MOSEL

MS310256

32,768x8 CMOS Mask Programmable ROM

T-46-13-13

FEATURES

- Access time: 150ns max
- Low Power operation:
  - Operating: 30mA max.
  - Standby: 30µA max.
- Fully static operation
- Automatic power down
- TTL compatible inputs and outputs
- 3-state outputs for wired-OR expansion
- EPROMs accepted as program data input
- Ultra low data retention supply

DESCRIPTION

The MS310256 is a high performance Read Only Memory organized as 32,768 words by 8 bits. It is designed to be compatible with all microprocessors and similar applications where high performance mass storage and simple interfacing are important design considerations.

The MS310256 offers automatic powerdown with powerdown controlled by the Chip Enable ($\overline{CE}$/CE) input. When $\overline{CE}$/CE goes HIGH/LOW the device will automatically power down and remain in a low power standby mode as long as $\overline{CE}$/CE remains HIGH/LOW. Pin 22 may be mask programmed as $\overline{OE}$/OE/NC (active HIGH, active LOW or no connection). In order to eliminate bus contention in multiple bus microprocessor systems.

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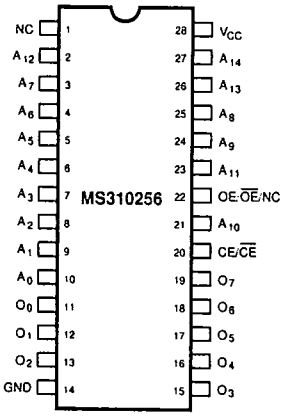
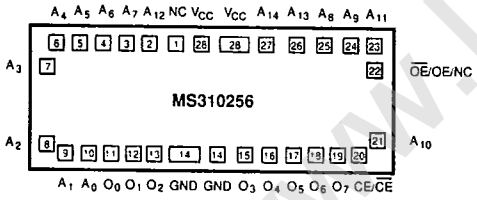
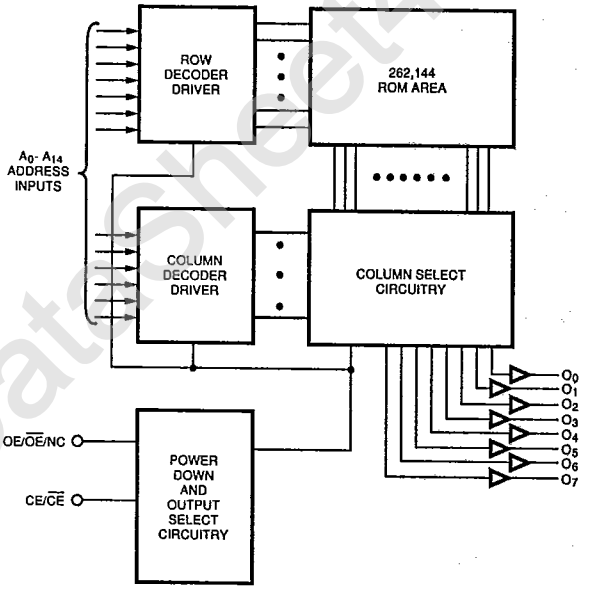
PIN CONFIGURATIONS





BLOCK DIAGRAM



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PIN DESCRIPTIONS

PIN NO.	SYMBOL	FUNCTION
2-10, 21, 23-27	A_0 - A_{14}	Address Input
11-13, 15-19	O_0 - O_7	Data Output
14	GND	Ground
28	V_{CC}	Power Supply
20	$\overline{CE}$/CE	Chip Enable Input
22	$\overline{OE}$/OE/NC	Output Enable Input /No Connection
1	NC	No Connection

ABSOLUTE MAXIMUM RATINGS(1)

Ambient Operating Temperature	–10°C to +80°C
Storage Temperature	–65°C to +150°C
Supply Voltage to Ground Potential	–0.5V to +7.0V
Output Voltage	–0.5V to V_{CC} + 0.5V
Input Voltage	–0.5V to V_{CC} + 0.5V
Power Dissipation	400 mW
Soldering Temperature and Time	260°C , 10 sec

1. Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only. Functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not recommended. Exposure to ABSOLUTE MAXIMUM RATINGS for extended periods may affect device reliability.

OPERATING RANGE

RANGE	AMBIENT TEMPERATURE	Vcc
Commercial	0°C to + 70°C	5V ± 10%

DC ELECTRICAL CHARACTERISTICS (over the commercial operating range)

PARAMETER NAME	PARAMETER	TEST CONDITIONS	MS311024 MIN.	TYP.	MAX.	UNITS
V_{IL}	Input Low Voltage		–0.5	—	0.8	V
V_{IH}	Input High Voltage		2.2		V_{CC}+ 0.3	V
$\|I_{LI}\|$	Input Leakage Current	V_{CC} = Max, V_{IN} = 0V to V_{CC}	—	—	10	µA
$\|I_{OL}\|$	Output Leakage Current	V_{OUT} = 0 V to V_{CC}	—	—	10	µA
V_{OL}	Output Low Voltage	V_{CC} = Min, I_{OL} = 3.2mA	—	—	0.4	V
V_{OH}	Output High Voltage	V_{CC} = Min, I_{OH} = –1mA	2.4	—	V_{CC}	V
I_{CC}	Operating Power Supply Current (1)		—	15	30	mA
I_{CCSB}	Standby Power Supply Current	$\overline{CE}$ = V_{IH}, CE = V_{IL}	—	0.2	1.5	mA
I_{CCSB1}	Super Standby Power Supply Current	$\overline{CE}$ = V_{CC} - 0.2V, CE = 0.2V	—	10	30	µA
I_{OS}	Output Short Circuit Current (2)		—	—	70	mA

1. Measured with device selected and outputs unloaded.
2. For a duration not to exceed 30 seconds.

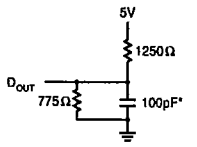
CAPACITANCE (Ta=25°C, f=1.0MHz)(1)

SYMBOL	PARAMETER	CONDITION	MAX.	UNIT
C_I	Input Capacitance	T_A = 25°C	10	pF
C_O	Output Capacitance	F = 1.0MHz	10	pF

1. This parameter is guaranteed but not 100% tested.

AC TEST CONDITIONS

Input Pulse Levels	0.4 ~ 2.4V
Input Rise and Fall Times	10 ns
Timing Measurement Level	V_{IL} = 0.8V V_{IH} = 2.2V
Reference	V_{OL} = 0.8V V_{OH} = 2.0V
Output Load	See Figure 1



* INCLUDING SCOPE AND JIG

Figure 1 Output Load Circuit

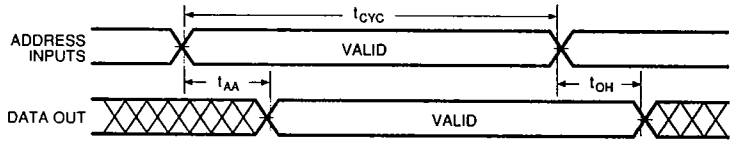
AC ELECTRICAL CHARACTERISTICS (over the operating range)

PARAMETER NAME	PARAMETER	MS310256-15 MIN.	MAX.	UNIT
t_{CYC}	Cycle Time	150	—	ns
t_{AA}	Address Access Time	—	150	ns
t_{ACE}	Chip Enable Access Time	—	150	ns
t_{ACS}	Output Enable Access Time	—	85	ns
t_{LZ}	Output LOW Z Delay(1)	10	—	ns
t_{HZ}	Output HIGH Z Delay(2)	0	85	
t_{OH}	Output Hold After Address Change	10	—	ns
t_{PU}	Power-Up Time	0	—	ns
t_{PD}	Powerdown Time	—	85	ns

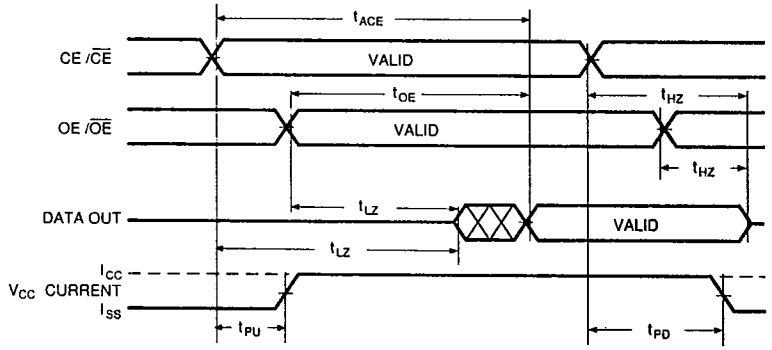
1. Output LOW impedance delay (t_{LZ}) is measured from CE/$\overline{CE}$ or OE/$\overline{OE}$ going active.
2. Output HIGH impedance delay (t_{HZ}) is measured from the earlier of CE/$\overline{CE}$ or OE/$\overline{OE}$ going inactive.

TIMING DIAGRAMS

PROPAGATION DELAY FROM ADDRESS (CE/$\overline{CE}$ = ACTIVE, OE/$\overline{OE}$ = ACTIVE)



PROPAGATION DELAY FROM CHIP ENABLE, OUTPUT ENABLE (ADDRESS VALID)



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ORDERING INFORMATION

SPEED (ns)	ORDERING PART NUMBER	PACKAGE REFERENCE NO.	TEMPERATURE RANGE
150	MS310256-15PC	P28-3	0°C to + 70°C
150	MS310256-15XC	Chip	0°C to + 70°C