

Dual monostable multivibrator

BU4528B / BU4528BF

The BU4528B and BU4528BF are monostable multivibrators with trigger and reset functions that can be activated. Each chip has two built-in circuits.

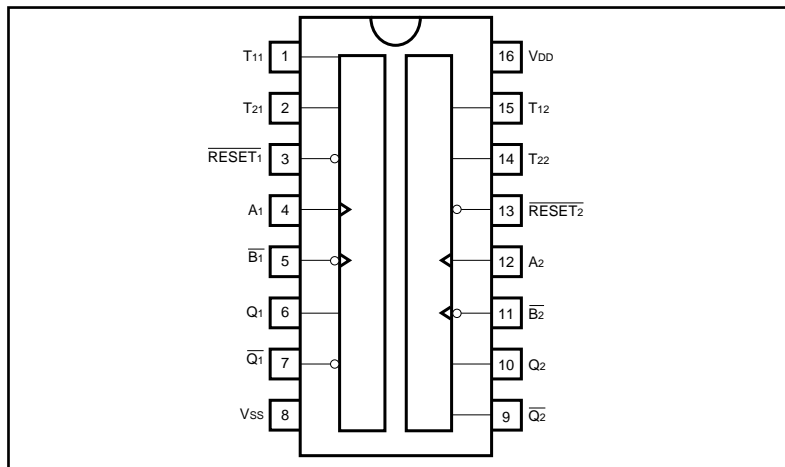
Triggers can initiate both rising and falling in response to Input A and Input B. As the output monostable pulse width is determined by the time constant of the external resistance (R_x) and the capacitor (C_x), a wide range of output pulse widths can be set.

Setting the $\overline{\text{RESET}}$ input to "L" enables external asynchronous resetting and this $\overline{\text{RESET}}$ input can be utilized to reduce the time from the trigger disable input or the power on until the BU4528B and BU4528BF are ready for monostable operation.

●Features

- 1) Low power dissipation.
- 2) Wide range of operating power supply voltages.
- 3) High input impedance.
- 4) High fan-out.
- 5) Direct drive of 2 L-TTL inputs and 1 LS-TTL input.

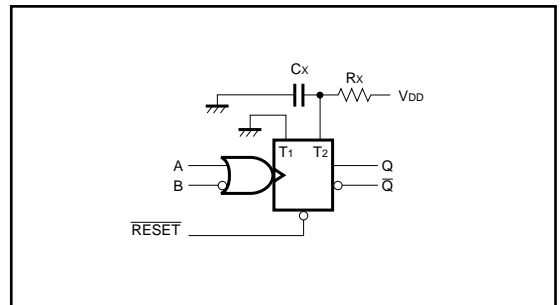
●Block diagram



●Truth table

$\overline{\text{RESET}}$	INPUT		OUTPUT	
	A	B	Q	\overline{Q}
H	\uparrow	H		
H	L	\downarrow		
H	\uparrow \downarrow	L	Not Triggered	
H	H	\uparrow \downarrow	Not Triggered	
H	L, H, \downarrow	H	Not Triggered	
H	L	L, H, \uparrow	Not Triggered	
L	X	X	L	H
\uparrow	X	X	Not Triggered	

●Logic circuit diagram



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

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

●Electrical characteristics

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
						V_{DD} (V)	
Input high level voltage	V_{IH}	3.5	—	—	V	5	—
		7.0	—	—		10	
		11.0	—	—		15	
Input low level voltage	V_{IL}	—	—	1.5	V	5	—
		—	—	3.0		10	
		—	—	4.0		15	
Input high level current	I_{IH}	—	—	0.3	μA	15	$V_{IH} = 15\text{V}$
Input low level current	I_{IL}	—	—	- 0.3	μA	15	$V_{IL} = 0\text{V}$
Output high level voltage	V_{OH}	4.95	—	—	V	5	$I_O = 0\text{mA}$
		9.95	—	—		10	
		14.95	—	—		15	
Output low level voltage	V_{OL}	—	—	0.05	V	5	$I_O = 0\text{mA}$
		—	—	0.05		10	
		—	—	0.05		15	
Output high level current	I_{OH}	- 0.16	—	—	mA	5	$V_{OH} = 4.6\text{V}$
		- 0.4	—	—		10	$V_{OH} = 9.5\text{V}$
		- 1.2	—	—		15	$V_{OH} = 13.5\text{V}$
Output low level current	I_{OL}	0.44	—	—	mA	5	$V_{OL} = 0.4\text{V}$
		1.1	—	—		10	$V_{OL} = 0.5\text{V}$
		3.0	—	—		15	$V_{OL} = 1.5\text{V}$
Static current dissipation	I_{DD}	—	—	20	μA	5	$V_I = V_{DD}$ or GND
		—	—	40		10	
		—	—	80		15	

Switching characteristics (Ta = 25°C, CL = 50pF, VSS = 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	VDD (V)	Conditions
Output rise time	t _{TLH}	—	100	—	ns	5	—
		—	50	—	ns	10	
		—	40	—	ns	15	
Output fall time	t _{THL}	—	100	—	ns	5	—
		—	50	—	ns	10	
		—	40	—	ns	15	
Propagation delay time, A or B to Q or \bar{Q}	t _{PLH} t _{PHL}	—	325	—	ns	5	Cx = 15pF, Rx = 5kΩ
		—	120	—	ns	10	
		—	90	—	ns	15	
Propagation delay time, A or B to Q or \bar{Q}	t _{PLH} t _{PHL}	—	705	—	ns	5	Cx = 1000pF, Rx = 10kΩ
		—	290	—	ns	10	
		—	210	—	ns	15	
Propagation delay, Reset to Q or \bar{Q}	t _{PLH} t _{PHL}	—	325	—	ns	5	Cx = 15pF, Rx = 5kΩ
		—	90	—	ns	10	
		—	60	—	ns	15	
		—	1000	—	ns	5	Cx = 1000pF, Rx = 10kΩ
		—	300	—	ns	10	
		—	250	—	ns	15	
Minimum input pulse width	t _{WIN}	—	70	—	ns	5	Cx = 1000pF, Rx = 10kΩ Cx = 15pF, Rx = 5kΩ
		—	30	—	ns	10	
		—	30	—	ns	15	
Output pulse width	t _{WOUT1}	—	550	—	ns	5	Cx = 15pF, Rx = 5kΩ
		—	350	—	ns	10	
		—	300	—	ns	15	
Output pulse width	t _{WOUT2}	25	40	55	μs	5	Cx = 1000pF, Rx = 10kΩ
		10	50	90	μs	10	
		15	55	95	μs	15	
Minimum trigger time	t _{tr}	—	0	—	ns	5	Cx = 1000pF, Rx = 10kΩ Cx = 15pF, Rx = 5kΩ
		—	0	—	ns	10	
		—	0	—	ns	15	
Input capacitance	C _{IN}	—	5	—	pF	—	—

