Data Sheet

Customer:	
Product:	**Automotive Grade Multilayer Chip Inductor – CL-GA Series**
Sizes.:	**0402/0603**
Issued Date:	**14-Apr-25**
Edition:	**REV.A2**

RoHS Compliant

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14-Apr-25	14-Apr-25	14-Apr-25	14-Apr-25	
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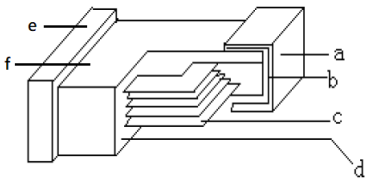
Automotive Grade Multilayer Chip Inductor

■Scope

－This specification involved in the product is recommended for automotive multimedia, wireless connection system and body comfort system. It can be used for automobile power system and safety management system without special clarifications. Please contact with our company for further confirmation before the products to be used for the Automotive area.

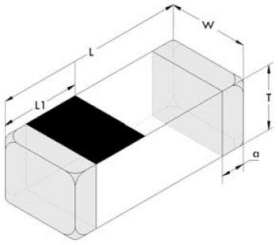
－AEC-Q200 Compliance

■Construction

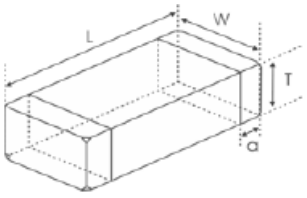


a	Ni/Sn Plating	d	Body
b	Ag Layer	e	Terminal Electrode
c	Inner Electrode	F	Ceramic

■Dimensions



CL02-GA



CL03-GA

Unit: mm

Type	Size (Inch)	L	W	T	a	L1
CL02-GA	0402	1.00±0.15	0.50±0.15	0.50±0.15	0.25±0.10	0.50±0.15
CL03-GA	0603	1.60±0.20	0.80±0.20	0.80±0.20	0.30±0.20	-

■Part Numbering

CL	02	J	T	HQ	R10	-G	A
Product Type	Dimensions	Inductance Tolerance	Packaging Code	Material Code	Inductance	Special	Function Code
	02: 0402 03: 0603	B: ±0.1nH C: ±0.2nH S: ±0.3nH G: ±2% H: ±3% J: ±5%	T: Taping Reel	H:H Material HQ:HQ Material	1N0: 1.0nH 10N: 10nH R10: 100nH		A: Automotive Grade

■Electrical Specifications

CL02-GA / HQ Material

Inductance (nH)	Tolerance	Q min	Test Frequency (MHz)	Test Voltage (mV)	SRF min. (MHz)	RDC (Ω) max.	IDC (mA) max.
1.0	±0.1nH,±0.2nH,±0.3nH	8	100	50	10000	0.06	1000
1.1	±0.1nH,±0.2nH,±0.3nH	8	100	50	10000	0.07	1000
1.2	±0.1nH,±0.2nH,±0.3nH	8	100	50	10000	0.07	1000
1.3	±0.1nH,±0.2nH,±0.3nH	8	100	50	10000	0.07	1000
1.5	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.08	1000
1.6	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.08	1000
1.8	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.08	900
2.0	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.09	900
2.2	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.09	900
2.4	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.10	800
2.7	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.12	800
3.0	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.12	800
3.3	±0.1nH,±0.2nH,±0.3nH	8	100	50	6000	0.13	800
3.6	±0.1nH,±0.2nH,±0.3nH	8	100	50	4000	0.15	700
3.9	±0.1nH,±0.2nH,±0.3nH	8	100	50	4000	0.16	700
4.3	±0.1nH,±0.2nH,±0.3nH	8	100	50	4000	0.16	700
4.7	±0.1nH,±0.2nH,±0.3nH	8	100	50	4000	0.16	700
5.1	±0.1nH,±0.2nH,±0.3nH	8	100	50	4000	0.16	600
5.6	±0.1nH,±0.2nH,±0.3nH	8	100	50	4000	0.20	600
6.2	±0.1nH,±0.2nH,±0.3nH	8	100	50	3900	0.20	600
6.8	±3%,±5%	8	100	50	3900	0.20	600
7.5	±3%,±5%	8	100	50	3700	0.24	500
8.2	±3%,±5%	8	100	50	3600	0.24	500
9.1	±3%,±5%	8	100	50	3400	0.26	500
10	±3%,±5%	8	100	50	3200	0.26	500
12	±3%,±5%	8	100	50	2700	0.50	400
15	±3%,±5%	8	100	50	2300	0.50	400
18	±3%,±5%	8	100	50	2100	0.60	350
20	±3%,±5%	8	100	50	2000	0.60	350
22	±3%,±5%	8	100	50	1900	0.60	350
27	±3%,±5%	8	100	50	1600	0.70	300
33	±3%,±5%	8	100	50	1300	0.80	300
39	±3%,±5%	8	100	50	1200	1.00	250
43	±3%,±5%	8	100	50	1100	1.10	250
47	±3%,±5%	8	100	50	1000	1.10	250
56	±3%,±5%	8	100	50	750	1.20	200
68	±3%,±5%	8	100	50	750	1.40	200
82	±3%,±5%	8	100	50	750	1.60	200
100	±3%,±5%	8	100	50	700	2.00	200
120	±3%,±5%	8	100	50	600	2.50	150
150	±3%,±5%	8	100	50	550	3.00	150
180	±3%,±5%	8	100	50	500	3.50	150
220	±3%,±5%	8	100	50	450	3.70	100
270	±3%,±5%	8	100	50	400	4.50	100
330	±3%,±5%	6	50	50	350	5.00	80
360	±3%,±5%	6	50	50	300	6.00	80

