Hex 2-input NOR drivers

74F805/74F1805

FEATURES

- High capacitive drive capability
- Choice of configuration
  Corner V_{CC} and GND – 74F805
  Center V_{CC} and GND – 74F1805
- Typical propagation delay of 2.3ns

TYPE	TYPICAL PROPA-GATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F805	2.3ns	10mA
74F1805	2.3ns	10mA

ORDERING INFORMATION

DESCRIPTION	ORDER CODE
	COMMERCIAL RANGE $V_{CC} = 5V \pm 10\%$, $T_{amb} = 0°C$ to $+70°C$
20–pin plastic DIP	N74F805N, N74F1805N
20–pin plastic SOL	N74F805D, N74F1805D

## INPUT AND OUTPUT LOADING AND FAN OUT TABLE

PINS	DESCRIPTION	74F (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
Dna – Dnb	Data inputs	1.0/0.033	20µA/20µA
$\overline{Q}0 – \overline{Q}5$	Data outputs	2400/80	48mA/48mA

NOTE: One (1.0) FAST unit load is defined as: 20µA in the high state and 0.6mA in the low state.

## PIN CONFIGURATION
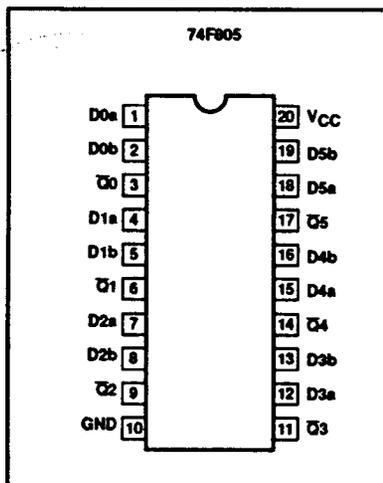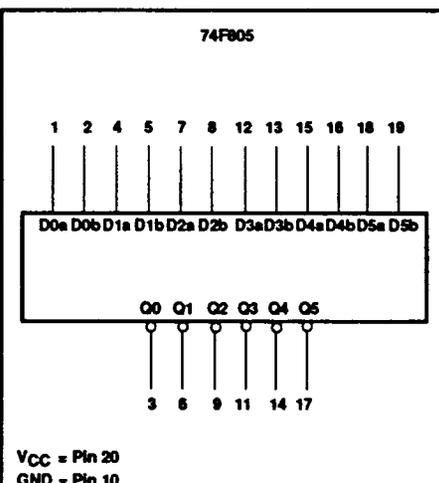
74F805

LOGIC SYMBOL

74F805

V_{CC} = Pin 20
GND = Pin 10

IEC/IEEE SYMBOL

74F805

PIN CONFIGURATION

74F1805

LOGIC SYMBOL

74F1805

V_{CC} = Pin 5
GND = Pin 15
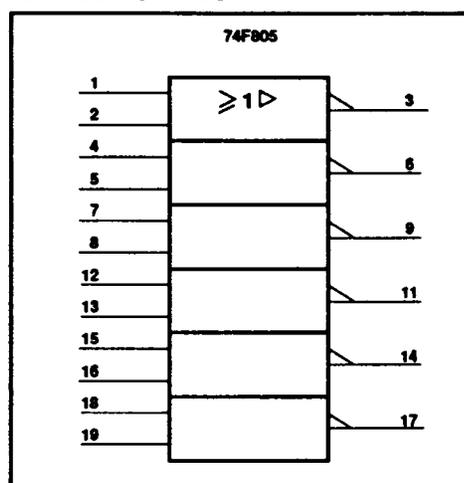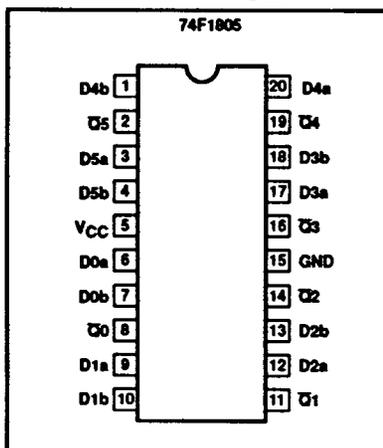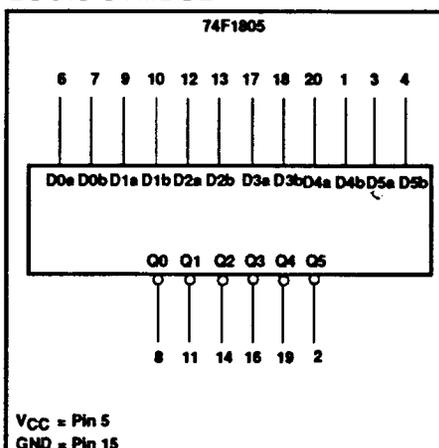
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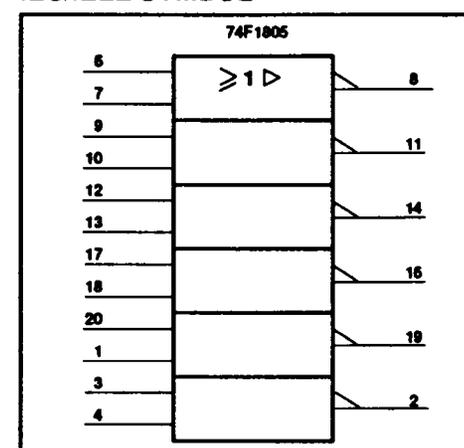
74F1805

