

# Common Mode SCF Coils, Three-Phase Series

## Overview

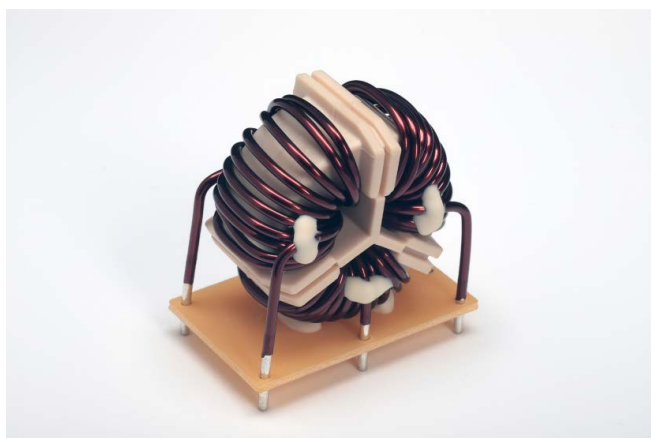
The KEMET SCF coils are common mode chokes with a wide variety of characteristics. These toroidal coils are designed with nanocrystalline metal cores and are useful in various noise countermeasure fields.

## Applications

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

## Benefits

- Nanocrystalline metal core
- Ultra-high inductance
- Ultra-high permeability
- Operating temperature range from -25°C to +120°C
- UL 94 V-0 flame retardant rated base and cap



## Part Number System

SCF	31-	150-	S	1R6	A	010	JH
Series	Dimension Code (See Dimensions)	Rated Current (A)	Phase	Wire Diameter (mm)	Windings	Inductance (mH) Minimum	Terminal Base Type
SCF	31 31B 47 47B	xxx = xx.x A  Examples: 150 = 15.0 A	S = Three-phase	R = Decimal point  Examples: 1R6 = 1.6 mm	A = Single B = Double C = Triple	xxx = xx.xmH  Examples: 010 = 1.0 mH  Note: With exceptions, see Table 1 for details.	J = Vertical type JH = Horizontal type

## Magnetic Permeability of Ferrite Material

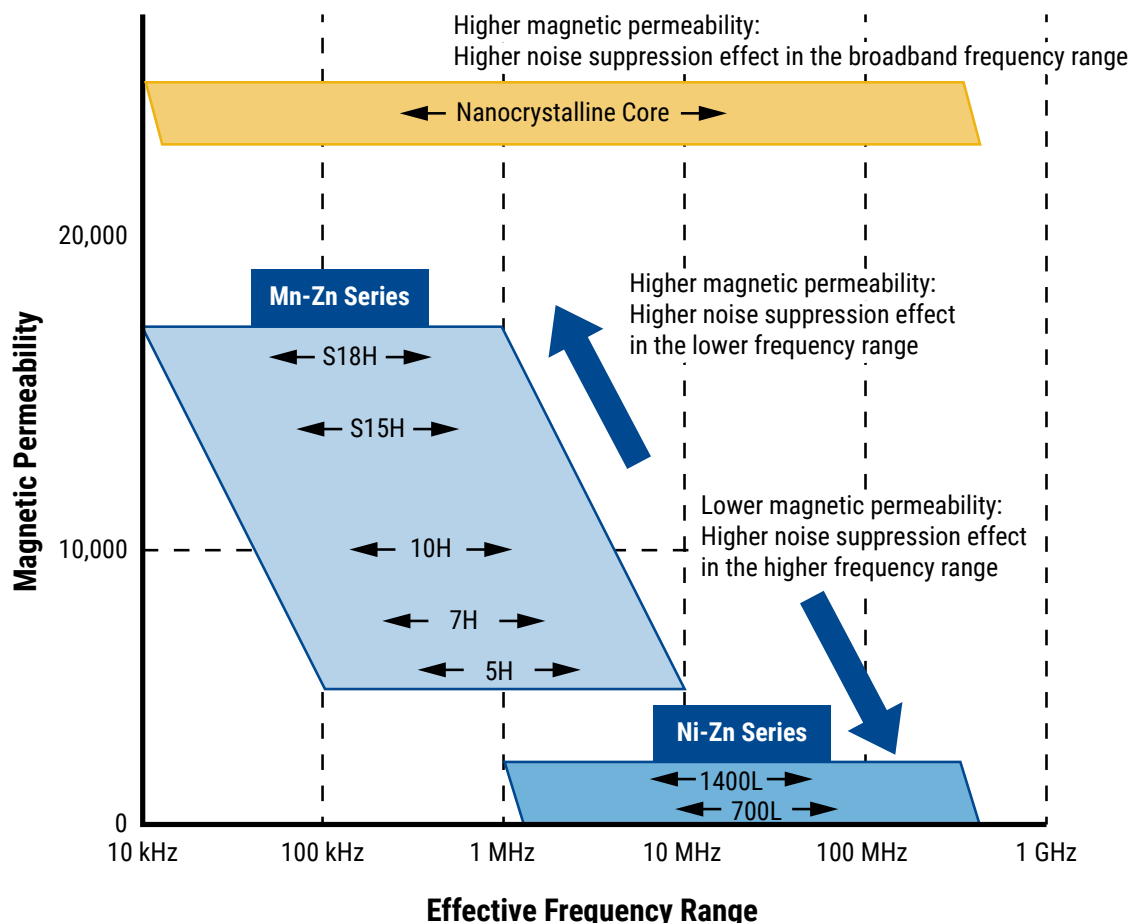
In order to achieve most efficient noise reduction, it is important to select the material according to the target frequency band. Depending on its magnetic permeability, a particular ferrite material or metal material will be effective in a certain frequency band. A schematic representation of the relationship between the magnetic permeability of each material and the corresponding effective band range is shown in Figure 1.

