

**General description:**

MIL-STD-1275 Filter module's: The product is a MIL-COTS 28 Volt vehicle power filter module for MIL-STD-1275 and DEF-STAN 61-5 (Part 6) electrical phenomena.

This product is considered to be a high-end product which enables the downstream subsystems to operate fully during the voltage surge event, (surge stopper) and other electrical phenomena's naturally occurring on a military vehicle.

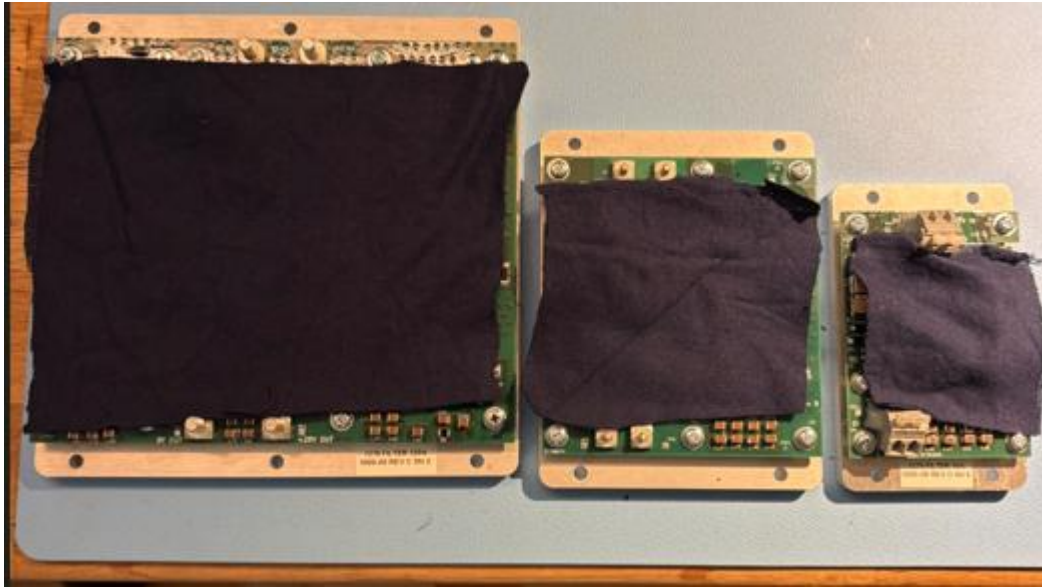
Product may open up the British market for military vehicles, and systems for such platforms, as it is designed to handle the 174 Volt surge event while the vehicle systems operate as normal.

A standardized module enables faster time to market, and less costly system development, since the downstream modules and components does not have to be designed to comply with the MIL-STD-1275 phenomena's and DEF-STAN 61-5 surge event.

The technology is mature and considered to be state of the art.

**Features:**

- Designed to comply with: MIL-STD-1275, all revisions
- Voltage surge protection
- Voltage spike protection
- Starting operations
- Reverse polarity protection
- Intermittent contact protection
- Soft start function
- ESD, Electro static discharge protection
- EMC filter function, capacitive
- Ripple protection



MIL-STD-1275 Filter Modules. 10 A, 40 A and 120 A

### **Technical description**

Designed for military vehicle systems operating on 28 V DC.

The module is designed to protect vehicle electronics from voltage phenomena's occurring on the 28 V supply.

Module protects against surge voltage by regulating the output voltages to maximum 47 V DC, typically 44 V. This enables the use of lower voltage rating on the output side and less costly electronics.

Input voltage range designed from 8 V to 174 V

Super-fast output voltage regulation to typically 44 V.

Stiff, rugged and compact design.

Conformal coating on circuit board.

Simple installation with M4 bolts (4.5 mm mount holes).

100 % surge, 100 V, tested in production.

Low-cost connector interface, yet high current rating and robust towards shock and vibration.

Soft-start feature, preventing high current inrush drawn from the vehicle power system.

Modules are designed to be scalable, (support parallel connecting) for even higher output current performance.

No increased current consumption during the surge event. Other surge protection devices may increase current significantly during the surge event, and therefore risk of damage to wires and possibly risk of fire at the event of a voltage surge.

De-rated for high lifetime.

Temperature rating: -40°C to +65°C.

All hardware, no software or firmware.

Basic EMC filtering function on the input and output.

