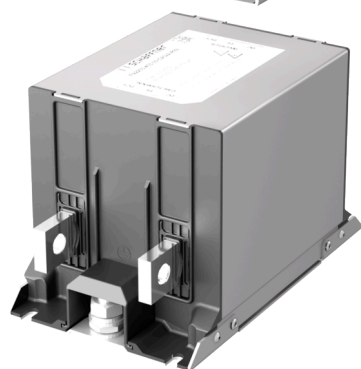
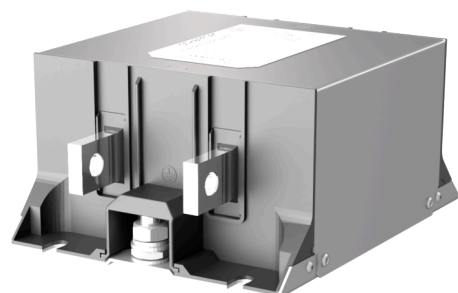
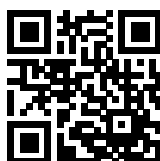


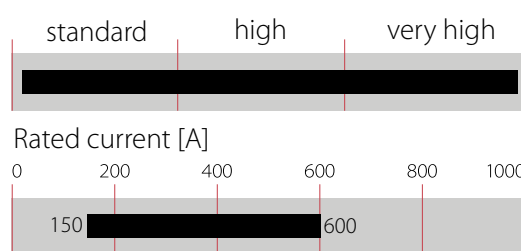
# DC-Busbar EMC/RFI Filter for EV charging



- Designed for usage in EV charging applications
- Ultra-compact filter
- Multiple performance options
- Design acc. to EV charging safety standards



### Performance indicators



### Approvals & Compliances



### Features and Benefits

- FN222X, FN223X and FN224X series of filters provides state-of-the-art EMI attenuation with a choice of three performance levels
- The filters are built to fit perfectly to high power EV charging applications
- The shape allows a convenient and space-saving installation
- Fulfills the requirements in IEC/EN 61851-23 Electric vehicle conductive charging system
- Fulfills the requirements in UL 2202 Electric Vehicle (EV) Charging System Equipment
- FN224X offers voltage and performance ratings of FN222X on a smaller footprint

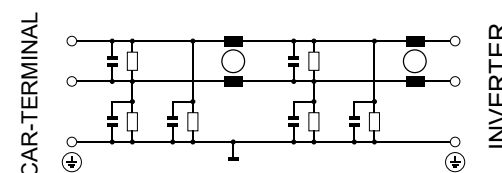
### Typical Applications

- High Power EV DC charging beyond HPC350 (500 A @ 920 V)
- Two voltage levels 500 VDC and 1000 VDC
- Compatible to CHAdeMO and CCS

## Technical Specifications

<b>Maximum continuous operating voltage</b>	500 VDC (FN223X) 1000 VDC (FN222X, FN224X)
<b>Rated currents</b>	250 to 2300 A @ 50°C
<b>Overload capability</b>	4x rated current at switch on, max. 8 sec 1.5x rated current for 1 minute, once per hour
<b>High potential test voltage</b>	P -> E 4800 VDC for 2 sec P -> P 3600 VDC for 2 sec
<b>Overtoltage category</b>	III acc. IEC 60664-1
<b>Pollution degree</b>	2 acc. IEC 60664-1
<b>Surge withstand</b>	2kV (P-P) / 4kV (3P - E) acc. to IEC 6100-4-5
<b>Temperature range (operation and storage)</b>	-40°C to +100°C
<b>Climatic category</b>	40/100/21 acc. to IEC 60068-1
<b>Protection category</b>	IP 00
<b>Flammability corresponding to</b>	UL 94V-0
<b>Design corresponding to</b>	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939, EN 60721-3, EN 62109
<b>MTBF (Mil-HB-217F)</b>	>300,000 h @ 50°C/500V

