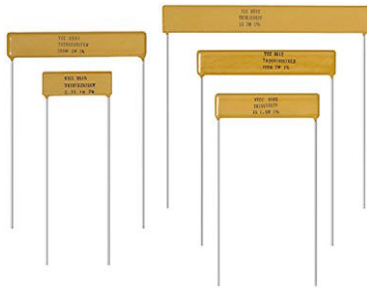


# Thick Film Planar Resistors, Through-Hole, High Voltage



## 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)



## 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 $P_{25^\circ\text{C}}$ W	MAXIMUM WORKING VOLTAGE <sup>(1)</sup> V	RESISTANCE RANGE <sup>(2)</sup> $\Omega$	TOLERANCE $\pm$ %	TEMPERATURE COEFFICIENT $\pm$ ppm/ $^\circ\text{C}$
TR03C	0.25	0.8K	300 to 3M	1, 2, 5, 10, 20	100
TR03X			300 to 25M	1, 2, 5, 10, 20	200, 300
TR05D	0.5	2.5K	25M to 250M	1, 2, 5, 10, 20	200, 300
TR05X			260M to 2G	5, 10, 20	200, 300
			2.1G to 10G	5, 10, 20	500
			500 to 25M	1, 2, 5, 10, 20	100
TR10F	1	4K	3K to 200M	1, 2, 5, 10, 20	200, 300
TR10X			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
			1K to 16M	1, 2, 5, 10, 20	100
			2K to 120M	1, 2, 5, 10, 20	200, 300
TR15G	1.5	6.5K	20M to 1G	1, 2, 5, 10, 20	200, 300
TR15X			1.1G to 15G	5, 10, 20	200, 300
			16G to 1T	5, 10, 20	500
			1.5K to 45M	1, 2, 5, 10, 20	100
TR20H	2	12.5K	5K to 340M	1, 2, 5, 10, 20	200, 300
TR20X			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
			2K to 64M	1, 2, 5, 10, 20	100
			8K to 480M	1, 2, 5, 10, 20	200, 300
TR30J	3	17.5K	80M to 1G	1, 2, 5, 10, 20	200, 300
TR30X			1.1G to 50G	5, 10, 20	200, 300
			51G to 2T	5, 10, 20	500
			3K to 82M	1, 2, 5, 10, 20	100
	3	20K	8.5K to 620M	1, 2, 5, 10, 20	200, 300
			80M to 1G	1, 2, 5, 10, 20	200, 300
			1.1G to 60G	5, 10, 20	200, 300
	3	25K	61G to 3T	5, 10, 20	500

## Notes

- Custom sizes available
- Voltage coefficient: typically less than 1 ppm/V (tested per MIL-STD-202)
- <sup>(1)</sup> Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less
- <sup>(2)</sup> 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	SIZE / POWER / VOLTAGE RATING			RESISTANCE VALUE		TOLERANCE		TCR		TERMINAL FINISH		PACKAGING
TR	03C = 0.25 W, med. voltage 03X = 0.25 W, max. voltage 05D = 0.5 W, med. voltage 05X = 0.5 W, max. voltage 10F = 1 W, med. voltage 10X = 1 W, max. voltage 15G = 1.5 W, med. voltage 15X = 1.5 W, max. voltage 20H = 2 W, med. voltage 20X = 2 W, max. voltage 30J = 3 W, med. voltage 30X = 3 W, max. voltage			R = Ω K = kΩ M = MΩ G = GΩ T = TΩ 400R = 400 Ω 10M0 = 10 MΩ 1T00 = 1 TΩ		F = ± 1.0 % G = ± 2.0 % J = ± 5.0 % K = ± 10.0 % M = ± 20.0 %		K = 100 ppm N = 200 ppm M = 300 ppm P = 500 ppm		E = Sn100 R = Sn60/Pb40		B = bag S = 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							

**Notes**

- For additional information on packaging, refer to the Through Hole Resistor Packaging document ([www.vishay.com/doc?31544](http://www.vishay.com/doc?31544))
- The TCR listed in this datasheet is for resistance values up to 1 GΩ. For resistance values > 1 GΩ, please contact factory

**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

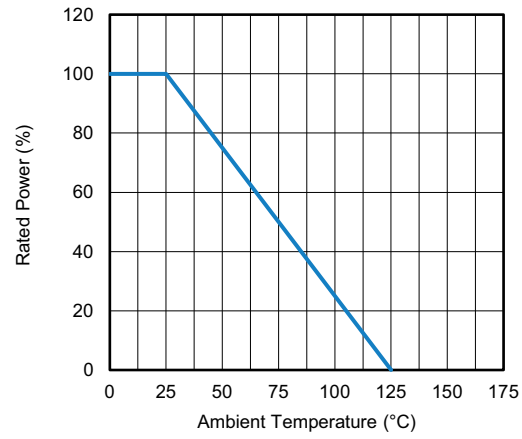
(for higher temperature range, consult factory)

**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 ± 0.030 (7.62 ± 0.76)	0.210 ± 0.021 (5.33 ± 0.53)	0.200 ± 0.020 (5.08 ± 0.51)	0.025 ± 0.002 (0.64 ± 0.05)
TR05	0.500 ± 0.050 (12.70 ± 1.27)	0.300 ± 0.030 (7.62 ± 0.76)	0.400 ± 0.040 (10.16 ± 1.02)	0.025 ± 0.002 (0.64 ± 0.05)
TR10	1.00 ± 0.100 (25.40 ± 2.54)	0.350 ± 0.035 (8.89 ± 0.89)	0.900 ± 0.090 (22.86 ± 2.29)	0.032 ± 0.002 (0.81 ± 0.05)
TR15	1.50 ± 0.150 (38.10 ± 3.81)	0.350 ± 0.035 (8.89 ± 0.89)	1.40 ± 0.140 (35.56 ± 3.56)	0.032 ± 0.002 (0.81 ± 0.05)
TR20	2.00 ± 0.200 (50.80 ± 5.08)	0.350 ± 0.035 (8.89 ± 0.89)	1.90 ± 0.190 (48.26 ± 4.83)	0.032 ± 0.002 (0.81 ± 0.05)
TR30	3.00 ± 0.300 (76.20 ± 7.62)	0.400 ± 0.040 (10.16 ± 1.02)	2.90 ± 0.290 (73.66 ± 7.37)	0.032 ± 0.002 (0.81 ± 0.05)



**DERATING**





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