NUF6410MN

6 Line EMI Filter with ESD Protection

This device is a 6 line EMI filter array for wireless applications. Greater than −20 dB typical attenuation is obtained at frequencies from 800 MHz to 3.0 GHz. The NUF6410MN has a typical cut−off frequency of 250 MHz. This DFN 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.
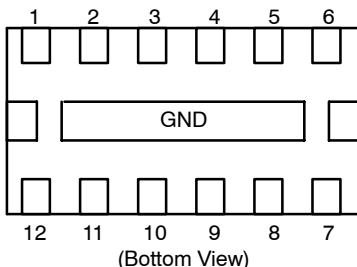
Features

- EMI Filtering and ESD Protection
- Integration of 30 Discrete Components
- DFN Package, 1.35 x 3.0 mm
- Moisture Sensitivity Level 1
- ESD Ratings: IEC61000−4−2 (Level 4)
  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 in a DFN Package
- Excellent S21 Characteristics with very Low Parasitic Inductances
- Integrated Solution Improves System Reliability
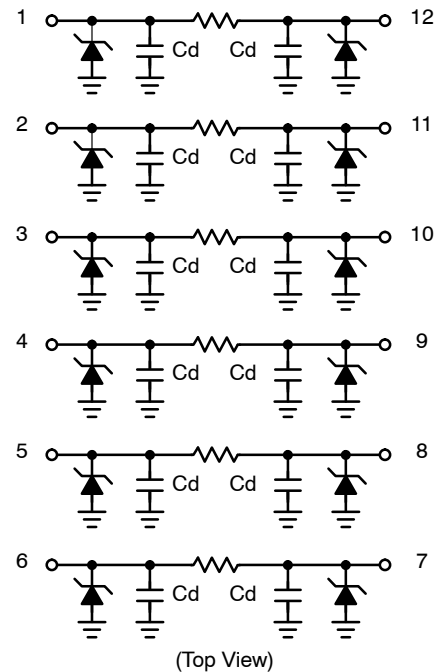- Compatible Footprint to BGA or Flip−Chip Package

Applications

- EMI Filtering and ESD Protection for Data Lines
- Wireless Phones
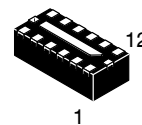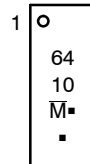- PDAs and Handheld Products
- Digital Camera
- LCD Displays

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

(Top View)

MARKING DIAGRAM

DFN12
CASE 506AD

6410 = Specific Device Code
$\overline{M}$ = Date and Assembly Location
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
NUF6410MNT1G	DFN12 (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.

NUF6410MN

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
ESD Discharge IEC61000−4−2 Contact Discharge	V_{PP}	8.0	kV
DC Power per Resistor	P_R	100	mW
DC Power per Package	P_T	600	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 seconds)	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°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 mA	6.0	7.0		V
Leakage Current	I_R	V_{RWM} = 3.3 V		10	100	nA
Resistance	R_A	I_R = 20 mA	85	100	115	Ω
Capacitance (Notes 1 and 2)	C_d	V_R = 2.5 V, f = 1.0 MHz		7.0	9.0	pF
Cut−Off Frequency (Note 3)	f_{3dB}	Above this frequency, appreciable attenuation occurs		250		MHz

1. Measured at 25°C, V_R = 2.5 V, f = 1.0 MHz.
2. Total line capacitance is 2 times the Diode Capacitance (Cd).
3. 50 Ω source and 50 Ω load termination.
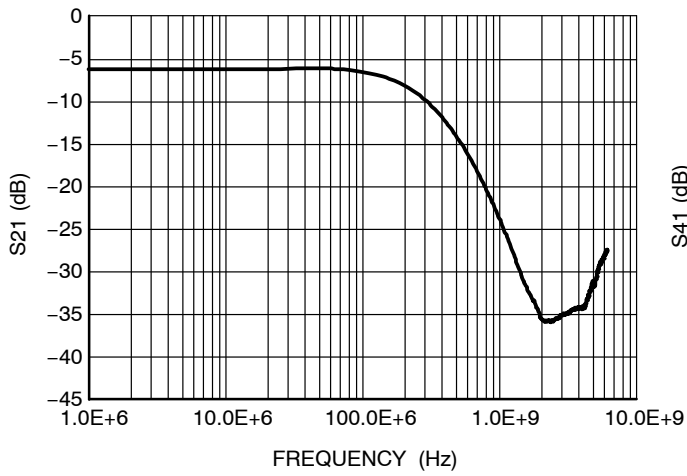
NUF6410MN

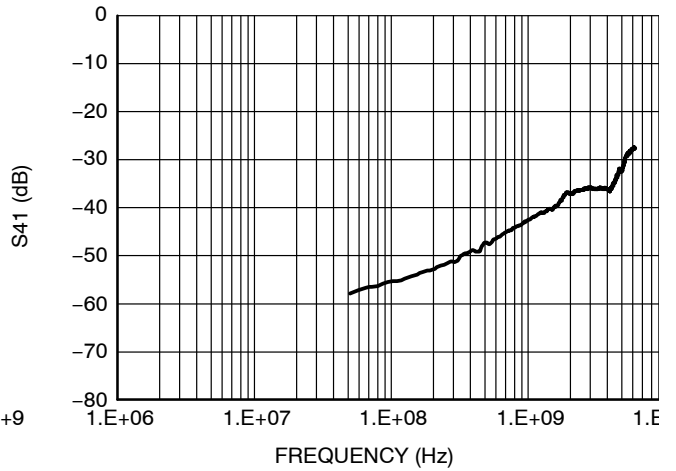Figure 1. Typical Insertion Loss Characteristic
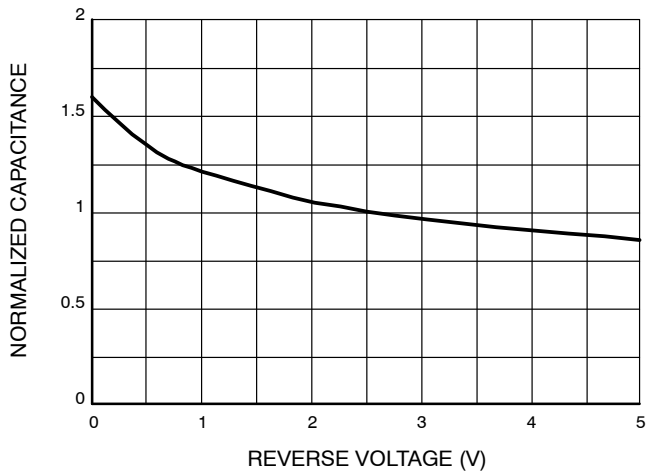

