

OKI semiconductor

MSM271000AS

131072 × 8 BIT UV ERASABLE ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY

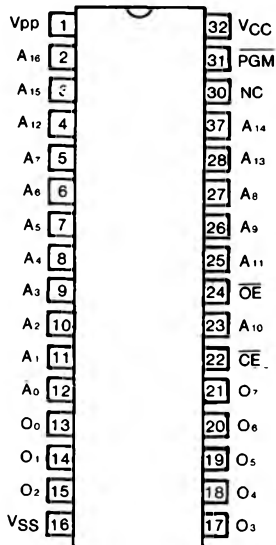
GENERAL DESCRIPTION

The MSM271000 is a 131072 words × 8 bit ultraviolet erasable and electrically programmable read-only memory. Users can freely prepare the memory content, which can be easily changed, so the MSM271000 is ideal for microprocessor programs, etc. The MSM271000 is manufactured by the N channel double silicon gate MOS technology and is contained in the 32 pin package.

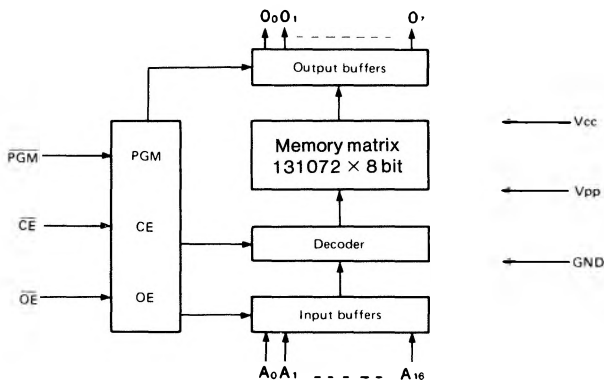
FEATURES

- +5V single power supply
- 131072 words × 8 bit configuration
- Access time:
 - MAX120 ns (MSM271000-12)
 - MAX150 ns (MSM271000-15)
 - MAX200 ns (MSM271000-20)
- 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 (22)	OE (24)	PGM (31)	V _{pp} (1)	V _{CC} (32)	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	T _a	–10°C ~ 80°C
Storage Temperature	T _{stg}	–55°C ~ 125°C
All Input/Output Voltages	V _{IN} , V _{OUT}	–0.6V ~ 13V
V _{CC} Supply Voltage	V _{CC}	–0.3V ~ 7V
Program Voltage	V _{pp}	–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.			
V _{CC} Power Supply Voltage	V _{CC}	4.75	5.0	5.25	0°C ~ 70°C	V _{CC} =5V±0.25V V _{pp} =V _{CC}	V
V _{pp} Voltage	V _{pp}	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

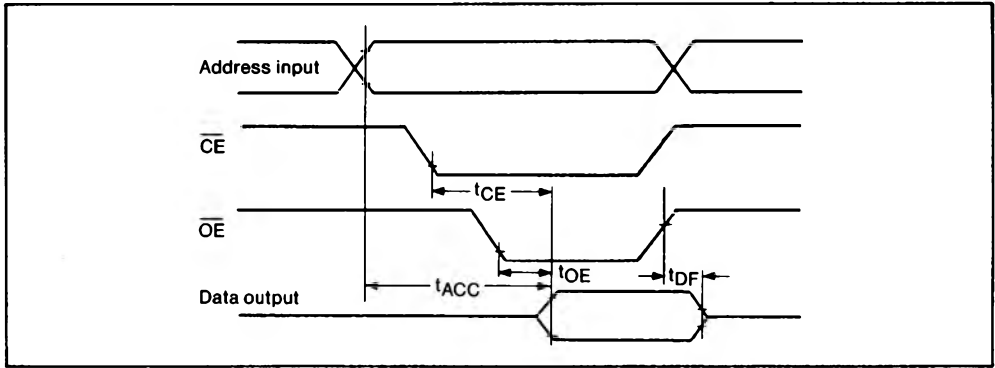
($V_{CC} = 5V \pm 5\%$, $V_{pp} = V_{CC}$, $T_a = 0^\circ C \sim 70^\circ C$)

Parameter	Symbol	Conditions	271000-12		271000-15		271000-20		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

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

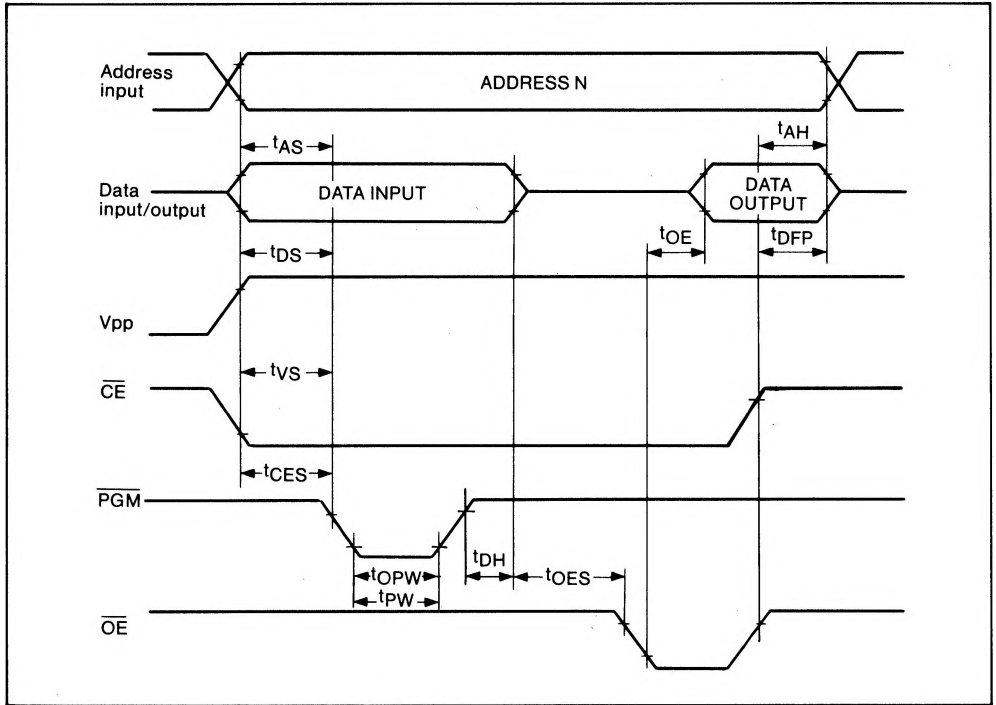
Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I_{LI}	$V_{IN} = 5.25V$	–	–	10	μA
V_{pp} Power Current	I_{pp}	$\overline{CE} = \overline{PGM} = V_{IL}$	–	–	50	mA
V_{CC} Power Current	I_{CC}	–	–	–	100	mA
Input Voltage "H" Level	V_{IH}	–	2.0	–	$V_{CC}+1$	V
Input Voltage "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}	$I_{OL} = 2.1 \text{ mA}$	–	–	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 \overline{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