## Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted).

| Parameter | | | Conditions | | DM54/74 23 Min | DM54/74 23 Typ (1) | DM54/74 23 Max | DM54/74 50, 53 Min | DM54/74 50, 53 Typ (1) | DM54/74 50, 53 Max | DM54/74 H50 Min | DM54/74 H50 Typ (1) | DM54/74 H50 Max | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High Level Input Voltage | | | | 2 | | | 2 | | | 2 | | | V |
| $V_{IL}$ | Low Level Input Voltage | | | | | | 0.8 | | | 0.8 | | | 0.8 | V |
| $V_I$ | Input Clamp Voltage | | $V_{CC}$ = Min | $I_I$ = −8 mA | | | | | | | | | −1.5 | V |
| | | | | $I_I$ = −12 mA | | | −1.5 | | | −1.5 | | | | |
| $I_{OH}$ | High Level Output Current | | | | | | −800 | | | −400 | | | −500 | μA |
| $V_{OH}$ | High Level Output Voltage | | $V_{CC}$ = Min, $V_I$ = (2), $I_{OH}$ = Max | | 2.4 | 3.4 | | 2.4 | 3.4 | | 2.4 | 3.4 | | V |
| $I_{OL}$ | Low Level Output Current | | | | | | 16 | | | 16 | | | 20 | mA |
| $V_{OL}$ | Low Level Output Voltage | | $V_{CC}$ = Min, $V_I$ = (2), $I_{OL}$ = Max | | | 0.2 | 0.4 | | 0.2 | 0.4 | | 0.2 | 0.4 | V |
| $I_I$ | Input Current at Maximum Input Voltage | | $V_{CC}$ = Max, $V_I$ = 5.5 V | | | | 1 | | | 1 | | | 1 | mA |
| $I_{IH}$ | High Level Input Current | Data Inputs | $V_{CC}$ = Max, $V_I$ = 2.4 V | | | | 40 | | | 40 | | | 50 | μA |
| | | Strobe of 23 | | | | | 160 | | | N/A | | | N/A | |
| $I_{IL}$ | Low Level Input Current | Data Inputs | $V_{CC}$ = Max, $V_I$ = 0.4 V | | | | −1.6 | | | −1.6 | | | −2 | mA |
| | | Strobe of 23 | | | | | −6.4 | | | N/A | | | N/A | |
| $I_{OS}$ | Short Circuit Output Current | | $V_{CC}$ = Max (3) | DM54 | −20 | | −55 | −20 | | −55 | −40 | | −100 | mA |
| | | | | DM74 | −18 | | −55 | −18 | | −55 | −40 | | −100 | |
| $I_{CC}$ | Supply Current | | $V_{CC}$ = Max | | See Table | | | | | | | | | |

**Note 1:** All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.

**Note 2:** The input voltage is $V_{IH}$ = 2 V or $V_{IL}$ = 0.8 V, as appropriate.

**Note 3:** Not more than one output should be shorted at a time, and for the DM54H/DM74H, duration of short circuit should not exceed one second.

## Electrical Characteristics using expander inputs, $V_{CC}$ = Min, $T_A$ = Min (unless otherwise noted) (4), (5)

| Device | $I_{\overline{X}}$ (mA) Expander Current | | | | $V_{BE(Q)}$ (V) Base-Emitter Voltage of Output Transistor Q | | | | $V_{OH}$ (V) High Level Output Voltage | | | | $V_{OL}$ (V) Low Level Output Voltage | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conditions | Min | Typ (1) | Max | Conditions | Min | Typ (1) | Max | Conditions | Min | Typ (1) | Max | Conditions | Min | Typ (1) | Max |
| DM5423<br>DM5450<br>DM5453 | $V_{\overline{X}X}$ = 0.4 V<br>$I_{OL}$ = 16 mA | | | −3.5<br>−2.9<br>−2.9 | $I_X + I_{\overline{X}}$ = 410 μA<br>$R_{\overline{X}X}$ = 0<br>$I_{OL}$ = 16 mA | | | 1.1 | $I_X$ = 150 μA<br>$I_{\overline{X}}$ = −150 μA<br>$I_{OH}$ = −400 μA | 2.4 | 3.4 | | $I_X + I_{\overline{X}}$ = 300 μA<br>$R_{\overline{X}X}$ = 138 Ω<br>$I_{OL}$ = 16 mA | | 0.2 | 0.4 |
| DM7423<br>DM7450<br>DM7453 | $V_{\overline{X}X}$ = 0.4 V<br>$I_{OL}$ = 16 mA | | | −3.5<br>−3.1<br>−3.1 | $I_X + I_{\overline{X}}$ = 620 μA<br>$R_{\overline{X}X}$ = 0<br>$I_{OL}$ = 16 mA | | | 1.0 | $I_X$ = 270 μA<br>$I_{\overline{X}}$ = −270 μA<br>$I_{OH}$ = −400 μA | 2.4 | 3.4 | | $I_X + I_{\overline{X}}$ = 430 μA<br>$R_{\overline{X}X}$ = 130 Ω<br>$I_{OL}$ = 16 mA | | 0.2 | 0.4 |
| DM54H50 | $V_{\overline{X}}$ = 1.4 V | | | −5.85 | $I_X + I_{\overline{X}}$ = 700 μA | | | 1.1 | $I_X$ = 320 μA | 2.4 | 3.4 | | $I_X + I_{\overline{X}}$ = 470 μA | | 0.2 | 0.4 |
| DM74H50 | $V_{\overline{X}}$ = 1.4 V | | | −6.3 | $I_X + I_{\overline{X}}$ = 1.1 mA | | | 1.0 | $I_X$ = 570 μA | 2.4 | 3.4 | | $I_X + I_{\overline{X}}$ = 600 μA | | 0.2 | 0.4 |

**Note 1:** All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.

**Note 4:** The 23, 50, and 53 are designed for use with up to four 60 expanders.

**Note 5:** The H50 is designed for use with a H62 expander.

## Supply Currents

| Device | $I_{CCH}$ (mA) Total With Outputs High | | $I_{CCL}$ (mA) Total With Outputs Low | |
|---|---|---|---|---|
| | Typ | Max | Typ | Max |
| 23 | 8 | 16 | 10 | 19 |
| 50 | 4 | 8 | 7.4 | 14 |
| 53 | 4 | 8 | 5.1 | 9.5 |
| H50 | 8.2 | 12.8 | 15.2 | 24 |

## Switching Characteristics at $V_{CC}$ = 5 V, $T_A$ = 25°C

| Device | Conditions | $t_{PLH}$ (ns) Propagation Delay Time, Low-To-High Level Output | | | $t_{PHL}$ (ns) Propagation Delay Time, High-To-Low Level Output | | |
|---|---|---|---|---|---|---|---|
| | | Min | Typ | Max | Min | Typ | Max |
| 23, 50, 53 | $C_L$ = 15 pF, $R_L$ = 400 Ω<br>Expander Pins Open | | 13 | 22 | | 8 | 15 |
| 50 | $C_L$ = 15 pF, $R_L$ = 400 Ω<br>From Input of 60 Expander | | 15 | 30 | | 10 | 20 |
| H50 | $C_L$ = 25 pF, $R_L$ = 280 Ω<br>Expander Pins Open | | 6.8 | 11 | | 6.2 | 11 |
| H50 | $C_L$ = 25 pF, $R_L$ = 280 Ω<br>C = 15 pF, (GND to $\overline{X}$ of H50) | | 11 | | | 7.4 | |