Figure 2. Typical Analog Crosstalk

Figure 3. Typical Capacitance vs.
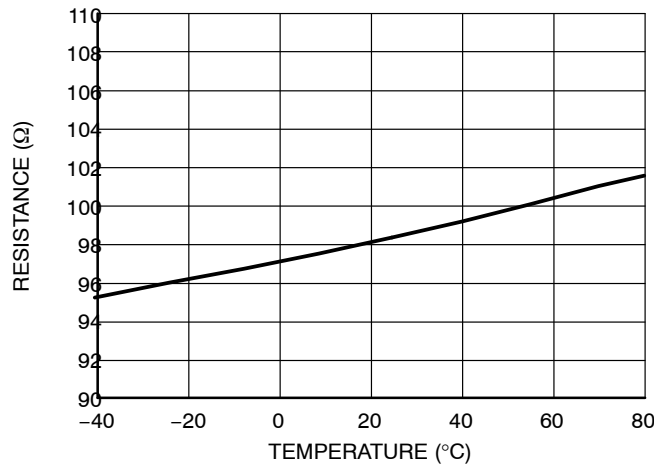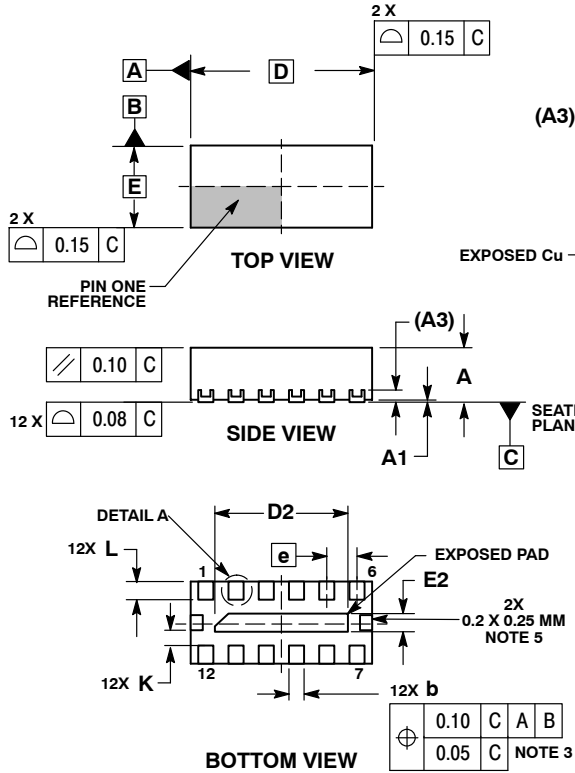Reverse Biased Voltage
(Normalized Capacitance, Cd @ 2.5 V)

Figure 4. Typical Resistance over Temperature
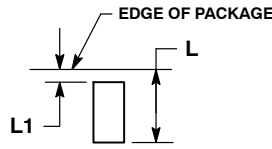
NUF6410MN
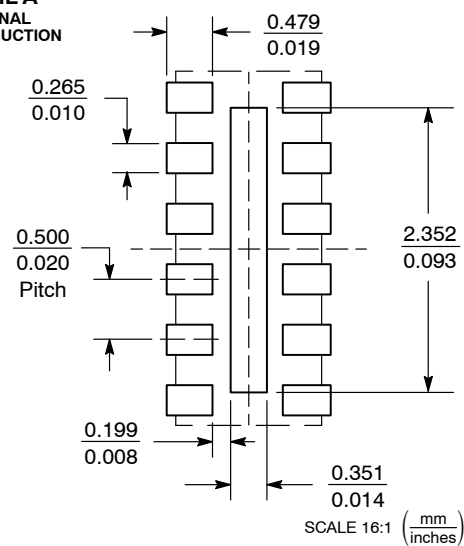
PACKAGE DIMENSIONS

DFN12 3.0x1.35, 0.5P
CASE 506AD−01
ISSUE J

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
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.
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	0.18	0.30
D	3.00 BSC	
D2	2.10	2.30
E	1.35 BSC	
E2	0.20	0.40
e	0.50 BSC	
K	0.20	---
L	0.20	0.40
L1	0.00	0.15

TOP VIEW

PIN ONE REFERENCE

2 X | 0.15 | C

SIDE VIEW

SEATING PLANE

BOTTOM VIEW

DETAIL A

EXPOSED PAD

2X 0.2 X 0.25 MM NOTE 5

| 0.10 | C | A | B |
| 0.05 | C | NOTE 3 |

DETAIL A
OPTIONAL CONSTRUCTION

EDGE OF PACKAGE

SOLDERING FOOTPRINT*

$\frac{0.479}{0.019}$

$\frac{0.265}{0.010}$

$\frac{0.500}{0.020}$ Pitch

$\frac{0.199}{0.008}$

$\frac{2.352}{0.093}$

$\frac{0.351}{0.014}$

SCALE 16:1 $\left(\frac{mm}{inches}\right)$

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