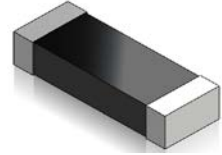


1. Features of CI Family :

- Multilayer high current chip beads are SMD components that possess a ultra-low DC resistance. When this component is inserted in series with a noise high current conduction path, the noise content can be attenuated.
- High current circuits due to its extremely low DC resistance. It can meet the power line to a maximum of DC-6A.
- Operating Temperature Range : -55°C to 125°C



2. Applications:

- Various power lines of electronic equipment.
- Mother board, tablet PC, notebook, desktop computers and peripheral equipment.
- DSC, DVC, LCD Television, Set Top Box.
- Digital communication equipment.
- Various automotive electronics.

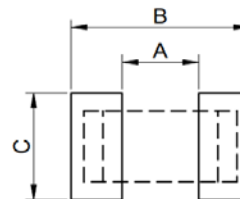
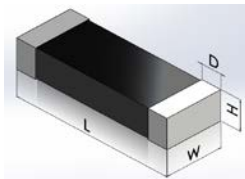
3. Product Identification:

CI 100505 A - 100 - 1

① ② ③ ④ ⑤

- ① Product Family Code
- ② Dimension Code (LxWxH)mm
- ③ Design Code
- ④ Impedance
- ⑤ Code for Special Specification

4. Dimensions and Recommended PCB layout:



Size	L	W	H	D	A	B	C
100505(0402)	1.0±0.05	0.5±0.05	0.5±0.05	0.2±0.10	0.5	1.5	0.55
160808(0603)	1.6±0.15	0.8±0.15	0.8±0.15	0.4±0.2	0.6	2.2	0.8
201209(0805)	2.0±0.20	1.25±0.20	0.90 +0.15/-0.2	0.5±0.3	0.8	2.3	1.3
321611(1206)	3.2±0.20	1.6±0.20	1.1±0.2	0.7±0.3	2.0	4.2	2.06

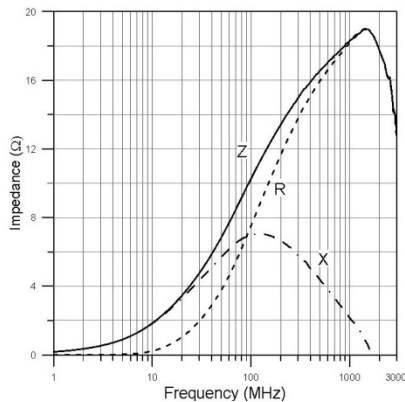
NOTE : Unit mm

1. CI100505 Series Electrical Characteristics

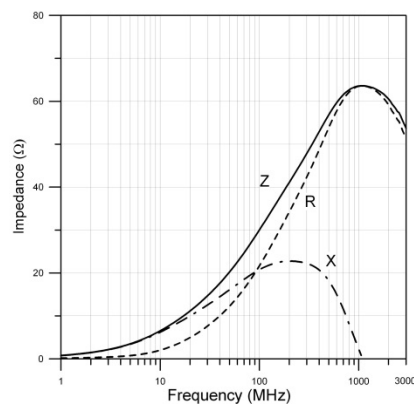
ITG Part Number	Impedance $\pm 25\%(\Omega)$	DCR (Ω)Max.	I _{rate} (mA)Max.
	At 100Mhz/0.25V		
CI100505A-100-1	10	0.03	2000
CI100505A-300-1	30	0.05	1700
CI100505A-300-2	30	0.04	2200
CI100505A-600-1	60	0.075	1500
CI100505A-800-1	80	0.07	1500
CI100505A-121-1	120	0.09	1200

