2N6338, 2N6341

NPN High Power Silicon Transistor

Rev. V2

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/509
- TO-3 (TO-204AA) Package
- Designed for Use in Hi-Reliability Power Amplifier and Switching Circuit Applications

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	I_C = 50 mA dc, 2N6338 I_C = 50 mA dc, 2N6341	$V_{(BR)CEO}$	V dc	100 150	—
Collector - Emitter Cutoff Current	V_{CE} = 50 V dc, 2N6338 V_{CE} = 75 V dc, 2N6341	I_{CEO}	µA dc	— —	50 50
Emitter - Base Cutoff Current	V_{EB} = 6.0 Vdc	I_{EBO}	µA dc	—	100
Collector - Emitter Cutoff Current	V_{CE} = 100 V dc; V_{BE} = -1.5 V dc, 2N6338 V_{CE} = 150 V dc; V_{BE} = -1.5 V dc, 2N6341	I_{CEX1}	µA dc	—	10 10
Collector - Base Cutoff Current	V_{CB} = 120 V dc, 2N6338 V_{CB} = 180 V dc, 2N6341	I_{CBO}	µA dc	—	10 10
Forward Current Transfer Ratio	V_{CE} = 2.0 V dc; I_C = 0.5 A dc V_{CE} = 2.0 V dc; I_C = 10 A dc V_{CE} = 2.0 V dc; I_C = 25 A dc	h_{FE}	-	40 30 12	120
Collector - Emitter Saturation Voltage	I_B = 1.0 A dc; I_C = 10 A dc I_B = 2.5 A dc; I_C = 25 A dc	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	— —	1.0 1.8
Base - Emitter Saturation Voltage	I_B = 1.0 V dc; I_C = 10 A dc	$V_{BE(sat)}$	V dc	—	1.8
Collector - Emitter Cutoff Current	T_A = +150°C V_{CE} = 100 V dc; V_{BE} = -1.5 V dc, 2N6338 V_{CE} = 150 V dc; V_{BE} = -1.5 V dc, 2N6341	I_{CEX2}	mA dc	—	1.0 1.0
Forward Current Transfer Ratio	T_A = -55°C V_{CE} = 2.0 V dc; I_C = 10 A dc	h_{FE4}	-	10	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	V_{CE} = 10 V dc; I_C = 1.0 A dc; f = 10 MHz	$\lvert h_{FE} \rvert$		4.0	12
Open Capacitance, Open Circuit	V_{CB} = 10 V dc; I_E = 0; 0.1 MHz ≤ f ≤ 1 MHz	C_{obo}	pF	—	450

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Absolute Maximum Ratings (T_A = +25°C unless otherwise specified)

Ratings	Symbol	Value
Collector - Emitter Voltage 2N6338 2N6341	V_{CEO}	 100 V dc 150 V dc
Collector - Base Voltage 2N6338 2N6341	V_{CBO}	 120 V dc 180 V dc
Emitter - Base Voltage	V_{EBO}	6.0 V dc
Base Current	I_B	10 A dc
Collector Current	I_C	25 A dc
Total Power Dissipation @ T_A = +25°C (1) (2) @ T_C = +25°C (1) (2) @ T_C = +100°C	P_T	 3.5 W 200 W 112 W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65°C to +200°C

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case (3)	$R_{\theta JC}$	0.875°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50°C/W

(1) Between T_C = +25°C and T_C = +200°C, linear derating factor (average) = 1.14 W/°C.
(2) Maintain voltage and current according to the safe operating area as shown on figures 2 and 3 and appropriate mounting conditions.
(3) See figure 4 for thermal impedance graphs.

Switching Characteristics	Symbol	Max. Value
V_{CC} = 80 V; I_C = 10 A dc; I_{B1} = 1.0 A dc	t_{on}	0.5 µs
V_{CC} = 80 V; I_C = 10 A dc; I_{B1} = I_{B2} = 1.0 A dc	t_{off}	1.25 µs
V_{CC} = 80V; I_C = 10 A dc; I_{B1} = I_{B2} = 1.0 A dc	t_S	1.0 µs

Safe Operating Area	
DC Tests:	T_C = +25 °C; 1Cycle; t = 1.0 s
Test 1:	I_C = 25 A dc; V_{CE} = 8 V dc
Test 2:	I_C = 14 A dc ; V_{CE} = 14 V dc
Test 3:	I_C = 100 mA dc; V_{CE} = 100 V dc 2N6338
Test 3:	I_C = 66 mA dc; V_{CE} = 150 V dc 2N6341

Outline Drawing (TO-3)

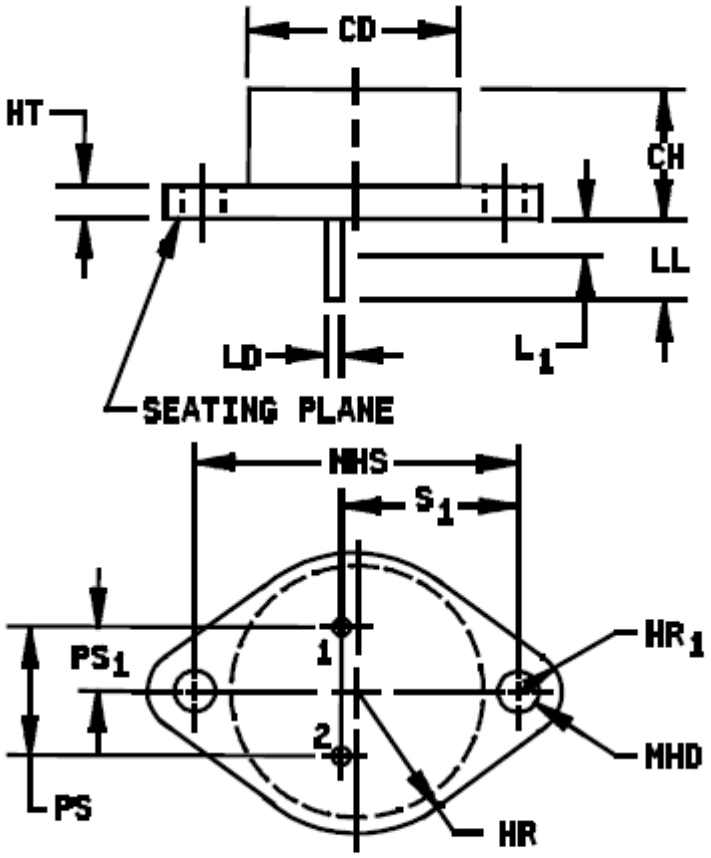

FIGURE 1. Physical dimensions (similar to TO-204AA formally TO-3).

Outline Drawing (TO-3)

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	
CH	.250	.360	6.35	9.14	
HR	.495	.525	12.57	13.33	4
HR_1	.131	.188	3.33	4.78	4
HT	.060	.135	1.52	3.43	
LD	.038	.043	0.97	1.09	4, 6
LL	.312	.500	7.92	12.7	
L_1		.050		1.27	6
* MHD	.151	.165	3.83	4.19	4
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	3
PS_1	.205	.225	5.21	5.72	3
S_1	.655	.675	16.64	17.15	
Notes	1, 2, 5, 7		1, 2, 5, 7		

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. These dimensions should be measured at points .050 inch (1.27 mm) +.005 inch (0.13 mm) -.000 inch (0.00 mm) below seating plane. When gauge is not used, measurement will be made at the seating plane.
4. Two places.
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. Lead diameter shall not exceed twice LD within L_1.
7. Lead designation shall be as follows:

Lead Number	
1	Emitter
2	Base
Case	Collector

* FIGURE 1. Physical dimensions (similar to TO-204AA formally TO-3) - Continued.