

ESD237-B1-W0201

Protection devices

TVS (Transient Voltage Suppressor)

Bi-directional, 8 V, 7 pF, 0201, RoHS and Halogen Free compliant

Quality Requirement Category: Standard

Features

- ESD / transient protection according to:
 - IEC61000-4-2 (ESD): ± 16 kV (air), ± 16 kV (contact discharge)
 - IEC61000-4-4 (EFT): ± 2 kV / ± 40 A (5/50 ns)
 - IEC61000-4-5 (surge): ± 3 A (8/20 μ s)
- Bi-directional working voltage up to: $V_{RWM} = \pm 8$ V
- Line capacitance: $C_L = 7$ pF (typical) at $f = 1$ MHz
- Clamping voltage: $V_{CL} = 13$ V (typical) at $I_{TLP} = 16$ A with $R_{DYN} = 0.21 \Omega$ (typical)
- Very low reverse current: $I_R < 1$ nA (typical)
- Minimized clamping overshoot due to extremely low parasitic inductance
- Small form factor SMD Size 0201 and low profile 0.58 mm x 0.28 mm x 0.15 mm
- Bidirectional and symmetric I/V characteristics for optimized design and assembly
- Pb-free (RoHS compliant) and halogen free package



Guidelines for optimized PCB design and assembly process are available in [\[2\]](#).

Application examples

- ESD Protection of highly susceptible IC/ASICs serving a wider usable voltage headroom
- Dedicated solution for audio PA lines to preserve uncompressed clean audio

Device information

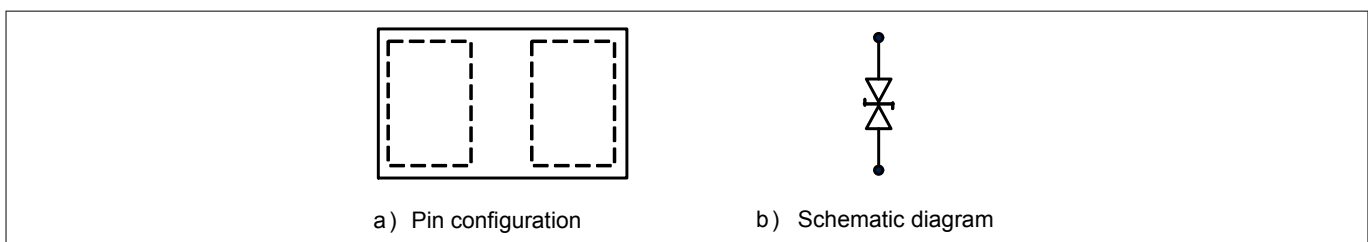


Figure 1 Pin configuration and schematic diagram

Table 1 Part information

Type	Package	Configuration	Marking code
ESD237-B1-W0201	WLL-2-1	1 line, bi-directional	YY ¹⁾

¹ The device does not have any marking on the device top. The marking code is on the pads.

Table of contents

	Features	1
	Application examples	1
	Device information	1
	Table of contents	2
1	Maximum ratings	3
2	Electrical characteristics	4
3	Typical characteristics diagrams	6
4	Package information	12
4.1	WLL-2-1 package	12
5	References	13
	Revision History	13
	Trademarks	14

Maximum ratings

1 Maximum ratings

Note: $T_A = 25\text{ °C}$, unless otherwise specified¹⁾

Table 2 Maximum Rating

Parameter	Symbol	Values	Unit
Reverse working voltage	V_{RWM}	± 8	V
ESD discharge ²⁾	V_{ESD} (contact)	± 16	kV
	V_{ESD} (air)	± 16	
Peak pulse power ³⁾	P_{PK}	42	W
Peak pulse current ³⁾	I_{PP}	± 3	A
Operating temperature range	T_{OP}	-55 to 85	°C
Storage temperature	T_{stg}	-55 to 150	°C

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

¹ Device is electrically symmetrical

² V_{ESD} according to IEC61000-4-2 (R = 330 Ω , C = 150 pF discharge network)

