

Approval

Approved By:	Checked By:	Prepared By :

Approved By:	Examined By:	Tested By :

Company's Stamp	
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Approval No. : _____

Product : NTC THERMISTOR SENSORS

Mayloon Part No. : MLHT502 H 3970

Customer's Part No. : _____

Specifications : R₂₅ 5,000 Ω $\pm$ 3%

B₂₅₋₈₅ 3970 $^{\circ}$ K $\pm$ 1 %

Date : 2007/05/10

1) SCOPE

This specifications define ratings, dimension, insulation, climatic sequence and mechanical characteristics for **(Lead-free)** MLHT type thermistor.

2) PART NO. : MLHT502H-3970

3) RATING

3-1) Rated zero-power resistance R_{25} : 5 k Ω ± 3 % (at 25°C)

3-2) B value. $B_{25/85}$: 3,970K ± 1 %

*The B value is calculated using the zero-power resistance values measured at 25°C and 85°C.

3-3) Dissipation factor. :Approx. 2 mW/°C (in air)

3-4) Thermal time constant. :Approx. ≤ 12 Sec (in air)

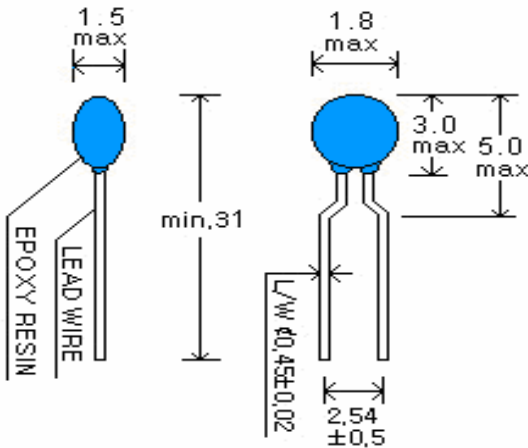
3-5) Maximum power rating. : 10 mW (at 25°C)

3-6) Category temperature range : -30 ~ 125 °C

3-7) Lead content : **RoHs Compliant.**

3-8) Cadmium : **RoHs Compliant.**

4) DIMENSIONS UNIT: mm



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5) Insulation

5-1) Insulation resistance

Insulation resistance of the test samples shall be over 100MΩ when it is measured at DC 500V between coated area and lead wires.

6) Climatic test

6-1) Dry Heat

After the test samples were exposed in air at 110 °C for 1,000 hours, the change ratio of the rated zero-power resistance shall be within ±1% of the initial value.

6-2) Damp heat

After the test samples were exposed in the humidity of 95% at 40°C for 1,000 hours, the change ratio of the rated zero-power resistance shall be within ±1% of the initial value.

6-3) Cold

After the test samples were exposed in air at -30°C for 1,000 hours, the change ratio of the rated zero-power resistance shall be within ±1% of the initial value.

6-4) Humidity load

After DC 1mA current was applied to the test samples in the temperature of 40°C and the humidity of 95% for 1,000 hours, the change ratio of the rated zero-power resistance shall be within ±1% of the initial value.

6-5) Change of temperature

One cycle of the change of temperature shall be carried out in the order of the following conditions.

- .Room ambient temperature.(Initial value)

- .At -30°C, for 30 minutes.

- .Room ambient temperature, for 3 minutes.

- .At + 90°C, for 30 minutes.

- .Room ambient temperature, for 3 minutes.

After 100 cycles of change of temperature, the change ratio of the rated zero-power resistance shall be within ±1% of the initial value.

6-6) High temperature load

After DC 1mA current was applied to the test samples in the temperature of 110°C for 1,000 hours, the change ratio of the rated zero-power resistance shall be within $\pm 1\%$ of the initial value.

7) Mechanical characteristics

7-1) Robustness of terminations

Ua: Tensile

After 2N loading weight for 3 seconds was applied to the wire terminations, there shall be no visible damage.

7-2) Free fall

After one time natural fall to a maple board from 1m high, there shall be no visible damage.

7-3) Resistance to soldering heat

After lead wire of the test samples were dipped on time within 8.5 mm from end of lead wire in solder bath at $260^{\circ}\text{C} \pm 10\%$ for 10 ± 0.5 seconds, the change ratio of the rated zero-power resistance shall be within $\pm 1\%$ of the initial value.

