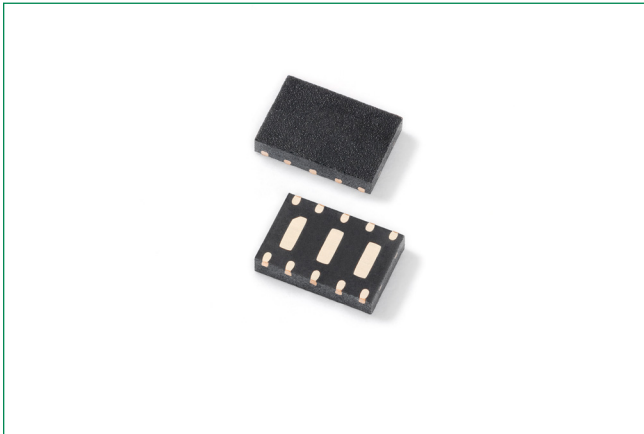
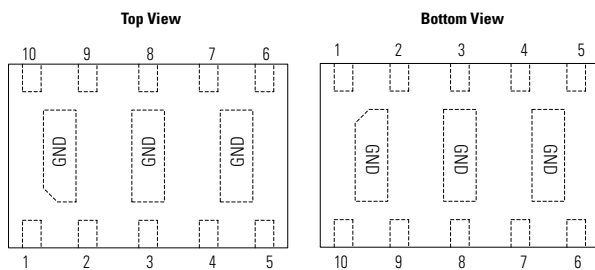
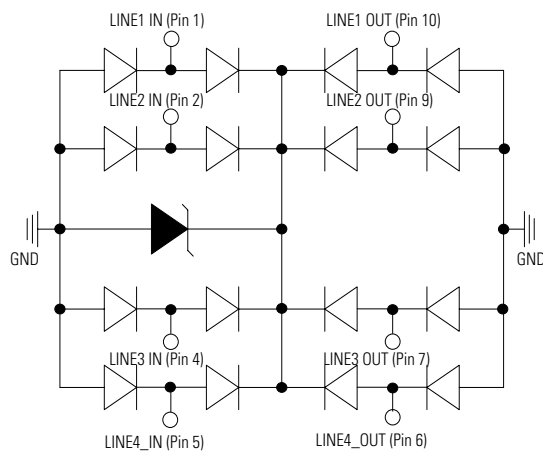


SP2574NUTG

2.5V 40A Diode Array

OBSOLETE DATE: 12/31/2020 PCN/ECN# ESU270-49
REPLACED BY: SP2555NUTG or AQ2555NUTG**Pinout****Note:** PIN3, PIN8 are same potential with GND**Functional Block Diagram****Description**

The SP2574NUTG is a low-capacitance, TVS Diode Array designed to provide protection against ESD (electrostatic discharge), CDE (cable discharge events), EFT (electrical fast transients), and lightning induced surges for high-speed, differential data lines. It's packaged in a μ DFN package (3.0 x 2.0mm) and each component can protect up to 4 channels or 2 differential pairs, up to 40A (IEC 61000-4-5) and up to 30kV ESD (IEC 61000-4-2). The "flow-through" design minimizes signal distortion, reduces voltage overshoot, and provides a simplified PCB design.

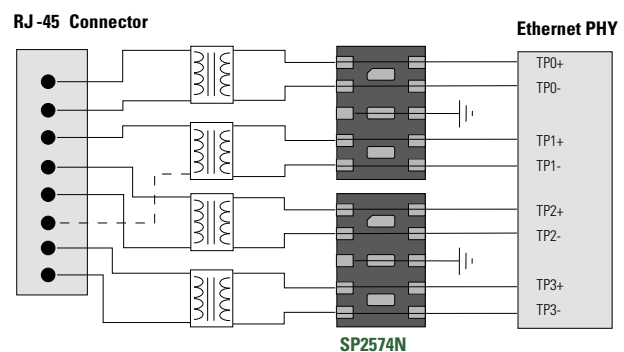
The SP2574NUTG with its low capacitance and low clamping voltage makes it ideal for high-speed data interfaces such as 1GbE applications found in notebooks, switches, etc.

