

T H E R M O M E T R I C S
A C O M M I T M E N T T O E X C E L L E N C E

Type GC11 GC14, GC16 Thermometrics Glass Encapsulated NTC Chip Thermistor



Description

Small glass encapsulated chip thermistors on fine diameter platinum alloy lead wires.

Features

- Glass encapsulated bead thermistors.
- Suitable for temperature measurement, control or compensation applications.
- Fast thermal response times.
- Suitable for self-heated applications such as liquid level sensing or gas flow measurement.
- Operating temperatures range from -40°C to $+250^{\circ}\text{C}$.
- Unaffected by severe environmental exposures, including nuclear radiation.
- Intermittent operation up to 450°C is permissible; however, stability will be degraded.
- Improved beta tolerance with respect to glass encapsulated beads.
- RoHS compliant to 2002/95/CE.

Options

- Non-standard resistance tolerances and values
- Reference temperature(s) other than 25°C - specify.
- Custom packaging available.
- Welded or soldered extension leads - specify lead material, diameter, length and insulation, if any.
- Calibration - specify temperature(s).
- Interchangeable pairs or sets, curve matching — specify temperature ranges and tolerance(s).
- Special aging and conditioning for high reliability applications.

Amphenol
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Specifications

Thermal and Electrical Properties

Note: These thermal and electrical properties are for all small glass encapsulated thermistors. All definitions and test methods are per MIL-PRF-23648.

Thermistor Series		GC11	GC14	GC16
Body Dimensions	Maximum Diameter	0.012"	0.016"	0.017"
	Maximum Length	0.024"	0.032"	0.034"
Lead Wires	Nominal Diameter	0.0012"		
	Minimum Lead Length	0.156" for adjacent cut	0.312"	
	Lead Material	Platinum alloy		
	Available Cuts	"K" adjacent "P" opposite		

Material System				
Code Letter	R-vs-T Curve	25/125 Ratio	Nominal Resistance Range @ 25°C	
A	GC1	11.9	-	1000-2500 Ω
A	GC2	14.7	-	2500-7000 Ω
A	GC3	21.1	-	7500-30000 Ω
F	GC4	27.8	-	30-100 k Ω
B	GC9	30.9	-	100-200 k Ω
G	GC6	36.4	-	200-500 k Ω
D	GC10	41.1	-	500-1000 k Ω
D	GC11	46.1	-	1000-2000 k Ω

Thermal Time Constant			
	Still Air @ 25°C	0.65	1.2 seconds
	Plunge into Water	12 milliseconds	16 milliseconds

Dissipation Constant			
	Still Air @ 25°C	0.07 mW/°C	0.12 mW/°C
	Still Water @ 25°C	-	0.60 mW/°C

Power Rating (in air)			
	Maximum Power Rating	-	0.015 Watt
	100% Maximum Power to:	-	75 °C
	Derated to 0% at	-	250 °C

Resistance-Vs.-Temperature Characteristics

The nominal resistance range for the zero-power resistance at 25°C is shown for each available Material System. Each Material System is denoted by an ordering Code Letter, a referenced curve number and the nominal 25°C/125°C resistance ratio. The R-vs.-T curves are on the facing page.

Standard Tolerances

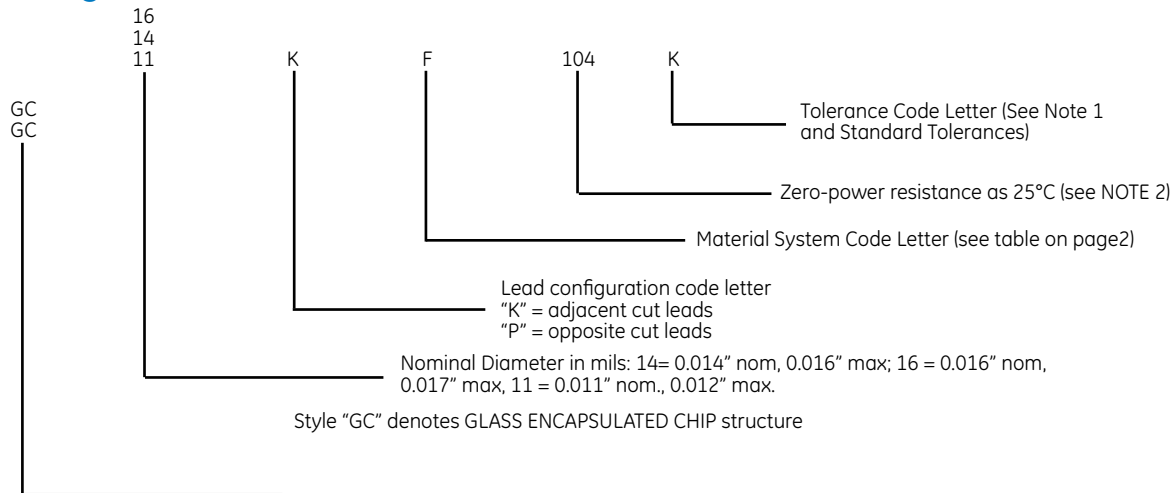
Tolerance Code Letter	G	J	K	L	M	N	S
±% Tolerance at 25 °C	2	5	10	15	20	25	Non-standard — consult factory

Resistance vs. Temperature Curves for GC14/16/11 Devices

BETA 0/50	2859	3103	3494	3844	3953	4111	4193	4316
RATIO 0/50	5.05	5.80	7.24	8.83	9.38	10.27	10.76	11.53
BETA 25/85	2916	3174	3588	3918	4036	4220	4344	4478
RATIO 25/85	5.15	5.95	7.51	9.04	9.66	10.71	11.49	12.38
BETA 0/70	2876	3124	3522	3866	3977	4143	4236	4364
RATIO 0/70	8.56	10.31	13.87	17.95	19.50	22.07	23.69	26.03
BETA 25/100	2924	3182	3601	3930	4050	4239	4371	4506
RATIO 25/100	7.18	8.54	11.33	14.15	15.34	17.42	19.04	20.86
BETA 25/125	2935	3192	3620	3948	4072	4268	4410	4548
RATIO 25/125	11.85	14.71	21.10	27.82	30.88	36.43	41.05	46.11
BETA 37.8/104.4	2938	3197	3624	3949	4074	4269	4413	4551
RATIO 37.8/104.4	5.30	6.14	7.83	9.42	10.11	11.29	12.25	13.25
R-vs-T Curve Material System: Temperature °C	GC1 A	GC2 A	GC3 A	GC4 F	GC9 B	GC6 G	GC10 D	GC11 D
0	2.38510	2.56365	2.88332	3.22243	3.32800	3.48195	3.55040	3.68144
5	1.98328	2.10061	2.30467	2.51276	2.57760	2.67266	2.71710	2.79650
10	1.65828	1.73088	1.85378	1.97488	2.01213	2.06756	2.09459	2.14001
15	1.39393	1.43403	1.50024	1.56297	1.58255	1.61148	1.62611	1.64935
20	1.17774	1.19442	1.22134	1.24597	1.25367	1.26507	1.27101	1.28000
25	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
30	0.85313	0.84143	0.82333	0.80780	0.80294	0.79573	0.79177	0.78631
35	0.73117	0.71145	0.68151	0.65660	0.64879	0.63723	0.63075	0.62214
40	0.62941	0.60439	0.56706	0.53689	0.52743	0.51343	0.50545	0.49523
45	0.54411	0.51579	0.47419	0.44153	0.43127	0.41612	0.40736	0.39650
50	0.47230	0.44211	0.39846	0.36510	0.35462	0.33917	0.33011	0.31925
55	0.41159	0.38059	0.33639	0.30349	0.29316	0.27795	0.26894	0.25845
60	0.36004	0.32897	0.28528	0.25356	0.24360	0.22898	0.22023	0.21033
65	0.31609	0.28549	0.24299	0.21288	0.20343	0.18959	0.18124	0.17204
70	0.27849	0.24872	0.20784	0.17957	0.17069	0.15774	0.14987	0.14142
75	0.24620	0.21749	0.17850	0.15215	0.14387	0.13186	0.12450	0.11679
80	0.21836	0.19086	0.15391	0.12948	0.12181	0.11072	0.10389	0.09690
85	0.19428	0.16808	0.13320	0.11064	0.10356	0.09337	0.08707	0.08076
90	0.17338	0.14852	0.11571	0.09493	0.08841	0.07907	0.07328	0.06759
95	0.15518	0.13165	0.10087	0.08175	0.07578	0.06723	0.06192	0.05681
100	0.13928	0.11707	0.08824	0.07069	0.06519	0.05739	0.05252	0.04793
105	0.12536	0.10442	0.07744	0.06133	0.05630	0.04918	0.04472	0.04061
110	0.11312	0.09341	0.06818	0.05340	0.04878	0.04229	0.03822	0.03453
115	0.10234	0.08380	0.06022	0.04665	0.04242	0.03649	0.03278	0.02947
120	0.09281	0.07538	0.05334	0.04088	0.03700	0.03160	0.02821	0.02523
125	0.08437	0.06798	0.04739	0.03594	0.03238	0.02745	0.02436	0.02169
130	0.07687	0.06147	0.04222	0.03169	0.02843	0.02393	0.02110	0.01870
135	0.07019	0.05572	0.03771	0.02803	0.02503	0.02092	0.01834	0.01617
140	0.06423	0.05063	0.03377	0.02486	0.02210	0.01834	0.01598	0.01403
145	0.05890	0.04611	0.03033	0.02210	0.01957	0.01612	0.01397	0.01221
150	0.05412	0.04209	0.02730	0.01971	0.01737	0.01422	0.01225	0.01066
155		0.03850	0.02463	0.01762	0.01546	0.01257	0.01076	0.00933
160		0.03529	0.02227	0.01579	0.01380	0.01114	0.00949	0.00819
165	Please	0.03241	0.02018	0.01418	0.01234	0.00990	0.00838	0.00721
170	inquire	0.02983	0.01833	0.01277	0.01107	0.00882	0.00743	0.00636
175	for	0.02750	0.01669	0.01152	0.00994	0.00788	0.00659	0.00563
180	details	0.02541	0.01522	0.01042	0.00896	0.00705	0.00587	0.00499

