

PNP HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/433

Devices

2N4399

2N5745

Qualified Level

JANTX
JANTXV

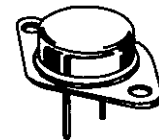
MAXIMUM RATINGS

| 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⁾ | 5.0 | W |
| | | @ $T_C = +100^{\circ}\text{C}$ ⁽²⁾ | 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 |
|-----------------|--------|------|------|------|
|-----------------|--------|------|------|------|

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 |

2N4399, 2N5745 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | Symbol | Min. | Max. | Unit |
|--|----------------------|--------|------|------|
| DC CHARACTERISTICS ⁽³⁾ | | | | |
| Forward-Current Transfer Ratio I _C = 1.0 Adc, V _{CE} = 2.0 Vdc | h _{FE} | 40 | 425 | |
| I _C = 15 Adc, V _{CE} = 2.0 Vdc 2N4399 | | 15 | 60 | |
| I _C = 10 Adc, V _{CE} = 2.0 Vdc 2N5745 | | 15 | 60 | |
| I _C = 30 Adc, V _{CE} = 5.0 Vdc 2N4399 | | 5.0 | | |
| I _C = 20 Adc, V _{CE} = 5.0 Vdc 2N5745 | | 5.0 | | |
| Collector-Emitter Saturation Voltage I _C = 5.0 Adc, I _B = 0.5 Adc | V _{CE(sat)} | | 0.55 | Vdc |
| I _C = 10 Adc, I _B = 1.0 Adc 2N4399 | | | 0.75 | |
| | | | 1.0 | |
| Base-Emitter Saturation Voltage I _C = 10 Adc, I _B = 1.0 Adc | V _{BE(sat)} | | 1.7 | Vdc |
| I _C = 15 Adc, I _B = 1.5 Adc 2N4399 | | | 1.8 | |
| | | 2N5745 | | |

DYNAMIC CHARACTERISTICS

| | | | | |
|--|------------------|-----|------|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I _C = 1.0 Adc, V _{CE} = 10 Vdc, f = 1.0 MHz | h _{fe} | 4.0 | 40 | |
| Small-Signal Short-Circuit Forward Current Transfer Ratio I _C = 1.0 Adc, V _{CE} = 10 Vdc, f = 1.0 MHz | h _{fe} | 40 | 425 | |
| Output Capacitance V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz | C _{obo} | | 1000 | pF |

SAFE OPERATING AREA

| | | | | |
|--|--|--|--|--|
| DC Tests T _C = +25°C, 1 Cycle, t = 1.0 s | | | | |
| Test 1 V _{CE} = 6.67 Vdc, I _C = 30 Adc 2N4399 | | | | |
| V _{CE} = 10 Vdc, I _C = 20 Adc 2N5745 | | | | |
| Test 2 V _{CE} = 20 Vdc, I _C = 10 Adc All Types | | | | |
| Test 3 V _{CE} = 40 Vdc, I _C = 3.0 Adc All Types | | | | |
| Test 4 V _{CE} = 50 Vdc, I _C = 600 mA 2N4399 | | | | |
| V _{CE} = 60 Vdc, I _C = 600 mA 2N5745 | | | | |

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