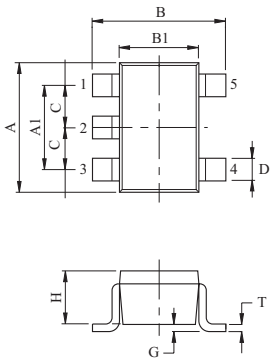
KIC7S66FU

SILICON MONOLITHIC CMOS DIGITAL INTEGRATED CIRCUIT

BILATERAL SWITCH

The KIC7S66FU is a high speed C²MOS BILATERAL SWITCH fabricated with silicon gate C²MOS technology.
It consists of a high speed switch capable of controlling either digital or analog signals while maintaining the C²MOS low power dissipation.
Control input (C) is provided to control the switch.
The switch turns ON while the Cl input is high, and the switch turns OFF while low.
Input is equipped with protection circuits against static discharge or transient excess voltage.



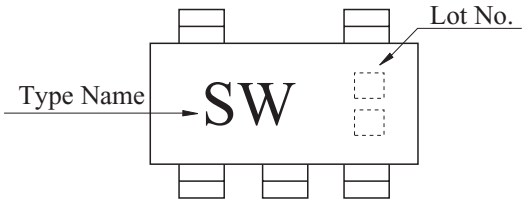
DIM	MILLIMETERS
A	2.00±0.20
A1	1.3±0.1
B	2.1±0.1
B1	1.25±0.1
C	0.65
D	0.2+0.10/-0.05
G	0-0.1
H	0.9±0.1
T	0.15+0.1/-0.05

USV

FEATURES

- High Speed : t_{pd}=7ns(Typ.) at V_{CC}=5V.
- Low Power Dissipation : I_{CC}=1 μA(Max.) at Ta=25℃.
- High Noise Immunity : V_{NIH}=V_{NIL}=28% V_{CC}(Min.).
- Low ON Resistance : R_{ON}=100Ω(Typ.) at V_{CC}=9V.
- Low T.H.D : THD=0.05%(Typ.) at V_{CC}=5V.

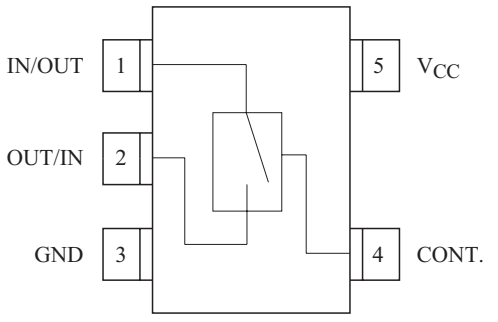
MARKING



MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{CC}	-0.5 10	V
Control Input Voltage	V_{IN}	-0.5 V_{CC}+0.5	V
Swith I/O Voltage	$V_{I/O}$	-0.5 V_{CC}+0.5	V
Control Diode Current	I_{CK}	±20	mA
Output Diode Current	I_{OK}	±20	mA
Through I/O Current	I_T	±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	℃

PIN CONNECTION (TOP VIEW)



LOGIC DIAGRAM

TRUTH TABLE

CONTROL	SWITCH FUNCTION
H	ON
L	OFF

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	2 9	V
Control Input Voltage	V_{IN}	0 V_{CC}	V
Switch I/O Voltage	$V_{I/O}$	0 V_{CC}	V
Operating Temperature	T_{opr}	-40 85	℃
Input Rise and Fall Time	t_r, t_f	0 1000 (V_{CC}=2.0V) 0 500 (V_{CC}=4.5V) 0 400 (V_{CC}=6.0V) 0 250 (V_{CC}=9.0V)	ns

DC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION		Ta=25℃			Ta=-40 85℃		UNIT
			V_{CC}	MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Control Input Voltage	V_{IHC}	-	2.0 4.5 9.0	1.5 3.15 6.3	- - -	- - -	1.5 3.15 6.3	- - -	V
Low-Level Control Input Voltage	V_{ILC}	-	2.0 4.5 9.0	- - -	- - -	0.5 1.35 2.7	- - -	0.5 1.35 2.7	V
ON Resistance	R_{ON}	V_{IN}=V_{IHC} $V_{I/O}$=V_{CC} to GND $V_{I/O}$≦1mA	4.5 9.0	- -	192 110	340 170	- -	400 200	Ω
		V_{IN}=V_{IHC} $V_{I/O}$=V_{CC} to GND $V_{I/O}$≦1mA	2.0 4.5 9.0	- - -	320 140 100	- 200 150	- - -	- 260 190	
Input/Output Leakage Current (SWITCH OFF)	I_{OFF}	V_{OS}=V_{CC} or GND V_{IS}=GND or V_{CC} V_{IN}=V_{ILC}	9.0	-	-	±100	-	±1000	
Switch Input Leakage Current (SW ON, Output OPEN)	I_{IZ}	V_{OS}=V_{CC} or GND V_{IN}=V_{IHC}	9.0	-	-	±100	-	±1000	nA
Control Input Current	I_{IN}	V_{IN}=V_{CC} or GND	9.0	-	-	±100	-	±1000	
Quiscent Device Current	I_{CC}	V_{IN}=V_{CC} or GND	6.0 9.0	- -	-	1.0 4.0	- -	10.0 40.0	μA

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.	
Phase difference between input and output	ϕI-O	-	2.0 4.5 9.0	- - -	20 7 4	75 15 12	- - -	100 20 15	ns
Output Enable Time	t_{PZL} t_{PZH}	R_L=1kΩ	2.0 4.5 9.0	- - -	20 13 9	150 30 18	- - -	190 38 33	ns
Output Disable Time	t_{PLZ} t_{PHZ}	R_L=1kΩ	2.0 4.5 9.0	- - -	40 11 10	170 35 30	- - -	220 44 38	ns
Maximum Control Input Frequency	-	R_L=1kΩ, C_L=15pF V_{OUT}=1/2 V_{CC}	2.0 4.5 9.0	- - -	30 30 30	- - -	- - -	- - -	MHz
Control Input Capacitance	C_{IN}	-	-	-	5	10	-	10	pF
Switch Terminal Capacitance	$C_{I/O}$	-	-	-	6	-	-	-	
Feedthrough Capacitance	C_{IOS}	-	-	-	0.5	-	-	-	
Power Dissipation Capacitance	C_{PD}	(Note 1)	-	-	15	-	-	-	

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

ANALOG SWITCH CHARACTERISTICS (GND=0V, Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{CC}	TYP.	UNIT
Total Harmonic Distortion (T.H.D)	-	f_{IN}=1kHz, V_{IN}=4V_{PP} (V_{CC}=4.5V) R_L=10kΩ, V_{IN}=8V_{PP} (V_{CC}=9.0V), C_L=50pF	4.5 9.0	0.05 0.04	%
Maximum Propagation Frequency (SWITCH ON)	f_{MAX}	Adjust f_{IN} voltage to obtain 0dBm at V_{OS} Increase f_{IN} frequency until dB Meter reads -3dB. R_L=50Ω, C_L=10pF, f_{IN}=1MHz, Sine Wave	4.5 9.0	200 200	MHz
Feedthrough (SWITCH ON)	-	Vin is ceintered at V_{CC}/2 Adjust input for 0dBm R_L=600Ω, C_L=50pF, f_{IN}=1MHz, Sine Wave	4.5 9.0	-60 -60	dB
Crosstalk (CONTROL SWITCH)	-	R_L=600Ω, C_L=50pF, IN=1MHz, PULSE (t_r=t_f=6ns)	4.5 9.0	60 100	mV

Note : These Characteristics are determined by design of devices.