

NUF2101M

USB Filter with ESD Protection

This device is designed for applications requiring **Line Termination**, **EMI Filtering** and **ESD Protection**. It is intended for use in downstream USB 1.1 ports, Cellular phones, Wireless equipment and computer applications. This device offers an integrated solution in a small package (TSOP-6, Case 318G) reducing PCB space and cost.

Features:

- Provides USB Line Termination, Filtering and ESD Protection
- Single IC Offers Cost Savings by Replacing 4 Resistors, 2 Capacitors, and 5 TVs diodes
- EMI Filtering Prevents Noise from Entering/Leaving the System
- IEC61000-4-2 (Level 4)
 - 8 kV (Contact)
 - 15 kV (Air)
- ESD Ratings: Machine Model = C
 - Human Body Model = 3B
- Pb-Free Package is Available

Benefits:

- TSOP-6 Package Minimizes PCB Space
- Integrated Circuit Increases System Reliability versus Discrete Component Implementation
- TVs Devices Provide ESD Protection That is Better than a Discrete Implementation because the Small IC minimizes Parasitic Inductances

Typical Applications:

- USB Hubs
- Computer Motherboards

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Rating	Symbol	Value	Unit
Steady State Power	P_D	225	mW
Maximum Junction Temperature	$T_{J(max)}$	125	$^\circ\text{C}$
Operating Temperature Range	T_J	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +125	$^\circ\text{C}$
Lead Solder Temperature (10 second duration)	T_L	260	$^\circ\text{C}$

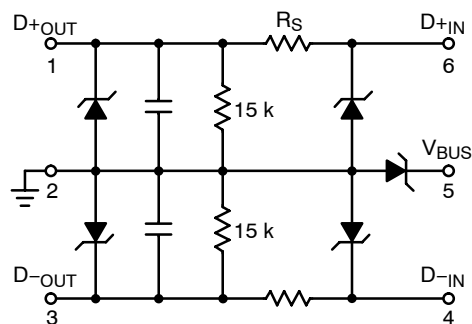
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



ON Semiconductor®

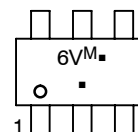
<http://onsemi.com>

SCHEMATIC



TSOP-6
CASE 318G
STYLE 10

MARKING DIAGRAM



6V = Specific Device Code
M = Date Code
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
NUF2101MT1	TSOP-6	3000/Tape & Reel
NUF2101MT1G	TSOP-6 (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 Specification Brochure, BRD8011/D.

NUF2101M

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Device	Device Marking	V _{RWM} (Volts)	V _{BR} @ 1 mA (Volts)		Max I _R @ V _{RWM} = 5.25 V V _{BUS} to GND (μA)	Max I _R @ V _{RWM} = 3.3 V V _{BUS} Pin (μA)	Typical Line Capacitance (pF) (Notes 2, 3)	Series Resistor R _S (Ω) (Note 1)			Pulldown Resistor R _{pd} (kΩ)		
			Min	Max				Min	Nom	Max	Min	Nom	Max
NUF2101MT1	6V	5.25	6.0	8.0	1.0	0.1	55	26.3	30	33.7	13	15	17
NUF2101MT1G	6V	5.25	6.0	8.0	1.0	0.1	55	26.3	30	33.7	13	15	17

1. For other R_S values (i.e. R_S = 30 Ω) contact your local ON Semiconductor sales representative.
2. Measured at 25°C, V_R = 0 V, f = 1 MHz, Pins 2, 3, 4 or 5 to GND with Pin 1 also grounded.
3. For other capacitance values contact your local ON Semiconductor sales representative.

