

# NUF4402MN

## Low Capacitance 4 Line EMI Filter with ESD Protection in DFN8 1.6 x 1.6 mm 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 3.0 GHz. 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)
- DFN Package, 1.6 x 1.6 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
- Integrated Solution Offers Cost and Space Savings
- Reduces Parasitic Inductances Which Offer a More “Ideal” Low Pass Filter Response
- Integrated Solution Improves System Reliability

### Applications

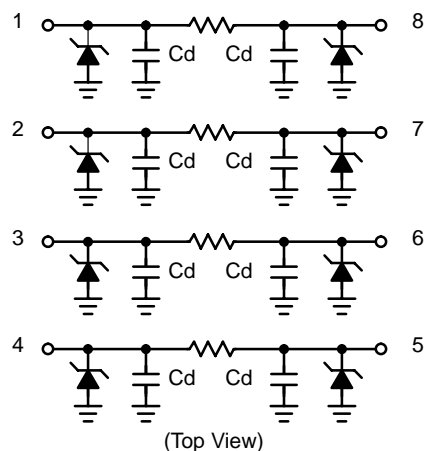
- EMI Filtering and ESD Protection for Data Lines
- Wireless Phones
- Handheld Products
- Notebook Computers
- LCD Displays

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

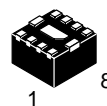


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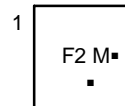
<http://onsemi.com>



### MARKING DIAGRAM

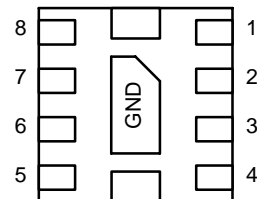


DFN8  
CASE 506AK



F2 = Specific Device Code  
M = Month Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### PIN CONNECTIONS



(Bottom View)

### ORDERING INFORMATION

Device	Package	Shipping†
NUF4402MNT1G	DFN8 (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.

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## MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
ESD Discharge IEC61000-4-2 Contact Discharge Machine Model Human Body Model	$V_{PP}$	14 0.4 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	12	15	pF
Cut-Off Frequency (Note 3)	$f_{3dB}$	Above this frequency, appreciable attenuation occurs		151		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.

# NUF4402MN

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

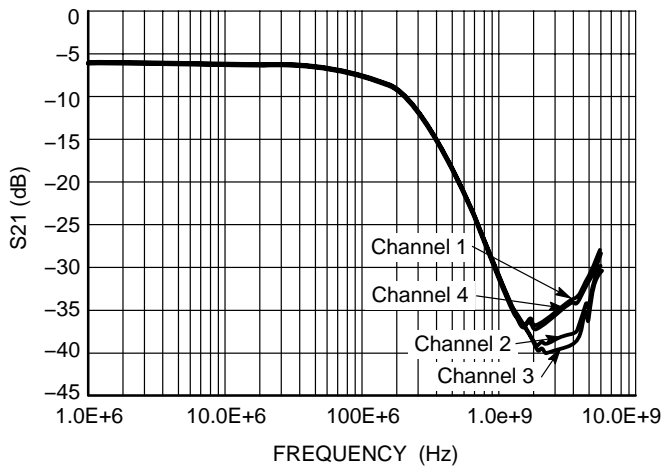


Figure 1. Insertion Loss Characteristic

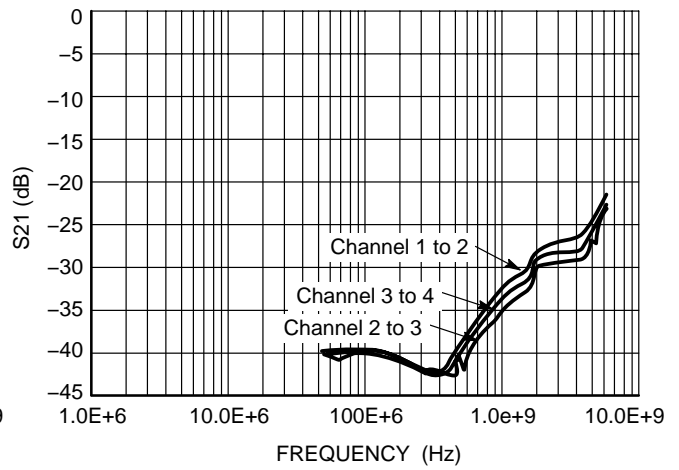


Figure 2. Insertion Loss Characteristic

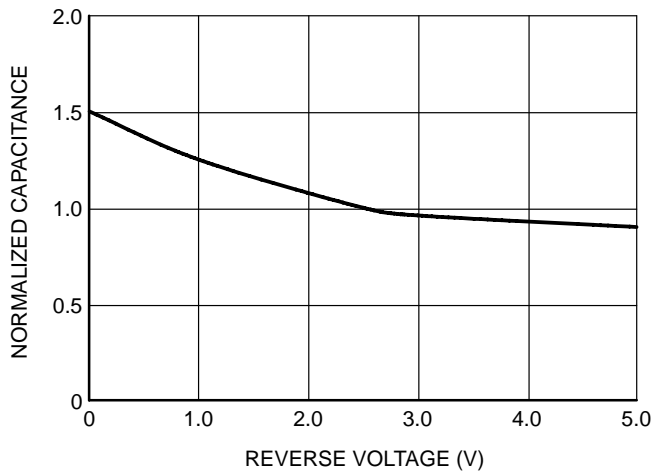


Figure 3. Typical Capacitance vs. Reverse Biased Voltage  
(Normalized Capacitance  $C_d$  at 2.5 V)

