National Semiconductor

Bipolar PROMs

DM54S188/DM74S188 256-Bit (32 x 8) Open-Collector PROM

DM54S288/DM74S288 256-Bit (32 x 8) TRI-STATE® PROM

General Description

These Schottky PROM memories are organized in the popular 32 words by 8 bits configuration. A memory enable input is provided to control the output states. When the enable input is in the low state, the outputs present the contents of the selected word.

If the enable input is raised to a high level, it causes all 8 outputs to go to the "OFF" or high impedance state. The memories are available in both open-collector and TRI-STATE® versions and are available as ROM's as well as PROM's.

PROM's are shipped from the factory with lows in all locations. A high may be programmed into any selected location by following the programming instructions. Once programmed, it is impossible to go back to a low.

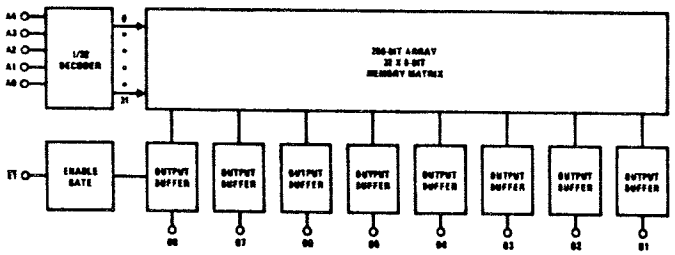
See the last page of this section for detailed programming information.

Features

- Advanced titanium-tungsten (Ti-W) fuses
- Schottky-clamped for high speed
  Address access—35 ns max
  Enable access—25 ns max
- PNP inputs reduce input loading
- All dc and ac parameters guaranteed over temperature
- Low voltage TRI-SAFE™ programming
- Board level programming

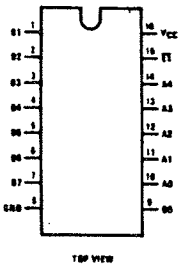
	Military	Commercial	Open-Collector	TRI-STATE	Package
DM74S188		X	X		N, J
DM74S288		X		X	N, J
DM54S188	X		X		J
DM54S288	X			X	J

Block Diagram



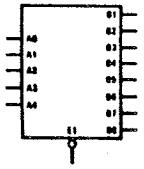
Connection Diagram

Dual-In-Line Package



Top View

Logic Symbol



Order Number DM54S188J, DM54S288J, DM74S188J or DM74S288J
See NS Package J16A

Order Number DM74S188N or DM74S288N
See NS Package N16A

Absolute Maximum Ratings (Note 1)

Supply Voltage (Note 2)	-0.5V to +7V
Input Voltage (Note 2)	-1.2V to +5.5V
Output Voltage (Note 2)	-0.5V to +5.5V
Storage Temperature	-65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

Operating Conditions

	MIN	MAX	UNITS
Supply Voltage (V_{CC})			
DM54S188, DM54S288	4.5	5.5	V
DM74S188, DM74S288	4.75	5.25	V
Ambient Temperature (T_A)			
DM54S188, DM54S288	-55	+125	°C
DM74S188, DM74S288	0	+70	°C
Logical "0" Input Voltage (Low)	0	0.8	V
Logical "1" Input Voltage (High)	2.0	5.5	V

DC Electrical Characteristics (Note 3)

