ELM7SH00x 2-input NAND Gate

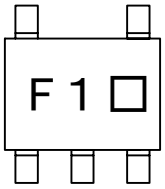
■ DESCRIPTION

ELM7SH00x is an Ultra-High-Speed CMOS 2-input NAND Gate IC. It is suitable for battery-operated devices, especially for a Note-PC, etc., due to its low voltage and Ultra-High-Speed operation.Its low power consumption contributes to longer battery life, which allows long time operation of devices.
Inner circuit is 3-phase composition with buffer.It provides wide noise allowance and stable output.
For all input, VIH(MAX)=5.5V is ensured at VCC=0 ～ 5.5V, which allows wide application such as an interface from 5V-circuits to 3V-circuits.

■ FEATURES

・Very small SOT-25 (2.9 × 1.6 × 1.1mm) 5-pin package
SSOT-25 (2.1 × 2.0 × 0.9mm) 5-pin package
・Power voltage range : 2.0V ～ 5.5V
・Ultra high speed operation : TYP. 4.0ns (VCC=3.0V, CL=15pF)
・For all input, VIH(MAX)=5.5V is ensured at VCC=0 ～ 5.5V

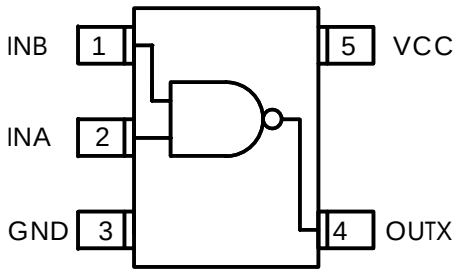
■ MARKING



F1:Identify ELM7SH00x
□:Lot No.

■ PIN CONFIGURATION

(TOP VIEW)



■ MAXIMUM ABSOLUTE RATINGS

Parameter	Symbol	Value	Units
Power Voltage	VCC	−0.5～+6.0	V
Input Voltage	VIN	−0.5～+6.0	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	±50	mA
Loss Tolerance	PT	150	mW
Storage Temp.	Tstg	−65～+150	℃

■ SUGGESTED OPERATING CONDITION

Parameter	Symbol	Value	Units
Power Voltage	VCC	2.0～5.5	V
Input Voltage	VIN	0～5.5	V
Output Voltage	VOUT	0～VCC	V
Operating Temp.	Topr	−40～+85	℃
High-input, Down-time	tr,tf	0～200 (VCC=3.3±0.3V)	ns
		0～100 (VCC=5.0±0.5V)	

■ DC ELECTRICAL CHARACTERISTICS

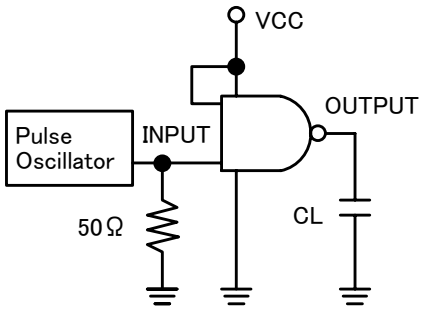
Parameter	Sym.	VCC	Ta = 25℃ Min.	Typ.	Max.	Ta = -40～+85℃ Min.	Max.	Units	Conditions	
Input Voltage	VIH	2.0	1.5	–	–	1.5	–	V		
		3.0	2.1	–	–	2.1	–			
		5.5	3.85	–	–	3.85	–			
	VIL	2.0	–	–	0.5	–	0.5	V		
		3.0	–	–	0.9	–	0.9			
		5.5	–	–	1.65	–	1.65			
Output Voltage	VOH	2.0	1.9	2	–	1.9	–	V	VIN=VIL or VIH	IOH = -50 μA
		3.0	2.9	3	–	2.9	–			
		4.5	4.4	4.5	–	4.4	–			
		3.0	2.58	–	–	2.48	–			IOH = -4mA
		4.5	3.94	–	–	3.8	–			IOH = -8mA
	VOL	2.0	–	–	0.1	–	0.1	V	VIN= VIH	IOL = 50 μA
		3.0	–	–	0.1	–	0.1			
		4.5	–	–	0.1	–	0.1			
		3.0	–	–	0.36	–	0.44			IOL = 4mA
		4.5	–	–	0.36	–	0.44			IOL = 8mA
Input Current	IIN	5.5	-0.1	–	0.1	-1.0	1.0	μA	VIN=VCC or GND	
Static Current	ICC	5.5	–	–	1.0	–	10.0	μA	VIN=VCC or GND	

■ AC ELECTRICAL CHARACTERISTICS

(tr = tf = 3ns)

Parameter	Sym.	VCC [V]	CL [pF]	Ta = 25℃ Min.	Typ.	Max.	Ta = -40～+85℃ Min.	Max.	Units	Conditions
Propagation Delay-time	tPLH	3.3±0.3	15	–	3.7	7.9	1.0	9.5	ns	Refer to test circuit
	tPHL			–	3.3	7.9	1.0	9.5		
	tPLH	3.3±0.3	50	–	5.4	11.4	1.0	13.0		
	tPHL			–	4.6	11.4	1.0	13.0		
	tPLH	5.0±0.5	15	–	2.7	5.5	1.0	6.5	ns	Refer to test circuit
	tPHL			–	2.5	5.5	1.0	6.5		
	tPLH	5.0±0.5	50	–	3.6	7.5	1.0	8.5		
	tPHL			–	3.5	7.5	1.0	8.5		
Input Capacity	CIN	5.0	–	–	2.0	10.0	–	10.0	pF	VIN=VCC or GND
Equivalent Inner Capacity	CPD	–	–	–	9.3	–	–	–	pF	f=1MHz

■ TEST CIRCUIT



* Output should be opened when measuring Current Consumption.

■ MEASURED WAVE PATTERN