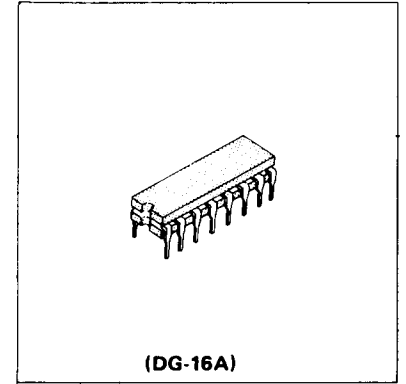


HM2510, HM2510-1, HM2510-2

1024-word × 1-bit Fully Decoded Random Access Memory

The HM 2510 Series item is a 1024-word x 1-bit read/write random access memory developed for application to buffer memories, control memories, high-speed main memories, etc. It is a fully decoded, read/write, random access memory perfectly compatible with standard DTL and TTL logic families, designed as an open collector output type for simplicity of expansion.

- Level TTL compatible
- Construction 1024-word x 1 bit
- Read access time HM2510: 70ns (max.)
HM2510-1: 45ns (max.)
HM2510-2: 35ns (max.)
- Chip select access time HM2510: 40ns (max.)
HM2510-1: 30ns (max.)
HM2510-2: 25ns (max.)
- Power consumption 0.5mW/bit
- Output Open collector

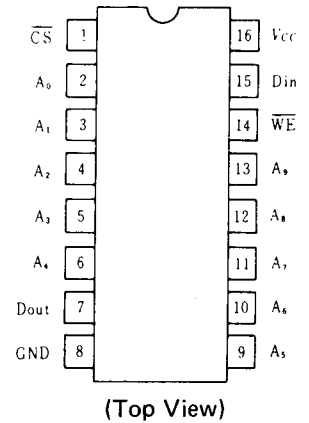


TRUTH TABLE

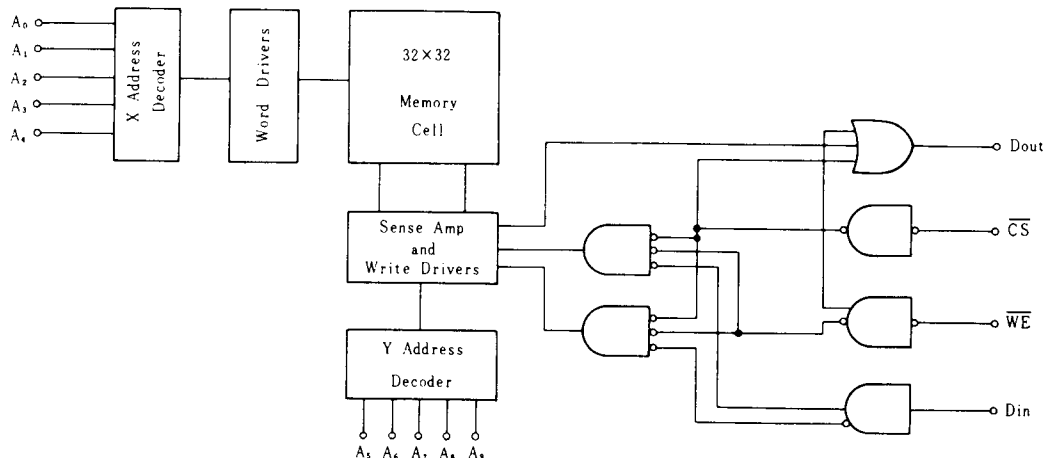
Inputs			Output	Mode
\overline{CS}	\overline{WE}	Din		
H	×	×	H	Not Selected
L	L	L	H	Write "0"
L	L	H	H	Write "1"
L	H	×	Dout *	Read

× : Don't care
* : Read out non-inverted

PIN ARRANGEMENT



BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	HM2510 Series	Unit
Supply Voltage	V_{CC}	-0.5 to +7.0	V
Input Voltage	V_{in}	-0.5 to +5.5	V
Input Current	I_{in}	-12 to +5.0	mA
Output Voltage (Output High)	V_{out}	-0.5 to +5.5	V
Output Voltage (DC Output Low)	I_{out}	+20	mA
Storage Temperature	T_{stg}	-65 to +150	°C
Storage Temperature	$T_{stg}(\text{Bias})^*$	-55 to +125	°C

* Under Bias

■ ELECTRICAL CHARACTERISTICS

● DC CHARACTERISTICS ($V_{CC}=5.0V \pm 5\%$, $T_a=0$ to +75°C, air flow exceeding 2m/sec)

