

$\frac{M}{(1)}$ $\frac{0402}{(2)}$ - $\frac{1}{(3)}$ $\frac{B}{(4)}$ $\frac{4N7}{(5)}$ $\frac{\quad}{(6)}$ $\frac{\quad}{(7)}$ $\frac{\quad}{(8)}$

(1) Type

M: Multilayer Ceramic Chip Inductors

(2) Dimensions (L x W)

M0201 : 0.6 x 0.3 mm
 M0402 : 1.0 x 0.5 mm
 M0603 : 1.6 x 0.8 mm
 M0805 : 2.0 x 1.2 mm

(3) Circuit

1: Single

(4) Material Code

B

(5) Inductance

4N7=4.7nH
 47N=47nH
 R47=470nH

(6) Tolerance

S : $\pm 0.3nH$
 J : $\pm 5\%$
 K : $\pm 10\%$

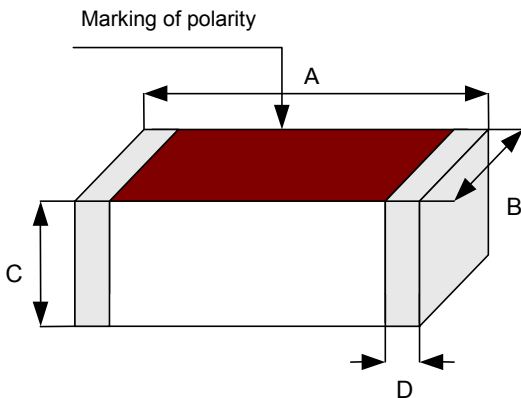
(7) Marking

M: With marking
 N: No marking

(8) Packaging

T: Tape & Reel

Shape & Dimension



Unit : mm (inch)

TYPE		A	B	C	D
M0201	0201	0.60 ± 0.05	0.30 ± 0.05	0.30 ± 0.05	0.15 ± 0.05
		(.0024 ± .002)	(.0012 ± .002)	(.0012 ± .004)	(.006 ± .004)
M0402	1005	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10
		(.039 ± .002)	(.020 ± .002)	(.020 ± .004)	(.010 ± .004)
M0603	1608	1.60 ± 0.15	0.80 ± 0.15	0.80 ± 0.15	0.30 ± 0.20
		(.063 ± .006)	(.031 ± .006)	(.031 ± .006)	(.012 ± .008)
M0805	2012	2.00 ± 0.20	1.20 ± 0.20	0.90 ± 0.20	0.45 ± 0.20
		(.079 ± .008)	(.047 ± .008)	(.033 ± .008)	(.018 ± .008)

*Marking of polarity indicating the magnetic flux direction is taped in an upward direction.



MULTILAYER CHIP INDUCTOR – CERAMIC / M0201

M0201 Series (1.0 ~ 33nH)

Part Number	Inductance (nH)	Q Min.	L/Q Freq. (MHz)	R _{DC} * (Ω) Max.	R _{DC} * (Ω) Typ.	S.R.F.* (MHz) Typ.	I _{DC} * (mA) Max.
M0201-1B1N0_NT	1.0 ± 0.3 nH	5	100	0.12	0.06	7000	300
M0201-1B1N2_NT	1.2 ± 0.3 nH	5	100	0.15	0.10	6800	300
M0201-1B1N5_NT	1.5 ± 0.3 nH	5	100	0.18	0.12	6500	300
M0201-1B1N8_NT	1.8 ± 0.3 nH	5	100	0.22	0.14	6300	290
M0201-1B2N2_NT	2.2 ± 0.3 nH	5	100	0.26	0.15	6000	270
M0201-1B2N7_NT	2.7 ± 0.3 nH	5	100	0.32	0.17	5600	270
M0201-1B3N3_NT	3.3 ± 0.3 nH or ± 10%	5	100	0.38	0.19	5300	240
M0201-1B3N9_NT	3.9 ± 0.3 nH or ± 10%	6	100	0.45	0.23	5000	210
M0201-1B4N7_NT	4.7 ± 0.3 nH or ± 10%	6	100	0.50	0.27	4400	210
M0201-1B5N6_NT	5.6 ± 0.3 nH or ± 10%	6	100	0.60	0.29	4200	210
M0201-1B6N8_NT	6.8 ± 5% or ± 10%	6	100	0.70	0.30	3800	210
M0201-1B8N2_NT	8.2 ± 5% or ± 10%	6	100	0.90	0.52	3500	200
M0201-1B10N_NT	10.0 ± 5% or ± 10%	6	100	1.20	0.58	3100	200
M0201-1B12N_NT	12.0 ± 5% or ± 10%	6	100	1.30	0.60	2800	190
M0201-1B15N_NT	15.0 ± 5% or ± 10%	6	100	1.40	0.70	2500	130
M0201-1B18N_NT	18.0 ± 5% or ± 10%	6	100	1.50	0.80	2200	120
M0201-1B22N_NT	22.0 ± 5% or ± 10%	6	100	1.80	1.00	1800	110
M0201-1B27N_NT	27.0 ± 5% or ± 10%	6	100	2.00	1.16	1600	100
M0201-1B33N_NT	33.0 ± 5% or ± 10%	6	100	2.30	1.50	1400	100