2. CI100505 Series Impedance vs Frequency Characteristics:

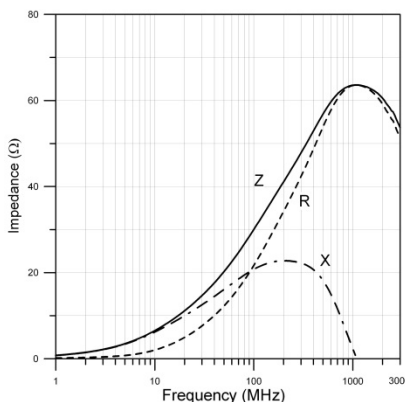
CI100505A-100-1



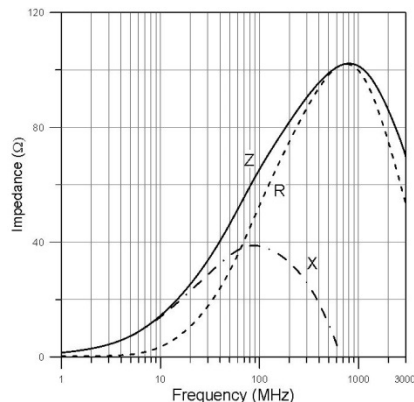
CI100505A-300-1



CI100505A-300-2

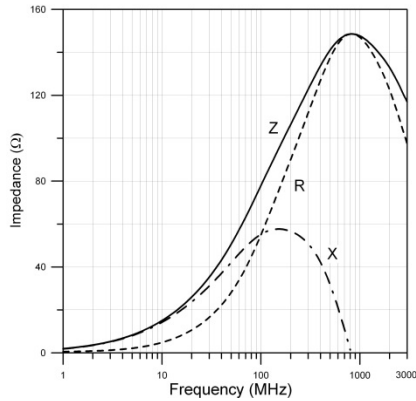


CI100505A-600-1

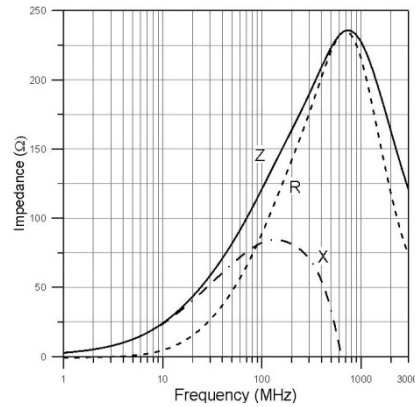


2. CI100505 Series Impedance vs Frequency Characteristics:

CI100505A-800-1



CI100505A-121-1

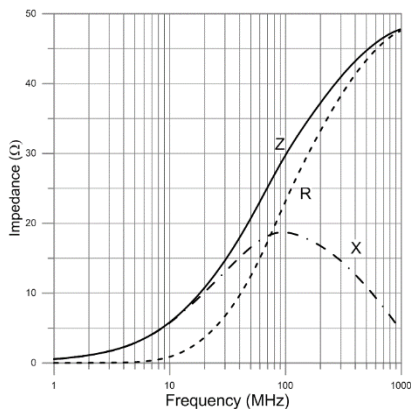


1. CI160808 Series Electrical Characteristics

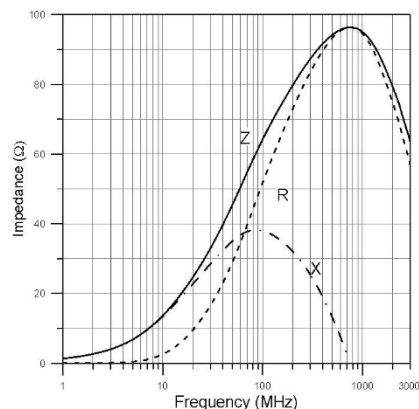
ITG Part Number	Impedance $\pm 25\%(\Omega)$	DCR (Ω)Max.	Irate (mA)Max.
	At 100Mhz/0.25V		
CI160808A-300-1	30	0.04	3000
CI160808A-600-1	60	0.04	3000
CI160808A-800-1	80	0.04	3000
CI160808A-101-1	100	0.04	3000
CI160808A-121-1	120	0.04	2000
CI160808A-181-1	180	0.08	2000
CI160808A-221-1	220	0.08	2000
CI160808A-301-1	300	0.10	1000
CI160808A-601-1	600	0.20	1000
CI160808A-102-1	1,000	0.20	1000
CI160808A-100-1	10	0.025	4000
CI160808A-220-1	22	0.008	6000
CI160808A-300-2	30	0.01	5000

