

# Common Mode SSR Coils, 21NVS-M/NHS-M, Wide Range Impedance Type

## Overview

The KEMET SSR coils are common mode chokes with a wide variety of characteristics. These gear type coils are designed with our proprietary high permeability ferrite S15H cores and are useful in various noise countermeasure fields.

## Applications

- Audio-visual equipment
- Office automation equipment
- Digital appliances
- Power supplies

## Benefits

- Proprietary S15H ferrite material
- High permeability
- Higher performance due additional windings
- High impedance in wide frequency range due to divided bobbin
- Compact size, low profile and light weight
- Operating temperature range from -25°C to +120°C
- UL94 V-0 flame retardant rated base and bobbin



## Part Number System

| SSR    | 21N            | VS-M                                                                                                                   | 03                                                                    | 1500                                                                             |
|--------|----------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Series | Core Size (mm) | Core Orientation and Bobbin Type                                                                                       | Rated Current AC (A)                                                  | Inductance (mH) Minimum                                                          |
| SSR    | 21N = 20.9 mm  | HS-M = Horizontal, bobbin with sectional winding structure<br>VS-M = Vertical, bobbin with sectional winding structure | 0x = 0.x A<br>xx = x.x A<br><br>Examples:<br>04 = 0.4 A<br>13 = 1.3 A | xxx0 = xxx mH<br>xxx = xx.x mH<br><br>Examples:<br>1590 = 159 mH<br>034 = 3.4 mH |

## 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.

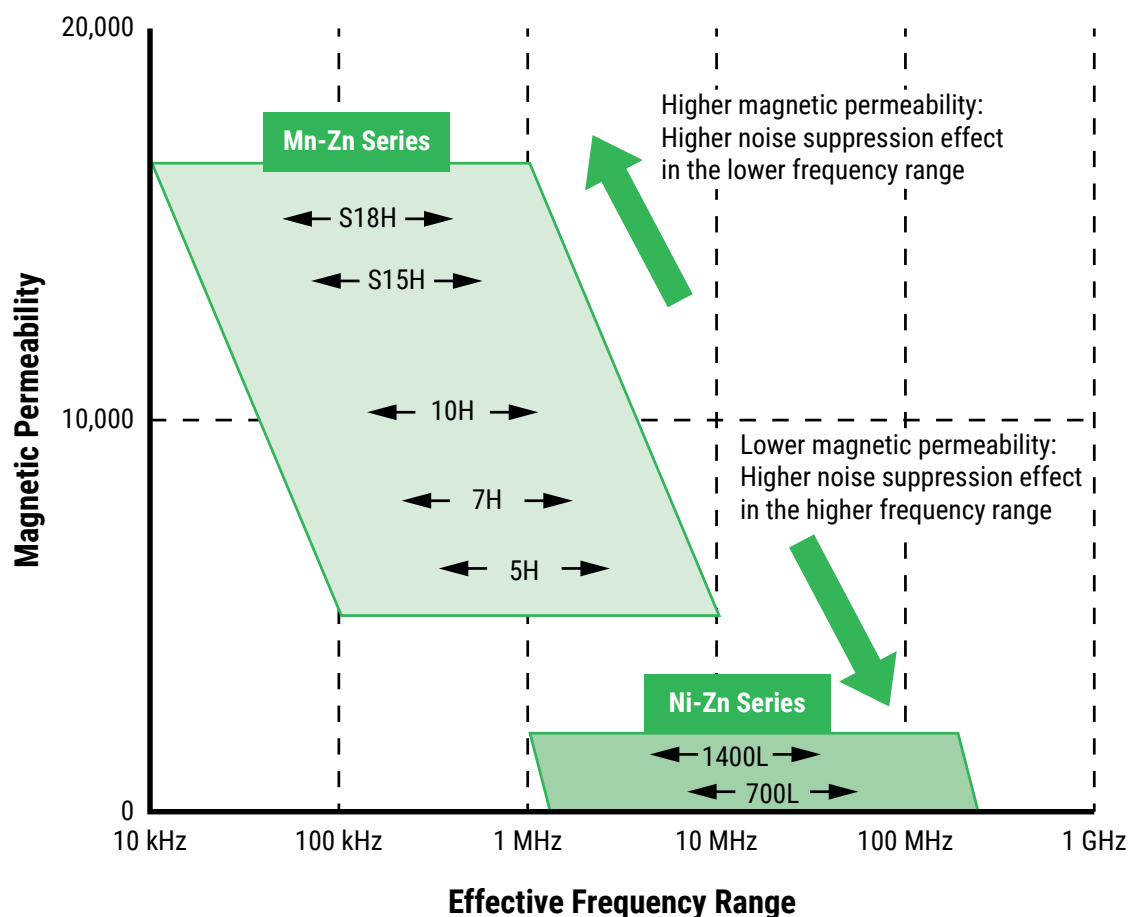
A schematic representation of the relationship between the magnetic permeability of each material and the corresponding effective band range is shown in Figure 1. Materials with higher magnetic permeability are effective in the lower frequency range, while those with lower magnetic permeability are effective 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, 5H, 1400L and 700L are KEMET's proprietary ferrite material names.

