



DM7575/DM8575, DM7576/DM8576 Programmable Logic Array (PLA)

general description

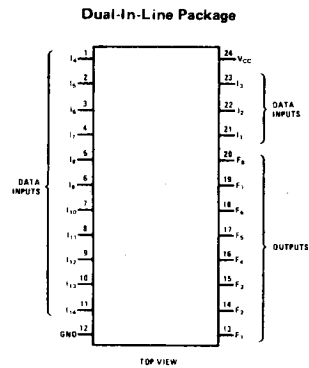
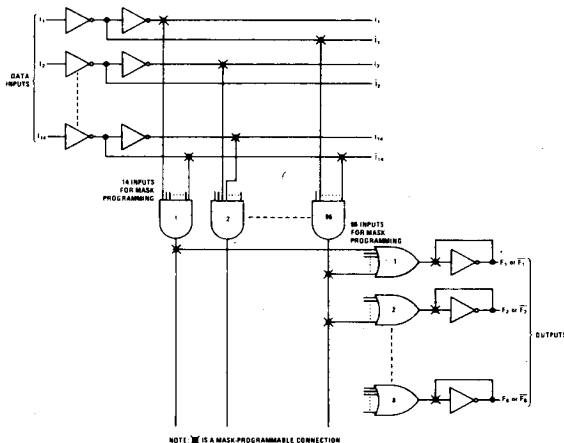
The DM7575/DM8575 and DM7576/DM8576 are mask-programmable logic arrays designed for use in applications where random logic is required. The devices have fourteen data inputs and eight outputs. Each output provides a sum of product terms where each product term can contain any combination of 14 variables or their complements. The total number of product terms which can be provided is 96. Any product term which is repeated is counted only once. Since some functions are more easily represented in their inverted form, an option is provided to allow for either the true or complement of the function on each output. The products are particularly useful in providing control logic for digital systems. The DM7575/

DM8575 has a conventional totem-pole output whereas the DM7576/DM8576 is provided with a passive pullup output. This latter configuration is useful in expanding functions by connection of outputs of different packages.

features

- A 2^{14} by 8 (128k) bit memory would be needed to provide equivalent function
- Typical delay 90 ns
- Typical power dissipation 550 mW
- Series 54/74 compatible

logic and connection diagrams



Order Number DM7575J, DM8575J,
DM7576J or DM8576J
See NS Package J24A

Order Number DM8575N or DM8576N
See NS Package N24B

absolute maximum ratings (Note 1) operating conditions

			MIN	MAX	UNITS
Supply Voltage	7.0V	Supply Voltage (V_{CC})			
Input Voltage	5.5V	DM7575, DM7576	4.5	5.5	V
Storage Temperature Range	-65°C to +150°C	DM8575, DM8576	4.75	5.25	V
Lead Temperature (Soldering, 10 sec)	300°C	Temperature (T_A)			
		DM7575, DM7576	-55	+125	°C
		DM8575, DM8576	0	70	°C

electrical characteristics (Note 2)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Logical "1" Input Voltage	$V_{CC} = \text{Min}$	2			V
Logical "0" Input Voltage	$V_{CC} = \text{Min}$			0.8	V
Logical "1" Output Voltage (DM7575/DM8575 Only)	$V_{CC} = \text{Min}$, $V_{IN(1)} = 2V$, $V_{IN(0)} = 0.8V$ $I_{OUT} = -800\mu A$	2.4			V
Logical "1" Output Current (DM7576/DM8576 Only)	$V_{CC} = \text{Max}$, $V_{OUT} = 5.5V$			100	μA
Logical "0" Output Voltage	$V_{CC} = \text{Min}$, $V_{IN(1)} = 2V$, $V_{IN(0)} = 0.8V$ $I_{OUT} = +12 \text{ mA}$			0.4	V
Logical "1" Input Current	$V_{CC} = \text{Max}$, $V_{IN} = 2.4V$ $V_{IN} = 5.5V$			40 1	μA mA
Logical "0" Input Current	$V_{CC} = \text{Max}$, $V_{IN} = 0.4V$			-1.0	mA
Output Short Circuit Current (Note 3)	DM7575/76 DM8575/76 $V_{CC} = \text{Max}$, $V_{OUT} = 0V$	-20/-1.75 -18/-1.65		-55/-3.5 -55/-3.3	mA
Supply Current	$V_{CC} = \text{Max}$		110	170	mA
Input Diode Clamp Voltage	$V_{CC} = \text{Min}$, $T_A = 25^\circ C$ $I_{IN} = -12 \text{ mA}$			-1.5	V
Propagation Delay to a Logical "0" from Data Inputs to Outputs, t_{pd0}	$V_{CC} = 5.0V$, $T_A = 25^\circ C$ $C_L = 50 \text{ pF}$, $R_L = 400\Omega$		100	150	ns
Propagation Delay to a Logical "1" from Data Inputs to Outputs, t_{pd1}	$V_{CC} = 5.0V$ $T_A = 25^\circ C$		80	150	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 DM7575/76 and across the 0°C to 70°C range for the DM8575/76. All typicals are given for $V_{CC} = 5.0V$ and $T_A = 25^\circ C$.

Note 3: Only one output at a time should be shorted.

standard pattern

1. PART NO. -- (DM7575AAA, DM8575AAA, DM7576AAA, DM8576AAA)
2. PATTERN IDENTIFICATION -- Hollerith 29 (IBM) to ASCII
3. TOTAL NO. OF UNIQUE PRODUCT TERMS USED -- 96
(Repeated Terms Count Only Once)
4. OUTPUT INVERTER OPTION

F8	F7	F6	F5	F4	F3	F2	F1
T	T	T	T	T	T	T	T

5. MATRIX

PRODUCT TERM	INPUT DATA														OUTPUT DATA								CHAR. ASSIGN.		
	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	F8	F7	F6	F5	F4	F3	F2	F1			
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Space
2	0	-0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	1	!
3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	"
4	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	1	#
5	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	\$
6	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	1	0	1	0	1	%
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	&
8	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	1	'
9	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	(
10	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	1)
11	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	*
12	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	1	1	1	+
13	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	,
14	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	1	0	1	0	-
15	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	1	0	0	.
16	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	1	1	1	1	1	/
17	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	1
19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	2
20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	1	1	1	3
21	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	4
22	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	5
23	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	0	6
24	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	7
25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	8
26	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	1	9
27	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	1	0	1	0	0	:
28	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1	0	1	1	0	0	;
29	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	<
30	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	=
31	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	0	0	>
32	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	?
33	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	@
34	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	A
35	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	B
36	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	C
37	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	D
38	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	E
39	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	F
40	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	0	G
41	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	H
42	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	I
CARD ZONES			9	8	7	6	5	4	3	2	1	0	11	12	ODD PAR	b7	b6	b5	b4	b3	b2	b1	ASCII BITS		

standard pattern (con't)

PRODUCT TERM	INPUT DATA														OUTPUT DATA							CHAR. ASSIGN.	
	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	F8	F7	F6	F5	F4	F3	F2		F1
43	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	J
44	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	1	1	K
45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	L
46	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	1	0	M
47	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	1	0	N
48	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1	1	1	O
49	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	P
50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	Q
51	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	R
52	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	1	S
53	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	T
54	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	1	0	1	0	U
55	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	1	1	0	V
56	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	W
57	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	X
58	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	Y
59	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	0	Z
60	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	1	1	0	1	{
61	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	0	0	Δ
62	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1	0	1	
63	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	0	0	∧
64	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	1	1	1	—
65	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	˘
66	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	0	a
67	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	1	0	b
68	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	1	c
69	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	1	0	0	1	0	d
70	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	1	0	0	1	e
71	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	1	0	0	1	1	f
72	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1	0	1	1	0	0	1	g
73	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	1	1	0	0	0	h
74	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	1	0	i
75	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	1	0	1	0	1	0	j
76	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	1	0	1	1	1	0	k
77	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	1	0	0	1	0	0	l
78	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	1	0	1	0	1	m
79	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	1	1	0	1	1	0	n
80	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	1	0	1	1	1	0	o
81	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	p
82	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	1	0	q
83	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	1	0	0	r
84	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	1	0	0	1	1	1	0	s
85	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	1	0	1	0	0	1	0	t
86	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	1	0	1	0	1	0	1	u
87	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0	v
88	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	1	0	1	1	1	1	0	w
89	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	x
90	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	1	0	y
91	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0	z
92	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	1	1	0	1	1	{
93	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	1	0	
94	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	0	1	1	0	~
95	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	0	1	1	0	˘
96	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	DEL
CARD ZONES			9	8	7	6	5	4	3	2	1	0	11	12	ODD PAR	b7	b6	b5	b4	b3	b2	b1	ASCII BITS

information needed to program the PLA

Information to program the PLA can be supplied in one of two formats:

1. Punched 80-column cards
2. The applicable section of this data sheet (manual entry of information).

punched cards

CARD 1: (Used to determine whether outputs are presented in their true or inverted form. If this card is not used it is assumed that all eight outputs are true.)