R-vs-T Curve Material System: Temperature °C	GC1 A	GC2 A	GC3 A	GC4 F	GC9 B	GC6 G	GC10 D	GC11 D
185		0.02351	0.01391	0.00944	0.00808	0.00633	0.00524	0.00443
190		0.02180	0.01273	0.00857	0.00731	0.00569	0.00468	0.00395
195		0.02024	0.01168	0.00780	0.00663	0.00512	0.00420	0.00353
200		0.01882	0.01073	0.00711	0.00602	0.00463	0.00377	0.00316
205	Please enquire for details.		0.00988	0.00649	0.00548	0.00418	0.00339	0.00283
210			0.00911	0.00594	0.00499	0.00379	0.00306	0.00254
215			0.00841	0.00544	0.00456	0.00344	0.00276	0.00229
220			0.00778	0.00500	0.00417	0.00313	0.00250	0.00207
225			0.00721	0.00460	0.00382	0.00285	0.00227	0.00187
230			0.00669	0.00423	0.00351	0.00261	0.00206	0.00169
235			0.00622	0.00390	0.00322	0.00238	0.00187	0.00153
240			0.00579	0.00361	0.00297	0.00218	0.00171	0.00139
245			0.00539	0.00334	0.00274	0.00200	0.00156	0.00127
250			0.00503	0.00309	0.00253	0.00184	0.00143	0.00116

Coding



NOTE 1: Special tolerances are available on request. Consult factory for special resistance tolerances, non-standard resistances and/or non-standard temperatures.

NOTE 2: The zero-power resistance at 25°C, expressed in ohms, is identified by a three-digit code number. The first two digits represent significant figures, and the last digit specifies the number of zeros to follow. Example: 51 kOhms = "513". The standard resistance values are from the 24-value series decade as specified in Military Standard MS90178.

1.0 / 1.1 / 1.2 / 1.3 / 1.5 / 1.6 / 1.8 / 2.0 / 2.2 / 2.4 / 2.7 / 3.0
3.3 / 3.6 / 3.9 / 4.3 / 4.7 / 5.1 / 5.6 / 6.2 / 6.8 / 7.5 / 8.2 / 9.1