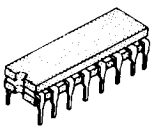
HM2510,HM2510-1, HM2510-2

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, desigend 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



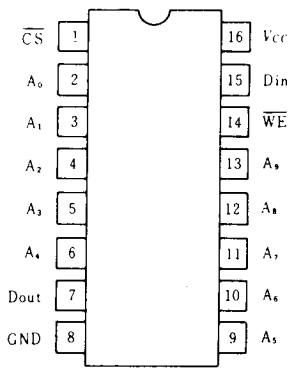
(DG-16A)

■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

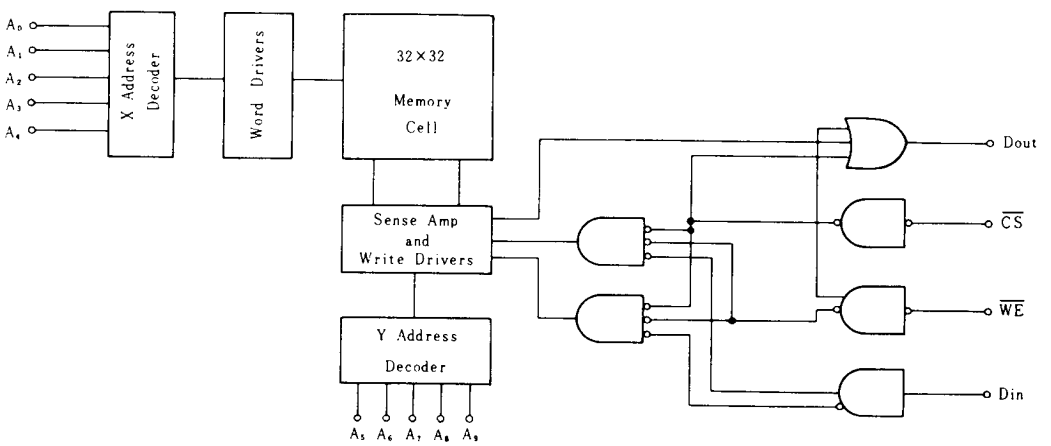
× : Don't care
* : Read out non-inverted

■PIN ARRANGEMENT



(Top View)

■BLOCK DIAGRAM



HITACHI

■ABSOLUTE MAXIMUM RATINGS

Item	Symbol	HM2510 Series	Unit
Supply Voltage	V_{CC}	−0.5 to +7.0	V
Input Voltage	Vin	−0.5 to +5.5	V
Input Current	Iin	−12 to +5.0	mA
Output Voltage (Output High)	$Vout$	−0.5 to +5.5	V
Output Voltage (DC Output Low)	$Iout$	+20	mA
Storage Temperature	$Tstg$	−65 to +150	°C
Storage Temperature	$Tstg$(Bias)*	−55 to +125	°C

* Under Bias

■ELECTRICAL CHARACTERISTICS

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

Item	Symbol	Test Condition	HM2510 Series min.	typ.	max.	Unit
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, Vin=4.5V	—	0	40	μA
	I_{IH2}	V_{CC}=5.25V, Vin=5.25V		0	1.0	mA
	I_{IL}	V_{CC}=5.25V, Vin=0.4V	—	−250	−400	μA
Output Leakage Current	I_{CEX}	V_{CC}=5.25V, $Vout$=4.5V	—	0	100	μA
Input Clamp Voltage	V_I	V_{CC}=5.25V, Iin=−10mA	—	−1.0	−1.5	V
Supply Current	I_{CC}	V_{CC}=5.25V, 0< Ta<25°C	—	—	155	mA
		All input GND, Ta≧25°C	—	95	130	mA

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

1. READ MODE

Item	Symbol	Test Condition	HM2510 min.	typ.	max.	HM2510-1 min.	typ.	max.	HM2510-2 min.	typ.	max.	Unit
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

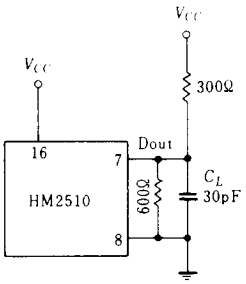
Item	Symbol	Test Condition	HM2510 min.	typ.	max.	HM2510-1 min.	typ.	max.	HM2510-2 min.	typ.	max.	Unit
Write Pulse Width	t_W	t_{WSA}=min	50	10	—	35	10	—	25	10	—	ns
Data Setup Time	t_{WSD}		5	0	—	5	—	—	5	0	—	ns
Data Hold Time	t_{WHD}		5	0	—	5	—	—	5	0	—	ns
Address Setup Time	t_{WSA}	t_W=min	15	0	—	5	—	—	5	0	—	ns
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_{WS}		—	20	40	—	20	35	—	15	25	ns
Write Recovery Time	t_{WR}		—	30	55	—	30	45	—	15	25	ns

3. CAPACITANCE

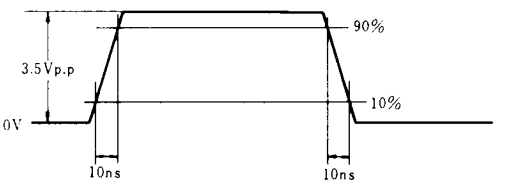
Item	Symbol	Test Condition	HM2510 Series			Unit
			min.	typ.	max.	
Input Capacitance	C_{in}		—	3	5	pF
Output Capacitance	C_{out}		—	6	8	pF

