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 accress times as products that operate at 5.0V. The MSM538031E's bytewide 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.

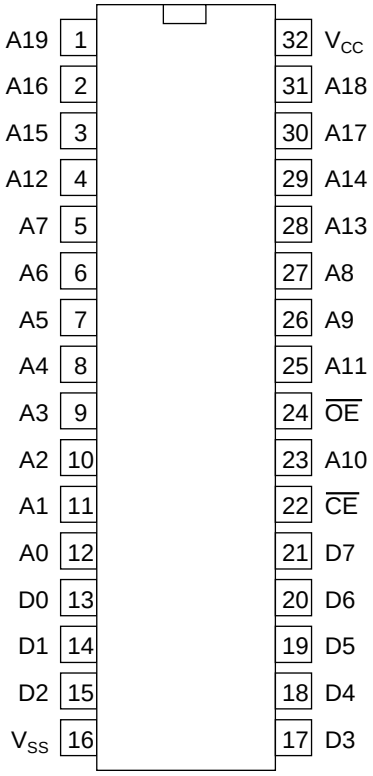
FEATURES

Single 3.0V or 3.3Vpower supply
1,048,576 word x 8 bit
Accress 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:

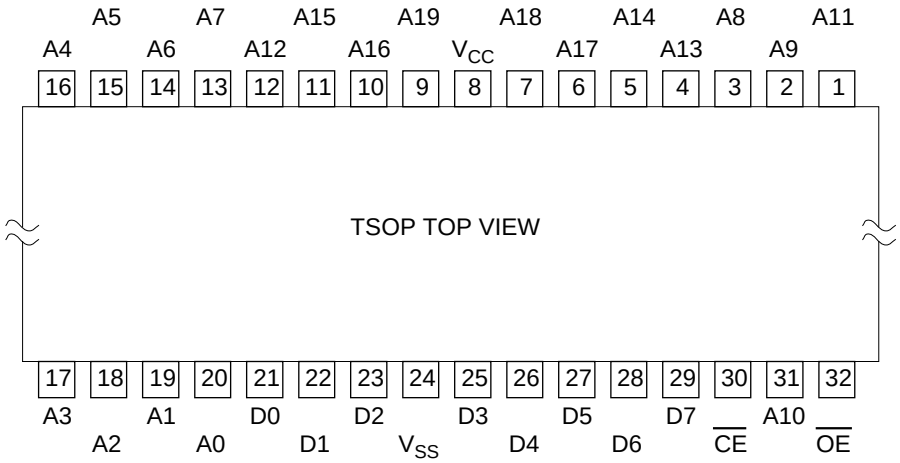
32-PIN PLASTIC DIP	(DIP32-P-600-2.54)	(MSM538001E-XXRS)
32-PIN PLASTIC SOP	(SOP32-P-525-1.27-K)	(MSM538001E-XXGS-K)
32-PIN PLASTIC TSOP	(TSOP32-P-814-0.50-1K)	(MSM538001E-XXTS-K)

