

## FINEMET® [Catalog]

# FINEMET® EMC Components



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<http://www.hitachi-metals.co.jp/e/prod/prod02/prod02.html>

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<http://www.metglas.com>



## Materials Mag!c

Hitachi Metals

As IT and electronics devices improve its performance, EMC regulations for those devices tends to be tighten. It requires higher performance in noise suppression for electric components and parts. Hitachi Metals provides a series of excellent EMC components using FINEMET®, the first nanocrystalline soft magnetic material in the world, to meet EMC requirements. FINEMET® EMC components offer superior technical solution, such as excellent electromagnetic noise suppression performance and size reduction, and low energy loss for your application.

## Common Mode Chokes P6~P17



Single-phase FM-A coils (P7)



Single-phase FM coils (P10)



Three-phase FM-A coils (P12)



Three-phase FM coils (P14)



Three-phase FM-H coils (P16)



FN coils (P17)

## Common Mode Choke Cores P19~P24



FT-3KM K series (P20)



FT-3KM N series (P21)



FT-3KM F series (P23)

## Serge Absorber Cores P25~P26



FINEMET® Beads (P26)

FINEMET® is a registered trademark of Hitachi Metals Ltd.

FINEMET®, this name derives from the combination of “FINE(in texture and magnetic properties)” and “METAL”.

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# How to Use This Catalog

## • FINEMET® EMC components (P6~P26)

Composed of pictures, specification, drawings, circuit diagram and graphs.

Product line and applied field are indicated on the top of each page.

Product line → **Common Mode Chokes**

Applied field → For DC and single-phase power lines

### Product name/series → **Single-phase FM-A coils**

FM-A series single-phase common mode chokes are a cost reduced version of FM series (p.10) that use a new manufacturing process and new structure.



Table 1. Standard Specifications

Item	Specification
Rated voltage	AC250V or DC250V
Insulation voltage rating	AC2kV for 1min. or AC2.4kV for 3 sec. (line - line)
Insulation resistance	Over 100MΩ after applying DC500V for 1min. (line - line)
Insulation grade	Class B (130°C)
Temperature rise	According to each specification
Operating temperature range	-40°C – +130°C (including temperature rise)

• No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.

\* Note 1: The temperature rise in Table 1 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 2 is conducted.

\* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 2. Product code, part number and specifications

Product code	P/N	Rated current (A)	Z  (kΩ) 100kHz MIN.	L (mH) 100kHz REF.	Wire Diameter (mm)	Finished dimensions (mm)					Weight (g) TYP.	DC Resistance (mΩ) MAX.	Temp.rise (°C)	Shape
						A MAX.	B MAX.	C MAX.	F REF.	G REF.				
F1AH0713	FM-A083V692PF	8	6.9	8.1	1.4	34	30.5	37	10	26	64	25	45	Fig.5
F1AH0714	FM-A103V402PF	10	4.0	4.7	1.6	36	30.5	37	10	26	63	15	45	Fig.5
F1AH0592	FM-A104V103PF	10	10.0	11.8	1.6	42	32	43	10	28	102	19	45	Fig.5
F1AH0872	FM-A153V332PF	15	3.3	3.9	1.7	38	33	37	18	16	70	12	60	Fig.5

- UL94V-0 certified resin is used for the case and the base plate
- Lead-free solder is used for the coil.
- Custom made coils are also available.

Product Code →

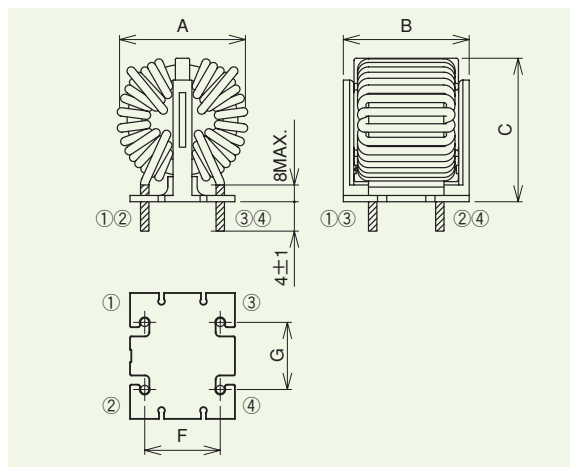


Figure 5. FM-A□□□V□□□PF

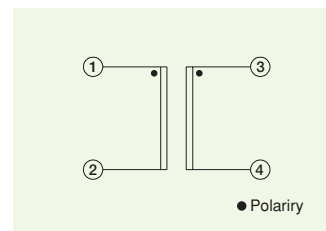


Figure 7. Circuit diagram



## What is FINEMET®?

- **The first nanocrystalline soft magnetic material in the world developed by Hitachi Metals Ltd.**  
The precursor of FINEMET® is amorphous metal obtained by rapid quenching the liquid alloy, consisting of Fe, Si, B and small amounts of Cu and Nb. By applying heat treatment to the alloy at higher than its crystallization temperature, this alloy forms a Nano-Crystalline (grain size of approximately 10 nanometer order), the first ever in the world.
- **Satisfy both high saturation magnetic flux density and high permeability.**  
FINEMET® has high saturation magnetic flux density (more than 1T) comparable to Fe-based amorphous metal and high permeability (over 10,000 at 100kHz) comparable to Co-based amorphous metal. It has the advantage of both Fe based and Co based amorphous.
- **Excellent temperature characteristics.**  
FINEMET® has very high Curie temperature (570°C) which results in small permeability variation (less than +/- 10%) at a temperature range of -40 to +150°C
- **Less affected by mechanical stress and very low audio noise emission.**  
FINEMET's permeability and core loss are hardly affected by mechanical stress due to low magnetostriction (less than 10<sup>-6</sup> order). Furthermore, FINEMET's lower magnetostriction significantly reduces audible noise emission when the voltage and current applied to the core at audible frequency range. In particular, FINEMET's materials FT-3H, FT-3M and FT-3L have superior properties because they have near zero magnetostriction.

## Applications of FINEMET® EMC Components

FINEMET® EMC components demonstrate excellent performance in suppression of line noise and radiation noise for electrical and electronic devices. Figure 1 shows examples of various applications. As you can see, FINEMET® is suitable for a wide variety of products.

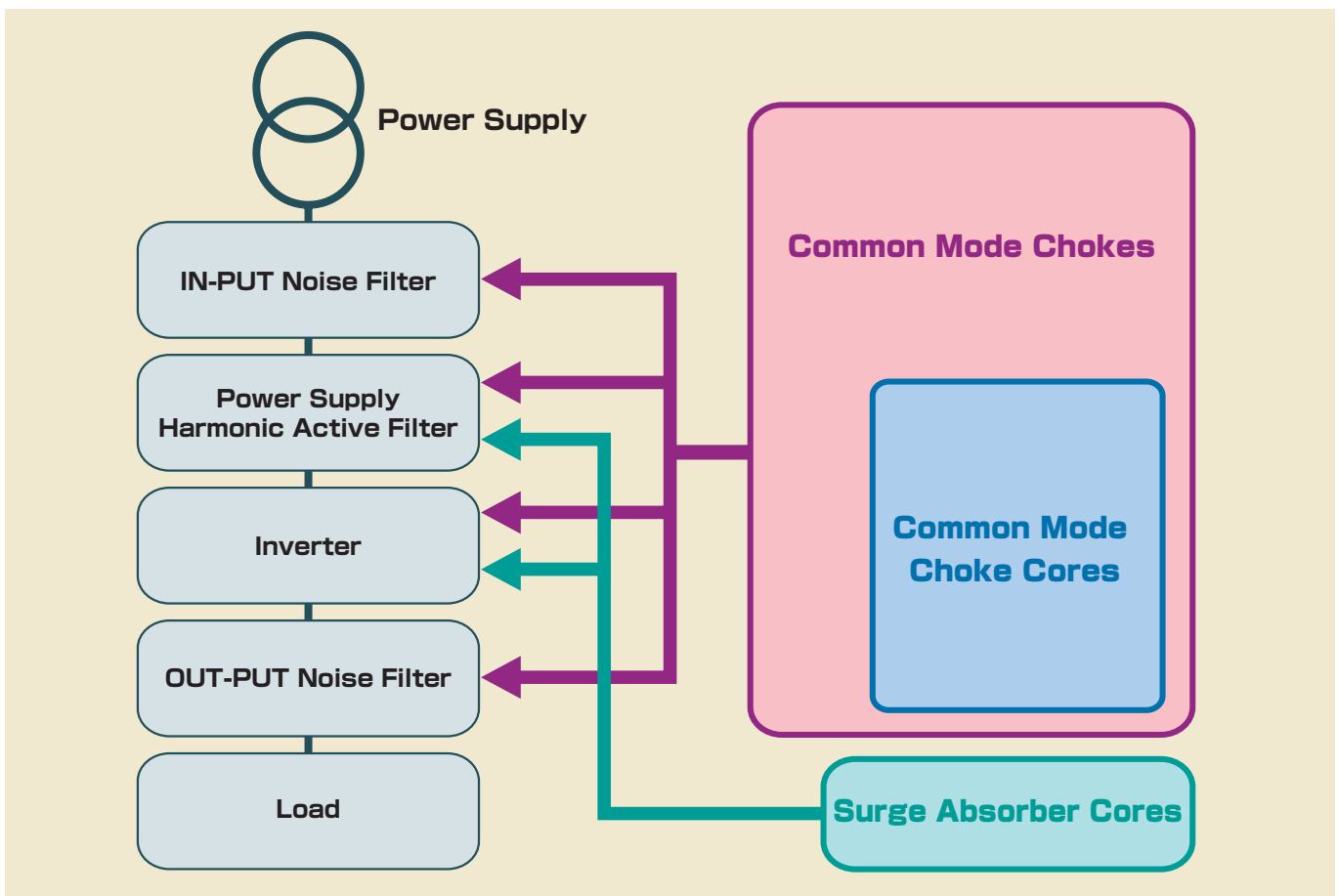


Figure1. Examples of applications for FINEMET® EMC components



# Common Mode Chokes

## Features

FINEMET® common mode chokes (CMC) have superior characteristics when compared with Mn-Zn ferrite chokes.

Those characteristics are as follows:

- 1) Because FINEMET® CMC has high permeability and low Q factor, it has higher impedance over a wide frequency range. Therefore, it offers excellent performance in noise suppression at wide frequencies. For instance, even when FINEMET® chokes and Mn-Zn ferrite chokes have same inductance value at 100kHz,

FINEMET® chokes show impedance two times higher than that of Mn-Zn ferrite chokes. Furthermore, since FINEMET™ chokes require fewer windings to obtain the same inductance value as Mn-Zn ferrite chokes, it creates smaller stray capacitance and keeps high impedance at high frequencies greater than 1 MHz (Figure 2).

- 2) Their frequency characteristics of impedance are not significantly affected by temperature change. As a result, it offers high noise suppression performance over a wide temperature range (Figure 3 and Figure 4).

## Major Applications

Air conditioner, elevator, liquid pump, inverters, NC machine, welding equipment, AC servo, UPS, personal computer, computer peripherals, copy machine, networking equipment, broadcast equipment, medical equipment, etc.

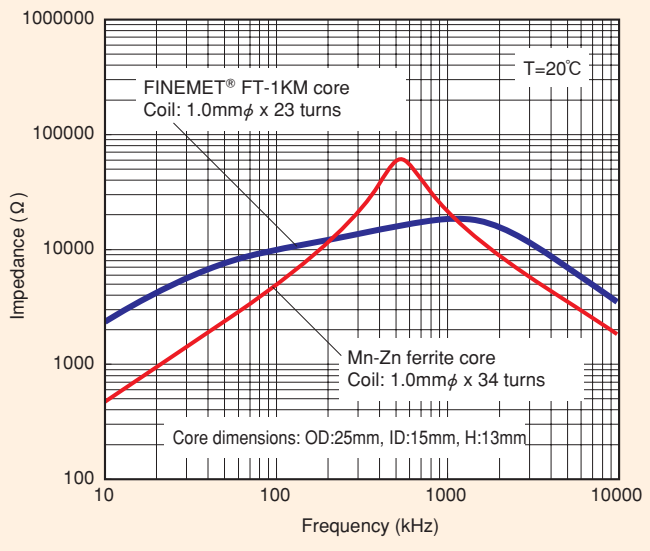


Figure 2. Comparison of impedance (8mH at 100kHz)

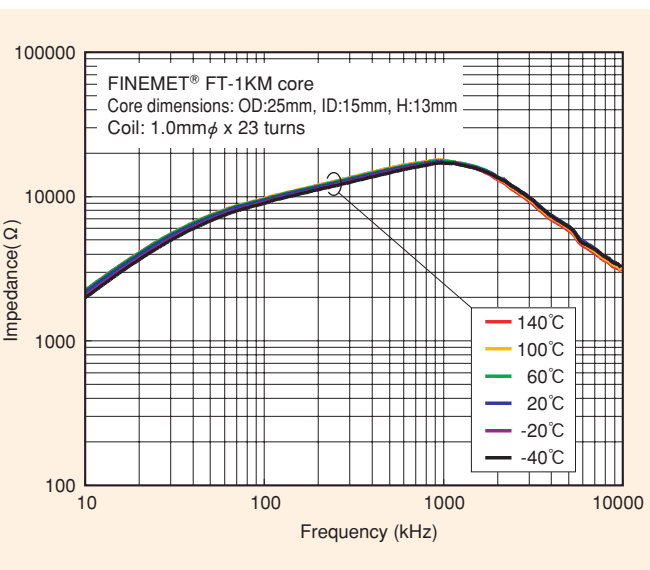


Figure 3. Temperature dependence of impedance for FINEMET® common mode chokes

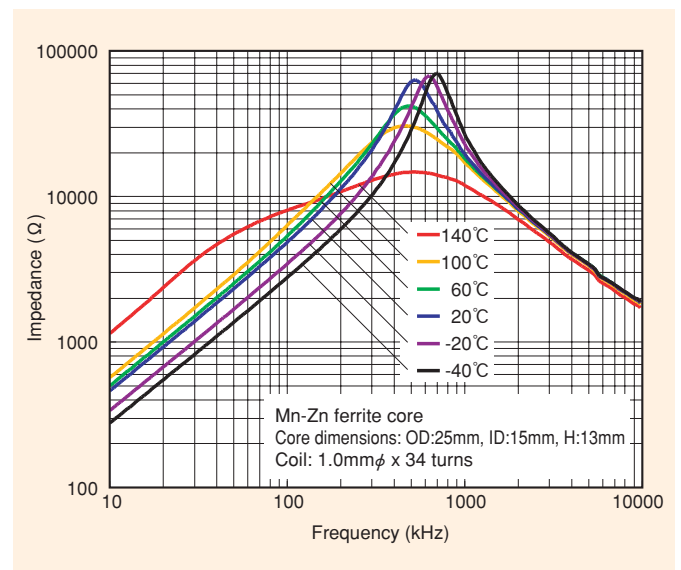


Figure 4. Temperature dependence of impedance for Mn-Zn ferrite common mode chokes



## Common Mode Chokes

For DC and single-phase AC power lines

# Single-phase FM-A coils

FM-A series single-phase common mode chokes are a cost economical version of FM series (P.10) that use a new manufacturing process and new structure.



Table 1. Standard Specifications

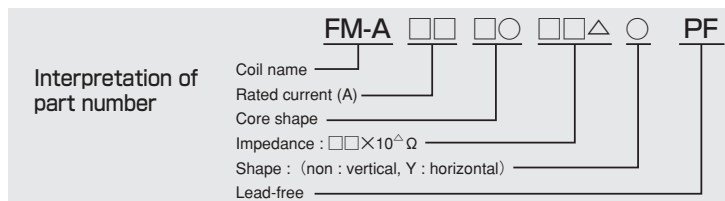
Item	Specification
Rated voltage	AC250V or DC250V
Insulation voltage rating	AC2kV for 1min. or AC2.4kV for 3 sec. (line - line)
Insulation resistance	Over 100MΩ after applying DC500V for 1min. (line - line)
Insulation grade	Class B (130°C)
Temperature rise	According to each specification
Operating temperature range	-40°C – +130°C (including temperature rise)

- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- \* Note 1: The temperature rise in Table 1 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 2 is conducted.
- \* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 2. Product code, part number and specifications

Product code	P/N	Rated current (A)	Z (kΩ) 100kHz MIN.	L (mH) 100kHz REF.	Wire Diameter (mm)	Finished dimensions (mm)					Weight (g) TYP.	DC Resistance (mΩ) MAX.	Temp.rise (°C)	Shape
						A MAX.	B MAX.	C MAX.	F REF.	G REF.				
F1AH0713	FM-A083V692PF	8	6.9	8.1	1.4	34	30.5	37	10	26	64	25	45	Fig.5
F1AH0714	FM-A103V402PF	10	4.0	4.7	1.6	36	30.5	37	10	26	63	15	45	Fig.5
F1AH0592	FM-A104V103PF	10	10.0	11.8	1.6	42	32	43	10	28	102	19	45	Fig.5
F1AH0872	FM-A153V332PF	15	3.3	3.9	1.7	38	33	37	18	16	70	12	60	Fig.5
F1AH0717	FM-A154V442PF	15	4.4	5.2	1.9	42	32	44	10	28	98	9	45	Fig.5
F1AH0873	FM-A154V722PF	15	7.2	8.5	1.7	42	32	44	10	28	102	14	60	Fig.5
F1AH0718	FM-A204V262PF	20	2.6	3.1	2.2	44	32	44	20	28	102	6	45	Fig.5
F1AH0599	FM-A205V852PF	20	8.5	10.0	2.2	52	43	60	18	34	202	12	60	Fig.5
F1AH0719	FM-A254V132PF	25	1.3	1.6	2.4	44	32	45	20	28	95	4	45	Fig.5
F1AH0722	FM-A255V242PF	25	2.4	2.9	2.6	52	43	55	18	34	163	5	45	Fig.5
F1AH0591	FM-A305V212PF	30	2.1	2.5	3.0	57	43	60	18	34	188	3	45	Fig.5
F1AH0874	FM-A054V173YPF	5	17.0	20.9	1.0	43	34	—	15	35	75	60	30	Fig.6
F1AH0723	FM-A083V692YPF	8	6.9	8.1	1.4	38	32	—	13	30	64	25	45	Fig.6
F1AH0875	FM-A083V942YPF	8	9.4	11.0	1.3	39	34	—	13	30	66	33	50	Fig.6
F1AH0876	FM-A084V173YPF	8	17.0	20.9	1.3	43	34	—	15	35	98	38	45	Fig.6
F1AH0724	FM-A103V402YPF	10	4.0	4.7	1.6	38	33	—	13	30	63	15	45	Fig.6
F1AH0726	FM-A104V103YPF	10	10.0	11.8	1.6	43	35	—	15	35	102	19	45	Fig.6
F1AH0877	FM-A153V332YPF	15	3.3	3.9	1.7	38	33	—	13	30	70	12	60	Fig.6
F1AH0727	FM-A154V442YPF	15	4.4	5.2	1.9	43	35	—	15	35	98	9	45	Fig.6
F1AH0878	FM-A154V722YPF	15	7.2	8.5	1.7	43	34	—	15	35	102	14	60	Fig.6
F1AH0879	FM-A205V852YPF	20	8.5	10.0	2.2	52	45	—	40	27	202	12	60	Fig.6

- UL94V-0 certified resin is used for the case and the base plate
- Lead-free solder is used for the coil.
- Custom made products are also available



# Common Mode Chokes

For DC and single-phase AC power lines

Single-phase FM-A coils

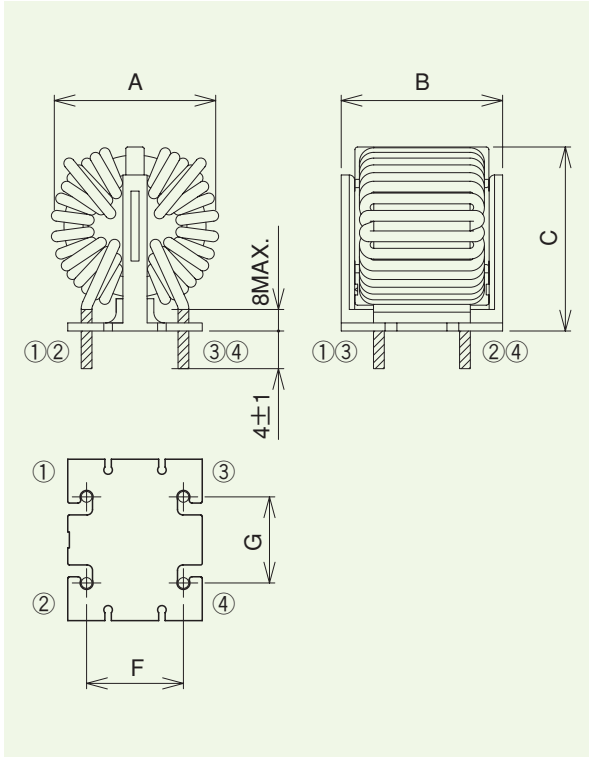


Figure 5. FM-A□□□V□□□PF

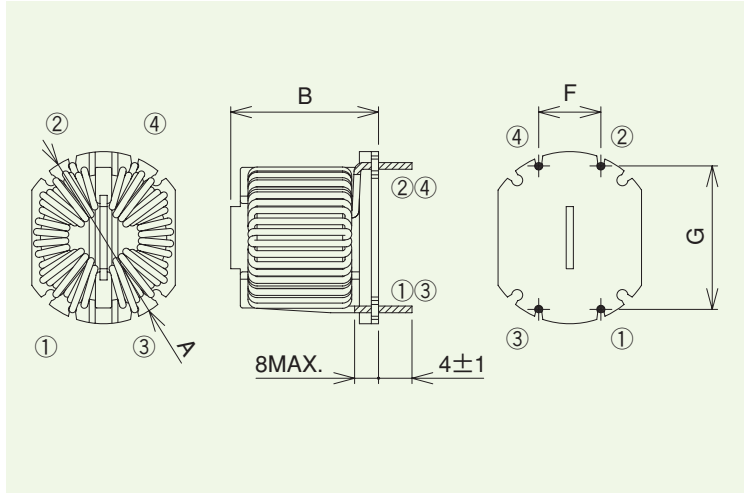


Figure 6. FM-A□□□V□□□YPF

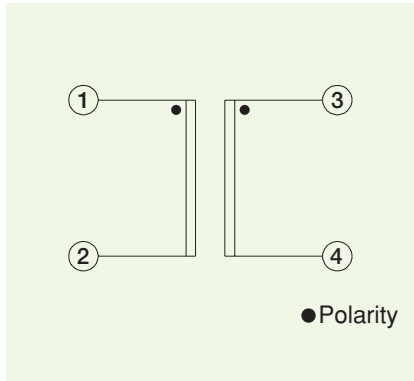


Figure 7. Circuit diagram

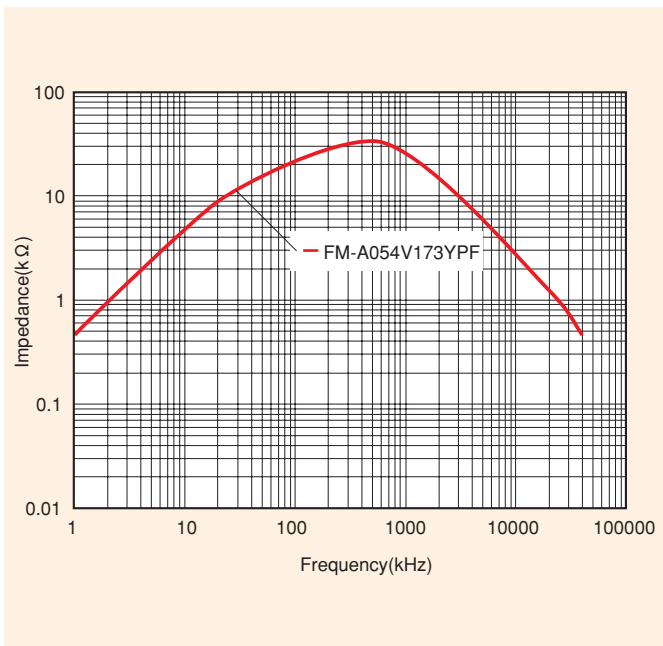


Figure 8. Frequency dependence of impedance for single-phase FM-A coils with rated current 5A

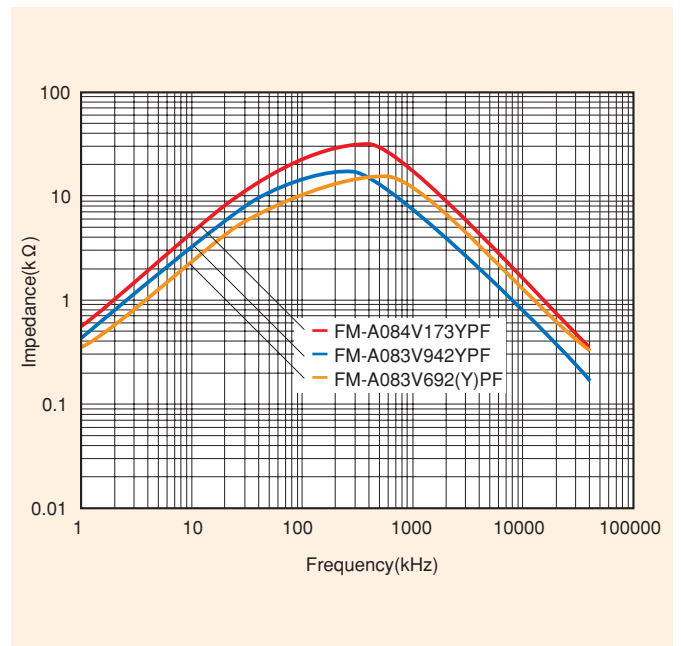


Figure 9. Frequency dependence of impedance for single-phase FM-A coils with rated current 8A





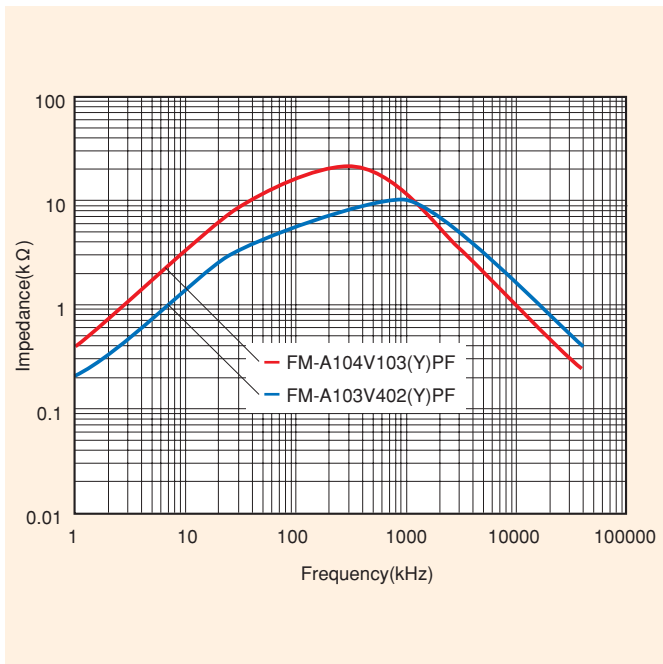


Figure 10. Frequency dependence of impedance for single-phase FM-A coils with rated current 10A

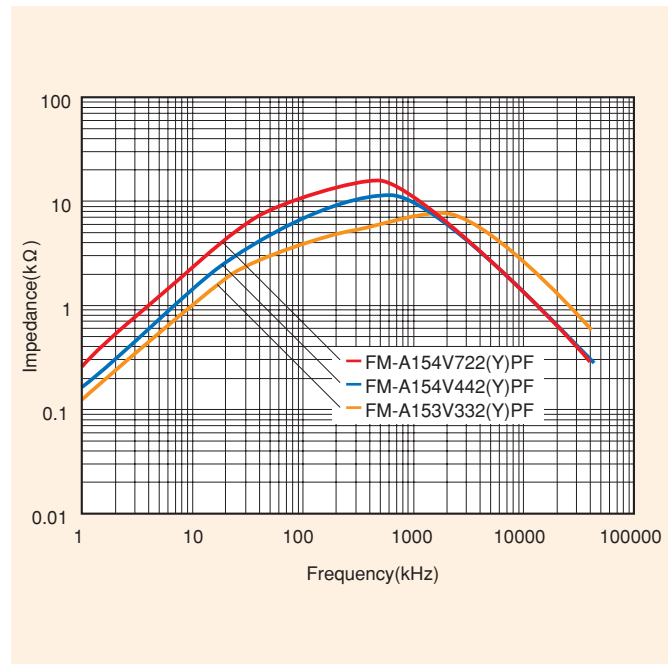


Figure 11. Frequency dependence of impedance for single-phase FM-A coils with rated current 15A

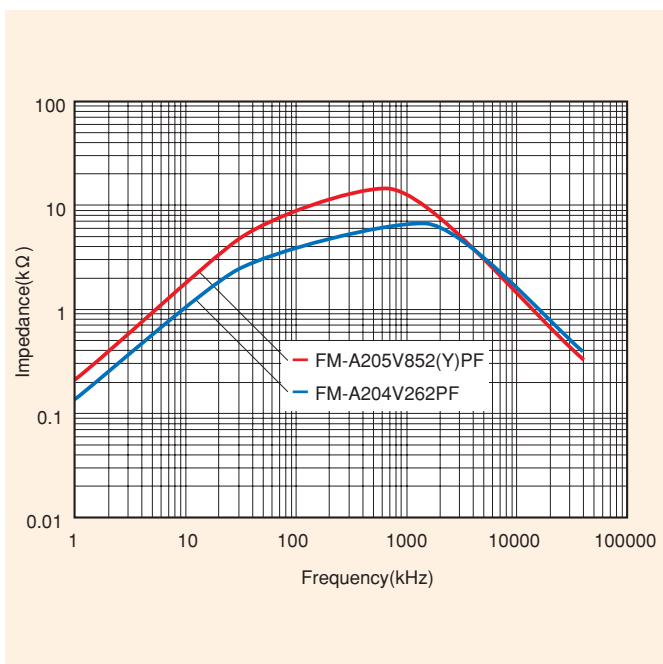


Figure 12. Frequency dependence of impedance for single-phase FM-A coils with rated current 20A

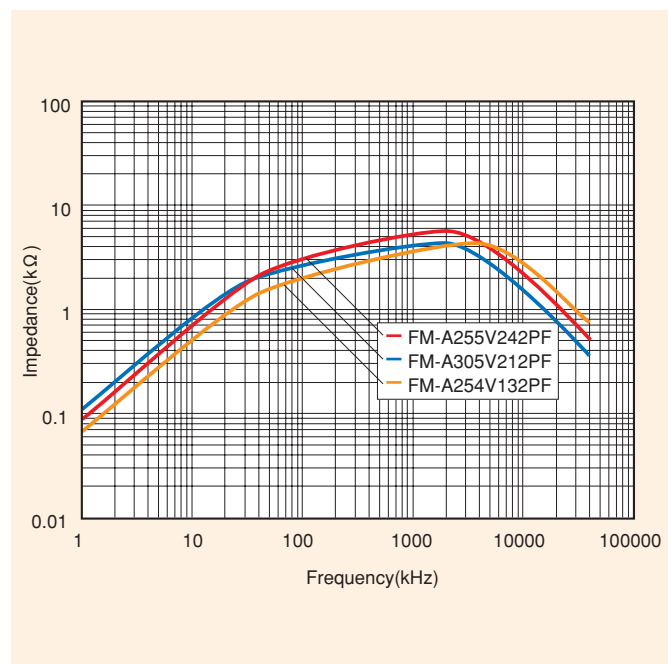


Figure 13. Frequency dependence of impedance for single-phase FM-A coils with rated current 25A-30A

## Common Mode Chokes

For DC and single-phase AC power lines



# Single-phase FM coils

FM series single-phase common mode chokes are compact in size and have excellent electromagnetic noise suppression properties.

Table 3. Standard Specifications

Item	Specification
Rated voltage	AC250V or DC250V
Insulation voltage rating	AC1.5kV for 1min. or AC1.8kV for 3 sec. (line – line)
Insulation resistance	Over 100M $\Omega$ after applying DC500V for 1min. (line – line)
Insulation grade	Class E (120 $^{\circ}$ C)
Temperature rise	*45 $^{\circ}$ C
Operating temperature range	-40 $^{\circ}$ C – +120 $^{\circ}$ C (including temperature rise)

• No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.

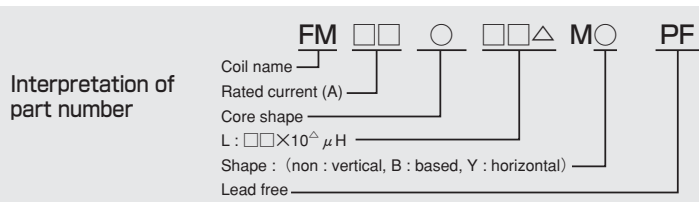
\* Note 1: The temperature rise in Table 3 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 4 is conducted.

\* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 4. Product code, part number and specifications

Product code	P/N	Rated current (A)	L (mH)		Wire Diameter (mm)	Finished dimensions (mm)				Weight (g) TYP.	DC Resistance (m $\Omega$ ) MAX.	Shape
			10kHz MIN.	100kHz MIN.		A MAX.	B MAX.	F REF.	G REF.			
F1AH 0866	FM02W752MPF	2	31.0	5.0	0.4	16	12	5	11	4.2	135	Fig.14
F1AH 0813	FM03C782MBPF	3	28.1	7.8	0.7	31	25	7	22	31.0	80	Fig.14
F1AH 0814	FM03D382MBPF	3	15.0	3.8	0.8	29	25	7	17	22.0	40	Fig.14
F1AH0790	FM05E572MBPF	5	22.0	5.7	1.1	33	32	7	24	46.0	30	Fig.14
F1AH0815	FM05F852MBPF	5	39.1	8.5	1.1	37	32	7	28	63.0	40	Fig.14
F1AH0816	FM08E242MBPF	8	9.3	2.4	1.4	36	32	7	24	51.0	12	Fig.14
F1AH0817	FM10G752MBPF	10	29.3	7.5	1.4	50	32	7	25	107.0	20	Fig.14
F1AH0818	FM10I113MBPF	10	44.4	10.6	1.5	50	37	10	32	146.0	25	Fig.14
F1AH0819	FM15F162MBPF	15	6.2	1.6	1.9	42	34	7	28	73.0	6	Fig.14
F1AH0820	FM15G462MBPF	15	18.0	4.6	1.8	51	34	7	25	123.0	10	Fig.14
F1AH0821	FM15I682MBPF	15	26.9	6.8	1.9	53	39	10	32	168.0	12	Fig.14
F1AH0822	FM20G242MBPF	20	9.4	2.4	2.0	52	35	7	25	117.0	6	Fig.14
F1AH0823	FM20I382MBPF	20	13.7	3.8	2.1	54	42	10	32	160.0	7	Fig.14
F1AH0880	FM25G142MBPF	25	5.6	1.4	2.3	54	37	7	25	120.0	4	Fig.14
F1AH0825	FM25I292MBPF	25	10.3	2.9	2.3	55	43	10	32	166.0	5	Fig.14
F1AH0826	FM10G752MYBPF	10	29.3	7.5	1.4	55	34	27	37	110.0	20	Fig.15
F1AH0827	FM10I113MYBPF	10	44.4	10.6	1.5	55	40	27	37	151.0	25	Fig.15
F1AH0828	FM15G462MYBPF	15	18.0	4.6	1.8	55	37	27	37	126.0	10	Fig.15
F1AH0829	FM15I682MYBPF	15	26.9	6.8	1.9	55	42	27	37	170.0	12	Fig.15
F1AH0830	FM20G242MYBPF	20	9.4	2.4	2.0	55	38	27	37	120.0	6	Fig.15
F1AH0831	FM20I382MYBPF	20	13.7	3.8	2.1	55	45	27	37	162.0	7	Fig.15
F1AH0832	FM20S562MYBPF	20	22.5	5.6	2.4	71	41	40	50	295.0	9	Fig.15
F1AH0833	FM25G142MYBPF	25	5.6	1.4	2.3	55	40	27	37	123.0	4	Fig.15
F1AH0834	FM25I292MYBPF	25	10.3	2.9	2.3	55	46	27	37	168.0	5	Fig.15
F1AH0835	FM30S192MYBPF	30	7.5	1.9	2.0x2	73	42	40	50	273.0	4	Fig.15
F1AH0836	FM40S122MYBPF	40	5.0	1.2	1.9x3	73	42	40	50	253.0	2	Fig.15

- UL94V-0 certified resin is used for the case and the base plate
- Lead-free solder is used for the coil.
- Custom made products are also available



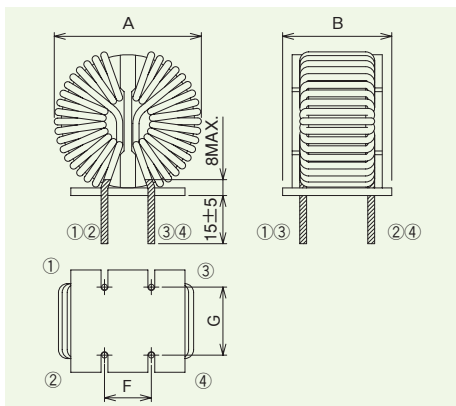


Figure 14. FM□□□□□MBPF

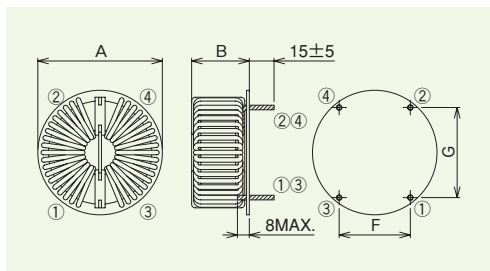


Figure 15. FM□□□□□MYBPF

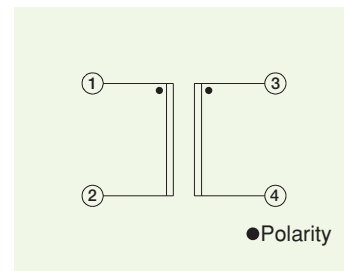


Figure 16. Circuit diagram

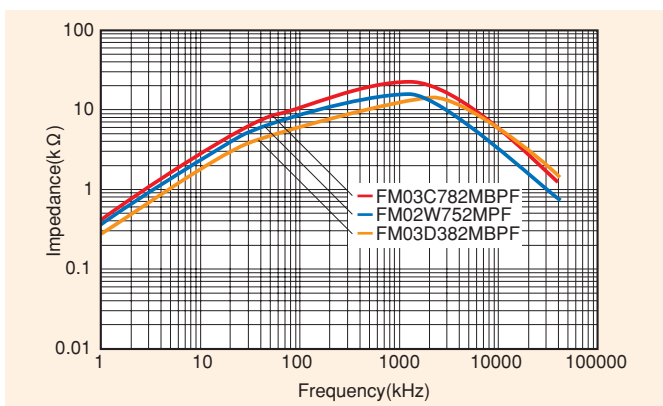


Figure 17. Frequency dependence of impedance for single-phase FM coils with rated current 2A-3A

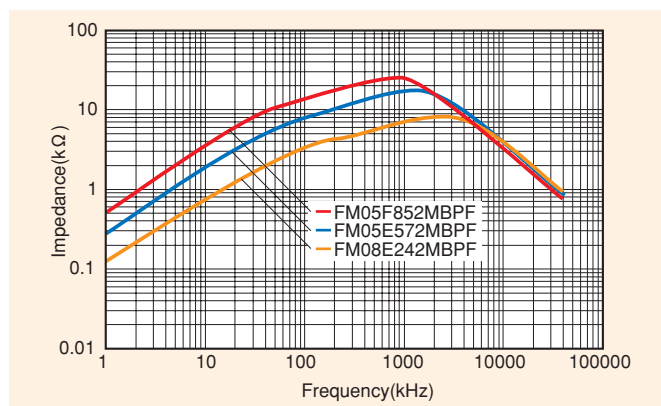


Figure 18. Frequency dependence of impedance for single-phase FM coils with rated current 5A-8A

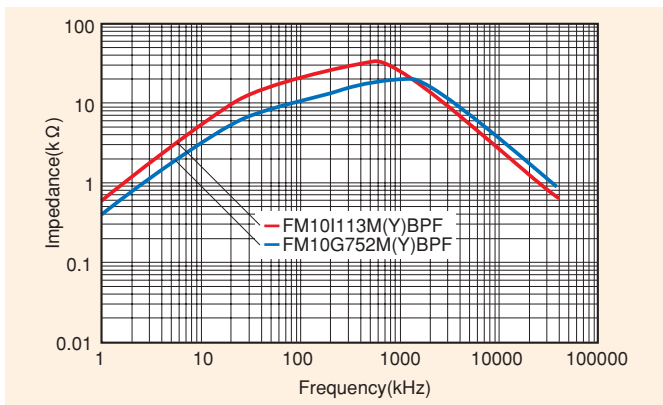


Figure 19. Frequency dependence of impedance for single-phase FM coils with rated current 10A

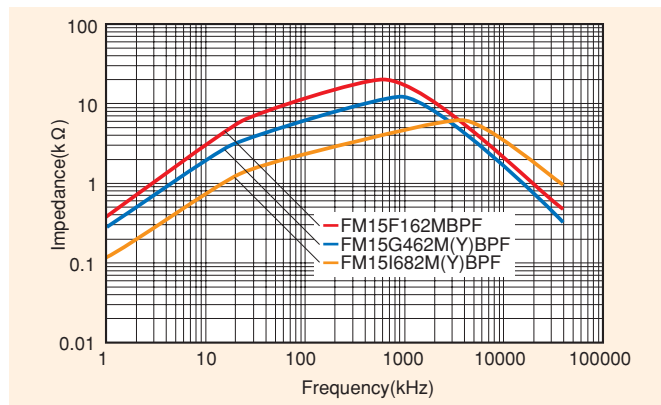


Figure 20. Frequency dependence of impedance for single-phase FM coils with rated current 15A

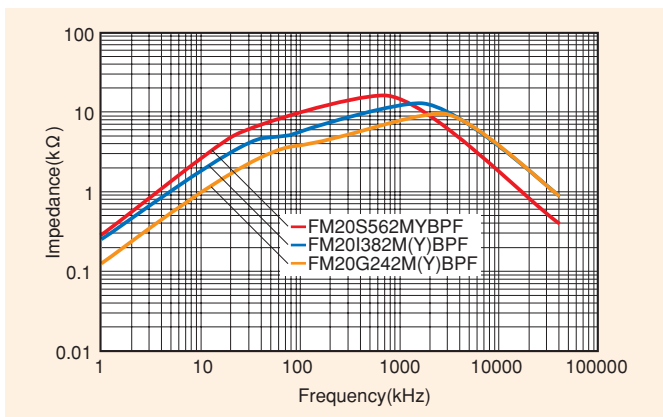


Figure 21. Frequency dependence of impedance for single-phase FM coils with rated current 20A

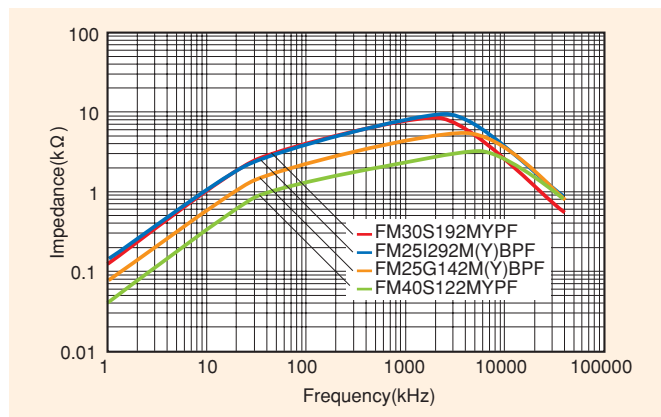


Figure 22. Frequency dependence of impedance for single-phase FM coils with rated current 25A-40A

## Common Mode Chokes

For three-phase AC power lines

### Three-phase FM-A coils

FM-A series three-phase common mode chokes are cost economical version of FM coils (P.14) that use a new manufacturing process and new structure.

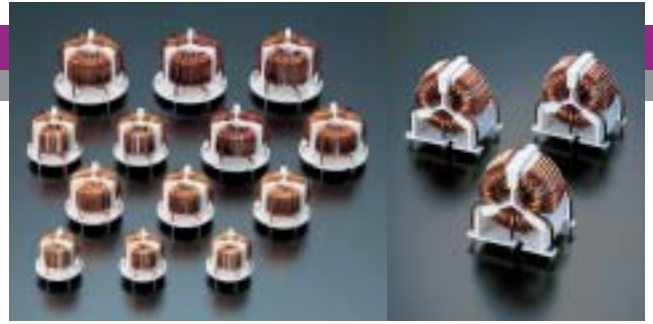


Table 5. Standard Specifications

Item	Specification
Rated voltage	AC250V
Insulation voltage rating	AC2kV for 1min. or AC2.4kV for 3 sec. (line – line)
Insulation resistance	Over 100M $\Omega$ after applying DC500V for 1min. (line – line)
Insulation grade	Class B (130°C)
Temperature rise	*60°C
Operating temperature range	-40°C – +130°C (including temperature rise)

• No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.

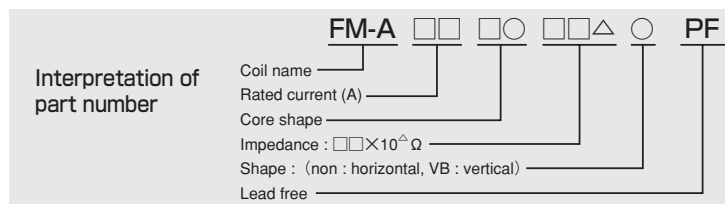
\* Note 1: The temperature rise in Table 5 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 6 is conducted.

\* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 6. Product code, part number and specifications

Product code	P/N	Rated current (A)	Z  (k $\Omega$ ) 100kHz MIN.	L (mH) 100kHz REF.	Wire Diameter (mm)	Finished dimensions (mm)					Weight (g) TYP.	DC Resistance (m $\Omega$ ) MAX.	Shape
						A MAX.	B MAX.	C MAX.	F REF.	G REF.			
F1AH0737	FM-A051 T 502PF	5	5.0	5.9	0.9	35	28	—	30	15	40	36	Fig.23
F1AH0728	FM-A081T202PF	8	2.0	2.3	1.1	35	28	—	30	15	39	17	Fig.23
F1AH0738	FM-A082T852PF	8	8.5	10.1	1.3	45	35	—	40	20	103	26	Fig.23
F1AH0739	FM-A102T602PF	10	6.0	7.1	1.5	45	35	—	40	20	109	17	Fig.23
F1AH0893	FM-A152T232PF	15	2.3	2.7	1.7	45	35	—	40	20	99	8	Fig.23
F1AH0740	FM-A153T452PF	15	4.5	5.3	1.8	56	38	—	50	25	153	11	Fig.23
F1AH0733	FM-A203T242PF	20	2.4	2.9	2.1	56	38	—	50	25	154	6	Fig.23
F1AH0741	FM-A204T442PF	20	4.4	5.3	2.2	63	46	—	56	28	236	9	Fig.23
F1AH0734	FM-A253T152PF	25	1.5	1.8	2.4	56	38	—	50	25	158	4	Fig.23
F1AH0735	FM-A254T312PF	25	3.1	3.7	2.4	63	46	—	56	28	236	6	Fig.23
F1AH0736	FM-A304T212PF	30	2.1	2.4	2.6	63	47	—	56	28	232	5	Fig.23
F1AH0881	FM-A082T852VBPF	8	8.5	10.1	1.3	45	33	45	40	26	105	26	Fig.24
F1AH0882	FM-A102T602VBPF	10	6.0	7.1	1.5	45	33	45	40	26	111	17	Fig.24
F1AH0883	FM-A152T232VBPF	15	2.3	2.7	1.7	45	33	45	40	26	101	8	Fig.24

- UL94V-0 certified resin is used for the case and the base plate
- Lead-free solder is used for the coil.
- Custom made products are also available



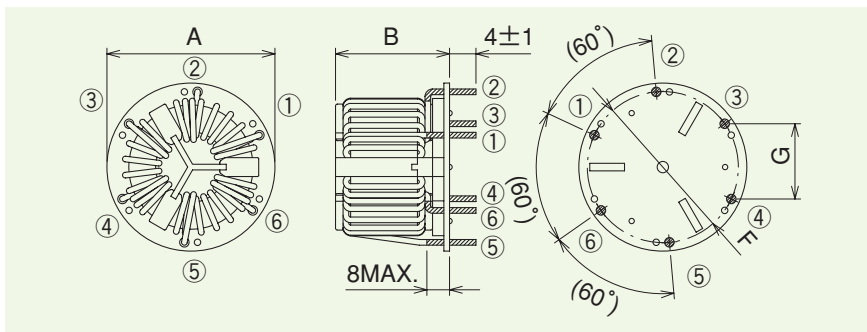


Figure 23. FM-A□□□T□□□PF

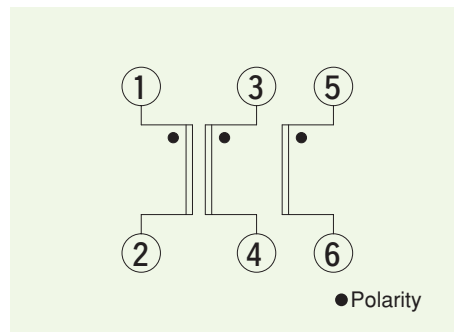


Figure 25. Circuit diagram

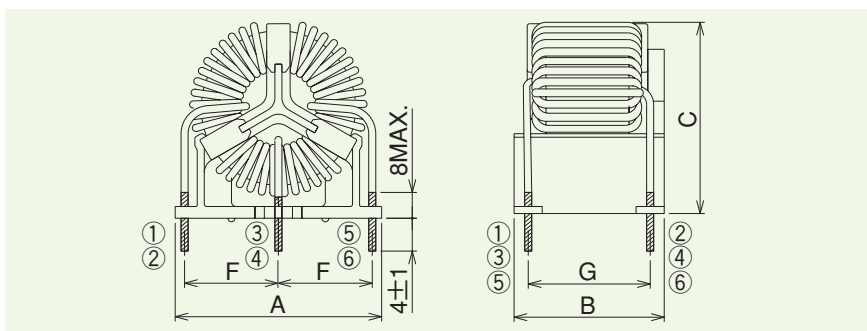


Figure 24. FM-A□□□T□□□VBPf

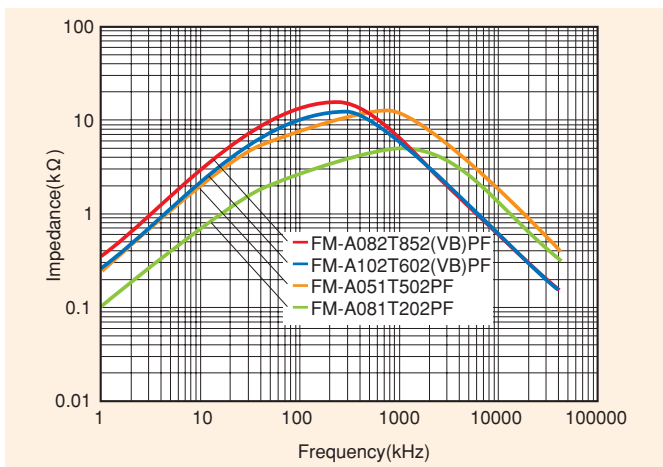


Figure 26. Frequency dependence of impedance for three-phase FM-A coils with rated current 5A-10A

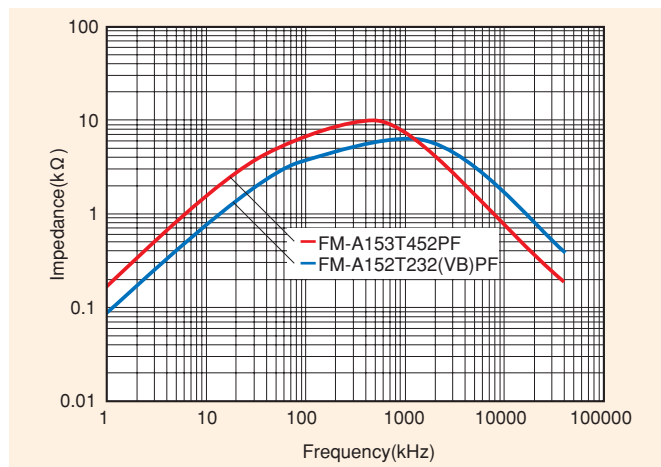


Figure 27. Frequency dependence of impedance for three-phase FM-A coils with rated current 15A

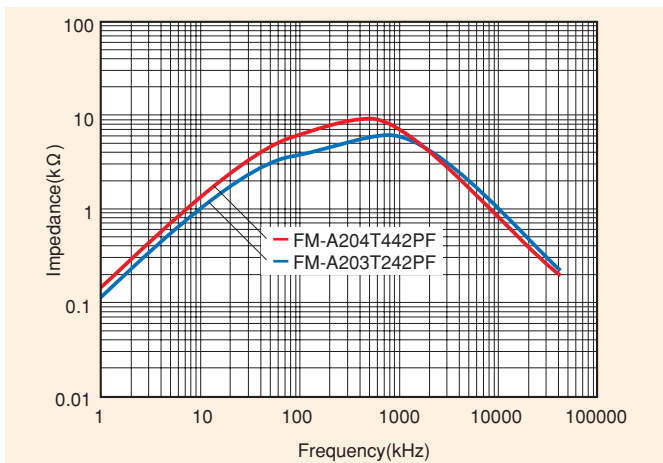


Figure 28. Frequency dependence of impedance for three-phase FM-A coils with rated current 20A

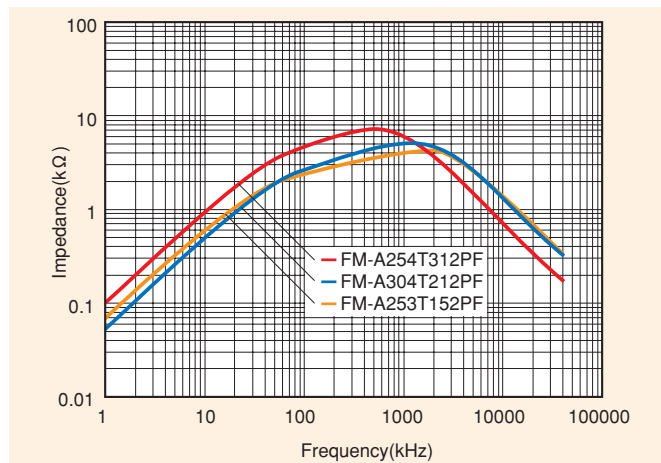


Figure 29. Frequency dependence of impedance for three-phase FM-A coils with rated current 25A-30A



## Common Mode Chokes

For three-phase AC power lines



### Three-phase FM coils

FM series three-phase common mode chokes are compact in size and have excellent electromagnetic noise suppression properties.

Table 7. Standard Specifications

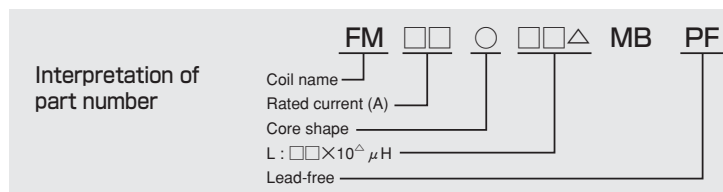
Item	Specification
Rated voltage	AC250V
Insulation voltage rating	AC2kV for 1min. or AC2.4kV for 3 sec. (line – line)
Insulation resistance	Over 100M $\Omega$ after applying DC500V for 1min. (line – line)
Insulation grade	Class E (120°C)
Temperature rise	*60°C
Operating temperature range	-40°C – +130°C (including temperature rise)

- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- \* Note 1: The temperature rise in Table 7 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 8 is conducted.
- \* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 8. Product code, part number and specifications

Product code	P/N	Rated current (A)	L (mH)		Wire Diameter (mm)	Finished dimensions (mm)				Weight (g) TYP.	DC Resistance (m $\Omega$ ) MAX.	Shape
			10kHz MIN.	100kHz MIN.		A MAX.	B MAX.	F REF.	G REF.			
F1AH0837	FM03R832MBPF	3	32.6	8.3	0.7	34	25	30	12	42	98	Fig.30
F1AH0838	FM05R302MBPF	5	12.0	3.0	0.9	34	25	30	12	47	32	Fig.30
F1AH0839	FM10J462MBPF	10	16.6	4.6	1.4	61	37	50	35	155	20	Fig.30
F1AH0840	FM15J322MBPF	15	11.5	3.2	1.8	61	37	50	35	175	10	Fig.30
F1AH0841	FM20J172MBPF	20	6.2	1.7	2.1	61	38	50	35	174	6	Fig.30
F1AH0842	FM20N242MBPF	20	8.6	2.4	2.3	66	39	60	40	241	6	Fig.30
F1AH0843	FM20O472MBPF	20	16.8	4.7	2.0	89	42	75	45	335	12	Fig.30
F1AH0844	FM25J112MBPF	25	4.1	1.1	2.3	63	37	50	35	174	4	Fig.30
F1AH0845	FM25O302MBPF	25	10.7	3.0	2.3	89	43	75	45	345	8	Fig.30
F1AH0846	FM30K252MBPF*	30	8.8	2.5	2.5	74	49	64	32	375	6	Fig.31
F1AH0847	FM30O232MBPF	30	8.2	2.3	2.6	89	40	75	45	390	6	Fig.30
F1AH0848	FM40K142MBPF*	40	5.0	1.4	2.7	78	49	64	32	345	4	Fig.31
F1AH0849	FM50K601MBPF*	50	2.2	0.6	2.8	74	49	64	32	310	3	Fig.31

- UL94V-0 certified resin is used for the case and the base plate
- Lead-free solder is used for the coil.
- Custom made products are also available
- \* Temperature rise: 80°C(projected value)



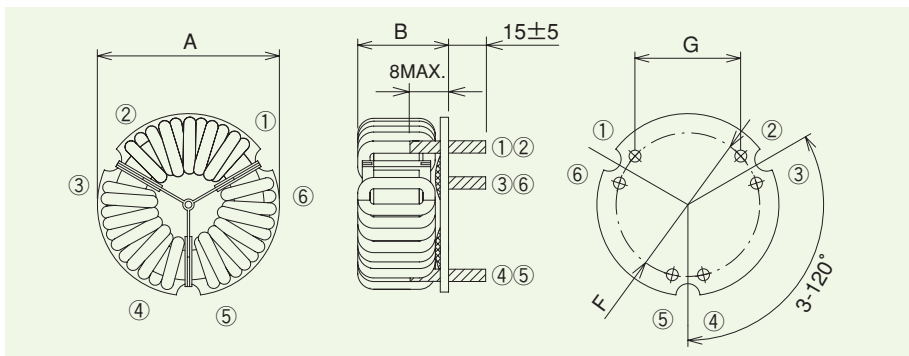


Figure 30. FM□□□□□□MBPF

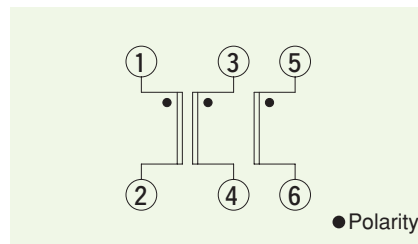


Figure 32. Circuit diagram

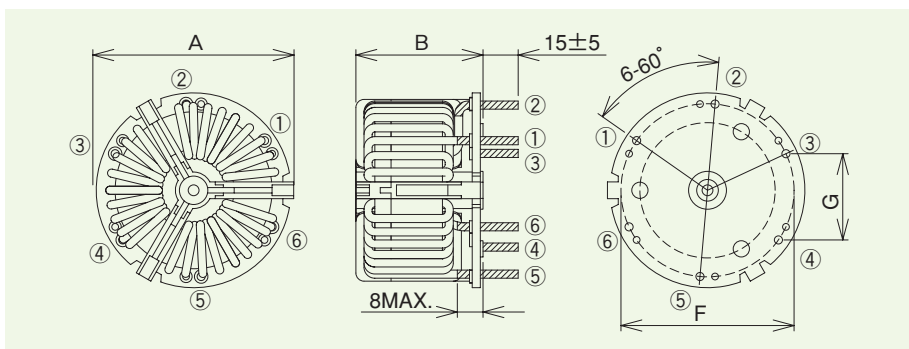


Figure 31. FM□□K□□□□MBPF

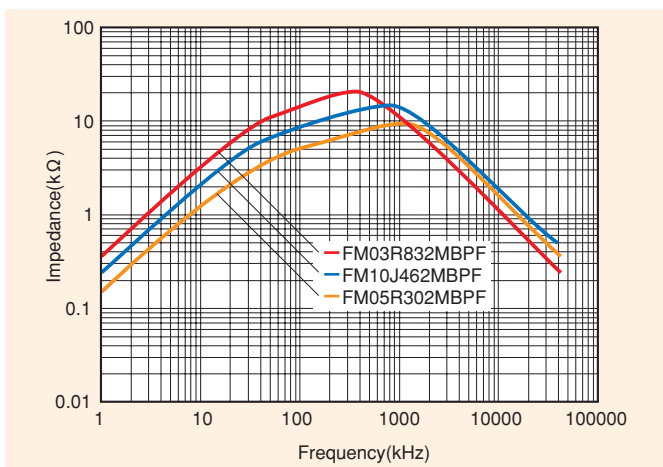


Figure 33. Frequency dependence of impedance for three-phase FM coils with rated current 3A-10A

