Waitrony

Thermistor – Thermal Sensor

Module No.: TS-10KNF

1. General Description:

The TS-10KNF is a compact size thermistor for temperature measurement. It is usually used for temperature-controlled equipment as well as sensor in wide range application. This thermistor has high precision and excellent endurance against thermal cycle.
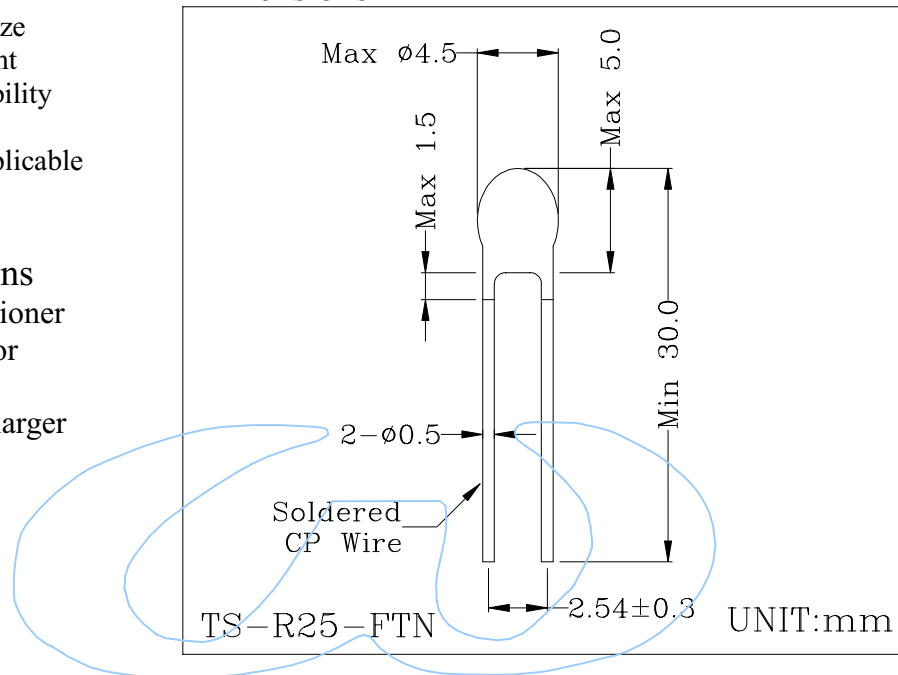
2. Features

➢ Compact Size
➢ Light Weight
➢ High Reliability
➢ Low Cost
➢ Widely Applicable

3. Applications

▭ Air Conditioner
▭ Refrigerator
▭ Heater
▭ Battery Charger

Dimensions

Max ø4.5 Max 5.0 Max 1.5 Min 30.0 2-ø0.5 Soldered CP Wire 2.54±0.3 TS-R25-FTN UNIT:mm

4. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Rated Power at 25°C	P_{R25}	10	mW
Operating Temperature	Topr	-30 ~ +110	°C
Storage Temperature	Tstg	-30 ~ +110	°C
Soldering Temperature *1	Tsol	250	°C

*1 At the position of 2mm from the glass package within 5 second.

5. Electro-thermal Characteristics

Parameter	Symbol	Value	Unit	Tolerance
Resistance at 25°C	R_{25}	10	kΩ	±3%
Material Thermal Constant *2	B	3,970	K	±2%
Thermal Time Constant *3	τ	1	sec.	
Dissipation Factor *4	δ	3.0	mW/°C	

*2 Material thermal constant (B value) is calculated from R25 and R85 where R25 and R85 are the resistance at 25°C and 85°C respectively.

*3 Thermal time constant (τ) is the time required by a thermistor to change 63.2% of the difference between its initial and final temperature.

*4 Dissipation factor (δ) is power required to raise thermistor temperature 1°C.

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5. Temperature Characteristics

