

# HIGH SPEED FULLY DECODED 256 BIT RAM

- **Fast Access Time—60 nsec max. over 0° to 75° C Temperature Range and ±5% Supply Voltage Tolerance — 3106A and 3107A**
- **Fully Decoded—On Chip Address Decode and Buffer**
- **DTL and TTL Compatible—Low Input Load Current: 0.25mA max.**

- **OR-Tie Capability—Open Collector (3107, 3107A) or Three State (3106, 3106A) Output**
- **Simple Memory Expansion through 3 Chip Select Inputs**
- **Minimum Line Reflection—Low Voltage Diode Input Clamp**
- **Ceramic and Plastic 16 Pin DIP**

RAMs

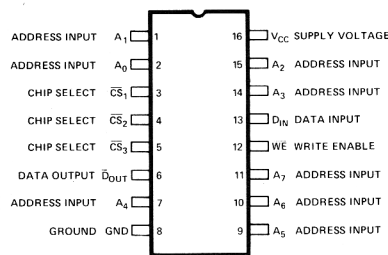
The Intel 3106, 3106A, 3107, and 3107A are high speed, fully decoded, 256 bit read/write random access memories, in a 256 word by 1 bit organization. These devices are designed for high speed scratch pad, buffer, and distributed main memory applications. The 3106A and 3107A are higher speed versions of the 3106 and 3107.

All devices feature three chip-select inputs. The 3106 and 3106A have a three-state output and the 3107 and 3107A provide the user with the popular open collector output. On-chip address decoding and the high speed chip-select facilitate easy memory expansion.

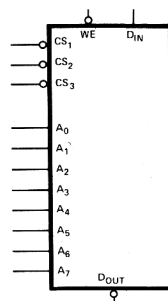
The use of Schottky barrier diode clamped transistors to obtain fast switching speeds results in higher performance than equivalent devices made with a gold diffusion process. The performance of these devices is specified over a temperature range from 0° C to +75° C.

The 3106, 3106A, 3107, and 3107A are compatible with TTL and DTL logic circuits.

### PIN CONFIGURATION



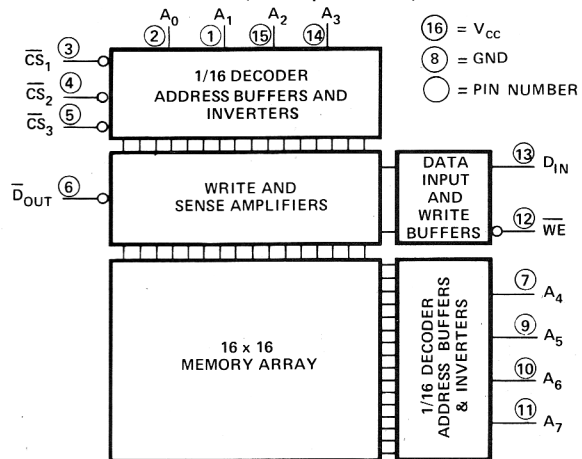
### LOGIC SYMBOL



### PIN NAMES

$D_{IN}$	DATA INPUT	$\overline{CS}_1 - \overline{CS}_3$	CHIP SELECT
$A_0 - A_7$	ADDRESS INPUTS	$\overline{D}_{OUT}$	DATA OUTPUT
WE	WRITE ENABLE INPUT		

### BLOCK DIAGRAM (3106, 3106A, 3107, 3107A)



### TRUTH TABLE (3106, 3106A, 3107, 3107A)

CHIP SELECT	WRITE ENABLE	OPERATION	OUTPUT
ALL LOW	LOW	WRITE	COMPLEMENT OF DATA INPUT
ALL LOW	HIGH	READ	COMPLEMENT OF WRITTEN DATA
ONE OR MORE HIGH	DON'T CARE	HOLD	3106, 3106A HIGH IMPEDANCE STATE 3107, 3107A HIGH

**Absolute Maximum Ratings\***

Temperature Under Bias	-55°C to +125°C
Storage Temperature	-65°C to +160°C
All Output or Supply Voltages	-0.5 to +7 Volts
All Input Voltages	-1.0 to +5.5 Volts
Output Currents	100 mA

**\*COMMENT:**

Stresses above those listed under "Absolute Maximum Ratings" 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. Characteristics**

