

OKI Semiconductor

MSM534031E

524,288-Word x 8-Bit MASKROM

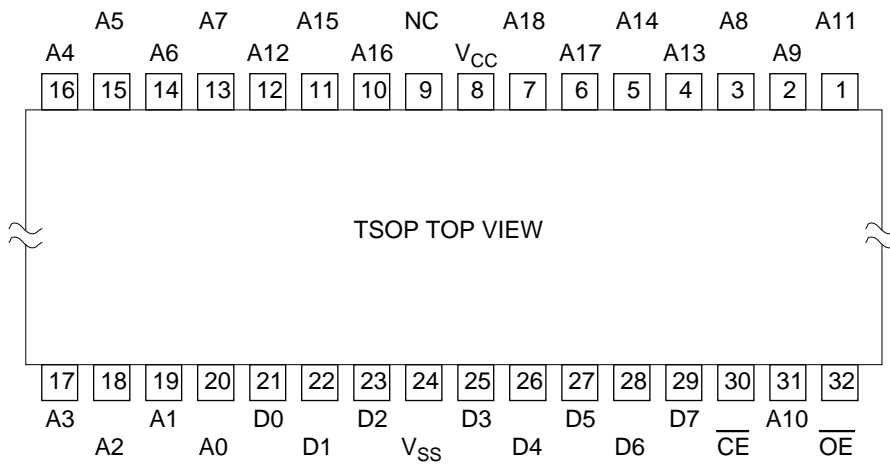
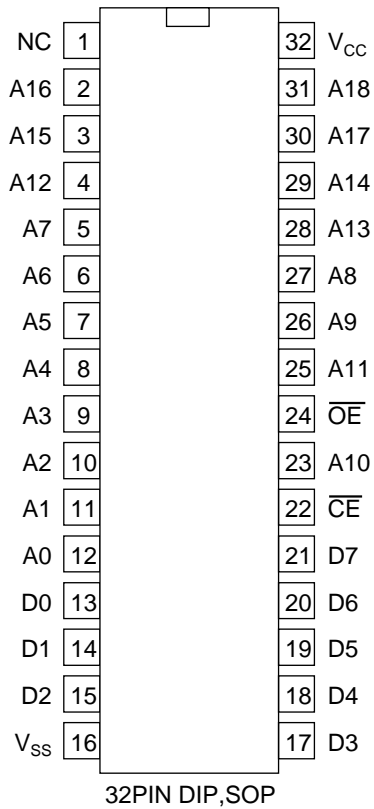
DESCRIPTION

The OKI MSM534031E is a high-speed silicon gate CMOS Mask ROM with 524,288-word x 8-bit capacity. The MSM534031E 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 MSM534031E's 8-bit 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

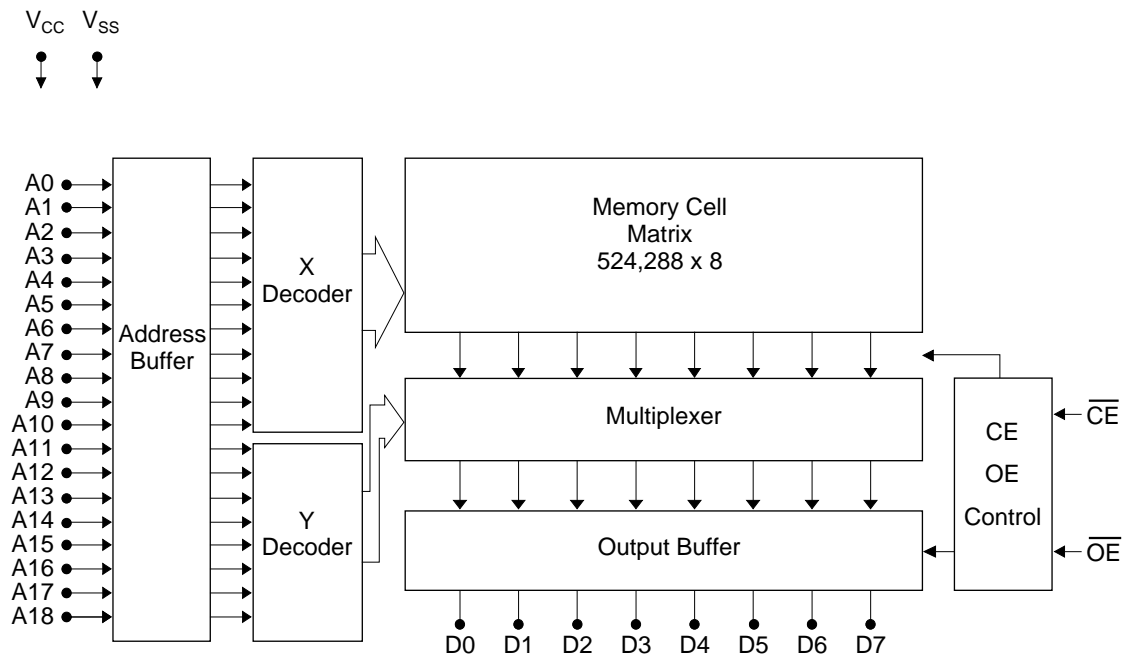
- Single 3.0V or 3.3V power supply
- 524,288-words x 8-bit
- Access time—current consumption
 - 150ns—15mA (3.0V±0.3V operation)
 - 120ns—20mA (3.3V±0.3V operation)
- Tri-State output TTL compatible
- Internal powerdown function
- Packages:
 - 32-PIN PLASTIC DIP (DIP32-P-600-2.54)
 - 32-PIN PLASTIC SOP (SOP32-P-525-1.27-K)
 - 32-PIN PLASTIC TSOP (TSOP32-P-814-0.80-K)
- 4MEPROM (32-PIN) pin compatible

