ESDA6V1S3
ESDA6V2S6

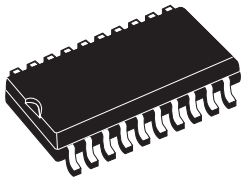
Application Specific Discretes
A.S.D.™

TRANSIL ARRAY
FOR ESD PROTECTION

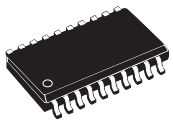
APPLICATIONS

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

- COMPUTERS
- PRINTERS
- COMMUNICATION SYSTEMS
- GSM HANDSETS AND ACCESSORIES
- OTHER TELEPHONE SETS



SO-20
ESDA6V1S3



SSOP20
ESDA6V2S6

FEATURES

- 18 UNIDIRECTIONAL TRANSIL FUNCTIONS
- LOW LEAKAGE CURRENT: I_R max. < 2 µA
- 200 W PEAK PULSE POWER (8/20 µs)

DESCRITION

The ESDA6xxSx is a monolithic voltage suppressor designed to protect components which are connected to data and transmission lines against ESD.

It clamps 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

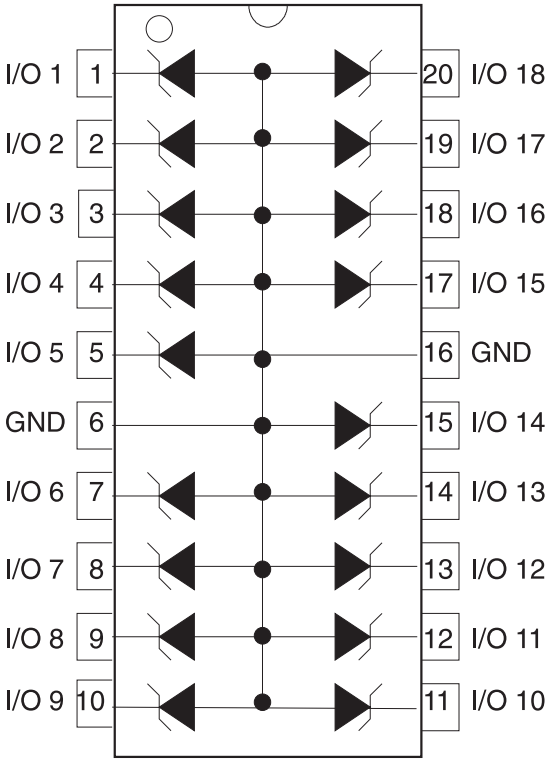
Suitable for high density boards

COMPLIES WITH THE FOLLOWING STANDARDS :

IEC 1000-4-2 : level 4

MIL STD 883C-Method 3015-6 : class3
(human body model)

FUNCTIONAL DIAGRAM

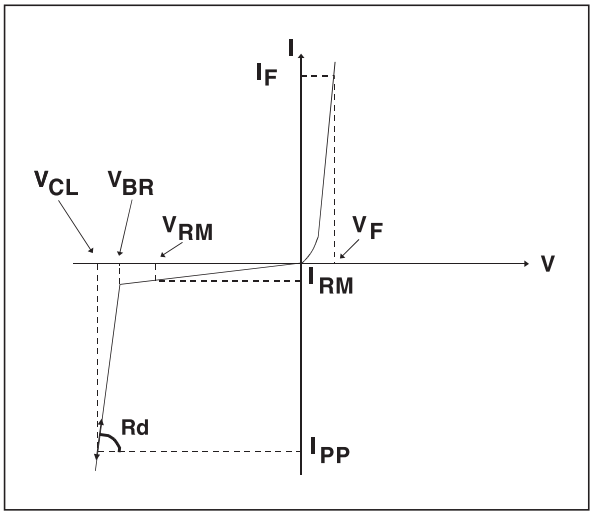


ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25°C)

Symbol	Parameter	Value	Unit
V_{PP}	Electrostatic discharge MIL STD 883C - Method 3015-6	25	kV
P_{PP}	Peak pulse power (8/20µs)	200	W
T_{stg} T_j	Storage temperature range Maximum junction temperature	- 55 to + 150 150	°C °C
T_L	Maximum lead temperature for soldering during 10s	260	°C