Aluminium heat-sink and mount plate

SurTec 650 surface treatment on heatsink, for excellent corrosion performance.

Fungus resistance.

No minimum capacitive load required on the output terminals.

## **Compliance**

Designed to comply with: DEF-STAN 61-5 (Part 6)

- 174 V peak at full output current

Designed to comply with: MIL-STD-1275, all revisions:

- Voltage surge 100 V at full output current
- Voltage spike  $\pm 250$  V peak
- Starting operations. (Circuit board operate from 8 V DC at power input, and has a certain internal energy storage for internal use)
- Reverse polarity (super-fast rectifier with very low power loss)
- Intermittent contact
- EMC (no switching of the main current.)
- ESD, Electro static discharge. (Minimum  $\pm 8$  kV. Designed to handle  $\pm 12$  kV at the input terminals)
- Ripple protection CS101, 8 Volt peak, 30 Hz to 150 kHz, MIL-STD-461

Designed to meet MIL-STD-810 vibration and shock levels for vehicles.

Rohs 2 according to 2011/65/EU.

EMC, MIL-STD-461 (In a system which is EMC designed. As a minimum an EMC filter must be mounted on the power input).

- CS101, up to 8 V peak.

## Ordering information

| Part number | Size   | Max. output Curr. | Environment measures |                            | Terminals                                                                     |
|-------------|--------|-------------------|----------------------|----------------------------|-------------------------------------------------------------------------------|
|             |        |                   | Heatsink             | Circuit board              |                                                                               |
| 1000-00     | Small  | 10 A              | SurTec 650           | Glue and conformal coating | Spring loaded for wire with ferrule, max 2.5 mm <sup>2</sup>                  |
| 1003-00     | Medium | 40 A              | SurTec 650           | Glue and conformal coating | M3<br>Use nut with washer and threadlock: Locktite 243.<br>Max torque: 0.5 Nm |
| 1006-00     | Large  | 120 A             | SurTec 650           | Glue and conformal coating | M5<br>Use nut with washer and threadlock: Locktite 243.<br>Max torque: 2.2 Nm |

## Electrical data

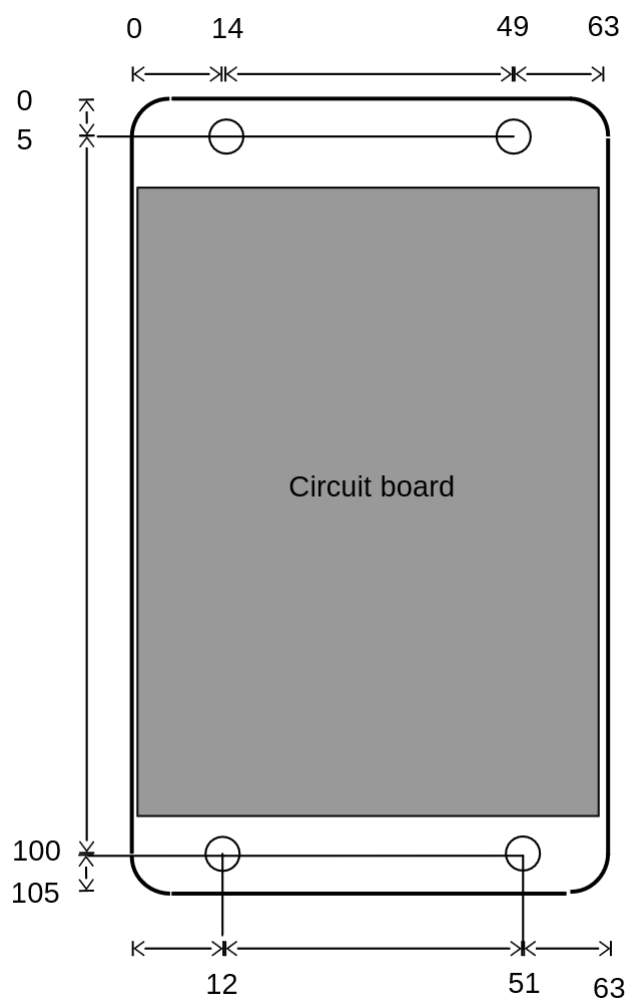
| Part number | Typical Current consumption with no load | Input capacitance on module | Output capacitance on module | Typical voltage loss |
|-------------|------------------------------------------|-----------------------------|------------------------------|----------------------|
| 1000-00     | 40 mA                                    | 16 uF                       | 70 uF                        | 0.9 V                |
| 1003-00     | 100 mA                                   | 16 uF                       | 70 uF                        | 0.9 V                |
| 1006-00     | 230 mA                                   | 47 uF                       | 212 uF                       | 0.9 V                |

