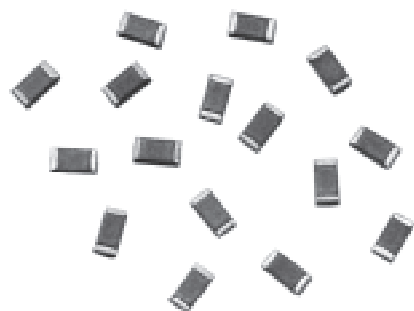


# Commercial Thin Film Chip Resistors

## Model TNPW



*Actual Size*  
TNPW-0603

### FEATURES

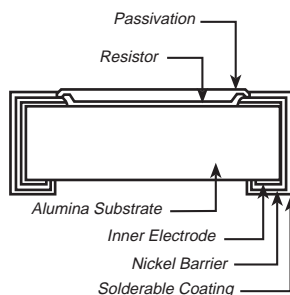
- Internationally standardized size
- Automatic placement compatibility
- Reflow solderable
- Thin film resistance element
- Wraparound termination
- Inner electrode protection
- 8mm reel or bulk packaging

### TYPICAL PERFORMANCE

	ABS
TCR	25
TOL	0.1

The Vishay Thin Film TNPW product offers internationally recognized sizes from 0402 (0510) to 1210 (3225). Our solder plated thin film wraparound termination offers consistent dimensions and the termination strength of sputtered thin film. The Nichrome resistive element along with the proprietary overcoat allows the design engineer to plan on the stability of Nichrome along with environmental protection. We can supply you with chips for nearly any application with our resistance range of 0.022 ohm through 1 megohm (see table for value vs. size availability). Whether your assembly needs are hand assembly, pick and place from a tray for prototypes or fully automated assembly from reels Vishay Thin Film chips can be delivered to you based upon your needs in bulk, in chip trays or on a reel.

### Construction



Test	Specifications	Conditions
Material	Nichrome	
Resistance Range	see case sizes	
Absolute TCR:	25 ppm/°C (Available to ±10 ppm/°C)	-55°C to +125°C
Stability (Δ R Ratio)	0.5% max	2000 x hrs. @ +70°C
Working Voltage	75 to 100 Volts	
Storage Temperature Range	-55°C to +150°C	
Noise	<-30 dB	
Shelf Life Stability	100 ppm	1 year @ +25°C
Operating Temperature Range	-55°C to +125°C	

# Commercial Thin Film Chip Resistors

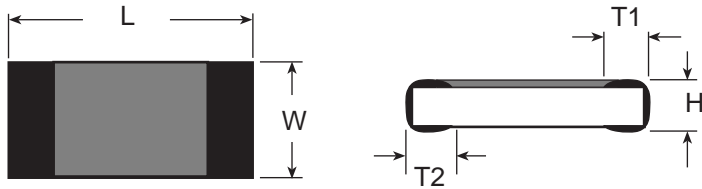
## Model TNPW



MODEL-Case Size	Temperature Coefficient Resistance	Resistance Range (Ohms)	Tolerance	Maximum Operating Voltage	Power Rating @ +70°C
TNPW-0603	±25 ppm/°C	100 - 33K	±0.5%	75	0.062 W
TNPW-0603	±50 ppm/°C	10 - 91	±0.5%	75	0.062 W
TNPW-0603	±100 ppm/°C	36K - 330K	±0.5%	75	0.062 W
TNPW-0805	±10, ±25 ppm/°C	100 - 250K	±0.1%	100	0.100 W
TNPW-0805	±50 ppm/°C	10 - 91	±0.5%	100	0.100 W
TNPW-1206	±25 ppm/°C	22.1 - 1M	±0.1%, ±0.5%, ±1.0%	100	0.125 W
TNPW-1206	±10, ±15 ppm/°C	100K - 1M	±0.1%, ±0.5%, ±1.0%	100	0.125 W
TNPW-1210	±25 ppm/°C	49.9 - 1M	±0.1%, ±0.5%, ±1.0%	100	0.250 W
TNPW-1210	±50 ppm/°C	22.1 - 1M	±0.5%, ±1.0%	100	0.250 W
TNPW-0805	±350 ppm/°C	0.022 - 0.68	±5%	*	0.250 W
TNPW-0805	±200 ppm/°C	0.1 - 4.7	±1%	*	0.250 W
TNPW-0402	±25 ppm/°C	100 Ω - 10K Ω	±0.5%	25	0.062 W
TNPW-0402	±100 ppm/°C	10 Ω - 91 Ω	±0.5%	25	0.062 W
TNPW-0402	±100 ppm/°C	11K Ω - 100K Ω	±0.5%	25	0.062 W

