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°C unless otherwise noted)

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

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Electrical Characteristics (T_A = +25°C unless otherwise noted)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Switching Characteristics					
Delay Time Rise Time Storage Time Fall Time Cross-Over Time	See figure 3 of MIL-PRF-19500/537	t_d t_r t_s t_f t_c	µs	—	0.1 0.6 2.5 0.5 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 (1) @ T_A = +25°C @ T_A = +25°C	P_T	6 175	6 175	W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65 to +200		°C

(1) Derate linearly @ 1.0 mW/°C for T_C > 25°C.
Derate linearly @ 34.2 mW/°C for T_A > 25°C.

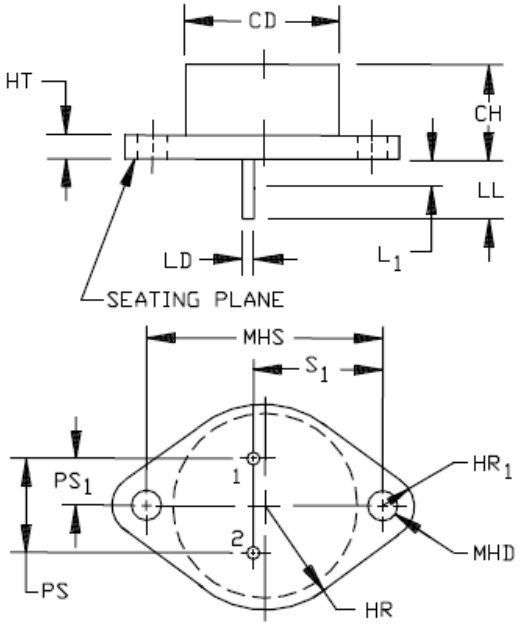
Thermal Characteristics

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

Safe Operating Area	
DC Tests:	T_C = +25°C, I 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)

Outline Drawing (TO-3)

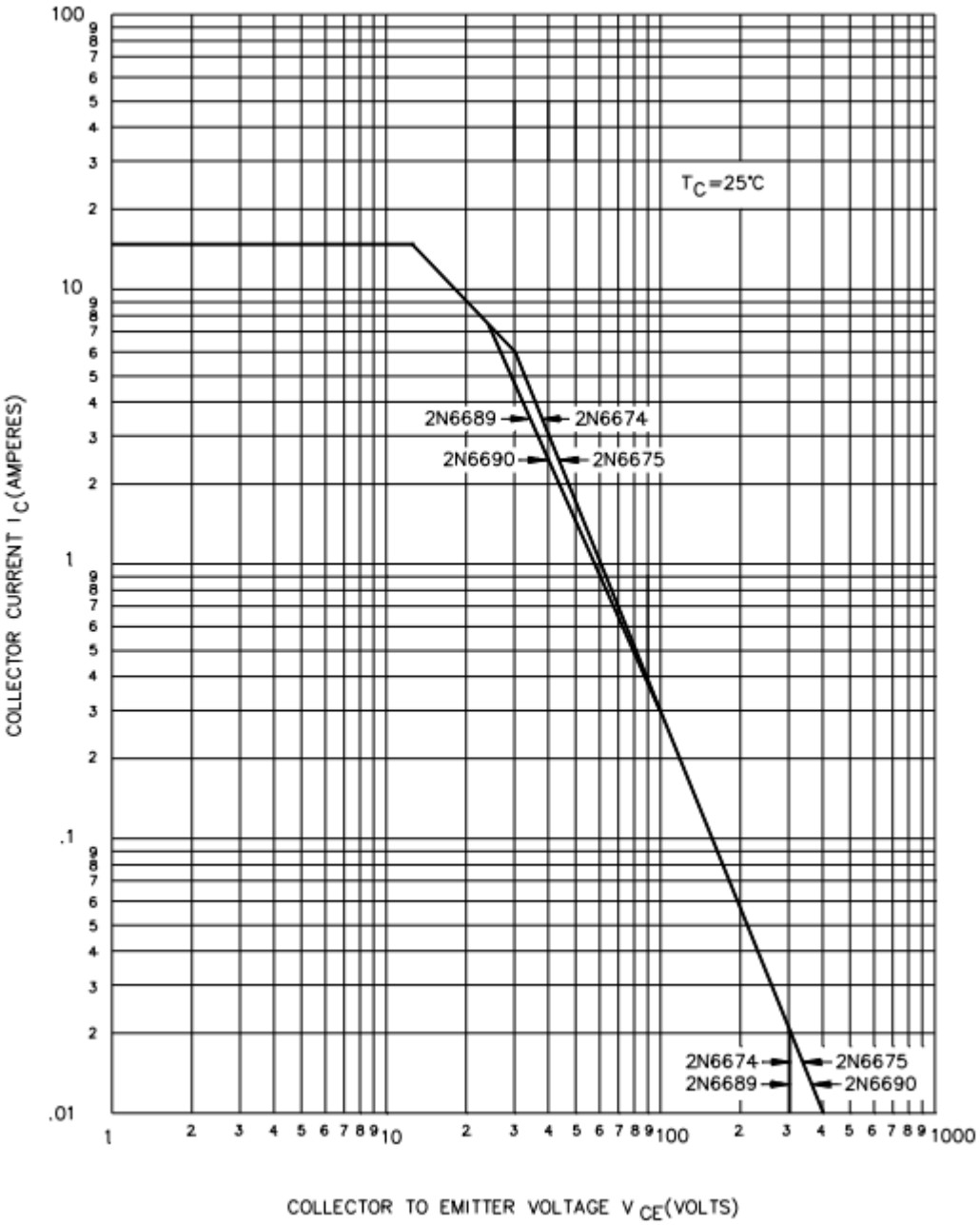
Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.270	.380	6.86	9.65	
HR	.495	.525	12.57	13.34	3
HR_1	.131	.188	3.33	4.78	3
HT	.060	.135	1.52	3.43	
LD	.038	.053	0.97	1.35	3, 4
LL	.312	.500	7.92	12.70	
L_1		.050		1.27	4
MHD	.151	.165	3.84	4.19	3
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	5, 6
PS_1	.205	.225	5.21	5.72	5,6
S_1	.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_1.
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 Φx symbology.

