75 VDC Input PCB Filter

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

Performance indicators

Attenuation performance

Rated current [A]

Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum continuous operating voltage</td>
<td>75 V</td>
</tr>
<tr>
<td>Rated currents</td>
<td>3 to 13 A</td>
</tr>
<tr>
<td>High potential test voltage</td>
<td>V1/V2 -&gt; GND 1500 VDC for 2 sec</td>
</tr>
<tr>
<td></td>
<td>V1 -&gt; V2 100 VDC for 2 sec</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>-40 °C to +100 °C (40/100/21)</td>
</tr>
<tr>
<td>Design corresponding to</td>
<td>UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939</td>
</tr>
<tr>
<td>Flammability corresponding to</td>
<td>UL 94 V-0</td>
</tr>
<tr>
<td>MTBF @ 40°C/230 V (Mil-HB-217F)</td>
<td>4,450,000 hours</td>
</tr>
<tr>
<td>Rated currents</td>
<td>3 to 13 A @50°C</td>
</tr>
</tbody>
</table>

Approvals & Compliances

RoHS

FN 409 PCB filters are designed to suppress common and differential-mode noise on DC voltage lines. The suppression performance is specially 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 13 A at 75 VDC
- Small form factor
- Good thermal conductance

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

Typical electrical schematic

3 and 6.5A types

13A types
Filter selection table

<table>
<thead>
<tr>
<th>Filter</th>
<th>Rated current</th>
<th>Inductance*</th>
<th>Capacitance*</th>
<th>DC Resistance*</th>
<th>Input/Output connections</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>@ 50 °C (40 °C)</td>
<td>L</td>
<td>L1</td>
<td>Cx</td>
<td>Cy</td>
<td>R @ 25 °C per path</td>
</tr>
<tr>
<td>FN 409-3-02</td>
<td>3 (3.2)</td>
<td>2.9</td>
<td>4700</td>
<td>4.7</td>
<td>86</td>
<td>-02</td>
</tr>
<tr>
<td>FN 409-6.5-02</td>
<td>6.5 (7)</td>
<td>0.5</td>
<td>4700</td>
<td>4.7</td>
<td>18</td>
<td>-02</td>
</tr>
<tr>
<td>FN 409-13-02</td>
<td>13 (14)</td>
<td>0.08</td>
<td>0.18</td>
<td>4700</td>
<td>7.8</td>
<td>-02</td>
</tr>
</tbody>
</table>

* Tolerances apply: Inductance: -30/+50%, Capacitance: ±20%, Resistance: ±10%

Typical filter attenuation

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

3 A types

6.5 A types

13 A types

Mechanical data

3 and 6.5 A types

13 A types

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

<table>
<thead>
<tr>
<th></th>
<th>3 A</th>
<th>6.5 A</th>
<th>13 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>51</td>
<td>51</td>
<td>50.8</td>
</tr>
<tr>
<td>B</td>
<td>27.9</td>
<td>27.9</td>
<td>40.6</td>
</tr>
<tr>
<td>C</td>
<td>8.2</td>
<td>8.2</td>
<td>12.7</td>
</tr>
<tr>
<td>D</td>
<td>Ø0.8</td>
<td>Ø0.8</td>
<td>5.1</td>
</tr>
<tr>
<td>E</td>
<td>0.5</td>
<td>0.5</td>
<td>Ø1</td>
</tr>
<tr>
<td>F</td>
<td>11.7</td>
<td>11.7</td>
<td>0.5</td>
</tr>
<tr>
<td>G</td>
<td>3.9</td>
<td>3.9</td>
<td>3.8</td>
</tr>
<tr>
<td>H</td>
<td>12.1</td>
<td>12.1</td>
<td>6.4</td>
</tr>
<tr>
<td>I</td>
<td>31.1</td>
<td>31.1</td>
<td>17.8</td>
</tr>
<tr>
<td>J</td>
<td>46</td>
<td>46</td>
<td>25.4</td>
</tr>
<tr>
<td>K</td>
<td>19.05</td>
<td>19.05</td>
<td>5.08</td>
</tr>
</tbody>
</table>

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

Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.
Headquarters, global innovation and development

Schaffner Group
Industrie Nord
Nordstrasse 11e
4542 Luterbach
T +41 32 681 66 26
info@schaffner.com

To find your local partner within Schaffner’s global network: www.schaffner.com

© 2021 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 C, No 565 Chuangye Road,
Pudong district
201201 Shanghai
T +86 21 3813 9500
cchina@schaffner.com
www.schaffner.com.cn

Finland
Schaffner Oy
Sauvonrinne 19 H
08500 Loiha
T +358 50 468 7284
finlandsales@schaffner.com

France
Schaffner EMC S.A.S.
16-20 Rue Louis Rameau
95875 Beaumont
T +33 1 34 34 30 60
F +33 1 39 47 02 28
francesales@schaffner.com

Germany
Schaffner Deutschland GmbH
Schoemperlenstrasse 128
76185 Karlsruhe
T +49 721 56910
germanysales@schaffner.com

India
Schaffner India Pvt. Ltd
REGUS WORLD TRADE CENTRE
WTC, 22nd Floor Unit No 2238, Brigade
Gateway Campus, 26/F, Dr. Rajkumar Road
Malleshwaram (W)
560055 Bangalore
T +91 80 67935355
indiasales@schaffner.com

Italy
Schaffner EMC S.r.l.
Via Ticino, 30
20900 Monza (MB)
T +39 039 21 41 070
italysales@schaffner.com

Japan
Schaffner EMC K.K.
Taiju-Seimei Sangenjaya Bldg.
1-32-12, Kaminuma, Setagaya-ku
154-0011 Tokyo
T +81 3 5712 3650
F +81 3 5712 3651
japansales@schaffner.com
www.schaffner.jp

Singapore
Schaffner EMC Pte Ltd.
#05-09, Kg Ub Di. Estate
408705 Singapore
T +65 6377 3283
F +65 6377 3281
singaporesales@schaffner.com

Spain
Schaffner EMC España
Calle Calendula 93, Miniparcs 3, Edificio E
El Soto de Moraleja, Alcobendas
28109 Madrid
T +34 917 912 900
F +34 917 912 901
spainsales@schaffner.com

Sweden
Schaffner EMC AB
Ostermalmsgt 1
114 42 Stockholm
T +46 8 5050 2425
swedensales@schaffner.com
www.schaffner.com

Switzerland
Schaffner EMV AG
Industrie Nord
Nordstrasse 11e
4542 Luterbach
T +41 32 681 66 88
T +41 32 681 66 26
switzerlandsales@schaffner.com

Taiwan
Schaffner EMV Ltd.
20 Floor-2, No 97, Section 1, XinTai 5th Road
22175 Xizhi District New Taipei City 22175
T +886 2 2697 5500
F +886 2 2697 5533
taiwansales@schaffner.com
www.schaffner.com.tw

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

United Kingdom
Schaffner Ltd.
1, Oakmede Place
Binfield
RG42 4JF Berkshire
T +44 118 9770070
F +44 118 9792969
uksales@schaffner.com

USA
Schaffner EMC Inc.
52 Mayfield Avenue
Edison, New Jersey
T +1 732 225 9533
F +1 732 225 4789
usasales@schaffner.com
www.schaffnerusa.com