## INVERTER

The KIC7SU04FU is a high speed C^2MOS INVERTER fabricated with silicon gate C^2MOS technology.
It achieves high speed operation similar to equivalent LSTTL while maintaining the C^2MOS low power dissipation.
The internal circuit is composed of single stages inverter, it can be applied for crystal oscillation.
The input is equipped with protection circuits against static discharge or transient excess voltage.

FEATURES
- High Speed : t_{pd}=7ns(Typ.) at V_{CC}=5V.
- Low Power Dissipation : I_{CC}=1μA(Max.) at Ta=25℃.
- High Noise Immunity : V_{NIH}=V_{NIL}=28% V_{CC}(Min.).
- Output Drive Capability : 5 LSTTL Loads.
- Symmetrical Output Impedance : |I_{OH}|=I_{OL}=2mA(Min.)
- Balanced Propagation Delays : t_{pLH}≒t_{pHL}
- Wide Operating Voltage Range : $V_{CC(opr)}$=2~6V.

DIM	MILLIMETERS
A	2.00±0.20
A1	1.3±0.1
B	2.1±0.1
B1	1.25±0.1
C	0.65
D	0.2+0.10/−0.05
G	0−0.1
H	0.9±0.1
T	0.15+0.1/−0.05

USV

MAXIMUM RATINGS

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}	±25	mA
Power Dissipation	P_D	200	mW
Storage Temperature	T_{stg}	−65~150	℃
Lead Temperature (10s)	T_L	260	℃

MARKING

Type Name

S S

CONNECTION(TOP VIEW)

IN B 1   5 V_{CC}
IN A 2
GND 3   4 OUT Y
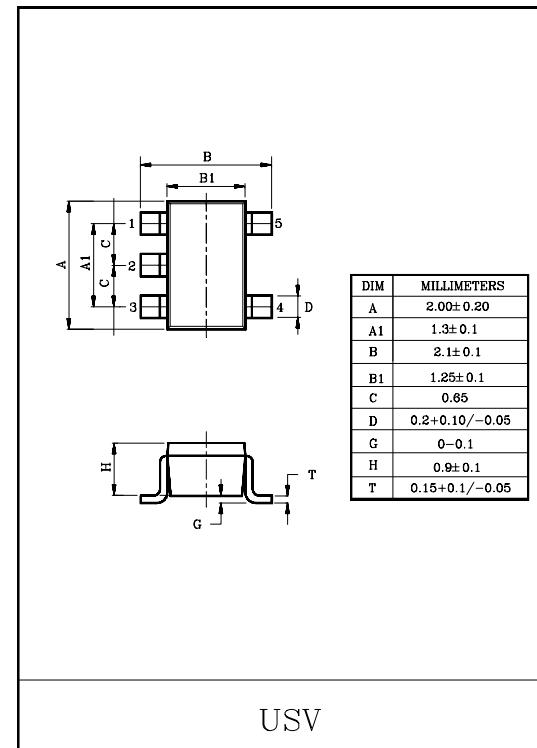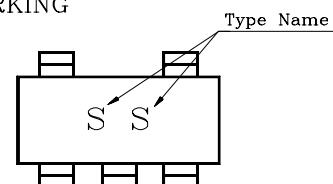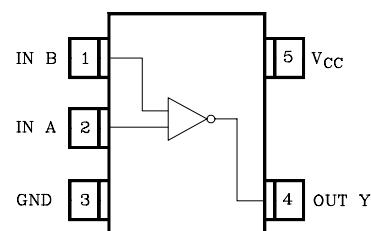
PIN CONNECTION(TOP VIEW)

NC 1   5 V_{CC}
IN A 2
GND 3   4 OUT Y
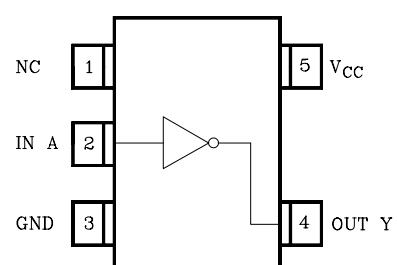
KIC7SU04FU

