

SCHMITT INVERTER

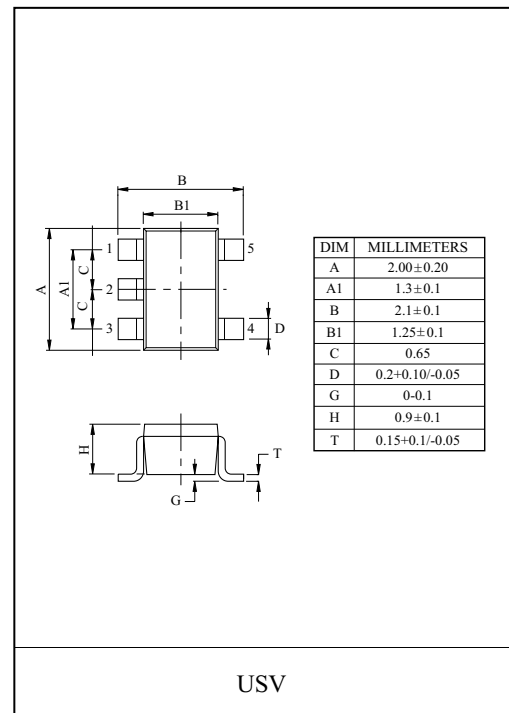
The KIC7S14FU is a high speed C²MOS SCHMITT INVERTER fabricated with silicon gate C²MOS technology. It achieves a high speed operation similar to equivalent LSTTL while maintaining the C²MOS low power dissipation. Pin Configuration and function are the same as the KIC7SU04FU but input have 25% V_{CC} 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

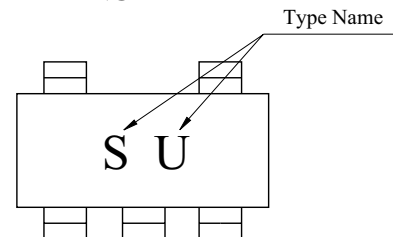
- High Speed : $t_{pd}=1\text{ns(Typ.)}$ at $V_{CC}=5\text{V}$.
- Low Power Dissipation : $I_{CC}=1\mu\text{A(Max.)}$ at $T_a=25^\circ\text{C}$.
- High Noise Immunity : $V_H=1.1\text{V}$ at $V_{CC}=5\text{V}$.
- Output Drive Capability : 5 LSTTL Loads.
- Symmetrical Output Impedance : $|I_{OH}|=I_{OL}=2\text{mA}$.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

MAXIMUM RATINGS (Ta=25 °C)

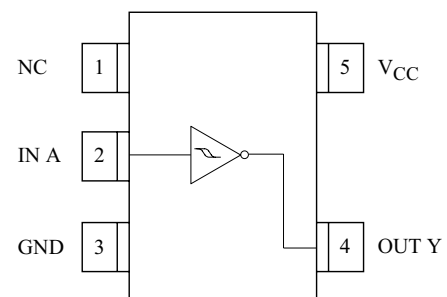
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage Range	V _{CC}	-0.5 ~ 7	V
DC Input Voltage	V _{IN}	-0.5 ~ V _{CC} +0.5	V
DC Output Voltage	V _{OUT}	-0.5 ~ V _{CC} +0.5	V
Input Diode Current	I _{IK}	±20	mA
Output Diode Current	I _{OK}	±20	mA
DC Output Current	I _{OUT}	±12.5	mA
DC V _{CC} /Ground Current	I _{CC}	±50	mA
Power Dissipation	P _D	200	mW
Storage Temperature	T _{stg}	-65 ~ 150	°C
Lead Temperature (10s)	T _L	260	°C



MARKING

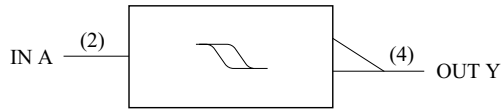


PIN CONNECTION (TOP VIEW)



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	V_{CC}	$T_a=25\text{ }^\circ\text{C}$			$T_a=-40\text{ }^\circ\text{C} \sim 85\text{ }^\circ\text{C}$		UNIT	
				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}	$V_{IN}=V_{IL}$	$I_{OH}=-20\text{ }\mu\text{A}$	2.0	1.9	2.0	-	1.9	-	V
				4.5	4.4	4.5	-	4.4	-	
			$I_{OH}=-2\text{ mA}$ $I_{OH}=-2.6\text{ mA}$	4.5	4.18	4.31	-	4.13	-	
				6.0	5.68	5.80	-	5.63	-	
Low-Level Output Voltage	V_{OL}	$V_{IN}=V_{IH}$	$I_{OL}=20\text{ }\mu\text{A}$	2.0	-	0.0	0.1	-	0.1	V
				4.5	-	0.0	0.1	-	0.1	
			$I_{OL}=2\text{ mA}$ $I_{OL}=2.6\text{ mA}$	4.5	-	0.17	0.26	-	0.33	
				6.0	-	0.18	0.26	-	0.33	
Input Leakage Current	I_{IN}	$V_{IN}=V_{CC}$ or GND	6.0	-	-	± 0.1	-	± 1.0	μA	
Quiescent Supply Current	I_{CC}	$V_{IN}=V_{CC}$ or GND	6.0	-	-	1.0	-	10.0		

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AC ELECTRICAL CHARACTERISTICS ($C_L=15\text{pF}$, $V_{CC}=5\text{V}$, $T_a=25\text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta=25 °C			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 ($C_L=50\text{pF}$, Input $t_r=t_f=6\text{ns}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{CC}	Ta=25 °C			Ta=-40 ~ 85 °C		UNIT
				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 : $I_{CC(oper)}=C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$