³ Stress pulse: 8/20 μ s current waveform according to IEC61000-4-5

Electrical characteristics

2 Electrical characteristics

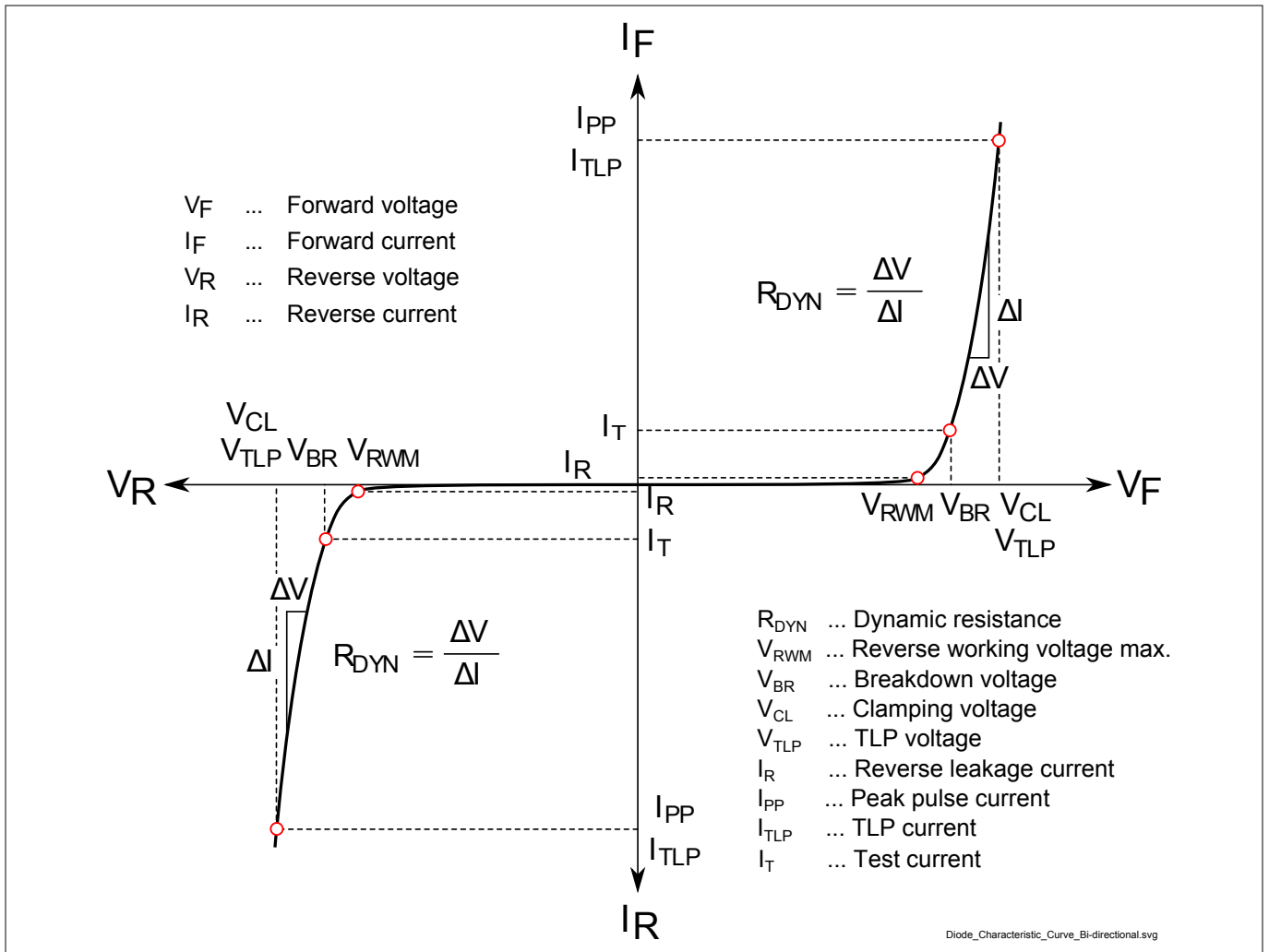


Figure 2 Definitions of electrical characteristics

Electrical characteristics

Table 3 DC characteristics ($T_A = 25\text{ °C}$, unless otherwise specified) ¹⁾

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Breakdown voltage	V_{BR}	9	10.5	12	V	$I_T = 1\text{ mA}$
Reverse current	I_R	–	–	100	nA	$V_R = 8\text{ V}$

Table 4 AC characteristics ($T_A = 25\text{ °C}$, unless otherwise specified)

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Line capacitance	C_L	–	7	–	pF	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$
		–	7	–		$V_R = 0\text{ V}$, $f = 1\text{ GHz}$

Table 5 ESD and surge characteristics ($T_A = 25\text{ °C}$, unless otherwise specified) ¹⁾

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Clamping voltage ²⁾	V_{CL}	–	13	–	V	$I_{TLP} = 16\text{ A}$, $t_p = 100\text{ ns}$
		–	17	–		$I_{TLP} = 30\text{ A}$, $t_p = 100\text{ ns}$
Clamping voltage ³⁾		–	10	–		$I_{PP} = 1\text{ A}$, $t_p = 8/20\text{ }\mu\text{s}$
		–	12	–		$I_{PP} = 3\text{ A}$, $t_p = 8/20\text{ }\mu\text{s}$
Dynamic resistance ²⁾	R_{DYN}	–	0.21		Ω	$t_p = 100\text{ ns}$

¹ Device is electrically symmetrical

² Please refer to Application Note AN210 [1]. TLP parameters: $Z_0 = 50\text{ }\Omega$, $t_p = 100\text{ ns}$, $t_r = 0.6\text{ ns}$.

