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XC74UL4066

ETR1308_002

CMOS Logic

■DESCRIPTION

XC74UL4066 is CMOS analog switch manufactured using silicon gate CMOS processes. The small supply current, which is one of the features of the CMOS logic, gives way to high speed analog or digital signal switching.
As the series is integrated into a mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

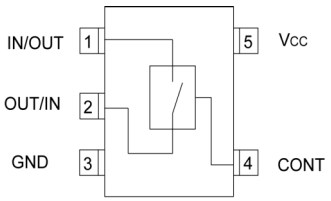
●Palmtops

●Digital equipment

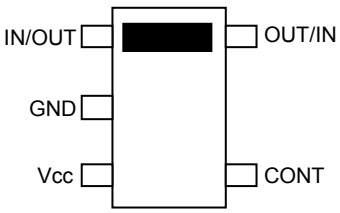
■FEATURES

High Speed Operation : tpd = 2ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption : 1μA (MAX.)
Low ON Resistance : 22Ω (TYP.)
CMOS Logic Analog Switch
Ultra Small Packages : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION

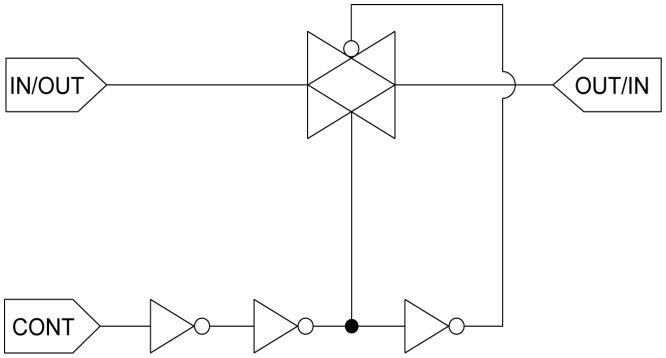


SSOT-25
(TOP VIEW)
XC74UL4066N



SON-6
(TOP VIEW)
XC74UL4066R

■LOGIC DIAGRAM



■FUNCTIONS

CONTROL	STATE
L	OFF
H	ON

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		V_{CC}	-0.5~+6.0	V
Control Input Voltage		V_{CONT}	-0.5~+6.0	V
Switch Output Voltage		V_{OUT}	-0.5~V_{CC}+0.5	V
Control Input Diode Current		I_{IK}	-20	mA
Switch Output Diode Current		I_{OK}	±20	mA
Switch Output Current		I_{OUT}	±25	mA
V_{CC},GND Current		I_{CC},I_{GND}	±50	mA
Power Dissipation*	SSOT-25	Pd	150	mW
	SON-6		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
* Ta=25℃

■RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS	UNITS
Supply Voltage	V_{CC}	—	2~5.5	V
Input Voltage	V_{IN}	—	0~5.5	V
Output Voltage	V_{OUT}	—	0~VCC	V
Operating Temperature Range	Topr	—	-40~+85	℃
Input Rise and Fall Time	tr,tf	3.3	0~100	ns/V
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
"High" Level Control Input Voltage	V_{IH}	2.0		1.5	—	—	1.5	—	V
		3.0		2.1	—	—	2.1	—	
		5.5		3.85	—	—	3.85	—	
"Low" Level Control Input Voltage	V_{IL}	2.0		—	—	0.5	—	0.5	V
		3.0		—	—	0.9	—	0.9	
		5.5		—	—	1.65	—	1.65	
Peak ON Resistance	Ronmax	2.0	V_{CONT}=V_{IH}	—	130	350	—	550	Ω
		3.0	V_{IN}=0~V_{CC}	—	22	50	—	65	
		4.5	$I_{IN/OUT}$=1mA	—	12	25	—	35	
ON Resistance	$R_{ON(1)}$	2.0	V_{CONT}=V_{IH}		23	50		65	
		3.0	V_{IN}=GND or V_{CC}		14	30		40	
		4.5	$I_{IN/OUT}$=1mA		10	20		25	
Power Off Leak Current	$I_{S(OFF)}$	5.5	V_{CONT}=V_{IL}, V_{IN}=V_{CC}, V_{OUT}=GND	—	—	±0.1	—	±1.0	μA
Power On Leak Current	$I_{S(ON)}$	5.5	V_{CONT}=V_{IH}, V_{IN}=V_{CC}, or GND	—	—	±0.1	—	±1.0	μA
Control Input Current	I_{CONT}	5.5	V_{IN}=V_{CC} or GND	—	—	±0.1	—	±1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND	—	—	1.0	—	5.0	μA

