

MSM27C128AS

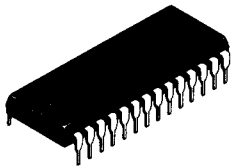
16384 × 8 BIT UV ERASABLE ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY

GENERAL DESCRIPTION

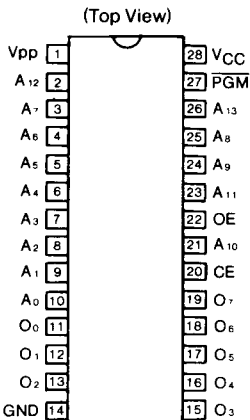
The MSM27C128 is a 16384 words × 8 bit ultraviolet erasable and electrically programmable read-only memory. Users can freely prepare the memory content, which can be easily changed, so the MSM27C128 is ideal for microprocessor programs, etc. The MSM27C128 is manufactured by the CMOS double silicon gate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

FEATURES

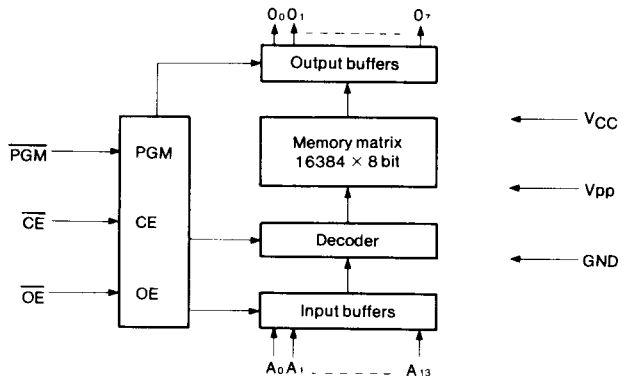
- ±5V single power supply
- 16384 words × 8 bit configuration
- Access time:
 - MAX200 ns (MSM27C128-20)
 - MAX250 ns (MSM27C128-25)
 - MAX300 ns (MSM27C128-30)
- Power consumption:
 - MAX165 mW (during operation)
 - MAX0.55 mW (during stand-by)
- Perfect static operation
- INPUT/OUTPUT TTL level (three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



PIN CONFIGURATION



FUNCTIONAL BLOCK DIAGRAM



This specification may be changed without notification.

FUNCTION TABLE

Mode	Pins					
	\overline{CE} (20)	\overline{OE} (22)	\overline{PGM} (27)	Vpp (1)	VCC (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	Ta	.....	-10°C ~ 80°C
Storage Temperature	Tstg	.....	-55°C ~ 125°C
All Input/Output Voltages	V _{IN} , V _{OUT}	.....	V _{IN} = -0.6V ~ 13.5V, V _{OUT} = -0.3V ~ V _{CC} + 1V
VCC Supply Voltage	VCC	.....	-0.3V ~ 7V
Program Voltage	Vpp	.....	-0.6V ~ 23V
Power Assembly Voltage	P _D	.....	1.5W

The voltage with respect to GND.

ELECTRICAL CHARACTERISTICS

< READ OPERATION >

RECOMMENDED OPERATION CONDITION

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Parameter	Symbol	Limit			Operating Temperature	Remarks	Symbol
		Min.	Typ.	Max.			
VCC Power Supply Voltage	VCC	4.5	5.0	5.5	0°C ~ 70°C	VCC=5V±10% Vpp=VCC±0.7V	V
Vpp Voltage	Vpp	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

($V_{CC} = 5V \pm 10\%$, $V_{pp} = V_{CC} \pm 0.7V$, $T_a = 0^\circ C \sim 70^\circ C$)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I_{LI}	$V_{IN} = 5.5V$	–	–	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}	$V_{pp} = V_{CC} \pm 0.7V$	–	–	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}	$I_{OH} = -400 \mu A$	4.0	–	–	V
Output Voltage "L" Level	V_{OL}	$I_{OL} = 2.1 mA$	–	–	0.45	V