Ferrite 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. Metal materials, however, are effective throughout the broadband frequency range, in low as well as high frequencies.

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. It should be tested on the actual device to determine its effectiveness.

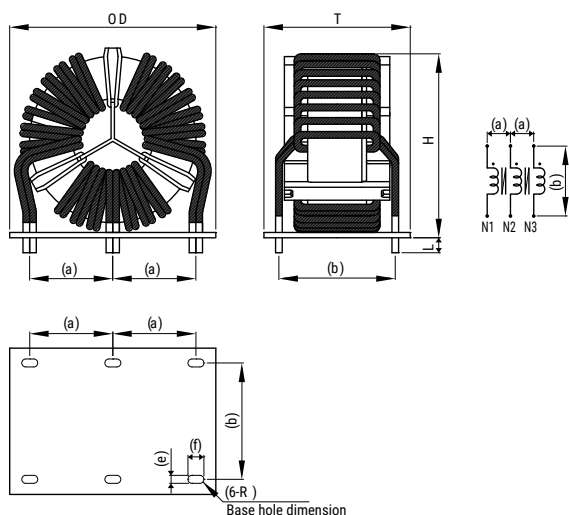
S18H, S15H, 10H, 7H, 5H, 1400L, and 700L are KEMET's proprietary ferrite material names. Other materials are available upon request.

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

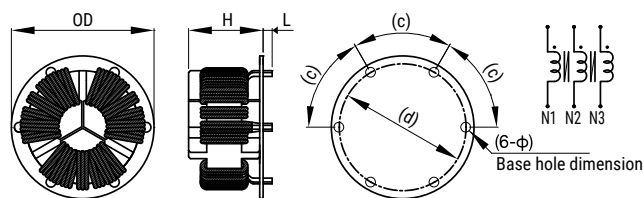


## Dimensions – Millimeters

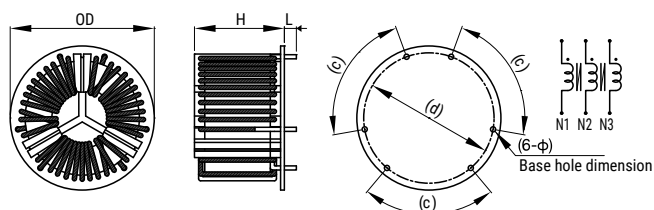
**Figure 1**



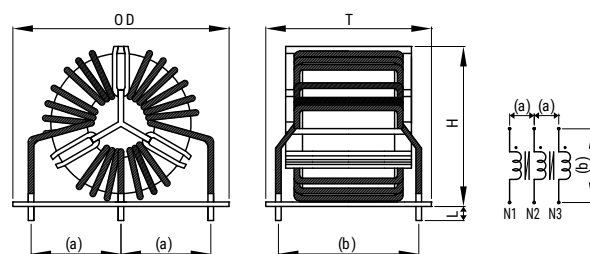
**Figure 2**



**Figure 3**



**Figure 4**



Part Name	Dimensions (mm)				Pin Pitch <sup>1</sup> (Reference)								Figure
	OD (Maximum)	T (Maximum)	H (Maximum)	L	a	b	c	d	φ	e	f	R	
SCF47B-200-S1R9B026J	63.0	45.0	65.0	5.1±1.0	25.0	35.0	-	-	-	2.3	5.0	1.15	Fig. 1
SCF47B-300-S2R0B012J	63.0	45.0	65.0	5.1±1.0	25.0	35.0	-	-	-	2.3	5.0	1.15	Fig. 1
SCF47-400-S1R7C028JH	71.0	-	40.0	4.0±1.0	-	-	60°	56.0	4.3	-	-	-	Fig. 2
SCF31-150-S1R6A010JH	42.0	-	27.0	5.0±2.0	-	-	80°	38.0	1.8	-	-	-	Fig. 3
SCF31B-180-S1R7A013J	46.5	32.0	44.0	5.0±1.0	20.0	25.0	-	-	-	-	-	-	Fig. 4

