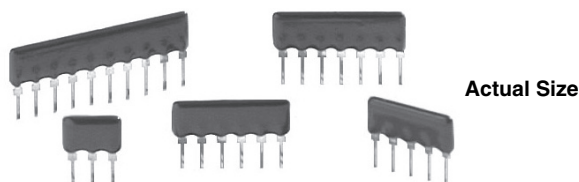


## Conformal, Single In-Line Resistor Networks (Standard)



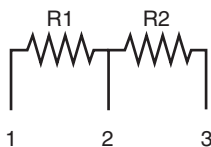
Actual Size

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.

### 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.

### 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)



RoHS\*  
COMPLIANT

### TYPICAL PERFORMANCE

|     | ABS | TRACKING |
|-----|-----|----------|
| TCR | 10  | 2        |
|     | ABS | RATIO    |
| TOL | 0.1 | 0.02     |

Complete Electrical Specifications at the end of schematics.

### TWO EQUAL RESISTORS

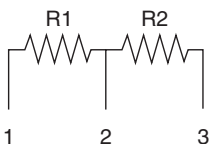
#### ORDERING INFORMATION

|                   |                |
|-------------------|----------------|
| 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: VTF209SBX

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

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



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 |

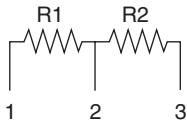
Lead (Pb)-free option add "S" after part number, e.g: VTF280SBX

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



$$R1 = 100K, 1M$$

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



Actual Size

L = Total Length = 0.320" (8.13 mm) Max.

H = Seated Height = 0.280" (7.11 mm) Max.

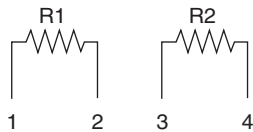
Except PN 283 where Seated Height = 0.362" (9.19 mm) Max.

**DIVIDER NETWORK 10:1****ORDERING INFORMATION**

R1 = 100K: VTF282BX

R1 = 1M: VTF283BX

$$R1 = R2$$



Actual Size

L = Total Length = 0.420" (10.67 mm) Max.

H = Seated Height = 0.280" (7.11 mm) Max.

**TWO EQUAL RESISTORS - ISOLATED****ORDERING INFORMATION**

R1 = 1K: VTF365BX      50K: VTF1000BX

2K: VTF997BX      100K: VTF348BX

5K: VTF998BX      200K: VTF1105BX

10K: VTF363BX      500K: VTF1106BX

20K: VTF1104BX      1M: VTF1103BX

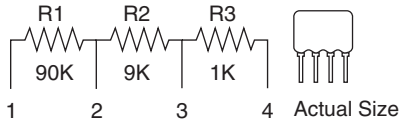
25K: VTF999BX

Lead (Pb)-free option add "S" after part number, e.g: VTF365SBX

$$R1 + R2 + R3 = 100K$$

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

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



Actual Size

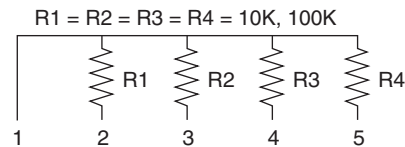
L = Total Length = 0.420" (10.67 mm) Max.

H = Seated Height = 0.280" (7.11 mm) Max.

**RATIO DIVIDER 10:1 AND 100:1****ORDERING INFORMATION**

R1 + R2 + R3 = 100K: VTF330BX

Lead (Pb)-free option add "S" after part number, e.g: VTF330SBX



Actual Size

L = Total Length = 0.520" (13.21 mm) Max.

H = Seated Height = 0.280" (7.11 mm) Max.

