NATIONAL

Bipolar ROMs
Advance Information

DM8531 16,384-bit ROM

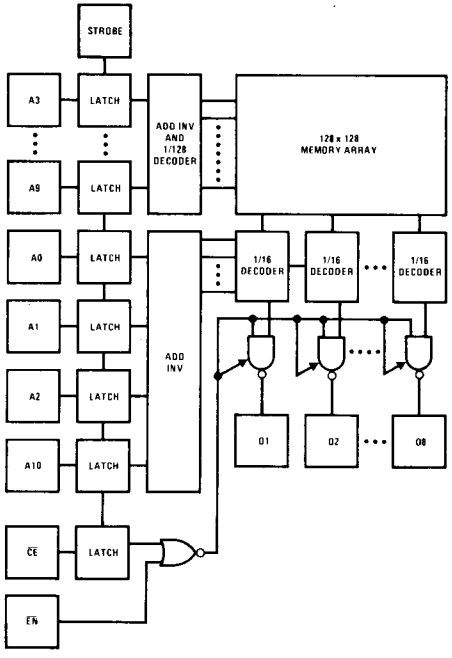
general description

The DM8531 is a 16,384-bit bipolar mask programmable ROM organized as 2048 x 8-bit words. Eleven address inputs select the desired 1-of-2048 words. All eleven address inputs and one of the two enable inputs have latch feature. The latch function is controlled by the strobe input. The two enable lines are used to either enable or disable the circuit. Truth table and logic diagram for this device are shown below. TRI-STATE® outputs allow for expansion to a greater number of words without sacrifice in speed as would be evidenced by open-collector outputs.

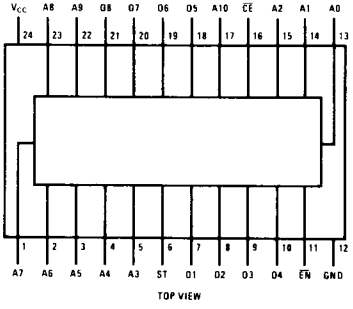
features

- 2k x 8 organization
- On-chip input latches
- TRI-STATE® outputs

logic and connection diagrams



Dual-In-Line Package



Order Number DM8531J
See Package 11
Order Number DM8531N
See Package 18

truth table

t			t + 1			
$\overline{CE}$	$\overline{EN}$	ST	$\overline{CE}$	$\overline{EN}$	ST	OUTPUTS
X	X	X	0	0	1	Read Stored Data
X	X	X	1	X	1	Hi-Z State
X	X	X	X	1	1	Hi-Z State
0	X	1	X	0	0	Read Stored Data for Address Inputs at t
1	X	1	X	X	0	Hi-Z State
X	X	X	X	1	0	Hi-Z State

absolute maximum ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Output Voltage	5.5V
Storage Temperature Range	−65°C to +160°C
Lead Temperature (Soldering, 10 seconds)	300°C

operating conditions

	MIN	MAX	UNITS
Supply Voltage (V_{CC})	4.75	5.25	V
Temperature (T_A)	0	+70	°C

electrical characteristics (Notes 2 and 3)

PARAMETER		CONDITIONS		MIN	TYP	MAX	UNITS
V_{IH}	Logical "1" Input Voltage	V_{CC} = Min		2			V
I_{IH}	Logical "1" Input Current	V_{CC} = Max	V_{IN} = 2.4V			40	μA
			V_{IN} = 5.5V			1	mA
V_{IL}	Logical "0" Input Voltage	V_{CC} = Min				0.8	V
I_{IL}	Logical "0" Input Current	V_{CC} = Max, V_{IN} = 0.4V				−0.8	mA
V_{CD}	Input Clamp Voltage	V_{CC} = Min, V_{IN} = −12 mA		−1.5			V
V_{OH}	Logical "1" Output Voltage	V_{CC} = Min, I_{OUT} = −0.4 mA		2.4			V
I_{OS}	Output Short Circuit Current	V_{CC} = Max, V_{OUT} = 0V, (Note 4)		−15		−50	mA
V_{OL}	Logical "0" Output Voltage	V_{CC} = Min, I_{OUT} = 6 mA				0.45	V
I_{CC}	Supply Current	V_{CC} = Max			115	160	mA
I_{OZ}	TRI-STATE Output Current	V_{CC} = Max	V_{OUT} = 0.4V			−40	μA
			V_{OUT} = 2.4V			40	μA

