

# NUF2030XV6, NUF2042XV6

## USB Upstream Terminator with ESD Protection

These devices are designed for applications requiring **Line Termination**, **EMI Filtering** and **ESD Protection**. They are intended for use in upstream USB ports, cellular phones, wireless equipment and computer applications. These devices offer an integrated solution in a small package (SOT-563) reducing PCB space and cost.

### Features:

- Provides USB Line Termination, Filtering and ESD Protection
- Single IC Offers Cost Savings
- Bidirectional EMI Filtering Prevents Noise from Entering/Leaving the System
- Compliance with IEC61000-4-2 (Level 4)
  - 8 kV (Contact)
  - 15 kV (Air)
- ESD Ratings: Machine Model = C  
Human Body Model = 3B
- These are Pb-Free Devices

### Benefits:

- SOT-563 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 Peripherals Using USB

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

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

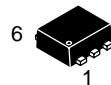
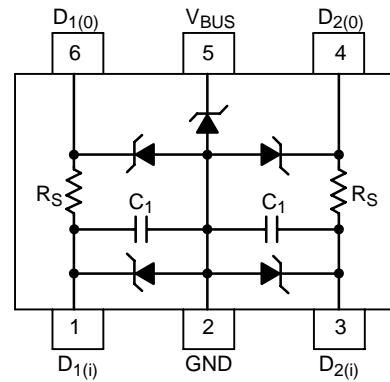
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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



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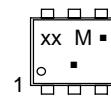
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### CIRCUIT DESCRIPTION



SOT-563  
CASE 463A

### MARKING DIAGRAM



xx = Specific Device Code  
(see table on page 5)  
M = Month Code  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

## NUF2030XV6, NUF2042XV6

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Device	$V_{RWM}$ (V)	$V_{BR}$ @ 1 mA (V)			$I_R$ @ 3.3 V (nA)			Line Capacitance $V_{dc} = 2.5\text{ V}$ $f = 1\text{ MHz}$ (pF) (Note 1)			Series Resistor $R_S$ ( $\Omega$ )		
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
NUF2030XV6T1	5.25	5.6	6.8	8.0	–	10	100	–	30	36	17.6	22	26.4
NUF2042XV6T1	5.25	5.6	6.8	8.0	–	10	100	37.6	42	56.4	17.6	22	26.4

1. Measured between pins 1, 3, 4, 6 and ground with pin 5 also grounded.

2. For other resistance value (e.g. 33  $\Omega$ ), please contact your local ON Semiconductor sales representative.

# NUF2030XV6, NUF2042XV6

## TYPICAL CHARACTERISTICS

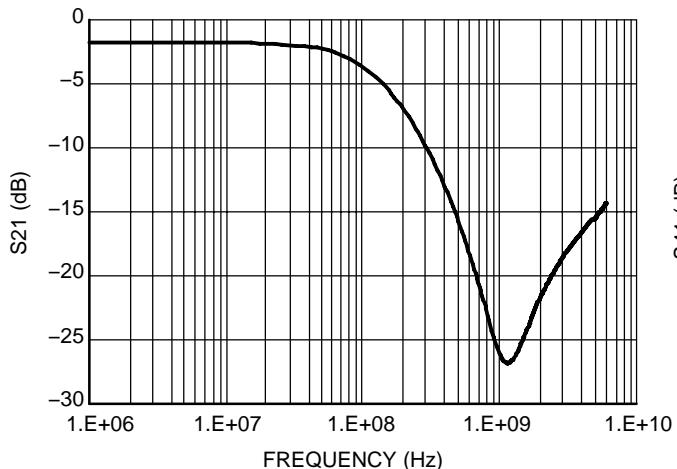


Figure 1. Insertion Loss Characteristics (NUF2030)

