

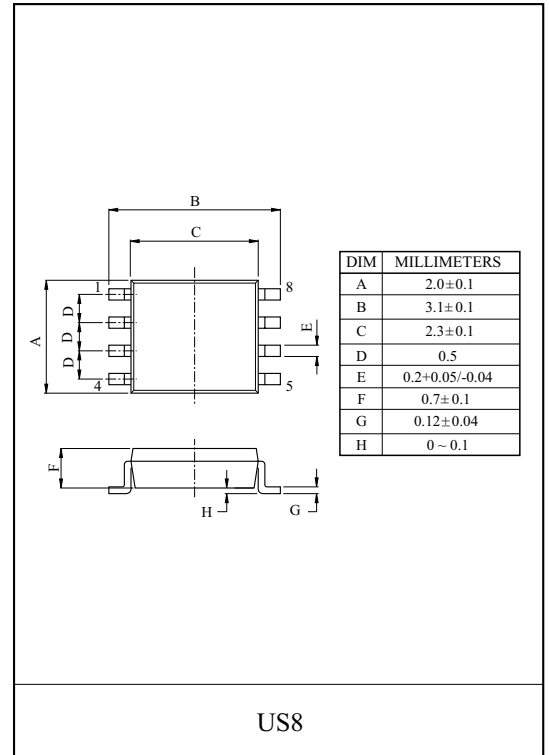
#### SCHMITT INVERTER

#### FEATURES

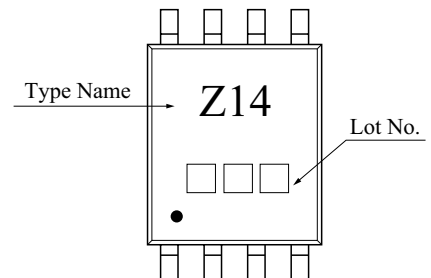
- High output drive :  $\pm 24\text{mA}(\text{min.}) @ V_{CC}=3\text{V}$ .
- Super high speed operation :  $t_{pd} 3.2\text{ns}(\text{typ.}) @ V_{CC}=5\text{V}, 50\text{pF}$ .
- Operation voltage range :  $V_{CC(\text{opr})}=1.65\sim 5.5\text{V}$ .
- Power down protection is provided on all inputs and outputs.

#### MAXIMUM RATINGS (Ta=25 °C)

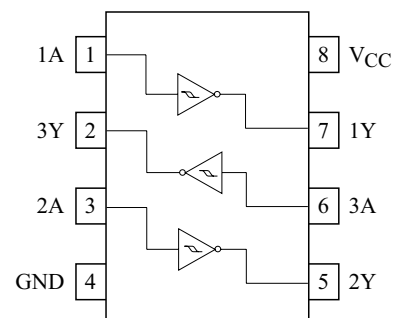
CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	$V_{CC}$	-0.5~7	V
DC Input Voltage	$V_{IN}$	-0.5~ $V_{CC}+0.5$	V
DC Output Voltage	$V_{OUT}$	-0.5~ $V_{CC}+0.5$	V
Input Diode Current	$I_{IK}$	-50	mA
Output Diode Current	$I_{OK}$	-50	mA
DC Output Current	$I_{OUT}$	$\pm 100$	mA
DC $V_{CC}$ /ground Current	$I_{CC}$	$\pm 100$	mA
Power Dissipation	$P_D$	200	mW
Storage Temperature Range	$T_{stg}$	-65 ~ 150	°C
Lead Temperature (10s)	$T_L$	260	°C



#### MARKING



#### PIN CONNECTION(TOP VIEW)

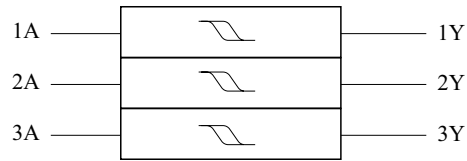


# KIC7WZ14FK

Truth Table

A	Y
L	H
H	L

Logic Diagram



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	$d_i/d_v$	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

