

Features

- Array of 8 or 12 diodes
- Low input capacitance
- Suitable for digital line protection

Complies with following standards:

- IEC 61000-4-2 Level 4
 - 15kV (air discharge)
 - 8kV (contact discharge)

Applications

- Protection of logic side of ISDN S-interface
- Protection of I/O lines of microcontroller
- Signal conditioning

Description

Array of 8 or 12 diodes configured by cells of 2 diodes, each cell being used to protect signal line from transient overvoltages by clamping action.

As maximum voltage of each diode is 18 V, maximum input voltage range between two I/Os is either 0 V to 18 V (REF1 = 0 V and REF2 = +18 V) or -9 V to +9 V (REF1 = -9 V and REF2 = +9 V)

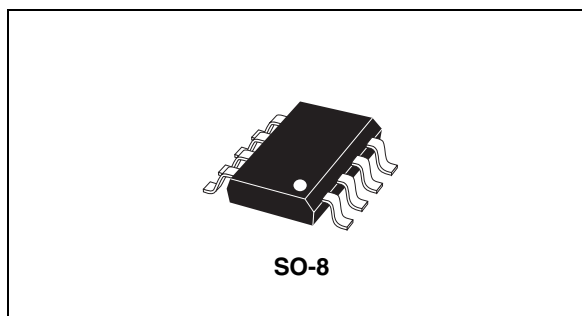


Figure 1. Functional diagram: DA108S1

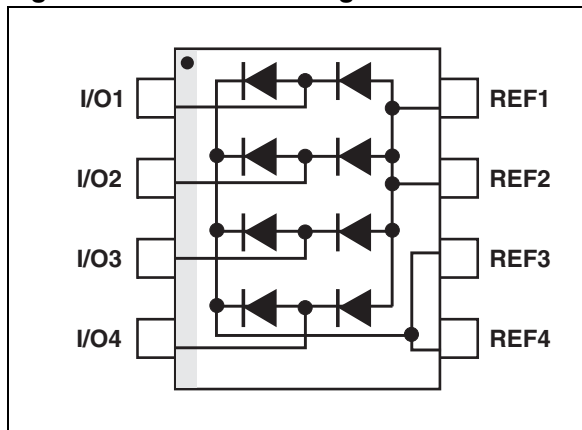
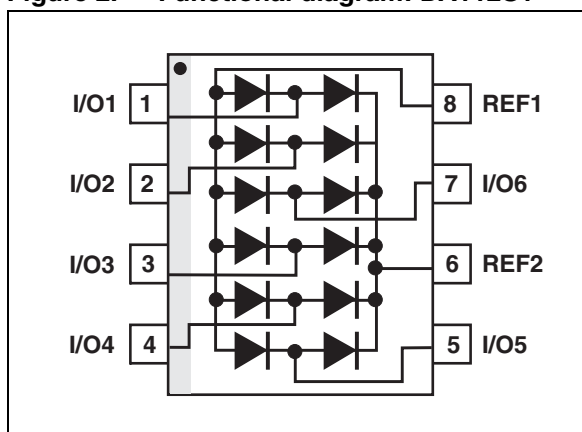


Figure 2. Functional diagram: DA112S1



1 Characteristics

Table 1. Absolute maximum ratings ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive peak reverse voltage (for one single diode)	18	V
I_{PP}	Repetitive peak forward current ⁽¹⁾	$t_p = 8/20\ \mu\text{s}$	A
P	Power dissipation	0.73	W
T_{stg}	Storage temperature range	-55 to +150	$^{\circ}\text{C}$
T_j	Operating junction temperature range	-55 to +150	$^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering during 10 s.	260	$^{\circ}\text{C}$

1. The surge is repeated after the device returns to ambient temperature

Table 2. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient	170	$^{\circ}\text{C/W}$

Table 3. Electrical characteristics ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter		Max.	Unit	
V_{FP}	Peak forward voltage	$I_{PP} = 12\ \text{A}$, $t_p = 8/20\ \mu\text{s}$	DA108S1 DA112S1	9 12	V
V_F	Forward voltage	$I_F = 50\ \text{mA}$		1.2	V
I_R	Reverse leakage current	$V_R = 15\ \text{V}$		2	μA

