

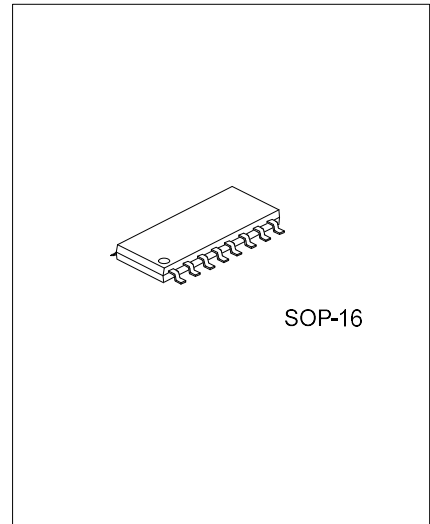


UMX2412

Preliminary

CMOS IC

LOW ON-RESISTANCE WIDE BANDWIDTH DUAL 4:1 MUX/DEMUX ANALOG SWITCH



DESCRIPTION

The UTC **UMX2412** is a Rail-to-Rail Dual 4:1 multiplexer / demultiplexer CMOS switch designed with advanced CMOS technology.

The On-Resistance is typically 4.5 ohm with signal voltage range from 0V to 5V. The **UMX2412** is low On-Resistance, high Off-Isolation, and wide bandwidth. It is a ideal high-performance, low-cost solution for digital or analog signal switch applications between signal sources.

FEATURES

- *CMOS Technology for Bus and Analog Applications
- *2V to 5.5V Supply Operation
- * Rail-to-Rail Analog Signal Range at $V_{DD}=2V$ to 5.5V
- *Low On-Resistance: 4.5Ω at 5V
- *High Off-Isolation: -66dB at 10MHz
- *Low Crosstalk: -60dB at 10Mhz

APPLICATIONS

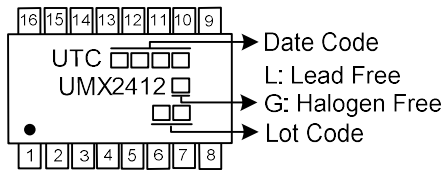
- *Digital TV
- *Cell Phones
- * Computer Peripherals
- *Portable Instrumentation

ORDERING INFORMATION

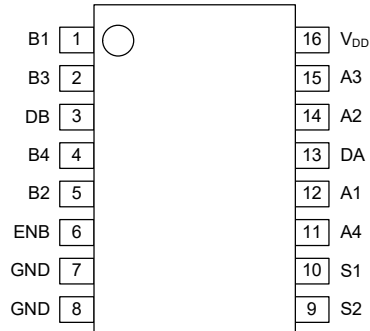
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMX2412L-S16-R	UMX2412G-S16-R	SOP-16	Tape Reel

<p>UMX2412G-S16-R</p> <ul style="list-style-type: none"> (1)Packing Type (2)Package Type (3)Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S16: SOP-16 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



PIN CONFIGURATION



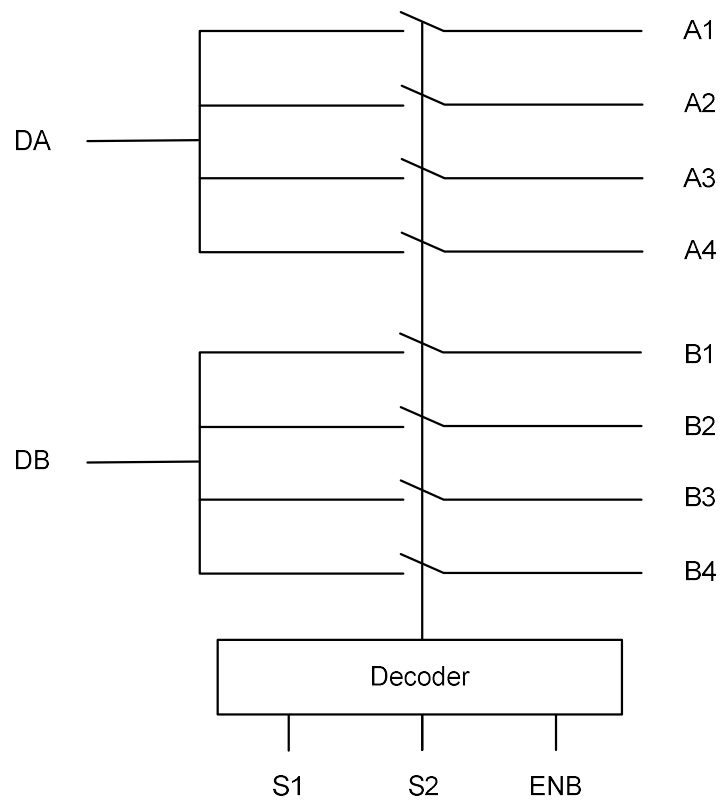
PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1, 2, 4, 5 11, 12, 14, 15	A1, A2, A3, A4 B1, B2, B3, B4	Analog Data I/O
3, 13	DA, DB	Analog Data I/O
6	ENB	Logic Control - Enable
7, 8	GND	Ground
9, 10	S1, S2	Logic Control - Selection
16	V _{DD}	Power

TRUTH TABLE

Selection	S1	S2	ENB
A1, B1	0	0	0
A2, B2	1	0	0
A3, B3	0	1	0
A4, B4	1	1	0
Disabled	X	X	1

■ BLOCK DIAGRAM



■ **ABSOLUTE MAXIMUM RATING** ($T_A=25^{\circ}\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage to Ground Potential		-0.5 ~ 7.0	V
DC Input Voltage	V_{IN}	-0.5 ~ 7.0	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** ($V_{DD}=5.0\text{V}$, $T_A=-40\sim+85^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note1)	MAX	UNIT
SUPPLY POWER						
Power Supply Current	I_S	$V_{DD}=5\text{V}$			± 1	μA
Analog Signal Range	V_{SWITCH}	$V_{DD}=5\text{V}$	0		V_{DD}	V
Input HIGH Voltage	V_H	$V_{DD}=5\text{V}$	3			V
Input LOW Voltage	V_L	$V_{DD}=5\text{V}$	-0.5		0.8	V
Input HIGH Current	I_H	$V_{IN}=V_{DD}$			± 1	μA
Input LOW Current	I_L	$V_{IN}=\text{GND}$			± 1	μA
Analog I/O Leakage Current	I_{LK}	Switch ON			± 1	μA
ON-Resistance	R_{ON}	$I_{ON}=30\text{mA}$		4.5		Ω
Match Between Channels	ΔR_{ON}	$I_{ON}=30\text{mA}$		0.3		Ω
Ron Flatness	R_{FLAT}	$I_{ON}=30\text{mA}$		2		Ω

Note: Typical values are at $V_{DD}=5.0\text{V}$, $T_A=25^{\circ}\text{C}$ ambient.

■ **DYNAMIC CHARACTERISTICS** ($V_{DD}=5.0\text{V}$, $T_A=-40\sim+85^{\circ}\text{C}$, 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		5		ns
Turn On Time	t_{ON}	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.2		40		ns
Turn OFF Time	t_{OFF}	$R_L=50\Omega$, $C_L=10\text{pF}$ (Note 1), see Fig.2		5		ns
Capacitance, switch ON	$C_{(ON)}$	$V_{IN}=0\text{V}$, $f=1\text{MHz}$		8.6		pF
Bandwidth	BW	See Fig.3		200		MHz
Off Isolation	Q_{IRR}	10MHz, see Fig.4		-66		dB
Crosstalk	X_{TALK}	10MHz, see Fig.5		60		dB

Notes: 1. Typical values are at $V_{DD}=5.0\text{V}$, $T_A=25^{\circ}\text{C}$ ambient.

2. C_L includes probe and jig capacitance.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note1)	MAX	UNIT
SUPPLY POWER						
Power Supply Current	I_S	$V_{DD}=3.3V$			± 1	μA
Analog Signal Range	V_{SWITCH}		0		V_{DD}	V
Input HIGH Voltage	V_H		2			V
Input LOW Voltage	V_L		-0.5		0.8	V
Input HIGH Current	I_H	$V_{IN}=V_{DD}$			± 1	μA
Input LOW Current	I_L	$V_{IN}=GND$			± 1	μA
Analog I/O Leakage Current	I_{LK}	Switch ON			± 1	μA
ON-Resistance	R_{ON}	$I_{ON}=30mA$		7		Ω
Match Between Channels	ΔR_{ON}	$I_{ON}=30mA$		0.3		Ω
Ron Flatness	R_{FLAT}	$I_{ON}=30mA$		4.5		Ω

Note: Typical values are at $V_{DD}=3.3V$, $T_A=25^{\circ}C$ ambient.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note1)	MAX	UNIT
Propagation Delay	t_{pd}	$R_L=50\Omega$, $C_L=10pF$ (Note 1), see Fig.1		5		ns
Turn On Time	t_{ON}	$R_L=50\Omega$, $C_L=10pF$ (Note 1), see Fig.2		40		ns
Turn OFF Time	t_{OFF}	$R_L=50\Omega$, $C_L=10pF$ (Note 1), see Fig.2		5		ns
Capacitance, switch ON	$C_{(ON)}$	$V_{IN}=0V$, $f=1MHz$		8.6		pF
Bandwidth	BW	See Fig.3		200		MHz
Off Isolation	Q_{IRR}	10MHz, see Fig.4		-66		dB
Crosstalk	X_{TALK}	10MHz, see Fig.5		60		dB

Notes: 1. Typical values are at $V_{DD}=3.3V$, $T_A=25^{\circ}C$ ambient.

2. C_L includes probe and jig capacitance.

■ TEST CIRCUIT AND WAVEFORMS

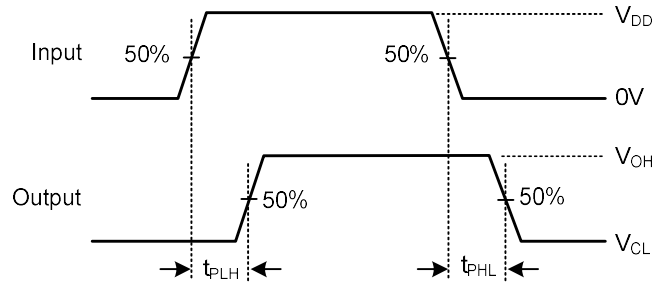


Fig. 1 Propagation Delay

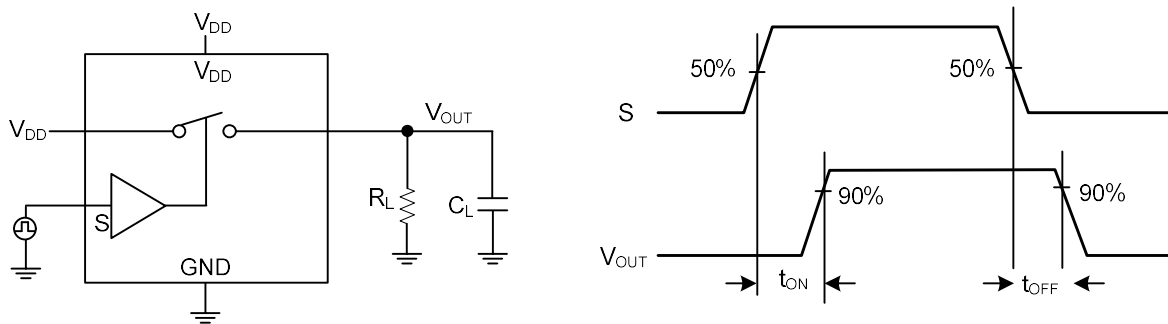


Fig. 2 Switching Time

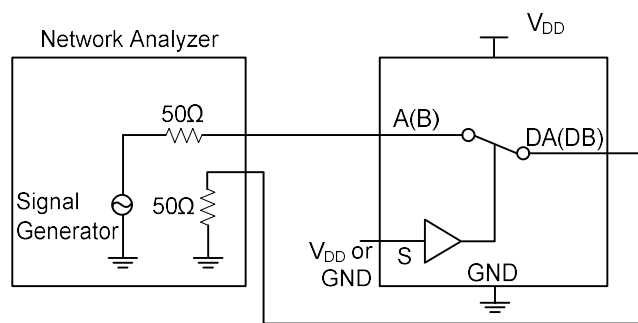


Fig. 3 Bandwidth

■ TEST CIRCUIT AND WAVEFORMS (Cont.)

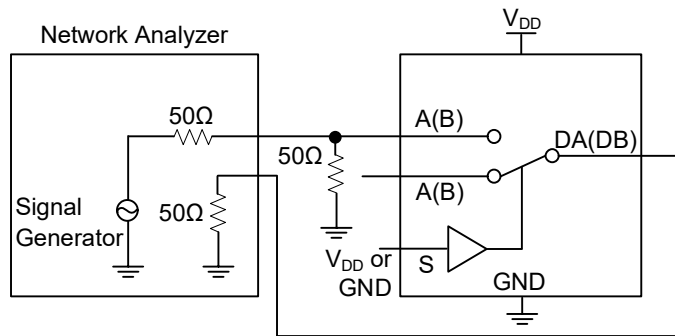


Fig. 4 Off Isolation

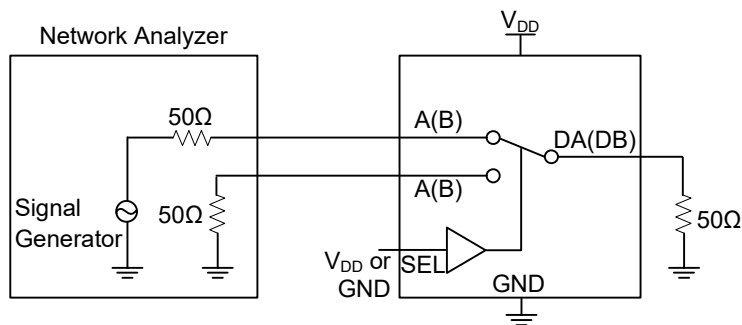


Fig. 5 Crosstalk

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