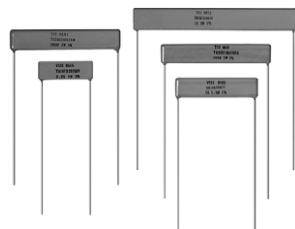


# Thick Film Planar Resistors, Through-Hole, High Voltage



## APPLICATIONS

Applications include power supplies, transformers and any application requiring operation within an environment where high voltages are used.

## FEATURES

- 30 000 V capability
- Very low voltage coefficient to less than 1 ppm/V
- Outstanding stability under adverse conditions
- Stable cermet resistive element bonded to a high-purity alumina substrate
- Tough epoxy-based coating and high voltage stability
- Dividers available, see Vishay Techno's TD datasheet ([www.vishay.com/doc?68042](http://www.vishay.com/doc?68042))
- 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.

STANDARD ELECTRICAL SPECIFICATIONS					
GLOBAL MODEL / SIZE	POWER RATING <i>P</i> <sub>25 °C</sub> W	MAXIMUM WORKING VOLTAGE <sup>(1)</sup> V	RESISTANCE RANGE <sup>(2)</sup> Ω	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± ppm/°C
TR03C	0.25	0.8K	300 to 3M	1, 2, 5, 10, 20	100
			300 to 25M	1, 2, 5, 10, 20	200, 300
TR03X		2.5K	25M to 250M	1, 2, 5, 10, 20	200, 300
			260M to 2G	5, 10, 20	200, 300
			2.1G to 10G	5, 10, 20	500
TR05D	0.5	4K	500 to 25M	1, 2, 5, 10, 20	100
			3K to 200M	1, 2, 5, 10, 20	200, 300
TR05X		5K	30M to 1G	1, 2, 5, 10, 20	200, 300
			1.1G to 20G	5, 10, 20	200, 300
			21G to 100G	5, 10, 20	500
TR10F	1	6.5K	1K to 16M	1, 2, 5, 10, 20	100
			2K to 120M	1, 2, 5, 10, 20	200, 300
TR10X		10K	20M to 1G	1, 2, 5, 10, 20	200, 300
			1.1G to 15G	5, 10, 20	200, 300
			16G to 1T	5, 10, 20	500
TR15G	1.5	12.5K	1.5K to 45M	1, 2, 5, 10, 20	100
			5K to 340M	1, 2, 5, 10, 20	200, 300
TR15X		15K	60M to 1G	1, 2, 5, 10, 20	200, 300
			1.1G to 35G	5, 10, 20	200, 300
			36G to 1.5T	5, 10, 20	500
TR20H	2	17.5K	2K to 64M	1, 2, 5, 10, 20	100
			8K to 480M	1, 2, 5, 10, 20	200, 300
TR20X		20K	80M to 1G	1, 2, 5, 10, 20	200, 300
			1.1G to 50G	5, 10, 20	200, 300
			51G to 2T	5, 10, 20	500
TR30J	3	25K	3K to 82M	1, 2, 5, 10, 20	100
			8.5K to 620M	1, 2, 5, 10, 20	200, 300
TR30X		30K	80M to 1G	1, 2, 5, 10, 20	200, 300
			1.1G to 60G	5, 10, 20	200, 300
			61G to 3T	5, 10, 20	500

## Notes

- Custom sizes available
  - Voltage coefficient: typically less than 1 ppm/V (tested per MIL-STD-202)
- (1) Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less.
- (2) All resistance values are calibrated at 100 V<sub>DC</sub>. Calibration at other voltages available upon request.

## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: TR20H1K00FKEB (preferred part number format)

T	R	2	0	H	1	K	0	0	F	K	E	B
GLOBAL MODEL TR	SIZE / POWER / VOLTAGE RATING			RESISTANCE VALUE			TOLERANCE		TCR	TERMINAL FINISH		PACKAGING
	<b>03C</b> = 0.25 W, med. voltage <b>03X</b> = 0.25 W, max. voltage <b>05D</b> = 0.5 W, med. voltage <b>05X</b> = 0.5 W, max. voltage <b>10F</b> = 1 W, med. voltage <b>10X</b> = 1 W, max. voltage <b>15G</b> = 1.5 W, med. voltage <b>15X</b> = 1.5 W, max. voltage <b>20H</b> = 2 W, med. voltage <b>20X</b> = 2 W, max. voltage <b>30J</b> = 3 W, med. voltage <b>30X</b> = 3 W, max. voltage			R = $\Omega$ K = k $\Omega$ M = M $\Omega$ G = G $\Omega$ T = T $\Omega$ <b>400R</b> = 400 $\Omega$ <b>10M0</b> = 10 M $\Omega$ <b>1T00</b> = 1 T $\Omega$			<b>F</b> = $\pm 1.0\%$ <b>G</b> = $\pm 2.0\%$ <b>J</b> = $\pm 5.0\%$ <b>K</b> = $\pm 10.0\%$ <b>M</b> = $\pm 20.0\%$		<b>K</b> = 100 ppm <b>N</b> = 200 ppm <b>M</b> = 300 ppm <b>P</b> = 500 ppm	<b>E</b> = Sn100 <b>R</b> = Sn60/Pb40		<b>B</b> = bag <b>S</b> = strip

