

# Ferrite Cores for EMI Suppression For Flat Cable and Flexible Substrate

## SH Series(Square Type)

### FEATURES

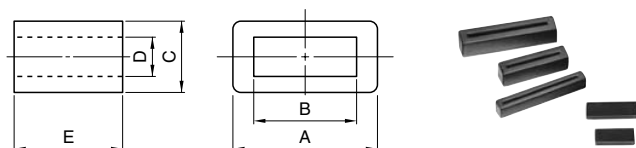
- Both regular and clamp-on types are available for use with flat cables and flexible substrate. Moreover, the thin type matched to small space is prepared.

### APPLICATIONS

Imaging devices, audio equipment, automotive electronics, telecommunication devices, office automation equipment, and others.

- Absorption EMI and penetrating noise
- Prevent parasitic oscillation

### SHAPES AND DIMENSIONS/CHARACTERISTICS

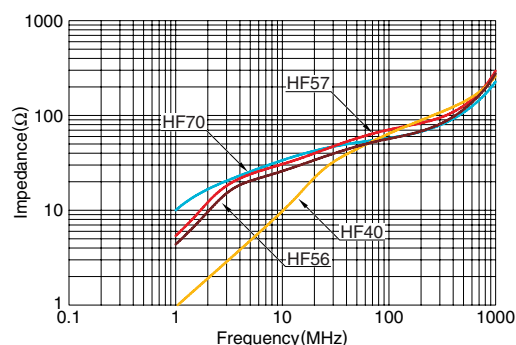


### MATERIAL CHARACTERISTICS

| Material | Initial permeability $\mu_i$ | Temperature factor of initial permeability $\alpha_{\mu ir} \times 10^{-6}/^{\circ}\text{C}$ | Curie temperature $T_c$ ( $^{\circ}\text{C}$ ) | Saturation magnetic flux density $B_s$ (mT) |
|----------|------------------------------|--|--|---|
| HF70     | 1500                         | 1 to 6   | >100   | 280[H=1600A/m]                              |
| HF57     | 600                          | 3 to 15  | >150   | 370[H=4000A/m]                              |
| HF56     | 600                          | 18 to 28   | >130   | 290[H=4000A/m]                              |
| HF40     | 120                          | 8 to 18  | >250   | 410[H=4000A/m]                              |

