

# Dual Mode SSHB Coils, 10HS Series, Wide Range Impedance Type

## Overview

The KEMET SSHB coils are dual mode chokes with a wide variety of characteristics. These hybrid coils combine the two functions of normal mode countermeasure and common mode noise suppression, with just one coil. Reducing the number of required products ensures cost savings and space efficiency. Our proprietary core materials provide optimized solutions for high-temperature requirements (standard type) or for high permeability needs (R type). In addition, the specially developed shape is efficient with normal noise suppression.

## Applications

- LED lighting
- Audio-visual equipment
- Office automation equipment
- Power supplies

## Benefits

- Proprietary 5HT and 10H ferrite materials and equivalents
- Optimization of magnetic circuit and material
- One coil to suppress both common and normal noise
- High impedance in wide frequency range due to divided bobbin
- High permeability for R type
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+130^{\circ}\text{C}$  for standard type
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+120^{\circ}\text{C}$  for R type
- Low leakage magnetic flux to outside
- Compact size and low height
- UL 94 V-0 flame retardant rated base and bobbin



## Part Number System

| SSHB   | 10             | HS-  | R   | 04  | 620   |
|--------|----------------|--|---|---|---|
| Series | Core Size Code | Core Orientation and Bobbin Type                         | Core Type                                 | Rated Current (A)   | Inductance (mH) Minimum   |
| SSHB   | 10             | HS = Horizontal, bobbin with sectional winding structure | Blank = Standard<br>R = High permeability | 0x = 0.x A<br>xx = x.x A<br><br>Examples:<br>03 = 0.3 A<br>13 = 1.3 A | xx0 = xx mH<br>xxx = xx.x mH<br>0xx = x.x mH<br><br>Examples:<br>620 = 62 mH<br>122 = 12.2 mH<br>071 = 7.1 mH |

## Magnetic Permeability of Ferrite Material

In order to achieve efficient noise reduction, it is important to select the material according to the target frequency band.

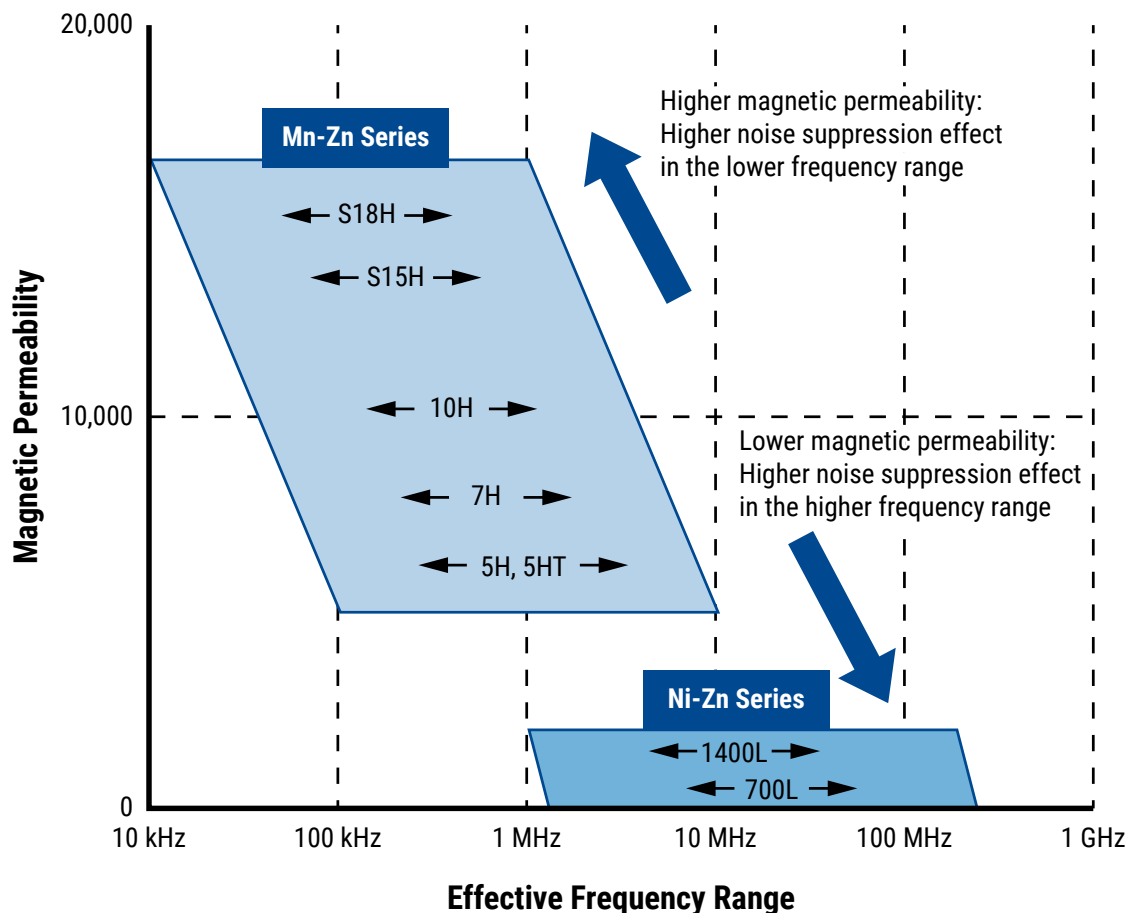
Depending on its magnetic permeability, a particular ferrite material will be effective in a certain frequency band. A schematic representation of the relationship between the magnetic permeability of each material and the corresponding effective band range is shown in Figure 1.

