

Zener Protection Diode

NZ8DH Series

The NZ8DH devices are designed for applications requiring transient overvoltage ESD protection. They are intended to protect voltage sensitive components from ESD and other harmful transient voltage events. This device provides a single channel of bidirectional protection in an, ultra-compact XDFNW2 1.0 x 0.6 mm package. This device is ideal to replace SOT23 or other dual diode 3 pin devices used as single line bi-directional protection.

Features

- Precise Clamping Voltage
- High ESD Ratings
- Wettable Flank Package for optimal Automated Optical Inspection (AOI)
- 175°C T_{J(MAX)} – Rated for High Temperature, Mission Critical Applications
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- Automotive ECU's
- In Vehicle Networking (IVN)
- Voltage Sensitive Circuits

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
IEC 61000-4-2 Contact (Note 1)	ESD	±30	kV
IEC 61000-4-2 Air		±30	kV
ISO 10605 Contact (330 pF / 330 Ω)	≤ 9.1 V > 9.1 V	±30	kV
		±26	kV
ISO 10605 Contact (330 pF / 2 kΩ)		±30	kV
ISO 10605 Contact (150 pF / 2 kΩ)		±30	kV
Maximum Peak Pulse Current (8/20 μs) (Note 2)	I _{pp}	4.5	A
Total Power Dissipation (Note 3 @ T _A = 25°C)	P _D	300	mW
Thermal Resistance, Junction-to-Ambient	R _{θJA}	400	°C/W
Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +175	°C

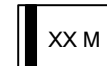
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Non-repetitive current pulse at T_A = 25°C, per IEC61000-4-2 waveform.
2. Non-repetitive current pulse per figure 1.
3. Mounted with recommended minimum pad size, DC board FR-4



XDFNW2
CASE 521AE

DEVICE MARKING INFORMATION



XX = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NZ8DHxxxxMXWT5G	XDFNW2 (Pb-Free)	8000 / Tape & Reel
SZ8DHxxxxMXWT5G		

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

NZ8DH Series

ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current (8/20 μs)
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

*See Application Note AND8308/D for detailed explanations of datasheet parameters.

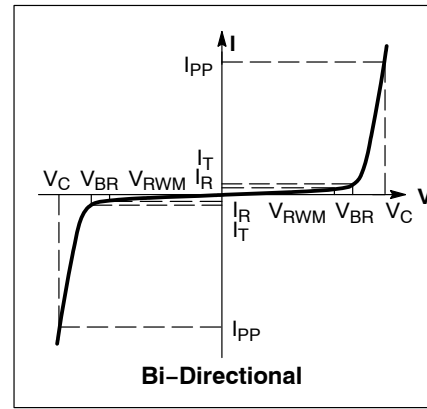


Figure 1.

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

Device*	Device Marking	V_{RWM} Max	V_{BR} $I_T = 5 \text{ mA}$ (Note 4)		I_R (μA) Max @ V_{RWM}	V_C Typ @ $I_{PP} = 1.0 \text{ A}$	C (pF) Typ @ $V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$
			Min	Max			
NZ8DH2V4†		1	3.00	3.60	50	3.70	60
NZ8DH2V7†		1	3.28	3.92	20	4.00	55
NZ8DH3V0†		1	3.55	4.25	10	4.30	54
NZ8DH3V3†		1	3.82	4.58	10	4.60	50
NZ8DH3V6†		1	4.10	4.91	10	4.90	48
NZ8DH3V9†		1	4.37	5.23	5	5.20	45
NZ8DH4V3†		1	4.73	5.67	5	5.60	42
NZ8DH4V7†		1	5.10	6.10	2	6.10	40
NZ8DH5V1†		1.5	5.46	6.54	2	6.50	38
NZ8DH5V6†		2.5	5.92	7.09	1	7.10	36
NZ8DH6V2†		3	6.46	7.74	1	7.70	35
NZ8DH6V8†		3.5	7.01	8.39	0.5	8.40	32
NZ8DH7V5†		4	7.64	9.16	0.5	9.20	30
NZ8DH8V2†		5	8.28	9.92	0.5	9.90	28
NZ8DH9V1MXWT5G	AA	6	9.30	10.70	0.5	10.90	25
NZ8DH10V†		7	10.14	11.66	0.1	11.90	23
NZ8DH11V†		8	11.07	12.73	0.1	13.00	22
NZ8DH12V†		9	12.00	13.80	0.1	14.10	20
NZ8DH13V†		10	12.93	14.87	0.1	15.20	19
NZ8DH15V†		11	14.79	17.01	0.1	17.40	18
NZ8DH16V†		12	15.72	18.08	0.1	18.50	18
NZ8DH18V†		14	17.58	20.22	0.1	20.70	17
NZ8DH20V†		15.4	19.44	22.36	0.1	22.90	16
NZ8DH22V†		16.8	21.30	24.50	0.1	25.10	14
NZ8DH24V†		18.9	23.16	26.64	0.1	27.30	12
NZ8DH27VMXWT5G	A5	22	25.95	29.85	0.1	30.70	12
NZ8DH33VMXWT5G	A6	26	31.53	36.27	0.1	37.30	10
NZ8DH47VMXWT5G	A7	38	44.55	51.25	0.1	52.70	8

