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SPECIFICATION FOR APPROVAL

CUSTOMER	道通
CERTIFIED MODEL/TYPE	NTSE1502
PART NO.	NTSE1502FZ021(RoHS)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	Feb.1.2023
REV. NO	1.0
REV. DATE	

FOR CUSTOMER APPROVAL	CHECKED BY
	Hu Feng
	APPROVED BY
	FM Chu

THINKING ELECTRONIC INDUSTRIAL CO.,LTD

CUSTOMER:道通

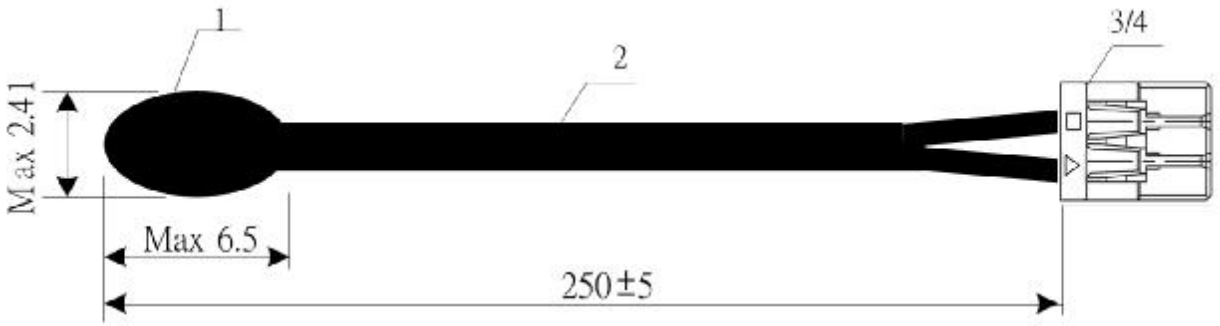
THINKING P/N:NTSE1502FZ021

REVISED RECORD SHEET

REV. NO	REV. DATE	REVISED CONTENT
1.0	2023/2/1	New released

A. Material List		
NO.	**ITEM**	**DESCRIPTION**
1	COATING RESIN	BLACK EPOXY
2	LEAD WIRE	UL4484#30*2C TS Black wire
3	HOUSING	A1257H-2P(長江)或同等品
4	TERMINAL	A1257-TP(長江)或同等品
*	ELEMENT	NTC Thermistor

B. Electrical Characteristic	
ITEM	**VALUE**
R25℃	5KΩ±1%
B25/100	3988 K ± 1%



							Customer	道通
							Customer P/N	
							Thinking P/N	NTSE1502FZ021
							Drawing NO.	SE2302003
							Date	2023/2/1
							Tol: ±mm	Unit: mm / Scale:
1.0	2023/2/1	New released		Hu Landan	Hu Feng	FM Chu	*THINKING ELECTRONIC INDUSTRIAL CO.,LTD*	
Rev.	Date	Subjects of Change	ECN.NO	Designed by	Checked by	Approved by		

THINKING ELECTRONIC INDUSTRIAL CO.,LTD

SUBJECT:CERTIFICATION OF MATERIALS

CUSTOMER:道通

THINKING P/N:NTSE1502FZ021

NO	PART NAME	PART P/N	Q'TY	UL FILE NO
1	COATING RESIN	BLACK EPOXY		
2	LEAD WIRE	UL4484#30*2C TS Black wire	1	
3	HOUSING	A1257H-2P(長江)或同等品	1	
4	TERMINAL	A1257-TP(長江)或同等品	2	
*	ELEMENT	NTC Thermistor	1	
NOTES				
FM Chu		Hu Feng	Hu Landan	

Approved by: Checked by: Designed by:

Specification of NTC Thermistor for Temperature Measurement and Control

PART NO . NTSE1502FZ021

CUSTOMER P/N .

1. Electrial characteristics

	Parameter	Symbol	Test Conditions	Min.	Nor.	Max.	Unit
a.	Resistance At 25℃	R_{25}	Ta=25℃±0.05℃ P_T≦0.02mW	4.95	5	5.05	KΩ
b.	B Constant	$R_{25/100}$	1483.396*Ln(R25/R100)	3948	3988	4028	K
e.	Thermal Dissipation Constant (in air)	δ	Ta=25℃	-----	Approx2.0	-----	mW/℃
f.	Thermal Time Constant (in water)	τ	25℃→85℃ T1=25+(85-25)*63.2%=62.92℃	-----	Approx10	-----	Sec
g	Insulation test	- - - - -	100V DC 3Sec	Min:50MΩ			

2.Maximun Ratings

	Parameter	Specification	Unit
	Operation Temperature Range	-55 ----- +150	℃

3. Reliability Test

Item	Test Conditions	Variable
Temp. cycle test	-55 ℃ x 30min → +25 ℃ x 5min +150 ℃ x 30min → +25 ℃ x 5min } X 100Cycles	No visible damage | △R25/ R25 | ≤3% | △B/ B | ≤3%
Low temp.test	-55± 5℃ X 1000 HRS	No visible damage | △R25/ R25 | ≤3% | △B/ B | ≤3%
High temp.test	150± 5℃ X 1000 HRS	No visible damage | △R25/ R25 | ≤3% | △B/ B | ≤3%
Humidity test	40 ℃ 93 % RH x 1000 HRS	No visible damage | △R25/ R25 | ≤3% | △B/ B | ≤3%

Install and use

1. Use this product within the specified temperature range.
2. Higher temperature may cause deterioration of the characteristics or the material quality of this product.
3. Do not melt the solder in resin head, when you solder this product. If you melt the solder in resin head,
   it has possibility that the break of wire, short and insulation damage.
4. Do not touch the resin head directly by solder iron. It may cause the melt of solder in resin head.
5. At least away from resin head 10mm above when lead dividing.
6. In case you cut the lead wire of this product less than 10mm from resin head,
   the heat of melted solder at lead wire edge is propagated easily to the resin head along the lead wire.
7. Radius of lead bending should be more than 1mm when lead bending.
   Holding element by side lead wire is recommended when lead wire is bent or cut.
8. Do not apply an excessive force to the lead. Otherwise, it may cause junction between lead and element to break or crack.
9. The ceramic element of this product is fragile, and care must be taken not to load an excessive press-force
   or not to give a shock at handling. Such forces may cause cracking or chipping.
10. If you mold by resin this product, please evaluate the quality of this product before you use it.

Warehouse Storage Conditions of Products

To keep solderability of product from declining, the following storage condition is recommended.

1. Storage condition:

Temperature -10℃ to +40℃

Humidity less than 75%RH (not dewing condition)

2. Storage term:

Use this product within 1 year after delivery by first-in and first-out stocking system.

3. Handling after unpacking:

After unpacking, reseal product promptly or store it in a sealed container with a drying agent.

4. Storage place:

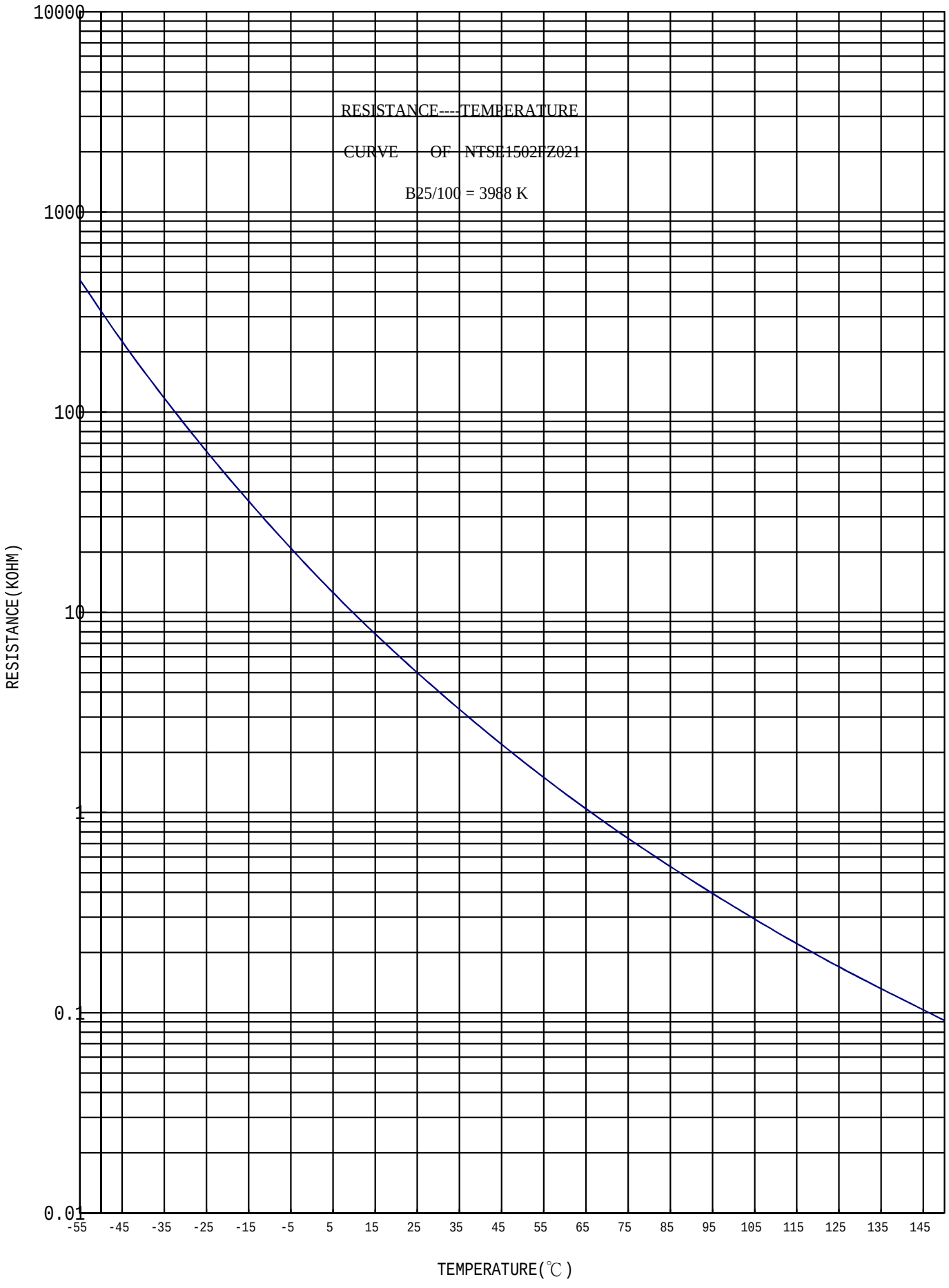
Do not store this product in corrosive gas (Sulfuric acid gas, Chlorine gas, etc.) or in direct sunlight.

Warn and note item

This product is designed for application in an ordinary environment (normal room temperature, humidity and atmospheric pressure).

Do not use under the following conditions because all of these factors can deteriorate the product characteristics or cause failures and burn-out.

1. Corrosive gas or deoxidizing gas (Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
2. Volatile or flammable gas
3. Dusty conditions
4. Under vacuum, or under high or low pressure
5. Wet or humid locations; soak in the liquid or wash with liquid
6. Places with salt water, oils, chemical liquids or organic solvents and do not use directly with quick-drying glue.
7. Strong vibrations
8. Other places where similar hazardous conditions exist
9. Be sure to provide an appropriate fail-safe function on your product to prevent secondary damages
   that may be caused by the abnormal function or the failure of our product.



R - T Table

Part No. :NTSE1502FZ021

R25=5KΩ ±1%

B25/100 = 3988 K ± 1%

Temperature (℃)	Rmax. (KΩ)	Rnor. (KΩ)	Rmin. (KΩ)	Temperature Tol. (℃)	
-55	482.477	456.614	432.094	-0.81	0.80
-54	449.875	426.055	403.456	-0.78	0.78
-53	418.867	396.969	376.179	-0.75	0.76
-52	389.606	369.503	350.402	-0.73	0.74
-51	362.227	343.785	326.249	-0.72	0.73
-50	336.789	319.873	303.775	-0.71	0.73
-49	313.275	297.753	282.971	-0.70	0.72
-48	291.606	277.354	263.772	-0.70	0.72
-47	271.663	258.567	246.078	-0.70	0.72
-46	253.310	241.266	229.771	-0.70	0.72
-45	236.404	225.318	214.730	-0.70	0.72
-44	220.807	210.594	200.834	-0.69	0.72
-43	206.391	196.977	187.973	-0.69	0.71
-42	193.042	184.359	176.048	-0.69	0.71
-41	180.659	172.646	164.972	-0.68	0.70
-40	169.155	161.757	154.668	-0.68	0.70
-39	158.453	151.622	145.071	-0.67	0.69
-38	148.489	142.178	136.122	-0.67	0.69
-37	139.203	133.372	127.773	-0.66	0.68
-36	130.545	125.156	119.978	-0.66	0.68
-35	122.469	117.488	112.699	-0.65	0.67
-34	114.934	110.329	105.898	-0.64	0.66
-33	107.903	103.645	99.5446	-0.64	0.66
-32	101.341	97.4023	93.6070	-0.63	0.65
-31	95.2156	91.5712	88.0575	-0.62	0.64
-30	89.4962	86.1235	82.8696	-0.62	0.64
-29	84.1549	81.0328	78.0188	-0.61	0.63
-28	79.1652	76.2744	73.4818	-0.61	0.63
-27	74.5023	71.8250	69.2369	-0.60	0.62
-26	70.1432	67.6629	65.2637	-0.60	0.62
-25	66.0662	63.7679	61.5433	-0.59	0.61
-24	62.2512	60.1210	58.0578	-0.58	0.60
-23	58.6796	56.7047	54.7908	-0.58	0.60
-22	55.3340	53.5028	51.7270	-0.57	0.59
-21	52.1984	50.5002	48.8523	-0.57	0.58
-20	49.2581	47.6829	46.1534	-0.56	0.58
-19	46.4995	45.0382	43.6184	-0.55	0.57
-18	43.9100	42.5542	41.2361	-0.55	0.56
-17	41.4781	40.2201	38.9963	-0.54	0.56
-16	39.1932	38.0258	36.8895	-0.53	0.55
-15	37.0456	35.9622	34.9070	-0.52	0.54
-14	35.0261	34.0207	33.0408	-0.52	0.54
-13	33.1266	32.1934	31.2834	-0.51	0.53

-12	31.3393	30.4732	29.6281	-0.50	0.52
-11	29.6572	28.8533	28.0685	-0.50	0.51
-10	28.0736	27.3275	26.5986	-0.49	0.51
-9	26.5825	25.8900	25.2131	-0.48	0.50
-8	25.1781	24.5355	23.9068	-0.47	0.49
-7	23.8553	23.2588	22.6749	-0.47	0.49
-6	22.6089	22.0553	21.5131	-0.46	0.48
-5	21.4344	20.9206	20.4171	-0.45	0.47
-4	20.3275	19.8506	19.3830	-0.45	0.46
-3	19.2840	18.8415	18.4072	-0.44	0.46
-2	18.3002	17.8895	17.4863	-0.43	0.45
-1	17.3725	16.9913	16.6169	-0.42	0.44
0	16.4974	16.1437	15.7960	-0.42	0.43
1	15.6718	15.3436	15.0208	-0.41	0.43
2	14.8928	14.5883	14.2886	-0.40	0.42
3	14.1574	13.8749	13.5967	-0.40	0.41
4	13.4632	13.2011	12.9428	-0.39	0.41
5	12.8075	12.5644	12.3246	-0.38	0.40
6	12.1880	11.9625	11.7400	-0.37	0.39
7	11.6026	11.3935	11.1870	-0.37	0.38
8	11.0491	10.8553	10.6637	-0.36	0.38
9	10.5257	10.3460	10.1683	-0.35	0.37
10	10.0305	9.86398	9.69921	-0.35	0.36
11	9.56186	9.40754	9.25478	-0.34	0.35
12	9.11810	8.97516	8.83358	-0.33	0.35
13	8.69776	8.56541	8.43423	-0.32	0.34
14	8.29943	8.17694	8.05545	-0.32	0.33
15	7.92181	7.80849	7.69602	-0.31	0.32
16	7.56366	7.45888	7.35482	-0.30	0.31
17	7.22384	7.12701	7.03078	-0.29	0.31
18	6.90128	6.81186	6.72292	-0.28	0.30
19	6.59497	6.51244	6.43030	-0.28	0.29
20	6.30398	6.22787	6.15207	-0.27	0.28
21	6.02742	5.95730	5.88740	-0.26	0.27
22	5.76449	5.69994	5.63555	-0.25	0.26
23	5.51441	5.45506	5.39580	-0.24	0.25
24	5.27647	5.22196	5.16749	-0.23	0.25
25	5.05000	5.00000	4.95000	-0.23	0.24
26	4.83856	4.78858	4.73865	-0.24	0.25
27	4.63700	4.58713	4.53735	-0.25	0.26
28	4.44481	4.39513	4.34557	-0.26	0.27
29	4.26149	4.21207	4.16281	-0.27	0.28
30	4.08660	4.03750	3.98858	-0.28	0.29
31	3.91970	3.87097	3.82246	-0.29	0.31
32	3.76038	3.71207	3.66402	-0.30	0.32
33	3.60826	3.56043	3.51288	-0.32	0.33
34	3.46300	3.41567	3.36865	-0.33	0.34
35	3.32424	3.27746	3.23101	-0.34	0.35
36	3.19168	3.14547	3.09961	-0.35	0.36
37	3.06501	3.01939	2.97416	-0.36	0.38
38	2.94395	2.89895	2.85436	-0.37	0.39
39	2.82823	2.78387	2.73994	-0.39	0.40

