TECH PUBLIC
台舟电子

NC7S00M5X

2-input NAND Gate

www.sot23.com.tw

Features

- Power voltage range : 2.0～6.0V
- Operation temp. range : -40～+85℃
- | 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

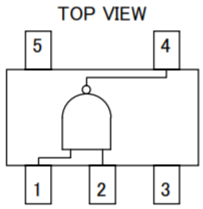
Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, Networking, Notebooks, Netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer Peripherals, Hard Drives, CD/DVD ROM
  - TV, DVD, DVR, Set-Top Box
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders

General Description

NC7S00M5X are CMOS 2-input NAND 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



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Marking : 7S00F

Function Table

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

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

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	℃

Suggested Operating Condition

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

DC Electrical Characteristics

Parameter	Sym.	VCC	Top = 25℃			Top = -40～+85℃		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 or VIL	IOH = -20 μA
		4.5	4.4	4.5	–	4.4	–			
		6.0	5.9	6.0	–	5.9	–			
		4.5	4.18	4.36	–	4.13	–			IOH = -2mA
		6.0	5.68	5.84	–	5.63	–			IOH = -2.6mA
	VOL	2.0	–	0.0	0.1	–	0.1	V	VIN= VIH	IOL = 20 μA
		4.5	–	0.0	0.1	–	0.1			
		6.0	–	0.0	0.1	–	0.1			
		4.5	–	0.11	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 = VCC or GND	
Static Current	ICC	6.0	–	–	1.0	–	10.0	μA	VIN = VCC or GND	

AC Electrical Characteristics

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

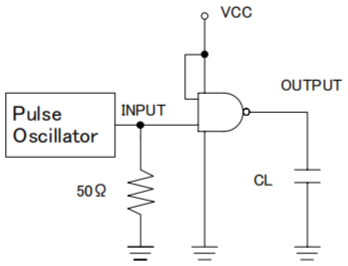
Parameter	Sym.	Top = 25℃			Units	Conditions
		Min.	Typ.	Max.		
High Output Down-time	tTLH	–	4	10	ns	Refer to following test circuit
	tTHL	–	3	10		
Propagation Delay-time	tPLH	–	5	15	ns	Refer to following test circuit
	tPHL	–	5	15		

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

Parameter	Sym.	VCC	Top = 25℃			Top = -40～+85℃		Units	Conditions
			Min.	Typ.	Max.	Min.	Max.		
High-Output Down-time	tTLH	2.0	–	18	125	–	155	ns	Refer to test circuit
		4.5	–	7	25	–	31		
		6.0	–	6	21	–	26		
	tTHL	2.0	–	14	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	–	8	20	–	25		
		6.0	–	7	17	–	21		
	tPHL	2.0	–	16	100	–	125	ns	
		4.5	–	6	20	–	25		
		6.0	–	5	17	–	21		
Input Capacity	CIN	–	–	5	10	–	10	pF	
Equivalent Inner Capacity	CPD	–	–	10	–	–	–	pF	

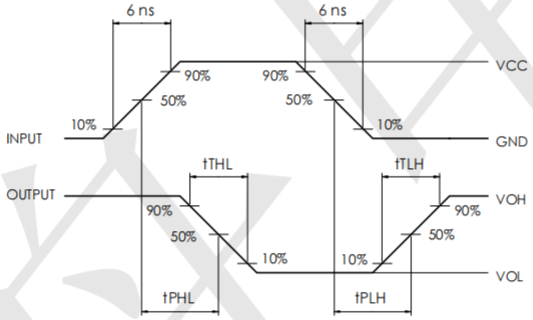
* CPD is IC's inner equivalent capacity which is calculated from non-loaded operating current consumption referred to following test circuit. Averaged operating current consumption at non-load is calculated as following formula;
ICC (opr) = CPD · VCC · fIN + ICC

Test Circuit And Waveforms



* Output should be opened when measuring current consumption.

Measured Wave Pattern



Package Outline Dimensions (Unit: mm)

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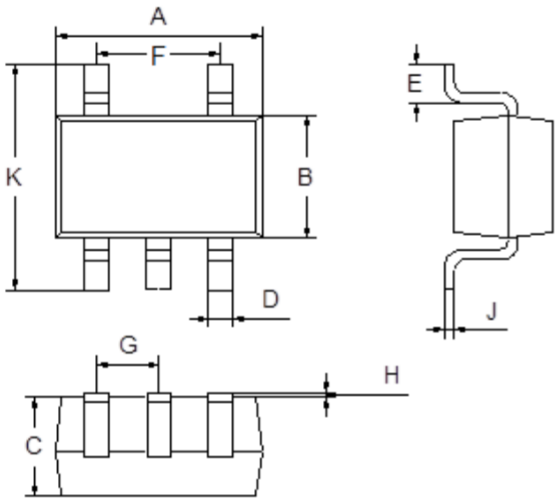
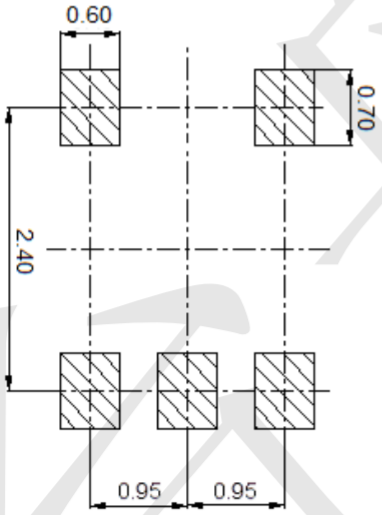


Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
F	1.80	2.00
G	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)



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