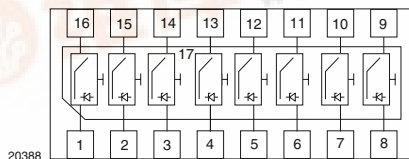
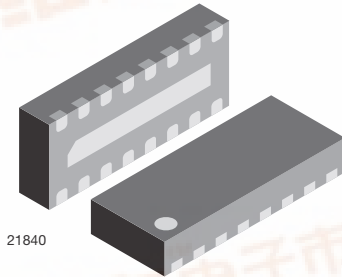


8-Channel LCR - EMI-Filter with ESD-Protection



FEATURES

- Ultra compact LLP3313-17L package
- Low package profile of 0.6 mm
- 8-channel LCR EMI-filter
- Low leakage current
- Line inductance $L_S = 10 \text{ nH}$
- Line resistance $R_S = 12 \Omega$
- Typical cut off frequency $f_{3dB} = 150 \text{ MHz}$
- ESD-protection acc. IEC 61000-4-2
± 25 kV contact discharge
± 25 kV air discharge
- e4 - precious metal (e.g. Ag, Au, NiPd, NiPdAu) (no Sn)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT
GREEN
[5-2008]**

MARKING (example only)



Dot = pin 1 marking

Y = type code (see table below)

XX = date code

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL (8 mm TAPE ON 7" REEL)	MINIMUM ORDER QUANTITY
VEMI85LA-HGK	VEMI85LA-HGK-G-08	3000	15 000

PACKAGE DATA

DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VEMI85LA-HGK	LLP3313-17L	9L	7.4 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

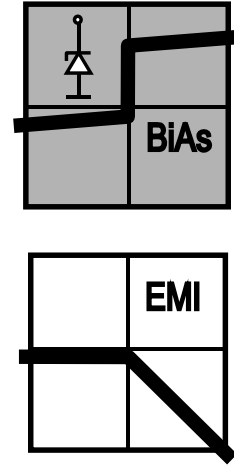
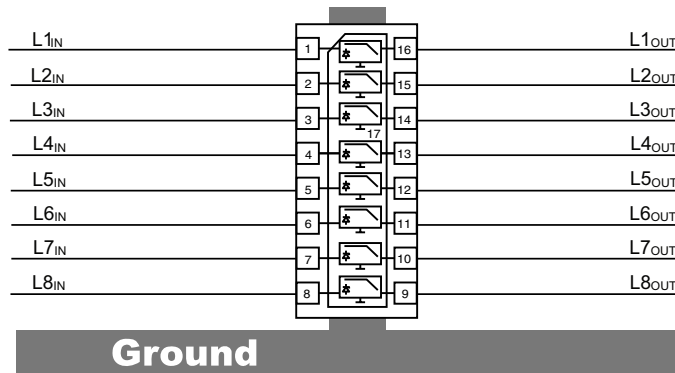
ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	All I/O pin to pin 17; acc. IEC 61000-4-5; $t_p = 8/20 \mu\text{s}$; single shot	I_{PPM}	4	A
ESD immunity	Contact discharge acc. IEC61000-4-2; 10 pulses	V_{ESD}	± 25	kV
	Air discharge acc. IEC61000-4-2; 10 pulses		± 25	
Operating temperature	Junction temperature	T_J	- 40 to + 125	°C
Storage temperature		T_{STG}	- 55 to + 150	°C

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?999902

APPLICATION NOTE

With the VEMI85LA-HGK 8 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 behaviour is Bidirectional and Asymmetric (BiAs).



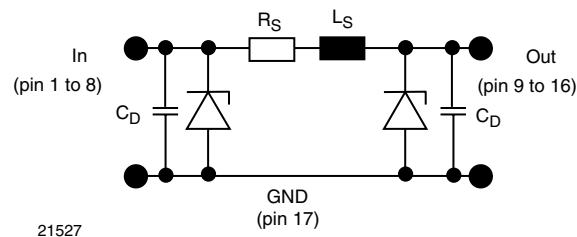
20389

The 8 independent EMI-filter are placed between

- pin 1 and pin 16,
- pin 2 and pin 15,
- pin 3 and pin 14,
- pin 4 and pin 13,
- pin 5 and pin 12,
- pin 6 and pin 11,
- pin 7 and pin 10 and
- pin 8 and pin 9.

