

# MULTILAYER CHIP INDUCTORS FOR HIGH FREQUENCY

## - GHF SERIES -

### FEATURES

- Multilayer inductor made of advanced ceramics with low-resistivity silver used as internal conductors provides excellent Q and SRF characteristics. NON MAGNETIC
- Designed to address surface mount inductor needs for applications above 100MHz
- Multilayer block structure ensures outstanding reliability, high productivity and product quality.



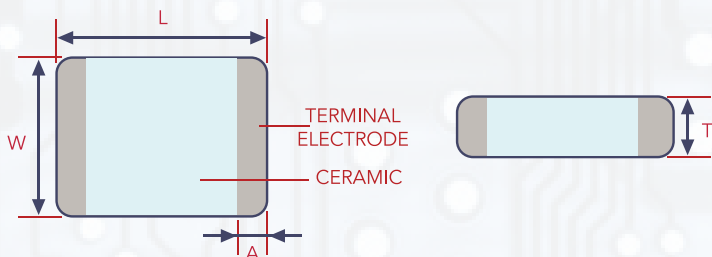
### APPLICATIONS

- Laptop / Desktop / Notebook Computers
- Terminals / Portable Servers / Workstation
- DC/DC Converter in Distributed Power Systems or VRM Applications
- Thin Type On-board Power Supply Module for Exchanger

### OPERATING TEMPERATURE

- 0603: -40~+125°C
- 1005: -40~+125°C
- 1608: -40~+125°C
- 2125: -40~+125°C

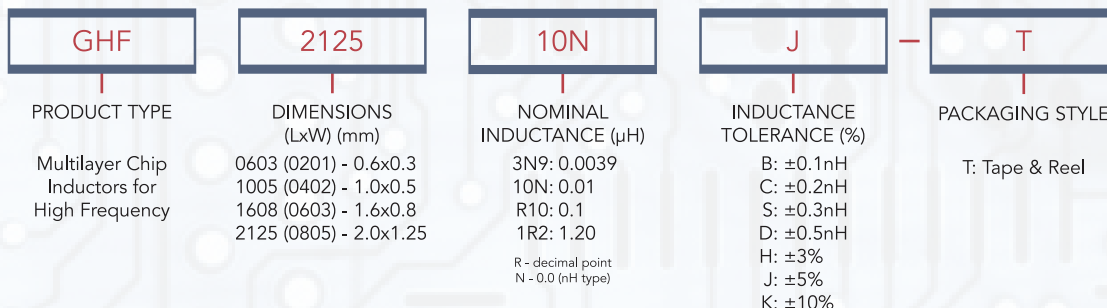
### CONSTRUCTION & DIMENSIONS



TYPE	L (MM)	W (MM)	T (MM)	A (MM)
0603 (0201)	0.6±0.03	0.3±0.03	0.33 Max	0.1~0.2
1005 (0402)	1.0±0.15	0.5±0.15	0.5±0.15	0.25±0.10
1608 (0603)	1.6±0.2	0.8±0.2	0.8±0.2	0.3±0.2
2125 (0805)	2.0±0.2	1.25±0.2	*	0.5±0.3

\*GHF2125 - Thickness 0.85±0.2 up to 120nH  
 \*GHF2125 - Thickness 1.25±0.2 150nH to 680nH

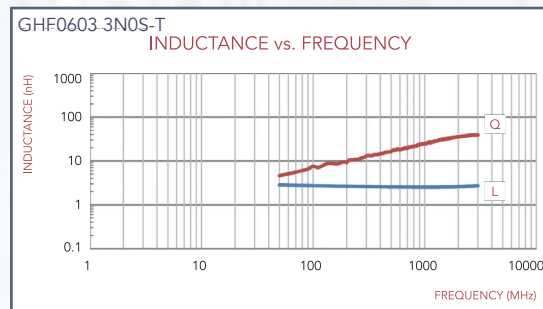
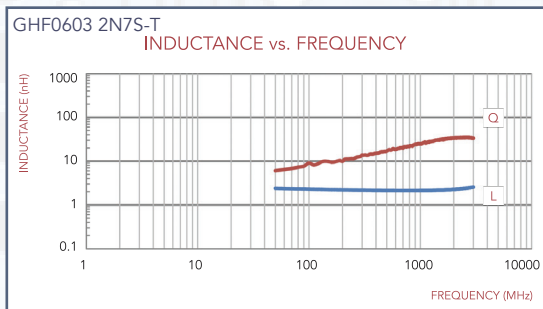
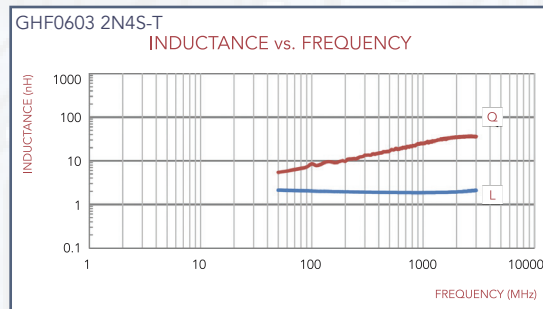
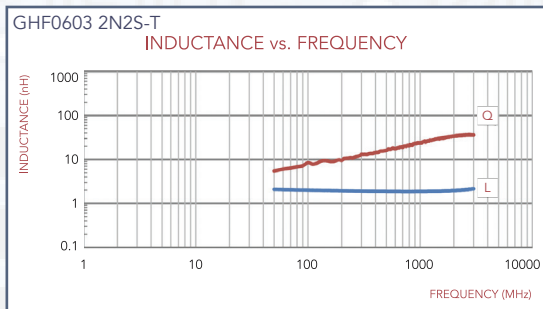
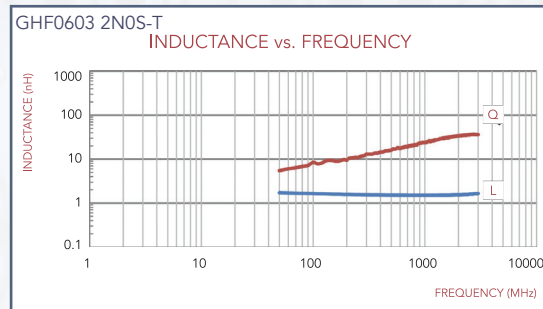
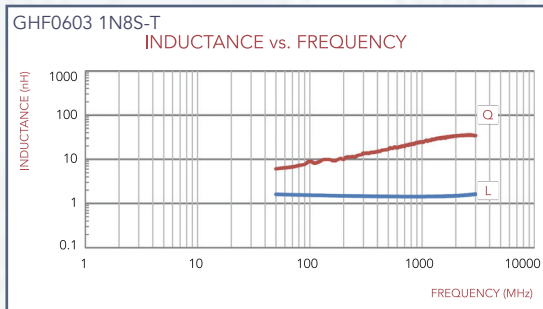
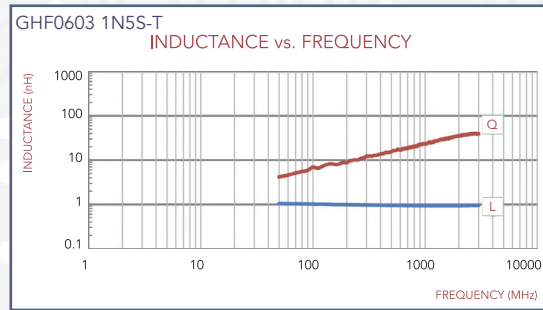
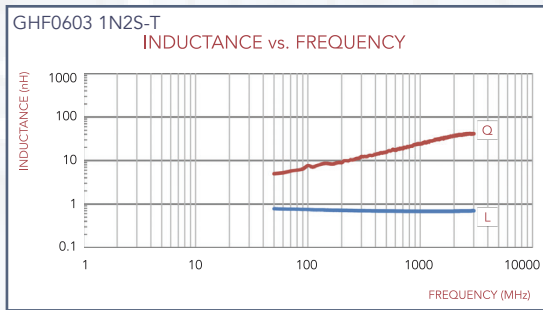
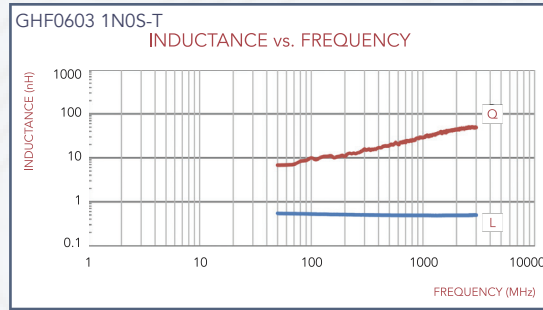
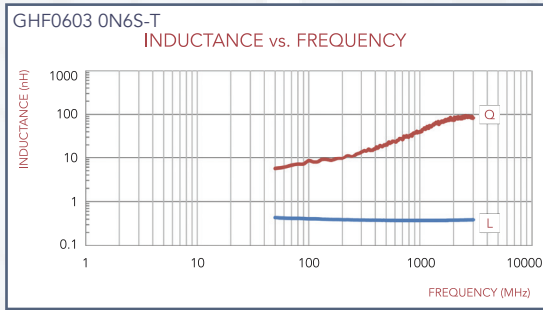
### PART NUMBERING



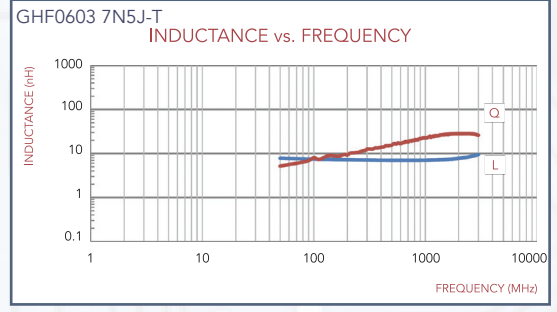
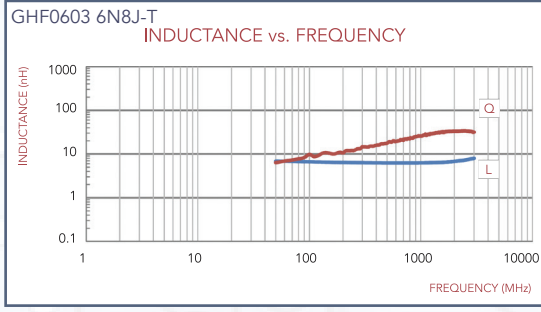
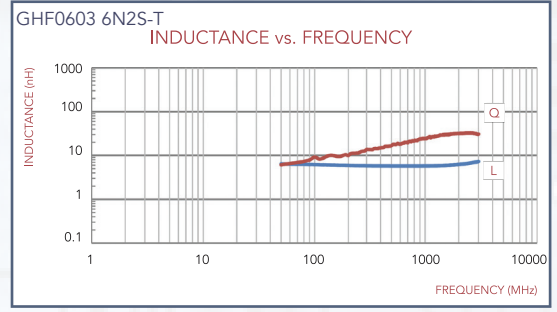
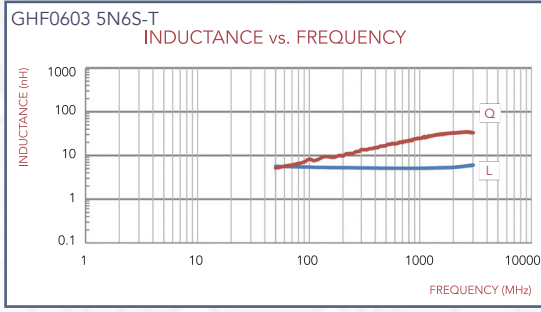
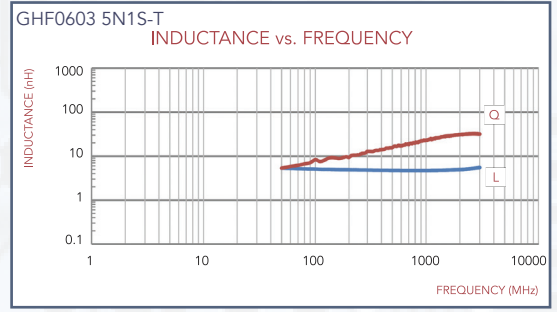
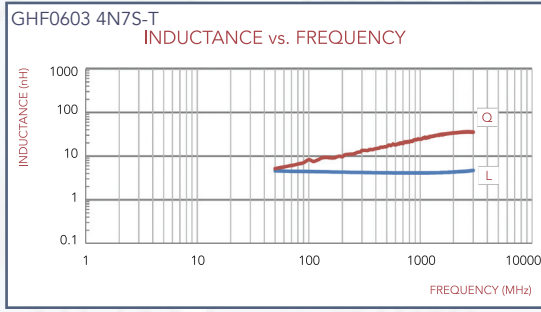
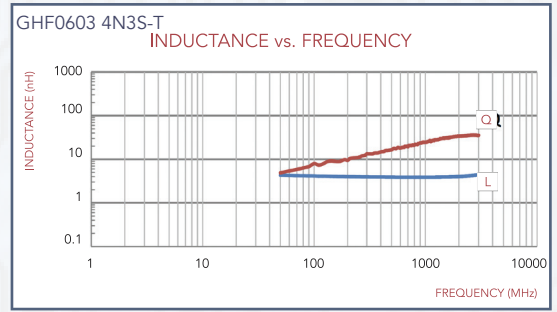
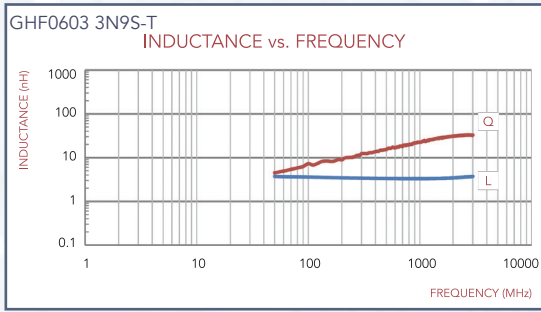
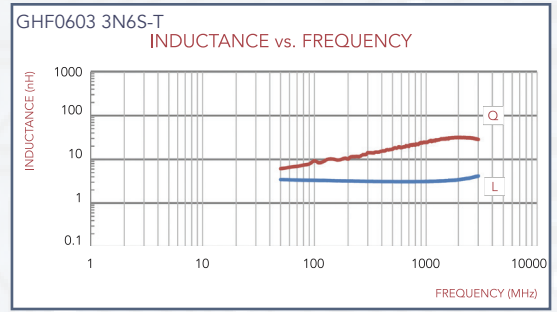
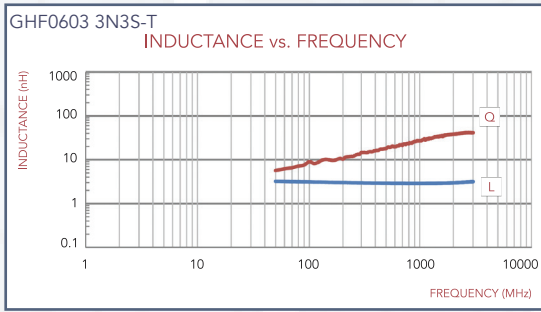
**ELECTRICAL CHARACTERISTICS - 0603 (0201)**

