

Preliminary Information

Description

The μPB10476LL is a very-high-speed 10K interface ECL RAM organized as 1024 words by 4 bits and designed with noninverted, open-emitter outputs and low power consumption.

The device integrates input latches, high-speed ECL RAM, output latches, and a write pulse generator. The synchronous design allows precise cycle control by use of an internal clock.

Features

- 1024-word x 4-bit organization
- 10K ECL interface
- High-speed clock cycle: 6 ns
- Latched I/O
- Self-timed write
- 28-pin ceramic package, DIP or flatpack

Ordering Information

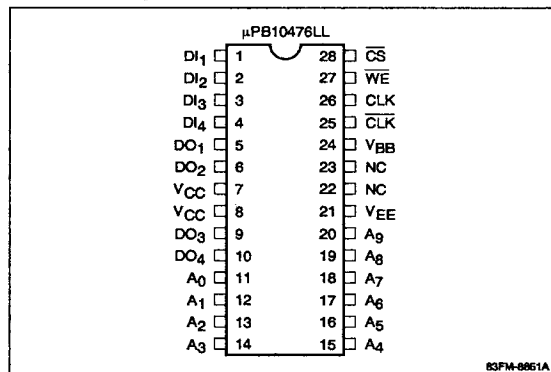
Part Number	Access Time (max)	Package
μPB10476LLDH-6	6 ns	28-pin cerdip
BH-6	6 ns	28-pin ceramic flatpack

Pin Identification

Symbol	Function
A ₀ - A ₉	Address inputs
DI ₁ - DI ₄	Data inputs
DO ₁ - DO ₄	Data outputs
CLK, $\overline{\text{CLK}}$	Clock inputs
$\overline{\text{CS}}$	Chip select input
WE	Write enable input
V _{BB}	Reference voltage output
V _{CC}	Power supply ground (current switches and bias driver)
V _{CCA}	Power supply ground (output devices)
V _{EE}	Power supply (-5.2 volts)
NC	No connection

