FERROTITE®

muRata

Ferrite Core for **EMI** Suppression

■FEATURES

- Useful and excellent noise suppression.
- Data lines can be passed through core or wound around core several times.
- Effective for suppressing noise at high frequencies.

■APPLICATIONS

- For computers, and peripheral equipment. (printer, FDD, HDD, display etc.)
- For digital equipment.
- For switching power supply.

■PART NUMBERING

(Ex.)

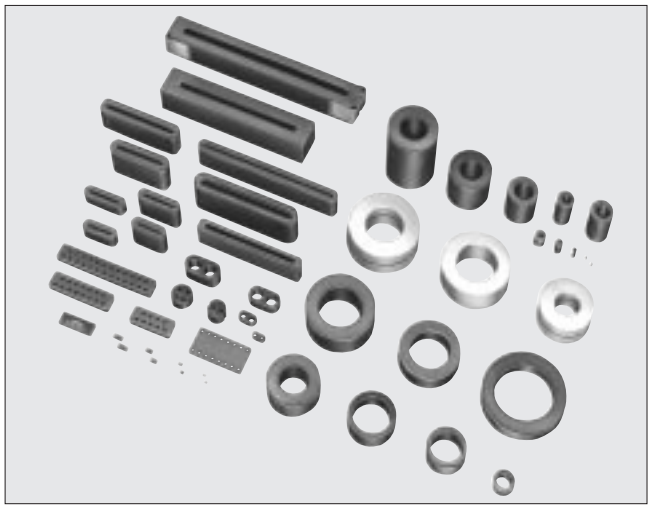
FS	OB	19	0	RT	01
❶	❷	❸	❹	❺	❻

❶Soft ferrite
❷Shape OH : Beads core
OB : Ring core
OC : Core for flat cable
MA : Multi hole core
SA : Plate core
❸Typical dimension
❹Assistant No.1
❺Material
❻Assistant No.2

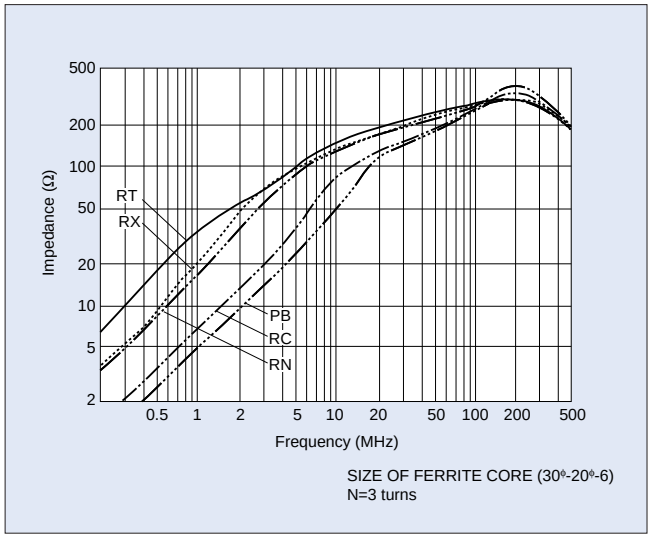
■STANDARD CHARACTERISTICS OF FERRITE MATERIALS

Material	μi	Bs (mT)	Tc (℃)	ρ (Ω-m)
RT	1600	290	≧110	$>10^5$
RX	750	330	≧110	$>10^5$
RN	550	310	≧130	$>10^5$
RC	250	320	≧140	$>10^5$
PB	150	220	≧300	$>10^4$

Size of ferrite core (30ϕ – 20ϕ – 6)



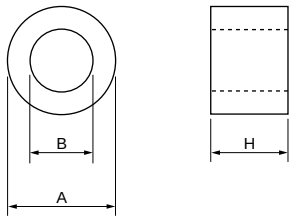
FERRITE MATERIAL COMPARISON



FERROTITE®

Ring Core

■DIMENSIONS



OB01

■SPECIFICATIONS

Part Number	Dimension (mm)			Impedance (Ω)		Figure	Shape	Note	
	ϕA	ϕB	H	10MHz	100MHz			*Case	Note<ref>
FSOB060RN01B	5.5	2.7	4.0	153	290	Fig.1	OB01		
FSOB071RN01B	7.0	4.0	4.0	114	222	Fig.1	OB01		
FSOB090RN02B	9.0	5.0	8.0	262	466	Fig.2	OB01		for USB
FSOB090RN05B	9.0	5.0	6.0	196	356	Fig.2	OB01		for USB
FSOB120RT01B	12.0	7.0	10.0	320	450	Fig.3	OB01		for USB
FSOB120RT02B	12.0	7.0	8.0	240	400	Fig.3	OB01		for USB
FSOB120RT05B	12.0	7.0	6.0	180	310	Fig.3	OB01		for USB
FSOB121RT01B	12.0	5.6	10.0	441	535	Fig.4	OB01		for USB
FSOB121RT02B	12.0	5.6	8.0	349	490	Fig.4	OB01		for USB
FSOB121RT03B	12.0	5.6	6.0	261	406	Fig.4	OB01		for USB
FSOB140RN	14.0	10.0	8.0	160	340	Fig.5	OB01		
FSOB140RN02B	14.0	10.0	14.0	260	450	Fig.5	OB01		
FSOB142RX01B	14.0	8.0	10.0	307	492	Fig.6	OB01		
FSOB142RX02B	14.0	8.0	8.0	246	415	Fig.6	OB01		
FSOB142RX03B	14.0	8.0	6.0	182	325	Fig.6	OB01		
FSOB162RN	16.3	8.3	16.0	550	640	Fig.7	OB01		
FSOB162RN02	16.3	8.3	5.0	180	310	Fig.7	OB01		
FSOB162RN03B	16.3	8.3	3.0	116	230	Fig.8	OB01		
FSOB162RN04B	16.3	8.3	10.0	379	557	Fig.8	OB01		
FSOB190RT	19.0	10.0	10.0	370	480	Fig.9	OB01	●	
FSOB190RT02B	19.0	10.0	6.0	220	360	Fig.9	OB01		
FSOB220RN	22.0	14.0	8.0	200	360	Fig.10	OB01		
FSOB250RT	25.0	15.0	12.0	350	470	Fig.10	OB01	●	
FSOB300RT03	30.0	20.0	8.0	180	300	Fig.10	OB01		