■**Operating temperature range: -55~+125℃ (including self-heating temperature)**

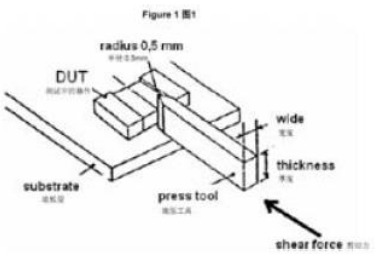
■Electrical Specifications

CL03-GA / H Material

Inductance (nH)	Tolerance	Q min	Test Frequency (MHz)	Test Voltage (mV)	SRF min. (MHz)	RDC (Ω) max.	IDC (mA) max.
1.0	±0.3nH,±0.5nH	8	100	50	10000	0.05	500
1.2	±0.3nH,±0.5nH	8	100	50	10000	0.05	500
1.5	±0.3nH,±0.5nH	8	100	50	6000	0.10	500
1.8	±0.3nH,±0.5nH	8	100	50	6000	0.10	500
2.0	±0.3nH,±0.5nH	8	100	50	6000	0.10	500
2.2	±0.3nH,±0.5nH	8	100	50	6000	0.10	500
2.4	±0.3nH,±0.5nH	8	100	50	6000	0.12	500
2.7	±0.3nH,±0.5nH	10	100	50	6000	0.12	500
3.3	±0.3nH,±0.5nH	10	100	50	6000	0.15	500
3.6	±0.3nH,±0.5nH	10	100	50	6000	0.16	500
3.9	±0.3nH,±0.5nH	10	100	50	6000	0.16	500
4.3	±0.3nH,±0.5nH	10	100	50	6000	0.18	500
4.7	±0.3nH,±0.5nH	10	100	50	6000	0.20	500
5.1	±0.3nH,±0.5nH	10	100	50	5500	0.25	500
5.6	±0.3nH,±0.5nH	10	100	50	5000	0.25	500
6.8	±5%,±10%	10	100	50	5000	0.30	500
7.5	±5%,±10%	10	100	50	4500	0.35	500
8.2	±5%,±10%	10	100	50	4500	0.35	500
9.1	±5%,±10%	10	100	50	3500	0.40	300
10	±5%,±10%	12	100	50	3500	0.40	300
12	±5%,±10%	12	100	50	3000	0.45	300
15	±5%,±10%	12	100	50	2300	0.50	300
18	±5%,±10%	12	100	50	2200	0.55	300
22	±5%,±10%	12	100	50	2000	0.60	300
27	±5%,±10%	12	100	50	1700	0.65	300
33	±5%,±10%	12	100	50	1500	0.70	300
39	±5%,±10%	12	100	50	1400	0.70	300
47	±5%,±10%	12	100	50	1200	0.70	300
56	±5%,±10%	12	100	50	1100	0.75	300
68	±5%,±10%	12	100	50	900	0.85	300
82	±5%,±10%	8	100	50	800	1.00	300
100	±5%,±10%	8	100	50	700	1.20	300
120	±5%,±10%	8	50	50	600	1.40	200
150	±5%,±10%	8	50	50	500	1.60	200
180	±5%,±10%	8	50	50	400	1.90	200
220	±5%,±10%	8	50	50	350	2.40	200
270	±5%,±10%	8	50	50	350	2.60	150
330	±5%,±10%	8	50	50	350	2.80	150
390	±5%,±10%	8	50	50	300	3.20	150
430	±5%,±10%	8	50	50	280	3.40	150
470	±5%,±10%	8	50	50	250	3.60	150

