ESD132-B1-W0201

Bi-directional TVS device, 5.5 V, 0.45 pF, 0201

Order now | Technical documents | Simulation | Support

Product description

This Infineon transient voltage suppressor (TVS) device has a bi-directional and symmetric *I*/*V* characteristic for optimized design and assembly.

Feature list

- ESD / transient protection according to:
  - IEC61000-4-2 (ESD): ±30 kV (air) / ±30 kV (contact)
  - IEC61000-4-4 (EFT): ±4 kV / ±80 A (5/50 ns)
  - IEC61000-4-5 (Surge): ±9 A (8/20 µs)
- Bi-directional maximum working voltage: V_{WM} = ±5.5 V
- Line capacitance: C_L = 0.45 pF at f = 1 MHz
- Clamping voltage: V_{cl} = 7 V at I_{TLP} = 16 A with R_{dyn} = 0.2 Ω
- Very low leakage current: I_L = 100 nA (max.)
- Small form factor SMD size 0201, low profile (0.58 x 0.28 x 0.15 mm^3) *[2]*

RoHS

Potential applications

- USB 3.0 / 3.1 / 3.2 Gen 1
- DVI, HDMI, Display Port
- Ethernet

Product validation

Qualified for industrial applications according to the relevant tests of JEDEC47/20/22.

Device information

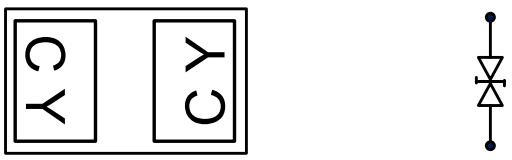

Figure 1 **Pin configuration (bottom view) and schematic diagram**

Table 1 **Part information**

Product name / Ordering code	Package	Pin configuration	Marking	Pieces / Reel
ESD132-B1-W0201 / ESD132B1W0201E6327XTSA1	WLL-2-3	1 line, bi-directional	CY	15 k

Table of contents

1 Absolute maximum ratings

Table 2 Absolute maximum ratings at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values		Unit	Note or test condition
		Min.	Max.		
Maximum working voltage	V_{WM}	-5.5	+5.5	V	
ESD discharge	V_{ESD} (contact)	-30	+30	kV	Discharge network: R = 330 Ω, C = 150 pF [1]
	V_{ESD} (air)	-30	+30		
Peak pulse power	P_{PK}	–	63	W	Stress pulse: 8/20 µs current waveform [2]
Peak pulse current	I_{PP}	-9	+9	A	Stress pulse: 8/20 µs current waveform [2]
Operating temperature range	T_{op}	-55	+125	°C	
Storage temperature	T_{stg}	-65	+150		

Attention**: **Stresses above the maximum values listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. Exceeding only one of these values may cause irreversible damage to the component.

1 Based on IEC61000-4-2.
2 Based on IEC61000-4-5.

2 Electrical characteristics

Note: *T_A = 25 °C, unless otherwise specified. Device is electrically symmetrical.*

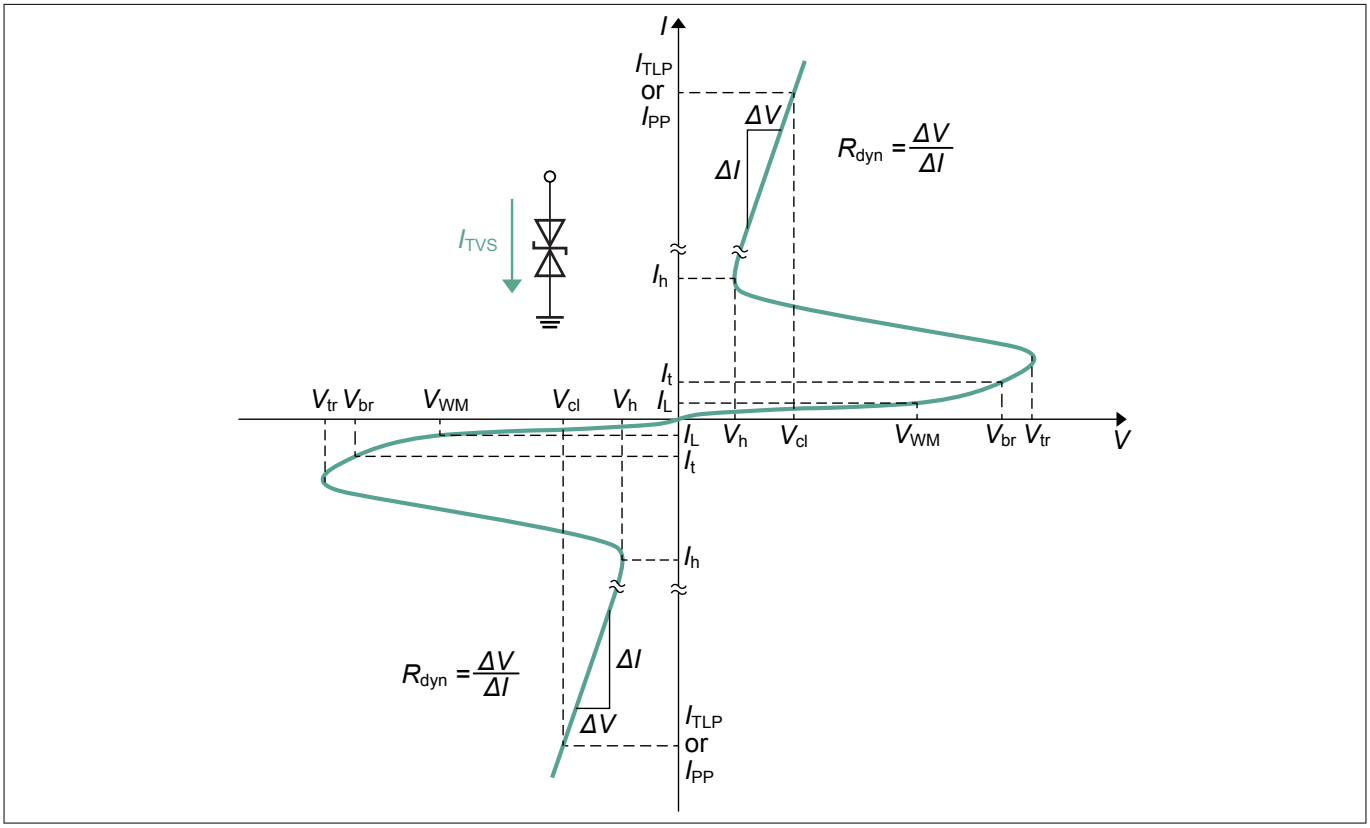

Figure 2 **Definitions of electrical characteristics**

Table 3 **Electrical parameters**

Symbol	Parameter
R_{dyn}	Dynamic resistance
V_{WM}	Maximum working voltage
V_{cl}	Clamping voltage
V_{TLP}	TLP voltage
I_{TLP}	TLP current
V_t	Test voltage
I_t	Test current
V_h	Holding voltage
I_h	Holding current
V_{br}	Breakdown voltage
V_{tr}	Trigger voltage
I_L	Leakage current
V_{ESD}	Maximum electrostatic discharge voltage, based on IEC61000-4-2
I_{PP}	Peak pulse current, based on IEC61000-4-5

