# Common Mode SCF-X Coils, Three-Phase Series

## Overview

The KEMET SCF-X coils are common mode chokes with a wide variety of characteristics. These toroidal coils are designed with nanocrystalline metal cores and are useful in various noise countermeasure fields.

## Applications

- Audio-visual equipment
- Industrial equipment
- Home appliances
- Power supplies

## Benefits

- Nanocrystalline metal core
- Ultra-high inductance
- Ultra-high permeability
- Operating temperature range from -40°C to +130°C
- UL 94 V–0 flame retardant rated base and cap

SCF47X-JV



SCF47X-JH



SCF56X-JH



## Part Number System

| SCF | 47X- | 200- | S | 1R8 | B | 011 | JV |
|---|---|---|---|---|---|---|---|
| Series | Dimension Code (See Dimensions) | Rated Current (A) | Phase | Wire Diameter (mm) | Windings | Number of Turns | Terminal Base Type |
| SCF | 47X<br>56X | xxx- = xx.x A<br><br>Examples:<br>200 = 20.0 A | S = Three-phase | R = Decimal point<br><br>Examples:<br>1R8 = 1.8 mm | A = Single<br>B = Double<br>C = Triple | 00x = x turns<br>0xx = xx turns<br><br>Examples:<br>005 = 5 turns<br>011 = 11 turns | JV = Vertical type<br>JH = Horizontal type |



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## Magnetic Permeability of Ferrite Material

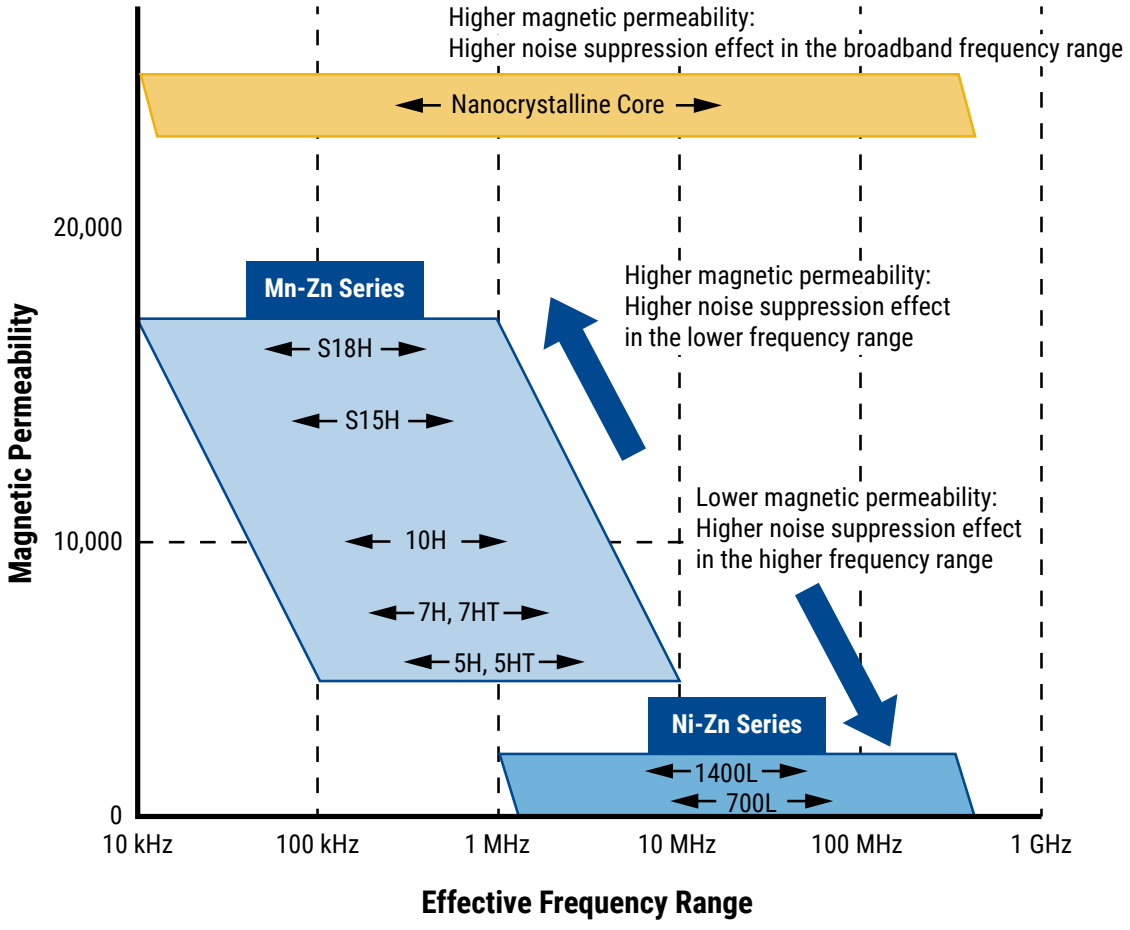
In order to achieve most efficient noise reduction, it is important to select the material according to the target frequency band. Depending on its magnetic permeability, a particular ferrite material will be effective in a certain frequency band. A schematic representation of the relationship between 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, 7HT, 5H, 5HT, 1400L, and 700L are KEMET's proprietary ferrite material names.
Other materials are available upon request.

