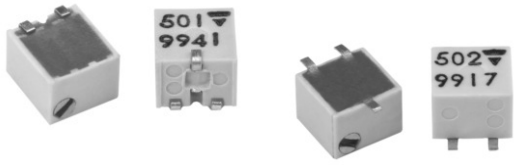
Surface Mount Miniature Trimmers
Multi-Turn Cermet Sealed



The TSM4 trimming potentiometer has been designed for surface mount applications and offers volumetric efficiency 5 x 5 x 3.7 mm^3 with high performance and stability.

The TSM4 design is suitable for both manual or automatic operation, and can withstand vapor phase and reflow soldering techniques.

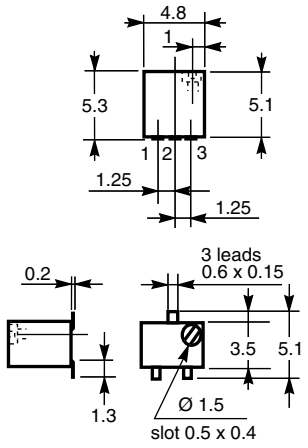
FEATURES

- 0.25 W at 85 °C
- Professional grade
- Test according to CECC 41 000
- Wide ohmic range (10 Ω to 1 MΩ)
- Low contact resistance variation (2 % or 3 Ω)
- Small size for optimum packing density
- Suitable for both manual or automatic operation

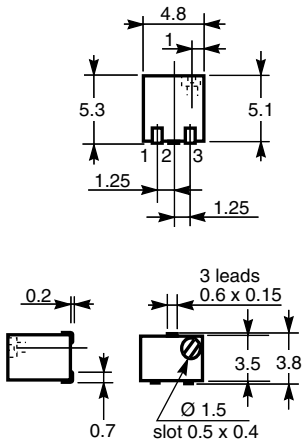
RoHS COMPLIANT

DIMENSIONS in millimeters

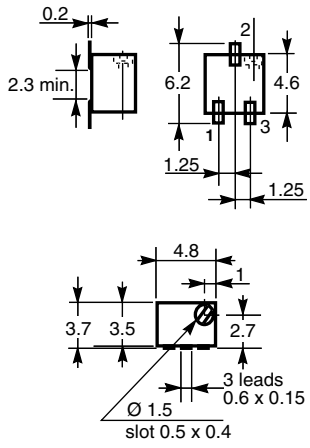
TSM4 YL



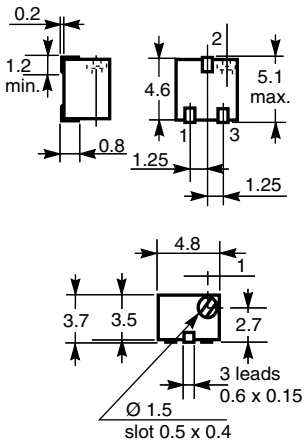
TSM4 YJ



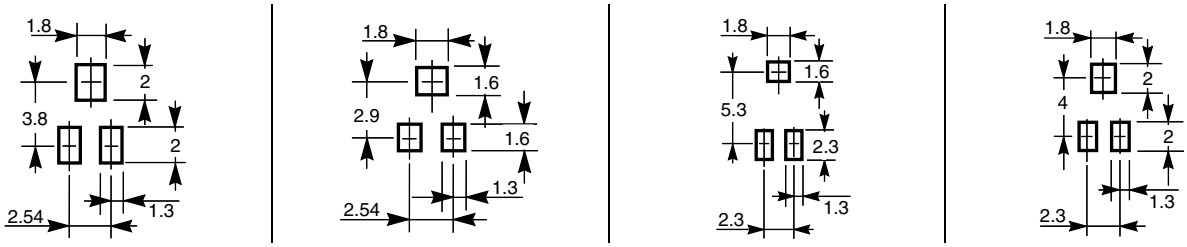
TSM4 ZL



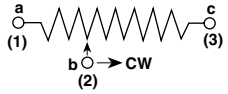
TSM4 ZJ



RECOMMENDED SOLDERING AREAS



CIRCUIT DIAGRAM



Tolerances unless otherwise specified ± 0.5

ELECTRICAL SPECIFICATIONS		
Resistive Element		Cermet
Electrical Travel		11 turns ± 2
Resistance Range		10 Ω to 1 MΩ
Standard Series		1 - 2 - 5
Tolerance Standard		± 10 %
Power Rating	**Linear**	0.25 W at + 85 °C
	Logarithmic	Not applicable
Temperature Coefficient		See Standard Resistance Element Table
Limiting Element Voltage (Linear Law)		200 V
Contact Resistance Variation (Typical)		2 % or 3 Ω
End Resistance (Typical)		1 Ω
Dielectric Strength (RMS)		600 V
Insulation Resistance		10^6 MΩ

