

AEM's High Reliability Ferrite Chip Beads

Benefits

- Sole source and first ever Defense Supply Center Columbus (DSCC) approved ferrite chip bead (tested to Drawing 03024)
- Made in USA
- Sn/Pb terminations (5%+ Pb, no tin whisker worries)
- Designed and qualified as Hi-Rel
- Complete material and process traceability
- Meets all high reliability demands

Features

- Operating temperature range of -55°C to +125°C
- Tin whisker free (Sn/Pb or Au termination finish)
- Reliable terminations (Ni barrier)
- Groups A/B data are supplied with each shipment. Group C inspection is optional.
- Monolithic structure for closed magnetic path and high reliability
- Standard EIA/EIAJ chip sizes (0603, 0805, 1206)

Applications

- Mission critical
- Where replacement is not an option
- Where pure tin terminations are prohibited
- Down-hole and undersea

As the first and only DLA-approved ferrite chip bead designed for high reliability use, the HRB Series ferrite chip beads from AEM, Inc. are manufactured in a AS9100 facility in San Diego, CA, providing complete material and process traceability. All components are manufactured with qualified materials and process systems and tested to DSCC drawing 03024.

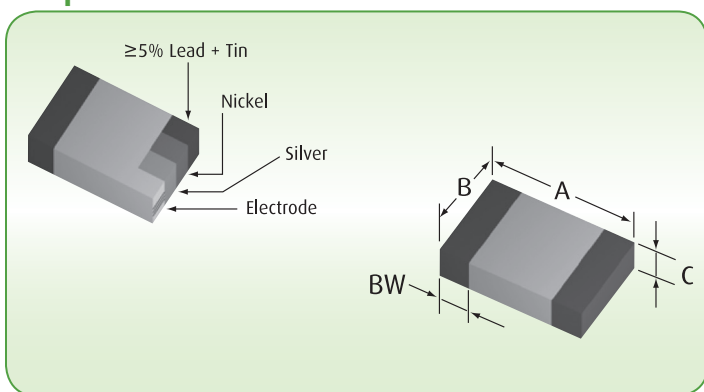
The HRB Series beads are designed with mission critical applications in mind. Capable of operating in harsh environments and extreme temperatures, these Hi-Rel chips are free of tin whiskers with Sn/Pb or Au terminations. A variety of EIA/EIAJ chip sizes are offered and feature nickel barrier terminations with a solder plate finish to help ensure a reliable solder joint.

AEM's High Reliability Ferrite Chip Beads

	AEM Part No.	DSCC Part No.	Impedance Ω	Max. Ω RDC	Max. Amps
0603	HRB0603S300P.500 . .	03024-001P	30	0.15	0.50
	HRB0603S600P.500 . .	03024-002P	60	0.15	0.50
	HRB0603S101P.400 . .	03024-003P	100	0.20	0.40
	HRB0603S151P.400 . .	03024-004P	150	0.25	0.40
	HRB0603S181P.400 . .	03024-005P	180	0.25	0.40
	HRB0603S301P.200 . .	03024-006P	300	0.30	0.20
	HRB0603S401P.200 . .	03024-007P	400	0.35	0.20
	HRB0603S601P.200 . .	03024-008P	600	0.40	0.20
	HRB0603S102P.200 . .	03024-009P	1000	0.60	0.20
0805	HRB0805S300P4.00 . .	03024-010P	30	0.02	4.00
	HRB0805S500P2.00 . .	03024-011P	50	0.08	2.00
	HRB0805S600P1.50 . .	03024-012P	60	0.15	1.50
	HRB0805S700P1.50 . .	03024-013P	70	0.15	1.50
	HRB0805S101P1.00 . .	03024-014P	100	0.20	1.00
	HRB0805S121P1.00 . .	03024-015P	120	0.20	1.00
	HRB0805S151P1.00 . .	03024-016P	150	0.20	1.00
	HRB0805S221P1.00 . .	03024-017P	220	0.20	1.00
	HRB0805S331P1.00 . .	03024-018P	330	0.25	1.00
	HRB0805S471P1.00 . .	03024-019P	470	0.25	1.00
	HRB0805S601P1.00 . .	03024-020P	600	0.30	1.00
	HRB0805S102P1.00 . .	03024-021P	1000	0.40	1.00
1206	HRB1206S300P4.00 . .	03024-022P	30	0.01	4.00
	HRB1206S500P3.00 . .	03024-023P	50	0.03	3.00
	HRB1206S800P1.50 . .	03024-024P	80	0.10	1.50
	HRB1206S121P1.50 . .	03024-025P	120	0.10	1.50
	HRB1206S251P1.50 . .	03024-026P	250	0.10	1.50
	HRB1206S501P1.00 . .	03024-027P	500	0.20	1.00
	HRB1206S601P1.00 . .	03024-028P	600	0.30	1.00

