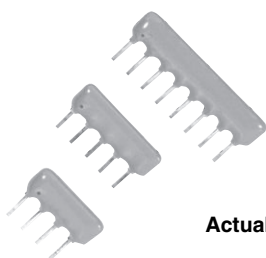


# Conformal Coating, Single-In-Line Thin Film Resistor, Through Hole Networks



Actual Size

These networks are designed to be used in analog circuits in conjunction with operational amplifiers. In addition to the standard models, Vishay also offers semi-custom or custom networks.

## FEATURES

- Standard design - no NRE
- Low TCR (10 ppm/°C)
- Excellent TCR tracking (< 2 ppm/°C)
- Low noise (< - 35 dB)
- High stability (0.005 % on ratio, after 2000 h at P<sub>n</sub> at + 70 °C)
- Through hole SIL resistors networks
- Evolution to SMD version see PRA datasheet ([www.vishay.com/doc?53033](http://www.vishay.com/doc?53033))
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

## STANDARD ELECTRICAL SPECIFICATIONS

MODEL	RESISTANCE RANGE Ω	POWER RATING PER RESISTOR <sup>(1)</sup> W	POWER RATING PER PACKAGE W	ABSOLUTE TOLERANCE ± %	RATIO TOLERANCE <sup>(2)</sup> ± %	ABSOLUTE TCR <sup>(3)</sup> ± ppm/°C	RATIO TCR <sup>(4)</sup> ppm/°C
TAS (CNS)	1K to 9.9M	0.100	Varies with size	0.1	0.01, 0.02, 0.05	10, 15	2

### Notes

- (1) at + 70 °C  
(2) ± 0.02 % or ± 0.01 % on request  
(3) ± 10 ppm/°C at 0 °C to 70 °C, 15 ppm/°C at - 40 °C to 125 °C  
(4) 1 ppm/°C on request

## PERFORMANCES

TEST	SPECIFICATIONS	CONDITIONS
Stability ( $\Delta R$ ratio)	0.005 %	2000 h at + 70 °C at P <sub>n</sub>
Voltage coefficient	< 0.002 ppm/V	
Working voltage	100 V	
Noise	- 35 dB typical	
Thermal EMF	0.1 $\mu$ V/°C	
Shelf life stability	50 ppm maximum	1 year

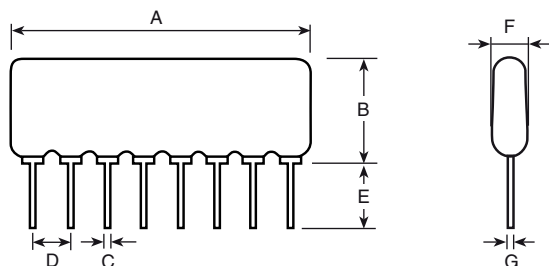
## CLIMATIC SPECIFICATIONS

Operating temperature range	- 40 °C to + 125 °C
Storage temperature range	- 55 °C to + 125 °C

## MECHANICAL SPECIFICATIONS

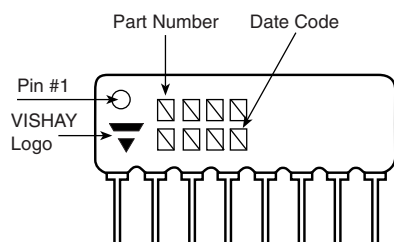
Resistive element	Passivated nichrome
Substrate material	Alumina
Body	Epoxy-conformal coating
Terminals	Tin/silver on Cu alloy
Marking resistance to solvents	Laser marking

## DIMENSIONS



DIMENSION	INCHES	MILLIMETERS
A	(see table below)	(see table below)
B	0.261	6,62 max.
C	0.020	0.51
D	0.1	2.54
E	0.125	3.17 min.
F	0.100	2.54 max.
G	0.010	0.25

## MARKING



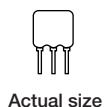
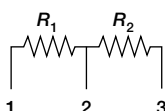
PIN COUNT		3	4	5	6	7	8	9	10
A <sub>max.</sub>	inch	0.330	0.430	0.530	0.630	0.730	0.830	0.930	1.030
	mm	8.38	10.92	13.46	16	18.54	21.08	23.62	26.16

## SCHEMATIC

### TWO EQUAL RESISTORS

$R_1 = R_2$

SMD version: see PRA datasheet



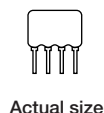
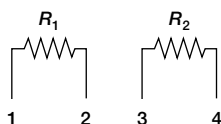
### ORDERING INFORMATION

