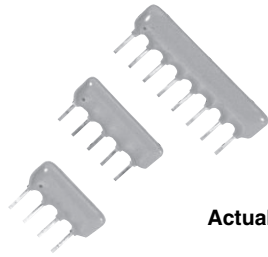


## Conformal Coating, Single-In-Line Thin Film Resistor, Through Hole Networks



Actual Size

**DESIGN SUPPORT TOOLS**
[click logo to get started](#)
**3D**  
 Models Available

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 Pn 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 Pn
Voltage coefficient	< 0.002 ppm/V	
Working voltage	100 V	
Noise	-35 dB typical	
Thermal EMF	0.1 $\mu V/^\circ C$	
Shelf life stability	50 ppm maximum	1 year

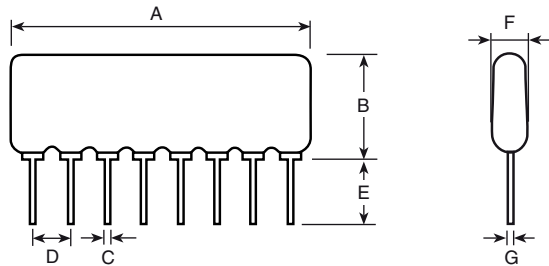
**CLIMATIC SPECIFICATIONS**

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

**MECHANICAL SPECIFICATIONS**

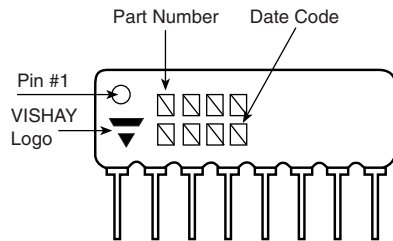
Resistive element	Passivated nichrome
Substrate material	Alumina
Body	Epoxy-conformal coating
Terminals	Tin / silver on Cu alloy
Marking resistance to solvents	Laser marking

**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**



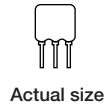
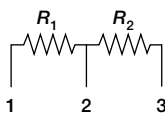
PIN COUNT		3	4	5	6	7	8	9	10
A <sub>max.</sub>	inch	0.330	0.430	0.530	0.630	0.730	0.830	0.930	1.030
	mm	8.38	10.92	13.46	16	18.54	21.08	23.62	26.16

**SCHEMATIC**

**TWO EQUAL RESISTORS**

$R_1 = R_2$

SMD version: see PRA datasheet



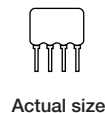
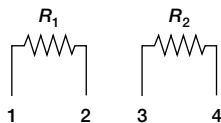
**ORDERING INFORMATION**

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

**TWO EQUAL RESISTORS**

$R_1 = R_2$

SMD version: see PRA datasheet



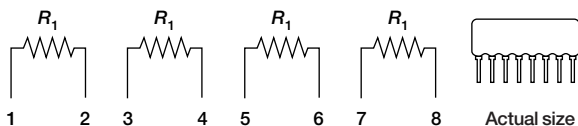
**ORDERING INFORMATION**

$R_1 = 1\text{ k}\Omega$	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



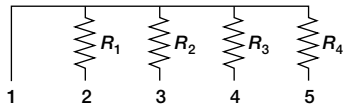
**ORDERING INFORMATION**

$R_1 = 1\text{ k}\Omega$	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



Actual size

**ORDERING INFORMATION**

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

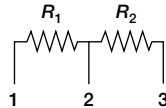
$R_1 = 100 \text{ k}\Omega \quad \text{TAS 367}$

**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

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



Actual size

**ORDERING INFORMATION**

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

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

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

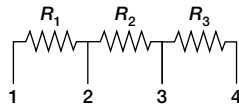
**RATIO DIVIDER 10:1, 100:1**

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

SMD version: see PRA datasheet

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

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



Actual size

**ORDERING INFORMATION**

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

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

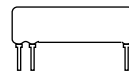
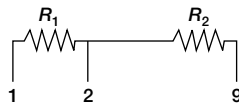
$R_2 = 9 \text{ k}\Omega$

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

**RATIO DIVIDER 100:1**

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

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



Actual size

**ORDERING INFORMATION**

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

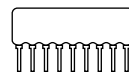
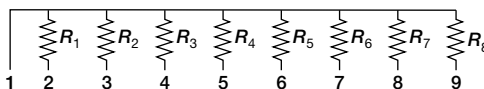
with  $R_1 = 100 \text{ k}\Omega$

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

**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



Actual size

**ORDERING INFORMATION**

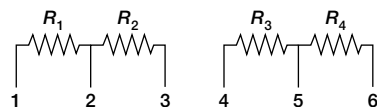
$R_1 = 10 \text{ k}\Omega \quad \text{TAS 368}$

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

**DIVIDER NETWORK 10:1**

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

SMD version: see PRA datasheet



Actual size

**ORDERING INFORMATION**

$\text{TAS 220}$

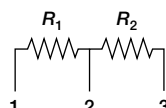
with  $R_1 = R_2 = 10 \text{ k}\Omega$

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

**DIVIDER NETWORK 10:1**

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

SMD version: see PRA datasheet



Actual size

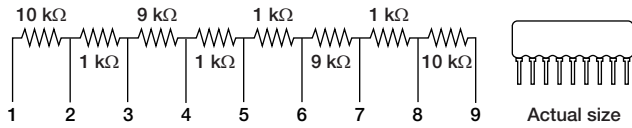
**ORDERING INFORMATION**

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

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

**EIGHT RESISTORS NETWORK**

SMD version: see PRA datasheet

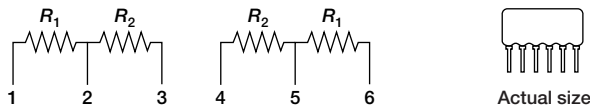


ORDERING INFORMATION	
TAS 272	

**DIVIDER NETWORK 10:1**

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

SMD version: see PRA datasheet

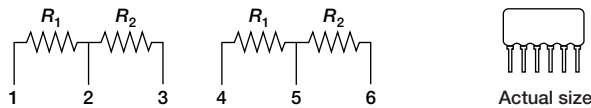


ORDERING INFORMATION	
$R_1 = 10\text{ k}\Omega, R_2 = 1\text{ k}\Omega$	TAS 328
$R_1 = 100\text{ k}\Omega, R_2 = 10\text{ k}\Omega$	TAS 284
$R_1 = 1\text{ M}\Omega, R_2 = 100\text{ k}\Omega$	TAS 285

**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)

T	A	S	2	1	4	B	W
GLOBAL MODEL		REFERENCE		ABS. TOLERANCE		RATIO TOLERANCE	
TAS		(see list)		B = 0.1 %		W = 0.05 % P = 0.02 %	

Custom Network: **CNS 1128**

CNS	1128
GLOBAL MODEL	REFERENCE

**Note**

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



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