



## SPECIFICATION FOR APPROVAL

CUSTOMER : IBS  
PRODUCT MODEL : NTC Thrmistor Sensor  
CUSTOMER PART NO. : CT-000502-00E  
PART NO. : MWF502F3977FB101-02  
FILE NO. : JK/Q-SR-001  
MATERIAL CODE : MWF-0010  
EDITION : A/0  
DATE : 2018-05-10  
DATE :

SUPPLIER CONFIRM	
Edited	
CHECK	
APPROVE	

CUSTOMER CONFIRM

**Huizhou Jocol Industry co.,Ltd**

Site: No.1Building Xingyun East Road Dongjiang High and New Technology

Industrial Zone, Zhongkai High tech District, Huizhou, Guangdong

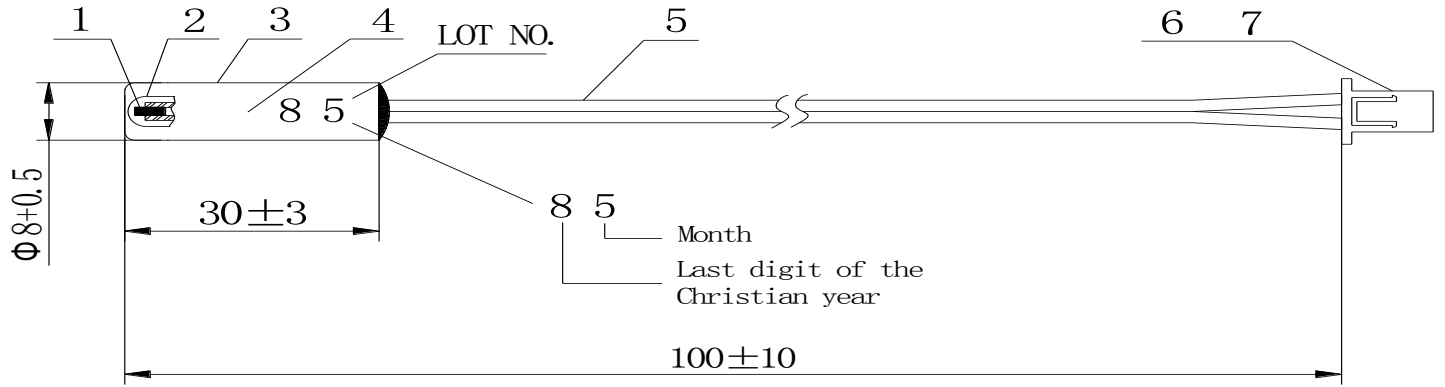
TEL: 0752- 2697969 FAX: 0752-2697819





PART NO.	MWF502F3977FB101-02
FILE NO.	JK/Q-SR-001

1、Shape Dimensions ( Unit: mm)



2、Component

Part	Definition	Specification	Quantity
1.	NTC Thermistor	MF52D 502F 3977F	1PCS
2.	Coating resin	FC505A、FC505B、FC505C Color:Black	--
3.	Pipe	PBT $\Phi$ 3*30 Color:White	1PCS
4.	Filling resin	FC500A、FC500B Color:White	--
5.	Wire	1569 26# 2C (7/0.16) 105°C 300V Color:White	1PCS
6.	Contact	XH-001T-P0.6 (JST)	2PCS
7.	Housing	XHP-2 (JST)	1PCS



PART NO.	MWF502F3977FB101-02
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### 3、 Electric Feature

Part	Items	Measure methods	Min	Nominal	Max	Unit
3-1.	Resistance at 25°C	Ta=25±0.05°C P <sub>T</sub> ≦0.1mw	4.95	5	5.05	kΩ
3-2.	B Value (25°C/85°C)	$B=LN \frac{R_{T1}}{R_{T2}} / (\frac{1}{T1} - \frac{1}{T2})$	3937.23	3977	4016.77	k
3-3.	Dissipation (σ )	In still air Ta=25±0.5°C	6	/	/	mw/°C
3-4.	Thermal Time Constant (τ )	In stirring water	/	/	20	sec
3-5.	Hi-pot Test	1800VAC/1mA/1S	No breakdown			
3-6.	Insulation test	DC500V insulation resistance is greater than or equal to 100MΩ .	100	/	/	MΩ
3-7.	Operating temperature range	/	-40	/	125	°C

