

NTC Thermistors, Low Thermal Gradient Lug Sensors



QUICK REFERENCE DATA		
PARAMETER	VALUE	UNIT
Resistance value at 25 °C	4.7K to 100K	Ω
Tolerance on R_{25} -value	± 1 ; ± 2 ; ± 3	%
$B_{25/85}$ value	3435 to 4190	K
Tolerance on $B_{25/85}$ -value	± 0.5 ; ± 1.0 ; ± 1.5	%
Operating temperature range at zero power	- 55 to 125	°C
Maximum dissipation at 25 °C	100	mW
Thermal time constant τ	≈ 5	s
Dissipation factor	10	mW/K
Thermal gradient	< 0.05	K/K
Min. dielectric withstanding voltage between terminals and lug	1500	V _{AC}
Climatic category (LCT/UCT/days)	55/125/56	
Weight	≈ 1.0	g

APPLICATIONS

Thermistors used for accurate surface temperature sensing and control in:

- Computer equipment
- Power electronics, heat-sink temperature control
- Consumer appliances
- Industrial equipment
- Automotive equipment

MOUNTING

The device is suitable for screwing e.g. on a metal surface through means of an M3 screw. The connections are suitable for soldering on a PCB or for connector insertion. The sensor is not suitable for being in permanent contact with water or liquids.

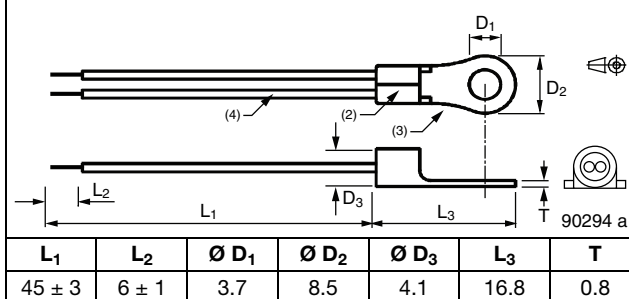
FEATURES

- Low thermal gradient due to the use of nickel conductor and low profile closed ring tongue
- AEC-Q200 qualified (grade 1)
- UL recognized, file E148885 (UL category XGPU2)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

DIMENSIONS in millimeters



DESCRIPTION

Vishay thermistor chip NTC with epoxy coating and middle buffer layer (2) mounted in a (3) metal ring lug with (4) PEEK insulated leads AWG#30 (Ø 0.25 mm), mono-stranded silver-plated nickel (insulation Ø 0.56 mm).

DESIGNERS TOOL

- NTC thermistor curve computation (Resistance/ Temperature) is available at: www.vishay.com/resistors-non-linear/curve-computation-list/
- Other applicable screw size are available, for example stud size metric 3 mm/American 3 to 4
- 3D or 2D solid models are available Refer to www.vishay.com/doc?29106
- Other R/T-curves and tolerances available on request
- Other lead length, insulation or connector crimping available on request
- AWG#28 or AWG#26 wires available on request

ELECTRICAL DATA AND ORDERING INFORMATION					
R_{25} (k Ω)	R_{25} TOL. (%)	$B_{25/85}$ -VALUE (K)	$B_{25/85}$ TOL. (%)	SAP MATERIAL AND ORDERING NUMBER	UL CERTIFICATION
4.7	± 2	3984	± 0.5	NTCALUG02A472G	-
4.7	± 1	3984	± 0.5	NTCALUG02A472F	-
5	± 2	3984	± 0.5	NTCALUG02A502G	UL
10	± 2	3984	± 0.5	NTCALUG02A103G ⁽¹⁾	UL
10	± 1	3984	± 0.5	NTCALUG02A103F	UL
10	± 1	3435	± 1.0	NTCALUG02A103FL	-
100	± 3	4190	± 1.5	NTCALUG02A104H	-