8MEPROM (32-PIN) pin compatible

PIN CONFIGURATION

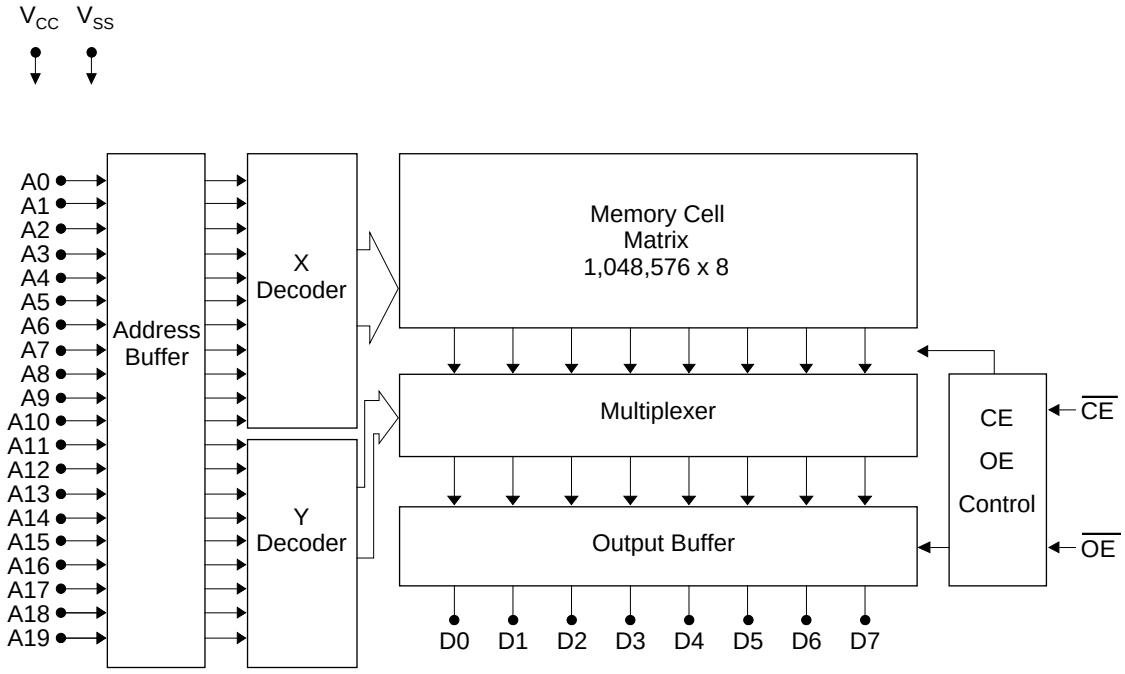


32PIN DIP,SOP



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°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}	CE = V_{IL}, OE = V_{IH}, t_C = 150ns	—	—	20	mA
Power Supply Current (Standby)	$I_{CCS}C$	CE = V_{CC}–0.2V	—	—	10	µA
	$I_{CCS}T$	CE = $V_{IH\ MIN}$	—	—	50	µA

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} = –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} $\overline{CE}$ = $V_{IH\ MIN}$	–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
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)

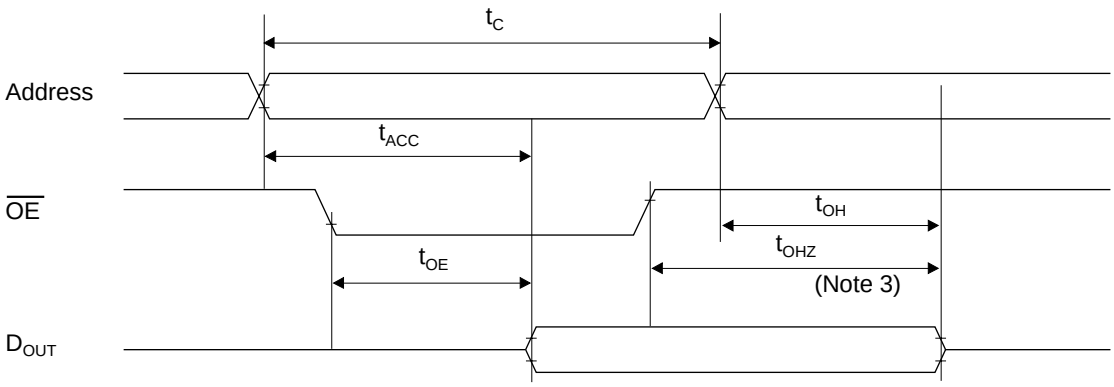
Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	150	—	—	ns
Address Access time	t_{ACC}	—	—	—	150	ns
$\overline{CE}$ Access time	t_{CE}	—	—	—	150	ns
$\overline{OE}$ Access time	t_{OE}	—	—	—	80	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	70	ns
$\overline{OE}$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

Read Cycle (V_{CC}=3.0V±0.3V)

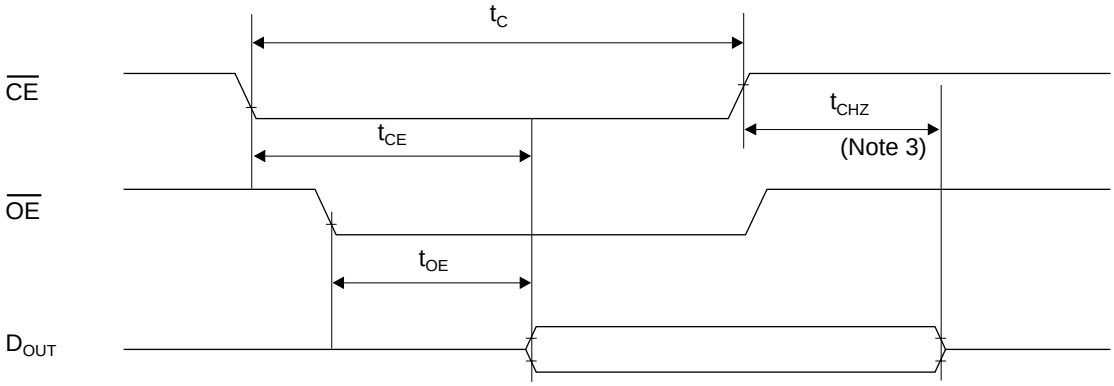
(Ta = 0 to 70°C)

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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