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**OKI Semiconductor**

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**MR533202J****Preliminary**

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**2,097,152-Word X 16-Bit or 4,097,152-Word X 8-Bit MASK ROM**

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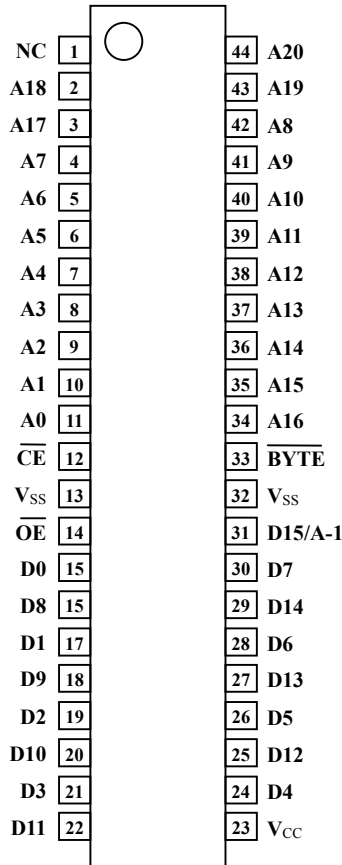
**DESCRIPTION**

The MR533202J is a 32Mbit Read-Only Memory whose configuration can be electrically switched between 2,097,152 word x 16bit and 4,194,304 word x 8bit. The MR533202J operates asynchronously, external clocks are not required, making this device easy-to-use. The MR533202J is suitable as large-capacity fixed memory for microcomputers and data terminals. It is manufactured using a CMOS silicon gate technology and is offered in 44-pin SOP or 44-pin TSOP packages.

**FEATURES**

- 2,097,152 word x 16bit / 4,194,304 word x 8bit electrically switchable configuration
- Single +4.5V~5.5V power supply
- Access time                      100ns
- V<sub>CC</sub> power supply current    65mA
- V<sub>CC</sub> standby current         50μA
- Input / Output TTL compatible
- Three-state output
- Packages
  - 44-pin plastic SOP    (SOP44-P-600-1.27-K)    MR533202J-XXMA
  - 44-pin plastic TSOP   (TSOPII44-P-400-0.80-K) MR533202J-XXTP

