

FAST 74F37

Buffer

Quad 2-Input NAND Buffer

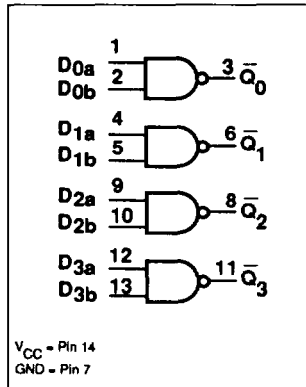
FAST Products

FUNCTION TABLE

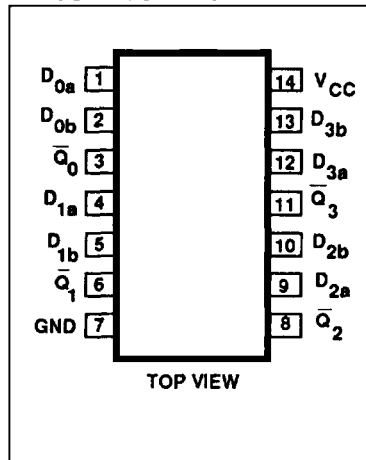
INPUTS		OUTPUT
D _{na}	D _{nb}	\bar{Q}_n
L	L	H
L	H	H
H	L	H
H	H	L

H = High voltage level
L = Low voltage level

LOGIC DIAGRAM



PIN CONFIGURATION



Product Specification

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F37	3.5 ns	13 mA

ORDERING INFORMATION

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 10\%$; $T_A = 0^\circ C$ to $+70^\circ C$
14-Pin Plastic DIP	N74F37N
14-Pin Plastic SO	N74F37D

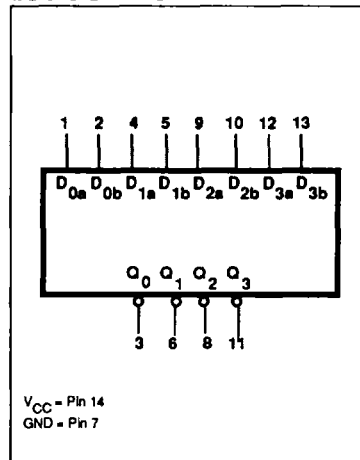
INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
D _{na} , D _{nb}	Data inputs	1.0/2.0	20 μ A/1.2mA
\bar{Q}_n	Data output	750/106.6	15mA/64mA

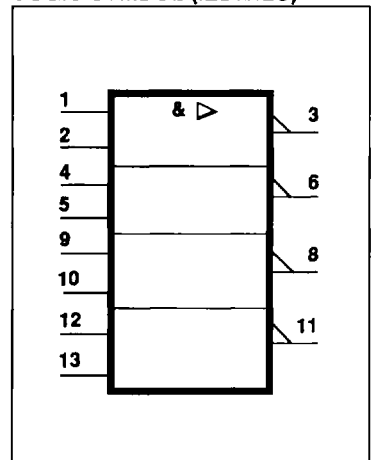
NOTE:

One (1.0) FAST Unit Load is defined as: 20 μ A in the High state and 0.6mA in the Low state.

LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



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ABSOLUTE MAXIMUM RATINGS (Operation beyond the limits 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	128	mA
T_A	Operating free-air temperature range	0 to +70	°C
T_{STG}	Storage temperature	-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			-15	mA
I_{OL}	Low-level output current			64	mA
T_A	Operating free-air temperature range	0		70	°C

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	$V_{CC} = \text{MIN}$ $V_{IL} = \text{MAX}$ $V_{IH} = \text{MIN}$	$I_{OH} = -1\text{mA}$	$\pm 10\%V_{CC}$	2.5		V
				$\pm 5\%V_{CC}$	2.7	3.4	V
		$I_{OH} = -15\text{mA}$	$\pm 10\%V_{CC}$	2.0		V	
			$\pm 5\%V_{CC}$	2.0		V	
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}$ $V_{IL} = \text{MAX}$ $V_{IH} = \text{MIN}$	$I_{OL} = \text{MAX}$	$\pm 10\%V_{CC}$		0.55	V
				$\pm 5\%V_{CC}$		0.42	0.55
V_{IK}	Input clamp voltage	$V_{CC} = \text{MIN}, I_I = I_{IK}$			-0.73	-1.2	V
I_I	Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7.0\text{V}$				100	μA
I_{IH}	High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$				20	μA
I_{IL}	Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.5\text{V}$				-0.6	mA
I_{OS}	Short circuit output current	$V_{CC} = \text{MAX}$			-100	-225	mA
I_{CC}	Supply current (total)	$V_{CC} = \text{MAX}$	$V_{IN} = \text{GND}$		3.0	6.0	mA
				$V_{IN} = 4.5\text{V}$		23	33

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.
- Not more than one output should be shorted at a time. For testing I_{OS} , the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a High output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I_{OS} tests should be performed last.

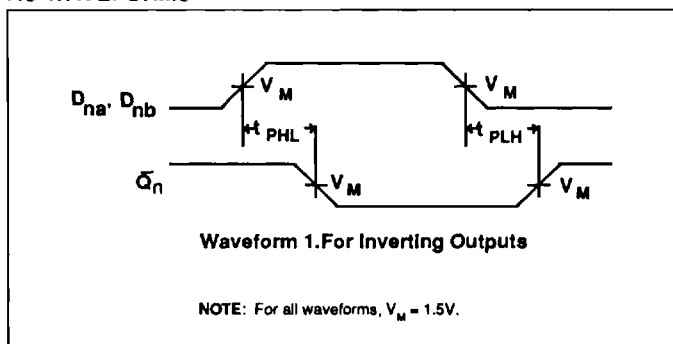
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AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			$T_A = +25^\circ\text{C}$ $V_{CC} = 5\text{V}$ $C_L = 50\text{pF}$ $R_L = 500\Omega$			$T_A = 0^\circ\text{C to } +70^\circ\text{C}$ $V_{CC} = 5\text{V} \pm 10\%$ $C_L = 50\text{pF}$ $R_L = 500\Omega$		
			Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation delay D_{na}, D_{nb} to \bar{Q}_n	Waveform 1	2.5 1.5	3.5 2.5	5.5 4.5	2.0 1.5	6.5 5.0	ns

AC WAVEFORMS



TEST CIRCUIT AND WAVEFORMS

