

NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/408

Devices

2N3715

2N3716

Qualified Level

JAN
JANTX
JANTXV

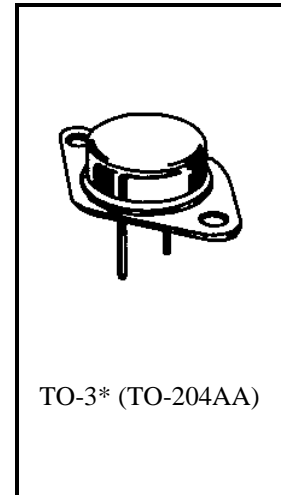
MAXIMUM RATINGS

| Ratings | Symbol | 2N3715 | 2N3716 | Units |
|--|----------------|-----------------------------|--------|------------------|
| Collector-Emitter Voltage | V_{CEO} | 60 | 80 | Vdc |
| Collector-Base Voltage | V_{CBO} | 80 | 100 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 7.0 | | Vdc |
| Base Current | I_B | 4.0 | | Adc |
| Collector Current | I_C | 10 | | Adc |
| Total Power Dissipation | P_T | @ $T_A = 25^\circ\text{C}$ | 5.0 | W |
| | | @ $T_C = 100^\circ\text{C}$ | 85.7 | W |
| Operating & Storage Junction Temperature Range | T_J, T_{stg} | -65 to +200 | | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max. | Unit |
|--------------------------------------|-----------------|------|--------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.17 | $^\circ\text{C/W}$ |

- 1) Derate linearly 28.57 mW/ $^\circ\text{C}$ for $T_A > 25^\circ\text{C}$
- 2) Derate linearly 0.857 W/ $^\circ\text{C}$ for $T_C > 100^\circ\text{C}$



*See Appendix A for Package Outline

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

| Characteristics | Symbol | Min. | Max. | Unit |
|-----------------|--------|------|------|------|
|-----------------|--------|------|------|------|

OFF CHARACTERISTICS

| | | | | |
|--|------------------|---------------|------------|-----------------|
| Collector-Emitter Breakdown Current $I_C = 10$ mAdc | 2N3715 2N3716 | $V_{(BR)CEO}$ | 60 80 | Vdc |
| Collector-Base Cutoff Current $V_{CB} = 80$ Vdc $V_{CB} = 100$ Vdc | 2N3715 2N3716 | I_{CBO} | 10 10 | μAdc |
| Emitter-Base Breakdown Voltage $V_{EB} = 7.0$ Vdc | | I_{EBO} | 1.0 | mAdc |
| Collector-Emitter Cutoff Current $V_{BE} = 1.5$ Vdc, $V_{CE} = 60$ Vdc $V_{BE} = 1.5$ Vdc, $V_{CE} = 80$ Vdc | 2N3715 2N3716 | I_{CEX} | 1.0 1.0 | mAdc |

2N3715, 2N3716 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | Symbol | Min. | Max. | Unit |
|--|------------------|------|------------|------|
| Collector-Emitter Cutoff Current V _{CE} = 60 Vdc V _{CE} = 80 Vdc | I _{CES} | | 1.0 1.0 | mAdc |

ON CHARACTERISTICS ⁽³⁾

| | | | | |
|---|----------------------|-----------------------|------------|-----|
| Forward-Current Transfer Ratio I _C = 1.0 Adc, V _{CE} = 2.0 Vdc I _C = 3.0 Adc, V _{CE} = 2.0 Vdc I _C = 5.0 Adc, V _{CE} = 2.0 Vdc I _C = 10 Adc, V _{CE} = 4.0 Vdc | h _{FE} | 50 30 10 5.0 | 150 120 | |
| Collector-Emitter Saturation Voltage I _C = 5.0 Adc, I _B = 0.5 Adc I _C = 10 Adc, I _B = 2.0 Adc | V _{CE(sat)} | | 1.0 2.5 | Vdc |
| Base-Emitter Saturation Voltage I _C = 5.0 Adc, I _B = 0.5 Adc I _C = 10 Adc, I _B = 2.0 Adc | V _{BE(sat)} | | 1.5 3.0 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|--|------------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio I _C = 0.5 Adc, V _{CE} = 10 Vdc, f = 100 kHz – 1.0 MHz | h _{fe} | 4.0 | 20 | |
| Forward Current Transfer Ratio I _C = 0.5 Adc, V _{CE} = 10 Vdc, f = 1.0 kHz | h _{fe} | 30 | 300 | |
| Output Capacitance V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz | C _{obo} | | 500 | pF |

SAFE OPERATING AREA

| | | | | |
|---|--|--|--|--|
| DC Tests T _C = +25°C, 1 Cycle, t ≥ 1.0 s | | | | |
| Test 1 V _{CE} = 15 Vdc, I _C = 10 Adc | | | | |
| Test 2 V _{CE} = 40 Vdc, I _C = 3.75 Adc | | | | |
| Test 3 V _{CE} = 55 Vdc, I _C = 0.9 Adc 2N3715 V _{CE} = 65 Vdc, I _C = 0.9 Adc 2N3716 | | | | |

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

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Datasheets for electronics components.