

## Philips Components

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ECL Products	

# 100175

## Translator

### FEATURES

- Typical propagation delay from  $D_n$  to  $Q_n$ : 2.2ns
- Typical propagation delay from  $E_n$  to  $Q_n$ : 2.7ns
- Typical supply current ( $-I_{EE}$ ): 67mA

### DESCRIPTION

The 100175 is composed of five latches, each with one data input and one data output. A Master Reset input (MR) and two Enable inputs ( $E_0$ ,  $E_1$ ) preside over all the latches. A  $Q_n$  output follows its  $D_n$  input when both  $E_0$  and  $E_1$  are Low. When either  $E_0$  or  $E_1$  (or both) go High, the latches store

the last valid data present on their  $D_n$  inputs. The MR input forces the  $Q_n$  outputs Low if either  $E_0$  or  $E_1$  (or both) are High. The inputs are 100K compatible and the outputs are 10K compatible.

Unused inputs must be tied to a low voltage,  $V_{IL}$  or  $V_{EE}$ .

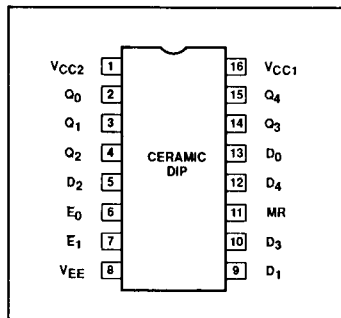
### PIN DESCRIPTION

PINS	DESCRIPTION
$D_0 - D_4$	Data inputs (100K ECL compatible)
MR	Master reset input (100K ECL compatible)
$E_0, E_1$	Enable input (100K ECL compatible)
$Q_0 - Q_4$	Data outputs (10K ECL compatible)

