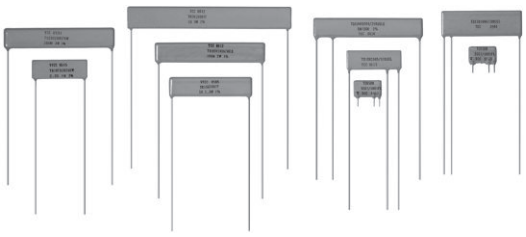
Thick Film Planar Resistors and Dividers, Through-Hole, High Voltage



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
- Designs built from customer supplied schematics
- Dividers available leaded or non-leaded
- Typical resistance ratios of 1000:1, 2000:1, etc.
- TCR tracking to ± 5 ppm/°C depending on values
- TD series dividers available, contact factory
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

e3

RoHS* COMPLIANT

HALOGEN FREE

Note

* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

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	(3)
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	(3)
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	(3)
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	(3)
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	(3)
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	(3)

Notes

- Custom sizes available
- Voltage coefficient: Typically less than 1 ppm/V (tested per MIL-STD-202)
- Ratio tolerance for dividers: 1 % to 20 %
- Ratio TCR for dividers: To ± 5 ppm/°C (ratio over 1000:1, contact factory)

(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.
(3) Contact factory

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 RATING	RESISTANCE VALUE	TOLERANCE	TCR	TERMINAL FINISH	PACKAGING
TR	**03C** = 0.25 W **03X** = 0.25 W, max. voltage **05D** = 0.5 W **05X** = 0.5 W, max. voltage **10F** = 1 W **10X** = 1 W, max. voltage **15G** = 1.5 W **15X** = 1.5 W, max. voltage **20H** = 2 W **20X** = 2 W, max. voltage **30J** = 3 W **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	**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

Note

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

MECHANICAL SPECIFICATIONS

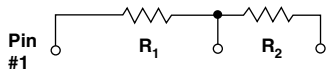
Resistive Element: Thick film
Substrate: 96 % pure alumina
Encapsulation: Epoxy base, conformal coating
Terminals: Tin plated copper leads
Terminal Strength: 4.5 pounds pull-test
Power: Derated from ambient temperature + 25 °C

ENVIRONMENTAL SPECIFICATIONS

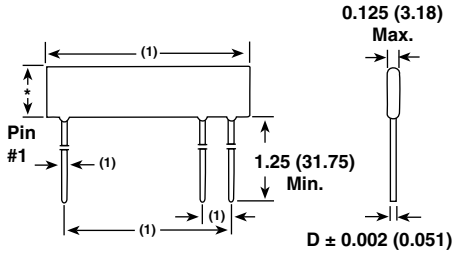
Temperature Range: - 55 °C to + 125 °C (for higher temperature range, consult factory)
Load Life: Less than 0.15 %, 1000 h

DIMENSIONS in inches (millimeters)

Typical Resistor Schematic for Divider

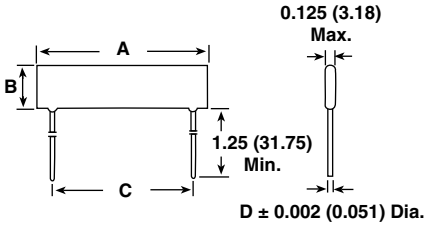


Typical High Voltage Divider



Note
(1) Specified by application

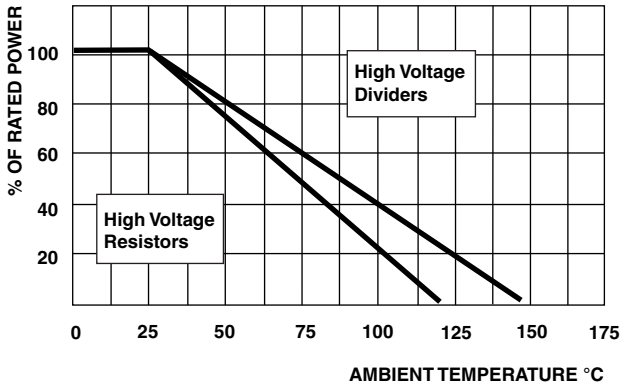
Standard High Voltage Resistor



DIMENSIONS (± 10 %)

MODEL	A (LENGTH)	B (HEIGHT)	C (LEAD SPACING)	D (LEAD DIA.)
TR03	0.300 (7.62)	0.210 (5.33)	0.200 (5.08)	0.025
TR05	0.500 (12.70)	0.300 (7.62)	0.400 (10.16)	0.025
TR10	1.00 (25.40)	0.350 (8.89)	0.900 (22.86)	0.032
TR15	1.50 (38.10)	0.350 (8.89)	1.40 (35.56)	0.032
TR20	2.00 (50.80)	0.350 (8.89)	1.90 (48.26)	0.032
TR30	3.00 (76.20)	0.400 (10.16)	2.90 (73.66)	0.032

DERATING



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