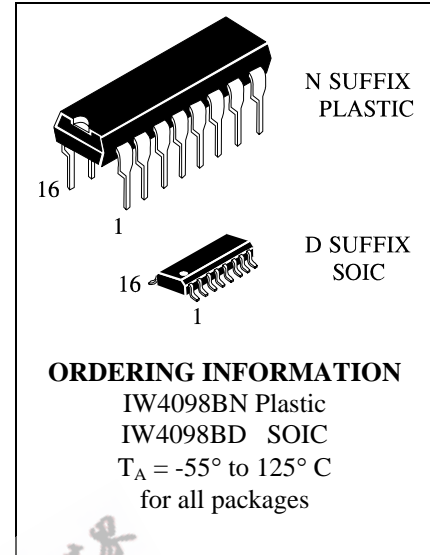


Two Multivibrators (flip-flop) High-Voltage Silicon-Gate CMOS

IW4098B

The IW4098B was especially designed for high-performance computing machinery with low power consumption, portable measuring equipment, communication systems with power supply from phone network, devices with power supply from solar battery, thermocouple etc.

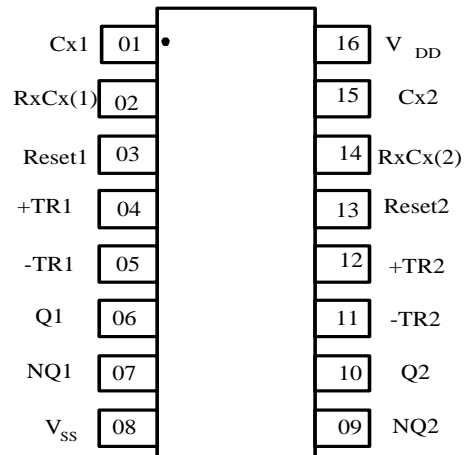
- Standard symmetric output features
- Wide range of supply voltage 3.0 to 18 V.
- 100%-control of DC characteristics at supply voltage 20V
- Maximum input current of 1 μ A at 18 V over full package-temperature range; 100 nA at 18 V and 25°C
- Noise margin (over full package temperature range):
1.0 V min @ 5.0 V supply
2.0 V min @ 10.0 V supply
2.5 V min @ 15.0 V supply



Pin description

Pin number	Symbol	Description
01	Cx1	For capacitor connection
02	RxCx(1)	For resistor & capacitor connection
03	RES1	Reset
04	+TR1	Data input
05	-TR1	Data input
06	Q1	Data output
07	NQ1	Data output
08	GND	Common
09	NQ2	Data output
10	Q2	Data output
11	-TR2	Data input
12	+TR2	Data input
13	RES2	Reset
14	RxCx(2)	For resistor & capacitor connection
15	Cx2	For capacitor connection
16	V _{DD}	Supply input

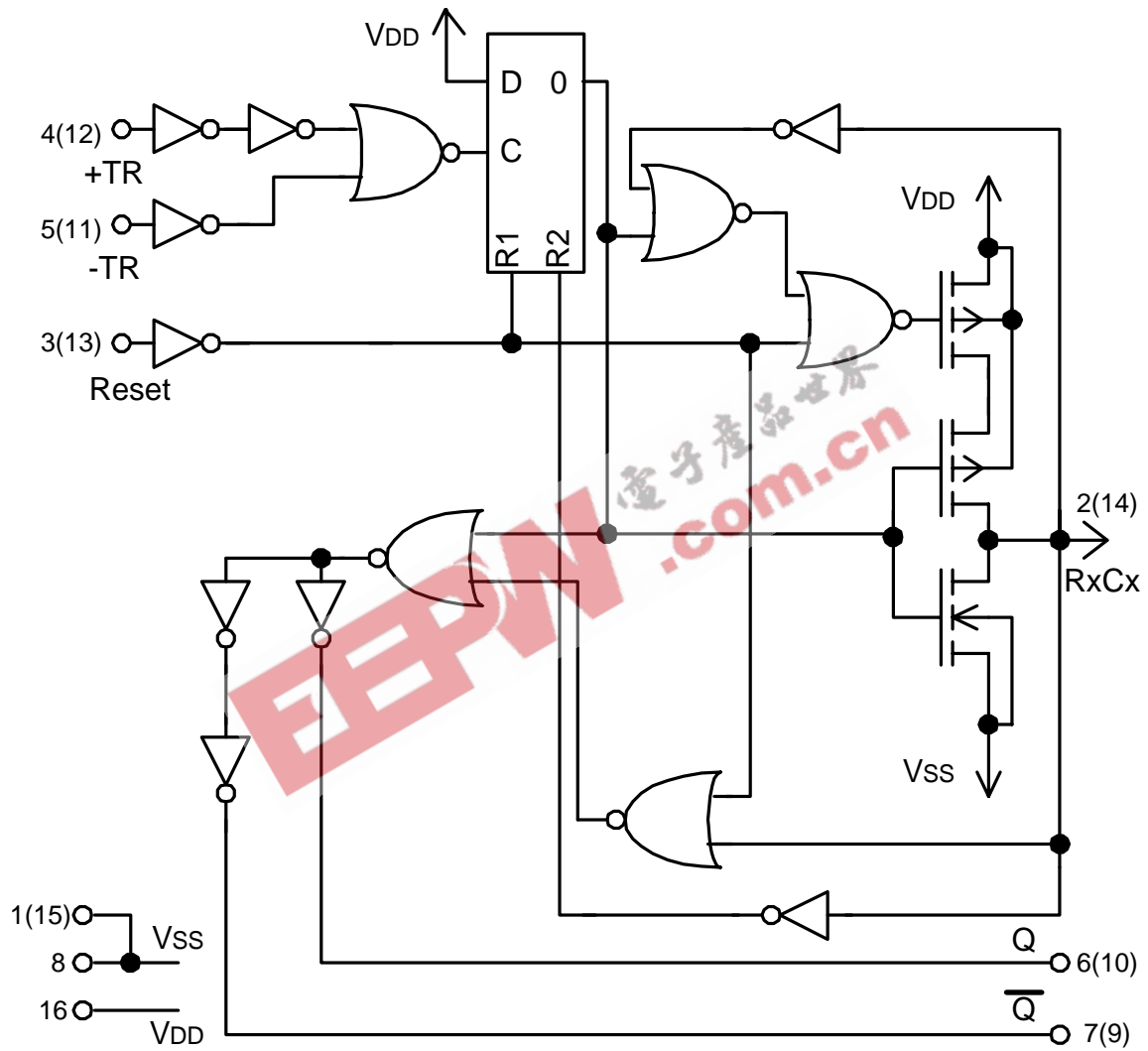
PIN ASSIGNMENT



TRUTH TABLE (serial input)

Input			Output	
RES	+TR	-TR	Q	Q
L	X	X	L	H
H		H		
H	L			
H		0	No switching	
H	H		No switching	
H		H	No switching	
H	L		No switching	

Logic diagram



V_{DD} = pin 16

V_{SS} = pin 8

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	-0.5 to +20	V
V _{IN}	DC Input Voltage (Referenced to GND)	-0.5 to V _{CC} +0.5	V
V _{OUT}	DC Output Voltage (Referenced to GND)	-0.5 to V _{CC} +0.5	V
I _{IN}	DC Input Current, per Pin	±10	mA
P _D	Power Dissipation in Still Air, Plastic DIP+ SOIC Package+	750 500	mW
P _D	Dissipation per Output Transistor	100	mW
T _{stg}	Storage Temperature	-65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds (Plastic DIP or SOIC Package)	260	°C

*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

+Derating - Plastic DIP: - 10 mW/°C from 65° to 125°C

SOIC Package: : - 7 mW/°C from 65° to 125°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	3.0	18	V
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage (Referenced to GND)	0	V _{CC}	V
T _A	Operating Temperature, All Package Types	-55	+125	°C

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation, V_{IN} and V_{OUT} should be constrained to the range GND ≤ (V_{IN} or V_{OUT}) ≤ V_{CC}.

Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or V_{CC}). Unused outputs must be left open.

