Common Mode SC31X Coils, SCF31X Series & SCT31X 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-	055-		1R1	A	045	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: 055 = 5.5 A 140 = 14.0A	Blank = Single-phase	R = Decimal point Examples: 1R1 = 1.1 mm 1R6 = 1.6 mm	A = Single	0xx = xx turns Examples: 045 = 45 turns	JV = Vertical type(With base) JH = Horizonta type(With base)

Magnetic Permeability of Ferrite Material

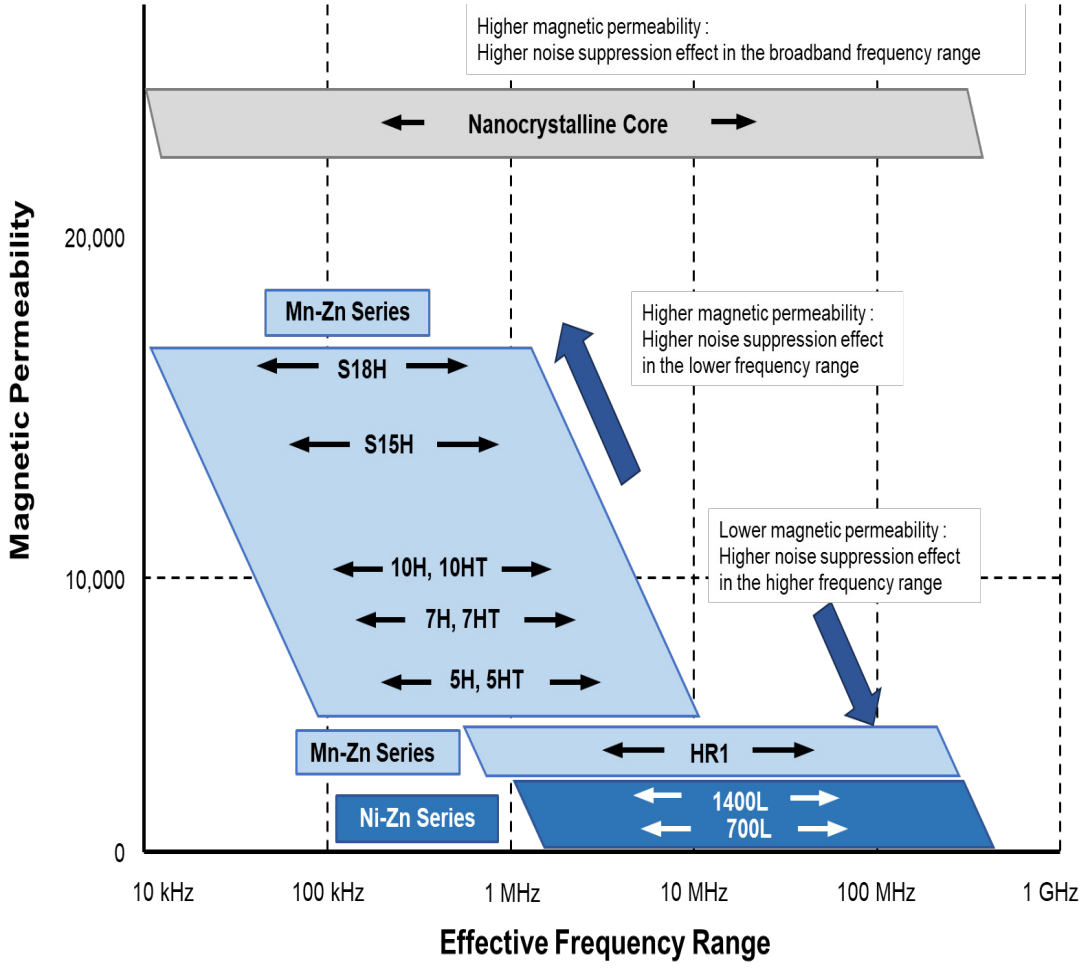
In order to achieve most efficient noise reduction, it is important to select the material according to the target frequency band. Depending on its magnetic permeability, a particular ferrite material or metal material will be effective in a certain frequency band. A schematic representation of the relationship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