8) R-T characteristics

PART NO.:	MLHT502H-3970	R25 :	5 K Ω $\pm$ 3%
		B25/85 :	3,970K $\pm$ 1%

Temperature (°C)	Resistance (Ω)			Temp. Coef.	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.	(%/°C)	MIN.	MAX.	MIN.	MAX.
-40	161631	172637	184227	-6.81	-6.38	6.71	-0.99	0.94
-39	151134	161316	172029	-6.76	-6.31	6.64	-0.98	0.93
-38	141392	150817	160724	-6.70	-6.25	6.57	-0.98	0.93
-37	132347	141074	150241	-6.65	-6.19	6.50	-0.98	0.93
-36	123944	132029	140515	-6.60	-6.12	6.43	-0.97	0.93
-35	116132	123626	131486	-6.55	-6.06	6.36	-0.97	0.93
-34	108866	115816	123099	-6.50	-6.00	6.29	-0.97	0.92
-33	102106	108554	115305	-6.45	-5.94	6.22	-0.96	0.92
-32	95811	101796	108058	-6.40	-5.88	6.15	-0.96	0.92
-31	89947	95505	101315	-6.36	-5.82	6.08	-0.96	0.92

-30	84482	89646	95039	-6.31	-5.76	6.02	-0.95	0.91
-29	79386	84185	89194	-6.26	-5.70	5.95	-0.95	0.91
-28	74632	79094	83748	-6.21	-5.64	5.88	-0.95	0.91
-27	70194	74345	78671	-6.17	-5.58	5.82	-0.94	0.91
-26	66050	69913	73935	-6.12	-5.53	5.75	-0.94	0.90
-25	62179	65775	69517	-6.08	-5.47	5.69	-0.94	0.90
-24	58559	61909	65391	-6.04	-5.41	5.62	-0.93	0.90
-23	55175	58296	61537	-5.99	-5.35	5.56	-0.93	0.89
-22	52008	54917	57936	-5.95	-5.30	5.50	-0.92	0.89
-21	49044	51756	54569	-5.91	-5.24	5.44	-0.92	0.89
-20	46268	48798	51420	-5.86	-5.18	5.37	-0.92	0.88
-19	43667	46028	48473	-5.82	-5.13	5.31	-0.91	0.88
-18	41229	43433	45714	-5.78	-5.07	5.25	-0.91	0.88
-17	38944	41002	43130	-5.74	-5.02	5.19	-0.90	0.87
-16	36799	38722	40708	-5.70	-4.97	5.13	-0.90	0.87
-15	34786	36583	38438	-5.66	-4.91	5.07	-0.90	0.87
-14	32897	34576	36309	-5.62	-4.86	5.01	-0.89	0.86
-13	31122	32692	34311	-5.58	-4.80	4.95	-0.89	0.86
-12	29454	30923	32436	-5.55	-4.75	4.89	-0.88	0.86
-11	27885	29260	30675	-5.51	-4.70	4.84	-0.88	0.85
-10	26411	27698	29021	-5.47	-4.65	4.78	-0.87	0.85
-9	25023	26228	27466	-5.43	-4.59	4.72	-0.87	0.85
-8	23717	24846	26005	-5.40	-4.54	4.66	-0.86	0.84
-7	22487	23545	24630	-5.36	-4.49	4.61	-0.86	0.84
-6	21329	22320	23336	-5.32	-4.44	4.55	-0.86	0.83
-5	20238	21167	22119	-5.29	-4.39	4.50	-0.85	0.83
-4	19209	20080	20972	-5.25	-4.34	4.44	-0.85	0.83
-3	18238	19056	19892	-5.22	-4.29	4.39	-0.84	0.82
-2	17323	18090	18874	-5.18	-4.24	4.33	-0.84	0.82
-1	16459	17179	17914	-5.15	-4.19	4.28	-0.83	0.81
0	15643	16319	17009	-5.12	-4.14	4.23	-0.83	0.81
1	14873	15508	16155	-5.08	-4.09	4.17	-0.82	0.80
2	14146	14742	15349	-5.05	-4.04	4.12	-0.82	0.80
3	13458	14018	14588	-5.02	-3.99	4.07	-0.81	0.80
4	12808	13334	13869	-4.99	-3.95	4.02	-0.81	0.79
5	12193	12688	13191	-4.95	-3.90	3.96	-0.80	0.79
6	11611	12076	12549	-4.92	-3.85	3.91	-0.79	0.78
7	11061	11498	11942	-4.89	-3.80	3.86	-0.79	0.78
8	10540	10951	11368	-4.86	-3.76	3.81	-0.78	0.77

