

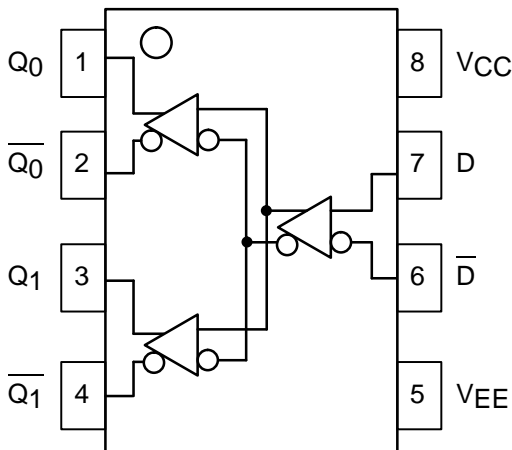
# Low Voltage 1:2 Differential Fanout Buffer

The MC100LVEL11 is a differential 1:2 fanout buffer. The device is functionally similar to the E111 device but with higher performance capabilities. Having within-device skews and output transition times significantly improved over the E111, the LVEL11 is ideally suited for those applications which require the ultimate in AC performance.

The differential inputs of the LVEL11 employ clamping circuitry to maintain stability under open input conditions. If the inputs are left open (pulled to  $V_{EE}$ ) the Q outputs will go LOW.

- 330ps Propagation Delay
- 5ps Skew Between Outputs
- High Bandwidth Output Transitions
- 75k $\Omega$  Internal Input Pulldown Resistors
- >2000V ESD Protection

### LOGIC DIAGRAM AND PINOUT ASSIGNMENT



## MC100LVEL11



**D SUFFIX**  
PLASTIC SOIC PACKAGE  
CASE 751-05

### PIN DESCRIPTION

| PIN        | FUNCTION     |
|------------|--------------|
| D          | Data Inputs  |
| $Q_0, Q_1$ | Data Outputs |

### DC CHARACTERISTICS ( $V_{EE} = V_{EE}(\text{min})$ to $V_{EE}(\text{max})$ ; $V_{CC} = \text{GND}$ )

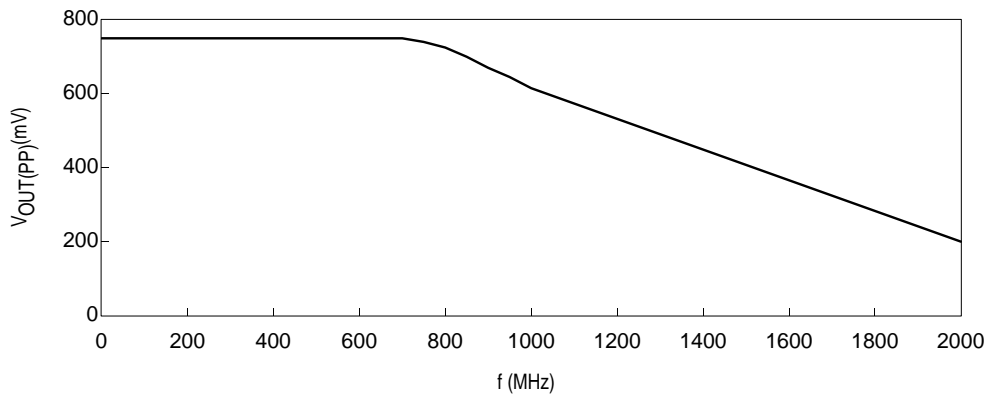
| Symbol   | Characteristic       | -40°C            |      |      | 0°C   |      |      | 25°C |      |      | 85°C |      |      | Unit          |
|----------|----------------------|------------------|------|------|-------|------|------|------|------|------|------|------|------|---------------|
|          |                      | Min              | Typ  | Max  | Min   | Typ  | Max  | Min  | Typ  | Max  | Min  | Typ  | Max  |               |
| $I_{EE}$ | Power Supply Current |                  | 24   | 28   |       | 24   | 28   |      | 24   | 28   |      | 25   | 30   | mA            |
| $V_{EE}$ | Power Supply Voltage | -3.0             | -3.3 | -3.8 | -3.0  | -3.3 | -3.8 | -3.0 | -3.3 | -3.8 | -3.0 | -3.3 | -3.8 | V             |
| $I_{IH}$ | Input HIGH Current   |                  |      | 150  |       |      | 150  |      |      | 150  |      |      | 150  | $\mu\text{A}$ |
| $I_{iL}$ | Input LOW Current    | $D_n$            | 0.5  |      | $D_n$ | 0.5  |      | 0.5  |      |      | 0.5  |      |      | $\mu\text{A}$ |
|          |                      | $\overline{D_n}$ | -600 |      |       | -600 |      | -600 |      |      | -600 |      |      |               |



