

Features

- Wide Supply Range 1.5 V to 5.5 V
- Differential 2:1 or 1:2 Switch/Multiplexer
- USB 3.1 Super Speed 10Gbps Switch
- High Bandwidth: 5.1GHz @ -3dB Bandwidth
- Isolation: -24dB @ 1.25 GHz
- Crosstalk: -34dB @ 1.25 GHz
- Low bit-to-bit skew, Bidirectional
- ESD Tolerance: 2kV HBM
- Powered Off Protection When VDD = 0 V
- 1.8-V Compatible Logic Inputs
- Pin-to-Pin ASW3410, DIO3340, FUSB340

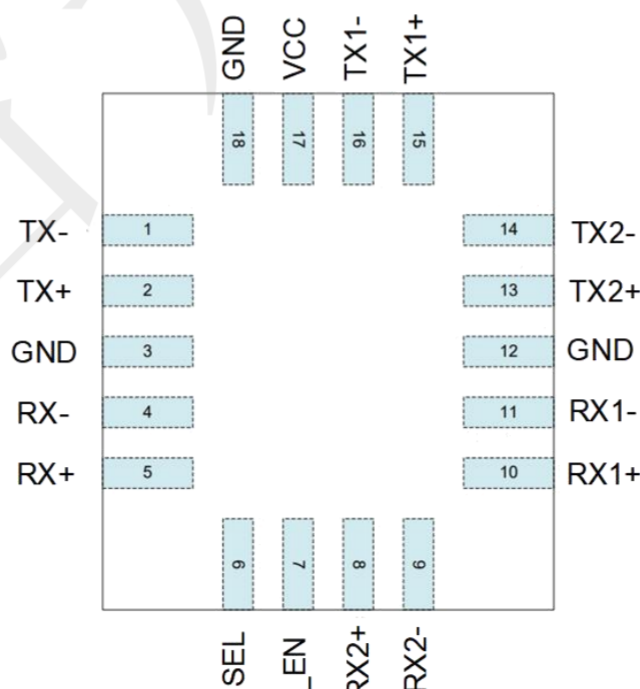
Applications

- USB Type-C Ecosystem
- Desktop and Notebook PCs
- Server/Storage Area Networks
- Shared I/O Ports
- PCI Express Backplanes
- FPD LinkII and FPD LinkIII Switching

General Description

The is a high-speed bidirectional passive switch in mux or demux configurations suited for USB Type-C™ application supporting USB 3.1 Gen 1 and Gen 2 data rates. Based on control pin SEL, the device provides switching on differential channels between Port L0 or Port L1 to Port C0. The is a generic analog differential passive switch that can work for any high-speed interface applications requiring a common mode voltage range of 0 to 2 V and differential signaling with differential amplitude up to 1.8Vpp. It employs adaptive tracking that ensures the channel remains unchanged for the entire common mode voltage range. Excellent dynamic characteristics of the device allow high-speed switching with minimum attenuation to the signal eye diagram with very little added jitter. It consumes <2mW of power when operational and has a shutdown mode exercisable by _EN pin resulting <20uW.

PIN CONFIGURATIONS (TOP VIEW) QFN2X3-18L



PIN DESCRIPTION

Pin#	Pin Name	Signal Type	Description
1	TX-	I/O	Super Speed TX- Common
2	TX+	I/O	Super Speed TX+ Common
3,12,18	GND	GND	Ground
4	RX-	I/O	Super Speed RX- Common
5	RX+	I/O	Super Speed RX+ Common
6	SEL	I	Switch logic control
7	_EN	I	Chip Enable, Active Low
8	RX2+	I/O	Super Speed RX2+
9	RX2-	I/O	Super Speed RX2-
10	RX1+	I/O	Super Speed RX1+
11	RX1-	I/O	Super Speed RX1-
13	TX2+	I/O	Super Speed TX2+
14	TX2-	I/O	Super Speed TX2-
15	TX1+	I/O	Super Speed TX1+
16	TX1-	I/O	Super Speed TX1-
17	VCC	Power	Supply Voltage