Temp. (°C)	Rmin (kΩ)	Rcent (kΩ)	Rmax (kΩ)	DR	DT (°C)	Temp. (°C)	Rmin (kΩ)	Rcent (kΩ)	Rmax (kΩ)	DR	DT (°C)
-30	159.2	173.8	189.60	9.05%	1.42	41	4.899	5.119	5.343	4.39%	1.10
-29	150.0	163.6	178.20	8.92%	1.41	42	4.704	4.919	5.139	4.47%	1.13
-28	141.4	154.0	167.50	8.79%	1.40	43	4.518	4.728	4.943	4.55%	1.16
-27	133.3	145.0	157.60	8.66%	1.39	44	4.340	4.545	4.756	4.64%	1.19
-26	125.8	136.6	148.30	8.53%	1.38	45	4.170	4.371	4.577	4.72%	1.22
-25	118.7	128.8	139.60	8.40%	1.37	46	4.008	4.204	4.406	4.80%	1.25
-24	112.0	121.4	131.40	8.27%	1.36	47	3.853	4.044	4.242	4.88%	1.27
-23	105.8	114.5	123.80	8.15%	1.35	48	3.704	3.892	4.085	4.96%	1.30
-22	99.89	108.0	116.70	8.02%	1.33	49	3.563	3.746	3.934	5.04%	1.33
-21	94.38	101.9	110.00	7.90%	1.32	50	3.427	3.606	3.790	5.12%	1.36
-20	89.20	96.22	103.70	7.77%	1.31	51	3.297	3.472	3.652	5.20%	1.39
-19	84.34	90.87	97.82	7.65%	1.30	52	3.173	3.344	3.520	5.28%	1.42
-18	79.76	85.84	92.30	7.53%	1.29	53	3.054	3.221	3.394	5.36%	1.45
-17	75.46	81.12	87.13	7.40%	1.28	54	2.940	3.103	3.272	5.44%	1.48
-16	71.42	76.69	82.28	7.28%	1.26	55	2.832	2.990	3.155	5.52%	1.51
-15	67.61	72.52	77.72	7.16%	1.25	56	2.727	2.882	3.044	5.59%	1.54
-14	64.03	68.61	73.44	7.04%	1.24	57	2.627	2.779	2.936	5.67%	1.57
-13	60.66	64.92	69.42	6.93%	1.23	58	2.532	2.680	2.834	5.75%	1.60
-12	57.48	61.45	65.64	6.81%	1.22	59	2.440	2.584	2.735	5.83%	1.63
-11	54.49	58.19	62.09	6.69%	1.20	60	2.352	2.493	2.640	5.90%	1.66
-10	51.67	55.12	58.74	6.58%	1.19	61	2.267	2.405	2.549	5.98%	1.69
-9	49.01	52.23	55.60	6.46%	1.18	62	2.187	2.321	2.462	6.05%	1.72
-8	46.51	49.50	52.65	6.35%	1.16	63	2.109	2.240	2.378	6.13%	1.76
-7	44.14	46.94	49.86	6.23%	1.15	64	2.035	2.163	2.297	6.20%	1.79
-6	41.91	44.52	47.24	6.12%	1.14	65	1.963	2.088	2.219	6.28%	1.82
-5	39.80	42.23	44.77	6.01%	1.13	66	1.894	2.017	2.145	6.35%	1.85
-4	37.81	40.08	42.45	5.90%	1.11	67	1.829	1.948	2.073	6.43%	1.88
-3	35.94	38.05	40.25	5.79%	1.10	68	1.765	1.882	2.004	6.50%	1.91
-2	34.16	36.13	38.19	5.68%	1.09	69	1.705	1.818	1.938	6.57%	1.95
-1	32.48	34.32	36.24	5.57%	1.07	70	1.646	1.757	1.874	6.64%	1.98
0	30.90	32.62	34.40	5.46%	1.06	71	1.590	1.699	1.813	6.72%	2.01
1	29.40	31.00	32.66	5.36%	1.04	72	1.536	1.642	1.754	6.79%	2.04
2	27.98	29.48	31.02	5.25%	1.03	73	1.485	1.588	1.697	6.86%	2.08
3	26.64	28.03	29.48	5.15%	1.02	74	1.435	1.536	1.642	6.93%	2.11
4	25.37	26.67	28.01	5.04%	1.00	75	1.387	1.485	1.589	7.00%	2.14
5	24.16	25.38	26.63	4.94%	0.99	76	1.341	1.437	1.539	7.07%	2.18
6	23.03	24.16	25.33	4.83%	0.97	77	1.297	1.390	1.490	7.15%	2.21
7	21.95	23.01	24.09	4.73%	0.96	78	1.254	1.346	1.443	7.22%	2.25
8	20.92	21.91	22.93	4.63%	0.95	79	1.213	1.302	1.397	7.29%	2.28
9	19.96	20.88	21.82	4.53%	0.93	80	1.173	1.261	1.354	7.36%	2.31
10	19.04	19.90	20.78	4.43%	0.92	81	1.135	1.221	1.311	7.42%	2.35
11	18.17	18.97	19.79	4.33%	0.90	82	1.099	1.182	1.271	7.49%	2.38
12	17.34	18.09	18.85	4.23%	0.89	83	1.063	1.145	1.231	7.56%	2.42
13	16.55	17.25	17.97	4.13%	0.87	84	1.029	1.109	1.194	7.63%	2.45
14	15.81	16.46	17.13	4.03%	0.86	85	0.9967	1.074	1.157	7.70%	2.49
15	15.10	15.71	16.33	3.93%	0.84	86	0.9651	1.041	1.122	7.77%	2.52
16	14.43	15.00	15.57	3.84%	0.83	87	0.9347	1.009	1.088	7.84%	2.56
17	13.79	14.32	14.86	3.74%	0.81	88	0.9054	0.9778	1.055	7.90%	2.59
18	13.19	13.68	14.18	3.65%	0.80	89	0.8771	0.9479	1.023	7.97%	2.63
19	12.61	13.07	13.54	3.55%	0.78	90	0.8498	0.9190	0.9928	8.04%	2.67
20	12.06	12.49	12.92	3.46%	0.76	91	0.8235	0.8911	0.9633	8.10%	2.70
21	11.54	11.94	12.34	3.37%	0.75	92	0.7981	0.8641	0.9347	8.17%	2.74
22	11.05	11.42	11.79	3.27%	0.73	93	0.7736	0.8381	0.9071	8.24%	2.77
23	10.58	10.92	11.27	3.18%	0.72	94	0.7500	0.8130	0.8805	8.30%	2.81
24	10.13	10.45	10.77	3.09%	0.70	95	0.7272	0.7887	0.8547	8.37%	2.85
25	9.700	10.00	10.30	3.00%	0.68	96	0.7051	0.7653	0.8298	8.43%	2.88
26	9.277	9.572	9.868	3.09%	0.71	97	0.6839	0.7426	0.8058	8.50%	2.92
27	8.875	9.165	9.456	3.18%	0.73	98	0.6633	0.7208	0.7825	8.56%	2.96
28	8.492	8.777	9.064	3.27%	0.76	99	0.6435	0.6996	0.7600	8.63%	3.00
29	8.128	8.408	8.691	3.36%	0.79	100	0.6243	0.6792	0.7382	8.69%	3.03
30	7.781	8.057	8.335	3.45%	0.81	101	0.6057	0.6594	0.7171	8.76%	3.07
31	7.452	7.722	7.995	3.53%	0.84	102	0.5878	0.6403	0.6967	8.82%	3.11
32	7.138	7.403	7.671	3.62%	0.86	103	0.5705	0.6218	0.6770	8.88%	3.15
33	6.839	7.099	7.362	3.71%	0.89	104	0.5538	0.6039	0.6579	8.95%	3.19
34	6.554	6.809	7.067	3.79%	0.92	105	0.5376	0.5866	0.6394	9.01%	3.22
35	6.282	6.532	6.786	3.88%	0.94	106	0.5219	0.5698	0.6215	9.07%	3.26
36	6.024	6.268	6.517	3.97%	0.97	107	0.5068	0.5536	0.6042	9.14%	3.30
37	5.777	6.016	6.260	4.05%	1.00	108	0.4921	0.5379	0.5874	9.20%	3.34
38	5.542	5.776	6.015	4.14%	1.02	109	0.4780	0.5227	0.5711	9.26%	3.38
39	5.317	5.547	5.781	4.22%	1.05	110	0.4643	0.5080	0.5554	9.33%	3.42
40	5.103	5.328	5.557	4.31%	1.08	-	-	-	-	-	-