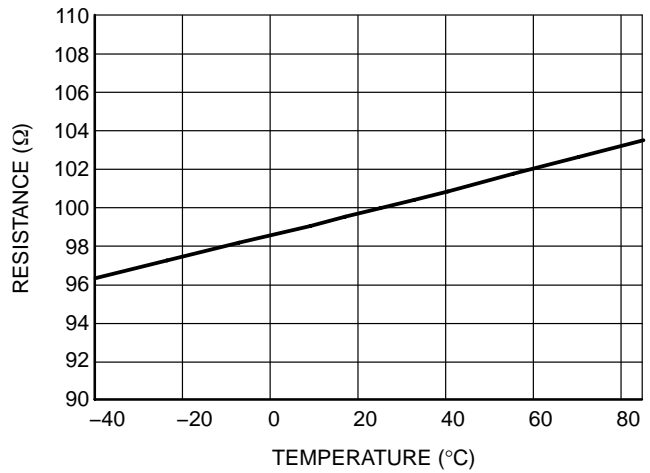
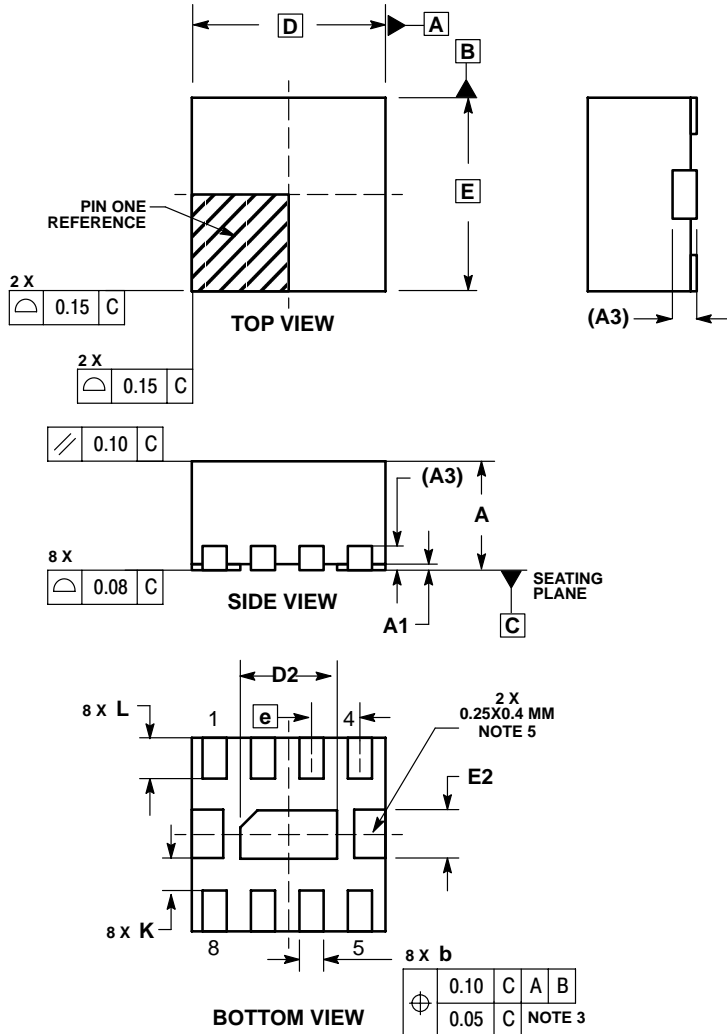


Figure 4. Typical Resistance over Temperature

# NUF4402MN

## PACKAGE DIMENSIONS

DFN8  
CASE 506AK-01  
ISSUE A



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION  $b$  APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
4. DIMENSION  $b$  APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. EXPOSED PADS CONNECTED TO DIE FLAG. USED AS TEST CONTACTS.

DIM	MILLIMETERS	
	MIN	MAX
A	0.80	1.00
A1	0.00	0.05
A3	0.20	REF
b	0.15	0.25
D	1.60	BSC
D2	0.70	0.90
E	1.60	BSC
E2	0.30	0.50
e	0.40	BSC
K	0.20	---
L	0.20	0.40

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