Historical Part Numbering: TR20H1001FKE3 (will continue to be accepted)

TR	20H	1001	F	K	e3
HISTORICAL MODEL	SIZE / POWER RATING	RESISTANCE VALUE	TOLERANCE	TCR	TERMINAL FINISH

### Note

- For additional information on packaging, refer to the Through Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544)).

## MECHANICAL SPECIFICATIONS

**Resistive Element:** thick film

**Substrate:** 96 % pure alumina

**Encapsulation:** epoxy base, conformal coating

**Terminals:** solder plated copper leads

**Terminal Strength:** 4.5 pounds pull-test

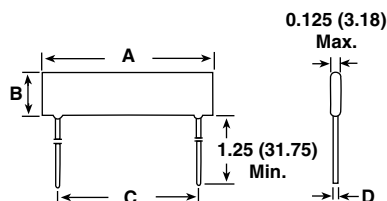
**Power:** derated from ambient temperature +25 °C

## ENVIRONMENTAL SPECIFICATIONS

**Temperature Range:** -55 °C to +125 °C (for higher temperature range, consult factory)

**Load Life:** less than 0.15 %, 1000 h

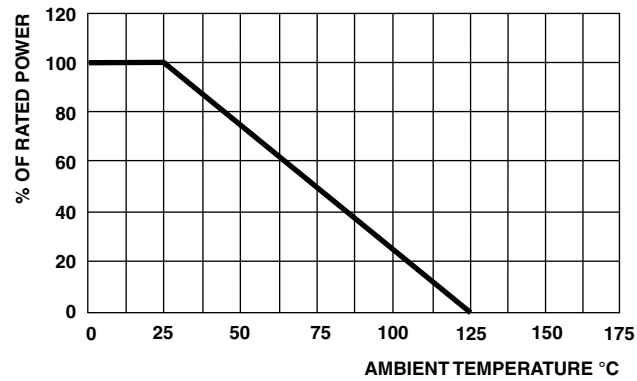
## DIMENSIONS in inches (millimeters)



MODEL	A (LENGTH)	B (HEIGHT)	C (LEAD SPACING)	D (LEAD DIA.)
TR03	0.300 $\pm$ 0.030 (7.62 $\pm$ 0.76)	0.210 $\pm$ 0.021 (5.33 $\pm$ 0.53)	0.200 $\pm$ 0.020 (5.08 $\pm$ 0.51)	0.025 $\pm$ 0.002 (0.64 $\pm$ 0.05)
TR05	0.500 $\pm$ 0.050 (12.70 $\pm$ 1.27)	0.300 $\pm$ 0.030 (7.62 $\pm$ 0.76)	0.400 $\pm$ 0.040 (10.16 $\pm$ 1.02)	0.025 $\pm$ 0.002 (0.64 $\pm$ 0.05)
TR10	1.00 $\pm$ 0.100 (25.40 $\pm$ 2.54)	0.350 $\pm$ 0.035 (8.89 $\pm$ 0.89)	0.900 $\pm$ 0.090 (22.86 $\pm$ 2.29)	0.032 $\pm$ 0.002 (0.81 $\pm$ 0.05)
TR15	1.50 $\pm$ 0.150 (38.10 $\pm$ 3.81)	0.350 $\pm$ 0.035 (8.89 $\pm$ 0.89)	1.40 $\pm$ 0.140 (35.56 $\pm$ 3.56)	0.032 $\pm$ 0.002 (0.81 $\pm$ 0.05)
TR20	2.00 $\pm$ 0.200 (50.80 $\pm$ 5.08)	0.350 $\pm$ 0.035 (8.89 $\pm$ 0.89)	1.90 $\pm$ 0.190 (48.26 $\pm$ 4.83)	0.032 $\pm$ 0.002 (0.81 $\pm$ 0.05)
TR30	3.00 $\pm$ 0.300 (76.20 $\pm$ 7.62)	0.400 $\pm$ 0.040 (10.16 $\pm$ 1.02)	2.90 $\pm$ 0.290 (73.66 $\pm$ 7.37)	0.032 $\pm$ 0.002 (0.81 $\pm$ 0.05)



## DERATING





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