# SPECIFICATION FOR APPROVAL

## INDEX

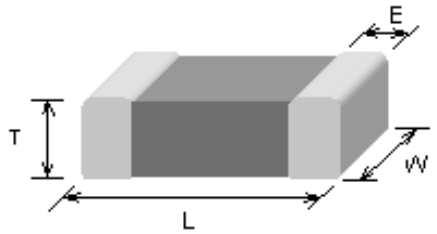


RoHS

## PRODUCT DETAIL

| Electrical Characteristics | | | Test Instruments |
|---|---|---|---|
| **Z** | Ω (See Page 7~8) | **TEST FREQ:** MHz (See Page 7~8) | •HP4291B RF IMPEDANCE / MATERIAL ANALYZER<br>•HP4338A/B MILLIOHMMETER<br>•Agilent 8720ES S-PARAMETER NETWORK ANALYZER<br>•HP6632B SYSTEM DC POWER SUPPLY |
| **DCR** | Ω (See Page 7~8) | | |
| **IDC** | mA (See Page 7~8) | **TEST LEVEL:** 250 mV | |

## SHAPES AND DIMENSIONS




Unit: mm

| TYPE | 100505 (EIA 0402) | 160808 (EIA 0603) | 201209 (EIA0805) | 321611 (EIA1206) | 322513 (EIA1210) | 451616 (EIA1806) | 453215 (EIA1812) |
|---|---|---|---|---|---|---|---|
| **L** | 1.0±0.10 | 1.6±0.15 | 2.0±0.20 | 3.2±0.20 | 3.2±0.20 | 4.5±0.25 | 4.5±0.25 |
| **W** | 0.5±0.10 | 0.8±0.15 | 1.25±0.2 | 1.6±0.20 | 2.5±0.20 | 1.6±0.20 | 3.2±0.25 |
| **T** | 0.5±0.10 | 0.8±0.15 | 0.9±0.20 | 1.1±0.20 | 1.3±0.20 | 1.6±0.20 | 1.5±0.25 |
| **E** | 0.25±0.1 | 0.3±0.20 | 0.5±0.30 | 0.5±030 | 0.5±0.30 | 0.6±0.40 | 0.6±0.40 |

## PART NUMBER CODE

| **MHC** | **1608** | **S** | **12** | **1** | **P** | **A** |
|---|---|---|---|---|---|---|
| *1* | *2* | *3* | *4* | *5* | *6* | *7* |

*1* Series Name
*2* Size Code：the first two digitals：length(mm), the last two digitals：width(mm)
*3* Material Code
*4* Impedance(Ω) + 25%
*5* Fixed Decimal Point ┐ (ex：900=90Ω ；121=120Ω)
*6* Rated Current Code

| | | | |
|---|---|---|---|
| L=1000mA | M=1500mA | N=2000mA | P=2500mA |
| Q=3000mA | R=4000mA | U=5000mA | W=6000mA |

*7* Soldering：Green Parts：A—Lead-Free

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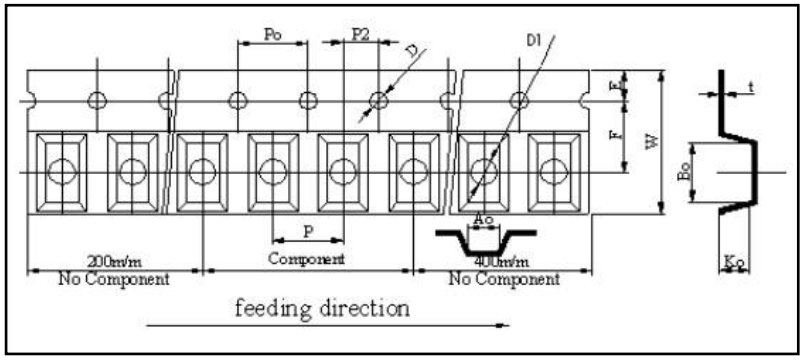
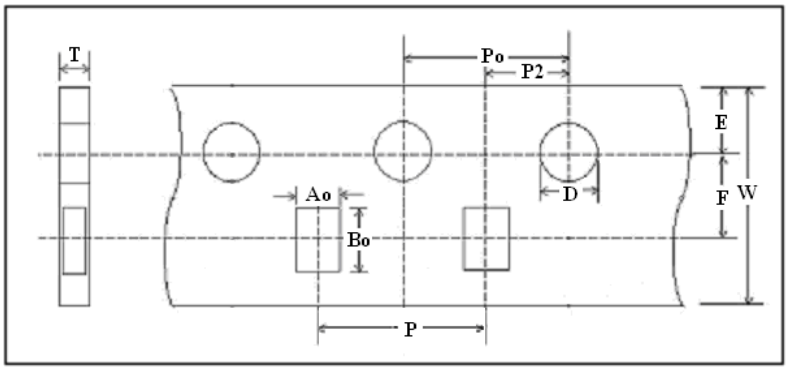
# TAPE AND REEL SPECIFICATIONS

## PLASTIC CARRIER




## PAPER CARRIER




## TAPING DIMENSIONS

Unit: mm

| | 453215 | 451616 | 322513 | 321611 | 201212 | 201209 | 201209 | 160808 | 100505 |
|---|---|---|---|---|---|---|---|---|---|
| Symbol | PLASTIC | PLASTIC | PLASTIC | PLASTIC | PLASTIC | PLASTIC | PAPER | PAPER | PAPER |
| W | 12 ±0.1 | 11.7~12.3 | 7.7~8.3 | 7.9~8.3 | 7.9~8.3 | 7.9~8.3 | 8.0 ±0.1 | 8.0 ±0.1 | 8.0 ±0.1 |
| P | 8.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 2.0 ±0.05 |
| E | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.1 | 1.75 ±0.10 | 1.75 ±0.05 |
| F | 5.5 ±0.05 | 5.5 ±0.05 | 3.5 ±0.05 | 3.5 ±0.05 | 3.5 ±0.05 | 3.5 ±0.05 | 3.5 ±0.1 | 3.5 ±0.1 | 3.5 ±0.05 |
| D | 1.55 ±0.05 | 1.55 ±0.05 | 1.55 ±0.05 | 1.55 ±0.05 | 1.50 ±0.05 | 1.50 ±0.10 | 1.56 ±0.10 | 1.56 ±0.10 | 1.55 ±0.05 |
| D1 | 1.5~1.75 | 1.5~1.75 | 0.95~1.20 | 0.95~1.20 | 0.95~1.20 | 1.0~1.25 | NA | NA | NA |
| Po | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 | 4.0 ±0.1 |
| Po10 | 40 ±0.2 | 40 ±0.2 | 40 ±0.2 | 40 ±0.2 | 40 ±0.2 | 40 ±0.2 | 40 ±0.2 | NA | NA |
| P2 | 2.0 ±0.05 | 2.0 ±0.05 | 2.0 ±0.05 | 2.0 ±0.05 | 2.0 ±0.05 | 2.0 ±0.05 | 2.0 ±0.1 | 2.0 ±0.1 | 2.0 ±0.05 |
| Ao | 3.66 ±0.1 | 1.83 ±0.1 | 2.57 ±0.1 | 1.85 ±0.1 | 1.42 ±0.1 | 1.42 ±0.1 | 1.50 ±0.05 | 1.05 ±0.05 | 0.62 ±0.03 |
| Bo | 4.95 ±0.1 | 4.85 ±0.1 | 3.4 ±0.1 | 3.43 ±0.1 | 2.26 ±0.1 | 2.24 ±0.1 | 2.30 ±0.05 | 1.85 ±0.05 | 1.12 ±0.03 |
| Ko(T) | 1.83 ±0.1 | 1.83 ±0.1 | 1.32 ±0.1 | 1.22 ±0.1 | 1.30 ±0.1 | 1.04 ±0.10 | 0.95 ±0.05 | 0.95 ±0.05 | 0.60 ±0.03 |
| t | 0.23 ±0.1 | 0.29±0.1 | 0.25 ±0.1 | 0.25 ±0.1 | 0.23 ±0.1 | 0.25 ±0.1 | NA | NA | NA |

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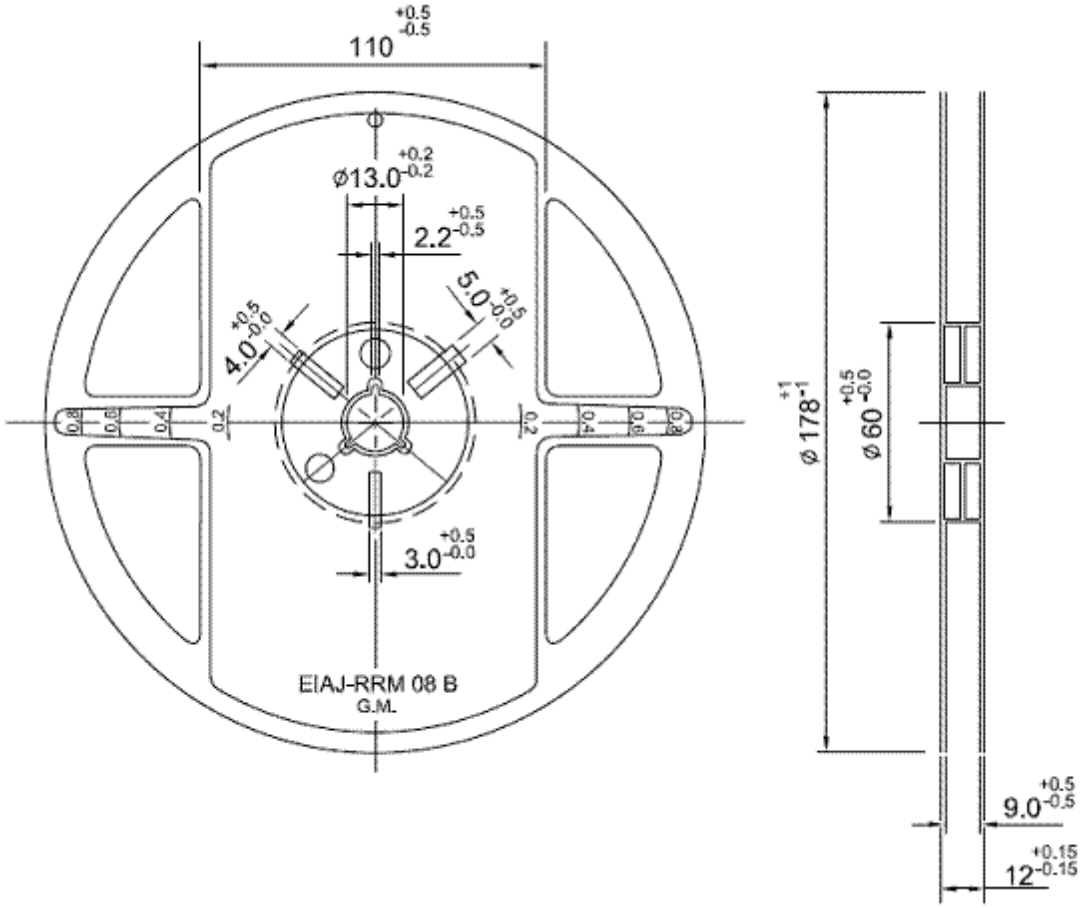
## REEL DIMENSIONS

Unit: mm




| Reel Packaging Quantity | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **PART SIZE (EIA SIZE)** | | **1005 (0402)** | **1608 (0603)** | **201209 (0805)** | **201212 (0805)** | **3216 (1206)** | **3225 (1210)** | **4516 (1806)** | **4532 (1812)** |
| **7" REEL** | **Qty. (pcs)** | 10,000 | 4,000 | 4,000 | 3,000 | 3,000 | 2,000 | 2,000 | 1,000 |

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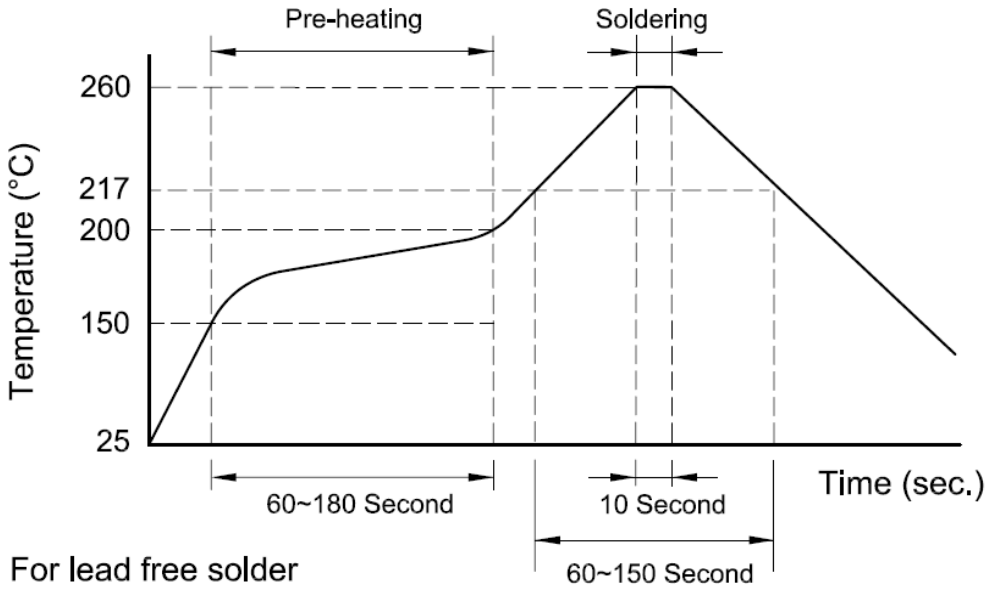
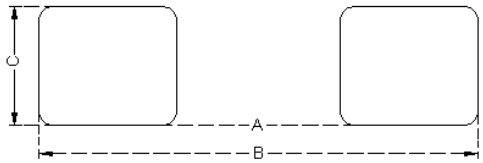
## RECOMMENDED SOLDERING CONDITIONS




## LAND PATTERNS FOR REFLOW SOLDERING




## SOLDER LAND INFORMATION

Unit: mm (inches)

| Size | A | B | C |
|---|---|---|---|
| 1005 | 0.4 ~ 0.6<br>(0.015 ~ 0.023) | 1.6 ~ 2.6<br>(0.063 ~ 0.102) | 0.4 ~ 0.7<br>(0.016 ~ 0.027) |
| 1608 | 0.5 ~ 0.7<br>(0.019 ~ 0.027) | 2.1 ~ 3.1<br>(0.083 ~ 0.122) | 0.65 ~ 0.95<br>(0.026 ~ 0.037) |
| 2012 | 1.0 ~ 1.2<br>(0.039 ~ 0.047) | 3.0 ~ 4.0<br>(0.118 ~ 0.157) | 0.8 ~ 1.1<br>(0.031 ~ 0.043) |
| 3216 | 2.0 ~ 2.4<br>(0.079 ~ 0.094) | 4.2 ~ 5.2<br>(0.165 ~ 0.204) | 1.0 ~ 1.4<br>(0.039 ~ 0.055) |
| 3225 | 2.1 ~ 2.3<br>(0.082 ~ 0.090) | 4.2 ~ 5.2<br>(0.165 ~ 0.204) | 2.2 ~ 2.5<br>(0.086 ~ 0.098) |
| 4516 | 3.4 ~ 3.7<br>(0.133 ~0.145) | 6.3 ~ 7.3<br>(0.248 ~ 0.287) | 1.3 ~ 1.7<br>(0.051 ~ 0.067) |
| 4532 | 3.4 ~ 3.7<br>(0.133 ~0.145) | 6.3 ~ 7.3<br>(0.248 ~ 0.287) | 2.9 ~ 3.2<br>(0.144 ~ 0.126) |

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## RELIABILITY AND TEST CONDITION

| Stress | Performance | Test Condition |
|---|---|---|
| **Resistance to Solder Heat** | The chip should not crack; More than 90% of the terminal electrode should be covered with solder, free from defects, chip body should not expose. | 1. Solder: SHEN MAU (Sn60A-B20)<br>2.Solder Temp: 265 ±5℃<br>3.Flux: Rosin<br>4.Dip time: 10 ±1 sec |
| **Solder ability 1 (IR Re-flow test)** | 1.Sn cover area need to over half thickness of chip<br>2.Chip shift distance under 50% of width<br>3.No short, open,…etc defect symptom | For Lead Process<br>1.Solder: Alpha (63Sn/37Pb)<br>2.General:135/135/195/235℃<br>For Lead-free Process<br>1.Solder: Alpha (SAC305)<br>2.100%TIN:155/155/220/250℃<br>3.Sn:Ag:Cu=96.5:3:0.5 |
| **Solder ability 2 (After steam 8 hrs)** | More than 90% of the terminal electrode should be covered with new solder | 1.Steam 8 hrs<br>2.Solder: SHEN MAU (Sn60A-B20)<br>3.Solder Temp.:235 ±5℃<br>4.Flux: Rosin<br>5.Dip time:5 ±1 sec |
| **Terminal Strength** | The terminal electrode should not peel off | 100505>0.2kgt, 160808>0.3kgt, 201209>0.6kgt, 201212>0.6kgt, 321611>1.0kgt, 322513>1.0kgt, 451616>1.0kgt, 453215>1.5kgt, ; pulling time:30 ±5 sec |
| **Bending Strength** | The body should not be damaged by force applied on the right | 100505>0.2kgf, 160808>0.3kgf, 201209>1.0kgf, 201212>1.0kgf, 321611>2.0kgf, 322513>2.5kgf, 451616>2.5kgf, 453215>2.5kgf, |
| **Flexure Strength** | No mechanical damage shall be noticed even when the board is bent 2 mm ( 0.079 inches) | 1. At ambient temperature & Humidity<br>2.To bend 2 mm |
| **Thermal Shock (Temperature Cycle)** | 1. No mechanical damage<br>2. Inductance should be within ±10% of the initial value<br>3.Q value should be within ±30% of the initial value<br>4.Impedance value should be within ±20% of the initial value | 1. Temperature:-40 ~ 85℃ For 30 minutes each<br>2. Cycle: 100 cycles<br>3. Measurement: At ambient temperature 24 hours after test completion |

