

TAYAO NTC THERMISTOR
SPECIFICATION FOR APPROVAL

CUSTOMER : 明曜科技股份有限公司

DATE : 2020 / 06 / 12

PRODUCT DESCRIPTION : NTC THERMISTOR

PRODUCT NO. : SS333-104F395FL14030

CUSTOMER PART NO. :

APPROVAL SIGNATURE :

*PLEASE RETURN ONE COPY AFTER APPROVED

APPROVED
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INSPECTED
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PROPOSED
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◎ 台灣-大耀科技股份有限公司

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TAYAO Technology CO., LTD.
NTC-THERMISTOR

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Explanation of Part Number

<u>SSXXX</u>	-	<u>XXX</u>		<u>X</u>		<u>XXX</u>		<u>X</u>		<u>X</u>		<u>XXXXX</u>
(1)		(2)		(3)		(4)		(5)		(6)		(7)

(1) Type

Sensor Type

(2) Resistance at 25°C

330 : $33 \times 10^0 = 33 \ \Omega$

103 : $10 \times 10^3 = 10 \text{ K}\Omega$

(3) Resistance Tolerance

F : $\pm 1\%$

G : $\pm 2\%$

H : $\pm 3\%$

J : $\pm 5\%$

(4) B Constant

343 : 3435

397 : 3970

410 : 4100

430 : 4300

(5) B Constant Tolerance

F : $\pm 1\%$

G : $\pm 2\%$

H : $\pm 3\%$

J : $\pm 5\%$

(6) Lead Condition

— : Leaded

L : Lead Free

(7) Drawing No.

For different dimension appearance, etc.

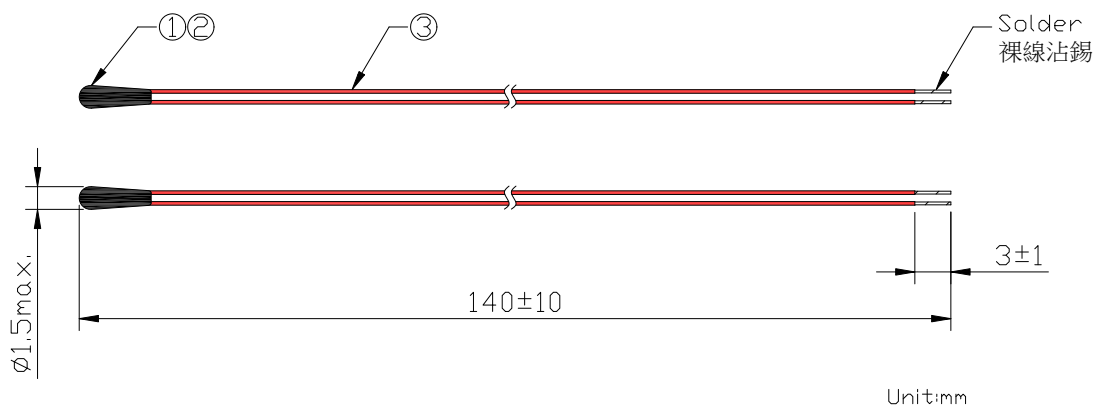
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1. SCOPE

The approval sheet is used for sensor type thermistor and the content consists of shape and dimensions, electrical characteristic, RT table & curve, coating, FQC, reliability test. The major functions of sensor type thermistor are temperature measurement and control. The feature is speed and high accurate response to temperature and excellent thermal shock endurance.

2. SHAPE AND STANDARD DIMENSIONS



Item (項目)	Part name (元件名稱)	P/N(Material) (元件編碼/材料)	Remark (備註)
①	Thermistor (熱敏電阻)	$R_{25}=100K \Omega \pm 1\%$, $B_{25/85}=3950K \pm 1\%$	Lead Free (無鉛)
②	Coating (塗裝)	Epoxy Resin	Color : Black (黑色)
③	Wire (導線)	Enamel Wire	Color : Red (紅色)

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3 ELECTRICAL CHARACTERISTICS

