Devices thru Material Innovation

NEC/TOKIN

Vol. 11

Noise Filters

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9615NFSVOL11E1106E1

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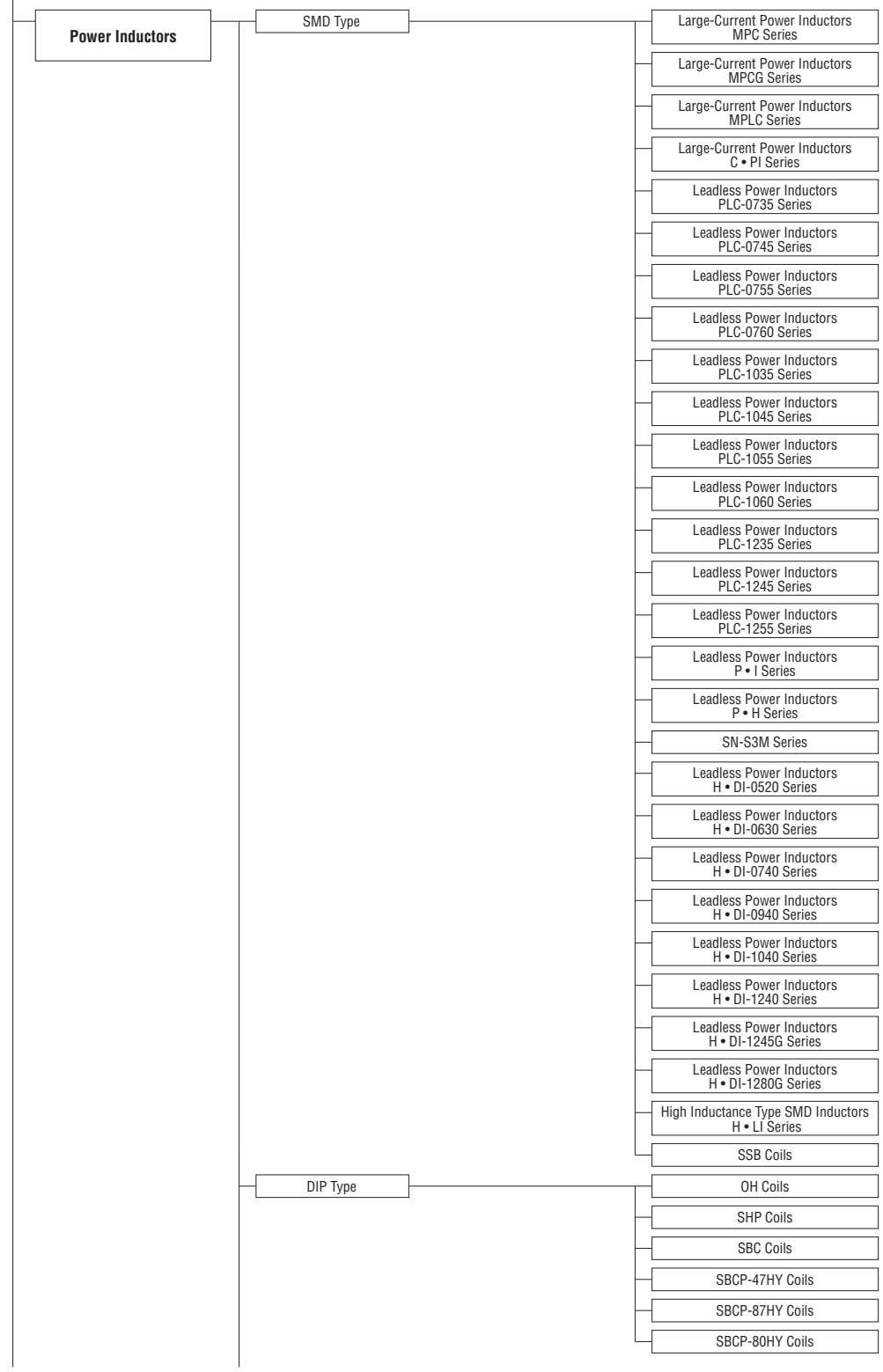
Classification of NEC TOKIN's EMI suppression parts



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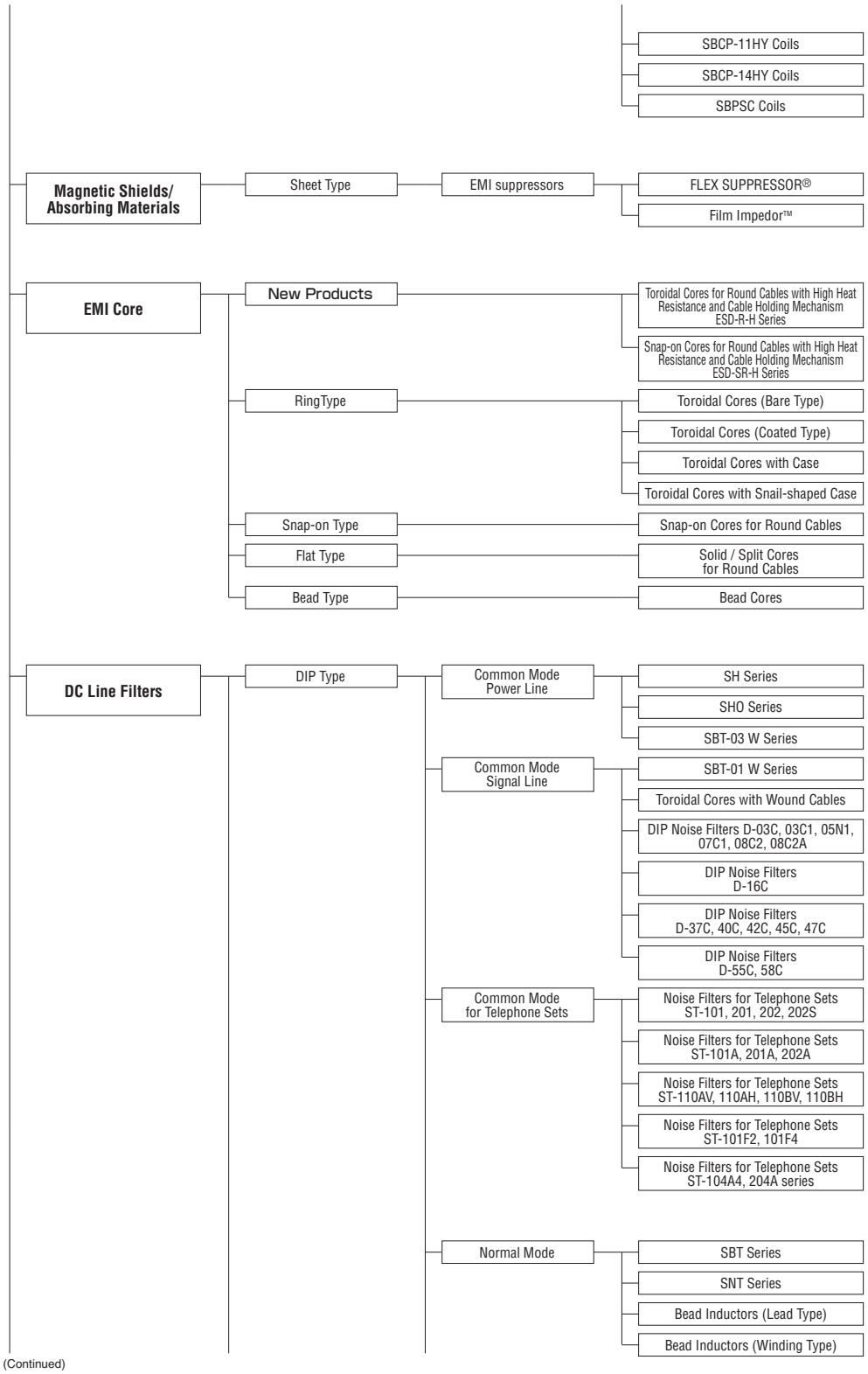

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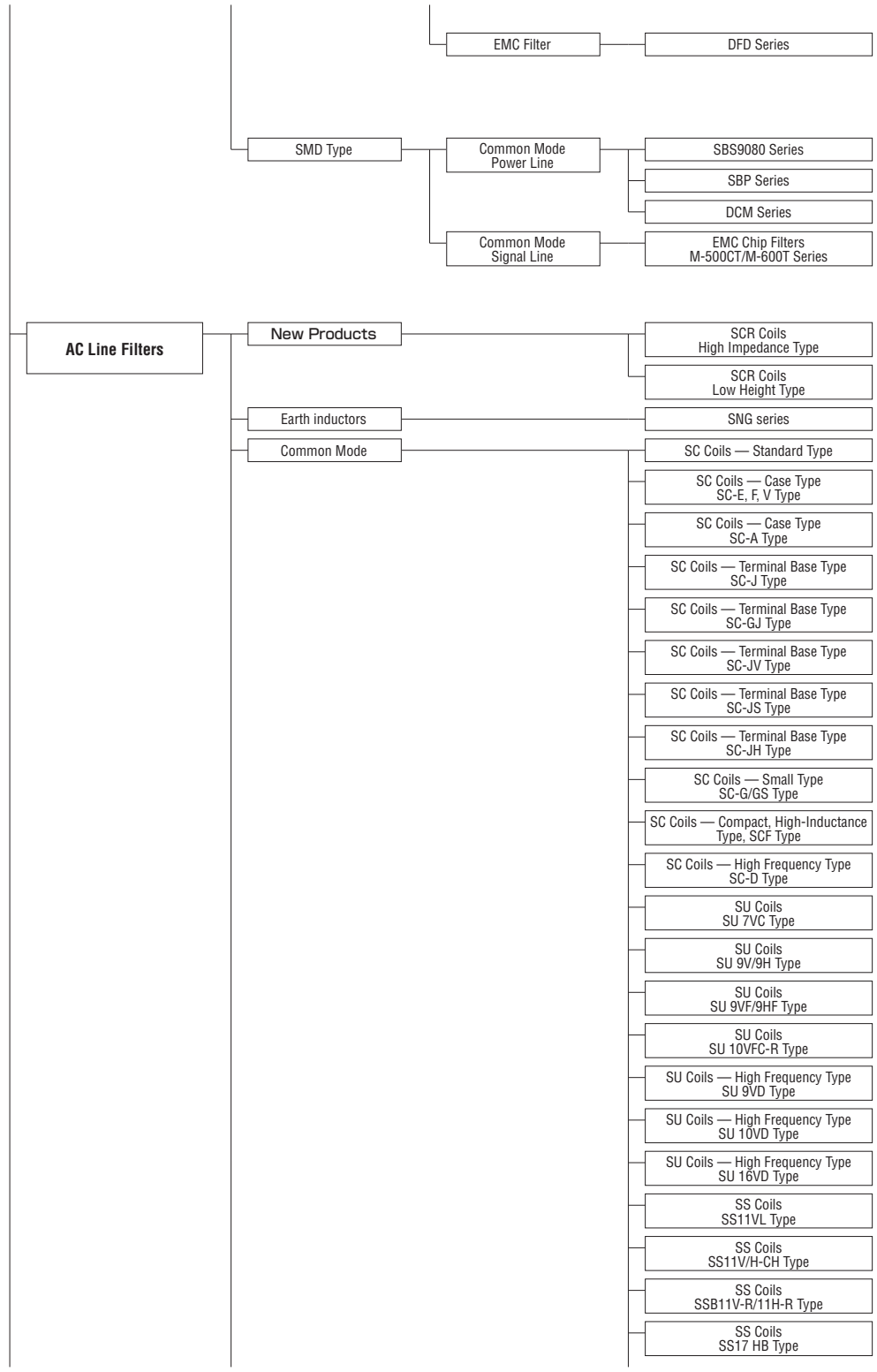

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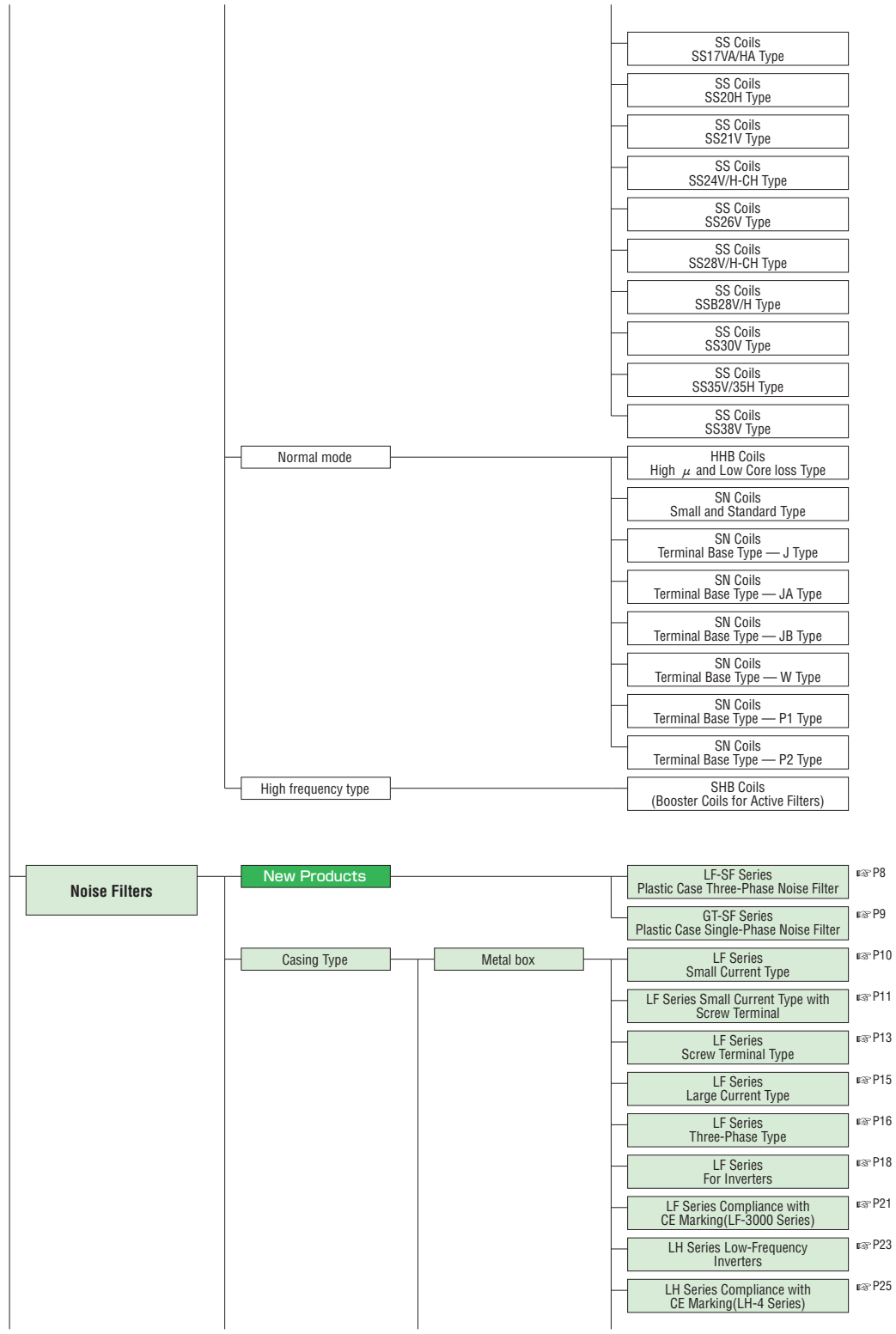