Other Sizes and Values may be added by request

Shape and Dimensions



Product Identification

HRB **0805** **S** **300** **P** **4.00** **F** **T** **(EM)**
(1) **(2)** **(3)** **(4)** **(5)** **(6)** **(7)** **(8)** **(9)**

- Series code: High Reliability Ferrite Chip Bead
- Chip size, EIA/EIAJ dimensions A x B
First 2 digits: A ("length") Last 2 digits: B ("width")
- Speed code: S = Standard
- Value code: Impedance (Ohms at 100 MHz)
The first two digits are significant. The last digit specifies zeros to follow 300 = 30 Ohms
- Tolerance code: J = $\pm 5\%$; K = $\pm 10\%$; M = $\pm 20\%$; P = $\pm 25\%$
- Current value in Ampere (4.00 = 4A; 150 = 0.15A)
- Termination code: F = Sn/Pb solder plate; G = Au plate
- Package Code: T = Tape & Reel; B = Bulk
- Engineering Model (if applicable); no (EM) = Flight Model

Chip Size EIA / EIAJ	A Inch (mm)	B Inch (mm)	C Inch (mm)	TERMINATION (BW) Inch (mm)
0603/1608	0.063 \pm 0.006 (1.60 \pm 0.15)	0.031 \pm 0.006 (0.80 \pm 0.15)	0.031 \pm 0.006 (0.80 \pm 0.15)	0.014 \pm 0.006 (0.36 \pm 0.15)
0805/2012	0.079 \pm 0.008 (2.00 \pm 0.20)	0.049 \pm 0.008 (1.25 \pm 0.20)	0.035 \pm 0.008 (0.90 \pm 0.20)	0.020 \pm 0.010 (0.51 \pm 0.25)
1206/3216	0.126 \pm 0.008 (3.20 \pm 0.20)	0.063 \pm 0.008 (1.60 \pm 0.20)	0.043 \pm 0.008 (1.10 \pm 0.20)	0.020 \pm 0.010 (0.51 \pm 0.25)



January 2013



AEM's HRB-US Product Overview

- Increases effective offering of HRB/DSCC part types to include Hi-Rel equivalents of most commercially available chip beads
- AEM facility uniquely qualified to perform needed processes
- Finished products up-screened to DSCC 03024 specifications
- For use in applications where failure is not an option
- Components provided as AEM warranted and supported products

Processes

- Commercial-grade components procured through OEM-approved distribution channels to ensure counterfeit prevention is maintained and pre-screened to AEM 387070 standard
- Component leads converted from RoHS to Sn/Pb utilizing AEM's proprietary plating process
- Components are completely screened per DSCC 03024 – Group A, B and C
- Up-screened flight components are tape & reel packaged with lot screening data (engineering model versions available upon request)

AEM, Inc. offers a unique service to up-screen high-quality, commercially available ferrite chip to meet high-reliability DSCC 03024 qualifications. This process provides a cost-effective means of producing an expanded inventory of DSCC part types for applications where failure is simply not an option.