Features & Benefits

- ESD, IEC 61000-4-2, ± 30 kV contact, ± 30 kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, 40A (8/20 μ s as defined in IEC 61000-4-5 2nd Edition)
- Low capacitance of 3.8pF@0V (TYP) per I/O
- Low leakage current of 0.1 μ A (TYP) at 2.5V
- μ DFN-10 package is optimized for high-speed data line routing
- Provides protection for two differential data pairs (4 channels) up to 40A
- Low operating and clamping voltage
- AEC-Q101 qualified

Applications

- 10/100/1000 Ethernet
- WAN/LAN Equipment
- Desktops, Servers and Notebooks
- LVDS Interfaces
- Integrated Magnetics
- Smart TV

Application Example

Life Support Note:

Not Intended for Use in Life Support or Life Saving Applications

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

SP2574NUTG

2.5V 40A Diode Array

Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|------------|--------------------------------------|-----------------|-------|
| I_{PP} | Peak Current ($t_p=8/20\mu s$) | 40 ¹ | A |
| P_{PK} | Peak Pulse Power ($t_p=8/20\mu s$) | 1000 | W |
| T_{OP} | Operating Temperature | -40 to 125 | °C |
| T_{STOR} | Storage Temperature | -55 to 150 | °C |

Notes:

1. Rating with 2 pins connected together per suggested diagram (For example, pin1 is connected to pin 10, pin 2 is connected to Pin 9, Pin 4 is connected to pin 7 and pin 5 is connected to pin 6)

Caution: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electrical Characteristics ($T_{OP}=25^\circ C$)

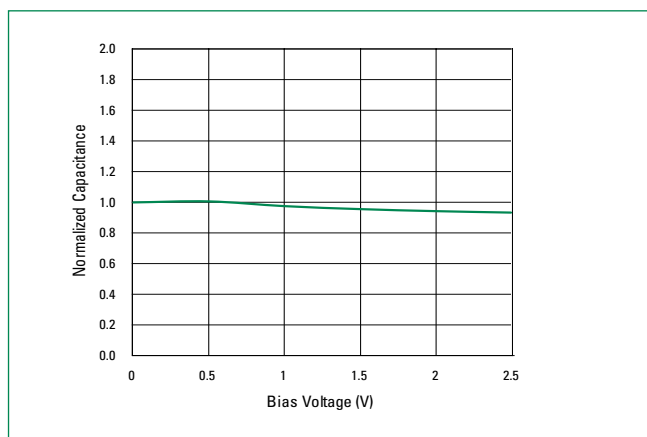
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---------------------------------|--------------------------|--|----------|------|------|----------|
| Reverse Standoff Voltage | V_{RWM} | $I_R \leq 1\mu A$ | | | 2.5 | V |
| Reverse Leakage Current | I_R | $V_{RWM} = 2.5V, T = 25^\circ C$ | | 0.1 | 0.5 | μA |
| Breakdown Voltage | V_{BR} | $I_{t1} = 1\mu A$ | 3.0 | 3.7 | 4.5 | V |
| Snap Back Voltage | V_{SB} | $I_H = 1mA$ | 3.0 | | | V |
| Clamp Voltage | V_C | $I_{PP} = 1A, t_p = 8/20\mu s$ Any I/O to Ground | | | 4.5 | V |
| | | $I_{PP} = 10A, t_p = 8/20\mu s$ Any I/O to Ground | | | 7.5 | |
| | | $I_{PP} = 25A, t_p = 8/20\mu s$ Any I/O to Ground | | | 12.0 | |
| | | $I_{PP} = 40A, t_p = 8/20\mu s$ Line-to-Line ¹ , two I/O Pins connected together on each line | | | 20.0 | |
| Dynamic Resistance ² | R_{DYN} | TLP, $t_p=100ns$, Any I/O to Ground | | 0.13 | | Ω |
| ESD Withstand Voltage | V_{ESD} | IEC 61000-4-2 (Contact) | ± 30 | | | kV |
| | | IEC 61000-4-2 (Air) | ± 30 | | | kV |
| Diode Capacitance | $C_{I/O \text{ to GND}}$ | Between I/O Pins and Ground $V_R = 0V, f = 1MHz$ | | 3.8 | 5.0 | pF |
| | $C_{I/O \text{ to I/O}}$ | Between I/O Pins $V_R = 0V, f = 1MHz$ | | 1.7 | | pF |

Notes:

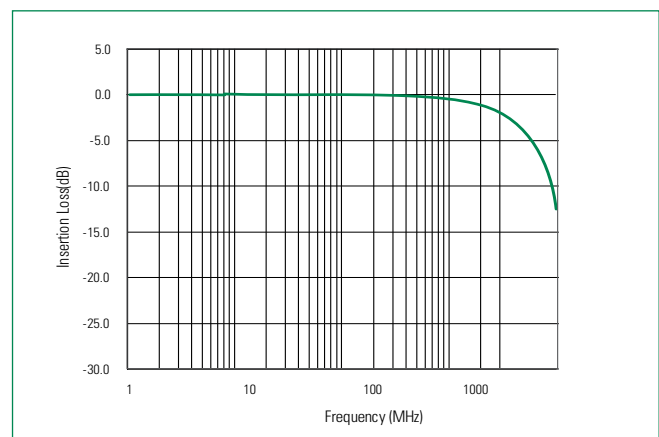
1. Rating with 2 pins connected together per suggested diagram (For example, pin1 is connected to pin 10, pin 2 is connected to Pin 9, Pin 4 is connected to pin 7 and pin 5 is connected to pin 6)

2. Transmission Line Pulse (TLP) with 100ns width, 2ns rise time, and average window $t1=70ns$ to $t2=90ns$

Normalized Capacitance vs. Voltage

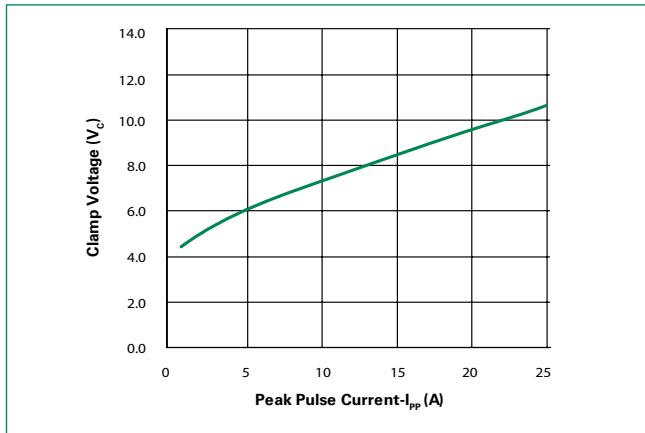
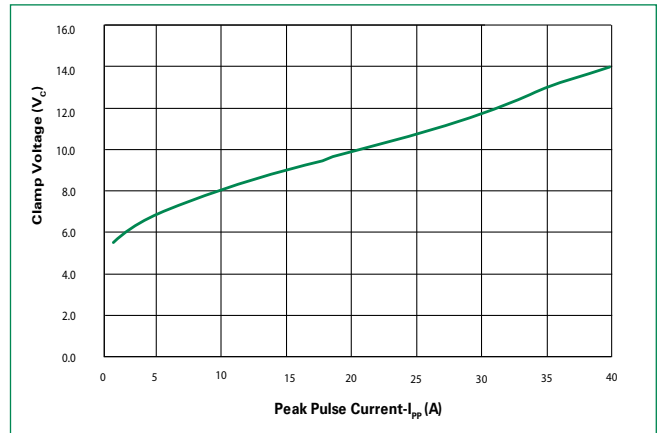
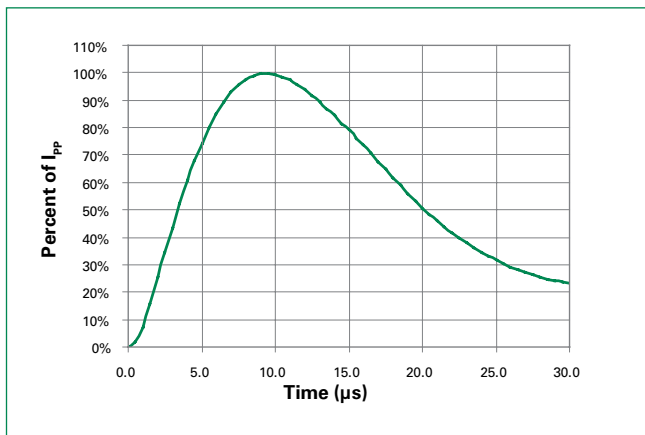
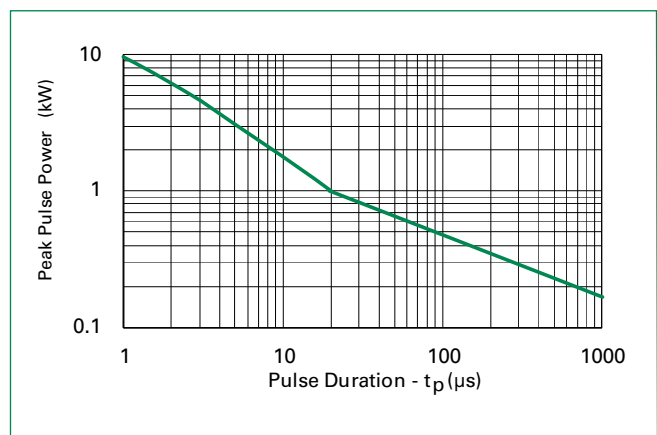
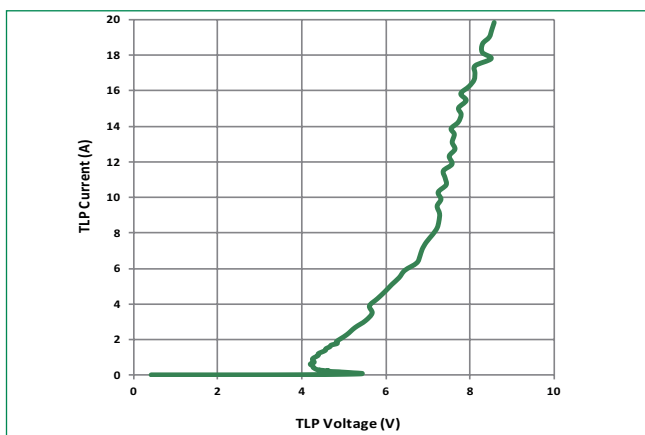


Insertion Loss (S21)



SP2574NUTG

2.5V 40A Diode Array

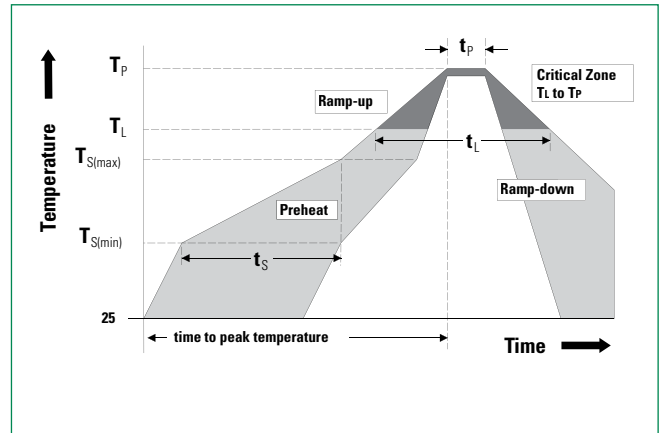
Clamping Voltage vs. IPP (I/O to GND)**Clamping Voltage vs. IPP (Line-to-Line, Two I/O Pins Connected Together)****8/20 μ s Pulse Waveform****Non-Repetitive Peak Pulse Power vs. Pulse Time****Transmission Line Pulse (TLP)**

SP2574NUTG

2.5V 40A Diode Array

Soldering Parameters

| | | |
|--|------------------------------------|------------------|
| Reflow Condition | Pb – Free assembly | |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus) Temp (T_L) to peak | 3°C/second max | |
| $T_{s(max)}$ to T_L - Ramp-up Rate | 3°C/second max | |
| Reflow | - Temperature (T_L) (Liquidus) | 217°C |
| | - Temperature (t_L) | 60 – 150 seconds |
| Peak Temperature (T_p) | 260 ^{+0/-5} °C | |
| Time within 5°C of actual peak Temperature (t_p) | 20 – 40 seconds | |
| Ramp-down Rate | 6°C/second max | |
| Time 25°C to peak Temperature (T_p) | 8 minutes Max. | |
| Do not exceed | 260°C | |



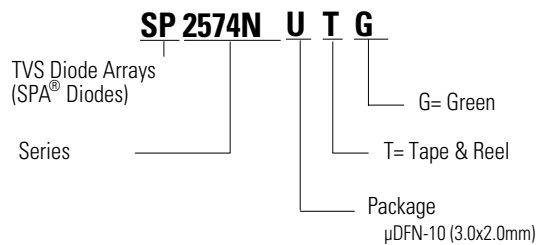
Product Characteristics

| | |
|---------------------------|--|
| Lead Plating | Pre-Plated Frame |
| Lead Material | Copper Alloy |
| Lead Coplanarity | 0.004 inches(0.102mm) |
| Substrate material | Silicon |
| Body Material | Molded Compound |
| Flammability | UL Recognized compound meeting flammability rating V-0 |

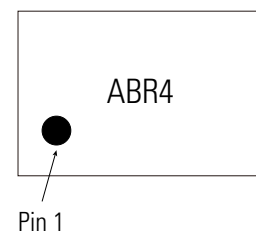
Ordering Information

| Part Number | Package | Min. Order Qty. |
|-------------|---------------------|-----------------|
| SP2574NUTG | μDFN-10 (3.0x2.0mm) | 3000 |

Part Numbering System



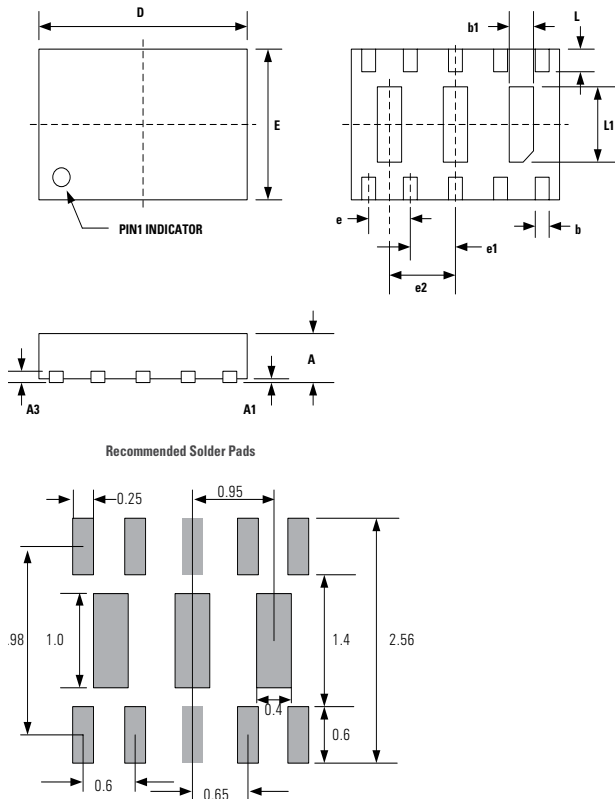
Part Marking System



SP2574NUTG

2.5V 40A Diode Array

Package Dimensions — μ DFN-10 (3.0x2.0mm)

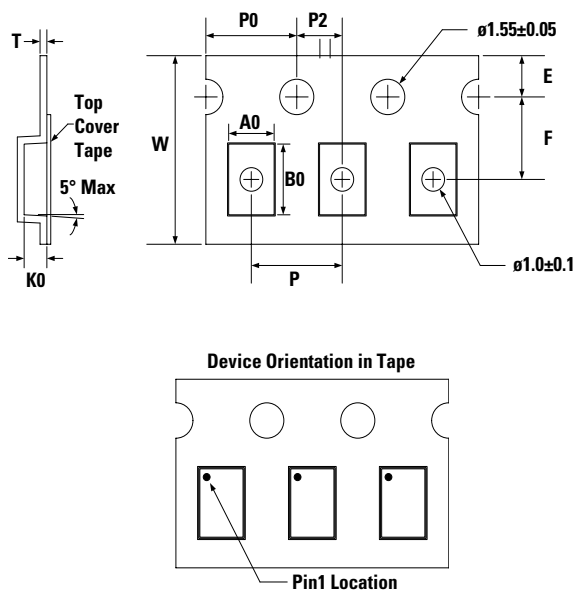


| Package | μ DFN-10 (3.0x2.0mm) | | | | | |
|---------|--------------------------|------|------|-----------|-------|-------|
| JEDEC | MO-229 | | | | | |
| Symbol | Millimeters | | | Inches | | |
| | Min | Nom | Max | Min | Nom | Max |
| A | 0.50 | 0.60 | 0.65 | 0.020 | 0.024 | 0.026 |
| A1 | 0.00 | 0.03 | 0.05 | 0.000 | 0.001 | 0.002 |
| A3 | 0.15 Ref | | | 0.006 Ref | | |
| b | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |
| b1 | 0.25 | 0.35 | 0.45 | 0.010 | 0.014 | 0.018 |
| D | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |
| E | 1.90 | 2.00 | 2.10 | 0.075 | 0.079 | 0.083 |
| e | 0.60 BSC | | | 0.024 BSC | | |
| e1 | 0.65 BSC | | | 0.026 BSC | | |
| e2 | 0.95 BSC | | | 0.037 | | |
| L | 0.25 | 0.30 | 0.35 | 0.010 | 0.012 | 0.014 |
| L1 | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |

Notes :

- All dimensions are in millimeters
- Dimensions include solder plating.
- Dimensions are exclusive of mold flash & metal burr

Tape & Reel Specification — μ DFN-10 (3.0x2.0mm)



| Package | μ DFN-10 (3.0x2.0mm) |
|---------|--------------------------|
| Symbol | Millimeters |
| A0 | 2.30 +/- 0.10 |
| B0 | 3.20 +/- 0.10 |
| E | 1.75 +/- 0.10 |
| F | 3.50 +/- 0.05 |
| K0 | 1.0 +/- 0.10 |
| P | 4.00 +/- 0.10 |
| P0 | 4.00 +/- 0.10 |
| P2 | 2.00 +/- 0.10 |
| T | 0.3 +/- 0.05 |
| W | 8.00 + 0.30 /- 0.10 |

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