

# NUF2116MN

## 2 Line Audio EMI Filter with ESD Protection

This device is a 2 line audio EMI filter array designed for speaker applications. It offers greater than -35 dB attenuation at frequencies from 800 MHz to 3.0 GHz. This device also offers ESD protection—clamping transients from static discharges and ESD protection is provided across all capacitors.

### Features

- Provides EMI Filtering and ESD Protection
- Integration of 10 Discretes
- Compliance with IEC61000-4-2 (Level 4)  
30 kV (Contact)
- DFN8, 2x2 mm Package
- Moisture Sensitivity Level 1
- ESD Ratings: Machine Model = C  
Human Body Model = 3B
- Matching Series Impedances for Speaker Applications
- This is a Pb-Free Device

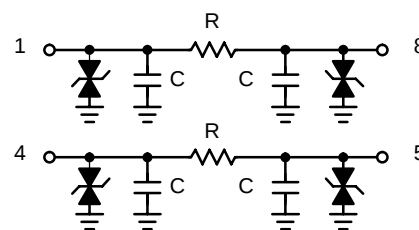
### Applications

- Wireless Phones
- MP3s
- PDAs
- Digital Cameras
- Portable DVDs



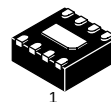
**ON Semiconductor®**

<http://onsemi.com>

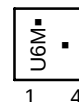


(Top View)

### MARKING DIAGRAM



DFN8  
CASE 506AA



U6 = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device       | Package           | Shipping <sup>†</sup> |
|--------------|-------------------|-----------------------|
| NUF2116MNT1G | DFN8<br>(Pb-Free) | 3000 / Tape & Reel    |

<sup>†</sup>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.

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

# NUF2116MN

## MAXIMUM RATINGS

| Parameter                                                                   | Symbol    | Value      | Unit |
|-----------------------------------------------------------------------------|-----------|------------|------|
| ESD Discharge IEC61000-4-2 Contact Discharge                                | $V_{PP}$  | 30         | kV   |
| Steady-State Power per Resistor @ 25°C                                      | $P_R$     | 180        | mW   |
| Steady-State Power per Package @ 25°C                                       | $P_T$     | 360        | 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 s) | $T_L$     | 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 ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                         | Test Conditions                                      | Symbol    | Min  | Typ  | Max  | Unit          |
|-----------------------------------|------------------------------------------------------|-----------|------|------|------|---------------|
| Maximum Reverse Working Voltage   |                                                      | $V_{RWM}$ | –    | –    | 12   | V             |
| Breakdown Voltage                 | $I_R = 1.0\text{ mA}$                                | $V_{BR}$  | 13.7 | 15.7 | 17.7 | V             |
| Leakage Current                   | $V_{RWM} = 12\text{ V}$                              | $I_R$     | –    | –    | 0.1  | $\mu\text{A}$ |
| Resistance                        | $I_F = 40\text{ mA}$                                 | $R$       | 53   | 64   | 75   | $\Omega$      |
| Capacitance per Diode (Note 1, 3) |                                                      | $C_d$     |      | 50   | 55   | pF            |
| Cut-Off Frequency (Note 2)        | Above this frequency, appreciable attenuation occurs | $f_{3dB}$ |      | 55   |      | MHz           |

1. Measured at 25°C,  $V_R = 0\text{ V}$ ,  $f = 1.0\text{ MHz}$ .
2. 50  $\Omega$  source and 50  $\Omega$  load termination.
3. Total line capacitance is 2 times the diode capacitance ( $C_d$ ).

