

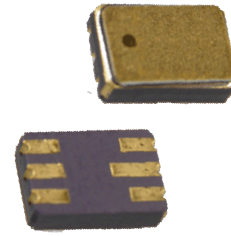
# Surface Mount NPN/ PNP Complementary Transistor

## 2N4854U (TX, TXV)



### Features:

- Ceramic 6 pin surface mount package
- Small package to minimize circuit board area
- Hermetically sealed
- Processed per MIL-PRF-19500/421



### Description:

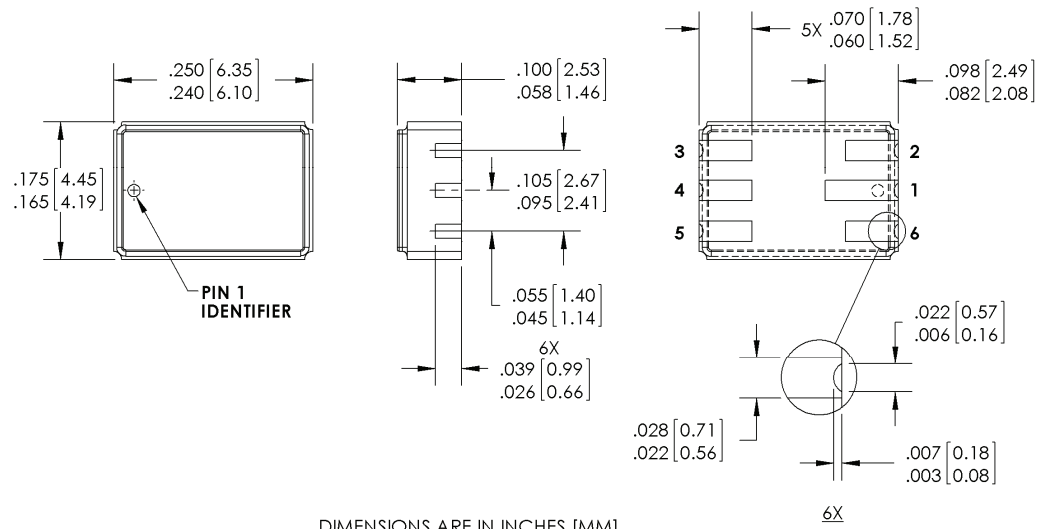
The 2N4854U (TX, TXV) are hermetically sealed, ceramic surface mount complementary NPN/PNP transistor pair. The “U” suffix denotes the six terminal (C-6) leadless chip carrier package option. The miniature six pin ceramic package is ideal for designs where board space and device weight are important design considerations.

Typical screening and lot acceptance tests are per MIL-PRF-19500/421. The burn-in condition is  $V_{CB} = 30\text{ V}$ ,  $P_D = 300\text{ mW}$  each transistor,  $T_A = 25^\circ\text{C}$ . Refer to MIL-PRF-19500/421 for complete requirements.

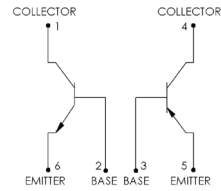
When ordering parts without processing, do not use the TX or TXV suffix.

### Applications:

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



DIMENSIONS ARE IN INCHES [MM]



Pin #	PNP Transistor	Pin #	NPN
3	Base	2	Base
4	Collector	1	Collector
5	Emitter	6	Emitter

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## Electrical Specifications

Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted.) See Note 3	
NPN to PNP Isolation Voltage	500 VDC
Collector-Base Voltage	60 V
Collector-Emitter Voltage	40 V
Emitter-Base Voltage	5.0 V
Collector Current-Continuous	600 mA
Operating Junction Temperature ( $T_J$ )	$-65^\circ\text{C}$ to $+200^\circ\text{C}$
Storage Junction Temperature ( $T_{stg}$ )	$-65^\circ\text{C}$ to $+200^\circ\text{C}$
Power Dissipation @ $T_A = 25^\circ\text{C}$ (both transistors driven equally)	0.6 W
Power Dissipation @ $T_c = 25^\circ\text{C}$ (both transistors driven equally)	2.0 W <sup>(1)</sup>
Soldering Temperature (vapor phase reflow for 30 seconds)	215° C
Soldering Temperature (heated collet for 5 seconds)	260° C

