Common Mode SCF Coils, SCF Series, High Inductance Type

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
- 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 cap

Part Number System

SCF	27	-10	-1300	
Series	Dimension Code (See Dimensions)	Rated Current (A)	Inductance (mH) Minimum	Core Orientation
SCF	Blank 20 25 27	0x = x A xx = xx A Examples: 02 = 2 A 10 = 10 A	xx00 = xx mH xx0 = x.x mH Examples: 1300 = 13 mH 650 = 6.5 mH	Blank = Vertical type H = Horizontal type

Magnetic Permeability of Ferrite Material

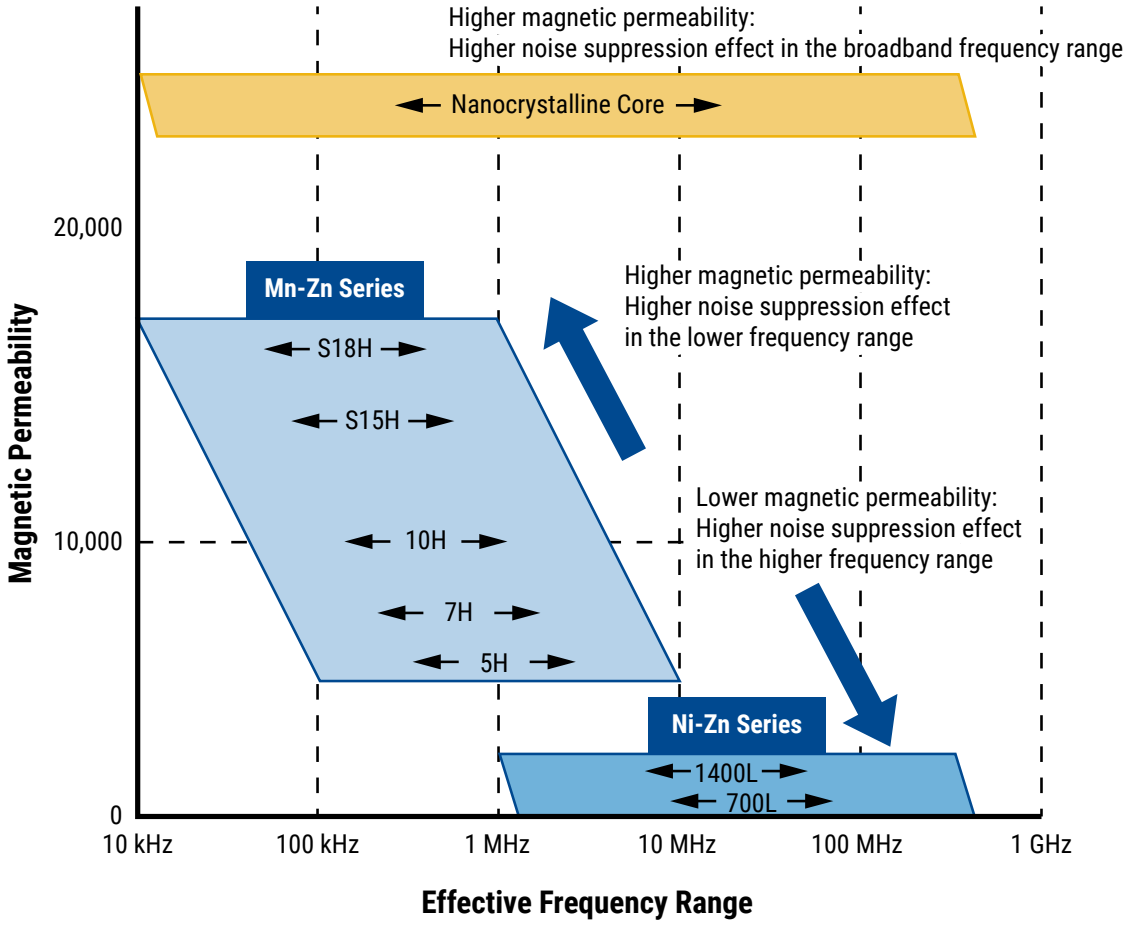
In order to achieve most efficient noise reduction, it is important to select the material according to the target frequency band. Depending on its magnetic permeability, a particular ferrite material or metal material will be effective in a certain frequency band. A schematic representation of the relationship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

