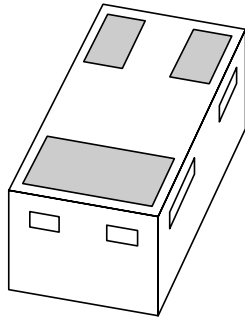


DATA SHEET



PESDxL2UM series Low capacitance double ESD protection diode

Product specification

2003 Aug 05

Low capacitance double ESD protection diode

PESDxL2UM series

FEATURES

- Uni-directional ESD protection of two lines or bi-directional ESD protection of one line
- Reverse standoff voltage 3.3 and 5 V
- Low diode capacitance
- Ultra low leakage current
- Leadless ultra small SOT883 surface mount package ($1 \times 0.6 \times 0.5$ mm)
- Board space 1.17 mm^2 (approx. 10% of SOT23)
- ESD protection >15 kV
- IEC 61000-4-2; level 4 (ESD); 15 kV (air) or 8 kV (contact).

APPLICATIONS

- Cellular handsets and accessories
- Portable electronics
- Computers and peripherals
- Communication systems
- Audio and video equipment.

MARKING

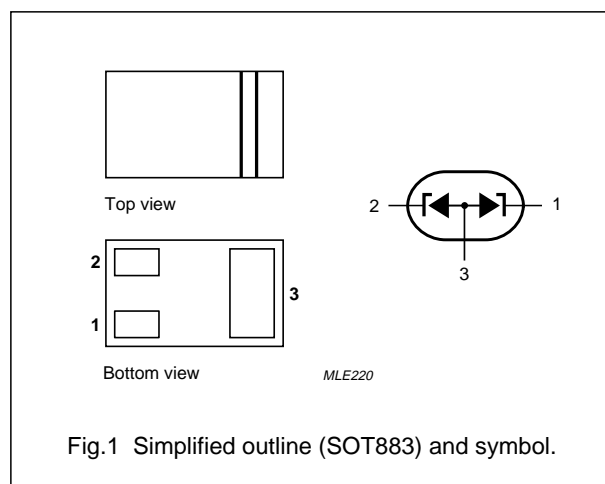
TYPE NUMBER	MARKING CODE
PESD3V3L2UM	F2
PESD5V0L2UM	F1

DESCRIPTION

Low capacitance ESD protection diode in a three pad SOT883 leadless ultra small plastic package designed to protect up to two transmission or data lines from ElectroStatic Discharge (ESD) damage.

PINNING

PIN	DESCRIPTION
1	cathode 1
2	cathode 2
3	common anode



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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
I_{pp}	peak pulse current	8/20 μ s pulse; notes 1, 2 and 3	–	3	A
	PESD3V3L2UM PESD5V0L2UM		–	2.5	A
P_{pp}	peak pulse power	8/20 μ s pulse; notes 1, 2 and 3	–	30	W
I_{FSM}	non-repetitive peak forward current	$t_p = 1$ ms; square pulse	–	3.5	A
I_{ZSM}	non-repetitive peak reverse current	$t_p = 1$ ms; square pulse	–	0.9	A
	PESD3V3L2UM PESD5V0L2UM		–	0.8	A
P_{tot}	total power dissipation	$T_{amb} = 25$ °C; note 4	–	250	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	$t_p = 1$ ms; square pulse; see Fig.4	–	6	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
ESD	electrostatic discharge	IEC 61000-4-2 (contact discharge)	15	–	kV
		HBM MIL-Std 883	10	–	kV

Notes

1. Non-repetitive current pulse 8/20 μ s exponential decay waveform; see Fig.5.
2. Pins 1 and 3 or 2 and 3.
3. Pins 1 and 2.
4. Device mounted on standard printed-circuit board.

ESD standards compliance

IEC 61000-4-2, level 4 (ESD)	>15 kV (air); >8 kV (contact)
HBM MIL-Std 883, class 3	>4 kV

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	all diodes loaded; note 1	500	K/W
		one diode loaded; note 2	290	K/W

Notes

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60 μ m copper strip line.
2. FR4 single-sided copper 1 cm².

