



Smart Technology. Delivered.

# EMI FILTERING & RF INDUCTORS



## About Laird

Laird is a global technology business focused on enabling wireless communication and smart systems, and providing components and systems that protect electronics. Laird operates through two divisions, Wireless Systems and Performance Materials. Wireless Systems solutions include antenna systems, embedded wireless modules, telematics products and wireless automation and control solutions. Performance Materials solutions include electromagnetic interference shielding, thermal management and signal integrity products. As a leader in the design, supply and support of innovative technology, our products allow people, organisations, machines and applications to connect effectively, helping to build a world where smart technology transforms the way of life. Custom products are supplied to major sectors of the electronics industry including the handset, telecommunications, IT, automotive, public safety, consumer, medical, rail, mining and industrial markets. Providing value and differentiation to our customers through innovation, reliable fulfilment and speed, Laird PLC is listed and headquartered in London, and employs over 9,000 people in more than 58 facilities located in 18 countries.

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All parts listed in this catalog are lead free and RoHS compliant.

### NOTICE

Laird products or subcomponents are not specifically designed or tested by Laird for use in any medical application or medical device manufacturing, or any similar procedure or process requiring approval, testing, or certification and drug administration or other similar Governmental entity. Applications with unusual environmental medical, life-support or life-sustaining equipment are specifically not recommended without additional

## Nomenclature Explanation

## PART NUMBERING SYSTEM

| HZ<br>PRODUCT<br>SERIES CODE                                            | 0402<br>EIA<br>SIZE CODE | A<br>RATED<br>CURRENT CODE | 601<br>IMPEDANCE (Z)<br>OR INDUCTANCE (L)                                     | R<br>PACKING<br>CODE              | -10<br>ADDITIONAL<br>DESCRIPTION |
|-------------------------------------------------------------------------|--------------------------|----------------------------|-------------------------------------------------------------------------------|-----------------------------------|----------------------------------|
| <b>HI</b> = High Current Chip Beads<br>( $\geq 3,000$ mA)               | 0402 2545                | A < 100 mA                 | First two numbers are Significant Digits                                      | B:                                | -10 =                            |
|                                                                         | 0504 2722                | B = 200 mA                 | The last number indicates how many zeros are added to the significant digits. | Bulk Standard Thru-Hole Packaging | Lead Free Standard Catalog Part  |
| <b>MI</b> = Mid Current Chip Beads<br>( $\geq 1,000$ mA to <3,000 mA )  | 0603 3032                | C = 300 mA                 |                                                                               | R :                               | -11 to -99 =                     |
|                                                                         | 0805 3312                | D = 400 mA                 | Impedance Examples:                                                           | Tape&Reel Standard SMT Package    | Non-Standard or Custom Part      |
| <b>LI</b> = Low Current Chip Beads<br>(<1,000 mA, <400 $\Omega$ Z)      | 0806 3322                | E = 500 mA                 | 100 = 10 OHMS                                                                 |                                   | -1□ = Tolerance Code             |
|                                                                         | 1008 3421                | F = 600 mA                 | 101 = 100 OHMS                                                                |                                   |                                  |
| <b>HZ</b> = High Impedance Chip Beads<br>(<1,000 mA, >400 $\Omega$ Z)   | 1206 3822                | G = 700 mA                 | 102 = 1,000 OHMS                                                              |                                   |                                  |
|                                                                         | 1210 4440                | H = 800 mA                 | 202 = 2,000 OHMS                                                              |                                   |                                  |
|                                                                         | 1211 4545                | I = 900 mA                 | 060 = 6 OHMS                                                                  |                                   |                                  |
| <b>HF</b> = High Frequency Chip Beads                                   | 1616 4732                | J = 1,000 mA               |                                                                               |                                   |                                  |
|                                                                         | 1612 5022                | K = 1,500 mA               | Examples: (For IC Series)                                                     |                                   |                                  |
| <b>LF</b> = Low Frequency Chip Beads                                    | 1806 5441                | L = 2,000 mA               | 470 = 47 nH                                                                   |                                   |                                  |
|                                                                         | 1812 6032                | M = 2,500 mA               | 471 = 470 nH                                                                  |                                   |                                  |
| <b>HR</b> = High Bias Retention<br>Chip Beads ( >3,000 mA)              | 1922                     | N = 3,000 mA               | 472 = 4,700 nH                                                                |                                   |                                  |
|                                                                         | 2021                     | O = 3,500 mA               | 473 = 47,000 nH                                                               |                                   |                                  |
| <b>CC</b> = CAN-Bus Common Mode<br>Chokes                               | 2220                     | P = 4,000 mA               | Examples: (For CCI series)                                                    |                                   |                                  |
|                                                                         | 2520                     | Q = 4,500 mA               | 0N3 = 0.3 nH                                                                  |                                   |                                  |
| <b>CM</b> = Common Mode Chokes                                          |                          | R = 5,000 mA               | 1N2 = 1.2 nH                                                                  |                                   |                                  |
| <b>CMX</b> = Wire-Wound Power<br>Common Mode Chokes                     |                          | S = 5,500 mA               | 12N = 12 nH                                                                   |                                   |                                  |
|                                                                         |                          | T = 6,000 mA               | R12 = 120 nH                                                                  |                                   |                                  |
| <b>CF</b> = Small Size (0805, 0504)<br>Monolithic Common Mode<br>Chokes |                          | U = 7,000 mA               | R22 = 220 nH                                                                  |                                   |                                  |
|                                                                         |                          | V = 8,000 mA               | Examples: (For CPI series)                                                    |                                   |                                  |
| <b>DA</b> = Multilines Array Chip Arrays                                |                          | W = 9,000 mA               | R47 = 0.47 uH                                                                 |                                   |                                  |
|                                                                         |                          | X = 10,000 mA              | 1R0 = 1.0 uH                                                                  |                                   |                                  |
| <b>IC</b> = Ferrite Chip Inductors                                      |                          | Y = 15,000 mA              | 4R7 = 4.7 uH                                                                  |                                   |                                  |
|                                                                         |                          | Z $\geq 20,000$ mA         | Examples: (For CMX series)                                                    |                                   |                                  |
| <b>CCI</b> = Ceramic Chip Inductors                                     |                          |                            | 680 = 68 uH                                                                   |                                   |                                  |
| <b>CPI</b> = Multilayer Power Chip<br>Inductors                         |                          |                            | 181 = 180 uH                                                                  |                                   |                                  |
|                                                                         |                          |                            | 132 = 1300 uH                                                                 |                                   |                                  |

## PART NUMBERING SYSTEM

| 29<br>MATERIAL TYPE                                      | F<br>PRODUCT<br>TYPE CODE                                | 0818<br>PART SIZE<br>CODE                                | -1<br>MINOR DIMENSION<br>CODE | S<br>BOARD<br>MOUNTING<br>SYTLE   | R<br>PACKAGING<br>CODE                                       | -10<br>ADDITIONAL<br>DESCRIPTION                                                        |
|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------|-----------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 28 & 29 = Broad Band Material<br>35 = Low Freq. Material | C = Choke<br>L = Axial Leaded Bead<br>F = Assembled Part | Unique Part<br>Identifier or<br>Significant<br>Dimension | Height or Length<br>Variation | S = Surface Mount<br>T= Thru-Hole | O = Bulk Standard<br>R = Tape & Reel<br>Standard SMT Package | -10 = Lead Free<br>Standard Catalog Part<br>-11 to -99 = Non Standard or<br>Custom Part |

## TEST CONDITIONS

Operation temperature: -40°C ~ +125°C (If no parts are specifically defined)

Visit [www.lairdtech.com](http://www.lairdtech.com) for additional and the most up-to-date information and for other board level part families not included in this catalog. All data charts are available by contacting your local Laird office.

A revolutionary new SPICE model for EMI ferrite chip beads is now available from Laird. This new design aid includes the de-rating effects of DC bias currents providing much greater accuracy for better designs the first time. This chip bead SPICE model is available by contacting your local Laird office.

Note: Most current ratings (I MAX) are based upon a 40°C temperature rise during continuous operation. Parts have no polarity.



## FEATURES



- Up to 10 Amps (I MAX) continuous operating capability
- Monolithic construction with small footprint and high reliability
- Excellent retention under bias
- Economical
- Broad range of sizes (from EIA 0201 up to 3312)
- For power line, low frequency and high frequency signal lines

## PART NUMBERING SYSTEM

| HZ                  | 0402          | A                  | 601                  | R            | -10                    |
|---------------------|---------------|--------------------|----------------------|--------------|------------------------|
| Product Series Code | EIA Size Code | Rated Current Code | Impedance Value Code | Packing Code | Additional Description |

## FOR SIGNAL LINE

| EIA Pkg. Size | Metric Pkg. Size | Part Number    | Typical Impedance ( $\Omega$ ) |             |             |           | Typical Peak Impedance ( $\Omega$ ) | Peak Impedance Frequency (MHz) | DCR MAX ( $\Omega$ ) | RATED I MAX (continuous) mA |
|---------------|------------------|----------------|--------------------------------|-------------|-------------|-----------|-------------------------------------|--------------------------------|----------------------|-----------------------------|
|               |                  |                | Z 25 MHz                       | Z @ 100 MHz | Z @ 500 MHz | Z @ 1 GHz |                                     |                                |                      |                             |
| 0402          | 1005             | LI0402E190R-10 | 6                              | 19          | 43          | 56        | 59                                  | 1,519                          | 0.10                 | 500                         |
| 0402          | 1005             | LI0402C220R-10 | 9                              | 22          | 30          | 31        | 31                                  | 830                            | 0.20                 | 300                         |
| 0402          | 1005             | LI0402E300R-10 | 9                              | 30          | 50          | 57        | 58                                  | 1,195                          | 0.30                 | 500                         |
| 0402          | 1005             | LI0402C470R-10 | 15                             | 47          | 76          | 90        | 92                                  | 1,402                          | 0.15                 | 300                         |
| 0402          | 1005             | LI0402E600R-10 | 29                             | 60          | 90          | 57        | 97                                  | 801                            | 0.30                 | 500                         |
| 0402          | 1005             | LI0402B800R-10 | 32                             | 80          | 220         | 224       | 243                                 | 769                            | 0.80                 | 200                         |
| 0402          | 1005             | LI0402E800R-10 | 34                             | 80          | 126         | 132       | 132                                 | 867                            | 0.17                 | 500                         |
| 0402          | 1005             | LI0402D121R-10 | 40                             | 120         | 205         | 195       | 213                                 | 682                            | 0.40                 | 400                         |
| 0402          | 1005             | LI0402C221R-10 | 72                             | 220         | 443         | 243       | 453                                 | 440                            | 0.35                 | 300                         |
| 0402          | 1005             | LI0402B301R-10 | 96                             | 300         | 454         | 351       | 549                                 | 374                            | 0.80                 | 200                         |
| 0402          | 1005             | HZ0402A601R-10 | 182                            | 600         | 600         | 300       | 965                                 | 241                            | 1.00                 | 100                         |
| 0402          | 1005             | HZ0402B102R-10 | 225                            | 1,000       | 489         | 222       | 1,116                               | 182                            | 1.00                 | 200                         |
| 0402          | 1005             | HZ0402A152R-10 | 400                            | 1,500       | 441         | 200       | 1,500                               | 143                            | 2.00                 | 50                          |
| 0402          | 1005             | HZ0402A182R-10 | 251                            | 1,800       | 520         | 265       | 2,702                               | 143                            | 1.40                 | 100                         |
| 0603          | 1608             | LI0603E470R-10 | 17                             | 47          | 83          | 91        | 91                                  | 1,000                          | 0.10                 | 500                         |
| 0603          | 1608             | LI0603G800R-10 | 32                             | 80          | 100         | 91        | 100                                 | 500                            | 0.20                 | 700                         |
| 0603          | 1608             | LI0603G121R-10 | 52                             | 120         | 156         | 113       | 177                                 | 389                            | 0.20                 | 700                         |
| 0603          | 1608             | LI0603E151R-10 | 61                             | 150         | 197         | 131       | 209                                 | 331                            | 0.25                 | 500                         |
| 0603          | 1608             | LI0603B201R-10 | 70                             | 200         | 340         | 210       | 362                                 | 420                            | 0.40                 | 200                         |
| 0603          | 1608             | LI0603G221R-10 | 98                             | 220         | 279         | 168       | 283                                 | 251                            | 0.30                 | 700                         |
| 0603          | 1608             | LI0603D301R-10 | 144                            | 300         | 286         | 165       | 389                                 | 261                            | 0.35                 | 400                         |
| 0603          | 1608             | HZ0603B471R-10 | 94                             | 470         | 560         | 253       | 1,060                               | 240                            | 0.85                 | 200                         |
| 0603          | 1608             | HZ0603C601R-10 | 232                            | 600         | 360         | 171       | 775                                 | 168                            | 0.45                 | 300                         |
| 0603          | 1608             | HZ0603C651R-10 | 296                            | 650         | 954         | 652       | 960                                 | 400                            | 0.60                 | 300                         |
| 0603          | 1608             | HZ0603B751R-10 | 302                            | 750         | 437         | 198       | 863                                 | 137                            | 0.60                 | 200                         |

FOR SIGNAL LINE

| EIA<br>PKG.<br>SIZE | METRIC<br>PKG.<br>SIZE | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |                |                |              | TYPICAL PEAK<br>IMPEDANCE<br>( $\Omega$ ) | PEAK IMPEDANCE<br>FREQUENCY<br>(MHz) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(CONTINUOUS)<br>mA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|--------------|-------------------------------------------|--------------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z @<br>25 MHz                  | Z @<br>100 MHz | Z @<br>500 MHz | Z @<br>1 GHz |                                           |                                      |                            |                                   |
| 0603                | 1608                   | HZ0603A102R-10 | 288                            | 1,000          | 1975           | 1,450        | 2,000                                     | 480                                  | 1.00                       | 100                               |
| 0603                | 1608                   | HZ0603B102R-10 | 453                            | 1,000          | 380            | 200          | 1,000                                     | 100                                  | 0.60                       | 200                               |
| 0603                | 1608                   | HZ0603D102R-10 | 453                            | 1,000          | 380            | 193          | 970                                       | 140                                  | 0.35                       | 400                               |
| 0603                | 1608                   | HZ0603B112R-10 | 515                            | 1,100          | 1,300          | 850          | 1,539                                     | 288                                  | 0.80                       | 200                               |
| 0603                | 1608                   | HZ0603A152R-10 | 552                            | 1,500          | 1,062          | 503          | 2,306                                     | 190                                  | 0.90                       | 100                               |
| 0603                | 1608                   | HZ0603C152R-10 | 319                            | 1,500          | 462            | 190          | 1,493                                     | 135                                  | 0.60                       | 300                               |
| 0603                | 1608                   | HZ0603A182R-10 | 610                            | 1,800          | 1,070          | 500          | 2,420                                     | 180                                  | 1.50                       | 50                                |
| 0603                | 1608                   | HZ0603A222R-10 | 195                            | 2,200          | 375            | 175          | 3,051                                     | 122                                  | 1.50                       | 100                               |
| 0603                | 1608                   | HZ0603A252R-10 | 791                            | 2,500          | 1,014          | 501          | 3,065                                     | 149                                  | 1.50                       | 50                                |
| 0805                | 2012                   | LI0805G201R-10 | 100                            | 200            | 221            | 128          | 272                                       | 250                                  | 0.30                       | 700                               |
| 0805                | 2012                   | LI0805G301R-10 | 124                            | 300            | 248            | 146          | 350                                       | 205                                  | 0.20                       | 700                               |
| 0805                | 2012                   | HZ0805G471R-10 | 221                            | 470            | 286            | 150          | 572                                       | 149                                  | 0.20                       | 700                               |
| 0805                | 2012                   | HZ0805E601R-10 | 277                            | 600            | 304            | 151          | 696                                       | 155                                  | 0.30                       | 500                               |
| 0805                | 2012                   | HZ0805D102R-10 | 280                            | 1,000          | 328            | 168          | 1,268                                     | 113                                  | 0.30                       | 400                               |
| 0805                | 2012                   | MI0805J102R-10 | 195                            | 1,000          | 226            | 108          | 1,112                                     | 120                                  | 0.15                       | 1,000                             |
| 0805                | 2012                   | HZ0805D152R-10 | 289                            | 1,500          | 333            | 166          | 1,525                                     | 110                                  | 0.40                       | 400                               |
| 0805                | 2012                   | HZ0805C202R-10 | 350                            | 2,000          | 300            | 150          | 2,000                                     | 100                                  | 0.50                       | 300                               |
| 0805                | 2012                   | HZ0805B222R-10 | 648                            | 2,200          | 419            | 213          | 2,200                                     | 100                                  | 0.80                       | 200                               |
| 0805                | 2012                   | HZ0805B252R-10 | 400                            | 2,500          | 400            | 180          | 2,900                                     | 90                                   | 0.75                       | 200                               |
| 0805                | 2012                   | HZ0805B272R-10 | 400                            | 2,700          | 400            | 150          | 2,900                                     | 88                                   | 0.80                       | 200                               |
| 1206                | 3216                   | HZ1206E601R-10 | 296                            | 600            | 202            | 103          | 674                                       | 75                                   | 0.30                       | 500                               |
| 1206                | 3216                   | HZ1206C202R-10 | 1,673                          | 915            | 180            | 100          | 2,505                                     | 41                                   | 0.50                       | 300                               |
| 1206                | 3216                   | HZ1206E152R-10 | 823                            | 950            | 188            | 57           | 1,564                                     | 57                                   | 0.30                       | 500                               |
| 1206                | 3216                   | HZ1206D102R-10 | 201                            | 1,250          | 250            | 100          | 1,000                                     | 100                                  | 0.40                       | 400                               |

FOR POWER LINE

| EIA<br>PKG.<br>SIZE | METRIC<br>PKG.<br>SIZE | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |                |                |              | TYPICAL PEAK<br>IMPEDANCE<br>( $\Omega$ ) | PEAK IMPEDANCE<br>FREQUENCY<br>(MHz) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(CONTINUOUS)<br>mA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|--------------|-------------------------------------------|--------------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z @<br>25 MHz                  | Z @<br>100 MHz | Z @<br>500 MHz | Z @<br>1 GHz |                                           |                                      |                            |                                   |
| 0402                | 1005                   | MI0402L100R-10 | 3.6                            | 10             | 14             | 13.2         | 15                                        | 510                                  | 0.10                       | 2,000                             |
| 0402                | 1005                   | LI0402E190R-10 | 6                              | 19             | 43             | 56           | 59                                        | 1,519                                | 0.10                       | 500                               |
| 0402                | 1005                   | LI0402C220R-10 | 9                              | 22             | 30             | 31           | 31                                        | 830                                  | 0.20                       | 300                               |
| 0402                | 1005                   | LI0402E300R-10 | 9                              | 30             | 50             | 57           | 58                                        | 1,195                                | 0.30                       | 500                               |
| 0402                | 1005                   | LI0402C470R-10 | 15                             | 47             | 76             | 90           | 92                                        | 1,402                                | 0.15                       | 300                               |
| 0402                | 1005                   | LI0402E600R-10 | 29                             | 60             | 90             | 57           | 97                                        | 801                                  | 0.30                       | 500                               |
| 0402                | 1005                   | LI0402E750R-10 | 30                             | 75             | 92             | 92           | 93                                        | 710                                  | 0.10                       | 500                               |
| 0402                | 1005                   | LI0402B800R-10 | 32                             | 80             | 220            | 224          | 243                                       | 769                                  | 0.80                       | 200                               |
| 0402                | 1005                   | LI0402E800R-10 | 34                             | 80             | 126            | 132          | 243                                       | 867                                  | 0.17                       | 500                               |
| 0402                | 1005                   | LI0402D121R-10 | 40                             | 120            | 205            | 195          | 213                                       | 682                                  | 0.40                       | 400                               |
| 0402                | 1005                   | MI0402K121R-10 | 52                             | 120            | 160            | 132          | 160                                       | 500                                  | 0.13                       | 1,500                             |
| 0402                | 1005                   | LI0402C221R-10 | 72                             | 220            | 443            | 243          | 453                                       | 440                                  | 0.35                       | 300                               |
| 0402                | 1005                   | LI0402B301R-10 | 96                             | 300            | 454            | 351          | 549                                       | 374                                  | 0.80                       | 200                               |
| 0402                | 1005                   | HZ0402B102R-10 | 225                            | 1,000          | 489            | 222          | 1,116                                     | 182                                  | 1.00                       | 200                               |
| 0603                | 1608                   | MI0603K300R-10 | 12                             | 30             | 43             | 45           | 45                                        | 1,000                                | 0.09                       | 1,500                             |
| 0603                | 1608                   | HI0603N300R-10 | 13                             | 30             | 44             | 48           | 54                                        | 1,000                                | 0.04                       | 3,000                             |
| 0603                | 1608                   | HI0603R300R-10 | 13                             | 30             | 44             | 45           | 47                                        | 950                                  | 0.01                       | 5,000                             |
| 0603                | 1608                   | HI0603N330R-10 | 13                             | 33             | 44             | 54           | 54                                        | 1,000                                | 0.025                      | 3,000                             |
| 0603                | 1608                   | LI0603E470R-10 | 17                             | 47             | 83             | 91           | 91                                        | 1,000                                | 0.10                       | 500                               |
| 0603                | 1608                   | MI0603J600R-10 | 25                             | 60             | 91             | 92           | 95                                        | 700                                  | 0.10                       | 1,000                             |
| 0603                | 1608                   | HI0603P600R-10 | 25                             | 60             | 85             | 83           | 95                                        | 738                                  | 0.03                       | 4,000                             |
| 0603                | 1608                   | MI0603J680R-10 | 35                             | 68             | 106            | 99           | 110                                       | 650                                  | 0.10                       | 1,000                             |
| 0603                | 1608                   | HI0603O700R-10 | 32                             | 70             | 91             | 94           | 98                                        | 600                                  | 0.02                       | 3,500                             |
| 0603                | 1608                   | LI0603G800R-10 | 32                             | 80             | 100            | 91           | 100                                       | 500                                  | 0.20                       | 700                               |

FOR POWER LINE

| EIA<br>PKG.<br>SIZE | METRIC<br>PKG.<br>SIZE | PART NUMBER    | TYPICAL IMPEDANCE (Ω) |                |                |              | TYPICAL PEAK<br>IMPEDANCE<br>(Ω) | PEAK IMPEDANCE<br>FREQUENCY<br>(MHZ) | DCR MAX<br>(Ω) | RATED I MAX<br>(CONTINUOUS)<br>MA |
|---------------------|------------------------|----------------|-----------------------|----------------|----------------|--------------|----------------------------------|--------------------------------------|----------------|-----------------------------------|
|                     |                        |                | Z @<br>25 MHZ         | Z @<br>100 MHZ | Z @<br>500 MHZ | Z @<br>1 GHZ |                                  |                                      |                |                                   |
| 0603                | 1608                   | LI0603G121R-10 | 52                    | 120            | 156            | 113          | 177                              | 389                                  | 0.20           | 700                               |
| 0603                | 1608                   | MI0603M121R-10 | 55                    | 120            | 169            | 138          | 170                              | 420                                  | 0.05           | 2,500                             |
| 0603                | 1608                   | LI0603E151R-10 | 61                    | 150            | 197            | 131          | 209                              | 331                                  | 0.25           | 500                               |
| 0603                | 1608                   | MI0603K181R-10 | 95                    | 180            | 238            | 190          | 245                              | 380                                  | 0.09           | 1,500                             |
| 0603                | 1608                   | LI0603B201R-10 | 70                    | 200            | 340            | 210          | 362                              | 420                                  | 0.40           | 200                               |
| 0603                | 1608                   | LI0603G221R-10 | 98                    | 220            | 279            | 168          | 283                              | 251                                  | 0.30           | 700                               |
| 0603                | 1608                   | MI0603L221R-10 | 107                   | 220            | 219            | 121          | 240                              | 280                                  | 0.05           | 2,000                             |
| 0603                | 1608                   | LI0603D301R-10 | 144                   | 300            | 286            | 165          | 389                              | 261                                  | 0.35           | 400                               |
| 0603                | 1608                   | MI0603L301R-10 | 50                    | 300            | 225            | 120          | 410                              | 200                                  | 0.10           | 2,000                             |
| 0603                | 1608                   | HZ0603B471R-10 | 94                    | 470            | 560            | 253          | 1,060                            | 240                                  | 0.85           | 200                               |
| 0603                | 1608                   | MI0603J471R-10 | 203                   | 470            | 398            | 181          | 580                              | 210                                  | 0.20           | 1,000                             |
| 0603                | 1608                   | MI0603K471R-10 | 237                   | 470            | 350            | 193          | 562                              | 197                                  | 0.15           | 1,500                             |
| 0603                | 1608                   | HZ0603C601R-10 | 232                   | 600            | 360            | 171          | 775                              | 168                                  | 0.45           | 300                               |
| 0603                | 1608                   | MI0603J601R-10 | 225                   | 600            | 400            | 200          | 620                              | 150                                  | 0.20           | 1,000                             |
| 0603                | 1608                   | HZ0603C651R-10 | 296                   | 650            | 954            | 652          | 960                              | 400                                  | 0.60           | 300                               |
| 0603                | 1608                   | HZ0603B751R-10 | 302                   | 750            | 437            | 198          | 863                              | 137                                  | 0.60           | 200                               |
| 0603                | 1608                   | HZ0603B102R-10 | 453                   | 1,000          | 380            | 200          | 1,000                            | 100                                  | 0.60           | 200                               |
| 0603                | 1608                   | MI0603J102R-10 | 432                   | 1,000          | 400            | 196          | 1,000                            | 120                                  | 0.20           | 1,000                             |
| 0603                | 1608                   | HZ0603B112R-10 | 515                   | 1,100          | 1,300          | 850          | 1,539                            | 288                                  | 0.80           | 200                               |
| 0603                | 1608                   | HZ0603C152R-10 | 319                   | 1,500          | 462            | 190          | 1,590                            | 135                                  | 0.60           | 300                               |
| 0805                | 2012                   | MI0805K110R-10 | 5                     | 11             | 18             | 19           | 20                               | 1,000                                | 0.06           | 1,500                             |
| 0805                | 2012                   | HI0805Q310R-10 | 12                    | 31             | 42             | 44           | 45                               | 800                                  | 0.025          | 4,500                             |
| 0805                | 2012                   | HI0805N310R-10 | 17                    | 31             | 41             | 39           | 42                               | 510                                  | 0.03           | 3,000                             |
| 0805                | 2012                   | HI0805P390R-10 | 17                    | 39             | 59             | 65           | 65                               | 1,050                                | 0.008          | 4,000                             |
| 0805                | 2012                   | LI0805H400R-10 | 18                    | 40             | 70             | 76           | 76                               | 1,000                                | 0.15           | 800                               |
| 0805                | 2012                   | MI0805K400R-10 | 19                    | 40             | 60             | 63           | 69                               | 903                                  | 0.05           | 1,500                             |
| 0805                | 2012                   | HI0805T500R-10 | 25                    | 50             | 64             | 59           | 65                               | 490                                  | 0.01           | 6,000                             |
| 0805                | 2012                   | HI0805N600R-10 | 34                    | 60             | 80             | 75           | 81                               | 500                                  | 0.04           | 3,000                             |
| 0805                | 2012                   | LI0805H750R-10 | 31                    | 75             | 128            | 130          | 132                              | 769                                  | 0.15           | 800                               |
| 0805                | 2012                   | HI0805R800R-10 | 38                    | 80             | 70             | 38           | 100                              | 200                                  | 0.01           | 5,000                             |
| 0805                | 2012                   | LI0805H121R-10 | 53                    | 120            | 170            | 114          | 170                              | 340                                  | 0.15           | 800                               |
| 0805                | 2012                   | HI0805O121R-10 | 61                    | 120            | 140            | 80           | 167                              | 270                                  | 0.02           | 3,500                             |
| 0805                | 2012                   | HI0805R121R-10 | 47                    | 120            | 98             | 58           | 149                              | 205                                  | 0.03           | 5,000                             |
| 0805                | 2012                   | HI0805P121R-10 | 45                    | 120            | 102            | 64           | 125                              | 240                                  | 0.02           | 4,000                             |
| 0805                | 2012                   | LI0805H151R-10 | 73                    | 150            | 207            | 150          | 210                              | 400                                  | 0.15           | 800                               |
| 0805                | 2012                   | LI0805G201R-10 | 100                   | 200            | 221            | 128          | 272                              | 250                                  | 0.30           | 700                               |
| 0805                | 2012                   | MI0805M221R-10 | 100                   | 220            | 274            | 115          | 287                              | 260                                  | 0.05           | 2,500                             |
| 0805                | 2012                   | HI0805N221R-10 | 81                    | 220            | 113            | 115          | 283                              | 220                                  | 0.04           | 3,000                             |
| 0805                | 2012                   | LI0805G301R-10 | 124                   | 300            | 248            | 146          | 350                              | 205                                  | 0.20           | 700                               |
| 0805                | 2012                   | MI0805L301R-10 | 135                   | 300            | 271            | 147          | 350                              | 200                                  | 0.06           | 2,000                             |
| 0805                | 2012                   | MI0805L331R-10 | 148                   | 330            | 264            | 143          | 197                              | 393                                  | 0.06           | 2,000                             |
| 0805                | 2012                   | HZ0805G471R-10 | 221                   | 470            | 286            | 150          | 572                              | 149                                  | 0.20           | 700                               |
| 0805                | 2012                   | HZ0805E601R-10 | 277                   | 600            | 304            | 151          | 696                              | 155                                  | 0.30           | 500                               |
| 0805                | 2012                   | MI0805K601R-10 | 280                   | 600            | 240            | 120          | 723                              | 130                                  | 0.10           | 1,500                             |
| 0805                | 2012                   | MI0805L601R-10 | 264                   | 600            | 316            | 172          | 663                              | 155                                  | 0.10           | 2,000                             |
| 0805                | 2012                   | HZ0805D102R-10 | 280                   | 1,000          | 328            | 168          | 1,268                            | 113                                  | 0.30           | 400                               |
| 0805                | 2012                   | MI0805J102R-10 | 195                   | 1,000          | 226            | 108          | 1,112                            | 120                                  | 0.15           | 1,000                             |
| 0805                | 2012                   | HZ0805D152R-10 | 289                   | 1,500          | 333            | 166          | 1,525                            | 110                                  | 0.40           | 400                               |
| 0805                | 2012                   | HZ0805C202R-10 | 350                   | 2,000          | 300            | 150          | 2,000                            | 100                                  | 0.50           | 300                               |
| 1206                | 3216                   | MI1206K260R-10 | 12                    | 26             | 44             | 46           | 46                               | 1,000                                | 0.06           | 1,500                             |
| 1206                | 3216                   | MI1206K310R-10 | 12                    | 31             | 37             | 41           | 41                               | 1,000                                | 0.045          | 1,500                             |
| 1206                | 3216                   | HI1206T500R-10 | 19                    | 50             | 66             | 70           | 70                               | 1,000                                | 0.01           | 6,000                             |
| 1206                | 3216                   | HI1206N680R-10 | 29                    | 68             | 93             | 102          | 102                              | 1,000                                | 0.012          | 3,000                             |
| 1206                | 3216                   | HI1206N800R-10 | 38                    | 80             | 120            | 129          | 130                              | 800                                  | 0.035          | 3,000                             |
| 1206                | 3216                   | MI1206K900R-10 | 44                    | 90             | 142            | 150          | 154                              | 867                                  | 0.08           | 1,500                             |
| 1206                | 3216                   | HI1206N101R-10 | 41                    | 100            | 144            | 145          | 150                              | 600                                  | 0.035          | 3,000                             |
| 1206                | 3216                   | LI1206H121R-10 | 53                    | 120            | 144            | 135          | 145                              | 422                                  | 0.15           | 800                               |
| 1206                | 3216                   | HI1206P121R-10 | 56                    | 120            | 130            | 105          | 142                              | 300                                  | 0.03           | 4,000                             |
| 1206                | 3216                   | LI1206H151R-10 | 73                    | 150            | 173            | 123          | 182                              | 241                                  | 0.15           | 800                               |
| 1206                | 3216                   | HI1206T161R-10 | 71                    | 160            | 220            | 127          | 229                              | 251                                  | 0.018          | 6,000                             |
| 1206                | 3216                   | MI1206L391R-10 | 100                   | 390            | 160            | 90           | 460                              | 130                                  | 0.05           | 2,000                             |

FOR POWER LINE

| EIA<br>PKG.<br>SIZE | METRIC<br>PKG.<br>SIZE | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |                |                |              | TYPICAL PEAK<br>IMPEDANCE<br>( $\Omega$ ) | PEAK IMPEDANCE<br>FREQUENCY<br>(MHZ) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(CONTINUOUS)<br>MA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|--------------|-------------------------------------------|--------------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z @<br>25 MHZ                  | Z @<br>100 MHZ | Z @<br>500 MHZ | Z @<br>1 GHz |                                           |                                      |                            |                                   |
| 1206                | 3216                   | MI1206L501R-10 | 210                            | 500            | 150            | 82           | 500                                       | 100                                  | 0.06                       | 2,000                             |
| 1206                | 3216                   | HZ1206E601R-10 | 296                            | 600            | 202            | 103          | 674                                       | 75                                   | 0.30                       | 500                               |
| 1206                | 3216                   | MI1206K601R-10 | 300                            | 600            | 250            | 130          | 650                                       | 80                                   | 0.08                       | 1,500                             |
| 1206                | 3216                   | MI1206L601R-10 | 296                            | 600            | 116            | 59           | 660                                       | 79                                   | 0.08                       | 2,000                             |
| 1206                | 3216                   | HZ1206E152R-10 | 823                            | 950            | 188            | 57           | 1,564                                     | 57                                   | 0.30                       | 500                               |
| 1206                | 3216                   | HZ1206C202R-10 | 1,673                          | 915            | 180            | 100          | 2,505                                     | 41                                   | 0.50                       | 300                               |
| 1206                | 3216                   | HZ1206D102R-10 | 201                            | 1,000          | 185            | 100          | 1,000                                     | 100                                  | 0.40                       | 400                               |
| 1210                | 3225                   | MI1210K600R-10 | 30                             | 60             | 90             | 95           | 105                                       | 900                                  | 0.035                      | 1,500                             |
| 1612                | 4131                   | HI1612X560R-10 | 23                             | 56             | 75             | 79           | 79                                        | 1,000                                | 0.004                      | 10,000                            |
| 1806                | 4516                   | HI1806T600R-10 | 28                             | 60             | 87             | 92           | 92                                        | 1,000                                | 0.01                       | 6,000                             |
| 1806                | 4516                   | LI1806E800R-10 | 28                             | 80             | 117            | 117          | 117                                       | 1,000                                | 0.30                       | 500                               |
| 1806                | 4516                   | MI1806J800R-10 | 34                             | 78             | 114            | 118          | 119                                       | 903                                  | 0.03                       | 1,000                             |
| 1806                | 4516                   | HI1806N910R-10 | 42                             | 91             | 140            | 150          | 150                                       | 1,000                                | 0.03                       | 3,000                             |
| 1806                | 4516                   | LI1806E101R-10 | 45                             | 100            | 157            | 164          | 166                                       | 966                                  | 0.30                       | 500                               |
| 1806                | 4516                   | LI1806C151R-10 | 60                             | 150            | 219            | 222          | 223                                       | 871                                  | 0.50                       | 300                               |
| 1806                | 4516                   | HZ1806K102R-10 | 60                             | 1,000          | 160            | 80           | 1,390                                     | 135                                  | 0.15                       | 1,500                             |
| 1812                | 4532                   | HI1812T800R-10 | 30                             | 80             | 97             | 107          | 107                                       | 1,000                                | 0.01                       | 6,000                             |
| 1812                | 4532                   | HI1812V101R-10 | 45                             | 100            | 136            | 134          | 139                                       | 800                                  | 0.01                       | 8,000                             |
| 1812                | 4532                   | LI1812D121R-10 | 55                             | 120            | 182            | 184          | 186                                       | 738                                  | 0.40                       | 400                               |
| 1812                | 4532                   | MI1812K121R-10 | 45                             | 120            | 162            | 170          | 175                                       | 900                                  | 0.055                      | 1,500                             |
| 2220                | 5620                   | HI2220T101R-10 | 50                             | 100            | 148            | 152          | 160                                       | 600                                  | 0.006                      | 6,000                             |
| 2220                | 5620                   | HI2220R151R-10 | 60                             | 150            | 230            | 196          | 230                                       | 500                                  | 0.015                      | 5,000                             |
| 2220                | 5620                   | HI2220P171R-10 | 78                             | 170            | 256            | 237          | 256                                       | 500                                  | 0.03                       | 4,000                             |
| 2220                | 5620                   | HI2220R181R-10 | 80                             | 180            | 263            | 234          | 270                                       | 400                                  | 0.02                       | 5,000                             |
| 2220                | 5620                   | HI2220P251R-10 | 100                            | 250            | 172            | 91           | 390                                       | 200                                  | 0.015                      | 4,000                             |
| 2220                | 5620                   | HI2220P271R-10 | 110                            | 270            | 360            | 250          | 390                                       | 300                                  | 0.035                      | 4,000                             |
| 2220                | 5620                   | HI2220R301R-10 | 100                            | 300            | 190            | 100          | 380                                       | 200                                  | 0.02                       | 5,000                             |
| 2220                | 5620                   | HI2220Q401R-10 | 100                            | 400            | 159            | 99           | 450                                       | 150                                  | 0.03                       | 4,500                             |
| 2220                | 5620                   | HI2220P551R-10 | 180                            | 550            | 670            | 343          | 850                                       | 300                                  | 0.035                      | 4,000                             |
| 2220                | 5620                   | HI2220P601R-10 | 220                            | 600            | 184            | 106          | 600                                       | 100                                  | 0.025                      | 4,000                             |
| 2220                | 5620                   | HR2220P601R-10 | 200                            | 600            | 150            | 75           | 600                                       | 100                                  | 0.025                      | 4,000                             |
| 2220                | 5620                   | HI2220P701R-10 | 200                            | 700            | 140            | 90           | 700                                       | 100                                  | 0.025                      | 4,000                             |
| 2220                | 5620                   | HR2220V701R-10 | 198                            | 700            | 120            | 62           | 760                                       | 91                                   | 0.01                       | 8,000                             |
| 2220                | 5620                   | HR2220V801R-10 | 150                            | 800            | 125            | 75           | 910                                       | 90                                   | 0.01                       | 8,000                             |
| 3312                | 8531                   | HI3312X101R-10 | 39                             | 100            | 160            | 172          | 172                                       | 1,000                                | 0.004                      | 10,000                            |

