

# H1832/1834 H1832C/1834C

1800 CMOS Microprocessor Family  
Static ROM

**HUGHES**  
A BELL & HOWELL COMPANY

**MICROELECTRONICS CENTER**

512x8 Static ROM — 1832  
1024x8 Static ROM — 1834

## DESCRIPTION

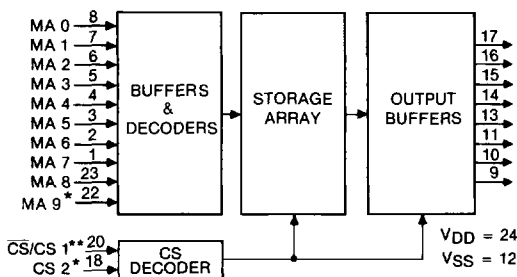
Hughes 1832 and 1834 are static CMOS Mask Programmable Read Only Memories. When an address is presented on lines MA 0-MA 8 (1832) or MA 0-MA 9 (1834) the decoded word location is accessed and presented to the output sense amplifiers. This 8-bit word is enabled onto the lines by the CS signal in the 1832, or the CS 1 and CS 2 signals in the 1834, which can be used for memory expansion. The 1832 is a pin-for-pin compatible replacement for the 2704/8704 PROMs while the 1834 is a pin-for-pin compatible replacement for the 2708 PROM or 2308 ROM.

The 1832 and 1834 operate over a 4-10.5 voltage range while the 1832C and 1834C operate over a 4-6.5 voltage range. The ROMs are available in a 24 lead hermetic dual-in-line ceramic package (D suffix), plastic package (P suffix), cerdip (Y suffix) or leadless chip carrier (L suffix). Devices in chip form (H suffix) are available upon request.

## FEATURES

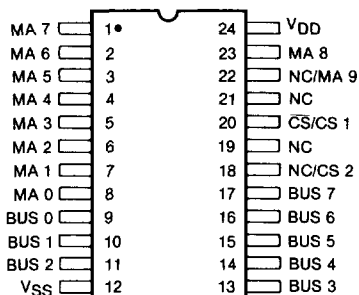
- Static Silicon Gate CMOS Circuitry
- Compatible with 1802A microprocessor at maximum speed
- Access Time — 1832  
950ns Typical at  $V_{DD} = 5V$   
500ns Typical at  $V_{DD} = 10V$
- Access Time — 1834  
640ns Typical at  $V_{DD} = 5V$   
360ns Typical at  $V_{DD} = 10V$
- Single Voltage Supply
- Low Quiescent and Operating Power
- Static — No Clocks Required
- Functional Replacement for Industry Standard 2704 (512 x 8) PROM or 2708 (1024 x 8) PROM

## FUNCTIONAL DIAGRAM



\* No Connection on 1832  
\*\* CS on 1832, CS 1 on 1834

## PIN CONFIGURATION



## ABSOLUTE MAXIMUM RATINGS

Operating Temperature Range (T<sub>A</sub>)

Ceramic Package ..... -55 to +125°C  
 Plastic Package ..... -40 to +85°C

DC Supply-Voltage Range (V<sub>DD</sub>)

(All voltage values referenced to V<sub>SS</sub> terminal)

1832/1834 ..... -0.5 to +13V

1832C/1834C ..... -0.5 to +7V

Input Voltage Range ..... V<sub>SS</sub>-0.3V to V<sub>DD</sub>+0.3V

Storage Temperature Range (T<sub>stg</sub>) ..... -65 to +150°C

*NOTE: Operating the device above the "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

## OPERATING CONDITIONS at T<sub>A</sub> = Full package temperature range unless otherwise specified

CHARACTERISTICS	CONDITIONS	LIMITS								UNITS
		1832		1832C		1834		1834C		
	V <sub>DD</sub> (V)	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
<b>STATIC</b>										
Supply Voltage Range (At T <sub>A</sub> = Full Package Temperature Range)	-	4	10.5	4	6.5	4	10.5	4	6.5	V
Recommended Input Voltage Range	-	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>SS</sub>	V <sub>DD</sub>	V