Col. 1-6: DM7575 or DM8575 or DM7576 or DM8576.

Col. 7-9: (Blank)

Col. 10-17: Output Data. Outputs are F_8 (most significant) to F_1 (least significant). All eight outputs must be specified.

A 'T' in an output location indicates that the output is true.

A 'C' in an output location indicates that the output is complemented (inverted).

Col. 18-39: (Blank)

Col. 40-75: This space is reserved for any unique letters/numbers desired by the customer (special part number, program number, etc.). However the exact combination of characters must appear on all cards, but only those cards, associated with that particular device.

Col. 76-78: (Blank)

Col. 79-80: 00

CARDS 2-97: Term Data Cards. Used to specify the input and output conditions.

Col. 1-6: DM7575 or DM8575 or DM7576 or DM8576.

Col. 7-9: (Blank)

Col. 10-17: Output Connections. Outputs are F_8 (most significant) to F_1 (least significant). This field describes the outputs on which the product term appears.

A '+' in one of the eight output locations indicates that the term described by the card is one of the "OR" terms in that output.

A '(blank)' in one of the eight output locations indicates that the term described by the card is not one of the "OR" terms in that output.

(Care should be exercised in punching this particular field; since in most cases, unless a product term is repeated, this field will appear as one '+' and seven blanks.)

Col. 18: (Blank)

Col. 19: = (equal sign)

Col. 20: (Blank)

Col. 21-34: Input Data. Inputs are I_{14} (most significant) to I_1 (least significant).

An 'H' in one of the fourteen locations indicates that input appears in the high state in the output term.

An 'L' in one of the fourteen input locations indicates that input appears in the low state in the output term.

An 'X' in one of the fourteen input locations indicates that input does not appear in the output term.

Col. 35-39: (Blank)

Col. 40-75: This space is reserved for any unique letter/number desired by the customer (special part number, program number, etc.) However the exact combination of characters must appear on all cards, but only those cards, associated with that particular device. The purpose of this section is to prevent mixing of cards.

Col. 76-78: (Blank)

Col. 79-80: Product Term Number 01 to 96. (All 96 cards need not be used.) Zero in column 79 may be suppressed.

manual entry

The matrix-blank shown in this data sheet can be used in lieu of punched cards to submit information for programming the PLA.

INSTRUCTIONS

1. Circle the appropriate part number. In the event a catalog part is not being purchased, circle the closest catalog part number. If an electrical screen is required between the military and commercial devices, the military designation should be circled.
2. Customer should write the name of his company.
3. Enter the total number of unique product terms found in all eight outputs. Repeated terms count only once.
4. Output Inverter Option. Under the appropriate output designation specify a 'T' when the high (true) level is desired on the output for the given input conditions. Specify a 'C' if the complement is needed.
5. Matrix
 - a. Input data. This block is used to describe what comprises each of the 96 (maximum) product terms. In each row, opposite the appropriate Product Term number, information on the fourteen Input Data locations is entered. Information must be entered on all 14 inputs.
 - 1). Enter an "H" under the appropriate input designation if that particular input appears in the product term as a high (true) level.
 - 2). Enter an "L" under the appropriate input designation if that particular input appears in the product term as a low (complemented) level.
 - 3). Enter an "X" under the appropriate input designation if that particular input does not appear in the product term.

If less than 96 product terms are used leave all spaces for the unused terms blank.
 - b. Output Data. This block is used to describe the outputs on which the product terms appear.
 - 1). Enter a '+' under the appropriate output designation if the product term is contained in that output's expression.
 - 2). Leave a location blank if the product term is not contained in that output's expression.

**manual date entry
truth table/order blank**

1. PART NO. — (DM7575, DM8575, DM7576, DM8576)

2. CUSTOMER IDENTIFICATION —

3. TOTAL NO. OF UNIQUE PRODUCT TERMS USED —
(Repeated Terms Count Only Once)

4. OUTPUT INVERTER OPTION

F ₈	F ₇	F ₆	F ₅	F ₄	F ₃	F ₂	F ₁

5. MATRIX

PRODUCT TERM	INPUT DATA														OUTPUT DATA								
	I ₁₄	I ₁₃	I ₁₂	I ₁₁	I ₁₀	I ₉	I ₈	I ₇	I ₆	I ₅	I ₄	I ₃	I ₂	I ₁	F ₈	F ₇	F ₆	F ₅	F ₄	F ₃	F ₂	F ₁	
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truth table/order blank (con't)

PRODUCT TERM	INPUT DATA														OUTPUT DATA								
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