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	$I_C = 10\ \mu\text{A}, I_E = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	40		V	$I_C = 10\ \text{mA}, I_B = 0^{(2)}$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	5		V	$I_E = 10\ \mu\text{A}, I_C = 0$
$I_{CBO}$	Collector-Base Cutoff Current		10	nA	$V_{CB} = 50\ \text{V}, I_E = 0$
			10	$\mu\text{A}$	$V_{CB} = 50\ \text{V}, I_E = 0, T_A = 150^\circ\text{C}$
$I_{EBO}$	Emitter-Base Cutoff Current		10	nA	$V_{EB} = 3\ \text{V}, I_C = 0$
<b>ON CHARACTERISTICS</b>					
$h_{FE}$	Forward-Current Transfer Ratio	50		-	$V_{CE} = 10\ \text{V}, I_C = 150\ \text{mA}^{(2)}$
		35		-	$V_{CE} = 10\ \text{V}, I_C = 0.1\ \text{mA}$
		50		-	$V_{CE} = 10\ \text{V}, I_C = 1.0\ \text{mA}$
		75		-	$V_{CE} = 10\ \text{V}, I_C = 10\ \text{mA}^{(2)}$
		100	300	-	$V_{CE} = 10\ \text{V}, I_C = 150\ \text{mA}^{(2)}$
		35		-	$V_{CE} = 10\ \text{V}, I_C = 300\ \text{mA}^{(2)}$
		12		-	$V_{CE} = 10\ \text{V}, I_C = 10\ \text{mA}, T_A = -55^\circ\text{C}$

Note: 1. Derate linearly 6.6 mW/°C above 25° C  
2. Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

3. Polarities given are for the NPN device. Reverse polarity on limits & conditions as applicable for the PNP side.

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OPTEK Technology, Inc.  
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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)</sub>	Collector-Emitter Saturation Voltage		0.40	V	I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA <sup>(2)</sup>
V <sub>BE(SAT)</sub>	Base-Emitter Saturation Voltage	0.8		V	I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA <sup>(2)</sup>
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
h <sub>ie</sub>	Small Signal Common Emitter Input Impedance	1.5	9	kΩ	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 1.0 mA, f = 1.0 KHZ
h <sub>oe</sub>	Small Signal Common Emitter Output Admittance		50	μmho	
h <sub>fe</sub>	Small Signal Current Transfer Ratio	60	300	-	
NF	Noise Figure		8	db	f = 1.0 KHZ, R <sub>G</sub> = 1.0 kΩ, I <sub>C</sub> = 0.1 mA, V <sub>CE</sub> = 10 V
h <sub>fe</sub>	Small Signal Forward Current Transfer Ratio	2	8	-	V <sub>CE</sub> = 20 V, I <sub>C</sub> = 20 mA, f = 100 MHz
C <sub>obo</sub>	Open Circuit Output Capacitance		8	pF	V <sub>CB</sub> = 10 V, 100 kHz ≤ f ≤ 1.0 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

Note: 1. Derate linearly 6.6 mW/°C above 25° C  
2. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

3. Polarities given are for the NPN device. Reverse polarity on limits & conditions as applicable for the PNP side.

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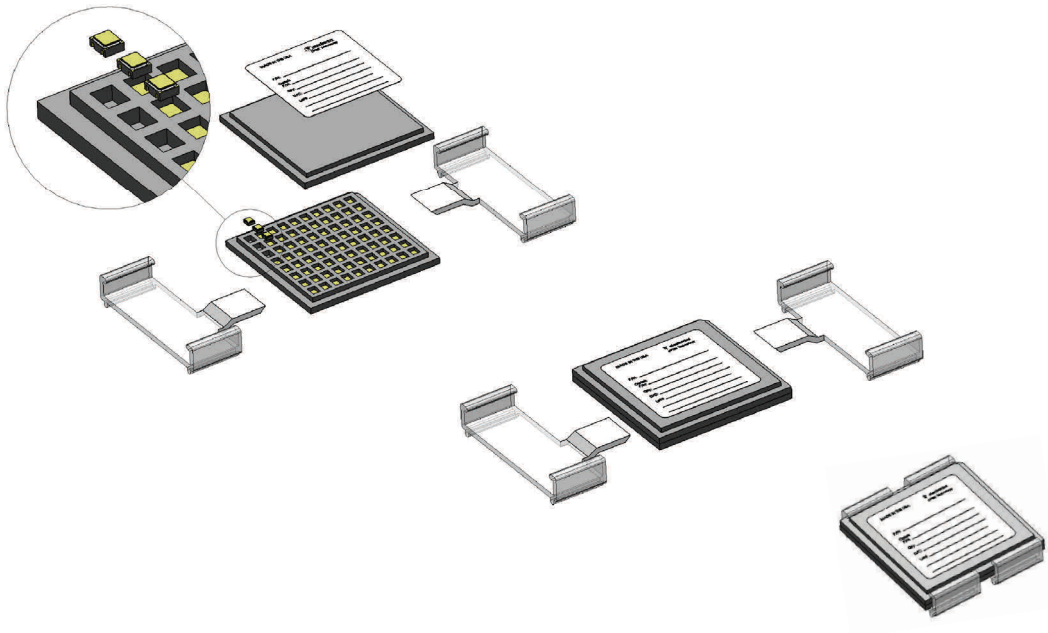
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## Standard Packaging:

Waffle Pack



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