

ON Semiconductor

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NUF6107MN

4 Channel Data Line EMI Filter with 2 Channel USB Filter and ESD Protection

This device is a four-channel EMI filter array for data lines. Greater than -35 dB attenuation is obtained at frequencies from 800 MHz to 2.2 GHz. It also offers USB filtering circuitry with speed detection. This includes the inline resistors for impedance matching and EMI filtering. ESD protection is provided across all capacitors.

Features

- EMI Filtering and ESD Protection for Data Lines
- USB 1.1 and 2.0 Full Speed Filtering Provided
- Integration of 26 Discrettes Offers Cost and Space Savings
- Low Profile DFN, Packaging, 3.0 x 1.35 mm
- MSL 1
- Compliant with IEC61000-4-2 (Level 4)
> 8 kV Contact on all outputs and data lines
- This is a Pb-Free Device

Typical Applications

- EMI and USB Filtering and ESD Protection for Data Lines
- Cell Phones
- Handheld Portables
- Notebook Computers
- MP3 Players

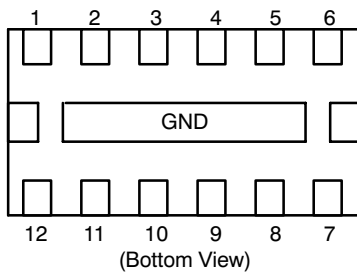
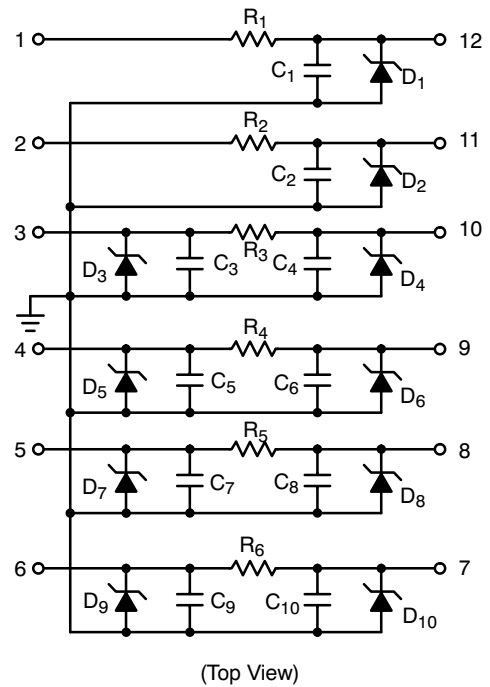


Figure 1. Pin Connections

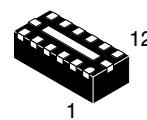


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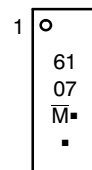
<http://onsemi.com>



MARKING DIAGRAM



DFN12
CASE 506AD



6107= Specific Device Code

M = Month

▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|--------------------|--------------------|
| NUF6107MNTBG | 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.

NUF6107MN

MAXIMUM RATINGS

| Parameter | Symbol | Value | Unit |
|---|-------------------------------|------------|------|
| ESD Discharge IEC61000-4-2 pins 1 to 2 pins 3 to 12 | Contact Discharge V_{PP} | 2.0 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 |

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 ($T_A = 25^\circ\text{C}$ 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 | 6.8 | 8.0 | V |
| Leakage Current | I_R | $V_{RWM} = 3.3 \text{ V per line}$ | - | - | 0.1 | μA |
| EMI Filter Resistors | $R_3 - R_6$ | | 80 | 100 | 120 | Ω |
| USB Resistors; Impedance Matching | R_1, R_2 | | 18 | 22 | 26 | Ω |
| Diode Capacitance | $C3 - C10$ | $V_R = 2.5 \text{ V}$ | 24 | 30 | 36 | pF |
| Diode Capacitance | $C1, C2$ | $V_R = 2.5 \text{ V}$ | 29 | 36 | 43 | pF |

NUF6107MN

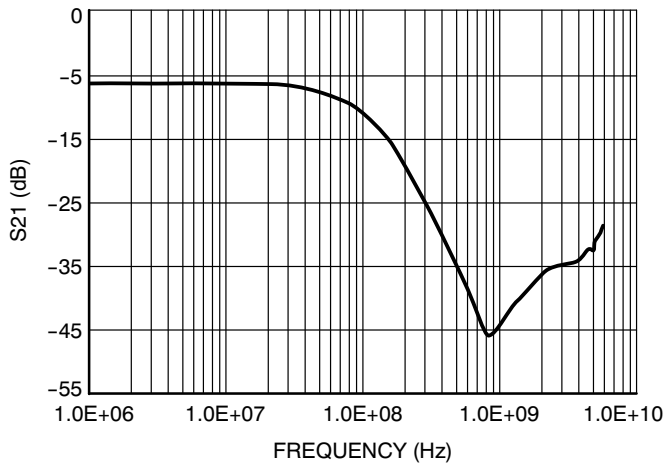


Figure 2. Insertion Loss Characteristics on Data Lines

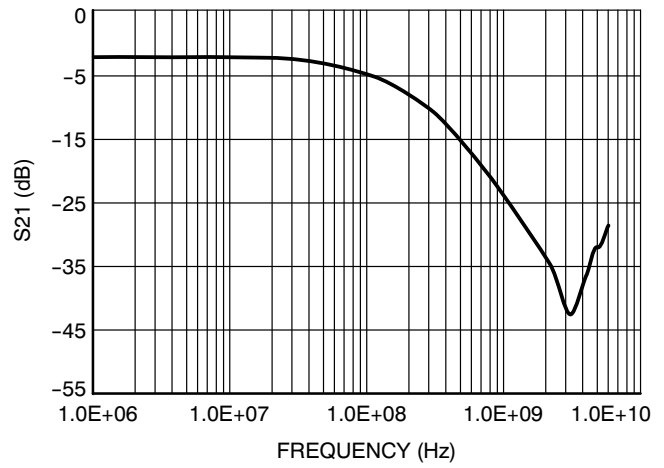


Figure 3. Insertion Loss Characteristics on USB Lines

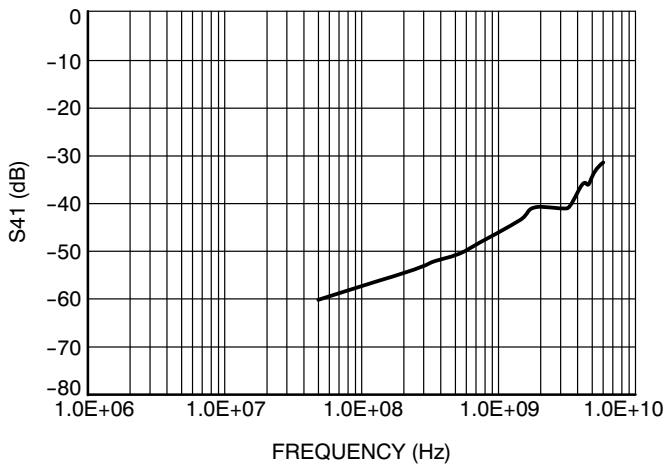


Figure 4. Typical Analog Crosstalk

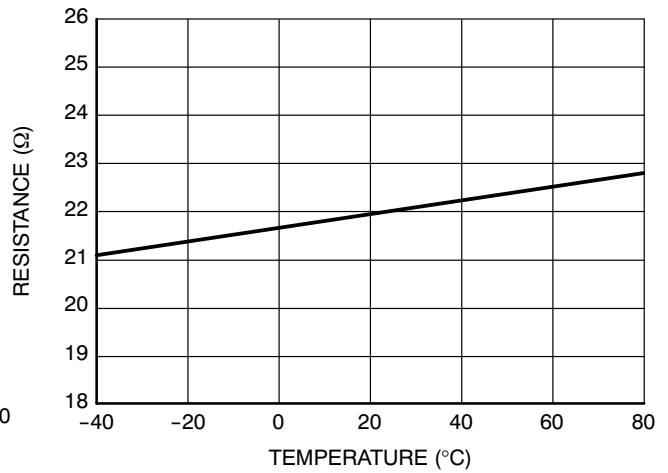


Figure 5. Typical Resistance over Temperature for R₁ and R₂

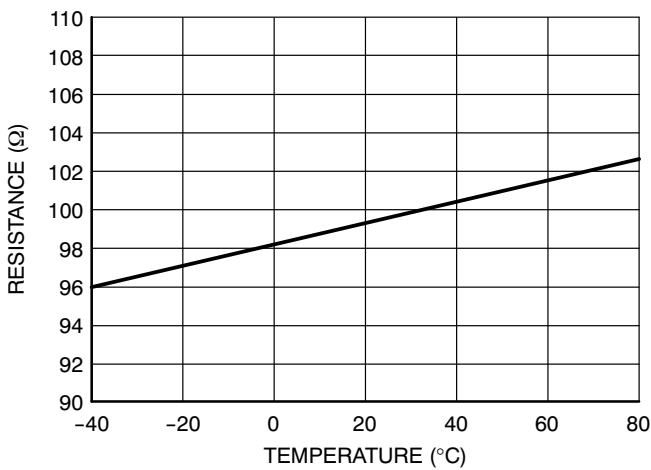


Figure 6. Typical Resistance over Temperature for R₃ - R₆

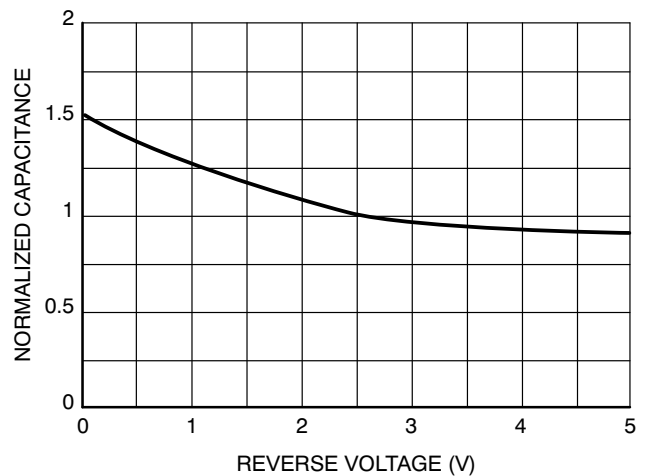
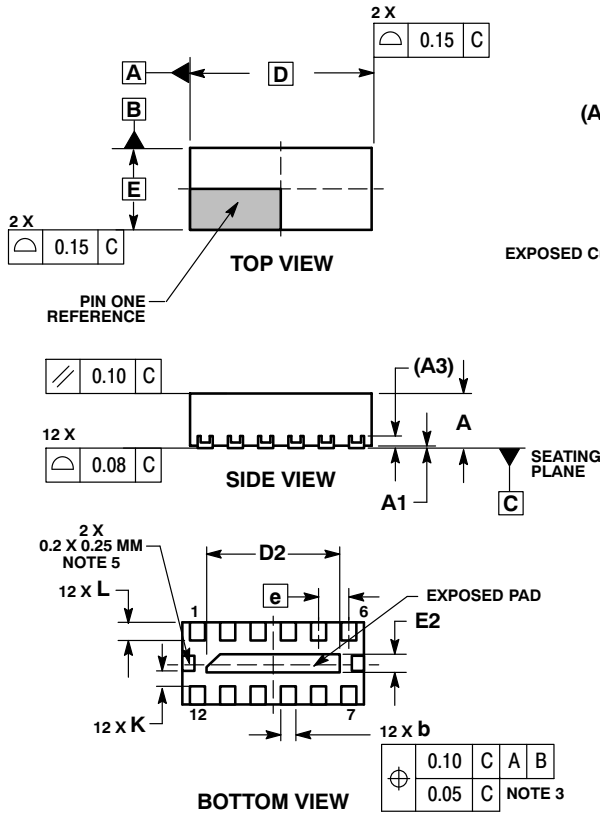


Figure 7. Typical Capacitance vs. Reverse Biased Voltage (Normalized Capacitance, Cd @ 2.5 V)

NUF6107MN

PACKAGE DIMENSIONS

DFN12 3.0x1.35, 0.5P
CASE 506AD-01
ISSUE H

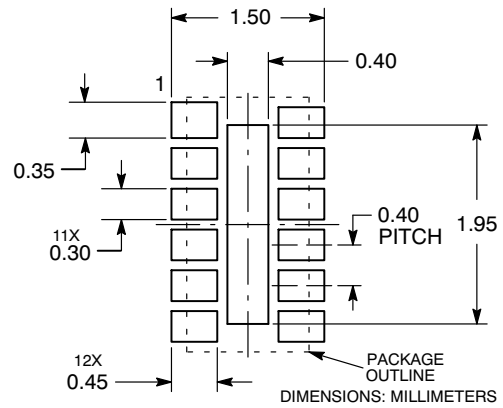


NOTES:

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.

| MILLIMETERS | | |
|-------------|----------|------|
| DIM | 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 |

SOLDERING FOOTPRINT*



*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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