

# Product Specification

Number: L-KLS6-MF52-A2-103J3470

Name: NTC thermistors resistors

Customer: \_\_\_\_\_

Date: 2024-04-08

Customer Signature:



**NINGBO KLS ELECTRONIC CO; LTD**

Tel : 0086-574-86828566

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ADD : NO. 8-1, RONGXIA RD. XIAPU SHANQIAN  
INDUSTRIAL ZONE BEILUN NINGBO ZHEJIANG.

Compi	Check	Review	Approva
Jenny	Jack.C		

This Approval Sheet indicates the property, test condition, structure and dimension of MF52-A2 series NTC thermistors Customer manufactured by NINGBO KLS ELECTRONIC CO.LTD . It is sincerely for your company's confirmation.  
Any doubt, Please contact with us by +86 574 8682 8566 ?86833703, or if there isn't any questions, please refax to confirm.  
Please inform us if you change your usage way of the thermistor.

Customer :		
Customer Confirmation	Confirmer	
	Checker	
	Time	

### 1、ELECTRICAL CHARACTERISTIC

Item	Symbol	Test Condition	Performance	Unit
1.1 Rated resistance	R <sub>25°C</sub>	+25±0.05°C	10±5%	kΩ
1.2 B value	B <sub>25/50</sub>	+25±0.05°C、+50±0.05°C	3470±2%	K
1.3 Time constant	τ	In still air	≤15	sec
1.4 Dissipation factor	δ	In still air	≥2.1	mW/°C
1.5 Max.Power	P <sub>max</sub>	Ambient Temp. +25°C	≤60	mW

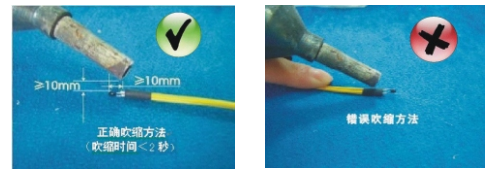
### 2、Reliability test

- 2.1 Intensity : Fix the thermistor probe, pull the lead wire gradually with force 5N for 10±1sec, no visible damage.
- 2.2 Solderability:
  - 260±10°C 2±0.5sec cover the solder joint evenly with solder
  - ΔR<sub>25/R25</sub>≤±3%
- 2.3 Solder heat resist:
  - 260±10°C 5±1sec solder 6mm away from thermistor probe
  - ΔR<sub>25/R25</sub>≤±3%
- 2.4 High temp.store (in air)
  - 105±3°C 1000h
  - ΔR<sub>25/R25</sub>≤±3%
- 2.5 Low temp.store (in air)
  - 40±3°C 1000h
  - ΔR<sub>25/R25</sub>≤±3%
- 2.6 Heat and Humidity Stability
  - 40±5°C 98%RH 1000h ΔR<sub>25/R25</sub>≤±3%
- 2.7 Temperature shift:
  - 40±5°C ×30min  $\xrightarrow[2\pm 1min]{Nor.Temp}$  105±3°C ×30min 10times
  - ΔR<sub>25/R25</sub>≤2%

### 3、Operation Notice:

- 3.1 Application: Temperature measure and control;
- 3.2 Operating temperature range: -40°C ~+125°C ;
- 3.3 Min. cutting length ≥6mm;
- 3.4 Avoid measurement error caused by excessive current;

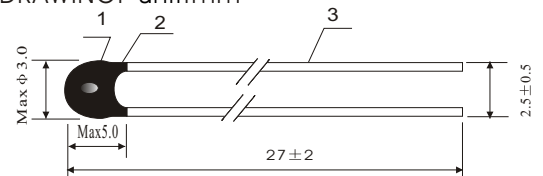
- 3.5 While adding heat shrink tube ,the outlet of hot air blower should be at least 10mm to the thermistor lest excessive heat shock.



- 3.6 Cannot be used in water (with steam), high humidity, electrolysis, salt, acid,alkaline and organic solvents and other corrosive environments
- 3.7 In view of the structural characteristics of epoxy components, users should avoid excessive stretching and bending force from the lead wire on the component encapsulating head when using it. If the lead wire needs to be bent, the bending point or the force point should be controlled on the leads beyond 6 mm below the encapsulating head , so as not to strain the chip, cause resistance drift or even open circuit, especially when the component is heated.

