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

<table>
<thead>
<tr>
<th>Attenuation performance</th>
<th>Rated current [A]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>0</td>
</tr>
<tr>
<td>High</td>
<td>3, 6, 9, 12</td>
</tr>
<tr>
<td>Very high</td>
<td>15</td>
</tr>
</tbody>
</table>

Technical specifications

- Maximum continuous operating voltage: 75 V
- Rated currents: 3 to 13 A
- High potential test voltage:
  - V1, V2 -> GND: 1500 VDC for 2 sec
  - V1 -> V2: 100 VDC 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 94 V0
- MTBF @ 40°C/230 V (Mil-HB-217F): 4,450,000 hours
- Rated currents: 3 to 13 A @ 50°C (480 V filters)

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

Approvals

- RoHS
- UL

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.

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

```
V12 2xL 2xL VO2
GND 2xL VO1
```

13A types

```
V12 2xL 2xL1 2xL1 VO2
GND 2xL VO1
```
Filter selection table

<table>
<thead>
<tr>
<th>Filter</th>
<th>Rated current @ 50 °C (40 °C)</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>[A] [mH] [mH] [nF] [nF] [mΩ]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FN 409-3-02</td>
<td>3 (3.2) 2.9</td>
<td>4700 4.7</td>
<td>86</td>
<td>-02</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>FN 409-6.5-02</td>
<td>6.5 (7) 0.5</td>
<td>4700 4.7</td>
<td>18</td>
<td>-02</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>FN 409-13-02</td>
<td>13 (14) 0.08 0.18</td>
<td>4700 4.7</td>
<td>7.8</td>
<td>-02</td>
<td>47</td>
<td></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.

### Recommended layout

- **Figure 1:** transient protection with a varistor
- **Figure 2:** transient protection with a transient diode

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.
EMC/EMI Products
Schaffner Group
Datasheets
05 Jul 2019

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