



UMX2215

Preliminary

CMOS IC

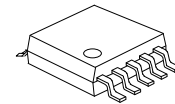
DPDT USB 2.0 HIGH-SPEED (480Mbps) AND MOBILE HIGH-DEFINITION LINK (MHL) SWITCH

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.



MSOP-10

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 < 6 Ω at V_{DD} = 3.3V
- * High Off-Isolation : -40dB at 240MHz
- * Low Crosstalk : -40dB at 240MHz

APPLICATIONS

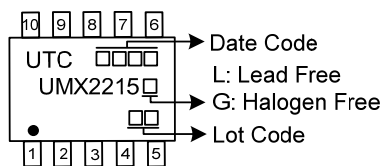
- * Routes Signals for USB 2.0 and MHL
- * Portable Instrumentation
- * Cell Phone and Digital Cameras

ORDERING INFORMATION

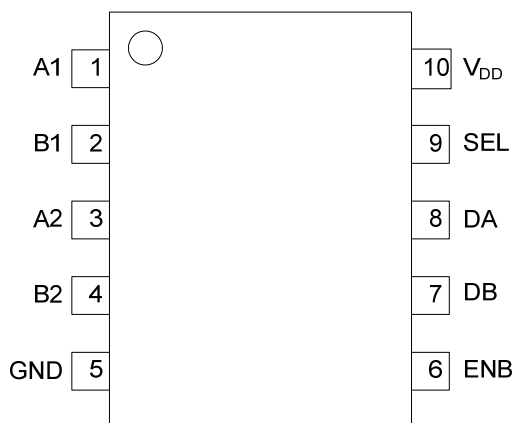
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMX2215L-SM2-R	UMX2215G-SM2-R	MSOP-10	Tape Reel

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
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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	S1	S2	ENB
X	H	Hi-Z	Hi-Z
L	L	A1	B1
H	L	A2	B2

■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, 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	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

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 ($T_A=-40\sim+85^{\circ}\text{C}$, 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	$V_{DD}=3.3\text{V}$, ENB=GND			65	μA
Shut Down Current	I_{OFF}	$V_{DD}=3.3\text{V}$, ENB= V_{DD}			± 2	μA
Analog Signal Range	V_{SWITCH}		0		V_{DD}	V
Input HIGH Voltage	V_H	$V_{DD}=2.3\text{V}\sim 3.6\text{V}$	1.25			V
Input LOW Voltage	V_L	$V_{DD}=2.3\text{V}\sim 3.6\text{V}$			0.6	V
Input HIGH Current	I_H	$V_{DD}=3.3\text{V}$, $V_{IN}=V_{DD}$			± 1	μA
Input LOW Current	I_L	$V_{DD}=5\text{V}$, $V_{IN}=\text{GND}$			± 1	μA
I/O Leakage Current	I_{LK}	$V_{DD}=3.3\text{V}$, $V_{INPUT}=0$ to 3.3V Switch=OFF, ENB=HIGH			± 1	μA
ON-Resistance	R_{ON}	$V_{DD}=3.3\text{V}$, $V_I=0\text{V}$ to V_{DD} , $I_O=-8\text{mA}$		10		Ω
Match Between Channels	ΔR_{ON}	$V_{DD}=3.3\text{V}$, $V_I=0\text{V}$ to V_{DD} , $I_O=-8\text{mA}$		1		Ω
Ron Flatness	R_{FLAT}	$V_{DD}=3.3\text{V}$, $V_I=0\text{V}$ to V_{DD} , $I_O=-8\text{mA}$		0.5		Ω

Note: $V_{DD}=3.3\text{V}$, $T_A=25^{\circ}\text{C}$ ambient and maximum loading, unless otherwise specified.

■ DYNAMIC CHARACTERISTICS ($V_{DD}=3.3\text{V}$, $T_A=-40\sim+85^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note1)	MAX	UNIT
Propagation Delay	t_{PD}	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.1		1.5		ns
Turn On Time – SEL	t_{ON}	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.2			10	ns
Turn OFF Time – SEL	t_{OFF}	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.2			50	ns
Enable Time – ENB	$t_{ZH, ZL}$	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.2			10	ns
Disable Time – ENB	$T_{HZ, LZ}$	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.2			50	ns
Capacitance, switch ON	$C_{(ON)}$	$V_{IN}=0\text{V}$, $f=1\text{MHz}$			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. $V_{DD}=3.3\text{V}$, $T_A=25^{\circ}\text{C}$ 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: $Z_O = 50\Omega$, $t_r \leq 8\text{ns}$, $t_f \leq 8\text{ns}$.

