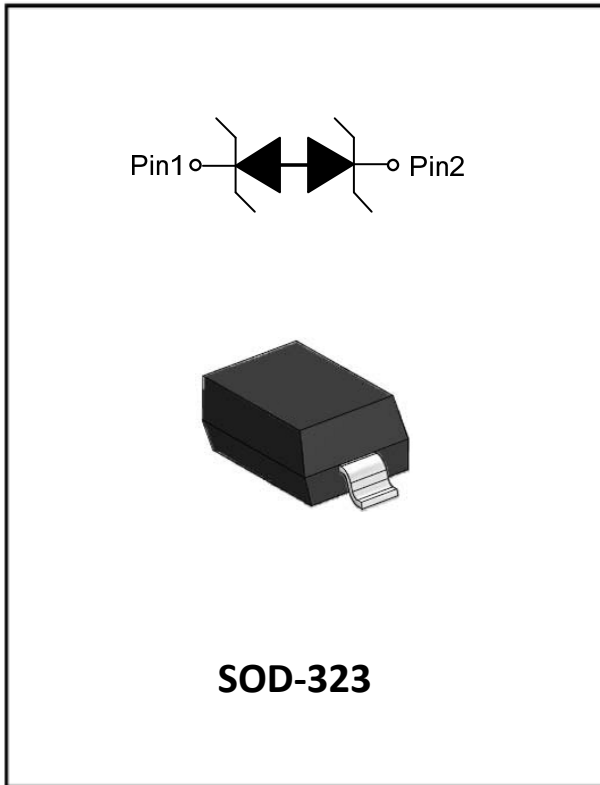


## 1- Line, Bi-directional, Transient Voltage Suppressor



### Features

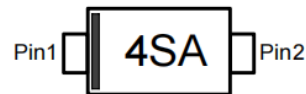
- Stand-off voltage:  $\pm 4.5V$  Max
- Transient protection for each line according to  
IEC61000-4-2(ESD):  $\pm 30kV$  (contact)  
IEC61000-4-4 (EFT): 80A (5/50ns)  
IEC61000-4-5(surge): 160A (8/20 $\mu s$ )
- capacitance:  $C_J = 300pF$  typ.
- Low leakage current
- Low clamping voltage:  
 $V_{CL} = 7V$  typ. @  $I_{PP} = 16A(TLP)$
- Solid-state silicon technology

### Applications

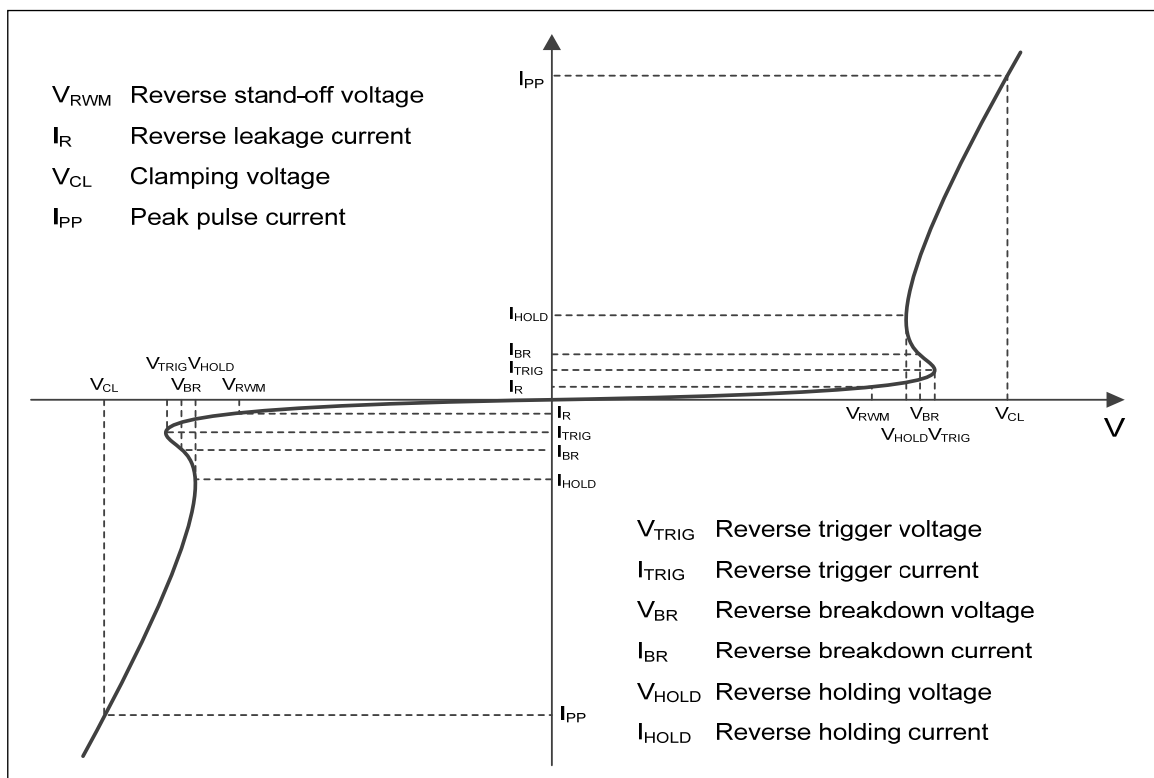
- Cellular handsets
- Tablets
- Laptops
- Other portable devices
- Network communication devices

