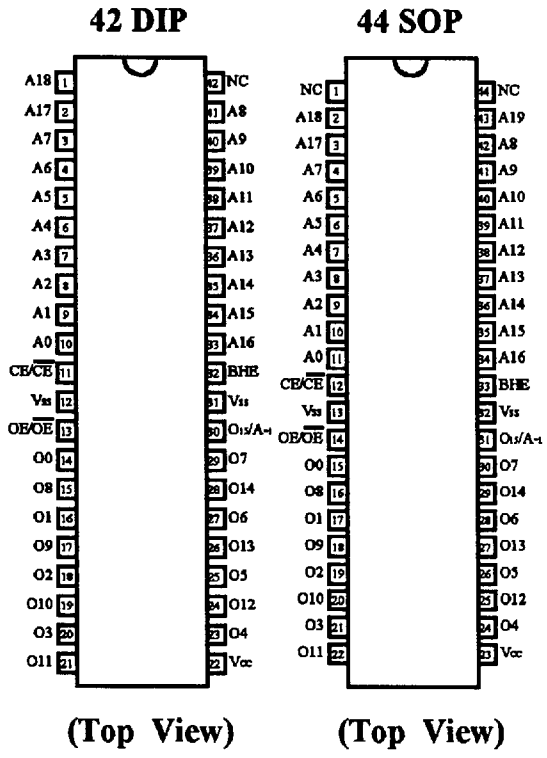
Description

The GM23C16050 high performance read only memory is organized either as 2,097,152 x 8 bit (Byte Mode) or as 1,048,576 x 16 bit (Word Mode) followed by BHE mode select. The GM23C16050 offers automatic power down controlled by the mask programmed CE or $\overline{CE}$ input. The GM23C16050 is includes page mode function. Page read mode allows two to eight words of data to be read changed. Page access time is 50ns. The GM23C16050 is packaged in a 600mil 42 pin DIP and GM23C16050FW in a 600mil 44 pin SOP.

Features

- Switchable Organization
  Byte Mode : 2,097,152 x 8 bit
  Word Mode : 1,048,576 x 16 bit
- Single 5V
- Access Time : 120ns (Normal)/50ns (Page)
- Operating current : 100mA (Max)
- Standby current : 50μA (Max)
- TTL-compatible inputs and outputs
- Polarity programmable chip enable and out enable pin
- Byte or Word switchable by BHE pin
  (BHE can be switched on the fly or a DC signal)
- Fully static operation
- Package :
  GM23V16050 : 42 Pin Plastic DIP (600 mil)
  GM23V16050FW : 44 Pin Plastic SOP (600 mil)

Pin Configuration



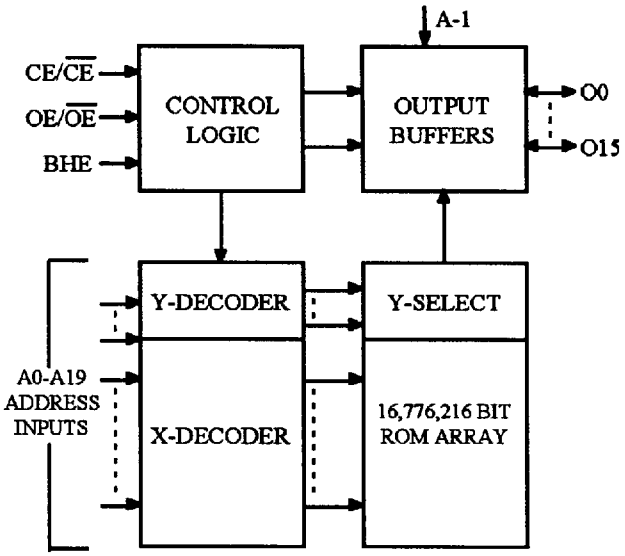
(Top View) (Top View)

Pin Description

Pin	Function
A0-A2	Page Address Inputs
A3-A19	Address Inputs
O0-O14	Data Outputs
O15/A-1	Output O15 (Word Mode)/ LSB Address (Byte Mode)
BHE	Word/Byte Selection
CE/$\overline{CE}$*	Chip Enable Input
OE/$\overline{OE}$*	Output Enable Input
Vcc	Power Supply (5V)
Vss	Ground
NC	No Connection

*User Selectable Polarity.