Electrical characteristics

Table 4 DC characteristics

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Breakdown voltage	V_{br}	6.1	8.5	–	V	I_t = 1 mA
Holding voltage	V_h	–	1.8	–		$I = I_h$
Holding current	I_h	–	30	–	mA	$V = V_h$
Leakage current	I_L	–	–	100	nA	V_{WM} = ±5.5 V

Table 5 AC characteristics

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Line capacitance	C_L	–	0.45	0.55	pF	V_t = 0 V, f = 1 MHz

Table 6 ESD and surge characteristics

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Clamping voltage (TLP) [3]	V_{cl}	–	5.5	–	V	I_{TLP} = 8 A
		–	7	–		I_{TLP} = 16 A
		–	9.5	–		I_{TLP} = 30 A
Clamping voltage (8/20) [4]		–	3	–		I_{PP} = 1 A
		–	6	8		I_{PP} = 8 A
Dynamic resistance [3]	R_{dyn}	–	0.2	–	Ω	

3 TLP parameters: Z_0 = 50 Ω, t_p = 100 ns, t_r = 0.6 ns. Refer to application note AN210 *[1]*.
4 t_p = 8/20 µs. Stress pulse based on IEC61000-4-5.

3 Typical characteristic diagrams

Note: *T_A = 25 °C, unless otherwise specified.*

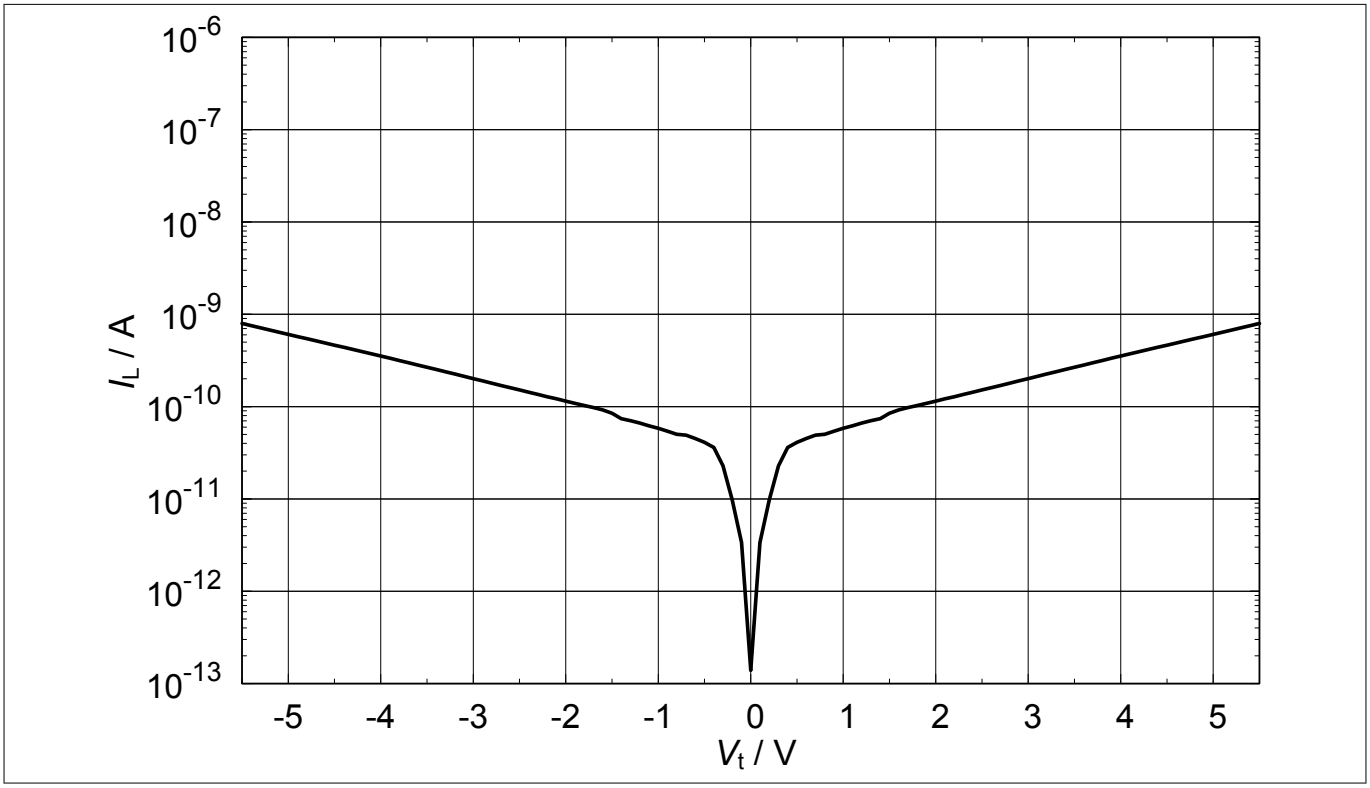

Figure 3 **Leakage current: $I_L = f(V_t)$**

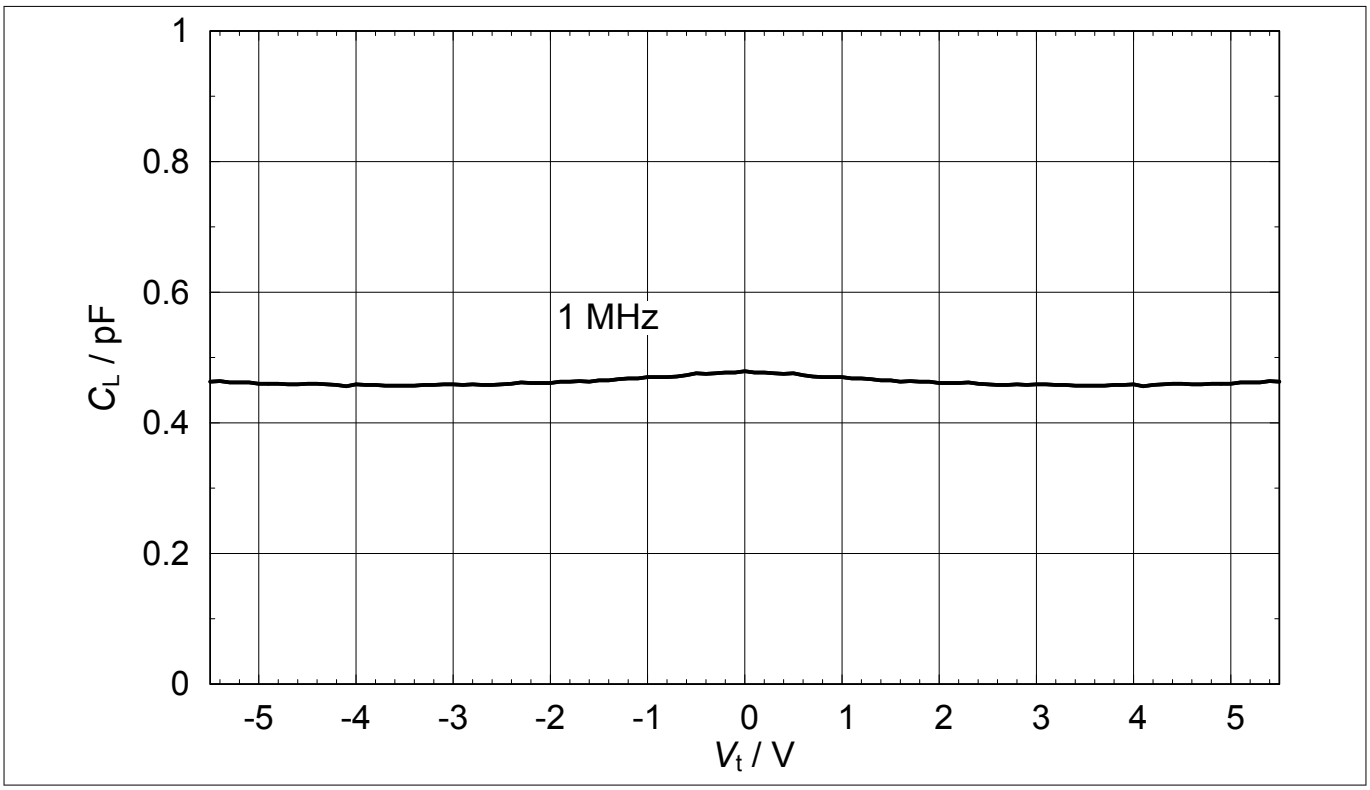

Figure 4 **Line capacitance: $C_L = f(V_t)$, f = 1 MHz**

Typical characteristic diagrams

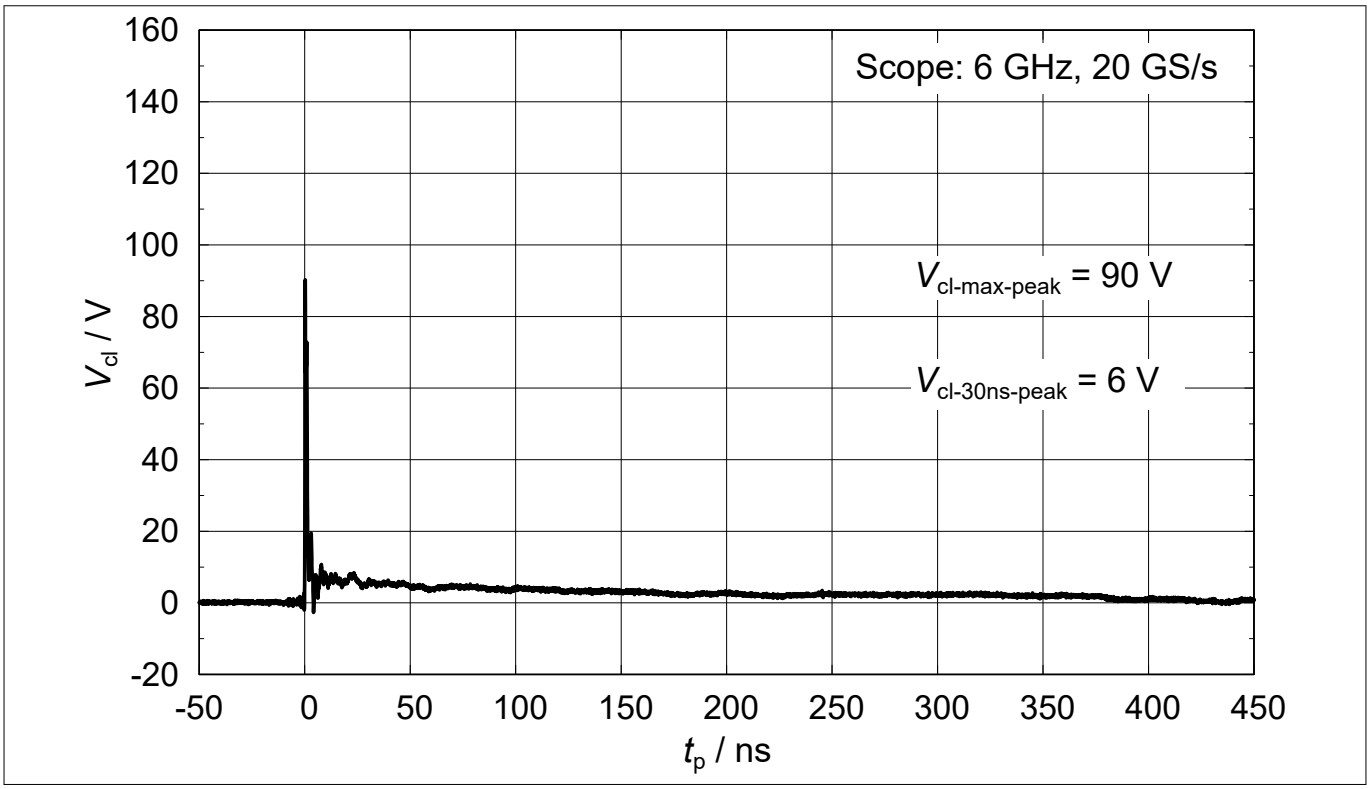

Figure 5 **Clamping voltage (ESD): V_{cl} = f(t_p), 8 kV positive pulse based on IEC61000-4-2**

