

ESDA25B1

Application Specific Discretes A.S.D.TM

TRANSILTM ARRAY FOR ESD PROTECTION

APPLICATIONS

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

- COMPUTER
- PRINTERS
- COMMUNICATION SYSTEMS

It is particulary recommended for RS232 I/O port protection where the line interface withstands only 2 kV ESD surges.

FEATURES

- 6 BIDIRECTIONAL TRANSIL™ FUNCTIONS
- VERY LOW CAPACITANCE: C= 20 pF @ V_{RM}
- 150 W peak pulse power (8/20 µs)

DESCRIPTION

The ESDA25B1 is a monolithic voltage suppressor designed to protect components which are connected to data and transmission lines against EDS.

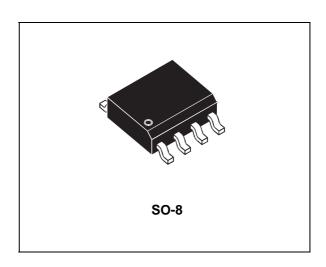
BENEFITS

High ESD protection level : up to 25 kV High integration Suitable for high density boards

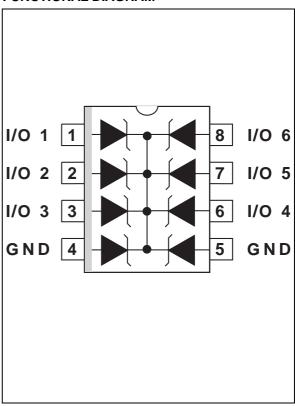
COMPLIES WITH THE FOLLOWING STANDARDS:

IEC 1000-4-2: level 4

MIL STD 883C-Method 3015-6 : class 3 (human body model)



FUNCTIONAL DIAGRAM



October 1999 - Ed : 2

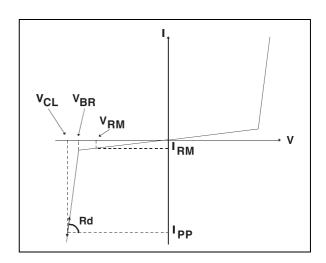
ESDA25B1

ABSOLUTE MAXIMUM RATINGS (Tamb = 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)	150	W
T _{stg} T _j	Storage temperature range Maximum junction temperature	- 55 to + 150 125	္ခိုင္
TL	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				
VcL	Clamping voltage				
I _{RM}	Leakage current				
lpp	Peak pulse current				
αΤ	Voltage temperature coefficient				
С	Capacitance				
Rd	Dynamic resistance				



Types	V _{BR} @		I _R	I _{RM} @) V _{RM}	Rd	αΤ	С
	min.	max.		max.		typ.	max.	typ.
	note 1			note 1		note 2	note 3	0V bias
	V	V	mA	μΑ	V	Ω	10 ⁻⁴ /°C	pF
ESDA25B1	25	30	1	2	24	1.5	9.7	15

 $\begin{array}{l} \textbf{note 1}: \mbox{Between any I/O pin and Groung} \\ \textbf{note 2}: \mbox{Square pulse}, \mbox{ Ipp} = 25\mbox{A}, \mbox{tp=2.5}\mbox{\mus}. \\ \textbf{note 3}: \mbox{ } \Delta \mbox{ } V_{BR} = \mbox{ } \alpha \mbox{T}^* \mbox{ } (\mbox{Tamb -}25^\circ\mbox{C}) \mbox{ } ^* \mbox{ } V_{BR} \mbox{ } (25^\circ\mbox{C}) \end{array}$

2/5

CALCULATION OF THE CLAMPING VOLTAGE

USE OF THE DYNAMIC RESISTANCE

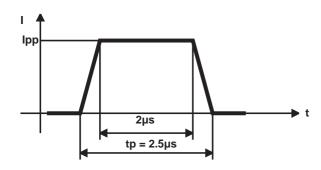
The ESDA family has been designed to clamp fast spikes like ESD. Generally the PCB designers need to calculate easily the clamping voltage V_{CL} . This is why we give the dynamic resistance in addition to the classical parameters. The voltage across the protection cell can be calculated with the following 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 $8/20\mu s$ and $10/1000\mu s$ surges.