Materials with higher magnetic permeability are effective in the lower frequency range, while those with lower magnetic permeability are effective in the higher frequency range. Thus, Mn-Zn products are mainly used for reducing conduction noise, while Ni-Zn products are commonly used for radiation noise countermeasures.

The effective frequency range varies depending on core shape, size and number of windings. This frequency dependence of the magnetic permeability as shown in the figure serves for reference purposes only and it should be tested on the actual device to determine its effectiveness.

S18H, S15H, 10H, 7H, 5H, 5HT, 1400L and 700L are KEMET’s proprietary ferrite material names. Other materials can also be available on request.

Figure 1 - Relationship between the magnetic permeability of each material and its effective frequency range



## Core Structure



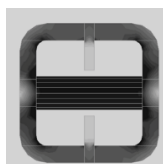
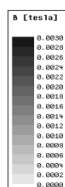
Conventional



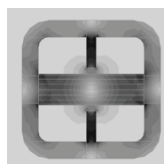
Original New Core Shape

This original shape structure allows for optimized composite characteristics of common mode and normal mode noise countermeasures.

### Magnetic Flux Density



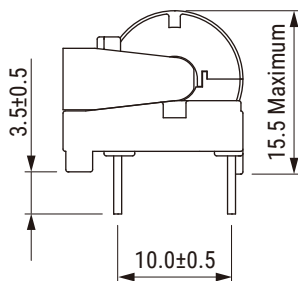
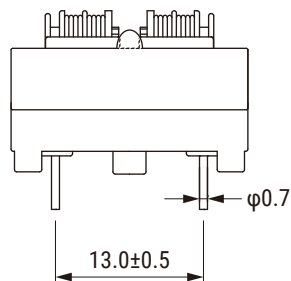
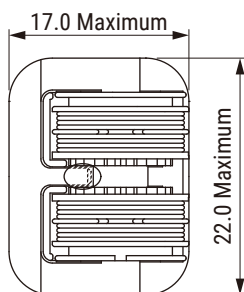
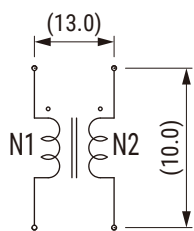
Common Mode



Normal Mode

- > Increased efficiency on normal mode inductance
- > Material solution for specific requirements
  - ✓ Standard type for high temperature needs
  - ✓ R type for high permeability needs
- > Low leakage magnetic flux to outside

## Dimensions – Millimeters



## Environmental Compliance

All KEMET AC Line Filters are RoHS Compliant.



## Performance Characteristics

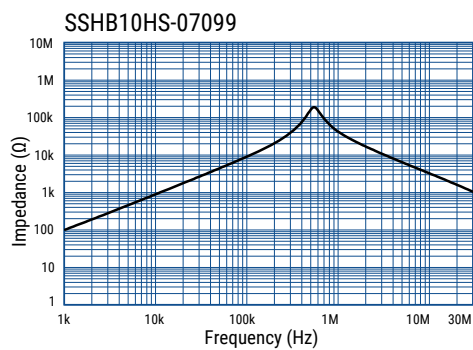
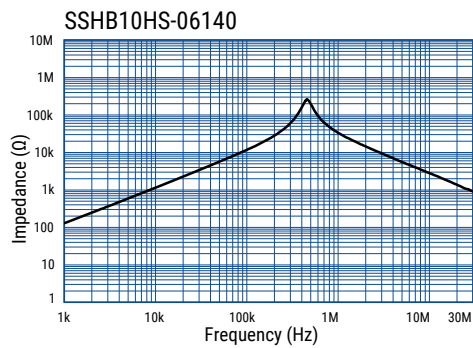
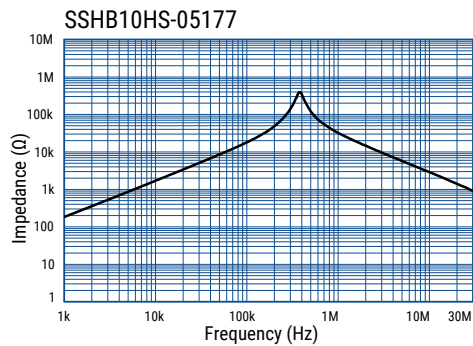
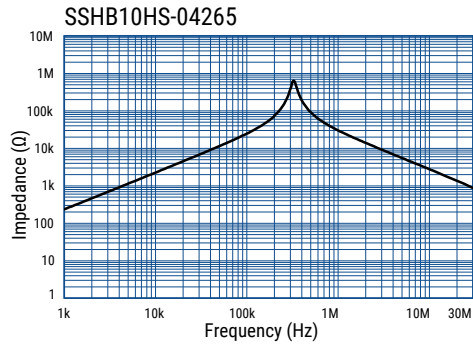
| Item                             | Performance Characteristics   |
|----------------------------------|---|
| Rated Voltage                    | 250 VAC<br>320 VAC (IEC60664 -1)  |
| Withstanding Voltage             | 2,400 VAC (2 seconds, between lines)  |
| Insulation Resistance            | > 100 MΩ at 500 VDC (between lines)   |
| Rated Current Range              | 0.4 – 3.0 A   |
| Rated Inductance Range           | 0.6 – 62.0 mH minimum   |
| Inductance Measurement Condition | 10 kHz  |
| Thermal Class                    | E (120°C) (R Type) and B (130°C)  |
| Operating Temperature Range      | -40°C to +120°C (include self temperature rise) (R Type) and<br>-40°C to +130°C (include self temperature rise) |

### Table 1 – Ratings & Part Number Reference

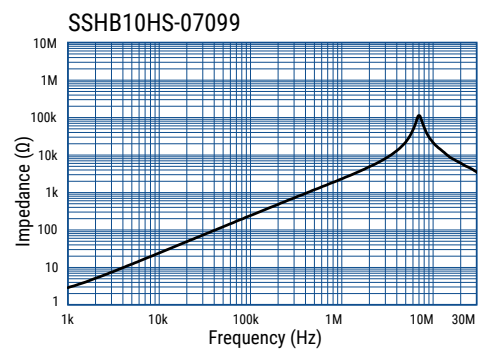
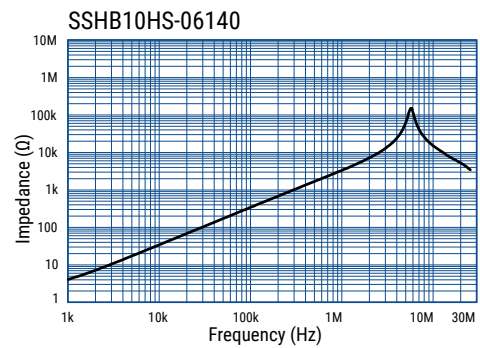
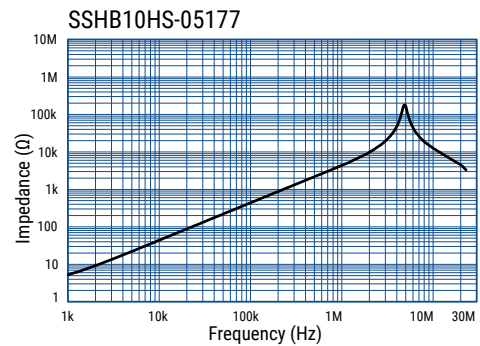
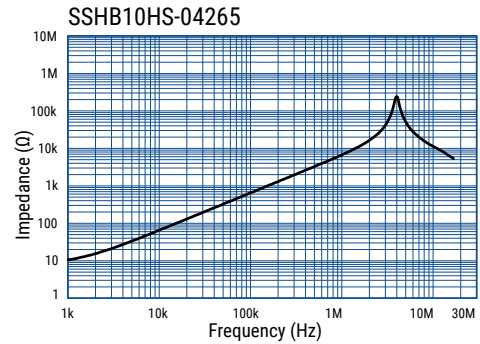
| Part Number     | Rated Current (A) | Inductance (Common) (mH) Minimum | Inductance (Normal) (μH) Typical | DC Resistance/ Line (Ω) Maximum | Temperature Rise (K) Maximum | Marking     | Weight (g) Approximate |
|-----------------|-------------------|----------------------------------|----------------------------------|---------------------------------|------------------------------|-------------|------------------------|
| SSHB10HS-04265  | 0.4               | 26.5                             | 949                              | 2.45                            | 50                           | 04 Lot No.  | 10                     |
| SSHB10HS-05177  | 0.5               | 17.7                             | 615                              | 1.55                            | 50                           | 05 Lot No.  | 10                     |
| SSHB10HS-06140  | 0.6               | 14.0                             | 484                              | 1.17                            | 50                           | 06 Lot No.  | 10                     |
| SSHB10HS-07099  | 0.7               | 9.9                              | 339                              | 0.81                            | 50                           | 07 Lot No.  | 10                     |
| SSHB10HS-08068  | 0.8               | 6.8                              | 231                              | 0.58                            | 50                           | 08 Lot No.  | 10                     |
| SSHB10HS-10051  | 1.0               | 5.1                              | 185                              | 0.43                            | 55                           | 10 Lot No.  | 10                     |
| SSHB10HS-11043  | 1.1               | 4.3                              | 135                              | 0.35                            | 50                           | 11 Lot No.  | 10                     |
| SSHB10HS-13030  | 1.3               | 3.0                              | 100                              | 0.25                            | 50                           | 13 Lot No.  | 10                     |
| SSHB10HS-17019  | 1.7               | 1.9                              | 64                               | 0.17                            | 50                           | 17 Lot No.  | 10                     |
| SSHB10HS-22011  | 2.2               | 1.1                              | 41                               | 0.11                            | 55                           | 22 Lot No.  | 10                     |
| SSHB10HS-30006  | 3.0               | 0.6                              | 23                               | 0.06                            | 60                           | 30 Lot No.  | 10                     |
| SSHB10HS-R04620 | 0.4               | 62.0                             | 949                              | 2.45                            | 50                           | R04 Lot No. | 10                     |
| SSHB10HS-R05415 | 0.5               | 41.5                             | 615                              | 1.55                            | 50                           | R05 Lot No. | 10                     |
| SSHB10HS-R06330 | 0.6               | 33.0                             | 484                              | 1.17                            | 50                           | R06 Lot No. | 10                     |
| SSHB10HS-R07230 | 0.7               | 23.0                             | 339                              | 0.81                            | 50                           | R07 Lot No. | 10                     |
| SSHB10HS-R08160 | 0.8               | 16.0                             | 231                              | 0.58                            | 50                           | R08 Lot No. | 10                     |
| SSHB10HS-R10122 | 1.0               | 12.2                             | 185                              | 0.43                            | 55                           | R10 Lot No. | 10                     |
| SSHB10HS-R11100 | 1.1               | 10.0                             | 135                              | 0.35                            | 50                           | R11 Lot No. | 10                     |
| SSHB10HS-R13071 | 1.3               | 7.1                              | 100                              | 0.25                            | 50                           | R13 Lot No. | 10                     |
| SSHB10HS-R17046 | 1.7               | 4.6                              | 64                               | 0.17                            | 50                           | R17 Lot No. | 10                     |
| SSHB10HS-R22027 | 2.2               | 2.7                              | 41                               | 0.11                            | 55                           | R22 Lot No. | 10                     |
| SSHB10HS-R30015 | 3.0               | 1.5                              | 23                               | 0.06                            | 60                           | R30 Lot No. | 10                     |

