



Descriptions

The NX3DV42GU is a bidirectional low-power dual port, high-speed, USB 2.0 analog switch with integrated protection for USB Type-C™ systems. The device is configured as a dual 2:1 or 1:2 switch. It is optimized for use with the USB 2.0 DP/DM lines in a USB Type-C™ system. The device is capable of true isolation. Even when COM+/- overrides VCC, very little current will flow back to the supply.

The NX3DV42GU has low bit-to-bit skew and high channel-to-channel noise isolation, and is compatible with various standards, such as high-speed USB 2.0 (480Mbps). Each switch is bidirectional and offers little or no attenuation of the high-speed signals at the outputs. Its bandwidth is wide enough to pass high-speed USB 2.0 differential signals (480 Mb/s) with good signal integrity.

GPIO control of SEL 1.8V logic compatible. The NX3DV42GU is available in QFN1418(X-QFN-10(1.4x1.8)) with Pb-free and Halogen-free making it a perfect candidate for mobile and space constrained applications.

Order Information

Package		Part Number	Top-Side Marking
QFN1418(X-QFN-10(1.4x1.8))	Tape and Reel	NX3DV42GU	A26 /GYW

Features

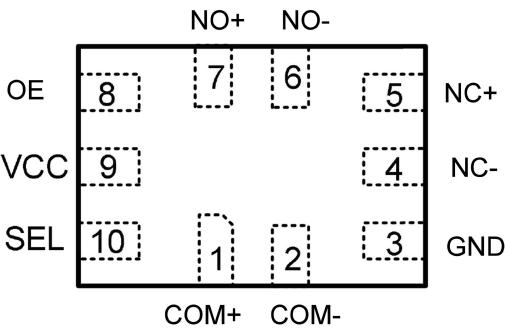
- Pin-to-Pin FSUSB42, NX3DV42, WAS7227, SGM7227, RS2228, BL1532
- Low On-resistance, Ron=1.5Ω when VCC =5V
- 1.8V Logic Compatible Control Pin
- COM+/- Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation: -100dB @ 100KHz
- Low Channel-to-Channel Crosstalk: -97dB @ 100KHz
- High Bandwidth (-3dB @800MHz) Suitable for USB2.0 High-Speed Routing
- Low Quiescent Current (<2uA) With Very Wide Supply Range (1.5V ~ 5.5V)

Applications

- Anywhere a USB Type-C™ or Micro-B Connector is Used
- Mobile Phones, Tablets and Notebooks



Pin Configuration

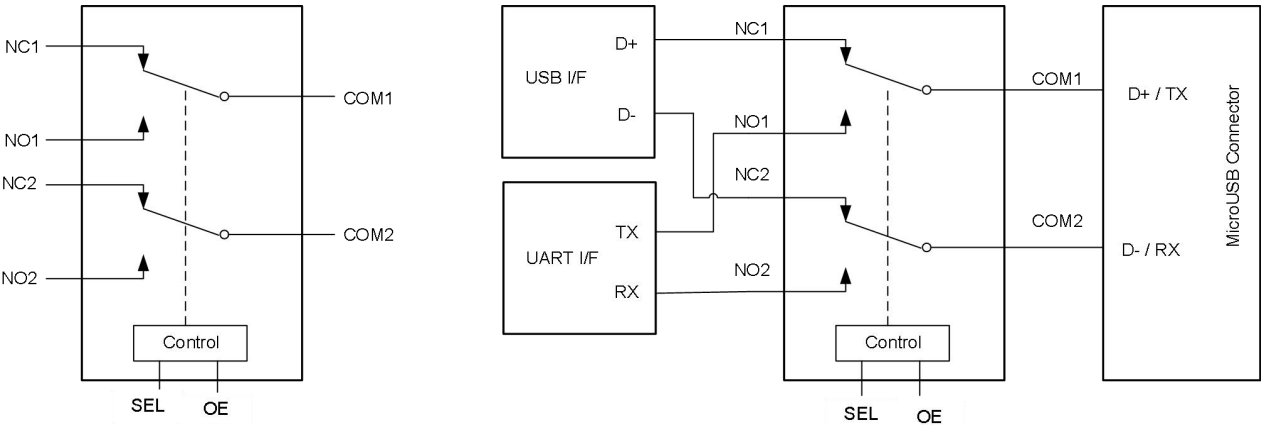


Functions and Pin Configuration

Pin Number	Symbol	Descriptions
1,2	COM _x	Common Signal Ports
3	OE	Active Low
8	GND	Ground
4,5	NC _x	Analog/Digital Signal Ports (Normally closed)
6,7	NO _x	Analog/Digital Signal Ports (Normally open)
9	VCC	Single Power Supply
10	SEL	Logic Input Selection

Function Descriptions

Input SEL	Function
0	NC1=COM1 and NC2=COM2
1	NO1=COM1 and NO2=COM2





Absolute Maximum Ratings ⁽¹⁾

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V _{IN}	-0.3 ~ 6.5	V
Continuous Current Through NO, NC, COM		±100	mA
Peak Current Through NO, NC, COM (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T _{STG}	-55 ~ 150	°C
Junction Temperature under Bias	T _J	150	°C
Lead Temperature (Soldering, 10 seconds)	T _L	260	°C
Power Dissipation	P _D	250	mW

Recommend operating ratings ⁽²⁾

Parameter	Symbol	Value	Unit
Supply Voltage Operating	V _{CC}	1.5 ~ 5.5	V
Control Input Voltage	V _{IN}	-0.3 ~ 5.5	V
Input Signal Voltage	V _{COM}	-0.3 ~ 5.5	V
Operating Temperature	T _A	-40 ~ 85	°C
Thermal Resistance	R _{θJA}	360	°C/W

Note:

1. “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.

Capacitance (Ta=25°C, VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C _{OFF}	F=100KHz		5		pF
On capacitance	C _{ON}	F=100KHz		7		pF



DC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

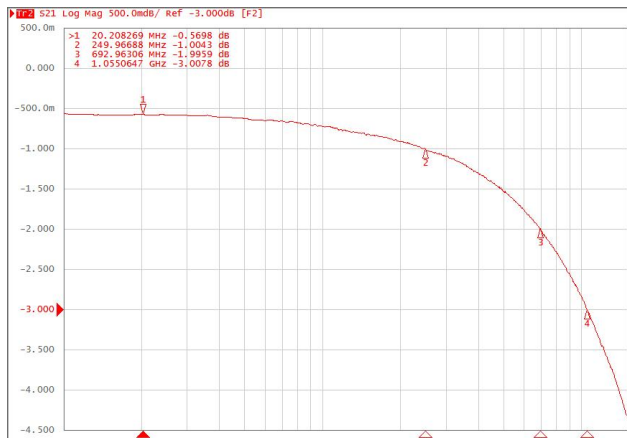
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	V _{IH}	VCC: 3.3 ~ 5.5V	1.6			V
		VCC: 1.5 ~ 3.3V	1.4			V
Input logic low level	V _{IL}	VCC: 3.3 ~ 5.5V			0.6	V
		VCC: 1.5 ~ 3.3V			0.4	V
Supply quiescent current	I _{CC}	I _{COM} =0, V _{IN} =0 or V _{IN} =VCC			1.0	uA
Increase in I _{CC} per input	I _{CCT}	I _{COM} =0, VCC=4.5V V _{IN} >1.8 or V _{IN} <0.5			1.0	uA
Off state leakage from COM _x to NC _x (or NO _x)	I _{COMx}	V _{COM} = 5.5V, V _{NC(or NO)} = 0V			±2.0	uA
On-Resistance	R _{ON1}	V _{COM} =0 ~ 0.5V, I _{COM} =30mA		3.0	3.5	Ω
	R _{ON2}	V _{COM} =0.5 ~ 2.0V, I _{COM} =30mA		3.6	3.9	Ω
	R _{ON3}	V _{COM} =2.0 ~ 4.0V, I _{COM} =30mA		2.5	3.5	Ω
	R _{ON4}	V _{COM} =4.0 ~ 5.5V, I _{COM} =30mA		1.5	1.8	Ω
On-Resistance Flatness	R _{FLAT1}	V _{COM} =0 ~ 0.5V, I _{COM} =30mA		0.7		Ω
	R _{FLAT2}	V _{COM} =0.5 ~ 2.0V, I _{COM} =30mA		0.5		Ω
	R _{FLAT3}	V _{COM} =2.0 ~ 4.0V, I _{COM} =30mA		1.6		Ω
	R _{FLAT4}	V _{COM} =4.0 ~ 5.5V, I _{COM} =30mA		0.3		Ω
On-Resistance Matching Between Channels	Δ R _{ON}	V _{COM} =0~5.5V, I _{COM} =30mA,		0.1	0.2	Ω