- The impedance value is measured with 3 turns.
- Various types, other than listed above, are available.
- We can supply core coated with epoxy or nylon, please consult MURATA.
- Please confirm the type and rated value upon ordering as specifications are subject to change for improvement without notice. Please contact MURATA for further information.

*●: We can supply core with case. Please consult MURATA.

■IMPEDANCE FREQUENCY CHARACTERISTICS

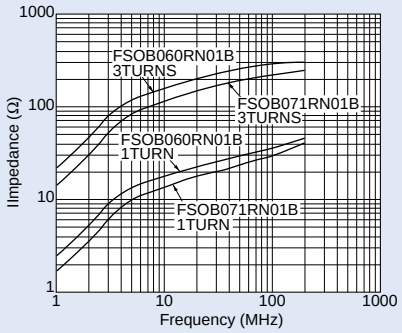


Fig.1

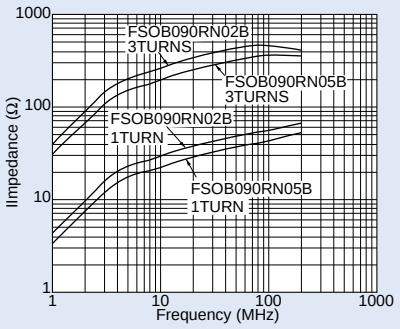


Fig.2

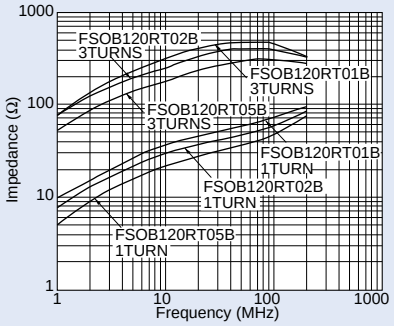


Fig.3

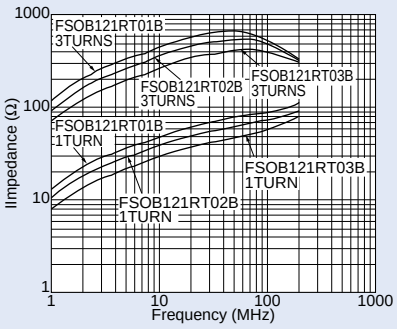


Fig.4

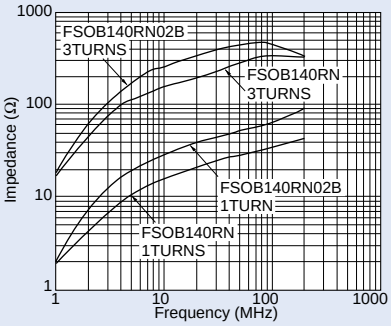
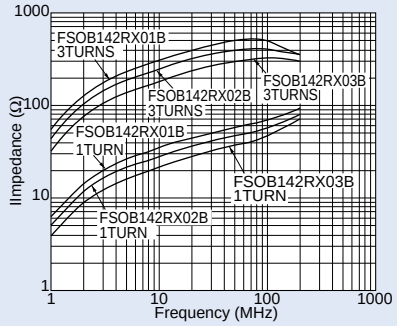


Fig.5



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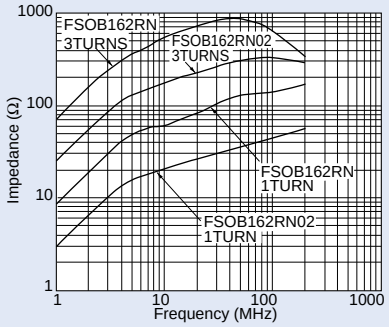


Fig.7

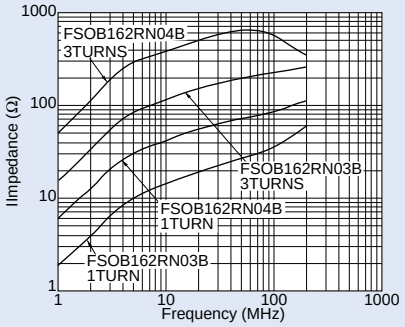


Fig.8

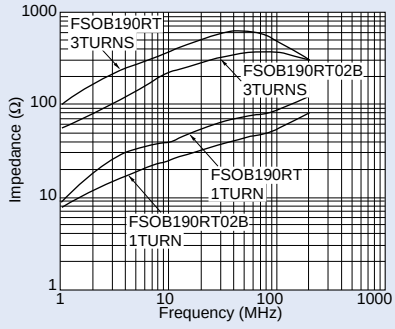


Fig.9

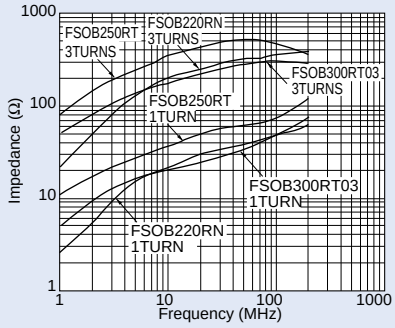
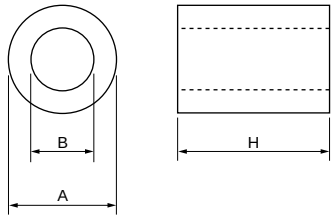


Fig.10

FERROTITE®

Beads Core

■DIMENSIONS



OH01

■SPECIFICATIONS

Part Number	Dimension (mm)			Impedance (Ω)		Figure	Shape	Note <ref>
	ϕA	ϕB	H	10MHz	100MHz			
FSOH021RN19A	1.95	1.02	4.9	19	34	Fig.1	OH01	
FSOH030RN	3.36	1.1	6.0	41	74	Fig.1	OH01	
FSOH041RN	3.6	1.0	4.85	37	66	Fig.1	OH01	
FSOH050RN	4.7	1.4	5.0	37	64	Fig.2	OH01	
FSOH050RN01	4.7	1.4	10.0	74	120	Fig.2	OH01	
FSOH060RN02	5.5	2.7	8.0	34	64	Fig.2	OH01	
FSOH070RN	7.0	4.0	14.0	47	82	Fig.3	OH01	
FSOH070RN02	7.0	4.0	8.0	28	59	Fig.3	OH01	
FSOH090RN	9.0	5.0	16.0	55	100	Fig.4	OH01	for USB
FSOH090RN02	9.0	5.0	10.0	35	72	Fig.4	OH01	for USB
FSOH090RN03	9.0	5.0	20.0	72	135	Fig.4	OH01	for USB
FSOH120RT	12.0	7.0	15.0	50	90	Fig.5	OH01	for USB
FSOH120RT02	12.0	7.0	20.0	69	120	Fig.5	OH01	for USB
FSOH120RT03	12.0	7.0	28.0	97	175	Fig.5	OH01	for USB
FSOH121RT01	12.0	5.6	20.0	100	170	Fig.6	OH01	for USB
FSOH121RT02	12.0	5.6	15.0	72	130	Fig.6	OH01	for USB
FSOH121RT04	12.0	5.6	25.0	118	223	Fig.6	OH01	for USB
FSOH142RX01	14.0	8.0	28.0	90	170	Fig.7	OH01	
FSOH142RX02	14.0	8.0	15.0	51	97	Fig.7	OH01	
FSOH142RX03	14.0	8.0	20.0	68	127	Fig.7	OH01	
FSOH162RN01	16.3	8.3	20.0	83	162	Fig.8	OH01	
FSOH162RN02	16.3	8.3	28.0	117	225	Fig.8	OH01	
FSOH190RT	19.0	10.0	28.5	120	200	Fig.7	OH01	

- The impedance value is measured with 1 turns.
- Various types, other than listed above, are available.
- Please confirm the type and rated value upon ordering as specifications are subject to change for improvement without notice. Please contact MURATA for further information.

■IMPEDANCE FREQUENCY CHARACTERISTICS

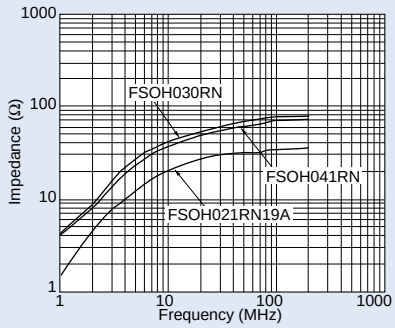


Fig.1

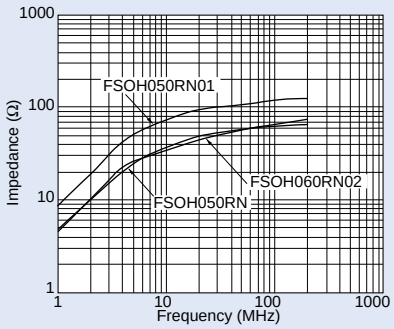


Fig.2

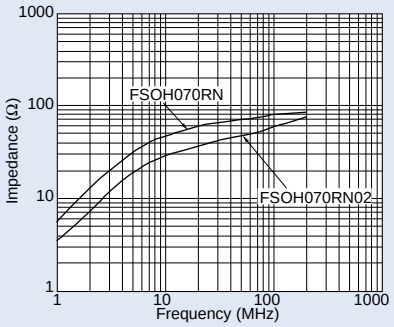


Fig.3

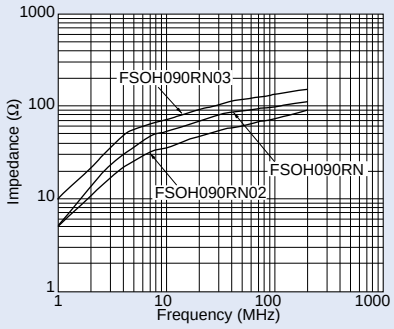


Fig.4

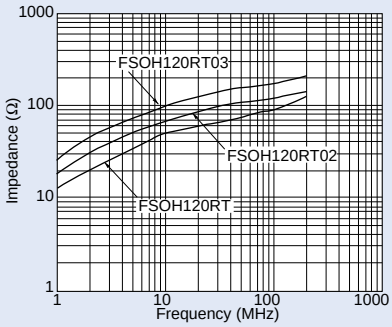


Fig.5

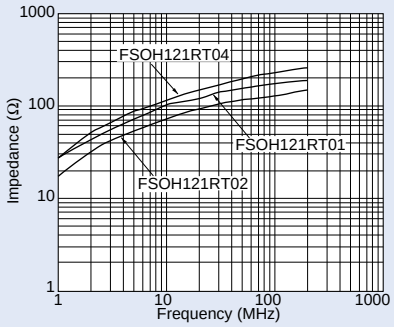


Fig.6

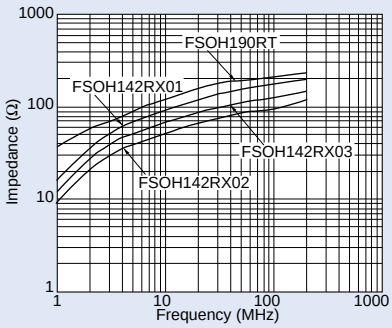


Fig.7

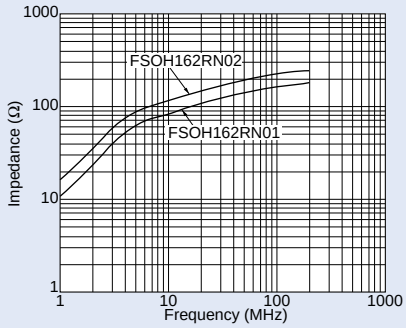
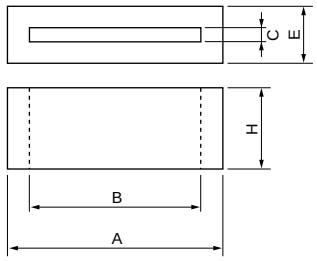


Fig.8

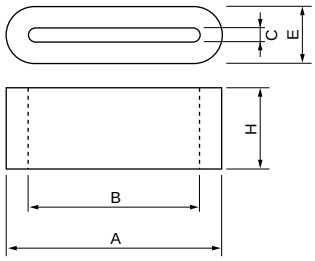
FERROTITE®

Core for Flat Ribbon Cable

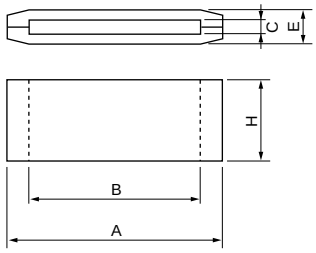
■DIMENSIONS



OC01



OC02



OC03

■SPECIFICATIONS

Part Number	Dimension (mm)					Impedance (Ω)		Figure	Shape	<ref.>	
	A	B	C	E	H	10MHz	100MHz			Number of Lead	Note
FSOC120RX01B	11.5	8.0	0.7	3.0	12.0	29	59	Fig.1	OC01	3	thin type
FSOC120RX02B	11.5	8.0	0.7	3.0	6.0	15	36	Fig.1	OC01	3	thin type
FSOC120RX04B	11.5	8.0	0.7	3.0	9.0	22	48	Fig.1	OC01	3	thin type
FSOC120RX06B	11.5	8.0	0.7	3.0	2.0	6.2	24	Fig.1	OC01	3	thin type
FSOC140RX01	13.8	9.6	0.8	5.0	12.0	38	78	Fig.2	OC02	6	
FSOC140RX02B	13.8	9.6	0.8	5.0	6.0	19	44	Fig.2	OC02	6	
FSOC140RX03B	13.8	9.6	0.8	5.0	3.0	11	30	Fig.2	OC02	6	
FSOC140RX04B	13.8	9.6	0.8	5.0	9.0	30	66	Fig.2	OC02	6	
FSOC170RT01	17.0	13.0	0.8	5.0	12.0	32	75	Fig.3	OC02	9	
FSOC170RT02	17.0	13.0	0.8	5.0	7.0	20	45	Fig.3	OC02	9	
FSOC170RT03B	17.0	13.0	0.8	5.0	6.0	16	37	Fig.3	OC02	9	
FSOC170RT04B	17.0	13.0	0.8	5.0	9.0	23	53	Fig.3	OC02	9	
FSOC170RT05B	17.0	13.0	0.8	5.0	3.0	9	26	Fig.3	OC02	9	
FSOC171RT01B	17.0	13.6	0.7	2.8	12.0	19	53	Fig.4	OC01	9	thin type
FSOC171RT02B	17.0	13.6	0.7	2.8	6.0	10	37	Fig.4	OC01	9	thin type
FSOC171RT04B	17.0	13.6	0.7	2.8	9.0	14	44	Fig.4	OC01	9	thin type
FSOC221RT01	22.8	18.8	0.55	2.8	15.0	20	73	Fig.5	OC03	12	thin & division type
FSOC222RX01	22.8	18.7	0.7	2.8	12.0	14	53	Fig.5	OC01	12	thin type
FSOC222RX02	22.8	18.7	0.7	2.8	6.0	8	37	Fig.5	OC01	12	thin type
FSOC240RX01	23.8	18.8	1.1	6.3	15.0	38	76	Fig.5	OC02	12	
FSOC250RT01	25.0	21.0	0.8	5.0	12.0	24	70	Fig.6	OC02	15	
FSOC250RT02	25.0	21.0	0.8	5.0	7.0	14	45	Fig.6	OC02	15	
FSOC280RX01	28.0	24.0	0.8	3.5	12.0	15	56	Fig.7	OC01	15	thin type
FSOC280RX02	28.0	24.0	0.8	3.5	6.0	9	39	Fig.7	OC01	15	thin type
FSOC280RX04	28.0	24.0	0.8	3.5	9.0	12	46	Fig.7	OC01	15	thin type
FSOC310RN01	31.0	27.0	0.8	5.0	12.0	18	70	Fig.8	OC02	20	
FSOC310RN02	31.0	27.0	0.8	5.0	6.0	10	47	Fig.8	OC02	20	
FSOC310RN07	31.0	27.0	0.8	5.0	20.0	31	100	Fig.8	OC02	20	
FSOC320RT01	32.0	27.8	1.3	6.5	12.0	21	60	Fig.8	OC02	20	
FSOC321RN01	32.0	28.0	3.5	7.5	15.0	17	47	Fig.9	OC01	20	wide hole type
FSOC321RN02	32.0	28.0	3.5	7.5	10.0	13	35	Fig.9	OC01	20	wide hole type
FSOC360RX01	36.0	32.0	0.8	3.5	12.0	13	56	Fig.10	OC01	24	thin type
FSOC360RX02	36.0	32.0	0.8	3.5	6.0	8	40	Fig.10	OC01	24	thin type
FSOC360RX04	36.0	32.0	0.8	3.5	9.0	10	47	Fig.10	OC01	24	thin type
FSOC400RT01	40.0	35.0	0.5	4.0	12.0	16	80	Fig.11	OC03	26	division type
FSOC410RN	41.2	35.0	1.5	7.7	15.0	23	70	Fig.11	OC02	26	
FSOC440RN01	44.0	40.0	3.8	7.5	10.0	10	34	Fig.9	OC01	32	wide hole type
FSOC560RT01	56.2	52.2	0.9	4.8	12.0	15	70	Fig.11	OC02	38	
FSOC600RN	60.0	48.0	1.9	12.0	12.7	25	72	Fig.12	OC01	34	
FSOC600RN02	60.0	48.0	1.9	12.0	10.0	20	69	Fig.12	OC01	34	
FSOC800RT01	80.0	68.6	2.6	10.0	12.7	17	71	Fig.12	OC03	50	division type