Block Diagram



Absolute Maximum Ratings*

Symbol	Parameter	Rating	Unit
T_A	Ambient Operating Temperature	-10 ~ 80	℃
T_{STG}	Storage Temperature	-65 ~ 150	℃
V_{CC}	Supply Voltage to Ground Potential	-0.5 ~ V_{CC} + 0.5	V
V_{OUT}	Output Voltage	-0.5 ~ V_{CC} + 0.5	V
V_{IN}	Input Voltage	-0.5 ~ 7.0	V

***Comments**

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Recommended DC Operating Conditions (V_{CC} = 5.0V ± 10%, T_A = 0 ~ 70℃)

Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	4.5	5.0	5.5	V
V_{SS}	Supply Voltage	0	0	0	V
V_{IH}	Input High Voltage	2.2	-	V_{CC} + 0.3	V
V_{IL}	Input Low Voltage	-0.3	-	0.8	V

DC Electrical Characteristics (V_{CC} = 5.0V ± 10%, T_A = 0 ~ 70℃)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{OH}	Output High Voltage	I_{OH} = -1mA	2.4			V
V_{OL}	Output Low Voltage	I_{OL} = 2.1mA			0.4	V
$I_{I(L)}$	Input Leakage Current	V_{IN} = 0V to V_{CC}			±10	μA
$I_{O(L)}$	Output Leakage Current	V_{OUT} = 0V to V_{CC}			±10	μA
I_{CC}	Operating Supply Current (f = 6.7 MHz)	$\overline{CE}$ = V_{IL}, CE = V_{IH}			100	mA
I_{SB1}	Standby Current (TTL)	$\overline{CE}$ = V_{IH}, all Output Open			1	mA
I_{SB2}	Standby Current (CMOS)	$\overline{CE}$ = V_{CC}, all Output Open			50	μA

Capacitance (T_A = 25℃, f = 1.0 MHz)

Symbol	Parameter	Condition	Min	Max	Unit
C_I	Input Capacitance	V_{IN} = 0V		10	pF
C_O	Output Capacitance	V_{OUT} = 0V		10	pF

Note : Capacitance is periodically sampled and not 100% tested.

Mode Selection

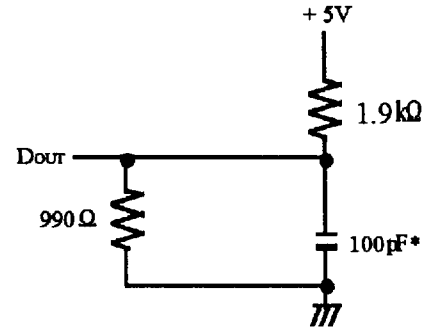
Mode	CE/$\overline{CE}$	OE/$\overline{OE}$	BHE	O0~07	O8~014	O15/A-1	Power
Standby	L/H	X	X	High-Z			Standby
16 Bit Operating	H/L	H/L	H	Data Out			Active
8 Bit Operating	H/L	H/L	L	Data Out (Lower 8 Bit)	High-Z	L	Active
				Data Out (Upper 8 Bit)		H	
Output Disable	H/L	L/H	X	High-Z		X	Active

AC Operating Characteristics ($V_{CC} = 5.0V \pm 10\%$, $T_A = 0 \sim 70℃$)

Symbol	Parameter	GM23C16050-12		GM23C16050-15		Unit
		Min	Max	Min	Max	
t_{RC}	Read Cycle Time	120		150		ns
t_{ACE}	Chip Enable Access Time		120		150	ns
t_{AA}	Address Access Time		120		150	ns
t_{PAA}	Page Address Access Time		50		70	
t_{AOE}	Output Enable Access Time		60		70	ns
t_{OH}	Output Hold From Address Change	10		10		ns
t_{OHZ} t_{CHZ}	Output or Chip Disable to Output High-Z		50		60	ns
t_{OLZ} t_{CLZ}	Output or Chip Enable to Output Low-Z	10		10		ns

