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PESD30VF1BL

Bidirectional ESD protection diode

1. General description

Ultra low capacitance bidirectional ElectroStatic Discharge (ESD) protection diode in a DFN1006-2 (SOD882) leadless ultra small Surface-Mounted Device (SMD) plastic package designed to protect one signal line from the damage caused by ESD and other transients.

2. Features and benefits

- Bidirectional ESD protection of one line
- High reverse standoff voltage $V_{RWM} = 30\text{ V}$
- Ultra-low diode capacitance $C_d = 0.27\text{ pF}$
- Ultra small plastic package $1.0 \times 0.6 \times 0.48\text{ mm}$
- ESD protection up to 12 kV ; IEC 61000-4-2
- AEC-Q101 qualified

3. Applications

- NFC antenna protection
- Protection of high-speed data lines

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25\text{ °C}$		-	-	30	V
I_{PPM}	rated peak pulse current	$t_p = 8/20\text{ }\mu\text{s}$	[1]	-	-	1	A
V_{CL}	clamping voltage	$I_{PPM} = 1\text{ A}$; $T_{amb} = 25\text{ °C}$	[1]	-	6.5	-	V

[1] Device stressed with $8/20\text{ }\mu\text{s}$ exponential decay waveform according to IEC 61000-4-5.

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode (diode 1)	Transparent top view DFN1006-2 (SOD882)	sym045
2	K2	cathode (diode 2)		

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6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PESD30VF1BL	DFN1006-2	DFN1006-2: leadless ultra small plastic package; 2 terminals	SOD882

7. Marking

Table 4. Marking codes

Type number	Marking code
PESD30VF1BL	L7

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
I_{PPM}	rated peak pulse current	$t_p = 8/20 \mu s$	[1]	-	1	A
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	150	°C
T_{stg}	storage temperature			-65	150	°C
ESD maximum ratings						
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2; contact discharge	[2]	-	12	kV

[1] Device stressed with 8/20 μs exponential decay waveform according to IEC 61000-4-5.

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

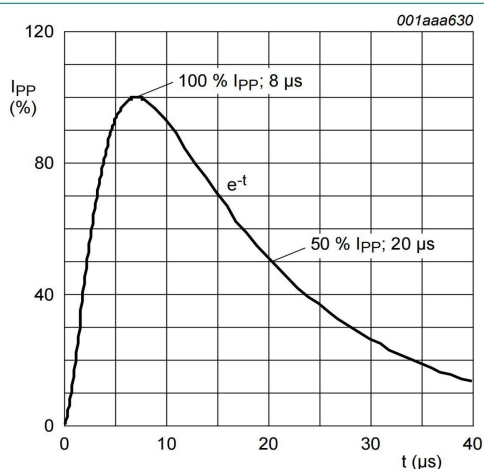


Fig. 1. 8/20 μs pulse waveform according to IEC 61000-4-5

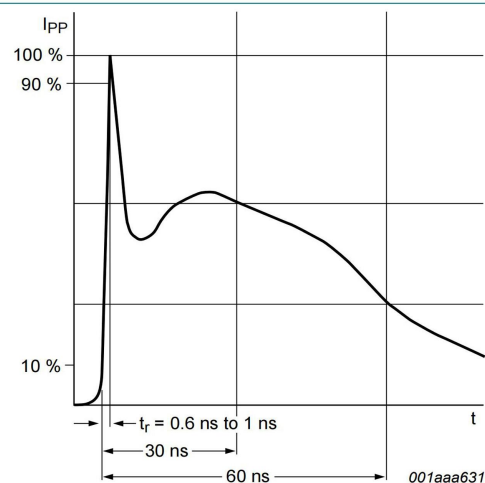


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

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9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage	$T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	30	V
V_{BR}	breakdown voltage	$I_R = 10\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$		31	34	39	V
I_{RM}	reverse leakage current	$V_R = 30\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$		-	0.1	50	nA
C_d	diode capacitance	$f = 1\text{ MHz}; V_R = 0\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$		-	0.27	0.4	pF
V_{CL}	clamping voltage	$I_{PPM} = 1\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$	[1]	-	6.5	-	V
		$I_{PP} = 16\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$	[2]	-	23	-	V
R_{dyn}	dynamic resistance	$I_R = 7.5\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$	[2]	-	0.7	-	Ω

[1] Device stressed with 8/20 μs exponential decay waveform according to IEC 61000-4-5.

[2] Non-repetitive current pulse, Transmission Line Pulse (TLP) $t_p = 100\text{ ns}$; square pulse; ANSI / ESD STM5.5.1-2008.

