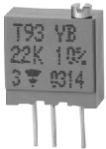


# 3/8" Square Multi-Turn Cermet Trimmers



The T93 is a small size trimmer - 3/8" x 3/8" x 3/16" - answering PC board mounting requirements. Five versions are available which differ by the position of the control screw in relation to the PC board plane and by the spacing of the terminals.

Excellent operational stability is provided by the use of a cermet element.

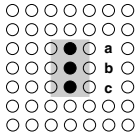
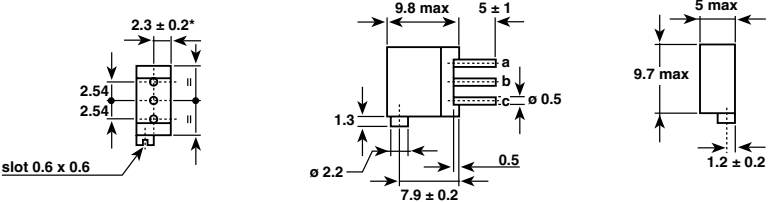
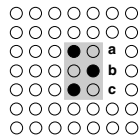
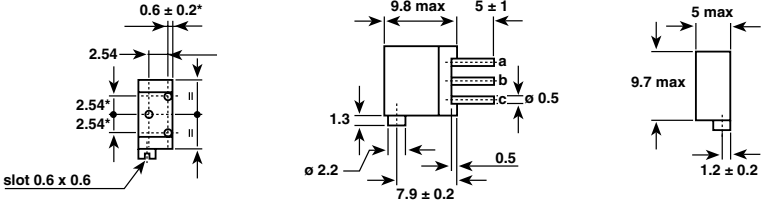
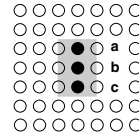
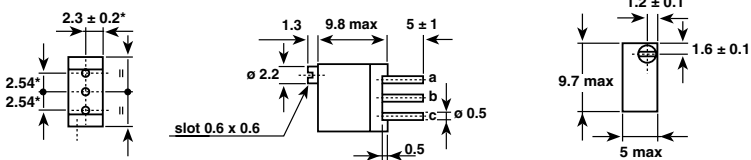
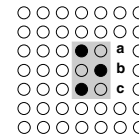
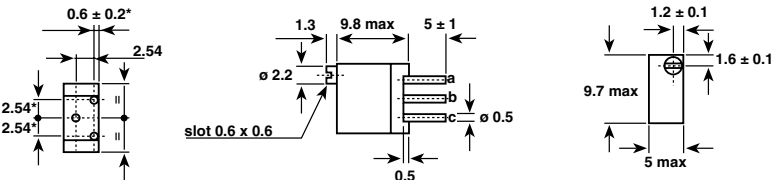
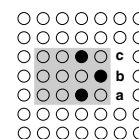
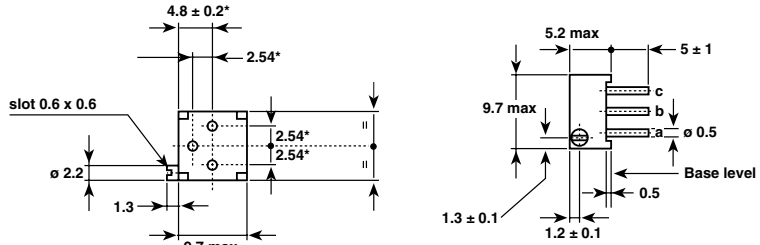
### FEATURES

- Industrial Grade
- 0.5 Watt at 70 °C
- Tests according to CECC 41 000
- Contact resistance variation < 1 % typical
- Lead (Pb)-free and RoHS compliant

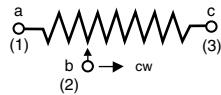


### DIMENSIONS in millimeters

### Terminal Spacing on a 2.54 PCB

**T93XA**

**T93XB**

**T93YA**

**T93YB**

**T93Z**


### CIRCUIT DIAGRAM



\* to be measured at base level

Tolerance unless otherwise specified ± 0.5



ELECTRICAL SPECIFICATIONS		
Resistive Element		cermet
Electrical Travel		21 turns ± 2
Resistance Range		10 Ω to 2.2 MΩ
Standard series E3		1 - 2.2 - 4.7 and on request 1 - 2 - 5
Tolerance	Standard	± 10 %
	On Request	± 5 %
Power Rating	Linear	0.5 W at + 70 °C
	Logarithmic	not applicable
Temperature Coefficient		See Standard Resistance Element Table
Limiting Element Voltage (Linear Law)		250 V
Contact Resistance Variation		2 % Rn or 2 Ω
End Resistance (Typical)		1 Ω
Dielectric Strength (RMS)		1000 V
Insulation Resistance (500 VDC)		10 <sup>6</sup> MΩ

