NTC Thermistors, Mini Epoxy PVC Single Insulated Leads



LINKS TO ADDITIONAL RESOURCES

3D Models | Design Tools | Related Documents

QUICK REFERENCE DATA		
PARAMETER	**VALUE**	**UNIT**
Resistance value at 25 °C	4.7K to 100K	Ω
Tolerance on R_{25}-value	± 1.0 to ± 5.0	%
$B_{25/85}$-value	3435 to 4190	K
Tolerance on $B_{25/85}$	± 0.5 to ± 1.5	%
Operating temperature range at zero dissipation	-40 to 105	°C
Maximum power dissipation at 55 °C	100	mW
Accuracy of temperature measurement (for 1 % types)	± 0.5 between 0 and 40 ± 1.0 between -40 and 80	°C
Dissipation factor δ (in still air)	≈ 3	mW/K
Response time (in oil)	≈ 2.5	s
Climatic category (LCT / UCT / days)	40 / 105 / 28	
Minimum dielectric withstanding voltage between leads and coated body	500	V_{RMS}
Weight (40 mm length)	0.2	g

FEATURES

- High adhesive strength between the PVC wire and the encapsulating lacquer
- Accurate down to ± 0.3 °C
- Small body of max. 3 mm for easy installation
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS COMPLIANT

APPLICATIONS

- Temperature measurement, sensing, and control
- On battery packs, heat-sinks, tubing, enclosures, etc.

DESCRIPTION

These sensors consist of small NTC chip soldered between stranded AWG #30, PVC 105 °C single hook-up wires (acc. to UL 1061). Terminations are solder dipped. They are lacquered and insulated with a black epoxy coating.

MARKING

Black lacquered body without additional mark

PACKAGING

SPQ: 125 items (for standard 40 mm lead wire length)

MOUNTING

Important mounting and handling instructions: see www.vishay.com/doc?29222

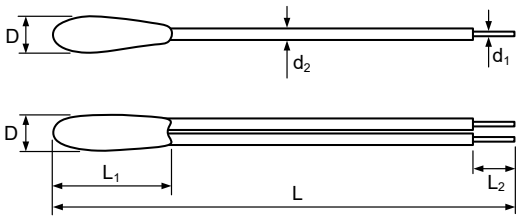
By soldering the wire end, or crimping connector. The body can be inserted in a tube, free in air, tape attached or glued. Not intended for fluid immersed applications or continuous contact with water. Not for potting in hard material or over-molding applications. Consult Vishay for specific application or mounting.

DESIGN-IN SUPPORT

- For complete curve computation, please visit: www.vishay.com/thermistors/ntc-curve-list/
- Other R/T curves available on request
- The lead length can be customized
- Connectors can be added to the wire end

DIMENSIONS in millimeters

Electronic components of assessed quality measured in accordance with IEC 60539-1

Outline	NTCLE428E3
	
Ø D max.	3.0
L	40 ± 5 (or refer to table SAP description)
L_1 max.	10
L_2	3 ± 1
Ø d_1	0.3 ± 0.03
Ø d_2	0.85 (for information)

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ELECTRICAL DATA AND ORDERING INFORMATION

R_{25} (Ω)	R_{25}-TOL. (± %)	$B_{25/85}$ (K)	$B_{25/85}$-TOL. (± %)	L (mm)	R/T TABLE	SAP MATERIAL AND ORDERING NUMBER	
						RoHS COMPLIANT WITH EXEMPTION (1)	RoHS COMPLIANT
4700	3	3984	0.5	40 ± 5	Table 1	**NTCLE428E3472H400**	**NTCLE428E3472H400A**
5000	3	3984	0.5	40 ± 5	Table 2	NTCLE428E3502H400	NTCLE428E3502H400A
10 000	1	3435	1	40 ± 5	Table 3	**NTCLE428E3103F400L**	**NTCLE428E3103F404A**
10 000	1	3435	1	52 ± 5	Table 3	**NTCLE428E3103F520L**	**NTCLE428E3103F524A**
10 000	3	3984	0.5	40 ± 5	Table 5	**NTCLE428E3103H400**	**NTCLE428E3103H400A**
10 000	3	3984	0.5	300 ± 5	Table 5	NTCLE428E3103H301	NTCLE428E3103H301A
47 000	3	4090	1.5	40 ± 5	Table 6	NTCLE428E3473H400	NTCLE428E3473H400A

