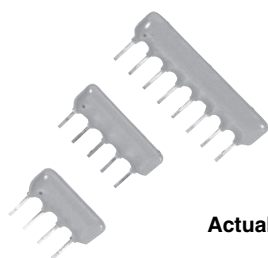


Conformal Coating, Single-In-Line Thin Film Resistor, Through Hole Networks



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



RoHS
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	RESISTANCE RANGE Ω	POWER RATING PER RESISTOR ⁽¹⁾ W	POWER RATING PER PACKAGE W	ABSOLUTE TOLERANCE ± %	RATIO TOLERANCE ⁽²⁾ ± %	ABSOLUTE TCR ⁽³⁾ ± ppm/°C	RATIO TCR ⁽⁴⁾ 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 (ΔR 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

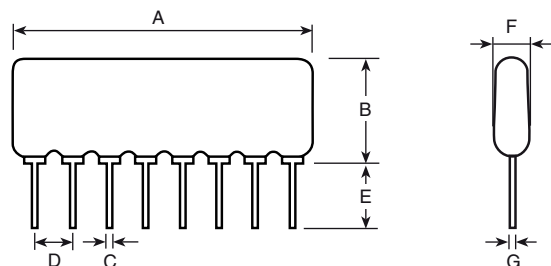
CLIMATIC SPECIFICATIONS

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

MECHANICAL SPECIFICATIONS

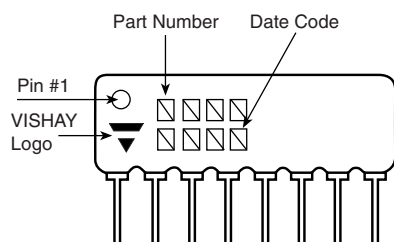
Resistive element	Passivated nichrome
Substrate material	Alumina
Body	Epoxy-conformal coating
Terminals	Tin / silver on Cu alloy
Marking resistance to solvents	Laser marking

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



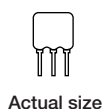
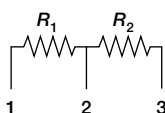
PIN COUNT		3	4	5	6	7	8	9	10
A _{max.}	inch	0.330	0.430	0.530	0.630	0.730	0.830	0.930	1.030
	mm	8.38	10.92	13.46	16	18.54	21.08	23.62	26.16

SCHEMATIC

TWO EQUAL RESISTORS

$R_1 = R_2$

SMD version: see PRA datasheet



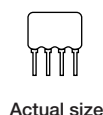
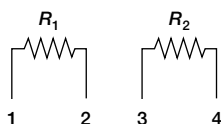
ORDERING INFORMATION

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



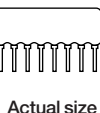
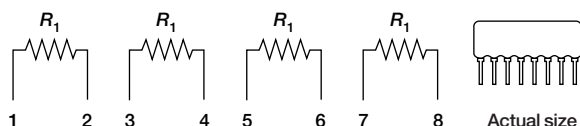
ORDERING INFORMATION

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



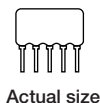
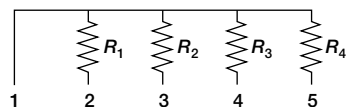
ORDERING INFORMATION

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

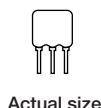
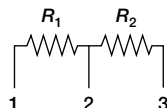
$R_1 = 10 \text{ k}\Omega$	TAS 366
$R_1 = 100 \text{ k}\Omega$	TAS 367

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

$R_1 + R_2 = 9 \text{ k}\Omega + 1 \text{ k}\Omega = 10 \text{ k}\Omega$	TAS 280
$R_1 + R_2 = 90 \text{ k}\Omega + 10 \text{ k}\Omega = 100 \text{ k}\Omega$	TAS 193
$R_1 + R_2 = 900 \text{ k}\Omega + 100 \text{ k}\Omega = 1 \text{ M}\Omega$	TAS 281

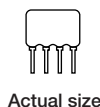
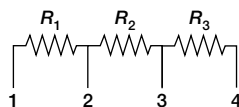
RATIO DIVIDER 10:1, 100:1

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

SMD version: see PRA datasheet

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

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



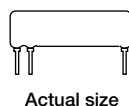
ORDERING INFORMATION

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

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

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



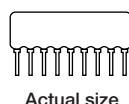
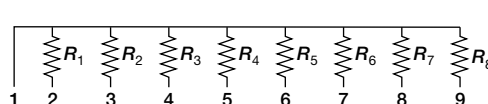
ORDERING INFORMATION

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



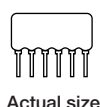
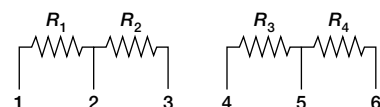
ORDERING INFORMATION

$R_1 = 10 \text{ k}\Omega$	TAS 368
$R_1 = 100 \text{ k}\Omega$	TAS 369

DIVIDER NETWORK 10:1

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

SMD version: see PRA datasheet



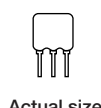
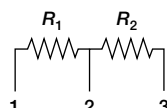
ORDERING INFORMATION

	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

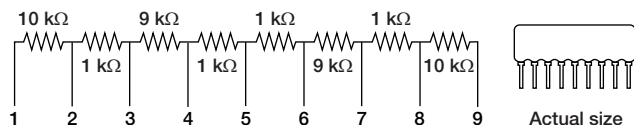


ORDERING INFORMATION

$R_1 = 100 \text{ k}\Omega, R_2 = 10 \text{ k}\Omega$	TAS 282
$R_1 = 1 \text{ M}\Omega, R_2 = 100 \text{ k}\Omega$	TAS 283

EIGHT RESISTORS NETWORK

SMD version: see PRA datasheet



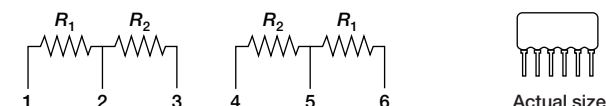
ORDERING INFORMATION

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

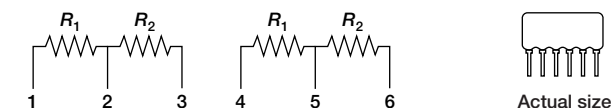
 $R_1 = 100 \text{ k}\Omega, R_2 = 10 \text{ k}\Omega$ TAS 284

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

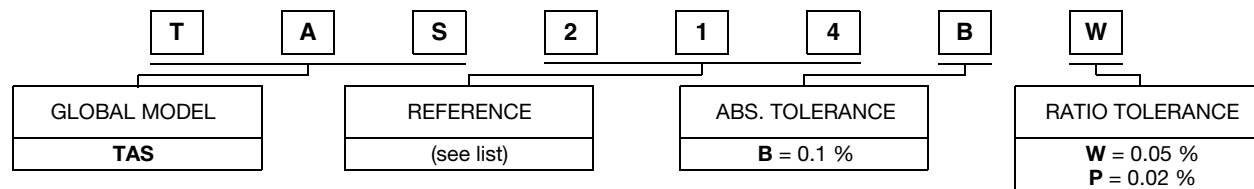
 $R_1 = 10 \text{ k}\Omega$ TAS 286

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

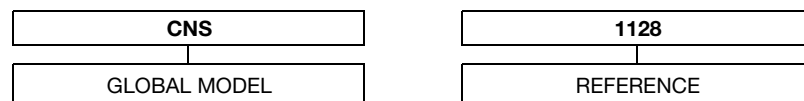
 $R_1 = 1 \text{ M}\Omega$ TAS 287

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



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.