

OKI Semiconductor

MSM538031E

1,048,576-Word x 8-Bit MASKROM

DESCRIPTION

The OKI MSM538031E is a high-speed silicon gate CMOS Mask ROM with 1,048,576-word x 8-bit capacity. The MSM538031E operates on a single 3.0V or 3.3V power supply but offers the same fast access times as products that operate at 5.0V. The MSM538031E's byte-wide data path and pin compatibility with UV erasable EPROMs make it suited for use as large capacity fixed memory for portable microcomputers and data terminals.

FEATURES

- Single 3.0V or 3.3V power supply

- 1,048,576 word x 8 bit

- Access time—current consumption

 - 150ns—20mA (When power supply is 3.0V±0.3V)

 - 120ns—25mA (When power supply is 3.3V±0.3V)

- Tri-state output configurations

- Internal powerdown function

- Package:

 - 32-PIN PLASTIC DIP (DIP32-P-600-2.54) (MSM538001E-XXRS)

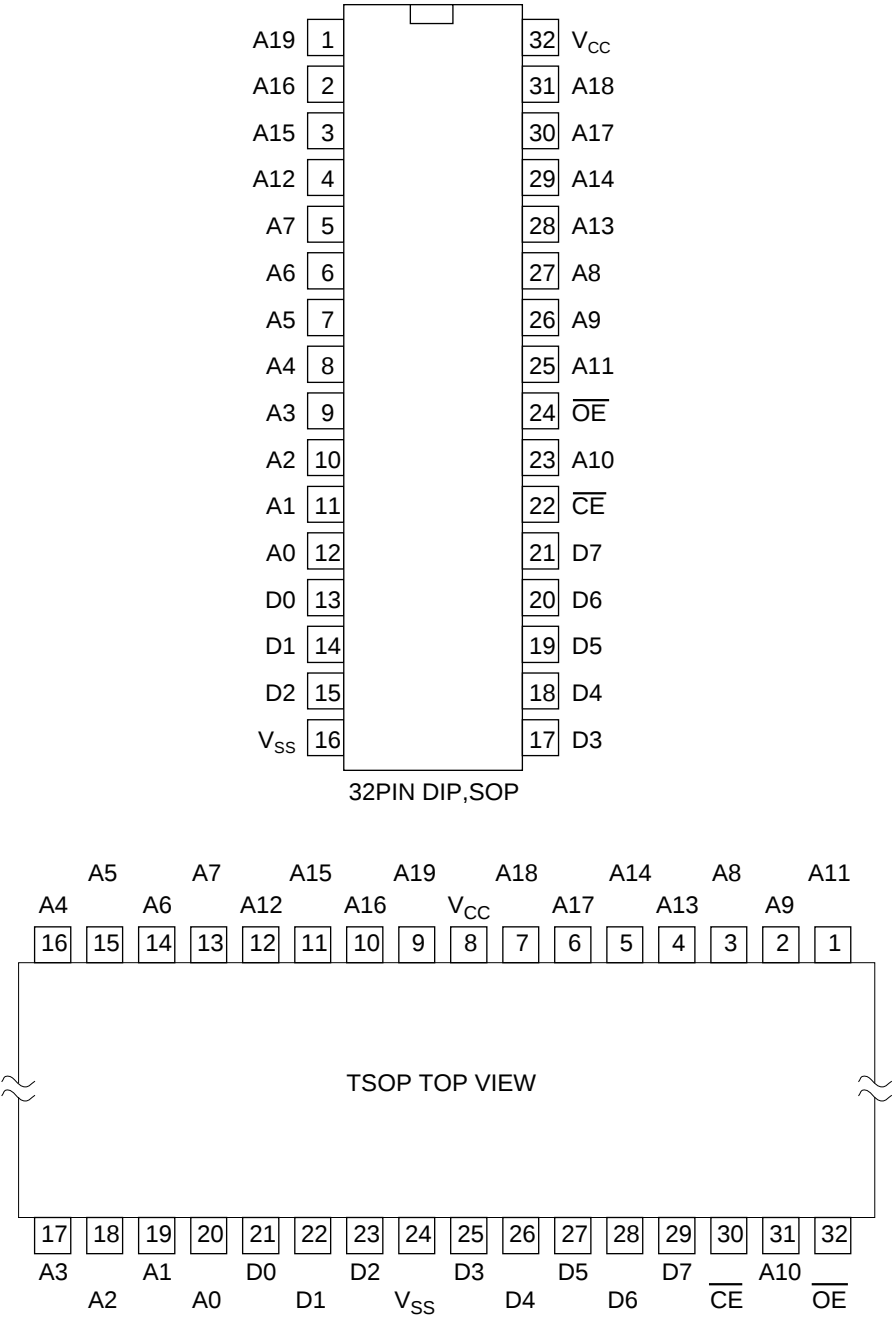
 - 32-PIN PLASTIC SOP (SOP32-P-525-1.27-K) (MSM538001E-XXGS-K)

 - 32-PIN PLASTIC TSOP (TSOP32-P-814-0.50-1K) (MSM538001E-XXTS-K)

- 8MEPROM (32-PIN) pin compatible

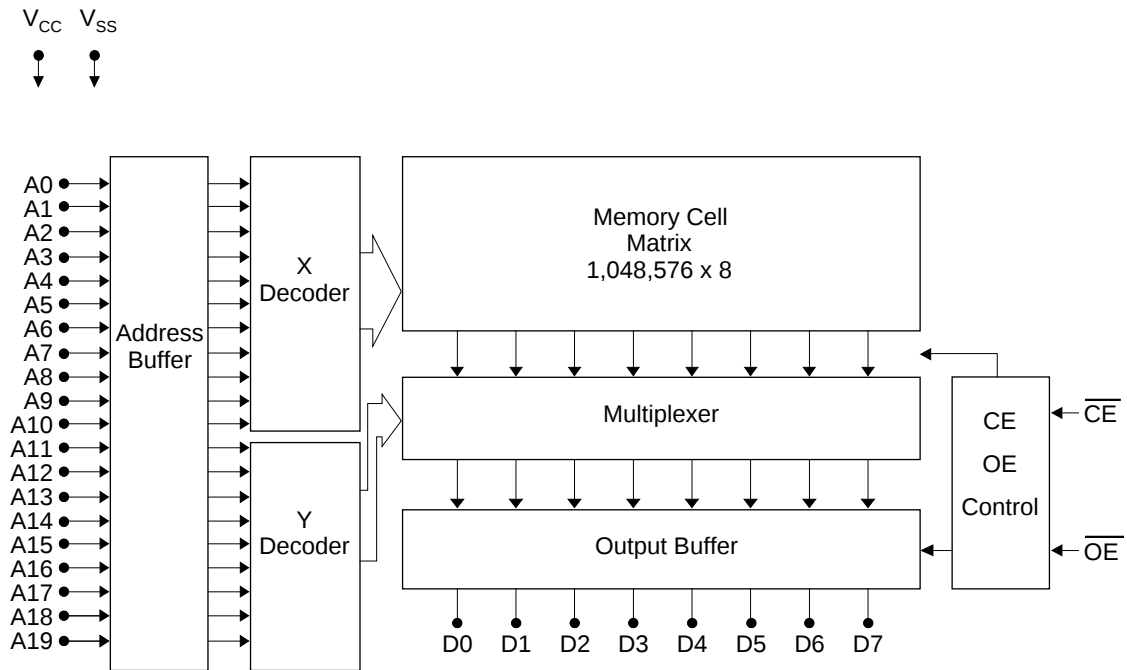
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PIN CONFIGURATION



Pin Name	Function
A0 to A19	Address input
D0 to D7	Data output
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
V_{CC}, V_{SS}	Power supply

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Rating	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 $T_{opr} = 25^\circ\text{C}$	1.0	W
Operating Temperature	T_{opr}		0 to 70	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to 150	$^\circ\text{C}$

Recommended Operating Conditions ($V_{CC}=3.0\text{V}$)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	—	2.7	3.0	3.3	V
	V_{SS}	—	0.0	0.0	0.0	V
"H" Input Voltage	V_{IH}	—	2.0	3.0	6.0	V
"L" Input Voltage	V_{IL}	—	-0.3	0.0	0.6	V
Operating Temperature	T_{opr}	—	0	—	70	$^\circ\text{C}$

