

NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/408

Devices

2N3715

2N3716

Qualified Level

JAN
JANTX
JANTXV

MAXIMUM RATINGS

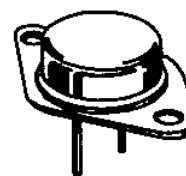
Ratings	Symbol	2N3715	2N3716	Units
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CBO}	80	100	Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Base Current	I_B	4.0		Adc
Collector Current	I_C	10		Adc
Total Power Dissipation @ $T_A = 25^{\circ}\text{C}$ @ $T_C = 100^{\circ}\text{C}$	P_T	5.0		W
		85.7		W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.17	$^{\circ}\text{C/W}$

1) Derate linearly 28.57 mW/ $^{\circ}\text{C}$ for $T_A > 25^{\circ}\text{C}$

2) Derate linearly 0.857 W/ $^{\circ}\text{C}$ for $T_C > 100^{\circ}\text{C}$



TO-3* (TO-204AA)

*See Appendix A for
Package Outline

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Current $I_C = 10 \text{ mAdc}$	2N3715	$V_{(BR)CEO}$	60	Vdc
	2N3716		80	
Collector-Base Cutoff Current $V_{CB} = 80 \text{ Vdc}$ $V_{CB} = 100 \text{ Vdc}$	2N3715	I_{CBO}	10	μAdc
	2N3716		10	
Emitter-Base Breakdown Voltage $V_{EB} = 7.0 \text{ Vdc}$		I_{EBO}	1.0	mAdc
Collector-Emitter Cutoff Current $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 60 \text{ Vdc}$ $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 80 \text{ Vdc}$	2N3715	I_{CEX}	1.0	mAdc
	2N3716		1.0	

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2N3715, 2N3716 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
Collector-Emitter Cutoff Current	I_{CES}			
$V_{CE} = 60 \text{ Vdc}$ 2N3715			1.0	mAdc
$V_{CE} = 80 \text{ Vdc}$ 2N3716			1.0	

ON CHARACTERISTICS ⁽³⁾

Forward-Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ $I_C = 3.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ $I_C = 5.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ $I_C = 10 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc}$	h_{FE}	50 30 10 5.0	150 120	
Collector-Emitter Saturation Voltage $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$ $I_C = 10 \text{ Adc}, I_B = 2.0 \text{ Adc}$			1.0 2.5	Vdc
Base-Emitter Saturation Voltage $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$ $I_C = 10 \text{ Adc}, I_B = 2.0 \text{ Adc}$			1.5 3.0	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio $I_C = 0.5 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ kHz} - 1.0 \text{ MHz}$	$ h_{fe} $	4.0	20	
Forward Current Transfer Ratio $I_C = 0.5 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	h_{fe}	30	300	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$	C_{obo}		500	pF

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t \geq 1.0 \text{ s}$ 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				
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(3) Pulse Test: Pulse Width = 300 μ s, Duty Cycle $\leq$ 2.0%.