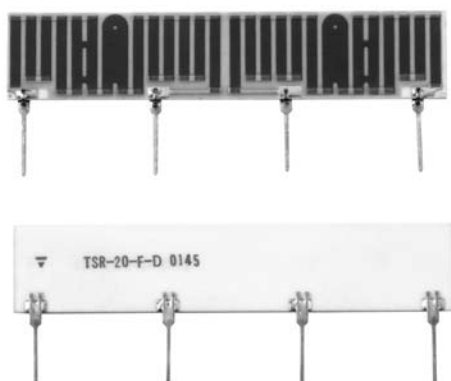


# Thick Film Surge Resistor Networks, Single-In-Line



The TSR surge resistor from Vishay Techno is used to protect sensitive components and circuits from the surges introduced by lightning strikes and power cross conditions.

The proprietary thick film technology used in the TSR can dissipate a large amount of energy during a short transient condition. These networks are designed to meet the applicable requirement of Bellcore GR-1089 and ITU-T K.20. The TSR is available in large quantities with a short lead-time.

## FEATURES

- Secondary protection for telecon line cards
- Lightning protection to Bellcore GR-1089 and ITU-T K.20
- Optional version with thermal fuse
- Custom designs available
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
Available  
**HALOGEN FREE**

## Note

\* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

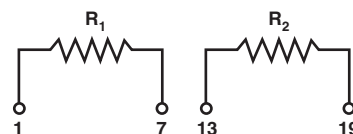
## LIGHTNING SURGE TESTS

**Bellcore Spec. GR-1089:** 10 x 1000  $\mu$ s 1 kV, 2 x 10  $\mu$ s 2.5 kV

**ITU-T K.20:** 10 x 700  $\mu$ s 2 kV

**Power Cross Test:** Per Bellcore spec.

## SCHEMATICS



## STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	POWER RATING ELEMENT $P_{25^{\circ}\text{C}}$ W	STANDARD RESISTANCE VALUES <sup>(1)</sup> $\Omega$ [ $R_1 = R_2$ ]	TOLERANCE <sup>(2)</sup> $\pm$ %	RATIO TOLERANCE <sup>(2)</sup> $\pm$ %	TEMPERATURE COEFFICIENT <sup>(2)</sup> (-55 $^{\circ}$ C to +125 $^{\circ}$ C) $\pm$ ppm/ $^{\circ}$ C	PULSE
TSR	2	24, 50, 100, 200	0.5	0.5	100	31 kW to 312 kW (value dependent)

## Notes

- (1) Other values available on special order  
(2) Contact factory for tighter specifications

## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: **TSR100RDDR** (preferred part number format)

<b>T</b>	<b>S</b>	<b>R</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>R</b>	<b>D</b>	<b>D</b>	<b>R</b>	<b>B</b>
GLOBAL MODEL	RESISTANCE VALUE		TOLERANCE		RATIO TOLERANCE		TERMINAL FINISH		PACKAGING	
TSR	R = $\Omega$ 20R0 = 20 $\Omega$ 100R = 100 $\Omega$		C = $\pm$ 0.25 % D = $\pm$ 0.5 % F = $\pm$ 1 %		C = $\pm$ 0.25 % D = $\pm$ 0.5 % F = $\pm$ 1 %		R = Sn60/Pb40 C = Sn95.5/Ag3.9/Cu0.6		B = Bulk S = Strip	

Historical Part Numbering: **TSR100DD** (will continue to be accepted)

<b>TSR</b>	<b>100</b>	<b>D</b>	<b>D</b>	
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE	RATIO TOLERANCE	TERMINAL FINISH

## ENVIRONMENTAL SPECIFICATIONS (typical)

Tests per MIL-STD-202

**Resistance to Solvents:** No marking deterioration

**Resistance to Solder Heat:**  $\pm 0.5\%$  or  $0.5\ \Omega$  whichever is greater

**Solderability:**  $> 95\%$  coverage


**Insulation Resistance:** 10 M $\Omega$  minimum (isolated pins)

**Bias Humidity Test:** 50 V, 85 % relative humidity, 85 °C

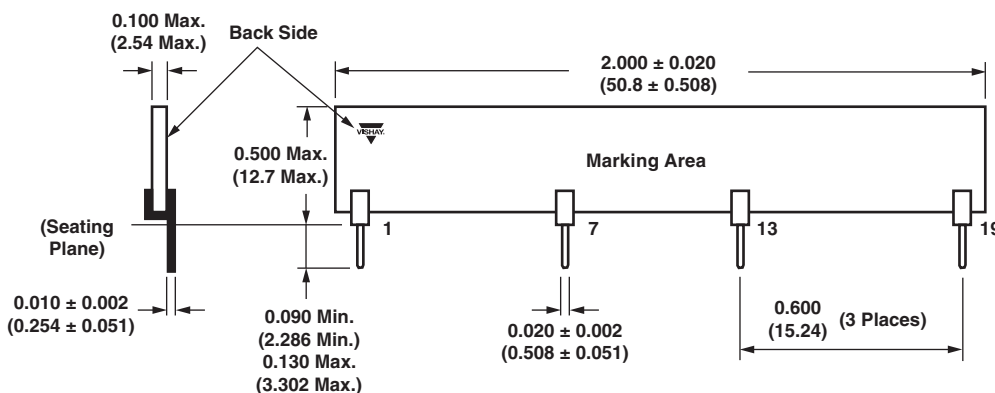
## MECHANICAL SPECIFICATIONS

Type	Ceramic SIP
Thick Film Element	96 % alumina
Terminals	Tinned copper alloy

## MARKING

- Complete part number
- Manufacturer's name/code
- Date code
-  Pin #1 identifier

## DIMENSIONS in inches (millimeters)





## 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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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.