2N6383, 2N6384, & 2N6385

NPN High Power Silicon Transistors

Rev. V1

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/523
- TO-3 (TO-204AA) Package

Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	I_C = 20 mAdc, L = 42 mH, 30 - 60 GHz (see figure 10 of MIL-PRF-19500/510) 2N6383 2N6384 2N6385	$V_{(BR)CEO}$	Vdc	40 60 80	—
Collector - Emitter Breakdown Voltage	I_C = 200 mAdc, L = 14 mH, 30 - 60 GHz (see figure 10 of MIL-PRF-19500/510) 2N6383 2N6384 2N6385	$V_{(BR)CER}$	Vdc	40 60 80	—
Collector - Base Cutoff Current	V_{CE} = 40 Vdc, 2N6383 V_{CE} = 60 Vdc, 2N6384 V_{CE} = 80 Vdc, 2N6385	I_{EBO}	mAdc	—	1
Emitter - Base Cutoff Current	V_{EB} = 6 Vdc	I_{EBO}	mAdc	—	5
Collector - Emitter Cutoff Current	V_{CE} = 40 Vdc, 2N6383 V_{CE} = 60 Vdc, 2N6384 V_{CE} = 80 Vdc, 2N6385	I_{CEO}	mAdc	—	1
Collector - Emitter Cutoff Current	V_{CE} = 40 Vdc, V_{BE} = -1.5 Vdc, 2N6383 V_{CE} = 60 Vdc, V_{BE} = -1.5 Vdc, 2N6384 V_{CE} = 80 Vdc, V_{BE} = -1.5 Vdc, 2N6385	I_{EBO}	mAdc	—	0.3
On Characteristics[1]					
Forward Current Transfer Ratio	I_C = 5 Adc, V_{CE} = 3 Vdc I_C = 10 Adc, V_{CE} = 3 Vdc	H_{FE}	-	1000 100	20000
Collector - Emitter Sustaining Voltage	I_C = 5 Adc, I_B = 10 mAdc I_C = 10 Adc, I_B = 0.1 mAdc	$V_{CE(SAT)}$	Vdc	—	2 3
Base - Emitter Saturation Voltage	I_C = 5 Adc, I_B = 3 Adc I_C = 10 Adc, I_B = 3 Adc	$V_{BE(SAT)}$	Vdc	—	2.8 4.5

1. Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤2.0%.

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Dynamic Characteristics					
Small-Signal Short-Circuit Forward Current Transfer Ratio	I_C = 1 Adc, V_{CE} = 5 Vdc, f = 1 MHz	$\lvert h_{FE} \rvert$	-	20	300
Output Capacitance	V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1 MHz	C_{OBO}	pF	—	200
Switching Characteristics					
Turn-On Time	V_{CC} = 200 Vdc; I_C = 1 Adc, I_B1 = 20 mAdc	T_{ON}	µs	—	2.5
Turn-Off Time	V_{CC} = 200 Vdc; I_C = 1 Adc, I_B1 = I_B1 = 20 mAdc	T_{OFF}	µs	—	10
Safe Operating Area					

DC Tests: T_C = +25 °C, I Cycle, t = 1.0 s
Test 1: V_{CE} = 10 Vdc, I_C = 10 Adc, All Types
Test 2: V_{CE} = 30 Vdc, I_C = 3.33 Adc, All Types
Test 3: V_{CE} = 40 Vdc, I_C = 1.5 Adc, 2N6383
V_{CE} = 60 Vdc, I_C = 0.4 Adc, 2N6384
V_{CE} = 80 Vdc, I_C = 0.16 Adc, 2N6385

Absolute Maximum Ratings

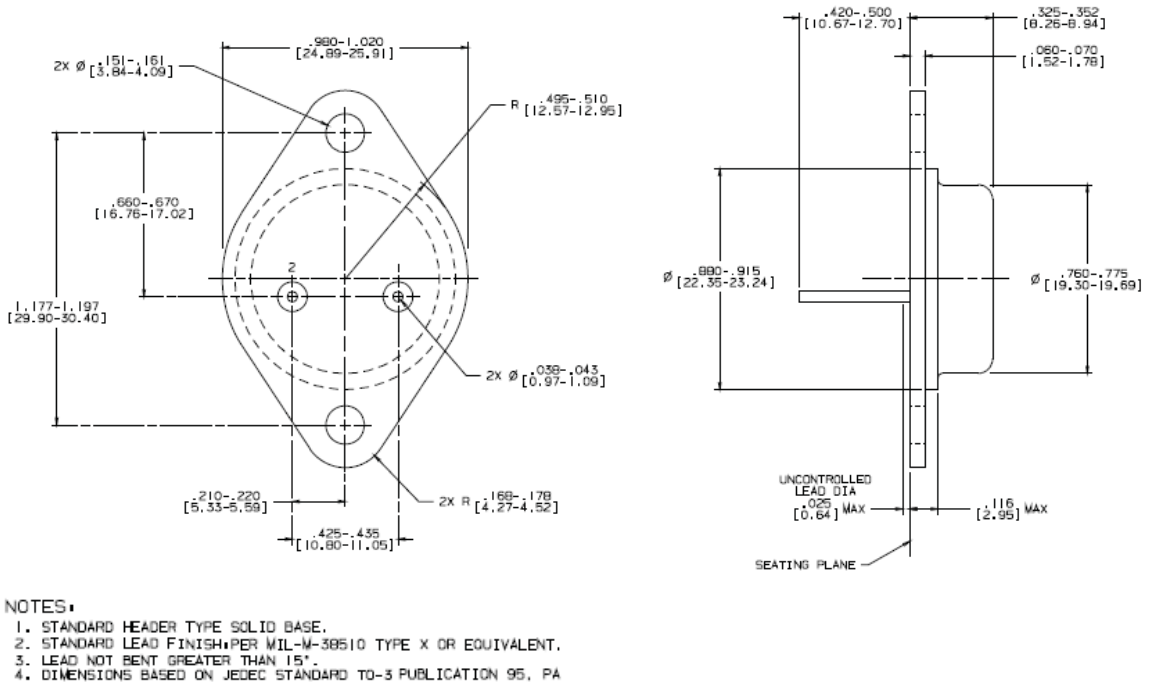
Ratings	Symbol	2N6383	2N6384	2N6385	Units
Collector - Emitter Voltage	V_{CEO}	40	60	80	Vdc
Collector - Base Voltage	V_{CBO}	40	60	80	Vdc
Emitter - Base Voltage	V_{EBO}	5			Vdc
Collector Current	I_C	10			Adc
Base Current	I_B	0.25			Adc
Total Power Dissipation @ T_A = +25°C[2] @ T_C = +25°C[3]	P_T	6 100			W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-55 to +175			°C

2. Derate linearly @ 34.2 mW / °C for T_A >25°C.
3. Derate linearly @ 571 mW / °C for T_C >75°C.

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.75°C/W

Outline Drawing



NOTES:
1. STANDARD HEADER TYPE SOLID BASE.
2. STANDARD LEAD FINISH: PER MIL-M-38510 TYPE X OR EQUIVALENT.
3. LEAD NOT BENT GREATER THAN 15°.
4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA