



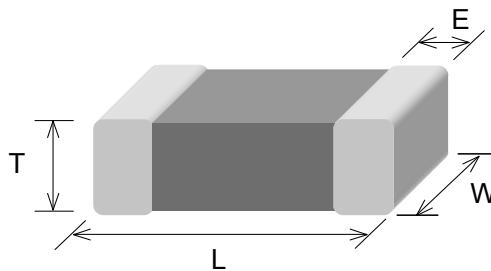
■ FEATURES

- Monolithic construction for high reliability.
- No cross coupling between inductors due to magnetic shield and is suitable for high density printed circuit boards.
- Excellent solderability and heat resistance for reflow soldering.

■ APPLICATIONS

TO suppress EMI/RFI and to prevent self-oscillation in electronic products.
RF and wireless communication, information technology equipment which includes computer, telecommunications, radar detectors, automotive elect.

■ SHAPES AND DIMENSIONS



Unit: mm

TYPE	160808 (EIA0603)	201209 (EIA0805)	201212 (EIA0805)	321611 (EIA 1206)
L	1.6±0.15	2.0±0.20	2.0±0.20	3.2±0.20
W	0.8±0.15	1.25±0.2	1.25±0.2	1.6±0.20
T	0.8±0.15	0.85±0.20	1.25±0.2	1.1±0.30
E	0.2~0.6	0.2~0.8	0.2~0.8	0.4~1.0

■ PART NUMBER CODE

MFI 3216 4R7 K A
1 2 3 4 5

- 1 Series Name
- 2 Size Code: the first two digitals : length(mm), the last two digitals : width(mm)
- 3 Inductance (R=Decimal Point) Unit : μH
- 4 Tolerance : J= $\pm 5\%$, K= $\pm 10\%$, M = $\pm 20\%$
- 5 Soldering : Green Parts: A—Lead-Free



■ PART NUMBER AND CHARACTERISTICS TABLE

1. MFI1608 Series

Part No.	Inductance & Tolerance (μH)	Q (min)	L,Q Test Freq. (MHz)	L,Q Test Voltage (mV)	S.R.F (MHz) min	DCR(Ω) (max)	Rated Current (mA)
MFI1608 R10KA	0.10 ± 10%	15	15	100	240	0.50	50
MFI1608 R12KA	0.12 ± 10%	15	15	100	205	0.50	50
MFI1608 R15KA	0.15 ± 10%	15	15	100	180	0.60	50
MFI1608 R18KA	0.18 ± 10%	15	15	100	165	0.60	50
MFI1608 R22KA	0.22 ± 10%	15	15	100	150	0.80	50
MFI1608 R27KA	0.27 ± 10%	15	15	100	136	0.80	50
MFI1608 R33KA	0.33 ± 10%	15	15	100	125	0.85	35
MFI1608 R39KA	0.39 ± 10%	15	15	100	110	1.00	35
MFI1608 R47KA	0.47 ± 10%	15	15	100	105	1.35	35
MFI1608 R56KA	0.56 ± 10%	15	15	100	95	1.55	35
MFI1608 R68KA	0.68 ± 10%	15	15	100	90	1.70	35
MFI1608 R82KA	0.82 ± 10%	15	15	100	85	2.10	35
MFI1608 1R0KA	1.0 ± 10%	35	10	100	75	0.60	25
MFI1608 1R2KA	1.2 ± 10%	35	10	100	65	0.80	25
MFI1608 1R5KA	1.5 ± 10%	35	10	100	60	0.80	25
MFI1608 1R8KA	1.8 ± 10%	35	10	100	55	0.95	25
MFI1608 2R2KA	2.2 ± 10%	35	10	100	50	1.15	15
MFI1608 2R7KA	2.7 ± 10%	35	10	100	45	1.35	15
MFI1608 3R3KA	3.3 ± 10%	35	10	100	40	1.55	15
MFI1608 3R9KA	3.9 ± 10%	35	10	100	35	1.70	15
MFI1608 4R7KA	4.7 ± 10%	35	10	100	33	2.10	15
MFI1608 5R6KA	5.6 ± 10%	35	4	100	22	1.55	5
MFI1608 6R8KA	6.8 ± 10%	35	4	100	20	1.70	5
MFI1608 8R2KA	8.2 ± 10%	35	4	100	18	2.10	5
MFI1608 10RKA	10 ± 10%	30	2	100	17	1.85	3



2. MFI2012 Series

Part No.	Thickness (mm)	Inductance & Tolerance (μ H)	Q (min)	L,Q Test Freq./Voltage (MHz)/(mV)	S.R.F (MHz) min	DCR(Ω) (max)	Rated Current (mA)
MFI2012 R10KA	0.85 \pm 0.2	0.10 \pm 10%	20	25/250	235	0.3	250
MFI2012 R12KA	0.85 \pm 0.2	0.12 \pm 10%	20	25/250	220	0.3	250
MFI2012 R15KA	0.85 \pm 0.2	0.15 \pm 10%	20	25/250	200	0.4	250
MFI2012 R18KA	0.85 \pm 0.2	0.18 \pm 10%	20	25/250	185	0.4	250
MFI2012 R22KA	0.85 \pm 0.2	0.22 \pm 10%	20	25/250	170	0.5	250
MFI2012 R27KA	0.85 \pm 0.2	0.27 \pm 10%	20	25/250	150	0.5	250
MFI2012 R33KA	0.85 \pm 0.2	0.33 \pm 10%	20	25/250	145	0.55	250
MFI2012 R39KA	0.85 \pm 0.2	0.39 \pm 10%	25	25/250	135	0.65	200
MFI2012 R47KA	0.85 \pm 0.2	0.47 \pm 10%	25	25/250	125	0.65	200
MFI2012 R56KA	0.85 \pm 0.2	0.56 \pm 10%	25	25/250	115	0.75	150
MFI2012 R68KA	0.85 \pm 0.2	0.68 \pm 10%	25	25/250	105	0.8	150
MFI2012 R82KA	0.85 \pm 0.2	0.82 \pm 10%	25	25/250	100	1.0	150
MFI2012 1R0KA	0.85 \pm 0.2	1.0 \pm 10%	45	10/250	75	0.4	50
MFI2012 1R2KA	0.85 \pm 0.2	1.2 \pm 10%	45	10/250	65	0.5	50
MFI2012 1R5KA	0.85 \pm 0.2	1.5 \pm 10%	45	10/250	60	0.5	50
MFI2012 1R8KA	0.85 \pm 0.2	1.8 \pm 10%	45	10/250	55	0.6	50
MFI2012 2R2KA	0.85 \pm 0.2	2.2 \pm 10%	45	10/250	50	0.65	30
MFI2012 2R7KA	1.25 \pm 0.2	2.7 \pm 10%	45	10/250	45	0.75	30
MFI2012 3R3KA	1.25 \pm 0.2	3.3 \pm 10%	45	10/250	41	0.8	30
MFI2012 3R9KA	1.25 \pm 0.2	3.9 \pm 10%	45	10/250	38	0.9	30
MFI2012 4R7KA	1.25 \pm 0.2	4.7 \pm 10%	45	10/250	35	1.0	30
MFI2012 5R6KA	1.25 \pm 0.2	5.6 \pm 10%	50	4/250	32	0.9	15
MFI2012 6R8KA	1.25 \pm 0.2	6.8 \pm 10%	50	4/250	29	1.0	15
MFI2012 8R2KA	1.25 \pm 0.2	8.2 \pm 10%	50	4/250	26	1.1	15
MFI2012 10RKA	1.25 \pm 0.2	10.0 \pm 10%	50	2/100	24	1.15	15
MFI2012 22RKA	1.25 \pm 0.2	22.0 \pm 10%	30	1/100	16	1.1	5



3. MFI3216 Series

Part No.	Inductance & Tolerance (μH)	Q (min)	L,Q Test Freq./Voltage (MHz)/(mV)	S.R.F (MHz) min	DCR (Ω) (max)	Rated Current (mA)
MFI3216 1R0KA	1.0 \pm 10%	45	10/250	75	0.4	100
MFI3216 4R7KA	4.7 \pm 10%	45	10/250	35	0.9	50
MFI3216 10RKA	10.0 \pm 10%	50	2/200	24	1.0	25
MFI3216 22RKA	22.0 \pm 10%	35	1/100	16	0.9	5

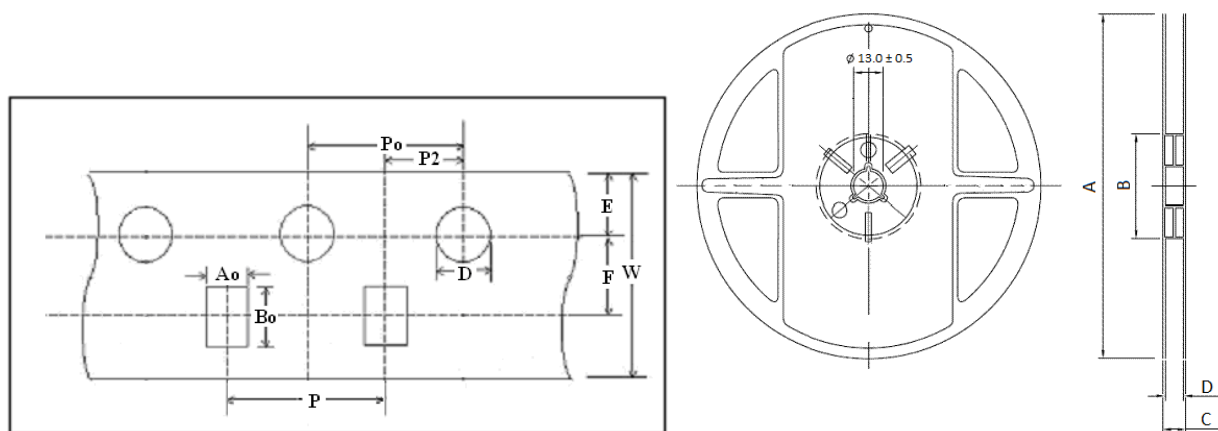
Test Equipment

Inductance: HP 4286A or equivalent.

DC Resistance: HP 4338 mili-ohm meter or equivalent.



■ PACKAGING SPECIFICATIONS



1. Taping Dimensions

Unit: mm

	160808	201209	201212	321611
Carrier type	PAPER	PAPER	PLASTIC	PLASTIC
W	8.0 ±0.2	8.0 ±0.2	8.0 ±0.2	8.0 ±0.2
P	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1
E	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1
F	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05
D	1.55 ±0.1	1.55 ±0.1	1.55 ±0.05	1.55 ±0.05
Po	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1
P2	2.0 ±0.05	2.0 ±0.05	2.0 ±0.05	2.0 ±0.05
Ao	1.03 ±0.1	1.45 ±0.1	1.50 ±0.1	1.88 ±0.1
Bo	1.85 ±0.1	2.25 ±0.1	2.35 ±0.1	3.50 ±0.1

2. Reel Dimensions

Dimension	A	B	C	D
mm	178	50 min.	20 max.	10±1.5

3. Packaging Quantity

	1608 (0603)	201209 (0805)	201212 (0805)	3216 (1206)
Qty. (Pcs/Reel)	4,000	4,000	3,000	3,000

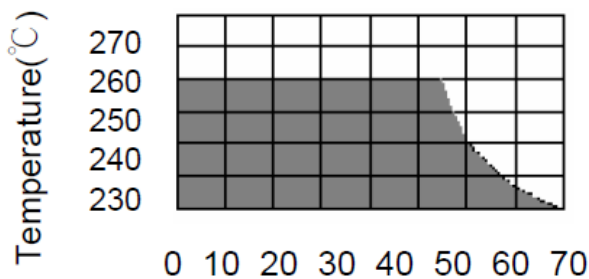


■ RECOMMENDED SOLDERING CONDITIONS

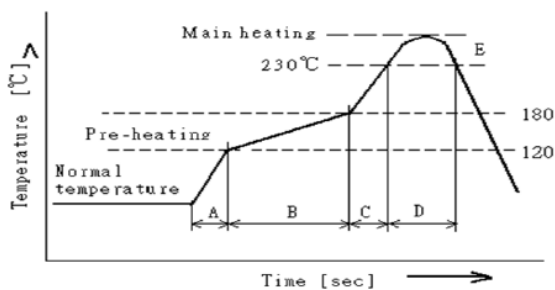
1. Reflow soldering conditions

1.1. Pre-heating should be in such a way that the temperature difference between solder and ferrite surface is limited to 150°C max. Also cooling into solvent after soldering should be in such a way that the temperature difference is limited to 100°C max. Unenough pre-heating may cause cracks on the ferrite, resulting in the deterioration of product quality.

1.2. Products should be soldered within the following allowable range indicated by the slanted line. The excessive soldering conditions may cause the corrosion of the electrode, when soldering is repeated, allowable time is the accumulated time.



