

NUP412VP5

Low Capacitance Quad Array for ESD Protection

This integrated transient voltage suppressor device (TVS) is designed for applications requiring transient overvoltage protection. It is intended to be used in sensitive equipment such as wireless headsets, PDAs, digital cameras, computers, printers, communication systems, and other applications. The integrated design provides very effective and reliable protection for four separate lines using only one package. This device is ideal for situations where board space is at a premium.

Features

- ESD Protection: IEC61000-4-2: Level 4
- Four Separate Unidirectional Configurations for Protection
- Low Leakage Current < 1 μ A @ 9 V
- Small SOT-953 SMT Package
- Low Capacitance
- These are Pb-Free Devices

Benefits

- Provides Protection for ESD Industry Standards: IEC 61000, HBM
- Protects Four Lines Against Transient Voltage Conditions
- Minimize Power Consumption of the System
- Minimize PCB Board Space

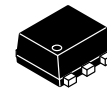
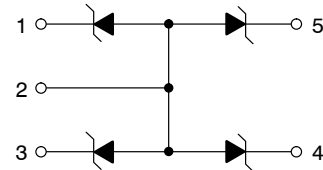
Typical Applications

- Cellular and Portable Electronics
- Serial and Parallel Ports
- Microprocessor Based Equipment
- Notebooks, Desktops, Servers



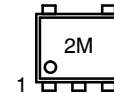
ON Semiconductor®

<http://onsemi.com>



**SOT-953
CASE 526AB**

MARKING DIAGRAM



2 = Specific Device Code
M = Date & Assembly Code

ORDERING INFORMATION

Device	Package	Shipping†
NUP412VP5T5G	SOT-953 (Pb-Free)	8000 / Tape & Reel

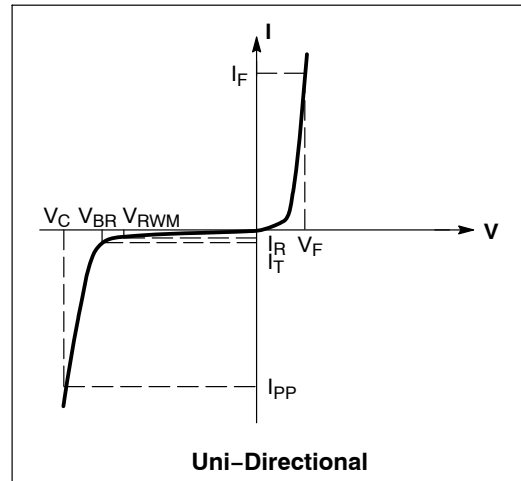
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

NUP412VP5

ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ 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
ΘV_{BR}	Maximum Temperature Coefficient of V_{BR}
I_F	Forward Current
V_F	Forward Voltage @ I_F
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}



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

Characteristic	Symbol	Value	Unit
Peak Power Dissipation (8 X 20 μs @ $T_A = 25^\circ\text{C}$) (Note 1)	P_{PK}	18	W
Thermal Resistance Junction-to-Ambient Above 25°C , Derate	$R_{\theta JA}$	560 4.5	$^\circ\text{C/W}$ $\text{mW}/^\circ\text{C}$
Maximum Junction Temperature	T_{Jmax}	150	$^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_J T_{stg}$	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature (10 seconds duration)	T_L	260	$^\circ\text{C}$
Human Body Model (HBM) Machine Model (MM)	ESD	8000 400	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.

1. Non-repetitive current.

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

Device	Device Marking	Breakdown Voltage V_{BR} @ 5 mA (Volts)			Leakage Current I_{RM} @ V_{RM}		Typ Capacitance @ 0 V Bias (pF) (Note 2)		Typ Capacitance @ 3 V Bias (pF) (Note 2)	
		Min	Nom	Max	V_{RWM}	I_{RWM} (μA)	Typ	Max	Typ	Max
NUP412VP5 (Note 3)	2	11.4	12	12.7	9.0	0.5	6.5	10	3.5	5.0

2. Capacitance of one diode at $f = 1 \text{ MHz}$, $T_A = 25^\circ\text{C}$.

3. V_{BR} at 5 mA.

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TYPICAL ELECTRICAL CHARACTERISTICS

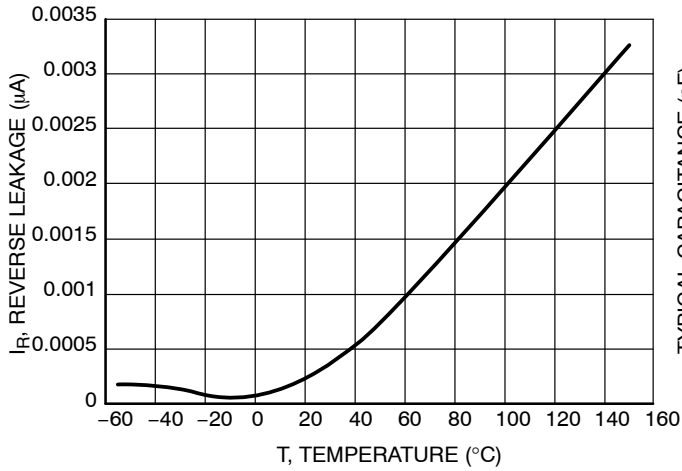


Figure 1. Reverse Leakage versus Temperature

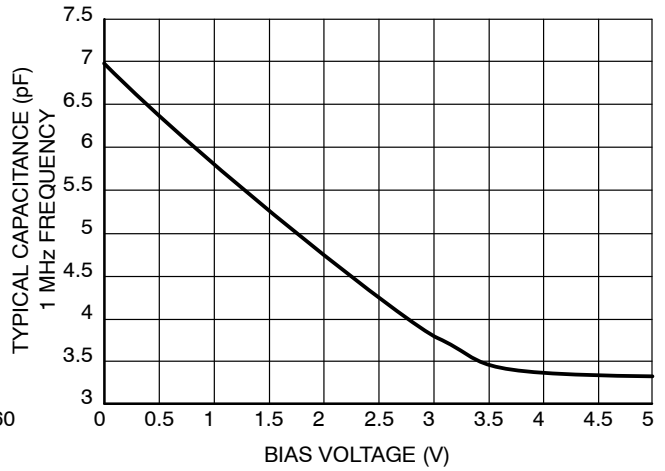


Figure 2. Capacitance

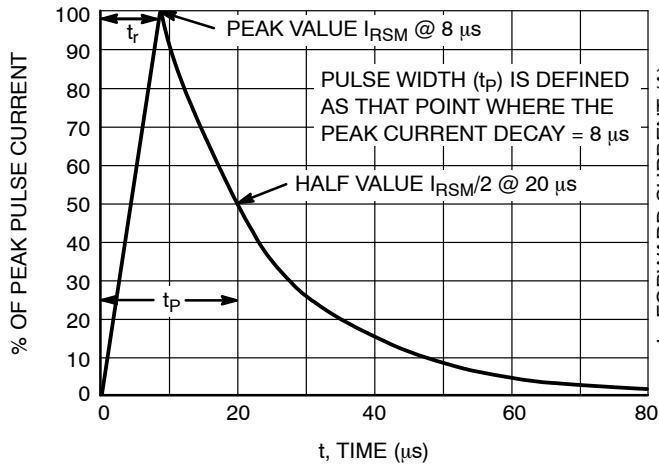


Figure 3. $8 \times 20 \mu\text{s}$ Pulse Waveform

