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FAST Products	

FAST 74F125, 74F126

Buffers

74F125 Quad Buffer (3-State)
74F126 Quad Buffer (3-State)

FEATURES

- High impedance NPN base inputs for reduced loading (20µA in High and Low states)

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F125	5.0ns	23mA
74F126	5.0ns	26mA

ORDERING INFORMATION

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 10\%$; $T_A = 0^\circ C$ to $+70^\circ C$
14-Pin Plastic DIP	N74F125N, N74F126N
14-Pin Plastic SO	N74F125D, N74F126D

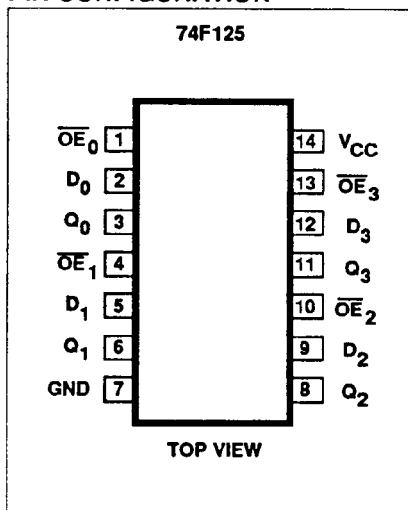
INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
D_0 - D_3	Data inputs	1.0/0.033	20µA/20µA
\overline{OE}_0 - \overline{OE}_3	Output Enable inputs (active Low) , F125	1.0/0.033	20µA/20µA
OE_0 - OE_3	Output Enable inputs (active High) , F126	1.0/0.033	20µA/20µA
Q_0 - Q_3	Data outputs	750/106.7	15mA/64mA

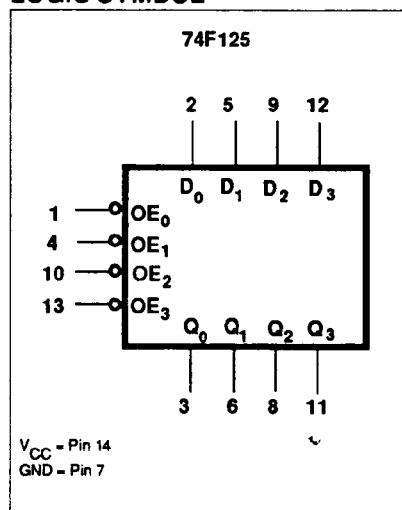
NOTE:

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

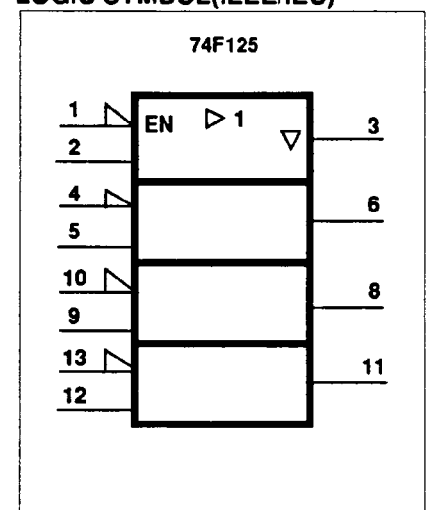
PIN CONFIGURATION



LOGIC SYMBOL



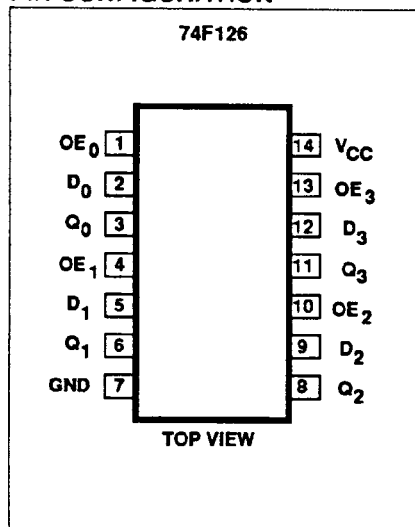
LOGIC SYMBOL (IEEE/IEC)



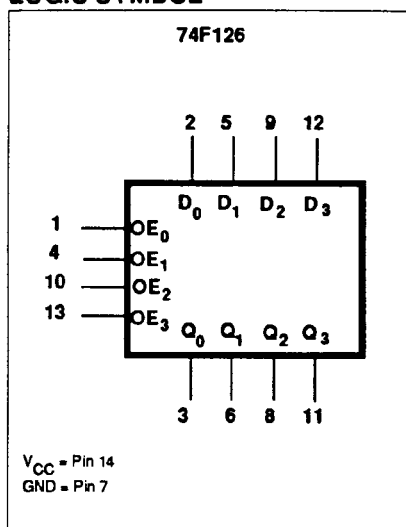
Buffers

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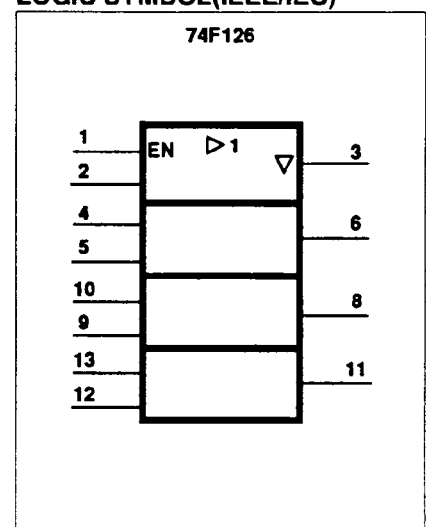
PIN CONFIGURATION



