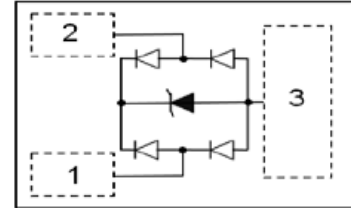


## FEATURES

- 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 × 0.6 × 0.5 mm)
- Board space 1.17 mm<sup>2</sup> (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.

## 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.

## LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$I_{pp}$	peak pulse current PESD3V3L2UM PESD5V0L2UM	8/20 $\mu$ s pulse; notes 1, 2 and 3	–	3 2.5	A A
$P_{pp}$	peak pulse power	8/20 $\mu$ 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 PESD3V3L2UM PESD5V0L2UM	$t_p = 1$ ms; square pulse	–	0.9 0.8	A 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

1. Non-repetitive current pulse 8/20  $\mu$ 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 <sub>th j-a</sub>	thermal resistance from junction to ambient	all diodes loaded; note 1	500	K/W
		one diode loaded; note 2	290	K/W

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60 μm copper strip line.
2. FR4 single-sided copper 1 cm<sup>2</sup>.

T<sub>j</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT				
<b>Per diode</b>										
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 200 mA	–	1	1.2	V				
V <sub>RWM</sub>	reverse stand-off voltage		–	–	3.3	V				
					PESD3V3L2UM	5	V			
I <sub>RM</sub>	reverse leakage current	V <sub>R</sub> = 3.3 V	–	75	300	nA				
						PESD3V3L2UM	V <sub>R</sub> = 5 V	5	25	nA
V <sub>(CL)R</sub>	clamping voltage	8/20 μs pulse	–	–	8	V				
						PESD3V3L2UM	I <sub>pp</sub> = 1 A; notes 1 and 2	12	V	
						I <sub>pp</sub> = 3 A; notes 1 and 2	9	V		
						I <sub>pp</sub> = 1 A; notes 1 and 3	13	V		
						I <sub>pp</sub> = 3 A; notes 1 and 3	10	V		
						PESD5V0L2UM	I <sub>pp</sub> = 1 A; notes 1 and 2	13	V	
						I <sub>pp</sub> = 2.5 A; notes 1 and 2	11	V		
						I <sub>pp</sub> = 1 A; notes 1 and 3	15	V		
V <sub>BR</sub>	breakdown voltage	I <sub>Z</sub> = 1 mA	5.32	5.6	5.88	V				
						PESD3V3L2UM	6.46	6.8	7.14	V
S <sub>Z</sub>	temperature coefficient	I <sub>Z</sub> = 1 mA	–	1.3	–	mV/K				
						PESD3V3L2UM	2.9	–	mV/K	
r <sub>diff</sub>	differential resistance	I <sub>R</sub> = 1 mA	–	–	200	Ω				
					PESD3V3L2UM	100	Ω			
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0	–	22	28	pF				
						PESD3V3L2UM	f = 1 MHz; V <sub>R</sub> = 5	12	17	pF
						PESD5V0L2UM	f = 1 MHz; V <sub>R</sub> = 0	16	19	pF
							f = 1 MHz; V <sub>R</sub> = 5	8	11	pF

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.

