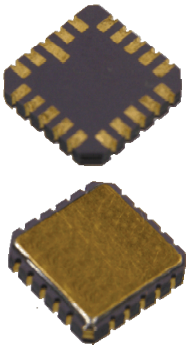
# Surface Mount Quad PNP Transistor

## 2N6987U (TX, TXV)



### Features:

- Ceramic 20 pin surface mount package
- Small package to minimize circuit board area
- Electrical performance similar to a 2N2907
- Hermetically sealed
- Processed per MIL-PRF-19500/558

### Description:

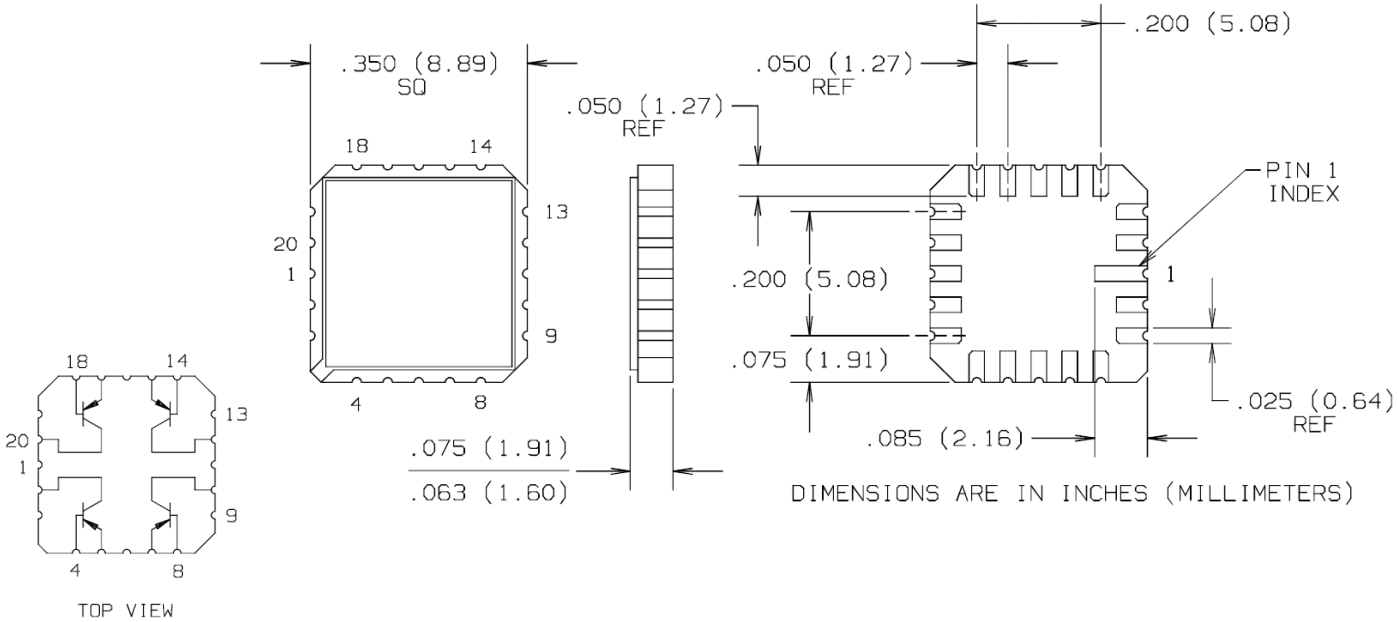
The 2N6987U (TX, TXV) is a hermetically sealed, ceramic surface-mount device, consisting of 4 silicon PNP transistors. The 20 pin ceramic package is ideal for designs where board space and device weight are important design considerations.

Typical screening and lot acceptance test are per MIL-PRF-19500/558. The burn-in condition is $V_{CB}$ = 30 V, $P_D$ = 250 mW each transistor, $T_A$ =25° C. Refer to MIL-PRF-19500/558 for complete requirements.

When ordering parts without processing, do not use the TX or TXV suffix.

### Applications:

- General switching
- Amplification
- Signal processing
- Radio transmission
- Logic gates




General Note
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## 2N6987U (TX, TXV)

## Electrical Specifications

| **Absolute Maximum Ratings** ($T_A$ = 25° C unless otherwise noted) | |
|---|---|
| Collector-Emitter Voltage | 60 V |
| Collector-Base Voltage | 60 V |
| Emitter-Base Voltage | 5 V |
| Collector Current-Continuous | 600 mA |
| Operating and Storage ($T_J$ , $T_{stg}$) | -65° C to +200 °C |
| Power Dissipation (single transistor, no heat sink) | 0.5 W |
| Power Dissipation (total device) | 1 W(1) |
| Isolation Voltage | 500 V |

