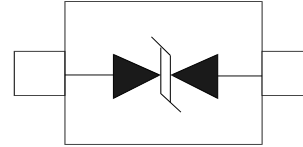## Description

Ultra low capacitance bidirectional ElectroStatic Discharge (ESD) protection diodes in small Surface-Mounted Device (SMD) plastic packages designed to protect one data line from the damage caused by ESD.

Features

- ■ Bidirectional ESD protection of one line
- ■ Ultra low diode capacitance: C_d = 2.9 pF
- ■ IEC 61000-4-2; level 4 (ESD)
- ■ Ultra low leakage current: I_{RM} = 5 nA
- ■ ESD protection of up to 10 kV

Applications

- ■ Computers and peripherals
- ■ Audio and video equipment
- ■ Cellular handsets and accessories
- ■ 10/100/1000 Ethernet
- ■ Local Area Network (LAN) equipment
- ■ Communication systems
- ■ Portable electronics
- ■ Subscriber Identity Module (SIM) card protection
- ■ FireWire
- ■ High-speed data lines

Quick reference data

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_{RWM}	reverse standoff voltage		-	-	5	V
C_d	diode capacitance	f = 1 MHz; V_R = 0 V	-	2.9	3.5	pF

Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
Per device					
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		−65	+150	°C
T_{stg}	storage temperature		−65	+150	°C

ESD maximum ratings

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	[1][2]	-	10	kV
		MIL-STD-883 (human body model)		-	8	kV

[1]   Device stressed with ten non-repetitive ESD pulses.

[2]   Measured from pin 1 to pin 2.

ESD standards compliance

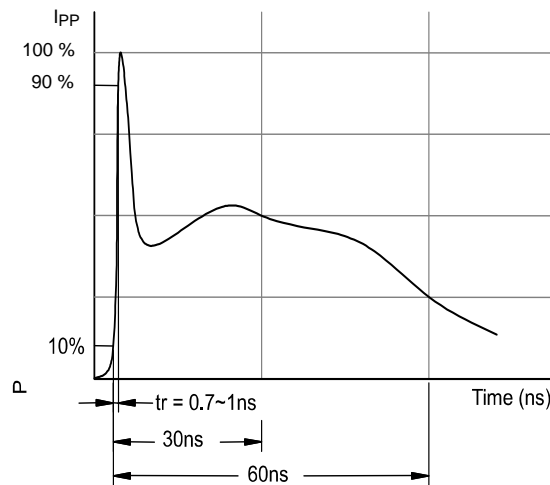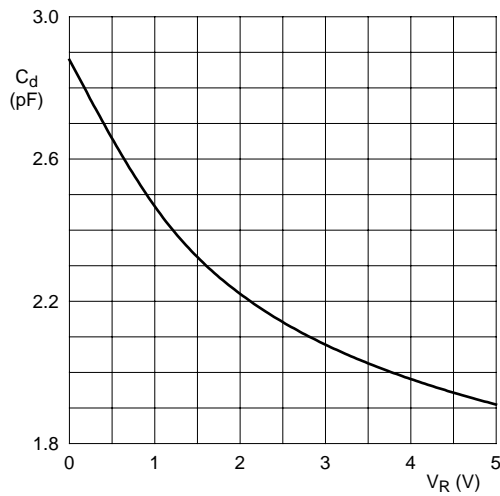| Standard	Conditions
Per diode	
IEC 61000-4-2; level 4 (ESD)	> 15 kV (air); > 8 kV (contact)
MIL-STD-883; class 3 (human body model)	> 4 kV

Fig 1.   ESD pulse waveform according to IEC 61000-4-2

Characteristics

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_{RWM}	reverse standoff voltage		-	-	5	V
I_{RM}	reverse leakage current	V_{RWM} = 5 V	-	5	100	nA
V_{BR}	breakdown voltage	I_R = 5 mA	5.5	7	9.5	V
C_d	diode capacitance	f = 1 MHz				
		V_R = 0 V	-	2.9	3.5	pF
		V_R = 5 V	-	1.9	-	pF
r_{dif}	differential resistance	I_R = 1 mA	-	-	100	Ω