■**Operating temperature range: -55~+125℃ (including self-heating temperature)**

■Environmental Characteristics

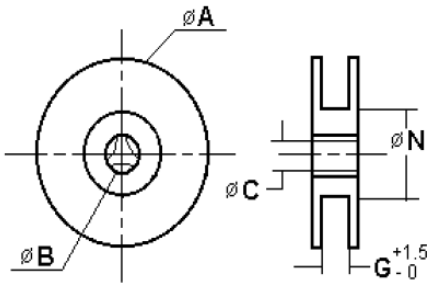
Item	Requirement	Test Condition
High Temperature Exposure (Storage)	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	Temperature: 125℃ Unpowered Duration 1000h Examination at 250h, 500h and 1000h Measurement at 24±4 hours after test conclusion.
Temperature Cycle	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	High Temperature: 125℃ Low Temperature: -55℃ Duration at each temperature 30 min Transition time ≦ 1 min Severity 1000 cycles Measurement at 24±4 hours after test conclusion.
Biased Humidity	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	Temperature: 85℃ Relative humidity: 85% Duration 1000h ; Unpowered. Examination at 250h, 500h and 1000h Measurement at 24±4 hours after test conclusion.
Operational Life	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	Temperature: 125℃ Testing current: Rated current at normal temperature. Duration 1000h ; Measurement at 24±4 hours after test conclusion.
Mechanical Shock	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	Half sine wave. Peak value 100g. Normal duration 6 ms Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks)
Vibration	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	The entire frequency range of 10~2000 Hz and return to 10Hz shall be traversed in 20 minutes. This cycle shall be preformed 12 time in each of three mutually perpendicular directions (total of 36 times), so that the motion shall be applied for a total period of approximately 12 hours. Peak value 5g.
Resistance to Soldering Heat	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	Solder bath Temperature: 260±5℃ Immersion timer: 10±1 seconds
Solderability	95% or more of electrode area shall be coated by new solder.	Solder bath: Lead-free solder Temperature: 245±5℃ Immersion timer: 3±0.3 seconds.
Board Flex	No visible damage. Inductance: ΔL/L within ≦±10% Q: ΔQ/Q within ≦±20%	The testing samples shall be mounted on a 100m x 40mm FR4 PCB board, which is 1.6mm ± 0.2mm thick. Bending shall be applied to the 2.0mm with 1.0mm/sec. Duration: 60±5s.
Terminal Strength (SMD)	No visible electrode damage or electrode detachment.	The testing samples shall be mounted on the testing epoxy boards,exerting force on side of the samples, Size 0603:2N；Size1005:5N；≧Size 1608:17.7N, Duration 60s±1s. 

■Storage Temperature: -10~40°C; Humidity: 30~70%RH

■Shelf life: 1 years Max

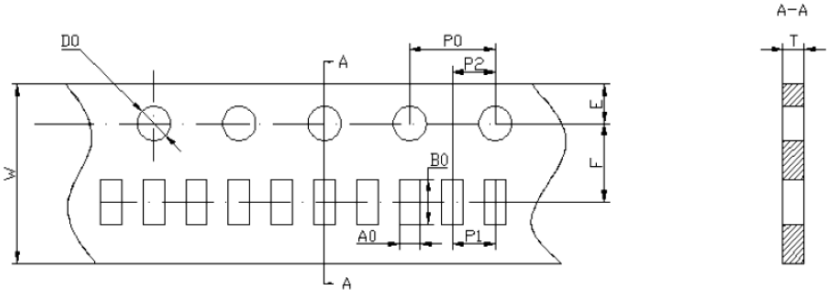
■Packaging Specifications

Reel Dimension



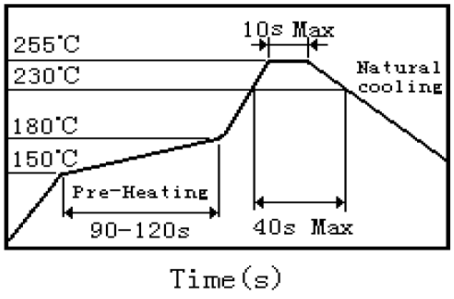
Type	A (mm)	B (mm)	C (mm)	N (mm)	G (mm)	Quantity (EA)
CL02-GA	178±2	22±2	12.5±1.5	57±2	8	10,000
CL03-GA	178±2	22±2	13.0±1.0	60±2	9.5±2	4,000

Tape Specifications



Type	A0 (mm)	B0 (mm)	W (mm)	F (mm)	E (mm)	P1 (mm)	P2 (mm)	P0 (mm)	D0 (mm)	T (mm)
CL02-GA	0.59±0.1	1.12±0.1	8.0±0.2	3.5±0.1	1.75±0.2	2.0±0.1	2.0±0.1	4.0±0.2	1.55±0.1	0.60±0.1
CL03-GA	1.05±0.2	1.85±0.2	8.0±0.2	3.5±0.1	1.75±0.2	2.0±0.2	2.0±0.1	4.0±0.2	1.55±0.1	0.95±0.1

■Reflow Soldering Profile



REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A2	Apr 14,2025		-Add Shelf life.