Note

(1) Is also known under material number NTCALUGE4C90294/2381 645 90294



NTCALUG02A472G

NTC LUG02A 4.7K 2 % 3984 K 0.5 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	R_{T}/R_{25}	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	33.43	157 109	3.90	- 6.63	0.59	150 982	163 236
- 35	24.13	113 422	3.72	- 6.41	0.58	109 206	117 638
- 30	17.61	82 782	3.54	- 6.19	0.57	79 851	85714
- 25	12.99	61 053	3.37	- 5.99	0.56	58 994	63 112
- 20	9.68	45 478	3.21	- 5.79	0.55	44 017	46 938
- 15	7.276	34 199	3.06	- 5.61	0.54	33 154	35 244
- 10	5.522	25 953	2.91	- 5.43	0.54	25 198	26 707
- 5	4.227	19 866	2.76	- 5.26	0.53	19 317	20 415
0	3.262	15 333	2.62	- 5.10	0.51	14 931	15 736
5	2.538	11 929	2.49	- 4.94	0.50	11 632	12 226
10	1.990	9352	2.36	- 4.80	0.49	9131	9572
15	1.571	7384	2.24	- 4.65	0.48	7219	7549
20	1.249	5872	2.12	- 4.52	0.47	5747	5996
25	1.000	4700	2.00	- 4.39	0.46	4606	4794
30	0.8056	3786	2.11	- 4.26	0.50	3706	3866
35	0.6530	3069	2.22	- 4.14	0.54	3001	3137
40	0.5324	2502	2.33	- 4.03	0.58	2444	2560
45	0.4365	2052	2.43	- 3.92	0.62	2002	2102
50	0.3599	1691	2.53	- 3.81	0.66	1649	1734
55	0.2982	1402	2.62	- 3.71	0.71	1365	1438
60	0.2484	1167	2.72	- 3.61	0.75	1136	1199
65	0.2079	977.0	2.81	- 3.51	0.80	949.6	1004
70	0.1748	821.4	2.89	- 3.42	0.85	797.6	845.2
75	0.1476	693.7	2.98	- 3.34	0.89	673.0	714.3
80	0.1252	588.3	3.06	- 3.25	0.94	570.3	606.4
85	0.1066	501.1	3.14	- 3.17	0.99	485.3	516.8
90	0.09116	428.4	3.22	- 3.09	1.04	414.7	442.2
95	0.07825	367.8	3.30	- 3.02	1.09	355.6	379.9
100	0.06741	316.8	3.37	- 2.94	1.14	306.2	327.5
105	0.05828	273.9	3.44	- 2.87	1.20	264.5	283.4
110	0.05057	237.7	3.51	- 2.81	1.25	229.3	246.0
115	0.04402	206.9	3.58	- 2.74	1.31	199.5	214.3
120	0.03844	180.7	3.65	- 2.68	1.36	174.1	187.3
125	0.03367	158.3	3.71	- 2.62	1.42	152.4	164.1