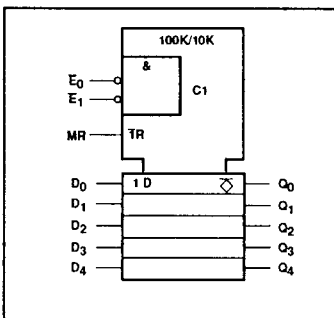
### ORDERING INFORMATION

DESCRIPTION	ORDER CODE
16-Pin Ceramic DIP (300 mils wide)	100175F

### PIN CONFIGURATION



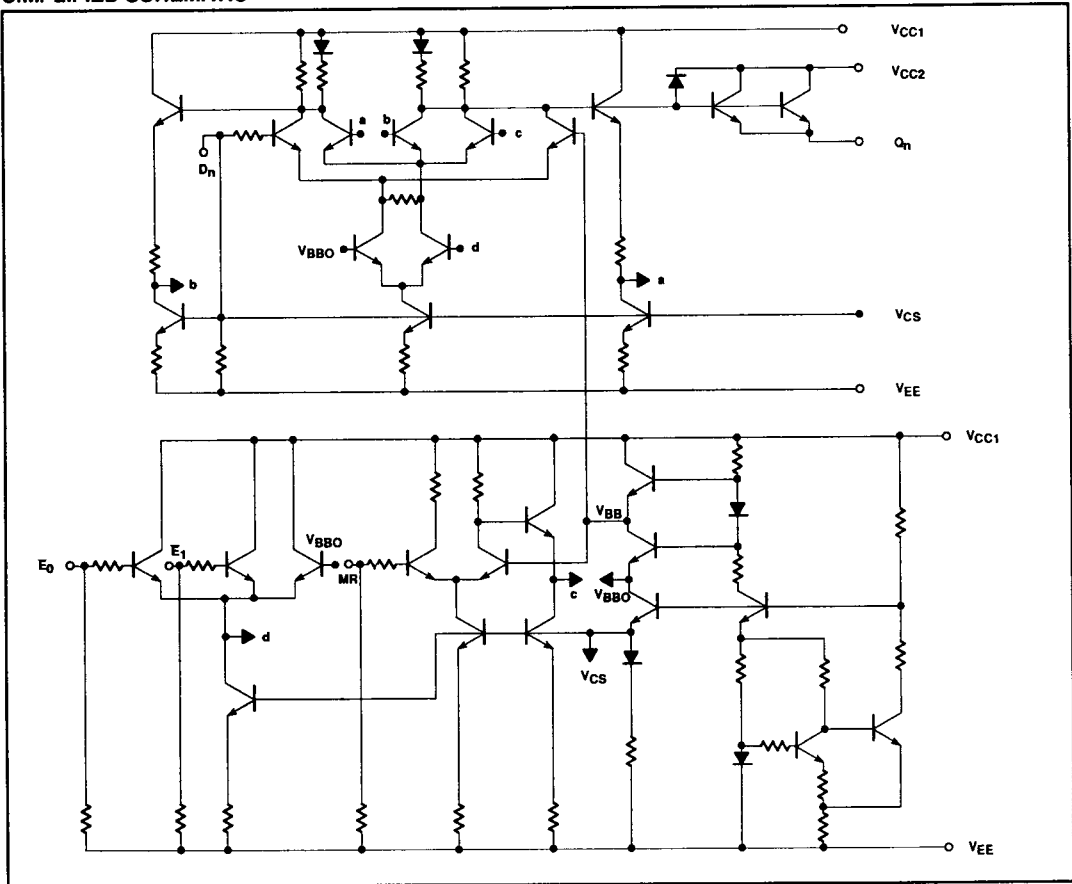
### IEC/IEEE



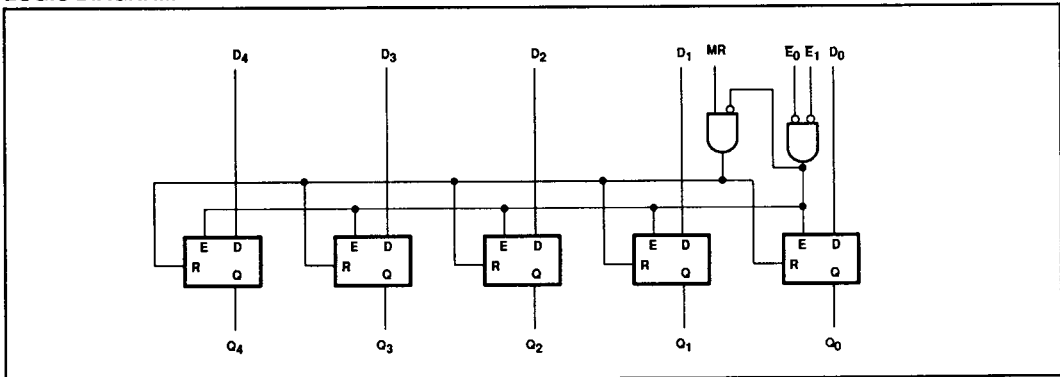
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## SIMPLIFIED SCHEMATIC



## LOGIC DIAGRAM



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## FUNCTION TABLE

INPUTS				OUTPUT
$D_n$	$E_0$	$E_1$	MR	$Q_n$
H	L	L	X	H
L	L	L	X	L
X	H	X	L	NC
X	X	H	L	NC
X	H	X	H	L
X	X	H	H	L

## NOTES:

H = High voltage level  
 L = Low voltage level  
 X = Don't care  
 NC = No change

**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		-5.7	-5.2		V
$V_{IH}$	High level input voltage	$V_{EE} = -5.2\text{V} \pm 0.010\text{V}$	-1165		-880	mV
$V_{IL}$	Low level input voltage	$V_{EE} = -5.2\text{V} \pm 0.010\text{V}$	-1810		-1475	mV
$T_A$	Operating ambient temperature range		0	+25	+85	$^\circ\text{C}$

## NOTE:

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

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**DC ELECTRICAL CHARACTERISTICS**  $V_{CC1} = V_{CC2} = \text{ground}$ ,  $V_{EE} = -5.2V \pm 0.010V$ ,  $T_A = 0^\circ\text{C}$  to  $+85^\circ\text{C}$  unless otherwise specified<sup>1,3</sup>

SYMBOL	PARAMETER		TEST CONDITIONS <sup>2</sup>		LIMITS			UNIT	
					MIN.	TYP.	MAX.		
$V_{OH}$	High level output voltage		Inputs at $V_{IHMAX}$ or $V_{ILMIN}$ .		$T_A = 0^\circ\text{C}$	-1000		-840	mV
					$T_A = +25^\circ\text{C}$	-960		-810	mV
					$T_A = +85^\circ\text{C}$	-890		-700	mV
$V_{OHT}$	High level output threshold voltage		Outputs loaded with $50\Omega$ to $-2.0V \pm 0.010V$ . Apply $V_{IHMIN}$ or $V_{ILMAX}$ to one input at a time. Other inputs at $V_{IHMAX}$ or $V_{ILMIN}$ .		$T_A = 0^\circ\text{C}$	-1020			mV
					$T_A = +25^\circ\text{C}$	-980			mV
					$T_A = +85^\circ\text{C}$	-910			mV
$V_{OLT}$	Low level output threshold voltage		Outputs loaded with $50\Omega$ to $-2.0V \pm 0.010V$ . Apply $V_{IHMIN}$ or $V_{ILMAX}$ to one input at a time. Other inputs at $V_{IHMAX}$ or $V_{ILMIN}$ .		$T_A = 0^\circ\text{C}$			-1645	mV
					$T_A = +25^\circ\text{C}$			-1630	mV
					$T_A = +85^\circ\text{C}$			-1595	mV
$V_{OL}$	Low level output voltage		Inputs at $V_{IHMAX}$ or $V_{ILMIN}$ .		$T_A = 0^\circ\text{C}$	-1870		-1665	mV
					$T_A = +25^\circ\text{C}$	-1850		-1650	mV
					$T_A = +85^\circ\text{C}$	-1825		-1615	mV
$I_{IH}$	High level input current	MR input	One input under test at $V_{IHMAX}$ . Other inputs at $V_{ILMIN}$ .					650	$\mu\text{A}$
		All others						290	$\mu\text{A}$
$I_{IL}$	Low level input current		One input under test at $V_{ILMIN}$ . Other inputs at $V_{IHMAX}$ .		0.5			$\mu\text{A}$	
$-I_{EE}$	$V_{EE}$ supply current		All inputs at $V_{IHMAX}$ .		50	67	102	mA	
$\frac{\Delta V_{OH}}{\Delta V_{EE}}$	High level output voltage compensation		$V_{EE} = -4.68V$ , $T_A = +25^\circ\text{C}$			0.016		V/V	
$\frac{\Delta V_{OL}}{\Delta V_{EE}}$	Low level output voltage compensation					0.250		V/V	

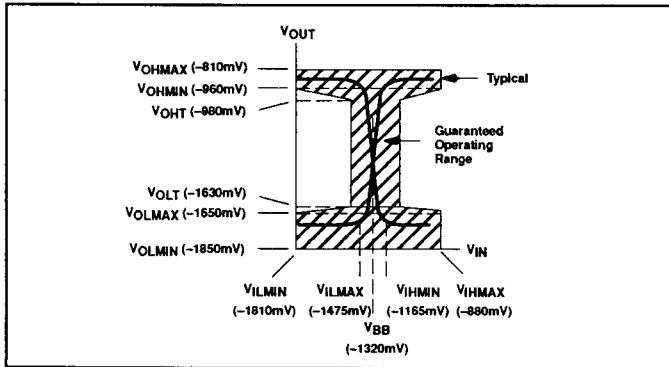
**NOTES:**

- 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.

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## TRANSFER CHARACTERISTIC



## AC ELECTRICAL CHARACTERISTICS

Ceramic DIP V<sub>CC1</sub> = V<sub>CC2</sub> = ground, V<sub>EE</sub> = -5.2V ± 0.010V

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT
			T <sub>A</sub> = 0°C		T <sub>A</sub> = +25°C		T <sub>A</sub> = +85°C		
			MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay D <sub>n</sub> to Q <sub>n</sub>	Waveform 1	1.00	3.40	1.00	3.40	1.00	3.40	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay E <sub>n</sub> to Q <sub>n</sub>		1.00	4.30	1.00	4.30	1.00	4.30	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay MR to Q <sub>n</sub>	Waveform 2	1.00	3.90	1.00	3.90	1.00	3.90	ns
t <sub>TLH</sub> t <sub>THL</sub>	Transition time Q <sub>n</sub>	Waveform 1	0.90	3.50	1.00	3.50	0.90	3.50	ns
t <sub>s</sub>	Setup time, D <sub>n</sub> to E <sub>n</sub>	Waveform 3	2.5		2.5		2.5		ns
t <sub>h</sub>	Hold time, E <sub>n</sub> to D <sub>n</sub>	Waveform 3	0.5		0.5		0.5		ns

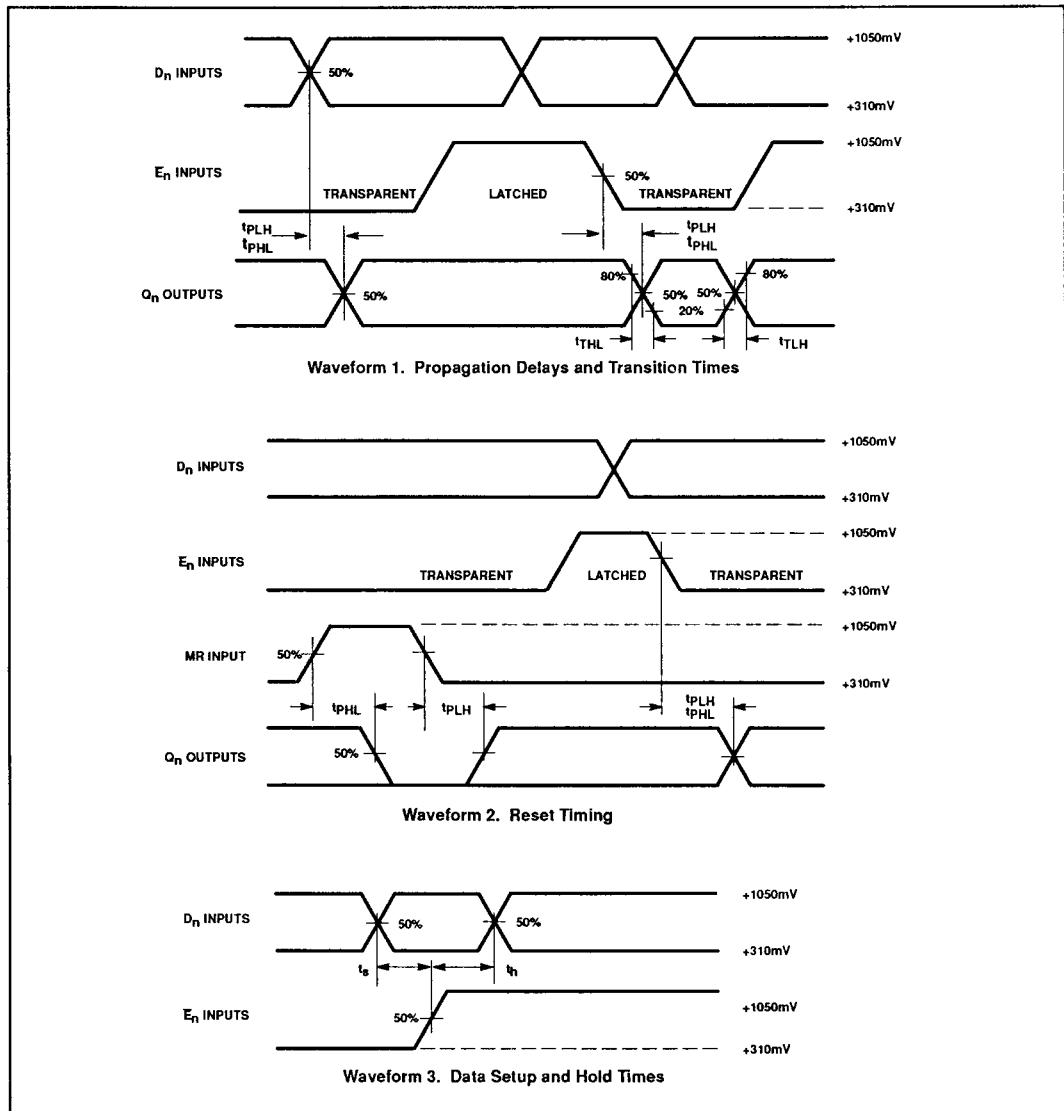
**NOTE:**

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

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## AC WAVEFORMS

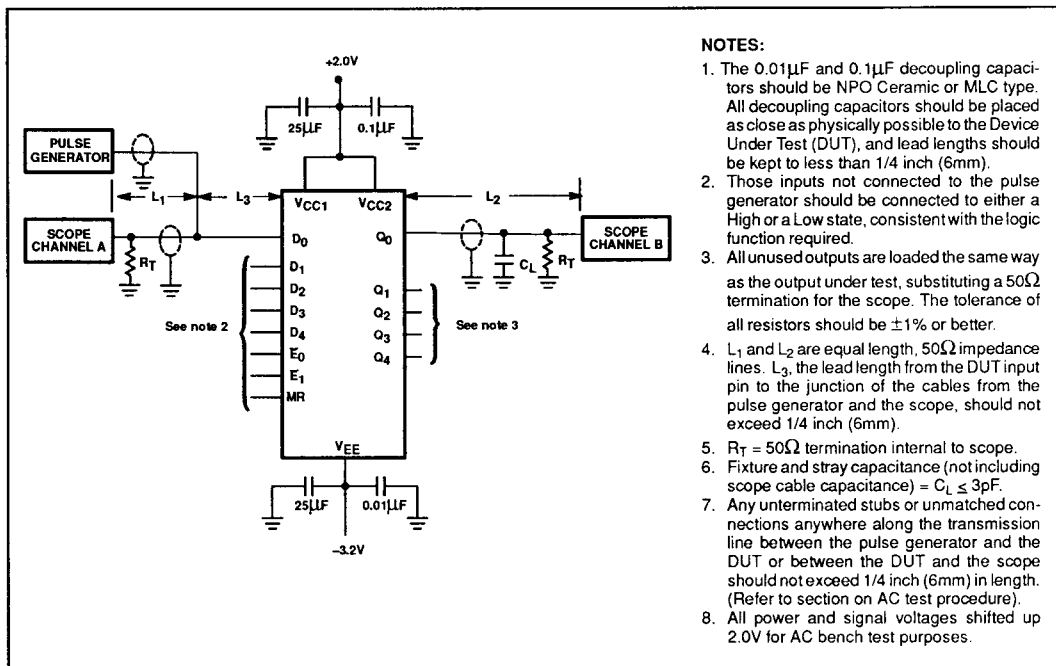


**NOTE:**  
All power and signal voltages shifted up 2.0V for AC bench test purposes.

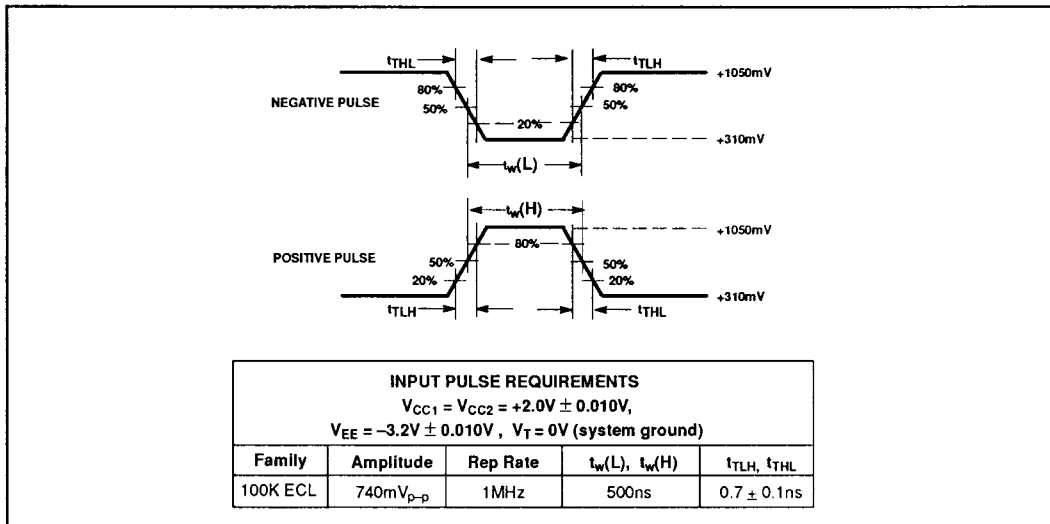
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## AC TEST CIRCUIT



## INPUT PULSE DEFINITION



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