



MICROCIRCUIT DATA SHEET

CN54F02-X REV 0A0

Original Creation Date: 06/25/97
Last Update Date: 07/08/97
Last Major Revision Date: 06/25/97

QUAD 2 INPUT NOR GATE

General Description

This device contains four independent gates, each of which performs the logic NOR function.

Industry Part Number

54F02

NS Part Numbers

54F02DC

Prime Die

M002

Processing

(blank)

Quality Conformance Inspection

(blank)

| Subgrp | Description | Temp (°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) | -30mA 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 Commercial | 0 C to +70 C |
| Supply Voltage Commercial | +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: 0C to +70C

| SYMBOL | PARAMETER | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|--------|-----------------------------------|---|-------|----------|------|------|------|------------|
| VIH | Input HIGH Voltage | Recognized as a HIGH signal | 1 | INPUTS | 2.0 | | V | 1, 2, 3 |
| VIL | Input LOW Voltage | Recognized as a LOW signal | 1 | INPUTS | | 0.8 | V | 1, 2, 3 |
| VCD | Input Clamp Diode Voltage | VCC=4.5V, IIN=-18mA | 2, 3 | INPUTS | | -1.2 | V | 1, 2, 3 |
| VOH | Output HIGH Voltage | VCC=4.5V, IOH=-1.0mA | 2, 3 | OUTPUTS | 2.5 | | V | 1, 2, 3 |
| | | VCC=4.75V, IOH=-1.0mA | 2, 3 | OUTPUTS | 2.7 | | V | 1, 2, 3 |
| VOL | Output LOW Voltage | VCC=4.5V, IOL=20mA | 2, 3 | OUTPUTS | | 0.5 | V | 1, 2, 3 |
| IIH | Input HIGH Current | VCC=5.5V, VIN=2.7V | 2, 3 | INPUTS | | 5.0 | uA | 1, 2, 3 |
| IBVI | Input HIGH Current Breakdown Test | VCC=5.5V, VIN=7.0V | 2, 3 | INPUTS | | 7.0 | uA | 1, 2, 3 |
| ICEX | Output HIGH Leakage Current | VCC=5.5V, VOUT = VCC | 2, 3 | OUTPUTS | | 100 | uA | 1, 2, 3 |
| VID | Input Leakage Test | VCC = 0.0V, IID = 1.9uA, All other pins grounded | 2, 3 | INPUTS | 4.75 | | V | 1, 2, 3 |
| IOD | Output Leakage Circuit Current | VCC = 0.0V, VIOD = 150mV, All other pins grounded | 2, 3 | OUTPUTS | | 4.75 | uA | 1, 2, 3 |
| IIL | Input LOW Current | VCC=5.5V, VIN=0.5V | 2, 3 | INPUTS | | -0.6 | mA | 1, 2, 3 |
| IOS | Output Short-Circuit Current | VCC=5.5V, VOUT = 0V | 2, 3 | OUTPUTS | -60 | -150 | mA | 1, 2, 3 |
| ICCH | Power Supply Current | VCC=5.5V, VO = HIGH | 2, 3 | VCC | | 5.6 | mA | 1, 2, 3 |
| ICCL | Power Supply Current | VCC=5.5V, VO = LOW | 2, 3 | VCC | | 13.0 | mA | 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 SEE AC FIGS, Temp Range: 0C to +70C

| SYMBOL | PARAMETER | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|--------|-------------------|---|-------|------------------------|-----|-----|------|------------|
| tpLH | Propagation Delay | VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | An/Bn to $\bar{O}n$ | 2.5 | 5.5 | ns | 9 |
| | | | 2, 3 | An/Bn to $\bar{O}n$ | 2.5 | 6.5 | ns | 10, 11 |
| tpHL | Propagation Delay | VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | An/Bn to $\bar{O}n$ | 1.5 | 4.3 | ns | 9 |
| | | | 2, 3 | An/Bn to $\bar{O}n$ | 1.5 | 5.3 | ns | 10, 11 |

Note 1: Guaranteed by applying specific input condition and testing VOL & VOH.

Note 2: Screen tested 100% on each device at +75C temperature only, subgroups A2 & A10.

Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +75C temperature only, subgroups A2 & A10.

Revision History

| Rev | ECN # | Rel Date | Originator | Changes |
|-----|----------|----------|---------------|---|
| 0A0 | M0001677 | 07/08/97 | Linda Collins | Legal issue with Fairchild due to the Fairchild/National split, is forcing the change from CN74F which is 'Fairchilds' product code to CN54F which is 'Nationals' product code. |