



## 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](http://www.redfishsensors.com)

[sales@redfishsensors.com](mailto:sales@redfishsensors.com)

Product : NTC THERMISTOR SENSOR

Redfish Part No. : RNSR -103F-3435

Specifications : R<sub>25</sub> 10,000 Ω ± 1 %  
B<sub>25-85</sub> 3435 °K ± 1 %

1) Scope

This specifications define ratings, dimension, insulation, climatic test and mechanical characteristics for **Lead Free** RNSR type Thermistor.

2) Part No. : RNSR-103F-3435

3) Rating

3-1) Rated zero-power resistance  $R_{25}$  : 10 k $\Omega$   $\pm$ 1% (at 25 $^{\circ}$ C)

3-2) B value.  $B_{25/85}$  : 3,435K  $\pm$ 1 %

\*The B value is calculated using the zero-power resistance values measured at 25  $^{\circ}$ C and 85 $^{\circ}$ C .

3-3) Dissipation factor. :Approx. 0.7 mW/ $^{\circ}$ C (in air)

3-4) Thermal time constant. :Approx. 5.0 s (in air)

3-5) Maximum power rating. : 3.5 mW (at 25 $^{\circ}$ C)

3-6) Category temperature range : -40 ~ 125  $^{\circ}$ C  
(=Operating temperature range)

**3-7)Lead content : 150 ppm. max.**

**3-8)Cadmium content : 2 ppm. max.**

4) Insulation resistance

Insulation resistance shall be more than 100 M $\Omega$  which is measured at DC 100V between film area and terminals.

5) Climatic test

5-1) Dry Heat

After the test samples were exposed in air at 90  $\pm$ 1 $^{\circ}$ C for 1,000 hours, the change ratio of the rated zero-power resistance shall be within  $\pm$ 1% of the initial value.

5-2) Damp heat

After the test samples were exposed in the humidity of 95% at 40  $\pm$ 2 $^{\circ}$ C for 1,000 hours, the change ratio of the rated zero-power resistance shall be within  $\pm$ 1% of the initial value.

### 5-3) Cold

After the test samples were exposed in air at  $-30 \pm 1^\circ\text{C}$  for 1,000 hours, the change ratio of the rated zero-power resistance shall be within  $\pm 1\%$  of the initial value.

### 5-4) Loading

After DC 1mA current was applied to the test samples in the temperature of  $40 \pm 2^\circ\text{C}$  and the humidity of 95% for 1,000 hours, the change ratio of the rated zero-power resistance shall be within  $\pm 1\%$  of the initial value.

### 5-5) Change of temperature

One cycle of the change of temperature shall be carried out in the order of the following conditions.

.Room ambient temperature.( Initial value)

.At  $-25 \pm 3^\circ\text{C}$ , for 30 minutes.

.Room ambient temperature, for 3 minutes.

.At  $+90 \pm 2^\circ\text{C}$ , for 30 minutes.

.Room ambient temperature, for 3 minutes.

After the 100 cycles of this process, the change ratio of the rated zero-power resistance shall be within  $\pm 1\%$  of the initial value.

## 6) Mechanical characteristics

### 6-1) Resistance to soldering heat

The terminals shall be dipped in to a soldering bath having a temperature of  $260 \pm 5^\circ\text{C}$  to a point 2.0 mm from the body and then be held there for  $5 \pm 1\text{s}$ , the change ratio of the rated zero-power resistance shall be within  $\pm 1\%$  of the initial value.

### 6-2) Solderability

After dipping the terminal to a depth in a soldering bath of  $235 \pm 5^\circ\text{C}$  for  $2 \pm 0.5\text{s}$ . Approximately 90% of terminals should be covered with solder uniformly.

