Bipolar RAMs

DM5489/DM7489 (SN5489/SN7489)
64-bit random access read/write memory

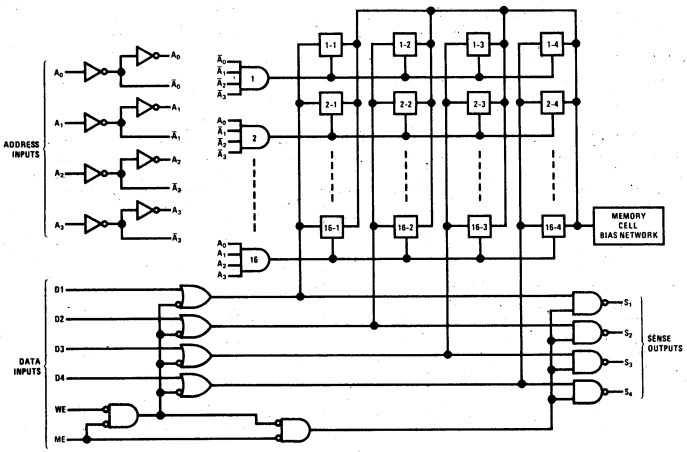
general description

The DM5489/DM7489 is a fully decoded 64-bit RAM 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.

features

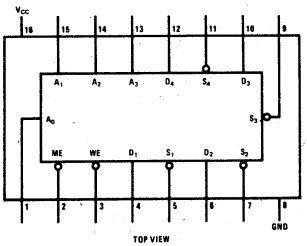
- Series 54/74 compatible
- Organized as 16 4-bit words
- Typical access from chip enable 23 ns
- Typical access 35 ns
- Typical power dissipation 400 mW
- Open collector outputs to permit "wire OR" capability

block diagram



connection diagram

Dual-In-Line Package



Order Number DM5489J or DM7489J
See Package 10

Order Number DM7489N
See Package 15

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

absolute maximum ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Output Voltage	5.5V
Operating Temperature Range	
DM5489	−55°C to +125°C
DM7489	0°C to +70°C
Storage Temperature Range	−65°C to +150°C
Lead Temperature (Soldering, 10 sec)	300°C

electrical characteristics (Note 2)

PARAMETER		CONDITIONS		MIN	TYP	MAX	UNITS
Logical "1" Input Voltage	DM5489	V_{CC} = 4.5V		2.0			V
	DM7489	V_{CC} = 4.75V					
Logical "0" Input Voltage	DM5489	V_{CC} = 4.5V				0.8	V
	DM7489	V_{CC} = 4.75V					
Logical "1" Output Current	DM5489	V_{CC} = 5.5V	V_O = 5.25V			100	μA
	DM7489	V_{CC} = 5.25V				20	μA
Logical "0" Output Voltage	DM5489	V_{CC} = 4.5V	I_O = 12 mA			0.4	V
	DM7489	V_{CC} = 4.75V					
Logical "1" Input Current	DM5489	V_{CC} = 5.5V	V_{IN} = 2.4V			40	μA
	DM7489	V_{CC} = 5.25V					
	DM5489	V_{CC} = 5.5V	V_{IN} = 5.5V			1	mA
	DM7489	V_{CC} = 5.25V					
Logical "0" Input Current	DM5489	V_{CC} = 5.5V				−1.6	mA
	DM7489	V_{CC} = 5.25V					
Supply Current	DM5489	V_{CC} = 5.5V	All Inputs at GND		80	120	mA
	DM7489	V_{CC} = 5.25V					
Input Clamp Voltage	DM5489	V_{CC} = 4.5V	I_{IN} = −12 mA			V_{CC} −1.5	V
	DM7489	V_{CC} = 4.75V					

switching characteristics (Over recommended operating ranges of V_{CC} and T_A)

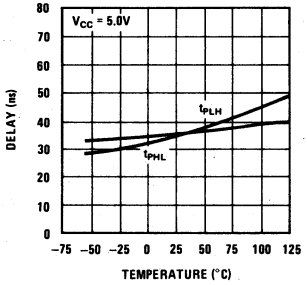
PARAMETER			CONDITIONS	DM5489			DM7489			UNITS
				MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Access Time From Address		R_{L1} = 300Ω, R_{L2} = 600Ω, C_L = 30 pF		34	80		34	60	ns
t_{PHL}					35	80		35	60	ns
t_{PLH}	Disable Time From Memory Enable				23	55		23	40	ns
t_{PHL}	Enable Time From Memory Enable				23	55		23	40	ns
t_{SETUP}	Setup Time	Address to Write Enable		0	−14		0	−14		ns
		Data to Write Enable		0	−15		0	−15		ns
		Memory Enable To Write Enable		0	−10		0	−10		ns
t_{HOLD}	Hold Time	Address From Write Enable		5	−7		5	−7		ns
		Data From Write Enable		0	−14		0	−14		ns
		Memory Enable From Write Enable		0	−10		0	−10		ns
t_{WP}	Write Pulse Width			50	20		40	20		ns
t_{SR}	Sense Recovery Time				31	65		31	55	ns

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

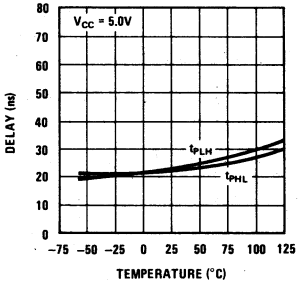
Note 2: Unless otherwise specified min/max limits apply across the −55°C to +125°C temperature range for the DM5489 and across the 0°C to 70°C range for the DM7489. All typicals are given for V_{CC} = 5.0V and T_A = 25°C.

typical performance characteristics

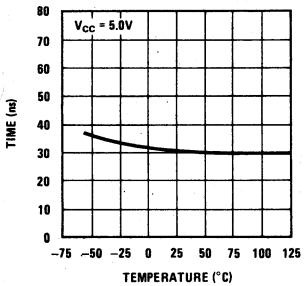
Delay from Address to Output



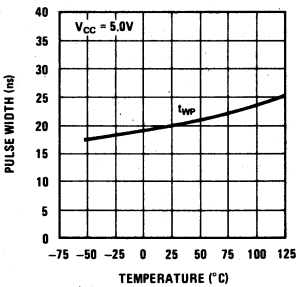
Delay from Memory Enable to Output



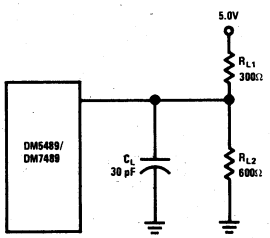
Sense Recovery Time



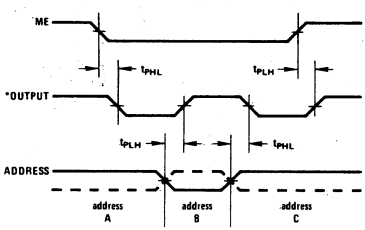
Minimum Write Pulse Width



ac test circuit and switching time waveforms



Read Cycle



*Output shown for stored data in address A = 1, in address B = 0.

Write Cycle