NUP3112UPMU

Quad Transient Voltage Suppressor Array

ESD Protection Diodes with Ultra−Low (0.7 pF) Capacitance

The three−line voltage transient suppressor array is designed to protect voltage−sensitive components that require ultra−low capacitance from ESD and transient voltage events. This device features a common anode design which protects three independent high speed data lines and a V_{CC} power line in a single six−lead UDFN low profile package.

Excellent clamping capability, low capacitance, low leakage, and fast response time make these parts ideal for ESD protection on designs where board space is at a premium. Because of its low capacitance, it is suited for use in high frequency designs such as a USB 2.0 high speed.

Features

- Low Capacitance Data Lines (0.7 pF Typical)
- Protects up to Three Data Lines Plus a V_{CC} Pin
- UDFN Package, 1.6 x 1.6 mm
- Low Profile of 0.50 mm for Ultra Slim Design
- ESD Rating: IEC61000−4−2: Level 4
  − Contact (14 kV)
- V_{CC} Pin = 15 V Protection
- D_1, D_2, and D_3 Pins = 5.2 V Minimum Protection
- This is a Pb−Free Device

Typical Applications

- USB 2.0 High−Speed Interface
- Cell Phones
- MP3 Players
- SIM Card Protection

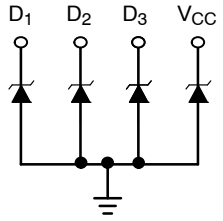
MAXIMUM RATINGS (T_J = 25°C, unless otherwise specified)

Symbol	Rating	Value	Unit
T_J	Operating Junction Temperature Range	−40 to 125	°C
T_{STG}	Storage Temperature Range	−55 to 150	°C
T_L	Lead Solder Temperature − Maximum (10 seconds)	260	°C
ESD	IEC 61000−4−2 Contact	14000	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.

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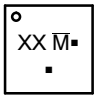
http://onsemi.com



MARKING DIAGRAM



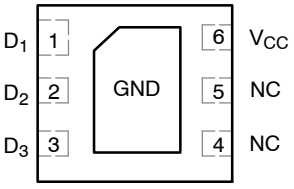
UDFN6 1.6x1.6
MU SUFFIX
CASE 517AP



XX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

PIN CONNECTIONS



ORDERING INFORMATION

Device	Package	Shipping†
NUP3112UPMUTAG	UDFN6 (Pb−Free)	3000/Tape & Reel

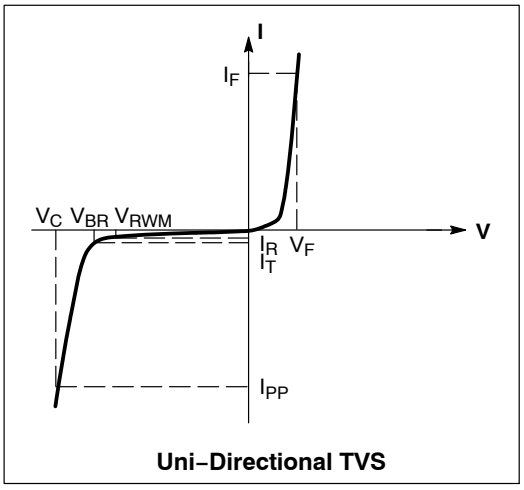
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F
P_{pk}	Peak Power Dissipation
C	Max. Capacitance @ V_R = 0 and f = 1.0 MHz



Uni−Directional TVS

ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Reverse Working Voltage (D_1, D_2, and D_3)	(Note 1)	V_{RWM1}	–	–	4.0	V
Reverse Working Voltage (V_1)	(Note 1)	V_{RWM2}	–	–	12	V
Breakdown Voltage (D_1, D_2, and D_3)	I_T = 1 mA, (Note 2)	V_{BR}	5.2	5.5	–	V
Breakdown Voltage (V_{CC})	I_T = 5 mA, (Note 2)	V_{BR2}	13.5	15	15.8	V
Reverse Leakage Current (D_1, D_2, and D_3)	@ V_{RWM}	I_R	–	–	1.0	μA
Reverse Leakage Current (V_{CC})	@ V_{RWM2}	I_R	–	–	1.0	μA
Capacitance (D_1, D_2, and D_3)	V_R = 0 V, f = 1 MHz (Line to GND)	C_J	–	0.7	0.9	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.