PART NUMBER	INDUCTANCE	TOLERANCE	Q MIN	TEST FREQUENCY (MHz)	SELF-RESONANT FREQUENCY (GHz) MIN.	DC RESISTANCE (Ω) MAX.	RATED CURRENT (mA) MAX.
GHF0603 0N6 -T	0.6	B/C/S	14	500	10	0.05	1000
GHF0603 0N7 -T	0.7	B/C/S	14	500	10	0.05	1000
GHF0603 0N8 -T	0.8	B/C/S	14	500	10	0.06	1000
GHF0603 0N9 -T	0.9	B/C/S	14	500	10	0.06	800
GHF0603 1N0 -T	1.0	B/C/S	14	500	10	0.07	800
GHF0603 1N1 -T	1.1	B/C/S	14	500	10	0.07	800
GHF0603 1N2 -T	1.2	B/C/S	14	500	10	0.10	800
GHF0603 1N3 -T	1.3	B/C/S	14	500	10	0.10	700
GHF0603 1N4 -T	1.4	B/C/S	14	500	10	0.10	700
GHF0603 1N5 -T	1.5	B/C/S	14	500	10	0.10	650
GHF0603 1N6 -T	1.6	B/C/S	14	500	10	0.10	650
GHF0603 1N7 -T	1.7	B/C/S	14	500	10	0.10	650
GHF0603 1N8 -T	1.8	B/C/S	14	500	9	0.15	650
GHF0603 2N0 -T	2.0	B/C/S	14	500	8.5	0.15	650
GHF0603 2N2 -T	2.2	B/C/S	14	500	7.5	0.15	650
GHF0603 2N4 -T	2.4	B/C/S	14	500	7.5	0.15	550
GHF0603 2N6 -T	2.6	B/C/S	14	500	7.5	0.20	550
GHF0603 2N7 -T	2.7	B/C/S	14	500	7.5	0.20	550
GHF0603 2N8 -T	2.8	B/C/S	14	500	7.5	0.20	500
GHF0603 3N0 -T	3.0	B/C/S	14	500	7.5	0.20	450
GHF0603 3N3 -T	3.3	B/C/S	14	500	7.5	0.25	450
GHF0603 3N6 -T	3.6	B/C/S	14	500	6.5	0.25	400
GHF0603 3N9 -T	3.9	B/C/S	14	500	6.5	0.25	400
GHF0603 4N3 -T	4.3	H/J/S	14	500	6.0	0.35	350
GHF0603 4N7 -T	4.7	H/J/S	14	500	6.0	0.40	350
GHF0603 5N1 -T	5.1	H/J/S	14	500	5.5	0.40	350
GHF0603 5N6 -T	5.6	H/J	14	500	5.0	0.40	350
GHF0603 6N2 -T	6.2	H/J	14	500	5.0	0.40	300
GHF0603 6N8 -T	6.8	H/J	14	500	4.5	0.50	300
GHF0603 7N5 -T	7.5	H/J	14	500	4.0	0.50	300
GHF0603 8N2 -T	8.2	H/J	14	500	4.0	0.50	250
GHF0603 9N1 -T	9.1	H/J	14	500	4.0	0.70	250
GHF0603 10N -T	10	H/J	14	500	4.0	0.70	250
GHF0603 12N -T	12	H/J	13	500	3.5	0.70	250
GHF0603 15N -T	15	H/J	13	500	3.2	0.85	250
GHF0603 18N -T	18	H/J	13	500	3.0	1.00	200
GHF0603 20N -T	20	H/J	13	500	2.2	1.10	150
GHF0603 22N -T	22	H/J	13	500	2.2	1.20	150
GHF0603 27N -T	27	H/J	13	500	2.2	1.50	140
GHF0603 33N -T	33	H/J	12	300	1.8	1.80	120
GHF0603 36N -T	36	H/J	12	300	1.7	2.00	120
GHF0603 39N -T	39	H/J	12	300	1.6	2.00	120
GHF0603 43N -T	43	H/J	12	300	1.6	2.20	100
GHF0603 47N -T	47	H/J	12	300	1.5	2.20	100
GHF0603 56N -T	56	H/J	12	300	1.2	2.50	100
GHF0603 68N -T	68	H/J	12	300	1.0	3.20	100
GHF0603 75N -T	75	H/J	11	300	1.0	3.60	100
GHF0603 82N -T	82	H/J	11	300	1.0	3.80	100
GHF0603 91N -T	91	H/J	11	300	0.9	3.80	80
GHF0603 R10 -T	100	H/J	11	300	0.8	4.00	80
GHF0603 R12 -T	120	H/J	10	300	0.8	5.00	80



