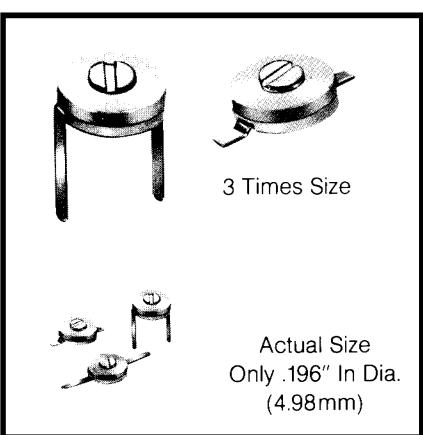


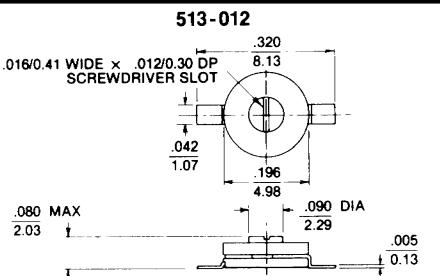
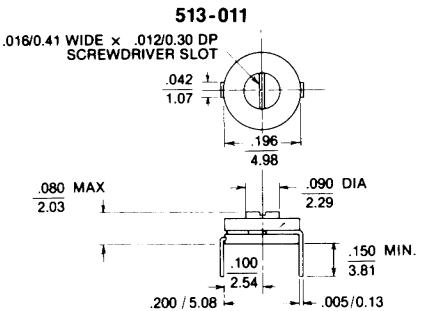
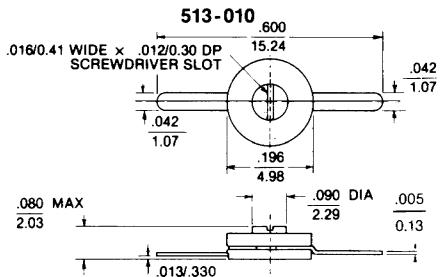
# TUSONIX

VARI-Thin®  
100WVdc  
CERAMIC  
TRIMMERS

SERIES 513  
Ultraminiature



## Terminal Variation Options



## Outstanding Features

- Only .196"/4.98mm diameter x .080"/2.03mm high.
- Ideal for wide range of products requiring real miniaturized capacitance trimming.
- Operates efficiently at -55°C to +85°C.
- Available in your choice of three basic terminal arrangements.
- Ceramic base seats directly on module substrates or circuit boards. No metal or mechanical attachments protruding beneath the base plane.
- Monolithic Rotor design offers optimum stability for higher capacitance ranges. Eliminates need to use unstable higher K dielectric materials. Monolithic construction offers greater ruggedness which cannot be achieved when using single plate construction, particularly with fragile Hi-K Dielectric materials.

The smallest trimmer now gets smaller...This describes TUSONIX' Style 513 VARI-Thin Ceramic Trimmer Capacitor. Only .196" in diameter and .080" high, the TUSONIX 513 is perfect for avionics apparatus, communications equipment, oscilloscopes, crys-

tal oscillators, crystal filters...an almost endless variety of applications requiring miniaturized capacitance trimming. The tiny 513 VARI-Thin is available with three basic terminal arrangements as shown at left.

Ordering Data			
Specify series 513 followed by the three digit Terminal Variation you select from the chart at left. Then list the dielectric you select from the Table at right and the corresponding cap. range. EXAMPLE: 513-010 A 1-5pF	Dielectric Type Code	Capacitance Range (pF)	Working Voltage (Vdc) 85°
	A	1-5	100
	A	2-10	100
	A	3.5-20	100
	A	5-30	100
	G	7-40	50

Minimum to maximum capacitance achieved through 180° rotation.

## SPECIFICATIONS

- Working Voltage ..... See Table Above  
Dielectric Strength ..... 2 times WVdc for 1 to 5 seconds  
Operating Temperature Range ..... -55°C to +85°C  
Q Factor @ 1 MHz ..... 500 Min. (Dielectric Code A)  
200 Min. (Dielectric Code G)  
Torque ..... 0.3 to 2.0 oz.in.  
Qualification Specification ..... TUSONIX Spec. 513 (page 2)  
**Marking:** All units will be marked with TUSONIX trademark, capacitance range and dielectric type code.  
**Example:** T 1-5 A

For dimensions  $\leq$  .125"/3.18mm, tolerance is  $\pm$  .005/0.13

For dimensions  $\geq$  .126"/3.20mm, tolerance is  $\pm$  .015/0.38

For other capacitance ranges and terminal arrangements call the nearest TUSONIX Sales Office or call Tucson, AZ 520-744-0400.



