

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



#### **LINKS TO ADDITIONAL RESOURCES**

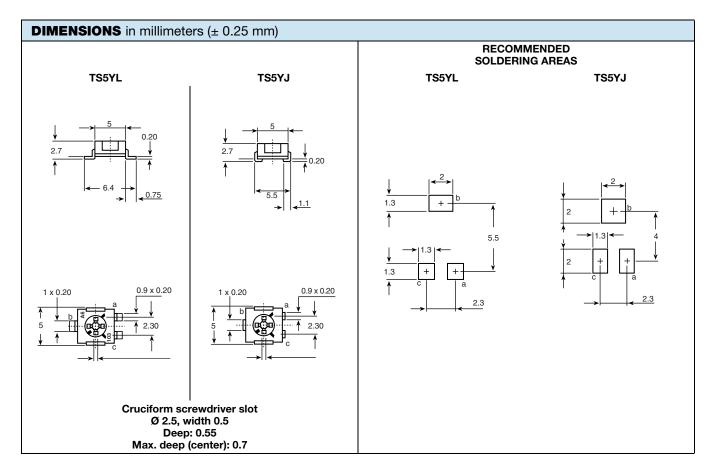


The TS5 trimming potentiometer has been designed for surface mount applications and offers volumetric efficiency (5 mm  $\times$  5 mm  $\times$  2.7 mm) with high performance and stability.

The TS5 design is suitable for both manual or automatic operation, and can withstand wave and reflow soldering techniques.

#### **FEATURES**

- 0.25 W at 70 °C
- Professional grade
- Wide ohmic range (10  $\Omega$  to 1 M $\Omega$ )
- Full sealing
- Low contact resistance variation (1 % or 3  $\Omega$ )
- Small size for optimum packaging density
- Tests according to CECC 41000 or IEC 60393-1
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>





ELECTRICAL SPECIFICATIONS			
Resistive element	Cermet		
Electrical travel	220° ± 15°		
Resistance range	10 Ω to 1 MΩ		
Standard series	1 - 2 - 5		
Tolerance standard	± 10 %		
	CIRCUIT DIAGRAM		
Variation law Linear	$ \begin{array}{c} a \\ \bigcirc \longrightarrow \bigvee \bigvee \bigvee \bigvee \bigcirc \bigcirc \\ (1) \\ b \stackrel{\wedge}{\bigcirc} \longrightarrow cw $ (2)		
Power rating	0.25 W at 70 °C  0.25  0.20  0.15  0.00  0		
Temperature coefficient	See Standard Resistance Element Data table		
Limiting element voltage (linear law)	200 V		
Contact resistance variation	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	
Net 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 <a href="https://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a>

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  $^{\circ}$ C + 5  $^{\circ}$ C and < 5  $^{\circ}$ 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			
		$\Delta R_{T}/R_{T}$ (%)	$\Delta R_{1-2}/R_{1-2}$ (%)	OTHER	
Electrical endurance	1000 h at rated power 90'/30' - ambient temp. +70 °C	± 2 %	± 3 %	Contact res. variation: $\Delta R < 1$ % 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: > $10^4 \ M\Omega$	
Charge of temperature	-55 °C to +125 °C 5 cycles	± 1 %		$\Delta V_{1-2}/\Delta V_{1-3} \le \pm 2 \%$	
Mechanical endurance	100 cycles - rated power	± (3 % + 5 Ω)			
Shock	50 g at 11 ms 3 successive shocks in 3 directions	± 1 %		$\Delta V_{1-2}/\Delta V_{1-3} \le \pm 1 \%$	
Vibration	10 Hz to 55 Hz 0.75 mm or 10 <i>g</i> during 6 h	± 1 %		$\Delta V_{1-2}/\Delta V_{1-3} \le \pm 1 \%$	

#### Note

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

STANDARD RESISTANCE ELEMENT DATA				
STANDARD		LINEAR LAW		
RESISTANCE VALUES	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CURRENT THROUGH ELEMENT	TCR -55 °C +125 °C
Ω	W	V	mA	ppm/°C
10	0.25	1.58	158	
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	± 100
5K	0.25	35.4	7	± 100
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

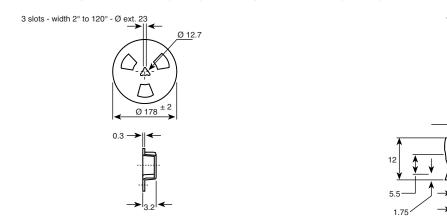
The ohmic value is indicated by a 3 figure code, the first two are significant figures, the third one is the multiplier.

Example:  $100 = 10 \Omega$ 

 $101 = 100 \Omega$   $102 = 1000 \Omega$  $503 = 50 000 \Omega$ 

# **PACKAGING** in millimeters On tape and reel of 500 pieces, coo

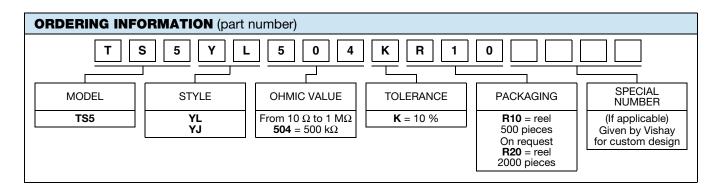
On tape and reel of 500 pieces, code R10 (TR500) and 2000 pieces, code R20 (TR2000)

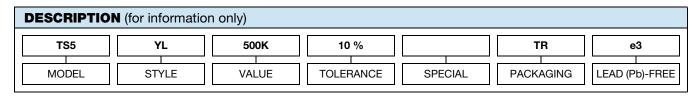


Cover tape panel strength specifications EIA 481 A and CEI 60286-3.

#### DRYPACK

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





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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