## Frequency Characteristics

### Common mode

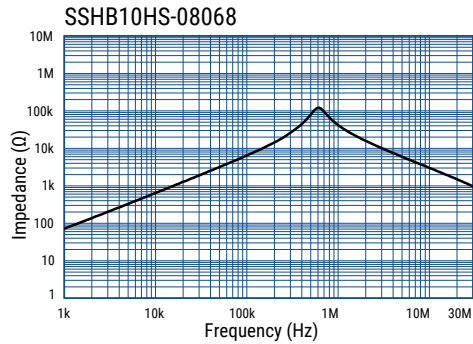


### Normal mode

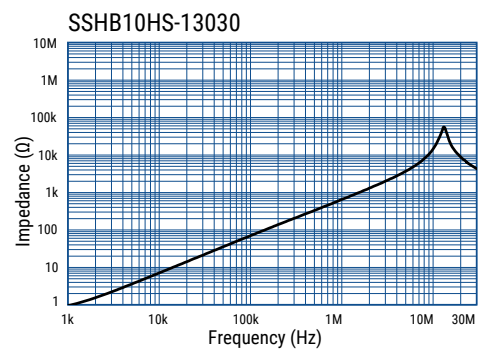
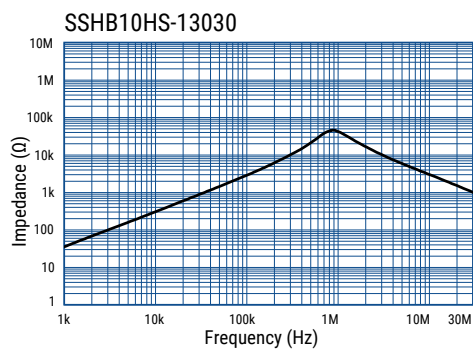
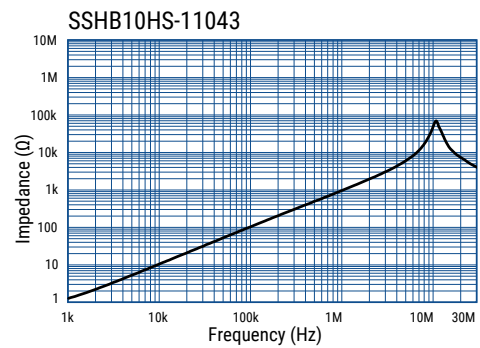
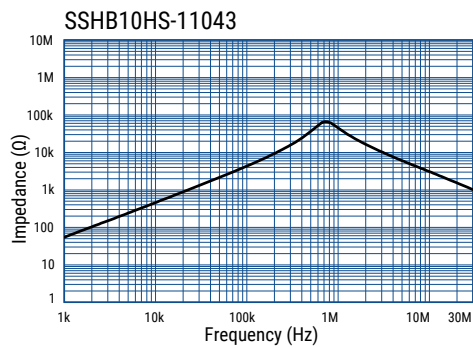
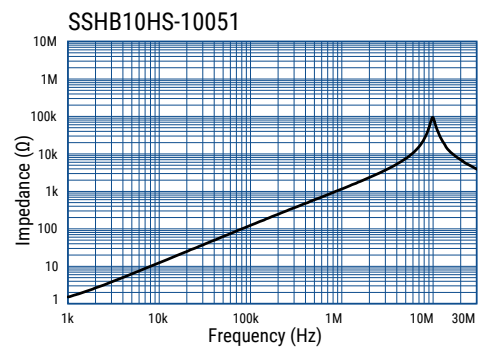
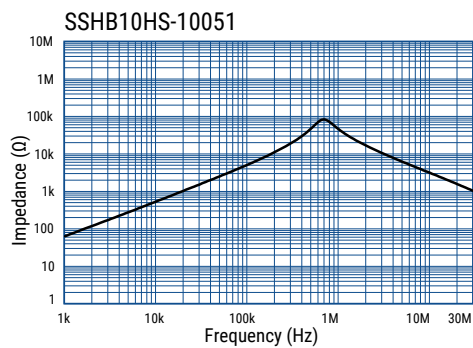
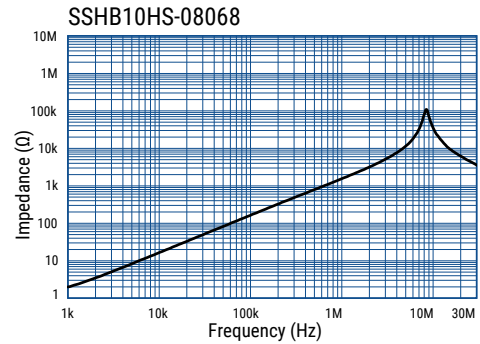