They all are connected to a common ground pin 17 on the backside of the package.

The circuit diagram of one EMI-filter-channel shows two identical Z-diodes at the input to ground and the output to ground. These Z-diodes are characterized by the breakthrough voltage level (V_{BR}) and the diode capacitance (C_D). Below the breakthrough voltage level the Z-diodes can be considered as capacitors. Together with these capacitors and the line resistance R_S between input and output the device works as a low pass filter. Low frequency signals ($f < f_{3dB}$) pass the filter while high frequency signals ($f > f_{3dB}$) will be shorted to ground through the diode capacitances C_D .



21527

Each filter is symmetrical so that both ports can be used as input or output.

ELECTRICAL CHARACTERISTICS VEMI85LA-HGK						
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of channels which can be protected	N_{channel}	-	-	4	channel
Reverse stand off voltage	at $I_R = 1 \mu\text{A}$	V_{RWM}	5	-	-	V
Reverse current	at $V_R = V_{\text{RWM}}$	I_R	-	-	1	μA
Reverse break down voltage	at $I_R = 1 \text{ mA}$	V_{BR}	6	-	-	V
Pos. clamping voltage	at $I_{\text{PP}} = 1 \text{ A}$ applied at the input, measured at the output; acc. IEC 61000-4-5	$V_{\text{C-out}}$	-	7.7	8.5	V
	at $I_{\text{PP}} = I_{\text{PPM}} = 4 \text{ A}$ applied at the input, measured at the output; acc. IEC 61000-4-5	$V_{\text{C-out}}$	-	8.3	9.5	V
Neg. clamping voltage	at $I_{\text{PP}} = -1 \text{ A}$ applied at the input, measured at the output; acc. IEC 61000-4-5	$V_{\text{C-out}}$	- 1	-	-	V
	at $I_{\text{PP}} = I_{\text{PPM}} = -4 \text{ A}$ applied at the input, measured at the output; acc. IEC 61000-4-5	$V_{\text{C-out}}$	- 1.2	-	-	V
Input capacitance	at $V_R = 0 \text{ V}$; $f = 1 \text{ MHz}$	C_{IN}	-	47	53	pF
	at $V_R = 2.5 \text{ V}$; $f = 1 \text{ MHz}$	C_{IN}	-	28	31	pF
Line inductance	Measured between input and output	L_S	-	10	-	nH
Line resistance	Measured between input and output; $I_S = 10 \text{ mA}$	R_S	-	12	-	Ω
Cut-off frequency	$V_{\text{IN}} = 0 \text{ V}$; measured in a 50Ω system	$f_{3\text{dB}}$	-	150	-	MHz

Note

- Ratings at 25°C , ambient temperature unless otherwise specified. All inputs (pin 1, 2, 3, 4, 5, 6, 7 and 8) to ground (pin 17)

TYPICAL CHARACTERISTICS ($T_{\text{amb}} = 25^\circ\text{C}$, unless otherwise specified)

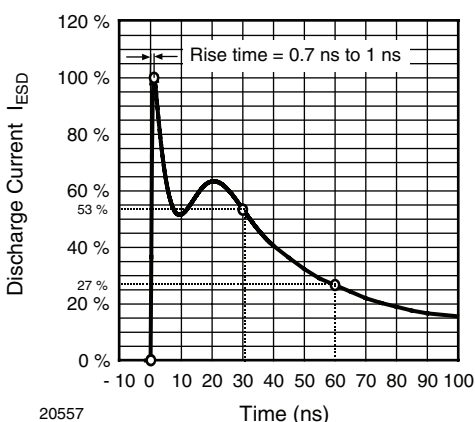


Fig. 1 - ESD Discharge Current Wave Form
acc. IEC 61000-4-2 (330 Ω /150 pF)

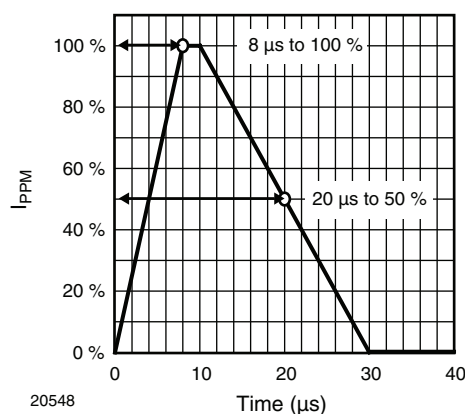


Fig. 2 - 8/20 μs Peak Pulse Current Wave Form
acc. IEC 61000-4-5

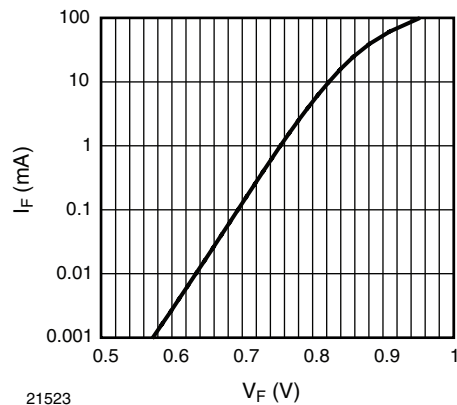


Fig. 3 - Typical Forward Current I_F vs. Forward Voltage V_F

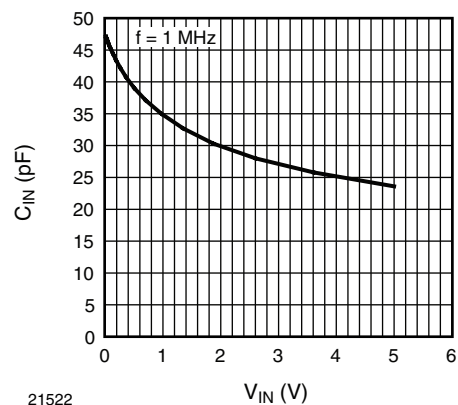


Fig. 6 - Typical Input Capacitance C_{IN} vs. Input Voltage V_{IN}

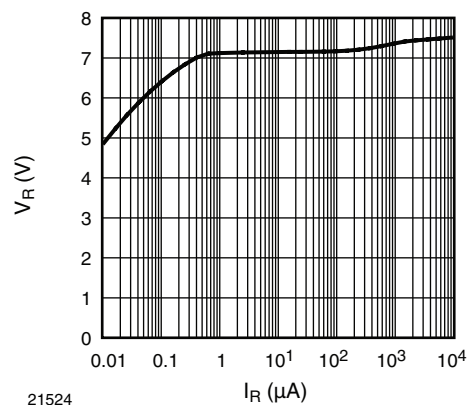


Fig. 4 - Typical Reverse Voltage V_R vs. Reverse Current I_R

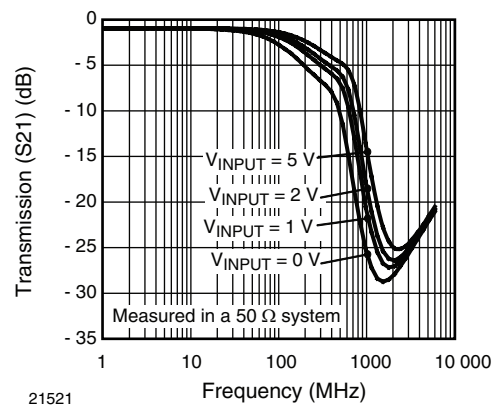