■TEST CIRCUIT AND WAVEFORMS

1. LOADING CONDITION

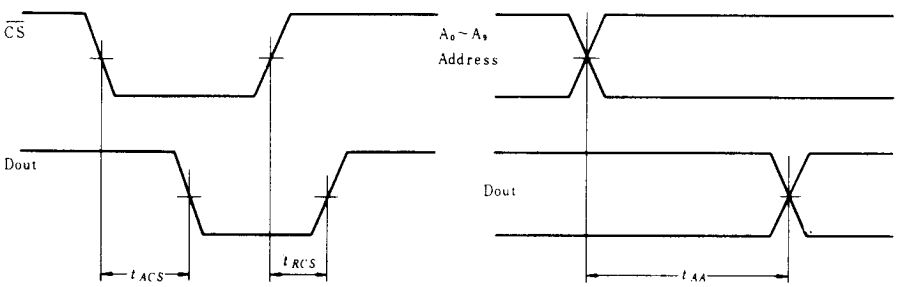


2. INPUT PULSE



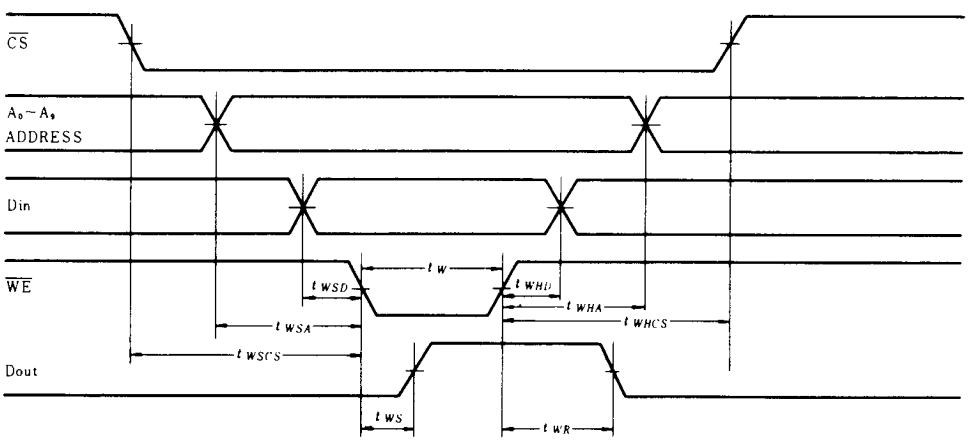
Note : C_L includes probe and stray capacitance

3. READ MODE



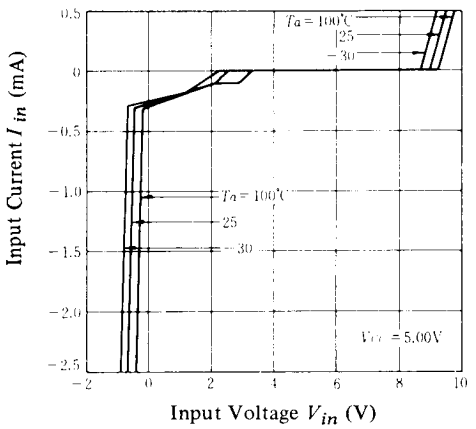
(All time measurements refer to 1.5V)

4. WRITE MODE

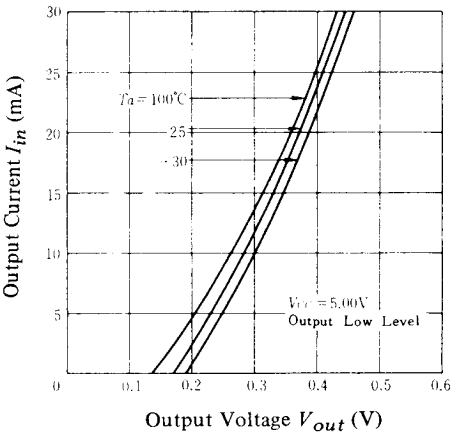


(All time measurements refer to 1.5V)

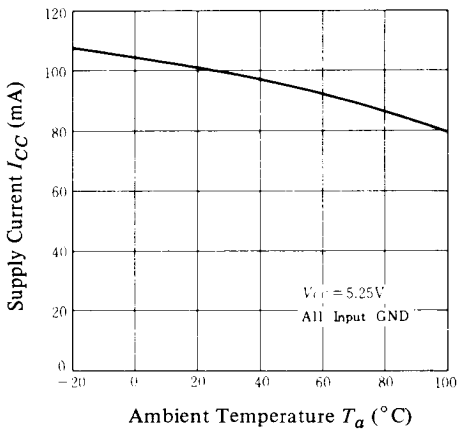
INPUT CHARACTERISTICS



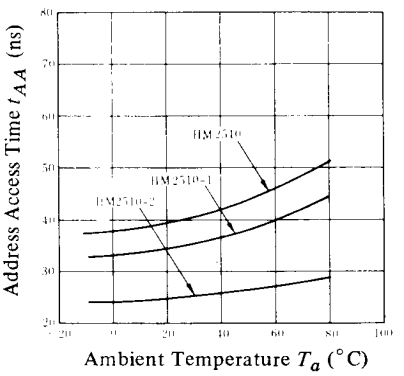
OUTPUT CHARACTERISTICS



SUPPLY CURRENT vs. AMBIENT TEMPERATURE



ADDRESS ACCESS TIME vs. AMBIENT TEMPERATURE



SUPPLY CURRENT vs. SUPPLY VOLTAGE