OKI Semiconductor

MSM534032E

262,144-Word x 16-Bit or 524,288-Word x 8-Bit MASKROM

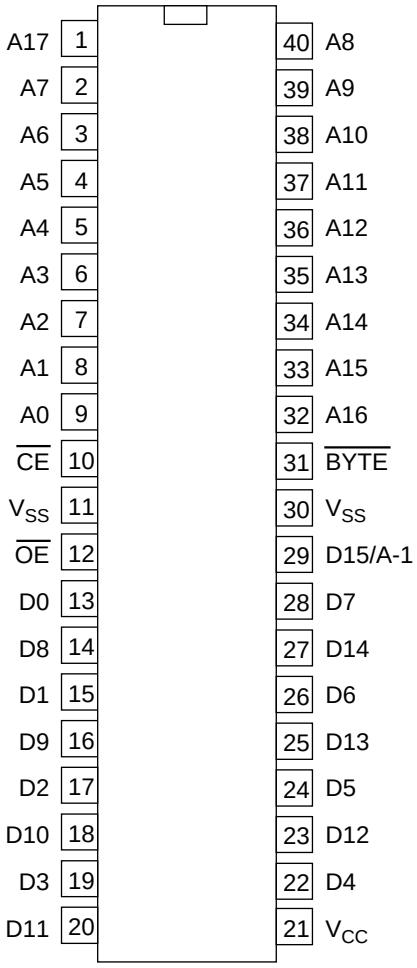
DESCRIPTION

The OKI MSM534032E is a high-speed CMOS Mask ROM that can electrically switch between 262,144-word x 16-bit and 524,288-word x 8-bit configurations. The MSM534032E operates on a single 3.0V or 3.3V power supply but offers the same fast access times as products operating at 5.0V. The MSM534032E's applied byte system and pin compatibility with UV erasable EPROMs make it ideally suited as large capacity read-only memory for portable microcomputers and data terminal equipment. Optional products with 2.7V~5.5V operating parameters are also available.

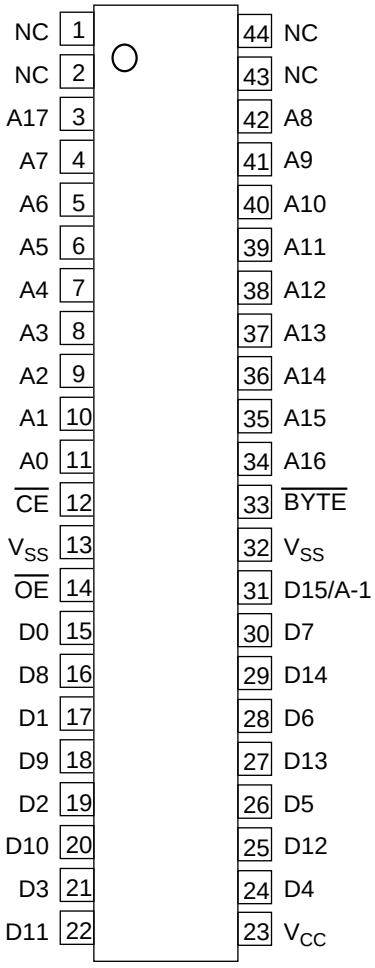
FEATURES

- 3.0V or 3.3V single power supply
- 262,144-words x 16-bit/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 configurations
- Internal powerdown function
- Packages:
  - 40-PIN PLASTIC DIP (DIP40-P-600-2.54)
  - 40-PIN PLASTIC SOP (SOP40-P-525-1.27-K)
  - 44-PIN PLASTIC TSOP (TSOPII44-P-400-0.80-K)
- 4MEPROM (40-PIN) pin compatible

PIN CONFIGURATION



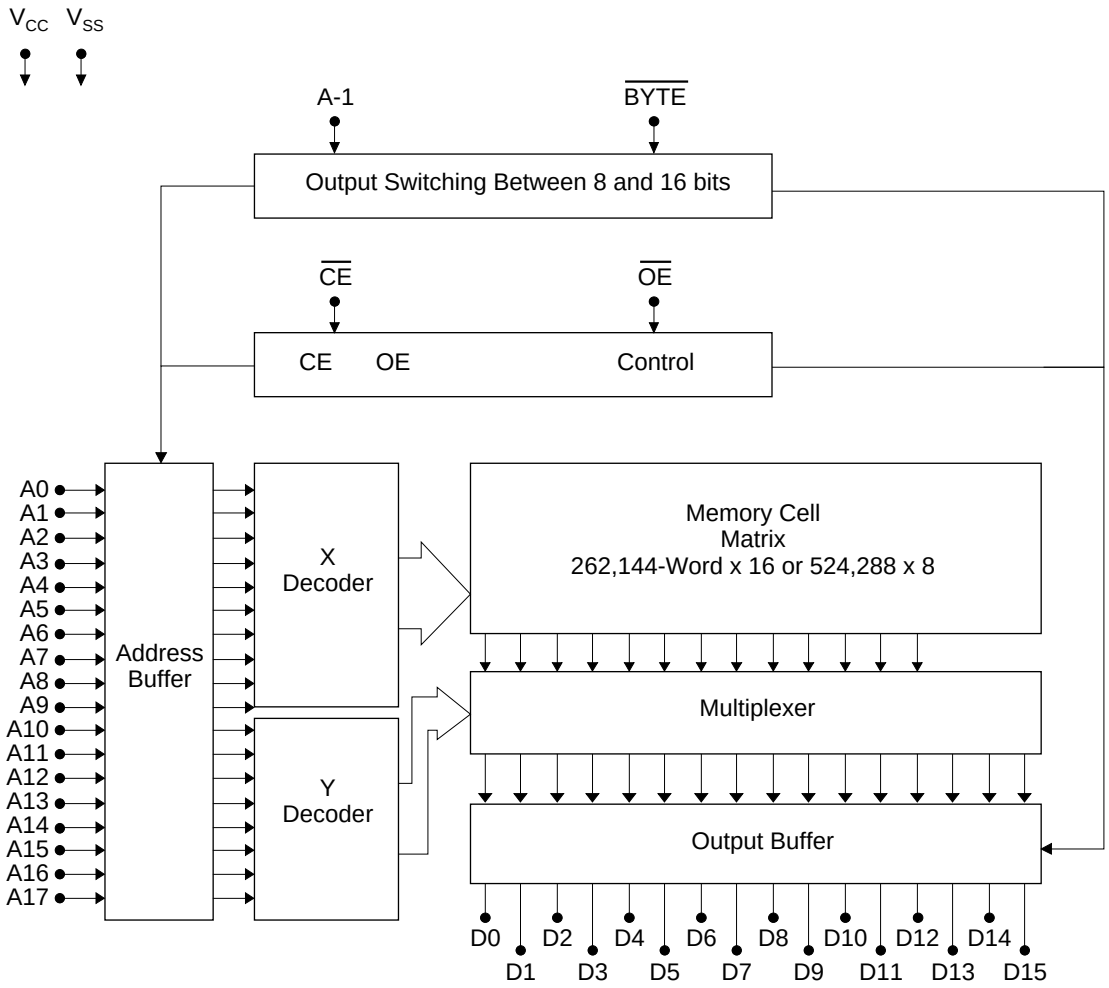
40PINDIP/SOP



44PINTSOP

Pin Name	Function
D15/A-1	Data output / address input
A0 to A17	Address input
D0 to D15	Data output
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
$\overline{BYTE}$	Mode switch
V_{CC}, V_{SS}	Power supply

BLOCK DIAGRAM



FUNCTION TABLE

$\overline{CE}$	$\overline{OE}$	$\overline{BYTE}$	A-1/D15	D0 to D7	D8 to D15	D_{OUT} Mode	LSB	MSB
H	X	X	X	Hi-Z	Hi-Z	Hi-Z	—	—
L	H	X	X	Hi-Z	Hi-Z			
L	L	H	Input Inhibited (D15)	D0 to D7	D8 to D15	16 bit	A0	A17
L	L	L	L	D0 to D7	Hi-Z	8 bit	A-1	A17
L	L	L	H	D8 to D15	Hi-Z			

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} = –400µA	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	—	—	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±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} = –400µA	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 = 120ns	—	—	30	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)

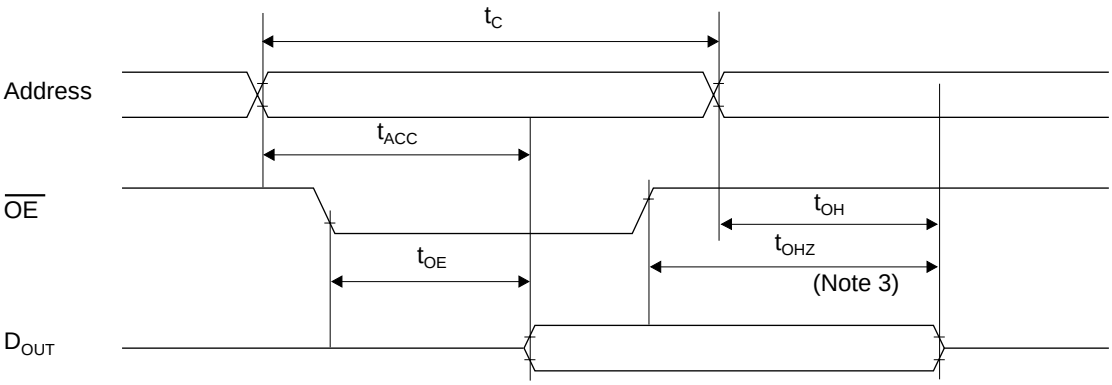
Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Cycle time	t_C	—	150	—	—	ns
Address Access time	t_{ACC}	—	—	—	150	ns
$\overline{CE}$ Access time	t_{CE}	—	—	—	150	ns
$\overline{OE}$ Access time	t_{OE}	—	—	—	80	ns
$\overline{CE}$ Output Disable time	t_{CHZ}	—	0	—	70	ns
$\overline{OE}$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

Read Cycle (V_{CC}=3.3V±0.3V)

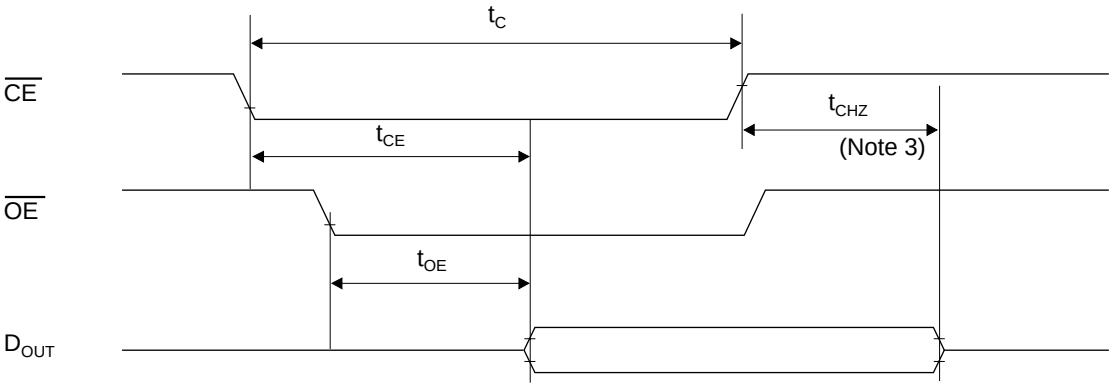
(Ta = 0 to 70°C)

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

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