Figure 3. Input capacitance

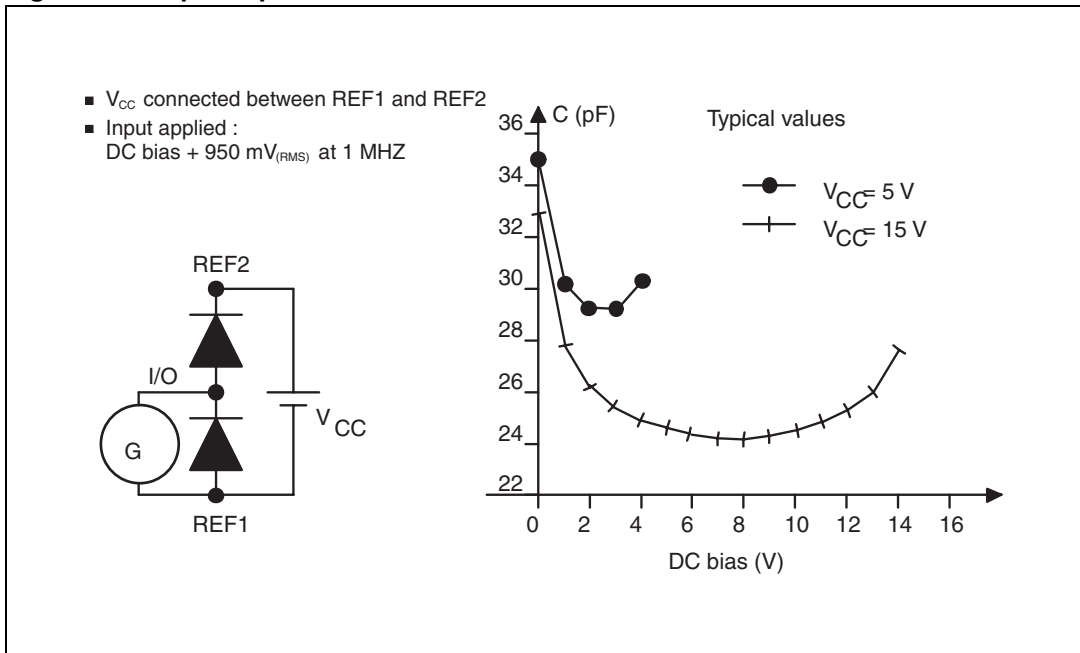


Figure 4. Typical peak forward voltage characteristics (8/20 μs pulse)

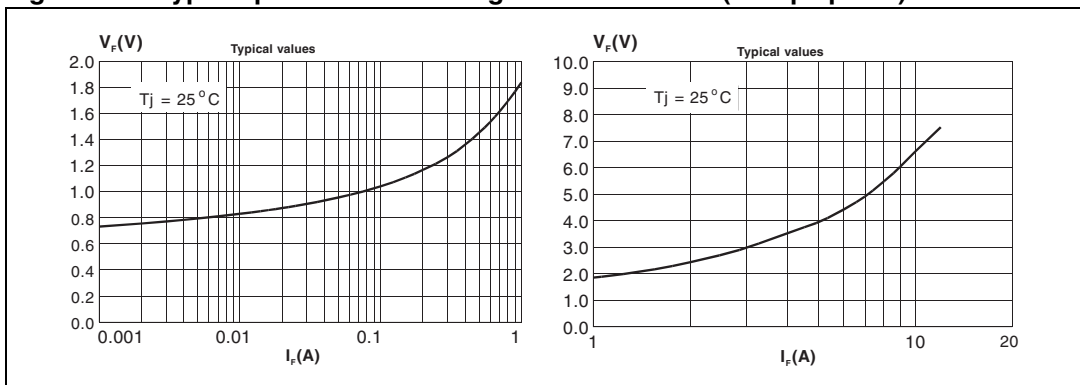


Figure 5. Application 1: ISDN interface protection, residual lightning surges at transformer secondary are suppressed by DA108S1

