

BO YUAN ELECTRONIC CO., LTD.

Address: Zhangmiao Street ,Houbai County, Jurong City,Jiangsu province
TEL: +086-0511-87501888 FAX: +086-0511-87501177

**SPECIFICATION FOR APPROVAL****CUSTOMER****MODEL NO.**

NTSM-1

PART NO.

NTSA2B103F39501B091

APPLICATION

Temperature measurement and control

CUSTOMER P/N**ISSUE DATE**

2021/11/11

REV. NO

1.1

REV. DATE

2021/11/11

FOR CUSTOMER APPROVAL	CHECKED BY
	<i>Jin Gao</i>
	APPROVED BY <i>MeifengWang</i>





REV. NO	REV. DATE	REVISED CONTENT
1.0	2018-4-25	1.The new material preparation

INDEX	Page
■ Part Number Code	1
■ Structure and Dimensions	2
■ Material table	3
■ reliability	4
■ Max. Power Dissipation Derating Curve	5
■ Safety certification	6
■ R -T Table	7-10

Part Number Code

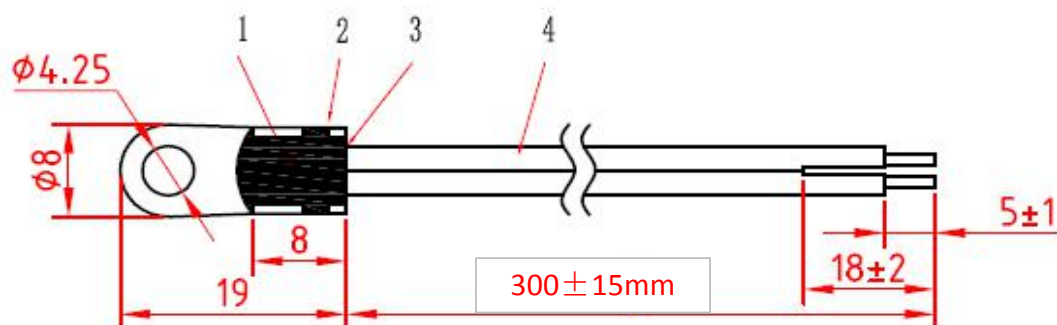
Example :

<u>NTSA2</u>	<u>B</u>	<u>103</u>	<u>F</u>	<u>3950</u>	<u>1</u>	<u>B091</u>
(1)	(2)	(3)	(4)	(5)	(6)	(7)

No.	Item	Digit	Specification
(1)	Product Type	NTSA2	Boyuan NTC thermistor NTSA-2 type
(2)	B Value	B	$B_{25/50}$
(3)	Resistance at 25°C	103	$10 \times 10^3 \Omega = 10K\Omega$
(4)	Tolerance of R25	F	$\pm 1\%$
(5)	B Value	3950	$B_{25/50}: 3950$
(6)	Tolerance of B Value	1	$\pm 1\%$
(7)	Special code	B091	CAP:5*27+20*29SUS LEAD WIRE:UL2651 26#

Structure and Dimensions

Unit: mm



No.	ITEM	DESCRIPTION	QUANTITY	REMARKS
1	ELEMENT	$R_{25}: 10K \Omega \pm 1\%$ $B_{25/50}: 3950K \pm 1\%$	1	MFE
2	CAP	$\Phi 4.2 \times 19$	1	Brass
3	coating resin	EPOXY	*	Black
4	LEAD WIRE	UL2651 26#	1	Black

Electrical Characteristics

Part No.	Resistance at 25°C	Tolerance of $R_{25^\circ C}$	$B_{25/50}$ Value	Tolerance of B Value	Max. Power Dissipation at 25°C	Dissipation Factor	Operating Temperature Range
	$R_{25^\circ C}$ (K Ω)	(\pm %)	(K)	(\pm %)	P_{max} (mW)	δ (mW/°C)	$T_L \sim T_U$ (°C)
NTSA2B103F39501B091	10.0	1	3950	1	50	≥ 2	-40 ~ +105



