August 1986 Revised April 2000 DM74S86 Quad 2-Input Exclusive-OR Gate

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General Description

FAIRCHILD

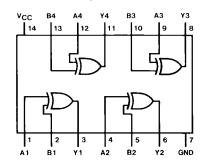
SEMICONDUCTOR

This device contains four independent gates each of which performs the logic Exclusive-OR function.

Ordering Code:

Order Number	Package Number	Package Description					
DM74S86N	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide					

Connection Diagram



Function Table

Н

Y = A \oplus B = \overline{A} B + A \overline{B} InputsOutputABYLLLLHHHLH

Н

L

H = HIGH Logic Level L = LOW Logic Level

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Absolute Maximum Ratings(Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	$0^{\circ}C$ to $+70^{\circ}C$
Storage Temperature Range	$-65^{\circ}C$ to $+150^{\circ}C$

Note 1: 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 tables 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
VIH	HIGH Level Input Voltage	2			V
V _{IL}	LOW Level Input Voltage			0.8	V
он	HIGH Level Output Current			-1	mA
I _{OL}	LOW Level Output Current			20	mA
T _A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

over recommended operating free air temperature (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
VI	Input Clamp Voltage	$V_{CC} = Min, I_I = -18 \text{ mA}$			-1.2	V
V _{OH}	HIGH Level	V _{CC} = Min, I _{OH} = Max	2.7	3.4		V
	Output Voltage	$V_{IL} = Max, V_{IH} = Min$	2.1			
V _{OL}	LOW Level	$V_{CC} = Min, I_{OL} = Max$			0.5	V
	Output Voltage	$V_{IH} = Min, V_{IL} = Max$				
l _l	Input Current @ Max Input Voltage	$V_{CC} = Max, V_I = 5.5V$			1	mA
I _{IH}	HIGH Level Input Current	$V_{CC} = Max, V_I = 2.7V$			50	μΑ
IIL	LOW Level Input Current	$V_{CC} = Max, V_I = 0.5V$			-2	mA
los	Short Circuit Output Current	V _{CC} = Max (Note 3)	-40		-100	mA
I _{CCH}	Supply Current with Outputs HIGH	V _{CC} = Max (Note 4)		35	50	mA
I _{CCL}	Supply Current with Outputs LOW	V _{CC} = Max (Note 5)		50	75	mA

Note 2: All typicals are at $V_{CC} = 5V$, $T_A = 25^{\circ}C$.

Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Note 4: I_{CCH} is measured with all outputs OPEN, one input of each gate at 4.5V, and the other inputs grounded.

Note 5: $\mathrm{I}_{\mathrm{CCL}}$ is measured with all outputs OPEN and all inputs grounded.

Switching Characteristics

at $V_{CC}=5V$ and $T_A=25^\circ C$

			$R_L = 280\Omega$				
Symbol	Parameter	From (Input)	C _L = 15 pF		C _L = 50 pF		Units
		to (Output)	Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time	A or B to Y		10.5		14	ns
	LOW-to-HIGH Level Output		10.0		14	110	
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output			10		13	ns

