

Silicon temperature sensors

KTY82-1 series

N AMER PHILIPS/DISCRETE 69E D

DESCRIPTION

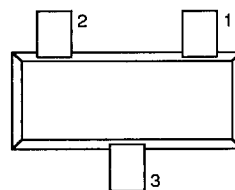
These temperature sensors have a positive temperature coefficient of resistance and are for use in measurement and control systems.

PINNING

PIN	DESCRIPTION
1	electrical contact
2	electrical contact
3	substrate (must remain potential free)

Marking codes:

KTY82-110: 110.
 KTY82-120: 120.
 KTY82-121: 121.
 KTY82-122: 122.
 KTY82-150: 150.
 KTY82-151: 151.
 KTY82-152: 152.



Top view

MSB003

Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
R_{25}	sensor resistance	$T_{amb} = 25\text{ }^{\circ}\text{C}; I_{cont} = 1\text{ mA}$			
	KTY82-110		990	1010	Ω
	KTY82-120		980	1020	Ω
	KTY82-121		980	1000	Ω
	KTY82-122		1000	1020	Ω
	KTY82-150		950	1050	Ω
	KTY82-151		950	1000	Ω
	KTY82-152		1000	1050	Ω
T_{amb}	ambient operating temperature range		-55	150	$^{\circ}\text{C}$

Note

Tolerances of 0.5% or other special selections available on request.

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LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{cont}	continuous sensor current	in free air; $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$	—	10	mA
		in free air; $T_{\text{amb}} = 150\text{ }^{\circ}\text{C}$	—	2	mA
T_{amb}	ambient operating temperature range		-55	150	$^{\circ}\text{C}$

CHARACTERISTICS

 $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$, in liquid, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
R_{25}	sensor resistance	$T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$; $I_{\text{cont}} = 1\text{ mA}$				
	KTY82-110		990	—	1010	Ω
	KTY82-120		980	—	1020	Ω
	KTY82-121		980	—	1000	Ω
	KTY82-122		1000	—	1020	Ω
	KTY82-150		950	—	1050	Ω
	KTY82-151		950	—	1000	Ω
	KTY82-152		1000	—	1050	Ω
TC	temperature coefficient		—	0.79	—	%/K
R_{100}/R_{25}	resistance ratio	at $T_{\text{amb}} = 100\text{ }^{\circ}\text{C}$ and $25\text{ }^{\circ}\text{C}$	1.676	1.696	1.716	
R_{-55}/R_{25}	resistance ratio	at $T_{\text{amb}} = -55\text{ }^{\circ}\text{C}$ and $25\text{ }^{\circ}\text{C}$	0.480	0.490	0.500	
τ	thermal time constant (note 1)	in still air	—	7	—	s
		in still liquid (note 2)	—	1	—	s
		in flowing liquid	—	0.5	—	s
	rated temperature range		-55	—	150	$^{\circ}\text{C}$

Notes

- The thermal time constant is the time the sensor needs to reach 63.2% of the total temperature difference. For example, the time needed to reach a temperature of $72.4\text{ }^{\circ}\text{C}$, when a sensor with an initial temperature of $25\text{ }^{\circ}\text{C}$ is put into an ambient with a temperature of $100\text{ }^{\circ}\text{C}$.
- Inert liquid FC43 by 3M.

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AMBIENT TEMPERATURES AND CORRESPONDING RESISTANCE OF
SENSOR $I_{\text{cont}} = 1 \text{ mA}$.

AMBIENT TEMPERATURE (°C)	RESISTANCE (Ω)
-55	490
-50	515
-40	567
-30	624
-20	684
-10	747
0	815
10	886
20	961
25	1000
30	1040
40	1122
50	1209
60	1299
70	1392
80	1490
90	1591
100	1696
110	1805
120	1915
125	1969
130	2023
140	2124
150	2211

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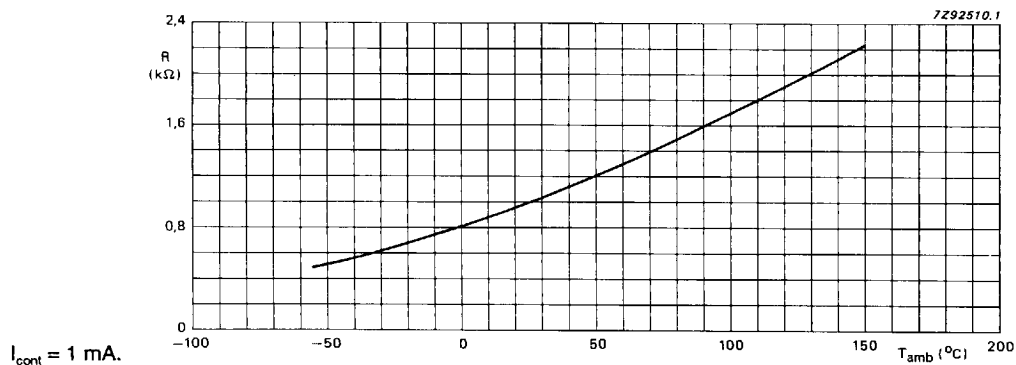


Fig.2 Average resistance value of sensor as a function of ambient temperature.