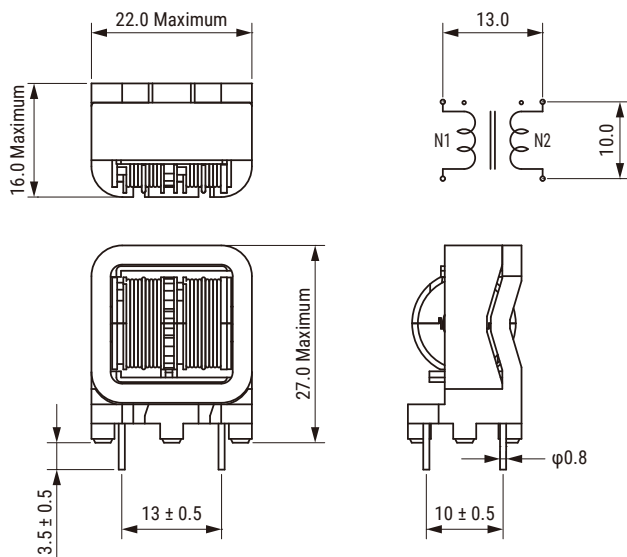
Other materials can also be available on request.

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

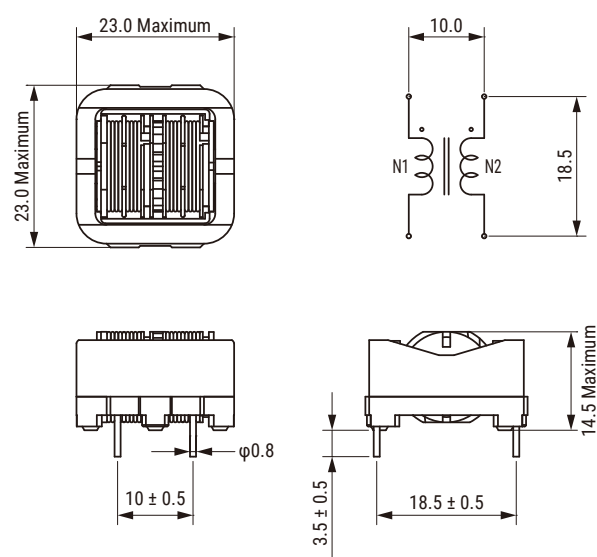


## Dimensions – Millimeters

### ● SSR21NVS-M



### ● SSR21NHS-M



## Environmental Compliance

All KEMET AC Line Filters are RoHS Compliant.