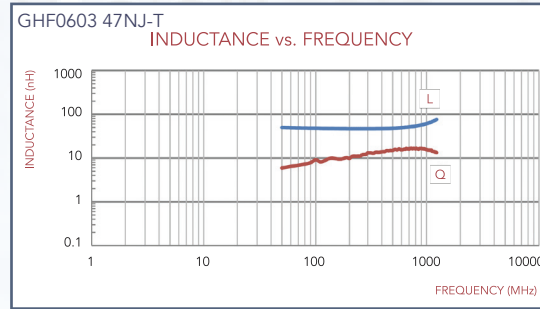
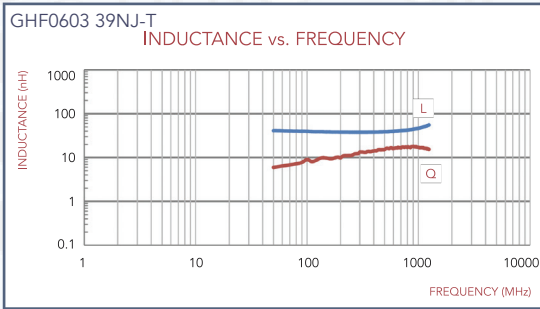
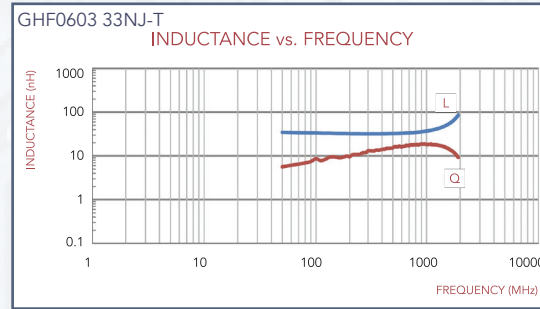
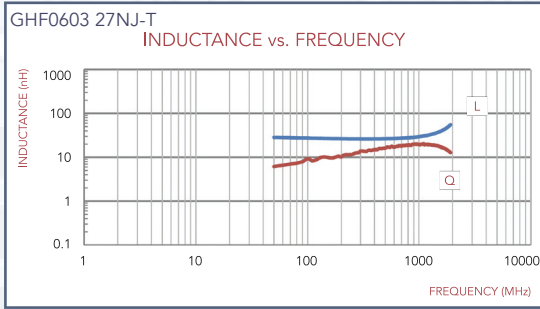
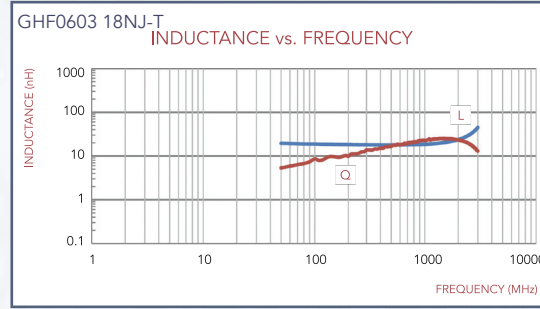
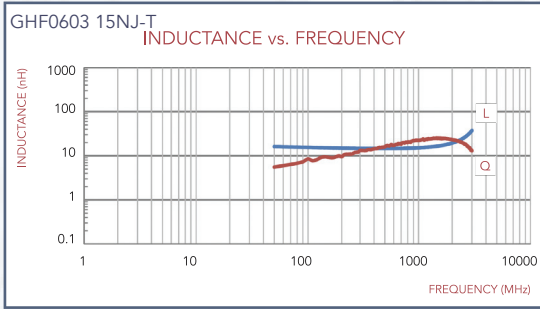
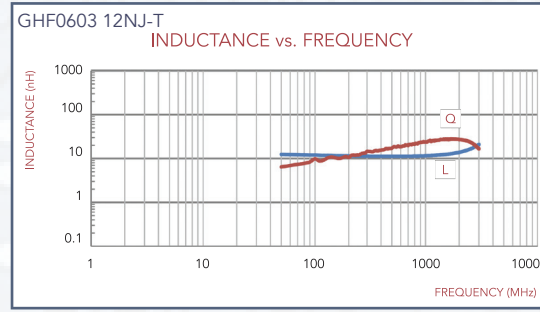
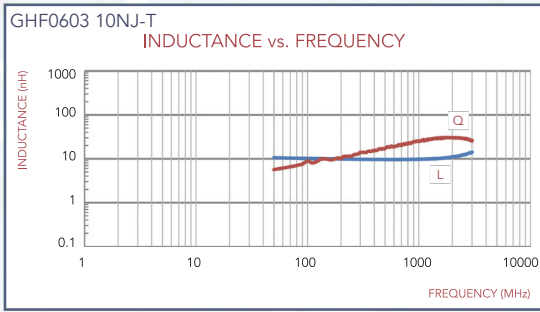
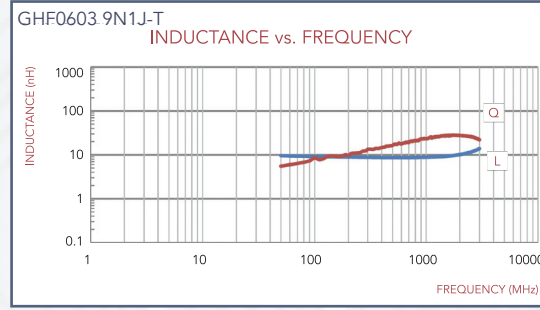
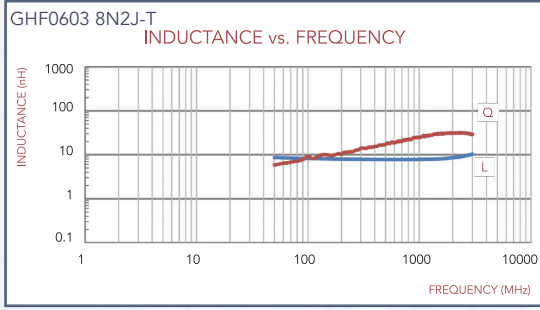


**ELECTRICAL CHARACTERISTICS- 0603 (0201)**

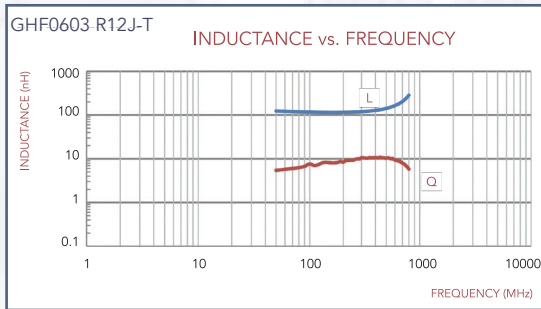
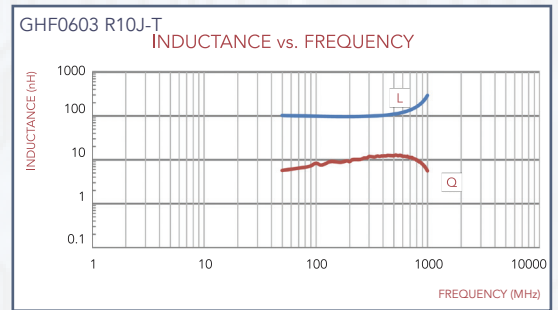
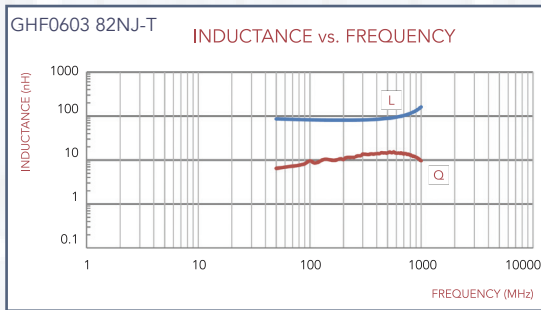
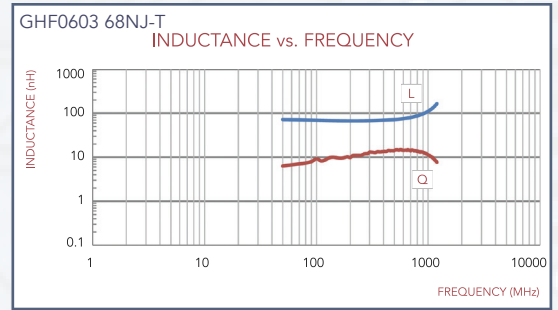
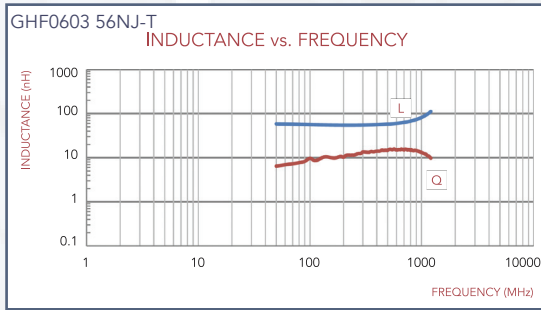