³ Stress pulse: 8/20 μs current waveform according to IEC61000-4-5

Typical characteristics diagrams

3 Typical characteristics diagrams

Note: $T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified

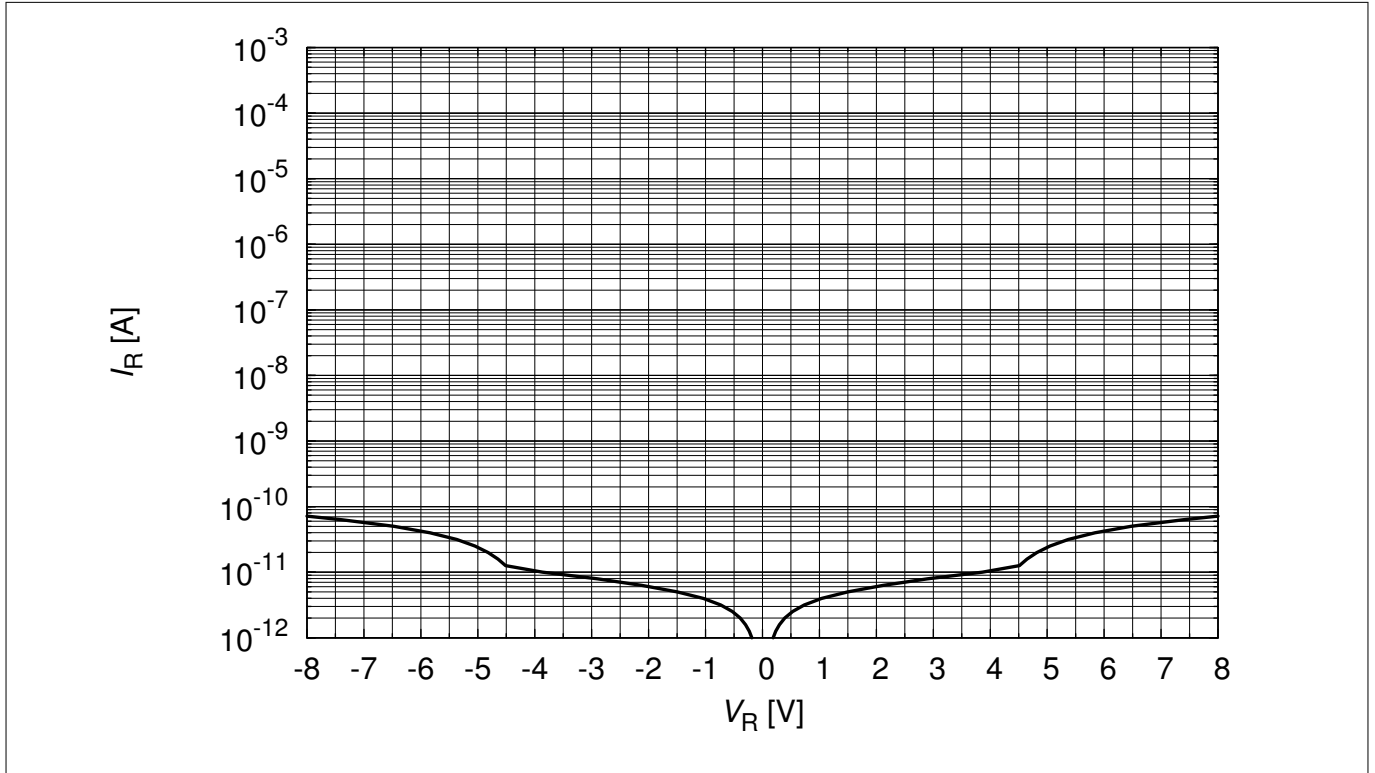


