

HM-7642/43

HIGH SPEED 1K x 4 PROM

HM-7642 - Open Collector Outputs
 HM-7643 - "Three State" Outputs

Features

- FAST ADDRESS ACCESS TIME
 - HM-7642/43 60ns MAXIMUM
 - HM-7642A/43A 50ns MAXIMUM
 - HM-7642B/43B 45ns MAXIMUM
- "THREE STATE" OR OPEN COLLECTOR OUTPUTS AND TWO CHIP ENABLE INPUTS
- SIMPLE HIGH SPEED PROGRAMMING PROCEDURE - ONE PULSE/BIT ASSURES FAST PROGRAMMING AND SUPERIOR RELIABILITY.
- FAST ACCESS TIME - GUARANTEED FOR WORST CASE N² SEQUENCING OVER COMMERCIAL AND MILITARY TEMPERATURE AND VOLTAGE RANGES.
- PIN COMPATIBLE WITH INDUSTRY STANDARD 4K PROMs.

Description

The HM-7642/43 are fully decoded high speed Schottky TTL 4096 bit Field Programmable ROMs in a 1K word by 4 bit/word format with open collector (HM-7642) or "three state" (HM-7643) outputs. These PROM's are available in an 18 pin DIP (ceramic or power plastic).

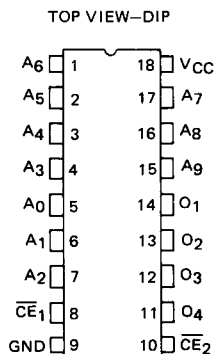
All bits are manufactured storing a logical "1" (positive logic) and can be selectively programmed for a logical "0" in any bit position.

Nickel-Chromium fuse technology is used on these and all other Harris Bipolar PROMs.

The HM-7642/43 contains test rows and columns which are in addition to the storage array to assure high programmability and guarantee parameters and A.C. performance. The fuses in these test rows and columns are blown prior to shipment.

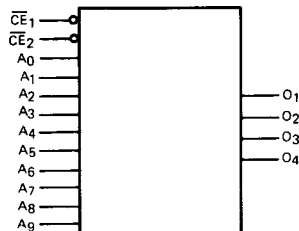
There are two chip enable inputs on the HM-7642/43. \overline{CE}_1 and \overline{CE}_2 low enables the chip.

Pinout



PIN NAMES
 A₀ - A₉ ADDRESS INPUTS
 O₁ - O₄ DATA OUTPUTS
 \overline{CE}_1 , \overline{CE}_2 CHIP ENABLE INPUTS

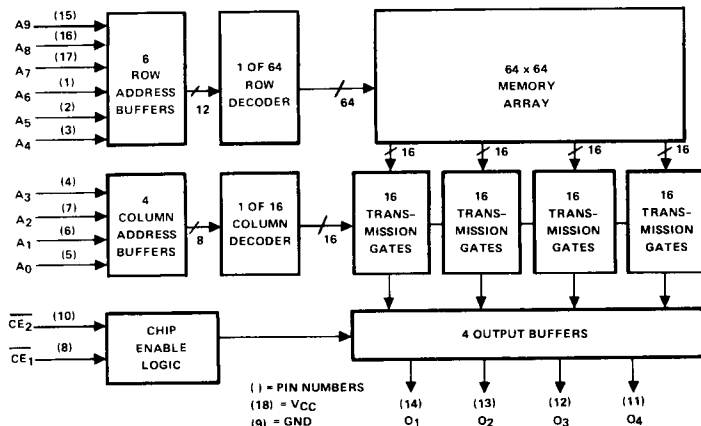
Logic Symbol



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BIPOLAR MEMORY

Functional Diagram



Specifications HM-7642/43

ABSOLUTE MAXIMUM RATINGS

Output or Supply Voltage (Operating)	-0.3 to +7.0V	Storage Temperature	-65°C to +150°C
Address/Enable Input Voltage	5.5V	Operating Temperature (Ambient)	-55°C to +125°C
Address/Enable Input Current	-20mA	Maximum Junction Temperature	+175°C
Output Sink Current	100mA		

CAUTION: Stresses above those listed under the "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress only ratings and functional operation of the device at these or at any other conditions above those indicated in the operational sections of this specification is not implied. (While programming, follow the programming specifications.)

D.C. ELECTRICAL CHARACTERISTICS (Operating) HM-7642/43-5 ($V_{CC} = 5.0V \pm 5\%$, $T_A = 0^\circ C$ to $+75^\circ C$) HM-742/43-2/-8 ($V_{CC} = 5.0V \pm 10\%$, $T_A = -55^\circ C$ to $+125^\circ C$)

Typical measurements are at $T_A = 25^\circ C$, $V_{CC} = +5V$.

NOTE: Multiple entries refer to parameter values for "B"/"A"/Std.
Positive current defined as into device terminals.

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
I_{IH} I_{IL}	Address/Enable "1" Input Current "0"	—	—	+40 -100/-250/-250	μA μA	$V_{IH} = V_{CC} \text{ Max.}$ $V_{IL} = 0.45V$
V_{IH} V_{IL}	Input Threshold "1" Voltage "0"	2.0*	—	— 0.8*	V	$V_{CC} = V_{CC} \text{ Min.}$ $V_{CC} = V_{CC} \text{ Max.}$
V_{OH} V_{OL}	Output "1" Voltage "0"	2.4**	3.2** 0.35	— 0.50	V	$I_{OH} = -2.0mA$, $V_{CC} = V_{CC} \text{ Min.}$ $I_{OL} = +16mA$, $V_{CC} = V_{CC} \text{ Min.}$
I_{OHE} I_{OLE}	Output Disable "1" Current "0"	—	—	+40/+40/+100 -40/-40/-100**	μA μA	V_{OH} , $V_{CC} = V_{CC} \text{ Max.}$ $V_{OL} = 0.3V$, $V_{CC} = V_{CC} \text{ Max.}$
V_{CL}	Input Clamp Voltage	—	—	-1.2	V	$I_{IN} = -18mA$
I_{OS}	Output Short Circuit Current	-15**	—	-100**	mA	$V_{CC} = V_{CC} \text{ Max.}$, $V_{OUT} = 0.0V$, One Output at a Time for a Max. of 1 Second
I_{CC}	Power Supply Current	—	100	140	mA	$V_{CC} = V_{CC} \text{ Max.}$, All Inputs Grounded.

* These are absolute voltages with respect to ground pin and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.

** "Three-State" only.

A.C. ELECTRICAL CHARACTERISTICS (Operating)

Typical Measurements are at $T_A = 25^\circ C$, $V_{CC} = +5V$.

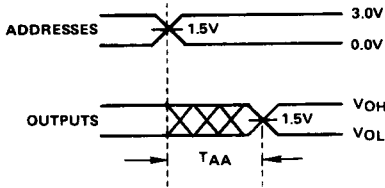
		HM-7642/43-5 5V \pm 5% 0°C to +75°C						HM-7642/43-2/-8 5V \pm 10% -55°C to +125°C						
		"B"		"A"		STD		"B"		"A"		STD		
SYMBOL	PARAMETER	TYP	MAX	TYP	MAX	TYP	MAX	TYP	MAX	TYP	MAX	TYP	MAX	UNITS
TAA	Address Access Time	35	45	40	50	45	60	—	55	—	70	—	85	ns
TEA	Chip Enable Access Time	—	25	—	25	—	25	—	30	—	30	—	30	ns
TDA	Chip Disable Access Time	—	25	—	25	—	25	—	30	—	30	—	30	ns

A.C. limits guaranteed for worst case N2 sequencing with maximum test frequency of 5MHz.

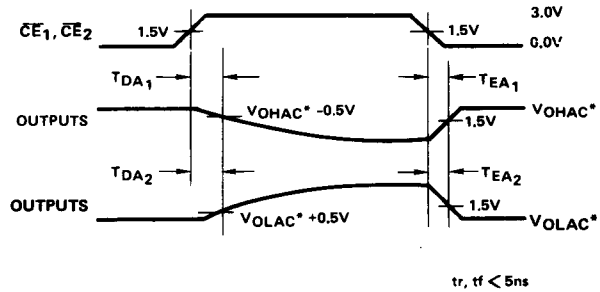
CAPACITANCE: $T_A = 25^\circ C$

SYMBOL	PARAMETER	TYPICAL	UNITS	TEST CONDITIONS
CINA, CINCE	Input Capacitance	8	pF	$V_{CC} = 5V$, $V_{IN} = 2.0V$, $f = 1MHz$
COUT	Output Capacitance	10	pF	$V_{CC} = 5V$, $V_{OUT} = 2.0V$, $f = 1MHz$

HM-7642/43 SWITCHING TIME DEFINITIONS

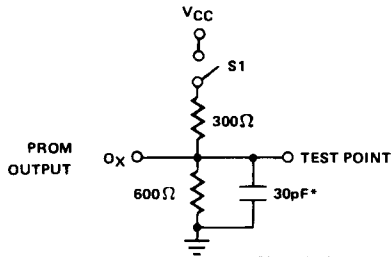


NOTE: As is common to all memory devices, output levels can be undefined during the address access period (T_{AA}); however, the outputs are guaranteed to reach stable levels by T_{AA} . It is not recommended that outputs from this class of devices be used to drive edge triggered inputs on subsequent devices (counters, flip-flops, etc.) without proper intermediate synchronization.



* V_{OLAC} AND V_{OHAC} ARE THE MEASURED OUTPUT VOLTAGE LEVELS WHILE ENABLED.

A.C. TEST LOAD



* Includes jig & probe total capacitance

This is the A.C. Test Load which Harris Semiconductor uses in its automatic test equipment, and it is recommended that users of Harris bipolar devices use the same or an equivalent load in performing A.C. testing.

SYMBOL	PARAMETER	S1
T_{AA}	Address Access Time	Closed
* T_{EA1}	Chip Enable Access Time from "Three State" to V_{OH}	Open
T_{EA2}	Chip Enable Access Time to V_{OL}	Closed
* T_{DA1}	Chip Disable Access Time from V_{OH} to "Three State"	Open
T_{DA2}	Chip Disable Access Time from V_{OL}	Closed

* Applies to "Three-State" only.