

- ◆ CMOS Analog Switch
- ◆ Low On-Resistance $R_{ON}=100\Omega$ TYP
- ◆ High Speed Operation $t_{pd}=4ns$ TYP
- ◆ Operating Voltage Range 2V~6V
- ◆ Low Power Consumption $1\mu A$ MAX

Applications

- Palmtops
- Digital Equipment

General Description

The XC74UH4066M is a high speed CMOS Analog Switch manufactured using silicon gate CMOS fabrication.

CMOS low power circuit operation makes high speed analog or digital signal switching possible.

As the XC74UH4066M is integrated into a mini molded, SOT-25 package, high density mounting is possible.

Features

High Speed Operation: $t_{pd}=12ns$ TYP

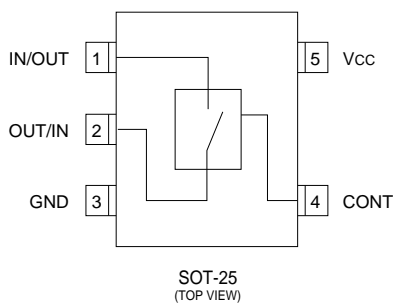
Low On-Resistance: $R_{ON}=100\Omega$ TYP

Operating Voltage Range: 2V~6V

Low Power Consumption: $1\mu A$ MAX

Space Saving Package: SOT-25

Pin Configuration

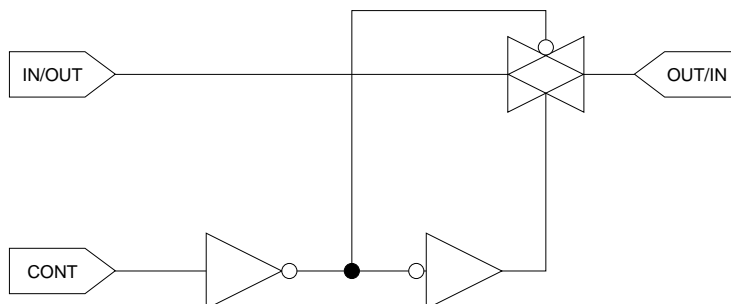


Function

CONT	SWITCH
L	OFF
H	ON

H=High level, L=Low level

Logic Diagram



Absolute Maximum Ratings

Ta=25°C

PARAMETER	SYMBOL	RATINGS	UNITS
Power Supply Voltage	VCC	-0.5 ~ +7.0	V
Input Voltage	VIN	-0.5 ~ VCC +0.5	V
Output Voltage	VOUT	-0.5 ~ VCC +0.5	V
Input Diode Current	I _{IK}	±20	mA
Output Diode Current	I _{OK}	±20	mA
Output Current	I _{OUT}	±25	mA
VCC ,GND Current	I _{CC} , I _{GND}	±25	mA
Continuous Total Power Dissipation	P _d	200	mW
Storage Temperature	T _{stg}	-65 ~ +150	°C

Note: Voltage is all Ground standardized.

Recommended Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	UNITS
Supply Voltage	VCC	2 ~ 6	V
Input Voltage	VIN	0 ~ VCC	V
Output Voltage	VOUT	0 ~ VCC	V
Operating Temperature	T _{opr}	-40 ~ +85	°C
Input Rise and Fall Time	tr, tf	0 ~ 1000 (VCC=2.0V)	ns
		0 ~ 500 (VCC=4.5V)	
		0 ~ 400 (VCC=6.0V)	

DC Electrical Characteristics

PARAMETER	SYMBOL	VCC(V)	CONDITIONS	Ta=25°C			Ta=-40~85°C		UNITS
				MIN	TYP	MAX	MIN	MAX	
Control Input Voltage	VIH	2.0		1.5	-	-	1.5	-	V
		4.5		3.15	-	-	3.15	-	
		6.0		4.2	-	-	4.2	-	
	VIL	2.0		-	-	0.5	-	0.5	V
		4.5		-	-	1.35	-	1.35	
		6.0		-	-	1.8	-	1.8	
On Resistance	RON	2.0	V _{CONT} =VIH	-	2000	5000	-	6250	Ω
		4.5	VIN=0 ~ VCC	-	100	200	-	250	
		6.0	IIN/OUT=1mA	-	60	170	-	210	
Power Off Leakage Current	IS(OFF)	6.0	V _{CON} =VIL, VIN=VCC, V _{OUT} =GND	-	-	±0.1	-	±1.0	μA
Power On Leakage Current	IS(ON)	6.0	V _{CON} =VIH, VIN=VCC, GND	-	-	±0.1	-	±1.0	μA
Control Input Current	I _{CONT}	6.0	VIN=VCC or GND	-	-	±0.1	-	±1.0	μA
Quiescent Supply Current	I _{CC}	6.0	VIN=VCC or GND	-	-	1.0	-	10.0	μA

Switching Electrical Characteristics

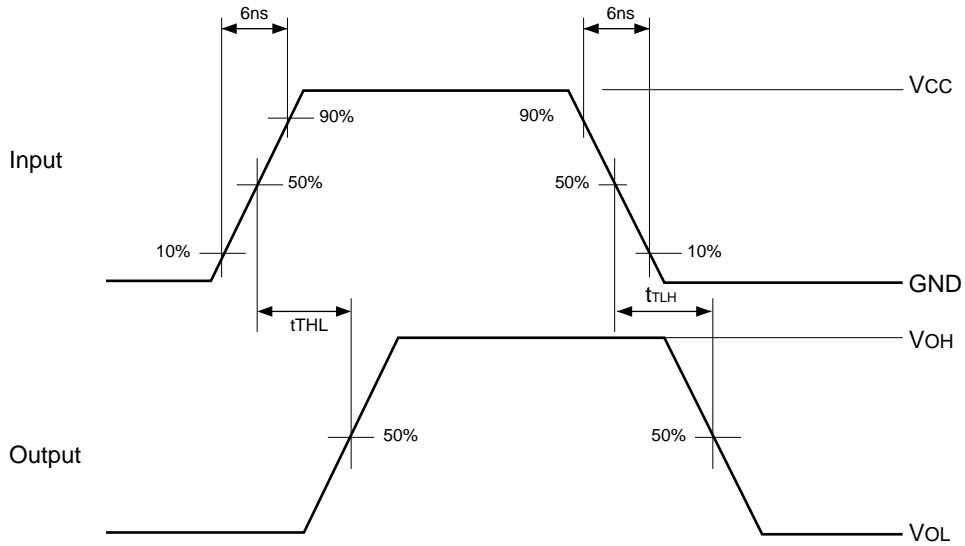
$t_r=t_f=6\text{ns}$

PARAMETER	SYMBOL	V _{CC} (V)	CONDITIONS	Ta=25°C			Ta=-40-85°C		UNITS
				MIN	TYP	MAX	MIN	MAX	
Propagation Delay Time	tPLH	2.0	RL=10kΩ	-	-	50	-	65	ns
	tPHL	4.5	CL=50pF	-	4	10	-	13	
		6.0		-	-	9	-	11	
Output Enable Time	tZL	2.0	RL=1kΩ	-	-	115	-	145	ns
	tZH	4.5	CL=50pF	-	10	23	-	29	
		6.0		-	-	20	-	25	
Output Disable Time	tLZ	2.0	RL=1kΩ	-	-	115	-	145	ns
	tHZ	4.5	CL=50pF	-	14	23	-	29	
		6.0		-	-	20	-	25	
Sine Wave Distortion Rate		4.5	RL=10kΩ CL=50pF Fin=1KgZ	-	0.05	-	-	-	%
-3dB Band Width		4.5	RL=600Ω, CL=50pF $20 \log_{10} \frac{V_{OUT}}{V_{IN}} = -3\text{dB}$	-	30	-	-	-	MHz
Feed Through (switch off)		4.5	RL=600Ω CL=50pF Fin=1MHZ	-	-50	-	-	-	dB
Cross Talk (control switch)		2.0	RL=600Ω	-	25	-	-	-	mV
		4.5	CL=50pF	-	60	-	-	-	
		6.0	Fin=1MHZ	-	75	-	-	-	
Maximum Control Input Frequency		2.0	RL=1kΩ	-	20	-	-	-	MHz
		4.5	CL=15pF	-	30	-	-	-	MHz
		6.0	VOUT=VCC/2	-	30	-	-	-	MHz
Control Input Capacitance	CIN	-		-	5	10	-	10	pF
Switch Input/Output Capacitance	CIN/OUT	-		-	6	-	-	-	pF
Feed Through Capacitance	CIN-OUT	-		-	0.5	-	-	-	pF
Power Dissipation Capacitance	CPD	-		-	13	-	-	-	pF

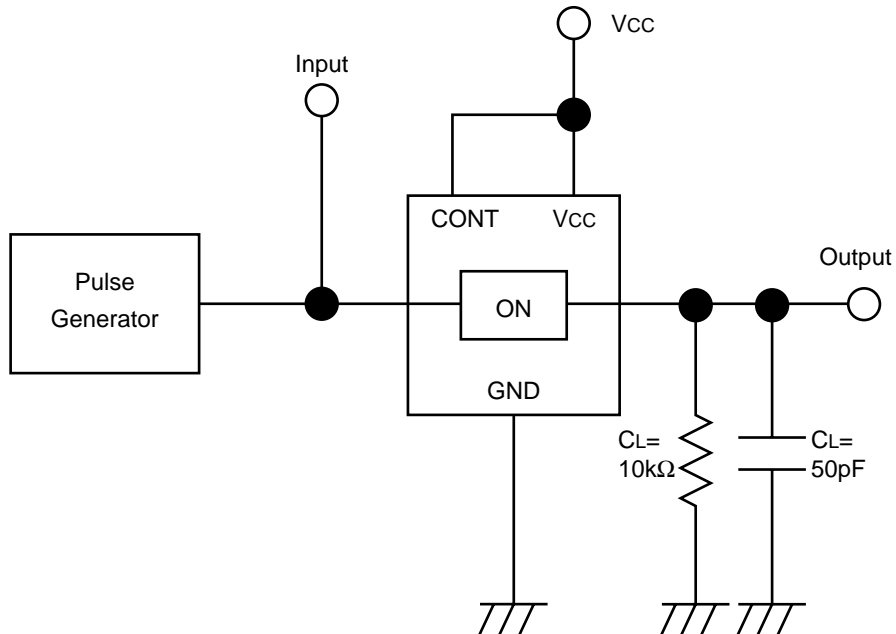
Note: CPD is defined as the value of the internal equivalent capacitance which is derived from the operating supply current at times of 'No Load' (Refer to Typical Application Circuits).
Ensure that the average operating supply current at times of 'No Load' meets the following conditions:
 $I_{CC}(\text{opr}) = \text{CPD} \cdot V_{CC} \cdot F_{in} + I_{CC}$

■ Propagation Delay Time

Waveforms

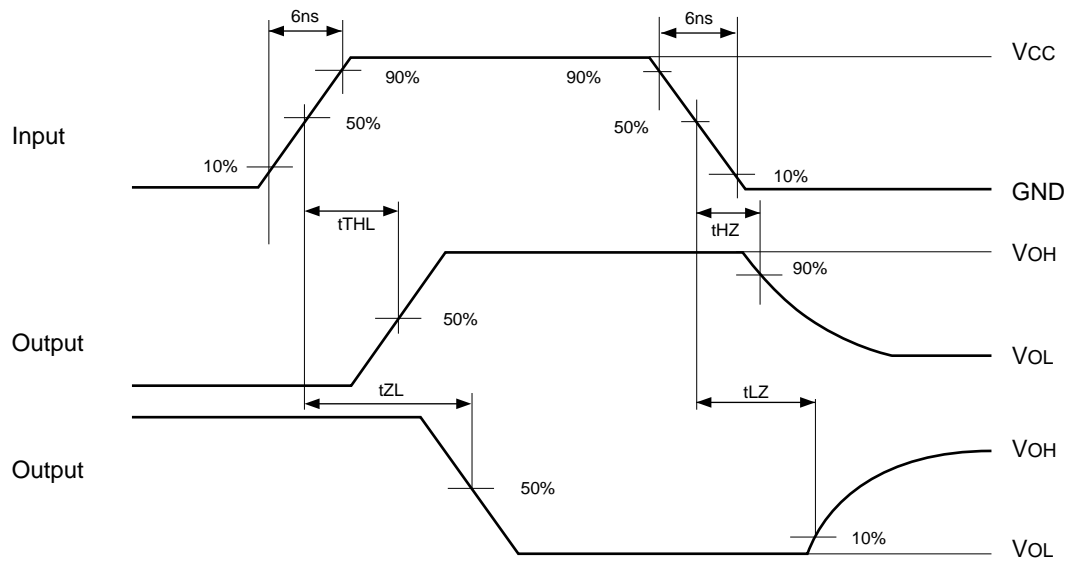


■ Typical Application Circuit

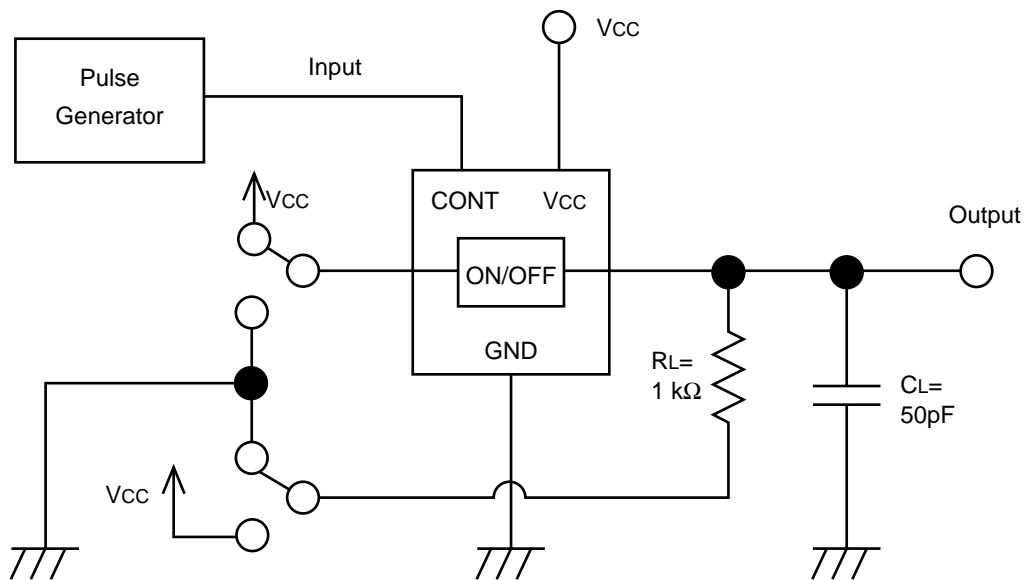


Note: open output when measuring supply current

Output Enable/Disable Time Waveform