Fig. 7 - Typical Small Signal Transmission (S_{21}) at $Z_O = 50 \Omega$

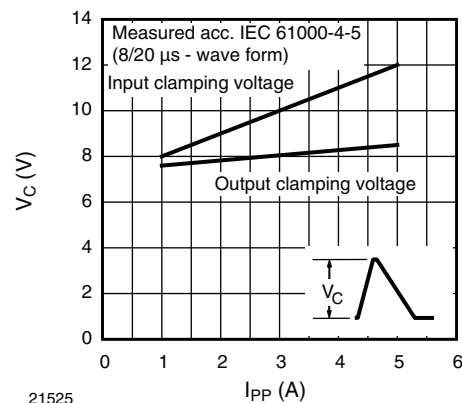
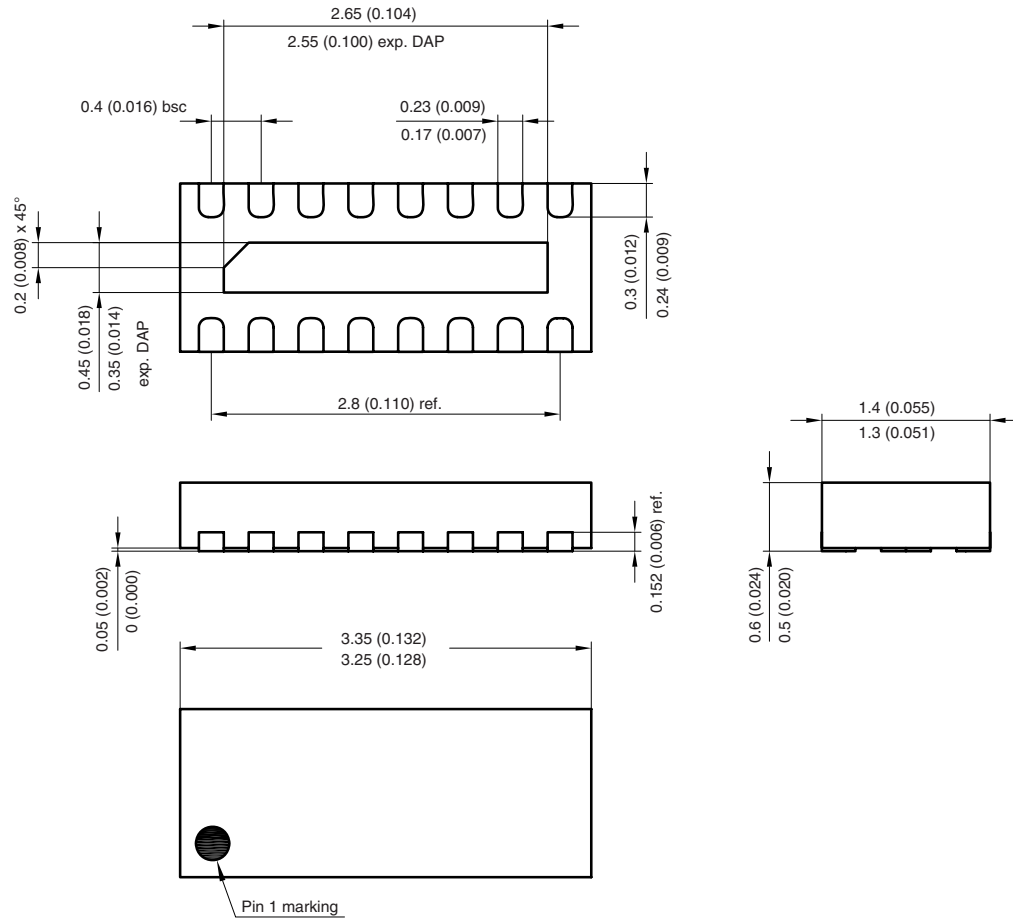
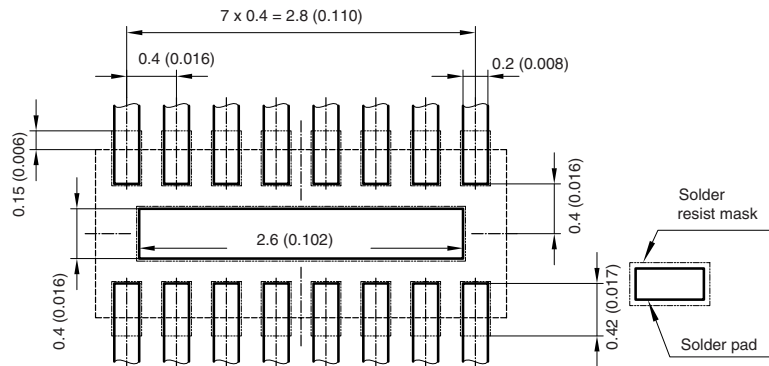


Fig. 5 - Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

PACKAGE DIMENSIONS in millimeters (inches): **LLP3313-17L**



Foot print recommendation:



Document no.:S8-V-3906.04-003 (4)
 Created - Date: 28. August 2006
 Rev. 1 - Date: 27. May 2008
 20391

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.