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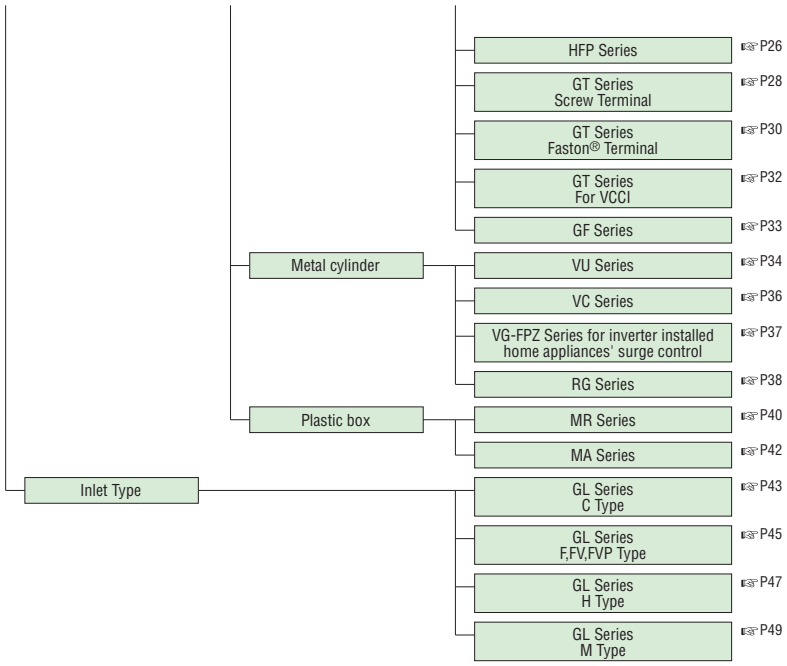

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9615NFSVOL11E1106E1

Plastic Case Three-Phase Noise Filter
LF-SF Series
[RoHS Compliant]

NEW PRODUCT

Features

- Plastic shell of the product eliminates resin filling (weight reduction)
- DIN rail installation types available
- Featuring mechanism of self-jump-up to prevent loss of screw (easy to install)
- Safety cover integrating contact terminal

Applications

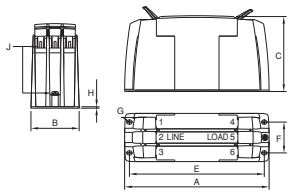
- Industrial equipment, machine tools

Model ※1	Rated voltage AC/DC(V)	Rated current AC/DC(A)	Withstanding voltage 2 sec., line to ground AC(V)	Insulation resistance 500VDC 1 min., line to ground (MΩ)min.	Leakage current 380V/50Hz, (mA)max.	Self-temperature rise (K)max.	Operating temperature range (℃)	Certified standard	Weight (g) ※2
LF-3100SF-10/20	520	10	3000	6000	0.48	50	-25～+100	UL、CSA、ENEC14	520 / 540
LF-3200SF-10/20	520	20	3000	6000	0.48	50	-25～+100	UL、CSA、ENEC14	520 / 540
LF-3300SF-10/20	520	30	3000	6000	0.48	50	-25～+100	UL、CSA、ENEC14	520 / 540
LF-3500SF-10/20	520	50	3000	6000	0.48	50	-25～+100	UL、CSA、ENEC14	950 / 960

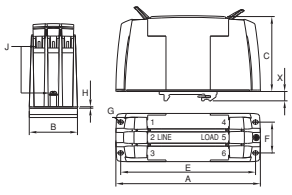
※1 : Model names ending with "10" indicate normal types, and those ending with "20" indicate DIN rail types. ※2 : Normal type / DIN rail type (DIN rails not included in the products)

Shape and Dimensions

●LF-3**0SF-10(Normal type)



●LF-3**0SF-20(DIN rail type)

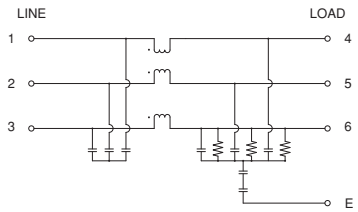


*Recommended torque (N·m) max. ◆Line terminal (M4: 1.20, M5: 2.20) ◆Earth terminal (M4: 1.20, M5: 2.20)

Model	A	B	C	E	F	G	H	J	X
Normal type10,20,30A	150	50	78	140	32	4.3x5.5	1.5	M4	
Normal type 50A	177	65	84	162	44	5.3x6.5	1.5	M5	
DIN rail type10,20,30A	150	50	78	140	32	4.3x5.5	1.5	M4	9.7
DIN rail type 50A	177	65	84	162	44	5.3x6.5	1.5	M5	9.7

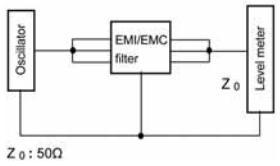
[mm]

Circuit Diagram



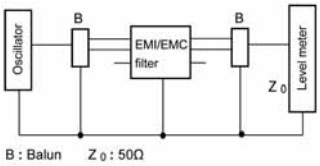
Measuring Circuit

●Common mode



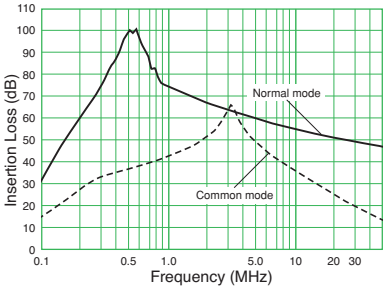
Z0 : 50Ω

●Normal mode



B : Balun Z0 : 50Ω

Attenuation(Static Characteristics)
Representative example: 50A



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Plastic Case Single-Phase Noise Filter
GT-SF Series
[RoHS Compliant]

NEW PRODUCT

Features

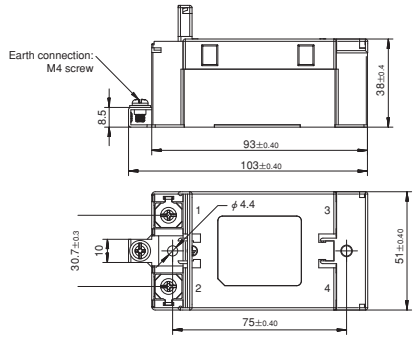
- Plastic shell of the product eliminates resin filling (weight reduction)
- DIN rail installation types available
- Featuring mechanism of self-jump-up to prevent loss of screw (easy to install)
- Safety cover integrating contact terminal

Applications

- Industrial equipment, electronic devices

Model ※1	Rated voltage AC/DC(V)	Rated current AC/DC(A)	Withstanding voltage 2 sec., line to ground AC(V)	Insulation resistance 500VDC 1 min., line to ground (MΩ)min.	Leakage current 250V/50Hz, (mA)max.	Self-temperature rise (K)max.	Operating temperature range (℃)	Certified standard	Weight (g) ※2
GT-2060SF-10	250	6	2500	6000	0.56	45	-25～+100	cCSAus,ENEC14	210
GT-2100SF-10	250	10	2500	6000	0.56	45	-25～+100	cCSAus,ENEC14	220
GT-2160SF-10	250	16	2500	6000	0.56	45	-25～+100	cCSAus,ENEC14	220
GT-2200SF-10	250	20	2500	6000	0.56	45	-25～+100	cCSAus,ENEC14	220

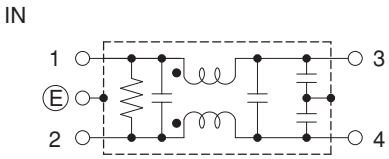
Shape and Dimensions



*Recommended torque (N·m) max. ◆Line terminal (M4: 1.00)
◆Earth terminal (M4: 1.00)

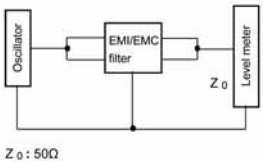
[mm]

Circuit Diagram

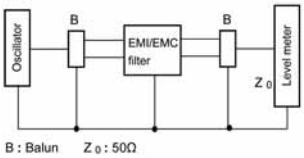


Measuring Circuit

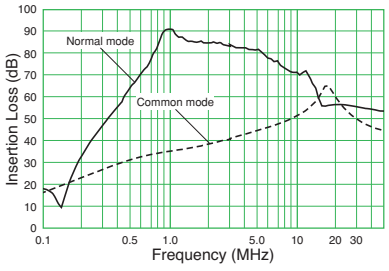
●Common mode



●Normal mode



Attenuation(Static Characteristics)
Representative example: 20A



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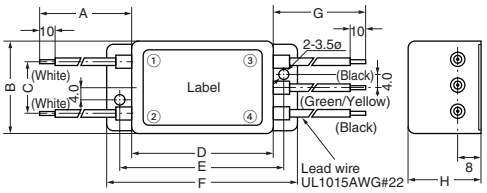
LF Series
Small Current Type
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (℃)	Certified standard	Weight (g)
LF-202A	250	2	1500	300	1	1.5	30	–20 to +55		95
LF-202U-1	250	2	1500	300	1	1.5	30	–20 to +55	UL	95

Shape and Dimensions

●LF-202A, LF-202U-1

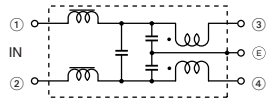


Model	A	B	C	D	E	F	G	H
LF-202A	100	32	17	48	56	64	100	25
LF-202U-1	200	32	17	48	56	64	200	25

[mm]

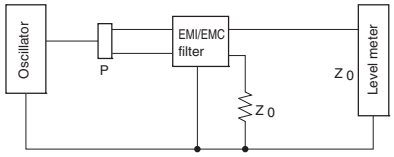
Circuit Diagram

●LF-200 Series



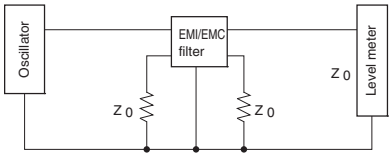
Measuring Circuit

●Common mode



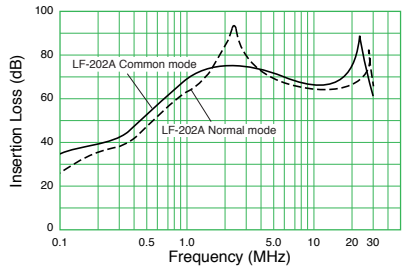
P: Power divider Z 0 : 50Ω

●Normal mode



Z 0 : 50Ω

Attenuation (Static Characteristics)



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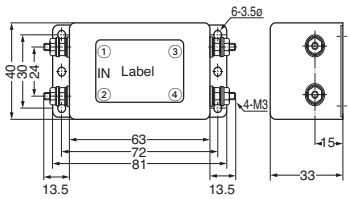
LF Series
Small Current Type with Screw Terminal
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
LF-205A	250	5	1500	300	1	1.5	30	–20 to +55		170
LF-205P	250	5	2000	300	1	1.5	30	–20 to +55		170
LF-210	250	10	1500	300	1	1.5	30	–20 to +55	UL	590
LF-215	250	15	1500	300	1	1.5	30	–20 to +55		620
LF-215U	250	15	1500	300	1	1.5	30	–20 to +55	UL	620
LF-210N	250	10	1500	300	1	1.5	30	–20 to +55		650
LF-210P	250	10	2000	300	1	1.5	30	–20 to +55		590
LF-215N	250	15	1500	300	1	1.5	30	–20 to +55		650
LF-215P	250	15	2000	300	1	1.5	30	–20 to +55		620

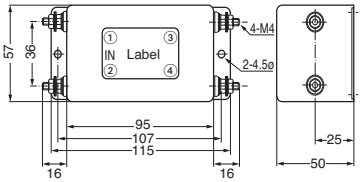
Shape and Dimensions

●LF-205A, LF-205P



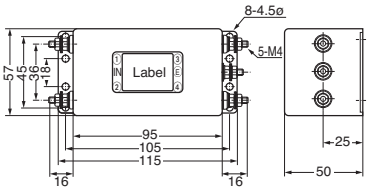
*Recommended torque (N·m) max. ◆Line terminal (M3: 0.49)

●LF-215U



*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78)

●LF-210, 210N, 210P, LF-215, 215N, 215P

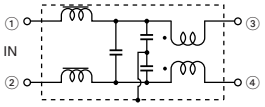


*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78)
◆Earth terminal (M4: 1.18)

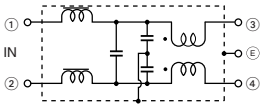
[mm]

