

# NUP4102XV6

## 6-Pin Bi-Directional Quad TVS Array

This 6-Pin bi-directional transient suppressor array is designed for applications requiring transient overvoltage protection capability. It is intended for use in transient voltage and ESD sensitive equipment such as computers, printers, cell phones, medical equipment, and other applications. Its integrated design provides bi-directional protection for four separate lines using a single SOT-563 package. This device is ideal for situations where board space is a premium.

### Features

- Bi-directional Protection for Four Lines in a Single SOT-563 Package
- Peak Power Dissipation – 75 W (8x20  $\mu$ sec Waveform)
- Low Leakage Current (100 nA @ 12 V)
- Low Capacitance (< 15 pF)
- Provides ESD Protection for JEDEC Standards JESD22
  - Machine Model = Class C
  - Human Body Model = Class 3B
- Provides ESD Protection for IEC 61000-4-2, 15 kV (Air), 8 kV (Contact)

### Mechanical Characteristics

- Void Free, Transfer-Molded, Thermosetting Plastic Case
- Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications

### Applications

- GSM Handsets and Accessories
- Other Telephone Sets
- Computers / Printers / Set-Top Boxes

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

| Rating  | Symbol    | Value                 | Unit             |
|---|-----------|-----------------------|------------------|
| Peak Power Dissipation<br>8x20 $\mu$ sec Double Exponential Waveform,<br>(Note 1)                       | $P_{PK}$  | 75                    | W                |
| 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 sec)  | $T_L$     | 260                   | $^\circ\text{C}$ |
| Human Body Model ( HBM)<br>Machine Model (MM)<br>IEC 61000-4-2 Air (ESD)<br>IEC 61000-4-2 Contact (ESD) | ESD       | 16<br>0.4<br>30<br>30 | kV               |

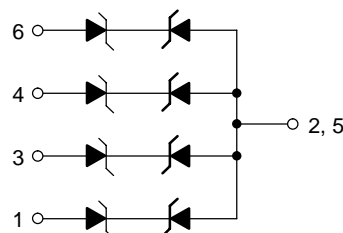
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Non-repetitive current pulse per Figure 3.



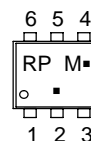
ON Semiconductor®

<http://onsemi.com>



SOT-563  
CASE 463A  
PLASTIC

### MARKING DIAGRAM



RP = Device Marking  
M = One Digit Date Code  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device        | Package              | Shipping†        |
|---------------|----------------------|------------------|
| NUP4102XV6T1G | SOT-563<br>(Pb-Free) | 4000/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.

# NUP4102XV6

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise specified)

| Parameter                  | Conditions                                  | Symbol           | Min  | Typ | Max  | Unit |
|----------------------------|---|------------------|------|-----|------|------|
| Reverse Working Voltage    | (Note 2)                                    | V <sub>RWM</sub> |      |     | 12   | V    |
| Breakdown Voltage          | I <sub>T</sub> = 1 mA, (Note 3)             | V <sub>BR</sub>  | 13.6 |     | 17.8 | V    |
| Reverse Leakage Current    | V <sub>RWM</sub> = 12 V                     | I <sub>R</sub>   |      | 10  | 100  | nA   |
| Clamping Voltage           | I <sub>PP</sub> = 3 A, (8x20 μsec Waveform) | V <sub>C</sub>   |      |     | 25   | V    |
| Maximum Peak Pulse Current | 8x20 μsec waveform                          | I <sub>PP</sub>  |      |     | 3.0  | A    |
| Capacitance                | V <sub>R</sub> = 0 V, f=1 MHz (Line to GND) | C <sub>j</sub>   |      | 13  | 15   | pF   |

- TVS devices are normally selected according to the working peak reverse voltage (V<sub>RWM</sub>), which should be equal or greater than the DC or continuous peak operating voltage level.
- V<sub>BR</sub> is measured at pulse test current I<sub>T</sub>; Pulse Width 1 ms.

## TYPICAL PERFORMANCE CURVES

(T<sub>J</sub> = 25°C unless otherwise specified)

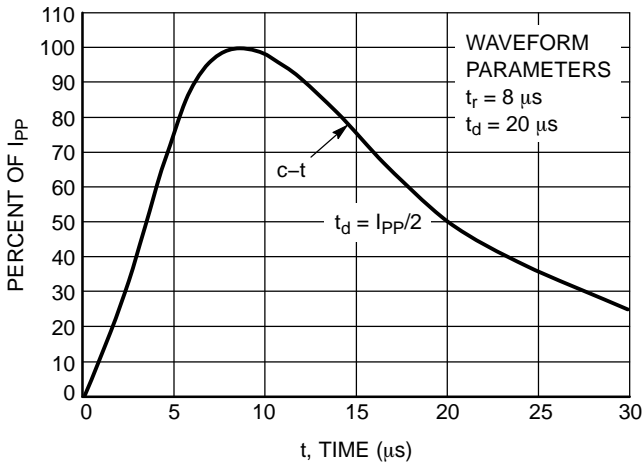


Figure 1. Pulse Waveform

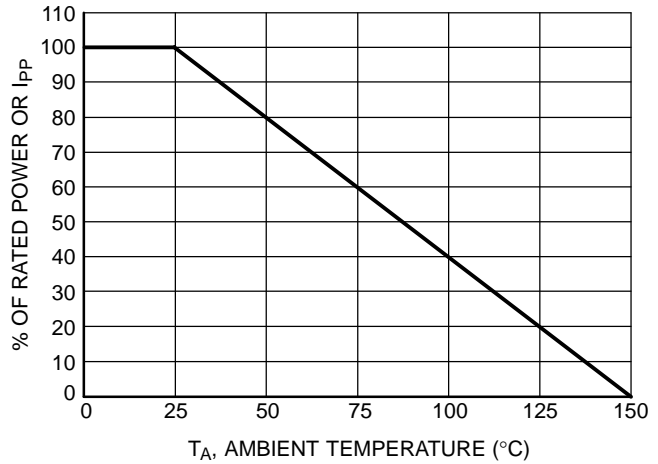


Figure 2. Power Derating Curve

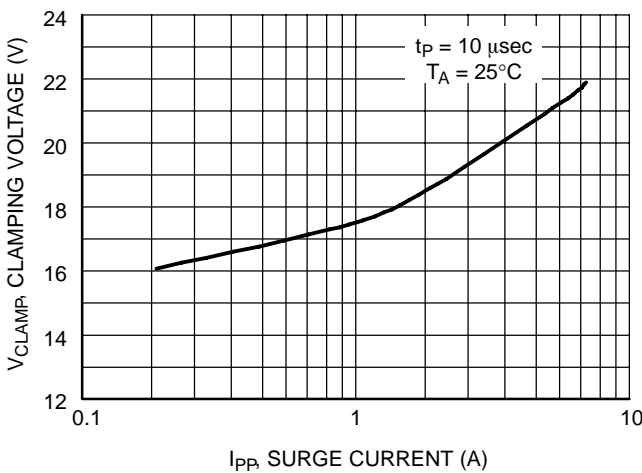


Figure 3. Clamping Voltage vs. Peak Pulse Current (10 μsec Square Wave Pulse)

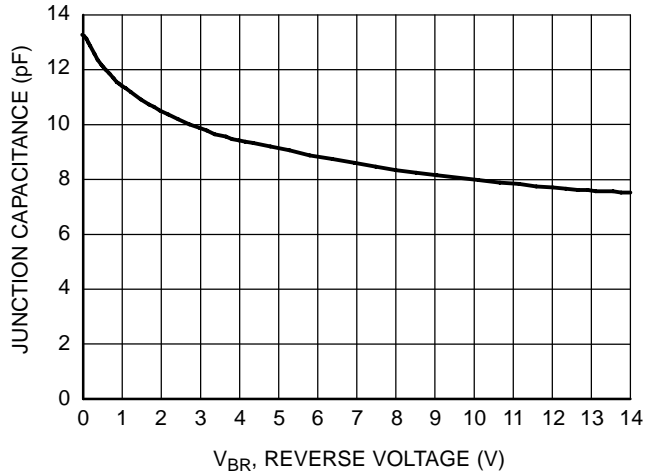
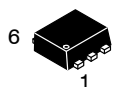


Figure 4. Junction Capacitance vs. Reverse Voltage

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



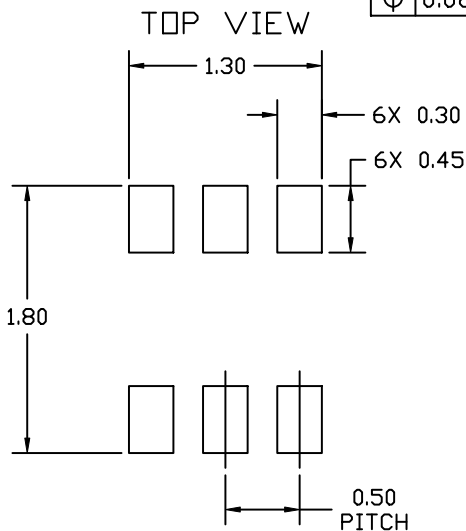
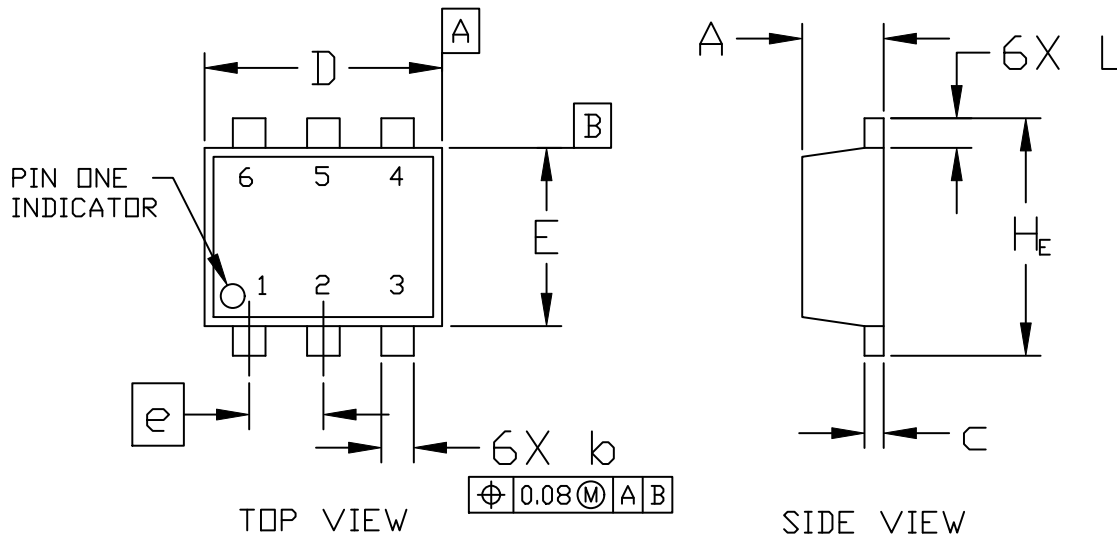
SCALE 4:1

