

Quad 2-input OR gate

74F32

FEATURE

- Industrial temperature range available (-40°C to +85°C)

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT(TOTAL)
74F32	4.1ns	8.2mA

ORDERING INFORMATION

DESCRIPTION	ORDER CODE	
	COMMERCIAL RANGE V _{CC} = 5V ±10%, T _{amb} = 0°C to +70°C	INDUSTRIAL RANGE V _{CC} = 5V ±10%, T _{amb} = -40°C to +85°C
14-pin plastic DIP	N74F32N	I74F32N
14-pin plastic SO	N74F32D	I74F32D

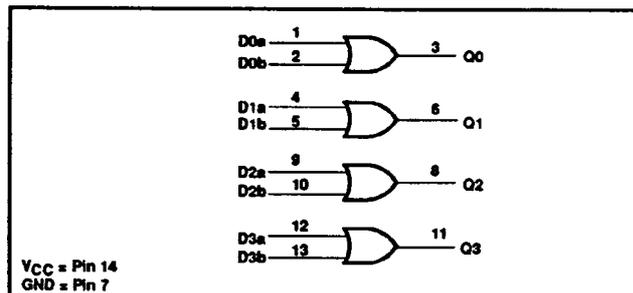
INPUT AND OUTPUT LOADNG AND FAN OUT TABLE

PINS	DESCRIPTION	74F (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
D _{na} , D _{nb}	Data inputs	1.0/1.0	20µA/0.6mA
Q _n	Data output	50/33	1.0mA/20mA

Note to input and output loading and fan out table

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

LOGIC DIAGRAM



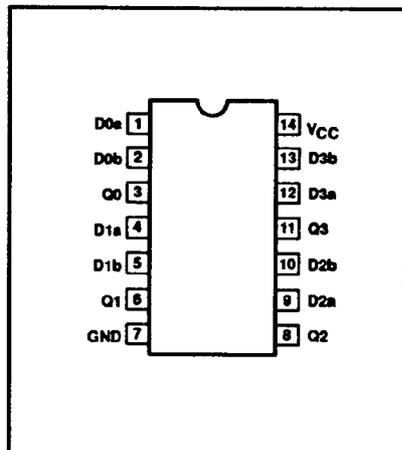
FUNCTION TABLE

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

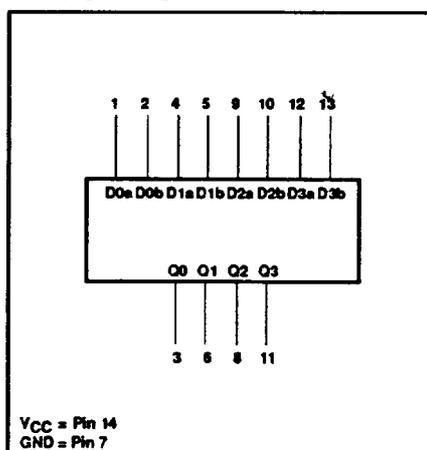
Notes to function table

- H = High voltage level
- L = Low voltage level

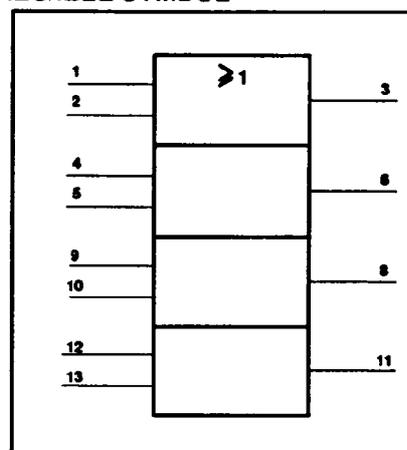
PIN CONFIGURATION



LOGIC SYMBOL



IEC/IEEE SYMBOL



Quad 2-input OR gate

74F32

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	40	mA	
T_{amb}	Operating free air temperature range	Commercial range	0 to +70	°C
		Industrial range	-40 to +85	°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			-1	mA
I_{OL}	Low-level output current			20	mA
T_{amb}	Operating free air temperature range	Commercial range	0	+70	°C
		Industrial range	-40	+85	°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	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}$	$\pm 10\%V_{CC}$	2.5		V	
		$V_{IH} = \text{MIN}, I_{OH} = \text{MAX}$	$\pm 5\%V_{CC}$	2.7	3.4	V	
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}$	$\pm 10\%V_{CC}$		0.30	0.50	V
		$V_{IH} = \text{MIN}, I_{OI} = \text{MAX}$	$\pm 5\%V_{CC}$		0.30	0.50	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	$V_{CC} = \text{MAX}, V_I = 7.0\text{V}$			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 ³	$V_{CC} = \text{MAX}$	-60		-150	mA	
I_{CC}	Supply current (total)	I_{CCH} $V_{CC} = \text{MAX}$	$V_N = 4.5\text{V}$		6.1	9.2	mA
		I_{CCL} $V_{CC} = \text{MAX}$	$V_N = \text{GND}$		10.3	15.5	mA

Notes to DC electrical characteristics

- 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 $V_{CC} = 5\text{V}$, $T_{amb} = 25^\circ\text{C}$.

Quad 2-input OR gate

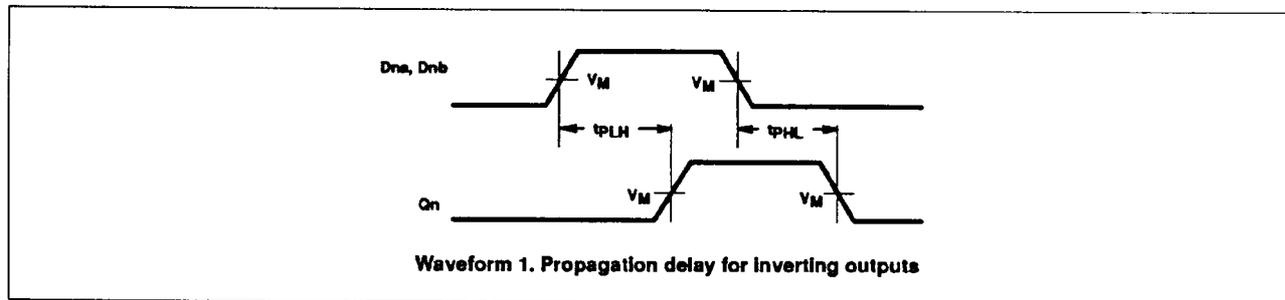
74F32

- 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.

AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT	
			$T_{amb} = +25^{\circ}C$ $V_{CC} = +5.0V$ $C_L = 50pF$ $R_L = 500\Omega$			$T_{amb} = 0^{\circ}C \text{ to } +70^{\circ}C$ $V_{CC} = +5.0V \pm 10\%$ $C_L = 50pF$ $R_L = 500\Omega$		$T_{amb} = -40^{\circ}C \text{ to } +85^{\circ}C$ $V_{CC} = +5.0V \pm 10\%$ $C_L = 50pF$ $R_L = 500\Omega$		
			MIN	TYP	MAX	MIN	MAX	MIN		MAX
t_{PLH} t_{PHL}	Propagation delay D_{na}, D_{nb} to C_n	Waveform 1	3.0	4.2	5.6	3.0	6.6	3.0	6.6	ns
			3.0	4.0	5.3	3.0	6.3	3.0	6.3	

AC WAVEFORMS



Note to AC Waveforms

- For all waveforms, $V_M = 1.5V$.

TEST CIRCUIT AND WAVEFORMS

