National Semiconductor

MICROCIRCUIT DATA SHEET

CN54F86-X REV 0A0

Original Creation Date: 01/07/98
Last Update Date: 01/22/98
Last Major Revision Date: 01/07/98

QUAD 2-INPUT EXCLUSIVE OR GATE

General Description

This device contains four indepentent gates, each of which performs the logic exclusive-OR function.

Industry Part Number

54F86

NS Part Numbers

54F86DC

Prime Die

M086

Processing

(blank)

Quality Conformance Inspection

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Subgrp	Description	Temp (^{O}C)
1	Static tests at	+25
2	Static tests at	+70
3	Static tests at	0
4	Dynamic tests at	+25
5	Dynamic tests at	+70
6	Dynamic tests at	0
7	Functional tests at	+25
8A	Functional tests at	+70
8B	Functional tests at	0
9	Switching tests at	+25
10	Switching tests at	+70
11	Switching tests at	0

(Absolute Maximum Ratings)

(Note 1)

Storage Temperature	-65 C to +150 C
Ambient Temperature under Bias	-55 C to +125 C
Junction Temperature under Bias	-55 C to +175 C
Vcc Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	-30 mA to +5.0mA
Voltage Applied to Output in HIGH State (with Vcc=0V)	
Standard Output	-0.5V to Vcc
TRI-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	twice the rated Iol(mA)

Note 1: Absolute Maximum ratings are those values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 2: Either voltage limit or current limit is sufficient to protect inputs.

Recommended Operating Conditions

Free Air Ambient Temperature	0 C to +70 C
Supply Voltage	+4.5V to +5.5V

Electrical Characteristics

DC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: VCC 4.5V to 5.5V, Temp range: 0 C to +70 C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IIH	Input High Current	VCC=5.5V, VM=2.7V, VINL=0.0V	1, 2	INPUTS		5.0	uA	1, 2, 3
IBVI	Input High Current	VCC=5.5V, VM=7.0V, VINL=0.0V	1, 2	INPUTS		7.0	uA	1, 2, 3
IIL	Input LOW Current	VCC=5.5V, VM=0.5V	1, 2	INPUTS		-0.6	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIH=2.0V, IOL=20mA	1, 2	OUTPUTS		0.5	V	1, 2, 3
VOH	Output HIGH Voltage	VCC=4.5V, VIL=0.8V, IOH=-1.0mA, VIH=2.0V	1, 2	OUTPUTS	2.5		V	1, 2, 3
		VCC=4.75V, VIL=0.8V, IOH=-1.0mA, VIH=2.0V	1, 2	OUTPUTS	2.7		V	1, 2, 3
IOS	Short Circuit Current	VCC=5.5V, VINL=0.0V, VINH=5.5V, VM=0.0V	1, 2	OUTPUTS	-60	-150	mA	1, 2, 3
VCD	Input Clamp Diode Voltage	VCC=4.5V, IM=-18mA	1, 2	INPUTS		-1.2	V	1, 2, 3
ICCH	Supply Current	VCC=5.5V, VINL=0.0V, VINH=5.5V	1, 2	VCC		18	mA	1, 2, 3
ICCL	Supply Current	VCC=5.5V, VINH=5.5V	1, 2	VCC		28	mA	1, 2, 3
ICEX	Output HIGH Leakage Current	VCC=5.5V, VINH=5.5V, VINL=0.0V, VM=5.5V	1, 2	OUTPUTS		100	uA	1, 2, 3
VID	Input Leakage Test	VCC=0V, IID=1.9uA	1, 2	INPUTS	4.75		V	1, 2, 3
IOD	Output Leakage Circuit Current	VCC=0V, VIOD=0.15V	1, 2	OUTPUTS		4.75	uA	1, 2, 3
VIL	Input Low Voltage	Recognized as a LOW signal	3	INPUTS		0.8	V	1, 2, 3
VIH	Input High Voltage	Recognized as a HIGH signal	3	INPUTS	2.0		V	1, 2, 3

Electrical Characteristics

AC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: CL=50pf, RL=500 OHMS, TR=2.5ns, TF=2.5ns

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpLH(1)	Propagation Delay An/Bn to On (UNUSED LOW)	VCC=5.0V @25C, VCC=4.5V & 5.5V @ 0C / +70C	1, 2		3.0	5.5	ns	9
			1, 2		3.0	6.5	ns	10, 11
tpHL(1)	Propagation Delay An/Bn to On (UNUSED LOW)	VCC=5.0V @25C, VCC=4.5V & 5.5V @ 0C / +70C	1, 2		3.0	5.5	ns	9
			1, 2		3.0	6.5	ns	10, 11
tpLH(2)	Propagation Delay An/Bn to On (UNUSED HIGH)	VCC=5.0V @25C, VCC=4.5V & 5.5V @ 0C / +70C	1, 2		3.5	7.0	ns	9
			1, 2		3.5	8.0	ns	10, 11
tpHL(2)	Propagation Delay An/Bn to On (UNUSED HIGH)	VCC=5.0V @25C, VCC=4.5V & 5.5V @ 0C / +70C	1, 2		3.0	6.5	ns	9
			1, 2		3.0	7.5	ns	10, 11

Note 1: Screen tested 100% on each device at +75C temperature, subgroups 2, 8A & 10.
Note 2: Sample tested (Method 5005, Table 1) on each MFG. lot at +75C temperature, subgroups 2, 8A & 10.
Note 3: Guaranteed by applying specific input condition and testing VOL & VOH.

Revision History

Rev	ECN #	Rel Date	Originator	Changes
0A0	M0002716	01/22/98	Donald B. Miller	Initial MDS Release, revision 0A0.