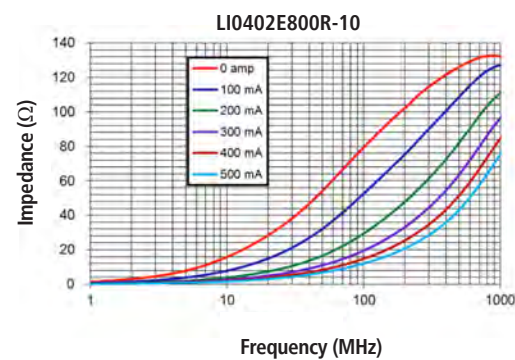
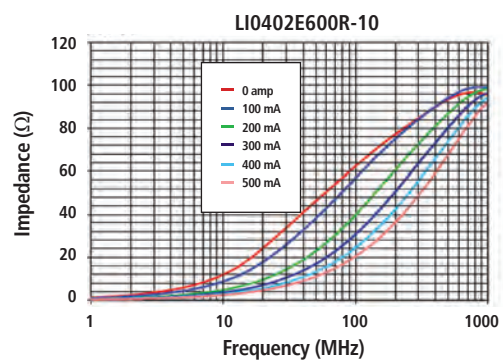
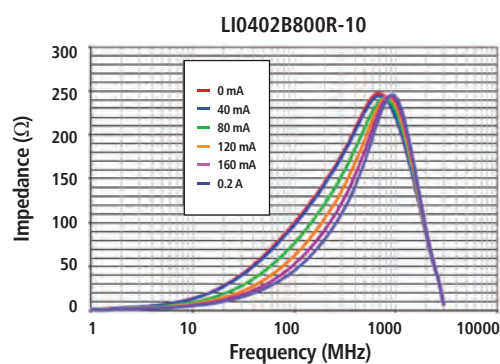
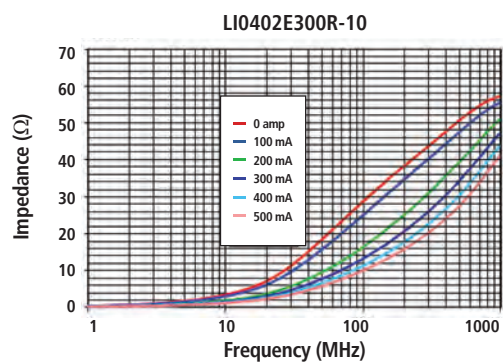
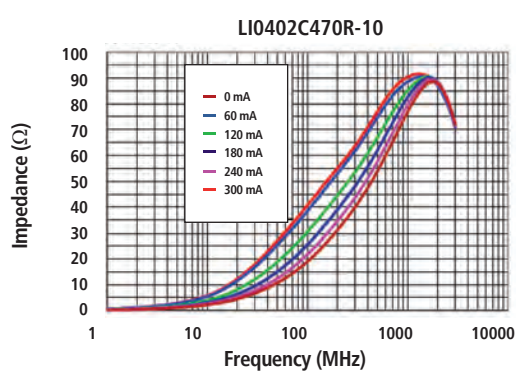
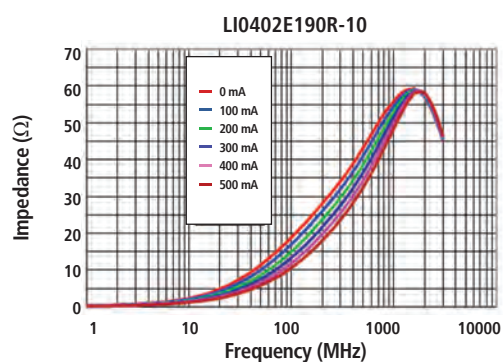
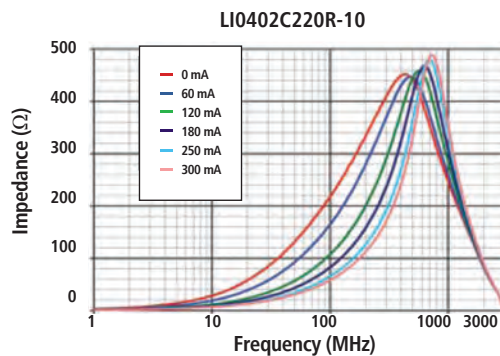
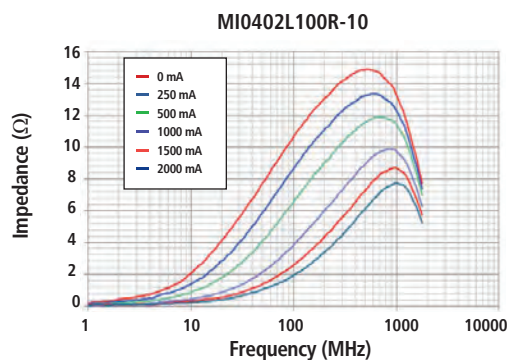
4 LINES CHIP BEAD ARRAY

| EIA<br>PKG.<br>SIZE | METRIC<br>PKG.<br>SIZE | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |                |                |              | TYPICAL PEAK<br>IMPEDANCE<br>( $\Omega$ ) | PEAK IMPEDANCE<br>FREQUENCY (MHZ) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(CONTINUOUS)<br>MA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|--------------|-------------------------------------------|-----------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z @<br>25 MHZ                  | Z @<br>100 MHZ | Z @<br>500 MHZ | Z @<br>1 GHz |                                           |                                   |                            |                                   |
| 1206                | 3216                   | DA1206E300R-10 | 10                             | 30             | 55             | 56           | 56                                        | 1,000                             | 0.30                       | 500                               |
| 1206                | 3216                   | DA1206D600R-10 | 15                             | 60             | 115            | 132          | 133                                       | 1,103                             | 0.20                       | 400                               |
| 1206                | 3216                   | DA1206C121R-10 | 39                             | 120            | 181            | 151          | 211                                       | 559                               | 0.20                       | 300                               |
| 1206                | 3216                   | DA1206D301R-10 | 94                             | 300            | 437            | 245          | 437                                       | 500                               | 0.40                       | 400                               |
| 1206                | 3216                   | DA1206B601R-10 | 180                            | 600            | 475            | 230          | 761                                       | 214                               | 0.35                       | 200                               |
| 1206                | 3216                   | DA1206B102R-10 | 275                            | 1,000          | 520            | 240          | 1,129                                     | 175                               | 0.80                       | 200                               |

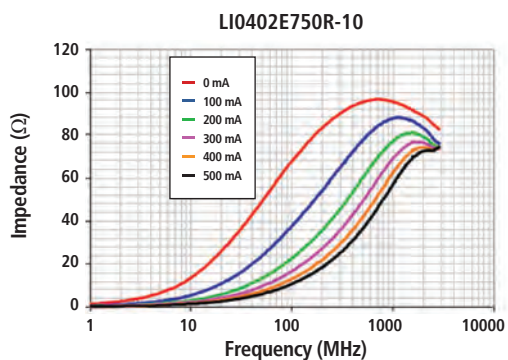
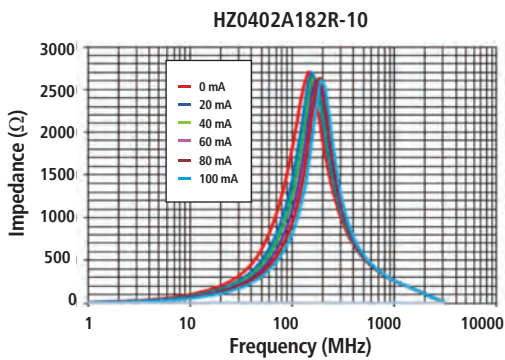
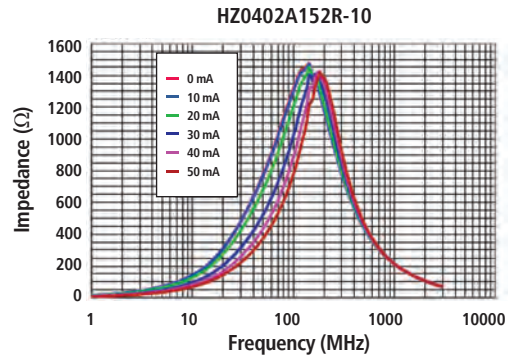
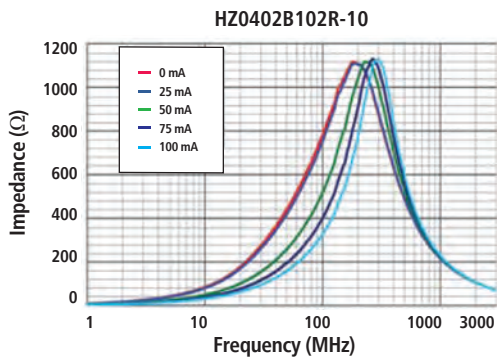
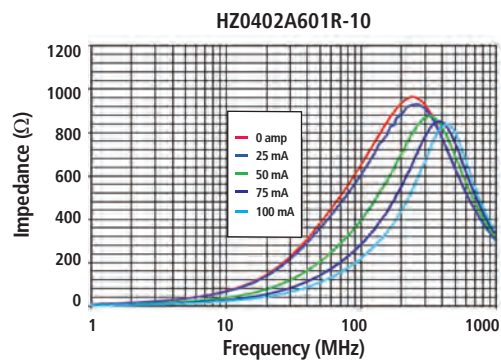
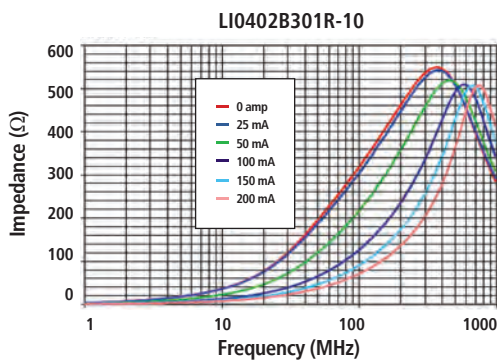
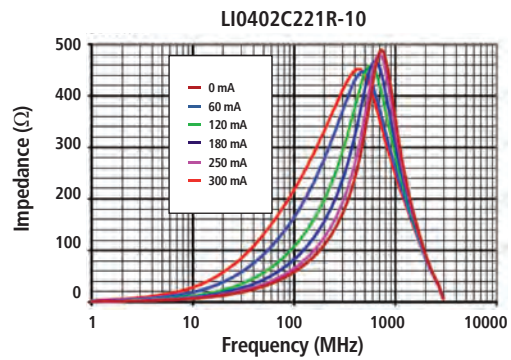
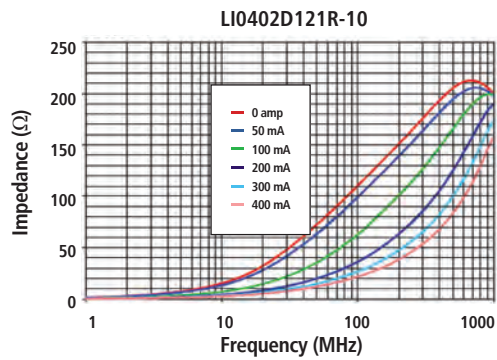
LOW FREQUENCY EMI CHIP BEADS

| EIA<br>PKG.<br>SIZE | METRIC<br>PKG.<br>SIZE | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |                |                | TYPICAL PEAK<br>IMPEDANCE<br>( $\Omega$ ) | PEAK IMPEDANCE<br>FREQUENCY (MHZ) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(CONTINUOUS)<br>mA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|-------------------------------------------|-----------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z                              | Z @<br>100 MHZ | Z @<br>500 MHZ |                                           |                                   |                            |                                   |
| 1206                | 3216                   | LF1206A302R-10 | 3,000 @ 10 MHz                 | 760            | 166            | 5,650                                     | 19                                | 1.05                       | 100                               |
| 1206                | 3216                   | LF1206C202R-10 | 2,000 @ 30 MHz                 | 915            | 180            | 2,505                                     | 41                                | 0.50                       | 300                               |
| 1206                | 3216                   | LF1206E152R-10 | 1,500 @ 50 MHz                 | 946            | 169            | 1,564                                     | 57                                | 0.30                       | 500                               |
| 0805                | 2012                   | LF0805A252R-10 | 2,500 @ 10 MHz                 | 1,248          | 306            | 5,138                                     | 25                                | 1.25                       | 100                               |

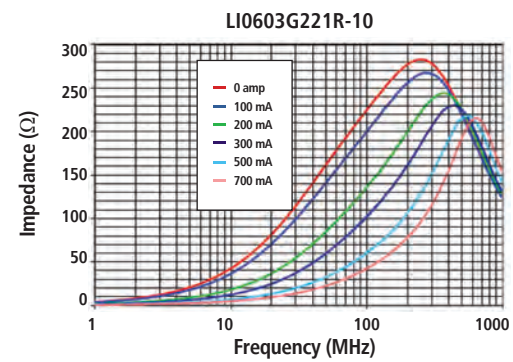
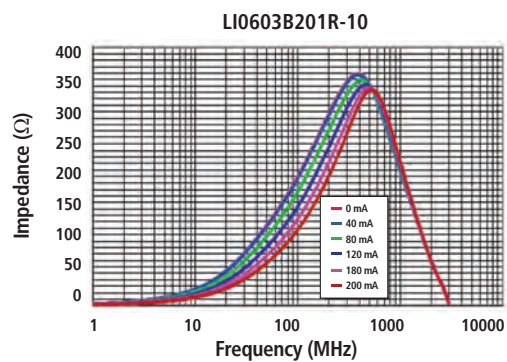
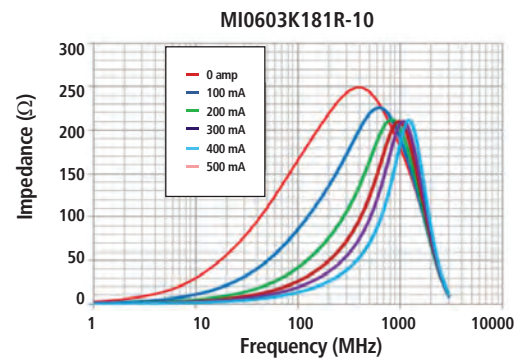
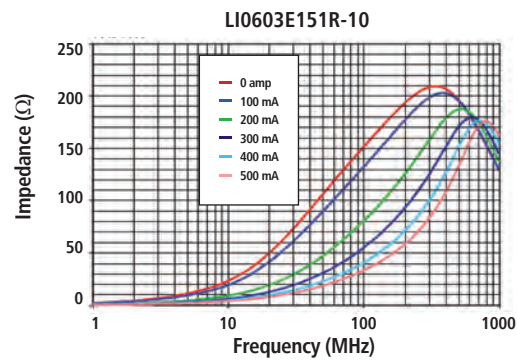
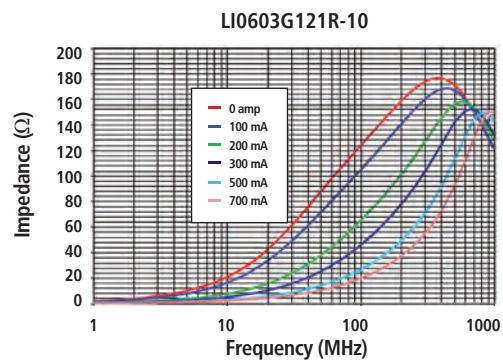
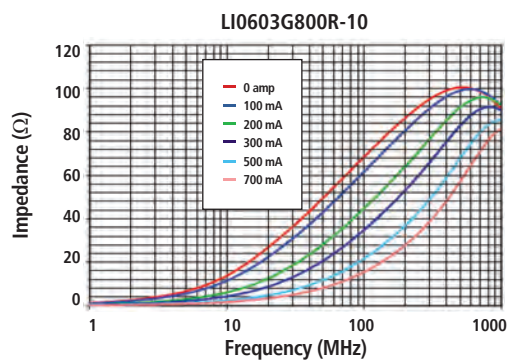
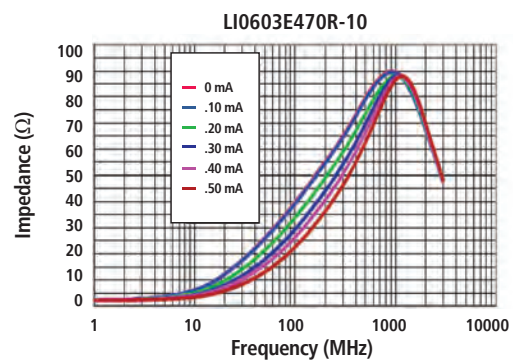
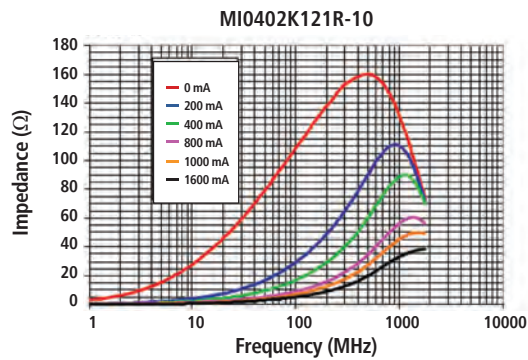
## 0402 Chip Bead Impedance Under DC Bias



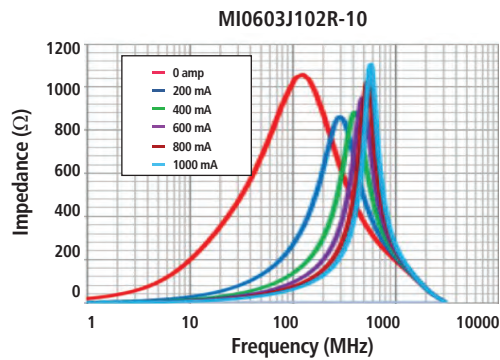
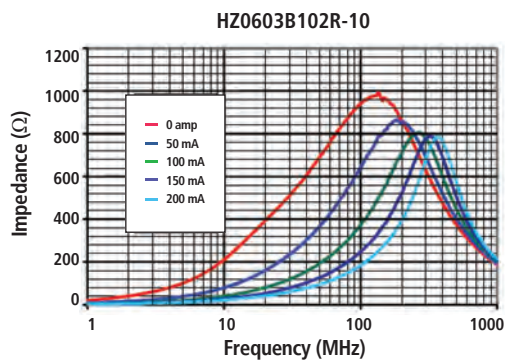
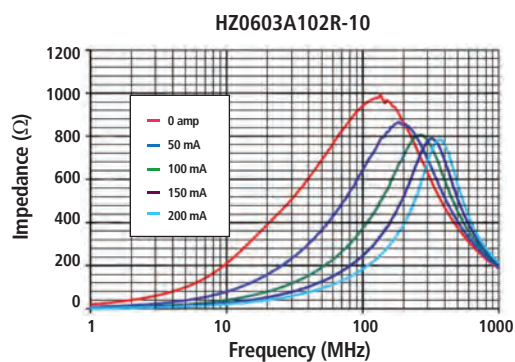
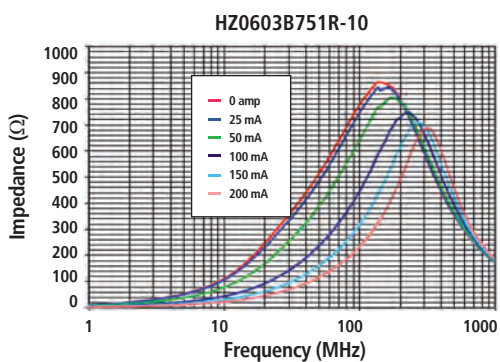
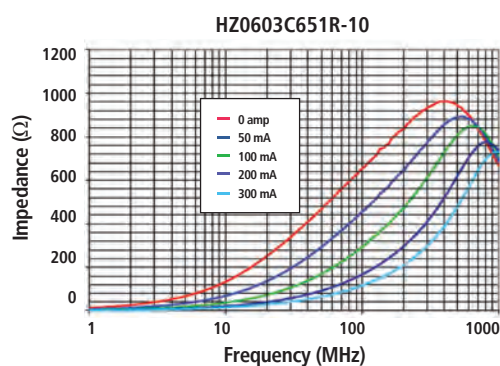
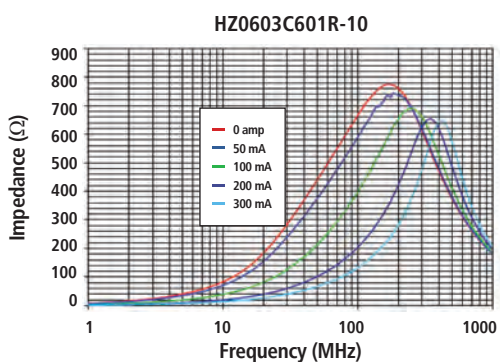
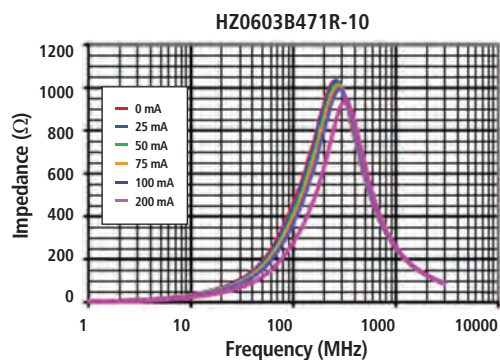
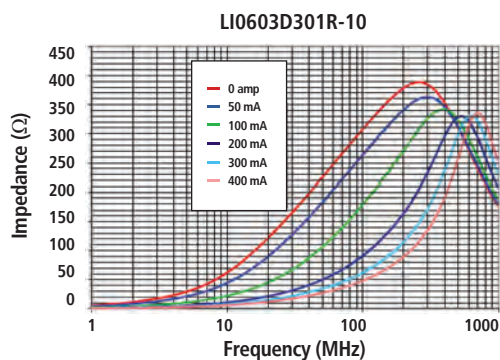
## 0402 Chip Bead Impedance Under DC Bias



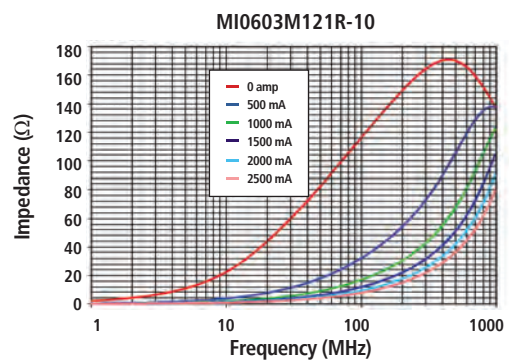
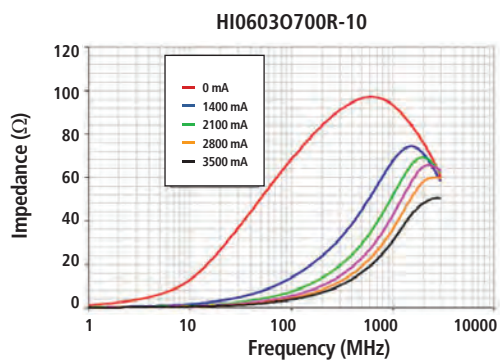
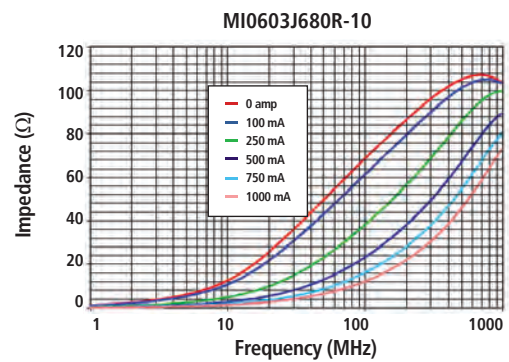
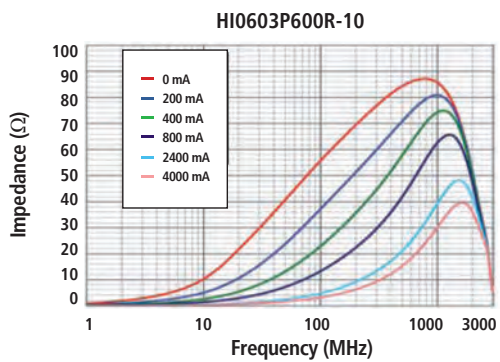
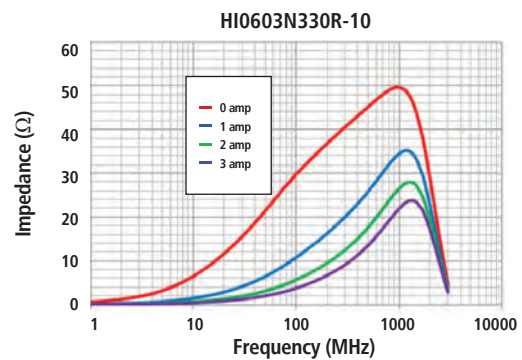
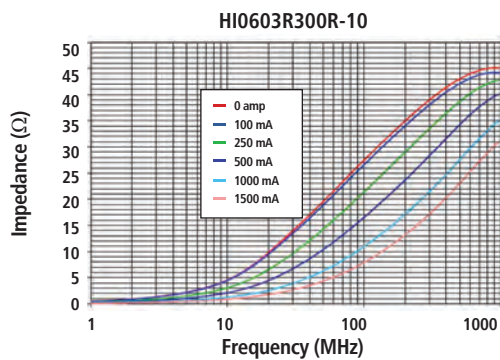
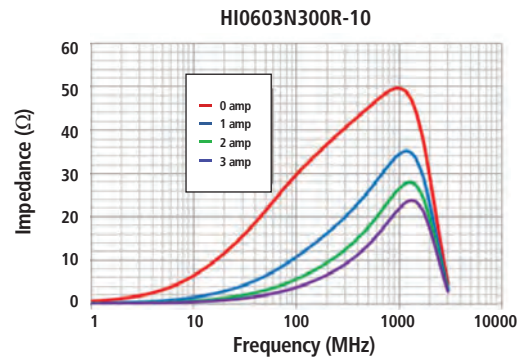
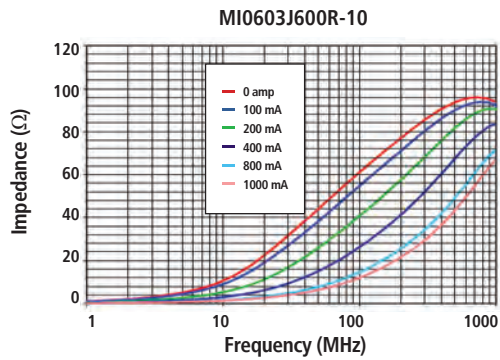
# 0402/0603 Chip Bead Impedance Under DC Bias



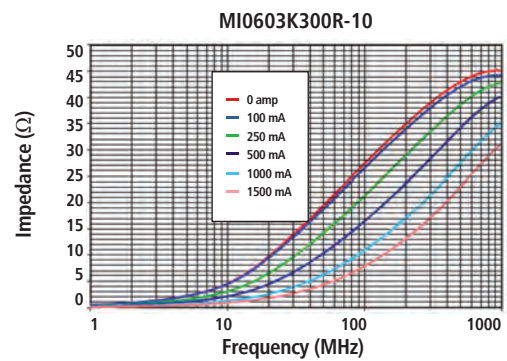
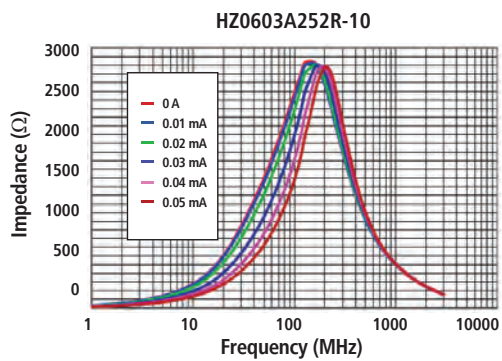
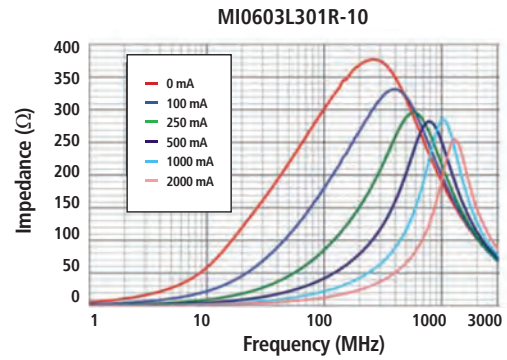
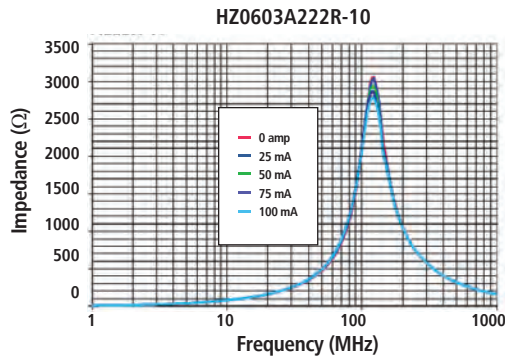
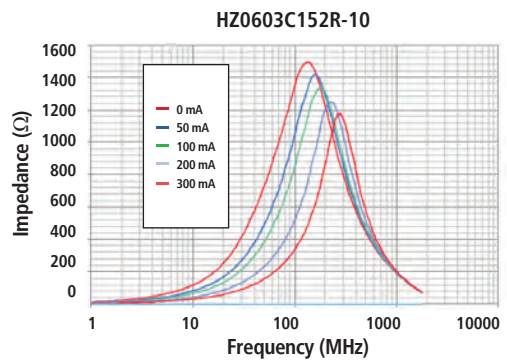
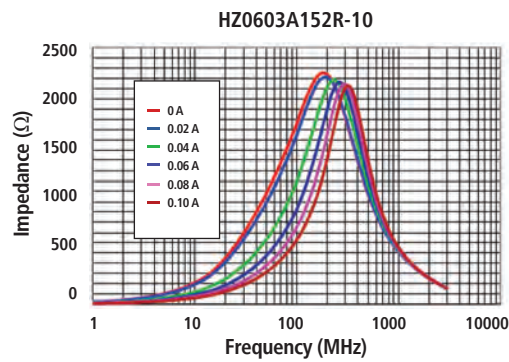
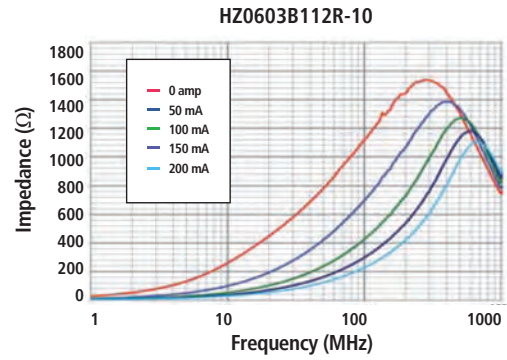
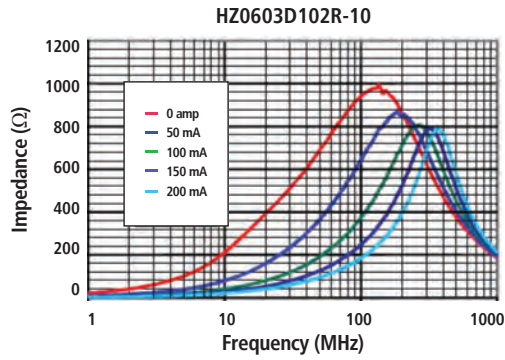
## 0603 Chip Bead Impedance Under DC Bias



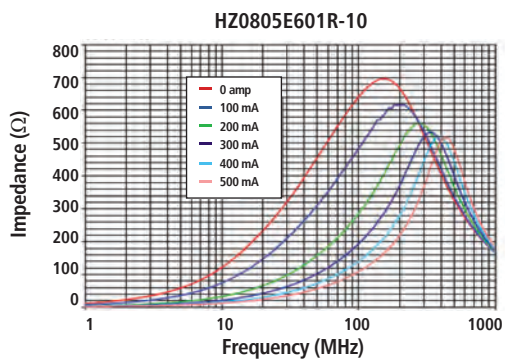
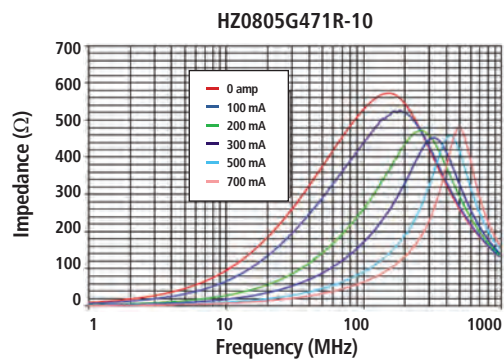
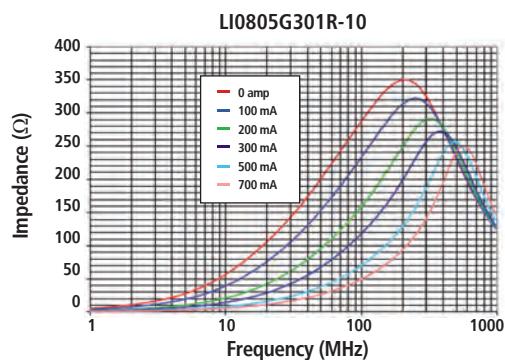
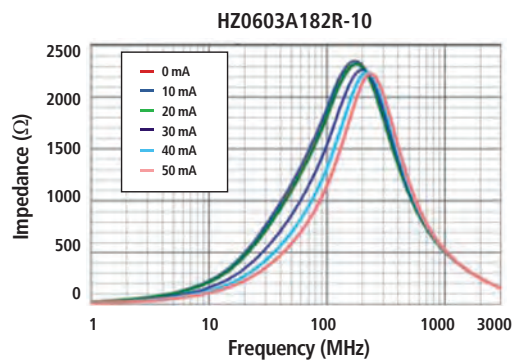
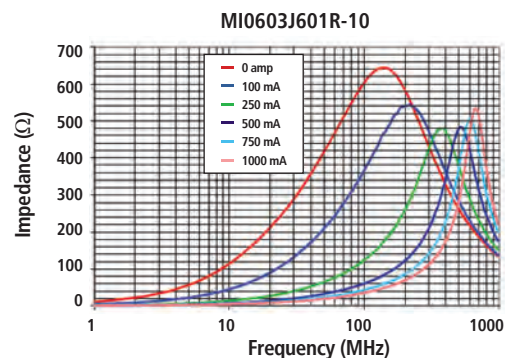
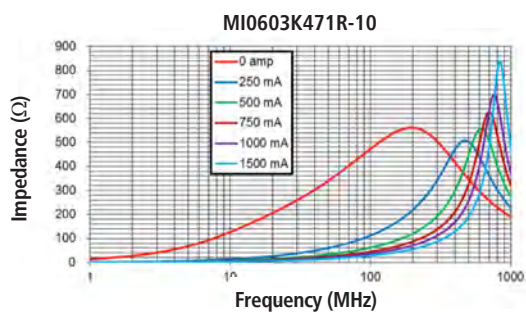
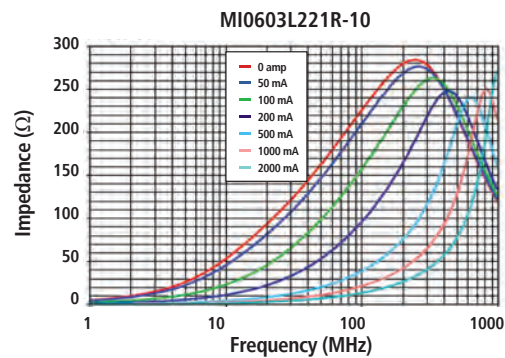
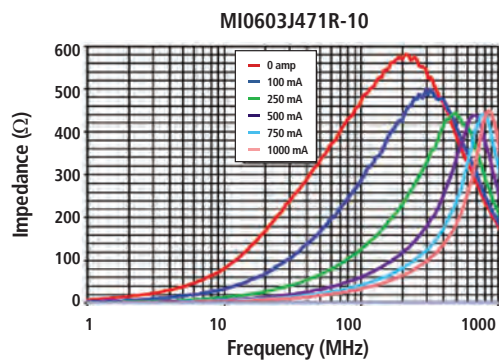
## 0603 Chip Bead Impedance Under DC Bias



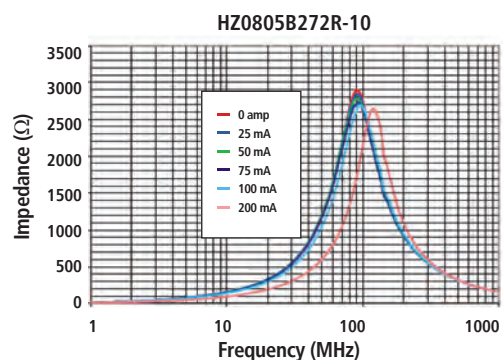
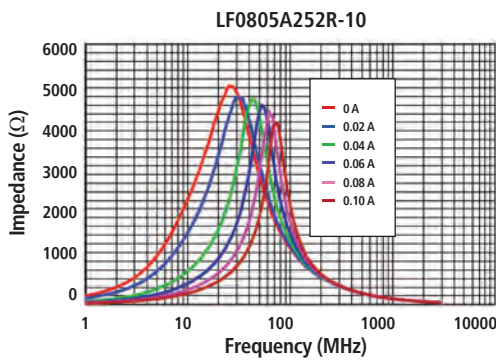
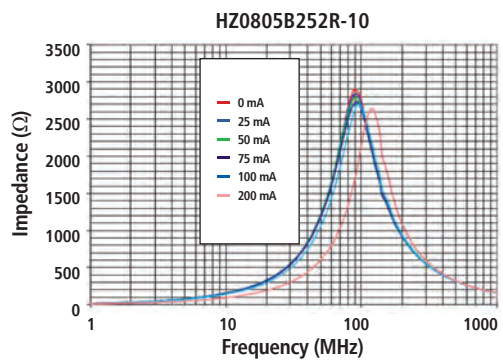
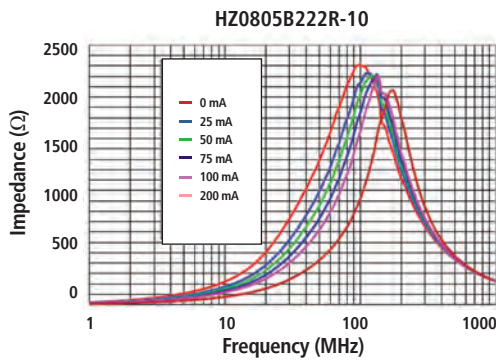
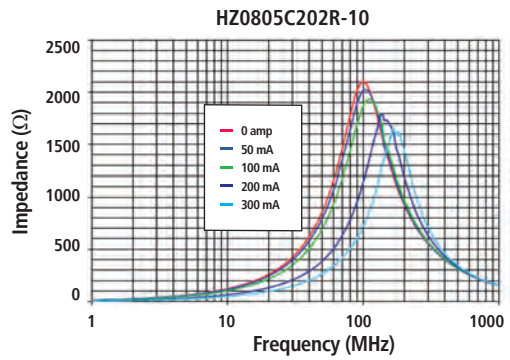
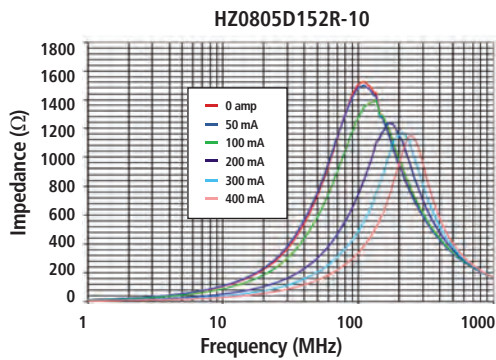
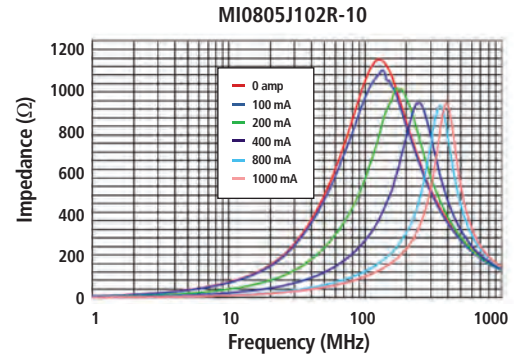
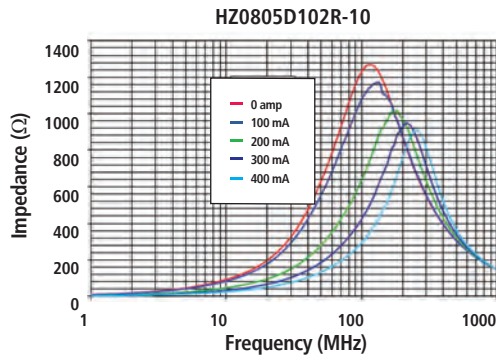
## 0603 Chip Bead Impedance Under DC Bias



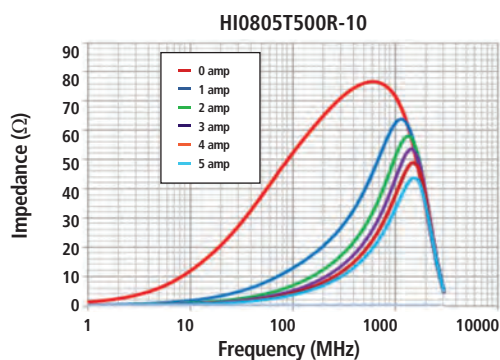
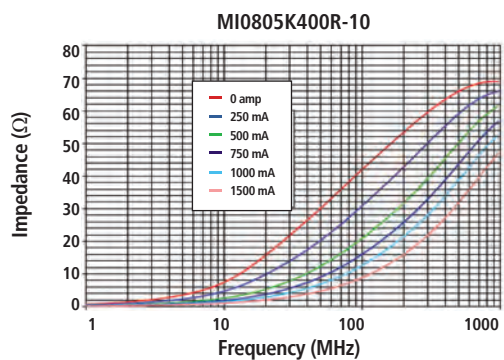
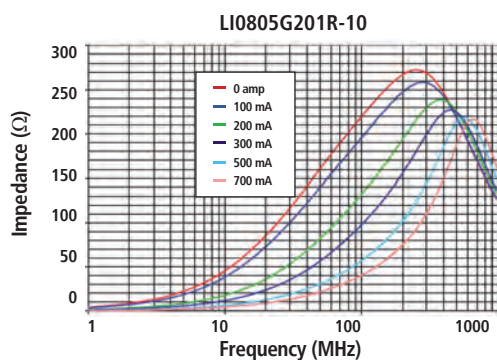
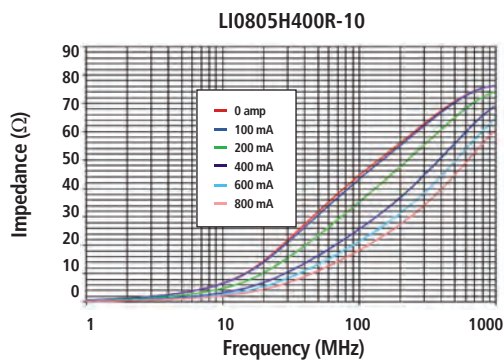
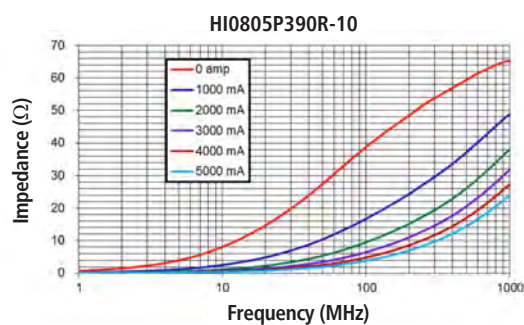
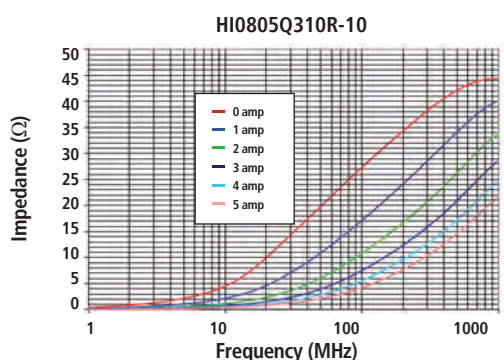
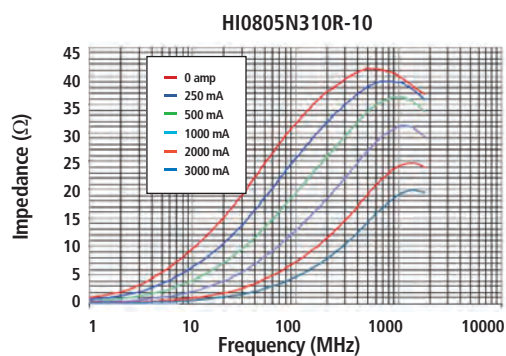
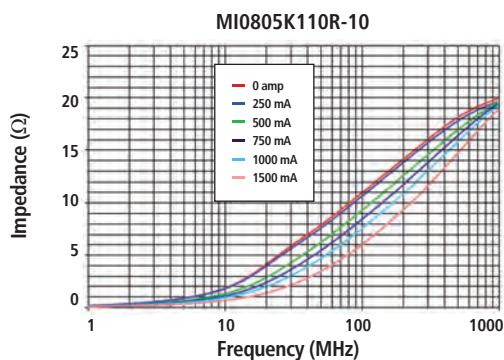
## 0603/0805 Chip Bead Impedance Under DC Bias



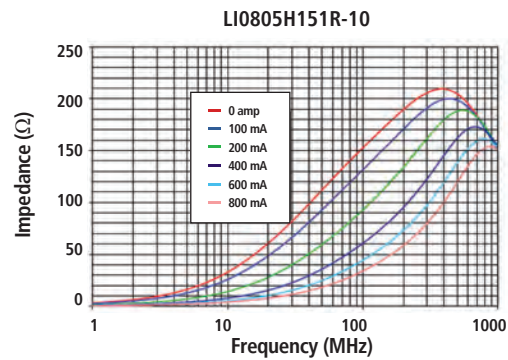
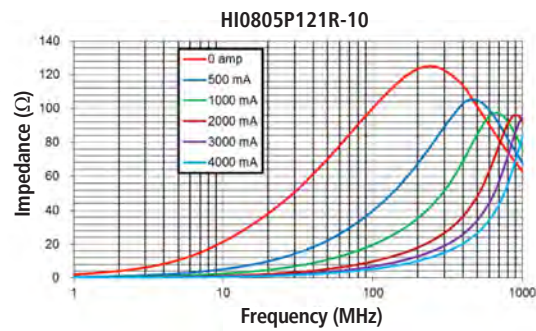
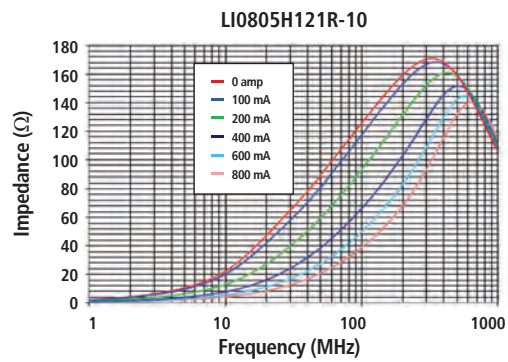
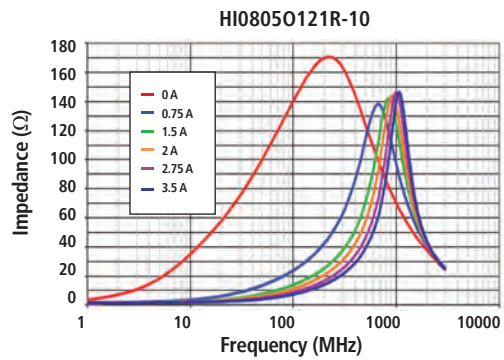
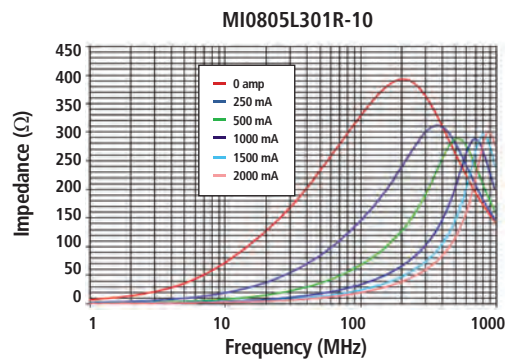
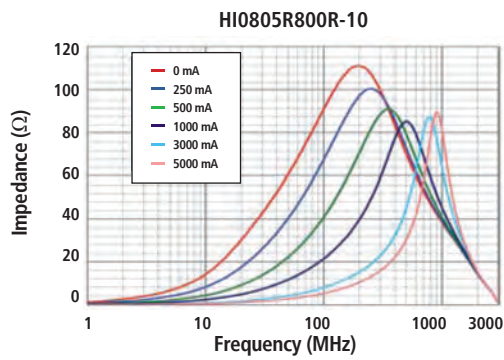
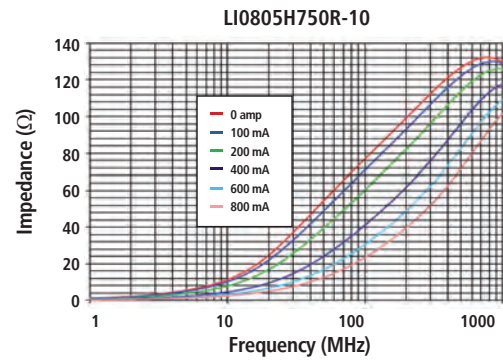
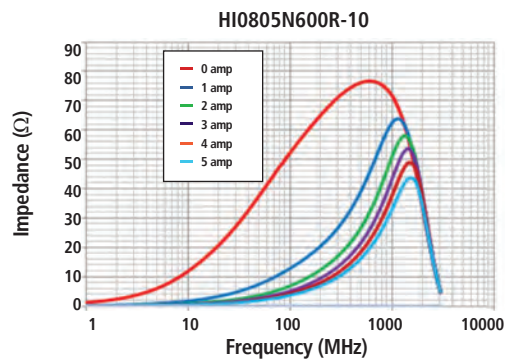
## 0805 Chip Bead Impedance Under DC Bias



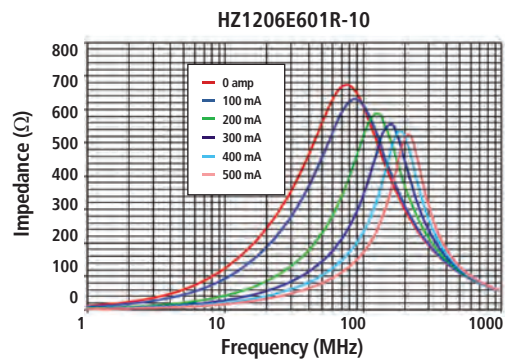
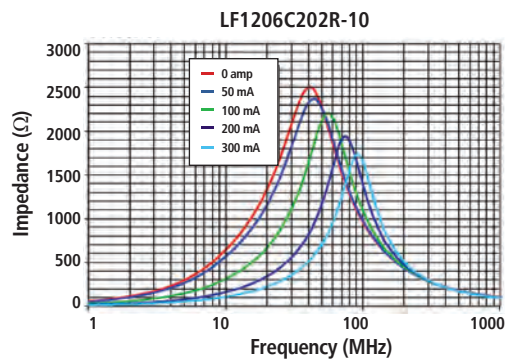
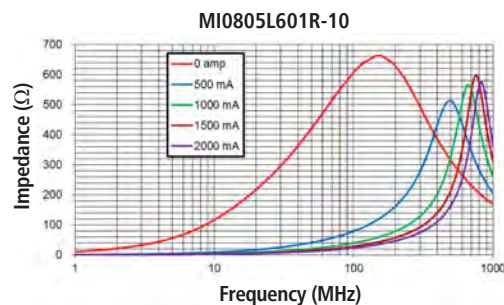
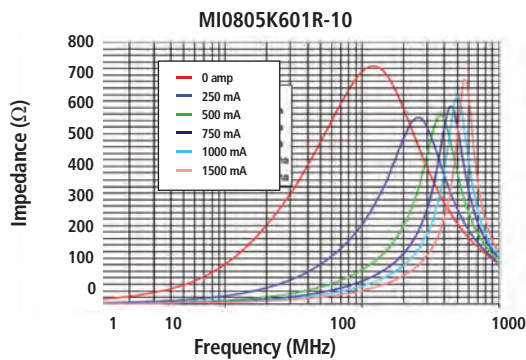
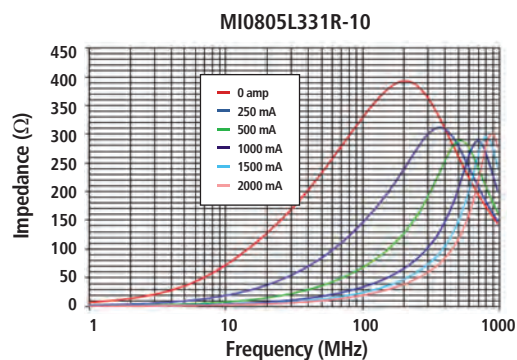
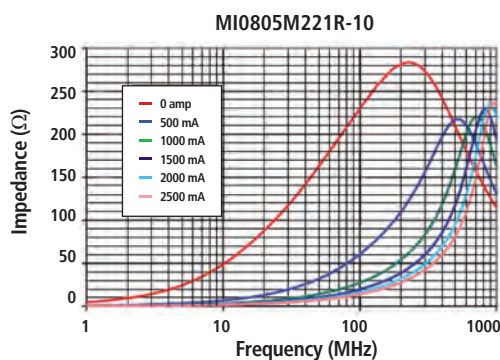
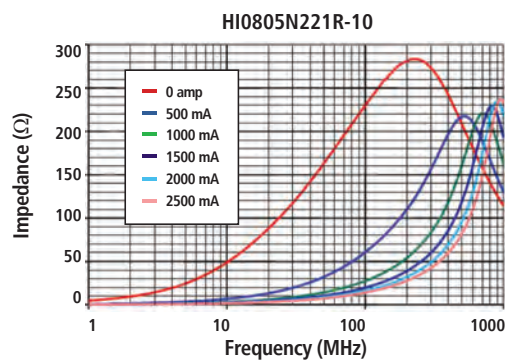
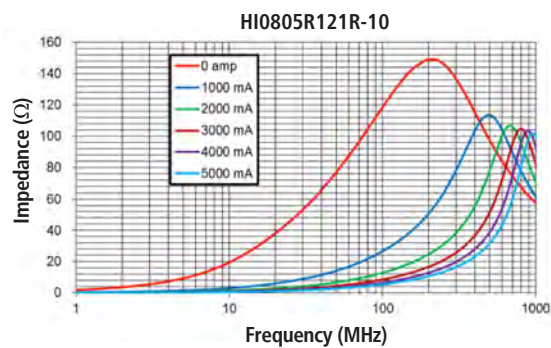
## 0805 Chip Bead Impedance Under DC Bias



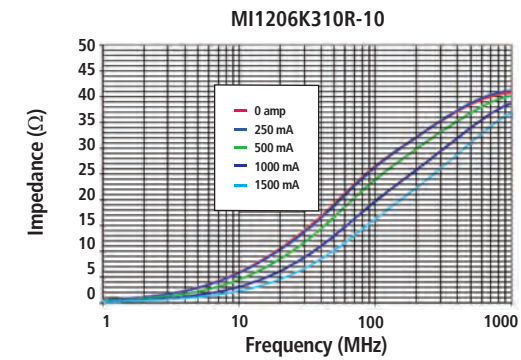
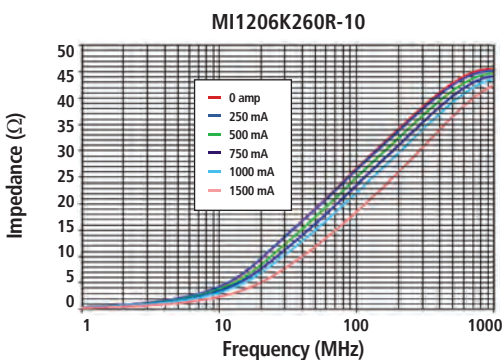
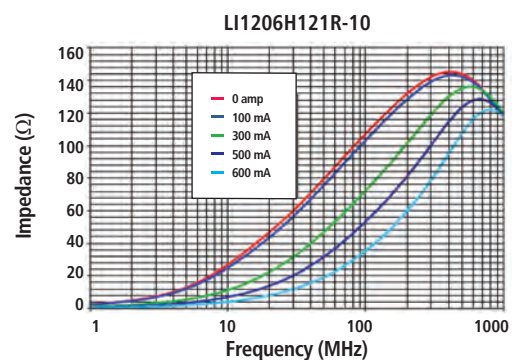
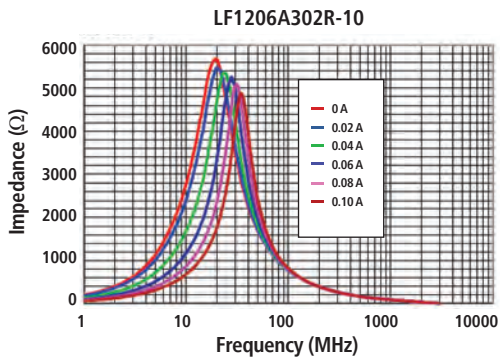
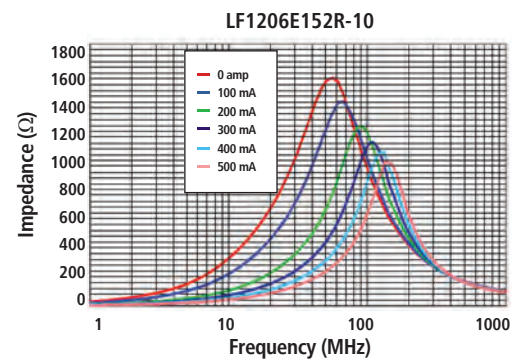
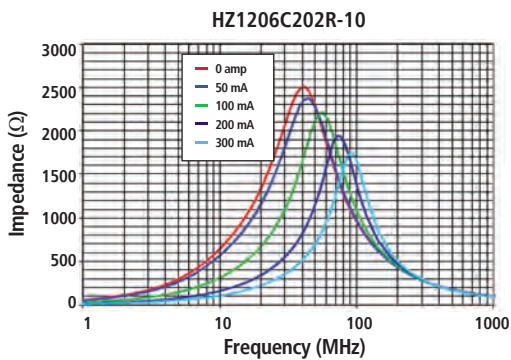
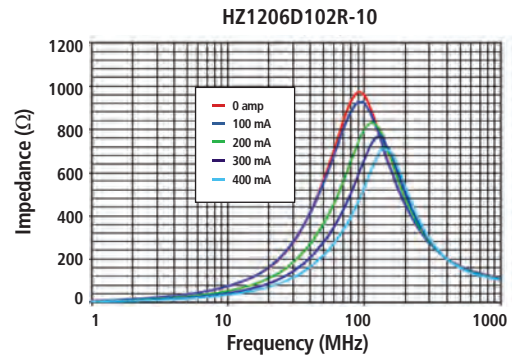
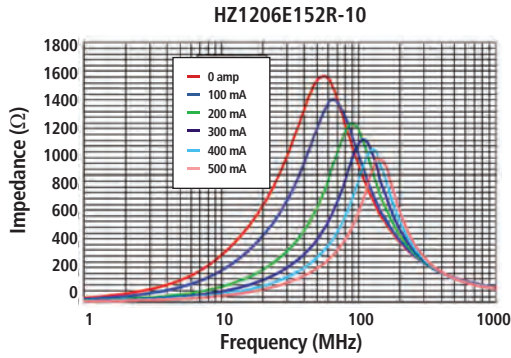
## 0805 Chip Bead Impedance Under DC Bias



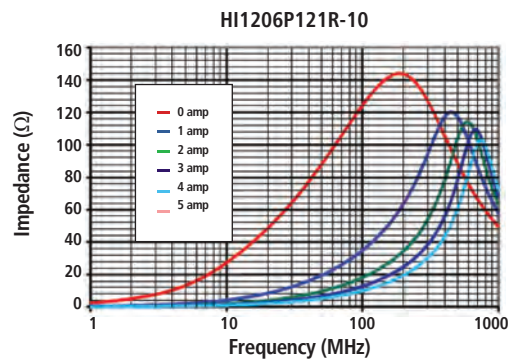
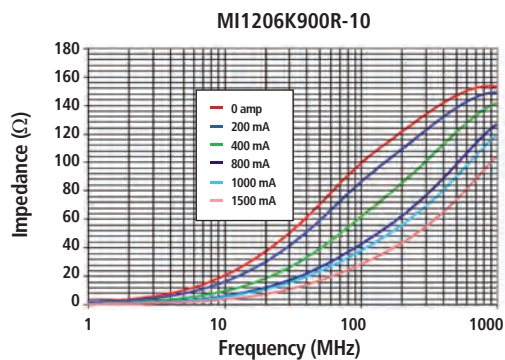
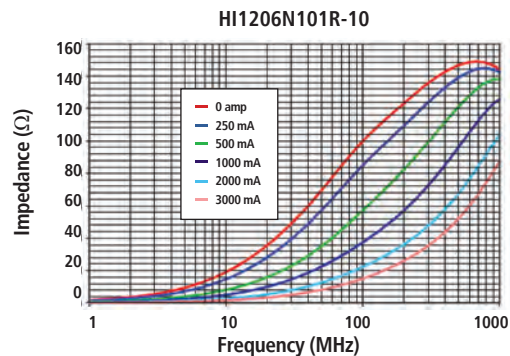
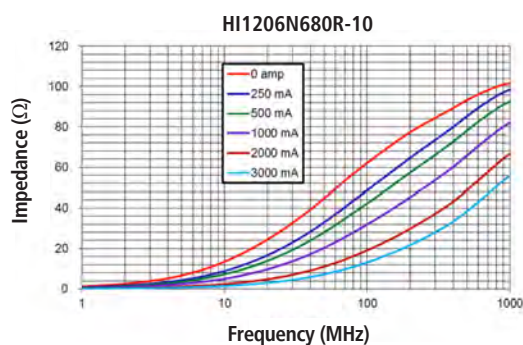
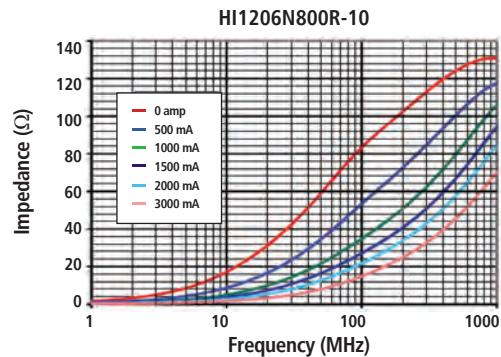
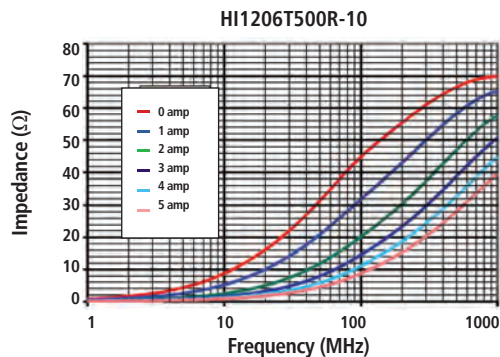
## 0805/1206 Chip Bead Impedance Under DC Bias



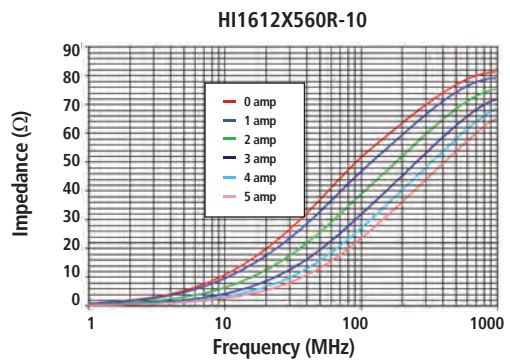
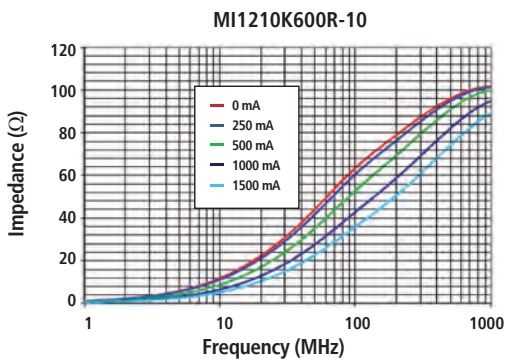
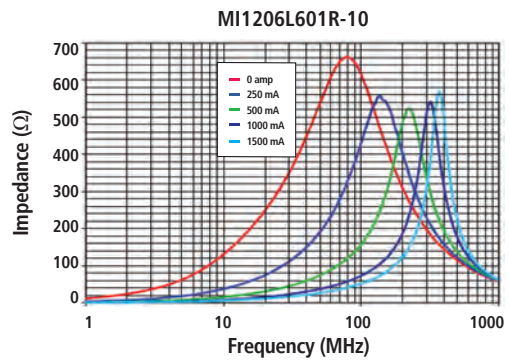
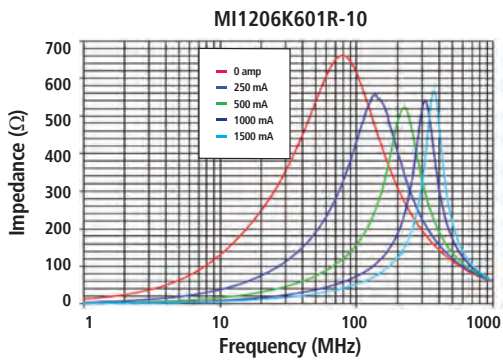
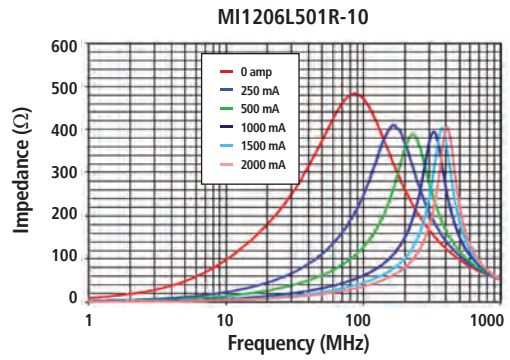
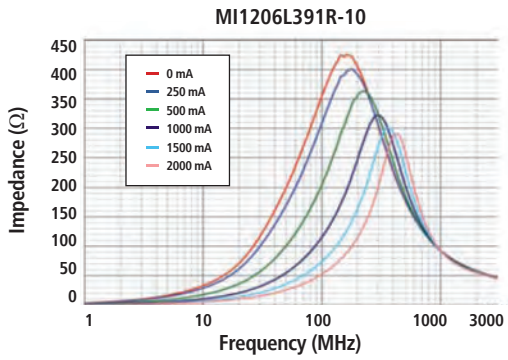
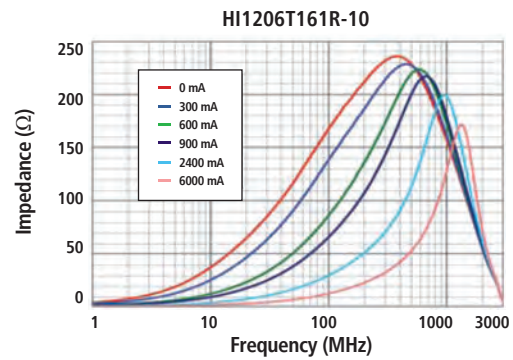
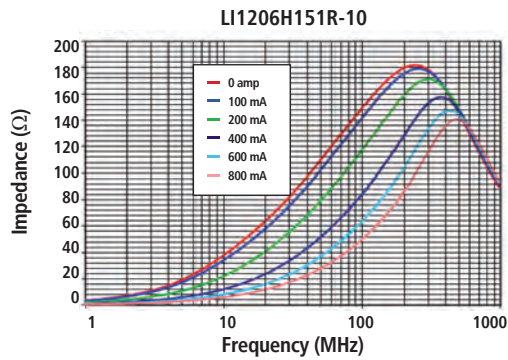
## 1206 Chip Bead Impedance Under DC Bias