### 4、 Maximum Ratings

Part	Items	Min	Nominal	Max	Unit
4-1.	Wire Operating Temperature Range	-40	/	105	°C
4-2.	NTC Operating Temperature Range	-40	/	125	°C
4-3.	Max Permissible current	/	/	4	mA
4-4.	Max Permissible Power-At 25°C	/	/	20	mW



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FILE NO.	JK/Q-SR-001

## 5、 Naming Rule

**MWF 502 F 3977 F B 101 - D 02**  
 ①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨

①	Type Code	NTC Thrmistor Sensor
②	Resistance at 25℃	$502=50*10^2\Omega =5K\Omega$
③	Resistance Tolerance	C=±0.3%, D=±0.6%, E=±0.8% F=±1%, G=±2%, H=±3%, J=±5%, K=±10%, M=±20%
④	B Value	3977K
⑤	B Value Tolerance	C=±0.3%, D=±0.5%, E=±0.6% F=±1%, G=±2%, H=±3%, J=±5%
⑥	B Value Calculating Methods	A: B25/50, B: B25/85, C: B0/25, D: B25/37.5, E: 0/100, F: B100/200
⑦	Wire Length	$101=10*10^1=100mm$
⑧	Package Type/ Temperature terminal type	D-Epoxy coating, B-Chip shape, C-Bullet shape, E-Flange shape, F-Screw thread shape G-Straight pipe shape, H-Casing shape, I-Cap spring shape, J-Combination shape, K-Special shape
⑨	The product type	Factory Internal Code

## 6、 Mechanical Properties

Part	Items	Criteria	Test Methods
5-1.	Tensile Test	No Crack Between Epoxy And Wire, No Deformation, No Break	20N, 10S
5-2.	Drop Test	No Visible damage	Free Falling At The Height Of 1 Meter, 5 times



PART NO.	MWF502F3977FB101-02
FILE NO.	JK/Q-SR-001

## 7、Reliability Test

Part	Items	Criteria	Test Methods
6-1.	Storage in dry heat	$\Delta R/R25 \leq \pm 3\%$ No visible damage	$80 \pm 3^\circ\text{C}$ , $1000 \pm 24\text{h}$
6-2.	Storage in coldness	$\Delta R/R25 \leq \pm 3\%$ No visible damage	$-40 \pm 3^\circ\text{C}$ , $1000 \pm 24\text{h}$
6-3.	Storage in damp, heat, steady state	$\Delta R/R25 \leq \pm 3\%$ No visible damage	$40 \pm 2^\circ\text{C}$ , 90%-95%RH, $1000 \pm 24\text{h}$
6-4.	Thermal shock	$\Delta R/R25 \leq \pm 3\%$ No visible damage	$-30^\circ\text{C} \times 10\text{min} \rightarrow 60^\circ\text{C} \times 10\text{min}$ 100 Cycles

## 8、Product use conditions

- 1) The maximum service temperature of product use, the maximum power to wait, all in accordance with the specification requirements homework, shall not exceed the scope of specification.
- 2) Product mobile, installation must be handled with care not pulling force .
- 3) Cap occur deformation, oxidation etc. Phenomenon, do not use, so as not to affect the temperature accuracy .
- 4) Product appearance found deformation, breakage, do not use, lest affect performance.
- 5) Avoid from exceeding radical temperature change, which is beyond operation temperature range.
- 6) Do not add excessive vibration shocking pressure.
- 7) Avoid from excessive pulling and bending of the lead wire.
- 8) Do not use in corrosiveness gas atmosphere (CO<sub>2</sub>, NH<sub>3</sub>, Sox, Nox) beyond the designated condition. Do not use at the place where the sensor touches the electrolytic, brine, acid, alkaline and organic solvent beyond the designated condition.
- 9) As far as possible avoid using in water, high humidity and other have rot environment.
- 10) Through the negative temperature coefficient temperature sensor current will cause element own fever and produce measurement error, therefore need before use this factor into consideration.
- 11) In extreme temperatures, the product can be short-term bear too high or too low temperature impact, but do not put product at extreme temperatures for a long time, in order to avoid shortening the service life of products.