## Dimensions

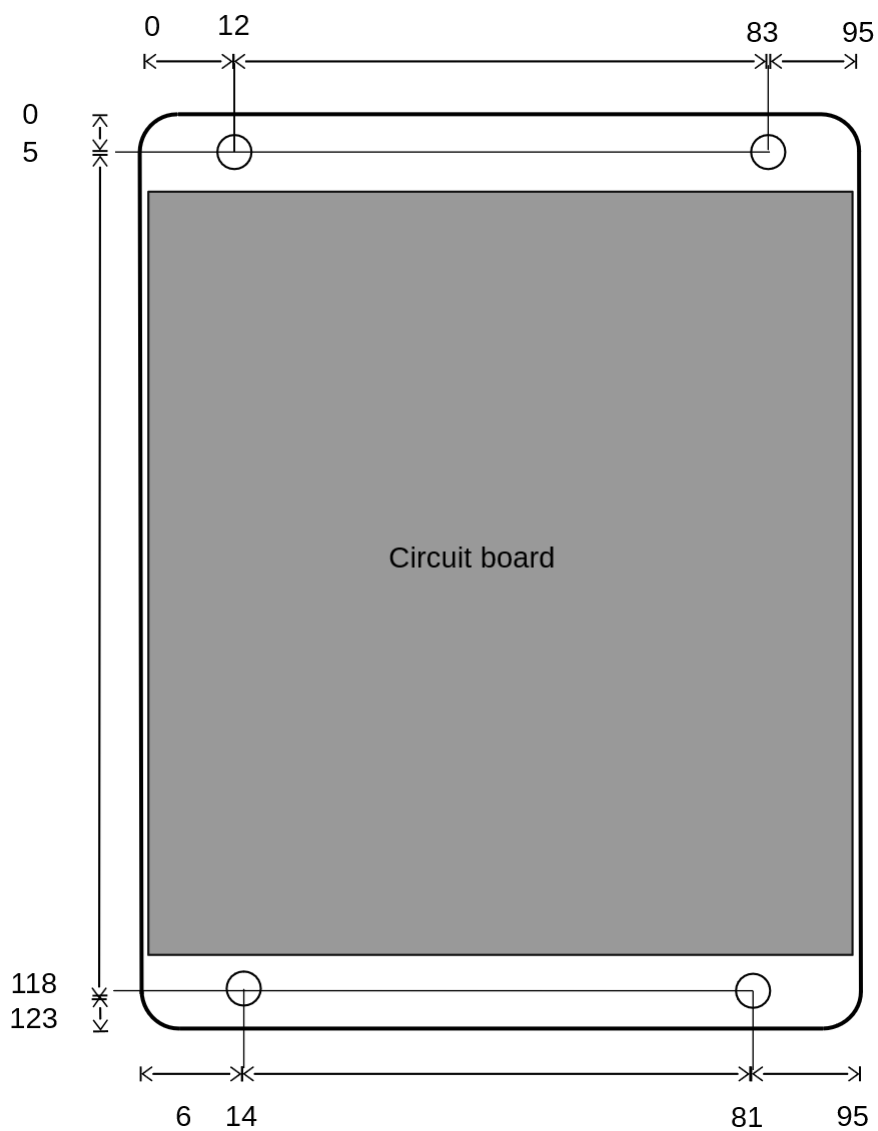


| <b>Part number</b> | <b>Dimensions<br/>(Width x<br/>Length x<br/>Thickness)<br/>[mm]</b> | <b>Weight<br/>[kg]<br/>typ.</b> | <b>Mount<br/>holes<br/>[mm]</b> | <b>Heatsink<br/>Corner<br/>radius<br/>[mm]</b> | <b>Power<br/>input</b>     | <b>Power<br/>output</b>     |
|--------------------|---------------------------------------------------------------------|---------------------------------|---------------------------------|------------------------------------------------|----------------------------|-----------------------------|
| 1000-00            | 63 x 105 x<br>34                                                    | 0.21                            | 4 pcs<br>4.5                    | 5                                              | Top of<br>circuit<br>board | Bot. of<br>circuit<br>board |
| 1003-00            | 95 x 123 x<br>25                                                    | 0.39                            | 4 pcs<br>4.5                    | 5                                              | Top of<br>circuit<br>board | Bot. of<br>circuit<br>board |
| 1006-00            | 160 x 159 x<br>28                                                   | 0.86                            | 6 pcs<br>4.5 mm                 | 5                                              | Top of<br>circuit<br>board | Bot. of<br>circuit<br>board |

