ESDAxxxWx

TRANSIL™ array for data protection

Main applications

Where transient overvoltage protection in ESD sensitive equipment is required, such as :

- Computers
- Printers
- Communication systems
- Cellular phones handsets and accessories
- Wireline and wireless telephone sets
- Set top boxes

Features

- 2 up to 5 Unidirectional Transil functions
- Breakdown voltage:
  V_{BR} = 6.1 V min. and 25 V min.
- Low leakage current: < 1 µA
- Very small PCB area < 4.2 mm^2 typically

Description

The ESDAxxxWx are monolithic suppressors designed to protect components connected to data and transmission lines against ESD.

These devices clamp the voltage just above the logic level supply for positive transients, and to a diode drop below ground for negative transients.

Benefits

- High ESD protection level: up to 25 kV
- High integration

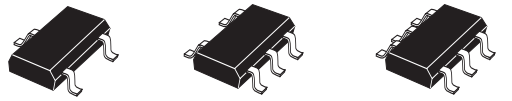
Complies with the following standards

IEC61000-4-2

Level 4 — 15 kV (air discharge)
8 kV(contact discharge)

MIL STD 883E - Method 3015-7 Class 3

25 kV HBM (Human Body Model)

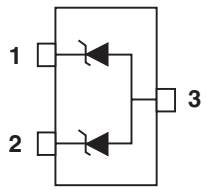


SOT323-3L **SOT323-5L** **SOT323-6L**

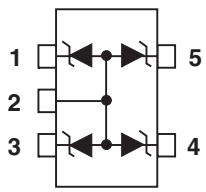
Order codes

Part Numbers	Marking
ESDA6V1W5	E61
ESDA6V1-5W6	E62
ESDA25W	E25
ESDA25W5	E25

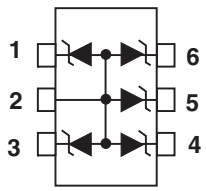
ESDA25W Functional diagram



ESDA6V1W5/ESDA25W5 Functional diagram



ESDA6V1-5W6 Functional diagram



1 Characteristics

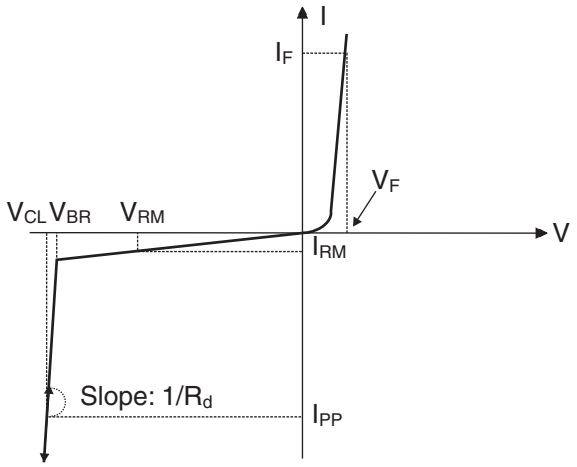
Table 1. Absolute Ratings (T_{amb} = 25°C)

Symbol	Parameter		Value	Unit
P_{PP}	Peak pulse power (8/20 µs)	ESDA25W	400	W
		ESDA25W5 / ESDA6V1W5	150	
		ESDA6V1-5W6	100	
T_j	Junction temperature		125	°C
T_{stg}	Storage temperature range		-55 to +150	°C
T_L	Maximum lead temperature for soldering during 10s		260	°C
T_{op}	Operating temperature range(1)	ESDA25W / ESDA25W5 / ESDA6V1W5	-40 to +125	°C
		ESDA6V1-5W6	-40 to +125	

1. The values of the operating parameters versus temperature are given through curves and αT parameter.

1.1 Electrical Characteristics (T_{amb} = 25°C)

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{CL}	Clamping voltage
I_{RM}	Leakage current
I_{PP}	Peak pulse current
I_R	Reverse leakage current
I_F	Forward current
αT	Voltage temperature coefficient
V_F	Forward voltage drop
C	Capacitance
R_d	Dynamic resistance