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### 9、R-T table

#### TEMPERATURE VS RESISTANCE TABLE

Resistance            5k Ohms at 25deg. C

Resistance Tolerance    +/- 1%

B Value                3977K at 25/85deg. C

B Value Tolerance       +/- 1%

Temp. (deg. C)	Rmax (k Ohms)	Rnor (k Ohms)	Rmin (k Ohms)
-30	99.3374	95.4952	91.7924
-29	93.0654	89.5235	86.1078
-28	87.2323	83.9662	80.8143
-27	81.8045	78.7918	75.8824
-26	76.7514	73.9714	71.2850
-25	72.0446	69.4787	66.9974
-24	67.6583	65.2892	62.9967
-23	63.5686	61.3805	59.2618
-22	59.7535	57.7321	55.7735
-21	56.1929	54.3250	52.5139
-20	52.8682	51.1417	49.4666
-19	49.7623	48.1661	46.6164
-18	46.8595	45.3834	43.9494
-17	44.1452	42.7798	41.4526
-16	41.6059	40.3428	39.1141
-15	39.2294	38.0606	36.9229
-14	37.0042	35.9225	34.8688
-13	34.9198	33.9184	32.9425
-12	32.9663	32.0392	31.1351
-11	31.1348	30.2763	29.4386
-10	29.4169	28.6218	27.8455
-9	27.8048	27.0685	26.3490
-8	26.2914	25.6094	24.9425
-7	24.8702	24.2383	23.6201
-6	23.5348	22.9494	22.3763
-5	22.2796	21.7372	21.2059



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PART NO.	MWF502F3977FB101-02
FILE NO.	JK/Q-SR-001

-4	21.0994	20.5968	20.1042
-3	19.9891	19.5235	19.0667
-2	18.9443	18.5128	18.0893
-1	17.9607	17.5609	17.1682
0	17.0343	16.6639	16.2998
1	16.1616	15.8183	15.4808
2	15.3389	15.0209	14.7080
3	14.5633	14.2687	13.9787
4	13.8318	13.5589	13.2900
5	13.1415	12.8887	12.6396
6	12.4899	12.2558	12.0250
7	11.8746	11.6579	11.4441
8	11.2934	11.0929	10.8948
9	10.7443	10.5587	10.3752
10	10.2252	10.0535	9.8837
11	9.7343	9.5755	9.4184
12	9.2700	9.1232	8.9778
13	8.8307	8.6950	8.5605
14	8.4148	8.2895	8.1652
15	8.0210	7.9053	7.7905
16	7.6481	7.5413	7.4352
17	7.2947	7.1962	7.0983
18	6.9597	6.8690	6.7787
19	6.6421	6.5586	6.4754
20	6.3410	6.2640	6.1874
21	6.0552	5.9845	5.9140
22	5.7841	5.7191	5.6543
23	5.5266	5.4670	5.4075
24	5.2822	5.2276	5.1730
25	5.0500	5.0000	4.9500
26	4.8337	4.7837	4.7337
27	4.6278	4.5780	4.5282
28	4.4320	4.3823	4.3328
29	4.2456	4.1962	4.1470
30	4.0681	4.0190	3.9702
31	3.8991	3.8504	3.8019
32	3.7380	3.6898	3.6418
33	3.5846	3.5368	3.4894
34	3.4383	3.3911	3.3442





