

Philips Components

Document No.	853-0647
ECN No.	99799
Date of Issue	June 14, 1990
Status	Product Specification
ECL Products	

10111 Gate

Dual 3-Input/3-Output NOR Gate (Line Driver)

FEATURES

- Typical propagation delay: 2.4ns
- Typical supply current ($-I_{EE}$): 29mA

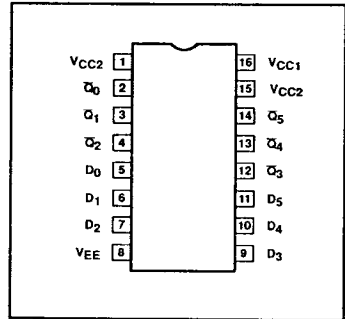
DESCRIPTION

The 10111 is a Dual 3-Input/3-Output NOR Gate intended to drive up to three transmission lines simultaneously. The ability to control three parallel lines makes this device particularly useful in clock distribution applications. All unused inputs can be left open due to integrated pull-down resistors which avoid the need for a supply voltage.

ORDERING INFORMATION

DESCRIPTION	ORDER CODE
16-Pin Plastic DIP	10111N
16-Pin Ceramic DIP	10111F

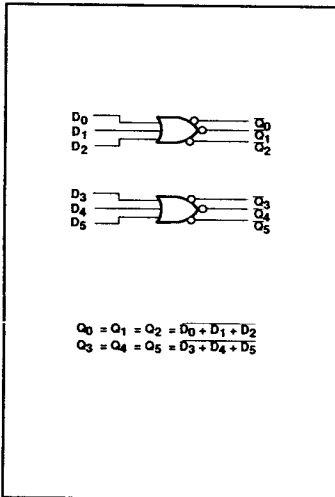
PIN CONFIGURATION



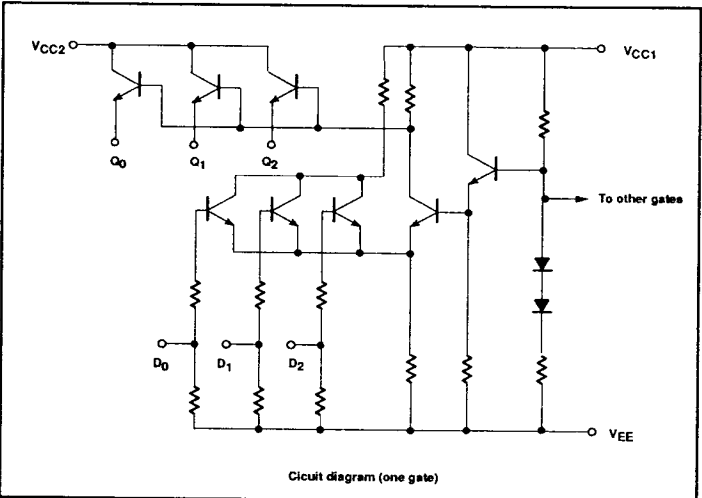
PIN DESCRIPTION

PINS	DESCRIPTION
$D_0 - D_5$	Data Inputs
$Q_0 - Q_5$	Data Outputs (NOR)

LOGIC DIAGRAM



SIMPLIFIED SCHEMATIC



Gate

10111

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER		LIMITS	UNIT
V_{EE}	Supply voltage		-8.0	V
V_{IN}	Input voltage (V_{IN} should never be more negative than V_{EE})		0 to V_{EE}	V
I_O	Output source current (continuous)		-50	mA
T_S	Storage temperature range		-55 to +150	°C
T_J	Maximum junction temperature	Ceramic Package	+165	°C
		Plastic Package	+150	°C

NOTE:

Operation beyond the limits set forth in this table may impair the useful life of the device. Unless otherwise noted, these limits are specified over the operating ambient temperature range.

DC OPERATING CONDITIONS

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			MIN.	NOM.	MAX.	
V_{CC1}, V_{CC2}	Circuit ground		0	0	0	V
V_{EE}	Supply voltage (negative)			-5.2		V
V_{IH}	High level input voltage	$T_A = -30^\circ\text{C}$			-890	mV
		$T_A = +25^\circ\text{C}$			-810	mV
		$T_A = +85^\circ\text{C}$			-700	mV
V_{IHT}	High level input threshold voltage	$T_A = -30^\circ\text{C}$	-1205			mV
		$T_A = +25^\circ\text{C}$	-1105			mV
		$T_A = +85^\circ\text{C}$	-1035			mV
V_{ILT}	Low level input threshold voltage	$T_A = -30^\circ\text{C}$			-1500	mV
		$T_A = +25^\circ\text{C}$			-1475	mV
		$T_A = +85^\circ\text{C}$			-1440	mV
V_{IL}	Low level input voltage	$T_A = -30^\circ\text{C}$	-1890			mV
		$T_A = +25^\circ\text{C}$	-1850			mV
		$T_A = +85^\circ\text{C}$	-1825			mV
T_A	Operating ambient temperature range		-30	+25	+85	°C

NOTE:

When operating at other than the specified V_{EE} voltage (-5.2V), the DC and AC Electrical Characteristics will vary slightly from specified values.

