

2 INPUT EXCLUSIVE OR GATE

FEATURES

- High output drive : $\pm 24\text{mA}(\text{min.}) @ V_{CC}=3\text{V}$.
- Super high speed operation : $t_{pd} 2.9\text{ns}(\text{typ.}) @ V_{CC}=5\text{V}, 50\text{pF}$.
- Operation voltage range : $V_{CC(\text{opr})}=1.65\sim 5.5\text{V}$.
- Latch-up performance : $\pm 200\text{V}$ or more (EIAJ)
: $\pm 2000\text{V}$ or more (MIL)
- Power down protection is provided on all inputs and outputs.

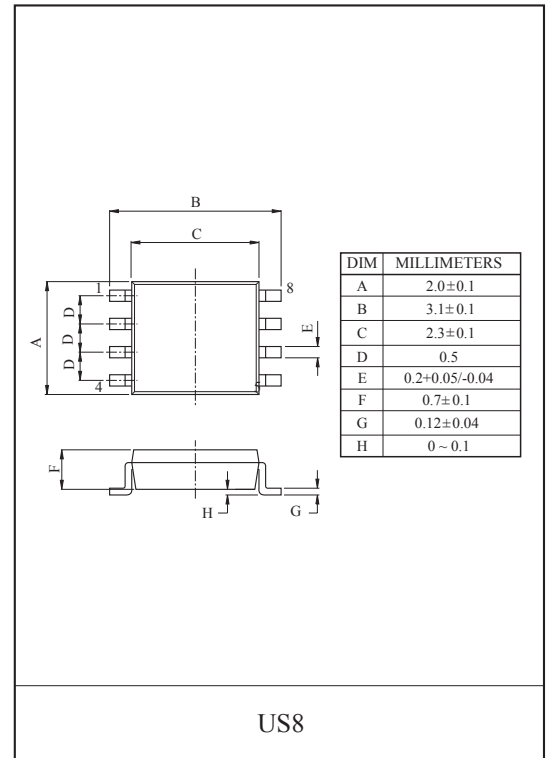
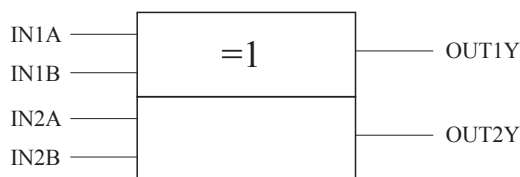
MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V_{CC}	-0.5~7	V
DC Input Voltage	V_{IN}	-0.5~7	V
DC Output Voltage	V_{OUT}	-0.5~7	V
Input Diode Current	I_{IK}	-50	mA
Output Diode Current	I_{OK}	-50	mA
DC Output Current	I_{OUT}	± 50	mA
DC V_{CC} /ground Current	I_{CC}	± 100	mA
Power Dissipation	P_D	200	mW
Storage Temperature Range	T_{stg}	-55 ~ 150	°C
Lead Temperature (10s)	T_L	-55 ~ 150	°C

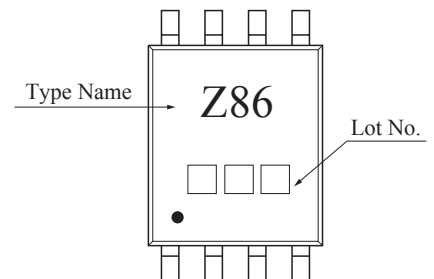
Truth Table

A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

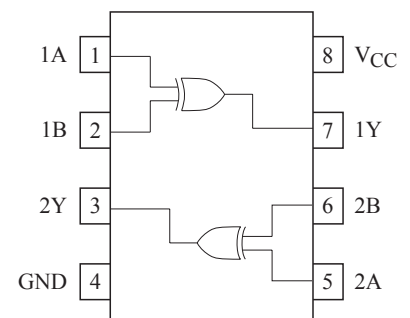
Logic Diagram



MARKING



PIN CONNECTION(TOP VIEW)



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Recommended Operating Conditions

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	1.65~5.5	V
		1.5~5.5 (Note1)	
Input Voltage	V_{IN}	0~5.5	V
Output Voltage	V_{OUT}	0~5.5 (Note2)	V
		0~ V_{CC} (Note3)	
Operating Temperature	T_{opr}	-40~85	°C
Input Rise and Fall Time	d_t/d_v	0~20 ($V_{CC}=1.8V \pm 0.15V, 2.5V \pm 0.2V$)	ns/V
		0~10 ($V_{CC}=3.3V \pm 0.3V$)	
		0~5 ($V_{CC}=5.5V \pm 0.5V$)	