AEM combines its unique testing and processing expertise to achieve this result. First, AEM's proprietary, aerospace-qualified plating and fusion process is used to convert the pre-screened commercial-grade parts, manufactured to be RoHS-compliant, to tin-lead (Sn/Pb) terminations and homogenizes the Sn/Pb terminal finish. The converted parts are then subjected to full DSCC 03024 Group A, B and C screening and repackaged in full reel with lot screening data.

HRB-US Series High-Reliability Ferrite Chip Beads

AEM is the first and only manufacturer of ferrite chip beads approved to the DSCC 03024 specification. In order to meet this demanding specification, AEM's ferrite beads are subjected to rigorous testing to assure compliance. While 03024 chip beads have been specifically design from the

ground up, AEM has determined that AEM sourced and tin/lead converted commercial components can approach 03024 series reliability through rigorous up-screening, utilizing the same lot acceptance testing performed on AEM's 03024 ferrite beads.

1

AEM procures OEM components through OEM-approved distribution channels. Only full reel quantities are obtained to maintain OEM Lot Number Date Code and Traceability.

2

AEM's proprietary, aerospace-qualified Sn/Pb plating and fusion process has been used to prevent tin-whiskers on surface-mount component terminations. Parts are screened prior to the Sn/Pb conversion (QA1), as well as following (QA2). Sampled parts are then subjected to destructive physical analysis (DPA) to verify internal microstructure integrity prior to DSCC screening.

3

Comprehensive DSCC screening involves three Groups as shown in the table below. AEM also conducts additional destructive physical analysis (DPA) sample evaluations on all HRB-US components.

4

HRB-US chip beads are then packaged in tape & reel with AEM lot number / AEM lot date code assigned to compliment OEM traceability information.

Group A Testing

Thermal Shock
DC Resistance
Impedance
Visual and Mechanical Examination
Material Verification Outgassing
Material Verification Terminations/Body

Group B Testing

Resistance to solvents
Solderability
Resistance to Soldering Heat
Termination Strength
Current Carrying Capacity

Group C Testing

Low Temperature Operation
Life (1000 Hours)
Thermal Vacuum
Bending
Vibration
Shock
Salt Spray
Moisture Resistance
Thermal Shock (100 Cycle)
Current Carrying Capacity (+25°C)
Insulation Resistance

