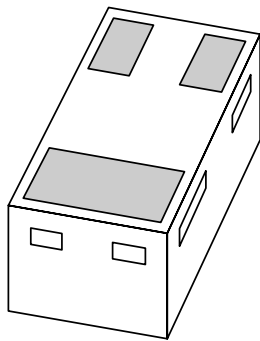


DATA SHEET



PESDxL2UM series

Low capacitance double ESD
protection diode

Product data sheet
Supersedes data of 2003 Aug 05

2005 May 23

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

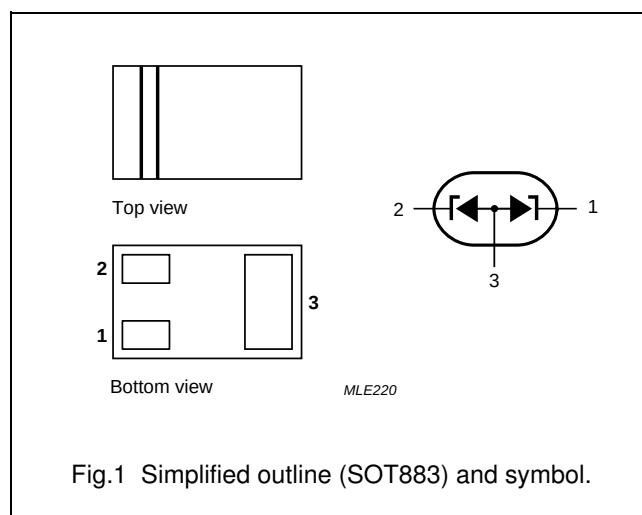
TYPE NUMBER	MARKING CODE
PESD3V3L2UM	F2
PESD5V0L2UM	F1

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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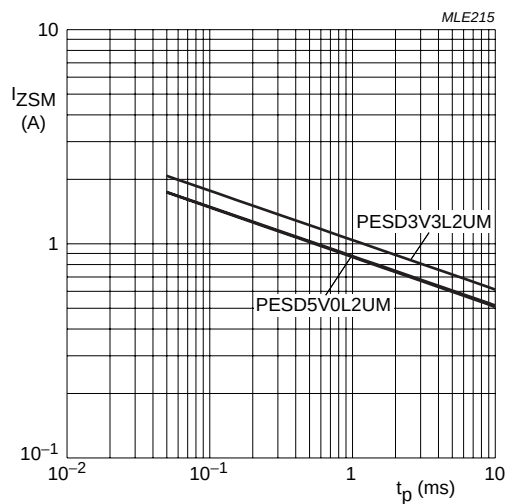
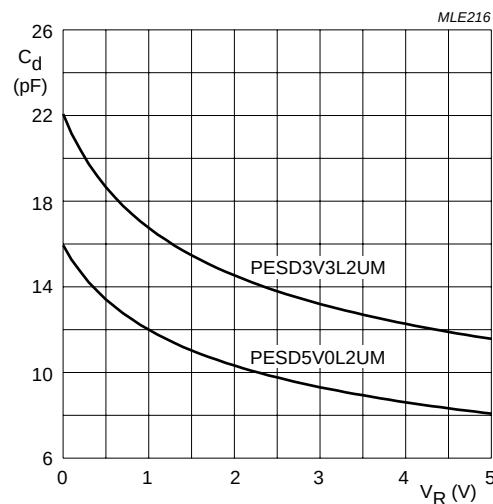
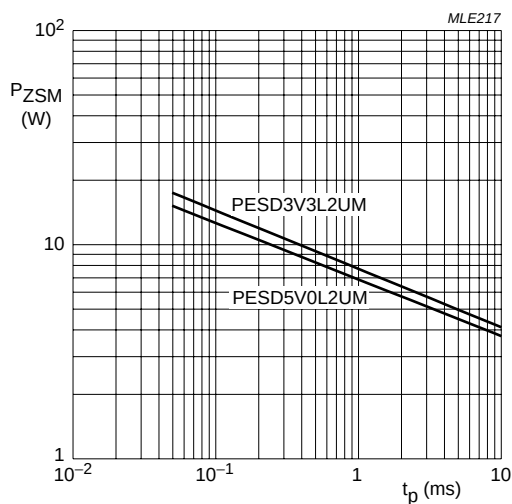


Fig.2 Non-repetitive peak reverse current as a function of pulse time (square pulse).



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

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).

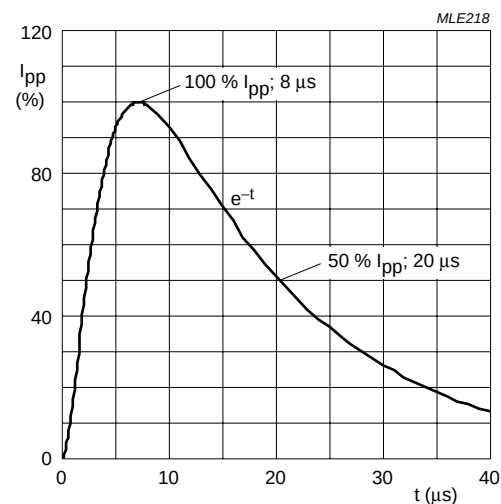


Fig.5 8/20 μs pulse waveform according to IEC 61000-4-5.

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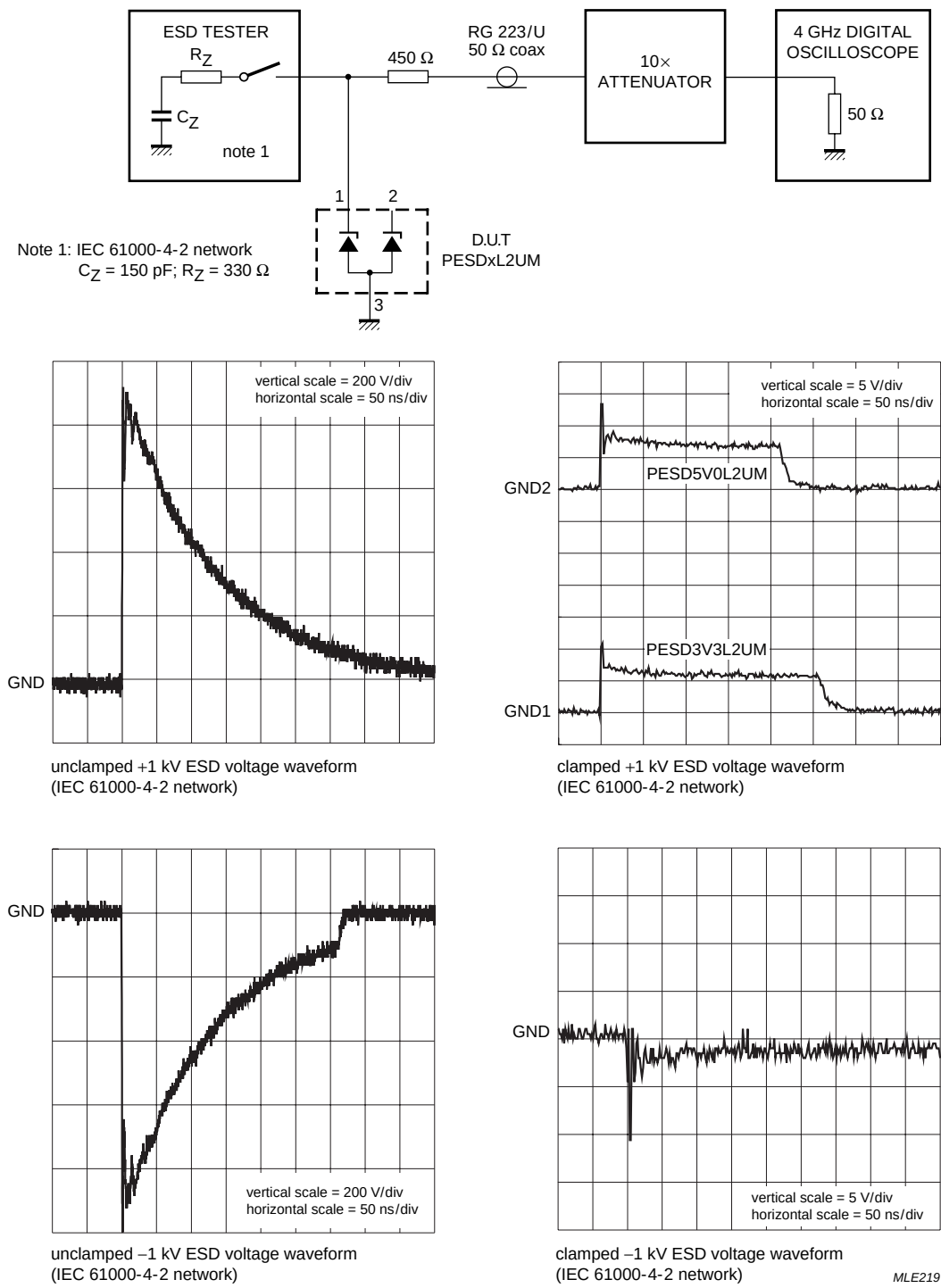


Fig.6 ESD clamping test set-up and waveforms.

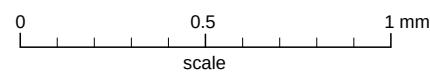
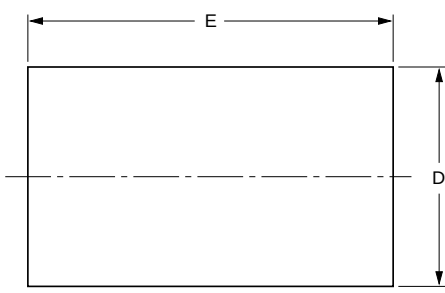
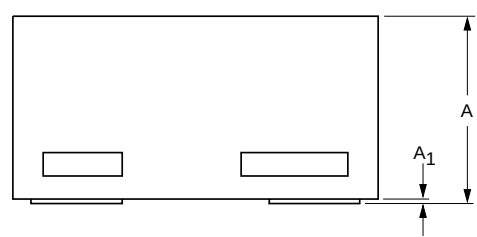
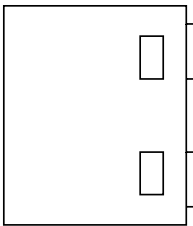
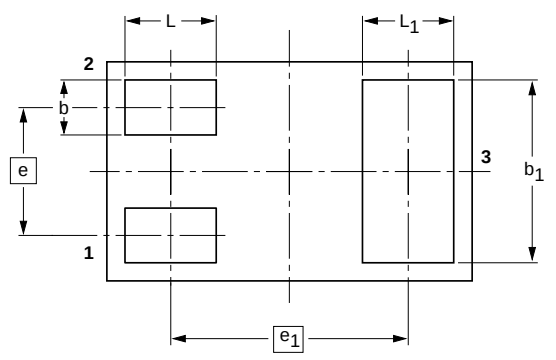
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PACKAGE OUTLINE

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

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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Printed in The Netherlands

R76/02/pp9

Date of release: 2005 May 23

Document order number: 9397 750 15162

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