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
αT	Voltage temperature coefficient
C	Capacitance
Rd	Dynamic resistance
V_F	Forward voltage drop



Types	V_{BR} @ I_R			I_{RM} @ V_{RM}		Rd	αT	C	V_F @ I_F	
	min. note1	max.		max. note1		typ. note 2	max. note 3	typ. 0V bias	max.	
	V	V	mA	µA	V	Ω	10^{-4}/°C	pF	V	mA
ESDA6V1S3	6.1	7.2	1	2	5.25	0.5	6	120	1.25	200
ESDA6V2S6	6.2	7.2	1	2	5.25	0.5	6	100	1.25	200

Note 1 : Between any I/O pin and Ground
Note 2 : Square pulse, I_{PP} = 25A for ESDA6V1S3 and I_{PP} = 15A for ESDA6V2S6 , t_p = 2.5µs
Note 3 : $\Delta V_{BR} = \alpha T * [T_{amb}-25] * V_{BR}(25°C)$

CALCULATION OF THE CLAMPING VOLTAGE

USE OF THE DYNAMIC RESISTANCE

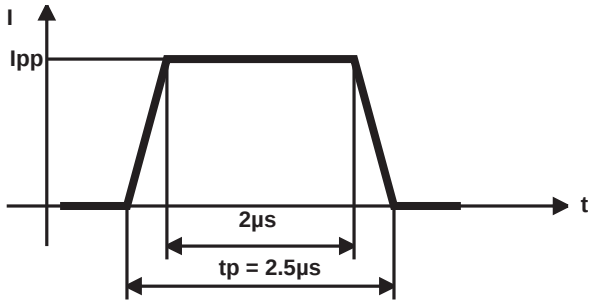
The ESDA family has been designed to clamp fast spikes like ESD. Generally the PCB designers need to calculate easily the clamping voltage V_{CL}. This is why we give the dynamic resistance in addition to the classical parameters. The voltage across the protection cell can be calculated with the following formula:

$$V_{CL} = V_{BR} + Rd\ I_{PP}$$

Where Ipp is the peak current through the ESDA cell.

DYNAMIC RESISTANCE MEASUREMENT

The short duration of the ESD has led us to prefer a more adapted test wave, as below defined, to the classical 8/20µs and 10/1000µs surges.



2.5µs duration measurement wave.

As the value of the dynamic resistance remains stable for a surge duration lower than 20µs, the 2.5µs rectangular surge is well adapted. In addition both rise and fall times are optimized to avoid any parasitic phenomenon during the measurement of Rd.

Fig. 1 : Peak power dissipation versus initial junction temperature.

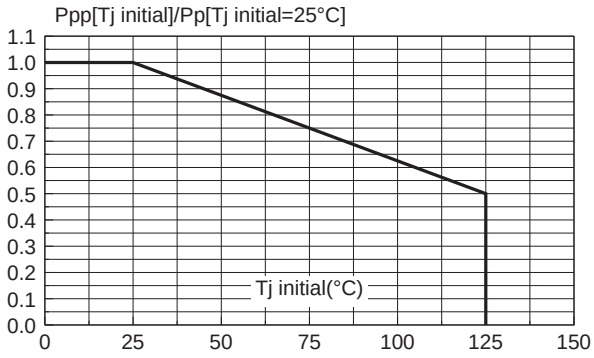


Fig. 2 : Peak pulse power versus exponential pulse duration (Tj initial = 25 °C).

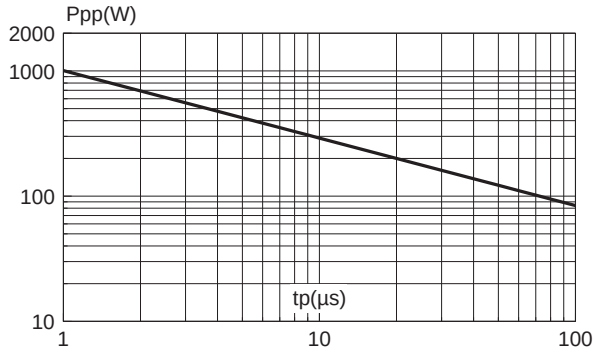


Fig. 3 : Clamping voltage versus peak pulse current (Tj initial = 25 °C).
Rectangular waveform tp = 2.5 µs.