Item	Symbol	Test Condition	HM2510 Series			Unit
			min.	typ.	max.	
Output Voltage	V_{OL}	$V_{CC}=4.75V$, $I_{OL}=16mA$	—	0.3	0.45	V
Input Voltage	V_{IH}	Guaranteed Input Voltage High	2.1	1.6	—	V
	V_{IL}	Guaranteed Input Voltage Low	—	1.5	0.80	V
Input Current	I_{IH1}	$V_{CC}=5.25V$, $V_{in}=4.5V$	—	0	40	μA
	I_{IH2}	$V_{CC}=5.25V$, $V_{in}=5.25V$	—	0	1.0	mA
	I_{IL}	$V_{CC}=5.25V$, $V_{in}=0.4V$	—	-250	-400	μA
Output Leakage Current	I_{CEX}	$V_{CC}=5.25V$, $V_{out}=4.5V$	—	0	100	μA
Input Clamp Voltage	V_I	$V_{CC}=5.25V$, $I_{in}=-10mA$	—	-1.0	-1.5	V
Supply Current	I_{CC}	$V_{CC}=5.25V$	—	—	155	mA
		All input GND	—	95	130	mA

● AC CHARACTERISTICS ($V_{CC}=5.0V \pm 5\%$, $T_a=0$ to +75°C, air flow exceeding 2m/sec)

1. READ MODE

Item	Symbol	Test Condition	HM2510			HM2510-1			HM2510-2			Unit
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Chip Select Access Time	t_{ACS}		—	15	40	—	—	30	—	15	25	ns
Chip Select Recovery Time	t_{RCS}		—	25	40	—	—	30	—	17	25	ns
Address Access Time	t_{AA}		—	40	70	—	35	45	—	25	35	ns

2. WRITE MODE

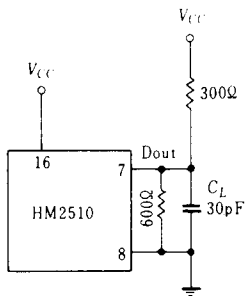
Item	Symbol	Test Condition	HM2510			HM2510-1			HM2510-2			Unit
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Write Pulse Width	t_w	$t_{WSA} = \text{min}$	50	10	—	35	10	—	25	10	—	ns
Data Setup Time	t_{WSD}		5	0	—	5	—	—	5	0	—	ns
Data Hold Time	t_{WHD}		5	0	—	5	—	—	5	0	—	ns
Address Setup Time	t_{WSA}		$t_w = \text{min}$	15	0	—	5	—	—	5	0	—
Address Hold Time	t_{WHA}		5	0	—	5	—	—	5	0	—	ns
Chip Select Setup Time	t_{WSCS}		5	0	—	5	—	—	5	0	—	ns
Chip Select Hold Time	t_{WHCS}		5	0	—	5	—	—	5	0	—	ns
Write Disable Time	t_{WSD}		—	20	40	—	20	35	—	15	25	ns
Write Recovery Time	t_{WR}		—	30	55	—	30	45	—	15	25	ns

3. CAPACITANCE

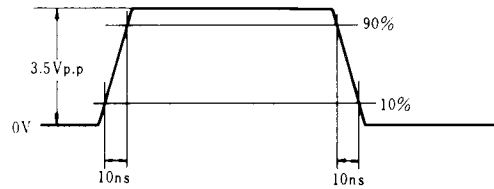
Item	Symbol	Test Condition	HM2510 Series			Unit
			min.	typ.	max.	
Input Capacitance	C_{in}		—	3	5	pF
Output Capacitance	C_{out}		—	6	8	pF