LOGIC DIAGRAM

IN A ──(2)── [1] ──(4)── OUT Y

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		V_{CC}	Ta=25℃ MIN.	Ta=25℃ TYP.	Ta=25℃ MAX.	Ta=-40~85℃ MIN.	Ta=-40~85℃ MAX.	UNIT
High-Level Input Voltage	V_{IH}	–		2.0	1.7	–	–	1.7	–	V
				4.5	3.6	–	–	3.6	–	
				6.0	4.8	–	–	4.8	–	
Low-Level Input Voltage	V_{IL}	–		2.0	–	–	0.3	–	0.3	V
				4.5	–	–	0.9	–	0.9	
				6.0	–	–	1.2	–	1.2	
High-Level Output Voltage	V_{OH}	$V_{IN}=V_{IL}$	$I_{OH}=-20\mu A$	2.0	1.8	2.0	–	1.8	–	V
				4.5	4.0	4.5	–	4.0	–	
				6.0	5.5	5.9	–	5.5	–	
			$I_{OH}=-2mA$	4.5	4.18	4.31	–	4.13	–	
			$I_{OH}=-2.6mA$	6.0	5.68	5.80	–	5.63	–	
Low-Level Output Voltage	V_{OL}	$V_{IN}=V_{IH}$	$I_{OL}=20\mu A$	2.0	–	0.0	0.2	–	0.2	V
				4.5	–	0.0	0.2	–	0.5	
				6.0	–	0.0	0.5	–	0.5	
			$I_{OL}=2mA$	4.5	–	0.17	0.26	–	0.33	
			$I_{OL}=2.6mA$	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	

KIC7SU04FU

AC ELECTRICAL CHARACTERISTICS (C_L=15pF, Input t_r=t_f=6ns, V_{CC}=5V)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta=25℃			UNIT
			MIN.	TYP.	MAX.	
Output Transition Time	t_{TLH} t_{THL}	–	–	5	10	ns
Propagation Delay Time	t_{pLH} t_{pHL}	–	–	7	15	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	–	50	125	–	155	ns
			4.5	–	14	25	–	31	
			6.0	–	12	21	–	26	
Propagation Delay Time	t_{pLH} t_{pHL}	–	2.0	–	48	100	–	125	ns
			4.5	–	12	20	–	25	
			6.0	–	9	17	–	21	
Input Capacitance	C_{IN}	–		–	5	10	–	10	pF
Power Dissipation Capacitance	C_{PD}	(Note 1)		–	10	–	–	–	

Note 1 : C_{PD} 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.
$$I_{CC(opr)}=C_{PD}\cdot V_{CC}\cdot f_{IN}+I_{CC}$$

SWITCHING CHARACTERISTICS TEST CIRCUIT
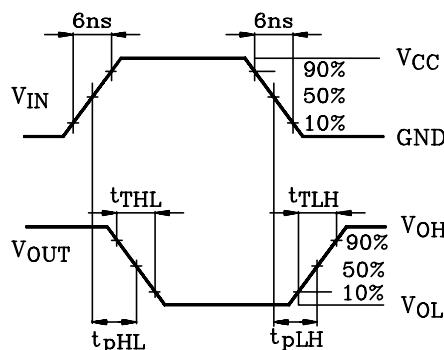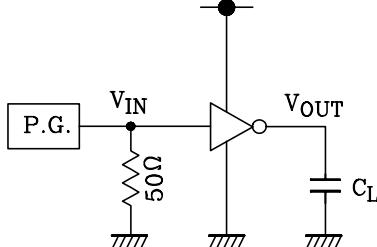
$I_{CC(opr)}$ TEST CIRCUIT
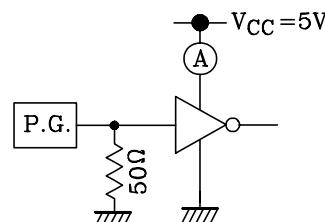
Input waveform is the same as that in case of switching characteristics test.