

**MN54F373-X REV 2A0**

 Original Creation Date: 05/30/96  
 Last Update Date: 04/14/98  
 Last Major Revision Date: 03/26/98

## OCTAL TRANSPARANT LATCH WITH 3-STATE OUTPUTS

### General Description

The F373 consists of eight latches with 3-state outputs for bus organized system applications. The flip-flops appear transparant to the data when Latch Enable (LE) is HIGH. When LE is LOW, the data that meets the setup times are latched. Data appear on the bus when the Output Enable (OE) is LOW. When OE is HIGH, the bus output is in the high impedance state.

### Industry Part Number

54F373

### NS Part Numbers

 54F373DMQB  
 54F373FMQB  
 54F373LMQB

### Prime Die

M373

### Processing

MIL-STD-883, Method 5004

### Quality Conformance Inspection

MIL-STD-883, Method 5005

| Subgrp | Description         | Temp ( °C) |
|--------|---------------------|------------|
| 1      | Static tests at     | +25        |
| 2      | Static tests at     | +125       |
| 3      | Static tests at     | -55        |
| 4      | Dynamic tests at    | +25        |
| 5      | Dynamic tests at    | +125       |
| 6      | Dynamic tests at    | -55        |
| 7      | Functional tests at | +25        |
| 8A     | Functional tests at | +125       |
| 8B     | Functional tests at | -55        |
| 9      | Switching tests at  | +25        |
| 10     | Switching tests at  | +125       |
| 11     | Switching tests at  | -55        |

**Features**

- 3-State Outputs for Bus Lines Interfacing
- Eight Latches in a single package

**(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.

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    |
| Military                     | -55 C to +125 C |
| Supply Voltage               |                 |
| Military                     | +4.5V to +5.5V  |
| 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: -55C to 125C

| SYMBOL | PARAMETER                   | CONDITIONS                                            | NOTES | PIN-NAME | MIN | MAX  | UNIT | SUB-GROUPS |
|--------|-----------------------------|-------------------------------------------------------|-------|----------|-----|------|------|------------|
| IIH    | Input High Current          | VCC=5.5V, VM=2.7V, VINH=5.5V                          | 1, 3  | INPUTS   |     | 20   | uA   | 1, 2, 3    |
| IBVI   | Input High Current          | VCC=5.5V, VM=7.0V, VINH=5.5V                          | 1, 3  | INPUTS   |     | 100  | uA   | 1, 2, 3    |
| IIL    | Input LOW Current           | VCC=5.5V, VM=0.5V, VINH=5.5V                          | 1, 3  | INPUTS   |     | -0.6 | mA   | 1, 2, 3    |
| VOL    | Output LOW Voltage          | VCC=4.5V, VIL=0.8V, IOL=20mA, VINH=5.5V               | 1, 3  | OUTPUTS  |     | 0.5  | V    | 1, 2, 3    |
| VOH    | Output HIGH Voltage         | VCC= 4.5V, VIH=2.0V, IOH=-1.0mA, VINH=5.5V, VINL=0.0V | 1, 3  | OUTPUTS  | 2.5 |      | V    | 1, 2, 3    |
| VOH3   | Output HIGH Voltage         | IOH3=-3.0mA, VCC=4.5V, VIH=2.0V, VINH=5.5V, VINL=0.0V | 1, 3  | OUTPUTS  | 2.5 |      | V    | 1          |
|        |                             |                                                       | 1, 3  | OUTPUTS  | 2.4 |      | V    | 2, 3       |
| IOS    | Short Circuit Current       | VCC=5.5V, VINH=5.5V, VINL=0.0V, VM=0.0V               | 1, 3  | OUTPUTS  | -60 | -150 | mA   | 1, 2, 3    |
| VCD    | Input Clamp Diode Voltage   | VCC=4.5V, IM=-18mA, VINH=5.5V                         | 1, 3  | INPUTS   |     | -1.2 | V    | 1, 2, 3    |
| ICCZ   | Supply Current              | VCC=5.5V, VINH=5.5V, VINL=0.0V                        | 1, 3  | VCC      |     | 55   | mA   | 1, 2, 3    |
| ICEX   | Output HIGH Leakage Current | VCC=5.5V, VINH=5.5V, VINL=0.0V, VM=5.5V               | 1, 3  | OUTPUTS  |     | 250  | uA   | 1, 2, 3    |
| IOZH   | Output Leakage Current      | VCC=5.5V, VM=2.7V, VIH=2.0V, VINH=5.5V, VINL=0.0V     | 1, 3  | OUTPUTS  |     | 50   | uA   | 1, 2, 3    |
| IOZL   | Output Leakage Current      | VCC=5.5V, VM=0.5V, VIH=2.0V, VINH=5.5V                | 1, 3  | OUTPUTS  |     | -50  | uA   | 1, 2, 3    |