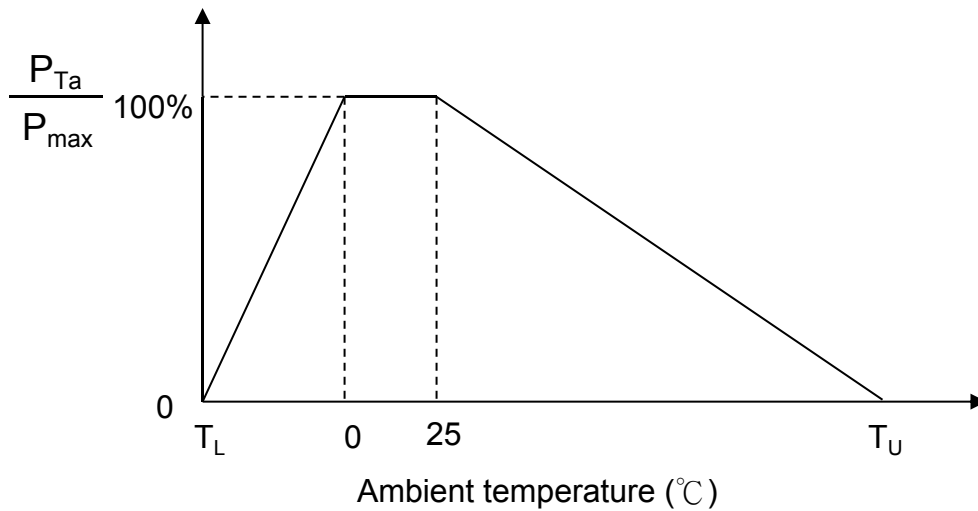
MARERIAL TO CONFIRM

NO	Item	DESCRIPTION	QUANTITY	CERTIFICATION
1	ELEMENT	R25:10K Ω \pm 1% B25/50:3950K \pm 1%	1	ROHS 、 CE APPROVED
2	CAP	Φ 4.2*19	1	ROHS APPROVED
3	coating resin	EPOXY	*	ROHS APPROVED
4	LEAD WIRE	UL2651 26#	1	UL 、 ROHS、 APPROVED

DEPENDABILITY

ITEM	STANDARD	TEST CONDITION	PERFORMANCE REQUIREMENT															
High temperature storage test	IEC60068-2-2	85 ± 5 °C , 1000 ± 24 hrs	No appearance damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
Low temperature storage test	IEC60068-2-1	-40± 5 °C , 1000 ± 24 hrs	No appearance damage ΔR ₂₅ /R ₂₅ ≤ 5 %															
The steady-state humid heat test	IEC60068-2-3	40 ± 2 °C , 9 0 ~ 95 % RH , 1000 ± 24 hrs	No appearance damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
Snap test temperature	IEC60068-2-14	<table><tr><th>STEP</th><th>TEMPERATURE (°C)</th><th>PERIOD (minutes)</th></tr><tr><td>1</td><td>-40 ± 5</td><td>30 ± 3</td></tr><tr><td>2</td><td>room temperature</td><td>5 ± 3</td></tr><tr><td>3</td><td>85± 5</td><td>30 ± 3</td></tr><tr><td>4</td><td>room temperature</td><td>5 ± 3</td></tr></table>	STEP	TEMPERATURE (°C)	PERIOD (minutes)	1	-40 ± 5	30 ± 3	2	room temperature	5 ± 3	3	85± 5	30 ± 3	4	room temperature	5 ± 3	No appearance damage ΔR ₂₅ /R ₂₅ ≤ 3 %
STEP	TEMPERATURE (°C)	PERIOD (minutes)																
1	-40 ± 5	30 ± 3																
2	room temperature	5 ± 3																
3	85± 5	30 ± 3																
4	room temperature	5 ± 3																
Load life test	IEC60539-1 4.26.3	25 ± 5 °C, Pmax. , 1000 ± 24 hrs	No appearance damage ΔR ₂₅ /R ₂₅ ≤ 3 %															
Insulation resistance test	MIL-STD-202F-Method 302	500 VDC 1 min	No appearance damage ≧ 100 MΩ															
Pressure test	MIL-STD-202F-Method 301	1800 VAC 10mA 1 s	No appearance damage															
Drop test	IEC60068-2-32	At the height of 1 meter, let products has its own fall, down to 10 mm thick oak board 5 times	No appearance damage															

Max. Power Dissipation Derating Curve



Note: T_L = Minimum operating temperature($^{\circ}\text{C}$)

T_U = Maximum operating temperature ($^{\circ}\text{C}$)

For example :

Ambient temperature(T_a)=55 $^{\circ}\text{C}$

Maximum operating temperature(T_u)=125 $^{\circ}\text{C}$

$P_{Ta}=(T_u-T_a)/(T_u-25)\times P_{max}=70\% P_{max}$

Storage Conditions of Products

(I) Storage Conditions :

- 1.Storage Temperature : -10 $^{\circ}\text{C}$ ~+40 $^{\circ}\text{C}$
- 2.Relative Humidity : $\leq 75\% \text{RH}$
- 3.Keep away from corrosive atmosphere and sunlight.