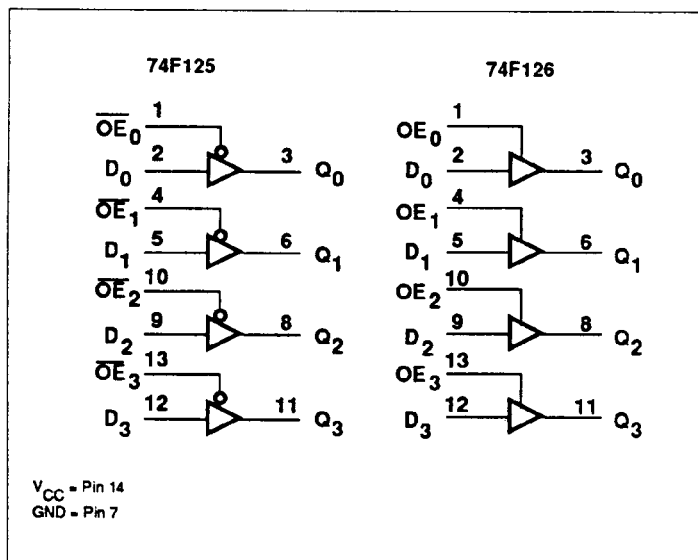
LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



LOGIC DIAGRAM



FUNCTION TABLE, 74F125

INPUTS		OUTPUT
\overline{OE}_n	D_n	Q_n
L	L	L
L	H	H
H	X	Z

FUNCTION TABLE, 74F126

INPUTS		OUTPUT
OE_n	D_n	Q_n
H	L	L
H	H	H
L	X	Z

H = High voltage level
 L = Low voltage level
 X = Don't care
 Z = High impedance "off" state

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

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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	$V_{CC} = \text{MIN},$ $V_{IL} = \text{MAX},$ $V_{IH} = \text{MIN}$	$I_{OH} = -3\text{mA}$	$\pm 10\%V_{CC}$	2.4		V			
				$\pm 5\%V_{CC}$	2.7	3.3	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		
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	$V_{CC} = 0.0\text{V}, V_I = 7.0\text{V}$				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	$V_{CC} = \text{MAX}, V_I = 0.5\text{V}$				-20	μA			
I_{OZH}	Off-state output current, High-level voltage applied	$V_{CC} = \text{MAX}, V_O = 2.7\text{V}$				50	μA			
I_{OZL}	Off-state output current, Low-level voltage applied	$V_{CC} = \text{MAX}, V_O = 0.5\text{V}$				-50	μA			
I_{OS}	Short circuit output current ³	$V_{CC} = \text{MAX}$			-100	-225	mA			
I_{CC}	Supply current (total)	'F125	$V_{CC} = \text{MAX}$	$\overline{OE}_n = \text{GND}, D_n = 4.5\text{V}$		17	24	mA		
						$\overline{OE}_n = D_n = \text{GND}$	28	40	mA	
							$\overline{OE}_n = D_n = 4.5\text{V}$	25	35	mA
		'F126		$V_{CC} = \text{MAX}$	$OE_n = D_n = 4.5\text{V}$			20	30	mA
								$OE_n = 4.5\text{V}, D_n = \text{GND}$	32	48
							$OE_n = \text{GND}, D_n = 4.5\text{V}$		26	39

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.

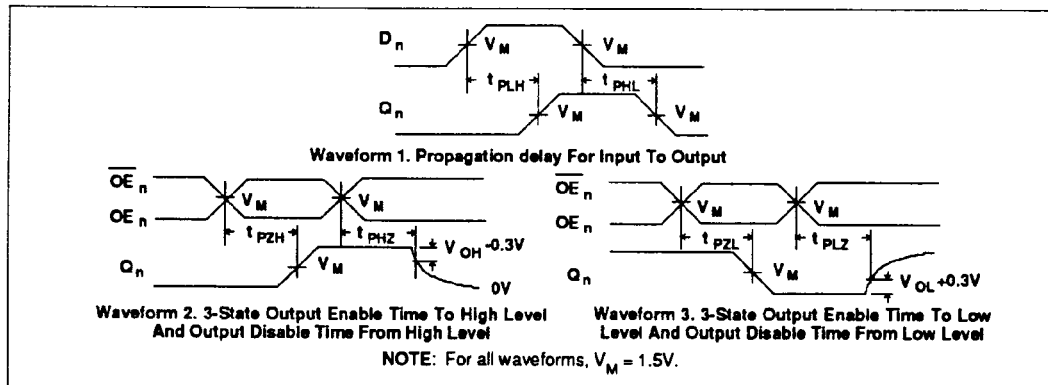
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AC ELECTRICAL CHARACTERISTICS

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_n to Q_n	Waveform 1	2.0	4.0	6.0	2.0	6.5	ns
			3.0	5.5	7.5	3.0	8.0	
t_{PZH} t_{PZL}	Output Enable time to High or Low level	74F125	3.5	5.5	7.5	3.5	8.5	ns
			4.0	6.0	8.0	4.0	9.0	
t_{PHZ} t_{PLZ}	Output Disable time from High or Low level	74F125	1.5	3.5	5.0	1.5	6.0	ns
			1.5	3.5	5.5	1.5	6.0	
t_{PLH} t_{PHL}	Propagation delay D_n to Q_n	74F126	2.0	4.0	6.5	2.0	7.0	ns
			3.0	5.5	8.0	3.0	8.5	
t_{PZH} t_{PZL}	Output Enable time to High or Low level	74F126	4.0	6.0	7.5	3.5	8.5	ns
			4.0	6.0	8.0	3.5	8.5	
t_{PHZ} t_{PLZ}	Output Disable time from High or Low level	74F126	2.0	4.5	6.5	2.0	7.5	ns
			3.0	5.5	7.5	3.0	8.0	

AC WAVEFORMS



TEST CIRCUIT AND WAVEFORMS

