MN4528B/MN4528BS

Dual Monostable Multivibrators

■ Description

The MN4528B/S are retriggerable, resettable monostable multivibrators and have 2 circuits in a package. The monostable pulse over a wide range of widths is determined by the external resistance and capacitance.

A negative going edge of the $\overline{I_0}$ input when I_1 is Low or a positive going edge of the I_1 input when $\overline{I_0}$ is High produces a positive pulse at the O output and a negative pulse at the O output if the $\overline{C_D}$ input is High.

A Low at the $\overline{C_D}$ input forces the O output Low and the $\overline{O}$ output High.

The MN4528B/S are equivalent to MOTOROLA MC14528B.

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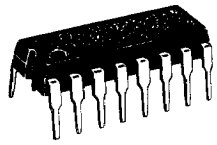

16-Pin • Plastic DIL Package

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16-Pin • Panaflat Package (SO-16D)

Pin Explanation

$\overline{I}_{0A}$, $\overline{I}_{0B}$: Input (⌝)

I_{1A}, I_{1B} : Input (⌜)

$\overline{C}_{DA}$, $\overline{C}_{DB}$: Direct Clear Input

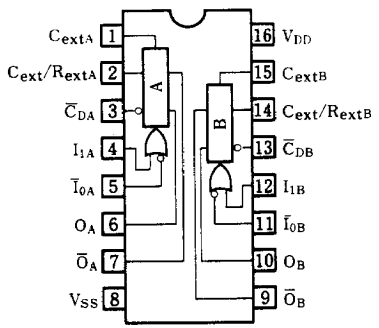
$Cext_A$, $Cext_B$: External capacitance connection

$Cext/Rext_A$, $Cext/Rext_B$: External capacitance, External resistance

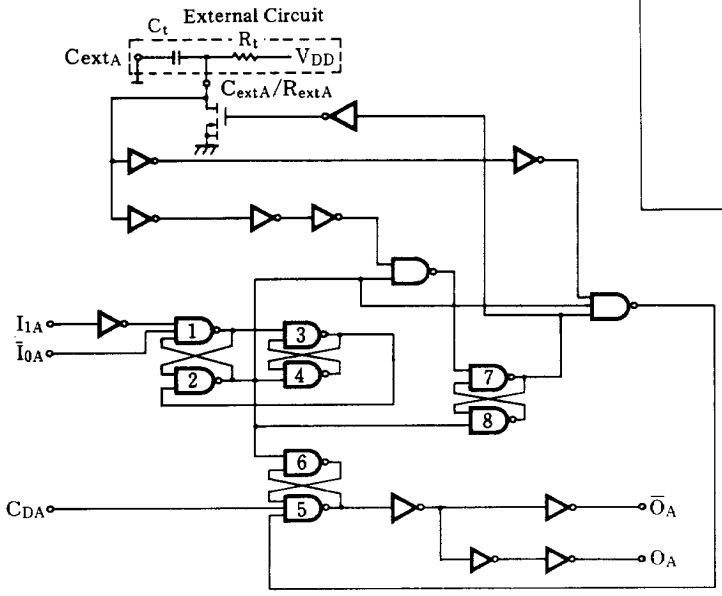
O_A, O_B : Positive output

$\overline{O}_A$, $\overline{O}_B$: Negative output

Pin Configuration



■ Logic Diagram (1/2)



■ Truth Table

Input			Output		Mode
I_1	I_0	$\overline{C_D}$	O	$\overline{O}$	
↑	H	H	⊓	⊔	output pulse
↑	L	H	L	H	inhibit
H	↓	H	L	H	
L	↓	H	⊓	⊔	output pulse
×	×	L	L	H	inhibit

Note) × : don't care

■ Maximum Ratings (Ta=25℃)

Item		Symbol	Ratings	Unit
Supply Voltage		V_{DD}	−0.5～+18	V
Input Voltage		V_I	−0.5～V_{DD}+0.5*	V
Output Voltage		V_O	−0.5～V_{DD}+0.5*	V
Peak Input · Output Current		$\pm I_I$	max. 10	mA
Power Dissipation (per package)	Ta=−40～+60℃	P_D	max. 400	mW
	Ta=+60～+85℃		Decrease up to 200mW rating at 8mW/°C	
Power Dissipation (per output terminal)		P_D	max. 100	mW
Operating Ambient Temperature		Topr	−40～+85	℃
Storage Temperature		Tstg	−65～+150	℃

* V_{DD} + 0.5V should be under 18V

■ DC Characteristics (V_{SS}=0V)