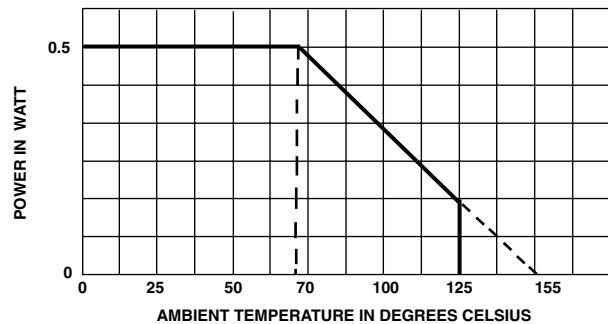
**MECHANICAL SPECIFICATIONS**

Mechanical Travel	23 turns ± 5
Operating Torque (max. Ncm)	1.5
End Stop Torque	clutch action
Net Weight	Approx. 0.82 g
Wiper (actual travel)	Positioned at approx. 50 %

**ENVIRONMENTAL SPECIFICATIONS**

Temperature Range	- 55 °C to + 155 °C
Climatic Category	55/125/56
Sealing	fully sealed container IP67

**POWER RATING CHART**



PERFORMANCE			
TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		$\frac{\Delta RT}{RT}$ (%)	$\frac{\Delta R_{1-2}}{R_{1-2}}$ (%)
Load Life	1000 hours at rated power 90°/30° - ambient temp. 70 °C	± 1 % Contact res. variation: < 1 % Rn	± 2 %
Climatic Sequence	Phase A dry heat 125 °C - 30 % Pr Phase B damp heat Phase C cold - 55 °C Phase D damp heat 5 cycles	± 0.5 %	± 1 %
Long Term Damp Heat	56 days 40 °C, 93 % RH	± 0.5 % Dielectric strength: 1000 V RMS Insulation resistance: > 10 <sup>4</sup> MΩ	± 1 %
Rapid Temperature Change	5 cycles - 55 °C at + 125 °C	± 0.5 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 1 \%$
Shock	50 g at 11 m secs 3 successive shocks in 3 directions	± 0.1 %	± 0.2 %
Vibration	10 - 55 Hz 0.75 mm or 10 g during 6 hours	± 0.1 %	$\frac{\Delta V_{1-2}}{V_{1-3}} \leq \pm 0.2 \%$
Rotational Life	200 cycles	± 4 % Contact res. variation: < 1 % Rn	



STANDARD RESISTANCE ELEMENT DATA				
STANDARD RESISTANCE VALUES	LINEAR LAW			TCR - 55 °C + 125 °C
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	
Ω	W	V	mA	ppm/°C
10	0.5	2.2	224	0 + 200
22	↓	3.3	150	
47		4.8	103	
100		7	70	
220		10.5	47	
470		15.3	32	
1K		22.4	22	
2.2K		33.2	15	
4.7K		48.5	10	
10K		70.7	7	
22K		105	4.8	± 100
47K	153	3.2		
100K	0.5	224	2.2	
220K	0.28	250	1.1	
470K	0.13	250	0.53	
1M	0.06	250	0.25	
2.2M	0.028	250	0.11	

**MARKING**

- Printed:
- VISHAY trademark
  - model
  - style
  - ohmic value (in Ω, kΩ, MΩ)
  - tolerance (in %)
  - manufacturing date
  - marking of terminal 3

PACKAGING
- In magazine pack by 50 pieces (tube) code "TU50".

ORDERING INFORMATION					
T93 MODEL	XA VERSION	220 kΩ OHMIC VALUE	± 10 % TOLERANCE	TU50 PACKAGING	e3 LEAD FINISH
				TU50 : Tube	e3: pure Sn

SAP PART NUMBERING GUIDELINES														
T	9	3	X	A	2	2	4	K	T	2	0	□	□	□
MODEL			STYLE		OHMIC VALUE			TOL	PACKAGING CODE			SPECIAL (IF APPLICABLE)		
See the end of this data book for conversion tables														



## Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.