# SPECIFICATION

## 513 Series

Ceramic  
Trimmer Capacitors

**CAPACITANCE:** When measured at room temperature ( $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ) and at a frequency of 0.1 to 1 megahertz, the minimum capacitance shall not be greater than that specified at minimum setting with a +10% tolerance, and the maximum capacitance shall not be less than that specified at maximum setting with a -10% tolerance.

**"Q" FACTOR:** When measured at room temperature ( $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ), at a frequency of approximately 1 megahertz, the capacitor at approximately maximum rated capacitance setting shall have a "Q" value not less than indicated for the respective style.

**INSULATION RESISTANCE:** The insulation resistance at approximately maximum capacitance setting shall be 10 gigaohms minimum at room temperature of ( $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ) when measured at 100 volts dc in a series with a protective resistance not exceeding 1 megohm after no more than one minute application of the voltage.

**DIELECTRIC STRENGTH:** The capacitor, set at approximately maximum capacitance shall withstand voltage between terminals for 1 to 5 sec. as indicated for the respective style. (50mA maximum charging current)

**TORQUE:** When measured at room temperature ( $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ), the torque required to start and maintain rotation of the rotor through one full turn, shall be as indicated for the respective style.

**TEMPERATURE CHARACTERISTIC:** The temperature characteristic of capacitance shall be within the limits shown in the following table. The temperature characteristic shall be determined by measuring the capacitance (capacitor shall be set at approximately 75% of the guaranteed maximum capacitance)  $+25^{\circ}\text{C}$ ,  $-55^{\circ}\text{C}$ , and either  $+85^{\circ}\text{C}$  or  $+125^{\circ}\text{C}$ , whichever is applicable to the respective style, at a frequency of 0.1 to 1 megahertz. Each measurement shall be made after the capacitor has

reached thermal stability.

**CAPACITANCE DRIFT:** With the capacitor set at approximately 75% of the guaranteed maximum capacitance, the capacitance drift shall be determined as the greatest difference between any two of three  $25^{\circ}\text{C}$  measurements, when temperature cycled as follows:  $+25^{\circ}\text{C}$ ,  $-55^{\circ}\text{C}$ ,  $+85^{\circ}\text{C}$  or  $+125^{\circ}\text{C}$ , whichever is applicable to respective style,  $+25^{\circ}\text{C}$ . The capacitance drift shall not exceed 0.75% or  $0.5\text{pF}$ , whichever is greater.

**ACCELERATED LIFE TEST:** The capacitor, at approximately 75% of the guaranteed maximum capacitance, shall be tested for 250 hours at twice rated voltage, and at a temperature equal to the maximum operating temperature  $\pm 3^{\circ}\text{C}$  for the respective style. At the end of this period the capacitance shall not have changed more than  $\pm 5\%$  of its value before the life test or  $\pm 0.5\text{pF}$ , whichever is greater; the insulation resistance shall be 1 gigaohm minimum and the "Q" at 1 megahertz shall be at least 40% of the initial test limit.

**TEMPERATURE CYCLING & HUMIDITY:** The capacitor, at approximately 75% of the guaranteed maxi-

mum capacitance, shall be given a treatment consisting of 5 temperature cycles as follows: Cool capacitor to  $-55^{\circ}\text{C} \pm 3^{\circ}\text{C}$ . Remove the capacitor from the cooling chamber and allow it to reach room temperature. Then place in an oven at a temperature equal to maximum operating temperature  $\pm 3^{\circ}\text{C}$  of the respective style. Remove from oven and allow capacitor to cool to room temperature. The capacitor shall be held at the specified minimum and maximum temperatures long enough to reach equilibrium, and in no case less than 15 minutes. The rate of change of temperature in cooling from room temperature, or heating above it, shall not be less than  $3^{\circ}\text{C}$  per minute. The temperature cycles shall be followed by exposure for 96 hours to a relative humidity of 95% at  $40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ . The capacitor shall then be removed from the humidity chamber and held at  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$  with a maximum humidity of 50% for four hours. The insulation resistance shall be at least 1 gigaohm, the "Q" at 1 MHZ is at least 40% of initial test limit and the capacitance shall not have changed by more than  $\pm 3\%$  or  $\pm 0.5\text{pF}$ , whichever is greater, from its value prior to the start of the temperature cycling.

Dielectric Type Code	PERCENT CAPACITANCE CHANGE FROM VALUE @ $25^{\circ}\text{C}$			
	$-55^{\circ}\text{C}$		$+85^{\circ}\text{C}$	
	Min.	Max.	Min.	Max.
A	-2.1	+4.2	-3.8	+1.1
G	0.0	+14.0	-8.0	-3.0