Figure 3 Reverse leakage current: $I_R = f(V_R)$

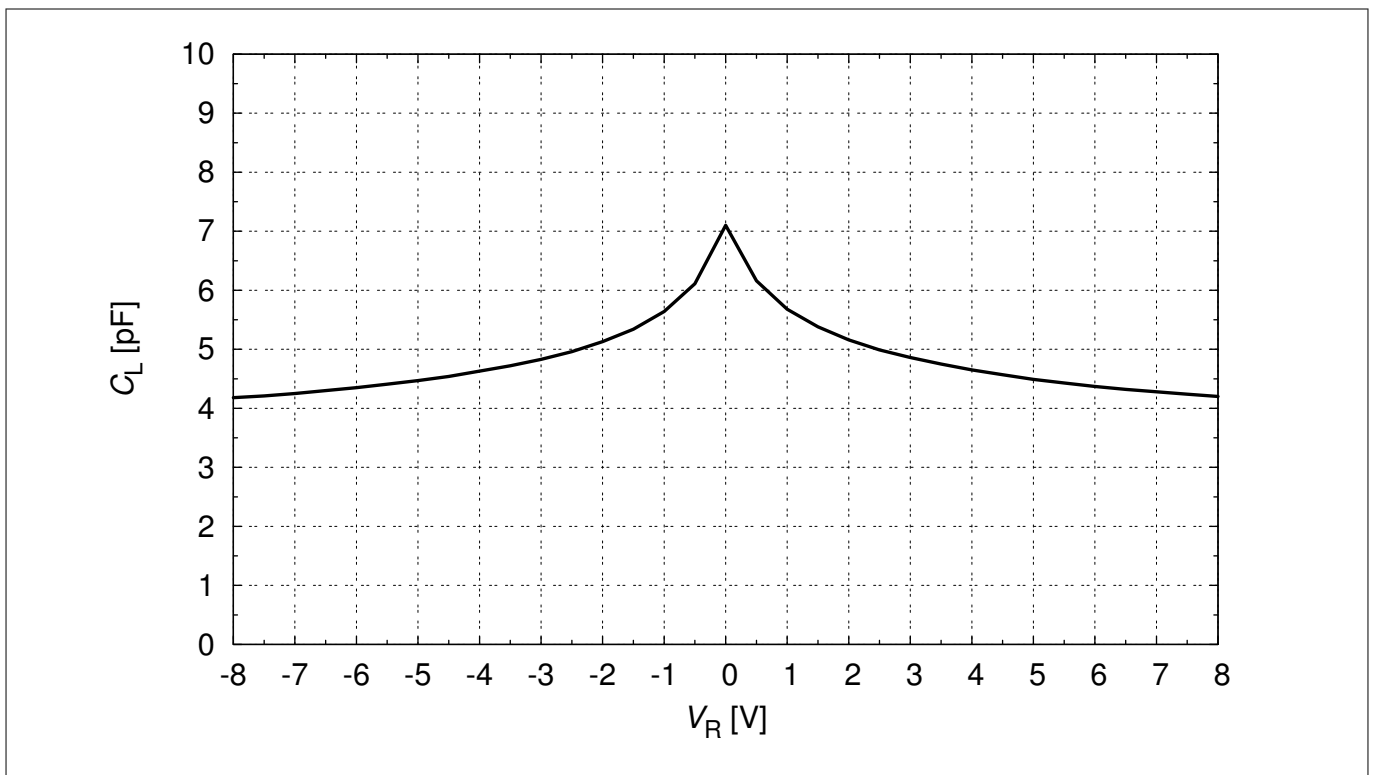


Figure 4 Line capacitance: $C_L = f(V_R)$, $f = 1\text{ MHz}$

Typical characteristics diagrams

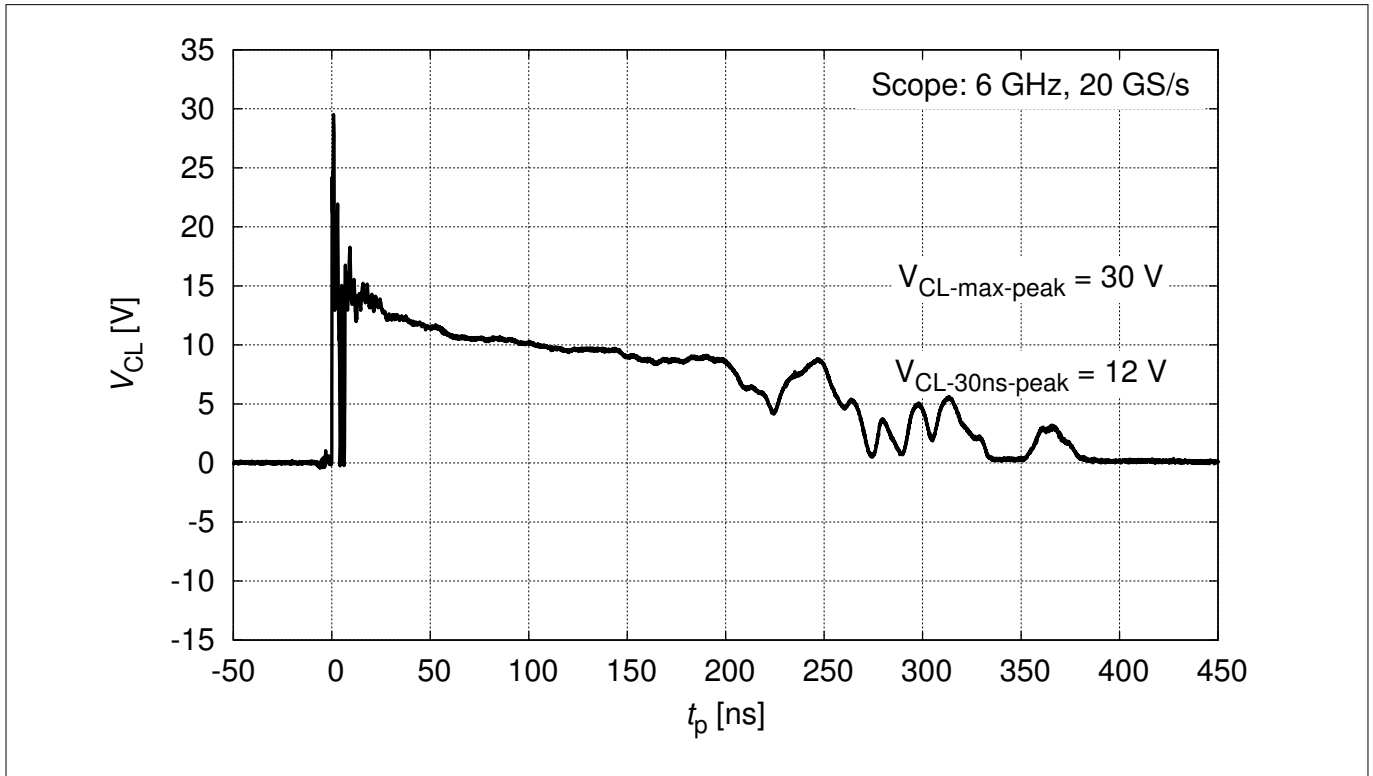


Figure 5 Clamping voltage (ESD): $V_{CL} = f(t)$, 8 kV positive pulse