<sup>1</sup> 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	250 VAC/VDC and 500 VAC/VDC
Withstanding Voltage	2,400 VAC (2 seconds, between lines)
Insulation Resistance	> 100 MΩ at 500 VDC (between lines)
Rated Current Range	15 – 40 A
Rated Inductance Range	1.0 – 2.8 mH minimum
Inductance Measurement Condition	10 kHz and 100 kHz
Thermal Class	E (120°C)
Operating Temperature Range	-25°C to +120°C (include self temperature rise)

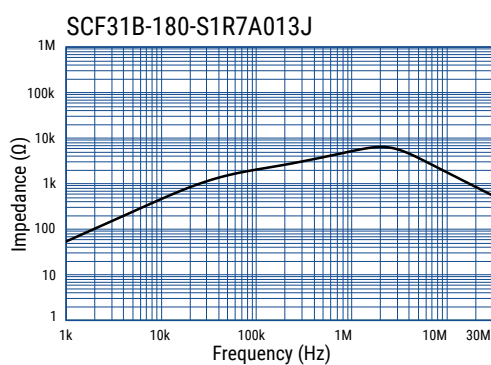
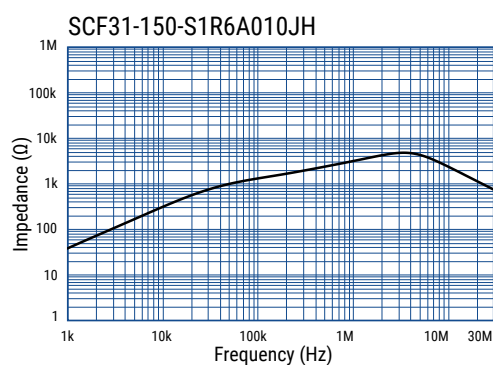
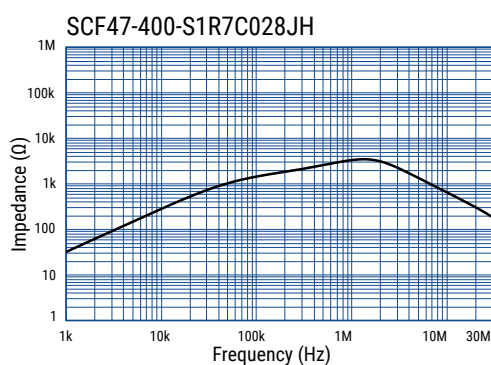
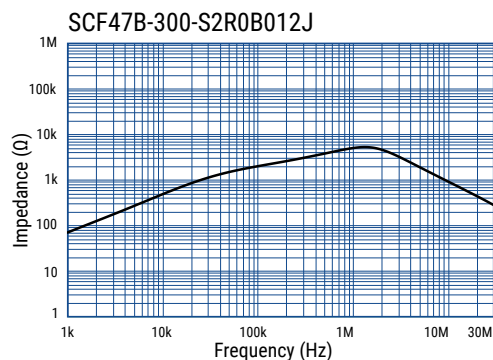
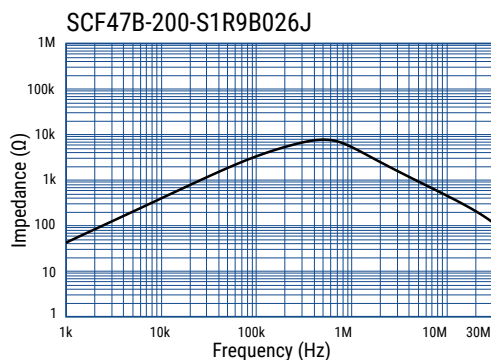
## Table 1 – Ratings & Part Number Reference

Part Number	Rated Voltage AC/DC (V)	Rated Current (A)	Inductance (mH) Minimum	DC Resistance/ Line (mΩ) Maximum	Temperature Rise (K) Maximum	Wire Diameter (mm)	Weight (g) Approximate
SCF47B-200-S1R9B026J	250	20	2.6 <sup>2</sup>	2.90	33	1.9 x 2 Parallel	229.1
SCF47B-300-S2R0B012J	250	30	1.2 <sup>2</sup>	2.40	50	2.0 x 2 Parallel	238.5
SCF47-400-S1R7C028JH	250	40	2.8 <sup>1</sup>	1.85	90	1.7 x 3 Parallel	200.0
SCF31-150-S1R6A010JH	500	15	1.0 <sup>2</sup>	5.40	60	1.60	70.0
SCF31B-180-S1R7A013J	500	18	1.5 <sup>2</sup>	6.50	82	1.70	82.4

<sup>1</sup> Inductance Measurement Condition: 10 kHz

<sup>2</sup> Inductance Measurement Condition: 100 kHz

## Frequency Characteristics



## Packaging

Type	Packaging Type	Pieces Per Box
SCF47B-200-S1R9B026J	Tray	27
SCF47B-300-S2R0B012J		
SCF47-400-S1R7C028JH		36
SCF31-150-S1R6A010JH		80
SCF31B-180-S1R7A013J		60

## 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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