**Electrical Characteristics** ($T_A$ = 25° C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | 60 | | V | $I_C$ = 10 µA |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 60 | | V | $I_C$ = 10 µA(2) |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | 5 | | V | $I_E$ = 10 µA |
| $I_{CBO2}$ | Collector-Base Cutoff Current | | 10 | nA | $V_{CB}$ = 50 V |
| $I_{CBO3}$ | Emitter-Base Cutoff Current | | 10 | µA | $V_{EB}$ = 50 V, TA = 150° C |
| $I_{EBO}$ | Emitter-Base Cutoff Current | | 50 | nA | $V_{EB}$ = 4 V |
| **ON CHARACTERISTICS** | | | | | |
| $h_{FE\ 1}$ | Forward-Current Transfer Ratio | 75 | | - | $V_{CE}$ = 10 V, $I_C$ = 0.1 mA |
| $h_{FE\ 2}$ | Forward-Current Transfer Ratio | 100 | 450 | - | $V_{CE}$ = 10 V, $I_C$ = 1.0 mA |
| $h_{FE\ 3}$ | Forward-Current Transfer Ratio | 100 | | - | $V_{CE}$ = 10 V, $I_C$ = 10 mA(2) |
| $h_{FE\ 4}$ | Forward-Current Transfer Ratio | 100 | 300 | - | $V_{CE}$ = 10 V, $I_C$ = 150 mA(2) |
| $h_{FE\ 5}$ | Forward-Current Transfer Ratio | 50 | | - | $V_{CE}$ = 10 V, $I_C$ = 500 mA(2) |
| $h_{FE\ 6}$ | Forward-Current Transfer Ratio | 50 | | - | $V_{CE}$ = 10 V, $I_C$ = 1 mA, $T_A$ = -55° C(2) |

Note:

1. Derate linearly 8.57 mW/°C above $T_A$ = 25°C
2. Pulse Width = 300 µs ±50, 1-2% Duty Cycle

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| Electrical Characteristics ($T_A$ = 25° C unless otherwise noted) | | | | | |
|---|---|---|---|---|---|
| **SYMBOL** | **PARAMETER** | **MIN** | **MAX** | **UNITS** | **TEST CONDITIONS** |
| **ON CHARACTERISTICS** | | | | | |
| $V_{CE\ (SAT)}$ 1 | Collector-Emitter Saturation Voltage | | 0.4 | V | $I_C$ = 150 mA, $I_B$= 15 mA(2) |
| $V_{CE\ (SAT)2}$ | Collector-Emitter Saturation Voltage | | 1.6 | V | $I_C$ = 500 mA, $I_B$= 50 mA(2) |
| $V_{BE(SAT)\ 1}$ | Base-Emitter Saturation Voltage | | 1.3 | V | $I_C$ = 150 mA, $I_B$= 15 mA(2) |
| $V_{BE(SAT)\ 2}$ | Base-Emitter Saturation Voltage | | 2.6 | V | $I_C$ = 500 mA, $I_B$= 50 mA(2) |
| **SMALL-SIGNAL CHARACTERISTICS** | | | | | |
| $\lvert h_{fe} \rvert$ | Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio | 2 | 8 | - | $V_{CE}$ = 20 V, $I_C$ = 50 mA, f = 100 MHz |
| $h_{fe}$ | Small Signal Short Circuit Forward Current Transfer Ratio | 100 | | - | $V_{CE}$ = 10 V, $I_C$ = 1 mA, f = 1 kHz |
| $C_{obo}$ | Open Circuit Output Capacitance | | 8 | pF | $V_{CB}$ = 10 V, $I_E$ = 0, 100 kHz ≤ f ≤ 1 MHZ |
| $C_{ibo}$ | Input Capacitance (Output Open) | | 30 | pF | $V_{EB}$ = 2 V, $I_C$ =0, 100 kHz ≤ f ≤ 1 MHZ |
| **SWITCHING CHARACTERISTICS** | | | | | |
| $t_{on}$ | Turn-On Time | | 45 | ns | $V_{CC}$ = 30 V, $I_C$ = 150 mA, $I_{B1}$ = 15 mA |
| $t_{off}$ | Turn-Off Time | | 300 | ns | $V_{CC}$ = 30 V, $I_C$ = 150 mA, $I_{B1}$ = $I_{B2}$ = 15 mA |
| **TRANSISTOR TO TRANSISTOR ISOLATION** | | | | | |
| $R_{t-t}$ | Isolation Resistance | | 10k | MΩ | $V_{t-t}$ = 500 V |

Note:

1. Derate linearly 8.57 mW/°C above $T_A$ = 25°C
2. Pulse Width = 300 µs ±50, 1-2% Duty Cycle


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# Surface Mount Quad PNP Transistor

## 2N6987U (TX, TXV)

| Issue | Change Description | Approval | Date |
|---|---|---|---|
| B | Updated with new TT format; changed $V_{(BR)CBO}$ and $V_{(BR(CEO}$ from $I_C$ = 10 mA to $I_C$ = 10 µA; changed $I_{CBO1}$ and $I_{CBO2}$ to $I_{CBO2}$ and $I_{CBO3}$ | Rodney Bailey | 04 Aug 2016 |
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