### 4、Resistance-Temperature Table: (see accessory)

### 5、SIZE DRAWING: unit:mm



Number	Material &spec.
1	Thermistor chip
2	Encapsulating epoxy resin (black)
3	φ0.4CP wire

File Number	Version	Date	Compile by	Check by
F52-A2-103J3470	A	2024-04-08	Jenny	Yang Guilin

R-T				TABLE				KLS06024-Z
R(25℃)=10kohm±5%				B(25/50)=3470±2%				
Temp.	Resistance(kΩ)			resistance tol. (%)		Temp.tol. (℃)		
℃	Rmin	R(t)Normal	Rmax	MIN	MAX	MIN	MAX	
-40	183.982	205.740	229.496	-10.6%	11.5%	-1.78	1.94	
-39	174.277	194.672	216.910	-10.5%	11.4%	-1.77	1.93	
-38	165.124	184.245	205.066	-10.4%	11.3%	-1.77	1.93	
-37	156.490	174.419	193.917	-10.3%	11.2%	-1.77	1.92	
-36	148.341	165.156	183.418	-10.2%	11.1%	-1.76	1.91	
-35	140.650	156.424	173.532	-10.1%	10.9%	-1.76	1.91	
-34	133.390	148.189	164.218	-10.0%	10.8%	-1.75	1.90	
-33	126.534	140.421	155.443	-9.9%	10.7%	-1.75	1.89	
-32	120.059	133.093	147.173	-9.8%	10.6%	-1.74	1.88	
-31	113.942	126.177	139.376	-9.7%	10.5%	-1.74	1.88	
-30	108.163	119.650	132.026	-9.6%	10.3%	-1.74	1.87	
-29	102.683	113.468	125.072	-9.5%	10.2%	-1.73	1.86	
-28	97.508	107.635	118.517	-9.4%	10.1%	-1.73	1.85	
-27	92.619	102.131	112.339	-9.3%	10.0%	-1.72	1.85	
-26	87.998	96.935	106.512	-9.2%	9.9%	-1.72	1.84	
-25	83.631	92.029	101.016	-9.1%	9.8%	-1.71	1.83	
-24	79.502	87.395	95.830	-9.0%	9.7%	-1.71	1.82	
-23	75.597	83.017	90.936	-8.9%	9.5%	-1.70	1.82	
-22	71.903	78.879	86.316	-8.8%	9.4%	-1.70	1.81	
-21	68.407	74.968	81.953	-8.8%	9.3%	-1.69	1.80	
-20	65.099	71.270	77.831	-8.7%	9.2%	-1.68	1.79	
-19	61.965	67.771	73.935	-8.6%	9.1%	-1.68	1.78	
-18	59.002	64.466	70.259	-8.5%	9.0%	-1.67	1.77	
-17	56.200	61.343	66.790	-8.4%	8.9%	-1.67	1.77	
-16	53.548	58.392	63.513	-8.3%	8.8%	-1.66	1.76	
-15	51.039	55.601	60.419	-8.2%	8.7%	-1.66	1.75	
-14	48.663	52.961	57.494	-8.1%	8.6%	-1.65	1.74	
-13	46.413	50.464	54.730	-8.0%	8.5%	-1.64	1.73	
-12	44.281	48.100	52.116	-7.9%	8.4%	-1.64	1.72	
-11	42.261	45.861	49.644	-7.9%	8.2%	-1.63	1.71	
-10	40.345	43.741	47.304	-7.8%	8.1%	-1.63	1.71	
-9	38.548	41.753	45.112	-7.7%	8.0%	-1.62	1.70	
-8	36.841	39.868	43.035	-7.6%	7.9%	-1.61	1.69	
-7	35.220	38.078	41.066	-7.5%	7.8%	-1.60	1.68	
-6	33.680	36.380	39.198	-7.4%	7.7%	-1.60	1.67	
-5	32.216	34.767	37.427	-7.3%	7.6%	-1.59	1.66	
-4	30.824	33.236	35.746	-7.3%	7.6%	-1.58	1.65	
-3	29.501	31.780	34.150	-7.2%	7.5%	-1.57	1.64	
-2	28.242	30.397	32.635	-7.1%	7.4%	-1.57	1.63	
-1	27.045	29.082	31.195	-7.0%	7.3%	-1.56	1.62	
0	25.905	27.832	29.828	-6.9%	7.2%	-1.55	1.60	
1	24.811	26.634	28.518	-6.8%	7.1%	-1.54	1.59	
2	23.769	25.493	27.273	-6.8%	7.0%	-1.53	1.58	

