

## NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/370

### Devices

**2N3442**

### Qualified Level

**JAN  
JANTX  
JANTXV**

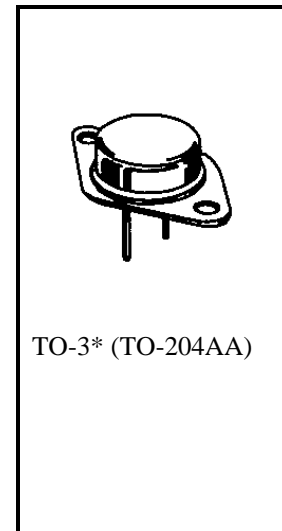
### MAXIMUM RATINGS

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	$P_T$	@ $T_A = 25^{\circ}\text{C}$ <sup>(1)</sup>	6.0	W
		@ $T_C = 25^{\circ}\text{C}$ <sup>(2)</sup>	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	$^{\circ}\text{C}/\text{W}$

- 1) Derate linearly 34.2 mW/ $^{\circ}\text{C}$  for  $T_A > 25^{\circ}\text{C}$
- 2) 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** <sup>(3)</sup>

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****DC Tests** $T_C = +25^{\circ}\text{C}$ , 1 Cycle,  $t = 1.0 \text{ s}$ **Test 1** $V_{CE} = 11.7 \text{ Vdc}, I_C = 10 \text{ Adc}$ **Test 2** $V_{CE} = 78 \text{ Vdc}, I_C = 1.5 \text{ Adc}$ **Test 3** $V_{CE} = 140 \text{ Vdc}, I_C = 0.5 \text{ Adc}$ (3) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .