Silicon Gate MOS **8101-2**

1024 BIT (256 x 4) STATIC MOS RAM WITH SEPARATE I/O

- **256 x 4 Organization to Meet Needs for Small System Memories**
- **Access Time — 850 nsec Max.**
- **Single +5V Supply Voltage**
- **Directly TTL Compatible — All Inputs and Output**
- **Static MOS — No Clocks or Refreshing Required**
- **Simple Memory Expansion — Chip Enable Input**
- **Inputs Protected — All Inputs Have Protection Against Static Charge**
- **Low Cost Packaging — 22 Pin Plastic Dual-In-Line Configuration**
- **Low Power — Typically 150 mW**
- **Three-State Output — OR-Tie Capability**
- **Output Disable Provided for Ease of Use in Common Data Bus Systems**

The Intel 8101-2® is a 256 word by 4 bit static random access memory element using normally off N-channel MOS devices integrated on a monolithic array. It uses fully DC stable (static) circuitry and therefore requires no clocks or refreshing to operate. The data is read out nondestructively and has the same polarity as the input data.

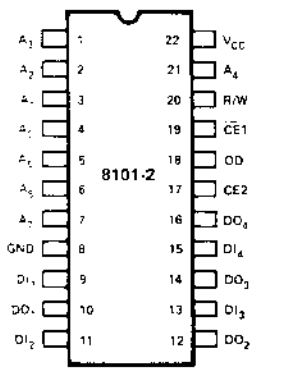
The 8101-2 is designed for memory applications where high performance, low cost, large bit storage, and simple interfacing are important design objectives.

It is directly TTL compatible in all respects: inputs, outputs, and a single +5V supply. Two chip-enables allow easy selection of an individual package when outputs are OR-tied. An output disable is provided so that data inputs and outputs can be tied for common I/O systems. Output disable is then used to eliminate any bidirectional logic.

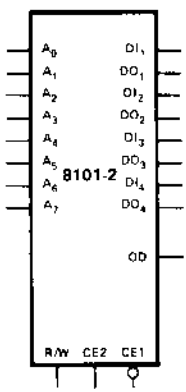
The Intel 8101-2 is fabricated with N-channel silicon gate technology. This technology allows the design and production of high performance, easy-to-use MOS circuits and provides a higher functional density on a monolithic chip than either conventional MOS technology or P-channel silicon gate technology.

Intel's silicon gate technology also provides excellent protection against contamination. This permits the use of low cost silicone packaging.

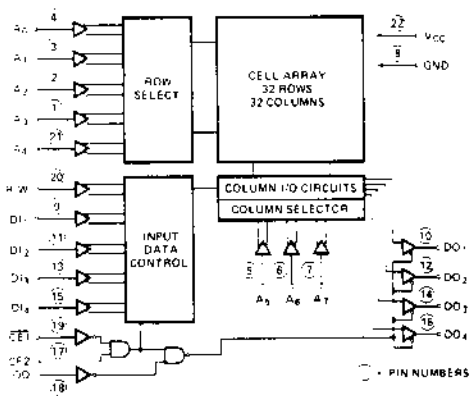
PIN CONFIGURATION



LOGIC SYMBOL



BLOCK DIAGRAM



PIN NAMES

D_{IN}	DATA INPUT	OD	OUTPUT DISABLE
A_0 - A_7	ADDRESS INPUTS	D_{OUT}	DATA OUTPUT
R/W	READ/WRITE INPUT	V_{CC}	POWER (+5V)
$\overline{CE1}$ $\overline{CE2}$	CHIP ENABLE		

Absolute Maximum Ratings*

Ambient Temperature Under Bias . . . . . 0°C to 70°C

Storage Temperature . . . . . -65°C to +150°C

Voltage On Any Pin
With Respect to Ground . . . . . -0.5V to +7V

Power Dissipation . . . . . 1 Watt

*COMMENT:

Stresses above those listed under "Absolute Maximum Rating" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or at any other condition above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

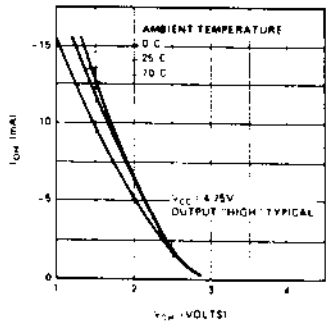
D.C. and Operating Characteristics

T_A = 0°C to 70°C, V_{CC} = 5V ±5% unless otherwise specified.

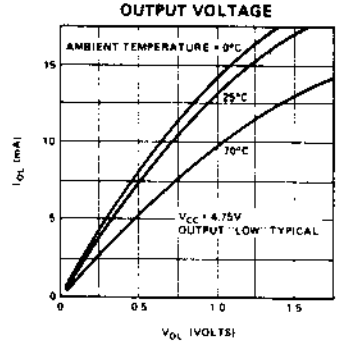
Symbol	Parameter	Min.	Typ.[1]	Max.	Unit	Test Conditions
I_{LI}	Input Current			10	μA	V_{IN} = 0 to 5.25V
I_{LOH}	I/O Leakage Current[2]			15	μA	$\overline{CE}$ = 2.2V, V_{OUT} = 4.0V
I_{LOL}	I/O Leakage Current[2]			-50	μA	$\overline{CE}$ = 2.2V, V_{OUT} = 0.45V
I_{CC1}	Power Supply Current		30	60	mA	V_{IN} = 5.25V, I_O = 0mA T_A = 25°C
I_{CC2}	Power Supply Current			70	mA	V_{IN} = 5.25V, I_O = 0mA T_A = 0°C
V_{IL}	Input "Low" Voltage	-0.5		+0.65	V	
V_{IH}	Input "High" Voltage	2.2		V_{CC}	V	
V_{OL}	Output "Low" Voltage			+0.45	V	I_{OL} = 2.0mA
V_{OH}	Output "High" Voltage	2.2			V	I_{OH} = -150 μA

NOTE: 1. Typical values are for T_A = 25°C and nominal supply voltage.
2. Input and Output tied together.

OUTPUT SOURCE CURRENT VS. OUTPUT VOLTAGE



OUTPUT SINK CURRENT VS. OUTPUT VOLTAGE



A.C. CHARACTERISTICS T_A = 0°C to 70°C, V_{CC} = 5V ±5% unless otherwise specified

SYMBOL	PARAMETER	LIMITS			UNIT
		MIN.	TYP.(1)	MAX.	
READ CYCLE					
t_{RC}	READ CYCLE	850			ns
t_A	ACCESS TIME		500	850	ns
t_{CO}	CHIP ENABLE TO OUTPUT TIME			500	ns
t_{OH1}	PREVIOUS READ DATA VALID WITH RESPECT TO ADDRESS	50			ns
t_{OH2}	PREVIOUS READ DATA VALID WITH RESPECT TO CHIP ENABLE	0			ns
WRITE CYCLE					
t_{WC}	WRITE CYCLE	850			ns
t_{AW}	ADDRESS TO WRITE SETUP TIME	200			ns
t_{WP}	WRITE PULSE WIDTH	600			ns
t_{WR}	WRITE RECOVERY TIME	50			ns
t_{DW}	DATA SETUP TIME	650			ns
t_{DH}	DATA HOLD TIME	100			ns
t_{CW}	CHIP ENABLE TO WRITE SETUP TIME	750			ns

(1) Typical values are for T_A = 25°C and nominal supply voltage.

A.C. CONDITIONS OF TEST

Input Pulse Levels: +0.65 Volt to 2.2 Volt

Input Pulse Rise and Fall Times: 20nsec

Timing Measurement Reference Level: 1.5 Volt

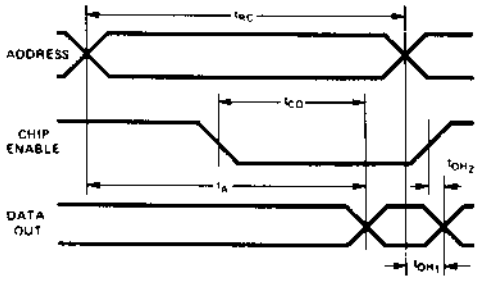
Output Load: 1 TTL Gate and C_L = 100 pF

CAPACITANCE T_A = 25°C, f = 1 MHz

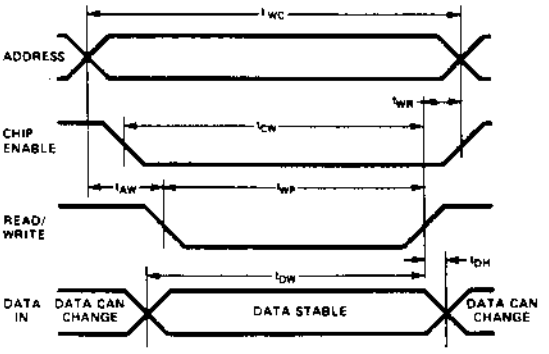
SYMBOL	TEST	LIMITS (pF)	
		TYP.	MAX.
C_{IN}	INPUT CAPACITANCE (ALL INPUT PINS) V_{IN} = 0V	3	5
C_{OUT}	OUTPUT CAPACITANCE V_{OUT} = 0V	7	10

WAVEFORMS

READ CYCLE

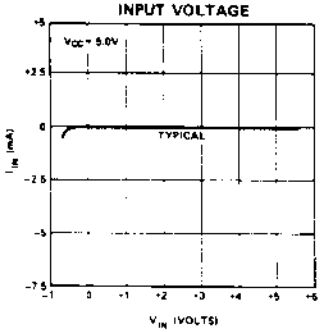


WRITE CYCLE

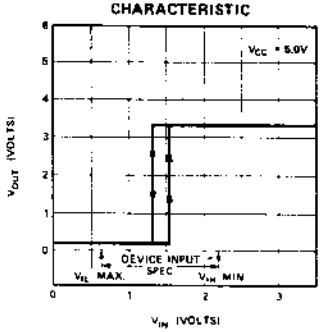


TYPICAL D.C. CHARACTERISTICS

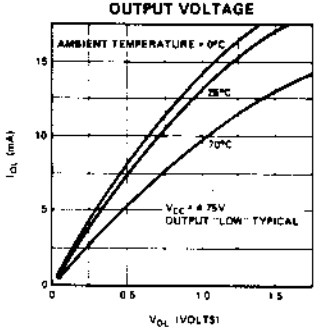
INPUT CURRENT VS. INPUT VOLTAGE



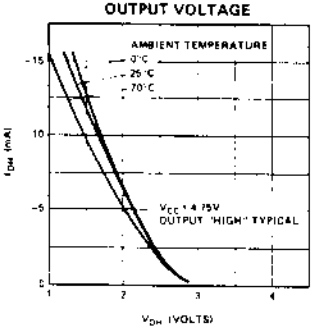
EFFECTIVE INPUT CHARACTERISTIC



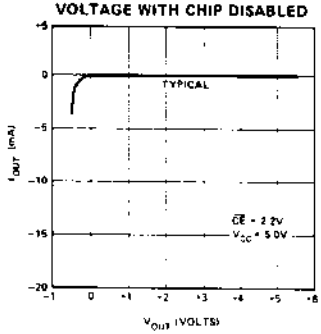
OUTPUT SINK CURRENT VS. OUTPUT VOLTAGE



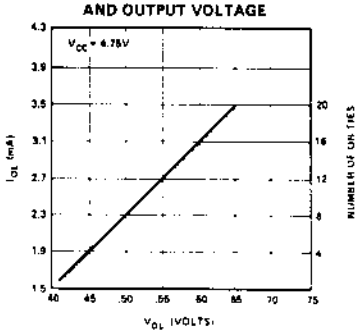
OUTPUT SOURCE CURRENT VS. OUTPUT VOLTAGE



OUTPUT CURRENT VS. OUTPUT VOLTAGE WITH CHIP DISABLED

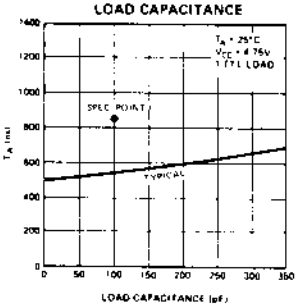


RELATIONSHIP BETWEEN OUTPUT SINK CURRENT, NUMBER OF OR-TIES, AND OUTPUT VOLTAGE



TYPICAL A.C. CHARACTERISTICS

ACCESS TIME VS. LOAD CAPACITANCE



ACCESS TIME VS. AMBIENT TEMPERATURE