



# MC100LVEL39 MC100EL39

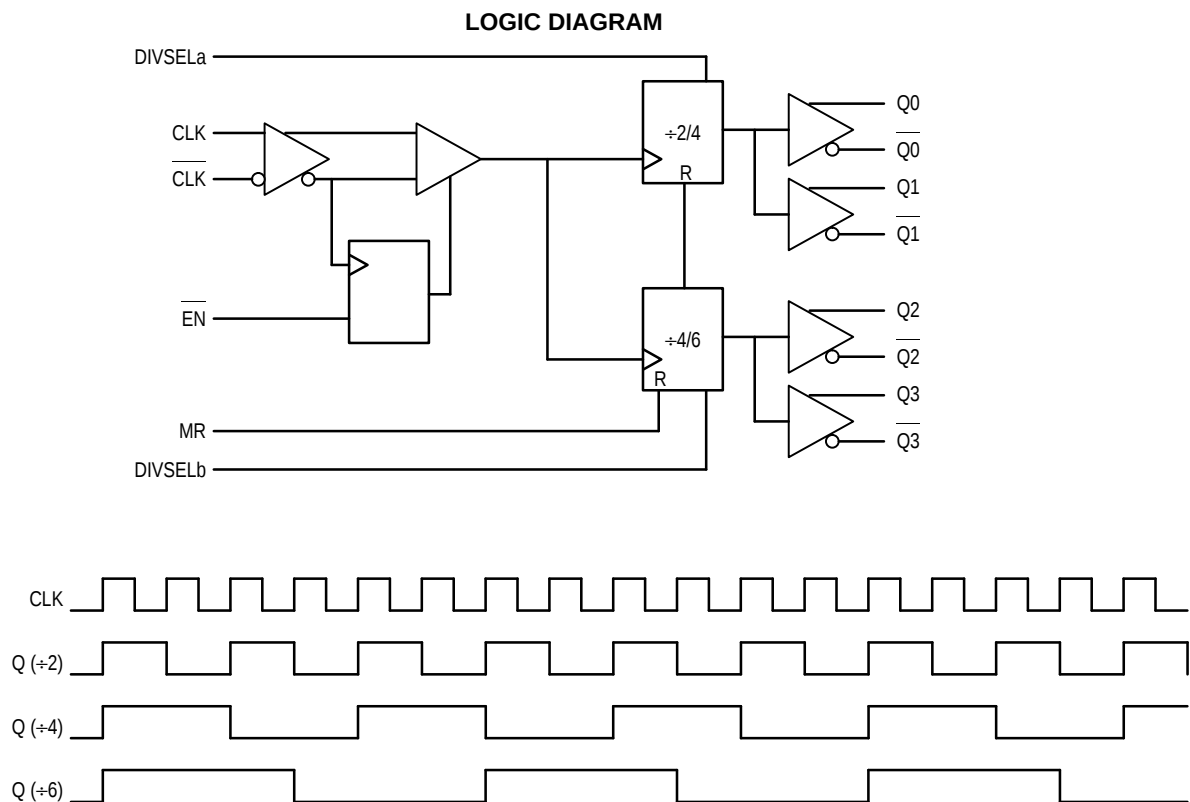


Figure 1. Timing Diagrams

## MC100LVEL39

### DC CHARACTERISTICS ( $V_{EE} = -3.8V$ to $-3.0$ ; $V_{CC} = GND$ )

| 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     |       | 50  | 59    |       | 50  | 59    |       | 50  | 59    |       | 54  | 61    | mA      |
| $V_{BB}$ | Output Reference Voltage | -1.38 |     | -1.26 | -1.38 |     | -1.26 | -1.38 |     | -1.26 | -1.38 |     | -1.26 | V       |
| $I_{IH}$ | Input High Current       |       |     | 150   |       |     | 150   |       |     | 150   |       |     | 150   | $\mu A$ |

## MC100LVEL39

### AC CHARACTERISTICS ( $V_{EE} = -3.8V$ to $-3.0$ ; $V_{CC} = GND$ )

| Symbol                 | Characteristic                                                               | -40°C             |     |                    | 0°C               |     |                    | 25°C              |     |                     | 85°C              |     |                     | Unit |
|------------------------|------------------------------------------------------------------------------|-------------------|-----|--------------------|-------------------|-----|--------------------|-------------------|-----|---------------------|-------------------|-----|---------------------|------|
|                        |                                                                              | Min               | Typ | Max                | Min               | Typ | Max                | Min               | Typ | Max                 | Min               | Typ | Max                 |      |
| $f_{MAX}$              | Maximum Toggle Frequency                                                     | 1000              |     |                    | 1000              |     |                    | 1000              |     |                     | 1000              |     |                     | MHz  |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay<br>to Output<br>CLK → Q (Diff)<br>CLK → Q (S.E.)<br>MR → Q | 760<br>710<br>600 |     | 960<br>1010<br>900 | 780<br>730<br>600 |     | 980<br>1030<br>900 | 800<br>750<br>610 |     | 1000<br>1050<br>910 | 850<br>800<br>630 |     | 1050<br>1100<br>930 | ps   |
| $t_{SKEW}$             | Within-Device Skew <sup>1</sup> Q <sub>0</sub> – Q <sub>3</sub>              |                   |     | 50                 |                   |     | 50                 |                   |     | 50                  |                   |     | 50                  | ps   |
|                        | Part-to-Part Q <sub>0</sub> – Q <sub>3</sub> (Diff)                          |                   |     | 200                |                   |     | 200                |                   |     | 200                 |                   |     | 200                 | ps   |
| $t_S$                  | Setup Time<br>EN → CLK<br>DIVSEL → CLK                                       | 250<br>400        |     |                    | 250<br>400        |     |                    | 250<br>400        |     |                     | 250<br>400        |     |                     | ps   |
| $t_H$                  | Hold Time<br>CLK → EN<br>CLK → Div_Sel                                       | 100<br>150        |     |                    | 100<br>150        |     |                    | 100<br>150        |     |                     | 100<br>150        |     |                     | ps   |

**MC100LVEL39 (continued)****AC CHARACTERISTICS** ( $V_{EE} = -3.8V$  to  $-3.0V$ ;  $V_{CC} = GND$ )

| Symbol     | Characteristic                                                            | -40°C        |     |              | 0°C          |     |              | 25°C         |     |              | 85°C         |     |              | Unit |
|------------|---------------------------------------------------------------------------|--------------|-----|--------------|--------------|-----|--------------|--------------|-----|--------------|--------------|-----|--------------|------|
|            |                                                                           | Min          | Typ | Max          | Min          | Typ | Max          | Min          | Typ | Max          | Min          | Typ | Max          |      |
| $V_{PP}$   | Minimum Input Swing CLK                                                   | 250          |     |              | 250          |     |              | 250          |     |              | 250          |     |              | mV   |
| $V_{CMR}$  | Common Mode Range <sup>3</sup><br>$V_{PP} < 500mV$<br>$V_{PP} \geq 500mV$ | -2.0<br>-1.8 |     | -0.4<br>-0.4 | -2.1<br>-1.9 |     | -0.4<br>-0.4 | -2.1<br>-1.9 |     | -0.4<br>-0.4 | -2.1<br>-1.9 |     | -0.4<br>-0.4 | V    |
| $t_{RR}$   | Reset Recovery Time                                                       |              |     | 100          |              |     | 100          |              |     | 100          |              |     | 100          | ps   |
| $t_{PW}$   | Minimum Pulse Width CLK<br>MR                                             | 500<br>700   |     |              | 500<br>700   |     |              | 500<br>700   |     |              | 500<br>700   |     |              | ps   |
| $t_r, t_f$ | Output Rise/Fall Times Q (20% – 80%)                                      | 280          |     | 550          | 280          |     | 550          | 280          |     | 550          | 280          |     | 550          | ps   |

1. Skew is measured between outputs under identical transitions.

2. Minimum input swing for which AC parameters are guaranteed. The device will function reliably with differential inputs down to 100mV.

3. 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 numbers in the spec table assume a nominal  $V_{EE} = -3.3V$ . Note for PECL operation, the  $V_{CMR(min)}$  will be fixed at  $3.3V - |V_{CMR(min)}|$ .

**MC100EL39****DC CHARACTERISTICS** ( $V_{EE} = -4.2V$  to  $-5.46V$ ;  $V_{CC} = GND$ )

| 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     |       | 50  | 59    |       | 50  | 59    |       | 50  | 59    |       | 54  | 61    | mA      |
| $V_{BB}$ | Output Reference Voltage | -1.38 |     | -1.26 | -1.38 |     | -1.26 | -1.38 |     | -1.26 | -1.38 |     | -1.26 | V       |
| $I_{IH}$ | Input High Current       |       |     | 150   |       |     | 150   |       |     | 150   |       |     | 150   | $\mu A$ |

**MC100EL39****AC CHARACTERISTICS** ( $V_{EE} = -4.2V$  to  $-5.46V$ ;  $V_{CC} = GND$ )

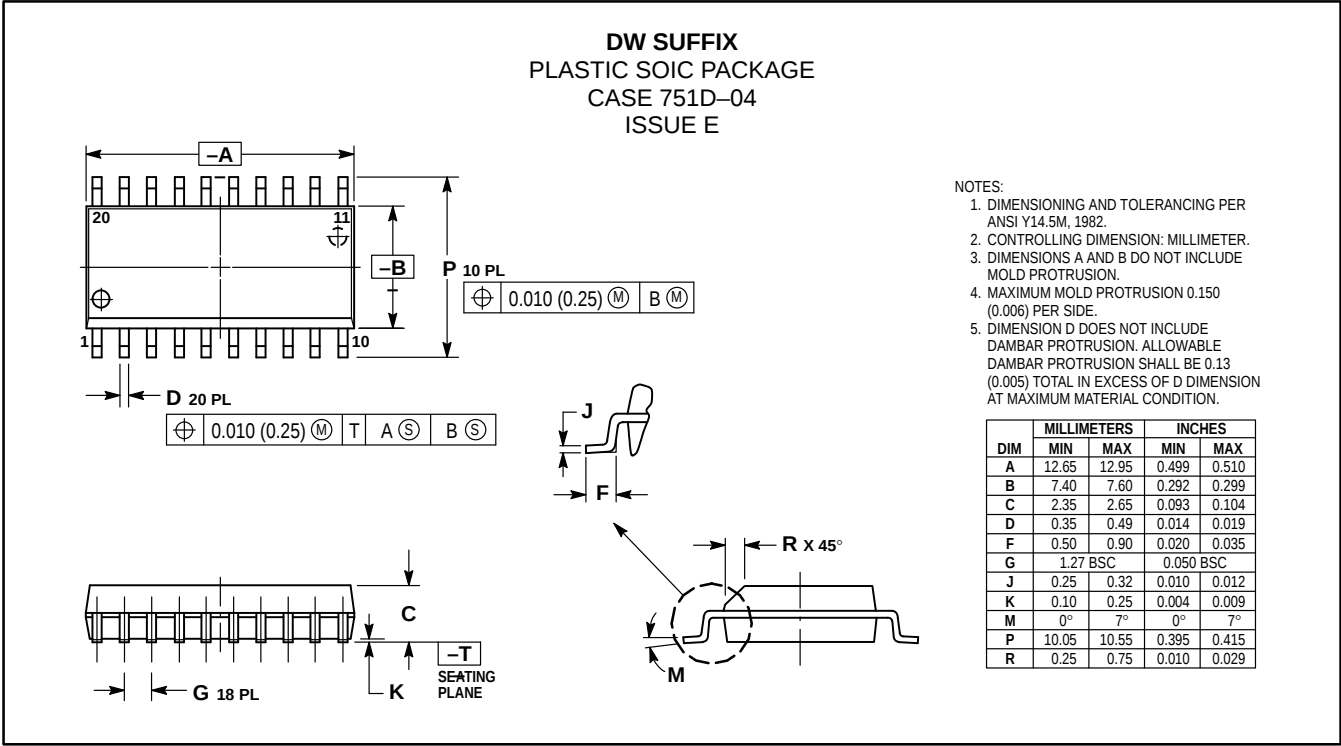
| Symbol                 | Characteristic                                                            | -40°C             |     |                    | 0°C               |     |                    | 25°C              |     |                     | 85°C              |     |                     | Unit |
|------------------------|---------------------------------------------------------------------------|-------------------|-----|--------------------|-------------------|-----|--------------------|-------------------|-----|---------------------|-------------------|-----|---------------------|------|
|                        |                                                                           | Min               | Typ | Max                | Min               | Typ | Max                | Min               | Typ | Max                 | Min               | Typ | Max                 |      |
| $f_{MAX}$              | Maximum Toggle Frequency                                                  | 1000              |     |                    | 1000              |     |                    | 1000              |     |                     | 1000              |     |                     | MHz  |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay CLK → Q (Diff)<br>to Output CLK → Q (S.E.)<br>MR → Q    | 760<br>710<br>600 |     | 960<br>1010<br>900 | 780<br>730<br>600 |     | 980<br>1030<br>900 | 800<br>750<br>610 |     | 1000<br>1050<br>910 | 850<br>800<br>630 |     | 1050<br>1100<br>930 | ps   |
| $t_{SKEW}$             | Within-Device Skew <sup>1</sup> $Q_0 - Q_3$                               |                   |     | 50                 |                   |     | 50                 |                   |     | 50                  |                   |     | 50                  | ps   |
|                        | Part-to-Part $Q_0 - Q_3$ (Diff)                                           |                   |     | 200                |                   |     | 200                |                   |     | 200                 |                   |     | 200                 | ps   |
| $t_S$                  | Setup Time EN → CLK<br>DIVSEL → CLK                                       | 250<br>400        |     |                    | 250<br>400        |     |                    | 250<br>400        |     |                     | 250<br>400        |     |                     | ps   |
| $t_H$                  | Hold Time CLK → EN<br>CLK → Div_Sel                                       | 100<br>150        |     |                    | 100<br>150        |     |                    | 100<br>150        |     |                     | 100<br>150        |     |                     | ps   |
| $V_{PP}$               | Minimum Input Swing CLK                                                   | 250               |     |                    | 250               |     |                    | 250               |     |                     | 250               |     |                     | mV   |
| $V_{CMR}$              | Common Mode Range <sup>3</sup><br>$V_{PP} < 500mV$<br>$V_{PP} \geq 500mV$ | -3.2<br>-3.0      |     | -0.4<br>-0.4       | -3.3<br>-3.1      |     | -0.4<br>-0.4       | -3.3<br>-3.1      |     | -0.4<br>-0.4        | -3.3<br>-3.1      |     | -0.4<br>-0.4        | V    |
| $t_{RR}$               | Reset Recovery Time                                                       |                   |     | 100                |                   |     | 100                |                   |     | 100                 |                   |     | 100                 | ps   |
| $t_{PW}$               | Minimum Pulse Width CLK<br>MR                                             | 500<br>700        |     |                    | 500<br>700        |     |                    | 500<br>700        |     |                     | 500<br>700        |     |                     | ps   |
| $t_r, t_f$             | Output Rise/Fall Times Q (20% – 80%)                                      | 280               |     | 550                | 280               |     | 550                | 280               |     | 550                 | 280               |     | 550                 | ps   |

1. Skew is measured between outputs under identical transitions.

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