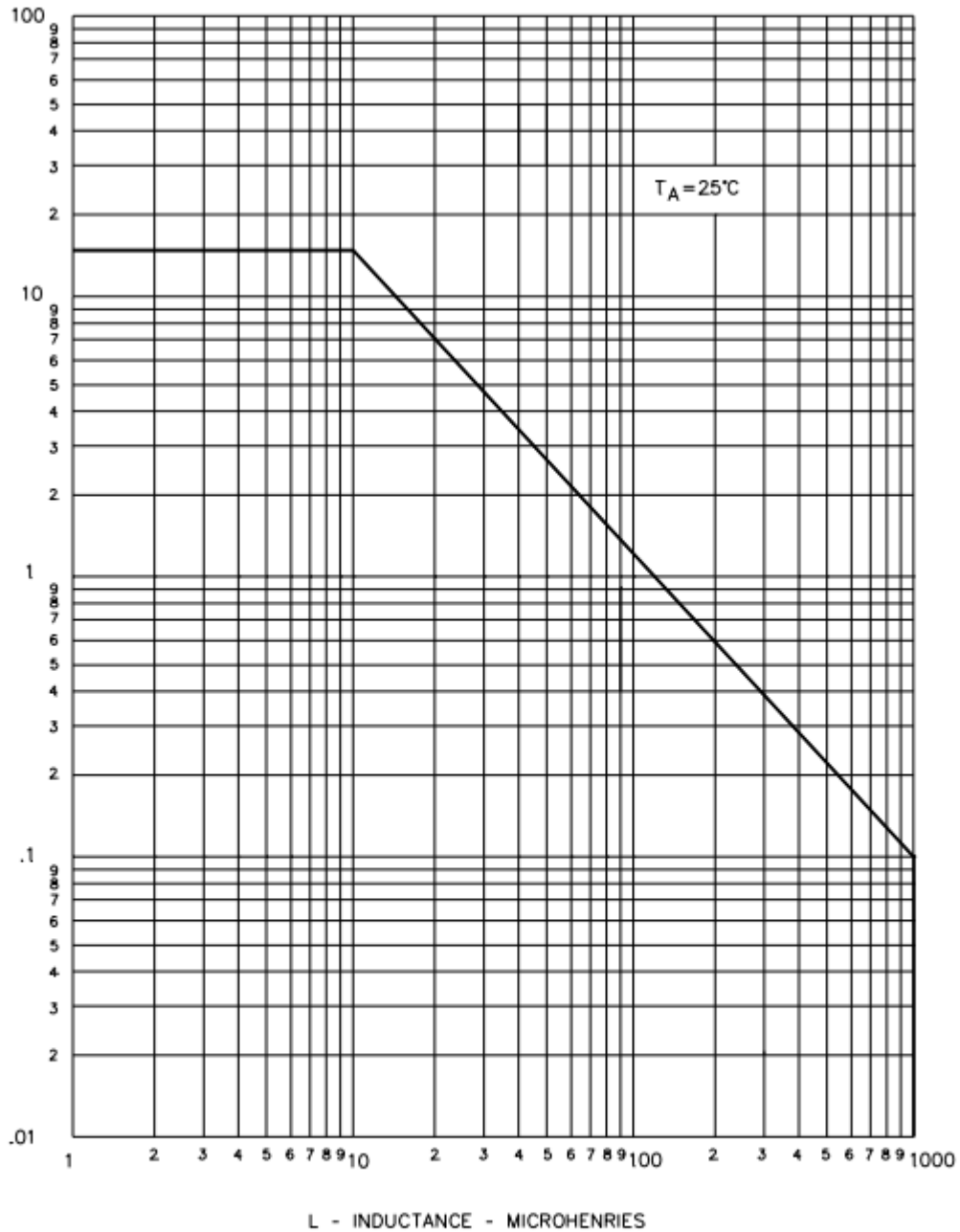


FIGURE 5. Safe operating area for switching between saturation and cutoff (unclamped inductive load).

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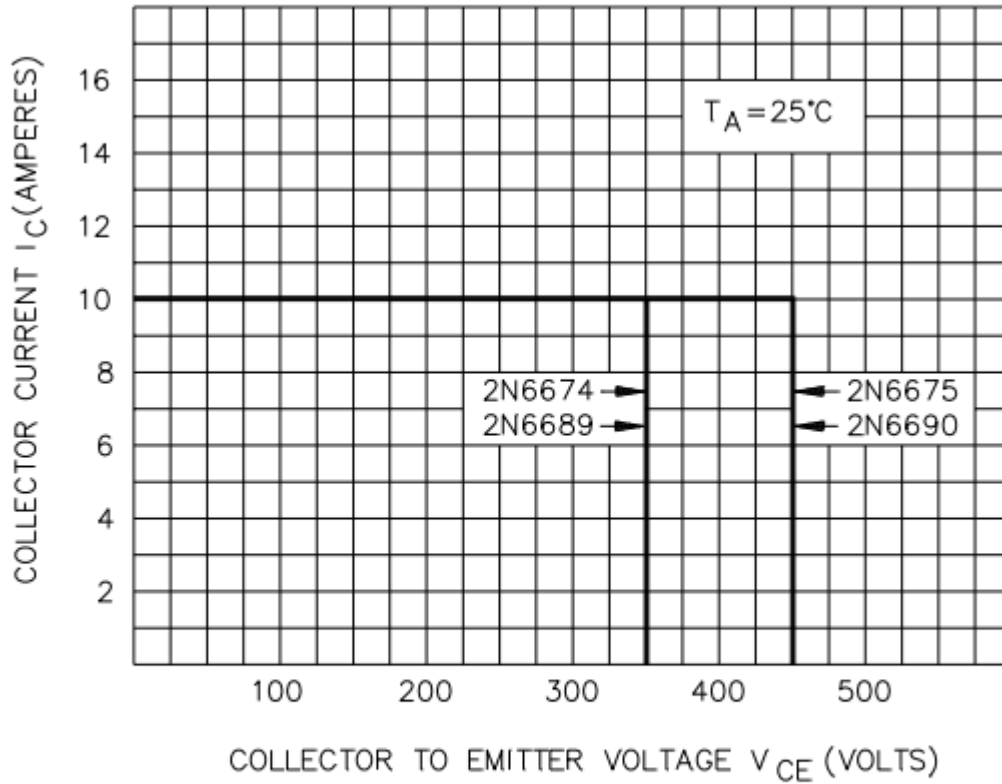


FIGURE 6. Safe operating area for switching between saturation and cutoff (clamped inductive load).

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