

NPN MEDIUM POWER SILICON SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/99

Devices

2N696
2N696S

2N697
2N697S

Qualified Level

JAN

MAXIMUM RATINGS

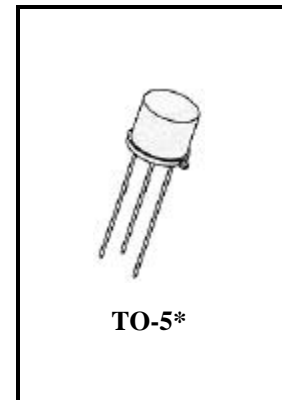
| Ratings | Symbol | Value | Units |
|--|----------------|-------------|--------------------|
| Collector-Base Voltage | V_{CBO} | 60 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 5.0 | Vdc |
| Total Power Dissipation @ $T_A = 25^{\circ}\text{C}$ ⁽¹⁾ @ $T_C = 25^{\circ}\text{C}$ ⁽²⁾ | P_T | 0.6 2.0 | W 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 | $R_{\theta JC}$ | 0.075 | $^{\circ}\text{C}/\text{mW}$ |

1) Derate linearly 4.0 mW/ $^{\circ}\text{C}$ for $T_A > 25^{\circ}\text{C}$

2) Derate linearly 13.3 mW/ $^{\circ}\text{C}$ for $T_C > 25^{\circ}\text{C}$



*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 $R_{BE} = 10 \Omega, I_C = 100 \text{ mAdc}$ | $V_{(BR)CER}$ | 40 | | Vdc |
| Collector-Base Cutoff Current $V_{CB} = 100 \text{ Vdc}$ $V_{CB} = 30 \text{ Vdc}$ | I_{CBO} | | 10 0.1 | μAdc |
| Emitter-Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$ | I_{EBO} | | 10 | μAdc |

ON CHARACTERISTICS ⁽³⁾

| | | | | | |
|---|--------------------|----------|--------------|-----------|--|
| Forward-Current Transfer Ratio $I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ | 2N696,s 2N697,s | h_{FE} | 20 40 | 60 120 | |
| $I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ | 2N696,s 2N697,s | | 12.5 20.0 | | |
| Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$ | $V_{CE(sat)}$ | 0.3 | 1.5 | Vdc | |
| Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$ | $V_{BE(sat)}$ | | 1.3 | Vdc | |

2N696, 2N696s, 2N697, 2N697s SERIES

ELECTRICAL CHARACTERISTICS (con't)

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

DYNAMIC CHARACTERISTICS

| | | | | | |
|---|------------|--------------------|------------|----------|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio $I_C = 50 \text{ mA dc}, V_{CE} = 10 \text{ V dc}; f = 20 \text{ MHz}$ | $ h_{fe} $ | 2N696,s 2N697,s | 2.5 3.0 | 10 12 | |
| Output Capacitance $V_{CB} = 10 \text{ V dc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$ | | C_{obo} | 2.0 | 25 | pF |

SWITCHING CHARACTERISTICS

| | | | | |
|---|-----------|--|-------|----------------|
| Turn-On Time (See Figure 3 of MIL-PRF-19500/ 99) | t_{on} | | 200 | ηs |
| Turn-Off Time (See Figure 4 of MIL-PRF-19500/99) | t_{off} | | 1,000 | ηs |

(3) Pulse Test: Pulse Width 250 to 350 μs , Duty Cycle $\leq 2.0\%$.