Note1 : Data retention only. Note2 : $V_{CC}=0V$. Note3 : High or low state

ELECTRICAL CHARACTERISTICS

DC Characteristics

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta=25°C			Ta=-40~85°C		UNIT		
			$V_{CC}(V)$	MIN.	TYP.	MAX.	MIN.		MAX.	
Input Voltage	High Level	-	1.65~1.95	$0.75 \times V_{CC}$	-	-	$0.75 \times V_{CC}$	V		
			2.3~5.5	$0.7 \times V_{CC}$	-	-	$0.7 \times V_{CC}$			
	Low Level	-	1.65~1.95	-	-	$0.25 \times V_{CC}$	$0.25 \times V_{CC}$			
			2.3~5.5	-	-	$0.3 \times V_{CC}$	$0.3 \times V_{CC}$			
Output Voltage	High Level	$V_{IN}=V_{IH}$ or V_{IL}	$I_{OH}=-100\mu A$	1.65	1.55	1.65	-	1.55	-	V
				2.3	2.2	2.3	-	2.2	-	
				3.0	2.9	3.0	-	2.9	-	
				4.5	4.4	4.5	-	4.4	-	
			$I_{OH}=-4mA$	1.65	1.29	1.52	-	1.29	-	
			$I_{OH}=-8mA$	2.3	1.9	2.15	-	1.9	-	
			$I_{OH}=-16mA$	3.0	2.4	2.80	-	2.4	-	
			$I_{OH}=-24mA$	3.0	2.3	2.68	-	2.3	-	
	$I_{OH}=-32mA$	4.5	3.8	4.20	-	3.8	-			
	Low Level	$V_{IN}=V_{IH}$ or V_{IL}	$I_{OL}=100\mu A$	1.65	-	0	0.1	-	0.1	V
				2.3	-	0	0.1	-	0.1	
				3.0	-	0	0.1	-	0.1	
				4.5	-	0	0.1	-	0.1	
			$I_{OL}=4mA$	1.65	-	0.08	0.24	-	0.24	
			$I_{OL}=8mA$	2.3	-	0.10	0.30	-	0.30	
			$I_{OL}=16mA$	3.0	-	0.15	0.40	-	0.40	
$I_{OL}=24mA$			3.0	-	0.22	0.55	-	0.55		
$I_{OL}=32mA$	4.5	-	0.22	0.55	-	0.55				
Input Leakage Current	I_{IN}	$V_{IN}=5.5V$ or GND	0~5.5	-	-	± 1	-	± 1	μA	
Power Off Leakage Current	I_{OFF}	V_{IN} or $V_{OUT}=5.5V$	0.0	-	-	1	-	10	μA	
Quiescent Supply Current	I_{CC}	$V_{IN}=5.5V$ or GND	1.65~5.5	-	-	1	-	10	μA	

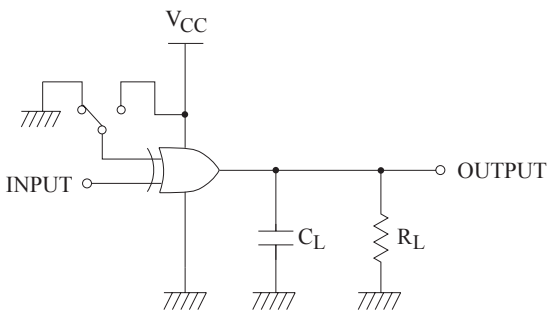
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AC Characteristics (unless otherwise specified, Input : $t_r=t_f=3ns$)

CHARACTERISTIC	SYMBOL	TEST CONDITION		Ta=25°C			Ta=-40~85°C		UNIT
			V _{CC} (V)	MIN.	TYP.	MAX.	MIN.	MAX.	
Propagation delay time	t _{PLH} t _{PHL}	C _L =15pF, R _L =1MΩ	1.8±0.15	2.0	6.7	12.5	2.0	13.0	ns
			2.5±0.2	1.0	4.1	7.0	1.2	7.5	
			3.3±0.3	0.8	3.0	4.8	0.8	5.2	
			5.0±0.5	0.5	2.2	3.5	0.5	3.8	
		C _L =50pF, R _L =500Ω	3.3±0.3	1.2	3.8	5.4	1.2	5.9	ns
			5.0±0.5	0.8	2.9	4.2	1.0	4.6	
Input Capacitance	C _{IN}	-	0~5.5	-	2.5	-	-	-	pF
Power Dissipation Capacitance	C _{PD}	(Note)	3.3	-	15	-	-	-	pF
			5.5	-	19	-	-	-	

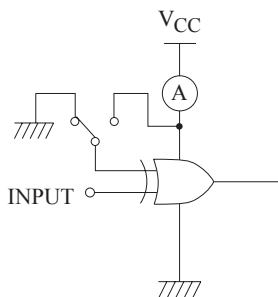
Note : C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output loading and operating at 50% duty cycle. (See Figure 2.) C_{PD} is related to I_{CCD} dynamic operating current by the expression : $I_{CCD}=C_{PD} \cdot V_{CC} \cdot f_{IN}+I_{CC}$

AC Loading and Waveforms



C_L includes load and stray capacitance
Input PRR=1.0MHz ; t_w=500ns

FIGURE 1. AC Test Circuit



Input=AC Waveform ; t_r=t_f=1.8ns
PRR=10MHz ; Duty Cycle=50%

FIGURE 2. I_{CCD} Test Circuit

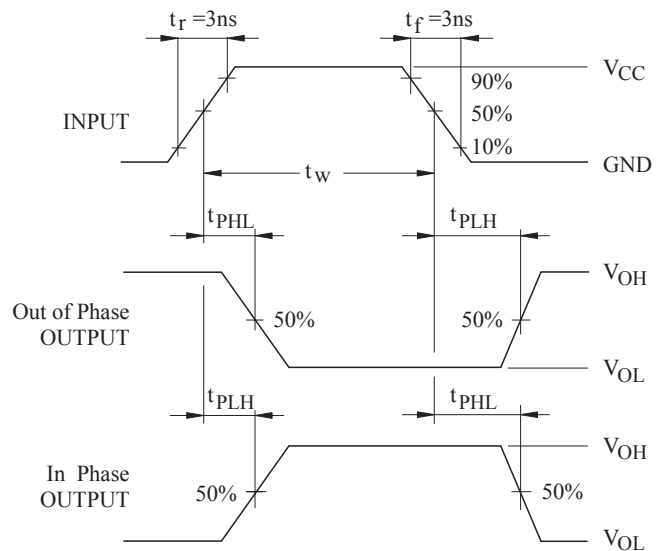


FIGURE 3. AC Waveforms