

MSM27C128AS

**16384 × 8 BIT UV ERASABLE ELECTRICALLY PROGRAMMABLE
READ-ONLY MEMORY**

GENERAL DESCRIPTION

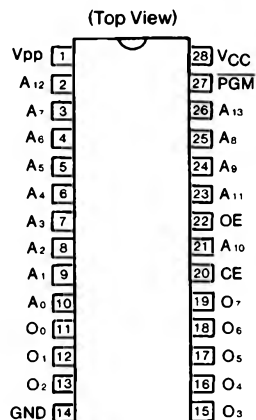
The MSM27C128 is a 16384 words × 8 bit ultraviolet erasable and electrically programmable read-only memory. Users can freely prepare the memory content, which can be easily changed, so the MSM27C128 is ideal for microprocessor programs, etc. The MSM27C128 is manufactured by the CMOS double silicon gate technology and is contained in the 28 pin package.

FEATURES

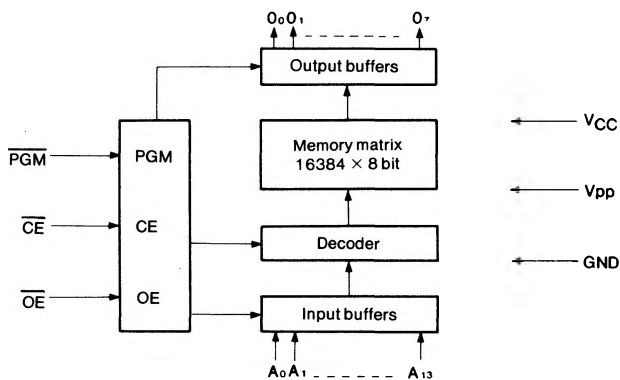
- +5V single power supply
- 16384 words × 8 bit configuration
- Access time:
 - MAX200 ns (MSM27C128-20)
 - MAX250 ns (MSM27C128-25)
 - MAX300 ns (MSM27C128-30)
- Power consumption:
 - MAX165 mW (during operation)
 - MAX0.55 mW (during stand-by)
- Perfect static operation
- INPUT/OUTPUT TTL level
(three state output)



PIN CONFIGURATION



FUNCTIONAL BLOCK DIAGRAM



This specification may be changed without notification.

FUNCTION TABLE

Pins Mode	$\overline{CE}$ (20)	$\overline{OE}$ (22)	$\overline{PGM}$ (27)	V_{pp} (1)	V_{CC} (28)	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}	+21V	+6V	D_{IN}
Program Verify	V_{IL}	V_{IL}	V_{IH}	+21V	+6V	Dout
Program Inhibit	V_{IH}	—	—	+21V	+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}	$V_{IN} = -0.6V \sim 13.5V,$ $V_{OUT} = -0.3V \sim V_{CC} + 1V$
V_{CC} Supply Voltage	V_{CC}	—0.3V ~ 7V
Program Voltage	V_{pp}	—0.6V ~ 23V
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°C ~ 70°C	$V_{CC} = 5V \pm 10\%$ $V_{pp} = V_{CC} \pm 0.7V$	V
V_{pp} Voltage	V_{pp}	3.8	5.0	6.2			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} ± 0.7V, T_a = 0°C ~ 70°C)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I _{LI}	V _{IN} = 5.5V	—	—	10	μA
Output Leakage Current	I _{LO}	V _{OUT} = 5.5V	—	—	10	μA
V _{CC} Power Current (Stand-by)	I _{CC1}	$\overline{CE} = V_{IH} = V_{CC}$	—	—	100	μA
V _{CC} Power Current (Operation)	I _{CC2}	$\overline{CE} = V_{IL}$	—	—	30	mA
V _{pp} Power Current	I _{pp1}	V _{pp} = V _{CC} ± 0.7V	—	—	100	μA
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	4.0	—	—	V
Output Voltage "L" Level	V _{OL}	I _{OL} = 2.1 mA	—	—	0.45	V