40	2.71759	2.67390	2.63064	-0.40	0.41
41	2.61181	2.56878	2.52621	-0.41	0.42
42	2.51064	2.46829	2.42642	-0.42	0.44
43	2.41387	2.37222	2.33105	-0.43	0.45
44	2.32131	2.28035	2.23989	-0.45	0.46
45	2.23274	2.19249	2.15274	-0.46	0.47
46	2.14800	2.10845	2.06941	-0.47	0.49
47	2.06689	2.02805	1.98973	-0.48	0.50
48	1.98926	1.95112	1.91352	-0.50	0.51
49	1.91494	1.87750	1.84061	-0.51	0.52
50	1.84379	1.80705	1.77086	-0.52	0.54
51	1.77565	1.73960	1.70412	-0.53	0.55
52	1.71039	1.67503	1.64025	-0.55	0.56
53	1.64787	1.61320	1.57910	-0.56	0.58
54	1.58797	1.55399	1.52057	-0.57	0.59
55	1.53058	1.49726	1.46452	-0.59	0.60
56	1.47557	1.44292	1.41085	-0.60	0.62
57	1.42284	1.39084	1.35943	-0.61	0.63
58	1.37229	1.34094	1.31017	-0.63	0.64
59	1.32380	1.29309	1.26296	-0.64	0.66
60	1.27730	1.24722	1.21772	-0.66	0.67
61	1.23269	1.20322	1.17434	-0.67	0.68
62	1.18988	1.16102	1.13275	-0.68	0.70
63	1.14879	1.12053	1.09286	-0.70	0.71
64	1.10935	1.08168	1.05459	-0.71	0.73
65	1.07148	1.04438	1.01787	-0.73	0.74
66	1.03510	1.00858	0.98263	-0.74	0.75
67	1.00016	0.97419	0.94880	-0.76	0.77
68	0.96658	0.94116	0.91631	-0.77	0.78
69	0.93430	0.90942	0.88511	-0.78	0.80
70	0.90328	0.87892	0.85513	-0.80	0.81
71	0.87344	0.84960	0.82633	-0.81	0.83
72	0.84474	0.82141	0.79864	-0.83	0.84
73	0.81714	0.79430	0.77202	-0.84	0.85
74	0.79057	0.76822	0.74642	-0.86	0.87
75	0.76499	0.74312	0.72180	-0.87	0.88
76	0.74037	0.71896	0.69810	-0.89	0.90
77	0.71666	0.69571	0.67530	-0.90	0.91
78	0.69382	0.67332	0.65335	-0.92	0.93
79	0.67182	0.65175	0.63222	-0.93	0.94
80	0.65061	0.63097	0.61187	-0.95	0.95
81	0.63017	0.61095	0.59226	-0.96	0.97
82	0.61046	0.59165	0.57337	-0.97	0.98
83	0.59146	0.57305	0.55516	-0.99	1.00
84	0.57313	0.55512	0.53762	-1.00	1.01
85	0.55544	0.53782	0.52070	-1.02	1.03
86	0.53838	0.52113	0.50439	-1.03	1.04
87	0.52191	0.50503	0.48865	-1.05	1.05
88	0.50602	0.48950	0.47347	-1.06	1.07
89	0.49067	0.47451	0.45883	-1.08	1.08
90	0.47585	0.46004	0.44470	-1.09	1.10
91	0.46155	0.44606	0.43106	-1.11	1.11
92	0.44772	0.43257	0.41789	-1.12	1.13