■SWITCHING ELECTRICAL CHARACTERISTICS

(tr=tf=3ns)

PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS	Ta=25℃			Ta=-40℃~85℃		UNITS
				MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	tPLH tPHL	2.0	R_L=10kΩ C_L=50pF	–	4	20	–	23	ns
		3.3		–	3	6	–	8	
		5.0		–	2	5	–	6	
Output Enable Time	tZL tZH	2.0	R_L=1kΩ C_L=50pF	–	9	50	–	65	ns
		3.3		–	5	10	–	12	
		5.0		–	3	8	–	10	
Output Disable Time	tLZ tHZ	2.0	R_L=1kΩ C_L=50pF	–	12	60	–	75	ns
		3.3		–	10	23	–	27	
		5.0		–	8	20	–	25	
Sine Wave Distortion Rate		3.0	R_L=10kΩ C_L=50pF f_{IN}=1kHz	–	0.05	–	–	–	%
-3dB Band Width		3.0	R_L=600kΩ, C_L=50pF $20\log \frac{V_{OUT}}{V_{IN}} = 10$ =- 3dB	–	200	–	–	–	MHz
Feed Through (Switch- off)		3.0	R_L=600kΩ C_L=50pF f_{IN}=1kHz	–	-60	–	–	–	dB
Cross Talk (Control Switch)		2.0	R_L=600kΩ C_L=50pF f_{IN}=1kHz	–	60	–	–	–	mV
		3.0		–	100	–	–	–	
		4.5		–	150	–	–	–	
Maximum Control Input Frequency		2.0	R_L=1kΩ C_L=15pF V_{OUT}=V_{CC}/2	–	30	–	–	–	MHz
		3.0		–	30	–	–	–	
		4.5		–	30	–	–	–	
Control Input Capacitance	C_{IN}	–		–	5	10	–	10	pF
Switch Input/Output Capacitance	$C_{IN/OUT}$	–		–	6	–	–	–	pF
Feed Through Capacitance	C_{IN-OUT}	–		–	0.5	–	–	–	pF
Power Dissipation Capacitance	C_{PD}	–		–	13	–	–	–	pF

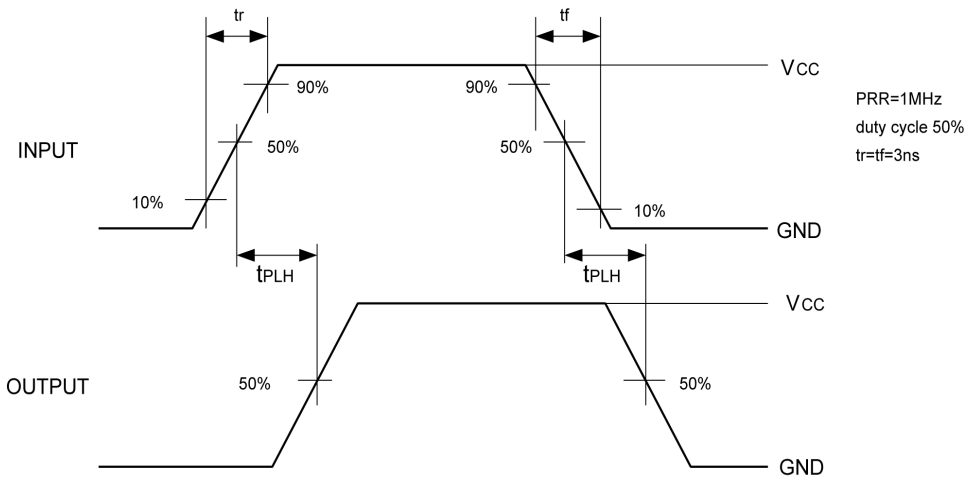
Note: C_{PD} is defined as the value of the internal equivalent capacitance which is derived from the operating supply current at times of "No Load".

Ensure that the average operating supply current at times of "No Load" meets the following conditions:

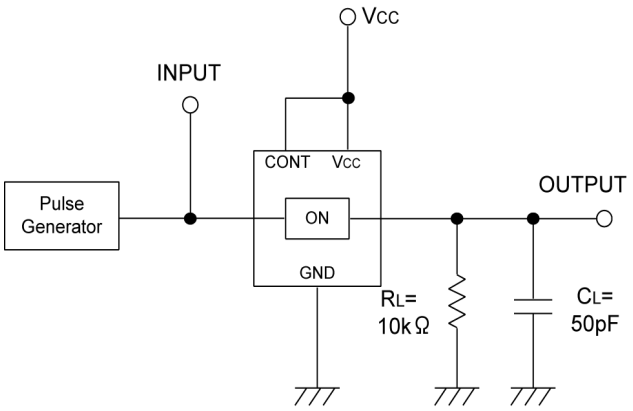
I_{CC} (opr)=C_{PD}・V_{CC}・F_{IN}+I_{CC}

■DELAY TIME

●WAVEFORM



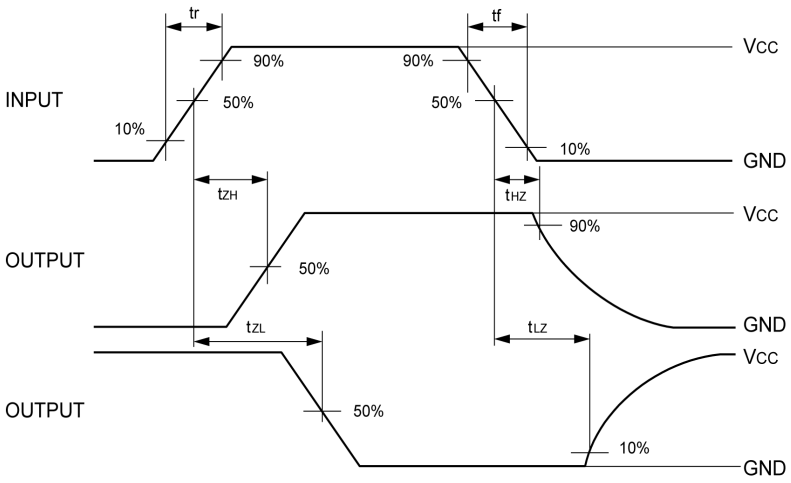
●TEST CIRCUIT



Note: Open output when measuring supply current

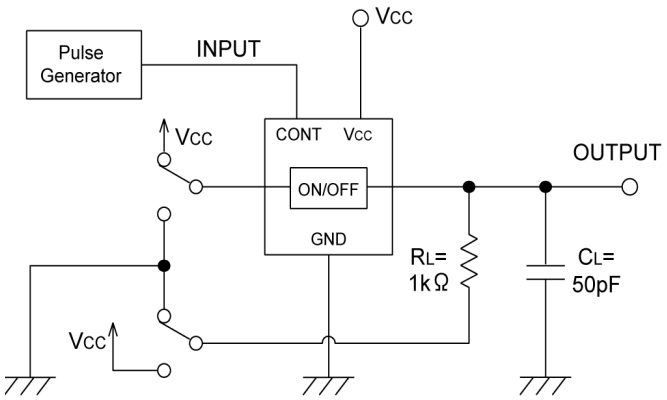
■OUTPUT ENABLE TIME, OUTPUT DISABLE TIME

