

CMOS LOGIC IC ELM7S08B 2-input AND gate

■ General description

ELM7S08B is CMOS 2-input AND gate IC. It realizes high speed operation similar to LS-TTL with lower power consumption by CMOS features. The inner circuit structure of 3-stage logic gate obtains wider noise immunity and constant output.

■ 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 : $2.0V\sim 6.0V$
- 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

ELM7S08B-EL

Symbol		
a	Function	08 : 2-input AND gate
b	Product version	B
c	Taping direction	EL : Refer to PKG file

ELM7S 08 B - EL
 ↑ ↑ ↑
 a b c

■ Maximum absolute ratings

Parameter	Symbol	Limit	Unit
Power supply voltage	Vdd	-0.5~+7.0	V
Input voltage	Vin	-0.5~Vdd+0.5	V
Output voltage	Vout	-0.5~Vdd+0.5	V
Input protection diode current	Iik	±20	mA
Output parasitic diode current	Iok	±20	mA
Output current	Iout	±25	mA
VDD/GND current	Idd, Ignd	±25	mA
Power dissipation	Pd	200	mW
Storage temperature	Tstg	-65~+150	°C

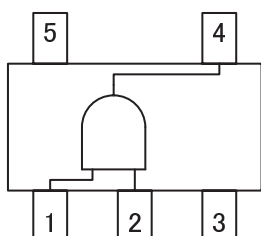
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■ Suggested operating condition

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

■ Pin configuration

SOT-25 (TOP VIEW)



Pin No.	Pin name
1	INB
2	INA
3	GND
4	OUTX
5	VDD

Input		Output
INA	INB	OUTX
Low	Low	Low
Low	High	Low
High	Low	Low
High	High	High

■ AC electrical characteristics

CL=15pF, tr=tf=6ns, Vdd=5V

Parameter	Sym.	Top=25°C			Unit	Condition
		Min.	Typ.	Max.		
Output transition time	tTLH		4	10	ns	Refer to test circuit
	tTHL		3	10		
Propagation delay-time	tPLH		4	15	ns	Refer to test circuit
	tPHL		5	15		

CL=50pF, tr=tf=6ns

Parameter	Sym.	Vdd	Top=25℃			Top=-40~+85℃		Unit	Condition
			Min.	Typ.	Max.	Min.	Max.		
Output transition time	tTLH	2.0		21	125		155	ns	Refer to test circuit
		4.5		7	25		31		
		6.0		6	21		26		
	tTHL	2.0		18	125		155	ns	
		4.5		6	25		31		
		6.0		6	21		26		
Propagation delay-time	tPLH	2.0		16	100		125	ns	Refer to test circuit
		4.5		6	20		25		
		6.0		5	17		21		
	tPHL	2.0		17	100		125	ns	
		4.5		8	20		25		
		6.0		7	17		21		
Input capacity	Cin			5	10		10	pF	
Equivalent inner capacity	Cpd			10				pF	

* Cpd is IC's inner equivalent capacity which is calculated from non-loaded operating current consumption referred to test circuit.

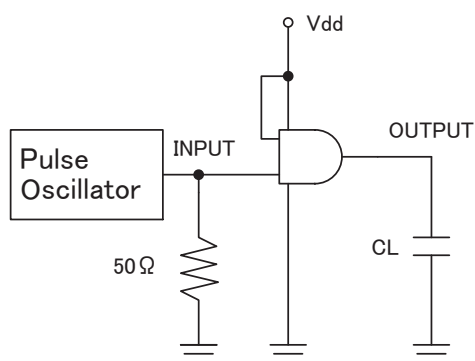
Averaged operating current consumption at non load is calculated as following formula: $I_{dd(opr)} = Cpd \cdot Vdd \cdot f_{in} + I_{dd}$

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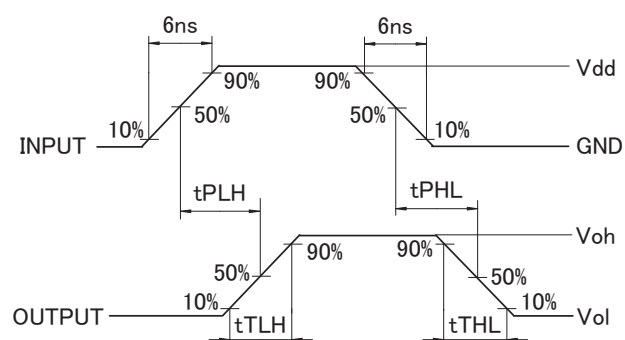
DC electrical characteristics

Parameter	Sym.	Vdd	Top=25℃			Top=-40~+85℃		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				
Output voltage	Voh	2.0	1.90	2.00		1.90		V	Vin=Vih	Ioh=-20μA	
		4.5	4.40	4.50		4.40				Ioh=-2mA	
		6.0	5.90	6.00		5.90				Ioh=-2.6mA	
		4.5	4.18	4.36		4.13					
		6.0	5.68	5.83		5.63					
	Vol	2.0		0.00	0.10		0.10	V	Vin=Vih or Vil	Iol=20μA	
		4.5		0.00	0.10		0.10				
		6.0		0.00	0.10		0.10				
		4.5		0.12	0.26		0.33			Iol=2mA	
		6.0		0.13	0.26		0.33			Iol=2.6mA	
	Input current	Iin	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



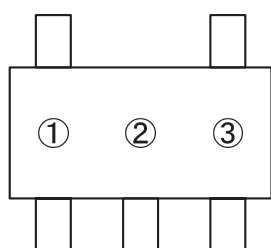
Measured wave pattern



* Output should be opened when measuring current consumption.

Marking

SOT-25



No.	Mark	Content
①	E	ELM7S series
②	2	ELM7S08B
③	A~Z (except I, O, X)	Lot No.