

# 3/8" Square Multi-Turn Cermet Trimmer



## FEATURES

- Industrial grade
- 0.5 W at 70 °C
- Tests according to CECC 41000 or IEC 60393-1
- Contact resistance variation < 2 %
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


RoHS  
COMPLIANT

## DESIGN SUPPORT TOOLS

[click logo to get started](#)
**3D**  
Models  
Available

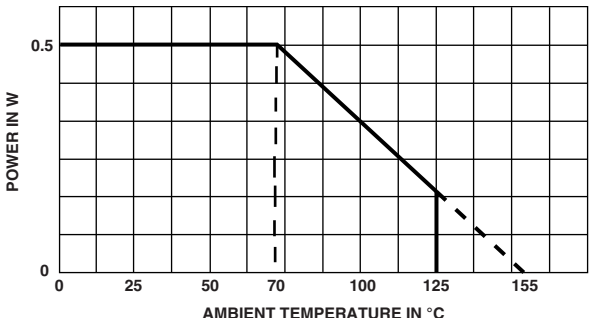
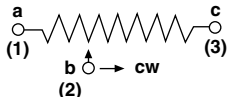
The T93 is a small size trimmer - 3/8" x 3/8" x 3/16" - answering PC board mounting requirements. Five versions are available which differ by the position of the control screw in relation to the PC board plane and by the spacing of the terminals. Excellent operational stability is provided by the use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

## DIMENSIONS in millimeters (± 0.5 mm)

<div data-bbox="159 787 232 814">T93XA</div> <div data-bbox="370 829 576 987"> </div> <div data-bbox="673 808 933 1008"> </div> <div data-bbox="1015 829 1153 997"> </div> <div data-bbox="1218 766 1437 819"> <b>Terminal Spacing on a 2.54 PCB</b> </div> <div data-bbox="1258 840 1404 976"> </div>	
<div data-bbox="159 1029 232 1056">T93XB</div> <div data-bbox="370 1039 576 1228"> </div> <div data-bbox="673 1029 933 1228"> </div> <div data-bbox="1015 1039 1153 1218"> </div> <div data-bbox="1218 1029 1437 1081"> <b>Terminal Spacing on a 2.54 PCB</b> </div> <div data-bbox="1258 1060 1404 1197"> </div>	
<div data-bbox="159 1249 232 1276">T93YA</div> <div data-bbox="370 1270 576 1428"> </div> <div data-bbox="673 1270 933 1428"> </div> <div data-bbox="1015 1270 1153 1438"> </div> <div data-bbox="1218 1249 1437 1302"> <b>Terminal Spacing on a 2.54 PCB</b> </div> <div data-bbox="1258 1281 1404 1417"> </div>	
<div data-bbox="159 1459 232 1486">T93YB</div> <div data-bbox="370 1459 576 1648"> </div> <div data-bbox="673 1459 933 1648"> </div> <div data-bbox="1015 1459 1153 1638"> </div> <div data-bbox="1218 1459 1437 1512"> <b>Terminal Spacing on a 2.54 PCB</b> </div> <div data-bbox="1258 1491 1404 1627"> </div>	
<div data-bbox="159 1669 215 1696">T93Z</div> <div data-bbox="370 1669 576 1858"> </div> <div data-bbox="673 1669 933 1858"> </div> <div data-bbox="1218 1669 1437 1722"> <b>Terminal Spacing on a 2.54 PCB</b> </div> <div data-bbox="1258 1701 1404 1837"> </div>	

## 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 % R <sub>n</sub> 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 +125 °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
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CURRENT THROUGH WIPER	
$\Omega$	W	V	mA	ppm/°C
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	
		$\Delta R_T/R_T$ (%)	$\Delta R_{1-2}/R_{1-2}$ (%)
Load life	1000 h 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 <sub>RMS</sub> Insulation resistance: > 10 <sup>4</sup> MΩ	± 1 %
Rapid temperature change	5 cycles -55 °C to +125 °C	± 0.5 %	$\Delta V_{1-2}/V_{1-3} \leq \pm 1 \%$
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 %	$\Delta V_{1-2}/V_{1-3} \leq \pm 0.2 \%$
Rotational life	200 cycles	± 4 % Contact res. variation: < 1 % Rn	-

## Note

- Nothing stated herein shall be construed as a guarantee of quality or durability

## MARKING

- Vishay trademark
- Model
- Style
- Ohmic value (in  $\Omega$ , k $\Omega$ , M $\Omega$ )
- Tolerance (in %)
- Manufacturing date
- Marking of terminal 3



## PACKAGING

- In tube of 50 pieces code T20 (TU50)

## 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 $\Omega$ to 2.2 M $\Omega$ 224 = 220 k $\Omega$			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

## RELATED DOCUMENTS

### APPLICATION NOTES

Potentiometers and Trimmers	<a href="http://www.vishay.com/doc?51001">www.vishay.com/doc?51001</a>
Guidelines for Vishay Sfernice Resistive and Inductive Components	<a href="http://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a>



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