

# NUF4220MN

## Audio EMI Filter, 4 Line, with ESD Protection

NUF4220MN is a 4 line LC EMI filter array designed for audio applications. It offers greater than -30 dB attenuation at frequencies from 800 MHz to 5.0 GHz, with no line loss. This part is a single chip solution for audio interface applications, 2 speaker lines with a microphone line. 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 20 Discretes
- Compliance with IEC61000-4-2 (Level 4)  
18 kV (Contact)
- DFN8, 2x2 mm Package
- Moisture Sensitivity Level 1
- ESD Ratings: Machine Model = C  
Human Body Model = 3B
- Excellent Line Efficiency with Low Line Resistance < 1.1  $\Omega$  max
- This is a Pb-Free Device\*

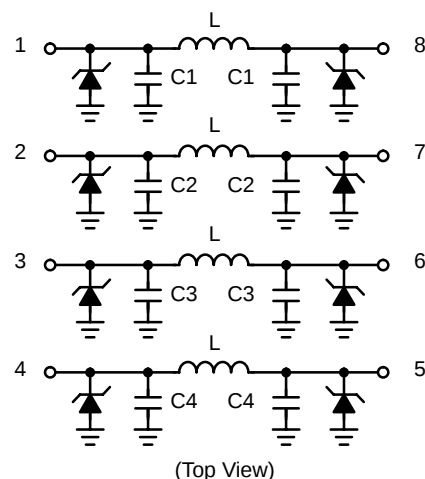
### Applications

- Headset
- MP3s
- PDAs
- Digital Cameras
- Portable DVDs
- Handfree Interface

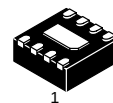


**ON Semiconductor®**

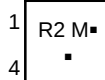
<http://onsemi.com>



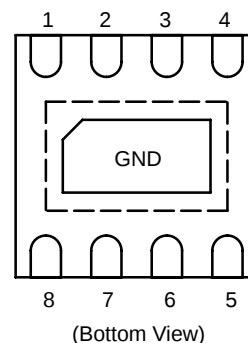
### MARKING DIAGRAM



DFN8  
CASE 506AA  
PLASTIC



R2 = Specific Device Code  
M = Date Code  
■ = Pb-Free Package



### ORDERING INFORMATION

| Device       | Package           | Shipping <sup>†</sup> |
|--------------|-------------------|-----------------------|
| NUF4220MNT1G | DFN8<br>(Pb-Free) | 3000 / Tape & Reel    |

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

<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.

# NUF4220MN

## MAXIMUM RATINGS

| Parameter                                                                   | Symbol    | Value      | Unit |
|-----------------------------------------------------------------------------|-----------|------------|------|
| ESD Discharge IEC61000-4-2 Contact Discharge                                | $V_{PP}$  | 18         | kV   |
| Steady-State Power per Inductor                                             | $P_L$     | 90         | mW   |
| Steady-State Power per Package                                              | $P_T$     | 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   |

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

| Parameter                       | Test Conditions                                      | Symbol    | Min | Typ  | Max | Unit          |
|---------------------------------|------------------------------------------------------|-----------|-----|------|-----|---------------|
| Maximum Reverse Working Voltage |                                                      | $V_{RWM}$ |     |      | 5.0 | V             |
| Breakdown Voltage               | $I_R = 1.0\text{ mA}$                                | $V_{BR}$  | 6.0 | 7.0  | 8.0 | V             |
| Leakage Current                 | $V_{RWM} = 3.3\text{ V}$                             | $I_R$     |     |      | 0.1 | $\mu\text{A}$ |
| Inductance                      |                                                      | $L$       |     | 4.9  |     | nH            |
| Series Resistance               |                                                      | $R_S$     | 0.6 | 0.85 | 1.1 | $\Omega$      |
| Capacitance (Note 1, 3)         |                                                      | $C_d$     |     | 205  |     | pF            |
| Cut-Off Frequency (Note 2)      | Above this frequency, appreciable attenuation occurs | $f_{3dB}$ |     | 16   |     | MHz           |