### Typical electrical schematic



## Filter Selection Table

Filter	Rated current @55°C [A]	Capacitance*		total equiv. capacitance to PE [nF]	Resistance*		Typical power dissipation @25°C/DC [W]	Weight approx. [kg]
		[nF]			[MOhm]			
		CY1	CY2		RX	RY		
<b>1000 VDC - compact housing style</b>								
<b>High performance:</b>								
FN2220-150-99-C2222-R99	150	330	330	990	10	10	6	3
FN2220-300-99-C2222-R99	300	330	330	990	10	10	14	3
FN2220-450-99-C2222-R99	450	330	330	990	10	10	14	3
FN2220-600-99-C2222-R99	600	330	330	990	10	10	25	3
<b>Very high performance:</b>								
FN2221-600-99-C2222-R99	600	330	330	990	10	10	25	3
<b>500 VDC - compact housing style</b>								
<b>High performance:</b>								
FN2230-150-99-C2022-R99	150	150	330	960	10	10	6	3
FN2230-300-99-C2022-R99	300	150	330	960	10	10	14	3
FN2230-450-99-C2022-R99	450	150	330	960	10	10	14	3
FN2230-600-99-C2022-R99	600	150	330	960	10	10	25	3
<b>Very high performance:</b>								
FN2231-600-99-C2022-R99	600	150	330	960	10	10	25	3
<b>1000 VDC - slim housing style</b>								
<b>High performance:</b>								
FN2240-150-99-C2222-R99	150	330	330	990	10	10	6	3
FN2240-300-99-C2222-R99	300	330	330	990	10	10	14	3
FN2240-450-99-C2222-R99	450	330	330	990	10	10	14	3
FN2240-600-99-C2222-R99	600	330	330	990	10	10	25	3
<b>Very high performance:</b>								
FN2241-600-99-C2222-R99	600	330	330	990	10	10	25	3

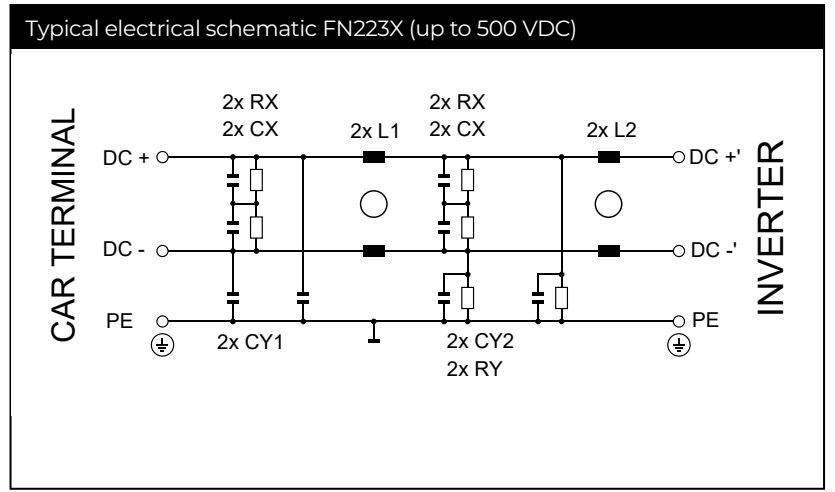
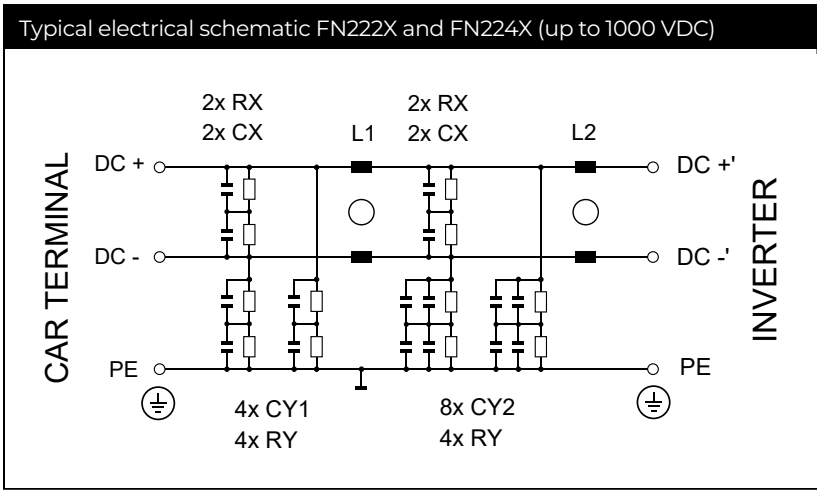
\* Tolerances apply: Capacitance: ±20%, Resistance: ±10%

## Product Selector\*

FN22rs-ttt-uu-Cvvzz-Rxy

xy	X-capacitor discharger resistor: x = RX / y = RY (e.g. -R99)
9:	10 Mohm
vvzz	Y-capacitor option: vv = Y-capacitor CY1 / zz = Y-capacitor CY2 (e.g. -C2222)
22:	330 nF
20:	150 nF
uu	Electrical connection
99:	Ni-plated busbar connection
ttt	Rated current
150:	150 A
300:	300 A
450:	450 A
600:	600 A
s	Performance
0:	High performance (recommended for most applications)
1:	Very high performance
2:	Standard performance (on request)
r	Version
2:	1000 V – compact housing style
3:	500 V – compact housing style
4:	1000 V – slim housing style

\*Filter can be adapted to specific requirements. Variations of resistor and capacitor values available on request.



### Typical Filter Attenuation

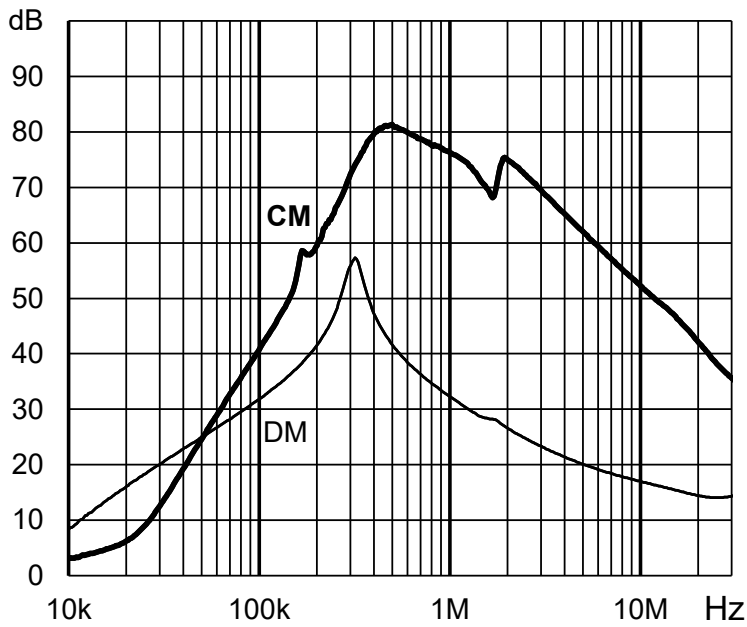
Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)

FN2220-ttt-uu-C2222-Rxy and FN2240-ttt-uu-C2222-Rxy

High Performance

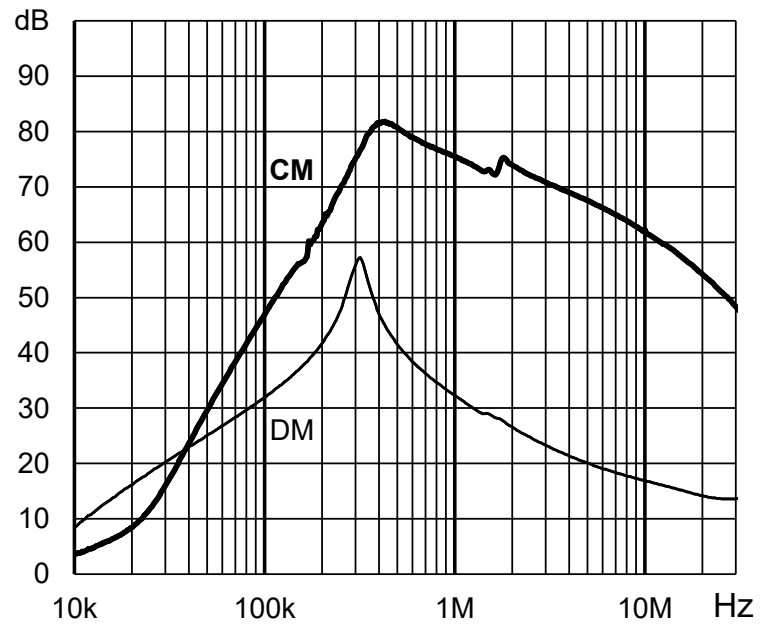
FN2221-ttt-uu-C2222-Rxy and FN2241-ttt-uu-C2222-Rxy