R-T				TABLE				KLS06024-Z
R(25°C)=10kohm±5%				B(25/50)=3470±2%				
Temp.	Resistance(kΩ)			resistance tol. (%)		Temp.tol. (°C)		
°C	Rmin	R(t)Normal	Rmax	MIN	MAX	MIN	MAX	
3	22.777	24.407	26.089	-6.7%	6.9%	-1.53	1.57	
4	21.831	23.374	24.962	-6.6%	6.8%	-1.52	1.56	
5	20.929	22.389	23.890	-6.5%	6.7%	-1.51	1.55	
6	20.071	21.453	22.872	-6.4%	6.6%	-1.50	1.54	
7	19.253	20.561	21.902	-6.4%	6.5%	-1.49	1.53	
8	18.473	19.711	20.980	-6.3%	6.4%	-1.48	1.52	
9	17.730	18.902	20.101	-6.2%	6.3%	-1.47	1.51	
10	17.020	18.130	19.265	-6.1%	6.3%	-1.47	1.50	
11	16.343	17.395	18.468	-6.0%	6.2%	-1.46	1.49	
12	15.697	16.694	17.709	-6.0%	6.1%	-1.45	1.48	
13	15.080	16.025	16.985	-5.9%	6.0%	-1.44	1.46	
14	14.491	15.386	16.295	-5.8%	5.9%	-1.43	1.45	
15	13.929	14.777	15.637	-5.7%	5.8%	-1.42	1.44	
16	13.393	14.198	15.012	-5.7%	5.7%	-1.41	1.43	
17	12.881	13.644	14.415	-5.6%	5.7%	-1.40	1.42	
18	12.391	13.114	13.845	-5.5%	5.6%	-1.39	1.40	
19	11.922	12.608	13.300	-5.4%	5.5%	-1.38	1.39	
20	11.474	12.124	12.779	-5.4%	5.4%	-1.37	1.38	
21	11.044	11.661	12.282	-5.3%	5.3%	-1.36	1.37	
22	10.633	11.218	11.806	-5.2%	5.2%	-1.35	1.35	
23	10.239	10.794	11.351	-5.1%	5.2%	-1.34	1.34	
24	9.862	10.389	10.916	-5.1%	5.1%	-1.33	1.33	
25	9.500	10.000	10.500	-5.0%	5.0%	-1.33	1.33	
26	9.139	9.627	10.116	-5.1%	5.1%	-1.34	1.34	
27	8.793	9.270	9.748	-5.1%	5.2%	-1.37	1.37	
28	8.462	8.927	9.395	-5.2%	5.2%	-1.39	1.40	
29	8.144	8.599	9.056	-5.3%	5.3%	-1.42	1.43	
30	7.840	8.284	8.731	-5.4%	5.4%	-1.45	1.46	
31	7.548	7.982	8.419	-5.4%	5.5%	-1.47	1.49	
32	7.269	7.692	8.119	-5.5%	5.6%	-1.50	1.52	
33	7.001	7.414	7.831	-5.6%	5.6%	-1.53	1.55	
34	6.744	7.147	7.555	-5.6%	5.7%	-1.56	1.58	
35	6.498	6.891	7.289	-5.7%	5.8%	-1.58	1.61	
36	6.261	6.645	7.034	-5.8%	5.9%	-1.61	1.64	
37	6.035	6.409	6.790	-5.8%	5.9%	-1.64	1.67	
38	5.817	6.182	6.554	-5.9%	6.0%	-1.67	1.70	
39	5.608	5.965	6.328	-6.0%	6.1%	-1.70	1.73	
40	5.408	5.755	6.110	-6.0%	6.2%	-1.72	1.76	
41	5.215	5.555	5.901	-6.1%	6.2%	-1.75	1.79	
42	5.030	5.362	5.700	-6.2%	6.3%	-1.78	1.82	
43	4.853	5.176	5.507	-6.2%	6.4%	-1.81	1.85	
44	4.682	4.998	5.321	-6.3%	6.5%	-1.84	1.88	
45	4.519	4.826	5.142	-6.4%	6.5%	-1.87	1.92	

R-T				TABLE				KLS06024-Z
R(25°C)=10kohm±5%				B(25/50)=3470±2%				
Temp.	Resistance(kΩ)			resistance tol. (%)		Temp.tol. (°C)		
°C	Rmin	R(t)Normal	Rmax	MIN	MAX	MIN	MAX	
46	4.361	4.662	4.970	-6.4%	6.6%	-1.90	1.95	
47	4.210	4.503	4.804	-6.5%	6.7%	-1.93	1.98	
48	4.065	4.351	4.645	-6.6%	6.8%	-1.96	2.01	
49	3.925	4.204	4.491	-6.6%	6.8%	-1.98	2.05	
50	3.791	4.063	4.343	-6.7%	6.9%	-2.01	2.08	
51	3.662	3.927	4.201	-6.8%	7.0%	-2.04	2.11	
52	3.538	3.797	4.065	-6.8%	7.1%	-2.07	2.14	
53	3.418	3.671	3.933	-6.9%	7.1%	-2.10	2.18	
54	3.303	3.550	3.806	-6.9%	7.2%	-2.13	2.21	
55	3.193	3.433	3.683	-7.0%	7.3%	-2.17	2.25	
56	3.086	3.321	3.565	-7.1%	7.3%	-2.20	2.28	
57	2.984	3.213	3.451	-7.1%	7.4%	-2.23	2.31	
58	2.885	3.109	3.341	-7.2%	7.5%	-2.26	2.35	
59	2.790	3.008	3.235	-7.3%	7.6%	-2.29	2.38	
60	2.698	2.911	3.133	-7.3%	7.6%	-2.32	2.42	
61	2.610	2.818	3.034	-7.4%	7.7%	-2.35	2.45	
62	2.525	2.727	2.939	-7.4%	7.8%	-2.38	2.49	
63	2.443	2.641	2.847	-7.5%	7.8%	-2.41	2.52	
64	2.364	2.557	2.759	-7.6%	7.9%	-2.44	2.56	
65	2.287	2.476	2.673	-7.6%	8.0%	-2.47	2.59	
66	2.214	2.398	2.591	-7.7%	8.0%	-2.51	2.63	
67	2.143	2.323	2.511	-7.7%	8.1%	-2.54	2.66	
68	2.075	2.250	2.434	-7.8%	8.2%	-2.57	2.70	
69	2.009	2.180	2.360	-7.9%	8.2%	-2.60	2.73	
70	1.945	2.113	2.288	-7.9%	8.3%	-2.63	2.77	
71	1.883	2.047	2.218	-8.0%	8.4%	-2.67	2.81	
72	1.824	1.983	2.151	-8.0%	8.5%	-2.70	2.84	
73	1.766	1.922	2.085	-8.1%	8.5%	-2.73	2.88	
74	1.711	1.862	2.022	-8.1%	8.6%	-2.76	2.92	
75	1.657	1.805	1.962	-8.2%	8.7%	-2.80	2.95	
76	1.606	1.750	1.903	-8.3%	8.7%	-2.83	2.99	
77	1.556	1.697	1.846	-8.3%	8.8%	-2.86	3.03	
78	1.508	1.646	1.791	-8.4%	8.9%	-2.89	3.06	
79	1.462	1.596	1.739	-8.4%	8.9%	-2.93	3.10	
80	1.417	1.548	1.687	-8.5%	9.0%	-2.96	3.14	
81	1.374	1.502	1.638	-8.5%	9.1%	-2.99	3.18	
82	1.332	1.457	1.590	-8.6%	9.1%	-3.03	3.22	
83	1.292	1.414	1.544	-8.6%	9.2%	-3.06	3.25	
84	1.253	1.373	1.500	-8.7%	9.3%	-3.10	3.29	
85	1.216	1.332	1.457	-8.8%	9.3%	-3.13	3.33	
86	1.180	1.294	1.415	-8.8%	9.4%	-3.16	3.37	
87	1.145	1.257	1.376	-8.9%	9.4%	-3.20	3.41	
88	1.112	1.221	1.337	-8.9%	9.5%	-3.23	3.45	

