

128M-Bit (8Mx16) CMOS MASK ROM

FEATURES

- 8,388,608 x 16 bit organization
- Fast access time
3.3V Operation : 100ns(Max.)@CL=50pF,
120ns(Max.)@CL=100pF
3.0V Operation : 120ns(Max.)@CL=100pF
- Supply voltage : single +3.3V/ single +3.0V
- Current consumption
Operating : 40mA(Max.)
Standby : 30μA(Max.)
- Fully static operation
- All inputs and outputs TTL compatible
- Three state outputs
- Package
- K3N9V(U)4000A-GC : 44-SOP-600

GENERAL DESCRIPTION

The K3N9V(U)4000A-GC is a fully static mask programmable ROM organized as 8,388,608 x 16 bit. It is fabricated using silicon gate CMOS process technology.

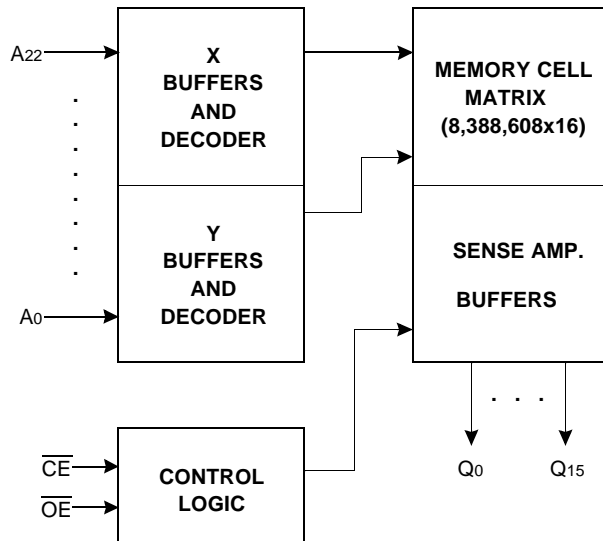
This device operates with 3.0V or 3.3V power supply, and all inputs and outputs are TTL compatible.

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.

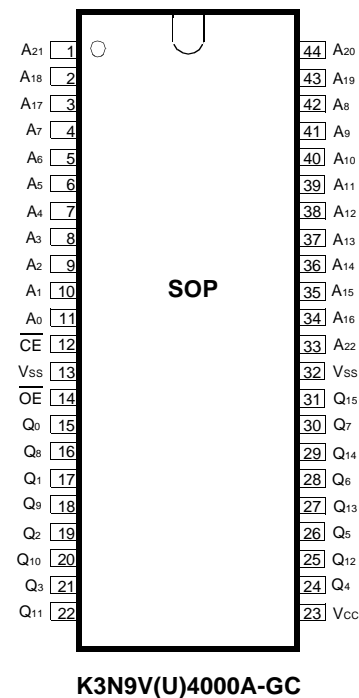
The K3N9V(U)4000A-GC is packaged in a 44-SOP.

FUNCTIONAL BLOCK DIAGRAM



Pin Name	Pin Function
A0 - A22	Address Inputs
Q0 - Q15	Data Outputs
\overline{CE}	Chip Enable
\overline{OE}	Output Enable
Vcc	Power
Vss	Ground

PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Voltage on Any Pin Relative to V _{SS}	V _{IN}	-0.3 to +4.5	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}	2.7/3.0	3.0/3.3	3.3/3.6	V
Supply Voltage	V _{SS}	0	0	0	V

DC CHARACTERISTICS

Parameter	Symbol	Test Conditions		Min	Max	Unit
Operating Current	I _{CC}	Cycle=5MHz, all outputs open, $\overline{CE}=\overline{OE}=V_{IL}$, V _{IN} =0.45V to 2.4V (AC Test Condition)	V _{CC} =3.3V±0.3V	-	40	mA
			V _{CC} =3.0V±0.3V		35	mA
Standby Current(TTL)	I _{SB1}	$\overline{CE}=V_{IH}$, all outputs open			500	μA
Standby Current(CMOS)	I _{SB2}	$\overline{CE}=V_{CC}$, all outputs open			30	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}			2.0	V _{CC} +0.3	V
Input Low Voltage, All Inputs	V _{IL}			-0.3	0.6	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 on 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

CE	OE	Mode	Data	Power
H	X	Standby	High-Z	Standby
L	H	Operating	High-Z	Active
L	L	Operating	Dout	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

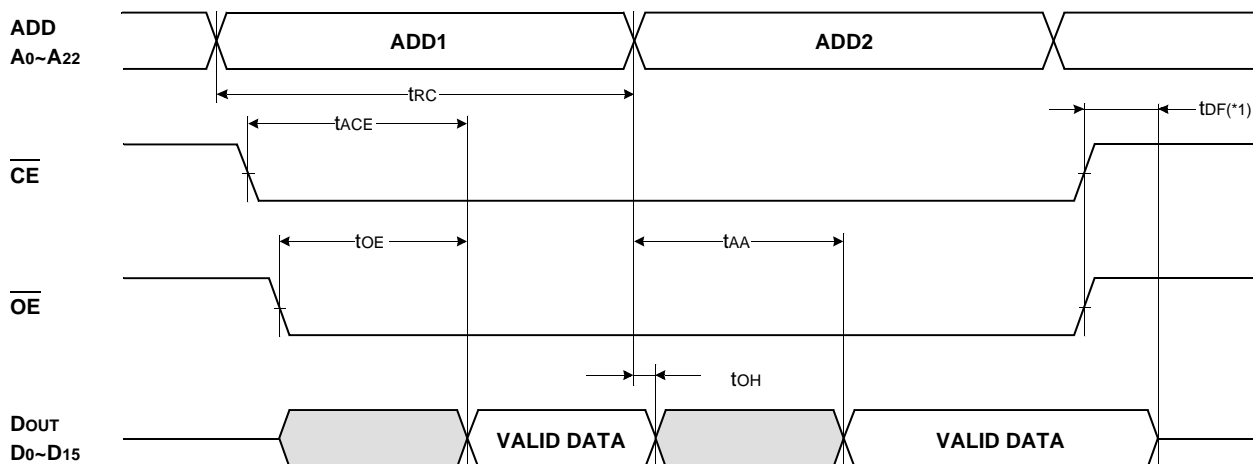
NOTE : Capacitance is periodically sampled and not 100% tested.

AC CHARACTERISTICS($T_A=0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$, $V_{CC}=3.3\text{V}/3.0\text{V}\pm 0.3\text{V}$, unless otherwise noted.)**TEST CONDITIONS**

Item	Value
Input Pulse Levels	0.45V to 2.4V
Input Rise and Fall Times	10ns
Input and Output timing Levels	1.5V
Output Loads	1 TTL Gate and $C_L=50\text{pF}$ or 100pF

READ CYCLE

Item	Symbol	K3N9V4000A-GC10 ($C_L=50\text{pF}$)		K3N9V4000A-GC12 ($C_L=100\text{pF}$)		K3N9U4000A-GC12 ($C_L=100\text{pF}$)		Unit
		Min	Max	Min	Max	Min	Max	
Read Cycle Time	t_{RC}	100		120		120		ns
Chip Enable Access Time	t_{ACE}		100		120		120	ns
Address Access Time	t_{AA}		100		120		120	ns
Output Enable Access Time	t_{OE}		50		60		60	ns
Output or Chip Disable to Output High-Z	t_{DF}		20		20		20	ns
Output Hold from Address Change	t_{OH}	0		0		0		ns

TIMING DIAGRAM**READ****NOTES :**

*1. 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.