AC Test Condition

Input Pulse Level	0.4V to 2.4V
Input Rise and Fall Time	10ns
Timing Measurement	V_{IL} = 0.8V V_{IH} = 2.2V
Output Load	See Fig. 1

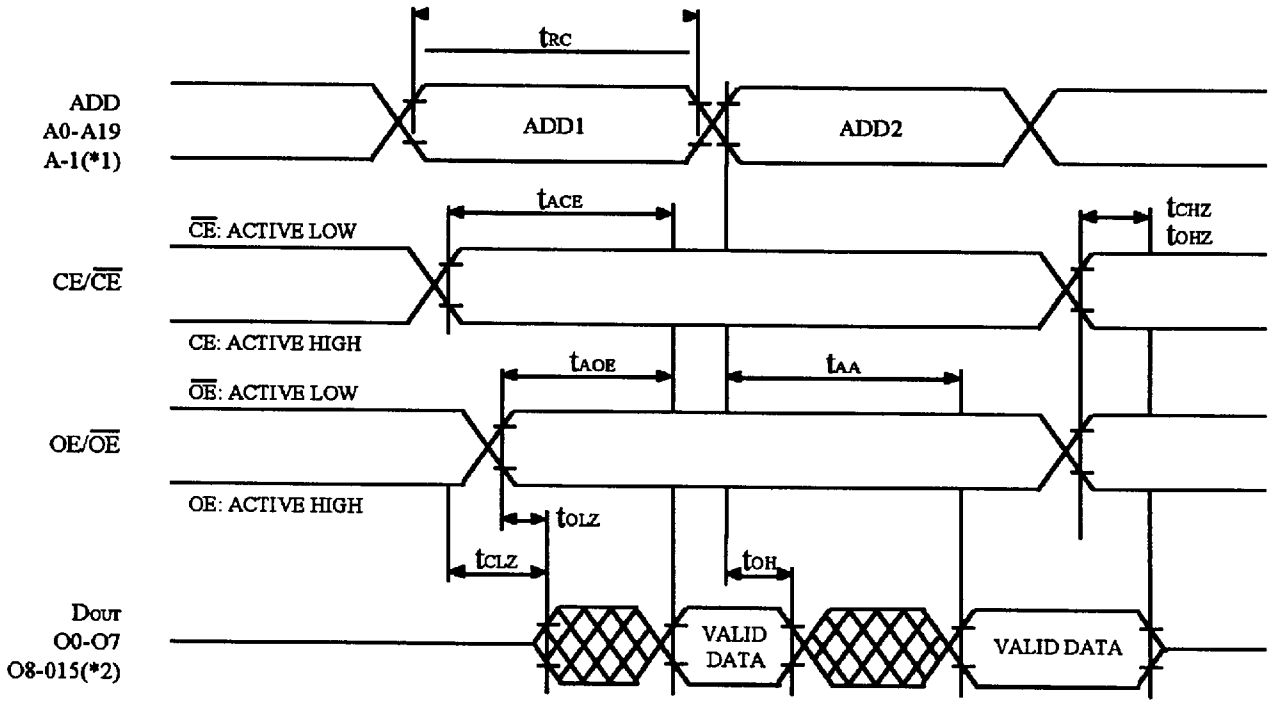


*Including scope and jig.