DC ELECTRICAL CHARACTERISTICS(Voltages Referenced to GND)

Parameter, unit	Sym- bol	Test conditions							Guaranteed Limit					
		U _I L V	U _I H V	U _{OL} V	U _{OH} V	I _{OL} μA	I _{OH} μA	U _{DD} V	T _A =-55°C		T _A =125°C		T _A =25°C	
									min	max	min	max	min	max
Low level output voltage,V	U _{OL}	0	3.0	-	-	1.0	-	3.0	-	0.1	-	0.1	-	0.1
		0	5.0	-	-	1.0	-	5.0	-	0.05	-	0.05	-	0.05
		0	10	-	-	1.0	-	10	-	0.05	-	0.05	-	0.05
		0	15	-	-	1.0	-	15	-	0.05	-	0.05	-	0.05
		0	18	-	-	1.0	-	18	-	0.1	-	0.1	-	0.1
		1.5	3.5	-	-	1.0	-	5.0	-	0.5	-	0.5	-	0.5
		3.0	7.0	-	-	1.0	-	10	-	1.0	-	1.0	-	1.0
		4.0	11	-	-	1.0	-	15	-	1.5	-	1.5	-	1.5
High level output voltage,V	U _{OH}	0	3.0	-	-	-	-1.0	3.0	2.9	-	2.9	-	2.9	-
		0	5.0	-	-	-	-1.0	5.0	4.95	-	4.95	-	4.95	-
		0	10	-	-	-	-1.0	10	9.95	-	9.95	-	9.95	-
		0	15	-	-	-	-1.0	15	14.95	-	14.95	-	14.95	-
		0	18	-	-	-	-1.0	18	17.9	-	17.9	-	17.9	-
		1.5	3.5	-	-	-	-1.0	5.0	4.5	-	4.5	-	4.5	-
		3.0	7.0	-	-	-	-1.0	10	9.0	-	9.0	-	9.0	-
		4.0	11	-	-	-	-1.0	15	13.5	-	13.5	-	13.5	-
Low level input current, μA	I _{IL}	0	18	-	-	-	-	18	-	-0.1	-	-1.0	-	-0.1
High level input current, μA	I _{IH}	0	18	-	-	-	-	18	-	0.1	-	1.0	-	0.1
Consumption current, μA	I _{DD}	0	5.0	-	-	-	-	5.0	-	1.0	-	30	-	1.0
		0	10	-	-	-	-	10	-	2.0	-	60	-	2.0
		0	15	-	-	-	-	15	-	4.0	-	120	-	4.0
		0	20	-	-	-	-	20	-	20	-	600	-	20
Low level output current, mA	I _{OL}	0	5.0	0.4	-	-	-	5.0	0.64	-	0.36	-	0.51	-
		0	10	0.5	-	-	-	10	1.6	-	0.9	-	1.3	-
		0	15	1.5	-	-	-	15	4.2	-	2.4	-	3.4	-
High level output current, mA	I _{OH}	0	5.0	-	4.6	-	-	5.0	-0.64	-	-0.36	-	-0.51	-
		0	5.0	-	2.5	-	-	5.0	-2.0	-	-1.15	-	-1.6	-
		0	10	-	9.5	-	-	10	-1.6	-	-0.9	-	-1.3	-
		0	15	-	13.5	-	-	15	-4.2	-	-2.4	-	-3.4	-
Output leakage current, μA	I _{OUT}	0	18	U _O =0.5 V				18		±0.4		±12		±0.4