● Measurement circuits

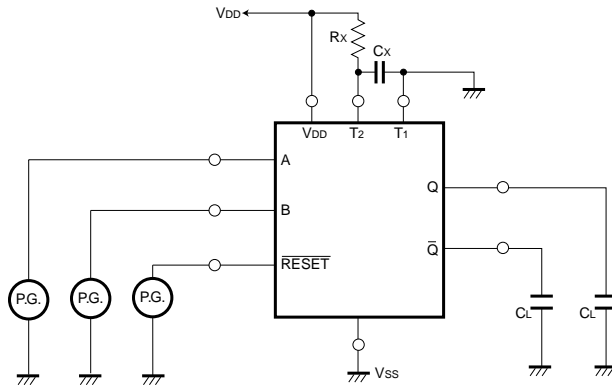


Fig. 1 Switching time measurement circuit

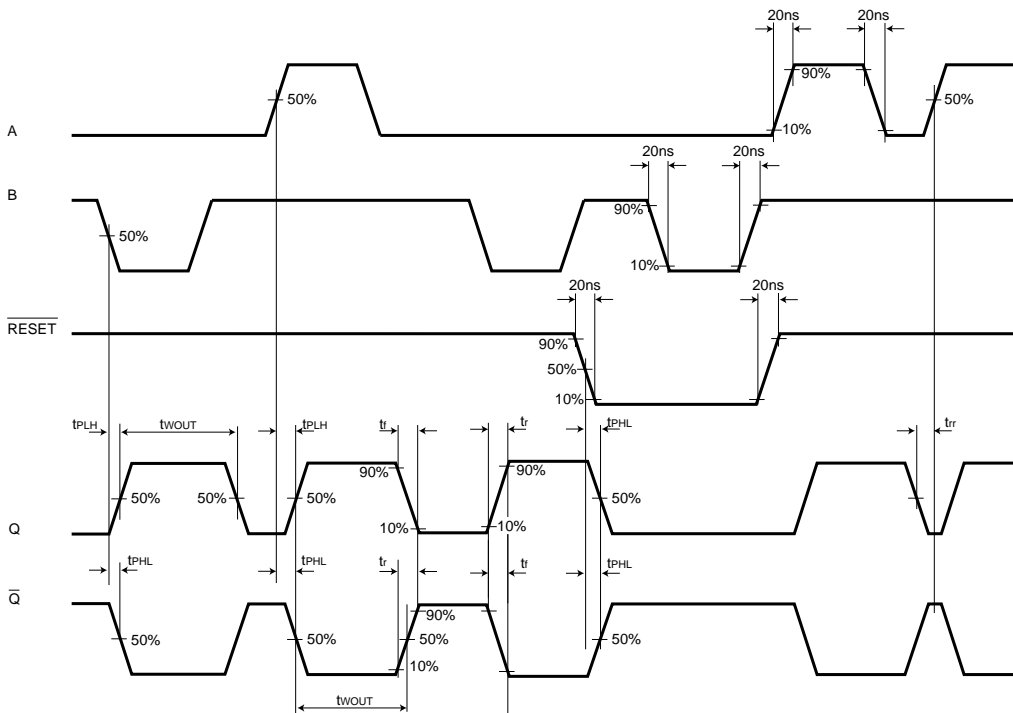


Fig. 2 Switching time waveform

●Timing chart

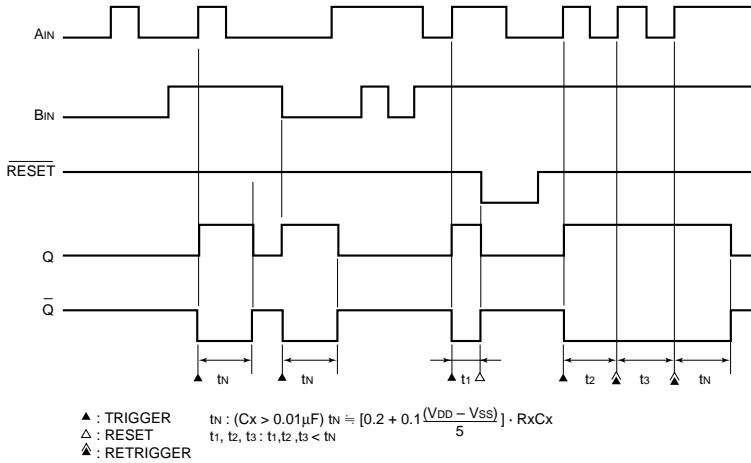


Fig. 3

●Electrical characteristic curve

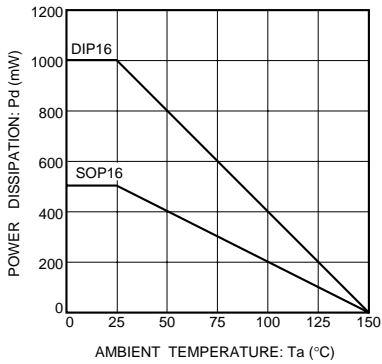
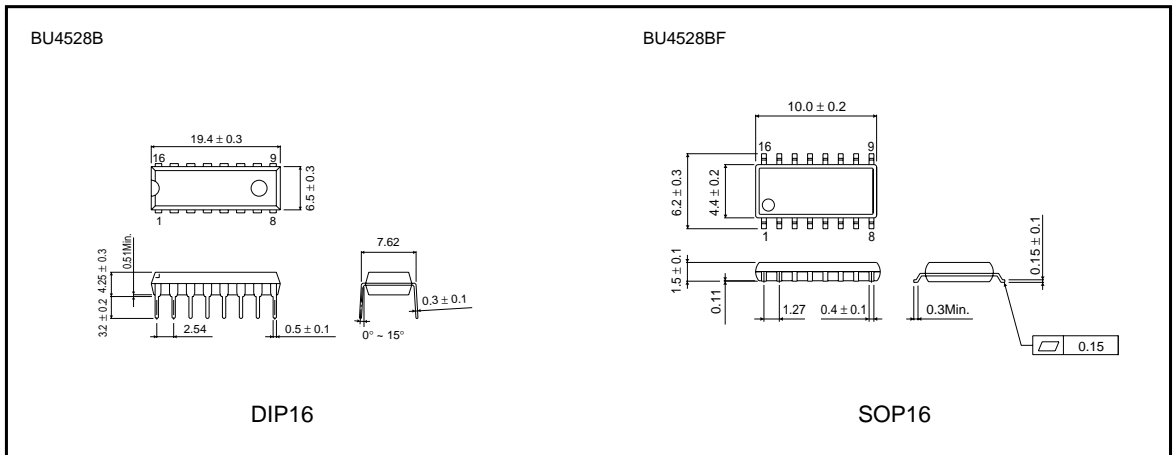


Fig. 4 Power dissipation vs. Ta

●External dimensions (Units: mm)



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