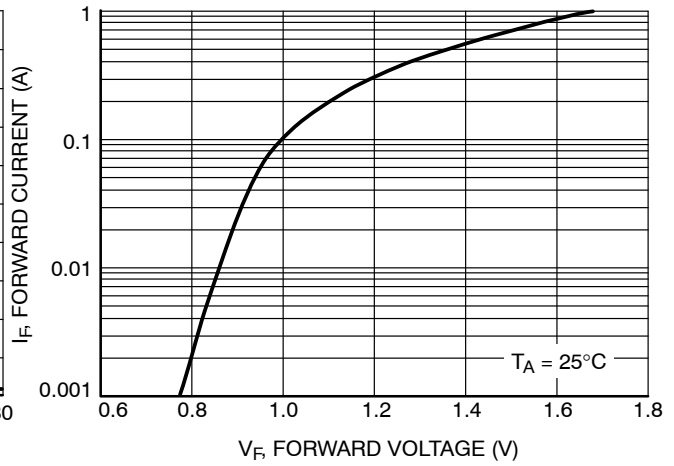


Figure 4. Forward Voltage

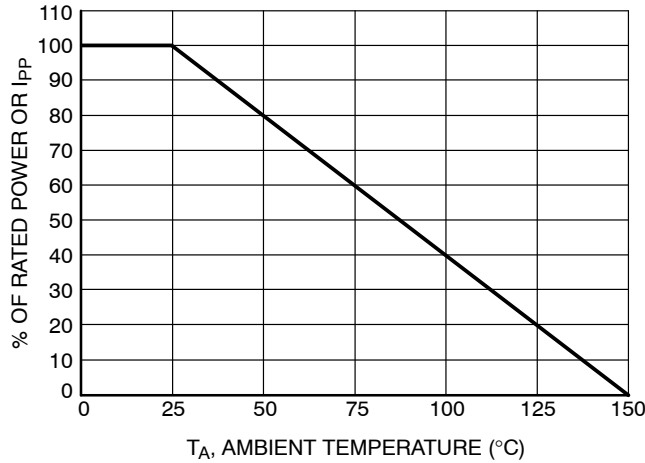
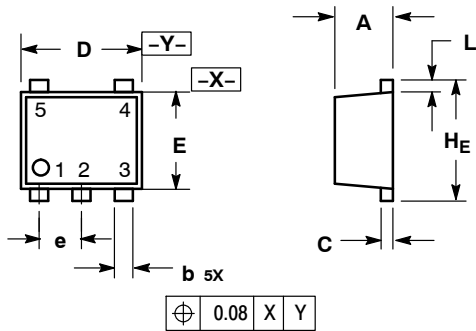


Figure 5. Power Derating Curve

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PACKAGE DIMENSIONS

SOT-953
CASE 527AB-01
ISSUE B

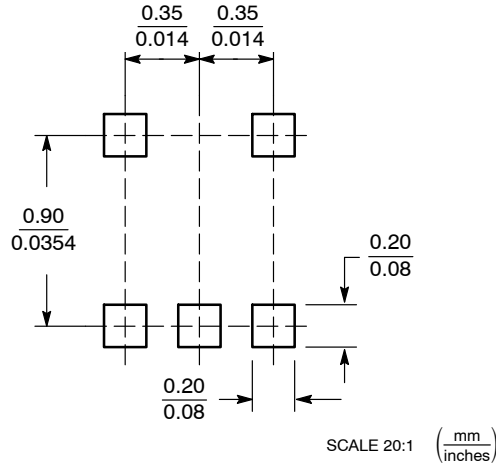


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.34	0.42	0.50	0.013	0.017	0.020
b	0.10	0.15	0.20	0.004	0.006	0.008
C	0.05	0.10	0.15	0.002	0.004	0.006
D	0.95	1.00	1.05	0.037	0.039	0.041
E	0.75	0.80	0.85	0.03	0.032	0.034
e	0.35 BSC			0.014 BSC		
L	0.05	0.10	0.15	0.002	0.004	0.006
HE	0.95	1.00	1.05	0.037	0.039	0.041

SOLDERING FOOTPRINT*



*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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