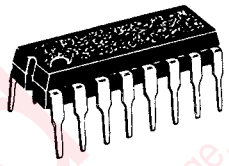
MN4528B/MN4528BS

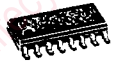
Dual Monostable Multivibrator

P-3



16-pin plastic DIL package

P-4



16-pin PANAFLAT package (SO-16D)

■ Outline

The MN4528B/S is a monostable multivibrator having two builtin circuits in one chip, and has a retrigger function and a reset function.

The monostable output pulse width is decided by the time constants of the external resistor Rt and the external condenser Ct, and the range of the output pulse width which can set is wide enough.

When the level of the $\overline{C}_D$ input is "H" and the level of the I_1 is "L", the positive positive pulse is obtainable on the output (O) at the fall of the $\overline{I}_0$ input, and when the level of the C_D input is "H" and the level of the $\overline{I}_0$ input is "H", the negative pulse is obtainable on the output ($\overline{O}$) at the rise of the I_1 input.

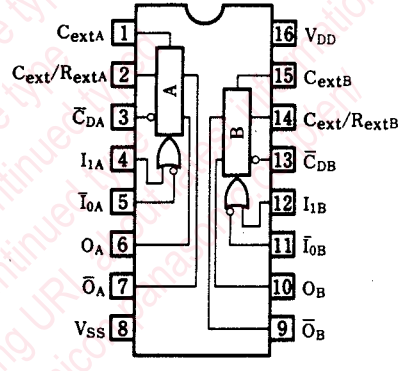
When the level of the $\overline{C}_D$ input is "L", the level of the output (O) is kept to "L" and the level of the output ($\overline{O}$) is kept to "H".

This dual monostable multivibrator is equivalent to Motorola's MC14528B.

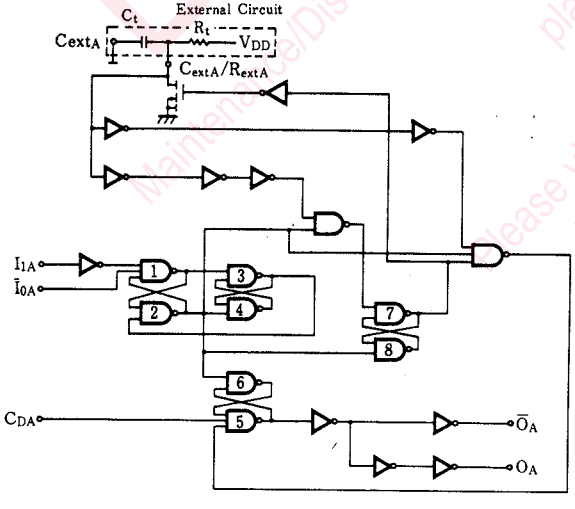
Pin description

$\overline{I}_{0A}$, $\overline{I}_{0B}$: Negative input (⌝)
I_{1A}, I_{1B} : Positive input (⌜)
$\overline{C}_{DA}$, $\overline{C}_{DB}$: Clear input
$Cext_A$ $Cext_B$: External capacitor connecting
$Cext/Rest_A$, $Cext/Rext_B$: Resistance connection
O_A, O_B : Positive output
$\overline{O}_A$, $\overline{O}_B$: Negative output

Pin Configuration



■ Logic Diagram



■ Truth Table

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

Note) ×: don't care

■ Absolute Maximum Ratings (Ta=25°C)

Item		Symbol	Rating	Unit
Supply voltage		V_{DD}	−0.5~+18	V
Input voltage		V_I	−0.5~V_{DD}+0.5*	V
Output pin voltage		V_O	−0.5~V_{DD}+0.5*	V
Peak input · output pin current		$\pm I_I$	max. 10	mA
Power dissipation (per package)	Ta=−40~+60°C	P_D	max. 400	mW
	Ta=+60~+80°C		Decrease to 200mW at the rate of 8mW/°C	
Power dissipation (per output pin)		P_D	max. 100	mW
Operating ambient temperature		T_{opr}	−40~+85	°C
Storage temperature		T_{stg}	−65~+150	°C

* V_{DD}+0.5V should be lower than 18V.

■ DC Characteristics (V_{SS}=0V)

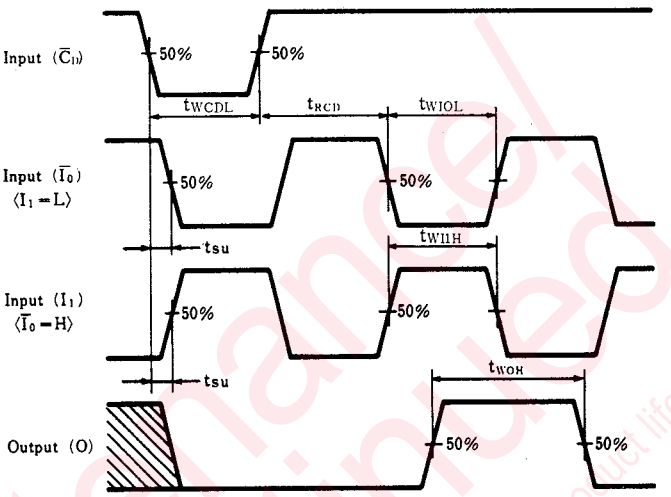
Item	V_{DD} (V)	Symbol	Condition		Ta=−40°C min.	Ta=−40°C max.	Ta=25°C min.	Ta=25°C max.	Ta=85°C min.	Ta=85°C max.	Unit
Static supply current	5	I_{DD}	V_I=V_{SS} or V_{DD}		—	20	—	20	—	150	μA
	10				—	40	—	40	—	300	
	15				—	80	—	80	—	600	
Output voltage low level	5	V_{OL}	V_I=V_{SS} or V_{DD}, $\lvert I_O\rvert$<1μA		—	0.05	—	0.05	—	0.05	V
	10				—	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}, $\lvert I_O\rvert$<1μA		4.95	—	4.95	—	4.95	—	V
	10				9.95	—	9.95	—	9.95	—	
	15				14.95	—	14.95	—	14.95	—	
Input voltage low level	5	V_{IL}	$\lvert I_O\rvert$<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}	$\lvert I_O\rvert$<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°C, 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 time I_0, I_1→O	5	t_{PLH}	—	155	465	ns
	10		—	60	180	
	15		—	40	120	
Propagation time I_0, I_1→$\overline{O}$	5	t_{PHL}	—	140	420	ns
	10		—	50	150	
	15		—	35	105	
Propagation time C_D→O	5	t_{PHL}	—	105	315	ns
	10		—	40	120	
	15		—	30	90	
Propagation time C_D→$\overline{O}$	5	t_{PLH}	—	120	360	ns
	10		—	50	150	
	15		—	35	105	
Minimum pulse width I_0	5	t_{W10L}	—	25	75	ns
	10		—	15	45	
	15		—	10	30	
Minimum pulse width I_1	5	t_{W11L}	—	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 (R_t=5kΩ, C_t=15pF)	5	t_{WOH}	—	235	—	ns
	10		—	155	—	
	15		—	140	—	
Output pulse width (R_t=10kΩ, C_t=1000pF)	5	t_{WOH}	—	5.45	—	μs
	10		—	4.95	—	
	15		—	4.85	—	
Input capacitance		C_I	—	—	7.5	pF
External timing resistance		R_t	5	—	1000	kΩ
External timing capacitance (Note)		C_t	—	—	10	μF

Note) When Ct is big capacitance as 0.1 – 10μF, add silicon diode (cathode side to V_{DD}) in parallel to Rt and use.

- Switching 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.

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