XC74UL00AA

ETR1302_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL00AA is a 2-input CMOS NAND Gate, manufactured using silicon gate CMOS fabrication.
CMOS low power circuit operation makes high speed LS-TTL operation achievable.
With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.
As the XC74UL00AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

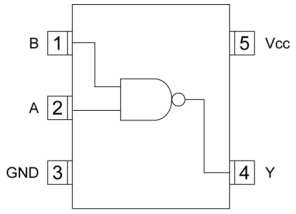
●Palmtops

●Digital equipment

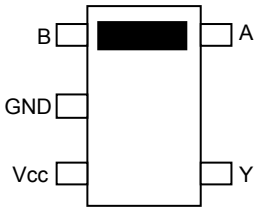
■FEATURES

High Speed Operation : tpd = 2.6ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption: 1 μA (MAX.)
CMOS 2-Input NAND Gate
Ultra Small Package : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION



SSOT-25
（TOP VIEW）
XC74UL00AAN



SON-6
（TOP VIEW）
XC74UL00AAR

■FUNCTIONS

INPUT		OUTPUT
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
*1）Ta=55℃
*2）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~V_{CC}	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	I_{OH}	3.0	-4	mA
		4.5	-8	
	I_{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns/V
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

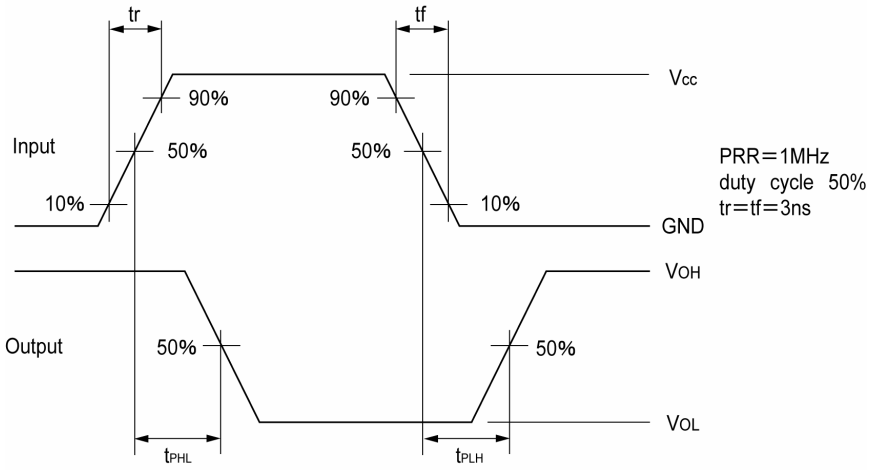
PARAMETER	SYMBOL	V_{CC} (V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Input Voltage	V_{IH}	2.0			1.5	–	–	1.5	–	V
		3.0			2.1	–	–	2.1	–	
		5.5			3.85	–	–	3.85	–	
	V_{IL}	2.0			–	–	0.5	–	0.5	V
		3.0			–	–	0.9	–	0.9	
		5.5			–	–	1.65	–	1.65	
Output Voltage	V_{OH}	2.0	V_{IN}=V_{IH} or V_{IL}	I_{OH}=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		I_{OH}=-4mA	2.58	–	–	2.48	–	
		4.5		I_{OH}=-8mA	3.94	–	–	3.80	–	
	V_{OL}	2.0	V_{IN}=V_{IH}	I_{OL}=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		I_{OL}=4mA	–	–	0.36	–	0.44	
		4.5		I_{OL}=8mA	–	–	0.36	–	0.44	
Input Current	I_{IN}	0~5.5	V_{IN}=V_{CC} or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND,I_{OUT}=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

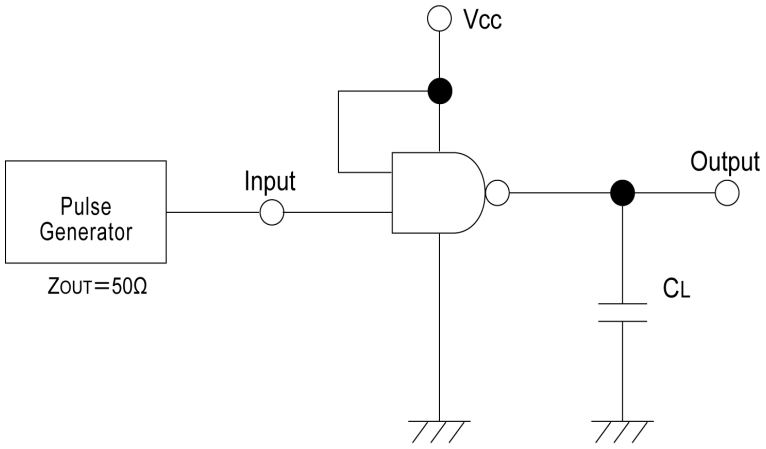
tr=tf=3ns

PARAMETER	SYMBOL	C_L	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	t_{PLH}	15pF	3.3		–	3.7	7.9	1.0	9.5	ns
			5.0		–	2.7	5.5	1.0	6.5	
		50pF	3.3		–	5.4	11.4	1.0	13.0	ns
			5.0		–	3.6	7.5	1.0	8.5	
	t_{PHL}	15pF	3.3		–	3.3	7.9	1.0	9.5	ns
			5.0		–	2.5	5.5	1.0	6.5	
		50pF	3.3		–	4.6	11.4	1.0	13.0	ns
			5.0		–	3.5	7.5	1.0	8.5	
Input Capacitance	C_{IN}	–	5.0	V_{IN}=V_{CC} or GND	–	2	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	9.3	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



Note: Open output when measuring supply current

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TOREX SEMICONDUCTOR LTD.

XC74UL02AA

TOREX

ETR1303_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL02AA is a 2-input CMOS NOR Gate, manufactured using silicon gate CMOS fabrication.
CMOS low power circuit operation makes high speed LS-TTL operation achievable.
With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.
As the XC74UL02AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

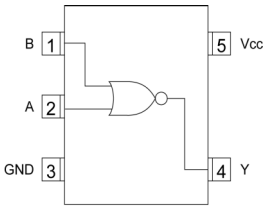
●Palmtops

●Digital equipment

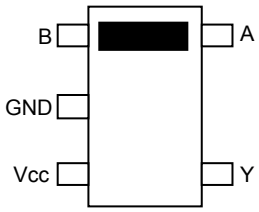
■FEATURES

High Speed Operation : tpd = 2.65ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption: 1μA (MAX.)
CMOS 2-Input NOR Gate
Ultra Small Packages : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION



SSOT-25
（TOP VIEW）
XC74UL02AAN



SON-6
（TOP VIEW）
XC74UL02AAR

■FUNCTIONS

INPUT		OUTPUT
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
*1）Ta=55℃
*2）Ta=25℃

■RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	Vcc(V)	CONDITIONS	UNITS
Supply Voltage	Vcc	–	2~5.5	V
Input Voltage	VIN	–	0~5.5	V
Output Voltage	VOUT	–	0~Vcc	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	IOH	3.0	-4	mA
		4.5	-8	
	IOL	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