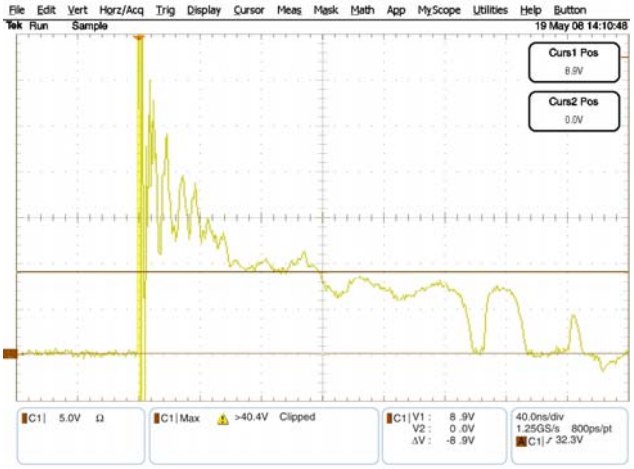


Figure 1. ESD Clamping Voltage Screenshot Positive 8 kV Contact per IEC61000−4−2

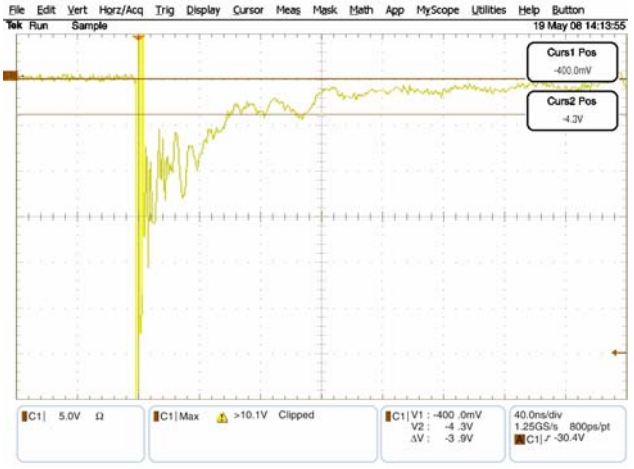
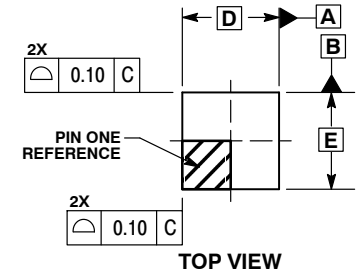


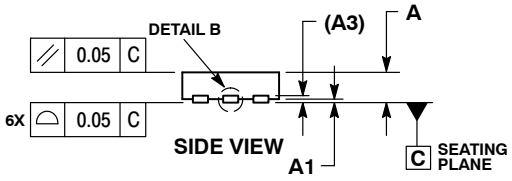
Figure 2. ESD Clamping Voltage Screenshot Negative 8 kV Contact per IEC61000−4−2

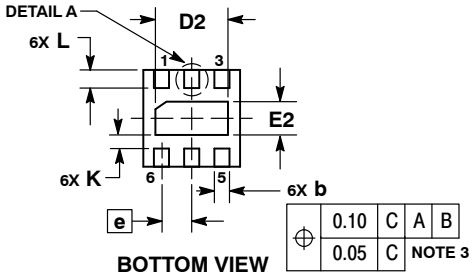
PACKAGE DIMENSIONS

UDFN6, 1.6x1.6, 0.5P
CASE 517AP−01
ISSUE O

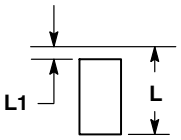


TOP VIEW

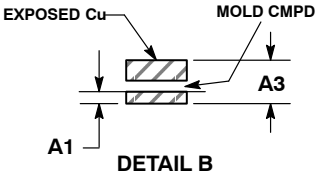




BOTTOM VIEW



DETAIL A
OPTIONAL CONSTRUCTION

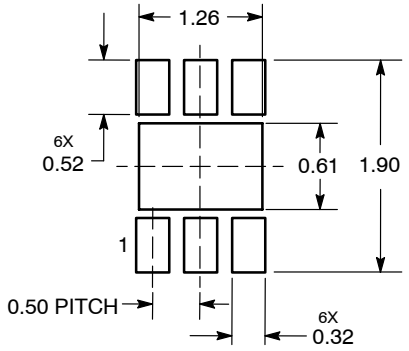


DETAIL B
OPTIONAL CONSTRUCTION

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 0.30 mm FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.13 REF	
b	0.20	0.30
D	1.60 BSC	
E	1.60 BSC	
e	0.50 BSC	
D2	1.10	1.30
E2	0.45	0.65
K	0.20	−−−
L	0.20	0.40
L1	0.00	0.15

SOLDERMASK DEFINED MOUNTING 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.

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