

ESD1014

Low Capacitance ESD Protection Array for High Speed Data Lines Protection

The ESD1014 transient voltage suppressor 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)
- 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	P_{pk}	450	W
Maximum Peak Pulse Current 8 x 20 μS @ $T_A = 25^\circ\text{C}$	I_{pp}	25	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	$^\circ\text{C}$
Human Body Model (HBM) Machine Model (MM) IEC 61000-4-2 Contact (ESD)	ESD	16000 400 30000	V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

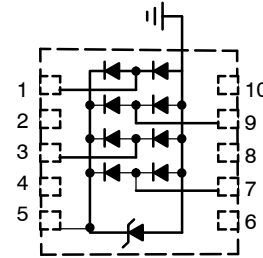


ON Semiconductor®

<http://onsemi.com>

LOW CAPACITANCE DIODE TVS 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

†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	$I_{PP} = 1\text{ A}$, pin 5 to GND			6.2	V
Clamping Voltage	V_C	$I_{PP} = 1\text{ A}$			7.5	V
Clamping Voltage	V_C	$I_{PP} = 10\text{ A}$			9.0	V
Clamping Voltage	V_C	$I_{PP} = 25\text{ A}$			11	V
Maximum Peak Pulse Current	I_{PP}	$8 \times 20\ \mu\text{s}$ Waveform			25	A
Junction Capacitance	C_J	$V_R = 0\text{ V}$, $f=1\text{ MHz}$ between I/O Pins and GND		3.8	6.0	pF
Junction Capacitance	C_J	$V_R = 0\text{ V}$, $f=1\text{ MHz}$ between I/O Pins		1.5	3.0	pF

1. TVS 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.
2. V_{BR} is measured at pulse test current I_T .

TYPICAL PERFORMANCE CURVES

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

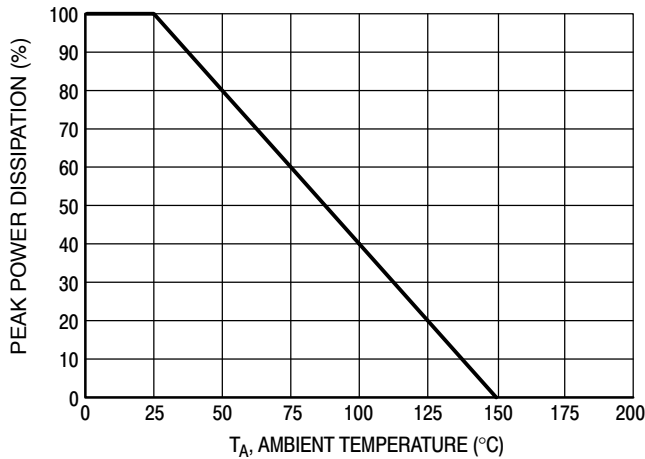


Figure 1. Pulse Derating Curve

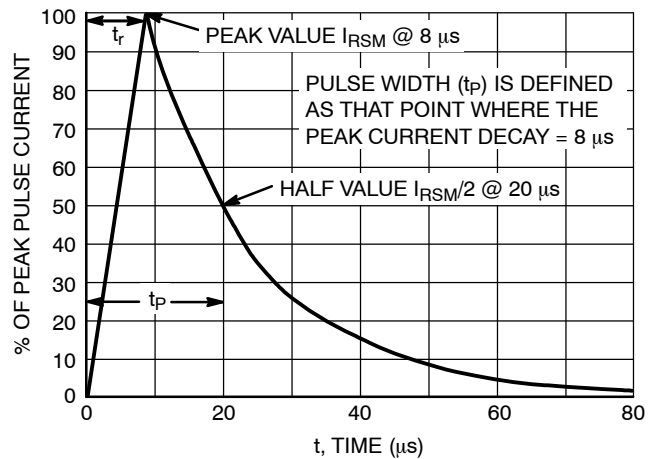
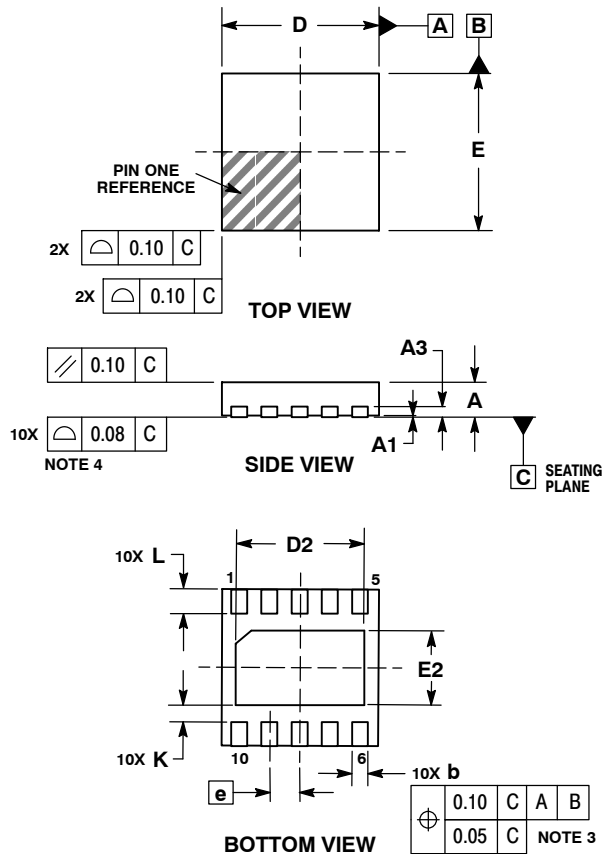


Figure 2. $8 \times 20\ \mu\text{s}$ Pulse Waveform

ESD1014

PACKAGE DIMENSIONS

UDFN10 2.6x2.6, 0.5P CASE 517AN-01 ISSUE O

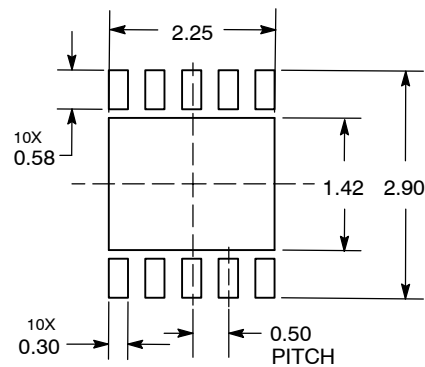


NOTES:

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

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.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative