General Line Series

❖ Features

- High Q, stable inductance in wide frequency
- Good reliability (Monolithic structure)
- Magnetically shielded
- Fast mounting speed
- RoHS compliant

❖ Applications

- Computer and its peripherals
- Hard-disk drivers
- Audio/ Visual Equipment

❖ General Code

CM	2012	F	2R2	K	T
1	2	3	4	5	6

1 Series Code
CM : Chip Ferrite Inductors

2 Dimension Code
The first two digits : length(mm)
The last two digits : width(mm)

3 Material Code
F : Ferrite

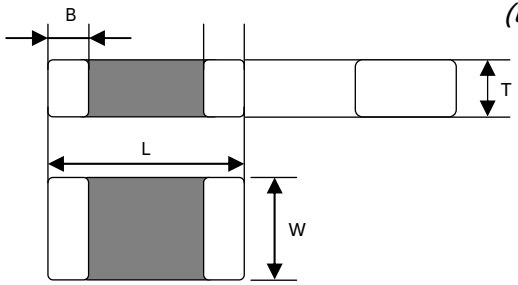
4 Inductance Value Code
22N = 22 nH 2R2 = 2.2 μH
220 = 22 μH R22 = 0.22 μH

5 Tolerance Code
K : ±10% M : ±20%

6 Packaging Code
T : Reel paper packaging
E : Reel embossed tape packaging

❖ Dimensions

(unit : mm)

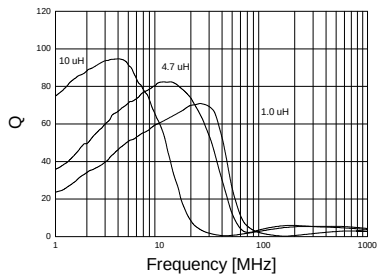


Size	L	W	T	B
1005	1.0±0.10	0.5±0.10	0.5±0.10	0.25±0.1
1608	1.6±0.15	0.8±0.15	0.8±0.15	0.3±0.2
2012	2.0±0.20	1.25±0.2	0.85±0.2 --- 1.25±0.2	0.5±0.3
3216	3.2±0.20	1.6±0.20	1.1±0.20	0.5±0.3

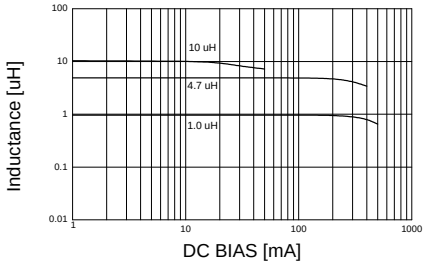
❖ Temperature Range

- Operating Temp. -40 ~ +85°C
- Storage Temp. -10 ~ +40 °C

❖ Q Characteristics



❖ DC Bias Characteristics



This description in the this catalogue is subject to change without notice

❖ 1005 SIZE

Part No.	Inductance		Q min.	Test Frequency (MHz)	SRF (MHz) min.	DC Resistance (Ω) max.	Rated Current (mA) max.	T (mm)
	(μH)	Tolerance						
CM1005FR10	0.10	±10%	15	25	190	0.6	25	0.5 ± 0.1
CM1005FR12	0.12		15	25	180	0.7	25	
CM1005FR15	0.15		15	25	165	0.9	25	
CM1005FR18	0.18		15	25	150	1.0	25	
CM1005FR22	0.22		15	25	135	1.1	25	
CM1005FR27	0.27		15	25	120	1.2	25	
CM1005FR33	0.33		15	25	105	1.25	25	
CM1005FR39	0.39		20	25	85	0.6	15	
CM1005FR47	0.47		20	25	80	0.7	15	
CM1005FR56	0.56		20	25	75	0.8	15	
CM1005FR68	0.68		20	25	70	0.9	15	
CM1005FR82	0.82		20	25	65	1.0	15	
CM1005F1R0	1.00		20	10	60	1.1	15	
CM1005F1R2	1.20		20	10	55	1.25	15	

※ Measuring Equipment

-. L : HP4291B / E4991A

-. Rdc : HP4338B

❖ 1608 SIZE

Part No.	Inductance		Q min.	Test Frequency (MHz)	SRF (MHz) min.	DC Resistance (Ω) max.	Rated Current (mA) max.	T (mm)
	(μH)	Tolerance						
CM1608FR18	0.18	±10% ±20%	15	25	165	0.60	50	0.8 ±0.15
CM1608FR22	0.22		15	25	150	0.80	50	
CM1608FR27	0.27		15	25	136	0.80	50	
CM1608FR33	0.33		15	25	125	0.85	35	
CM1608FR39	0.39		15	25	110	1.00	35	
CM1608FR47	0.47		15	25	105	1.35	35	
CM1608FR56	0.56		15	25	95	1.55	35	
CM1608FR68	0.68		15	25	80	1.70	35	
CM1608FR82	0.82		15	25	75	2.10	35	
CM1608F1R0	1.00		35	10	70	0.60	25	
CM1608F1R2	1.20		35	10	60	0.80	25	
CM1608F1R5	1.50		35	10	55	0.80	25	
CM1608F1R8	1.80		35	10	50	0.95	25	
CM1608F2R2	2.20		35	10	45	1.15	15	
CM1608F2R7	2.70		35	10	40	1.35	15	
CM1608F3R3	3.30		35	10	38	1.55	15	
CM1608F3R9	3.90		35	10	36	1.70	15	
CM1608F4R7	4.70		35	10	33	2.10	15	
CM1608F100	10.0		35	2	17	2.55	5	

※ Measuring Equipment

-. L : HP4291B / E4991A

-. Rdc : HP4338B

❖ 2012 SIZE

Part No.	Inductance		Q min.	Test Frequency (MHz)	SRF (MHz) min.	DC Resistance (Ω) max.	Rated Current (mA) max.	T (mm)
	(μH)	Tolerance						
CM2012FR22	0.22	±10% ±20%	20	25	170	0.50	250	0.85 1.25 ±0.2
CM2012FR27	0.27		20	25	150	0.50	250	
CM2012FR33	0.33		20	25	145	0.55	250	
CM2012FR47	0.47		25	25	125	0.65	200	
CM2012FR56	0.56		25	25	115	0.75	150	
CM2012FR68	0.68		25	25	105	0.80	150	
CM2012FR82	0.82		25	25	100	1.00	150	
CM2012F1R0	1.0		45	10	75	0.40	50	
CM2012F1R5	1.5		45	10	60	0.50	50	
CM2012F1R8	1.8		45	10	55	0.60	50	
CM2012F2R2	2.2		45	10	50	0.65	30	
CM2012F2R7	2.7		45	10	45	0.75	30	
CM2012F3R3	3.3		45	10	41	0.80	30	
CM2012F3R9	3.9		45	10	38	0.90	30	
CM2012F4R7	4.7		45	10	35	1.00	30	
CM2012F5R6	5.6		50	4	32	0.90	15	
CM2012F6R8	6.8		50	4	29	1.00	15	
CM2012F8R2	8.2		50	4	26	1.10	15	
CM2012F100	10		50	2	24	1.15	15	
CM2012F120	12		50	2	22	1.25	15	
CM2012F150	15		30	1	19	0.80	5	
CM2012F220	22		30	1	16	1.10	5	

※ Measuring Equipment

-. L : HP4291B / E4991A

-. Rdc : HP4338B

❖ 3216 SIZE

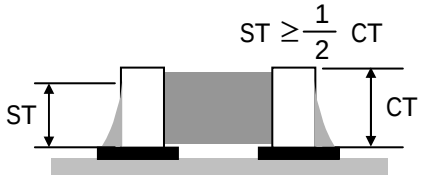
Part No.	Inductance		Q min.	Test Frequency (MHz)	SRF (MHz) min.	DC Resistance (Ω) max.	Rated Current (mA) max.	T (mm)
	(μH)	Tolerance						
CM3216F1R0	1.0	±10%	45	10	75	0.40	100	1.10 ±0.2
CM3216F1R5	1.5		45	10	60	0.50	50	
CM3216F1R8	1.8		45	10	55	0.50	50	
CM3216F2R2	2.2		45	10	50	0.60	50	
CM3216F3R3	3.3		45	10	41	0.70	50	
CM3216F4R7	4.7		45	10	35	0.80	50	
CM3216F5R6	5.6		50	4	32	0.60	25	
CM3216F6R8	6.8		50	4	29	0.60	25	
CM3216F8R2	8.2		50	4	26	0.90	25	
CM3216F100	10		50	2	24	0.70	25	
CM3216F120	12		50	2	22	1.05	25	
CM3216F150	15		35	1	19	1.10	25	

