



Redfish Sensors

360 S. Adkins Way Suite A

Meridian Idaho 83642

208.475.3587 ph.

877-786-4698 fax

877-253-5755 toll free

www.redfishsensors.com

sales@redfishsensors.com

Product : NTC THERMISTOR SENSORS

Redfish Part No. : RGLA-103F-3977

Specifications : R₂₅ 10,000 Ω ± 1 %

B₂₅₋₈₅ 3,977 °K ± 1 %

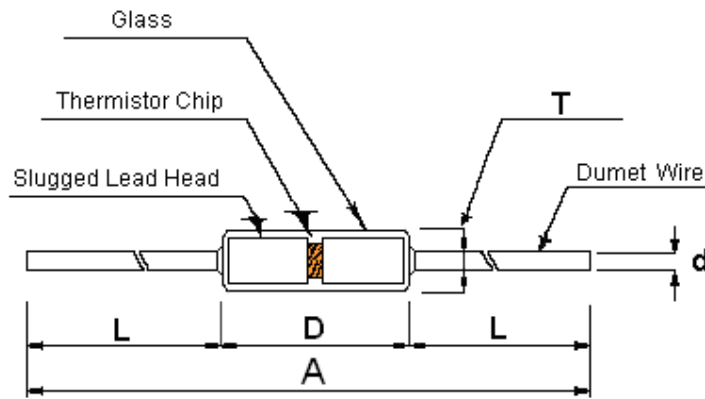
1. DESCRIPTION

These specifications define ratings, dimension, insulation, climatic tests and mechanical characteristics for (RoHS) RGLA type Thermistor.

2. PART NO. : **RGLA-103F-3977**

3. SPECIFICATION

3 – 1. APPEARANCE (Unit : mm)



	A	D	T	L	d
Size (mm)	59	3.8	2.0	28.0	0.50
Tol (mm)	± 0.5	± 0.5	± 0.2	± 0.5	± 0.05

3 – 2. THE OTHER SPECIFICATION ON THE APPEARANCE

- There is neither crack nor bare element, lead appearance on coated surface.
- There is neither two failure factors – scratch, burr, etc – nor more factors.
- There is neither bending point exceed 10 ° on the lead wire nor over two bending point.

3 – 3. ELECTRICAL SPECIFICATION

	Item	Particulars		Specification
3-3-1	Resistance	Resistance at 25°C	R ₂₅	10 kΩ ±1%
3-3-2	“B” Constant	R ₂₅ to R ₈₅ °C	B _{25/85}	3977°K ±1%
3-3-3	Operating Temp. Range			-40 to 250°C
3-3-4	Dissipation Constant	at 25°C, in still Air		2 mW/°C
3-3-5	Insulation Resistance	at DC 500V		Min. 100 MΩ
3-3-6	Rated Power	at 25°C, in still Air		0.5mW
3-3-7	Thermal Time Constant	at 25°C, in still Air		8 sec max.

4. INSPECTION CONDITION

4-1. SAMPLING METHOD: Apply to MIL-STD-105D

4-2. LEVEL: Level 1, AQL 1.0%

4-3. CHECK POINT AND METHOD

Check point	Test method	Grade
Appearance and Dimension	Refer to 5-2.	Important
Electrical Characteristics	Refer to 5-3.	Very Important
Mechanical Characteristics	Refer to 5-4.	Very Important
Environment Test	Refer to 5-5.	Very Important

∞ Follow the special specification if another check point require

5. TEST SPECIFICATION

5-1. TEST CONDITION

5-1-1. NORMAL CONDITION

- ① Temperature : 15~35°C
- ② Relative humidity : 25 ~85%
- ③ Atmosphere : 860 ~ 1016 mbar

5-1-2. STANDARD CONDITION

- ① Temperature : 25°C
- ② Relative humidity : 50%
- ③ Atmosphere : 1013 mbar

5-2. APPEARANCE AND DIMENSION

5-2-1. APPEARANCE : Visual test on normally but it can be use microscope or another equipment if necessary

5-2-2. DIMENSION : Apply to following tool normally

- ① Vernier calipers : It can be check within 0.05 mm

5-3. ELECTRICAL CHARACTERISTICS

5-3-1. ZERO POWER RESISTANCE ($R_0@T^\circ\text{C}$)

The resistance value of a Thermistor at a specified temperature with zero electrical power dissipation. The temperature controlled liquid bath for précis measurements must be 0.05°C on temperature tolerance and the liquid volume of the bath should be at least 1000 times that of any object placed in it.