### Mechanical Data

- Package: SOD-323
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below



### ■ Definitions of electrical characteristics





# ESD4V5D3BA

## ■Maximum Ratings

PARAMETER	SYMBOL	LIMITS	UNIT
Peak pulse power ( $t_p = 8/20\mu s$ )	$P_{pk}$	1920	W
Peak pulse current ( $t_p = 8/20\mu s$ )	$I_{PP}$	160	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	$T_J$	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				$\pm 4.5$
Reverse leakage current	$I_R$	$\mu A$	$V_{RWM} = 4.5V$			1
Reverse breakdown voltage	$V_{(BR)}$	V	$I_T = 1mA$	4.6		
Clamping voltage <sup>1)</sup>	$V_{CL}$	V	$I_{PP} = 16A, t_p = 100ns$		7	
Dynamic resistance <sup>1)</sup>	$R_{DYN}$	$\Omega$			0.04	
Clamping voltage <sup>2)</sup>	$V_{CL}$	V	$V_{ESD} = 8kV$		9	
Clamping voltage <sup>3)</sup>	$V_{CL}$	V	$I_{PP} = 1A, t_p = 8/20\mu s$		5	7
		V	$I_{PP} = 20A, t_p = 8/20\mu s$		5.5	7.5
		V	$I_{PP} = 160A, t_p = 8/20\mu s$		10	12
Junction capacitance	$C_J$	pF	$V_R = 0V, f = 1MHz$		280	300

Notes:

- 1) TLP parameter:  $Z_0 = 50\Omega, t_p = 100ns, t_r = 2ns$ , averaging window from 60ns to 80ns.  $R_{DYN}$  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	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
ESD4V5D3BA	Approximate 0.004	3000	30000	120000	7 reel