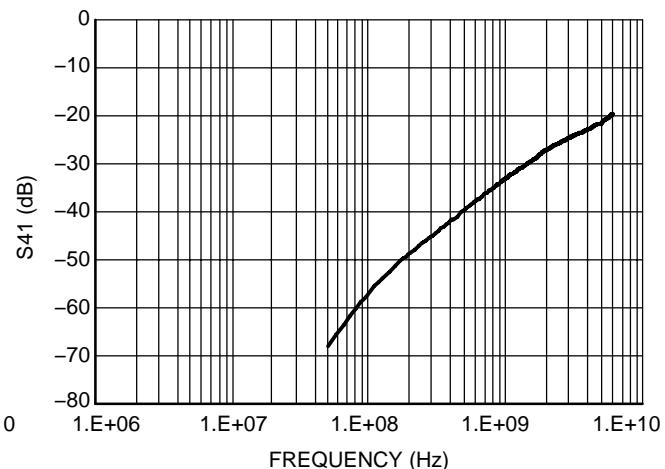


Figure 2. Analog Cross-Talk (NUF2030)

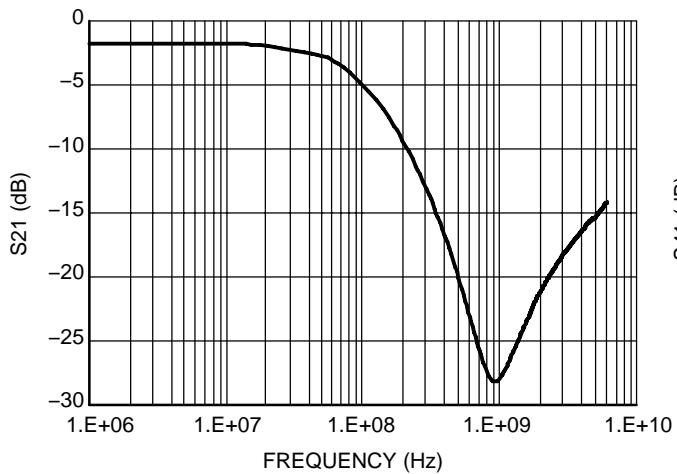


Figure 3. Insertion Loss Characteristics (NUF2042)

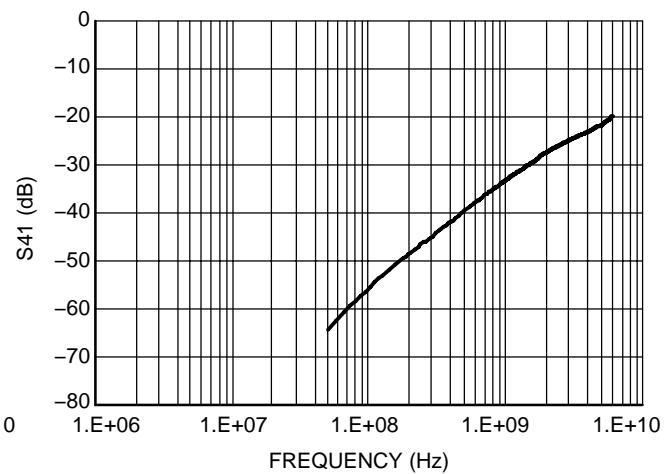


Figure 4. Analog Cross-Talk (NUF2042)

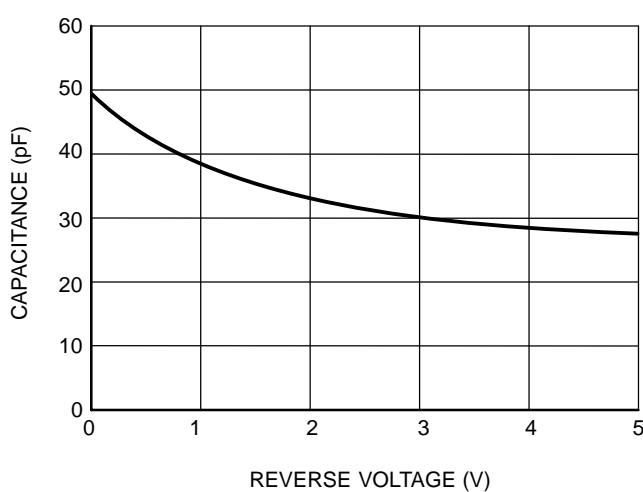


Figure 5. Typical Capacitance (NUF2030)