### TYPICAL MATERIAL CHARACTERISTICS

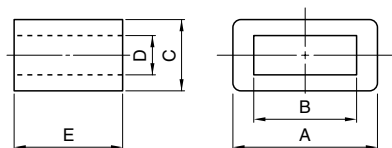
#### SHAPE: T20X10X12



| Part No.         | Dimensions(mm) |                |                |               |                | Impedance Z ( $\Omega$ )[at 23 $^{\circ}\text{C}$ ] |             | Features  |
|------------------|----------------|----------------|----------------|---------------|----------------|---|-------------|-----------|
|                  | A              | B              | C              | D             | E              | 10MHz typ.  | 100MHz typ. |           |
| HF70SH6X0.6X5    | 8.5 $\pm$ 0.25 | 6.0 $\pm$ 0.2  | 2.0 $\pm$ 0.2  | 0.6 $\pm$ 0.2 | 5.0 $\pm$ 0.3  | 11  | 25          | Thin type |
| HF70SH7X0.6X8    | 9.5 $\pm$ 0.3  | 7.0 $\pm$ 0.3  | 2.1 $\pm$ 0.25 | 0.6 $\pm$ 0.2 | 8.0 $\pm$ 0.3  | 14  | 30          | Thin type |
| HF70SH8X0.6X5    | 10.5 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 2.1 $\pm$ 0.25 | 0.6 $\pm$ 0.2 | 5.0 $\pm$ 0.3  | 10  | 24          | Thin type |
| HF56SH8X1X10     | 12.2 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 5.5 $\pm$ 0.3  | 1.0 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 30  | 65          |           |
| HF70SH8X1X18     | 12.2 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 5.5 $\pm$ 0.3  | 1.0 $\pm$ 0.3 | 18.0 $\pm$ 0.5 | 71  | 128         |           |
| HF70SH9X0.7X10   | 12.6 $\pm$ 0.3 | 9.0 $\pm$ 0.3  | 3.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 27  | 54          |           |
| HF56SH9X0.7X10   | 12.6 $\pm$ 0.3 | 9.0 $\pm$ 0.3  | 3.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 21  | 51          |           |
| HF70SH10X1X6     | 14.0 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 1.0 $\pm$ 0.3 | 6.0 $\pm$ 0.3  | 20  | 37          |           |
| HF56SH10X1X8     | 14.0 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 1.0 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 19  | 43          |           |
| HF40SH10X0.6X3-G | 12.5 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 2.1 $\pm$ 0.25 | 0.6 $\pm$ 0.2 | 3.0 $\pm$ 0.2  | 3   | 21          | Thin type |
| HF70SH10X0.6X5   | 12.5 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 2.1 $\pm$ 0.25 | 0.6 $\pm$ 0.2 | 5.0 $\pm$ 0.3  | 8   | 23          | Thin type |
| HF70SH11X0.7X8   | 13.5 $\pm$ 0.3 | 11.0 $\pm$ 0.3 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 15  | 32          | Thin type |
| HF70SH12X0.9X12  | 16.0 $\pm$ 0.3 | 12.0 $\pm$ 0.3 | 4.65 $\pm$ 0.7 | 0.9 $\pm$ 0.1 | 12.0 $\pm$ 0.4 | 31  | 58          |           |
| HF70SH13X0.7X3A  | 17.0 $\pm$ 0.5 | 13.0 $\pm$ 0.4 | 2.3 $\pm$ 0.25 | 0.7 $\pm$ 0.2 | 3.0 $\pm$ 0.2  | 5   | 19          | Thin type |
| HF70SH13X0.7X7   | 17.0 $\pm$ 0.5 | 13.0 $\pm$ 0.4 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 7.0 $\pm$ 0.4  | 12  | 36          | Thin type |
| HF56SH13X0.7X8B  | 16.6 $\pm$ 0.4 | 13.0 $\pm$ 0.3 | 3.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 13  | 36          |           |
| HF70SH13X0.7X10  | 17.0 $\pm$ 0.5 | 13.0 $\pm$ 0.4 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 10.0 $\pm$ 0.4 | 17  | 40          | Thin type |
| HF70SH13X0.7X12  | 17.0 $\pm$ 0.5 | 13.0 $\pm$ 0.4 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 12.0 $\pm$ 0.4 | 19  | 45          | Thin type |
| HF56SH13X0.7X12B | 16.6 $\pm$ 0.4 | 13.0 $\pm$ 0.3 | 3.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 12.0 $\pm$ 0.5 | 19  | 53          |           |
| HF70SH13X1.3X12  | 17.0 $\pm$ 0.5 | 13.0 $\pm$ 0.4 | 3.5 $\pm$ 0.3  | 1.3 $\pm$ 0.3 | 12.0 $\pm$ 0.4 | 19  | 41          |           |
| HF70SH15X0.7X8   | 17.5 $\pm$ 0.4 | 15.0 $\pm$ 0.3 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 12  | 36          | Thin type |
| HF40SH15X0.7X8-G | 17.5 $\pm$ 0.4 | 15.0 $\pm$ 0.3 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 8.0 $\pm$ 0.3  | 4.5   | 34          | Thin type |
| HF70SH15X0.7X10  | 17.5 $\pm$ 0.4 | 15.0 $\pm$ 0.3 | 2.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 10.0 $\pm$ 0.3 | 14  | 40          | Thin type |
| HF56SH15X0.7X12A | 18.6 $\pm$ 0.4 | 15.0 $\pm$ 0.3 | 3.75 $\pm$ 0.3 | 0.7 $\pm$ 0.3 | 12.0 $\pm$ 0.5 | 17  | 52          |           |
| HF70SH17.5X0.6X8 | 20.5 $\pm$ 0.4 | 17.5 $\pm$ 0.4 | 2.0 $\pm$ 0.2  | 0.6 $\pm$ 0.2 | 8.0 $\pm$ 0.4  | 8   | 33          | Thin type |

• All specifications are subject to change without notice.