**FOUR EQUAL RESISTORS ONE COMMON****ORDERING INFORMATION**

R1 = 10K: VTF366BX

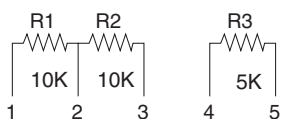
100K: VTF367BX

Lead (Pb)-free option add "S" after part number, e.g: VTF366SBX

$$R1 = 10K$$

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

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



Actual Size

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

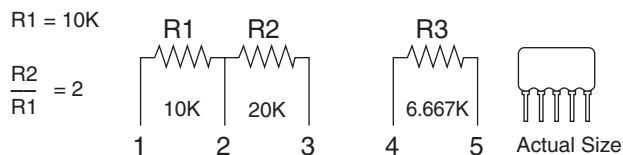
**DIVIDER NETWORK 2:1****ORDERING INFORMATION**

VTF1087BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1087SBX

# VTF (Standard)

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



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

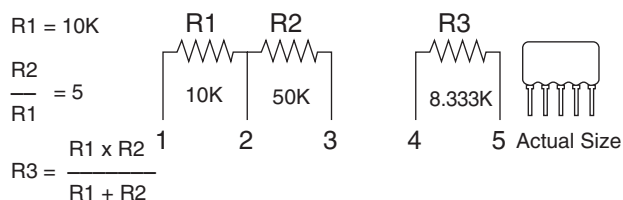
L = 0.520" (13.21 mm), H = 0.280" (7.11 mm) Max.

## DIVIDER NETWORK 2:1

### ORDERING INFORMATION

VTF1088BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1088SBX



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

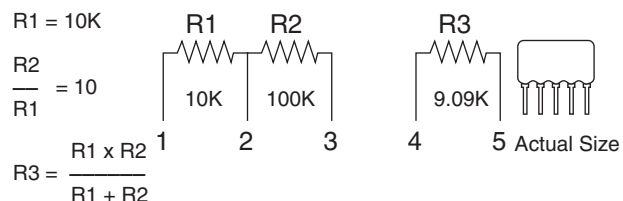
L = 0.520" (13.21 mm), H = 0.280" (7.11 mm) Max.

## DIVIDER NETWORK 5:1

### ORDERING INFORMATION

VTF1089BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1089SBX



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

NOTE: R2 TC Tracking 3 ppm/°C

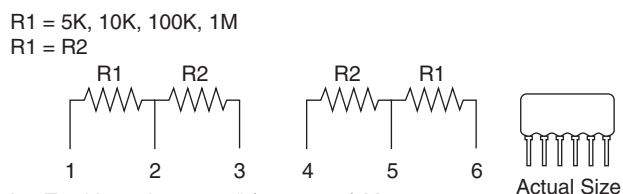
L = 0.520" (13.21 mm), H = 0.280" (7.11 mm) Max.

## DIVIDER NETWORK 10:1

### ORDERING INFORMATION

VTF1090BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1090SBX



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

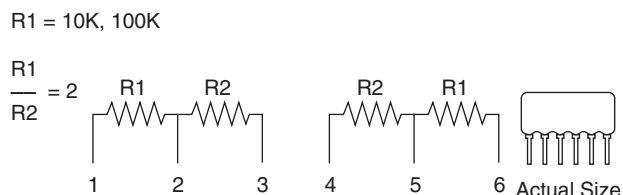
R1 = 5K: VTF225BX

10K: VTF286BX

100K: VTF219BX

1M: VTF287BX

Lead (Pb)-free option add "S" after part number, e.g: VTF225SBX



L = Total Length = 0.620" (15.75 mm) Max.

H = Seated Height = 0.280" (7.11 mm) Max.