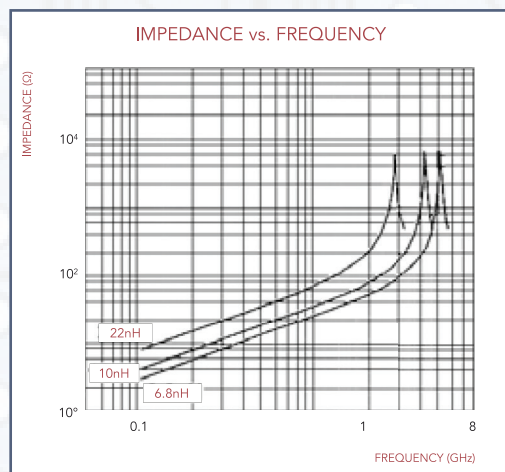
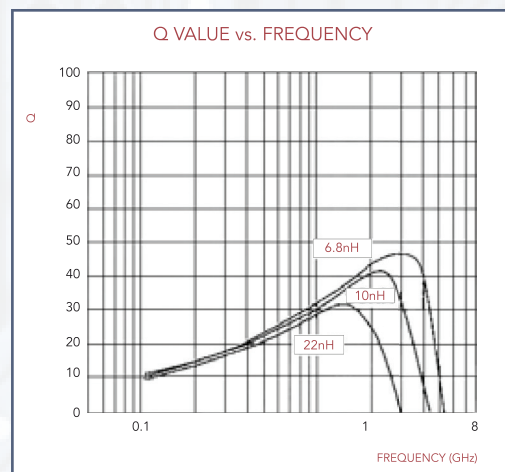
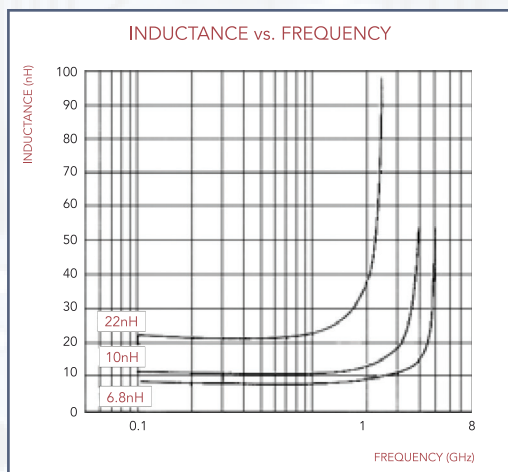
# ELECTRICAL CHARACTERISTICS- 0603 (0201)



**ELECTRICAL CHARACTERISTICS- 0603 (0201)**

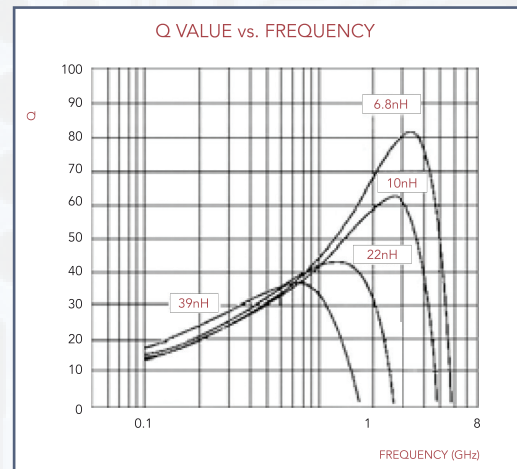
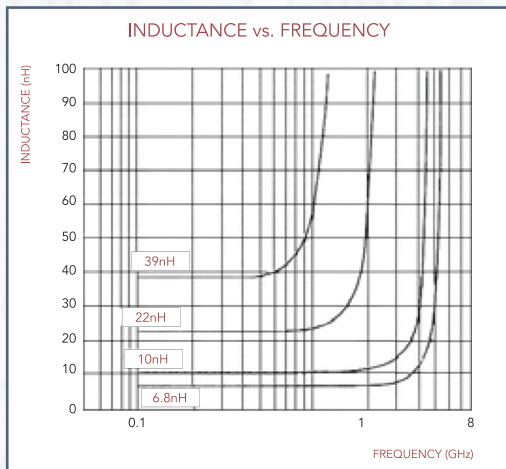


PART NUMBER	INDUCTANCE (nH)	Q MIN	TEST FREQUENCY (MHz)	Q FREQUENCY (MHz)					SRF (MHz) MIN	DCR (Ω) MAX	IR (mA) MAX
				100	300	500	800	1000			
GHF10051N0S-T	1.0	7	100	8	20	26	34	38	6000	0.17	300
GHF10051N2S-T	1.2	7	100	8	20	26	34	38	6000	0.17	300
GHF10051N5S-T	1.5	7	100	8	20	26	34	38	6000	0.18	300
GHF10051N8S-T	1.8	7	100	8	18	24	30	35	6000	0.19	300
GHF10052N2S-T	2.2	7	100	8	17	24	29	35	6000	0.21	300
GHF10052N7S-T	2.7	7	100	8	17	23	29	34	5500	0.22	300
GHF1005 3N3S-T	3.3	7	100	8	17	23	28	34	5500	0.25	300
GHF1005 3N9S-T	3.9	7	100	8	17	23	28	33	5200	0.25	300
GHF1005 4N7S-T	4.7	7	100	8	17	23	28	33	4800	0.30	300
GHF1005 5N6S-T	5.6	7	100	8	17	22	28	33	4600	0.30	300
GHF1005 6N8J-T	6.8	7	100	8	17	22	27	33	4000	0.37	250
GHF1005 8N2J-T	8.2	7	100	10	16	22	28	32	3600	0.45	250
GHF1005 10NJ-T	10	7	100	10	17	22	30	32	3200	0.47	250
GHF1005 12NJ-T	12	8	100	11	17	24	31	34	2800	0.55	250
GHF1005 15NJ-T	15	8	100	11	18	24	30	33	2500	0.70	250
GHF1005 18NJ-T	18	8	100	11	18	24	30	32	2200	0.70	200
GHF1005 22NJ-T	22	8	100	11	18	24	30	31	2000	0.90	200
GHF1005 27NJ-T	27	8	100	11	18	23	27	29	1600	1.00	200
GHF1005 33NJ-T	33	8	100	11	18	22	25	25	1300	1.10	200
GHF1005 39NJ-T	39	8	100	11	18	22	24	23	1200	1.30	150
GHF1005 47NJ-T	47	8	100	11	18	21	23	21	1000	1.40	150