Truth Table

_EN	SEL	TX+	TX-	RX+	RX-
High	X	Hi-Z	Hi-Z	Hi-Z	Hi-Z
Low	Low	TX1+	TX1-	RX1+	RX1-
Low	High	TX2+	TX2-	RX2+	RX2-

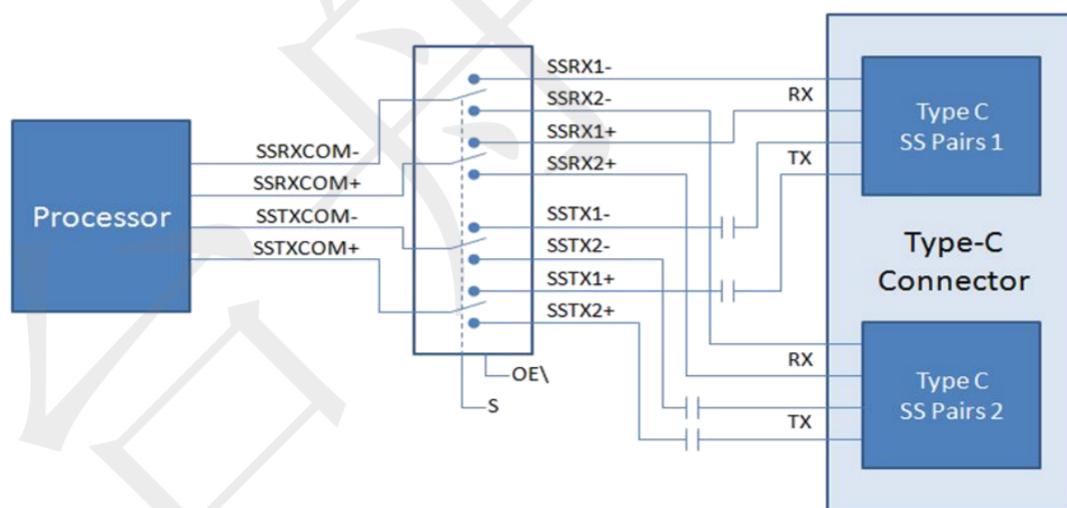
Absolute Maximum Ratings (Unless otherwise specified)

Parameter	Range
Storage Temperature	-65°C to +150°C
Junction Temperature	125°C
Supply Voltage to Ground Potential	-0.5V to +5.5V
Super Speed Data Channel TX / RX	-0.5V to 3.8V
DC Input Voltage	-0.5V to VCC
DC Output Current	50mA
Power Dissipation	300mW

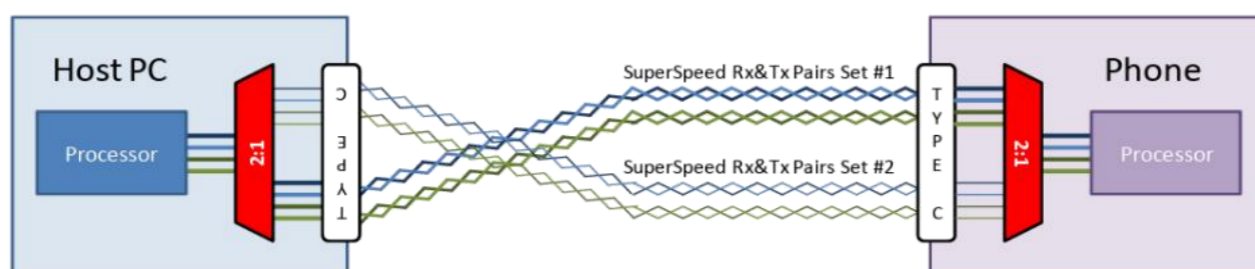
Notes:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Block Diagram



Typical Application



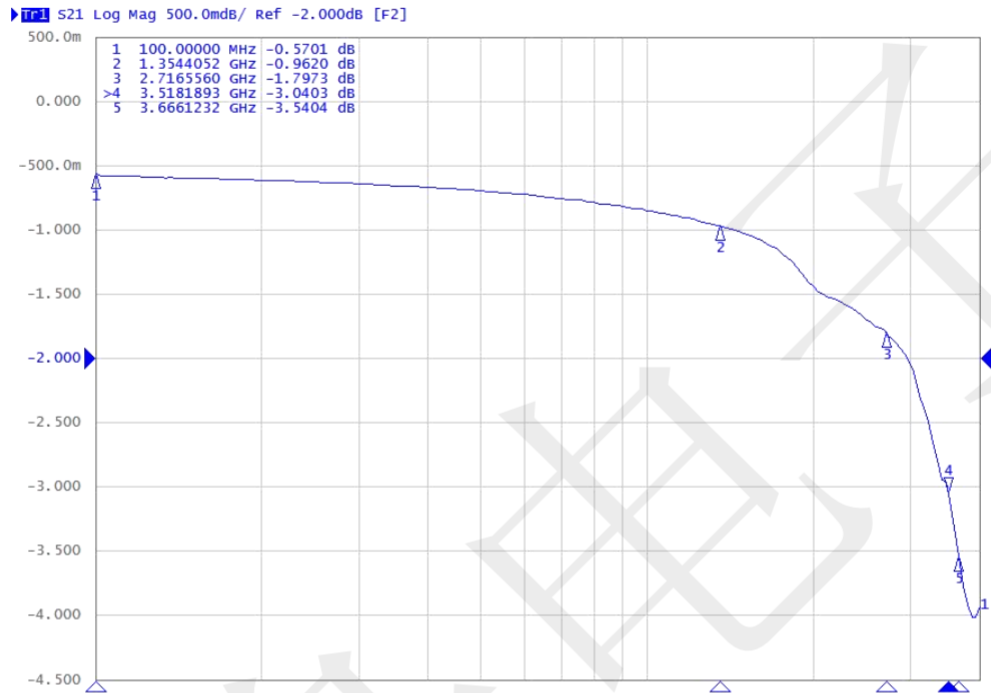
Electronics Characteristics (Ta=25°C, VCC=+1.8V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
POWER SUPPLY						
VCC Quiescent Current	I _Q	SEL=0 or VCC, _EN=0	--	28	--	uA
Power-down Current	I _{PD}	SEL=0 or VCC, _EN=VCC	--	--	1	uA
DC CHARACTERISTICS						
Input logic high	V _{IH}	VCC=1.8~4.5V	1.6	--	--	V
Input logic low	V _{IL}	VCC=1.8~4.5V	--	--	0.4	V
_EN Internal pull-up resistor	R _{UP}		--	2	--	MΩ
SEL Internal pull-down resistor	R _{DN}		--	2	--	MΩ
On-Resistance for TX/RX	R _{ON_HS}	V _{IS} = 0.2V I _{ON} =8mA	--	6.7	8	Ω
R _{ON} Flatness for TX/RX	R _{FLAT_LP}	V _{IS} = 0 to 1.2V I _{ON} =8mA	--	0.8	1	Ω
R _{ON} Flatness for TX/RX	R _{FLAT_LP}	V _{IS} = 0 to 0.2V I _{ON} =8mA	--	0.2	0.3	Ω
R _{ON} Matching Between Channels	R _{MATCH}	V _{IS} = 0 to 1.2V I _{ON} =8mA	--	0.1	--	Ω
Switch Off Leakage Current	I _{OFF}	_EN=VCC, Tx, Rx =VCC TX1, TX2, RX1, RX2=0	-0.5	--	0.5	uA
AC CHARACTERISTICS						
Enable Time _EN to Output	t _{EN}	R _L =50Ω C _L =0pF V _{IS} = 0.6V	--	80	150	uS
Disable Time _EN to Output	t _{DIS}	R _L =50Ω C _L =0pF V _{IS} = 0.6V	--	40	250	nS
Turn-On Time SEL to Output	t _{ON}	R _L =50Ω C _L =0pF V _{IS} = 0.6V	--	400	1200	nS
Turn-Off Time SEL to Output	t _{OFF}	R _L =50Ω C _L =0pF V _{IS} = 0.6V	--	130	800	nS
Break-Before-Make Time	t _{BBM}	R _L =50Ω C _L =0pF V _{IS} = 0.6V	--	250	500	nS
Propagation Delay	t _{PD}	R _L =50Ω C _L =0pF V _{IS} = 0.6V	--	0.25	--	nS
Off Isolation	Off	R _L = 50Ω f = 1.2GHz V _{IS} = 0.2V _{PP}	--	-27	--	dB
Crosstalk	X _{TALK}	R _L = 50Ω f = 1.2GHz V _{IS} = 0.2V _{PP}	--	-43	--	dB
-3dB Bandwidth	BW _{-3dB}	R _L =50Ω C _L =0pF Signal 0dBm	4.5	5.1	--	GHz
CAPACITANCE						
Switch On Capacitance	C _{ON}	V _{Bias} = 0.2V, f = 1.5GHz	--	1.5	--	pF
Switch Off Capacitance	C _{OFF}	V _{Bias} = 0.2V, f = 1.5GHz	--	1.0	--	pF

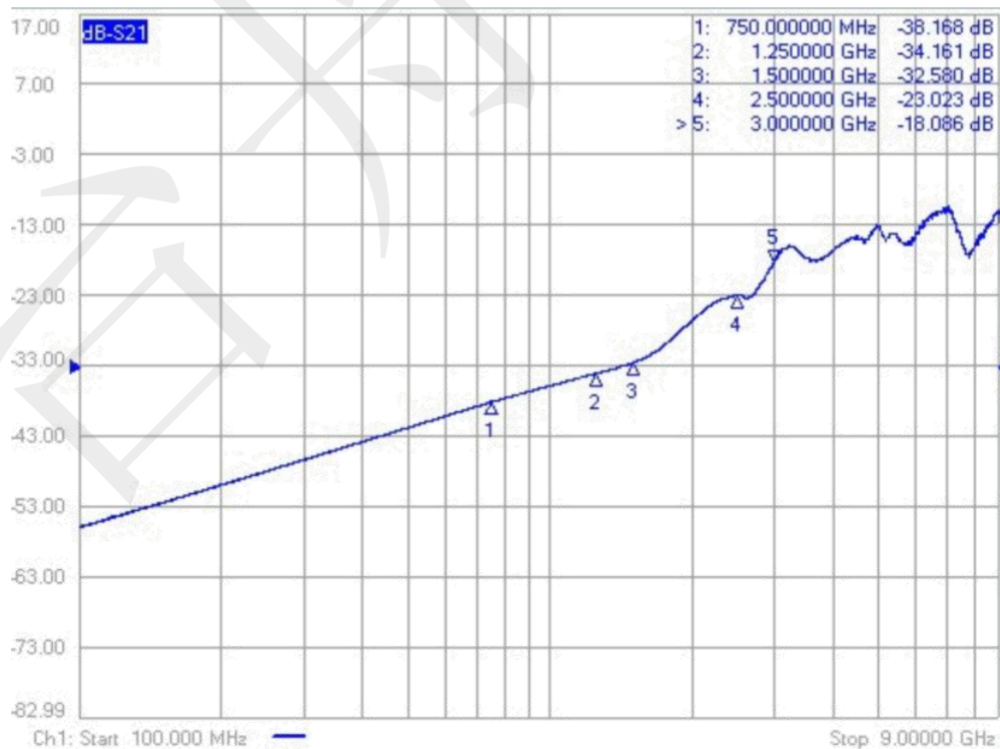
Note:

- (1) Flatness is defined as the difference between maximum and minimum value of ON-resistance at the specified analog signal voltage points.
- (2) RON matching between channels is calculated by subtracting the channel with the lowest max Ron value from the channel with the highest max Ron value.
- (3) Crosstalk is inversely proportional to source impedance.

Typical Characteristics (Ta=25°C, VCC=3.0V, CAP=0.1uF, unless otherwise noted)



Switch Bandwidth or Insertion Loss



Switch Channel to Channel Cross-Talk

Typical Characteristics (Ta=25°C, VCC=3.0V, CAP=0.1uF, unless otherwise noted)



Switch Off Isolation

Package information

QFN2X3-18L

