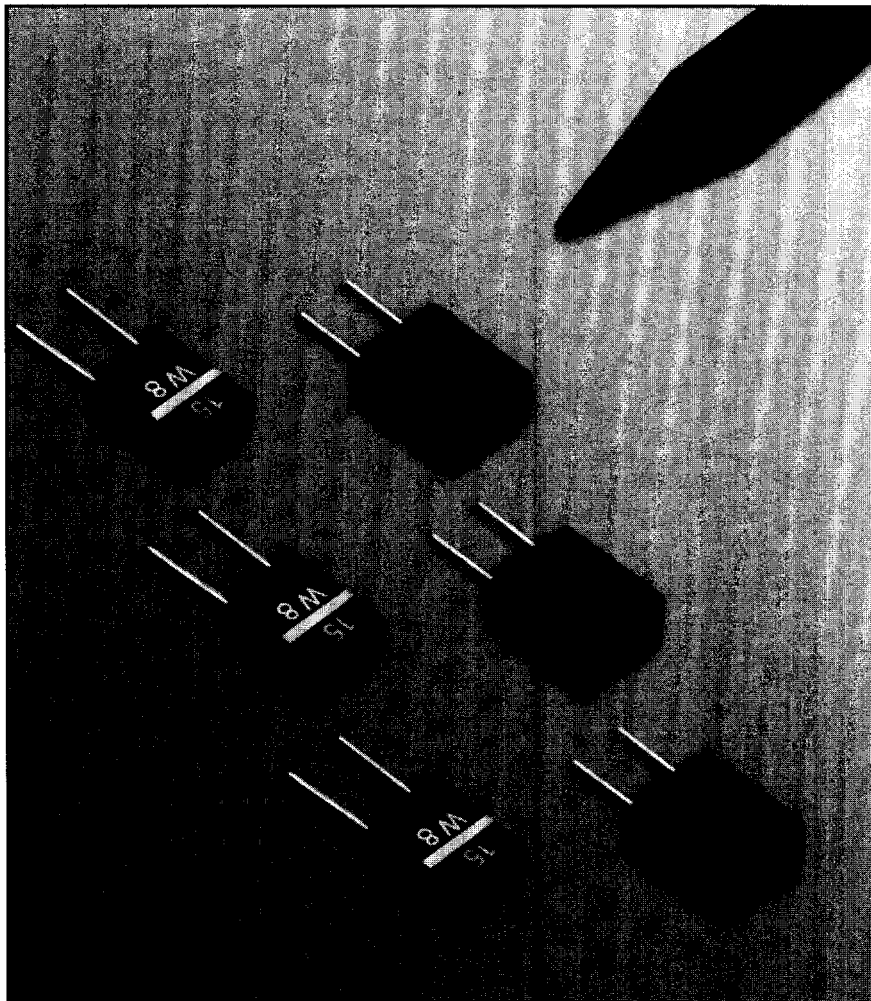


Sprague-Goodman

ENGINEERING BULLETIN
SG-990

LEADED INDUCTORS



Sprague-Goodman Electronics, Inc.

