

SCHMITT INVERTER

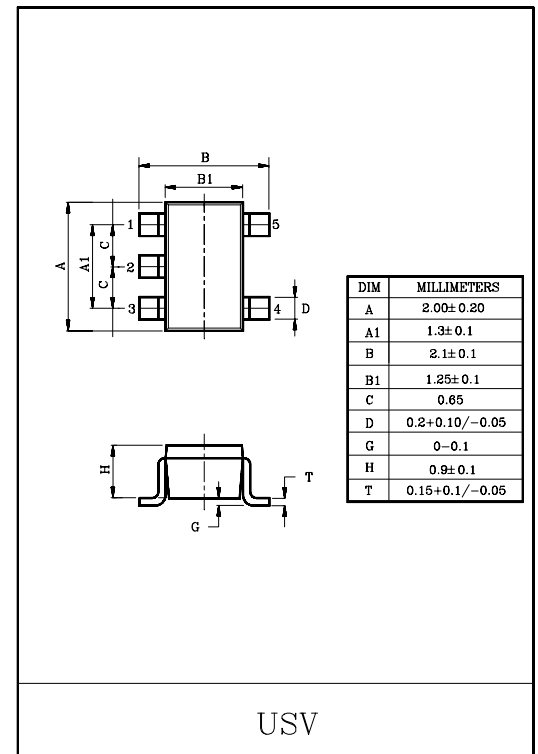
The KIC7S14FU is a high speed C²MOS SCHMITT INVERTER fabricated with silicon gate C²MOS technology. It achieves a high speed operation similar to equivalent LSTTL while maintaining the C²MOS low power dissipation. Pin Configuration and function are the same as the KIC7SU04FU but input have 25% V_{CC} hysteresis and with its schmitt trigger function, the KIC7S14FU can be used as line receivers which will receive slow input signal. Input is equipped with protection circuits against static discharge or transient excess voltage.

FEATURES

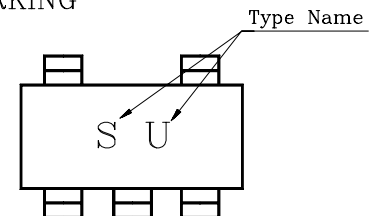
- High Speed : $t_{pd}=11ns(Typ.)$ at $V_{CC}=5V$.
- Low Power Dissipation : $I_{CC}=1\mu A(Max.)$ at $T_a=25^{\circ}C$.
- High Noise Immunity : $V_H=1.1V$ at $V_{CC}=5V$.
- Output Drive Capability : 5 LSTTL Loads.
- Symmetrical Output Impedance : $|I_{OH}|=I_{OL}=2mA$.
- Balanced Propagation Delays : $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range : $V_{CC(opr)}=2\sim 6V$.

MAXIMUM RATINGS

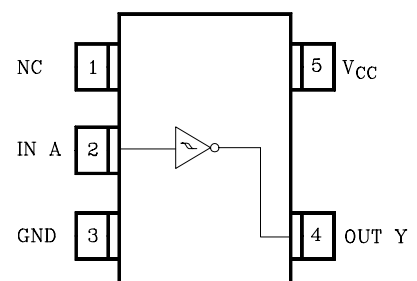
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V_{CC}	$-0.5\sim 7$	V
DC Input Voltage	V_{IN}	$-0.5\sim V_{CC}+0.5$	V
DC Output Voltage	V_{OUT}	$-0.5\sim V_{CC}+0.5$	V
Input Diode Current	I_{IK}	± 20	mA
Output Diode Current	I_{OK}	± 20	mA
DC Output Current	I_{OUT}	± 12.5	mA
DC V_{CC} /Ground Current	I_{CC}	± 50	mA
Power Dissipation	P_D	200	mW
Storage Temperature	T_{stg}	$-65\sim 150$	$^{\circ}C$
Lead Temperature (10s)	T_L	260	$^{\circ}C$



