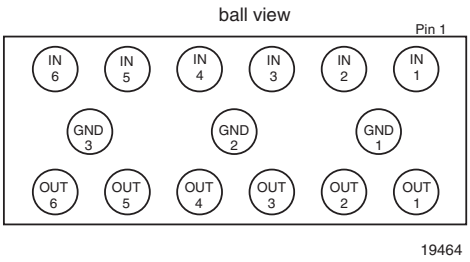
6-channel Flip-Chip EMI Filter with ESD-Protection

Features

- Ultra compact Flip-Chip package
- In-line pinning
- 3 dB Cut-off frequency = 60 MHz
- Series resistance 100 Ohms
- Low leakage current
- ESD protection to **IEC 61000-4-2 ± 30 kV**
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



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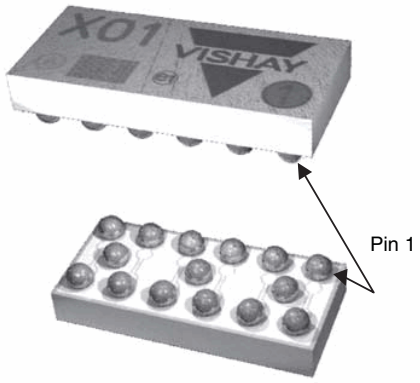

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Mechanical Data

Case: FC2 (FlipChip/BGA)

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

Weight: 5.5 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: X01

Absolute Maximum Ratings

(T_A = 25 °C 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

(T_A = 25 °C unless otherwise specified)

Parameter	Symbol	Value	Unit
Operating Temperature	T_J	- 40 to + 85	°C
Storage Temperature	T_{STG}	- 55 to + 150	°C

Electrical Characteristics

(T_A = 25 °C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse Stand-Off Voltage	Input to ground	V_{RWM}	5			V
Line resistance	between input and output	R_S	90	100	110	Ω
Cut-off Frequency	3 dB - attenuation	f_{3dB}		60		MHz
Attenuation	f = 800 MHz - 2 GHz	S_{21}		- 30		dB
Input current	Input to ground at V_{RWM} output not connected	I_R			1	µA
Max. clamping output voltage	Output to ground V_{in-ESD} = 8 kV	V_{C-Out}			8	V
Max. Peak pulse current	each Input to ground See Fig. 1	at I_{PPM}	5			A
Reverse Breakdown Voltage	at I_R = 1 mA each input or output to ground	V_{BR}	6.5			V
Capacitance	at V_R = 0 V; f = 1 MHz each input or output to ground	C_{IN}		90		pF