RoHS Compliant

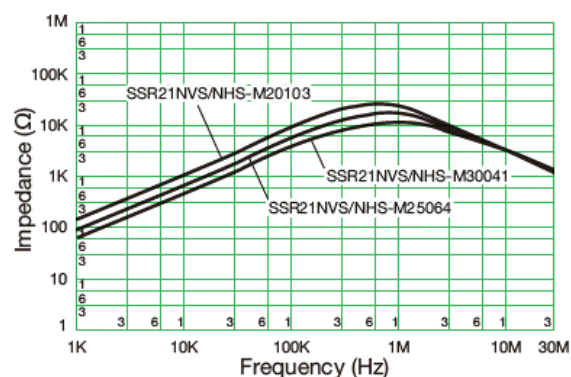
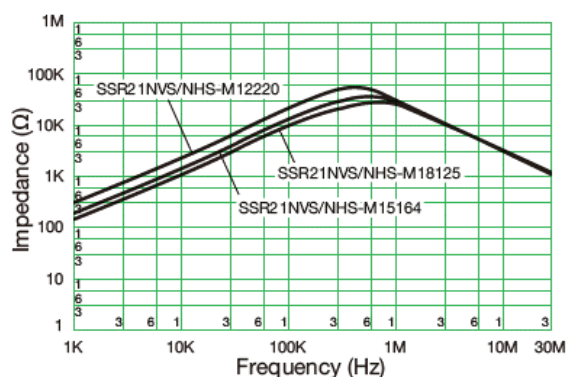
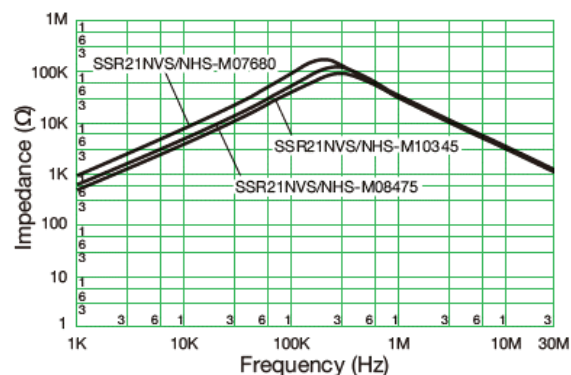
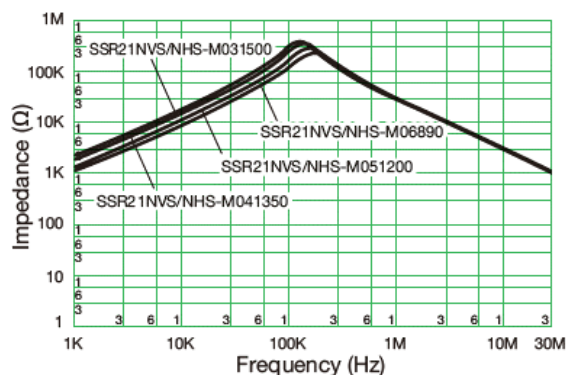
**Table 1 – Ratings & Part Number Reference**

