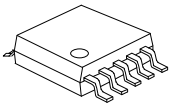
DPDT USB 2.0 HIGH-SPEED (480Mbps) AND MOBILE HIGH-DEFINITION LINK (MHL) SWITCH



MSOP-10

■ DESCRIPTION

The **UMX2215** is a differential channel 2:1 switch designed for the application of high speed USB 2.0 and Mobile High-Definition Link (MHL). The wide bandwidth of this switch allows signals to pass with minimum distortion. These configurations allow the system designer to use a common USB or Micro-USB connector for both MHL video signals and USB data.

■ FEATURES

* USB 2.0 (high speed) and Mobile High-Definition Link (MHL) Compliant
* V_{DD} Operation at 2.5V and 3.3V
* Channel On Capacitance < 2.7pF
* Low On-Resistance < 6Ω at V_{DD} = 3.3V
* High Off-Isolation : -40dB at 240MHz
* Low Crosstalk : -40dB at 240MHz

■ APPLICATIONS

* Routes Signals for USB 2.0 and MHL
* Portable Instrumentation
* Cell Phone and Digital Cameras

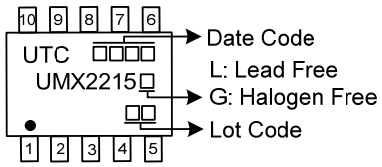
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMX2215L-SM2-R	UMX2215G-SM2-R	MSOP-10	Tape Reel

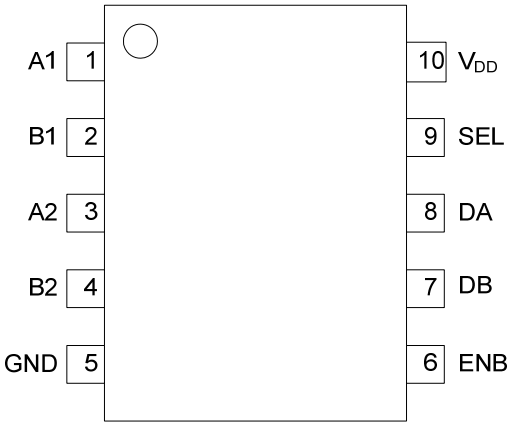
UMX2215G-SM2-R
- (1)Packing Type
- (2)Package Type
- (3)Green Package

(1) R: Tape Reel
(2) SM2: MSOP-10
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION



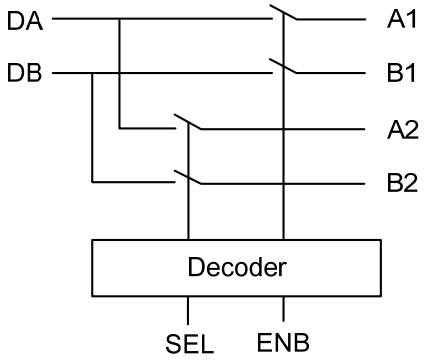
■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1, 2 3, 4	A1, B1 A2, B2	Analog Data I/O
5	GND	Ground
6	ENB	Logic Control
9	SEL	Logic Control
7, 8	DA, DB	Analog Data I/O
10	V_{DD}	Power

■ 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 (T_A=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage to Ground Potential		-0.5 ~ 4.6	V
DC Input Voltage	V_{IN}	-0.5 ~ 4.6	V
DC Output Current	V_{OUT}	120	mA
Power Dissipation	P_D	0.5	W
Ambient Temperature with Power applied		-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 (T_A=-40~+85°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note1)	MAX	UNIT
SUPPLY POWER						
Supply Power	V_{DD}		2.3		3.6	V
Power Supply Current	I_S	V_{DD}=3.3V, ENB=GND			65	μA
Shut Down Current	I_{OFF}	V_{DD}=3.3V, ENB=V_{DD}			±2	μA
Analog Signal Range	V_{SWITCH}		0		V_{DD}	V
Input HIGH Voltage	V_H	V_{DD}=2.3V~3.6V	1.25			V
Input LOW Voltage	V_L	V_{DD}=2.3V~3.6V			0.6	V
Input HIGH Current	I_H	V_{DD}=3.3V, V_{IN}=V_{DD}			±1	μA
Input LOW Current	I_L	V_{DD}=5V, V_{IN}=GND			±1	μA
I/O Leakage Current	I_{LK}	V_{DD}=3.3V, V_{INPUT}=0 to 3.3V Switch=OFF, ENB=HIGH			±1	μA
ON-Resistance	R_{ON}	V_{DD}=3.3V, V_I=0V to V_{DD}, I_O=-8mA		10		Ω
Match Between Channels	ΔR_{ON}	V_{DD}=3.3V, V_I=0V to V_{DD}, I_O=-8mA		1		Ω
Ron Flatness	R_{FLAT}	V_{DD}=3.3V, V_I=0V to V_{DD}, I_O=-8mA		0.5		Ω

Note: V_{DD}=3.3V, T_A=25°C ambient and maximum loading, unless otherwise specified.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note1)	MAX	UNIT
Propagation Delay	t_{PD}	R_L=50Ω, C_L=10pF (Note 1), see Fig.1		1.5		ns
Turn On Time – SEL	t_{ON}	R_L=50Ω, C_L=10pF (Note 1), see Fig.2			10	ns
Turn OFF Time – SEL	t_{OFF}	R_L=50Ω, C_L=10pF (Note 1), see Fig.2			50	ns
Enable Time – ENB	$t_{ZH,\ ZL}$	R_L=50Ω, C_L=10pF (Note 1), see Fig.2			10	ns
Disable Time – ENB	$T_{HZ,\ LZ}$	R_L=50Ω, C_L=10pF (Note 1), see Fig.2			50	ns
Capacitance, switch ON	$C_{(ON)}$	V_{IN}=0V, f=1MHz			2.7	pF
-3dB Bandwidth	BW	See Fig.3		2.3		GHz
Off Isolation	Q_{IRR}	240MHz, see Fig.4		-40		dB
Crosstalk	X_{TALK}	240MHz, see Fig.5		-40		dB

Notes: 1. V_{DD}=3.3V, 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, $t_r \leq$ 8ns, $t_f \leq$ 8ns.

