

# 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.

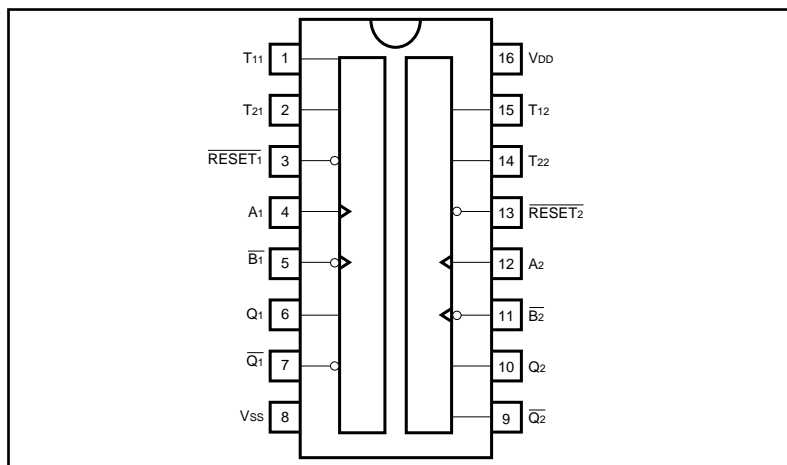
Triggers can initiate both rising and falling in response to Input A and Input B. As the output monostable pulse width is determined by the time constant of the external resistance ( $R_x$ ) and the capacitor ( $C_x$ ), a wide range of output pulse widths can be set.

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.

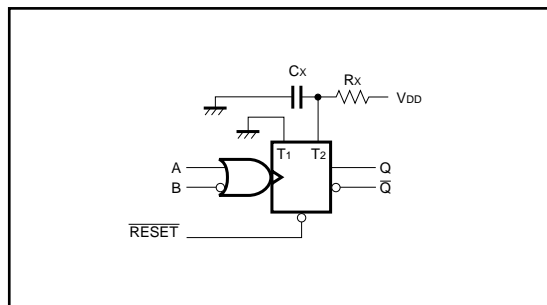
### ●Block diagram



### ●Truth table

INPUT			OUTPUT	
$\overline{\text{RESET}}$	A	B	Q	$\overline{Q}$
H		H		
H	L			
H		L	Not Triggered	
H	H		Not Triggered	
H	L, H,	H	Not Triggered	
H	L	L, H,	Not Triggered	
L	X	X	L	H
	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	$V_{DD}$	$-0.3 \sim +18$	V
Power dissipation	$P_d$	1000 (DIP), 500 (SOP)	mW
Operating temperature	$T_{opr}$	$-40 \sim +85$	$^\circ\text{C}$
Storage temperature	$T_{stg}$	$-55 \sim +150$	$^\circ\text{C}$
Input voltage	$V_{IN}$	$-0.3 \sim V_{DD} + 0.3$	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	$V_{DD}$ (V)	Conditions
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	$\mu\text{A}$	15	$V_{IH} = 15\text{V}$
Input low level current	$I_{IL}$	—	—	-0.3	$\mu\text{A}$	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	$\mu\text{A}$	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 <sub>TLH</sub>	—	100	—	ns	5	—
		—	50	—	ns	10	
		—	40	—	ns	15	
Output fall time	t <sub>THL</sub>	—	100	—	ns	5	—
		—	50	—	ns	10	
		—	40	—	ns	15	
Propagation delay time, A or B to Q or $\bar{Q}$	t <sub>PLH</sub> t <sub>PHL</sub>	—	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 <sub>PLH</sub> t <sub>PHL</sub>	—	705	—	ns	5	Cx = 1000pF, Rx = 10kΩ
		—	290	—	ns	10	
		—	210	—	ns	15	
Propagation delay, Reset to Q or $\bar{Q}$	t <sub>PLH</sub> t <sub>PHL</sub>	—	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 <sub>WIN</sub>	—	70	—	ns	5	Cx = 1000pF, Rx = 10kΩ Cx = 15pF, Rx = 5kΩ
		—	30	—	ns	10	
		—	30	—	ns	15	
Output pulse width	t <sub>WOUT1</sub>	—	550	—	ns	5	Cx = 15pF, Rx = 5kΩ
		—	350	—	ns	10	
		—	300	—	ns	15	
Output pulse width	t <sub>WOUT2</sub>	25	40	55	μs	5	Cx = 1000pF, Rx = 10kΩ
		10	50	90	μs	10	
		15	55	95	μs	15	
Minimum trigger time	t <sub>tr</sub>	—	0	—	ns	5	Cx = 1000pF, Rx = 10kΩ Cx = 15pF, Rx = 5kΩ
		—	0	—	ns	10	
		—	0	—	ns	15	
Input capacitance	C <sub>IN</sub>	—	5	—	pF	—	—

## ● Measurement circuits

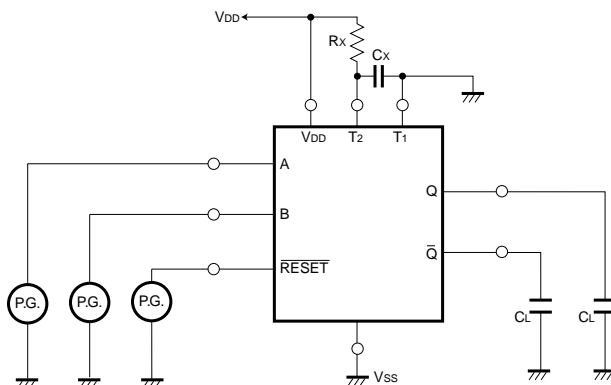


Fig. 1 Switching time measurement circuit

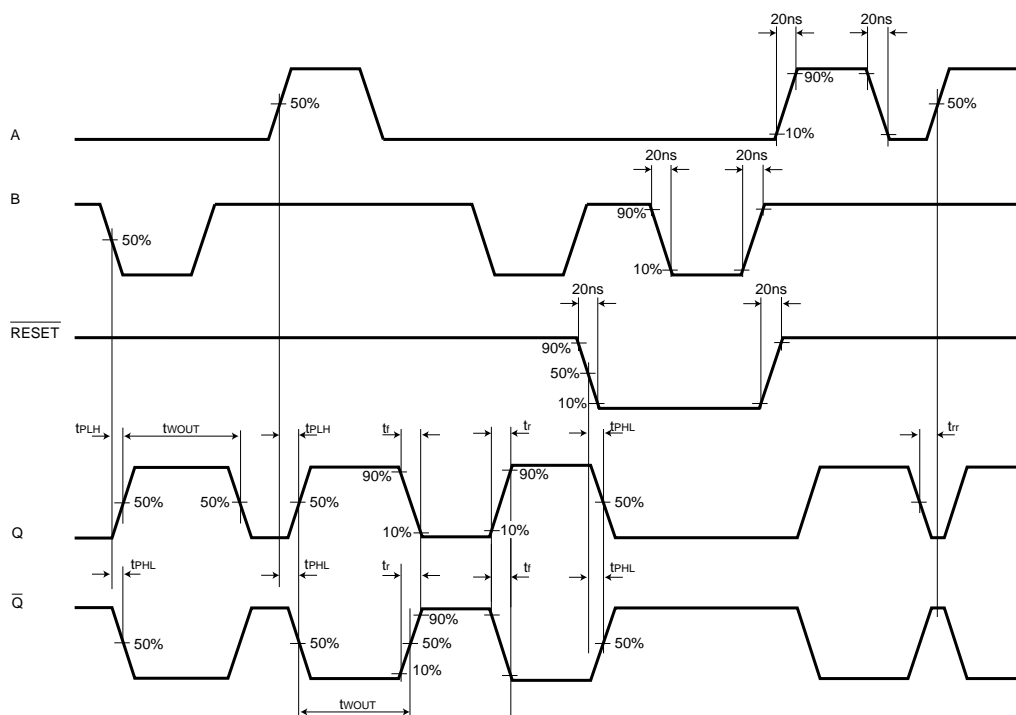


Fig. 2 Switching time waveform

## ●Timing chart

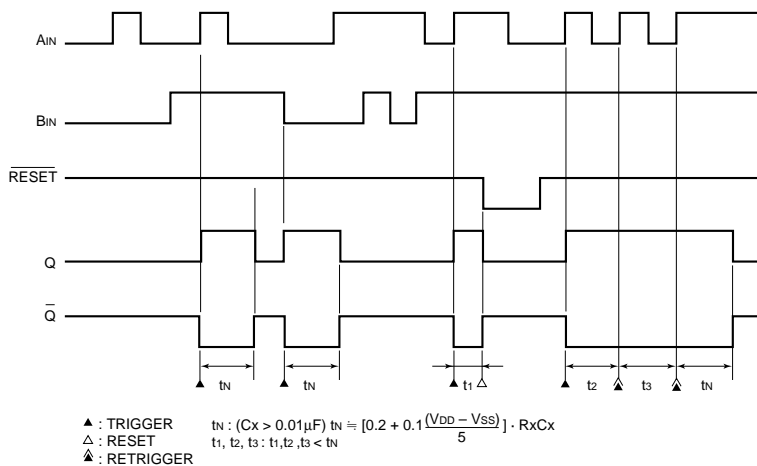
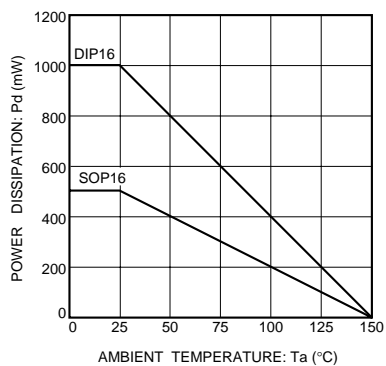


Fig. 3

## ●Electrical characteristic curve

Fig. 4 Power dissipation vs.  $T_a$ 

## ●External dimensions (Units: mm)