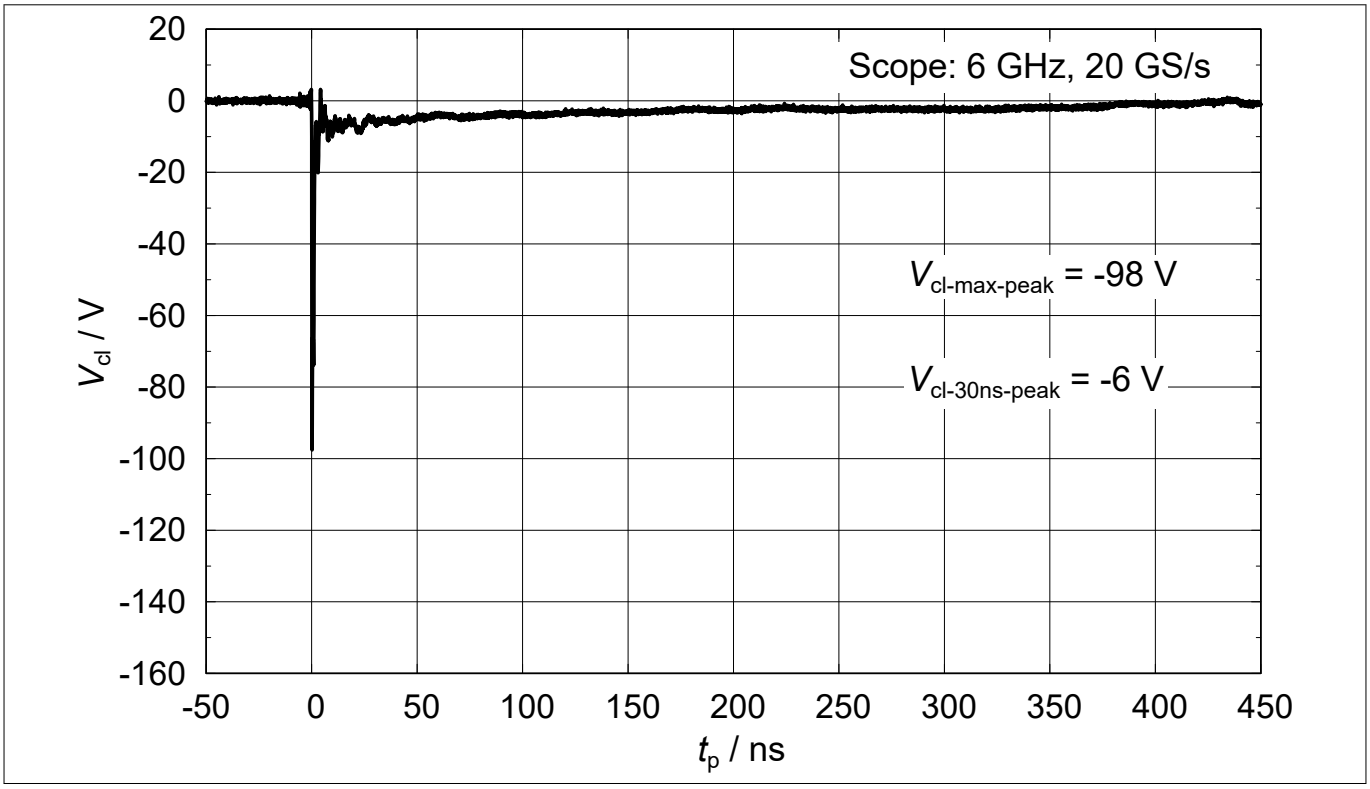

Figure 6 **Clamping voltage (ESD): V_{cl} = f(t_p), 8 kV negative pulse based on IEC61000-4-2**

Typical characteristic diagrams

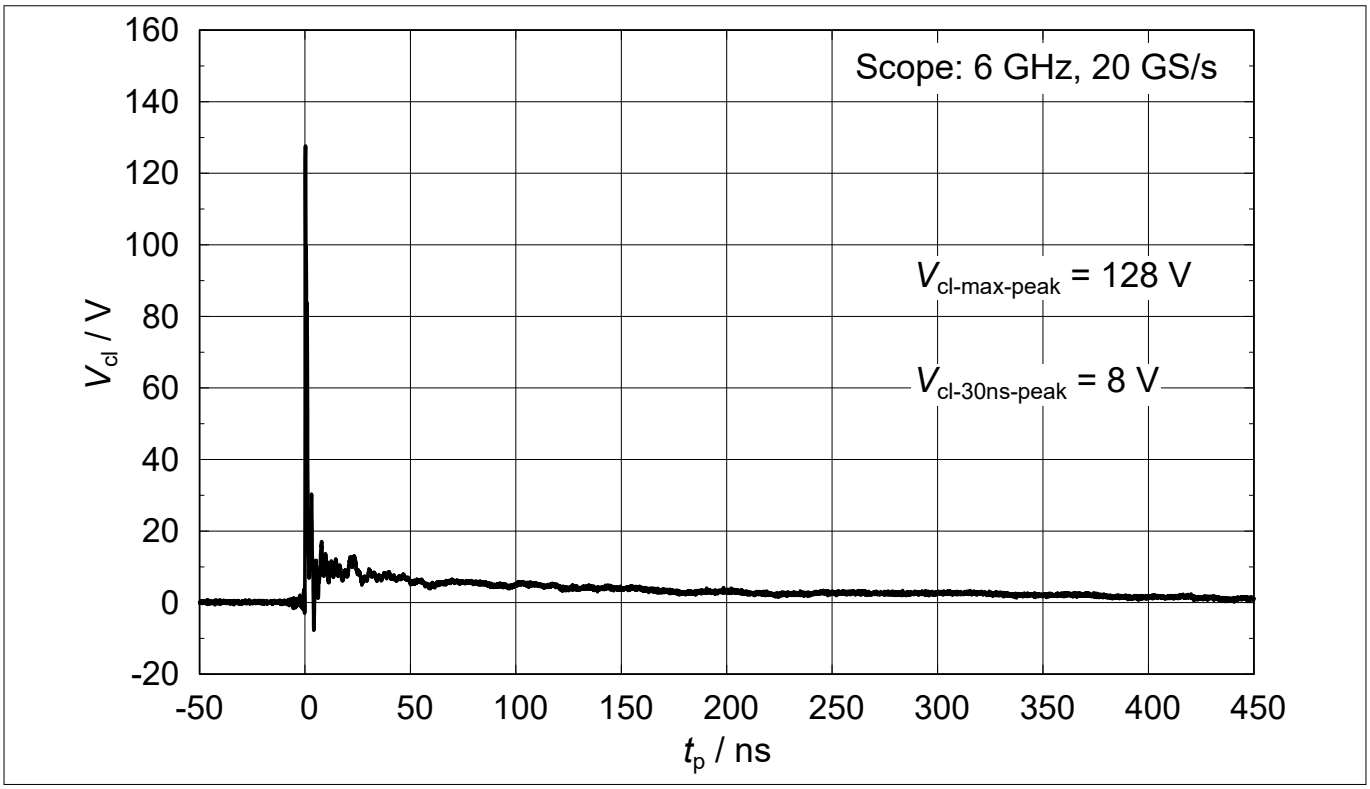

Figure 7 **Clamping voltage (ESD): V_{cl} = f(t_p), 15 kV positive pulse based on IEC61000-4-2**