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| Stress | Performance | Test Condition |
|---|---|---|
| **Operational Life** | 1.No mechanical damage<br>2.Inductance should be within ± 10% of the initial value<br>3.Q value should be within ±30% of the initial value<br>4.Impedance value should be within ±20% of the initial value | 1. Temperature: 125 ±5℃<br>2. Testing time: 1000 hrs<br>3. Applied current: Full rated current<br>4. Measurement:<br>At ambient temperature 24 hours after test completion |
| **Biased Humidity** | 1.No mechanical damage<br>2.Inductance should be within ±10% of the initial value<br>3.Q value should be within ±30 % of the initial value<br>4.Impedance value should be within ±20% of the initial value | 1.Temperature: 40℃<br>2.Humidity: 90-95 % RH<br>3. Applied current: Full rated current<br>4.Testing time: 1000 hrs<br>5. Measurement:<br>At ambient temperature 24 hours after test completion |
| **Rated Current** | 1. MCB / MFI / MCI product Surface temperature below room temperature plus 10 ℃<br>2. MHC product surface temp. below room temperature plus 40℃ | 1. At ambient temperature & humidity<br>2. Testing time:5 minutes ( under full rated current ) |

**GENERAL TECHNICAL DATA**

Operating temperature range : - 55℃ ~ +125℃

Storage temperature (on board): - 40℃ ~ +85℃

Storage Condition : Less than 40℃ and 70% RH

Storage Time: 12 months max.

Soldering method: Reflow or Wave Solderin

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## PRODUCT DETAILS

| Part No. | Impedance(Ω) +/-25% | Test Freq.(MHz) | DCR(Ω) (max) | Rated Current (mA) |
|---|---|---|---|---|
| **MHC1005 Series** | | | | |
| MHC1005S100NA | 10 | 100 | 0.09 | 2000 |
| MHC1005S300NA | 30 | 100 | 0.09 | 2000 |
| MHC1005S600LA | 60 | 100 | 0.20 | 1000 |
| MHC1005S121LA | 120 | 100 | 0.20 | 1000 |
| **MHC1608 Series** | | | | |
| MHC1608S300QA | 30 | 100 | 0.04 | 3000 |
| MHC1608S600QA | 60 | 100 | 0.04 | 3000 |
| MHC1608S800QA | 80 | 100 | 0.04 | 3000 |
| MHC1608S121PA | 120 | 100 | 0.07 | 2500 |
| MHC1608S221NA | 220 | 100 | 0.09 | 2000 |
| MHC1608S301NA | 300 | 100 | 0.09 | 2000 |
| MHC1608S451MA | 450 | 100 | 0.15 | 1500 |
| MHC1608S601LA | 600 | 100 | 0.20 | 1000 |
| **MHC2012 Series** | | | | |
| MHC2012S110WA | 11 | 100 | 0.015 | 6000 |
| MHC2012S260NA | 26 | 100 | 0.09 | 2000 |
| MHC2012S310WA | 31 | 100 | 0.015 | 6000 |
| MHC2012S400RA | 40 | 100 | 0.03 | 4000 |
| MHC2012S600QA | 60 | 100 | 0.04 | 3000 |
| MHC2012S800UA | 80 | 100 | 0.02 | 5000 |
| MHC2012S900UA | 90 | 100 | 0.02 | 5000 |
| MHC2012S121UA | 120 | 100 | 0.02 | 5000 |
| MHC2012S221QA | 220 | 100 | 0.04 | 3000 |
| MHC2012S251QA | 250 | 100 | 0.04 | 3000 |
| MHC2012S301NA | 300 | 100 | 0.09 | 2000 |
| MHC2012S331NA | 330 | 100 | 0.09 | 2000 |
| MHC2012S601NA | 600 | 100 | 0.09 | 2000 |
| **MHC3216 Series** | | | | |
| MHC3216S500WA | 50 | 100 | 0.015 | 6000 |
| MHC3216S600QA | 60 | 100 | 0.04 | 3000 |
| MHC3216S750QA | 75 | 100 | 0.04 | 3000 |
| MHC3216S800RA | 80 | 100 | 0.03 | 4000 |
| MHC3216S900QA | 90 | 100 | 0.04 | 3000 |
| MHC3216S121WA | 120 | 100 | 0.015 | 6000 |
| MHC3216S151NA | 150 | 100 | 0.09 | 2000 |
| MHC3216S501PA | 500 | 100 | 0.07 | 2500 |
| MHC3216S601PA | 600 | 100 | 0.07 | 2500 |
| MHC3216S122LA | 1200 | 100 | 0.20 | 1000 |
| **MHC3225 Series** | | | | |
| MHC3225S600MA | 60 | 100 | 0.15 | 1500 |
| MHC3225S102NA | 1000 | 50 | 0.09 | 2000 |

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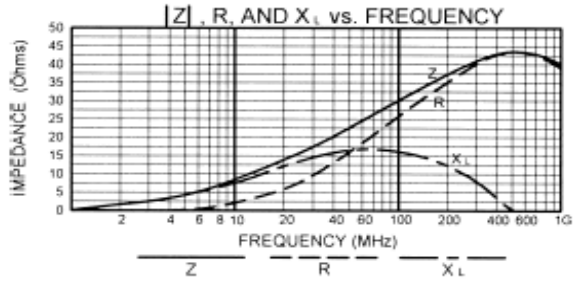
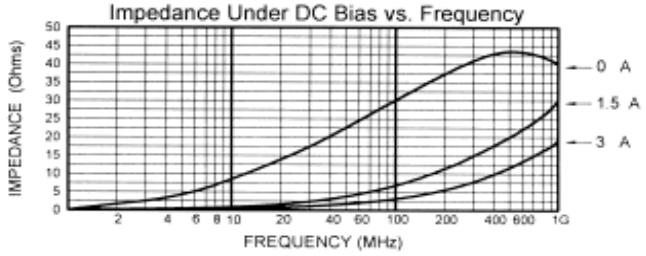
| Part No. | Impedance(Ω) +/-25% | Test Freq.(MHz) | DCR(Ω) (max) | Rated Current (mA) |
|---|---|---|---|---|
| **MHC4516 series** | | | | |
| MHC4516S600WA | 60 | 100 | 0.015 | 6000 |
| MHC4516S800WA | 80 | 100 | 0.015 | 6000 |
| MHC4516S471NA | 470 | 100 | 0.09 | 2000 |
| MHC4516S851MA | 850 | 100 | 0.15 | 1500 |
| **MHC4532 series** | | | | |
| MHC4532S800WA | 80 | 100 | 0.015 | 6000 |
| MHC4532S121WA | 120 | 100 | 0.015 | 6000 |
| MHC4532S151WA | 150 | 100 | 0.015 | 6000 |
| MHC4532S601QA | 600 | 50 | 0.04 | 3000 |
| MHC4532S681QA | 680 | 50 | 0.04 | 3000 |
| MHC4532S132QA | 1300 | 60 | 0.04 | 3000 |

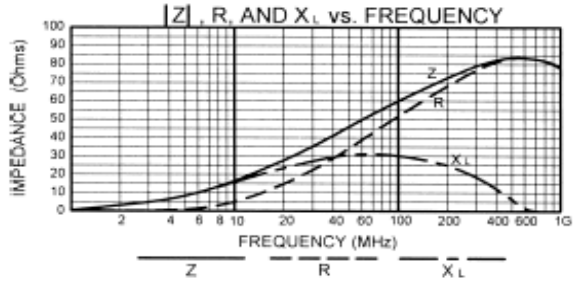
## PRINT

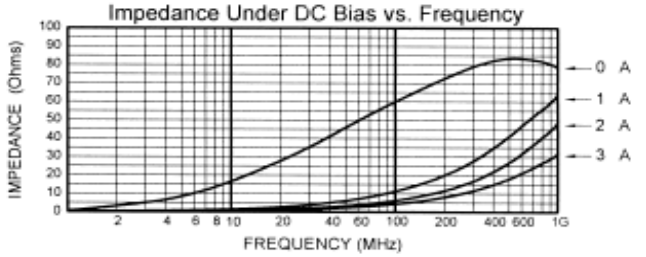
### MHC1608S300Q



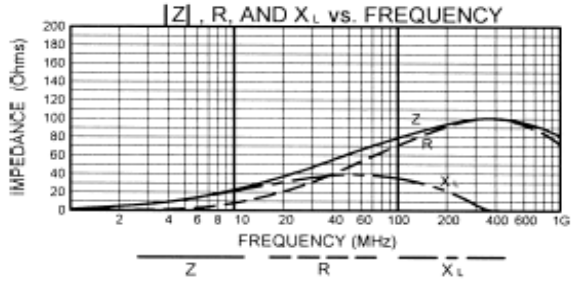



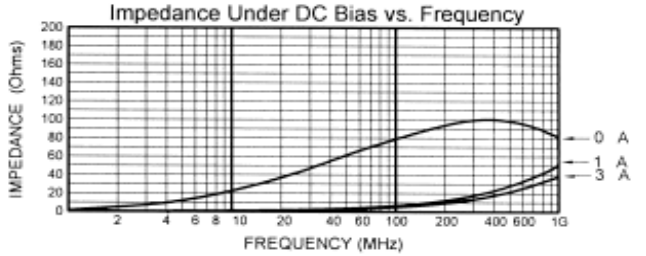

### MHC1608S600Q



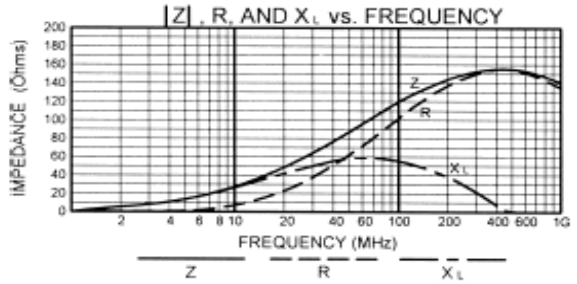



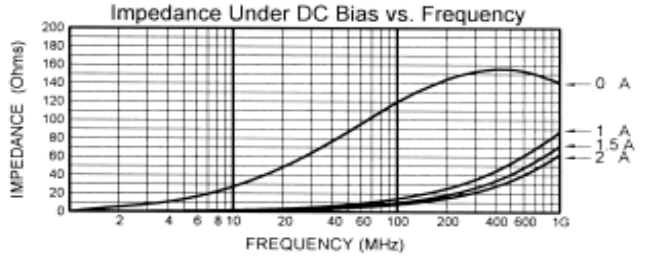

### MHC1608S800Q



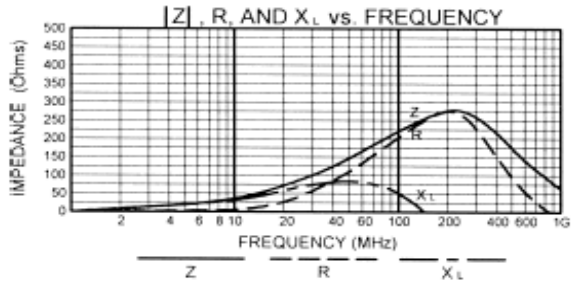



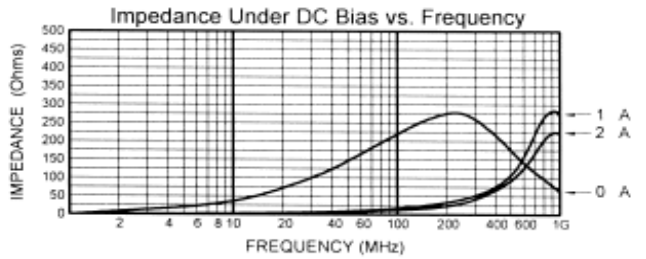

### MHC1608S121N




### MHC1608S221N

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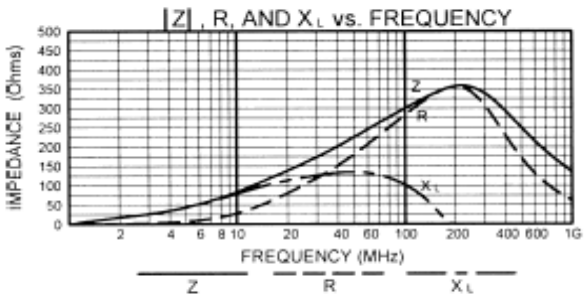
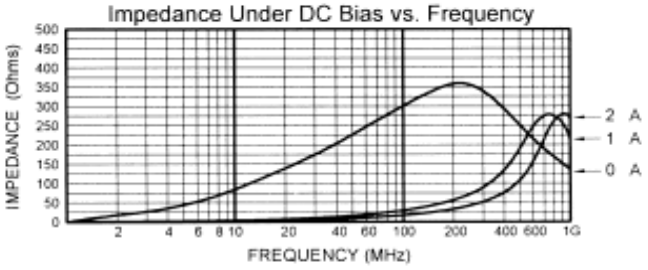
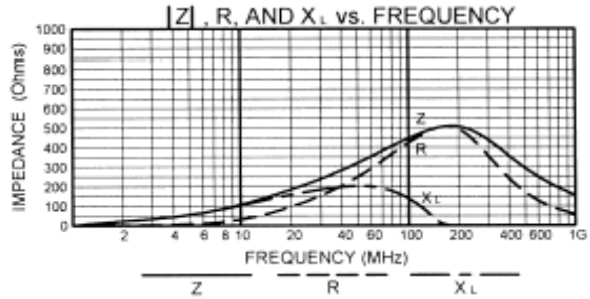
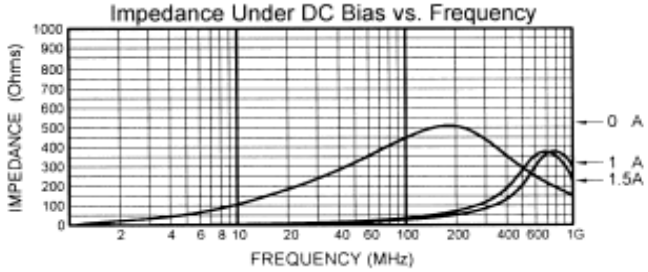
## MHC1608S301N



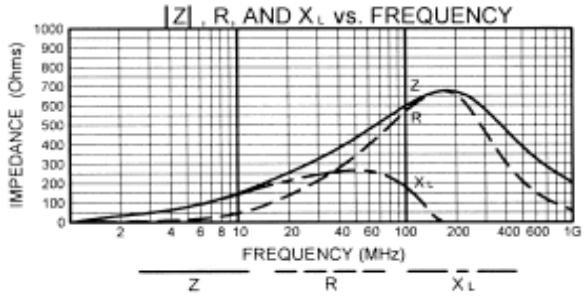



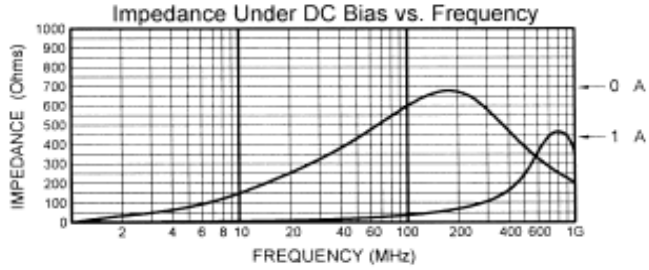

## MHC1608S451M



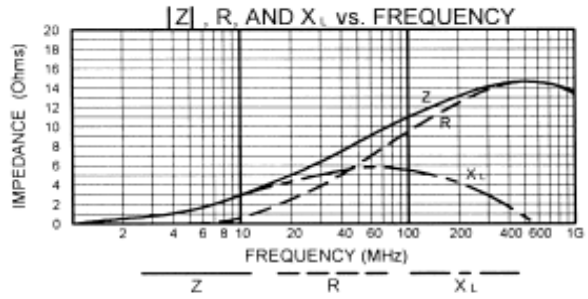



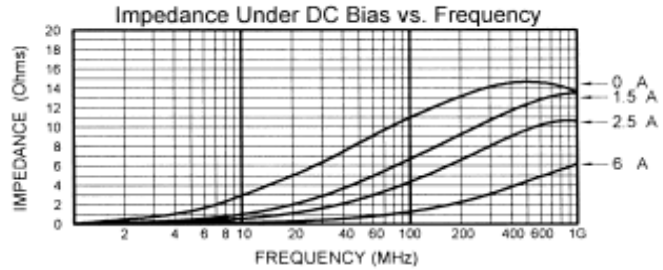

## MHC1608S601L



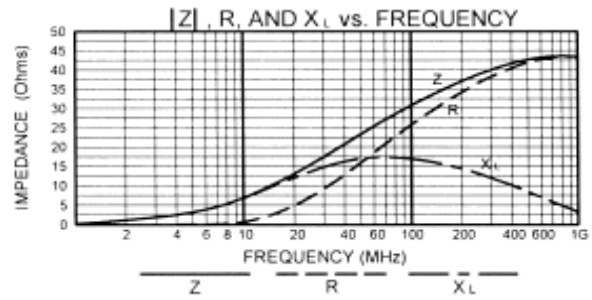



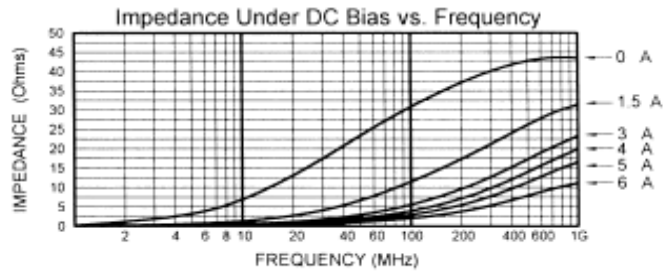

## MHC2012S110W



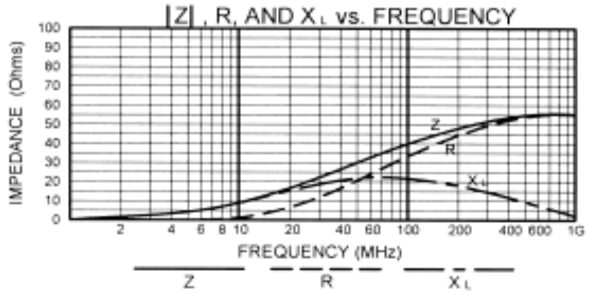

## MHC2012S310W

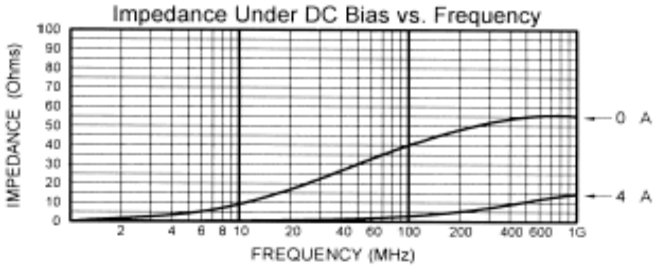


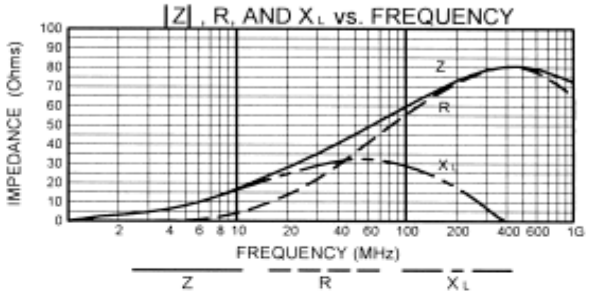

RoHS

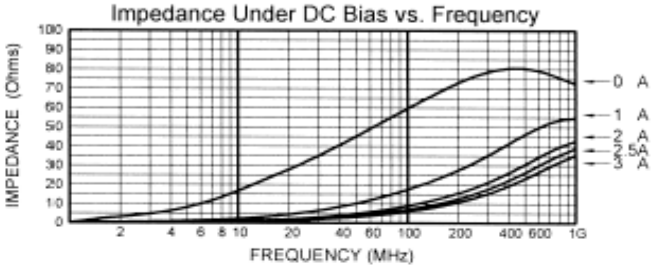
## MHC2012S400R




## MHC2012S600Q

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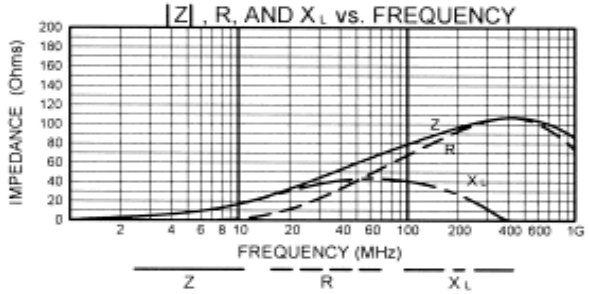
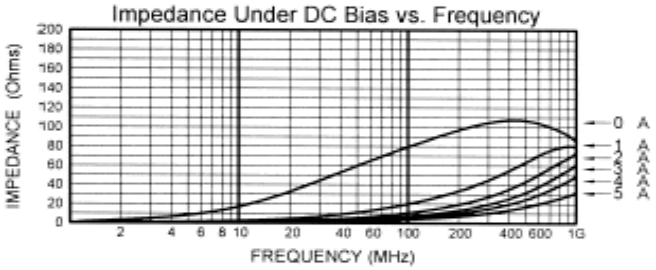
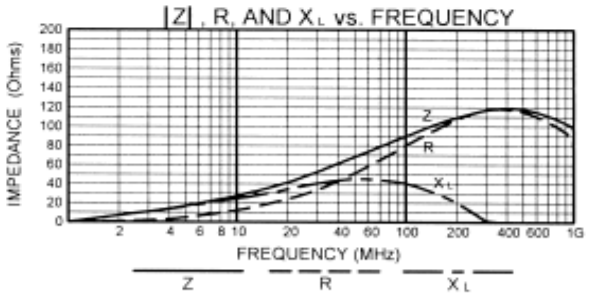
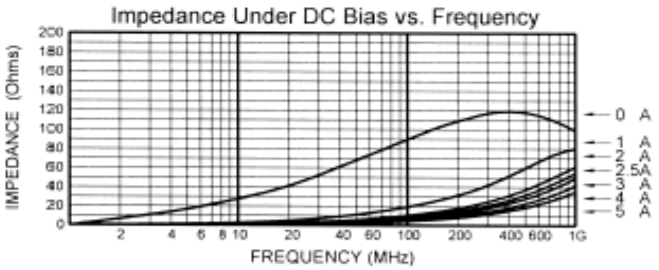


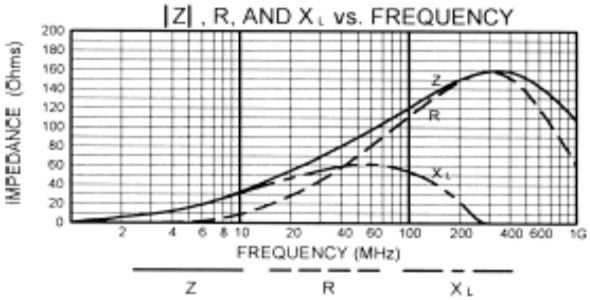



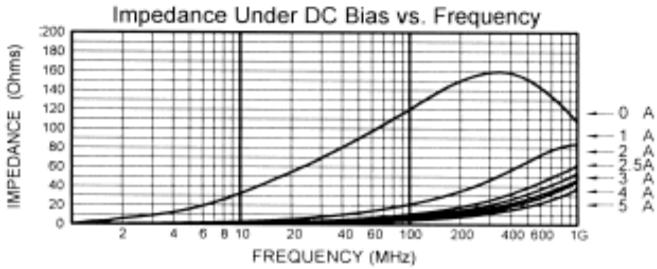

## MHC2012S900U



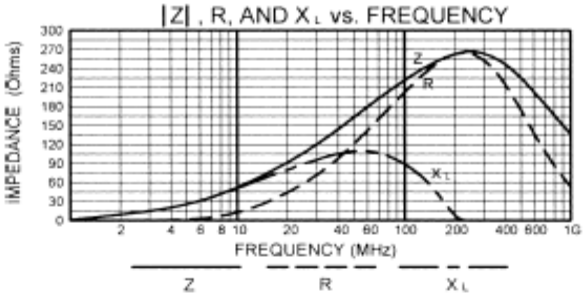

## MHC2012S121U

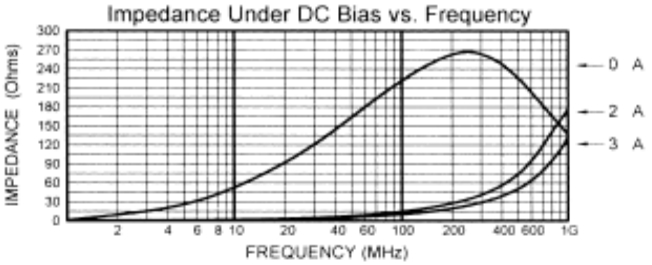


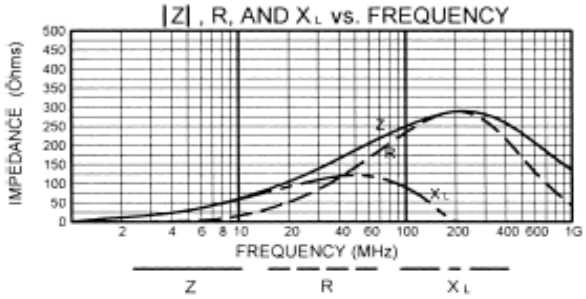

RoHS

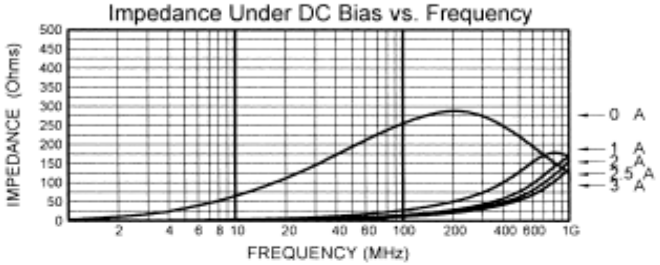
## MHC2012S221Q




## MHC2012S251Q

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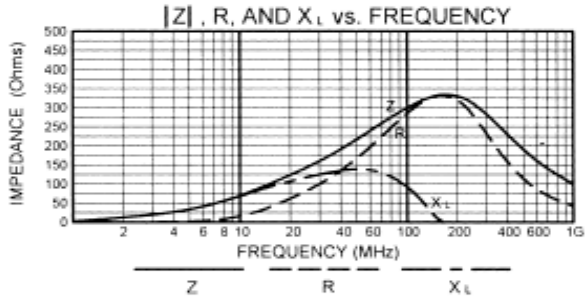