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



## Dimensions – Millimeters

**Fig. 01**

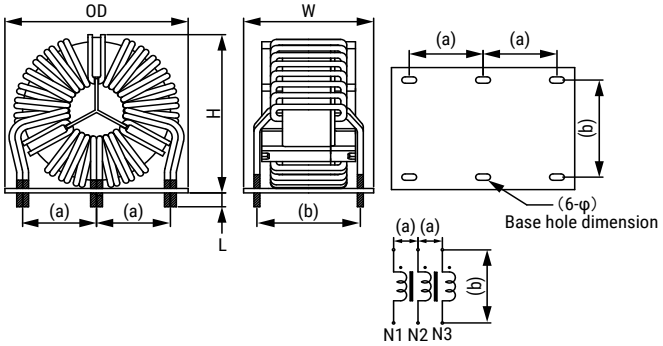



**Fig. 02**

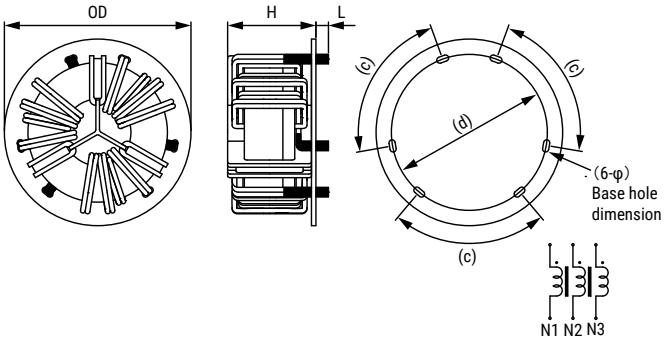
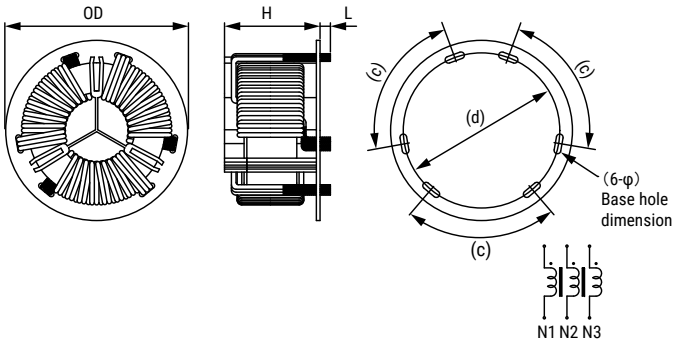



**Fig. 03**




| Part Name | Dimensions (mm) | | | | Pin Pitch[1] (Reference) | | | | | | | | Figure |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OD (Maximum) | T (Maximum) | H (Maximum) | L | a | b | c | d | φ | e | f | R | |
| SCF47X-200-S1R8B011JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-250-S1R9B010JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-300-S2R0B009JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-350-S2R1B008JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-400-S2R2B007JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-450-S2R3B006JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-500-S2R4B005JV | 63.0 | 45.0 | 61.0 | 4.5 ±1.5 | 25.0 | 35.0 | - | - | - | - | - | - | Fig. 1 |
| SCF47X-200-S1R8B011JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 2.2×4.40×R1.10 | - | - | - | Fig. 2 |
| SCF47X-250-S1R9B010JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 2.2×4.40×R1.10 | - | - | - | Fig. 2 |
| SCF47X-300-S2R0B009JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 3.0×5.40×R1.50 | - | - | - | Fig. 2 |
| SCF47X-350-S2R1B008JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 3.0×5.40×R1.50 | - | - | - | Fig. 2 |
| SCF47X-400-S2R2B007JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 3.0×5.40×R1.50 | - | - | - | Fig. 2 |
| SCF47X-450-S2R3B006JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 3.0×5.40×R1.50 | - | - | - | Fig. 2 |
| SCF47X-500-S2R4B005JH | 70.0 | - | 38.0 | 4.5 ±1.5 | - | - | 80° | 56.0 | 3.0×5.40×R1.50 | - | - | - | Fig. 2 |
| SCF56X-400-S2R4B009JH | 80.0 | - | 45.0 | 4.5 ±1.5 | - | - | 80° | 68.0 | 2.7×5.25×R1.35 | - | - | - | Fig. 3 |
| SCF56X-450-S2R0C008JH | 80.0 | - | 45.0 | 4.5 ±1.5 | - | - | 80° | 68.0 | 2.9×8.70×R1.45 | - | - | - | Fig. 3 |
| SCF56X-500-S2R1C007JH | 80.0 | - | 45.0 | 4.5 ±1.5 | - | - | 80° | 68.0 | 2.9×8.70×R1.45 | - | - | - | Fig. 3 |
| SCF56X-550-S2R2C006JH | 80.0 | - | 45.0 | 4.5 ±1.5 | - | - | 80° | 68.0 | 2.9×8.70×R1.45 | - | - | - | Fig. 3 |
| SCF56X-650-S2R3C005JH | 80.0 | - | 45.0 | 4.5 ±1.5 | - | - | 80° | 68.0 | 2.9×8.70×R1.45 | - | - | - | Fig. 3 |
| SCF56X-800-S2R4C004JH | 80.0 | - | 45.0 | 4.5 ±1.5 | - | - | 80° | 68.0 | 2.9×8.70×R1.45 | - | - | - | Fig. 3 |

[1] *Pin pitch listed above for reference only. Values not guaranteed.*

## Environmental Compliance

All KEMET AC line filters are RoHS Compliant.

## Performance Characteristics

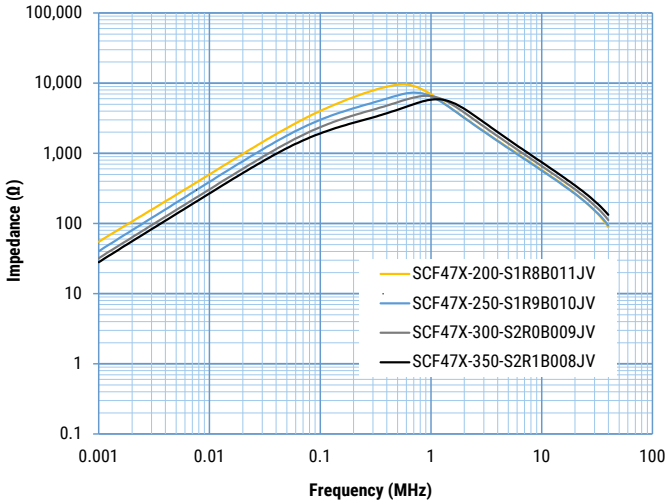
| Item | Performance Characteristics |
|---|---|
| Rated Voltage | 500 VAC/VDC |
| Withstanding Voltage | 2,400 VAC (2 seconds, between lines) |
| Insulation Resistance | > 100 MΩ at 500 VDC (between lines) |
| Rated Current Range | 20 – 80 A |
| Rated Inductance Range | 0.34 – 3.21 mH minimum |
| Inductance Measurement Condition | 100 kHz |
| Thermal Class | 130°C |
| Operating Temperature Range | -40°C to +130°C (include self temperature rise) |

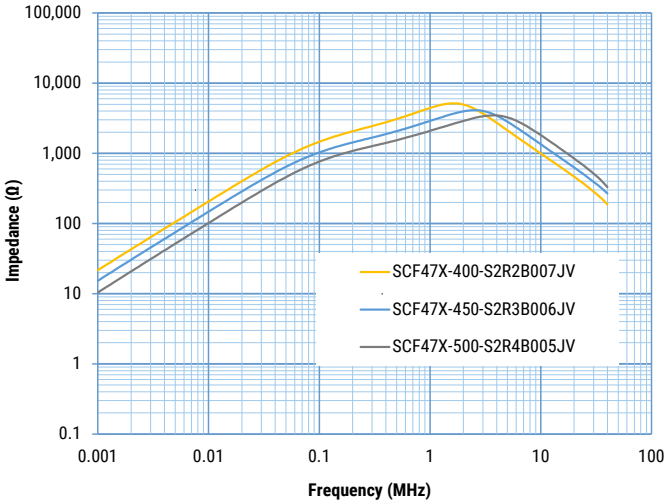
## Table 1 – Ratings & Part Number Reference

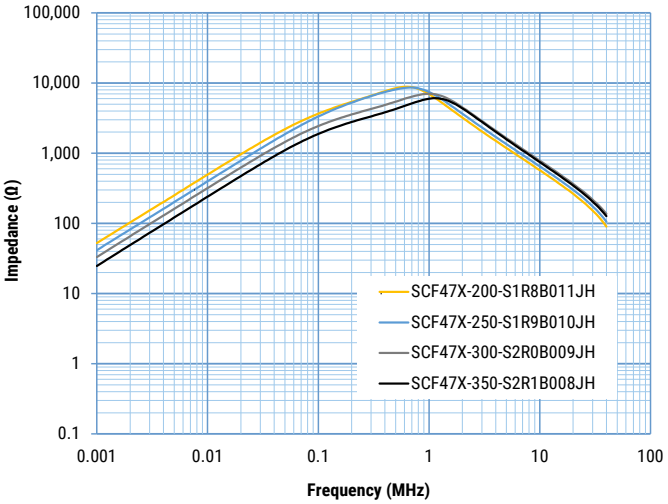
| Part Number | Rated Voltage AC/DC (V) | Rated Current AC (A) | Inductance (mH) Minimum | DC Resistance/ Line (mΩ) Maximum | Temperature Rise (K) Maximum | Wire Diameter (mm) | Weight (g) Approximate |
|---|---|---|---|---|---|---|---|
| SCF47X-200-S1R8B011JV | 500 | 20 | 3.21 | 3.52 | 40 | 1.8 x 2 Parallel | 235 |
| SCF47X-250-S1R9B010JV | 500 | 25 | 2.65 | 2.91 | 50 | 1.9 x 2 Parallel | 237 |
| SCF47X-300-S2R0B009JV | 500 | 30 | 2.15 | 2.31 | 60 | 2.0 x 2 Parallel | 234 |
| SCF47X-350-S2R1B008JV | 500 | 35 | 1.69 | 1.91 | 65 | 2.1 x 2 Parallel | 237 |
| SCF47X-400-S2R2B007JV | 500 | 40 | 1.30 | 1.53 | 70 | 2.2 x 2 Parallel | 237 |
| SCF47X-450-S2R3B006JV | 500 | 45 | 0.95 | 1.16 | 60 | 2.3 x 2 Parallel | 229 |
| SCF47X-500-S2R4B005JV | 500 | 50 | 0.66 | 0.96 | 65 | 2.4 x 2 Parallel | 216 |
| SCF47X-200-S1R8B011JH | 500 | 20 | 3.21 | 3.52 | 40 | 1.8 x 2 Parallel | 237 |
| SCF47X-250-S1R9B010JH | 500 | 25 | 2.65 | 2.91 | 50 | 1.9 x 2 Parallel | 233 |
| SCF47X-300-S2R0B009JH | 500 | 30 | 2.15 | 2.31 | 60 | 2.0 x 2 Parallel | 239 |
| SCF47X-350-S2R1B008JH | 500 | 35 | 1.69 | 1.91 | 65 | 2.1 x 2 Parallel | 236 |
| SCF47X-400-S2R2B007JH | 500 | 40 | 1.30 | 1.53 | 70 | 2.2 x 2 Parallel | 234 |
| SCF47X-450-S2R3B006JH | 500 | 45 | 0.95 | 1.16 | 65 | 2.3 x 2 Parallel | 232 |
| SCF47X-500-S2R4B005JH | 500 | 50 | 0.66 | 0.96 | 65 | 2.4 x 2 Parallel | 216 |
| SCF56X-400-S2R4B009JH | 500 | 40 | 1.72 | 1.84 | 65 | 2.4 x 2 Parallel | 407 |
| SCF56X-450-S2R0C008JH | 500 | 45 | 1.36 | 1.59 | 70 | 2.0 x 3 Parallel | 370 |
| SCF56X-500-S2R1C007JH | 500 | 50 | 1.04 | 1.21 | 60 | 2.1 x 3 Parallel | 384 |
| SCF56X-550-S2R2C006JH | 500 | 55 | 0.76 | 0.98 | 60 | 2.2 x 3 Parallel | 361 |
| SCF56X-650-S2R3C005JH | 500 | 65 | 0.53 | 0.78 | 60 | 2.3 x 3 Parallel | 352 |
| SCF56X-800-S2R4C004JH | 500 | 80 | 0.34 | 0.55 | 65 | 2.4 x 3 Parallel | 338 |

