

# NUF4000MU

## 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 -30 dB typical attenuation is obtained at frequencies from 800 MHz to 5.0 GHz. The NUF4000MU has a typical cut-off frequency of 105 MHz. 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)
- 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  $\mu$ DFN Package
- Reduces Parasitic Inductances Which Offer a More “Ideal” Low Pass Filter Response
- Integrated Solution Improves System Reliability

### Applications

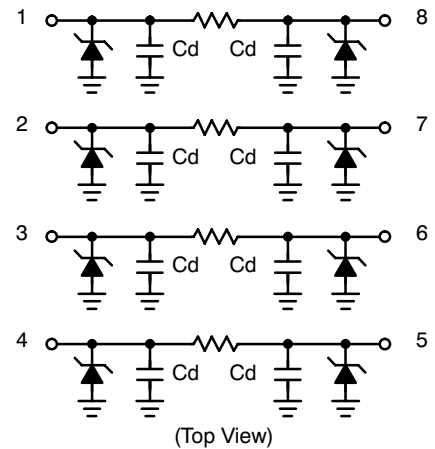
- EMI Filtering and ESD Protection for Data Lines
- Keypad Interface and Protection for Portable Electronics
- Bottom Connector Interface for Mobile Handsets
- Notebook Computers and Digital Cameras
- LCD Display Interface in Mobile Handsets
- Camera Display Interface in Mobile Handsets

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



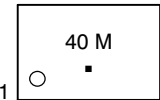
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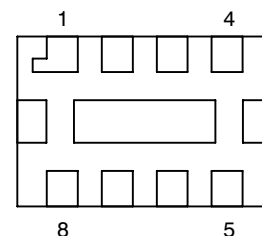
UDFN8  
CASE 517AD

### MARKING DIAGRAM



- 40 = Specific Device Code
- M = Assembly and Date Code
- = Pb-Free Package

### PIN CONNECTIONS



### ORDERING INFORMATION

Device	Package	Shipping†
NUF4000MUT2G	UDFN8 (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.

# NUF4000MU

## MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
ESD Discharge IEC61000-4-2 Contact Discharge	$V_{PP}$	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	$V_R = 2.5 \text{ V}, f = 1.0 \text{ MHz}$		15	20	pF
Cut-Off Frequency (Note 3)	$f_{3dB}$	Above this frequency, appreciable attenuation occurs		105		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.

