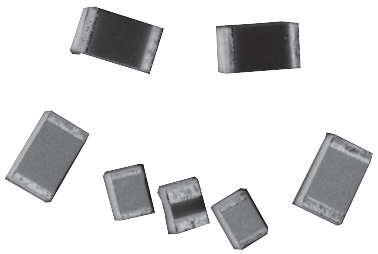
Wraparound and Single-In-Line, Thin Film Temperature Sensors



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) (3)
- Wide resistance range: 25 Ω to 2500 Ω, TFS-S
  25 Ω to 250 Ω, TFS-W
- Packaging available: W/A, SIL
- High stability ($\frac{\Delta R}{R}$ and $\frac{\Delta CT}{CT}$ < 0.2 % 1000 h at Pn at 150 °C)
- 2 versions: SMD and through hole
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* COMPLIANT

GREEN (5-2008) Available

Note

* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	RESISTANCE RANGE (1) Ω	RATED POWER W	TOLERANCE ± %	TEMPERATURE COEFFICIENT (2) (3) ± ppm/°C
TFS-S	0.2" lead spacing (4)	25 to 2500	0.500	1, 2	6180
TFS-W	0805	25 to 100	0.200	1, 2	6180
TFS-W	1206	25 to 250	0.330	1, 2	6180

Notes

(1) Nominal value at 23 °C

(2) Between 0 °C and 100 °C

(3) 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 = ± 6180 ppm/°C
Vishay Sfernice can calculate ohmic value at T = 0 °C (as ohmic value mentioned in ordering procedure is at 23 °C).

(4) 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

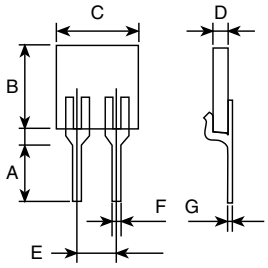
Resistive element	Nickel, around 1.5 µm thick
Substrate material	99.6 % alumina
Leads (TFS-S)	Tin/silver plated on copper alloy
Terminals (TFS-W)	Tin silver over nickel

TECHNICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
MATERIAL	**NICKEL**	
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
Dissipation factor (TFS-S only)	$\frac{1}{R_{th}}$ = 6.7 mW/°C (for information only)	In air

DIMENSIONS

TFS-S Single-In-Line

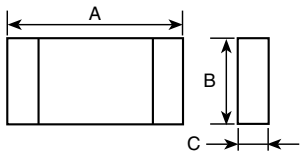


DIMENSION	INCHES	MILLIMETERS
A	0.200	3.17
B	0.200	5
C	0.200	5
D	0.025	0.63
E	0.100	2.54
F	0.020	0.50
G	0.010	0.25

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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