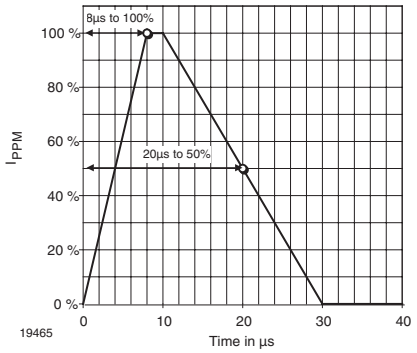


Figure 1. 8/20 µs Peak Pulse Current wave from IEC 61000-4-5

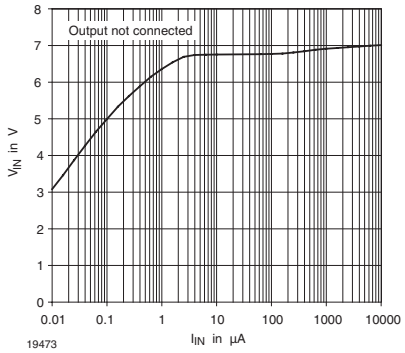


Figure 3. Typical Input Voltage V_{IN} vs. Input Current I_{IN}

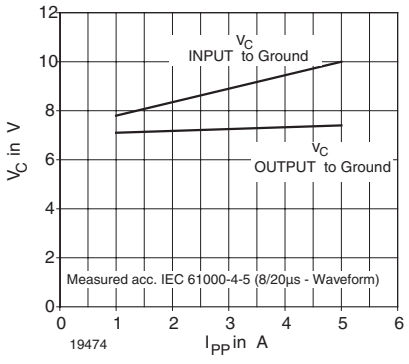


Figure 2. Typical Clamping Voltage vs. Peak Pulse Current I_{PP}

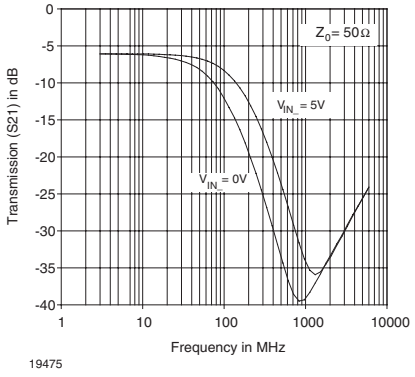


Figure 4. Typical small signal transmission (S21) at Z_0 = 50 Ohm

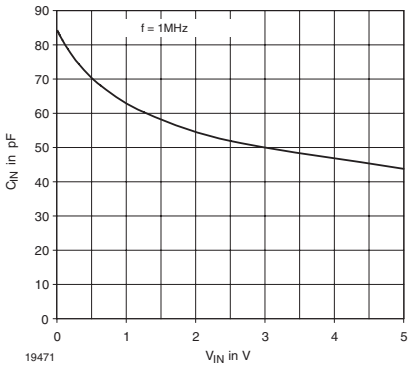
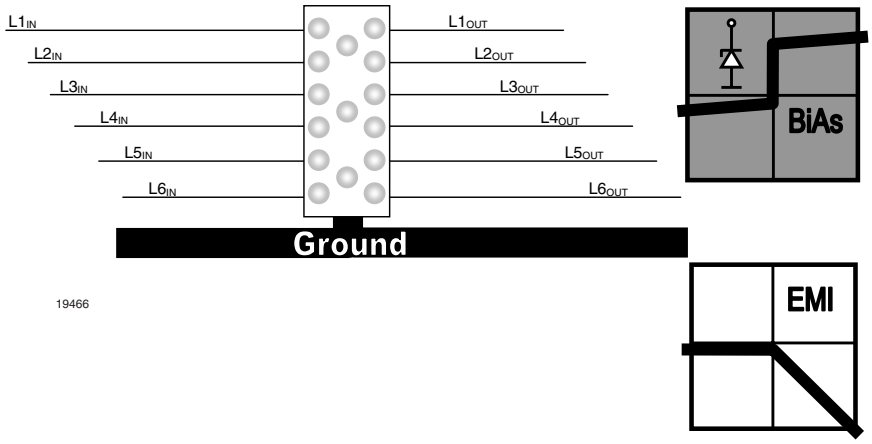


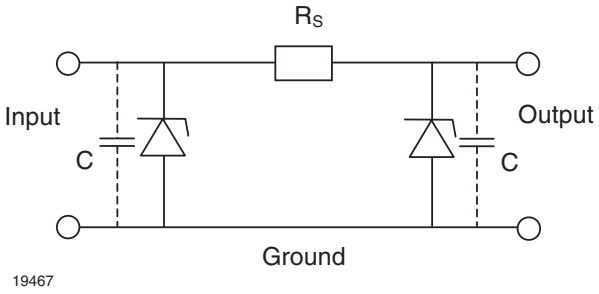
Figure 5. Typical Input Capacitance C_{IN} vs. Input Voltage V_{IN}

Application Note:

a) With the **VEMI65A6-FC2** 6 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)**.