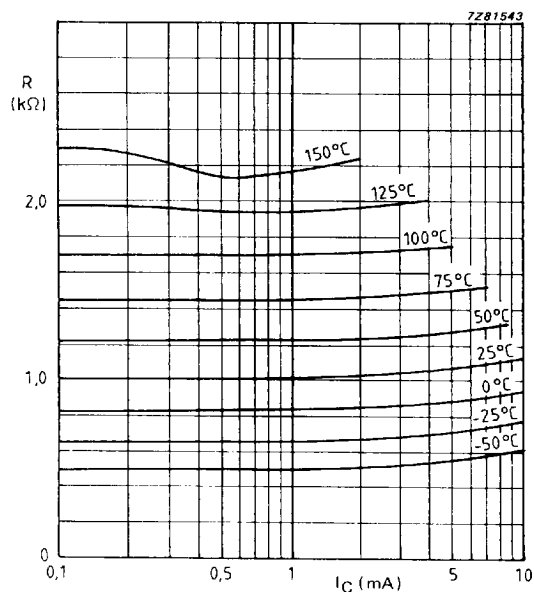


Fig.3 Sensor resistance as a function of operating current.

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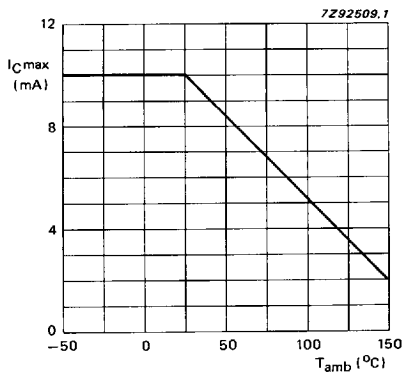
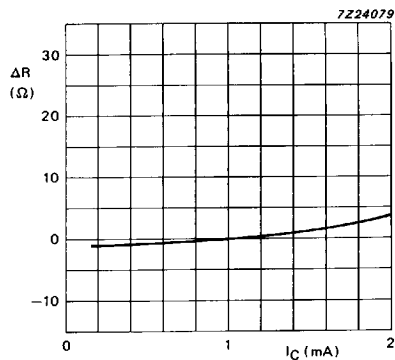


Fig.4 Maximum operating current for safe operation.



$T_{amb} = 25^\circ\text{C}$.

Fig.5 Deviation of sensor resistance as a function of operating current in still liquid.

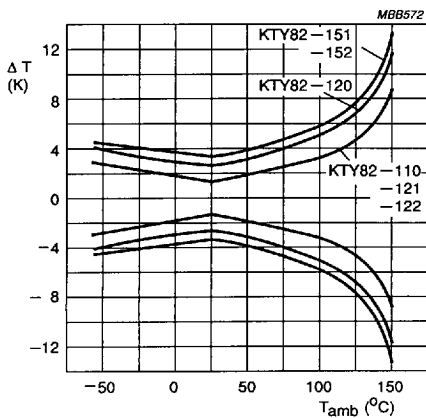


Fig.6 Maximum expected temperature error (ΔT).

Note

To keep the temperature error low, an operating current of $I_{cont} = 1\text{ mA}$ is recommended for temperatures above 100°C .

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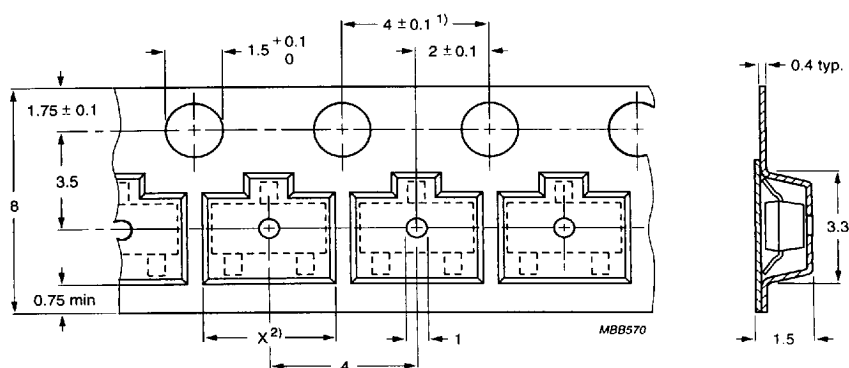
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PACKING DIMENSIONS

Tape specification

Sensors in SOT23 encapsulation are delivered in reel packing for automatic placement on hybrid circuits and printed circuit boards. The devices are placed with the mounting side downwards in compartments.



Dimensions in mm.

1) Tolerance over any 10 pitches: ± 0.2 mm.

X = component length + 0.2 mm.

Fig.7 Configuration of bandolier.

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PACKAGE OUTLINE