PARAMETER		CONDITIONS	DM54S188, 54S288			DM74S188, 74S288			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
I_{IL}	Input Load Current, All Inputs	V_{CC} = Max, V_{IN} = 0.45V		-80	-250		-80	-250	µA
I_{IH}	Input Leakage Current, All Inputs	V_{CC} = Max, V_{IN} = 2.7V			25			25	µA
I_I	Input Leakage Current, All Inputs	V_{CC} = Max, V_{IN} = 5.5V			1.0			1.0	mA
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = 16 mA		0.35	0.5		0.35	0.45	V
V_{IL}	Low Level Input Voltage				0.80			0.80	V
V_{IH}	High Level Input Voltage		2.0			2.0			V
I_{CEX}	Output Leakage Current (Open-Collector Only) (Note 5)	V_{CC} = Max, V_{CEX} = 2.4V			50			50	µA
		V_{CC} = Max, V_{CEX} = 5.5V			100			100	µA
V_C	Input Clamp Voltage	V_{CC} = Min, I_{IN} = -18 mA		-0.8	-1.2		-0.8	-1.2	V
C_{IN}	Input Capacitance	V_{CC} = 5V, V_{IN} = 2V, T_A = 25°C, 1 MHz		4.0			4.0		pF
C_O	Output Capacitance	V_{CC} = 5V, V_O = 2V, T_A = 25°C, 1 MHz, Output "OFF"		6.0			6.0		pF
I_{CC}	Power Supply Current	V_{CC} = Max, All Inputs Grounded, All Outputs Open		70	110		70	110	mA
TRI-STATE PARAMETERS									
I_{SC}	Output Short Circuit Current (Note 5)	V_O = 0V, V_{CC} = Max, (Note 4)	-20		-70	-20		-70	mA
I_{HZ}	Output Leakage (TRI-STATE)	V_{CC} = Max, V_O = 0.45 to 2.4V, Chip Disabled			±50			±50	µA
V_{OH}	Output Voltage High, (Note 5)	I_{OH} = -2 mA	2.4	3.2					V
		I_{OH} = -6.5 mA				2.4	3.2		V

AC Electrical Characteristics (With standard load)

PARAMETER		CONDITIONS	DM54S188, 54S288 5V ±10%; -55°C to +125°C			DM74S188, 74S288 5V ±5%; 0°C to +70°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{AA}	Address Access Time			22	45		22	35	ns
t_{EA}	Enable Access Time			15	30		15	20	ns
t_{ER}	Enable Recovery Time			15	35		15	25	ns

Note 1: Absolute maximum ratings are those values beyond which the device may be permanently damaged. They do not mean that the device may be operated at these values.

Note 2: These limits do not apply during programming. For the programming ratings, refer to the programming instructions.

Note 3: These limits apply over the entire operating range unless stated otherwise. All typical values are for V_{CC} = 5V and T_A = 25°C.

Note 4: During I_{SC} measurement, only one output at a time should be grounded. Permanent damage may otherwise result.

Note 5: To measure V_{OH}, I_{CEX} or I_{SC} on an unprogrammed part, apply 10.5V to either A0 (pin 10) or A4 (pin 14).

National Semiconductor

Bipolar PROMs

DM54S287/DM74S287 1024-Bit (256 x 4) TRI-STATE® PROM
DM54S387/DM74S387 1024-Bit (256 x 4) Open-Collector PROM

General Description

These Schottky memories are organized in the popular 256 words by 4 bits configuration. Two memory enable inputs are provided to control the output states. When both enable inputs are in the low state, the outputs present the contents of the selected word.

If either or both of the enable inputs is raised to a high state, it causes all four outputs to go to the "OFF" or high impedance state. The memories are available in both open-collector and TRI-STATE versions and are available as ROM's as well as PROM's.

PROM's are shipped from the factory with lows in all locations. A high may be programmed into any selected location by following the programming instructions. Once programmed, it is impossible to go back to a low.

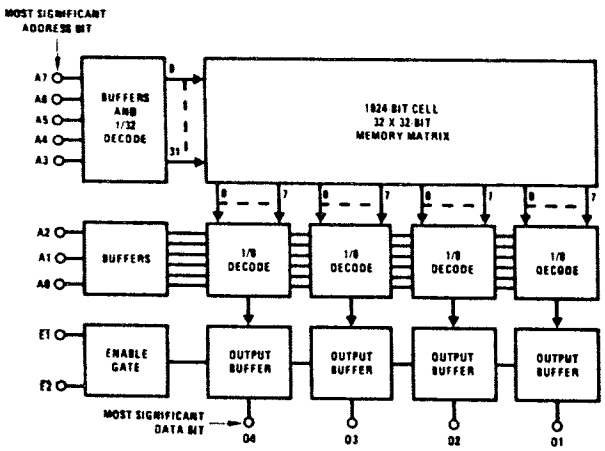
See the last page of this section for detailed programming information.