- 3-1 Resistance : $R_{25}=100K(\Omega) \pm 1 \%$ (in $25 \pm 0.1^{\circ}\text{C}$ Oil bath)
- 3-2 B Constant : $B_{25/85}= 3950(K) \pm 1 \%$
- 3-3 Dissipation Factor : *approx. 1 (mW/°C)* (in still air)
- 3-4 Thermal Time Constant : *approx. 2.5 (sec)* (in Oil bath)
- 3-5 Operating Temperature Range : $-40^{\circ}\text{C} \sim +110^{\circ}\text{C}$

4 COATING

- 4-1 Material of Coating : *Epoxy*
- 4-2 Color of Coating : *Black*

5 FINAL PRODUCT TEST REQUIREMENTS

Test Items	Sampling Plan	Test Method	Specification	Equipment
Zero Power Resistance	MIL-STD-105E level I AQL=0.1%	Bath temp.= $25 \pm 0.1^{\circ}\text{C}$	$100K\Omega \pm 1\%$	Resistance test system
Insulation Resistance(I.R.)	MIL-STD-105E level S-3 AQL=0.65%	DC100V	$\geq 100M\Omega$	electrical safety tester
Dimensions	MIL-STD-105E level S-3 AQL=0.65%	-----	see item 2	Caliper
Appearance	MIL-STD-105E level I AQL=0.1%	-----	Appearance spec.	Visual inspection

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6. RELIABILITY TEST

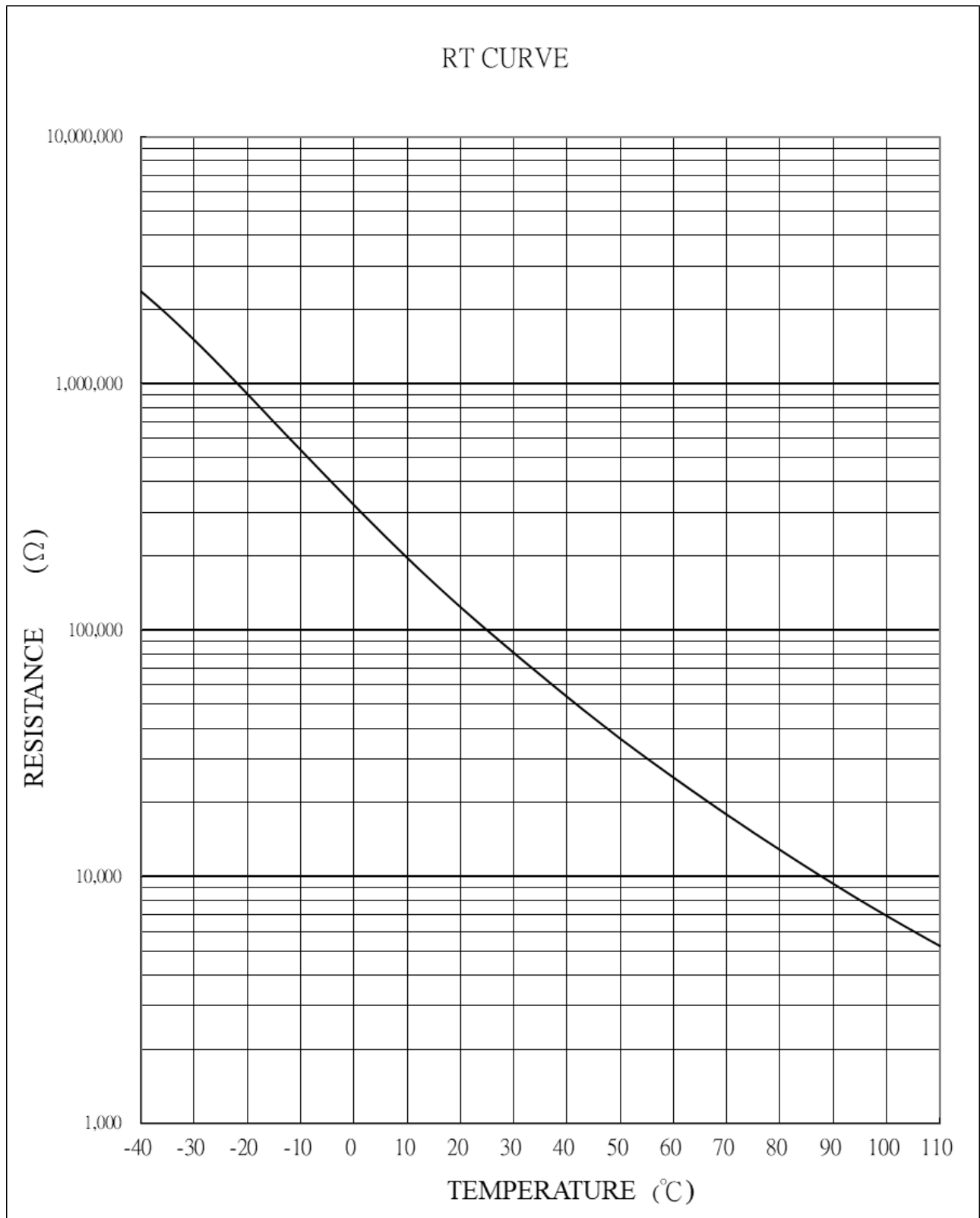
Item	Standard	Condition			Equipment	Specification
High Temperature Test	IEC 60068-2-3 UL1434	Temp.=110±5℃ Period=1000±12hrs			Environmental Chamber	1. $\Delta R_{25} / R_{25} \leq \pm 3\%$ 2. $\Delta B / B \leq \pm 3\%$
Low Temperature Test	IEC 60068-2-2	Temp.=-40±5℃ Period=1000±12hrs			Environmental Chamber	1. $\Delta R_{25} / R_{25} \leq \pm 3\%$ 2. $\Delta B / B \leq \pm 3\%$
Thermal Shock	IEC 60068-2-14 UL1434	The thermal shock condition shown below shall be repeated 10 times.			Thermal shock Machine	1. $\Delta R_{25} / R_{25} \leq \pm 3\%$ 2. $\Delta B / B \leq \pm 3\%$
		Step	Temperature(℃)	Period(min)		
		1	-40 ± 2 ℃	30		
		2	Room Temp.	5		
		3	110 ± 2 ℃	30		
		4	Room Temp.	5		
Humidity	IEC 60068-2-3 UL1434	Temp.=40±2℃ Humidity = 95%RH Period=1000 hrs			Environmental Chamber	1. $\Delta R_{25} / R_{25} \leq \pm 3\%$ 2. $\Delta B / B \leq \pm 3\%$

7. MECHANICAL TEST

Item	Condition	Specification
Lead Pull Test	From lead wire axis direction, hang a load of 2N and stay for 60 sec. between lead wire and the coating.	1. Insulation resistance shall exceed 100MΩ at 500VDC 2. $\Delta R_{25} / R_{25} \leq \pm 1\%$ 3. $\Delta B / B \leq \pm 1\%$
Drop Test	Drop from height 50 cm 3 times	1. Insulation resistance shall exceed 100MΩ at 500VDC 2. $\Delta R_{25} / R_{25} \leq \pm 1\%$ 3. $\Delta B / B \leq \pm 1\%$

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8. RT-CURVE



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9. RT-TABLE

RESISTANCE-TEMPERATURE CHARACTERISTICS

$$R_{25} = 100K \Omega \pm 1\%$$

$$B_{25/85} = 3950 K \pm 1\%$$

Temp. (°C)	Resistance (Ω)			Temp. Coef.(%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-40	2275718	2364791	2461544	-4.10	-4.62	4.62	-1.13	1.13
-39	2184450	2268544	2360025	-4.20	-4.57	4.57	-1.09	1.09
-38	2094815	2174092	2260468	-4.30	-4.51	4.51	-1.05	1.05
-37	2007034	2081667	2163114	-4.39	-4.45	4.45	-1.01	1.01
-36	1921297	1991464	2068166	-4.47	-4.38	4.38	-0.98	0.98
-35	1837758	1903643	1975791	-4.55	-4.32	4.32	-0.95	0.95
-34	1756546	1818335	1886123	-4.62	-4.26	4.26	-0.92	0.92
-33	1677759	1735641	1799264	-4.69	-4.20	4.20	-0.90	0.90
-32	1601475	1655637	1715291	-4.75	-4.13	4.13	-0.87	0.87
-31	1527747	1578376	1634254	-4.81	-4.07	4.07	-0.85	0.85
-30	1456608	1503888	1556182	-4.86	-4.01	4.01	-0.82	0.82
-29	1388075	1432185	1481084	-4.91	-3.94	3.94	-0.80	0.80
-28	1322149	1363265	1408951	-4.95	-3.88	3.88	-0.78	0.78
-27	1258815	1297108	1339760	-4.99	-3.82	3.82	-0.76	0.76
-26	1198050	1233683	1273474	-5.03	-3.75	3.75	-0.75	0.75
-25	1139816	1172948	1210044	-5.06	-3.69	3.69	-0.73	0.73
-24	1084070	1114853	1149414	-5.09	-3.63	3.63	-0.71	0.71
-23	1030759	1059339	1091519	-5.12	-3.57	3.57	-0.70	0.70
-22	979825	1006341	1036285	-5.14	-3.50	3.50	-0.68	0.68
-21	931204	955789	983638	-5.16	-3.44	3.44	-0.67	0.67
-20	876938	907609	938280	-5.18	-3.38	3.38	-0.65	0.65
-19	832623	861190	889756	-5.19	-3.32	3.32	-0.64	0.64
-18	790444	817040	843636	-5.21	-3.26	3.26	-0.63	0.63
-17	750322	775076	799829	-5.21	-3.19	3.19	-0.61	0.61
-16	712181	735211	758242	-5.22	-3.13	3.13	-0.60	0.60
-15	675941	697362	718783	-5.22	-3.07	3.07	-0.59	0.59
-14	642133	662078	682023	-5.23	-3.01	3.01	-0.58	0.58
-13	610011	628577	647143	-5.23	-2.95	2.95	-0.57	0.57
-12	579504	596782	614060	-5.22	-2.90	2.90	-0.55	0.55
-11	550541	566617	582693	-5.22	-2.84	2.84	-0.54	0.54

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Temp. (°C)	Resistance (Ω)			Temp. Coef.(%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-10	523053	538008	552963	-5.21	-2.78	2.78	-0.53	0.53
-9	496975	510884	524792	-5.20	-2.72	2.72	-0.52	0.52
-8	472239	485173	498107	-5.19	-2.67	2.67	-0.51	0.51
-7	448784	460809	472833	-5.18	-2.61	2.61	-0.50	0.50
-6	426547	437725	448903	-5.17	-2.55	2.55	-0.49	0.49
-5	405469	415858	426247	-5.15	-2.50	2.50	-0.49	0.49
-4	385308	394955	404603	-5.13	-2.44	2.44	-0.48	0.48
-3	366212	375169	384127	-5.12	-2.39	2.39	-0.47	0.47
-2	348127	356442	364758	-5.10	-2.33	2.33	-0.46	0.46
-1	331001	338719	346437	-5.07	-2.28	2.28	-0.45	0.45
0	314783	321946	329109	-5.05	-2.22	2.22	-0.44	0.44
1	299438	306084	312731	-5.03	-2.17	2.17	-0.43	0.43
2	284907	291074	297240	-5.00	-2.12	2.12	-0.42	0.42
3	271149	276868	282588	-4.98	-2.07	2.07	-0.41	0.41
4	258121	263425	268729	-4.95	-2.01	2.01	-0.41	0.41
5	245784	250702	255621	-4.92	-1.96	1.96	-0.40	0.40
6	234102	238661	243220	-4.90	-1.91	1.91	-0.39	0.39
7	223038	227263	231489	-4.87	-1.86	1.86	-0.38	0.38
8	212559	216475	220390	-4.84	-1.81	1.81	-0.37	0.37
9	202634	206261	209888	-4.81	-1.76	1.76	-0.37	0.37
10	193233	196591	199949	-4.77	-1.71	1.71	-0.36	0.36
11	184354	187463	190573	-4.74	-1.66	1.66	-0.35	0.35
12	175939	178818	181696	-4.71	-1.61	1.61	-0.34	0.34
13	167965	170628	173291	-4.68	-1.56	1.56	-0.33	0.33
14	160405	162869	165332	-4.64	-1.51	1.51	-0.33	0.33
15	153239	155516	157793	-4.61	-1.46	1.46	-0.32	0.32
16	146448	148552	150657	-4.57	-1.42	1.42	-0.31	0.31
17	140008	141951	143894	-4.53	-1.37	1.37	-0.30	0.30
18	133898	135692	137486	-4.50	-1.32	1.32	-0.29	0.29
19	128102	129756	131411	-4.46	-1.28	1.28	-0.29	0.29
20	122601	124126	125651	-4.42	-1.23	1.23	-0.28	0.28
21	117380	118785	120189	-4.39	-1.18	1.18	-0.27	0.27
22	112424	113716	115008	-4.35	-1.14	1.14	-0.26	0.26
23	107717	108905	110093	-4.31	-1.09	1.09	-0.25	0.25

