

ESD Protection Diode Array

Low Capacitance ESD Protection Diode for High Speed Data Line

ESD1014

The ESD1014 surge protection is designed to protect high speed data lines from ESD, EFT, and lightning.

Features

- Low Capacitance (6 pF Maximum Between I/O Lines and GND)
- ESD Rating of Class 3B (Exceeding 8 kV) per Human Body model and Class C (Exceeding 400 V) per Machine Model
- Protection for the Following IEC Standards:
IEC 61000-4-2 (ESD) Level 4 – 30 kV (Contact)
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- This is a Pb-Free Device

Typical Applications

- High Speed Communication Line Protection
- USB 1.1 and 2.0 Power and Data Line Protection
- Digital Video Interface (DVI)
- Monitors and Flat Panel Displays
- T1/E1 and T3/E3
- 10/100/1000 Ethernet Protection
- Gigabit Ethernet Protection

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 1)	P_{pk}	450	W
Maximum Peak Pulse Current (Note 1)	I_{pp}	30	A
Operating Junction Temperature Range	T_J	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature – Maximum (10 Seconds)	T_L	260	$^\circ\text{C}$
Machine Model (MM) Human Body Model (HBM) IEC 61000-4-2 Contact (ESD)	ESD	0.4 16 30	kV

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. 8/20 μs Waveform per Figure 2 (@ $T_A = 25^\circ\text{C}$).

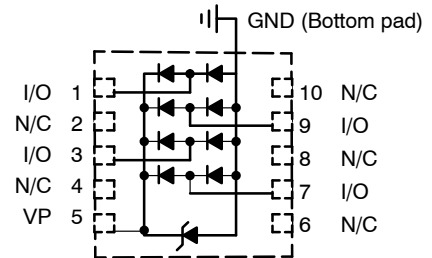


ON Semiconductor®

www.onsemi.com

LOW CAPACITANCE DIODE SURGE PROTECTION ARRAY

PIN CONFIGURATION AND SCHEMATIC



UDFN10
CASE 517AN

MARKING DIAGRAM



- 1014 = Specific Device Code
- A = Assembly Location
- Y = Year
- W = Work Week
- = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping†
ESD1014MUTAG	UDFN10 (Pb-Free)	3000 / Tape & Reel
SZESD1014MUTAG	UDFN10 (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

ESD1014

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	(Note 1)			3.3	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{ mA}$, (Note 2)	5.0	5.3		V
Reverse Leakage Current	I_R	$V_{RWM} = 3.3\text{ V}$			5.0	μA
Clamping Voltage	V_C	Pin 5 to GND, $I_{PP} = 1\text{ A}$			6.2	V
Clamping Voltage	V_C	Any I/O pin to GND $I_{PP} = 1\text{ A}$ $I_{PP} = 10\text{ A}$ $I_{PP} = 25\text{ A}$			7.5 9.0 11	V
Maximum Peak Pulse Current	I_{PP}	8/20 μs Waveform per Figure 2			30	A
Junction Capacitance	C_J	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ between I/O Pins and GND		3.8	5.0	pF
		$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ between I/O Pins		1.5	3.0	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

- Surge protection devices are normally selected according to the working peak reverse voltage (V_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.
- V_{BR} is measured at pulse test current I_T .

TYPICAL PERFORMANCE CURVES

($T_J = 25^\circ\text{C}$ unless otherwise noted)

