

**CN54F244-X REV 0A0**

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

## OCTAL BUFFERS/LINE DRIVERS WITH TRI-STATE OUTPUTS

### General Description

The F244 is an octal buffer and line driver designed to be employed as a memory and address driver, clock driver and bus oriented transmitter/receiver which provides improved PC and board density.

### Industry Part Number

54F244

### NS Part Numbers

54F244DC

### Prime Die

M244

### Processing

### Quality Conformance Inspection

### 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   |

**Features**

- Guaranteed 4000V minimum ESD protection
- TRI-STATE outputs drive bus lines or buffer memory address registers
- Outputs sink 64 mA (48 mA Mil)
- 12 mA source current
- Input clamp diodes limit high-speed termination effects

**(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<br>(Note 2)                             | -0.5V to +7.0V          |
| Input Current<br>(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) |
| ESD Last Passing Voltage (Min)                        | 4000V                   |

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 PARAMETERS

(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 |
|---------|-----------------------------------|---------------------------------------------------|-------|----------|------|------|------|------------|
| 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=-3.0mA                              | 2, 3  | OUTPUTS  | 2.4  |      | V    | 1, 2, 3    |
|         |                                   | VCC=4.75V, IOH=-3.0mA                             | 2, 3  | OUTPUTS  | 2.7  |      | V    | 1, 2, 3    |
|         |                                   | VCC=4.5V, IOH=-15.0mA                             | 2, 3  | OUTPUTS  | 2.0  |      | V    | 1, 2, 3    |
| VOL     | Output LOW Voltage                | VCC=4.5V, IOL=64mA                                | 2, 3  | OUTPUTS  |      | 0.55 | 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 (OE1, OE2)                     | 2, 3  | INPUTS   |      | -1.0 | mA   | 1, 2, 3    |
| IIL (2) | Input LOW Current                 | VCC=5.5V, VIN=0.5V (Dn)                           | 2, 3  | INPUTS   |      | -1.6 | mA   | 1, 2, 3    |
| IOZH    | Output Leakage Current            | VCC=5.5V, VOUT=2.7V                               | 2, 3  | OUTPUTS  |      | 50   | uA   | 1, 2, 3    |
| IOZL    | Output Leakage Current            | VCC=5.5V, VOUT=0.5V                               | 2, 3  | OUTPUTS  |      | -50  | uA   | 1, 2, 3    |
| IOS     | Output Short Circuit Current      | VCC=5.5V, VOUT = 0V                               | 2, 3  | OUTPUTS  | -100 | -225 | mA   | 1, 2, 3    |
| IZZ     | Bus Drainage Test                 | VCC=0.0V, VOUT=2.5V                               | 2, 3  | OUTPUTS  |      | 500  | uA   | 1, 2, 3    |
| ICCH    | Power Supply Current              | VCC=5.5V, VO = HIGH                               | 2, 3  | VCC      |      | 60   | mA   | 1, 2, 3    |
| ICCL    | Power Supply Current              | VCC=5.5V, VO = LOW                                | 2, 3  | VCC      |      | 90   | mA   | 1, 2, 3    |

## Electrical Characteristics

### DC PARAMETERS(Continued)

(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 |
|--------|----------------------|-----------------------|-------|----------|-----|-----|------|------------|
| ICCZ   | Power Supply Current | VCC=5.5V, VO = HIGH Z | 2, 3  | VCC      |     | 90  | mA   | 1, 2, 3    |

### AC PARAMETERS

(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: 0°C to +70°C

|      |                     |                                               |      |          |     |     |    |        |
|------|---------------------|-----------------------------------------------|------|----------|-----|-----|----|--------|
| tpLH | Propagation Delay   | VCC=+5.0V @ +25C,<br>VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | In to On | 2.5 | 5.2 | ns | 9      |
|      |                     |                                               | 2, 3 | In to On | 2.5 | 6.2 | ns | 10, 11 |
| tpHL | Propagation Delay   | VCC=+5.0V @ +25C,<br>VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | In to On | 2.5 | 5.2 | ns | 9      |
|      |                     |                                               | 2, 3 | In to On | 2.5 | 6.5 | ns | 10, 11 |
| tpZH | Output Enable Time  | VCC=+5.0V @ +25C,<br>VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | OE to On | 2.0 | 5.7 | ns | 9      |
|      |                     |                                               | 2, 3 | OE to On | 2.0 | 6.7 | ns | 10, 11 |
| tpZL | Output Enable Time  | VCC=+5.0V @ +25C,<br>VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | OE to On | 2.0 | 7.0 | ns | 9      |
|      |                     |                                               | 2, 3 | OE to On | 2.0 | 8.0 | ns | 10, 11 |
| tpHZ | Output Disable Time | VCC=+5.0V @ +25C,<br>VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | OE to On | 2.0 | 6.0 | ns | 9      |
|      |                     |                                               | 2, 3 | OE to On | 2.0 | 7.0 | ns | 10, 11 |
| tpLZ | Output Disable Time | VCC=+5.0V @ +25C,<br>VCC=4.5V & 5.5V @ 0/+70C | 2, 3 | OE to On | 2.0 | 6.0 | ns | 9      |
|      |                     |                                               | 2, 3 | OE to On | 2.0 | 7.0 | 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 | M0001725 | 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. |