Part Numbers	V_{BR}			I_{RM} @ V_{RM}		V_F @ I_F		R_d	αT	C
	min.	max. @ I_R				max.		typ.(1)	max.(2)	typ. 0V bias
	V	V	mA	µA	V	V	mA	Ω	10^{-4}/°C	pF
ESDA25W	25	30	1	1	24	1.2	10	1.1	10	65
ESDA25W5	25	30	1	1	24	1.2	10	1.9	10	30
ESDA6V1-5W6	6.1	7.2	1	1	3	1.25	200	0.61	6	50
ESDA6V1W5	6.1	7.2	1	1	3	1.25	200	0.35	6	90

1. Square pulse I_{pp} = 15 A, t_p = 2.5 µs
2. V_{BR} = aT* (T_{amb} - 25 °C) * V_{BR} (25 °C)

Figure 1. Peak power dissipation versus initial junction temperature

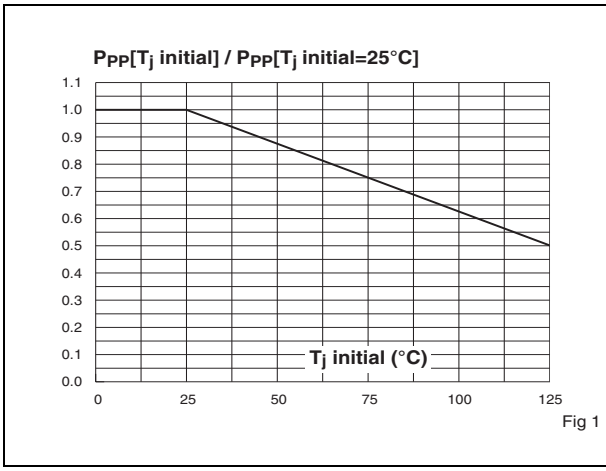


Fig 1

Figure 2. Peak pulse power versus exponential pulse duration (T_j initial = 25°C) (ESDA25W)

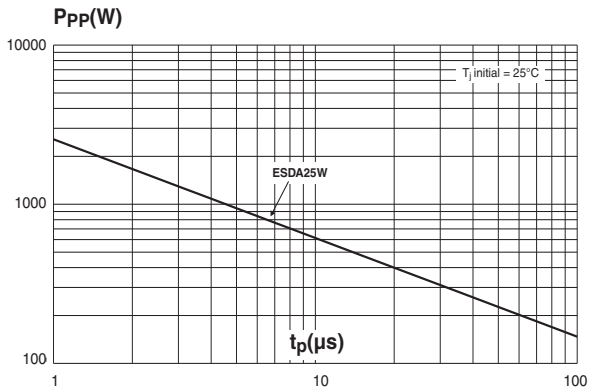


Figure 3. Peak pulse power versus exponential pulse duration (T_j initial = 25°C) (ESDA25W5 / ESDA6V1W5 / ESDA6V1-5W6)

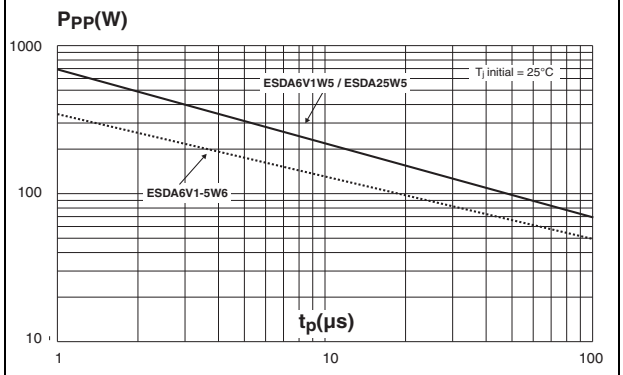


Figure 4. Clamping voltage versus peak pulse current (T_j initial = 25°C, rectangular waveform, t_p = 2.5 µs) (ESDA25W / ESDA25W5)

