2N3791 & 2N3792

PNP High Power Silicon Transistor

Rev. V3

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/379
- TO-3 (TO-204AA) Package
- Designed for High Power, Medium Speed Switching and Amplifier Applications

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	I_C = -10 mA dc; 2N3791 I_C = -10 mA dc; 2N3792	$V_{(BR)CEO}$	V dc	-60 -80	—
Collector - Emitter Cutoff Current	V_{CE} = -60 V dc; V_{BE} = -1.5 V dc, 2N3791 V_{CE} = -80 V dc; V_{BE} = -1.5 V dc, 2N3792	I_{CEX}	μA dc	—	-20 -20
Collector - Base Cutoff Current	V_{CE} = -60 V dc, 2N3791 V_{CE} = -80 V dc, 2N3792	I_{CBO}	μA dc	—	-20 -20
Emitter - Base Cutoff Current	V_{EB} = -7 V dc	I_{EBO}	mA dc	—	-5.0
Collector-Emitter Cutoff Current	V_{CE} = -50 V dc, 2N3791 V_{CE} = -70 V dc, 2N3792	I_{CES1}	μA dc		-20 -20
Forward Current Transfer Ratio	V_{CE} = -2.0 V dc; I_C = -1.0 A dc V_{CE} = -2.0 V dc; I_C = -3.0 A dc V_{CE} = -2.0 V dc; I_C = -5 A dc V_{CE} = -4.0 V dc; I_C = -10 A dc	h_{FE}	-	50 30 10 5	150 120
Collector - Emitter Saturation Voltage	I_C = -5 A dc; I_B = -0.5 A dc I_C = -10 A dc; I_B = -2.0 A dc	$V_{CE(sat)1}$ $V_{CE(sat)2}$	Vdc	—	-1.0 -2.5
Base - Emitter Saturation Voltage	I_C = -5 A dc; I_B = -0.5 Vdc I_C = -10 A dc; I_B = -2.0 Vdc	$V_{BE(sat)1}$ $V_{BE(sat)2}$	Vdc	—	-1.5 -3.0
Collector-Emitter Cutoff Current	T_A = +150°C V_{CE} = -50 V dc, 2N3791 V_{CE} = -70 V dc, 2N3792	I_{CES2}	mA dc		-3.4 -3.4
Forward Current Transfer Ratio	T_A = -55°C V_{CE} = -2.0 V dc; I_C = -3.0 A dc	h_{FE5}		12	
Dynamic Characteristics					
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	V_{CE} = -10 V dc; I_C = -0.5 A dc; f = 1 MHz	$\|h_{fe}\|$		4.0	20
Small-Signal Short-Circuit Forward Current Transfer Ratio	V_{CE} = -10 V dc; I_C = -0.5 A dc; f = 1 kHz	h_{fe}		30	300
Open Circuit Output Capacitance	V_{CB} = -10 V dc; I_E = 0; f = 1MHz	C_{obo}	pF	—	500

For further information and support please visit:
info@vptcomponents.com

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Switching Characteristics					
Delay Time Rise Time Storage Time Fall Time	See figure 4 of MIL-PRF-19500/379	t_d t_r t_s t_f	µs	—	0.2 1.3 1.4 1.0

Absolute Maximum Ratings (T_C = +25°C unless otherwise noted)

Ratings	Symbol	Value
Collector - Emitter Voltage 2N3791 2N3792	V_{CEO}	-60 V dc -80 V dc
Collector - Base Voltage 2N3791 2N3792	V_{CBO}	-60 V dc -80 V dc
Emitter - Base Voltage	V_{EBO}	-7 V dc
Base Current	I_B	-4 V dc
Collector Current	I_C	-10 A dc
Total Power Dissipation @ T_A = +25°C (1) @ T_C = +100°C (2)	P_T	5.0 W 85.7 W
Operating & Storage Temperature Range	T_J, T_{STG}	-65°C to +200°C

(1) Derate linearly 28.57 mW/°C above T_A = +25°C.
(2) See figure 2 of Mil-PRF-19500/379 for temperature-power derating curves.