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

*Includes SZ prefix where applicable: SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

†Consult factory on availability.

4. Breakdown voltage is tested from pin 1 to 2 and pin 2 to 1.

NZ8DH Series

TYPICAL CHARACTERISTICS

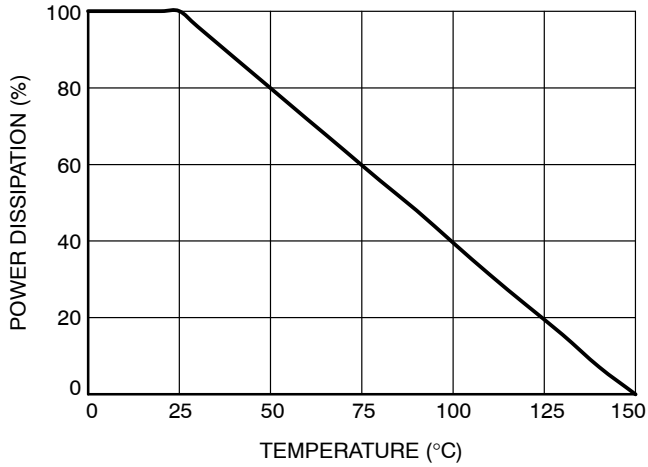


Figure 2. Steady State Power Derating

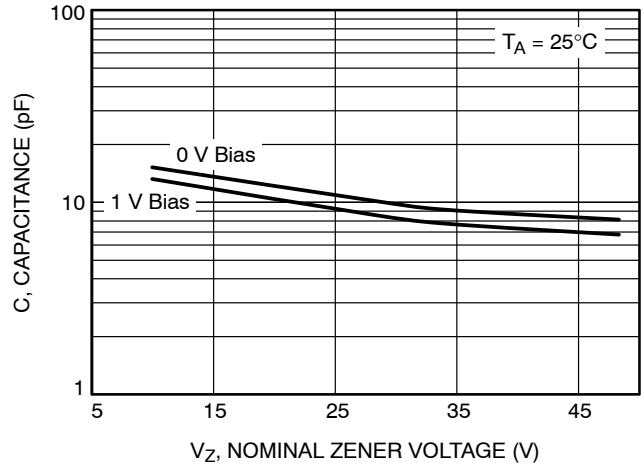


Figure 3. Typical Capacitance

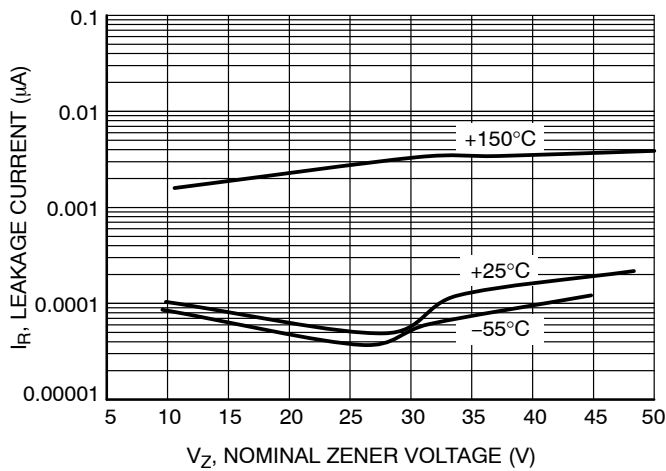


Figure 4. Typical Leakage Current

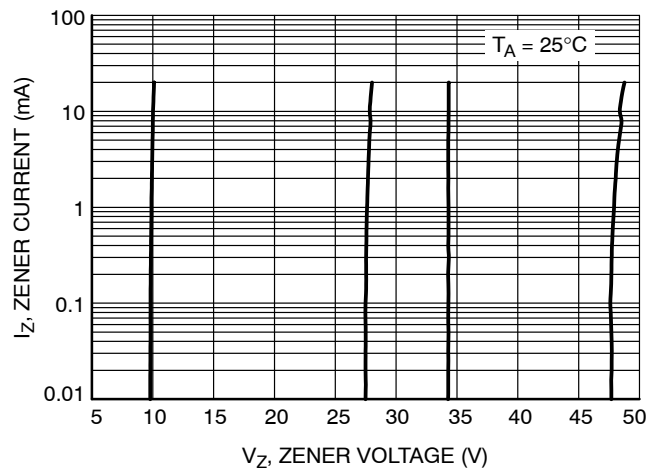


Figure 5. Zener Voltage vs. Zener Current

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

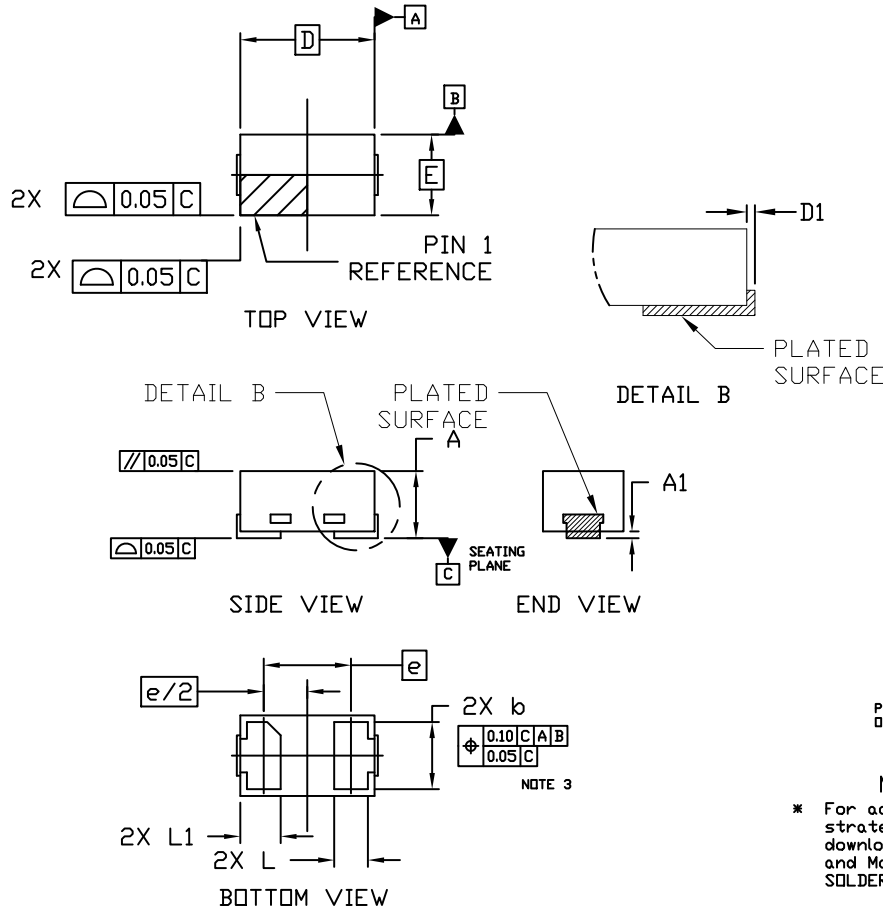
ON Semiconductor®



SCALE 8:1

XDFNW2 1.0x0.6, 0.65P
CASE 521AE
ISSUE A

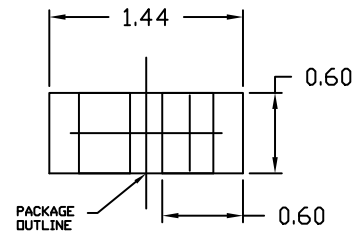
DATE 24 AUG 2021



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO THE PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 FROM THE TERMINAL TIP.

DIM	MILLIMETERS		
	MIN.	NDM.	MAX.
A	0.45	0.50	0.55
A1	---	---	0.05
b	0.45	0.50	0.55
D	0.90	1.00	1.10
D1	---	---	0.05
E	0.50	0.60	0.70
e	0.65 BSC		
L	0.22 REF		
L1	0.24	0.285	0.34



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*



XX = Specific Device Code
M = Date Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	98AON33477H	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	XDFNW2 1.0X0.6, 0.65P	PAGE 1 OF 1

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. **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.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com

onsemi Website: www.onsemi.com

TECHNICAL SUPPORT

North American Technical Support:

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative