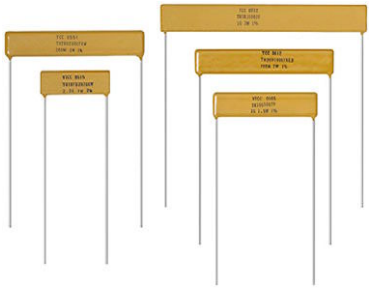
Thick Film Planar Resistors, Through-Hole, High Voltage



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)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

e3

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

APPLICATIONS

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

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL / SIZE	POWER RATING $P_{25\,°C}$ W	MAXIMUM WORKING VOLTAGE (1) V	RESISTANCE RANGE (2) 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_{DC}. Calibration at other voltages available upon request

For technical questions, contact: te1resistors@vishay.com

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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)
- The TCR listed in this datasheet is for resistance values up to 1 GΩ. For resistance values > 1 GΩ, please contact factory

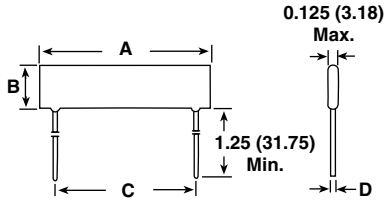
MECHANICAL SPECIFICATIONS

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)

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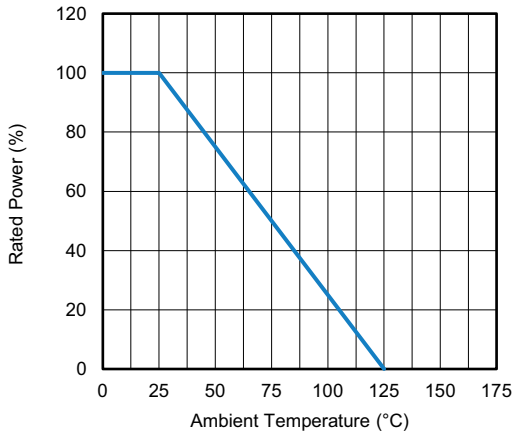
DERATING



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