

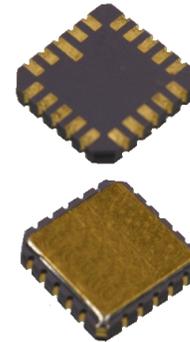
# Surface Mount Quad PNP Transistor

## 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:

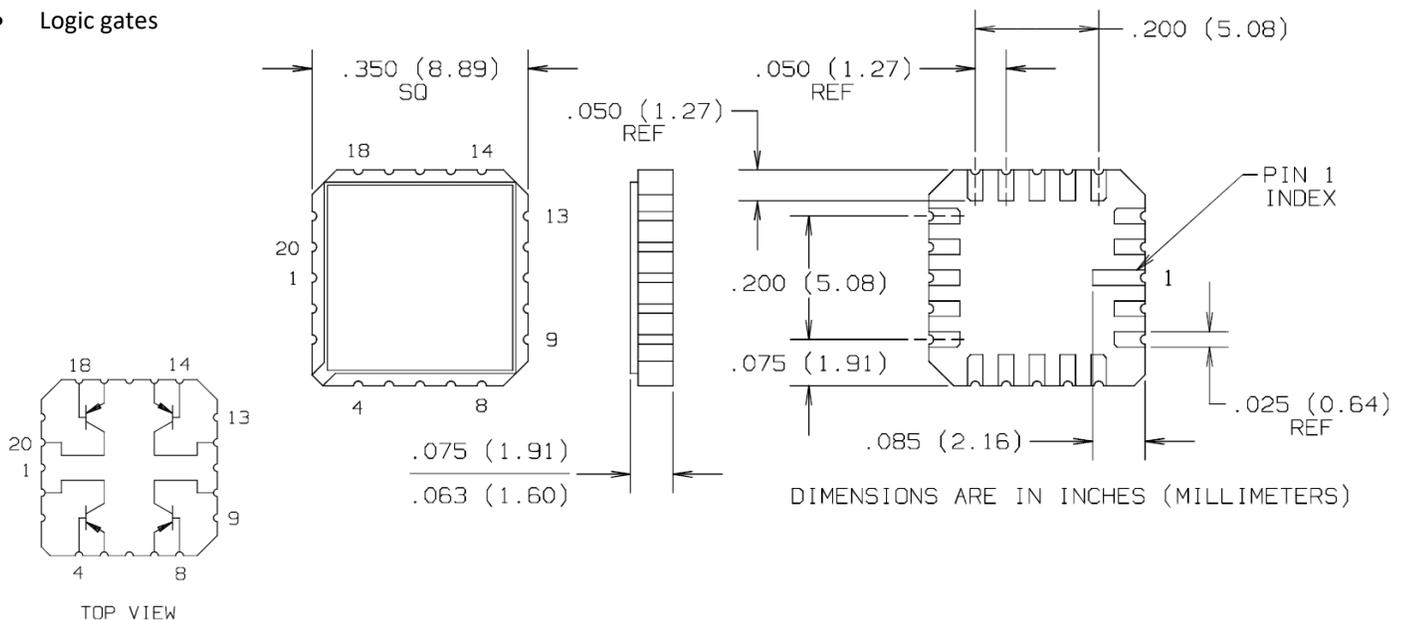
The 2N6987U (TX, TXV) is a hermetically sealed, ceramic surface-mount device, consisting of 4 silicon PNP transistors. The 20 pin ceramic package is ideal for designs where board space and device weight are important design considerations.

Typical screening and lot acceptance test are per MIL-PRF-19500/558. The burn-in condition is  $V_{CB} = 30\text{ V}$ ,  $P_D = 250\text{ mW}$  each transistor,  $T_A = 25^\circ\text{ C}$ . 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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## Electrical Specifications

Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ 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 ( $T_J, T_{stg}$ )	$-65^\circ\text{C}$ to $+200^\circ\text{C}$
Power Dissipation (single transistor, no heat sink)	0.5 W
Power Dissipation (total device)	1 W <sup>(1)</sup>
Isolation Voltage	500 V

Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)					
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>OFF CHARACTERISTICS</b>					
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	60		V	$I_C = 10\ \mu\text{A}$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	60		V	$I_C = 10\ \mu\text{A}^{(2)}$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	5		V	$I_E = 10\ \mu\text{A}$
$I_{CBO2}$	Collector-Base Cutoff Current		10	nA	$V_{CB} = 50\ \text{V}$
$I_{CBO3}$	Emitter-Base Cutoff Current		10	$\mu\text{A}$	$V_{EB} = 50\ \text{V}, T_A = 150^\circ\text{C}$
$I_{EBO}$	Emitter-Base Cutoff Current		50	nA	$V_{EB} = 4\ \text{V}$
<b>ON CHARACTERISTICS</b>					
$h_{FE1}$	Forward-Current Transfer Ratio	75		-	$V_{CE} = 10\ \text{V}, I_C = 0.1\ \text{mA}$
$h_{FE2}$	Forward-Current Transfer Ratio	100	450	-	$V_{CE} = 10\ \text{V}, I_C = 1.0\ \text{mA}$
$h_{FE3}$	Forward-Current Transfer Ratio	100		-	$V_{CE} = 10\ \text{V}, I_C = 10\ \text{mA}^{(2)}$
$h_{FE4}$	Forward-Current Transfer Ratio	100	300	-	$V_{CE} = 10\ \text{V}, I_C = 150\ \text{mA}^{(2)}$
$h_{FE5}$	Forward-Current Transfer Ratio	50		-	$V_{CE} = 10\ \text{V}, I_C = 500\ \text{mA}^{(2)}$
$h_{FE6}$	Forward-Current Transfer Ratio	50		-	$V_{CE} = 10\ \text{V}, I_C = 1\ \text{mA}, T_A = -55^\circ\text{C}^{(2)}$

**Note:**

- Derate linearly 8.57 mW/°C above  $T_A = 25^\circ\text{C}$
- Pulse Width = 300  $\mu\text{s} \pm 50$ , 1-2% Duty Cycle

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Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted)					
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>ON CHARACTERISTICS</b>					
V <sub>CE(SAT)1</sub>	Collector-Emitter Saturation Voltage		0.4	V	I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA <sup>(2)</sup>
V <sub>CE(SAT)2</sub>	Collector-Emitter Saturation Voltage		1.6	V	I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA <sup>(2)</sup>
V <sub>BE(SAT)1</sub>	Base-Emitter Saturation Voltage		1.3	V	I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA <sup>(2)</sup>
V <sub>BE(SAT)2</sub>	Base-Emitter Saturation Voltage		2.6	V	I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA <sup>(2)</sup>
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
h <sub>fe</sub>	Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	2	8	-	V <sub>CE</sub> = 20 V, I <sub>C</sub> = 50 mA, f = 100 MHz
h <sub>fe</sub>	Small Signal Short Circuit Forward Current Transfer Ratio	100		-	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 1 mA, f = 1 kHz
C <sub>obo</sub>	Open Circuit Output Capacitance		8	pF	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1 MHz
C <sub>ibo</sub>	Input Capacitance (Output Open)		30	pF	V <sub>EB</sub> = 2 V, I <sub>C</sub> = 0, 100 kHz ≤ f ≤ 1 MHz
<b>SWITCHING CHARACTERISTICS</b>					
t <sub>on</sub>	Turn-On Time		45	ns	V <sub>CC</sub> = 30 V, I <sub>C</sub> = 150 mA, I <sub>B1</sub> = 15 mA
t <sub>off</sub>	Turn-Off Time		300	ns	V <sub>CC</sub> = 30 V, I <sub>C</sub> = 150 mA, I <sub>B1</sub> = I <sub>B2</sub> = 15 mA
<b>TRANSISTOR TO TRANSISTOR ISOLATION</b>					
R <sub>t-t</sub>	Isolation Resistance		10k	MΩ	V <sub>t-t</sub> = 500 V

Note:

1. Derate linearly 8.57 mW/°C above T<sub>A</sub> = 25°C
2. Pulse Width = 300 μs ±50, 1-2% Duty Cycle

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