Notes

Preferred versions for new designs

- Preferred types are marked in **bold**

(1) RoHS exemption 7(c)-I: electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezo-electronic devices, or in a glass or ceramic matrix compound

Table 1

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 4.7K 3 % B3984 K	4.7	3	3984	0.5

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	157 109	33.427	4.92	-6.63	0.74	149 382	164 836
-35.0	113 422	24.132	4.73	-6.41	0.74	108 052	118 791
-30.0	82 782	17.613	4.56	-6.19	0.74	79 010	86 555
-25.0	61 053	12.990	4.39	-5.99	0.73	58 375	63 731
-20.0	45 478	9.6761	4.22	-5.79	0.73	43 557	47 399
-15.0	34 199	7.2765	4.07	-5.61	0.73	32 809	35 590
-10.0	25 953	5.5218	3.92	-5.43	0.72	24 936	26 969
-5.0	19 866	4.2268	3.77	-5.26	0.72	19 117	20 615
0.0	15 333	3.2624	3.63	-5.10	0.71	14 777	15 890
5.0	11 929	2.5381	3.49	-4.94	0.71	11 512	12 346
10.0	9351.5	1.9897	3.36	-4.80	0.70	9036.9	9666.2
15.0	7384.3	1.5711	3.24	-4.65	0.70	7145.1	7623.5
20.0	5871.6	1.2493	3.12	-4.52	0.69	5688.5	6054.6
25.0	4700.0	1.00000	3.00	-4.39	0.68	4559.0	4841.0
30.0	3786.3	0.80560	3.11	-4.26	0.73	3668.4	3904.2
35.0	3069.0	0.65297	3.22	-4.14	0.78	2970.1	3167.9
40.0	2502.2	0.53239	3.33	-4.03	0.83	2418.9	2585.5
45.0	2051.7	0.43653	3.43	-3.92	0.88	1981.3	2122.1
50.0	1691.4	0.35987	3.53	-3.81	0.93	1631.7	1751.1
55.0	1401.7	0.29823	3.63	-3.71	0.98	1350.8	1452.5
60.0	1167.4	0.24838	3.72	-3.61	1.03	1123.9	1210.9
65.0	976.97	0.20787	3.81	-3.51	1.09	939.70	1014.2
70.0	821.40	0.17477	3.90	-3.42	1.14	789.34	853.45
75.0	693.68	0.14759	3.99	-3.34	1.20	666.02	721.35
80.0	588.35	0.12518	4.07	-3.25	1.25	564.39	612.30
85.0	501.07	0.10661	4.15	-3.17	1.31	480.26	521.88
90.0	428.45	0.091159	4.23	-3.09	1.37	410.31	446.58
95.0	367.75	0.078246	4.31	-3.02	1.43	351.91	383.60
100.0	316.83	0.067411	4.38	-2.94	1.49	302.94	330.72
105.0	273.94	0.058284	4.46	-2.87	1.55	261.73	286.14

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Table 2

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 5K 3 % B3984 K	5	3	3984	0.5