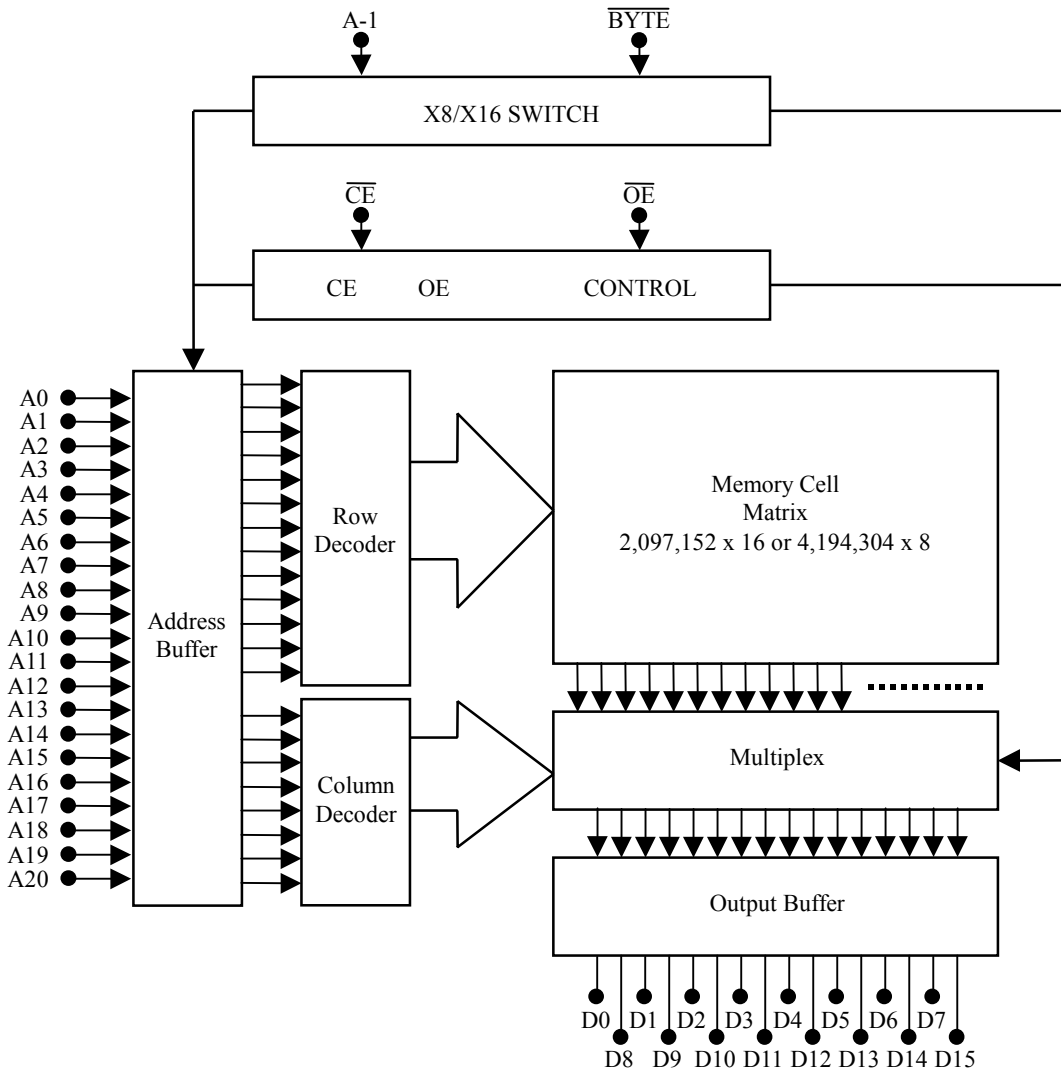
**PIN CONFIGURATION (TOP VIEW)**



**44-Pin SOP  
44-Pin TSOPII**

PIN NAMES	FUNCTIONS
D15/A-1	Data output / Address input
A0~A20	Address input
D0~D14	Data output
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
$\overline{BYTE}$	Mode switch
$V_{CC}$	Power supply voltage
$V_{SS}$	GND
NC	Non connection

**BLOCK DIAGRAM**



**FUNCTION TABLE**

MODE	$\overline{CE}$	$\overline{OE}$	$\overline{BYTE}$	D0~D7	D8~D14	A-1/D15
STAND BY	H	X	X	Hi-Z	Hi-Z	L/H
OUTPUT DISABLE	L	H	H			
OUTPUT DISABLE	L	H	L			
READ(16-BIT)	L	L	H	$D_{OUT}$		
READ(8-BIT)	L	L	L	$D_{OUT}$	Hi-Z	L/H

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Value	Unit
Operating temperature under bias	T <sub>OPR</sub>	-	0 ~ 70	°C
Storage temperature	T <sub>STG</sub>	-	-55 ~ 125	°C
Input voltage	V <sub>I</sub>	Relative to V <sub>SS</sub>	-0.5 ~ V <sub>CC</sub> +0.5	V
Output voltage	V <sub>O</sub>		-0.5 ~ V <sub>CC</sub> +0.5	V
Power supply voltage	V <sub>CC</sub>		-0.5 ~ 7	V
Power dissipation per package	P <sub>D</sub>	-	1.0	W

## RECOMMENDED OPERATING CONDITIONS FOR READ

(Ta=0 ~ 70°C)

Parameter	Symbol	Condition	Min.	Typ.	Min.	Unit
V <sub>CC</sub> power supply voltage	V <sub>CC</sub>	V <sub>CC</sub> =4.5V ~ 5.5V	4.5	5.0	5.5	°C
Input "H" level	V <sub>IH</sub>		2.2	-	V <sub>CC</sub> +0.5	°C
Input "L" level	V <sub>IL</sub>		-0.5	-	0.8	V

Voltage is relative to V<sub>SS</sub>

## PIN Capacitance

(V<sub>CC</sub>=5.0V, Ta=25°C, f=1MHz)

