

# HM10480-15, HM10480F-15

## 16,384-words × 1-bit Fully Decoded Random Access Memory

The HM10480 is ECL 10K compatible, 16,384-words × 1-bit, read/write random access memory developed for high speed systems such as scratch pads and control/buffer storages.

The fabrication process uses the Hitachi's low capacitance, oxide isolation method with double metalization.

The HM10480 is encapsulated in cerdip-20 pin and flat 20-pin package, compatible with Fairchild's F10480.

### FEATURES

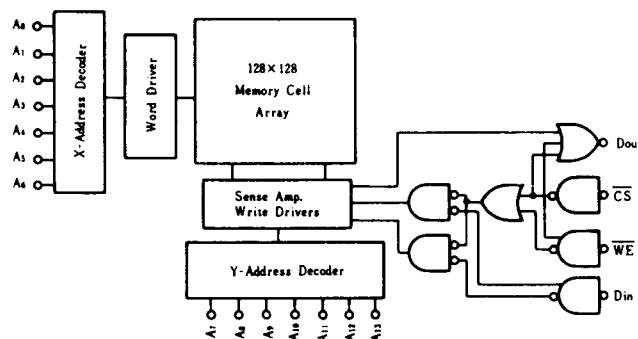
- 16,384-words × 1-bit organization
- Fully compatible with 10K ECL level
- Address access time: 15ns (max)
- Write pulse width: 15ns (min)
- Low power dissipation: 0.06mW/bit
- Output obtainable by wired-OR (open emitter)

### TRUTH TABLE

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

Notes) x : Irrelevant  
 • : Read Out Noninvert

### BLOCK DIAGRAM

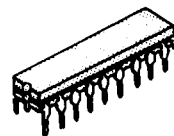


### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

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	°C
Storage Temperature	$T_{stg}(\text{Bias})^*$	-55 to +125	°C

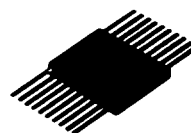
\* Under Bias

HM10480-15



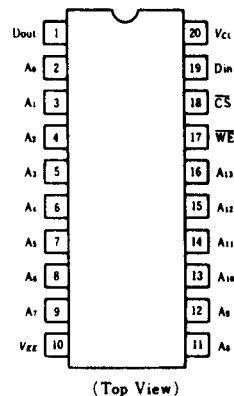
(DG-20N)

HM10480F-15



(FG-20D)

### PIN ARRANGEMENT



(Top View)



## ■ ELECTRICAL CHARACTERISTICS

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

Item	Symbol	Test Condition		min (B)	typ	max (A)	Unit	
Output Voltage	V <sub>OH</sub>	V <sub>IN</sub> = V <sub>INA</sub> or V <sub>ILB</sub>		0°C	−1000	—	−840	mV
				+25°C	−960	—	−810	
				+75°C	−900	—	−720	
	V <sub>OL</sub>			0°C	−1870	—	−1665	
				+25°C	−1850	—	−1650	
				+75°C	−1830	—	−1625	
Output Threshold Voltage	V <sub>OHC</sub>	V <sub>IN</sub> = V <sub>INB</sub> or V <sub>ILA</sub>		0°C	−1020	—	—	mV
				+25°C	−980	—	—	
				+75°C	−920	—	—	
	V <sub>OLC</sub>			0°C	—	—	−1645	
				+25°C	—	—	−1630	
				+75°C	—	—	−1605	
Input Voltage	V <sub>IH</sub>	Guaranteed Input Voltage High for All Inputs		0°C	−1145	—	−840	mV
				+25°C	−1105	—	−810	
				+75°C	−1045	—	−720	
	V <sub>IL</sub>	Guaranteed Input Voltage Low for All Inputs		0°C	−1870	—	−1490	
				+25°C	−1850	—	−1475	
				+75°C	−1830	—	−1450	
Input Current	I <sub>IN</sub>	V <sub>IN</sub> = V <sub>INA</sub>		0 to +75°C	—	—	220	μA
	I <sub>IL</sub>	CS	V <sub>IN</sub> = V <sub>ILB</sub>	0 to +75°C	0.5	—	170	
		Others			−50	—	—	
Supply Current	I <sub>EX</sub>	All Input and Output Open, Test Pin 10		T <sub>a</sub> = 0°C	−240	−220	—	mA
				T <sub>a</sub> = 75°C	—	−200	—	