## Frequency Characteristics cont.

### Common mode

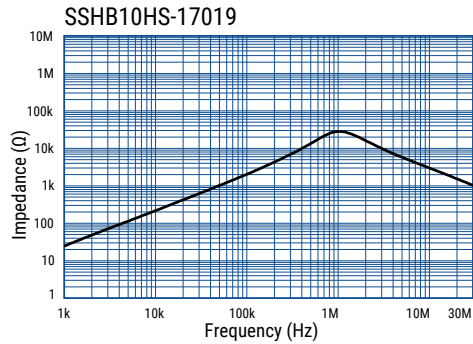


### Normal mode

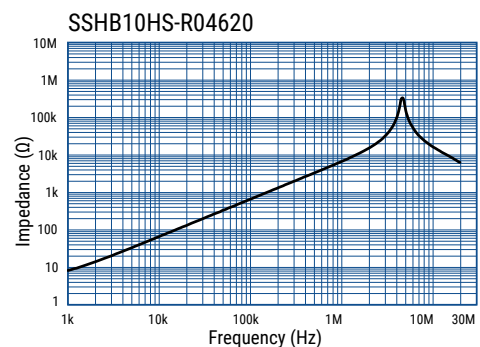
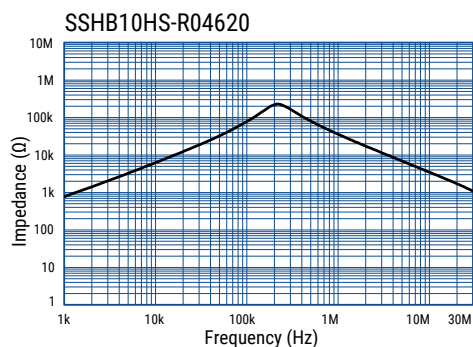
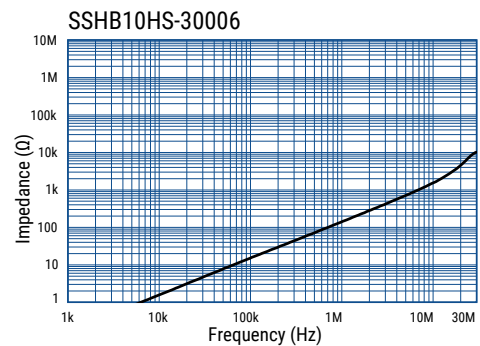
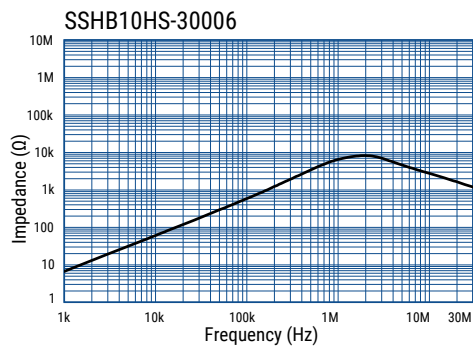
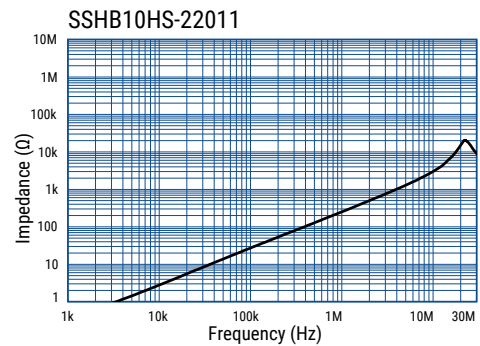
