Common Mode SC31X Coils, SCF31X Series & SCT31X Series, Three-Phase Series

Overview

The KEMET SCF31X & SCT31X coils are common mode chokes with a wide variety of characteristics. These toroidal coils are designed with nanocrystalline metal and Mn-Zn Ferrite cores and are useful in various noise countermeasure fields.

Applications

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

Benefits

- Nanocrystalline metal core for SCF31X
- Mn-Zn Ferrite 10HT for SCT31X
- 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

SC31X-JV

SC31X-JH

Part Number System

SC	F	31X-	060-	S	1R1	A	011	JV
Series	Core material Code	Dimension Code (See Dimensions)	Rated Current (A)	Phase	Wire Diameter (mm)	Windings	Number of Turns	Terminal Base Type
SC	F = Nanocrystal core T = Mn-Zn Ferrite core 10HT	31X	xxx- = xx.x A Examples: 060 = 6.0 A	S = Three-phase	R = Decimal point Examples: 1R1 = 1.1 mm	A = Single	00x = x turns 0xx = xx turns Examples: 009 = 9 turns 011 = 11 turns	JV = Vertical type JH = Horizontal type

Magnetic Permeability of Ferrite Material

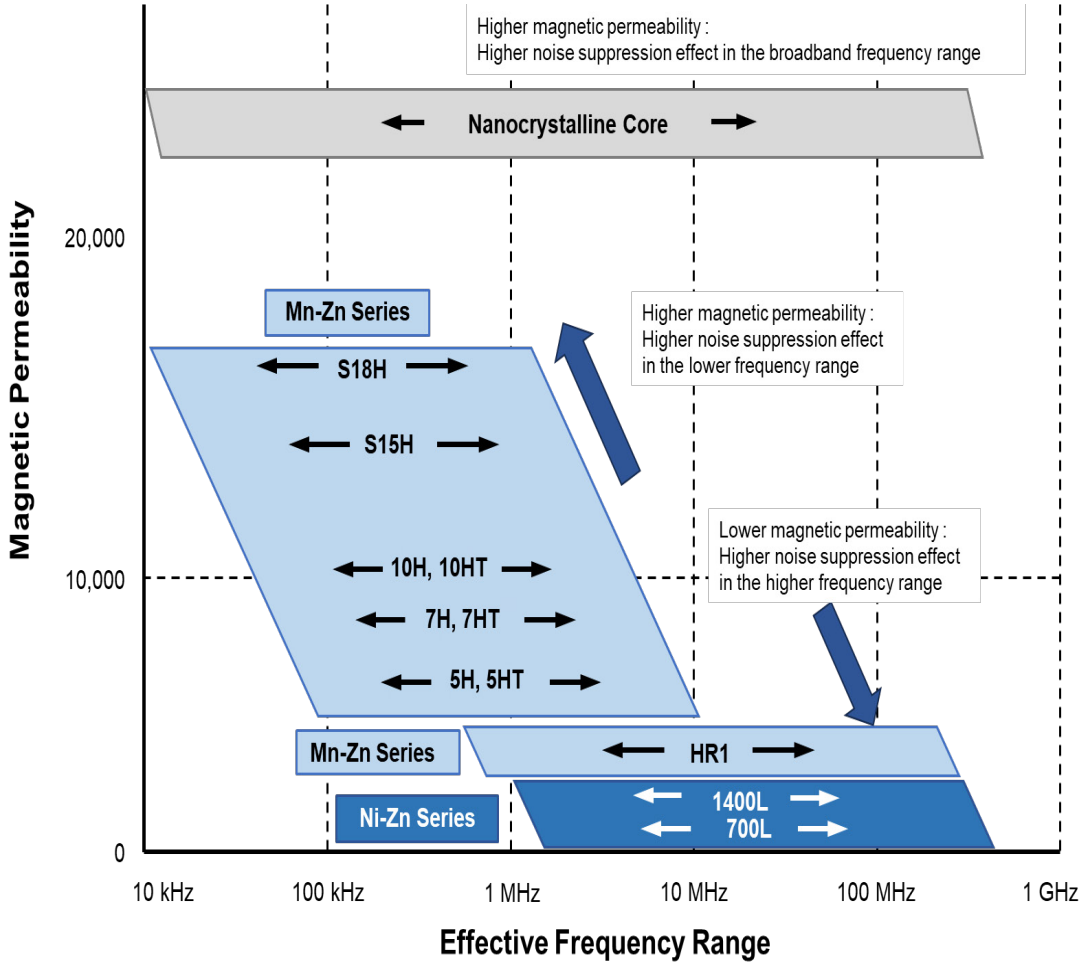
In order to achieve most efficient noise reduction, it is important to select the material according to the target frequency band. Depending on its magnetic permeability, a particular ferrite material or metal material will be effective in a certain frequency band. A schematic representation of the relationship 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, 10HT, 7H, 7HT, 5H, 5HT, HR1, 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.1

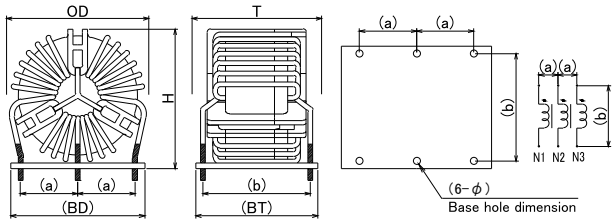
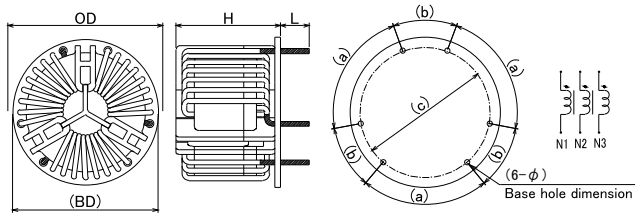


Fig.2



Part Name	Dimensions (mm)				Base Dimensions[1] (Reference)		Pin Pitch[2] (Reference)				Figure
	OD (Maximum)	T (Maximum)	H (Maximum)	L	BD	BT	a	b	c	φ	
SCF31X-060-S1R1A028JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCF31X-070-S1R2A023JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCF31X-080-S1R3A020JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCF31X-100-S1R4A017JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCF31X-110-S1R5A015JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCF31X-130-S1R6A013JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCF31X-150-S1R7A011JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCF31X-160-S1R8A010JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCF31X-180-S1R9A009JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCF31X-060-S1R1A028JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.5	Fig. 2
SCF31X-070-S1R2A023JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.5	Fig. 2
SCF31X-080-S1R3A020JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.5	Fig. 2
SCF31X-100-S1R4A017JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.8	Fig. 2
SCF31X-110-S1R5A015JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.8	Fig. 2
SCF31X-130-S1R6A013JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.8	Fig. 2
SCF31X-150-S1R7A011JH	43.0	-	32.0	3.5 ±0.5	42.6	-	80°	40°	38.0	2.3	Fig. 2
SCF31X-160-S1R8A010JH	43.0	-	32.0	3.5 ±0.5	42.6	-	80°	40°	38.0	2.3	Fig. 2
SCF31X-180-S1R9A009JH	43.0	-	32.0	3.5 ±0.5	42.6	-	80°	40°	38.0	2.3	Fig. 2
SCT31X-060-S1R1A028JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCT31X-070-S1R2A023JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCT31X-080-S1R3A020JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCT31X-100-S1R4A017JV	46.5	32.0	42.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	1.6	Fig. 1
SCT31X-110-S1R5A015JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCT31X-130-S1R6A013JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCT31X-150-S1R7A011JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCT31X-160-S1R8A010JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCT31X-180-S1R9A009JV	46.5	32.0	44.0	3.5 ±0.5	45.5	29.5	20.0	25.0	-	2.1	Fig. 1
SCT31X-060-S1R1A028JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.5	Fig. 2
SCT31X-070-S1R2A023JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.5	Fig. 2
SCT31X-080-S1R3A020JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.5	Fig. 2
SCT31X-100-S1R4A017JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.8	Fig. 2
SCT31X-110-S1R5A015JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.8	Fig. 2
SCT31X-130-S1R6A013JH	42.0	-	32.0	3.5 ±0.5	41.6	-	80°	40°	38.0	1.8	Fig. 2
SCT31X-150-S1R7A011JH	43.0	-	32.0	3.5 ±0.5	42.6	-	80°	40°	38.0	2.3	Fig. 2
SCT31X-160-S1R8A010JH	43.0	-	32.0	3.5 ±0.5	42.6	-	80°	40°	38.0	2.3	Fig. 2
SCT31X-180-S1R9A009JH	43.0	-	32.0	3.5 ±0.5	42.6	-	80°	40°	38.0	2.3	Fig. 2

[1] We do not inspect the terminal base dimension. (design guarantee)

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

Environmental Compliance

All KEMET AC line filters are RoHS Compliant.

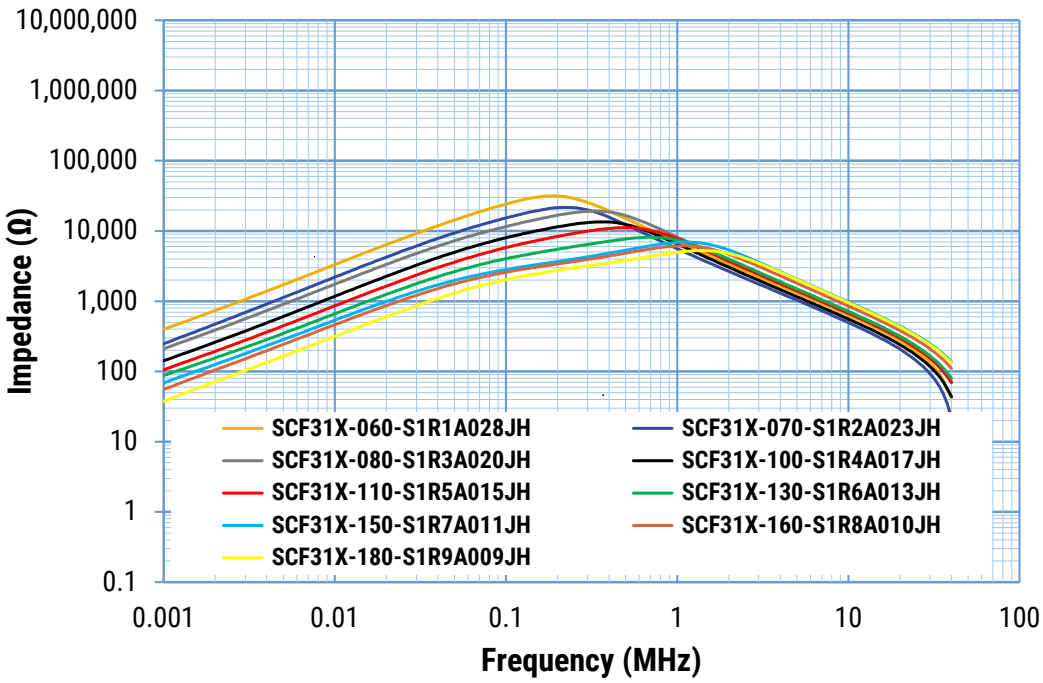
Performance Characteristics

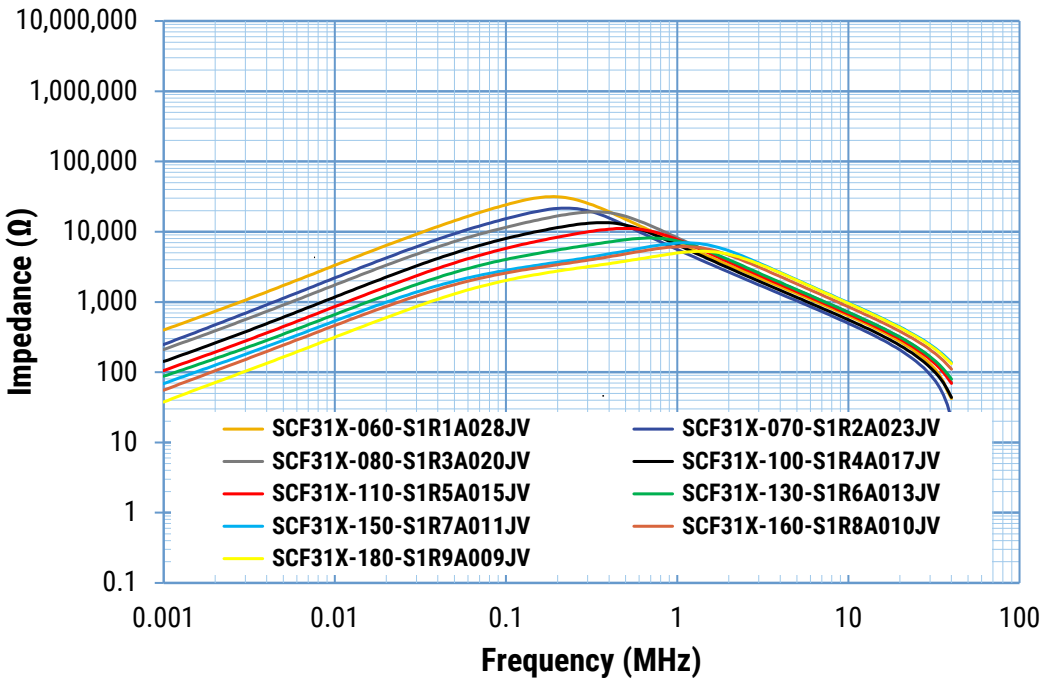
Item	Performance Characteristics
Rated Voltage	530 VAC/VDC
Withstanding Voltage	2,400 VAC (2 seconds, between lines)
Insulation Resistance	> 100 MΩ at 500 VDC (between lines)
Rated Current Range	6 – 18 A
Rated Inductance Range	0.61 – 14.44 mH minimum
Inductance Measurement Condition	100 kHz
Thermal Class	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 100kHz (mH) Minimum	DC Resistance/ Line (mΩ) Maximum	Temperature Rise (K) Maximum	Wire Diameter (mm)	Weight (g) Approximate
SCF31X-060-S1R1A028JV	500	6	14.44	38.97	65	1.1	97.8
SCF31X-070-S1R2A023JV	500	7	9.74	27.19	65	1.2	98.8
SCF31X-080-S1R3A020JV	500	8	7.36	19.97	65	1.3	98.7
SCF31X-100-S1R4A017JV	500	10	5.32	15.00	65	1.4	98.0
SCF31X-110-S1R5A015JV	500	11	4.14	11.53	65	1.5	99.0
SCF31X-130-S1R6A013JV	500	13	3.11	8.74	65	1.6	98.8
SCF31X-150-S1R7A011JV	500	15	2.22	6.50	65	1.7	97.5
SCF31X-160-S1R8A010JV	500	16	1.84	5.25	60	1.8	97.9
SCF31X-180-S1R9A009JV	500	18	1.50	4.33	65	1.9	98.7
SCF31X-060-S1R1A028JH	500	6	14.44	38.97	65	1.1	98.0
SCF31X-070-S1R2A023JH	500	7	9.74	27.19	65	1.2	98.9
SCF31X-080-S1R3A020JH	500	8	7.36	19.97	65	1.3	99.6