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.1°C/W

Safe Operating Area	
DC Tests:	T_C = +25°C, I Cycle, t ≥ 1.0 s
Test 1:	V_{CE} = -15 V dc; I_C = -10 A dc
Test 2:	V_{CE} = -40 V dc; I_C = -3.75 A dc
Test 3:	V_{CE} = -55 V dc; I_C = -0.9 A dc, 2N3791 V_{CE} = -65 V dc; I_C = -0.9 A dc, 2N3792

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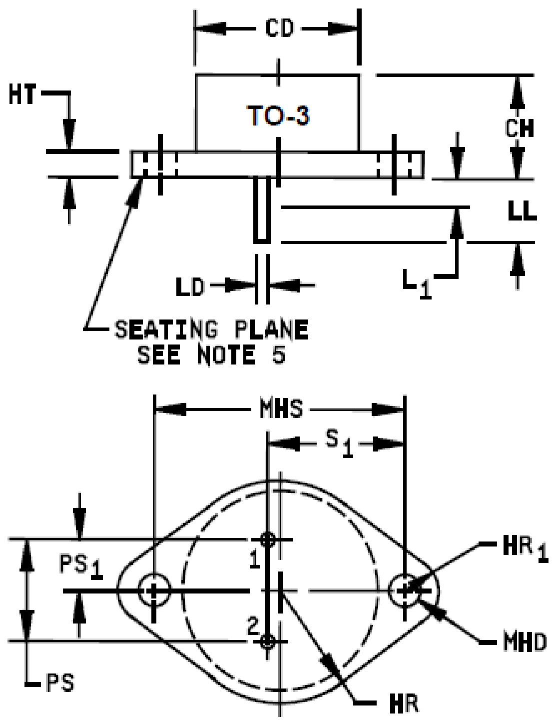
Outline Drawing (TO-3)

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.22	
CH	.270	.350	6.86	8.89	
HR	.495	.525	12.57	13.34	
HR_1	.131	.188	3.33	4.78	
HT	.060	.135	1.52	3.43	
LD	.038	.043	0.97	1.09	7
LL	.312	.500	7.92	12.70	
L_1		.050		1.27	7
MHD	.151	.165	3.84	4.19	
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	4,5
PS_1	.205	.225	5.21	5.72	4,5
s_1	.655	.675	16.64	17.15	4

