



## Descriptions

The BL1555MM is a dual SPDT low on-resistance analog switch. It can operate from a single 1.5V to 5.5V power supply. The device offers low ON-state resistance and excellent ON-state resistance matching with break-before-make feature, to prevent signal distortion during the transferring of a signal from one channel to another. The device is capable of true isolation. Even when COMx overrides VCC, very little current will flow back to the supply.

## Order Information

Package		Part Number	Top-Side Marking
MSOP-10	Tape and Reel	BL1555MM	TBD

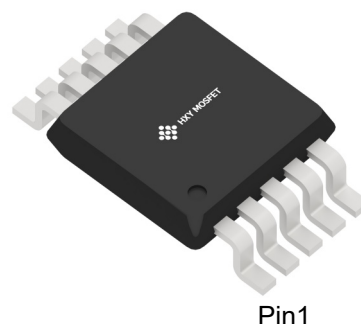
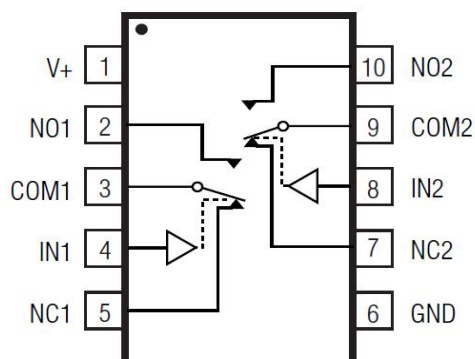
## Features

- Pin-to-Pin MAX4717EUB, ISL8484, TS3A24159, SGM4717YMS and DIO3712, MSOP-10 Package
- Low On-resistance,  $R_{on}=1.5\Omega$  when  $COMx=5V$
- 1.8V Logic Compatible Control Pin
- COMx Overrides VCC to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation:  $-100dB @ 100KHz$
- Low Channel-to-Channel Crosstalk:  $-97dB @ 100KHz$
- High Bandwidth (  $-3dB @ 700MHz$ ) Suitable For USB2.0 High-Speed Routing
- Low Quiescent Current ( $<2\mu A$ ) With Very Wide Supply Range (1.5V ~ 5.5V)

## Applications

- Audio, Video, UART, USB2.0 Signal and Supply Routing
- Cell phones and TWS headset

## Pin Configuration





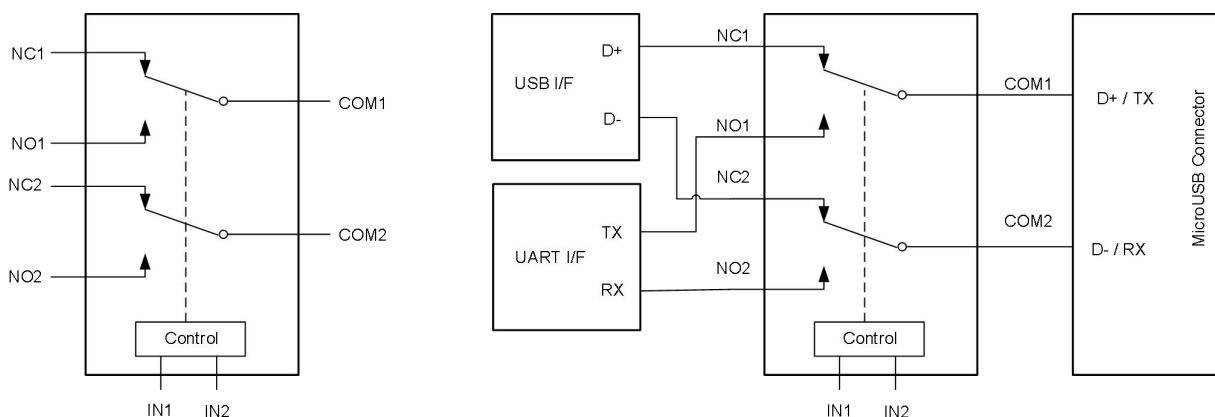
## Functions and Pin Configuration

Pin Number	Symbol	Descriptions
1	VCC	Single Power Supply
2,10	NO <sub>x</sub>	Analog/Digital Signal Ports (Normally open)
3,9	COM <sub>x</sub>	Common Signal Ports
5,7	NC <sub>x</sub>	Analog/Digital Signal Ports (Normally closed)
6	GND	Ground
4,8	IN <sub>x</sub>	Logic Input Control