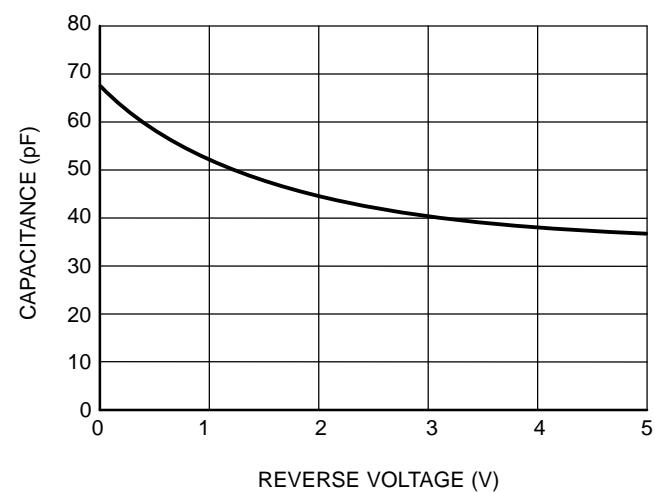
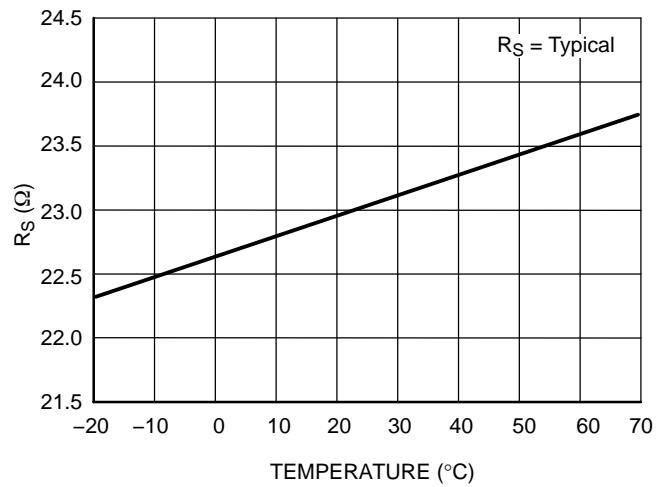


Figure 6. Typical Capacitance (NUF2042)

## NUF2030XV6, NUF2042XV6



**Figure 7.  $R_S$  versus Temperature  
(NUF2030 and NUF2042)**

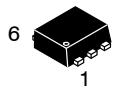
## NUF2030XV6, NUF2042XV6

### ORDERING INFORMATION

Device	Device Marking	Package	Shipping <sup>†</sup>
NUF2030XV6T1	30	SOT-563*	4000 / Tape & Reel
NUF2030XV6T1G	30	SOT-563*	4000 / Tape & Reel
NUF2042XV6T1	22	SOT-563*	4000 / Tape & Reel
NUF2042XV6T1G	22	SOT-563*	4000 / Tape & Reel

<sup>†</sup>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.

\*These packages are inherently Pb-Free.