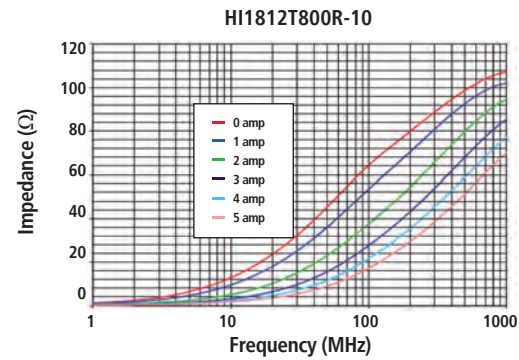
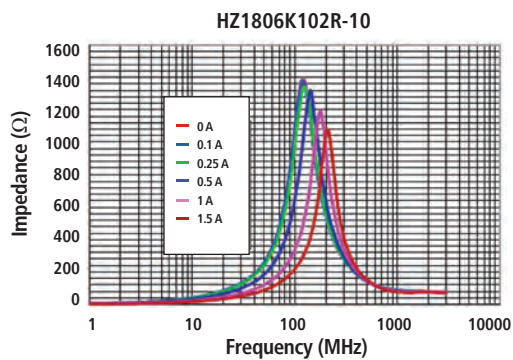
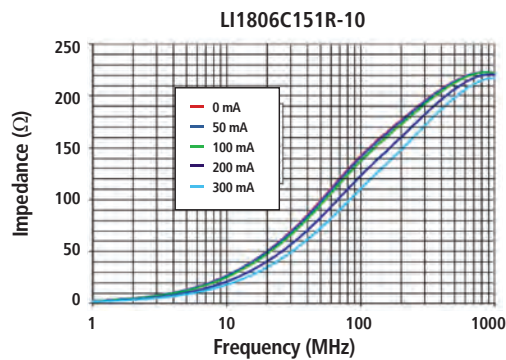
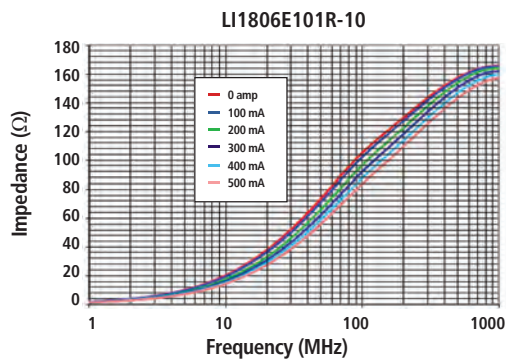
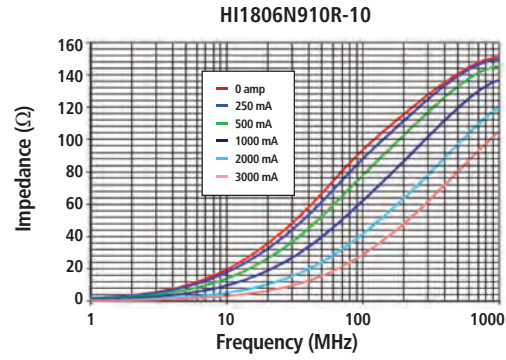
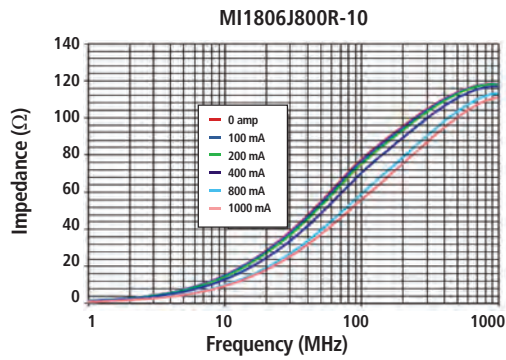
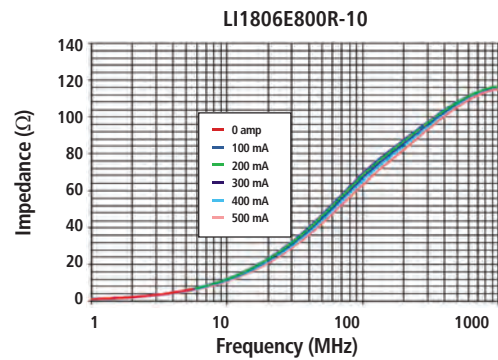
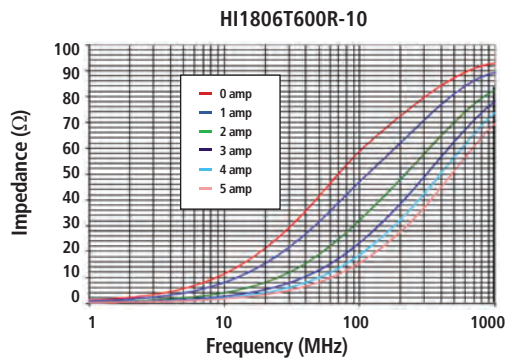
## 1206 Chip Bead Impedance Under DC Bias



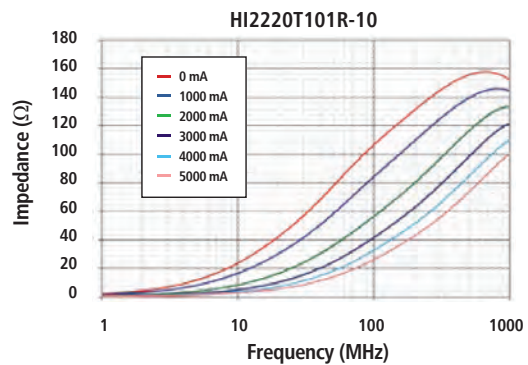
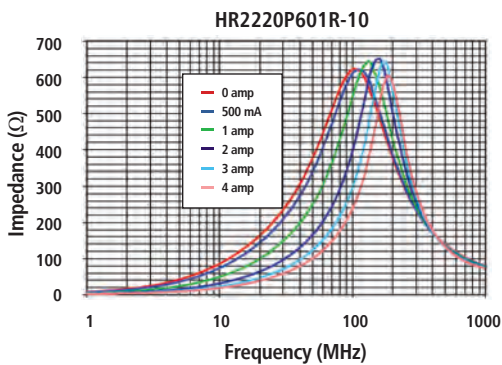
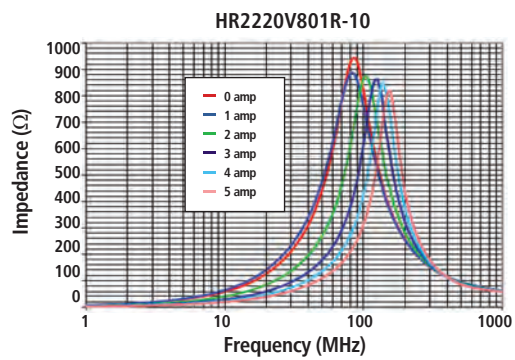
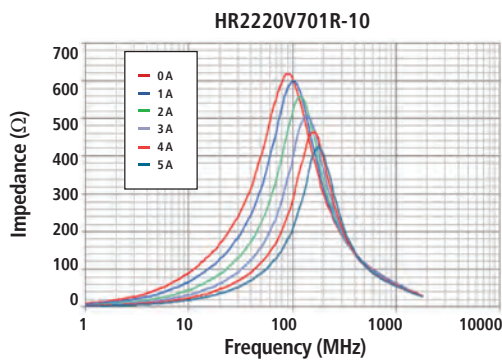
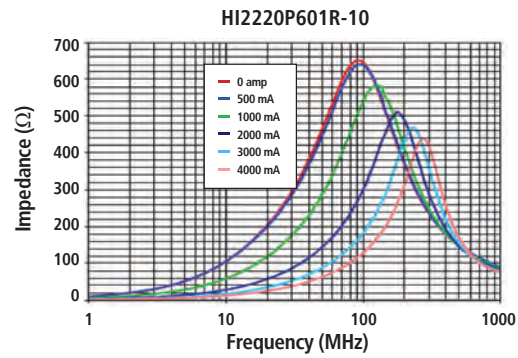
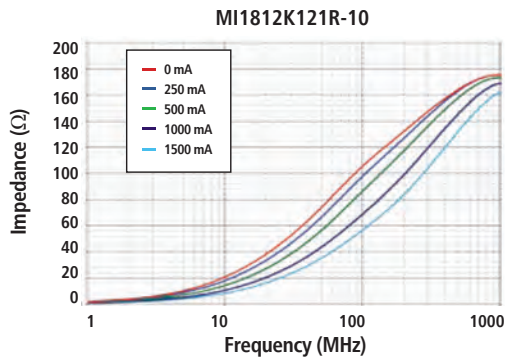
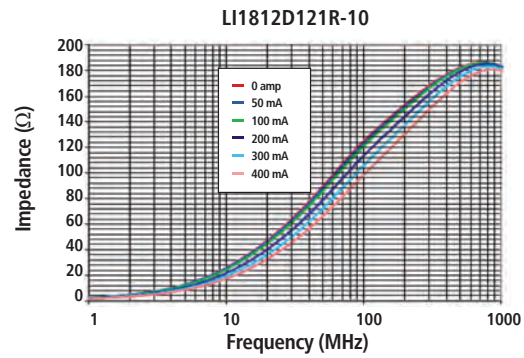
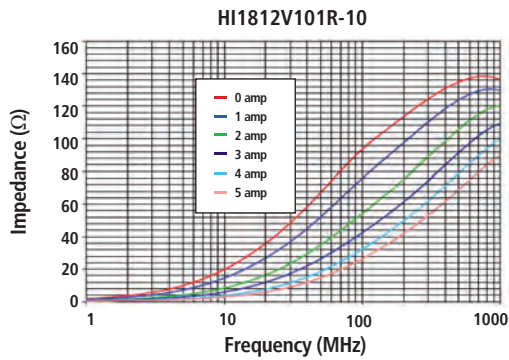
## 1206/1210/1612 Chip Bead Impedance Under DC Bias



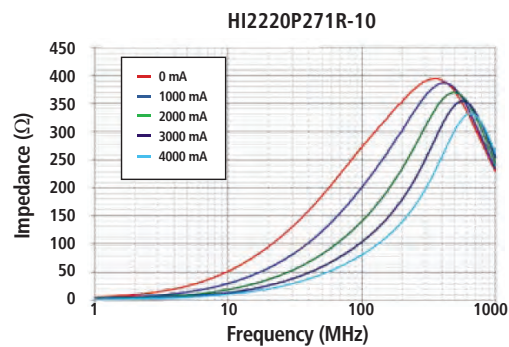
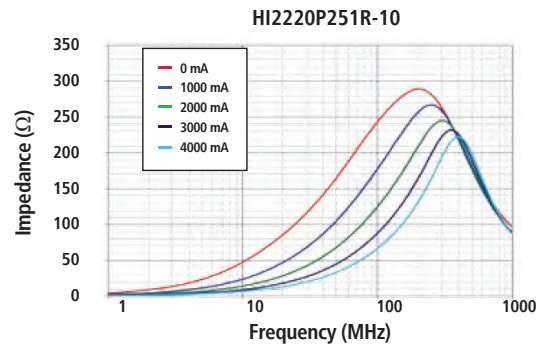
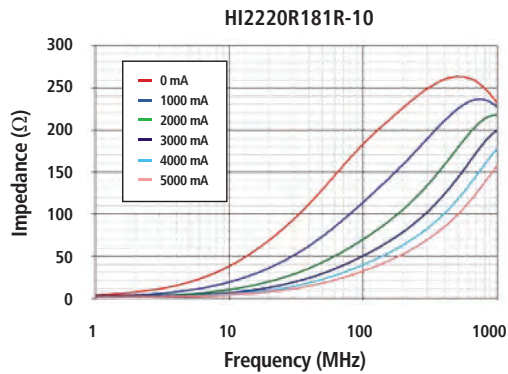
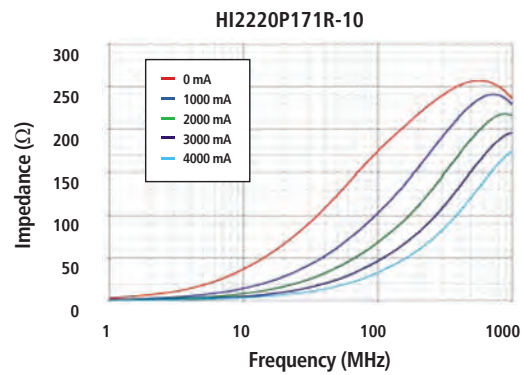
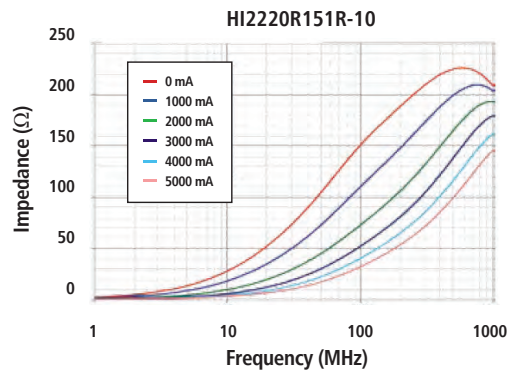
## 1806/1812 Chip Bead Impedance Under DC Bias



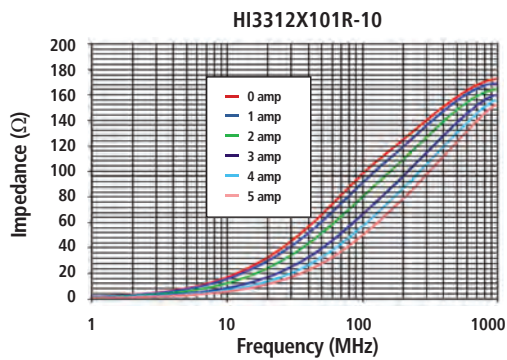
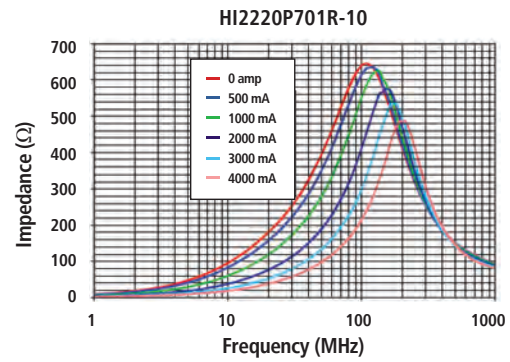
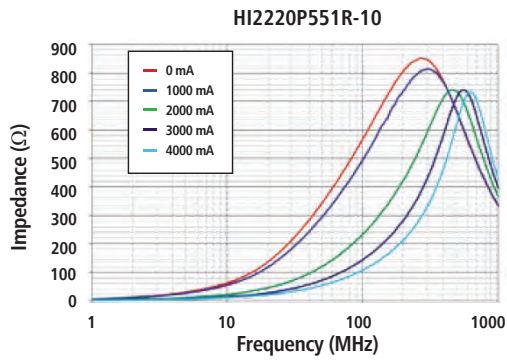
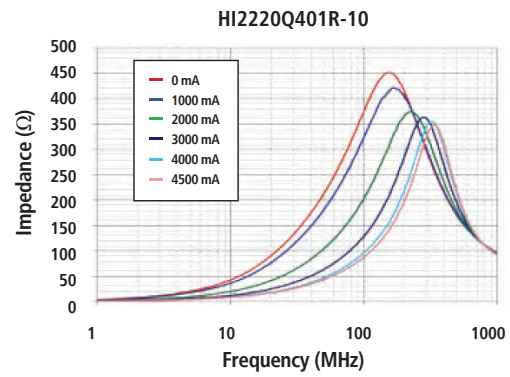
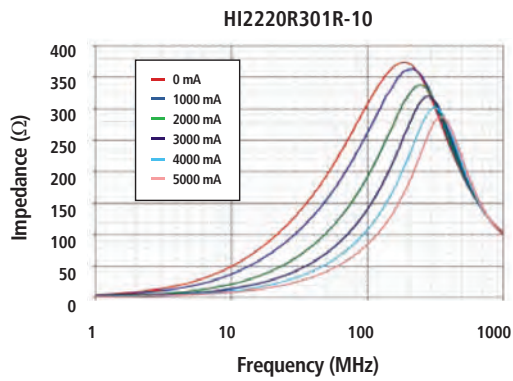
## 1812/2220 Chip Bead Impedance Under DC Bias



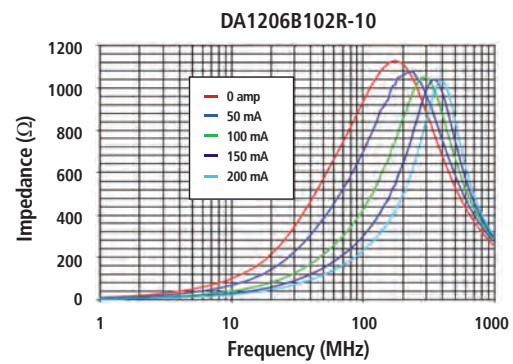
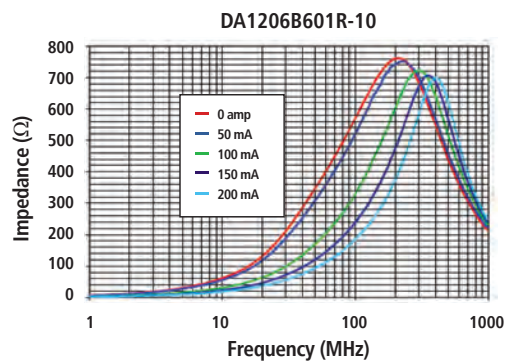
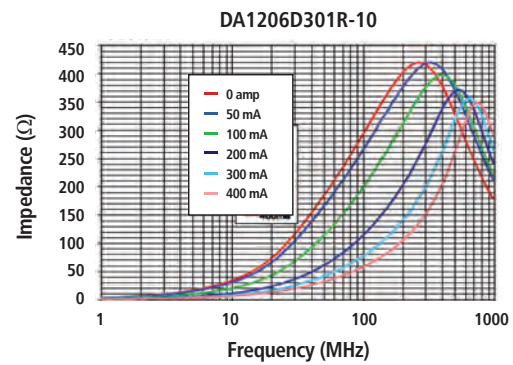
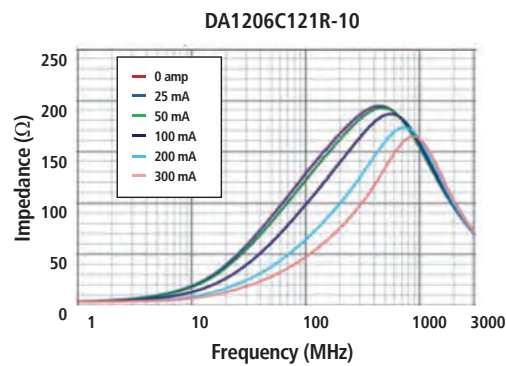
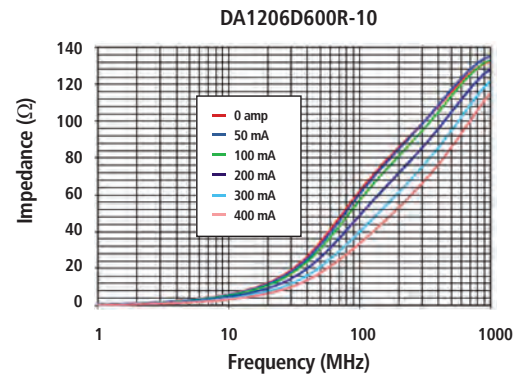
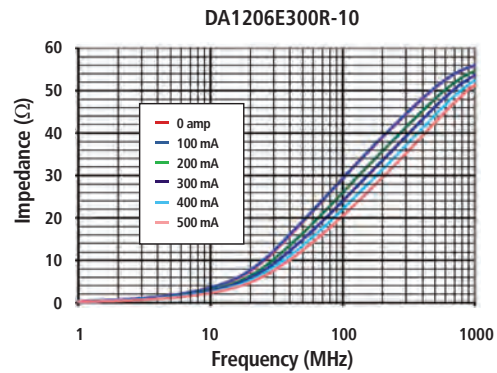
## 2220 Chip Bead Impedance Under DC Bias



## 2220/3312 Chip Bead Impedance Under DC Bias



#### 4 Line Array Impedance Under DC Bias



## FERRITE EMI SMT BEAD ASSEMBLIES



### FEATURES



- 10 Amps continuous operating current capability
- Very low RDC
- Broadband (28F) and (35F) parts available
- Lead free and RoHS compliant

### PART NUMBERING SYSTEM

| 28            | F                  | 0121          | -0                      | S                      | R            | -10                    |
|---------------|--------------------|---------------|-------------------------|------------------------|--------------|------------------------|
| Material Code | Product Code (EIA) | EIA Size Code | Selected Dimension Code | Additional Description | Packing Code | Additional Description |

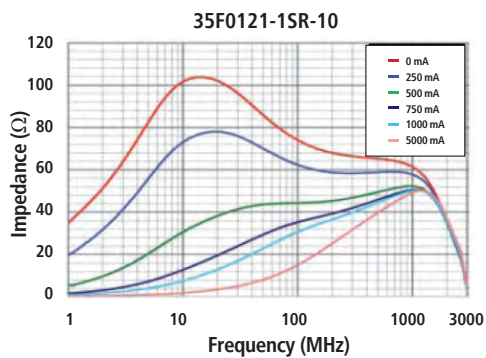
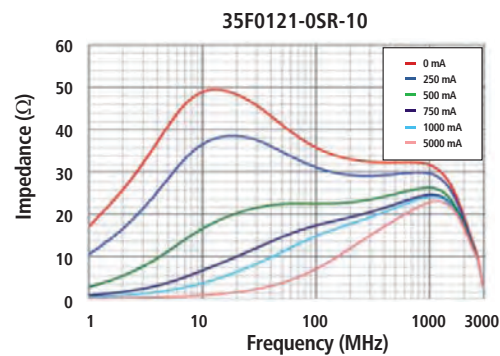
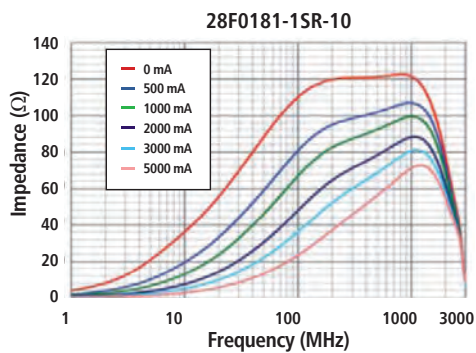
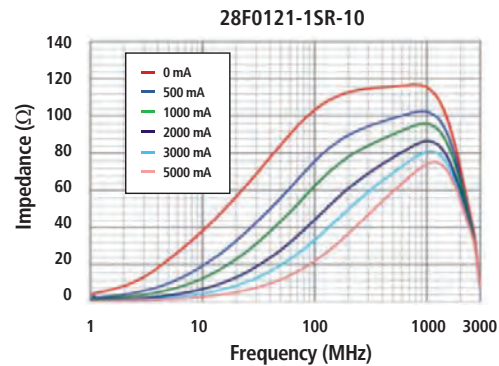
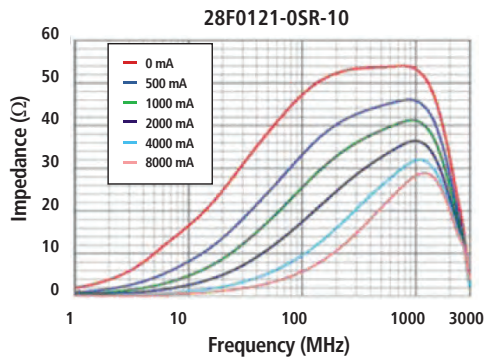
### SMT BEAD ASSEMBLIES - POWER LINE

| EIA<br>PKG.<br>SIZE | Metric<br>Pkg.<br>Size | Part Number    | Typical Impedance ( $\Omega$ ) |                |                |              | Typical<br>Peak Im-<br>pedance ( $\Omega$ ) | Peak<br>Impedance<br>Frequency<br>(MHz) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(continuous)<br>mA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|--------------|---------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z @<br>MHz                     | Z @<br>100 MHz | Z @<br>500 MHz | Z @<br>1 GHz |                                             |                                         |                            |                                   |
| 1612                | 4131                   | 28F0121-0SR-10 | 30                             | 48             | 53             | 53           | 54                                          | 800                                     | 0.00075                    | 10,000                            |
| 3312                | 8531                   | 28F0121-1SR-10 | 60                             | 96             | 115            | 114          | 117                                         | 833                                     | 0.001                      | 10,000                            |
| 3318                | 8545                   | 28F0181-1SR-10 | 72                             | 115            | 123            | 123          | 125                                         | 900                                     | 0.001                      | 10,000                            |

### LOW FREQUENCY BEAD ASSEMBLIES - POWER LINE

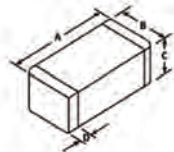
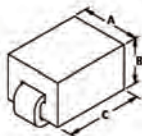
| EIA<br>PKG.<br>SIZE | Metric<br>Pkg.<br>Size | Part Number    | Typical Impedance ( $\Omega$ ) |                |                |              | Typical<br>Peak Im-<br>pedance ( $\Omega$ ) | Peak<br>Impedance<br>Frequency<br>(MHz) | DCR<br>MAX<br>( $\Omega$ ) | RATED I MAX<br>(continuous)<br>mA |
|---------------------|------------------------|----------------|--------------------------------|----------------|----------------|--------------|---------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------|
|                     |                        |                | Z @<br>MHz                     | Z @<br>100 MHz | Z @<br>500 MHz | Z @<br>1 GHz |                                             |                                         |                            |                                   |
| 1612                | 4131                   | 35F0121-0SR-10 | 17                             | 41             | 48             | 47           | 49                                          | 13                                      | 0.00075                    | 10,000                            |
| 3312                | 8531                   | 35F0121-1SR-10 | 35                             | 82             | 102            | 90           | 104                                         | 17                                      | 0.001                      | 10,000                            |

### SMT Bead Assemblies Impedance Under DC Bias



## BEAD ASSEMBLIES

## DIMENSION

| METRIC ( EIA )<br>PKG. SIZE | A mm<br>(INCHES) | B mm<br>(INCHES) | C* mm<br>(INCHES) | D mm<br>(INCHES) | MONOLITHIC CHIP BEAD                                                                |
|-----------------------------|------------------|------------------|-------------------|------------------|-------------------------------------------------------------------------------------|
| 0603 (0201)                 | 0.60 (0.023)     | 0.30 (0.011)     | 0.30 (0.011)      | 0.15 (0.006)     |  |
| 1005 (0402)                 | 1.01 (0.040)     | 0.50 (0.020)     | 0.50 (0.020)      | 0.30 (0.012)     |                                                                                     |
| 1608 (0603)                 | 1.60 (0.063)     | 0.80 (0.031)     | 0.80 (0.031)      | 0.36 (0.014)     |                                                                                     |
| 2010 (0804)                 | 2.00 (0.079)     | 1.00 (0.039)     | 0.50 (0.020)      | 0.025 (0.010)    |                                                                                     |
| 2012 (0805)                 | 2.00 (0.079)     | 1.25 (0.049)     | 0.90 (0.035)      | 0.51 (0.020)     |                                                                                     |
| 3216 (1206)                 | 3.20 (0.126)     | 1.60 (0.063)     | 1.10 (0.043)      | 0.51 (0.020)     |                                                                                     |
| 3225 (1210)                 | 3.20 (0.126)     | 2.50 (0.098)     | 1.40 (0.055)      | 0.46 (0.018)     |                                                                                     |
| 4030 (1612)                 | 4.06 (0.160)     | 3.05 (0.120)     | 2.28 (0.090)      | 0.46 (0.018)     |                                                                                     |
| 4516 (1806)                 | 4.50 (0.177)     | 1.60 (0.063)     | 1.60 (0.063)      | 0.51 (0.020)     |                                                                                     |
| 4532 (1812)                 | 4.50 (0.177)     | 3.20 (0.126)     | 1.40 (0.055)      | 0.46 (0.018)     |                                                                                     |
| 5650 (2220)                 | 5.59 (0.220)     | 5.08 (0.200)     | 3.45 (0.136)      | 0.76 (0.030)     |                                                                                     |
| 8530 (3312)                 | 8.50 (0.335)     | 3.05 (0.120)     | 2.28 (0.090)      | 0.51 (0.020)     |                                                                                     |
| PART<br>NUMBER              | A mm<br>(INCHES) | B mm<br>(INCHES) | C* mm<br>(INCHES) | D mm<br>(INCHES) | FERRITE<br>SMT BEAD ASSEMBLIES                                                      |
| -- F0121-OSR                | 3.05 (0.120)     | 2.54 (0.100)     | 4.06 (0.160)      | --               |  |
| -- F0121-1SR                | 3.05 (0.120)     | 2.54 (0.100)     | 8.51 (0.335)      | --               |                                                                                     |
| -- F0181-OSR                | 4.57 (0.180)     | 2.54 (0.100)     | 8.51 (0.335)      | --               |                                                                                     |

\*C Dimension (height) may vary with current and impedance rating requirements.  
Refer to part print for specific dimensions. Parts have no polarity.

## COMMON MODE AND DIFFERENTIAL MODE EXPLANATION

Laird common mode chokes are the ideal components for EMI filtering of power and signal lines. These components withstand high DC currents without degradation of filtering performance that can occur with differential mode filters like small chip beads. Stable common mode chokes allow most signals to pass unaffected, yet filter the noise (EMI) from these circuits.

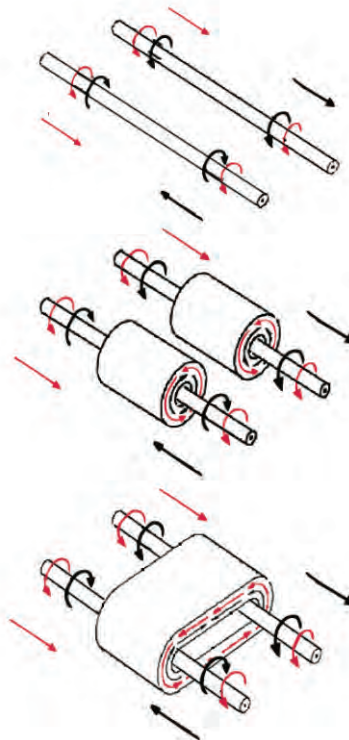
Switch mode power supplies are required for most advanced electronics because harmonics of the switch mode power supply can escape the power supply as EMI. The power delivery circuit often creates opportunities for unintended common mode current loops to form in the end product, even when using a “certified” or “regulation compliant” power supply. Installation of a common mode choke to the supply output can significantly reduce this common mode energy flow and help insure product performance and EMI regulatory compliance.

Small ferrite chip beads or inductors are degraded by the power supply output. However, common mode chokes continue their high performance regardless of the high power currents that might flow or spike in the circuit.

Modern systems are frequently an interconnection of functional blocks and connections made by cables or wiring harnesses. These interconnections often present the opportunity for common mode current loops between devices that can lead to EMI regulatory failure. The addition of a common mode choke before the connector filters these common mode currents while allowing the desired signals to pass unaffected. The result is effective communication between devices, reliable product and system operation and product EMI regulatory compliance.

Most well-designed power and signal circuits present no EMI caused from intended currents. As an example, at 30 MHz a pair of traces or wires 1 m long, separated by 1.3 mm, require over 20 mA differential current imbalance to exceed 100  $\mu\text{V/m}$  radiation 3 meters away. However, unintended, unforeseen common mode currents can exceed 100  $\mu\text{V/m}$  radiation with only 8  $\mu\text{A}$  common mode current flow! Suppression of these tiny common mode currents is often crucial to assuring EMI regulatory compliance and reliable product performance. Ferrite common mode chokes operate by acting on the magnetic fields surrounding a pair of conductors.

**Black arrows represent differential (normal) mode. Red arrows represent common mode.**



Two conductors used in a standard “differential” transmission circuit create magnetic fields surrounding the conductors. These magnetic fields flow around the conductors in the directions depicted by the black arrows.

Likewise, common mode currents generate magnetic fields surrounding the conductors. The red arrows depict the common mode current path and the associated flux paths around the wires.

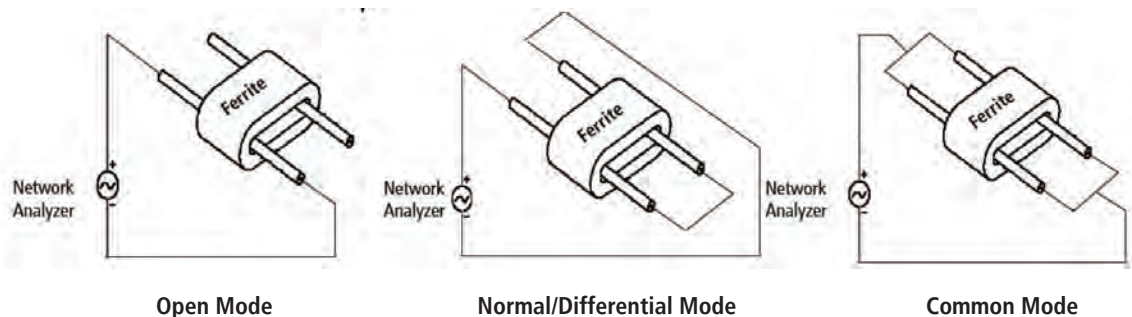
The same two wires shown above have been fitted above with two separate ferrite EMI cores in a differential-mode configuration with one core per line. In this application, each core must contain the total magnetic flux resulting from both the differential mode (intended) current and the common mode (unintended) by the intended current. Differential mode filters (like small chip beads) are not stable under significant load.

The same two wires have now been fitted with a ferrite EMI core in a common mode configuration; a single core with both lines through a common opening in the core. The differential mode (black) fields in the core are now equal and opposite, which yields a net flux seen by the core of approximately zero. Saturation is no longer an issue, and a much smaller ferrite core/choke can be used. The field from the common mode noise (red arrows) is additive and is the only remaining flux to be inflected by the core. The common mode choke configuration applies to both cable cores and board level components. Common mode chokes are stable under load.

## COMMON MODE CHOKE FAMILY

| PART SERIES | SPECIAL FEATURES                          | EIA PACKAGE SIZE | IMPEDANCE (Z) $\Omega$ @ 100 MHz | RATED I MAX (CONTINUOUS) mA | PEAK IMPEDANCE (Z) FREQUENCY | # OF SINGLE LINE PAIRS OR CHOKES |
|-------------|-------------------------------------------|------------------|----------------------------------|-----------------------------|------------------------------|----------------------------------|
| CM 05       | USB 2.0, Low Normal Mode Z                | 0805             | 90-370                           | 100-400                     | 1 GHz - 1.4 GHz              | 1                                |
| CH 05       | HDMI High Speed Signal                    | 0805             | 90                               | 400                         | 2000                         | 1                                |
| CF Beads    | Normal Signal, Small Package              | 0504-0805        | 67-220                           | 300-400                     | 180-583                      | 1                                |
| CM 21       | High Current, Low Profile                 | 2021-3421        | 33-60                            | 15,000                      | 1GHz                         | 1                                |
| CM 22 Array | Firewire, Gigabit Ethernet                | 2722-5022        | 45-200                           | 5,000                       | 200 MHz - 3 GHz              | 2,3,4                            |
| CM 32 Array | High Current, High Frequency              | 3032- 6032       | 120-300                          | 8,000                       | 150 MHz - 2 GHz              | 2,3,4                            |
| CM 40 Array | High Current, Low to High Frequency       | 3440-5740        | 170                              | 20,000                      | 1 GHz                        | 1,2                              |
| CM 41       | Ultra High Current, Low to High Frequency | 5441             | 90-160                           | 75,000                      | 600 MHz - 700 MHz            | 1                                |
| CM 44       | 3 Line Power                              | 4440             | 110                              | 20,000                      | 500 MHz                      | 3                                |
| CM 45       | 2 & 4 Line Power                          | 2545-4545        | 130-170                          | 10,000                      | 500 MHz - 1 GHz              | 1,2                              |
| LF CM       | Low Frequency                             | 1812-5740        | 100-3500                         | 200-20,000                  | 3 MHz - 80 MHz               | 1                                |

### IMPEDANCE TEST FOR COMMON MODE CHOKES



#### Open-Mode Impedance Measurement -

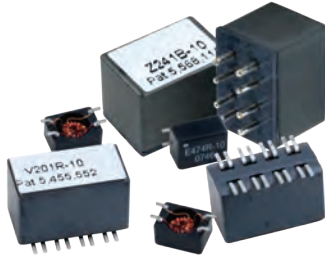
The open-mode impedance characterizes the impedance of only a single conductor in the ferrite common mode choke.

