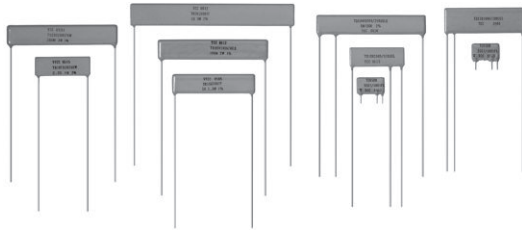


# Thick Film Planar Resistors and Dividers, Through-Hole, High Voltage



## 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
- Designs built from customer supplied schematics
- Dividers available leaded or non-leaded
- Typical resistance ratios of 1000:1, 2000:1, etc.
- TCR tracking to  $\pm 5$  ppm/ $^{\circ}$ C depending on values
- TD series dividers available, contact factory
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
COMPLIANT  
HALOGEN  
**FREE**

### Note

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

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/ $^{\circ}$ C	
TR03C	0.25	0.8K	300 to 3M	1, 2, 5, 10, 20	100	
TR03X			2.5K	300 to 25M	1, 2, 5, 10, 20	200, 300
				25M to 250M	1, 2, 5, 10, 20	200, 300
TR05D	0.5	4K	260M to 2G	5, 10, 20	200, 300	
			2.1G to 10G	5, 10, 20	<sup>(3)</sup>	
TR05X		5K	500 to 25M	1, 2, 5, 10, 20	100	
			3K to 200M	1, 2, 5, 10, 20	200, 300	
	30M to 1G		1, 2, 5, 10, 20	200, 300		
TR10F	1	6.5K	1.1G to 20G	5, 10, 20	200, 300	
			21G to 100G	5, 10, 20	<sup>(3)</sup>	
			1K to 16M	1, 2, 5, 10, 20	100	
TR10X		10K	2K to 120M	1, 2, 5, 10, 20	200, 300	
			20M to 1G	1, 2, 5, 10, 20	200, 300	
TR15G		1.5	12.5K	1.1G to 15G	5, 10, 20	200, 300
	16G to 1T			5, 10, 20	<sup>(3)</sup>	
	1.5K to 45M			1, 2, 5, 10, 20	100	
TR15X	15K		5K to 340M	1, 2, 5, 10, 20	200, 300	
			60M to 1G	1, 2, 5, 10, 20	200, 300	
TR20H	2		17.5K	1.1G to 35G	5, 10, 20	200, 300
		36G to 1.5T		5, 10, 20	<sup>(3)</sup>	
		2K to 64M		1, 2, 5, 10, 20	100	
TR20X		20K	8K to 480M	1, 2, 5, 10, 20	200, 300	
			80M to 1G	1, 2, 5, 10, 20	200, 300	
TR30J		3	25K	1.1G to 50G	5, 10, 20	200, 300
	51G to 2T			5, 10, 20	<sup>(3)</sup>	
	3K to 82M			1, 2, 5, 10, 20	100	
TR30X	30K		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	
			61G to 3T	5, 10, 20	<sup>(3)</sup>	

### 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  $\pm 5$  ppm/ $^{\circ}$ C (ratio over 1000:1, contact factory)
- <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.  
<sup>(3)</sup> 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](http://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

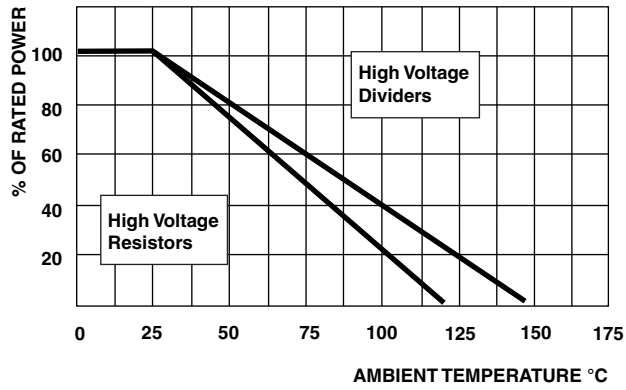
**ENVIRONMENTAL SPECIFICATIONS**

**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				
<p>Note            (1) Specified by application</p>				
Standard High Voltage Resistor				
<b>DIMENSIONS (± 10 %)</b>				
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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