

## PNP HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/433

### Devices

2N4399

2N5745

### Qualified Level

JANTX  
JANTXV

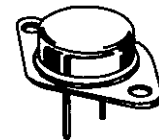
### MAXIMUM RATINGS

Ratings	Symbol	2N4399	2N5745	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	80	Vdc
Collector-Base Voltage	$V_{CBO}$	60	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0		Vdc
Base Current	$I_B$	7.5		Adc
Collector Current	$I_C$	30	20	Adc
Total Power Dissipation		@ $T_A = +25^{\circ}\text{C}$ <sup>(1)</sup>	5.0	W
		@ $T_C = +100^{\circ}\text{C}$ <sup>(2)</sup>	115	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	$R_{\theta JC}$	0.875	$^{\circ}\text{C}/\text{W}$
Junction-to-Ambient	$R_{\theta JA}$	35	

- 1) Derate linearly @  $28.57 \text{ mW}/^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$
- 2) Derate linearly @  $1.15 \text{ W}/^{\circ}\text{C}$  for  $T_C > +100^{\circ}\text{C}$



TO-3\*  
(TO-204AA)

\*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}$	2N4399 2N5745	$V_{(BR)CEO}$	60 80	Vdc
Collector-Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}$ $V_{CE} = 80 \text{ Vdc}$	2N4399 2N5745	$I_{CEO}$	100 100	$\mu\text{Adc}$
Collector-Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ $V_{CE} = 80 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	2N4399 2N5745	$I_{CEX}$	5.0 5.0	$\mu\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$		$I_{EBO}$	5.0	$\mu\text{Adc}$

**2N4399, 2N5745 JAN SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
<b>DC CHARACTERISTICS <sup>(3)</sup></b>				
Forward-Current Transfer Ratio I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 2.0 Vdc	h <sub>FE</sub>	40	425	
I <sub>C</sub> = 15 Adc, V <sub>CE</sub> = 2.0 Vdc 2N4399		15	60	
I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 2.0 Vdc 2N5745		15	60	
I <sub>C</sub> = 30 Adc, V <sub>CE</sub> = 5.0 Vdc 2N4399		5.0		
I <sub>C</sub> = 20 Adc, V <sub>CE</sub> = 5.0 Vdc 2N5745		5.0		
Collector-Emitter Saturation Voltage I <sub>C</sub> = 5.0 Adc, I <sub>B</sub> = 0.5 Adc	V <sub>CE(sat)</sub>		0.55	Vdc
I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.0 Adc 2N4399			0.75	
			1.0	
Base-Emitter Saturation Voltage I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 1.0 Adc	V <sub>BE(sat)</sub>		1.7	Vdc
I <sub>C</sub> = 15 Adc, I <sub>B</sub> = 1.5 Adc 2N4399			1.8	
			2.0	

**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 10 Vdc, f = 1.0 MHz	h <sub>fe</sub>	4.0	40	
Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 10 Vdc, f = 1.0 MHz	h <sub>fe</sub>	40	425	
Output Capacitance V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz	C <sub>obo</sub>		1000	pF

**SAFE OPERATING AREA**

<b>DC Tests</b> T <sub>C</sub> = +25°C, 1 Cycle, t = 1.0 s				
<b>Test 1</b>				
V <sub>CE</sub> = 6.67 Vdc, I <sub>C</sub> = 30 Adc	2N4399			
V <sub>CE</sub> = 10 Vdc, I <sub>C</sub> = 20 Adc	2N5745			
<b>Test 2</b>				
V <sub>CE</sub> = 20 Vdc, I <sub>C</sub> = 10 Adc	All Types			
<b>Test 3</b>				
V <sub>CE</sub> = 40 Vdc, I <sub>C</sub> = 3.0 Adc	All Types			
<b>Test 4</b>				
V <sub>CE</sub> = 50 Vdc, I <sub>C</sub> = 600 mA	2N4399			
V <sub>CE</sub> = 60 Vdc, I <sub>C</sub> = 600 mA	2N5745			

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