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	167 137	33.427	4.92	-6.63	0.74	158 917	175 358
-35.0	120 661	24.132	4.73	-6.41	0.74	114 949	126 373
-30.0	88 066	17.613	4.56	-6.19	0.74	84 053	92 079
-25.0	64 950	12.990	4.39	-5.99	0.73	62 101	67 799
-20.0	48 381	9.6761	4.22	-5.79	0.73	46 337	50 424
-15.0	36 382	7.2765	4.07	-5.61	0.73	34 903	37 862
-10.0	27 609	5.5218	3.92	-5.43	0.72	26 528	28 690
-5.0	21 134	4.2268	3.77	-5.26	0.72	20 337	21 931
0.0	16 312	3.2624	3.63	-5.10	0.71	15 720	16 904
5.0	12 691	2.5381	3.49	-4.94	0.71	12 247	13 134
10.0	9948.4	1.9897	3.36	-4.80	0.70	9613.7	10 283
15.0	7855.6	1.5711	3.24	-4.65	0.70	7601.2	8110.1
20.0	6246.4	1.2493	3.12	-4.52	0.69	6051.6	6441.1
25.0	5000.0	1.00000	3.00	-4.39	0.68	4850.0	5150.0
30.0	4028.0	0.80560	3.11	-4.26	0.73	3902.6	4153.4
35.0	3264.9	0.65297	3.22	-4.14	0.78	3159.6	3370.1
40.0	2661.9	0.53239	3.33	-4.03	0.83	2573.3	2750.6
45.0	2182.6	0.43653	3.43	-3.92	0.88	2107.7	2257.6
50.0	1799.4	0.35987	3.53	-3.81	0.93	1735.8	1862.9
55.0	1491.1	0.29823	3.63	-3.71	0.98	1437.0	1545.3
60.0	1241.9	0.24838	3.72	-3.61	1.03	1195.7	1288.1
65.0	1039.3	0.20787	3.81	-3.51	1.09	999.69	1079.0
70.0	873.83	0.17477	3.90	-3.42	1.14	839.73	907.93
75.0	737.96	0.14759	3.99	-3.34	1.20	708.53	767.39
80.0	625.90	0.12518	4.07	-3.25	1.25	600.42	651.39
85.0	533.05	0.10661	4.15	-3.17	1.31	510.92	555.19
90.0	455.79	0.091159	4.23	-3.09	1.37	436.50	475.08
95.0	391.23	0.078246	4.31	-3.02	1.43	374.37	408.08
100.0	337.06	0.067411	4.38	-2.94	1.49	322.28	351.83
105.0	291.42	0.058284	4.46	-2.87	1.55	278.44	304.41

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Table 3

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 10K 1 % B3435 K	10	1	3435	1.0

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	190 953	19.095	4.24	-5.46	0.78	182 848	199 057
-35.0	145 953	14.595	3.93	-5.30	0.74	140 213	151 693
-30.0	112 440	11.244	3.63	-5.14	0.71	108 354	116 526
-25.0	87 285	8.7285	3.35	-4.99	0.67	84 364	90 206
-20.0	68 260	6.8260	3.07	-4.85	0.63	66 164	70 355
-15.0	53 762	5.3762	2.80	-4.71	0.60	52 254	55 270
-10.0	42 636	4.2636	2.55	-4.57	0.56	41 549	43 723
-5.0	34 038	3.4038	2.30	-4.44	0.52	33 254	34 822
0.0	27 348	2.7348	2.07	-4.31	0.48	26 783	27 913
5.0	22 108	2.2108	1.84	-4.19	0.44	21 702	22 515
10.0	17 979	1.7979	1.62	-4.08	0.40	17 689	18 270
15.0	14 706	1.4706	1.40	-3.96	0.35	14 499	14 912
20.0	12 094	1.2094	1.20	-3.86	0.31	11 949	12 239
25.0	10 000	1.0000	1.00	-3.75	0.27	9900.0	10 100
30.0	8310.8	0.83108	1.19	-3.65	0.33	8211.7	8409.8
35.0	6941.1	0.69411	1.38	-3.55	0.39	6845.5	7036.7
40.0	5824.9	0.58249	1.56	-3.46	0.45	5734.1	5915.6
45.0	4910.6	0.49106	1.73	-3.37	0.51	4825.6	4995.7
50.0	4158.3	0.41583	1.90	-3.28	0.58	4079.2	4237.3
55.0	3536.2	0.35362	2.06	-3.20	0.65	3463.2	3609.2
60.0	3019.7	0.30197	2.22	-3.12	0.71	2952.5	3086.8
65.0	2588.8	0.25888	2.38	-3.04	0.78	2527.3	2650.4
70.0	2228.0	0.22280	2.53	-2.96	0.85	2171.7	2284.3
75.0	1924.6	0.19246	2.67	-2.89	0.92	1873.1	1976.0
80.0	1668.4	0.16684	2.81	-2.82	1.00	1621.5	1715.3
85.0	1451.3	0.14513	2.95	-2.75	1.07	1408.5	1494.2
90.0	1266.7	0.12667	3.08	-2.69	1.15	1227.7	1305.8
95.0	1109.2	0.11092	3.21	-2.62	1.22	1073.6	1144.8
100.0	974.26	0.097426	3.34	-2.56	1.30	941.74	1006.8
105.0	858.33	0.085833	3.46	-2.50	1.38	828.62	888.04