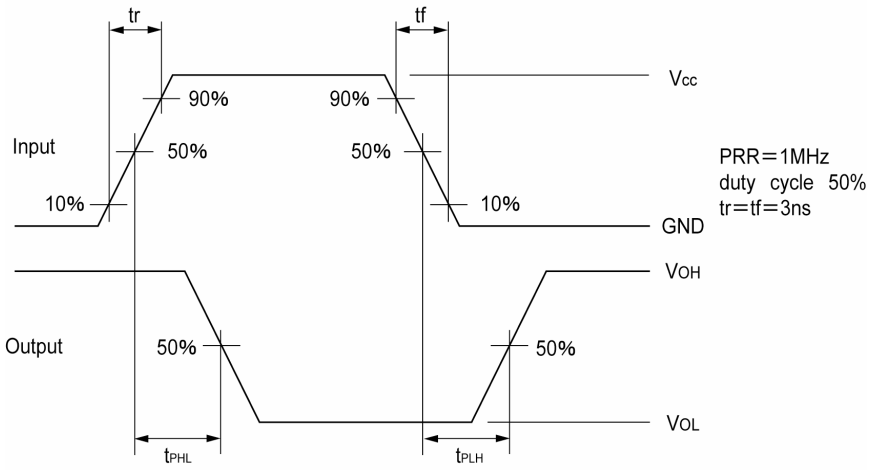
PARAMETER	SYMBOL	Vcc(V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Input Voltage	VIH	2.0			1.5	–	–	1.5	–	V
		3.0			2.1	–	–	2.1	–	
		5.5			3.85	–	–	3.85	–	
	VIL	2.0			–	–	0.5	–	0.5	V
		3.0			–	–	0.9	–	0.9	
		5.5			–	–	1.65	–	1.65	
Output Voltage	VOH	2.0	VIN=VIH	IOH=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		IOH=-4mA	2.58	–	–	2.48	–	
		4.5		IOH=-8mA	3.94	–	–	3.80	–	
	VOL	2.0	VIN=VIH	IOL=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		IOL=4mA	–	–	0.36	–	0.44	
		4.5		IOL=8mA	–	–	0.36	–	0.44	
Input Current	IIN	0~5.5	VIN=Vcc or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	ICC	5.5	VIN=Vcc or GND,IOUT=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

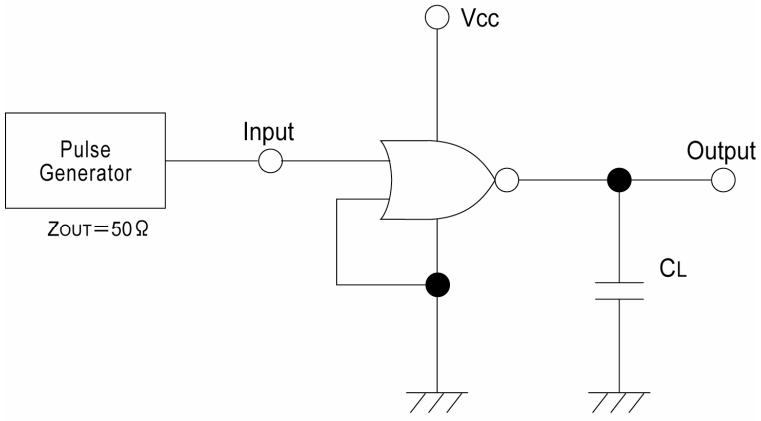
tr=tf=3ns

PARAMETER	SYMBOL	CL	Vcc(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	tPLH	15pF	3.3		–	3.9	7.9	1.0	9.5	ns
			5.0		–	2.7	5.5	1.0	6.5	
		50pF	3.3		–	5.5	11.4	1.0	13.0	ns
			5.0		–	3.9	7.5	1.0	8.5	
	tPHL	15pF	3.3		–	3.5	7.9	1.0	9.5	ns
			5.0		–	2.6	5.5	1.0	6.5	
		50pF	3.3		–	4.9	11.4	1.0	13.0	ns
			5.0		–	3.6	7.5	1.0	8.5	
Input Capacitance	CIN	–	5.0	VIN=Vcc or GND	–	4	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	9.7	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



Note: Open output when measuring supply current

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TOREX SEMICONDUCTOR LTD.

XC74UL04AA

TOREX

ETR1304_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL04AA is a CMOS inverter, manufactured using silicon gate CMOS fabrication.

CMOS low power circuit operation makes high speed LS-TTL operation achievable.

The internal circuit is composed of inverter and buffer, which provide high noise immunity and stable output.

As the XC74UL04AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

●Palmtops

●Digital equipment

■FEATURES

High Speed Operation : tpd = 2.05ns(TYP.)

Operating Voltage Range : 2V ~ 5.5V

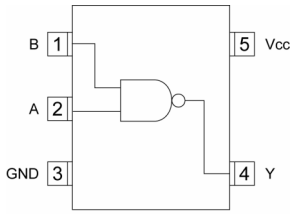
Low Power Consumption: 1 μA (MAX.)

CMOS Inverter

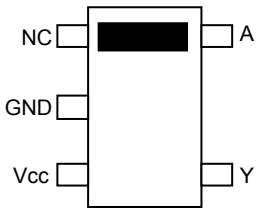
Ultra Small Packages : SSOT-25, SON-6*

* Under Development

■PIN CONFIGURATION



SSOT-25
（TOP VIEW）
XC74UL04AAN



SON-6
（TOP VIEW）
XC74UL04AAR

■FUNCTIONS

INPUT	OUTPUT
A	Y
H	L
L	H

H=High level

L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.

＊1）Ta=55℃

＊2）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~V_{CC}	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	I_{OH}	3.0	-4	mA
		4.5	-8	
	I_{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

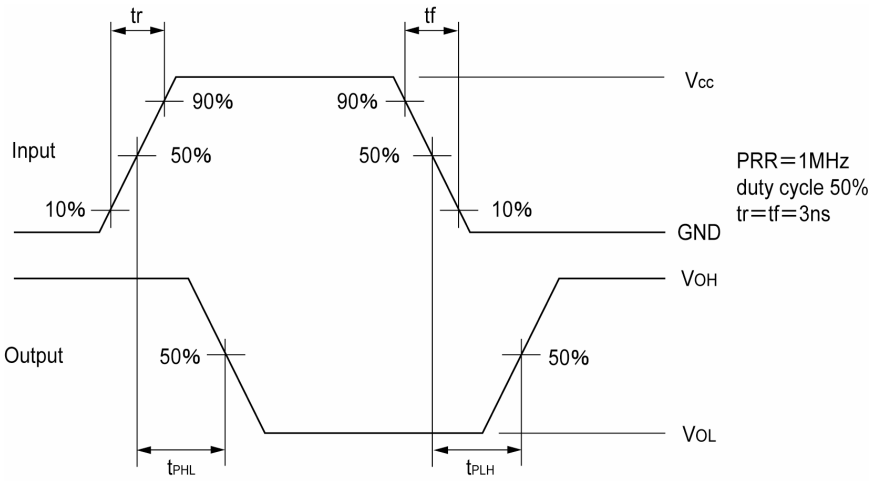
PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Input Voltage	V_{IH}	2.0			1.5	–	–	1.5	–	V
		3.0			2.1	–	–	2.1	–	
		5.5			3.85	–	–	3.85	–	
	V_{IL}	2.0			–	–	0.5	–	0.5	V
		3.0			–	–	0.9	–	0.9	
		5.5			–	–	1.65	–	1.65	
Output Voltage	V_{OH}	2.0	V_{IN}=V_{IL}	I_{OH}=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		I_{OH}=-4mA	2.58	–	–	2.48	–	
		4.5		I_{OH}=-8mA	3.94	–	–	3.80	–	
	V_{OL}	2.0	V_{IN}=V_{IH}	I_{OL}=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		I_{OL}=4mA	–	–	0.36	–	0.44	
		4.5		I_{OL}=8mA	–	–	0.36	–	0.44	
Input Current	I_{IN}	0~5.5	V_{IN}=V_{CC} or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND,I_{OUT}=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