TYPICAL PERFORMANCE CURVES

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

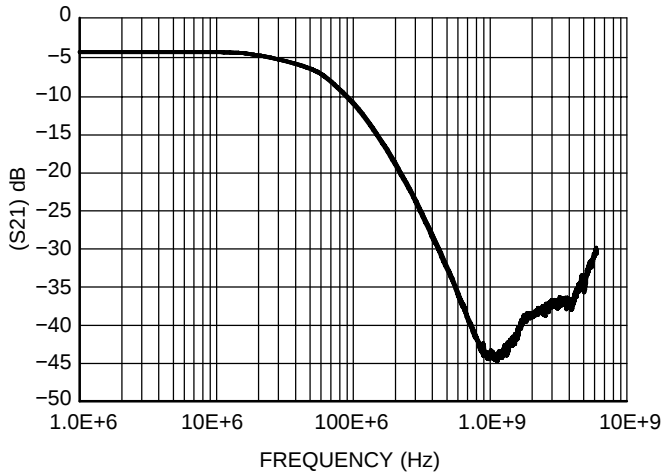


Figure 1. Insertion Loss Characteristics

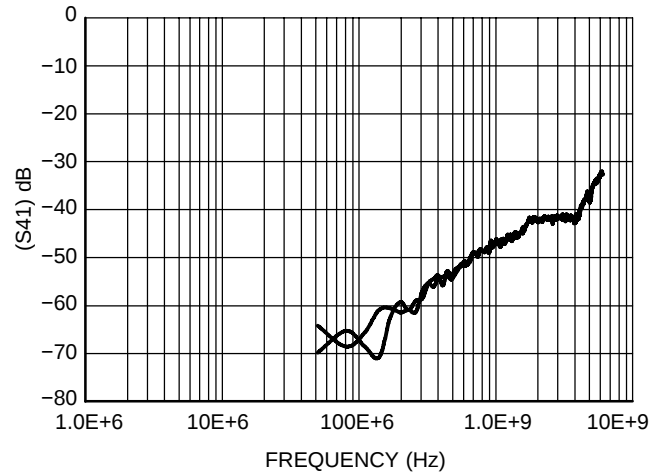


Figure 2. Analog Cross-Talk

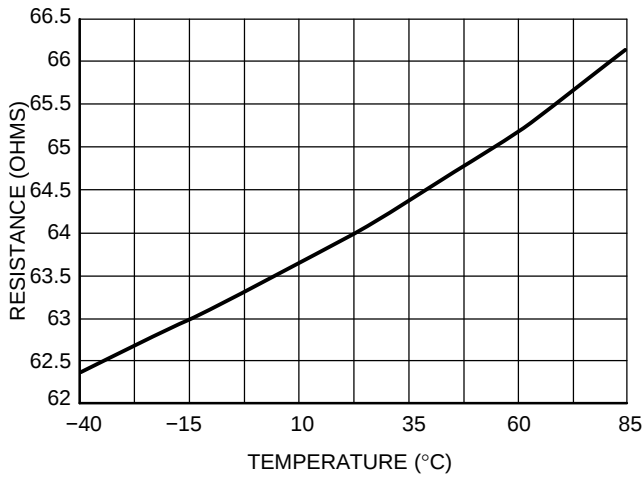


Figure 3. Typical Resistance over Temperature

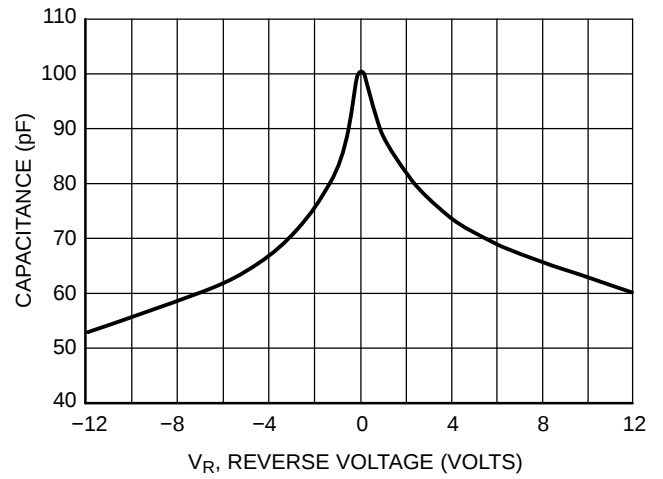
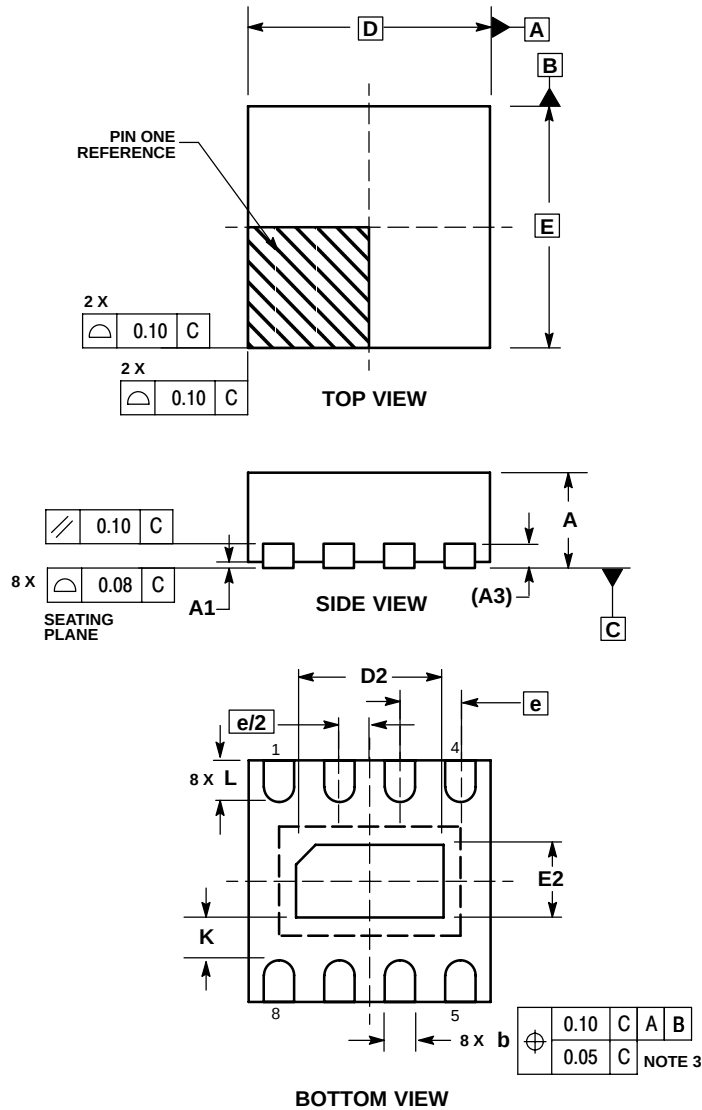


Figure 4. Typical Line Capacitance over Reverse Voltage

# NUF2116MN

## PACKAGE DIMENSIONS

DFN8  
CASE 506AA-01  
ISSUE D



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994 .
2. CONTROLLING DIMENSION: MILLIMETERS.
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.

| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 0.80        | 1.00 |
| A1  | 0.00        | 0.05 |
| A3  | 0.20        | REF  |
| b   | 0.20        | 0.30 |
| D   | 2.00        | BSC  |
| D2  | 1.10        | 1.30 |
| E   | 2.00        | BSC  |
| E2  | 0.70        | 0.90 |
| e   | 0.50        | BSC  |
| K   | 0.20        | ---  |
| L   | 0.25        | 0.35 |

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC 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:**  
Literature Distribution Center for ON Semiconductor  
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA  
**Phone:** 480-829-7710 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 480-829-7709 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada

**Japan:** ON Semiconductor, Japan Customer Focus Center  
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051  
**Phone:** 81-3-5773-3850

**ON Semiconductor Website:** <http://onsemi.com>

**Order Literature:** <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.

NUF2116MN/D