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SPGOS00034

GLHA & GLHB SERIES - 7.5 x 10.5 x 4.6 mm

APPLICATIONS

- RFI suppression
- Filters
- Decoupling

SPECIFICATIONS

Operating Temperature Range:
-40°C to +125°C

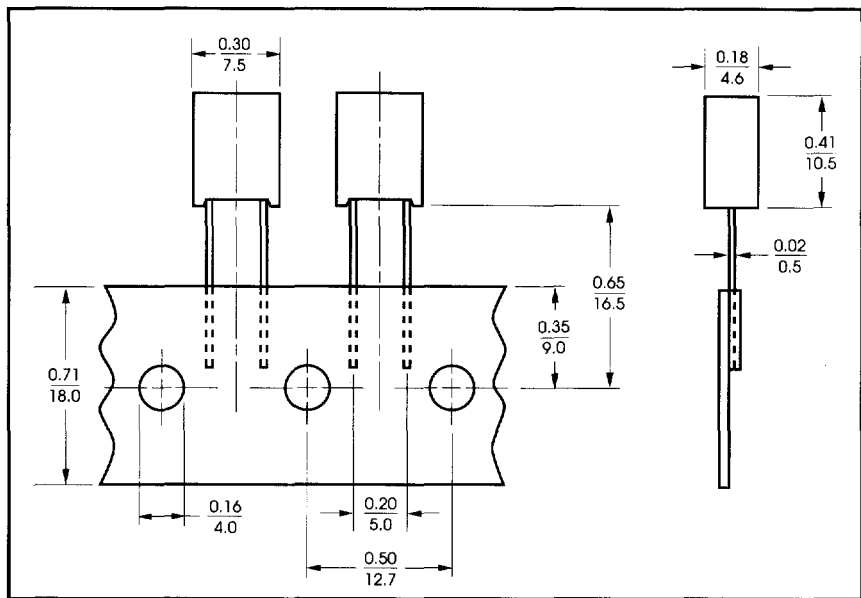
Max Soldering Temperature:
235°C, 5 s

Nominal Temperature Coefficient:
200 ppm/°C

Power Dissipation at 40°C: 270 mW

FEATURES

- Suitable for automatic insertion
- High Quality
- For reflow and vapor phase soldering
- Ammo pack (1000 pcs)



All dimensions are in /mm.

Inductance (μH)	Standard Inductance Tolerance	Inductance Test Freq. (kHz)	Q min	Q Test Freq. (MHz)	SRF (MHz) min	DCR (Ω) max	Rated Current* (mA) max	Model Number
0.10	±10%	1000	70	50	600	0.15	868	GLHAR10010
0.12	±10%	1000	80	50	560	0.15	868	GLHAR12010
0.15	±10%	1000	80	50	470	0.20	868	GLHAR15010
0.18	±10%	1000	80	50	420	0.20	868	GLHAR18010
0.22	±10%	1000	80	50	380	0.20	868	GLHAR22010
0.27	±10%	1000	80	50	320	0.25	868	GLHAR27010
0.33	±10%	1000	80	50	290	0.25	868	GLHAR33010
0.39	±10%	1000	75	50	260	0.25	868	GLHAR39010
0.47	±10%	1000	75	50	230	0.30	868	GLHAR47010
0.56	±10%	300	45	20	210	0.35	868	GLHAR56010
0.68	±10%	300	45	20	185	0.35	868	GLHAR68010
0.82	±10%	300	45	20	165	0.40	868	GLHAR82010
1.0	±10%	300	55	5	155	0.25	868	GLHA1R010
1.2	±10%	300	60	5	135	0.30	868	GLHA1R210
1.5	±10%	300	65	5	115	0.30	868	GLHA1R510
1.8	±10%	300	65	5	100	0.30	868	GLHA1R810
2.2	±10%	300	65	5	85	0.33	868	GLHA2R210
2.7	±10%	300	70	5	75	0.33	868	GLHA2R710
3.3	±10%	100	55	2	72	0.35	868	GLHA3R310
3.9	±10%	100	60	2	64	0.40	868	GLHA3R910
4.7	±10%	100	60	2	58	0.44	813	GLHA4R710
5.6	±10%	100	65	2	51	0.46	813	GLHA5R610
6.8	±10%	100	65	2	47	0.50	813	GLHA6R810
8.2	±10%	100	70	2	41	0.55	813	GLHA8R210
10.0	±5%	100	55	1	38	0.55	759	GLHA10005
12.0	±5%	100	55	1	32	0.60	737	GLHA12005
15.0	±5%	100	60	1	27	0.70	672	GLHA15005
18.0	±5%	100	60	1	23	0.75	629	GLHA18005
22.0	±5%	100	60	1	20	0.85	607	GLHA22005
27.0	±5%	30	60	1	18	0.90	586	GLHA27005
33.0	±5%	30	60	1	16	0.95	564	GLHA33005
39.0	±5%	30	60	1	14	1.10	542	GLHA39005
47.0	±5%	30	60	1	12	1.20	521	GLHA47005
56.0	±5%	30	60	1	9	1.30	499	GLHA56005
68.0	±5%	30	60	0.5	8	1.40	477	GLHA68005

*See note on page 3.

