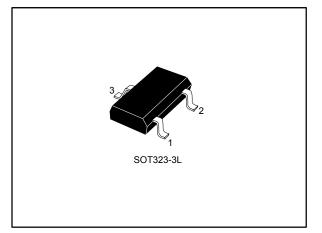


ESDA37W

Dual Transil[™] array for ESD protection

Datasheet - production data



Features

- Unidirectional device
- Low leakage current (I_R max. < 1 μA at V_{RM})
- 300 W peak pulse power (8/20 µs)

Benefits

- High ESD protection level: up to 30 kV
- High integration
- Suitable for high density boards

Complies with the following standards

- IEC 61000-4-2 (exceeds level 4) :
 - 30 kV (air discharge)
 - 30 kV (contact discharge)

Applications

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

- Entertainment
- Signal communications
 - Connectivity
 - Comfort and convenience

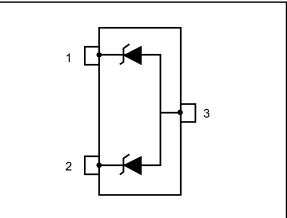
Description

This device is a diode array designed to protect 1 line or 2 lines against ESD transients.

The device is ideal for applications where both reduced line capacitance and board space saving are required.

It can also be used a bidirectional suppressor by connecting only pin 1 and 2.

Figure 1: Functional diagram



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This is information on a product in full production.

1 Characteristics

Table 1: Absolute maximum ratings (T_{amb} = 25 °C)

Symbol	Parameter	Value	Unit		
		IEC 61000-4-2:			
V _{pp}	Peak pulse voltage ⁽¹⁾	Contact discharge	30	kV	
		Air discharge	30		
P _{pp}	Peak pulse power (8/20 µs)	300	W		
I _{pp}	Peak pulse current (8/20 µs)	ESDA37W	6.3	А	
Tj	Operating junction temperature range	-40 to 150	°C		
T _{stg}	Storage junction temperature range	-65 to 150	°C		
ΤL	Maximum lead temperature for soldering during 10 s at 5 mm from case260				

Notes:

 $^{(1)}\mbox{For}$ a surge greater than the maximum values, the diode will fail in short-circuit.

$\begin{array}{l} \text{Symbol} \\ \text{V}_{\text{BR}} &= \\ \text{V}_{\text{CL}} &= \\ \text{V}_{\text{RM}} &= \\ \text{I}_{\text{RM}} &= \\ \text{I}_{\text{F}} &= \\ \text{I}_{\text{PP}} &= \\ \text{I}_{\text{R}} &= \\ \text{V}_{\text{F}} &= \\ \text{C} &= \\ \text{R}_{\text{d}} &= \\ \alpha \text{T} &= \end{array}$	Parameter Breakdown voltage Clamping voltage Stand-off voltage Leakage current Forward current Peak pulse current Breakdown current Forward voltage drop Capacitance Dynamic impedance Voltage temperature	VBR VdI ▼ VRM Slope = 1/Rd	I ▲ IF VF IRM
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Figure 2: Electrical characteristics (definitions)

	١	∕ _{BR} at I _R		I _{RM} at	Vrm	Rd ⁽¹⁾	αT ⁽²⁾	Cline	V _F a	t IF
Order code	Min.	Max.		Max.		Тур.	Max.	Typ. at 0 V bias	Max.	
	v	v	mA	μA	v	mΩ	10 ⁻⁴ /°C	pF	v	mA
ESDA37W	37	43.3	1	1	36	2400	11	48	0.9	10

Notes:

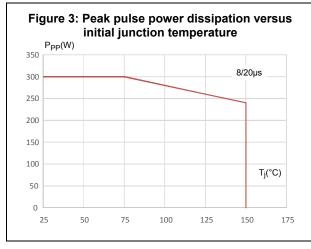
 $^{(1)}Square$ pulse I_{pp} = 15 A, t_p = 2.5 μs

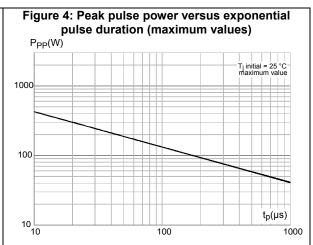
 $^{(2)}\Delta$ V_{BR} = α T x (T_{amb} -25 °C) x V_{BR} (25 °C)

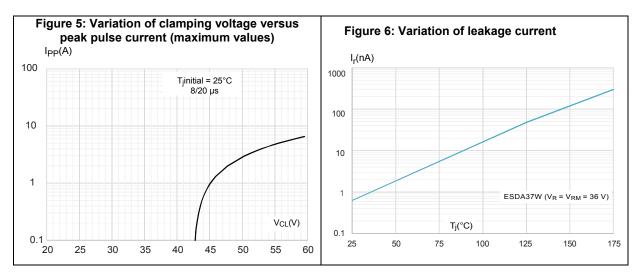


ESDA37W

1.1 Characteristics (curves)









2 Application and design guidelines

Refer to STMicroelectronics application note:

• AN2689: Protection of automotive electronics from electrical hazards, guidelines for design and component selection.