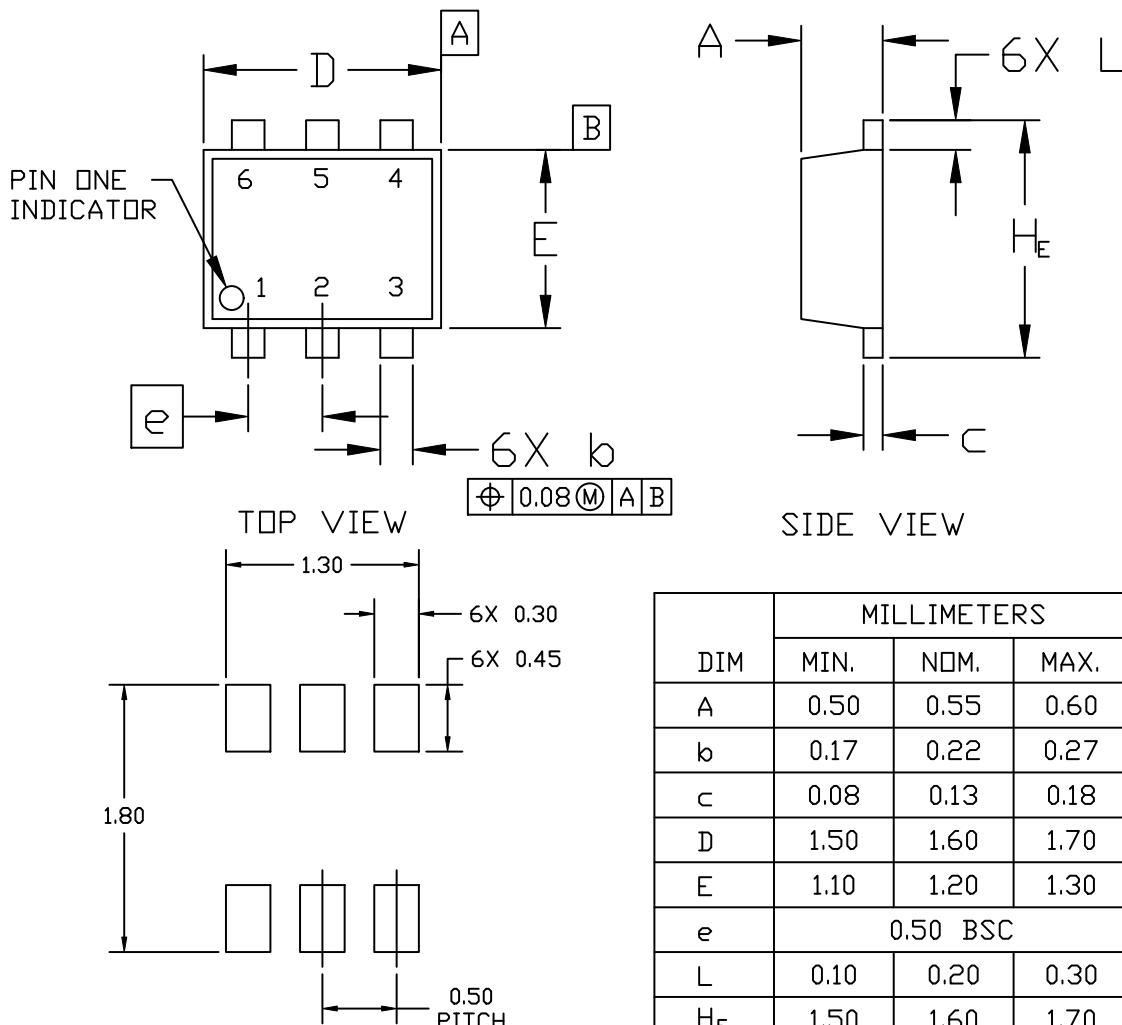
SCALE 4:1

**SOT-563, 6 LEAD**  
CASE 463A  
ISSUE H

DATE 26 JAN 2021

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.



**RECOMMENDED MOUNTING FOOTPRINTS\***

\* 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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**SOT-563, 6 LEAD**  
**CASE 463A**  
**ISSUE H**

DATE 26 JAN 2021

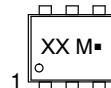
STYLE 1: PIN 1. Emitter 1 2. Base 1 3. Collector 2 4. Emitter 2 5. Base 2 6. Collector 1	STYLE 2: PIN 1. Emitter 1 2. Emitter 2 3. Base 2 4. Collector 2 5. Base 1 6. Collector 1	STYLE 3: PIN 1. Cathode 1 2. Cathode 1 3. Anode/Anode 2 4. Cathode 2 5. Cathode 2 6. Anode/Anode 1
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STYLE 4: PIN 1. Collector 2. Collector 3. Base 4. Emitter 5. Collector 6. Collector	STYLE 5: PIN 1. Cathode 2. Cathode 3. Anode 4. Anode 5. Cathode 6. Cathode	STYLE 6: PIN 1. Cathode 2. Anode 3. Cathode 4. Cathode 5. Cathode 6. Cathode
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STYLE 7: PIN 1. Cathode 2. Anode 3. Cathode 4. Cathode 5. Anode 6. Cathode	STYLE 8: PIN 1. Drain 2. Drain 3. Gate 4. Source 5. Drain 6. Drain	STYLE 9: PIN 1. Source 1 2. Gate 1 3. Drain 2 4. Source 2 5. Gate 2 6. Drain 1
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STYLE 10: PIN 1. Cathode 1 2. N/C 3. Cathode 2 4. Anode 2 5. N/C 6. Anode 1	STYLE 11: PIN 1. Emitter 2 2. Base 2 3. Collector 1 4. Emitter 1 5. Base 1 6. Collector 2
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**GENERIC  
MARKING DIAGRAM\***



XX = Specific Device Code  
M = Month Code  
■ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present. Some products may not follow the Generic Marking.

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