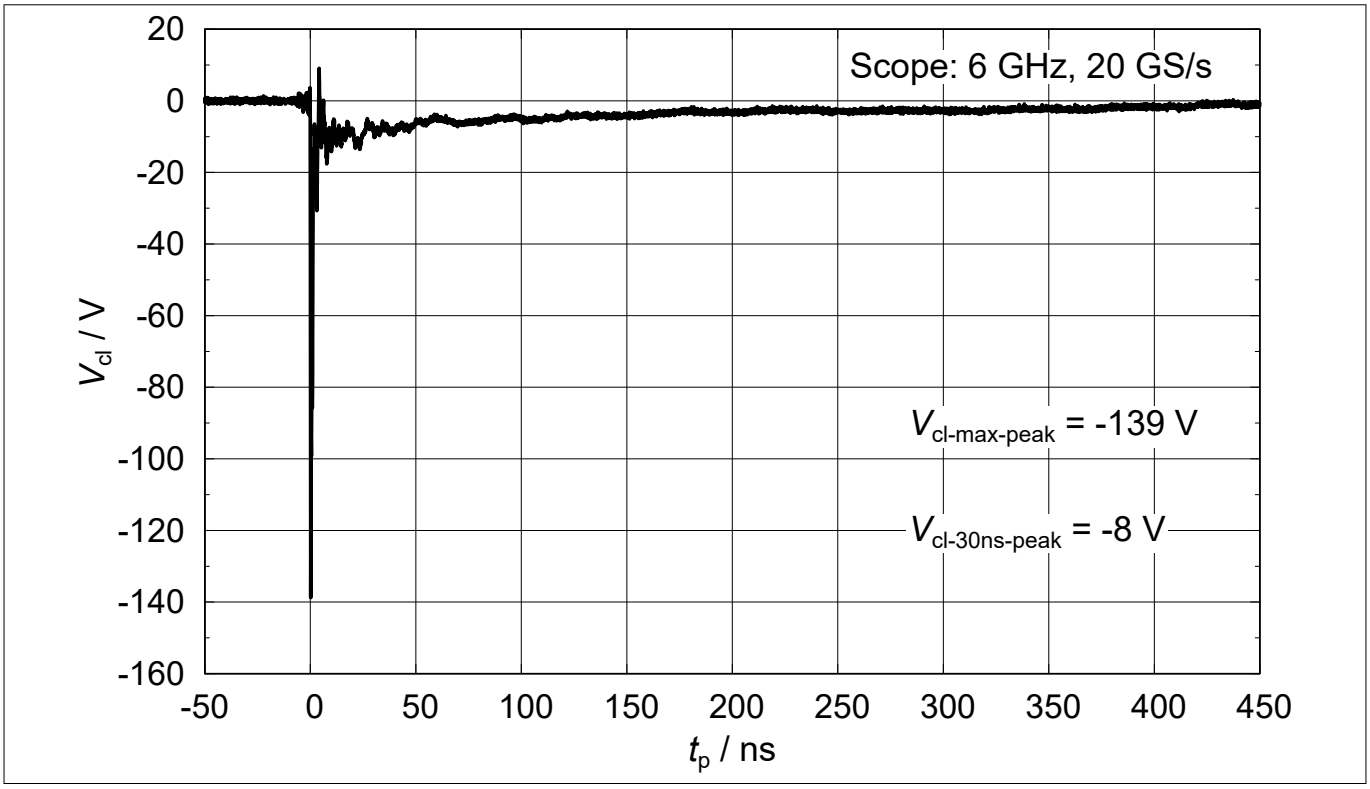

Figure 8 **Clamping voltage (ESD): V_{cl} = f(t_p), 15 kV negative pulse based on IEC61000-4-2**

