MOTOROLA

MCM68A316E

2048 × 8 BIT READ ONLY MEMORY

The MCM68A316E is a mask-programmable byte-organized memory designed for use in bus-organized systems. It is fabricated with N-channel silicon-gate technology. For ease of use, the device operates from a single power supply, has compatibility with TTL and DTL, and needs no clocks or refeshing because of static operation.

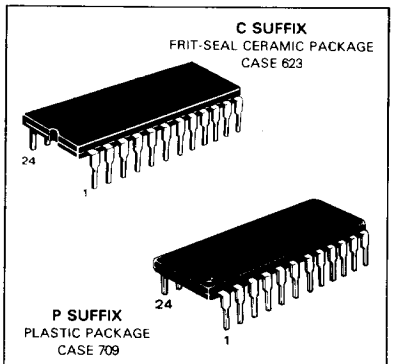
The memory is compatible with the M6800 Microcomputer Family, providing read only storage in byte increments. Memory expansion is provided through multiple Chip Select inputs. The active level of the Chip Select inputs and the memory content are defined by the user.

- Fully Static Operation
- Three-State Data Output
- Mask-Programmable Chip Selects for Simplified Memory Expansion
- Single ±10% 5-Volt Power Supply
- TTL Compatible
- Maximum Access Time = 350 ns
- Plug-in Compatible with 2316E
- Pin Compatible with 2708 and TMS2716 EPROMs

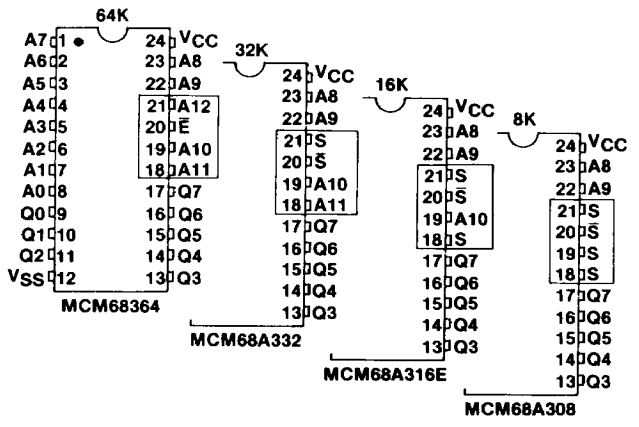
MOS

(N-CHANNEL, SILICON-GATE)

2048 × 8 BIT
READ ONLY MEMORY

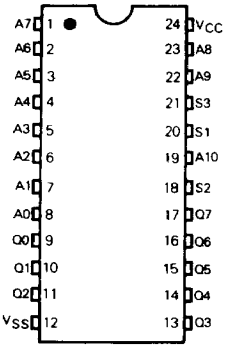


MOTOROLA'S PIN-COMPATIBLE ROM FAMILY



INDUSTRY STANDARD PINOUTS

PIN ASSIGNMENT



PIN NAMES	
A0-A10	Address Inputs
S1-S3	Chip Selects
Q0-Q7	Data Output
V_{CC}	+5 V Power Supply
V_{SS}	Ground

ROM

DC OPERATING CONDITIONS AND CHARACTERISTICS

(Full operating voltage and temperature range unless otherwise noted)

RECOMMENDED DC OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.5	5.0	5.5	Vdc
Input High Voltage	V_{IH}	2.0	–	5.5	Vdc
Input Low Voltage	V_{IL}	−0.3	–	0.8	Vdc

DC CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Input Current (V_{in} = 0 to 5.5 V)	I_{in}	−2.5	2.5	μAdc
Output High Voltage (I_{OH} = −205 μA)	V_{OH}	2.4	–	Vdc
Output Low Voltage (I_{OL} = 1.6 mA)	V_{OL}	–	0.4	Vdc
Output Leakage Current (Three-State) (S = 0.8 V or $\overline{S}$ = 2.0 V, V_{out} = 0.4 V to 2.4 V)	I_{LO}	−10	10	μAdc
Supply Current (V_{CC} = 5.5 V, T_A = 0°C)	I_{CC}	–	130	mAdc

ABSOLUTE MAXIMUM RATINGS (See Note 1)

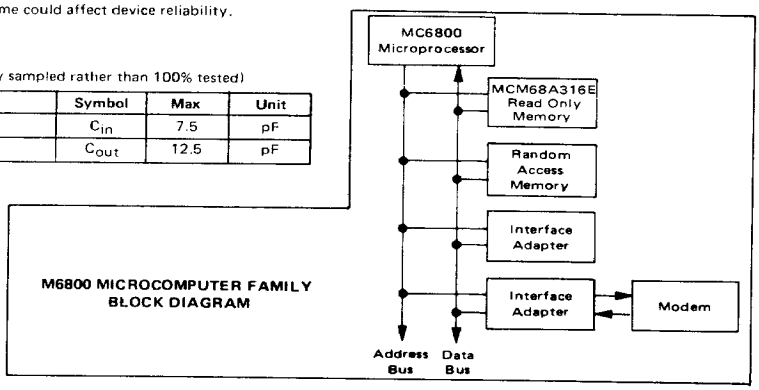
Rating	Symbol	Value	Unit
Supply Voltage	V_{CC}	−0.3 to +7.0	Vdc
Input Voltage	V_{in}	−0.3 to +7.0	Vdc
Operating Temperature Range	T_A	0 to +70	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

NOTE 1: Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. Functional operation should be restricted to RECOMMENDED OPERATING CONDITIONS. Exposure to higher than recommended voltages for extended periods of time could affect device reliability.

CAPACITANCE

(f = 2.0 MHz, T_A = 25°C, periodically sampled rather than 100% tested)

Characteristic	Symbol	Max	Unit
Input Capacitance	C_{in}	7.5	pF
Output Capacitance	C_{out}	12.5	pF



M6800 MICROCOMPUTER FAMILY
BLOCK DIAGRAM

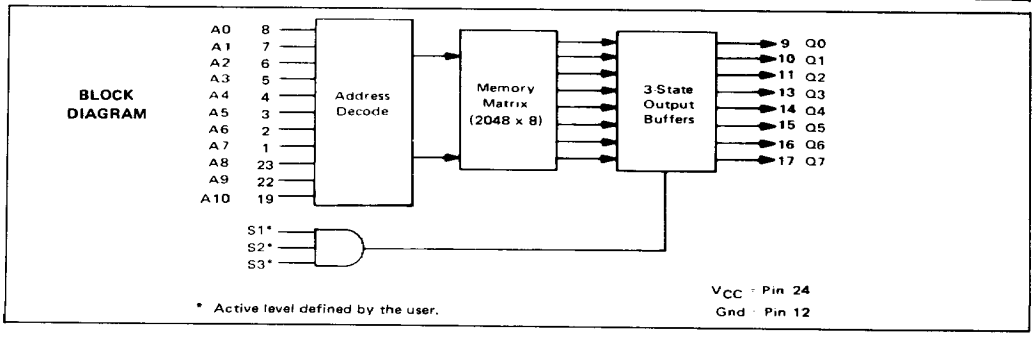


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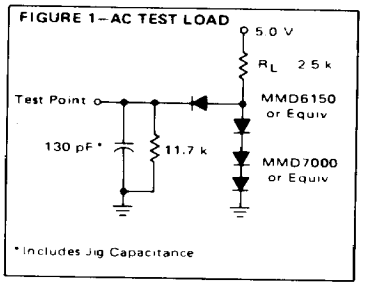
FIGURE 1–AC TEST LOAD



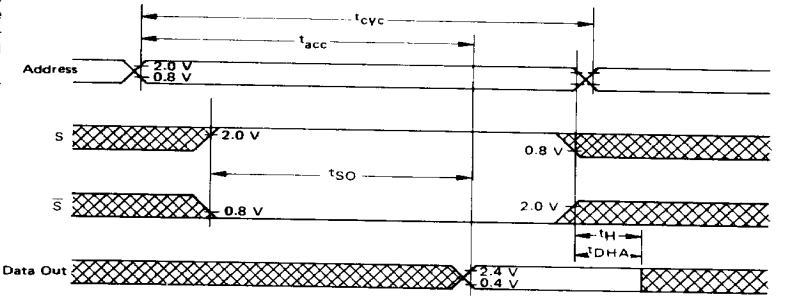
This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields; however, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high-impedance circuit.

AC OPERATING CONDITIONS AND CHARACTERISTICS

(Full operating voltage and temperature unless otherwise noted.
All timing with $t_r = t_f = 20$ ns, Load of Figure 1)

Characteristic	Symbol	Min	Max	Unit
Cycle Time	t_{cyc}	350	–	ns
Access Time	t_{acc}	–	350	ns
Chip Select to Output Delay	t_{SO}	–	150	ns
Data Hold from Address	t_{DHA}	10	–	ns
Data Hold from Deselection	t_H	10	150	ns

TIMING DIAGRAM



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CUSTOM PROGRAMMING

By the programming of a single photomask for the MCM68A316E, the customer may specify the content of the memory and the method of enabling the outputs.

Information on the general options of the MCM68A316E should be submitted on an Organizational Data form such as that shown in Figure 2. ("No-Connect" must always be the highest order Chip Select(s).)

Information for custom memory content may be sent to Motorola in one of two forms (shown in order of preference):

1. EPROM (TMS2716 or MCM2716)
2. Magnetic Tape
   9 track, 800 bpi, odd parity written in EBCDIC character code. Motorola's R.O.M.S. format.

FIGURE 2 — FORMAT FOR PROGRAMMING GENERAL OPTIONS

ORGANIZATIONAL DATA
MCM68A316E MOS READ ONLY MEMORY

Customer:

Company _____

Part No. _____

Originator _____

Phone No. _____

Motorola Use Only:

Quote: _____

Part No.: _____

Specif. No.: _____

Chip Select:

	Active High	Active Low	No Connect
S1	☐	☐	☐
S2	☐	☐	☐
S3	☐	☐	☐

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