Operating Temperature Range : -40 ~ +100°C

Storage Temperature Range : -55 ~ +100°C

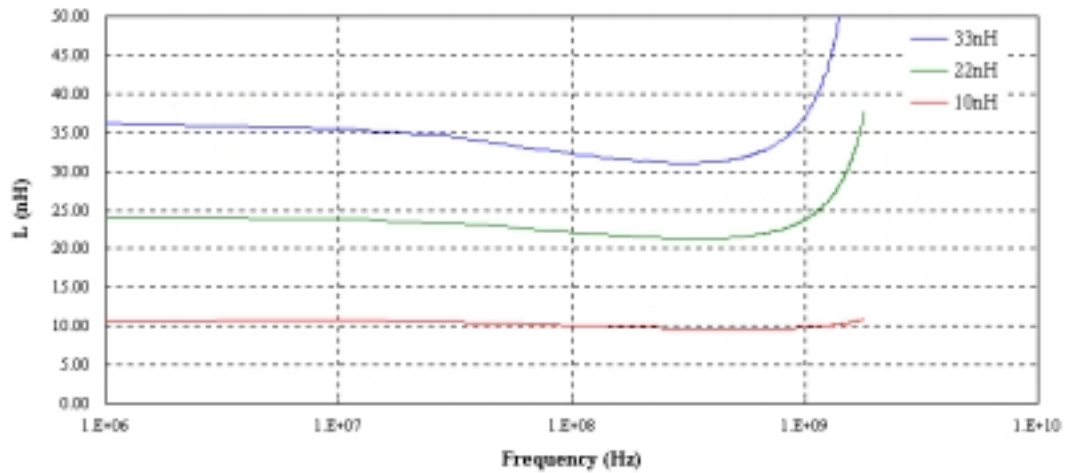
Test Method : L and Q : HP 4291B (+16192A)
 S.R.F. (Self Resonant Frequency) : HP 8722D
 R_{DC} (DC Resistance) : HP 4338B
 I_{DC} (Rated Current) : HP 4284A



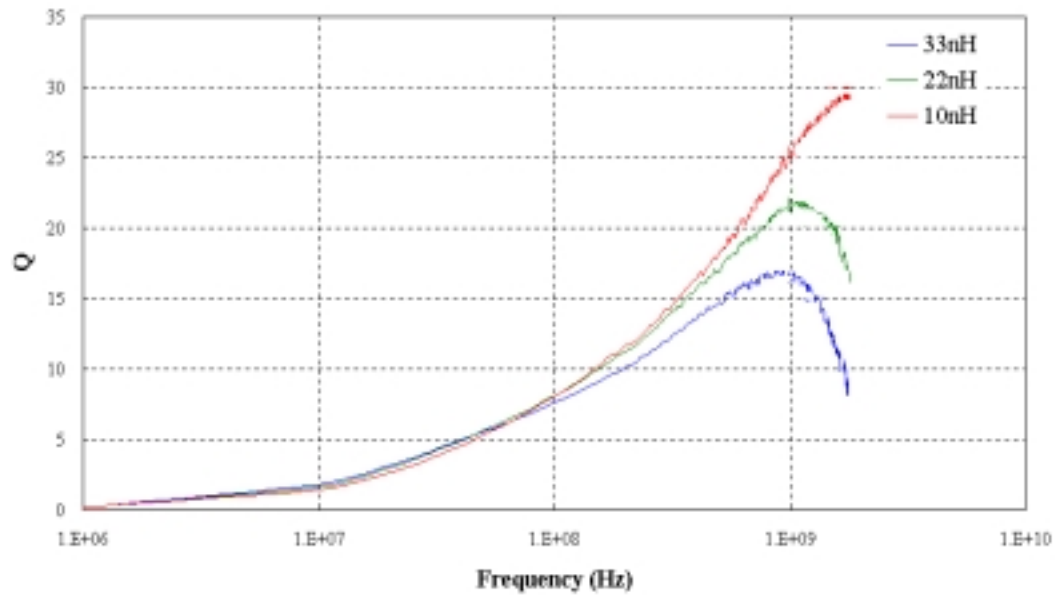
MULTILAYER CHIP INDUCTOR – CERAMIC / M0201

M0201 Series Typical Electrical Characteristics

TYPICAL L vs FREQUENCY



TYPICAL Q vs FREQUENCY





MULTILAYER CHIP INDUCTOR – CERAMIC / M0402 (1005)

M0402 Series (1.0 ~ 100nH)

Part Number	Inductance (nH)	Q Min.	L/Q Freq. (MHz)	R _{DC} * (Ω) Max.	S.R.F.* (MHz) Typ.	I _{DC} * (mA) Max.	Q'ty/ Reel (pcs)
M0402-1B1N0_MT	1.0 ± 0.3 nH	8	100	0.12	>15000	300	10,000
M0402-1B1N2_MT	1.2 ± 0.3 nH	8	100	0.12	>15000	300	10,000
M0402-1B1N5_MT	1.5 ± 0.3 nH	8	100	0.13	>15000	300	10,000
M0402-1B1N8_MT	1.8 ± 0.3 nH	8	100	0.14	14000	300	10,000
M0402-1B2N2_MT	2.2 ± 0.3 nH	8	100	0.16	12000	300	10,000
M0402-1B2N7_MT	2.7 ± 0.3 nH	8	100	0.17	9500	300	10,000
M0402-1B3N3_MT	3.3 ± 0.3 nH or ± 10%	8	100	0.19	8500	300	10,000
M0402-1B3N9_MT	3.9 ± 0.3 nH or ± 10%	8	100	0.22	7000	300	10,000
M0402-1B4N7_MT	4.7 ± 0.3 nH or ± 10%	8	100	0.24	6000	300	10,000
M0402-1B5N6_MT	5.6 ± 0.3 nH or ± 10%	8	100	0.27	5400	300	10,000
M0402-1B6N8_MT	6.8 ± 5% or ± 10%	8	100	0.32	5000	250	10,000
M0402-1B8N2_MT	8.2 ± 5% or ± 10%	8	100	0.37	4600	250	10,000
M0402-1B10N_MT	10.0 ± 5% or ± 10%	8	100	0.42	3700	250	10,000
M0402-1B12N_MT	12.0 ± 5% or ± 10%	8	100	0.50	3200	250	10,000
M0402-1B15N_MT	15.0 ± 5% or ± 10%	8	100	0.55	3100	250	10,000
M0402-1B18N_MT	18.0 ± 5% or ± 10%	8	100	0.65	2900	200	10,000
M0402-1B22N_MT	22.0 ± 5% or ± 10%	8	100	0.80	2100	200	10,000
M0402-1B27N_MT	27.0 ± 5% or ± 10%	8	100	0.90	1900	200	10,000
M0402-1B33N_MT	33.0 ± 5% or ± 10%	8	100	1.00	1600	200	10,000
M0402-1B39N_MT	39.0 ± 5% or ± 10%	8	100	1.20	1400	150	10,000
M0402-1B47N_MT	47.0 ± 5% or ± 10%	8	100	1.30	1200	150	10,000
M0402-1B56N_MT	56.0 ± 5% or ± 10%	8	100	2.00	1100	150	10,000
M0402-1B68N_MT	68.0 ± 5% or ± 10%	8	100	2.20	1000	150	10,000
M0402-1B82N_MT	82.0 ± 5% or ± 10%	8	100	2.50	900	100	10,000
M0402-1BR10_MT	100.0 ± 5% or ± 10%	8	100	2.50	850	100	10,000
M0402-1BR12_MT	120.0 ± 5% or ± 10%	8	100	2.50	800	100	10,000

Operating Temperature Range : -40 ~ +100°C

Storage Temperature Range : -55 ~ +100°C

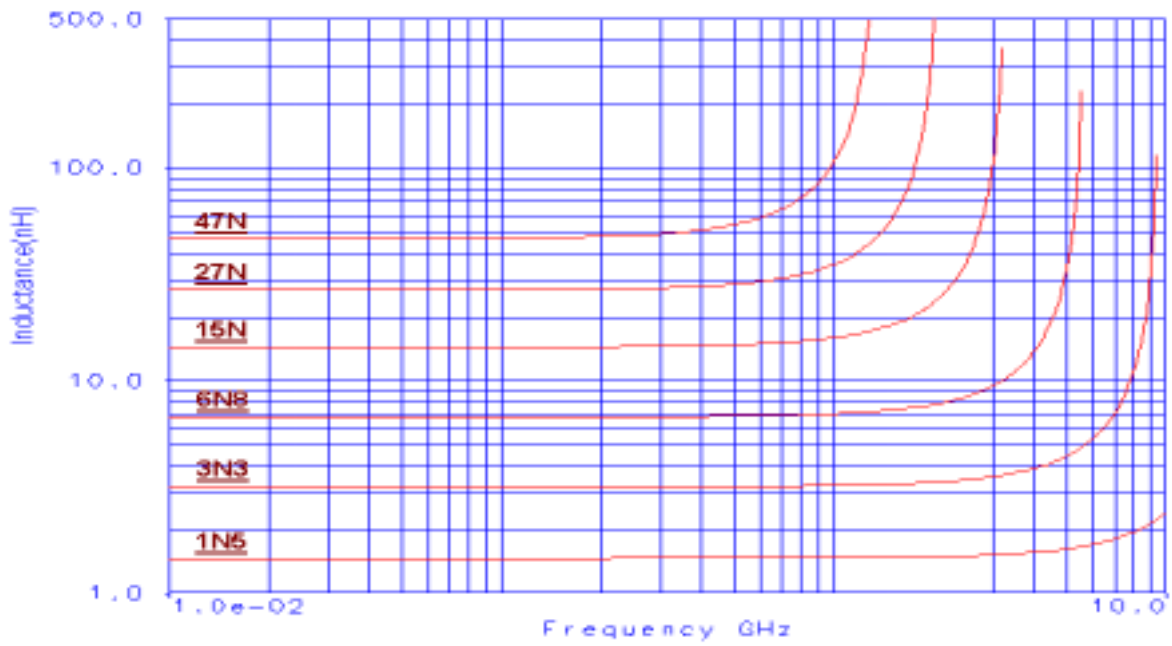
Test Method : L and Q : HP 4291B
 S.R.F. (Self Resonant Frequency) : HP 8722D
 R_{DC} (DC Resistance) : HP 4338B
 I_{DC} (Rated Current) : HP 4284A



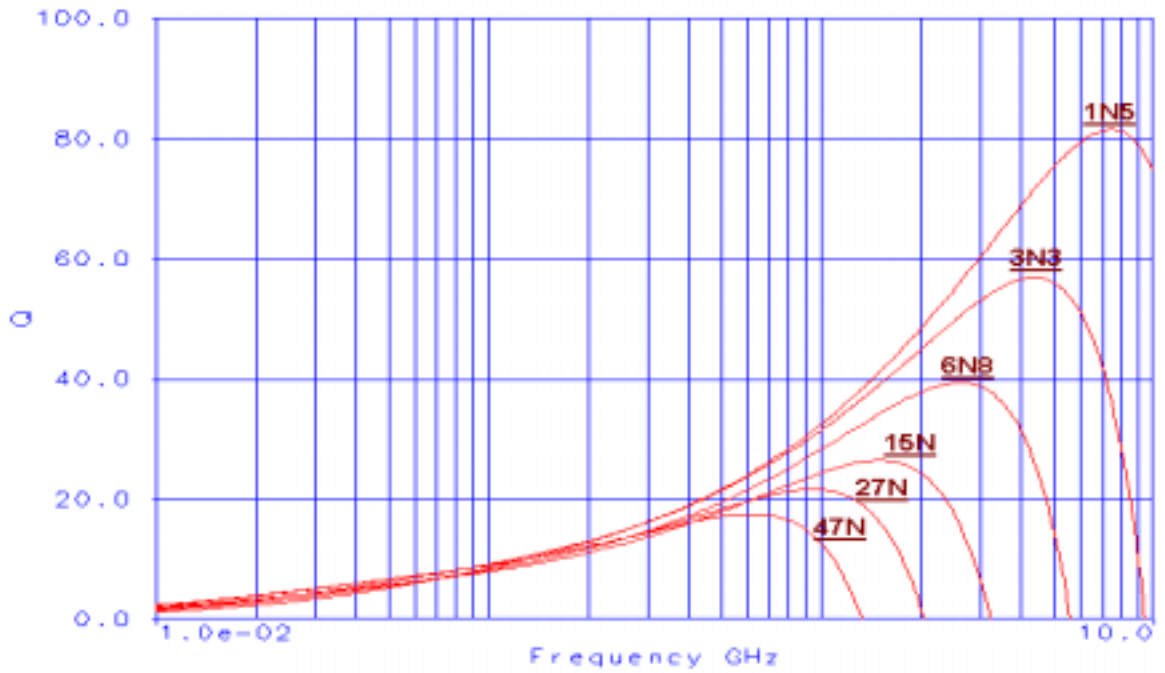
MULTILAYER CHIP INDUCTOR – CERAMIC / M0402 (1005)

M0402 Series Typical Electrical Characteristics

TYPICAL L vs FREQUENCY



TYPICAL Q vs FREQUENCY





MULTILAYER CHIP INDUCTOR – CERAMIC / M0603 (1608)

M0603 Series (1.0 ~ 220nH)

Part Number	Inductance (nH)	Q Min.	L/Q Freq. (MHz)	R _{DC} * (Ω) Max.	S.R.F.* (MHz) Typ.	I _{DC} * (mA) Max.	Q'ty/ Reel (pcs)
M 0603-1B1N0_NT	1.0 ± 0.3 nH	8	100	0.10	>17000	300	4,000
M 0603-1B1N2_NT	1.2 ± 0.3 nH	8	100	0.10	>17000	300	4,000
M 0603-1B1N5_NT	1.5 ± 0.3 nH	8	100	0.10	>17000	300	4,000
M 0603-1B1N8_NT	1.8 ± 0.3 nH	8	100	0.10	13000	300	4,000
M 0603-1B2N2_NT	2.2 ± 0.3 nH	8	100	0.10	12000	300	4,000
M 0603-1B2N7_NT	2.7 ± 0.3 nH	8	100	0.10	8600	300	4,000
M 0603-1B3N3_NT	3.3 ± 0.3 nH or ± 10%	8	100	0.12	6500	300	4,000
M 0603-1B3N9_NT	3.9 ± 0.3 nH or ± 10%	8	100	0.14	6300	300	4,000
M 0603-1B4N7_NT	4.7 ± 0.3 nH or ± 10%	8	100	0.16	5400	300	4,000
M 0603-1B5N6_NT	5.6 ± 0.3 nH or ± 10%	8	100	0.18	4600	300	4,000
M 0603-1B6N8_NT	6.8 ± 5% or ± 10%	8	100	0.22	4500	300	4,000
M 0603-1B8N2_NT	8.2 ± 5% or ± 10%	8	100	0.24	3800	300	4,000
M 0603-1B10N_NT	10.0 ± 5% or ± 10%	8	100	0.26	3700	300	4,000
M 0603-1B12N_NT	12.0 ± 5% or ± 10%	8	100	0.28	3200	300	4,000
M 0603-1B15N_NT	15.0 ± 5% or ± 10%	8	100	0.32	2900	300	4,000
M 0603-1B18N_NT	18.0 ± 5% or ± 10%	10	100	0.35	2100	300	4,000
M 0603-1B22N_NT	22.0 ± 5% or ± 10%	10	100	0.40	2100	300	4,000
M 0603-1B27N_NT	27.0 ± 5% or ± 10%	10	100	0.45	2000	300	4,000
M 0603-1B33N_NT	33.0 ± 5% or ± 10%	10	100	0.55	1600	300	4,000
M 0603-1B39N_NT	39.0 ± 5% or ± 10%	10	100	0.60	1500	300	4,000
M 0603-1B47N_NT	47.0 ± 5% or ± 10%	12	100	0.70	1200	300	4,000
M 0603-1B56N_NT	56.0 ± 5% or ± 10%	12	100	0.75	1100	300	4,000
M 0603-1B68N_NT	68.0 ± 5% or ± 10%	12	100	0.85	1000	300	4,000
M 0603-1B82N_NT	82.0 ± 5% or ± 10%	12	100	0.95	850	300	4,000
M 0603-1BR10_NT	100.0 ± 5% or ± 10%	12	100	1.00	750	300	4,000
M 0603-1BR12_NT	120.0 ± 5% or ± 10%	8	50	1.20	700	300	4,000
M 0603-1BR15_NT	150.0 ± 5% or ± 10%	8	50	1.20	650	300	4,000
M 0603-1BR18_NT	180.0 ± 5% or ± 10%	8	50	1.30	550	300	4,000
M 0603-1BR22_NT	220.0 ± 5% or ± 10%	8	50	1.50	450	300	4,000

