

Philips Components

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Status	Product Specification
ECL Products	

100107

Quint Exclusive-OR/Exclusive-NOR Gate With Compare Output

FEATURES

- Typical propagation delay: 0.95ns
- Typical supply current ($-I_{EE}$): 68mA

DESCRIPTION

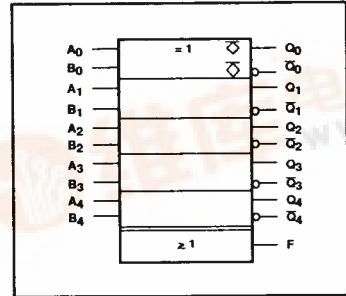
The 100107 has five 2-input, 2-output Exclusive-OR/Exclusive-NOR gates with a Compare Output.

All unused inputs can be left open due to integrated pull-down resistors.

PIN DESCRIPTION

PINS	DESCRIPTION
$A_0 - A_4$, $B_0 - B_4$	Data Inputs
$Q_0 - Q_4$	Exclusive-OR Outputs
$\bar{Q}_0 - \bar{Q}_4$	Exclusive-NOR Outputs
F	Compare Output

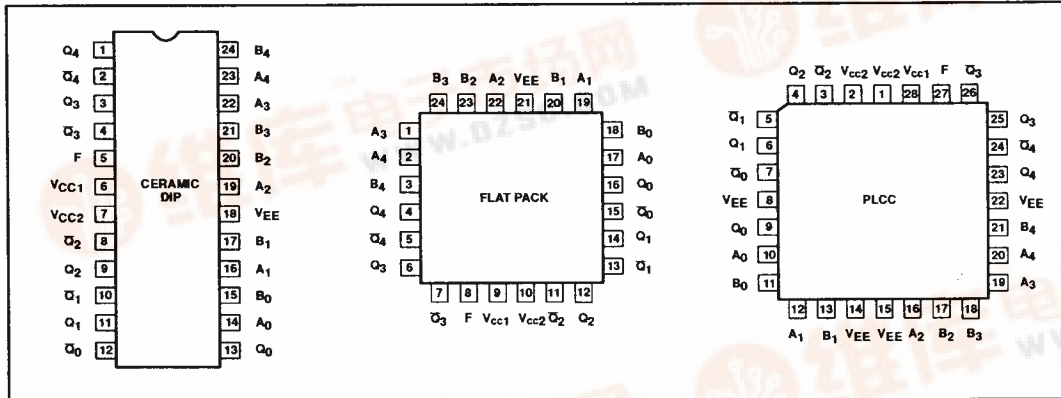
IEC/IEEE SYMBOL



ORDERING INFORMATION

DESCRIPTION	ORDER CODE
24-Pin Ceramic DIP (400 mils wide)	100107F
24-Pin Ceramic Flat Pack	100107Y
28-Pin PLCC	100107A

PIN CONFIGURATIONS

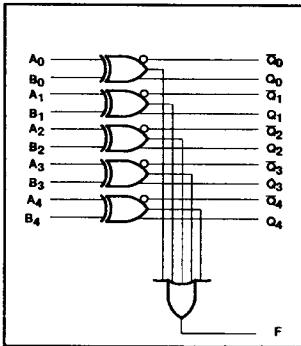


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LOGIC DIAGRAM



FUNCTION TABLE (For Q_n and \bar{Q}_n)

INPUTS		OUTPUTS	
A_n	B_n	$Q_n = A_n \oplus B_n$	$\bar{Q}_n = \overline{A_n \oplus B_n}$
L	L	L	H
L	H	H	L
H	L	H	L
H	H	L	H

