

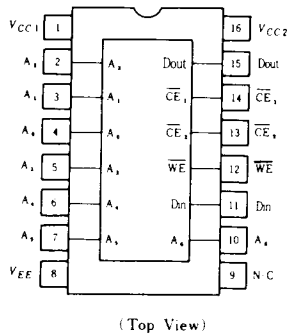
HD10147

128-word × 1-bit Random Access Memory

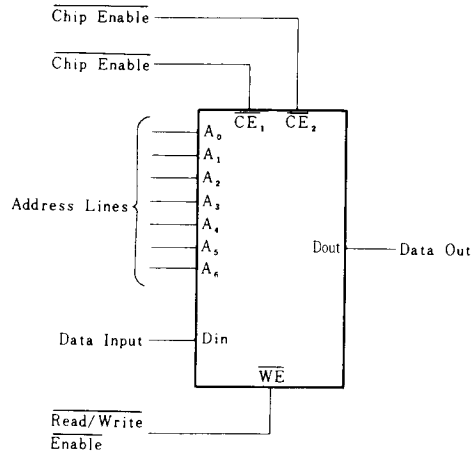
The HD10147 is a fast 128-word × 1-bit RAM. Bit selection is achieved by means of a 7-bit address, A0 through A6. The active-low chip selects and fast chip select access time allow easy memory expansion up to 512 words without affecting system performance. The operating mode ($\overline{CE}$

input low) is controlled by the $\overline{WE}$ input. With $\overline{WE}$ low the chip is in the write mode- the output is low and the data present at Dn is stroed at the selected address. With $\overline{WE}$ high the chip is in the read mode- the data state at the selected memory location is presented non-inverted at Dout.

PIN ARRANGEMENT



BLOCK DIAGRAM



FUNCTION TABLE

Mode	Input				Output
	$\overline{CE}_1$	$\overline{CE}_2$	$\overline{WE}$	Din	Dout
Write "L"	L	L	L	L	L
Write "H"	L	L	L	H	L
Read	L	L	H	×	Q
Disabled	H	L	×	×	L
	L	H	×	×	L

Note) × : Don't care.

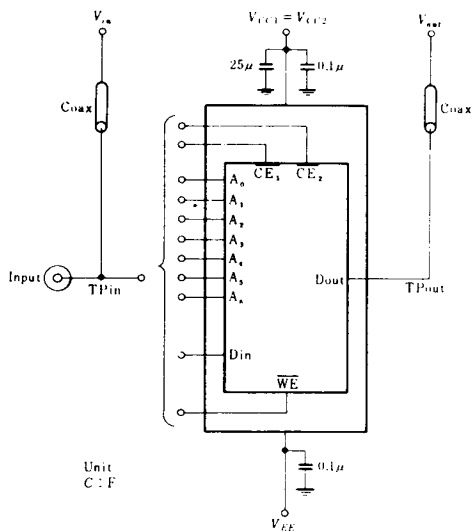
DC CHARACTERISTICS ($V_{EE} = -5.2V$, $T_a = -30 \sim +85^\circ C$)