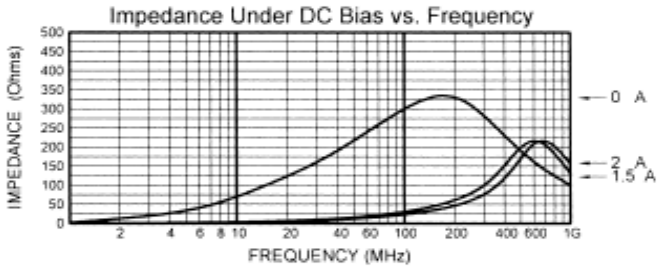


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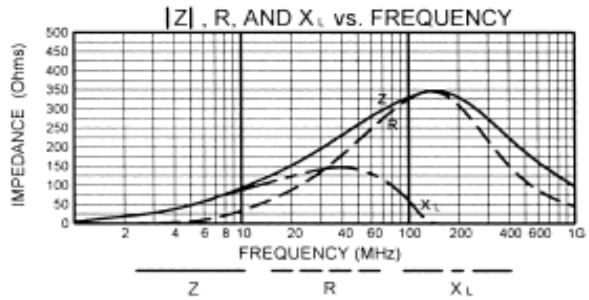
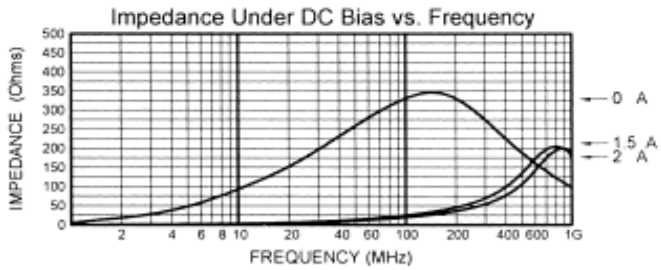
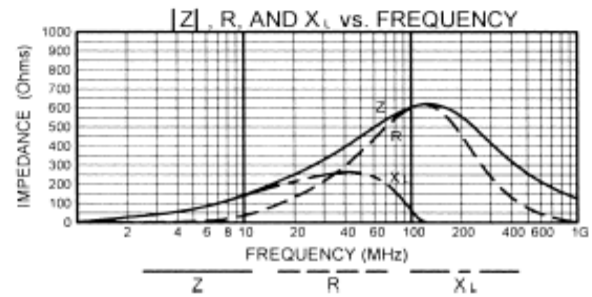
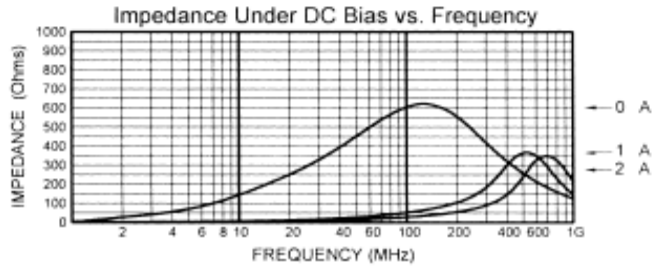



## MHC2012S601N



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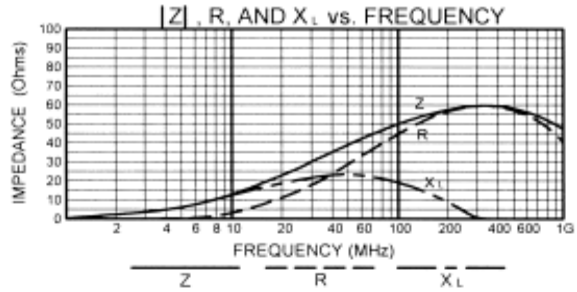


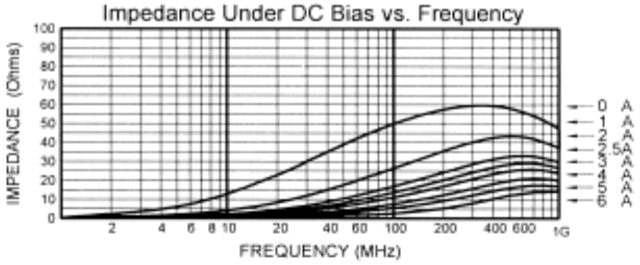


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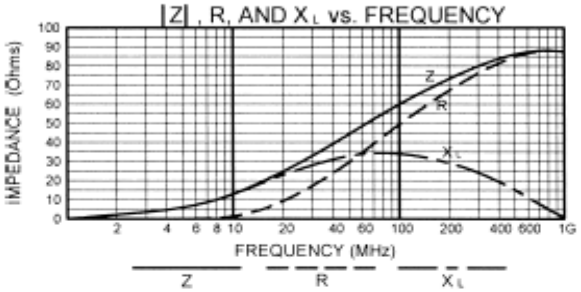


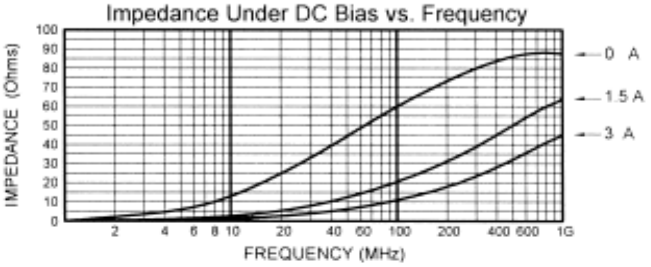


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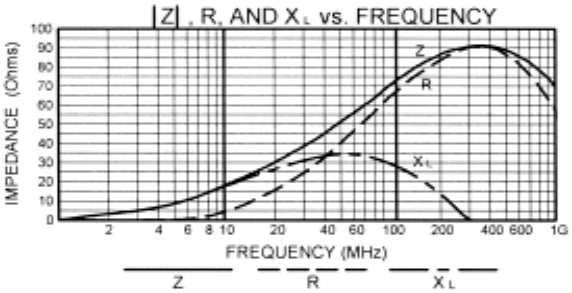


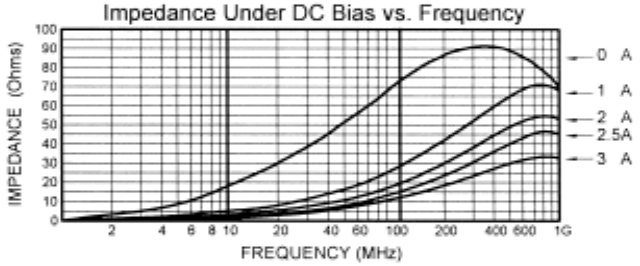


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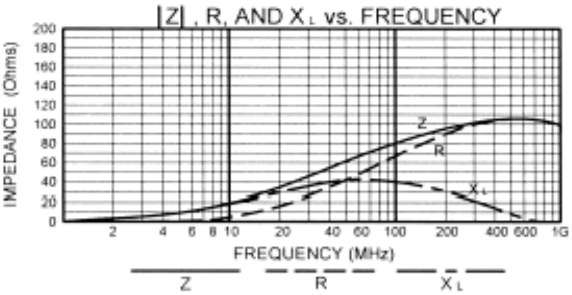


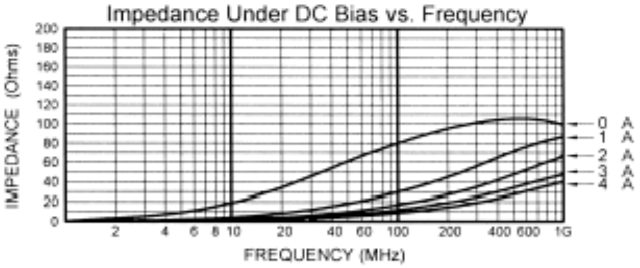


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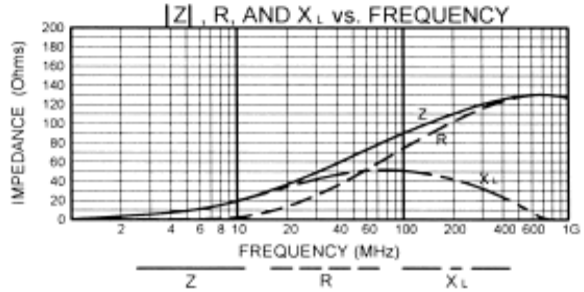
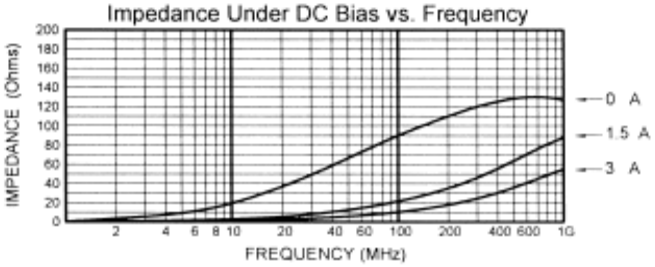
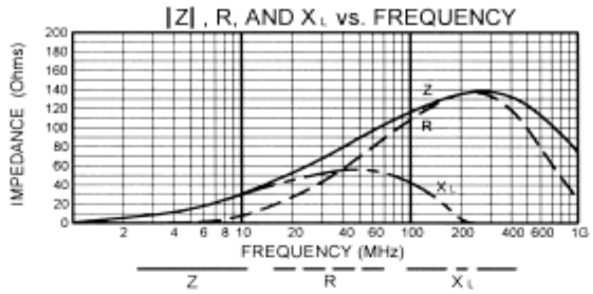
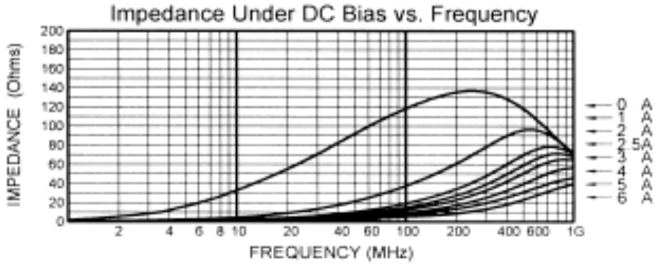


## MHC3216S121W

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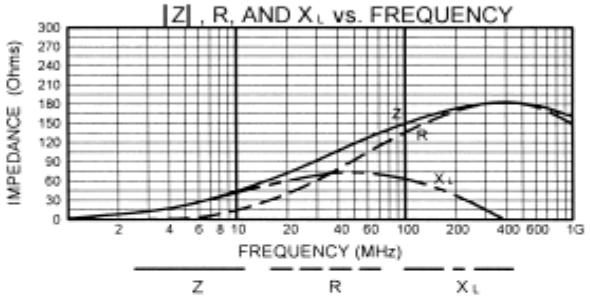


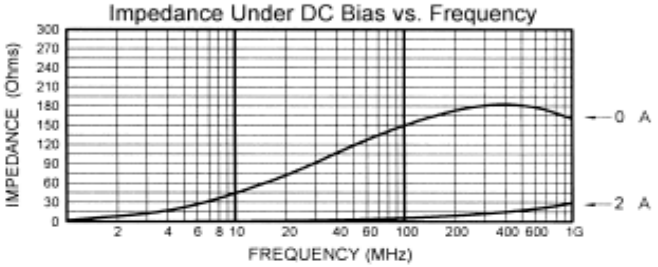


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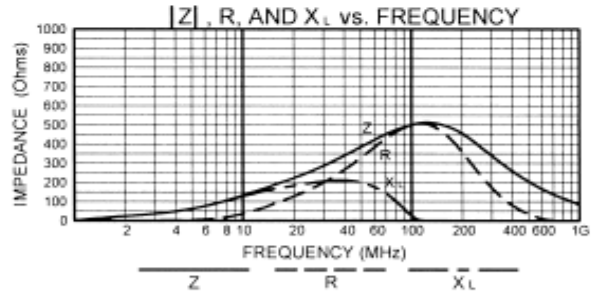


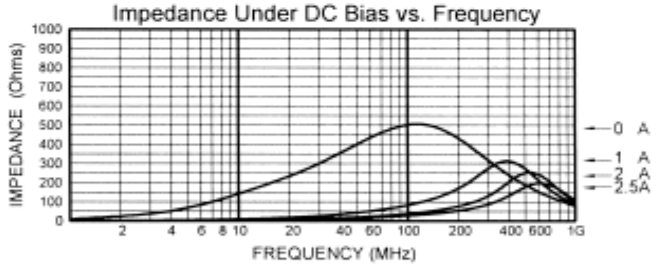


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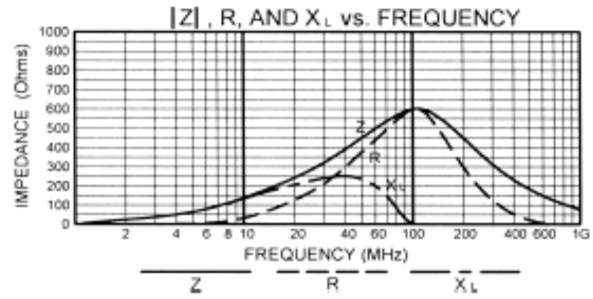


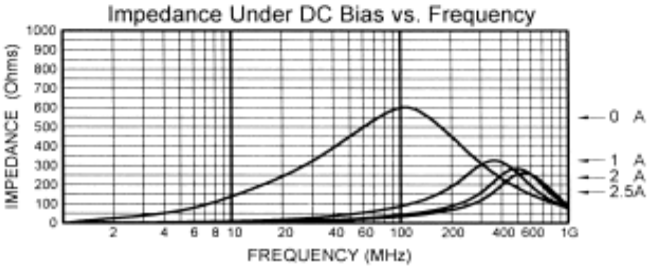

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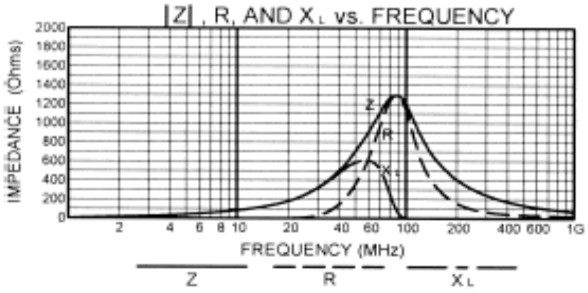


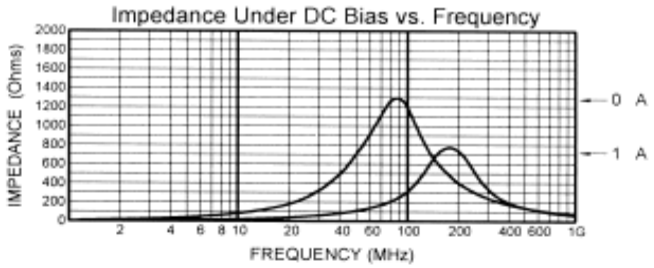


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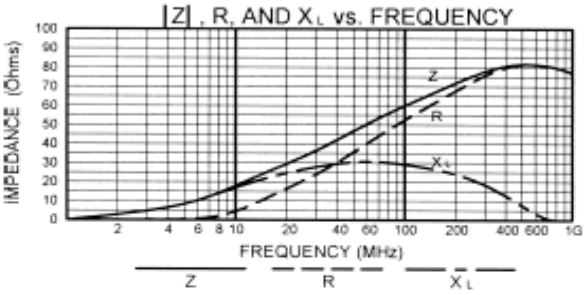


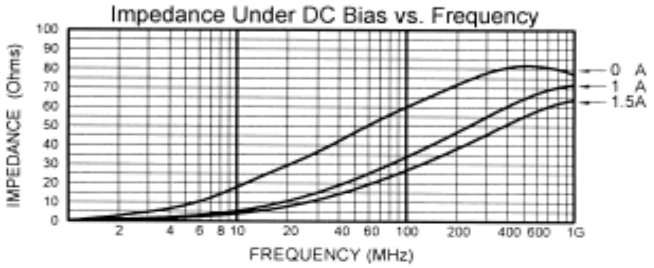


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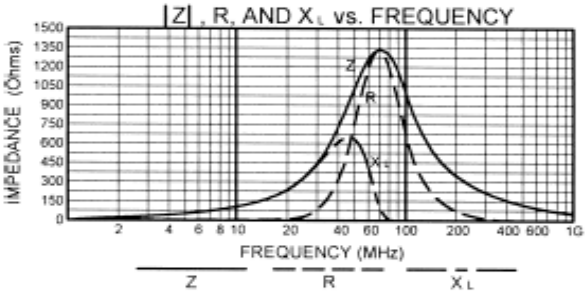
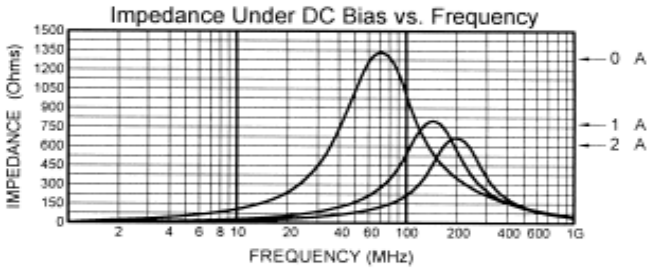
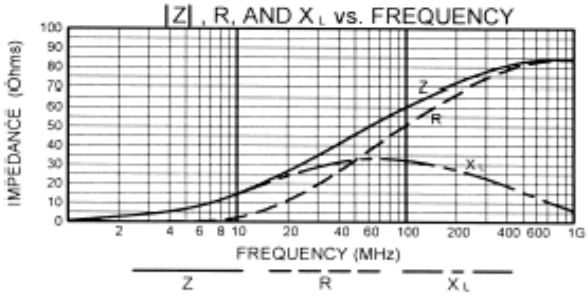
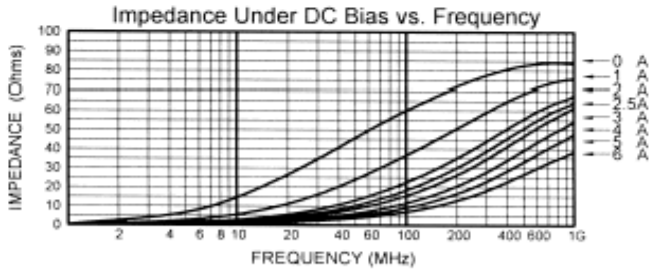



## MHC4516S600W

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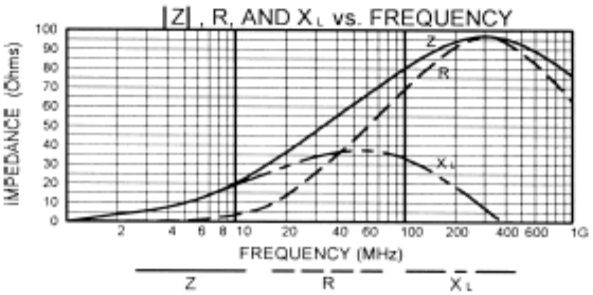


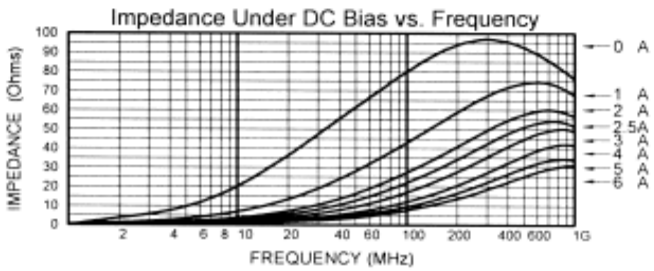

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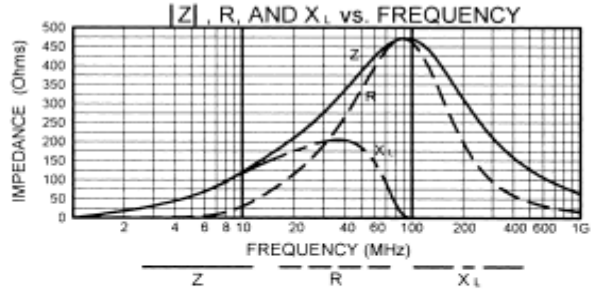


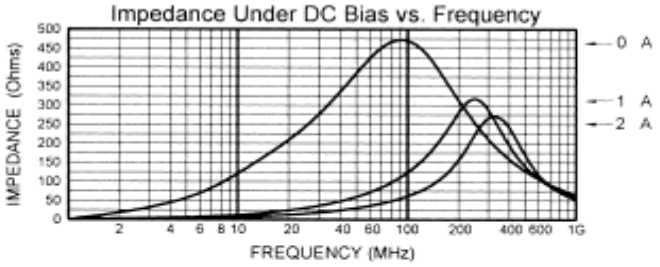


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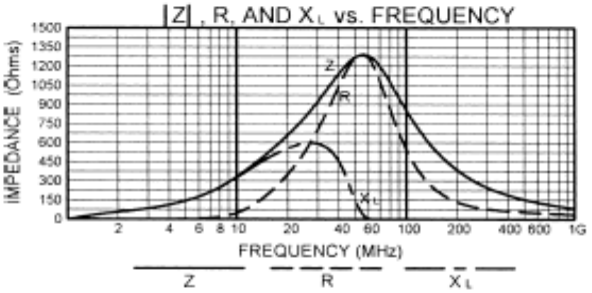


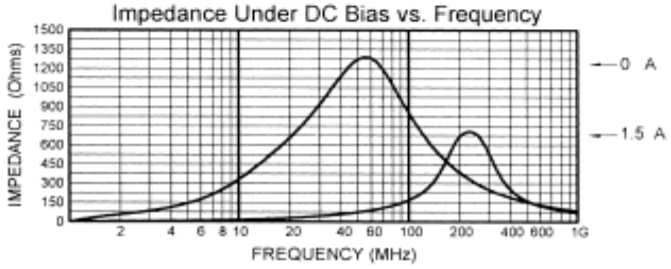


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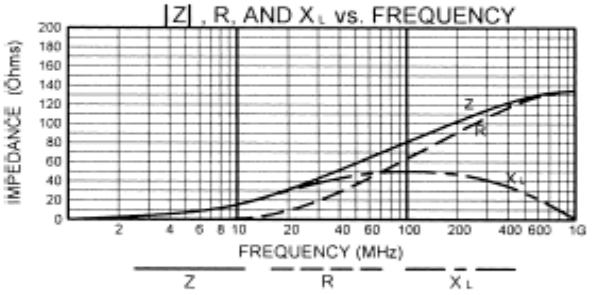


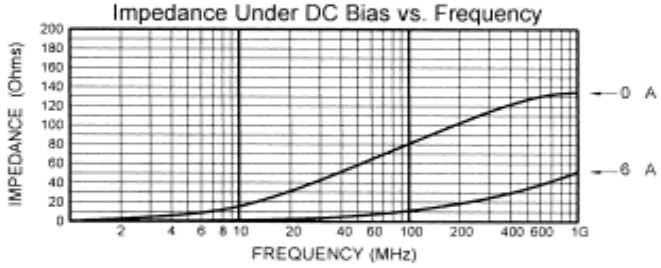


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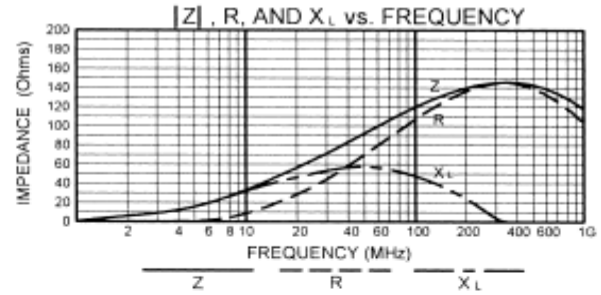


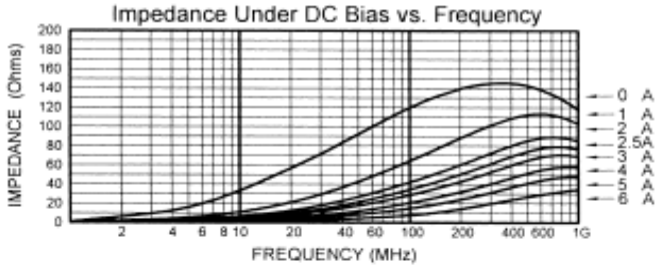


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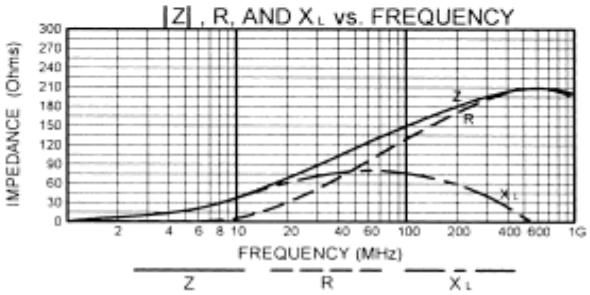


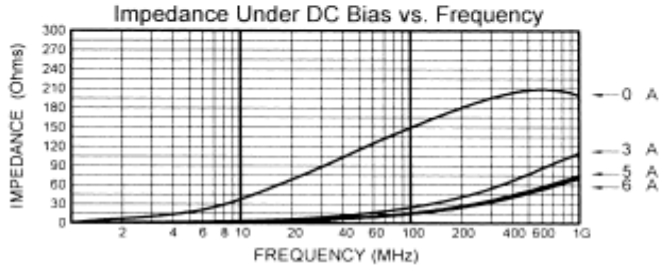

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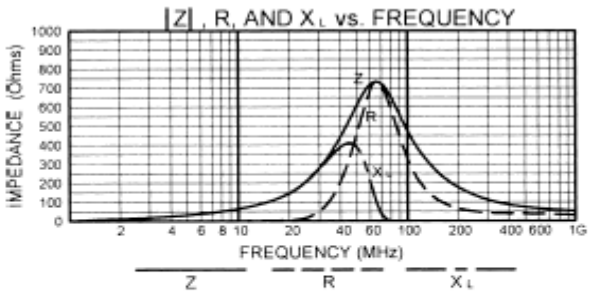


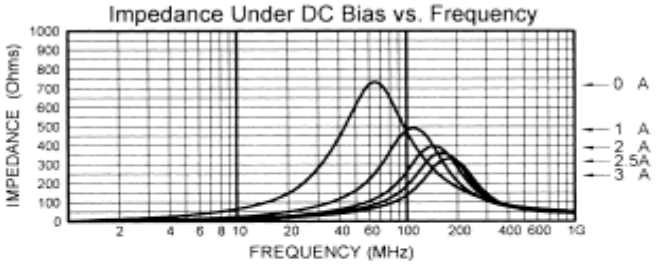


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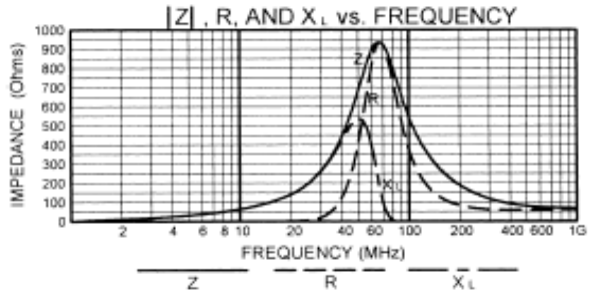


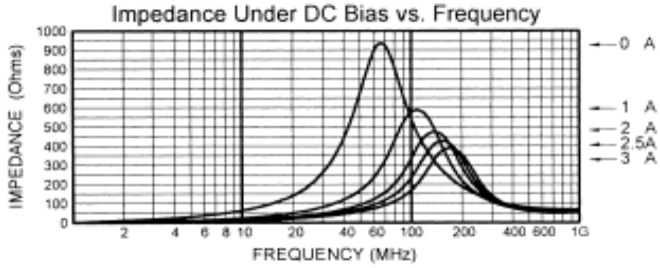


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