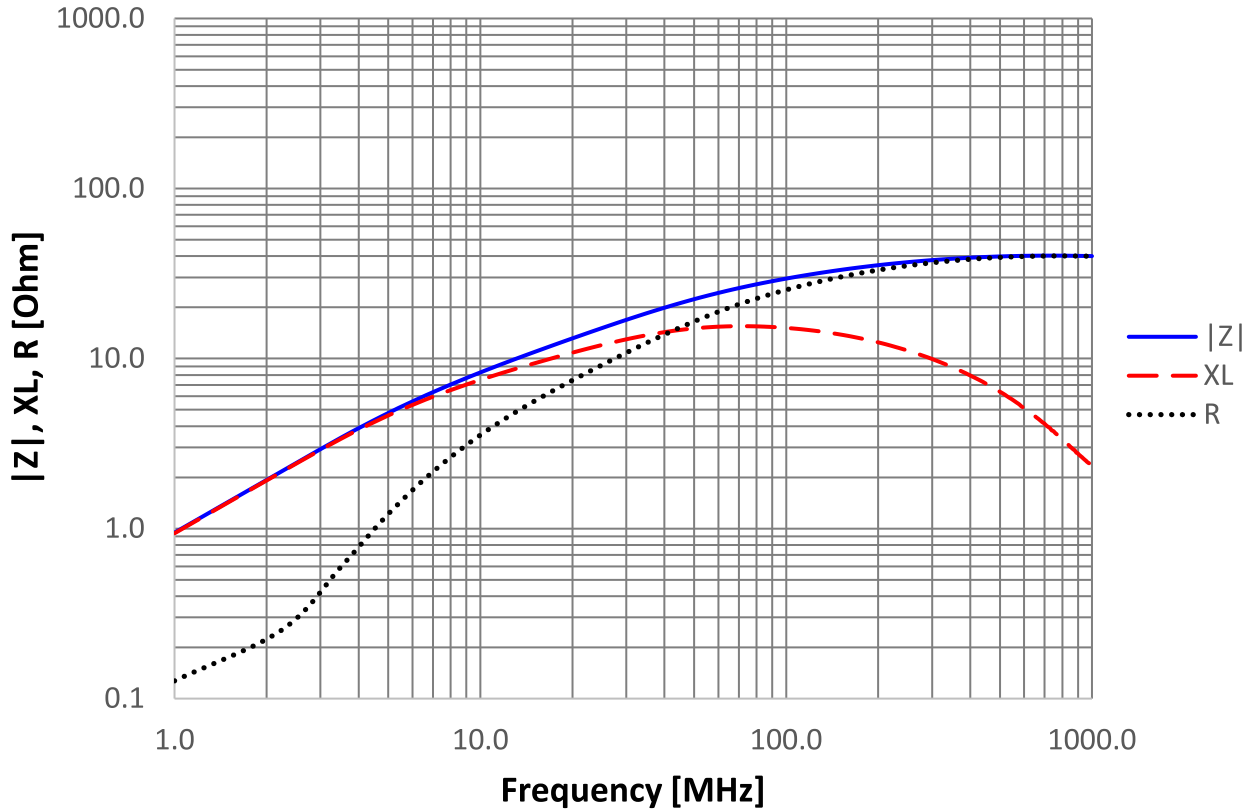


July 2016

AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

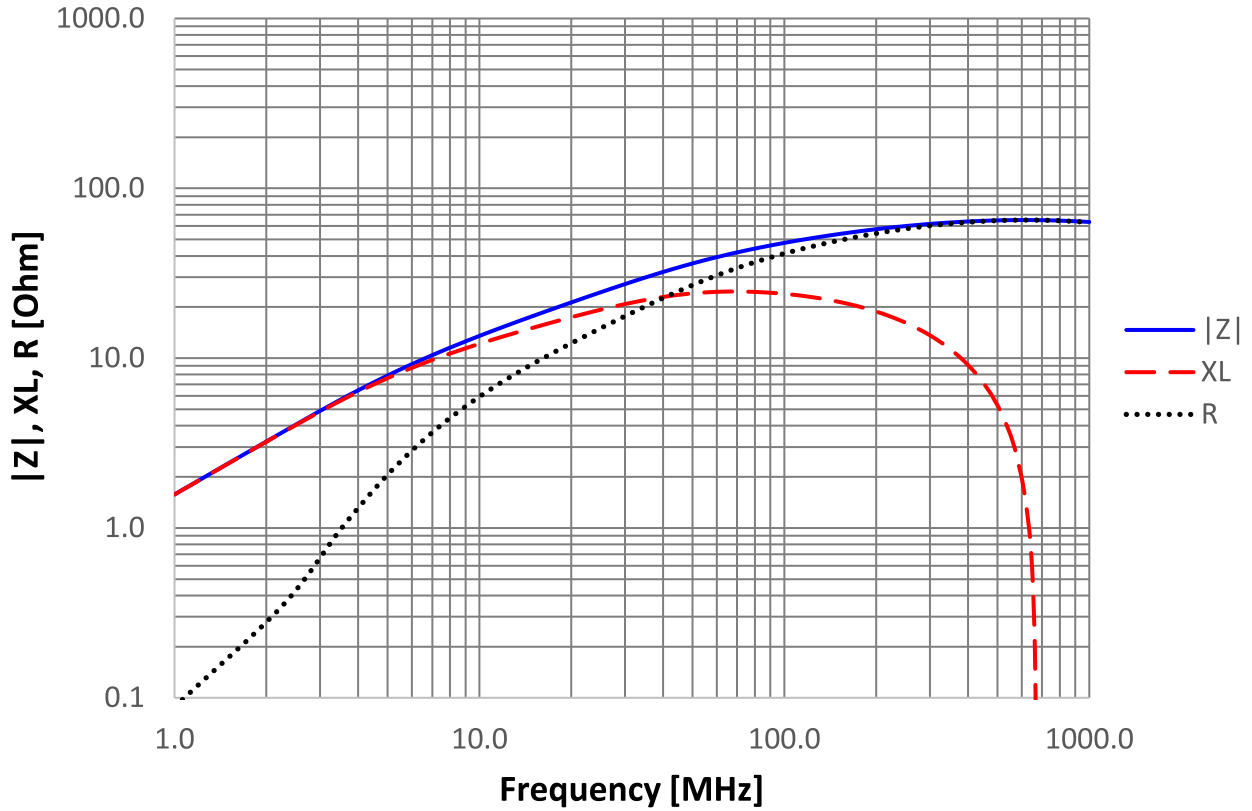
03024-022x / HRB1206S300x4.00x



AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

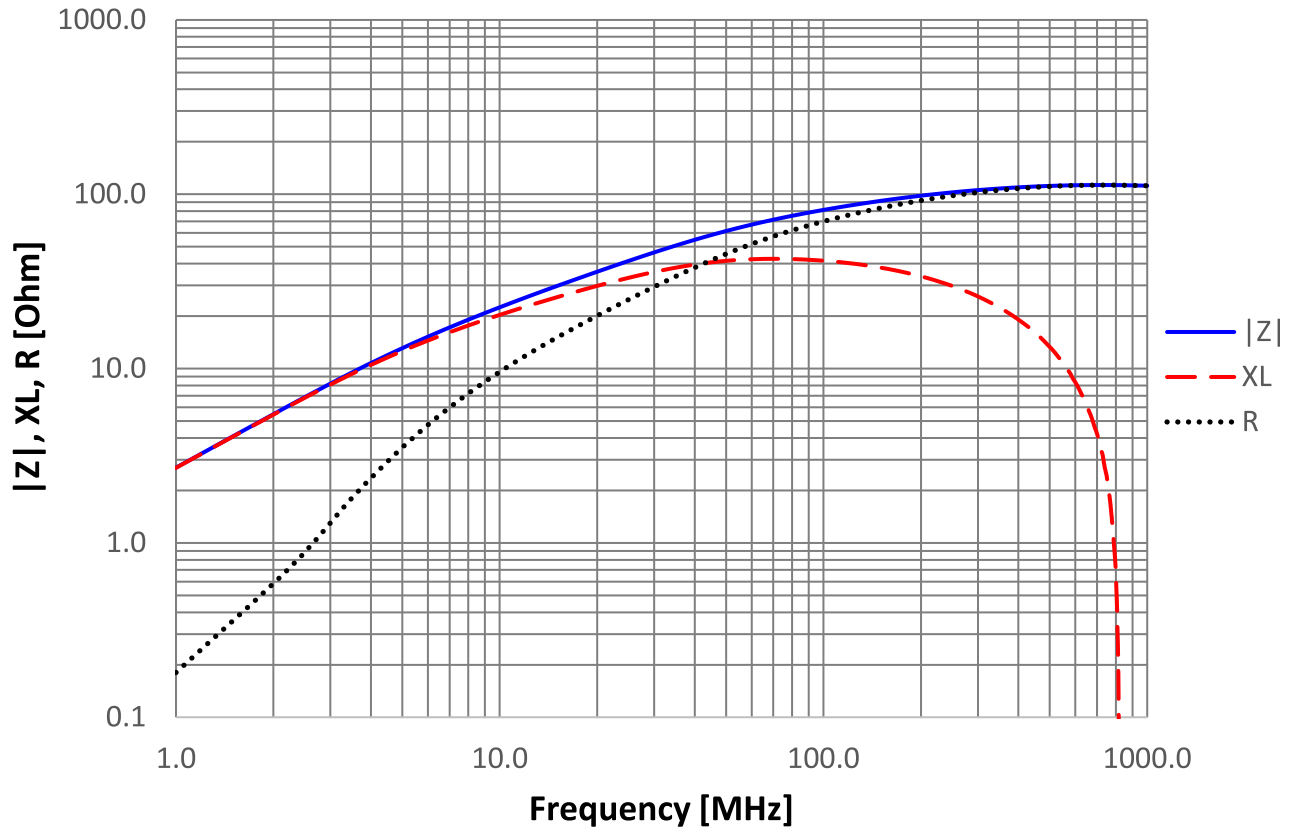
03024-023x / HRB1206S500x3.00x



AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

