

MSM271024AS

**65536 × 16 BIT UV ERASABLE ELECTRICALLY PROGRAMMABLE
READ-ONLY MEMORY**

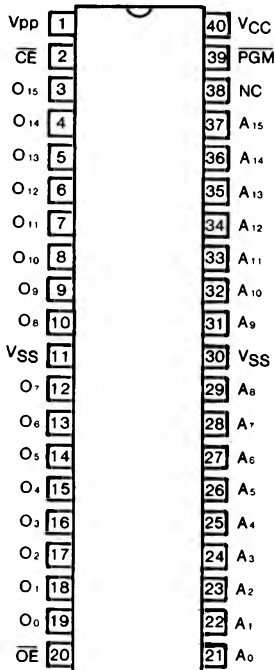
GENERAL DESCRIPTION

The MSM271024 is a 65536 words × 16 bit ultraviolet erasable and electrically programmable read-only memory. Users can freely prepare the memory content, which can be easily changed, so the MSM271024 is ideal for microprocessor programs, etc. The MSM271024 is manufactured by the N channel double silicon gate MOS technology and is contained in the 40 pin package.

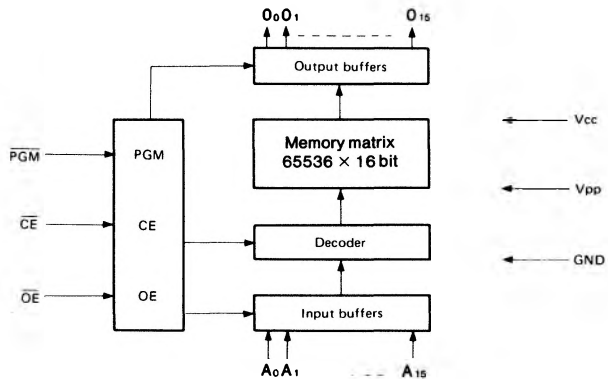
FEATURES

- +5V single power supply
- 65536 words × 16 bit configuration
- Access time:
 - MAX120 ns (MSM271024-12)
 - MAX150 ns (MSM271024-15)
 - MAX200 ns (MSM271024-20)
- Power consumption:
 - MAX525 mW (during operation)
 - MAX184 mW (during stand-by)
- Perfect static operation
- INPUT/OUTPUT TTL level
(three state output)

PIN CONFIGURATION



FUNCTIONAL BLOCK DIAGRAM



This specification may be changed without notification.

FUNCTION TABLE

Mode	Pins CE (2)	OE (20)	PGM (39)	Vpp (1)	VCC (40)	Outputs
Read	V _{IL}	V _{IL}	V _{IH}	+5V	+5V	Dout
Output Disable	V _{IL}	V _{IH}	V _{IH}	+5V	+5V	High impedance
Stand-by	V _{IH}	—	—	+5V	+5V	High impedance
Program	V _{IL}	—	V _{IL}	+12.5V	+6V	D _{iN}
Program Verify	V _{IL}	V _{IL}	V _{IH}	+12.5V	+6V	Dout
Program Inhibit	V _{IH}	—	—	+12.5V	+6V	High impedance

—; Can be either V_{IL} or V_{IH}

ABSOLUTE MAXIMUM RATINGS

Temperature Under Bias	Ta	.....	-10°C ~ 80°C
Storage Temperature	Tstg	.....	-55°C ~ 125°C
All Input/Output Voltages	V _{IN} , V _{OUT}	.....	-0.6V ~ 13V
VCC Supply Voltage	VCC	.....	-0.3V ~ 7V
Program Voltage	Vpp	.....	-0.6V ~ 13.5V
Power Assembly Voltage	P _D	.....	1.5W

The voltage with respect to GND.