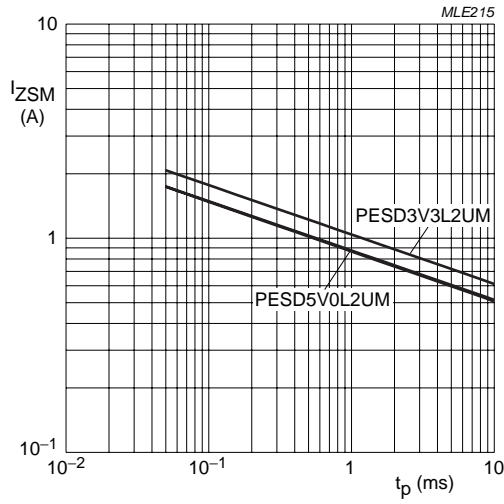
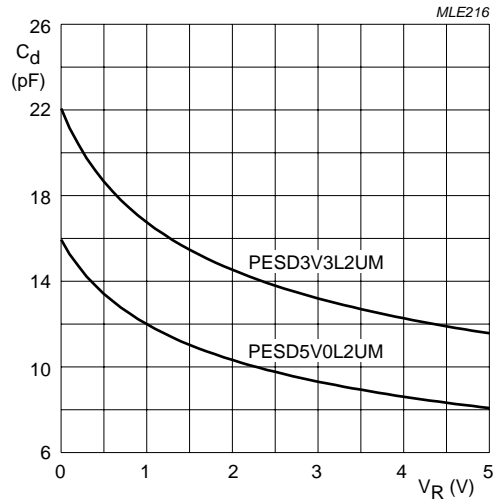
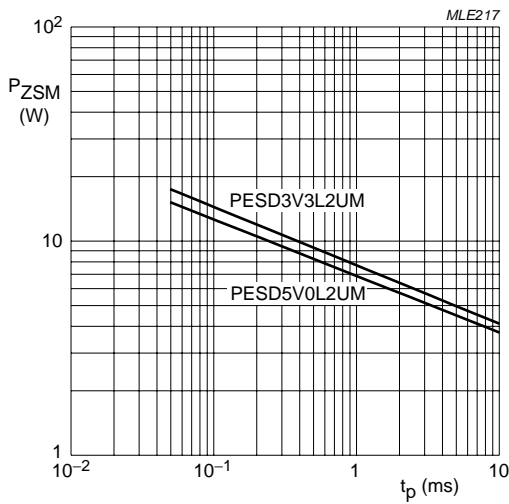


Fig.2 Non-repetitive peak reverse current as a function of pulse time (square pulse).



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

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).

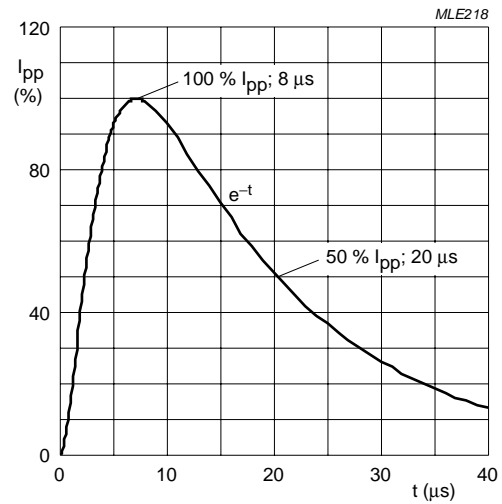
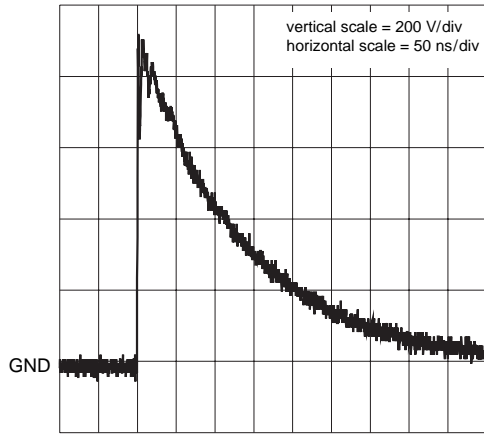
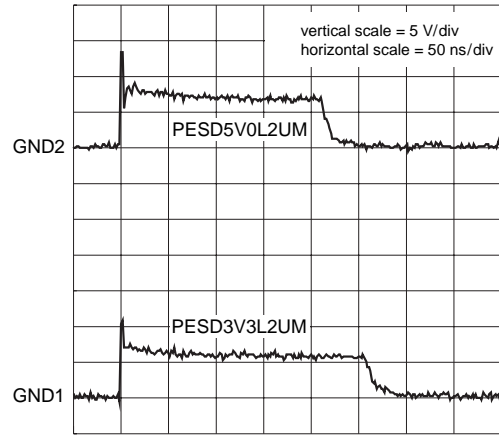


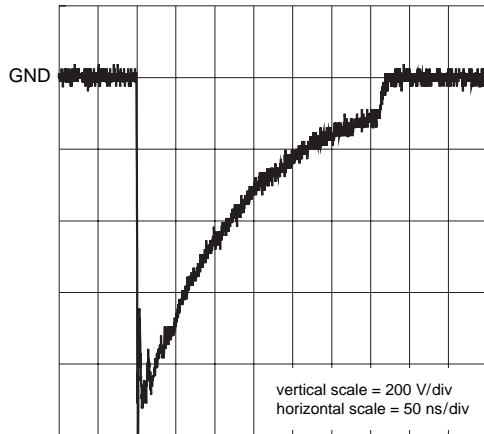
Fig.5 8/20  $\mu\text{s}$  pulse waveform according to IEC 61000-4-5.



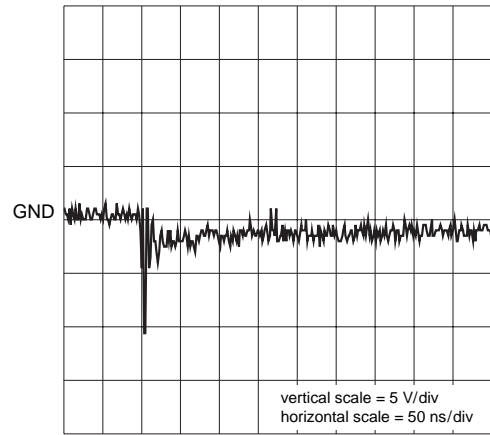
unclamped +1 kV ESD voltage waveform (IEC 61000-4-2 network)



clamped +1 kV ESD voltage waveform (IEC 61000-4-2 network)



unclamped -1 kV ESD voltage waveform (IEC 61000-4-2 network)

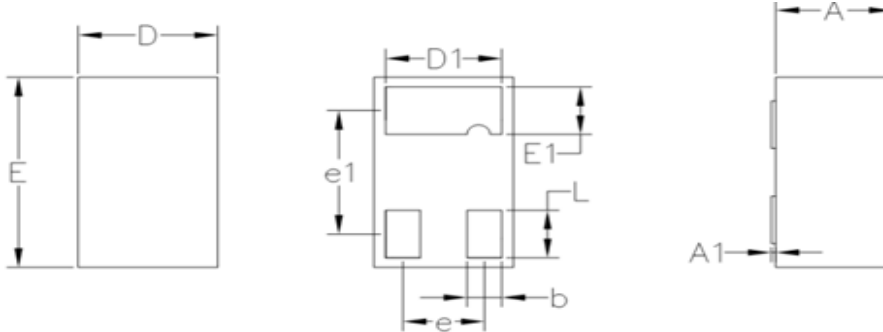


clamped -1 kV ESD voltage waveform (IEC 61000-4-2 network)

MLE219

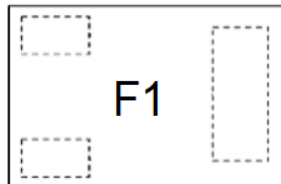
Fig.6 ESD clamping test set-up and waveforms.

**SOT-883 PACKAGE OUTLINE DIMENSIONS**



SYMBOL	DIMENSIONS IN MM		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	—	0.05
D	0.55	0.60	0.65
E	0.95	1.00	1.05
D1	0.45	0.50	0.55
E1	0.20	0.25	0.30
L	0.20	0.25	0.30
b	0.10	0.15	0.20
e	0.35BSC		
e1	0.65BSC		

**Marking**



**Ordering information**

Order code	Marking code	Package	Baseqty	Deliverymode
UMW PESD3V3L2UM	F2	SOT-883	10000	Tape and reel
UMW PESD5V0L2UM	F1	SOT-883	10000	Tape and reel