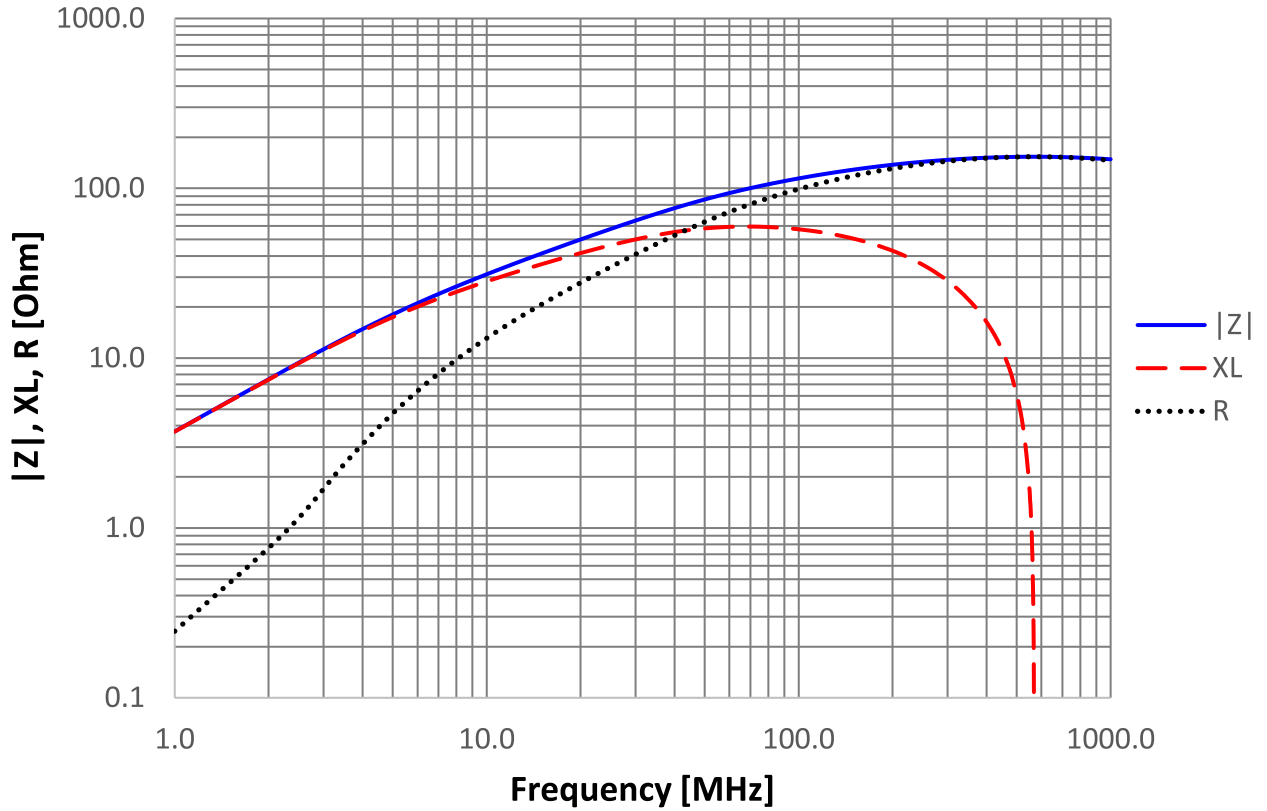
03024-024x / HRB1206S800x1.50x



AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

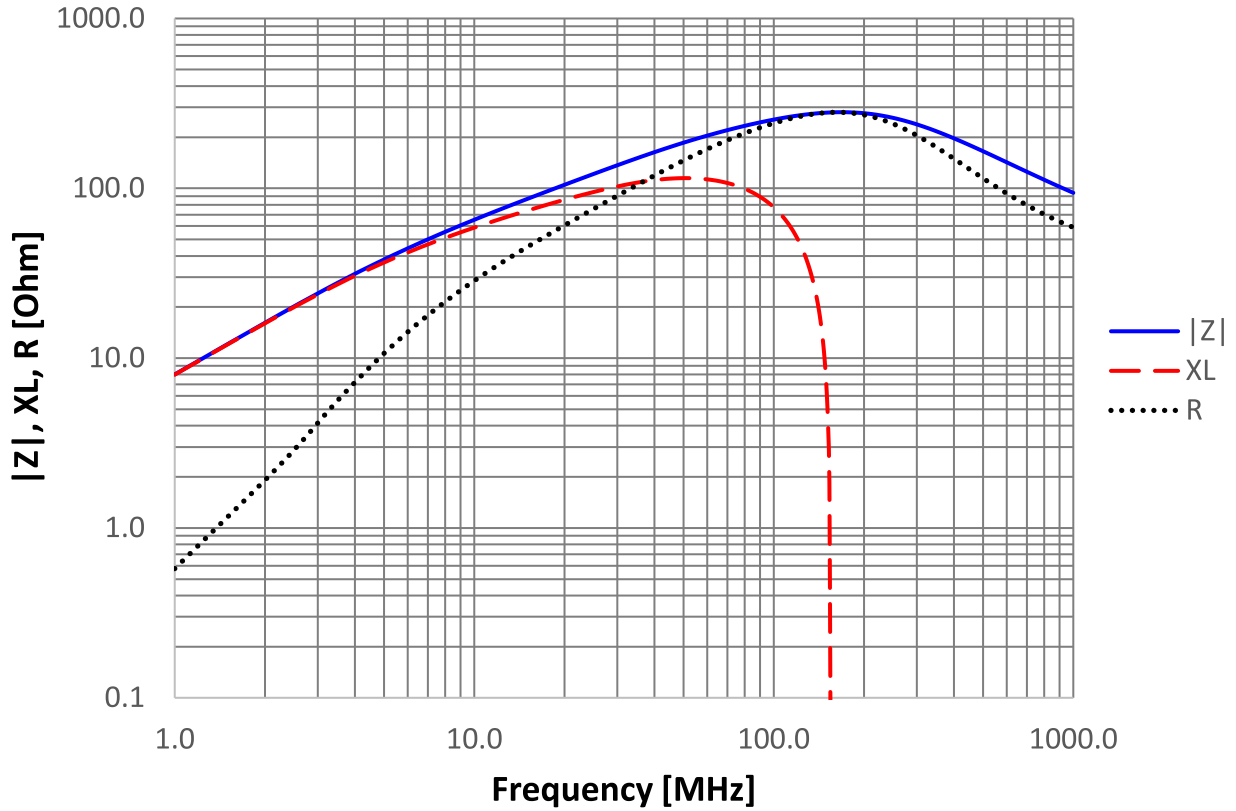
