

Quad 2-channel analog multiplexer / demultiplexer

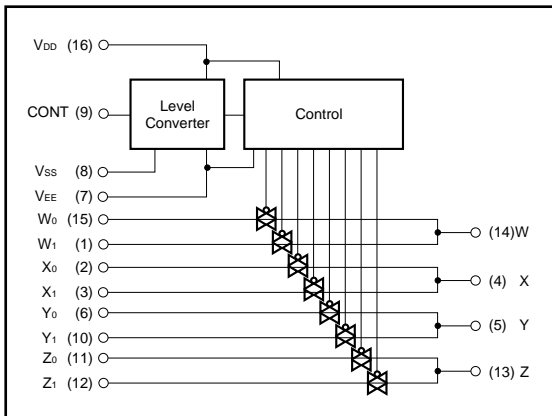
BU4551B / BU4551BF / BU4551BFV

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

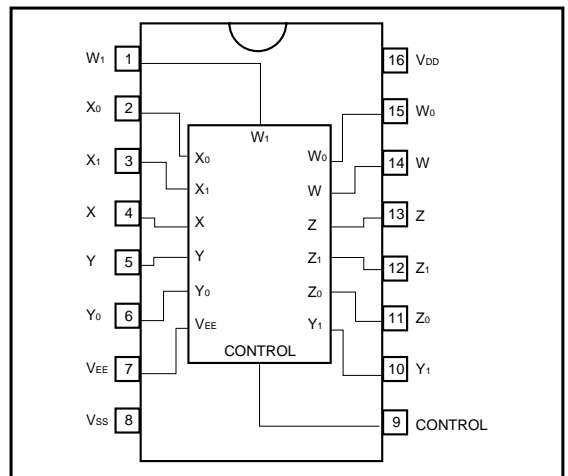
Control signals are used to turn on the switch of the corresponding channel. In addition, even if the logical amplitude ($V_{DD}-V_{SS}$) of the control signal is low, signals with a large amplitude ($V_{DD}-V_{EE}$) can be switched.

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 ~ + 18	V
Power supply voltage 2	V_{DD}	- 0.3 ~ + 18	V
Power dissipation	P_d	1000 (DIP), 500 (SOP), 400 (SSOP)	mW
Operating temperature	T_{opr}	- 40 ~ + 85	$^\circ C$
Storage temperature	T_{stg}	- 55 ~ + 150	$^\circ C$
Input voltage	V_{IN}	- 0.3 ~ $V_{DD} + 0.3$	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	μA	15	$V_{IH} = 15V$	Fig.1
Input low-level current	I_{IL}	—	—	- 0.3	μA	15	$V_{IL} = 0V$	Fig.1
ON resistance	R_{ON}	—	—	1100	Ω	5	$V_{IN} = V_{DD} / 2$	Fig.2
		—	—	500		10		
		—	—	280		15		
ON resistance deflexion	ΔR_{ON}	—	25	—	Ω	5	—	Fig.2
		—	10	—		10		
		—	5	—		15		
OFF-channel leakage current	I_{OFF}	—	—	0.3	μA	15	—	Fig.3
		—	—	- 0.3		15		
Static current dissipation	I_{DD}	—	—	5	μA	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	Conditions		Measurement circuit
						V_{DD} (V)		
Propagation delay time Switch IN→OUT	t_{PLH} t_{PHL}	—	35	—	ns	5	—	Fig.4
		—	15	—		10		
		—	12	—		15		
Propagation delay time CONT→OUT	t_{PZH} t_{PHZ}	—	360	—	ns	5	—	Fig.5, 6
		—	160	—		10		
		—	120	—		15		
Propagation delay time CONT→OUT	t_{PZL} t_{PLZ}	—	360	—	ns	5	—	Fig.5, 6
		—	160	—		10		
		—	120	—		15		
Max. propagation frequency	f_{Max}	—	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_C	—	5	—	pF	—	—	—
Input capacitance (switch)	C_S	—	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

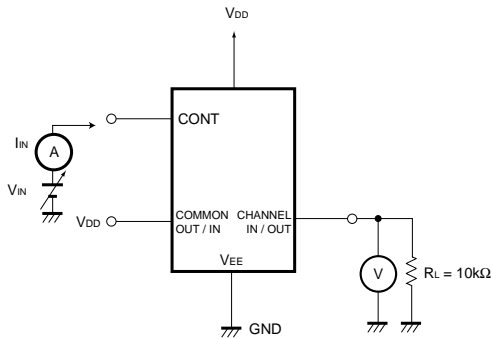


Fig. 1 Input voltage, current

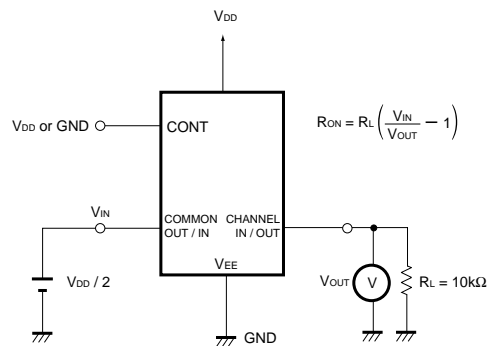


Fig. 2 ON resistance

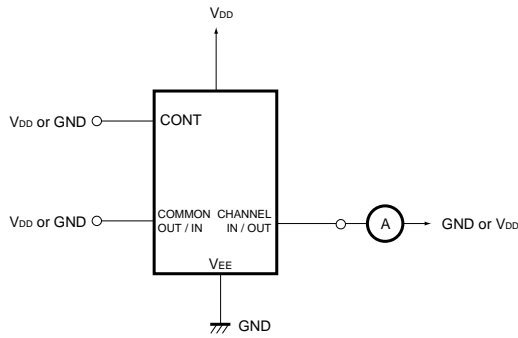


Fig. 3 OFF-channel leakage current

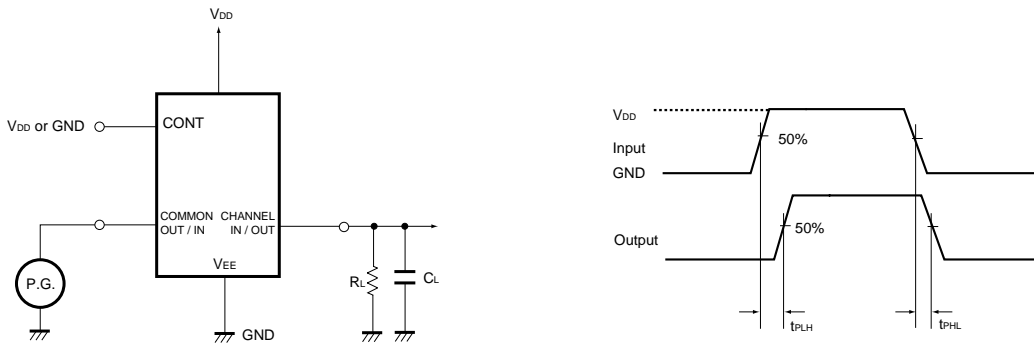


Fig. 4 Propagation delay time (Switch IN to OUT)

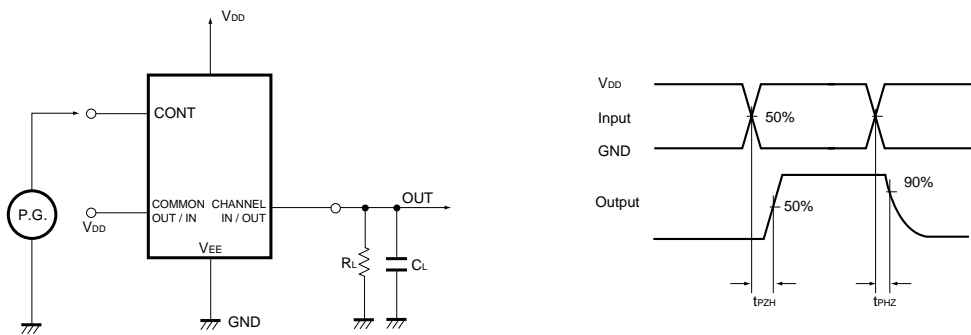


Fig. 5 Propagation delay time (CONT, INH to OUT)

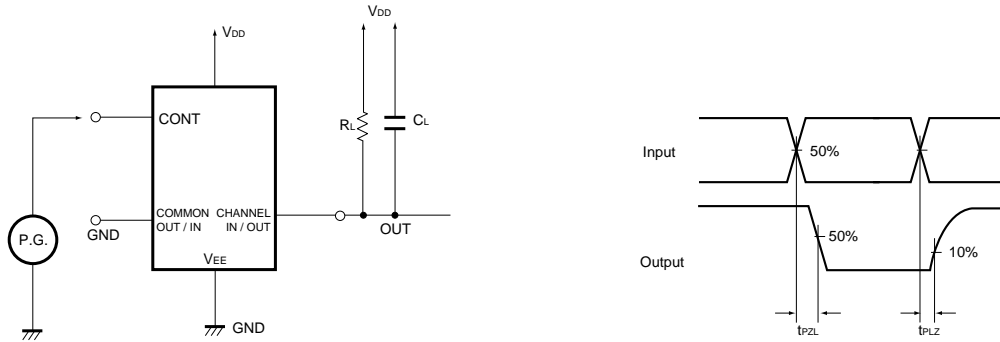


Fig. 6 Propagation delay time (CONT, INH to OUT)

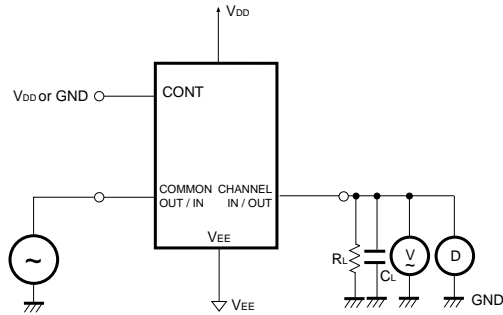


Fig. 7 Maximum propagation frequency, feedthrough attenuation, sine wave distortion

●Electrical characteristic curve

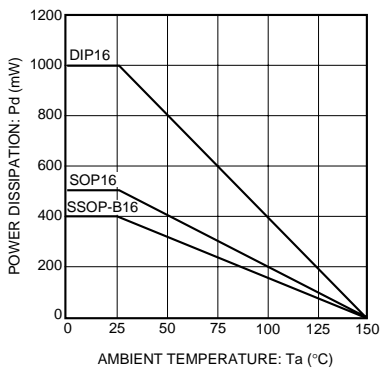


Fig. 8 Power dissipation vs. ambient temperature

●External dimensions (Units: mm)