2. CI160808 Series Impedance vs Frequency Characteristics:

CI160808A-300-1

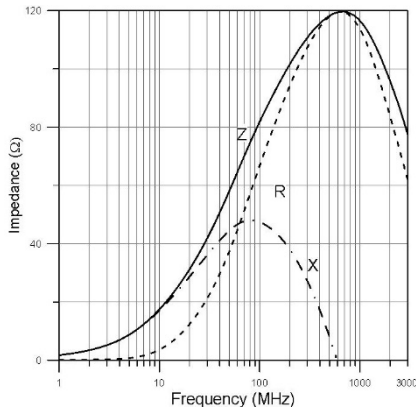


CI160808A-600-1

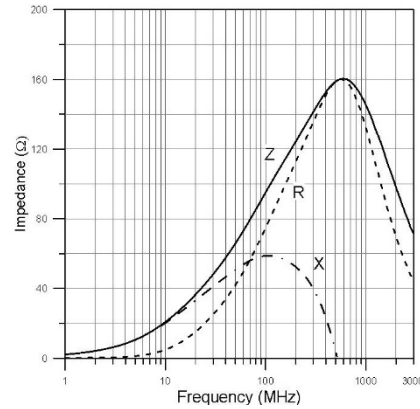


2. CI160808 Series Impedance vs Frequency Characteristics:

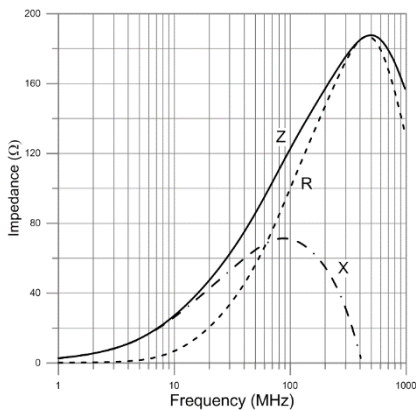
CI160808A-800-1



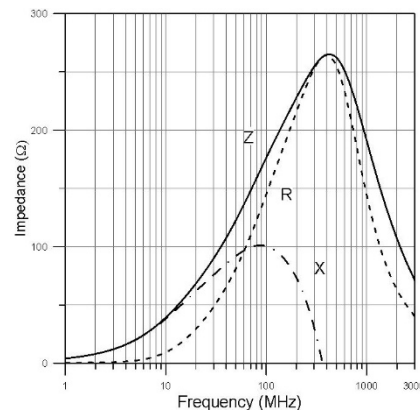
CI160808A-101-1



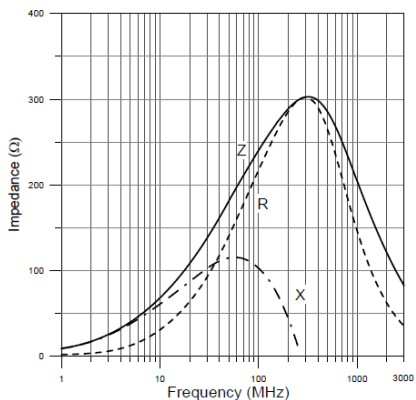
CI160808A-121-1



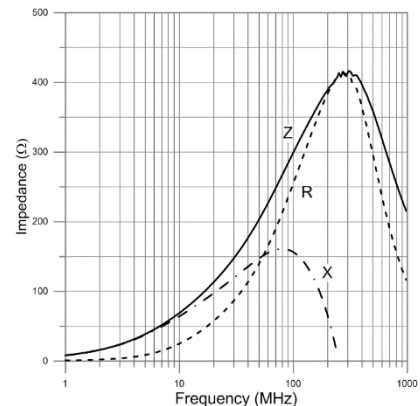
CI160808A-181-1



CI160808A-221-1

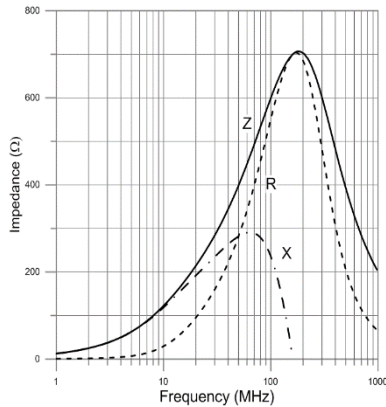


CI160808A-301-1

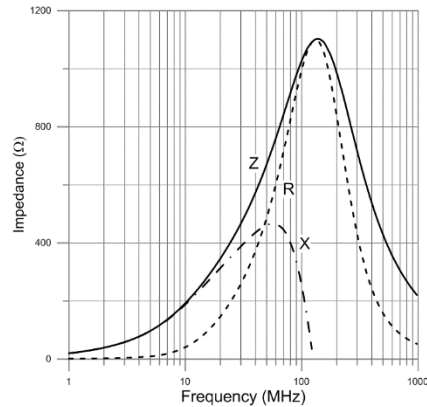


2. CI160808 Series Impedance vs Frequency Characteristics:

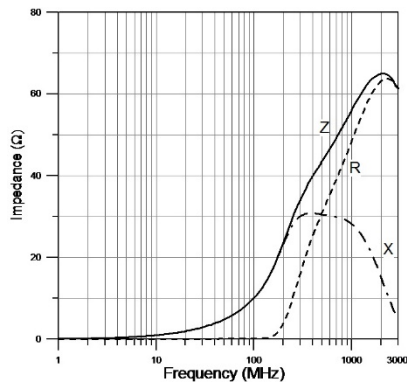
CI160808A-601-1



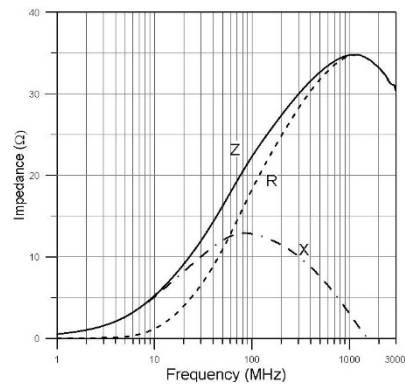
CI160808A-102-1



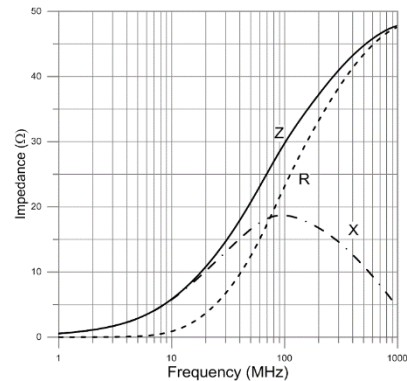
CI160808A-100-1



CI160808A-220-1



CI160808A-300-2

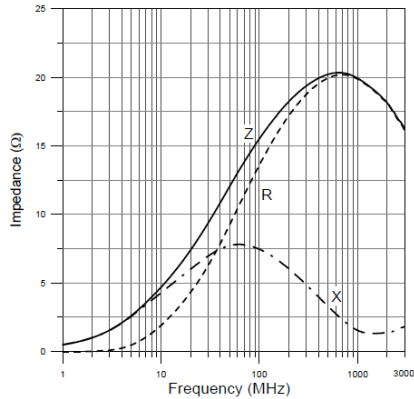


1. CI201209 Series Electrical Characteristics

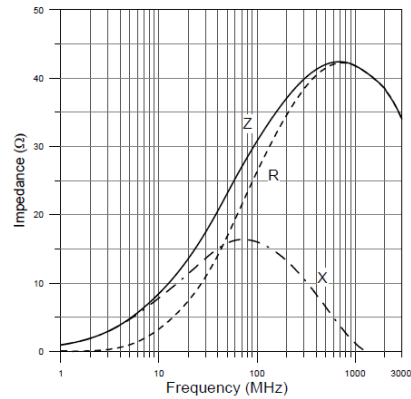
ITG Part Number	Impedance $\pm 25\%(\Omega)$	DCR (Ω)Max.	I _{rate} (mA)Max.
	At 100Mhz/0.25V		
CI201209A-170-1	17	0.03	3000
CI201209A-300-1	30	0.03	3000
CI201209A-600-1	60	0.04	3000
CI201209A-800-1	80	0.04	3000
CI201209A-101-1	100	0.04	3000
CI201209A-121-1	120	0.05	3000
CI201209A-221-1	220	0.05	3000
CI201209A-301-1	300	0.05	3000
CI201209A-601-1	600	0.10	2000
CI201209A-102-1	1,000	0.30	1000
CI201209A-152-1	1,500	0.30	1000
CI201209H-70-1	7	0.008	6000
CI201209H-110-1	11	0.008	6000
CI201209A-170-2	17	0.008	6000
CI201209A-190-1	19	0.008	6000
CI201209A-220-1	22	0.008	6000
CI201209A-300-2	30	0.008	6000
CI201209A-390-1	39	0.008	6000
CI201209A-600-2	60	0.010	5000
CI201209A-800-2	80	0.010	5000
CI201209A-121-2	120	0.020	4000
CI201209A-121-3	120	0.015	5000