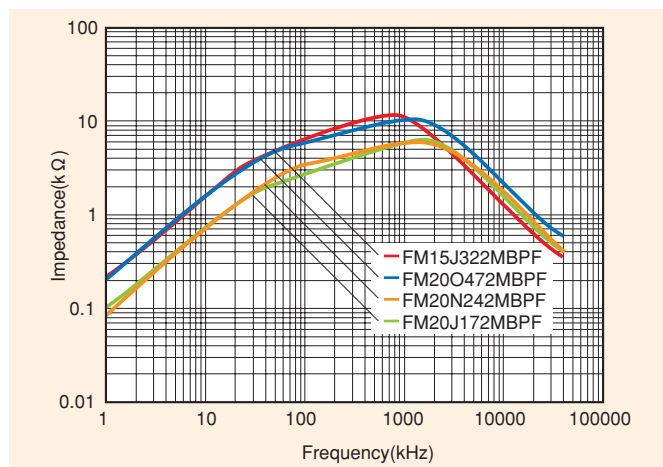


Figure 34. Frequency dependence of impedance for three-phase FM coils with rated current 15A-20A

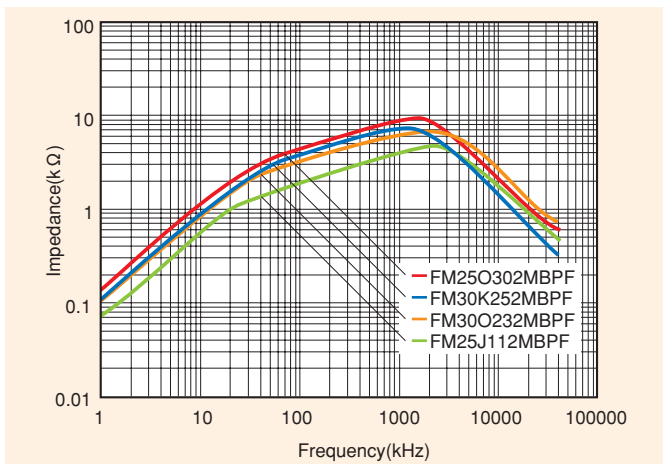


Figure 35. Frequency dependence of impedance for three-phase FM coils with rated current 25A-30A

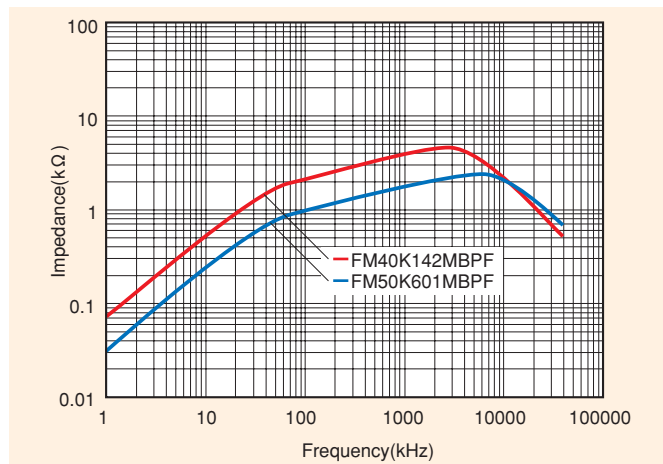


Figure 36. Frequency dependence of impedance for three-phase FM coils with rated current 40A-50A



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# Common Mode Chokes

For three-phase AC power lines



## Three-phase FM-H coils

FM-H coils are compact common modes chokes having excellent RF noise suppression properties for three-phase AC 400V power lines.

Table 9. Standard Specifications

Item	Specification
Rated voltage	AC415V
Insulation voltage rating	AC2kV for 1min. or AC2.4kV for 3 sec. (line - line)
Insulation resistance	Over 100MΩ after applying DC500V for 1min. (line - line)
Insulation grade	Class B (130°C)
Temperature rise	*60°C
Operating temperature range	-40°C - +130°C (including temperature rise)

- The above specifications are in accordance with Electrical Appliance and Material Control Law, UL, CSA and IEC standards.
- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- \* Note 1: The temperature rise in Table 1 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 2 is conducted.
- \* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 10. Product code, part number and specifications

Product code	P/N	Rated current (A)	L(mH)		Wire diameter (mm)	Finished dimensions(mm)				Weight (g) TYP.	DC resistance (mΩ) MAX.
			10kHz MIN.	100kHz MIN.		A MAX.	B MAX.	F REF.	G REF.		
F1AH0884	FM-H15O672MBPF	15	24.1	6.7	1.8	85	52	75	40	370	17.0
F1AH0885	FM-H20O472MBPF	20	16.8	4.7	2.2					410	9.5
F1AH0886	FM-H25O302MBPF	25	10.7	3.0	2.4					410	6.5
F1AH0887	FM-H30O232MBPF	30	8.2	2.3	2.8					440	4.5

- UL94V-0 certified resin is used for the case and the base plate
- Lead-free solder is used for the coil.
- Custom made products are also available

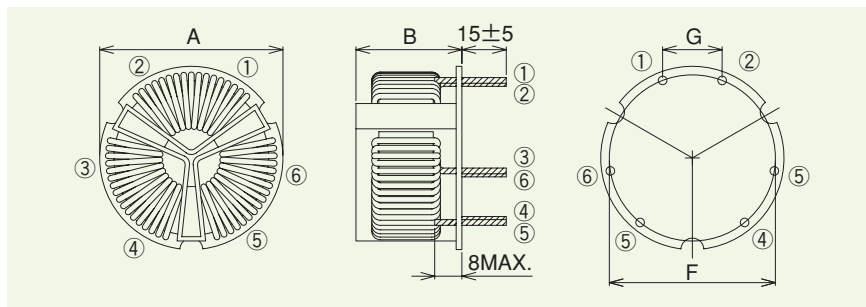


Figure 37. FM-H□□□□□PF

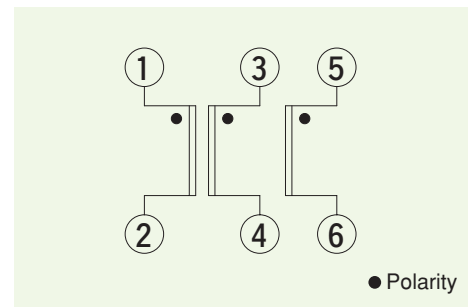


Figure 38. Circuit diagram

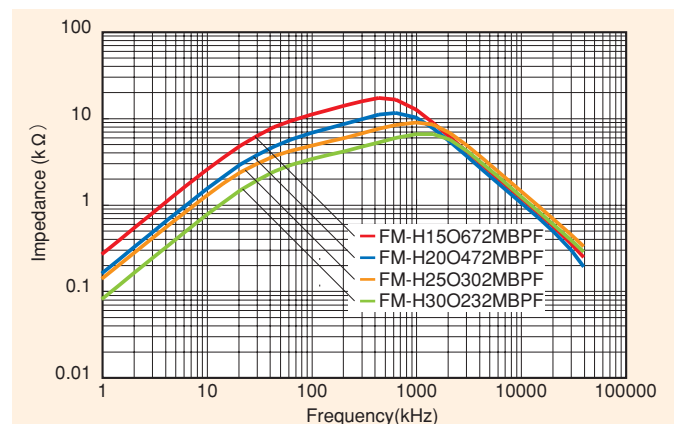
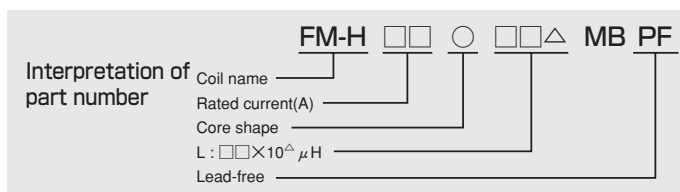


Figure 39. Frequency dependence of impedance



## Common Mode Chokes

For three-phase AC power lines

### Three-phase FN coils

FN coils made of FT-3KM F series cores (P22) are compact three phase common modes chokes having excellent RF noise suppression properties for rated current over 100 Amperes.

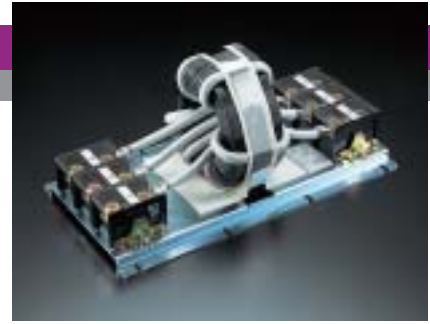


Table 11. Standard Specifications

Item	Specification
Rated voltage	AC600V
Insulation voltage rating	AC2kV for 1min. or AC2.4kV for 3 sec. (line - line)
Insulation resistance	Over 100MΩ after applying DC500V for 1min. (line - line)
Temperature rise (coil)	According to each specification
Operating temperature range	Coil : -30°C - +120°C (including temperature rise) Terminal : -30°C - +80°C (including temperature rise)

• The above specifications are in accordance with Electrical Appliance and Material Control Law, UL, CSA and IEC standards.

• No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.

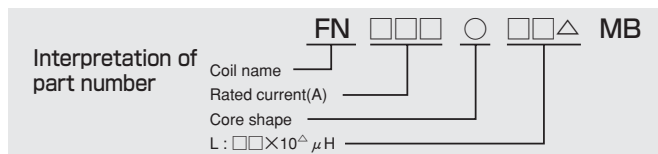
\* Note 1: The temperature rise in Table 11 is a projected value based on temperature increase by the heat from DC resistance of the coil when the rated current (DC or 50/60Hz) in Table 12 is conducted.

\* Note 2: The temperature rise is affected by the mounting condition on the circuit board and the amount of harmonic distortion on the load current. Please make sure that the temperatures of the coil and the terminals are not exceeded the operating temperature range.

Table 12. Product code, part number and specifications

Product code	P/N	Rated current (A)	L(mH)		Finished dimensions (mm)					Weight (kg) TYP.	DC resistance (mΩ) MAX.	Temp. rise (°C)
			10kHz REF.	100kHz ±30%	A ±1	B ±1	C MAX.	F REF.	H			
F1AH0033	FN100I102MB	100	4.5	1.18	320	160	150	24.5	M8	4	1.0	60
F1AH0039	FN100I202MB	100	9.0	2.30	350	160	150	24.5	M8	5	1.3	60
F1AH0034	FN150I102MB	150	4.5	1.18	320	160	150	27.0	M8	4	0.7	60
F1AH0040	FN150J202MB	150	13.0	3.17	400	210	200	45.0	M10	8	1.3	60
F1AH0035	FN200J102MB	200	5.0	1.24	400	210	200	45.0	M10	8	0.7	60
F1AH0041	FN200J202MB	200	10.0	2.43	400	210	200	45.0	M10	9	0.8	60
F1AH0036	FN300J102MB	300	5.0	1.24	450	210	200	45.0	M10	11	0.4	70
F1AH0042	FN300J202MB	300	10.0	2.48	520	210	200	45.0	M10	15	0.8	70
F1AH0679	FN600K152MB	600	5.0	1.51	650	300	270	63.0	M16	32	0.2	70

• Custom made product are also available.



Some products weigh over 15kgs. Please be careful when you lift up the product.

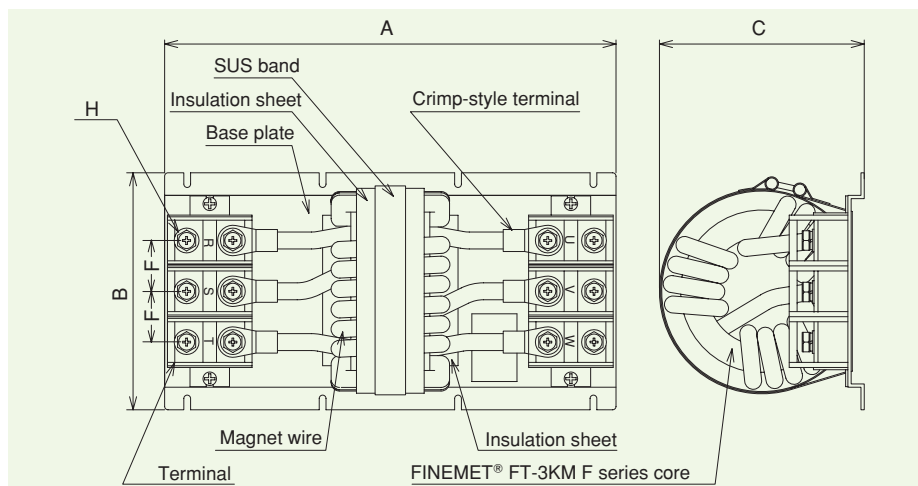


Figure 40. FN coil

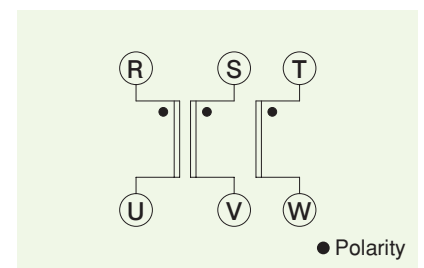


Figure 41. Circuit diagram



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# Common Mode Chokes

For three-phase AC power lines

FN Coils

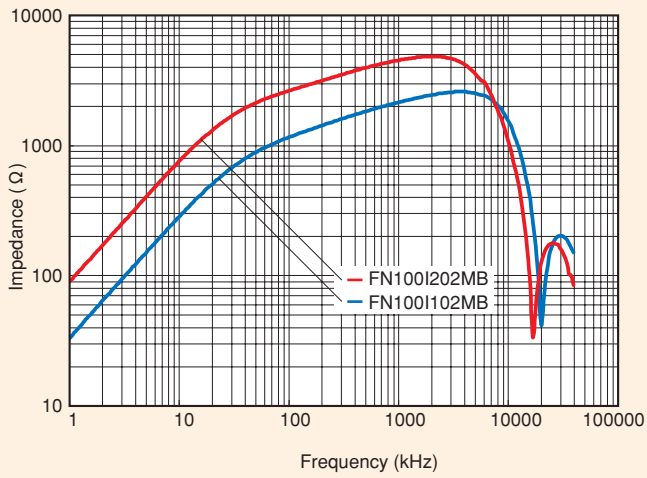


Figure 42. Frequency dependence of impedance for three-phase FN coils with rated current 100A

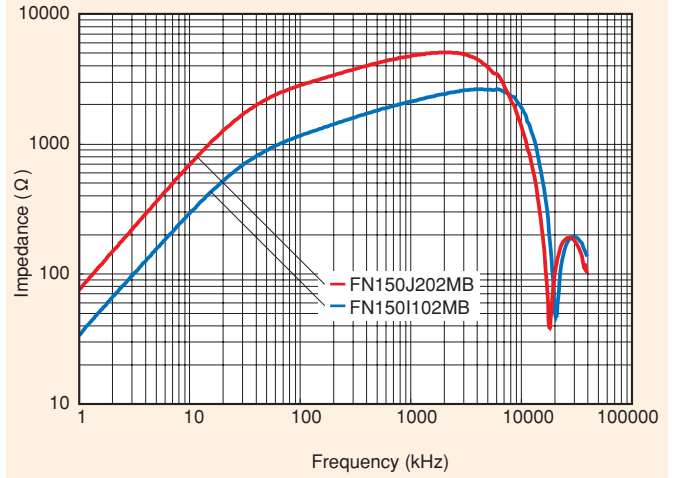


Figure 43. Frequency dependence of impedance for three-phase FN coils with rated current 150A