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



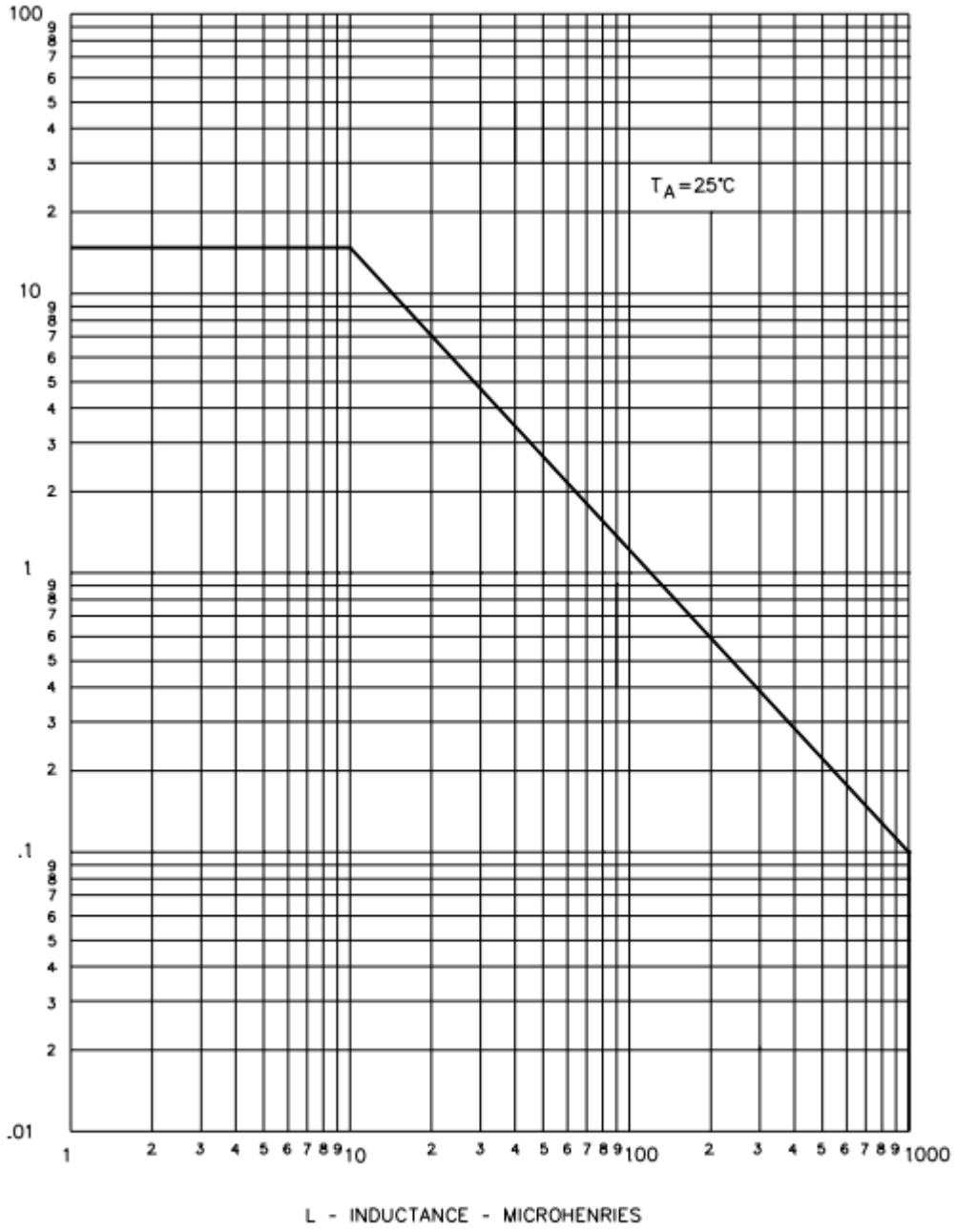


FIGURE 5. Safe operating area for switching between saturation and cutoff (unclamped inductive load).

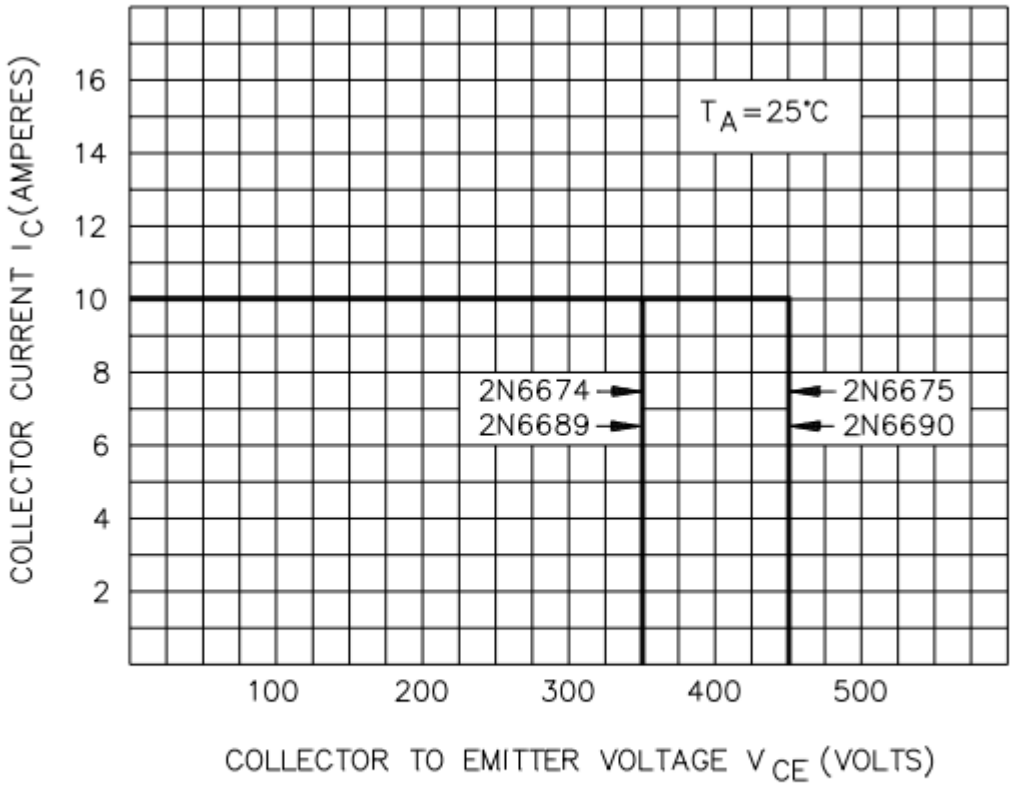


FIGURE 6. Safe operating area for switching between saturation and cutoff (clamped inductive load).