NTCALUG02A472F

NTC LUG02A 4.7K 1 % 3984 K 0.5 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	R_T	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	33.43	157 109	2.88	- 6.63	0.43	152 582	161 636
- 35	24.13	113 422	2.70	- 6.41	0.42	110 359	116 484
- 30	17.61	82 782	2.53	- 6.19	0.41	80 691	84 874
- 25	12.99	61 053	2.36	- 5.99	0.39	59 612	62 494
- 20	9.68	45 478	2.20	- 5.79	0.38	44 477	46 478
- 15	7.276	34 199	2.05	- 5.61	0.36	33 500	34 899
- 10	5.522	25 953	1.90	- 5.43	0.35	25 460	26 445
- 5	4.227	19 866	1.75	- 5.26	0.33	19 517	20 215
0	3.262	15 333	1.62	- 5.10	0.32	15 085	15 581
5	2.538	11 929	1.49	- 4.94	0.30	11 752	12 106
10	1.990	9352	1.36	- 4.80	0.28	9225	9478
15	1.571	7384	1.23	- 4.65	0.27	7293	7475
20	1.249	5872	1.12	- 4.52	0.25	5806	5937
25	1.000	4700	1.00	- 4.39	0.23	4653	4747
30	0.8056	3786	1.11	- 4.26	0.26	3744	3828
35	0.6530	3069	1.22	- 4.14	0.29	3032	3106
40	0.5324	2502	1.32	- 4.03	0.33	2469	2535
45	0.4365	2052	1.42	- 3.92	0.36	2022	2081
50	0.3599	1691	1.52	- 3.81	0.40	1666	1717
55	0.2982	1402	1.62	- 3.71	0.44	1379	1424
60	0.2484	1167	1.71	- 3.61	0.47	1147	1187
65	0.2079	977.0	1.80	- 3.51	0.51	959.4	994.5
70	0.1748	821.4	1.88	- 3.42	0.55	805.9	836.9
75	0.1476	693.7	1.97	- 3.34	0.59	680.0	707.3
80	0.1252	588.3	2.05	- 3.25	0.63	576.3	600.4
85	0.1066	501.1	2.13	- 3.17	0.67	490.4	511.7
90	0.09116	428.4	2.21	- 3.09	0.71	419.0	437.9
95	0.07825	367.8	2.28	- 3.02	0.76	359.4	376.2
100	0.06741	316.8	2.36	- 2.94	0.80	309.4	324.3
105	0.05828	273.9	2.43	- 2.87	0.84	267.3	280.6
110	0.05057	237.7	2.50	- 2.81	0.89	231.7	243.6
115	0.04402	206.9	2.56	- 2.74	0.94	201.6	212.2
120	0.03844	180.7	2.63	- 2.68	0.98	175.9	185.4
125	0.03367	158.3	2.69	- 2.62	1.03	154.0	162.5



NTCALUG02A502G

NTC LUG02A 5K 2 % 3984 K 0.5 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	$R_{(T)}/R_{25}$	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	33.43	167 137	3.90	- 6.63	0.59	160 619	173 655
- 35	24.13	120 661	3.72	- 6.41	0.58	116 177	125 146
- 30	17.61	88 066	3.54	- 6.19	0.57	84 947	91 185
- 25	12.99	64 950	3.37	- 5.99	0.56	62 759	67 141
- 20	9.68	48 381	3.21	- 5.79	0.55	46 827	49 934
- 15	7.276	36 382	3.06	- 5.61	0.54	35 270	37 494
- 10	5.522	27 609	2.91	- 5.43	0.54	26 807	28 411
- 5	4.227	21 134	2.76	- 5.26	0.53	20 550	21 718
0	3.262	16 312	2.62	- 5.10	0.51	15 884	16 740
5	2.538	12 691	2.49	- 4.94	0.50	12 375	13 007
10	1.990	9948	2.36	- 4.80	0.49	9714	10 183
15	1.571	7856	2.24	- 4.65	0.48	7680	8031
20	1.249	6246	2.12	- 4.52	0.47	6114	6379
25	1.000	5000	2.00	- 4.39	0.46	4900	5100
30	0.8056	4028	2.11	- 4.26	0.50	3943	4113
35	0.6530	3265	2.22	- 4.14	0.54	3192	3337
40	0.5324	2662	2.33	- 4.03	0.58	2600	2724
45	0.4365	2183	2.43	- 3.92	0.62	2130	2236
50	0.3599	1799	2.53	- 3.81	0.66	1754	1845
55	0.2982	1491	2.62	- 3.71	0.71	1452	1530
60	0.2484	1242	2.72	- 3.61	0.75	1208	1276
65	0.2079	1039	2.81	- 3.51	0.80	1010	1068
70	0.1748	873.8	2.89	- 3.42	0.85	848.5	899.1
75	0.1476	738.0	2.98	- 3.34	0.89	716.0	759.9
80	0.1252	625.9	3.06	- 3.25	0.94	606.7	645.1
85	0.1066	533.1	3.14	- 3.17	0.99	516.3	549.8
90	0.09116	455.8	3.22	- 3.09	1.04	441.1	470.5
95	0.07825	391.2	3.30	- 3.02	1.09	378.3	404.1
100	0.06741	337.1	3.37	- 2.94	1.14	325.7	348.4
105	0.05828	291.4	3.44	- 2.87	1.20	281.4	301.5
110	0.05057	252.8	3.51	- 2.81	1.25	244.0	261.7
115	0.04402	220.1	3.58	- 2.74	1.31	212.2	228.0
120	0.03844	192.2	3.65	- 2.68	1.36	185.2	199.2
125	0.03367	168.4	3.71	- 2.62	1.42	162.1	174.6