Parameter	Symbol	Condition	Min.	Typ.	Min.	Unit
Input	C <sub>IN</sub>	V <sub>I</sub> =0V	-	-	12	pF
Output	C <sub>OUT</sub>	V <sub>O</sub> =0V	-	-	15	pF

**ELECTRICAL CHARACTERISTICS**

**DC Characteristics**

(V<sub>CC</sub>=4.5V~5.5V, Ta=0~70°C)

Parameter	Symbol	Condition	Min.	Typ.	Min.	Unit
Input leakage current	C <sub>IN</sub>	V <sub>I</sub> =0V~V <sub>CC</sub>	-	-	10	μA
Output leakage current	C <sub>OUT</sub>	V <sub>O</sub> =0V~V <sub>CC</sub>	-	-	10	μA
V <sub>CC</sub> power supply current (Standby)	I <sub>CCSC</sub>	$\overline{CE} = V_{CC}$	-	-	50	μA
	I <sub>CCST</sub>	$\overline{CE} = V_{IH}$	-	-	1	mA
V <sub>CC</sub> power supply current (Active)	I <sub>CCA</sub>	$\overline{CE} = V_{IL}, \overline{OE} = V_{IH}$ tc= 100ns	-	-	65	mA
Input "H" level	V <sub>IH</sub>	-	2.2	-	V <sub>CC</sub> +0.5	V
Input "L" level	V <sub>IL</sub>	-	-0.5	-	0.8	V
Output "H" level	V <sub>OH</sub>	I <sub>OH</sub> =-400 μA	2.4	-	-	V
Output "L" level	V <sub>OL</sub>	I <sub>OL</sub> =2.1mA	-	-	0.4	V

Voltage is relative to V<sub>SS</sub>

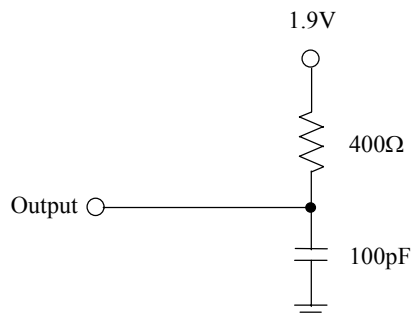
**AC Characteristics**

(V<sub>CC</sub>=4.5V~5.5V, Ta=0~70°C)

Parameter	Symbol	Condition	Min.	Min.	Unit
Address access cycle time	T <sub>C</sub>	-	100	-	ns
Address access time	T <sub>ACC</sub>	$\overline{CE} = \overline{OE} = V_{IL}$	-	100	ns
$\overline{CE}$ access time	T <sub>CE</sub>	$\overline{OE} = V_{IL}$	-	100	ns
$\overline{OE}$ access time	T <sub>OE</sub>	$\overline{CE} = V_{IL}$	-	50	ns
Output disable time	T <sub>CHZ</sub>	$\overline{OE} = V_{IL}$	0	40	ns
	T <sub>OHZ</sub>	$\overline{CE} = V_{IL}$	0	30	ns
Output hold time	T <sub>OH</sub>	$\overline{CE} = \overline{OE} = V_{IL}$	0	-	ns