9	10046	10433	10826	-4.83	-3.71	3.76	-0.78	0.77
10	9579	9943	10312	-4.80	-3.66	3.71	-0.77	0.76
11	9136	9479	9826	-4.77	-3.62	3.66	-0.77	0.76
12	8716	9038	9365	-4.74	-3.57	3.61	-0.76	0.75
13	8317	8621	8929	-4.71	-3.53	3.56	-0.76	0.75
14	7940	8226	8515	-4.68	-3.48	3.51	-0.75	0.74
15	7581	7851	8123	-4.65	-3.44	3.47	-0.75	0.74
16	7241	7495	7752	-4.62	-3.39	3.42	-0.74	0.73
17	6918	7158	7399	-4.59	-3.35	3.37	-0.73	0.73
18	6611	6837	7064	-4.57	-3.30	3.32	-0.73	0.72
19	6320	6533	6747	-4.54	-3.26	3.28	-0.72	0.72
20	6043	6244	6446	-4.51	-3.22	3.23	-0.72	0.71
21	5780	5969	6159	-4.48	-3.17	3.18	-0.71	0.71
22	5530	5708	5887	-4.46	-3.13	3.14	-0.70	0.70
23	5292	5460	5629	-4.43	-3.09	3.09	-0.70	0.70
24	5065	5224	5384	-4.40	-3.04	3.05	-0.69	0.69
25	4850	5000	5150	-4.38	-3.00	3.00	-0.69	0.69
26	4641	4786	4932	-4.35	-3.04	3.04	-0.70	0.70
27	4442	4583	4725	-4.33	-3.08	3.09	-0.71	0.71
28	4253	4390	4527	-4.30	-3.13	3.13	-0.73	0.73
29	4072	4206	4339	-4.27	-3.17	3.18	-0.74	0.74
30	3901	4030	4160	-4.25	-3.21	3.22	-0.76	0.76
31	3737	3863	3989	-4.23	-3.25	3.27	-0.77	0.77
32	3582	3703	3826	-4.20	-3.29	3.31	-0.79	0.78
33	3433	3552	3671	-4.18	-3.33	3.35	-0.80	0.80
34	3292	3407	3522	-4.15	-3.37	3.40	-0.82	0.81
35	3157	3269	3381	-4.13	-3.41	3.44	-0.83	0.83
36	3028	3137	3246	-4.10	-3.45	3.48	-0.85	0.84
37	2906	3011	3117	-4.08	-3.49	3.52	-0.86	0.86
38	2789	2891	2994	-4.06	-3.53	3.57	-0.88	0.87
39	2677	2776	2876	-4.03	-3.57	3.61	-0.89	0.88
40	2571	2667	2764	-4.01	-3.61	3.65	-0.91	0.90
41	2469	2562	2657	-3.99	-3.65	3.69	-0.93	0.91
42	2372	2462	2554	-3.97	-3.68	3.73	-0.94	0.93
43	2279	2367	2456	-3.94	-3.72	3.77	-0.96	0.94
44	2190	2275	2362	-3.92	-3.76	3.81	-0.97	0.96
45	2105	2188	2273	-3.90	-3.80	3.85	-0.99	0.97
46	2024	2105	2187	-3.88	-3.84	3.90	-1.00	0.99
47	1946	2025	2105	-3.86	-3.87	3.94	-1.02	1.00

48	1872	1948	2026	-3.84	-3.91	3.98	-1.04	1.02
49	1801	1875	1951	-3.82	-3.95	4.02	-1.05	1.03
50	1733	1805	1878	-3.79	-3.98	4.05	-1.07	1.05
51	1668	1738	1809	-3.77	-4.02	4.09	-1.08	1.07
52	1606	1674	1743	-3.75	-4.06	4.13	-1.10	1.08
53	1547	1613	1680	-3.73	-4.09	4.17	-1.12	1.10
54	1490	1554	1619	-3.71	-4.13	4.21	-1.13	1.11
55	1435	1497	1561	-3.69	-4.16	4.25	-1.15	1.13
56	1382	1443	1505	-3.67	-4.20	4.29	-1.17	1.14
57	1332	1391	1451	-3.65	-4.23	4.33	-1.18	1.16
58	1284	1341	1400	-3.63	-4.27	4.36	-1.20	1.17
59	1238	1294	1351	-3.61	-4.30	4.40	-1.22	1.19
60	1194	1248	1303	-3.59	-4.34	4.44	-1.24	1.21
61	1151	1204	1258	-3.58	-4.37	4.48	-1.25	1.22
62	1111	1162	1214	-3.56	-4.41	4.51	-1.27	1.24
63	1071	1121	1172	-3.54	-4.44	4.55	-1.29	1.25
64	1034	1082	1132	-3.52	-4.47	4.59	-1.30	1.27
65	998	1045	1093	-3.50	-4.51	4.63	-1.32	1.29
66	963	1009	1056	-3.48	-4.54	4.66	-1.34	1.30
67	930	975	1021	-3.46	-4.57	4.70	-1.36	1.32
68	898	942	986	-3.45	-4.61	4.73	-1.37	1.34
69	868	910	953	-3.43	-4.64	4.77	-1.39	1.35
70	838	879	921	-3.41	-4.67	4.81	-1.41	1.37
71	810	850	891	-3.39	-4.70	4.84	-1.43	1.39
72	783	822	862	-3.38	-4.74	4.88	-1.44	1.40
73	756	794	833	-3.36	-4.77	4.91	-1.46	1.42
74	731	768	806	-3.34	-4.80	4.95	-1.48	1.44
75	707	743	780	-3.32	-4.83	4.98	-1.50	1.45
76	684	719	755	-3.31	-4.86	5.02	-1.52	1.47
77	661	695	731	-3.29	-4.89	5.05	-1.54	1.49
78	640	673	707	-3.27	-4.93	5.09	-1.55	1.50
79	619	651	685	-3.26	-4.96	5.12	-1.57	1.52
80	599	631	663	-3.24	-4.99	5.16	-1.59	1.54
81	580	610	642	-3.22	-5.02	5.19	-1.61	1.56
82	561	591	622	-3.21	-5.05	5.22	-1.63	1.57
83	543	573	603	-3.19	-5.08	5.26	-1.65	1.59
84	526	555	584	-3.18	-5.11	5.29	-1.67	1.61
85	510	537	566	-3.16	-5.14	5.32	-1.68	1.63
86	494	521	548	-3.15	-5.17	5.36	-1.70	1.64