Operating Temperature Range : -40 ~ +100°C

Storage Temperature Range : -55 ~ +100°C

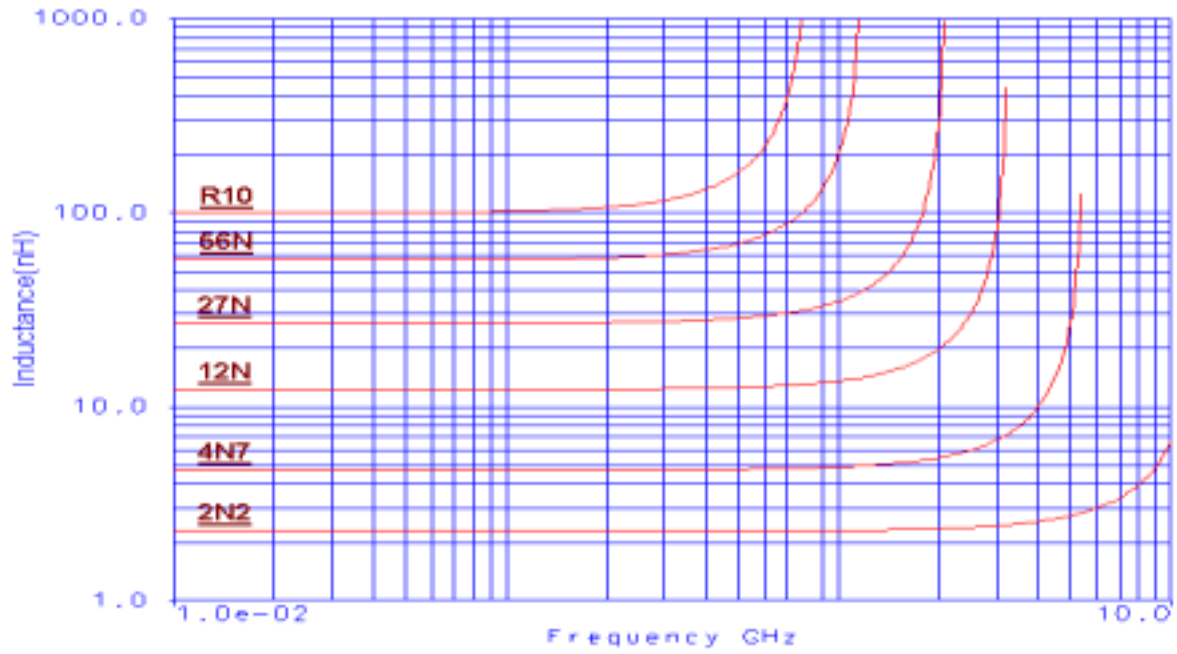
Test Method : L and Q : HP 4291B
 S.R.F. (Self Resonant Frequency) : HP 8722D
 R_{DC} (DC Resistance) : HP 4338B
 I_{DC} (Rated Current) : HP 4284A



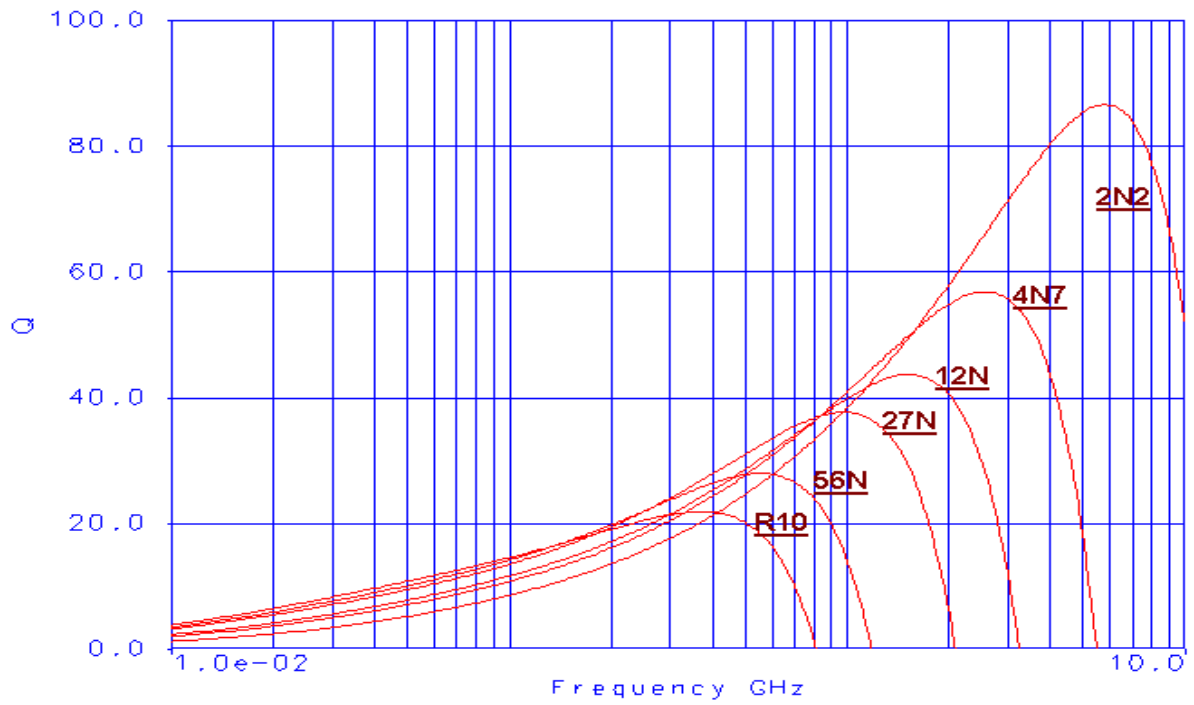
MULTILAYER CHIP INDUCTOR – CERAMIC / M0603 (1608)

M0603 Series Typical Electrical Characteristics

TYPICAL L vs. FREQUENCY



TYPICAL Q vs. FREQUENCY





MULTILAYER CHIP INDUCTOR – CERAMIC / M0805 (2012)

M0805 Series (1.5 ~ 680nH)

