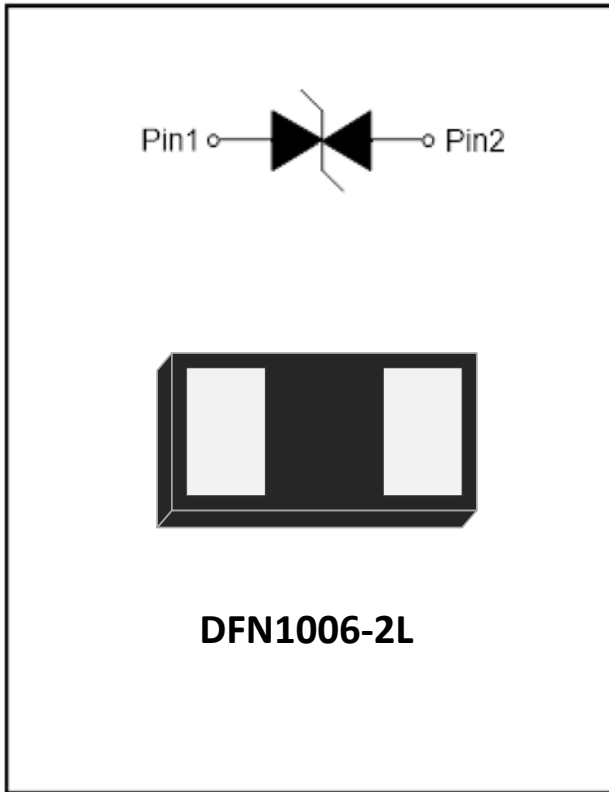


## 1-Line, Bi-directional, Transient Voltage Suppressor



### Features

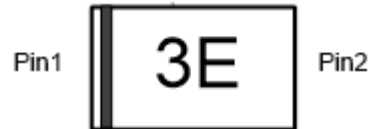
- Stand-off voltage:  $\pm 3.3V$  Max
- Transient protection for each line according to
  - IEC61000-4-2(ESD):  $\pm 30kV$  (contact)
  - IEC61000-4-4 (EFT): 80A (5/50ns)
  - IEC61000-4-5(surge): 20A (8/20 $\mu s$ )
- Low leakage current
- Ultra-low capacitance:  $C_J = 35pF$  typ
- Low clamping voltage:  
 $V_{CL} = 5.6V$  typ. @  $I_{PP} = 16A$  (TLP)
- RoHS Compliant

### Applications

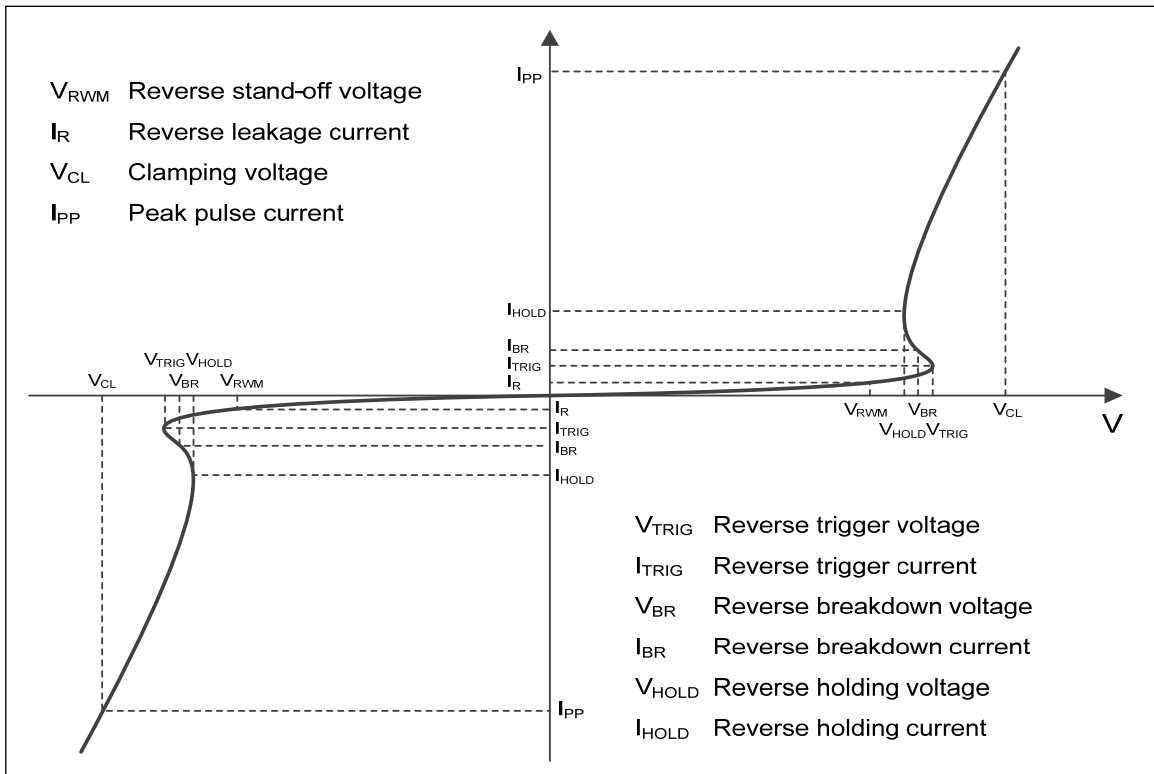
- Cellular Handsets
- Tablets
- Laptops
- Other portable devices
- Network communication devices

### Mechanical Data

- Package: DFN1006-2L
- Case Material: "Green" Molding Compound
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below



### Definitions of electrical characteristics





# ESD3V3LBA4

## ■Maximum Ratings

PARAMETER	SYMBOL	LIMITS	UNIT
Peak pulse power ( $t_p = 8/20\mu s$ )	$P_{pk}$	170	W
Peak pulse current ( $t_p = 8/20\mu s$ )	$I_{PP}$	20	A
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
Junction temperature	$T_J$	-55~125	$^{\circ}C$
Storage temperature	$T_{STG}$	-55~150	$^{\circ}C$

## ■Electrical Characteristics ( $T_a=25^{\circ}C$ Unless otherwise specified)

PARAMETER	Symbol	UNIT	Conditions	Min	Typ	Max
Reverse maximum working voltage	$V_{RWM}$	V				$\pm 3.3$
Reverse leakage current	$I_R$	$\mu A$	$V_{RWM} = 3.3V$			0.1
Reverse breakdown voltage	$V_{BR}$	V	$I_{BR} = 1mA$	3.5	4	
Reverse holding voltage	$V_{HOLD}$	V	$I_{HOLD} = 50mA$	3.5	4	
Clamping voltage <sup>1)</sup>	$V_{CL}$	V	$I_{PP} = 16A, t_p = 0.2/100ns(TLP)$		5.6	
Dynamic resistance <sup>1)</sup>	$R_{DYN}$	$\Omega$			0.1	
Clamping voltage <sup>2)</sup>	$V_{CL}$	V	$V_{ESD} = 8kV$		8	
Clamping voltage <sup>1)</sup>	$V_{CL}$	V	$I_{PP} = 1A, t_p = 8/20\mu s$		4.3	5.5
		V	$I_{PP} = 10A, t_p = 8/20\mu s$		6	7.5
		V	$I_{PP} = 20A, t_p = 8/20\mu s$		7.5	9
Junction capacitance	$C_J$	pF	$V_R = 0V, f = 1MHz$		35	45
Junction capacitance	$C_J$	pF	$V_R = 2.5V, f = 1MHz$		25	35

Notes:

- 1) TLP parameter:  $Z_0 = 50\Omega, t_p = 100ns, t_r = 2ns$ , averaging window from 60ns to 80ns. RDYN is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

## ■Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(mg)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
ESD3V3LBA4	F1	Approximate 0.9	10000	100000	400000	7" reel



