

HM10494 Series

16384-word × 4-bit Fully Decoded Random Access Memory

Description

The HM10494 is ECL 10K compatible, 16384-word by 4-bits read/write random access memory developed for high speed systems such as scratch pads and control/buffer storage.

Features

- 16384-word × 4-bit organization
- Fully compatible with 10K ECL level
- Address access time: 10/12 ns (max)
- Write pulse width: 6 ns (min)
- Low power dissipation: 800 mW (typ)
- Output obtainable by wired-OR (open emitter)

Ordering Information

Type No.	Access Time	Package
HM10494-10	10 ns	400 mil 28 pin Cerdip
HM10494-12	12 ns	(DG-28N)
HM10494F-10	10 ns	28 pin Ceramic Flat
HM10494F-12	12 ns	(FG-28D)

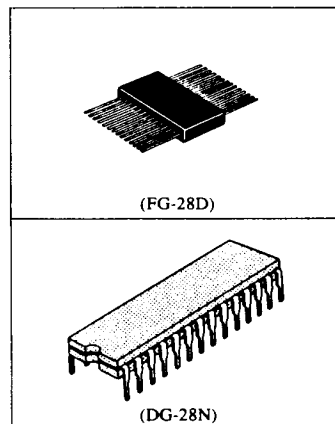
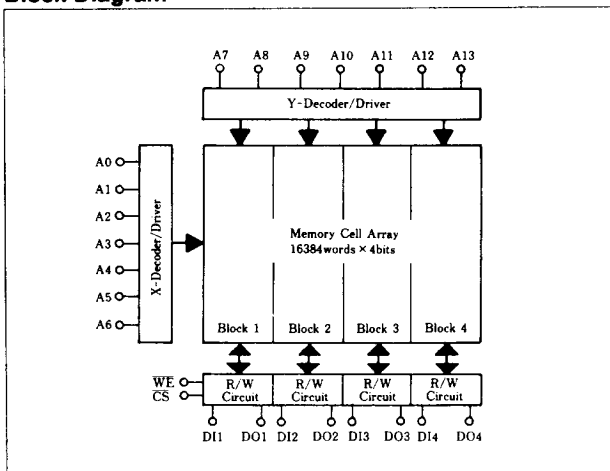
Function Table

Input			Output	Mode
CS	WE	Din		
H	X	X	L	Not Selected
L	L	L	L	Write "0"
L	L	H	L	Write "1"
L	H	X	Dout* ¹	Read

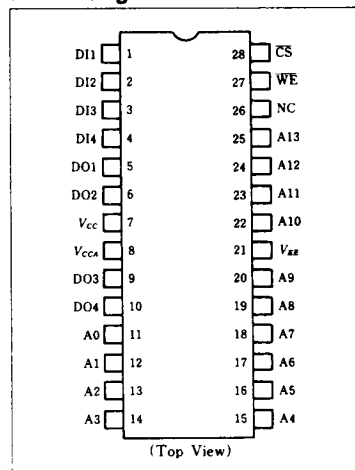
Notes: X; Irrelevant

*1; Read Out Noninvert

Block Diagram



Pin Arrangement



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Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Item	Symbol	Rating	Unit
Supply Voltage	V_{EE} to V_{CC}	+0.5 to -7.0	V
Input Voltage	V_{in}	+0.5 to V_{EE}	V
Output Current	I_{out}	-30	mA
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$
Storage Temperature	T_{stg} (Bias)*1	-55 to +125	$^\circ\text{C}$

Note: *1; Under Bias

Electrical Characteristics**DC Characteristics** ($V_{EE} = -5.2\text{V}$, $R_L = 50\text{k}\Omega$ to -2.0V , $T_a = 0$ to $+75^\circ\text{C}$, air flow exceeding 2 m/sec)

Item	Symbol	Min (B)	Typ	Max (A)	Unit	Test Conditions	
Output Voltage	V_{OH}	-1000	—	-840	mV	$V_{in} = V_{IH(A)} \text{ or } V_{IL(B)}$	0°C
		-960	—	-810			$+25^\circ\text{C}$
		-900	—	-720			$+75^\circ\text{C}$
	V_{OL}	-1870	—	-1665			0°C
		-1850	—	-1650			$+25^\circ\text{C}$
		-1830	—	-1625			$+75^\circ\text{C}$
Output Threshold Voltage	$V_{OH(C)}$	-1020	—	—	mV	$V_{in} = V_{IH(B)} \text{ or } V_{IL(A)}$	0°C
		-980	—	—			$+25^\circ\text{C}$
		-920	—	—			$+75^\circ\text{C}$
	$V_{OL(C)}$	—	—	-1645			0°C
		—	—	-1630			$+25^\circ\text{C}$
		—	—	-1605			$+75^\circ\text{C}$
Input Voltage	V_{IH}	-1145	—	-840	mV	Guaranteed Input Voltage	0°C
		-1105	—	-810		High for All Inputs	$+25^\circ\text{C}$
		-1045	—	-720			$+75^\circ\text{C}$
	V_{IL}	-1870	—	-1490		Guaranteed Input Voltage	0°C
		-1850	—	-1475		Low for All Inputs	$+25^\circ\text{C}$
		-1830	—	-1450			$+75^\circ\text{C}$
Input Current	I_{IH}	—	—	220	μA	$V_{in} = V_{IH(A)}$	0 to $+75^\circ\text{C}$
	I_{IL}	0.5	—	170		$V_{in} = V_{IL(B)}$ CS Others	0 to $+75^\circ\text{C}$
Supply Current	I_{EE}	-180	—	—	mA	All Inputs and Outputs	$T_a = 0^\circ\text{C}$
		-180	—	—		Open	$T_a = 75^\circ\text{C}$

AC Characteristics ($V_{EE} = -5.2\text{V} \pm 5\%$, $T_a = 0$ to $+75^\circ\text{C}$, air flow exceeding 2 m/sec)**Read Mode**

Item	Symbol	HM10494-10			HM10494-12			Unit	Test Conditions
		Min	Typ	Max	Min	Typ	Max		
Chip Select Access Time	t_{ACS}	—	—	6	—	—	8	ns	
Chip Select Recovery Time	t_{RCS}	—	—	6	—	—	8	ns	
Address Access Time	t_{AA}	—	—	10	—	—	12	ns	



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Write Mode

Item	Symbol	HM10494-10			HM10494-12			Unit	Test Conditions
		Min	Typ	Max	Min	Typ	Max		
Write Pulse Width	tw	6	—	—	8	—	—	ns	twsa = twsa min
Data Setup Time	twSD	2	—	—	2	—	—	ns	
Data Hold Time	tWHD	2	—	—	2	—	—	ns	
Address Setup Time	twsa	2	—	—	2	—	—	ns	tw = tw min
Address Hold Time	tWHA	2	—	—	2	—	—	ns	
Chip Select Setup Time	twscs	2	—	—	2	—	—	ns	
Chip Select Hold Time	tWHCS	2	—	—	2	—	—	ns	
Write Disable Time	tws	—	—	6	—	—	8	ns	
Write Recovery Time	tWR	—	—	12	—	—	14	ns	

Rise/Fall Time

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output Rise Time	tr	—	2	—	ns	
Output Fall Time	tf	—	2	—	ns	

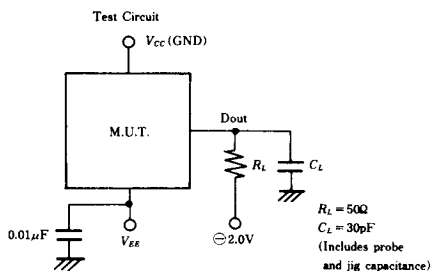
Capacitance

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Input Capacitance	Cin	—	3	—	pF	
Output Capacitance	Cout	—	5	—	pF	

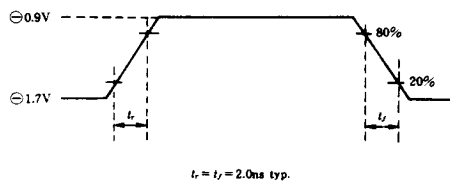


Test Circuit and Waveforms

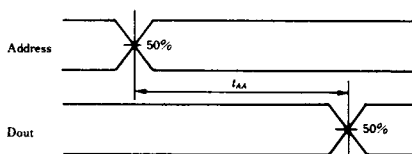
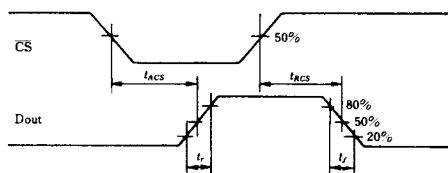
Loading Condition



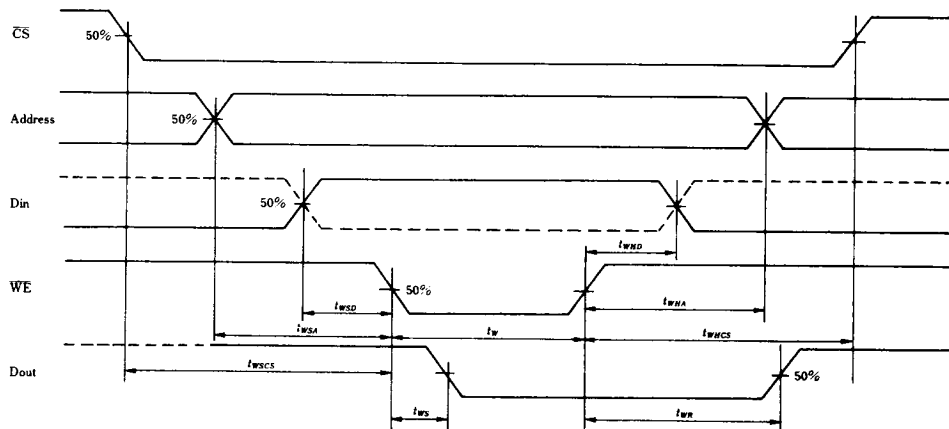
Input Pulse



Read Mode



Write Mode



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