※ Measuring Equipment

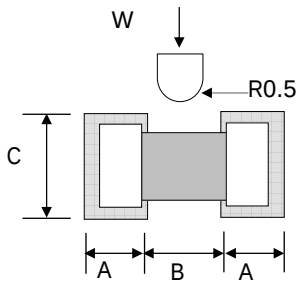
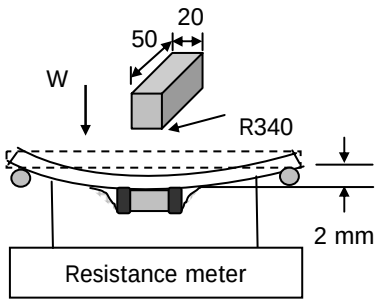
-. L : HP4291B / E4991A

-. Rdc : HP4338B

Reliability & Test Condition

Item	Requirements	Test Conditions
Operating temperature range	- 40 ℃ ~ + 85 ℃	-
Storage temperature range	40 ℃ max., 70% RH max.	at packing condition
Solderability	More than 90% of the terminal electrode shall be covered with new solder	Preheat temperature : 100 ~ 150 ℃ Preheat time : 60 sec. Solder temperature : 245 ± 5 ℃ Soldering time : 10 ± 1 sec.
Resistance to soldering heat	1. No damage such as cracks should be caused in chip element 2. More than 75% of the terminal electrode shall be covered with new solder 3. Inductance shall not change more than ±10 % 4. Q shall not change more than ±20 %	Preheat temperature : 100 ~ 150 ℃ Preheat time : 60 sec. Solder temperature : 270 ± 10 ℃ Soldering time : 10 ± 0.5 sec.
Reflow soldering	More than 50% of the terminal electrode shall be covered with new solder 	Preheat temperature : 150 ℃ Preheat time : 60 sec. Solder temperature : 245 ± 5 ℃ Soldering time : 10 sec. max. (Reflow soldering profile)
High temperature resistance	1. No mechanical damage 2. Inductance shall not change more than ±10 % 3. Q shall not change more than ±20 %	Temperature : 85 ± 3 ℃ Time : 500 ± 12 hours Measurement at room ambient temperature after placing for 24 hours
High temperature load resistance		Temperature : 85 ± 3 ℃ Applied current : rated current Time : 1000 ± 12 hours Measurement at room ambient temperature after placing for 24 hours
Humidity resistance		Temperature : 40 ± 2 ℃ Humidity : 90 ± 2 % RH Time : 500 ± 12 hours Measurement at room ambient temperature after placing for 24 hours

Reliability & Test Condition

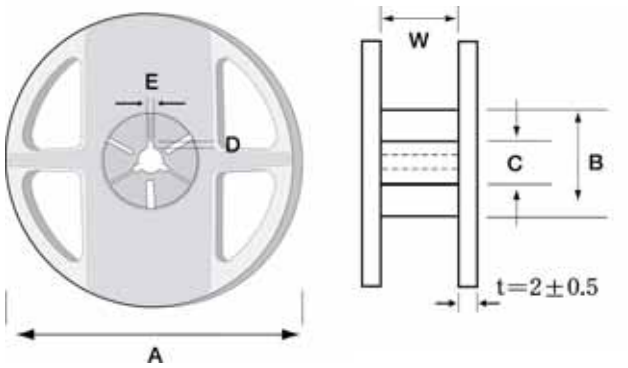
<table>
<tr><th>Item</th><th>Requirements</th><th>Test Conditions</th></tr>
<tr><td>Humidity load resistance</td><td rowspan="4">1. No mechanical damage
2. Inductance shall not change more than ±10 %
3. Q shall not change more than ±20 %</td><td>Temperature : 40 ± 2 ℃
Humidity : 90 ± 2 % RH
Applied current : rated current
Time : 500 ± 12 hours
Measurement at room ambient temperature after placing for 24 hours</td></tr>
<tr><td>Low temperature resistance</td><td>Temperature : -40 ± 3 ℃
Time : 1000 ± 12 hours
Measurement at room ambient temperature after placing for 24 hours</td></tr>
<tr><td>Thermal shock</td><td>1. -40 ± 3℃ for 30 minutes
2. 85 ± 3 ℃ for 30 minutes
3. repeat 100 cycle</td></tr>
<tr><td>Vibration</td><td>Frequency : 10 ~ 55 Hz
Amplitude : 1.5 mm
Direction : X, Y, Z
Sweep time : 2 hours for each axis</td></tr>
<tr><td>Drop</td><td></td><td>Drop 10 times on a concrete floor from a height of 100 cm</td></tr>
<tr><td>Flexure strength</td><td>No mechanical damage
<table>
<tr><th>ITEM</th><th>1005</th><th>1608</th><th>2012</th><th>3216</th></tr>
<tr><td>A (mm)</td><td>0.7</td><td>1.0</td><td>1.0</td><td>1.3</td></tr>
<tr><td>B (mm)</td><td>0.5</td><td>0.8</td><td>1.0</td><td>1.5</td></tr>
<tr><td>C (mm)</td><td>0.7</td><td>1.3</td><td>1.3</td><td>3.0</td></tr>
<tr><td>W (kgf)</td><td>0.7</td><td>2.0</td><td>4.0</td><td>5.0</td></tr>
</table></td><td> 
</td></tr>
<tr><td>Bending strength</td><td>The terminal electrode shall be neither break off nor the chip damage</td><td> 
</td></tr>
</table>

Packaging

❖ Standard Quantity

Size	Q'TY(PCS)	Remarks
1005	10,000	
1608	4,000	
2012	4,000	0.85 T size
	3,000	1.25 T size
3216	3,000	

❖ Reel Dimension

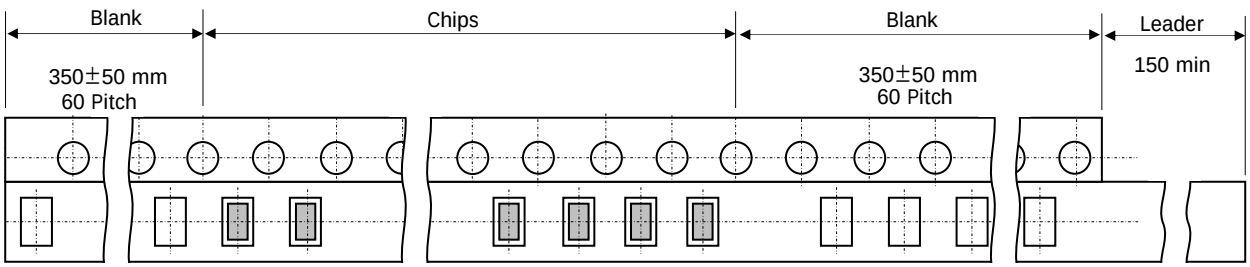


(Unit:mm)

A	B	C
Φ178±2	Φ50 min.	Φ13±0.5
D	**E**	**W**
4±0.8	2±0.2	9±1.5

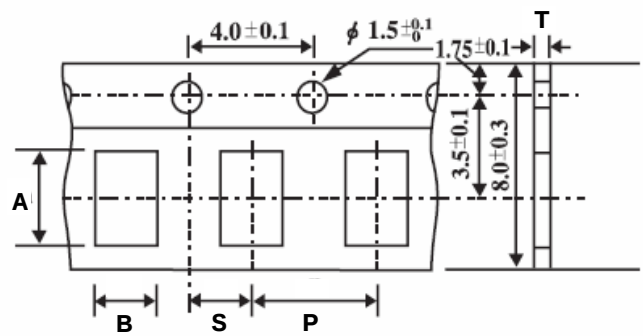
❖ Leader & Blank Portion

(Unit:mm)