## Electrical Characteristics

### 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

| SYMBOL  | PARAMETER           | CONDITIONS                               | NOTES | PIN-NAME       | MIN | MAX  | UNIT | SUB-GROUPS |
|---------|---------------------|------------------------------------------|-------|----------------|-----|------|------|------------|
| tpLH(1) | Propagation Delay   | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | Dn to Qn       | 3.0 | 7.0  | ns   | 9          |
|         |                     |                                          | 2, 4  | Dn to Qn       | 3.0 | 8.5  | ns   | 10, 11     |
| tpHL(1) | Propagation Delay   | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | Dn to Qn       | 2.0 | 5.0  | ns   | 9          |
|         |                     |                                          | 2, 4  | Dn to Qn       | 2.0 | 7.0  | ns   | 10, 11     |
| tpLH(2) | Propagation Delay   | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | LE to Qn       | 5.0 | 11.5 | ns   | 9          |
|         |                     |                                          | 2, 4  | LE to Qn       | 5.0 | 15.0 | ns   | 10, 11     |
| tpHL(2) | Propagation Delay   | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | LE to Qn       | 3.0 | 7.0  | ns   | 9          |
|         |                     |                                          | 2, 4  | LE to Qn       | 3.0 | 8.5  | ns   | 10, 11     |
| tpZH    | Output Enable Time  | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | OUTPUT ENABLE  | 2.0 | 11.0 | ns   | 9          |
|         |                     |                                          | 2, 4  | OUTPUT ENABLE  | 2.0 | 13.5 | ns   | 10, 11     |
| tpZL    | Output Enable Time  | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | OUTPUT ENABLE  | 2.0 | 7.5  | ns   | 9          |
|         |                     |                                          | 2, 4  | OUTPUT ENABLE  | 2.0 | 10.0 | ns   | 10, 11     |
| tpHZ    | Output Disable Time | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | OUTPUT DISABLE | 1.5 | 6.5  | ns   | 9          |
|         |                     |                                          | 2, 4  | OUTPUT DISABLE | 1.5 | 10.0 | ns   | 10, 11     |
| tpLZ    | Output Disable Time | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 2, 4  | OUTPUT DISABLE | 1.5 | 5.0  | ns   | 9          |
|         |                     |                                          | 2, 4  | OUTPUT DISABLE | 1.5 | 7.0  | ns   | 10, 11     |
| ts(H/L) | Setup Time          | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 5     | Dn to LE       | 2.0 |      | ns   | 9, 10, 11  |
| th(H)   | Setup Time          | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 5     | Dn to LE       | 3.0 |      | ns   | 9, 10, 11  |
| th(L)   | Setup Time          | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 5     | Dn to LE       | 3.0 |      | ns   | 9          |
|         |                     |                                          | 5     | Dn to LE       | 4.0 |      | ns   | 10, 11     |

## Electrical Characteristics

### AC PARAMETERS(Continued)

(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

| SYMBOL | PARAMETER   | CONDITIONS                               | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|--------|-------------|------------------------------------------|-------|----------|-----|-----|------|------------|
| tw(H)  | Pulse Width | VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C | 5     | LE       | 6.0 |     | ns   | 9, 10, 11  |

Note 1: Screen tested 100% on each device at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.

Note 2: Screen tested 100% on each device at +25C temperature only, subgroup A9.

Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.

Note 4: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C subgroup A9, and periodically at +125C & -55C temperature, subgroups 10 & 11.

Note 5: GUARANTEED BUT NOT TESTED. (Design Characterization Data)

**Revision History**

| Rev | ECN #    | Rel Date | Originator    | Changes                                                                                                                                         |
|-----|----------|----------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 2A0 | M0002831 | 04/14/98 | Linda Collins | New update: MN54F373-X rev 2A0. Corrected a typo in the VOH test conditions, IOH was listed as positive 1.0mA, should have been negative 1.0mA. |