Very High Performance



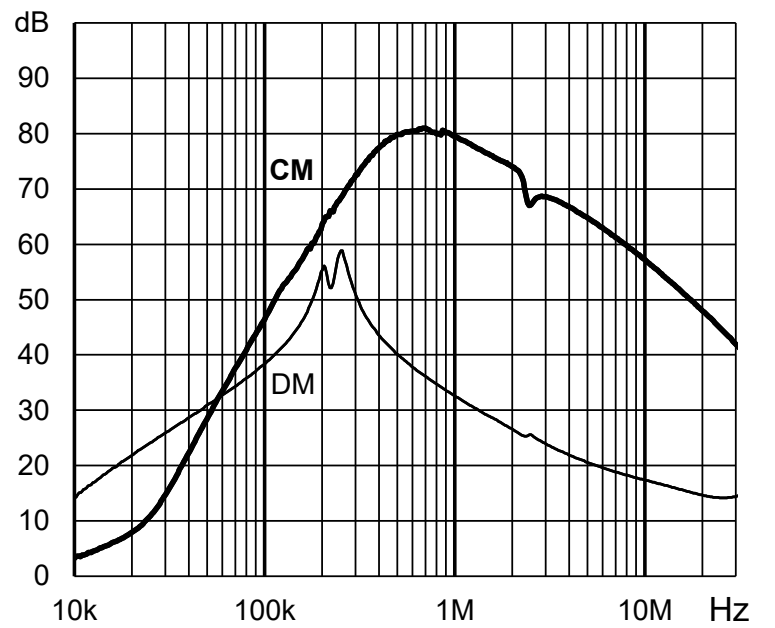
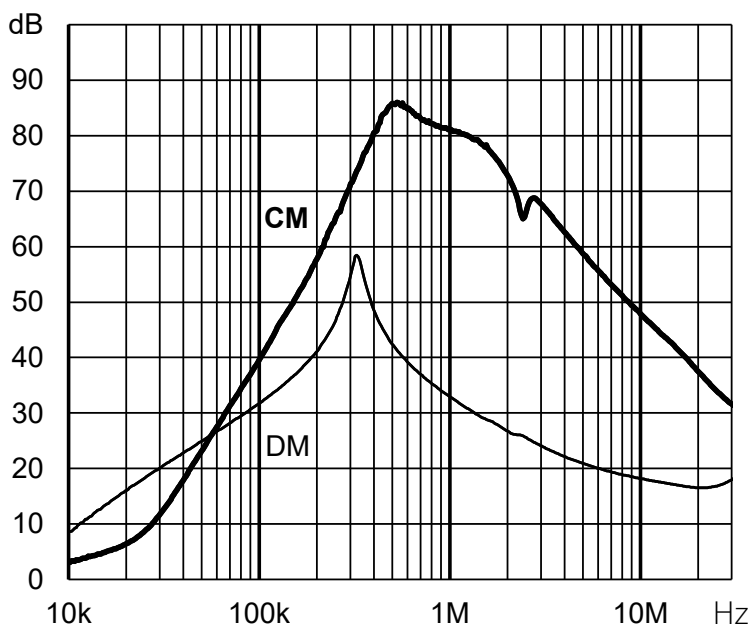
FN2230-ttt-uu-C2022-Rxy