1. Measured at  $25^\circ\text{C}$ ,  $V_R = 0\text{ V}$ ,  $f = 1.0\text{ MHz}$ .
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)

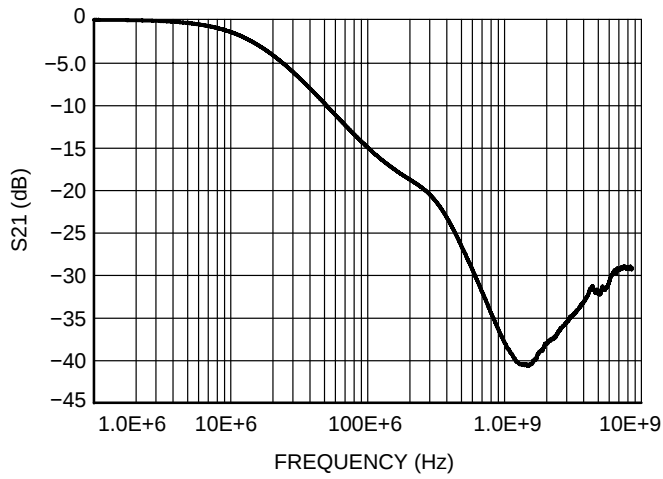


Figure 1. Typical Insertion Loss Characteristics

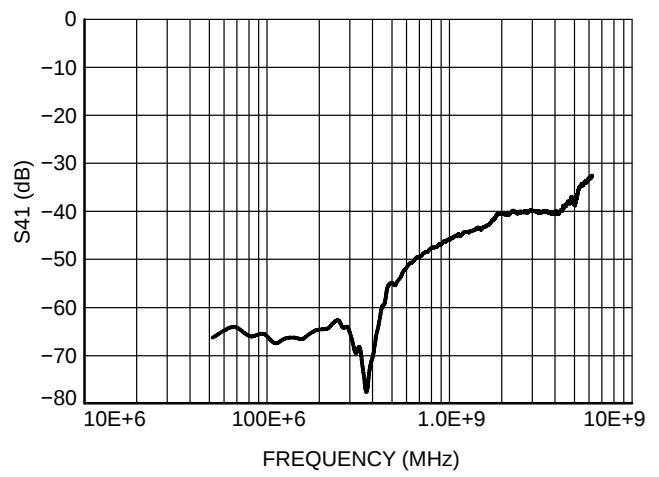


Figure 2. Typical Analog Crosstalk

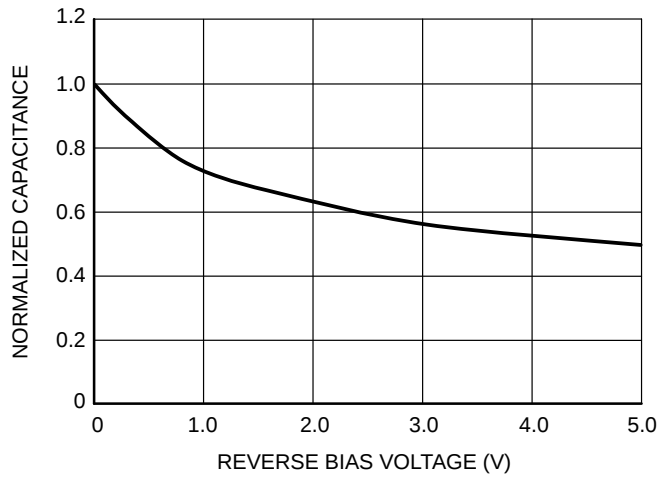


Figure 3. Typical Line Capacitance vs. Reverse Bias Voltage (Normalized to Capacitance @ 0 V)

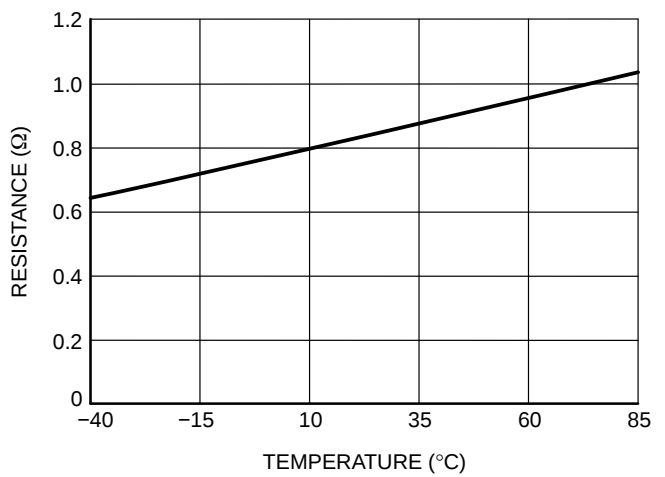


Figure 4. Typical Resistance Over Temperature

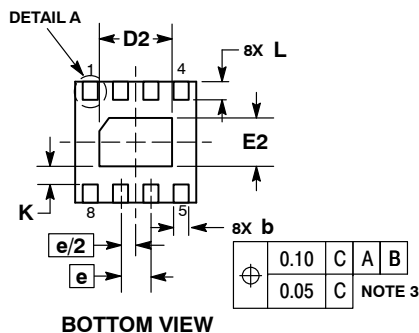
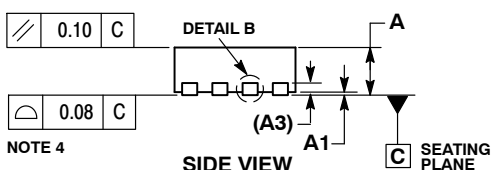
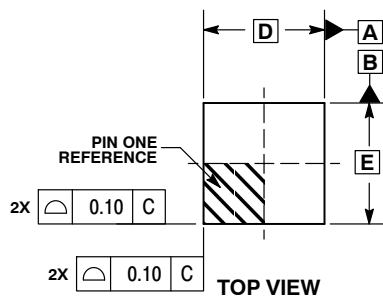
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



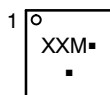
SCALE 4:1

DFN8 2x2, 0.5P  
CASE 506AA  
ISSUE F

DATE 04 MAY 2016

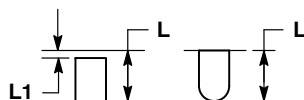


## GENERIC MARKING DIAGRAM\*

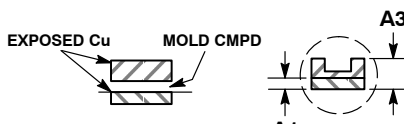


XX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Device

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



DETAIL A  
OPTIONAL  
CONSTRUCTIONS



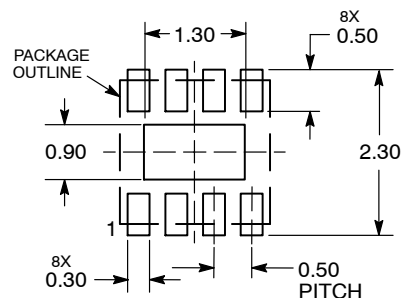
DETAIL B  
ALTERNATE  
CONSTRUCTIONS

## 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 0.15 AND 0.20 MM FROM TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| MILLIMETERS |      |      |
|-------------|------|------|
| DIM         | 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           | 0.30 | REF  |
| L           | 0.25 | 0.35 |
| L1          |      | 0.10 |

## RECOMMENDED SOLDERING FOOTPRINT\*



DIMENSIONS: MILLIMETERS

\*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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| DESCRIPTION:     | DFN8, 2.0X2.0, 0.5MM PITCH | PAGE 1 OF 1                                                                                                                                                                      |

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