f = 1 MHz; T_{amb} = 25 °C

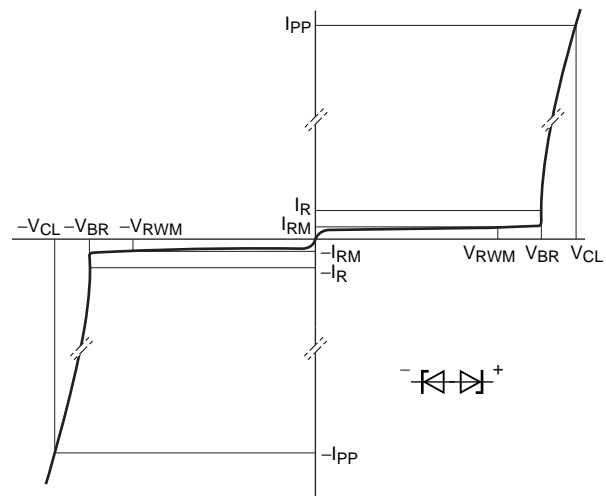**Fig 2. Diode capacitance as a function of reverse voltage; typical values**

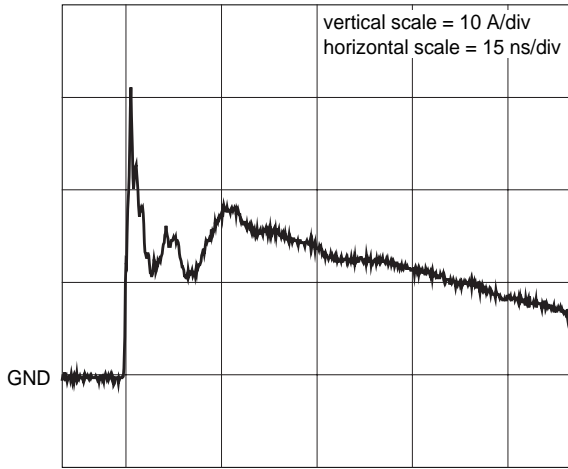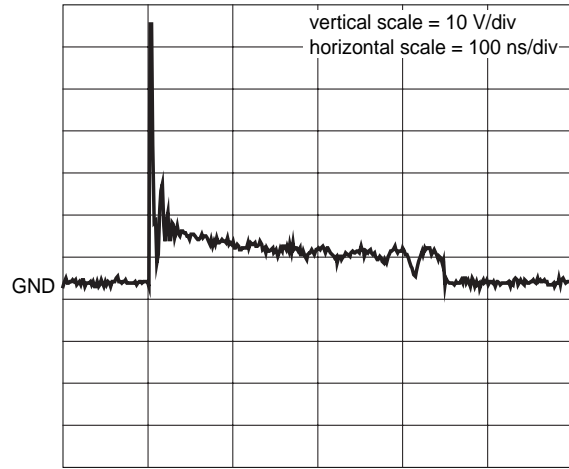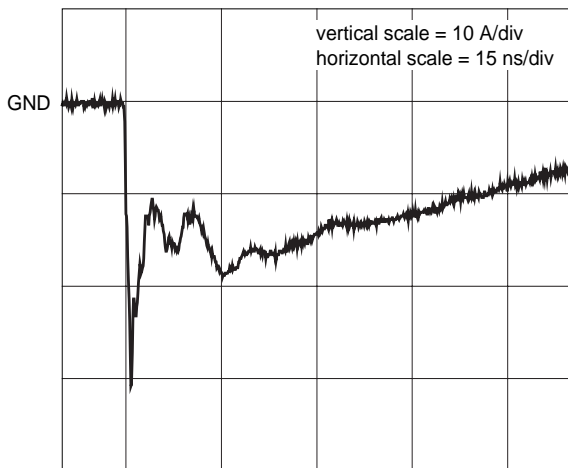**Fig 3. V-I characteristics for a bidirectional ESD protection diode**

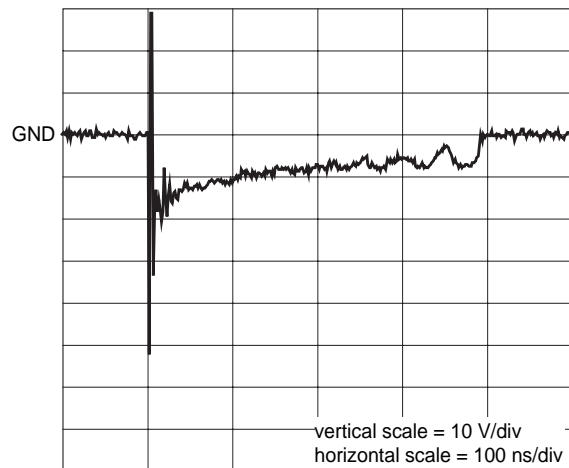vertical scale = 10 A/div
horizontal scale = 15 ns/div

GND

unclamped +8 kV ESD pulse waveform
(IEC 61000-4-2 network)

vertical scale = 10 V/div
horizontal scale = 100 ns/div

GND

clamped +8 kV ESD pulse waveform
(IEC 61000-4-2 network) pin 1 to 2

vertical scale = 10 A/div
horizontal scale = 15 ns/div

GND

unclamped −8 kV ESD pulse waveform
(IEC 61000-4-2 network)

GND

vertical scale = 10 V/div
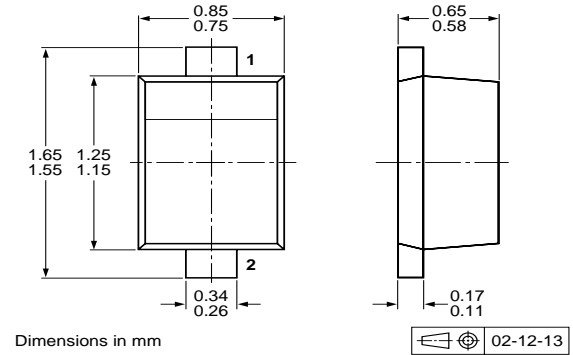horizontal scale = 100 ns/div

clamped −8 kV ESD pulse waveform
(IEC 61000-4-2 network) pin 1 to 2

Fig 4.   ESD clamping test setup and waveforms

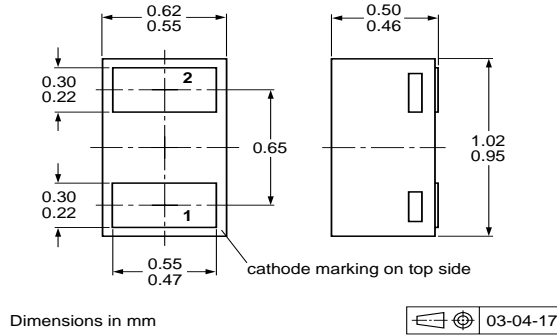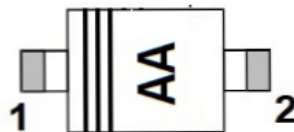## SOD-323/SOD-523/SOD-882 PACKAGE OUTLINE DIMENSIONS

1.35
1.15

1.1
0.8

0.45
0.15

2.7   1.8
2.3   1.6

0.40
0.25

0.25
0.10

Dimensions in mm

⊏⊐ ⊕ | 03-12-17

PESD5V0L1UA (SOD323)

0.85
0.75

0.65
0.58

1.65   1.25
1.55   1.15

0.34
0.26

0.17
0.11

Dimensions in mm

⊏⊐ ⊕ | 02-12-13

PESD5V0L1UB (SOD523)

0.62
0.55

0.50
0.46

0.30
0.22

2

0.65

1.02
0.95

0.30
0.22

1

0.55
0.47

cathode marking on top side

Dimensions in mm

⊏⊐ ⊕ | 03-04-17

PESD5V0L1UL (SOD882)

Marking

1   AA   2

Ordering information

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02EL E6327 ESD119B1W01005E6327XTSA1 ESD5V0L1B02VH6327XTSA1 ESD7451N2T5G 19180-510 CPDT-5V0USP-HF
3.0SMCJ33CA-F 3.0SMCJ36A-F HSPC16701B02TP JANTX1N6126A JANTX1N6462 JANTX1N6465 USB50805e3/TR7
D3V3Q1B2DLP3-7 D55V0M1B2WS-7 DRTR5V0U4SL-7 SCM1293A-04SO ESD200-B1-CSP0201 E6327 SM12-7 SM1605E3/TR13
SMLJ45CA-TP CEN955 W/DATA 82350120560 VESD12A1A-HD1-GS08 CPDUR5V0R-HF CPDQC5V0U-HF CPDQC5V0USP-HF
CPDQC5V0-HF D1213A-01LP4-7B ESD101-B1-02EL E6327 824500181 MMAD1108/TR13 5KP100A