TEST CIRCUIT AND WAVEFORMS

1. LOADING CONDITION

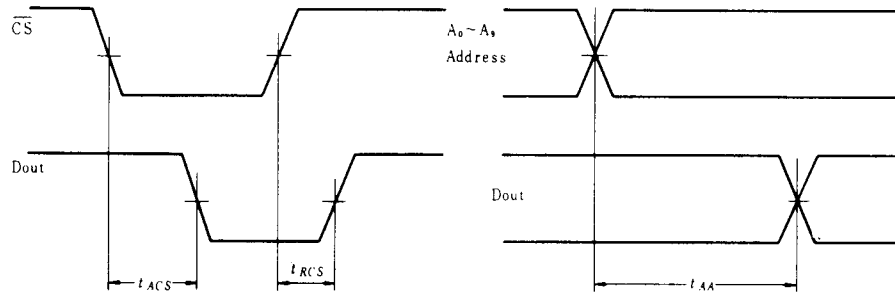


2. INPUT PULSE



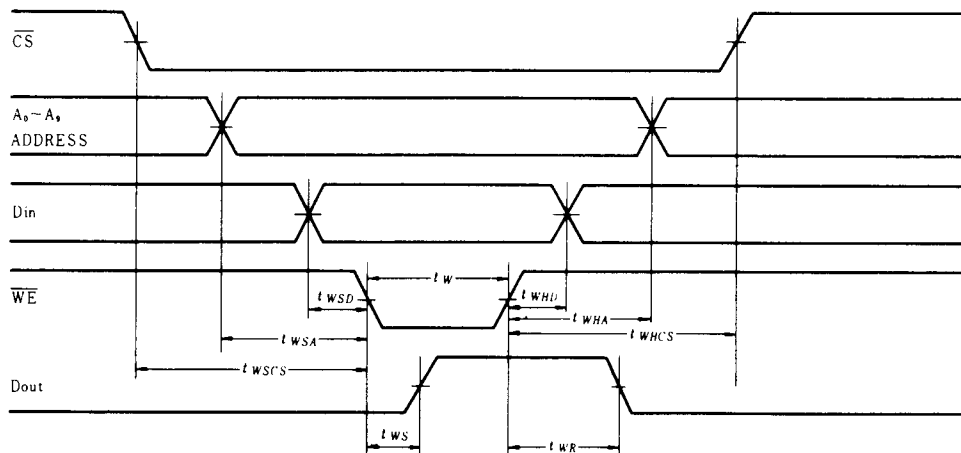
Note: C_L includes probe and stray capacitance

3. READ MODE



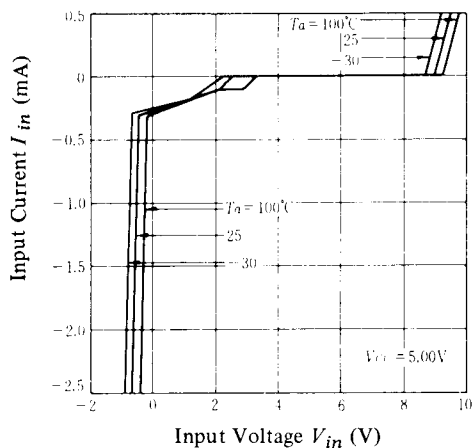
(All time measurements refer to 1.5V)

4. WRITE MODE

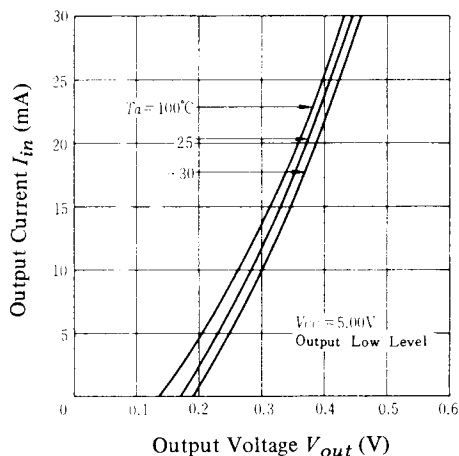


(All time measurements refer to 1.5V)

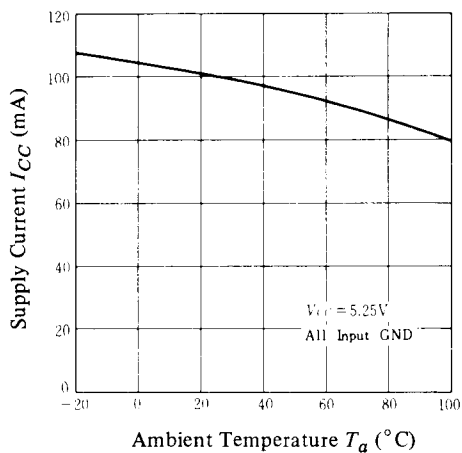
INPUT CHARACTERISTICS



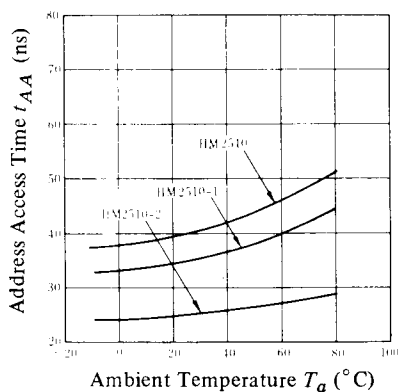
OUTPUT CHARACTERISTICS



SUPPLY CURRENT vs. AMBIENT TEMPERATURE



ADDRESS ACCESS TIME vs. AMBIENT TEMPERATURE



SUPPLY CURRENT vs. SUPPLY VOLTAGE