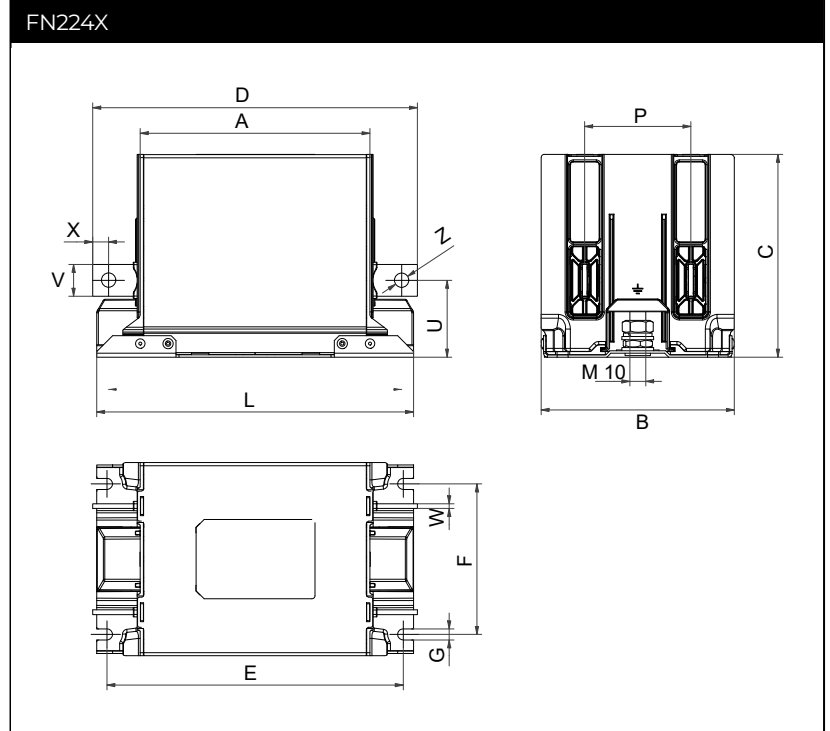
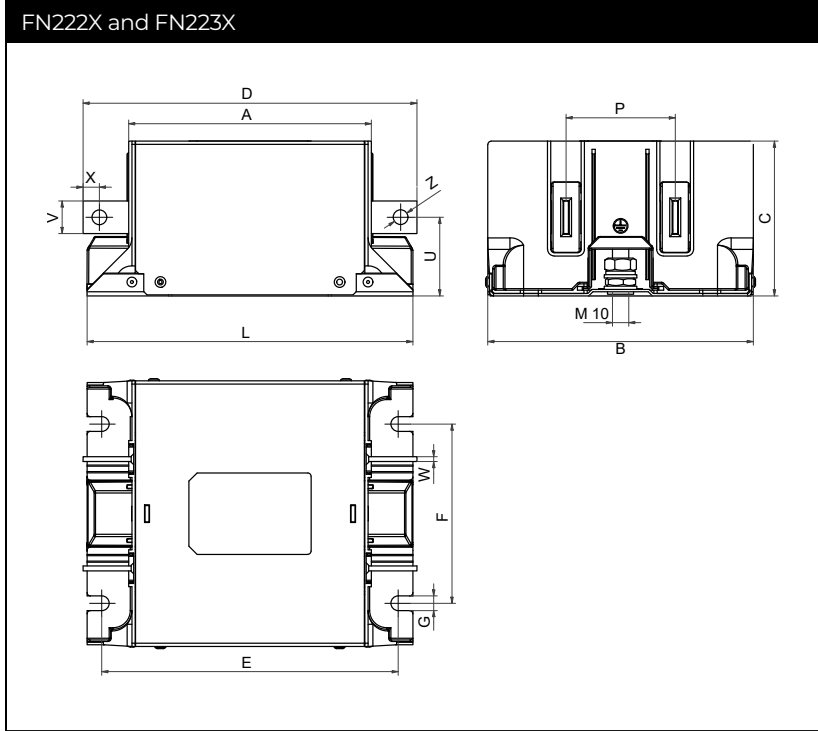
High Performance



FN2231-ttt-uu-C2022-Rxy

Very High Performance





### Dimensions\*

	FN222X and FN223X				FN224X				Tolerances
	150 A	300 A	450 A	600 A	150 A	300 A	450 A	600 A	
<b>A</b>	145	145	145	145	145	145	145	145	±1
<b>B</b>	163	163	163	163	122	122	122	122	
<b>C</b>	95	95	95	95	128	128	128	128	±1
<b>D</b>	205	210	210	210	205	210	210	210	±2
<b>E</b>	182	182	182	182	187	187	187	187	
<b>F</b>	110	110	110	110	95	95	95	95	
<b>G</b>	9	9	9	9	7	7	7	7	
<b>L</b>	200	200	200	200	200	200	200	200	
<b>P</b>	67	67	67	67	67	67	67	67	±1
<b>U</b>	48	48	48	48	48	48	48	48	±1
<b>V</b>	20	25	25	25	20	25	25	25	
<b>W</b>	3	4	8	8	3	4	8	8	
<b>X</b>	10	12.5	12.5	12.5	10	12.5	12.5	12.5	
<b>Z</b>	9	11	11	11	9	11	11	11	

\* All dimensions in mm. For dimensions without stated tolerances: ISO 2768-m/EN 22768-m applies.