Features

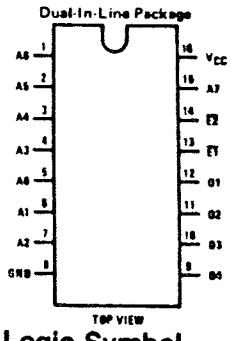
- Advanced titanium-tungsten (Ti-W) fuses
- Schottky-clamped for high speed
  - Address access—50 ns max
  - Enable access—25 ns max
- PNP inputs reduce input loading
- All dc and ac parameters guaranteed over temperature
- Low voltage TRI-SAFE™ programming
- Board level programming
- ROM mates are DM74S187 and DM85S97

	Military	Commercial	Open-Collector	TRI-STATE	Package
DM74S387		X	X		N, J
DM74S287		X		X	N, J
DM54S387	X		X		J
DM54S287	X			X	J

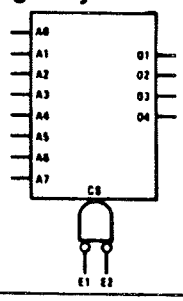
Block Diagram



Connection Diagram



Logic Symbol



Order Number DM54S287J, DM54S387J, DM74S287J or DM74S387J
See NS Package J16A

Order Number DM74S287N or DM74S387N
See NS Package N16A

Absolute Maximum Ratings (Note 1)

Supply Voltage (Note 2)	−0.5V to +7V
Input Voltage (Note 2)	−1.2V to +5.5V
Output Voltage (Note 2)	−0.5V to +5.5V
Storage Temperature	−65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

Operating Conditions

	MIN	MAX	UNITS
Supply Voltage (V_{CC})			
DM54S387, DM54S287	4.5	5.5	V
DM74S387, DM74S287	4.75	5.25	V
Ambient Temperature (T_A)			
DM54S387, DM54S287	−55	+125	°C
DM74S387, DM74S287	0	+70	°C
Logical "0" Input Voltage (Low)	0	0.8	V
Logical "1" Input Voltage (High)	2.0	5.5	V

DC Electrical Characteristics (Note 3)

PARAMETER		CONDITIONS	DM54S387/54S287			DM74S387/74S287			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
I_F	Input Load Current, All Inputs	V_{CC} = Max, V_F = 0.45V		−80	−250		−80	−250	μA
I_R	Input Leakage Current, All Inputs	V_{CC} = Max, V_R = 2.7V			25			25	μA
I_{RB}	Input Leakage Current, All Inputs	V_{CC} = Max, V_{RB} = 5.5V			1.0			1.0	mA
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = 16 mA		0.35	0.5		0.35	0.45	V
V_{IL}	Low Level Input Voltage				0.80			0.80	V
V_{IH}	High Level Input Voltage		2.0			2.0			V
I_{CEX}	Output Leakage Current (Open-Collector Only) (Note 5)	V_{CC} = Max, V_{CEX} = 2.4V			50			50	μA
		V_{CC} = Max, V_{CEX} = 5.5V			100			100	μA
V_C	Input Clamp Voltage	V_{CC} = Min, I_{IN} = −18 mA		−0.8	−1.2		−0.8	−1.2	V
C_{IN}	Input Capacitance	V_{CC} = 5V, V_{IN} = 2V, T_A = 25°C, 1 MHz		4.0			4.0		pF
C_O	Output Capacitance	V_{CC} = 5V, V_O = 2V, T_A = 25°C, 1 MHz, Output "OFF"		6.0			6.0		pF
I_{CC}	Power Supply Current	V_{CC} = Max, All Inputs Grounded, All Outputs Open		80	130		80	130	mA
TRI-STATE PARAMETERS									
I_{SC}	Output Short Circuit Current	V_O = 0V, V_{CC} = Max, (Note 4)	−20		−70	−20		−70	mA
I_{HZ}	Output Leakage (TRI-STATE)	V_{CC} = Max, V_O = 0.45 to 2.4V, Chip Disabled			±50			±50	μA
V_{OH}	Output Voltage High, (Note 5)	I_{OH} = −2 mA	2.4	3.2					V
		I_{OH} = −6.5 mA				2.4	3.2		V

AC Electrical Characteristics (With standard load)

PARAMETER		CONDITIONS	DM54S387/54S287 5V ±10%; −55°C to +125°C			DM74S387/74S287 5V ±5%; 0°C to +70°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{AA}	Address Access Time	*(Figure 1)*	10	35	60	10	35	50	ns
t_{EA}	Enable Access Time	*(Figure 2)*	5	15	30	5	15	25	ns
t_{ER}	Enable Recovery Time	*(Figure 2)*	5	15	30	5	15	25	ns

Note 1: Absolute maximum ratings are those values beyond which the device may be permanently damaged. They do not mean that the device may be operated at these values.