- The impedance value is measured with 1 turns.
- Please confirm the type and rated value upon ordering as specifications are subject to change for improvement without notice. Please contact MURATA for further information.

■IMPEDANCE FREQUENCY CHARACTERISTICS

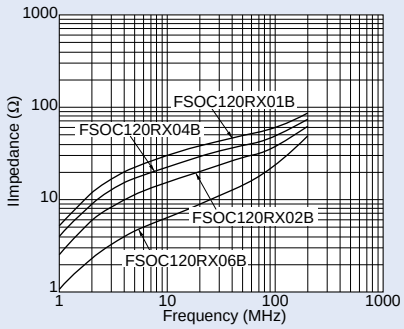


Fig.1

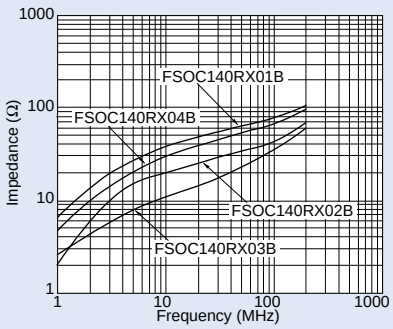


Fig.2

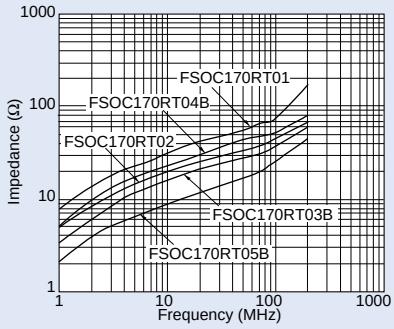


Fig.3

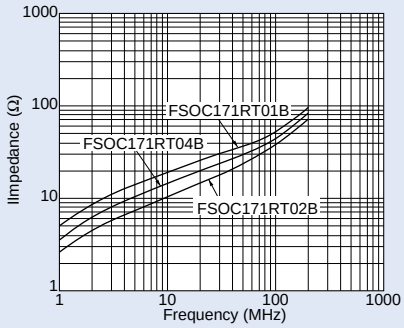


Fig.4

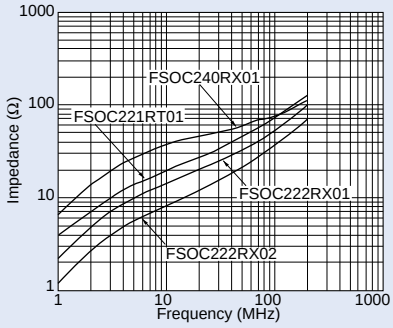


Fig.5

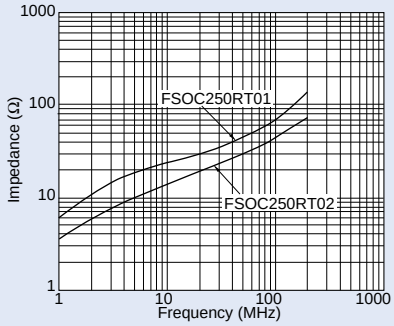


Fig.6

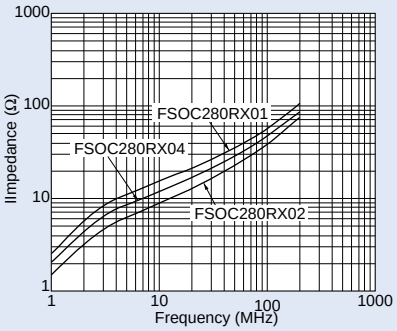


Fig.7

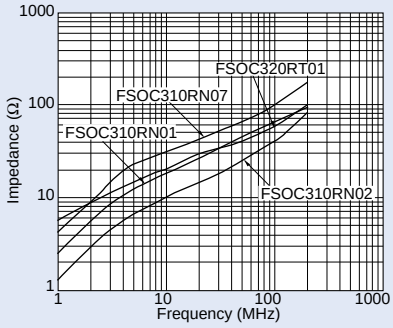


Fig.8

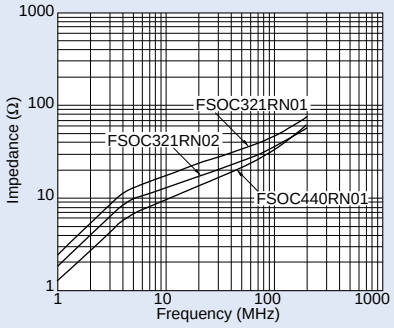


Fig.9

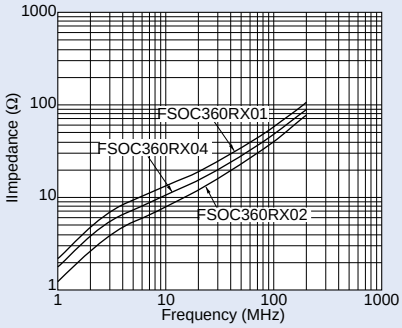


Fig.10

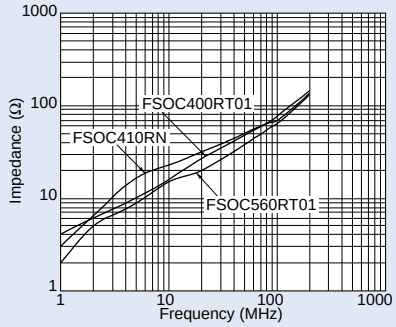


Fig.11

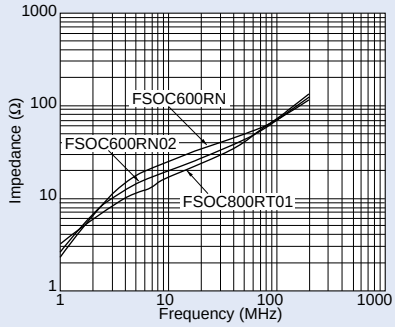
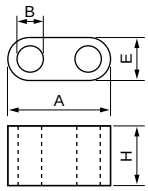


Fig.12

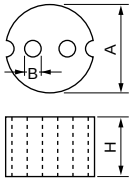
FERROTITE®

Multi Hole Core

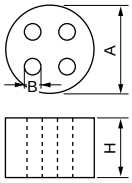
■DIMENSIONS



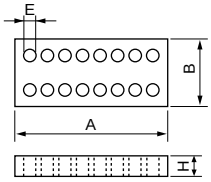
MA01



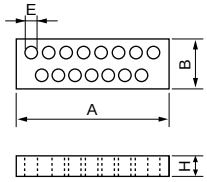
MA02



MC01



SA01



SA02

■SPECIFICATIONS

Part Number	Dimension (mm)				Impedance (Ω)		Pitch (mm)	Number of hole	Figure	Shape
	A	B	E	H	10MHz	100MHz				
FSMA050RL01	5.20	1.30	2.50	2.00	9.6	21	2.7	2	Fig.1	MA01
FSMA070PB	7.00	1.50	-	5.50	17	75	3.0	2	Fig.1	MA02
FSMA070PB14	7.14	1.84	4.19	6.20	18	78	2.9	2	Fig.2	MA01
FSMA070RL	6.50	1.00	3.00	10.0	74	100	3.0	2	Fig.1	MA01
FSMA071PB	7.00	2.20	3.70	3.00	5.6	28	3.05	2	Fig.1	MA01
FSMA120PB	12.00	4.00	6.50	4.00	7.9	36	5.5	2	Fig.2	MA01
FSMA140PB	14.00	4.50	7.00	6.50	10	49	6.0	2	Fig.2	MA01
FSMC080PB	8.00	1.40	-	5.00	18	72	3.0	4	Fig.2	MC01
FSSA160RN	16.0	6.40	1.15	2.5	22	43	2.743	9	Fig.3	SA02
FSSA200RN01	20.32	10.2	1.10	1.5	15	29	2.54	16	Fig.3	SA01
FSSA240RN	24.0	6.4	1.15	2.5	22	45	2.743	15	Fig.3	SA02
FSSA381RN	38.0	6.4	1.15	2.5	24	45	2.76	25	Fig.3	SA02

- The impedance value is measured with 1 turn.
- Various types, other than listed above, are available.
- Please confirm the type and rated value upon ordering as specifications are subject to change for improvement without notice. Please contact MURATA for further information.

■IMPEDANCE FREQUENCY CHARACTERISTICS

Fig.1

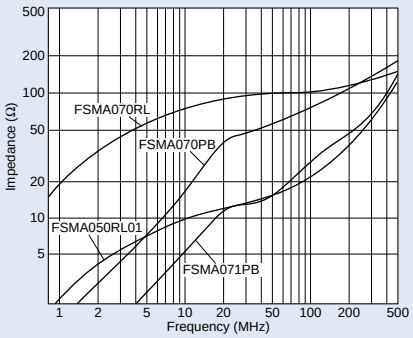


Fig.2

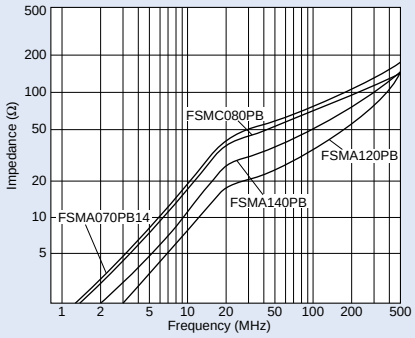
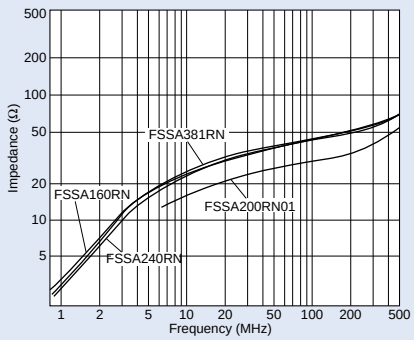