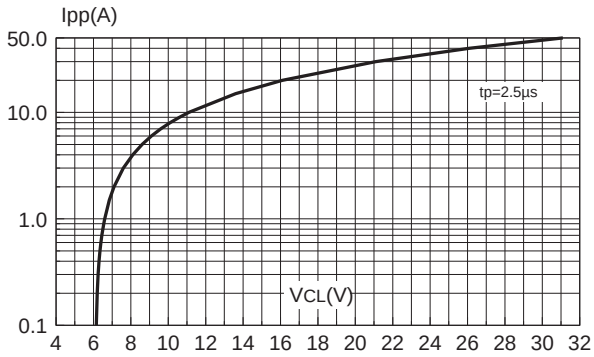


Fig. 4 : Capacitance versus reverse applied voltage (typical values).

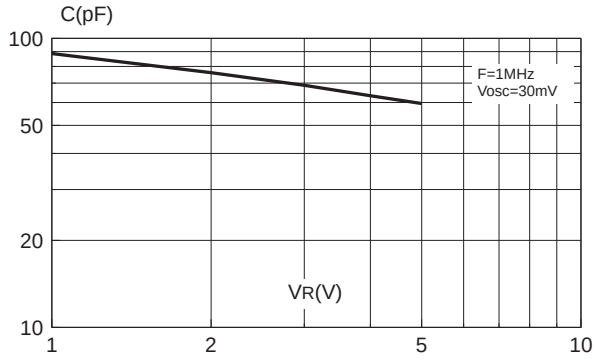


Fig. 5 : Relative variation of leakage current versus junction temperature (typical values).

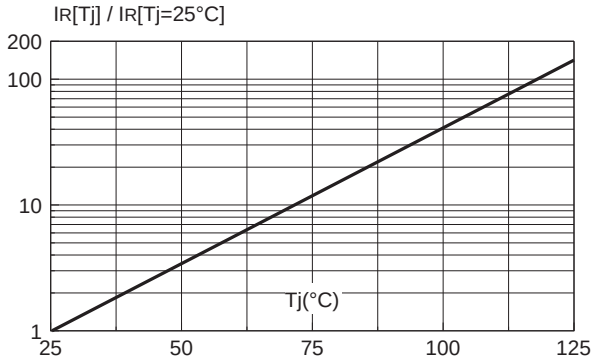
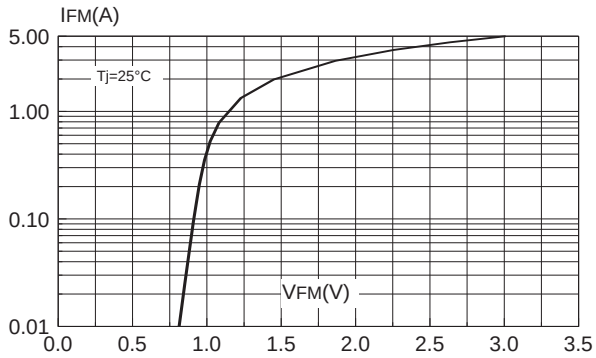
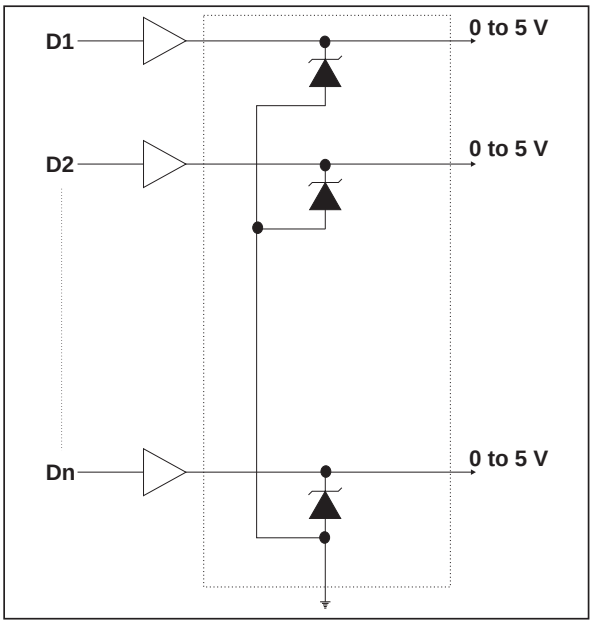


Fig. 6 : Peak forward voltage drop versus peak forward current (typical values).

