

**Sinloon**

# Approval

**Manufacturer:**

Mayloon Electronic Co., Ltd.,  
Flat E,17/F Houston Ind., Bldg.,  
32-40 Wang Lung St., Tsuen Wan, HK  
Tel: 852-2408 9788 Fax:852-2406 9983

**Customer:**

Approved By:	Checked By:	Prepared By :

Approved By:	Examined By:	Tested By :

Company's Stamp	
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Company's Stamp	
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Approval No. : \_\_\_\_\_

Product : NTC THERMISTOR SENSORS

Mayloon Part No. : MLHT 502F- 3970

Customer's Part No. : \_\_\_\_\_

Specifications : R25 5,000 Ω ± 1 %

B25-85 3970 °K ± 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. : MLHT502F-3970

3) RATING

3-1) Rated zero-power resistance  $R_{25}$  : 5 k $\Omega$   $\pm 1\%$  (at 25 $^{\circ}$ C)

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

\*The B value is calculated using the zero-power resistance values measured at 25 $^{\circ}$ C and 85 $^{\circ}$ C.

3-3) Dissipation factor. : Approx. 2 mW/ $^{\circ}$ C (in air)

3-4) Thermal time constant. : Approx.  $\leq 12$  Sec (in air)

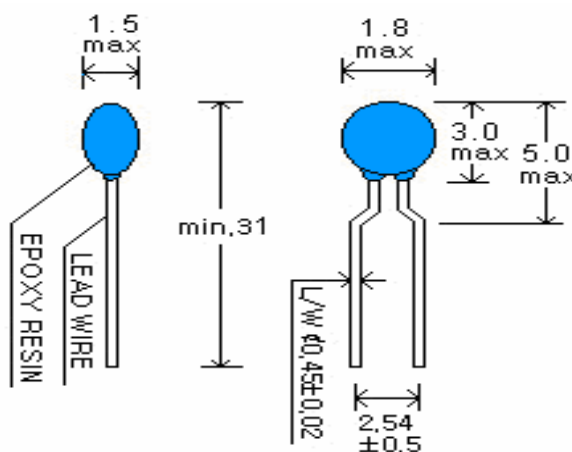
3-5) Maximum power rating. : 10 mW (at 25 $^{\circ}$ C)

3-6) Category temperature range : -30 ~ 125  $^{\circ}$ C

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

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

4) DIMENSIONS UNIT: mm



Spec.No.: STANDARD		Note	REVISION	
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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 ±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°C ±10% for 10 ±0.5 seconds, the change ratio of the rated zero-power resistance shall be within ±1% of the initial value.

8) R-T characteristics

**PART NO.:**

**MLHT502F-3970**

**R25 : 5 KΩ ±1%**

**B25/85 : 3,970K ±1%**

Temperature (°C)	Resistance (Ω)			Temp. Coef. (%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
<b>-40</b>	164963	172637	180650	-6.81	-4.44	4.64	-0.68	0.65
<b>-39</b>	154250	161316	168689	-6.76	-4.38	4.57	-0.68	0.65
<b>-38</b>	144308	150817	157603	-6.70	-4.32	4.50	-0.67	0.64
<b>-37</b>	135076	141074	147324	-6.65	-4.25	4.43	-0.67	0.64
<b>-36</b>	126499	132029	137787	-6.60	-4.19	4.36	-0.66	0.63
<b>-35</b>	118526	123626	128933	-6.55	-4.13	4.29	-0.66	0.63
<b>-34</b>	111111	115816	120709	-6.50	-4.06	4.22	-0.65	0.62
<b>-33</b>	104211	108554	113066	-6.45	-4.00	4.16	-0.64	0.62
<b>-32</b>	97786	101796	105959	-6.40	-3.94	4.09	-0.64	0.62
<b>-31</b>	91802	95505	99348	-6.36	-3.88	4.02	-0.63	0.61

-30	86224	89646	93194	-6.31	-3.82	3.96	-0.63	0.61
-29	81023	84185	87462	-6.26	-3.76	3.89	-0.62	0.60
-28	76171	79094	82122	-6.21	-3.70	3.83	-0.62	0.59
-27	71642	74345	77143	-6.17	-3.64	3.76	-0.61	0.59
-26	67412	69913	72500	-6.12	-3.58	3.70	-0.60	0.58
-25	63461	65775	68167	-6.08	-3.52	3.64	-0.60	0.58
-24	59767	61909	64121	-6.04	-3.46	3.57	-0.59	0.57
-23	56312	58296	60343	-5.99	-3.40	3.51	-0.59	0.57
-22	53080	54917	56811	-5.95	-3.34	3.45	-0.58	0.56
-21	50055	51756	53510	-5.91	-3.29	3.39	-0.57	0.56
-20	47222	48798	50422	-5.86	-3.23	3.33	-0.57	0.55
-19	44567	46028	47532	-5.82	-3.17	3.27	-0.56	0.54
-18	42079	43433	44826	-5.78	-3.12	3.21	-0.55	0.54
-17	39746	41002	42292	-5.74	-3.06	3.15	-0.55	0.53
-16	37558	38722	39918	-5.70	-3.01	3.09	-0.54	0.53
-15	35504	36583	37692	-5.66	-2.95	3.03	-0.54	0.52
-14	33575	34576	35604	-5.62	-2.90	2.97	-0.53	0.52
-13	31763	32692	33645	-5.58	-2.84	2.91	-0.52	0.51
-12	30061	30923	31806	-5.55	-2.79	2.86	-0.52	0.50
-11	28460	29260	30080	-5.51	-2.73	2.80	-0.51	0.50
-10	26955	27698	28458	-5.47	-2.68	2.74	-0.50	0.49
-9	25539	26228	26933	-5.43	-2.63	2.69	-0.49	0.48
-8	24206	24846	25500	-5.40	-2.57	2.63	-0.49	0.48
-7	22951	23545	24152	-5.36	-2.52	2.58	-0.48	0.47
-6	21769	22320	22883	-5.32	-2.47	2.52	-0.47	0.46
-5	20655	21167	21689	-5.29	-2.42	2.47	-0.47	0.46
-4	19605	20080	20565	-5.25	-2.37	2.41	-0.46	0.45
-3	18614	19056	19505	-5.22	-2.32	2.36	-0.45	0.44
-2	17680	18090	18507	-5.18	-2.26	2.31	-0.45	0.44
-1	16798	17179	17566	-5.15	-2.21	2.25	-0.44	0.43
0	15966	16319	16679	-5.12	-2.16	2.20	-0.43	0.42
1	15180	15508	15841	-5.08	-2.11	2.15	-0.42	0.42
2	14437	14742	15051	-5.05	-2.06	2.10	-0.42	0.41
3	13735	14018	14305	-5.02	-2.02	2.05	-0.41	0.40
4	13072	13334	13600	-4.99	-1.97	2.00	-0.40	0.39
5	12444	12688	12934	-4.95	-1.92	1.94	-0.39	0.39
6	11851	12076	12305	-4.92	-1.87	1.89	-0.38	0.38
7	11289	11498	11710	-4.89	-1.82	1.84	-0.38	0.37
8	10757	10951	11148	-4.86	-1.77	1.79	-0.37	0.36

