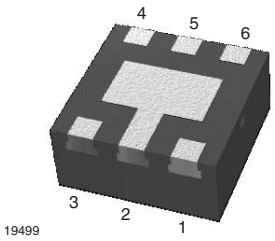
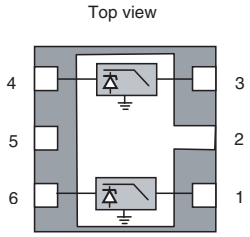
# 2-channel EMI Filter with ESD-Protection

## Features

- Ultra compact LLP75 package
- 2-channel EMI-Filter + ESD-protection
- Low leakage current
- Line resistance of 50 Ohms
- Typical cut-off frequency 100 MHz
- ESD protection to **IEC 61000-4-2 ± 30 kV (Air)**
- ESD protection to **IEC 61000-4-2 ± 30 kV (Contact)**
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE2002/96/EC




## Mechanical Data

**Case:** LLP75-6A (plastic package).
Non magnetic

**Molding Compound Flammability Rating:**
UL 94 V-0

**Terminals:** High temperature soldering guaranteed: 260 °C/10 sec. at terminals

**Weight:** 5 mg

**Packaging Codes/Options:**

GS18 = 10 k per 13" reel (8 mm tape), 10 k/box

GS08 = 3 k per 7" reel (8 mm tape), 15 k/box

## Marking:


Square = Pin 1 marking
"T1" = Type Code for VEMI255A-HS3
SD = Date Code (Example only)

## Absolute Maximum Ratings

Ratings at 25 °C, ambient temperature unless otherwise specified

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| ESD Air Discharge per IEC 61000-4-2 | $V_{ESD}$ | 30 | kV |
| ESD Contact Discharge per IEC 61000-4-2 | $V_{ESD}$ | 30 | kV |

## Thermal Characteristics

Ratings at 25 °C, ambient temperature unless otherwise specified

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Operating Temperature | $T_J$ | - 40 to + 125 | °C |
| Storage Temperature | $T_{STG}$ | - 55 to + 150 | °C |

## Electrical Characteristics

($T_A$ = 25 °C unless otherwise specified)

| Parameter | Test Conditions | Synbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Reverse Stand-Off Voltage | at $I_R$ = 1 µA each Input to Pin 2 | $V_{RWM}$ | 5 | | | V |
| Max. Reverse current | at $V_R$ = 5 V each Input to Pin 2 | $I_R$ | | | 1 | µA |

| Parameter | Test Conditions | Synbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Max. Output Clamping voltage | at $I_{PP}$ = 4 A each Input to Pin 2 Acc. IEC 61000-4-5 measured at output pin | $V_C$ | | | 8 | V |
| Max. Forward Clamping voltage | at $I_F$ = 4 A each Input to Pin 2 Acc. IEC 61000-4-5 | $V_F$ | | | 4.5 | V |
| Max. Peak pulse current | each Input to Pin 2 Acc. IEC 61000-4-5 | $I_{PPM}$ | - 4 | | 4 | A |
| Min. Reverse Breakdown Voltage | each Input to Pin 2 at $I_R$ = 1 mA | $V_{BR}$ | 6 | | | V |
| Input Capacitance | each Input to Pin 2; output not connected; $V_{IN}$ = 0 V ; f = 1 MHz | $C_{IN}$ | | 60 | | pF |
| ESD-Immunity | 10 pulses, both polarities Acc. IEC 6100-4-2 device not damaged | $V_{ESD}$ | | ± 30 kV | | V |
| Cut-off Frequency | Measured in a 50 Ohm system | $f_{3dB}$ | | 100 | | MHz |
| Line Resistance | Measure between input and output; Pin 2 = not connecte; $I_S$ = 10 mA | $R_S$ | | 50 | | Ω |