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Table 4

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 10K 5 % B3435 K	10	5	3435	1.0

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	190 953	19.095	8.37	-5.46	1.53	174 965	206 940
-35.0	145 953	14.595	8.05	-5.30	1.52	134 205	157 700
-30.0	112 440	11.244	7.74	-5.14	1.51	103 739	121 141
-25.0	87 285	8.7285	7.44	-4.99	1.49	80 792	93 779
-20.0	68 260	6.8260	7.15	-4.85	1.48	63 377	73 142
-15.0	53 762	5.3762	6.88	-4.71	1.46	50 066	57 459
-10.0	42 636	4.2636	6.61	-4.57	1.45	39 818	45 455
-5.0	34 038	3.4038	6.35	-4.44	1.43	31 875	36 201
0.0	27 348	2.7348	6.11	-4.31	1.42	25 677	29 018
5.0	22 108	2.2108	5.87	-4.19	1.40	20 810	23 406
10.0	17 979	1.7979	5.64	-4.08	1.38	16 965	18 994
15.0	14 706	1.4706	5.42	-3.96	1.37	13 908	15 503
20.0	12 094	1.2094	5.21	-3.86	1.35	11 465	12 724
25.0	10 000	1.0000	5.00	-3.75	1.33	9500.0	10 500
30.0	8310.8	0.83108	5.20	-3.65	1.42	7878.6	8742.9
35.0	6941.1	0.69411	5.39	-3.55	1.52	6566.8	7315.4
40.0	5824.9	0.58249	5.58	-3.46	1.61	5499.8	6149.9
45.0	4910.6	0.49106	5.76	-3.37	1.71	4627.7	5193.5
50.0	4158.3	0.41583	5.94	-3.28	1.81	3911.4	4405.1
55.0	3536.2	0.35362	6.11	-3.20	1.91	3320.3	3752.2
60.0	3019.7	0.30197	6.27	-3.12	2.01	2830.3	3209.0
65.0	2588.8	0.25888	6.43	-3.04	2.12	2422.3	2755.3
70.0	2228.0	0.22280	6.59	-2.96	2.22	2081.2	2374.7
75.0	1924.6	0.19246	6.74	-2.89	2.33	1794.9	2054.2
80.0	1668.4	0.16684	6.88	-2.82	2.44	1553.5	1783.3
85.0	1451.3	0.14513	7.03	-2.75	2.55	1349.4	1553.3
90.0	1266.7	0.12667	7.17	-2.69	2.67	1176.0	1357.5
95.0	1109.2	0.11092	7.30	-2.62	2.78	1028.2	1190.2
100.0	974.26	0.097426	7.43	-2.56	2.90	901.86	1046.7
105.0	858.33	0.085833	7.56	-2.50	3.02	793.45	923.21

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Table 5

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 10K 3 % B3984 K	10	3	3984	0.5