MARKING

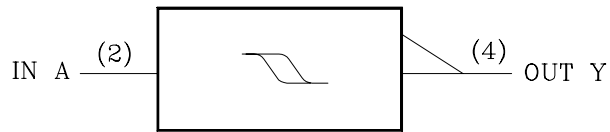


PIN CONNECTION(TOP VIEW)



KIC7S14FU

LOGIC DIAGRAM



TRUTH TABLE

A	Y
L	H
H	L

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	2~6	V
Input Voltage	V_{IN}	0~ V_{CC}	V
Output Voltage	V_{OUT}	0~ V_{CC}	V
Operating Temperature	T_{opr}	-40~85	°C

DC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION		$T_a=25^{\circ}\text{C}$			$T_a=-40\sim 85^{\circ}\text{C}$		UNIT
			V_{CC}	MIN.	TYP.	MAX.	MIN.	MAX.	
Positive Threshold Voltage	V_P	-	2.0	1.0	1.25	1.5	1.0	1.5	V
			4.5	2.3	2.7	3.15	2.3	3.15	
			6.0	3.0	3.5	4.2	3.0	4.2	
Negative Threshold Voltage	V_N	-	2.0	0.3	0.65	0.9	0.3	0.9	V
			4.5	1.13	1.6	2.0	1.13	2.0	
			6.0	1.5	2.3	2.6	1.5	2.6	
Hysteresis Voltage	V_H	-	2.0	0.3	0.6	1.0	0.3	1.0	V
			4.5	0.6	1.1	1.4	0.6	1.4	
			6.0	0.8	1.2	1.7	0.8	1.7	
High-Level Output Voltage	V_{OH}	$V_{IN}=V_{IL}$	$I_{OH}=-20\mu\text{A}$	2.0	1.9	2.0	-	1.9	V
				4.5	4.4	4.5	-	4.4	
				6.0	5.9	6.0	-	5.9	
				4.5	4.18	4.31	-	4.13	
Low-Level Output Voltage	V_{OL}	$V_{IN}=V_{IH}$	$I_{OL}=20\mu\text{A}$	2.0	-	0.0	0.1	-	V
				4.5	-	0.0	0.1	-	
				6.0	-	0.0	0.1	-	
				4.5	-	0.17	0.26	-	
Input Leakage Current	I_{IN}	$V_{IN}=V_{CC}$ or GND	6.0	-	-	± 0.1	-	± 1.0	μA
			6.0	-	-	1.0	-	10.0	
Quiescent Supply Current	I_{CC}	$V_{IN}=V_{CC}$ or GND	6.0	-	-	1.0	-	10.0	

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AC ELECTRICAL CHARACTERISTICS (C_L=15pF, V_{CC}=5V, T_a=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	T _a =25℃			UNIT
			MIN.	TYP.	MAX.	
Output Transition Time	t _{TLH} t _{THL}	—	—	4	8	ns
Propagation Delay Time	t _{pLH} t _{pHL}	—	—	11	21	ns

AC ELECTRICAL CHARACTERISTICS (C_L=50pF, Input t_r=t_f=6ns)

CHARACTERISTIC	SYMBOL	TEST CONDITION		T _a =25℃			T _a =-40~85℃		UNIT
			V _{CC}	MIN.	TYP.	MAX.	MIN.	MAX.	
Output Transition Time	t _{TLH} t _{THL}	—	2.0	—	50	125	—	145	ns
			4.5	—	14	25	—	30	
			6.0	—	12	21	—	24	
Propagation Delay Time	t _{pLH} t _{pHL}	—	2.0	—	48	100	—	235	ns
			4.5	—	12	20	—	48	
			6.0	—	9	17	—	40	
Input Capacitance	C _{IN}	—	—	—	5	10	—	10	pF
Power Dissipation Capacitance	C _{PD}	(Note 1)	—	—	28	—	—	—	

Note 1 : C_{PD} is defined as the value of internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$