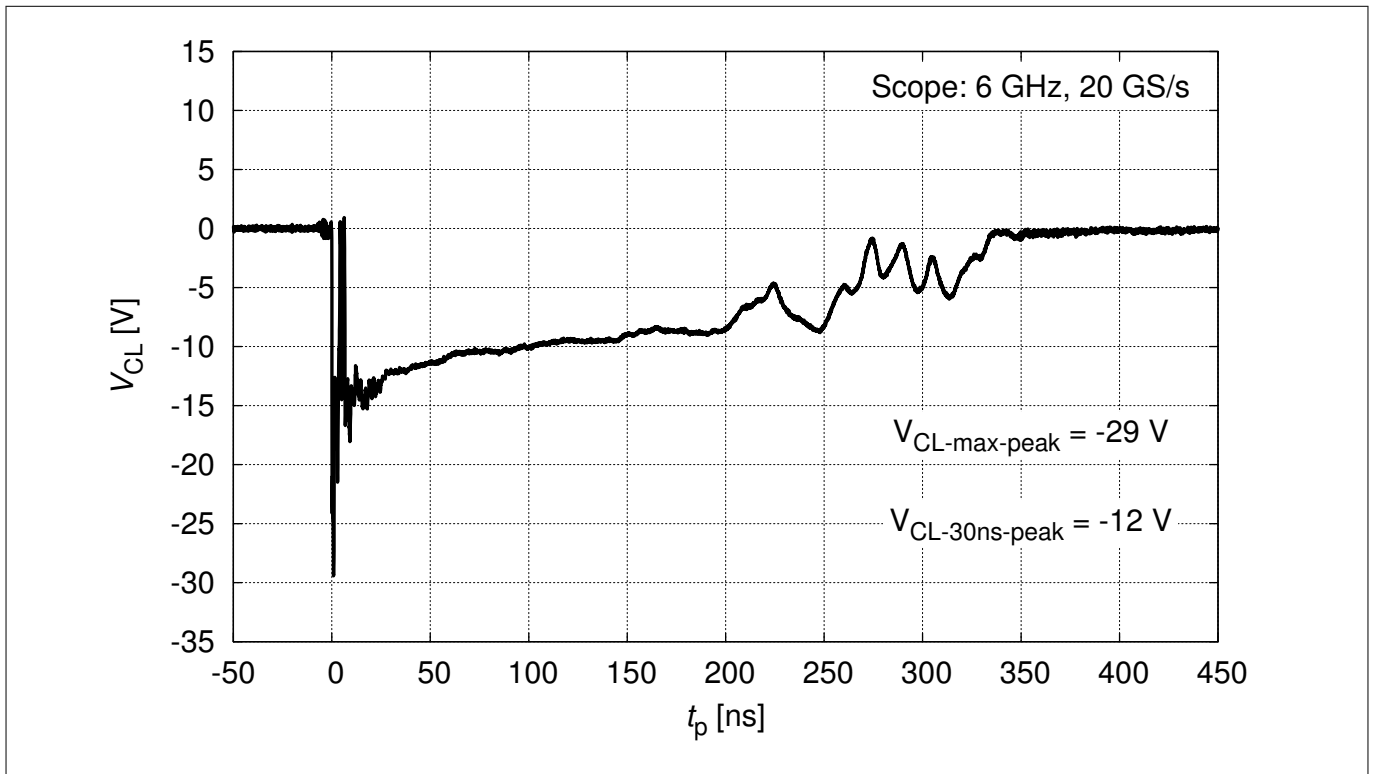


Figure 6 Clamping voltage (ESD): $V_{CL} = f(t)$, 8 kV negative pulse

Typical characteristics diagrams

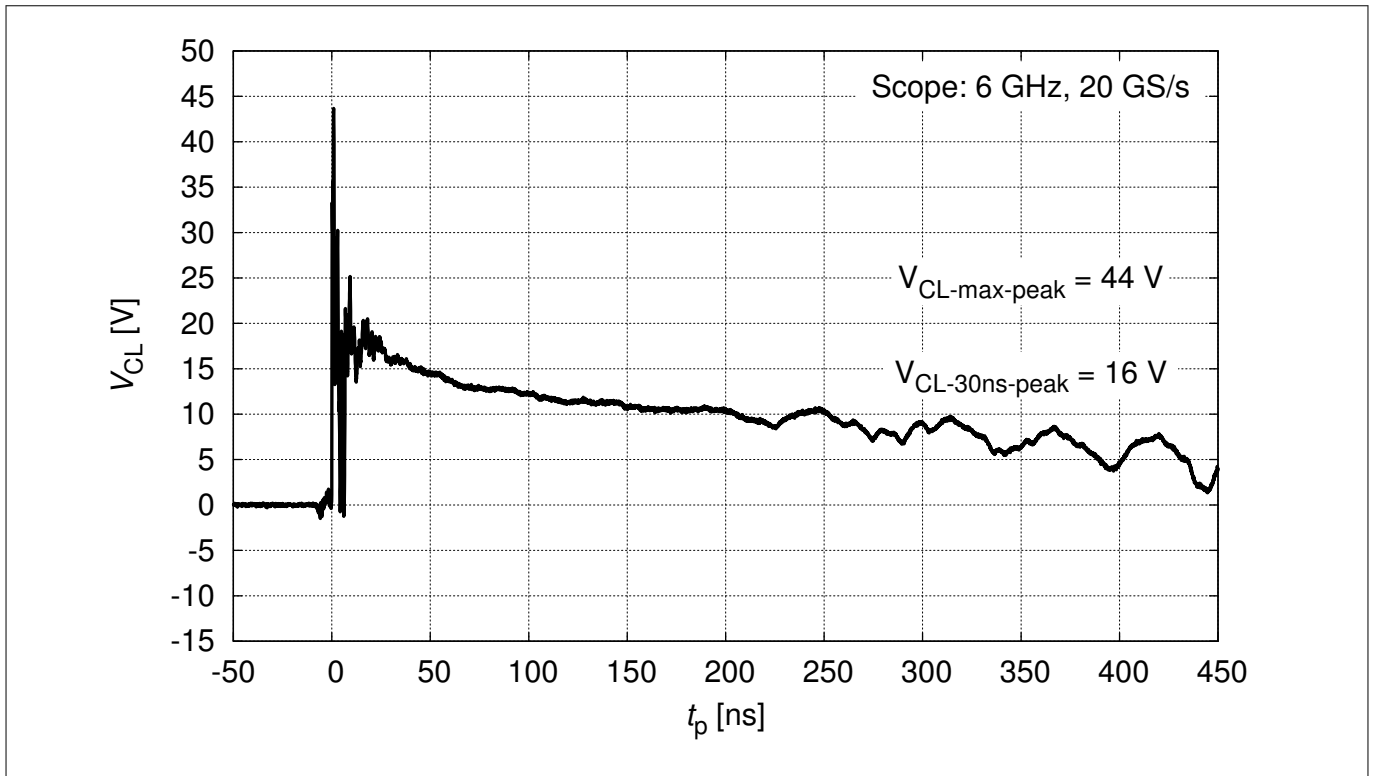


Figure 7 Clamping voltage (ESD): $V_{CL} = f(t)$, 15 kV positive pulse

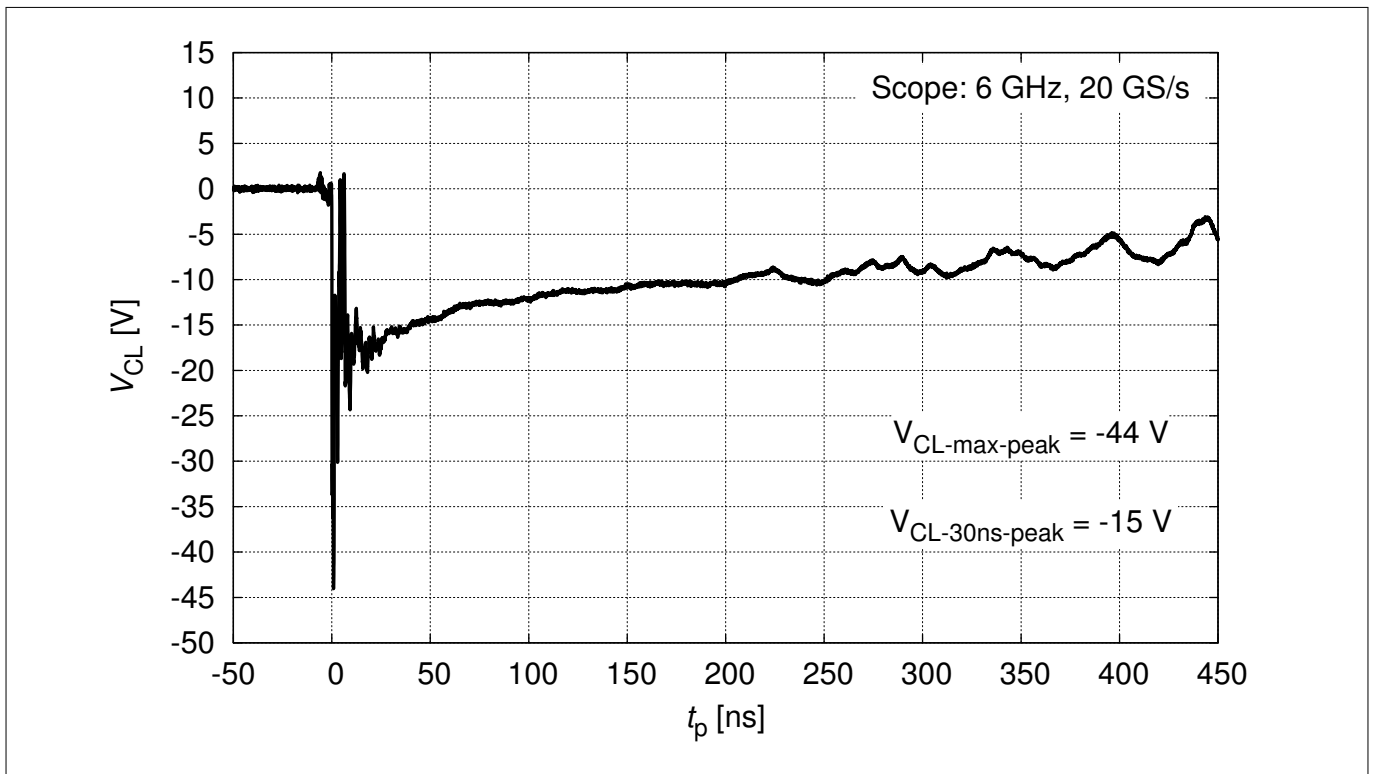


Figure 8 Clamping voltage (ESD): $V_{CL} = f(t)$, 15 kV negative pulse

Typical characteristics diagrams

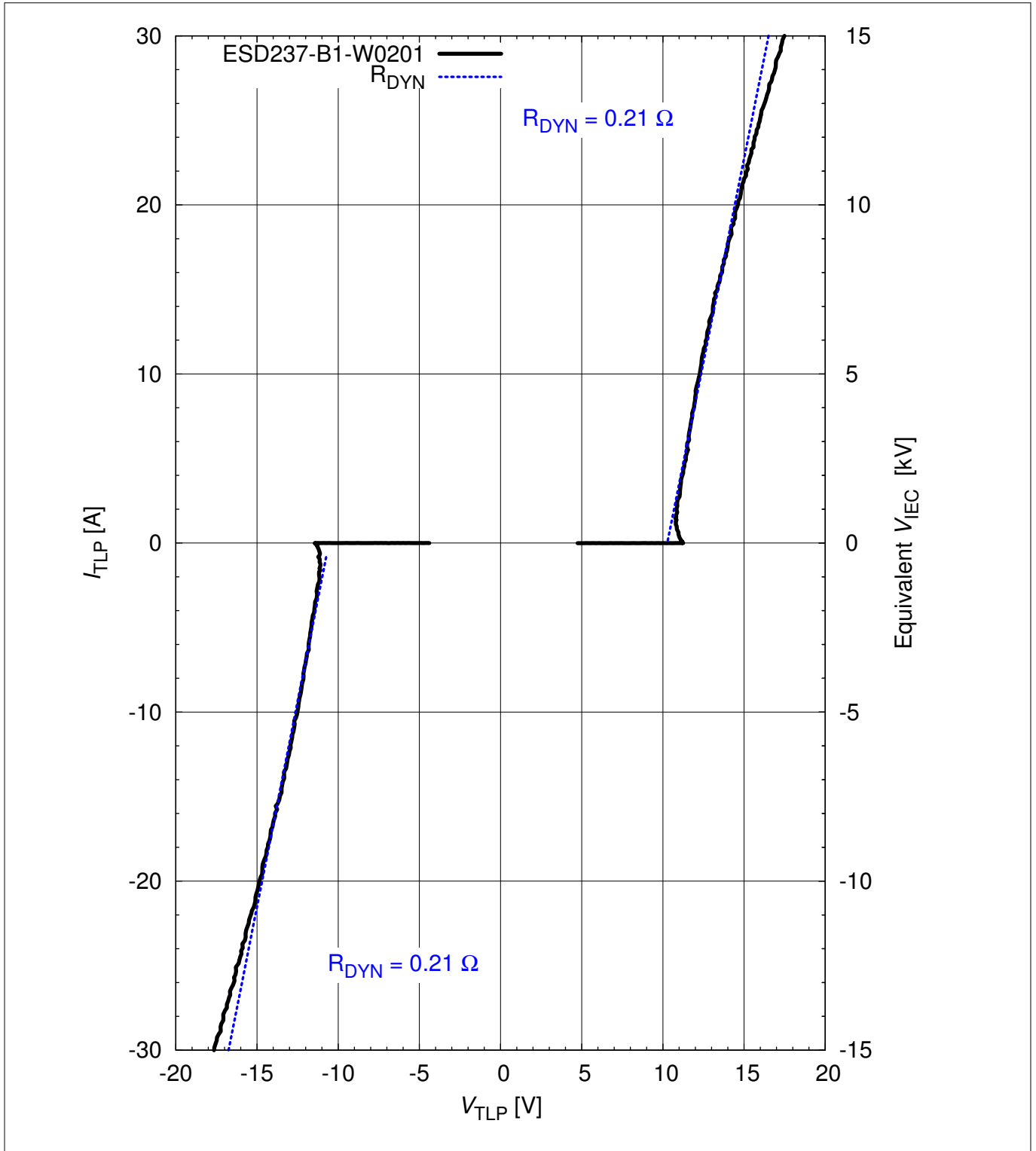


Figure 9 Clamping voltage (TLP): $I_{TLP} = f(V_{TLP})$ [1]

