

■ Application



EV Motor Protection
From Over Heating.



EV Motor Thermal
Monitoring & Management



Safety Cutoff
Motor Protection

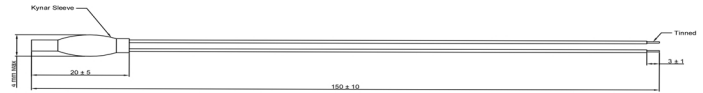
■ Features

- Tight tolerance on resistance at 25°C (R10= ohms @25°C) and on the Beta (β) constant $\pm 1\%$ or $\pm 3\%$ tolerance.
- Fast response time (low thermal time constant) so changes in temperature (especially under load) are sensed promptly.
- High temperature capability (because motor housing / stator may see 120 °C - 150°C or higher depending on cooling).
- Customisable lead lengths, insulation type, connector options, mounting form (probe, clip, adhesive patch, embedded) depending on motor design.

■ Options Available

- Encapsulation types: epoxy coated, glass encapsulated bead, metal housing (immersion sensors), chip version.
- Lead types: insulated thin wires, high temp wires, connectorized harness, or simple pair of wires.
- Tolerance classes: e.g., $\pm 1\%$, $\pm 3\%$ on $R_{(25)}$ and $\pm 1\%$ or $\pm 2\%$ on Beta, depending on cost/accuracy.
- Leadwire options: insulated thin wires, high temp wires, connectorized harness, or simple pair of wires. Lead length, cable gauge, connector type can be customised

■ Dimensions



■ Electrical Data (Resistance and Beta Values)

Resistance At 25°C (Ω)	Beta Value (25°C/85°C) (Unit :K)	Resistance At 25°C (Ω)	Beta Value (25°C/85°C) (Unit :K)
2000	3540	20000	4000
2057	3540	30000	4050
2800	3900	47000	4100
3000	3977	49300	3960
4700	3977	50000	4100
5000	3977	100000	4400
10000	3977	170000	4250

■ Rated Temp and Dissipation Factor

Heat capacity (Cth) :		$\approx 18 \text{ mJ/K}$	
Lower Temperature :	-40°C	Dissipation factor in air($\delta\theta$) :	approx 1.5 mW/K
Upper Temperature :	140°C	Beta Tolerance ($\Delta\beta/\beta$) :	$\pm 1\%$, $\pm 2\%$, $\pm 3\%$.
Max Permissible Power at 25°C :	60 mW	Resistance Tolerance ($\Delta R/R$) :	$\pm 0.5\%$, $\pm 1\%$, $\pm 2\%$, $\pm 5\%$
Rated Temperature (TN) :	25°C	Thermal cooling time constant in air (τ_c) :	$\approx 12s$

■ Reliability Data

Test	Standard	Test Conditions	Change In R	Remarks
Storage in dry heat	IEC 60068-2- 2	Storage at upper category temp T: 100°C t: 1000 h	<2%	No Visible Damage
Storage in damp heat, steady state	IEC 60068 - 2- 78	Temp of air:40 °C Relative humidity of air: 93 % Duration: 56 days	<2%	No Visible Damage
Storage in coldness		Storage at lower category temp T: -30 °C t: 1000 h	<2%	No Visible Damage
Vibration resistance	IEC 60068-2-6	Frequency range: 5 to 500 Hz Amplitude: 7.5 mm, 2 g Duration: 3 x 8 h	<3%	No Visible Damage
Long-term stability (empirical value)		Temperature: 200 °C t: 10000 h	<3%	No Visible Damage
Voltage proof Test		1250 V AC, 1 s	<3%	No Flashover
Insulation test		The sensors are placed in a vessel containing metallic balls of 1 mm diameter (with total immersed head). The applied voltage is 100 V DC.		Above 1000 M Ω
Rapid temperature cycling	IEC 60068 - 2- 14	Lower test temp :- -30°C Upper test temp : 150°C Time to change from Low to Up Temp : <30s Number of cycles: 1000 Medium: air	<2%	No Visible Damage

■ Ordering Codes For Sensor

STTS		103	R5	E49	K	H	151	3977
Product Category		Beta Value @ (25 °C/85 °C)						
STTS	NTC THERMISTOR TEMPERATURE SENSOR SERIES	3977 3977K						
		3435 3435K						
		3930 3930K						
Resistance Value @0 °C (In Ohm Unit)								
PT 1000	1000 Ohm							
PT 100	100 Ohm							
PT 200	200 Ohm							
Resistance Value Tolerance		Wire Length						
R5	5% Tolerance in Resistance Value	151	150 MM					
R1	1% Tolerance in Resistance Value	1001	1000 MM					
R2	2% Tolerance in Resistance Value	211	210 MM					
Encapsulation		Wire Gauge						
E49	Kynar Sleeve Shrunk	N	AWG 21					
E127	FEP Sleeve Shrunk	P	AWG 20					
E01	Blue Epoxy Powder Coating	H	AWG 26					
Wire Type								
M	PTFE Multicore Copper Wire(Shielded)							
K	PTFE Multi strand copper wire							
AA	FEP Multi strand copper wire							