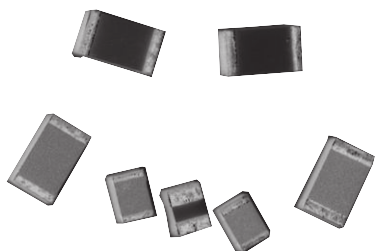




Wraparound and Single-In-Line, Thin Film Nickel Temperature Sensors



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) ⁽³⁾
- 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



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 ⁽¹⁾ Ω	RATED POWER W	MAX. CURRENT mA	TOLERANCE ± %	TEMPERATURE COEFFICIENT ^{(2) (3)} ± ppm/°C
TFS-S	0.2" lead spacing ⁽⁴⁾	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

⁽¹⁾ Nominal value

⁽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

$$R_T/R_0 = 1.6180$$

$$TCR = \pm 6180 \text{ ppm/°C}$$

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

⁽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

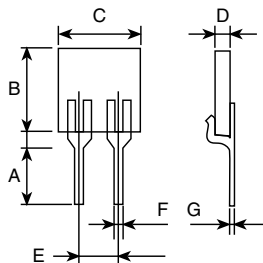
TECHNICAL SPECIFICATIONS

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
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

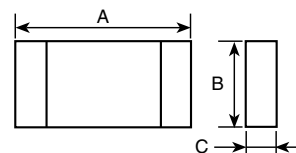


DIMENSION	INCHES	MILLIMETERS
A	0.200	3.17
B	0.200	5
C	0.200	5
D	0.025	0.63
E	0.100	2.54
F	0.020	0.50
G	0.010	0.25

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



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.