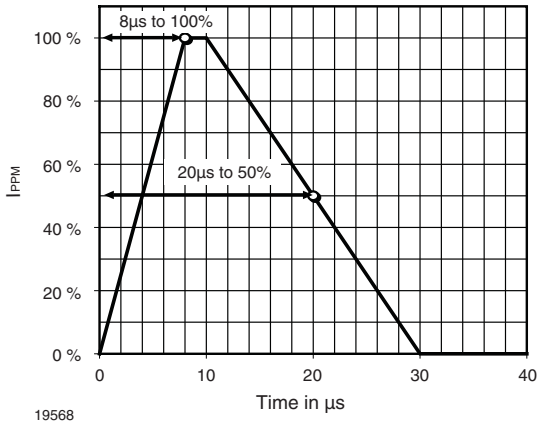



Figure 1. 8/20µs Peak Pulse Current wave form acc. IEC 61000-4-5

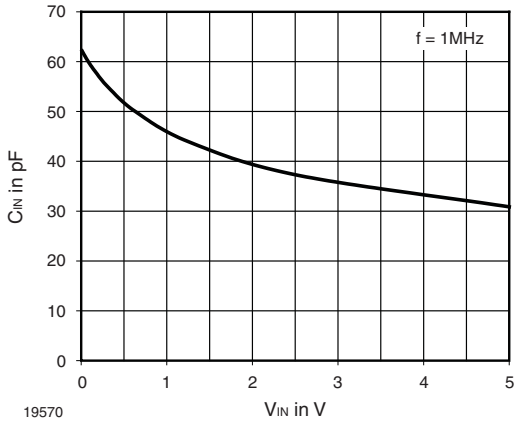



Figure 3. Typical Capacitance $C_{IN}$ vs. Reverse Voltage $V_{IN}$

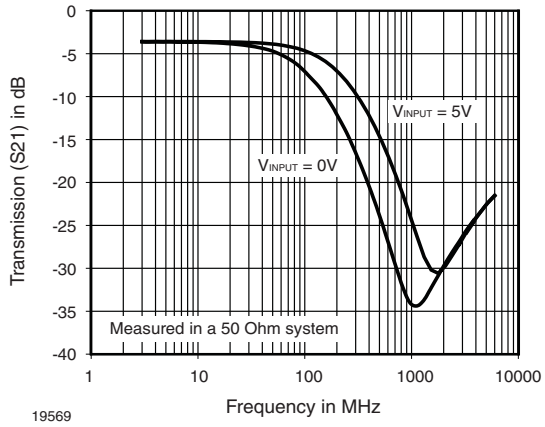



Figure 2. Typical small signal transmission (S21) @ $Z_0$ = 50 Ohm

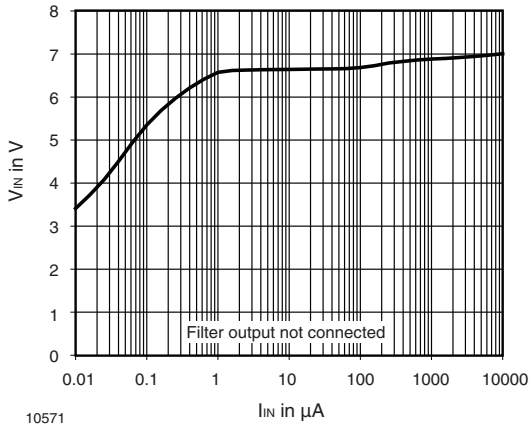



Figure 4. Typical Input Voltage $V_{IN}$ vs. Input Current $I_{IN}$

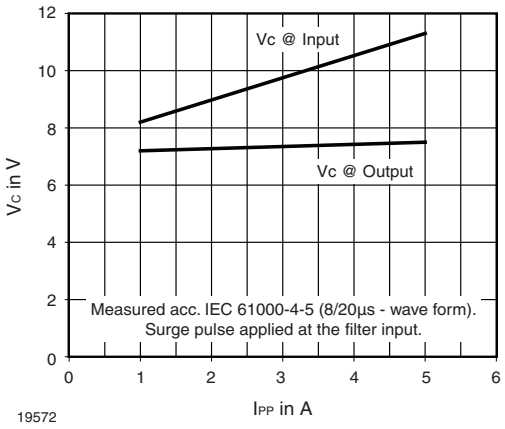
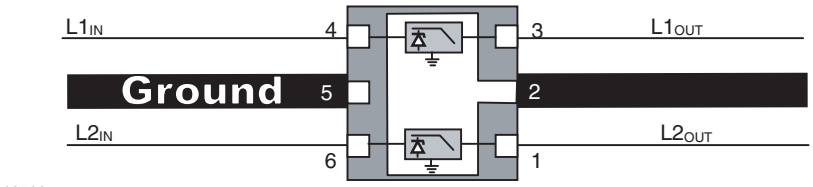



Figure 5. Typical Clamping Voltage vs. Peak Pulse Current $I_{PP}$

### Application Note:

a) With the **VEMI255A-HS3** 2 different signal or data lines can be filtered and clamped to ground. Due to the different clamping levels in forward and reverse direction the clamping behavior is **Bi**directional and **As**ymmetric **(BiAs)**.