Typical characteristic diagrams

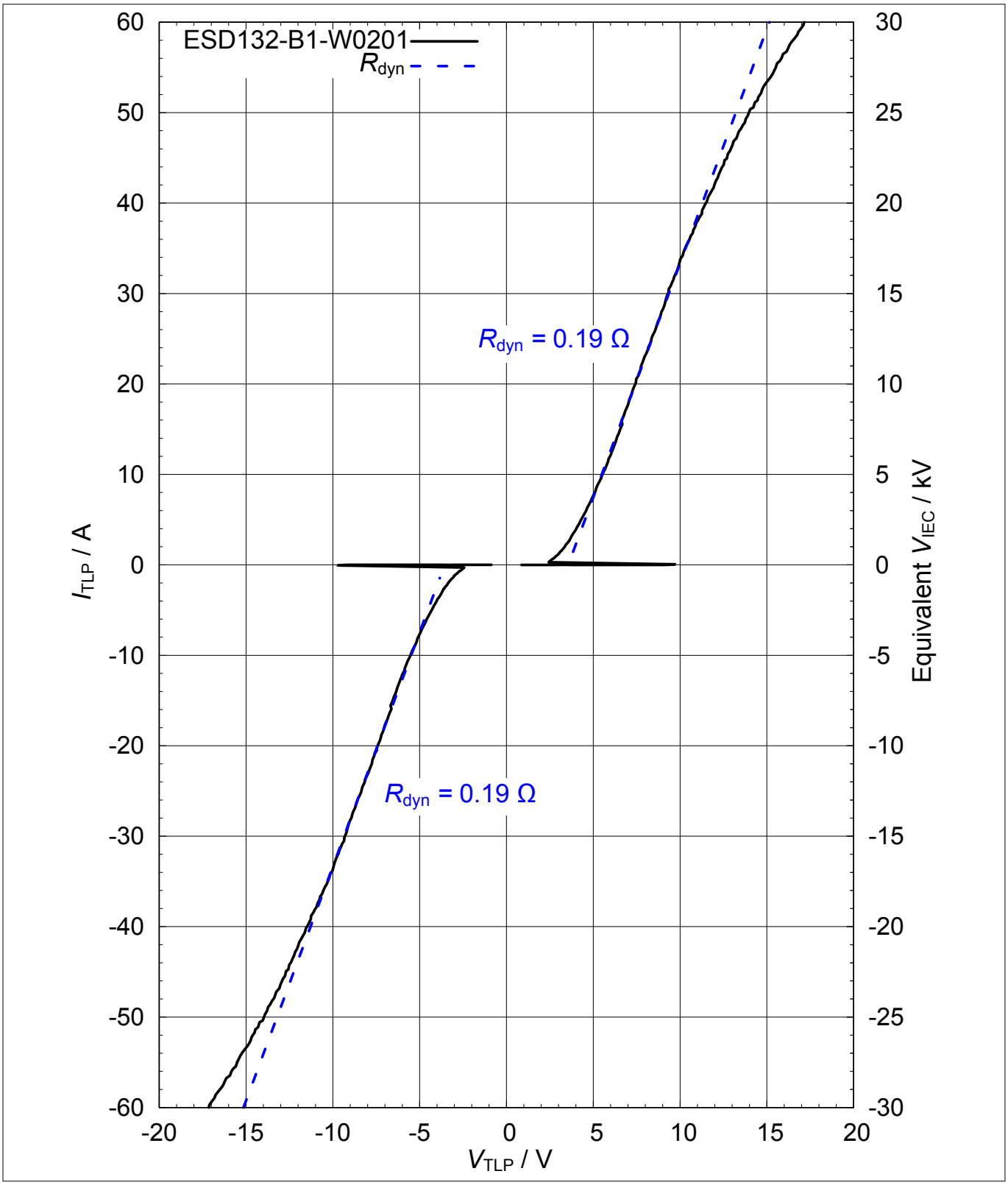

Figure 9 **Clamping voltage (TLP): I_{TLP} = f(V_{TLP})**

Typical characteristic diagrams

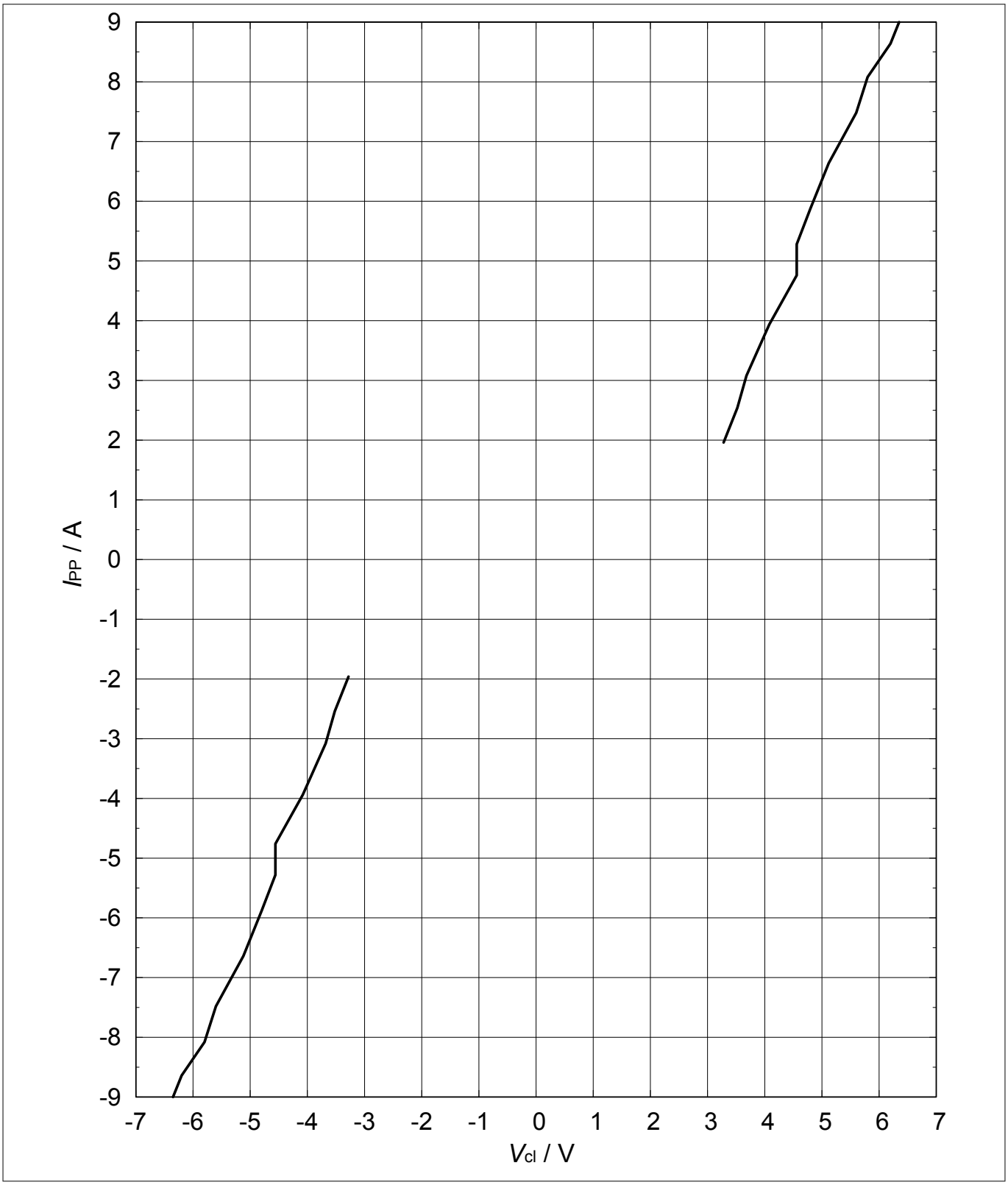

Figure 10 **Clamping voltage (Surge): $I_{PP} = f(V_{cl})$, based on IEC61000-4-5**