■ TEST CIRCUIT AND WAVEFORMS

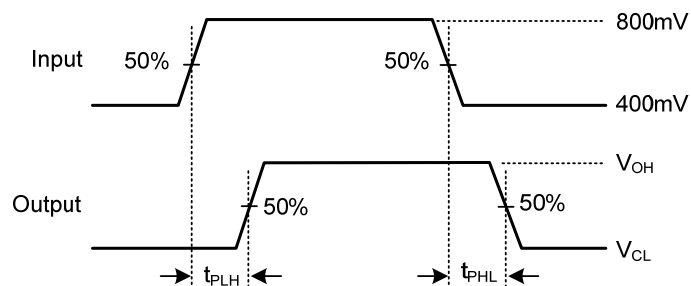


Fig. 1 Propagation Delay

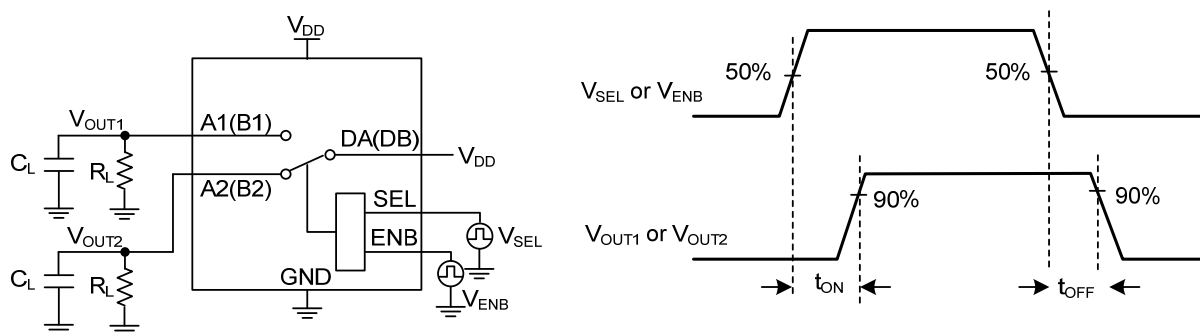


Fig. 2 Switching Time

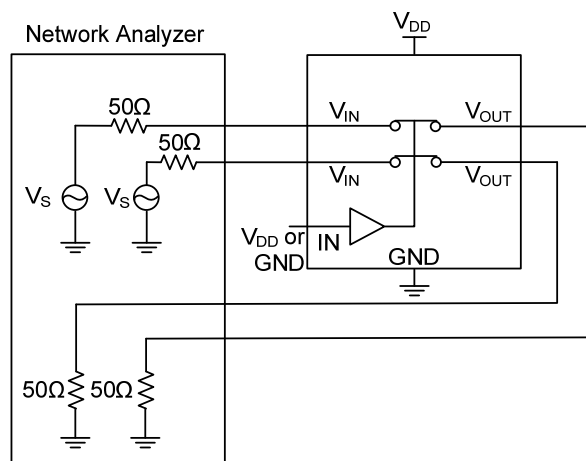


Fig. 3 Bandwidth

■ TEST CIRCUIT AND WAVEFORMS (Cont.)

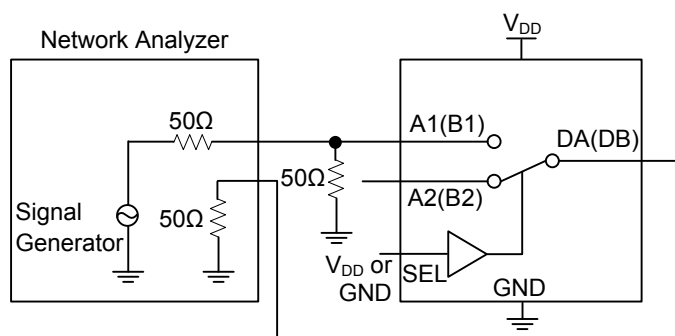


Fig. 4 Off Isolation

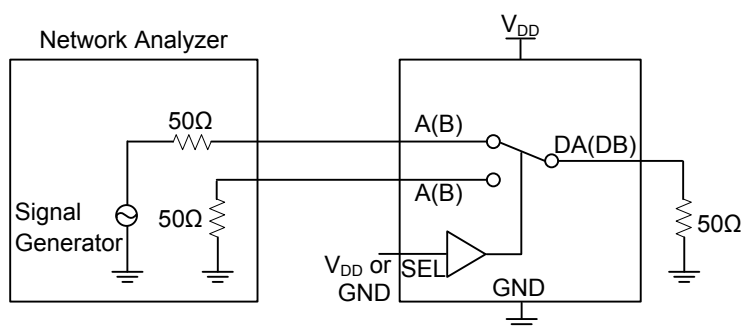


Fig. 5 Crosstalk

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