Inductance (μH)	Standard Inductance Tolerance	Inductance Test Freq. (kHz)	Q min	Q Test Freq. (MHz)	SRF (MHz) min	DCR (Ω) max	Rated Current* (mA) max	Model Number
82	±5%	30	60	0.5	7.0	1.60	434	GLHA82005
100	±5%	30	60	0.5	6.5	1.80	412	GLHA10105
120	±5%	30	60	0.5	5.5	2.00	390	GLHA12105
150	±5%	30	60	0.5	4.5	2.20	369	GLHA15105
180	±5%	30	60	0.5	2.8	2.50	347	GLHA18105
220	±5%	30	60	0.5	2.5	2.80	325	GLHA22105
270	±5%	10	60	0.5	2.2	3.10	304	GLHA27105
330	±5%	10	60	0.5	2.0	3.40	293	GLHA33105
390	±5%	10	65	0.5	3.5	8.00	195	GLHA39105
470	±5%	10	70	0.5	3.0	9.00	195	GLHA47105
560	±5%	10	70	0.5	2.5	10	184	GLHA56105
680	±5%	10	70	0.5	1.5	11	163	GLHA68105
820	±5%	10	70	0.5	1.5	12	152	GLHA82105
1000	±5%	10	65	0.5	1.3	14	152	GLHA10205
1200	±5%	10	60	0.5	1.2	16	141	GLHA12205
1500	±5%	10	55	0.2	1.1	17	130	GLHA15205
1800	±5%	10	55	0.2	0.75	19	130	GLHA18205
2200	±5%	10	55	0.2	0.70	21	119	GLHA22205
2700	±5%	3	55	0.2	0.65	23	119	GLHA27205
3300	±5%	3	45	0.2	0.85	42	98	GLHA33205
3900	±5%	3	50	0.2	0.75	48	87	GLHA39205
4700	±5%	3	55	0.2	0.70	53	81	GLHA47205
5600	±5%	3	55	0.2	0.40	55	76	GLHA56205
6800	±5%	3	50	0.2	0.35	60	71	GLHA68205
8200	±5%	3	40	0.1	0.33	100	60	GLHA82205
10000	±5%	3	40	0.1	0.32	105	54	GLHA10305
12000	±5%	3	40	0.1	0.31	120	52	GLHA12305
15000	±5%	3	35	0.1	0.30	135	49	GLHA15305
18000	±5%	3	30	0.05	0.24	145	46	GLHA18305
22000	±5%	3	24	0.05	0.20	240	38	GLHA22305
27000	±5%	1	26	0.05	0.19	270	36	GLHA27305
33000	±5%	1	28	0.05	0.18	315	33	GLHA33305
39000	±5%	1	30	0.05	0.17	350	30	GLHA39305
47000	±5%	1	12	0.02	0.15	470	27	GLHA47305
56000	±5%	1	12	0.02	0.14	530	24	GLHA56305
68000	±5%	1	10	0.02	0.11	780	20	GLHA68305

*Note:

The listed nominal values of maximum rated current are for the maximum working temperature of 125°C, or for the highest magnetic (current) loading causing the inductance value to start to drop.

Rating current in this manner is very conservative compared to methods which are based on a temperature rise above an ambient of 25°C, or inductance drops of 10%. To determine the permissible current at ambient temperatures other than 25°C, the following relationship applies:

$$I_p = \frac{I_r \times (T_w - T_a)^{1/2}}{(T_w - 25^\circ\text{C})^{1/2}}$$

Where:

- I_p = Permissible current
- I_r = Rated current
- T_w = Maximum permissible working temperature (125°C)
- T_a = Ambient temperature (°C)