2. CI201209 Series Impedance vs Frequency Characteristics:

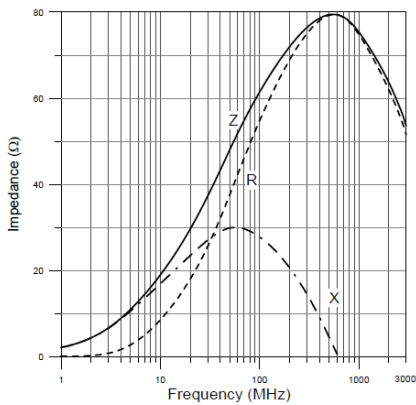
CI201209A-170-1



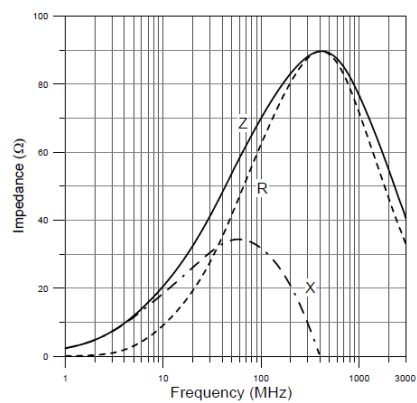
CI201209A-300-1



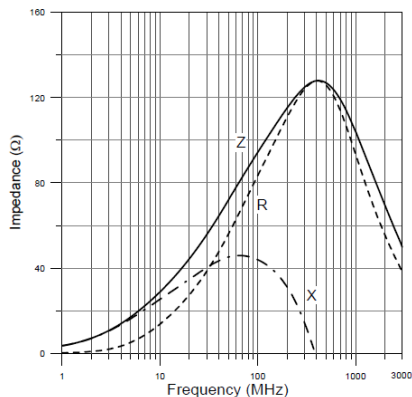
CI201209A-600-1



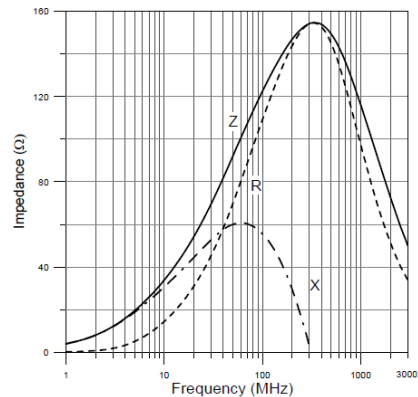
CI201209A-800-1



CI201209A-101-1

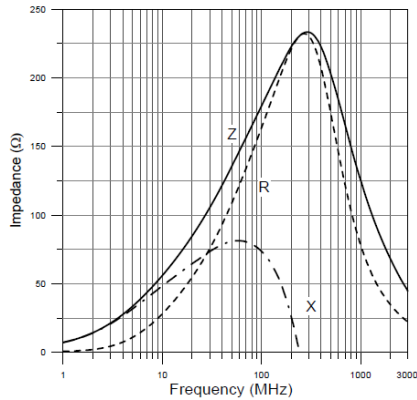


CI201209A-121-1

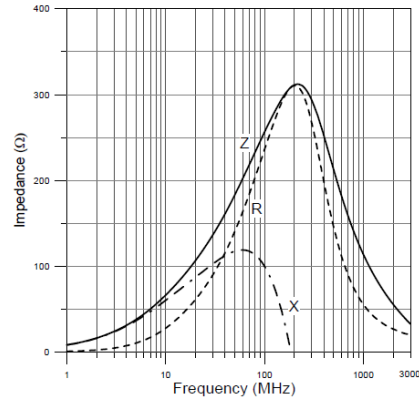


2. CI201209 Series Impedance vs Frequency Characteristics:

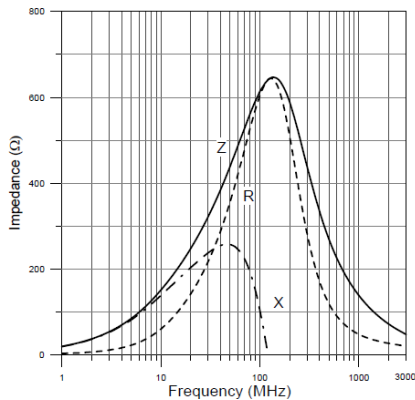
CI201209A-221-1



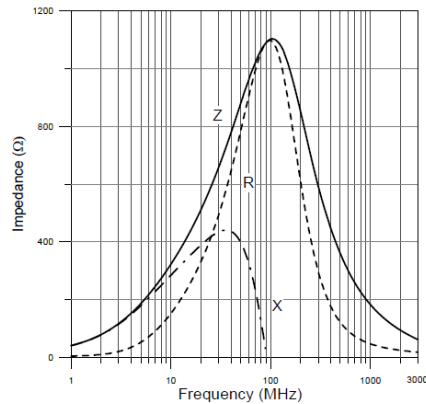
CI201209A-301-1



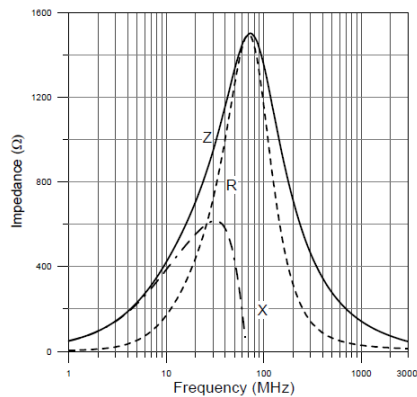
CI201209A-601-1



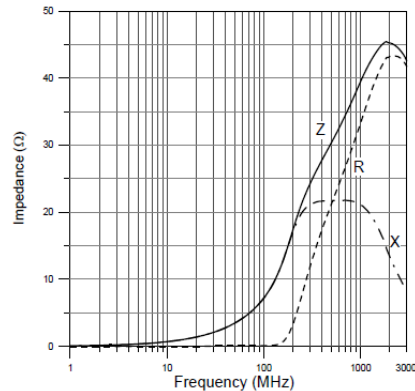
CI201209A-102-1



CI201209A-152-1

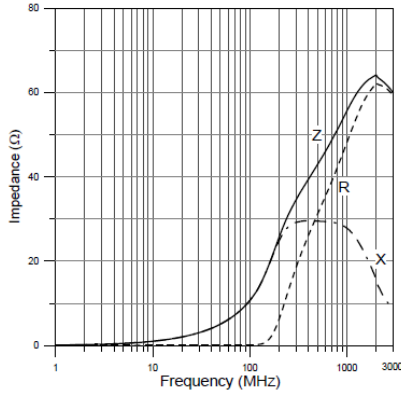


CI201209H-70-1

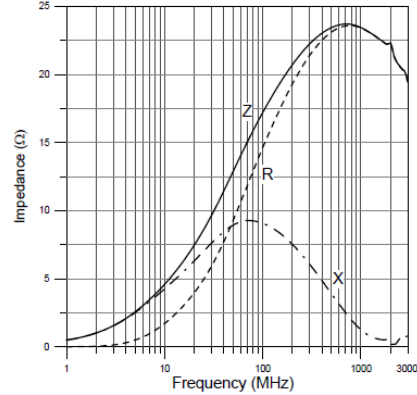


2. CI201209 Series Impedance vs Frequency Characteristics:

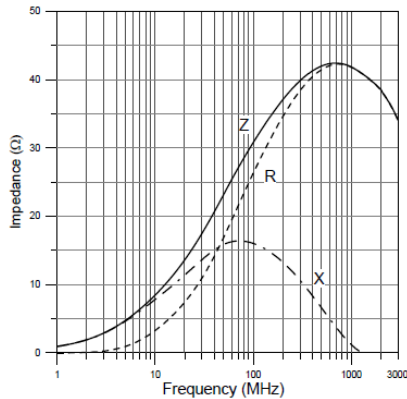
CI201209H-110-1