## ELECTRICAL CHARACTERISTICS at T<sub>A</sub> = -55 to 125°C, V<sub>DD</sub> = ±5% except as noted

CHARACTERISTICS	CONDITIONS		1832			1832C			1834			1834C			UNITS
	V <sub>O</sub> (V)	V <sub>DD</sub> (V)	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
<b>STATIC</b>															
Quiescent Device Current, I <sub>L</sub> <sup>2</sup>	-	5	-	200	1000	-	200	1000	-	200	1000	-	200	1000	μA
	-	10	-	200	1000	-	-	-	-	200	1000	-	-	-	
Output Drive Current N-Channel (Sink), I <sub>DN</sub>	0.4	5	.28	.4	-	.28	.4	-	.67	.94	-	.67	.94	mA	
	0.5	10	.56	.8	-	-	-	-	1.51	2.16	-	-	-		
P-Channel (Source), I <sub>DP</sub>	4.6	5	-.28	-.4	-	-.28	-.4	-	-.67	-.94	-	-.67	-.94	mA	
	9.5	10	-.56	-.8	-	-	-	-	-1.51	-2.16	-	-	-		
Output Voltage Low Level, V <sub>OL</sub> <sup>1</sup>	-	5	-	0	0.1	-	0	0.1	-	0	0.1	-	0	0.1	V
	-	10	-	0	0.1	-	-	-	-	0	0.1	-	-	-	
Output Voltage High Level, V <sub>OH</sub> <sup>1</sup>	-	5	4.9	5	-	4.9	5	-	4.9	5	-	4.9	5	V	
	-	10	9.9	10	-	-	-	-	9.9	10	-	-	-		
Input Leakage Current I <sub>IL</sub> , I <sub>IH</sub> <sup>2</sup>	-	5	-	±1	±10	-	±1	±10	-	-	±1	-	±1	μA	
	-	10	-	±1	±10	-	-	-	-	-	±1	-	-		
3 State Output Leakage Current, I <sub>OUT</sub> <sup>2</sup>	0.5	5	-	±1	±20	-	±1	±20	-	-	±1	-	-	μA	
	0.10	10	-	±1	±20	-	-	-	-	-	±1	-	-		
<b>DYNAMIC: T<sub>A</sub> = -55 to 125°C, C<sub>L</sub> = 50pF, R<sub>L</sub> &gt; 10MΩ</b>															
Access Time From Address Change, t <sub>AA</sub>	-	5	-	950	1330	-	950	1330	-	640	895	-	640	895	ns
	-	10	-	500	700	-	-	-	-	360	505	-	-	-	
Access Time From Chip Select, t <sub>AC</sub>	-	5	-	850	1190	-	850	1190	-	595	835	-	595	835	ns
	-	10	-	450	630	-	-	-	-	350	490	-	-	-	

\* Typical values are for T<sub>A</sub> = 25°C and nominal V<sub>DD</sub>

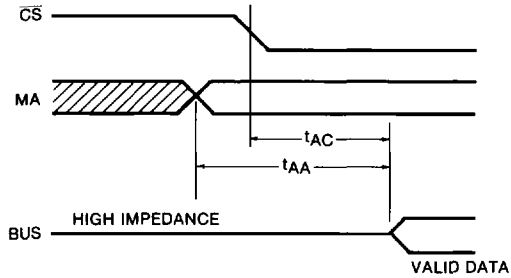
Note 1: Design assured but not tested.

Note 2: Parameters guaranteed by other tests at -55°C.

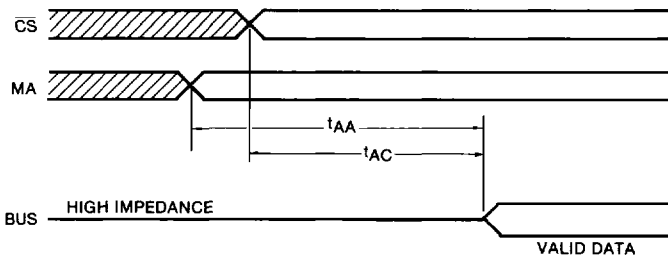
**TIMING DIAGRAMS**

**H1832/1834**

**1832**



**1834**

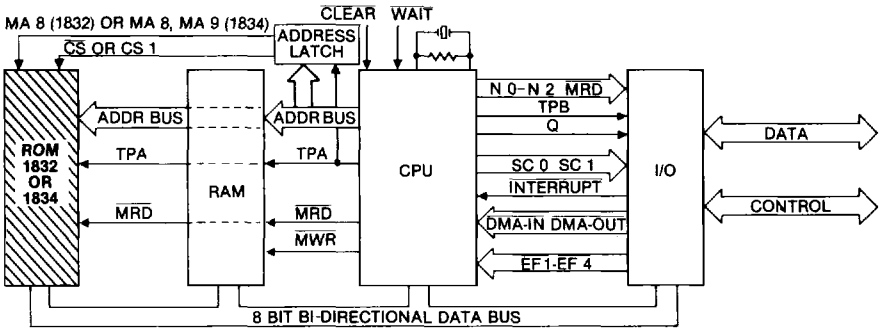


INVALID OR DON'T CARE CONDITIONS

**FUNCTIONAL OPERATION**

These ROMs are completely static (no clocks are required). Decode of the input address selects a word from the storage array. The chip select signal enables the selected word to appear on the output bus line.

**SYSTEM INTERCONNECT**



**SIGNAL DESCRIPTION**

**MA0-MA9:** These address lines, MA0-MA 8 (1832) or MA0-MA9 (1834), select a decoded word.

**BUS0-BUS7:** These eight bi-directional three-state data lines form a common bus with the 1802A microprocessor.

**CS, CS1, CS2:** These chip select signals are provided for memory expansion. Outputs are enabled when CS = 0 in the 1832, while the polarity of CS1 and CS2 are user mask programmable in the 1834.

**ORDERING INFORMATION:**

Contact Hughes for prices and other information relating to ROMs. ROM order forms and instructions concerning means of data conveyance are available from Hughes Microelectronics Center or Hughes' Representatives.

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Hughes Microelectronics Center  
 500 Superior Avenue, Box H  
 Newport Beach, CA 92658-8903  
 Tele: (714) 759-2727  
 FAX: (714) 759-2720

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