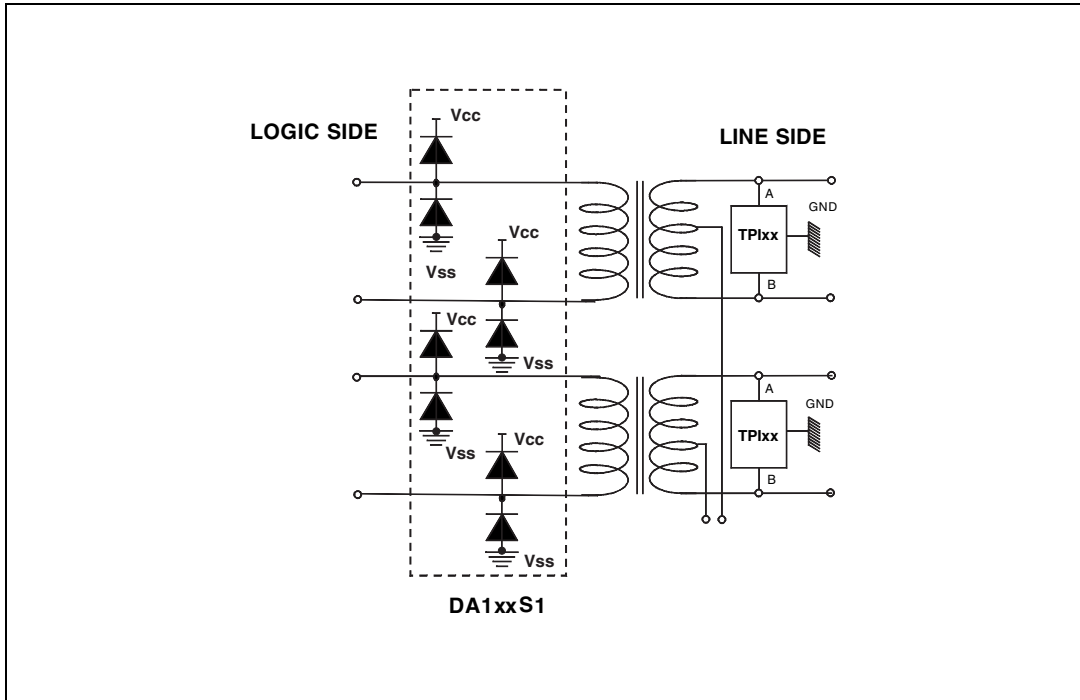
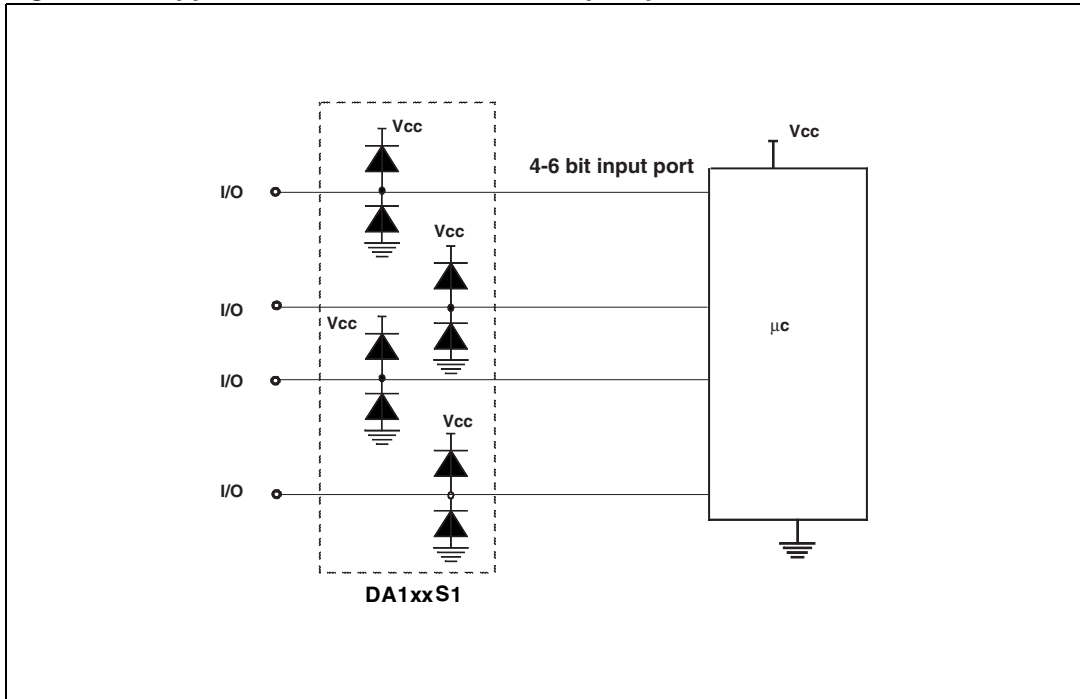