5-3-2. β VALUE ($\beta(T_1/T_2)$)

The β value is the ratio of the zero power resistance of a Thermistor measured at two specified reference temperature. It may be determined as following equation.

$$\beta(T_1/T_2) = \frac{\ln \frac{R@T_1}{R@T_2}}{\frac{1}{T_1} - \frac{1}{T_2}} \quad (T_1 < T_2)$$

$R@T_1$ = Resistance at Kelvin temperature T_1

$R@T_2$ = Resistance at Kelvin temperature T_2

T_1, T_2 = Kelvin temperature ($K = ^\circ C + 273.15$)

5-3-3. DISSIPATION CONSTANT (δ)

Unless otherwise specified, the dissipation constant is given for the Thermistor when supported by its leads in stirred oil at an ambient temperature of 25°C within Thermistor under chamber have a volume greater than 1,000 times the volume of the Thermistor under test. Usually, the power dissipated is taken as the power required to raise the body temperature of the Thermistor by 50°C.

5-3-4. THERMAL TIME CONSTANT (τ)

The time constant is the time required for a Thermistor to change 63.2% of the difference between its initial and final body temperature in stirred oil.

5-3-5. INSULATING RESISTANCE

There shall be satisfied insulation resistance at specified DC voltage between coating area and terminal. 100M Ω Min. at DC 500V unless otherwise specified.

6-4. MECHANICAL CHARACTERISTICS

6-4-1. REQUIREMENT: Requirements shall be as specified herein after each test.

- Zero power resistance: Max. $\pm 2\%$ change from initial at specified temperature
- β value: Max. $\pm 1\%$ change from initial value
- Insulation resistance: Min. 100M Ω at DC 500V
- No mechanical damage – leakage, removal, breakage, etc – in appearance.

6-4-2. SOLDERABILITY

Dip two terminals in 235°C $\pm 5^\circ$ C molten solder for 2 sec.

Test the soldering area is over 95% in dip-area.

6-4-3. RESISTANCE TO SOLDERING HEAT

Dip two terminals to point located 2.0~2.5 mm from element in 260°C $\pm 5^\circ$ C molten solder for 10 sec.

7-5. ENVIRONMENT TEST

7-5-1. REQUIREMENT: Refer to 4-4-1.

7-5-2. LOW TEMPERATURE STORAGE

Store in cold still air at -20°C $\pm 5^\circ$ C for 1000 hours.

7-5-3. HOT TEMPERATURE STORAGE

Store in hot still air at 200°C $\pm 5^\circ$ C for 1000 hours.

7-5-4. TEMPERATURE CYCLE

Test 10 times as following conditioned air.

-20°C x 1HR. \leftarrow ROOM TEMP. 0.5HR. \rightarrow 200°C x 1HR.

7-5-5. THERMAL SHOCK

Test 50 times as following conditioned air.

-20°C x 0.5HR. ←5MIN. → 200°C x 0.5HR.

7-5-6. IMMERSION

Test 2 times by dipping 0.9% salt solution as following condition.

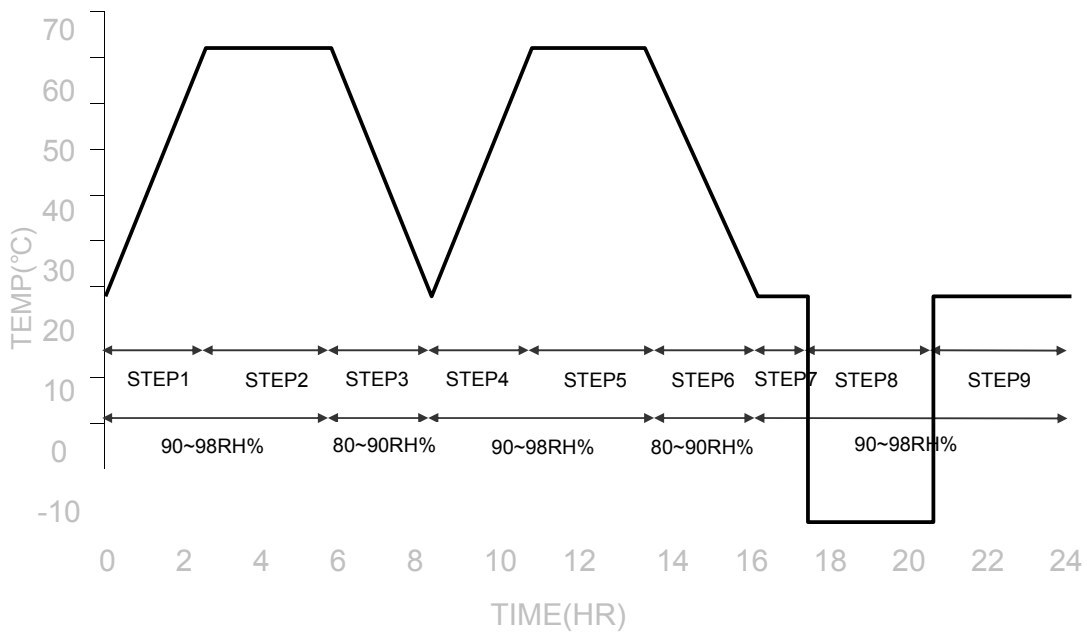
65°C x 15MIN. ↔25°C x 15MIN.