AC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

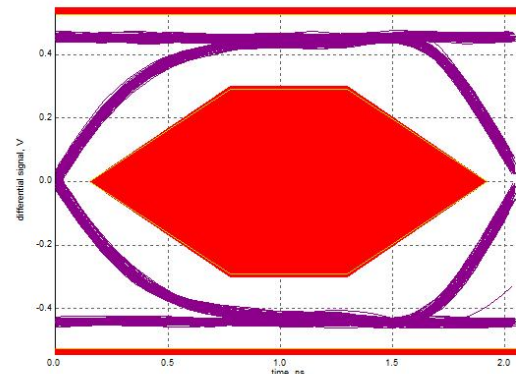
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T _{ON}	V _{COM} =1.5V, C _L =35pF, R _L =50Ω		200		ns
Turn-Off Time	T _{OFF}	V _{COM} =1.5V, C _L =35pF, R _L =50Ω		200		ns
Break-Before-Make time	T _{BBM}	V _{COM} =1.5V, C _L =35pF, R _L =50Ω		500		ns
-3dB Bandwidth	BW	R _L =50Ω, C _L =0pF		800		MHz
Off isolation	OIRR	F=1KHz, R _L =50Ω		-81		dB
		F=10KHz, R _L =50Ω		-80		dB
Crosstalk	Xtalk	F=1KHz, R _L =50Ω		-83		dB
		F=10KHz, R _L =50Ω		-82		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz V _{COM} =600mVp-p @R _L =32Ω,		-80		dB



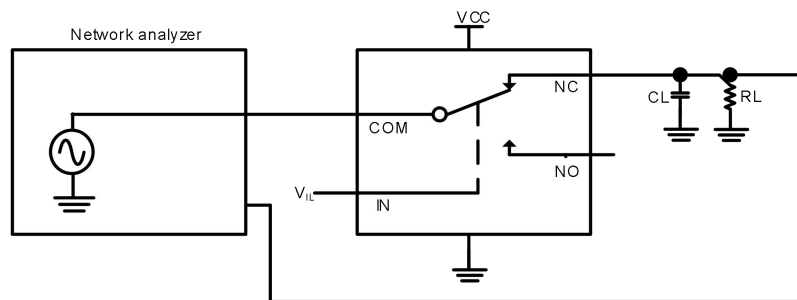
Typical Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)



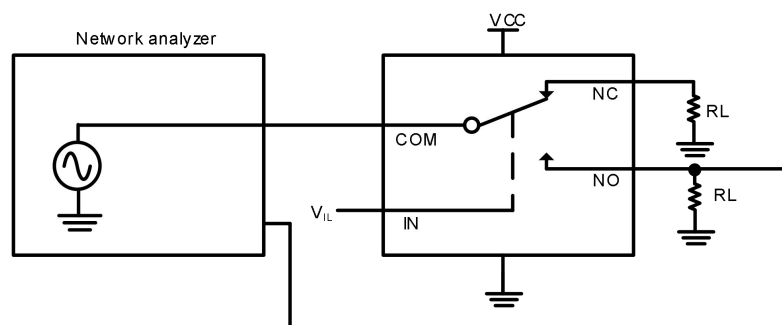
Bandwidth



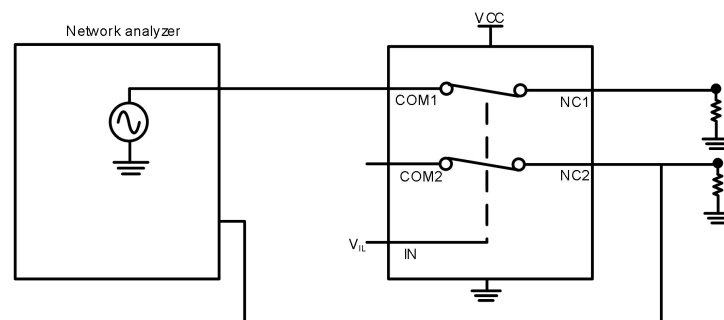
Eye Diagram (480Mbps)



Bandwidth



Off isolation

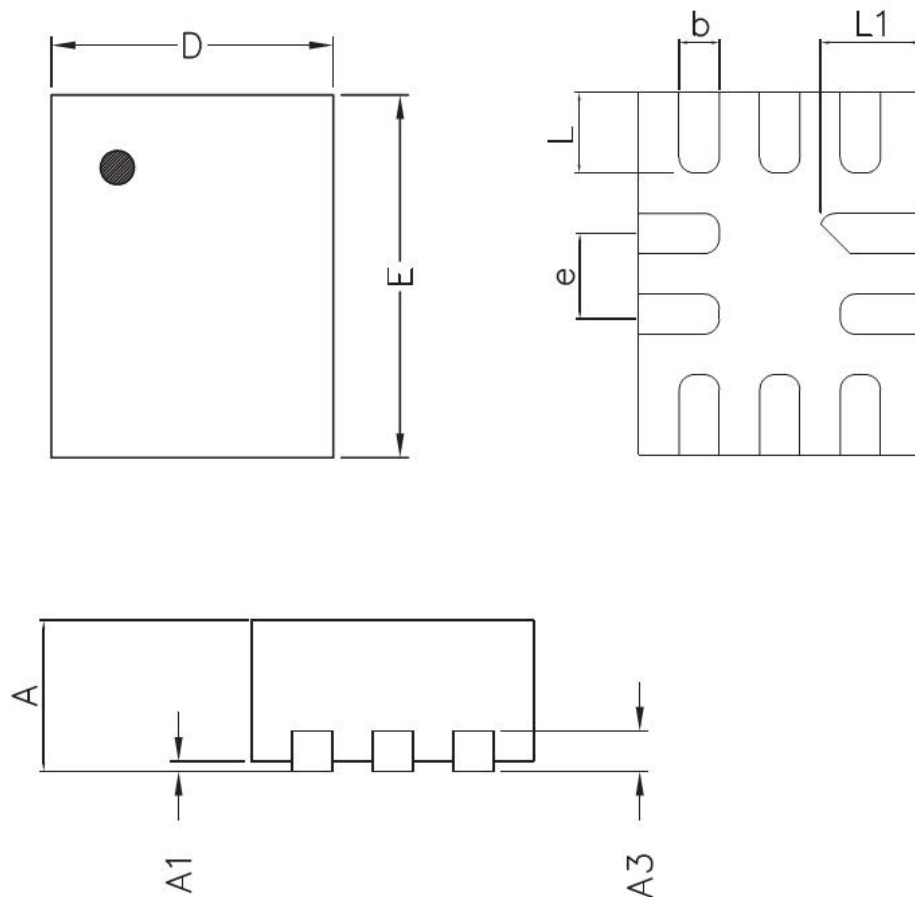


Crosstalk



Package Outline Dimensions

QFN1418(X-QFN-10(1.4x1.8))



Symbol	Dimension in Millimeters	
	Min.	Max.
A	0.450	0.550
A1	0.000	0.050
A3	0.152 Ref.	
D	1.350	1.450
E	1.750	1.850
b	0.150	0.250
e	0.400 Typ.	
L	0.350	0.450
L1	0.450	0.550



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