Part Number	Inductance (nH)	Q Min.	L/Q Freq. (MHz)	R _{DC} * (Ω) Max.	S.R.F.* (MHz) Typ.	I _{DC} * (mA) Max.	Q'ty/ Reel (pcs)
M0805-1B1N5_NT	1.5 ± 0.3 nH	10	100	0.10	>6000	300	4,000
M0805-1B1N8_NT	1.8 ± 0.3 nH	10	100	0.10	>6000	300	4,000
M0805-1B2N2_NT	2.2 ± 0.3 nH	10	100	0.10	>6000	300	4,000
M0805-1B2N7_NT	2.7 ± 0.3 nH	12	100	0.12	>6000	300	4,000
M0805-1B3N3_NT	3.3 ± 0.3 nH or ± 10%	12	100	0.13	>6000	300	4,000
M0805-1B3N9_NT	3.9 ± 0.3 nH or ± 10%	12	100	0.15	5600	300	4,000
M0805-1B4N7_NT	4.7 ± 0.3 nH or ± 10%	12	100	0.20	5500	300	4,000
M0805-1B5N6_NT	5.6 ± 0.3 nH or ± 10%	12	100	0.23	4700	300	4,000
M0805-1B6N8_NT	6.8 ± 5% or ± 10%	15	100	0.25	3900	300	4,000
M0805-1B8N2_NT	8.2 ± 5% or ± 10%	15	100	0.28	3200	300	4,000
M0805-1B10N_NT	10.0 ± 5% or ± 10%	15	100	0.30	3100	300	4,000
M0805-1B12N_NT	12.0 ± 5% or ± 10%	15	100	0.35	2800	300	4,000
M0805-1B15N_NT	15.0 ± 5% or ± 10%	15	100	0.40	2400	300	4,000
M0805-1B18N_NT	18.0 ± 5% or ± 10%	15	100	0.45	2100	300	4,000
M0805-1B22N_NT	22.0 ± 5% or ± 10%	15	100	0.50	2000	300	4,000
M0805-1B27N_NT	27.0 ± 5% or ± 10%	15	100	0.55	1800	300	4,000
M0805-1B33N_NT	33.0 ± 5% or ± 10%	15	100	0.60	1700	300	4,000
M0805-1B39N_NT	39.0 ± 5% or ± 10%	18	100	0.65	1400	300	4,000
M0805-1B47N_NT	47.0 ± 5% or ± 10%	18	100	0.70	1200	300	4,000
M0805-1B56N_NT	56.0 ± 5% or ± 10%	18	100	0.75	1000	300	4,000
M0805-1B68N_NT	68.0 ± 5% or ± 10%	18	100	0.80	900	300	4,000
M0805-1B82N_NT	82.0 ± 5% or ± 10%	18	100	0.85	900	300	4,000
M0805-1BR10_NT	100.0 ± 5% or ± 10%	18	100	0.90	700	300	4,000
M0805-1BR12_NT	120.0 ± 5% or ± 10%	13	50	0.95	600	300	4,000
M0805-1BR15_NT	150.0 ± 5% or ± 10%	13	50	1.00	500	300	4,000
M0805-1BR18_NT	180.0 ± 5% or ± 10%	13	50	1.10	430	300	4,000
M0805-1BR22_NT	220.0 ± 5% or ± 10%	12	50	1.20	400	300	4,000
M0805-1BR27_NT	270.0 ± 5% or ± 10%	12	50	1.30	340	300	4,000
M0805-1BR33_NT	330.0 ± 5% or ± 10%	12	50	1.50	320	300	4,000
M0805-1BR39_NT	390.0 ± 5% or ± 10%	10	50	1.60	270	300	4,000
M0805-1BR47_NT	470.0 ± 5% or ± 10%	10	50	1.80	250	300	4,000
M0805-1BR56_NT	560.0 ± 5% or ± 10%	10	50	2.50	230	300	4,000
M0805-1BR68_NT	680.0 ± 5% or ± 10%	10	50	3.00	180	300	4,000

Operating Temperature Range : -40 ~ +100°C

Storage Temperature Range : -55 ~ +100°C

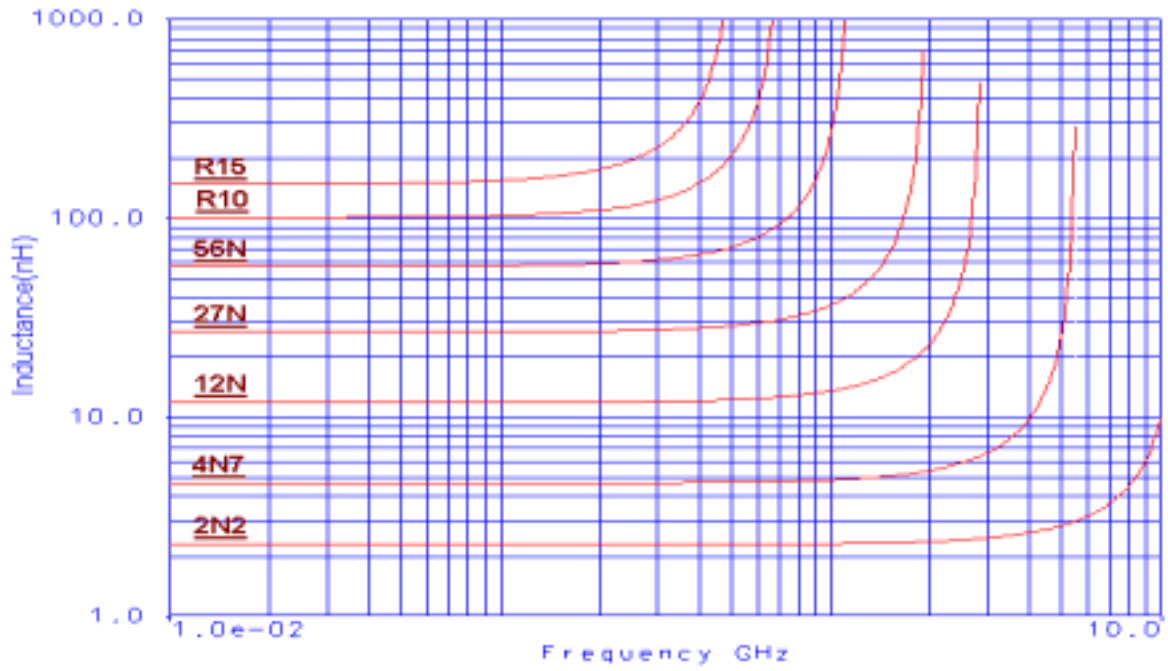
Test Method : L and Q : HP 4291B
 S.R.F. (Self Resonant Frequency) : HP 8722D
 R_{DC} (DC Resistance) : HP 4338B
 I_{DC} (Rated Current) : HP 4284A