2.5µs duration measurement wave.

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

ESDA25B1

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

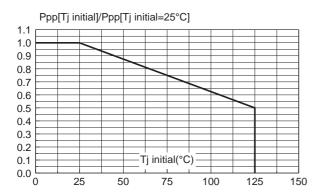


Fig. 2: Peak pulse power versus exponential pulse duration (Tj initial = 25 °C).

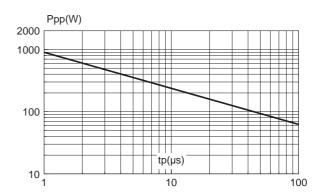


Fig. 3 : Clamping voltage versus peak pulse current (Tj initial = 25 °C). Rectangular waveform tp = $2.5 \,\mu s$.

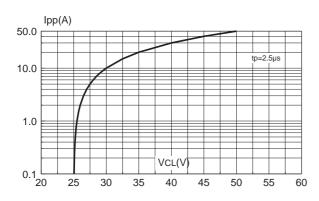


Fig. 4: Capacitance versus reverse applied voltage (typical values).

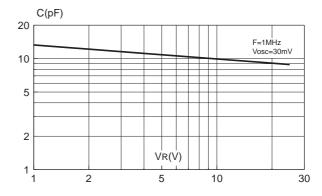
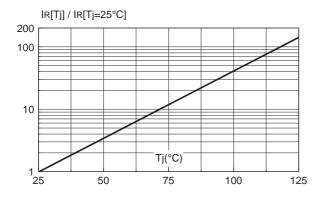
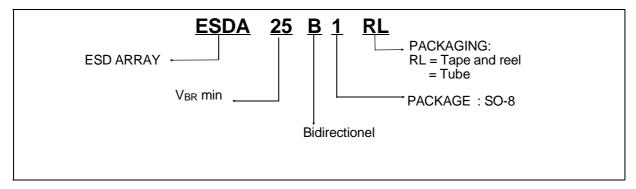


Fig. 5: Relative variation of leakage current versus junction temperature (typical values).



4/5

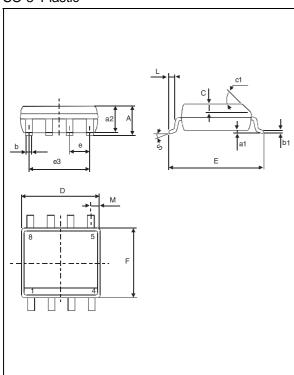
ORDER CODE



MARKING: Logo, Date Code, E25B1

PACKAGE MECHANICAL DATA

SO-8 Plastic



	DIMENSIONS							
REF.	Mi	Illimete	ers	Inches				
	Min.	Тур.	Max.	Min.	Тур.	Max.		
Α			1.75			0.069		
a1	0.1		0.25	0.004		0.010		
a2			1.65			0.065		
a3	0.65		0.85	0.026		0.033		
b	0.35		0.48	0.014		0.019		
b1	0.19		0.25	0.007		0.010		
С	0.25		0.5	0.010		0.020		
c1			45°	(typ)				
D	4.8		5.0	0.189		0.197		
Е	5.8		6.2	0.228		0.244		
е		1.27			0.050			
e3		3.81			0.150			
F	3.8		4.0	0.15		0.157		
L	0.4		1.27	0.016		0.050		
М			0.6			0.024		
S	8° (max)							

Packaging: Preferred packaging is tape and reel.

Weight: 0.08g.

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ESD119B1W01005E6327XTSA1 ESD5V0L1B02VH6327XTSA1 ESD7451N2T5G 19180-510 CPDT-5V0USP-HF 3.0SMCJ33CA-F
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