Preliminary

MSM27C64AS

8192 × 8 BIT UV ERASABLE ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY

GENERAL DESCRIPTION

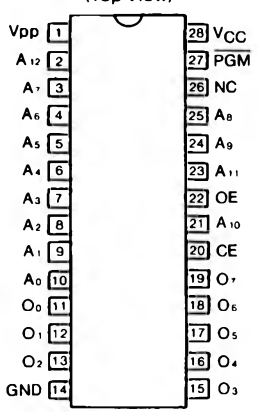
The MSM27C64 is a 8192 words × 8 bit ultraviolet erasable and electrically programmable read-only memory. Users can freely prepare the memory content, which can be easily changed, so the MSM27C64 is ideal for microprocessor programs, etc. The MSM27C64 is manufactured by the CMOS double silicon gate technology and is contained in the 28 pin package.

FEATURES

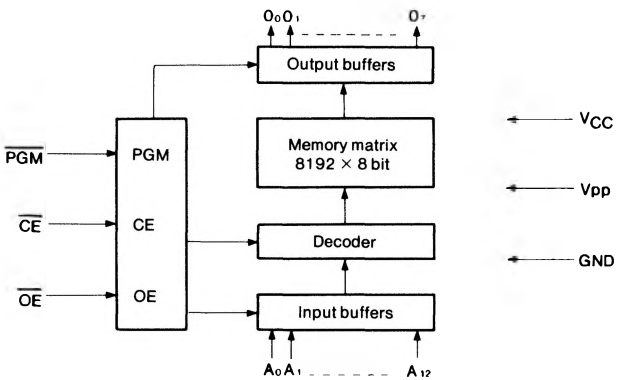
- +5V single power supply
- 8192 words × 8 bit configuration
- Access time:
  MAX200 ns (MSM27C64-20)
  MAX250 ns (MSM27C64-25)
  MAX300 ns (MSM27C64-30)
- Power consumption:
  MAX165 mW (during operation)
  MAX0.55 mW (during stand-by)
- Perfect static operation
- INPUT/OUTPUT TTL level
  (three state output)

PIN CONFIGURATION

(Top View)



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)	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	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
V_{CC} Supply Voltage	V_{CC}	−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

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±10% Vpp=V_{CC}±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±10%, Vpp = V_{CC}±0.7V, Ta = 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_{CC_1}	$\overline{CE}$ = V_{IH} = V_{CC}	–	–	100	μA
V_{CC} Power Current (Operation)	I_{CC_2}	$\overline{CE}$ = V_{IL}	–	–	30	mA
Vpp Power Current	I_{PP_1}	Vpp = 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

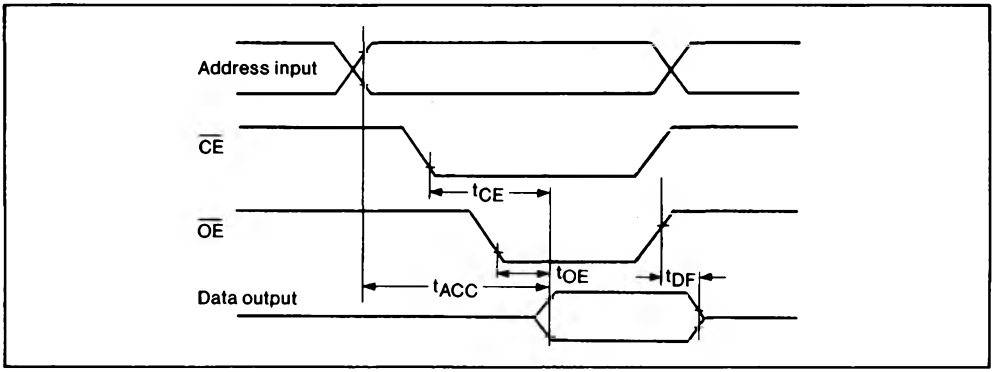
(V_{CC} = 5V±10%, Vpp = V_{CC}±0.7V, Ta = 0°C ~ 70°C)

Parameter	Symbol	Conditions	27C64-20		27C64-25		27C64-30		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
CE Access Time	t_{CE}	$\overline{OE}$ = V_{IL}, PGM = V_{IH}	–	200	–	250	–	300	ns
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


Address input
$\overline{CE}$
t_{CE}
$\overline{OE}$
t_{OE}
t_{DF}
t_{ACC}
Data output

DC CHARACTERISTICS

(V_{CC} = 6V±0.25V, Vpp = 21V±0.5V, Ta = 25°C±5°C)

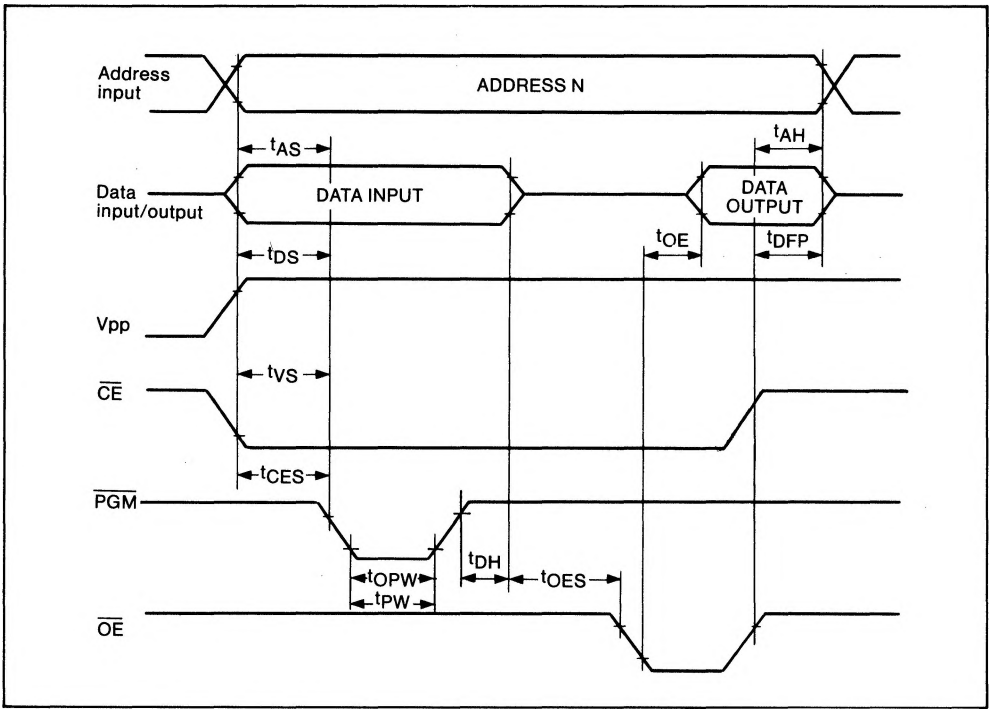
Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Input Leakage Current	I_{LI}	V_{IN} = 5.5V	–	–	10	μA
Vpp Power Current	Ipp	$\overline{CE} = \overline{PGM} = V_{IL}$	–	–	30	mA
V_{CC} Power Current	I_{CC}	–	–	–	30	mA
Input Voltage "H" Level	V_{IH}	–	2.0	–	V_{CC}+1	V
Input Voltage "L" Level	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, Vpp = 21V±0.5V, Ta = 25°C±5°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
Vpp 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 OE	t_{OE}	–	–	–	150	ns

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