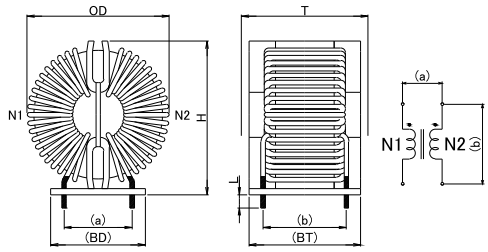
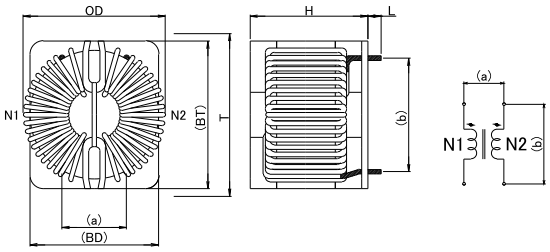


Fig.2



Part Name	Dimensions (mm)				Base Dimensions[1] (Reference)		Pin Pitch[2] (Reference)		Figure
	OD (Maximum)	T (Maximum)	H (Maximum)	L	BD	BT	a	b	
SCF31X-055-1R1A045JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-065-1R2A038JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-075-1R3A032JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-085-1R4A027JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-105-1R5A024JV	42.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-115-1R6A021JV	42.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-140-1R7A017JV	43.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-155-1R8A015JV	43.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-175-1R9A014JV	45.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-200-2R0A012JV	45.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-220-2R1A011JV	45.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCF31X-055-1R1A045JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-065-1R2A038JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-075-1R3A032JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-085-1R4A027JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-105-1R5A024JH	42.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-115-1R6A021JH	42.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-140-1R7A017JH	42.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-155-1R8A015JH	43.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-175-1R9A014JH	45.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-200-2R0A012JH	45.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCF31X-220-2R1A011JH	45.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-055-1R1A045JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-065-1R2A038JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-075-1R3A032JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-085-1R4A027JV	40.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-105-1R5A024JV	42.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-115-1R6A021JV	42.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-140-1R7A017JV	43.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-155-1R8A015JV	43.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1

[1] *We do not inspect the terminal base dimension. (design guarantee)*
[2] *Pin pitch listed above for reference only. Values not guaranteed.*

Dimensions – Millimeters cont.

Part Name	Dimensions (mm)				Base Dimensions[1] (Reference)		Pin Pitch[2] (Reference)		Figure
	OD (Maximum)	T (Maximum)	H (Maximum)	L	BD	BT	a	b	
SCT31X-175-1R9A014JV	45.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-200-2R0A012JV	45.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-220-2R1A011JV	45.0	31.0	42.0	3.5±0.5	25.0	29.5	18.0	22.0	Fig. 1
SCT31X-055-1R1A045JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-065-1R2A038JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-075-1R3A032JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-085-1R4A027JH	40.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-105-1R5A024JH	42.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-115-1R6A021JH	42.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-140-1R7A017JH	42.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-155-1R8A015JH	43.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-175-1R9A014JH	45.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-200-2R0A012JH	45.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2
SCT31X-220-2R1A011JH	45.0	42.0	33.0	3.5±0.5	34.0	39.0	17.0	30.0	Fig. 2

Environmental Compliance

All KEMET AC line filters are RoHS Compliant.