## SHAPES AND DIMENSIONS/CHARACTERISTICS

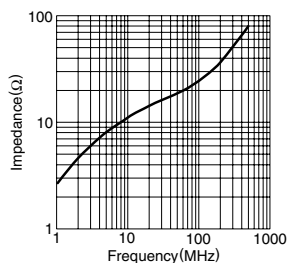


| Part No.           | Dimensions(mm) |              |          |               |          | Impedance Z ( $\Omega$ )[at 23°C] |             | Features  |
|--------------------|----------------|--------------|----------|---------------|----------|-----------------------------------|-------------|-----------|
|                    | A              | B            | C        | D             | E        | 10MHz typ.                        | 100MHz typ. |           |
| HF40SH18.5X0.7X8-G | 21.5±0.4       | 18.5±0.4     | 3.0±0.3  | 0.7±0.3       | 8.0±0.3  | 5                                 | 36          | Thin type |
| HF70SH18.5X0.7X6   | 21.5±0.4       | 18.5±0.4     | 3.0±0.3  | 0.7±0.3       | 6.0±0.3  | 9                                 | 27          | Thin type |
| HF70SH18.5X0.7X8   | 21.5±0.4       | 18.5±0.4     | 3.0±0.3  | 0.7±0.3       | 8.0±0.3  | 11                                | 33          | Thin type |
| HF70SH18.8X1.1X7   | 23.8±0.4       | 18.8±0.4     | 6.3±0.4  | 1.1±0.2       | 7.0±0.5  | 19                                | 41          |           |
| HF56SH18.8X1.1X7   | 23.8±0.4       | 18.8±0.4     | 6.3±0.4  | 1.1±0.3       | 7.0±0.3  | 13                                | 35          |           |
| HF70SH18.8X1.1X15  | 23.8±0.4       | 18.8±0.4     | 6.3±0.4  | 1.1±0.2       | 15.0±0.5 | 38                                | 75          |           |
| HF56SH18.8X1.1X15  | 23.8±0.4       | 18.8±0.4     | 6.3±0.4  | 1.1±0.2       | 15.0±0.5 | 29                                | 74          |           |
| HF70SH20X0.5X8     | 22.6±0.4       | 20.0±0.4     | 1.8±0.25 | 0.5±0.2       | 8.0±0.3  | 8                                 | 35          | Thin type |
| HF70SH20X0.7X8     | 23.0±0.6       | 20.0±0.6     | 3.0±0.4  | 0.7±0.4       | 8.0±0.5  | 12                                | 37          | Thin type |
| HF70SH20X0.7X12    | 23.0±0.6       | 20.0±0.6     | 3.0±0.4  | 0.7±0.4       | 12.0±0.5 | 15                                | 50          | Thin type |
| HF70SH20X0.9X12    | 23.0±0.6       | 20.0±0.6     | 3.0±0.4  | 0.9±0.2       | 12.0±0.5 | 14                                | 40          | Thin type |
| HF70SH21X0.8X7     | 25.0±0.8       | 21.0±0.7     | 5.0±0.5  | 0.8±0.4       | 7.0±0.5  | 16                                | 45          |           |
| HF70SH21X0.8X12    | 25.0±0.8       | 21.0±0.7     | 5.0±0.5  | 0.8±0.4, -0.3 | 12.0±0.5 | 22                                | 53          |           |
| HF56SH21X0.8X12    | 25.0±0.8       | 21.0±0.7     | 5.0±0.5  | 0.8±0.4       | 12.0±0.5 | 18                                | 56          |           |
| HF70SH22X0.8X7     | 26.0±0.8       | 22.0±0.7     | 5.0±0.5  | 0.8±0.4       | 7.0±0.5  | 15                                | 40          |           |
| HF56SH22X0.8X12    | 26.0±0.8       | 22.0±0.7     | 5.0±0.5  | 0.8±0.4       | 12.0±0.5 | 17                                | 56          |           |
| HF70SH25X0.7X10    | 28.6±0.4       | 25.0±0.5     | 3.75±0.4 | 0.7±0.3       | 10.0±0.3 | 14                                | 47          |           |
| HF70SH25X1X15      | 31.0±0.5       | 25.0±0.5     | 7.0±0.3  | 1.0±0.3       | 15.0±0.8 | 36                                | 80          |           |
| HF70SH27X1.3X10    | 33.5±0.8       | 27.0±0.8     | 6.5±0.4  | 1.3±0.3       | 10.0±0.5 | 21                                | 55          |           |
| HF56SH27X1.3X10    | 33.5±0.8       | 27.0±0.8     | 6.5±0.4  | 1.3±0.3       | 10.0±0.5 | 14                                | 45          |           |
| HF70SH28X0.7X12    | 32.0±0.8       | 28.0±0.8     | 3.5±0.4  | 0.7±0.4       | 12.0±0.5 | 16                                | 58          |           |
| HF70SH28X2X10      | 34.0±0.5       | 28.0±0.5     | 7.5±0.5  | 2.0±0.2       | 10.0±0.3 | 23                                | 53          |           |
| HF70SH32X2X12.5    | 40.0±1.0       | 32.0±1.0     | 10.0±0.5 | 2.0±0.5       | 12.5±0.5 | 27                                | 64          |           |
| HF70SH32X2X25      | 40.0±1.0       | 32.0±1.0     | 10.0±0.5 | 2.0±0.5       | 25.0±1.0 | 52                                | 120         |           |
| HF70SH35X0.8X8     | 39.0±0.8       | 35.0±0.8     | 4.0±0.5  | 0.8±0.5       | 8.0±0.5  | 10                                | 40          |           |
| HF70SH35X0.8X12    | 39.0±0.8       | 35.0±0.8     | 4.0±0.5  | 0.8±0.5       | 12.0±0.5 | 15                                | 60          |           |
| HF70SH35X1.3X12    | 40.0±1.0       | 35.0±1.0     | 6.5±0.4  | 1.3±0.3       | 12.0±0.5 | 19                                | 58          |           |
| HF56SH35X1.3X12    | 40.0±1.0       | 35.0±1.0     | 6.5±0.4  | 1.3±0.3       | 12.0±0.5 | 16                                | 60          |           |
| HF70SH40X1.3X8     | 46.5±1.0       | 40.0±1.0     | 6.5±0.4  | 1.3±0.3       | 8.0±0.4  | 12                                | 41          |           |
| HF70SH40X2X12      | 50.0±0, -2.0   | 40.0±2.0, -0 | 12.0±0.5 | 2.0±0.5       | 12.0±1.0 | 25                                | 60          |           |
| HF70SH41X0.8X12    | 46.0±1.0       | 41.0±1.0     | 4.5±0.5  | 0.8±0.5, -0.2 | 12.0±0.5 | 16                                | 60          |           |
| HF70SH42X0.9X12    | 47.0±1.0       | 42.0±0.8     | 4.6±0.5  | 0.95±0.35     | 12.0±0.5 | 14                                | 55          |           |
| HF70SH46X1.9X10    | 53.0±1.0       | 46.0±1.0     | 7.1±0.6  | 1.9±0.5       | 10.0±0.5 | 15                                | 48          |           |
| HF70SH46X1.9X13    | 56.0±1.0       | 46.0±1.0     | 12.0±0.5 | 1.9±0.5       | 13.0±0.5 | 29                                | 73          |           |
| HF70SH52X1X12      | 57.0±1.0       | 52.0±1.0     | 5.0±0.5  | 1.0±0.5       | 12.0±0.5 | 16                                | 62          |           |

