

NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/370

Devices

2N3442

Qualified Level

JAN
JANTX
JANTXV

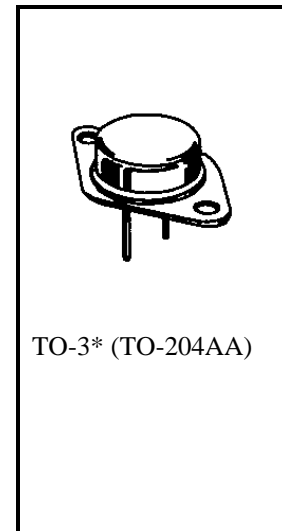
MAXIMUM RATINGS

Ratings	Symbol	Value	Units	
Collector-Emitter Voltage	V_{CEO}	140	Vdc	
Collector-Base Voltage	V_{CBO}	160	Vdc	
Collector-Emitter Voltage	V_{CER}	150	Vdc	
Emitter-Base Voltage	V_{EBO}	7.0	Vdc	
Base Current	I_B	7.0	Adc	
Collector Current	I_C	10	Adc	
Total Power Dissipation	P_T	@ $T_A = 25^{\circ}\text{C}$ ⁽¹⁾	6.0	W
		@ $T_C = 25^{\circ}\text{C}$ ⁽²⁾	117	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-55 to +200	$^{\circ}\text{C}$	

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.5	$^{\circ}\text{C}/\text{W}$

- Derate linearly 34.2 mW/ $^{\circ}\text{C}$ for $T_A > 25^{\circ}\text{C}$
- Derate linearly 668 mW/ $^{\circ}\text{C}$ for $T_C > 25^{\circ}\text{C}$



*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 Voltage $I_C = 3.0 \text{ Adc}$	$V_{(BR)CEO}$	140		Vdc
Collector-Emitter Breakdown Voltage $I_C = 1.5 \text{ Adc}, R_{BE} = 100 \Omega$	$V_{(BR)CER}$	150		Vdc
Collector-Emitter Breakdown Voltage $I_C = 1.5 \text{ Adc}, V_{EB} = 1.5 \text{ Vdc}$	$V_{(BR)CEX}$	160		Vdc
Collector-Base Cutoff Current $V_{CB} = 140 \text{ Vdc}, V_{EB} = 1.5 \text{ Vdc}$	I_{CEX}		1.0	mAdc
Emitter-Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$	I_{EBO}		1.0	mAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
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ON CHARACTERISTICS ⁽³⁾

Forward-Current Transfer Ratio $I_C = 3.0 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc}$	h_{FE}	20	70	
Collector-Emitter Saturation Voltage $I_C = 3.0 \text{ Adc}, I_B = 300 \text{ mAdc}$	$V_{CE(sat)}$		1.0	Vdc
Base-Emitter Voltage $I_C = 3.0 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc}$	V_{BE}		1.7	Vdc

DYNAMIC CHARACTERISTICS

Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 3.0 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc}, f = 100 \text{ kHz}$	$ h_{fe} $	1.0		
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SAFE OPERATING AREA

<p>DC Tests $T_C = +25^{\circ}\text{C}$, 1 Cycle, $t = 1.0 \text{ s}$</p> <p>Test 1 $V_{CE} = 11.7 \text{ Vdc}, I_C = 10 \text{ Adc}$</p> <p>Test 2 $V_{CE} = 78 \text{ Vdc}, I_C = 1.5 \text{ Adc}$</p> <p>Test 3 $V_{CE} = 140 \text{ Vdc}, I_C = 0.5 \text{ Adc}$</p>

(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.