## DIVIDER NETWORK 2:1

### ORDERING INFORMATION

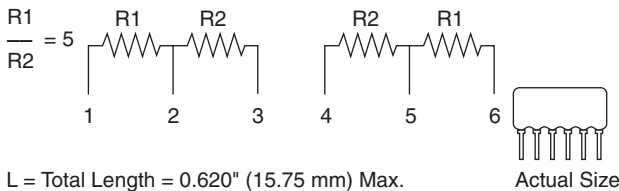
R1 = 10K: VTF1009BX

100K: VTF1010BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1009SBX



R1 = 10K, 100K



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

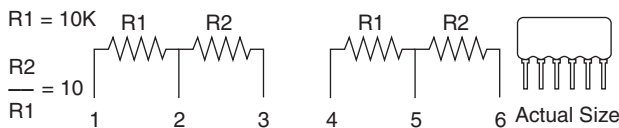
#### DIVIDER NETWORK 5:1

##### ORDERING INFORMATION

R1 = 10K: VTF1007BX

100K: VTF1008BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1007SBX



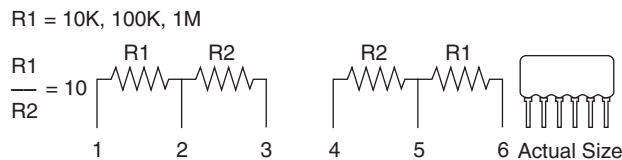
L = Total Length = 0.620" (15.75 mm) Max.  
H = Seated Height = 0.280" (7.11 mm) Max.

#### DIVIDER NETWORK 10:1

##### ORDERING INFORMATION

R1 = 10K: VTF220BX

Lead (Pb)-free option add "S" after part number, e.g: VTF220SBX



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

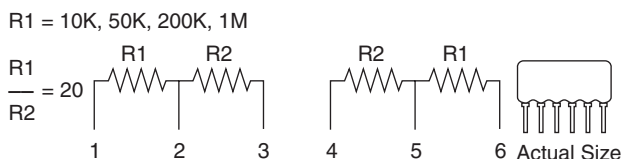
##### ORDERING INFORMATION

R1 = 10K: VTF328BX

100K: VTF284BX

1M: VTF285BX

Lead (Pb)-free option add "S" after part number, e.g: VTF328SBX



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

#### DIVIDER NETWORK 20:1

##### ORDERING INFORMATION

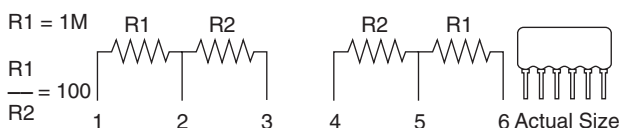
R1 = 10K: VTF1073BX

50K: VTF1074BX

200K: VTF1107BX

1M: VTF1108BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1073SBX



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

#### DIVIDER NETWORK 100:1

##### ORDERING INFORMATION

R1 = 1M: VTF1109BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1109SBX

### Common Mode

Division Ratio 250, 100, 50

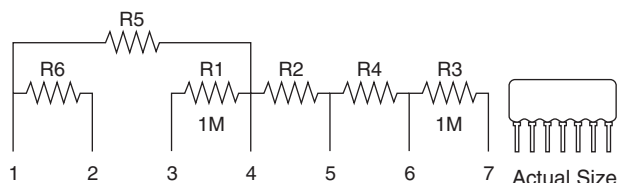
R1 = R3 = 1M

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

### SIX RESISTOR NETWORK

(Designed for Unity Gain/High Common Mode Voltage Rejection Differential Amplifier)

#### ORDERING INFORMATION

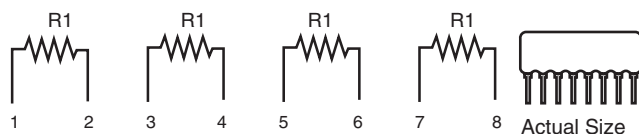
$\frac{R1}{R2}$  = Division Ratio = 250: VTF442BX

100: VTF443BX

50: VTF444BX

Lead (Pb)-free option add "S" after part number, e.g: VTF442SBX

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



L = Total Length = 0.820" (20.83 mm) Max.

H = Seated Height = 0.280" (7.11 mm) Max.

### FOUR EQUAL RESISTORS ISOLATED

#### ORDERING INFORMATION

R1 = 1K: VTF329BX

2K: VTF1001BX

5K: VTF1002BX

10K: VTF158BX

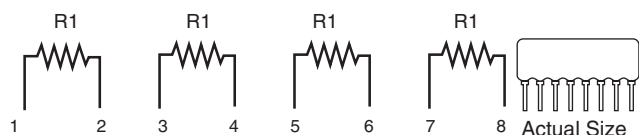
25K: VTF1003BX

50K: VTF1004BX

100K: VTF288BX

Lead (Pb)-free option add "S" after part number, e.g: VTF329SBX

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.

