

# MC10E111, MC100E111

## 5V ECL 1:9 Differential Clock Driver

### Description

The MC10E/100E111 is a low skew 1-to-9 differential driver, designed with clock distribution in mind. It accepts one signal input, which can be either differential or else single-ended if the  $V_{BB}$  output is used. The signal is fanned out to 9 identical differential outputs. An enable input is also provided. A HIGH disables the device by forcing all Q outputs LOW and all  $\bar{Q}$  outputs HIGH.

The device is specifically designed, modeled and produced with low skew as the key goal. Optimal design and layout serve to minimize gate to gate skew within-device, and empirical modeling is used to determine process control limits that ensure consistent  $t_{pd}$  distributions from lot to lot. The net result is a dependable, guaranteed low skew device.

The lowest TPD delay time results from terminating only one output pair, and the greatest TPD delay time results from terminating all the output pairs. This shift is about 10 – 20 pS in TPD. The skew between any two output pairs within a device is typically about 25 nS. If other output pairs are not terminated, the lowest TPD delay time results from both output pairs and the skew is typically 25 nS. When all outputs are terminated, the greatest TPD (delay time) occurs and all outputs display about the same 10 – 20 pS increase in TPD, so the relative skew between any two output pairs remains about 25 nS.

The  $V_{BB}$  pin, an internally generated voltage supply, is available to this device only. For single-ended input conditions, the unused differential input is connected to  $V_{BB}$  as a switching reference voltage.  $V_{BB}$  may also rebias AC coupled inputs. When used, decouple  $V_{BB}$  and  $V_{CC}$  via a 0.01  $\mu$ F capacitor and limit current sourcing or sinking to 0.5 mA. When not used,  $V_{BB}$  should be left open.

The 100 Series contains temperature compensation.

### Features

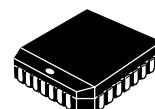
- Guaranteed Skew Spec
- Differential Design
- $V_{BB}$  Output
- PECL Mode Operating Range:  $V_{CC} = 4.2$  V to 5.7 V with  $V_{EE} = 0$  V
- NECL Mode Operating Range:  $V_{CC} = 0$  V with  $V_{EE} = -4.2$  V to  $-5.7$  V
- Internal Input 50 K $\Omega$  Pulldown Resistors
- ESD Protection: Human Body Model; > 3 kV
- Meets or Exceeds JEDEC Standard EIA/JESD78 IC Latchup Test

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



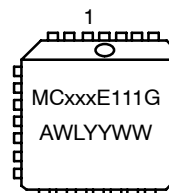
ON Semiconductor®

<http://onsemi.com>



PLCC-28  
FN SUFFIX  
CASE 776

### MARKING DIAGRAM\*



|     |                     |
|-----|---------------------|
| xxx | = 10 or 100         |
| A   | = Assembly Location |
| WL  | = Wafer Lot         |
| YY  | = Year              |
| WW  | = Work Week         |
| G   | = Pb-Free Package   |

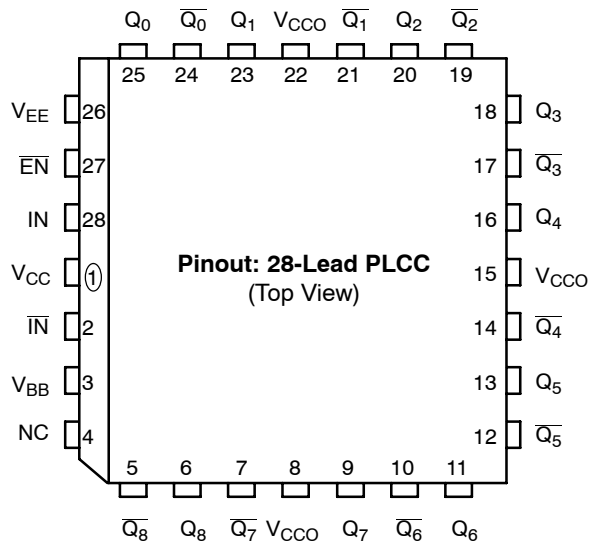
\*For additional marking information, refer to Application Note AND8002/D.

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 8 of this data sheet.

- Moisture Sensitivity Level:  
Pb = 1  
Pb-Free = 3  
For Additional Information, see Application Note AND8003/D
- Flammability Rating: UL 94 V-0 @ 0.125 in, Oxygen Index: 28 to 34
- Transistor Count = 178 devices
- Pb-Free Packages are Available\*

# MC10E111, MC100E111



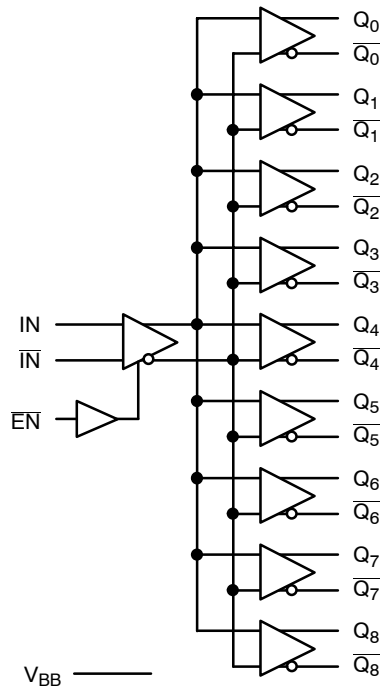
**Table 1. PIN DESCRIPTION**

| PIN                                       | FUNCTION                    |
|---|-----------------------------|
| IN, $\overline{IN}$                       | ECL Differential Input Pair |
| EN  | ECL Enable                  |
| $Q_0, \overline{Q_0}-Q_8, \overline{Q_8}$ | ECL Differential Outputs    |
| $V_{BB}$                                  | Reference Voltage Output    |
| $V_{CC}, V_{CCO}$                         | Positive Supply             |
| $V_{EE}$                                  | Negative Supply             |
| NC  | No Connect                  |

\* All  $V_{CC}$  and  $V_{CCO}$  pins are tied together on the die.

Warning: All  $V_{CC}$ ,  $V_{CCO}$ , and  $V_{EE}$  pins must be externally connected to Power Supply to guarantee proper operation.

**Figure 1. 28-Lead Pinout**



**Figure 2. Logic Symbol**

# MC10E111, MC100E111

**Table 2. MAXIMUM RATINGS**

| Symbol        | Parameter  | Condition 1                                    | Condition 2                            | Rating       | Unit   |
|---------------|--|--|--|--------------|--|
| $V_{CC}$      | PECL Mode Power Supply                             | $V_{EE} = 0\text{ V}$                          |  | 8            | V  |
| $V_I$         | PECL Mode Input Voltage<br>NECL Mode Input Voltage | $V_{EE} = 0\text{ V}$<br>$V_{CC} = 0\text{ V}$ | $V_I \leq V_{CC}$<br>$V_I \geq V_{EE}$ | 6<br>-6      | V<br>V   |
| $I_{out}$     | Output Current                                     | Continuous<br>Surge                            |  | 50<br>100    | mA<br>mA   |
| $I_{BB}$      | $V_{BB}$ Sink/Source                               |  |  | $\pm 0.5$    | mA   |
| $T_A$         | Operating Temperature Range                        |  |  | -40 to +85   | $^{\circ}\text{C}$   |
| $T_{stg}$     | Storage Temperature Range                          |  |  | -65 to +150  | $^{\circ}\text{C}$   |
| $\theta_{JA}$ | Thermal Resistance (Junction-to-Ambient)           | 0 lfpm<br>500 lfpm                             | PLCC-28<br>PLCC-28                     | 63.5<br>43.5 | $^{\circ}\text{C}/\text{W}$<br>$^{\circ}\text{C}/\text{W}$ |
| $\theta_{JC}$ | Thermal Resistance (Junction-to-Case)              | Standard Board                                 | PLCC-28                                | 22 to 26     | $^{\circ}\text{C}/\text{W}$                                |
| $T_{sol}$     | Wave Solder<br>Pb<br>Pb-Free                       |  |  | 265<br>265   | $^{\circ}\text{C}$   |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

# MC10E111, MC100E111

**Table 3. 10E SERIES PECL DC CHARACTERISTICS**  $V_{CCx} = 5.0\text{ V}$ ;  $V_{EE} = 0.0\text{ V}$  (Note 1)

| Symbol      | Characteristic   | -40°C |      |      | 25°C |      |      | 85°C |      |      | Unit          |
|-------------|--|-------|------|------|------|------|------|------|------|------|---------------|
|             |  | Min   | Typ  | Max  | Min  | Typ  | Max  | Min  | Typ  | Max  |               |
| $I_{EE}$    | Power Supply Current   |       | 41   | 60   |      | 42   | 60   |      | 43   | 60   | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 2)   | 3920  | 4030 | 4110 | 4020 | 4105 | 4190 | 4090 | 4185 | 4280 | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 2)  | 3050  | 3230 | 3350 | 3050 | 3210 | 3370 | 3050 | 3227 | 3405 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)  | 3870  | 4030 | 4190 | 3870 | 4030 | 4190 | 3940 | 4110 | 4280 | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)   | 3050  | 3285 | 3520 | 3050 | 3285 | 3520 | 3050 | 3302 | 3555 | mV            |
| $V_{BB}$    | Output Voltage Reference   | 3.6   |      | 3.73 | 3.65 |      | 3.75 | 3.69 |      | 3.90 | V             |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 3) | 3.4   |      | 4.6  | 3.4  |      | 4.6  | 3.4  |      | 4.6  | V             |
| $I_{IH}$    | Input HIGH Current   |       |      | 150  |      |      | 150  |      |      | 150  | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current  | 0.5   |      |      | 0.5  | 0.25 |      | 0.3  | 0.2  |      | $\mu\text{A}$ |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

1. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary  $-0.46\text{ V} / +0.06\text{ V}$ .
2. Outputs are terminated through a  $50\ \Omega$  resistor to  $V_{CC} - 2.0\text{ V}$ .
3.  $V_{IHCMR}$  min and max vary 1:1 with  $V_{CC}$ .

**Table 4. 10E SERIES NECL DC CHARACTERISTICS**  $V_{CCx} = 0.0\text{ V}$ ;  $V_{EE} = -5.0\text{ V}$  (Note 4)

| Symbol      | Characteristic   | -40°C |       |       | 25°C  |       |       | 85°C  |       |       | Unit          |
|-------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|
|             |  | Min   | Typ   | Max   | Min   | Typ   | Max   | Min   | Typ   | Max   |               |
| $I_{EE}$    | Power Supply Current   |       | 41    | 60    |       | 42    | 60    |       | 43    | 60    | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 5)   | -1080 | -970  | -890  | -980  | -895  | -810  | -910  | -815  | -720  | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 5)  | -1950 | -1770 | -1650 | -1950 | -1790 | -1630 | -1950 | -1773 | -1595 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)  | -1130 | -970  | -810  | -1130 | -970  | -810  | -1060 | -890  | -720  | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)   | -1950 | -1715 | -1480 | -1950 | -1715 | -1480 | -1950 | -1698 | -1445 | mV            |
| $V_{BB}$    | Output Voltage Reference   | -1.40 |       | -1.27 | -1.35 |       | -1.25 | -1.31 |       | -1.19 | V             |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 6) | -1.6  |       | -0.4  | -1.6  |       | -0.4  |       | 1.6   | -0.4  | V             |
| $I_{IH}$    | Input HIGH Current   |       |       | 150   |       |       | 150   |       |       | 150   | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current  | 0.5   |       |       | 0.5   | 0.065 |       | 0.3   | 0.2   |       | $\mu\text{A}$ |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

4. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary  $-0.46\text{ V} / +0.06\text{ V}$ .
5. Outputs are terminated through a  $50\ \Omega$  resistor to  $V_{CC} - 2.0\text{ V}$ .
6.  $V_{IHCMR}$  min and max vary 1:1 with  $V_{CC}$ .

# MC10E111, MC100E111

**Table 5. 100E SERIES PECL DC CHARACTERISTICS**  $V_{CCx} = 5.0\text{ V}$ ;  $V_{EE} = 0.0\text{ V}$  (Note 7)

| Symbol      | Characteristic   | -40°C |      |      | 25°C |      |      | 85°C |      |      | Unit          |
|-------------|--|-------|------|------|------|------|------|------|------|------|---------------|
|             |  | Min   | Typ  | Max  | Min  | Typ  | Max  | Min  | Typ  | Max  |               |
| $I_{EE}$    | Power Supply Current   |       | 40   | 60   |      | 45   | 60   |      | 50   | 69   | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 8)   | 3975  | 4020 | 4120 | 3975 | 4020 | 4120 | 3975 | 4020 | 4120 | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 8)  | 3190  | 3300 | 3380 | 3190 | 3300 | 3380 | 3190 | 3300 | 3380 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)  | 3835  | 3975 | 4120 | 3835 | 3975 | 4120 | 3835 | 3975 | 4120 | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)   | 3190  | 3355 | 3525 | 3190 | 3355 | 3525 | 3190 | 3355 | 3525 | mV            |
| $V_{BB}$    | Output Voltage Reference   | 3.64  |      | 3.75 | 3.62 |      | 3.74 | 3.62 |      | 3.74 | V             |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 9) | 3.4   |      | 4.6  | 3.4  |      | 4.6  | 3.4  |      | 4.6  | V             |
| $I_{IH}$    | Input HIGH Current   |       |      | 150  |      |      | 150  |      |      | 150  | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current  | 0.5   |      |      | 0.5  | 0.25 |      | 0.5  | 0.2  |      | $\mu\text{A}$ |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

7. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary  $-0.46\text{ V} / +0.8\text{ V}$ .

8. Outputs are terminated through a  $50\ \Omega$  resistor to  $V_{CC} - 2.0\text{ V}$

9.  $V_{IHCMR}$  min and max vary 1:1 with  $V_{CC}$ .

**Table 6. 100E SERIES NECL DC CHARACTERISTICS**  $V_{CCx} = 0.0\text{ V}$ ;  $V_{EE} = -5.0\text{ V}$  (Note 10)

| Symbol      | Characteristic  | -40°C |       |       | 25°C  |       |       | 85°C  |       |       | Unit          |
|-------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|
|             |   | Min   | Typ   | Max   | Min   | Typ   | Max   | Min   | Typ   | Max   |               |
| $I_{EE}$    | Power Supply Current  |       | 40    | 60    |       | 45    | 60    |       | 50    | 69    | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 11)   | -1025 | -980  | -880  | -1025 | -980  | -880  | -1025 | -980  | -880  | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 11)  | -1810 | -1700 | -1620 | -1810 | -1700 | -1620 | -1810 | -1700 | -1620 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)   | -1165 | -1025 | -880  | -1165 | -1025 | -880  | -1165 | -1025 | -880  | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)  | -1810 | -1645 | -1475 | -1810 | -1645 | -1475 | -1810 | -1645 | -1475 | mV            |
| $V_{BB}$    | Output Voltage Reference  | -1.38 |       | -1.25 | -1.38 |       | -1.26 | -1.38 |       | -1.26 | V             |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 12) | -1.6  |       | -0.4  | -1.6  |       | -0.4  | -1.6  |       | -0.4  | V             |
| $I_{IH}$    | Input HIGH Current  |       |       | 150   |       |       | 150   |       |       | 150   | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current   | 0.5   |       |       | 0.5   | 0.25  |       | 0.5   | 0.2   |       | $\mu\text{A}$ |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

10. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary  $-0.46\text{ V} / +0.8\text{ V}$ .

11. Outputs are terminated through a  $50\ \Omega$  resistor to  $V_{CC} - 2.0\text{ V}$

12.  $V_{IHCMR}$  min and max vary 1:1 with  $V_{CC}$ .

# MC10E111, MC100E111

**Table 7. AC CHARACTERISTICS**  $V_{CCx} = 5.0\text{ V}$ ;  $V_{EE} = 0.0\text{ V}$  or  $V_{CCx} = 0.0\text{ V}$ ;  $V_{EE} = -5.0\text{ V}$  (Note 13)

| Symbol                 | Characteristic   | -40°C                    |      |                          | 25°C                     |      |                          | 85°C                     |      |                          | Unit |
|------------------------|--|--------------------------|------|--------------------------|--------------------------|------|--------------------------|--------------------------|------|--------------------------|------|
|                        |  | Min                      | Typ  | Max                      | Min                      | Typ  | Max                      | Min                      | Typ  | Max                      |      |
| $f_{MAX}$              | Maximum Toggle Frequency   |                          | 800  |                          |                          | 800  |                          |                          | 800  |                          | MHz  |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output<br>IN (Diff) (Note 14)<br>IN (SE) (Note 15)<br>Enable (Note 16)<br>Disable (Note 16) | 430<br>380<br>400<br>400 |      | 630<br>680<br>900<br>900 | 430<br>380<br>450<br>450 |      | 630<br>680<br>850<br>850 | 430<br>380<br>450<br>450 |      | 630<br>680<br>850<br>850 | ps   |
| $t_s$                  | Setup Time (Note 17) $\overline{EN}$ to IN   | 250                      | 0    |                          | 200                      | 0    |                          | 200                      | 0    |                          | ps   |
| $t_H$                  | Hold Time (Note 18) IN to $\overline{EN}$  | 50                       | -200 |                          | 0                        | -200 |                          | 0                        | -200 |                          | ps   |
| $t_R$                  | Release Time (Note 19) $\overline{EN}$ to IN   | 350                      | 100  |                          | 300                      | 100  |                          | 300                      | 100  |                          | ps   |
| $t_{skew}$             | Within-Device Skew (Note 20)   |                          | 25   | 75                       |                          | 25   | 50                       |                          | 25   | 50                       | ps   |
| $t_{JITTER}$           | Random Clock Jitter (RMS)  |                          | < 1  | < 2                      |                          | < 1  | < 2                      |                          | < 1  | < 2                      | ps   |
| $V_{PP}$               | Minimum Input Swing  | 50                       |      |                          | 50                       |      |                          | 50                       |      |                          | mV   |
| $t_r, t_f$             | Rise/Fall Time   | 250                      | 450  | 650                      | 275                      | 375  | 600                      | 275                      | 375  | 600                      | ps   |

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

13. 10 Series:  $V_{EE}$  can vary  $-0.46\text{ V} / +0.06\text{ V}$ .  
100 Series:  $V_{EE}$  can vary  $-0.46 / +0.8\text{ V}$ .

14. The differential propagation delay is defined as the delay from the crossing points of the differential input signals to the crossing point of the differential output signals.

15. The single-ended propagation delay is defined as the delay from the 50% point of the input signal to the 50% point of the output signal.

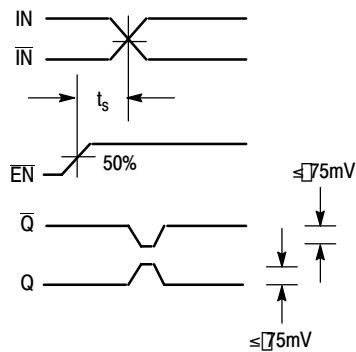
16. Enable is defined as the propagation delay from the 50% point of a **negative** transition on  $\overline{EN}$  to the 50% point of a **positive** transition on Q (or a negative transition on  $\overline{Q}$ ). Disable is defined as the propagation delay from the 50% point of a **positive** transition on  $\overline{EN}$  to the 50% point of a **negative** transition on Q (or a positive transition on  $\overline{Q}$ ).

17. The setup time is the minimum time that  $\overline{EN}$  must be asserted prior to the next transition of IN/ $\overline{IN}$  to prevent an output response greater than  $\pm 75\text{ mV}$  to that IN/ $\overline{IN}$  transition (Figure 3).

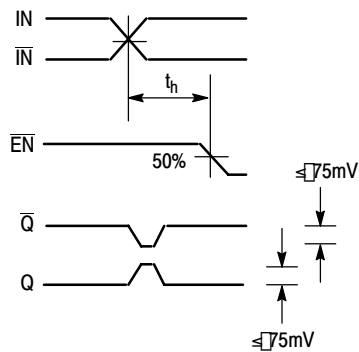
18. The hold time is the minimum time that  $\overline{EN}$  must remain asserted after a negative going IN or a positive going  $\overline{IN}$  to prevent an output response greater than  $\pm 75\text{ mV}$  to that IN/ $\overline{IN}$  transition (Figure 4).

19. The release time is the minimum time that  $\overline{EN}$  must be deasserted prior to the next IN/ $\overline{IN}$  transition to ensure an output response that meets the specified IN to Q propagation delay and output transition times (Figure 5).

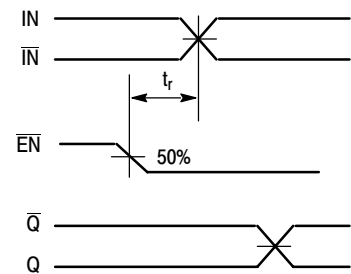
20. The within-device skew is defined as the worst case difference between any two similar delay paths within a single device.



**Figure 3. Setup Time**



**Figure 4. Hold Time**



**Figure 5. Release Time**

# MC10E111, MC100E111

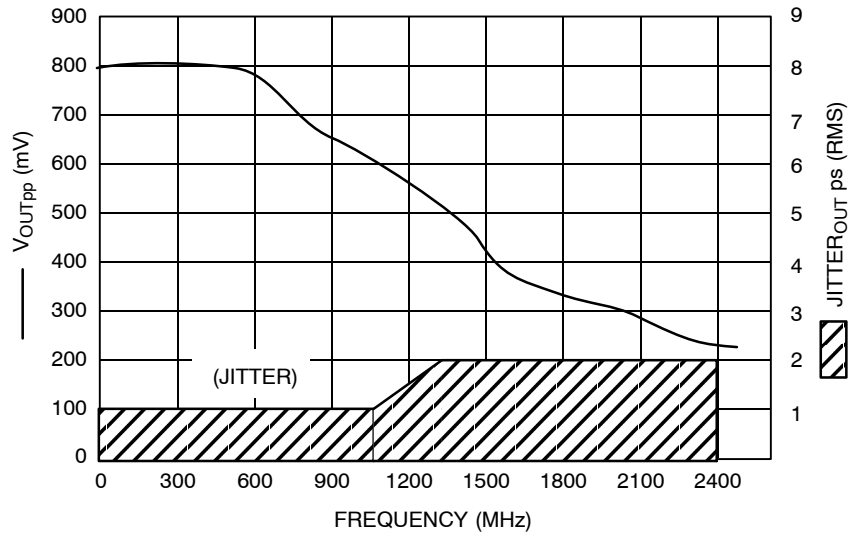


Figure 6.  $F_{max}/Jitter$

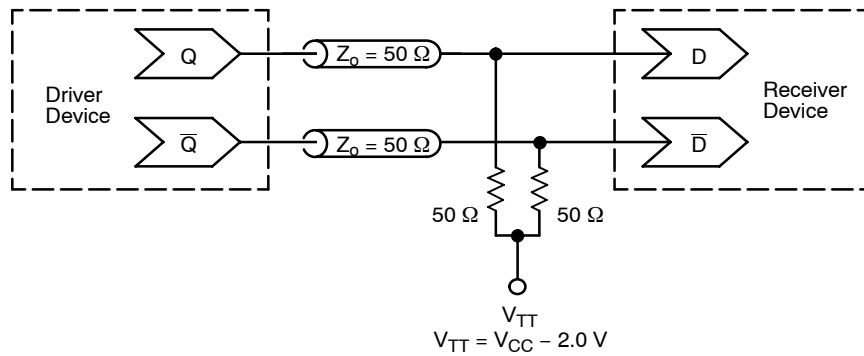


Figure 7. Typical Termination for Output Driver and Device Evaluation  
(See Application Note AND8020/D – Termination of ECL Logic Devices.)

# MC10E111, MC100E111

## ORDERING INFORMATION

| Device         | Package              | Shipping†         |
|----------------|----------------------|-------------------|
| MC10E111FN     | PLCC-28              | 37 Units / Rail   |
| MC10E111FNG    | PLCC-28<br>(Pb-Free) | 37 Units / Rail   |
| MC10E111FNR2   | PLCC-28              | 500 / Tape & Reel |
| MC10E111FNR2G  | PLCC-28<br>(Pb-Free) | 500 / Tape & Reel |
| MC100E111FN    | PLCC-28              | 37 Units / Rail   |
| MC100E111FNG   | PLCC-28<br>(Pb-Free) | 37 Units / Rail   |
| MC100E111FNR2  | PLCC-28              | 500 / Tape & Reel |
| MC100E111FNR2G | PLCC-28<br>(Pb-Free) | 500 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

### Resource Reference of Application Notes

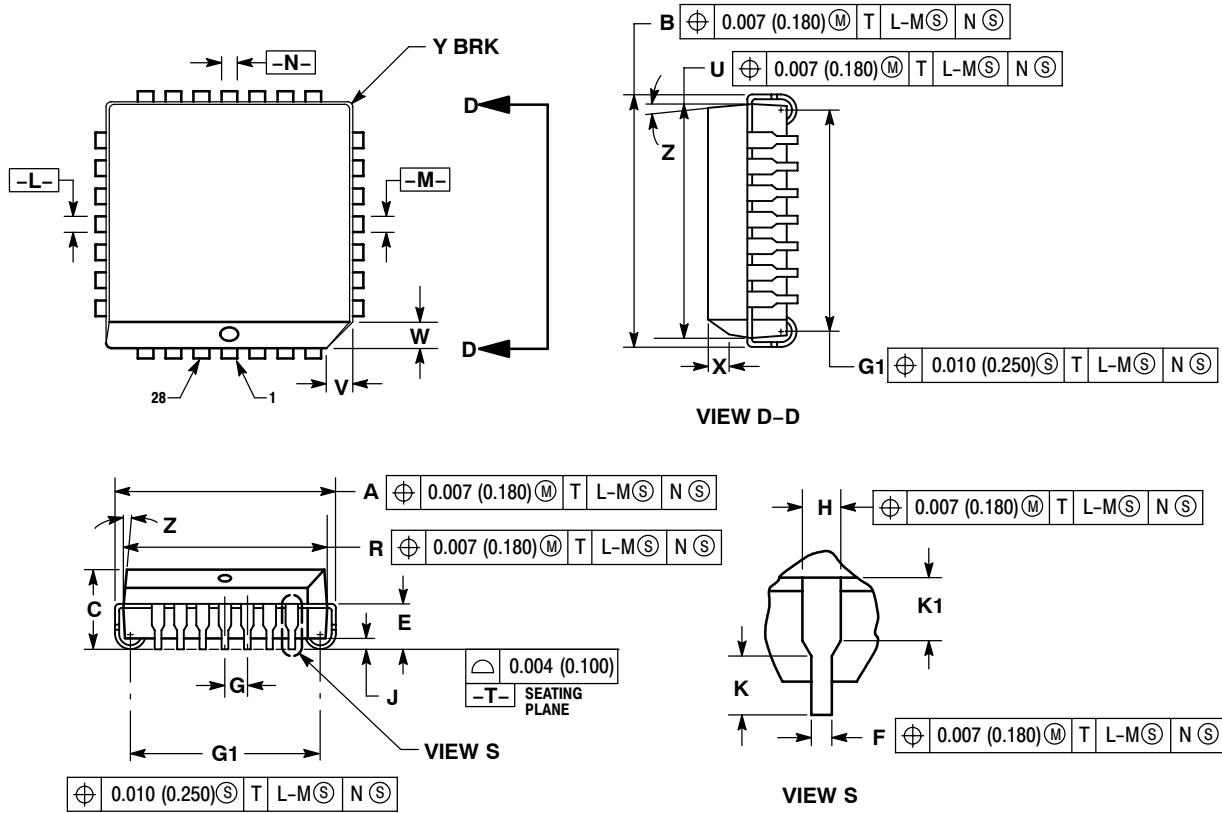
- AN1405/D** – ECL Clock Distribution Techniques
- AN1406/D** – Designing with PECL (ECL at +5.0 V)
- AN1503/D** – ECLinPS™ I/O SPICE Modeling Kit
- AN1504/D** – Metastability and the ECLinPS Family
- AN1568/D** – Interfacing Between LVDS and ECL
- AN1672/D** – The ECL Translator Guide
- AND8001/D** – Odd Number Counters Design
- AND8002/D** – Marking and Date Codes
- AND8020/D** – Termination of ECL Logic Devices
- AND8066/D** – Interfacing with ECLinPS
- AND8090/D** – AC Characteristics of ECL Devices



# MC10E111, MC100E111

## PACKAGE DIMENSIONS

PLCC-28  
FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 776-02  
ISSUE E



### NOTES:

- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- THE PACKAGE BOTTOM MAY BE SMALLER THAN THE PACKAGE TOP BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
- DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.485     | 0.495 | 12.32       | 12.57 |
| B   | 0.485     | 0.495 | 12.32       | 12.57 |
| C   | 0.165     | 0.180 | 4.20        | 4.57  |
| E   | 0.090     | 0.110 | 2.29        | 2.79  |
| F   | 0.013     | 0.019 | 0.33        | 0.48  |
| G   | 0.050 BSC |       | 1.27 BSC    |       |
| H   | 0.026     | 0.032 | 0.66        | 0.81  |
| J   | 0.020     | ---   | 0.51        | ---   |
| K   | 0.025     | ---   | 0.64        | ---   |
| R   | 0.450     | 0.456 | 11.43       | 11.58 |
| U   | 0.450     | 0.456 | 11.43       | 11.58 |
| V   | 0.042     | 0.048 | 1.07        | 1.21  |
| W   | 0.042     | 0.048 | 1.07        | 1.21  |
| X   | 0.042     | 0.056 | 1.07        | 1.42  |
| Y   | ---       | 0.020 | ---         | 0.50  |
| Z   | 2°        |       | 10°         |       |
| G1  | 0.410     | 0.430 | 10.42       | 10.92 |
| K1  | 0.040     | ---   | 1.02        | ---   |

# MC10E111, MC100E111

ECLinPS is a trademark of Semiconductor Components Industries, LLC (SCILLC).

**ON Semiconductor** and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5773-3850

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local  
Sales Representative