

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/498

Devices

2N6306

2N6308

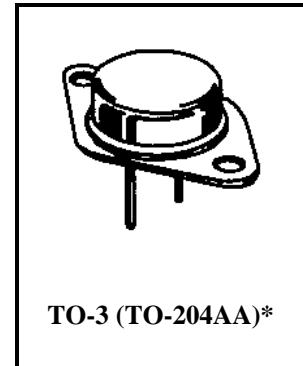
Qualified Level

JAN
JANTX
JANTXV

MAXIMUM RATINGS

| Ratings | Symbol | 2N6306 | 2N6308 | Units |
|---------------------------------------|-------------------|-------------------------------|--------|-------------|
| Collector-Emitter Voltage | V_{CEO} | 250 | 350 | Vdc |
| Collector-Base Voltage | V_{CBO} | 500 | 700 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 8.0 | | Vdc |
| Collector Current | I_C | 8.0 | | Adc |
| Base Current | I_B | 4.0 | | Adc |
| Total Power Dissipation | P_T | @ $T_C = +25^{\circ}C^{(1)}$ | 125 | W |
| | | @ $T_C = +100^{\circ}C^{(1)}$ | 62.5 | W |
| Operating & Storage Temperature Range | T_{op}, T_{stg} | -65 to +200 | | $^{\circ}C$ |

1) Between $T_C = +25^{\circ}C$ and $T_C = +175^{\circ}C$, linear derating factor average = 0.833 W/ $^{\circ}C$



*See Appendix A for Package Outline

ELECTRICAL CHARACTERISTICS

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

OFF CHARACTERISTICS

| | | | | |
|--|------------------|---------------|------------|-----------|
| Collector-Base Breakdown Voltage $I_C = 100$ mAdc | 2N6306 2N6308 | $V_{(BR)CEO}$ | 250 350 | Vdc |
| Collector-Emitter Cutoff Current $V_{CE} = 500$ Vdc; $V_{BE} = 1.5$ Vdc $V_{CE} = 700$ Vdc; $V_{BE} = 1.5$ Vdc | 2N6306 2N6308 | I_{CEX} | 5.0 5.0 | μ Adc |
| Collector-Emitter Cutoff Current $V_{CE} = 250$ Vdc $V_{CE} = 350$ Vdc | 2N6306 2N6308 | I_{CEO} | 50 50 | μ Adc |
| Emitter-Base Cutoff Current $V_{EB} = 8$ Vdc | | I_{EBO} | 5.0 | μ Adc |

2N6306, 2N6308 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | | Symbol | Min. | Max. | Unit |
|---|--------|---------------|------|------|------|
| DC CHARACTERISTICS ⁽²⁾ | | | | | |
| Forward-Current Transfer Ratio $I_C = 3.0 \text{ Adc}; V_{CE} = 5.0 \text{ Vdc}$ | 2N6306 | h_{FE} | 15 | 75 | |
| | 2N6308 | | 12 | 60 | |
| $I_C = 8.0 \text{ Adc}; V_{CE} = 5.0 \text{ Vdc}$ | 2N6306 | | 4 | | |
| | 2N6308 | | 3 | | |
| $I_C = 0.5 \text{ Adc}; V_{CE} = 5.0 \text{ Vdc}$ | 2N6306 | | 15 | | |
| | 2N6308 | | 12 | | |
| Base-Emitter Voltage $V_{CE} = 5.0 \text{ Vdc}; I_C = 3.0 \text{ Adc}$ | 2N6306 | $V_{BE(on)}$ | | 1.3 | Vdc |
| | 2N6308 | | | 1.5 | |
| Base-Emitter Saturated Voltage $I_B = 2.0 \text{ Adc}; I_C = 8.0 \text{ Adc}$ | 2N6306 | $V_{BE(sat)}$ | | 2.3 | Vdc |
| $I_B = 2.67 \text{ Adc}; I_C = 8.0 \text{ Adc}$ | 2N6308 | | | 2.5 | |
| Collector-Emitter Saturated Voltage $I_B = 2.0 \text{ Adc}; I_C = 8.0 \text{ Adc}$ | 2N6306 | $V_{CE(sat)}$ | | 5.0 | Vdc |
| $I_B = 2.67 \text{ Adc}; I_C = 8.0 \text{ Adc}$ | 2N6308 | | 5.0 | | |
| $I_B = 0.6 \text{ Adc}; I_C = 3.0 \text{ Adc}$ | 2N6306 | | 0.8 | | |
| | 2N6308 | | 1.5 | | |

DYNAMIC CHARACTERISTICS

| | | | | | |
|--|--|------------|---|-----|----|
| Magnitude of Common-Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.3 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1 \text{ MHz}$ | | $ h_{fe} $ | 5 | 30 | |
| Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.5 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc}, f = 1.0 \text{ kHz}$ | | h_{fe} | 5 | | |
| Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$ | | C_{obo} | | 250 | pF |

SWITCHING CHARACTERISTICS

| | | | | | |
|--|--|-----------|--|-----|---------------|
| Turn-On Time $V_{CC} = 125 \text{ Vdc}; I_C = 3.0 \text{ Adc}; I_B = 0.6 \text{ Adc}$ | | t_{on} | | 0.6 | μs |
| Turn-Off Time $V_{CC} = 125 \text{ Vdc}; I_C = 3.0 \text{ Adc}; I_{B1} = 0.6 \text{ Adc}; I_{B2} = 1.5 \text{ Adc}$ | | t_{off} | | 3.0 | μs |

SAFE OPERATING AREA

| | | | | | |
|---|--------|--|--|--|--|
| DC Tests | | | | | |
| $T_C = +25^\circ\text{C}; t = 1 \text{ s}, 1 \text{ cycle (See Figure 2 and 3 of MIL-PRF-19500/498)}$ | | | | | |
| Test 1 | | | | | |
| $V_{CE} = 15.6 \text{ Vdc}, I_C = 8 \text{ Adc}$ | | | | | |
| Test 2 | | | | | |
| $V_{CE} = 37 \text{ Vdc}, I_C = 3.4 \text{ Adc}$ | | | | | |
| Test 3 | | | | | |
| $V_{CE} = 200 \text{ Vdc}, I_C = 65 \text{ mAdc}$ | 2N6306 | | | | |
| $V_{CE} = 300 \text{ Vdc}, I_C = 25 \text{ mAdc}$ | 2N6308 | | | | |

2.) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.