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ELECTRICAL CHARACTERISTICS $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
V_F	forward voltage	$I_F = 200\text{ mA}$	–	1	1.2	V
V_{RWM}	reverse stand-off voltage					
	PESD3V3L2UM		–	–	3.3	V
	PESD5V0L2UM		–	–	5	V
I_{RM}	reverse leakage current					
	PESD3V3L2UM	$V_R = 3.3\text{ V}$	–	75	300	nA
	PESD5V0L2UM	$V_R = 5\text{ V}$	–	5	25	nA
$V_{(CL)R}$	clamping voltage	8/20 μs pulse				
	PESD3V3L2UM	$I_{pp} = 1\text{ A}$; notes 1 and 2	–	–	8	V
		$I_{pp} = 3\text{ A}$; notes 1 and 2	–	–	12	V
		$I_{pp} = 1\text{ A}$; notes 1 and 3	–	–	9	V
		$I_{pp} = 3\text{ A}$; notes 1 and 3	–	–	13	V
	PESD5V0L2UM	$I_{pp} = 1\text{ A}$; notes 1 and 2	–	–	10	V
		$I_{pp} = 2.5\text{ A}$; notes 1 and 2	–	–	13	V
		$I_{pp} = 1\text{ A}$; notes 1 and 3	–	–	11	V
		$I_{pp} = 2.5\text{ A}$; notes 1 and 3	–	–	15	V
V_{BR}	breakdown voltage	$I_Z = 1\text{ mA}$				
	PESD3V3L2UM		5.32	5.6	5.88	V
	PESD5V0L2UM		6.46	6.8	7.14	V
S_Z	temperature coefficient	$I_Z = 1\text{ mA}$				
	PESD3V3L2UM		–	1.3	–	mV/K
	PESD5V0L2UM		–	2.9	–	mV/K
r_{diff}	differential resistance	$I_R = 1\text{ mA}$				
	PESD3V3L2UM		–	–	200	Ω
	PESD5V0L2UM		–	–	100	Ω
C_d	diode capacitance					
	PESD3V3L2UM	$f = 1\text{ MHz}$; $V_R = 0$	–	22	28	pF
		$f = 1\text{ MHz}$; $V_R = 5$	–	12	17	pF
	PESD5V0L2UM	$f = 1\text{ MHz}$; $V_R = 0$	–	16	19	pF
		$f = 1\text{ MHz}$; $V_R = 5$	–	8	11	pF

Notes

1. Non-repetitive current pulse 8/20 μs exponential decay waveform; see Fig.5.
2. Pins 1 and 3 or 2 and 3.
3. Pins 1 and 2.

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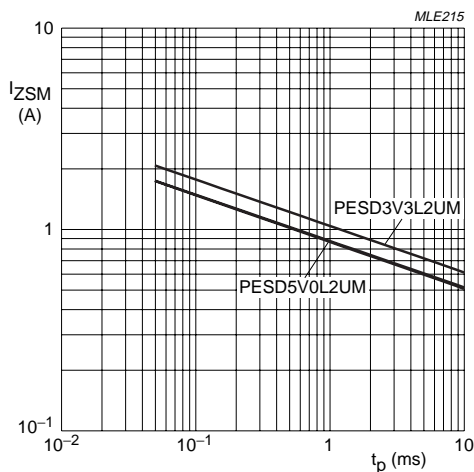
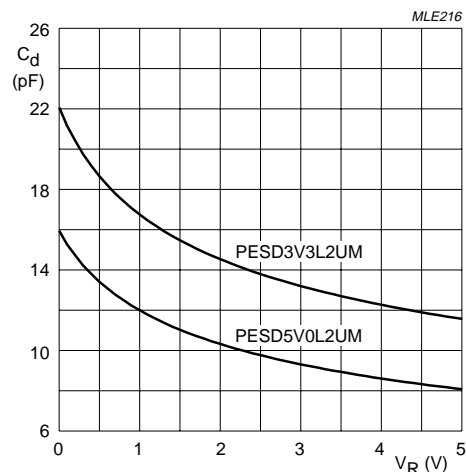
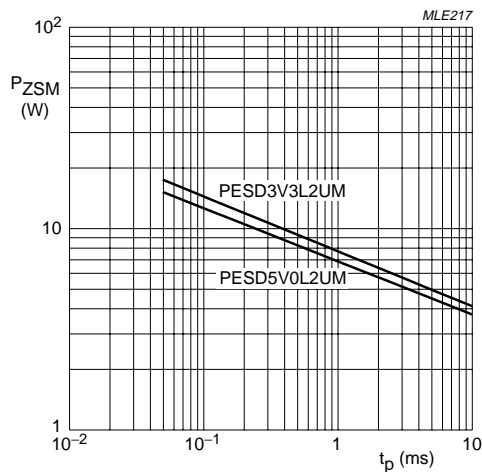


