National Semiconductor

Not Intended For New Designs

T-45-23-33

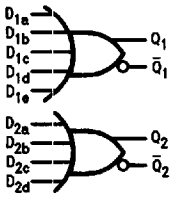
11C01
Dual 5-4 Input OR/NOR Gate

General Description

The 11C01 is a voltage-compensated ECL dual 5-4 input OR/NOR gate. The circuit has standard internal voltage compensation with DC parameters identical to 10K ECL devices.

Ordering Code: See Section 6

Logic Symbol



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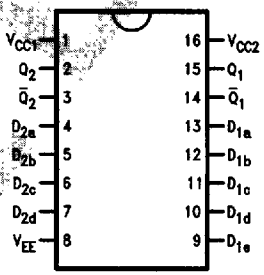
Pin Names	Description
D_{1a}–D_{1e}, D_{2a}–D_{2d}	Data Inputs
Q_1, $\overline{Q}_1$, Q_2, $\overline{Q}_2$	Outputs

Connection Diagrams

16-Pin DIP



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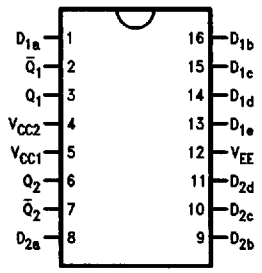
16-Pin Flatpak



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Truth Tables

In					Out	
D_{1a}	D_{1b}	D_{1c}	D_{1d}	D_{1e}	Q_1	$\overline{Q}_1$
L	L	L	L	L	L	H
H	X	X	X	X	H	L
X	H	X	X	X	H	L
X	X	H	X	X	H	L
X	X	X	H	X	H	L
X	X	X	X	H	H	L

In				Out	
D_{2a}	D_{2b}	D_{2c}	D_{2d}	Q_2	$\overline{Q}_2$
L	L	L	L	L	H
H	X	X	X	H	L
X	H	X	X	H	L
X	X	H	X	H	L
X	X	X	H	H	L

H = HIGH Voltage Level
L = LOW Voltage Level
X = Don't Care

Absolute Maximum Ratings

Above which the useful life may be impaired

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Storage Temperature	−65°C to +150°C
Maximum Junction Temperature (T_J)	+150°C
Supply Voltage Range	−7.0V to GND
Input Voltage (DC)	V_{EE} to GND
Output Current (DC Output HIGH)	−50 mA
Operating Range	−5.5V to −4.75V
Lead Temperature (Soldering, 10 sec.)	300°C

Recommended Operating Conditions

	Min	Typ	Max	Units
Supply Voltage (V_{EE})	−5.5	−5.2	−4.75	V
Ambient Temperature (T_A)	0		+75	°C