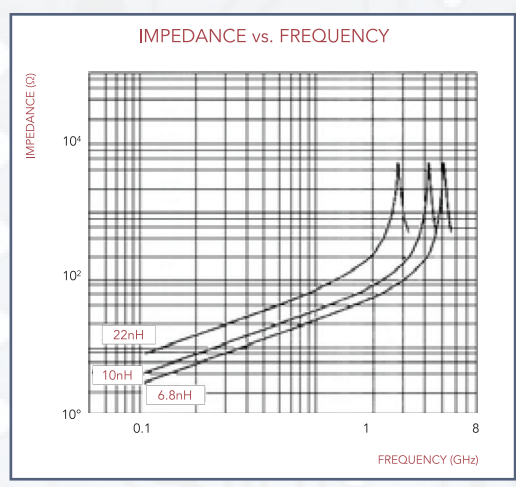
**ELECTRICAL CHARACTERISTICS- 1608 (0603)**

PART NUMBER	INDUCTANCE (nH)	Q MIN	TEST FREQUENCY (MHz)	Q FREQUENCY (MHz)					SRF (MHz) MIN	DCR (Ω) MAX	IR (mA) MAX
				100	300	500	800	1000			
GHF1608 1N0S-T	1.0	8	100	14	20	30	35	50	10000	0.05	500
GHF1608 1N5S-T	1.5	8	100	14	20	30	35	50	10000	0.10	500
GHF1608 1N6S-T	1.6	8	100	14	22	37	38	68	10000	0.10	400
GHF1608 1N8S-T	1.8	8	100	14	21	33	35	61	9800	0.12	400
GHF1608 2N2S-T	2.2	8	100	14	26	40	39	60	6000	0.10	300
GHF1608 2N7S-T	2.7	8	100	12	23	27	37	47	7000	0.20	400
GHF1608 3N3S-T	3.3	8	100	12	23	27	36	47	6200	0.20	400
GHF1608 3N9S-T	3.9	8	100	12	25	28	38	47	5600	0.25	400
GHF1608 4N7S-T	4.7	8	100	12	26	30	38	49	4800	0.30	400
GHF1608 5N6S-T	5.6	8	100	12	26	29	35	34	4600	0.30	400
GHF1608 6N8S-T	6.8	8	100	12	23	27	35	40	4200	0.35	400
GHF1608 8N2J-T	8.2	8	100	12	22	26	33	39	3600	0.35	400
GHF1608 10NJ-T	10	8	100	13	25	31	38	45	3200	0.40	300
GHF1608 12NJ-T	12	8	100	13	24	28	35	39	2800	0.40	300
GHF1608 15NJ-T	15	8	100	13	22	27	24	40	2600	0.45	300
GHF1608 18NJ-T	18	8	100	13	24	28	35	38	2400	0.60	300
GHF1608 22NJ-T	22	8	100	15	27	32	38	43	2000	0.60	300
GHF1608 27NJ-T	27	8	100	14	26	29	36	44	1900	0.80	300
GHF1608 33NJ-T	33	8	100	14	26	29	35	34	1600	0.80	300
GHF1608 39NJ-T	39	8	100	14	22	25	28	28	1400	1.00	300
GHF1608 47NJ-T	47	8	100	15	25	29	30	25	1200	1.00	200
GHF1608 56NJ-T	56	8	100	17	28	31	31	25	1000	1.00	200
GHF1608 68NJ-T	68	8	100	17	22	24	25	15	900	1.00	200
GHF1608 82NJ-T	82	8	100	17	23	24	22	13	800	1.00	200
GHF1608 R10J-T	100	8	100	17	25	27	24	17	700	1.40	200
GHF1608 R12J-T	120	8	100	15	24	23			600	1.60	150
GHF1608 R15J-T	150	8	100	13	19				500	1.20	300
GHF1608 R18J-T	180	8	50						400	1.30	300
GHF1608 R18G-T	180	8	50						400	1.30	300
GHF1608 R22J-T	220	8	50						400	1.30	300
GHF1608 R22G-T	220	8	50						400	1.30	300
GHF1608 R27J-T	270	8	50						400	1.90	300
GHF1608 R27G-T	270	8	50						350	2.10	300
GHF1608 R33J-T	330	8	50						350	2.10	300
GHF1608 R33G-T	330	8	50						350	2.10	300
GHF1608 R39J-T	390	8	50						350	2.30	150
GHF1608 R39G-T	390	8	50						350	2.30	150
GHF1608 R47J-T	470	8	50						300	2.60	150
GHF1608 R47G-T	470	8	50						300	2.60	150





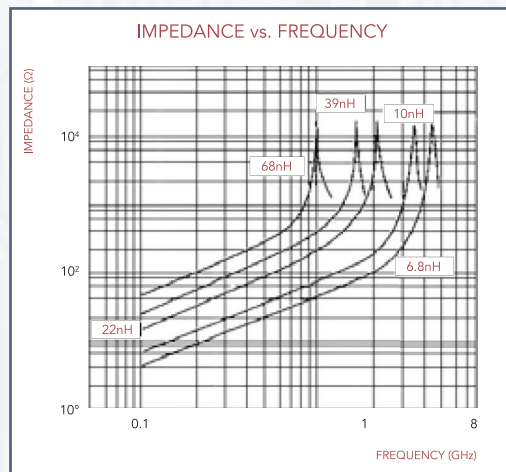
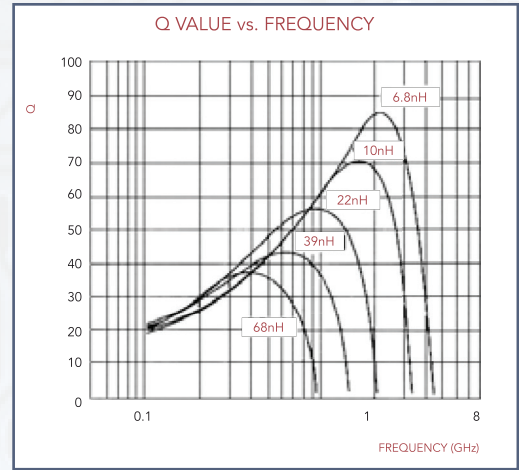
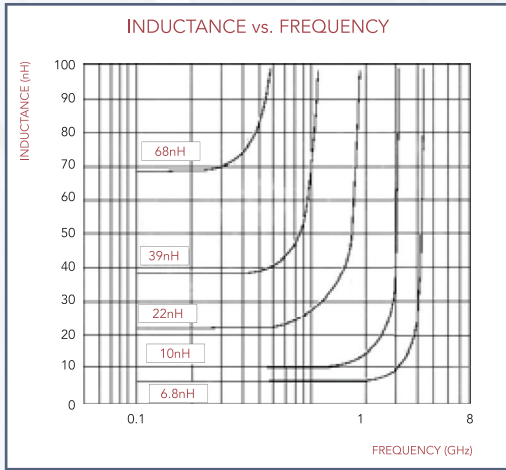
**ELECTRICAL CHARACTERISTICS- 1608 (0603)**