NUF2101M

TYPICAL CHARACTERISTICS

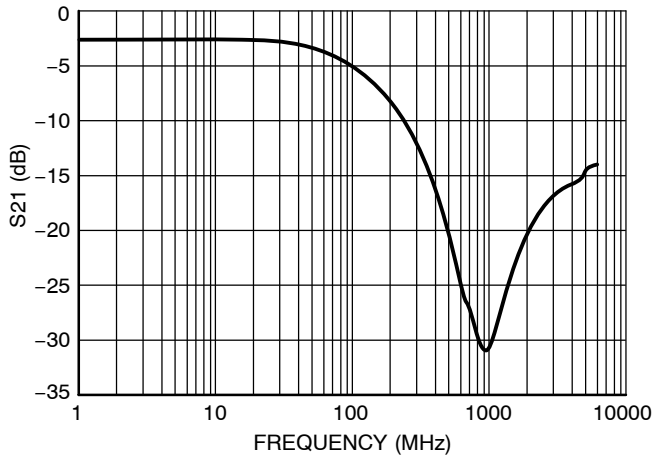


Figure 1. Insertion Loss Characteristics

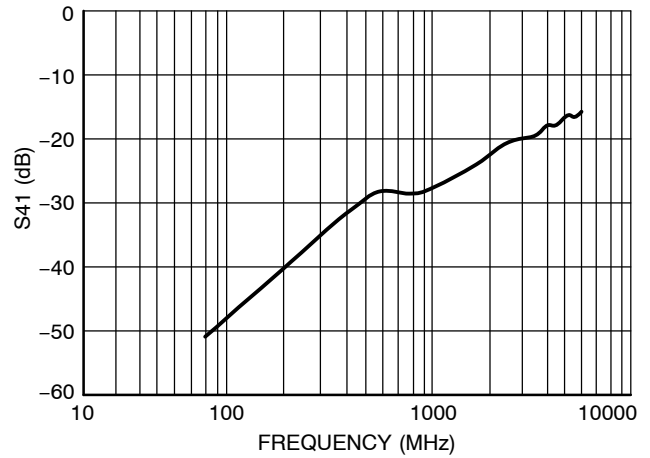


Figure 2. Analog Cross-Talk

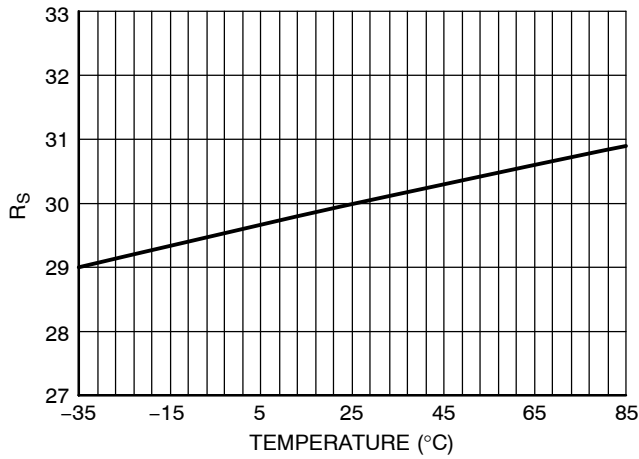


Figure 3. R_S vs. Temperature

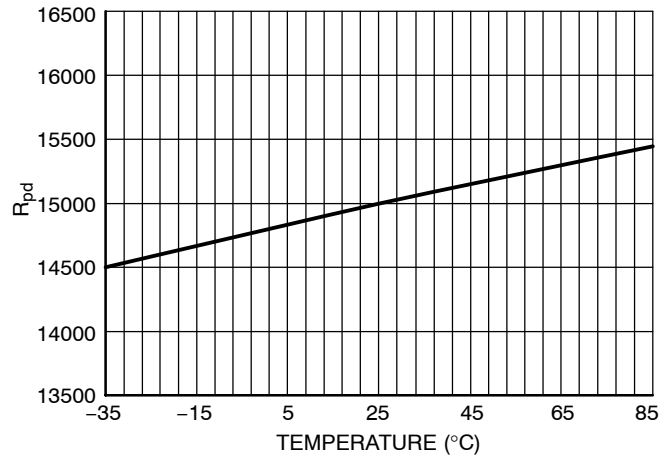


Figure 4. R_{pd} vs. Temperature

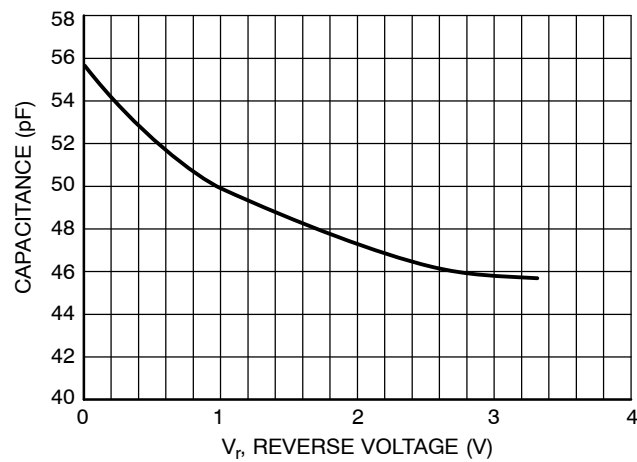
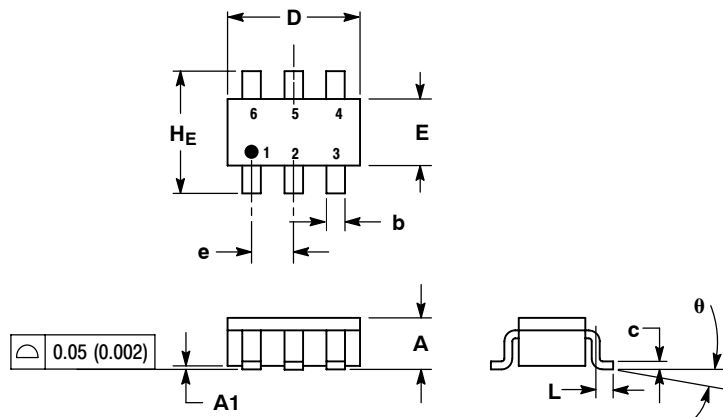


Figure 5. Typical Capacitance

NUF2101M

PACKAGE DIMENSIONS

TSOP-6 CASE 318G-02 ISSUE P



NOTES:

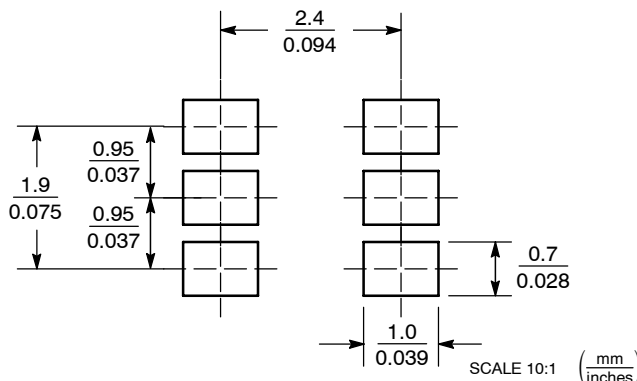
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.38	0.50	0.010	0.014	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
HE	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	—	10°	0°	—	10°

STYLE 10:

- PIN 1: D(OUT)+
- GND
- D(OUT)-
- D(IN)-
- VBUS
- D(IN)+

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.

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.