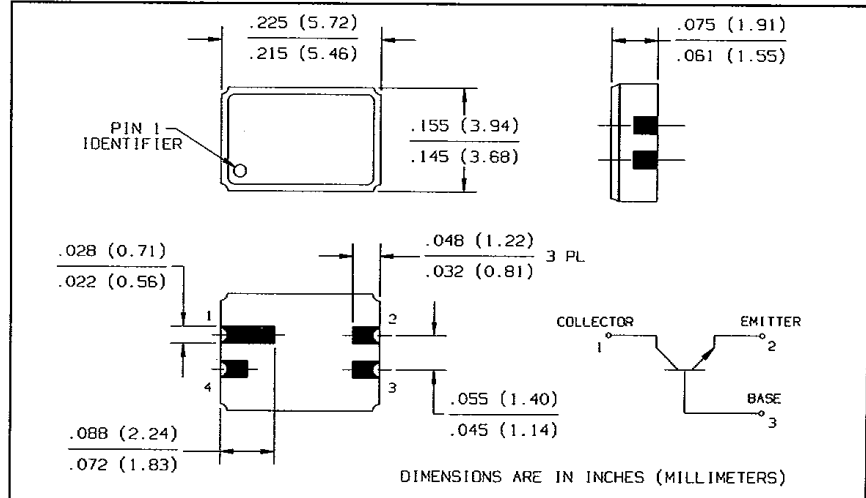
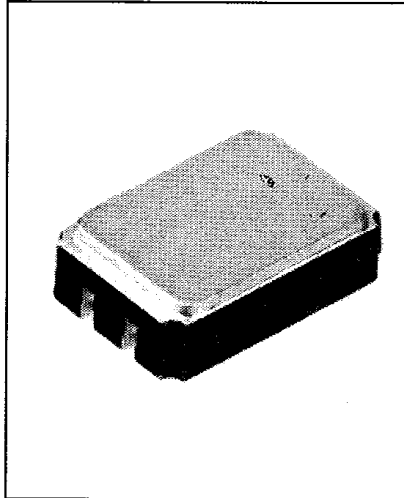


# Surface Mount NPN General Purpose Transistor

## Types TX, TXV, 2N2222AUA



### Features

- Ceramic surface mount package
- Small package to minimize circuit board area
- Hermetically sealed
- Qualification per MIL-PRF-19500/255

### Description

The .TX/.TXV2N2222AUA is a hermetically sealed ceramic surface mount general purpose switching transistor. The four pin ceramic package is ideal for designs where board space and device weight are important design considerations. The "UA" suffix denotes the 4 terminal leadless chip carrier package, type "A" per MIL-PRF-19500/255.

Typical screening and lot acceptance tests are provided on page 13-4. The burn-in condition is  $V_{CB} = 30$  V.  $P_D = 400$  mW,  $T_A = 25^\circ$  C,  $t = 80$  hrs. Refer to MIL-PRF-19500/255 for complete requirements. In addition, the TX and TXV versions receive 100% thermal response testing.

When ordering parts without processing, do not use a JAN prefix.

### Absolute Maximum Ratings ( $T_A = 25^\circ$ C unless otherwise noted)

Collector-Base Voltage	75 V
Collector-Emitter Voltage	50 V
Emitter-Base Voltage	6.0 V
Collector Current-Continuous	800 mA
Operating Junction Temperature ( $T_J$ )	$-65^\circ$ C to $+200^\circ$ C
Storage Junction Temperature ( $T_{stg}$ )	$-65^\circ$ C to $+200^\circ$ C
Power Dissipation @ $T_A = 25^\circ$ C	0.5 W
Power Dissipation @ $T_C = 25^\circ$ C	1.16 W <sup>(1)</sup>
Soldering Temperature (vapor phase reflow for 30 sec.)	215° C
Soldering Temperature (heated collet for 5 sec.)	260° C

#### Notes:

(1) Derate linearly 6.6 mW/ $^\circ$  C above 25° C.

# Types TX, TXV, 2N2222AUA

Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITION
<b>Off Characteristics</b>					
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	75		V	$I_C = 10\ \mu\text{A}, I_E = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	50		V	$I_C = 10\ \text{mA}, I_B = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	6.0		V	$I_E = 10\ \mu\text{A}, I_C = 0$
$I_{CBO}$	Collector-Base Cutoff Current		10	nA	$V_{CB} = 60\ \text{V}, I_E = 0$
			10	$\mu\text{A}$	$V_{CB} = 60\ \text{V}, I_E = 0, T_A = 150^\circ\text{C}$
$I_{EBO}$	Emitter-Base Cutoff Current		10	nA	$V_{EB} = 4\ \text{V}, I_C = 0$
$I_{CES}$	Collector-Emitter Cutoff Current		50	nA	$V_{CE} = 50\ \text{V}$
<b>On Characteristics</b>					
$h_{FE}$	Forward-Current Transfer Ratio	50		-	$V_{CE} = 10\ \text{V}, I_C = 0.1\ \text{mA}$
		75	325	-	$V_{CE} = 10\ \text{V}, I_C = 1.0\ \text{mA}$
		100		-	$V_{CE} = 10\ \text{V}, I_C = 10\ \text{mA}$
		100	300	-	$V_{CE} = 10\ \text{V}, I_C = 150\ \text{mA}^{(2)}$
		30		-	$V_{CE} = 10\ \text{V}, I_C = 500\ \text{mA}^{(2)}$
		35		-	$V_{CE} = 10\ \text{V}, I_C = 10\ \text{mA}, T_A = -55^\circ\text{C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		0.3	V	$I_C = 150\ \text{mA}, I_B = 15\ \text{mA}^{(2)}$
			1.0	V	$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}^{(2)}$
$V_{BE(SAT)}$	Base-Emitter Saturation Voltage	0.6	1.2	V	$I_C = 150\ \text{mA}, I_B = 15\ \text{mA}^{(2)}$
			2.0	V	$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}^{(2)}$
<b>Small-Signal Characteristics</b>					
$h_{fe}$	Small Signal Forward Current Transfer Ratio	50		-	$V_{CE} = 10\ \text{V}, I_C = 1.0\ \text{mA}, f = 1.0\ \text{kHz}$
$I_{h_{fe}}$	Small Signal Forward Current Transfer Ratio	2.5		-	$V_{CE} = 20\ \text{V}, I_C = 20\ \text{mA}, f = 100\ \text{MHz}$
$C_{obo}$	Open Circuit Output Capacitance		8.0	pF	$V_{CB} = 10\ \text{V}, 100\ \text{kHz} \leq f \leq 1.0\ \text{MHz}$
$C_{ibo}$	Input Capacitance (Output Open)		25	pF	$V_{EB} = 0.5\ \text{V}, 100\ \text{kHz} \leq f \leq 1.0\ \text{MHz}$
<b>Switching Characteristics</b>					
$t_{on}$	Turn-On Time		35	ns	$V_{CC} = 30\ \text{V}, I_C = 150\ \text{mA}, I_{B1} = 15\ \text{mA}$
$t_{off}$	Turn-Off Time		300	ns	$V_{CC} = 30\ \text{V}, I_C = 150\ \text{mA}, I_{B1} = I_{B2} = 15\ \text{mA}$

(2) Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$