

# NUF6410MN

## 6 Line EMI Filter with ESD Protection

This device is a 6 line EMI filter array for wireless applications. Greater than -20 dB typical attenuation is obtained at frequencies from 800 MHz to 3.0 GHz. The NUF6410MN has a typical cut-off frequency of 250 MHz. This DFN package is specifically designed to enhance EMI filtering for low-profile or slim design electronics especially where space and height is a premium. It also offers ESD protection clamping transients from static discharges. ESD protection is provided across all capacitors.

### Features

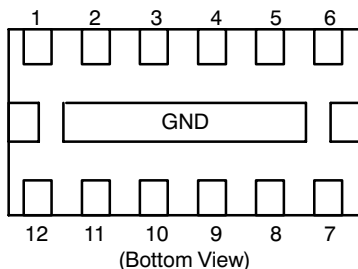
- EMI Filtering and ESD Protection
- Integration of 30 Discrete Components
- DFN Package, 1.35 x 3.0 mm
- Moisture Sensitivity Level 1
- ESD Ratings: IEC61000-4-2 (Level 4)  
Machine Model = C  
Human Body Model = 3B
- This is a Pb-Free Device\*

### Benefits

- Reduces EMI/RFI Emissions on a Data Line
- Integrated Solution Offers Cost and Space Savings in a DFN Package
- Excellent S21 Characteristics with very Low Parasitic Inductances
- Integrated Solution Improves System Reliability
- Compatible Footprint to BGA or Flip-Chip Package

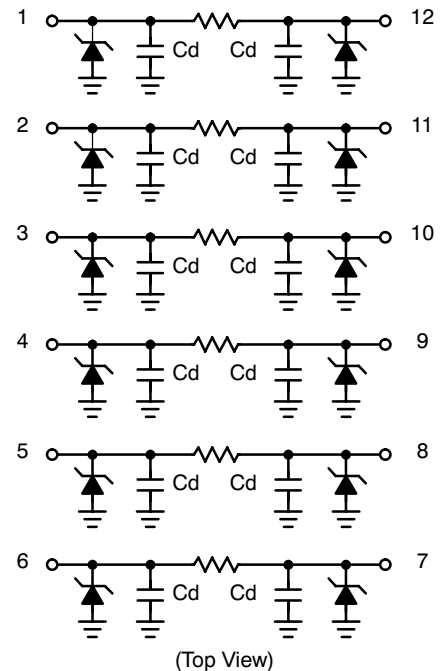
### Applications

- EMI Filtering and ESD Protection for Data Lines
- Wireless Phones
- PDAs and Handheld Products
- Digital Camera
- LCD Displays

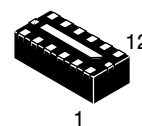


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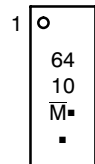
<http://onsemi.com>



### MARKING DIAGRAM



DFN12  
CASE 506AD



6410 = Specific Device Code  
M = Date and Assembly Location  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device       | Package            | Shipping†          |
|--------------|--------------------|--------------------|
| NUF6410MNT1G | DFN12<br>(Pb-Free) | 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.

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

# NUF6410MN

## MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise noted)

| Parameter   | Symbol           | Value      | Unit |
|---|------------------|------------|------|
| ESD Discharge IEC61000-4-2<br>Contact Discharge                                   | V <sub>PP</sub>  | 8.0        | kV   |
| DC Power per Resistor   | P <sub>R</sub>   | 100        | mW   |
| DC Power per Package  | P <sub>T</sub>   | 600        | mW   |
| Operating Temperature Range   | T <sub>OP</sub>  | -40 to 85  | °C   |
| Storage Temperature Range   | T <sub>STG</sub> | -55 to 150 | °C   |
| Maximum Lead Temperature for Soldering Purposes (1.8 in from case for 10 seconds) | T <sub>L</sub>   | 260        | °C   |

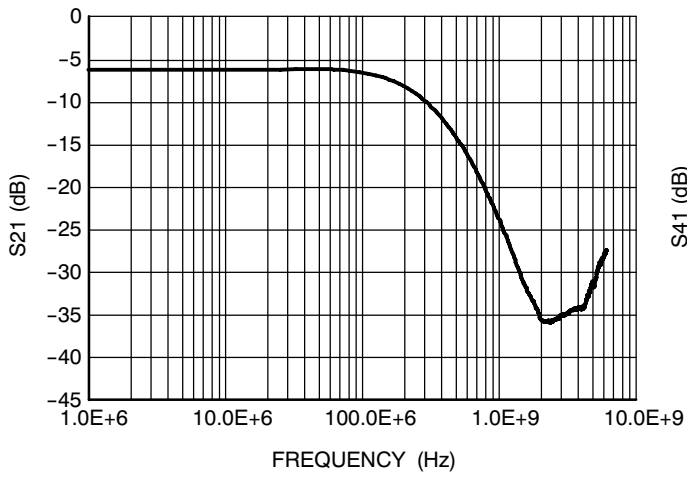
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise noted)

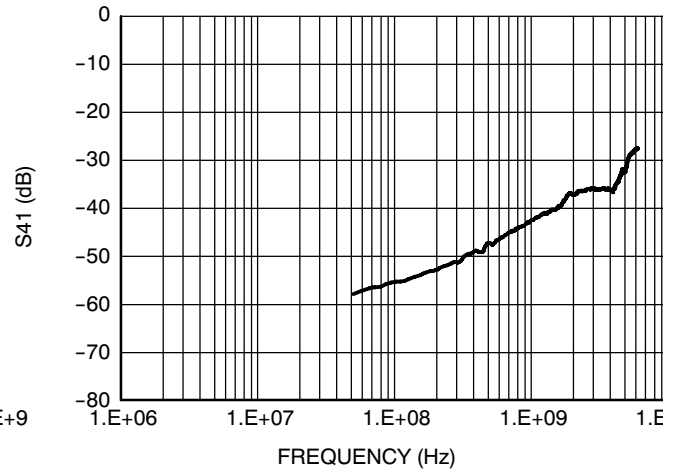
| Parameter                       | Symbol           | Test Conditions   | Min | Typ | Max | Unit |
|---------------------------------|------------------|---|-----|-----|-----|------|
| Maximum Reverse Working Voltage | V <sub>RWM</sub> |   |     |     | 5.0 | V    |
| Breakdown Voltage               | V <sub>BR</sub>  | I <sub>R</sub> = 1.0 mA                                 | 6.0 | 7.0 |     | V    |
| Leakage Current                 | I <sub>R</sub>   | V <sub>RWM</sub> = 3.3 V                                |     | 10  | 100 | nA   |
| Resistance                      | R <sub>A</sub>   | I <sub>R</sub> = 20 mA                                  | 85  | 100 | 115 | Ω    |
| Capacitance (Notes 1 and 2)     | C <sub>d</sub>   | V <sub>R</sub> = 2.5 V, f = 1.0 MHz                     |     | 7.0 | 9.0 | pF   |
| Cut-Off Frequency (Note 3)      | f <sub>3dB</sub> | Above this frequency,<br>appreciable attenuation occurs |     | 250 |     | MHz  |

1. Measured at 25°C, V<sub>R</sub> = 2.5 V, f = 1.0 MHz.
2. Total line capacitance is 2 times the Diode Capacitance (C<sub>d</sub>).
3. 50 Ω source and 50 Ω load termination.