GLHB SERIES

Inductance (μH)	Standard Inductance Tolerance	Inductance Test Freq. (kHz)	Q min	Q Test Freq. (MHz)	SRF (MHz) min	DCR (Ω) max	Rated Current* (mA) max	Model Number
4.0	± 5%	100	80	5.0	80.0	0.40	868	GLHB4R005
4.7	± 3%	100	80	5.0	70.0	0.45	813	GLHB4R703
5.6	± 5%	100	80	5.0	51.0	0.46	813	GLHB5R605
6.8	± 5%	100	80	5.0	47.0	0.50	813	GLHB6R805
10.0	±10%	100	75	5.0	48.0	1.10	542	GLHB10010
10.0	± 4%	100	75	5.0	48.0	1.10	542	GLHB10004
10.0	± 2%	100	75	5.0	46.0	0.60	738	GLHB10002
12.5	± 4%	100	75	5.0	40.0	0.65	705	GLHB12004
27.0	± 3%	100	65	1.0	23.0	0.90	586	GLHB27003
27.0	± 5%	100	60	1.0	21.0	0.90	586	GLHB27005
32	± 5%	100	55	1.0	20.0	0.95	564	GLHB32005
32	±10%	100	60	1.0	19.0	1.00	542	GLHB10010
39	± 3%	100	50	1.0	18.0	1.20	521	GLHB39003
47	± 5%	100	60	1.0	18.0	2.60	336	GLHB47005
75	± 5%	100	50	1.0	11.0	1.50	456	GLHB75005
130	± 5%	100	50	0.5	3.0	1.35	488	GLHB13105
390	± 5%	10	45	0.5	1.8	3.80	282	GLHB39105
750	± 5%	10	70	0.5	1.7	11.00	163	GLHB75105
850	± 2.5%	10	60	0.5	2.0	12.60	152	GLHB85103
1000	±10%	10	65	0.5	1.3	14	152	GLHB10210
1200	± 2.5%	10	60	0.5	1.2	16	141	GLHB12203
1500	± 2%	10	60	0.2	1.1	17	130	GLHB15202
1500	± 3%	10	60	0.2	1.1	17	130	GLHB15203
3300	± 3%	3	55	0.2	0.85	42	98	GLHB33203
5100	± 5%	3	65	0.3	0.45	48	81	GLHB51205
15000	± 2.5%	3	35	0.1	0.3	135	48	GLHB15303
36000	± 5%	3	25	0.05	0.17	330	30	GLHB36305
44000	± 5%	3	25	0.05	0.16	370	28	GLHB44305

*Note:

The listed nominal values of maximum rated current are for the maximum working temperature of 125°C, or for the highest magnetic (current) loading causing the inductance value to start to drop.

Rating current in this manner is very conservative compared to methods which are based on a temperature rise above an ambient of 25°C, or inductance drops of 10%. To determine the permissible current at ambient temperatures other than 25°C, the following relationship applies:

$$I_p = \frac{I_r \times (T_w - T_a)^{1/2}}{(T_w - 25^\circ\text{C})^{1/2}}$$

Where:

- I_p = Permissible current
- I_r = Rated current
- T_w = Maximum permissible working temperature (125°C)
- T_a = Ambient temperature (°C)

GLHC SERIES Shielded - 8.5 x 11.4 x 6 mm

APPLICATIONS

- Decoupling
- Filters

SPECIFICATIONS

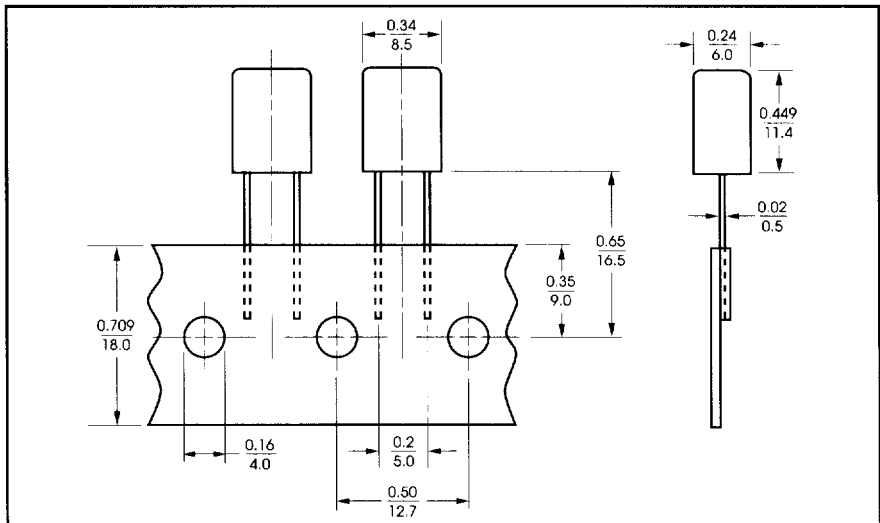
Operating Temperature Range:
-40°C to +125°C

Max Soldering Temperature:
235°C, 5 s

Coupling Factor per MIL-C-15305:
Nominal 6.0 x 10⁻³

FEATURES

- Compact design
- Suitable for automatic insertion
- For wave soldering
- Ammo pack (500 pcs)



All dimensions are in / mm.