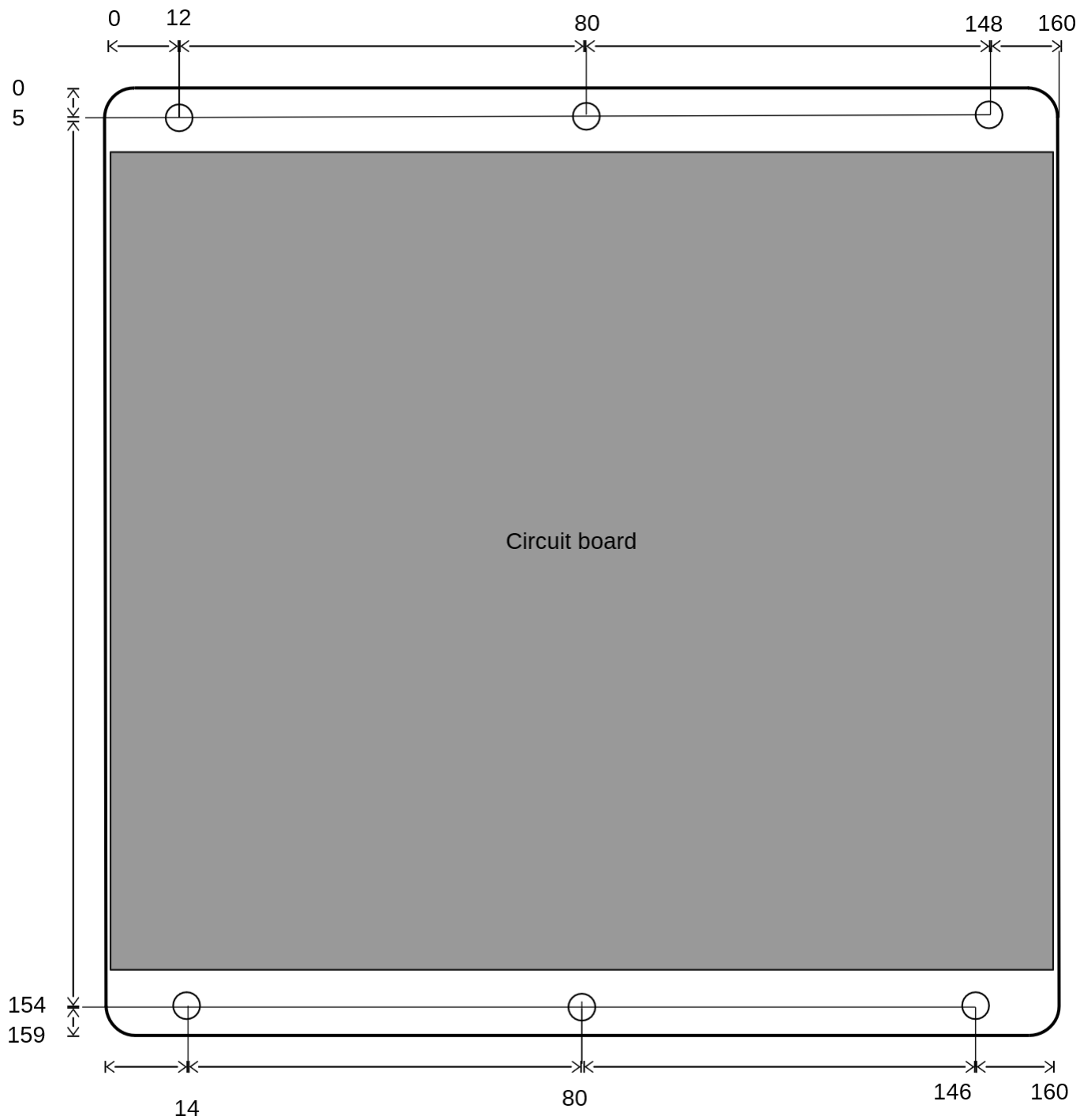
Small



## Medium



Large



## Installation

The 1275 Filter module is designed for mounting into a shielded and environmentally protected enclosure.