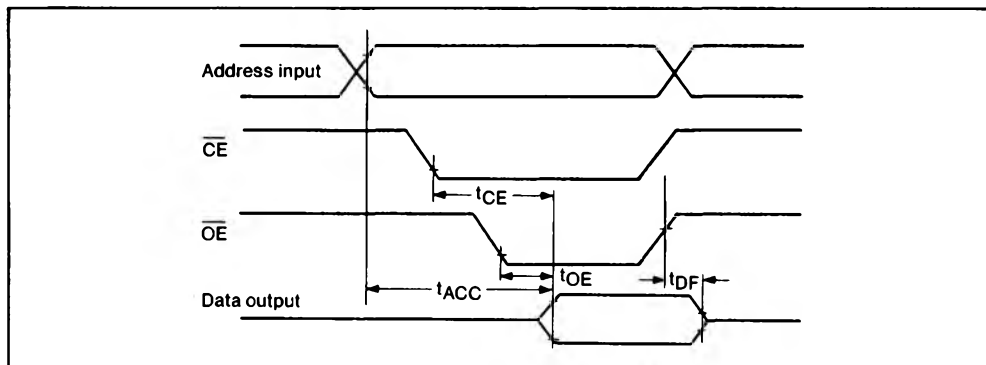
AC CHARACTERISTICS(V_{CC} = 5V ± 10%, V_{pp} = V_{CC} ± 0.7V, T_a = 0°C ~ 70°C)

Parameter	Symbol	Conditions	27C128-20		27C128-25		27C128-30		Unit
			Min.	Max.	Min.	Max.	Min.	Max.	
Address Access Time	t _{ACC}	$\overline{CE} = \overline{OE} = V_{IL}$, PGM = V _{IH}	—	200	—	250	—	300	ns
$\overline{CE}$ Access Time	t _{CE}	$\overline{OE} = V_{IL}$, PGM = V _{IH}	—	200	—	250	—	300	ns
$\overline{OE}$ Access Time	t _{OE}	$\overline{CE} = V_{IL}$, PGM = V _{IH}	—	75	—	100	—	120	ns
Output Disable Time	t _{DF}	$\overline{CE} = V_{IL}$, PGM = V _{IH}	0	60	0	85	0	105	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



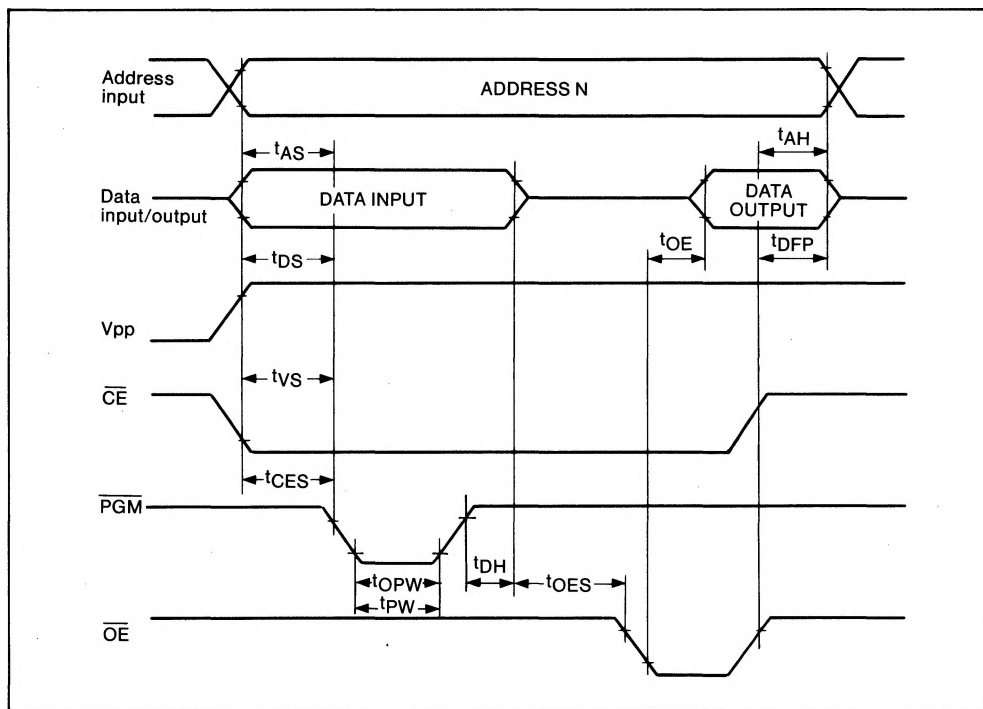
DC CHARACTERISTICS(V_{CC} = 6V±0.25V, V_{pp} = 21V±0.5V, T_a = 25°C±5°C)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I _{LI}	V _{IN} = 5.5V	—	—	10	μA
V _{pp} Power Current	I _{pp}	CE = PGM = V _{IL}	—	—	30	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} = 21V±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}	—	3.8	—	63	ms
$\overline{\text{CE}}$ Set-up Time	t _{CES}	—	2	—	—	μs
Data Valid from $\overline{\text{OE}}$	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