Inductance ±10% (mH)	Inductance Test Freq. (kHz)	Q min	Q Test Freq. (kHz)	SRF (MHz) min	DCR (Ω) max	Rated Current* (mA) max	Model Number
0.1	30	75	500	5.0	1.2	163	GLHC10110
0.12	30	70	500	7.0	1.3	152	GLHC12110
0.15	30	70	500	6.0	1.4	141	GLHC15110
0.18	30	70	500	5.5	1.6	125	GLHC18110
0.22	30	70	500	4.5	1.8	108	GLHC22110
0.27	10	70	500	4.0	2.1	98	GLHC27110
0.33	10	70	500	3.5	2.3	87	GLHC33110
0.39	10	60	500	3.2	2.6	81	GLHC39110
0.47	10	55	500	2.8	2.9	76	GLHC47110
0.56	10	60	500	2.5	3.2	71	GLHC56110
0.68	10	65	200	2.2	3.5	65	GLHC68110
0.82	10	65	200	2.0	7.8	60	GLHC82110
1.0	10	65	200	2.0	8.6	54	GLHC10210
1.2	10	65	200	1.8	9.6	49	GLHC12210
1.5	10	65	200	1.4	11	46	GLHC15210
1.8	10	65	200	1.2	12	42	GLHC18210
2.2	10	65	200	1.0	14	38	GLHC22210
2.7	3	65	200	0.9	15	34	GLHC27210
3.3	3	65	200	0.7	17	29	GLHC33210
3.9	3	65	200	0.6	18	20	GLHC39210
4.7	3	65	200	0.5	20	24	GLHC47210
5.6	3	65	200	0.4	24	22	GLHC56210
6.8	3	60	100	0.3	43	20	GLHC68210
8.2	3	60	100	0.3	45	17	GLHC82210
10	3	65	100	0.26	50	16	GLHC10310
12	3	65	100	0.25	58	15	GLHC12310
15	3	60	100	0.25	68	14	GLHC15310
18	3	45	50	0.25	105	13	GLHC18310
22	3	50	50	0.24	110	11	GLHC22310
27	1	50	50	0.22	132	10	GLHC27310
33	1	50	50	0.20	140	9	GLHC33310
39	1	55	50	0.18	160	8	GLHC39310
47	1	40	50	0.15	250	8	GLHC47310
56	1	22	20	0.12	290	7	GLHC56310
68	1	24	20	0.12	340	7	GLHC68310
82	1	26	20	0.12	360	5	GLHC82310
110	1	24	20	0.12	480	5	GLHC10410
120	1	12	10	0.11	540	4	GLHC12410
150	1	10	10	0.08	790	4	GLHC15410

*See note on page 3.

GLHD SERIES - 8 x 9.6 x 8 mm

APPLICATIONS

- RFI suppression
- Energy storage choke for switching mode power supplies
- Decoupling

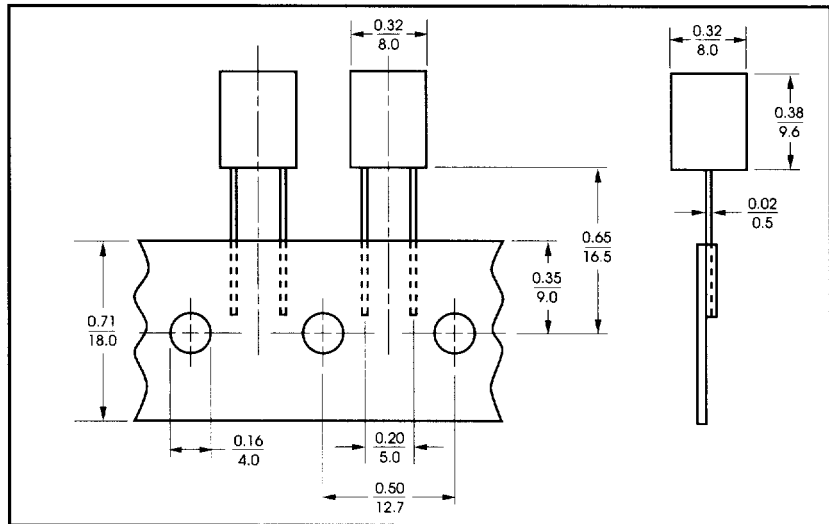
SPECIFICATIONS

Operating Temperature Range:
-40°C to +125°C

Max Soldering Temperature:
235°C, 5 s

FEATURES

- Compact design
- Suitable for automatic insertion
- For wave soldering
- Ammo pack (500 pcs)



All dimensions are in /mm.