AC CHARACTERISTICS

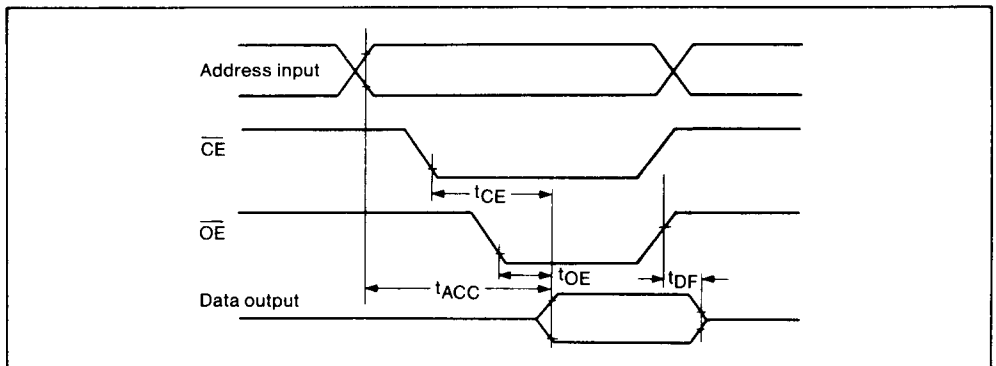
($V_{CC} = 5V \pm 10\%$, $V_{pp} = V_{CC} \pm 0.7V$, $T_a = 0^\circ C \sim 70^\circ C$)

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



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DC CHARACTERISTICS

($V_{CC} = 6V \pm 0.25V$, $V_{pp} = 21V \pm 0.5V$, $T_a = 25^\circ C \pm 5^\circ C$)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I_{LI}	$V_{IN} = 5.5V$	–	–	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}	$I_{OH} = -400 \mu A$	2.4	–	–	V
Output Voltage “L” Level	V_{OL}	$I_{OL} = 2.1 \text{ mA}$	–	–	0.45	V

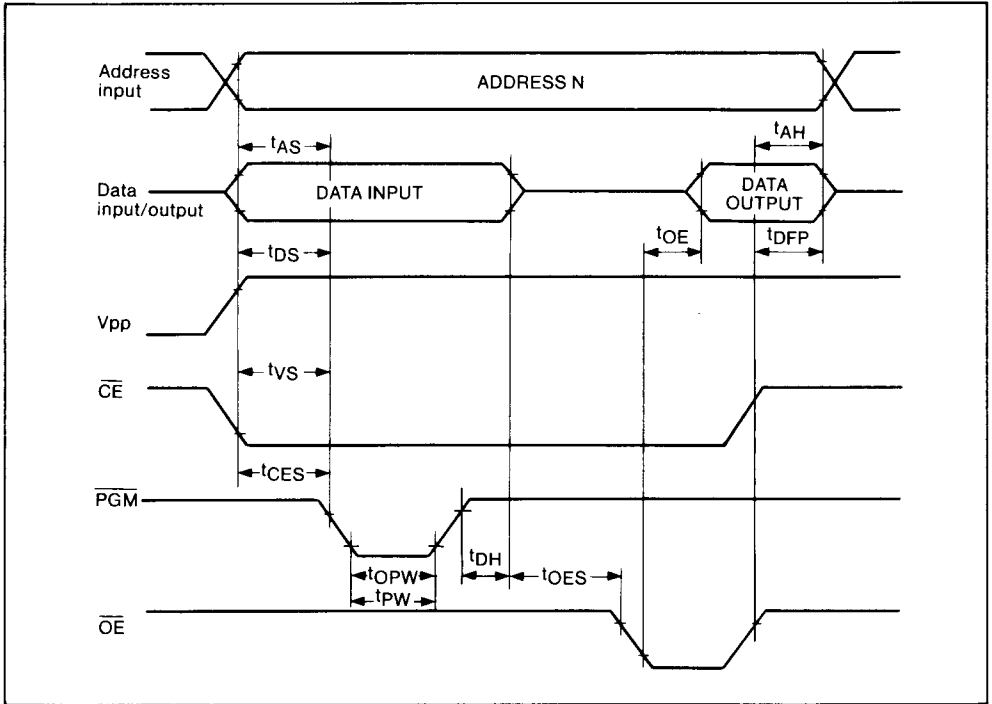
AC CHARACTERISTICS

($V_{CC} = 6V \pm 0.25V$, $V_{pp} = 21V \pm 0.5V$, $T_a = 25^\circ C \pm 5^\circ C$)

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}	–	3.8	–	63	ms
\overline{CE} Set-up Time	t_{CES}	–	2	–	–	μS
Data Valid from \overline{OE}	t_{OE}	–	–	–	150	ns

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TIME CHART



CAPACITANCE

(Ta = 25°C, f = 1 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