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	334 274	33.427	4.92	-6.63	0.74	317 833	350 716
-35.0	241 323	24.132	4.73	-6.41	0.74	229 899	252 747
-30.0	176 133	17.613	4.56	-6.19	0.74	168 106	184 159
-25.0	129 900	12.990	4.39	-5.99	0.73	124 201	135 599
-20.0	96 761	9.6761	4.22	-5.79	0.73	92 674	100 848
-15.0	72 765	7.2765	4.07	-5.61	0.73	69 806	75 724
-10.0	55 218	5.5218	3.92	-5.43	0.72	53 056	57 380
-5.0	42 268	4.2268	3.77	-5.26	0.72	40 674	43 861
0.0	32 624	3.2624	3.63	-5.10	0.71	31 440	33 809
5.0	25 381	2.5381	3.49	-4.94	0.71	24 494	26 268
10.0	19 897	1.9897	3.36	-4.80	0.70	19 227	20 566
15.0	15 711	1.5711	3.24	-4.65	0.70	15 202	16 220
20.0	12 493	1.2493	3.12	-4.52	0.69	12 103	12 882
25.0	10 000	1.00000	3.00	-4.39	0.68	9700.0	10 300
30.0	8056.0	0.80560	3.11	-4.26	0.73	7805.1	8306.8
35.0	6529.7	0.65297	3.22	-4.14	0.78	6319.3	6740.2
40.0	5323.9	0.53239	3.33	-4.03	0.83	5146.6	5501.1
45.0	4365.3	0.43653	3.43	-3.92	0.88	4215.4	4515.1
50.0	3598.7	0.35987	3.53	-3.81	0.93	3471.6	3725.8
55.0	2982.3	0.29823	3.63	-3.71	0.98	2874.0	3090.5
60.0	2483.8	0.24838	3.72	-3.61	1.03	2391.3	2576.3
65.0	2078.7	0.20787	3.81	-3.51	1.09	1999.4	2157.9
70.0	1747.7	0.17477	3.90	-3.42	1.14	1679.5	1815.9
75.0	1475.9	0.14759	3.99	-3.34	1.20	1417.1	1534.8
80.0	1251.8	0.12518	4.07	-3.25	1.25	1200.8	1302.8
85.0	1066.1	0.10661	4.15	-3.17	1.31	1021.8	1110.4
90.0	911.59	0.091159	4.23	-3.09	1.37	873.01	950.16
95.0	782.46	0.078246	4.31	-3.02	1.43	748.75	816.17
100.0	674.11	0.067411	4.38	-2.94	1.49	644.56	703.66
105.0	582.84	0.058284	4.46	-2.87	1.55	556.87	608.82

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Table 6

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 47K 3 % B4090 K	47	3	4090	1.5

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	1 589 068	33.810	8.91	-6.54	1.36	1 447 482	1 730 653
-35.0	1 151 627	24.503	8.34	-6.34	1.32	1 055 560	1 247 693
-30.0	842 790	17.932	7.80	-6.15	1.27	777 081	908 499
-25.0	622 597	13.247	7.27	-5.96	1.22	577 315	667 878
-20.0	464 110	9.8747	6.77	-5.79	1.17	432 690	495 530
-15.0	348 989	7.4253	6.29	-5.62	1.12	327 051	370 927
-10.0	264 628	5.6304	5.82	-5.45	1.07	249 224	280 032
-5.0	202 280	4.3038	5.37	-5.30	1.01	191 412	213 148
0.0	155 823	3.3154	4.94	-5.14	0.96	148 124	163 522
5.0	120 932	2.5730	4.52	-5.00	0.91	115 460	126 404
10.0	94 528	2.0112	4.12	-4.86	0.85	90 630	98 425
15.0	74 399	1.5830	3.74	-4.72	0.79	71 619	77 178
20.0	58 945	1.2542	3.36	-4.59	0.73	56 964	60 927
25.0	47 000	1.0000	3.00	-4.47	0.67	45 590	48 410
30.0	37 706	0.80226	3.35	-4.35	0.77	36 443	38 969
35.0	30 429	0.64743	3.69	-4.23	0.87	29 307	31 551
40.0	24 696	0.52545	4.02	-4.12	0.97	23 705	25 688
45.0	20 154	0.42880	4.33	-4.01	1.08	19 281	21 027
50.0	16 534	0.35178	4.64	-3.91	1.19	15 767	17 301
55.0	13 633	0.29006	4.94	-3.81	1.30	12 960	14 306
60.0	11 296	0.24035	5.23	-3.71	1.41	10 706	11 887
65.0	9404.5	0.20010	5.51	-3.62	1.52	8886.6	9922.3
70.0	7865.2	0.16735	5.78	-3.53	1.64	7410.7	8319.7
75.0	6606.9	0.14057	6.04	-3.44	1.75	6207.6	7006.2
80.0	5573.5	0.11858	6.30	-3.36	1.87	5222.3	5924.6
85.0	4721.0	0.10045	6.55	-3.28	2.00	4411.8	5030.2
90.0	4014.7	0.085420	6.79	-3.20	2.12	3742.0	4287.4
95.0	3427.2	0.072919	7.03	-3.13	2.25	3186.3	3668.1
100.0	2936.5	0.062478	7.26	-3.05	2.38	2723.3	3149.6
105.0	2525.0	0.053723	7.48	-2.98	2.51	2336.1	105.0