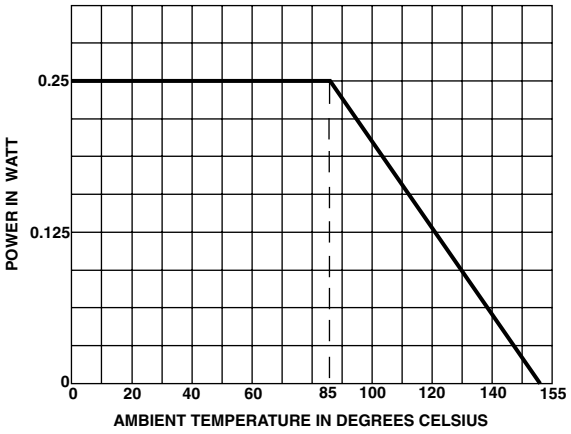
MECHANICAL SPECIFICATIONS

Mechanical Travel	13 turns ± 2
Operating Torque (max. Ncm)	1
End Stop Torque (Ncm)	clutch action (2 turns max)
Unit Weight (max. g)	0.15
Wiper (actual travel)	positioned at approx. 50 %

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55 °C to + 125 °C
Climatic Category	55/125/56
Sealing	sealed container solder immersion IP67
MSL Level	1

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 temperature + 85 °C	± 2 %	± 3 % Contact resistance variation: Δ > 1 % Rn
Moisture Resistance	MIL STD 202 Method 106 10 cycles of 24 hours constituted with damp heat - cold - vibrations	± 2 %	± 3 % Dielectric strength: 1000 V RMS Insulation resistance: > 10^4 MΩ
Long Term Damp Heat	Temperature 40 °C - RH 93 % 56 days	± 2 %	± 3 % Dielectric strength: 1000 V_{RMS} Insulation resistance: > 10^4 MΩ
Thermal Shock	- 55 °C to + 125 °C - 5 cycles	± 1 %	$\frac{\Delta V_{1-2}}{V_{1-3}}$ ≤ ± 2 %
Rotational Life (Electrical and Mechanical)	100 cycles - rated power	± (3 % + 3 Ω)	
Shock	MIL STD 202 Method 213/1 100 g - 6 ms 3 successive shocks in 3 directions	± 1 %	$\frac{\Delta V_{1-2}}{V_{1-3}}$ ≤ ± 1 %
Vibration	MIL STD 202 Method 204/D 20 g - 12 hours	± 1 %	$\frac{\Delta V_{1-2}}{V_{1-3}}$ ≤ ± 1 %

STANDARD RESISTANCE ELEMENT DATA				
STANDARD RESISTANCE VALUES	LINEAR LAW			TYPICAL TCR - 55 °C + 125 °C
	MAX. POWER AT 85 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH ELEMENT	
Ω	W	V	mA	ppm/°C
10	0.25	1.58	158	
20		2.23	112	
50		3.53	77	
100		5.00	50	
200		7.07	35	
500		11.2	22	
1K		15.8	15.8	
2K		22.3	11.2	
5K		35.3	7.1	± 100
10K		50.0	5.0	
20K		70.7	3.5	
50K		112	2.2	
100K		158	1.6	
200K	0.25	200	1.0	
500K	0.08	200	0.4	
1M	0.04	200	0.2	

MARKING

VISHAY trademark, ohmic value, manufacturing date.

The ohmic value is indicated by a 3 figure code, the first two digits are significant figures, the third one is the multiplier.

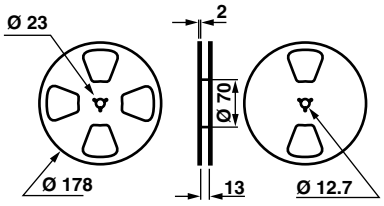
Example: 100 = 10 Ω
101 = 100 Ω
102 = 1000 Ω
503 = 50 000 Ω

SOLDERING RECOMMENDATIONS

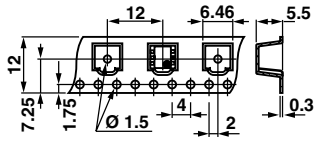
see Application notes

PACKAGING

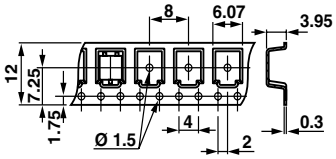
On tape and reel, by 500 pieces for Z version: code TR500, or 250 pieces for Y version: code TR250.
In bulk on request (plastic box of 50 pieces): code BO50.



Version Y



Version Z



ORDERING INFORMATION

TSM4	YL	500 kΩ	± 10 %	TR250	e3
SERIES	STYLE	OHMIC VALUE	TOLERANCE	PACKAGING	LEAD FINISH
				Version Z: code TR500 Version Y: code TR250 On request: BO50	e3: pure Sn

SAP PART NUMBERING GUIDELINES

T	S	M	4	Y	L	5	0	4	K	R	0	5			
MODEL				STYLE		OHMIC VALUE			TOL.	PACKAGING CODE			SPECIAL (IF APPLICABLE)		

See the end of this data book for conversion tables

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