Fig.2 Non-repetitive peak reverse current as a function of pulse time (square pulse).



$T_j = 25^\circ\text{C}$; $f = 1\text{ MHz}$.

Fig.3 Diode capacitance as a function of reverse voltage; typical values.



$$P_{ZSM} = V_{ZSM} \times I_{ZSM}$$

V_{ZSM} is the non-repetitive peak reverse voltage at I_{ZSM} .

Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).

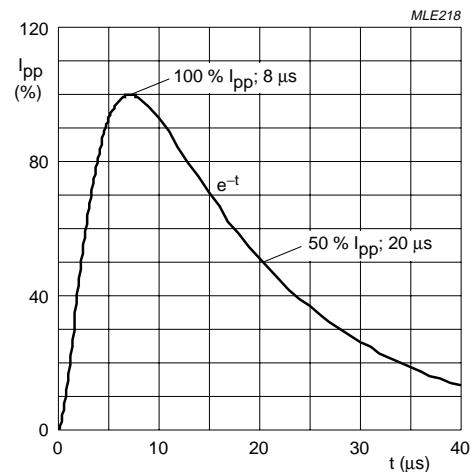


Fig.5 8/20 μs pulse waveform according to IEC 61000-4-5.

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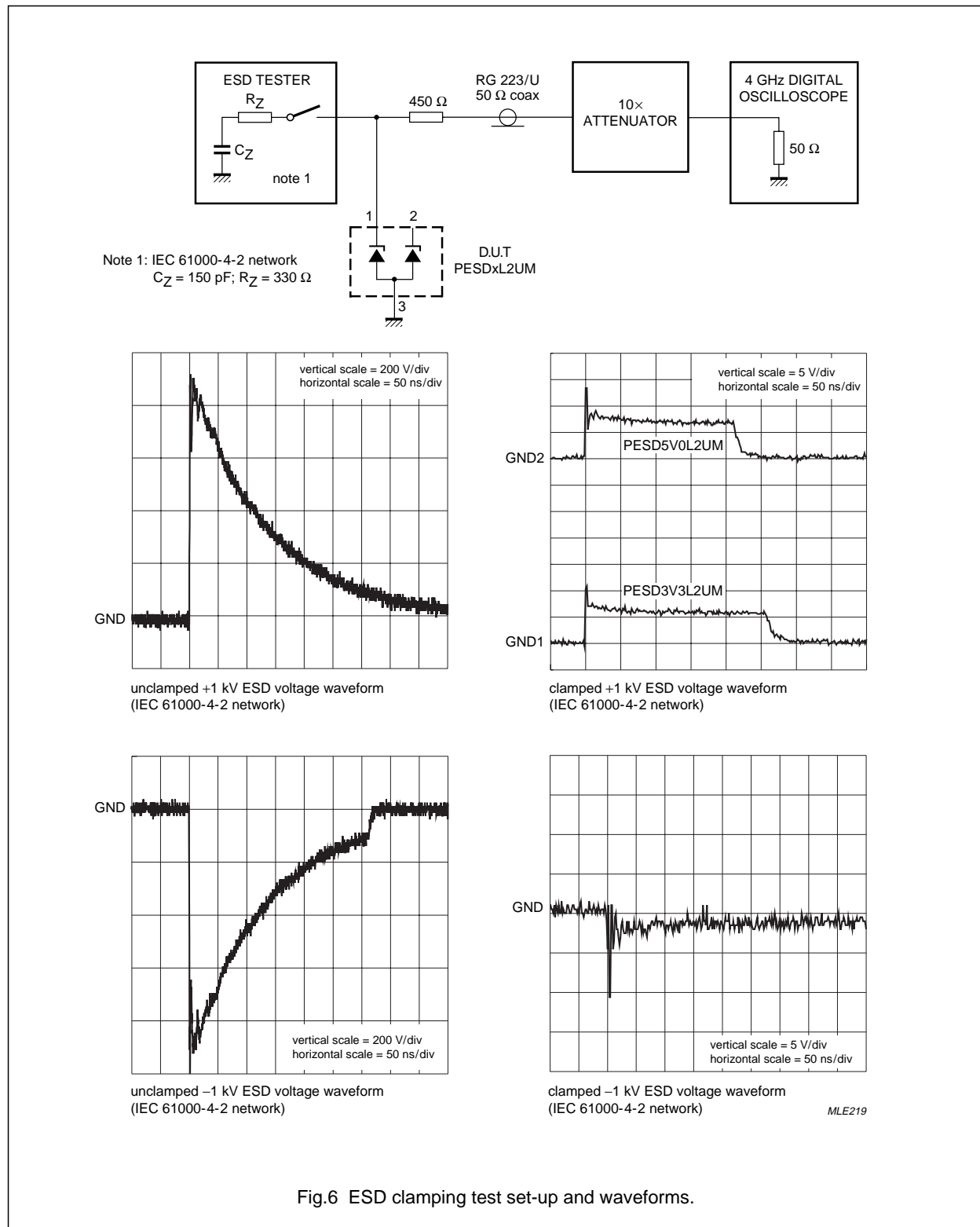


