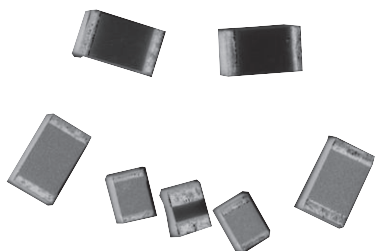




## Wraparound and Single-In-Line, Thin Film Nickel Temperature Sensors



### LINKS TO ADDITIONAL RESOURCES



Vacuum deposited nickel films are used to produce temperature sensors with various characteristics. The small size and small thermal mass of these devices result in a quick response to changes in temperature.

### FEATURES

- Conforms to the DIN 43760 specs in -60 °C to +180 °C temperature range
- TCR: 6180 ppm/°C (between 0 °C and 100 °C) <sup>(3)</sup>
- Wide resistance range: 25 Ω to 2500 Ω, TFS-S  
25 Ω to 250 Ω, TFS-W
- Packaging available: W/A, SIL
- 2 versions: SMD and through hole
- High stability ( $\frac{\Delta R}{R}$  and  $\frac{\Delta CT}{CT}$  < 0.2 % 1000 h at Pn at 150 °C)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	RESISTANCE RANGE AT 23 °C <sup>(1)</sup> Ω	RATED POWER W	MAX. CURRENT mA	TOLERANCE ± %	TEMPERATURE COEFFICIENT <sup>(2) (3)</sup> ± ppm/°C
TFS-S	0.2" lead spacing <sup>(4)</sup>	25 to 2500	0.500	5	1, 2	6180
TFS-W	0805	25 to 100	0.200	4	1, 2	6180
TFS-W	1206	25 to 250	0.330	4.5	1, 2	6180

### Notes

<sup>(1)</sup> Nominal value

<sup>(2)</sup> Between 0 °C and 100 °C

<sup>(3)</sup> The ohmic value  $R_T$  at temperature  $T$  (°C) depends on  $R_0$  (ohmic value at 0 °C) according to the following equation:

$$R_T/R_0 = 1 + 5.485 \times 10^{-3} T + 6.65 \times 10^{-6} T^2 + 2.805 \times 10^{-11} T^4$$

**Example:** A  $T = 100$  °C

$$R_T/R_0 = 1.6180$$

$$TCR = \pm 6180 \text{ ppm/°C}$$

Vishay Sfernice can calculate ohmic value at  $T = 0$  °C (as ohmic value mentioned in ordering procedure is at 23 °C)

<sup>(4)</sup> TFS-S is a single in line (through-hole)

### CLIMATIC SPECIFICATIONS

Operating temperature range	-55 °C to +125 °C
Storage temperature range	-55 °C to +155 °C

### MECHANICAL SPECIFICATIONS

Resistive element	Nickel, around 1.5 μm thick
Substrate material	99.6 % alumina
Leads (TFS-S)	Tin/silver plated on copper alloy
Terminals (TFS-W)	Tin silver over nickel

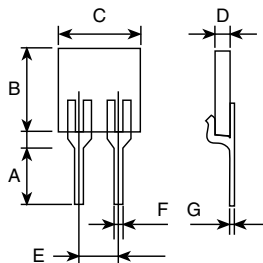
### TECHNICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
<b>MATERIAL</b>	<b>NICKEL</b>	
Tolerance on temperature	Up to 0, 33 °C	
Stability	$\frac{\Delta R}{R} < 0.2 \%$ ; $\frac{\Delta CT}{CT} < 0.2 \%$	1000 h at Pn at +150 °C
Thermal conductance (TFS-S only)	$\frac{1}{R_{th}} = 6.7 \text{ mW/°C}$ (for information only)	In air



**DIMENSIONS**

TFS-S Single-In-Line

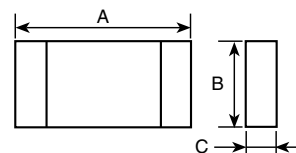


DIMENSION	INCHES	MILLIMETERS
A	0.200	3.17
B	0.200	5
C	0.200	5
D	0.025	0.63
E	0.100	2.54
F	0.020	0.50
G	0.010	0.25

**Note**

- Please refer to Vishay Sfernice Application Note “Guidelines for Vishay Sfernice Resistive and Inductive Products” for soldering recommendation (document number: 52029), paragraph 2: GENERAL SOLDERING RECOMMENDATION FOR THROUGH HOLE OR SMD COMPONENTS

TFS-W Chip for SMD



0805 DIMENSION	INCHES	MILLIMETERS
A	0.075	1.90
B	0.050	1.25
C	0.020	0.50

1206 DIMENSION	INCHES	MILLIMETERS
A	0.125	3.20
B	0.063	1.60
C	0.027	0.70

**Note**

- Please refer to Vishay Sfernice Application Note “Guidelines for Vishay Sfernice Resistive and Inductive Products” for soldering recommendation (document number: 52029), paragraph 3: GUIDELINES FOR SURFACE MOUNTING COMPONENTS (SMD). Profile #3 applies

PACKAGING
Waffle pack or tape and reel for TFS-W Sticks or special packaging for TFS-S

**HOW TO ORDER**

**Wraparound**

T F S W 0 8 0 5 - 5 6 R F

MODEL	STYLE	SIZE	OHMIC VALUE	TOLERANCE
TFS	W	0805 1206	In clear R stands for decimal point	F = 1 % G = 2 %

**Note**

- Ohmic value ordered is the one at 23 °C

**SIL**

T F S S - 2 K 5 F

MODEL	STYLE	OHMIC VALUE	TOLERANCE
TFS	S	In clear R stands for decimal point K stands for 1000	F = 1 % G = 2 %

**Note**

- Ohmic value ordered is the one at 23 °C

**Historical Part Number:**

TFS W 0805 56U 1 % e2  
TFS S 2K5 1 % e2



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