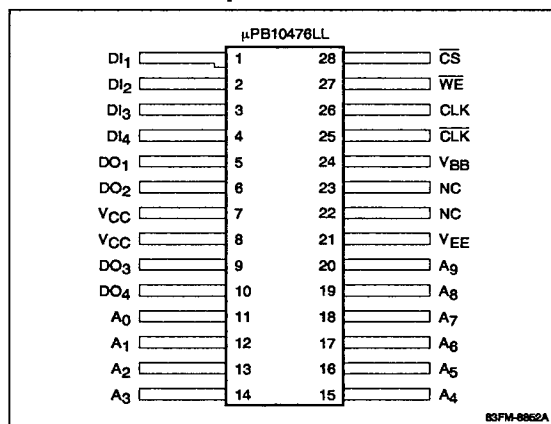
Pin Configuration

28-Pin Cerdip

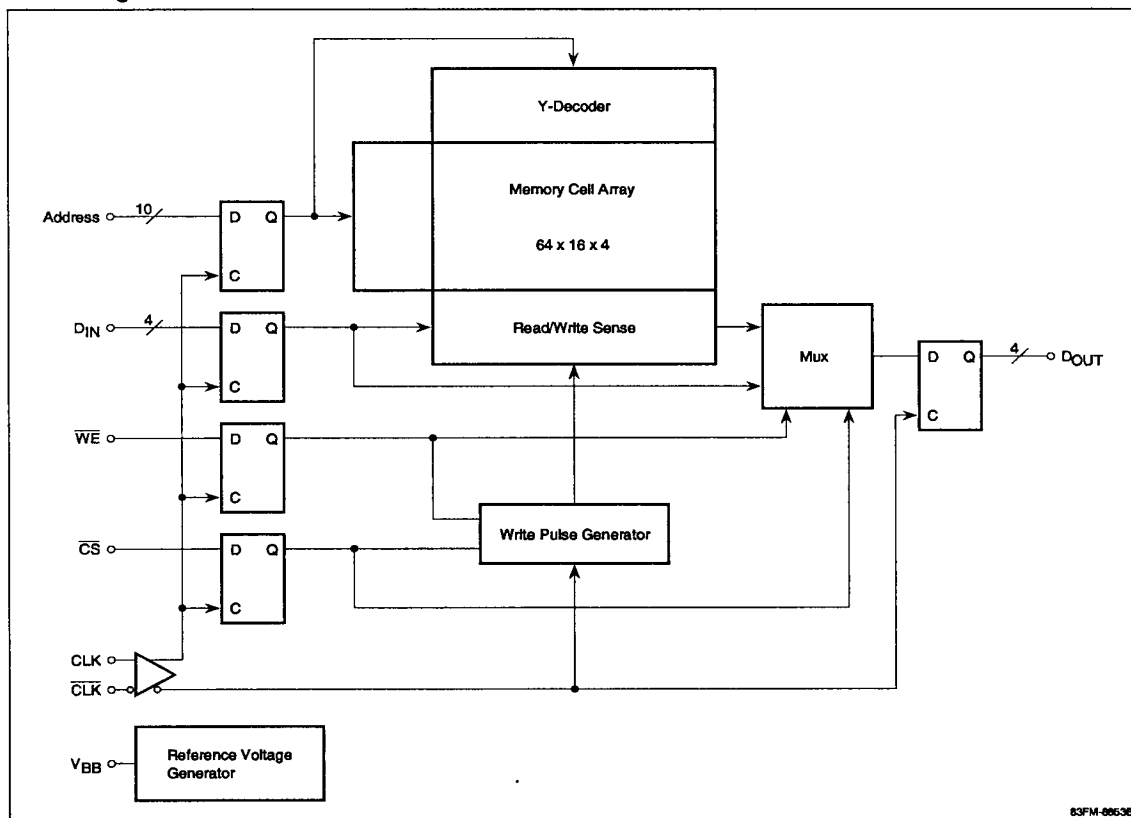


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28-Pin Ceramic Flatpack



Block Diagram



Absolute Maximum Ratings

Supply voltage, V_{EE} to V_{CC}	-7.0 to +0.5 V
Input voltage, V_{IN}	V_{EE} to +0.5 V
Output current, I_{OUT}	-30 to +0.1 mA
Storage temperature, T_{STG}	-65 to +150°C
Storage temperature under bias, T_{STG} (bias)	-55 to +125°C

Exposure to Absolute Maximum Ratings for extended periods may affect device reliability; exceeding the ratings could cause permanent damage. The device should be operated within the limits specified under DC and AC Characteristics.

Capacitance

$f = 1 \text{ MHz}$

Parameter	Symbol	Min	Typ	Max	Unit
Input capacitance	C _{IN}		4		pF
Output capacitance	C _{OUT}		5		pF

Truth Table

$\overline{CS}$	$\overline{WE}$	D_{IN}	Output	Mode
H	X	X	L	Not selected
L	L	L	L	Write 0
L	L	H	H	Write 1
L	H	X	D_{OUT}	Read

X = don't care.

DC Characteristics

$T_A = 0 \text{ to } +75^\circ\text{C}$; $V_{CC} = V_{CCA} = 0 \text{ V}$; $V_{EE} = -5.2 \text{ V}$; output load = 50Ω to -2.0 V