93	0.43437	0.41955	0.40519	-1.14	1.14
94	0.42148	0.40697	0.39291	-1.15	1.16
95	0.40901	0.39481	0.38107	-1.17	1.17
96	0.39697	0.38307	0.36962	-1.18	1.19
97	0.38533	0.37173	0.35857	-1.20	1.20
98	0.37408	0.36077	0.34789	-1.21	1.22
99	0.36321	0.35018	0.33758	-1.23	1.23
100	0.35269	0.33994	0.32761	-1.25	1.25
101	0.34253	0.33005	0.31798	-1.26	1.26
102	0.33270	0.32048	0.30868	-1.28	1.28
103	0.32320	0.31124	0.29969	-1.29	1.29
104	0.31402	0.30230	0.29100	-1.31	1.31
105	0.30513	0.29367	0.28260	-1.33	1.32
106	0.29654	0.28531	0.27449	-1.34	1.34
107	0.28823	0.27724	0.26664	-1.36	1.36
108	0.28019	0.26943	0.25906	-1.38	1.37
109	0.27242	0.26188	0.25173	-1.40	1.39
110	0.26490	0.25458	0.24464	-1.41	1.41
111	0.25762	0.24752	0.23779	-1.43	1.42
112	0.25058	0.24069	0.23116	-1.45	1.44
113	0.24377	0.23408	0.22475	-1.47	1.46
114	0.23719	0.22769	0.21856	-1.49	1.48
115	0.23081	0.22151	0.21257	-1.50	1.50
116	0.22464	0.21553	0.20677	-1.52	1.51
117	0.21867	0.20975	0.20117	-1.54	1.53
118	0.21289	0.20415	0.19575	-1.56	1.55
119	0.20730	0.19873	0.19050	-1.58	1.57
120	0.20189	0.19349	0.18543	-1.60	1.59
121	0.19665	0.18842	0.18052	-1.62	1.61
122	0.19157	0.18351	0.17577	-1.64	1.63
123	0.18665	0.17875	0.17117	-1.66	1.65
124	0.18189	0.17415	0.16671	-1.68	1.67
125	0.17728	0.16968	0.16240	-1.70	1.69
126	0.17281	0.16536	0.15822	-1.72	1.71
127	0.16848	0.16118	0.15418	-1.74	1.72
128	0.16428	0.15712	0.15026	-1.76	1.74
129	0.16020	0.15318	0.14646	-1.78	1.76
130	0.15625	0.14937	0.14277	-1.80	1.78
131	0.15242	0.14567	0.13920	-1.82	1.80
132	0.14870	0.14207	0.13573	-1.84	1.82
133	0.14508	0.13859	0.13237	-1.86	1.84
134	0.14157	0.13520	0.12910	-1.88	1.85
135	0.13816	0.13191	0.12593	-1.90	1.87
136	0.13485	0.12872	0.12285	-1.92	1.89
137	0.13162	0.12561	0.11985	-1.94	1.90
138	0.12848	0.12258	0.11694	-1.95	1.92
139	0.12543	0.11964	0.11410	-1.97	1.93
140	0.12245	0.11677	0.11134	-1.98	1.94
141	0.11955	0.11397	0.10864	-1.99	1.95
142	0.11671	0.11124	0.10602	-2.01	1.96
143	0.11395	0.10858	0.10346	-2.02	1.97
144	0.11125	0.10598	0.10096	-2.03	1.98

145	0.10861	0.10344	0.09851	-2.03	1.98
146	0.10603	0.10096	0.09612	-2.04	1.99
147	0.10350	0.09853	0.09379	-2.04	1.99
148	0.10102	0.09615	0.09150	-2.05	1.99
149	0.09859	0.09381	0.08925	-2.05	1.99
150	0.09621	0.09152	0.08705	-2.05	1.99