

## 3/8" Square Multi-Turn Cermet Trimmer



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 W at 70 °C
- Tests according to CECC 41000 or IEC 60393-1
- Contact resistance variation < 1 %
- Compliant to RoHS directive 2002/95/EC



**RoHS**  
COMPLIANT

DIMENSIONS in millimeters ( $\pm 0.5$ mm)			
<b>T93XA</b> 	<b>Terminal Spacing on a 2.54 PCB</b> 		
<b>T93XB</b> 			
<b>T93YA</b> 			
<b>T93YB</b> 			
<b>T93Z</b> 			

### Note

(1) To be measured at base level

ELECTRICAL SPECIFICATIONS		
Resistive element	Cermet	
Electrical travel	21 turns $\pm$ 2	
Resistance range	10 $\Omega$ to 2.2 M $\Omega$	
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	
Circuit diagram		
Temperature coefficient	See Standard Resistance Element table	
Limiting element voltage (linear law)	250 V	
Contact resistance variation	2 % Rn or 2 $\Omega$	
End resistance (typical)	1 $\Omega$	
Dielectric strength (RMS)	1000 V	
Insulation resistance (500 V <sub>DC</sub> )	10 <sup>6</sup> M $\Omega$	

MECHANICAL SPECIFICATIONS	
Mechanical travel	23 turns $\pm$ 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 %
Terminals	Pure Sn (code e3)

ENVIRONMENTAL SPECIFICATIONS	
Temperature range	- 55 °C to + 155 °C
Climatic category	55/125/56
Sealing	Fully sealed - IP67



STANDARD RESISTANCE ELEMENT DATA				
STANDARD RESISTANCE VALUES	LINEAR LAW			TYPICAL TCR - 55 °C + 125 °C ppm/°C
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CURRENT THROUGH WIPER	
Ω	W	V	mA	
10	0.5	2.2	224	± 100
22	0.5	3.3	150	
47	0.5	4.8	103	
100	0.5	7	70	
220	0.5	10.5	47	
470	0.5	15.3	32	
1K	0.5	22.4	22	
2.2K	0.5	33.2	15	
4.7K	0.5	48.5	10	
10K	0.5	70.7	7	
22K	0.5	105	4.8	
47K	0.5	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	

PERFORMANCES			
TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS	
		ΔR <sub>T</sub> /R <sub>T</sub> (%)	ΔR <sub>1-2</sub> /R <sub>1-2</sub> (%)
Load life	1000 h at rated power 90°/30° - ambient temp. 70 °C	± 1 % Contact res. variation: < 1 % R <sub>n</sub>	± 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 <sub>RMS</sub> Insulation resistance: > 10 <sup>4</sup> MΩ	± 1 %
Rapid temperature change	5 cycles - 55 °C at + 125 °C	± 0.5 %	ΔV <sub>1-2</sub> /ΔV <sub>1-3</sub> ≤ ± 1 %
Shock	50 g at 11 ms 3 successive shocks in 3 directions	± 0.1 %	± 0.2 %
Vibration	10 Hz to 55 Hz 0.75 mm or 10 g during 6 h	± 0.1 %	ΔV <sub>1-2</sub> /ΔV <sub>1-3</sub> ≤ ± 0.2 %
Rotational life	200 cycles	± 4 % Contact res. variation: < 1 % R <sub>n</sub>	-

MARKING
<ul style="list-style-type: none"> <li>VISHAY trademark</li> <li>Model</li> <li>Style</li> <li>Ohmic value (in Ω, kΩ, MΩ)</li> <li>Tolerance (in %)</li> <li>Manufacturing date</li> <li>Marking of terminal 3</li> </ul>

PACKAGING
<ul style="list-style-type: none"> <li>In tube of 50 pieces code T20 (TU50)</li> </ul>



ORDERING INFORMATION (Part Number)														
T	9	3	X	A	2	2	4	K	T	2	0			
Model	STYLE		OHMIC VALUE			TOLERANCE		PACKAGING		SPECIAL NUMBER				
T93	XA XB YA YB Z		From 10 Ω to 2.2 MΩ 224 = 220 kΩ			K = 10 % on request J = 5 %		T20 = Tube 50 pieces		(If applicable) Given by Vishay for custom design				

DESCRIPTION (for information only)						
T93	XA	220K	10 %		TU50	e3
MODEL	STYLE	VALUE	TOLERANCE	SPECIAL	PACKAGING	LEAD FINISH



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