

# NUF4001MU

## Low Capacitance 4 Line EMI Filter with ESD Protection in UDFN8 Package

This device is a 4 line EMI filter array for wireless applications. Greater than -25 dB attenuation is obtained at frequencies from 800 MHz to 5.0 GHz. The NUF4001MU has a cut-off frequency of 150 MHz and can be used in applications for data rate up to 58 MHz or 116 Mbps. This UDFN 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 20 Discrete Components
- Compliance with IEC61000-4-2 (Level 4)
  - >14 kV (Contact)
  - >15 kV (Air)
- UDFN Package, 1.2 x 1.8 mm
- Moisture Sensitivity Level 1
- ESD Ratings: Machine Model = C
- Human Body Model = 3B
- This is a Pb-Free Device\*

### Benefits

- Reduces EMI/RFI Emissions on a Data Line
- Low Profile Package; Typical Height of 0.5 mm
- Design-Friendly and Easy-to-Use Pin Configurations, Particularly for Portable Electronics
- Integrated Solution Offers Cost and Space Savings in UDFN Package
- Reduces Parasitic Inductances Which Offer a More “Ideal” Low Pass Filter Response
- Integrated Solution Improves System Reliability

### Applications

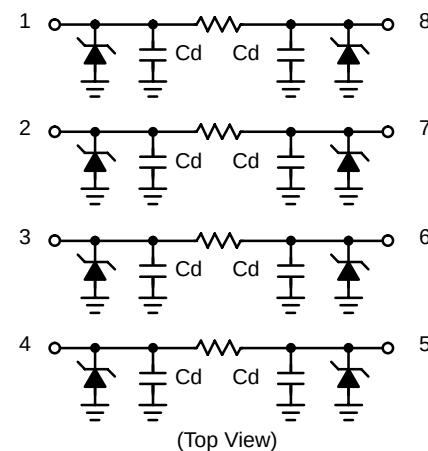
- EMI Filtering and ESD Protection for Data Lines
- Keypad Interface and Protection for Portable Electronics
- Bottom Connector Interface for Mobile Handsets
- Notebook Computers and Digital Cameras
- LCD Display Interface in Mobile Handsets
- Camera Display Interface in Mobile Handsets

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



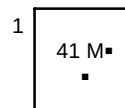
ON Semiconductor®

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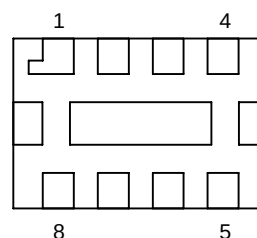
UDFN8  
CASE 517AD

### MARKING DIAGRAM



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

### PIN CONNECTIONS



### ORDERING INFORMATION

| Device       | Package            | Shipping†          |
|--------------|--------------------|--------------------|
| NUF4001MUT2G | UDFN8<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.

# NUF4001MU

## MAXIMUM RATINGS

| Parameter                                                                            | Symbol    | Value            | Unit |
|--------------------------------------------------------------------------------------|-----------|------------------|------|
| ESD Discharge IEC61000-4-2<br>Contact Discharge<br>Machine Model<br>Human Body Model | $V_{PP}$  | 14<br>0.4<br>8.0 | kV   |
| 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 ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                       | Symbol    | Test Conditions                                         | Min | Typ | Max | Unit     |
|---------------------------------|-----------|---------------------------------------------------------|-----|-----|-----|----------|
| Maximum Reverse Working Voltage | $V_{RWM}$ |                                                         |     |     | 5.0 | V        |
| Breakdown Voltage               | $V_{BR}$  | $I_R = 1.0\text{ mA}$                                   | 6.0 | 7.0 | 8.0 | V        |
| Leakage Current                 | $I_R$     | $V_{RWM} = 3.3\text{ V}$                                |     |     | 100 | nA       |
| Resistance                      | $R_A$     | $I_R = 10\text{ mA}$                                    | 85  | 100 | 115 | $\Omega$ |
| Capacitance (Notes 1 and 2)     | Cd        | $V_R = 2.5\text{ V}$ , $f = 1.0\text{ MHz}$             | 10  | 13  | 16  | pF       |
| Cut-Off Frequency (Note 3)      | $f_{3dB}$ | Above this frequency,<br>appreciable attenuation occurs |     | 150 |     | MHz      |

1. Measured at  $25^\circ\text{C}$ .
2. Total Line Capacitance is two times the Diode Capacitance (Cd).
3. 50  $\Omega$  source and 50  $\Omega$  load termination.