**ELECTRICAL CHARACTERISTICS- 2125 (0805)**

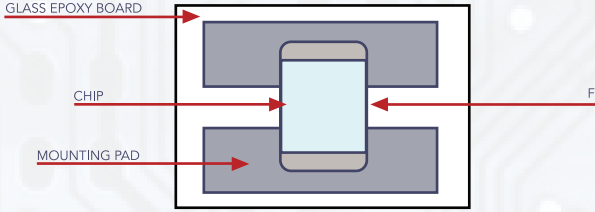
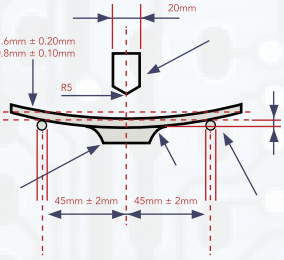
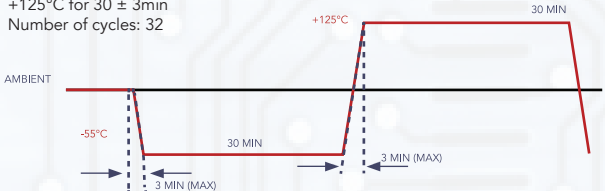
PART NUMBER	INDUCTANCE (nH)	Q MIN	TEST FREQUENCY (MHz)	Q FREQUENCY (MHz)					SRF (MHz) MIN	DCR (Ω) MAX	IR (mA) MAX	THICKNESS
				100	300	500	800	1000				
GHF2125 1N5S-T	1.5	8	100	10	23	46	54	85	6000	0.10	600	0.90±0.2
GHF2125 1N8S-T	1.8	8	100	13	24	46	55	85	6000	0.10	600	0.90±0.2
GHF2125 2N2S-T	2.2	8	100	13	25	46	53	85	6000	0.10	600	0.90±0.2
GHF2125 2N7S-T	2.7	8	100	13	25	42	45	76	6000	0.10	600	0.90±0.2
GHF2125 3N3S-T	3.3	8	100	15	28	48	52	85	6000	0.13	600	0.90±0.2
GHF2125 3N9S-T	3.9	8	100	15	28	49	55	85	5400	0.15	600	0.90±0.2
GHF2125 4N7S-T	4.7	8	100	15	28	48	53	85	4500	0.20	400	0.90±0.2
GHF2125 5N6S-T	5.6	8	100	16	30	44	45	78	4000	0.23	400	0.90±0.2
GHF2125 6N8S-T	6.8	8	100	16	30	40	45	69	3650	0.25	400	0.90±0.2
GHF2125 8N2J-T	8.2	8	100	16	28	42	45	69	3000	0.28	400	0.90±0.2
GHF2125 10NJ-T	10	8	100	16	28	43	45	71	2500	0.30	300	0.90±0.2
GHF2125 12NJ-T	12	8	100	16	28	43	45	50	2450	0.35	300	0.90±0.2
GHF2125 15NJ-T	15	8	100	18	30	43	43	56	2000	0.40	300	0.90±0.2
GHF2125 18NJ-T	18	8	100	18	26	40	42	59	1750	0.45	300	0.90±0.2
GHF2125 22NJ-T	22	8	100	17	31	45	45	59	1700	0.50	300	0.90±0.2
GHF2125 27NJ-T	27	8	100	17	31	45	45	54	1550	0.55	300	0.90±0.2
GHF2125 33NJ-T	33	8	100	18	27	41	40	44	1350	0.60	300	0.90±0.2
GHF2125 39NJ-T	39	8	100	19	31	42	31	20	1300	0.70	300	0.90±0.2
GHF2125 47NJ-T	47	8	100	20	24	33	31	29	1200	0.80	300	0.90±0.2
GHF2125 56NJ-T	56	8	100	21	34	43	35	25	1150	0.80	300	0.90±0.2
GHF2125 68NJ-T	68	8	100	19	28	37	29		1000	0.85	300	0.90±0.2
GHF2125 82NJ-T	82	8	100	19	29	30	27		850	0.90	300	0.90±0.2
GHF2125 R10J-T	100	8	100	13	27	36			600	1.00	300	0.90±0.2
GHF2125 R12J-T	120	8	100	19	27				500	1.20	300	0.90±0.2
GHF2125 R15J-T	150	13	50						500	1.50	300	1.25±0.2
GHF2125 R18J-T	180	13	50						400	1.10	300	1.25±0.2
GHF2125 R22J-T	220	12	50						350	1.20	300	1.25±0.2
GHF2125 R27J-T	270	12	50						300	1.30	300	1.25±0.2
GHF2125 R33J-T	330	12	50						250	1.40	300	1.25±0.2
GHF2125 R39J-T	390	10	50						250	1.40	300	1.25±0.2
GHF2125 R47J-T	470	10	50						200	2.00	300	1.25±0.2
GHF2125 R56J-T	560	10	50						180	5.00	50	1.25±0.2
GHF2125 R68J-T	680	10	50						160	5.50	50	1.25±0.2

