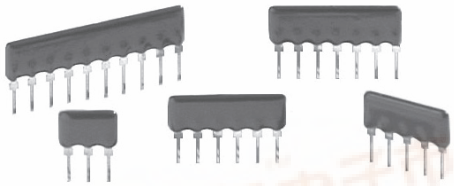
VTF (Standard)

Vishay Thin Film

Conformal, Single In-Line Resistor Networks (Standard)



Actual Size

VISHAY 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 VISHAY Thin Film 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 meet your requirements with a semicustom “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 VISHAY’s Guide to Understanding and Using Thin Film Precision Networks.

THROUGH HOLE NETWORKS

FEATURES

- Lead (Pb)-free available
- Off-the-shelf delivery
- Wide variety of standards
- Small size (SIP)
- Standard designs - no NRE
- Low capacitance < 0.1 pF/PIN
- Flame resistant (UL94V-0 rating)

Pb-free Available

RoHS* COMPLIANT

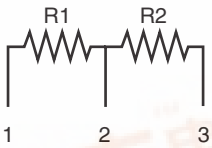
TYPICAL PERFORMANCE

	ABS	TRACKING
TCR	10	2
	ABS	RATIO
TOL	0.1	0.02

Complete Electrical Specifications at the end of schematics.

SCHEMATIC

R1 = R2



Actual Size

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

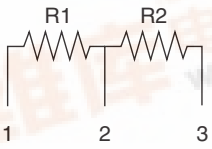
TWO EQUAL RESISTORS

ORDERING INFORMATION			
R1 =	1K: VTF209BX	50K:	VTF214BX
	2K: VTF210BX	100K:	VTF215BX
	5K: VTF211BX	200K:	VTF216BX
	10K: VTF212BX	500K:	VTF217BX
	20K: VTF213BX	1M:	VTF218BX

Lead (Pb)-free option add “S” after part number, e.g: VTF209**S**BX

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

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



Actual Size

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

RATIO DIVIDER 10:1

ORDERING INFORMATION	
R1 + R2 =	
9K + 1K = 10K:	VTF280BX
90K + 10K = 100K:	VTF193BX
900K + 100K = 1M:	VTF281BX

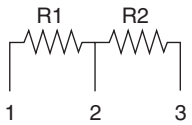
Lead (Pb)-free option add “S” after part number, e.g: VTF280**S**BX

* Pb containing terminations are not RoHS compliant, exemptions may apply

DIVIDER NETWORK 10:1

R1 = 100K, 1M

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



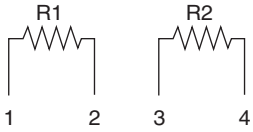
Actual Size

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

ORDERING INFORMATION	
R1 = 100K:	VTF282BX
R1 =1M:	VTF283BX

TWO EQUAL RESISTORS - ISOLATED

R1 = R2



Actual Size

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

ORDERING INFORMATION			
R1 =	1K:	VTF365BX	50K: VTF1000BX
	2K:	VTF997BX	100K: VTF348BX
	5K:	VTF998BX	200K: VTF1105BX
	10K:	VTF363BX	500K: VTF1106BX
	20K:	VTF1104BX	1M: VTF1103BX
	25K:	VTF999BX	

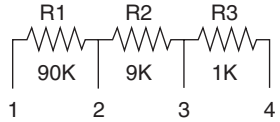
Lead (Pb)-free option add “S” after part number, e.g: VTF365**S**BX

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

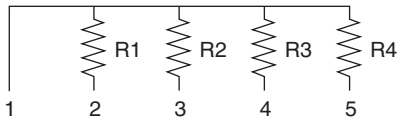
L = Total Length = 0.420" (10.67 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

ORDERING INFORMATION
R1 + R2 + R3 = 100K: VTF330BX

Lead (Pb)-free option add “S” after part number, e.g: VTF330**S**BX

FOUR EQUAL RESISTORS ONE COMMON

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



Actual Size

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

ORDERING INFORMATION	
R1 = 10K:	VTF366BX
100K:	VTF367BX

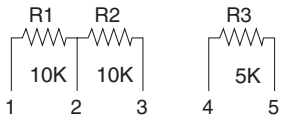
Lead (Pb)-free option add “S” after part number, e.g: VTF366**S**BX

DIVIDER NETWORK 2:1

R1 = 10K

$\frac{R2}{R1}$ = 1

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



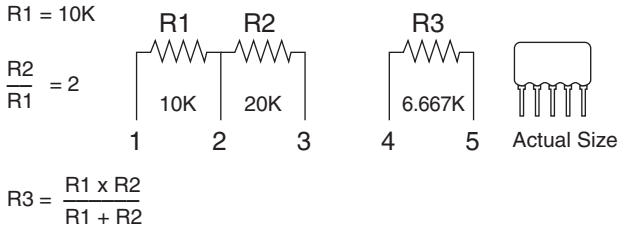
Actual Size

L = 0.520 (13.21 mm), H = 0.280 (7.11 mm) Max.