Typical characteristic diagrams

Figure 11 10 Gbps Eye diagram with USB 3.1/3.2 Gen 2 Mask, test board only

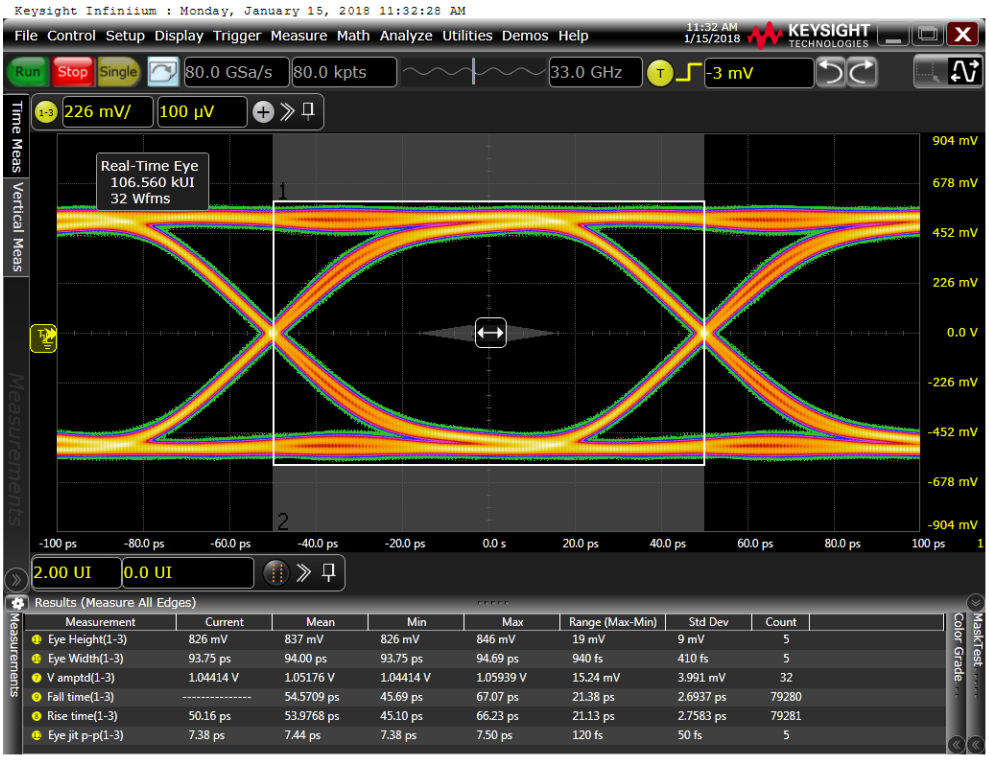

Figure 12 10 Gbps Eye diagram with USB 3.1/3.2 Gen 2 Mask, test board + ESD132-B1-W0201

Typical characteristic diagrams

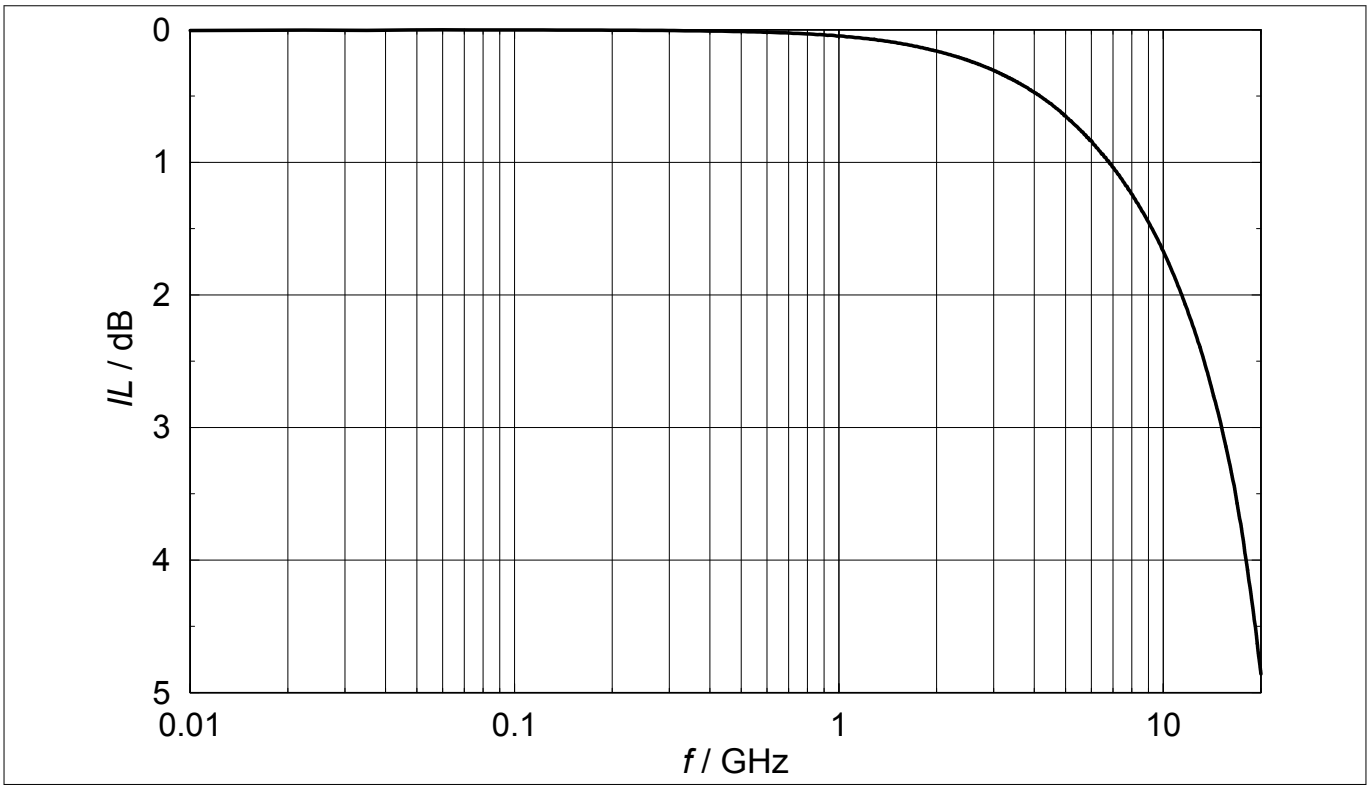

Figure 13 **Insertion loss: *IL* = f(*f*), measured in a 50 Ω system**

4 Package information WLL-2-3

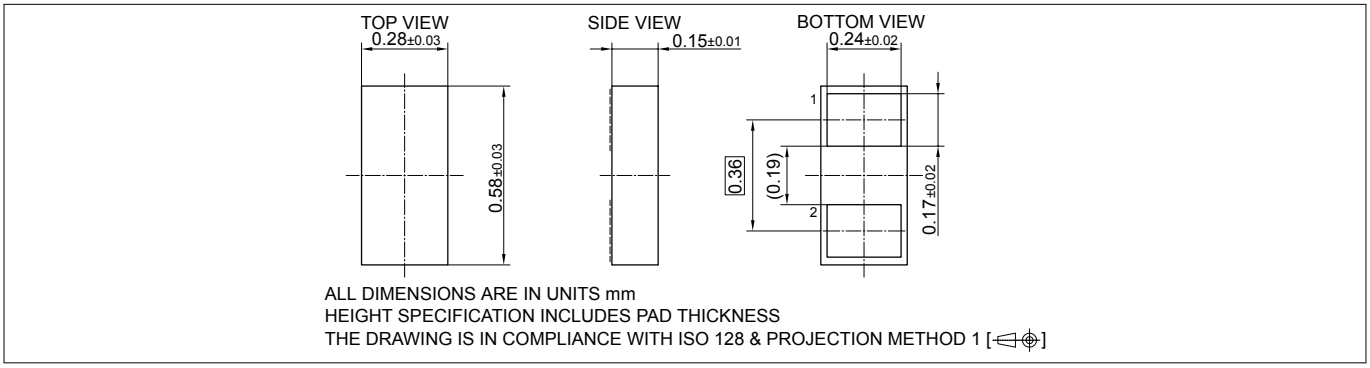

Figure 14 Package outline

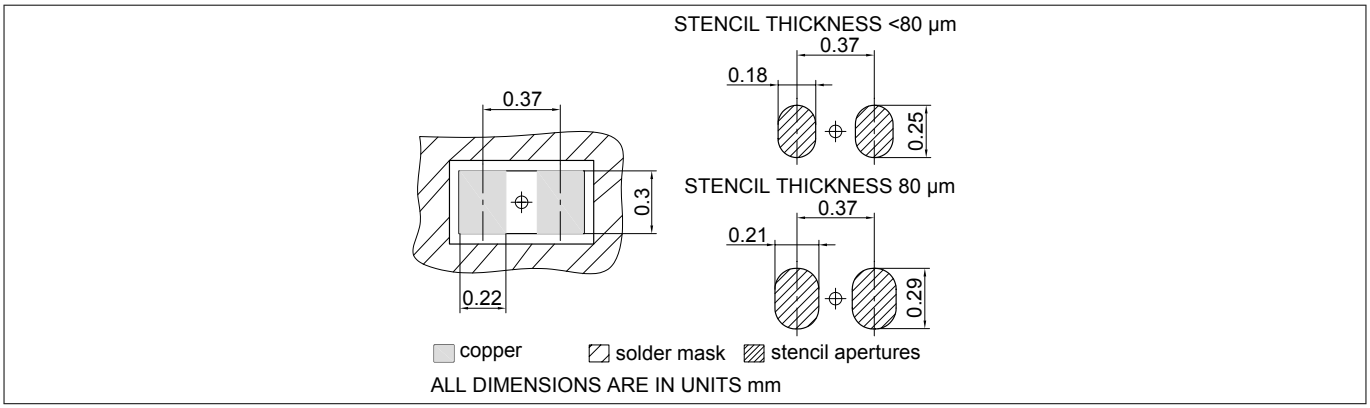

Figure 15 Footprint

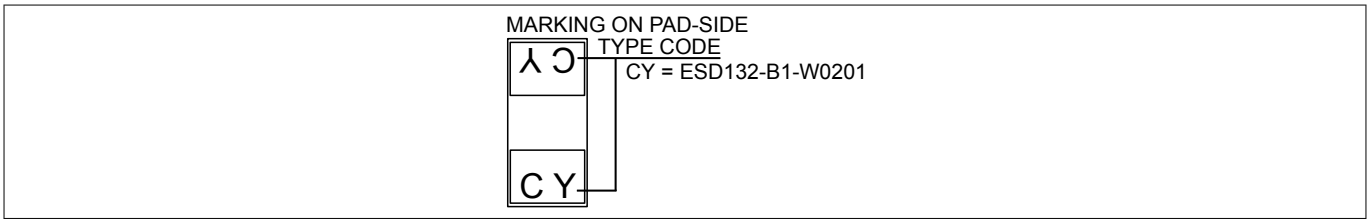

Figure 16 ESD132 Marking layout

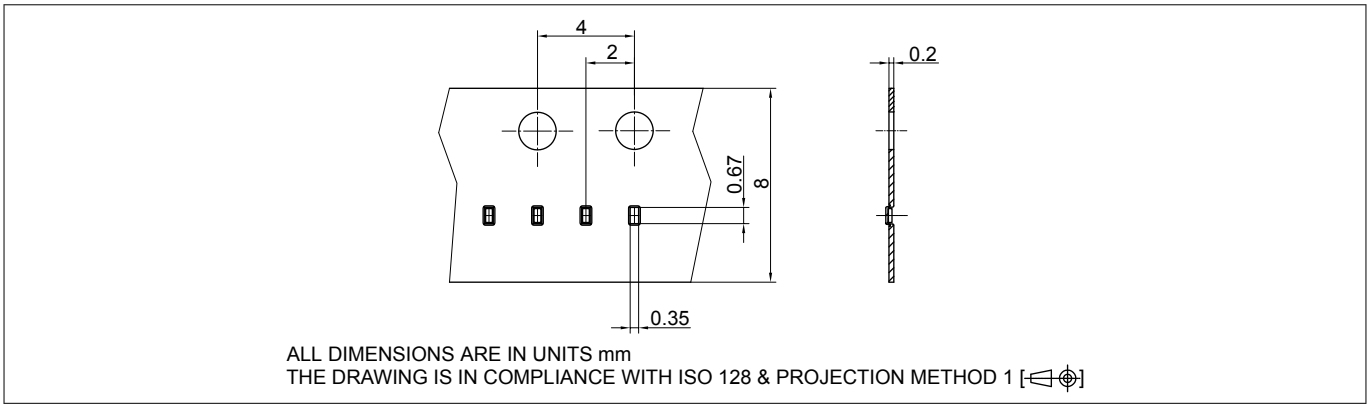

Figure 17 Packaging

5 References

[1]	Infineon AG - **Application note AN210**: Effective ESD Protection Design at System Level Using VF-TLP Characterization Methodology
[2]	Infineon AG - **Recommendations for Printed Circuit Board Assembly of Infineon WLL Packages** ***http://www.infineon.com/Packageinformation_WLL***

Revision history

Document version	Date of release	Description of changes
0.9	2018-02-06	• First release
1.0	2018-06-26	• Typical and maximum values updated to production values • Typical curves updated to production values • V_{cl} pulse curves and eye diagrams added • Minor editorial changes
2.0	2019-08-09	• New datasheet layout

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2019-08-09