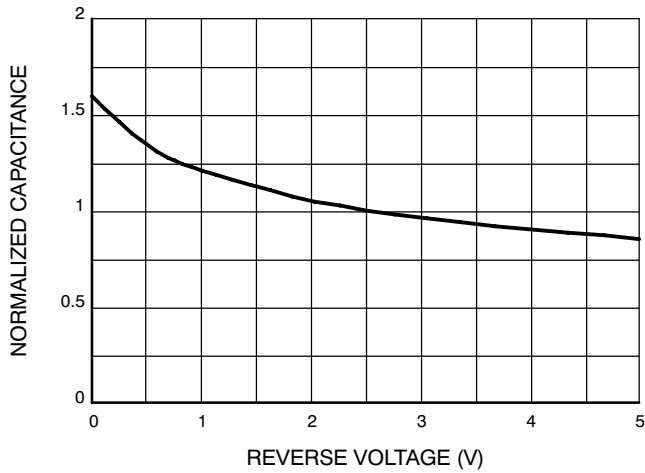
# NUF6410MN



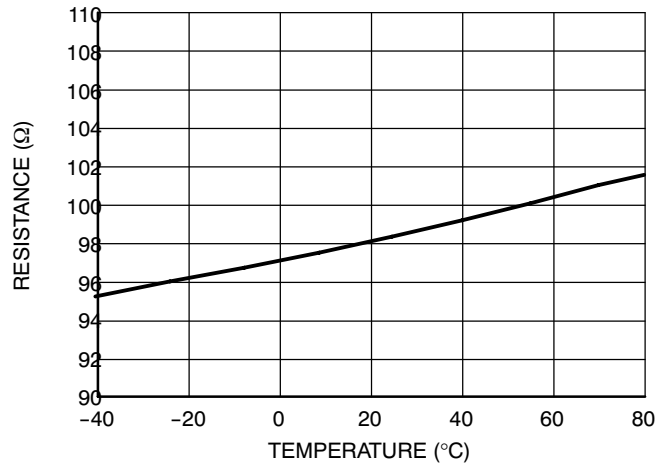
**Figure 1. Typical Insertion Loss Characteristic**



**Figure 2. Typical Analog Crosstalk**



**Figure 3. Typical Capacitance vs. Reverse Biased Voltage (Normalized Capacitance, Cd @ 2.5 V)**

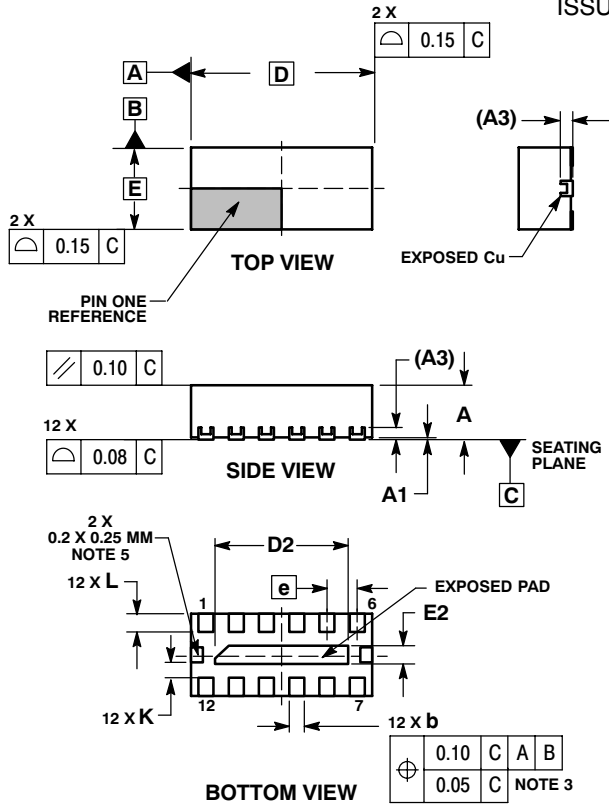


**Figure 4. Typical Resistance over Temperature**

# NUF6410MN

## PACKAGE DIMENSIONS

DFN12 3.0x1.35, 0.5P  
CASE 506AD-01  
ISSUE G

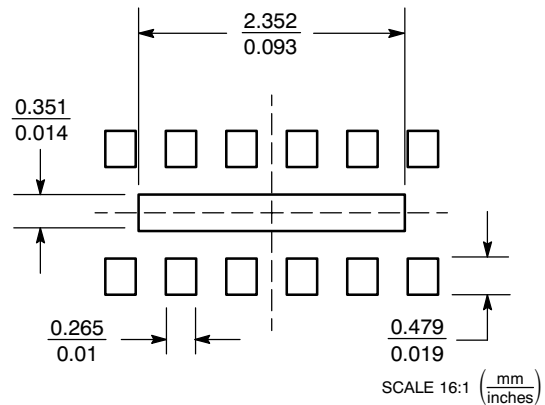


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION b APPLIES TO PLATED 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           | 0.18 | 0.30 |
| D           | 3.00 | BSC  |
| D2          | 2.10 | 2.30 |
| E           | 1.35 | BSC  |
| E2          | 0.20 | 0.40 |
| e           | 0.50 | BSC  |
| K           | 0.20 | ---  |
| L           | 0.20 | 0.40 |

**SOLDERING 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.

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