XC74WL74AASR

CMOS Logic

◆CMOS Logic D-Type Flip Flop
◆Operating Voltage Range : 2V ~ 5.5V
◆High Speed Operations : fmax = 170MHz (TYP.)
◆Low Power Consumption : 1 μ A(MAX.)
◆MSOP-8B Package

■APPLICATIONS

●Palmtops

●Digital equipment

■GENERAL DESCRIPTION

XC74WL74AASR is d-type flip flop 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 operations which enables LS-TTL.

With wave forming buffers connected internally, stabilized output can be achieved as the series offers high noise immunity.

As the series is integrated into a mini molded, MSOP-8B package, high density mounting is possible.
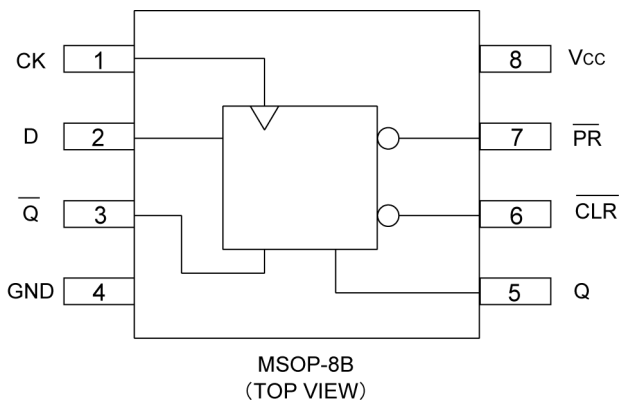
■FEATURES

High Speed Operations : fmax = 170MHz (TYP.) (V_{CC}=5V)
Operating Voltage Range : 2V ~ 5.5V
Low Power Consumption : 1 μ A (MAX.)
Small Package : MSOP-8B

■PIN CONFIGURATION

CK	1		8	V_{CC}
D	2		7	$\overline{PR}$
$\overline{Q}$	3		6	$\overline{CLR}$
GND	4		5	Q

MSOP-8B
（TOP VIEW）

■FUNCTIONS

INPUT				OUTPUT	
$\overline{PR}$	$\overline{CLR}$	CK	D	Q	$\overline{Q}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H	H
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	↓	X	Q_0	$\overline{Q_0}$

H=High level

L=Low level

X=Don't care

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■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER	SYMBOL	CONDITIONS	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
Switch Output Current	IOUT	±25	mA
VCC,GND Current	ICC,IGND	±50	mA
Power Dissipation (Ta = 25℃)	Pd	300	mW
Storage Temperature Range	Tstg	-65~+150	℃

Note; Voltage is all ground standardized.

■RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	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	℃
Input Rise and Fall Time	tr, tf	0~200 （VCC=3.3V）	ns
		0~100 （Vcc=5V）	

■DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	Vcc(V)	CONDITIONS		Ta=25℃			Ta=-40℃~85℃		UNITS
					MIN.	TYP.	MAX.	MIN.	MAX.	
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		IOH=-50μA	1.9	2.0	—	1.9	—	V
		3.0			2.9	3.0	—	2.9	—	
		4.5	VIN=VIL		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		IOL=50μA	—	—	0.1	—	0.1	V
		3.0			—	—	0.1	—	0.1	
		4.5	VIN=VIL or VIH		—	—	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	μA

■SWITCHING ELECTRICAL CHARACTERISTICS

(tr=tf=3ns)

