



TECHNICAL DATA

PNP LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/485

Devices

2N5415 2N5416
2N5415S 2N5416S

Qualified Level

JAN
JANTX
JANTXV

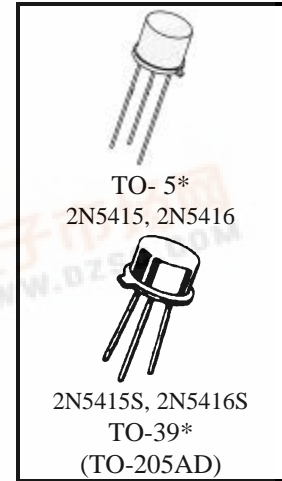
MAXIMUM RATINGS

| Ratings | Symbol | 2N5415 | 2N5416 | Units |
|--|-------------------|-------------|--------|-------------|
| Collector-Emitter Voltage | V_{CEO} | 200 | 300 | Vdc |
| Collector-Base Voltage | V_{CBO} | 200 | 350 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 6.0 | | Vdc |
| Collector Current | I_C | 1.0 | | Adc |
| Total Power Dissipation @ $T_A = +25^{\circ}C$ | P_T | 0.75 | | W |
| | | 10 | | W |
| Operating & Storage Temperature Range | T_{op}, T_{stg} | -65 to +200 | | $^{\circ}C$ |

THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max. | Unit |
|--------------------------------------|-----------------|------|---------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 17.5 | $^{\circ}C/W$ |

- Derate linearly 4.28 mW/ $^{\circ}C$ for $T_A > +25^{\circ}C$
- Derate linearly 57.1 mW/ $^{\circ}C$ for $T_C > +25^{\circ}C$



*See appendix A for package outline

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

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

OFF CHARACTERISTICS

| | | | | |
|--|--------|------------|-----|-----------|
| Collector-Emitter Cutoff Current $V_{CE} = 150$ Vdc | 2N5415 | I_{CEO} | 50 | μ Adc |
| $V_{CE} = 200$ Vdc | 2N5415 | | 1.0 | mAdc |
| $V_{CE} = 250$ Vdc | 2N5416 | | 50 | μ Adc |
| $V_{CE} = 300$ Vdc | 2N5416 | | 1.0 | mAdc |
| Emitter-Base Cutoff Current $V_{EB} = 6.0$ Vdc | | I_{EBO} | 20 | μ Adc |
| Collector-Emitter Cutoff Current $V_{CE} = 200$ Vdc, $V_{BE} = 1.5$ Vdc | 2N5415 | I_{CEX} | 50 | μ Adc |
| $V_{CE} = 300$ Vdc, $V_{BE} = 1.5$ Vdc | 2N5416 | | 50 | μ Adc |
| Collector-Base Cutoff Current $V_{CB} = 175$ Vdc | 2N5415 | I_{CBO1} | 50 | μ Adc |
| $V_{CB} = 280$ Vdc | 2N5416 | | 50 | μ Adc |
| Collector-Base Cutoff Current $V_{CB} = 200$ Vdc | 2N5415 | I_{CBO2} | 500 | μ Adc |
| $V_{CB} = 350$ Vdc | 2N5416 | | 500 | μ Adc |



2N5415, 2N5416 JAN, SERIES

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | Symbol | Min. | Max. | Unit |
|---|---------------|----------|------|------|
| ON CHARACTERISTICS ⁽³⁾ | | | | |
| Forward-Current Transfer Ratio $I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ | h_{FE} | 30 15 | 120 | |
| Collector-Emitter Saturation Voltage $I_C = 50 \text{ mAdc}, I_B = 5.0 \text{ mAdc}$ | $V_{CE(sat)}$ | | 2.0 | Vdc |
| Base-Emitter Voltage $I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ | V_{BE} | | 1.5 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|--|------------|-----|----|----|
| Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ MHz}$ | $ h_{fe} $ | 3.0 | 15 | |
| Forward Current Transfer Ratio $I_C = 5.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$ | h_{fe} | 25 | | |
| Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$ | C_{obo} | | 15 | pF |
| Input Capacitance $V_{EB} = 5.0 \text{ Vdc}, I_C = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$ | C_{ibo} | | 75 | pF |

SWITCHING CHARACTERISTICS

| | | | | |
|--|-----------|--|-----|---------------|
| Turn-On Time $V_{CC} = 200 \text{ Vdc}, I_C = 50 \text{ mAdc}, I_{B1} = 5.0 \text{ mAdc}$ | t_{on} | | 1.0 | μs |
| Turn-Off Time $V_{CC} = 200 \text{ Vdc}, I_C = 50 \text{ mAdc}, I_{B1} = I_{B2} = 5.0 \text{ mAdc}$ | t_{off} | | 10 | μs |

SAFE OPERATING AREA

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| <p>DC Tests $T_C = +25^{\circ}\text{C}; 1 \text{ Cycle}; t = 0.4 \text{ s}$</p> <p>Test 1 $V_{CE} = 10 \text{ Vdc}, I_C = 1.0 \text{ Adc}$</p> <p>Test 2 $V_{CE} = 100 \text{ Vdc}, I_C = 100 \text{ mAdc}$</p> <p>Test 3 $V_{CE} = 200 \text{ Vdc}, I_C = 24 \text{ mAdc}$ 2N5415</p> <p>Test 4 $V_{CE} = 300 \text{ Vdc}, I_C = 10 \text{ mAdc}$ 2N5416</p> |
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(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.