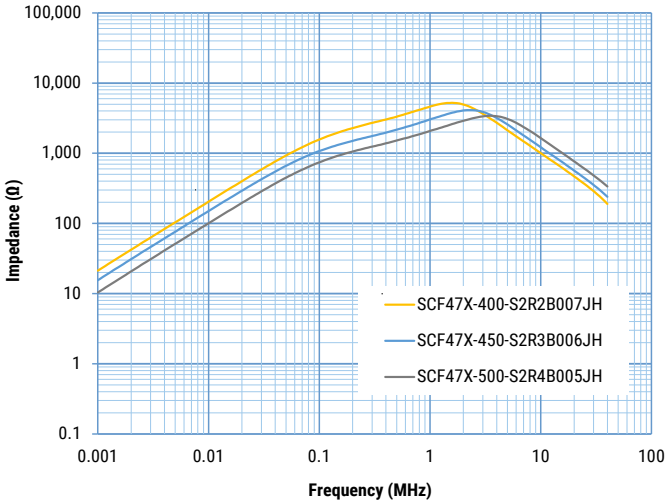
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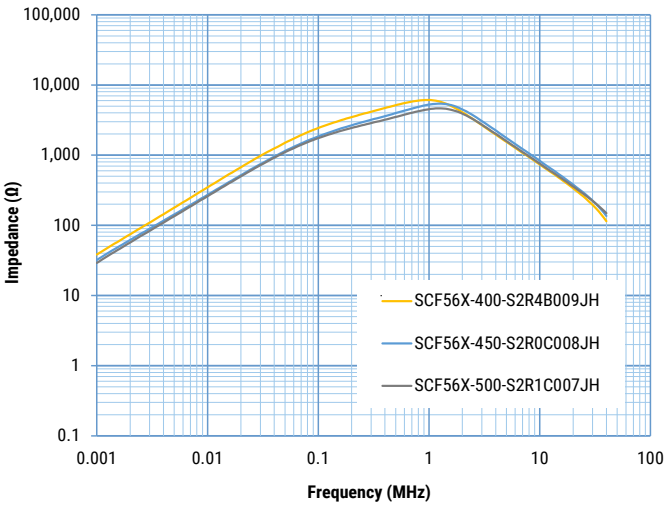
## Frequency Characteristics

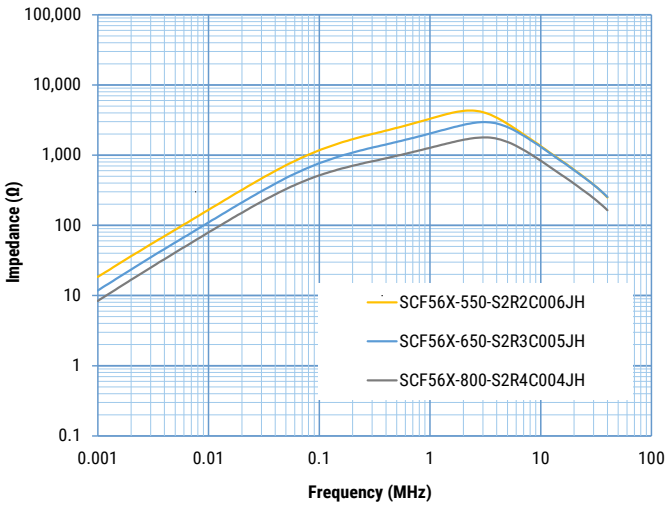



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## Packaging

| Type | Packaging Type | Pieces Per Box |
|---|---|---|
| SCF47X-JV | Tray | 27 |
| SCF47X-JH | | |
| SCF56X-JH | | 18 |

## 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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