Inductance ±10% (mH)	Inductance Test Freq. (kHz)	Q min	Q Test Freq. (MHz)	SRF (MHz) min	DCR (Ω) max	Rated Current* (mA) max	Model Number
0.10	10	40	0.5	4.4	0.41	824	GLHD10110
0.12	10	40	0.5	4.0	0.44	759	GLHD12110
0.15	10	40	0.5	3.8	0.49	672	GLHD15110
0.18	10	40	0.5	3.0	0.82	607	GLHD18110
0.22	10	40	0.5	2.7	0.92	553	GLHD22110
0.27	10	40	0.5	2.5	1.0	499	GLHD27110
0.33	10	50	0.5	2.4	1.1	445	GLHD33110
0.39	10	60	0.5	2.0	1.9	423	GLHD39110
0.47	10	80	0.5	1.8	2.2	380	GLHD47110
0.56	10	80	0.5	1.7	2.3	347	GLHD56110
0.68	10	80	0.5	1.5	2.5	315	GLHD68110
0.82	10	80	0.5	1.3	2.8	293	GLHD82110
1.0	10	100	0.5	1.2	4.5	260	GLHD10210
1.2	10	100	0.5	1.1	4.8	239	GLHD12210
1.5	10	100	0.2	0.9	5.4	217	GLHD15210
1.8	10	100	0.2	0.8	6.0	195	GLHD18210
2.2	10	120	0.2	0.75	10.5	174	GLHD22210
2.7	10	120	0.2	0.7	12	163	GLHD27210
3.3	10	120	0.2	0.65	13	141	GLHD33210
3.9	10	120	0.2	0.6	14	130	GLHD39210
4.7	1	120	0.2	0.5	24	119	GLHD47210
5.6	1	120	0.2	0.48	27	108	GLHD56210
6.8	1	120	0.2	0.43	30	98	GLHD68210
8.2	1	100	0.1	0.39	33	87	GLHD82210
10	1	100	0.1	0.35	36	81	GLHD10310
12	1	80	0.1	0.32	64	76	GLHD12310
15	1	80	0.1	0.28	70	65	GLHD15310
18	1	50	0.05	0.25	77	60	GLHD18310
22	1	50	0.05	0.23	86	54	GLHD22310
27	1	40	0.05	0.2	150	49	GLHD27310
33	1	40	0.05	0.18	165	43	GLHD33310
39	1	45	0.05	0.16	180	41	GLHD39310
47	1	20	0.02	0.15	212	38	GLHD47310
56	1	22	0.02	0.14	231	35	GLHD56310
68	1	16	0.02	0.12	370	30	GLHD68310
82	1	16	0.02	0.11	410	27	GLHD82310
100	1	18	0.02	0.10	450	24	GLHD10410
120	1	10	0.01	0.09	500	22	GLHD12410
150	1	12	0.01	0.08	550	20	GLHD15410

*See note on page 3.

GLHE and GLHF SERIES

APPLICATIONS

- RFI suppression
- Automotive electronics
- Decoupling in low frequency circuits
- Energy storage choke for switching mode power supplies

FEATURES

- For wave soldering
- GLHE series models up to 82 μH have pins formed from the ends of the coil winding
- Available with or without housing

