

## NTC Thermistors, Flex Foil Sensors



**DESIGN SUPPORT TOOLS** click logo to get started



- NTC curve computation:  
[www.vishay.com/thermistors/ntc-curve-list/](http://www.vishay.com/thermistors/ntc-curve-list/)

QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	10K to 122K	Ω
Tolerance on $R_{25}$ -value	± 1; ± 3	%
$B_{25/85}$ -value	3435 to 3960	K
Tolerance on $B_{25/85}$ -value	± 1	%
Operating temperature range at zero power	-40 to +125	°C
Thermal time constant by heating <sup>(1) (3)</sup>	2	s
Thermal gradient <sup>(3)</sup>	< 0.02	K/K
Minimum dielectric withstanding voltage <sup>(2)</sup>	500	V <sub>AC</sub>
Minimum insulation resistance	10	MΩ
Maximum dissipation at 25 °C	60	mW
Weight (without connector)	0.06	g

### Notes

- (1) Measured from 25 °C air to 125 °C heated plate, pressed on the surface
- (2) Withstanding voltage up to 4 kV<sub>AC</sub> between the NTC and the bottom stiffener
- (3) Thermal time constant and thermal gradient are dependent on the way of mounting

### FEATURES

- Rapid response time on surface down to 2 s
- Suitable for narrow space applications
- High flexibility of the foil
- Insulated and humidity resistant
- A strain relief hole is included in the flex design to avoid traction to the sensor head
- Gold plated terminations
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### APPLICATIONS

- Consumer appliances and white goods
- Power supply (heat-sinks)
- Battery, displays, LED
- Industrial applications, robotics
- Boilers
- EV and HV batteries

### DESCRIPTION

- Miniature NTC thermistor body mounted on an insulated flex foil and topped with an insulating epoxy glob top
- For flat surface temperature sensing with low thermal mass and rapid response time

### MOUNTING

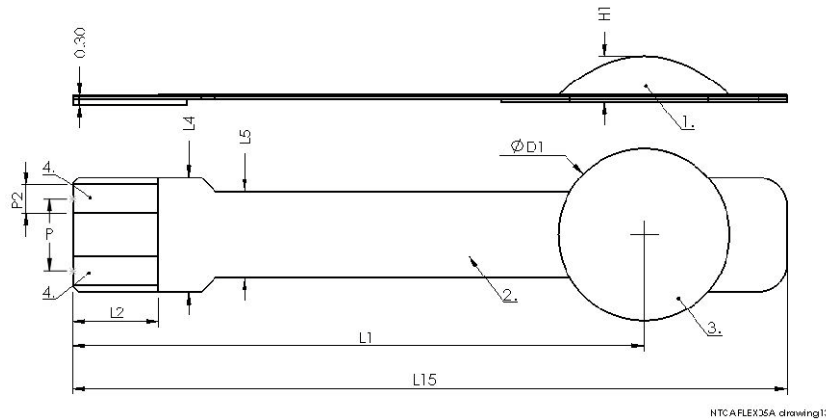
- The stiff flat sensing area can be pressed against a flat surface by means of insulating material (silicone foam), by spring force or by taping it with a double sided temperature resistant adhesive
- The sensor contacts can be connected to a PCB counter-connector or wire-to-wire connector or soldered to conductors, or crimped with FFC connectors and ZIF connectors
- A mating connector can be for example a 0.5 mm pitch 7 poles connector for FPC, with top contacts, accepting 4 mm FPC width, ZIF or non-ZIF versions. The poles (1 + 2) and (6 + 7) can be used for the electrical connection. For example in SMT versions : TE 1734839-7, Hirose FH34S-7S-0,5SH(50), Molex 054550-0771, Molex 052745-0797
- Consult Vishay for other screw sizes, lead length, insulation, connector crimping or other features

### Note

- FFC/FPC = Flexible Film Circuit/Flexible Printed Circuit

ELECTRICAL DATA AND ORDERING INFORMATION					
$R_{25}$ (Ω)	$R_{25}$ -TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$ -TOL (± %)	DESCRIPTION	SAP MATERIAL AND ORDERING NUMBER
10 000	1	3435	1	NTC Flex05 10K 1 % 3435K 25 mm	NTCAFLEX05103FL
10 000	3	3960	1	NTC Flex05 10K 3 % 3960K 25 mm	NTCAFLEX05103HH
47 000	3	3960	1	NTC Flex05 47K 3 % 3960K 25 mm	NTCAFLEX05473HH
122 000	1	3590	1	NTC Flex05 122K 1 % 3590 K 25 mm	NTCAFLEX05124FM

SAP CODIFICATION							
Part Number: NTCAFLEX01473HH							
<div style="display: flex; justify-content: space-around; font-weight: bold; font-size: 1.2em;"> <span>N</span><span>T</span><span>C</span><span>A</span><span>F</span><span>L</span><span>E</span><span>X</span><span>0</span><span>5</span><span>4</span><span>7</span><span>3</span><span>H</span><span>H</span><span> </span> </div>							
MODEL	ASSEMBLY	FLEX SENSOR	MECHANICAL EXECUTION	RESISTANCE VALUE	TOLERANCE ON $R_{25}$	B-VALUE RANGE	OPTION
NTC	A	FLEX	05	<b>103</b> = $10 \times 10^3 \Omega$ <b>473</b> = $47 \times 10^3 \Omega$ <b>124</b> = $12.2 \times 10^4 \Omega$	<b>H</b> = $\pm 3\%$ <b>F</b> = $\pm 1\%$	<b>L</b> (low) = $3000 \leq B_{25/85} < 3500$ <b>M</b> (medium) = $3500 \leq B_{25/85} < 3750$ <b>H</b> (high) = $3750 \leq B_{25/85} < 4000$ <b>X</b> (very high) = $4000 \leq B_{25/85} < 4250$	Blank

**MECHANICAL DATA**


DIMENSIONS in millimeters								
L1	L15	L2	Ø D1	L4	L5	H1	P	P2
20 ± 1	25 ± 1	3 ± 0.5	6 ± 0.5	4 ± 1	3 ± 1	1.40 ± 0.2	2.50	1

1. NTC on flex foil circuit, sensing area on the flat bottom side
2. Flex foil circuit
3. High quality modified epoxy glob top
4. Conductive tracks, gold plated

RELIABILITY TEST (following IEC 60068 test methods)		
TEST	PROCEDURE	REQUIREMENT
Dry heat, steady state	125 °C; 1000 h	$\Delta R/R \leq 3\%$
Damp heat, steady state	56 days at 40 °C 90 % to 95 % RH	$\Delta R/R \leq 3\%$
Rapid change of temperature	-40 °C to +125 °C; 100 cycles	$\Delta R/R \leq 3\%$



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