### FOUR EQUAL RESISTORS ISOLATED

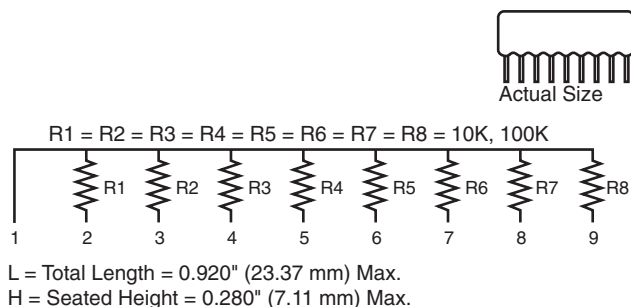
#### ORDERING INFORMATION

R1 = 1K: VTF1005BX

10K: VTF1006BX

100K: VTF1137BX

Lead (Pb)-free option add "S" after part number, e.g: VTF1005SBX

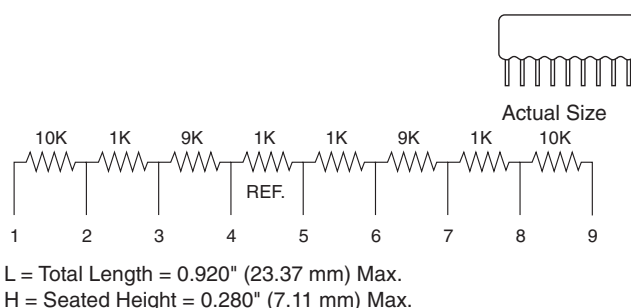


### EIGHT EQUAL RESISTORS ONE COMMON

## ORDERING INFORMATION

|           |          |
|-----------|----------|
| R1 = 10K: | VTF368BX |
| 100K:     | VTF369BX |

Lead (Pb)-free option add "S" after part number, e.g: VTF368**SBX**



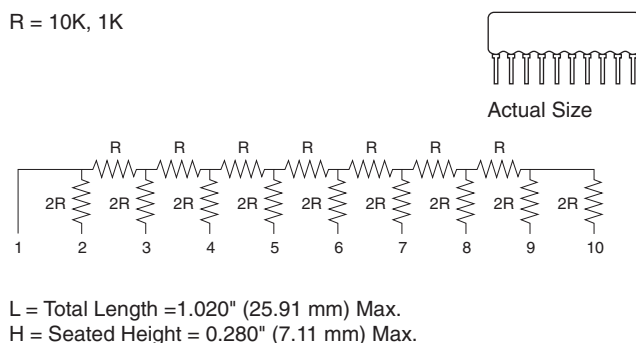
## EIGHT RESISTOR NETWORK

(Designed for Instrument Amplifier with Shield Driver)

## ORDERING INFORMATION

|          |
|----------|
| VTF272BX |
|----------|

Lead (Pb)-free option add "S" after part number, e.g: VTF272**SBX**

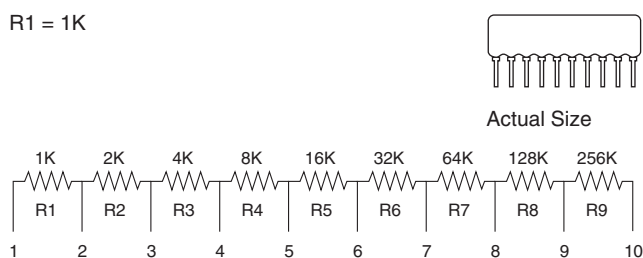


## EIGHT BIT R/2R LADDER NETWORK

## ORDERING INFORMATION

|                       |
|-----------------------|
| ( $\pm 1/2$ LSB)      |
| R = 1K:     VTF1072BX |
| R = 10K:    VTF267BX  |

Lead (Pb)-free option add "S" after part number, e.g: VTF1072**SBX**



## RESISTANCE DOUBLER

## ORDERING INFORMATION

|           |
|-----------|
| VTF1011BX |
|-----------|

Lead (Pb)-free option add "S" after part number, e.g: VTF1011**SBX**

Absolute Tolerance =  $\pm 0.1\%$

Ratio Tolerance =  $\pm 0.1 \%$

TCR Tracking =  $\pm 3$  ppm/ $^{\circ}\text{C}$

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)