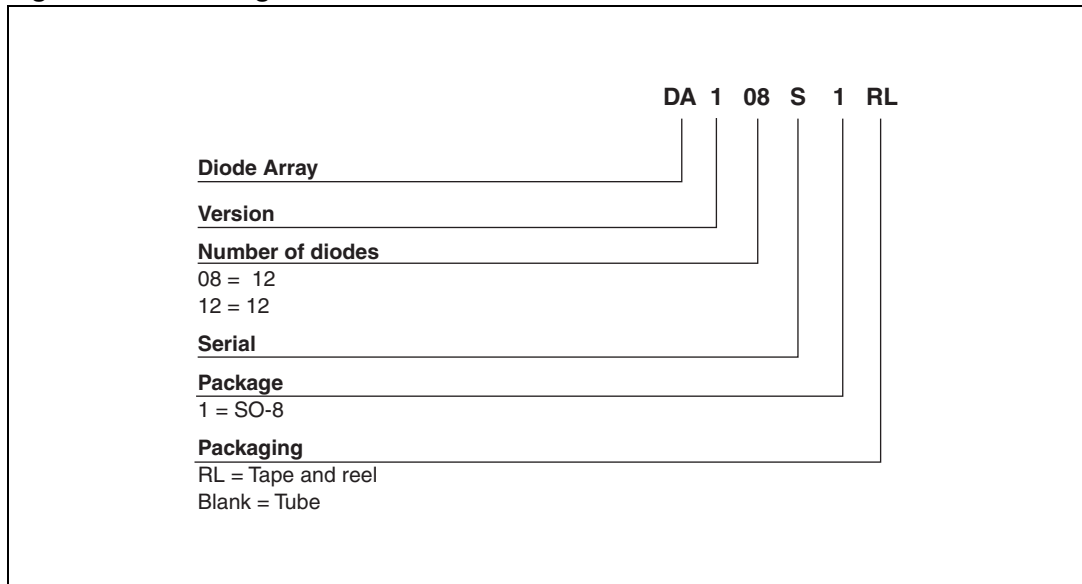
Figure 6. Application 2: microcontroller I/O port protection



Note: **IMPORTANT** : DA108S1 must be connected to the reference voltages through REF1 and REF2.

2 Ordering information scheme

Figure 7. Ordering information scheme



3 Package mechanical data

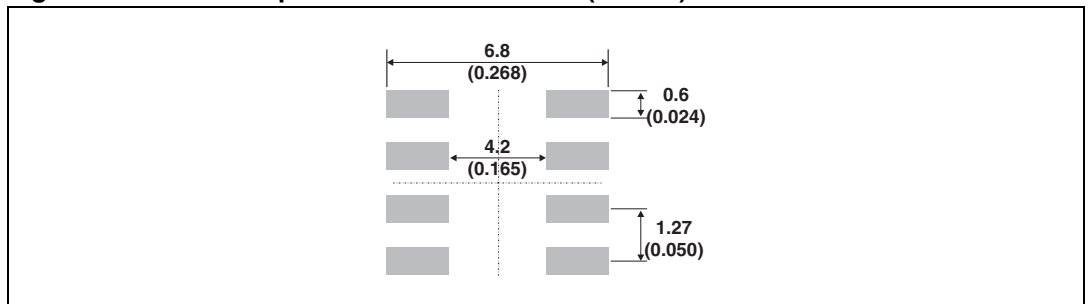
- Epoxy meets UL94, V0

In order to meet environmental requirements, ST offers these devices in ECOPACK[®] packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at www.st.com.

Table 4. SO-8 dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
A1	0.1		0.25	0.004		0.010
A2	1.25			0.049		
b	0.28		0.48	0.011		0.019
C	0.17		0.23	0.007		0.009
D	4.80	4.90	5.00	0.189	0.193	0.197
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e		1.27			0.050	
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
L1		1.04			0.041	
k°	0		8	0		8
ccc			0.10			0.004

Figure 8. SO-8 footprint dimensions in mm (inches)



4 Ordering information

Figure 9. Ordering information

Order codes	Marking	Package	Weight	Base qty	Delivery mode
DA108S1	DA108S	SO-8	0.11 g	100	Tube
DA108S1RL				2500	Tape and reel ⁽¹⁾
DA112S1	DA112S			100	Tube
DA112S1RL				2500	Tape and reel ⁽¹⁾

1. Preferred packaging is tape and reel

5 Revision history

Figure 10. Revision history

Date	Revision	Changes
Aug-2001	4	Previous release.
15-Feb-2007	5	Reformatted to current standard. Standard typing error corrected.
15-Jan-2008	6	Reformatted to current standards. Added paragraph on maximum input voltage range to Description . Parameters updated in Table 1 . Added Pin 1 marker to package illustration. Added Figure 8: SO-8 footprint dimensions in mm (inches) .

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2008 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com