SCF31X-100-S1R4A017JH	500	10	5.32	15.00	65	1.4	99.4
SCF31X-110-S1R5A015JH	500	11	4.14	11.53	65	1.5	99.4
SCF31X-130-S1R6A013JH	500	13	3.11	8.74	65	1.6	99.2
SCF31X-150-S1R7A011JH	500	15	2.22	6.50	65	1.7	99.0
SCF31X-160-S1R8A010JH	500	16	1.84	5.25	60	1.8	99.1
SCF31X-180-S1R9A009JH	500	18	1.50	4.33	65	1.9	99.5
SCT31X-060-S1R1A028JV	500	6	5.92	38.97	65	1.1	91.0
SCT31X-070-S1R2A023JV	500	7	3.99	27.19	65	1.2	90.2
SCT31X-080-S1R3A020JV	500	8	3.02	19.97	65	1.3	92.6
SCT31X-100-S1R4A017JV	500	10	2.18	15.00	65	1.4	92.7
SCT31X-110-S1R5A015JV	500	11	1.69	11.53	65	1.5	93.2
SCT31X-130-S1R6A013JV	500	13	1.27	8.74	65	1.6	92.6
SCT31X-150-S1R7A011JV	500	15	0.91	6.50	65	1.7	91.0
SCT31X-160-S1R8A010JV	500	16	0.75	5.25	60	1.8	92.2
SCT31X-180-S1R9A009JV	500	18	0.61	4.33	65	1.9	93.0
SCT31X-060-S1R1A028JH	500	6	5.92	38.97	65	1.1	90.1
SCT31X-070-S1R2A023JH	500	7	3.99	27.19	65	1.2	89.8
SCT31X-080-S1R3A020JH	500	8	3.02	19.97	65	1.3	92.5
SCT31X-100-S1R4A017JH	500	10	2.18	15.00	65	1.4	92.2
SCT31X-110-S1R5A015JH	500	11	1.69	11.53	65	1.5	93.1
SCT31X-130-S1R6A013JH	500	13	1.27	8.74	65	1.6	92.5
SCT31X-150-S1R7A011JH	500	15	0.91	6.50	65	1.7	92.5
SCT31X-160-S1R8A010JH	500	16	0.75	5.25	60	1.8	91.9
SCT31X-180-S1R9A009JH	500	18	0.61	4.33	65	1.9	93.0

