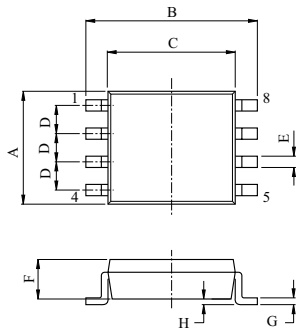
KIC7W14FK

SILICON MONOLITHIC CMOS DIGITAL INTEGRATED CIRCUIT

SCHMITT INVERTER

The KIC7W14FK is high speed C²MOS SCHMITT INVERTER fabricated with silicon gate C²MOS technology.
It achieves the high speed operation similar to equivalent LSTTL while maintaining the C²MOS low power dissipation.
Pin configuration and function are the same as the KIC7WU04FK but the inputs have 25% V_{CC} hysteresis and with its schmitt trigger function, the KIC7W14FK can be used as a line receivers which will receive slow input signals.
All inputs are equipped with protection circuits against static discharge or transient excess voltage.



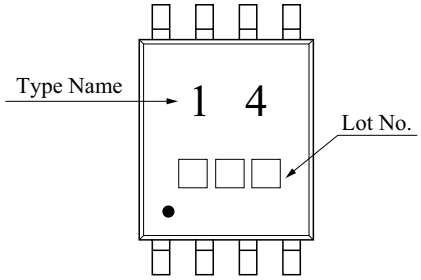
DIM	MILLIMETERS
A	2.0±0.1
B	3.1±0.1
C	2.3±0.1
D	0.5
E	0.2+0.05/-0.04
F	0.7±0.1
G	0.12±0.04
H	0 ~ 0.1

US8

FEATURES

- High Speed : t_{pd}=11ns(Typ.) at V_{CC}=5V.
- Low Power Dissipation : I_{CC}=1㎂(Max.) at Ta=25℃.
- High Noise Immunity : V_H=1.1V at Ta=25℃
- Output Drive Capability : 10 LSTTL Loads.
- Symmetrical Output Impedance : $|I_{OH}|=I_{OL}$=4mA(Min.)
- Balanced Propagation Delays : $t_{pLH} \fallingdotseq t_{pHL}$
- Wide Operating Voltage Range : $V_{CC(opr)}$=2 ~6V.

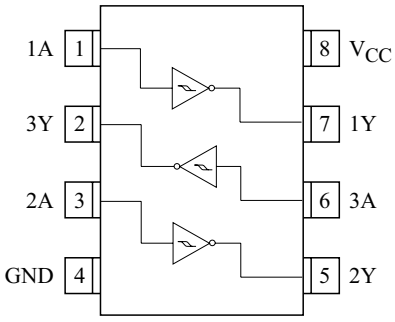
MARKING



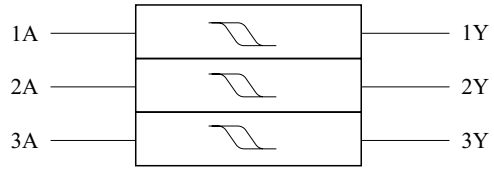
MAXIMUM RATINGS (Ta=25℃)

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}	±25	mA
DC V_{CC}/Ground Current	I_{CC}	±25	mA
Power Dissipation	P_D	200	mW
Storage Temperature	T_{stg}	-65 ~150	℃
Lead Temperature (10s)	T_L	260	℃

PIN CONNECTION (TOP VIEW)



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	℃

DC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION			Ta=25℃			Ta=-40 ~ 85℃		UNIT
				V_{CC}	MIN.	TYP.	MAX.	MIN.	MAX.	
Positive Threshold Voltage	V_P	-		2.0 4.5 6.0	1.0 2.3 3.0	1.25 2.7 3.5	1.5 3.15 4.2	1.0 2.3 3.0	1.5 3.15 4.2	V
Negative Threshold Voltage	V_N	-		2.0 4.5 6.0	0.3 1.13 1.5	0.65 1.6 2.3	0.9 2.0 2.6	0.3 1.13 1.5	0.9 2.0 2.6	V
Hysteresis Voltage	V_H	-		2.0 4.5 6.0	0.3 0.6 0.8	0.6 1.1 1.2	1.0 1.4 1.7	0.3 0.6 0.8	1.0 1.4 1.7	V
High-Level Output Voltage	V_{OH}	$V_{IN}=V_{IL}$	I_{OH}=-20μA	2.0 4.5 6.0	1.9 4.4 5.9	2.0 4.5 6.0	- - -	1.9 4.4 5.9	- - -	V
			I_{OH}=-4mA I_{OH}=-5.2mA	4.5 6.0	4.18 5.68	4.31 5.80	- -	4.13 5.63	- -	
Low-Level Output Voltage	V_{OL}	$V_{IN}=V_{IH}$	I_{OL}=20μA	2.0 4.5 6.0	- - -	0.0 0.0 0.0	0.1 0.1 0.1	- - -	0.1 0.1 0.1	V
			I_{OL}=4mA I_{OL}=5.2mA	4.5 6.0	- -	0.17 0.18	0.26 0.26	- -	0.33 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	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta=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		Ta=25℃			Ta=-40～85℃		UNIT
			V_{CC}	MIN.	TYP.	MAX.	MIN.	MAX.	
Output Transition Time	t_{TLH} t_{THL}	-	2.0 4.5 6.0	- - -	30 8 7	75 15 13	- - -	95 19 16	ns
Propagation Delay Time	t_{pLH} t_{pHL}	-	2.0 4.5 6.0	- - -	42 14 12	125 25 21	- - -	155 31 26	ns
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 of IC which is calculated from the operating current consumption without load (refer to Test Circuit.) Average operating current can be obtained by the equation hereunder.

$I_{CC(opr)}=C_{PD} \cdot V_{CC} \cdot f_{IN}+I_{CC}/2$ (per gate)