## Function Descriptions

Logic Input(IN <sub>x</sub> )	Function
0	NC1=COM1 and NC2=COM2
1	NO1=COM1 and NO2=COM2

Note: X= 1 or 2



Typical Application: Configured as USB2.0 Mux

## Absolute Maximum Ratings <sup>(1)</sup>

Parameter	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	-0.3 ~ 6.5	V
Control Input Voltage	V <sub>IN</sub>	-0.3 ~ 6.5	V
Continuous Current Through NO, NC, COM		±100	mA
Peak Current Through NO, NC, COM (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T <sub>STG</sub>	-55 ~ 150	°C
Junction Temperature under Bias	T <sub>J</sub>	150	°C
Lead Temperature (Soldering, 10 seconds)	T <sub>L</sub>	260	°C
Power Dissipation	P <sub>D</sub>	250	mW



### Recommend operating ratings <sup>(2)</sup>

Parameter	Symbol	Value	Unit
Supply Voltage Operating	$V_{CC}$	1.5 ~ 5.5	V
Control Input Voltage	$V_{IN}$	-0.3 ~ 5.5	V
Input Signal Voltage	$V_{COM}$	-0.3 ~ 5.5	V
Operating Temperature	$T_A$	-40 ~ 85	°C
Thermal Resistance	$R_{\theta JA}$	360	°C/W

#### Note:

1. "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.

### DC Electronics Characteristics ( $T_a=25^{\circ}\text{C}$ , $V_{CC}=3.3\text{V}$ , unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	$V_{IH}$	$V_{CC}: 3.3 \sim 5.5\text{V}$	1.6			V
		$V_{CC}: 1.5 \sim 3.3\text{V}$	1.4			V
Input logic low level	$V_{IL}$	$V_{CC}: 3.3 \sim 5.5\text{V}$			0.6	V
		$V_{CC}: 1.5 \sim 3.3\text{V}$			0.4	V
Supply quiescent current	$I_{CC}$	$I_{COM}=0$ , $V_{IN}=0$ or $V_{IN}=V_{CC}$			1.0	uA
Increase in $I_{CC}$ per input	$I_{CCT}$	$I_{COM}=0$ , $V_{CC}=4.5\text{V}$ $V_{IN}>1.8$ or $V_{IN}<0.5$			1.0	uA
Off state leakage from $COM_x$ to $NC_x$ (or $NO_x$ )	$I_{COMx}$	$V_{COM} = 5.5\text{V}$ , $V_{NC(\text{or } NO)} = 0\text{V}$		$\pm 20$	$\pm 40$	nA
On-Resistance	$R_{ON1}$	$V_{COM}=0 \sim 0.5\text{V}$ , $I_{COM}=30\text{mA}$		3.0	3.5	$\Omega$
	$R_{ON2}$	$V_{COM}=0.5 \sim 2.0\text{V}$ , $I_{COM}=30\text{mA}$		3.6	3.9	$\Omega$
	$R_{ON3}$	$V_{COM}=2.0 \sim 4.0\text{V}$ , $I_{COM}=30\text{mA}$		2.5	3.5	$\Omega$
	$R_{ON4}$	$V_{COM}=4.0 \sim 5.5\text{V}$ , $I_{COM}=30\text{mA}$		1.5	1.8	$\Omega$
On-Resistance Flatness	$R_{FLAT1}$	$V_{COM}=0 \sim 0.5\text{V}$ , $I_{COM}=30\text{mA}$		0.7		$\Omega$
	$R_{FLAT2}$	$V_{COM}=0.5 \sim 2.0\text{V}$ , $I_{COM}=30\text{mA}$		0.5		$\Omega$
	$R_{FLAT3}$	$V_{COM}=2.0 \sim 4.0\text{V}$ , $I_{COM}=30\text{mA}$		1.6		$\Omega$
	$R_{FLAT4}$	$V_{COM}=4.0 \sim 5.5\text{V}$ , $I_{COM}=30\text{mA}$		0.3		$\Omega$
On-Resistance Matching Between Channels	$\Delta R_{ON}$	$V_{COM}=0 \sim 5.5\text{V}$ , $I_{COM}=30\text{mA}$ ,		0.1	0.2	$\Omega$



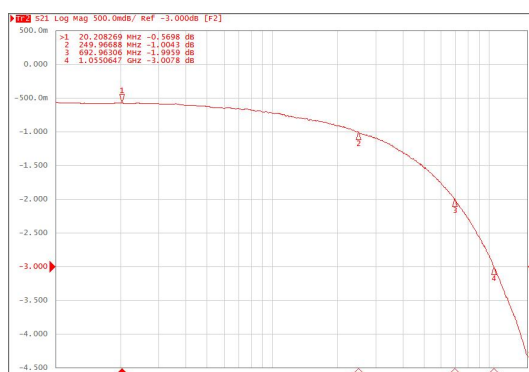
### AC Electronics Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T <sub>ON</sub>	V <sub>COM</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω		200		ns
Turn-Off Time	T <sub>OFF</sub>	V <sub>COM</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω		200		ns
Break-Before-Make time	T <sub>BBM</sub>	V <sub>COM</sub> =1.5V, C <sub>L</sub> =35pF, R <sub>L</sub> =50Ω		500		ns
-3dB Bandwidth	BW	R <sub>L</sub> =50Ω, C <sub>L</sub> =0pF		850		MHz
Off isolation	OIRR	F=1KHz, R <sub>L</sub> =50Ω		-81		dB
		F=10KHz, R <sub>L</sub> =50Ω		-80		dB
Crosstalk	Xtalk	F=1KHz, R <sub>L</sub> =50Ω		-83		dB
		F=10KHz, R <sub>L</sub> =50Ω		-82		dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz		-80		dB
		V <sub>COM</sub> =600mVp-p @R <sub>L</sub> =32Ω,				

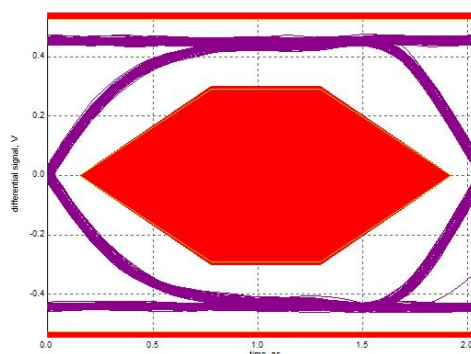
### Capacitance (Ta=25°C, VCC=3.3V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C <sub>OFF</sub>	F=100KHz		5		pF
On capacitance	C <sub>ON</sub>	F=100KHz		7		pF

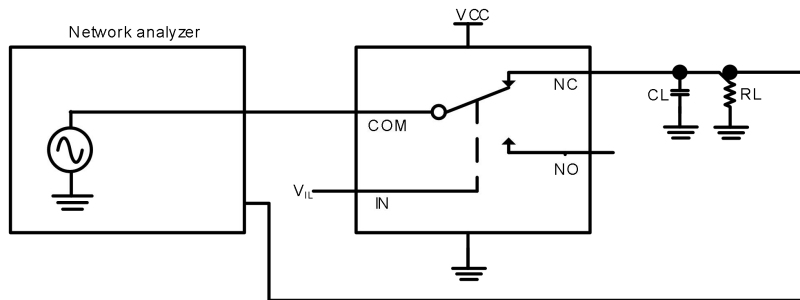
### Typical Characteristics (Ta=25°C, VCC=3.3V, unless otherwise noted)