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LOGIC DIAGRAM

74F805

D0a 1	
D0b 2	3 Q̄0
D1a 4	
D1b 5	6 Q̄1
D2a 7	
D2b 8	9 Q̄2
D3a 12	
D3b 13	11 Q̄3
D4a 15	
D4b 16	14 Q̄4
D5a 18	
D5b 19	17 Q̄5

Vcc = Pin 20
GND = Pin 10

74F1805

D0a 6	
D0b 7	8 Q̄0
D1a 9	
D1b 10	11 Q̄1
D2a 12	
D2b 13	14 Q̄2
D3a 17	
D3b 18	16 Q̄3
D4a 20	
D4b 1	19 Q̄4
D5a 3	
D5b 4	2 Q̄5

Vcc = Pin 5
GND = Pin 15
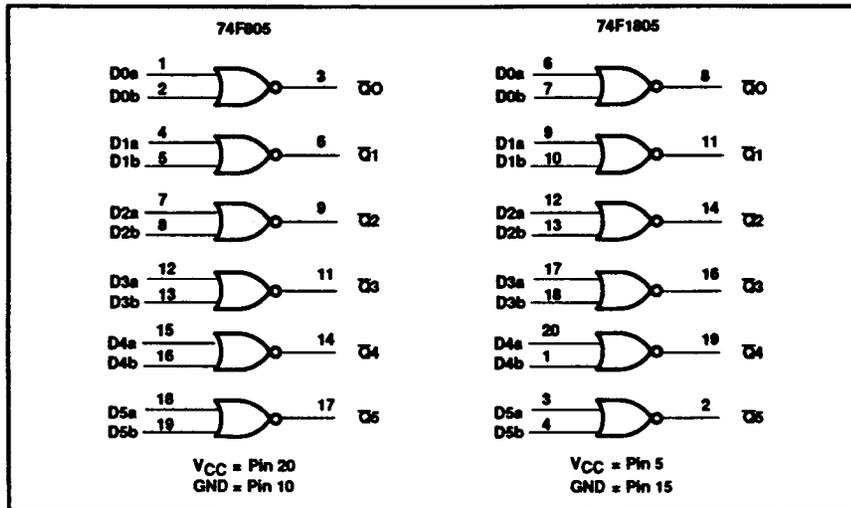
FUNCTION TABLE

INPUTS		OUTPUT
Dna	Dnb	Q̄n
H	X	L
X	H	L
L	L	H

Notes to function table
1. H = High voltage level
2. L = Low voltage level
3. X = Don't care

ABSOLUTE MAXIMUM RATINGS
(Operation beyond the limit set forth in this table may impair the useful life of the device. Unless otherwise noted these limits are over the operating free air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	–0.5 to +7.0	V
V_{IN}	Input voltage	–0.5 to +7.0	V
I_{IN}	Input current	–30 to +5	mA
V_{OUT}	Voltage applied to output in high output state	–0.5 to V_{CC}	V
I_{OUT}	Current applied to output in low output state	96	mA
T_{amb}	Operating free–air temperature range	0 to +70	°C
T_{stg}	Storage temperature range	–65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS			UNIT
		MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5.0	5.5	V
V_{IH}	High–level input voltage	2.0			V
V_{IL}	Low–level input voltage			0.8	V
I_{Ik}	Input clamp current			–18	mA
I_{OH}	High–level output current			–48	mA
I_{OL}	Low–level output current			48	mA
T_{amb}	Operating free air temperature range	0		+70	°C

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DC ELECTRICAL CHARACTERISTICS

(Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER	TEST CONDITIONS[1]		LIMITS			UNIT
				MIN	TYP[2]	MAX	
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IL} = MAX	±10%V_{CC}	2.0			V
		V_{IH} = MIN, I_{OH} = MAX	±5%V_{CC}	2.0			V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IL} = MAX	±10%V_{CC}		0.38	0.55	V
		V_{IH} = MIN, I_{OI} = MAX	±5%V_{CC}		0.38	0.55	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = I_K			-0.73	-1.2	V
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 7.0V				100	μA
I_{IH}	High-level input current	V_{CC} = MAX, V_I = 2.7V				20	μA
I_{IL}	Low-level input current	V_{CC} = MAX, V_I = 0.5V				-20	μA
I_O	Output current[3]	V_{CC} = MAX		-60		-150	mA
I_{CC}	Supply current (total)	I_{CCH}	V_{CC} = MAX	V_{IN} = GND		3.0	5.0	mA
		I_{CCL}		V_{IN} = 4.5V		17	25	mA

NOTES:
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_{amb} = 25°C.
3. The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

AC ELECTRICAL CHARACTERISTICS

| SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			T_{amb} = +25°C V_{CC} = +5.0V C_L = 50pF, R_L = 500Ω			T_{amb} = 0°C to +70°C V_{CC} = +5.0V ± 10% C_L = 50pF, R_L = 500Ω		
			MIN	TYP	MAX	MIN	MAX	
t_{PLH} t_{PHL}	Propagation delay Dna, Dnb to Qn	Waveform 1	1.0 1.0	2.0 2.5	4.0 4.5	1.0 1.0	4.0 4.5	ns
$t_{sk(o)}$	Output skew[1,2]	Waveform 2			1.5		1.5	ns

NOTES:
1. [t_{PN} actual – t_{PM} actual] for any output compared to any other output where N and M are either LH or HL.
2. Skew times are valid only under same test conditions (temperature, V_{CC}, loading, etc.,).

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AC WAVEFORMS

Waveform 1. Propagation delay for inverting output

Waveform 2. Output skew
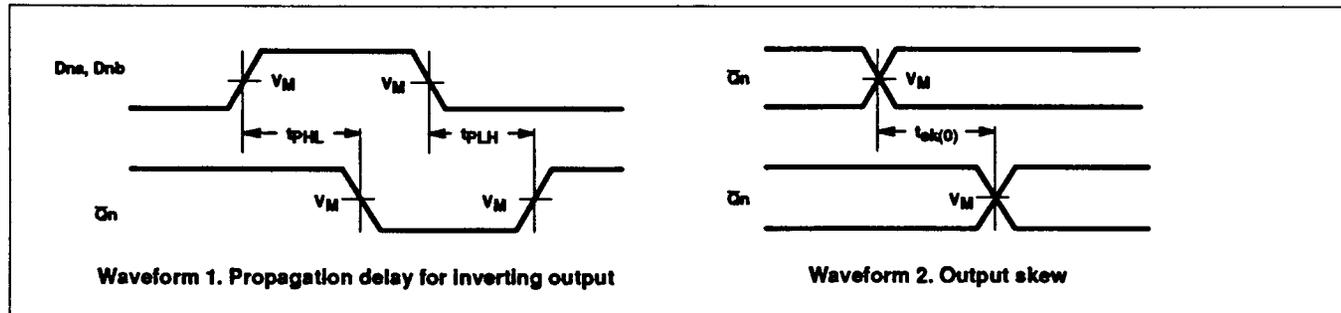
NOTE: For all waveforms, $V_M = 1.5V$.

TEST CIRCUIT AND WAVEFORMS

Test circuit for totem-pole outputs

DEFINITIONS:

R_L = Load resistor;
see AC electrical characteristics for value.

C_L = Load capacitance includes jig and probe capacitance;
see AC electrical characteristics for value.

R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

Input pulse definition

family	INPUT PULSE REQUIREMENTS					
	amplitude	V_M	rep. rate	t_w	t_{TLH}	t_{THL}
74F	3.0V	1.5V	1MHz	500ns	2.5ns	2.5ns