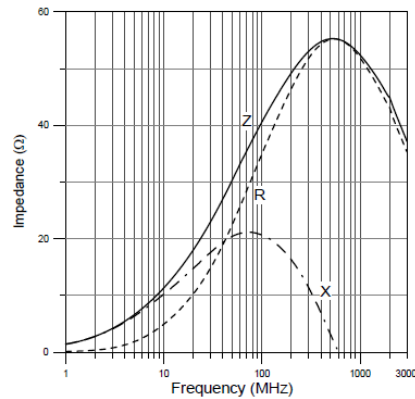
CI201209A-170-2



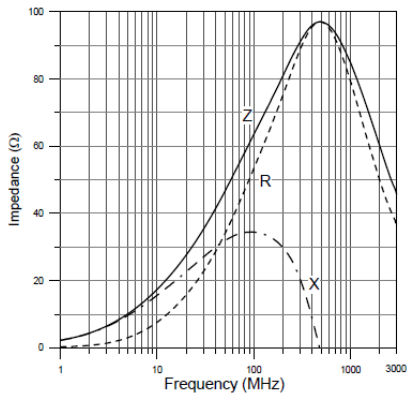
CI201209A-300-2



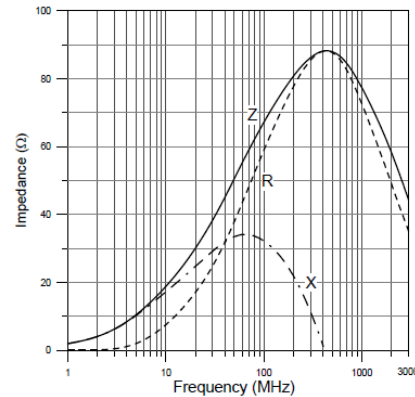
CI201209A-390-1



CI201209A-600-2

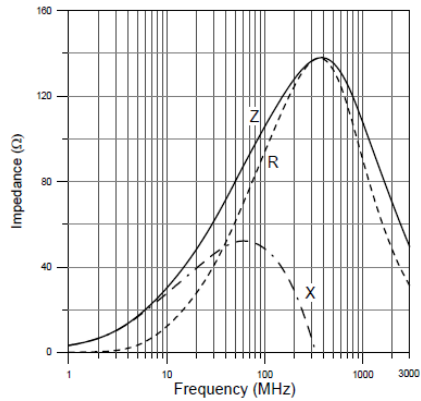


CI201209A-800-2



2. CI201209 Series Impedance vs Frequency Characteristics:

CI201209A-121-2

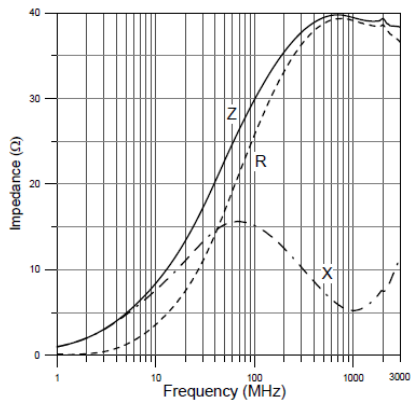


1. CI321611 Series Electrical Characteristics

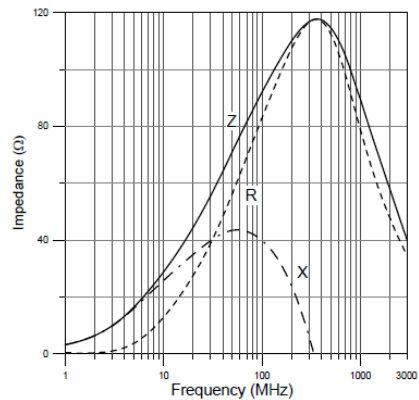
ITG Part Number	Impedance $\pm 25\%(\Omega)$	DCR (Ω)Max.	Irate (mA)Max.
	At 100Mhz/0.25V		
CI321611A-310-1	31	0.03	3000
CI321611A-600-1	60	0.03	3000
CI321611A-101-1	100	0.04	3000
CI321611A-121-1	120	0.05	3000
CI321611A-301-1	300	0.06	3000
CI321611A-501-1	500	0.07	2500
CI321611A-601-1	600	0.08	2000
CI321611A-601-2	600	0.06	3000
CI321611A-102-1	1,000	0.30	1000
CI321611A-330-1	33	0.006	6000
CI321611A-520-1	52	0.008	6000
CI321611A-800-1	80	0.02	4000
CI321611A-121-2	120	0.012	6000

2. CI321611 Series Impedance vs Frequency Characteristics:

CI321611A-310-1

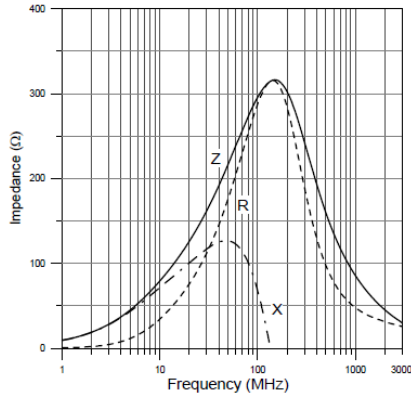


CI321611A-101-1

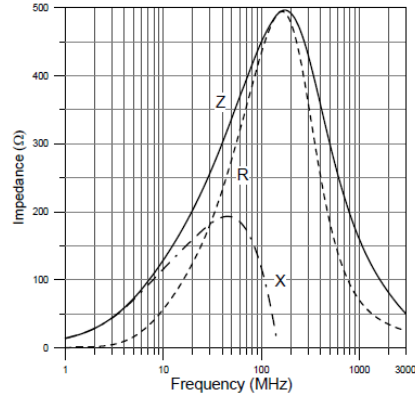


2. CI321611 Series Impedance vs Frequency Characteristics:

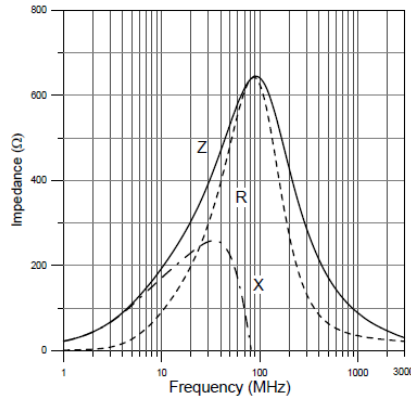
CI321611A-301-1



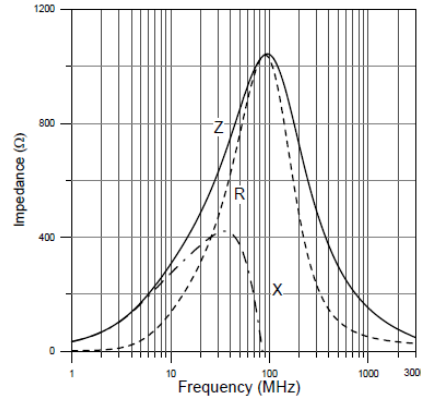
CI321611A-501-1



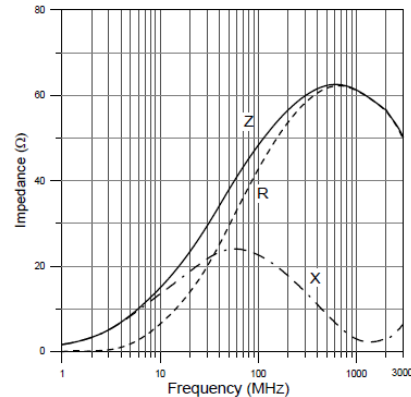
CI321611A-601-1



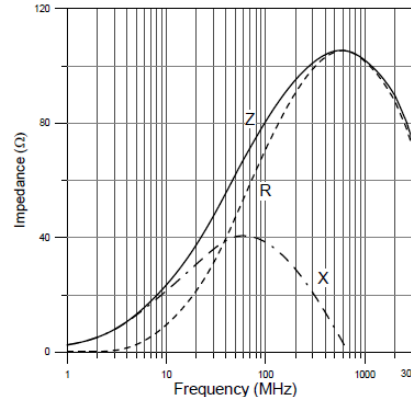
CI321611A-102-1



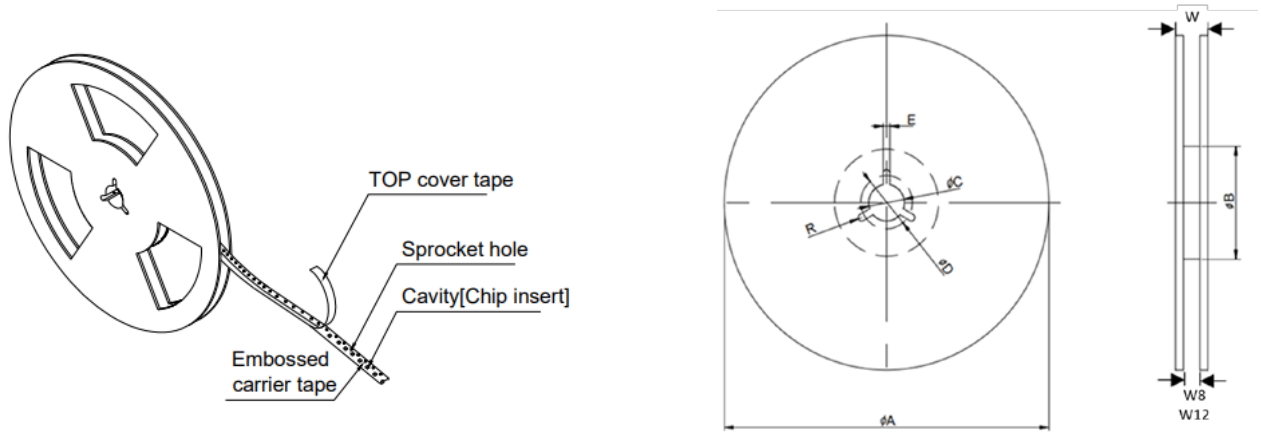
CI321611A-520-1



CI321611A-800-1



1. Reel and Carrier Tape



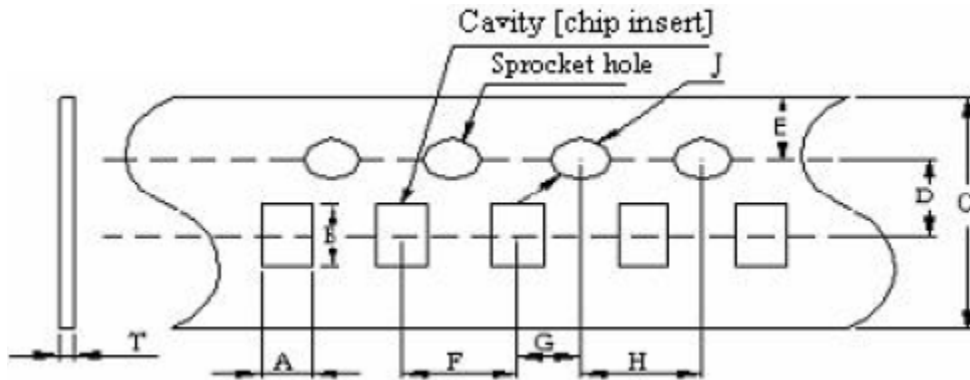
Size	T(Ø178mm) reel
A	Ø178 ± 2
B	50 Min.
C	Ø13 ± 0.5
D	Ø21 ± 0.8
E	2 ± 0.5
W8 / W12	10 ± 1.5 / 14.5 ± 1.5
W	20 Max.
R	1.0

NOTE : Unit mm

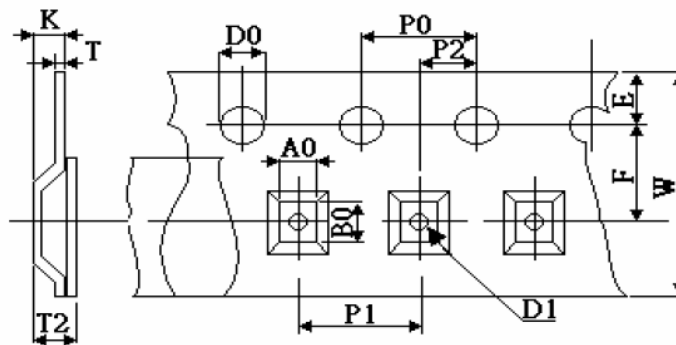
2. Packaging Quantity

Size	T(Ø178mm)(7.008 inches) reel
060303(0201)	15000 pcs /reel
100505(0402)	10000 pcs /reel
160808(0603)	4000 pcs /reel
201209(0805)	4000 pcs /reel
321611(1206)	3000 pcs /reel

3. Carrier Tape Dimension (Standard Reference: ICE 60286-3)

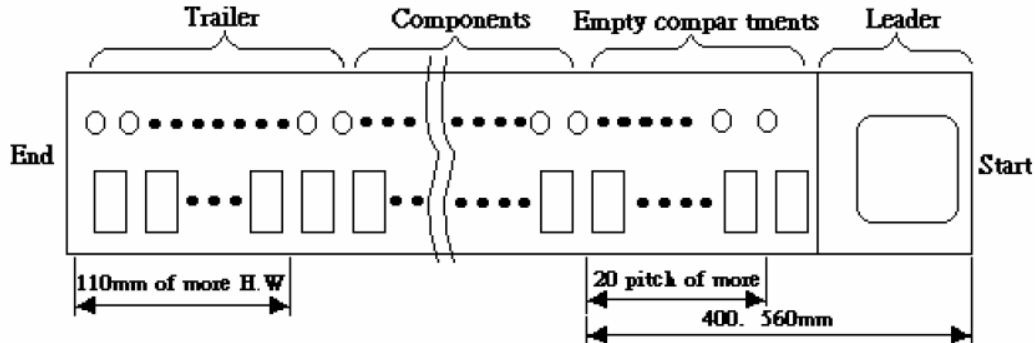


Size	A	B	C	D	E	F	G	H	J	T
060303(0201)	0.38 ±0.04	0.68 ±0.04	8.00 ±0.20	3.50 ±0.05	1.75 ±0.10	2.00 ±0.05	2.00 ±0.05	4.00 ±0.10	1.50 +0.1,-0.0	1.10 Max.
100505(0402)	0.62 ±0.05	1.12 ±0.05	8.00 ±0.10	3.50 ±0.05	1.75 ±0.10	2.00 ±0.05	2.00 ±0.05	4.00 ±0.10	1.55 ±0.05	0.6 ±0.05
160808(0603)	1.03 ±0.05	1.85 ±0.05	8.00 ±0.10	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.55 ±0.05	0.95 ±0.05