### 6-3) Free fall

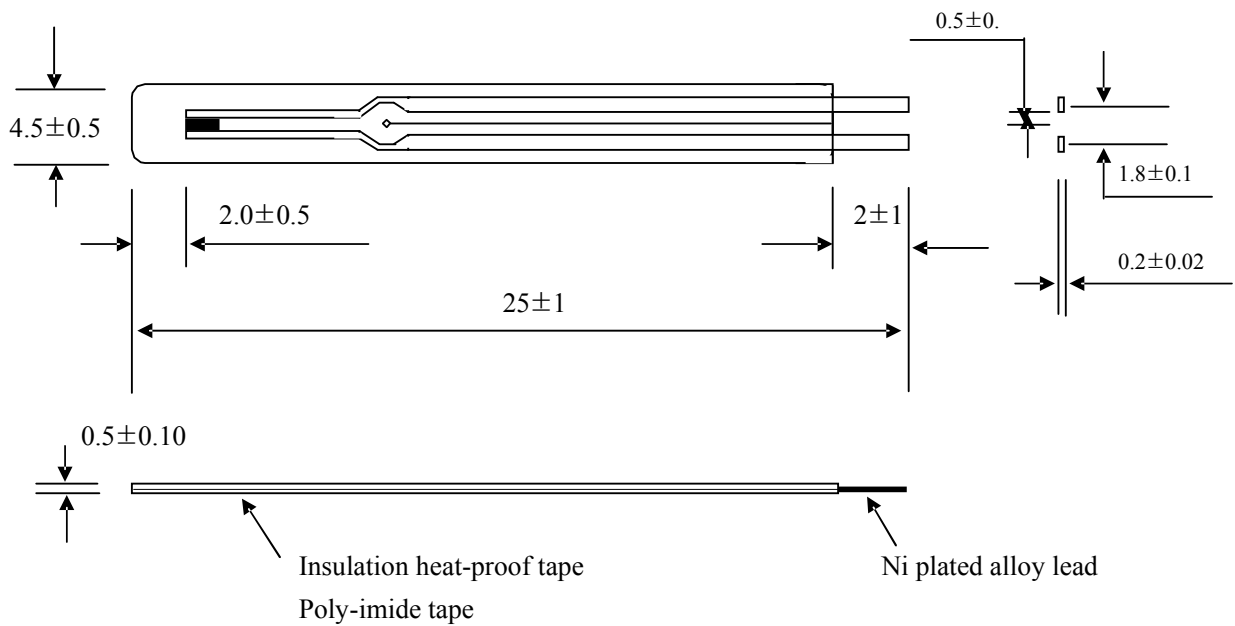
After three times fall to a maple board from 0.75 m high, there shall be no visible damage and the change ratio of the rated zero-power resistance shall be within  $\pm 1\%$  of the initial value.

#### 6-4) Robustness of terminations

After 1N loading weight for  $10 \pm 1s$  was applied to the wire terminations, there shall be no visible damage and the change ratio of the rated zero-power resistance shall be within  $\pm 1\%$  of the initial value.



#### 7) Dimensions [mm]



8) R-T Table

Part No. : **RNSR-103F-3435** R : 10,000 ohms  $\pm$  1%  
 B : 3435  $^{\circ}$ K  $\pm$  1%

Temperature ( $^{\circ}$ C)	Resistance ( $\Omega$ )			Temp. Coef. (%/ $^{\circ}$ C)	Resist. Tolerance (%)		Temp. Tolerance ( $^{\circ}$ C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-40	238024	248277	258944	-6.32	-4.13	4.30	-0.68	0.65
-39	223650	233136	243000	-6.27	-4.07	4.23	-0.68	0.65
-38	210255	219036	228161	-6.21	-4.01	4.17	-0.67	0.65
-37	197765	205897	214343	-6.16	-3.95	4.10	-0.67	0.64
-36	186114	193648	201467	-6.11	-3.89	4.04	-0.66	0.64
-35	175238	182221	189464	-6.06	-3.83	3.97	-0.66	0.63
-34	165081	171556	178267	-6.01	-3.77	3.91	-0.65	0.63
-33	155590	161596	167817	-5.96	-3.72	3.85	-0.65	0.62
-32	146717	152290	158059	-5.91	-3.66	3.79	-0.64	0.62
-31	138416	143590	148942	-5.86	-3.60	3.73	-0.64	0.62
-30	130648	135452	140419	-5.81	-3.55	3.67	-0.63	0.61
-29	123375	127837	132448	-5.76	-3.49	3.61	-0.63	0.61
-28	116560	120707	124989	-5.72	-3.44	3.55	-0.62	0.60
-27	110173	114028	118006	-5.67	-3.38	3.49	-0.62	0.60
-26	104184	107768	111464	-5.62	-3.33	3.43	-0.61	0.59
-25	98564	101898	105334	-5.58	-3.27	3.37	-0.60	0.59
-24	93289	96391	99586	-5.53	-3.22	3.31	-0.60	0.58
-23	88336	91222	94194	-5.49	-3.16	3.26	-0.59	0.58
-22	83681	86369	89133	-5.45	-3.11	3.20	-0.59	0.57
-21	79306	81809	84382	-5.40	-3.06	3.15	-0.58	0.57
-20	75192	77523	79918	-5.36	-3.01	3.09	-0.58	0.56
-19	71320	73492	75722	-5.32	-2.96	3.03	-0.57	0.56
-18	67677	69701	71778	-5.28	-2.90	2.98	-0.56	0.55
-17	64245	66132	68067	-5.24	-2.85	2.93	-0.56	0.54
-16	61013	62771	64575	-5.19	-2.80	2.87	-0.55	0.54
-15	57966	59606	61286	-5.15	-2.75	2.82	-0.55	0.53
-14	55093	56623	58189	-5.11	-2.70	2.77	-0.54	0.53
-13	52383	53810	55270	-5.08	-2.65	2.71	-0.53	0.52
-12	49825	51157	52519	-5.04	-2.60	2.66	-0.53	0.52
-11	47411	48654	49924	-5.00	-2.55	2.61	-0.52	0.51
-10	45130	46290	47475	-4.96	-2.51	2.56	-0.52	0.51
-9	42976	44058	45164	-4.92	-2.46	2.51	-0.51	0.50
-8	40939	41950	42981	-4.89	-2.41	2.46	-0.50	0.49
-7	39013	39957	40919	-4.85	-2.36	2.41	-0.50	0.49
-6	37191	38072	38970	-4.81	-2.31	2.36	-0.49	0.48
-5	35467	36290	37128	-4.78	-2.27	2.31	-0.48	0.47
-4	33834	34603	35386	-4.74	-2.22	2.26	-0.48	0.47

-3	32288	33006	33737	-4.71	-2.18	2.21	-0.47	0.46
-2	30824	31494	32176	-4.67	-2.13	2.17	-0.46	0.46
-1	29435	30062	30698	-4.64	-2.08	2.12	-0.46	0.45
0	28119	28704	29299	-4.60	-2.04	2.07	-0.45	0.44
1	26871	27417	27972	-4.57	-1.99	2.02	-0.44	0.44
2	25686	26197	26715	-4.54	-1.95	1.98	-0.44	0.43
3	24562	25039	25522	-4.50	-1.90	1.93	-0.43	0.42
4	23495	23940	24391	-4.47	-1.86	1.89	-0.42	0.42
5	22481	22897	23318	-4.44	-1.82	1.84	-0.41	0.41
6	21517	21906	22299	-4.41	-1.77	1.80	-0.41	0.40
7	20602	20964	21331	-4.38	-1.73	1.75	-0.40	0.40
8	19731	20070	20412	-4.35	-1.69	1.71	-0.39	0.39
9	18903	19219	19539	-4.31	-1.64	1.66	-0.39	0.38
10	18115	18410	18708	-4.28	-1.60	1.62	-0.38	0.37
11	17366	17641	17919	-4.25	-1.56	1.57	-0.37	0.37
12	16652	16909	17168	-4.22	-1.52	1.53	-0.36	0.36
13	15972	16212	16453	-4.20	-1.48	1.49	-0.35	0.35
14	15325	15548	15773	-4.17	-1.44	1.45	-0.35	0.34
15	14708	14916	15125	-4.14	-1.40	1.40	-0.34	0.34
16	14119	14313	14508	-4.11	-1.35	1.36	-0.33	0.33
17	13559	13739	13921	-4.08	-1.31	1.32	-0.32	0.32
18	13024	13192	13360	-4.05	-1.27	1.28	-0.32	0.31
19	12513	12669	12827	-4.02	-1.23	1.24	-0.31	0.31
20	12026	12171	12317	-4.00	-1.19	1.20	-0.30	0.30
21	11561	11696	11832	-3.97	-1.15	1.16	-0.29	0.29
22	11117	11242	11368	-3.94	-1.12	1.12	-0.28	0.28
23	10693	10809	10926	-3.92	-1.08	1.08	-0.28	0.27
24	10287	10395	10503	-3.89	-1.04	1.04	-0.27	0.27
25	9900	10000	10100	-3.86	-1.00	1.00	-0.26	0.26
26	9522	9622	9722	-3.84	-1.04	1.04	-0.27	0.27
27	9161	9261	9361	-3.81	-1.08	1.08	-0.28	0.28
28	8816	8916	9015	-3.79	-1.11	1.12	-0.29	0.29
29	8487	8585	8684	-3.76	-1.15	1.15	-0.31	0.31
30	8171	8269	8368	-3.74	-1.19	1.19	-0.32	0.32
31	7869	7967	8065	-3.71	-1.22	1.23	-0.33	0.33
32	7581	7678	7775	-3.69	-1.26	1.27	-0.34	0.34
33	7304	7400	7497	-3.66	-1.30	1.30	-0.36	0.35
34	7040	7135	7231	-3.64	-1.33	1.34	-0.37	0.37
35	6786	6881	6975	-3.62	-1.37	1.38	-0.38	0.38
36	6544	6637	6731	-3.59	-1.41	1.41	-0.39	0.39
37	6311	6403	6496	-3.57	-1.44	1.45	-0.41	0.40
38	6088	6179	6271	-3.55	-1.48	1.49	-0.42	0.42
39	5875	5965	6056	-3.53	-1.51	1.52	-0.43	0.43
40	5670	5759	5849	-3.50	-1.54	1.56	-0.45	0.44
41	5473	5561	5650	-3.48	-1.58	1.59	-0.46	0.45