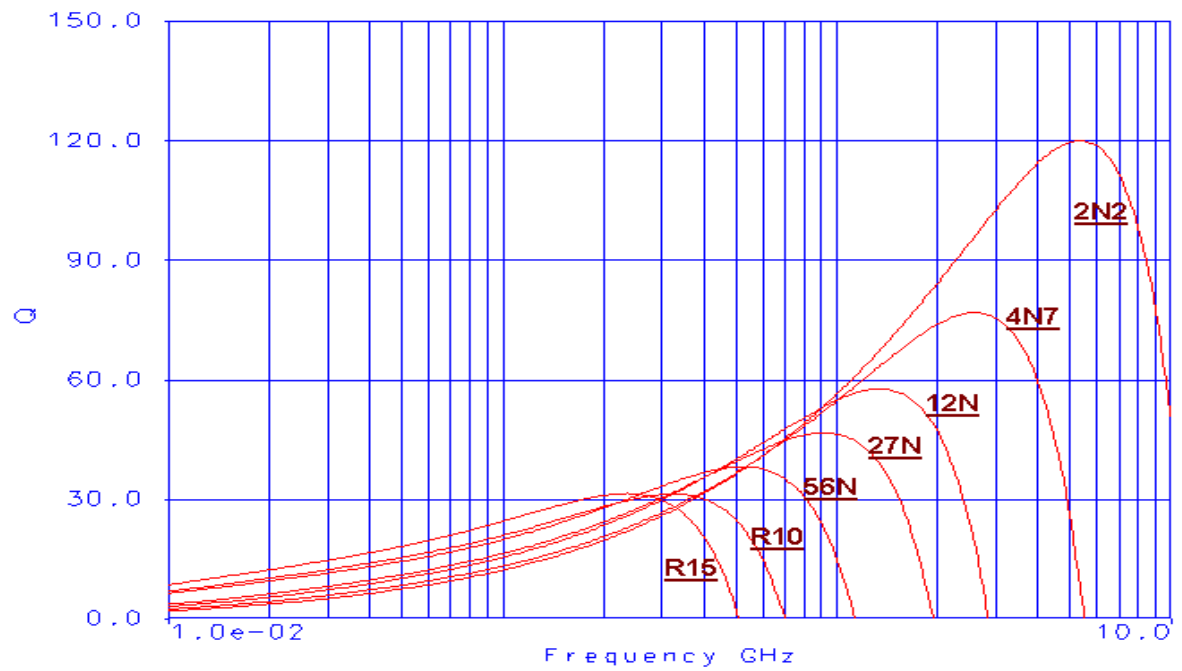
MULTILAYER CHIP INDUCTOR – CERAMIC / M0805 (2012)

M0805 Series Typical Electrical Characteristics

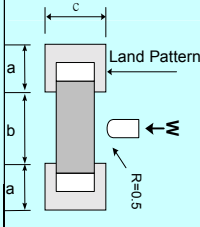
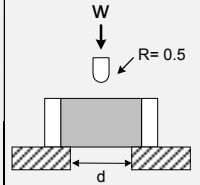
TYPICAL L vs FREQUENCY



TYPICAL Q vs FREQUENCY



RELIABILITY TEST

Item	Requirements	Procedure				
Solder ability	No apparent damage More than 75% of the terminal electrode shall be covered with new solder. L : within $\pm 10\%$ Q: within $\pm 20\%$	Preheat : $120 \pm 20^\circ\text{C}$ for ≥ 1 min. Solder : $230 \pm 10^\circ\text{C}$ for 3 ± 1 sec.				
Solder Heat Resistance	No apparent damage More than 75% of the terminal electrode shall be covered with new solder. L : within $\pm 10\%$ Q: within $\pm 20\%$	Preheat : $120 \pm 20^\circ\text{C}$ for ≥ 1 min. Solder : $260 \pm 10^\circ\text{C}$ for 10 ± 1 sec.				
Thermal Shock (Temperature Cycle)	No apparent damage L : within $\pm 10\%$ Q: within $\pm 20\%$	One cycle/step 1 : $100 \pm 5^\circ\text{C}$ for 30 ± 3 min step 2 : $-40 \pm 3^\circ\text{C}$ for 30 ± 3 min No. of cycles : 100.				
Heat Resistance with Loading	No apparent damage L : within $\pm 10\%$ Q: within $\pm 20\%$	Temperature : $85 \pm 2^\circ\text{C}$. Applied current : rated current. Duration : 1000 ± 48 hours. Recovery : 1-2hr.				
Low Temperature Resistance	No apparent damage L : within $\pm 10\%$ Q: within $\pm 20\%$	Temperature : $-40 \pm 5^\circ\text{C}$. Duration : 1000 ± 48 hours. Recovery : 1-2hr.				
Humidity Resistance with Loading	No apparent damage L : within $\pm 10\%$ Q: within $\pm 20\%$	Temperature : $40 \pm 2^\circ\text{C}$. Humidity : 90 ~ 95% RH. Applied current : rated current. Duration : 1000 ± 48 hours. Recovery : 1-2hr.				
Termination Adhesion (Flexure Strength)	No apparent damage		Type	M0402	M0603	M0805
		a (mm)	0.6	0.9	1.0	
		b (mm)	0.5	0.8	1.0	
		c (mm)	0.6	0.9	1.3	
		W (kgf)	0.75	2.0	3.5	
Body Strength (Bending Strength)	No apparent damage		Type	M0402	M0603	M0805
		d (mm)	0.4	1.0	1.5	
		W (kgf)	0.75	1.0	2.0	

Storage temperature range: $-55^\circ\text{C} \sim +100^\circ\text{C}$ ($0^\circ\text{C} \sim +40^\circ\text{C}$ for tape and reel)

Operating temperature range: $-40^\circ\text{C} \sim +100^\circ\text{C}$

Test Equipment & Method

❖ Inductance and Q

Test Equipment: HP 4291B+16192A (M0201, M0402) ; HP4291B+16193A (M0805, M0603)

Test Method : Measure L and Q at 50/100MHz (M0805, M0603) 、100MHz (M0402)

❖ Self Resonant Frequency (S.R.F.)

Test Equipment: HP 8722D

Test Method : Measure the frequency of the first transmission zero.

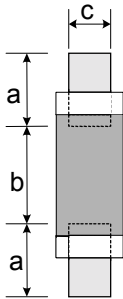
❖ DC Resistance (R_{DC})

Test Equipment: HP 4338B

Test Method : Measure the resistance value using DC source.

Soldering Conditions

❖ Recommended Pattern

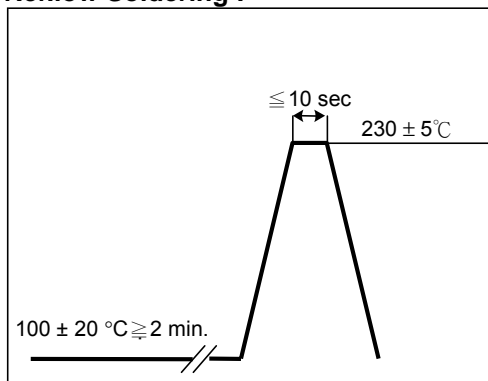


Unit : mm

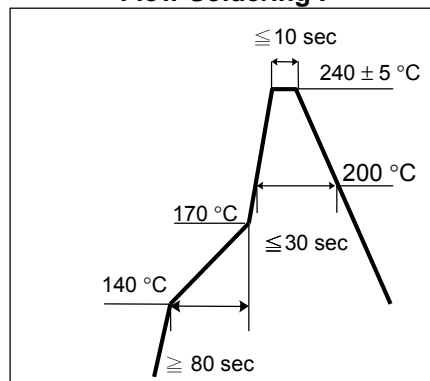
Type	M0201 (0402)	M0402 (1005)	M0603 (1608)	M0805 (2012)
a	0.2~0.3	0.5 ± 0.1	0.7 ± 0.1	1.1 ± 0.2
b	0.2~0.3	0.5 ± 0.1	0.7 ± 0.1	1.1 ± 0.2
c	0.2~0.3	0.5 ± 0.1	0.7 ± 0.1	1.1 ± 0.2

Typical Soldering Profile

Ref.low Soldering :

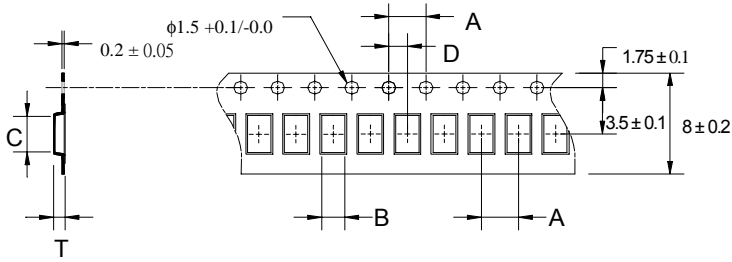


Flow Soldering :



The sample must be pre-heated before soldering .The temperature difference between preheating and soldering must be within 150 °C .

Tape Dimensions (Unit: mm)

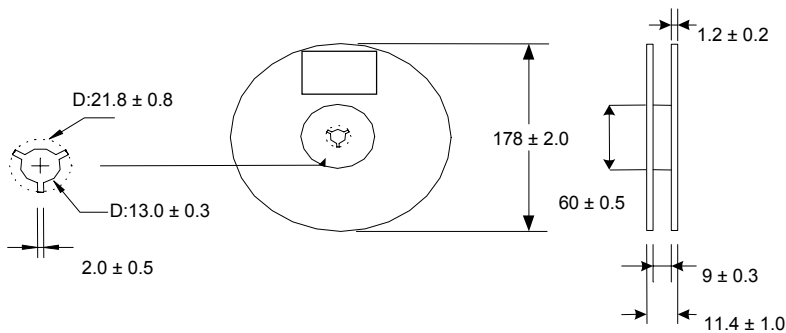


Type	A	B	C	D	T
M0402	2.0±0.1	0.6±0.1	1.1±0.1	1.0±0.1	Max.1.0
M0603	4.0±0.1	1.0±0.1	1.8±0.1	2.0±0.1	Max.1.3
M0805	4.0±0.1	1.6±0.1	2.4±0.1	2.0±0.1	Max.1.3

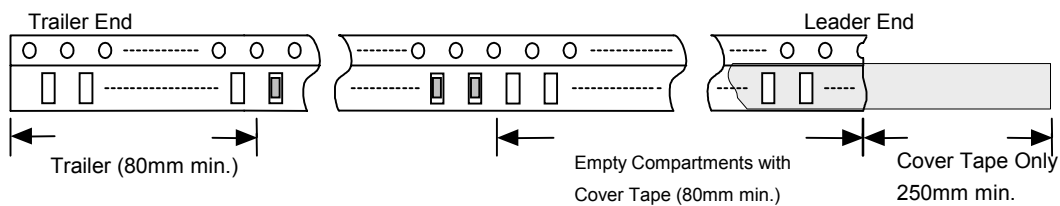
Quantity

Type	M0402	M0603	M0805
Quantity/per reel	10,000 pcs	4,000 pcs	4,000 pcs

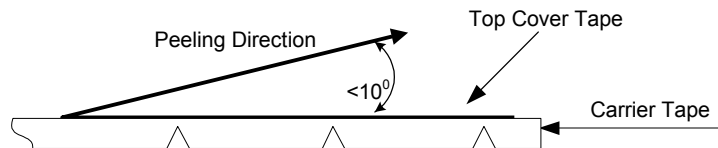
Reel Dimensions (Unit: mm)



Leader / Trailer Tape (Unit: mm)



Peel-off Force



Peel-off force should be in the range of 0.1~ 0.6N at a peel-off speed of 300±10 mm/min .