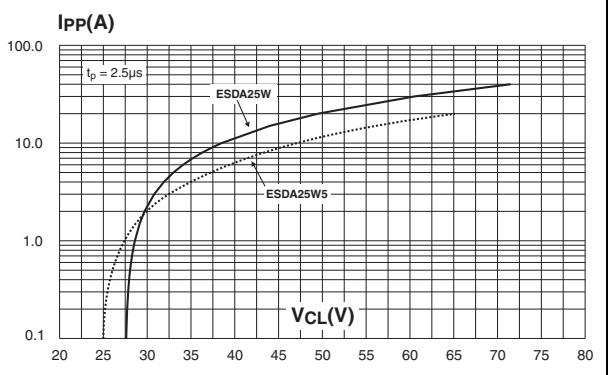


Figure 5. Clamping voltage versus peak pulse current (T_j initial = 25°C, rectangular waveform, t_p = 2.5 µs) (ESDA6V1W5 / ESDA6V1-5W6)

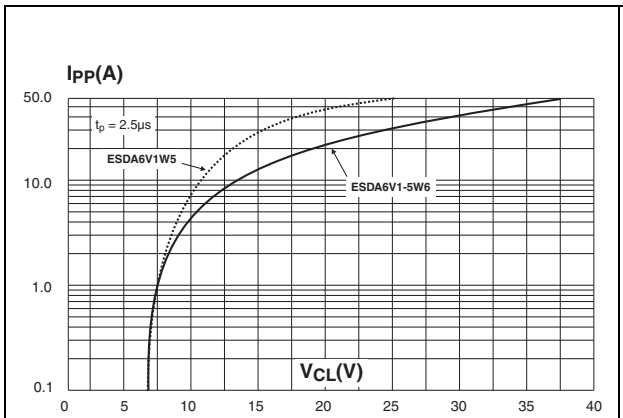


Figure 6. Capacitance versus reverse applied voltage (typical values) (ESDA25W / ESDA25W5)

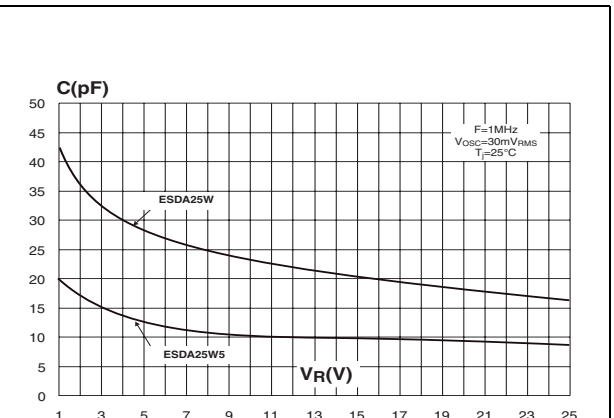


Figure 7. Capacitance versus reverse applied voltage (typical values) (ESDA6V1W5 / ESDA6V1-5W6)

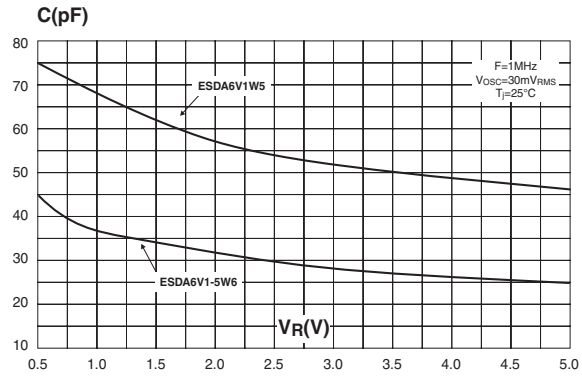


Figure 8. Relative variation of leakage current versus junction temperature (typical values)

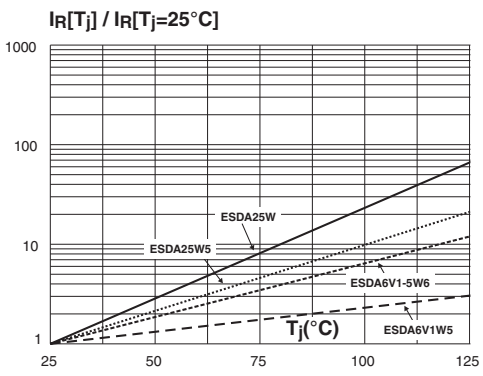


Figure 9. Peak forward voltage drop versus peak forward current (typical values) (ESDA25W / ESDA25W5)

