

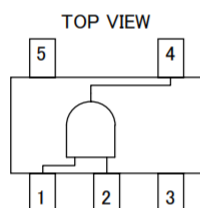
Features

- Power voltage range : 2.0 ~ 6.0V
- Operation temp. range : -40 ~ +85°C
- | IOH | = IOL = 2mA (min)
- ESD Protection Exceeds ESD 22
 - 2000-V Human-Body Model (A114-A)
 - 1000-V Charged-Device Model (C101)
- SOT23-5 Package Available

General Description

NC7S08M5X are CMOS 2-input AND gate ICs. They realize a high speed operation similar to LS-TTL with a lower power consumption by CMOS features. An inner circuit structure of 3-stages logic gates obtains wider noise immunity and constant output.

Pin Configuration



SOT23-5

Marking : 7S08F

Function Table

Pin No.	Pin Name
1	INB
2	INA
3	GND
4	OUTX
5	VCC

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

Maximum Absolute Ratings

Parameter	Symbol	Value	Units
Power Voltage	VCC	-0.5~+7.0	V
Input Voltage	VIN	-0.5~VCC+0.5	V
Output Voltage	VOUT	-0.5~VCC+0.5	V
Input Protection Diode Current	IIK	±20	mA
Output Parasitic Diode Current	IOK	±20	mA
Output Current	IOUT	±25	mA
VCC/GND Current	ICC, IGND	±25	mA
Power Dissipation	Pd	200	mW
Storage Temp.	Tstg	-65~+150	°C

Suggested Operating Condition

Parameter	Symbol	Value	Units
Power Voltage	VCC	2.0~6.0	V
Input Voltage	VIN	0~VCC	V
Output Voltage	VOU	0~VCC	V
Operating Temp.	Top	-40~+85	°C
High-input, Down-time	tr,tf	0~1000 (VCC=2.0V) 0~500 (VCC=4.5V) 0~400 (VCC=6.0V)	ns

DC Electrical Characteristics

Parameter	Sym.	VCC	Top = 25°C			Top = -40~+85°C		Units	Conditions		
			Min.	Typ.	Max.	Min.	Max.				
Input Voltage	VIH	2.0	1.5	-	-	1.5	-	V			
		4.5	3.15	-	-	3.15	-				
		6.0	4.2	-	-	4.2	-				
	VIL	2.0	-	-	0.5	-	0.5	V			
		4.5	-	-	1.35	-	1.35				
		6.0	-	-	1.8	-	1.8				
Output Voltage	VOH	2.0	1.9	2.0	-	1.9	-	V	VIN= VIH	IOH = -20 μ A	
		4.5	4.4	4.5	-	4.4	-				
		6.0	5.9	6.0	-	5.9	-				
		4.5	4.18	4.36	-	4.13	-				
		6.0	5.68	5.83	-	5.63	-				
	VOL	2.0	-	0.0	0.1	-	0.1	V	VIN= VIH or VIL	IOL = 20 μ A	
		4.5	-	0.0	0.1	-	0.1				
		6.0	-	0.0	0.1	-	0.1				
		4.5	-	0.12	0.26	-	0.33				
		6.0	-	0.13	0.26	-	0.33				
	Input Current	IIN	6.0	-0.1	-	0.1	-1.0	1.0	μ A	VIN = VCC or GND	
	Static Current	ICC	6.0	-	-	1.0	-	10.0	μ A	VIN = VCC or GND	

AC Electrical Characteristics

(CL=15pF, tr=tf=6ns, VCC=5V)

Parameter	Sym.	Top = 25°C			Units	Conditions
		Min.	Typ.	Max.		
High Output Down-time	tTLH	-	4	10	ns	Refer to following test circuit
	tTHL	-	3	10		
Propagation Delay-time	tPLH	-	4	15	ns	Refer to following test circuit
	tPHL	-	5	15		

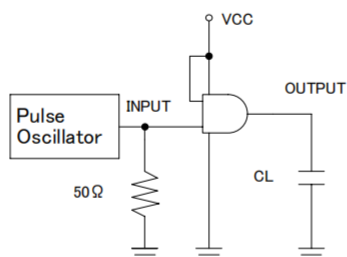
(CL=50pF, tr=tf=6ns)

Parameter	Sym.	VCC	Top = 25°C			Top = -40~+85°C		Units	Conditions
			Min.	Typ.	Max.	Min.	Max.		
High-Output Down-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 following test circuit. Averaged operating current consumption at non-load is calculated as following formula;

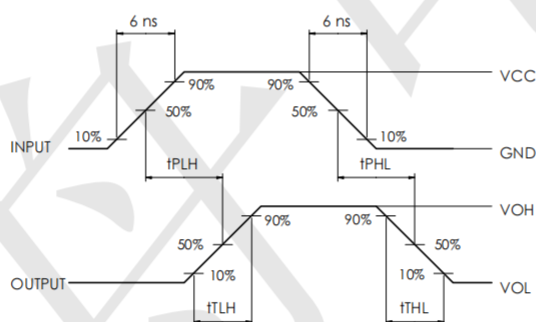
$$ICC (opr) = CPD \cdot VCC \cdot f_{IN} + ICC$$

Test Circuit And Waveforms



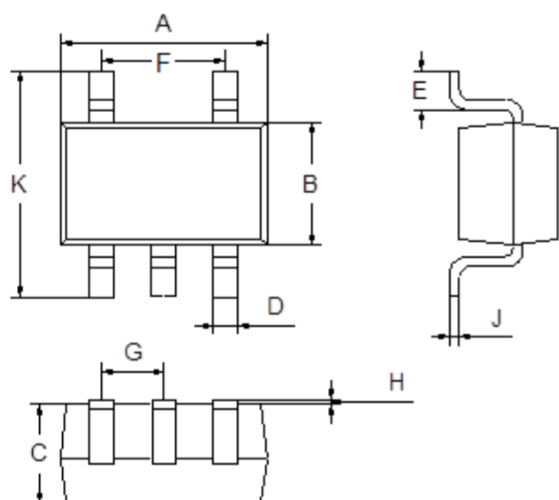
* Output should be opened when measuring current consumption.

Measured Wave Pattern



Package Outline Dimensions (Unit: mm)

SOT23-5



Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

