NUP46V8P5

ESD Protection Diode Array

Quad, Low Capacitance

This integrated surge protection device 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 μA @ 3 V
- Small SOT−953 SMT Package
- Low Capacitance
- This is a Pb−Free Device

Benefits

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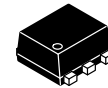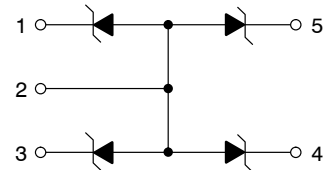- Minimize PCB Board Space

Typical Applications

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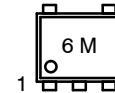
ON Semiconductor®

SCALE 4:1

SOT−953
CASE 526AE

MARKING DIAGRAM

6 = Specific Device Code
M = Date Code

ORDERING INFORMATION

| Device	Package	Shipping[†]
NUP46V8P5T5G	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.

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
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}

Uni−Directional
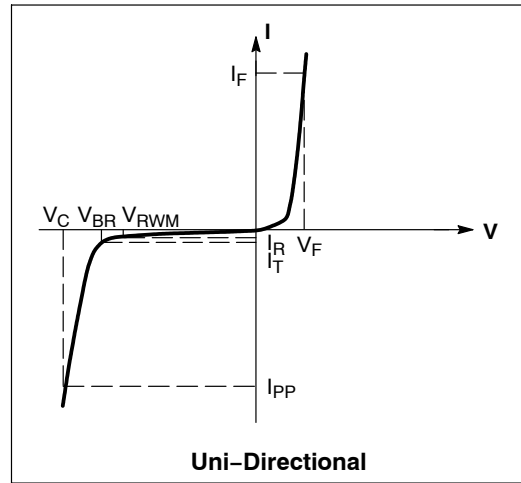
MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Device	Device Marking	Breakdown Voltage V_{BR} @ 1 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
NUP46V8P5	6	6.47	6.8	7.14	4.3	1.0	12	15	6.7	9.5

1. Non−repetitive current per Figure 1.
2. Capacitance of one diode at f = 1 MHz, V_R = 0 V, T_A = 25°C.
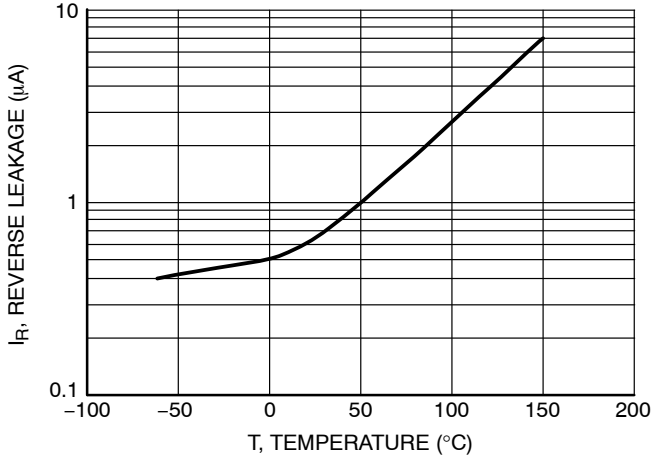
TYPICAL ELECTRICAL CHARACTERISTICS

Figure 1. Reverse Leakage versus Temperature

X-axis: T, TEMPERATURE (°C)
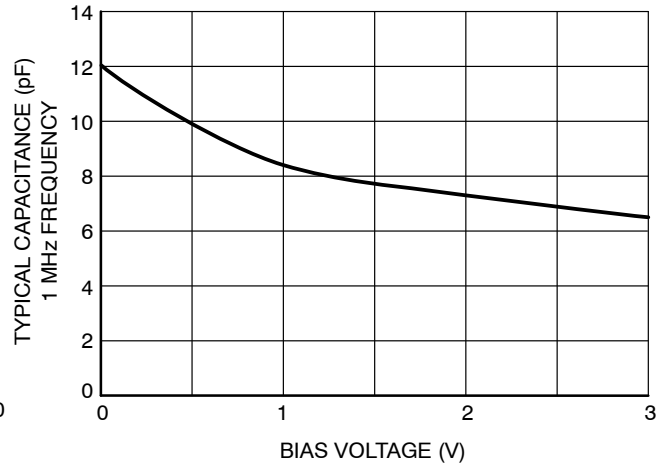Y-axis: I_R, REVERSE LEAKAGE (μA)