Fig.6 ESD clamping test set-up and waveforms.

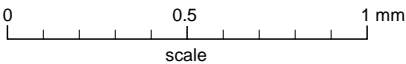
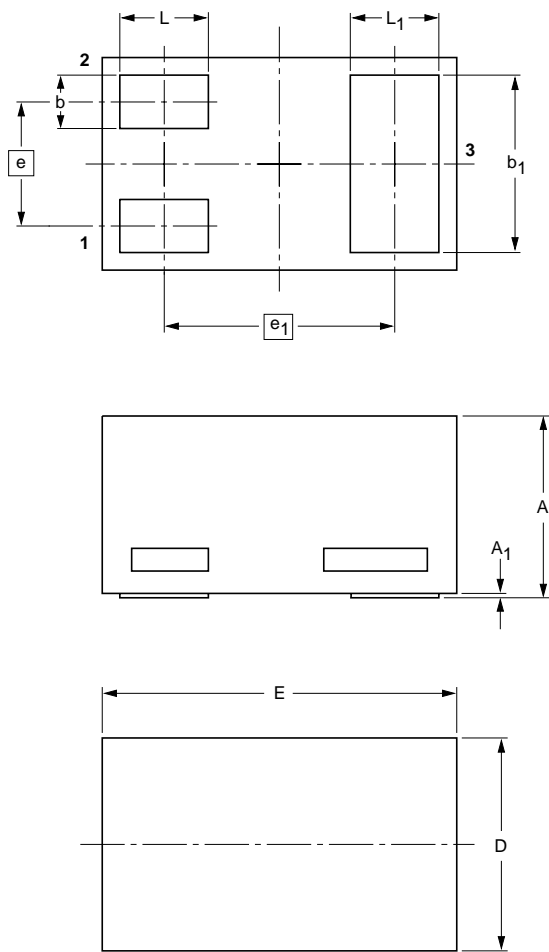
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PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883



DIMENSIONS (mm are the original dimensions)

UNIT	A ⁽¹⁾	A ₁ max.	b	b ₁	D	E	e	e ₁	L	L ₁
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

Note

1. Including plating thickness

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT883			SC-101			03-02-05 03-04-03

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DATA SHEET STATUS

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