Circuit Diagram

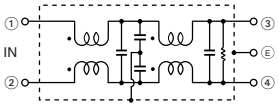
●LF-205A, 205P, 215U



●LF-210, 215, 210P, 215P



●LF-210N, 215N



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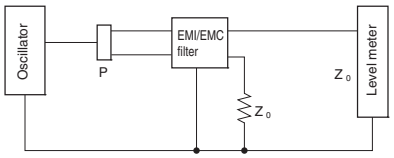
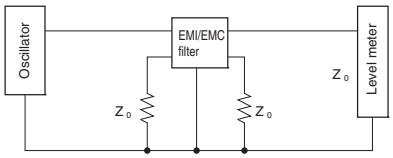
Measuring Circuit

●Common mode



P: Power divider Z_0: 50Ω

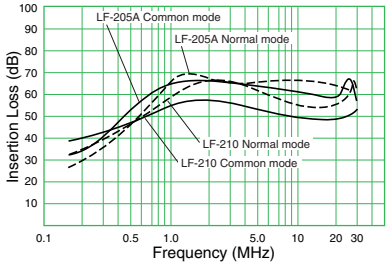
●Normal mode



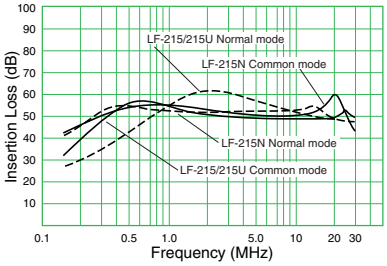
Z_0: 50Ω

Attenuation (Static Characteristics)

●LF-205A, LF-210



●LF-215, LF-215U, LF-215N



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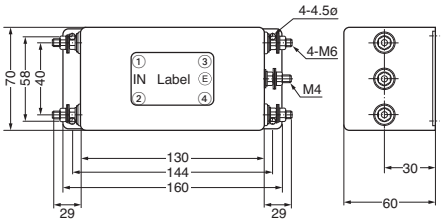
LF Series
Screw Terminal Type
[RoHS Compliant]

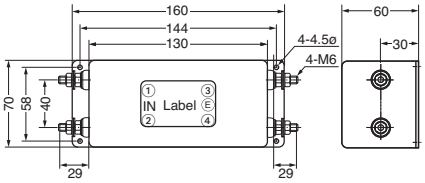
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (kg)
LF-220	250	20	1500	300	1	1.5	30	–20 to +55		1.2
LF-230	250	30	1500	300	1	1.5	30	–20 to +55		1.2
LF-230FU	250	30	1500	300	1	1.5	30	–20 to +55	UL	1.2
LF-220N	250	20	1500	300	1	1.5	30	–20 to +55		1.2
LF-220P	250	20	2000	300	1	1.5	30	–20 to +55		1.2
LF-230N	250	30	1500	300	1	1.5	30	–20 to +55		1.2
LF-230P	250	30	2000	300	1	1.5	30	–20 to +55		1.2

Shape and Dimensions

●LF-220, 220N, 220P, LF-230, 230N, 230P



●LF-230FU

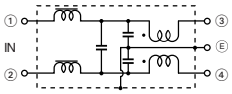


[mm]

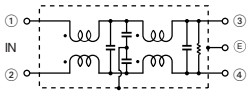
*Recommended torque (N·m) max. ◆Line terminal (M6: 1.18) ◆Earth terminal (M4: 1.18)

Circuit Diagram

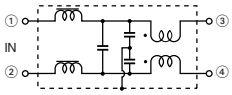
●LF-220, 220P, 230, 230P



●LF-220N, 230N Series

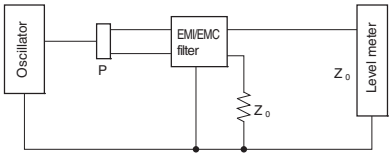


●LF-230FU



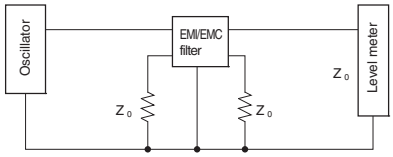
Measuring Circuit

●Common mode



P: Power divider Z_0: 50Ω

●Normal mode



Z_0: 50Ω

⚠

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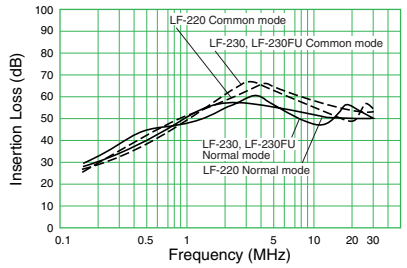
Attenuation (Static Characteristics)



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9615NFSVOL11E1106E1

LF Series

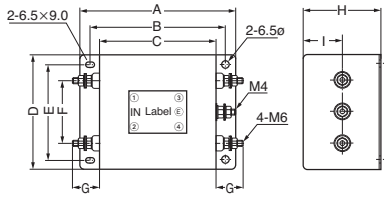
Large Current Type

[RoHS Compliant]

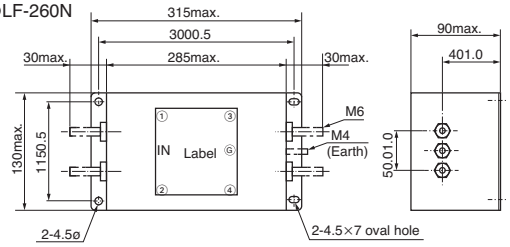
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (kg)
LF-240	250	40	1500	300	1	1.5	40	–20 to +45		3.2
LF-240P	250	40	2000	300	1	1.5	40	–20 to +45		3.2
LF-250	250	50	1500	300	1	1.5	40	–20 to +45		4.0
LF-250P	250	50	2000	300	1	1.5	40	–20 to +45		4.0
LF-260N	250	60	1500	300	1	1.5	30	–20 to +55		6.5
LF-240U	250	40	1500	300	1	1.5	40	–20 to +45	UL	3.2

Shape and Dimensions

●LF-240/240P/240U, LF-250/250P



●LF-260N



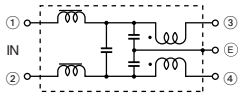
*Recommended torque (N·m) max. ◆Line terminal (M6: 1.18) ◆Earth terminal (M4: 1.18)

Model	A	B	C	D	E	F	G	H	I
LF-240/240P	210	190	170	120	100	60	29	75	40
LF-240U	240	220	200	90	70	40	30	80	40
LF-250/250P	240	220	200	90	70	40	30	80	40
LF-260N	315	300	285	130	115	50	30	90	50

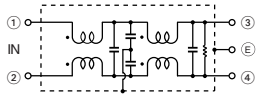
[mm]

Circuit Diagram

●LF-240, 240P, 240U, 250, 250P

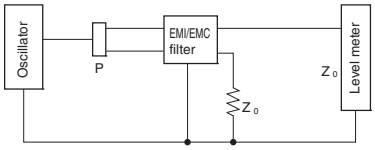


●LF-260N Series



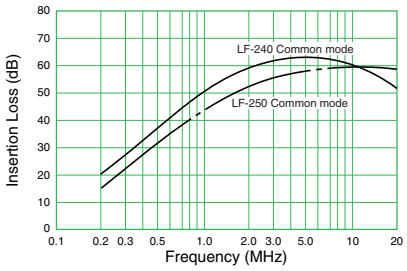
Measuring Circuit

Common mode



P: Power divider Z_0: 50Ω

Attenuation (Static Characteristics)



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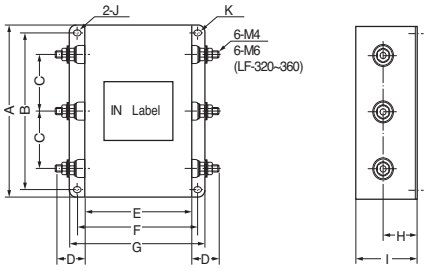
LF Series
Three-Phase Type
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (℃)	Certified standard	Weight (kg)
LF-305	250	5	1500	300	1	1.5	30	–20 to +55		0.65
LF-310	250	10	1500	300	1	1.5	30	–20 to +55	UL	1.9
LF-315	250	15	1500	300	1	1.5	30	–20 to +55		1.9
LF-320	250	20	1500	300	1	1.5	30	–20 to +55		2.3
LF-320U	250	20	1500	300	1	1.5	30	–20 to +55	UL, CSA	2.4
LF-330	250	30	1500	300	1	1.5	30	–20 to +55	UL	2.4
LF-340	250	40	1500	300	1	1.5	40	–20 to +45	UL	5.3
LF-350	250	50	1500	300	1	1.5	40	–20 to +45	UL	5.3
LF-360	250	60	1500	300	1	1.5	40	–20 to +45		8.0
LF-305A	450	5	2000	300	2	1.5	40	–20 to +45		0.65
LF-310A	450	10	2000	300	2	1.5	40	–20 to +45		1.9
LF-315A	450	15	2000	300	2	1.5	40	–20 to +45		1.9
LF-320A	450	20	2000	300	2	1.5	40	–20 to +45	UL	2.3
LF-330A	450	30	2000	300	2	1.5	40	–20 to +45		2.4
LF-340A	450	40	2000	300	2	1.5	40	–20 to +45		5.3
LF-350A	450	50	2000	300	2	1.5	40	–20 to +45		5.3

Shape and Dimensions

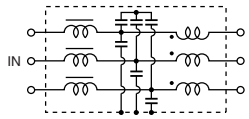


*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78, M6: 1.18)

Model	A	B	C	D	E	F	G	H	I	J	K
LF-305, 305A	120	110	40	25	80	95	110	25	45	4.5×7	4.5ø
LF-310, 310A	180	170	60	25	120	135	150	35	65	4.5×7	4.5ø
LF-315, 315A	180	170	60	25	120	135	150	35	65	4.5×7	4.5ø
LF-320, 320A	180	170	60	29	120	135	150	35	65	4.5×7	4.5ø
LF-320U	180	170	60	29	120	135	150	35	65	4.5×7	4.5ø
LF-330, 330A	180	170	60	29	120	135	150	35	65	4.5×7	4.5ø
LF-340, 340A	180	160	50	30	200	220	240	40	80	6.5×9	6.5ø
LF-350, 350A	180	160	50	30	200	220	240	40	80	6.5×9	6.5ø
LF-360	200	180	60	30	300	320	340	50	100	6.5×9	6.5ø

[mm]

Circuit Diagram



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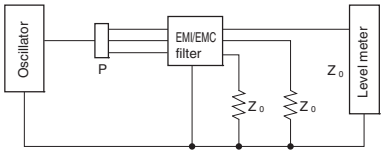
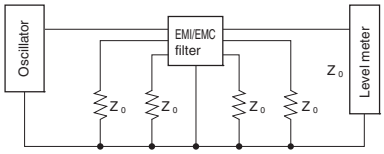
Measuring Circuit

●Common mode



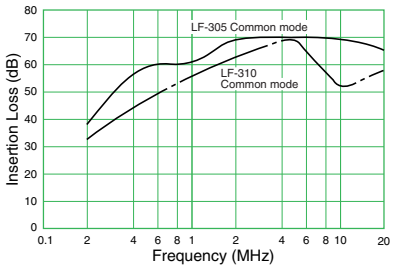
P: Power divider　Z_0 : 50Ω

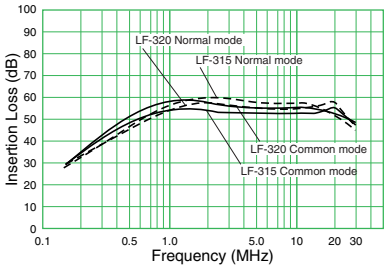
●Normal mode

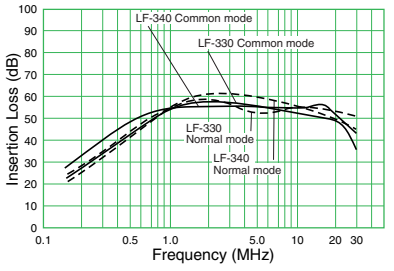


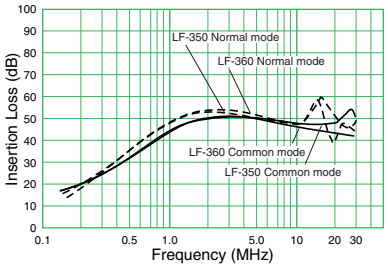
Z_0 : 50Ω

Attenuation (Static Characteristics)









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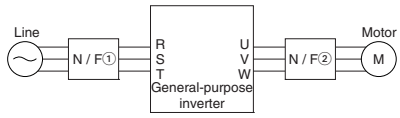
LF Series
For Inverters
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Operating temperature range (˚C)	Certified standard	Installation position
LF-305	250	5	1500	300	1	–20 to +55		① (input side)
LF-310	250	10	1500	300	1	–20 to +55	UL	① (input side)
LF-315	250	15	1500	300	1	–20 to +55		① (input side)
LF-320	250	20	1500	300	1	–20 to +55		① (input side)
LF-330	250	30	1500	300	1	–20 to +55	UL	① (input side)
LF-340	250	40	1500	300	1	–20 to +45	UL	① (input side)
LF-350	250	50	1500	300	1	–20 to +45	UL	① (input side)
LF-360	250	60	1500	300	1	–20 to +45		① (input side)
LF-305G	250	5	1500	300	1	–25 to +55		① (input side)
LF-310G	250	10	1500	300	1	–25 to +55		① (input side)
LF-320G	250	20	1500	300	1	–25 to +55		① (input side)
LF-315K	250	15	2000	300	5	–25 to +55		① (input side)
LF-325K	250	25	2000	300	5	–25 to +55		① (input side)
LF-335K	250	35	2000	300	5	–25 to +55		① (input side)
LF-380K	250	80	2000	300	5	–25 to +55		① (input side)
LF-314K4	506	14	2500	300	10 (500V, 60Hz)	–25 to +55		① (input side)
LF-330K4	506	30	2500	300	10 (500V, 60Hz)	–25 to +55		① (input side)
LF-355K4	506	55	2500	300	10 (500V, 60Hz)	–25 to +55		① (input side)
LF-380K4	506	80	2500	300	10 (500V, 60Hz)	–25 to +55		① (input side)
LF-310KA	250	10	2000	300	—	–25 to +55		② (output side)
LF-320KA	250	20	2000	300	—	–25 to +55		② (output side)
LF-350KA	250	50	2000	300	—	–25 to +55		② (output side)
LF-310KB	440	10	2500	300	—	–25 to +55		② (output side)
LF-320KB	440	20	2500	300	—	–25 to +55		② (output side)
LF-335KB	440	35	2500	300	—	–25 to +55		② (output side)
LF-345KB	440	45	2500	300	—	–25 to +55		② (output side)
LF-375KB	440	75	2500	300	—	–25 to +55		② (output side)
LF-3110KB	440	110	2500	300	—	–25 to +55		② (output side)

Installation Diagram



●N/F ① LF-K Series (conforms to CISPR Pub 14)
LF Series (conforms to FCC P15-J and JTTC)
LF-G Series (conforms to FCC P15-J and JTTC)

●N/F ② LF-KA Series (200V line)
LF-KB Series (400V line)

Caution Only LF-KA and KB can be used in N/F②.

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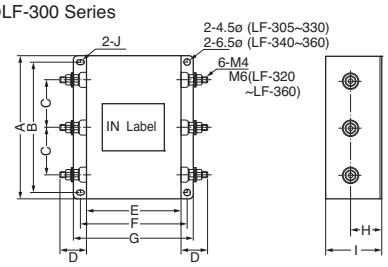
Shape and Dimensions

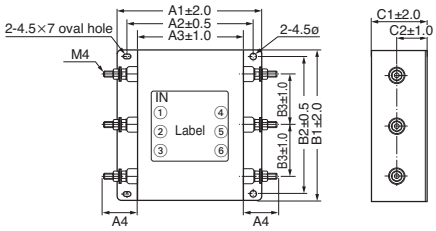
●LF-300 Series



[mm]

Model	A	B	C	D	E	F	G	H	I	J
LF-305	120	110	40	25	80	95	110	25	45	4.5×7
LF-310	180	170	60	25	120	135	150	35	65	4.5×7
LF-315	180	170	60	25	120	135	150	35	65	4.5×7
LF-320	180	170	60	29	120	135	150	35	65	4.5×7
LF-330	180	170	60	29	120	135	150	35	65	4.5×7
LF-340	180	160	50	30	200	220	240	40	80	6.5×9
LF-350	180	160	50	35	200	220	240	40	80	6.5×9
LF-360	200	180	60	30	300	320	340	40	100	6.5×9

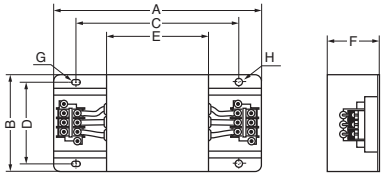
●LF-G Series



[mm]

Model	A1	A2	A3	A4	B1	B2	B3	C1	C2
LF-305G	110	95	80	25	120	110	40	45	25
LF-310G	150	135	120	25	120	110	40	65	35
LF-320G	150	135	120	25	120	110	40	65	35

●LF-K Series



[mm]

	Model	Terminal board	A	B	C	D	E	F	G	H
200V line	**LF-315K**	TE-K5.5 M4	260	180	180	160	120	65	7×4.5ø	4.5ø
	LF-325K	TE-K22 M6	340	180	260	160	200	80	9×6.5ø	6.5ø
	LF-335K	TE-K22 M6	440	200	360	180	300	100	9×6.5ø	6.5ø
	LF-380K	TE-K22 M6	670	400	560	380	500	170	9×6.5ø	6.5ø
400V line	**LF-314K4**	TE-K5.5 M4	260	180	180	160	120	65	7×4.5ø	4.5ø
	LF-330K4	TE-K22 M6	440	200	360	180	300	100	9×6.5ø	6.5ø
	LF-355K4	TE-K22 M6	540	300	470	270	400	130	9×6.5ø	6.5ø
	LF-380K4	TE-K22 M6	672	400	560	380	500	170	9×6.5ø	6.5ø

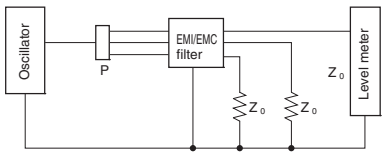
*Recommended torque (N·m) max.
◆Line terminal (M4: 1.86, M6: 5.78, M8: 10.29)

[mm]

	Model	Terminal board	A	B	C	D	E	F	G	H
200V line	**LF-310KA**	TE-K5.5 M4	140	100	100	90	70	45	7×4.5ø	4.5ø
	LF-320KA	TE-K5.5 M4	140	100	100	90	70	45	7×4.5ø	4.5ø
	LF-350KA	TE-K22 M6	260	180	180	160	120	65	7×4.5ø	4.5ø
400V line	**LF-310KB**	TE-K5.5 M4	140	100	100	90	70	45	7×4.5ø	4.5ø
	LF-320KB	TE-K5.5 M4	140	100	100	90	70	45	7×4.5ø	4.5ø
	LF-335KB	TE-K5.5 M4	140	100	100	90	70	45	7×4.5ø	4.5ø
	LF-345KB	TE-K22 M6	260	180	180	160	120	65	7×4.5ø	4.5ø
	LF-375KB	TE-K22 M6	540	320	480	300	340	240	9×6.5ø	6.5ø
	LF-3110KB	TE-K60 M8	540	320	480	300	340	240	9×6.5ø	6.5ø

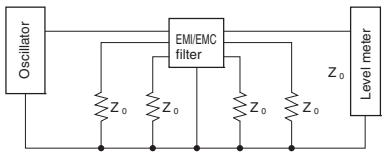
Measuring Circuit

●Common mode



P: Power divider Z_0 : 50Ω

●Normal mode



Z_0 : 50Ω

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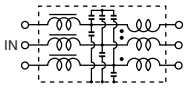
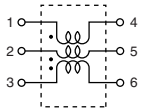
Circuit Diagram

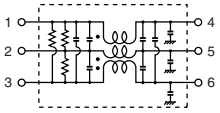
●LF-300 Series



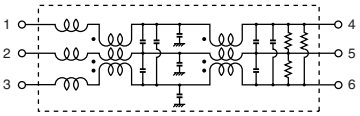
●KA, KB Series



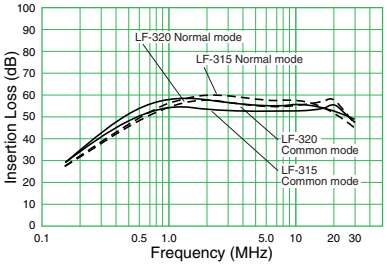
●LF-G Series

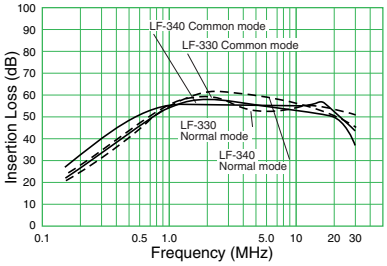


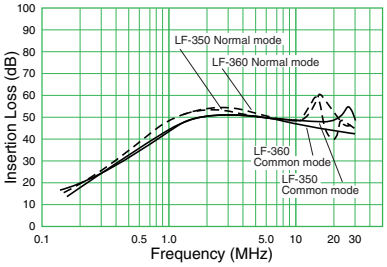
●K, K4 Series

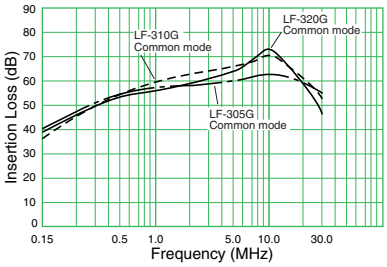


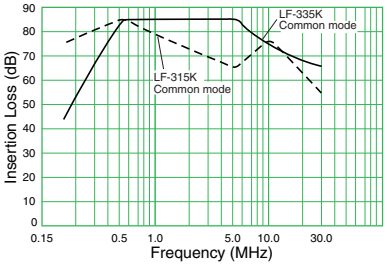
Attenuation (Static Characteristics)











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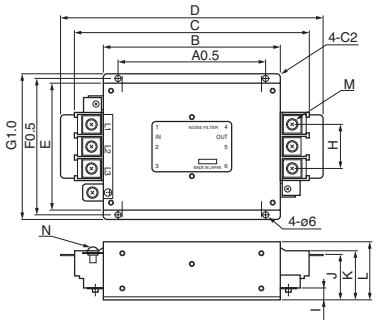
LF Series
Compliance with CE Marking
(LF-3000 Series)
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard
LF-3200	250	20	2000	300	1.2	1.5	30	–25 to +55	TÜV
LF-3300	250	30	2000	300	1.2	1.5	30	–25 to +55	TÜV
LF-3400	250	40	2000	300	1.2	1.5	30	–25 to +55	TÜV
LF-3500	250	50	2000	300	1.2	1.5	30	–25 to +55	TÜV
LF-3600	250	60	2000	300	1.2	1.5	30	–25 to +55	TÜV

Shape and Dimensions

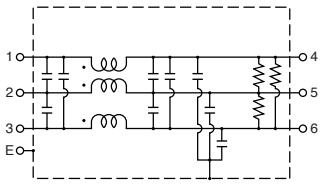


Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
LF-3200	150	180	219	247	90	100	110	32	17	45.5	47.5	60	M5	M5
LF-3300	150	180	219	247	90	100	110	32	17	45.5	47.5	60	M5	M5
LF-3400	150	180	237	264	129	139	149	46	24	58.5	63	75	M6	M6
LF-3500	150	180	237	264	129	139	149	46	14	48.5	53	60	M6	M6
LF-3600	300	330	387	414	180	200	220	46	55	89.5	94	115	M6	M6

[mm]

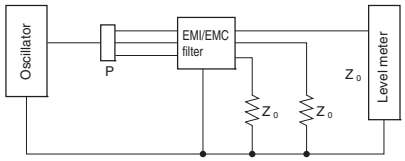
*Recommended torque (N·m) max. ◆Line terminal (M5: 3.33, M6: 5.78)
◆Earth terminal (M5: 3.33, M6: 5.78)

Circuit Diagram



Measuring Circuit

●Common mode



P: Power divider Z_0: 50Ω

⚠

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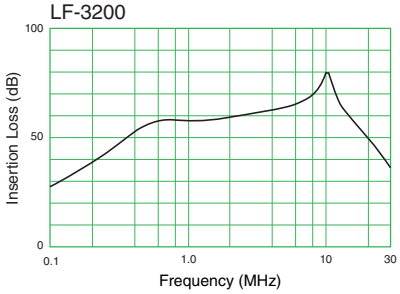
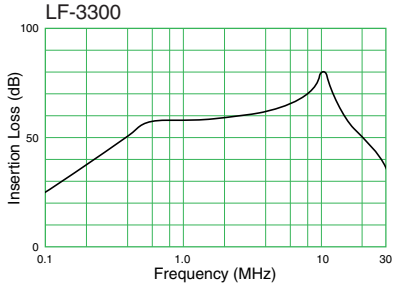
Attenuation (Static Characteristics)

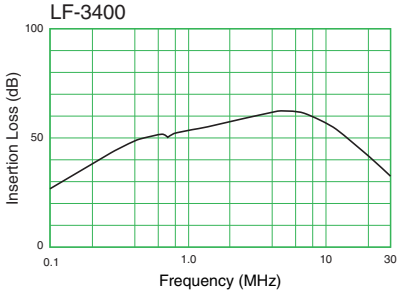
LF-3200



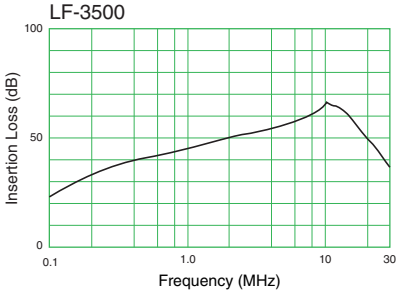
LF-3300



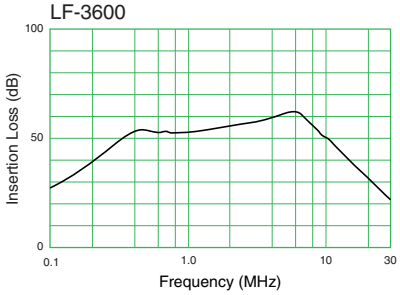
LF-3400



LF-3500



LF-3600



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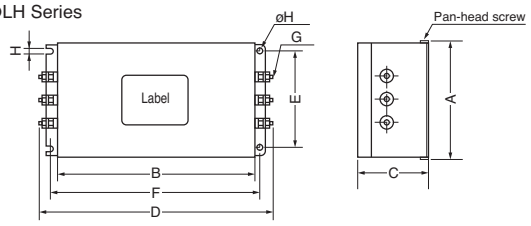
LH Series
Low-Frequency Inverters
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Self-temperature rise (K) max.	Operating temperature range (°C)
LH-3102	250	10	2000	300	1	40	–20 to +45
LH-3152	250	15	2000	300	1	40	–20 to +45
LH-3202	250	20	2000	300	1	40	–20 to +45
LH-3302	250	30	2000	300	1	40	–20 to +45
LH-3402	250	40	2000	300	1	40	–20 to +45
LH-3502	250	50	2000	300	1	40	–20 to +45
LH-3602	250	60	2000	300	1	40	–20 to +45
LH-3702	250	70	2000	300	1	40	–20 to +45
LH-3802	250	80	2000	300	1	40	–20 to +45

Shape and Dimensions

●LH Series

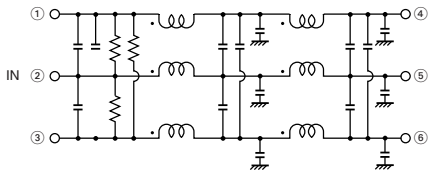


*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78, M6: 1.18, M8: 2.65)