9	10253	10433	10615	-4.83	-1.73	1.75	-0.36	0.36
10	9776	9943	10112	-4.80	-1.68	1.70	-0.35	0.35
11	9324	9479	9635	-4.77	-1.63	1.65	-0.35	0.34
12	8895	9038	9183	-4.74	-1.58	1.60	-0.34	0.33
13	8489	8621	8755	-4.71	-1.54	1.55	-0.33	0.33
14	8103	8226	8350	-4.68	-1.49	1.50	-0.32	0.32
15	7738	7851	7965	-4.65	-1.45	1.46	-0.31	0.31
16	7390	7495	7601	-4.62	-1.40	1.41	-0.30	0.30
17	7061	7158	7255	-4.59	-1.35	1.36	-0.30	0.29
18	6748	6837	6927	-4.57	-1.31	1.32	-0.29	0.29
19	6450	6533	6616	-4.54	-1.26	1.27	-0.28	0.28
20	6168	6244	6320	-4.51	-1.22	1.22	-0.27	0.27
21	5899	5969	6040	-4.48	-1.18	1.18	-0.26	0.26
22	5644	5708	5773	-4.46	-1.13	1.13	-0.25	0.25
23	5401	5460	5520	-4.43	-1.09	1.09	-0.25	0.25
24	5170	5224	5279	-4.40	-1.04	1.04	-0.24	0.24
25	4950	5000	5050	-4.38	-1.00	1.00	-0.23	0.23
26	4737	4786	4836	-4.35	-1.04	1.04	-0.24	0.24
27	4533	4583	4633	-4.33	-1.09	1.09	-0.25	0.25
28	4340	4390	4439	-4.30	-1.13	1.13	-0.26	0.26
29	4156	4206	4255	-4.27	-1.17	1.17	-0.27	0.27
30	3981	4030	4079	-4.25	-1.21	1.22	-0.29	0.29
31	3814	3863	3912	-4.23	-1.26	1.26	-0.30	0.30
32	3655	3703	3752	-4.20	-1.30	1.30	-0.31	0.31
33	3504	3552	3599	-4.18	-1.34	1.35	-0.32	0.32
34	3360	3407	3454	-4.15	-1.38	1.39	-0.33	0.33
35	3222	3269	3315	-4.13	-1.42	1.43	-0.35	0.34
36	3091	3137	3183	-4.10	-1.46	1.47	-0.36	0.36
37	2966	3011	3057	-4.08	-1.50	1.51	-0.37	0.37
38	2846	2891	2936	-4.06	-1.54	1.55	-0.38	0.38
39	2732	2776	2821	-4.03	-1.58	1.60	-0.40	0.39
40	2624	2667	2710	-4.01	-1.62	1.64	-0.41	0.40
41	2520	2562	2605	-3.99	-1.66	1.68	-0.42	0.42
42	2420	2462	2505	-3.97	-1.70	1.72	-0.43	0.43
43	2326	2367	2408	-3.94	-1.74	1.76	-0.45	0.44
44	2235	2275	2316	-3.92	-1.78	1.80	-0.46	0.45
45	2148	2188	2228	-3.90	-1.81	1.84	-0.47	0.47
46	2066	2105	2144	-3.88	-1.85	1.88	-0.48	0.48
47	1987	2025	2064	-3.86	-1.89	1.92	-0.50	0.49

48	1911	1948	1987	-3.84	-1.93	1.96	-0.51	0.50
49	1838	1875	1913	-3.82	-1.97	2.00	-0.52	0.52
50	1769	1805	1842	-3.79	-2.00	2.03	-0.54	0.53
51	1703	1738	1774	-3.77	-2.04	2.07	-0.55	0.54
52	1639	1674	1709	-3.75	-2.08	2.11	-0.56	0.55
53	1578	1613	1647	-3.73	-2.11	2.15	-0.58	0.57
54	1520	1554	1588	-3.71	-2.15	2.19	-0.59	0.58
55	1464	1497	1530	-3.69	-2.19	2.23	-0.60	0.59
56	1411	1443	1476	-3.67	-2.22	2.26	-0.62	0.61
57	1360	1391	1423	-3.65	-2.26	2.30	-0.63	0.62
58	1311	1341	1373	-3.63	-2.29	2.34	-0.64	0.63
59	1263	1294	1324	-3.61	-2.33	2.37	-0.66	0.64
60	1218	1248	1278	-3.59	-2.36	2.41	-0.67	0.66
61	1175	1204	1233	-3.58	-2.40	2.45	-0.68	0.67
62	1133	1162	1191	-3.56	-2.43	2.48	-0.70	0.68
63	1094	1121	1150	-3.54	-2.47	2.52	-0.71	0.70
64	1055	1082	1110	-3.52	-2.50	2.56	-0.73	0.71
65	1019	1045	1072	-3.50	-2.54	2.59	-0.74	0.72
66	983	1009	1036	-3.48	-2.57	2.63	-0.76	0.74
67	949	975	1001	-3.46	-2.61	2.66	-0.77	0.75
68	917	942	967	-3.45	-2.64	2.70	-0.78	0.77
69	885	910	935	-3.43	-2.67	2.74	-0.80	0.78
70	855	879	904	-3.41	-2.71	2.77	-0.81	0.79
71	827	850	874	-3.39	-2.74	2.81	-0.83	0.81
72	799	822	845	-3.38	-2.77	2.84	-0.84	0.82
73	772	794	817	-3.36	-2.80	2.88	-0.86	0.84
74	746	768	791	-3.34	-2.84	2.91	-0.87	0.85
75	722	743	765	-3.32	-2.87	2.94	-0.89	0.86
76	698	719	740	-3.31	-2.90	2.98	-0.90	0.88
77	675	695	716	-3.29	-2.93	3.01	-0.92	0.89
78	653	673	693	-3.27	-2.97	3.05	-0.93	0.91
79	632	651	671	-3.26	-3.00	3.08	-0.95	0.92
80	611	631	650	-3.24	-3.03	3.11	-0.96	0.93
81	592	610	630	-3.22	-3.06	3.15	-0.98	0.95
82	573	591	610	-3.21	-3.09	3.18	-0.99	0.96
83	555	573	591	-3.19	-3.12	3.21	-1.01	0.98
84	537	555	573	-3.18	-3.15	3.25	-1.02	0.99
85	520	537	555	-3.16	-3.18	3.28	-1.04	1.01
86	504	521	538	-3.15	-3.21	3.31	-1.05	1.02

87	488	505	521	-3.13	-3.24	3.34	-1.07	1.04
88	473	489	506	-3.11	-3.28	3.38	-1.08	1.05
89	458	474	490	-3.10	-3.31	3.41	-1.10	1.07
90	444	460	475	-3.08	-3.33	3.44	-1.12	1.08
91	431	446	461	-3.07	-3.36	3.47	-1.13	1.10
92	418	432	447	-3.05	-3.39	3.50	-1.15	1.11
93	405	419	434	-3.04	-3.42	3.53	-1.16	1.13
94	393	407	421	-3.02	-3.45	3.57	-1.18	1.14
95	381	395	409	-3.01	-3.48	3.60	-1.20	1.16
96	370	383	397	-3.00	-3.51	3.63	-1.21	1.17
97	359	372	385	-2.98	-3.54	3.66	-1.23	1.19
98	348	361	374	-2.97	-3.57	3.69	-1.24	1.20
99	338	350	363	-2.95	-3.60	3.72	-1.26	1.22
100	328	340	353	-2.94	-3.63	3.75	-1.28	1.23
101	318	330	343	-2.92	-3.65	3.78	-1.29	1.25
102	309	321	333	-2.91	-3.68	3.81	-1.31	1.26
103	300	312	324	-2.90	-3.71	3.84	-1.33	1.28
104	291	303	314	-2.88	-3.74	3.87	-1.34	1.30
105	283	294	306	-2.87	-3.77	3.90	-1.36	1.31
106	275	286	297	-2.86	-3.79	3.93	-1.38	1.33
107	267	278	289	-2.84	-3.82	3.96	-1.39	1.34
108	260	270	281	-2.83	-3.85	3.99	-1.41	1.36
109	252	263	273	-2.82	-3.87	4.02	-1.43	1.38
110	245	255	266	-2.80	-3.90	4.05	-1.44	1.39
111	238	248	258	-2.79	-3.93	4.08	-1.46	1.41
112	232	241	251	-2.78	-3.96	4.11	-1.48	1.42
113	225	235	245	-2.77	-3.98	4.14	-1.50	1.44
114	219	228	238	-2.75	-4.01	4.17	-1.51	1.46
115	213	222	232	-2.74	-4.03	4.19	-1.53	1.47
116	207	216	225	-2.73	-4.06	4.22	-1.55	1.49
117	202	210	219	-2.71	-4.09	4.25	-1.57	1.51
118	196	205	214	-2.70	-4.11	4.28	-1.58	1.52
119	191	199	208	-2.69	-4.14	4.31	-1.60	1.54
120	186	194	202	-2.68	-4.16	4.34	-1.62	1.56
121	181	189	197	-2.67	-4.19	4.36	-1.64	1.57
122	176	184	192	-2.65	-4.22	4.39	-1.65	1.59
123	172	179	187	-2.64	-4.24	4.42	-1.67	1.61
124	167	175	182	-2.63	-4.27	4.45	-1.69	1.62
125	163	170	178	-2.62	-4.29	4.47	-1.71	1.64