Typical characteristics diagrams

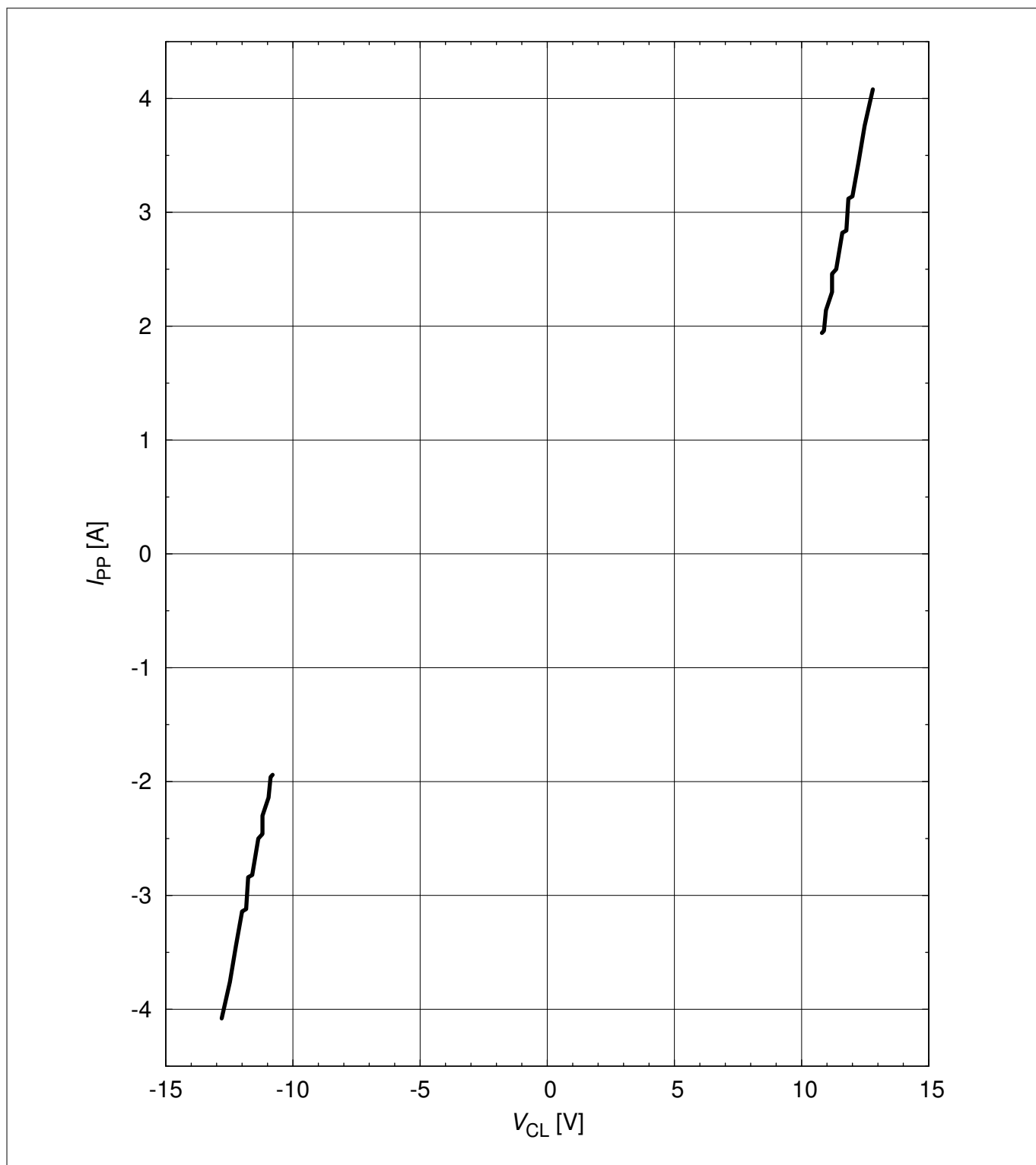


Figure 10 Clamping voltage (Surge): $I_{PP} = f(V_{CL})$ [1]

Typical characteristics diagrams

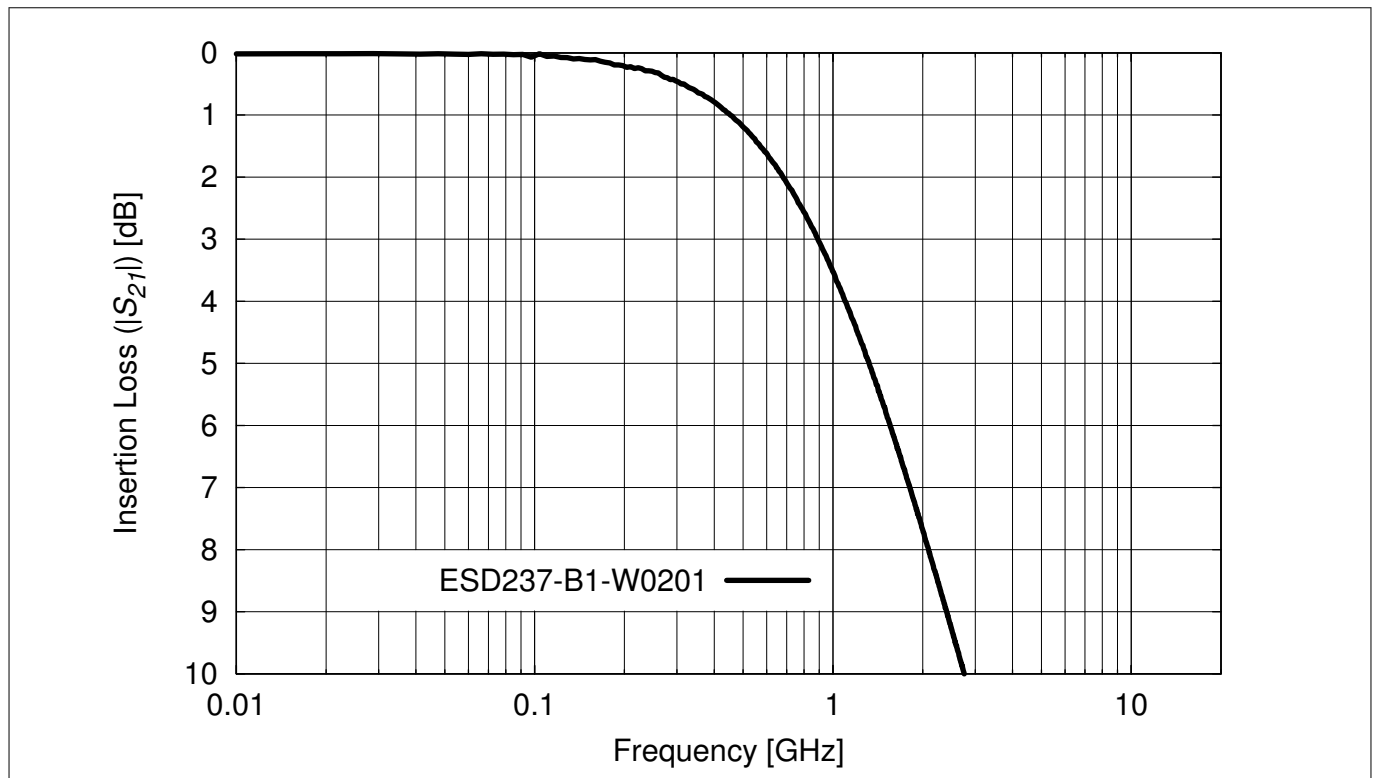


Figure 11 Insertion loss vs. frequency in a 50 Ω system

Package information

4 Package information

4.1 WLL-2-1 package

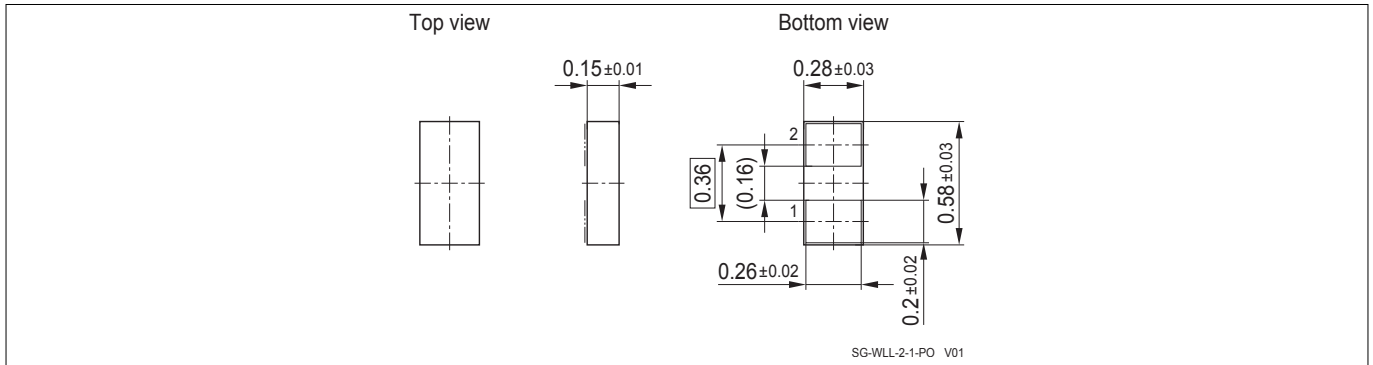


Figure 12 WLL-2-1 package outline (dimension in mm)