**ELECTRICAL CHARACTERISTICS- 2125 (0805)**





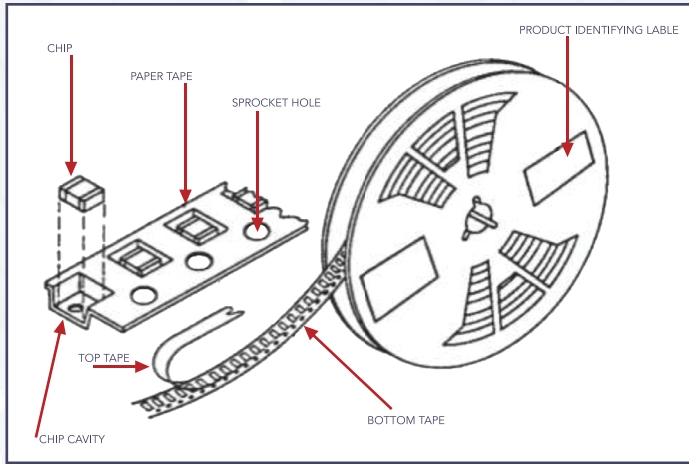
# RELIABILITY TEST METHOD

NO.	ITEM	REQUIREMENTS	TEST CONDITION
1.	Operating Temperature Rang	-55°C ~ +125°C	---
2.	Solderability	95% (75% for 0402/0603 series) or more of electrode area shall be coated by new solder.	Preheating Temperature: 120°C ~ 150°C Preheating Time: 60s Solder 96.5% Sn / 3.0%Ag / 0.5%Cu of the Sn solder Solder Temperature: 245° ± 3°C Immersion Tin Depth: 10mm Duration: 3 ± 0.3s Dip Performance to a flux of about 3 ~5s
3.	Resistance to Soldering Heat	At least 95% (75% for 0402/0603 series) of terminal electrode should be covered with solder. No mechanical damage Inductance: H/HQ: change within ±10% Q Value Change (ceramic): within ±20%	Preheating Temperature: 120°C ~ 150°C Preheating Time: 60s Solder 96.5% Sn / 3.0%Ag / 0.5%Cu of the Sn solder Solder Temperature: 260° ± 5°C Immersion Tin Depth: 10mm Duration: 10 ± 1s Dip Performance to a flux of about 3 ~5s
4.	Adhesion of Electrode	The termination and body should be no damage	Applied Force: 1N force for 0402 series 2N force for 0603 series 5N force for 105 series 7N force for 1608 series 10N force for 2012 series Keep Time: 10 ± 1S  
5.	Low Temperature Resistance	No mechanical damage. Inductance change: within ±10% Q Value change (ceramic): within ±20%	Temperature: -40 ± 2°C Testing Time: 1000 <sup>+24-0</sup> h
6.	Bending Strength	No mechanical damage	Testing board: glass epoxy-resin substrate for (1+0.5) mm/s compression speed, curvature: 2mm, hold time 20±1s.  
7.	Vibration	No mechanical damage Inductance change: within ±10% Q Value change (ceramic): within ±20%	Aplitude modulation: 1.5mm Test Time: A period of 2h in each of 3 mutually perpendicular directions. Frequency Range: 10Hz to 55Hz to 10Hz for 1 min.
8.	High Temperature Resistance	No mechanical damage Inductance change: within ±10% Q Value change (ceramic): within ±20%	Testing Time: 1000 <sup>+24-0</sup> h Temperature: 125 ± 2°C
9.	Static Humidity	No mechanical damage Inductance change: within ±10% Q Value change (ceramic): within ±20%	Humidity: 90% to 95% RH Temperature: 60°C ± 2°C Testing Time: 1000 <sup>+24-0</sup> h
10.	High Temperature Load	No mechanical damage Inductance change: within ±10% Q Value change (ceramic): within ±20%	Impose Current: Rated Current Testing Time: 1000 <sup>+24-0</sup> h Temperature: 125 ± 2°C
11.	Temperature Shock	No mechanical damage Inductance change: within ±10% Q Value change (ceramic): within ±20%	Temperature: -55°C for 30±3min +125°C for 30 ± 3min Number of cycles: 32  

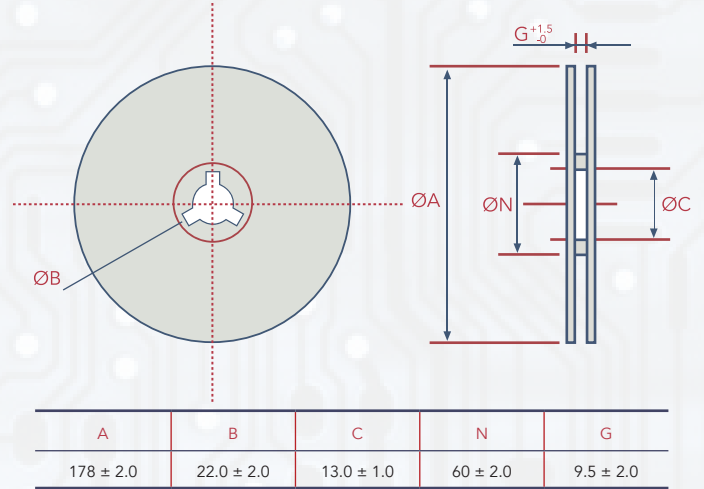
Note: When there are questions concerning, measurement shall be made after 24±2hrs of recovery under the standard condition.

**PACKAGING**

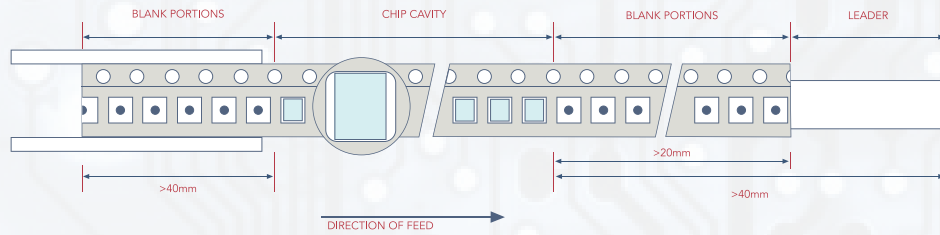
- Taping Drawings



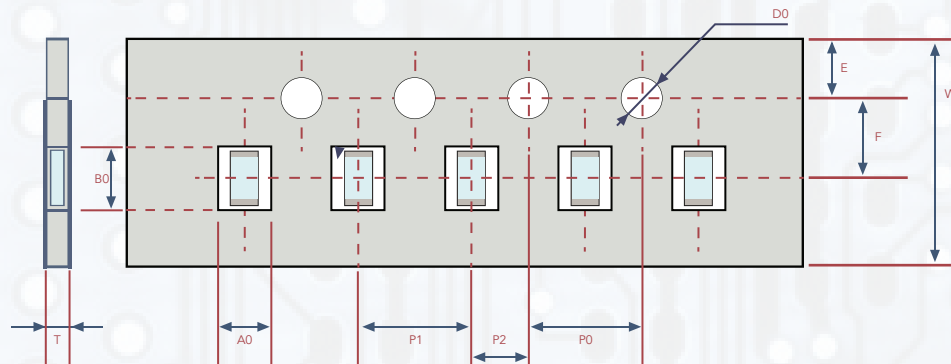
- Reel Dimensions (unit: mm)



- Leader and Blank Portion



- Taping Dimensions (unit: mm)



PART NUMBER	A0	B0	W	F	E	P1	P2	P0	D0	T
0201 (0603)	$0.38 \pm 0.03$	$0.68 \pm 0.03$	$8.00 \pm 0.10$	$3.50 \pm 0.05$	$1.75 \pm 0.05$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$4.00 \pm 0.10$	$1.55 \pm 0.05$	$0.42 \pm 0.03$
1005 (0402)	$0.59 \pm 0.10$	$1.12 \pm 0.10$	$8.00 \pm 0.20$	$3.50 \pm 0.10$	$1.75 \pm 0.20$	$2.00 \pm 0.20$	$2.00 \pm 0.10$	$4.00 \pm 0.20$	$1.55 \pm 0.10$	$0.60 \pm 0.10$
1608 (0603)	$1.03 \pm 0.05$	$1.85 \pm 0.05$	$8.00 \pm 0.20$	$3.50 \pm 0.10$	$1.75 \pm 0.20$	$4.00 \pm 0.20$	$2.00 \pm 0.10$	$4.00 \pm 0.20$	$1.55 \pm 0.10$	$0.95 \pm 0.10$
2125 (0805)	$1.45 \pm 0.05$	$2.25 \pm 0.05$	$8.00 \pm 0.20$	$3.50 \pm 0.10$	$1.75 \pm 0.20$	$4.00 \pm 0.20$	$2.00 \pm 0.10$	$4.00 \pm 0.20$	$1.55 \pm 0.10$	$0.95 \pm 0.10$