ELECTRICAL CHARACTERISTICS

< READ OPERATION >

RECOMMENDED OPERATION CONDITION

Parameter	Symbol	Limit			Operating Temperature	Remarks	Symbol
		Min.	Typ.	Max.			
VCC Power Supply Voltage	VCC	4.75	5.0	5.25	0°C ~ 70°C	VCC=5V±0.25V Vpp=VCC	V
Vpp Voltage	Vpp	4.75	5.0	5.25			V
"H" Level Input Voltage	V _{IH}	2.00	—	6.25			V
"L" Level Input Voltage	V _{IL}	-0.1	—	0.8			V

The voltage with respect to GND

DC CHARACTERISTICS

($V_{CC} = 5V \pm 5\%$, $V_{pp} = V_{CC}$, $T_a = 0^\circ C \sim 70^\circ C$)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I_{LI}	$V_{IN} = 5.25V$	–	–	10	μA
Output Leakage Current	I_{LO}	$V_{OUT} = 5.25V$	–	–	10	μA
V_{CC} Power Current (Stand-by)	I_{CC1}	$\overline{CE} = V_{IH}$	–	–	35	mA
V_{CC} Power Current (Operation)	I_{CC2}	$\overline{CE} = V_{IL}$	–	–	100	mA
Program Power Current	I_{pp1}	$V_{pp} = V_{CC}$	–	–	5	mA
Input Voltage "H" Level	V_{IH}	–	2.0	–	$V_{CC}+1$	V
Input Voltage "L" Level	V_{IL}	–	–0.1	–	0.8	V
Output Voltage "H" Level	V_{OH}	$I_{OH} = -400 \mu A$	2.4	–	–	V
Output Voltage "L" Level	V_{OL}	$I_{OL} = 2.1 mA$	–	–	0.45	V

AC CHARACTERISTICS

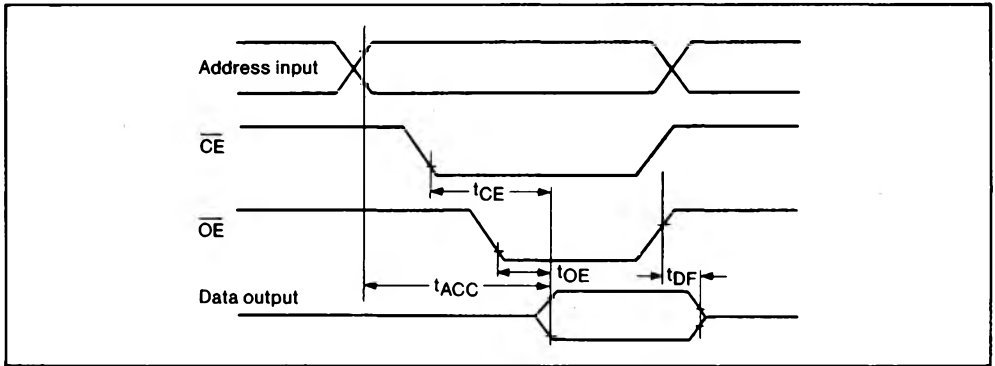
($V_{CC} = 5V \pm 5\%$, $V_{pp} = V_{CC}$, $T_a = 0^\circ C \sim 70^\circ C$)

Parameter	Symbol	Conditions	271024-12		271024-15		271024-20		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
Address Access Time	t_{ACC}	$\overline{CE} = \overline{OE} = V_{IL}$, $PGM = V_{IH}$	–	120	–	150	–	200	ns
\overline{CE} Access Time	t_{CE}	$\overline{OE} = V_{IL}$, $PGM = V_{IH}$	–	120	–	150	–	200	ns
\overline{OE} Access Time	t_{OE}	$\overline{CE} = V_{IL}$, $PGM = V_{IH}$	–	50	–	60	–	75	ns
Output Disable Time	t_{DF}	$\overline{CE} = V_{IL}$, $PGM = V_{IH}$	0	40	0	50	0	55	ns

Measurement condition

- Input pulse level 0.45V and 2.4V
- Input timing reference level 0.8V and 2.0V
- Output load 1TTL GATE + 100pF
- Output timing reference level 0.8V and 2.0V

TIME CHART



< PROGRAMMING OPERATION >

DC CHARACTERISTICS

($V_{CC} = 6V \pm 0.25V$, $V_{pp} = 12.5V \pm 0.5V$, $T_a = 25^{\circ}C \pm 5^{\circ}C$)

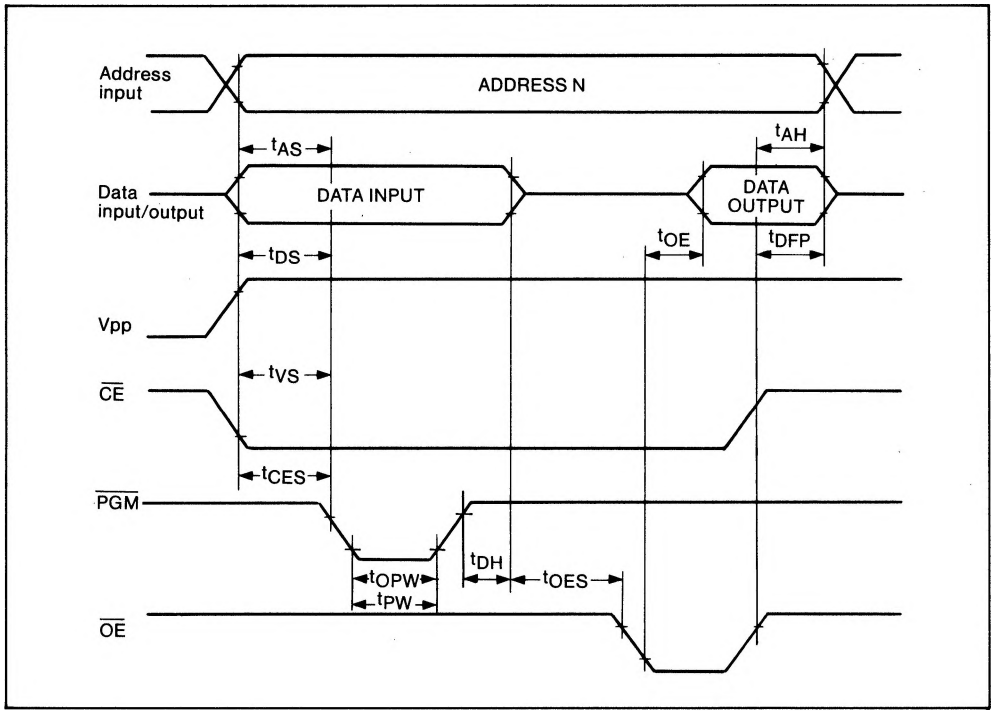
Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I_{LI}	$V_{IN} = 5.25V$	–	–	10	μA
V_{pp} Power Current	I_{pp}	$\overline{CE} = \overline{PGM} = V_{IL}$	–	–	50	mA
V_{CC} Power Current	I_{CC}	–	–	–	100	mA
Input Voltage "H" Level	V_{IH}	–	2.0	–	$V_{CC} + 1$	V
Input Voltage "L" Level	V_{IL}	–	–0.1	–	0.8	V
Output Voltage "H" Level	V_{OH}	$I_{OH} = -400 \mu A$	2.4	–	–	V
Output Voltage "L" Level	V_{OL}	$I_{OL} = 2.1 mA$	–	–	0.45	V

AC CHARACTERISTICS

($V_{CC} = 6V \pm 0.25V$, $V_{pp} = 12.5V \pm 0.5V$, $T_a = 25^{\circ}C \pm 5^{\circ}C$)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Address Set-up Time	t_{AS}	–	2	–	–	μS
\overline{OE} Set-up Time	t_{OES}	–	2	–	–	μS
Data Set-up Time	t_{DS}	–	2	–	–	μS
Address Hold Time	t_{AH}	–	0	–	–	μS
Data Hold Time	t_{DH}	–	2	–	–	μS
Output Enable to Output Float Delay	t_{DFP}	–	0	–	130	ns
V_{pp} Power Set-up Time	t_{VS}	–	2	–	–	μS
\overline{PGM} Initial Program Pulse Width	t_{PW}	–	0.95	1.0	1.05	ms
\overline{PGM} Overprogram Pulse Width	t_{OPW}	–	2.85	–	78.75	ms
\overline{CE} Set-up Time	t_{CES}	–	2	–	–	μS
Data Valid from OE	t_{OE}	–	–	–	150	ns

TIME CHART



CAPACITANCE

($T_a = 25^\circ\text{C}$, $f = 1\text{ MHz}$)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit.
Input Capacitance	C_{IN}	$V_{IN} = 0V$	—	4	6	pF
Output Capacitance	C_{OUT}	$V_{OUT} = 0V$	—	8	12	pF