NTCALUG02A103G

NTC LUG02A 10K 2 % 3984 K 0.5 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	$R_{(T)}/R_{25}$	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	33.43	334 274	3.90	- 6.63	0.59	321 238	347 311
- 35	24.13	241 323	3.72	- 6.41	0.58	232 353	250 293
- 30	17.61	176 133	3.54	- 6.19	0.57	169 895	182 370
- 25	12.99	129 900	3.37	- 5.99	0.56	125 518	134 282
- 20	9.68	96 761	3.21	- 5.79	0.55	93 654	99 869
- 15	7.276	72 765	3.06	- 5.61	0.54	70 541	74 988
- 10	5.522	55 218	2.91	- 5.43	0.54	53 613	56 823
- 5	4.227	42 268	2.76	- 5.26	0.53	41 100	43 435
0	3.262	32 624	2.62	- 5.10	0.51	31 768	33 480
5	2.538	25 381	2.49	- 4.94	0.50	24 749	26 013
10	1.990	19 897	2.36	- 4.80	0.49	19 427	20 367
15	1.571	15 711	2.24	- 4.65	0.48	15 360	16 063
20	1.249	12 493	2.12	- 4.52	0.47	12 228	12 757
25	1.000	10 000	2.00	- 4.39	0.46	9800	10 200
30	0.8056	8056	2.11	- 4.26	0.50	7886	8226
35	0.6530	6530	2.22	- 4.14	0.54	6385	6675
40	0.5324	5324	2.33	- 4.03	0.58	5200	5448
45	0.4365	4365	2.43	- 3.92	0.62	4259	4471
50	0.3599	3599	2.53	- 3.81	0.66	3508	3690
55	0.2982	2982	2.62	- 3.71	0.71	2904	3060
60	0.2484	2484	2.72	- 3.61	0.75	2416	2551
65	0.2079	2079	2.81	- 3.51	0.80	2020	2137
70	0.1748	1748	2.89	- 3.42	0.85	1697	1798
75	0.1476	1476	2.98	- 3.34	0.89	1432	1520
80	0.1252	1252	3.06	- 3.25	0.94	1213	1290
85	0.1066	1066	3.14	- 3.17	0.99	1033	1100
90	0.09116	911.6	3.22	- 3.09	1.04	882.2	940.9
95	0.07825	782.5	3.30	- 3.02	1.09	756.7	808.2
100	0.06741	674.1	3.37	- 2.94	1.14	651.4	696.8
105	0.05828	582.8	3.44	- 2.87	1.20	562.8	602.9
110	0.05057	505.7	3.51	- 2.81	1.25	487.9	523.4
115	0.04402	440.2	3.58	- 2.74	1.31	424.4	455.9
120	0.03844	384.4	3.65	- 2.68	1.36	370.4	398.4
125	0.03367	336.7	3.71	- 2.62	1.42	324.2	349.2