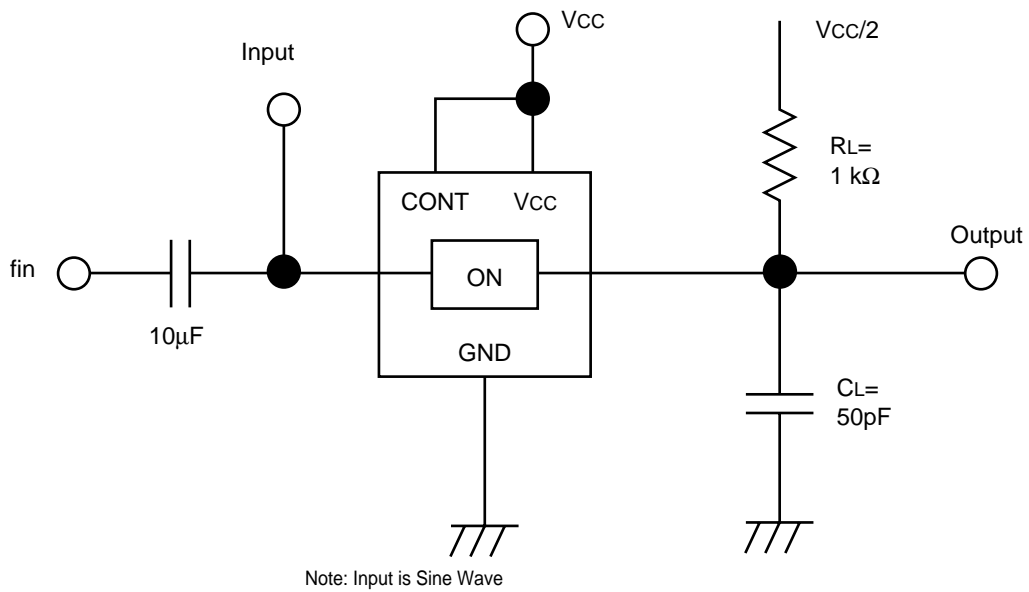


Typical Application Circuit

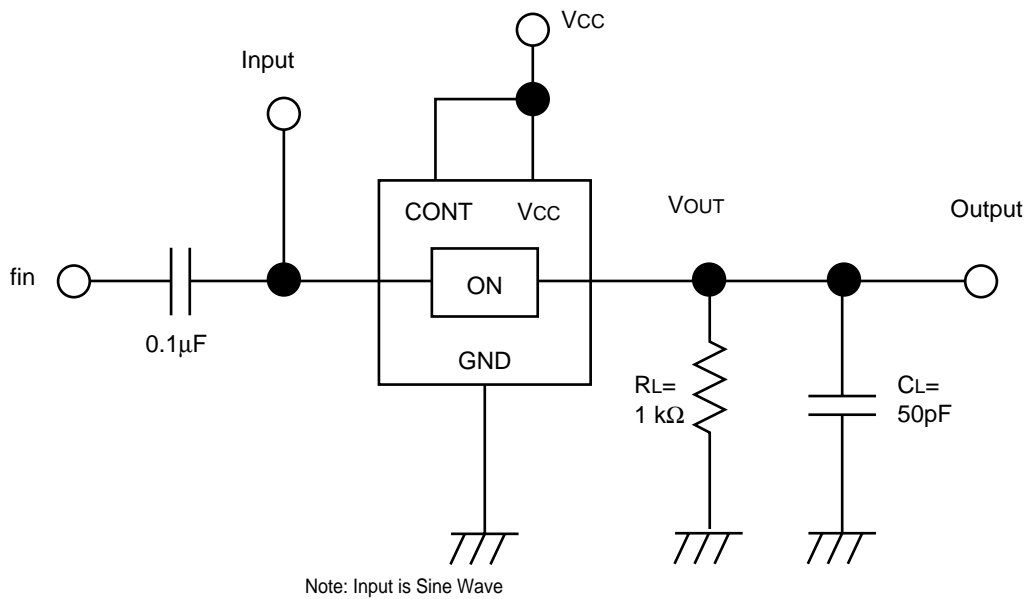


Note: open output when measuring supply current

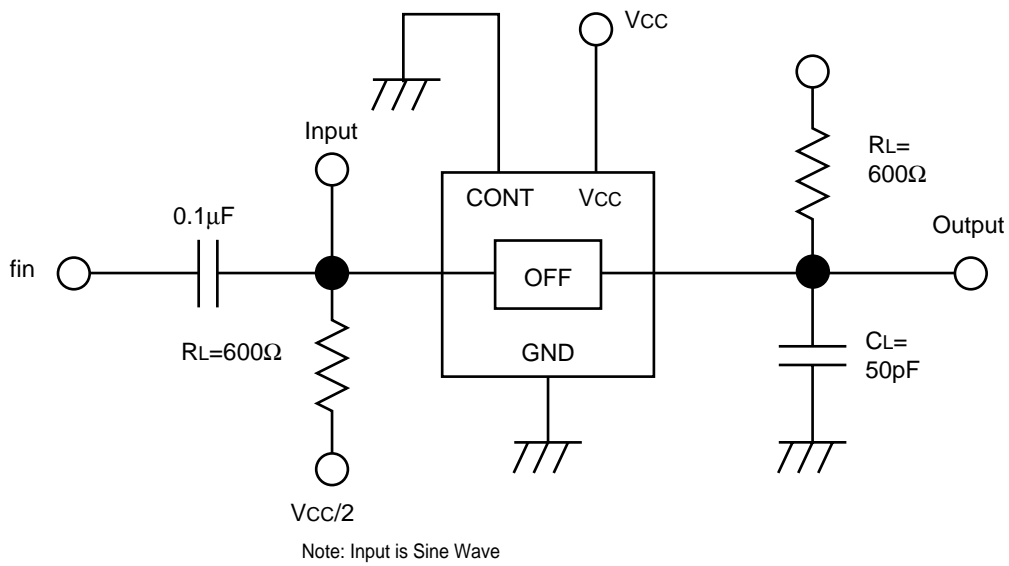
■ Sine Wave Distortion Rate



■ -3dB Band Width