7-5-7. HUMIDITY

Test in condition 80°C, 95%RH for 1000 hours.

7-5-8. MOISTURE RESISTANCE

Test 10 times as following condition in 1.5hours after standing off form drying oven. But, apply the 50% of maximum power rating as initial 2hours of STEP 2 and STEP 5.



7-5-9. LOAD LIFE

Apply the maximum power rating ON for 1.5 hours and OFF 0.5 hours for 1000 hours in room temperature

8. RT- CHARACTERISTICS

PART NO.:

RGLA-103F-3977

R25 : 10,000 Ohms ± 1%
 B25/85 : 3,977 °K ± 1%

Temperature (°C)	Resistance (Ω)			Temperature Coef. (%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-40.0	383415	401860	421150	-7.27	-4.59	4.80	-0.66	0.63
-39.0	356911	373810	391471	-7.20	-4.52	4.72	-0.66	0.63
-38.0	332442	347933	364109	-7.14	-4.45	4.65	-0.65	0.62
-37.0	309836	324043	338868	-7.08	-4.38	4.57	-0.65	0.62
-36.0	288939	301975	315568	-7.02	-4.32	4.50	-0.64	0.61
-35.0	269610	281577	294045	-6.96	-4.25	4.43	-0.64	0.61
-34.0	251720	262710	274153	-6.91	-4.18	4.36	-0.63	0.61
-33.0	235151	245249	255755	-6.85	-4.12	4.28	-0.63	0.60
-32.0	219796	229079	238730	-6.79	-4.05	4.21	-0.62	0.60
-31.0	205559	214096	222964	-6.74	-3.99	4.14	-0.61	0.59
-30.0	192350	200204	208357	-6.68	-3.92	4.07	-0.61	0.59
-29.0	180088	187316	194815	-6.63	-3.86	4.00	-0.60	0.58
-28.0	168698	175354	182253	-6.57	-3.80	3.93	-0.60	0.58
-27.0	158113	164243	170594	-6.52	-3.73	3.87	-0.59	0.57
-26.0	148269	153918	159765	-6.47	-3.67	3.80	-0.59	0.57
-25.0	139110	144317	149703	-6.41	-3.61	3.73	-0.58	0.56
-24.0	130584	135385	140349	-6.36	-3.55	3.67	-0.58	0.56
-23.0	122643	127071	131646	-6.31	-3.49	3.60	-0.57	0.55
-22.0	115241	119328	123546	-6.26	-3.42	3.54	-0.56	0.55
-21.0	108341	112112	116003	-6.21	-3.36	3.47	-0.56	0.54
-20.0	101903	105385	108975	-6.16	-3.30	3.41	-0.55	0.54
-19.0	95893	99109	102423	-6.12	-3.24	3.34	-0.55	0.53
-18.0	90281	93252	96311	-6.07	-3.19	3.28	-0.54	0.53
-17.0	85038	87783	90608	-6.02	-3.13	3.22	-0.53	0.52
-16.0	80136	82674	85283	-5.97	-3.07	3.16	-0.53	0.51
-15.0	75552	77898	80309	-5.93	-3.01	3.09	-0.52	0.51
-14.0	71262	73432	75660	-5.88	-2.95	3.03	-0.52	0.50
-13.0	67247	69253	71312	-5.84	-2.90	2.97	-0.51	0.50
-12.0	63485	65341	67245	-5.79	-2.84	2.91	-0.50	0.49
-11.0	59960	61678	63439	-5.75	-2.78	2.85	-0.50	0.48
-10.0	56656	58246	59874	-5.70	-2.73	2.80	-0.49	0.48

-9.0	53557	55028	56534	-5.66	-2.67	2.74	-0.48	0.47
-8.0	50648	52011	53404	-5.62	-2.62	2.68	-0.48	0.47
-7.0	47918	49179	50469	-5.58	-2.56	2.62	-0.47	0.46
-6.0	45354	46522	47715	-5.53	-2.51	2.56	-0.46	0.45
-5.0	42945	44026	45130	-5.49	-2.46	2.51	-0.46	0.45
-4.0	40680	41681	42703	-5.45	-2.40	2.45	-0.45	0.44
-3.0	38550	39477	40423	-5.41	-2.35	2.40	-0.44	0.43
-2.0	36546	37405	38281	-5.37	-2.30	2.34	-0.44	0.43
-1.0	34659	35455	36266	-5.33	-2.25	2.29	-0.43	0.42
0.0	32883	33621	34371	-5.29	-2.19	2.23	-0.42	0.41
1.0	31210	31893	32588	-5.26	-2.14	2.18	-0.41	0.41
2.0	29633	30266	30909	-5.22	-2.09	2.12	-0.41	0.40
3.0	28147	28733	29328	-5.18	-2.04	2.07	-0.40	0.39
4.0	26745	27288	27838	-5.14	-1.99	2.02	-0.39	0.39
5.0	25422	25925	26434	-5.11	-1.94	1.97	-0.39	0.38
6.0	24173	24639	25111	-5.07	-1.89	1.91	-0.38	0.37
7.0	22994	23425	23862	-5.03	-1.84	1.86	-0.37	0.37
8.0	21881	22279	22683	-5.00	-1.79	1.81	-0.36	0.36
9.0	20828	21197	21571	-4.96	-1.74	1.76	-0.36	0.35
10.0	19833	20175	20520	-4.93	-1.69	1.71	-0.35	0.34
11.0	18892	19208	19527	-4.89	-1.64	1.66	-0.34	0.34
12.0	18002	18294	18589	-4.86	-1.60	1.61	-0.33	0.33
13.0	17160	17430	17702	-4.82	-1.55	1.56	-0.32	0.32
14.0	16362	16612	16863	-4.79	-1.50	1.51	-0.32	0.31
15.0	15607	15837	16069	-4.76	-1.45	1.47	-0.31	0.31
16.0	14891	15104	15318	-4.72	-1.41	1.42	-0.30	0.30
17.0	14213	14409	14607	-4.69	-1.36	1.37	-0.29	0.29
18.0	13570	13751	13933	-4.66	-1.31	1.32	-0.28	0.28
19.0	12960	13127	13294	-4.63	-1.27	1.28	-0.28	0.27
20.0	12382	12535	12689	-4.60	-1.22	1.23	-0.27	0.27
21.0	11833	11974	12116	-4.57	-1.18	1.18	-0.26	0.26
22.0	11312	11441	11571	-4.53	-1.13	1.14	-0.25	0.25
23.0	10817	10936	11055	-4.50	-1.09	1.09	-0.24	0.24
24.0	10347	10456	10565	-4.47	-1.04	1.05	-0.23	0.23
25.0	9900	10000	10100	-4.44	-1.00	1.00	-0.23	0.23
26.0	9467	9567	9667	-4.41	-1.04	1.04	-0.24	0.24
27.0	9056	9155	9255	-4.38	-1.09	1.09	-0.25	0.25
28.0	8665	8764	8863	-4.36	-1.13	1.13	-0.26	0.26
29.0	8293	8391	8490	-4.33	-1.17	1.18	-0.27	0.27
30.0	7939	8037	8135	-4.30	-1.22	1.22	-0.28	0.28
31.0	7603	7700	7797	-4.27	-1.26	1.26	-0.30	0.29