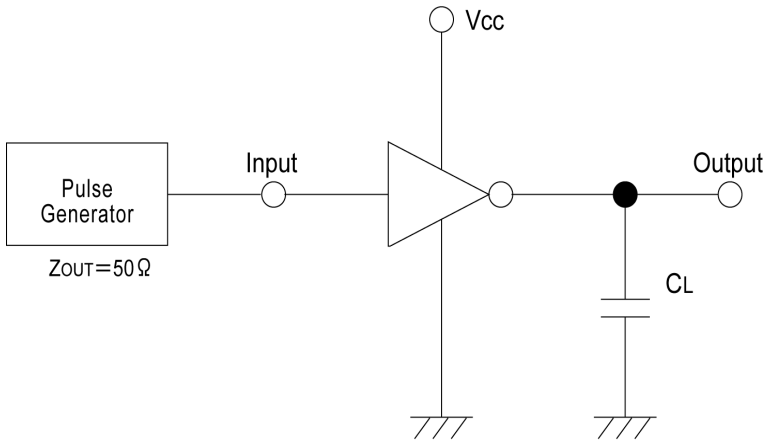
tr=tf=3ns

PARAMETER	SYMBOL	C_L	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	t_{PLH}	15pF	3.3		–	2.7	7.1	1.0	8.5	ns
			5.0		–	2.1	5.5	1.0	6.5	
		50pF	3.3		–	4.1	10.6	1.0	12.0	ns
			5.0		–	3.2	7.5	1.0	8.5	
	t_{PHL}	15pF	3.3		–	2.5	7.1	1.0	8.5	ns
			5.0		–	2.0	5.5	1.0	6.5	
		50pF	3.3		–	3.9	10.6	1.0	12.0	ns
			5.0		–	3.0	7.5	1.0	8.5	
Input Capacitance	C_{IN}	–	5.0	V_{IN}=V_{CC} or GND	–	2	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	8.9	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



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TOREX SEMICONDUCTOR LTD.

XC74UL08AA

TOREX

ETR1305_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL08AA is a 2-input CMOS AND Gate, manufactured using silicon gate CMOS fabrication.
CMOS low power circuit operation makes high speed LS-TTL operation achievable.
With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.
As the XC74UL08AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

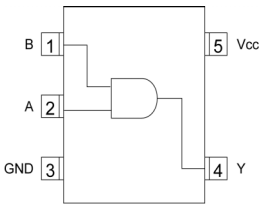
●Palmtops

●Digital equipment

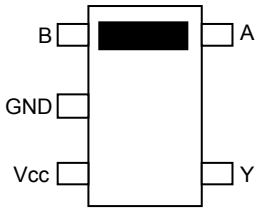
■FEATURES

High Speed Operation : tpd = 2.6ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption: 1 μA (MAX.)
CMOS 2-Input AND Gate
Ultra Small Packages : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION



SSOT-25
(TOP VIEW)
XC74UL08AAN



SON-6
(TOP VIEW)
XC74UL08AAR

■FUNCTIONS

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
*1) Ta=55℃
*2) 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~V_{CC}	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	I_{OH}	3.0	-4	mA
		4.5	-8	
	I_{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

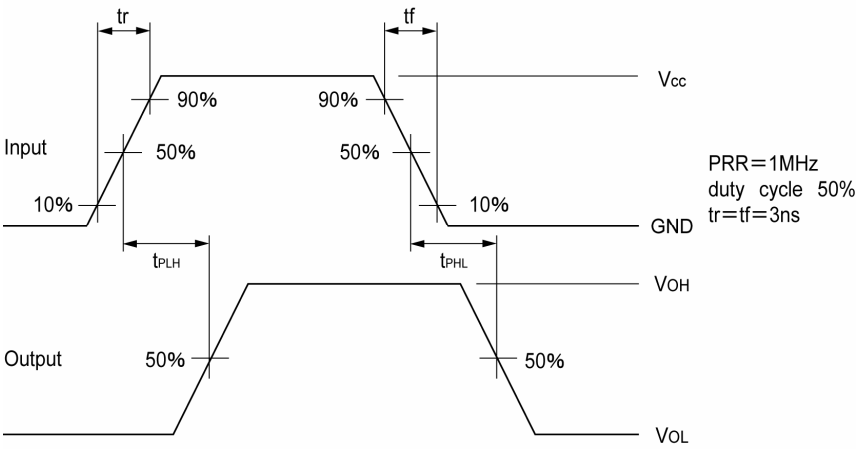
PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Input Voltage	V_{IH}	2.0			1.5	–	–	1.5	–	V
		3.0			2.1	–	–	2.1	–	
		5.5			3.85	–	–	3.85	–	
	V_{IL}	2.0			–	–	0.5	–	0.5	V
		3.0			–	–	0.9	–	0.9	
		5.5			–	–	1.65	–	1.65	
Output Voltage	V_{OH}	2.0	V_{IN}=V_{IH}	I_{OH}=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		I_{OH}=-4mA	2.58	–	–	2.48	–	
		4.5		I_{OH}=-8mA	3.94	–	–	3.80	–	
	V_{OL}	2.0	V_{IN}=V_{IH} or V_{IL}	I_{OL}=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		I_{OL}=4mA	–	–	0.36	–	0.44	
		4.5		I_{OL}=8mA	–	–	0.36	–	0.44	
Input Current	I_{IN}	5.5	V_{IN}=V_{CC} or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND,I_{OUT}=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

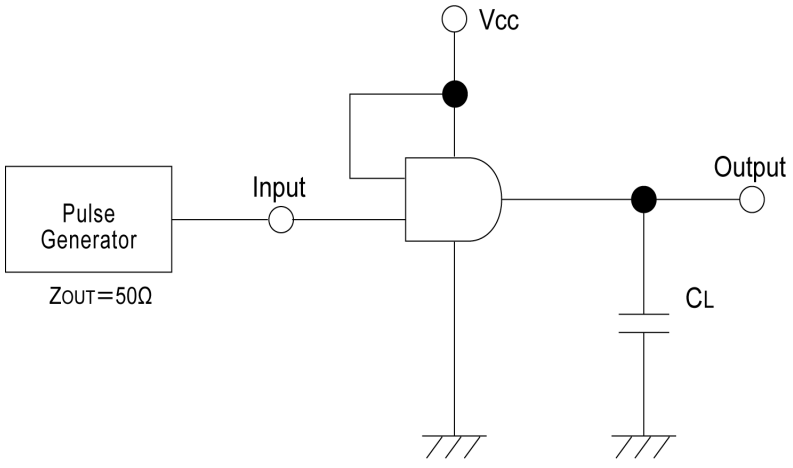
tr=tf=3ns

PARAMETER	SYMBOL	C_L	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	tPLH	15pF	3.3		–	3.7	8.8	1.0	10.5	ns
			5.0		–	2.8	5.9	1.0	7.0	
		50pF	3.3		–	5.2	12.3	1.0	14.0	ns
			5.0		–	3.7	7.9	1.0	9.0	
	tPHL	15pF	3.3		–	3.2	8.8	1.0	10.5	ns
			5.0		–	2.4	5.9	1.0	7.0	
		50pF	3.3		–	4.5	12.3	1.0	14.0	ns
			5.0		–	3.4	7.9	1.0	9.0	
Input Capacitance	C_{IN}	–	5.0	V_{IN}=V_{CC} or GND	–	4	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	9.3	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



Note: Open output when measuring supply current

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TOREX SEMICONDUCTOR LTD.