(II) Period of Storage : 1 year

SAFETY CERTIFICATION**2006/95/EC: Low Voltage Directive****2004/108/EC: Electromagnetic Compatibility Directive****SYSTEM CERTIFICATION****ISO 9001/TS16949 CERTIFICATION****ROHS TESTING****RoHS**

R(25℃)=10k Ω ±1%				B(25/50)= 3950K±1%			
Temp.	Resistance(k Ω)			resistance tol. (%)		Temp.tol. (℃)	
℃	Rmin	R(t)Normal	Rmax	MIN	MAX	MIN	MAX
-40	324.37	339.40	355.09	-4.4%	4.6%	-0.64	0.67
-39	303.73	317.59	332.05	-4.4%	4.6%	-0.63	0.66
-38	284.54	297.33	310.66	-4.3%	4.5%	-0.63	0.66
-37	266.67	278.48	290.78	-4.2%	4.4%	-0.63	0.65
-36	250.05	260.95	272.30	-4.2%	4.3%	-0.62	0.65
-35	234.56	244.63	255.10	-4.1%	4.3%	-0.62	0.64
-34	220.14	229.44	239.11	-4.1%	4.2%	-0.61	0.64
-33	206.68	215.28	224.21	-4.0%	4.1%	-0.61	0.63
-32	194.14	202.09	210.34	-3.9%	4.1%	-0.60	0.63
-31	182.44	189.78	197.41	-3.9%	4.0%	-0.60	0.62
-30	171.51	178.31	185.35	-3.8%	4.0%	-0.59	0.62
-29	161.31	167.60	174.11	-3.8%	3.9%	-0.59	0.61
-28	151.78	157.60	163.63	-3.7%	3.8%	-0.58	0.60
-27	142.87	148.26	153.83	-3.6%	3.8%	-0.58	0.60
-26	134.54	139.53	144.69	-3.6%	3.7%	-0.57	0.59
-25	126.74	131.36	136.14	-3.5%	3.6%	-0.57	0.59
-24	119.45	123.73	128.15	-3.5%	3.6%	-0.56	0.58
-23	112.61	116.58	120.67	-3.4%	3.5%	-0.56	0.58
-22	106.21	109.89	113.68	-3.3%	3.5%	-0.55	0.57
-21	100.21	103.62	107.13	-3.3%	3.4%	-0.55	0.56
-20	94.59	97.75	101.00	-3.2%	3.3%	-0.54	0.56
-19	89.31	92.24	95.25	-3.2%	3.3%	-0.54	0.55
-18	84.36	87.07	89.87	-3.1%	3.2%	-0.53	0.55
-17	79.71	82.23	84.82	-3.1%	3.2%	-0.52	0.54
-16	75.34	77.68	80.08	-3.0%	3.1%	-0.52	0.53
-15	71.24	73.41	75.63	-3.0%	3.0%	-0.51	0.53
-14	67.39	69.40	71.46	-2.9%	3.0%	-0.51	0.52
-13	63.76	65.63	67.55	-2.8%	2.9%	-0.50	0.51
-12	60.36	62.09	63.87	-2.8%	2.9%	-0.50	0.51
-11	57.15	58.76	60.41	-2.7%	2.8%	-0.49	0.50
-10	54.14	55.63	57.16	-2.7%	2.7%	-0.48	0.49
-9	51.30	52.68	54.10	-2.6%	2.7%	-0.48	0.49
-8	48.62	49.91	51.23	-2.6%	2.6%	-0.47	0.48
-7	46.10	47.30	48.52	-2.5%	2.6%	-0.46	0.47
-6	43.73	44.84	45.97	-2.5%	2.5%	-0.46	0.47
-5	41.49	42.53	43.58	-2.4%	2.5%	-0.45	0.46
-4	39.39	40.34	41.32	-2.4%	2.4%	-0.45	0.45
-3	37.40	38.28	39.19	-2.3%	2.4%	-0.44	0.45
-2	35.52	36.34	37.18	-2.3%	2.3%	-0.43	0.44
-1	33.74	34.51	35.29	-2.2%	2.3%	-0.43	0.43
0	32.07	32.78	33.50	-2.2%	2.2%	-0.42	0.43
1	30.49	31.15	31.82	-2.1%	2.2%	-0.41	0.42
2	29.00	29.61	30.23	-2.1%	2.1%	-0.40	0.41
3	27.58	28.15	28.73	-2.0%	2.1%	-0.40	0.40
4	26.25	26.78	27.31	-2.0%	2.0%	-0.39	0.40
5	24.99	25.47	25.97	-1.9%	1.9%	-0.38	0.39
6	23.78	24.24	24.70	-1.9%	1.9%	-0.38	0.38
7	22.65	23.07	23.49	-1.8%	1.8%	-0.37	0.37
8	21.57	21.96	22.36	-1.8%	1.8%	-0.36	0.37
9	20.55	20.91	21.28	-1.7%	1.7%	-0.35	0.36
10	19.59	19.92	20.26	-1.7%	1.7%	-0.35	0.35