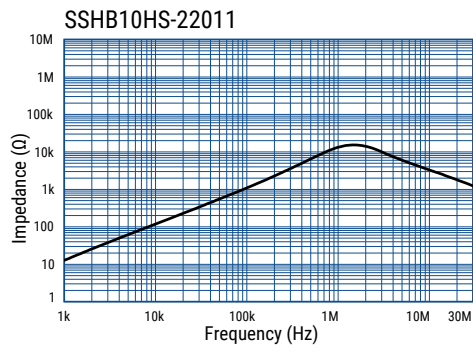
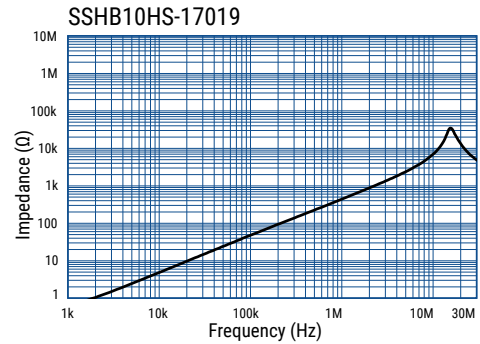


## Frequency Characteristics cont.

### Common mode

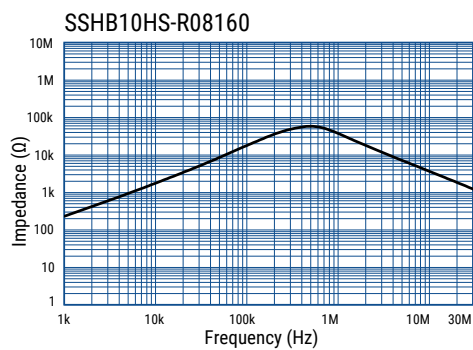
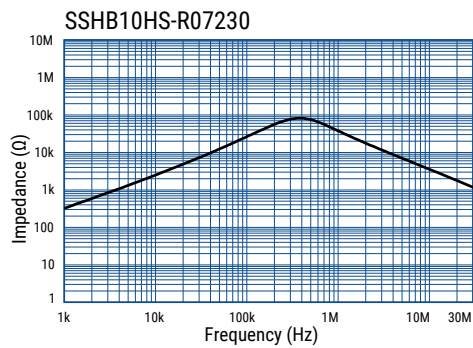
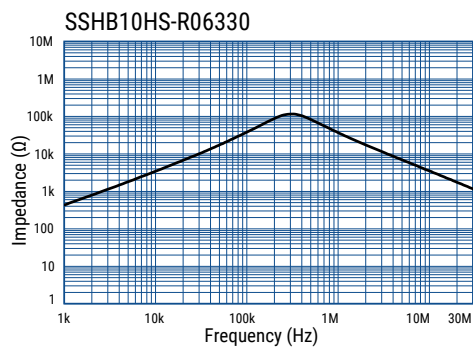
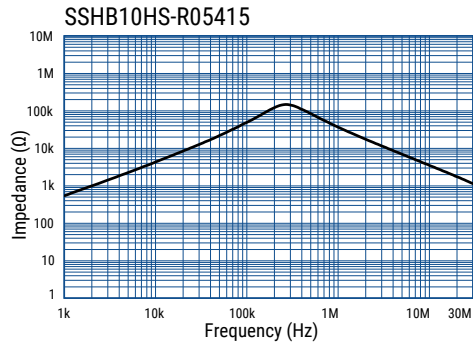