42	5285	5372	5459	-3.46	-1.61	1.63	-0.47	0.47
43	5104	5189	5276	-3.44	-1.65	1.66	-0.48	0.48
44	4930	5015	5100	-3.42	-1.68	1.70	-0.50	0.49
45	4764	4847	4931	-3.39	-1.71	1.73	-0.51	0.51
46	4604	4686	4769	-3.37	-1.75	1.77	-0.52	0.52
47	4450	4531	4612	-3.35	-1.78	1.80	-0.54	0.53
48	4302	4382	4462	-3.33	-1.81	1.84	-0.55	0.54
49	4161	4239	4318	-3.31	-1.85	1.87	-0.57	0.56
50	4024	4101	4179	-3.29	-1.88	1.90	-0.58	0.57
51	3893	3969	4046	-3.27	-1.91	1.94	-0.59	0.58
52	3767	3842	3917	-3.25	-1.94	1.97	-0.61	0.60
53	3646	3719	3794	-3.23	-1.97	2.00	-0.62	0.61
54	3529	3601	3675	-3.21	-2.01	2.04	-0.63	0.63
55	3417	3488	3560	-3.19	-2.04	2.07	-0.65	0.64
56	3309	3379	3450	-3.17	-2.07	2.10	-0.66	0.65
57	3205	3274	3343	-3.15	-2.10	2.13	-0.68	0.67
58	3105	3172	3241	-3.13	-2.13	2.17	-0.69	0.68
59	3008	3075	3142	-3.11	-2.16	2.20	-0.71	0.69
60	2916	2981	3047	-3.09	-2.19	2.23	-0.72	0.71
61	2826	2890	2956	-3.08	-2.22	2.26	-0.74	0.72
62	2740	2803	2867	-3.06	-2.25	2.29	-0.75	0.74
63	2657	2719	2782	-3.04	-2.28	2.32	-0.76	0.75
64	2577	2638	2700	-3.02	-2.31	2.36	-0.78	0.76
65	2499	2559	2620	-3.00	-2.34	2.39	-0.79	0.78
66	2425	2484	2544	-2.99	-2.37	2.42	-0.81	0.79
67	2353	2411	2470	-2.97	-2.40	2.45	-0.82	0.81
68	2284	2341	2399	-2.95	-2.43	2.48	-0.84	0.82
69	2217	2273	2330	-2.93	-2.46	2.51	-0.85	0.84
70	2152	2207	2263	-2.92	-2.48	2.54	-0.87	0.85
71	2090	2144	2199	-2.90	-2.51	2.57	-0.89	0.87
72	2030	2083	2137	-2.88	-2.54	2.60	-0.90	0.88
73	1972	2024	2077	-2.87	-2.57	2.63	-0.92	0.90
74	1916	1967	2019	-2.85	-2.60	2.66	-0.93	0.91
75	1861	1912	1963	-2.83	-2.62	2.69	-0.95	0.93
76	1809	1858	1909	-2.82	-2.65	2.71	-0.96	0.94
77	1758	1807	1856	-2.80	-2.68	2.74	-0.98	0.96
78	1710	1757	1806	-2.79	-2.71	2.77	-0.99	0.97
79	1662	1709	1757	-2.77	-2.73	2.80	-1.01	0.99
80	1617	1662	1709	-2.75	-2.76	2.83	-1.03	1.00
81	1572	1617	1664	-2.74	-2.79	2.86	-1.04	1.02
82	1530	1574	1619	-2.72	-2.81	2.88	-1.06	1.03
83	1488	1532	1576	-2.71	-2.84	2.91	-1.08	1.05
84	1448	1491	1535	-2.69	-2.87	2.94	-1.09	1.06
85	1409	1451	1494	-2.68	-2.89	2.97	-1.11	1.08
86	1372	1413	1455	-2.66	-2.92	3.00	-1.12	1.10