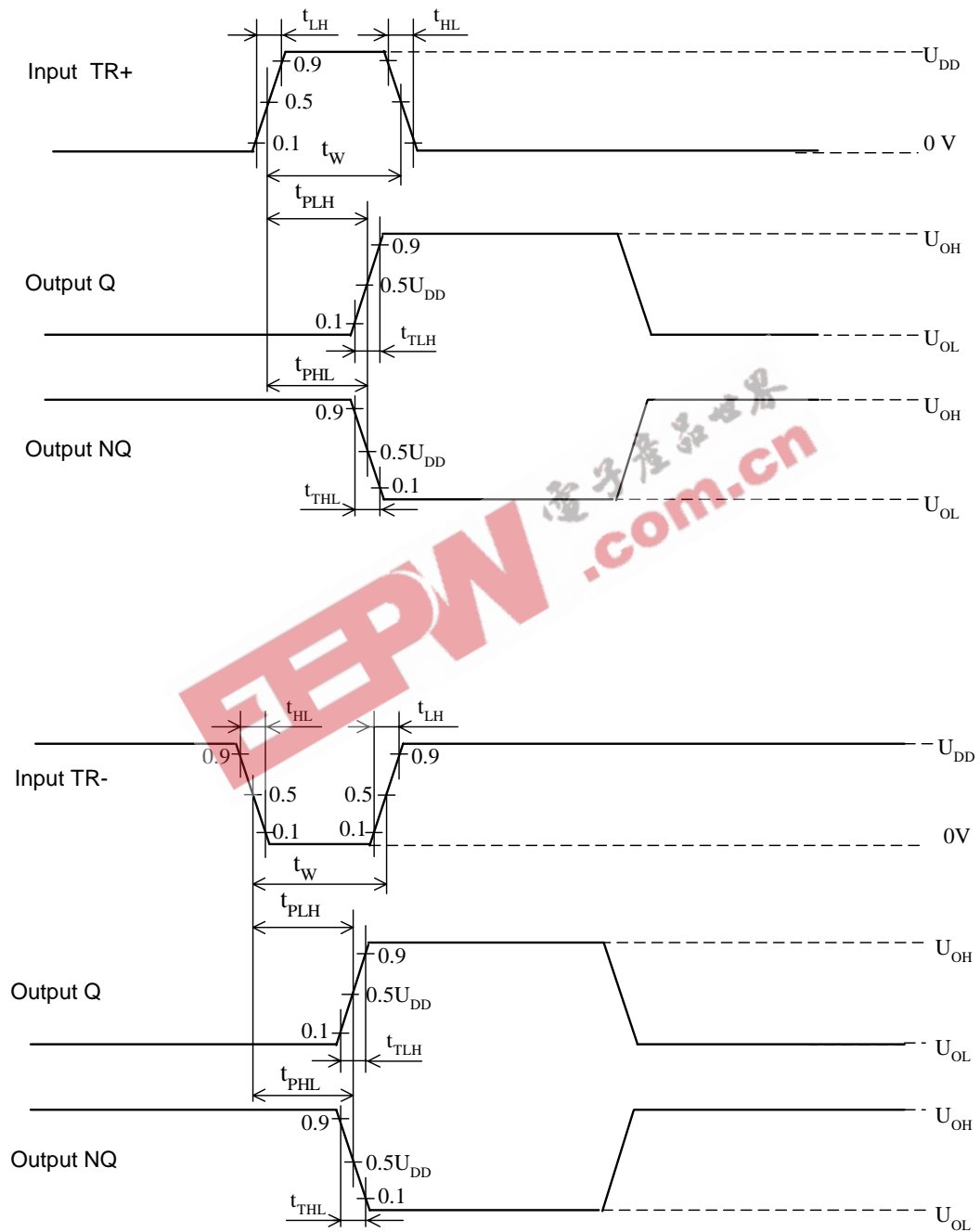
AC ELECTRICAL CHARACTERISTICS($C_L=50\text{pF}$, $R_L=200\text{k}\Omega$, Input $t_r=t_f=20\text{ ns}$)

Parameter, unit	Symbol	Test conditions			Guaranteed Limit					
		R_X	C_X	U_{DD}	$T_A=-55^\circ\text{C}$		$T_A=125^\circ\text{C}$		$T_A=25^\circ\text{C}$	
		$\text{k}\Omega$	pF	V	min	max	min	max	min	max
Propagation delay at switch on & switch off, ns inputs +TR, -TR - outputs Q, Q	t_{PHL1} , t_{PLH1}	5-10000	$t_{LH}=t_{HL} \leq 20\text{ ns}$, $C_L=50\text{pF}$, $R_L=200\text{ k}\Omega$	≥ 15	5.0	500	1000	500	200	250
					10	250	500	400	200	
					15	200	400	300	150	
input RES - outputs Q, Q	t_{PHL2} , t_{PLH2}	5-10000	$t_{LH}=t_{HL} \leq 20\text{ ns}$, $C_L=50\text{pF}$, $R_L=200\text{ k}\Omega$	≥ 15	5.0	450	900	450	250	150
					10	250	500	300	150	
					15	150	300	150	150	
Pulse width of signals +TR, -TR, ns	t_{WL} , t_{WH}	5-10000	$t_{LH}=t_{HL} \leq 20\text{ ns}$, $C_L=50\text{pF}$, $R_L=200\text{ k}\Omega$	≥ 15	5.0	140	280	140	60	40
					10	60	120	60	40	
					15	40	80	40	40	
Pulse width of signal RES, ns	t_{WR}	100	$t_{LH}=t_{HL} \leq 20\text{ ns}$, $C_L=50\text{pF}$, $R_L=200\text{ k}\Omega$	≥ 15	5.0	200	400	200	80	60
					10	80	160	80	60	
					15	60	120	60	60	
					5.0	1200	2400	1200	600	
					10	600	1200	600	500	
					15	500	1000	500	50	
					5.0	50	100	50	30	
					10	30	60	30	20	
					15	20	40	20	20	