# ESD4V5D3BA

## ■ Characteristics (Typical)

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

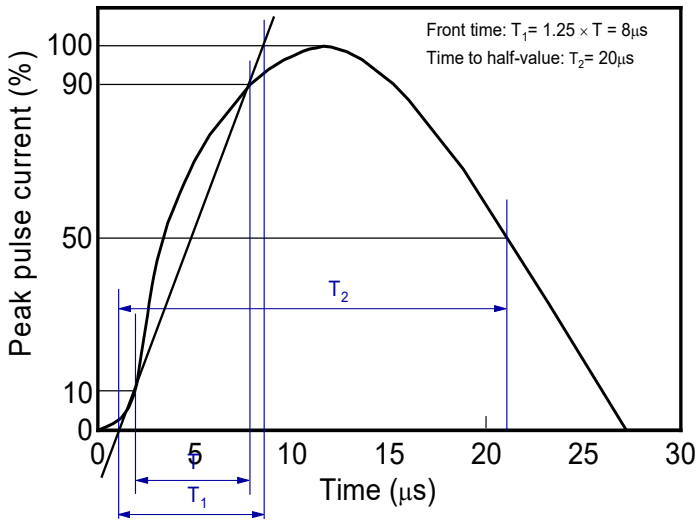


Fig.2 Contact discharge current waveform per IEC61000-4-2

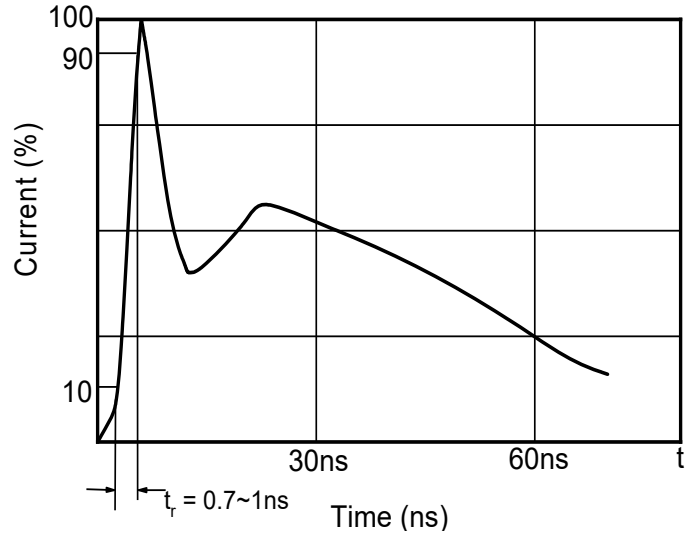


Fig.3 Clamping voltage vs. Peak pulse current

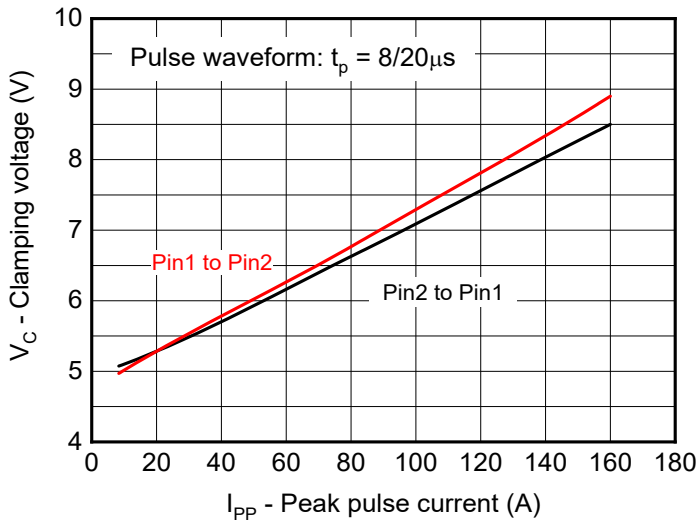


Fig.4 Capacitance vs. Reverse voltage

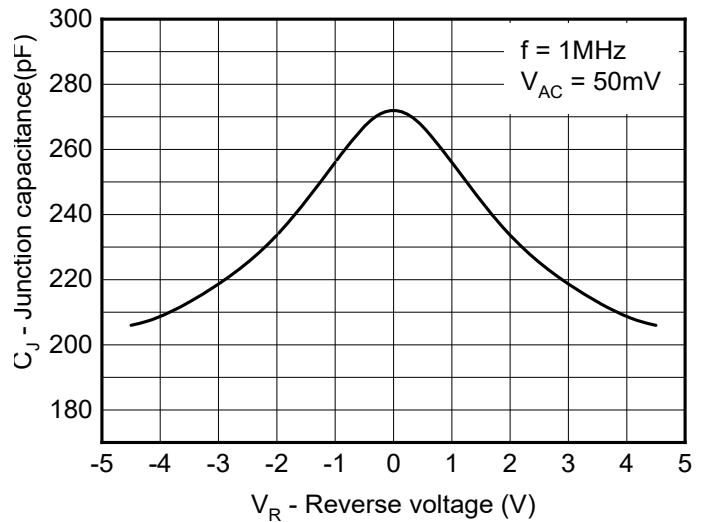


Fig.5 Non-repetitive peak pulse power vs. Pulse time

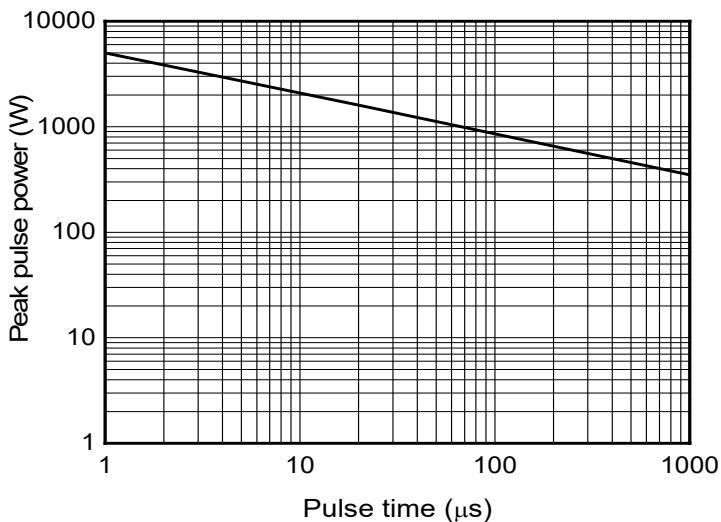
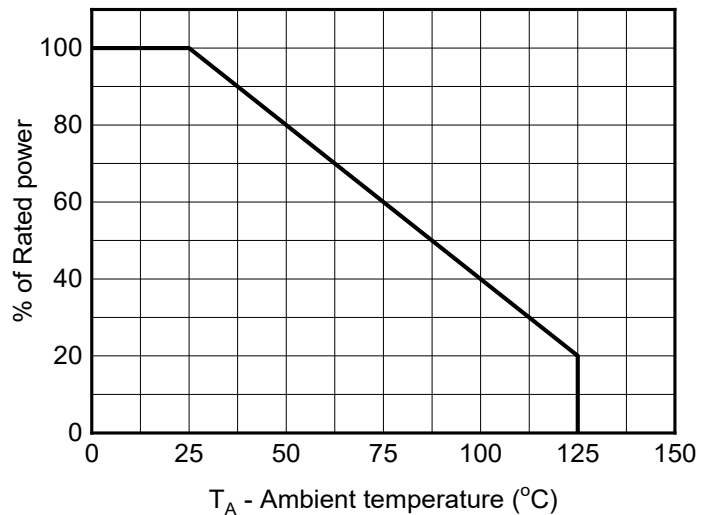


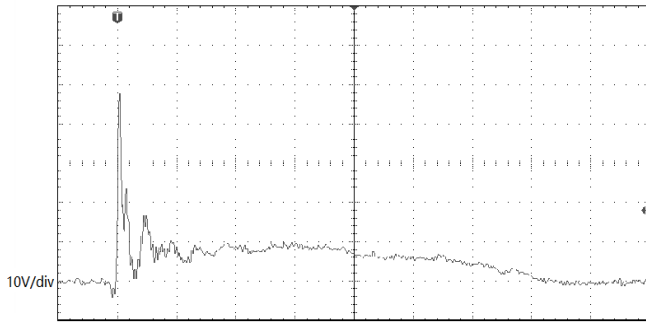
Fig.6 Power derating vs. Ambient temperature



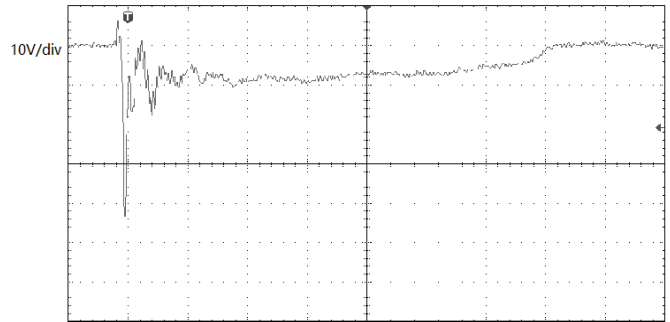


# ESD4V5D3BA

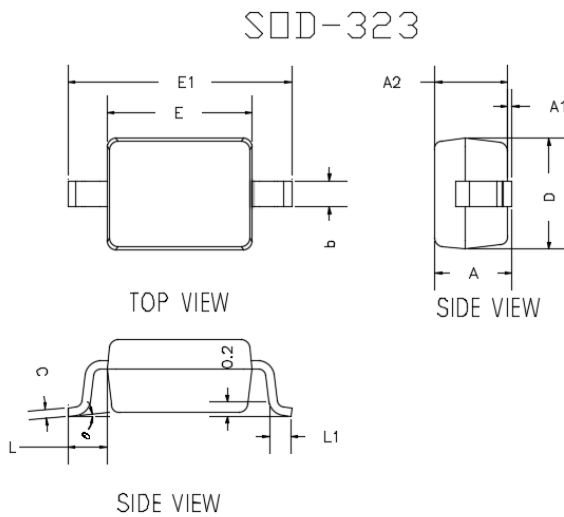
**Fig.7 ESD clamping**  
(+8kV contact discharge per IEC61000-4-2)



**Fig.8 ESD clamping**  
(-8kV contact discharge per IEC61000-4-2)

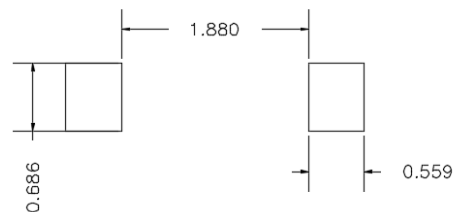


## ■ Outline Dimensions



DIMENSIONS				
DIM	INCHES		MM	
	MIN	MAX	MIN	MAX
A	---	0.0393	---	1.0000
A1	0.0000	0.0039	0.0000	0.1000
A2	0.0314	0.0354	0.8000	0.9000
b	0.0098	0.0157	0.2500	0.4000
c	0.0031	0.0059	0.0800	0.1500
D	0.0472	0.0551	1.2000	1.4000
E	0.0629	0.0709	1.6000	1.8000
E1	0.0984	0.1063	2.5000	2.7000
L	0.0187TYP		0.475TYP	
L1	0.0098	0.0157	0.250	0.400
ϕ	0°	8°	0°	8°

## ■ Soldering Footprint



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

### Notes:

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



## ESD4V5D3BA

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