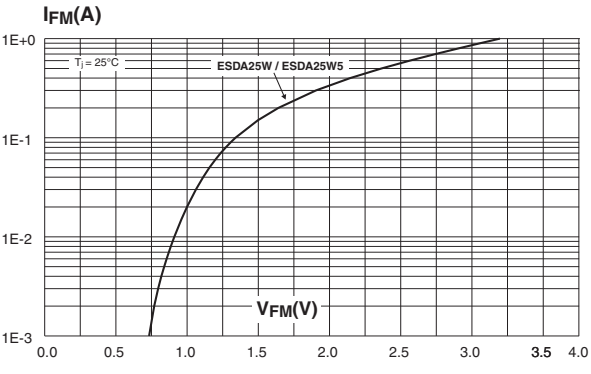


Figure 10. Peak forward voltage drop versus peak forward current (typical values) (ESDA6V1W5 / ESDA6V1-5W6)

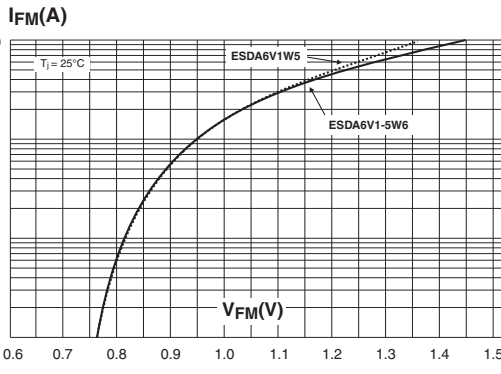
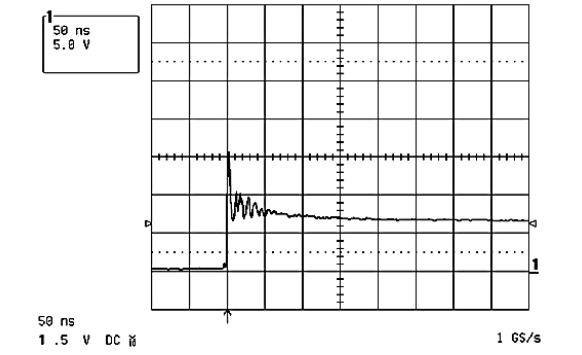
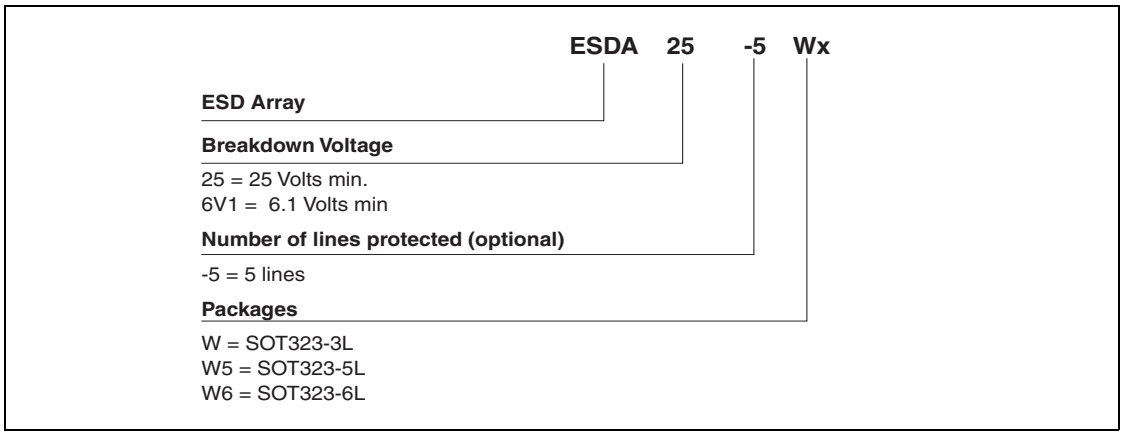


Figure 11. ESD response to IEC61000-4-2 (air discharge 15 kV, positive surge)

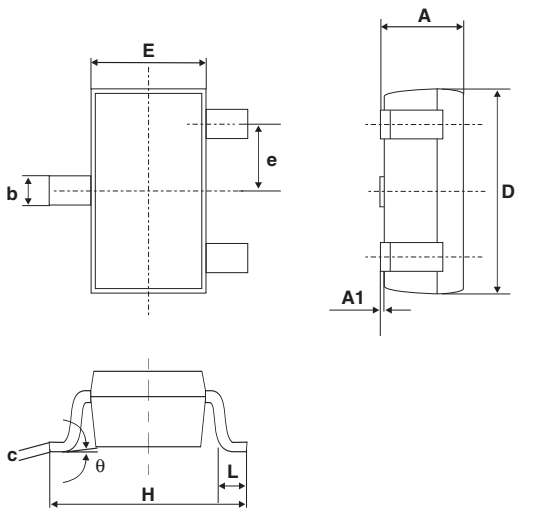


2 Ordering information scheme



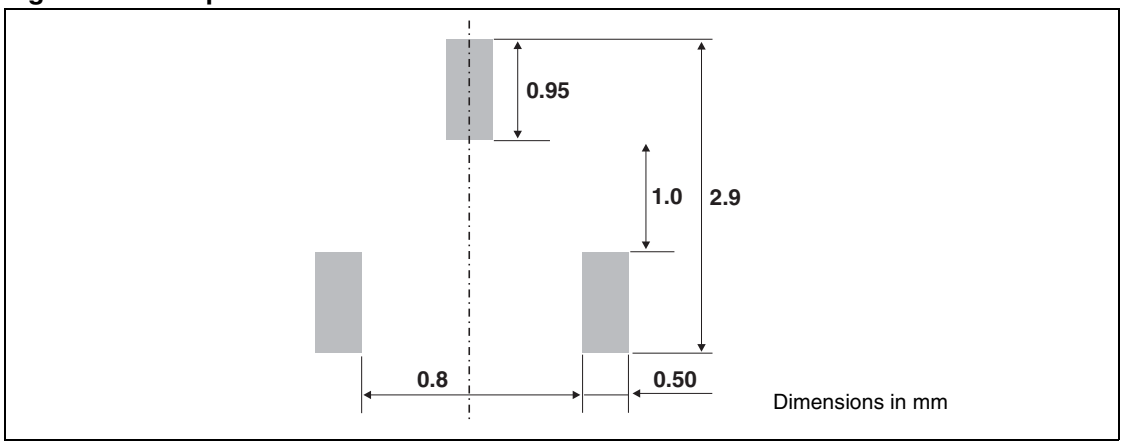
3 Package mechanical data

3.1 SOT323-3L package

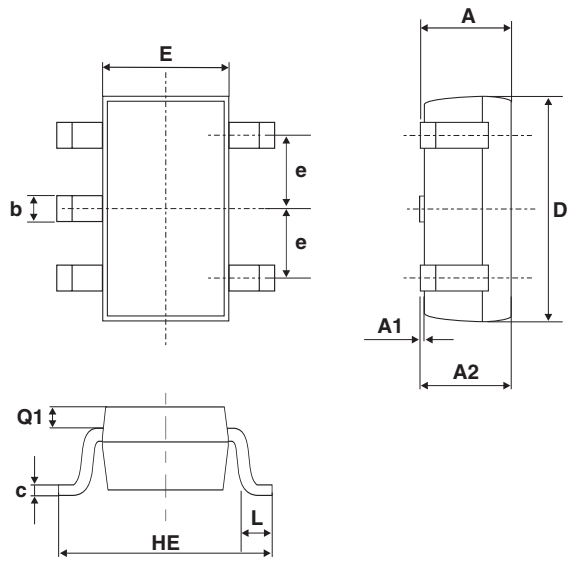


REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.8		1.1	0.031		0.043
A1	0.0		0.1	0.0		0.004
b	0.25		0.4	0.010		0.016
c	0.1		0.26	0.004		0.010
D	1.8	2.0	2.2	0.071	0.079	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e		0.65			0.026	
H	1.8	2.1	2.4	0.071	0.083	0.094
L	0.1	0.2	0.3	0.004	0.008	0.012
q	0		30°	0		30°

Figure 12. Footprint dimensions

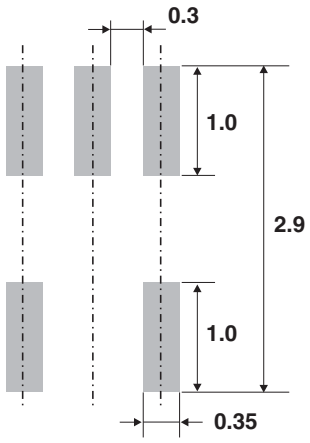


3.2 SOT323-5L package



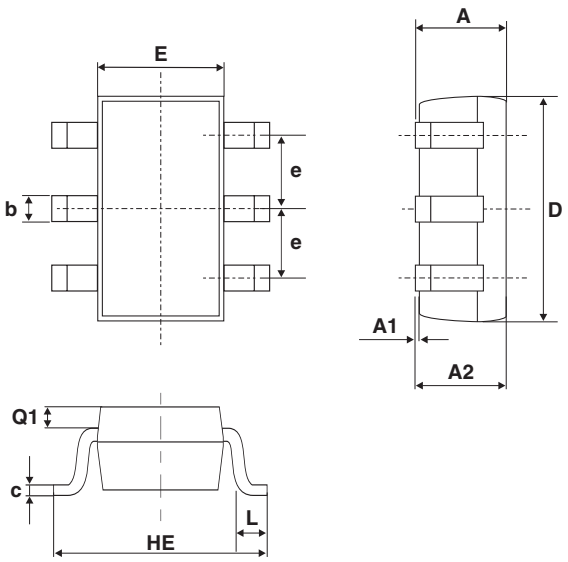
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.8	1.1	0.031	0.043
A1	0	0.1	0	0.004
A2	0.8	1	0.031	0.039
b	0.15	0.3	0.006	0.012
c	0.1	0.18	0.004	0.007
D	1.8	2.2	0.071	0.086
E	1.15	1.35	0.045	0.053
e	0.65 Typ.		0.025 Typ.	
H	1.8	2.4	0.071	0.094
Q1	0.1	0.4	0.004	0.016

Figure 13. Footprint dimensions



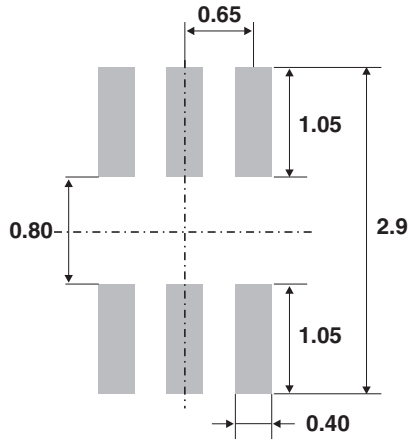
Dimensions in mm

3.3 SOT323-6L package



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.8	1.1	0.031	0.043
A1	0	0.1	0	0.004
A2	0.8	1	0.031	0.039
b	0.15	0.3	0.006	0.012
c	0.1	0.18	0.004	0.007
D	1.8	2.2	0.071	0.086
E	1.15	1.35	0.045	0.053
e	0.65 Typ.		0.025 Typ.	
H	1.8	2.4	0.071	0.094
Q	0.1	0.4	0.004	0.016

Figure 14. Footprint dimensions



4 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
ESDA6V1W5	E61	SOT323-5L	6 mg	3000	Tape & reel
ESDA6V1-5W6	E62	SOT323-6L			
ESDA25W	E25	SOT323-3L			
ESDA25W5	E25	SOT323-5L			

5 Revision history

Date	Revision	Changes
20-Jul-2005	1	Initial release
29-Aug-2005	2	Added notes to table on page2, removed annotations in Figure 1.