PARAMETER	SYMBOL	CL	Vcc(V)	CONDITIONS	Ta=25℃			Ta=-40℃~85℃		UNITS
					MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time (CK-Q Q̄)	tPLH	15pF	3.3		—	6.7	11.9	1.0	14.0	ns
			5.0		—	4.6	7.3	1.0	8.5	
		50pF	3.3		—	9.2	15.4	1.0	17.5	ns
			5.0		—	6.1	9.3	1.0	10.5	
	tPHL	15pF	3.3		—	6.7	11.9	1.0	14.0	ns
			5.0		—	4.6	7.3	1.0	8.5	
		50pF	3.3		—	9.2	15.4	1.0	17.5	ns
			5.0		—	6.1	9.3	1.0	10.5	
Delay Time (P̄R̄, C̄L̄R̄-Q, Q̄)	tPLH	15pF	3.3		—	7.6	12.3	1.0	14.5	ns
			5.0		—	4.8	7.7	1.0	9.0	
		50pF	3.3		—	10.1	15.8	1.0	18.0	ns
			5.0		—	6.3	9.7	1.0	11.0	
	tPHL	15pF	3.3		—	7.6	12.3	1.0	14.5	ns
			5.0		—	4.8	7.7	1.0	9.0	
		50pF	3.3		—	10.1	15.8	1.0	18.0	ns
			5.0		—	6.3	9.7	1.0	11.0	
Minimum Set Up Time	ts(L)	—	3.3		6.0	—	—	7.0	—	ns
	ts(H)	—	5.0		5.0	—	—	5.0	—	
Minimum Hold Time	th(L)	—	3.3		2.0	—	—	2.0	—	ns
	th(H)	—	5.0		2.0	—	—	2.0	—	
Minimum Pulse Width (CK)	tw(L)	—	3.3		7.0	—	—	7.0	—	ns
	tw(H)	—	5.0		5.0	—	—	5.0	—	
Minimum Pulse Width (P̄R̄, C̄L̄R̄)	Tw	—	3.3		7.0	—	—	7.0	—	ns
		—	5.0		5.0	—	—	5.0	—	
Minimum Removal Time (P̄R̄, C̄L̄R̄)	trem	—	3.3		5.0	—	—	5.0	—	ns
		—	5.0		3.0	—	—	3.0	—	
Maximum Clock Frequency	fmax	15pF	3.3		80	125	—	70	—	MHz
			5.0		130	170	—	110	—	
		50pF	3.3		50	75	—	45	—	MHz
			5.0		90	115	—	75	—	
Input Capacitance	CIN	—	5.0	VIN=VCC or GND	—	4	10	—	10	pF
Power Dissipation Capacitance	Cpd	No Load, f=1MHz			—	9.3	—	—	—	pF

■NOISE CHARACTERISTICS

(tr=tf=3ns)

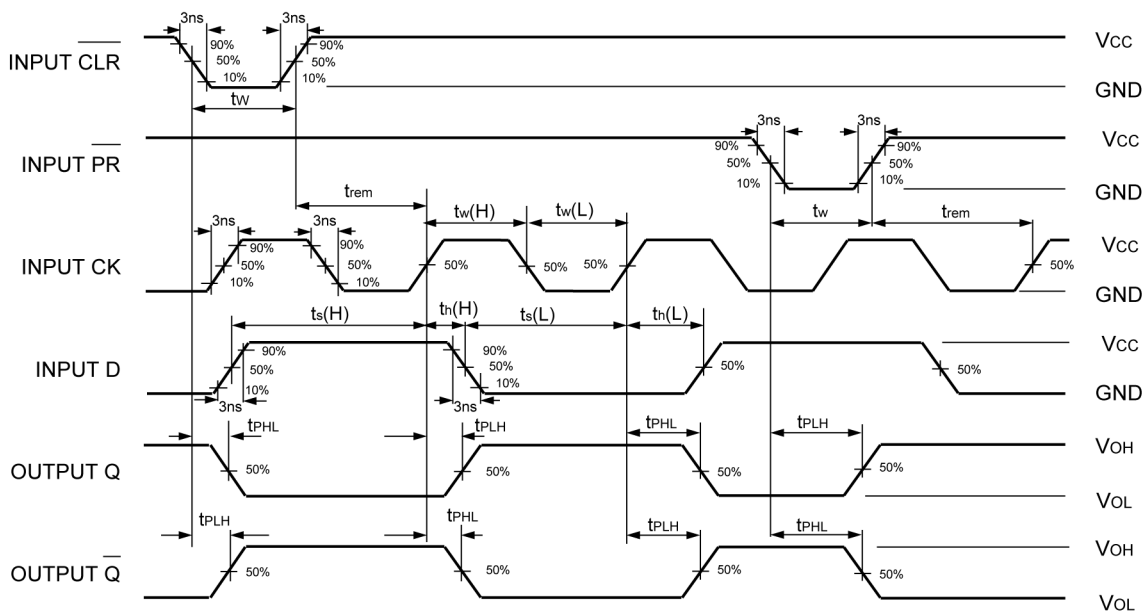| PARAMETER	SYMBOL	CL	Vcc(V)	CONDITIONS	Ta=25℃			UNITS
					MIN.	TYP.	MAX.	
Non Functional Output Maximum Dynamic VOL	VOLP	50pF	5.0		—	0.3	0.8	V
Non Functional Output Minimum Dynamic VOL	VOLV	50pF	5.0		-0.8	-0.3	—	V
Minimum Dynamic VIH	VIHD	50pF	5.0		—	—	3.5	V
Maximum Dynamic VIL	VILD	50pF	5.0		—	—	1.5	V

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■TEST CIRCUIT
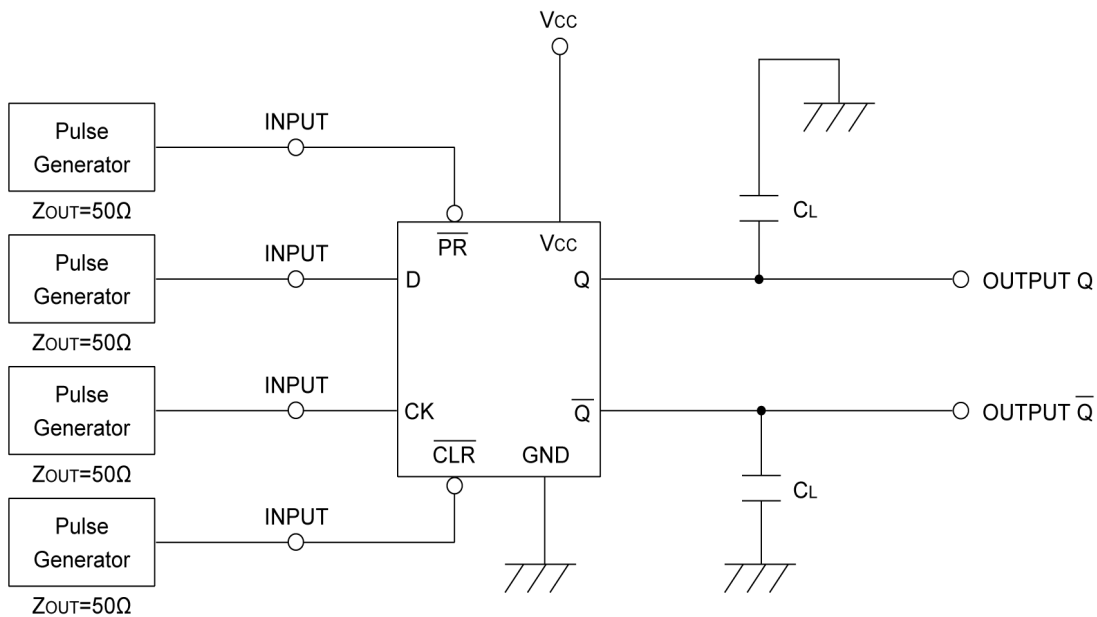
Notes: V_OUT=open when measuring supply current

■WAVEFORM

Notes: 1. Input Clock Frequency: 10MHz
2. D Input Frequency: 5MHz