### Normal mode

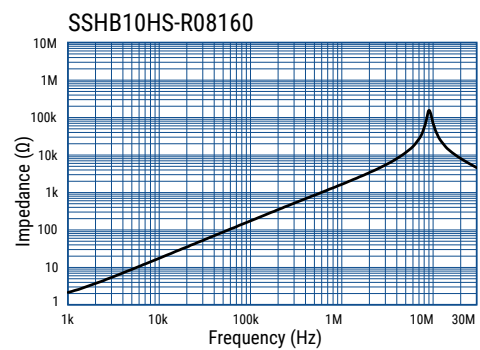
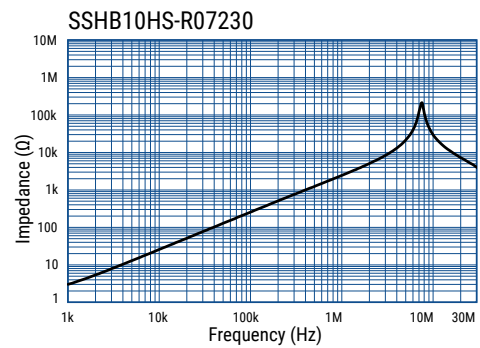
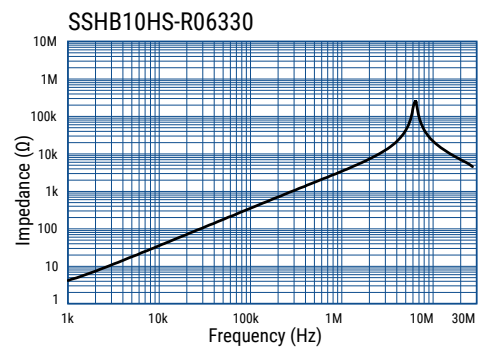
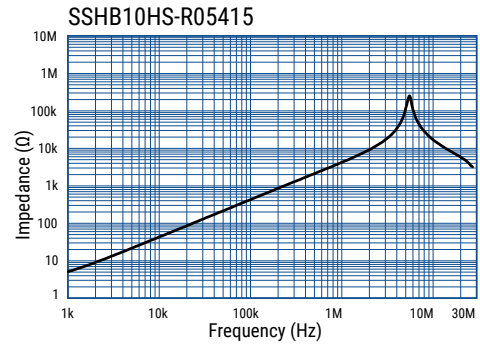


## Frequency Characteristics cont.

### Common mode



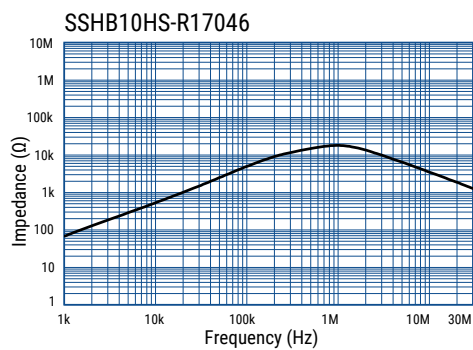
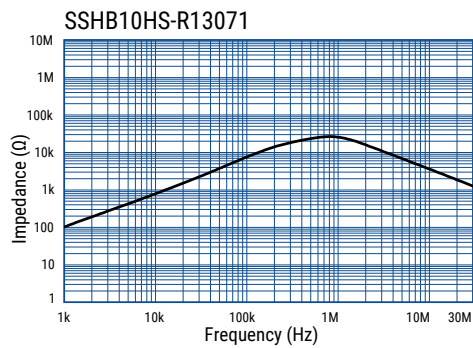
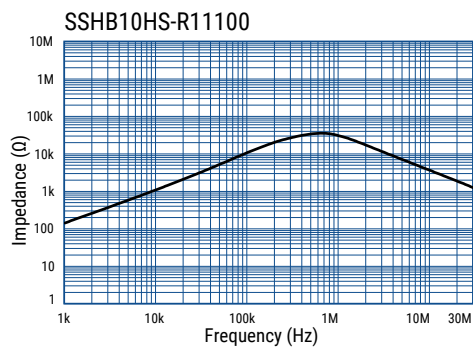
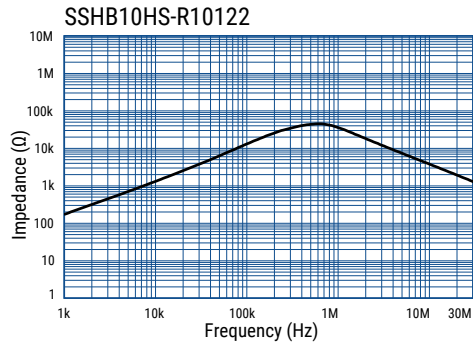
### Normal mode