Item	Symbol	Test Condition		min	typ	max	Unit
Supply Current	I_{EE}		25°C	—	80	100	mA
Input Current	I_{IH}	$V_{IH} = -0.810V$	A, D, $\overline{CE}$	25°C	—	35	μA
			$\overline{WE}$	25°C	—	75	
	I_{IL}	$V_{IL} = -1.850V$	A, $\overline{WE}$	25°C	-6.0	6.0	μA
			D, $\overline{CE}$	25°C	—	6.0	
Output Voltage	V_{OH}	$\overline{WE} = -1.205V$, $\overline{CE} = -1.500V$		-30°C	-1.060	-0.890	V
		$\overline{WE} = -1.105V$, $\overline{CE} = -1.475V$		25°C	-0.960	-0.810	
		$\overline{WE} = -1.035V$, $\overline{CE} = -1.440V$		85°C	-0.890	-0.700	
	V_{OL}	$\overline{WE} = -1.205V$, $\overline{CE} = -1.500V$		-30°C	-1.890	-1.675	V
		$\overline{WE} = -1.105V$, $\overline{CE} = -1.475V$		25°C	-1.850	-1.650	
		$\overline{WE} = -1.035V$, $\overline{CE} = -1.440V$		85°C	-1.825	-1.615	
Output Threshold Voltage	$V_{OH\>}$	$\overline{WE} = -1.205V$, $\overline{CE} = -1.500V$		-30°C	-1.080	—	V
		$\overline{WE} = -1.105V$, $\overline{CE} = -1.475V$		25°C	-0.980	—	
		$\overline{WE} = -1.035V$, $\overline{CE} = -1.440V$		85°C	-0.910	—	
	$V_{OL\>}$	$\overline{CE}_1$ or $\overline{CE}_2 = -1.205V$		-30°C	—	-1.655	V
		$\overline{CE}_1$ or $\overline{CE}_2 = -1.105V$		25°C	—	-1.630	
		$\overline{CE}_1$ or $\overline{CE}_2 = -1.035V$		85°C	—	-1.595	

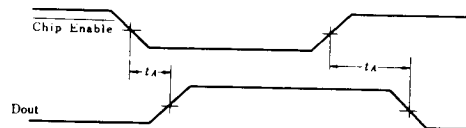
AC CHARACTERISTICS ($V_{EE} = -3.2V$, $V_{CC} = +2.0V$, $T_a = 25^\circ C$)

Item	Symbol	Input	Output	Test Condition	min	typ	max	Unit
Access Time	t_A	$\overline{CE}$	Q	$R_L = 50\Omega$	—	—	8.0	ns
		A_1	Q		—	10	12	
		A_0	Q		—	9	10	
Write Strobe Mode	Setup Time	D $\rightarrow$ $\overline{WE}$	Q		1.0	—	—	ns
		$\overline{CE} \rightarrow \overline{WE}$	Q		1.0	—	—	
		$A_1 \rightarrow \overline{WE}$	Q		3.0	—	—	
		$A_0 \rightarrow \overline{WE}$	Q		4.0	—	—	
	Hold Time	D $\rightarrow$ $\overline{WE}$	Q		1.0	—	—	ns
		$\overline{CE} \rightarrow \overline{WE}$	Q		1.0	—	—	
		A $\rightarrow$ $\overline{WE}$	Q		3.0	—	—	
Write Recovery Time	t_{WR}	$\overline{WE}$	Q		—	—	8.0	ns
Write Pulse Width	$t_{W(\overline{WE})}$	$\overline{WE}$	Q		—	—	8.0	ns
Rise Time	t_{rLH}		Q		—	2.0	—	ns
Fall Time	t_{rHL}		Q		—	1.0	—	ns

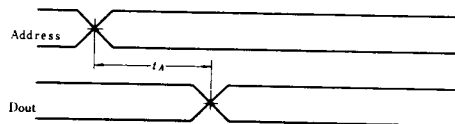
SWITCHING TIME TEST CIRCUIT



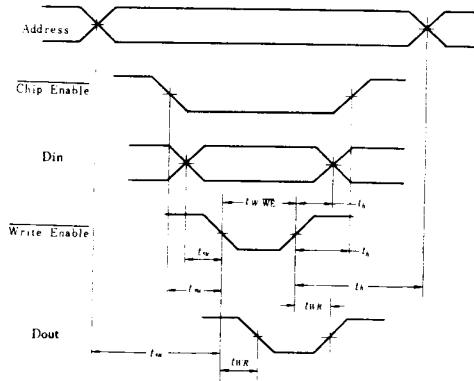
1. Chip Enable Access Time



2. Address Access Time



3. Write Strobe Mode



- Notes)
1. 50Ω termination to ground located in each scope channel input. All input and output cables to the scope are equal lengths of 50Ω coaxial cable.
 2. Wire length should be <6.35mm (1/4 inch) from TPin to input pin and TPout to output pin.
 3. Unused outputs connected to a 50Ω resistor to ground.