

# Quad 2-channel analog multiplexer / demultiplexer

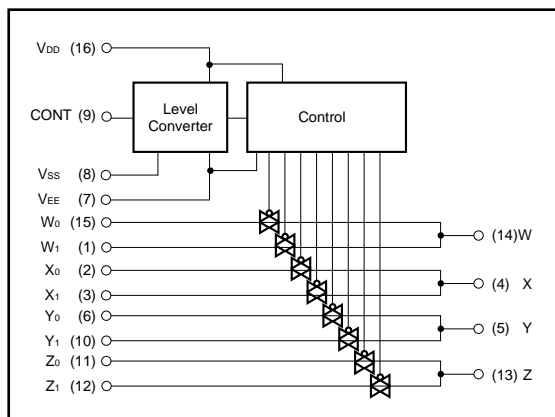
## BU4551B / BU4551BF / BU4551BFV

The BU4551B, BU4551BF, and BU4551BFV are multiplexers / demultiplexers capable of selecting and combining analog signals and digital signals with a configuration of 2 ch  $\times$  4.

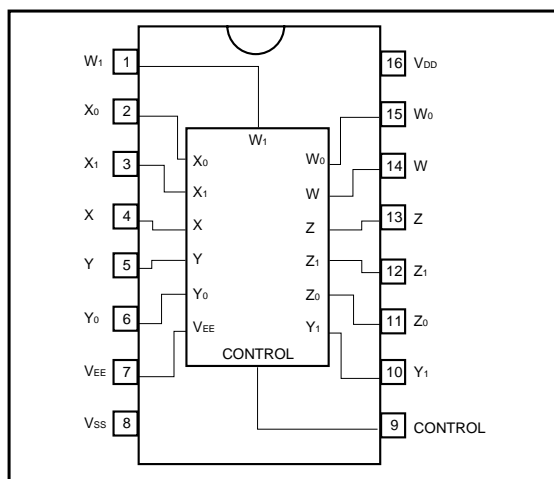
Control signals are used to turn on the switch of the corresponding channel. In addition, even if the logical amplitude ( $V_{DD}-V_{SS}$ ) of the control signal is low, signals with a large amplitude ( $V_{DD}-V_{EE}$ ) can be switched.

In addition, as each switch has a low ON resistance, it can be connected to a low impedance circuit.

### ●Logic circuit diagram



### ●Block diagram



### ●Truth table

CONTROL	ON
0	$W_0$ $X_0$ $Y_0$ $Z_0$
1	$W_1$ $X_1$ $Y_1$ $Z_1$

●Absolute maximum ratings ( $V_{SS} = 0V$ ,  $T_a = 25^\circ C$ )

Parameter	Symbol	Limits	Unit
Power supply voltage 1	$V_{DD} - V_{EE}$	$-0.3 \sim +18$	V
Power supply voltage 2	$V_{DD}$	$-0.3 \sim +18$	V
Power dissipation	$P_d$	1000 (DIP), 500 (SOP), 400 (SSOP)	mW
Operating temperature	$T_{opr}$	$-40 \sim +85$	$^\circ C$
Storage temperature	$T_{stg}$	$-55 \sim +150$	$^\circ C$
Input voltage	$V_{IN}$	$-0.3 \sim V_{DD} + 0.3$	V

●Electrical characteristics

DC characteristics (unless otherwise noted,  $T_a = 25^\circ C$ ,  $V_{EE} = V_{SS} = 0V$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	$V_{DD}$ (V)	Conditions	Measurement circuit
Input high-level voltage	$V_{IH}$	3.5	—	—	V	5	—	Fig.1
		7.0	—	—		10		
		11.0	—	—		15		
Input low-level voltage	$V_{IL}$	—	—	1.5	V	5	—	Fig.1
		—	—	3.0		10		
		—	—	4.0		15		
Input high-level current	$I_{IH}$	—	—	0.3	$\mu A$	15	$V_{IH} = 15V$	Fig.1
Input low-level current	$I_{IL}$	—	—	-0.3	$\mu A$	15	$V_{IL} = 0V$	Fig.1
ON resistance	$R_{ON}$	—	—	1100	$\Omega$	5	$V_{IN} = V_{DD} / 2$	Fig.2
		—	—	500		10		
		—	—	280		15		
ON resistance deflexion	$\Delta R_{ON}$	—	25	—	$\Omega$	5	—	Fig.2
		—	10	—		10		
		—	5	—		15		
OFF-channel leakage current	$I_{OFF}$	—	—	0.3	$\mu A$	15	—	Fig.3
		—	—	-0.3		15		
Static current dissipation	$I_{DD}$	—	—	5	$\mu A$	5	$V_I = V_{DD}$ or GND	—
		—	—	10		10		
		—	—	15		15		

