



PCB Filters FN 409

SCHAFFNER
energy efficiency and reliability

75VDC Input PCB Filter



- Rated currents from 3 to 13A, 75VDC
- Very compact PCB-mounting design
- Exceptional attenuation performance
- High frequency noise compression

Approvals



Technical specifications

Maximum continuous operating voltage:	75V
Rated currents:	3 to 13 A
High potential test voltage:	VI1/VI2 -> GND 2000VDC for 2 sec VI1 -> VI2 100VDC for 2 sec
Temperature range (operation and storage):	-40°C to +100°C (40/100/21)
Design corresponding to:	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
Flammability corresponding to:	UL 94V-0
MTBF @ 40°C/230V (Mil-HB-217F):	4,450,000 hours

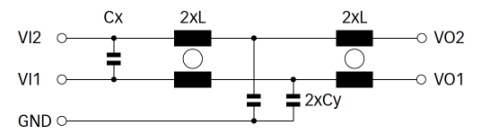
FN 409 PCB filters are designed to suppress common and differential-mode noise on DC voltage lines. The suppression performance is special designed to fulfill the requirements for high frequency switching DC/DC converter modules. FN 409 filters can also be used to filter the output current of switch-mode power supplies in applications with intelligent power distribution.

Features and benefits

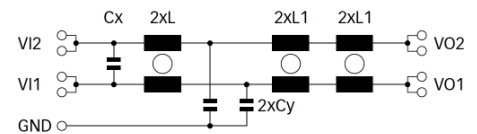
- High common and differential-mode noise suppression.
- Rated currents up to 13A at 75VDC.
- Small form factor.
- Good thermal conductance.

Typical electrical schematic

3 and 6.5A types



13A types



Typical applications

- Input or output filter for high frequency DC/DC converters
- DC output filter for switch-mode power supplies
- Computer and office automation equipment
- Telecom equipment
- Input/output filter within DC power distribution networks

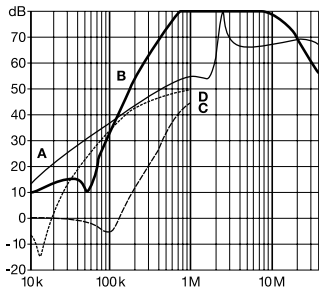
Filter selection table

Filter	Rated current @ 50°C (40°C)	Inductance L		Capacitance Cx		DC Resistance R @ 25°C per path	Input/Output connections	Weight
	[A]	[mH]	[mH]	[nF]	[nF]			
FN 409-3-02	3 (3.2)	2.9		4700	4.7	86	-02	30
FN 409-6.5-02	6.5 (7)	0.5		4700	4.7	18	-02	30
FN 409-13-02	13 (14)	0.08	0.18	4700	4.7	7.8	-02	47

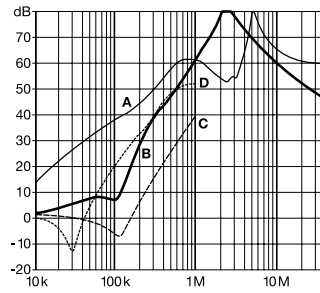
Typical filter attenuation

Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym; C = 0.1Ω/100Ω sym; D = 100Ω/0.1Ω sym

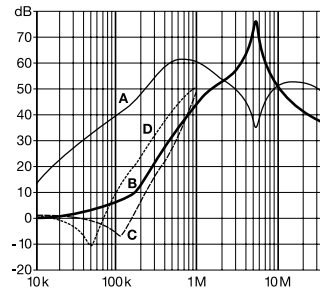
3A types



6.5A types

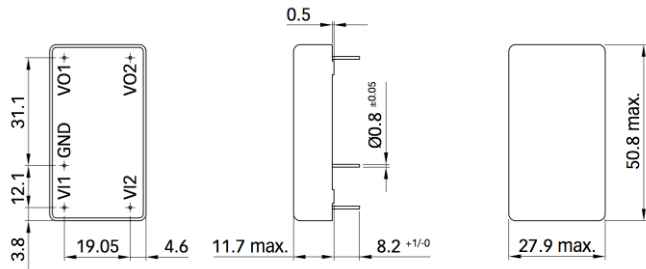


13A types

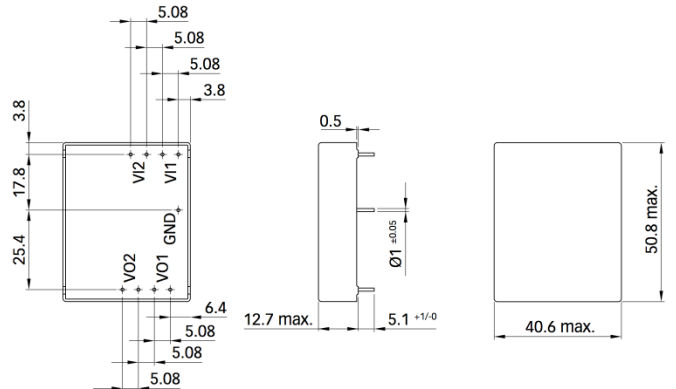


Mechanical data

3 and 6.5A types



13A types



All dimensions in mm; 1 inch = 25.4mm
Tolerances according: ISO 2768-m / EN 22768-m

Application

The filters are intended to be used in DC applications per EN/IEC 60950, where no transient on the DC bus occurs. To protect the filter against transient voltages a varistor

(VDR, fig. 1) or a transient diode (fig. 2) must be placed at the input side of the filter module. For protection against overcurrent place a fuse on each input lead (VI+, VI-). When AC

voltage is superimposed on DC voltage, VP-P or VO-P, whichever is larger, should be maintained within the rated voltage range.