201209(0805)	1.45 ±0.05	2.25 ±0.05	8.00 ±0.10	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.55 ±0.05	0.95 ±0.05



Size	A 0	B 0	W	F	E	P 1	P 2	P 0	D 0	D 1	K	T	T 2
321611(1206)	1.88 ±0.10	3.5 ±0.10	8.00 ±0.10	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.55 ±0.05	1.00 ±0.10	1.49 ±0.15	0.22 ±0.05	1.49 ±0.25

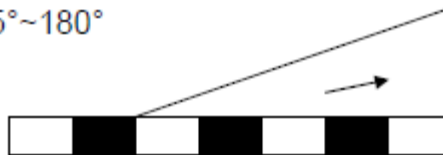
4. Leader and Trailer Tape



5. Peeling Strength of Cover Tape

Cover tape	10g~100g
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165°~180°



Test condition

1. peel angle : 165°~180° vs carrier tape
2. peel speed : 300mm/min

6. Packing

1. Tape & Reel packaging in composite specification 6/8
2. Reel and a bag of desiccant shall be packed in Nylon or plastic bag
3. Maximum of 5 reels shall be packaged in a inner box
4. Maximum of 6 inner box shall be packaged in a outer box

7. Storage

1. The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Packages must be stored at 40°C or less and 70% RH or less.
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).
3. Packaging material may be deformed if packages are stored where they are exposed to heat or direct sunlight.
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.
5. Solderability specified in composite specification 4/8 shall be for 6 months from the date of delivery on condition that they are stored at the environment specified clause 13-1 & 13-2. For those parts which passed more than 6 months shall be checked solderability before it is used.