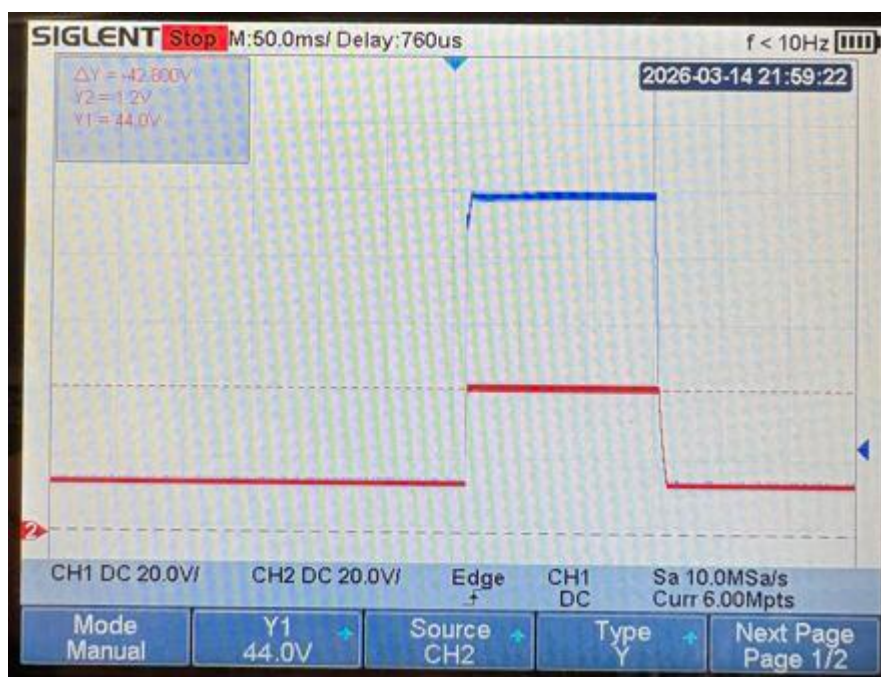
An EMC filter should be mounted between the power input and the 1275 Filter Module.

The mounting surface in the vehicle must be conductive to EMC function.

Fuse or circuit braker to be installed before the MIL-STD-1275 filter module.

### Performance 100 V surge, MIL-STD-1275

CH1, blue curve is input voltage, 100 V DC. CH2, red curve is output voltage regulated to approximately 43 V.



### Export control

Product is intended used on military vehicle systems. Export classification is List I, code ML6. End User Statement is required for export approval.

### Disclaimer

Electronics Design Kongsberg AS will not take economical responsibility for costs, occurring on the platform installed, in the event of a possible technical fault.

### Reliability data, MTBF, Mean Time Between Failures

The reliability method MIL-HDBK-217F, for Ground Mobile at temperature 45°C has been used.

| Part number | MTBF                 |                      |                              |                              |
|-------------|----------------------|----------------------|------------------------------|------------------------------|
|             | Operating<br>[hours] | Operating<br>[years] | Non-<br>operating<br>[hours] | Non-<br>operating<br>[years] |
| 1000-00     | 257 229              | 29.4                 | 2 572 291                    | 293.6                        |
| 1003-00     | 239 484              | 27.3                 | 2 394 845                    | 273.3                        |
| 1006-00     | 178 328              | 20.3                 | 1 783 285                    | 203.6                        |

### Failure modes

For system safety analysis related to MIL-STD-882: failure modes of product (at the event of a component failure at the end of life):

- No output voltage, or
- Loss of surge protection function. (the effect of short circuit in main series regulator or failure in control circuit), or
- Input short to ground

### Packaging and labelling

Each module is packed in metalized ESD protective bag. Then wrapped in antistatic bubble plastic. Then it is packed in a cardboard box. This follows the main principles of MIL-STD-130.

Three labels are used on the product. One on box, one on bag, and one on the module.

Each label has: Name, part number, revision and serial number. This follows the main principles of MIL-STD-129.

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