

## 64-Bit Read/Write Memories

### General Description

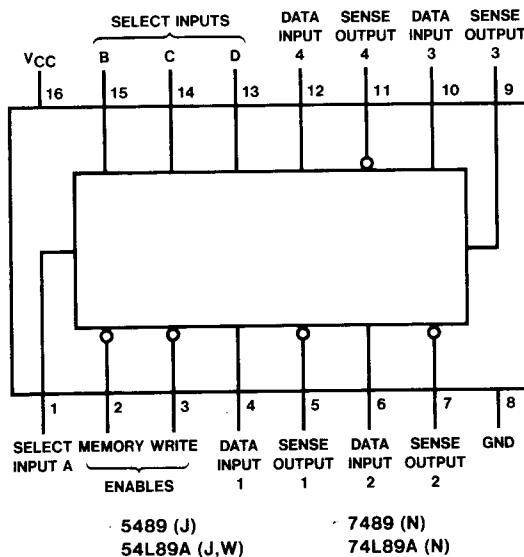
The DM5489B/DM7489B, DM54L89A/DM74L89A are fully decoded 64-bit RAMs organized as 16, 4-bit words. The memory is addressed by applying a binary number to the four Address inputs. After addressing, information may be either written into or read from the memory. To write, both the Memory Enable and the Write Enable inputs must be in the logical "0" state. Information applied to the four Write inputs will then be written into the addressed location. To read information from the memory the Memory Enable input must be in the logical "0" state and the Write Enable input in the logical "1" state. Information will be read as the complement of what was written into the memory. When the Memory Enable input is in the logical "1" state, the outputs will go to the logical "1" state.

The "A" suffix on the low power versions is used to denote that full "tenth-power" technology has been employed in building this RAM.

### Features

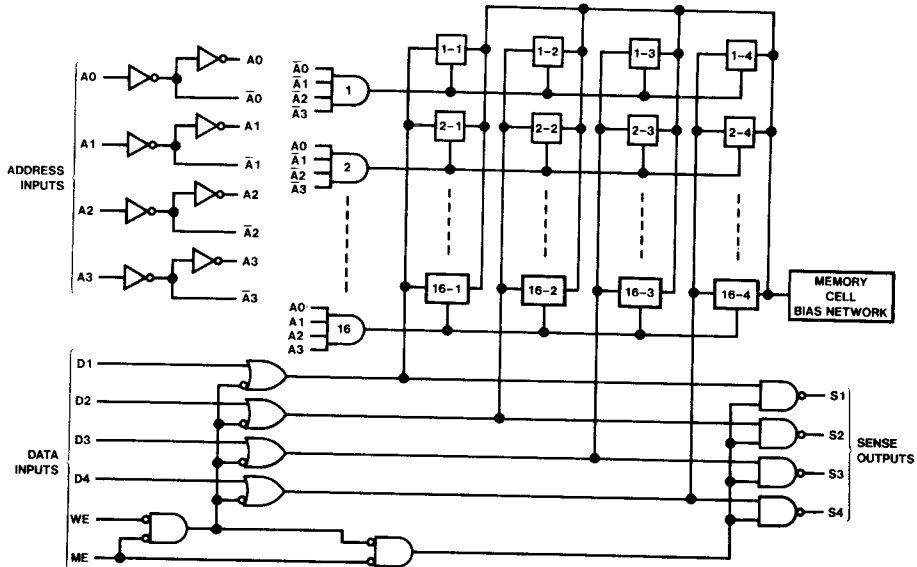
- For application as a "scratch pad" memory with nondestructive read-out
- Fully decoded memory organized as 16 words of four bits each
- Fast access time
  - DM54/74—35 ns typical
  - DM54L/74L—110 ns
- Diode-clamped, buffered inputs
- Open-collector outputs provide wire-OR capability
- Typical power dissipation
  - DM54/74—400 mW
  - DM54L/74L—75 mW
- Pin compatible with 3101, MM5501

### Connection Diagram



### Truth Table

Memory Enable	Write Enable	Operation	Outputs
0	0	Write	Logical "1" State
0	1	Read	Complement of Data Stored in Memory
1	X	Hold	Logical "1" State

**Logic Diagram**

**Electrical Characteristics** Over recommended operating free-air temperature range (unless otherwise noted)

Parameter		Conditions	DM54/74			DM54/74			Units
			89			L89A			
			Min	Typ (1)	Max	Min	Typ (1)	Max	
V <sub>IH</sub>	High Level Input Voltage		2			2		V	
V <sub>IL</sub>	Low Level Input Voltage				0.8		0.7	V	
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -12 mA			-1.5		-1.5	V	
I <sub>CEX</sub>	High Level Output Current	V <sub>CC</sub> = Min, V <sub>IH</sub> = 2 V V <sub>IL</sub> = Max, V <sub>OH</sub> = 5.5 V			100		50	μA	
I <sub>OL</sub>	Low Level Output Current				20		50	mA	
					12		2.0		
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, V <sub>IH</sub> = 2 V V <sub>IL</sub> = Max, I <sub>OL</sub> = Max			12		3.6	V	
					12		0.3		
					0.4		0.4		
I <sub>I</sub>	Input Current at Maximum Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5 V			1		0.1	mA	
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4 V			40		10	μA	
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max					-0.18	mA	
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = Max (2)			-1.6				
C <sub>O</sub>	Off-State Output Capacitance	V <sub>CC</sub> = 5 V, V <sub>O</sub> = 2.0 V, f = 1 MHz			80	120	15	19	mA
					6		N/A		

Note 1: All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

Note 2: I<sub>CC</sub> is measured with all inputs grounded.

**Switching Characteristics**  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ 

Parameter		Condition	DM54 / 74			Conditions	DM54 / 74L			Units
			89				L89A			
			Min	Typ	Max		Min	Typ	Max	
t <sub>PLH</sub>	Propagation Delay Time, Low-to-High Level Output From Memory Enable	C <sub>L</sub> = 30 pF R <sub>L1</sub> = 300 Ω R <sub>L2</sub> = 600 Ω		23	35	C <sub>L</sub> = 50 pF R <sub>L</sub> = 4 kΩ		64	90	ns
t <sub>PHL</sub>	Propagation Delay Time, High-to-Low Level Output From Memory Enable			23	35			33	60	ns
t <sub>PLH</sub>	Propagation Delay Time, Low-to-High Level Output From Select			34	50			90	150	ns
t <sub>PHL</sub>	Propagation Delay Time, High-to-Low Level Output From Select			35	50			78	150	ns
t <sub>SR</sub>	Sense Recovery Time After Writing			35	50			110	165	ns
t <sub>w</sub>	Width of Write-Enable Pulse		40			50			ns	
t <sub>SETUP</sub>	Setup Time, Data Input With Respect to Write Enable		0			0			ns	
t <sub>SETUP</sub>	Select Input Setup Time With Respect to Write Enable		0			0			ns	
t <sub>HOLD</sub>	Hold Time, Data Input With Respect to Write Enable		0			0			ns	
t <sub>HOLD</sub>	Select Input Hold Time After Writing		5			0			ns	