Packaging

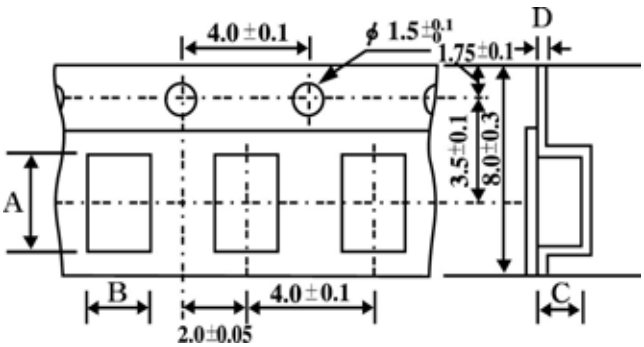
❖ Taping Dimensions (Paper tape)



(Unit:mm)

Type	A ±0.1	B ±0.1	P ±0.1	S ±0.1	T (Max.)
1005	1.15	0.65	2.0	1.0	0.8
1608	1.80	1.00	4.0	2.0	1.1
2012	2.30	1.55	4.0	2.0	1.1

❖ Taping Dimensions (Emboss tape)

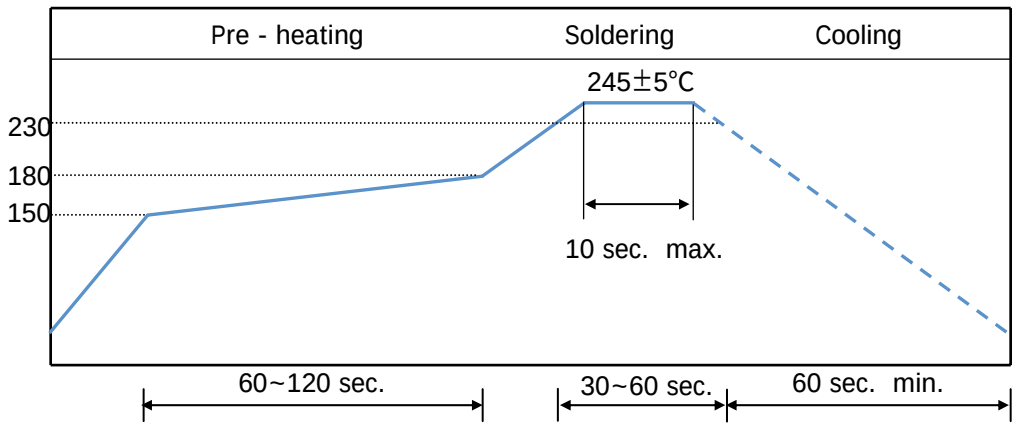


(Unit:mm)

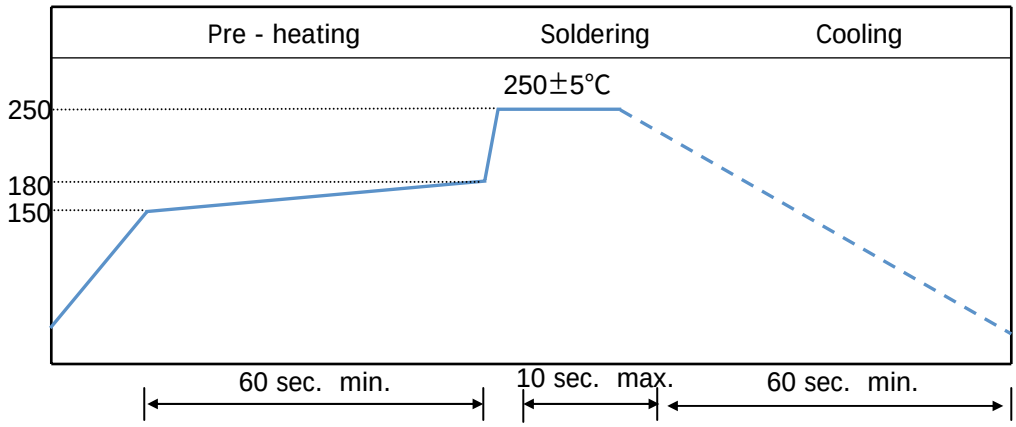
Type	A ±0.1	B ±0.1	C ±0.1	D ±0.1
2012	2.25	1.45	1.50	0.23
3216	3.50	1.85	1.25	0.23

Soldering Profile

❖ Reflow Soldering



❖ Flow Soldering



❖ Manual Soldering