Temperature Profile



A	Slope of temp. rise	1 to 5	°C/sec
B	Heat time	50 to 150	sec
	Heat temperature	120 to 180	°C
C	Slope of temp. rise	1 to 5	°C/sec
D	Time over 230°C	90~120	sec
E	Peak temperature	255~260	°C
	Peak hold time	10 max.	sec
No. of mounting		3	times

(Melting area of solder)

2. Reworking with soldering iron

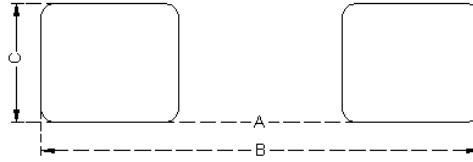
Preheating	150°C, 1 minute
Tip temperature	280°C max.
Soldering time	3 seconds max.
Soldering iron output	30w max.
End of soldering iron	φ 3mm max.

- Reworking should be limited to only one time.

Note: Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the ferrite material due to the thermal shock.



3. Recommended Land Patterns for Reflow Soldering



Unit: mm (inches)

Size	A	B	C
1608	0.6 (0.023)	2.6 (0.102)	0.8 (0.031)
2012	0.66 (0.026)	3.23 (0.127)	1.47 (0.058)
3216	2.2 (0.087)	4.4 (0.173)	2.06 (0.081)

■ GENERAL TECHNICAL DATA

1. Operating temperature range : - 40°C ~ +125°C

2. Storage

2.1. Storage Condition : -5°C~ 40°C and less than 70% RH.

2.2. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust or harmful gas (hydrogen chloride, sulfurous acid gas or hydrogen sulfide).

2.3. Packaging material may be deformed if packages are stored where they are exposed to heat or direct sunlight.

2.4. Minimum packages, such as polyvinyl heat—seal packages shall not be opened until just before they are used. If opened, use the reels as soon as possible.

2.5. Storage Time: 6 months from the date of delivery on condition that they are stored at the environment specified clause 2.1 & 2.2.

For those parts which passed more than 6 months shall be checked solderability before it is used.



■ RELIABILITY AND TEST CONDITION

Test item	Test Condition	Criteria
High Temperature Resistance	1. Temperature: 125 ±2°C 2. Test time: 1000 ± 12 hrs 3. Measurement: at ambient temperature 24 hours after test completion	1.No mechanical damage 2.Inductance value should be within ±20% of the initial value
Humidity Resistance	1. Temperature: 85°C ±2°C 2. Humidity: 85 ± 5 % RH 3. Testing time: 1000 ± 12 hrs 4. Measurement: at ambient temperature 24 hours after test completion	1.No mechanical damage 2.Inductance value should be within ±20% of the initial value
Temperature Cycle	1. Temperature:-55 ~ 125°C 2. Cycle: 1000 cycles 3. Dwell time: 30 minutes 4. Measurement: at ambient temperature 24 hours after test completion	1.No mechanical damage 2.Inductance value should be within ±20% of the initial value
VIBRATION TEST	1. Frequency and Amplitude:10-2000-10Hz 2. Direction: X,Y,Z 3. Test duration:4 hours for each direction, 12 hours in total.	1.No mechanical damage 2.Inductance value should be within ±20% of the initial value
Mechanical Shock TEST	1. Peak acceleration : 100 g's 2. Duration of pulse : 6 ms 3. Waveform : Half-sine 4. Velocity change : 12.3 ft/sec 5. Direction : X , Y , Z (3axes/3 times)	1.No mechanical damage 2.Inductance value should be within ±20% of the initial value
Terminal strength Test	Solder chip on PCB and applied 10N (1.02 Kgf) for 10 sec.	Terminal strength does not distort the case shall meet SPEC DC resistance specifications.
Resistance to Solder Heat	1. Solder temperature: 265 ±3°C 2. Immersion time: 6 ±1 sec 3. Preheating: 100°C to 150°C, 1 minute. 4. Measurement: at ambient temperature 24 hours after test completion Solder: Sn-3Ag-0.5Cu	1.No visible damage. 2. Electrical characteristics and mechanic characteristics shall be satisfied.
Solderability	1. Solder temperature: 240 ±5°C 2. Immersion time: 3 ±1 sec Solder: Sn-3Ag-0.5Cu	More than 95% of terminal electrode should be covered with new solder.