Fig.3

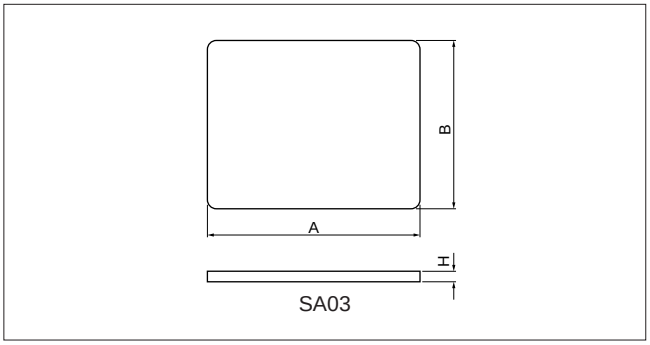


FERROTITE®

muRata

Plate core

■DIMENSIONS



■SPECIFICATIONS

Part Number	Dimension (mm)			Material	Shape
	A	B	H		
FSSA100RN01	10.0	10.0	1.0	RN	SA03
FSSA100RN02	10.0	10.0	0.55	RN	SA03
FSSA100RN03	10.0	10.0	0.8	RN	SA03
FSSA202RN01	20.0	16.5	1.5	RN	SA03
FSSA202RN02	20.0	16.5	1.0	RN	SA03
FSSA203RN01	20.0	20.0	1.0	RN	SA03
FSSA270RN01	27.0	20.0	1.0	RN	SA03
FSSA300RN01	30.0	30.0	1.0	RN	SA03
FSSA530RT01	52.8	28.5	1.4	RT	SA03
FSSA600RN02	60.5	30.6	2.0	RN	SA03

- Please confirm the type and rated value upon ordering as specifications are subject to change for improvement without notice. Please contact MURATA for further information.
- We can supply custom-mode core. Please consult MURATA.

■STANDARD CHARACTERISTICS OF FERRITE MATERIALS

Ni-Zn	RN	RT
Intial Permeability (μi)	550	1600
Curie Temperature	≧130℃	≧110℃
Electrical Resistivity	≧10^5Ω·m	≧10^5Ω·m

■CASE TO USE (Plate core)

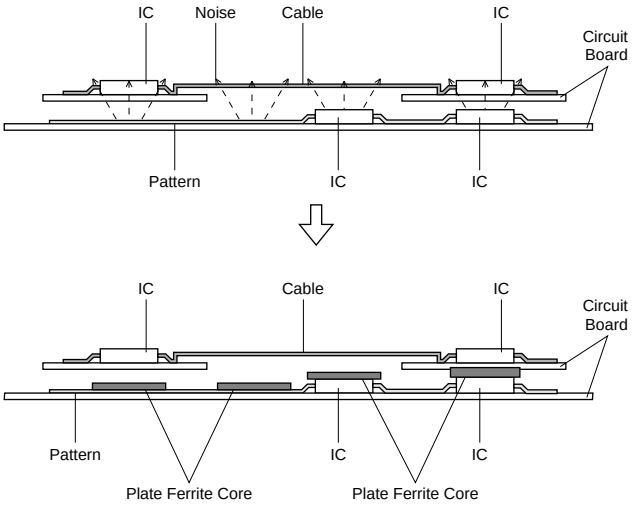


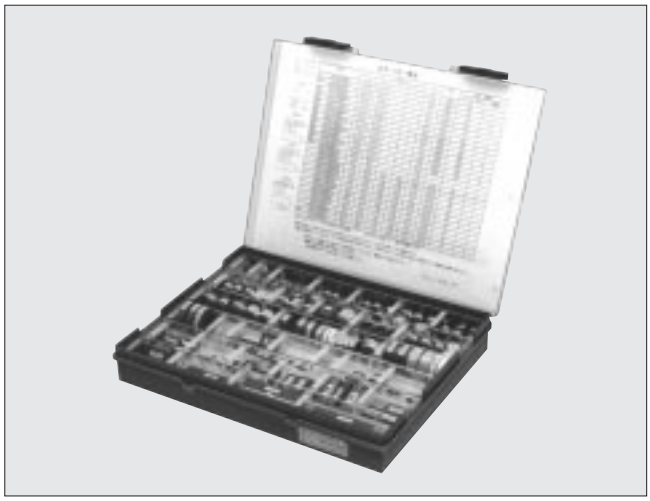
Fig.1

FERROTITE®

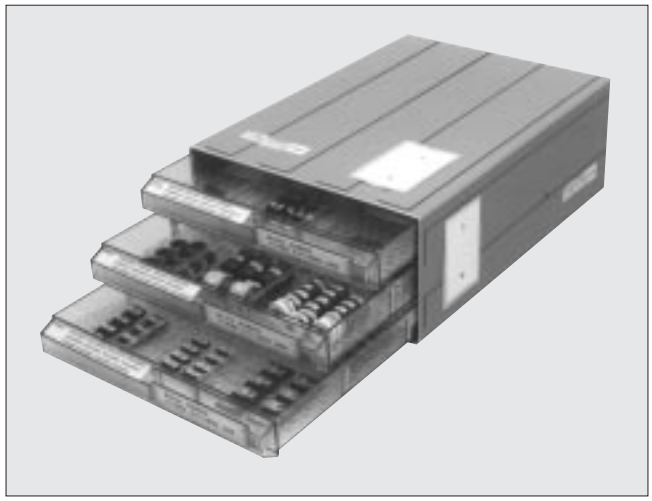
Sample Kit

■SAMPLE KIT

The Ferrite Core sample kit has each of the filters in a plastic case to facilitate selection when testing the noise suppression capabilities of the Ferrite Core range.
The kit can be used equally either on-site or in the laboratory.



TYPE A



TYPE B

SERIES : Ferrite Beads Core
Ring Core
Plate Core
Core for Flat Ribbon Cable.

Please consult MURATA about specifications

- Please use the products in this Sample Kit experiment or test production, but do not use for mass production. When using for mass production, please order them after confirming detailed specifications by approving the appropriate individual specification sheet.

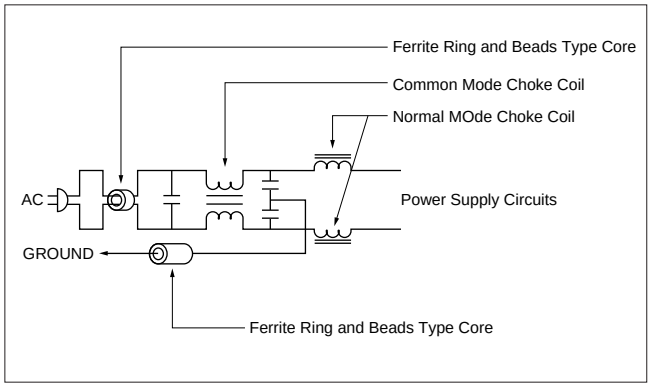
FERROTITE®

muRata

Ferrite Core for EMI Suppression

■EMI SUPPRESSION IN POWER SUPPLY CIRCUITS

In power supply circuits, AC line filter and the capacitor for normal/common mode noise are used fro EMI countermeasures. But some noise passes over these filters and propagates onto the AC cable. For this noise, winding the AC cable (2-3 turns) over a ferrite ring core or ground inductor (coil with several turns over ferrite ring core) is very effective.

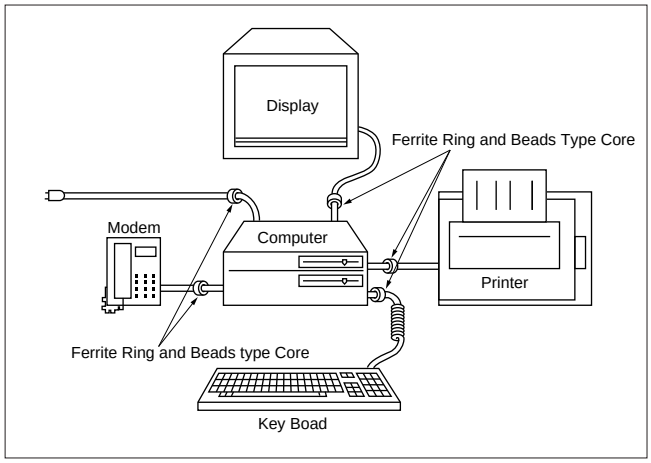


■EMI SUPPRESSION FOR INTERFACE CABLES

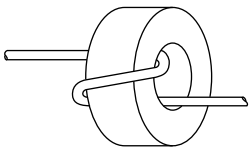
Current development of digital circuit engineering expands the application of micro-computers in various products. Digital circuits in micro-computers may radiate noise (eq. clock signal and associated harmonic waves).

This noise couples onto the interface cables which acts as an antenna because of the high frequency components. This radiated noise can then interfere with other equipment and conversely the micro-computer is susceptible to similar radiated noise from other sources.

An easy and cost effective method of noise suppression can be accomplished when the cable is passed through a ferrite core or wound around a ferrite ring.

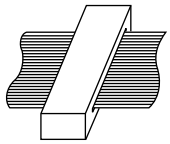


■CASES TO USE (Except plate core)



Ring Type
(FSOB Type)

Beads Type
(FSOH Type)



Core for Flat Cable Type
(FSOC Type)

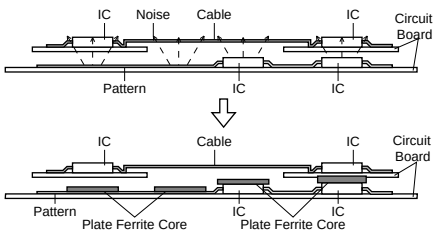


Plate Type
(FSSA Type)

■NOTICE

Please do a prototype build using ferrite core for EMI suppression in the actual application in order to effectively evaluate the part before mass production.

FERROTITE®

Ferrite Core for EMI Suppression

⚠Note:

1. Export Control
   〈For customers outside Japan〉
   Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.
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   For products which 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.
2. Please contact our sales representatives or product engineers before using our products listed in this catalog for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property, or when intending to use one of our products for other applications than specified in this catalog.
   ① Aircraft equipment
   ② Aerospace equipment
   ③ Undersea equipment
   ④ Medical equipment
   ⑤ Transportation equipment (vehicles, trains, ships,etc.)
   ⑥ Traffic signal equipment
   ⑦ Disaster prevention / crime prevention equipment
   ⑧ Data-processing equipment
   ⑨ Application of similar complexity and/or reliability requirements to the applications listed in the above
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4. The parts numbers and specifications listed in this catalog are for information only. You are requested to approve our product specification or to transact the approval sheet for product specification, before your ordering.
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6. None of ozone depleting substances (ODS) under the Montreal Protocol is used in manufacturing process of us.

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http://www.murata.co.jp/products/

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