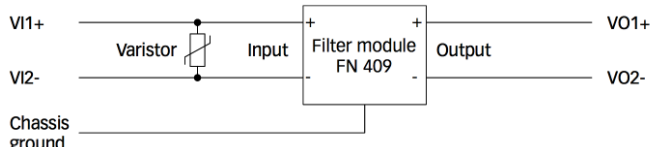


Figure 1: transient protection with a varistor

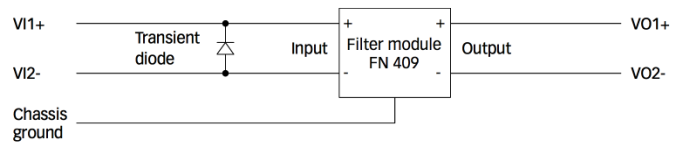
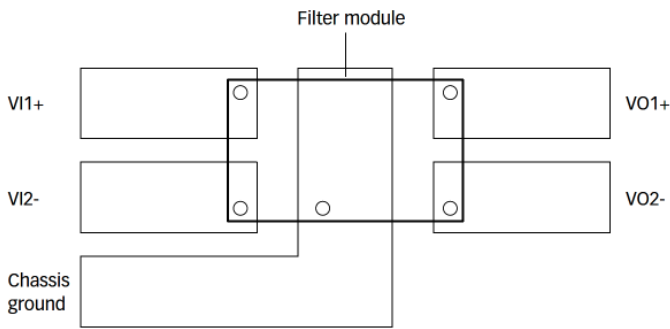


Figure 2: transient protection with a transient diode

Recommended layout



Note: avoid routing signal tracks or planes under the filter module

**Headquarters, global
innovation and
development center**

Schaffner Group

Nordstrasse 11
4542 Luterbach
Switzerland
T +41 32 681 66 26
F +41 32 681 66 30
info@schaffner.com
www.schaffner.com

To find your local partner within
Schaffner's global network,
please go to:
www.schaffner.com

© 2014 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.

Sales and application centers

China

Schaffner EMC Ltd. Shanghai
T20-3, No 565 Chuangye Road
Pudong New Area
201201 Shanghai
T +86 21 3813 9500
F F +86 21 3813 9501 / 02
cschina@schaffner.com
<http://www.schaffner.com.cn/>

Finland

Schaffner Oy
Sauvonrinne 19 H
08500 Lohja
T +358 19 35 72 71
finlandsales@schaffner.com

France

Schaffner EMC S.A.S.
112, Quai de Bezons
Boîte postale 133
95103 Argenteuil
T +33 1 34 34 30 60
F +33 1 39 47 02 28
francesales@schaffner.com

Italy

Schaffner EMC S.r.l.
Via Galileo Galilei 47
20092 Cinisello Balsamo (MI)
T +39 02 66 04 30 45/47
F +39 02 61 23 943
italysales@schaffner.com

Japan

Schaffner EMC K.K.
1-32-12, Kamiuma, Setagaya-ku
7F Mitsui-seimei Sangenjaya Bldg.
154-0011 Tokyo
T +81 3 5712 3650
F +81 3 5712 3651
japansales@schaffner.com
<http://www.schaffner.jp>

Singapore

Schaffner EMC Pte Ltd.
Blk 3015A Ubi Road 1
05-09 Kampong Ubi Industrial Estate
408705 Singapore
T +65 6377 3283
F +65 6377 3281
singaporesales@schaffner.com

Germany

Schaffner Deutschland GmbH
Schoemperlenstrasse 12B
76185 Karlsruhe
T +49 721 56910
F +49 721 569110
germanysales@schaffner.com

Spain

Schaffner EMC España
Calle Caléndula 93, Miniparc III, Edificio
E
El Soto de la Moraleja Alcobendas
28109 Madrid
T +34 618 176 133
spainsales@schaffner.com

Sweden

Schaffner EMC AB
Turebergstorg 1, 6
19147 Sollentuna
T +46 8 5792 1121 / 22
F +46 8 92 96 90
swedensales@schaffner.com

Switzerland

Schaffner EMV AG
Nordstrasse 11
4542 Luterbach
T +41 32 6816 626
F +41 32 6816 641
sales@schaffner.ch

Taiwan R.O.C.

Schaffner EMV Ltd.
6 Floor, No. 413
Rui Guang Road
114 Neihu District Taipei City
T +886 2 87525050
F +886 2 87518086
taiwansales@schaffner.com

Thailand

Schaffner EMC Co. Ltd.
Northern Region Industrial Estate
67 Moo 4 Tambon Ban Klang Amphur
Muangng P.O. Box 14
51000 Lamphun
T +66 53 58 11 04
F +66 53 58 10 19
thailandsales@schaffner.com

UK

Schaffner Ltd.
5 Ashville Way
Molly Millars Lane Wokingham
RG41 2PL Berks hire
T +44 118 9770070
F +44 118 9792969
uksales@schaffner.com
<http://www.schaffner.uk.com>

USA

Schaffner EMC Inc.
52 Mayfield Avenue
08837 Edison
T 1-800-367-5566
T 732-225-9533
F 732-225-4789
usasales@schaffner.com
<http://www.schaffner.com/us>