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

## 1. READ MODE

Item	Symbol	Test Condition	min	typ	max	Unit
Chip Select Access Time	$t_{ACS}$		2	—	8	ns
Chip Select Recovery Time	$t_{RCS}$		2	—	8	ns
Address Access Time	$t_{AA}$		3	12	15	ns

## 2. WRITE MODE

Item	Symbol	Test Condition	min	typ	max	Unit
Write Pulse Width	$t_W$	$t_{WSA} = 3ns$	15	—	—	ns
Data Setup Time	$t_{WSD}$		2	—	—	ns
Data Hold Time	$t_{WHD}$		3	—	—	ns
Address Setup Time	$t_{WSA}$	$t_W = 15ns$	3	—	—	ns
Address Hold Time	$t_{WHA}$		2	—	—	ns
Chip Select Setup Time	$t_{WSCS}$		3	—	—	ns
Chip Select Hold Time	$t_{WHCS}$		3	—	—	ns
Write Disable Time	$t_{WD}$		—	—	12	ns
Write Recovery Time	$t_{WR}$		—	—	17	ns

## 3. RISE/FALL TIME

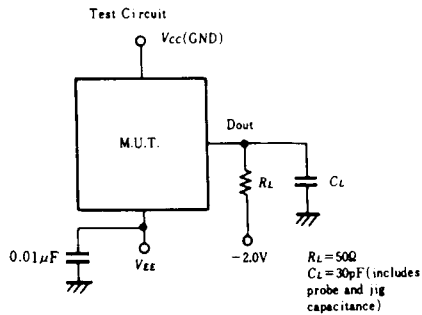
Item	Symbol	Test Condition	min	typ	max	Unit
Output Rise Time	$t_r$		—	2	—	ns
Output Fall Time	$t_f$		—	2	—	ns

## 4. CAPACITANCE

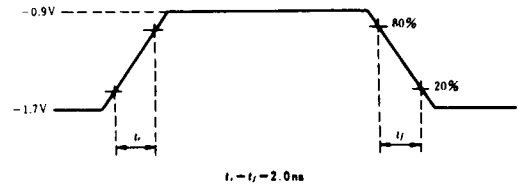
Item	Symbol	Test Condition	min	typ	max	Unit
Input Capacitance	$C_{in}$		—	3	—	pF
Output Capacitance	$C_{out}$		—	5	—	pF

## ■ TEST CIRCUIT AND WAVEFORMS

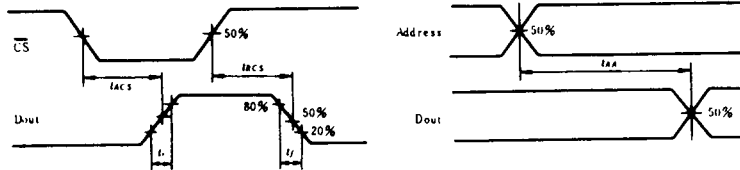
## 1. LOADING CONDITION



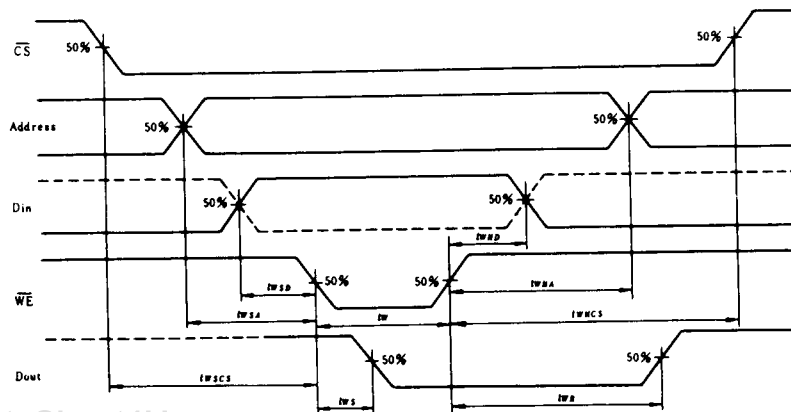
## 2. INPUT PULSE



## 3. READ MODE



## 4. WRITE MODE



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