Model	A	B	C	D	E	F	G	H
LH-3102	105	182	70	230 max.	80	200	M4	4.5
LH-3152	105	182	70	230 max.	80	200	M4	4.5
LH-3202	105	182	70	230 max.	80	200	M4	4.5
LH-3302	115	203	85	250 max.	75	220	M6	5.5
LH-3402	115	203	85	250 max.	75	220	M6	5.5
LH-3502	190	300	125	355 max.	150	320	M6	5.5
LH-3602	190	300	125	355 max.	150	320	M6	5.5
LH-3702	190	335	155	430 max.	150	360	M8	5.5
LH-3802	190	335	155	430 max.	150	360	M8	5.5

[mm]

Circuit Diagram



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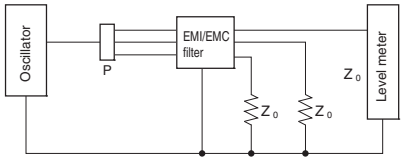
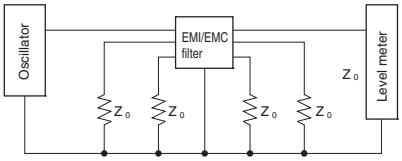
Measuring Circuit

●Common mode



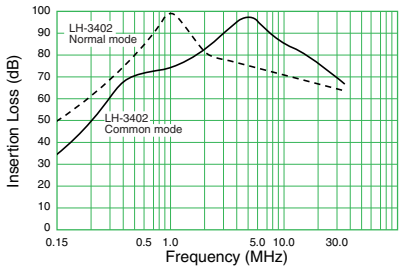
P: Power divider Z_0 : 50Ω

●Normal mode



Z_0 : 50Ω

Attenuation (Static Characteristics)



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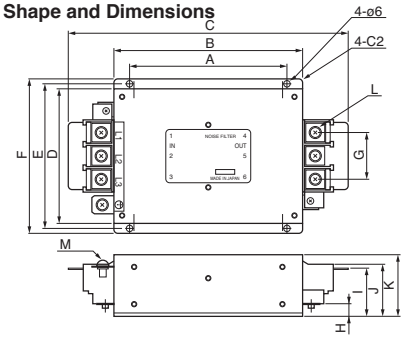
LH Series
Compliance with CE Marking
(LH-4 Series)
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard
LH-3304	250	30	2000	300	1.2	1.5	30	–25 to +55	TÜV
LH-3404	250	40	2000	300	1.2	1.5	30	–25 to +55	TÜV
LH-3604	250	60	2000	300	1.2	1.5	30	–25 to +55	TÜV
LH-3804	250	80	2000	300	1.2	1.5	30	–25 to +55	TÜV
LH-31204	250	120	2000	300	1.2	1.5	30	–25 to +55	TÜV
LH-31504	250	150	2000	300	1.2	1.5	30	–25 to +55	TÜV

Shape and Dimensions

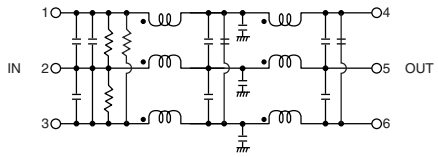


Model	A	B	C	D	E	F	G	H	I	J	K	L	M
LH-3304	250	280	349	90	100	110	32	17	45.5	47.5	85	M5	M5
LH-3404	250	280	366	129	139	149	46	23	58	62	85	M6	M6
LH-3604	306	336	422	160	170	180	46	55	90	94	160	M6	M6
LH-3804	450	480	600	210	230	250	56	60	103	107	170	M8	M8
LH-31204	480	510	630	222	242	262	56	60	103	107	170	M8	M8
LH-31504	630	660	788	250	270	290	76	70	126	130	200	M10	M10

[mm]

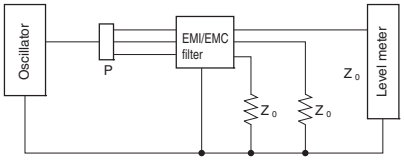
*Recommended torque (N·m) max.
◆Line terminal (M5: 3.33, M6: 5.78, M8: 10.29, M10: 19.1)
◆Earth terminal (M5: 3.33, M6: 5.78, M8: 10.29, M10: 19.1)

Circuit Diagram



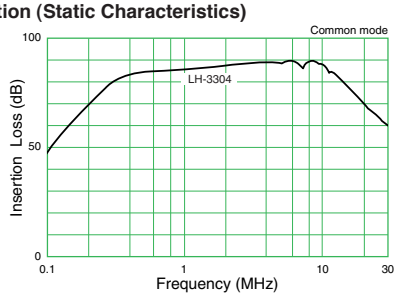
Measuring Circuit

●Common mode



P: Power divider Z_0: 50Ω

Attenuation (Static Characteristics)



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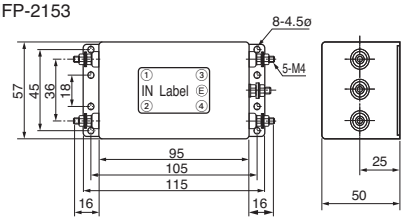
HFP Series

[RoHS Compliant]

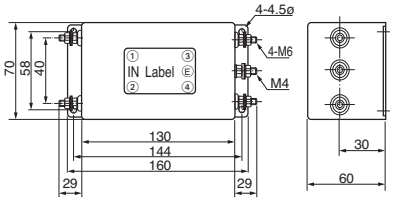
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current (mA) max.	Self-temperature rise (K) max.	Operating temperature range (˚C)	Certified standard	Weight (kg)
HFP-2153	250	15	AC1500	10	1.5 (250V, 60Hz)	30	–20 to +55	UL,CSA,TÜV	0.64
HFP-2303	250	30	AC1500	10	1.5 (250V, 60Hz)	30	–20 to +55	UL,CSA,TÜV	1.3
HFP-2303A1	250	30	AC1500	10	1.5 (250V, 60Hz)	30	–20 to +55	UL,CSA,TÜV	3.9
HFP-4153A	420	15	DC2600	10	3.5 (420V, 60Hz)	30	–20 to +55	UL,CSA,TÜV	6.5
HFP-4503A	420	50	DC2600	10	3.5 (420V, 60Hz)	35	–20 to +55	UL,CSA,TÜV	14.0

Shape and Dimensions

●HFP-2153

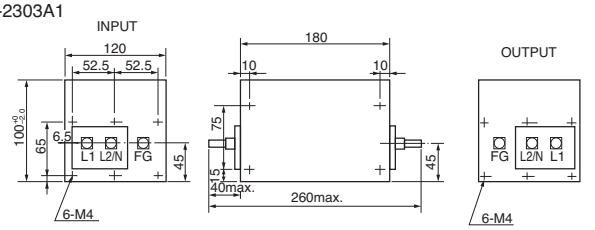


●HFP-2303



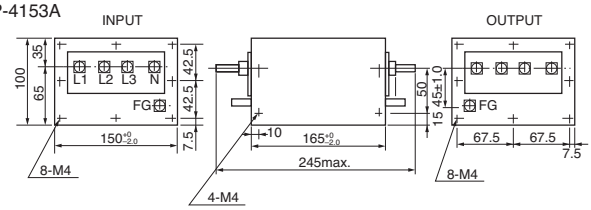
*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78, M6: 1.18) ◆Earth terminal (M4: 1.18)

●HFP-2303A1



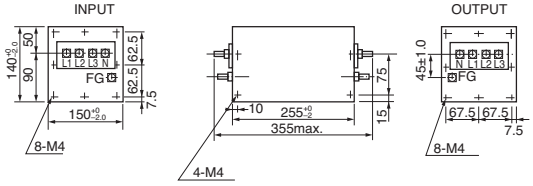
*Recommended torque (N·m) max.
◆Panel installation (M4: 1.18)

●HFP-4153A



*Recommended torque (N·m) max.
◆Panel installation (M4: 1.18)

●HFP-4503A



*Recommended torque (N·m) max.
◆Panel installation (M4: 1.18)

[mm]

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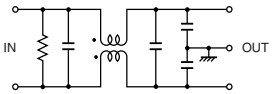
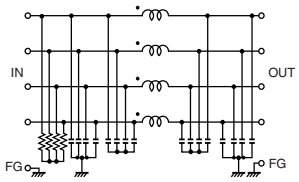
Circuit Diagram

●HFP-2153, 2303, 2303A1

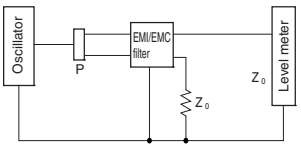


●HFP-4153A, 4503A



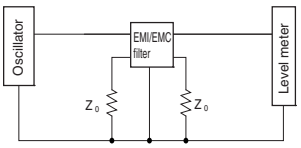
Measuring Circuit

●Common mode



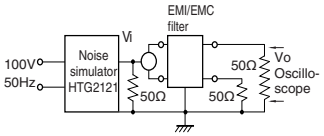
P : Power divider Z0 : 50Ω

●Normal mode

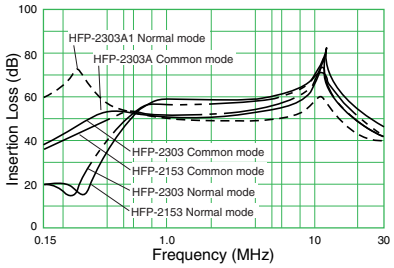


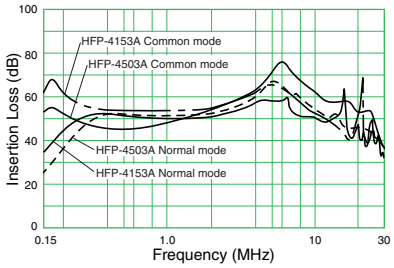
Z0 : 50Ω

●Pulse characteristic measuring circuit

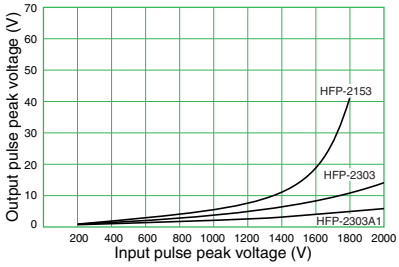


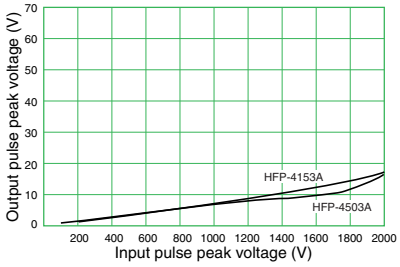
Attenuation (Static Characteristics)





Pulse Attenuation Example





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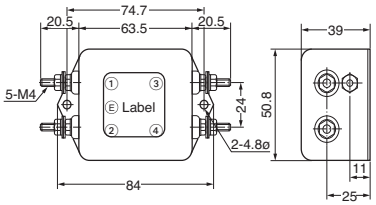
GT Series
Screw Terminal
[RoHS Compliant]

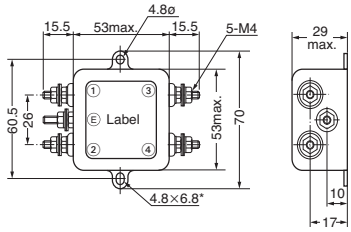
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
GT-2050	250	5	1500	300	0.5	1	35	–20 to +55		150
GT-2100	250	10	1500	300	0.5	1	35	–20 to +55		260
GT-2150	250	15	1500	300	0.5	1	35	–20 to +55		270
GT-2200	250	20	1500	300	0.5	1	35	–20 to +55		270
GT-205U	250	5	1500	300	0.5	1	35	–20 to +55	UL, TÜV, VDE, CSA	170
GT-210U	250	10	1500	300	0.5	1	35	–20 to +55	UL, TÜV, VDE, CSA	260
GT-215U	250	15	1500	300	0.5	1	35	–20 to +55	UL	270
GT-220U	250	20	1500	300	0.5	1	35	–20 to +55	UL, TÜV	270
GT-2050R	250	5	1500	300	0.5	1	35	–20 to +55		160
GT-2100R	250	10	1500	300	0.5	1	35	–20 to +55		270
GT-2150R	250	15	1500	300	0.5	1	35	–20 to +55		280
GT-2200R	250	20	1500	300	0.5	1	35	–20 to +55		285

Shape and Dimensions

●GT-2100, GT-210U, GT-2150, GT-215U, GT-2200
GT-220U, GT-2150R, GT-2100R, GT-2200R



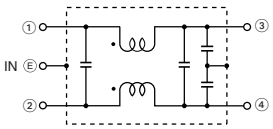
●GT-2050, GT-205U, GT-2050R



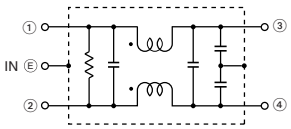
*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78) ◆Earth terminal (M4: 1.18)
*ø4.8 for GT-205U
[mm]

Circuit Diagram

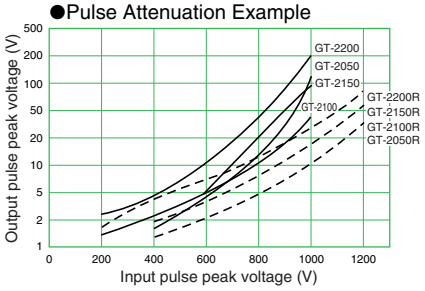
●GT-2000 Series
GT-2000R Series



●GT-200U Series



●Pulse Attenuation Example



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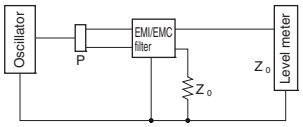
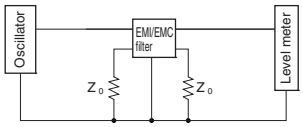
Measuring Circuit