87	478	505	532	-3.13	-5.20	5.39	-1.72	1.66
88	463	489	516	-3.11	-5.23	5.42	-1.74	1.68
89	449	474	500	-3.10	-5.26	5.46	-1.76	1.70
90	435	460	485	-3.08	-5.29	5.49	-1.78	1.71
91	422	446	470	-3.07	-5.32	5.52	-1.80	1.73
92	409	432	456	-3.05	-5.35	5.55	-1.82	1.75
93	397	419	443	-3.04	-5.37	5.58	-1.84	1.77
94	385	407	430	-3.02	-5.40	5.62	-1.86	1.79
95	373	395	417	-3.01	-5.43	5.65	-1.88	1.80
96	362	383	405	-3.00	-5.46	5.68	-1.90	1.82
97	351	372	393	-2.98	-5.49	5.71	-1.92	1.84
98	341	361	382	-2.97	-5.52	5.74	-1.94	1.86
99	331	350	371	-2.95	-5.54	5.77	-1.96	1.88
100	321	340	360	-2.94	-5.57	5.81	-1.98	1.90
101	312	330	350	-2.92	-5.60	5.84	-2.00	1.91
102	303	321	340	-2.91	-5.63	5.87	-2.02	1.93
103	294	312	330	-2.90	-5.66	5.90	-2.04	1.95
104	286	303	321	-2.88	-5.68	5.93	-2.06	1.97
105	277	294	312	-2.87	-5.71	5.96	-2.08	1.99
106	269	286	303	-2.86	-5.74	5.99	-2.10	2.01
107	262	278	295	-2.84	-5.76	6.02	-2.12	2.03
108	254	270	286	-2.83	-5.79	6.05	-2.14	2.05
109	247	263	278	-2.82	-5.82	6.08	-2.16	2.06
110	240	255	271	-2.80	-5.84	6.11	-2.18	2.08
111	234	248	263	-2.79	-5.87	6.14	-2.20	2.10
112	227	241	256	-2.78	-5.90	6.17	-2.22	2.12
113	221	235	249	-2.77	-5.92	6.20	-2.24	2.14
114	215	228	243	-2.75	-5.95	6.23	-2.26	2.16
115	209	222	236	-2.74	-5.97	6.26	-2.28	2.18
116	203	216	230	-2.73	-6.00	6.29	-2.30	2.20
117	198	210	224	-2.71	-6.02	6.32	-2.33	2.22
118	192	205	218	-2.70	-6.05	6.34	-2.35	2.24
119	187	199	212	-2.69	-6.08	6.37	-2.37	2.26
120	182	194	206	-2.68	-6.10	6.40	-2.39	2.28
121	177	189	201	-2.67	-6.13	6.43	-2.41	2.30
122	173	184	196	-2.65	-6.15	6.46	-2.43	2.32
123	168	179	191	-2.64	-6.18	6.49	-2.46	2.34
124	164	175	186	-2.63	-6.20	6.51	-2.48	2.36
125	159	170	181	-2.62	-6.23	6.54	-2.50	2.38