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

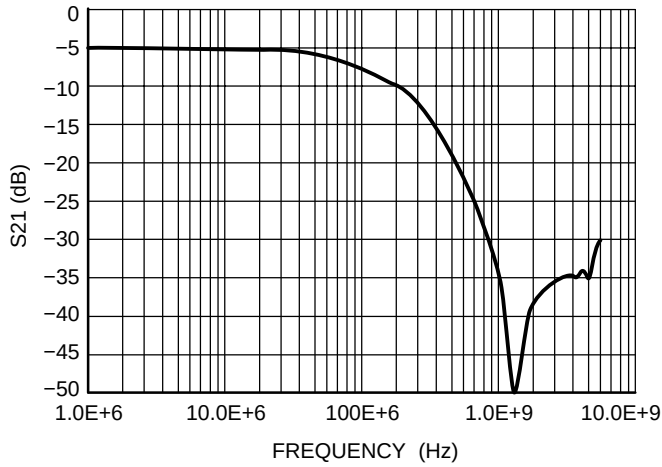


Figure 1. Insertion Loss Characteristic

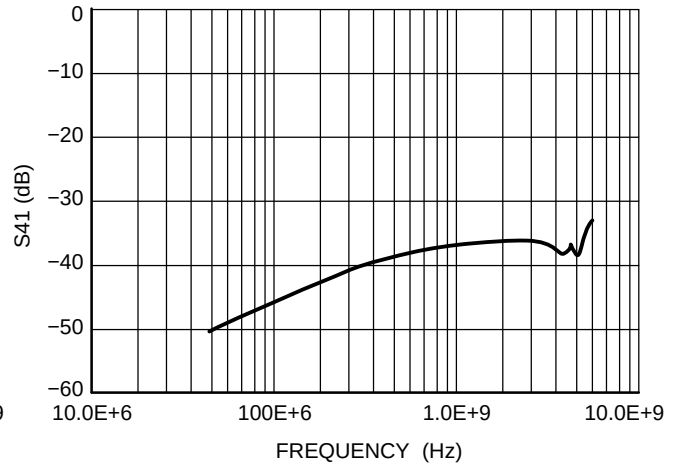


Figure 2. Insertion Loss Characteristic

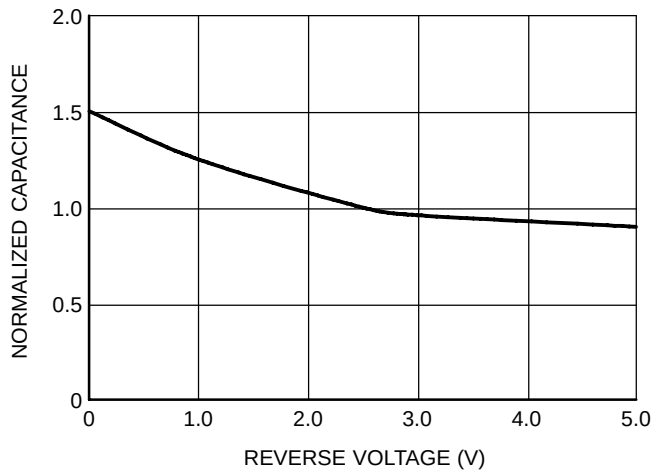


Figure 3. Typical Capacitance vs.  
Reverse Biased Voltage  
(Normalized Capacitance  $C_d$  at 2.5 V)

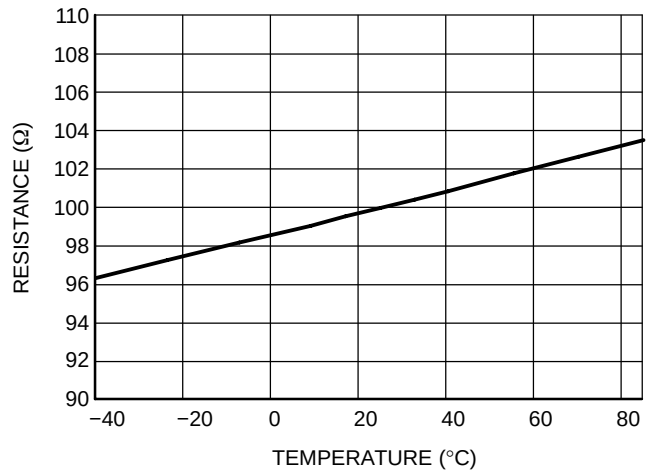
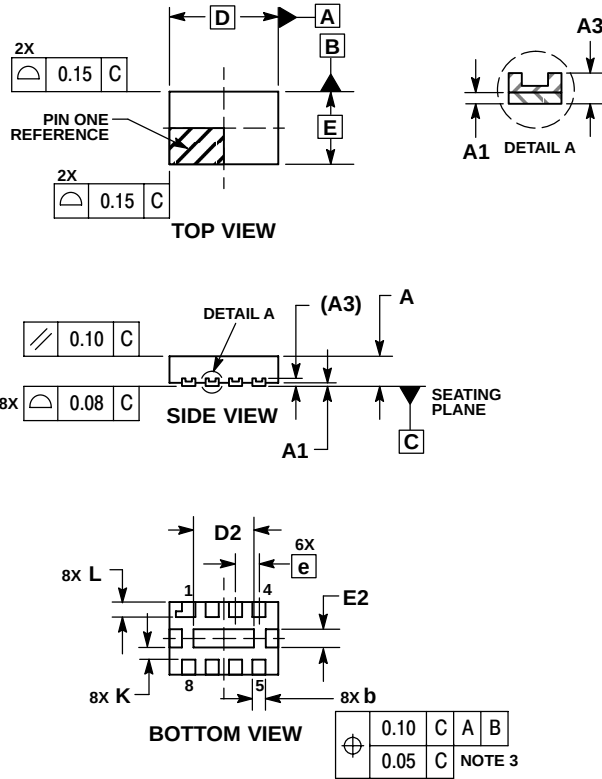


Figure 4. Typical Resistance over Temperature

# NUF4001MU

## PACKAGE DIMENSIONS

UDFN8, 1.8x1.2, 0.4P  
CASE 517AD-01  
ISSUE O



### 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.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| MILLIMETERS |           |      |      |
|-------------|-----------|------|------|
| DIM         | MIN       | NOM  | MAX  |
| A           | 0.45      | 0.50 | 0.55 |
| A1          | 0.00      | 0.03 | 0.05 |
| A3          | 0.127 REF |      |      |
| b           | 0.15      | 0.20 | 0.25 |
| D           | 1.80 BSC  |      |      |
| D2          | 0.90      | 1.00 | 1.10 |
| E           | 1.20 BSC  |      |      |
| E2          | 0.20      | 0.30 | 0.40 |
| e           | 0.40 BSC  |      |      |
| K           | 0.20      | ---  | ---  |
| L           | 0.20      | 0.25 | 0.30 |

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