32.0	7283	7379	7476	-4.24	-1.30	1.31	-0.31	0.31
33.0	6979	7074	7169	-4.21	-1.34	1.35	-0.32	0.32
34.0	6689	6783	6877	-4.19	-1.38	1.39	-0.33	0.33
35.0	6413	6506	6599	-4.16	-1.42	1.44	-0.35	0.34
36.0	6150	6241	6334	-4.13	-1.47	1.48	-0.36	0.35
37.0	5899	5989	6080	-4.11	-1.51	1.52	-0.37	0.37
38.0	5660	5749	5839	-4.08	-1.55	1.56	-0.38	0.38
39.0	5433	5520	5609	-4.05	-1.59	1.60	-0.40	0.39
40.0	5215	5301	5389	-4.03	-1.63	1.64	-0.41	0.40
41.0	5008	5093	5179	-4.00	-1.67	1.68	-0.42	0.42
42.0	4810	4894	4978	-3.98	-1.70	1.72	-0.43	0.43
43.0	4621	4703	4786	-3.95	-1.74	1.76	-0.45	0.44
44.0	4441	4522	4603	-3.93	-1.78	1.80	-0.46	0.45
45.0	4269	4348	4428	-3.90	-1.82	1.84	-0.47	0.47
46.0	4104	4182	4261	-3.88	-1.86	1.88	-0.49	0.48
47.0	3947	4024	4101	-3.85	-1.90	1.92	-0.50	0.49
48.0	3797	3872	3948	-3.83	-1.93	1.96	-0.51	0.51
49.0	3653	3727	3802	-3.81	-1.97	2.00	-0.53	0.52
50.0	3516	3588	3661	-3.78	-2.01	2.04	-0.54	0.53
51.0	3385	3455	3527	-3.76	-2.05	2.08	-0.55	0.54
52.0	3259	3328	3399	-3.74	-2.08	2.12	-0.57	0.56
53.0	3139	3207	3276	-3.71	-2.12	2.16	-0.58	0.57
54.0	3023	3090	3158	-3.69	-2.16	2.19	-0.59	0.58
55.0	2913	2978	3045	-3.67	-2.19	2.23	-0.61	0.60
56.0	2808	2871	2937	-3.65	-2.23	2.27	-0.62	0.61
57.0	2706	2769	2833	-3.62	-2.26	2.31	-0.64	0.62
58.0	2609	2671	2733	-3.60	-2.30	2.34	-0.65	0.64
59.0	2516	2577	2638	-3.58	-2.33	2.38	-0.66	0.65
60.0	2427	2486	2546	-3.56	-2.37	2.42	-0.68	0.67
61.0	2342	2399	2458	-3.54	-2.40	2.45	-0.69	0.68
62.0	2260	2316	2374	-3.52	-2.44	2.49	-0.71	0.69
63.0	2181	2237	2293	-3.50	-2.47	2.52	-0.72	0.71
64.0	2106	2160	2215	-3.47	-2.51	2.56	-0.74	0.72
65.0	2033	2086	2141	-3.45	-2.54	2.60	-0.75	0.74
66.0	1964	2016	2069	-3.43	-2.57	2.63	-0.77	0.75
67.0	1897	1948	2000	-3.41	-2.61	2.67	-0.78	0.76
68.0	1833	1883	1934	-3.39	-2.64	2.70	-0.80	0.78
69.0	1771	1820	1870	-3.37	-2.67	2.74	-0.81	0.79
70.0	1712	1760	1809	-3.35	-2.71	2.77	-0.83	0.81
71.0	1655	1702	1750	-3.34	-2.74	2.80	-0.84	0.82
72.0	1601	1646	1693	-3.32	-2.77	2.84	-0.86	0.84