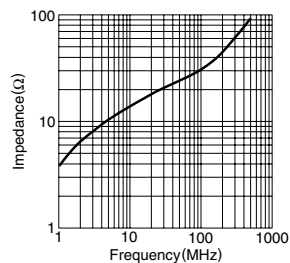
## TYPICAL ELECTRICAL CHARACTERISTICS

### IMPEDANCE vs. FREQUENCY CHARACTERISTICS

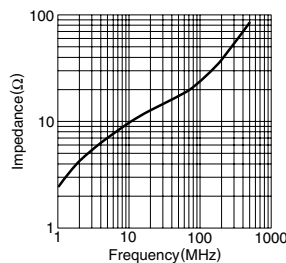
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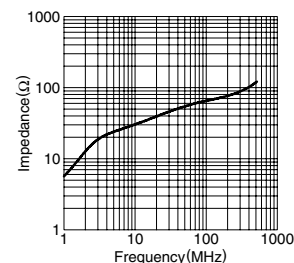
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HF70SH8X0.6X5



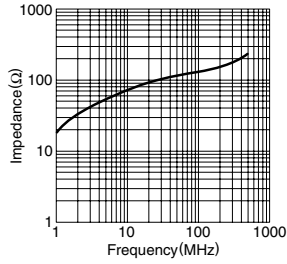
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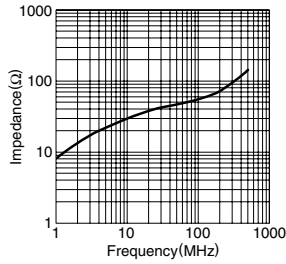
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**TYPICAL ELECTRICAL CHARACTERISTICS**  
**IMPEDANCE vs. FREQUENCY CHARACTERISTICS**

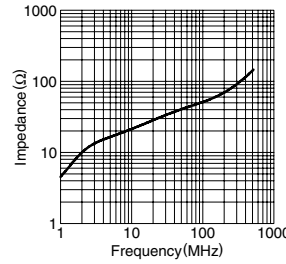
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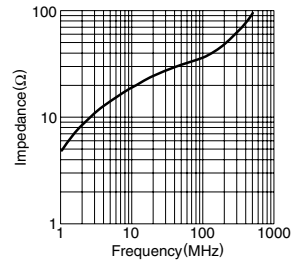
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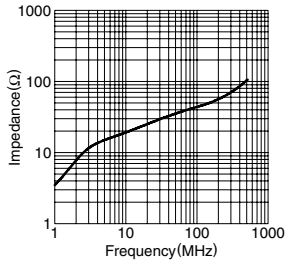
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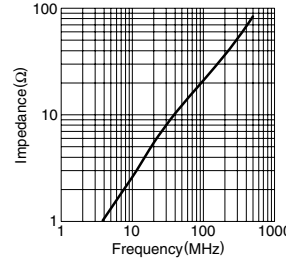
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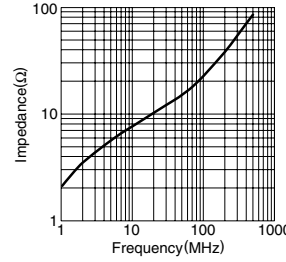
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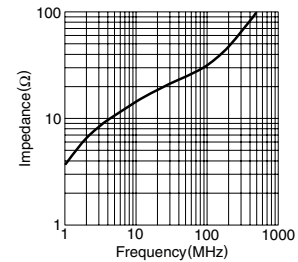
**HF40SH10X0.6X3-G**



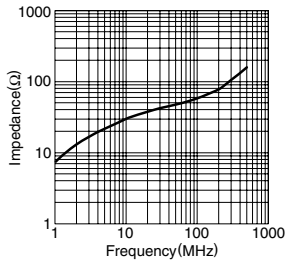
**HF70SH10X0.6X5**



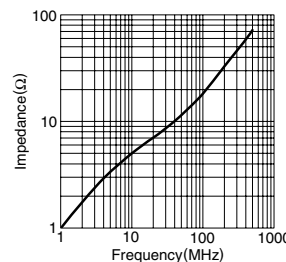
**HF70SH11X0.7X8**



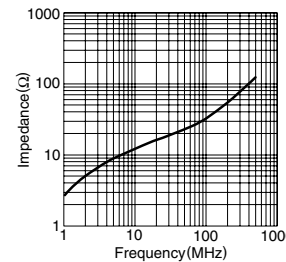
**HF70SH12X0.9X12**



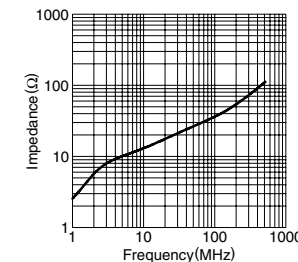
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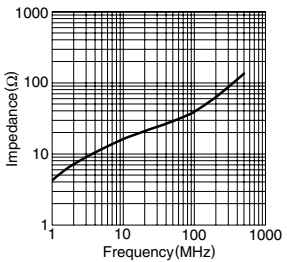
**HF70SH13X0.7X7**