Frequency Characteristics





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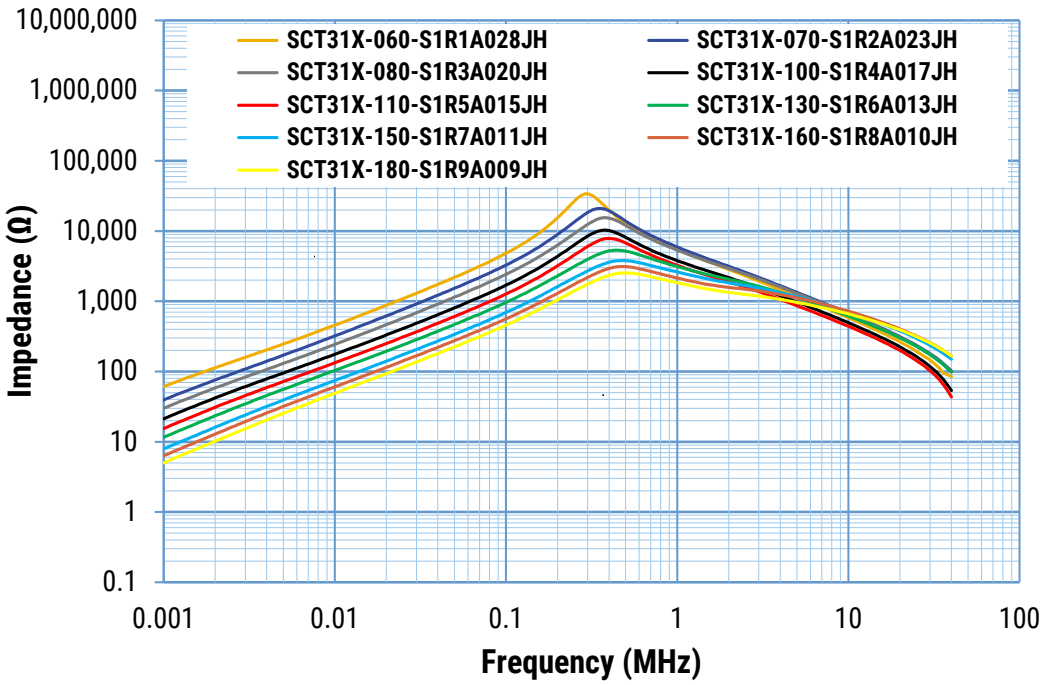

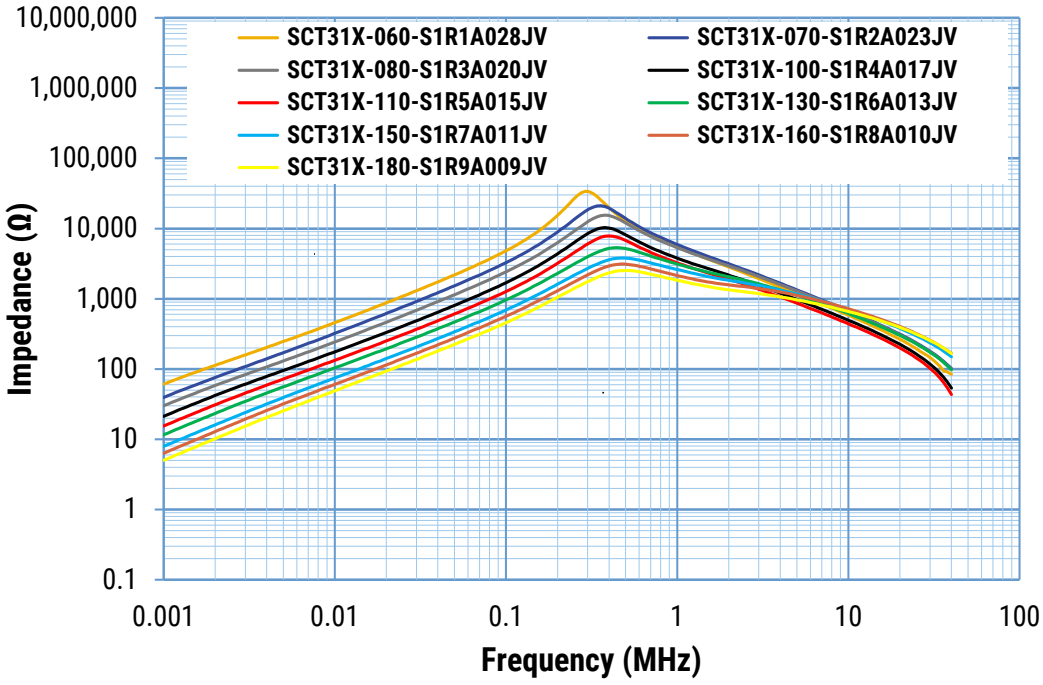

Packaging

Type	Packaging Type	Pieces Per Box
SCF31X-JV	Tray	60
SCF31X-JH		
SCT31X-JV		
SCT31X-JH		

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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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

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