Figure 2. Capacitance

X-axis: BIAS VOLTAGE (V)
Y-axis: TYPICAL CAPACITANCE (pF) 1 MHz FREQUENCY

Figure 3. 8 × 20 μs Pulse Waveform

X-axis: t, TIME (μs)
Y-axis: % OF PEAK PULSE CURRENT

t_r

PEAK VALUE I_{RSM} @ 8 μs

PULSE WIDTH (t_P) IS DEFINED AS THAT POINT WHERE THE PEAK CURRENT DECAY = 8 μs

HALF VALUE I_{RSM}/2 @ 20 μs

t_P
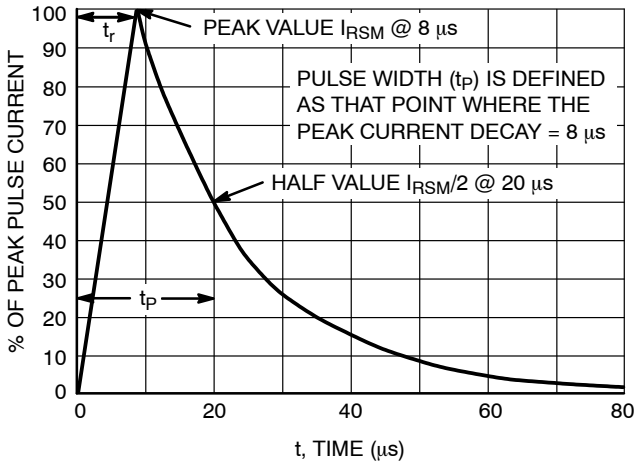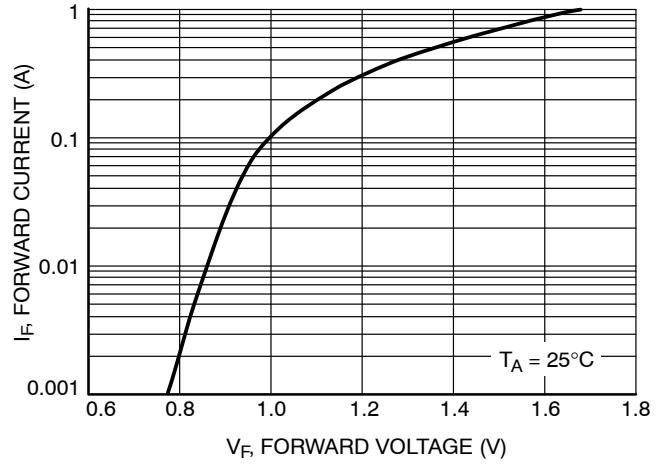
Figure 4. Forward Voltage

X-axis: V_F, FORWARD VOLTAGE (V)
Y-axis: I_F, FORWARD CURRENT (A)

$T_A = 25°C$
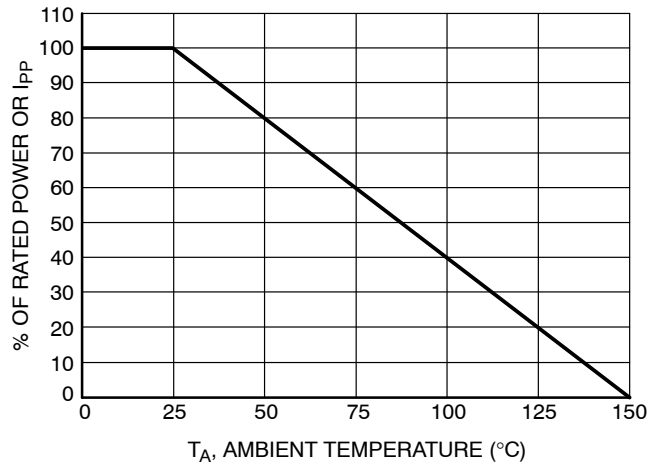
Figure 5. Power Derating Curve

X-axis: T_A, AMBIENT TEMPERATURE (°C)
Y-axis: % OF RATED POWER OR I_{PP}
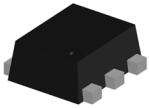
SOT−953 1.00x0.80x0.37, 0.35P
CASE 527AE
ISSUE F

DATE 17 JAN 2024

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.34	0.37	0.40
b	0.10	0.15	0.20
C	0.07	0.12	0.17
D	0.95	1.00	1.05
E	0.75	0.80	0.85
e	0.35 BSC		
H	0.95	1.00	1.05
L	0.125	0.175	0.225
L2	0.05	0.10	0.15
L3	0.075 (REF)		

PIN 1 INDICATOR

TOP VIEW

SIDE VIEW

5X L
5X (L3)
5X L2
5X b

⊕ 0.08 A B

BOTTOM VIEW

PACKAGE OUTLINE

0.200
0.350
1.200
0.350
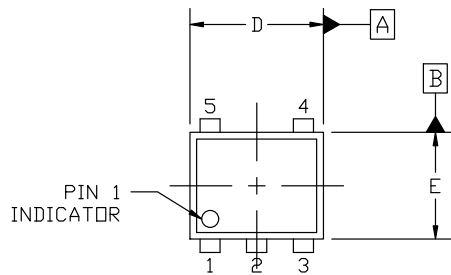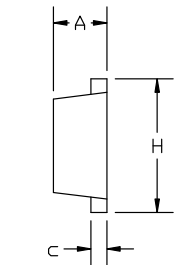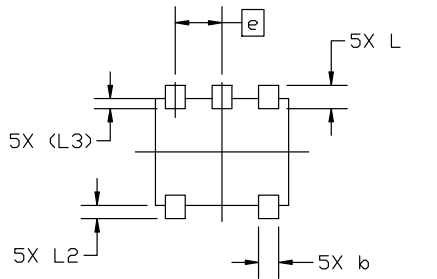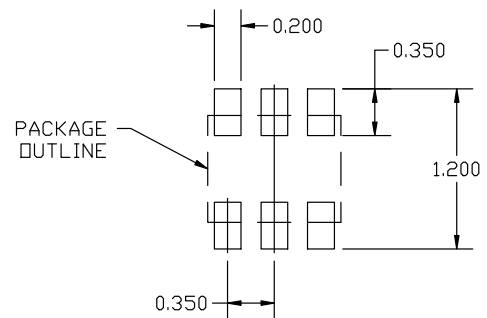
RECOMMENDED MOUNTING FOOTPRINT

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*

XM

1
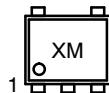
X   = Specific Device Code
M   = Month Code

*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.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales

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