R-T				TABLE				KLS06024-Z
R(25℃)=10kohm±5%				B(25/50)=3470±2%				
Temp.	Resistance(kΩ)			resistance tol. (%)		Temp.tol. (℃)		
℃	Rmin	R(t)Normal	Rmax	MIN	MAX	MIN	MAX	
89	1.080	1.186	1.300	-9.0%	9.6%	-3.27	3.49	
90	1.049	1.153	1.264	-9.0%	9.6%	-3.30	3.53	
91	1.019	1.120	1.229	-9.1%	9.7%	-3.34	3.57	
92	0.990	1.089	1.195	-9.1%	9.8%	-3.38	3.61	
93	0.961	1.059	1.163	-9.2%	9.8%	-3.41	3.65	
94	0.934	1.029	1.131	-9.2%	9.9%	-3.45	3.69	
95	0.908	1.001	1.100	-9.3%	9.9%	-3.48	3.74	
96	0.883	0.973	1.071	-9.3%	10.0%	-3.52	3.78	
97	0.858	0.947	1.042	-9.4%	10.1%	-3.55	3.82	
98	0.834	0.921	1.014	-9.4%	10.1%	-3.59	3.86	
99	0.811	0.896	0.987	-9.5%	10.2%	-3.63	3.90	
100	0.789	0.872	0.961	-9.5%	10.3%	-3.66	3.94	
101	0.767	0.848	0.936	-9.6%	10.3%	-3.70	3.99	
102	0.746	0.826	0.911	-9.6%	10.4%	-3.74	4.03	
103	0.726	0.803	0.887	-9.7%	10.4%	-3.77	4.07	
104	0.706	0.782	0.864	-9.7%	10.5%	-3.81	4.11	
105	0.687	0.761	0.842	-9.8%	10.5%	-3.85	4.16	
106	0.668	0.741	0.820	-9.8%	10.6%	-3.89	4.20	
107	0.651	0.722	0.799	-9.9%	10.7%	-3.92	4.24	
108	0.633	0.703	0.778	-9.9%	10.7%	-3.96	4.29	
109	0.616	0.685	0.758	-10.0%	10.8%	-4.00	4.33	
110	0.600	0.667	0.739	-10.0%	10.8%	-4.04	4.37	
111	0.584	0.650	0.720	-10.1%	10.9%	-4.08	4.42	
112	0.569	0.633	0.702	-10.1%	11.0%	-4.11	4.46	
113	0.554	0.617	0.685	-10.1%	11.0%	-4.15	4.51	
114	0.540	0.601	0.668	-10.2%	11.1%	-4.19	4.55	
115	0.526	0.586	0.651	-10.2%	11.1%	-4.23	4.60	
116	0.512	0.571	0.635	-10.3%	11.2%	-4.27	4.64	
117	0.499	0.557	0.619	-10.3%	11.2%	-4.31	4.69	
118	0.486	0.543	0.604	-10.4%	11.3%	-4.35	4.73	
119	0.474	0.529	0.589	-10.4%	11.4%	-4.38	4.78	
120	0.462	0.516	0.575	-10.5%	11.4%	-4.42	4.82	
121	0.450	0.503	0.561	-10.5%	11.5%	-4.46	4.87	
122	0.439	0.491	0.547	-10.6%	11.5%	-4.50	4.92	
123	0.428	0.479	0.534	-10.6%	11.6%	-4.54	4.96	
124	0.417	0.467	0.521	-10.6%	11.6%	-4.58	5.01	
125	0.407	0.456	0.509	-10.7%	11.7%	-4.62	5.05	
126	0.397	0.445	0.497	-10.7%	11.7%	-4.66	5.10	
127	0.387	0.434	0.485	-10.8%	11.8%	-4.70	5.15	
128	0.378	0.423	0.474	-10.8%	11.9%	-4.74	5.20	
129	0.368	0.413	0.463	-10.9%	11.9%	-4.78	5.24	
130	0.359	0.403	0.452	-10.9%	12.0%	-4.82	5.29	
131	0.351	0.394	0.441	-11.0%	12.0%	-4.86	5.34	

R-T				TABLE				KLS06024-Z
R(25°C)=10kohm±5%				B(25/50)=3470±2%				
Temp.	Resistance(kΩ)			resistance tol. (%)		Temp.tol. (°C)		
°C	Rmin	R(t)Normal	Rmax	MIN	MAX	MIN	MAX	
132	0.342	0.385	0.431	-11.0%	12.1%	-4.91	5.39	
133	0.334	0.376	0.421	-11.0%	12.1%	-4.95	5.43	
134	0.326	0.367	0.411	-11.1%	12.2%	-4.99	5.48	
135	0.318	0.358	0.402	-11.1%	12.2%	-5.03	5.53	
136	0.311	0.350	0.393	-11.2%	12.3%	-5.07	5.58	
137	0.304	0.342	0.384	-11.2%	12.3%	-5.11	5.63	
138	0.296	0.334	0.375	-11.2%	12.4%	-5.15	5.68	
139	0.289	0.326	0.367	-11.3%	12.4%	-5.20	5.73	
140	0.283	0.319	0.359	-11.3%	12.5%	-5.24	5.78	
141	0.276	0.312	0.351	-11.4%	12.5%	-5.28	5.83	
142	0.270	0.305	0.343	-11.4%	12.6%	-5.32	5.88	
143	0.264	0.298	0.335	-11.4%	12.6%	-5.37	5.93	
144	0.258	0.291	0.328	-11.5%	12.7%	-5.41	5.98	
145	0.252	0.284	0.321	-11.5%	12.7%	-5.45	6.03	
146	0.246	0.278	0.314	-11.6%	12.8%	-5.49	6.08	
147	0.240	0.272	0.307	-11.6%	12.8%	-5.54	6.13	
148	0.235	0.266	0.300	-11.6%	12.9%	-5.58	6.18	
149	0.230	0.260	0.294	-11.7%	13.0%	-5.62	6.23	
150	0.225	0.254	0.287	-11.7%	13.0%	-5.67	6.28	