NTCALUG02A103F

NTC LUG02A 10K 1 % 3984 K 0.5 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	R_{T}/R_{25}	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	33.43	334 274	2.88	- 6.63	0.43	324 643	343 906
- 35	24.13	241 323	2.70	- 6.41	0.42	234 807	247 839
- 30	17.61	176 133	2.53	- 6.19	0.41	171 683	180 582
- 25	12.99	129 900	2.36	- 5.99	0.39	126 835	132 965
- 20	9.68	96 761	2.20	- 5.79	0.38	94 633	98 889
- 15	7.276	72 765	2.05	- 5.61	0.36	71 276	74 253
- 10	5.522	55 218	1.90	- 5.43	0.35	54 170	56 266
- 5	4.227	42 268	1.75	- 5.26	0.33	41 526	43 010
0	3.262	32 624	1.62	- 5.10	0.32	32 096	33 152
5	2.538	25 381	1.49	- 4.94	0.30	25 004	25 758
10	1.990	19 897	1.36	- 4.80	0.28	19 627	20 167
15	1.571	15 711	1.23	- 4.65	0.27	15 517	15 905
20	1.249	12 493	1.12	- 4.52	0.25	12 353	12 632
25	1.000	10 000	1.00	- 4.39	0.23	9900	10 100
30	0.8056	8056	1.11	- 4.26	0.26	7966	8145
35	0.6530	6530	1.22	- 4.14	0.29	6450	6609
40	0.5324	5324	1.32	- 4.03	0.33	5253	5394
45	0.4365	4365	1.42	- 3.92	0.36	4303	4427
50	0.3599	3599	1.52	- 3.81	0.40	3544	3653
55	0.2982	2982	1.62	- 3.71	0.44	2934	3030
60	0.2484	2484	1.71	- 3.61	0.47	2441	2526
65	0.2079	2079	1.80	- 3.51	0.51	2041	2116
70	0.1748	1748	1.88	- 3.42	0.55	1715	1781
75	0.1476	1476	1.97	- 3.34	0.59	1447	1505
80	0.1252	1252	2.05	- 3.25	0.63	1226	1277
85	0.1066	1066	2.13	- 3.17	0.67	1043	1089
90	0.09116	911.6	2.21	- 3.09	0.71	891.5	931.7
95	0.07825	782.5	2.28	- 3.02	0.76	764.6	800.3
100	0.06741	674.1	2.36	- 2.94	0.80	658.2	690.0
105	0.05828	582.8	2.43	- 2.87	0.84	568.7	597.0
110	0.05057	505.7	2.50	- 2.81	0.89	493.0	518.3
115	0.04402	440.2	2.56	- 2.74	0.94	428.9	451.5
120	0.03844	384.4	2.63	- 2.68	0.98	374.3	394.5
125	0.03367	336.7	2.69	- 2.62	1.03	327.7	345.8



NTCALUG02A103FL

NTC LUG02A 10K 1 % 3435 K 1 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	R_{T}/R_{25}	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	19.10	190 953	4.24	- 5.46	0.78	182 848	199 057
- 35	14.60	145 953	3.93	- 5.30	0.74	140 213	151 693
- 30	11.24	112 440	3.63	- 5.14	0.71	108 354	116 526
- 25	8.729	87 285	3.35	- 4.99	0.67	84 364	90 206
- 20	6.826	68 260	3.07	- 4.85	0.63	66 164	70 355
- 15	5.376	53 762	2.80	- 4.71	0.60	52 254	55 270
- 10	4.264	42 636	2.55	- 4.57	0.56	41 549	43 723
- 5	3.404	34 038	2.30	- 4.44	0.52	33 254	34 822
0	2.735	27 348	2.07	- 4.31	0.48	26 783	27 913
5	2.211	22 108	1.84	- 4.19	0.44	21 702	22 515
10	1.798	17 979	1.62	- 4.08	0.40	17 689	18 270
15	1.471	14 706	1.40	- 3.96	0.35	14 499	14 912
20	1.209	12 094	1.20	- 3.86	0.31	11 949	12 239
25	1.000	10 000	1.00	- 3.75	0.27	9900	10 100
30	0.8311	8311	1.19	- 3.65	0.33	8212	8410
35	0.6941	6941	1.38	- 3.55	0.39	6845	7037
40	0.5825	5825	1.56	- 3.46	0.45	5734	5916
45	0.4911	4911	1.73	- 3.37	0.51	4826	4996
50	0.4158	4158	1.90	- 3.28	0.58	4079	4237
55	0.3536	3536	2.06	- 3.20	0.65	3463	3609
60	0.3020	3020	2.22	- 3.12	0.71	2953	3087
65	0.2589	2589	2.38	- 3.04	0.78	2527	2650
70	0.2228	2228	2.53	- 2.96	0.85	2172	2284
75	0.1925	1925	2.67	- 2.89	0.92	1873	1976
80	0.1668	1668	2.81	- 2.82	1.00	1621	1715
85	0.1451	1451	2.95	- 2.75	1.07	1409	1494
90	0.1267	1267	3.08	- 2.69	1.15	1228	1306
95	0.1109	1109	3.21	- 2.62	1.22	1074	1145
100	0.09743	974.3	3.34	- 2.56	1.30	941.7	1007
105	0.08583	858.3	3.46	- 2.50	1.38	828.6	888.0
110	0.07584	758.4	3.58	- 2.45	1.46	731.2	785.6
115	0.06720	672.0	3.70	- 2.39	1.55	647.1	696.8
120	0.05971	597.1	3.81	- 2.34	1.63	574.3	619.8
125	0.05319	531.9	3.92	- 2.29	1.72	511.0	552.7