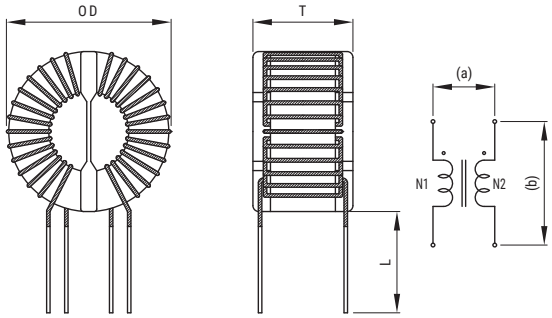
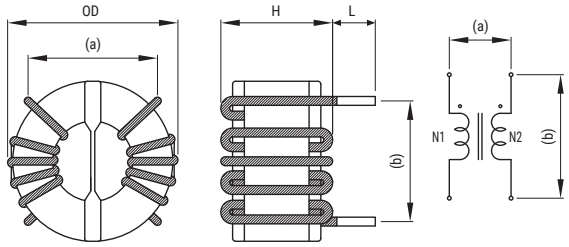


Figure 2



Part Name	Dimensions (mm)				Pin Pitch[1] (Reference)		Figure
	OD (Maximum)	T (Maximum)	H (Maximum)	L	a	b	
SCF-01-5000	15.0	12.0	-	15±2.0	–	–	Fig. 1
SCF-02-1300	15.0	12.0	-	15±2.0	–	–	Fig. 1
SCF-03-650	15.0	12.0	-	15±2.0	5	9	Fig. 1
SCF-03-650H	15.0	-	12.0	5±2.0	10	10	Fig. 2
SCF-05-060	15.0	11.0	-	5±1.5	5	9	Fig. 1
SCF-05-350	15.5	12.0	-	15±2.0	5	9	Fig. 1
SCF20-05-550	25.0	15.5	-	20±2.5	14	12	Fig. 1
SCF20-05-1100	25.0	15.5	-	20±2.5	14	12	Fig. 1
SCF25-06-2000	32.0	23.0	-	10±2.5	13	20	Fig. 1
SCF25-08-1300	32.0	23.0	-	10±2.5	13	20	Fig. 1
SCF27-10-1300	35.0	24.0	-	15±3.0	24	20	Fig. 1
SCF27-15-700	36.0	24.0	-	15±3.0	24	20	Fig. 1
SCF27-15-700H	35.0	-	25.0	10±2.0	22	21	Fig. 2

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

Environmental Compliance

All KEMET AC line filters are RoHS Compliant.

RoHS

Performance Characteristics

Item	Performance Characteristics
Rated Voltage	250 VAC/VDC
Withstanding Voltage	2,400 VAC (2 seconds, between lines)
Rated Current Range	1 – 15 A
Rated Inductance Range	0.6 – 50.0 mH minimum
Inductance Measurement Condition	10 kHz
Thermal Class	E (120°C)
Operating Temperature Range	–25°C to +120°C (include self temperature rise)

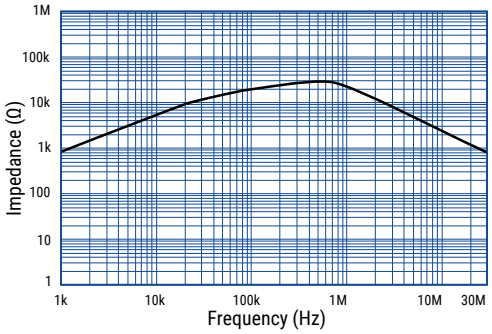
Table 1 – Ratings & Part Number Reference