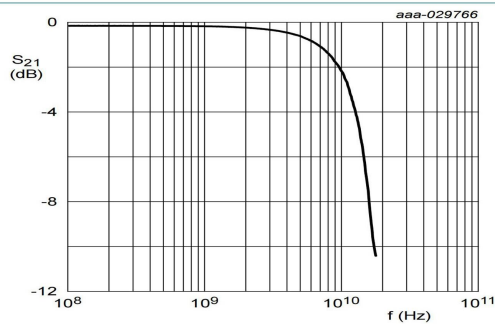


Fig. 3. Insertion loss; typical values

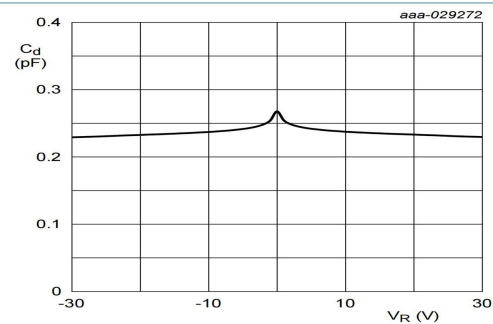


Fig. 4. Diode capacitance as a function of reverse voltage; typical values

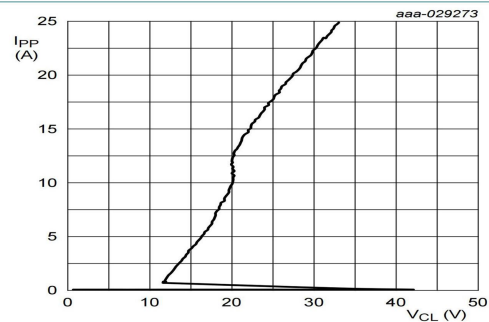


Fig. 5. Positive clamping voltage (TLP); typical values

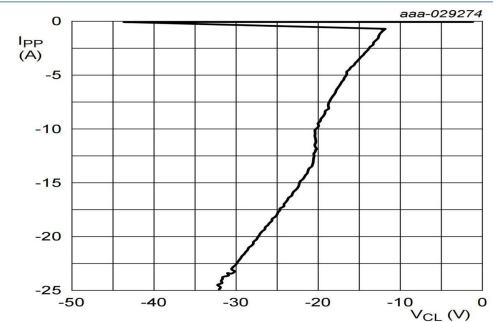


Fig. 6. Negative clamping voltage (TLP); typical values

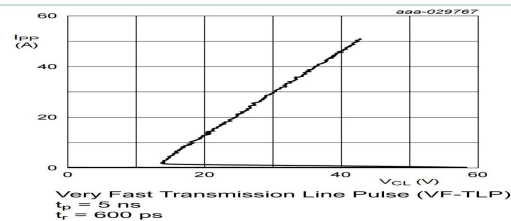


Fig. 7. Positive clamping voltage (VF-TLP); typical values

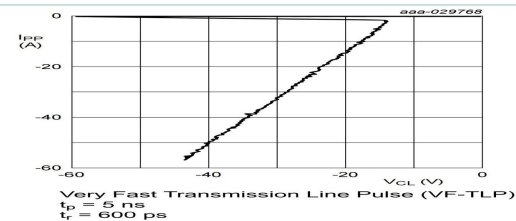


Fig. 8. Negative clamping voltage (VF-TLP); typical values

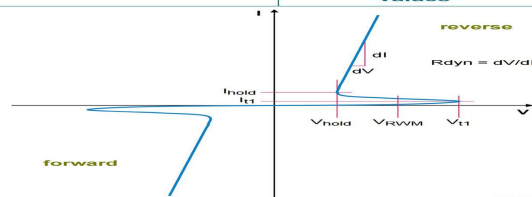


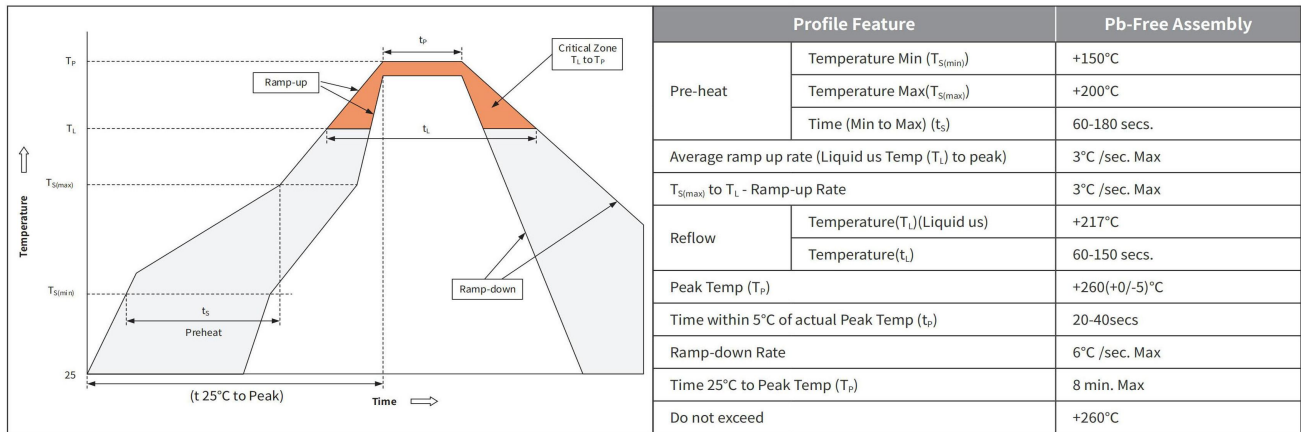
Fig. 9. V-I characteristics for a bidirectional ESD protection diode

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Ordering Information

PREFERRED P/N	PACKAGE	SIZE(mm)	DELIVERY MODE	MPQ(PCS)
	DFN1006-2L	1.00×0.60×0.37	7" REEL	10,000

Recommended Soldering Conditions



Package Outline Dimensions (DFN1006-2L)

Symbol	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.950	1.050	0.037	0.041
B	0.550	0.650	0.022	0.026
C	0.350	0.450	0.014	0.018
D	0.550	0.650	0.022	0.026
D ₁	0.280	0.380	0.011	0.015
E	0.450	0.550	0.018	0.022
L	0.000	0.100	0.000	0.004

Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
J	0.50	0.60	0.020	0.024
K	0.25	0.35	0.010	0.014
M	0.55	0.65	0.022	0.026