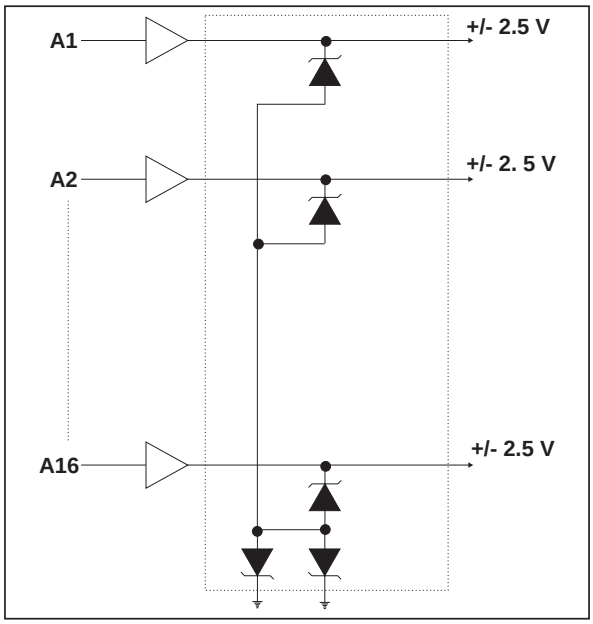


APPLICATION EXAMPLE :

1 - Protection of logic-level signals.
(ex : centronics junction)



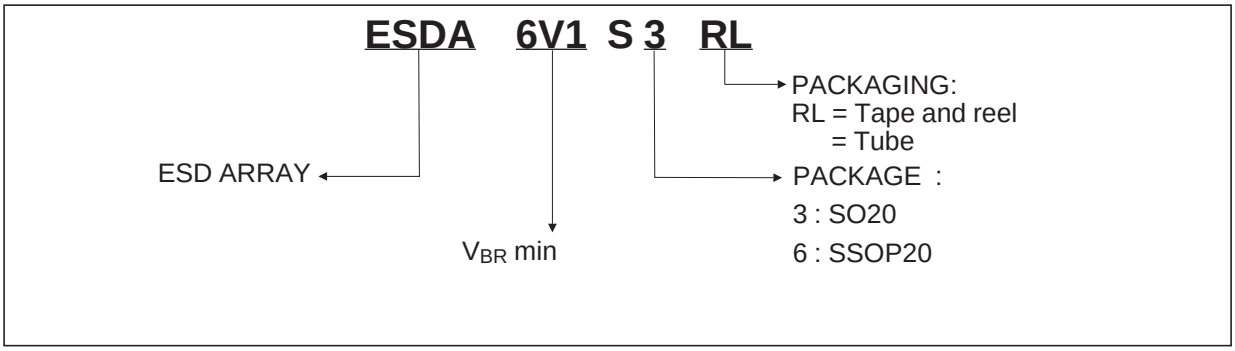
2 - Protection of symmetrical signals.
Note : Capacitance value between any I/O pin and Ground is divided by 2.



Implementing its ASD™ technology, STMicroelectronics has developed a monolithic TRANSIL diode array, which is a reliable protection against electrostatic overloads for computer I/O ports, modems, GSM handsets and accessories or other similar systems with data outputs. The ESDAxxSx integrates 18 TRANSIL diodes in a compact package that can be easily mounted close to the circuitry to be protected, eliminating the assembly costs associated with the use of discrete diodes, and also increasing system reliability.

Each TRANSIL has a breakdown voltage between 6.2V (minimum) and 7.2V (maximum). When the input voltage is lower than the breakdown voltage, the diodes present a high impedance to ground. For short overvoltage pulses, the fast-acting diodes provide an almost instantaneous response, clamping the voltage to a safe level.

ORDER CODE



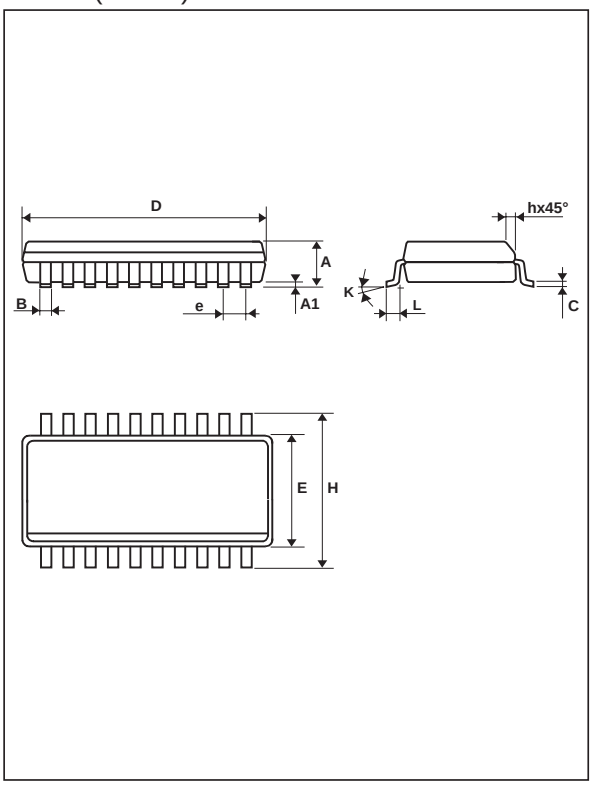
MARKING : Logo, date code

TYPE	MARKING
ESDA6V1S3	E6V1S3
ESDA6V2S6	ESDA6V2S6

Packaging : Preferred packaging is tape and reel.

PACKAGE MECHANICAL DATA

SO-20 (Plastic)

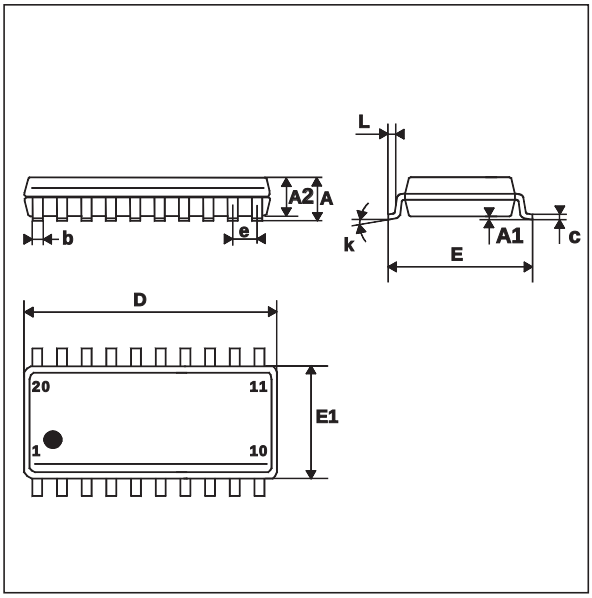


REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.35		2.65	0.092		0.104
A1	0.10		0.20	0.004		0.008
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	12.6		13.0	0.484		0.512
E	7.40		7.60	0.291		0.299
e		1.27			0.050	
H	10.0		10.65	0.394		0.419
h	0.25		0.75	0.010		0.029
L	0.50		1.27	0.020		0.050
K	8° (max)					

Weight : 0.55g.

PACKAGE MECHANICAL DATA

SSOP20 (Plastic)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			2.00			0.079
A1			0.25			0.010
A2	1.51		2.00	0.059		0.079
b	0.25	0.30	0.35	0.010	0.012	0.014
c	0.10		0.35	0.004		0.014
D	7.05		8.05	0.278		0.317
E	7.60		8.70	0.299		0.343
E1	5.02	6.10	6.22	0.198	0.240	0.245
e		0.65			0.026	
k	0°		10°	0°		10°
L	0.25	0.50	0.80	0.010	0.020	0.031

Weight : 0.18g.