$T_A = 0^\circ\text{C to } 75^\circ\text{C}$ ,  $V_{CC} = 5.0\text{V} \pm 5\%$

SYMBOL	PARAMETER	LIMITS			UNIT	TEST CONDITIONS
		MIN.	TYP.(1)	MAX.		
$I_F$	INPUT LOAD CURRENT ALL INPUTS			-0.25	mA	$V_{CC} = 5.25\text{V}$ $V_{IN} = 0.45\text{V}$
$I_R$	INPUT LEAKAGE CURRENT, ALL INPUTS			10	$\mu\text{A}$	$V_{CC} = 4.75\text{V}$ $V_R = 5.25\text{V}$
$V_C$	INPUT CLAMP VOLTAGE, ALL INPUTS			-1.0	V	$V_{CC} = 4.75\text{V}$ $I_{IN} = -5.0\text{ mA}$
$V_{OL}$	OUTPUT LOW VOLTAGE			0.45	V	$V_{CC} = 4.75\text{V}$ $I_{OL} = 15\text{ mA}$
$I_{CEX}$	OUTPUT LEAKAGE CURRENT			100	$\mu\text{A}$	$V_{CC} = V_{CEX} = 5.25\text{V}$
$I_{CC}$	POWER SUPPLY CURRENT		90	130	mA	$V_{CC} = 5.25\text{V}$ ALL INPUTS OPEN
$V_{IL}$	INPUT LOW VOLTAGE			0.85	V	$V_{CC} = 5.0\text{V}$
$V_{IH}$	INPUT HIGH VOLTAGE	2.0			V	
<b>3106, 3106A ONLY</b>						
$ I_O $	OUTPUT LEAKAGE FOR HIGH IMPEDANCE STATE			100	$\mu\text{A}$	$V_{CC} = 5.25\text{V}$ $V_O = 0.45\text{V}/5.25\text{V}$
$I_{SC}$	OUTPUT SHORT CIRCUIT CURRENT	-20		-60	mA	$V_O = 0\text{V}$ $V_{CC} = 5\text{V}$
$V_{OH}$	OUTPUT HIGH VOLTAGE	2.4			V	$I_O = 3.2\text{ mA}$ $V_{CC} = 4.75\text{V}$

(1) Typical values are for  $T_A = 25^\circ\text{C}$  and nominal supply voltages.

### A.C. Characteristics $T_A = 0^\circ\text{C}$ to $+75^\circ\text{C}$ , $V_{CC} = 5.0\text{V} \pm 5\%$ unless otherwise specified.

READ CYCLE							
SYMBOL	TEST	3106A/3107A			3106/3107		
		LIMITS (ns)			LIMITS (ns)		
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
$t_{A-}$ , $t_{A+}$	ADDRESS TO OUTPUT DELAY (ALL CHIP SELECTS LOW)	15	40	60	15	50	80
$t_{S-}$ , $t_{S+}$	CHIP SELECT TO OUTPUT DELAY (ALL ADDRESS INPUTS STABLE)	5	25	40	5	25	40

WRITE CYCLE							
SYMBOL	TEST	3106A/3107A			3106/3107		
		LIMITS (ns)			LIMITS (ns)		
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
$t_{WP}$	WRITE ENABLE PULSE WIDTH	50	35		60	45	
$t_{SR}$	TIME INPUT DATA APPEARS AT THE OUTPUT FOLLOWING A WRITE COMMAND $t_{WP} \geq \text{MIN. LIMIT}$		5	20		10	25

#### 3106 & 3106A ONLY

SYMBOL	TEST	MIN.	MAX.
$t_{ON}$	TIME OUTPUT REACHES LOW IMPEDANCE STATE AFTER CHIP ENABLED	0	
$t_{OFF}$	TIME OUTPUT REACHES HIGH IMPEDANCE STATE AFTER CHIP DISABLED		20

#### CAPACITANCE, $T_A = 25^\circ\text{C}$

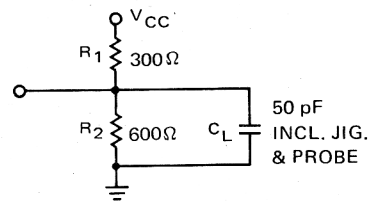
SYMBOL	TEST	PACKAGE	LIMITS (pF)	
			TYP.	MAX.
$C_{IN}^*$	INPUT CAPACITANCE (ALL INPUT PINS)	PLASTIC	6	8
	ALL DEVICES	CERAMIC	7	10
$C_{OUT}^*$	OUTPUT CAPACITANCE	PLASTIC	8	11
	ALL DEVICES	CERAMIC	9	13

\*This parameter is periodically sampled and is not 100% tested. Condition of measurement is  $f = 1\text{ MHz}$ ,  $V_{bias} = 2\text{V}$ ,  $V_{CC} = 0\text{V}$ , and  $T_A = 25^\circ\text{C}$ .