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35	3.2989	3.2522	3.2059
36	3.1659	3.1198	3.0741
37	3.0390	2.9935	2.9484
38	2.9180	2.8731	2.8287
39	2.8024	2.7582	2.7144
40	2.6921	2.6486	2.6055
41	2.5868	2.5439	2.5015
42	2.4861	2.4440	2.4023
43	2.3900	2.3485	2.3075
44	2.2981	2.2573	2.2171
45	2.2103	2.1702	2.1307
46	2.1263	2.0870	2.0481
47	2.0460	2.0073	1.9692
48	1.9692	1.9312	1.8938
49	1.8957	1.8584	1.8217
50	1.8253	1.7887	1.7527
51	1.7579	1.7221	1.6868
52	1.6934	1.6583	1.6237
53	1.6317	1.5972	1.5633
54	1.5725	1.5387	1.5055
55	1.5158	1.4827	1.4501
56	1.4615	1.4290	1.3971
57	1.4094	1.3775	1.3463
58	1.3594	1.3282	1.2976
59	1.3115	1.2809	1.2510
60	1.2655	1.2356	1.2063
61	1.2214	1.1921	1.1634
62	1.1791	1.1504	1.1223
63	1.1385	1.1104	1.0829
64	1.0995	1.0720	1.0450
65	1.0621	1.0351	1.0087
66	1.0261	0.9997	0.9739
67	0.9915	0.9657	0.9404
68	0.9583	0.9330	0.9083
69	0.9264	0.9016	0.8775
70	0.8957	0.8715	0.8478
71	0.8662	0.8425	0.8193
72	0.8378	0.8146	0.7920
73	0.8105	0.7878	0.7657



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FILE NO.	JK/Q-SR-001

74	0.7843	0.7621	0.7404
75	0.7590	0.7373	0.7161
76	0.7347	0.7134	0.6927
77	0.7113	0.6905	0.6702
78	0.6888	0.6684	0.6485
79	0.6671	0.6471	0.6277
80	0.6462	0.6266	0.6076
81	0.6260	0.6069	0.5883
82	0.6066	0.5879	0.5697
83	0.5879	0.5696	0.5518
84	0.5699	0.5520	0.5345
85	0.5525	0.5350	0.5179
86	0.5358	0.5186	0.5019
87	0.5196	0.5028	0.4865
88	0.5040	0.4876	0.4716
89	0.4890	0.4729	0.4572
90	0.4745	0.4587	0.4434
91	0.4605	0.4450	0.4301
92	0.4470	0.4318	0.4172
93	0.4339	0.4191	0.4048
94	0.4213	0.4068	0.3928
95	0.4092	0.3950	0.3812
96	0.3974	0.3835	0.3700
97	0.3860	0.3724	0.3593
98	0.3751	0.3617	0.3488
99	0.3645	0.3514	0.3388
100	0.3542	0.3414	0.3291
101	0.3443	0.3318	0.3197
102	0.3347	0.3225	0.3106
103	0.3255	0.3135	0.3018
104	0.3165	0.3047	0.2934
105	0.3079	0.2963	0.2852
106	0.2995	0.2882	0.2773
107	0.2914	0.2803	0.2696
108	0.2835	0.2727	0.2622
109	0.2759	0.2653	0.2550
110	0.2686	0.2581	0.2481
111	0.2614	0.2512	0.2414
112	0.2545	0.2445	0.2349



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113	0.2479	0.2380	0.2286
114	0.2414	0.2318	0.2225
115	0.2351	0.2257	0.2166
116	0.2290	0.2198	0.2109
117	0.2232	0.2141	0.2054
118	0.2175	0.2086	0.2000
119	0.2119	0.2032	0.1948
120	0.2066	0.1980	0.1898
121	0.2014	0.1930	0.1849
122	0.1963	0.1881	0.1802
123	0.1914	0.1834	0.1757
124	0.1867	0.1788	0.1712
125	0.1821	0.1744	0.1669