# NUF4000MU

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

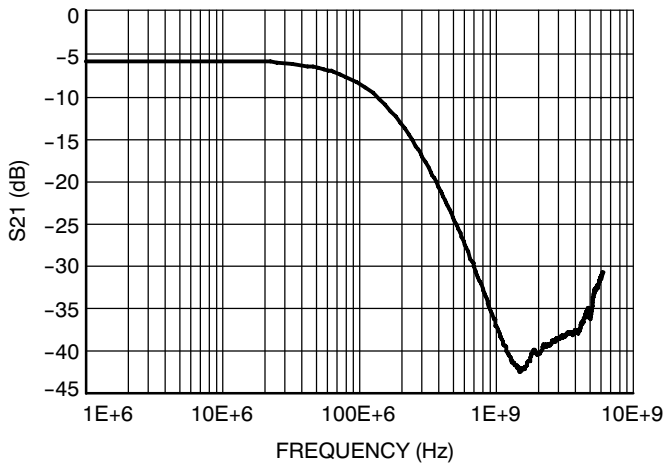


Figure 1. Insertion Loss Characteristic

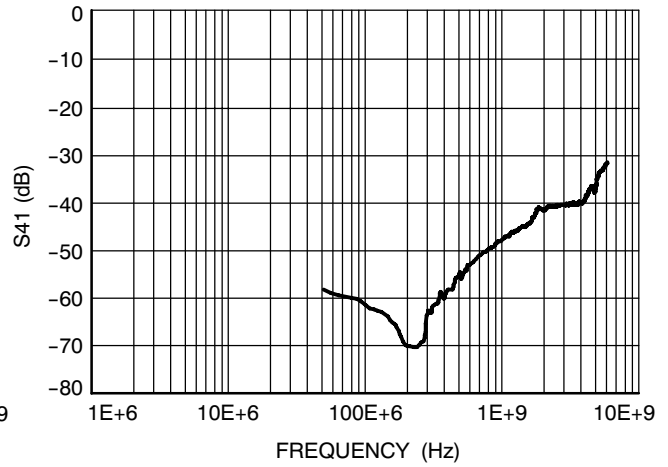


Figure 2. Insertion Loss Characteristic

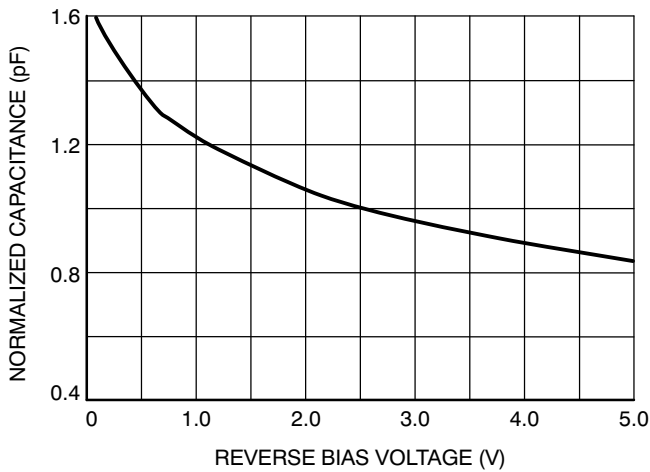


Figure 3. Typical Capacitance vs. Reverse Biased Voltage  
(Normalized Capacitance  $C_d$  at 2.5 V)

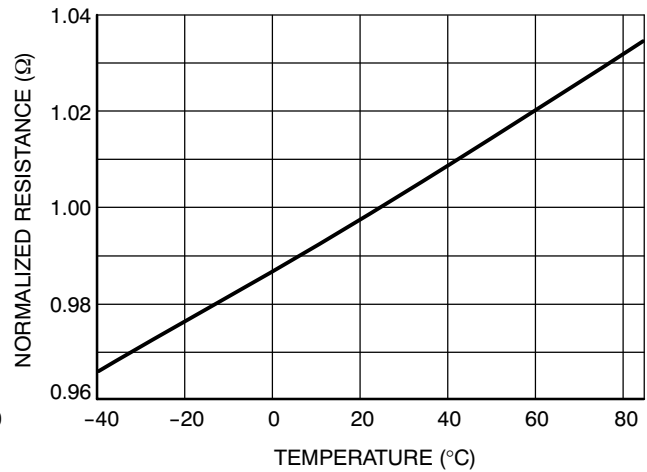
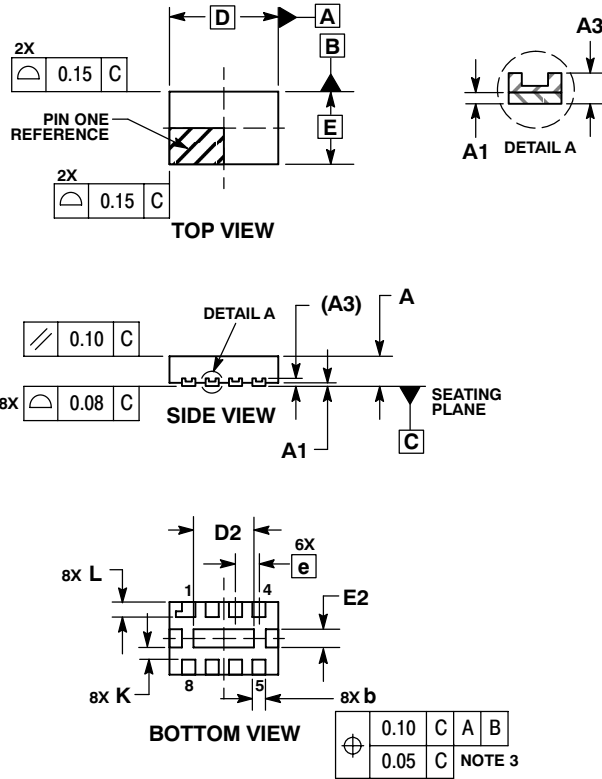


Figure 4. Typical Resistance over Temperature

# NUF4000MU

## 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.

DIM	MILLIMETERS		
	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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