## Headquarters, Global Innovation and Development

### Switzerland

#### Schaffner Group

Industrie Nord  
Nordstrasse 5  
4542  
Luterbach  
+41 32 681 66 26  
[info@schaffner.com](mailto:info@schaffner.com)

## Sales and Application Centers

### Finland

#### Schaffner Oy

Lohjanharjuntie 1109  
08500  
Lohja  
+ 358 50 468 72 84  
[finlandsales@schaffner.com](mailto:finlandsales@schaffner.com)

### France

#### Schaffner EMC S.A.S.

16-20 Rue Louis Rameau  
95875  
Bezons  
+33 1 34 34 30 60  
[francesales@schaffner.com](mailto:francesales@schaffner.com)

### Germany

#### Schaffner Deutschland GmbH

Ohiostr. 8  
76149  
Karlsruhe  
+49 721 56910  
[germanysales@schaffner.com](mailto:germanysales@schaffner.com)

### Italy

#### Schaffner EMC S.r.l.

Via Ticino, 30  
20900  
Monza (MB)  
+39 335 120 44 32  
[italysales@schaffner.com](mailto:italysales@schaffner.com)

### Japan

#### Schaffner EMC K.K.

ISM Sangenjaya 7F  
1-32-12 Kamiyama Setagaya-ku  
154-0011  
Tokyo  
+81 3 5712 3650  
[japansales@schaffner.com](mailto:japansales@schaffner.com)

### Singapore

#### Schaffner EMC Pte Ltd.

Blk 3015A Ubi Road 1 #05-09 Kampong Ubi  
Industrial Estate  
408705  
Singapore  
+65 63773283  
[singaporesales@schaffner.com](mailto:singaporesales@schaffner.com)

### Sweden

#### Schaffner EMC AB

Östermalmströgr 1  
114 42  
Stockholm  
+46 8 5050 2425  
[swedensales@schaffner.com](mailto:swedensales@schaffner.com)

### Switzerland

#### Schaffner EMV AG

Industrie Nord  
Nordstrasse 5  
4542  
Luterbach  
+41 32 681 66 26  
[switzerlandsales@schaffner.com](mailto:switzerlandsales@schaffner.com)

### India

#### Schaffner India Pvt. Ltd

Regus World Trade Centre  
WTC 22nd Floor Unit No 2238 Brigade  
Gateway Campus 26/1 Dr. Rajkumar Road  
Malleshwaram (W)  
560055  
Bangalore  
+91 8067935355  
[indiasales@schaffner.com](mailto:indiasales@schaffner.com)

### United Kingdom

#### Schaffner Ltd.

Suite 1 Oakmede Place  
Terrace Road  
RG42 4JF  
Binfield  
+44 118 9770070  
[schaffner.uksales@te.com](mailto:schaffner.uksales@te.com)

### United States

#### Schaffner EMC Inc.

52 Mayfield Avenue  
Edison, New Jersey  
+1 732 225 9533  
[usasales@schaffner.com](mailto:usasales@schaffner.com)

To find your local partner within Schaffner's global network [schaffner.com](http://schaffner.com)

© 2025 Schaffner Group

The content of this document has been carefully checked and understood. However, neither Schaffner nor its subsidiaries assume any liability whatsoever for any errors or inaccuracies of this document and the consequences thereof. Published specifications are subject to change without notice. Product suitability for any area of application must ultimately be determined by the customer. In all cases, products must never be operated outside their published specifications. Schaffner does not guarantee the availability of all published products. This disclaimer shall be governed by substantive Swiss law and resulting disputes shall be settled by the courts at the place of business of Schaffner Holding AG. Latest publications and a complete disclaimer can be downloaded from the Schaffner website. All trademarks recognized.