●Common mode



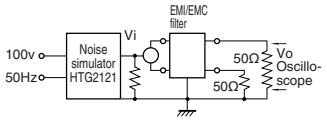
P: Power divider Z_0: 50Ω

●Normal mode



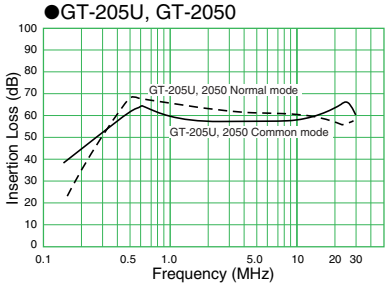
Z_0 : 50Ω

●Pulse-characteristic measuring circuit

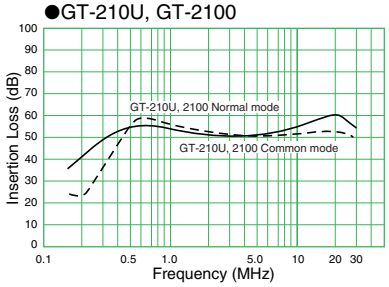


Attenuation (Static Characteristics)

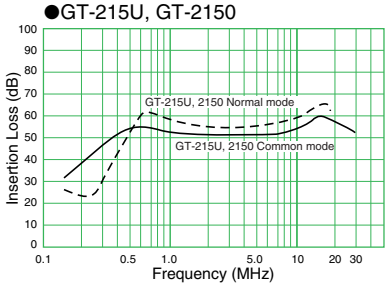
●GT-205U, GT-2050



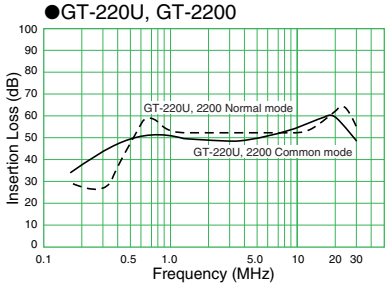
●GT-210U, GT-2100



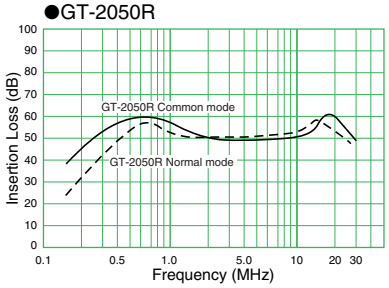
●GT-215U, GT-2150



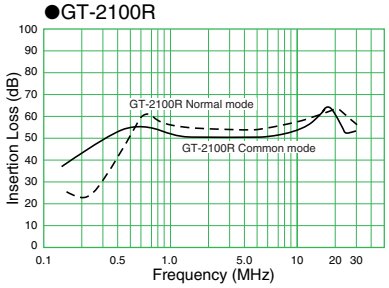
●GT-220U, GT-2200



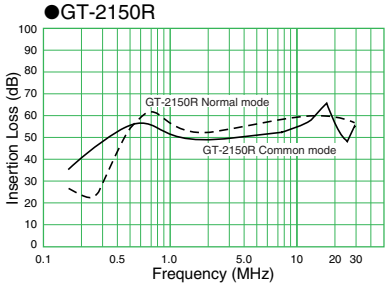
●GT-2050R



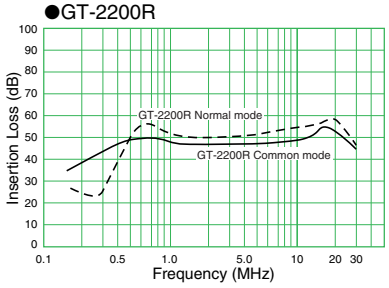
●GT-2100R



●GT-2150R



●GT-2200R



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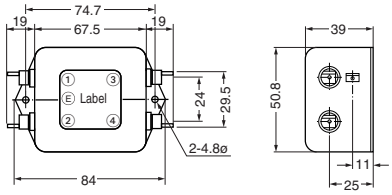
GT Series
Faston Terminal
[RoHS Compliant]

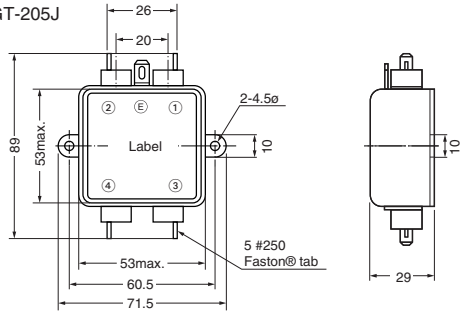
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
GT-205J	250	5	1500	300	0.5	1	35	–20 to +55	UL, CSA, TÜV, VDE	135
GT-210J	250	10	1500	300	0.5	1	35	–20 to +55	UL, CSA, TÜV, VDE	240
GT-215J	250	15	1500	300	0.5	1	35	–20 to +50	UL, CSA, TÜV, VDE	255
GT-20301	250	3	1500	300	1.0	1	35	–20 to +50	UL, CSA, TÜV	160
GT-20601	250	6	1500	300	1.0	1	35	–20 to +55	UL, CSA, TÜV	190
GT-21001	250	10	1500	300	1.0	1	35	–20 to +55	UL, CSA, TÜV	300
GT-20302	250	3	1500	300	1.0	1	35	–20 to +55	UL, CSA, TÜV	215

Shape and Dimensions

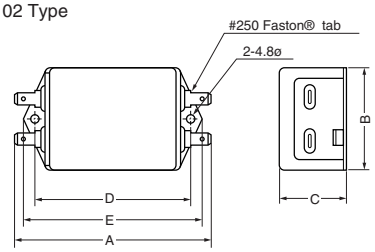
●GT-210J, GT-215J



●GT-205J



●GT-01, 02 Type



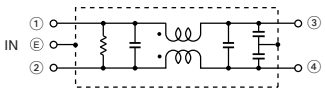
*Faston® is a registered trademark of Tyco Electronics AMP.

Model	A	B	C	D	E
GT-20301	91.5	52.0	30.0	74.7	84.3
GT-20601	105.7	57.5	32.0	87.1	96.5
GT-21001	105.7	57.5	44.5	87.1	96.5
GT-20302	91.5	52.0	45.0	74.7	84.3

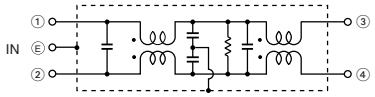
[mm]

Circuit Diagram

●GT-J, 01 Type



●GT-02 Type



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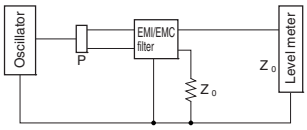
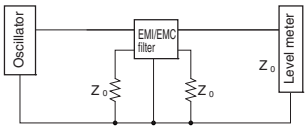
Measuring Circuit

●Common mode



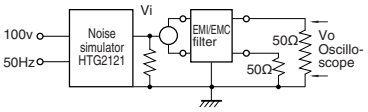
P: Power divider Z_0: 50Ω

●Normal mode



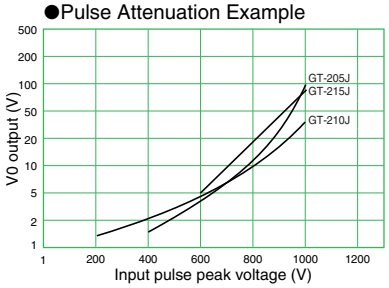
Z_0: 50Ω

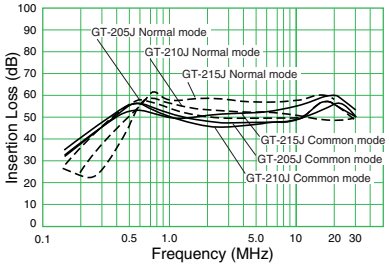
●Pulse characteristic measuring circuit

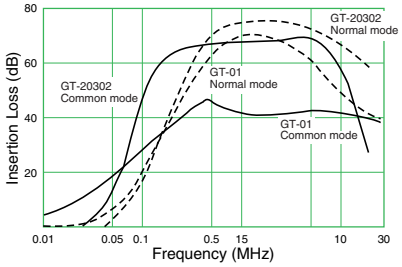


Attenuation (Static Characteristics)

●Pulse Attenuation Example







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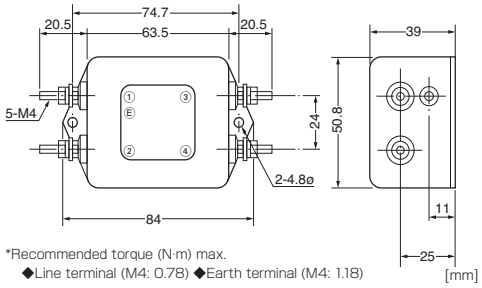
GT Series
For VCCI
[RoHS Compliant]

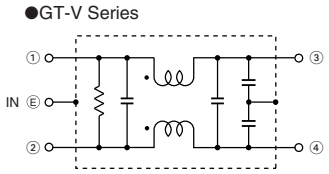
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (℃)	Certified standard	Weight (kg)
GT-20501V	250	5	1500	300	0.5	1	35	–20 to +55		220
GT-21001V	250	10	1500	300	0.5	1	35	–20 to +55	UL, CSA, TÜV	280
GT-22001V	250	20	1500	300	0.5	1	35	–20 to +55		285

Shape and Dimensions



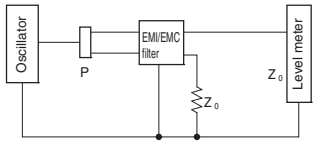
*Recommended torque (N·m) max.
◆Line terminal (M4: 0.78) ◆Earth terminal (M4: 1.18)

Circuit Diagram



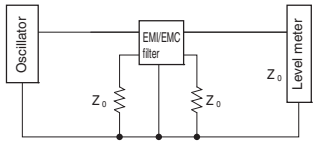
Measuring Circuit

●Common mode



P: Power divider Z_0 : 50Ω

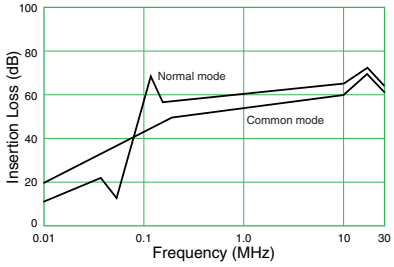
●Normal mode



Z_0 : 50Ω

Attenuation (Static Characteristics)

●GT-21001V



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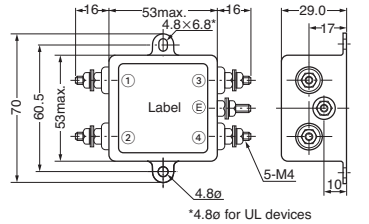
GF Series

[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (˚C)	Certified standard	Weight (g)
GF-2050	250	5	1500	300	1	1.5	30	–20 to +60		130
GF-205U	250	5	1500	300	1	1.5	30	–20 to +60	UL	130
GF-2100	250	10	1500	300	1	1.5	30	–20 to +60		140
GF-210U	250	10	1500	300	1	1.5	30	–20 to +60	UL	140
GF-2150	250	15	1500	300	1	1.5	30	–20 to +60		140
GF-2200	250	20	1500	300	1	1.5	30	–20 to +60		150
GF-220U	250	20	1500	300	1	1.5	30	–20 to +60	UL	150
GF-205E	250	5	1500	300	1	1.5	30	–20 to +55	UL, CSA	130

Shape and Dimensions

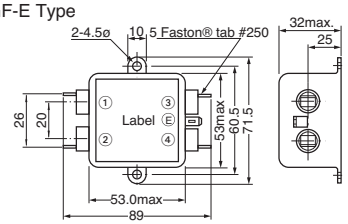
●GE Series (Except Type E)



*4.8ø for UL devices

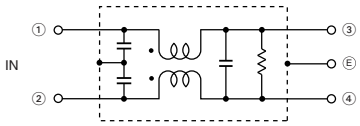
*Recommended torque (N·m) max. ◆Line terminal (M4: 0.78)
◆Earth terminal (M4: 1.18)

●GF-E Type



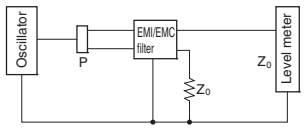
[mm]

Circuit Diagram



Measuring Circuit

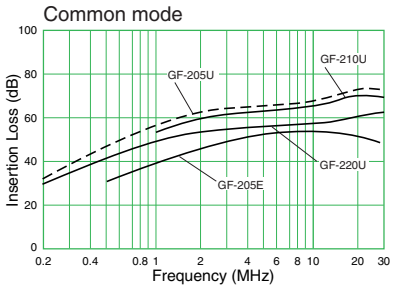
●Common mode



P: Power divider Z_0: 50Ω

Attenuation (Static Characteristics)

Common mode



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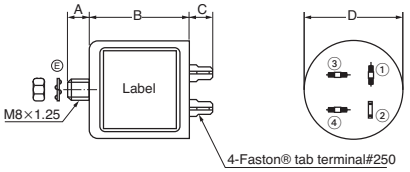
VU Series

[RoHS Compliant]

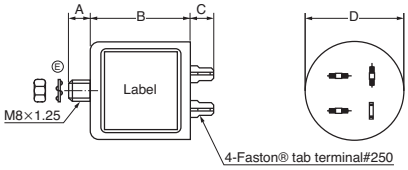
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
VU-210FA	250	10	1500	300	1	1.5	40	–25 to +55	UL, CSA	130
VU-215F	250	15	1500	300	1	1.5	40	–25 to +55	UL, CSA	130
VU-215F3	250	15	1500	300	1	1.5	40	–25 to +55	UL, CSA	105
VU-215FE	250	15	1500	300	1	1.5	40	–25 to +55	UL, CSA	130
VU-220F	250	20	1500	300	1	1.5	40	–25 to +55	UL, CSA, TÜV	240

Shape and Dimensions

●VU-215F, VU-215F3, VU-220F, 210FA



●VU-215FE



*Faston® is a registered trademark of Tyco Electronics AMP.

