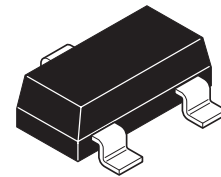


ZNI1000

TEMPERATURE SENSOR

DESCRIPTION

The ZNI1000 is a Ni thin film Resistance Temperature Detector (RTD), specified to DIN 43760. The high temperature coefficient offers higher signal outputs than other RTD's, which results in higher accuracy with smaller temperature changes.



SOT23

FEATURES

- Resistance at 0°C: 1000Ω
- SOT23 package
- Available on 8mm tape

APPLICATIONS

- Automotive electronic
- Circuit protection
- Temperature compensation
- Temperature measurement

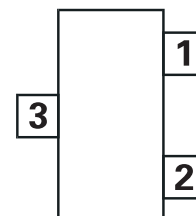
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZNI1000TA	7"	8mm	3,000 units
ZNI1000TC	13"	8mm	10,000 units

DEVICE MARKING

- ZNI

PINOUT



Top View

Pin 1 - Ni1000
Pin 2 - Ni1000
Pin 3 - need a good thermal contact for a short response time

ZNI1000

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Continuous current	I_{CC}	4	mA
Total power dissipation	P_{TOT}	20	mW
Operating temperature range	T_{amb}	-55 to +150	°C
Storage temperature range	T_{stg}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS

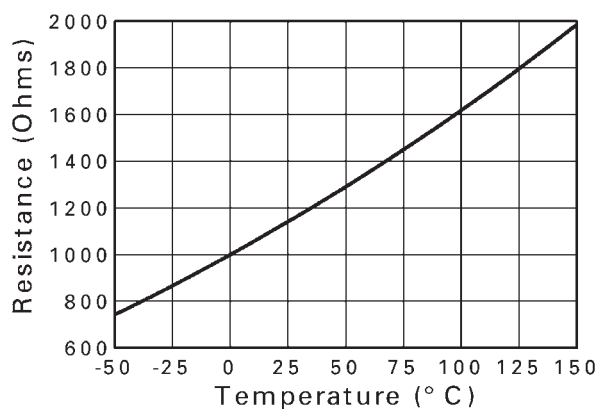
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	CONDITIONS
Resistance 0°C	R_0	-	1000	-	Ω	$T=0^\circ\text{C}$, $I<1\text{mA}$
Resistance 100°C	R_{100}	-	1618	-	Ω	$T=100^\circ\text{C}$, $I<1\text{mA}$
Tolerance class B		-	$\pm(0.4+0.028 \times T)$	-		-55 to 0°C
Tolerance class B		-	$\pm(0.4+0.007 \times T)$	-		0 to 150°C

CHARACTERISTICS ACCORDING TO DIN43760

Resistance at a given temperature

R_0	Resistance at 0°C	B	6.650×10^{-6}
T	Temperature in °C	C	2.805×10^{-11}
A	5.485×10^{-3}	D	-2.000×10^{-17}

$$R(T) = R_0 \times (1 + A \times T + B \times T^2 + C \times T^4 + D \times T^6)$$



Sensor Resistance vs Temperature

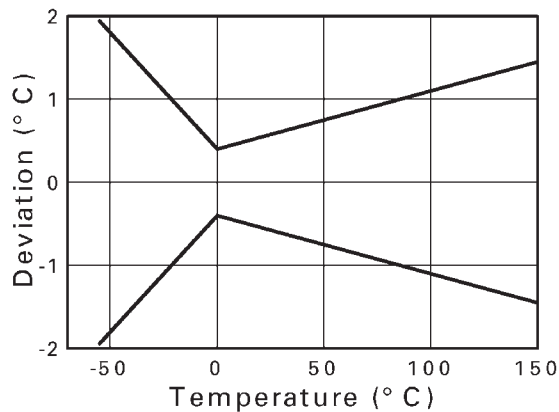
ZNI1000

Formula for temperature at a given resistance:

$$T(R) = a + bR + cR^2 + dR^3$$

coefficients:

$$\begin{aligned} a. &= -232.2 \\ b. &= 0.290 \\ c. &= -66.65 \times 10^{-6} \\ d. &= -8.85 \times 10^{-9} \end{aligned}$$



ZNI1000 Tolerances Class B

Tolerances: Class B +/- (0,4 + 0,007 *|TI|) in range from 0 to 150°C
 +/- (0,4 + 0,028 *|TI|) in range from -55 to 0°C

