

MSM27C1024AS

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

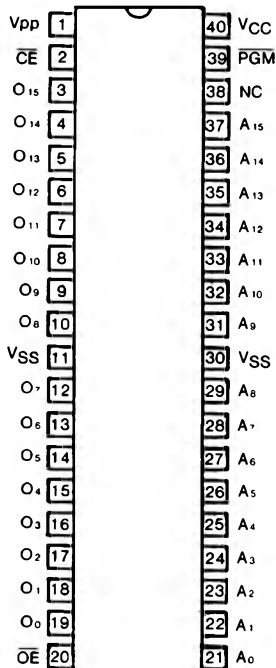
GENERAL DESCRIPTION

The MSM27C1024 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 MSM27C1024 is ideal for microprocessor programs, etc. The MSM27C1024 is manufactured by the CMOS double silicon gate technology and is contained in the 40 pin package.

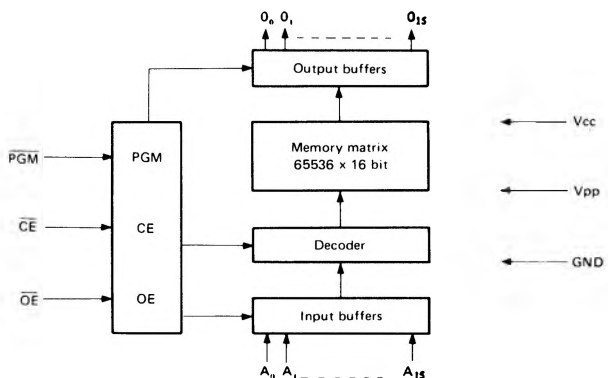
FEATURES

- +5V single power supply
- 65536 words × 16 bit configuration
- Access time:
 - MAX100 ns (MSM27C1024-10)
 - MAX150 ns (MSM27C1024-15)
 - MAX200 ns (MSM27C1024-20)
- Power consumption:
 - MAX175 mW (during operation)
 - MAX0.55 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

Pins Mode	$\overline{\text{CE}}$ (2)	$\overline{\text{OE}}$ (20)	$\overline{\text{PGM}}$ (39)	V_{pp} (1)	V_{CC} (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	T_a	$-10^{\circ}\text{C} \sim 80^{\circ}\text{C}$
Storage Temperature	T_{stg}	$-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$
All Input/Output Voltages	$V_{\text{IN}}, V_{\text{OUT}}$	$V_{\text{IN}} = -0.6\text{V} \sim 13\text{V},$ $V_{\text{OUT}} = -0.3\text{V} \sim V_{\text{CC}} + 1\text{V}$
V_{CC} Supply Voltage	V_{CC}	$-0.3\text{V} \sim 7\text{V}$
Program Voltage	V_{pp}	$-0.6\text{V} \sim 13.5\text{V}$
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}	4.5	5.0	5.5	$0^{\circ}\text{C} \sim 70^{\circ}\text{C}$	$V_{\text{CC}} = 5\text{V} \pm 0.5\text{V}$ $V_{\text{pp}} = V_{\text{CC}}$	V
V_{pp} Voltage	V_{pp}	4.5	5.0	5.5			V
"H" Level Input Voltage	V_{IH}	2.00	—	6.5			V
"L" Level Input Voltage	V_{IL}	-0.1	—	0.8			V

The voltage with respect to GND

DC CHARACTERISTICS(V_{CC} = 5V±10%, V_{pp} = V_{CC}, Ta = 0°C ~ 70°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}	$\overline{CE} = V_{IH} = V_{CC}$	—	—	50	μ
V _{CC} Power Current (Operation)	I _{CC2}	$\overline{CE} = V_{IL}$	—	—	30	mA
Program Power Current	I _{pp1}	V _{pp} = V _{CC}	—	—	50	μ
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 μA	2.4	—	—	V
Output Voltage "L" Level	V _{OL}	I _{OL} = 2.1 mA	—	—	0.45	V

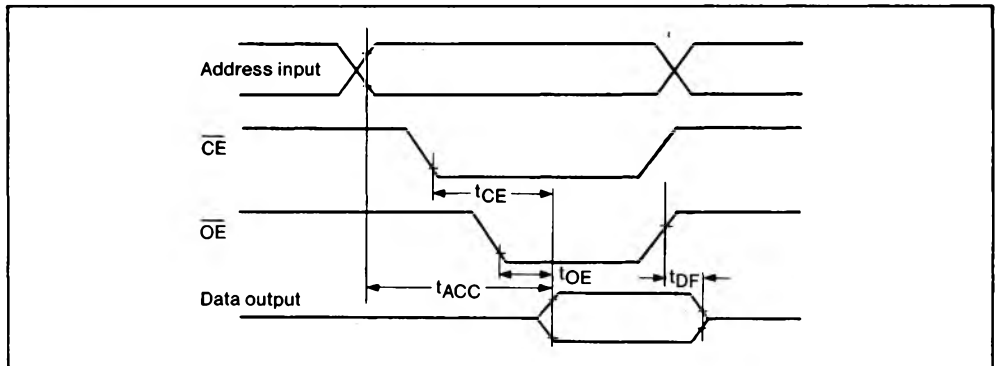
AC CHARACTERISTICS(V_{CC} = 5V±10%, V_{pp} = V_{CC}, Ta = 0°C ~ 70°C)