73.0	1548	1593	1638	-3.30	-2.80	2.87	-0.87	0.85
74.0	1498	1541	1586	-3.28	-2.83	2.91	-0.89	0.86
75.0	1449	1492	1536	-3.26	-2.87	2.94	-0.90	0.88
76.0	1402	1444	1487	-3.24	-2.90	2.97	-0.92	0.89
77.0	1357	1398	1440	-3.22	-2.93	3.01	-0.93	0.91
78.0	1314	1354	1395	-3.20	-2.96	3.04	-0.95	0.92
79.0	1272	1311	1352	-3.19	-2.99	3.07	-0.96	0.94
80.0	1232	1270	1310	-3.17	-3.02	3.11	-0.98	0.95
81.0	1193	1231	1269	-3.15	-3.05	3.14	-1.00	0.97
82.0	1156	1193	1231	-3.13	-3.08	3.17	-1.01	0.98
83.0	1120	1156	1193	-3.11	-3.11	3.20	-1.03	1.00
84.0	1086	1121	1157	-3.10	-3.14	3.23	-1.04	1.02
85.0	1052	1087	1122	-3.08	-3.17	3.27	-1.06	1.03
86.0	1020	1054	1089	-3.06	-3.20	3.30	-1.08	1.05
87.0	989	1022	1056	-3.05	-3.23	3.33	-1.09	1.06
88.0	959	992	1025	-3.03	-3.26	3.36	-1.11	1.08
89.0	930	962	995	-3.01	-3.29	3.39	-1.13	1.09
90.0	903	934	966	-3.00	-3.32	3.42	-1.14	1.11
91.0	876	906	937	-2.98	-3.35	3.45	-1.16	1.12
92.0	850	880	910	-2.96	-3.38	3.49	-1.18	1.14
93.0	825	854	884	-2.95	-3.41	3.52	-1.19	1.16
94.0	801	829	859	-2.93	-3.43	3.55	-1.21	1.17
95.0	777	805	834	-2.91	-3.46	3.58	-1.23	1.19
96.0	755	782	811	-2.90	-3.49	3.61	-1.24	1.20
97.0	733	760	788	-2.88	-3.52	3.64	-1.26	1.22
98.0	712	738	766	-2.87	-3.55	3.67	-1.28	1.24
99.0	692	718	744	-2.85	-3.57	3.70	-1.30	1.25
100.0	672	698	724	-2.84	-3.60	3.73	-1.31	1.27
101.0	653	678	704	-2.82	-3.63	3.75	-1.33	1.29
102.0	635	659	684	-2.81	-3.66	3.78	-1.35	1.30
103.0	617	641	665	-2.79	-3.68	3.81	-1.37	1.32
104.0	600	623	647	-2.78	-3.71	3.84	-1.38	1.34
105.0	584	606	630	-2.76	-3.74	3.87	-1.40	1.35
106.0	568	590	613	-2.75	-3.76	3.90	-1.42	1.37
107.0	552	574	597	-2.73	-3.79	3.93	-1.44	1.39
108.0	537	559	581	-2.72	-3.82	3.96	-1.46	1.40
109.0	523	544	565	-2.70	-3.84	3.98	-1.47	1.42
110.0	509	529	550	-2.69	-3.87	4.01	-1.49	1.44
111.0	495	515	536	-2.68	-3.89	4.04	-1.51	1.45
112.0	482	502	522	-2.66	-3.92	4.07	-1.53	1.47
113.0	469	488	508	-2.65	-3.94	4.10	-1.55	1.49

114.0	457	476	495	-2.64	-3.97	4.12	-1.56	1.51
115.0	445	463	483	-2.62	-3.99	4.15	-1.58	1.52
116.0	433	451	470	-2.61	-4.02	4.18	-1.60	1.54
117.0	422	440	458	-2.59	-4.05	4.21	-1.62	1.56
118.0	411	429	447	-2.58	-4.07	4.23	-1.64	1.58
119.0	401	418	435	-2.57	-4.09	4.26	-1.66	1.59
120.0	390	407	425	-2.56	-4.12	4.29	-1.68	1.61
121.0	380	397	414	-2.54	-4.14	4.31	-1.70	1.63
122.0	371	387	404	-2.53	-4.17	4.34	-1.72	1.65
123.0	361	377	394	-2.52	-4.19	4.37	-1.73	1.67
124.0	352	368	384	-2.50	-4.22	4.39	-1.75	1.68
125.0	344	359	375	-2.49	-4.24	4.42	-1.77	1.70
126.0	335	350	366	-2.48	-4.26	4.44	-1.79	1.72
127.0	327	341	357	-2.47	-4.29	4.47	-1.81	1.74
128.0	319	333	348	-2.45	-4.31	4.49	-1.83	1.76
129.0	311	325	340	-2.44	-4.33	4.52	-1.85	1.77
130.0	303	317	332	-2.43	-4.36	4.55	-1.87	1.79
131.0	296	310	324	-2.42	-4.38	4.57	-1.89	1.81
132.0	289	302	316	-2.41	-4.40	4.60	-1.91	1.83
133.0	282	295	309	-2.39	-4.43	4.62	-1.93	1.85
134.0	275	288	302	-2.38	-4.45	4.65	-1.95	1.87
135.0	269	281	295	-2.37	-4.47	4.67	-1.97	1.89
136.0	262	275	288	-2.36	-4.50	4.70	-1.99	1.91
137.0	256	268	281	-2.35	-4.52	4.72	-2.01	1.92
138.0	250	262	275	-2.34	-4.54	4.75	-2.03	1.94
139.0	244	256	268	-2.33	-4.56	4.77	-2.05	1.96
140.0	239	250	262	-2.31	-4.58	4.79	-2.07	1.98
141.0	233	245	256	-2.30	-4.61	4.82	-2.09	2.00
142.0	228	239	251	-2.29	-4.63	4.84	-2.11	2.02
143.0	223	234	245	-2.28	-4.65	4.87	-2.13	2.04
144.0	218	228	240	-2.27	-4.67	4.89	-2.15	2.06
145.0	213	223	234	-2.26	-4.69	4.91	-2.18	2.08
146.0	208	218	229	-2.25	-4.71	4.94	-2.20	2.10
147.0	203	213	224	-2.24	-4.74	4.96	-2.22	2.12
148.0	199	209	219	-2.23	-4.76	4.98	-2.24	2.14
149.0	194	204	214	-2.22	-4.78	5.01	-2.26	2.16
150.0	190	200	210	-2.21	-4.80	5.03	-2.28	2.18
151.0	186	195	205	-2.20	-4.82	5.05	-2.30	2.20
152.0	182	191	201	-2.19	-4.84	5.08	-2.32	2.22
153.0	178	187	197	-2.18	-4.86	5.10	-2.34	2.24
154.0	174	183	192	-2.16	-4.88	5.12	-2.37	2.26

155.0	170	179	188	-2.15	-4.90	5.15	-2.39	2.28
156.0	167	175	184	-2.14	-4.92	5.17	-2.41	2.30
157.0	163	172	180	-2.13	-4.94	5.19	-2.43	2.32
158.0	160	168	177	-2.12	-4.96	5.21	-2.45	2.34
159.0	156	164	173	-2.12	-4.98	5.24	-2.48	2.36
160.0	153	161	169	-2.11	-5.00	5.26	-2.50	2.38
161.0	150	158	166	-2.10	-5.02	5.28	-2.52	2.40
162.0	147	154	163	-2.09	-5.04	5.30	-2.54	2.42
163.0	144	151	159	-2.08	-5.06	5.32	-2.56	2.44
164.0	141	148	156	-2.07	-5.08	5.35	-2.59	2.46
165.0	138	145	153	-2.06	-5.10	5.37	-2.61	2.48
166.0	135	142	150	-2.05	-5.12	5.39	-2.63	2.50
167.0	132	139	147	-2.04	-5.14	5.41	-2.65	2.52
168.0	129	136	144	-2.03	-5.16	5.43	-2.68	2.54
169.0	127	134	141	-2.02	-5.18	5.45	-2.70	2.56
170.0	124	131	138	-2.01	-5.20	5.47	-2.72	2.59
171.0	122	128	135	-2.00	-5.22	5.50	-2.74	2.61
172.0	119	126	133	-1.99	-5.24	5.52	-2.77	2.63
173.0	117	123	130	-1.98	-5.26	5.54	-2.79	2.65
174.0	115	121	128	-1.98	-5.28	5.56	-2.81	2.67
175.0	112	119	125	-1.97	-5.29	5.58	-2.84	2.69
176.0	110	116	123	-1.96	-5.31	5.60	-2.86	2.71
177.0	108	114	120	-1.95	-5.33	5.62	-2.88	2.73
178.0	106	112	118	-1.94	-5.35	5.64	-2.91	2.76
179.0	104	110	116	-1.93	-5.37	5.66	-2.93	2.78
180.0	102	108	114	-1.92	-5.39	5.68	-2.95	2.80
181.0	100	106	112	-1.92	-5.40	5.70	-2.98	2.82
182.0	98	104	110	-1.91	-5.42	5.72	-3.00	2.84
183.0	96	102	107	-1.90	-5.44	5.74	-3.03	2.87
184.0	94	100	105	-1.89	-5.46	5.76	-3.05	2.89
185.0	93	98	104	-1.88	-5.48	5.78	-3.07	2.91
186.0	91	96	102	-1.87	-5.49	5.80	-3.10	2.93
187.0	89	94	100	-1.87	-5.51	5.82	-3.12	2.95
188.0	87	93	98	-1.86	-5.53	5.84	-3.15	2.98
189.0	86	91	96	-1.85	-5.55	5.86	-3.17	3.00
190.0	84	89	94	-1.84	-5.56	5.88	-3.19	3.02
191.0	83	88	93	-1.83	-5.58	5.90	-3.22	3.04
192.0	81	86	91	-1.83	-5.60	5.92	-3.24	3.07
193.0	80	84	89	-1.82	-5.62	5.94	-3.27	3.09
194.0	78	83	88	-1.81	-5.63	5.96	-3.29	3.11
195.0	77	81	86	-1.80	-5.65	5.98	-3.32	3.13

