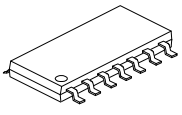
USB 2.0 HIGH-SPEED (480Mbps) DUAL 2:1 MUX/DEMUX ANALOG SWITCH



SOP-14

QFN10-(1.8×1.4)

■ DESCRIPTION

The **UMX2211** is a differential channel 2:1 multiplexer/ demultiplexer switch designed for the application of high speed USB 2.0. The wide bandwidth of this switch allows signals to pass with minimum distortion. The device multiplexes differential outputs from a USB host device to one of two corresponding outputs. It is bidirectional and designed for low bit-to-bit skew, high channel-to-channel noise isolation.

The **UMX2211** offers a high-performance, low-cost solution for the switching of high-speed USB2.0 signals.

■ FEATURES

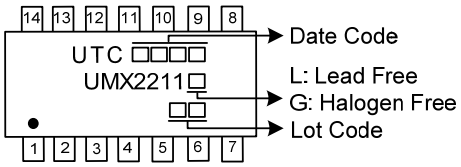
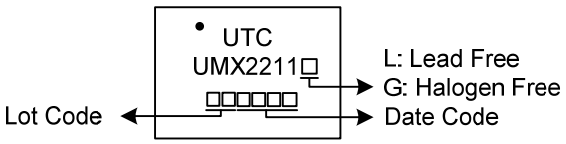
* USB 2.0 compliant (high speed and full speed)
* V_{DD} Supply : 2.8V ~ 5V
* Channel On Capacitance : 6.5pF
* Low On-Resistance : 4.5Ω at V_{DD}=3V

■ ORDERING INFORMATION

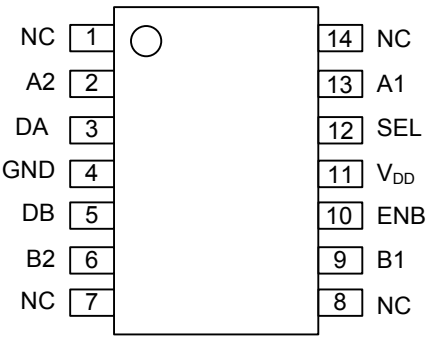
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMX2211L-S14-R	UMX2211G-S14-R	SOP-14	Tape Reel
UMX2211L-Q10-1814-R	UMX2211G-Q10-1814-R	QFN-10(1.8×1.4)	Tape Reel

UMX2211G-S14-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S14: SOP-14, Q10-1814: QFN-10(1.8×1.4) (3) G: Halogen Free and Lead Free, L: Lead Free

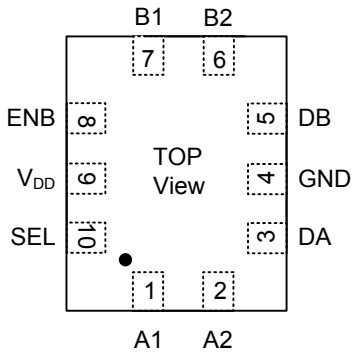
■ MARKING

SOP-14	QFN-10 (1.8×1.4)
	

■ PIN CONFIGURATION



SOP-14



QFN-10 (1.8×1.4)

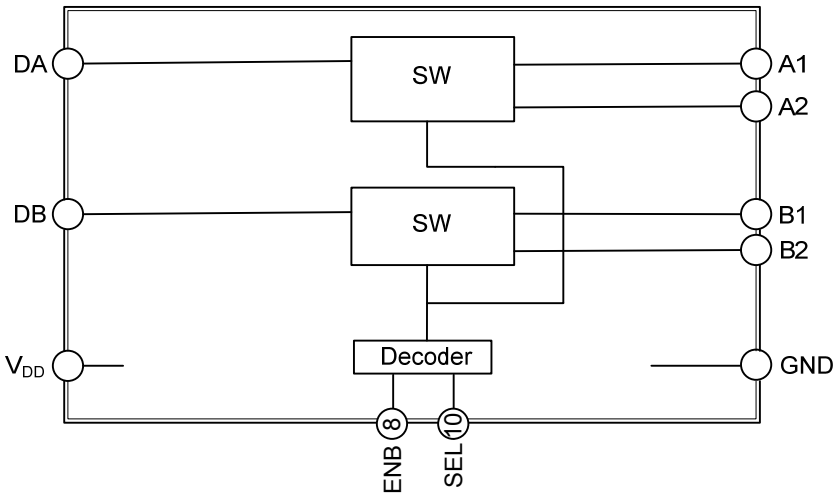
■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOP-14	QFN-10 (1.8×1.4)		
2	2	A2	Analog Data I/O
3	3	DA	Analog Data I/O
4	4	GND	Ground
5	5	DB	Analog Data I/O
6	6	B2	Analog Data I/O
9	7	B1	Analog Data I/O
10	8	ENB	Logic Control
11	9	V_{DD}	Power
12	10	SEL	Logic Control
13	1	A1	Analog Data I/O