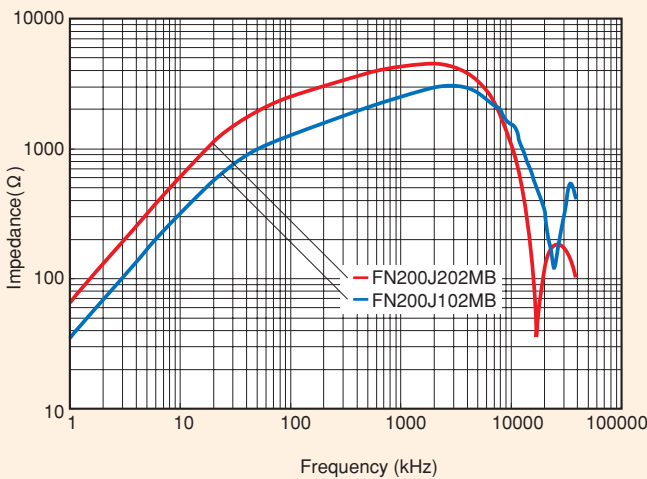


Figure 44. Frequency dependence of impedance for three-phase FN coils with rated current 200A

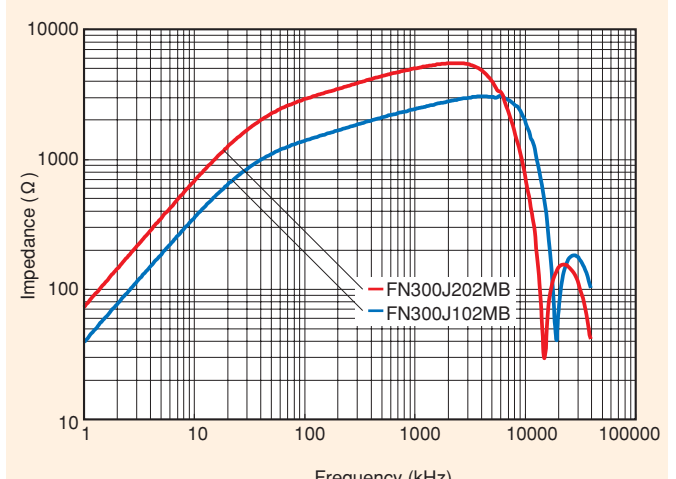


Figure 45. Frequency dependence of impedance for three-phase FN coils with rated current 300A

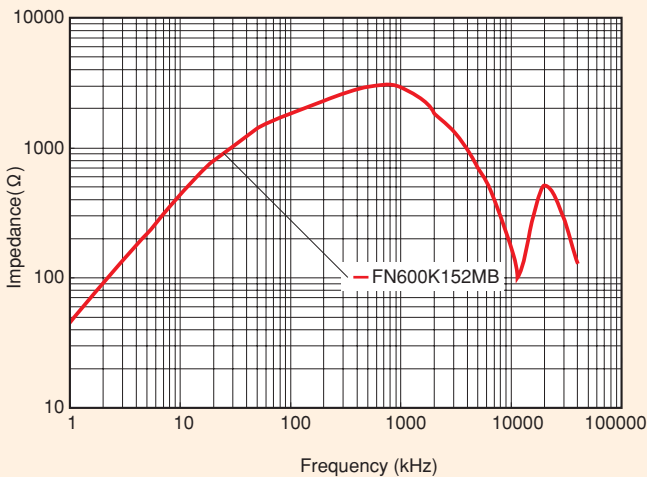


Figure 46. Frequency dependence of impedance for three-phase FN coils with rated current 600A





# Common Mode Choke Cores

FINEMET® common mode choke cores has high permeability which makes them suitable for use in common mode chokes and superior to the material most commonly used, Mn-Zn ferrite.

The followings are the advantages of FINEMET® over Mn-Zn ferrite cores.

- 1) The real part of complex permeability ( $\mu_r'$ ) at 100kHz and 20 °C reaches more than twice as high as that of Mn-Zn ferrite cores. The impedance relative permeability ( $\mu_{rZ}$ ) including imaginary part of complex permeability ( $\mu_r''$ ) reaches more than four times as high as that of Mn-Zn ferrite cores. Consequently, the cores shows following benefits when compared with a same size Mn-Zn ferrite core (Table 13, Figure 47, Figure 48).
  - It allows four times higher impedance when applied to the

- same number of winding turns.
- FINEMET® can be reduced to 1/2 winding turns to obtain same impedance value as a Mn-Zn ferrite core in low frequency. Consequently, it reduces stray capacitance significantly. As a result, impedance in high frequency range becomes large.
- 2) Frequency dependence of initial permeability ( $\mu_r'$ ) is not significantly affected by temperature change. Consequently, common mode chokes with FINEMET™ cores have low temperature dependence of inductance and impedance over a wide frequency and temperature range (Figure 49, Figure 50).
  - FT-3 material is the improved version of FT-1 material.
  - FT-3 material has low saturation magnetostriction constant ( $10^{-7}$  order), as a result has less audible noise emission.

Table 13. Comparison of magnetic and physical properties between FINEMET® and Mn-Zn ferrite

		FT-1KM	FT-3KM	Mn-Zn ferrite
Initial permeability at 100kHz $\mu_r'$	20°C	16,000	17,000	5,300
	100°C	16,300	18,000	7,000
Impedance permeability at 100kHz $\mu_{rZ}$	20°C	25,700	26,900	5,300
	100°C	26,300	27,100	7,000
Saturation magnetic flux density $B_s^*$ (T)	20°C	1.35	1.23	0.44
	100°C	1.30	1.20	0.27
Residual magnetic flux density $B_r^*$ (T)	20°C	0.81	0.62	0.10
	100°C	0.73	0.59	0.06
Coercive force $H_c^*$ (A/m)	20°C	1.3	2.5	8.0
	100°C	1.4	2.7	4.9
Curie temperature $T_c$ (°C)		570	570	150
Saturation magnetostriction $\lambda_s$ ( $\times 10^{-6}$ )		+2.3	$\approx 0.0$	-1.1
Electrical resistivity $\rho$ ( $\mu\Omega \cdot m$ )		1.1	1.2	$1.0 \times 10^6$
Density $d$ ( $kg/m^3$ )		$7.4 \times 10^3$	$7.3 \times 10^3$	$4.85 \times 10^3$

• DC magnetic properties at 800A/m

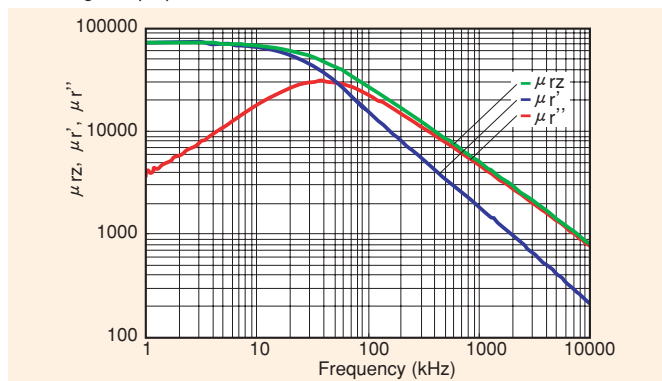


Figure 47.  $\mu_{rZ}$ ,  $\mu_r'$  and  $\mu_r''$  for FINEMET® FT-1KM

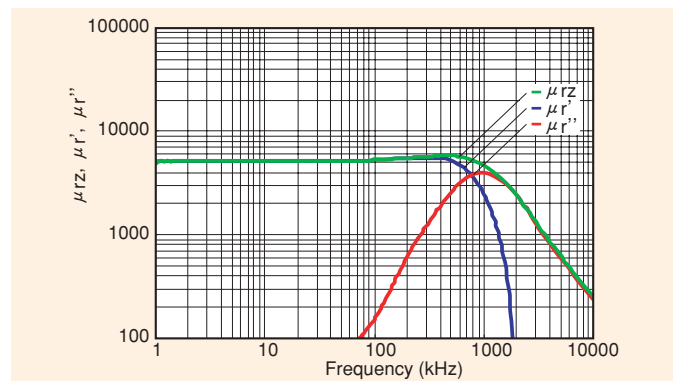


Figure 48.  $\mu_{rZ}$ ,  $\mu_r'$  and  $\mu_r''$  for Mn-Zn ferrite

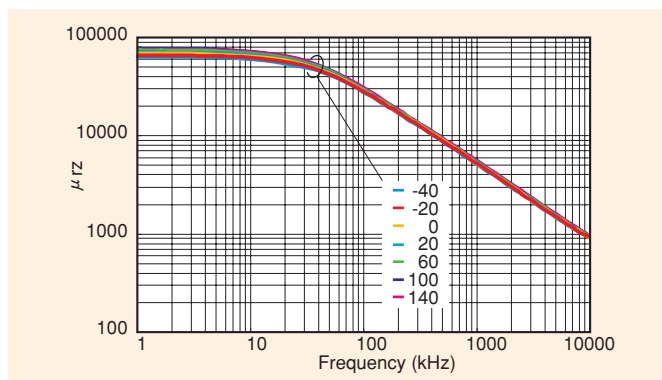


Figure 49. Temperature dependence of impedance permeability ( $\mu_{rZ}$ ) for FINEMET® FT-1KM

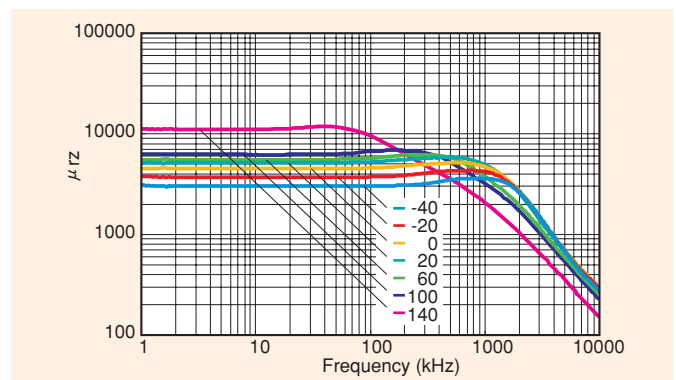


Figure 50. Temperature dependence of impedance permeability ( $\mu_{rZ}$ ) for Mn-Zn ferrite



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## Common Mode Choke Cores

For signal lines, DC and single-phase AC power lines



### ● FT-3KM K series

FT-3KM K series cores made of FT-3M material are toroidal cores for common mode chokes used in signal lines, DC power lines and single-phase AC power lines. FT-3M allows significant reduction of audible noise emission for the cores due to low saturation magnetostriction ( $\lambda_s$ ).

Table 14. Product code, part number and specifications

Product code	P/N	Finished dimensions(mm)							$A_e$ (mm <sup>2</sup> ) TYP.	$L_m$ (mm) TYP.	Weight (g) TYP.	AL value( $\mu H/N^2$ )	
		A $\pm 0.7$	B $\pm 0.7$	C $\pm 0.5$	D $\pm 0.7$	E REF.	F REF.	G REF.				10kHz MIN.	100kHz $\pm 30\%$
F1AH0538	FT-3KM K1208A	13.0	7.1	6.0	10.7	2.6	—	1.8	7.7	30.3	2.9	18.2	5.8
F1AH0692	FT-3KM K1208C	13.5	12.5	6.8	15.5	3.0	—	1.5	13.3	31.7	4.5	24.0	8.8
F1AH0654	FT-3KM K1812A	20.2	8.1	10.3	13.1	3.5	—	2.5	11.3	47.1	5.8	14.7	5.3
F1AH0693	FT-3KM K1912C	21.1	13.3	10.0	18.3	3.5	—	2.5	24.4	48.9	13.0	28.2	10.6
F1AH0694	FT-3KM K2313D	25.2	15.1	11.5	20.7	4.0	—	2.8	43.9	57.3	23.0	41.6	15.3
F1AH0695	FT-3KM K2214B	24.2	10.6	12.0	16.2	4.0	—	2.8	22.2	56.5	13.0	22.2	8.1
F1AH0696	FT-3KM K2515D	27.2	15.6	13.0	21.2	3.5	—	2.8	46.3	62.8	26.0	41.6	15.3
F1AH0697	FT-3KM K2818E	30.4	18.0	15.8	24.0	3.5	1.5	3.0	55.5	72.3	37.0	43.4	15.9
F1AH0699	FT-3KM K3819D	40.4	15.5	16.8	23.5	4.0	2.0	4.0	87.9	89.5	68.0	55.5	20.4
F1AH0700	FT-3KM K3824G	40.6	23.0	21.4	31.0	4.0	2.0	4.0	105.0	97.4	87.0	61.0	24.4
F1AH0701	FT-3KM K5328E	56.4	19.0	24.6	29.0	5.5	2.0	5.0	127.5	114.7	155.0	62.5	25.0

- UL94V-0 certified resin (130°C of heat resistance) is used for the core case.
- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- $A_e$ : effective cross-section area  $L_m$ : mean magnetic path length

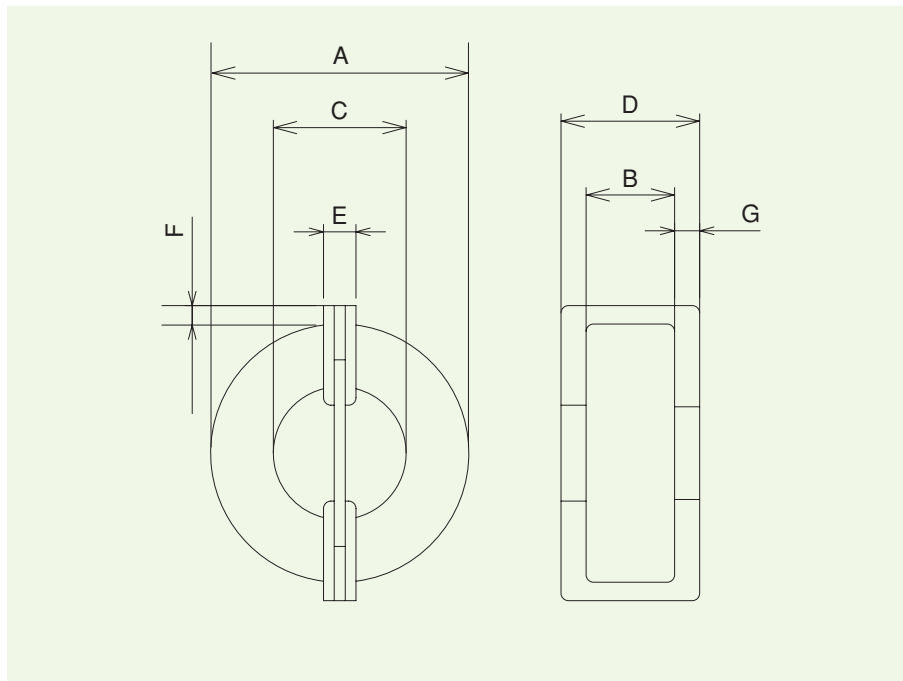


Figure 51. FT-3KM K series core



## Common Mode Choke Cores

For three-phase AC power lines

### ● FT-3KM N series

FT-3KM N series cores made of FT-3M material are toroidal cores for common mode chokes used in three-phase AC power lines. FT-3M allows significant reduction of audible noise emission for the cores due to low saturation magnetostriction ( $\lambda_s$ ).



Table 15. Product code, part number and specifications

Product code	P/N	Finished dimensions (mm)							Ae (mm <sup>2</sup> ) TYP.	Lm (mm) TYP.	Weight (g) TYP.	AL value( $\mu$ H/N <sup>2</sup> )	
		A	B	C	D	E	F	G				10kHz	100kHz
		$\pm 0.7$	$\pm 0.7$	$\pm 0.5$	$\pm 0.7$	REF.	REF.	REF.				MIN.	$\pm 30\%$
F1AH0702	FT-3KM N2515D	27.6	16.0	12.6	22.0	3.2	1.0	3.0	46.9	62.8	28	41.6	15.3
F1AH0703	FT-3KM N3320E	35.6	19.0	17.4	27.0	3.2	1.5	4.0	73.1	73.3	56	49.7	19.9
F1AH0704	FT-3KM N4225E	46.0	19.0	21.0	27.0	4.0	3.0	4.0	95.6	105.2	95	51.4	20.6
F1AH0705	FT-3KM N5034E	54.0	19.0	30.0	29.0	4.0	—	5.0	90.0	131.9	110	38.6	15.4
F1AH0706	FT-3KM N6442E	68.0	19.0	38.0	29.0	5.0	—	5.0	123.8	166.5	184	42.0	16.8
F1AH0708	FT-3KM N5434G	58.2	25.0	30.0	47.0	6.2	8.0	7.0	150.0	138.0	210	61.4	24.5

- UL94V-0 certified resin (130°C of heat resistance) is used for the core case.
- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- Ae: effective cross-section area Lm: mean magnetic path length

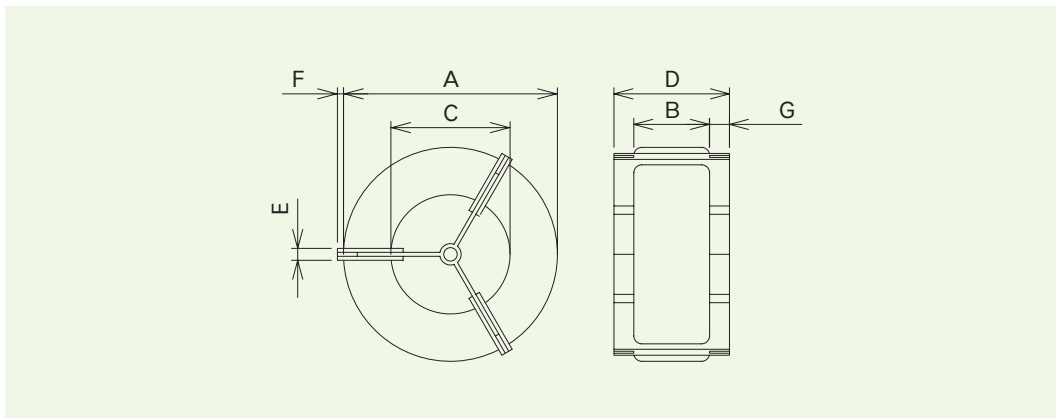


Figure 52. FT-3KM N series core

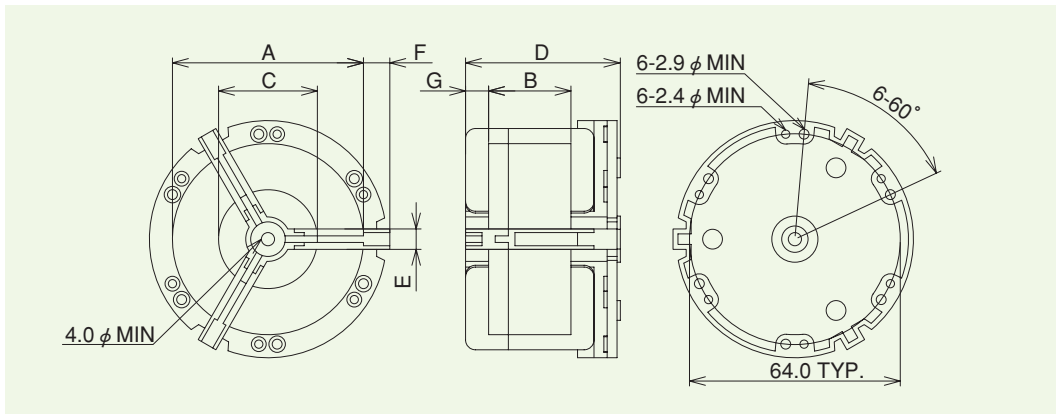


Figure 53. FT-3KM N5434G



## Common Mode Choke Cores

For signal lines, DC and AC power lines



### ● FT-3KM F series

FT-3KM F series cores made of FT-3M material are toroidal cores for common mode chokes for signal lines, DC power lines and AC power lines. FT-3M allows significant reduction of audible noise emission for the cores due to low saturation magnetostriction ( $\lambda_s$ ).

For the proper usage, please apply cables with appropriate rated voltage.

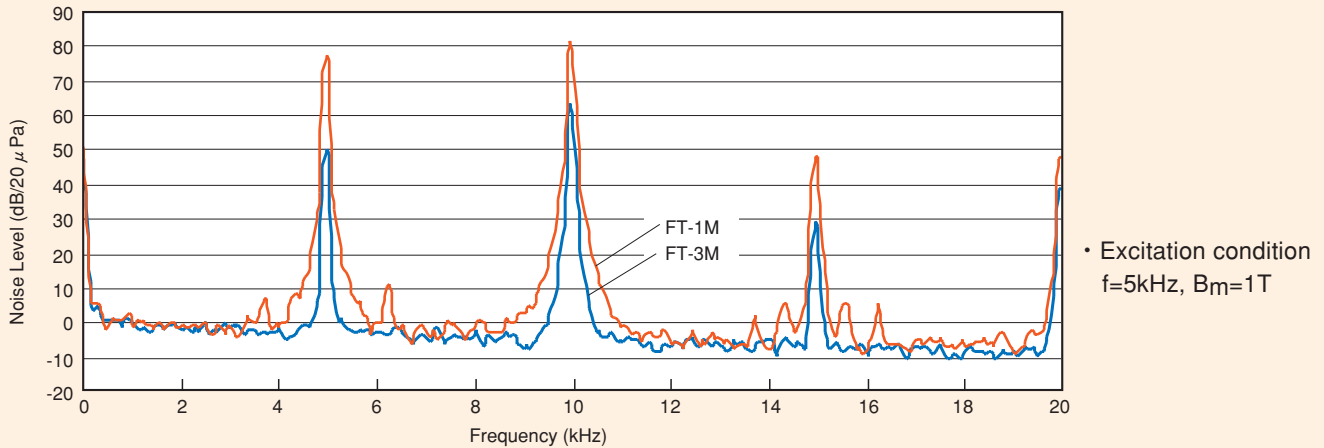


Figure 54. Noise level at audio frequency drive

Table 16. Product code, part number and specifications (Toroidal type: Figure 55)

Product code	P/N	Finished dimensions (mm)			$A_e$ (mm <sup>2</sup> ) TYP.	$L_m$ (mm) TYP.	Weight (g) TYP.	AL value ( $\mu H/N^2$ )	
		A	B	C				10kHz	100kHz
F1AH0047	FT-3KM F2515D	28.0±0.5	16.8±0.7	12.8±0.5	46.9	62.8	25	42.0~100.0	16.9±30%
F1AH0048	FT-3KM F3320E	35.8±0.5	17.5±0.7	17.3±0.5	73.1	83.3	49	49.7~120.0	19.9±30%
F1AH0049	FT-3KM F3724E	40.0±0.5	17.6±0.7	21.1±0.5	73.1	95.8	59	43.0~100.0	17.3±30%
F1AH0050	FT-3KM F4424G	46.5±0.6	22.8±0.6	21.5±0.5	142.5	106.8	123	75.4~180.0	30.2±30%
F1AH0896	FT-3KM F4535G	49.0±0.5	25.0±0.7	31.0±0.5	75.0	125.7	89	34.0~ 80.0	13.5±30%
F1AH0897	FT-3KM F4627H	50.0±0.7	28.2±1.0	23.4±0.5	178.1	114.7	168	89.2~210.0	35.1±30%
F1AH0898	FT-3KM F6045G	64.0±0.7	25.0±1.0	41.0±0.7	112.5	164.9	162	39.0~ 90.0	15.4±30%
F1AH0899	FT-3KM F7555G	79.0±0.7	25.0±0.7	51.0±0.7	150.0	204.2	267	42.0~100.0	16.6±30%
F1AH0900	FT-3KM F10080G	104.0±0.7	25.0±0.7	76.0±0.7	138.8	285.1	336	30.0~ 65.0	12.0±30%
F1AH0901	FT-3KM F140100	144.0±1.0	35.0±1.0	96.0±0.7	427.5	380.1	1335	63.0~150.0	24.8±30%
F1AH0024	FT-3KM F200160	204.0±1.0	35.0±1.0	156.0±1.0	427.5	568.6	1875	42.0~100.0	15.1+50%,-30%

- UL94V-0 certified resin (130°C heat resistance) is used for the core cases
- No Ozone Depleting Chemicals are used in these products and in their manufacturing process
- $A_e$ : effective sectional area  $L_m$ : mean magnetic path length



Table 17. Product code, part number and specifications (Base plate type: Figure 56, Figure 57)

Product code	P/N	Finished dimensions (mm)								
		A MAX.	B MAX.	C MAX.	D ±0.5	E ±0.3	F ±0.5	G ±0.5	H ±0.5	K MIN.
F1AH0026	FT-3KM F6045GB	95.0	26.0	78.0	80.0	12.5	72.0	50.0	7.0	39.0
F1AH0903	FT-3KM F7555GB	121.0	30.0	100.0	100.0	—	—	—	—	50.0
F1AH0904	FT-3KM F10080GB	161.0	32.0	122.0	140.0	—	—	—	—	75.0
F1AH0029	FT-3KM F11080GB	181.0	26.0	131.0	150.0	12.5	124.0	100.0	20.0	74.0
F1AH0905	FT-3KM F140100PB	181.0	42.0	162.0	160.0	—	—	—	—	95.0
F1AH0032	FT-3KM F200160PB	241.0	42.0	217.0	220.0	—	—	—	—	155.0

	A <sub>e</sub> (mm <sup>2</sup> ) TYP.	L <sub>m</sub> (mm) TYP.	Weight (g) TYP.	Applied screw		AL value(μH/N <sup>2</sup> )		Shape	
				I	J	10kHz	100kHz		
F1AH0026	FT-3KM F6045GB	112.5	164.9	193	M4	M5	39.0~ 90.0	15.4±30%	Fig.57
F1AH0903	FT-3KM F7555GB	150.0	204.2	377	—	M6	42.0~100.0	16.6±30%	Fig.56
F1AH0904	FT-3KM F10080GB	138.8	285.1	516	—	M6	30.0~ 65.0	12.0±30%	Fig.56
F1AH0029	FT-3KM F11080GB	213.8	300.8	613	M5	M6	40.2~ 95.0	16.1±30%	Fig.57
F1AH0905	FT-3KM F140100PB	427.5	380.1	1595	—	M6	63.0~150.0	24.8±30%	Fig.56
F1AH0032	FT-3KM F200160PB	427.5	568.6	2235	—	M6	42.0~100.0	15.1+50%、-30%	Fig.56

- UL94V-0 certified resin (130°C heat resistance) is used for the core cases
- No Ozone Depleting Chemicals are used in these products and in their manufacturing process
- A<sub>e</sub>: effective sectional area L<sub>m</sub>: mean magnetic path length

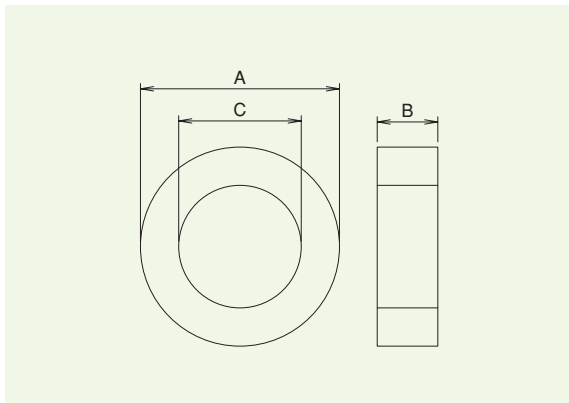


Figure 55. Toroidal type

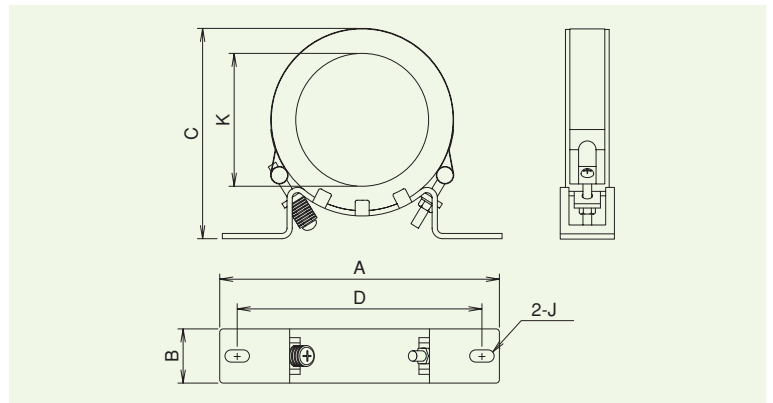


Figure 56. Base plate type

The structure: the core is fixed onto the zinc-electroplated SPCC base by using SUS 304 stainless steel band.

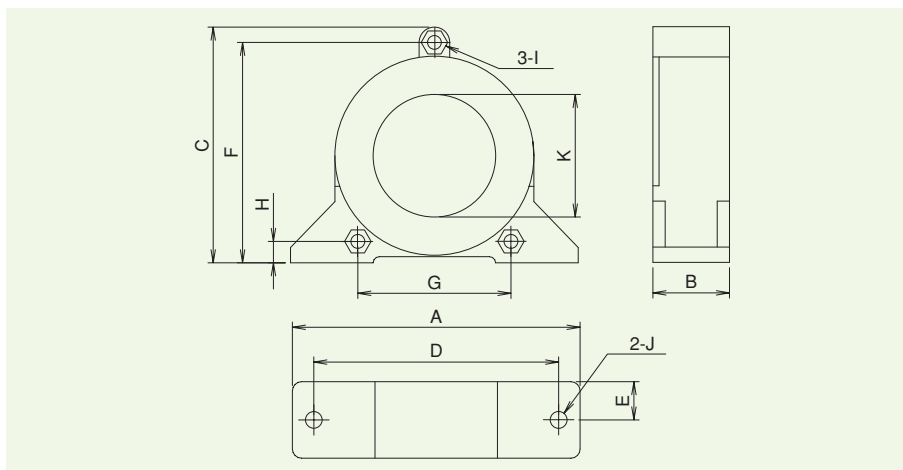


Figure 57. Base combined type





# Common Mode Choke Cores

For signal lines, DC and AC power lines

FT-3KM F Series

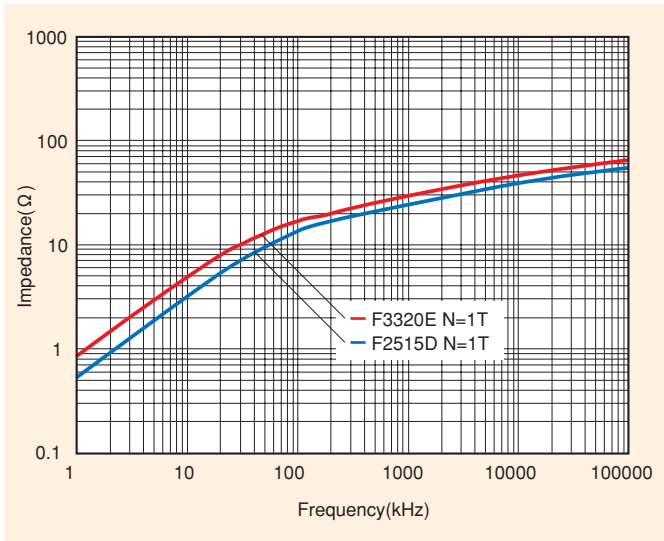


Figure 58. Frequency dependence of impedance for F2515D and F3320E

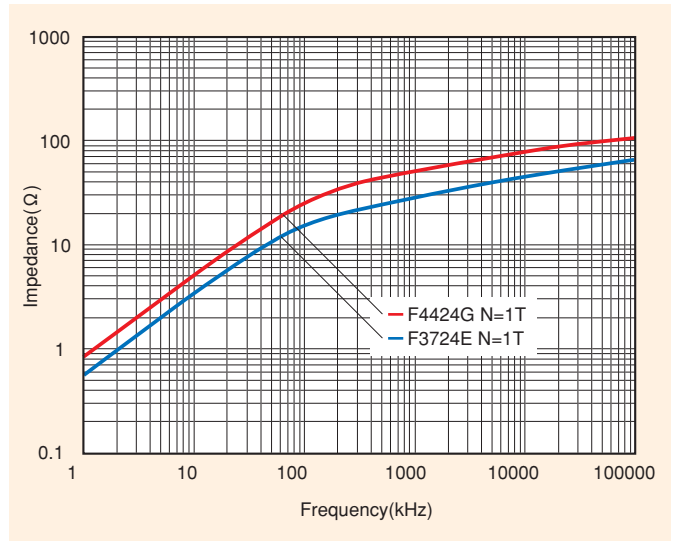


Figure 59. Frequency dependence of impedance for F3724E and F4424G

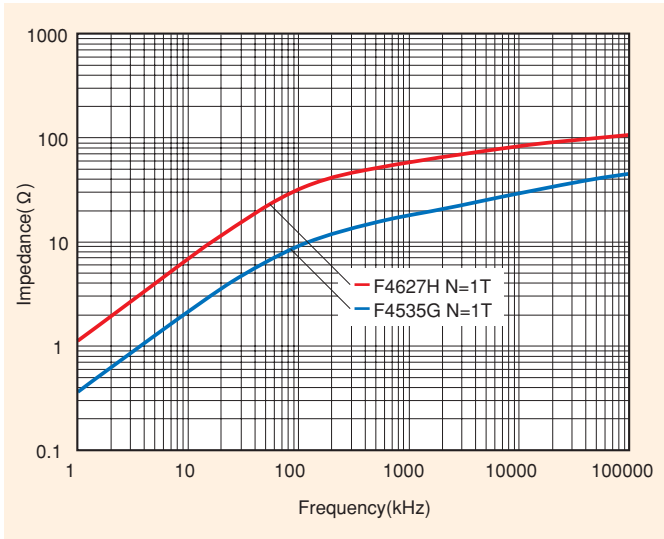


Figure 60. Frequency dependence of impedance for F4535G and F4627H

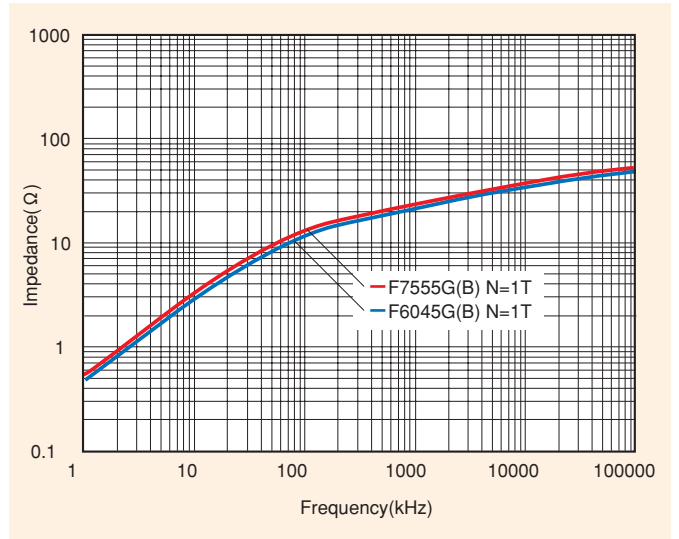


Figure 61. Frequency dependence of impedance for F6045G(B) and F7555G(B)

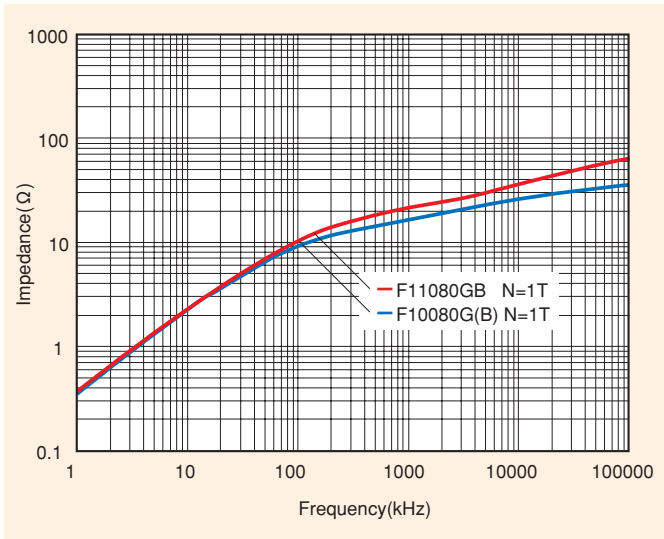


Figure 62. Frequency dependence of impedance for F10080G(B) and F11080GB

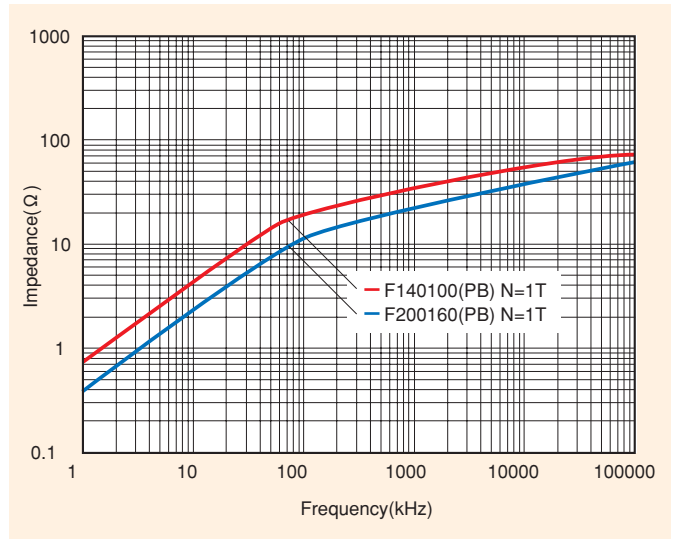


Figure 63. Frequency dependence of impedance for F140100(PB) and F220160(PB)



# Surge Absorber Cores

## Features

FT-3AM bead cores made of FT-3M are cores for surge absorbers which have high pulse permeability. These cores have excellent performance in suppression of reverse recovery current from the diode and ringing or surge current from switching circuit.

Comparison of FT-3AM to other materials:

1) The saturation magnetic flux density is twice as high as that of Co-based amorphous metal and three times higher than that of Ni-Zn ferrite. The pulse permeability and the core loss are comparable to Co-based amorphous metal. As a result, a small core made of FT-3AM material offers higher performance in suppression of surge current and voltage.

2) The temperature characteristics of FT-3AM is very stable due to its high curie temperature, 570 °C, and is much superior to Co-based amorphous metal and Ni-Zn ferrite which have curie temperatures around 200 °C.

3) Unlike Co-based amorphous metal, which has negative aging effects (decreasing of the permeability, and increasing of squareness, coercivity and core loss over time), the aging effects of FT-3AM is very small.

4) FT-3AM cores have a much lower cost than Co-based amorphous metal cores.

Table 18. Comparison of magnetic and physical properties among FT-3AM and conventional materials.

		FT-3AM	Co-based amorphous	Ni-Zn ferrite
Saturation flux density $B_S^*$ (T)	20°C	1.23	0.60	0.38
	100°C	1.20	0.53	0.29
Squareness ratio $B_r/B_S^*$	20°C	0.50	0.80	0.71
	100°C	0.48	0.78	0.60
Coercive force $H_c^*$ (A/m)	20°C	2.5	0.30	30
	100°C	2.7	0.29	20
Pulse permeability $\mu_{rp}^{**}$		3,500	4,500	500
Core loss $P_{cv}^{**}$ (J/m <sup>3</sup> )		7.5	6.0	7.0
Curie temperature $T_c$ (°C)		570	210	200
Saturation magnetostriction $\lambda_s$ ( $\times 10^{-6}$ )		$\approx 0$	$\approx 0$	-7.8
Electrical resistivity $\rho$ ( $\mu\Omega \cdot m$ )		1.2	1.3	$1 \times 10^{12}$
Density $d$ (kg/m <sup>3</sup> )		7.3X103	$7.7 \times 10^3$	$5.2 \times 10^3$

\*DC magnetic properties at 800A/m

\*\*Pulse width 0.1  $\mu s$ , operating magnetic flux density  $\Delta B=0.2T$

## Major Applications

1. Suppression of reverse recovery current and surge current from the diode in the switching mode power supplies or invertors.
2. Suppression of the surge current at the moment of activation of current in the diode, such as in a power MOS-FET.
3. Suppression of spike or ringing current generated in the switching circuit.



## Surge Absorber Cores

For small handling power

### ● FINEMET® Beads

FINEMET® Beads made of FT-3M material are small size bead cores which show excellent performance in suppression of various kinds of current or voltage surge, such as the surge from a switching diode.



Table 19. Product code, part number and specifications (toroidal type)

Product code	P/N	Finished dimensions(mm)			A <sub>e</sub> (mm <sup>2</sup> ) TYP.	L <sub>m</sub> (mm) TYP.	Weight (g) TYP.	2φs(μWb)MIN.		AL value (μH/N <sup>2</sup> ) 100kHz
		A	B	C				25°C	120°C	
F1AH0432	FT-3AM B3X	4.0MAX.	5.0MAX.	1.6TYP.	1.13	7.85	0.10	2.2	2.0	2.0MIN.
F1AH0433	FT-3AM B3AR	4.0MAX.	7.0MAX.	1.6TYP.	1.88	7.85	0.16	3.6	3.4	3.3MIN.
F1AH0434	FT-3AM B4AR	5.0MAX.	7.0MAX.	1.6TYP.	3.75	9.42	0.34	7.3	6.9	5.5MIN.

- UL94V-0 certified resin is used for the core case.
- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- A<sub>e</sub>: effective cross-section area L<sub>m</sub>: mean magnetic path length.

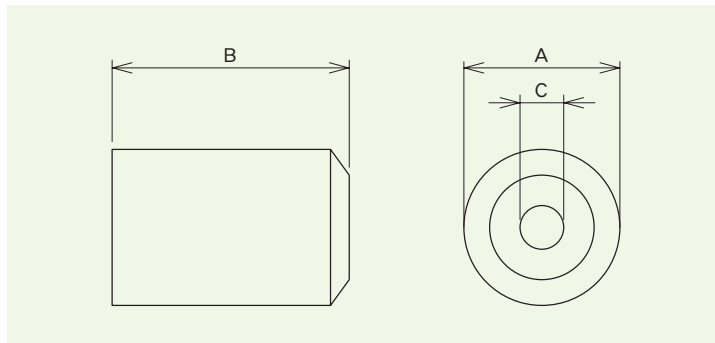


Figure 64. Toroidal type

Table 20. Product code, part number and specifications (lead wire type)

Product code	P/N	Finished dimensions(mm)								Weight (g) TYP.
		A	B	C	D	E	F	G	H	
F1AH0675	FT-3AM B4ARL-PF	5.0MAX.	7.0REF.	15.0REF.	3.0MIN.	7.0MAX.	5.0±1	1.0φ	2.0MAX.	0.52
F1AH0676	FT-3AM B4ARLY-PF	5.0MAX.	7.0MAX.	3.0MIN.	4.0±1	—	15.0±1	1.0φ	2.8MAX.	0.56

- A<sub>e</sub>, L<sub>m</sub>, 2φs, AL value and core case are the same as FT-3AM B4AR
- No Ozone Layer Depleting Chemicals are used in these products or in their manufacturing process.
- They are lead-free products.

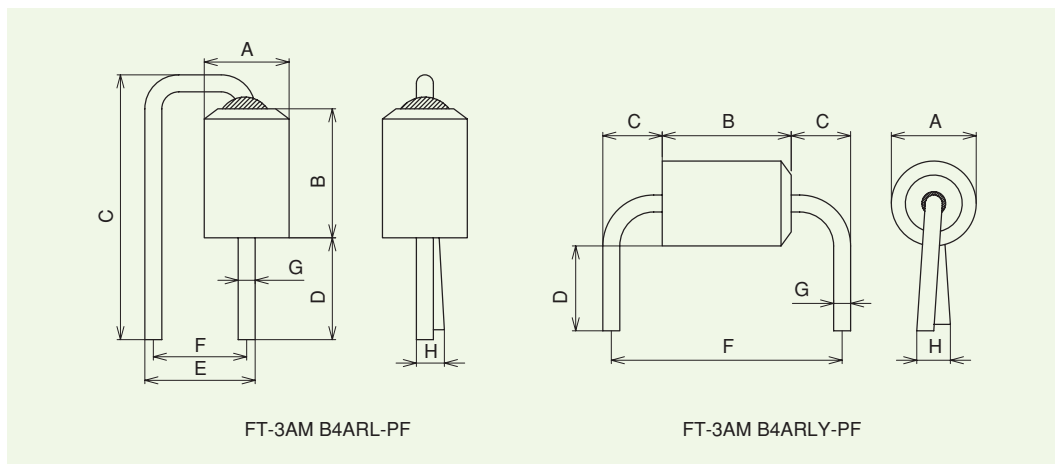


Figure 65. Lead wire type



## Catalogs for other FINEMET® Products

### ●FINEMET® EMC Components

#### CORES

For suppression of conduction noise and radiation noise for inverters, etc.



**FT-3KM S series**  
Common mode choke core designed for bus bar



**FT-3KL F series**  
Cores for high saturation current common mode chokes

#### SHEET

For radiation noise suppression and electromagnetic shield



**MS-F/MS-FR series**  
High Performance, Thin and Flexible Magnetic Shielding Sheet



**Absorshield® K-EK series**  
Halogen-free Noise Suppression Sheet with Flame Retardant

### ●Power Electronics Devices



**Saturable Core MP Series**

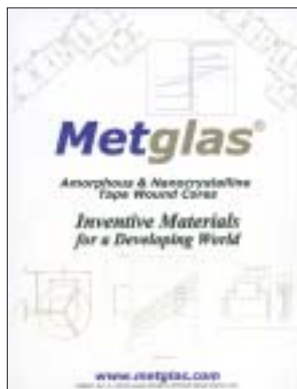


**FINEMET® F3CC Series Cut Core**

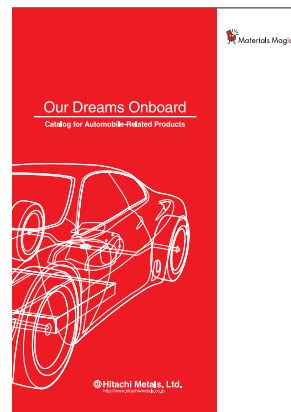
### ●Others



**FINEMET®**  
Nanocrystalline soft magnetic material



**Metglas®**  
Catalog



#### Automobile-Related Products

This catalog includes FINEMET® products as electromagnetic noise suppression components for inverters and interior accessories (e.g. car navigation system) for hybrid vehicle and electric vehicle.

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