●WAVEFORM

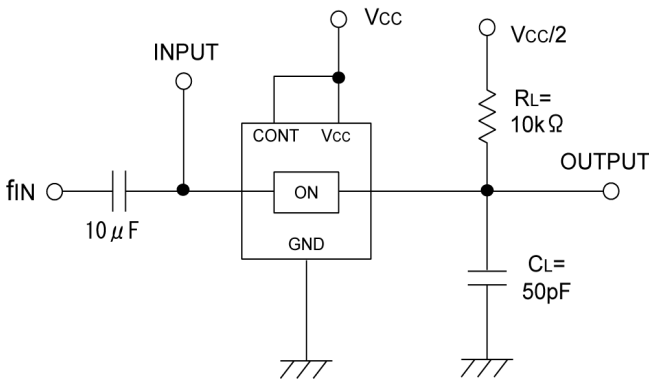


PRR =1 MHz
duty cycle 50%
tr =tf =3ns

●TEST CIRCUIT

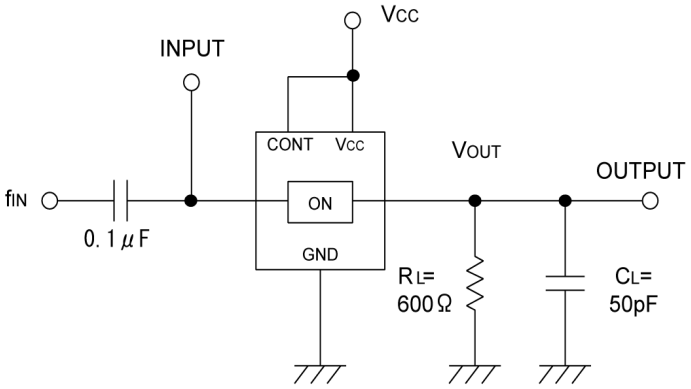


■SINE WAVE DISTORTION RATE



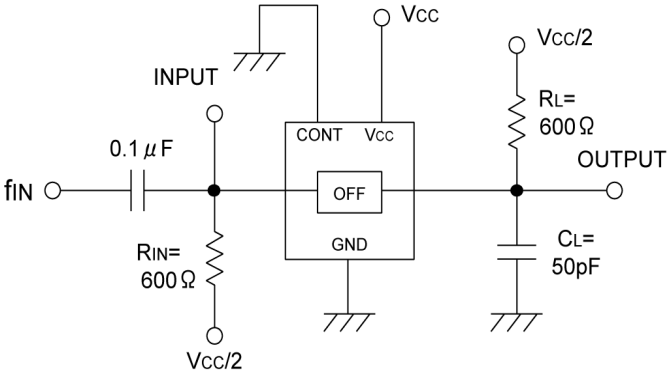
* Input by sine wave

■-3dB BAND WIDTH



* Input by sine wave

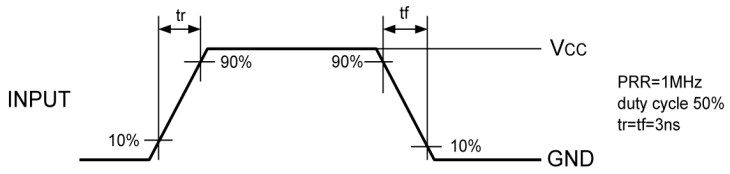
■FEED THROUGH TEST CIRCUIT



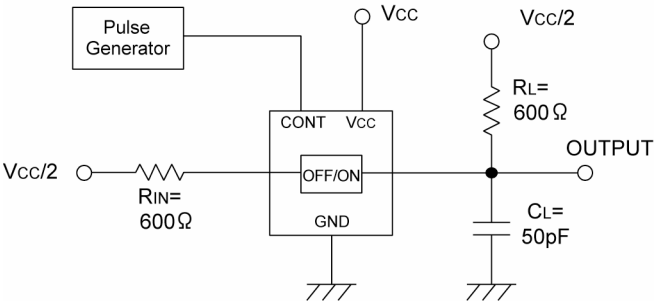
* Input by sine wave

■CROSS TALK

●WAVEFORM

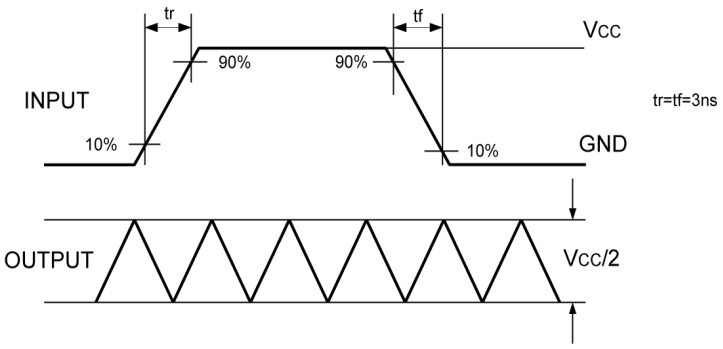


●TEST CIRCUIT

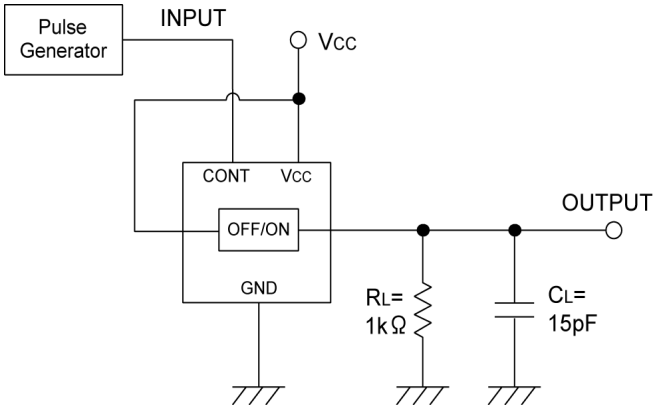


■MAXIMUM CONTROL INPUT FREQUENCY

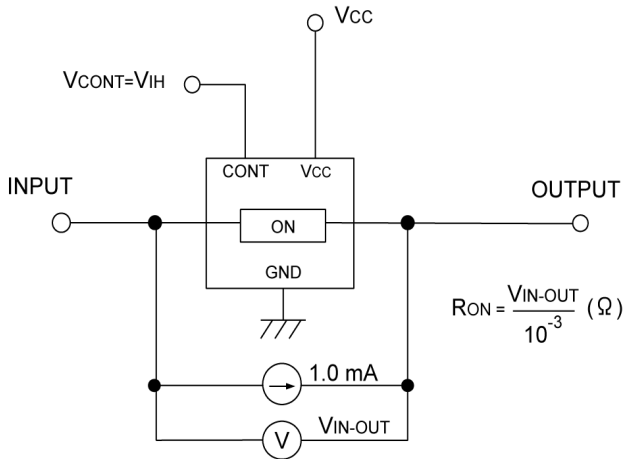
●WAVEFORM



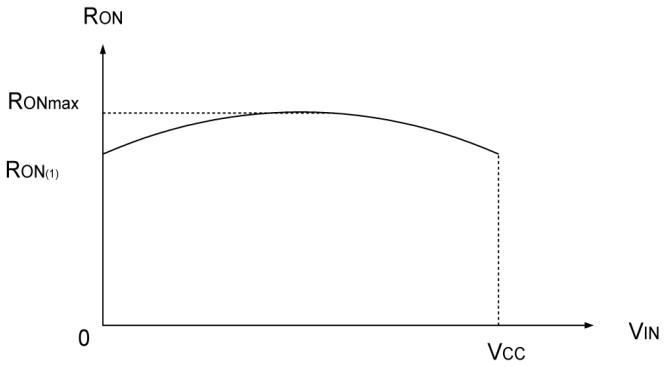
●TEST CIRCUIT



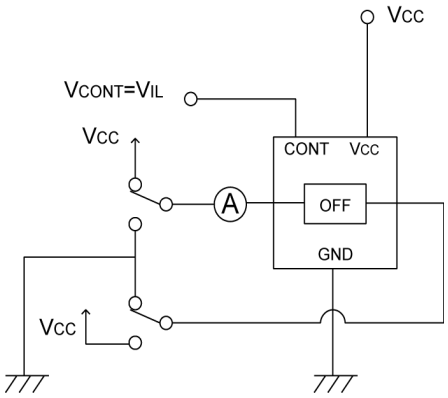
■ON RESISTANCE



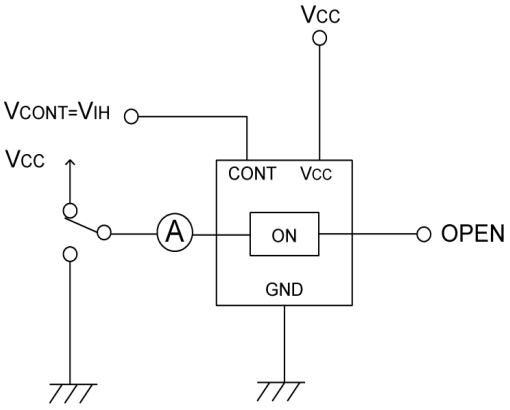
■VOLTAGE DEPENDANCIES OF ON RESISTANCE



■POWER OFF LEAK CURRENT



■POWER ON LEAK CURRENT



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