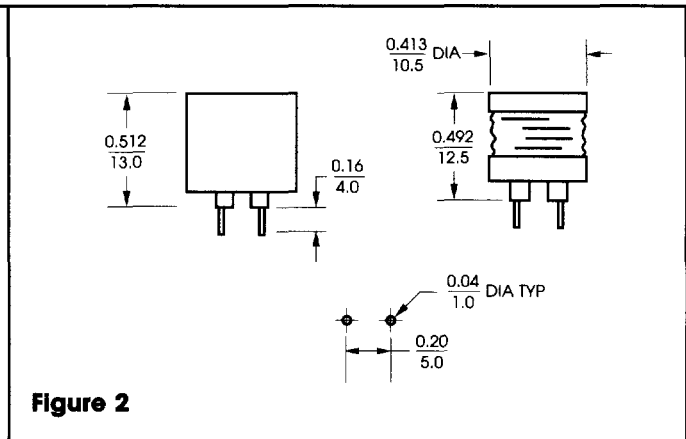
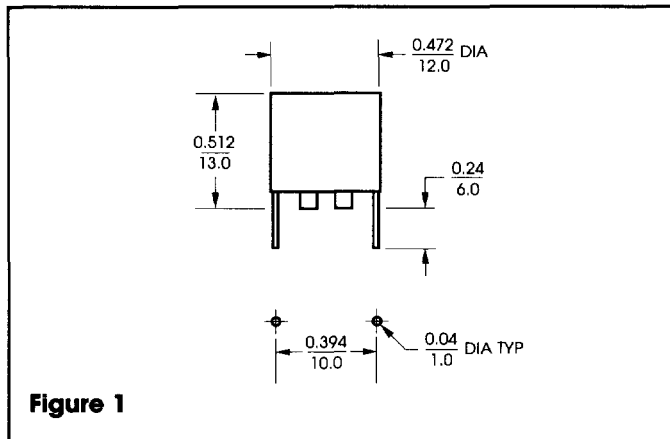
SPECIFICATIONS

Operating Temperature Range: -25°C to $+125^{\circ}\text{C}$

Max Soldering Temperature: 235°C , 5 s

Allowable Power Loss at 40°C : 1 W (approx)

Inductance $\pm 10\%$ (μH)	Inductance Test Freq. (kHz)	SRF min (MHz)	DC Resistance max (Ω)	Rated Current* (A) max	Figure	Model Number (With Housing)	Model Number (Without Housing)
10	100	13.0	0.025	6.0	1	GLHE10010	----
12	100	12.0	0.030	5.6	1	GLHE12010	----
15	100	11.0	0.035	5.4	1	GLHE15000	----
18	100	9.0	0.045	4.9	1	GLHE18010	----
22	100	8.0	0.050	4.6	1	GLHE22010	----
27	30	7.0	0.055	4.3	1	GLHE27010	----
33	30	6.5	0.075	3.5	1	GLHE33010	----
39	30	5.0	0.10	3.0	1	GLHE39010	----
47	30	4.3	0.11	2.9	1	GLHE47010	----
56	30	4.0	0.12	2.8	1	GLHE56010	----
68	30	3.8	0.13	2.7	1	GLHE68010	----
82	30	3.6	0.14	2.6	1	GLHE82010	----
100	30	3.7	0.25	1.8	2	GLHE10110	GLHF10110
120	30	3.4	0.28	1.7	2	GLHE12110	GLHF12110
150	30	3.0	0.32	1.6	2	GLHE15110	GLHF15110
180	30	2.7	0.36	1.5	2	GLHE18110	GLHF18110
220	30	2.4	0.40	1.4	2	GLHE22110	GLHF22110
270	10	2.2	0.60	1.2	2	GLHE27110	GLHF27110
330	10	2.0	0.70	1.1	2	GLHE33110	GLHF33110
390	10	1.8	0.75	1.0	2	GLHE39110	GLHF39110
470	10	1.6	0.85	0.98	2	GLHE47110	GLHF47110
560	10	1.4	1.35	0.81	2	GLHE56110	GLHF56110
680	10	1.3	1.5	0.76	2	GLHE68110	GLHF68110
820	10	1.2	1.7	0.71	2	GLHE82110	GLHF82110
1000	10	1.1	2.0	0.65	2	GLHE10210	GLHF10210
1200	10	1.0	3.5	0.49	2	GLHE12210	GLHF12210
1500	10	0.9	4.2	0.43	2	GLHE15210	GLHF15210
1800	10	0.8	4.5	0.41	2	GLHE18210	GLHF18210
2200	10	0.7	5.0	0.38	2	GLHE22210	GLHF22210
2700	3	0.6	5.6	0.36	2	GLHE27210	GLHF27210



*See note on page 3.