**AC CHARACTERISTICS** ( $V_{EE} = V_{EE}(\text{min})$  to  $V_{EE}(\text{max})$ ;  $V_{CC} = \text{GND}$ )

| Symbol                 | Characteristic  | -40°C        |        |              | 0°C          |        |              | 25°C         |        |              | 85°C         |        |              | Unit |
|------------------------|---|--------------|--------|--------------|--------------|--------|--------------|--------------|--------|--------------|--------------|--------|--------------|------|
|                        |   | Min          | Typ    | Max          | Min          | Typ    | Max          | Min          | Typ    | Max          | Min          | Typ    | Max          |      |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output   | 235          |        | 385          | 245          |        | 395          | 255          | 330    | 405          | 285          |        | 435          | ps   |
| $t_{SKEW}$             | Within-Device Skew <sup>1</sup><br>Duty Cycle Skew <sup>2</sup>                         |              | 5<br>5 | 20<br>20     |              | 5<br>5 | 20<br>20     |              | 5<br>5 | 20<br>20     |              | 5<br>5 | 20<br>20     | ps   |
| $V_{PP}$               | Minimum Input Swing <sup>3</sup>  | 200          |        |              | 200          |        |              | 200          |        |              | 200          |        |              | mV   |
| $V_{CMR}$              | Common Mode Range <sup>4</sup><br>$V_{PP} < 500\text{mV}$<br>$V_{PP} \geq 500\text{mV}$ | -2.1<br>-1.9 |        | -0.2<br>-0.2 | -2.2<br>-2.0 |        | -0.2<br>-0.2 | -2.2<br>-2.0 |        | -0.2<br>-0.2 | -2.2<br>-2.0 |        | -0.2<br>-0.2 | V    |
| $t_r$<br>$t_f$         | Output Rise/Fall Times Q<br>(20% – 80%)   | 120          |        | 320          | 120          |        | 320          | 120          | 220    | 320          | 120          |        | 320          | ps   |

1. Within-device skew defined as identical transitions on similar paths through a device.
2. Duty cycle skew is the difference between a TPLH and TPHL propagation delay through a device.
3. Minimum input swing for which AC parameters guaranteed. The device will function properly with input swings below 200mV, however, AC delays may move outside of the specified range. The device has a DC gain of  $\approx 40$ .
4. The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between  $V_{ppmin}$  and 1V. The lower end of the CMR range varies 1:1 with  $V_{EE}$ . The number in the spec table assumes a nominal  $V_{EE} = -3.3\text{V}$ . Note for PECL operation, the  $V_{CMR}(\text{min})$  will be fixed at  $3.3\text{V} - |V_{CMR}(\text{min})|$ .



**Figure 1. Output Swing versus Frequency**

OUTLINE DIMENSIONS

D SUFFIX  
PLASTIC SOIC PACKAGE  
CASE 751-05  
ISSUE P



NOTES:

1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
3. DIMENSIONS ARE IN MILLIMETER.
4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
5. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
6. DIMENSION D DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 4.80        | 5.00 |
| B   | 3.80        | 4.00 |
| C   | 1.35        | 1.75 |
| D   | 0.35        | 0.49 |
| F   | 0.40        | 1.25 |
| G   | 1.27 BSC    |      |
| J   | 0.18        | 0.25 |
| K   | 0.10        | 0.25 |
| M   | 0°          | 7°   |
| P   | 5.80        | 6.20 |
| R   | 0.25        | 0.50 |

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