NTC Thermistors, Flex Foil Sensors



LINKS TO ADDITIONAL RESOURCES

3D Models Design Tools

QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	10K to 122K	Ω
Tolerance on R_{25}-value	± 1; ± 2; ± 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 (1) (3)	2	s
Thermal gradient (3)	< 0.02	K/K
Minimum dielectric withstanding voltage (2)	500	V_{AC}
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_{AC} between the NTC and the bottom stiffener

(3) Thermal time constant and thermal gradient are dependent on the way of mounting

DESIGN-IN SUPPORT

- Other resistance curves and tolerances are available on request
- 3D solid models: www.vishay.com/doc?29158
- NTC curve computation: www.vishay.com/en/thermistors/ntc-rt-calculator/

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
- Mounting: flat surface
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb e4 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 with bottom stiffeners 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, Molex 054550-0771, Molex 052745-0797

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	2	3435	1	NTC Flex05 10K 2 % 3435K 25 mm	NTCAFLEX05103GL
10 000	3	3960	1	NTC Flex05 10K 3 % 3960K 25 mm	NTCAFLEX05103HH
10 000	3	3960	1	NTC Flex15 10K 3 % 3960K 25 mm	NTCAFLEX15103HH
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

For technical questions, contact: nlr@vishay.com

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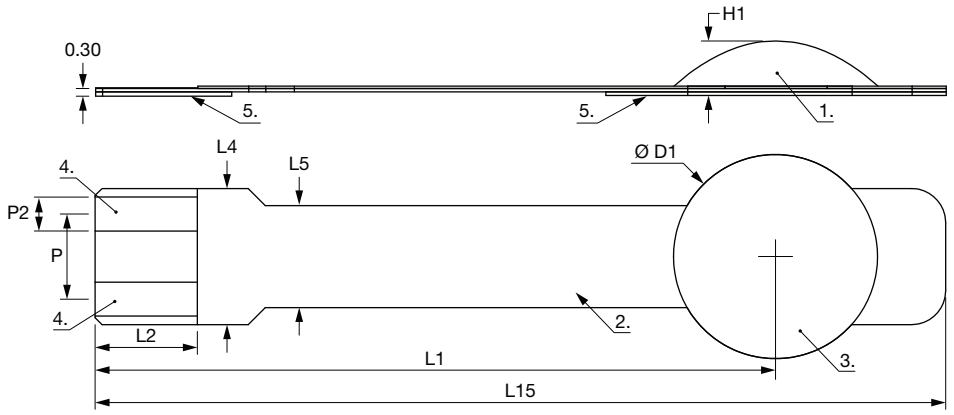
SAP CODIFICATION

Part Number: NTCAFLEX05473HH

N	T	C	A	F	L	E	X	0	5	4	7	3	H	H	

MODEL	ASSEMBLY	FLEX SENSOR	MECHANICAL EXECUTION	RESISTANCE VALUE	TOLERANCE ON R_{25}	B-VALUE RANGE	OPTION
NTC	**A**	**FLEX**	**05** **15**	**103** = 10 x 10^3 Ω **473** = 47 x 10^3 Ω **124** = 12.2 x 10^4 Ω	**F** = ± 1 % **G** = ± 2 % **H** = ± 3 %	**L** (low) = 3000 ≤ $B_{25/85}$ < 3500 **M** (medium) = 3500 ≤ $B_{25/85}$ < 3750 **H** (high) = 3750 ≤ $B_{25/85}$ < 4000 **X** (very high) = 4000 ≤ $B_{25/85}$ < 4250	**Blank**

MECHANICAL DATA



DIMENSIONS in millimeters

MODEL	L1	L15	L2	Ø D1	L4	L5	H1	P	P2
NTCAFLEX05	20 ± 1	25 ± 1	3 ± 0.5	6 ± 0.5	4 ± 1	3 ± 1	1.40 ± 0.2	2.50	1
NTCAFLEX15	20 ± 1	25 ± 1	3 ± 0.5	6 ± 0.5	5.5 ± 1	3 ± 1	1.40 ± 0.2	3.00	1.5

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
5. Bottom stiffener

TEST REQUIREMENTS

DESCRIPTION	TEST REFERENCE	TEST CONDITIONS	REQUIREMENTS MAX. $\lvert\Delta R_{25}/R_{25}\rvert$
High temperature exposure	MIL-STD 202 method 108	125 °C; 1000 h	3 %
Temperature cycling	JESD22 method JA-104	-40 °C to +125 °C; 1000 cycles	3 %
Biased humidity	MIL-STD 202 method 103	85 °C / 85 % RH; 5 V_{DC}, R_S = 1 kΩ; 1000 h	3 %
Biased damp heat	IEC 60068-2-78	40 °C / 95 % RH; 5 V_{DC}, R_S = 1 kΩ; 1344 h	3 %
Operational life	MIL-STD 202 method 108	125 °C; 5 V_{DC}, R_S = 1 kΩ; 1000 h	3 %
Terminal strength (leaded)	MIL-STD 202 method 211	Condition A: pull test 2.27 kg	3 %
Terminal strength (leaded)	MIL-STD 202 method 211	Condition C: bending wire 227 g	3 %
Resistance to solvents	AEC-Q200 + MIL-STD 202 method 215	Solvent 1, solvent 2, solvent 3, solvent 4	3 %
Mechanical shock	MIL-STD 202 method 213	Shock and vibration sequential	3 %
Vibration	MIL-STD 202 method 204	Shock and vibration sequential	3 %
Resistance to soldering heat	MIL-STD 202 method 210	RSH 260 °C 10 s	3 %
ESD	AEC-Q200-002	ESD 25 kV air discharge	3 %
Solderability	J-STD-002	Method A: dip and look	3 %
Flammability	UL 94	V-0 or V-1	V-0 or V-1

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