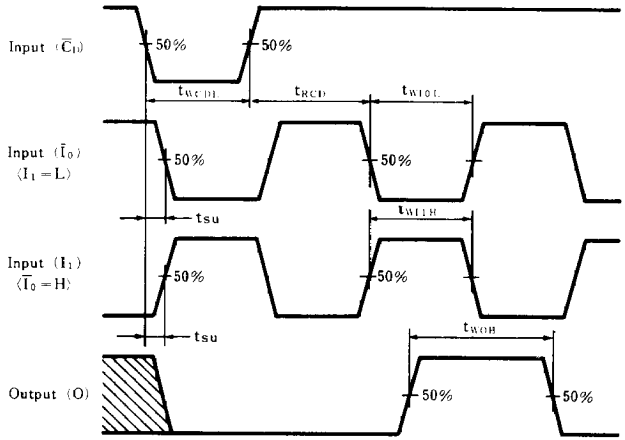
Item	V_{DD} (V)	Symbol	Conditions		Ta=−40℃ min.	Ta=−40℃ max.	Ta=25℃ min.	Ta=25℃ max.	Ta=85℃ min.	Ta=85℃ max.	Unit
Quiescent Power Supply Current	5	I_{DD}	V_I=V_{SS} or V_{DD}		—	20	—	20	—	150	μA
	10				—	40	—	40	—	300	
	15				—	80	—	80	—	600	
Output Voltage Low Level	5	V_{OL}	V_I=V_{SS} or V_{DD}		—	0.05	—	0.05	—	0.05	V
	10		$\|I_O\|$<1μA		—	0.05	—	0.05	—	0.05	
	15				—	0.05	—	0.05	—	0.05	
Output Voltage High Level	5	V_{OH}	V_I=V_{SS} or V_{DD}		4.95	—	4.95	—	4.95	—	V
	10		$\|I_O\|$<1μA		9.95	—	9.95	—	9.95	—	
	15				14.95	—	14.95	—	14.95	—	
Input Voltage Low Level	5	V_{IL}	$\|I_O\|$<1μA	V_O=0.5V or 4.5V	—	1.5	—	1.5	—	1.5	V
	10			V_O=1V or 9V	—	3	—	3	—	3	
	15			V_O=1.5V or 13.5V	—	4	—	4	—	4	
Input Voltage High Level	5	V_{IH}	$\|I_O\|$<1μA	V_O=0.5V or 4.5V	3.5	—	3.5	—	3.5	—	V
	10			V_O=1V or 9V	7	—	7	—	7	—	
	15			V_O=1.5V or 13.5V	11	—	11	—	11	—	
Output Current Low Level	5	I_{OL}	V_O=0.4V, V_I=0 or 5V		0.52	—	0.44	—	0.36	—	mA
	10		V_O=0.5V, V_I=0 or 10V		1.3	—	1.1	—	0.9	—	
	15		V_O=1.5V, V_I=0 or 15V		3.6	—	3	—	2.4	—	
Output Current High Level	5	$-I_{OH}$	V_O=4.6V, V_I=0 or 5V		0.52	—	0.44	—	0.36	—	mA
	10		V_O=9.5V, V_I=0 or 10V		1.3	—	1.1	—	0.9	—	
	15		V_O=13.5V, V_I=0 or 15V		3.6	—	3	—	2.4	—	
Output Current High Level	5	$-I_{OH}$	V_O=2.5V, V_I=0 or 5V		1.7	—	1.4	—	1.1	—	mA
Input Leakage Current	15	$\pm I_I$	V_I=0 or 15V		—	0.3	—	0.3	—	1	μA

■ **Switching Characteristics** ($Ta=25℃$, $V_{SS}=0V$, $C_L=50pF$)

Item	V_{DD} (V)	Symbol	min.	typ.	max.	Unit
Output Rise Time	5	t_{TLH}	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Output Fall Time	5	t_{THL}	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Propagation Delay Time I_0, $I_1 \rightarrow O$	5	t_{PLH}	—	155	465	ns
	10		—	60	180	
	15		—	40	120	
Propagation Delay Time I_0, $I_1 \rightarrow \overline{O}$	5	t_{PHL}	—	140	420	ns
	10		—	50	150	
	15		—	35	105	
Propagation Delay Time $C_D \rightarrow O$	5	t_{PHL}	—	105	315	ns
	10		—	40	120	
	15		—	30	90	
Propagation Delay Time $C_D \rightarrow \overline{O}$	5	t_{PLH}	—	120	360	ns
	10		—	50	150	
	15		—	35	105	
Minimum Pulse Width I_0	5	t_{WI0L}	—	25	75	ns
	10		—	15	45	
	15		—	10	30	
Minimum Pulse Width I_1	5	t_{WI1L}	—	25	75	ns
	10		—	15	45	
	15		—	10	30	
Minimum Pulse Width C_D	5	t_{WCDL}	—	30	90	ns
	10		—	15	45	
	15		—	10	30	
Output Pulse Width (Rt= 5 kΩ, Ct=15pF)	5	t_{WOH}	—	235	—	ns
	10		—	155	—	
	15		—	140	—	
Output Pulse Width (Rt=10kΩ, Ct=1000pF)	5	t_{WOH}	—	5.45	—	μs
	10		—	4.95	—	
	15		—	4.85	—	
Input Capacitance		C_I	—	—	7.5	pF
External Timing Resistance		Rt	5	—	1000	kΩ
External Timing Capacitance (Note)		Ct	—	—	10	μF

(Note) It is recommended to use the silicon diode (cathode toward V_{DD}) in parallel with R_t when C_t is large capacity (ranging from 0.1μF to 10μF).

• Dynamic Signal Waveforms



Waveforms showing minimum $\overline{I}_0$, I_1 and O pulse widths, set-up and recovery times; set-up and recovery times are shown as positive values but may be specified as negative values.