

PNP HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/433

Devices

2N4399

2N5745

Qualified Level

JANTX
JANTXV

MAXIMUM RATINGS

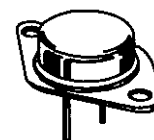
Ratings	Symbol	2N4399	2N5745	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Base Current	I_B	7.5		Adc
Collector Current	I_C	30	20	Adc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾ @ $T_C = +100^{\circ}\text{C}$ ⁽²⁾	P_T	5.0		W
		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 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly @ 1.15 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	μAdc
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	μAdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$		I_{EBO}	5.0	μAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ $I_C = 15 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ 2N4399 $I_C = 10 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ 2N5745 $I_C = 30 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ 2N4399 $I_C = 20 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ 2N5745	h_{FE}	40 15 15 5.0 5.0	425 60 60	
Collector-Emitter Saturation Voltage $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$ $I_C = 10 \text{ Adc}, I_B = 1.0 \text{ Adc}$ 2N4399 2N5745	$V_{CE(sat)}$		0.55 0.75 1.0	Vdc
Base-Emitter Saturation Voltage $I_C = 10 \text{ Adc}, I_B = 1.0 \text{ Adc}$ $I_C = 15 \text{ Adc}, I_B = 1.5 \text{ Adc}$ 2N4399 2N5745	$V_{BE(sat)}$		1.7 1.8 2.0	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ MHz}$	$ h_{fe} $	4.0	40	
Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ MHz}$	h_{fe}	40	425	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		1000	pF

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
Test 1 $V_{CE} = 6.67 \text{ Vdc}, I_C = 30 \text{ Adc}$ 2N4399 $V_{CE} = 10 \text{ Vdc}, I_C = 20 \text{ Adc}$ 2N5745				
Test 2 $V_{CE} = 20 \text{ Vdc}, I_C = 10 \text{ Adc}$ All Types				
Test 3 $V_{CE} = 40 \text{ Vdc}, I_C = 3.0 \text{ Adc}$ All Types				
Test 4 $V_{CE} = 50 \text{ Vdc}, I_C = 600 \text{ mAdc}$ 2N4399 $V_{CE} = 60 \text{ Vdc}, I_C = 600 \text{ mAdc}$ 2N5745				

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