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Table 7

PART IDENTIFICATION	R_{25}		$B_{25/85}$	
	kΩ	± %	K	± %
NTCLE428 100K 3 % B4190 K	100	3	4190	1.5

RESISTANCE VALUES AT INTERMEDIATE TEMPERATURES

TEMPERATURE (°C)	R_T (Ω)	R_T/R_{25}	R-TOL. (± %)	α (%/K)	T-TOL. (± °C)	$R_{MIN.}$ (Ω)	$R_{MAX.}$ (Ω)
-40.0	3 666 299	36.663	9.05	-6.69	1.35	3 334 354	3 998 244
-35.0	2 637 588	26.376	8.47	-6.49	1.31	2 414 139	2 861 036
-30.0	1 916 576	19.166	7.91	-6.29	1.26	1 764 917	2 068 236
-25.0	1 406 111	14.061	7.38	-6.10	1.21	1 302 387	1 509 836
-20.0	1 041 184	10.412	6.86	-5.92	1.16	969 745	1 112 622
-15.0	777 846	7.7785	6.37	-5.75	1.11	728 330	827 362
-10.0	586 097	5.8610	5.89	-5.58	1.06	551 581	620 613
-5.0	445 257	4.4526	5.43	-5.42	1.00	421 079	469 435
0.0	340 942	3.4094	4.99	-5.26	0.95	323 936	357 948
5.0	263 054	2.6305	4.56	-5.11	0.89	251 054	275 054
10.0	204 446	2.0445	4.15	-4.97	0.84	195 960	212 931
15.0	160 014	1.6001	3.75	-4.83	0.78	154 008	166 020
20.0	126 087	1.2609	3.37	-4.70	0.72	121 837	130 336
25.0	100 000	1.00000	3.00	-4.57	0.66	97 000	103 000
30.0	79 808	0.79808	3.36	-4.45	0.75	77 128	82 488
35.0	64 077	0.64077	3.70	-4.33	0.86	61 703	66 451
40.0	51 745	0.51745	4.04	-4.22	0.96	49 655	53 836
45.0	42 021	0.42021	4.36	-4.11	1.06	40 187	43 855
50.0	34 308	0.34308	4.68	-4.00	1.17	32 702	35 913
55.0	28 156	0.28156	4.98	-3.90	1.28	26 752	29 559
60.0	23 222	0.23222	5.28	-3.80	1.39	21 996	24 449
65.0	19 246	0.19246	5.57	-3.71	1.50	18 174	20 318
70.0	16 025	0.16025	5.85	-3.62	1.62	15 088	16 961
75.0	13 402	0.13402	6.12	-3.53	1.73	12 582	14 222
80.0	11 258	0.11258	6.38	-3.45	1.85	10 539	11 976
85.0	9495.8	0.094958	6.64	-3.36	1.97	8865.6	10 126
90.0	8042.0	0.080420	6.89	-3.28	2.10	7488.3	8595.7
95.0	6837.3	0.068373	7.13	-3.21	2.22	6350.0	7324.7
100.0	5835.1	0.058351	7.36	-3.13	2.35	5405.4	6264.7
105.0	4997.8	0.049978	7.59	-3.06	2.48	4618.4	5377.3

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