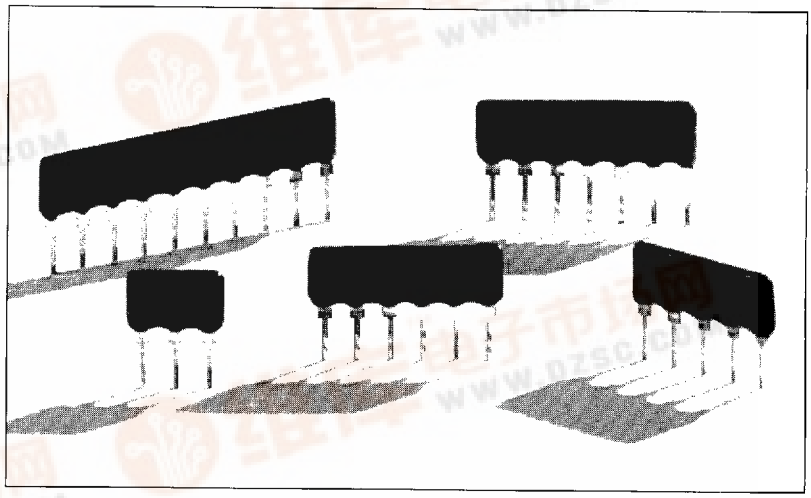
STANDARD PRODUCTS

A COMPANY OF VISHAY OHMTEK

Standard Precision Resistor Networks Single-In-Line

Features

- ▲ Off-the-shelf availability
- ▲ Low cost
- ▲ Wide variety of applications
- ▲ Small size (SIP)
- ▲ Standard designs - no NRE
- ▲ Low TCR <10 ppm
- ▲ Low noise –40 dB
- ▲ Low thermal EMF < 0.1 µV/°C
- ▲ Excellent tracking < 2 ppm/°C
- ▲ Low capacitance < 0.1 pF/PIN
- ▲ High stability ≤0.01%/year

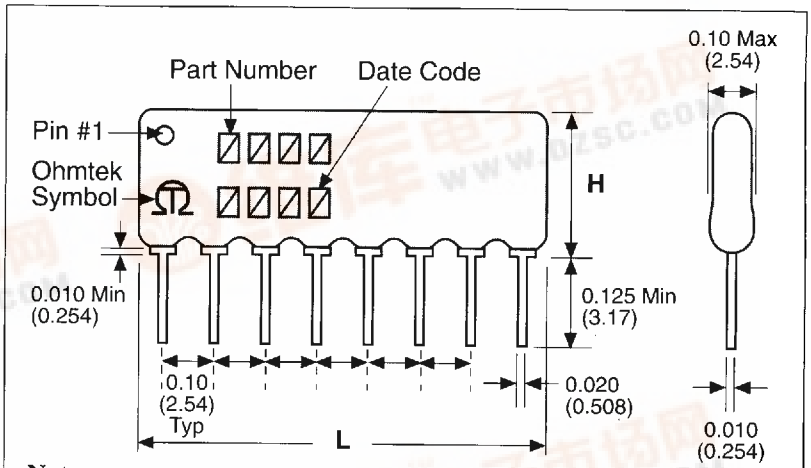


OHMTEK Thin Film resistor networks are designed to be used in analog circuits in conjunction with operational amplifiers. Engineers can use these circuits to achieve an infinite number of very low noise and high stability circuits for industrial, medical and scientific instrumentation.

This family of standard resistor networks will continually be expanded with new and innovative designs, and OHMTEK stocks most designs in house for off-the-shelf convenience. However, if you can not find the standard network you need, call Applications Engineering at (716)283-4025, as we may be able to fulfill your requirements with a semi-custom "match" for a quick delivery.

For standard networks with tighter specifications, or for custom networks, contact Applications Engineering at the above number. For a quick review of typical applications, request Ohmtek's Guide to Understanding and Using Thin Film Precision Networks.

▼ Figure 1 Mechanical Specifications



Note
"L" and "H" (length and height) dimensions for each model on following pages.
Dimensions in parenthesis indicate millimeters.

▼ Table 1 General Specifications

Tolerances	Temperature Coefficient At 0°C - 70°C	Noise	Power	Voltage Coefficient	Thermal EMF
Absolute: ±0.1%	Absolute: ±10 ppm/°C	<-35 dB	100 mW	±0.002 ppm/V	±0.1 µV/°C
Ratio: ±0.02%	Tracking: 2 ppm/°C				

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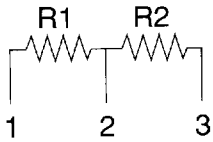
▼ Figure 2 Two Equal Resistors

R1 = R2



Actual Size

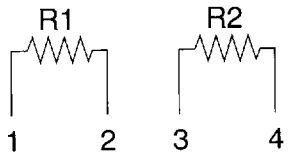
L = Total Length = 0.320" (8.13) Max
H = Seated Height = 0.280" (7.11) Max
Except PN 218 where Seated Height = 0.342" (8.69) Max

Ordering Information

R1 =	1K:	PN 209	50K:	PN 214
	2K:	PN 210	100K:	PN 215
	5K:	PN 211	200K:	PN 216
	10K:	PN 212	500K:	PN 217
	20K:	PN 213	1M:	PN 218

▼ Figure 3 Two Equal Resistors — Isolated

R1 = R2



Actual Size

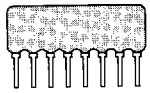
L = Total Length = 0.420" (10.67) Max
H = Seated Height = 0.280" (7.11) Max

Ordering Information

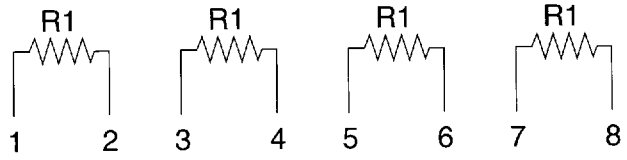
R1 =	1K:	PN 365
	2K:	PN 997
	5K:	PN 998
	10K:	PN 363
	25K:	PN 999
	50K:	PN 1000
	100K:	PN 348

▼ Figure 4 Four Equal Resistors — Isolated

R1 = 1K, 10K, 25K, 50K, 100K



Actual Size



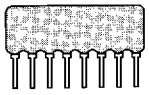
L = Total Length = 0.820" (20.83) Max
H = Seated Height = 0.280" (7.11) Max

Ordering Information

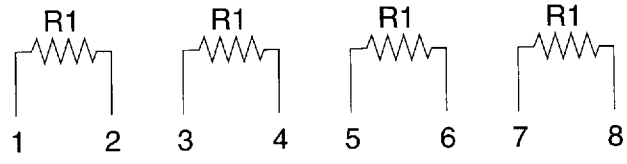
R1 =	1K:	PN 329
	2K:	PN 1001
	5K:	PN 1002
	10K:	PN 158
	25K:	PN 1003
	50K:	PN 1004
	100K:	PN 288

▼ Figure 5 Four Equal Resistors — Isolated

R1 = 1K, 10K



Actual Size



Absolute Tolerance = 0.1%
Ratio Tolerance = 0.1%

L = Total Length = 0.820" (20.83) Max
H = Seated Height = 0.280" (7.11) Max

Ordering Information

R1 =	1K:	PN 1005
	10K:	PN 1006

Dimensions in parenthesis indicate millimeters.