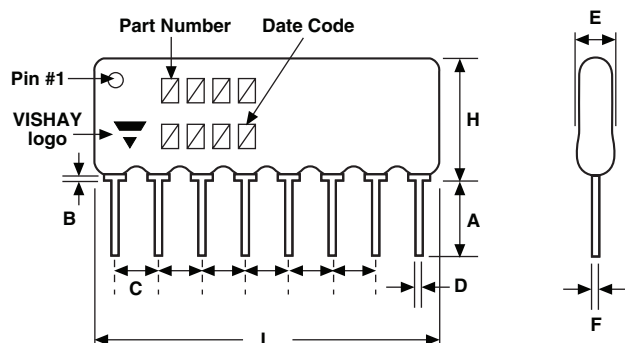


THROUGH HOLE  
NETWORKS

## STANDARD ELECTRICAL SPECIFICATIONS

| TEST                        |                  | SPECIFICATIONS                                  | CONDITIONS                                   |
|-----------------------------|------------------|-------------------------------------------------|----------------------------------------------|
| Material                    |                  | Passivated nichrome                             |                                              |
| TCR*:                       | Tracking         | $\pm 2 \text{ ppm}/^{\circ}\text{C}$            | $0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ |
|                             | Absolute         | $\pm 10 \text{ ppm}/^{\circ}\text{C}$           | $0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ |
| Tolerance:                  | Ratio            | $\pm 0.02 \%$                                   | $+25^{\circ}\text{C}$                        |
|                             | Absolute         | $\pm 0.1 \%$                                    | $+25^{\circ}\text{C}$                        |
| Stability:                  | $\Delta R$ Ratio | $\leq 0.01 \%$                                  | 2000 h at $+70^{\circ}\text{C}$              |
| Voltage Coefficient         |                  | $\pm 0.01 \text{ ppm/V}$                        |                                              |
| Working Voltage             |                  | 100 V                                           |                                              |
| Operating Temperature Range |                  | $0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$    |                                              |
| Storage Temperature Range   |                  | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ |                                              |
| Noise                       |                  | -35 dB                                          |                                              |
| Thermal EMF                 |                  | $< 0.1 \mu\text{V}/^{\circ}\text{C}$            |                                              |
| Shelf Life Stability:       | Absolute         | 100 ppm                                         | 1 year at $+25^{\circ}\text{C}$              |
|                             | Ratio            | 20 ppm                                          | 1 year at $+25^{\circ}\text{C}$              |

## 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.

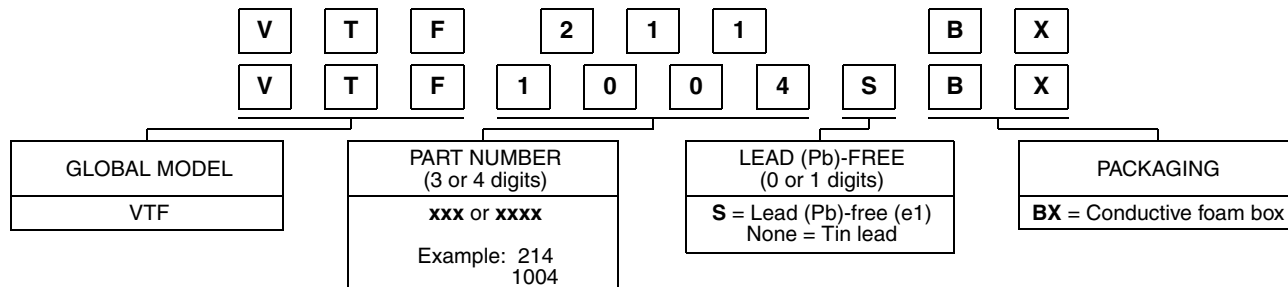
## MECHANICAL SPECIFICATIONS

|                                |                               |
|--------------------------------|-------------------------------|
| 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)



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





### Disclaimer

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

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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.