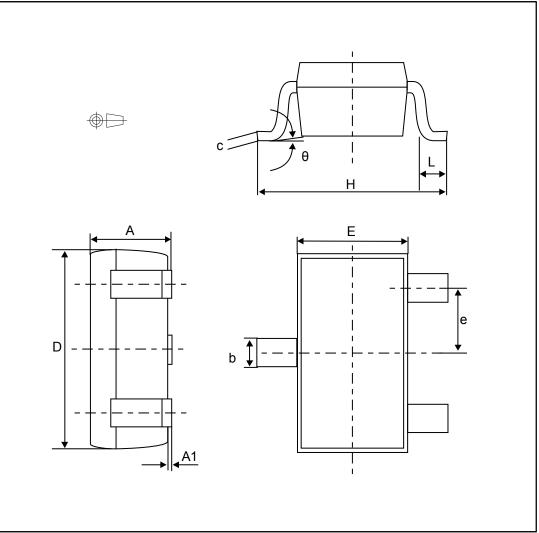


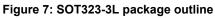
3 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK[®] is an ST trademark.

- Epoxy meets UL 94,V0
- Lead-free package

3.1 SOT323-3L package information





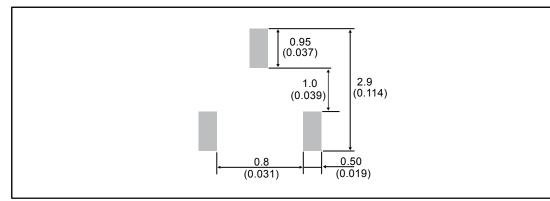


Package information

ESDA37W

Table 3: SOT323-3L package mechanical data								
	Dimensions							
Ref.		Millimeters		Inches				
	Min.	Тур.	Max.	Min.	Тур.	Max.		
A	0.8		1.1	0.031		0.043		
A1	0.0		0.1	0.000		0.003		
b	0.25		0.4	0.0098		0.0157		
с	0.1		0.26	0.003		0.0102		
D	1.8	2.0	2.2	0.070	0.078	0.086		
E	1.15	1.25	1.35	0.0452	0.0492	0.0531		
е	0.60	0.65	0.70	0.024	0.026	0.028		
Н	1.8	2.1	2.4	0.070	0.082	0.094		
L	0.1	0.2	0.30	0.004	0.008	0.012		
θ	0		30°	0		30°		

Figure 8: SOT323-3L recommended footprint (dimensions in inches)





4 **Recommendation on PCB assembly**

4.1 Solder paste

- 1. Halide-free flux qualification ROL0 according to ANSI/J-STD-004.
- 2. "No clean" solder paste is recommended.
- 3. Offers a high tack force to resist component movement during high speed.
- 4. Use solder paste with fine particles: powder particle size 20-45 μ m.

4.2 Placement

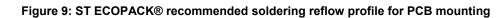
- 1. Manual positioning is not recommended.
- 2. It is recommended to use the lead recognition capabilities of the placement system, not the outline centering
- 3. Standard tolerance of ± 0.05 mm is recommended.
- 4. 3.5 N placement force is recommended. Too much placement force can lead to squeezed out solder paste and cause solder joints to short. Too low placement force can lead to insufficient contact between package and solder paste that could cause open solder joints or badly centered packages.
- 5. To improve the package placement accuracy, a bottom side optical control should be performed with a high resolution tool.
- 6. For assembly, a perfect supporting of the PCB (all the more on flexible PCB) is recommended during solder paste printing, pick and place and reflow soldering by using optimized tools.

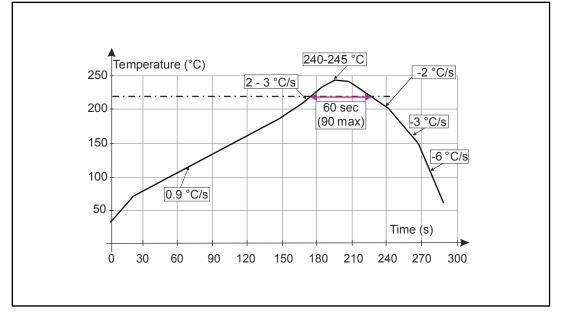
4.3 PCB design preference

- 1. To control the solder paste amount, the closed via is recommended instead of open vias.
- 2. The position of tracks and open vias in the solder area should be well balanced. A symmetrical layout is recommended, to avoid any tilt phenomena caused by asymmetrical solder paste due to solder flow away.



4.4 Reflow profile





3

Minimize air convection currents in the reflow oven to avoid component movement.



5 Ordering information

	ESDA	XX W
ESD Array		
Minimum breakdown voltage		
Package		
N= SOT323-3L		

Table 4: Ordering information

Order code	Marking ⁽¹⁾ Package		Weight Base qty.		Delivery mode	
ESDA37W	ESDA37W E37 SOT323-3L		6.6 mg	3000	Tape and reel	

Notes:

 $^{(1)}\mbox{The}$ marking can be rotated by multiples of 90° to differentiate assembly location.

6 Revision history

Table 5: Document revision history

Date	Revision	Changes
18-Dec-2017	1	First issue.



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