#### Normal (Differential) Mode Impedance Measurement

The normal mode impedance characterizes the impedance presented by the common mode choke to the normal (differential) signals present in the circuit. The test circuit represents the forward and return paths through the device.

#### Common Mode Impedance Measurement -

The common mode impedance characterizes the impedance presented by the choke to the unintended common mode currents that might flow in the circuit and cause EMI failures. Since this current flows in both conductors, it is necessary to short the conductors on each side of the choke so that test current flows equally through both conductors.



## FEATURES

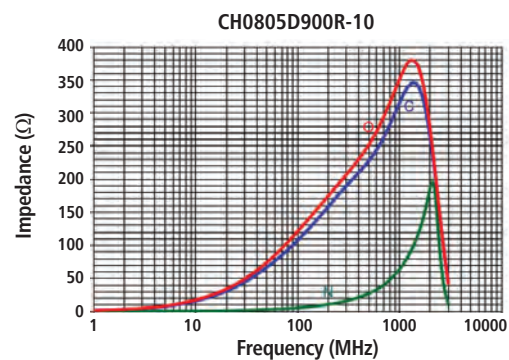
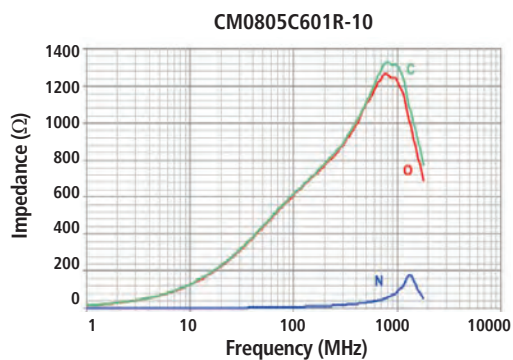
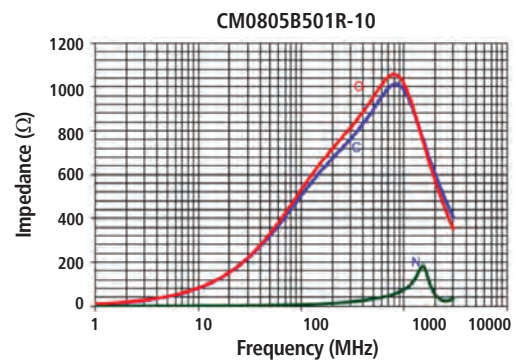
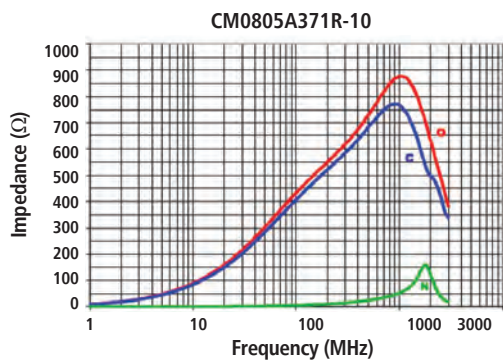
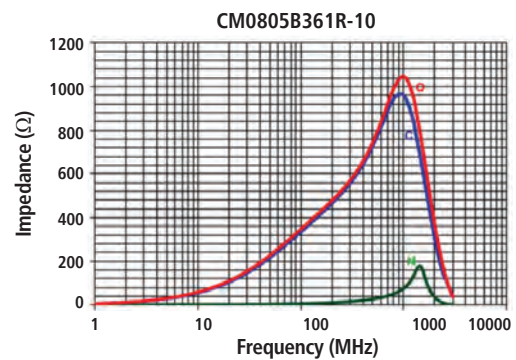
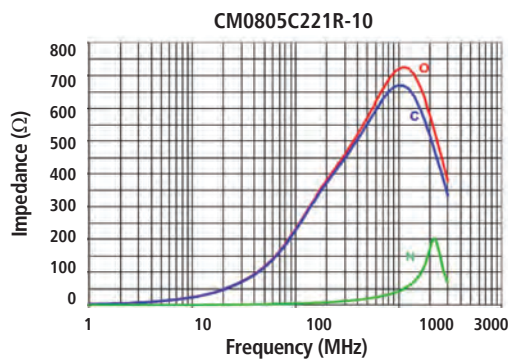
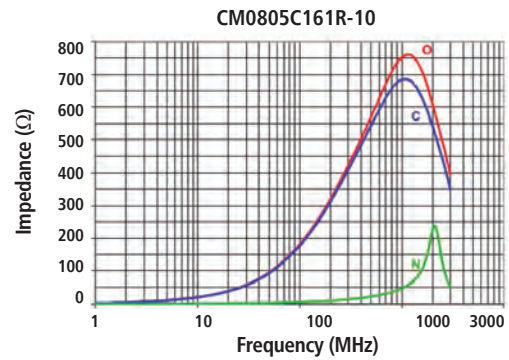
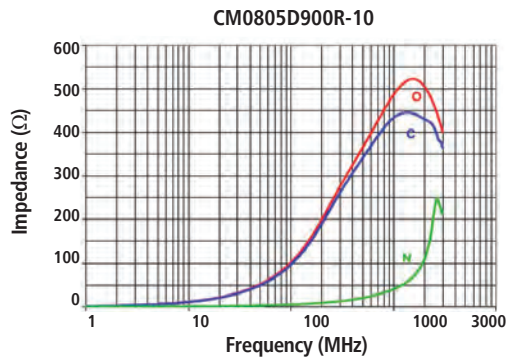
- Wire wound SMT and through hole structure rated current up to 75 Amps
- Low DCR with small package
- Stable performance under load bias
- Excellent impedance vs frequency feature
- Small size and high reliability
- For power, low frequency and high frequency signal lines
- For USB, HDMI, 1394, DVI, S-ATA, LVDS signal line applications
- Suitable for power saving especially for portable application

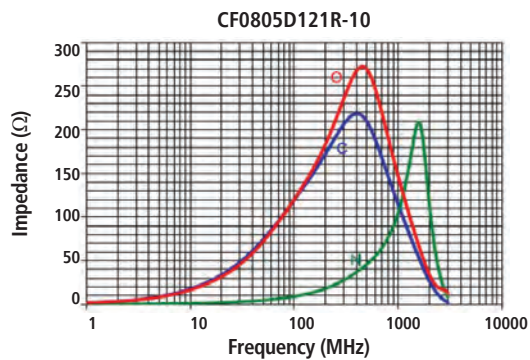
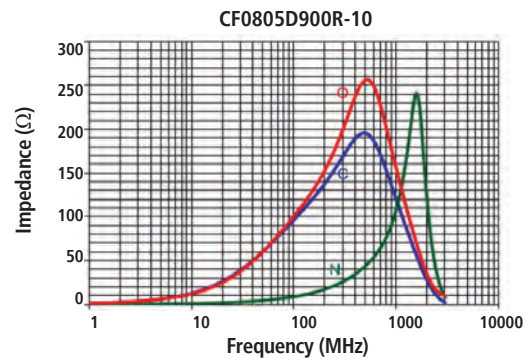
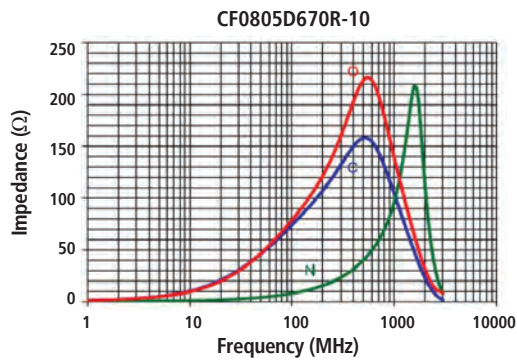
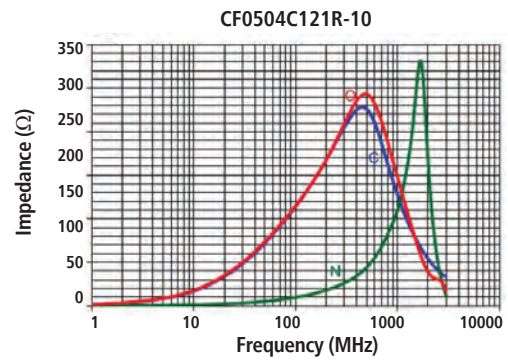
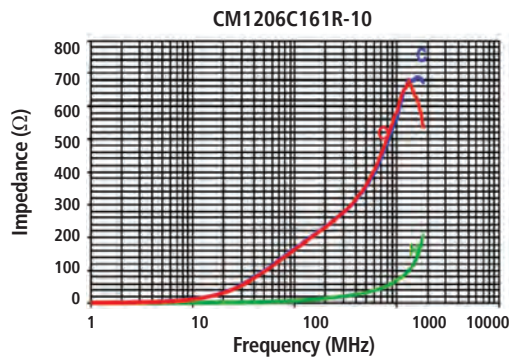
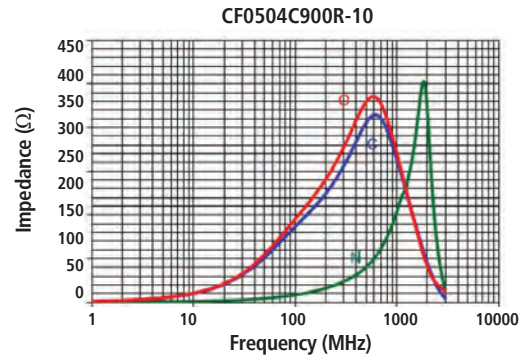
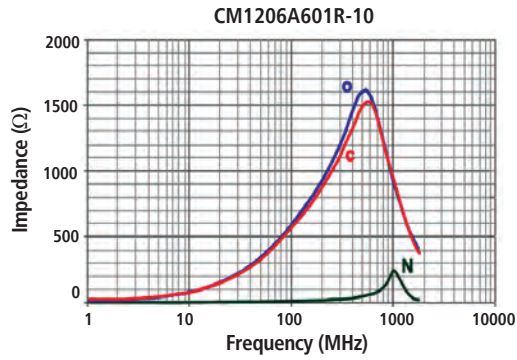
### PART NUMBERING SYSTEM

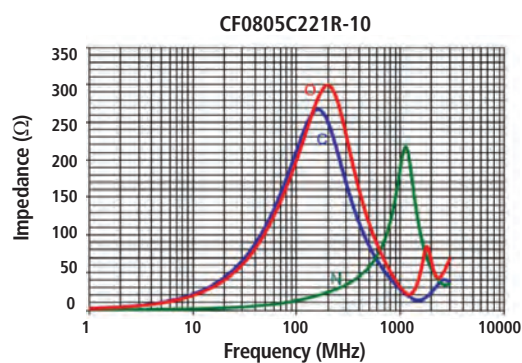
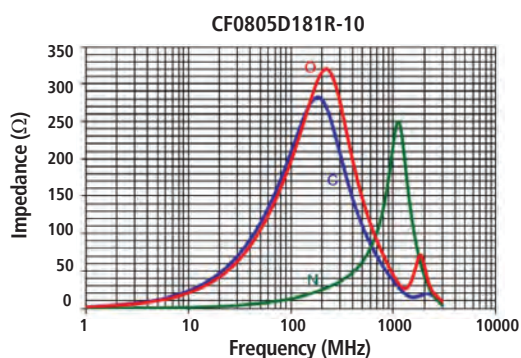
| CM                  | 0805          | D                  | 900                   | R            | -10                    |
|---------------------|---------------|--------------------|-----------------------|--------------|------------------------|
| Product Series Code | EIA Size Code | Rated Current Code | Inductance Value Code | Packing Code | Additional Description |

### HIGH SPEED SERIAL INTERFACE COMMON MODE CHOKE

| APPLICATION     | TYPE                     | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |             |             |           | TYPICAL PEAK IMPEDANCE ( $\Omega$ ) | PEAK IMPEDANCE FREQUENCY (MHz) | DCR MAX ( $\Omega$ ) | RATED I MAX (CONTINUOUS) (mA) |
|-----------------|--------------------------|----------------|--------------------------------|-------------|-------------|-----------|-------------------------------------|--------------------------------|----------------------|-------------------------------|
|                 |                          |                | Z @ 25 MHz                     | Z @ 100 MHz | Z @ 500 MHz | Z @ 1 GHz |                                     |                                |                      |                               |
| USB2.0/LVDS     | Wirewound (For 2 lines)  | CM0805D900R-10 | 24                             | 90          | 340         | 435       | 445                                 | 1405                           | 0.3                  | 400                           |
|                 |                          | CM0805C161R-10 | 49                             | 160         | 540         | 684       | 684                                 | 1000                           | 0.35                 | 300                           |
|                 |                          | CM0805C221R-10 | 57                             | 220         | 570         | 720       | 724                                 | 1147                           | 0.4                  | 300                           |
|                 |                          | CM0805B361R-10 | 95                             | 360         | 1080        | 1310      | 1343                                | 913                            | 0.4                  | 280                           |
|                 |                          | CM0805A371R-10 | 186                            | 370         | 730         | 878       | 878                                 | 1000                           | 0.5                  | 100                           |
|                 |                          | CM0805B501R-10 | 185                            | 500         | 895         | 980       | 1015                                | 833                            | 0.5                  | 250                           |
|                 |                          | CM0805C601R-10 | 265                            | 600         | 1080        | 1227      | 1264                                | 782                            | 0.375                | 250                           |
| HDMI/DVI/SATA   | Wirewound (For 2 lines)  | CH0805D900R-10 | 48                             | 90          | 249         | 339       | 494                                 | 2000                           | 0.3                  | 400                           |
|                 |                          | CM1206A601R-10 | 200                            | 600         | 1450        | 980       | 1530                                | 580                            | 0.8                  | 260                           |
|                 |                          | CM1206C161R-10 | 81                             | 160         | 358         | 555       | 718                                 | 2177                           | 0.4                  | 340                           |
| USB/Signal Line | Multilayer (For 2 lines) | CF0504C900R-10 | 28                             | 90          | 210         | 148       | 217                                 | 583                            | 0.6                  | 300                           |
|                 |                          | CF0504C121R-10 | 33                             | 120         | 250         | 145       | 250                                 | 500                            | 0.6                  | 300                           |
|                 |                          | CF0805D670R-10 | 24                             | 67          | 196         | 98        | 166                                 | 510                            | 0.4                  | 400                           |
|                 |                          | CF0805D900R-10 | 32                             | 90          | 210         | 106       | 220                                 | 435                            | 0.4                  | 400                           |
|                 |                          | CF0805D121R-10 | 36                             | 120         | 240         | 103       | 260                                 | 397                            | 0.4                  | 400                           |
|                 |                          | CF0805D181R-10 | 48                             | 180         | 123         | 42        | 277                                 | 210                            | 0.5                  | 400                           |
|                 |                          | CF0805C221R-10 | 50                             | 220         | 109         | 33        | 296                                 | 180                            | 0.5                  | 300                           |







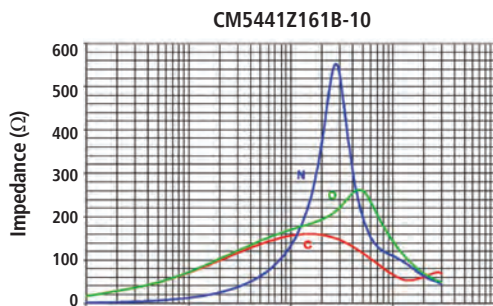
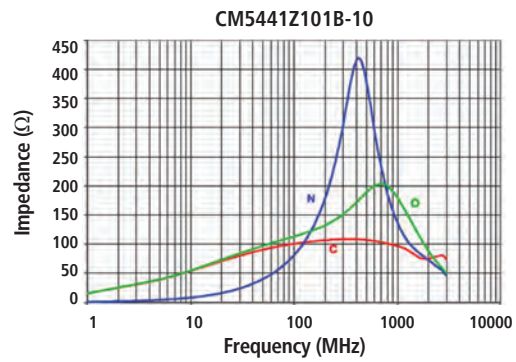
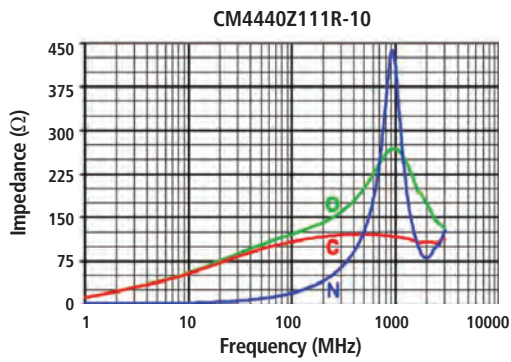
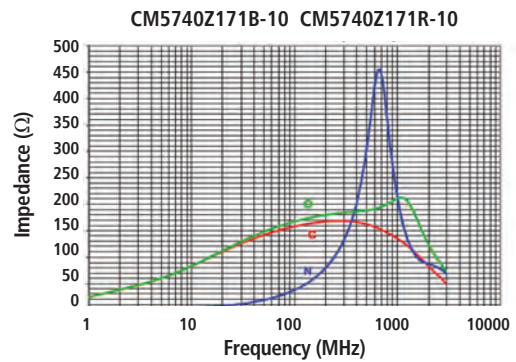
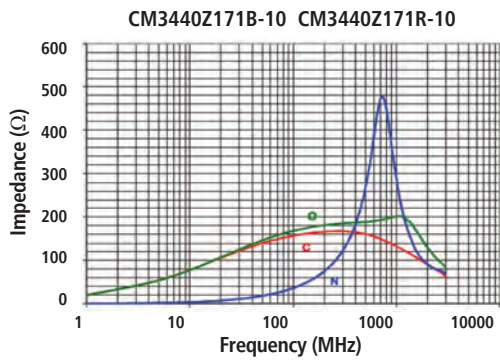
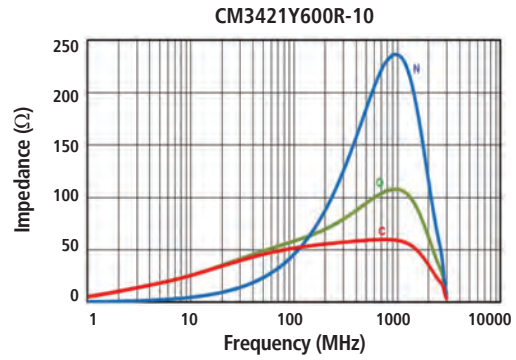
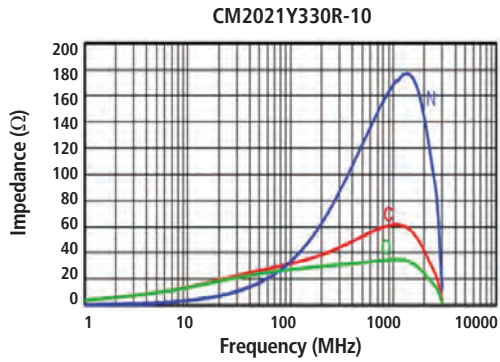
32

## DIMENSION

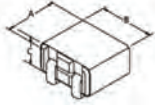
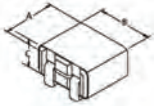
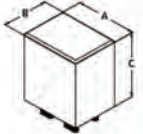
| PART NUMBER   | EIA<br>PKG SIZE | METRIC PKG SIZE | A mm<br>(INCHES) | B mm<br>(INCHES) | C mm<br>(INCHES) | D mm<br>(INCHES) | D1 mm<br>(INCHES) | E mm<br>(INCHES) |  |
|---------------|-----------------|-----------------|------------------|------------------|------------------|------------------|-------------------|------------------|--|
| CM0805 CH0805 | 0805            | 2012            | 2.00<br>(0.079)  | 1.20<br>(0.047)  | 1.20<br>(0.047)  | —                | —                 | —                |  |
| CF0504        | 0504            | 1210            | 1.25<br>(0.049)  | 1.00<br>(0.039)  | 0.82<br>(0.032)  | 0.30<br>(0.012)  | 0.20 (0.008)      | 0.50<br>(0.020)  |  |
| CF0805        | 0805            | 2012            | 2.00<br>(0.079)  | 1.25<br>(0.049)  | 1.00<br>(0.039)  | 0.30<br>(0.012)  | —                 | 0.40<br>(0.016)  |  |

## POWER LINES COMMON MODE CHOKER

| APPLICATION | TYPE                           | PART NUMBER    | TYPICAL IMPEDANCE (Ω) |                |                |              | TYPICAL PEAK<br>IMPEDANCE<br>(Ω) | PEAK<br>IMPEDANCE<br>FREQUENCY<br>(MHz) | DCR MAX<br>(Ω) | RATED I MAX<br>(CONTINUOUS)<br>(mA)                             |
|-------------|--------------------------------|----------------|-----------------------|----------------|----------------|--------------|----------------------------------|-----------------------------------------|----------------|-----------------------------------------------------------------|
|             |                                |                | Z @<br>25 MHz         | Z @<br>100 MHz | Z @<br>500 MHz | Z @<br>1 GHz |                                  |                                         |                |                                                                 |
| Power Lines | Surface Mount<br>(For 2 lines) | CM2021Y330R-10 | 18                    | 33             | 52             | 61           | 62                               | 1100                                    | 0.0008         | 15,000                                                          |
|             |                                | CM3421Y600R-10 | 39                    | 60             | 96             | 110          | 110                              | 1000                                    | 0.0008         | 15,000                                                          |
|             | Thru-Hole<br>(For 2 lines)     | CM3440Z171B-10 | 116                   | 170            | 189            | 202          | 202                              | 1000                                    | 0.001          | 20,000                                                          |
|             |                                | CM5740Z171B-10 | 116                   | 170            | 189            | 202          | 202                              | 1000                                    | 0.001          | 20,000                                                          |
|             | Surface Mount<br>(For 2 lines) | CM3440Z171R-10 | 116                   | 170            | 189            | 202          | 202                              | 1000                                    | 0.001          | 20,000                                                          |
|             |                                | CM5740Z171R-10 | 116                   | 170            | 189            | 202          | 202                              | 1000                                    | 0.001          | 20,000                                                          |
|             | Surface Mount<br>(For 3 lines) | CM4440Z111R-10 | 79                    | 110            | 122            | 117          | 122                              | 500                                     | 0.001          | 20,000                                                          |
|             |                                | CM4440Z121R-10 | 82                    | 120            | 122            | 117          | 123                              | 460                                     | 0.001          | 20,000                                                          |
|             | Thru-Hole<br>(For 2 lines)     | CM5441Z101B-10 | 79                    | 100            | 188            | 183          | 204                              | 682                                     | 0.0003         | 30,000 mA @<br>25°C Temp Rise<br>70,000 mA @<br>30 °C Temp Rise |
|             |                                | CM5441Z161B-10 | 112                   | 160            | 261            | 146          | 263                              | 457                                     | 0.0003         |                                                                 |
|             |                                | CM5441Z161R-10 | 110                   | 160            | 260            | 140          | 265                              | 460                                     | 0.0003         |                                                                 |



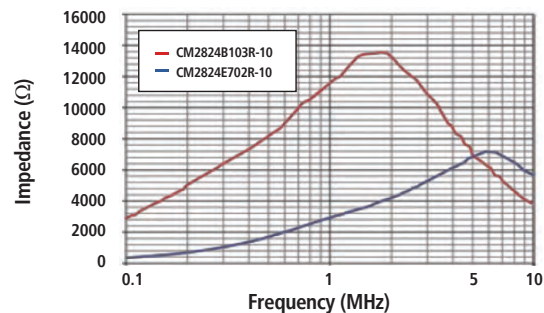
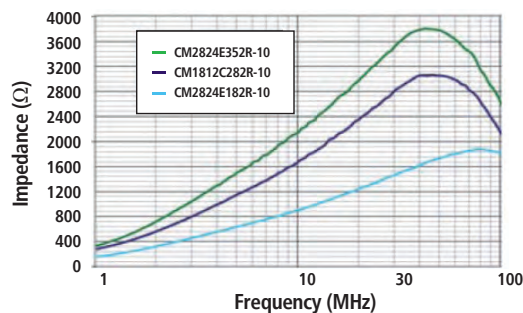
## DIMENSION

| PART NUMBER    | A mm (INCHES) | B mm (INCHES) | C mm (INCHES) |                                                                                                                                                                            |
|----------------|---------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CM2021Y330R-10 | 5.00 (0.197)  | 5.60 (0.220)  | 2.85 (0.112)  |                                                                                         |
| CM3421Y600R-10 | 8.68 (0.342)  | 5.60 (0.220)  | 2.85 (0.112)  |                                                                                         |
| CM3440Z171B-10 | 8.51 (0.335)  | 10.03 (0.395) | 9.32 (0.367)  | <br> |
| CM3440Z171R-10 | 8.51 (0.335)  | 10.03 (0.395) | 9.32 (0.367)  |                                                                                                                                                                            |
| CM5740Z171B-10 | 14.48 (0.570) | 10.03 (0.395) | 9.32 (0.367)  |                                                                                        |
| CM5740Z171R-10 | 14.48 (0.570) | 10.03 (0.395) | 9.32 (0.367)  |                                                                                       |
| CM4440Z111R-10 | 11.05 (0.435) | 10.03 (0.395) | 9.32 (0.367)  |                                                                                       |
| CM5441Z101B-10 | 13.72 (0.540) | 10.41 (0.410) | 10.52 (0.414) |                                                                                       |
| CM5441Z161B-10 | 13.72 (0.540) | 10.41 (0.410) | 15.24 (0.600) |                                                                                                                                                                            |

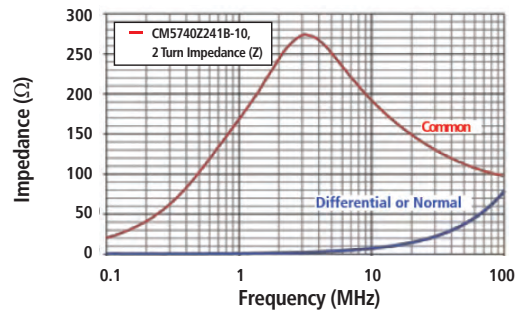
# COMMON MODE CHOKES

| APPLICATION           | TYPE                        | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |               |               |               | TYPICAL PEAK IMPEDANCE ( $\Omega$ ) | PEAK IMPEDANCE FREQUENCY (MHz) | DCR MAX ( $\Omega$ ) | RATED I MAX (CONTINUOUS) (mA) |
|-----------------------|-----------------------------|----------------|--------------------------------|---------------|---------------|---------------|-------------------------------------|--------------------------------|----------------------|-------------------------------|
|                       |                             |                | Z @ 1 MHz                      | Z @ 4 MHz     | Z @ 10 MHz    | Z @ 100 MHz   |                                     |                                |                      |                               |
| Signal/<br>Power Line | Surface Mount (For 2 lines) | CM1812C282R-10 | 370                            | 1,100         | 1,900         | 2,800         | 3500                                | 50                             | 0.5                  | 200                           |
|                       |                             | CM2824B103R-10 | 10,000                         | 8,900         | 3,980         | 400           | 13,200                              | 2                              | 1.3                  | 400                           |
|                       |                             | CM2824E182R-10 | 200                            | 570           | 920           | 1,800         | 1,920                               | 80                             | 0.26                 | 800                           |
|                       |                             | CM2824E352R-10 | 350                            | 1400          | 2,100         | 3,500         | 3,950                               | 45                             | 0.3                  | 800                           |
|                       | Thru-Hole (For 4 lines)     | CM2824E702R-10 | 3,000                          | 7,000         | 5,800         | 800           | 7,200                               | 6                              | 0.26                 | 700                           |
|                       |                             | CM5740Z241B-10 | 170 (2 Turns)                  | 240 (2 Turns) | 173 (2 Turns) | 100 (2 Turns) | 276 (2 Turns)                       | 3 (2 Turns)                    | 0.0013               | 20,000                        |

## Impedance (Z) versus Frequency



## CM5740Z241B-10, 2 Turn Impedance (Z)



## DIMENSION

| PART NUMBER    | A mm (INCHES) | B mm (INCHES) | C mm (INCHES) |  |
|----------------|---------------|---------------|---------------|--|
| CM1812C282R-10 | 5.00 (0.197)  | 3.50 (0.138)  | 5.55 (0.140)  |  |
| CM2824B103R-10 | 7.50 (0.295)  | 5.50 (0.217)  | 3.80 (0.150)  |  |
| CM2824E182R-10 | 7.50 (0.295)  | 5.50 (0.217)  | 3.80 (0.150)  |  |
| CM2824E352R-10 | 7.50 (0.295)  | 5.50 (0.217)  | 3.80 (0.150)  |  |
| CM2824E702R-10 | 7.50 (0.295)  | 5.50 (0.217)  | 3.80 (0.150)  |  |
| CM5740Z241B-10 | 14.40 (0.570) | 10.03 (0.395) | 9.32 (0.387)  |  |

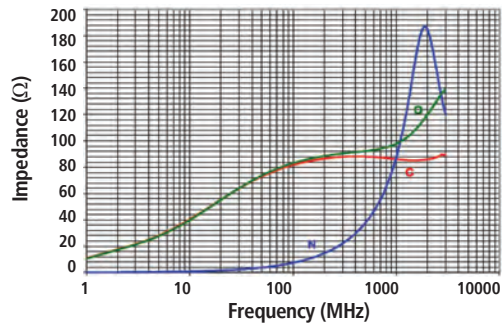
## APPLICATION FOR POWER LINES

| TYPE                         | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |             |             |           | TYPICAL PEAK IMPEDANCE ( $\Omega$ ) | PEAK IMPEDANCE FREQUENCY (MHz) | DCR MAX ( $\Omega$ ) | RATED I MAX (CONTINUOUS) (mA) |
|------------------------------|----------------|--------------------------------|-------------|-------------|-----------|-------------------------------------|--------------------------------|----------------------|-------------------------------|
|                              |                | Z @ 25 MHz                     | Z @ 100 MHz | Z @ 500 MHz | Z @ 1 GHz |                                     |                                |                      |                               |
| Surface Mount (For 4 lines)  | CM2722R800R-10 | 60                             | 80          | 92          | 98        | 140                                 | 3000                           | 0.02                 | 5,000                         |
|                              | CM2722R151R-10 | 113                            | 150         | 165         | 165       | 168                                 | 1783                           | 0.02                 | 5,000                         |
|                              | CM2722R201R-10 | 141                            | 200         | 202         | 187       | 206                                 | 272                            | 0.02                 | 5,000                         |
| Surface Mount (For 6 lines)  | CM3822R800R-10 | 63                             | 80          | 97          | 105       | 151                                 | 3000                           | 0.02                 | 5,000                         |
|                              | CM3822R151R-10 | 108                            | 150         | 170         | 169       | 172                                 | 1646                           | 0.02                 | 5,000                         |
|                              | CM3822R201R-10 | 140                            | 200         | 207         | 187       | 213                                 | 218                            | 0.02                 | 5,000                         |
| Surface Mount (For 8 lines)  | CM5022R800R-10 | 61                             | 80          | 95          | 102       | 150                                 | 3000                           | 0.02                 | 5,000                         |
|                              | CM5022R151R-10 | 112                            | 150         | 165         | 167       | 177                                 | 2092                           | 0.02                 | 5,000                         |
|                              | CM5022R201R-10 | 144                            | 200         | 206         | 188       | 210                                 | 306                            | 0.02                 | 5,000                         |
| Surface Mount (For 4 lines)  | CM3032V121R-10 | 80                             | 120         | 130         | 140       | 169                                 | 200                            | 0.01                 | 8,000                         |
|                              | CM3032V201R-10 | 143                            | 200         | 210         | 199       | 214                                 | 319                            | 0.01                 | 8,000                         |
|                              | CM3032V301R-10 | 211                            | 300         | 280         | 224       | 307                                 | 214                            | 0.01                 | 8,000                         |
| Surface Mount (For 6 lines)  | CM4732V201R-10 | 152                            | 200         | 218         | 187       | 229                                 | 241                            | 0.01                 | 8,000                         |
|                              | CM4732V301R-10 | 217                            | 300         | 250         | 172       | 328                                 | 168                            | 0.01                 | 8,000                         |
| Surface Mount (For 8 lines)  | CM6032V201R-10 | 140                            | 200         | 219         | 213       | 219                                 | 500                            | 0.01                 | 8,000                         |
|                              | CM6032V301R-10 | 240                            | 300         | 258         | 170       | 346                                 | 149                            | 0.01                 | 8,000                         |
| Thru-Hole ( For 2 lines)     | CM2545X171B-10 | 108                            | 170         | 210         | 180       | 210                                 | 500                            | 0.01                 | 10,000                        |
| Surface Mount ( For 2 lines) | CM2545X171R-10 | 108                            | 170         | 210         | 180       | 210                                 | 500                            | 0.01                 | 10,000                        |
| Thru-Hole ( For 4 lines)     | CM4545Z131B-10 | 65                             | 130         | 267         | 256       | 288                                 | 682                            | 0.01                 | 10,000                        |
| Surface Mount ( For 4 lines) | CM4545Z131R-10 | 65                             | 130         | 267         | 256       | 288                                 | 682                            | 0.01                 | 10,000                        |

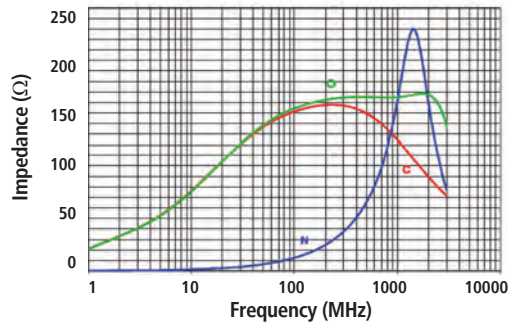
| PART NUMBER    | # OF CHOKES | TYPICAL IMPEDANCE ( $\Omega$ ) FOR MULTIPLE PASS BOARD LAYOUT OPTIONS |         |       |          |         |       |            |         |       |           |         |       |
|----------------|-------------|-----------------------------------------------------------------------|---------|-------|----------|---------|-------|------------|---------|-------|-----------|---------|-------|
|                |             | ONE PASS                                                              |         |       | TWO PASS |         |       | THREE PASS |         |       | FOUR PASS |         |       |
|                |             | 100 MHz                                                               | 500 MHz | 1 GHz | 100 MHz  | 500 MHz | 1 GHz | 100 MHz    | 500 MHz | 1 GHz | 100 MHz   | 500 MHz | 1 GHz |
| CM2722R800R-10 | 2           | 80                                                                    | 92      | 98    | 174      | 190     | 173   | -          | -       | -     | -         | -       | -     |
| CM2722R151R-10 | 2           | 150                                                                   | 165     | 165   | 292      | 311     | 222   | -          | -       | -     | -         | -       | -     |
| CM2722R201R-10 | 2           | 200                                                                   | 202     | 187   | 433      | 362     | 187   | -          | -       | -     | -         | -       | -     |
| CM3822R800R-10 | 3           | 80                                                                    | 97      | 105   | 174      | 190     | 173   | 304        | 334     | 257   | -         | -       | -     |
| CM3822R151R-10 | 3           | 150                                                                   | 170     | 169   | 292      | 311     | 222   | 490        | 448     | 226   | -         | -       | -     |
| CM3822R201R-10 | 3           | 200                                                                   | 207     | 187   | 433      | 362     | 187   | 670        | 470     | 208   | -         | -       | -     |
| CM5022R800R-10 | 4           | 80                                                                    | 95      | 102   | 174      | 190     | 173   | 304        | 334     | 257   | 389       | 446     | 283   |
| CM5022R151R-10 | 4           | 150                                                                   | 165     | 167   | 292      | 311     | 222   | 490        | 448     | 226   | 674       | 535     | 229   |
| CM5022R201R-10 | 4           | 200                                                                   | 206     | 188   | 433      | 362     | 187   | 670        | 470     | 208   | 945       | 499     | 212   |
| CM3032V121R-10 | 2           | 120                                                                   | 130     | 140   | 266      | 284     | 241   | -          | -       | -     | -         | -       | -     |
| CM3032V201R-10 | 2           | 200                                                                   | 210     | 199   | 432      | 300     | 175   | -          | -       | -     | -         | -       | -     |
| CM3032V301R-10 | 2           | 300                                                                   | 280     | 224   | 631      | 251     | 156   | -          | -       | -     | -         | -       | -     |
| CM4732V201R-10 | 3           | 200                                                                   | 218     | 187   | 491      | 317     | 182   | 771        | 331     | 194   | -         | -       | -     |
| CM4732V301R-10 | 3           | 300                                                                   | 250     | 172   | 684      | 258     | 156   | 967        | 278     | 172   | -         | -       | -     |
| CM6032V201R-10 | 4           | 200                                                                   | 219     | 213   | 472      | 313     | 179   | 737        | 315     | 193   | 995       | 358     | 250   |
| CM6032V301R-10 | 4           | 300                                                                   | 258     | 170   | 681      | 266     | 161   | 926        | 273     | 167   | 1075      | 317     | 300   |

### Part Impedance

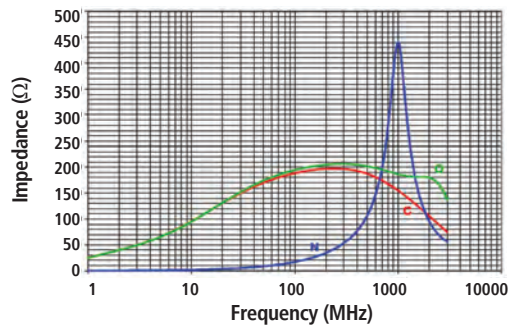
CM2722R800R-10, CM3822R800R-10,  
CM5022R800R-10



CM2722R151R-10M, CM3822R151R-10,  
CM5022R151R-10

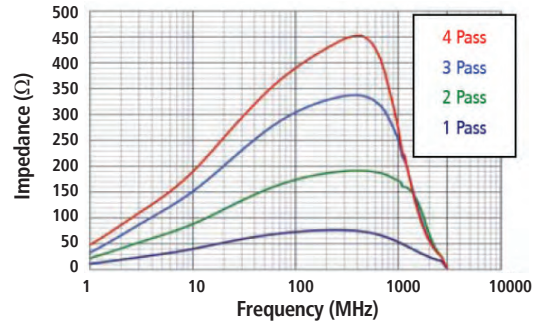


CM2722R201R-10, CM3822R201R-10,  
CM5022R201R-10

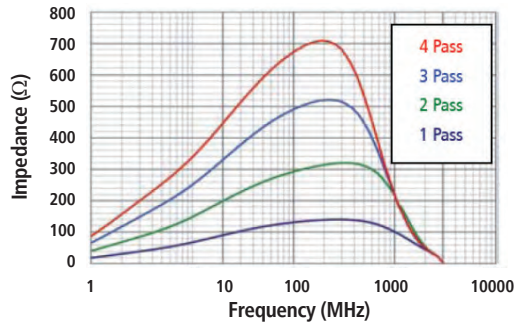


### Multi-Pass Impedance (for multiple pass board layout options)

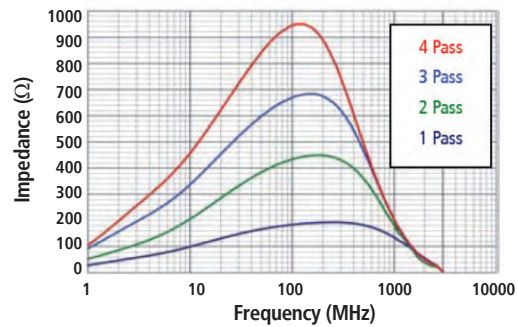
CM2722R800R-10, CM3822R800R-10,  
CM5022R800R-10



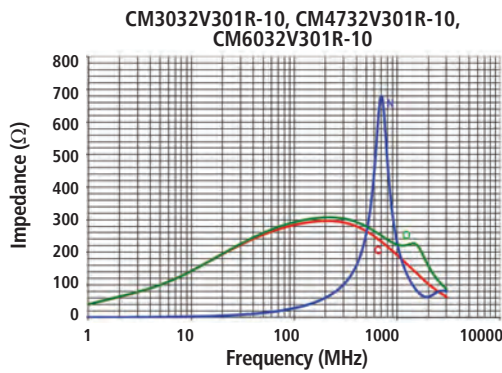
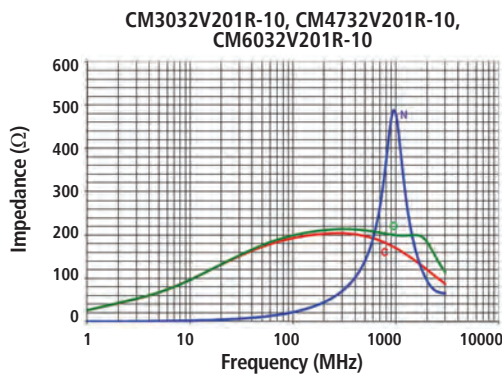
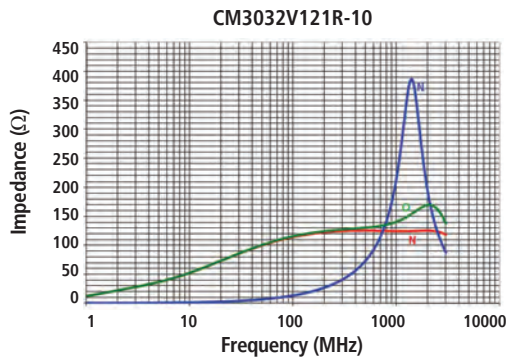
CM2722R151R-10M, CM3822R151R-10,  
CM5022R151R-10



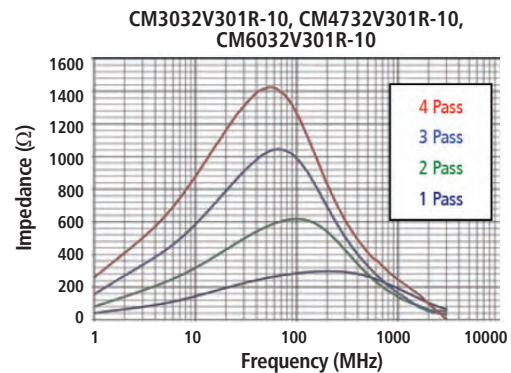
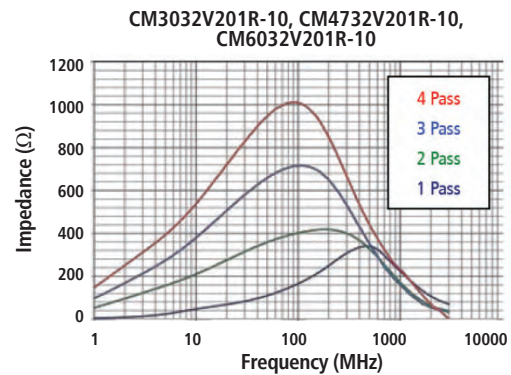
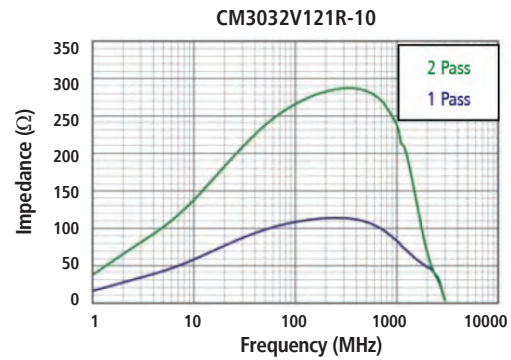
CM2722R201R-10, CM3822R201R-10,  
CM5022R201R-10



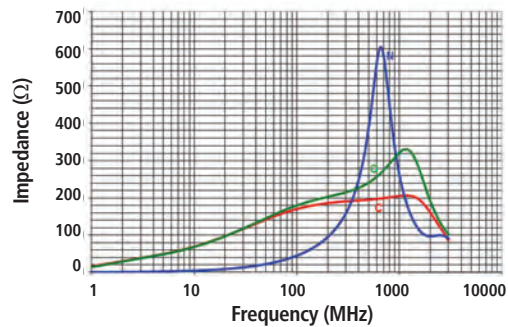
### Part Impedance



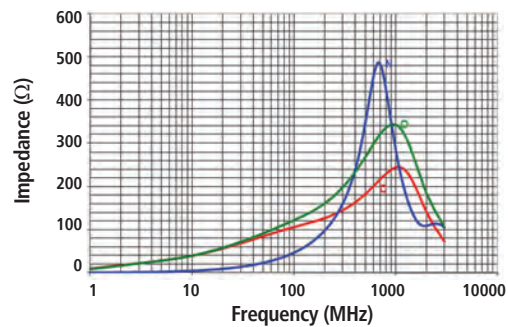
### Multi-Pass Impedance (for multiple pass board layout options)



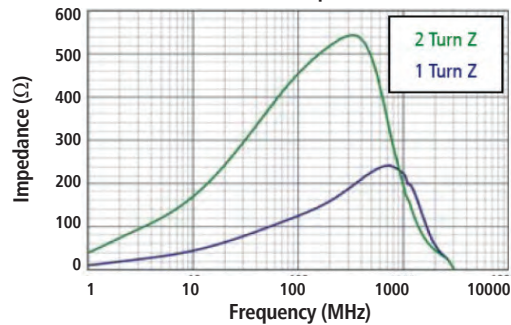
CM2545X171B-10, CM2545X171R-10



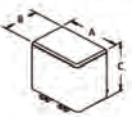
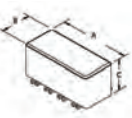
CM4545X131B-10, CM4545X131R-10

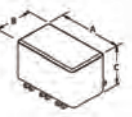
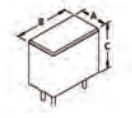
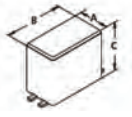


CM4545X131B-10, CM4545X131R-10,  
Multi-Turn Impedance



DIMENSION

| PART NUMBER    | A mm<br>(INCHES) | B mm<br>(INCHES) | C mm<br>(INCHES) |                                                                                     |
|----------------|------------------|------------------|------------------|-------------------------------------------------------------------------------------|
| CM2722R800R-10 | 6.99<br>(0.275)  | 5.72<br>(0.225)  | 4.32<br>(0.170)  |    |
| CM2722R151R-10 | 6.99<br>(0.275)  | 5.72<br>(0.225)  | 7.62<br>(0.300)  |                                                                                     |
| CM2722R201R-10 | 6.99<br>(0.275)  | 5.72<br>(0.225)  | 9.53<br>(0.375)  |                                                                                     |
| CM3822R800R-10 | 9.78<br>(0.385)  | 5.72<br>(0.225)  | 4.32<br>(0.170)  |   |
| CM3822R151R-10 | 9.78<br>(0.385)  | 5.72<br>(0.225)  | 7.62<br>(0.300)  |                                                                                     |
| CM3822R201R-10 | 9.78<br>(0.385)  | 5.72<br>(0.225)  | 9.53<br>(0.375)  |                                                                                     |
| CM5022R800R-10 | 12.57<br>(0.495) | 5.72<br>(0.225)  | 4.32<br>(0.170)  |  |
| CM5022R151R-10 | 12.57<br>(0.495) | 5.72<br>(0.225)  | 7.62<br>(0.300)  |                                                                                     |
| CM5022R201R-10 | 12.57<br>(0.495) | 5.72<br>(0.225)  | 9.53<br>(0.375)  |                                                                                     |
| CM3032V121R-10 | 7.62<br>(0.300)  | 8.13<br>(0.320)  | 5.72<br>(0.225)  |  |

| PART NUMBER    | A mm<br>(INCHES) | B mm<br>(INCHES) | C mm<br>(INCHES) |                                                                                       |
|----------------|------------------|------------------|------------------|---------------------------------------------------------------------------------------|
| CM3032V201R-10 | 7.62<br>(0.300)  | 8.13<br>(0.320)  | 9.45<br>(0.372)  |    |
| CM3032V301R-10 | 7.62<br>(0.300)  | 8.13<br>(0.320)  | 14.48<br>(0.570) |                                                                                       |
| CM4732V201R-10 | 11.94<br>(0.470) | 8.13<br>(0.320)  | 9.45<br>(0.372)  |    |
| CM4732V301R-10 | 11.94<br>(0.470) | 8.13<br>(0.320)  | 14.48<br>(0.570) |                                                                                       |
| CM6032V201R-10 | 15.24<br>(0.600) | 8.13<br>(0.320)  | 9.45<br>(0.372)  |   |
| CM6032V301R-10 | 15.24<br>(0.600) | 8.13<br>(0.320)  | 14.48<br>(0.570) |                                                                                       |
| CM2545X171B-10 | 6.3<br>(0.248)   | 11.38<br>(0.448) | 9.32<br>(0.367)  |  |
| CM2545X171R-10 | 6.3<br>(0.248)   | 11.38<br>(0.448) | 9.32<br>(0.367)  |  |
| CM4545Z131B-10 | 11.38<br>(0.448) | 11.38<br>(0.448) | 9.32<br>(0.367)  |  |
| CM4545Z131R-11 | 11.38<br>(0.448) | 11.38<br>(0.448) | 9.32<br>(0.367)  |  |

## CAN-BUS COMMON MODE CHOKE SERIES



### FEATURES

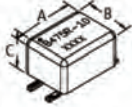
- Accurate current matching capability over a broad range of inductance values
- Sector wound coils at 25 & 51  $\mu$ H to filter differential mode noise from the data signal.
- Low distortion
- Custom designs possible
- Open bottom case construction
- Small (1812) size parts are so available
- Surface Mount

### HIGH SPEED SERIAL INTERFACE COMMON MODE CHOKE

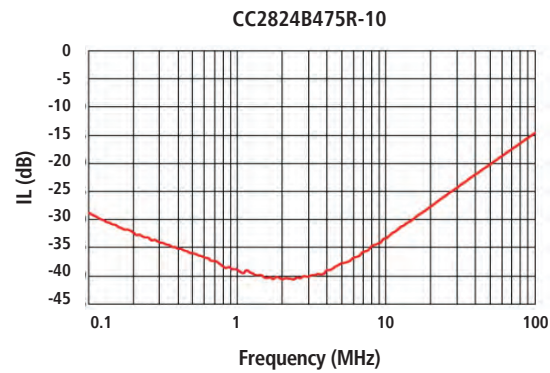
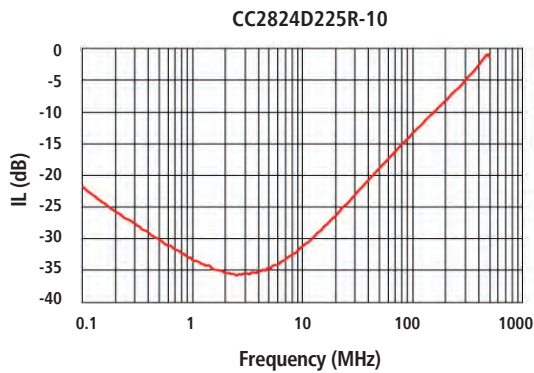
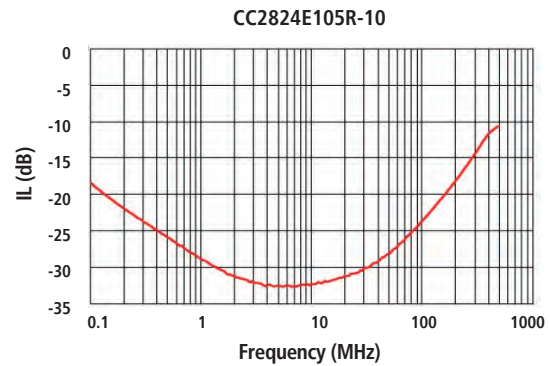
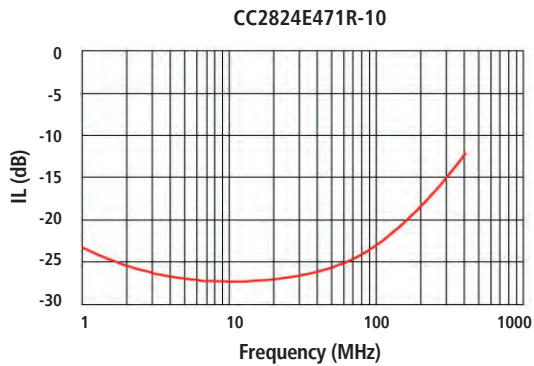
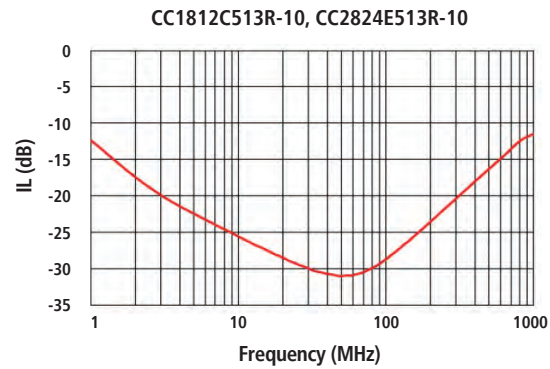
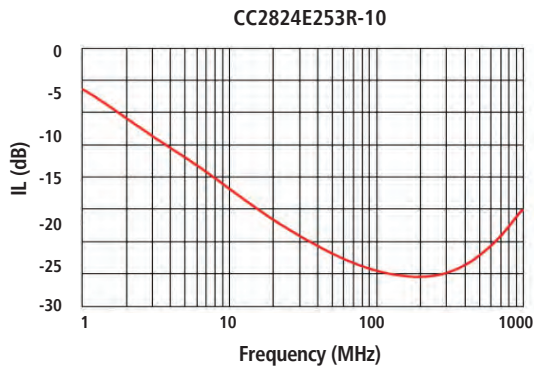
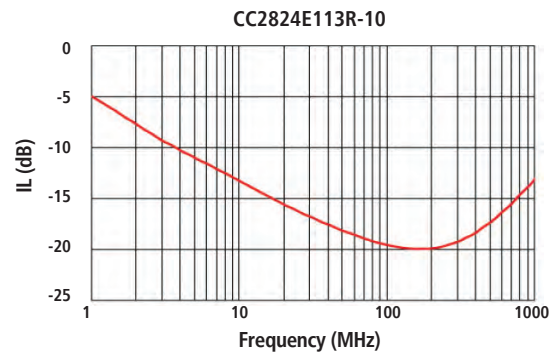
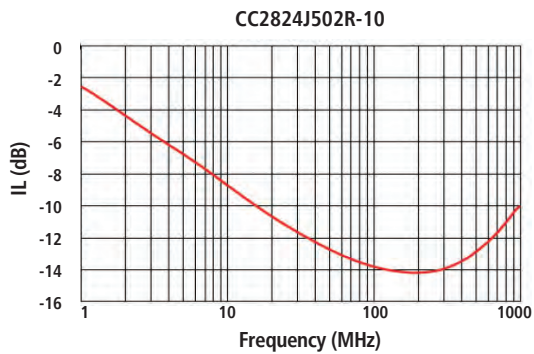
| TYPE                           | PART NUMBER     | Lp IMPEDANCE ( $\mu$ H) |      |      |      | PEAK IMPEDANCE (Z) | L LEAKAGE ( $\mu$ H) | HI-POT (VAC)<br>0.5 mA 2 SEC | DCR TYPICAL ( $\Omega$ ) | Idc (mA) |
|--------------------------------|-----------------|-------------------------|------|------|------|--------------------|----------------------|------------------------------|--------------------------|----------|
|                                |                 | TEST CONDITION          | MIN  | NOM  | MAX  |                    |                      |                              |                          |          |
| Surface Mount<br>(For 2 lines) | CC1812C513R-10* | 100 KHz / 50mV          | 35.7 | 51   | 66.3 | 3500 @40 MHz       | 2.6                  | 250                          | 0.5                      | 200      |
|                                | CC2824J502R-10  | 100 KHz / 50 mV         | 3.5  | 5    | 6.5  | 400 @ 500 MHz      | 0.05                 | 250                          | 0.1                      | 1200     |
|                                | CC2824E113R-10  | 100 KHz / 50mV          | 7.7  | 11   | 14.3 | 800 @ 200 MHz      | 0.05                 | 250                          | 0.12                     | 800      |
|                                | CC2824E253R-10  | 100 KHz / 50mV          | 17.5 | 25   | 32.5 | 2000 @ 100 MHz     | 1.5                  | 250                          | 0.13                     | 800      |
|                                | CC2824E513R-10* | 100 KHz / 50mV          | 35   | 51   | 66.3 | 3800 @ 50 MHz      | 2                    | 250                          | 0.16                     | 800      |
|                                | CC2824E474R-10  | 100 KHz / 50mV          | 329  | 470  | 611  | 8600 @ 5 MHz       | 0.2                  | 750                          | 0.2                      | 700      |
|                                | CC2824E105R-10  | 100 KHz / 50mV          | 700  | 1000 | 1500 | 4250 @ 7 MHz       | 0.2                  | 750                          | 0.2                      | 700      |
|                                | CC2824D225R-10  | 10 KHz / 50mV           | 1540 | 2200 | 3300 | 5300 @ 5 MHz       | 0.25                 | 750                          | 0.4                      | 500      |
|                                | CC2824B475R-10  | 10 KHz / 50mV           | 3290 | 4700 | 7050 | 12300 @ 2 MHz      | 0.3                  | 750                          | 0.55                     | 400      |

\* Sector Wound

### DIMENSION

| PART NUMBER | A mm (INCHES)        | B mm (INCHES)        | C mm (INCHES)        |                                                                                     |
|-------------|----------------------|----------------------|----------------------|-------------------------------------------------------------------------------------|
| CC2824      | 7.50 MAX (0.295 MAX) | 5.50 MAX (0.217 MAX) | 3.80 MAX (0.150 MAX) |  |
| CC1812      | 5.00 MAX (0.197 MAX) | 3.50 MAX (0.138 MAX) | 5.55 MAX (0.140 MAX) |  |

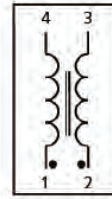
Typical Insertion Loss @ 50 Ω



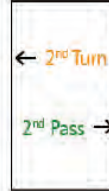
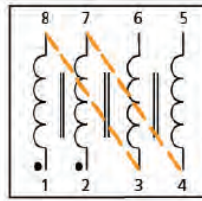
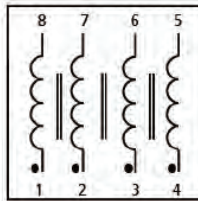
EMI Chip Beads, Chip Inductors



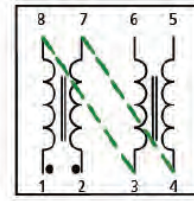
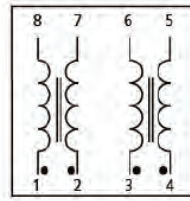
CM Beads, CM 05 / 21 / 40 / 41  
/ 45, LF CM, Can Bus



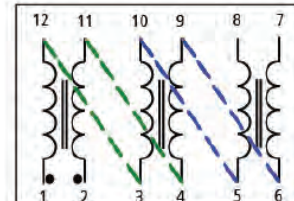
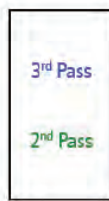
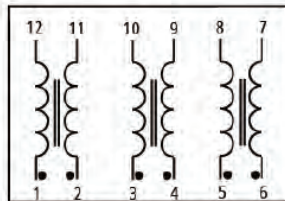
CM5740Z241B-10, CM 45 Array



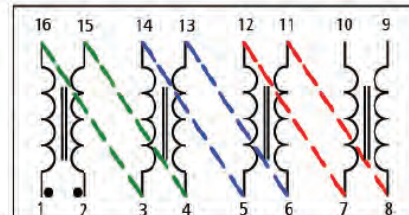
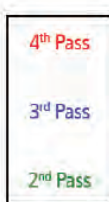
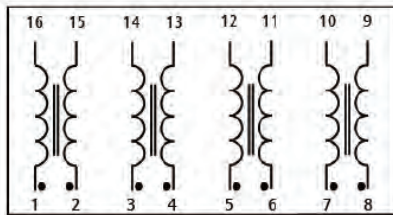
CM22 Array, CM 32 Array, CM 40 Array



CM22 Array, CM 32 Array



CM22 Array, CM 32 Array



## EXPLANATION OF PASSES & TURNS

Laird multi-choke arrays can be electrically connected in the PC board to increase effective impedance. When the PCB circuits are configured, as shown above, such that individual side-by-side chokes within one array part are connected in series, the impedance is increased by a factor of the number of passes through the part. Since internal construction of Laird ferrite common mode chokes varies, Laird refers to this special installation configuration using the different terms of "pass" (additive) or "turn" (multiplicative).

When the term "pass" is used to describe series connections through a choke, each additional pass increases the impedance ( $Z$ ) in proportion to the number of series PCB connections applied. Each additional "pass" adds a choke in series. If needed, it's an optional effective method of increasing impedance with an array.

When the term "turn" is used to describe series connection through a choke, each additional turn increases the impedance in proportion to the square of the number of series PCB connections applied. Each turn multiplies impedance.

Parts have no polarity.

## WIRE-WOUND SMT POWER COMMON-MODE CHOKES



CMX 1211 Series

### FEATURES



- Small size with high current
- Stable performance under load bias and high reliability
- High suppression of asymmetric interferences at both low and high frequency
- SMT Type with less height
- Operation temperature: -40°C to 125°C (Including self-heating)
- Custom designs on request

### APPLICATIONS

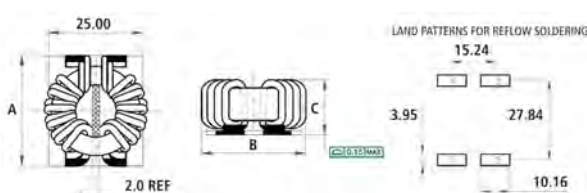
- Interferences suppression of common mode noise
- Power line filter
- Switch-mode power supplies

### ELECTRICAL SPECIFICATIONS

| PART NO.        | INDUCTANCE @ 100 KHZ / 100 mV (uH) |      |      | DCR MAX (mΩ) | CURRENT RATING MAX (A) | RATING VOLTAGE MAX (Vrms) | HIPOT COIL – COIL (VAC) |
|-----------------|------------------------------------|------|------|--------------|------------------------|---------------------------|-------------------------|
|                 | NOM                                | MIN  | MAX  |              |                        |                           |                         |
| CMX1211Z680B-10 | 68                                 | 40.8 | 91.8 | 0.56         | 50                     | 250                       | 1500                    |
| CMX1211Z181B-10 | 180                                | 108  | 243  | 1.35         | 32                     | 250                       | 1500                    |
| CMX1211Z321B-10 | 320                                | 192  | 432  | 2.5          | 28                     | 250                       | 1500                    |
| CMX1211Z601B-10 | 620                                | 372  | 837  | 3.5          | 20                     | 250                       | 1500                    |
| CMX1211Y801B-10 | 800                                | 480  | 1080 | 5.3          | 16                     | 250                       | 1500                    |
| CMX1211X132B-10 | 1300                               | 780  | 1755 | 10           | 11                     | 250                       | 1500                    |
| CMX1211W182B-10 | 1800                               | 1080 | 2430 | 14           | 9                      | 250                       | 1500                    |

### DIMENSIONS CMX1211

Unit: mm



| A Max | B Max | C Max |
|-------|-------|-------|
| 31.50 | 19.00 | 28.80 |

### ORDERING INFORMATION

| CMX1211 SERIES PART NUMBER EXAMPLE |   |                       |   |                           |   |
|------------------------------------|---|-----------------------|---|---------------------------|---|
| C                                  | M | X                     | 1 | 2                         | 1 |
| 1                                  | 2 | 1                     | 1 | Z                         | 6 |
| 6                                  | 8 | 0                     | B | -                         | 1 |
| 0                                  |   |                       |   |                           | 0 |
| Product series code                |   | EIA size code (L x W) |   | Rated Current Code        |   |
|                                    |   |                       |   | Inductance value code (L) |   |
|                                    |   |                       |   | Packing Code              |   |
|                                    |   |                       |   | Additional Description    |   |

Product series code

EIA size code (L x W)

Rated Current Code

X = 10,000 mA  
Y = 15,000 mA  
Z = 20,000 mA

Inductance value code (L)

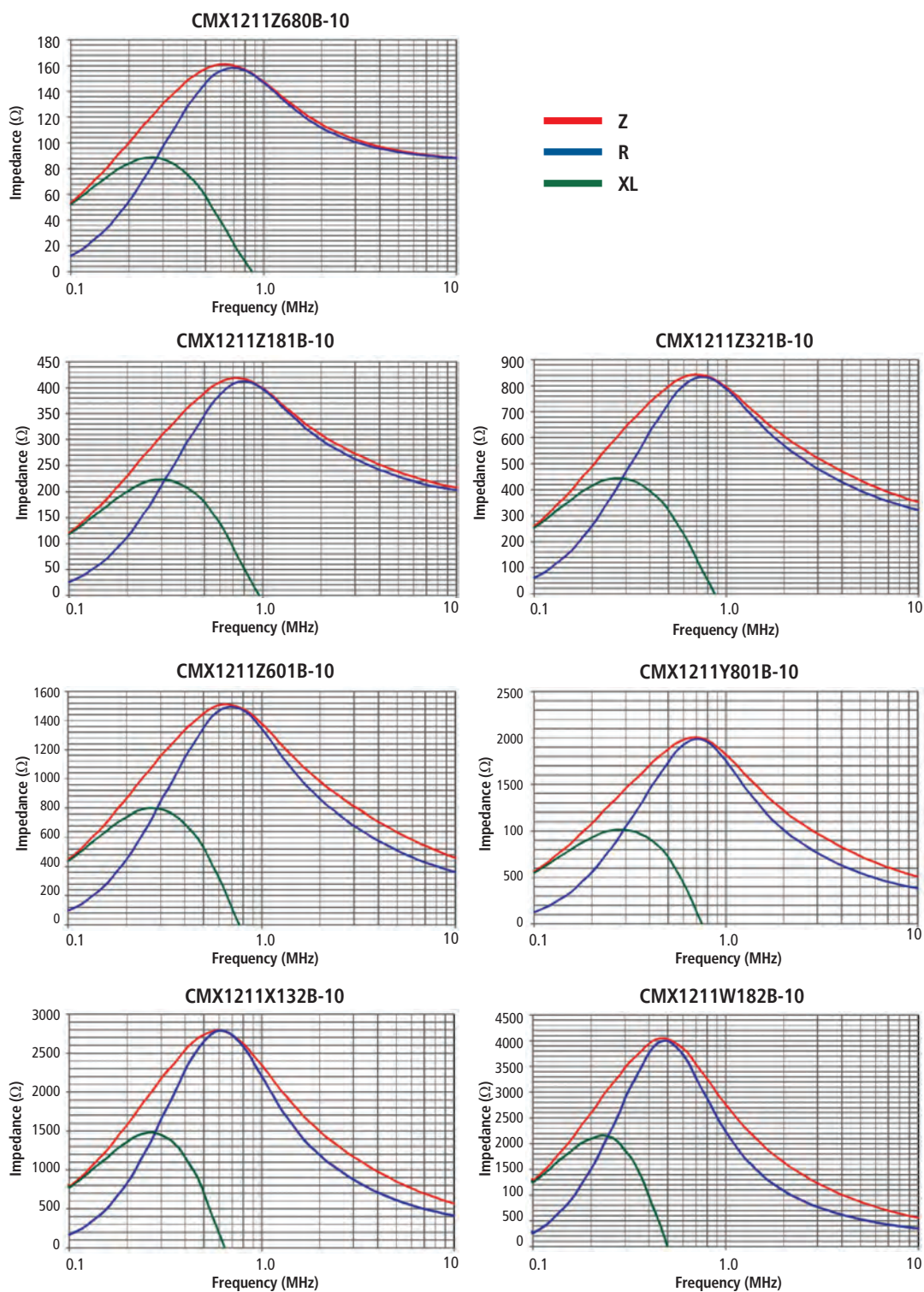
401 = 396 uH  
171 = 176 uH  
222 = 2156 uH

Packing Code

B = Bulk Packaging

Additional Description

## TYPICAL CHARACTERISTICS – ZRX VS FREQUENCY





CMX 1616 Series

FEATURES



- Current rating up to 62 Amp
- Stable performance and high reliability
- High suppression of asymmetric interferences at both low and high frequency
- Operation temperature: -40°C to 125°C (Including self-heating)
- Custom designs on request

APPLICATIONS

- Interferences suppression of common mode noise
- Power line filter
- Switch-mode power supplies

ELECTRICAL SPECIFICATIONS

| PART NO.        | INDUCTANCE @ 100 KHZ / 100 mV (uH) |      |      | DCR MAX (mΩ) | CURRENT RATING MAX (A) | RATING VOLTAGE MAX (Vrms) | HIPOT COIL – COIL (VAC) |
|-----------------|------------------------------------|------|------|--------------|------------------------|---------------------------|-------------------------|
|                 | NOM                                | MIN  | MAX  |              |                        |                           |                         |
| CMX1616X282B-10 | 2816                               | 1689 | 3802 | 11.0         | 14                     | 250                       | 1500                    |
| CMX1616Y222B-10 | 2156                               | 1293 | 2911 | 6.0          | 19                     | 250                       | 1500                    |
| CMX1616Z112B-10 | 1000                               | 600  | 1350 | 2.8          | 30                     | 250                       | 1500                    |
| CMX1616Z162B-10 | 1584                               | 950  | 2138 | 4.1          | 24                     | 250                       | 1500                    |
| CMX1616Z171B-10 | 176                                | 105  | 238  | 0.65         | 62                     | 250                       | 1500                    |
| CMX1616Z401B-10 | 396                                | 237  | 535  | 1.15         | 46                     | 250                       | 1500                    |
| CMX1616Z701B-10 | 704                                | 422  | 951  | 2.3          | 33                     | 250                       | 1500                    |

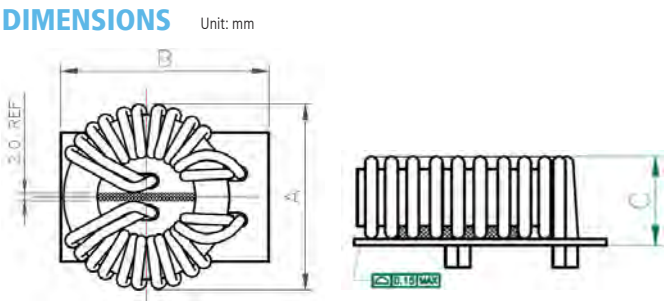
ORDERING INFORMATION

CMX1616 SERIES PART NUMBER EXAMPLE

|                     |   |   |                       |   |   |                                                 |   |                                               |   |                    |   |                        |   |   |
|---------------------|---|---|-----------------------|---|---|-------------------------------------------------|---|-----------------------------------------------|---|--------------------|---|------------------------|---|---|
| C                   | M | X | 1                     | 6 | 1 | 6                                               | Z | 1                                             | 1 | 2                  | B | -                      | 1 | 0 |
| Product series code |   |   | EIA size code (L x W) |   |   | Rated Current Code                              |   | Inductance value code (L)                     |   | Packing Code       |   | Additional Description |   |   |
|                     |   |   |                       |   |   | X = 10,000 mA<br>Y = 15,000 mA<br>Z = 20,000 mA |   | 401 = 396 uH<br>171 = 176 uH<br>222 = 2156 uH |   | B = Bulk Packaging |   |                        |   |   |