BLOCK DIAGRAM



Pin Name	Function
A0 to A18	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 ($V_{CC}=3.0V\pm 0.3V$)

(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}	$V_I = 0 \text{ to } V_{CC}$	-10	—	10	μA
Output Leakage Current	I_{LO}	$V_O = 0 \text{ to } V_{CC}$ $CE = V_{IH \text{ MIN}}$	-10	—	10	μA
Power Supply Current (Operating)	I_{CC}	$\overline{CE} = V_{IL}, \overline{OE} = V_{IH}, t_C = 150ns$	—	—	15	mA
Power Supply Current (Standby)	$I_{CCS C}$	$\overline{CE} = V_{CC} - 0.2V$	—	—	10	μA
	$I_{CCS T}$	$\overline{CE} = V_{IH \text{ MIN}}$	—	—	50	μA

I DC CHARACTERISTICS ($V_{CC}=3.3V\pm 0.3V$)

(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}	$V_I = 0 \text{ to } V_{CC}$	-10	—	10	μA
Output Leakage Current	I_{LO}	$V_O = 0 \text{ to } V_{CC}$ $CE = V_{IH \text{ MIN}}$	-10	—	10	μA
Power Supply Current (Operating)	I_{CC}	$CE = V_{IL}, OE = V_{IH}, t_C = 120ns$	—	—	20	mA
Power Supply Current (Standby)	$I_{CCS C}$	$CE = V_{CC} - 0.2V$	—	—	10	μA
	$I_{CCS T}$	$CE = V_{IH \text{ MIN}}$	—	—	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 ($V_{CC}=3.0V\pm 0.3V$)

(Ta = 0 to 70°C)

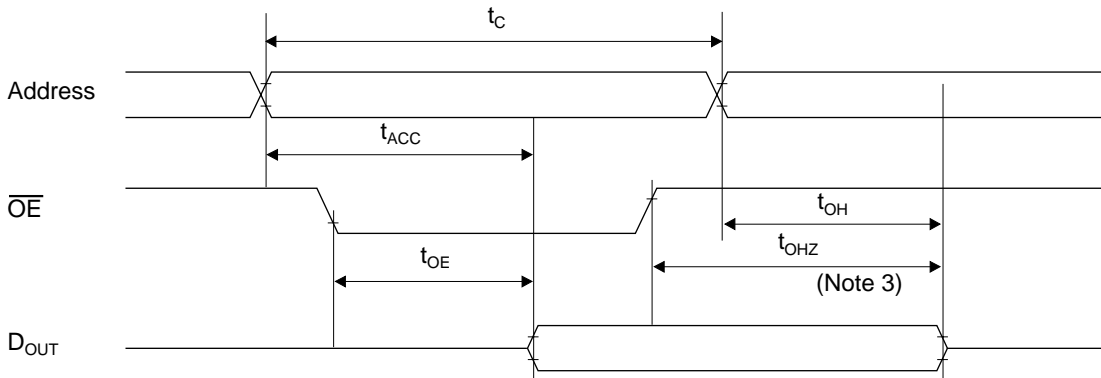
Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	150	—	—	ns
Address Access time	t_{ACC}	—	—	—	150	ns
\overline{CE} Access time	t_{CE}	—	—	—	150	ns
\overline{OE} Access time	t_{OE}	—	—	—	80	ns
\overline{CE} Output Disable time	t_{CHZ}	—	0	—	70	ns
\overline{OE} Output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

Read Cycle ($V_{CC}=3.3V\pm 0.3V$)

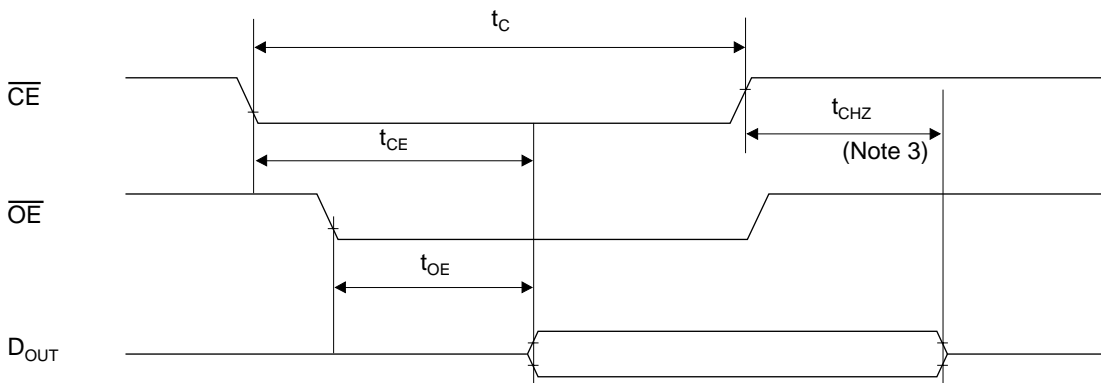
(Ta = 0 to 70°C)

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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