## ■ Characteristics (Typical)

Fig.1 8/20 $\mu$ s waveform per IEC61000-4-5

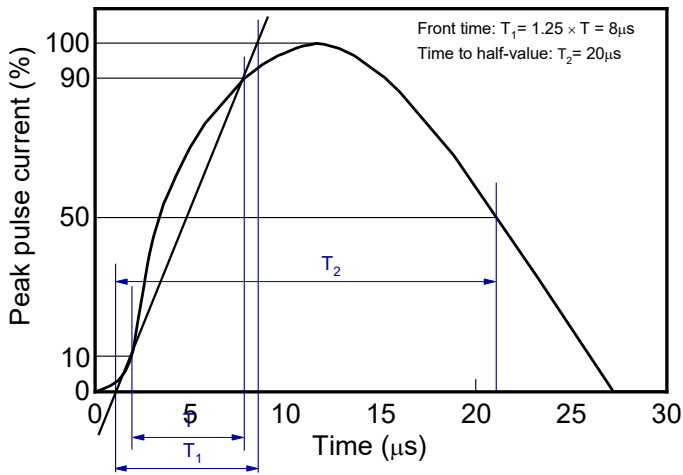


Fig.2 Contact discharge current waveform per IEC61000-4-2

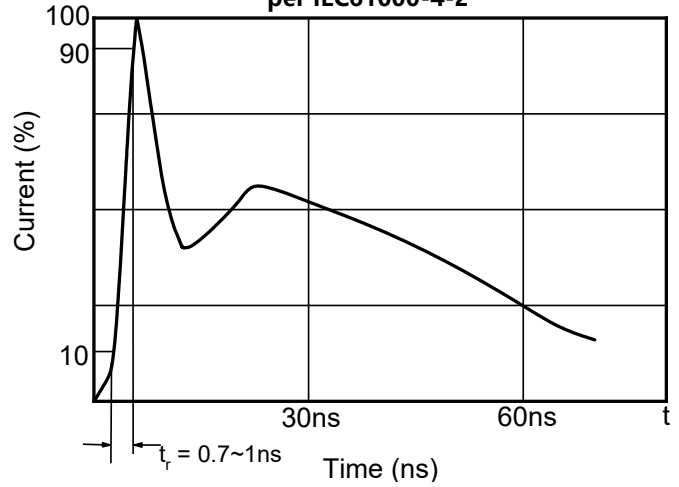


Fig.3 Clamping voltage vs. Peak pulse current

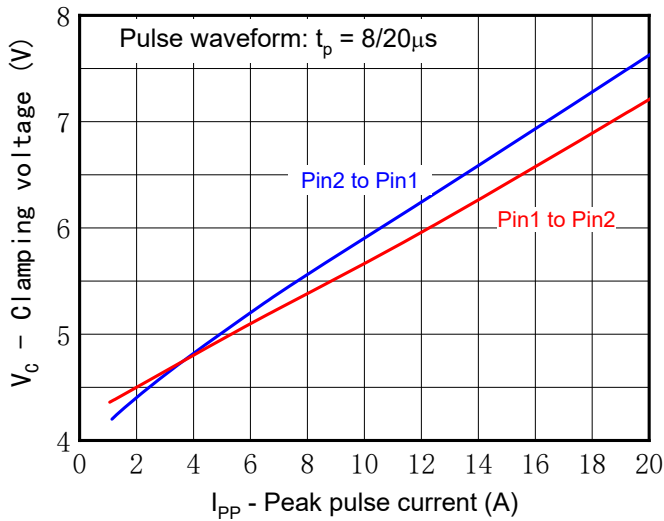


Fig.4 Capacitance vs. Reverse voltage

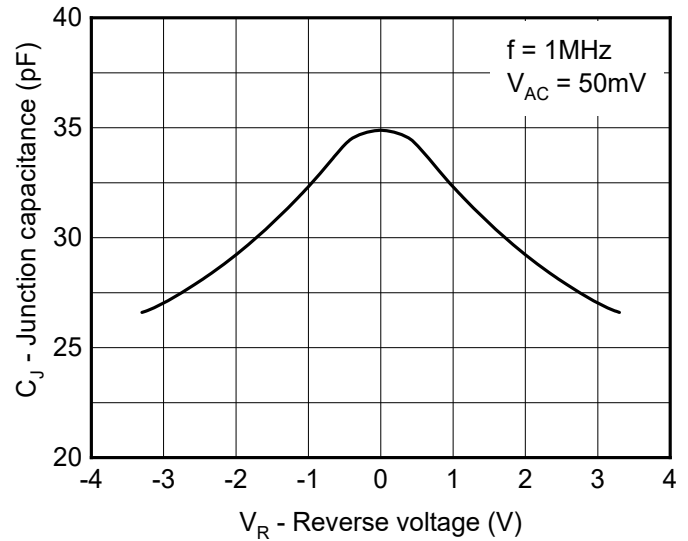


Fig.5 Non-repetitive peak pulse power vs. Pulse time

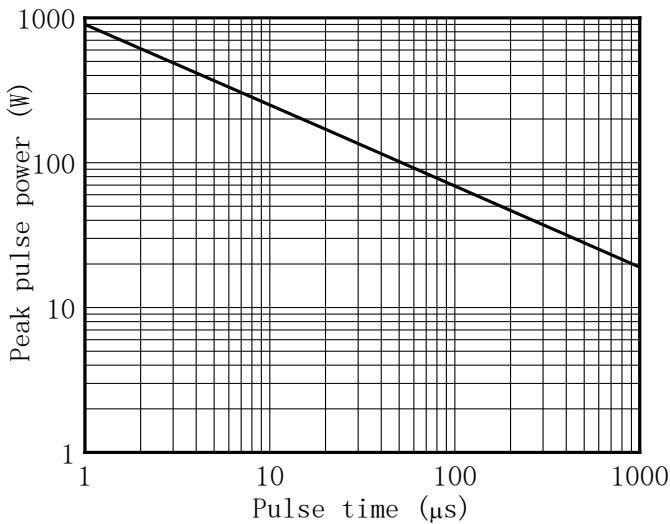
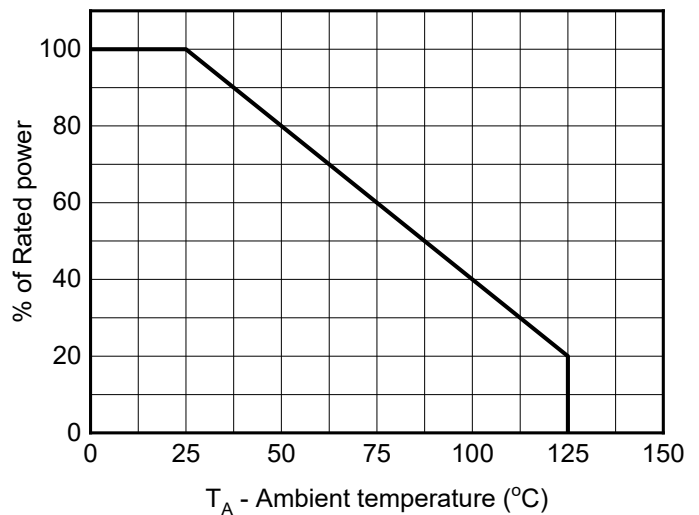


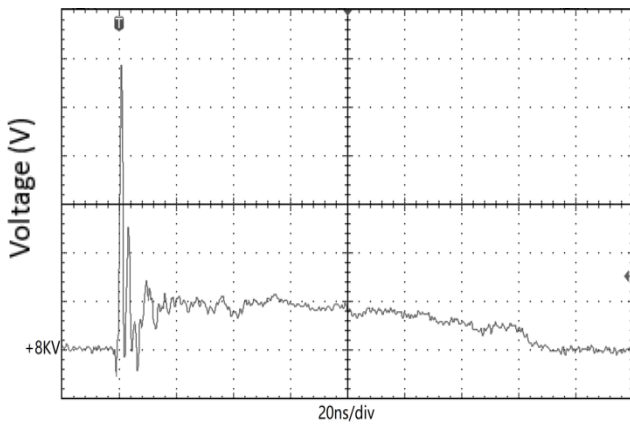
Fig.6 Power derating vs. Ambient temperature





# ESD3V3LBA4

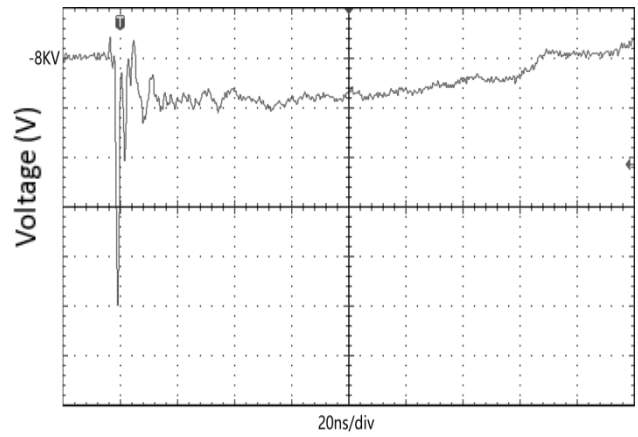
Fig.7 ESD clamping



Time (ns)

(+8kV contact discharge per IEC61000-4-2)

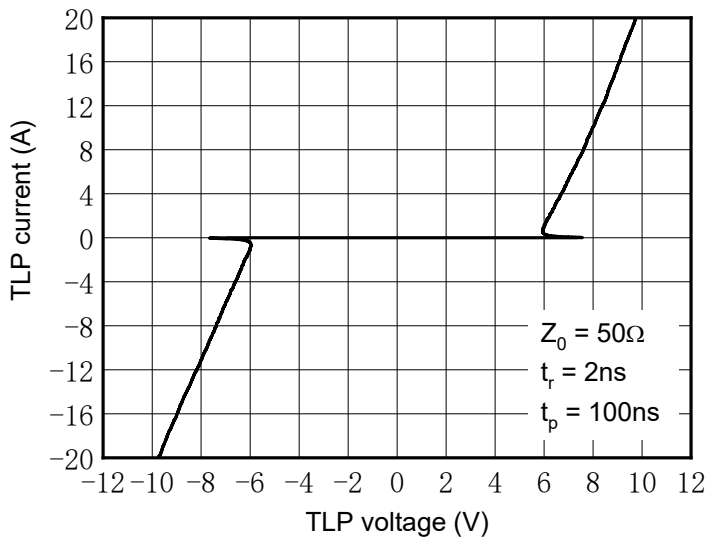
Fig.8 ESD clamping t



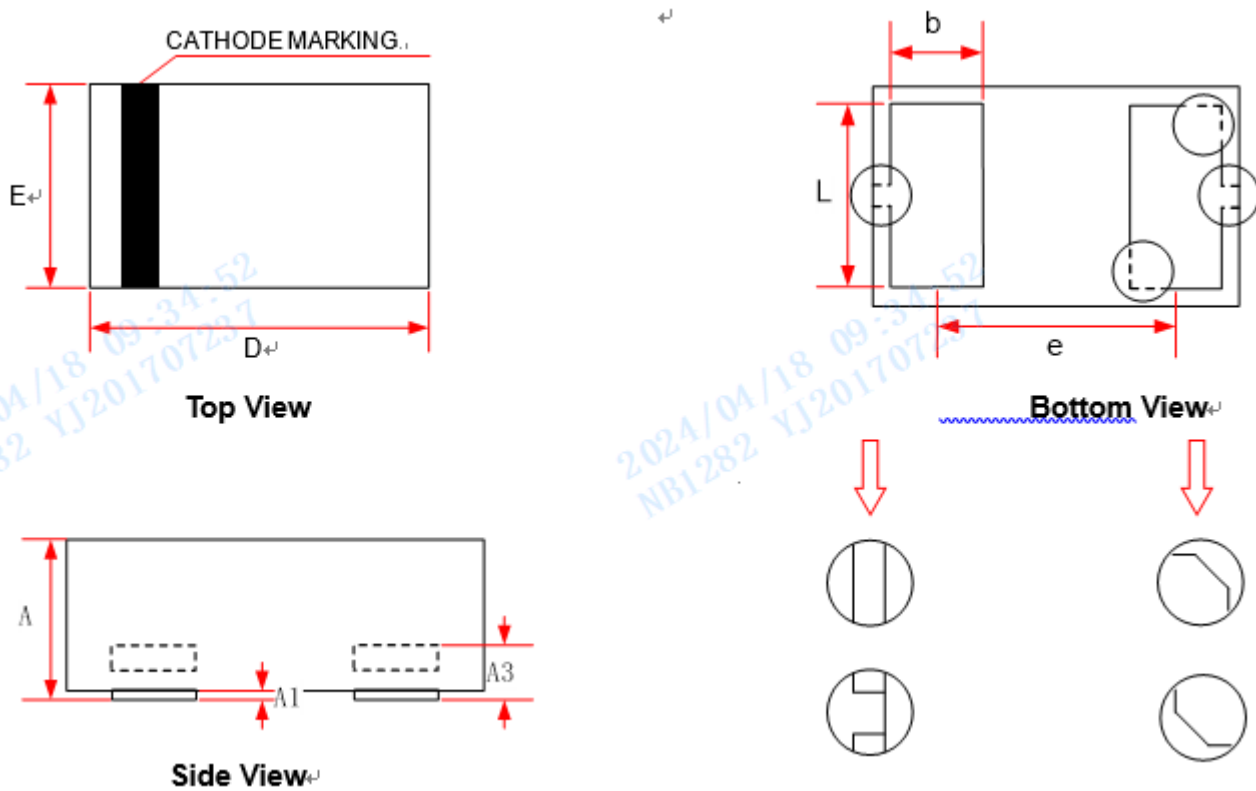
Time (ns)

(-8kV contact discharge per IEC61000-4-2)

Fig. 9 TLP Measurement

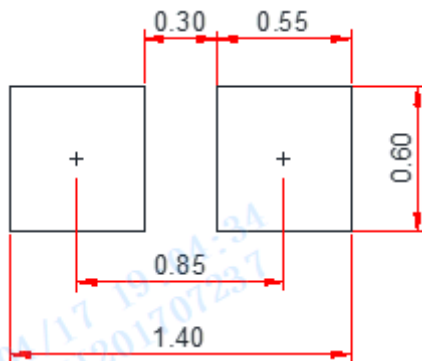


## ■ Outline Dimensions



Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.340	0.450	0.530
A1	0.000	0.020	0.050
A3	0.125 Ref.		
D	0.950	1.000	1.080
E	0.550	0.600	0.680
b	0.200	0.250	0.300
L	0.450	0.500	0.550
e	0.650 BSC		

## ■ Recommended PCB Layout



Unit:mm

### Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met



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