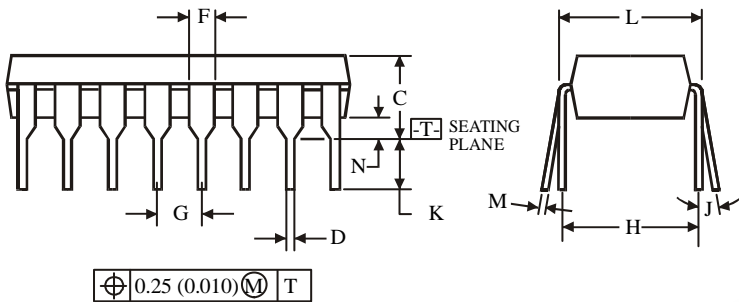
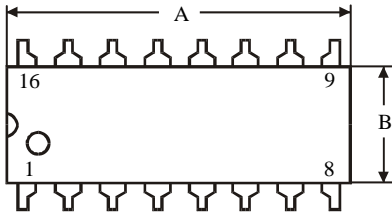
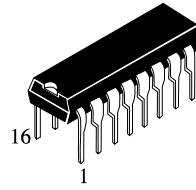
CAPACITY CHARACTERISTICS

Symbol	Parameter	V_{DD} , V	Value	Unit
C_{IN}	Input capacity		7.5	pF

Time Diagram



**N SUFFIX PLASTIC
(MS - 001BB)**

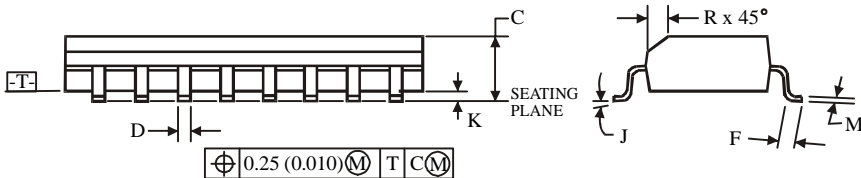
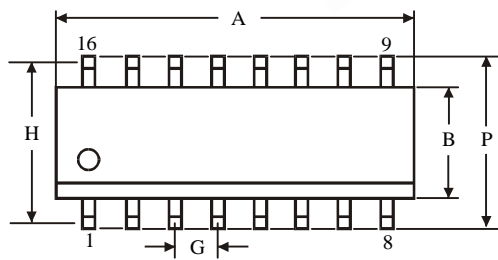
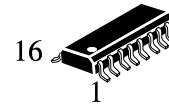


Symbol	Dimensions, mm	
	MIN	MAX
A	18.67	19.69
B	6.10	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.20	0.36
N	0.38	

NOTES:

- Dimensions "A", "B" do not include mold flash or protrusions. Maximum mold flash or protrusions 0.25 mm (0.010) per side.

**D SUFFIX SOIC
(MS - 012AC)**



Symbol	Dimensions, mm	
	MIN	MAX
A	9.80	10.0
B	3.80	4.00
C	1.35	1.75
D	0.33	0.51
F	0.40	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.10	0.25
M	0.19	0.25
P	5.80	6.20
R	0.25	0.50

NOTES:

- Dimensions A and B do not include mold flash or protrusion.
- Maximum mold flash or protrusion 0.15 mm (0.006) per side for A, for B - 0.25 mm (0.010) per side.