All dimensions are in /mm.

GLHG, GLHJ and GLHK SERIES

APPLICATIONS

- RFI suppression
- Decoupling

SPECIFICATIONS

Operating Temperature Range: -25°C to +125°C

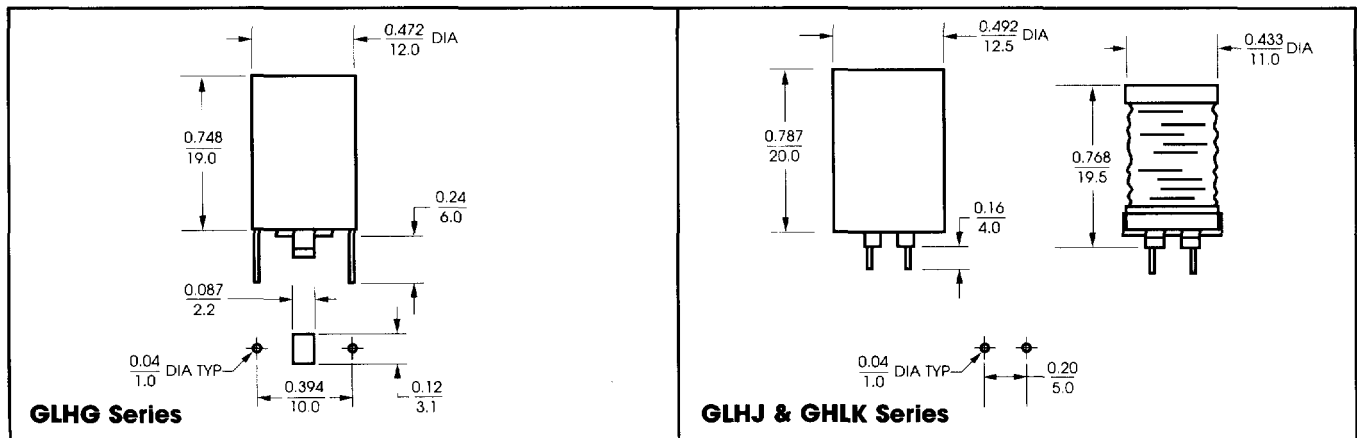
Max Soldering Temperature: 235°C, 5 s

FEATURES

- For wave soldering
- GLHG series pins are formed from the ends of the coil winding
- Available with or without housing

Inductance ±10% (μH)	Inductance Test Freq. (kHz)	SRF (MHz)	DCR max (mΩ)	Rated Current* (A) max	Model Number
10	100	20.0	25	6.5	GLHG10010
15	100	14.0	30	4.9	GLHG15010
22	100	8.0	35	4.2	GLHG22010
33	30	5.0	45	3.3	GLHG33010
47	30	4.0	55	2.8	GLHG47010
68	30	3.5	65	2.4	GLHG68010
100	30	3.0	75	2.0	GLHG10110
150	30	2.5	110	1.6	GLHG15110
220	30	2.0	175	1.3	GLHG22110
270	10	1.7	200	1.2	GLHG27110
330	10	1.5	220	1.1	GLHG33110
400	10	1.2	280	1.0	GLHG40110
470	10	1.0	300	0.9	GLHG47110
560	10	0.9	410	0.9	GLHG56110
680	10	0.8	450	0.8	GLHG68110

Inductance ±10% (mH)	Inductance Test Freq. (kHz)	SRF (MHz)	DCR (Ω)	Rated Current* (A) max	Model Number (With Housing)	Model Number (Without Housing)
1.0	3	0.85	1.4	0.70	GLHJ10210	GLHK10210
1.5	3	0.75	1.7	0.54	GLHJ15210	GLHK15210
2.2	3	0.60	2.1	0.46	GLHJ22210	GLHK22210
3.3	1	0.45	3.8	0.38	GLHJ33210	GLHK33210
4.7	1	0.30	5.0	0.33	GLHJ47210	GLHK47210
6.8	1	0.20	6.0	0.26	GLHJ68210	GLHK68210
10.0	1	0.18	10.0	0.22	GLHJ10310	GLHK10310
15.0	1	0.15	12.0	0.17	GLHJ15310	GLHK15310



*See note on page 3.

All dimensions are in / mm.

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