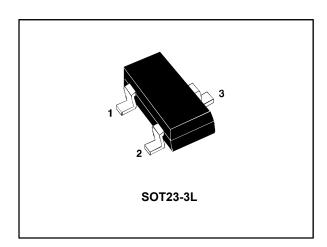


Automotive dual Transil™ array for ESD protection

Datasheet - production data



Features

- AEC-Q101 qualified
- Dual unidirectional Transil functions
- Low leakage current: I_R max. < 20 μA at V_{BR}
- 300 W peak pulse power (8/20 μs)

Benefits

- High ESD protection level: up to 25 kV
- High integration
- Suitable for high density boards
- AEC-Q101 qualified

Complies with the following standards

- ISO 10605: C = 330 pF, R = 330 Ω
 - 30 kV (air discharge)
 - 30 kV (contact discharge)
- ISO 7637-3 fast transient
 - Pulse a: V_S = -150 V
 - Pulse b: V_S = +100 V
- ISO 7637-3 slow transient
 - Positive pulse: V_S = +85 V
 Negative pulse: V_S = -85 V

Applications

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

- Entertainment
- Signal communications
- Connectivity
- Comfort and convenience

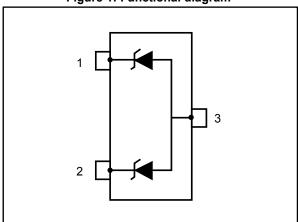
Description

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 as bidirectional suppressor by connecting only pin 1 and 2.

Figure 1: Functional diagram



Characteristics ESDALY

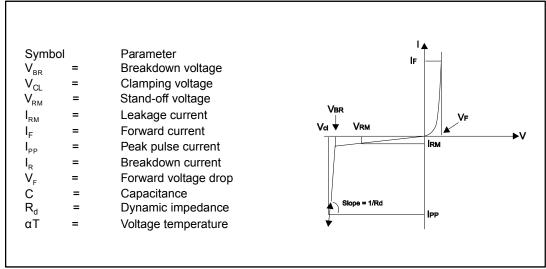
1 Characteristics

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

Symbol	F	Value	Unit	
V_{pp}		ISO 10605 (C = 330 pF, R = 330 Ω):	20	
	Peak pulse voltage ⁽¹⁾	Contact discharge	30	
		Air discharge	30	kV
		ISO 10605 (C = 150 pF, R = 330 Ω):	20	
		Contact discharge	30	
		Air discharge	30	
P_pp	Peak pulse power (8/20 μs)	300	W	
I _{pp}	Peak pulse current (8/20 μs)	ESDA5V3LY		
		ESDA6V1LY		
		ESDA14V2LY	14	Α
		ESDA25LY		
		ESDA37LY	6.3	
Tj	Operating junction temperature	-40 to 150	°C	
T _{stg}	Storage junction temperature r	-65 to 150	°C	
TL	Maximum temperature for sold	260	°C	

Notes:

Figure 2: Electrical characteristics (definitions)



47/

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

ESDALY Characteristics

Table 2: Electrical characteristics (T_{amb} = 25 °C)

	V _{BR} at I _R		I _{RM} at V _{RM}		R _d ⁽¹⁾	αT ⁽²⁾	Cline	V _F at I _F		
Order code	Min.	Max.		Max.		Тур.	Max.	Typ. at 0 V bias	Max.	
	V	٧	mA	μΑ	V	mΩ	10 ⁻⁴ /°C	pF	٧	mA
ESDA5V3LY	5.3	5.9	1	2	3	280	5	220	1.25	200
ESDA6V1LY	6.1	7.2	1	20	5.25	350	6	140	1.25	200
ESDA14V2LY	14.2	15.8	1	5	12	650	11	90	1.25	200
ESDA25LY	25	30	1	1	24	1000	11	50	1.2	10
ESDA37LY	37	43.3	1	1	36	2400	11	48	0.9	10

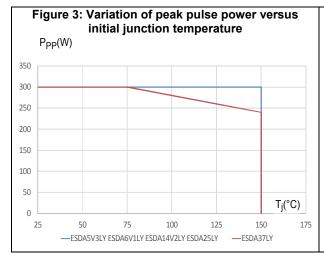
Notes:

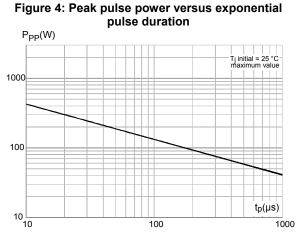
 $^{^{(1)}} Square$ pulse I_{pp} = 15 A, t_{p} = 2.5 μs

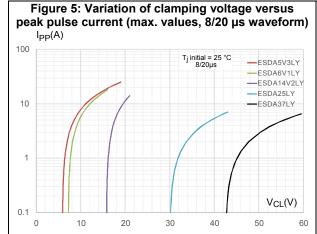
 $^{^{(2)}\!\}Delta$ V_{BR} = α T x (T_{amb} -25 °C) x V_{BR} (25 °C)

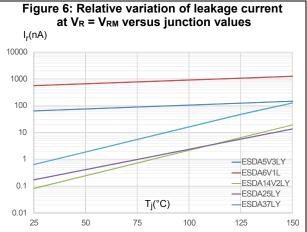
Characteristics ESDALY

1.1 Characteristics (curves)





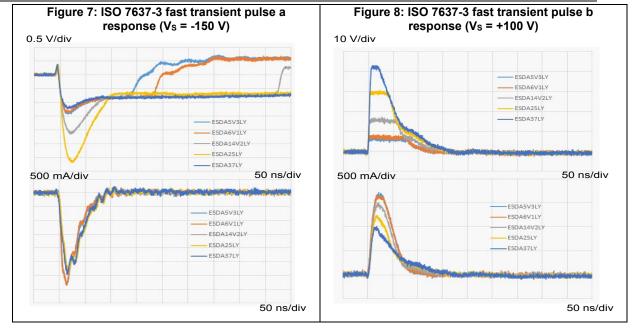


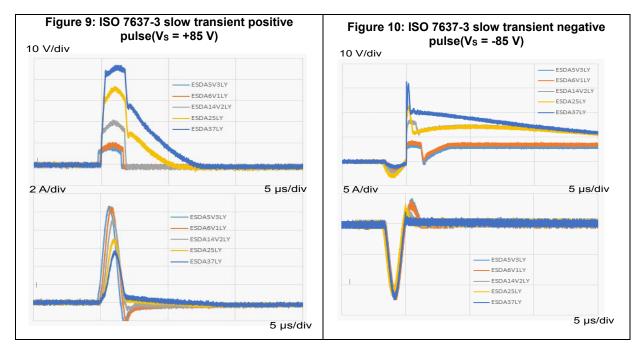


57

4/12 DocID022075 Rev 2

ESDALY Characteristics







2 Application and design guidelines

Refer to STMicroelectronics application note:

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

4

ESDALY Package information

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.

Figure 11: SOT23-3L package outline

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

3.1 SOT23-3L mechanical data

D

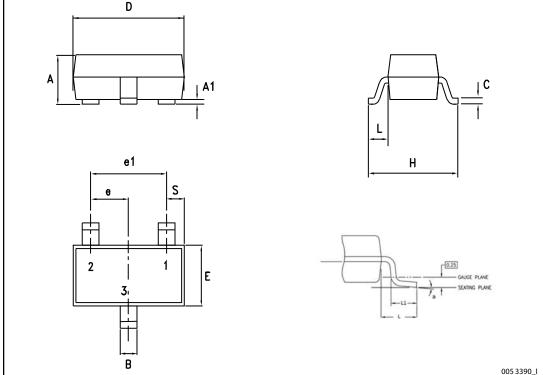
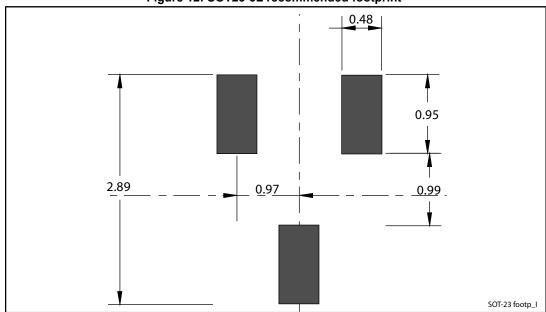


Table 3: SOT23-3L mechanical data

I also of the first of the firs							
Dim.	mm						
Dilli.	Min.	Тур.	Max.				
Α	0.89		1.40				
A1	0		0.10				
В	0.30		0.51				
С	0.085		0.18				
D	2.75		3.04				
е	0.85		1.05				
e1	1.70		2.10				
E	1.20		1.75				
Н	2.10		3.00				
L		0.60					
S	0.35		0.65				
L1	0.25		0.55				
а	0°	0°					

Figure 12: SOT23-3L recommended footprint





Dimensions are in mm.

7/

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 μm.

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

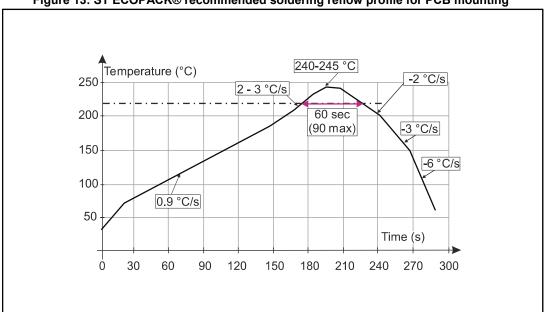
- 1. To control the solder paste amount, the closed via is recommended instead of open vias.
- The position of tracks and open vias in the solder area should be well balanced. A symmetrical layout is recommended, to avoid any tilt phenomena caused by asymmetrical solder paste due to solder flow away.



DocID022075 Rev 2

4.4 Reflow profile

Figure 13: ST ECOPACK® recommended soldering reflow profile for PCB mounting





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

47/

ESDALY Ordering information

5 Ordering information

Figure 14: Ordering information scheme

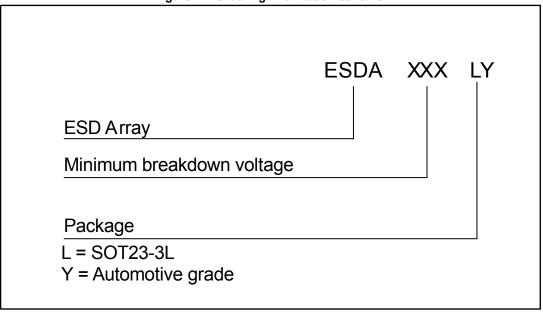


Table 4: Ordering information

Order code	Marking ⁽¹⁾	Package	Weight	Base qty.	Delivery mode
ESDA5V3LY	EL5Y				
ESDA6V1LY	EL6Y	SOT23-3L	0.7		
ESDA14V2LY	EL1Y		8.7 mg	3000	Tape and reel
ESDA25LY	EL2Y				
ESDA37LY	EL3Y		9.8 mg		

Notes

6 Revision history

Table 5: Document revision history

Date	Revision	Changes		
16-Feb-2012 1		Initial version. This document merges and updates the content of the datasheet ESDA25LY Revision 1, 01-Feb-2010.		
20-Jul-2017	2	Added ESDA37LY package information.		

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

IMPORTANT NOTICE - PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics - All rights reserved

