MSM538002C

524,288-Word x 16-Bit or 1,048,576-Word x 8-Bit Mask ROM

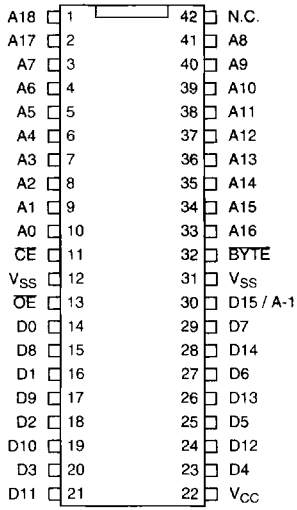
DESCRIPTION

The OKI MSM538002C is a high-speed CMOS Mask ROM that can electrically switch between 524,288-word x 16-bit and 1,048,576-word x 8-bit configurations. The MSM538002C operates on a single 5.0 V power supply and is TTL compatible. The chip's asynchronous I/O requires no external clock assuring easy operation. A power-down mode provides low power dissipation when the chip is not selected. The $\overline{CE}$ and $\overline{OE}$ pins are provided as control signals that permit three-stated output allowing easy memory expansion on a system bus. The MSM538002C is suited for use as large capacity fixed memory for micro-computers and data terminals.

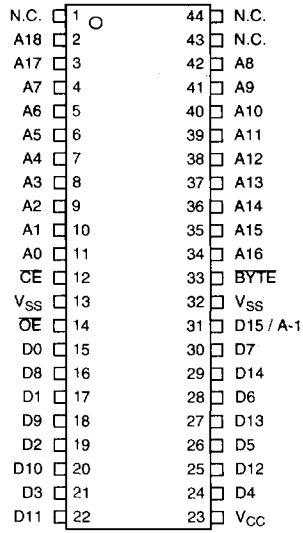
FEATURES

- Dual, electrically switchable configurations
  - 512K x 16 bits
  - 1 Meg x 8 bits
- Single 5.0 V power supply
- 120 ns access time (max.)
- Input/Output TTL compatible
- Pin compatible OTP available
- Three-state output
- Packages
  - 42-Pin plastic DIP
  - 44-Pin plastic SOP

PIN CONFIGURATION



42-Pin DIP

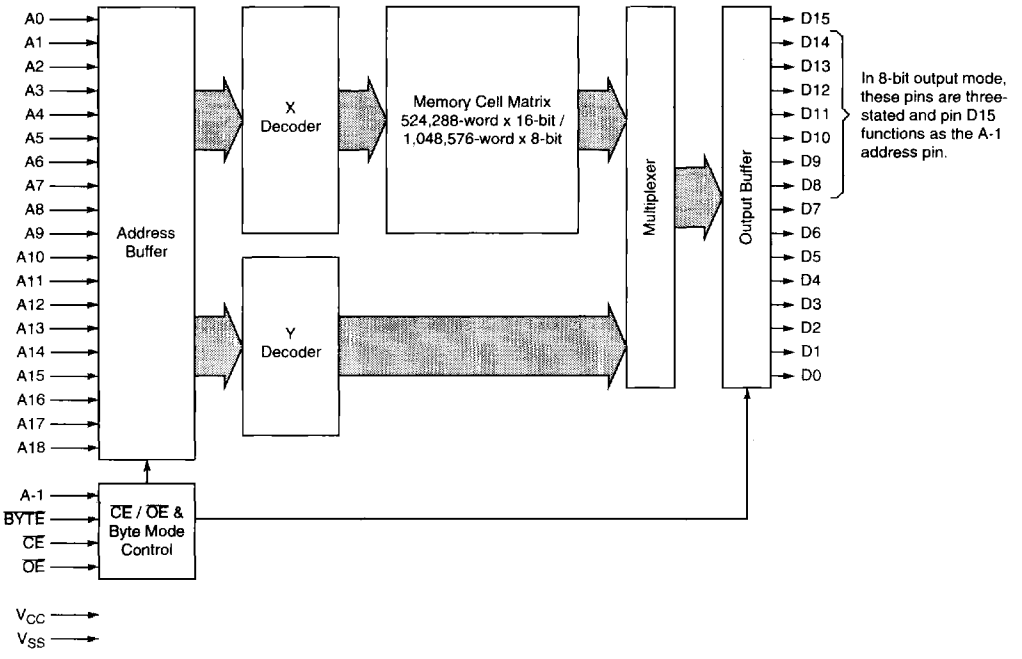


44-Pin SOP

Pin Configuration

Pin Name	Function
A0 ~ A18	Address input
D0 ~ D14	Data output
D15 / A-1	Data output / address input
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
$\overline{BYTE}$	Mode switch
V_{CC}, V_{SS}	Power supply

BLOCK DIAGRAM



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Function Table

CE	OE	BYTE	D15 / A-1	D0 ~ D7	D8 ~ D15	DOUT 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	D0 ~ D7	D8 ~ D15	16-Bit	A0	A18
L	L	L	L	D0 ~ D7	Hi-Z	8-Bit	A-1	A18
L	L	L	H	D8 ~ D15	Hi-Z			

ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings [1]

Parameter	Symbol	Value	Unit
Power supply voltage V_{CC} relative to V_{SS}	V_{CC}	-0.3 ~ +7.0	V
Input voltage relative to V_{SS}	V_{IN}	-0.3 ~ V_{CC} + 0.5	V
Output voltage relative to V_{SS}	V_{OUT}	-0.3 ~ V_{CC} + 0.5	V
Power dissipation	P_D	1.0	W
Operating temperature	T_{OPR}	-0 ~ +70	°C
Storage temperature	T_{STG}	-55 ~ +150	°C

1. Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Recommended Operating Conditions (V_{CC} = 5.0 V, T_a = 0 to +70°C)

Parameter	Symbol	Rated Value			Unit
		Min	Typ	Max	
Power supply voltage	V_{CC}	4.5	5.0	5.5	V
	V_{SS}	0	0	0	V
Input high voltage	V_{IH}	2.2	5.0	V_{CC} + 0.5	V
Input low voltage	V_{IL}	-0.3	0	0.8	V

Capacitance (T_a = 25°C, f = 1 MHz)

Parameter	Symbol	Conditions	Rated Value			Unit
			Min	Typ	Max	
Input capacitance	C_I	V_{IN} = 0 V	-	-	15	pF
Output capacitance	C_O	V_{OUT} = 0 V	-	-	15	pF

DC Characteristics (V_{CC} = 5.0 V ±10%, T_a = 0°C ~ +70°C)

Parameter	Symbol	Condition	Rated Value			Unit
			Min	Typ	Max	
Output high voltage	V_{OH}	I_{OH} = -400 µA	2.4	-	-	V
Output low voltage	V_{OL}	I_{OL} = 2.1 mA	-	-	0.4	V
Input leakage current	I_{LI}	V_{IN} = 0 V, — V_{CC}	-10	-	10	µA
Output leakage current	I_{LO}	V_{OUT} = 0 V, — V_{CC}, $\overline{CE}$ = $V_{IH\ (MIN)}$	-10	-	10	µA
Average power supply current (Operating)	I_{CC}	$\overline{CE}$ = V_{IL}, $\overline{OE}$ = V_{IH}, t_C = 120 ns	-	-	40	mA
		$\overline{CE}$ = V_{IL}, $\overline{OE}$ = V_{IH}, t_C = 1 µs	-	-	30	mA
Power supply current (Standby)	I_{CCS}	$\overline{OE}$ = V_{CC} - 0.2 V	-	-	50	µA
	I_{CCS1}	$\overline{CE}$ = $V_{IH\ (MIN)}$	-	-	500	µA

AC Characteristics Read Cycle (V_{CC} = 5.0 V ±10%, C_L = 100 pF+1TTL, T_a = 0°C ~ +70°C) [1]

Parameter	Symbol	Conditions	Rated Value			Unit
			Min	Typ	Max	
Address access time	t_{ACC}		-	-	120	ns
$\overline{CE}$ access time	t_{CE}		-	-	120	ns
$\overline{OE}$ access time	t_{OE}		-	-	60	ns
$\overline{CE}$ output disable time [2]	t_{CHZ}		0	-	50	ns
$\overline{OE}$ output disable time [2]	t_{OHZ}		0	-	40	ns
Output hold time	t_{OH}		0	-	-	ns

1. Input signal level: V_{IH} = 2.4 V, V_{IL} = 0.6 V. AC measurements assume $t_r = t_f$ = 5 ns. Timing reference level: V_{IN} = 1.5 V, V_{OUT} = 0.8 V & 2.0 V.
2. t_{CHZ} and t_{OHZ} define the time at which the output achieves an open circuit condition and are not referenced to output voltage levels.

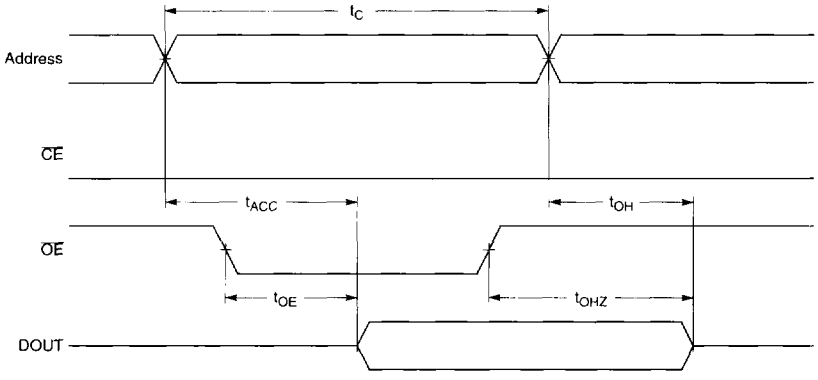

Figure 1. Read Cycle 1

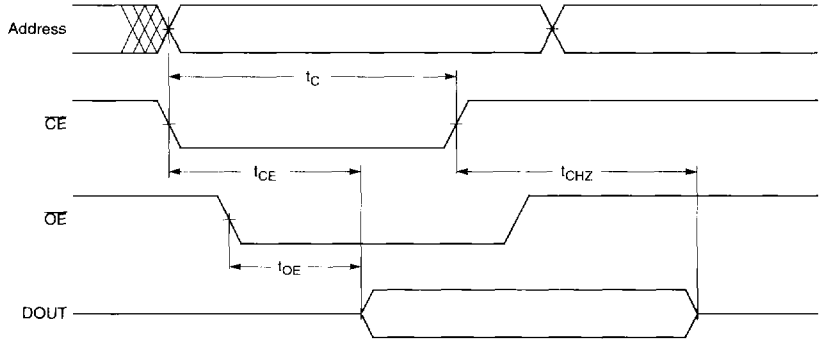

Figure 2. Read Cycle 2