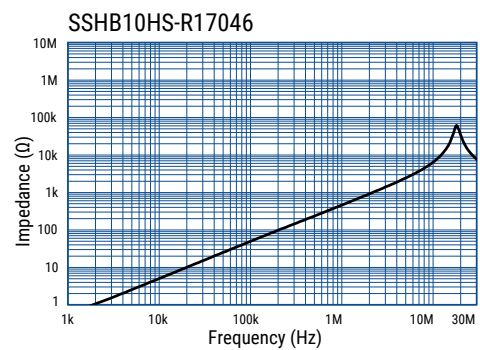
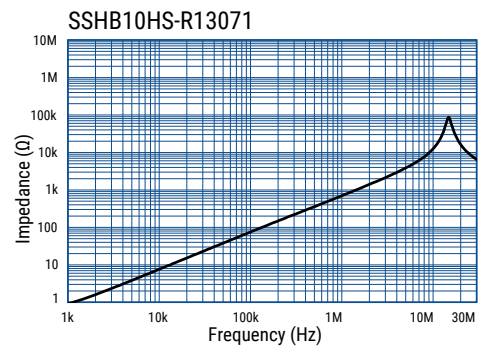
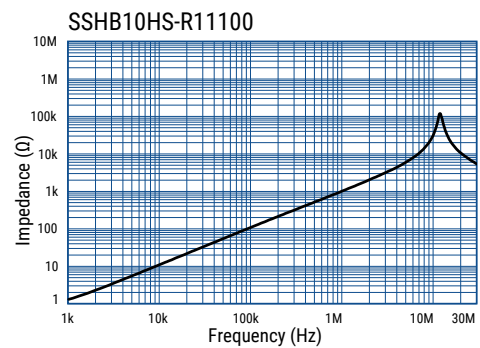
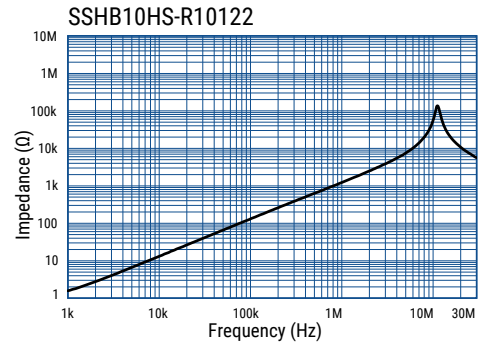


## Frequency Characteristics cont.

### Common mode

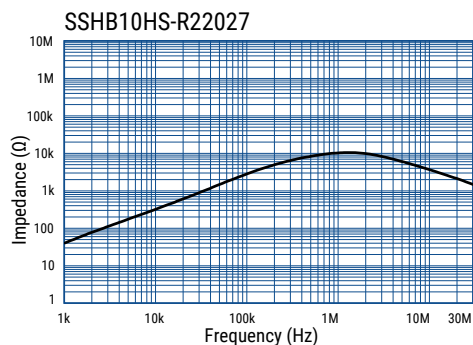


### Normal mode

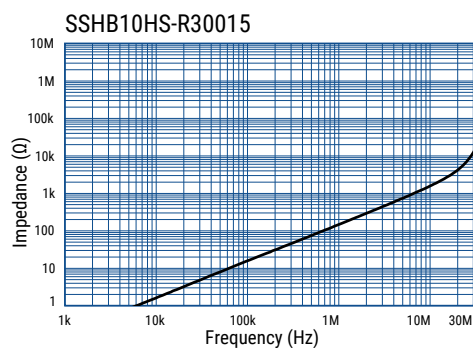
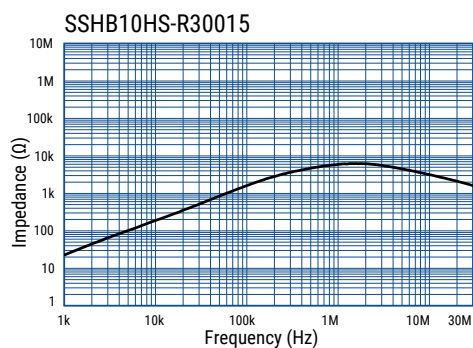
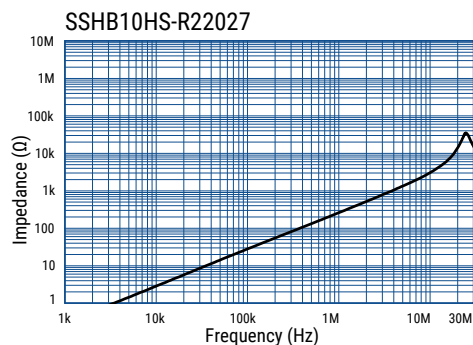


## Frequency Characteristics cont.

### Common mode



### Normal mode



## Packaging

| Type     | Packaging Type | Pieces Per Box |
|----------|----------------|----------------|
| SSHB10HS | Tray           | 300            |

## Handling Precautions

### Precautions for product storage

AC Line Filters should be stored in normal working environments. While the chokes themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity. Atmospheres should be free of chlorine and sulfur bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts. Avoid storage near strong magnetic fields, as this might magnetize the product.

For optimized solderability, AC line filters stock should be used promptly and preferably within 6 months of receipt.

### Product temperature rise values

The values listed for temperature rise are the result of self-heating in wires when the rated current (commercial frequency) is applied.

When using the product, check and evaluate the value of the core temperature rise under actual operating conditions.

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