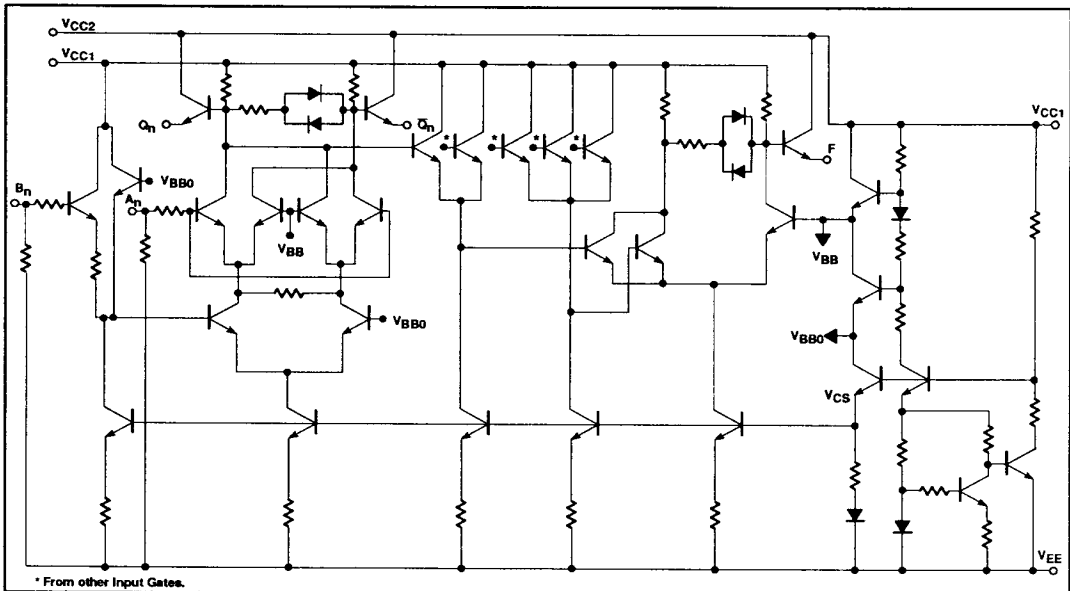
FUNCTION TABLE (For the Compare Output)

INPUTS					OUTPUT
$A_0 \oplus B_0$	$A_1 \oplus B_1$	$A_2 \oplus B_2$	$A_3 \oplus B_3$	$A_4 \oplus B_4$	F
L	L	L	L	L	L
H	X	X	X	X	H
X	H	X	X	X	H
X	X	H	X	X	H
X	X	X	H	X	H
X	X	X	X	H	H

NOTES:

- \oplus = Exclusive-OR operation
- H = High voltage level
- L = Low voltage level
- X = Don't care

SIMPLIFIED SCHEMATIC



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[查询"100107A"供应商](#)**ABSOLUTE MAXIMUM RATINGS** $V_{CC1} = V_{CC2} = \text{ground}$, $T_A = 0^\circ\text{C}$ to $+85^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	LIMITS	UNIT
V_{EE}	Supply voltage range	-7.0 to +0.5	V
V_{IN}	Input voltage (V_{IN} should never be more negative than V_{EE})	V_{EE} to +0.5	V
I_O	Output source current (continuous)	-55	mA
T_S	Storage temperature range	-65 to +150	$^\circ\text{C}$
T_J	Maximum junction temperature	+150	$^\circ\text{C}$

NOTE:

Operation beyond the limits set forth in this table may impair the useful life of the device.

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		-4.8	-4.5	-4.2	V
V_{EE}	Supply voltage when operating with the 10K or the 10KH ECL family		-5.7			V
V_{IH}	High level input voltage	$V_{EE} = -4.2\text{V}$	-1150			mV
		$V_{EE} = -4.5\text{V}$	-1165		-880	
		$V_{EE} = -4.8\text{V}$	-1165			
V_{IL}	Low level input voltage	$V_{EE} = -4.2\text{V}$			-1475	mV
		$V_{EE} = -4.5\text{V}$	-1810		-1475	mV
		$V_{EE} = -4.8\text{V}$			-1490	mV
T_A	Operating ambient temperature range		0	+25	+85	$^\circ\text{C}$

NOTE:When operating at other than the specified V_{EE} voltages (-4.2V, -4.5V, -4.8V), the DC and AC electrical characteristics will vary slightly from their specified values.

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DC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -4.8\text{V to } -4.2\text{V}$, $T_A = 0^\circ\text{C to } +85^\circ\text{C}$ unless otherwise specified^{1,3,4}

SYMBOL	PARAMETER	TEST CONDITIONS ²			LIMITS			UNIT
					MIN.	TYP.	MAX.	
V _{OH}	High level output voltage	Inputs at V _{IHMAX} or V _{ILMIN} .	V _{EE} = -4.2V	-1020		-870	mV	
			V _{EE} = -4.5V	-1025	-955	-880	mV	
			V _{EE} = -4.8V	-1035		-880	mV	
V _{OHT}	High level output threshold voltage	Outputs Loaded	Apply V _{IHMIN} or V _{ILMAX} to one input at a time, other inputs at V _{IHMAX} or V _{ILMIN} .	V _{EE} = -4.2V	-1030		mV	
			V _{EE} = -4.5V	-1035		mV		
			V _{EE} = -4.8V	-1045		mV		
V _{OLT}	Low level output threshold voltage	with 50Ω to -2.0V ±0.010V	Apply V _{IHMIN} or V _{ILMAX} to one input at a time, other inputs at V _{IHMAX} or V _{ILMIN} .	V _{EE} = -4.2V		-1595	mV	
			V _{EE} = -4.5V		-1610	mV		
			V _{EE} = -4.8V		-1610	mV		
V _{OL}	Low level output voltage	Inputs at V _{IHMAX} or V _{ILMIN} .	V _{EE} = -4.2V	-1810		-1605	mV	
			V _{EE} = -4.5V	-1810	-1705	-1620	mV	
			V _{EE} = -4.8V	-1830		-1620	mV	
I _{IH}	High level input current	B _n	One input under test at V _{IHMAX} .			250	μA	
		A _n	Other inputs at V _{ILMIN} .			350	μA	
I _{IL}	Low level input current		One input under test at V _{ILMIN} . Other inputs at V _{IHMAX} .	0.5			μA	
-I _{EE}	V _{EE} supply current		All inputs at V _{IHMAX} .	46	68	96	mA	

NOTES:

- 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.
- 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.
- 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.
- The device can function down to V_{EE} = -5.7V, allowing operation with either the 10K or the 10KH family. Correction factors can be used to calculate new DC limits for the extended V_{EE} range. For more information, see Chapters 5 and 10, Section 4.

AC ELECTRICAL CHARACTERISTICS

Ceramic DIP $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -4.8\text{V to } -4.2\text{V}$

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT
			T _A = 0°C		T _A = +25°C		T _A = +85°C		
			MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t _{PLH} t _{PHL}	Propagation delay B _n to Q _n or \bar{Q}_n	Waveform 1	0.55	1.90	0.55	1.80	0.55	1.90	ns
			0.55	1.90	0.55	1.80	0.55	1.90	ns
t _{PLH} t _{PHL}	Propagation delay A _n to Q _n or \bar{Q}_n		0.55	1.70	0.55	1.60	0.55	1.70	ns
			0.55	1.70	0.55	1.60	0.55	1.70	ns
t _{PLH} t _{PHL}	Propagation delay A _n , B _n to F		1.15	2.75	1.15	2.75	1.15	3.00	ns
			1.15	2.75	1.15	2.75	1.15	3.00	ns
t _{TLH} t _{THL}	Transition time Q _n , \bar{Q}_n or F	0.45	1.70	0.45	1.55	0.45	1.70	ns	
		0.45	1.70	0.45	1.55	0.45	1.70	ns	

NOTE:

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

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AC ELECTRICAL CHARACTERISTICS

Ceramic DIP $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -5.2V \pm 5\%$

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT
			$T_A = 0^\circ\text{C}$		$T_A = +25^\circ\text{C}$		$T_A = +85^\circ\text{C}$		
			MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t_{PLH} t_{PHL}	Propagation delay B_n to Q_n or \bar{Q}_n	Waveform 1	0.55 0.55	1.90 1.90	0.55 0.55	1.80 1.80	0.55 0.55	1.90 1.90	ns ns
t_{PLH} t_{PHL}	Propagation delay A_n to Q_n or \bar{Q}_n		0.55 0.55	1.70 1.70	0.55 0.55	1.60 1.60	0.55 0.55	1.70 1.70	ns ns
t_{PLH} t_{PHL}	Propagation delay A_n, B_n to F		1.15 1.15	2.75 2.75	1.15 1.15	2.75 2.75	1.15 1.15	3.00 3.00	ns ns
t_{TLH} t_{THL}	Transition time Q_n, \bar{Q}_n or F		0.45 0.45	1.70 1.70	0.45 0.45	1.55 1.55	0.45 0.45	1.70 1.70	ns ns

NOTE:

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

AC ELECTRICAL CHARACTERISTICS

Flat Pack and PLCC $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -4.8V$ to $-4.2V$

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT
			$T_A = 0^\circ\text{C}$		$T_A = +25^\circ\text{C}$		$T_A = +85^\circ\text{C}$		
			MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t_{PLH} t_{PHL}	Propagation delay B_n to Q_n or \bar{Q}_n	Waveform 1	0.55 0.55	1.70 1.70	0.55 0.55	1.60 1.60	0.55 0.55	1.70 1.70	ns ns
t_{PLH} t_{PHL}	Propagation delay A_n to Q_n or \bar{Q}_n		0.55 0.55	1.50 1.50	0.55 0.55	1.40 1.40	0.55 0.55	1.50 1.50	ns ns
t_{PLH} t_{PHL}	Propagation delay A_n, B_n to F		1.15 1.15	2.55 2.55	1.15 1.15	2.55 2.55	1.15 1.15	2.80 2.80	ns ns
t_{TLH} t_{THL}	Transition time Q_n, \bar{Q}_n or F		0.45 0.45	1.70 1.70	0.45 0.45	1.55 1.55	0.45 0.45	1.70 1.70	ns ns

NOTE:

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

AC ELECTRICAL CHARACTERISTICS

Flat Pack and PLCC $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -5.2V \pm 5\%$

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT
			$T_A = 0^\circ\text{C}$		$T_A = +25^\circ\text{C}$		$T_A = +85^\circ\text{C}$		
			MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t_{PLH} t_{PHL}	Propagation delay B_n to Q_n or \bar{Q}_n	Waveform 1	0.55 0.55	1.70 1.70	0.55 0.55	1.60 1.60	0.55 0.55	1.70 1.70	ns ns
t_{PLH} t_{PHL}	Propagation delay A_n to Q_n or \bar{Q}_n		0.55 0.55	1.50 1.50	0.55 0.55	1.40 1.40	0.55 0.55	1.50 1.50	ns ns
t_{PLH} t_{PHL}	Propagation delay A_n, B_n to F		1.15 1.15	2.55 2.55	1.15 1.15	2.55 2.55	1.15 1.15	2.80 2.80	ns ns
t_{TLH} t_{THL}	Transition time Q_n, \bar{Q}_n or F		0.45 0.45	1.70 1.70	0.45 0.45	1.55 1.55	0.45 0.45	1.70 1.70	ns ns

NOTE:

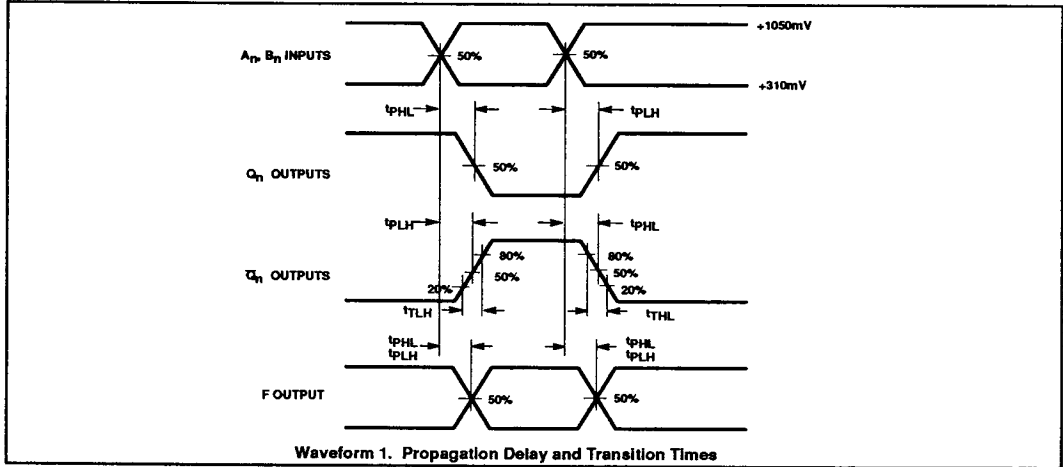
For AC test setup information, see AC Testing, Chapter 2, Section 3.

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AC WAVEFORMS



Waveform 1. Propagation Delay and Transition Times

NOTE:

All power and signal voltages shifted up 2.0V for AC bench test purposes.