03024-025x / HRB1206S121x1.50x



AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

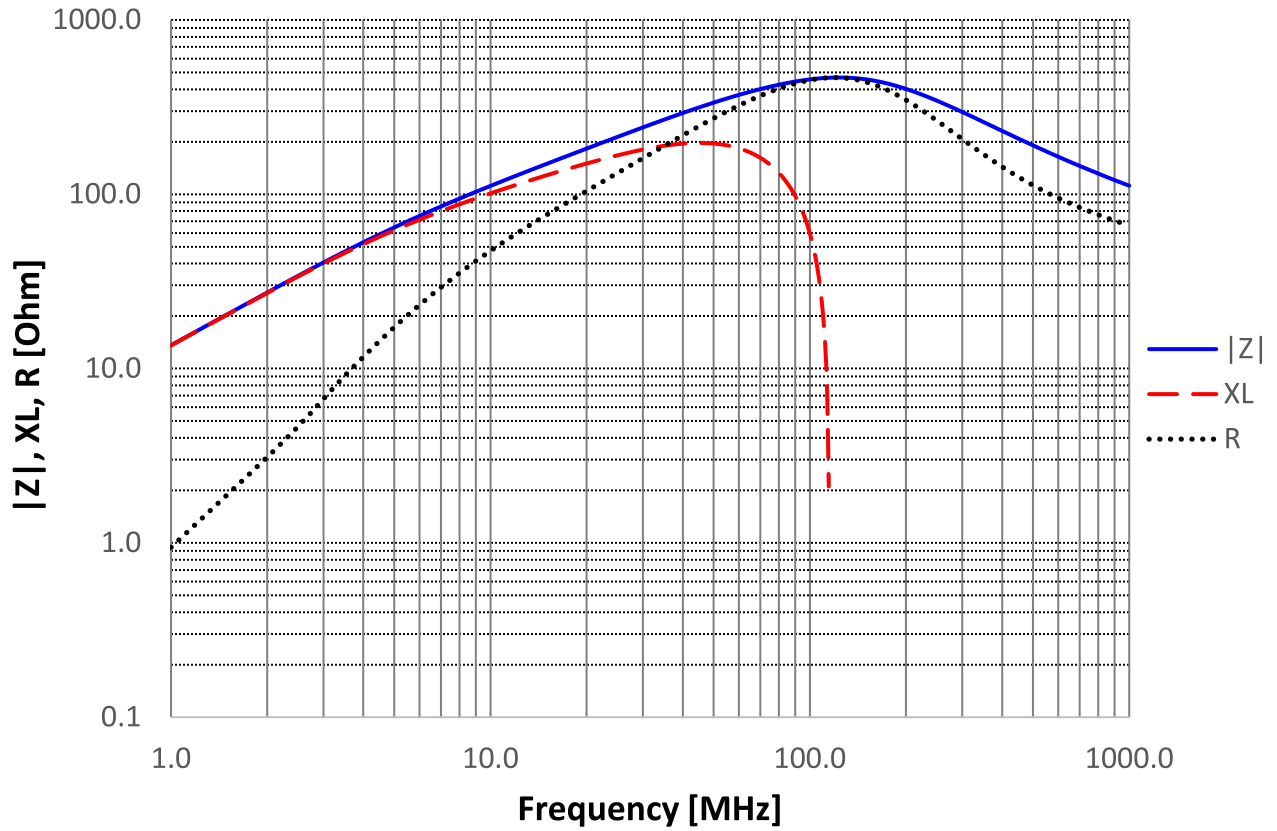
03024-026x / HRB1206S251x1.50x



AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

03024-027x / HRB1206S501x1.00x



AEM, Inc. High Reliability Ferrite Chip Beads

HRB 1206 Frequency Response Curves

03024-028x / HRB1206S601x1.00x