Gate

10111

DC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -5.2V \pm 0.010V$, $T_A = -30^\circ\text{C}$ to $+85^\circ\text{C}$ output loading 50Ω to $-2.0V \pm 0.010V$ unless otherwise specified^{1,3}

SYMBOL	PARAMETER	TEST CONDITIONS ²		LIMITS			UNIT
				MIN.	TYP.	MAX.	
V _{OH}	High level output voltage	T _A = −30°C	Apply V _{ILMIN} to all inputs.	−1060		−890	mV
		T _A = +25°C		−960		−810	mV
		T _A = +85°C		−890		−700	mV
V _{OHT}	High level output threshold voltage	T _A = −30°C	Apply V _{ILT} to each input,	−1080			mV
		T _A = +25°C	one at a time, with V _{ILMIN}	−980			mV
		T _A = +85°C	applied to all other inputs	−910			mV
V _{OLT}	Low level output threshold voltage	T _A = −30°C	Apply V _{IHT} to each input,			−1655	mV
		T _A = +25°C	one at a time, with V _{ILMIN}			−1630	mV
		T _A = +85°C	applied to all other inputs			−1595	mV
V _{OL}	Low level output voltage	T _A = −30°C	Apply V _{IHMAX} to all inputs.	−1890		−1675	mV
		T _A = +25°C		−1850		−1650	mV
		T _A = +85°C		−1825		−1615	mV
I _{IH}	High level input current	T _A = −30°C	Apply V _{IHMAX} to each input under test,			680	μA
		T _A = +25°C	one at a time, with V _{ILMIN} applied			425	μA
		T _A = +85°C	to all other inputs.			425	μA
I _{IL}	Low level input current	T _A = −30°C	Apply V _{ILMIN} to each input under test,	0.5			μA
		T _A = +25°C	one at a time, with V _{IHMAX} applied	0.5			μA
		T _A = +85°C	to all other inputs.	0.3			μA
−I _{EE}	V _{EE} supply current	T _A = −30°C				42	mA
		T _A = +25°C			29	38	mA
		T _A = +85°C				42	mA
$\frac{\Delta V_{OH}}{\Delta V_{EE}}$	High level output voltage compensation	T _A = +25°C			0.016		V/V
$\frac{\Delta V_{OL}}{\Delta V_{EE}}$	Low level output voltage compensation				0.250		V/V
$\frac{\Delta V_{BB}}{\Delta V_{EE}}$	Reference bias voltage compensation				0.148		V/V

NOTES:

1. The specified limits represent the worst case values for the parameter. Since these worst case values normally occur at the supply voltage and temperature extremes, additional noise immunity can be achieved by decreasing the allowable operating condition ranges.
2. Conditions for testing shown in the tables are not necessarily worst case. For worst case testing guidelines, refer to DC Testing, Chapter 1, Section 3.
3. The specified limits shown in the DC Electrical Characteristics table can be met only after thermal equilibrium has been established. Thermal equilibrium is established by applying power for at least 2 minutes, while maintaining transverse airflow of 2.5 meters/sec (500 linear feet/min) over the device, mounted either in a test socket or on a printed circuit board. Test voltage values are given in the DC Operating Conditions table.

Gate

10111

AC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -5.2V \pm 0.010V$

SYMBOL	PARAMETER	TEST CONDITION	LIMITS								UNIT
			T _A = -30°C		T _A = +25°C			T _A = +85°C			
			MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
t _{PLH} t _{PHL}	Propagation delay D _n to Q _n	Waveform 1	1.40 1.40	3.50 3.50	1.40 1.40	2.40 2.40	3.50 3.50	1.50 1.50	3.80 3.80	ns ns	
t _{TLH} t _{THL}	Transition time 20% to 80%, 80% to 20%	Waveform 1	1.00 1.00	3.50 3.50	1.10 1.10	2.20 2.20	3.50 3.50	1.20 1.20	3.80 3.80	ns ns	

NOTE:

For AC test setup information, see AC Testing, Chapter 2, Section 3.

AC WAVEFORMS