11	18.68	18.99	19.30	-1.6%	1.6%	-0.34	0.34
12	17.81	18.10	18.39	-1.6%	1.6%	-0.33	0.34
13	16.99	17.26	17.52	-1.5%	1.6%	-0.32	0.33
14	16.21	16.46	16.71	-1.5%	1.5%	-0.32	0.32
15	15.47	15.70	15.93	-1.4%	1.5%	-0.31	0.31
16	14.78	14.99	15.20	-1.4%	1.4%	-0.30	0.30
17	14.12	14.31	14.51	-1.4%	1.4%	-0.29	0.30
18	13.49	13.67	13.85	-1.3%	1.3%	-0.30	0.31
19	12.90	13.07	13.23	-1.3%	1.3%	-0.28	0.28
20	12.33	12.49	12.64	-1.2%	1.2%	-0.27	0.27
21	11.80	11.94	12.08	-1.2%	1.2%	-0.26	0.26
22	11.29	11.42	11.55	-1.1%	1.1%	-0.25	0.25
23	10.80	10.92	11.04	-1.1%	1.1%	-0.25	0.25
24	10.34	10.45	10.56	-1.0%	1.0%	-0.24	0.24
25	9.900	10.000	10.100	-1.0%	1.0%	-0.24	0.24
26	9.471	9.571	9.671	-1.0%	1.0%	-0.24	0.24
27	9.063	9.163	9.263	-1.1%	1.1%	-0.25	0.25
28	8.675	8.774	8.874	-1.1%	1.1%	-0.26	0.26
29	8.306	8.404	8.503	-1.2%	1.2%	-0.27	0.27
30	7.954	8.051	8.150	-1.2%	1.2%	-0.28	0.29
31	7.618	7.715	7.813	-1.3%	1.3%	-0.30	0.30
32	7.299	7.395	7.492	-1.3%	1.3%	-0.31	0.31
33	6.995	7.090	7.185	-1.3%	1.3%	-0.32	0.32
34	6.704	6.798	6.893	-1.4%	1.4%	-0.33	0.33
35	6.428	6.521	6.614	-1.4%	1.4%	-0.34	0.35
36	6.164	6.256	6.348	-1.5%	1.5%	-0.36	0.36
37	5.912	6.003	6.094	-1.5%	1.5%	-0.37	0.37
38	5.672	5.761	5.851	-1.5%	1.6%	-0.38	0.38
39	5.443	5.531	5.619	-1.6%	1.6%	-0.39	0.40
40	5.225	5.311	5.398	-1.6%	1.6%	-0.40	0.41
41	5.016	5.101	5.186	-1.7%	1.7%	-0.42	0.42
42	4.816	4.900	4.984	-1.7%	1.7%	-0.43	0.43
43	4.626	4.708	4.791	-1.7%	1.8%	-0.44	0.45
44	4.444	4.524	4.606	-1.8%	1.8%	-0.45	0.46
45	4.270	4.349	4.429	-1.8%	1.8%	-0.47	0.47
46	4.104	4.181	4.260	-1.9%	1.9%	-0.48	0.49
47	3.945	4.021	4.098	-1.9%	1.9%	-0.49	0.50
48	3.793	3.867	3.943	-1.9%	2.0%	-0.50	0.51
49	3.647	3.721	3.795	-2.0%	2.0%	-0.52	0.53
50	3.508	3.580	3.653	-2.0%	2.0%	-0.53	0.54
51	3.375	3.446	3.517	-2.0%	2.1%	-0.54	0.55
52	3.248	3.317	3.387	-2.1%	2.1%	-0.56	0.57
53	3.126	3.194	3.263	-2.1%	2.2%	-0.57	0.58
54	3.009	3.075	3.143	-2.2%	2.2%	-0.58	0.59
55	2.897	2.962	3.029	-2.2%	2.2%	-0.60	0.61
56	2.790	2.854	2.919	-2.2%	2.3%	-0.61	0.62
57	2.688	2.750	2.814	-2.3%	2.3%	-0.62	0.63
58	2.589	2.651	2.713	-2.3%	2.4%	-0.64	0.65
59	2.495	2.555	2.616	-2.3%	2.4%	-0.65	0.66
60	2.405	2.464	2.523	-2.4%	2.4%	-0.66	0.68
61	2.318	2.376	2.434	-2.4%	2.5%	-0.68	0.69
62	2.235	2.292	2.349	-2.4%	2.5%	-0.69	0.71
63	2.156	2.211	2.267	-2.5%	2.5%	-0.70	0.72
64	2.079	2.133	2.188	-2.5%	2.6%	-0.72	0.73
65	2.006	2.059	2.112	-2.6%	2.6%	-0.73	0.75

66	1.936	1.987	2.040	-2.6%	2.6%	-0.75	0.76
67	1.868	1.918	1.970	-2.6%	2.7%	-0.76	0.78
68	1.803	1.852	1.903	-2.7%	2.7%	-0.77	0.79
69	1.741	1.789	1.838	-2.7%	2.8%	-0.79	0.81
70	1.681	1.728	1.776	-2.7%	2.8%	-0.80	0.82
71	1.624	1.670	1.717	-2.8%	2.8%	-0.82	0.84
72	1.569	1.614	1.660	-2.8%	2.9%	-0.83	0.85
73	1.515	1.560	1.605	-2.8%	2.9%	-0.85	0.87
74	1.464	1.508	1.552	-2.9%	2.9%	-0.86	0.88
75	1.415	1.458	1.501	-2.9%	3.0%	-0.88	0.90
76	1.368	1.409	1.452	-2.9%	3.0%	-0.89	0.91
77	1.323	1.363	1.405	-3.0%	3.0%	-0.91	0.93
78	1.279	1.319	1.359	-3.0%	3.1%	-0.92	0.94
79	1.237	1.276	1.315	-3.0%	3.1%	-0.93	0.96
80	1.197	1.235	1.273	-3.0%	3.1%	-0.95	0.98
81	1.158	1.195	1.233	-3.1%	3.2%	-0.96	0.99
82	1.121	1.157	1.194	-3.1%	3.2%	-0.98	1.01
83	1.085	1.120	1.156	-3.1%	3.2%	-0.99	1.02
84	1.050	1.084	1.120	-3.2%	3.3%	-1.01	1.04
85	1.016	1.050	1.085	-3.2%	3.3%	-1.03	1.06
86	0.984	1.017	1.051	-3.2%	3.3%	-1.04	1.07
87	0.953	0.985	1.019	-3.3%	3.4%	-1.06	1.09
88	0.923	0.955	0.987	-3.3%	3.4%	-1.07	1.10
89	0.894	0.925	0.957	-3.3%	3.4%	-1.09	1.12
90	0.867	0.897	0.928	-3.4%	3.5%	-1.10	1.14
91	0.840	0.869	0.900	-3.4%	3.5%	-1.12	1.15
92	0.814	0.843	0.872	-3.4%	3.5%	-1.13	1.17
93	0.789	0.817	0.846	-3.4%	3.6%	-1.15	1.19
94	0.765	0.792	0.821	-3.5%	3.6%	-1.17	1.20
95	0.742	0.769	0.797	-3.5%	3.6%	-1.18	1.22
96	0.719	0.746	0.773	-3.5%	3.7%	-1.20	1.24
97	0.698	0.724	0.750	-3.6%	3.7%	-1.21	1.26
98	0.677	0.702	0.728	-3.6%	3.7%	-1.23	1.27
99	0.657	0.681	0.707	-3.6%	3.7%	-1.25	1.29
100	0.637	0.661	0.686	-3.7%	3.8%	-1.26	1.31
101	0.619	0.642	0.667	-3.7%	3.8%	-1.28	1.32
102	0.600	0.624	0.648	-3.7%	3.8%	-1.30	1.34
103	0.583	0.606	0.629	-3.7%	3.9%	-1.31	1.36
104	0.566	0.588	0.611	-3.8%	3.9%	-1.33	1.38
105	0.550	0.571	0.594	-3.8%	3.9%	-1.34	1.39
106	0.534	0.555	0.577	-3.8%	4.0%	-1.36	1.41
107	0.519	0.539	0.561	-3.8%	4.0%	-1.38	1.43
108	0.504	0.524	0.545	-3.9%	4.0%	-1.39	1.45
109	0.490	0.509	0.530	-3.9%	4.1%	-1.41	1.47
110	0.476	0.495	0.515	-3.9%	4.1%	-1.43	1.48
111	0.462	0.482	0.501	-4.0%	4.1%	-1.45	1.50
112	0.450	0.468	0.488	-4.0%	4.1%	-1.46	1.52
113	0.437	0.455	0.474	-4.0%	4.2%	-1.48	1.54
114	0.425	0.443	0.461	-4.0%	4.2%	-1.50	1.56
115	0.413	0.431	0.449	-4.1%	4.2%	-1.51	1.57
116	0.402	0.419	0.437	-4.1%	4.3%	-1.53	1.59
117	0.391	0.408	0.425	-4.1%	4.3%	-1.55	1.61
118	0.380	0.397	0.414	-4.1%	4.3%	-1.57	1.63
119	0.370	0.386	0.403	-4.2%	4.3%	-1.58	1.65
120	0.360	0.376	0.392	-4.2%	4.4%	-1.60	1.67
121	0.350	0.366	0.382	-4.2%	4.4%	-1.62	1.69
122	0.341	0.356	0.372	-4.2%	4.4%	-1.64	1.71
123	0.332	0.347	0.362	-4.3%	4.5%	-1.66	1.72
124	0.323	0.338	0.353	-4.3%	4.5%	-1.67	1.74
125	0.315	0.329	0.344	-4.3%	4.5%	-1.69	1.76

