

# 2N3715 & 2N3716



## NPN High Power Silicon Transistor

Rev. V1

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/408
- TO-3 (TO-204AA) Package



### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Off Characteristics</b>					
Collector - Emitter Breakdown Voltage	$I_C = 10 \text{ mAdc}$ , 2N3715 $I_C = 10 \text{ mAdc}$ , 2N3716	$V_{(BR)CEO}$	Vdc	60 80	—
Collector - Base Cutoff Current	$V_{CE} = 60 \text{ Vdc}$ , 2N3715 $V_{CE} = 80 \text{ Vdc}$ , 2N3716	$I_{CEO}$	$\mu\text{Adc}$	—	10 10
Emitter - Base Cutoff Current	$V_{EB} = 7 \text{ Vdc}$	$I_{EBO}$	mAdc	—	1
Collector - Emitter Cutoff Current	$V_{CE} = 60 \text{ Vdc}$ , $V_{BE} = 1.5 \text{ Vdc}$ , 2N3715 $V_{CE} = 80 \text{ Vdc}$ , $V_{BE} = 1.5 \text{ Vdc}$ , 2N3716	$I_{CEX}$	$\mu\text{Adc}$	—	10 10
Collector - Emitter Cutoff Current	$V_{CE} = 50 \text{ Vdc}$ , 2N3715 $V_{CE} = 70 \text{ Vdc}$ , 2N3716	$I_{CEO}$	$\mu\text{Adc}$	—	10 10
<b>On Characteristics<sup>1</sup></b>					
Forward Current Transfer Ratio	$I_C = 1 \text{ Adc}$ , $V_{CE} = 2 \text{ Vdc}$ $I_C = 3 \text{ Adc}$ , $V_{CE} = 2 \text{ Vdc}$ $I_C = 5 \text{ Adc}$ , $V_{CE} = 2 \text{ Vdc}$ $I_C = 10 \text{ Adc}$ , $V_{CE} = 4 \text{ Vdc}$	$H_{FE}$	-	50 30 10 5	150 120 — —
Collector - Emitter Saturation Voltage	$I_C = 5 \text{ Adc}$ , $I_B = 0.5 \text{ Adc}$ $I_C = 10 \text{ Adc}$ , $I_B = 2.0 \text{ Adc}$	$V_{CE(SAT)}$	Vdc	—	1.0 2.5
Emitter - Base Saturation Voltage	$I_C = 5 \text{ Adc}$ , $I_B = 0.5 \text{ Vdc}$ $I_C = 10 \text{ Adc}$ , $I_B = 2.0 \text{ Vdc}$	$V_{BE(SAT)}$	Vdc	—	1.5 3.0
<b>Dynamic Characteristics</b>					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 4 \text{ Adc}$ , $V_{CE} = 4 \text{ Vdc}$ , $f = 100 \text{ kHz}$	$ H_{FE} $		4	20
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 0.5 \text{ Adc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 1 \text{ kHz}$	$H_{FE}$		30	300
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{OBO}$	pF	—	500
<b>Safe Operating Area</b>					
DC Tests:	$T_C = +25 \text{ }^\circ\text{C}$ , 1 Cycle, $t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 15 \text{ Vdc}$ , $I_C = 10 \text{ Adc}$				
Test 2:	$V_{CE} = 40 \text{ Vdc}$ , $I_C = 3.75 \text{ Adc}$				
Test 3:	$V_{CE} = 55 \text{ Vdc}$ , $I_C = 0.9 \text{ Adc}$ , 2N3715				
	$V_{CE} = 65 \text{ Vdc}$ , $I_C = 0.9 \text{ Adc}$ , 2N3716				

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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### Absolute Maximum Ratings

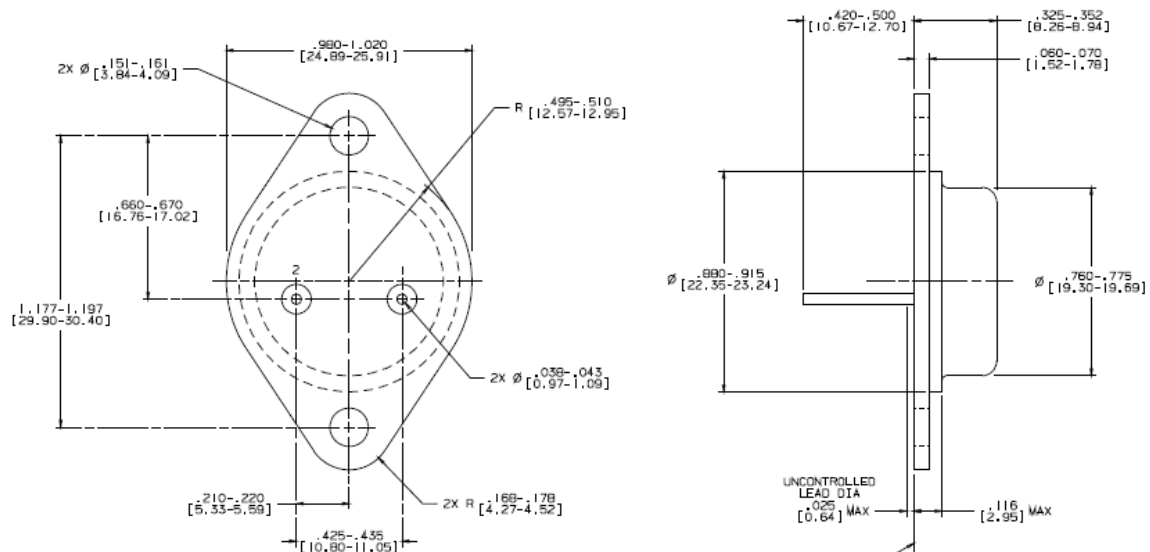
Ratings	Symbol	Value
Collector - Emitter Voltage 2N3715 2N3716	$V_{CEO}$	60 Vdc 80 Vdc
Collector - Base Voltage 2N3715 2N3716	$V_{CBO}$	80 Vdc 100 Vdc
Emitter - Base Voltage	$V_{EBO}$	7 Vdc
Base Current	$I_B$	4 Vdc
Collector Current	$I_C$	10 Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}^2$ @ $T_A = 25^\circ\text{C}$	$P_T$	5 W 117 W
Operating & Storage Temperature Range	$T_{OP}, T_{STG}$	$-65^\circ\text{C}$ to $+200^\circ\text{C}$

2. Derate linearly @ 28.57 mW / °C for  $T_A = 25^\circ\text{C}$

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5°C/W

### Outline Drawing



#### NOTES:

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

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