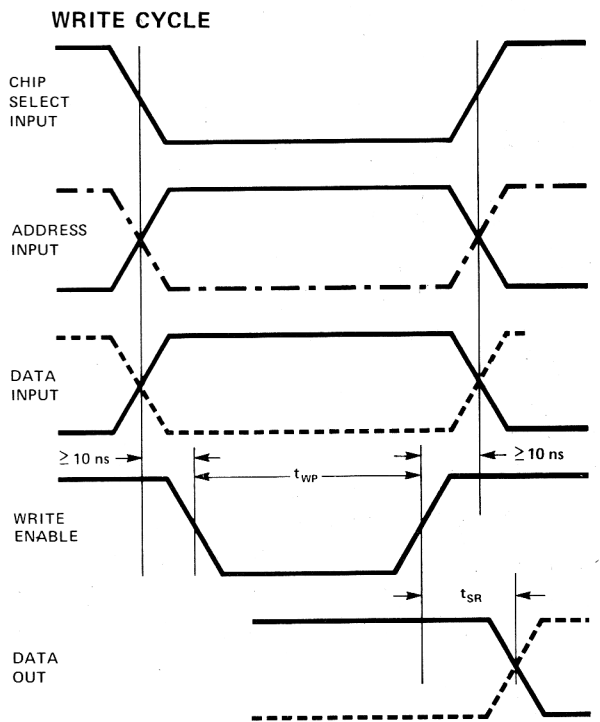
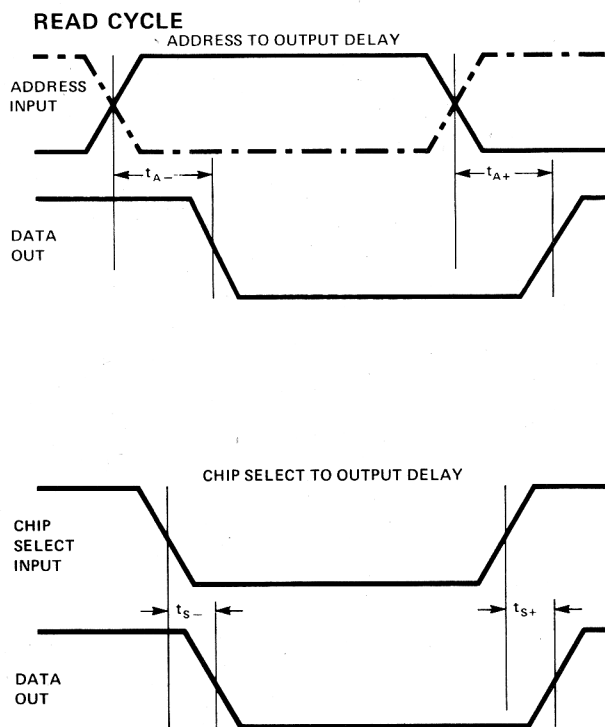
#### Conditions of Test:

- Input Pulse amplitudes: 2.5V
- Input Pulse rise and fall times: 5 nanoseconds between 1 volt and 2 volts
- Measurements made at 1.5 volt level

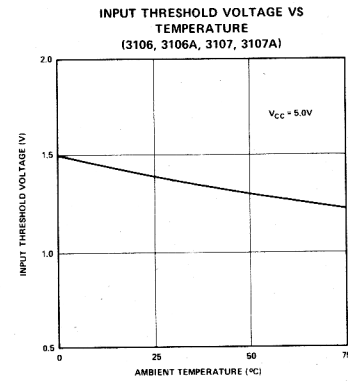
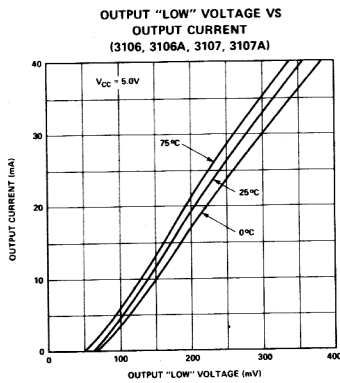
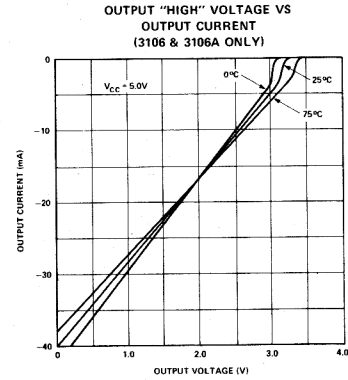
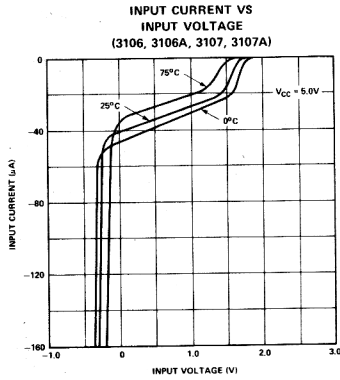
#### Test Load



### Waveforms



Typical D. C. Characteristics



Typical A. C. Characteristics