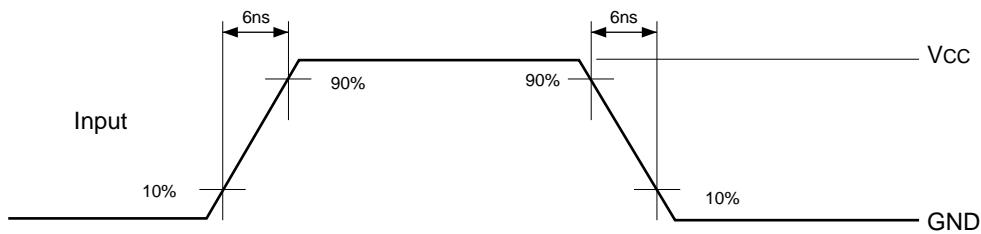


Feed Through

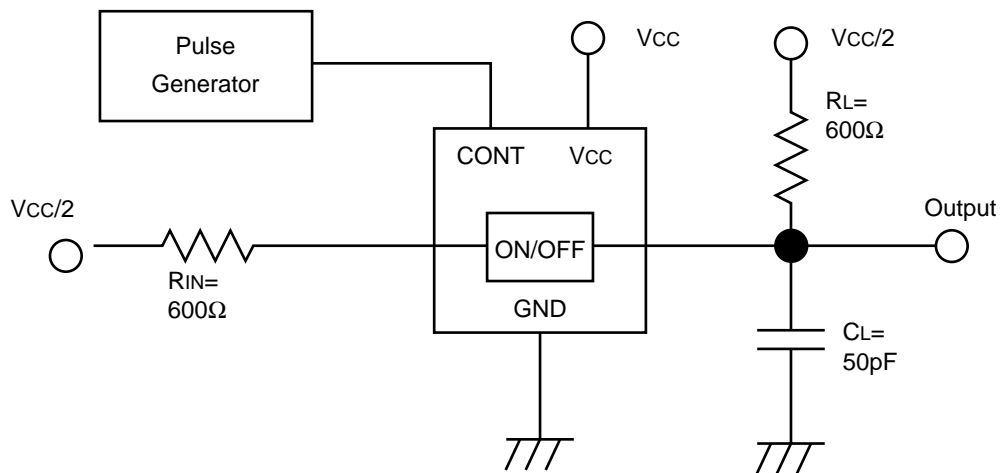


Cross Talk

Wave form

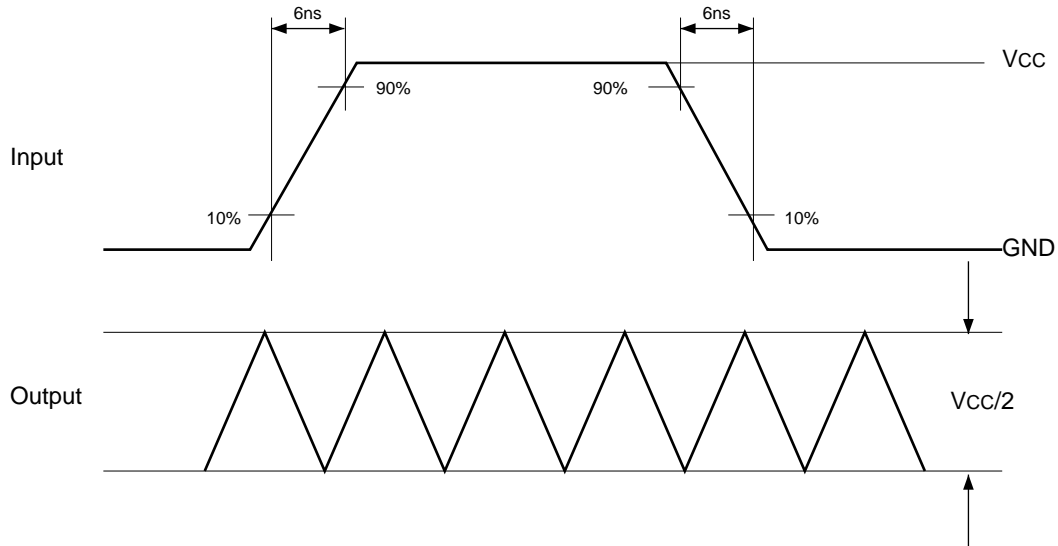


Measurement Circuit



Maximum Control Input Frequency

Waveforms



Measurement Circuit