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Temp. (°C)	Resistance (Ω)			Temp. Coef.(%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
24	103247	104337	105428	-4.27	-1.05	1.05	-0.24	0.24
25	99000	100000	101000	-4.23	-1.00	1.00	-0.24	0.24
26	94904	95907	96909	-4.30	-1.05	1.05	-0.24	0.24
27	90900	91903	92906	-4.27	-1.09	1.09	-0.26	0.26
28	87085	88087	89089	-4.25	-1.14	1.14	-0.27	0.27
29	83451	84450	85449	-4.23	-1.18	1.18	-0.28	0.28
30	79987	80982	81977	-4.20	-1.23	1.23	-0.29	0.29
31	76685	77674	78664	-4.18	-1.27	1.27	-0.30	0.30
32	73536	74519	75502	-4.16	-1.32	1.32	-0.32	0.32
33	70533	71508	72483	-4.13	-1.36	1.36	-0.33	0.33
34	67668	68635	69601	-4.11	-1.41	1.41	-0.34	0.34
35	64935	65892	66849	-4.09	-1.45	1.45	-0.36	0.36
36	62287	63234	64181	-4.07	-1.50	1.50	-0.37	0.37
37	59760	60696	61633	-4.04	-1.54	1.54	-0.38	0.38
38	57348	58273	59199	-4.02	-1.59	1.59	-0.39	0.39
39	55046	55960	56873	-4.00	-1.63	1.63	-0.41	0.41
40	52849	53750	54651	-3.98	-1.68	1.68	-0.42	0.42
41	50750	51638	52527	-3.96	-1.72	1.72	-0.43	0.43
42	48745	49621	50496	-3.93	-1.76	1.76	-0.45	0.45
43	46829	47692	48554	-3.91	-1.81	1.81	-0.46	0.46
44	44999	45848	46697	-3.89	-1.85	1.85	-0.48	0.48
45	43249	44085	44920	-3.87	-1.90	1.90	-0.49	0.49
46	41576	42398	43220	-3.85	-1.94	1.94	-0.50	0.50
47	39977	40784	41592	-3.83	-1.98	1.98	-0.52	0.52
48	38446	39240	40034	-3.81	-2.02	2.02	-0.53	0.53
49	36983	37763	38543	-3.79	-2.07	2.07	-0.55	0.55
50	35582	36348	37114	-3.77	-2.11	2.11	-0.56	0.56
51	34268	35020	35772	-3.75	-2.15	2.15	-0.57	0.57
52	33008	33747	34485	-3.73	-2.19	2.19	-0.59	0.59
53	31802	32527	33251	-3.71	-2.23	2.23	-0.60	0.60
54	30646	31357	32068	-3.69	-2.27	2.27	-0.61	0.61
55	29538	30235	30933	-3.67	-2.31	2.31	-0.63	0.63
56	28475	29159	29843	-3.65	-2.35	2.35	-0.64	0.64
57	27457	28127	28798	-3.63	-2.38	2.38	-0.66	0.66

