

Zener Diode Voltage Regulators

250 mW Wettable Flank

NZ8F Series

This series of Zener diodes is packaged in a X2DFNW2 surface mount package with an industry standard size of 0402 in. They are designed to provide voltage regulation protection and are especially attractive in situations where space is at a premium. They are well suited for applications such as cellular phones, hand held portables, and automotive control units.

Specification Features

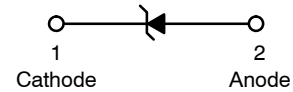
- Zener Breakdown Voltage Range -2.4 V to 47 V
 - ◆ Standard Tolerance Series – NZ8FxxxMX2WT5G
 - ◆ Tight Tolerance Series – NZ8FxxxSMX2WT5G
- Low Body Height: 0.016" (0.40 mm)
- Wettable Flank Package for optimal Automated Optical Inspection (AOI)
- SZ Prefix for Automotive and Other Applications Requiring 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

MAXIMUM RATINGS

| Rating | Symbol | Max | Unit |
|--|-----------------------------------|----------------|-------------|
| Total Device Dissipation FR-5 Board, (Note 1) @ T _A = 25°C Derate above 25°C | P _D | 250 1.5 | mW mW/°C |
| Total Device Dissipation FR-5 Board, (Note 2) @ T _A = 25°C Derate above 25°C | P _D | 500 1.2 | mW mW/°C |
| Thermal Resistance from Junction-to-Ambient (Note 1) (Note 2) | R _{θJA} | 415 247 | °C/W |
| Non-Repulsive Peak Reverse Power (Note 3) | P _{ZSM} | 40 | W |
| Junction and Storage Temperature Range | T _J , T _{stg} | -65 to +150 | °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. FR-4 Minimum Pad, 1 oz. Cu.
2. FR-4 150 mm², 1 oz. Cu.
3. T_A = 25°C, t_p = 100 μs.



X2DFNW2
CASE 711BG

MARKING DIAGRAM



XX = Specific Device Code
M = Date Code

ORDERING INFORMATION

| Device | Package | Shipping† |
|---------------------------------------|----------------------|-----------------------|
| NZ8FxxxMX2WT5G, SZNZ8FxxxMX2WT5G | X2DFNW2 (Pb-Free) | 8000 / Tape & Reel |
| NZ8FxxxSMX2WT5G, SZNZ8FxxxSMX2WT5G | X2DFNW2 (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 Specifications Brochure, BRD8011/D.

DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 2 of this data sheet.

NZ8F Series

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)

| Symbol | Parameter |
|-----------------|---|
| V _Z | Reverse Zener Voltage @ I _{ZT} |
| I _{ZT} | Reverse Current |
| Z _{ZT} | Maximum Zener Impedance @ I _{ZT} |
| I _R | Reverse Leakage Current @ V _R |
| V _R | Reverse Voltage |
| I _F | Forward Current |
| V _F | Forward Voltage @ I _F |
| ΘV _Z | Maximum Temperature Coefficient of V _Z |
| C | Max. Capacitance @ V _R = 0 and f = 1 MHz |

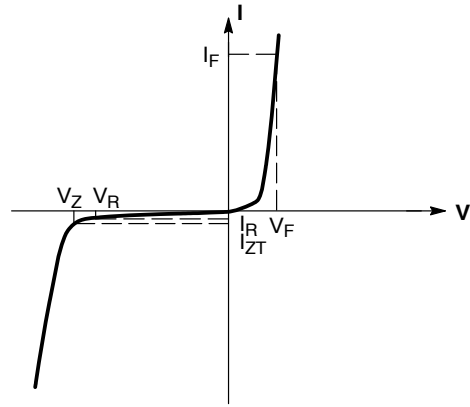


Figure 1. Uni-directional Zener

ELECTRICAL CHARACTERISTICS (NZ8FxxxMX2W Standard Tolerance Series)

(V_F = 0.9 V Max @ I_F = 10 mA for all types)

| Device* | Device Marking | Zener Voltage (Note 1) | | | Zener Impedance | Leakage Current | | C @ V _R = 0 f = 1 MHz pF |
|----------------|----------------|------------------------|-------|-------------------|-----------------------------------|---------------------------------|-------|--|
| | | V _Z (Volts) | | @ I _{ZT} | Z _{ZT} @ I _{ZT} | I _R @ V _R | | |
| | | Min | Max | mA | Ω | μA | Volts | |
| NZ8F2V4MX2WT5G | AA | 2.11 | 2.69 | 5 | 100 | 50 | 1 | 210 |
| NZ8F2V7MX2WT5G | AC | 2.43 | 2.97 | 5 | 100 | 20 | 1 | 210 |
| NZ8F3V0MX2WT5G | AD | 2.75 | 3.25 | 5 | 100 | 10 | 1 | 210 |
| NZ8F3V3MX2WT5G | AE | 3.05 | 3.55 | 5 | 100 | 10 | 1 | 210 |
| NZ8F3V6MX2WT5G | AF | 3.35 | 3.85 | 5 | 100 | 10 | 1 | 210 |
| NZ8F3V9MX2WT5G | AG | 3.65 | 4.15 | 5 | 100 | 5 | 1 | 210 |
| NZ8F4V3MX2WT5G | AH | 4.09 | 4.52 | 5 | 100 | 5 | 1 | 210 |
| NZ8F4V7MX2WT5G | AJ | 4.47 | 4.94 | 5 | 100 | 2 | 1 | 150 |
| NZ8F5V1MX2WT5G | AK | 4.85 | 5.36 | 5 | 80 | 2 | 1.5 | 130 |
| NZ8F5V6MX2WT5G | AL | 5.32 | 5.88 | 5 | 60 | 1 | 2.5 | 115 |
| NZ8F6V2MX2WT5G | AM | 5.89 | 6.51 | 5 | 60 | 1 | 3 | 110 |
| NZ8F6V8MX2WT5G | AN | 6.46 | 7.14 | 5 | 40 | 0.5 | 3.5 | 105 |
| NZ8F7V5MX2WT5G | AQ | 7.13 | 7.88 | 5 | 30 | 0.5 | 4 | 100 |
| NZ8F8V2MX2WT5G | AP | 7.79 | 8.61 | 5 | 30 | 0.5 | 5 | 90 |
| NZ8F9V1MX2WT5G | AR | 8.65 | 9.56 | 5 | 30 | 0.5 | 6 | 80 |
| NZ8F10VMX2WT5G | AT | 9.50 | 10.50 | 5 | 30 | 0.1 | 7 | 80 |
| NZ8F11VMX2WT5G | AU | 10.45 | 11.55 | 5 | 30 | 0.1 | 8 | 80 |
| NZ8F12VMX2WT5G | AV | 11.40 | 12.60 | 5 | 30 | 0.1 | 9 | 80 |
| NZ8F13VMX2WT5G | AW | 12.35 | 13.65 | 5 | 37 | 0.1 | 10 | 75 |
| NZ8F15VMX2WT5G | AX | 14.25 | 15.75 | 5 | 42 | 0.1 | 11 | 70 |
| NZ8F16VMX2WT5G | AY | 15.20 | 16.80 | 5 | 50 | 0.1 | 12 | 65 |
| NZ8F18VMX2WT5G | AZ | 17.10 | 18.90 | 5 | 50 | 0.1 | 14 | 60 |
| NZ8F20VMX2WT5G | A2 | 19.00 | 21.00 | 5 | 55 | 0.1 | 15.4 | 55 |
| NZ8F22VMX2WT5G | A3 | 20.90 | 23.10 | 5 | 55 | 0.1 | 16.8 | 55 |
| NZ8F24VMX2WT5G | A4 | 22.80 | 25.20 | 5 | 70 | 0.1 | 18.9 | 50 |
| NZ8F27VMX2WT5G | A5 | 25.65 | 28.35 | 5 | 80 | 0.1 | 22 | 50 |
| NZ8F33VMX2WT5G | A6 | 31.35 | 34.65 | 5 | 95 | 0.1 | 26 | 45 |
| NZ8F47VMX2WT5G | A7 | 44.65 | 49.35 | 2 | 170 | 0.1 | 38 | 40 |

*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.

NZ8F Series

ELECTRICAL CHARACTERISTICS (NZ8FxxxSMX2W Tight Tolerance Series)

($V_F = 0.9\text{ V Max @ } I_F = 10\text{ mA}$ for all types)

| Device* | Device Marking | Zener Voltage (Note 1) | | | Zener Impedance | Leakage Current | | C@ $V_R = 0\text{ f}$ = 1 MHz |
|-----------------|----------------|------------------------|-------|------------|---------------------|-----------------|-------|----------------------------------|
| | | V_Z (Volts) | | @ I_{ZT} | Z_{ZT} @ I_{ZT} | I_R @ V_R | | |
| | | Min | Max | mA | Ω | μA | Volts | |
| NZ8F2V4SMX2WT5G | CA | 2.26 | 2.55 | 5 | 100 | 50 | 1 | 210 |
| NZ8F2V7SMX2WT5G | CC | 2.54 | 2.86 | 5 | 100 | 20 | 1 | 210 |
| NZ8F3V0SMX2WT5G | CD | 2.85 | 3.15 | 5 | 100 | 10 | 1 | 210 |
| NZ8F3V3SMX2WT5G | CE | 3.14 | 3.47 | 5 | 100 | 10 | 1 | 210 |
| NZ8F3V6SMX2WT5G | CF | 3.42 | 3.78 | 5 | 100 | 10 | 1 | 210 |
| NZ8F3V9SMX2WT5G | CG | 3.71 | 4.10 | 5 | 100 | 5 | 1 | 210 |
| NZ8F4V3SMX2WT5G | CH | 4.16 | 4.45 | 5 | 100 | 5 | 1 | 210 |
| NZ8F4V7SMX2WT5G | CJ | 4.59 | 4.81 | 5 | 100 | 2 | 1 | 150 |
| NZ8F5V1SMX2WT5G | CK | 4.98 | 5.22 | 5 | 80 | 2 | 1.5 | 130 |
| NZ8F5V6SMX2WT5G | CL | 5.47 | 5.73 | 5 | 60 | 1 | 2.5 | 115 |
| NZ8F6V2SMX2WT5G | CM | 6.06 | 6.34 | 5 | 60 | 1 | 3 | 110 |
| NZ8F6V8SMX2WT5G | CN | 6.64 | 6.96 | 5 | 40 | 0.5 | 3.5 | 105 |
| NZ8F7V5SMX2WT5G | CP | 7.33 | 7.67 | 5 | 30 | 0.5 | 4 | 100 |
| NZ8F8V2SMX2WT5G | CQ | 8.01 | 8.39 | 5 | 30 | 0.5 | 5 | 90 |
| NZ8F9V1SMX2WT5G | CR | 8.89 | 9.31 | 5 | 30 | 0.5 | 6 | 80 |
| NZ8F10VSMX2WT5G | CT | 9.77 | 10.23 | 5 | 30 | 0.1 | 7 | 80 |
| NZ8F11VSMX2WT5G | CU | 10.75 | 11.25 | 5 | 30 | 0.1 | 8 | 80 |
| NZ8F12VSMX2WT5G | CV | 11.72 | 12.28 | 5 | 30 | 0.1 | 9 | 80 |
| NZ8F13VSMX2WT5G | CW | 12.70 | 13.30 | 5 | 37 | 0.1 | 10 | 75 |
| NZ8F15VSMX2WT5G | CX | 14.66 | 15.35 | 5 | 42 | 0.1 | 11 | 70 |
| NZ8F16VSMX2WT5G | CY | 15.63 | 16.37 | 5 | 50 | 0.1 | 12 | 65 |
| NZ8F18VSMX2WT5G | CZ | 17.59 | 18.41 | 5 | 50 | 0.1 | 14 | 60 |
| NZ8F20VSMX2WT5G | C2 | 19.54 | 20.46 | 5 | 55 | 0.1 | 15.4 | 55 |
| NZ8F22VSMX2WT5G | C3 | 21.49 | 22.51 | 5 | 55 | 0.1 | 16.8 | 55 |
| NZ8F24VSMX2WT5G | C4 | 23.45 | 24.55 | 5 | 70 | 0.1 | 18.9 | 50 |
| NZ8F27VSMX2WT5G | C5 | 26.38 | 27.62 | 5 | 80 | 0.1 | 22 | 50 |
| NZ8F33VSMX2WT5G | C6 | 32.24 | 33.76 | 5 | 95 | 0.1 | 26 | 45 |
| NZ8F47VSMX2WT5G | C7 | 45.92 | 48.08 | 2 | 170 | 0.1 | 38 | 40 |

*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.

NZ8F Series

TYPICAL CHARACTERISTICS

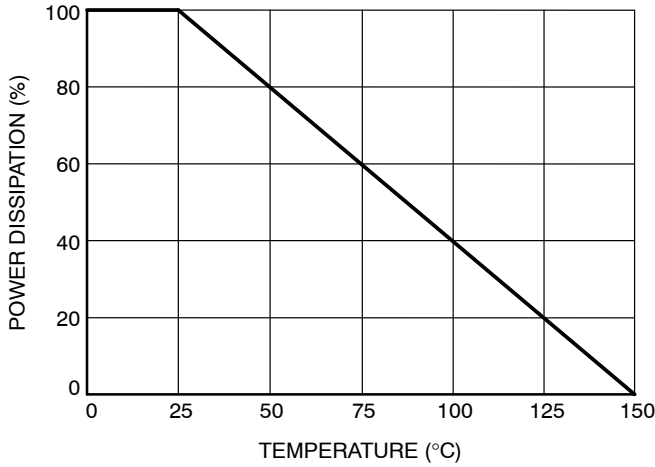


Figure 2. Steady State Power Derating

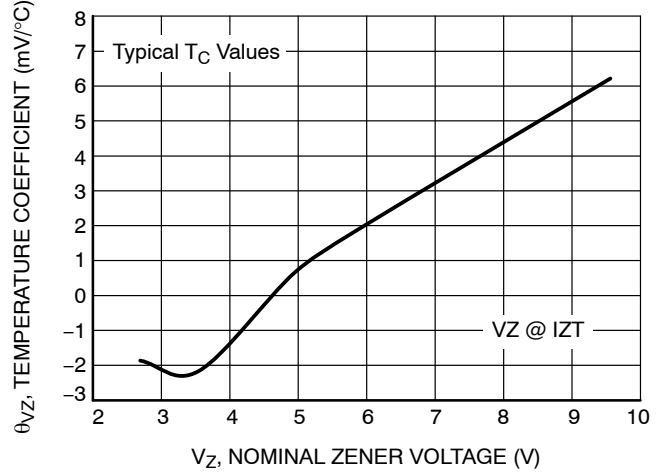


Figure 3. Temperature Coefficients (Temperature Range -55°C to $+150^{\circ}\text{C}$)

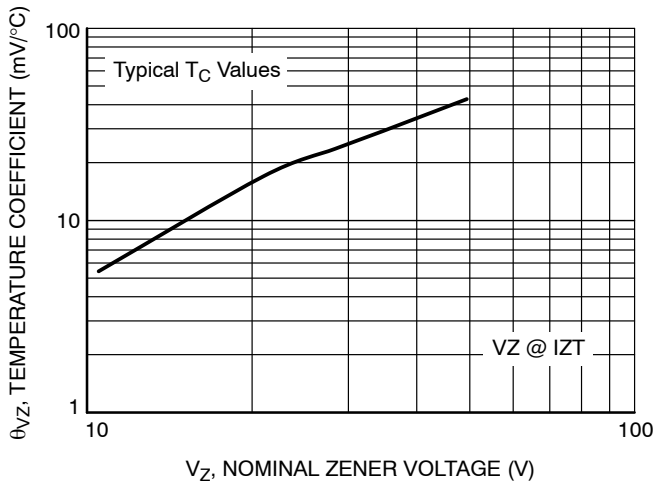


Figure 4. Temperature Coefficients (Temperature Range -55°C to $+150^{\circ}\text{C}$)

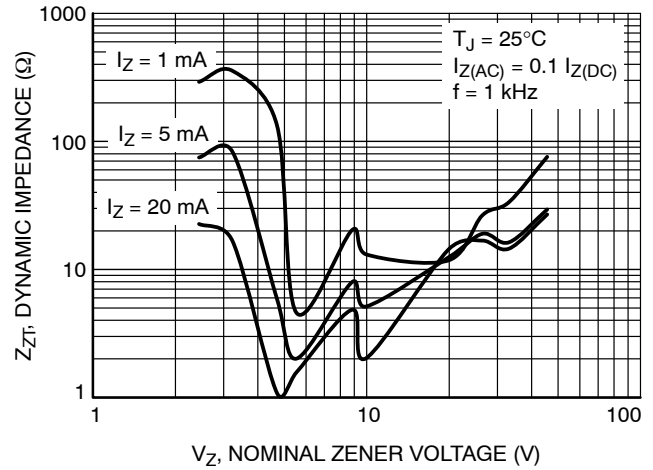


Figure 5. Effect of Zener Voltage on Zener Impedance

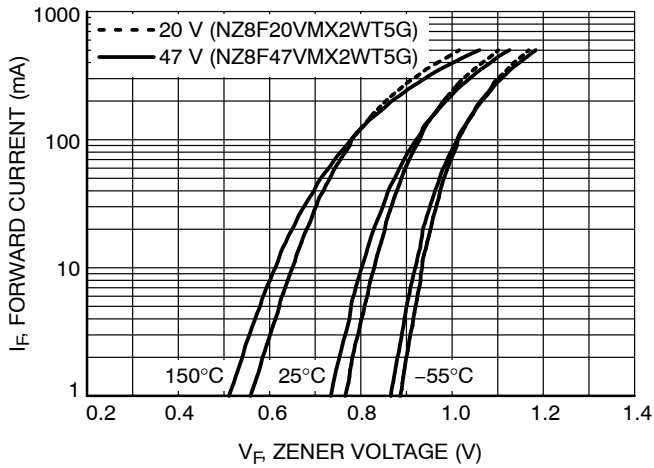


Figure 6. Typical Forward Voltage

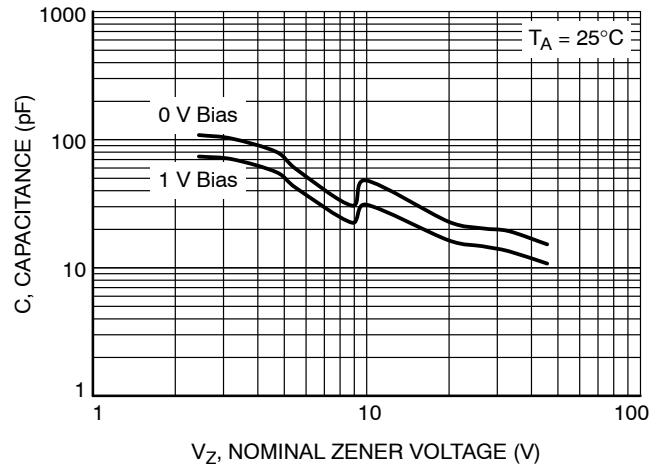


Figure 7. Typical Capacitance

NZ8F Series

TYPICAL CHARACTERISTICS