XC74UL14AA

TOREX

ETR1306_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL14AA is a CMOS schmitt trigger inverter, manufactured using silicon gate CMOS fabrication.
CMOS low power circuit operation makes high speed LS-TTL operation achievable.
With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.
As the XC74UL14AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

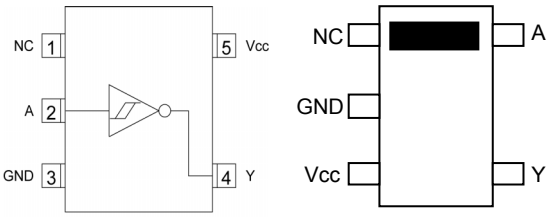
●Palmtops

●Digital equipment

■FEATURES

High Speed Operation : tpd = 2.3ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption: 1μA (MAX.)
CMOS Schmitt Trigger Inverter
Ultra Small Packages : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION



SSOT-25
（TOP VIEW）
XC74UL14AAN

SON-6
（TOP VIEW）
XC74UL14AAR

■FUNCTIONS

INPUT	OUTPUT
A	Y
H	L
L	H

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
＊1）Ta=55℃
＊2）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~V_{CC}	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	I_{OH}	3.0	-4	mA
		4.5	-8	
	I_{OL}	3.0	4	
		4.5	8	

■DC ELECTRICAL CHARACTERISTICS

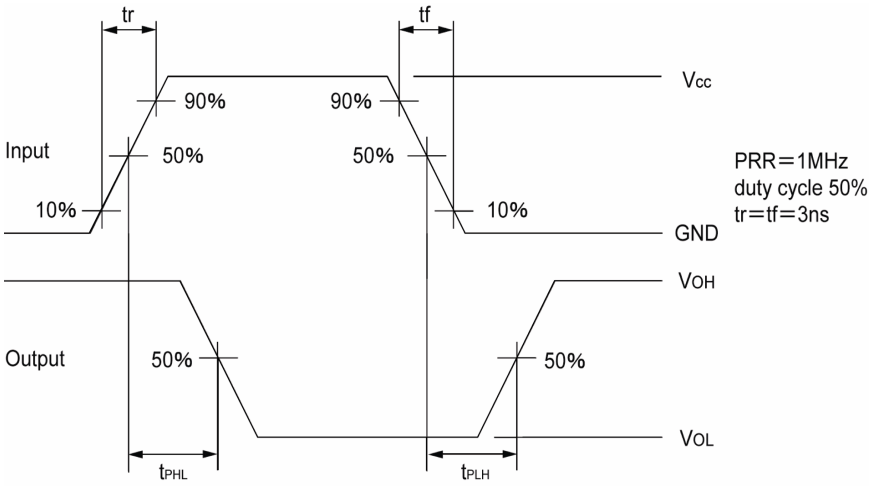
PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Threshold Voltage	V_{T+}	2.0			–	–	2.2	–	2.2	V
		3.0			–	–	3.15	–	3.15	
		5.5			–	–	3.85	–	3.85	
	V_{T-}	2.0			0.9	–	–	0.9	–	V
		3.0			1.35	–	–	1.35	–	
		5.5			1.65	–	–	1.65	–	
Hysteresis Voltage	V_H	3.0			0.25	–	1.2	0.25	1.2	
		4.5			0.30	–	1.4	0.30	1.4	
		5.5			0.35	–	1.6	0.35	1.6	
Output Voltage	V_{OH}	2.0	V_{IN}=V_{IL}	I_{OH}=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		I_{OH}=-4mA	2.58	–	–	2.48	–	
		4.5		I_{OH}=-8mA	3.94	–	–	3.80	–	
	V_{OL}	2.0	V_{IN}=V_{IH}	I_{OL}=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		I_{OL}=4mA	–	–	0.36	–	0.44	
		4.5		I_{OL}=8mA	–	–	0.36	–	0.44	
Input Current	I_{IN}	5.5	V_{IN}=V_{CC} or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND,I_{OUT}=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

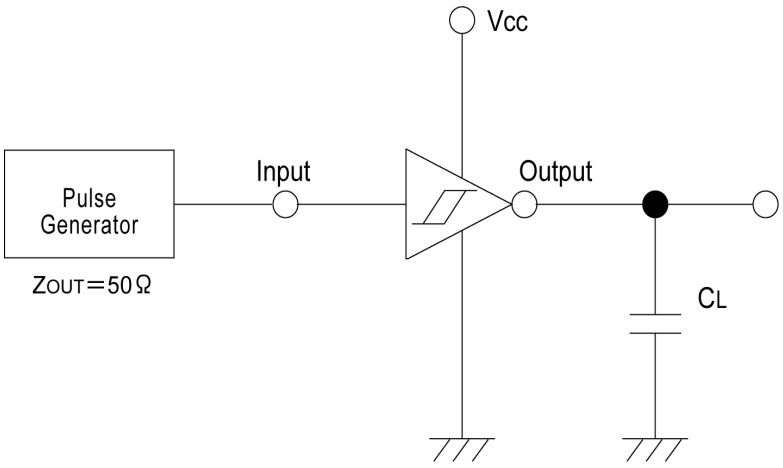
tr=tf=3ns

PARAMETER	SYMBOL	C_L	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	tPLH	15pF	3.3		–	2.8	12.8	1.0	15.0	ns
			5.0		–	2.1	8.6	1.0	10.0	
		50pF	3.3		–	4.3	16.3	1.0	18.5	ns
			5.0		–	3.1	10.6	1.0	12.0	
	tPHL	15pF	3.3		–	3.1	12.8	1.0	15.0	ns
			5.0		–	2.5	8.6	1.0	10.0	
		50pF	3.3		–	4.4	16.3	1.0	18.5	ns
			5.0		–	3.4	10.6	1.0	12.0	
Input Capacitance	C_{IN}	–	5.0	V_{IN}=V_{CC} or GND	–	2	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	10	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



Note: Open output when measuring supply current

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TOREX SEMICONDUCTOR LTD.

XC74UL32AA

TOREX

ETR1307_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL32AA is a 2-input CMOS OR Gate, manufactured using silicon gate CMOS fabrication.
CMOS low power circuit operation makes high speed LS-TTL operation achievable.
With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.
As the XC74UL32AA is integrated into mini molded, SSOT-25 and SON-6 ackage, high density mounting is possible.