CMX1616 SERIES

WIRE-WOUND DIP POWER COMMON-MODE CHOKES

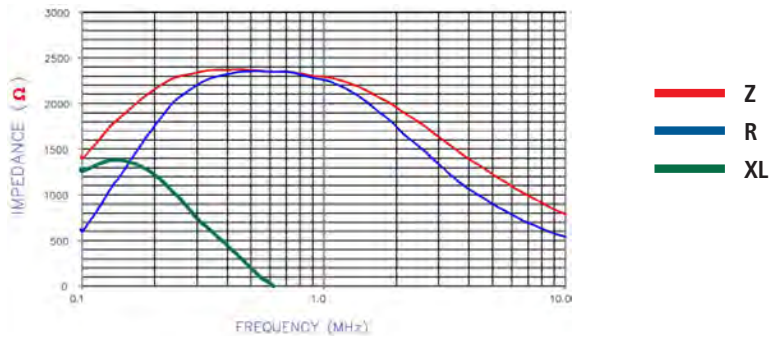


| Part Number     | A Max | B Max | C Max | LAND PATTERN |
|-----------------|-------|-------|-------|--------------|
| CMX1616X282B-10 | 42.00 | 40.00 | 15.50 |              |
| CMX1616Y222B-10 | 42.00 | 40.00 | 15.50 |              |
| CMX1616Z112B-10 | 40.00 | 40.00 | 16.50 |              |
| CMX1616Z162B-10 | 42.00 | 41.00 | 16.50 |              |
| CMX1616Z171B-10 | 41.00 | 41.00 | 16.50 |              |
| CMX1616Z401B-10 | 41.00 | 41.00 | 16.50 |              |
| CMX1616Z701B-10 | 40.00 | 40.00 | 16.50 |              |

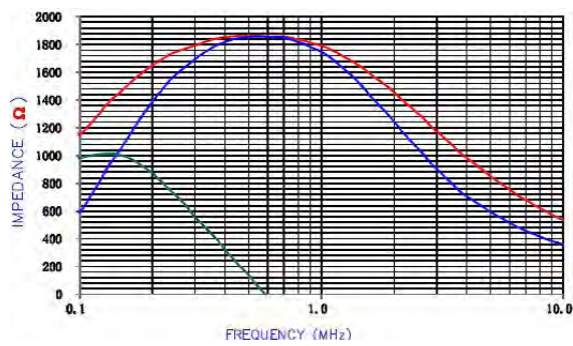
## WIRE-WOUND DIP POWER COMMON-MODE CHOKES

## TYPICAL CHARACTERISTICS – ZRX VS FREQUENCY

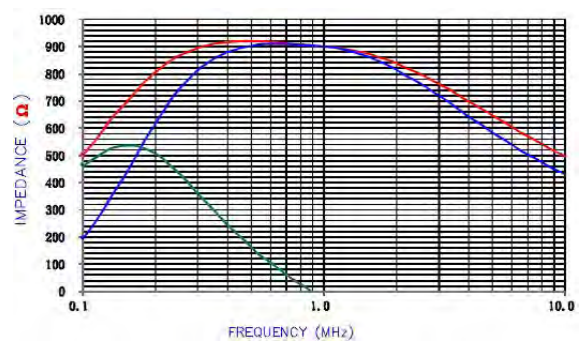
CMX1616X282B-10



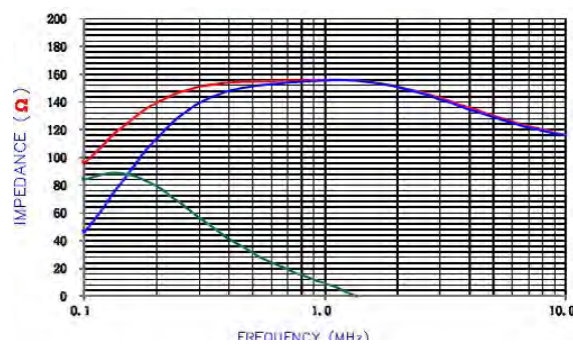
CMX1616Y222B-10



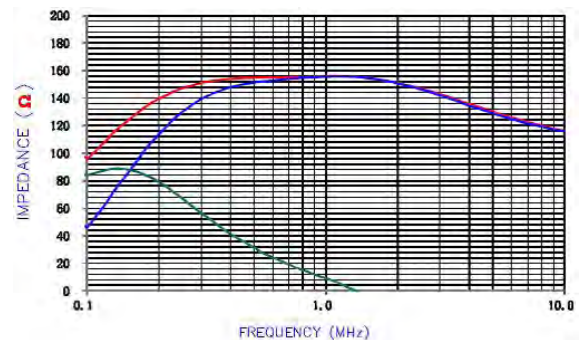
CMX1616Z112B-10



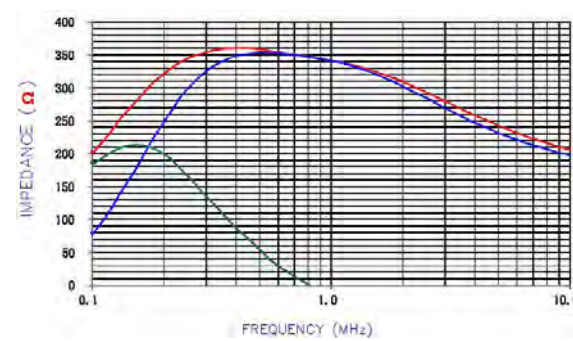
CMX1616Z162B-10



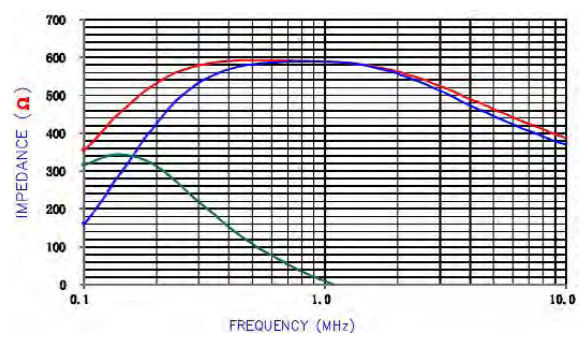
CMX1616Z171B-10



CMX1616Z401B-10



CMX1616Z701B-10



# COMMON MODE CHOKE SERIES

## SORTED BY IMPEDANCE @ 100 MHz OR 4 MHz

| PART NUMBER         | TYPICAL<br>Z Ω @ 25<br>MHz | NOMINAL<br>Z Ω @ 100<br>MHz | TYPICAL<br>Z<br>Ω @ 500<br>MHz | TYPICAL<br>Z Ω @<br>1 GHz | TYPICAL PEAK<br>IMPEDANCE<br>(Ω) | TYPICAL PEAK<br>IMPEDANCE<br>FREQ. (MHz) | DCR MAX<br>(Ω) | RATED<br>CONTINUOUS<br>CURRENT<br>(mA) | A (mm)<br>LENGTH | B (mm)<br>WIDTH | C (mm)<br>HEIGHT |
|---------------------|----------------------------|-----------------------------|--------------------------------|---------------------------|----------------------------------|------------------------------------------|----------------|----------------------------------------|------------------|-----------------|------------------|
| CM2021Y330R-10      | 18                         | 33                          | 52                             | 61                        | 62                               | 1100                                     | 0.001          | 15,000                                 | 5.60             | 2.85            | 5.00             |
| CM3421Y600R-10      | 39                         | 60                          | 96                             | 110                       | 110                              | 1000                                     | 0.001          | 15,000                                 | 5.60             | 2.85            | 8.68             |
| CF0805D670R-10      | 24                         | 67                          | 196                            | 98                        | 166                              | 510                                      | 0.4            | 400                                    | 2.00             | 1.25            | 1.00             |
| CM2722R800R-10      | 60                         | 80                          | 92                             | 98                        | 140                              | 3000                                     | 0.02           | 5,000                                  | 6.99             | 5.72            | 4.32             |
| CM3822R800R-10      | 64                         | 80                          | 97                             | 105                       | 151                              | 3000                                     | 0.02           | 5,000                                  | 9.78             | 5.72            | 4.32             |
| CM5022R800R-10      | 61                         | 80                          | 95                             | 102                       | 150                              | 3000                                     | 0.02           | 5,000                                  | 12.57            | 5.72            | 4.32             |
| CF0504C900R-10      | 28                         | 90                          | 210                            | 148                       | 217                              | 583                                      | 0.6            | 300                                    | 1.25             | 1.00            | 0.82             |
| CF0805D900R-10      | 32                         | 90                          | 210                            | 106                       | 220                              | 435                                      | 0.4            | 400                                    | 2.00             | 1.25            | 1.00             |
| CM0805D900R-10      | 24                         | 90                          | 340                            | 435                       | 445                              | 1405                                     | 0.3            | 400                                    | 2.00             | 1.20            | 1.20             |
| CH0805D900R-10      | 48                         | 90                          | 249                            | 339                       | 494                              | 2000                                     | 0.3            | 400                                    | 2.00             | 1.20            | 1.20             |
| CM5441Z101B-10      | 79                         | 100                         | 188                            | 183                       | 204                              | 682                                      | 0.0008         | 75,000                                 | 13.72            | 10.41           | 10.52            |
| CM4440Z111R-10      | 79                         | 110                         | 122                            | 177                       | 122                              | 500                                      | 0.001          | 20,000                                 | 11.05            | 10.03           | 9.32             |
| CM4440Z121R-10      | 82                         | 120                         | 122                            | 117                       | 123                              | 460                                      | 0.001          | 20,000                                 | 11.05            | 10.03           | 9.32             |
| CF0504C121R-10      | 33                         | 120                         | 250                            | 145                       | 250                              | 500                                      | 0.6            | 300                                    | 1.25             | 1.00            | 0.82             |
| CF0805D121R-10      | 36                         | 120                         | 240                            | 103                       | 260                              | 397                                      | 0.4            | 400                                    | 2.00             | 1.25            | 1.00             |
| CM3032V121R-10      | 80                         | 120                         | 130                            | 140                       | 169                              | 2010                                     | 0.01           | 8,000                                  | 7.62             | 8.13            | 5.72             |
| CM4545Z131B-10      | 65                         | 130                         | 267                            | 256                       | 288                              | 682                                      | 0.01           | 10,000                                 | 11.38            | 11.38           | 9.32             |
| CM4545Z131R-10      | 65                         | 130                         | 267                            | 256                       | 288                              | 682                                      | 0.01           | 10,000                                 | 11.38            | 11.38           | 9.32             |
| CM5022R151R-10      | 113                        | 150                         | 165                            | 167                       | 177                              | 2092                                     | 0.02           | 5,000                                  | 12.57            | 5.72            | 7.62             |
| CM2722R151R-10      | 113                        | 150                         | 165                            | 165                       | 168                              | 1783                                     | 0.02           | 5,000                                  | 6.99             | 5.72            | 7.62             |
| CM3822R151R-10      | 107                        | 150                         | 170                            | 169                       | 172                              | 1646                                     | 0.02           | 5,000                                  | 9.78             | 5.72            | 7.62             |
| CM0805C161R-10      | 49                         | 160                         | 540                            | 684                       | 684                              | 1000                                     | 0.35           | 300                                    | 2.00             | 1.20            | 1.20             |
| CM1206C161R-10      | 81                         | 160                         | 358                            | 555                       | 718                              | 2177                                     | 0.4            | 340                                    | 3.20             | 1.60            | 1.80             |
| CM5441Z161B-10      | 112                        | 160                         | 261                            | 146                       | 263                              | 457                                      | 0.0008         | 75,000                                 | 13.72            | 10.41           | 15.24            |
| CM5441Z161R-10      | 110                        | 160                         | 260                            | 140                       | 265                              | 457                                      | 0.0003         | 75,000                                 | 13.72            | 10.41           | 15.24            |
| CM3440Z171B-10      | 116                        | 170                         | 189                            | 202                       | 202                              | 1000                                     | 0.001          | 20,000                                 | 8.51             | 10.03           | 9.32             |
| CM3440Z171R-10      | 116                        | 170                         | 189                            | 202                       | 202                              | 1000                                     | 0.001          | 20,000                                 | 8.51             | 10.03           | 9.32             |
| CM5740Z171B-10      | 114                        | 170                         | 189                            | 202                       | 202                              | 1000                                     | 0.001          | 20,000                                 | 14.48            | 10.03           | 9.32             |
| CM5740Z171R-10      | 114                        | 170                         | 189                            | 202                       | 202                              | 1000                                     | 0.001          | 20,000                                 | 14.48            | 10.03           | 9.32             |
| CM2545X171B-10      | 108                        | 170                         | 210                            | 180                       | 210                              | 500                                      | 0.01           | 10,000                                 | 6.30             | 11.38           | 9.32             |
| CM2545X171R-10      | 108                        | 170                         | 210                            | 180                       | 210                              | 500                                      | 0.01           | 10,000                                 | 6.30             | 11.38           | 9.32             |
| CF0805D181R-10      | 48                         | 180                         | 123                            | 42                        | 277                              | 210                                      | 0.5            | 400                                    | 2.00             | 1.25            | 1.00             |
| CM6032V201R-10      | 140                        | 200                         | 219                            | 213                       | 219                              | 500                                      | 0.01           | 8,000                                  | 15.24            | 8.13            | 9.45             |
| CM3032V201R-10      | 143                        | 200                         | 210                            | 199                       | 214                              | 319                                      | 0.01           | 8,000                                  | 7.62             | 8.13            | 9.45             |
| CM5022R201R-10      | 142                        | 200                         | 206                            | 188                       | 210                              | 306                                      | 0.02           | 5,000                                  | 12.57            | 5.72            | 9.53             |
| CM2722R201R-10      | 142                        | 200                         | 202                            | 187                       | 206                              | 272                                      | 0.02           | 5,000                                  | 6.99             | 5.72            | 9.53             |
| CM4732V201R-10      | 152                        | 200                         | 218                            | 187                       | 229                              | 241                                      | 0.01           | 8,000                                  | 11.94            | 8.13            | 9.45             |
| CM3822R201R-10      | 141                        | 200                         | 207                            | 187                       | 213                              | 218                                      | 0.02           | 5,000                                  | 9.78             | 5.72            | 9.53             |
| CF0805C221R-10      | 50                         | 220                         | 109                            | 33                        | 296                              | 180                                      | 0.5            | 300                                    | 2.00             | 1.25            | 1.00             |
| CM0805C221R-10      | 57                         | 220                         | 570                            | 720                       | 724                              | 1147                                     | 0.4            | 300                                    | 2.00             | 1.20            | 1.20             |
| CM3032V301R-10      | 211                        | 300                         | 280                            | 224                       | 307                              | 214                                      | 0.01           | 8,000                                  | 7.62             | 8.13            | 14.48            |
| CM4732V301R-10      | 217                        | 300                         | 250                            | 172                       | 328                              | 168                                      | 0.01           | 8,000                                  | 11.94            | 8.13            | 14.48            |
| CM6032V301R-10      | 240                        | 300                         | 258                            | 170                       | 346                              | 149                                      | 0.01           | 8,000                                  | 15.24            | 8.13            | 14.48            |
| CM0805A371R-10      | 186                        | 370                         | 730                            | 878                       | 878                              | 1000                                     | 0.5            | 100                                    | 2.00             | 1.20            | 1.20             |
| Low Frequency Parts | @ 1 MHz                    | @ 4 MHz                     | @ 10 MHz                       | @ 25 MHz                  | (Ohms)                           | (MHz)                                    | (Ohms)         | (mA)                                   | (mm)             | (mm)            | (mm)             |
| CM5740Z241B-10      | 170<br>(2 Turns)           | 240<br>(2 Turns)            | 173<br>(2 Turns)               | 140<br>(2 Turns)          | 276<br>(2 Turns)                 | 3<br>(2 Turns)                           | 0.001          | 20,000                                 | 14.48            | 10.03           | 9.32             |
| CM2824E182R-10      | 200                        | 570                         | 920                            | 1400                      | 1920                             | 80                                       | 0.26           | 800                                    | 7.50             | 5.50            | 3.80             |
| CM1812C282R-10      | 370                        | 1100                        | 1900                           | 2700                      | 3500                             | 50                                       | 0.5            | 200                                    | 5.00             | 3.50            | 5.55             |
| CM2824E352R-10      | 350                        | 1400                        | 2100                           | 3200                      | 3950                             | 45                                       | 0.3            | 800                                    | 7.50             | 5.50            | 3.80             |
| CM2824E702R-10      | 3000                       | 7000                        | 5800                           | 4800                      | 7200                             | 6                                        | 0.26           | 700                                    | 7.50             | 5.50            | 3.80             |
| CM2824B103R-10      | 10000                      | 8900                        | 3980                           | 1800                      | 13200                            | 2                                        | 1.3            | 400                                    | 7.50             | 5.50            | 3.80             |

**SORTED BY RATED CURRENT (AT CONTINUOUS OPERATION)**

| PART NUMBER         | TYPICAL<br>Z Ω @<br>25 MHz | NOMINAL<br>Z Ω @<br>100 MHz | TYPICAL<br>Z Ω @<br>500 MHz | TYPICAL<br>Z Ω @<br>1 GHz | TYPICAL<br>PEAK<br>IMPEDANCE<br>(Ω) | TYPICAL<br>PEAK<br>IMPEDANCE<br>FREQ. (MHz) | DCR MAX<br>(Ω) | RATED<br>CONTINUOUS<br>CURRENT<br>(mA) | A (mm)<br>LENGTH | B (mm)<br>WIDTH | C (mm)<br>HEIGHT |
|---------------------|----------------------------|-----------------------------|-----------------------------|---------------------------|-------------------------------------|---------------------------------------------|----------------|----------------------------------------|------------------|-----------------|------------------|
| CM0805A371R-10      | 186                        | 370                         | 730                         | 878                       | 878                                 | 1,000                                       | 0.5            | 100                                    | 2.00             | 1.20            | 1.20             |
| CM0805C161R-10      | 49                         | 160                         | 540                         | 684                       | 684                                 | 1,000                                       | 0.35           | 300                                    | 2.00             | 1.20            | 1.20             |
| CM0805C221R-10      | 57                         | 220                         | 570                         | 720                       | 724                                 | 1,147                                       | 0.4            | 300                                    | 2.00             | 1.20            | 1.20             |
| CF0504C900R-10      | 28                         | 90                          | 210                         | 148                       | 217                                 | 583                                         | 0.6            | 300                                    | 1.25             | 1.00            | 0.82             |
| CF0504C121R-10      | 33                         | 120                         | 250                         | 145                       | 250                                 | 500                                         | 0.6            | 300                                    | 1.25             | 1.00            | 0.82             |
| CF0805C221R-10      | 50                         | 220                         | 109                         | 33                        | 296                                 | 180                                         | 0.5            | 300                                    | 2.00             | 1.25            | 1.00             |
| CF0805D670R-10      | 24                         | 67                          | 196                         | 98                        | 166                                 | 510                                         | 0.4            | 400                                    | 2.00             | 1.25            | 1.00             |
| CF0805D900R-10      | 32                         | 90                          | 210                         | 106                       | 220                                 | 435                                         | 0.4            | 400                                    | 2.00             | 1.25            | 1.00             |
| CF0805D121R-10      | 36                         | 120                         | 240                         | 103                       | 260                                 | 397                                         | 0.4            | 400                                    | 2.00             | 1.25            | 1.00             |
| CF0805D181R-10      | 48                         | 180                         | 123                         | 42                        | 277                                 | 210                                         | 0.5            | 400                                    | 2.00             | 1.25            | 1.00             |
| CH0805D900R-10      | 48                         | 90                          | 249                         | 339                       | 494                                 | 2000                                        | 0.3            | 400                                    | 2.00             | 1.20            | 1.20             |
| CM0805D900R-10      | 24                         | 90                          | 340                         | 435                       | 445                                 | 1,405                                       | 0.3            | 400                                    | 2.00             | 1.20            | 1.20             |
| CM2722R151R-10      | 113                        | 150                         | 165                         | 165                       | 168                                 | 1,783                                       | 0.02           | 5,000                                  | 6.99             | 5.72            | 7.62             |
| CM2722R201R-10      | 142                        | 200                         | 202                         | 187                       | 206                                 | 272                                         | 0.02           | 5,000                                  | 6.99             | 5.72            | 9.53             |
| CM2722R800R-10      | 60                         | 80                          | 92                          | 98                        | 140                                 | 3,000                                       | 0.02           | 5,000                                  | 6.99             | 5.72            | 4.32             |
| CM3822R151R-10      | 107                        | 150                         | 170                         | 169                       | 172                                 | 1,646                                       | 0.02           | 5,000                                  | 9.78             | 5.72            | 7.62             |
| CM3822R201R-10      | 141                        | 200                         | 207                         | 187                       | 213                                 | 218                                         | 0.02           | 5,000                                  | 9.78             | 5.72            | 9.53             |
| CM3822R800R-10      | 64                         | 80                          | 97                          | 105                       | 151                                 | 3,000                                       | 0.02           | 5,000                                  | 9.78             | 5.72            | 4.32             |
| CM5022R151R-10      | 113                        | 150                         | 165                         | 167                       | 177                                 | 2,092                                       | 0.02           | 5,000                                  | 12.57            | 5.72            | 7.62             |
| CM5022R201R-10      | 142                        | 200                         | 206                         | 188                       | 210                                 | 306                                         | 0.02           | 5,000                                  | 12.57            | 5.72            | 9.53             |
| CM5022R800R-10      | 61                         | 80                          | 95                          | 102                       | 150                                 | 3,000                                       | 0.02           | 5,000                                  | 12.57            | 5.72            | 4.32             |
| CM3032V121R-10      | 80                         | 120                         | 130                         | 140                       | 169                                 | 2,010                                       | 0.01           | 8,000                                  | 7.62             | 8.13            | 5.72             |
| CM3032V201R-10      | 143                        | 200                         | 210                         | 199                       | 214                                 | 319                                         | 0.01           | 8,000                                  | 7.62             | 8.13            | 9.45             |
| CM3032V301R-10      | 211                        | 300                         | 280                         | 224                       | 307                                 | 214                                         | 0.01           | 8,000                                  | 7.62             | 8.13            | 14.48            |
| CM4732V201R-10      | 152                        | 200                         | 218                         | 187                       | 229                                 | 241                                         | 0.01           | 8,000                                  | 11.94            | 8.13            | 9.45             |
| CM4732V301R-10      | 217                        | 300                         | 250                         | 172                       | 328                                 | 168                                         | 0.01           | 8,000                                  | 11.94            | 8.13            | 14.48            |
| CM6032V201R-10      | 140                        | 200                         | 219                         | 213                       | 219                                 | 500                                         | 0.01           | 8,000                                  | 15.24            | 8.13            | 9.45             |
| CM6032V301R-10      | 240                        | 300                         | 258                         | 170                       | 346                                 | 149                                         | 0.01           | 8,000                                  | 15.24            | 8.13            | 14.48            |
| CM2545X171B-10      | 108                        | 170                         | 210                         | 180                       | 210                                 | 500                                         | 0.01           | 10,000                                 | 6.30             | 11.38           | 9.32             |
| CM2545X171R-10      | 108                        | 170                         | 210                         | 180                       | 210                                 | 500                                         | 0.01           | 10,000                                 | 6.30             | 11.38           | 9.32             |
| CM4545Z131B-10      | 65                         | 130                         | 267                         | 256                       | 288                                 | 682                                         | 0.01           | 10,000                                 | 11.38            | 11.38           | 9.32             |
| CM4545Z131R-10      | 65                         | 130                         | 267                         | 256                       | 288                                 | 682                                         | 0.01           | 10,000                                 | 11.38            | 11.38           | 9.32             |
| CM2021Y330R-10      | 18                         | 33                          | 52                          | 61                        | 62                                  | 1,100                                       | 0.001          | 15,000                                 | 5.60             | 2.85            | 5.00             |
| CM3421Y600R-10      | 39                         | 60                          | 96                          | 110                       | 110                                 | 1,000                                       | 0.001          | 15,000                                 | 5.60             | 2.85            | 8.68             |
| CM3440Z171B-10      | 116                        | 170                         | 189                         | 202                       | 202                                 | 1,000                                       | 0.001          | 20,000                                 | 8.51             | 10.03           | 9.32             |
| CM3440Z171R-10      | 116                        | 170                         | 189                         | 202                       | 202                                 | 1,000                                       | 0.001          | 20,000                                 | 8.51             | 10.03           | 9.32             |
| CM4440Z111R-10      | 79                         | 110                         | 122                         | 117                       | 122                                 | 500                                         | 0.001          | 20,000                                 | 11.05            | 10.03           | 9.32             |
| CM5740Z171B-10      | 114                        | 170                         | 189                         | 202                       | 202                                 | 1,000                                       | 0.001          | 20,000                                 | 14.48            | 10.03           | 9.32             |
| CM5740Z171R-10      | 114                        | 170                         | 189                         | 202                       | 202                                 | 1,000                                       | 0.001          | 20,000                                 | 14.48            | 10.03           | 9.32             |
| CM5441Z101B-10      | 79                         | 100                         | 188                         | 183                       | 204                                 | 682                                         | 0.0008         | 75,000                                 | 13.72            | 10.41           | 10.52            |
| CM5441Z101B-13      | 79                         | 100                         | 188                         | 183                       | 204                                 | 682                                         | 0.0008         | 75,000                                 | 13.72            | 10.41           | 10.52            |
| CM5441Z161B-10      | 112                        | 160                         | 261                         | 146                       | 263                                 | 457                                         | 0.0008         | 75,000                                 | 13.72            | 10.41           | 15.24            |
| CM5441Z161B-13      | 112                        | 160                         | 261                         | 146                       | 263                                 | 457                                         | 0.0008         | 75,000                                 | 13.72            | 10.41           | 15.24            |
| Low Frequency Parts | @ 1 MHz                    | @ 4 MHz                     | @ 10 MHz                    | @ 25 MHz                  | (Ohms)                              | (MHz)                                       | (Ohms)         | (mA)                                   | (mm)             | (mm)            | (mm)             |
| CM1812C282R-10      | 370                        | 1,100                       | 1,900                       | 2,700                     | 3,500                               | 50                                          | 0.5            | 200                                    | 5.00             | 3.50            | 5.55             |
| CM2824B103R-10      | 10,000                     | 8,900                       | 3,980                       | 1,800                     | 13,200                              | 2                                           | 1.3            | 400                                    | 7.50             | 5.50            | 3.80             |
| CM2824E702R-10      | 3,000                      | 7,000                       | 5,800                       | 4,800                     | 7,200                               | 6                                           | 0.26           | 700                                    | 7.50             | 5.50            | 3.80             |
| CM2824E182R-10      | 200                        | 570                         | 920                         | 1,400                     | 1,920                               | 80                                          | 0.26           | 800                                    | 7.50             | 5.50            | 3.80             |
| CM2824E352R-10      | 350                        | 1,400                       | 2,100                       | 3,200                     | 3,950                               | 45                                          | 0.3            | 800                                    | 7.50             | 5.50            | 3.80             |
| CM5740Z241B-10      | 170<br>(2 Turns)           | 240<br>(2 Turns)            | 173<br>(2 Turns)            | 140<br>(2 Turns)          | 276<br>(2 Turns)                    | 3<br>(2 Turns)                              | 0.001          | 20,000                                 | 14.48            | 10.03           | 9.32             |



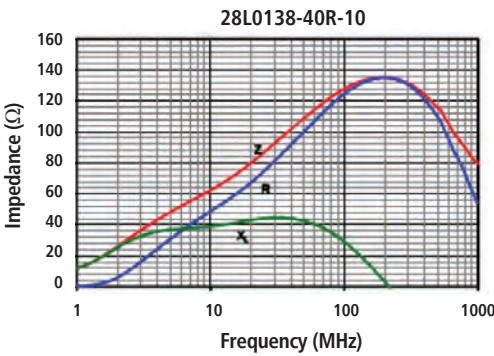
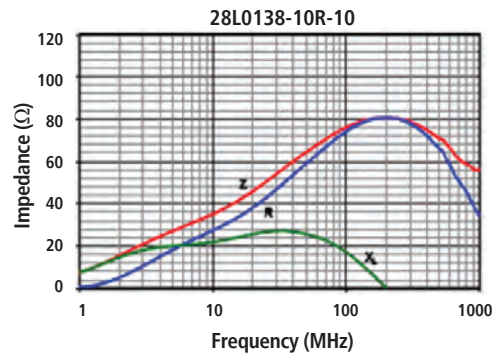
FEATURES  

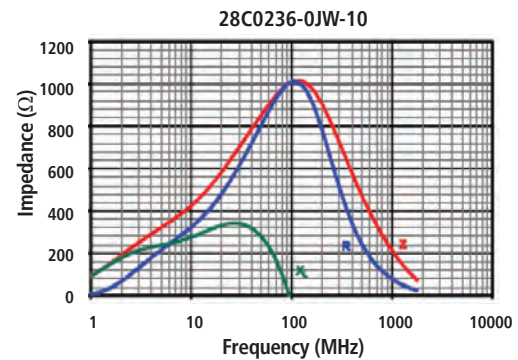
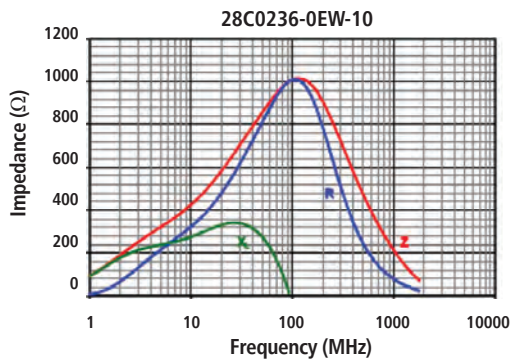
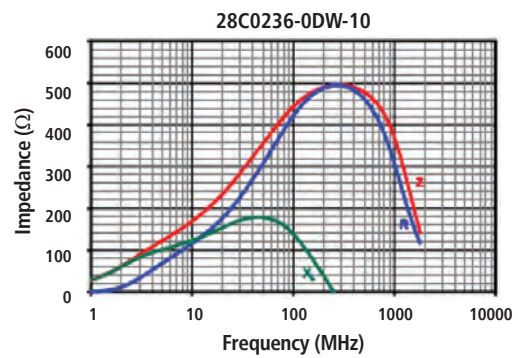
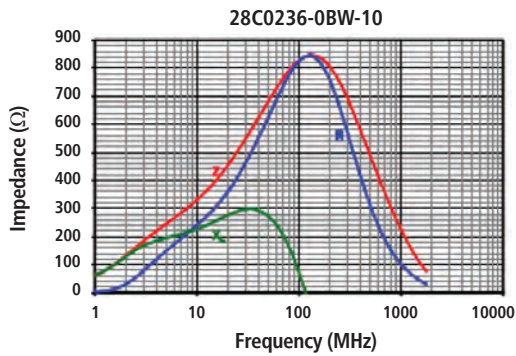
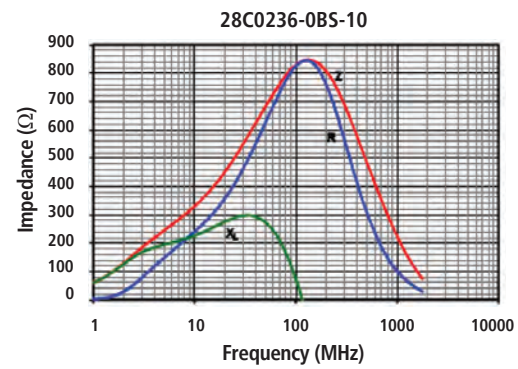
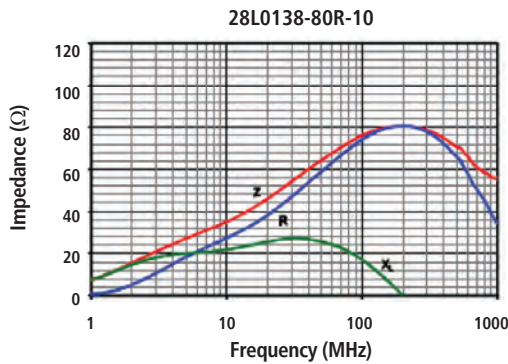
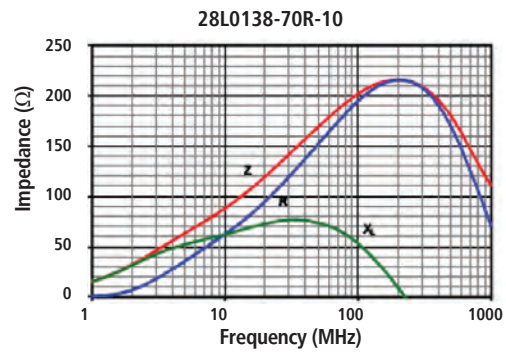
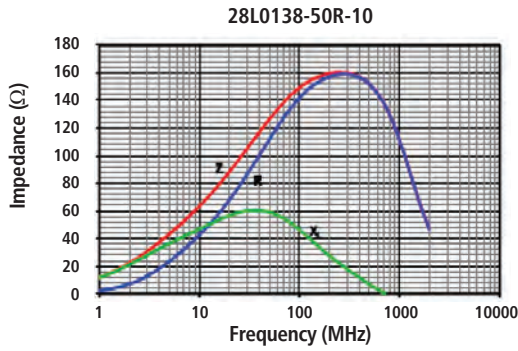
- Differential mode EMI filter, high current, thru-hole type
- Up to 5 Amps continuous operation current
- Low DCR
- For power lines application for LCD-TV, automotive, telecom, test equipment etc.

PART NUMBERING SYSTEM

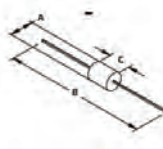
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|---------------|--------------|---------------|-----------------------|------------------------|--------------|------------------------|
| Material Code | Product Code | EIA Size Code | Stated Dimension Code | Additional Description | Packing Code | Additional Description |

| TYPE                                  | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |             |             |           | TYPICAL PEAK IMPEDANCE ( $\Omega$ ) | PEAK IMPEDANCE FREQUENCY (MHZ) | DCR MAX ( $\Omega$ ) | RATED I MAX (CONTINUOUS) mA |
|---------------------------------------|----------------|--------------------------------|-------------|-------------|-----------|-------------------------------------|--------------------------------|----------------------|-----------------------------|
|                                       |                | Z @ 25 MHz                     | Z @ 100 MHz | Z @ 500 MHz | Z @ 1 GHz |                                     |                                |                      |                             |
| Power Line Thru-Hole (Single Turn)    | 28L0138-10R-10 | 45                             | 75          | 70          | 55        | 80                                  | 200                            | 0.01                 | 5,000                       |
|                                       | 28L0138-40R-10 | 99                             | 135         | 180         | 80        | 138                                 | 200                            | 0.01                 | 5,000                       |
|                                       | 28L0138-50R-10 | 92                             | 153         | 152         | 111       | 161                                 | 150                            | 0.01                 | 5,000                       |
|                                       | 28L0138-70R-10 | 123                            | 220         | 180         | 110       | 220                                 | 100                            | 0.01                 | 5,000                       |
|                                       | 28L0138-80R-10 | 48                             | 86          | 78          | 57        | 85                                  | 100                            | 0.01                 | 5,000                       |
| Power Line Thru-Hole (Multiple Turns) | 28C0236-0BS-10 | 500                            | 835         | 480         | 220       | 846                                 | 156                            | 0.01                 | 5,000                       |
|                                       | 28C0236-0BW-10 | 500                            | 835         | 480         | 220       | 846                                 | 156                            | 0.01                 | 5,000                       |
|                                       | 28C0236-0DW-10 | 260                            | 460         | 478         | 360       | 498                                 | 300                            | 0.01                 | 5,000                       |
|                                       | 28C0236-0EW-10 | 620                            | 998         | 484         | 205       | 1010                                | 140                            | 0.01                 | 5,000                       |
|                                       | 28C0236-0JW-10 | 620                            | 998         | 484         | 205       | 1010                                | 140                            | 0.01                 | 5,000                       |

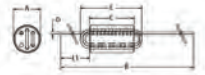
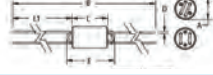
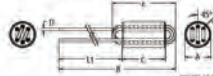


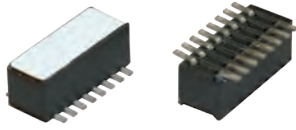


#### DIMENSION

| PART NUMBER    | A mm<br>(INCHES) | B mm<br>(INCHES) | C mm<br>(INCHES) |                                                                                   |
|----------------|------------------|------------------|------------------|-----------------------------------------------------------------------------------|
| 28L0138-10R-10 | 3.51<br>(0.138)  | 59.00<br>(2.323) | 4.45<br>(0.175)  |  |
| 28L0138-40R-10 | 3.51<br>(0.138)  | 59.00<br>(2.323) | 8.89<br>(0.350)  |                                                                                   |
| 28L0138-50R-10 | 3.51<br>(0.138)  | 59.00<br>(2.323) | 9.53<br>(0.375)  |                                                                                   |
| 28L0138-70R-10 | 3.51<br>(0.138)  | 59.00<br>(2.323) | 13.97<br>(0.550) |                                                                                   |
| 28L0138-80R-10 | 3.51<br>(0.138)  | 59.00<br>(2.323) | 5.23<br>(0.206)  |                                                                                   |

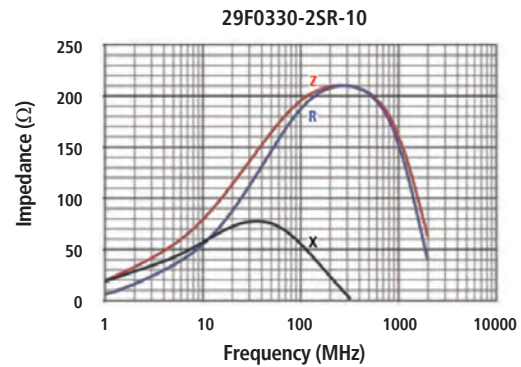
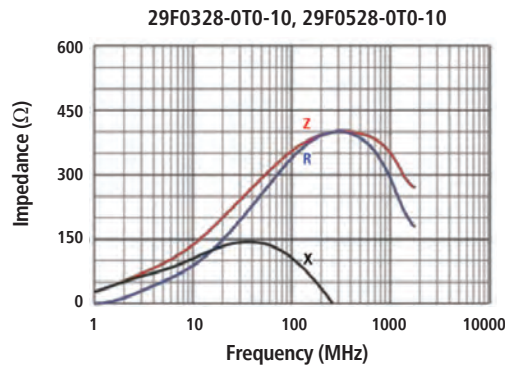
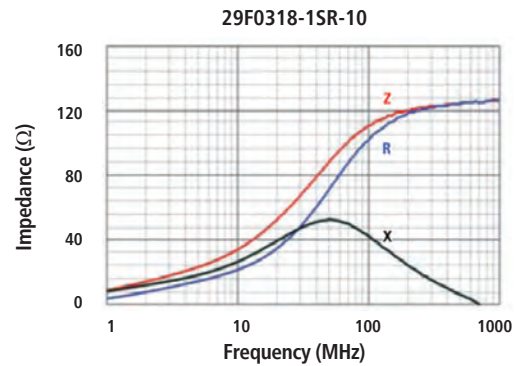
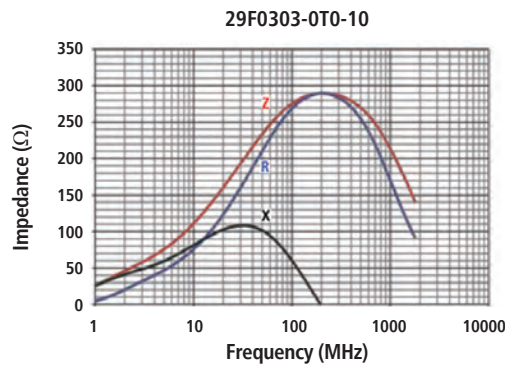
#### DIMENSION

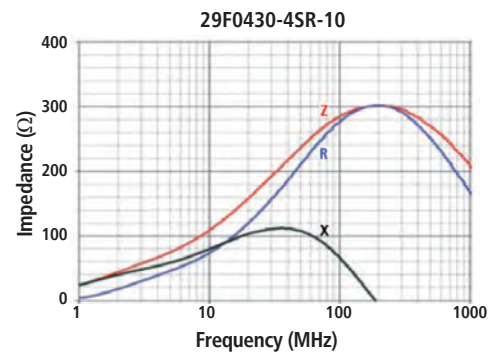
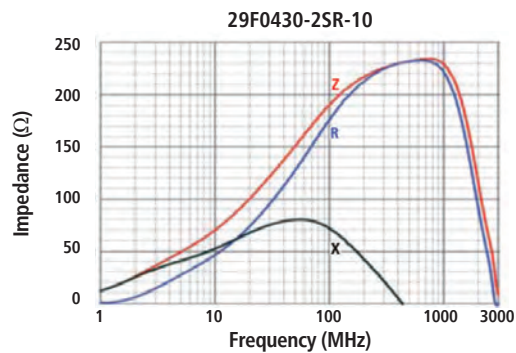
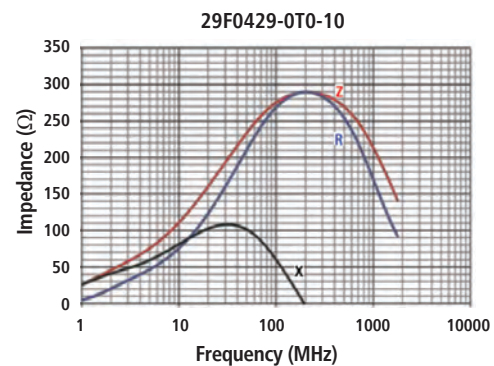
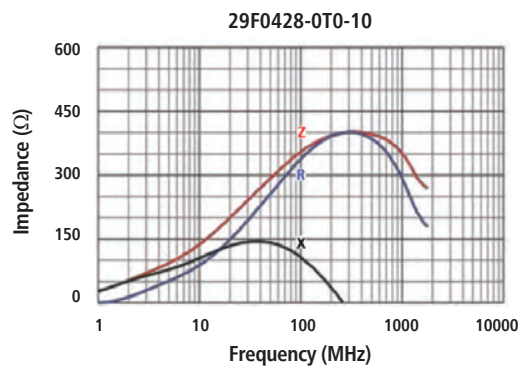
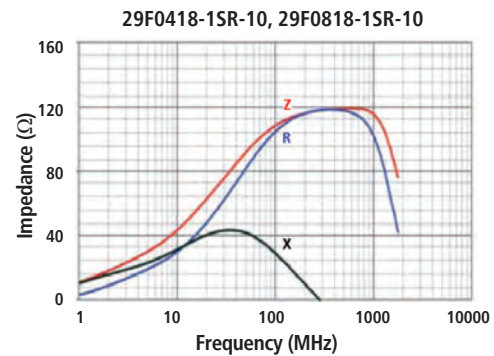
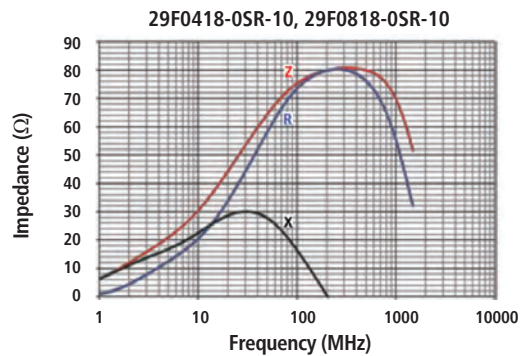
| PART NUMBER    | A mm<br>(INCHES) | B mm<br>(INCHES) | C mm<br>(INCHES) | D mm<br>(INCHES) | E mm<br>(INCHES) | F mm<br>(INCHES) | L1 mm<br>(INCHES) |                                                                                       |
|----------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|---------------------------------------------------------------------------------------|
| 28C0236-0BS-10 | 6.00<br>(0.236)  | 14.99<br>(0.590) | 10.00<br>(0.394) | 0.51<br>(0.020)  | 14.61<br>(0.575) | -                | 5.99<br>(0.236)   |  |
| 28C0236-0BW-10 | 6.00<br>(0.236)  | 86.46<br>(3.404) | 10.00<br>(0.394) | 0.51<br>(0.020)  | 14.61<br>(0.575) | -                | 38.10<br>(1.500)  |  |
| 28C0236-0DW-10 | 6.00<br>(0.236)  | 86.46<br>(3.404) | 10.00<br>(0.394) | 0.51<br>(0.020)  | 14.61<br>(0.575) | -                | 38.23<br>(1.505)  |  |
| 28C0236-0EW-10 | 6.00<br>(0.236)  | 50.53<br>(1.989) | 10.00<br>(0.394) | 0.51<br>(0.020)  | 14.61<br>(0.575) | -                | 38.10<br>(1.500)  |  |
| 28C0236-0JW-10 | 6.00<br>(0.236)  | 20.96<br>(0.825) | 10.00<br>(0.394) | 0.51<br>(0.020)  | 15.90<br>(0.626) | 5.08<br>(0.200)  | 5.08<br>(0.200)   |  |



## POWER LINE

| TYPE                    | PART NUMBER    | TYPICAL IMPEDANCE ( $\Omega$ ) |             |             |           | TYPICAL PEAK IMPEDANCE ( $\Omega$ ) | PEAK IMPEDANCE FREQUENCY (MHz) | DCR MAX ( $\Omega$ ) | RATED I MAX (CONTINUOUS) mA |
|-------------------------|----------------|--------------------------------|-------------|-------------|-----------|-------------------------------------|--------------------------------|----------------------|-----------------------------|
|                         |                | Z @ 25 MHz                     | Z @ 100 MHz | Z @ 500 MHz | Z @ 1 GHz |                                     |                                |                      |                             |
| Thru-Hole (3 lines)     | 29F0303-0T0-10 | 180                            | 266         | 278         | 215       | 288                                 | 200                            | 0.01                 | 8,000                       |
| Surface Mount (3 lines) | 29F0318-1SR-10 | 70                             | 119         | 119         | 118       | 119                                 | 500                            | 0.01                 | 6,000                       |
| Thru-Hole (3 lines)     | 29F0328-0T0-10 | 232                            | 342         | 418         | 360       | 420                                 | 350                            | 0.01                 | 10,000                      |
| Surface Mount (3 lines) | 29F0330-2SR-10 | 125                            | 200         | 201         | 160       | 210                                 | 300                            | 0.01                 | 9,000                       |
| Surface Mount (4 lines) | 29F0418-0SR-10 | 48                             | 80          | 80          | 70        | 83                                  | 300                            | 0.01                 | 6,000                       |
| Surface Mount (4 lines) | 29F0418-1SR-10 | 70                             | 119         | 119         | 118       | 119                                 | 500                            | 0.01                 | 6,000                       |
| Thru-Hole (4 lines)     | 29F0428-0T0-10 | 225                            | 342         | 390         | 350       | 400                                 | 300                            | 0.01                 | 10,000                      |
| Thru-Hole (4 lines)     | 29F0429-0T0-10 | 180                            | 245         | 270         | 211       | 280                                 | 200                            | 0.01                 | 8,000                       |
| Surface Mount (4 lines) | 29F0430-2SR-10 | 120                            | 200         | 230         | 225       | 235                                 | 800                            | 0.01                 | 8,000                       |
| Surface Mount (4 lines) | 29F0430-4SR-10 | 175                            | 290         | 268         | 209       | 300                                 | 200                            | 0.01                 | 9,000                       |
| Thru-Hole (5 lines)     | 29F0528-0T0-10 | 232                            | 342         | 418         | 360       | 420                                 | 350                            | 0.01                 | 10,000                      |
| Surface Mount (8 lines) | 29F0818-0SR-10 | 48                             | 75          | 80          | 70        | 83                                  | 370                            | 0.01                 | 6,000                       |
| Surface Mount (8 lines) | 29F0818-1SR-10 | 70                             | 119         | 119         | 118       | 119                                 | 500                            | 0.01                 | 6,000                       |





**DIMENSION**

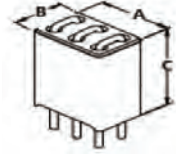
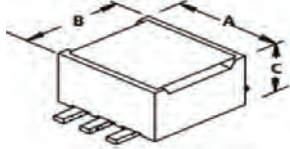
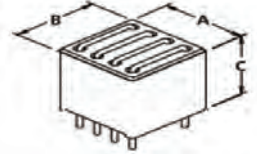
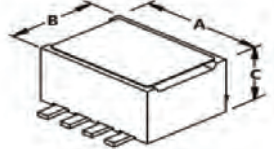
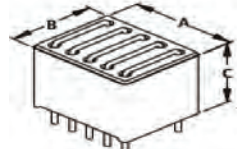
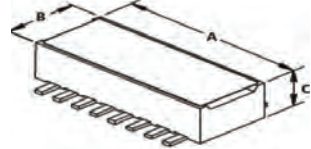
| PART NUMBER    |               | # OF LINES | A mm (INCHES) | B mm (INCHES) | C mm (INCHES) |                                                                                       |
|----------------|---------------|------------|---------------|---------------|---------------|---------------------------------------------------------------------------------------|
| 29F0303-0T0-10 | Thru-hole     | 3          | 7.62 (0.300)  | 5.08 (0.200)  | 10.44 (0.411) |    |
| 29F0328-0T0-10 |               | 3          | 8.34 (0.328)  | 10.88 (0.428) | 10.57 (0.416) |                                                                                       |
| 29F0318-1SR-10 | Surface-Mount | 3          | 4.83 (0.190)  | 4.50 (0.177)  | 4.19 (0.165)  |    |
| 29F0330-2SR-10 |               | 3          | 8.33 (0.328)  | 10.87 (0.428) | 6.35 (0.250)  |                                                                                       |
| 29F0428-0T0-10 | Thru-hole     | 4          | 10.88 (0.428) | 10.88 (0.428) | 10.57 (0.416) |    |
| 29F0429-0T0-10 |               | 4          | 10.88 (0.428) | 5.49 (0.216)  | 10.44 (0.411) |                                                                                       |
| 29F0418-0SR-10 | Surface-Mount | 4          | 6.10 (0.240)  | 4.50 (0.177)  | 2.92 (0.115)  |  |
| 29F0418-1SR-10 |               | 4          | 6.10 (0.240)  | 4.50 (0.177)  | 4.19 (0.165)  |                                                                                       |
| 29F0430-2SR-10 |               | 4          | 10.87 (0.428) | 10.87 (0.428) | 6.35 (0.250)  |                                                                                       |
| 29F0430-4SR-10 |               | 4          | 10.87 (0.428) | 10.87 (0.428) | 8.89 (0.350)  |                                                                                       |
| 29F0528-0T0-10 | Thru-hole     | 5          | 13.42 (0.528) | 10.88 (0.428) | 10.57 (0.416) |  |
| 29F0818-0SR-10 | Surface-Mount | 8          | 11.43 (0.450) | 4.50 (0.177)  | 2.92 (0.115)  |  |
| 29F0818-1SR-10 |               | 8          | 11.43 (0.450) | 4.50 (0.177)  | 4.19 (0.165)  |                                                                                       |

Diagram #1



Diagram #2

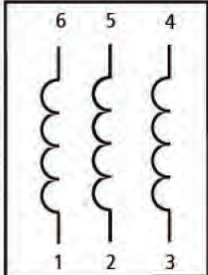


Diagram #3

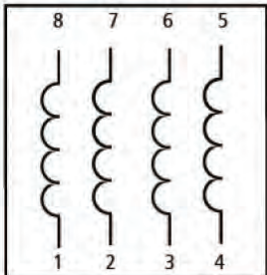


Diagram #4

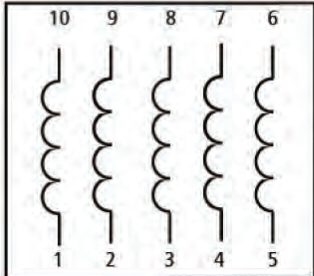
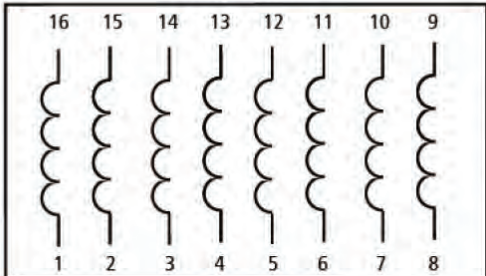


Diagram #5





## FEATURES



- Monolithic construction, small size
- High reliability
- Economical
- Broadband and high frequency available
- For RF and wireless communication, computers, telecommunications, automotive electronics etc.

## PART NUMBERING SYSTEM

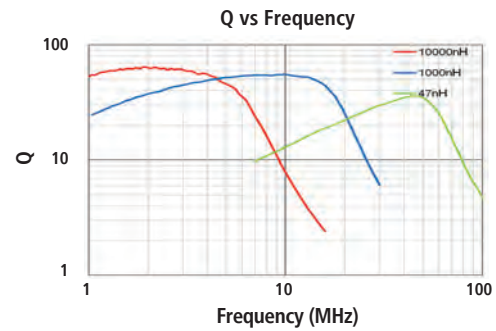
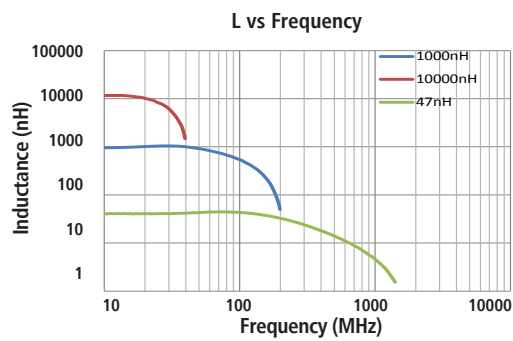
| IC                  | 0603          | A                  | 102                   | R            | -10                    |
|---------------------|---------------|--------------------|-----------------------|--------------|------------------------|
| Product Series Code | EIA Size Code | Rated Current Code | Inductance Value Code | Packing Code | Additional Description |

| EIA PKG. SIZE | METRIC PKG. SIZE | PART NUMBER    | L (nH) ± 10% | Q (MIN) | TEST FREQ. L, Q (MHZ) | SELF-RESONANT FREQ. (MHZ) | DCR MAX (Ω) | RATED I MAX (mA) |
|---------------|------------------|----------------|--------------|---------|-----------------------|---------------------------|-------------|------------------|
| 0603          | 1608             | IC0603A102R-10 | 1,000        | 30      | 10                    | 70                        | 0.6         | 25               |
| 0603          | 1608             | IC0603A103R-10 | 10,000       | 30      | 2                     | 17                        | 2.55        | 15               |
| 0603          | 1608             | IC0603A152R-10 | 1500         | 35      | 10                    | 60                        | 0.70        | 40               |
| 0603          | 1608             | IC0603A472R-10 | 4700         | 35      | 10                    | 33                        | 1.60        | 30               |
| 0603          | 1608             | IC0603A182R-10 | 1,800        | 30      | 10                    | 50                        | 0.95        | 25               |
| 0603          | 1608             | IC0603A681R-10 | 680          | 15      | 25                    | 80                        | 1.7         | 35               |
| 0603          | 1608             | IC0603B181R-10 | 180          | 15      | 25                    | 165                       | 0.6         | 50               |
| 0603          | 1608             | IC0603B470R-10 | 47           | 10      | 50                    | 260                       | 0.3         | 200              |
| 0603          | 1608             | IC0603A821R-10 | 820          | 15      | 25                    | 85                        | 2.10        | 35               |
| 0603          | 1608             | IC0603B820R-10 | 82           | 10      | 50                    | 245                       | 0.3         | 200              |

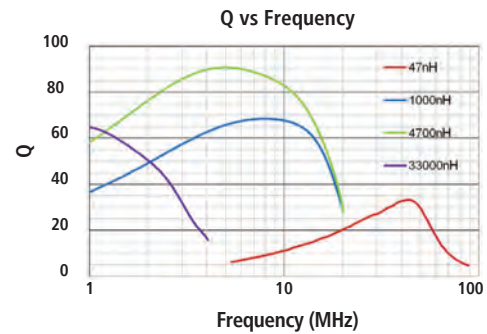
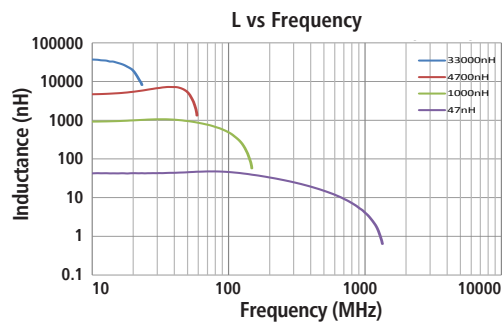
|      |      |                |        |    |     |     |      |     |
|------|------|----------------|--------|----|-----|-----|------|-----|
| 0805 | 2012 | IC0805A103R-10 | 10,000 | 45 | 2   | 24  | 1.15 | 15  |
| 0805 | 2012 | IC0805A153R-10 | 15,000 | 30 | 1   | 19  | 0.8  | 5   |
| 0805 | 2012 | IC0805A183R-10 | 18,000 | 30 | 1   | 18  | 0.9  | 5   |
| 0805 | 2012 | IC0805A223R-10 | 22,000 | 30 | 1   | 16  | 1.1  | 5   |
| 0805 | 2012 | IC0805A272R-10 | 2,700  | 45 | 10  | 45  | 0.75 | 30  |
| 0805 | 2012 | IC0805A333R-10 | 33,000 | 30 | 0.4 | 13  | 1.25 | 5   |
| 0805 | 2012 | IC0805A472R-10 | 4,700  | 45 | 10  | 35  | 1    | 30  |
| 0805 | 2012 | IC0805A681R-10 | 680    | 25 | 25  | 105 | 0.8  | 150 |
| 0805 | 2012 | IC0805A821R-10 | 820    | 25 | 25  | 100 | 1.00 | 150 |
| 0805 | 2012 | IC0805A822R-10 | 8,200  | 45 | 4   | 26  | 1.1  | 15  |
| 0805 | 2012 | IC0805B101R-10 | 100    | 20 | 25  | 235 | 0.3  | 250 |
| 0805 | 2012 | IC0805B102R-10 | 1,000  | 45 | 10  | 75  | 0.4  | 50  |
| 0805 | 2012 | IC0805B122R-10 | 1200   | 45 | 10  | 65  | 0.50 | 250 |
| 0805 | 2012 | IC0805B182R-10 | 1,800  | 45 | 10  | 55  | 0.6  | 50  |
| 0805 | 2012 | IC0805B222R-10 | 2,200  | 45 | 10  | 50  | 0.65 | 30  |
| 0805 | 2012 | IC0805B331R-10 | 330    | 20 | 25  | 145 | 0.55 | 250 |
| 0805 | 2012 | IC0805B332R-10 | 3300   | 45 | 10  | 41  | 0.80 | 200 |
| 0805 | 2012 | IC0805C470R-10 | 47     | 15 | 50  | 320 | 0.2  | 300 |
| 0805 | 2012 | IC0805C680R-10 | 68     | 15 | 50  | 280 | 0.2  | 300 |

|      |      |                |        |    |     |     |      |     |
|------|------|----------------|--------|----|-----|-----|------|-----|
| 1206 | 3216 | IC1206A103R-10 | 10,000 | 50 | 2   | 24  | 1    | 25  |
| 1206 | 3216 | IC1206A332R-10 | 3,330  | 45 | 10  | 41  | 0.7  | 50  |
| 1206 | 3216 | IC1206A333R-10 | 33,000 | 35 | 0.4 | 13  | 1.05 | 5   |
| 1206 | 3216 | IC1206A472R-10 | 4,700  | 45 | 10  | 35  | 0.9  | 50  |
| 1206 | 3216 | IC1206B153R-10 | 15,000 | 35 | 1   | 19  | 0.7  | 5   |
| 1206 | 3216 | IC1206B183R-10 | 18,000 | 35 | 1   | 21  | 0.7  | 5   |
| 1206 | 3216 | IC1206B331R-10 | 330    | 20 | 25  | 145 | 0.5  | 250 |
| 1206 | 3216 | IC1206B821R-10 | 820    | 25 | 25  | 100 | 0.9  | 150 |

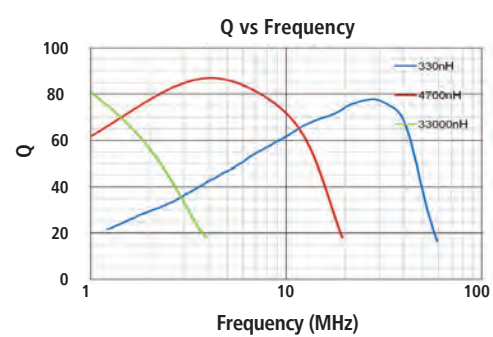
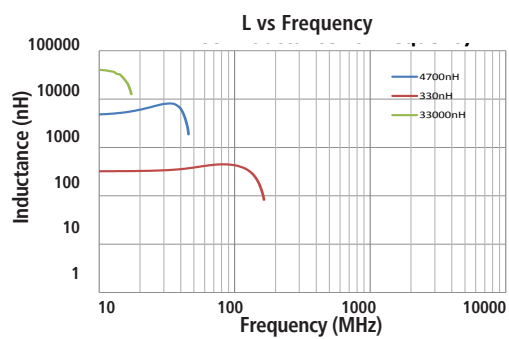
### 0603 Characteristics



### 0805 Characteristics



### 1206 Characteristics





## FEATURES



- Small size (L x W : EIA 0805, 0806 and 1008) with max 1.0 mm in thickness
- Lead-free product and support lead-free soldering
- Applications: mainly for DC-DC converters and power modules. Compact electrical instruments like DSCs, DVCs, PDA, DVD and HDDs, cellular phones
- Operation temperature: -55°C ~ +125°C
- Rated Current Definition: Temperature rise to 40°C max.

## PART NUMBERING SYSTEM

| CPI                 | 0805          | J                  | R47                   | R            | -1□                    |
|---------------------|---------------|--------------------|-----------------------|--------------|------------------------|
| Product Series Code | EIA Size Code | Rated Current Code | Inductance Value Code | Packing Code | Additional Description |

### RATED CURRENT CODE

E = 500 mA F = 600 mA  
G = 700 mA H = 800 mA  
I = 900 mA J = 1000 mA ≤ IDC < 1500 mA  
K = 1500 mA ≤ IDC < 2000 mA

### INDUCTANCE VALUE CODE

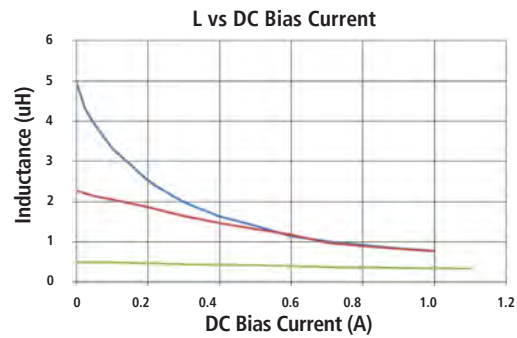
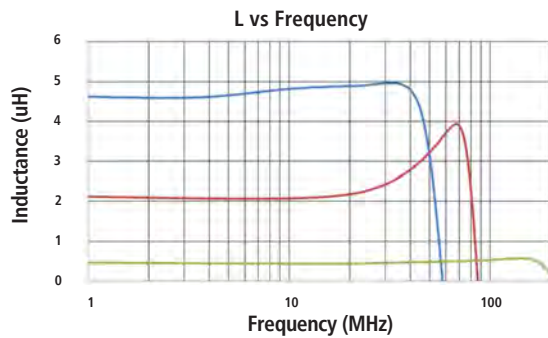
R47 = 0.47 μH 1R0 = 1.0 μH  
4R7 = 4.7 μH

| EIA PKG. SIZE | METRIC PKG. SIZE | PART NUMBER     | INDUCTANCE (μH) | INDUCTANCE TOLERANCE | TEST FREQ. (MHz) | DCR (Ω)  | RATED CURRENT MAX (mA) |
|---------------|------------------|-----------------|-----------------|----------------------|------------------|----------|------------------------|
| 0805          | 2012             | CPI0805JR47R-10 | 0.47            | 20%                  | 1                | 0.10±25% | 1100                   |
| 0805          | 2012             | CPI0805JR68R-10 | 0.68            | 20%                  | 1                | 0.12±25% | 1000                   |
| 0805          | 2012             | CPI0805JR82R-10 | 0.82            | 20%                  | 1                | 0.14±25% | 900                    |
| 0805          | 2012             | CPI0805H1R0R-10 | 1.0             | 20%                  | 1                | 0.16±25% | 800                    |
| 0805          | 2012             | CPI0805H1R2R-10 | 1.2             | 20%                  | 1                | 0.16±25% | 800                    |
| 0805          | 2012             | CPI0805G1R5R-10 | 1.5             | 20%                  | 1                | 0.22±25% | 700                    |
| 0805          | 2012             | CPI0805G1R8R-10 | 1.8             | 20%                  | 1                | 0.22±25% | 700                    |
| 0805          | 2012             | CPI0805F2R2R-10 | 2.2             | 20%                  | 1                | 0.25±25% | 600                    |
| 0805          | 2012             | CPI0805E3R3R-10 | 3.3             | 20%                  | 1                | 0.22±25% | 500                    |
| 0805          | 2012             | CPI0805E4R7R-10 | 4.7             | 20%                  | 1                | 0.30±25% | 500                    |
| 0806          | 2016             | CPI0806KR47R-10 | 0.47            | 20%                  | 1                | 0.14±30% | 1500                   |
| 0806          | 2016             | CPI0806KR68R-10 | 0.68            | 20%                  | 1                | 0.15±30% | 1500                   |
| 0806          | 2016             | CPI0806KR82R-10 | 0.82            | 20%                  | 1                | 0.16±30% | 1500                   |
| 0806          | 2016             | CPI0806J1R0R-10 | 1.0             | 20%                  | 1                | 0.16±30% | 1400                   |
| 0806          | 2016             | CPI0806J1R2R-10 | 1.2             | 20%                  | 1                | 0.16±30% | 1400                   |
| 0806          | 2016             | CPI0806J1R5R-10 | 1.5             | 20%                  | 1                | 0.20±30% | 1200                   |
| 0806          | 2016             | CPI0806J1R8R-10 | 1.8             | 20%                  | 1                | 0.20±30% | 1200                   |
| 0806          | 2016             | CPI0806J2R2R-10 | 2.2             | 20%                  | 1                | 0.22±30% | 1200                   |
| 0806          | 2016             | CPI0806J3R3R-10 | 3.3             | 20%                  | 1                | 0.24±30% | 1100                   |
| 0806          | 2016             | CPI0806J4R7R-10 | 4.7             | 20%                  | 1                | 0.30±30% | 1100                   |
| 1008          | 2520             | CPI1008KR47R-10 | 0.47            | 20%                  | 1                | 0.07±25% | 1800                   |
| 1008          | 2520             | CPI1008KR68R-10 | 0.68            | 20%                  | 1                | 0.09±25% | 1700                   |
| 1008          | 2520             | CPI1008KR82R-10 | 0.82            | 20%                  | 1                | 0.10±25% | 1700                   |
| 1008          | 2520             | CPI1008K1R0R-10 | 1.0             | 20%                  | 1                | 0.11±25% | 1600                   |
| 1008          | 2520             | CPI1008K1R2R-10 | 1.2             | 20%                  | 1                | 0.11±25% | 1600                   |
| 1008          | 2520             | CPI1008K1R5R-10 | 1.5             | 20%                  | 1                | 0.13±25% | 1500                   |
| 1008          | 2520             | CPI1008K1R8R-10 | 1.8             | 20%                  | 1                | 0.13±25% | 1500                   |
| 1008          | 2520             | CPI1008J2R2R-10 | 2.2             | 20%                  | 1                | 0.17±25% | 1300                   |
| 1008          | 2520             | CPI1008J3R3R-10 | 3.3             | 20%                  | 1                | 0.16±25% | 1200                   |
| 1008          | 2520             | CPI1008J4R7R-10 | 4.7             | 20%                  | 1                | 0.20±25% | 1100                   |

## DIMENSION

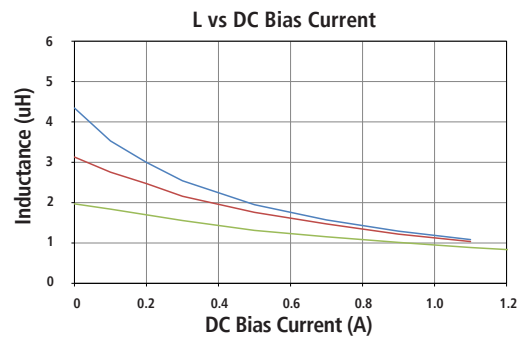
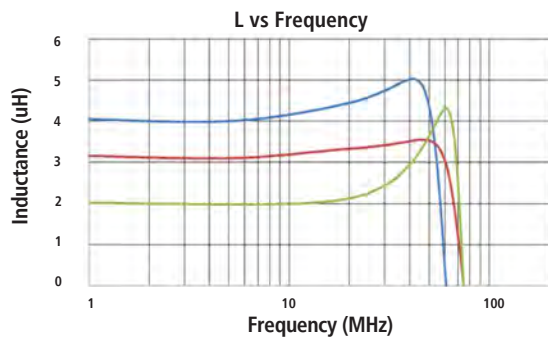
| METRIC ( EIA ) PKG. SIZE | A mm (INCHES)              | B mm (INCHES)              | C* mm (INCHES)            | D mm (INCHES)             | MONOLITHIC POWER CHIP INDUCTOR |
|--------------------------|----------------------------|----------------------------|---------------------------|---------------------------|--------------------------------|
| 2012 (0805)              | 2.00±0.20<br>(0.079±0.008) | 1.25±0.20<br>(0.049±0.008) | 0.9±0.10<br>(0.035±0.004) | 0.5±0.20<br>(0.02±0.008)  |                                |
| 2016 (0806)              | 2.00±0.15<br>(0.079±0.006) | 1.60±0.15<br>(0.063±0.006) | 0.9±0.10<br>(0.035±0.004) | 0.5±0.20<br>(0.02±0.008)  |                                |
| 2520 (1008)              | 2.50±0.20<br>(0.098±0.008) | 2.00±0.20<br>(0.079±0.008) | 0.9±0.10<br>(0.035±0.004) | 0.6±0.20<br>(0.024±0.008) |                                |

### 0805 Characteristics



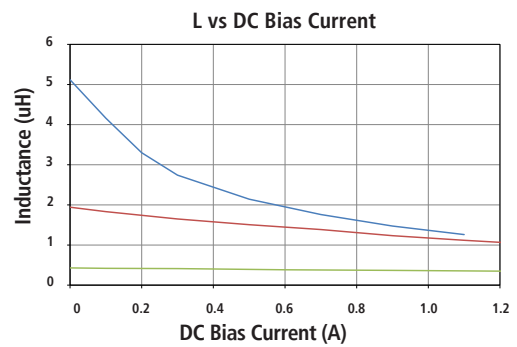
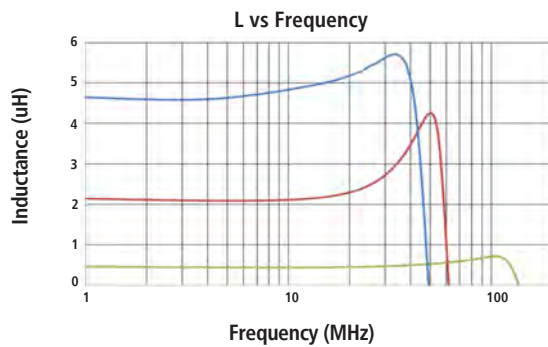
— CPI0805E4R7R-10  
— CPI0805F2R2R-10  
— CPI0805JR47R-10

### 0806 Characteristics



— CPI0806J4R7R-10  
— CPI0806J3R3R-10  
— CPI0806J2R2R-10

### 1008 Characteristics



— CPI1008J4R7R-10  
— CPI1008J2R2R-10  
— CPI1008KR47R-10



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