| Part Number      | Rated Current<br>AC (A) | Inductance (mH)<br>Minimum | DC Resistance/<br>Line ( $\Omega$ )<br>Maximum | Temperature<br>Rise (K)<br>Maximum | Wire Diameter<br>(mm) | Weight (g)<br>Approximate |
|------------------|-------------------------|----------------------------|------------------------------------------------|------------------------------------|-----------------------|---------------------------|
| SSR21NHS-M031500 | 0.3                     | 150.0                      | 2.70                                           | 40                                 | 0.20                  | 13.0                      |
| SSR21NVS-M031500 | 0.3                     | 150.0                      | 2.70                                           | 40                                 | 0.20                  | 14.5                      |
| SSR21NHS-M041350 | 0.4                     | 135.0                      | 2.00                                           | 40                                 | 0.23                  | 13.0                      |
| SSR21NVS-M041350 | 0.4                     | 135.0                      | 2.00                                           | 40                                 | 0.23                  | 14.5                      |
| SSR21NHS-M051200 | 0.5                     | 120.0                      | 1.85                                           | 60                                 | 0.23                  | 13.0                      |
| SSR21NVS-M051200 | 0.5                     | 120.0                      | 1.85                                           | 60                                 | 0.23                  | 14.5                      |
| SSR21NHS-M06890  | 0.6                     | 89.0                       | 1.35                                           | 60                                 | 0.25                  | 13.0                      |
| SSR21NVS-M06890  | 0.6                     | 89.0                       | 1.35                                           | 60                                 | 0.25                  | 14.5                      |
| SSR21NHS-M07680  | 0.7                     | 68.0                       | 0.95                                           | 60                                 | 0.28                  | 13.0                      |
| SSR21NVS-M07680  | 0.7                     | 68.0                       | 0.95                                           | 60                                 | 0.28                  | 14.5                      |
| SSR21NHS-M08475  | 0.8                     | 47.5                       | 0.68                                           | 60                                 | 0.30                  | 13.0                      |
| SSR21NVS-M08475  | 0.8                     | 47.5                       | 0.68                                           | 60                                 | 0.30                  | 14.5                      |
| SSR21NHS-M10345  | 1.0                     | 34.5                       | 0.51                                           | 60                                 | 0.32                  | 13.0                      |
| SSR21NVS-M10345  | 1.0                     | 34.5                       | 0.51                                           | 60                                 | 0.32                  | 14.5                      |
| SSR21NHS-M12220  | 1.2                     | 22.0                       | 0.35                                           | 60                                 | 0.35                  | 13.0                      |
| SSR21NVS-M12220  | 1.2                     | 22.0                       | 0.35                                           | 60                                 | 0.35                  | 14.5                      |
| SSR21NHS-M15164  | 1.5                     | 16.4                       | 0.23                                           | 60                                 | 0.40                  | 13.0                      |
| SSR21NVS-M15164  | 1.5                     | 16.4                       | 0.23                                           | 60                                 | 0.40                  | 14.5                      |
| SSR21NHS-M18125  | 1.8                     | 12.5                       | 0.19                                           | 60                                 | 0.40                  | 13.0                      |
| SSR21NVS-M18125  | 1.8                     | 12.5                       | 0.19                                           | 60                                 | 0.40                  | 14.5                      |
| SSR21NHS-M20103  | 2.0                     | 10.3                       | 0.15                                           | 60                                 | 0.45                  | 13.0                      |
| SSR21NVS-M20103  | 2.0                     | 10.3                       | 0.15                                           | 60                                 | 0.45                  | 14.5                      |
| SSR21NHS-M25064  | 2.5                     | 6.4                        | 0.09                                           | 60                                 | 0.50                  | 13.0                      |
| SSR21NVS-M25064  | 2.5                     | 6.4                        | 0.09                                           | 60                                 | 0.50                  | 14.5                      |
| SSR21NHS-M30041  | 3.0                     | 4.1                        | 0.07                                           | 60                                 | 0.55                  | 13.0                      |
| SSR21NVS-M30041  | 3.0                     | 4.1                        | 0.07                                           | 60                                 | 0.55                  | 14.5                      |

## Performance Characteristics

| Item                             | Performance Characteristics                     |
|----------------------------------|-------------------------------------------------|
| Rated Voltage                    | 250 VAC                                         |
| Withstanding Voltage             | 2,400 VAC (2 seconds, between lines)            |
| Insulation Resistance            | > 100 M $\Omega$ at 500 VDC (between lines)     |
| Rated Current AC Range           | 0.3 – 3.0 A                                     |
| Rated Inductance Range           | 4.1 – 150.0 mH minimum                          |
| Inductance Measurement Condition | 10 kHz                                          |
| Thermal Class                    | E (120°C)                                       |
| Operating Temperature Range      | -25°C to +120°C (include self temperature rise) |
| Inductance Measurement Condition | at 10 kHz                                       |

## Frequency Characteristics



## Packaging

| Type       | Packaging Type | Pieces per Box |
|------------|----------------|----------------|
| SSR21NHS-M | Tray           | 420            |
| SSR21NVS-M |                | 450            |

## 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 and atmospheres should be free of chlorine and sulfur bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts. Avoid also storage near strong magnetic fields as this might magnetize the product.

For optimized solderability, AC Line Filters' stock should be used promptly, 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.

Check and evaluate the value of the core temperature rise under actual operating conditions when using.

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## Export Control

### For customers in Japan

For products that are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

### For customers outside Japan

AC Line Filters should not be used or sold for the use in the development, production, stockpiling or utilization of any conventional weapons, mass-destruction weapons (nuclear, chemical, biological weapons or missiles) or any other weapons.

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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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