Fig. 1 Output Load Circuit

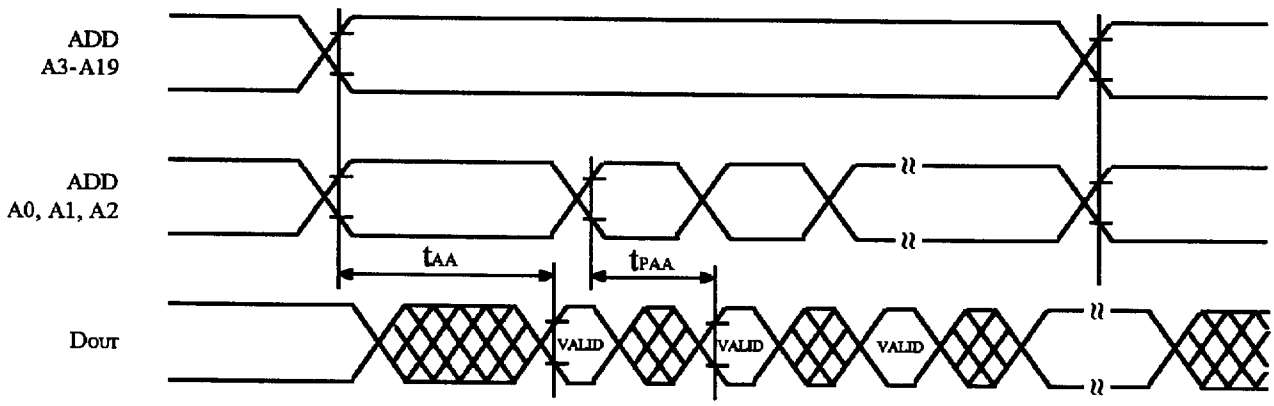
Timing Waveforms

Read



(*1) Byte Mode only. A-1 is Least Significant Bit Address. (BHE = V_{IL})
(*2) Word Mode only. (BHE = V_{IH})

Page Read

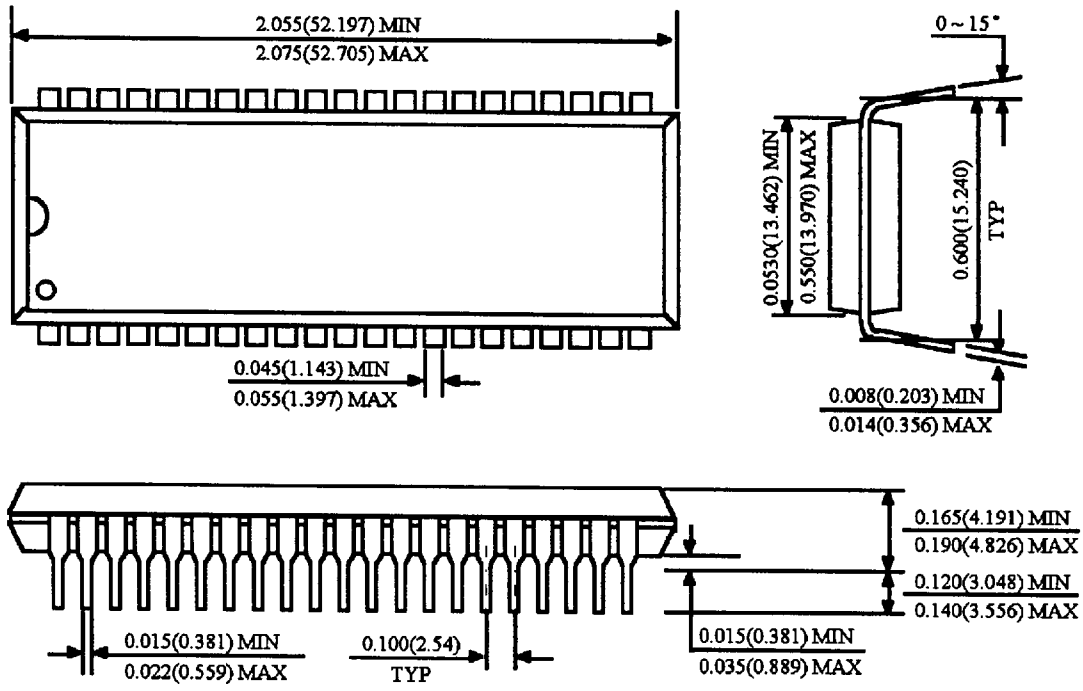


*After power up, in order to prevent wrong operation of special application, dummy cycle of CE or any address input (Min. 80ns) is required.

Package Dimensions

Unit: Inches (mm)

42 DIP



44 SOP