\* Voltage calculated by  $V = \sqrt{P \cdot R}$

### Dimensions and Imprinting



- TNPW-0603** — 3 digit code (E-24 decade values)
- TNPW-1206** — 4 digit code (E-96 decade values)
- TNPW-1210** — 4 digit code (E-96 decade value)
- TNPW-0805** - ±25 ppm/°C — 4 digit code (E-192 decade values)
- TNPW-0805** - ±50 ppm/°C & ±100 ppm/°C — 3 digit code # (E-96 decade values)  
# If the value can be specified in 3 digits
- TNPW-0402** — No value Marking (E-24 decade values)

MODEL	L	W	H	T1	T2
TNPW-0402 (0510)	0.039 ±0.002 (1.00 ±0.05)	0.020 ±0.002 (0.50 ±0.05)	0.014 ±0.002 (0.35 ±0.05)	0.008 ±0.004 (0.20 ±0.10)	0.008 ±0.004 (0.20 ±0.10)
TNPW-0603	0.063 ±0.008 (1.60 ±0.20)	0.032 ±0.008 (0.81 ±0.20)	0.016 ±0.004 (0.41 ±0.10)	0.012 ±0.008 (0.31 ±0.20)	0.012 ±0.008 (0.31 ±0.20)
TNPW-0805	0.080 ±0.008 (2.03 ±0.20)	0.049 ±0.008 (1.24 ±0.20)	0.016 ±0.004 (0.41 ±0.10)	0.016 ±0.010 (0.41 ±0.25)	0.016 ±0.010 (0.41 ±0.25)
TNPW-1206	0.126 ±0.006 (3.20 ±0.15)	0.063 ±0.006 (1.60 ±0.15)	0.024 ±0.006 (0.61 ±0.15)	0.020 ±0.010 (0.51 ±0.25)	0.020 ±0.010 (0.51 ±0.25)
TNPW-1210	0.126 ±0.006 (3.20 ±0.15)	0.098 ±0.006 (2.49 ±0.15)	0.024 ±0.006 (0.61 ±0.15)	0.018 ±0.008 (0.46 ±0.20)	0.018 ±0.004 (0.46 ±0.10)

# Commercial Thin Film Chip Resistors

## Model TNPW



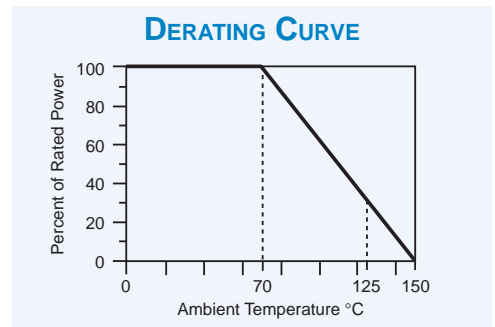
### Environmental Test

TEST	MAX. ΔR (Typical Test Lots)	Low Value TNPW-0805 and TNPW-0402 (MAX. ΔR)
Thermal Shock	±0.1% Max. +0.05 Ω	1.0%
Short Time Overload	±0.1% Max. +0.05 Ω	2.0%
Low Temperature Operation	±0.1% Max. +0.05 Ω	1.0%
High Temperature Exposure	±0.1% Max. +0.05 Ω	3.0%
Moisture Resistance	±0.2% Max. +0.05 Ω	3.0%
Resistance to Bonding Exposure	±0.2% Max. +0.05 Ω	2.0%
Solderability	±230°C, 5 sec., 95% coverage	+230°C, 5 sec., 95% coverage
Life	±0.5% Max. +0.05Ω	3.0%
Termination Adhesion	0.5 kg	0.5 kg

\*RCWV = √ .25W x Resistance Value

### Mechanical Specifications

Resistive Element ..... Nichrome  
 Substrate Material ..... Alumina



### How to Order

Model	Size	Value	Tolerance	Temperature Coefficient
TNPW	1206 0402 0603 0805 1206 1210	XXX or XXXX <b>3 Digit Code:</b> First two digits are significant figures. Last digit specifies the number of zeros to follow. <b>4 Digit Code:</b> First three digits are significant figures. Last digit specifies the number of zeros to follow.	B B = ±0.1% D = ±0.5% F = ±1.0%	T-9 T-1 = ±100 ppm/°C T-2 = ±50 ppm/°C T-9 = ±25 ppm/°C T-10 = ±15 ppm/°C T-13 = ±10 ppm/°C

±15 ppm/°C

TNPW	1206-2	XXX or XXXX	B
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### Low Value TNPW-0805

TNPW	0805	0.022	5%	RT5
		use Actual Value	use Actual Value	Paper Tape, 10,000 pc reels