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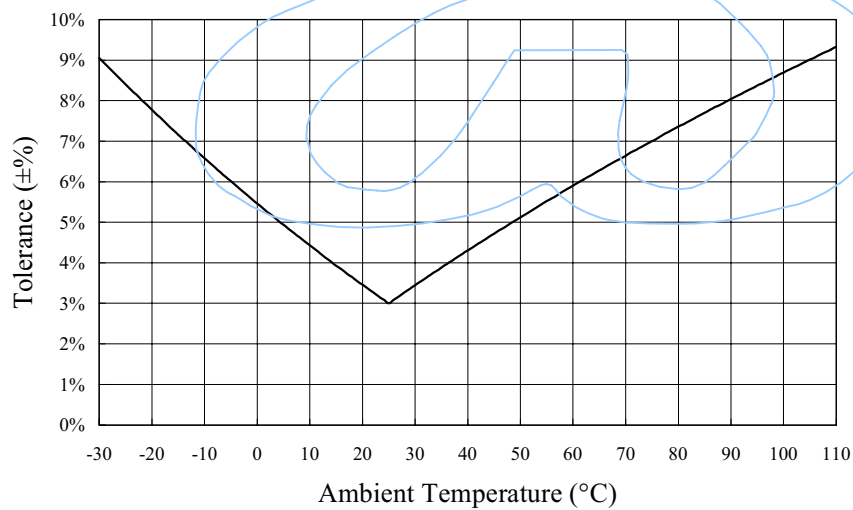Module No.: TS-10KNF

6. Resistance - Temperature
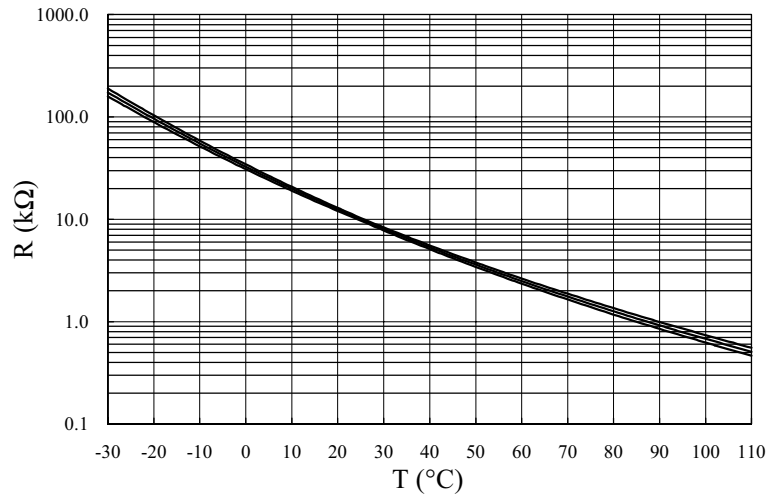
7. Resistance Tolerance

8. Temperature Precision