■APPLICATIONS

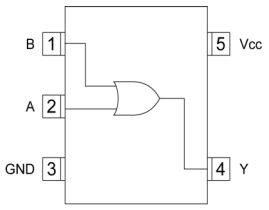
●Palmtops

●Digital equipment

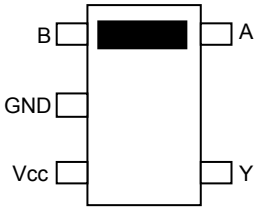
■FEATURES

High Speed Operation : tpd = 3.8ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption: 1μA (MAX.)
CMOS 2-Input OR Gate
Ultra Small Packages : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION



SSOT-25
（TOP VIEW）
XC74UL32AAN



SON-6
（TOP VIEW）
XC74UL32AAR

■FUNCTIONS

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
＊1）Ta=55℃
＊2）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~V_{CC}	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	I_{OH}	3.0	-4	mA
		4.5	-8	
	I_{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

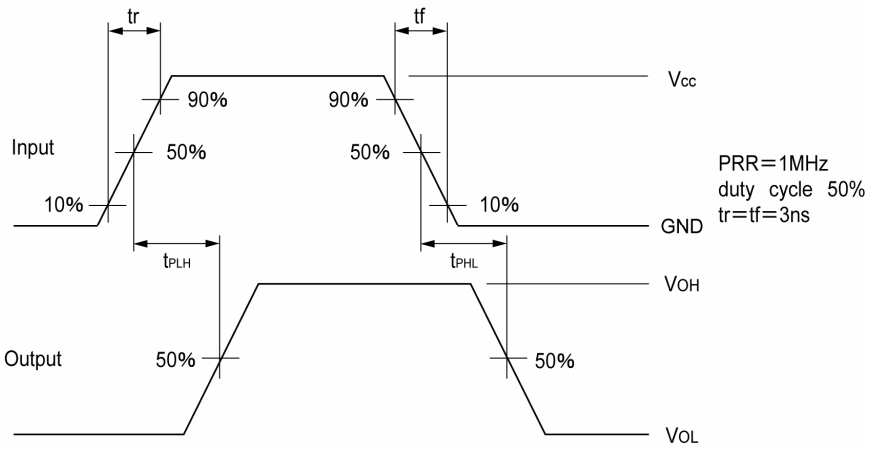
PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Input Voltage	V_{IH}	2.0			1.5	–	–	1.5	–	V
		3.0			2.1	–	–	2.1	–	
		5.5			3.85	–	–	3.85	–	
	V_{IL}	2.0			–	–	0.5	–	0.5	V
		3.0			–	–	0.9	–	0.9	
		5.5			–	–	1.65	–	1.65	
Output Voltage	V_{OH}	2.0	V_{IN}=V_{IH} or V_{IL}	I_{OH}=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		I_{OH}=-4mA	2.58	–	–	2.48	–	
		4.5		I_{OH}=-8mA	3.94	–	–	3.80	–	
	V_{OL}	2.0	V_{IN}=V_{IL}	I_{OL}=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		I_{OL}=4mA	–	–	0.36	–	0.44	
		4.5		I_{OL}=8mA	–	–	0.36	–	0.44	
Input Current	I_{IN}	5.5	V_{IN}=V_{CC} or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND,I_{OUT}=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

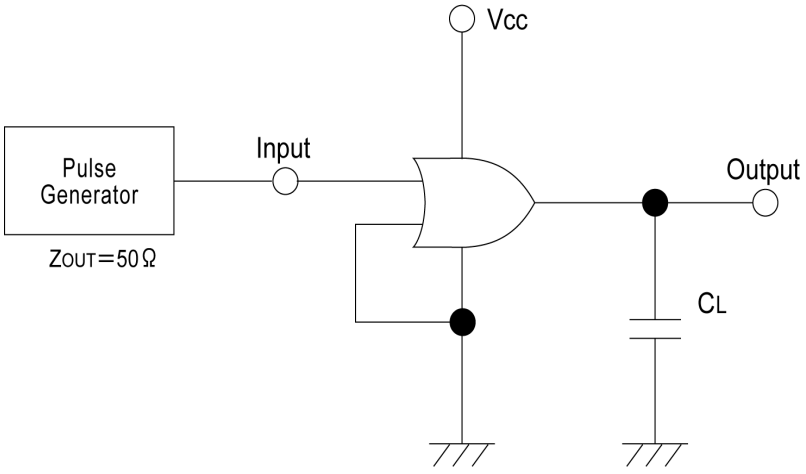
tr=tf=3ns

PARAMETER	SYMBOL	C_L	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	tPLH	15pF	3.3		–	5.5	7.9	1.0	9.5	ns
			5.0		–	3.8	5.5	1.0	6.5	
		50pF	3.3		–	8.0	11.4	1.0	13.0	ns
			5.0		–	5.3	7.5	1.0	8.5	
	tPHL	15pF	3.3		–	5.5	7.9	1.0	9.5	ns
			5.0		–	3.8	5.5	1.0	6.5	
		50pF	3.3		–	8.0	11.4	1.0	13.0	ns
			5.0		–	5.3	7.5	1.0	8.5	
Input Capacitance	C_{IN}	–	5.0	V_{IN}=V_{CC} or GND	–	2	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	8.9	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



Note: Open output when measuring supply current

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TOREX SEMICONDUCTOR LTD.

XC74UL4066

ETR1308_003a

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 package, high density mounting is possible.

■APPLICATIONS

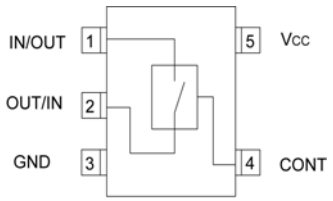
●Palmtops

●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 Package : SSOT-25

■PIN CONFIGURATION



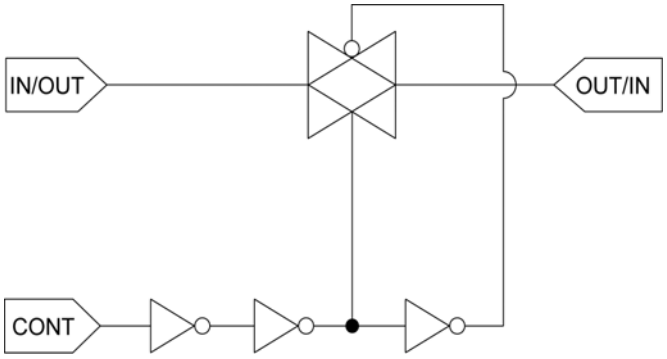
SSOT-25
（TOP VIEW）

■PRODUCT CLASSIFICATION

●Ordering Information

PRODUCT NAME	PACKAGE	ORDER UNIT
XC74UL4066NR	SSOT-25	3,000/Reel

■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*	Pd	150	mW
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	R_{ONmax}	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	Vcc(V)	CONDITIONS	Ta=25℃			Ta=-40℃~85℃		UNITS
				MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	tPLH tPHL	2.0	RL=10kΩ CL=50pF	–	4	20	–	23	ns
		3.3		–	3	6	–	8	
		5.0		–	2	5	–	6	
Output Enable Time	tZL tZH	2.0	RL=1kΩ CL=50pF	–	9	50	–	65	ns
		3.3		–	5	10	–	12	
		5.0		–	3	8	–	10	
Output Disable Time	tLZ tHZ	2.0	RL=1kΩ CL=50pF	–	12	60	–	75	ns
		3.3		–	10	23	–	27	
		5.0		–	8	20	–	25	
Sine Wave Distortion Rate		3.0	RL=10kΩ CL=50pF fIN=1kHz	–	0.05	–	–	–	%
-3dB Band Width		3.0	RL=600kΩ, CL=50pF $20\log \frac{V_{OUT}}{V_{IN}} = 10 = -3dB$	–	200	–	–	–	MHz
Feed Through (Switch- off)		3.0	RL=600kΩ CL=50pF fIN=1kHz	–	-60	–	–	–	dB
Cross Talk (Control Switch)		2.0	RL=600kΩ CL=50pF fIN=1kHz	–	60	–	–	–	mV
		3.0		–	100	–	–	–	
		4.5		–	150	–	–	–	
Maximum Control Input Frequency		2.0	RL=1kΩ CL=15pF VOUT=Vcc/2	–	30	–	–	–	MHz
		3.0		–	30	–	–	–	
		4.5		–	30	–	–	–	
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