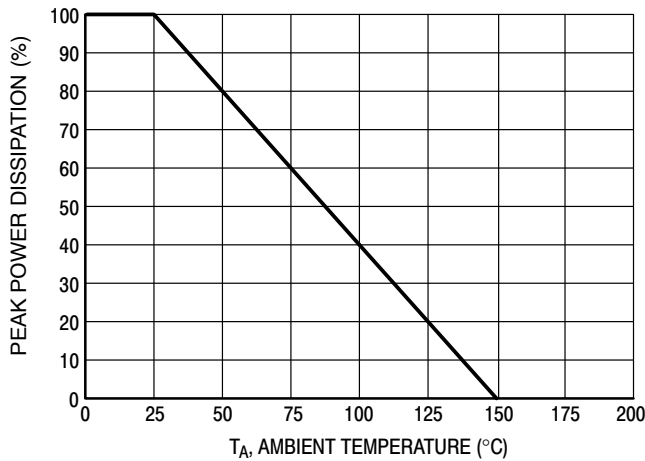


Figure 1. Pulse Derating Curve

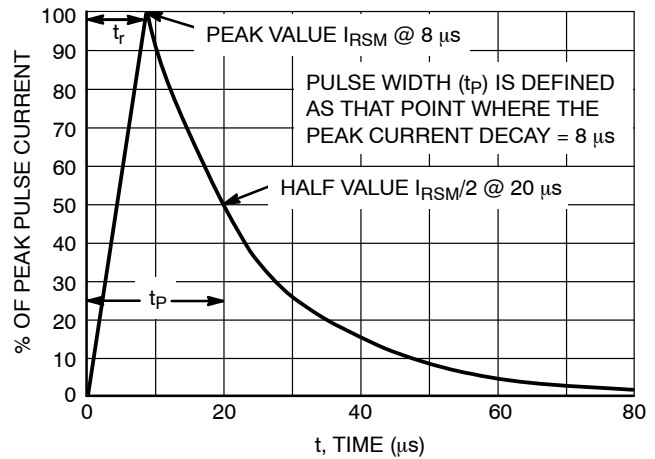


Figure 2. 8/20 μs Pulse Waveform

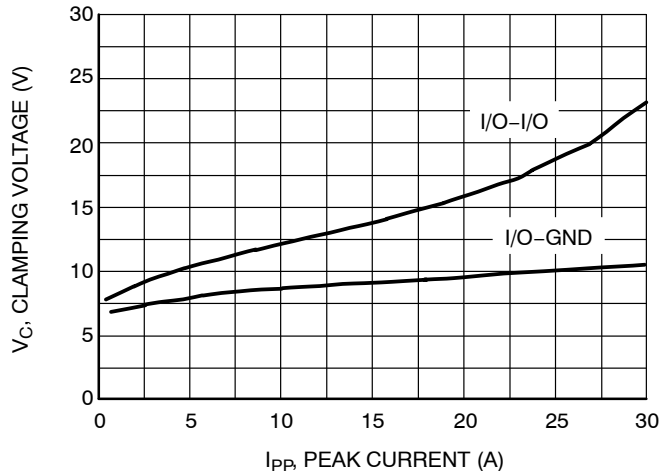


Figure 3. Clamping Voltage, 8/20 μs Waveform

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

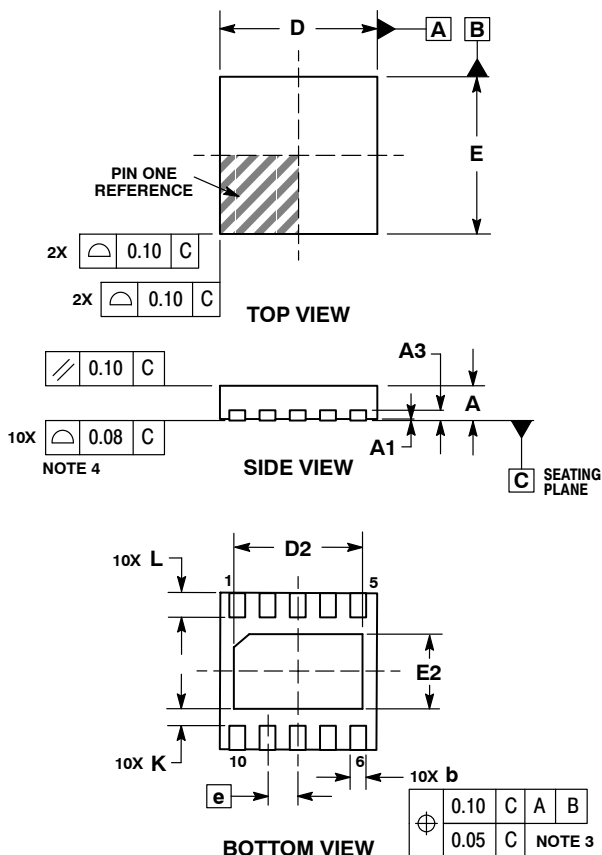
ON Semiconductor®



SCALE 2:1

UDFN10 2.6x2.6, 0.5P
CASE 517AN
ISSUE B

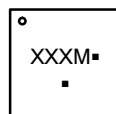
DATE 03 OCT 2012



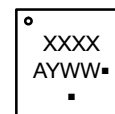
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM TERMINAL.
 4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

DIM	MILLIMETERS	
	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.127 REF	
b	0.20	0.30
D	2.60 BSC	
D2	2.00	2.25
E	2.60 BSC	
E2	1.11	1.36
e	0.50 BSC	
K	0.20	---
L	0.30	0.40

GENERIC MARKING DIAGRAMS*



IC



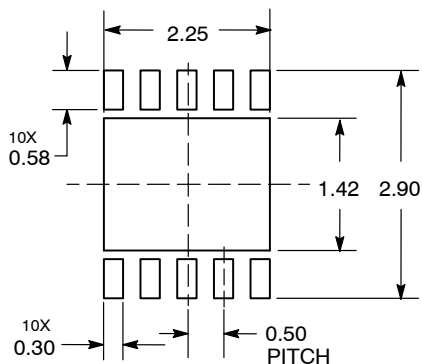
Discrete

- XXX = Specific Device Code
M = Month Code
▪ = Pb-Free Package
- XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

(*Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

DOCUMENT NUMBER:	98AON25522D	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	UDFN10 2.6X2.6, 0.5P	PAGE 1 OF 1

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales