iC-NH
8-BIT INPUT PORT (74THC2400)

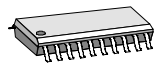
FEATURES

- 8 Schmitt trigger inputs with high hysteresis
- Inverting TTL/CMOS compatible output stages, divided into nibbles
- Guaranteed push-pull driving capability of ±6mA
- Outputs capable of Tri-State switching at 4 bits
- Inputs and outputs protected against being damaged by ESD
- Compatible to standard 74THC2400

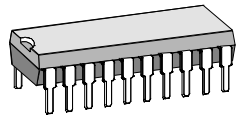
APPLICATIONS

- 8-Bit input port to drive micro-processors, bus-oriented receivers and transmitters

PACKAGES

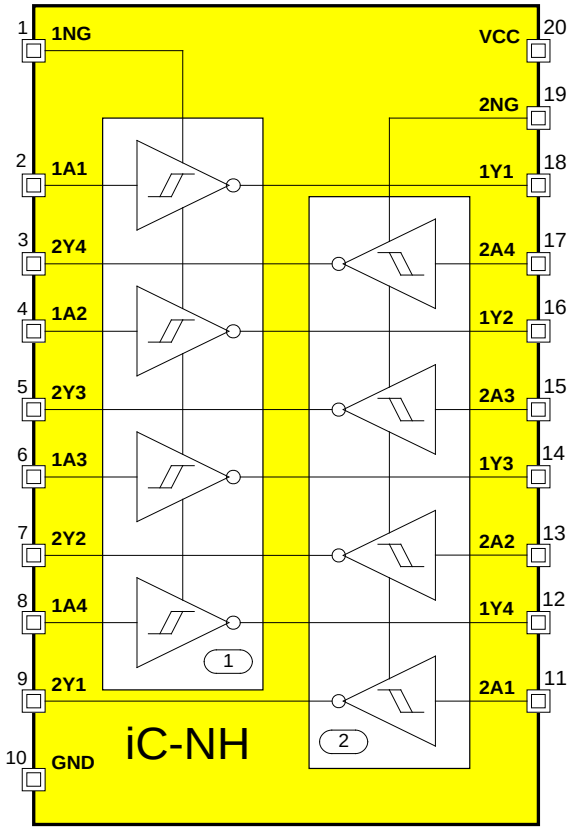


SO20



PDIP20

BLOCK DIAGRAM



Rev A0

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DESCRIPTION

The device iC-NH is used to condition digital signals when driving microprocessors, bus-oriented receivers and transmitters.

The 8 inverting drivers are divided into 2×4 bits (nibbles). The Schmitt trigger inputs accept standard CMOS levels and, due to the hysteresis, ensure a high signal-to-noise voltage ratio. They are capable of transforming slowly changing and noisy input signals into sharply defined output logic levels.

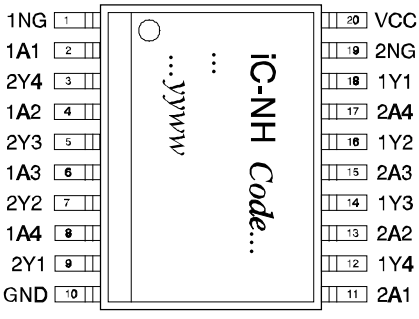
The garanteed push-pull driving capability is ±6mAdc at low saturation voltage. The push-pull drivers are designed for TTL/CMOS compatible output levels. High levels at the enable inputs 1NG and 2NG switch the output driver stages to the Tri-State mode.

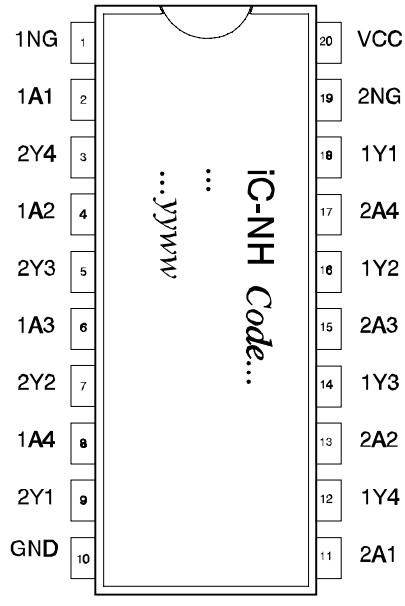
Clamping diodes to VCC and to GND protect all inputs and outputs against damage due to ESD.