196.0	75	80	85	-1.79	-5.67	6.00	-3.34	3.16
197.0	74	79	83	-1.79	-5.68	6.02	-3.37	3.18
198.0	73	77	82	-1.78	-5.70	6.03	-3.39	3.20
199.0	71	76	80	-1.77	-5.72	6.05	-3.42	3.23
200.0	70	74	79	-1.76	-5.73	6.07	-3.44	3.25
201.0	69	73	78	-1.76	-5.75	6.09	-3.47	3.27
202.0	68	72	76	-1.75	-5.77	6.11	-3.49	3.30
203.0	67	71	75	-1.74	-5.78	6.13	-3.52	3.32
204.0	65	69	74	-1.73	-5.80	6.15	-3.54	3.34
205.0	64	68	72	-1.73	-5.82	6.16	-3.57	3.37
206.0	63	67	71	-1.72	-5.83	6.18	-3.59	3.39
207.0	62	66	70	-1.71	-5.85	6.20	-3.62	3.41
208.0	61	65	69	-1.71	-5.86	6.22	-3.65	3.44
209.0	60	64	68	-1.70	-5.88	6.24	-3.67	3.46
210.0	59	63	67	-1.69	-5.90	6.26	-3.70	3.48
211.0	58	62	65	-1.69	-5.91	6.27	-3.72	3.51
212.0	57	61	64	-1.68	-5.93	6.29	-3.75	3.53
213.0	56	60	63	-1.67	-5.94	6.31	-3.78	3.56
214.0	55	59	62	-1.66	-5.96	6.33	-3.80	3.58
215.0	54	58	61	-1.66	-5.98	6.34	-3.83	3.60
216.0	53	57	60	-1.65	-5.99	6.36	-3.85	3.63
217.0	52	56	59	-1.64	-6.01	6.38	-3.88	3.65
218.0	52	55	58	-1.64	-6.02	6.40	-3.91	3.68
219.0	51	54	57	-1.63	-6.04	6.41	-3.93	3.70
220.0	50	53	56	-1.62	-6.05	6.43	-3.96	3.73
221.0	49	52	56	-1.62	-6.07	6.45	-3.99	3.75
222.0	48	51	55	-1.61	-6.08	6.47	-4.01	3.78
223.0	47	51	54	-1.60	-6.10	6.48	-4.04	3.80
224.0	47	50	53	-1.60	-6.11	6.50	-4.07	3.83
225.0	46	49	52	-1.59	-6.13	6.52	-4.09	3.85
226.0	45	48	51	-1.59	-6.14	6.53	-4.12	3.87
227.0	45	47	51	-1.58	-6.16	6.55	-4.15	3.90
228.0	44	47	50	-1.57	-6.17	6.57	-4.18	3.92
229.0	43	46	49	-1.57	-6.19	6.58	-4.20	3.95
230.0	42	45	48	-1.56	-6.20	6.60	-4.23	3.98
231.0	42	45	48	-1.55	-6.22	6.62	-4.26	4.00
232.0	41	44	47	-1.55	-6.23	6.63	-4.29	4.03
233.0	41	43	46	-1.54	-6.25	6.65	-4.31	4.05
234.0	40	43	45	-1.54	-6.26	6.67	-4.34	4.08
235.0	39	42	45	-1.53	-6.27	6.68	-4.37	4.10
236.0	39	41	44	-1.52	-6.29	6.70	-4.40	4.13

237.0	38	41	43	-1.52	-6.30	6.72	-4.43	4.15
238.0	38	40	43	-1.51	-6.32	6.73	-4.45	4.18
239.0	37	39	42	-1.51	-6.33	6.75	-4.48	4.20
240.0	36	39	41	-1.50	-6.35	6.76	-4.51	4.23
241.0	36	38	41	-1.49	-6.36	6.78	-4.54	4.26
242.0	35	38	40	-1.49	-6.37	6.80	-4.57	4.28
243.0	35	37	40	-1.48	-6.39	6.81	-4.59	4.31
244.0	34	37	39	-1.48	-6.40	6.83	-4.62	4.33
245.0	34	36	39	-1.47	-6.42	6.84	-4.65	4.36
246.0	33	36	38	-1.47	-6.43	6.86	-4.68	4.39
247.0	33	35	37	-1.46	-6.44	6.88	-4.71	4.41
248.0	32	35	37	-1.45	-6.46	6.89	-4.74	4.44
249.0	32	34	36	-1.45	-6.47	6.91	-4.77	4.47
250.0	31	34	36	-1.44	-6.48	6.92	-4.80	4.49