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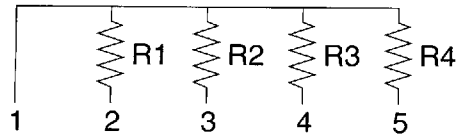
▼ Figure 6 Four Equal Resistors — One Common

R1 = R2 = R3 = R4 = 10K, 100K



Actual Size

Ordering Information

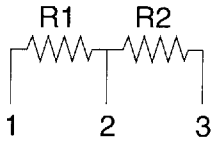
R1 =	10K:	PN 366
	100K:	PN 367

L = Total Length = 0.520" (13.21) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 7 Ratio Divider 10:1

R1 + R2 = 10K, 100K, 1M

$$\frac{R1 + R2}{R2} = 10$$



Actual Size

Ordering Information

R1 + R2	=		
9K + 1K	=	10K:	PN 280
90K + 10K	=	100K:	PN 193
900K +100K	=	1M:	PN 281

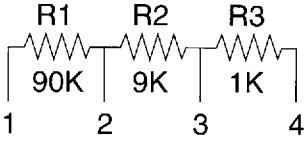
L = Total Length = 0.320" (8.13) Max
H = Seated Height = 0.280" (7.11) Max
Except PN 281 where Seated Height = 0.362" (9.19) Max

▼ Figure 8 Ratio Divider 10:1 and 100:1

R1 + R2 + R3 = 100K

$$\frac{R1 + R2 + R3}{R3} = 100$$

$$\frac{R1 + R2 + R3}{R2 + R3} = 10$$



Actual Size

Ordering Information

R1 + R2 + R3 = 100K: PN 330

L = Total Length = 0.420" (10.67) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 9 Ratio Divider 100:1

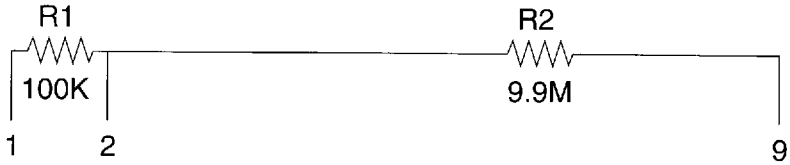
R1 + R2 = 10M

$$\frac{R1 + R2}{R1} = 100$$

Actual Size

Ordering Information

R1 + R2 = 10M: PN 112

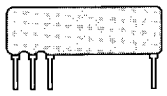


L = Total Length = 0.920" (23.37) Max
H = Seated Height = 0.415" (10.54) Max

Dimensions in parenthesis indicate millimeters.

▼ Figure 10 Ratio Divider 100:1

$\frac{R1 + R2}{R1} = 100$ R1 + R2 = 10M



Actual Size

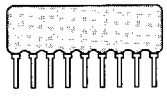
Ordering Information

R1 + R2 = 10M: PN 177

L = Total Length = 0.920" (23.37) Max
H = Seated Height = 0.430" (10.92) Max

▼ Figure 11 Eight Equal Resistors — One Common

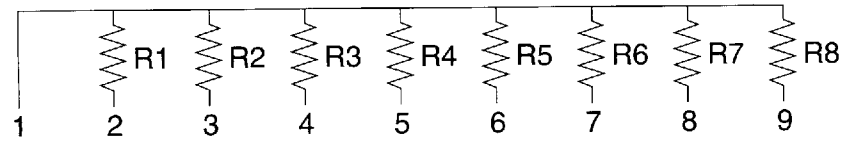
R1 = R2 = R3 = R4 = R5 = R6 = R7 = R8 = 10K, 100K



Actual Size

Ordering Information

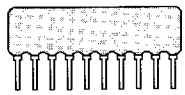
R1 = 10K: PN 368
100K: PN 369



L = Total Length = 0.920" (23.37) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 12 Eight Bit R/2R Ladder Network

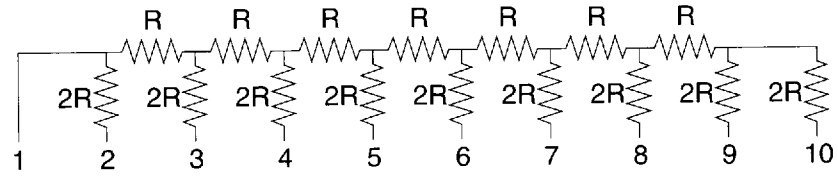
R = 10K, 1K



Actual Size

Ordering Information

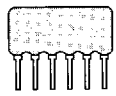
R1 = 1K: PN 1072
R1 = 10K: PN 267



L = Total Length =1.020" (25.91) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 13 Divider Network 1:1

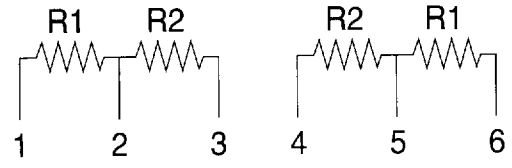
R1 = 5K, 10K, 100K, 1M
R1 = R2



Actual Size

Ordering Information

R1 = 5K: PN 225
= 10K: PN 286
= 100K: PN 219
= 1M: PN 287



L = Total Length = 0.620" (15.75) Max
H = Seated Height = 0.280" (7.11) Max
Except PN 287 Seated Height = 0.362" (9.19) Max.

Dimensions in parenthesis indicate millimeters.

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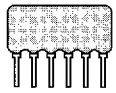
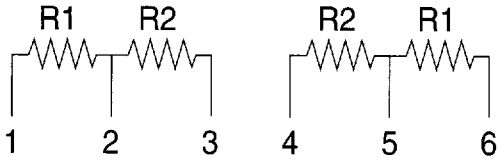
▼ Figure 14 Divider Network 2:1

R1 = 10K, 100K

$\frac{R1}{R2} = 2$



Actual Size



Ordering Information

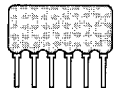
R1 = 10K: PN 1009
100K: PN 1010

L = Total Length = 0.620" (15.75) Max
H = Seated Height = 0.280" (7.11) Max

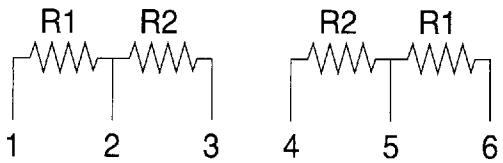
▼ Figure 15 Divider Network 5:1

R1 = 10K, 100K

$\frac{R1}{R2} = 5$



Actual Size



Ordering Information

R1 = 10K: PN 1007
100K: PN 1008

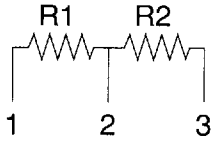
L = Total Length = 0.620" (15.75) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 16 Divider Network 10:1

R1 = 100K, 1M

$\frac{R1}{R2} = 10$

Actual Size



Ordering Information

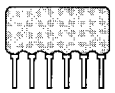
R1 = 100K: PN 282
R1 = 1M: PN 283

L = Total Length = 0.320" (8.13) Max
H = Seated Height = 0.280" (7.11) Max
Except PN 283 where Seated Height = 0.362" (9.19) Max

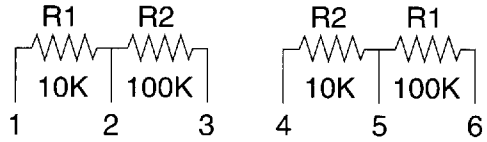
▼ Figure 17 Divider Network 10:1

R1 = 10K

$\frac{R2}{R1} = 10$



Actual Size



Ordering Information

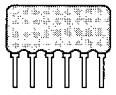
R1 = 10K: PN 220

L = Total Length = 0.620" (15.75) Max
H = Seated Height = 0.280" (7.11) Max

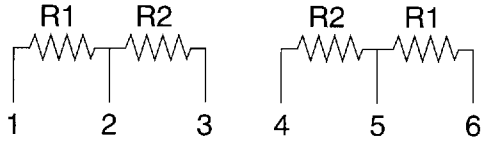
▼ Figure 18 Divider Network 10:1

R1 = 10K, 100K, 1M

$\frac{R1}{R2} = 10$



Actual Size



Ordering Information

R1 = 10K: PN 328
= 100K: PN 284
= 1M: PN 285

L = Total Length = 0.620" (15.75) Max
H = Seated Height = 0.280" (7.11) Max
Except PN 285 Seated Height = 0.320" (8.13) Max

Dimensions in parenthesis indicate millimeters.

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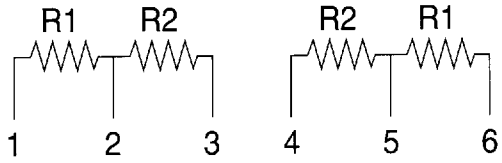
▼ Figure 19 Divider Network 20:1

R1 = 10K, 50K

$\frac{R1}{R2} = 20$

Actual Size

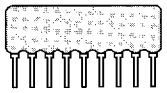


Ordering Information

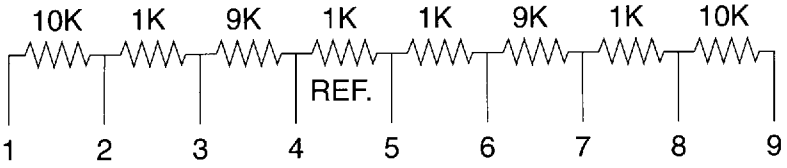
R1 = 10K: PN 1073
50K: PN 1074

L = Total Length = 0.620" (15.75) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 20 Eight Resistor Network (Designed for Instrument Amplifier with Shield Driver)



Actual Size



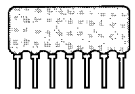
Ordering Information

PN 272

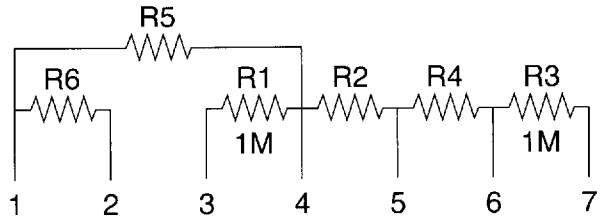
L = Total Length = 0.920" (23.37) Max
H = Seated Height = 0.280" (7.11) Max

▼ Figure 21 Six Resistor Network (Designed for Unity Gain/High Common Mode Voltage Rejection Differential Amplifier)

Common Mode
Division Ratio 250, 100, 50
R1 = R3 = 1M
R2 = 4K, 10K, 20K
R4 = 3.984K, 9.901K, 19.608K
R5 = 900K, 950K, 975K
R6 = 100K, 50K, 25K



Actual Size



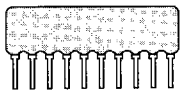
Ordering Information

$\frac{R1}{R2}$ = Division Ratio = 250: PN 442
100: PN 443
50: PN 444

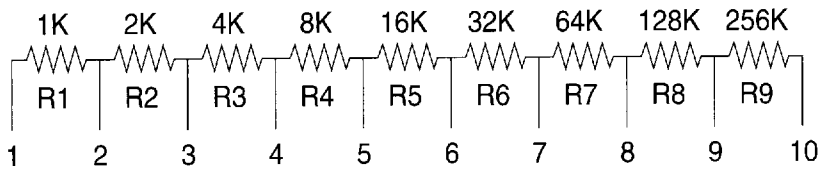
L = Total Length = 0.720" (18.29) Max
H = Seated Height = 0.280" (7.11) Max
Maximum voltage to pins #3 and #7 is 300V.

▼ Figure 22 Resistance Doubler

R1 = 1K



Actual Size



Ordering Information

PN 1011

Absolute Tolerance = 0.1%
Ratio Tolerance = 0.1%
TC Tracking = 3 ppm/°C
L = Total Length = 1.02" (25.91) Max
H = Seated Height = 0.280" (7.11) Max

Dimensions in parenthesis indicate millimeters.