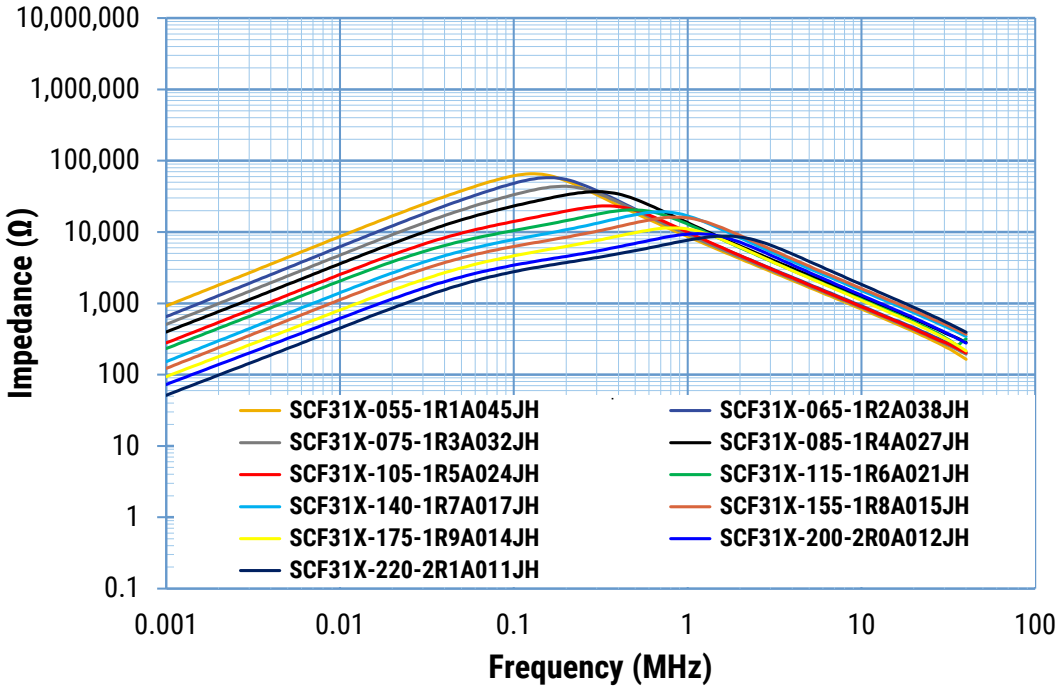
Performance Characteristics

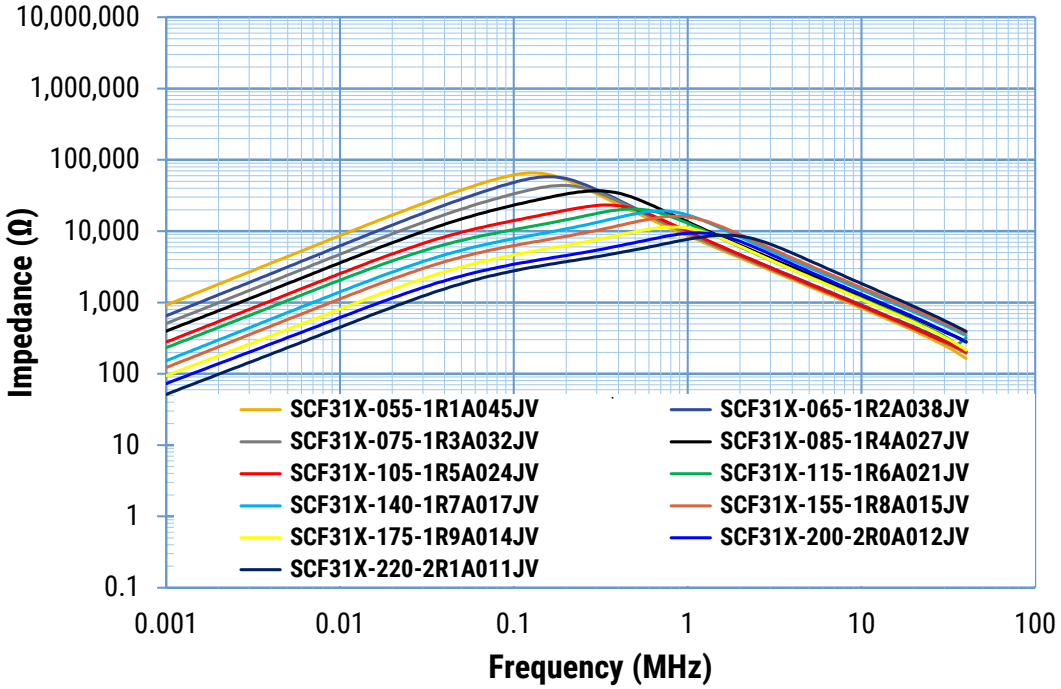
Item	Performance Characteristics
Rated Voltage	500 VAC
Withstanding Voltage	2,400 VAC (2 seconds, between lines)
Insulation Resistance	> 100 MΩ at 500 VDC (between lines)
Rated Current Range	5.5 – 22 A
Rated Inductance Range	0.88 – 95.26 mH minimum
Inductance Measurement Condition	10kHz
Thermal Class	130°C
Operating Temperature Range	-40°C to +130°C (include self temperature rise)

Table 1 – Ratings & Part Number Reference

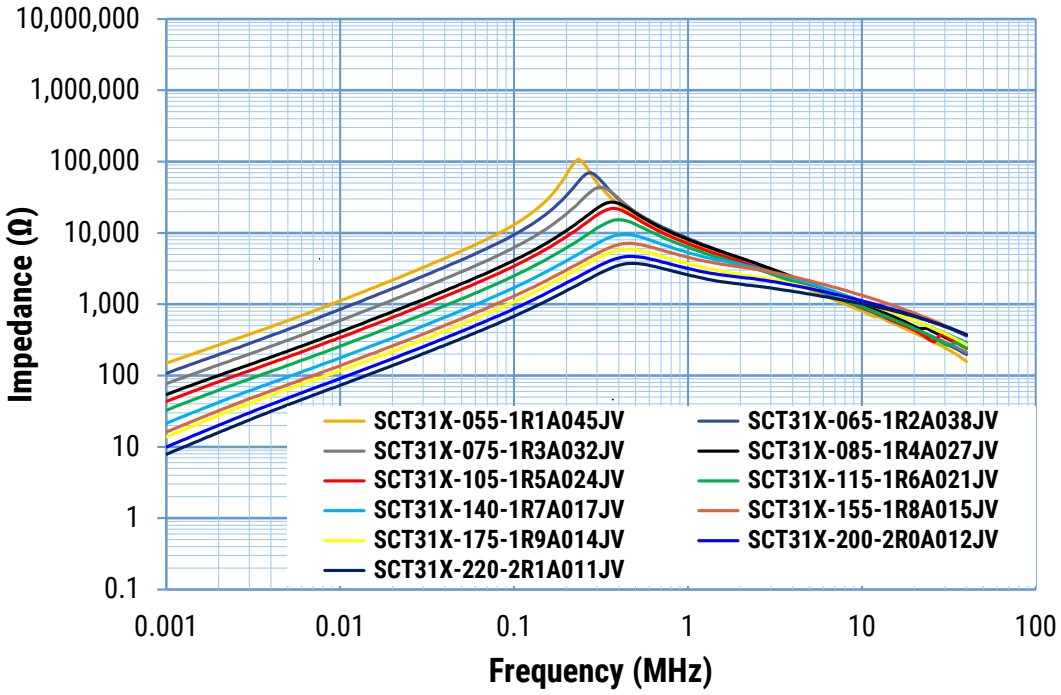
Part Number	Rated Voltage AC/DC (V)	Rated Current AC (A)	Inductance 100kHz (mH) Minimum	DC Resistance/ Line (mΩ) Maximum	Temperature Rise (K) Maximum	Wire Diameter (mm)	Weight (g) Approximate
SCF31X-055-1R1A045JV	500	5.5	95.26	65.26	50	1.1	91.2
SCF31X-065-1R2A038JV	500	6.5	67.92	44.89	50	1.2	91.6
SCF31X-075-1R3A032JV	500	7.5	48.17	31.93	45	1.3	90.1
SCF31X-085-1R4A027JV	500	8.5	34.28	24.49	45	1.4	88.1
SCF31X-105-1R5A024JV	500	10.5	27.09	18.25	45	1.5	90.5
SCF31X-115-1R6A021JV	500	11.5	20.73	13.69	45	1.6	91.1
SCF31X-140-1R7A017JV	500	14.0	13.58	9.91	45	1.7	89.8
SCF31X-155-1R8A015JV	500	15.5	10.58	7.80	40	1.8	90.1
SCF31X-175-1R9A014JV	500	17.5	9.21	6.60	45	1.9	93.0
SCF31X-200-2R0A012JV	500	20.0	6.77	5.16	45	2.0	89.1
SCF31X-220-2R1A011JV	500	22.0	5.68	4.39	45	2.1	91.9
SCF31X-055-1R1A045JH	500	5.5	95.26	65.26	50	1.1	91.2
SCF31X-065-1R2A038JH	500	6.5	67.92	44.89	50	1.2	91.6
SCF31X-075-1R3A032JH	500	7.5	48.17	31.93	45	1.3	90.1
SCF31X-085-1R4A027JH	500	8.5	34.28	24.49	45	1.4	88.1
SCF31X-105-1R5A024JH	500	10.5	27.09	18.25	45	1.5	90.5
SCF31X-115-1R6A021JH	500	11.5	20.73	13.69	45	1.6	91.1
SCF31X-140-1R7A017JH	500	14.0	13.58	9.91	45	1.7	89.8
SCF31X-155-1R8A015JH	500	15.5	10.58	7.80	40	1.8	90.1
SCF31X-175-1R9A014JH	500	17.5	9.21	6.60	45	1.9	93.0
SCF31X-200-2R0A012JH	500	20.0	6.77	5.16	45	2.0	89.1
SCF31X-220-2R1A011JH	500	22.0	5.68	4.39	45	2.1	91.9
SCT31X-055-1R1A045JV	500	5.5	14.87	65.26	50	1.1	91.2
SCT31X-065-1R2A038JV	500	6.5	10.61	44.89	50	1.2	91.6
SCT31X-075-1R3A032JV	500	7.5	7.51	31.93	45	1.3	90.1
SCT31X-085-1R4A027JV	500	8.5	5.35	24.49	45	1.4	88.1
SCT31X-105-1R5A024JV	500	10.5	4.22	18.25	45	1.5	90.5
SCT31X-115-1R6A021JV	500	11.5	3.23	13.69	45	1.6	91.1
SCT31X-140-1R7A017JV	500	14.0	2.11	9.91	45	1.7	89.8
SCT31X-155-1R8A015JV	500	15.5	1.64	7.80	40	1.8	90.1
SCT31X-175-1R9A014JV	500	17.5	1.43	6.60	45	1.9	93.0
SCT31X-200-2R0A012JV	500	20.0	1.05	5.16	45	2.0	89.1
SCT31X-220-2R1A011JV	500	22.0	0.88	4.39	45	2.1	91.9
SCT31X-055-1R1A045JH	500	5.5	14.87	65.26	50	1.1	91.2
SCT31X-065-1R2A038JH	500	6.5	10.61	44.89	50	1.2	91.6
SCT31X-075-1R3A032JH	500	7.5	7.51	31.93	45	1.3	90.1
SCT31X-085-1R4A027JH	500	8.5	5.35	24.49	45	1.4	88.1
SCT31X-105-1R5A024JH	500	10.5	4.22	18.25	45	1.5	90.5
SCT31X-115-1R6A021JH	500	11.5	3.23	13.69	45	1.6	91.1
SCT31X-140-1R7A017JH	500	14.0	2.11	9.91	45	1.7	89.8
SCT31X-155-1R8A015JH	500	15.5	1.64	7.80	40	1.8	90.1
SCT31X-175-1R9A014JH	500	17.5	1.43	6.60	45	1.9	93.0
SCT31X-200-2R0A012JH	500	20.0	1.05	5.16	45	2.0	89.1
SCT31X-220-2R1A011JH	500	22.0	0.88	4.39	45	2.1	91.9