ORDERING INFORMATION
VTF1087BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1087**S**BX

THROUGH HOLE NETWORKS

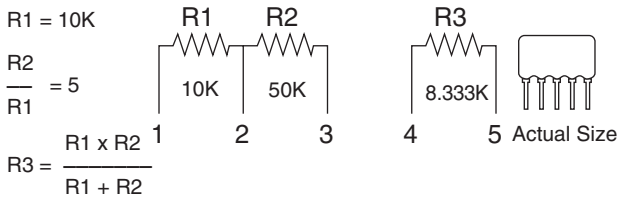


L = 0.520" (13.21 mm), H = 0.280" (7.11 mm) Max.

DIVIDER NETWORK 2:1

ORDERING INFORMATION
VTF1088BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1088**S**BX

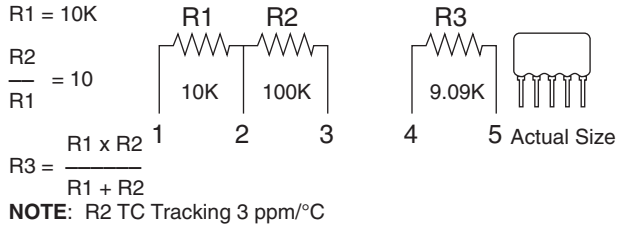


L = 0.520" (13.21 mm), H = 0.280" (7.11 mm) Max.

DIVIDER NETWORK 5:1

ORDERING INFORMATION
VTF1089BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1089**S**BX



NOTE: R2 TC Tracking 3 ppm/°C

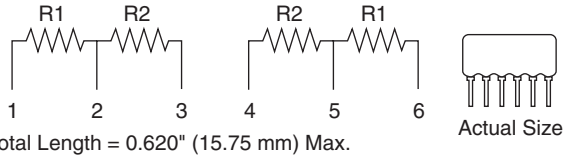
L = 0.520" (13.21 mm), H = 0.280" (7.11 mm) Max.

DIVIDER NETWORK 10:1

ORDERING INFORMATION
VTF1090BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1090**S**BX

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



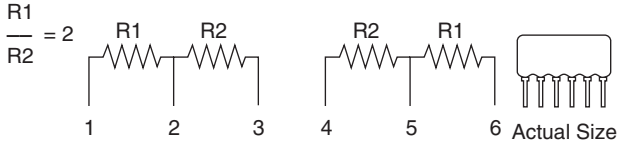
L = Total Length = 0.620" (15.75 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.
Except PN 287 Seated Height = 0.362" (9.19 mm) Max.

DIVIDER NETWORK 1:1

ORDERING INFORMATION	
R1 = 5K:	VTF225BX
10K:	VTF286BX
100K:	VTF219BX
1M:	VTF287BX

Lead (Pb)-free option add “S” after part number, e.g: VTF225**S**BX

R1 = 10K, 100K



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

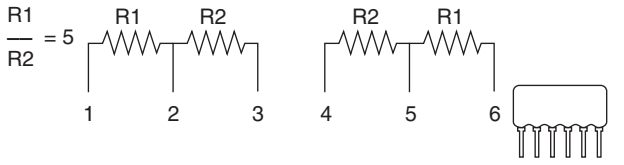
DIVIDER NETWORK 2:1

ORDERING INFORMATION	
R1 = 10K:	VTF1009BX
100K:	VTF1010BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1009**S**BX

THROUGH HOLE NETWORKS

R1 = 10K, 100K



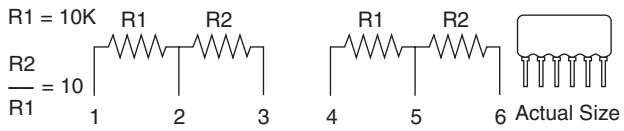
L = Total Length = 0.620" (15.75 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

DIVIDER NETWORK 5:1

ORDERING INFORMATION	
R1 = 10K:	VTF1007BX
100K:	VTF1008BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1007**S**BX

R1 = 10K



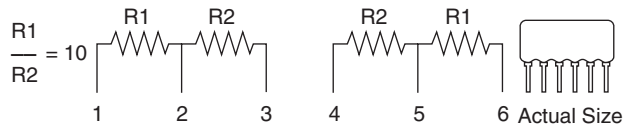
L = Total Length = 0.620" (15.75 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

DIVIDER NETWORK 10:1

ORDERING INFORMATION	
R1 = 10K:	VTF220BX

Lead (Pb)-free option add "S" after part number, e.g: VTF220**S**BX

R1 = 10K, 100K, 1M



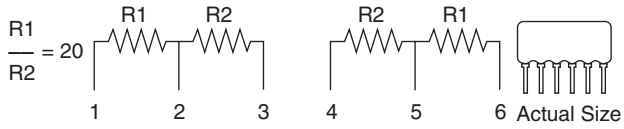
L = Total Length = 0.620" (15.75 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.
Except PN 285 Seated Height = 0.320" (8.13 mm) Max.

DIVIDER NETWORK 10:1

ORDERING INFORMATION	
R1 = 10K:	VTF328BX
100K:	VTF284BX
1M:	VTF285BX

Lead (Pb)-free option add "S" after part number, e.g: VTF328**S**BX

R1 = 10K, 50K, 200K, 1M



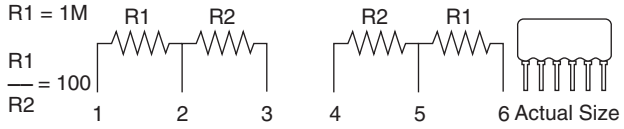
L = Total Length = 0.620" (15.75 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

DIVIDER NETWORK 20:1

ORDERING INFORMATION	
R1 = 10K:	VTF1073BX
50K:	VTF1074BX
200K:	VTF1107BX
1M:	VTF1108BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1073**S**BX

R1 = 1M



DIVIDER NETWORK 100:1

ORDERING INFORMATION	
R1 = 1M:	VTF1109BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1109**S**BX

THROUGH HOLE NETWORKS

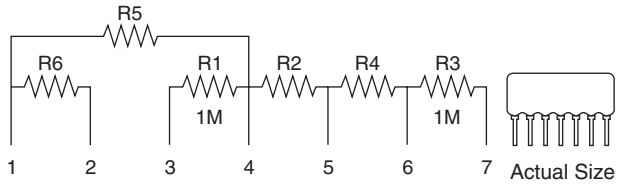
VTF (Standard)

Vishay Thin Film — Conformal, Single In-Line Resistor Networks (Standard)

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



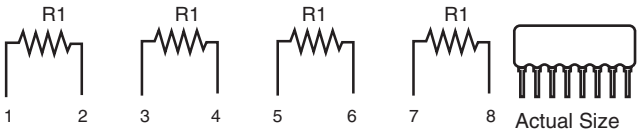
L = Total Length = 0.720" (18.29 mm) Max.
H = Seated Height = 0.360" (9.14 mm) Max.
Maximum voltage to pins #3 and #7 is 300 V

ORDERING INFORMATION	
$\frac{R1}{R2}$	= Division Ratio = 250: VTF442BX
100:	VTF443BX
50:	VTF444BX

Lead (Pb)-free option add “S” after part number, e.g: VTF442**S**BX

FOUR EQUAL RESISTORS ISOLATED

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



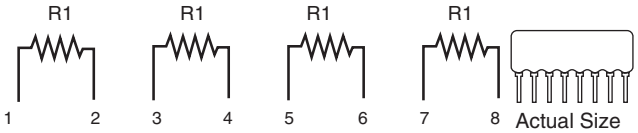
L = Total Length = 0.820" (20.83 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

ORDERING INFORMATION	
R1 = 1K:	VTF329BX
2K:	VTF1001BX
5K:	VTF1002BX
10K:	VTF158BX
25K:	VTF1003BX
50K:	VTF1004BX
100K:	VTF288BX

Lead (Pb)-free option add “S” after part number, e.g: VTF329**S**BX

FOUR EQUAL RESISTORS ISOLATED

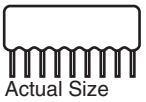
R1 = 1K, 10K, 100K

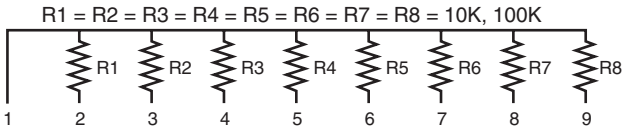


Absolute Tolerance = 0.1 %
Ratio Tolerance = 0.1 %
L = Total Length = 0.820" (20.83 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

ORDERING INFORMATION	
R1 = 1K:	VTF1005BX
10K:	VTF1006BX
100K:	VTF1137BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1005**S**BX



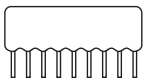


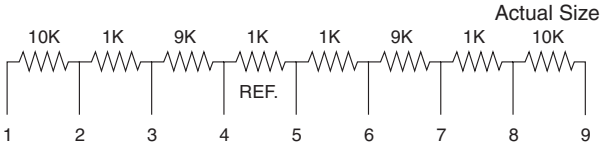
L = Total Length = 0.920" (23.37 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

EIGHT EQUAL RESISTORS ONE COMMON

ORDERING INFORMATION	
R1 = 10K:	VTF368BX
100K:	VTF369BX

Lead (Pb)-free option add “S” after part number, e.g: VTF368**S**BX





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

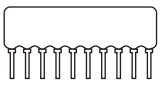
EIGHT RESISTOR NETWORK

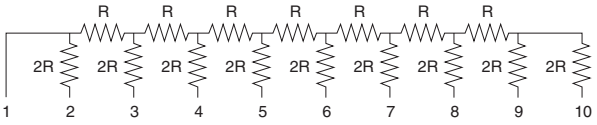
(Designed for Instrument Amplifier with Shield Driver)

ORDERING INFORMATION
VTF272BX

Lead (Pb)-free option add “S” after part number, e.g: VTF272**S**BX

R = 10K, 1K





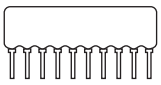
L = Total Length =1.020" (25.91 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

EIGHT BIT R/2R LADDER NETWORK

ORDERING INFORMATION	
(± 1/2 LSB)	
R = 1K:	VTF1072BX
R = 10K:	VTF267BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1072**S**BX

R1 = 1K



RESISTANCE DOUBLER

ORDERING INFORMATION
VTF1011BX

Lead (Pb)-free option add “S” after part number, e.g: VTF1011**S**BX

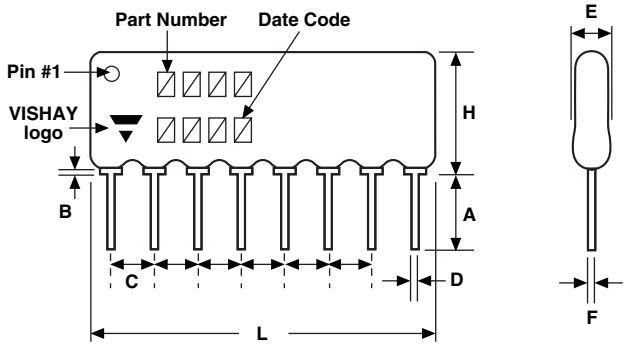
Absolute Tolerance = ± 0.1 %
Ratio Tolerance = ± 0.1 %
TCR Tracking = ± 3 ppm/°C
L = Total Length = 1.02" (25.91 mm) Max.
H = Seated Height = 0.280" (7.11 mm) Max.

VTF (Standard)

Vishay Thin Film Conformal, Single In-Line Resistor Networks (Standard)

STANDARD ELECTRICAL SPECIFICATIONS			
TEST		**SPECIFICATIONS**	**CONDITIONS**
Material		Passivated nichrome	
TCR*:	**Tracking**	± 2 ppm/°C	0 °C to + 70 °C
	Absolute	± 10 ppm/°C	0 °C to + 70 °C
Tolerance:	**Ratio**	± 0.02 %	+ 25 °C
	Absolute	± 0.1 %	+ 25 °C
Stability:	**ΔR Ratio**	≤ 0.01 %	2000 h at + 70 °C
Voltage Coefficient		± 0.01 ppm/V	
Working Voltage		100 V	
Operating Temperature Range		0 °C to + 70 °C	
Storage Temperature Range		- 55 °C to + 125 °C	
Noise		- 35 dB	
Thermal EMF		< 0.1 µV/°C	
Shelf Life Stability:	**Absolute**	100 ppm	1 year at + 25 °C
	Ratio	20 ppm	1 year at + 25 °C

DIMENSIONS AND IMPRINTING in inches and millimeters



DIMENSION	INCHES	MM
A	0.125 (min.)	3.17
B	0.010 (min.)	0.25
C	0.100	2.54 typ.
D	0.020 typ.	0.51
E	0.100 max.	2.54
F	0.010 typ.	0.25

NOTE: **"L"** and **"H"** (length and height) dimensions for each model are found alongside the schematic drawing.

MECHANICAL SPECIFICATIONS	
Resistive Material	Passivated nichrome
Substrate Material	Alumina
Body	Epoxy coated
Terminals	Copper
Plating	Sn 60
Marking Resistance to Solvents	Per MIL-PRF-83401
Lead (Pb)-free Option	96.5 % Sn, 3.0 % Ag, 0.5 % Cu
Lead (Pb)-free Finish	Hot solder dip

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: VTF211BX (preferred part number format)

V	T	F	2	1	1		B	X
V	T	F	1	0	0	4	S	B	X

GLOBAL MODEL	PART NUMBER (3 or 4 digits)	LEAD (Pb)-FREE (0 or 1 digits)	PACKAGING
VTF	**xxx** or **xxxx** Example: 214 1004	**S** = Lead (Pb)-free (e1) None = Tin lead	**BX** = Conductive foam box

Historical Part Number example: VTF 211 (will continue to be accepted)

VTF	211
MODEL	PART NUMBER

THROUGH HOLE NETWORKS

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All product specifications and data are subject to change without notice.

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