Specification: R₀ = 1000 Ohm at 0°C

Temperature range: operating -55 to +150°C
 storage -55 to +150°C

Long Term stability: ΔR = 0,1 % after 1000 h at 150°C

Measurement Current (DC): typ. 1,2 mA; max. 5 mA

Self heating

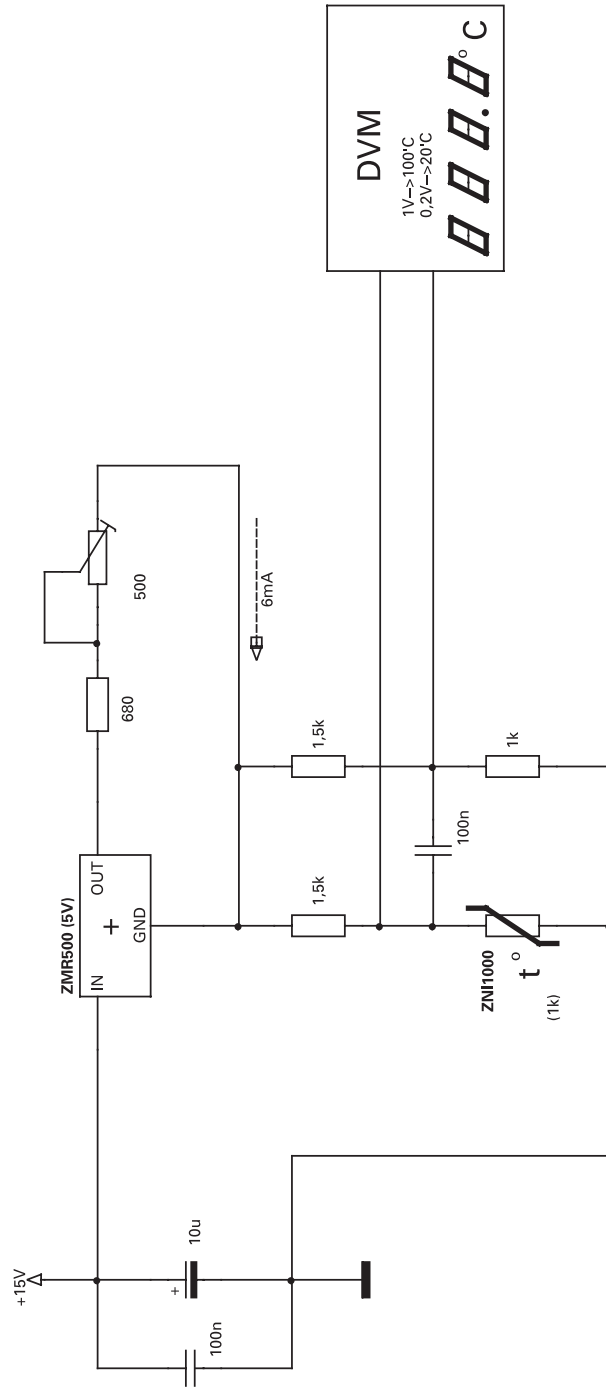
For accurate temperature measurement it's recommended to choose a small current in order to avoid self heating of the resistor. The temperature failure caused by the measurement current can be calculated with:

$$\Delta T = P/EK$$

where P = I² * R is the heat power caused by the measurement current and EK is the self heating coefficient.

The self heating coefficient for the Ni1000-SOT is EW=(1,7 ± 0,3) mW/K (Air: 23°C; no air flow)

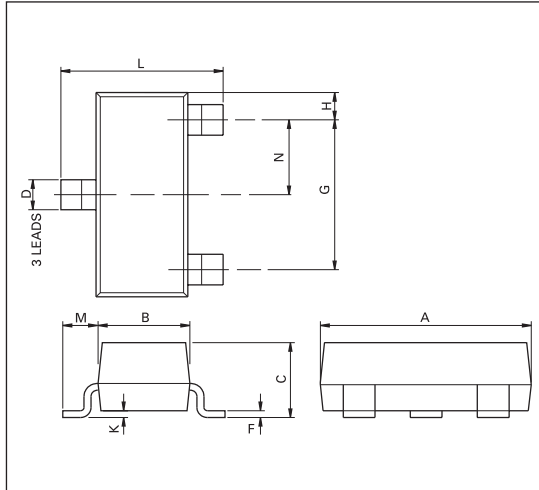
ZNI1000



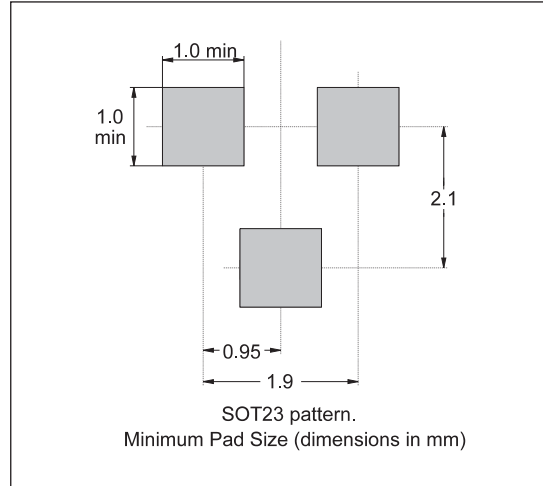
Application of the nickel sensor ZNI 1000

ZNI1000

PACKAGE OUTLINE



PAD LAYOUT



CONTROLLING DIMENSIONS IN MILLIMETERS APPROX CONVERSIONS INCHES

PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Max	Max
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	—	1.10	—	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		—	—		—	

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