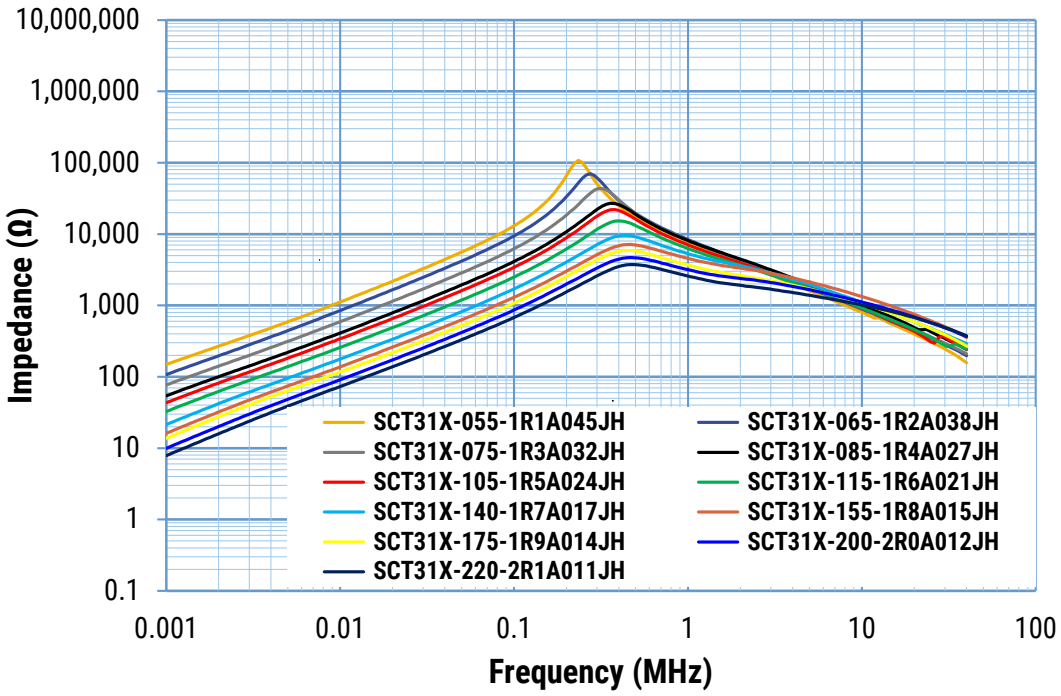
Frequency Characteristics





Frequency Characteristics cont.





Packaging

Type	Packaging Type	Pieces Per Box
SCF31X-JV	Tray	60
SCF31X-JH		80
SCF31X-JV		60
SCF31X-JH		80

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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