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Output voltage, high	V_{OH}	-1000		-840	mV	$V_{IN} = V_{IH} \text{ max or } V_{IL} \text{ min}; T_A = 0^\circ\text{C}$
		-960		-810	mV	$V_{IN} = V_{IH} \text{ max or } V_{IL} \text{ min}; T_A = 25^\circ\text{C}$
		-900		-720	mV	$V_{IN} = V_{IH} \text{ max or } V_{IL} \text{ min}; T_A = 75^\circ\text{C}$
Output voltage, low	V_{OL}	-1870		-1665	mV	$V_{IN} = V_{IH} \text{ max or } V_{IL} \text{ min}; T_A = 0^\circ\text{C}$
		-1850		-1650	mV	$V_{IN} = V_{IH} \text{ max or } V_{IL} \text{ min}; T_A = 25^\circ\text{C}$
		-1830		-1625	mV	$V_{IN} = V_{IH} \text{ max or } V_{IL} \text{ min}; T_A = 75^\circ\text{C}$
Output threshold voltage, high	V_{OHC}	-1020			mV	$V_{IN} = V_{IH} \text{ min or } V_{IL} \text{ max}; T_A = 0^\circ\text{C}$
		-980			mV	$V_{IN} = V_{IH} \text{ min or } V_{IL} \text{ max}; T_A = 25^\circ\text{C}$
		-920			mV	$V_{IN} = V_{IH} \text{ min or } V_{IL} \text{ max}; T_A = 75^\circ\text{C}$
Output threshold voltage, low	V_{OLC}			-1645	mV	$V_{IN} = V_{IH} \text{ min or } V_{IL} \text{ max}; T_A = 0^\circ\text{C}$
				-1630	mV	$V_{IN} = V_{IH} \text{ min or } V_{IL} \text{ max}; T_A = 25^\circ\text{C}$
				-1605	mV	$V_{IN} = V_{IH} \text{ min or } V_{IL} \text{ max}; T_A = 75^\circ\text{C}$
Input voltage, high	V_{IH}	-1145		-840	mV	For all inputs: $T_A = 0^\circ\text{C}$
		-1105		-810	mV	For all inputs: $T_A = 25^\circ\text{C}$
		-1045		-720	mV	For all inputs: $T_A = 75^\circ\text{C}$
Input voltage, low	V_{IL}	-1870		-1490	mV	For all inputs: $T_A = 0^\circ\text{C}$
		-1850		-1475	mV	For all inputs: $T_A = 25^\circ\text{C}$
		-1830		-1450	mV	For all inputs: $T_A = 75^\circ\text{C}$
Input current, high	I_{IH}			220	μA	$V_{IN} = V_{IH} \text{ max}$
Input current, low	I_{IL}	0.5		170	μA	For CS: $V_{IN} = V_{IL} \text{ min}$
		-50			μA	For all others: $V_{IN} = V_{IL} \text{ min}$
Supply current	I_{EE}	-350			mA	All inputs and outputs open
Reference voltage	V_{BB}	-1820		-1250	mV	

Notes:

- (1) The device under test is mounted in a test socket and measured at a thermal equilibrium established with a transverse air flow maintained at greater than 2.0 m/s.

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μ PB10476LL

AC Characteristics

$T_A = 0$ to $+75^\circ\text{C}$; $V_{EE} = -5.2\text{ V} \pm 5\%$; output load = $50\ \Omega$ to -2.0 V

μ PB10476LL-6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Address access time	$t_{A(\text{Add})}$			2.5	ns	$t_{SA} = 0.5\text{ ns}$
Clock access time	$t_{A(\text{Clk})}$			3.3	ns	$t_{WL(\text{Clk})} = 1.5\text{ ns}$
$\overline{\text{CS}}$ access time	$t_{A(\text{CS})}$			2.3	ns	$t_{SC} = 0.5\text{ ns}$
Data access time	$t_{A(\text{D})}$			2.3	ns	$t_{SD} = 0.5\text{ ns}$
Write access time	$t_{A(\text{W})}$			2.3	ns	$t_{SW} = 0.5\text{ ns}$
Clock cycle time	t_{CYC}	6			ns	
Data release time	t_{DR}	0.3		1.8	ns	$t_{WL(\text{Clk})} > t_{A(\text{Clk})}\text{ max, } t_{SA} > t_{A(\text{Add})}\text{ max, } t_{SC} > t_{A(\text{CS})}\text{ max, } t_{SD} > t_{A(\text{D})}\text{ max}$
Address hold time	t_{HA}	1			ns	
$\overline{\text{CS}}$ hold time	t_{HC}	1			ns	
Data hold time	t_{HD}	1			ns	
$\overline{\text{WE}}$ hold time	t_{HW}	1			ns	
Address setup time	t_{SA}	0.5			ns	
$\overline{\text{CS}}$ setup time	t_{SC}	0.5			ns	
Data setup time	t_{SD}	0.5			ns	
$\overline{\text{WE}}$ setup time	t_{SW}	0.5			ns	
Clock high-pulse width	$t_{\text{WH}(\text{Clk})}$	4.5			ns	
Clock low-pulse width	$t_{\text{WL}(\text{Clk})}$	1.5			ns	

Notes:

- (1) The device under test is mounted in a test socket and measured at a thermal equilibrium established with a transverse air flow maintained at greater than 2.0 m/s.
- (2) See figure 1 for loading conditions and input pulse shape.

Figure 1. Test Circuit

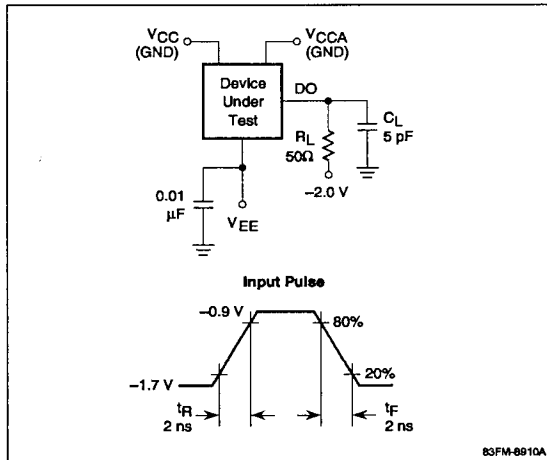
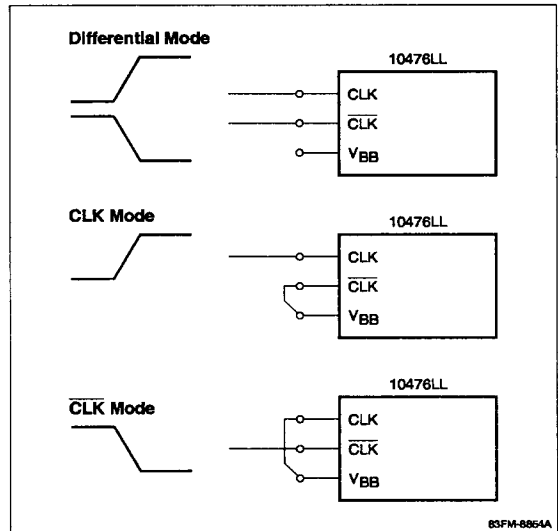
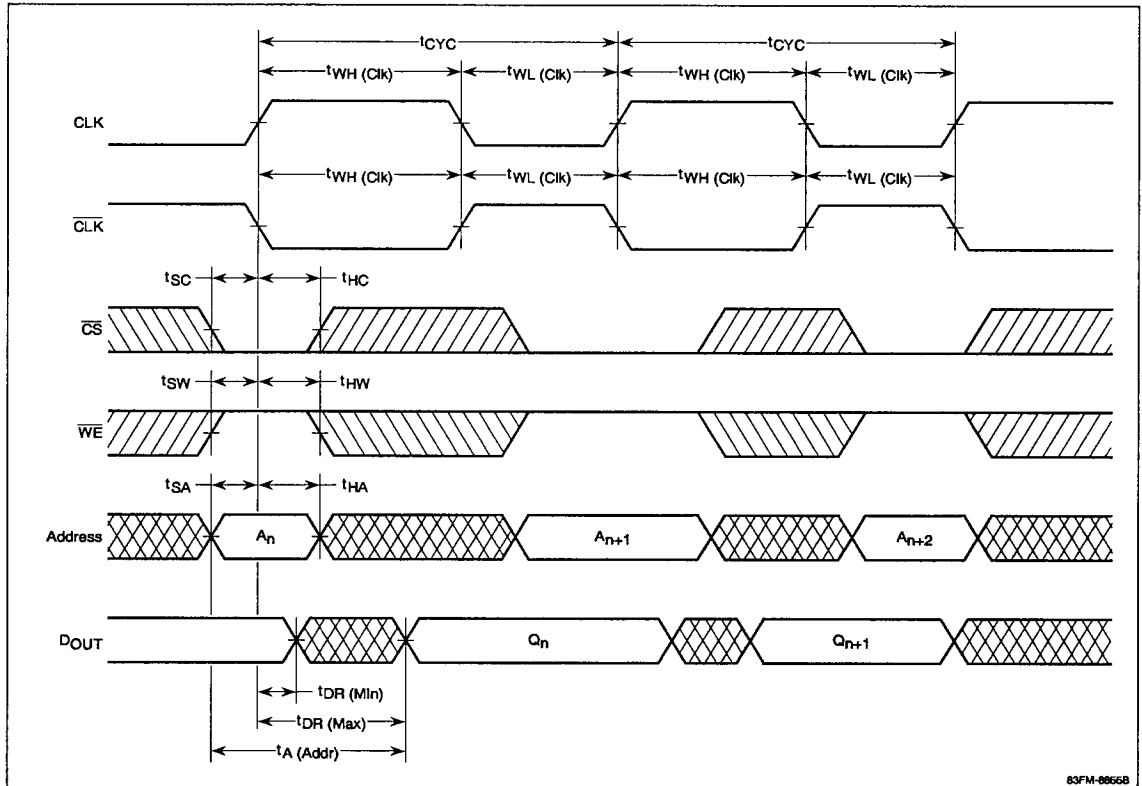


Figure 2. Clock Input Modes



Timing Waveforms

Address Access, Read Mode

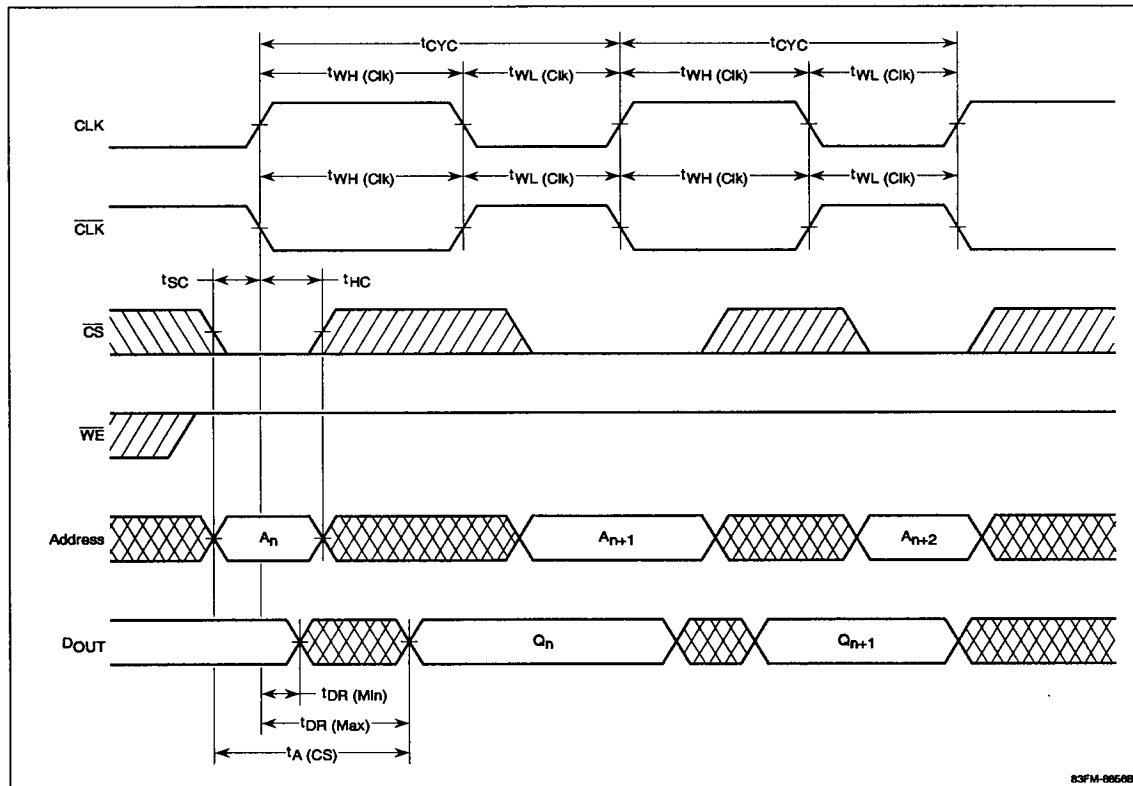


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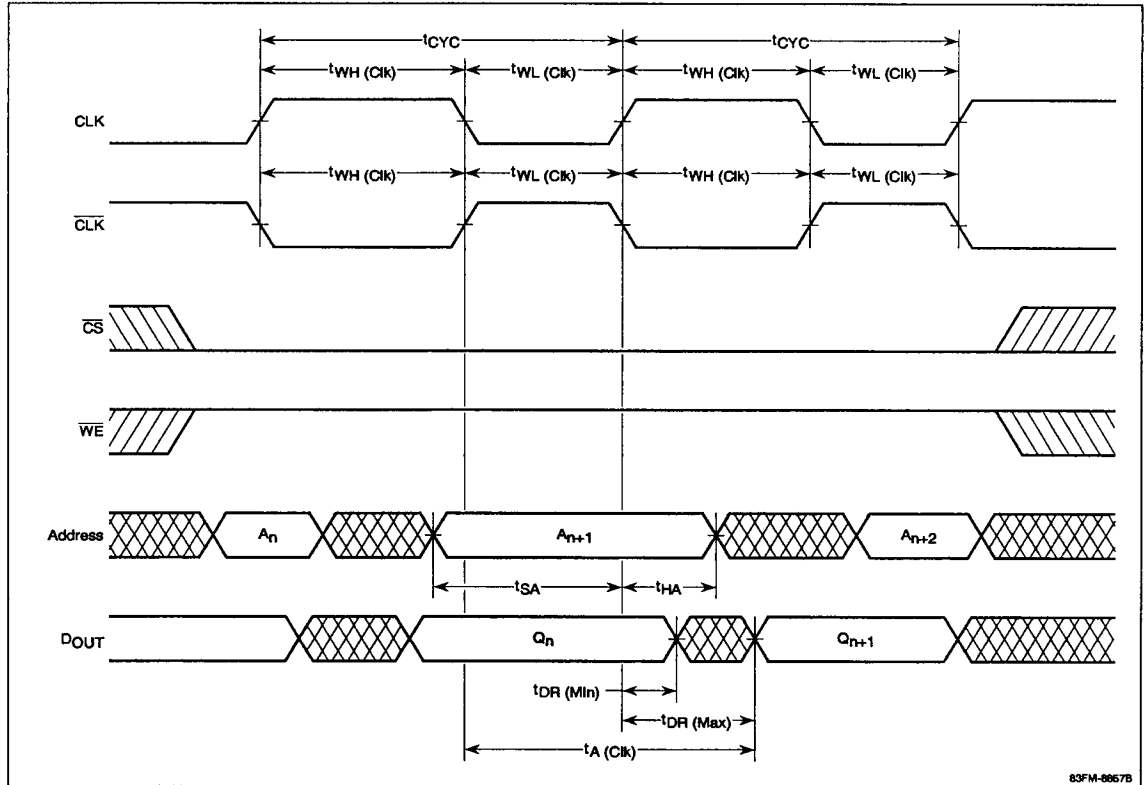
Timing Waveforms (cont)

Chip Select Access, Read Mode



Timing Waveforms (cont)

Clock Access, Read Mode



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Timing Waveforms (cont)

Write Mode