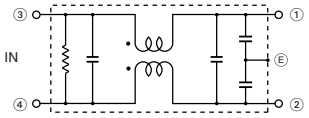
Model	A	B	C	D
VU-215F	12	50	12	38
VU-215F3	12	40	13	45
VU-215FE	12	50	12	38
VU-220F, 210FA	12	50	12	50

*Recommended torque (N·m) max. ◆Earth terminal (M8: 4.41)

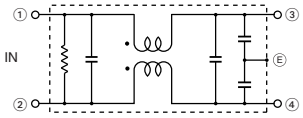
[mm]

Circuit Diagram

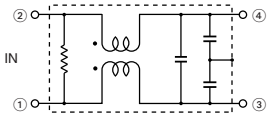
●VU-210FA, 215F, 220F



●VU-215FE



●VU-215F3



Caution: Ⓔ represents a screw installation portion (M8).

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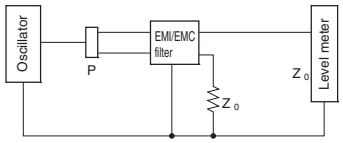
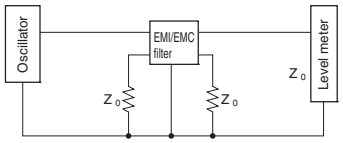
Measuring Circuit

●Common mode



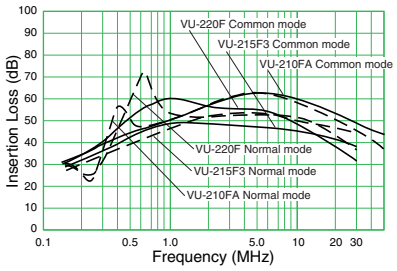
P: Power divider Z 0 : 50Ω

●Normal mode



Z 0 : 50Ω

Attenuation (Static Characteristics)



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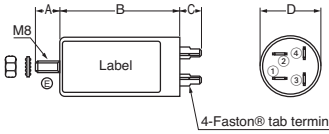
VC Series

[RoHS Compliant]

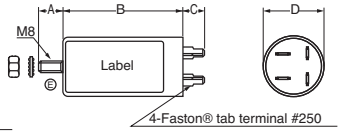
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
VC-210FA	250	10	1500	300	1.5	1	40	–20 to +55	VDE	130
VC-215F3V	250	15	1500	300	1.5	1	40	–20 to +55	TÜV	110

Shape and Dimensions

●VC-210FA



●VC-215F3V



Model	A	B	C	D
VC-210FA	12	70	12	38
VC-215F3V	12	60	12	38

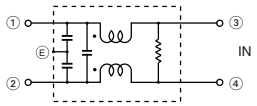
*Recommended torque (N·m) max. ◆Earth terminal (M8: 4.41)

*Faston® is a registered trademark of Tyco Electronics AMP.

[mm]

Circuit Diagram

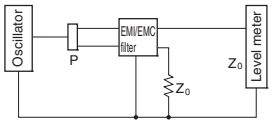
●VC Series



Caution: Ⓔ represents a case.

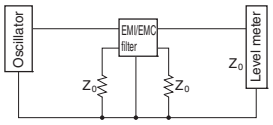
Measuring Circuit

●Common mode



P: Power divider Z_0: 50Ω

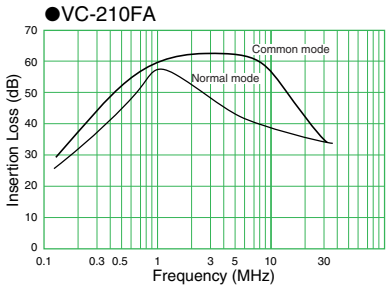
●Normal mode



Z_0: 50Ω

Attenuation (Static Characteristics)

●VC-210FA



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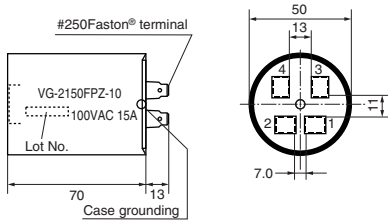
VG-FPZ Series
for inverter installed home appliances' surge control
[RoHS Compliant]

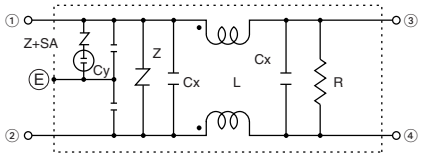
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Operating temperature range (°C)	Weight (g)
VG-2150FPZ-10	100	15	1000	300	0.5 (125V)	–25 to +55	200
VG-2150FPZ-20	200	15	1500	300	1.0 (250V)	–25 to +55	200
VG-2200FPZ-10	100	20	1000	300	0.5 (125V)	–25 to +55	220

Shape and Dimensions



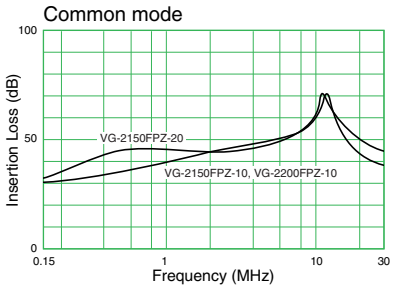
*Faston® is a registered trademark of Tyco Electronics AMP. [mm]

Circuit Diagram



Caution: Ⓔ represents a case.

Attenuation Characteristics



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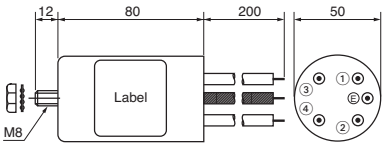
RG Series

[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
RG-208F	250	8	1500	100	1	2	55	–20 to +50	TÜV	320
RG-208F1	250	8	1500	100	1	2	55	–20 to +50	UL, TÜV	320
RG-208F2	250	8	1500	100	1	2	55	–20 to +50	UL, TÜV	220
RG-208V-A	250	8	1500	100	1	2	55	–20 to +50	TÜV	370

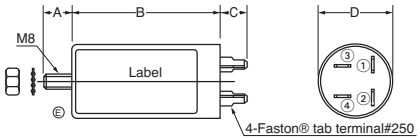
Shape and Dimensions

●RG-208V-A



Lead: UL1015AWG#16

●RG-208F, 208F1, 208F2



*Faston® is a registered trademark of Tyco Electronics AMP.

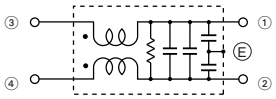
*Recommended torque (N·m) max. ◆Earth terminal (M8: 4.41)

Model	A	B	C	D
RG-208F/F1	12	90	13	50
RG-208F2	12	60	13	50

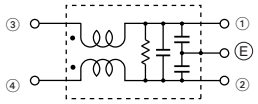
[mm]

Circuit Diagram

●RG-208F2



●RG-208F, 208F1, 208V-A



Caution: Ⓔ represents a screw installation portion (M8) in modelRG-208F.

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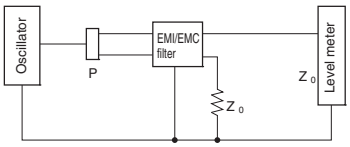
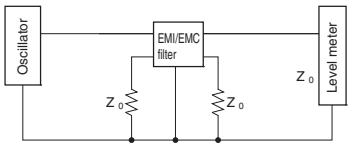
Measuring Circuit

●Common mode



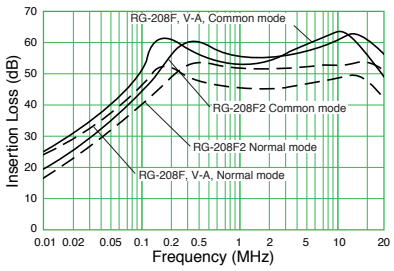
P: Power divider Z_0: 50Ω

●Normal mode



Z_0 : 50Ω

Attenuation (Static Characteristics)



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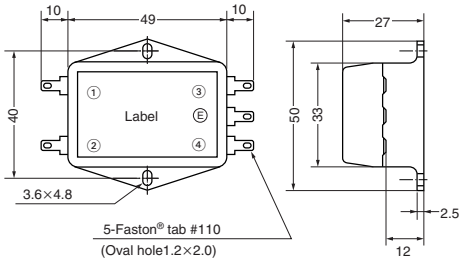
9615NFSVOL11E1106E1

MR Series

[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature rise (°C)	Certified standard	Weight (g)
MR-2021	250	2	1500	300	0.75	1.5	30	–20 to +60	UL, CSA, VDE	35
MR-2032	250	3	1500	300	—	1.5	30	–20 to +60	UL, CSA	35
MR-2043	250	4	1500	300	0.75	1.5	30	–20 to +60	UL, CSA, VDE	40
MR-2053	250	5	1500	300	0.75	1.5	30	–20 to +60		40
MR-2054	250	5	1500	300	0.75	1.5	30	–20 to +60		40
MR-2029	250	2	1500	300	0.5	1.5	30	–20 to +60		35
MR-2059	250	5	1500	300	0.5	1.5	30	–20 to +60		35

Shape and Dimensions



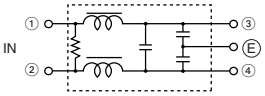
Caution: No Ⓔ terminals on MR-2032.

*Faston® is a registered trademark of Tyco Electronics AMP.

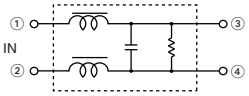
[mm]

Circuit Diagram

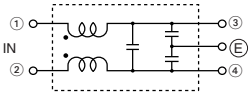
●MR-2021



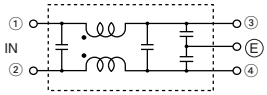
●MR-2032



●MR-2043, MR-2053
●MR-2029, MR-2059



●MR-2054



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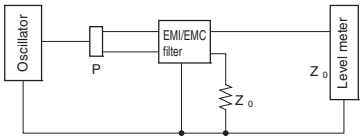
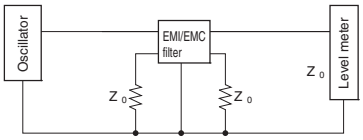
Measuring Circuit

●Common mode



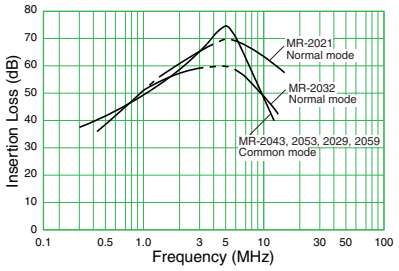
P: Power divider Z 0 : 50Ω

●Normal mode



Z 0 : 50Ω

Attenuation (Static Characteristics)



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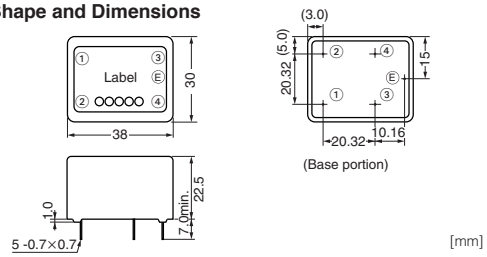
MA Series

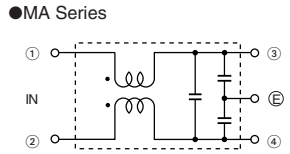
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
MA-2013	250	1	1500	300	0.75	1	30	–25 to +55	UL, CSA, TÜV	30
MA-2023	250	2	1500	300	0.75	1	30	–25 to +55	UL, CSA, TÜV	30
MA-2033	250	3	1500	300	0.75	1	30	–25 to +55	UL, CSA, TÜV	30
MA-2043	250	4	1500	300	0.75	1	30	–25 to +55	UL, CSA, TÜV	30
MA-2053	250	5	1500	300	0.75	1	30	–25 to +55	UL, CSA, TÜV	30

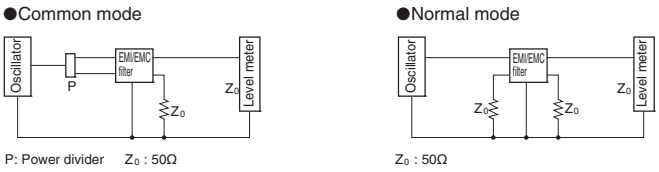
Shape and Dimensions



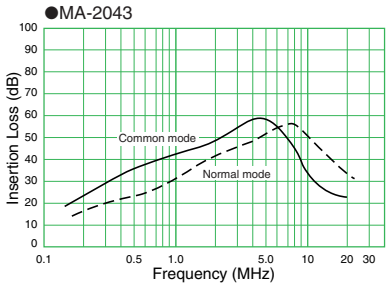
Circuit Diagram



Measuring Circuit



Attenuation (Static Characteristics)



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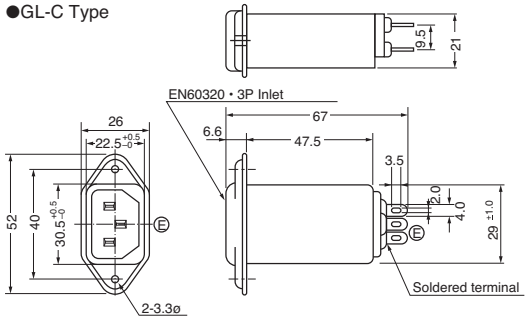
GL Series
C Type
[RoHS Compliant]

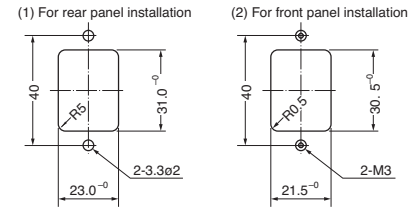
Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (μA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
GL-2030C	250	3	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV, VDE	55
GL-2060C	250	6	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV, VDE	55
GL-2100C	250	10	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2150C	250	15	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2030C2	250	3	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2030C3	250	3	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2060C3	250	6	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2060C1	250	6	1500	300	5	1	30	–25 to +55	UL, CSA	55
GL-2080C1	250	8	1500	300	5	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2080C4	250	8	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55
GL-2030CT	250	3	1500	300	5	1	30	–25 to +55	UL	55
GL-2060C4	250	6	1500	300	500	1	30	–25 to +55	UL, CSA, TÜV	55

Shape and Dimensions

●GL-C Type



Reference Installation Dimensions



*Recommended torque (N·m) max.
◆Panel installation (M3: 0.78)

[mm]

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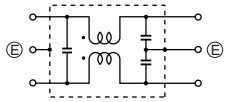
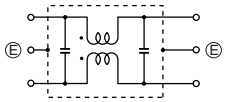
Circuit Diagram

●GL-C, C2, C3, C4 Type



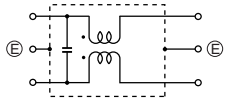
(Inlet side) (Soldered terminal side)

●GL-C1



(Inlet side) (Soldered terminal side)

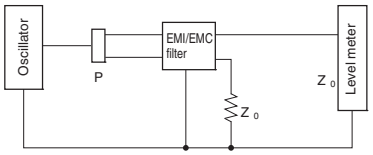
●GL-CT



(Inlet side) (Soldered terminal side)

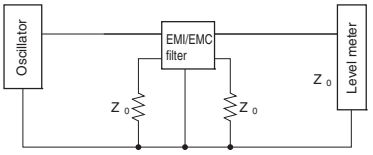
Measuring Circuit

●Common mode



P : Power divider Z_0 : 50Ω

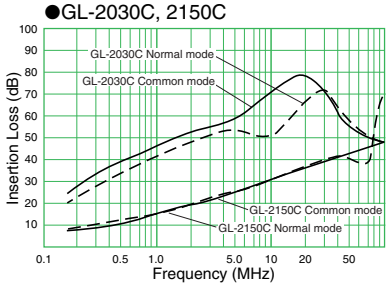
●Normal mode



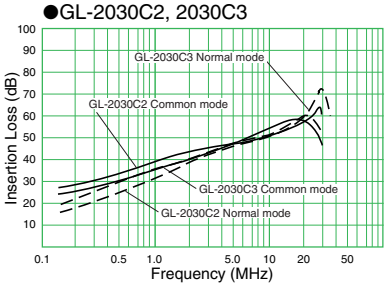
Z_0 : 50Ω

Attenuation (Static Characteristics)

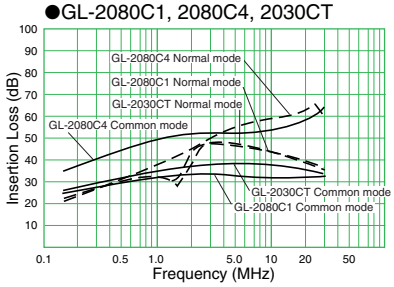
●GL-2030C, 2150C



●GL-2030C2, 2030C3



●GL-2080C1, 2080C4, 2030CT



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GL Series

F, FV, FVP Type

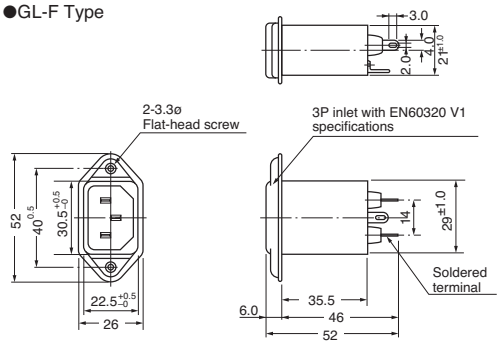
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
GL-2030F	250	3	1500	300	0.5	1	30	–25 to +55	UL,CSA,TÜV,VDE	40
GL-2060F	250	6	1500	300	0.5	1	30	–25 to +55	UL,CSA,TÜV,VDE	40
GL-2030FV	250	3	1500	300	0.5	1	30	–25 to +55	UL,CSA,TÜV,VDE	40
GL-2060FV	250	6	1500	300	0.5	1	30	–25 to +55	UL,CSA,TÜV,VDE	40
GL-2080FVP	250	8	1500	300	0.2	1	30	–25 to +55	cULus	50
GL-2060FVP-XL	250	6	1500	300	0.1	1	30	–25 to +55	—	90

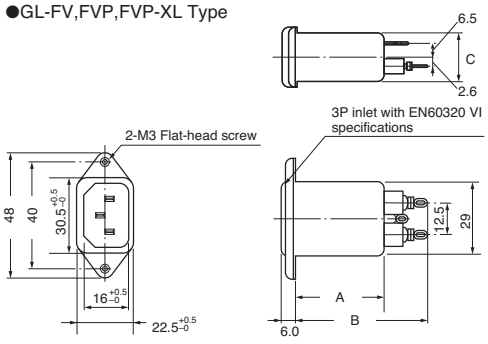
*FV and FVP types are also available with Faston® terminal.
*Faston® is a registered trademark of Tyco Electronics AMP.

Shape and Dimensions

●GL-F Type

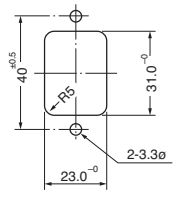


●GL-FV,FVP,FVP-XL Type

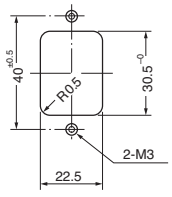


Reference installation dimensions

(1) For rear panel installation



(2) For front panel installation

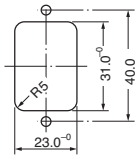


Model	A	B	C
GL-FV	35.5	50.0	21.0
GL-FVP	47.5	61.0	21.0
GL-FVP-XL	69.5	82.8	22.0

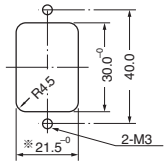
[mm]

Reference installation dimensions

(1) For rear panel installation



(2) For front panel installation



※22.5 for GL-2060FVP-XL

*Recommended torque (N·m) max. ◆Panel installation (M3: 0.78)

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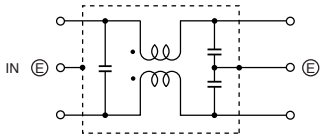
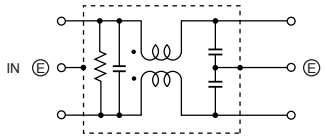
Circuit Diagram

●GL-F FV FVP Type



(Inlet side) (Soldered terminal side)

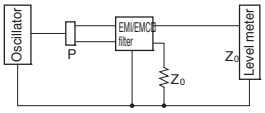
●GL-FVP-XL



(Inlet side) (Soldered terminal side)

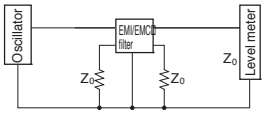
Measuring Circuit

●Common mode



P: Power divider Z_0: 50Ω

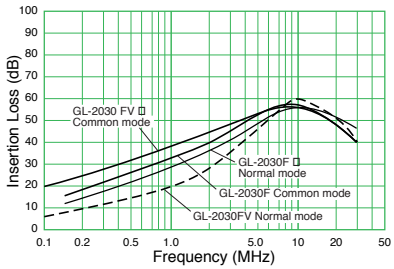
●Normal mode



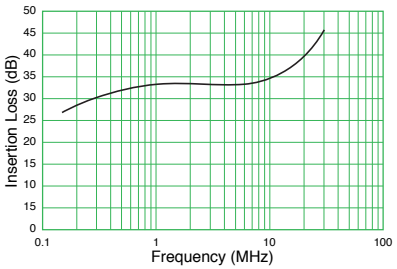
Z_0: 50Ω

Attenuation (Static Characteristics)

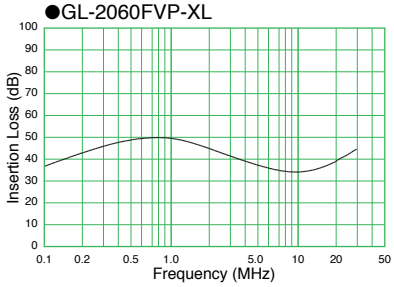
GL-2030F/2030FV



GL-2080-FVP



●GL-2060FVP-XL



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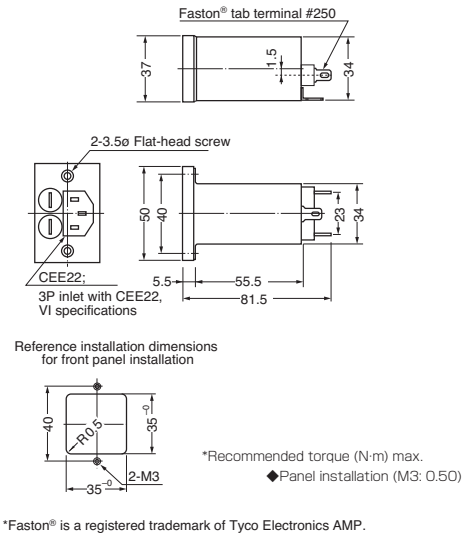
GL Series
H Type
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
GL-2030H2	250	3	1500	300	0.5	1	30	–25 to +55	TÜV	90
GL-2060H2	250	6	1500	300	0.5	1	30	–25 to +55	TÜV	90

Shape and Dimensions

●GL-H2 Type (2-fuse type)

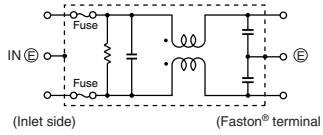


*Faston® is a registered trademark of Tyco Electronics AMP.

[mm]

Circuit Diagram

●GL-H2 Type



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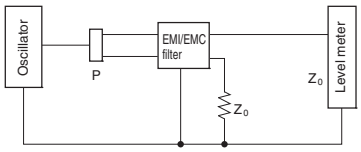
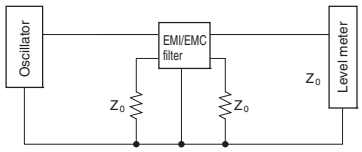
Measuring Circuit

●Common mode



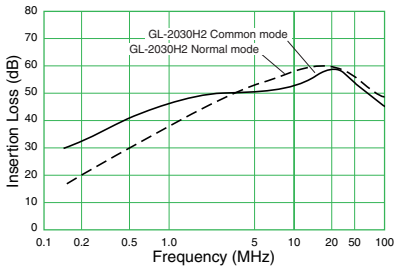
P: Power divider Z_0 : 50Ω

●Normal mode



Z_0 : 50Ω

Attenuation (Static Characteristics)



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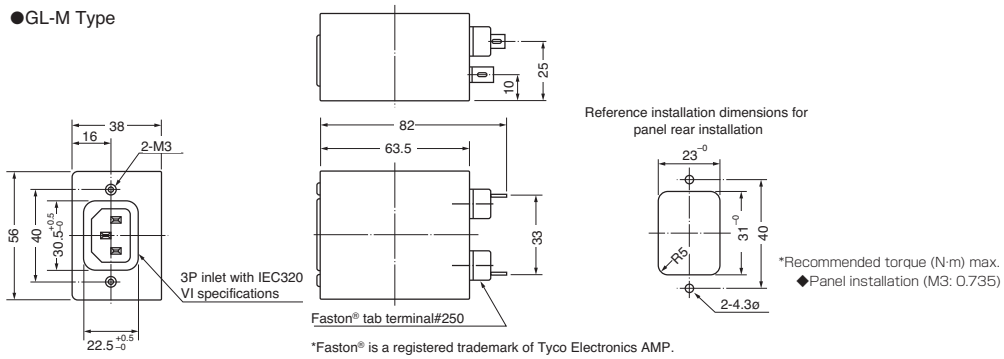
GL Series
M Type
[RoHS Compliant]

Model	Rated voltage AC/DC (V)	Rated current AC/DC (A)	Withstanding voltage 1 min., line to ground AC (V)	Insulation resistance 500VDC 1 min., line to ground (MΩ) min.	Leakage current 250V/60Hz, (mA) max.	Voltage drop 50Hz, (V) max.	Self-temperature rise (K) max.	Operating temperature range (°C)	Certified standard	Weight (g)
GL-2030M	250	3	1500	300	0.5	1	30	–25 to +55	UL, CSA, TÜV	200
GL-2060M	250	6	1500	300	0.5	1	30	–25 to +55	UL, CSA, TÜV	205
GL-2100M	250	10	1500	300	0.5	1	30	–25 to +55	UL, CSA, TÜV	210

Shape and Dimensions

●GL-M Type

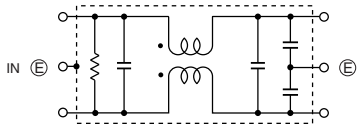


*Faston® is a registered trademark of Tyco Electronics AMP.

[mm]

Circuit Diagram

●GL-M Type

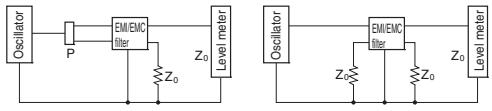


(Inlet side) (Faston® terminal side)

Measuring Circuit

●Common mode

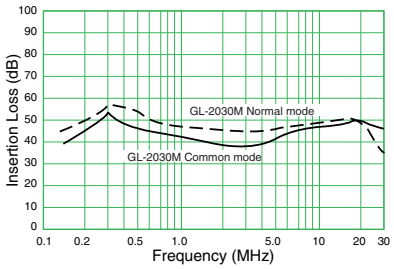
●Normal mode



P: Power divider Z_0 : 50Ω

Z_0 : 50Ω

Attenuation (Static Characteristics)



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TÜV Rheinland Japan Ltd. Certification Numbers

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		LF-3600	No.R50014465
25	LH Series	LH-3304	No.R50133298
		LH-3404	
		LH-3604	
		LH-3804	
		LH-31204	
		LH-31504	
26	HFP Series	HFP-2153	No.R50014217
		HFP-2303	No.R50013926
		HFP-2303A1	No.R50014219
		HFP-4153A	No.R50015970
		HFP-4503A	No.J8830914
28	GT Series Screw Terminal	GT-220U	No. R9651191
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30	GT Series Faston® Terminal	GT-20301	
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38	RG Series	RG-208F	No.R2-50006637
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49	GL Series M Type	GL-2030M	No.R50013384
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