$R_1 = 1 \text{ k}\Omega$	TAS 209	50 $\text{k}\Omega$	TAS 214
$R_1 = 2 \text{ k}\Omega$	TAS 210	100 $\text{k}\Omega$	TAS 215
$R_1 = 5 \text{ k}\Omega$	TAS 211	200 $\text{k}\Omega$	TAS 216
$R_1 = 10 \text{ k}\Omega$	TAS 212	500 $\text{k}\Omega$	TAS 217
$R_1 = 20 \text{ k}\Omega$	TAS 213	1 $\text{M}\Omega$	TAS 218

### TWO EQUAL RESISTORS

$R_1 = R_2$

SMD version: see PRA datasheet



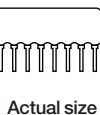
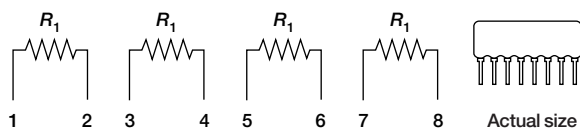
### ORDERING INFORMATION

$R_1 = 1 \text{ k}\Omega$	TAS 365
$R_1 = 10 \text{ k}\Omega$	TAS 363
$R_1 = 100 \text{ k}\Omega$	TAS 348

### FOUR EQUAL RESISTORS

$R_1$

SMD version: see PRA datasheet



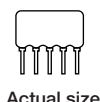
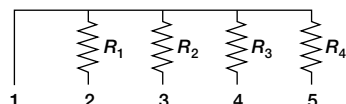
### ORDERING INFORMATION

$R_1 = 1 \text{ k}\Omega$	TAS 329
$R_1 = 5 \text{ k}\Omega$	TAS 1002
$R_1 = 10 \text{ k}\Omega$	TAS 158
$R_1 = 100 \text{ k}\Omega$	TAS 288

### FOUR EQUAL RESISTORS, ONE COMMON

$$R_1 = R_2 = R_3 = R_4$$

SMD version: see PRA datasheet



#### ORDERING INFORMATION

$$R_1 = 10 \text{ k}\Omega \quad \text{TAS 366}$$

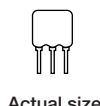
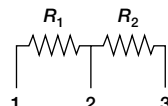
$$R_1 = 100 \text{ k}\Omega \quad \text{TAS 367}$$

### RATIO DIVIDER 10:1

$$R_1 + R_2 = 10 \text{ k}\Omega, 100 \text{ k}\Omega, 1 \text{ M}\Omega$$

SMD version: see PRA datasheet

$$\frac{R_1 + R_2}{R_2} = 10$$



#### ORDERING INFORMATION

$$R_1 + R_2 = 9 \text{ k}\Omega + 1 \text{ k}\Omega = 10 \text{ k}\Omega \quad \text{TAS 280}$$

$$R_1 + R_2 = 90 \text{ k}\Omega + 10 \text{ k}\Omega = 100 \text{ k}\Omega \quad \text{TAS 193}$$

$$R_1 + R_2 = 900 \text{ k}\Omega + 100 \text{ k}\Omega = 1 \text{ M}\Omega \quad \text{TAS 281}$$

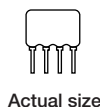
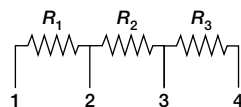
### RATIO DIVIDER 10:1, 100:1

$$R_1 + R_2 + R_3 = 100 \text{ k}\Omega \text{ and } R_2 + R_3 = 10 \text{ k}\Omega$$

SMD version: see PRA datasheet

$$\frac{R_1 + R_2 + R_3}{R_3} = 100$$

$$\frac{R_1 + R_2 + R_3}{R_2 + R_3} = 10$$



#### ORDERING INFORMATION

$$R_1 + R_2 + R_3 = 100 \text{ k}\Omega \quad \text{TAS 330}$$

$$\text{with } R_1 = 90 \text{ k}\Omega$$

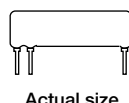
$$R_2 = 9 \text{ k}\Omega$$

$$R_3 = 1 \text{ k}\Omega$$

### RATIO DIVIDER 100:1

$$R_1 + R_2 = 10 \text{ M}\Omega$$

$$\frac{R_1 + R_2}{R_1} = 100$$



#### ORDERING INFORMATION

$$R_1 + R_2 = 10 \text{ M}\Omega \quad \text{TAS 112}$$

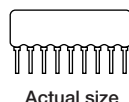
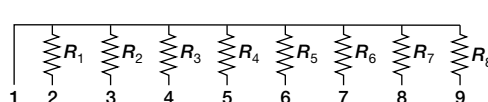
$$\text{with } R_1 = 100 \text{ k}\Omega$$

$$R_2 = 9.9 \text{ M}\Omega$$

### EIGHT EQUAL RESISTORS, ONE COMMON

$$R_1 = R_2 = R_3 = R_4 = R_5 = R_6 = R_7 = R_8$$

SMD version: see PRA datasheet



#### ORDERING INFORMATION

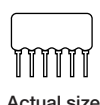
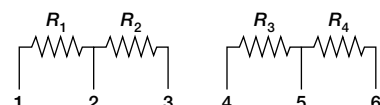
$$R_1 = 10 \text{ k}\Omega \quad \text{TAS 368}$$

$$R_1 = 100 \text{ k}\Omega \quad \text{TAS 369}$$

### DIVIDER NETWORK 10:1

$$\frac{R_2}{R_1} = \frac{R_4}{R_3} = 10$$

SMD version: see PRA datasheet



#### ORDERING INFORMATION

$$\text{TAS 220}$$

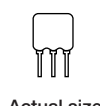
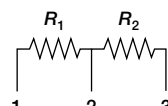
$$\text{with } R_1 = R_2 = 10 \text{ k}\Omega$$

$$R_2 = R_4 = 100 \text{ k}\Omega$$

### DIVIDER NETWORK 10:1

$$\frac{R_1}{R_2} = 10$$

SMD version: see PRA datasheet



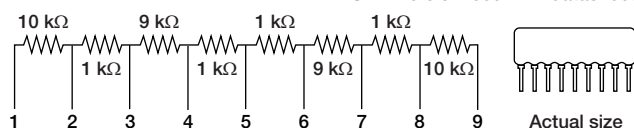
#### ORDERING INFORMATION

$$R_1 = 100 \text{ k}\Omega, R_2 = 10 \text{ k}\Omega \quad \text{TAS 282}$$

$$R_1 = 1 \text{ M}\Omega, R_2 = 100 \text{ k}\Omega \quad \text{TAS 283}$$

## EIGHT RESISTORS NETWORK

SMD version: see PRA datasheet



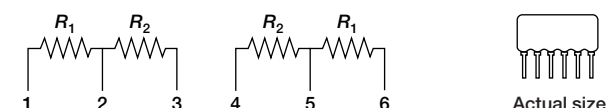
### ORDERING INFORMATION

TAS 272

## DIVIDER NETWORK 10:1

$$\frac{R_1}{R_2} = 10$$

SMD version: see PRA datasheet



### ORDERING INFORMATION

 $R_1 = 10 \text{ k}\Omega$ ,  $R_2 = 1 \text{ k}\Omega$  TAS 328

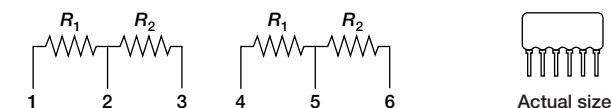
 $R_1 = 100 \text{ k}\Omega$ ,  $R_2 = 10 \text{ k}\Omega$  TAS 284

 $R_1 = 1 \text{ M}\Omega$ ,  $R_2 = 100 \text{ k}\Omega$  TAS 285

## DIVIDER NETWORK 1:1

$$R_1 = R_2$$

SMD version: see PRA datasheet



### ORDERING INFORMATION

 $R_1 = 5 \text{ k}\Omega$  TAS 225

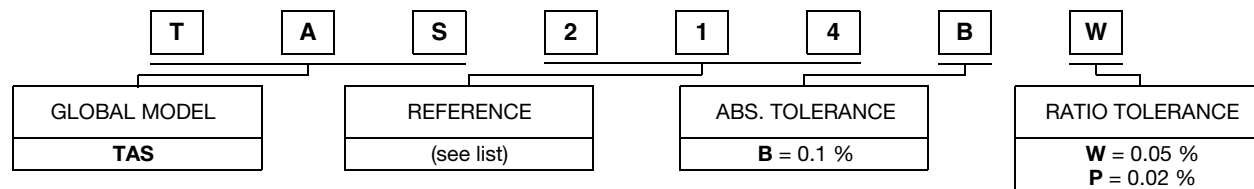
 $R_1 = 10 \text{ k}\Omega$  TAS 286

 $R_1 = 100 \text{ k}\Omega$  TAS 219

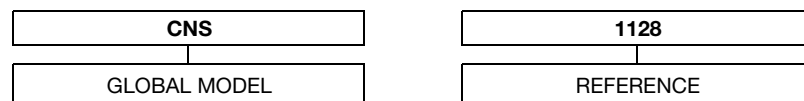
 $R_1 = 1 \text{ M}\Omega$  TAS 287

## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: TAS214BW (preferred part number format)



Custom Network: CNS 1128



### Note

- For custom specification a specific part number will be issued by Vishay Sfernice. E.g. CNS1128.



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