

MN74HC132/MN74HC132S

Quad 2-Input NAND Schmitt Triggers

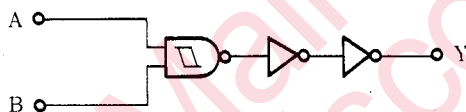
■ Outline

The MN74HC132/MN74HC132S is a 2-input NAND Schmitt trigger circuit whose every input pin has a Schmitt trigger function.

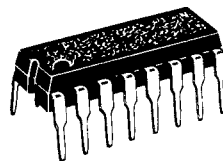
Owing to the silicon gate CMOS process, this Schmitt trigger circuit has realized low power consumption and high noise immunity equivalent to those of a standard CMOS, and can directly drive ten LS TTL inputs. Since the circuit threshold voltage (V_{IH}) at the rise of the input waveform differs from the circuit threshold voltage (V_{IL}) at the fall of the input waveform, this trigger circuit is widely applicable to an ordinary inverter, a line receiver, a waveform shaping circuit, a multivibrator, etc.

To protect the input and output against electrostatic breakdown, a resistor and a diode are used for the V_{CC} and the GND. The pin configuration and the function are the same as those of the standard 54LS/74LS logic family.

■ Logic Diagram



P-3



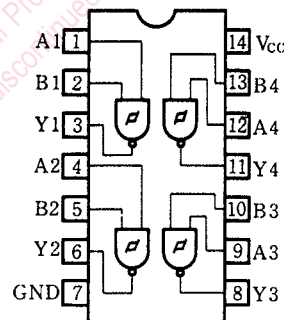
16-pin plastic DIL package

P-4



16-pin PANAFLAT package (SO-16D)

Pin Configuration



■ Absolute Maximum Ratings

Item			Symbol	Rating	Unit
Supply voltage			V_{CC}	$-0.5\sim+7.0$	V
Input output voltage			V_i, V_o	$-0.5\sim V_{CC}+0.5$	V
Input protective diode current			I_{IK}	± 20	mA
Output parasitic diode current			I_{OK}	± 20	mA
Output current			I_O	± 25	mA
Supply current			I_{CC}, I_{GND}	± 50	mA
Storage temperature			T_{stg}	$-65\sim+150$	$^{\circ}\text{C}$
Power dissipation	MN74HC132	$T_a=-40\sim+60^{\circ}\text{C}$	P_D	400	mW
		$T_a=+60\sim+85^{\circ}\text{C}$		Decrease to 200mW at the rate of 8mW/ $^{\circ}\text{C}$	
	MN74HC132S	$T_a=-40\sim+60^{\circ}\text{C}$	P_D	275	mW
		$T_a=+60\sim+85^{\circ}\text{C}$		Decrease to 200mW at the rate of 3.8mW/ $^{\circ}\text{C}$	

■ Recommended Operating Conditions

Item	Symbol	V _{CC} (V)	Rating	Unit
Operating power supply voltage	V _{CC}		1.4~6.0	V
Input output voltage	V _I , V _O		0~V _{CC}	V
Operating temperature	T _A		-40~+85	°C

■ DC Characteristics (GND=0V)

Item	Symbol	V _{CC} (V)	Test Condition			Temperature					Unit
			V _I	I _O	Unit	Ta=25°C			Ta=-40~+85°C		
						min.	typ.	max.	min.	max.	
Output voltage high level	V _{OH}	2.0	V _{IH} or V _{IL}	-20.0	μA	1.9	2.0		1.9		V
		4.5		-20.0	μA	4.4	4.5		4.4		
		6.0		-20.0	μA	5.9	6.0		5.9		
		4.5		-4.0	mA	3.92			3.84		
		6.0		-5.2	mA	5.48			5.34		
Output voltage low level	V _{OL}	2.0	V _{IH} or V _{IL}	20.0	μA	0.0	0.1		0.1		V
		4.5		20.0	μA	0.0	0.1		0.1		
		6.0		20.0	μA	0.0	0.1		0.1		
		4.5		4.0	mA		0.26		0.33		
		6.0		5.2	mA		0.26		0.33		
Input leakage current	I _I	6.0	V _I =V _{CC} or GND					±0.1		±0.1	μA
Static supply current	I _{CC}	6.0	V _I =V _{CC} or GND, I _O =0					2.0		20.0	μA
Input threshold voltage	V _{T+}	2.0					1.35				V
		4.5					2.69				
		6.0					3.55				
	V _{T-}	2.0					0.75				V
		4.5					1.85				
		6.0					2.45				
Hysteresis voltage	V _H	2.0					0.60				V
		4.5					0.84				
		6.0					1.10				

■ AC Characteristics (GND=0V, Input transition time ≤ 6ns, C_L=50pF)

Item	Symbol	V _{CC} (V)	Test Condition	Temperature					Unit
				T _a =25°C			T _a =−40~+85°C		
				min.	typ.	max.	min.	max.	
Output rise time	t _{TLH}	2.0			25	75		95	ns
		4.5			8	15		19	
		6.0			7	13		16	
Output fall time	t _{THL}	2.0			20	75		95	ns
		4.5			7	15		19	
		6.0			6	13		16	
Propagation time (L→H)	t _{PLH}	2.0			38	100		125	ns
		4.5			12	20		25	
		6.0			11	17		21	
Propagation time (H→L)	t _{PHL}	2.0			32	100		125	ns
		4.5			12	20		25	
		6.0			10	17		21	

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