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	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
58	26479	27137	27795	-3.61	-2.42	2.42	-0.67	0.67
59	25542	26187	26831	-3.59	-2.46	2.46	-0.69	0.69
60	24642	25274	25906	-3.57	-2.50	2.50	-0.70	0.70
61	23779	24399	25018	-3.55	-2.54	2.54	-0.71	0.71
62	22951	23557	24164	-3.53	-2.58	2.58	-0.73	0.73
63	22155	22750	23344	-3.51	-2.61	2.61	-0.74	0.74
64	21391	21974	22556	-3.50	-2.65	2.65	-0.76	0.76
65	20657	21228	21799	-3.48	-2.69	2.69	-0.77	0.77
66	19946	20505	21064	-3.46	-2.73	2.73	-0.79	0.79
67	19262	19810	20357	-3.44	-2.76	2.76	-0.80	0.80
68	18605	19142	19678	-3.42	-2.80	2.80	-0.82	0.82
69	17974	18499	19025	-3.41	-2.84	2.84	-0.83	0.83
70	17368	17882	18396	-3.39	-2.88	2.88	-0.85	0.85
71	16785	17288	17792	-3.37	-2.91	2.91	-0.86	0.86
72	16224	16717	17210	-3.35	-2.95	2.95	-0.88	0.88
73	15685	16168	16650	-3.33	-2.99	2.99	-0.90	0.90
74	15166	15639	16112	-3.32	-3.02	3.02	-0.91	0.91
75	14668	15130	15593	-3.30	-3.06	3.06	-0.93	0.93
76	14188	14641	15094	-3.28	-3.09	3.09	-0.94	0.94
77	13726	14169	14613	-3.27	-3.13	3.13	-0.96	0.96
78	13281	13715	14149	-3.25	-3.17	3.17	-0.97	0.97
79	12853	13278	13703	-3.23	-3.20	3.20	-0.99	0.99
80	12441	12857	13273	-3.22	-3.24	3.24	-1.01	1.01
81	12040	12448	12855	-3.20	-3.27	3.27	-1.02	1.02
82	11655	12053	12452	-3.18	-3.31	3.31	-1.04	1.04
83	11283	11673	12064	-3.17	-3.34	3.34	-1.06	1.06
84	10925	11307	11689	-3.15	-3.38	3.38	-1.07	1.07
85	10581	10954	11328	-3.13	-3.41	3.41	-1.09	1.09
86	10248	10614	10980	-3.12	-3.45	3.45	-1.11	1.11
87	9928	10286	10644	-3.10	-3.48	3.48	-1.12	1.12
88	9620	9970	10320	-3.09	-3.52	3.52	-1.14	1.14
89	9322	9665	10008	-3.07	-3.55	3.55	-1.16	1.16
90	9035	9371	9707	-3.06	-3.58	3.58	-1.17	1.17
91	8758	9087	9416	-3.04	-3.62	3.62	-1.19	1.19

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	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
92	8491	8813	9135	-3.03	-3.65	3.65	-1.21	1.21
93	8234	8549	8864	-3.01	-3.68	3.68	-1.22	1.22
94	7985	8293	8602	-3.00	-3.72	3.72	-1.24	1.24
95	7745	8047	8349	-2.98	-3.75	3.75	-1.26	1.26
96	7517	7813	8108	-2.97	-3.78	3.78	-1.28	1.28
97	7297	7586	7876	-2.95	-3.82	3.82	-1.29	1.29
98	7084	7367	7651	-2.94	-3.85	3.85	-1.31	1.31
99	6879	7156	7434	-2.92	-3.88	3.88	-1.33	1.33
100	6680	6952	7224	-2.91	-3.91	3.91	-1.35	1.35
101	6488	6754	7020	-2.89	-3.94	3.94	-1.36	1.36
102	6303	6563	6824	-2.88	-3.97	3.97	-1.38	1.38
103	6123	6379	6634	-2.86	-4.00	4.00	-1.40	1.40
104	5950	6200	6450	-2.85	-4.03	4.03	-1.42	1.42
105	5782	6027	6272	-2.84	-4.06	4.06	-1.43	1.43
106	5620	5860	6100	-2.82	-4.10	4.10	-1.45	1.45
107	5463	5698	5934	-2.81	-4.13	4.13	-1.47	1.47
108	5312	5542	5772	-2.79	-4.16	4.16	-1.49	1.49
109	5165	5391	5616	-2.78	-4.19	4.19	-1.51	1.51
110	5023	5244	5465	-2.77	-4.22	4.22	-1.52	1.52