Am9218/8316E

2048 x 8 Read Only Memory

DISTINCTIVE CHARACTERISTICS

- 2048 x 8 organization
- Plug-in replacement for 8316E
- Access times as fast as 350 ns
- Fully capacitive inputs – simplified driving
- 3 fully programmable Chip Selects – increased flexibility
- Logic voltage levels compatible with TTL
- Three-state output buffers – simplified expansion
- Drives two full TTL loads
- Single supply voltage – +5.0V
- Low power dissipation
- N-channel silicon gate MOS technology
- 100% MIL-STD-883 reliability assurance testing

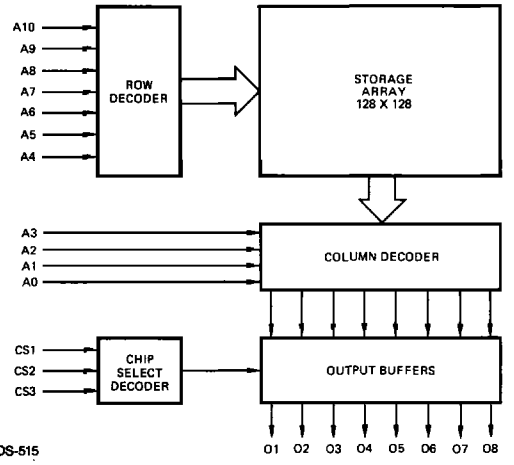
FUNCTIONAL DESCRIPTION

The Am9218 devices are high performance, 16384-bit, static, mask programmed, read only memories. Each memory is implemented as 2048 words by 8 bits per word. This organization simplifies the design of small memory systems and permits incremental memory sizes as small as 2048 words. The fast access times provided allow the ROM to service high performance microcomputer applications without stalling the processor.

Three programmable Chip Select input signals are provided to control the output buffers. Each Chip Select polarity may be specified by the customer thus allowing the addressing of 8 memory chips without external gating. The outputs of unselected chips are turned off and assume a high impedance state. This permits wire-ORing with additional Am9218 devices and other three-state components.

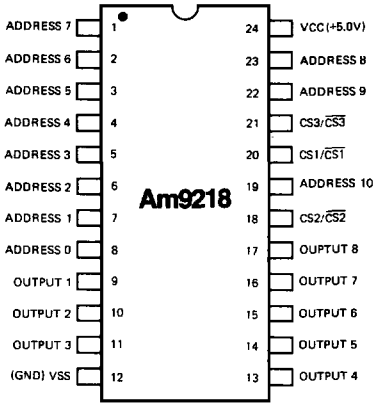
These memories are fully static and require no clock signals of any kind. A selected chip will output data from a location specified by whatever address is present on the address input lines. Input and output voltage levels are compatible with TTL specifications.

BLOCK DIAGRAM



MOS-515

CONNECTION DIAGRAM



Top View

MOS-516 Pin 1 is marked for orientation.

ORDERING INFORMATION

Package Type	Ambient Temperature Specifications	Access Time	
		450ns	350ns
Molded	$0°C \leq T_A \leq 70°C$	AM9218BPC P8316E	AM9218CPC
Cerdip	$0°C \leq T_A \leq 70°C$	AM9218BCC	AM9218CCC
Side-Brazed Ceramic	$0°C \leq T_A \leq 70°C$	AM9218BDC C8316E	AM9218CDC
	$-55°C \leq T_A \leq +125°C$	AM9218BDM	

MAXIMUM RATINGS (Above which the useful life may be impaired)

Storage Temperature	−65°C to +150°C
Ambient Temperature Under Bias	−55°C to +125°C
VCC with Respect to VSS	+7.0V
DC Voltage Applied to Outputs	−0.5V to +7.0V
DC Input Voltage	−0.5V to +7.0V
Power Dissipation	1.0W

The products described by this specification include internal circuitry designed to protect input devices from damaging accumulations of static charge. It is suggested nevertheless, that conventional precautions be observed during storage, handling and use in order to avoid exposure to excessive voltages.