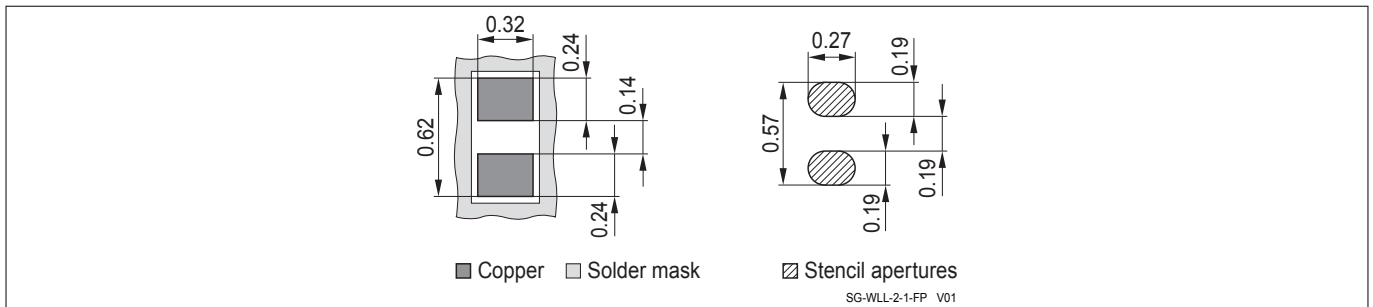


Figure 13 WLL-2-1 footprint (dimension in mm), Recommendations for Printed Circuit Board Assembly see [2]

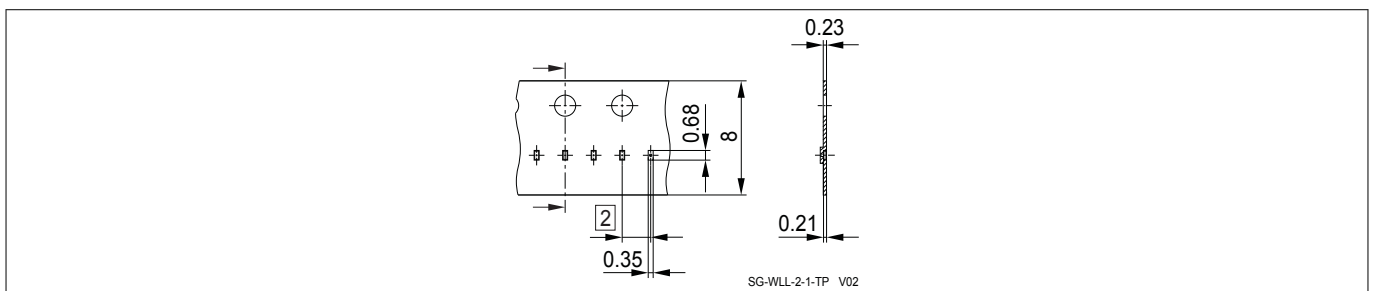


Figure 14 WLL-2-1 packing (dimension in mm)

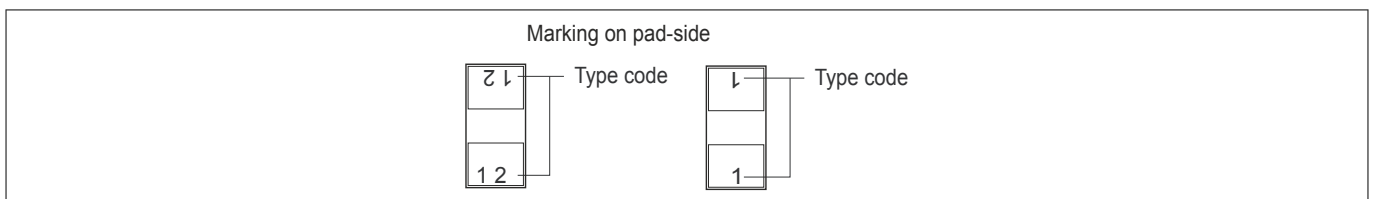


Figure 15 WLL-2-1 marking example (see also Table 1)

References

5 References

- [1] Infineon AG - **Application Note AN210**: Effective ESD Protection design at System Level Using VF-TLP Characterization Methodology
- [2] Infineon AG - Recommendation for Printed Circuit Board Assembly of Infineon WLL Packages
http://www.infineon.com/Packageinformation_WLL
- [3] Infineon AG - **Application Note AN392**: TVS Diodes in ChipScalePackage reduce size and save cost

Revision History

Revision History: Rev.0.3, 2016-01-15

Page or Item	Subjects (major changes since previous revision)
Revision 1.0, 2016-10-18	
All	Status change to final

Trademarks of Infineon Technologies AG

μ HVIC™, μ IPM™, μ PFC™, AU-ConvertIR™, AURIX™, C166™, CanPAK™, CIPOS™, CIPURSE™, CoolDP™, CoolGaN™, COOLiR™, CoolMOS™, CoolSET™, CoolSiC™, DAVE™, DI-POL™, DirectFET™, DrBlade™, EasyPIM™, EconoBRIDGE™, EconoDUAL™, EconoPACK™, EconoPIM™, EiceDRIVER™, eupec™, FCOS™, GaNpowIR™, HEXFET™, HITFET™, HybridPACK™, iMOTION™, IRAM™, ISOFACE™, IsoPACK™, LEDriviR™, LITIX™, MIPAQ™, ModSTACK™, my-d™, NovalithIC™, OPTIGA™, OptiMOS™, ORIGA™, PowIRaudio™, PowIRstage™, PrimePACK™, PrimeSTACK™, PROFET™, PRO-SIL™, RASIC™, REAL3™, SmartLEWIS™, SOLID FLASH™, SPOC™, StrongIRFET™, SuplIRBuck™, TEMPFET™, TRENCHSTOP™, TriCore™, UHVIC™, XHP™, XMC™.

Trademarks Update 2015-12-22

Other Trademarks

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

Edition 2016-10-18

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2016 Infineon Technologies AG
All Rights Reserved.

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

Email: erratum@infineon.com

Document reference
IFX-asy1466596076585

IMPORTANT NOTICE

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

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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Infineon:](#)

[ESD237B1W0201E6327XTSA1](#)