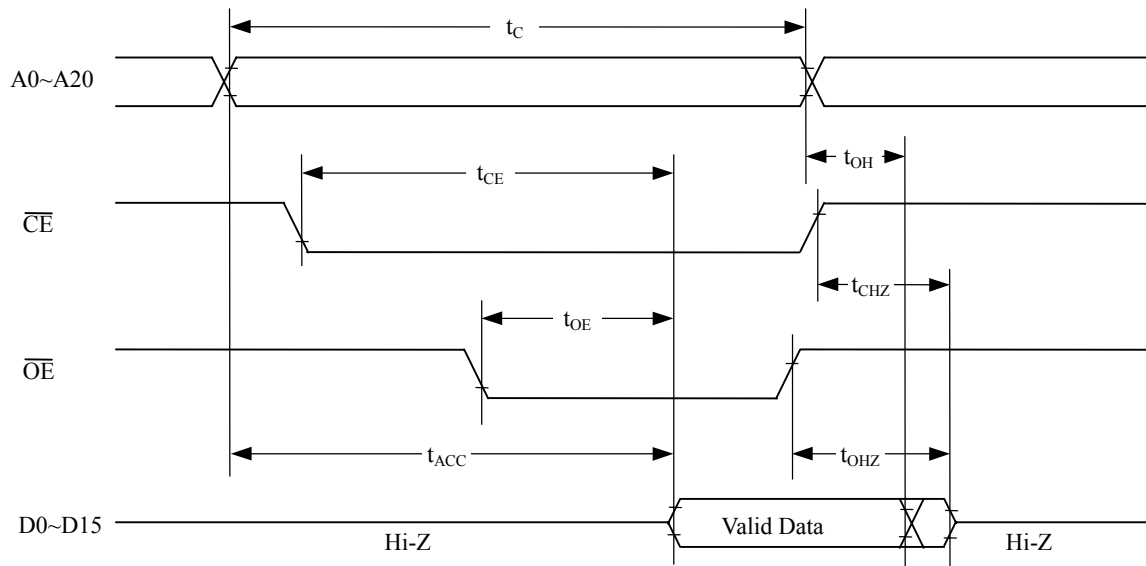
Measurement condition

- Input signal level                    0V/3V
- Input timing reference level        0.8V/2.0V
- Output load                            100pF
- Output timing reference level       0.8V/2.0V

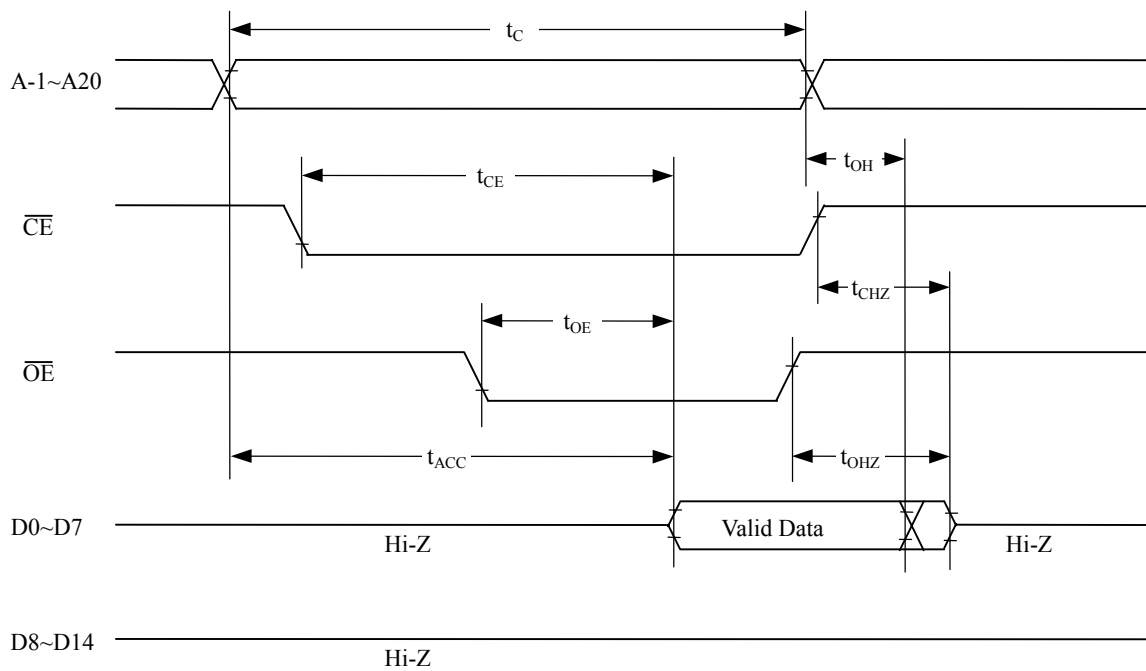


TIMING CHART

16BIT READ MODE ( $\overline{\text{BYTE}}=\text{H}$ )



8BIT READ MODE ( $\overline{\text{BYTE}}=\text{L}$ )



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