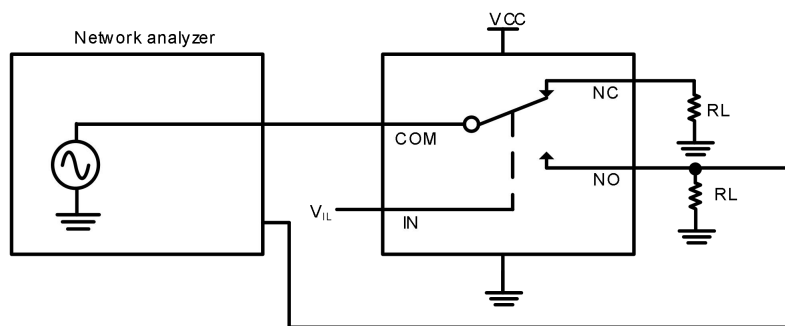
Bandwidth



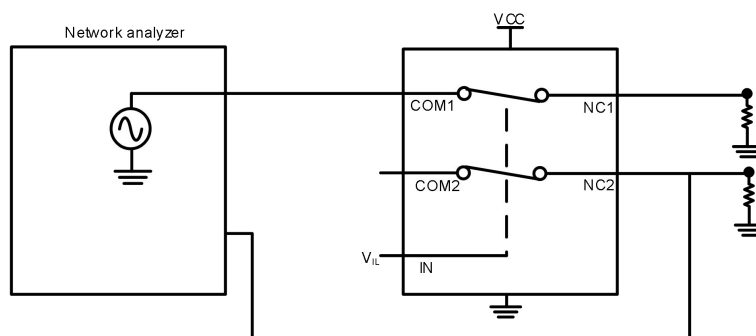
Eye Diagram (480Mbps)



**Bandwidth**



**Off isolation**

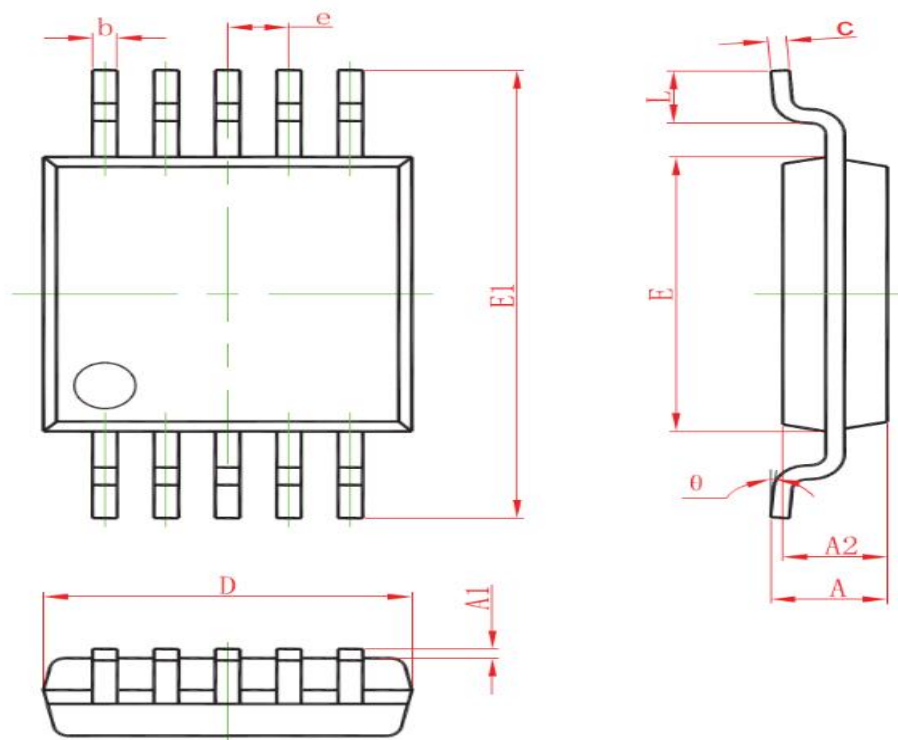


**Crosstalk**



## Package Outline Dimensions

### MSOP-10



Symbol	Dimension in Millimeters	
	Min.	Max.
A	0.820	1.100
A1	0.020	0.150
A2	0.750	0.950
b	0.180	0.280
c	0.090	0.230
D	2.900	3.100
e	0.50(BSC)	
E	2.900	3.100
E1	4.750	5.050
L	0.400	0.800
θ	0°	6°



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