OKI Semiconductor

MSM534031E

524,288-Word x 8-Bit MASKROM

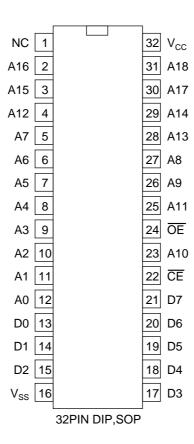
DESCRIPTION

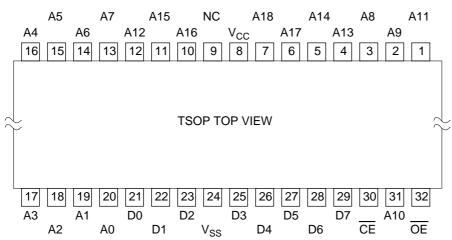
The OKI MSM534031E is a high-speed silicon gate CMOS Mask ROM with 524,288-word x 8-bit capacity. The MSM534031E operates on a single 3.0V or 3.3V power supply but offers the same fast access times as products that operate at 5.0V. The MSM534031E's 8-bit wide data path and pin compatibility with UV erasable 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



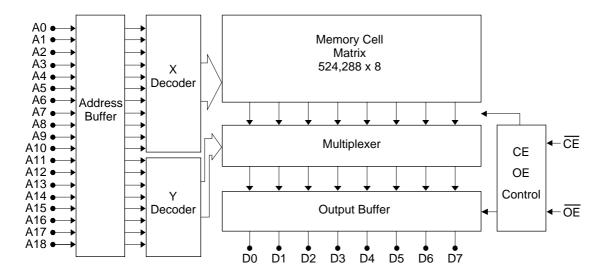


Pin Name	Function
A0 to A18	Address input
D0 to D7	Data output
CE	Chip enable
ŌĒ	Output enable
V_{CC} , V_{SS}	Power supply

BLOCK DIAGRAM

 $V_{CC}\ V_{SS}$

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ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Rating	Unit
Power Supply Voltage	V _{cc}		–0.3 to 7	V
Input Voltage	V _I	to V _{SS}	-0.3 to V _{CC} + 0.5	V
Output Voltage	Vo		-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	0	0	F			
	Symbol Conditions	Min.	Тур.	Max.	Unit	
Dawas Ownah Waltana	V _{cc}	_	2.7	3.0	3.3	V
Power Supply Voltage	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 $_{\mbox{CC}}$ =3.3V)

Parameter	Conditions	F	I Imit			
	Symbol Conditions		Min.	Тур.	Max.	Unit
Dawer Cumhi Valtage	V _{CC}	_	3.0	3.3	3.6	V
Power Supply Voltage	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} =3.0 V_{\pm} 0.3V)

(Ta = 0 to 70°C)

Danamatan	0	0 1111	R	11		
	Symbol	Symbol Conditions		Тур.	Max.	Unit
O. d d \ / -	V _{OH} 1	$I_{OH} = -100 \mu A$	V _{CC} - 0.1	_	_	V
"H" Output voltage	V _{OH} ²	$I_{OH} = -1.0 \text{mA}$	V _{CC} - 0.4	_	_	V
	V _{OL} 1	$I_{OL} = 100 \mu A$	_	_	0.1	V
"L" Output Voltage	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}	$\overline{CE} = V_{IL,} \overline{OE} = V_{IH,} t_C = 150 \text{ns}$	_	_	15	mA
Power Supply Current	I _{CCS} C	$\overline{\text{CE}} = V_{\text{CC}} - 0.2V$	_	_	10	μA
(Standby)	I_{CCS}^T	$\overline{CE} = V_{IHMIN}$	_	_	50	μA

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

 $(Ta = 0 \text{ to } 70^{\circ}C)$

Parameter	Symbol	Conditions	R	Unit		
"H" Output Voltage	Symbol	Conditions	Min.	Тур.	Max.	Offic
"L" Output Voltage	V _{OH} 1	$I_{OH} = -100uA$	V _{CC} - 0.1	_	_	V
n Output voltage	V _{OH} ²	$I_{OH} = -1.0 \text{mA}$	$V_{CC} - 0.4$	_	_	V
"I " Output Voltage	V _{OL} 1	$I_{OL} = 100uA$	_	_	0.1	V
"L" Output Voltage	V _{OL} 2	I _{OI} = 1.0mA	_	_	0.4	V
Input Leakage Current	ILI	$V_I = 0$ 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	I _{CCS} C	$CE = V_{CC} - 0.2V$	_	_	10	uA
(Standby)	I _{CCS} T	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)

 $(Ta = 0 \text{ to } 70^{\circ}C)$

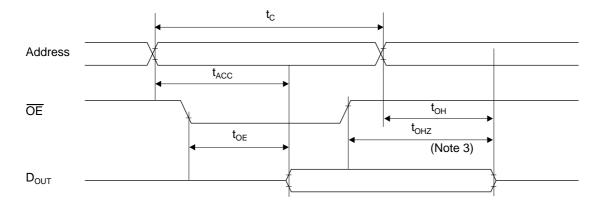
Demonstra	Cumbal	0 1:::	R			
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Cycle time	t _C	_	150	_	_	ns
Address Access time	t _{ACC}	_	_	_	150	ns
CE Access time	t _{CE}	_			150	ns
OE Access time	t _{OE}	_	_	_	80	ns
CE Output Disable time	t _{CHZ}	_	0		70	ns
OE Output Disable time	t _{OHZ}	_	0		60	ns
Output Hold time	t _{OH}	_	0	_	_	ns

Read Cycle (V_{CC} =3.3V±0.3V)

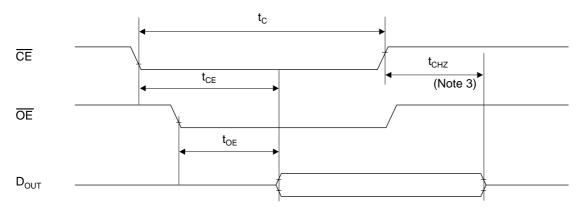
 $(Ta = 0 \text{ to } 70^{\circ}C)$

Danamatan	Cumbal	Conditions	R	1		
Parameter	Symbol		Min.	Тур.	Max.	Unit
Cycle time	t _C	_	120	_	_	ns
Address Access time	t _{ACC}	_	_	_	120	ns
CE Access time	t _{CE}	_	_	_	120	ns
OE Access time	t _{OE}	_	_	_	70	ns
CE Output Disable time	t _{CHZ}	_	0	_	60	ns
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)

- CE is low level.
 Address is fixed before or at the same time when CE level falls.
 t_{CHZ} & t_{OHZ} indicate the time until floating. They are not determined by the output level.

I/O CAPACITANCE

Danasatan	0	O - m disting -	F			
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Input Capacitance	Cı	V _I =0V	_	_	8	pF
Output Capacitance	Co	V _O =0V	_		10	pF



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