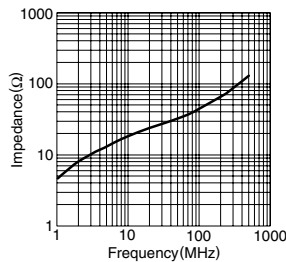
**HF56SH13X0.7X8B**



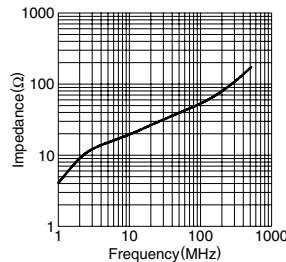
**HF70SH13X0.7X10**



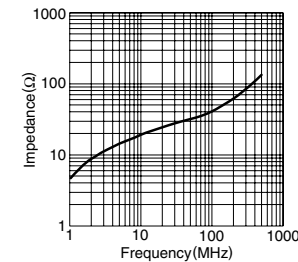
**HF70SH13X0.7X12**



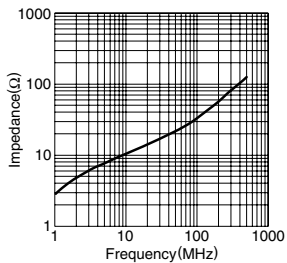
**HF56SH13X0.7X12B**



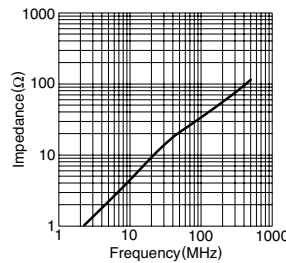
**HF70SH13X1.3X12**



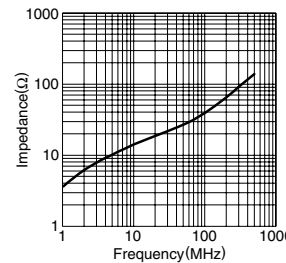
**HF70SH15X0.7X8**



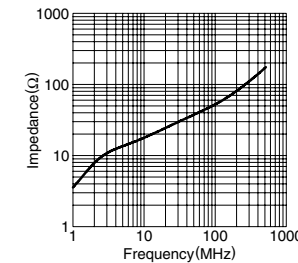
**HF40SH15X0.7X8-G**



**HF70SH15X0.7X10**



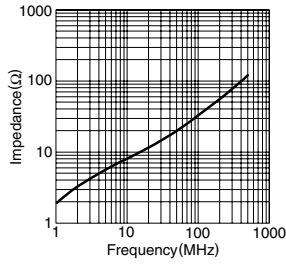
**HF56SH15X0.7X12A**



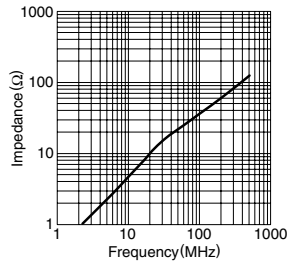
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**IMPEDANCE vs. FREQUENCY CHARACTERISTICS**

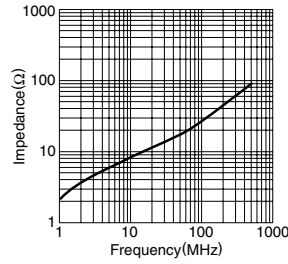
**HF70SH17.5X0.6X8**



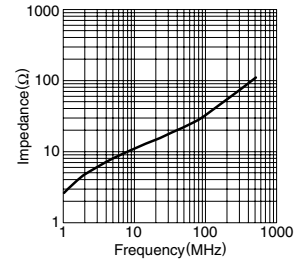
**HF40SH18.5X0.7X8-G**



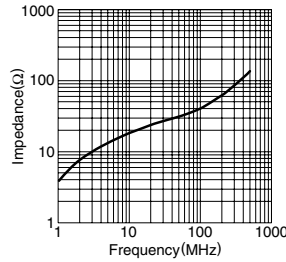
**HF70SH18.5X0.7X6**



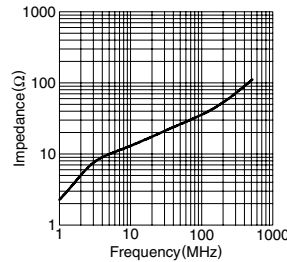
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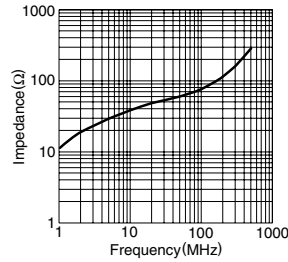
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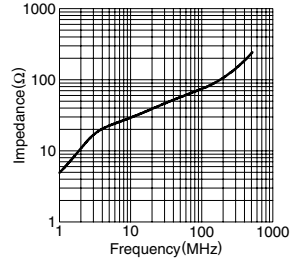
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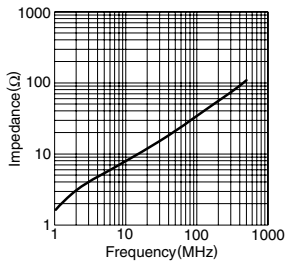
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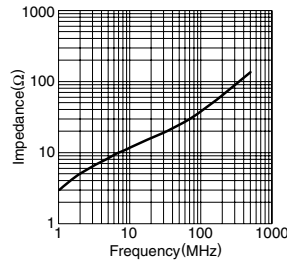
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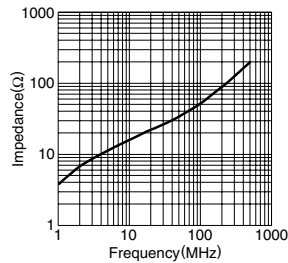
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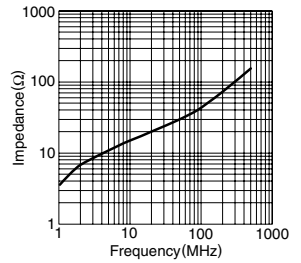
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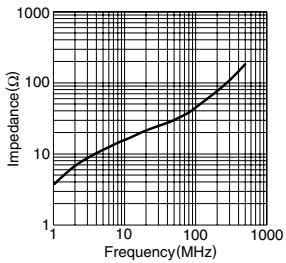
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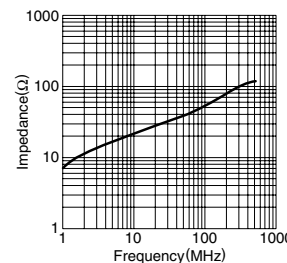
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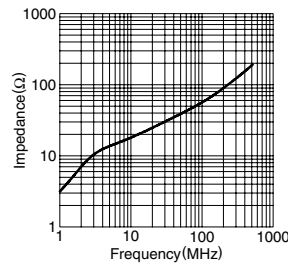
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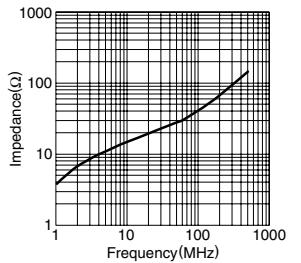
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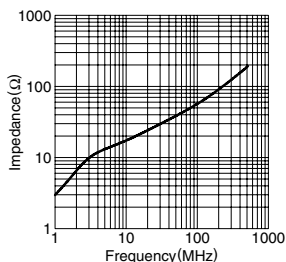
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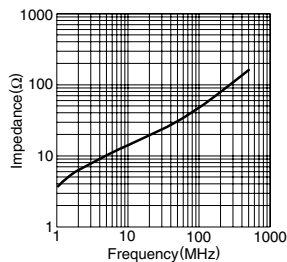
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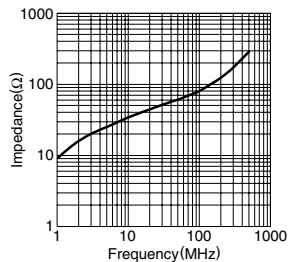
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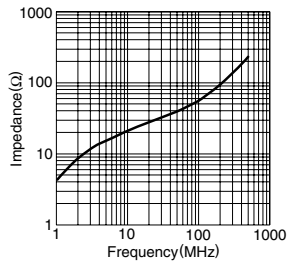
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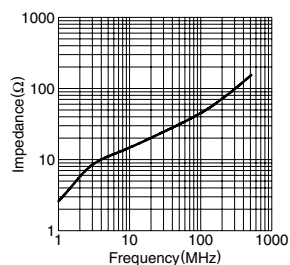
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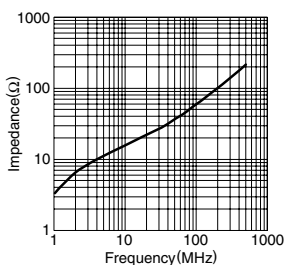
• All specifications are subject to change without notice.

### TYPICAL ELECTRICAL CHARACTERISTICS IMPEDANCE vs. FREQUENCY CHARACTERISTICS

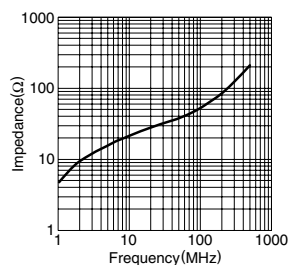
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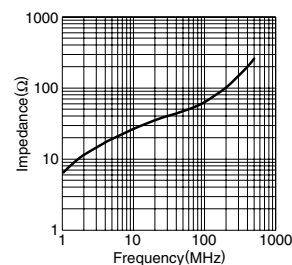
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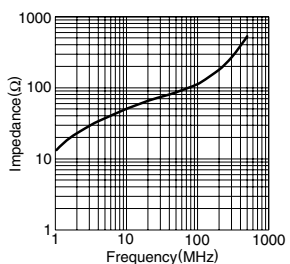
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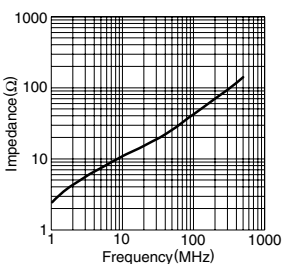
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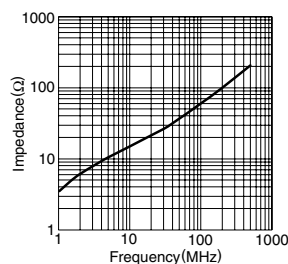
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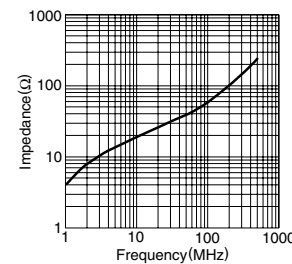
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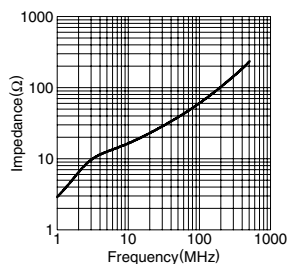
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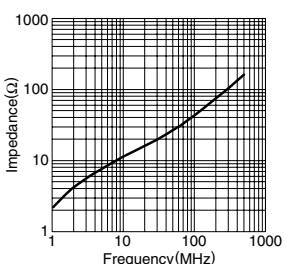
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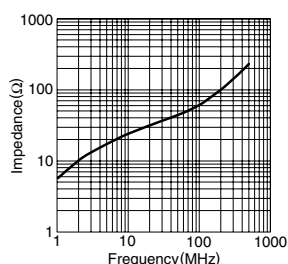
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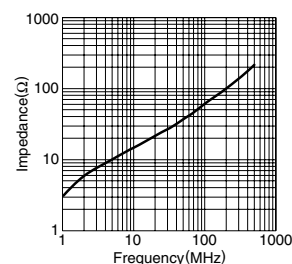
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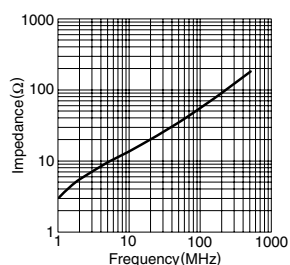
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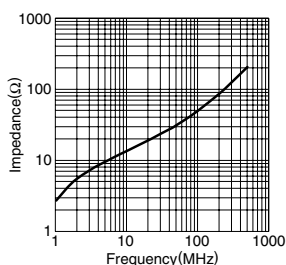
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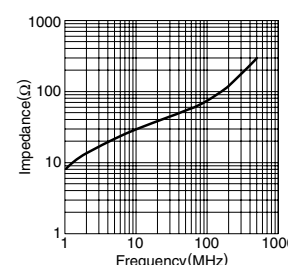
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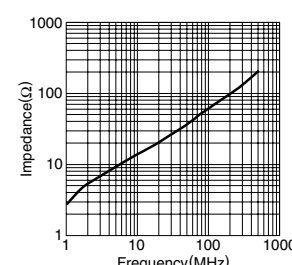
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**HF70SH46X1.9X13**



**HF70SH52X1X12**



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