OKI Semiconductor

MSM534031E

524,288-Word x 8-Bit MASKROM

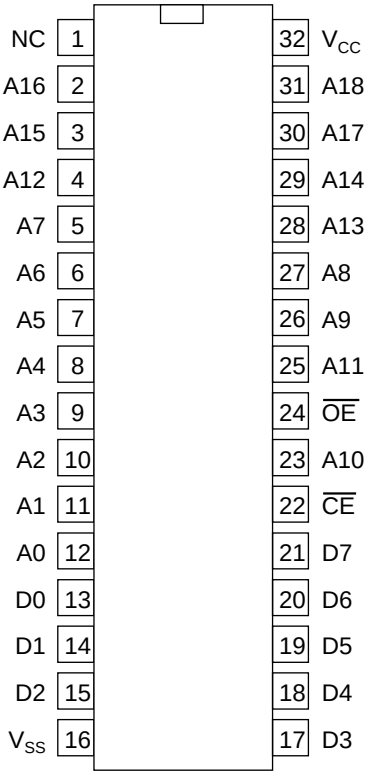
DESCRIPTION

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.

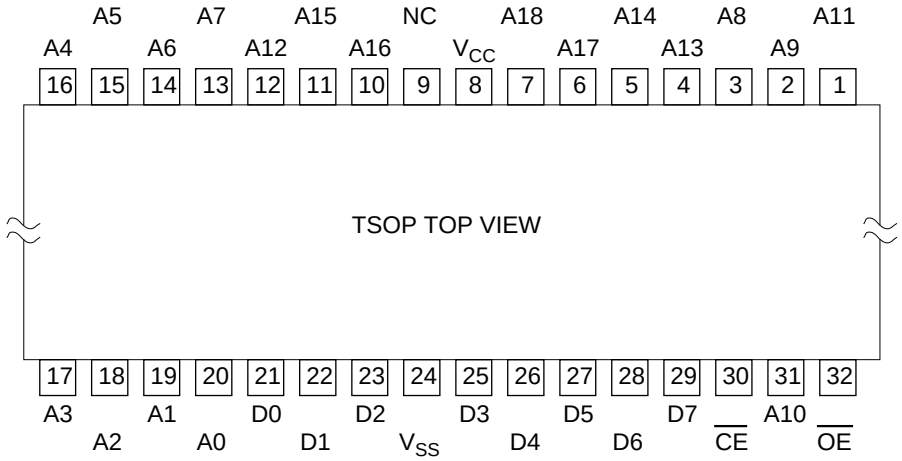
FEATURES

- 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

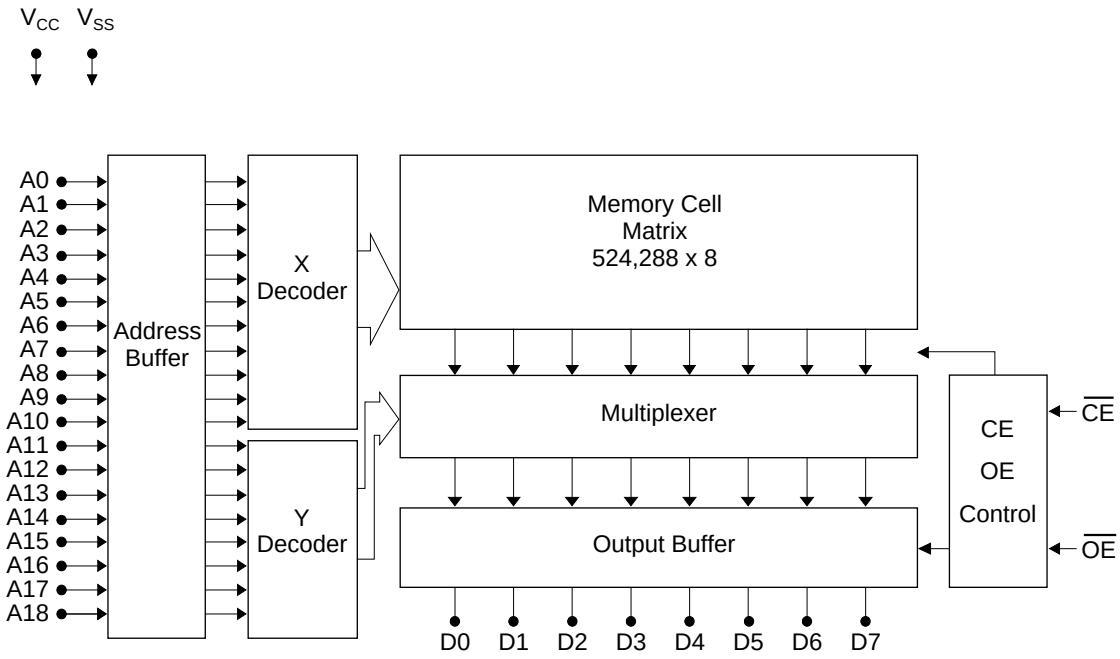


32PIN DIP,SOP



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°C	1.0	W
Operating Temperature	T_{opr}		0 to 70	°C
Storage Temperature	T_{stg}		–55 to 150	°C

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

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	°C

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

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	°C

DC CHARACTERISTICS (V_{CC}=3.0V±0.3V)

(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	$V_{OH}1$	I_{OH} = –100µA	V_{CC} – 0.1	—	—	V
	$V_{OH}2$	I_{OH} = –1.0mA	V_{CC} – 0.4	—	—	V
"L" Output Voltage	$V_{OL}1$	I_{OL} = 100µA	—	—	0.1	V
	$V_{OL}2$	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} CE = $V_{IH\ MIN}$	–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_{CCSC}	$\overline{CE}$ = V_{CC}–0.2V	—	—	10	µA
	I_{CCST}	$\overline{CE}$ = $V_{IH\ MIN}$	—	—	50	µA

I DC CHARACTERISTICS (V_{CC}=3.3V±0.3V)

(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	$V_{OH}1$	I_{OH} = –100uA	V_{CC} – 0.1	—	—	V
	$V_{OH}2$	I_{OH} = –1.0mA	V_{CC} – 0.4	—	—	V
"L" Output Voltage	$V_{OL}1$	I_{OL} = 100uA	—	—	0.1	V
	$V_{OL}2$	I_{OI} = 1.0mA	—	—	0.4	V
Input Leakage Current	I_{LI}	V_I = 0 to V_{CC}	–10	—	10	uA
Output Leakage Current	I_{LO}	V_O = 0 to V_{CC} CE = $V_{IH\ MIN}$	–10	—	10	uA
Power Supply Current (Operating)	I_{CC}	CE = V_{IL}, OE = V_{IH}, t_C = 120 ns	—	—	20	mA
Power Supply Current (Standby)	I_{CCSC}	CE = V_{CC}–0.2V	—	—	10	uA
	I_{CCST}	CE = $V_{IH\ MIN}$	—	—	50	uA

AC CHARACTERISTICS

Timing conditions

Parameter	Conditions
Input Signal Level	V_{IH}=2.7V, V_{IL}=0.0V
Transtion 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±0.3V)

(Ta = 0 to 70°C)

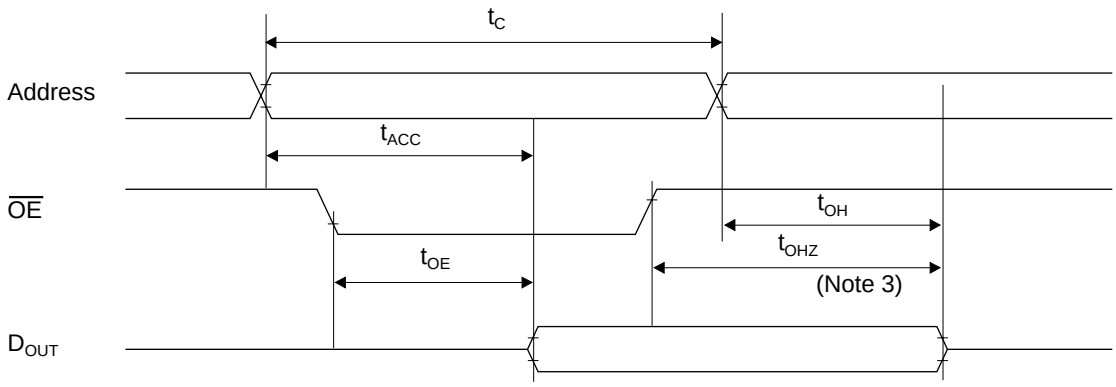
Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	150	—	—	ns
Address Access time	t_{ACC}	—	—	—	150	ns
$\overline{CE}$ Access time	t_{CE}	—	—	—	150	ns
$\overline{OE}$ Access time	t_{OE}	—	—	—	80	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	70	ns
$\overline{OE}$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

Read Cycle (V_{CC}=3.3V±0.3V)

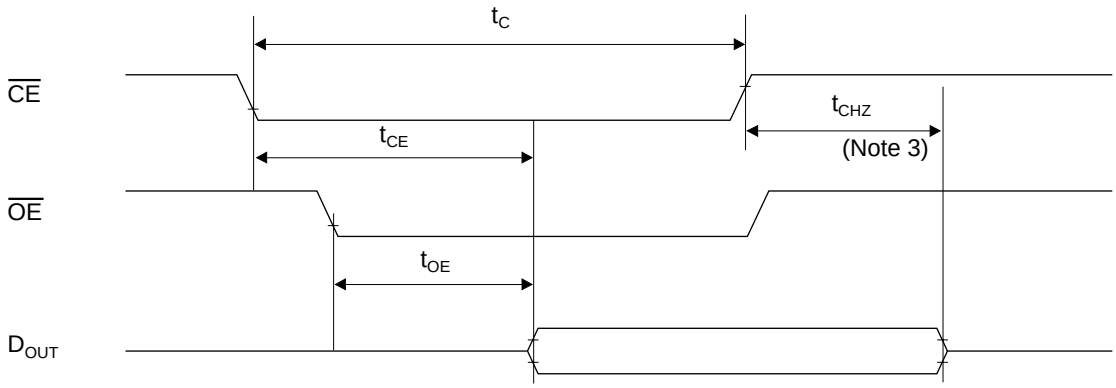
(Ta = 0 to 70°C)

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

NOTICE

The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.

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