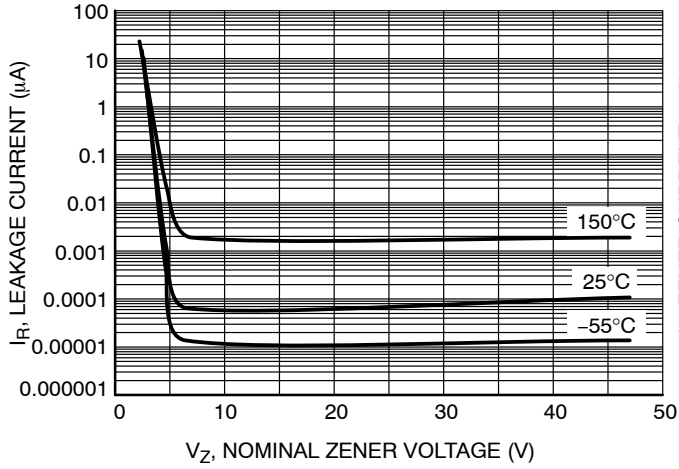


Figure 8. Typical Leakage Current

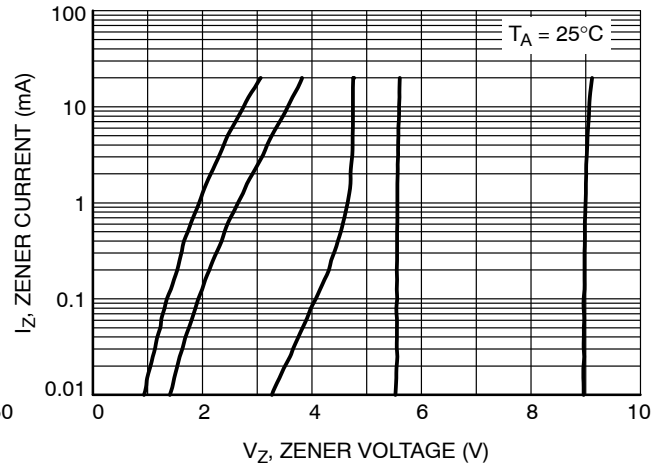


Figure 9. Zener Voltage vs. Zener Current (V_Z up to 9.1 V)

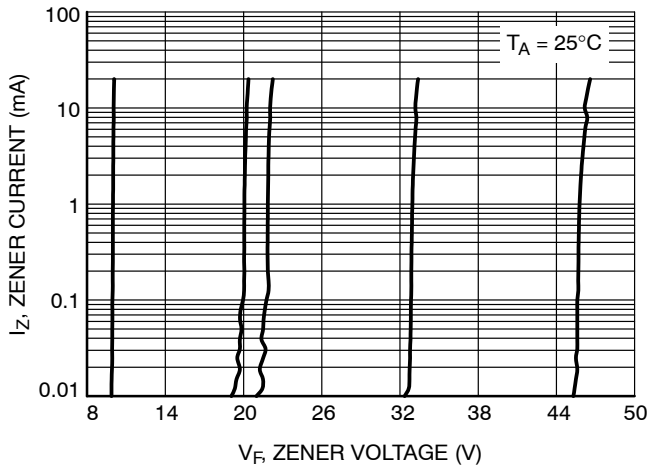


Figure 10. Zener Voltage vs. Zener Current ($V_Z = 9.1 \text{ V to } 47 \text{ V}$)

