2N6437 & 2N6438

PNP Power Silicon Transistor

Rev. V1

Features

- Available in JAN, JANTX and JANTXV per MIL-PRF-19500/508
- TO-3 Package
- Designed for Power Amplifier and Medium Speed Switching 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, 2N6437 I_C = -50 mA dc, 2N6438	$V_{(BR)CEO}$	V dc	-100 -120	—
Collector - Emitter Cutoff Current	V_{CE} = -50 V dc, 2N6437 V_{CE} = -60 V dc, 2N6438	I_{CEO}	µA dc	—	-50
Collector - Emitter Cutoff Current	V_{CE} = -100 V dc, V_{BE} = +1.5 V dc, 2N6437 V_{CE} = -120 V dc, V_{BE} = +1.5 V dc, 2N6438	I_{CEX1}	µA dc	—	-5.0
Collector - Base Cutoff Current	V_{CB} = -120 V dc, 2N6437 V_{CB} = -140 V dc, 2N6438	I_{CBO}	µA dc	—	-10
Emitter - Base Cutoff Current	V_{EB} = -6 V dc	I_{EBO}	µA dc	—	-100
Base - Emitter Voltage (saturated)	I_C = -10 A dc, I_B = -1.0A dc	$V_{BE(sat)}$	V dc	—	-1.8
Collector-Emitter Voltage (saturated)	I_C = -10 A dc, I_B = -1.0 A dc I_C = -25 A dc, I_B = -2.5 A dc	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	-1.0 -1.8
Forward Current Transfer Ratio	V_{CE} = -2 V dc, I_C = -.5 A dc V_{CE} = -2 V dc, I_C = -10 A dc V_{CE} = -2 V dc, I_C = -25 A dc	h_{FE1} h_{FE2} h_{FE3}	-	40 30 12	120
Collector - Emitter Cutoff Current	T_A = +150°C V_{CE} = -100 V dc, V_{BE} = +1.5 V dc, 2N6437 V_{CE} = -120 V dc, V_{BE} = +1.5 V dc, 2N6438	I_{CEX2}	mA dc	—	-1.0
Forward - Current Transfer Ratio	T_A = -55°C V_{CE} = -2V dc, I_C = -10 A dc	h_{FE4}		10	

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Turn-On Time	V_{CC} = -80 V dc, I_C = -10 A dc, I_{B1} = -1.0 A dc	t_{on}	µs	—	0.5
Turn-Off Time	V_{CC} = -80 V dc, I_C = -10 A dc, I_{B1} = I_{B2} = -1.0 A dc	t_{off}	µs	—	1.25
Storage Time	V_{CC} = -80 V dc, I_C = -10 A dc, I_{B1} = I_{B2} = -1.0 A dc	t_s	µs	—	1.0
Dynamic Characteristics					
Magnitude of Common-Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	V_{CE} = -10 V dc, I_C = -1 A dc, f = 10 MHz	$\lvert h_{fe} \rvert$	-	4.0	12
Output Capacitance (Open Circuit)	V_{CB} = -10 V dc; I_E = 0, 0.1 MHz ≤ f ≤ 1 MHz	C_{obo}	pF	—	700

Safe Operating Area Continuous

DC Tests: T_C = +25°C, I Cycle, t = 1.0 s

Test 1: V_{CE} = -8 V dc, I_C = -25 A dc (Both device types)

Test 2: V_{CE} = -14 V dc, I_C = -14 A dc (Both device types)

Test 3: V_{CE} = -100 V dc, I_C = -100 mA dc 2N6437
V_{CE} = -120 Vdc, I_C = -83 mA dc 2N6438

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

Ratings	Symbol	Value
Collector - Emitter Voltage 2N6437 2N6438	V_{CEO}	 -100 V dc -120 V dc
Collector - Base Voltage 2N6437 2N6438	V_{CBO}	 -120 V dc -140 V dc
Emitter - Base Voltage	V_{EBO}	-6 V dc
Base Current	I_B	-10 A dc
Collector Current	I_C	-25 A dc
Total Power Dissipation T_C = +25°C T_C = +100°C	P_T (1)	 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	$R_{\theta JC}$	0.875°C/W

1. Between T_C = +25°C and T_C = +200°C, linear derating factor (average) = 1.14 W/°C.

Outline Drawing (TO-3)

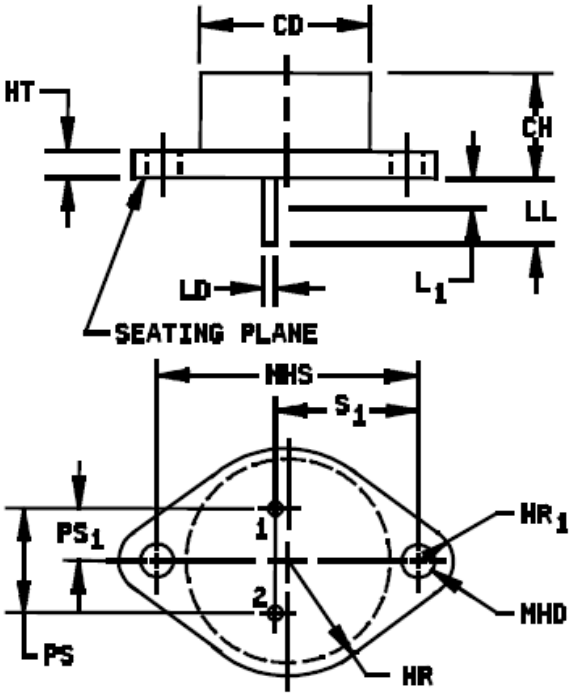

FIGURE 1. Physical dimensions (TO-204 similar to TO-3).

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	1.65	3.83	41.91	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. 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:
8. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

Lead number	Bipolar transistor
1	Emitter
2	Base
Case	Collector

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

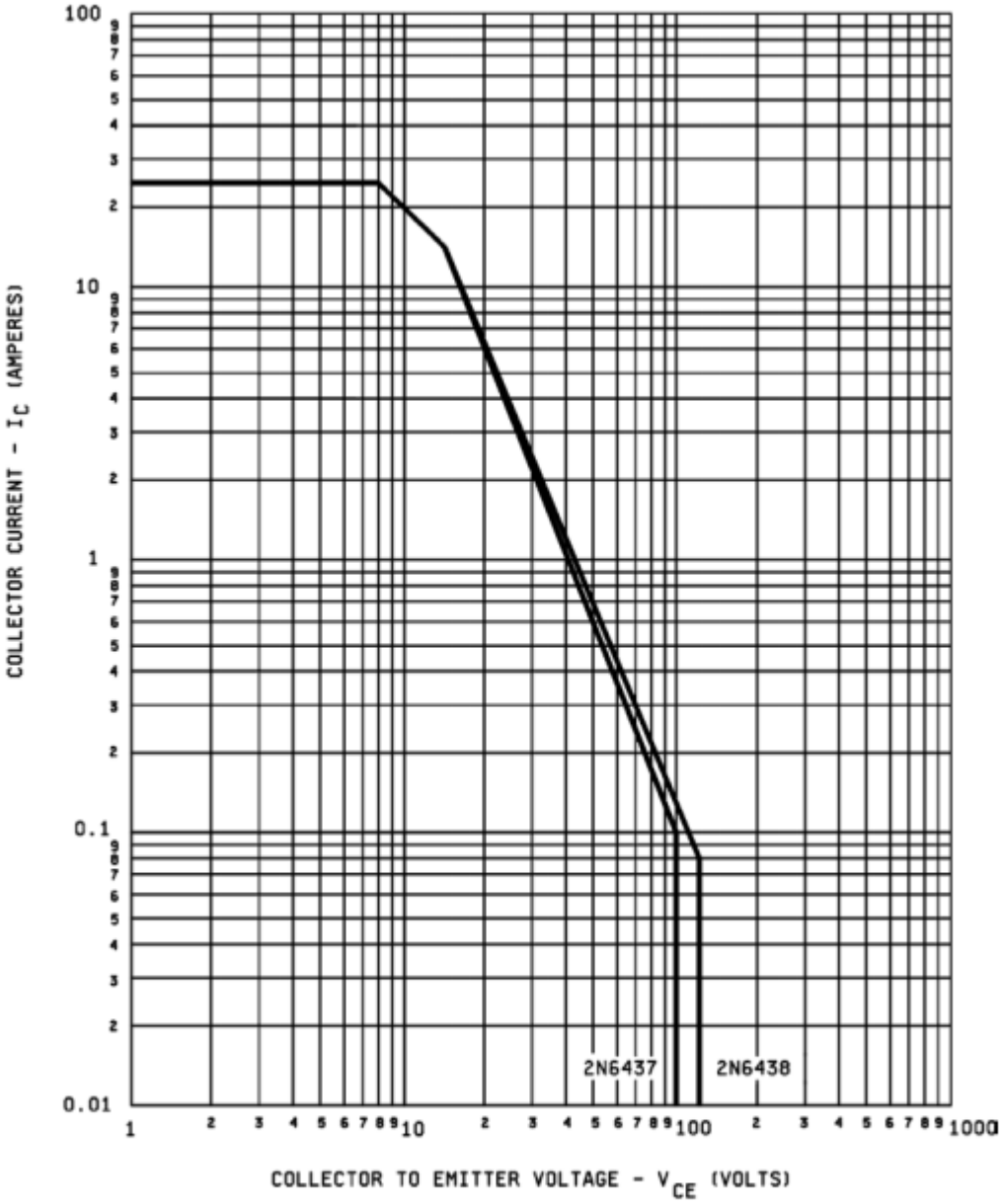

FIGURE 3. Maximum safe operating area (continuous dc).

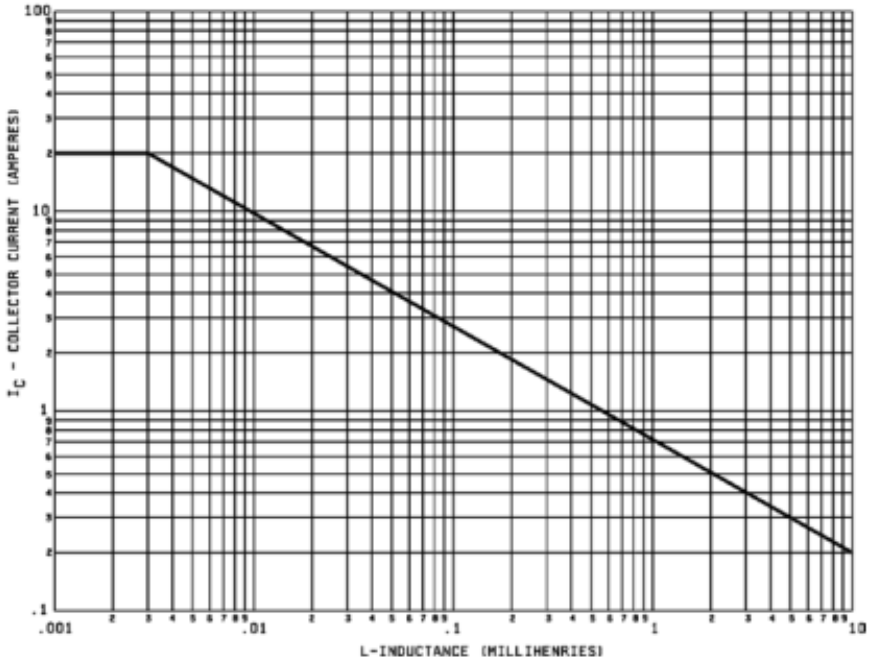

FIGURE 4 Safe operating area for switching between saturation and cutoff (unclamped inductive load).