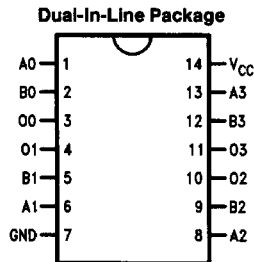# National Semiconductor

DM9386 4-Bit Quad Exclusive-NOR with Open-Collector Outputs

General Description

The DM9386 consists of four independent Exclusive-NOR gates with open-collector outputs. Single 1-bit comparisons may be made with each gate, or multiple bit comparisons may be made by connecting the outputs of the four gates together. Typical power dissipation is 170 mW. The DM9386 is equivalent to the 8242.

Connection Diagram

Dual-In-Line Package

A0 — 1	14 — V_{CC}
B0 — 2	13 — A3
O0 — 3	12 — B3
O1 — 4	11 — O3
B1 — 5	10 — O2
A1 — 6	9 — B2
GND — 7	8 — A2

TL/F/9798–1

Order Number DM9386N
See NS Package Number N14A

Pin Names	Description
A0, B0	Gate 0 Inputs
A1, B1	Gate 1 Inputs
A2, B2	Gate 2 Inputs
A3, B3	Gate 3 Inputs
O0–O3	Gate Outputs

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
Commercial	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Note: *The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.*

Recommended Operating Conditions

Symbol	Parameter	Min	Nom	Max	Units
V_{CC}	Supply Voltage	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
I_{OH}	High Level Output Current	−0.150		−0.150	mA
I_{OL}	Low Level Output Current			25	mA
T_A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

Over recommended operating free air temperature range (unless otherwise noted)

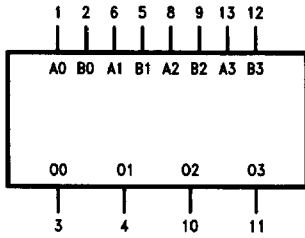| Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −12 mA			−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max	2.4	3.4		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min		0.2	0.4	V
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 5.5V			1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.4V			80	µA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V			−3.2	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	−18		−57	mA
I_{CC}	Supply Curent	V_{CC} = Max, $V_{IN}(A)$, $V_{IN}(B)$ = 0.4V			47.5	mA

Switching Characteristics at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

Symbol	Parameter	Conditions	Min	Max	Units
t_{PLH}	Propagation Delay Time Low to High Level Output	C_L = 30 pF R_L = 530Ω		25	ns
t_{PHL}	Propagation Delay Time High to Low Level Output			25	ns

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time.

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Logic Symbol

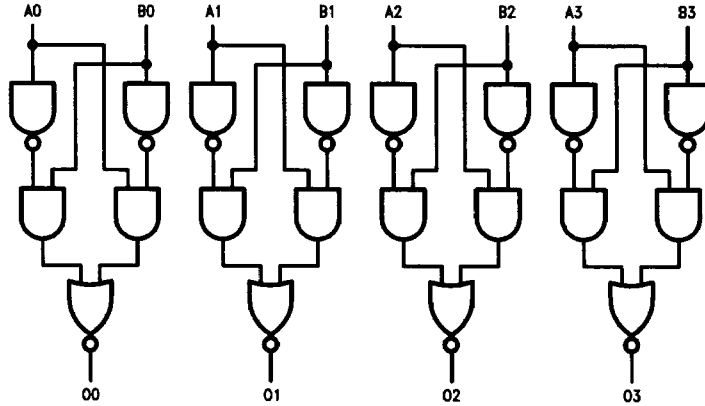| 1	2	6	5	8	9	13	12
A0	B0	A1	B1	A2	B2	A3	B3

| | O0 | O1 | O2 | O3 | |
| | 3 | 4 | 10 | 11 | |

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V_{CC} = Pin 14
GND = Pin 7

Truth Table

Inputs		Output
An	**Bn**	**On**
L	L	H
H	L	L
L	H	L
H	H	H

H = HIGH Voltage Level
L = LOW Voltage Level

Logic Diagram

TL/F/9798-3