Published by

Infineon Technologies AG

81726 Munich, Germany

Do you have a question about any aspect of this document?

Email: erratum@infineon.com

Document reference
IFX-wiz1558682416030

IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”) .

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies’ products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for ESD Suppressors / TVS Diodes ***category:***

Click to view products by Infineon ***manufacturer:***

Other Similar products are found below :

60KS200C D18V0L1B2LP-7B D5V0F4U5P5-7 NTE4902 P4KE27CA P6KE11CA P6KE8.2A SA60CA SA64CA SMBJ12CATR SMBJ33CATR SMBJ6.5A SMBJ8.0A ESD101-B1-02ELS E6327 ESD112-B1-02EL E6327 ESD7451N2T5G 19180-510 CPDT-5V0USP-HF 3.0SMCJ33CA-F 3.0SMCJ36A-F HSPC16701B02TP JANTX1N6126A D3V3Q1B2DLP3-7 D55V0M1B2WS-7 SCM1293A-04SO ESD200-B1-CSP0201 E6327 SM12-7 CEN955 W/DATA VESD12A1A-HD1-GS08 CPDQC5V0-HF D1213A-01LP4-7B ESD101-B1-02EL E6327 AOZ8808DI-03 5KP15A 5KP48A 5KP90A ESD3V3D7-TP 15KPA36A-LF P4KE56CA P4KE68A P4KE91CATR P6KE120A P6KE13CA P6KE43CA P6KE6.8CA P6KE8.2 P6SMBJ20CA JANTX1N6072A SR2835ESKG SA90CA