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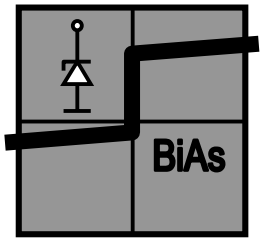


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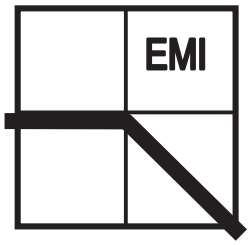
The 2 independent EMI-Filter are placed between

Pin 1 & Pin 6, and
Pin 3 & Pin 4

They all are connected to the common ground Pin no. 2. Pin no. 5 is not connected.
Each filter is symmetrical so that all ports (Pin 1, 3, 4 & 6) can be used as Input or Output.

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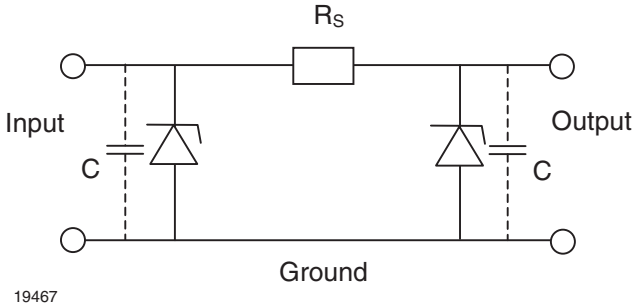
Circuit diagram of one EMI-Filter-Channel

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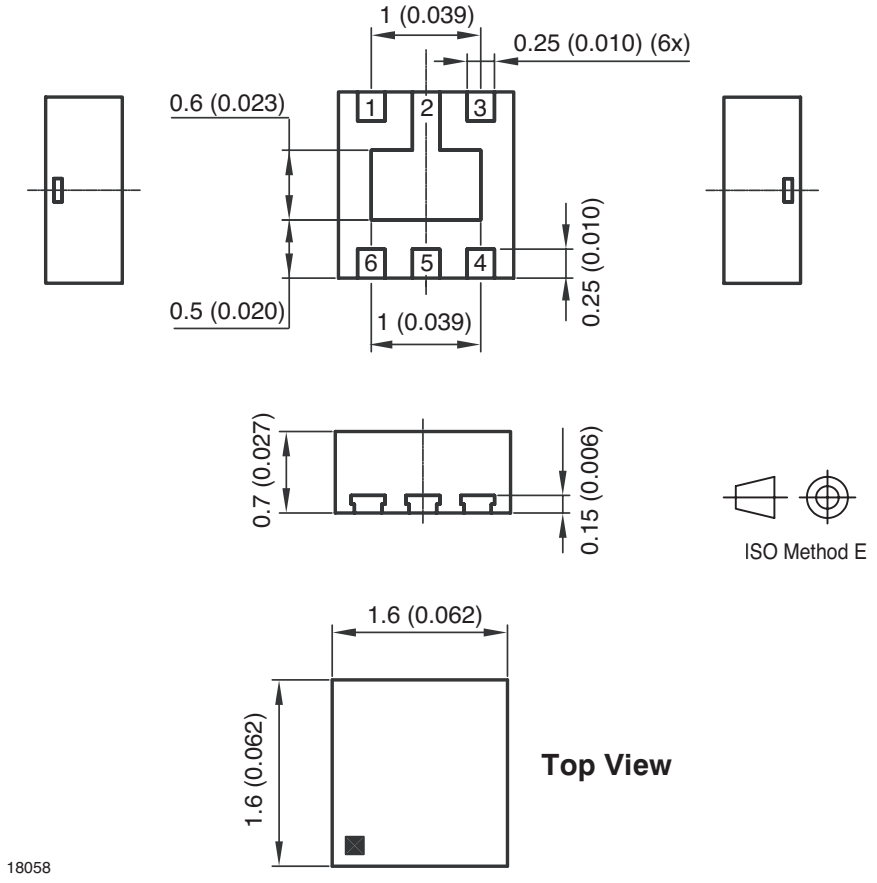
Each filter is symmetrical so that both ports can be used as Input or Output.

## Package dimensions in mm (inches)



## Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.



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