Switching characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ ,  $V_{EE} = V_{SS} = 0\text{V}$ ,  $R_L = 10\text{ k}\Omega$ ,  $C_L = 50\text{pF}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	V <sub>DD</sub> (V)	Conditions	Measurement circuit
Propagation delay time Switch IN→OUT	t <sub>PLH</sub> t <sub>PHL</sub>	—	35	—	ns	5	—	Fig.4
		—	15	—		10		
		—	12	—		15		
Propagation delay time CONT→OUT	t <sub>PZH</sub> t <sub>PHZ</sub>	—	360	—	ns	5	—	Fig.5, 6
		—	160	—		10		
		—	120	—		15		
Propagation delay time CONT→OUT	t <sub>PZL</sub> t <sub>PLZ</sub>	—	360	—	ns	5	—	Fig.5, 6
		—	160	—		10		
		—	120	—		15		
Max. propagation frequency	f <sub>Max.</sub>	—	15	—	MHz	—	$V_{EE} = -5\text{V}^{*1}$	Fig.7
Feedthrough attenuation	FT	—	0.7	—	MHz	—	$V_{EE} = -5\text{V}^{*2}$	Fig.7
Sine wave distortion	D	—	0.02	—	%	—	$V_{EE} = -5\text{V}^{*3}$	Fig.7
Input capacitance (control)	C <sub>C</sub>	—	5	—	pF	—	—	—
Input capacitance (switch)	C <sub>S</sub>	—	10	—	pF	—	—	—

\*1  $V_{IN} = 5\text{V}_{P-P}$  sine wave, frequency that enables  $20 \log_{10} V_{OUT} / V_{IN} = -3\text{dB}$

\*2  $V_{IN} = 5\text{V}_{P-P}$  sine wave, frequency that enables  $20 \log_{10} V_{OUT} / V_{IN} = -50\text{dB}$  at channel off

\*3  $V_{IN} = 5\text{V}_{P-P}$  sine wave

#### ● Measurement circuits

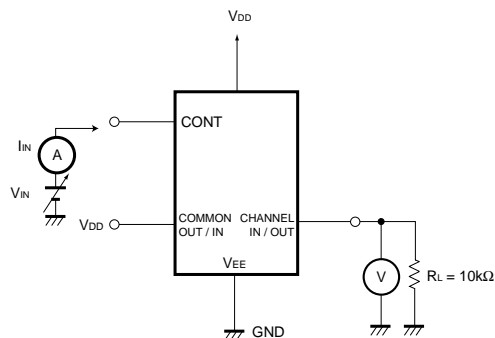


Fig. 1 Input voltage, current

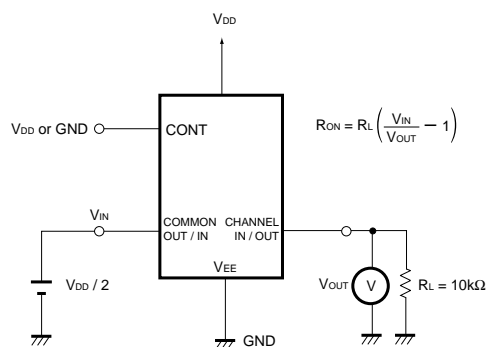


Fig. 2 ON resistance

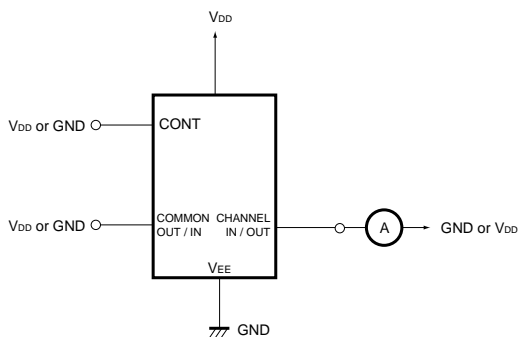


Fig. 3 OFF-channel leakage current

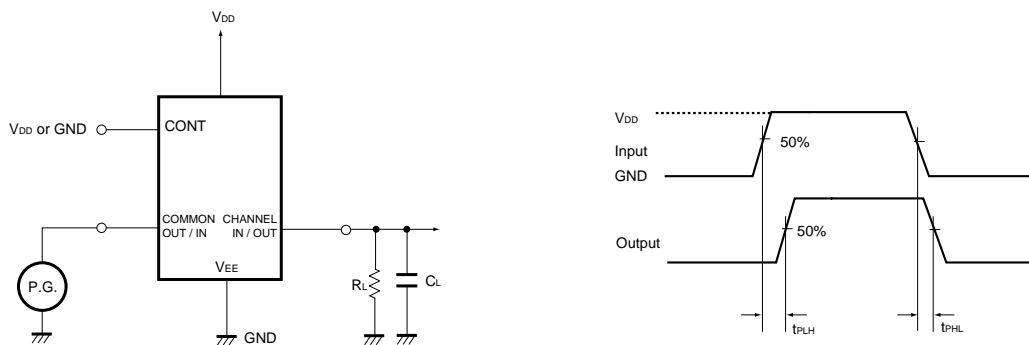


Fig. 4 Propagation delay time (Switch IN to OUT)

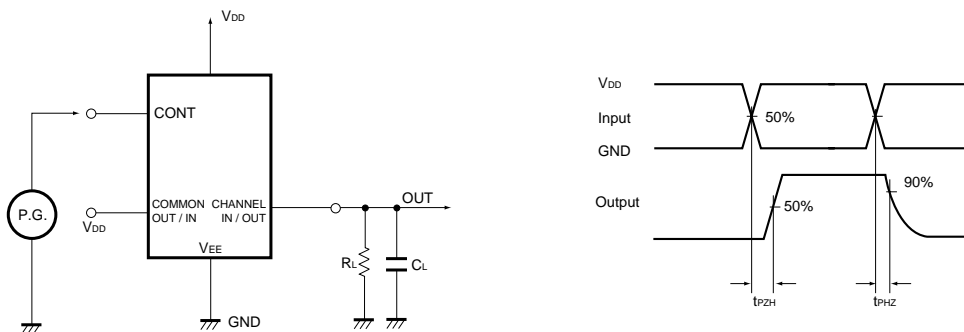


Fig. 5 Propagation delay time (CONT, INH to OUT)

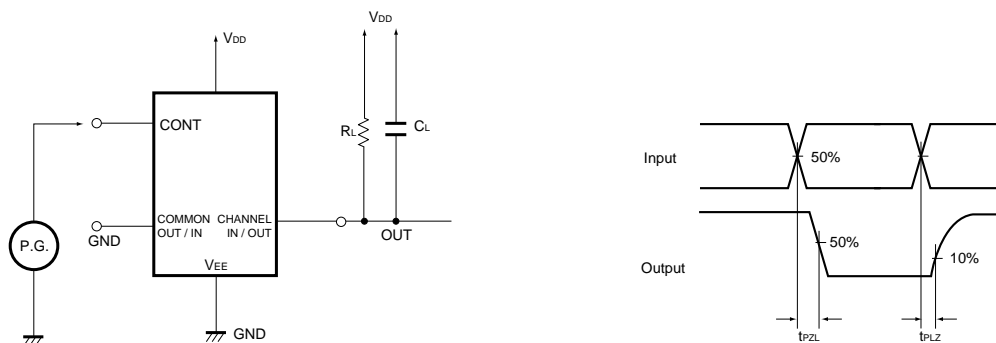


Fig. 6 Propagation delay time (CONT, INH to OUT)

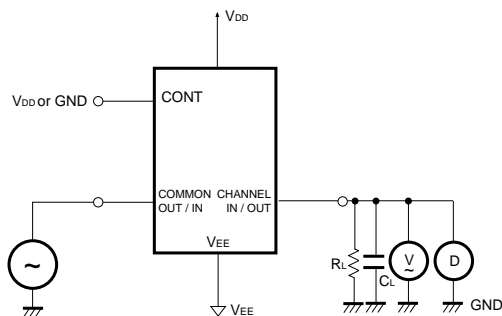


Fig. 7 Maximum propagation frequency, feedthrough attenuation, sine wave distortion

### ●Electrical characteristic curve

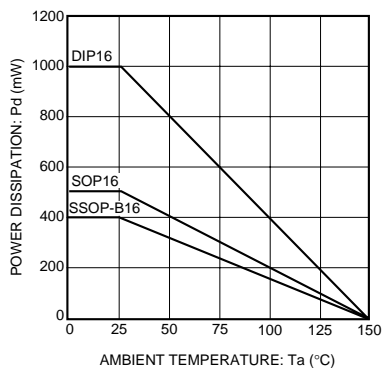
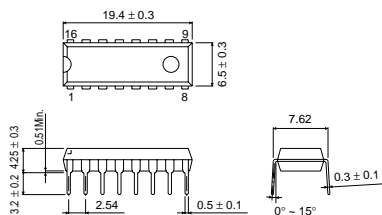


Fig. 8 Power dissipation vs. ambient temperature

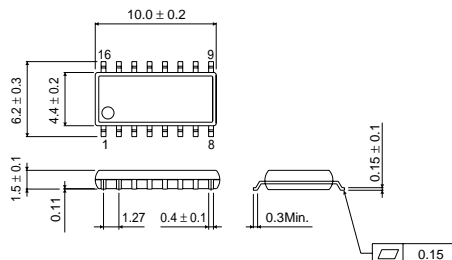
## ● External dimensions (Units: mm)

BU4551B



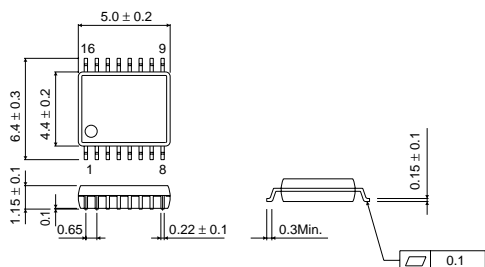
DIP16

BU4551BF



SOP16

BU4551BFV



SSOP-B16

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