DC Electrical Characteristics

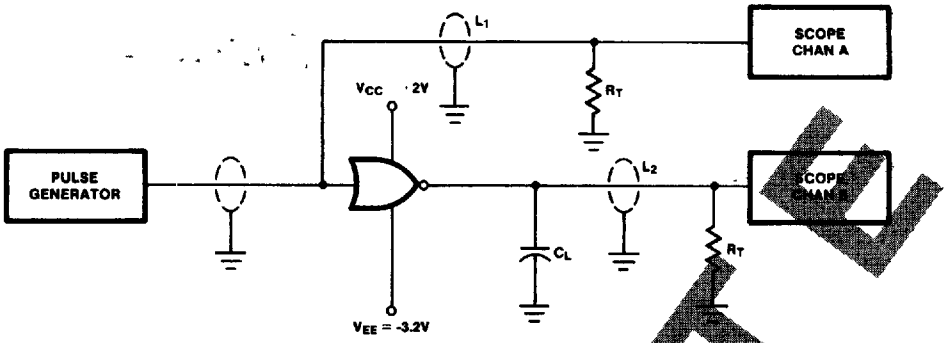
V_{EE} = −5.2V, V_{CC} = GND

Symbol	Parameter	Min	Typ	Max	Units	T_A	Conditions	
V_{OH}	Output Voltage HIGH	−1000 −960 −900		−840 −810 −720	mV	0°C +25°C +75°C	V_{IN} = $V_{IH(Max)}$ or $V_{IL(Min)}$ per Truth Table	Loading is 50Ω to −2.0V
V_{OL}	Output Voltage LOW	−1870 −1850 −1830		−1665 −1650 −1625	mV	0°C +25°C +75°C		
V_{OHC}	Output Voltage HIGH	−1020 −980 −920			mV	0°C +25°C +75°C	V_{IN} = $V_{IH(Min)}$ or $V_{IL(Max)}$ per Truth Table	
V_{OLC}	Output Voltage LOW			−1645 −1630 −1605	mV	0°C +25°C +75°C		
V_{IH}	Input Voltage HIGH	−1145 −1105 −1045		−840 −810 −720	mV	0°C +25°C +75°C	Guaranteed Input Voltage HIGH for All Inputs	
V_{IL}	Input Voltage LOW	−1870 −1850 −1830		−1490 −1475 −1450	mV	0°C +25°C +75°C	Guaranteed Input Voltage LOW for All Inputs	
I_{IH}	Input Current HIGH			350	μA	+25°C	V_{IN} = $V_{IH(Max)}$	
I_{IL}	Input Current LOW	0.5			μA	+25°C	V_{IN} = $V_{IL(Min)}$	
I_{EE}	Power Supply Current	−30	−24		mA	+25°C	Inputs and Outputs Open	

AC Electrical Characteristics

V_{EE} = −5.2V, T_A = +25°C

Symbol	Parameter	Flatpak			DIP			Units	Conditions
		Min	Typ	Max	Min	Typ	Max		
t_{PLH}	Propagation Delay LOW to HIGH	0.45	0.7	0.95	0.60	0.90	1.15	ns	See *Figure 1*
t_{PHL}	Propagation Delay HIGH to LOW	0.45	0.7	0.95	0.60	0.90	1.15	ns	
t_{TLH}	Output Transition Time LOW to HIGH (20% to 80%)		0.7	0.95		0.90	1.15	ns	
t_{THL}	Output Transition Time HIGH to LOW (80% to 20%)		0.7	0.95		0.90	1.15	ns	



Notes:

L1 and L2 = equal length 50Ω impedance lines
R_T = 50Ω Termination of scope
Decoupling 0.1 μF from GND to V_{EE} and V_{CC}
$C_L \leq 3$ pF

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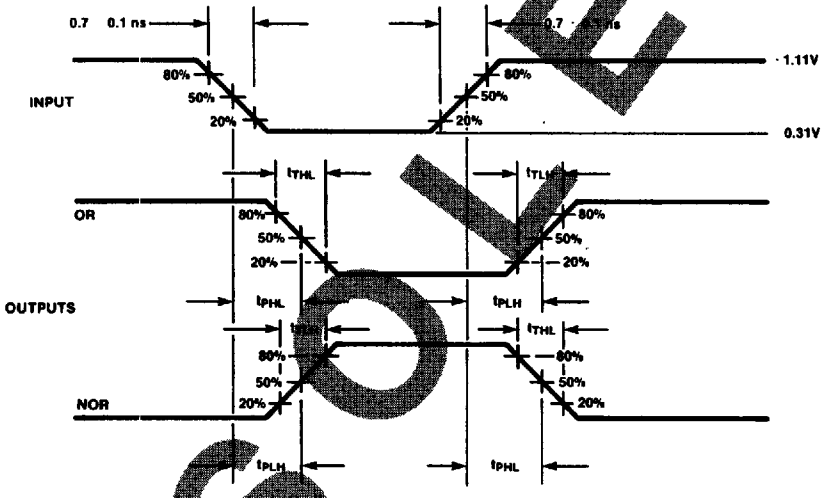

Notes:

Jig setup with no circuit under test
$V_{CC1} = V_{CC2} = +2.0V$
$V_{EE} = -3.2V$

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FIGURE 1. Switching Circuit and Waveforms