87	1336	1376	1418	-2.65	-2.94	3.02	-1.14	1.11
88	1300	1340	1381	-2.63	-2.97	3.05	-1.16	1.13
89	1266	1305	1346	-2.62	-3.00	3.08	-1.18	1.14
90	1233	1272	1311	-2.60	-3.02	3.10	-1.19	1.16
91	1201	1239	1278	-2.59	-3.05	3.13	-1.21	1.18
92	1171	1208	1246	-2.58	-3.07	3.16	-1.23	1.19
93	1141	1177	1214	-2.56	-3.10	3.18	-1.24	1.21
94	1111	1147	1184	-2.55	-3.12	3.21	-1.26	1.22
95	1083	1118	1155	-2.53	-3.15	3.24	-1.28	1.24
96	1056	1091	1126	-2.52	-3.17	3.26	-1.29	1.26
97	1030	1063	1098	-2.51	-3.19	3.29	-1.31	1.27
98	1004	1037	1072	-2.49	-3.22	3.31	-1.33	1.29
99	979	1012	1046	-2.48	-3.24	3.34	-1.35	1.31
100	955	987	1020	-2.47	-3.27	3.37	-1.36	1.32
101	931	963	996	-2.45	-3.29	3.39	-1.38	1.34
102	909	940	972	-2.44	-3.31	3.42	-1.40	1.36
103	887	917	949	-2.43	-3.34	3.44	-1.42	1.37
104	865	895	926	-2.41	-3.36	3.47	-1.44	1.39
105	844	874	904	-2.40	-3.38	3.49	-1.45	1.41
106	824	853	883	-2.39	-3.41	3.52	-1.47	1.43
107	805	833	863	-2.38	-3.43	3.54	-1.49	1.44
108	786	814	843	-2.36	-3.45	3.57	-1.51	1.46
109	767	795	823	-2.35	-3.48	3.59	-1.53	1.48
110	749	776	804	-2.34	-3.50	3.61	-1.54	1.50
111	732	758	786	-2.33	-3.52	3.64	-1.56	1.51
112	715	741	768	-2.32	-3.54	3.66	-1.58	1.53
113	698	724	751	-2.30	-3.57	3.69	-1.60	1.55
114	682	708	734	-2.29	-3.59	3.71	-1.62	1.57
115	667	692	717	-2.28	-3.61	3.73	-1.64	1.58
116	651	676	701	-2.27	-3.63	3.76	-1.66	1.60
117	637	661	686	-2.26	-3.65	3.78	-1.68	1.62
118	622	646	671	-2.25	-3.68	3.80	-1.69	1.64
119	609	632	656	-2.23	-3.70	3.83	-1.71	1.65
120	595	618	642	-2.22	-3.72	3.85	-1.73	1.67
121	582	604	628	-2.21	-3.74	3.87	-1.75	1.69
122	569	591	614	-2.20	-3.76	3.90	-1.77	1.71
123	557	578	601	-2.19	-3.78	3.92	-1.79	1.73
124	544	566	588	-2.18	-3.80	3.94	-1.81	1.75
125	533	554	576	-2.17	-3.82	3.97	-1.83	1.76