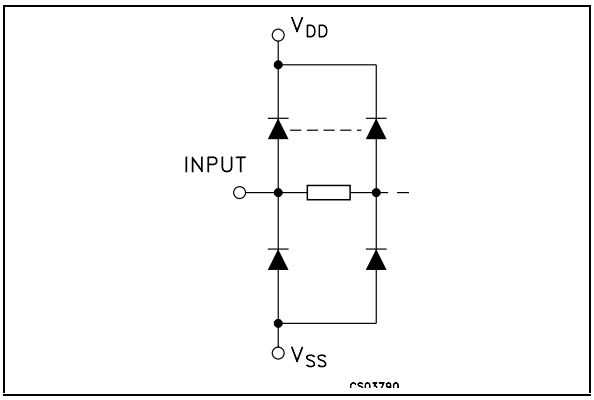
An unused RESET input should be tied to V_{DD} . However, if an entire section of the HCF4098B is not used, its reset should be tied to V_{SS} (see table 1). In normal operation the circuit triggers (extends the output pulse one period) on the application of each new trigger pulse. For operation in the non-retiggerable mode, $\overline{Q}$ is connected to -TR when leading edge triggering (+TR) is used or Q is connected to +TR when trailing edge triggering (-TR) is used. The time period (T) for this multivibrator can be calculated by : $T = 1/2\ R_X\ C_X$ for $C_X \geq 0.01\mu F$. The min. value of external resistance, R_X, is 5KΩ. The max. values of external capacitance, C_X, is 100 μF. The output pulse width has variations of ±2.5% typically, over the temperature range of -55 °C to 125 °C for C_X=1000pF and R_X = 100KΩ . For power supply variation of ±5% typically , for V_{DD} = 10V and 15V and ±1% typically for V_{DD} = 5V at C_X = 1000pF and R_X = 5KΩ .

IINPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
4, 12	+TR	Leading Trigger Inputs
5, 11	-TR	Trailing Trigger Inputs
3, 13	RESET	Reset Inputs
1, 15	C_X1, C_X2	External Capacitors
2, 14	R_XC_X1 R_XC_X2	External resistors to Vdd
6, 7	Q1, $\overline{Q1}$	Ouputs Mono 1
10, 9	Q2, $\overline{Q2}$	Outputs Mono 2
8	V_{SS}	Negative Supply Voltage
16	V_{DD}	Positive Supply Voltage

FUNCTIONAL DIAGRAM

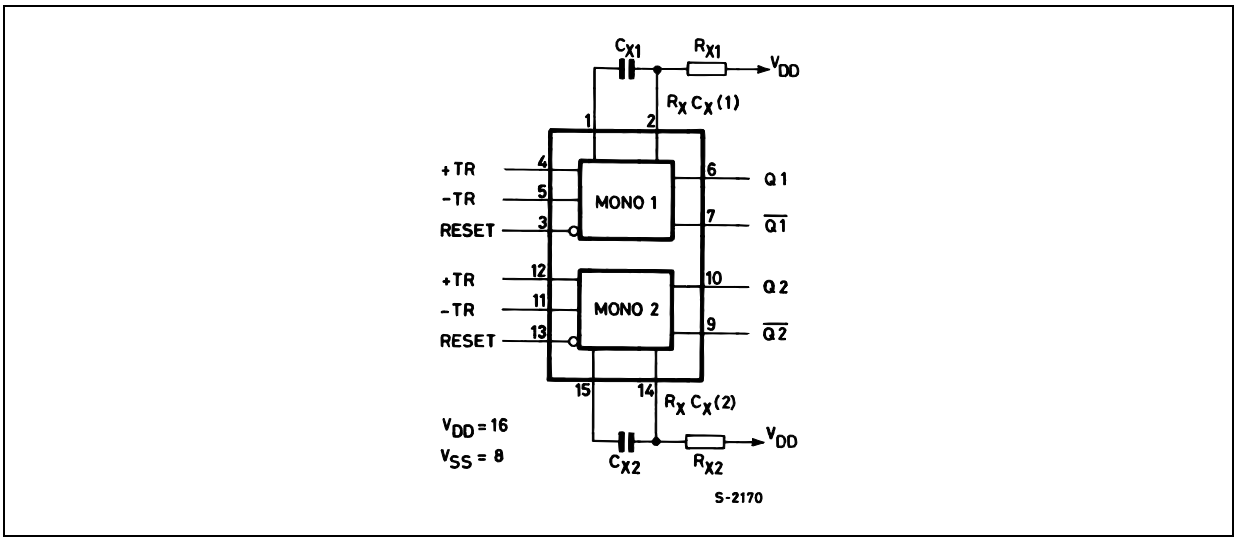
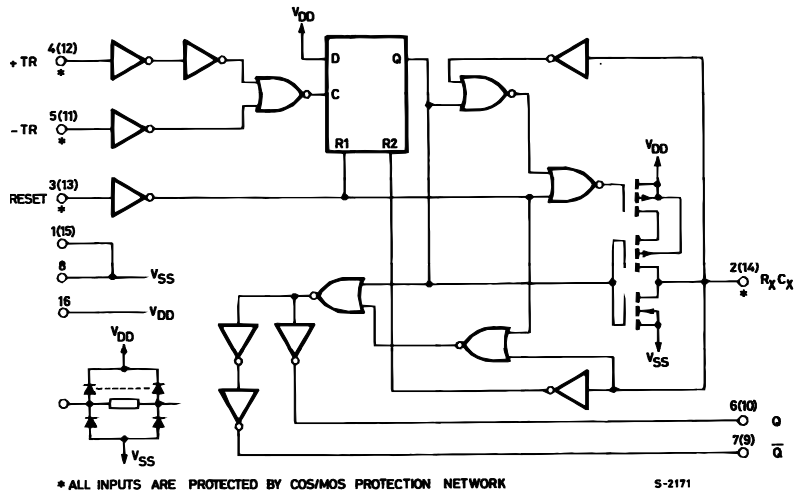


TABLE 1 : Functional Terminal Connections

FUNCTION	V_{DD} to Term. N°		V_{SS} to Term. N°		Input Pulse to Term. N°		Other Connections	
	Mono (1)	Mono (2)	Mono (1)	Mono (2)	Mono (1)	Mono (2)	Mono (1)	Mono (2)
Leading Edge Trigger/ Retriggerable	3, 5	11, 13			4	12		
Leading Edge Trigger/Non Retriggerable	3	13			4	12	5, 7	11, 9
Trailing Edge Trigger/ Retriggerable	3	13	4	12	5	11		
Trailing Edge Trigger/Non Retriggerable	3	13			5	11	4, 6	12, 10
Unused Section	5	11	3, 4	12, 13				

A Retriggerable one-shot multivibrator has an output pulse width which is extended on full time period (T) after application of the last trigger pulse.
A Non-Retriggerable one-shot multivibrator has a time period (T) referenced from the application of the firs trigger pulse.

LOGIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	-0.5 to +22	V
V_I	DC Input Voltage	-0.5 to V_{DD} + 0.5	V
I_I	DC Input Current	± 10	mA
P_D	Power Dissipation per Package	200	mW
	Power Dissipation per Output Transistor	100	mW
T_{op}	Operating Temperature	-55 to +125	°C
T_{stg}	Storage Temperature	-65 to +150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.
All voltage values are referred to V_{SS} pin voltage.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	3 to 20	V
V_I	Input Voltage	0 to V_{DD}	V
T_{op}	Operating Temperature	-55 to 125	°C

DC SPECIFICATIONS

Symbol	Parameter	Test Condition				Value							Unit
		V_I (V)	V_O (V)	$\|I_O\|$ (μA)	V_{DD} (V)	T_A = 25°C			-40 to 85°C		-55 to 125°C		
						Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
I_L	Quiescent Current	0/5			5		0.02	1		30		30	μA
		0/10			10		0.02	2		60		60	
		0/15			15		0.02	4		120		120	
		0/20			20		0.04	20		600		600	
V_{OH}	High Level Output Voltage	0/5		<1	5	4.95			4.95		4.95		V
		0/10		<1	10	9.95			9.95		9.95		
		0/15		<1	15	14.95			14.95		14.95		
V_{OL}	Low Level Output Voltage	5/0		<1	5		0.05			0.05		0.05	V
		10/0		<1	10		0.05			0.05		0.05	
		15/0		<1	15		0.05			0.05		0.05	
V_{IH}	High Level Input Voltage		0.5/4.5	<1	5	3.5			3.5		3.5		V
			1/9	<1	10	7			7		7		
			1.5/13.5	<1	15	11			11		11		
V_{IL}	Low Level Input Voltage		4.5/0.5	<1	5			1.5		1.5		1.5	V
			9/1	<1	10			3		3		3	
			13.5/1.5	<1	15			4		4		4	
I_{OH}	Output Drive Current	0/5	2.5	<1	5	-1.6	-3.2		-1.3		-1.3		mA
		0/5	4.6	<1	5	-0.51	-1		-0.42		-0.42		
		0/10	9.5	<1	10	-1.3	-2.6		-1.1		-1.1		
		0/15	13.5	<1	15	-3.4	-6.8		-2.8		-2.8		
I_{OL}	Output Sink Current	0/5	0.4	<1	5	-0.51	1		-0.42		-0.42		mA
		0/10	0.5	<1	10	-1.3	2.6		-1.1		-1.1		
		0/15	1.5	<1	15	-3.4	6.8		-2.8		-2.8		
I_I	Input Leakage Current	0/18	Any Input		18		$\pm 10^{-5}$	±0.1		±1		±1	μA
C_I	Input Capacitance		Any Input				5	7.5					pF

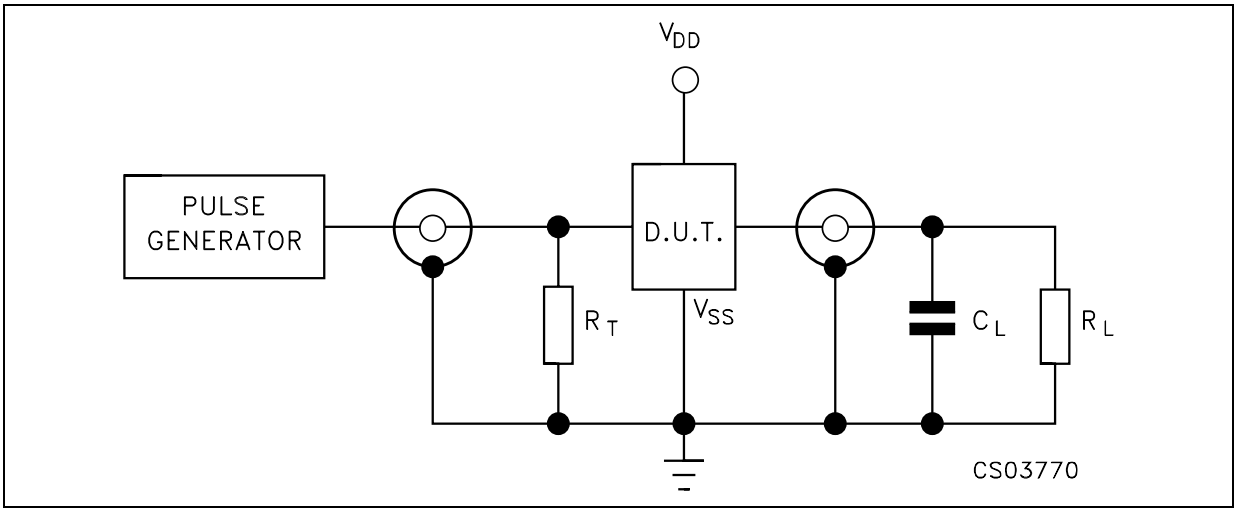
The Noise Margin for both "1" and "0" level is: 1V min. with V_{DD}=5V, 2V min. with V_{DD}=10V, 2.5V min. with V_{DD}=15V

DYNAMIC ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C, C_L = 50pF, R_L = 200KΩ, $t_r = t_f$ = 20 ns)

Symbol	Parameter	Test Condition			Value (*)			Unit
		R_X (KΩ)	C_X (pF)	V_{DD} (V)	Min.	Typ.	Max.	
t_{PLH} t_{PHL}	Propagation Delay Time +TR or -TR to Q or $\overline{Q}$	5 to 10000	≥15	5		250	500	ns
				10		125	250	
				15		100	200	
t_{WH} t_{WL}	Trigger Pulse Width	5 to 10000	≥15	5	140	70		ns
				10	60	30		
				15	40	20		
t_{TLH}	Transition Time	5 to 10000	≥15	5		100	200	ns
				10		50	100	
				15		40	80	
t_{THL}	Transition Time	5 to 10000	15 to 10000	5		100	200	ns
				10		50	100	
				15		40	80	
		5 to 10000	0.01µF to 0.1µF	5		150	300	
				10		75	150	
				15		65	130	
		5 to 10000	0.1µF to 1µF	5		250	500	
				10		150	300	
				15		80	160	
t_{PLH} t_{PHL}	Propagation Delay Time (Reset)	5 to 10000	≥15	5		225	450	ns
				10		125	250	
				15		75	150	
t_{WR}	Pulse Width (reset)	100	15	5	200	100		ns
				10	80	40		
				15	60	30		
			1000	5	1200	600		
				10	600	300		
				15	500	250		
			0.1µF	5	50	250		µs
				10	30	15		
				15	20	10		
t_r, t_f (TR)	Rise or Fall Time (trigger)		5 to 15				100	µs
	Pulse Width Match Between Circuits in Same Package	10	10000	5		5	10	%
				10		7.5	15	
				15		7.5	15	

(*) Typical temperature coefficient for all V_{DD} value is 0.3 %/°C.

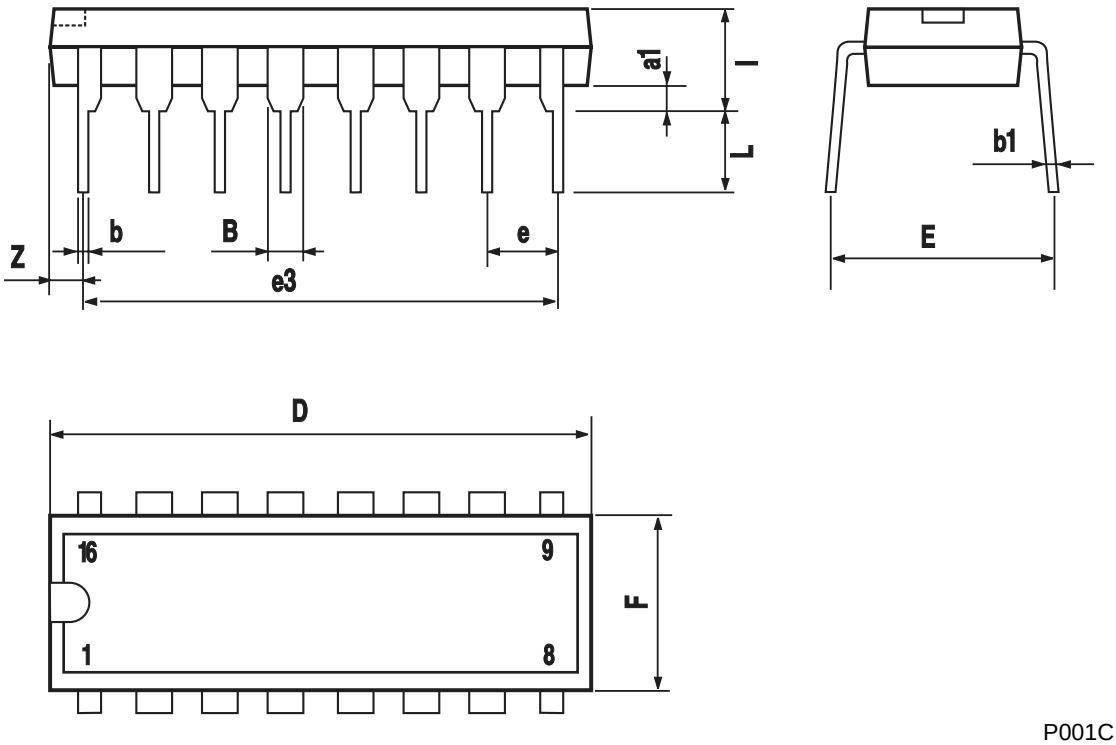
TEST CIRCUIT



C_L = 50pF or equivalent (includes jig and probe capacitance)
R_L = 200KΩ
R_T = Z_{OUT} of pulse generator (typically 50Ω)

Plastic DIP-16 (0.25) MECHANICAL DATA

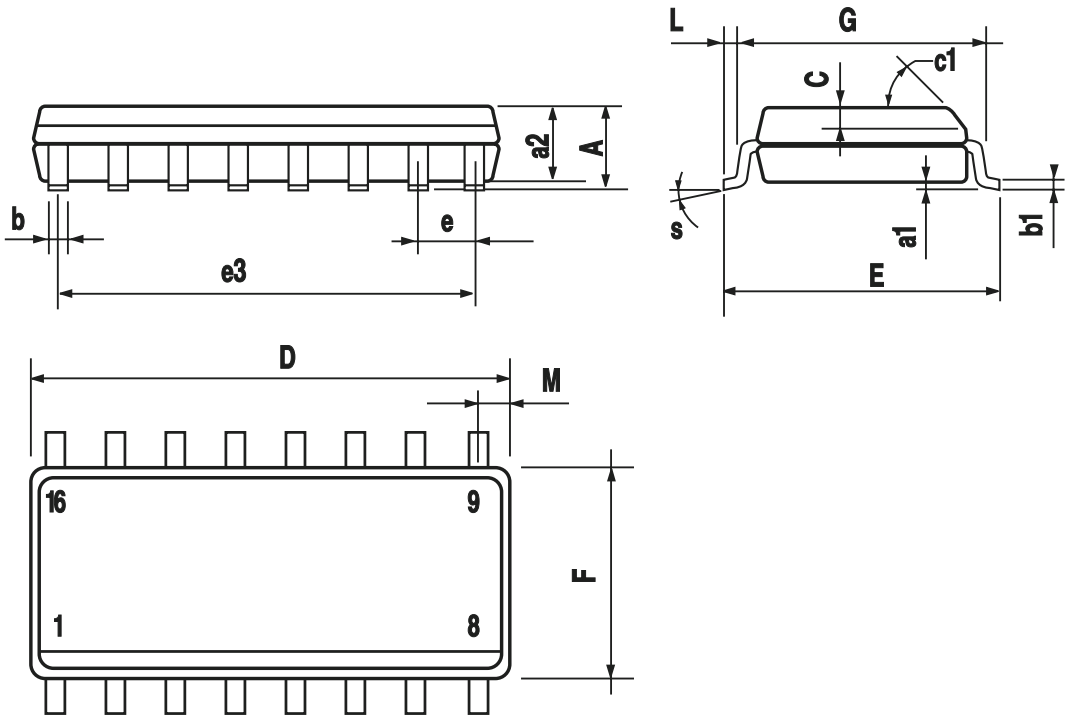
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



P001C

SO-16 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.003		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	9.8		10	0.385		0.393
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.62			0.024
S	8° (max.)					



PO13H