PACKAGES SO20, PDIP20 to JEDEC Standard

PIN CONFIGURATION SO20, PDIP20

(top view)





PIN FUNCTIONS SO20, PDIP20

No.	Name	Function
1	1NG	Enable Input for Nibble 1
2	1A1	Input
3	2Y4	Output
4	1A2	Input
5	2Y3	Output
6	1A3	Input
7	2Y2	Output
8	1A4	Input
9	2Y1	Output
10	GND	Ground
11	2A1	Input
12	1Y4	Output
13	2A2	Input
14	1Y3	Output
15	2A3	Input
16	1Y2	Output
17	2A4	Input
18	1Y1	Output
19	2NG	Enable Input for Nibble 2
20	VCC	5V Supply Voltage

ABSOLUTE MAXIMUM RATINGS

Values beyond which damage may occur; device operation is not guaranteed

Item	Symbol	Parameter	Conditions	Fig.	Min.	Max.	Unit
G001	VCC	Supply Voltage			-0.3	6.5	V
G002	I()	Current in VCC or GND			-50	50	mA
G003	I()	Current in jAi, jYi, jNG (*)			-20	20	mA
G004	Ic()	Current in Clamp Diodes at jAi, jYi, jNG			-20	20	mA
G005	Ilu()	Peakcurrent in jAi, jNG (Latch-Up Strength)	Pulse duration ≤ 10µs, inputs and outputs open		-100	100	mA
E001	Vd()	ESD Susceptibility, at all pins	MIL-STD-883, Method 3015, HBM 100pF discharged through 1.5kΩ			2	kV
TG1	Tj	Junction Temperature			-40	125	°C
TG2	Ts	Storage Temperature			-40	125	°C

(*) j= 1,2 and i= 1 to 4

THERMAL DATA

Operating Conditions: VCC= 5V ±10%

Item	Symbol	Parameter	Conditions	Fig.	Min.	Typ.	Max.	Unit
T1	Ta	Operating Ambient Temperature Range (extended temperature range on request)			0		70	°C
T2	Rthja	Thermal Resistance Chip to Ambient	Package SO20 surface mounted on PCB				110	K/W
T3	Rthja	Thermal Resistance Chip to Ambient	Package PDIP20 soldered on PCB				80	K/W

All voltages are referenced to ground unless otherwise noted.
All currents into the device pins are positive; all currents out of the device pins are negative.

ELECTRICAL CHARACTERISTICS

Operating Conditions: VCC= 5V ±10%, Tj= 0..125°C, unless otherwise noted

Item	Symbol	Parameter	Conditions	Tj °C	Bild	Min.	Typ.	Max.	Unit
Total Device									
001	VCC	Permissible Supply Voltage Range				4.5		5.5	V
002	I(VCC)	Supply Current in VCC	V(jNG)= 0V or VCC, V(jAi)= 0V or VCC					600	µA
003	I(VCC)	Supply Current in VCC, Outputs lo	V(jNG)= 0V or VCC, V(jAi)= 0.2*VCC					1	mA
004	I(VCC)	Supply Current in VCC, Outputs hi	V(jNG)= 0V or VCC, V(jAi)= 0.7*VCC					2	mA
005	fo	Permissible Operating Frequency						10	MHz
Switching Characteristic jAi, jYi, jNG (j= 1,2 and i= 1..4)									
101	tplh	Propagation Delay A→Y (Y: lo → hi)	CL(Y)= 35pF, RL(Y)= ∞	1	27		8.4	32	ns
102	tphl	Propagation Delay A→Y (Y: hi → lo)	CL(Y)= 35pF, RL(Y)= ∞	1	27		10	32	ns
103	tp(NG-Y)	Output Disable Time NG→Y (Y: lo,hi → Tri-State)	CL(Y)= 35pF, RL(Y)=1kΩ, RL(Y/VCC)= 1kΩ	2	27		4	30	ns
104	tp(NG-Y)	Output Enable Time NG→Y (Y: Tri-State → lo,hi)	CL(Y)= 35pF, RL(Y)=1kΩ, RL(Y/VCC)= 1kΩ	2	27		7	30	ns
Schmitt Trigger Inputs jAi									
201	Vt()hi	Threshold Voltage hi						70	%VCC
202	Vt()lo	Threshold Voltage lo				20			%VCC
203	Vt()hys	Input Hysteresis	Vt(A)hys= Vt()hi-Vt()lo			0.85		2.55	V
204	I()	Input Current	V(A)= 0..VCC			-1		1	µA
205	Vc()hi	Clamp Voltage hi	Vc(A)hi= V(A)- VCC; I(A)= 20mA			0.4		1.5	V
206	Vc()lo	Clamp Voltage lo	I(A)= -20mA			-1.5		-0.4	V
Driver Outputs jYi									
301	Vs()hi	Saturation Voltage hi	Vs(Y)hi= VCC- V(Y); I(Y)= -60µA					0.1	V
302	Vs()lo	Saturation Voltage lo	I(Y)= 60µA					0.1	V
303	Vs()hi	Saturation Voltage hi	Vs(Y)hi= VCC- V(Y); I(Y)= -6mA					0.8	V
304	Vs()lo	Saturation Voltage lo	I(Y)= 6mA					0.4	V
305	I0()	Leakage Current	jNG= hi, V(Y)= 0..VCC			-10		10	µA
306	Vc()hi	Clamp Voltage hi	Vc(Y)hi= V(Y)- VCC; I(Y)= 20mA			0.4		1.5	V
307	Vc()lo	Clamp Voltage lo	I(Y)= -20mA			-1.5		-0.4	V
Enable Inputs jNG									
401	Vt()	Threshold Voltage for TRI-State mode				37		52	%VCC
402	I()	Input Current	V(NG)= 0..VCC			-1		1	µA
403	Vc()hi	Clamp Voltage hi	Vc(NG)hi= V(NG)- VCC; I(NG)= 20mA			0.4		1.5	V
404	Vc()lo	Clamp Voltage lo	I(NG)= -20mA			-1.5		-0.4	V

ELECTRICAL CHARACTERISTICS: PROPAGATION DELAYS

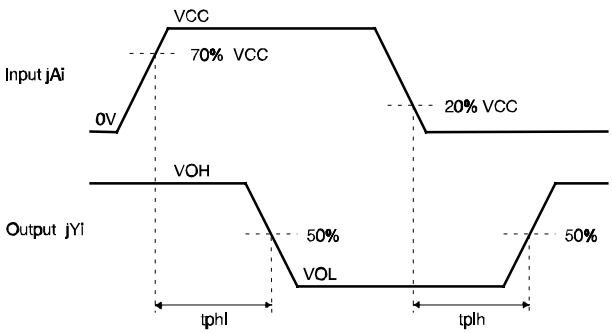


Fig. 1: Propagation delay from input to output

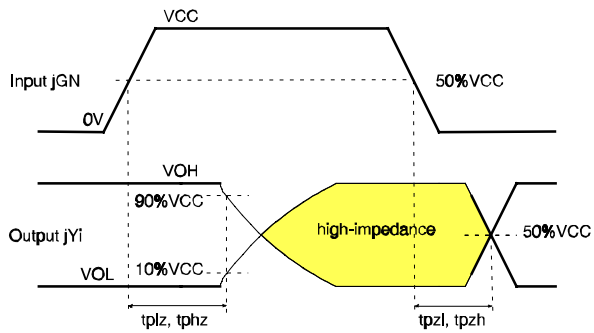
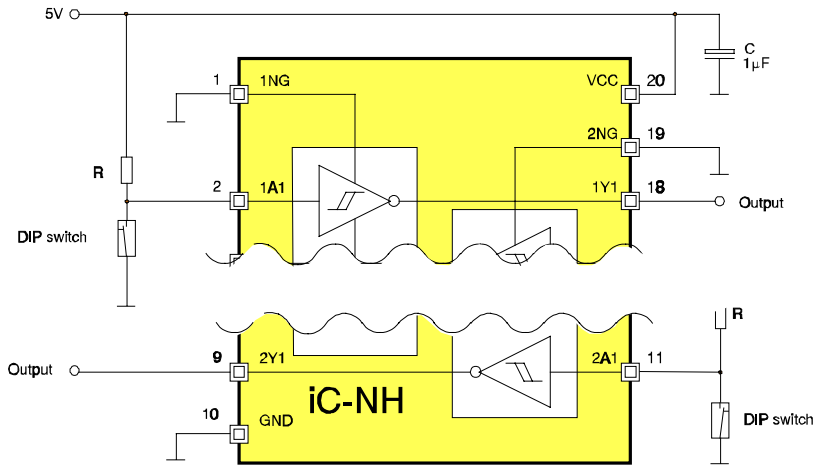
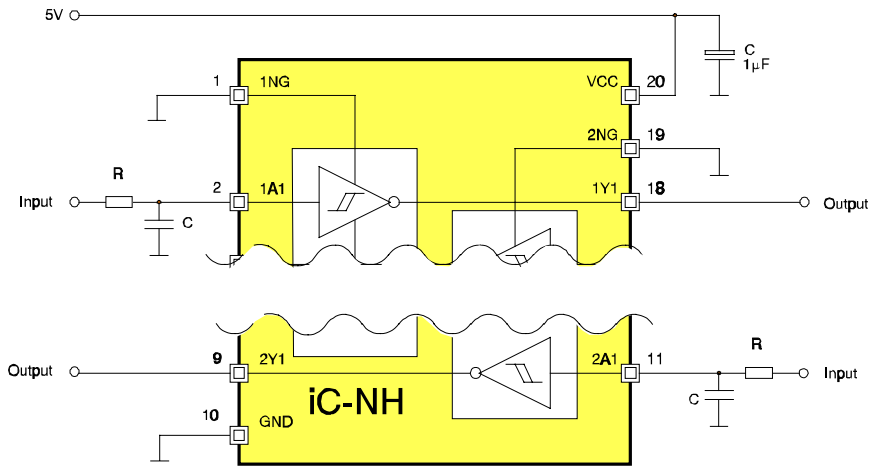


Fig. 2: Propagation delay for Tri-State

APPLICATIONS INFORMATION



Example 1: 8-Bit Input Port to read DIP switch states



Example 2: 8-Bit Input Port with RC filter

ORDERING INFORMATION

Type	Package	Order designation
iC-NH	SO20	iC-NH-SO20
iC-NH	PDIP20	iC-NH-PDIP20

For information about prices, terms of delivery, options for other case types, etc., please contact:

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