

BILATERAL SWITCH

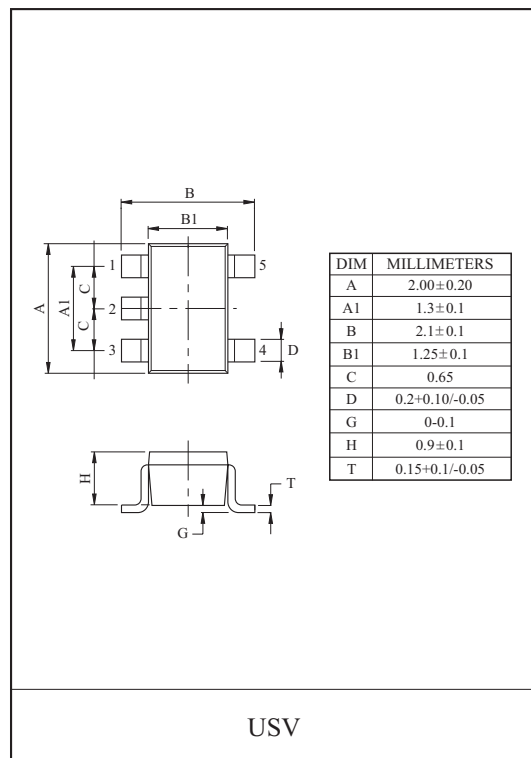
The KIC7S66FU is a high speed C²MOS BILATERAL SWITCH fabricated with silicon gate C²MOS technology. It consists of a high speed switch capable of controlling either digital or analog signals while maintaining the C²MOS low power dissipation. Control input (C) is provided to control the switch. The switch 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.

FEATURES

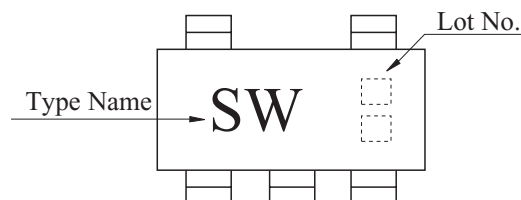
- High Speed : $t_{pd}=7ns(Typ.)$ at $V_{CC}=5V$.
- Low Power Dissipation : $I_{CC}=1\mu A(Max.)$ at $T_a=25^\circ C$.
- High Noise Immunity : $V_{NIH}=V_{NIL}=28\% V_{CC}(Min.)$.
- Low ON Resistance : $R_{ON}=100\Omega(Typ.)$ at $V_{CC}=9V$.
- Low T.H.D : $THD=0.05\%(Typ.)$ at $V_{CC}=5V$.

MAXIMUM RATINGS ($T_a=25^\circ C$)

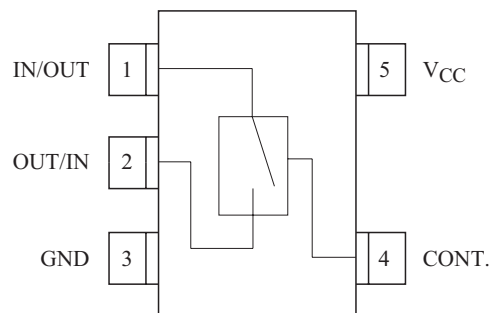
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{CC}	-0.5 10	V
Control Input Voltage	V_{IN}	-0.5 $V_{CC}+0.5$	V
Switc I/O Voltage	V_{IO}	-0.5 $V_{CC}+0.5$	V
Control Diode Current	I_{CK}	± 20	mA
Output Diode Current	I_{OK}	± 20	mA
Through I/O Current	I_T	± 12.5	mA
DC V_{CC} /Ground Current	I_{CC}	± 25	mA
Power Dissipation	P_D	200	mW
Storage Temperature	T_{stg}	-65 150	
Lead Temperature (10s)	T_L	260	



MARKING



PIN CONNECTION (TOP VIEW)



KIC7S66FU

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	V_{CC}	$T_a=25$			$T_a=-40 \ 85$		UNIT
				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

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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	-	20	75	-	100	ns
			4.5	-	7	15	-	20	
			9.0	-	4	12	-	15	
Output Enable Time	t _{PZL} t _{PZH}	R _L =1kΩ	2.0	-	20	150	-	190	ns
			4.5	-	13	30	-	38	
			9.0	-	9	18	-	33	
Output Disable Time	t _{PLZ} t _{PHZ}	R _L =1kΩ	2.0	-	40	170	-	220	ns
			4.5	-	11	35	-	44	
			9.0	-	10	30	-	38	
Maximum Control Input Frequency	-	R _L =1kΩ, C _L =15pF V _{OUT} =1/2 V _{CC}	2.0	-	30	-	-	-	MHz
			4.5	-	30	-	-	-	
			9.0	-	30	-	-	-	
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		TYP.	UNIT
			V _{CC}		
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	0.05	%
			9.0	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	200	MHz
			9.0	200	
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	-60	dB
			9.0	-60	
Crosstalk (CONTROL SWITCH)	-	R _L =600Ω, C _L =50pF, IN=1MHz, PULSE (t _r =t _f =6ns)	4.5	60	mV
			9.0	100	

Note : These Characteristics are determined by design of devices.