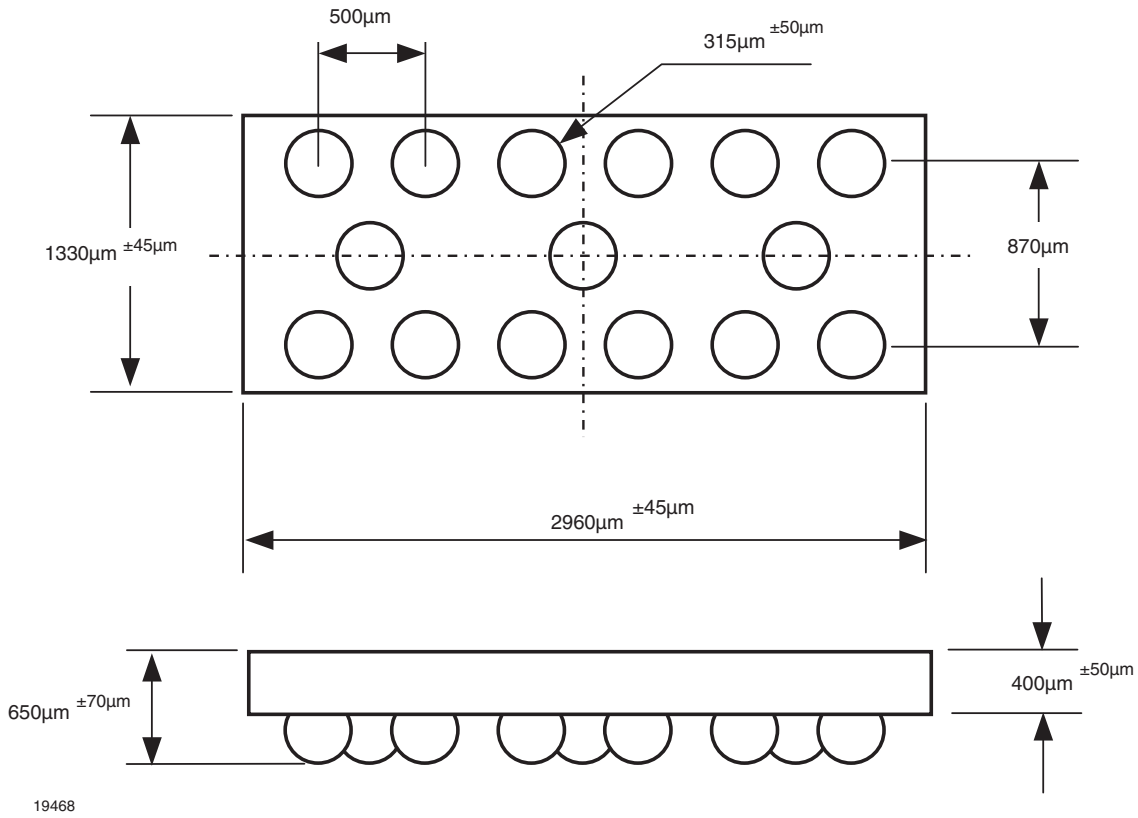


Circuit diagram of one EMI-Filter-Channel

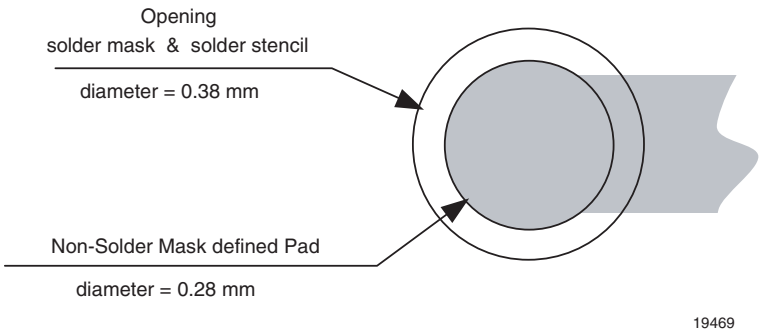


Each filter is symmetrical so that both ports can be used as Input or Output.

Package Dimensions in mm (Inches)



Foot print recommendation:



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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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