ELECTRICAL CHARACTERISTICS

Am9218BDC, Am9218CDC, C8316A: T_A = 0°C to +70°C; VCC = 5.0V ±5%

Parameters	Description	Test Conditions		Am9218XDC Min.	Am9218XDC Max.	C8316E Min.	C8316E Max.	Units
VOH	Output HIGH Voltage	9218	IOH = −200µA	2.4				Volts
		8316E	IOH = −100µA			2.4		
VOL	Output LOW Voltage	9218	IOL = 3.2mA		0.4			Volts
		8316E	IOL = 2.1mA				0.4	
VIH	Input HIGH Voltage			2.0	VCC + 1.0	2.0	VCC + 1.0	Volts
VIL	Input LOW Voltage			−0.5	0.8	−0.5	0.8	Volts
ILO	Output Leakage Current	Chip Disabled			10		10	µA
ILI	Input Leakage Current				10		10	µA
ICC	VCC Supply Current				70		95	mA

ELECTRICAL CHARACTERISTICS

Am9218BDM: T_A = −55°C to +125°C; VCC = 5.0V ±10%

Parameters	Description	Test Conditions	Am9218B Min.	Am9218B Max.	Units
VOH	Output HIGH Voltage	IOH = −200µA	2.2		Volts
VOL	Output LOW Voltage	IOL = 3.2mA		0.45	Volts
VIH	Input HIGH Voltage		2.0	VCC + 1.0	Volts
VIL	Input LOW Voltage		−0.5	0.8	Volts
ILO	Output Leakage Current	Chip Disabled		10	µA
ILI	Input Leakage Current			10	µA
ICC	VCC Supply Current			80	mA

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

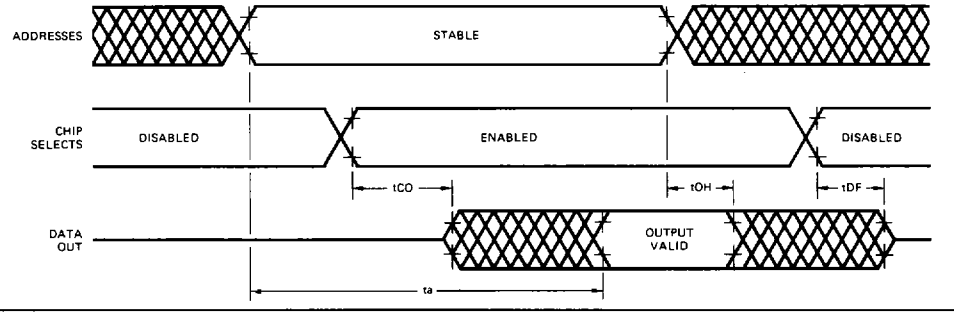
Am9218XDC/C8316E: T_A = 0°C to +70°C; VCC = 5.0V ± 5%

Am9218BDM: T_A = −55°C to +125°C; VCC = 5.0V ± 10%

Parameters	Description	Test Conditions	Am9218B Min.	Am9218B Max.	Am9218C Min.	Am9218C Max.	8316E Min.	8316E Max.	Units
ta	Address to Output Access Time	tr = tf = 20ns; Output Load: one standard TTL gate plus 100pF (Note 1)		450		350		450	ns
tCO	Chip Select to Output ON Delay			150		130		250	ns
tOH	Previous Read Data Valid with Respect to Address Change		20		20		–		ns
tDF	Chip Select to Output OFF Delay			150		130		250	ns
CI	Input Capacitance	T_A = 25°C, f = 1.0MHz; All pins at 0V		7.0		7.0		7.0	pF
CO	Output Capacitance			7.0		7.0		7.0	pF

Notes: 1. Timing reference levels: High = 2.0V, Low = 0.8V.

SWITCHING WAVEFORMS



PROGRAMMING INSTRUCTIONS

CUSTOM PATTERN ORDERING INFORMATION

The Am9218 is programmed from punched cards, card coding forms or paper tape in card image format as shown below.
Logic "1" = a more positive voltage (normally +5.0 V)
Logic "0" = a more negative voltage (normally 0 V)

FIRST CARD

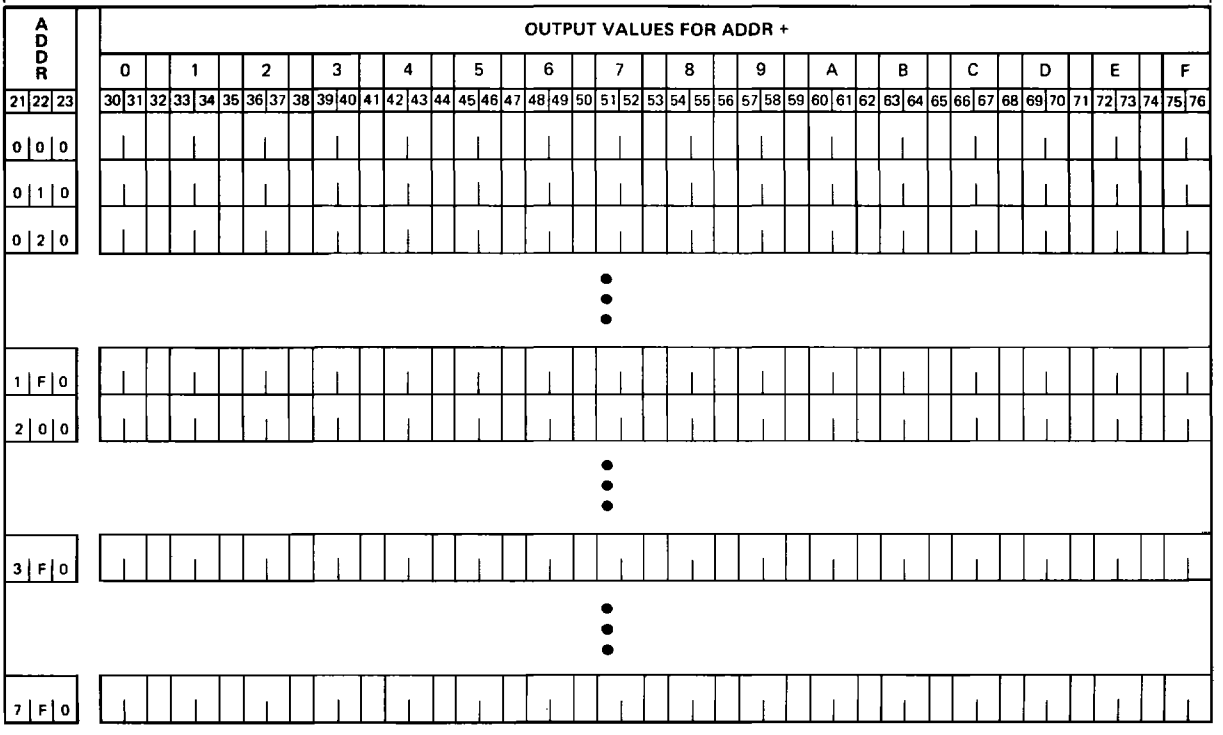
Column Number	Description
10 thru 29	Customer Name
32 thru 37	Total number of "1's" contained in the data. This is optional and should be left blank if not used.
50 thru 62	8316E or 9218
65 thru 72	Optional information

SECOND CARD

Column Number	Description
29	CS3 input required to select chip (0 or 1)
31	CS2 input required to select chip (0 or 1)
33	CS1 input required to select chip (0 or 1)

Two options are provided for entering the data pattern with the remaining cards.

OPTION 1 is the Binary Option where the address and data are presented in binary form on the basis of one word per card. With this option 2048 data cards are required.

Column Number	
10, 12, 14, 16, 18 20, 22, 24, 26, 28, 30	Address input pattern with the most significant bit (A10) in column 10 and the least significant bit (A0) in column 30.
40, 42, 44, 46, 48, 50, 52, 54	Output pattern with the most significant bit (O8) in column 40 and the least significant bit (O1) in column 54.
73 thru 80	Coding these columns is not essential and may be used for card identification purposes.

OPTION 2 is the Hexadecimal Option and is a much more compact way of presenting the data. This format requires only 128 data cards. Each data card contains the 8-bit output information for 16 storage locations in the memory. The address indicated in columns 21, 22 and 23 is the address of the data presented in columns 30 and 31. Addresses for successive data are assumed to be in incremental ascending order from the initial address. Since the address in columns 21, 22 and 23 always points only to the first data on the card, column 23 is always zero. Columns 21 and 22 take all hex values from 00 through 7F: 128 cards in all. Data is entered in hex values and may be any combination of 8 bits, that is, hex values from 00 through FF.