**SOT-563, 6 LEAD**  
CASE 463A  
ISSUE H

DATE 26 JAN 2021

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.



| DIM            | MILLIMETERS |      |      |
|----------------|-------------|------|------|
|                | MIN.        | NOM. | MAX. |
| A              | 0.50        | 0.55 | 0.60 |
| b              | 0.17        | 0.22 | 0.27 |
| c              | 0.08        | 0.13 | 0.18 |
| D              | 1.50        | 1.60 | 1.70 |
| E              | 1.10        | 1.20 | 1.30 |
| e              | 0.50 BSC    |      |      |
| L              | 0.10        | 0.20 | 0.30 |
| H <sub>E</sub> | 1.50        | 1.60 | 1.70 |

**RECOMMENDED MOUNTING 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.

|                         |                        |  |
|-------------------------|------------------------|--|
| <b>DOCUMENT NUMBER:</b> | <b>98AON11126D</b>     | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| <b>DESCRIPTION:</b>     | <b>SOT-563, 6 LEAD</b> | <b>PAGE 1 OF 2</b>   |

ON Semiconductor and 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.

**SOT-563, 6 LEAD**  
CASE 463A  
ISSUE H

DATE 26 JAN 2021

STYLE 1:  
PIN 1. EMITTER 1  
2. BASE 1  
3. COLLECTOR 2  
4. EMITTER 2  
5. BASE 2  
6. COLLECTOR 1

STYLE 2:  
PIN 1. EMITTER 1  
2. EMITTER 2  
3. BASE 2  
4. COLLECTOR 2  
5. BASE 1  
6. COLLECTOR 1

STYLE 3:  
PIN 1. CATHODE 1  
2. CATHODE 1  
3. ANODE/ANODE 2  
4. CATHODE 2  
5. CATHODE 2  
6. ANODE/ANODE 1

STYLE 4:  
PIN 1. COLLECTOR  
2. COLLECTOR  
3. BASE  
4. EMITTER  
5. COLLECTOR  
6. COLLECTOR

STYLE 5:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE  
4. ANODE  
5. CATHODE  
6. CATHODE

STYLE 6:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. CATHODE  
6. CATHODE

STYLE 7:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. ANODE  
6. CATHODE

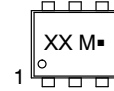
STYLE 8:  
PIN 1. DRAIN  
2. DRAIN  
3. GATE  
4. SOURCE  
5. DRAIN  
6. DRAIN

STYLE 9:  
PIN 1. SOURCE 1  
2. GATE 1  
3. DRAIN 2  
4. SOURCE 2  
5. GATE 2  
6. DRAIN 1

STYLE 10:  
PIN 1. CATHODE 1  
2. N/C  
3. CATHODE 2  
4. ANODE 2  
5. N/C  
6. ANODE 1

STYLE 11:  
PIN 1. EMITTER 2  
2. BASE 2  
3. COLLECTOR 1  
4. EMITTER 1  
5. BASE 1  
6. COLLECTOR 2

**GENERIC  
MARKING DIAGRAM\***



XX = Specific Device Code  
M = Month Code  
■ = Pb-Free Package

\*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. Some products may not follow the Generic Marking.

|                         |                        |  |
|-------------------------|------------------------|--|
| <b>DOCUMENT NUMBER:</b> | <b>98AON11126D</b>     | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| <b>DESCRIPTION:</b>     | <b>SOT-563, 6 LEAD</b> | <b>PAGE 2 OF 2</b>   |

ON Semiconductor and 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](http://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](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)

