5 mm Square Surface Mount Miniature Trimmers Single-Turn Cermet Sealed

FEATURES

- 0.25 W at 70 °C
- For through hole version see T53Y series
- Wide ohmic range (10 Ω to 1 MΩ)
- Small size for optimum packaging density
- Tests according to CECC 41000 or IEC 60393-1
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

LINKS TO ADDITIONAL RESOURCES

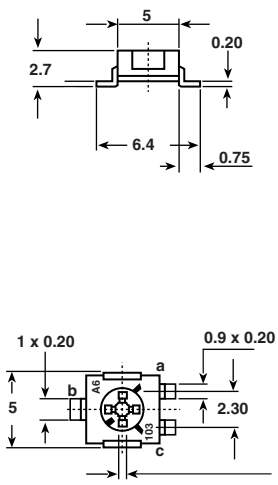
3D Models

The TS53 trimming potentiometer has been designed for surface mount applications and offers volumetric efficiency (5 mm x 5 mm x 2.7 mm) with high performance and stability.

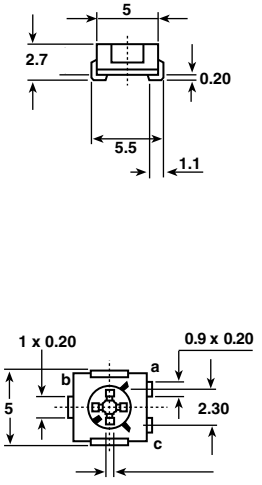
The TS53 design is suitable for both manual or automatic operation, and can withstand wave, and reflow soldering techniques.

DIMENSIONS in millimeters (± 0.25 mm)

TS53YL



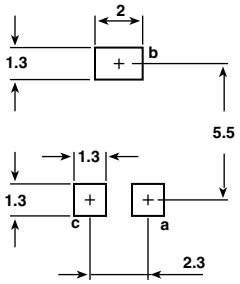
TS53YJ



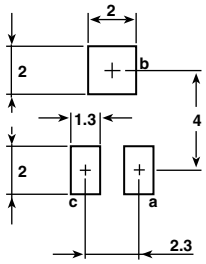
Cruciform screwdriver slot
Ø 2.5, width 0.5
Deep: 0.55
Max. deep (center): 0.7

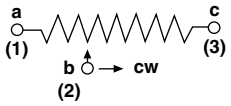
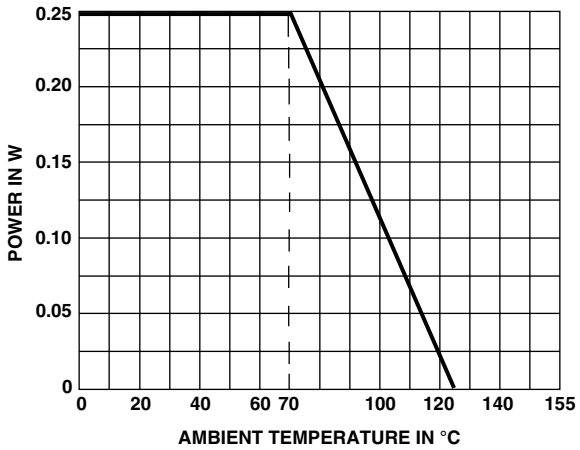
RECOMMENDED SOLDERING AREAS

TS53YL



TS53YJ



ELECTRICAL SPECIFICATIONS	
Resistive element	Cermet
Electrical travel	220° ± 15°
Resistance range	10 Ω to 1 MΩ
Standard series	1 - 2 - 5
Tolerance standard	± 20 %
Circuit diagram	
Power rating linear	0.25 W at + 70 °C 
Temperature coefficient	See Standard Resistance Element Data table
Limiting element voltage (linear law)	200 V
Contact resistance variation (typical)	1 % or 3 Ω
End resistance (typical)	0.1 % or 3 Ω
Dielectric strength (RMS)	1000 V
Insulation resistance	1 GΩ

MECHANICAL SPECIFICATIONS	
Mechanical travel	270 ° ± 10°
Operating torque (max. Ncm)	1.5
End stop torque (max. Ncm)	3.5
Unit weight (max. g)	0.15
Terminals	Pure Sn (e3)

ENVIRONMENTAL SPECIFICATIONS	
Temperature range	-55 °C to +125 °C
Climatic category	55 / 125 / 56
Sealing	Sealed container IP67
MSL level	4

SOLDERING RECOMMENDATIONS

Recommended reflow profile 2, see Application Note www.vishay.com/doc?52029

Caution
Reflow soldering must be done within 72 h while stored under a max. temperature of 30 °C, 60 % RH after opening the dry pack envelope.

RECOMMENDED METHOD OF STORAGE

Dry box storage is recommended as soon as the hermetic bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 72 h under these conditions, moisture content will be too high for reflow soldering.
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

192 h at 40 °C + 5 °C/- 0 °C and < 5 % RH (dry air/nitrogen) or
96 h at 60 °C + 5 °C and < 5 % RH for all device containers (not suitable for reel) or
24 h at 125 °C + 5 °C (not suitable for reel)

PERFORMANCES

TESTS	CONDITIONS	TYPICAL VALUES AND DRIFTS		
		$\Delta R_T/R_T$ (%)	$\Delta R_{1\text{-}2}/R_{1\text{-}2}$ (%)	OTHER
Electrical endurance	1000 h at rated power 90'/30' - ambient temp. 70 °C	± 2 %	± 3 %	Contact resistance variation: ΔR < 1 % Rn
Climatic sequence	Phase A dry heat 125 °C Phase B damp heat Phase C cold -55 °C Phase D damp heat 5 cycles	± 2 %	± 3 %	
Damp heat steady state	Temperature 40 °C - RH 93 % 56 days	± 2 %	± 3 %	Dielectric strength: 1000 V_{RMS} Insulation resistance: > 10^4 MΩ
Charge of temperature	-55 °C to +125 °C - 5 cycles	± 1 %		$\Delta V_{1\text{-}2}/V_{1\text{-}3} \leq \pm 2$ %
Mechanical endurance	100 cycles - rated power	± (3 % + 5 Ω)		
Shock	50 *g* - 11 ms 3 successive shocks in 3 directions	± 1 %		$\Delta V_{1\text{-}2}/V_{1\text{-}3} \leq \pm 1$ %
Vibration	10 Hz to 55 Hz 0.75 mm or 10 *g* - 6 h	± 1 %		$\Delta V_{1\text{-}2}/V_{1\text{-}3} \leq \pm 1$ %

Note

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

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 ELEMENT	
Ω	W	V	mA	ppm/°C
10	0.25	1.58	158	± 100
20	0.25	2.24	112	
50	0.25	3.54	71	
100	0.25	5.00	50	
200	0.25	7.07	35	
500	0.25	11.2	22	
1K	0.25	15.8	16	
2K	0.25	22.4	11	
5K	0.25	35.4	7	
10K	0.25	50.0	5	
20K	0.25	70.7	3.5	
50K	0.25	112	2.2	
100K	0.25	158	1.6	
200K	0.20	200	1.0	
500K	0.08	200	0.4	
1M	0.04	200	0.2	

MARKING

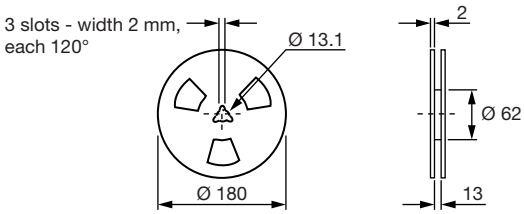
Vishay trademark, ohmic value, manufacturing date

The ohmic value is indicated by a 3 figure code, the first two are significant figures, the third one is the multiplier.
Example: 100 = 10 Ω
101 = 100 Ω
102 = 1000 Ω
503 = 50 000 Ω

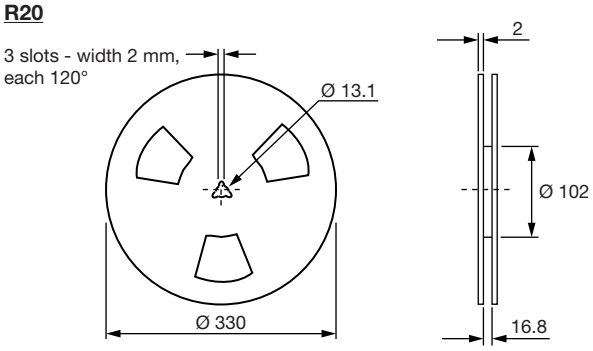
PACKAGING

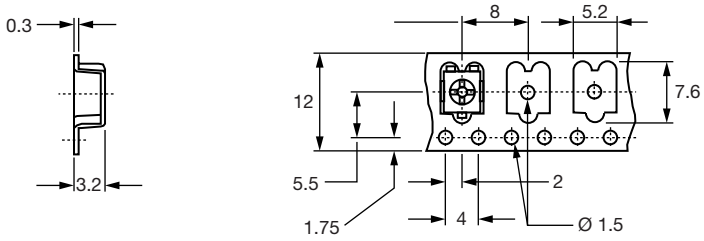
On tape and reel of 500 pieces, code R10 (TR500) and 2000 pieces, code R20 (TR2000)

R10



R20





Cover tape panel strength specifications EIA 481 A and CEI 60286-3.

DRYPACK
Devices are packed in moisture barrier bags to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

ORDERING INFORMATION (part number)

T	S	5	3	Y	L	5	0	4	M	R	1	0				

MODEL	STYLE	OHMIC VALUE	TOLERANCE	PACKAGING	SPECIAL NUMBER
TS53	**YL** **YJ**	From 10 Ω to 1 MΩ **504** = 500 kΩ	**M** = 20 %	**R10** = reel 500 pieces On request **R20** = reel 2000 pieces	(If applicable) Given by Vishay for custom design

DESCRIPTION (for information only)

TS53	YL	500K	20 %		TR	e3
MODEL	STYLE	VALUE	TOLERANCE	SPECIAL	PACKAGING	LEAD (Pb)-FREE

RELATED DOCUMENTS

APPLICATION NOTES	
Potentiometers and Trimmers	www.vishay.com/doc?51001
Guidelines for Vishay Sfernice Resistive and Inductive Components	www.vishay.com/doc?52029

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