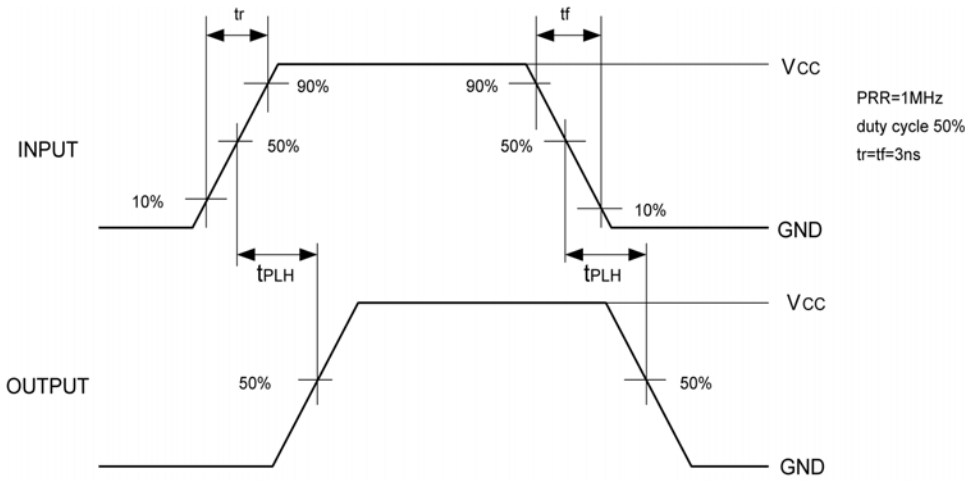
Note: CPD is defined as the value of the internal equivalent capacitance which is derived from the operating supply current at times of "No Load".

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

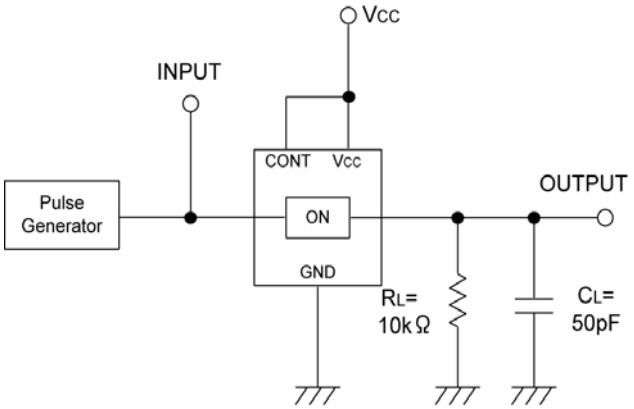
ICC (opr)=CPD・VCC・FIN+ICC

■DELAY TIME

●WAVEFORM



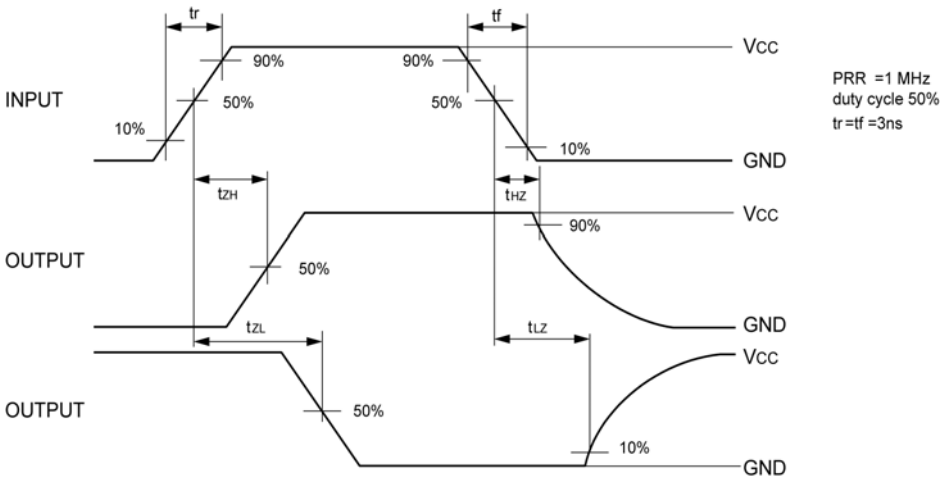
●TEST CIRCUIT



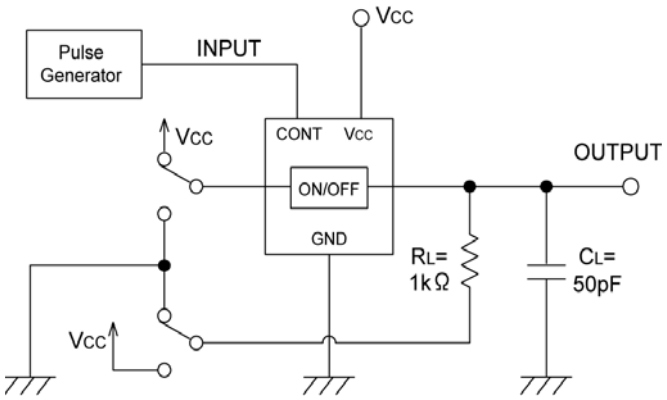
Note: Open output when measuring supply current