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## ELECTRICAL CHARACTERISTICS

### DC Characteristics

CHARACTERISTIC	SYMBOL	TEST CONDITION		Ta=25 °C			Ta=-40~85 °C		UNIT					
				V <sub>CC</sub> (V)	MIN.	TYP.	MAX.	MIN.		MAX.				
Positive Threshold Voltage	V <sub>P</sub>	-		1.65	0.6	-	1.4	0.6	1.4	V				
				1.8	0.7	-	1.5	0.7	1.5					
				2.3	1.0	-	1.8	1.0	1.8					
				3.0	1.3	-	2.2	1.3	2.2					
				4.5	1.9	-	3.1	1.9	3.1					
				5.5	2.2	-	3.6	2.2	3.6					
Negative Threshold Voltage	V <sub>N</sub>	-		1.65	0.2	0.5	0.8	0.2	0.8	V				
				1.8	0.25	0.56	0.9	0.25	0.9					
				2.3	0.40	0.75	1.15	0.40	1.15					
				3.0	0.6	0.98	1.5	0.6	1.5					
				4.5	1.0	1.42	2.0	1.0	2.0					
				5.5	1.2	1.68	2.3	1.2	2.3					
Hysteresis Voltage	V <sub>H</sub>	-		1.65	0.1	0.48	0.9	0.1	0.9	V				
				1.8	0.15	0.51	1.0	0.15	1.0					
				2.3	0.25	0.62	1.1	0.25	1.1					
				3.0	0.4	0.76	1.2	0.4	1.2					
				4.5	0.6	1.01	1.5	0.6	1.5					
				5.5	0.7	1.20	1.7	0.7	1.7					
Output Voltage	High Level	V <sub>OH</sub>	V <sub>IN</sub> =V <sub>IL</sub>	I <sub>OH</sub> =-100 μA	1.65	1.55	1.65	-	1.55	-	V			
					1.8	1.7	1.8	-	1.7	-				
					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 <sub>OH</sub> =-4mA	1.65	1.29	1.52	-	1.29		-		
						I <sub>OH</sub> =-8mA	2.3	1.9	2.14	-		1.9	-	
							I <sub>OH</sub> =-16mA	3.0	2.4	2.75		-	2.4	-
								I <sub>OH</sub> =-24mA	3.0	2.3		2.62	-	2.3
	I <sub>OH</sub> =-32mA	4.5	3.8	4.13					-	3.8	-			
	Low Level	V <sub>OL</sub>	V <sub>IN</sub> =V <sub>IH</sub>	I <sub>OL</sub> =100 μA	1.65	-	0.0	0.1	-	0.1	V			
					1.8	-	0.0	0.1	-	0.1				
					2.3	-	0.0	0.1	-	0.1				
					3.0	-	0.0	0.1	-	0.1				
					4.5	-	0.0	0.1	-	0.1				
					I <sub>OL</sub> =4mA	1.65	-	0.08	0.24	-		0.24		
						I <sub>OL</sub> =8mA	2.3	-	0.10	0.3		-	0.3	
							I <sub>OL</sub> =16mA	3.0	-	0.16		0.4	-	0.4
I <sub>OL</sub> =24mA								3.0	-	0.24		0.55	-	0.55
		I <sub>OL</sub> =32mA	4.5	-	0.25	0.55	-	0.55						
Input Leakage Current		I <sub>IN</sub>	V <sub>IN</sub> =5.5V or GND	0~5.5	-	-	±0.1	-	±10	μA				
Power Off Leakage Current		I <sub>OFF</sub>	V <sub>IN</sub> or V <sub>OUT</sub> =5.5V	0.0	-	-	1	-	10	μA				
Quiescent Supply Current		I <sub>CC</sub>	V <sub>IN</sub> =5.5V or GND	1.65~5.5	-	-	1.0	-	10	μA				