Parameter	Symbol	Conditions	27C1000-10		27C1000-15		27C1000-20		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
Address Access Time	t _{ACC}	$\overline{CE} = \overline{OE} = V_{IL}$, PGM = V _{IH}	—	100	—	150	—	200	ns
$\overline{CE}$ Access Time	t _{CE}	$\overline{OE} = V_{IL}$, PGM = V _{IH}	—	100	—	150	—	200	ns
$\overline{OE}$ Access Time	t _{OE}	$\overline{CE} = V_{IL}$, PGM = V _{IH}	—	45	—	60	—	75	ns
Output Disable Time	t _{DF}	$\overline{CE} = V_{IL}$, PGM = V _{IH}	0	35	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



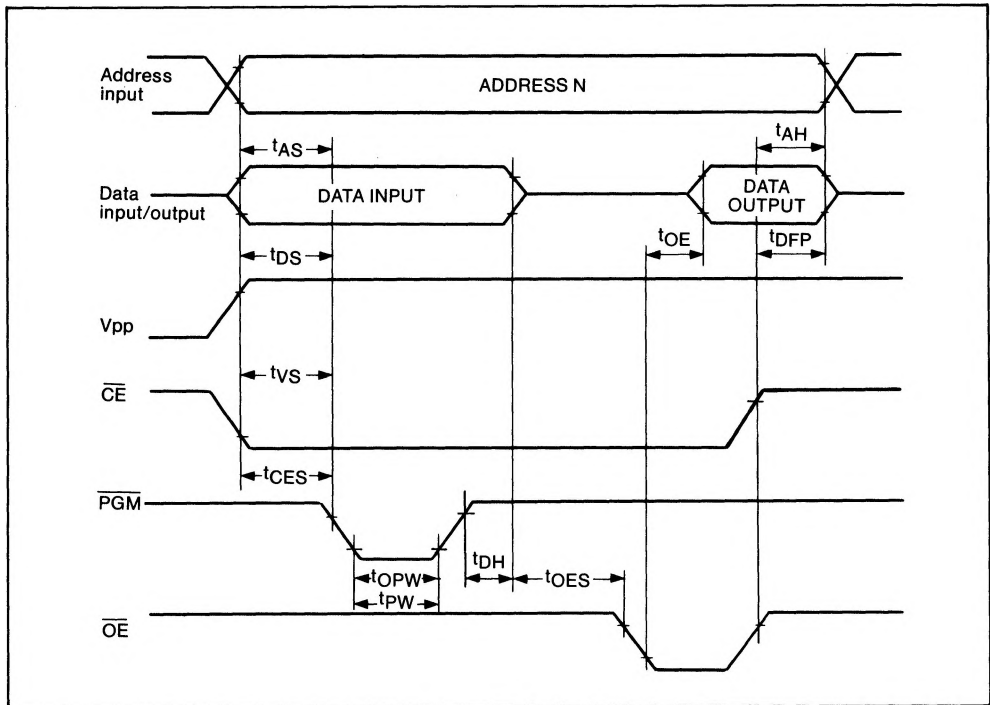
DC CHARACTERISTICS(V_{CC} = 6V±0.25V, V_{pp} = 12.5V±0.5V, T_a = 25°C±5°C)

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}	$\overline{\text{CE}} = \overline{\text{PGM}} = V_{IL}$	—	—	50	mA
V _{CC} Power Current	I _{CC}	—	—	—	30	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 μA	2.4	—	—	V
Output Voltage "L" Level	V _{OL}	I _{OL} = 2.1 mA	—	—	0.45	V

AC CHARACTERISTICS(V_{CC} = 6V±0.25V, V_{pp} = 12.5V±0.5V, T_a = 25°C±5°C)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Address Set-up Time	t _{AS}	—	2	—	—	μs
$\overline{\text{OE}}$ 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
$\overline{\text{PGM}}$ Initial Program Pulse Width	t _{PW}	—	0.95	1.0	1.05	ms
$\overline{\text{PGM}}$ Overprogram Pulse Width	t _{OPW}	—	2.85	—	78.75	ms
$\overline{\text{CE}}$ 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