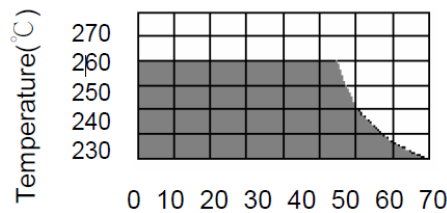
8. Quality System

- ISO/IATF 16949
- IECQ QC 080000

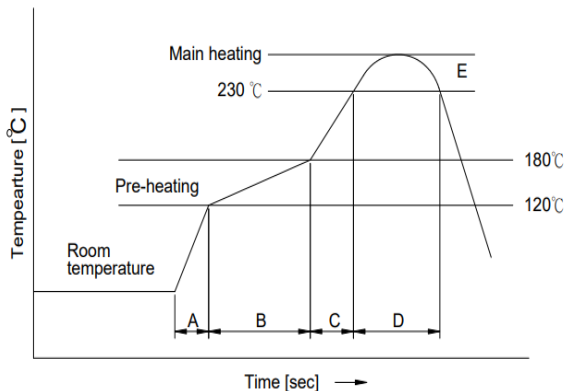
Recommended Soldering Condition

1. Reflow Soldering Conditions

- 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.
- 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.



2. 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

3. Reworking with Soldering Iron

Preheating	150°C, 1 minute
Tip temperature	280°C max
Soldering time	3seconds max.
Soldering iron output	30w max.
End of soldering iron	φ3mm max.

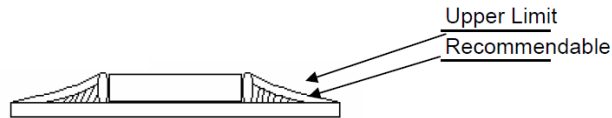
- Reworking should be limited to only one time.

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.

Recommended Soldering Condition

4. Solder Volume

Solder shall be used not to be exceed the upper limits as shown below.



Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance.

5. Equipment

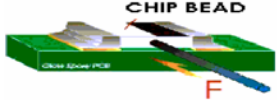
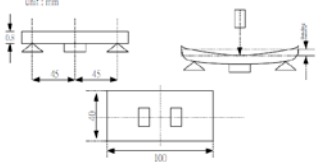
1 IMPEDANCE

Impedance shall be measured with HP—4286A impedance analyzer or equivalent system

2 DC RESISTANCE

DC resistance shall be measured using HP 4338 digital mil—ohm meter with 4 terminal method.

6. Mechanical Characteristics

Item	Specification	Test Conditions
TERMINAL STRENGTH	Without deformation cases inductance shall be satisfied $\pm 20\%$ DC resistance shall be satisfied.	Solder chip on PCB and applied 10N (1.02Kgf) for 10 sec 
Substrate bending test	Without deformation cases, inductance shall be satisfied $\pm 20\%$ DC resistance shall be satisfied.	After soldering a chip to a test substrate, bend the substrate by 3mm hold for 10s and then return. Soldering shall be done in accordance with the recommended PC board pattern and reflow soldering. 
RESISTANCE TO SOLDER Heat	No visible damage Electrical characteristics and mechanic characteristics shall be satisfied. Consult standard MIL-STD-202 METHOD 210	Solder Temp. : $265 \pm 3^\circ\text{C}$ immersion time : 6 ± 1 sec Preheating : 100°C to 150°C , 1 minute. Measurement to be made after keeping at room temp for 24 ± 2 hrs. Solder : Sn-3Ag-0.5Cu
SOLDER-Ability	95% min. coverage of all metabolised area Consult standard J-STD-002	Solder temp. : $240 \pm 5^\circ\text{C}$ Immersion time : 3 ± 1 sec Solder : Sn-3Ag-0.5Cu

Reliability and Test Condition

1. Reliability and Test Conditions

1-1 High Temperature Resistance

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. Temperature: $125^{\circ}\text{C} \pm 2^{\circ}\text{C}$
 - b-2. Testing time : 1000 ± 12 hrs
 - b-3. Measurement : After placing at room ambient temperature for 24 hours minimum

1-2 Biased Humidity Resistance

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. Humidity: $85 \pm 5\% \text{RH}$
 - b-2. Temperature: $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$
 - b-3. Testing time: 1000 ± 12 hours
 - b-4. Measurement : After placing at room ambient temperature for 24 hours minimum

1-3 Temperature Cycle

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. Low Temperature: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ kept stabilized for 30 minutes each
 - b-2. High Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ kept stabilized for 30 minutes each
 - b-3. Cycle : 1000 cycles
 - b-4. Measurement : After placing for 24 hours minimum at room ambient temperature
 - b-5. step1. $-55^{\circ}\text{C} \text{ temp} \pm 5^{\circ}\text{C} 30 \pm 3$ minutes
 - step2. Room temperature 2 to 5 minutes
 - step3. $+125^{\circ}\text{C} \text{ temp} \pm 5^{\circ}\text{C} 30 \pm 3$ minutes
 - step4. room temperature 2 to 5 minutes

1-4 Vibration Test

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. Frequency and Amplitude: 10-2000-10 Hz
 - b-2. Direction: X, Y, Z.
 - b-3. Test duration: 4 hours for each direction, 12 hours in total.



Reliability and Test Condition



1-5 Mechanical Shock TEST

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. Peak acceleration : 100 g's
 - b-2. Duration of pulse : 6 ms
 - b-3. Waveform : Half-sine
 - b-4. Velocity change : 12.3 ft/sec
 - b-5. Direction : X , Y , Z (3axes/3 times)

1-6 Operational Life

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. Temperature: 125°C $\pm 2^\circ\text{C}$
 - b-2. Testing time : 1000 $\pm$ 12hrs
 - b-3. Measurement : After placing at room ambient temperature for 24 hours minimum

1-7 Electrostatic discharge test

- a. Performance specification
 - a-1. Appearance : no mechanical damage
 - a-2. Inductance shall be with $\pm 20\%$ of the initial value
- b. Test condition
 - b-1. ESD voltage: 15k volts
 - b-2. Mode 1:150 pF/330 Ohm
 - b-3. Mode 2:150 pF/2000 Ohm

2. REMARK

Reliability tests can be performed according to customers' special requirements.