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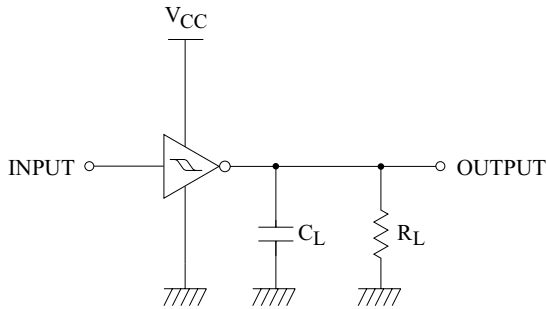
## ELECTRICAL CHARACTERISTICS

### AC Characteristics

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta=25 °C			Ta=-40~85 °C		UNIT	
			V <sub>CC</sub> (V)	MIN.	TYP.	MAX.	MIN.		MAX.
Propagation Delay	t <sub>PLH</sub> t <sub>PHL</sub>	C <sub>L</sub> =15pF, R <sub>L</sub> =1MΩ	1.65	2.5	7.6	13.1	2.5	14.5	ns
			1.8	2.5	6.3	10.9	2.5	12	
			2.5±0.2	1.8	4.3	7.4	1.8	8.1	
			3.3±0.3	1.5	3.3	5.0	1.5	5.5	
			5.0±0.5	1.0	2.7	4.1	1.0	4.5	
Propagation Delay	t <sub>PLH</sub> t <sub>PHL</sub>	C <sub>L</sub> =50pF, R <sub>L</sub> =500Ω	3.3±0.3	1.8	4.0	6.0	1.8	6.6	ns
			5.0±0.5	1.2	3.2	4.9	1.2	5.4	
Input Capacitance	C <sub>IN</sub>	-	0	-	2.5	-	-	-	pF
Power Dissipation Capacitance	C <sub>PD</sub>	(Note)	3.3	-	11	-	-	-	pF
			5.5	-	12.5	-	-	-	

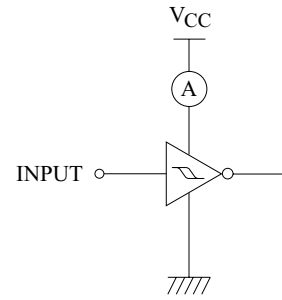
Note : C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption (I<sub>CCD</sub>) at no output loading and operating at 50% duty cycle. (See Figure2.) C<sub>PD</sub> is related to I<sub>CCD</sub> dynamic operating current by the expression : I<sub>CCD(opr)</sub>=C<sub>PD</sub> · V<sub>CC</sub> · f<sub>IN</sub>+(I<sub>CC</sub>static)

### AC Loading and Waveforms



C<sub>L</sub> includes load and stray capacitance  
Input PRR=1.0MHz ; t<sub>w</sub>=500ns

FIGURE 1. AC Test Circuit



Input=AC Waveform ; t<sub>r</sub>=t<sub>f</sub>=1.8ns  
PRR=variable ; Duty Cycle=50%

FIGURE 2. I<sub>CCD</sub> Test Circuit

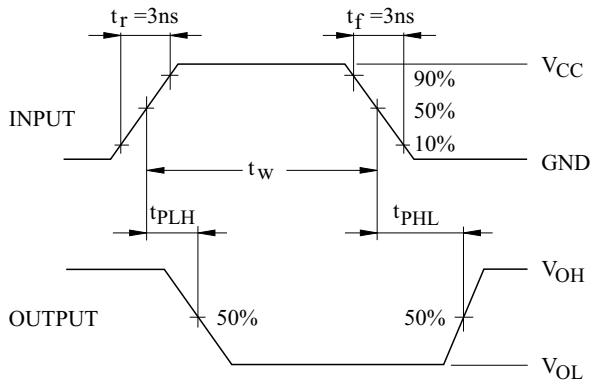


FIGURE 3. AC Waveforms