Recommended Operating Conditions ($V_{CC}=3.3\text{V}$)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	—	3.0	3.3	3.6	V
	V_{SS}	—	0.0	0.0	0.0	V
"H" Input Voltage	V_{IH}	—	2.0	3.3	6.0	V
"L" Input Voltage	V_{IL}	—	-0.3	0.0	0.6	V
Operating Temperature	T_{opr}	—	0	—	70	$^\circ\text{C}$

DC CHARACTERISTICS ($V_{CC}=3.0V\pm0.3V$)

(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	V_{OH1}	$I_{OH} = -100\mu A$	$V_{CC} - 0.1$	—	—	V
	V_{OH2}	$I_{OH} = -1.0mA$	$V_{CC} - 0.4$	—	—	V
"L" Output Voltage	V_{OL1}	$I_{OL} = 100\mu A$	—	—	0.1	V
	V_{OL2}	$I_{OI} = 1.0mA$	—	—	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} $\overline{CE} = V_{IH\ MIN}$	-10	—	10	μA
Power Supply Current (Operating)	I_{CC}	$\overline{CE} = V_{IL}, \overline{OE} = V_{IH}, t_C = 150ns$	—	—	20	mA
Power Supply Current (Standby)	I_{CCS}^C	$\overline{CE} = V_{CC} - 0.2V$	—	—	10	μA
	I_{CCS}^T	$\overline{CE} = V_{IH\ MIN}$	—	—	50	μA

DC CHARACTERISTICS ($V_{CC}=3.3V\pm0.3V$)

(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	V_{OH1}	$I_{OH} = -100\mu A$	$V_{CC} - 0.1$	—	—	V
	V_{OH2}	$I_{OH} = -1.0mA$	$V_{CC} - 0.4$	—	—	V
"L" Output Voltage	V_{OL1}	$I_{OL} = 100\mu A$	—	—	0.1	V
	V_{OL2}	$I_{OI} = 1.0mA$	—	—	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} $\overline{CE} = V_{IH\ MIN}$	-10	—	10	μA
Power Supply Current (Operating)	I_{CC}	$\overline{CE} = V_{IL}, \overline{OE} = V_{IH}, t_C = 150ns$	—	—	25	mA
Power Supply Current (Standby)	I_{CCS}^C	$\overline{CE} = V_{CC} - 0.2V$	—	—	10	μA
	I_{CCS}^T	$\overline{CE} = V_{IH\ MIN}$	—	—	50	μA

AC CHARACTERISTICS

Timing conditions

Parameter	Conditions
Input Signal Level	$V_{IH}=2.7V$, $V_{IL}=0.0V$
Transition Time	$t_r=t_f=5ns$
Timing Reference Level	Input Voltage=1.5V Output Voltage=0.8V&2.0V
Load Condition	CL=50pF

Read Cycle ($V_{CC}=3.0V\pm0.3V$)

(Ta = 0 to 70°C)

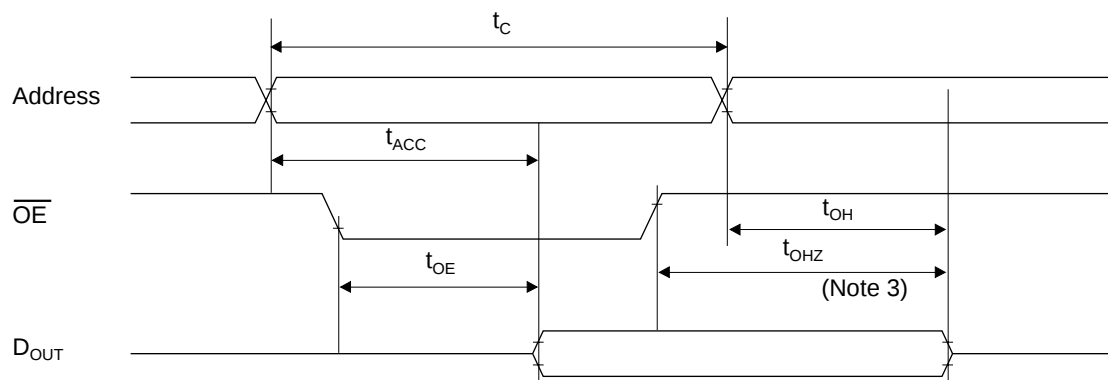
Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	150	—	—	ns
Address Access time	t_{ACC}	—	—	—	150	ns
$\overline{CE}$ Access time	t_{CE}	—	—	—	150	ns
$\overline{OE}$ Access time	t_{OE}	—	—	—	80	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	70	ns
$\overline{OE}$ Output Disable time	t_{OHZ}	—	0	—	60	ns
Output Hold time	t_{OH}	—	0	—	—	ns

Read Cycle ($V_{CC}=3.0V\pm0.3V$)

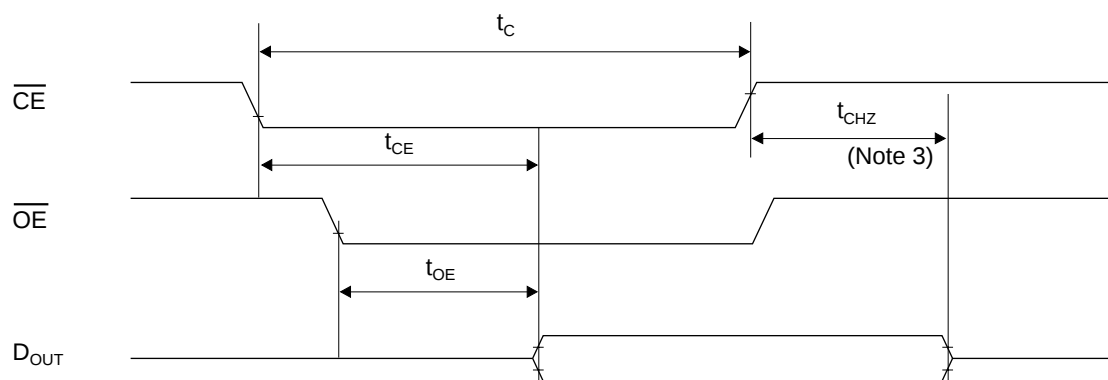
(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Rated Value			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}	—	—	—	70	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	60	ns
$\overline{OE}$ Output Disable time	t_{OHZ}	—	0	—	50	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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People To People Technology

ADDRESSES & SEMICONDUCTOR WEB SITES

OKI Electric Industry Co., Ltd.,

Device Business Group,
10-3, Shibaura, 4-chome,
Minato-ku, Tokyo 108, Japan,
Tel.: +81-(0)3-5445-6327,
Fax.: +81-(0)3-5445-6328,
<http://www.oki.co.jp/semi/>

OKI Semiconductor Group,

785 North Mary Avenue,
Sunnyvale, CA 94086, U.S.A.,
Tel.: +1-408-720-1900,
Fax.: +1-408-720-1918,
<http://www.okisemi.com/>

OKI Electric Europe GmbH,

Head Office Europe,
Hellersbergstrasse 2,
D-41460 Neuss, Germany,
Tel: +49-2131-15960,
Fax: +49-2131-103539,
<http://www.oki-europe.de/>

OKI Electronics (Hong Kong) Ltd.,

Suite 1901-1&19, Tower 3,
China Hong Kong City,
33 Canton Road, Tsimshatsui,
Kowloon, Hong Kong,
Tel.: +852-2-736-2336,
Fax.: +852-2-736-2395

OKI Semiconductor (Asia) Pte. Ltd.,

78 Shenton Way 09-01,
Singapore 0207,
Tel.: +65-221-3722,
Fax.: +65-323-5376

OKI Semiconductor (Asia) Pte. Ltd.,

Taipei Branch,
7th Fl. No.260, Tun Hwa North Road,
Taipei, Taiwan, R.O.C.,
Sumitomo-Flysun Building,
Tel.: +886-2-2719-2561,
Fax.: +886-2-2715-2892
<http://www.oki.net.tw/>

For further information, please contact: