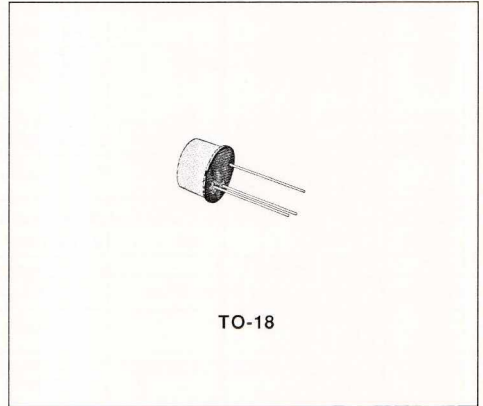




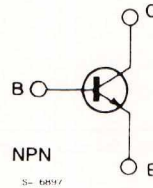
AMPLIFIERS AND SWITCHES

DESCRIPTION

The 2N718A and 2N956 are silicon planar epitaxial NPN transistors in Jedec TO-18 metal case, intended for high-speed switching and amplifier applications.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|----------------|---|-------------|------------|
| V_{CBO} | Collector-base Voltage ($I_E = 0$) | 75 | V |
| V_{CEr} | Collector-emitter Voltage ($R_{BE} \leq 10 \Omega$) | 50 | V |
| V_{EBO} | Emitter-base Voltage ($I_C = 0$) | 7 | V |
| I_C | Collector Current | 1 | A |
| P_{10t} | Total Power Dissipation at $T_{amb} \leq 25^\circ C$ at $T_{case} \leq 25^\circ C$ | 0.5 1.8 | W W |
| T_{stg}, T_J | Storage and Junction Temperature | - 65 to 200 | $^\circ C$ |

THERMAL DATA

| | | | | |
|------------------|-------------------------------------|-----|-----|---------------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Max | 97 | $^{\circ}C/W$ |
| $R_{th\ j-amb}$ | Thermal Resistance Junction-ambient | Max | 350 | $^{\circ}C/W$ |

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\ ^{\circ}C$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---|--|----------------------------|------|----------|------------------|
| I_{CBO} | Collector Cutoff Current ($I_E = 0$) | $V_{CB} = 60\ V$ $V_{CB} = 60\ V$ $T_{amb} = 150\ ^{\circ}C$ | | | 10 10 | nA μA |
| I_{EBO} | Emitter Cutoff Current ($I_C = 0$) | $V_{EB} = 5\ V$ for 2N718A for 2N956 | | | 10 5 | nA nA |
| $V_{(BR)CBO}$ | Collector-base Breakdown Voltage ($I_E = 0$) | $I_C = 100\ \mu A$ | 75 | | | V |
| $V_{(BR)CER}^*$ | Collector-emitter Breakdown Voltage ($R_{BE} \leq 10\ \Omega$) | $I_C = 10\ mA$ | 50 | | | V |
| $V_{(BR)EBO}$ | Emitter-base Breakdown Voltage ($I_C = 0$) | $I_E = 100\ \mu A$ | 7 | | | V |
| $V_{CE(sat)}^*$ | Collector-emitter Saturation Voltage | $I_C = 150\ mA$ $I_B = 15\ mA$ | | 0.24 | 1.5 | V |
| $V_{BE(sat)}^*$ | Base-emitter Saturation Voltage | $I_C = 150\ mA$ $I_B = 15\ mA$ | | 1 | 1.3 | V |
| h_{FE}^* | DC Current Gain | for 2N718A $I_C = 0.1\ mA$ $V_{CE} = 10\ V$ $I_C = 10\ mA$ $V_{CE} = 10\ V$ $I_C = 150\ mA$ $V_{CE} = 10\ V$ $I_C = 500\ mA$ $V_{CE} = 10\ V$ $I_C = 10\ mA$ $V_{CE} = 10\ V$ $T_{amb} = -55\ ^{\circ}C$ for 2N956 $I_C = 0.01\ mA$ $V_{CE} = 10\ V$ $I_C = 0.1\ mA$ $V_{CE} = 10\ V$ | 20 35 40 20 20 | | 120 | - - - - |

* Pulsed : pulse duration = 300 μs , duty cycle = 1 %.

ELECTRICAL CHARACTERISTICS (continued)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------|----------------------------|--|-----------------------|------|--------------------------|------------------|
| h_{FE}^* | DC Current Gain | for 2N956 $I_C = 10 \text{ mA}$ $V_{CE} = 10 \text{ V}$ $I_C = 150 \text{ mA}$ $V_{CE} = 10 \text{ V}$ $I_C = 500 \text{ mA}$ $V_{CE} = 10 \text{ V}$ $I_C = 10 \text{ mA}$ $V_{CE} = 10 \text{ V}$ $T_{amb} = -55 \text{ }^\circ\text{C}$ | 75 100 40 35 | | 300 | – – – – |
| h_{fe} | Small Signal Current Gain | for 2N718A $I_C = 1 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $I_C = 5 \text{ mA}$ $V_{CE} = 10 \text{ V}$ for 2N956 $I_C = 1 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $I_C = 5 \text{ mA}$ $V_{CE} = 10 \text{ V}$ | 30 35 50 70 | | 150 150 300 300 | – – – – |
| f_T | Transition Frequency | $I_C = 50 \text{ mA}$ $V_{CE} = 10 \text{ V}$ $f = 20 \text{ MHz}$ for 2N718A for 2N956 | 60 70 | | | MHz MHz |
| C_{EBO} | Emitter–base Capacitance | $I_C = 0$ $V_{EB} = 0.5 \text{ V}$ $f = 1 \text{ MHz}$ | | | 80 | pF |
| C_{CBO} | Collector–base Capacitance | $I_E = 0$ $V_{CB} = 10 \text{ V}$ $f = 1 \text{ MHz}$ | | | 25 | pF |
| NF | Noise Figure | $I_C = 300 \text{ } \mu\text{A}$ $V_{CE} = 10 \text{ V}$ $f = 1 \text{ kHz}$ for 2N718A for 2N956 | | | 12 8 | dB dB |

* Pulsed : pulse duration = 300 μs , duty cycle = 1 %.