■ TRUTH TABLE

SEL	ENB	DA	DB
X	H	Hi-Z	Hi-Z
L	L	A1	B1
H	L	A2	B2

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

over operating free-air temperature range (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
DC Input Voltage	V_{DD}	-0.5V to +7.0V	V
DC Output Current		120	mA
Supply Voltage to Ground Potentia		-0.5 ~ +7.0	V
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ DC ELECTRICAL CHARACTERISTICS (V_{DD}=2.8V~5V, T_A=-40~+85°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT
Supply	V_{DD}		2.8		5	V
Power SupplyCurrent	I_S	V_{DD}=5.5V			1	μA
Analog Signal Range	Vswitch		0		V_{DD}	V
Input HIGH Voltage	V_{IH}	V_{DD}=5V	3			V
		V_{DD}=3.3V	2			V
Input LOW Voltage	V_{IL}	V_{DD}=3.3Vor5V	-0.5		0.8	V
Input HIGH Current	I_H	V_{DD}=5V, V_{IN}=VDD			±1	μA
Input LOW Current	I_L	V_{DD}=5V, V_{IN}=GND			±1	μA
I/O Leakage Current	I_{LK}	V_{DD}=5V, V_{IN}=0 to 5V, Switch OFF, ENB=HIGH			±1	μA
ON-Resistane	R_{ON}	V_{DD}=3V, V_{IN}=-0.4V to 1.0V, I_{ON}=-40mA		4.5		Ω
Match Between Channels	$\triangle R_{ON}$	V_{DD}=3V, V_{IN}=-0.4V to 1.0V, I_{ON}=-40mA		0.5		Ω
Ron Flatness	R_{FLAT}	V_{DD}=3V, V_{IN}=-0.4V to 1.0V, I_{ON}=-40mA		1.9		Ω

Note: T_A=25°C ambient and maximum loading unless otherwise specified.

■ SWITCHING CHARACTERISTICS (V_{DD}=3.3V, T_A=-40°C ~ +85°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT
Propagation Delay	t_{PD}	R_L=50Ω,C_L=10pF(Note 2), see Fig. 1		0.25		ns
Turn On Time – SEL, ENB	t_{ON}	R_L=50Ω,C_L=10pF(Note 2), see Fig. 2		4		ns
Turn OFF Time – SEL, ENB	t_{OFF}	R_L=50Ω,C_L=10pF(Note 2), see Fig. 2		4		ns
Capacitance, Switch ON	$C_{(ON)}$	V_{IN}=0V, f=1MHz		6.5		pF
-3dB Bandwidth	BW	see Fig. 3		800		MHz
Off Isolation	Q_{IRR}	see Fig. 4		-36		dB
Crosstalk	X_{TALK}	see Fig. 5		-32		dB

Notes: 1. T_A=25°C ambient and maximum loading unless otherwise specified.
2. C_L includes probe and jig capacitance.
3. All input pulses are supplied by generators having the following characteristics :Z_O=50Ω, t_r ≤ 8ns, t_f ≤ 8ns.

■ TEST CIRCUIT AND WAVEFORMS

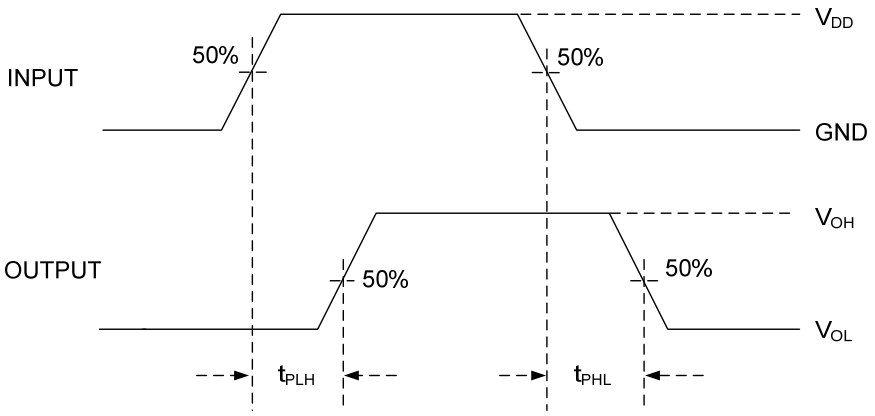


Fig.1 PROPAGATION DELAY TIMES

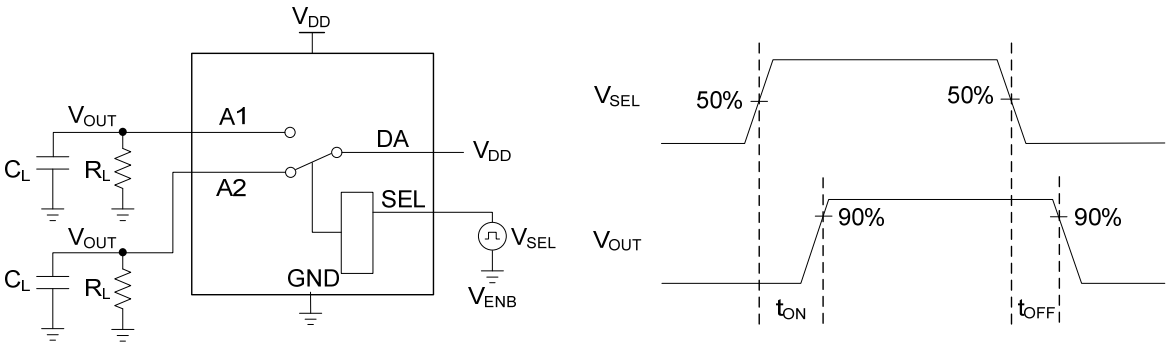


Fig.2 SWITCHING TIME

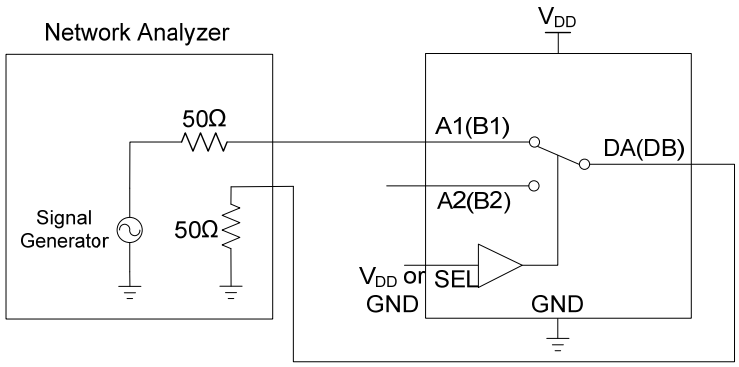


Fig.3 BANDWIDTH

■ TEST CIRCUIT AND WAVEFORMS

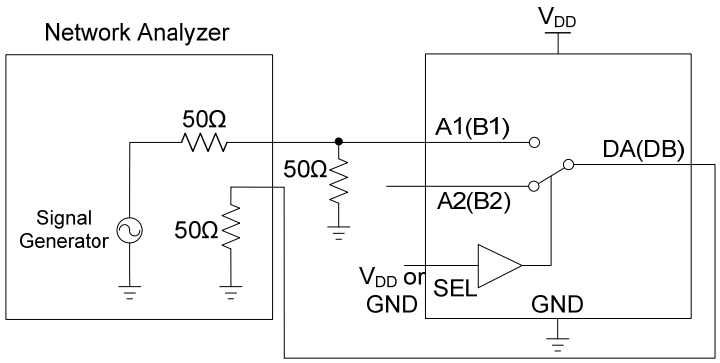


Fig.4 OFF ISOLATION

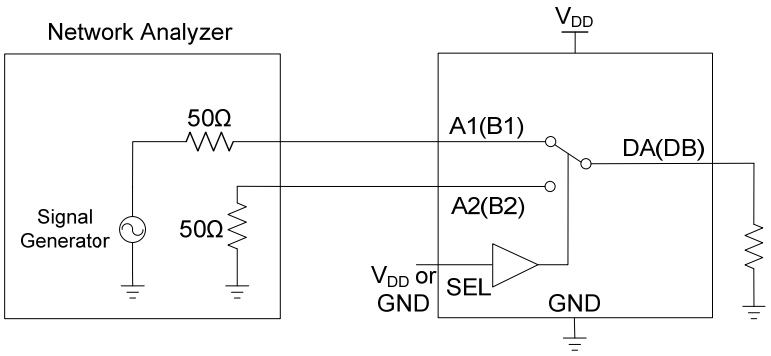


Fig.5 CROSSTALK