

## Multi-Turn Surface Mount 1/4" Square Cermet Trimmers, Fully Sealed



### FEATURES

- 0.25 W at 70 °C
- Industrial grade
- Multi-turn operation
- A low contact resistance variation (down to 2 % Rn)
- Low end contact resistance (1 Ω typical)
- Full sealing
- Tests according to CECC 41000 or IEC 60393-1
- Compliant to RoHS Directive 2002/95/EC



The TS63 multiturn trimmer has been designed for use in PCB surface mounting applications.

Three variations are available according to the positioning of the control screw and contact positions.

The cermet track gives a high stability performance with an extended ohmic capacity of 10 Ω to 2 MΩ.

| DIMENSIONS in millimeters (± 0.5 mm) |   |
|--------------------------------------|---|
| <p><b>TS63X</b></p>                  | <p><b>RECOMMENDED SOLDERING AREAS</b></p> |
| <p><b>TS63Z</b></p>                  |   |
| <p><b>TS63Y</b></p>                  |   |

| <b>ELECTRICAL SPECIFICATIONS</b>       |  |            |
|--|--|------------|
| Resistive Element                      | Cermet                                     |            |
| Electrical Travel                      | 14 turns $\pm$ 2                           |            |
| Resistance Range                       | 10 $\Omega$ to 2 M $\Omega$                |            |
| Standard Series                        | 1 - 2 - 5                                  |            |
| Tolerance                              | Standard                                   | $\pm$ 10 % |
|  | On Request                                 | $\pm$ 5 %  |
| Circuit Diagram                        |  |            |
| Power Rating                           | Linear<br>0.25 W at 70 °C<br>              |            |
| Temperature Coefficient                | See Standard Resistance Element Data table |            |
| Limiting Element Voltage               | 250 V                                      |            |
| Contact Resistance Variation (Typical) | 2 % R <sub>n</sub> or 2 $\Omega$           |            |
| End Resistance Typical)                | 1 $\Omega$                                 |            |
| Dielectric Strength (RMS)              | 1000 V                                     |            |
| Insulation Resistance                  | 10 <sup>6</sup> M $\Omega$                 |            |

| <b>MECHANICAL SPECIFICATIONS</b> |                            |
|----------------------------------|----------------------------|
| Mechanical Travel                | 15 turns $\pm$ 5           |
| Operating Torque (max. Ncm)      | 1.5                        |
| End Stop Torque                  | Clutch action              |
| Unit Weight (max. g)             | 0.5                        |
| Wiper (Actual Travel)            | Positioned at approx. 50 % |

| <b>ENVIRONMENTAL SPECIFICATIONS</b> |                          |
|-------------------------------------|--------------------------|
| Temperature Range                   | - 55 °C to + 155 °C      |
| Climatic Category                   | 55/125/56                |
| Sealing                             | Sealed container<br>IP67 |
| MSL Level                           | 1                        |

| <b>SOLDERING RECOMMENDATIONS</b>  |  |
|---|--|
| Recommended reflow profile 2, see Application Note <a href="http://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a> |  |



| <b>PERFORMANCES</b>    |  |                           |                              |   |
|------------------------|--|---------------------------|------------------------------|---|
| 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<br>90'/30' - ambient temp. 70 °C   | ± 1 %                     | ± 2 %                        | Contact res. variation: < 1 % Rn  |
| Climatic Sequence      | Phase A dry heat 125 °C<br>Phase B damp heat<br>Phase C cold - 55 °C<br>Phase D damp heat 5 cycles | ± 2 %                     | ± 3 %                        |   |
| Damp Heat Steady State | 40 °C 93 % RH<br>56 days   | ± 2 %                     | ± 3 %                        | Dielectric strength: 1000 V <sub>RMS</sub><br>Insulation resistance: > 10 <sup>4</sup> MΩ |
| Charge of Temperature  | - 55 °C to + 125 °C<br>5 cycles  | ± 1 %                     |                              | $\Delta V_{1-2}/\Delta V_{1-3} \leq \pm 2 \%$   |
| Mechanical Endurance   | 200 cycles at rated power  | ± (2 % + 3 Ω)             |                              | Contact res. variation: < 3 % Rn  |
| Shock                  | 50 g's at 11 ms<br>3 successive shocks in 3 directions   | ± 1 %                     |                              | $\Delta V_{1-2}/\Delta V_{1-3} \leq 1 \%$   |
| Vibration              | 10 Hz to 55 Hz<br>0.75 mm or 10 g's<br>for 6 h   | ± 1 %                     |                              | $\Delta V_{1-2}/\Delta V_{1-3} \leq \pm 2 \%$   |

| <b>STANDARD RESISTANCE ELEMENT DATA</b> |                     |                      |                            |  |
|---|---------------------|----------------------|----------------------------|--|
| STANDARD RESISTANCE VALUES              | LINEAR LAW          |                      |                            | TYPICAL TCR<br>- 55 °C<br>+ 125 °C<br><br>ppm/°C |
|   | MAX. POWER AT 70 °C | MAX. WORKING VOLTAGE | MAX. CURRENT THROUGH WIPER |  |
| Ω                                       | W                   | V                    | mA                         |  |
| 10                                      | 0.25                | 1.58                 | 158                        | ± 100  |
| 20                                      | 0.25                | 2.23                 | 112                        |  |
| 50                                      | 0.25                | 3.53                 | 77                         |  |
| 100                                     | 0.25                | 5.00                 | 50                         |  |
| 200                                     | 0.25                | 7.07                 | 35                         |  |
| 500                                     | 0.25                | 11.2                 | 22                         |  |
| 1K                                      | 0.25                | 15.8                 | 15.8                       |  |
| 2K                                      | 0.25                | 22.3                 | 11.2                       |  |
| 5K                                      | 0.25                | 35.3                 | 7.1                        |  |
| 10K                                     | 0.25                | 50.0                 | 5.0                        |  |
| 20K                                     | 0.25                | 70.7                 | 3.5                        |  |
| 25K                                     | 0.25                | 79.0                 | 3.2                        |  |
| 50K                                     | 0.25                | 112                  | 2.2                        |  |
| 100K                                    | 0.25                | 158                  | 1.6                        |  |
| 200K                                    | 0.25                | 224                  | 1.1                        |  |
| 250K                                    | 0.25                | 250                  | 1.1                        |  |
| 500K                                    | 0.13                | 250                  | 0.50                       |  |
| 1M                                      | 0.06                | 250                  | 0.25                       |  |
| 2M                                      | 0.03                | 200                  | 0.125                      |  |

| <b>MARKING</b>   |
|--|
| Printed: VISHAY trademark, model, style, ohmic value (in Ω, kΩ, MΩ), tolerance (in %) only if non standard, manufacturing date, marking of terminal 3. |

**PACKAGING** in millimeters

- X, Y and Z types: on tape and reel (dia. 330 mm) of 500 pieces, code TR500
- On request in magazine pack by 50 pieces (Tube) code TU


**ORDERING INFORMATION** (Part Number)

|   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|
| T | S | 6 | 3 | Y | 5 | 0 | 4 | K | R | 1 | 0 |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|

| MODEL | STYLE       | OHMIC VALUE                          | TOLERANCE                             | PACKAGING   | SPECIAL NUMBER  |
|-------|-------------|--------------------------------------|---------------------------------------|---|---|
| TS63  | X<br>Y<br>Z | From<br>10 Ω to 2 MΩ<br>504 = 500 kΩ | K = ± 10 %<br>On request<br>J = ± 5 % | R10 =<br>Reel 500 pieces<br>On request<br>T20 =<br>Tube 2000 pieces | (If applicable)<br>Given by<br>Vishay<br>for custom<br>design |

**DESCRIPTION** (for information only)

|       |       |       |           |         |           |             |
|-------|-------|-------|-----------|---------|-----------|-------------|
| TS63  | Y     | 500K  | 10 %      |         | TR        | e3          |
| MODEL | STYLE | VALUE | TOLERANCE | SPECIAL | PACKAGING | LEAD FINISH |



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**