NTCALUG02A104H

NTC LUG02A 100K 3 % 4190 K 1.50 %

RESISTANCE TEMPERATURE CHARACTERISTICS

TEMP. (°C)	$R_{(T)}/R_{25}$	RESISTANCE (Ω)	$\Delta R/R$ (%)	α (%/K)	ΔT (K)	$R_{min.}$ (Ω)	$R_{max.}$ (Ω)
- 40	36.66	3 666 299	9.05	- 6.69	1.35	3 334 354	3 998 244
- 35	26.38	2 637 588	8.47	- 6.49	1.31	2 414 139	2 861 036
- 30	19.17	1 916 576	7.91	- 6.29	1.26	1 764 917	2 068 236
- 25	14.06	1 406 111	7.38	- 6.10	1.21	1 302 387	1 509 836
- 20	10.41	1 041 184	6.86	- 5.92	1.16	969 745	1 112 622
- 15	7.778	777 846	6.37	- 5.75	1.11	728 330	827 362
- 10	5.861	586 097	5.89	- 5.58	1.06	551 581	620 613
- 5	4.453	445 257	5.43	- 5.42	1.00	421 079	469 435
0	3.409	340 942	4.99	- 5.26	0.95	323 936	357 948
5	2.631	263 054	4.56	- 5.11	0.89	251 054	275 054
10	2.044	204 446	4.15	- 4.97	0.84	195 960	212 931
15	1.600	160 014	3.75	- 4.83	0.78	154 008	166 020
20	1.261	126 087	3.37	- 4.70	0.72	121 837	130 336
25	1.000	100 000	3.00	- 4.57	0.66	97 000	103 000
30	0.7981	79 808	3.36	- 4.45	0.75	77 128	82 488
35	0.6408	64 077	3.70	- 4.33	0.86	61 703	66 451
40	0.5175	51 745	4.04	- 4.22	0.96	49 655	53 836
45	0.4202	42 021	4.36	- 4.11	1.06	40 187	43 855
50	0.3431	34 308	4.68	- 4.00	1.17	32 702	35 913
55	0.2816	28 156	4.98	- 3.90	1.28	26 752	29 559
60	0.2322	23 222	5.28	- 3.80	1.39	21 996	24 449
65	0.1925	19 246	5.57	- 3.71	1.50	18 174	20 318
70	0.1602	16 025	5.85	- 3.62	1.62	15 088	16 961
75	0.1340	13 402	6.12	- 3.53	1.73	12 582	14 222
80	0.1126	11 258	6.38	- 3.45	1.85	10 539	11 976
85	0.09496	9496	6.64	- 3.36	1.97	8866	10 126
90	0.08042	8042	6.89	- 3.28	2.10	7488	8596
95	0.06837	6837	7.13	- 3.21	2.22	6350	7325
100	0.05835	5835	7.36	- 3.13	2.35	5405	6265
105	0.04998	4998	7.59	- 3.06	2.48	4618	5377
110	0.04296	4296	7.82	- 2.99	2.61	3960	4632
115	0.03705	3705	8.03	- 2.93	2.75	3407	4003
120	0.03206	3206	8.25	- 2.86	2.88	2942	3470
125	0.02783	2783	8.45	- 2.80	3.02	2548	3018



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.