■ TEST CIRCUIT AND WAVEFORMS

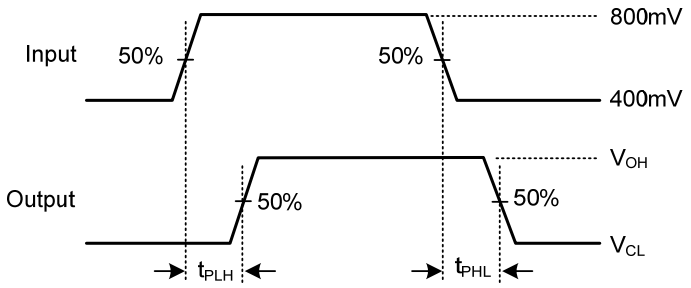


Fig. 1 Propagation Delay

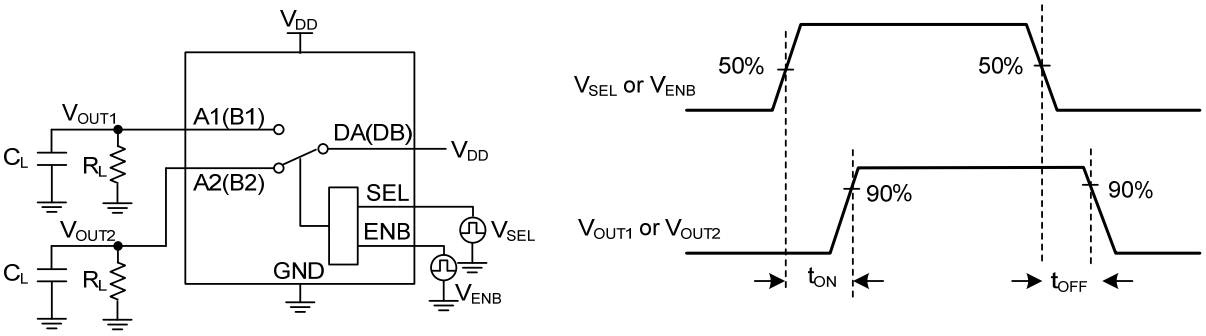


Fig. 2 Switching Time

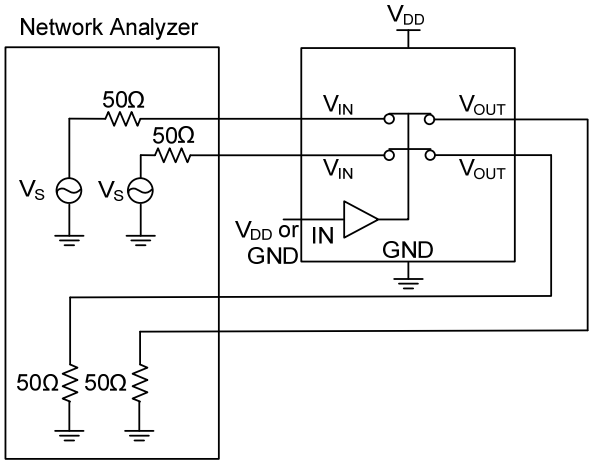


Fig. 3 Bandwidth

■ TEST CIRCUIT AND WAVEFORMS (Cont.)

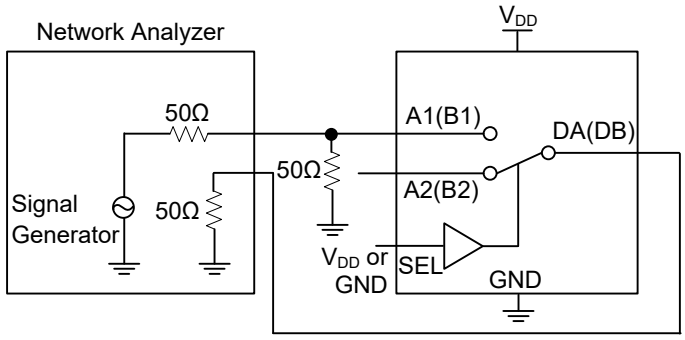


Fig. 4 Off Isolation

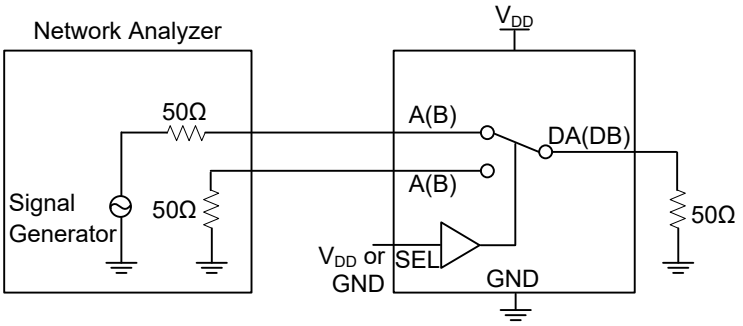


Fig. 5 Crosstalk