■OUTPUT ENABLE TIME, OUTPUT DISABLE TIME

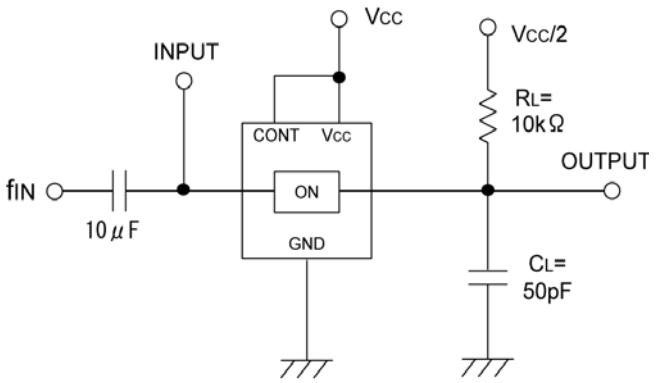
●WAVEFORM



●TEST CIRCUIT

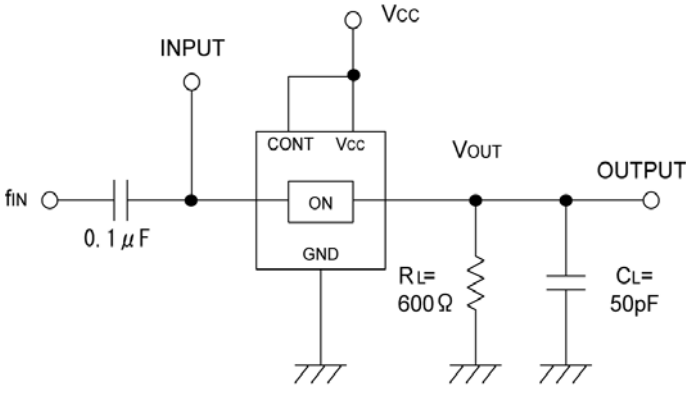


■SINE WAVE DISTORTION RATE



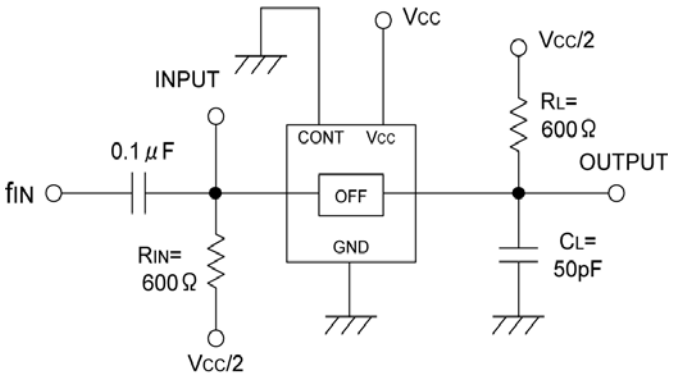
* Input by sine wave

■-3dB BAND WIDTH



* Input by sine wave

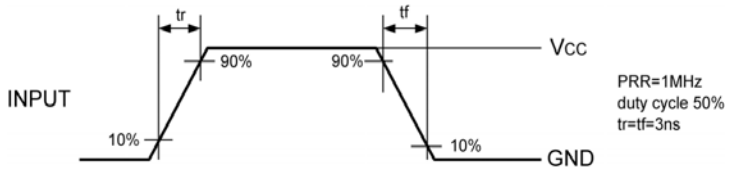
■FEED THROUGH TEST CIRCUIT



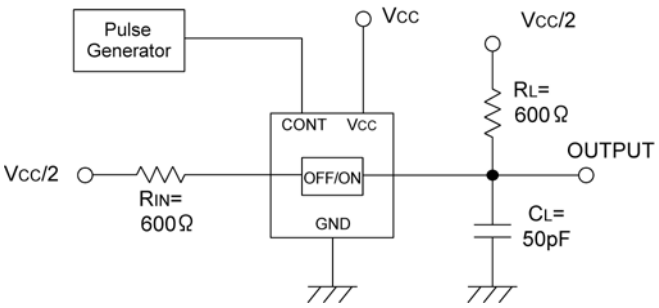
* Input by sine wave

■CROSS TALK

●WAVEFORM

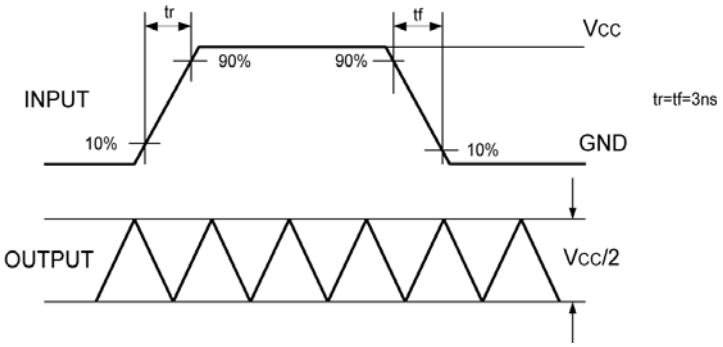


●TEST CIRCUIT

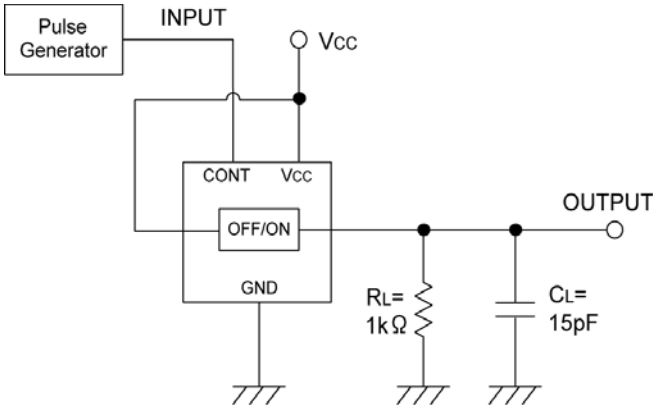


■MAXIMUM CONTROL INPUT FREQUENCY

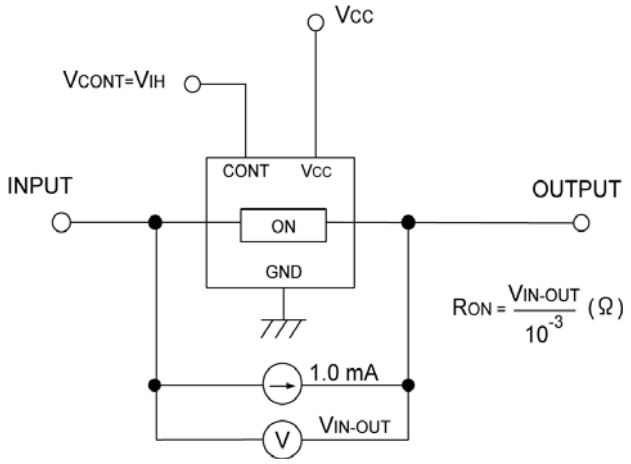
●WAVEFORM



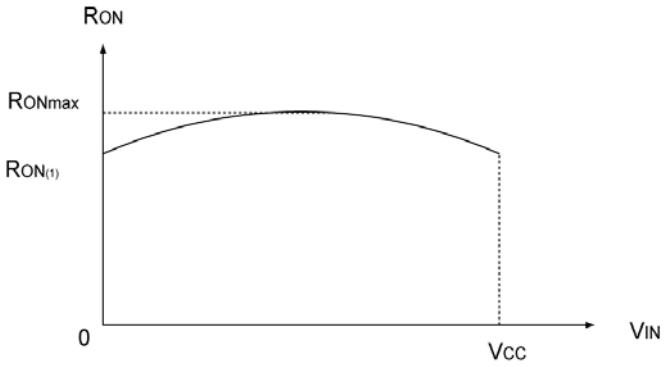
●TEST CIRCUIT



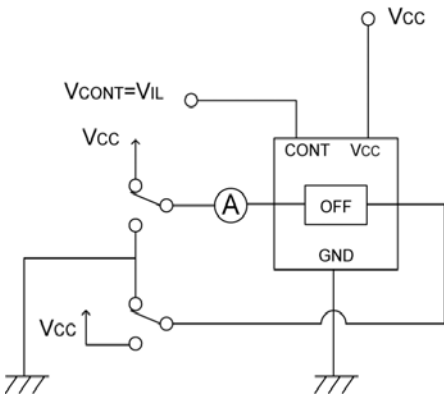
■ON RESISTANCE



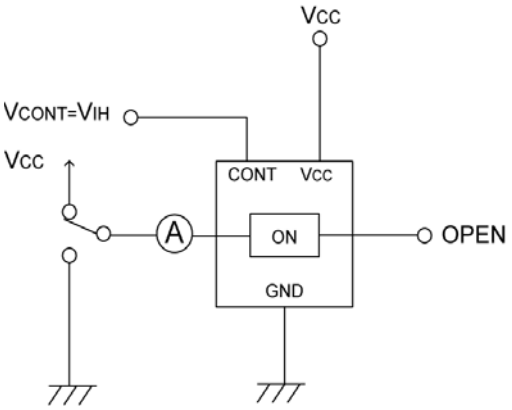
■VOLTAGE DEPENDANCIES OF ON RESISTANCE



■POWER OFF LEAK CURRENT



■POWER ON LEAK CURRENT



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TOREX SEMICONDUCTOR LTD.

XC74UL86AA

TOREX

ETR1309_002

CMOS Logic

■GENERAL DESCRIPTION

The XC74UL86AA is a 2-input CMOS exclusive-OR Gate, manufactured using silicon gate CMOS fabrication.
CMOS low power circuit operation makes high speed LS-TTL operation achievable.
With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.
As the XC74UL86AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■APPLICATIONS

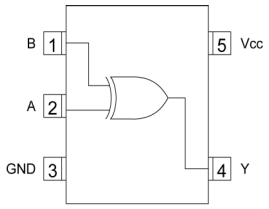
●Palmtops

●Digital equipment

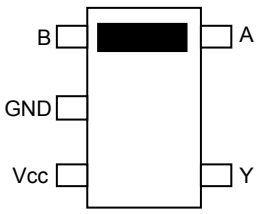
■FEATURES

High Speed Operation : tpd = 3.1ns (TYP.)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption: 1 μA (MAX.)
CMOS 2-Input Exclusive-OR Gate
Ultra Small Packages : SSOT-25, SON-6*
* Under Development

■PIN CONFIGURATION



SSOT-25
（TOP VIEW）
XC74UL86AAN



SON-6
（TOP VIEW）
XC74UL86AAR

■FUNCTIONS

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

H=High level
L=Low level

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER		SYMBOL	RATINGS	UNITS
Supply Voltage		VCC	-0.5~+6.0	V
Input Voltage		VIN	-0.5~+6.0	V
Output Voltage		VOUT	-0.5~VCC+0.5	V
Input Diode Current		IIK	-20	mA
Output Diode Current		IOK	±20	mA
Output Current		IOUT	±25	mA
VCC,GND Current		ICC,IGND	±50	mA
Power Dissipation	SSOT-25*1	Pd	150	mW
	SON-6*2		200	
Storage Temperature Range		Tstg	-65~+150	℃

Voltage is all ground standardized.
＊1）Ta=55℃
＊2）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~V_{CC}	V
Operating Temperature Range	Topr	–	-40~+85	℃
Output Current	I_{OH}	3.0	-4	mA
		4.5	-8	
	I_{OL}	3.0	4	
		4.5	8	
Input Rise and Fall Time	tr,tf	3.3	0~100	ns
		5.0	0~20	

■DC ELECTRICAL CHARACTERISTICS

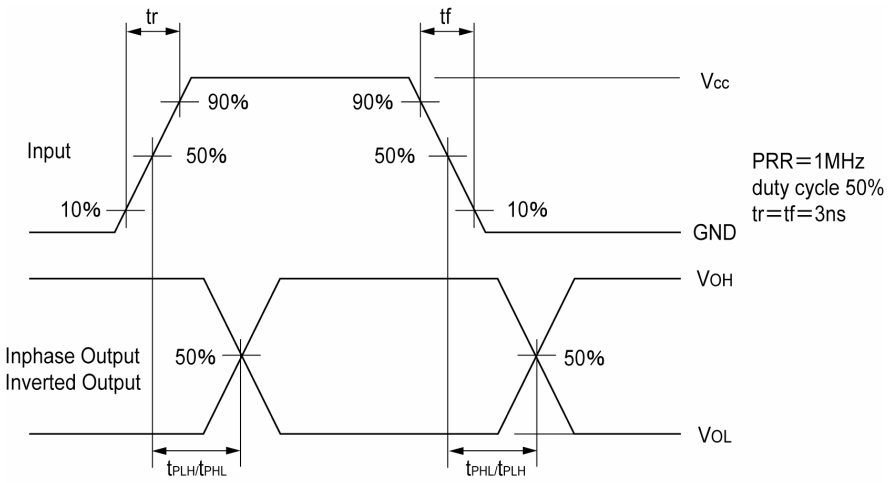
PARAMETER	SYMBOL	V_{CC}(V)	CONDITIONS		Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Input Voltage	V_{IH}	2.0			1.5	–	–	1.5	–	V
		3.0			2.1	–	–	2.1	–	
		5.5			3.85	–	–	3.85	–	
	V_{IL}	2.0			–	–	0.5	–	0.5	V
		3.0			–	–	0.9	–	0.9	
		5.5			–	–	1.65	–	1.65	
Output Voltage	V_{OH}	2.0	V_{IN}=V_{IH} or V_{IL}	I_{OH}=-50μA	1.9	2.0	–	1.9	–	V
		3.0			2.9	3.0	–	2.9	–	
		4.5			4.4	4.5	–	4.4	–	
		3.0		I_{OH}=-4mA	2.58	–	–	2.48	–	
		4.5		I_{OH}=-8mA	3.94	–	–	3.80	–	
	V_{OL}	2.0	V_{IN}=V_{IH} or V_{IL}	I_{OL}=50μA	–	–	0.1	–	0.1	V
		3.0			–	–	0.1	–	0.1	
		4.5			–	–	0.1	–	0.1	
		3.0		I_{OL}=4mA	–	–	0.36	–	0.44	
		4.5		I_{OL}=8mA	–	–	0.36	–	0.44	
Input Current	I_{IN}	5.5	V_{IN}=V_{CC} or GND		-0.1	–	0.1	-1.0	1.0	μA
Static Supply Current	I_{CC}	5.5	V_{IN}=V_{CC} or GND,I_{OUT}=0μA		–	–	1.0	–	10.0	

■SWITCHING ELECTRICAL CHARACTERISTICS

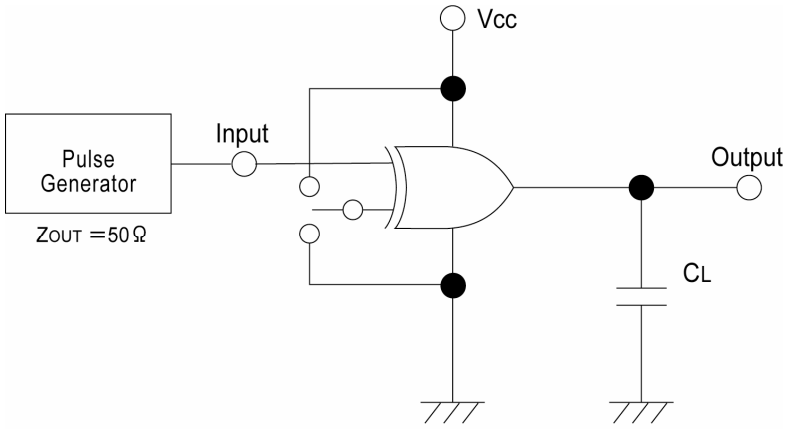
tr=tf=3ns

PARAMETER	SYMBOL	C_L	V_{CC}(V)	CONDITIONS	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40℃~85℃ MIN.	Ta=-40℃~85℃ MAX.	UNITS
Delay Time	tPLH	15pF	3.3		–	4.4	11.0	1.0	13.0	ns
			5.0		–	3.3	6.8	1.0	8.0	
		50pF	3.3		–	6.1	14.5	1.0	16.5	ns
			5.0		–	4.4	8.8	1.0	10.0	
	tPHL	15pF	3.3		–	4.0	11.0	1.0	13.0	ns
			5.0		–	2.9	6.8	1.0	8.0	
		50pF	3.3		–	5.6	14.5	1.0	16.5	ns
			5.0		–	4.1	8.8	1.0	10.0	
Input Capacitance	C_{IN}	–	5.0	V_{IN}=V_{CC} or GND	–	4	10	–	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			–	12	–	–	–	pF

■WAVEFORM



■TEST CIRCUIT



Note: Open output when measuring supply current

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