# NUF4402MN

*Advance Information*

# EMI Filter with ESD Protection

This device is a 4 line EMI filter array for wireless applications. Greater than −30 dB attenuation is obtained at frequencies from 900 MHz to 2.2 GHz. It also offers ESD protection−clamping transients from static discharges. ESD protection is provided across all capacitors.

### Features

- EMI Filtering and ESD Protection
- Integration of 12 Discrete Components
- Compliance with IEC61000−4−2 (Level 4)
  - 8.0 kV (Contact)
  - 15 kV (Air)
- DFN Package, 1.6 x 1.6 mm
- Moisture Sensitivity Level 1
- ESD Ratings: Machine Model = C
  Human Body Model = 3B

### Benefits

- Reduces EMI/RFI Emmisions on a Data Line
- Integrated Solution Offers Cost and Space Savings
- Reduces Parasitic Inductances Which Offer a More “Ideal” Low Pass Filter Response
- Integrated Solution Improves System Reliability

### Applications

- EMI Filtering and ESD Protection for Data Lines
- Wireless Phones
- Handheld Products
- Notebook Computers
- LCD Displays

This document contains information on a new product. Specifications and information herein are subject to change without notice.

ON Semiconductor®

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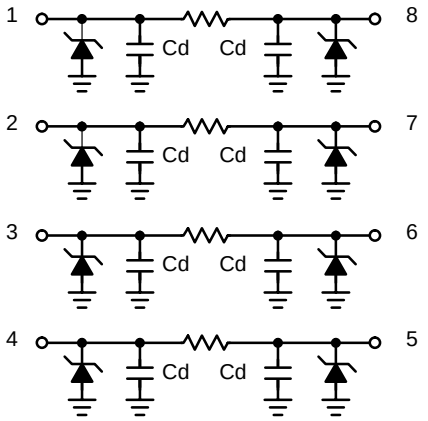
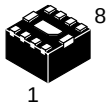



(Top View)

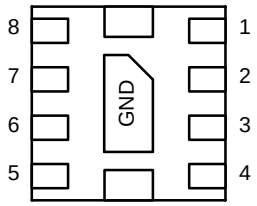
**MARKING DIAGRAM**




**DFN**
**CASE TBD**
**PRELIMINARY**


XX = Specific Device Code
D = Date Code

**PIN CONNECTIONS**




(Bottom View)

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| NUF4402MNT1 | DFN | 3000 / 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.

**MAXIMUM RATINGS**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| ESD Discharge IEC61000−4−2<br>Air Discharge<br>Contact Discharge<br>Machine Model | $V_{PP}$ | <br>15<br>8.0<br>TBD | kV |
| Steady−State Power per Resistor | $P_R$ | | mW |
| Steady−State Power per Package | $P_T$ | | mW |
| Operating Temperature Range | $T_{OP}$ | −40 to 85 | °C |
| Storage Temperature Range | $T_{STG}$ | −55 to 150 | °C |
| Maximum Lead Temperature for Soldering Purposes (1.8 in from case for 10 seconds) | $T_L$ | 260 | °C |

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.

**ELECTRICAL CHARACTERISTICS** ($T_J$ = 25°C unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Maximum Reverse Working Voltage | $V_{RWM}$ | | | | 5.0 | V |
| Breakdown Voltage | $V_{BR}$ | $I_R$ = 1.0 mA | 6.0 | 7.0 | | V |
| Leakage Current | $I_R$ | $V_{RWM}$ = 3.0 V | | | 1.0 | μA |
| Resistance | $R_A$ | | 85 | 100 | 115 | Ω |
| Capacitance (Notes 1 and 2) | Cd | | | 12 | 16 | pF |
| Cut−Off Frequency (Note 3) | $f_{3dB}$ | Above this frequency, appreciable attenuation occurs | | 110 | | MHz |

1. Measured at 25°C, $V_R$ = 2.5 V, f = 1.0 MHz.
2. Total Line Capacitance is 2 times the Diode Capacitance (Cd).
3. 50 Ω source and 50 Ω load termination.

**TYPICAL PERFORMANCE CURVES** ($T_A$= 25°C unless otherwise specified)

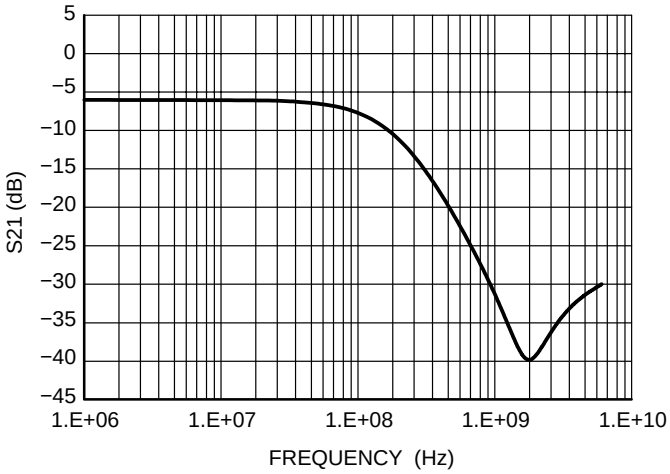



**Figure 1. Insertion Loss Characteristic**

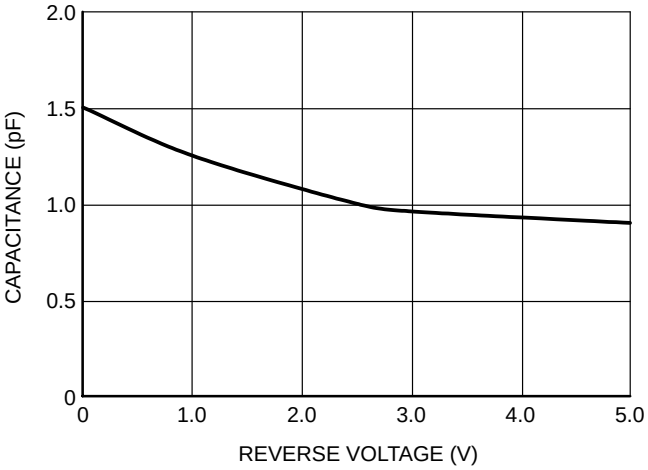



**Figure 2. Typical Capactiance vs. Reverse Biased Voltage (Normalized Capactiance Cd at 2.5 V)**

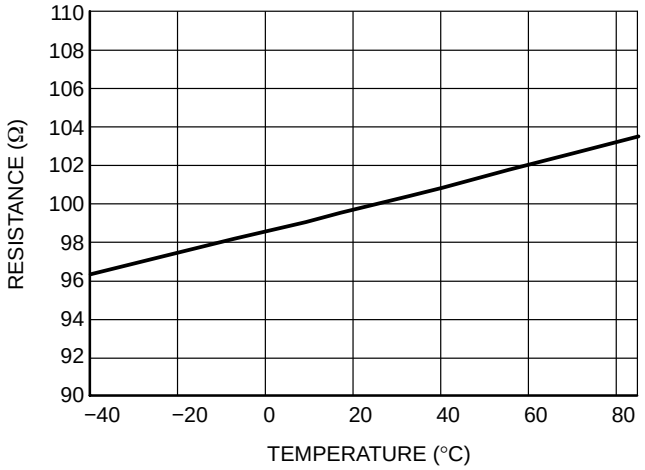
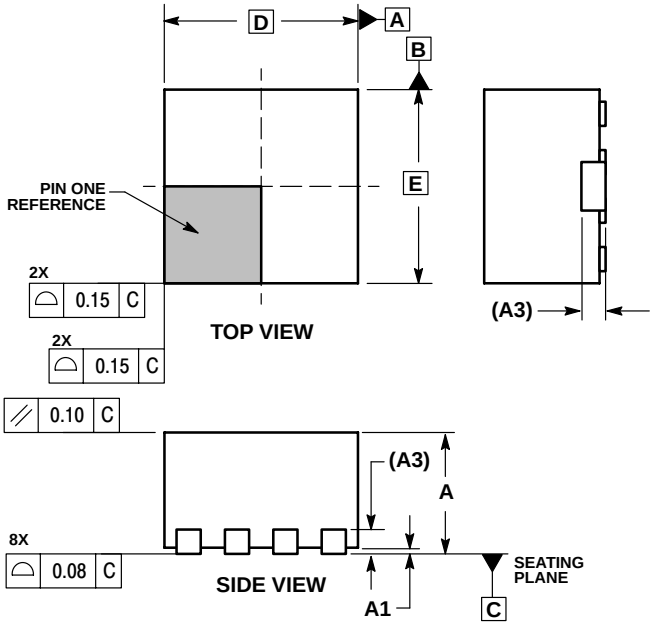
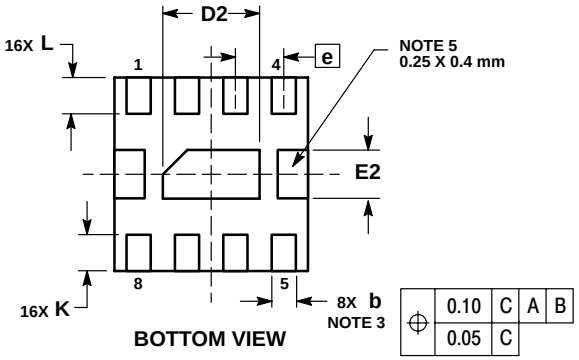



**Figure 3. Typical Resistance over Temperature**

## PACKAGE DIMENSIONS

**DFN8**
CASE TBD
ISSUE O




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO TERMINAL AND IS MEASURED BETWEEN 0.25 AND 0.30 MM FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. EXPOSED PADS CONNECTED TO DIE FLAG. USED AS TEST CONTACTS.

| | MILLIMETERS | |
|---|---|---|
| DIM | MIN | MAX |
| A | 0.80 | 1.00 |
| A1 | 0.00 | 0.05 |
| A3 | 0.20 REF | |
| b | 0.15 | 0.25 |
| D | 1.6 BSC | |
| D2 | 0.70 | 0.90 |
| E | 1.60 BSC | |
| E2 | 0.30 | 0.50 |
| e | 0.40 BSC | |
| K | 0.20 | −−− |
| L | 0.20 | 0.40 |



### PUBLICATION ORDERING INFORMATION

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