OKI Semiconductor

MSM533202E

2,097,152-Word x 16-Bit or 4,194,304-Word x 8-Bit MASKROM

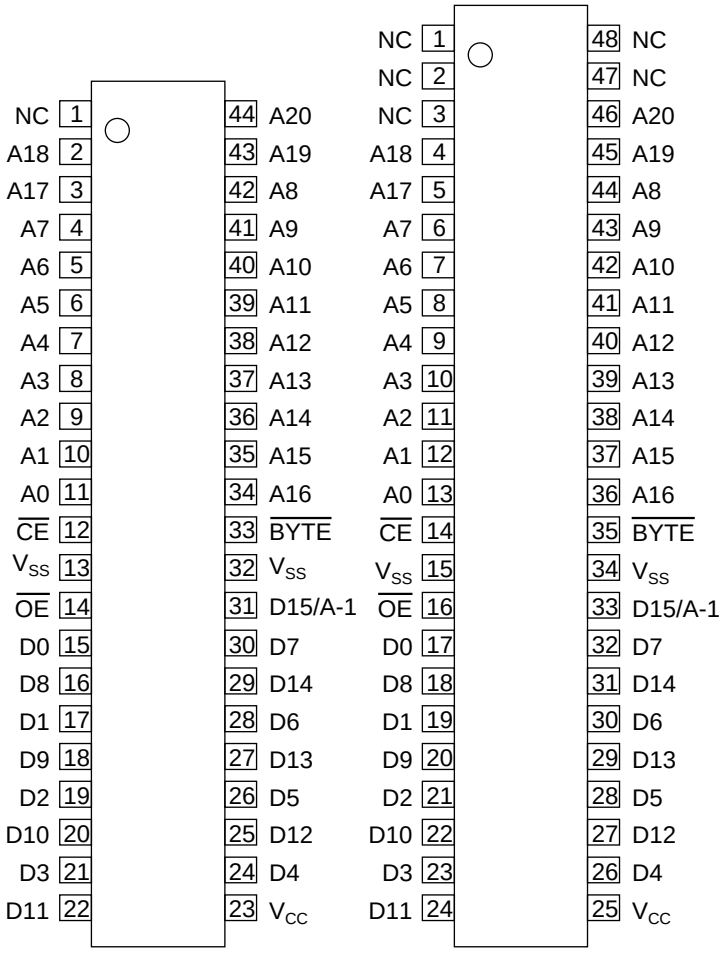
DESCRIPTION

The OKI MSM533202E is a high-speed CMOS Mask ROM that can electrically switch between 2,097,152-word x 16-bit or 4,194,304-word x 8-bit configurations. The MSM533202E operates on a single 5.0V power supply and is TTL compatible. The chip's asynchronous I/O requires no external clock assuring easy operation.A power-down mode provides low power dissipation when the chip is not selected. The CE and OE pins are provided as control signals that permit three-stated output allowing easy memory expansion on a system bus.The MSM533202E is suited for use as large capacity fixed memory for microcomputers and data terminals.

FEATURES

Single 5.0V power supply
2,097,152-words x 16-bit/4,194,304-words x 8-bit
Access time
  120ns MAX
Input/Output TTL compatible
Tri-State output configurations
Internal powerdown function
Packages:
  44-PIN PLASTIC SOP (SOP44-P-600-K)
  48-PIN PLASTIC TSOP (TSOP48-P-550-K)

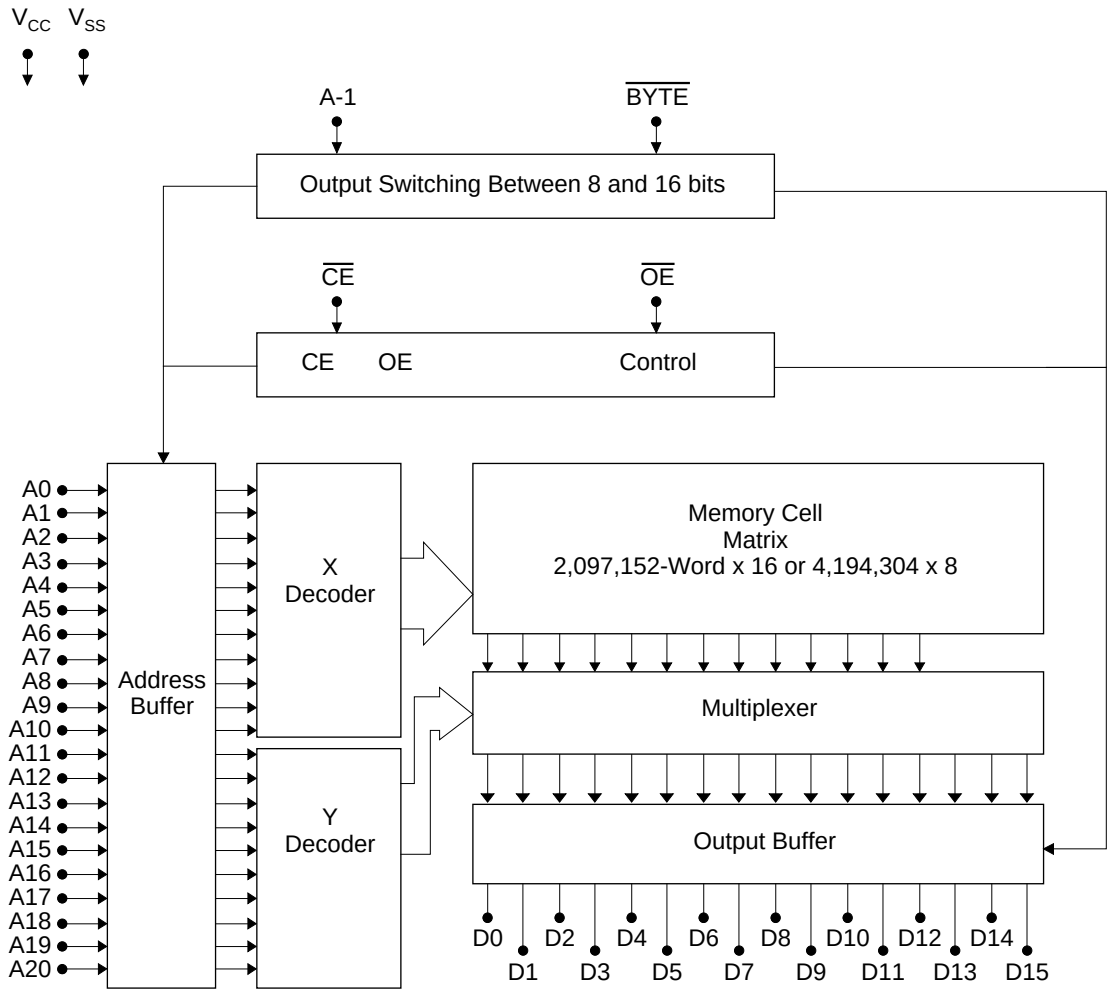
PIN CONFIGURATION



44 PIN SOP　　48 PIN TSOP

Pin Name	Function
D15/A-1	Data output / address input
A0 to A20	Address input
D0 to D15	Data output
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
$\overline{BYTE}$	Mode switch
V_{CC}, V_{SS}	Power supply

BLOCK DIAGRAM



FUNCTION TABLE

$\overline{CE}$	$\overline{OE}$	$\overline{BYTE}$	A-1/D15	D0 to D7	D8 to D15	D_{OUT} Mode	LSB	MSB
H	X	X	X	Hi-Z	Hi-Z	Hi-Z	—	—
L	H	X	X	Hi-Z	Hi-Z			
L	L	H	Input Inhibited (D15)	D0 to D7	D8 to D15	16 bit	A0	A20
L	L	L	L	D0 to D7	Hi-Z	8 bit	A-1	A20
L	L	L	H	D8 to D15	Hi-Z			

ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Limits	Unit
Power Supply Voltage	V_{CC}	to V_{SS}	–0.3 to 7	V
Input Voltage	V_I		–0.3 to V_{CC} + 0.5	V
Output Voltage	V_O		–0.3 to V_{CC} + 0.5	V
Power Dissipation	P_D	Per Package T_{opr} = 25°C	1.0	W
Operating Temperature	T_{opr}	—	0 to 70	°C
Storage Temperature	T_{stg}	—	–55 to 150	°C

Recommended Operating Conditions

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	—	4.5	5.0	5.5	V
	V_{SS}	—	0.0	0.0	0.0	V
"H" Input Voltage	V_{IH}	—	2.2	5.0	V_{CC} + 0.5	V
"L" Input Voltage	V_{IL}	—	–0.3	0.0	0.8	V
Operating Temperature	T_{opr}	—	0	—	70	°C

DC Characteristics

(V_{CC} = 5V±10%, Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	V_{OH}	I_{OH} = –400µA	2.4	—	—	V
"L" Output Voltage	V_{OL}	I_{OH} = 2.1mA	—	—	0.4	V
Input Leakage Current	I_{LI}	V_I = 0 to V_{CC}	–10	—	10	µA
Output Leakage Current	I_{LO}	V_O = 0 to V_{CC} CE = $V_{IH\ MIN}$	–10	—	10	µA
Power Supply Current (Operating)	I_{CC}	$\overline{CE}$ = V_{IL}, $\overline{OE}$ = V_{IH}, t_C = 120ns	—	—	60	mA
Power Supply Current (Standby)	I_{CCS}1	$\overline{CE}$ = V_{CC}–0.2V	—	—	50	µA
	I_{CCS}	$\overline{CE}$ = $V_{IH\ MIN}$	—	—	500	µA

AC CHARACTERISTICS

Timing conditions

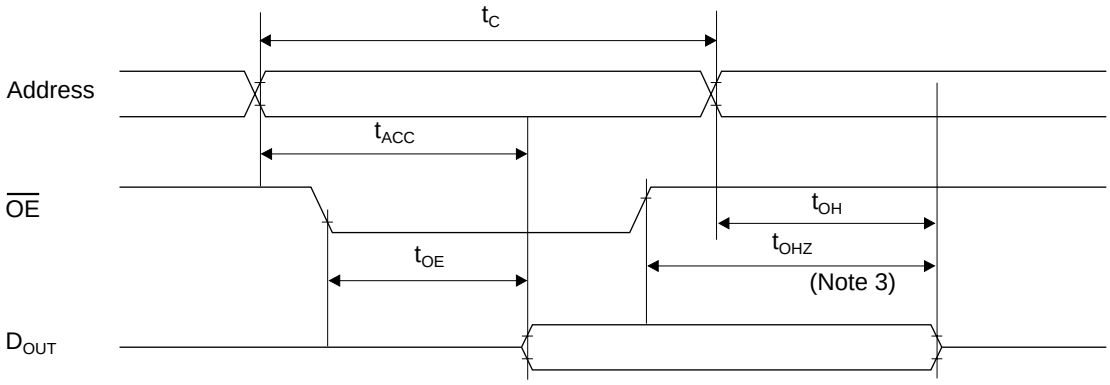
Parameter	Conditions
Input Signal Level	V_{IH}=2.4V, V_{IL}=0.6V
Transtion Time	t_r=t_f=5ns
Timing Reference Level	Input Voltage=1.5V Output Voltage=0.8V&2.0V
Load Condition	CL=100pF+1TTL

Read Cycle

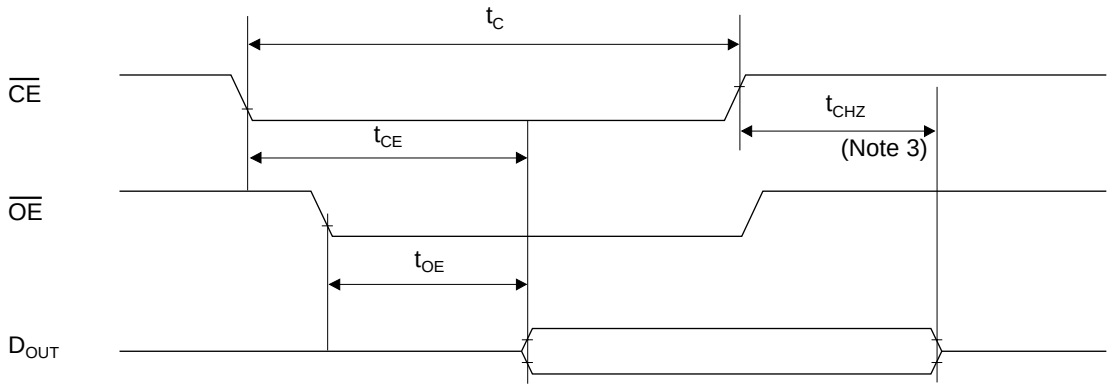
(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	120	—	—	ns
Address Access time	t_{ACC}	—	—	—	120	ns
$\overline{CE}$ Access time	t_{CE}	—	—	—	120	ns
$\overline{OE}$ Access time	t_{OE}	—	—	—	60	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	40	ns
$\overline{OE}$ Output Disable time	t_{OHZ}	—	0	—	30	ns
Output Hold time	t_{OH}	—	0	—	—	ns

Read Cycle (Note 1)



Read Cycle (Note 2)



Note) 1. $\overline{CE}$ is low level.
2. Address is fixed before or at the same time when $\overline{CE}$ level falls.
3. t_{CHZ} & t_{OHZ} indicate the time until floating. They are not determined by the output level.

I/O CAPACITANCE

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_I	V_I=0V	—	—	8	pF
Output Capacitance	C_O	V_O=0V	—	—	10	pF

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