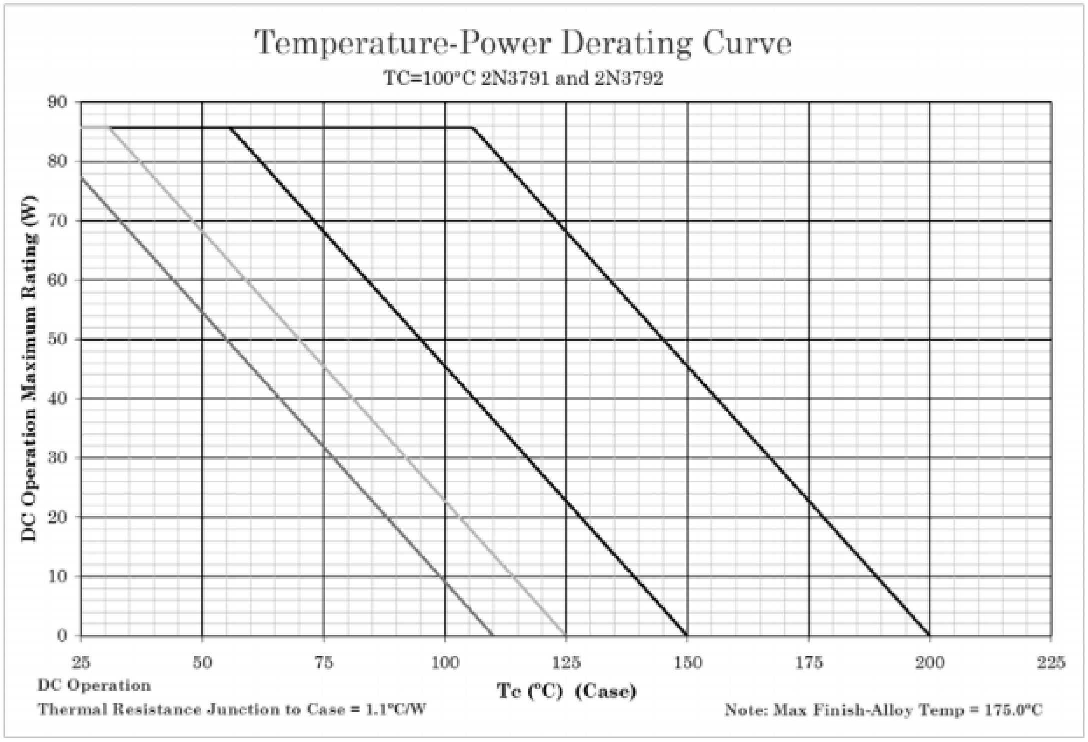


NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Terminal 2, base; terminal 1, emitter; case, collector.
4. These dimensions should be measured at points .050 inch (1.27 mm) to .055 inch (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 .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.
6. Collector shall be electrically connected to the case.
7. LD applies between L_1 and LL. Lead diameter shall not exceed twice LD within L_1.
8. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

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

Temperature-Power Derating Curve

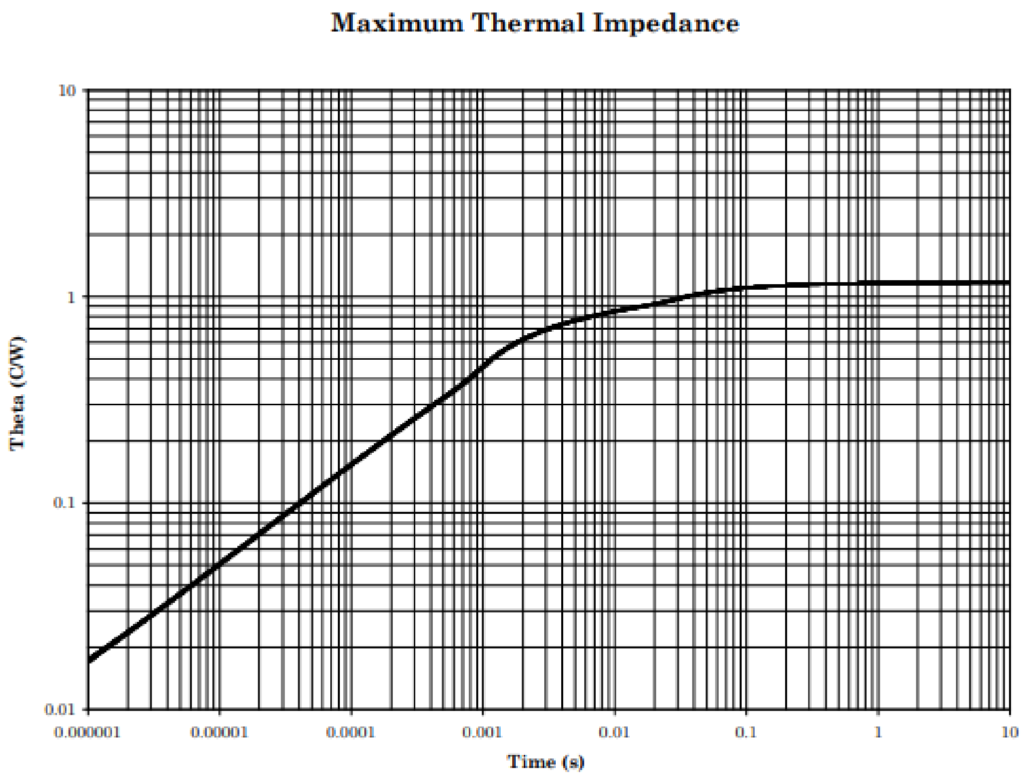


NOTES:

1. All devices are capable of operating at ≤ T_J specified on this curve. Any parallel line to this curve will intersect the appropriate power/current for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperature (T_J ≤ +200°C) and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at T_J ≤ +150°C, where the maximum temperature of electrical test is performed.
4. Derate design curves chosen at T_J ≤ +125°C, and +110°C to show power rating where most users want to limit T_J in their application.

FIGURE 2. Temperature-power derating graphs, TO-3.

Thermal Impedance Curve



T_C = +25C. $R_{\theta JC}$ = 1.1°C/W.

FIGURE 3. Transient thermal impedance graph.