Part Number	Rated Current (A)	Inductance (mH) Minimum	DC Resistance/ Line (mΩ) Maximum	Temperature Rise (K) Maximum	Wire Diameter (mm)	Weight (g) Approximate
SCF-01-5000[1]	1	50.0	390.0	60	0.35	5.0
SCF-02-1300[1]	2	13.0	115.0	50	0.45	5.0
SCF-03-650[1]	3	6.5	70.0	55	0.50	5.0
SCF-03-650H[1]	3	6.5	70.0	55	0.50	5.0
SCF-05-060[1]	5	0.6	18.0	55	0.50	3.3
SCF-05-350[1]	5	3.5	35.0	55	0.60	5.0
SCF20-05-550	5	5.5	28.0	50	0.80	11.4
SCF20-05-1100	5	11.0	39.0	70	0.80	13.5
SCF25-06-2000	6	20.0	26.0	45	1.10	41.5
SCF25-08-1300	8	13.0	18.0	50	1.20	41.0
SCF27-10-1300	10	13.0	15.0	55	1.30	47.0
SCF27-15-700	15	7.0	5.0	70	1.50	48.0
SCF27-15-700H	15	7.0	8.5	70	1.50	49.0

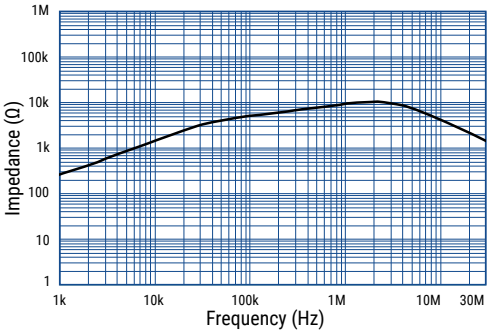
[1] *Insulation distance designed value of ≥ 2.6 mm.*

Frequency Characteristics

SCF-01-5000



SCF-02-1300



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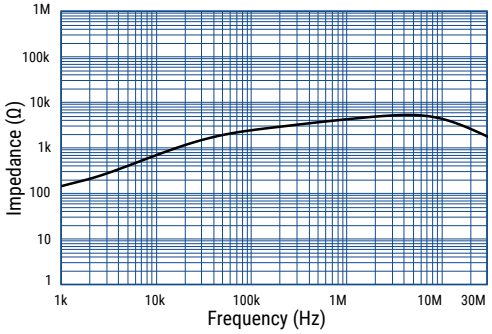
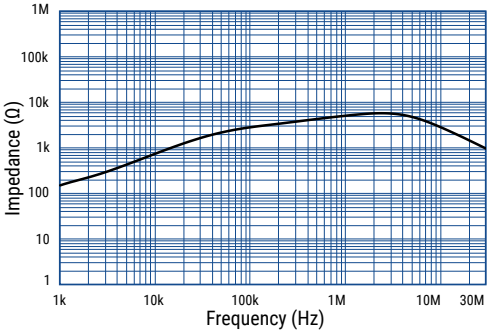


SCF-03-650H



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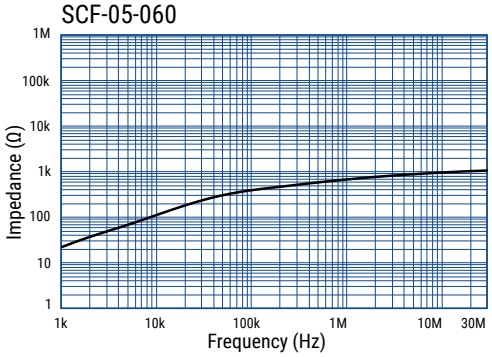
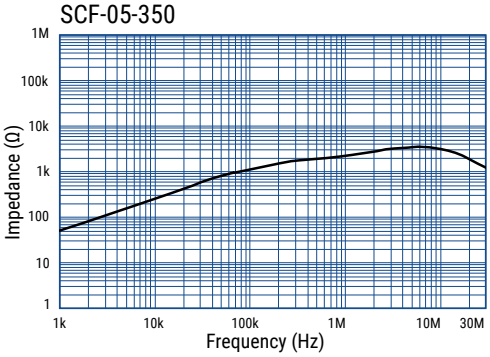


SCF-05-350



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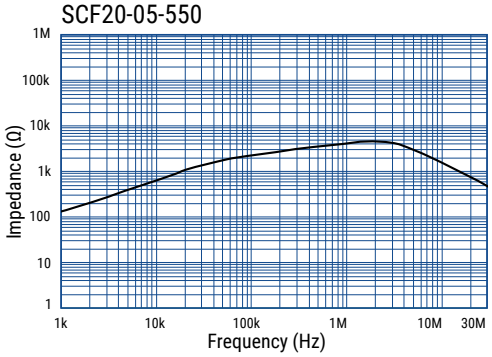

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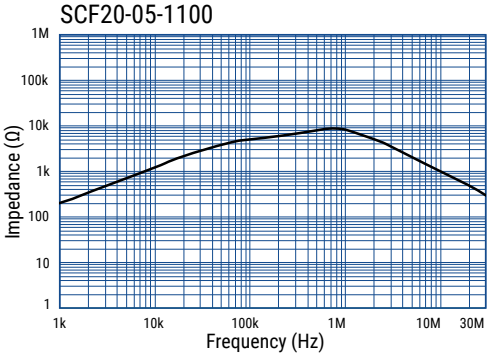
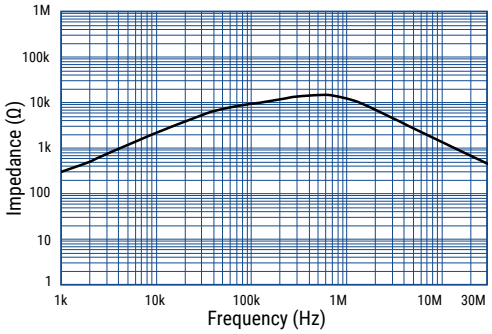


Frequency Characteristics cont.

SCF25-06-2000



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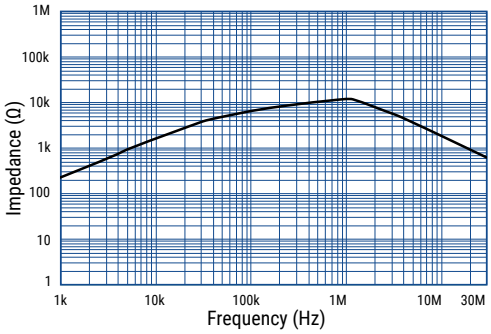
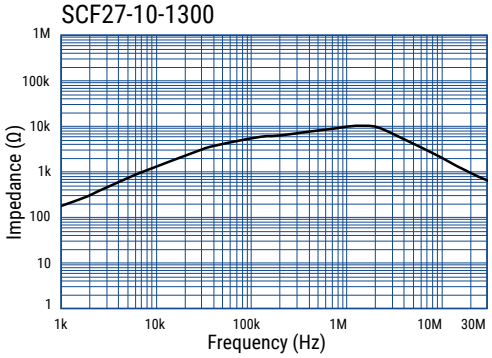
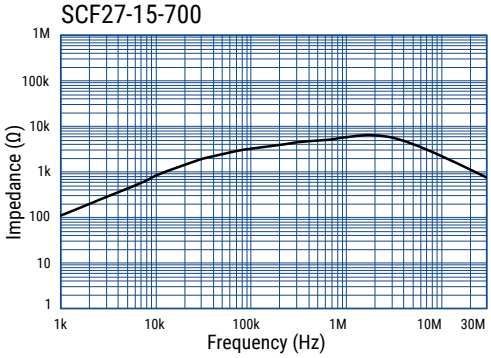


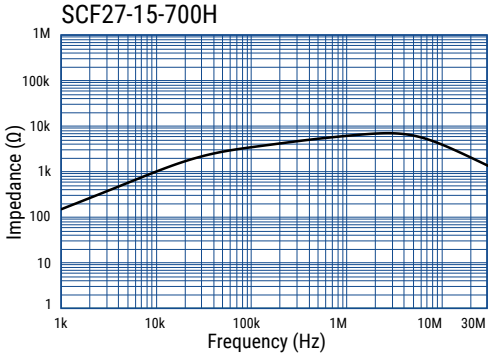
SCF27-10-1300



SCF27-15-700



SCF27-15-700H



Packaging

Type	Packaging Type	Pieces Per Box
SCF-01-5000	Tray	1,300
SCF-02-1300		
SCF-03-650		
SCF-03-650H		1,020
SCF-05-060		1,300
SCF-05-350		
SCF20-05-550		400
SCF20-05-1100		
SCF25-06-2000		100
SCF25-08-1300		
SCF27-10-1300		
SCF27-15-700		
SCF27-15-700H		150

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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