

CMOS LOGIC IC ELM7S66B Analog switch

■General description

ELM7S66B is CMOS analog switch. It realizes high speed operation with low power consumption by CMOS features. With low on resistance and high transmission rate, it realizes wider input voltage range.

■Features

- Same electrical characteristic as 74HC series (output current is around 1/2 of 74HC series)
- Low consumption current : $I_{dd}=1.0\mu A(\text{Max.})(T_{op}=25^{\circ}C)$
- Wide power voltage range : 2.0V to 6.0V
- High speed : $T_{pd}=5ns(\text{Typ.})(V_{dd}=5.0V)$
- Symmetrical output impedance : $|I_{oh}|=I_{ol}=2mA(\text{Min.})(V_{dd}=4.5V)$
- Small package : SOT-25

■Application

- Cell phones
- Digital cameras
- Portable electrical appliances like PDA, etc.
- Computers and peripherals
- Digital electrical appliances like LCD TV sets, DVD recorders/players, STB, etc.
- Modification inside print board, adjustment of timing, solution to noise

■Selection guide

ELM7S66B-EL

Symbol		
a	Function	66: Analog switch
b	Product version	B
c	Taping direction	EL: Refer to PKG file

ELM7S 66 B - EL
 ↑ ↑ ↑
 a b c

■Maximum absolute ratings

Parameter	Symbol	Limit	Unit
Power supply voltage	V _{dd}	-0.5 to +7.0	V
Input voltage	V _{in}	-0.5 to V _{dd} +0.5	V
Output voltage	V _{out}	-0.5 to V _{dd} +0.5	V
Input protection diode current	I _{ik}	±20	mA
Output parasitic diode current	I _{ok}	±20	mA
Output current	I _{out}	±25	mA
VDD/GND current	I _{dd} , I _{gnd}	±25	mA
Power dissipation	P _d	200	mW
Storage temperature	T _{stg}	-65 to +150	°C

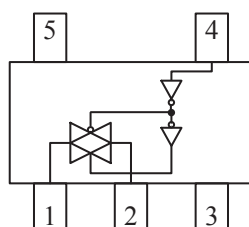
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■Suggested operating condition

Parameter	Symbol	Limit		Unit
Power voltage	Vdd	2.0 to 6.0		V
Input voltage	Vin	0 to Vdd		V
Output voltage	Vout	0 to Vdd		V
Operating temperature	Top	-40 to +85		°C
High-input down-time	tr, tf	Vdd=2.0V	0 to 1000	ns
		Vdd=4.5V	0 to 500	
		Vdd=6.0V	0 to 400	

■Pin configuration

SOT-25(TOP VIEW)



Pin No.	Pin name
1	IN/OUT
2	OUT/IN
3	GND
4	CONTROL
5	VDD

Control	Switch
Low	OFF
High	ON

■AC electrical characteristics

tr=tf=6ns

Parameter	Sym.	Vdd	Top=25°C			Top=-40 to +85°C		Unit	Condition
			Min.	Typ.	Max.	Min.	Max.		
Propagation delay-time	tPLH	2.0			50		65	ns	CL=50pF RL=10kΩ
	tPHL	3.3		4	10		13		
		5.0			9		11		
Output enable-time	tZL	2.0			115		145	ns	CL=50pF RL=1kΩ
	tZH	3.3		10	23		29		
		5.0			20		25		
Output disable-time	tLZ	2.0			115		145	ns	CL=50pF RL=1kΩ
	tHZ	4.5		14	23		29		
		6.0			20		25		
Maximum control input frequency	fin	2.0		20				MHz	CL=15pF RL=1kΩ Vout=Vdd/2
		4.5		30					
		6.0		30					
Control input capacity	Cin			5	10		10	pF	
SW-input/output capacity	Cin/out			6				pF	
Feed-through capacity	Cin-out			0.5				pF	
Equivalent inner capacity	Cpd			13				pF	

* Cpd is IC's inner equivalent capacity which is calculated from non-loaded operating current consumption referred to a test circuit. Averaged operating current consumption at non load is calculated as following formula; $I_{dd}(opr) = C_{pd} \cdot V_{dd} \cdot f_{in} + I_{dd}$

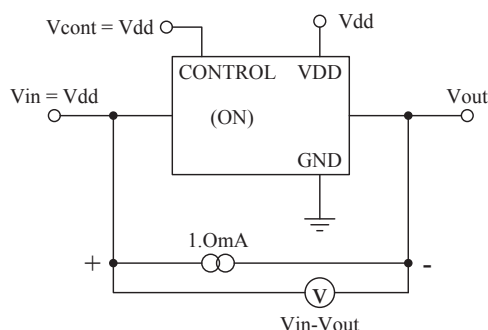
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■DC electrical characteristics

Parameter	Sym.	Vdd	Top=25°C			Top=-40 to +85°C		Unit	Condition
			Min.	Typ.	Max.	Min.	Max.		
Input voltage	Vih	2.0	1.50			1.50		V	
		4.5	3.15			3.15			
		6.0	4.20			4.20			
	Vil	2.0			0.50		0.50	V	
		4.5			1.35		1.35		
		6.0			1.80		1.80		
ON-resister	Ron	2.0		2000	5000		6250	Ω	Vcont=Vdd Vin=0 to Vdd Iin/out=1mA
		4.5		100	200		250		
		6.0		60	170		210		
SW-OFF leak-current	IS (OFF)	6.0	-0.1		0.1	-1.0	1.0	μA	Vcont=GND Vin=Vdd Vout=GND
SW-ON leak-current	IS (ON)	6.0	-0.1		0.1	-1.0	1.0	μA	Vcont=Vdd Vin=Vdd or GND
Cont input current	Icont	6.0	-0.1		0.1	-1.0	1.0	μA	Vin=Vdd or GND
Static current	Idd	6.0			1.0		10.0	μA	Vin=Vdd or GND

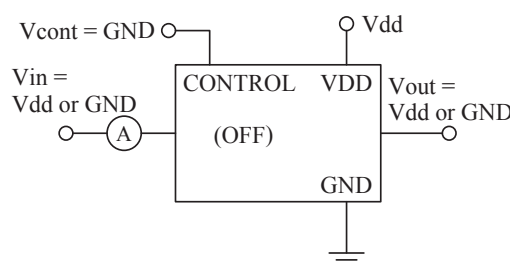
■Test circuit

- Ron : ON resister

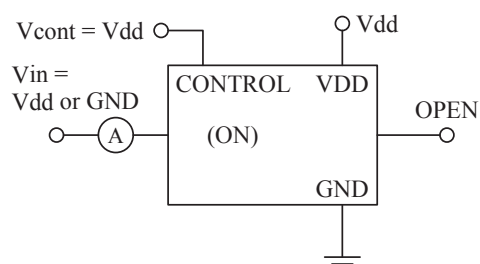


$$R_{on} = \frac{V_{in} - V_{out}}{10^{-3}} (\Omega)$$

- IS(OFF) : SW-OFF leak

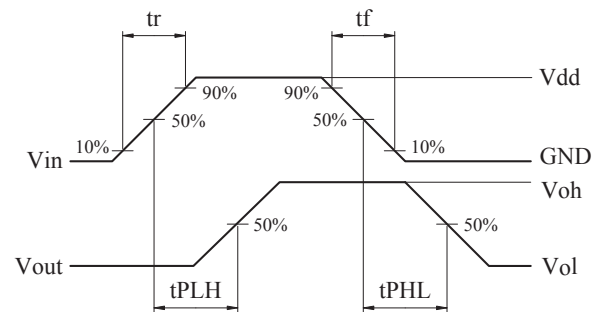
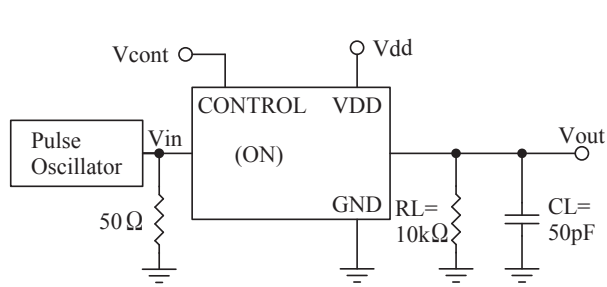


- IS(ON) : SW-ON leak current

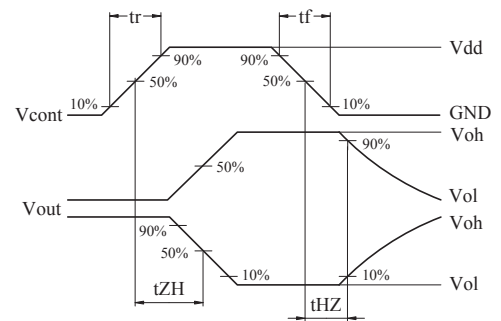
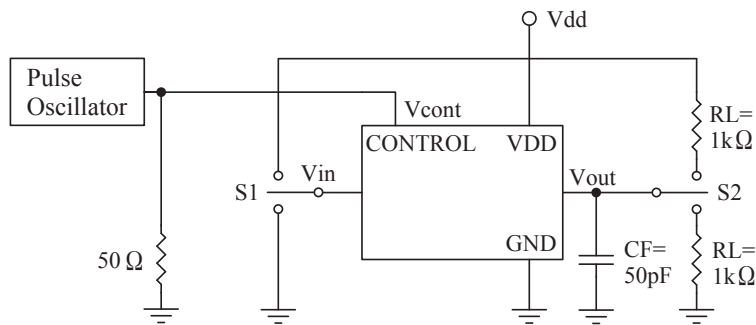


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- t_{PLH} , t_{PHL} : Propagation delay-time (SW-input→SW-output)

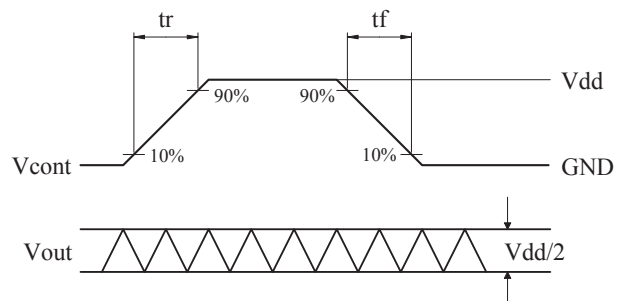
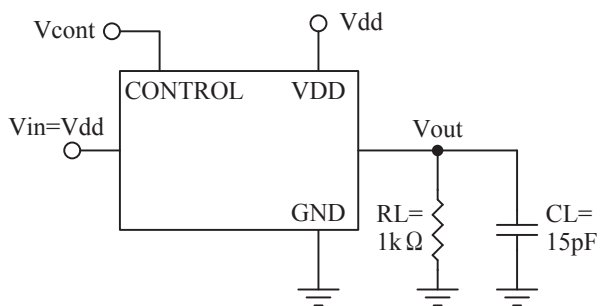


- t_{ZH} , t_{ZL}/t_{HZ} , t_{LZ} : Output enable time, Output disable time



	t_{ZH}	t_{ZL}	t_{HZ}	t_{LZ}
S1	Vdd	GND	Vdd	GND
S2	GND	Vdd	GND	Vdd

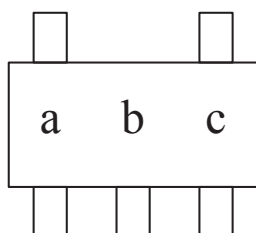
- Maximum controlled input frequency



Note : Input duty cycle 50%

■ Marking

SOT-25



No.	Mark	Content
a	E	ELM7S series
b	9	ELM7S66B
c	A to Z (except I, O, X)	Lot No.