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

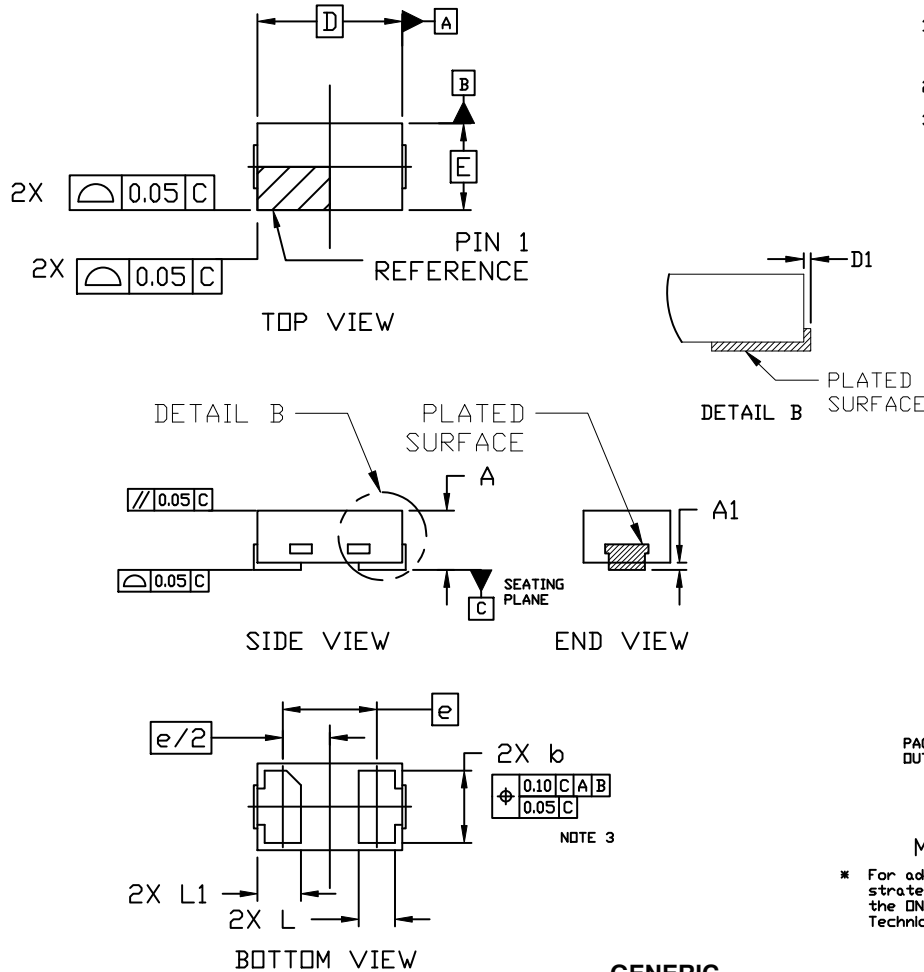
ON Semiconductor®



SCALE 8:1

X2DFNW2 1.0x0.6, 0.65P
CASE 711BG
ISSUE C

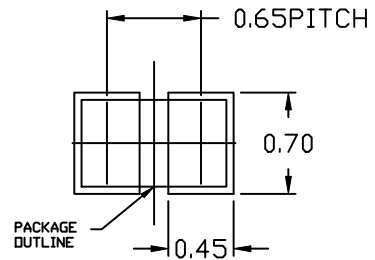
DATE 13 SEP 2019



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 | 0.34 | 0.37 | 0.40 |
| 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, SOLDERM/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: | 98AON15241G | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| DESCRIPTION: | X2DFNW2 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

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Zener Diodes](#) category:

Click to view products by [ON Semiconductor](#) manufacturer:

Other Similar products are found below :

[RKZ13B2KG#P1](#) [DL5234B](#) [1N4682](#) [1N4691](#) [1N4693](#) [1N4732A](#) [1N4733A-TR](#) [1N4736A](#) [1N4750A](#) [1N4759ARL](#) [1N5241B](#) [1N5365B](#)
[1N5369B](#) [1N747A](#) [1N959B](#) [1N964B](#) [1N966B](#) [1N972B](#) [NTE149A](#) [NTE5116A](#) [NTE5121A](#) [NTE5147A](#) [NTE5152A](#) [NTE5155A](#)
[NTE5164A](#) [JANS1N4974US](#) [1N4692](#) [1N4700](#) [1N4702](#) [1N4704](#) [1N4711](#) [1N4714](#) [1N4737A](#) [1N4745ARL](#) [1N4752A](#) [1N4752ARL](#)
[1N4760ARL](#) [1N5221B](#) [1N5236B](#) [1N5241BTR](#) [1N5242BTR](#) [1N5350B](#) [1N5352B](#) [1N961BRR1](#) [1N964BRL](#) [RKZ5.1BKU#P6](#)
[3SMAJ5950B-TP](#) [3SMBJ5925B-TP](#) [TDZTR24](#) [441774C](#)