switching characteristics

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
t_{PHL}	Propagation Delay to a Logical "0" from Address Inputs to Outputs			200	450	ns
t_{PLH}	Propagation Delay to a Logical "1" from Address Inputs to Outputs			150	450	ns
t_{HZ}	Delay from Enable ($\overline{CE}$, $\overline{EN}$) to High Impedance State (from Logical "1" Level)			20	50	ns
t_{LZ}	Delay from Enable ($\overline{CE}$, $\overline{EN}$) to High Impedance State (from Logical "0" Level)			40	60	ns
t_{ZH}	Delay from Enable ($\overline{CE}$, $\overline{EN}$) to Logical "1" Level (from High Impedance State)			40	80	ns
t_{ZL}	Delay from Enable ($\overline{CE}$, $\overline{EN}$) to Logical "0" Level (from High Impedance State)			70	165	ns
t_{S1}	Address Set-Up Time		30	10		ns
t_{H1}	Address Hold Time		30	10		ns
t_{S2}	Enable Set-Up Time		30	10		ns
t_{H2}	Enable Hold Time		30	10		ns
t_W	Minimum Strobe Pulse Width		40	20		ns
t_{ST}	Strobe Access Time			250	450	ns

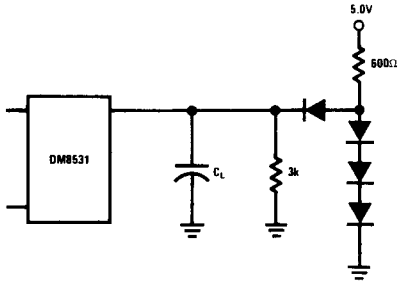
Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual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

Note 2: Unless otherwise specified min/max limits apply across the 0°C to +70°C range for the DM8531. All typicals are given for V_{CC} = 5.0V and T_A = 25°C.

Note 3: All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max or min on absolute value basis.

Note 4. Only one output at a time should be shorted.

ac test circuit

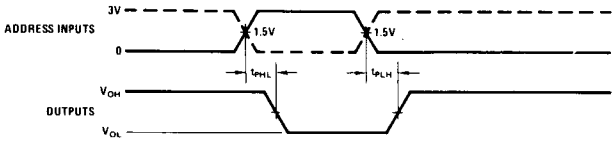


All Diodes are FD100

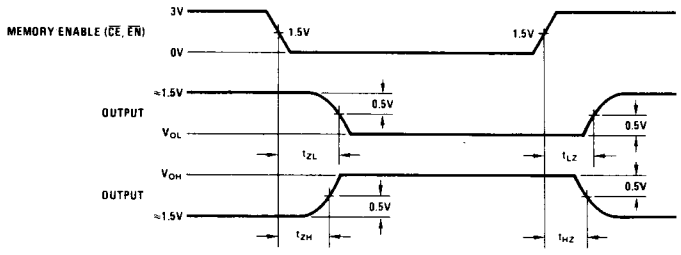
AC PARAMETERS	CL
t_{LZ}	5 pF
t_{HZ}	5 pF
All Others	50 pF

switching time waveforms

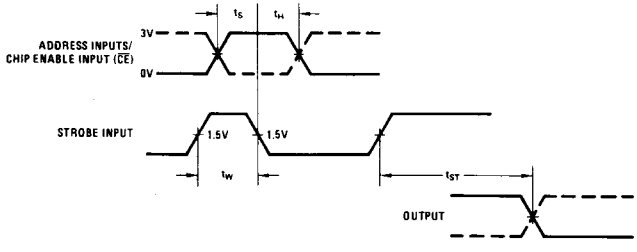
Address to Output Access Time



Memory Enable to Output Access Time



Strobe Input Setup and Hold Time



Notes: Input pulse waveform characteristics
f = 1 MHz, $t_r = t_f \leq 10$ ns (10% to 90%), duty cycle = 50%