131	0.269	0.281	0.295	-4.5%	4.7%	-1.80	1.88
132	0.262	0.274	0.287	-4.5%	4.7%	-1.82	1.90
133	0.255	0.267	0.280	-4.5%	4.7%	-1.84	1.92
134	0.249	0.261	0.273	-4.5%	4.8%	-1.86	1.94
135	0.243	0.254	0.266	-4.6%	4.8%	-1.87	1.96
136	0.236	0.248	0.260	-4.6%	4.8%	-1.89	1.98
137	0.231	0.242	0.253	-4.6%	4.8%	-1.91	2.00
138	0.225	0.236	0.247	-4.6%	4.9%	-1.93	2.02
139	0.219	0.230	0.241	-4.7%	4.9%	-1.95	2.04
140	0.214	0.224	0.235	-4.7%	4.9%	-1.97	2.06
141	0.209	0.219	0.230	-4.7%	4.9%	-1.99	2.08
142	0.203	0.214	0.224	-4.7%	5.0%	-2.01	2.10
143	0.198	0.208	0.219	-4.8%	5.0%	-2.02	2.12
144	0.194	0.203	0.214	-4.8%	5.0%	-2.04	2.14
145	0.189	0.198	0.208	-4.8%	5.0%	-2.06	2.16
146	0.184	0.194	0.204	-4.8%	5.1%	-2.08	2.18
147	0.180	0.189	0.199	-4.9%	5.1%	-2.10	2.20
148	0.176	0.185	0.194	-4.9%	5.1%	-2.12	2.23
149	0.172	0.180	0.190	-4.9%	5.1%	-2.14	2.25
150	0.167	0.176	0.185	-4.9%	5.2%	-2.16	2.27