32M-Bit (4Mx8 /2Mx16) CMOS MASK ROM

FEATURES

- Switchable organization
  4,194,304x8(byte mode)
  2,097,152x16(word mode)
- Fast access time
  Random Access : 100ns(Max.)
  Page Access : 30ns(Max.)
- Supply voltage : single +5V
- Current consumption
  Operating : 150mA(Max.)
  Standby : 50μA(Max.)
- Fully static operation
- All inputs and outputs TTL compatible
- Three state outputs
- Package
  -. KM23C32005BG : 44-SOP-600

GENERAL DESCRIPTION

The KM23C32005BG is a fully static mask programmable ROM fabricated using silicon gate CMOS process technology, and is organized either as 4,194,304x8 bit(byte mode) or as 2,097,152x16 bit(word mode) depending on BHE voltage level.(See mode selection table)

This device includes page read mode function, page read mode allows four to eight words of data to read fast in the same page, $\overline{CE}$ and A_3 ~ A_{20} should not be changed.

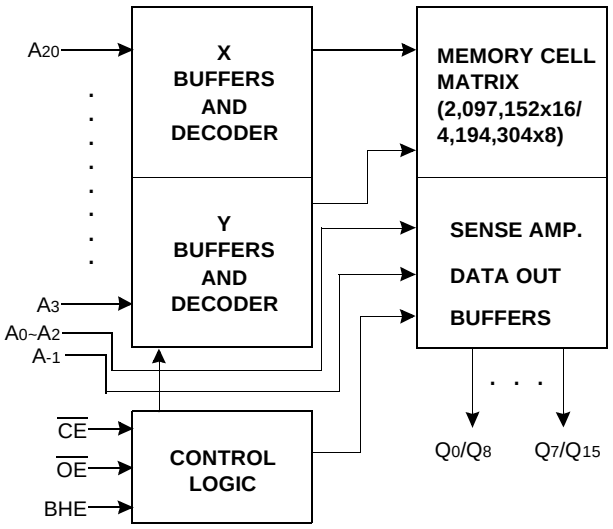
This device operates with a 5V single power supply, and all inputs and outputs are TTL compatible.

Because of its asynchronous operation, it requires no external clock assuring extremely easy operation.

It is suitable for use in program memory of microprocessor, and data memory, character generator.

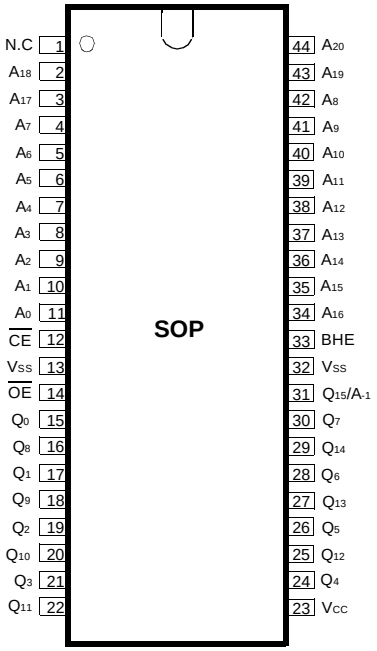
The KM23C32005BG is packaged in a 44-SOP.

FUNCTIONAL BLOCK DIAGRAM



Pin Name	Pin Function
A_0 - A_2	Page Address Inputs
A_3 - A_{20}	Address Inputs
Q_0 - Q_{14}	Data Outputs
Q_{15} /A_{-1}	Output 15(Word mode)/ LSB Address(Byte mode)
BHE	Word/Byte selection
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
V_{CC}	Power (+5V)
V_{SS}	Ground
N.C	No Connection

PIN CONFIGURATION



KM23C32005BG

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Voltage on Any Pin Relative to V_{SS}	V_{IN}	-0.3 to +7.0	V
Temperature Under Bias	T_{BIAS}	-10 to +85	°C
Storage Temperature	T_{STG}	-55 to +150	°C

NOTE : Permanent device damage may occur if "ABSOLUTE MAXIMUM RATINGS" are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS (Voltage reference to V_{SS}, T_A=0 to 70°C)

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Supply Voltage	V_{SS}	0	0	0	V

DC CHARACTERISTICS

Parameter	Symbol	Test Conditions	Min	Max	Unit
Operating Current	I_{CC}	$\overline{CE}$=$\overline{OE}$=V_{IL} all outputs open	-	150	mA
Standby Current(TTL)	I_{SB1}	$\overline{CE}$=V_{IH}, all outputs open	-	1	mA
Standby Current(CMOS)	I_{SB2}	$\overline{CE}$=V_{CC}, all outputs open	-	50	µA
Input Leakage Current	I_{LI}	V_{IN}=0 to V_{CC}	-	10	µA
Output Leakage Current	I_{LO}	V_{OUT}=0 to V_{CC}	-	10	µA
Input High Voltage, All Inputs	V_{IH}		2.2	V_{CC}+0.3	V
Input Low Voltage, All Inputs	V_{IL}		-0.3	0.8	V
Output High Voltage Level	V_{OH}	I_{OH}=-400µA	2.4	-	V
Output Low Voltage Level	V_{OL}	I_{OL}=2.1mA	-	0.4	V

NOTE : Minimum DC Voltage(V_{IL}) is -0.3V an input pins. During transitions, this level may undershoot to -2.0V for periods <20ns.
Maximum DC voltage on input pins(V_{IH}) is V_{CC}+0.3V which, during transitions, may overshoot to V_{CC}+2.0V for periods <20ns.

MODE SELECTION

$\overline{CE}$	$\overline{OE}$	BHE	Q_{15}/A_{-1}	Mode	Data	Power
H	X	X	X	Standby	High-Z	Standby
L	H	X	X	Operating	High-Z	Active
L	L	H	Output	Operating	Q_0~Q_{15} : Dout	Active
		L	Input	Operating	Q_0~Q_7 : Dout Q_8~Q_{14} : Hi-Z	Active

CAPACITANCE (T_A=25°C, f=1.0MHz)

Item	Symbol	Test Conditions	Min	Max	Unit
Output Capacitance	C_{OUT}	V_{OUT}=0V	-	12	pF
Input Capacitance	C_{IN}	V_{IN}=0V	-	12	pF

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

AC CHARACTERISTICS (T_A=0°C to +70°C, V_{CC}=5V±10%, unless otherwise noted.)

TEST CONDITIONS

Item	Value
Input Pulse Levels	0.6V to 2.4V
Input Rise and Fall Times	10ns
Input and Output timing Levels	0.8V and 2.0V
Output Loads	1 TTL Gate and C_L=100pF

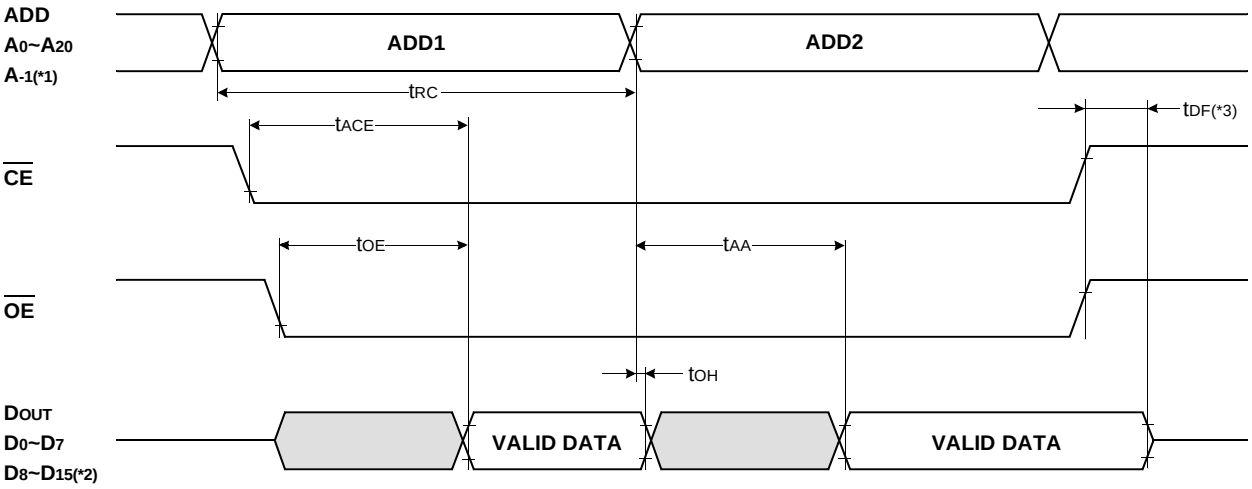
READ CYCLE

Item	Symbol	KM23C32005BG-10		KM23C32005BG-12		KM23C32005BG-15		Unit
		Min	Max	Min	Max	Min	Max	
Read Cycle Time	t_{RC}	100		120		150		ns
Chip Enable Access Time	t_{ACE}		100		120		150	ns
Address Access Time	t_{AA}		100		120		150	ns
Page Address Access Time	t_{PA}		30		50		70	ns
Output Enable Access Time	t_{OE}		30		50		70	ns
Output or Chip Disable to Output High-Z	t_{DF}		20		20		30	ns
Output Hold from Address	t_{OH}	0		0		0		ns

NOTE : Page Address ; A_0, A_1, A_2.

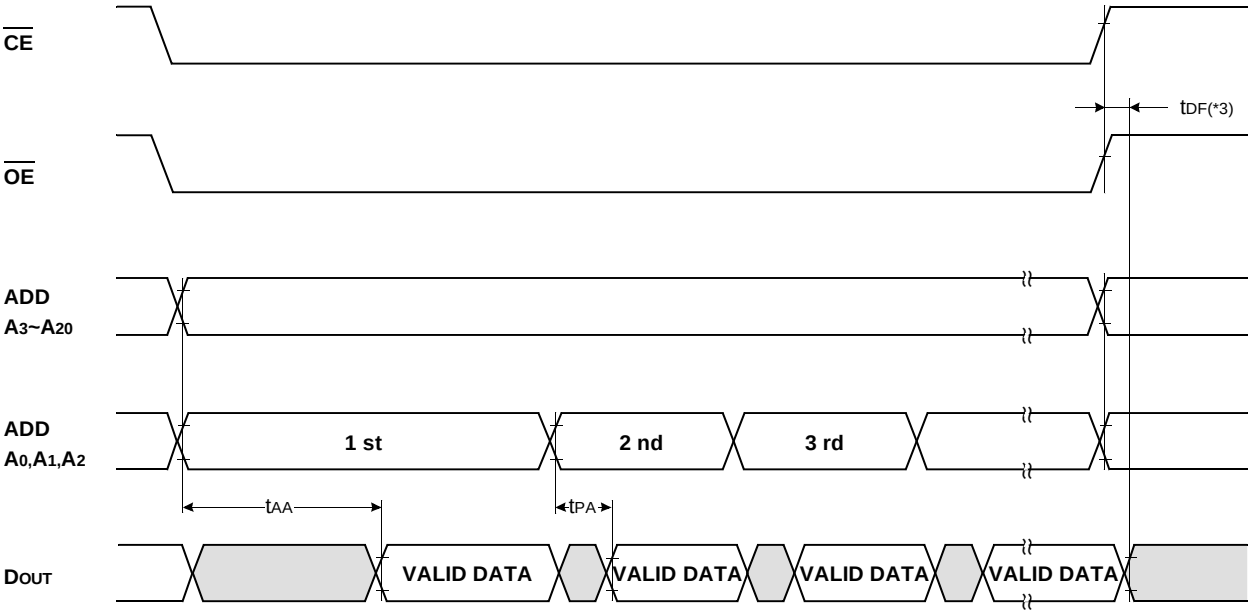
TIMING DIAGRAM

READ



NOTES :
*1. Byte Mode only. A_{-1} is Least Significant Bit Address.(BHE=V_{IL})
*2. Word Mode only.(BHE=V_{IH})
*3. t_{DF} is defined as the time at which the outputs achieve the open circuit condition and is not referenced to V_{OH} or V_{OL} level.

PAGE READ



PACKAGE DIMENSIONS

Unit : mm/inch

44-SOP-600