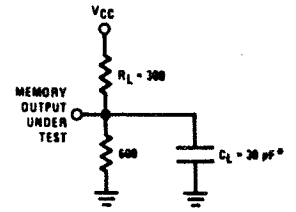
Note 2: These limits do not apply during programming. For the programming ratings, refer to the programming instructions.

Note 3: These limits apply over the entire operating range unless stated otherwise. All typical values are for V_{CC} = 5V and T_A = 25°C.

Note 4: During I_{SC} measurement, only one output at a time should be grounded. Permanent damage may otherwise result.

Note 5: To measure V_{OH} or I_{CEX} on an unprogrammed part, apply 10.5V to both A7 and A2 (pin 15 and pin 7).

Standard Test Load



*C_L includes probe and jig capacitance.

- Input waveforms are supplied by a pulse generator having the following characteristics: PRR = 1 MHz, Z_{OUT} = 50Ω, $t_r \leq 2.5$ ns and $t_f \leq 2.5$ ns (between 1.0V and 2.0V).
- t_{AA} is measured with both enable inputs at a steady low level.
- t_{EA} and t_{ER} are measured from the 1.5V on inputs and outputs with all address inputs at a steady level and with the unused enable input at a steady low level.

Switching Time Waveforms

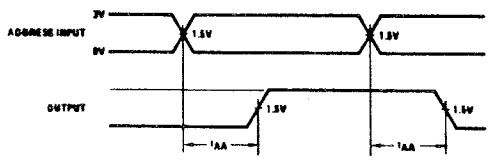


FIGURE 1. Address Access Time

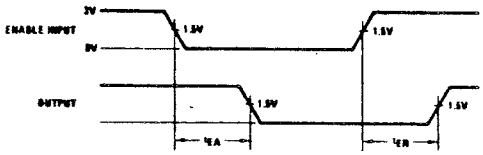
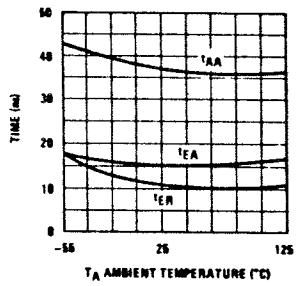


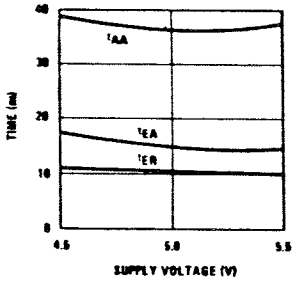
FIGURE 2. Enable Access Time and Recovery Time

Typical Performance Characteristics

Typical Switching Characteristics as a Function of Temperature (V_{CC} = 5V, Standard Load)

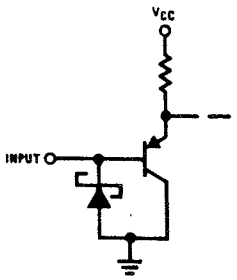


Typical Switching Characteristics as a Function of V_{CC} (T_A = 25°C, Standard Load)

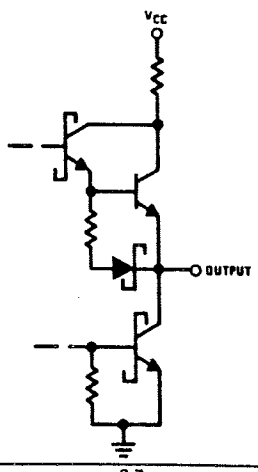


Equivalent Circuits

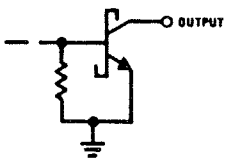
Equivalent of Each Input



Typical TRI-STATE Output



Typical Open-Collector Output



National Semiconductor

Bipolar PROMs

DM54S473/DM74S473 4096-Bit (512 x 8) Open-Collector PROM
DM54S472/DM74S472 4096-Bit (512 x 8) TRI-STATE® PROM

General Description

These Schottky PROM memories are organized in the popular 512 words by 8 bits configuration. A memory enable input is provided to control the output states. When the enable input is in the low state, the outputs present the contents of the selected word.

If the enable input is raised to a high level, it causes all 8 outputs to go to the "OFF" or high impedance state. The memories are available in both open-collector and TRI-STATE versions.

PROM's are shipped from the factory with lows in all locations. A high may be programmed into any selected location by following the programming instructions. Once programmed, it is impossible to go back to a low.

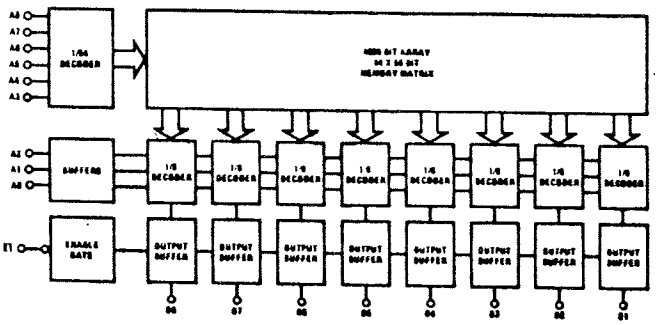
See the last page of this section for detailed programming information.

Features

- Advanced titanium-tungsten (Ti-W) fuses
- Schottky-clamped for high speed
  - Address access—60 ns max
  - Enable access—30 ns max
- PNP inputs reduce input loading
- All dc and ac parameters guaranteed over temperature
- Low voltage TRI-SAFE™ programming
- Board level programming
- High density 20-pin package

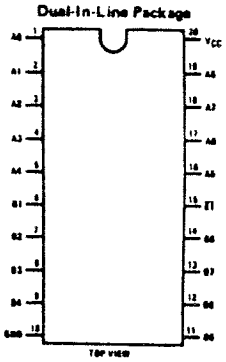
	Military	Commercial	Open-Collector	TRI-STATE	Package
		X	X		N, J
DM74S472		X		X	N, J
DM54S473	X		X		J
DM54S472	X			X	J

Block Diagram

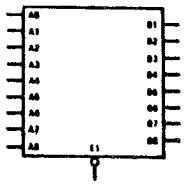


Connection Diagram

Dual-In-Line Package



Logic Symbol



Order Number DM54S472J, DM54S473J, DM74S472J or DM74S473J
See NS Package J20B

Order Number DM74S472N or DM74S473N
See NS Package N20A

Absolute Maximum Ratings (Note 1)

Supply Voltage (Note 2)	−0.5V to +7V
Input Voltage (Note 2)	−1.2V to +5.5V
Output Voltage (Note 2)	−0.5V to +5.5V
Storage Temperature	−65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

Operating Conditions

	MIN	MAX	UNITS
Supply Voltage (V_{CC})			
DM54S473, DM54S472	4.5	5.5	V
DM74S473, DM74S472	4.75	5.25	V
Ambient Temperature (T_A)			
DM54S473, DM54S472	−55	+125	°C
DM74S473, DM74S472	0	+70	°C
Logical "0" Input Voltage (Low)	0	0.8	V
Logical "1" Input Voltage (High)	2.0	5.5	V

DC Electrical Characteristics (Note 3)

PARAMETER		CONDITIONS	DM54S473, 54S472			DM74S473, 74S472			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
I_{IL}	Input Load Current, All Inputs	V_{CC} = Max, V_{IN} = 0.45V		−80	−250		−80	−250	μA
I_{IH}	Input Leakage Current, All Inputs	V_{CC} = Max, V_{IN} = 2.7V			25			25	μA
I_I	Input Leakage Current, All Inputs	V_{CC} = Max, V_{IN} = 5.5V			1.0			1.0	mA
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = 16 mA		0.35	0.5		0.35	0.45	V
V_{IL}	Low Level Input Voltage				0.80			0.80	V
V_{IH}	High Level Input Voltage		2.0			2.0			V
I_{CEX}	Output Leakage Current (Open-Collector Only) (Note 6)	V_{CC} = Max, V_{CEX} = 2.4V			50			50	μA
		V_{CC} = Max, V_{CEX} = 5.5V			100			100	μA
V_C	Input Clamp Voltage	V_{CC} = Min, I_{IN} = −18 mA		−0.8	−1.2		−0.8	−1.2	V
C_{IN}	Input Capacitance	V_{CC} = 5V, V_{IN} = 2V, T_A = 25°C, 1 MHz		4.0			4.0		pF
C_O	Output Capacitance	V_{CC} = 5V, V_O = 2V, T_A = 25°C, 1 MHz, Output "OFF"		6.0			6.0		pF
I_{CC}	Power Supply Current	V_{CC} = Max, All Inputs Grounded, All Outputs Open		120	155		120	155	mA
TRI-STATE PARAMETERS									
I_{SC}	Output Short Circuit Current (Note 5)	V_O = 0V, V_{CC} = Max, (Note 4)	−20		−70	−20		−70	mA
I_{HZ}	Output Leakage (TRI-STATE)	V_{CC} = Max, V_O = 0.45 to 2.4V, Chip Disabled			±50			±50	μA
V_{OH}	Output Voltage High, (Note 5)	I_{OH} = −2 mA	2.4	3.2					V
		I_{OH} = −6.5 mA				2.4	3.2		V

AC Electrical Characteristics (With standard load)

PARAMETER		CONDITIONS	DM54S473, 54S472 5V ±10%; −55°C to +125°C			DM74S473, 74S472 5V ±5%; 0°C to +70°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{AA}	Address Access Time				75			60	ns
t_{EA}	Enable Access Time				35			30	ns
t_{ER}	Enable Recovery Time				35			30	ns

Note 1: Absolute maximum ratings are those values beyond which the device may be permanently damaged. They do not mean that the device may be operated at these values.

Note 2: These limits do not apply during programming. For the programming ratings, refer to the programming instructions.

Note 3: These limits apply over the entire operating range unless stated otherwise. All typical values are for V_{CC} = 5V and T_A = 25°C.

Note 4: During I_{SC} measurement, only one output at a time should be grounded. Permanent damage may otherwise result.

Note 5: To measure V_{OH}, I_{CEX} or I_{SC} on an unprogrammed part, apply 10.5V.

National Semiconductor

Bipolar PROMs

DM54S474/DM74S474 4096-Bit (512 x 8) TRI-STATE® PROM
DM54S475/DM74S475 4096-Bit (512 x 8) Open-Collector PROM

General Description

These Schottky memories are organized in the popular 512 words by 8 bits configuration. Four memory enable inputs are provided to control the output states. When E1 and E2 are low and E3 and E4 are high, the output presents the contents of the selected word.

If E1 or E2 are high, or E3 or E4 are low, it causes all 8 outputs to go to the "OFF" or high impedance state. The memories are available in both open-collector and TRI-STATE versions and are available as ROM's as well as PROM's.

PROM's are shipped from the factory with lows in all locations. A high may be programmed into any selected location by following the programming instructions. Once programmed, it is impossible to go back to a low.

See the last page of this section for detailed programming information.

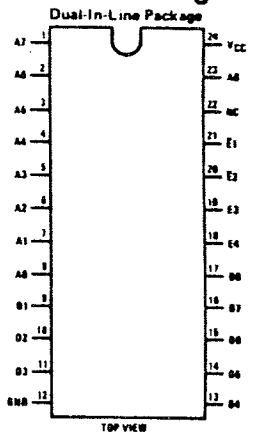
Features

- Advanced titanium-tungsten (Ti-W) fuses
- Schottky-clamped for high speed
  Address access—65 ns
  Enable access—35 ns
- PNP inputs reduce input loading
- All dc and ac parameters guaranteed over temperature
- Low voltage TRI-SAFE™ programming
- Board level programming
- ROM mates are DM87S95 and DM87S96

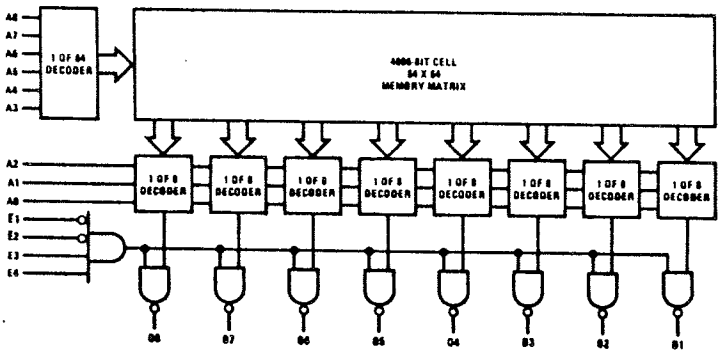
	Military	Commercial	Open-Collector	TRI-STATE	Package
DM74S475		X	X		N, J
DM74S474		X		X	N, J
DM54S475	X		X		J
DM54S474	X			X	J

Connection Diagram

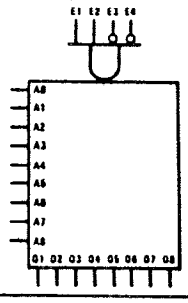
Dual-In-Line Package



Block Diagram



Logic Symbol



Order Number DM54S474J, DM54S475J, DM74S474J or DM74S475J
See NS Package J24A

Order Number DM74S474N or DM74S475N
See NS Package N24B

Absolute Maximum Ratings (Note 1)

Supply Voltage (Note 2)	−0.5V to +7V
Input Voltage (Note 2)	−1.2V to +5.5V
Output Voltage (Note 2)	−0.5V to +5.5V
Storage Temperature	−65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

Operating Conditions

	MIN	MAX	UNITS
Supply Voltage (V_{CC})			
DM54S474, DM54S475	4.5	5.5	V
DM74S474, DM74S475	4.75	5.25	V
Ambient Temperature (T_A)			
DM54S474, DM54S475	−55	+125	°C
DM74S474, DM74S475	0	+70	°C
Logical "0" Input Voltage (Low)	0	0.8	V
Logical "1" Input Voltage (High)	2.0	5.5	V

DC Electrical Characteristics (Note 3)

PARAMETER		CONDITIONS	DM54S474, DM54S475			DM74S474, DM74S475			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
I_{IL}	Input Load Current, All Inputs	V_{CC} = Max, V_{IN} = 0.45V		−80	−250		−80	−250	μA
I_{IH}	Input Leakage Current, All Inputs	V_{CC} = Max, V_{IN} = 2.7V			25			25	μA
I_I	Input Leakage Current, All Inputs	V_{CC} = Max, V_{IN} = 5.5V			1.0			1.0	mA
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = 16 mA		0.35	0.5		0.35	0.45	V
V_{IL}	Low Level Input Voltage				0.80			0.80	V
V_{IH}	High Level Input Voltage		2.0			2.0			V
I_{CEX}	Output Leakage Current (Open-Collector Only) (Note 5)	V_{CC} = Max, V_{CEX} = 2.4V			50			50	μA
		V_{CC} = Max, V_{CEX} = 5.5V			100			100	μA
V_C	Input Clamp Voltage	V_{CC} = Min, I_{IN} = −18 mA		−0.8	−1.2		−0.8	−1.2	V
C_{IN}	Input Capacitance	V_{CC} = 5V, V_{IN} = 2V, T_A = 25°C, 1 MHz		4.0			4.0		pF
C_O	Output Capacitance	V_{CC} = 5V, V_O = 2V, T_A = 25°C, 1 MHz, Output "OFF"		8.0			8.0		pF
I_{CC}	Power Supply Current	V_{CC} = Max, All Inputs Grounded, All Outputs Open		115	170		115	170	mA
TRI-STATE PARAMETERS									
I_{SC}	Output Short Circuit Current (Note 5)	V_O = 0V, V_{CC} = Max, (Note 4)	−20		−70	−20		−70	mA
I_{HZ}	Output Leakage (TRI-STATE)	V_{CC} = Max, V_O = 0.45 to 2.4V, Chip Disabled			±50			±50	μA
V_{OH}	Output Voltage High, (Note 5)	I_{OH} = −2 mA	2.4	3.2					V
		I_{OH} = −6.5 mA				2.4	3.2		V

AC Electrical Characteristics (With standard load)

PARAMETER		CONDITIONS	DM54S474, DM54S475 5V ±10%; −55°C to +125°C			DM74S474, DM74S475 5V ±5%; 0°C to +70°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
t_{AA}	Address Access Time	*(Figure 1)*		40	75		40	65	ns
t_{EA}	Enable Access Time	*(Figure 2)*		20	40		20	35	ns
t_{ER}	Enable Recovery Time	*(Figure 2)*		20	40		20	35	ns

Note 1: Absolute maximum ratings are those values beyond which the device may be permanently damaged. They do not mean that the device may be operated at these values.

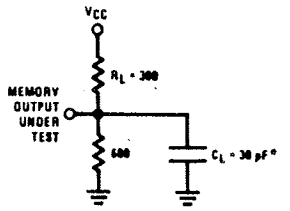
Note 2: These limits do not apply during programming. For the programming ratings, refer to the programming instructions.

Note 3: These limits apply over the entire operating range unless stated otherwise. All typical values are for V_{CC} = 5V and T_A = 25°C.

Note 4: During I_{SC} measurement, only one output at a time should be grounded. Permanent damage may otherwise result.

Note 5: To measure V_{OH}, I_{CEX} or I_{SC} on an unprogrammed part, apply 10.5V to both A7 and A2 (pin 1 and pin 8).

Standard Test Load



*C_L includes probe and jig capacitance.

- Input waveforms are supplied by a pulse generator having the following characteristics: PRR = 1 MHz, Z_{OUT} = 50Ω, $t_r \leq 2.5$ ns and $t_f \leq 2.5$ ns (between 1.0V and 2.0V).
- t_{AA} is measured with both enable inputs at a steady low level.
- t_{EA} and t_{ER} are measured from the 1.5V on inputs and outputs with all address inputs at a steady level and with the unused enable input at a steady low level.

Switching Time Waveforms

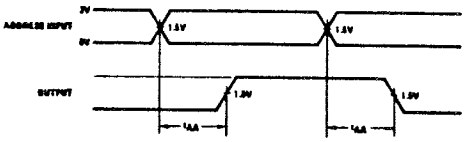


FIGURE 1. Address Access Time

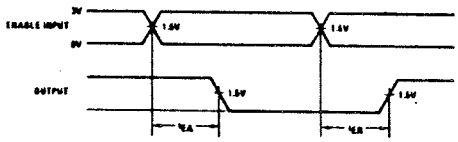
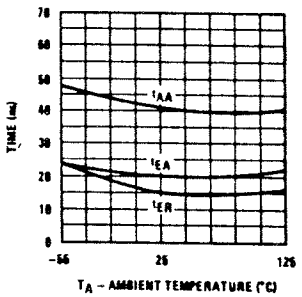


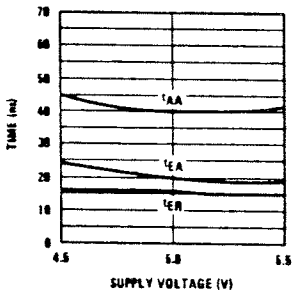
FIGURE 2. Enable Access Time and Recovery Time

Typical Performance Characteristics

Typical Switching Characteristics as a Function of Temperature (V_{CC} = 5V, Standard Load)

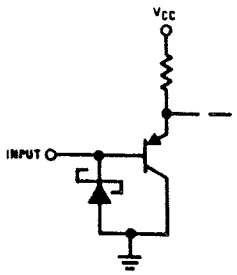


Typical Switching Characteristics as a Function of V_{CC} (T_A = 25°C, Standard Load)

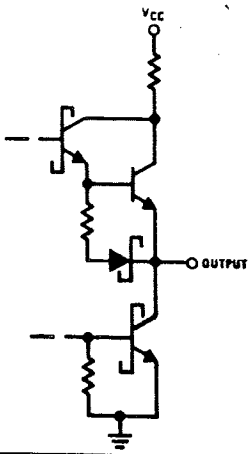


Equivalent Circuits

Equivalent of Each Input



Typical TRI-STATE Output



Typical Open-Collector Output