

# MC10EP05, MC100EP05

## 3.3V / 5V ECL 2-Input Differential AND/NAND

The MC10/100EP05 is a 2-input differential AND/NAND gate. The device is functionally equivalent to the EL05 and LVEL05 devices. With AC performance much faster than the LVEL05 device, the EP05 is ideal for applications requiring the fastest AC performance available.

The 100 Series contains temperature compensation.

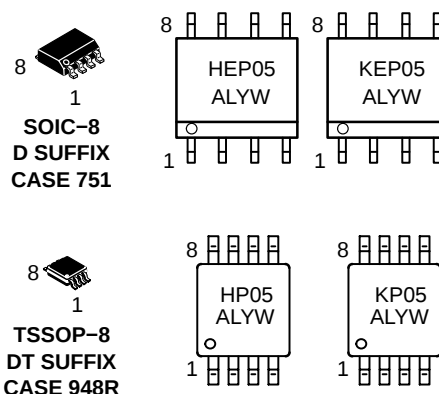
- 220 ps Typical Propagation Delay
- Maximum Frequency > 3 GHz Typical
- PECL Mode Operating Range:  $V_{CC} = 3.0\text{ V}$  to  $5.5\text{ V}$  with  $V_{EE} = 0\text{ V}$
- NECL Mode Operating Range:  $V_{CC} = 0\text{ V}$  with  $V_{EE} = -3.0\text{ V}$  to  $-5.5\text{ V}$
- Open Input Default State
- Safety Clamp on Inputs
- Q Output Will Default LOW with Inputs Open or at  $V_{EE}$
- Pb-Free Package is Available



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### MARKING DIAGRAMS\*



H = MC10                      L = Wafer Lot  
K = MC100                    Y = Year  
A = Assembly Location      W = Work Week

\*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.

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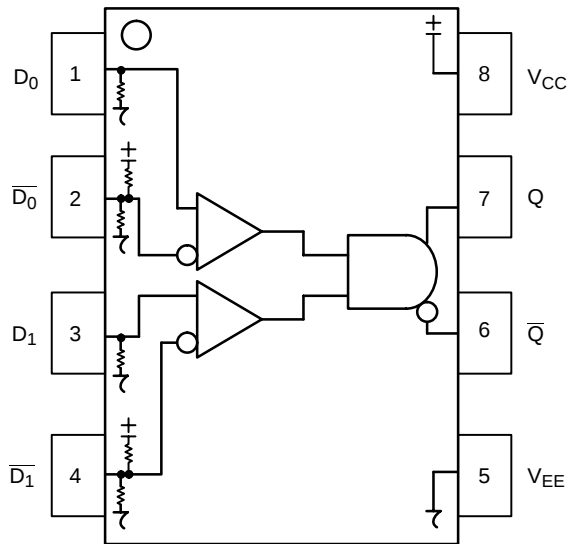


Figure 1. 8-Lead Pinout (Top View) and Logic Diagram

Table 1. PIN DESCRIPTION

| PIN                                              | FUNCTION         |
|--------------------------------------------------|------------------|
| D0*, D1*, $\overline{D0}$ **, $\overline{D1}$ ** | ECL Data Inputs  |
| Q, $\overline{Q}$                                | ECL Data Outputs |
| V <sub>CC</sub>                                  | Positive Supply  |
| V <sub>EE</sub>                                  | Negative Supply  |

\* Pins will default LOW when left open.

\*\* Pins will default to V<sub>CC</sub>/2 when left open.

Table 2. TRUTH TABLE

| D0 | D1 | $\overline{D0}$ | $\overline{D1}$ | Q | $\overline{Q}$ |
|----|----|-----------------|-----------------|---|----------------|
| L  | L  | H               | H               | L | H              |
| L  | H  | H               | L               | L | H              |
| H  | L  | L               | H               | L | H              |
| H  | H  | L               | L               | H | L              |

Table 3. ATTRIBUTES

| Characteristics                                               |                      | Value                |
|---------------------------------------------------------------|----------------------|----------------------|
| Internal Input Pulldown Resistor                              |                      | 75 k $\Omega$        |
| Internal Input Pullup Resistor                                |                      | 37.5 k $\Omega$      |
| ESD Protection                                                | Human Body Model     | > 4 kV               |
|                                                               | Machine Model        | > 200 V              |
|                                                               | Charged Device Model | > 2 kV               |
| Moisture Sensitivity, Indefinite Time Out of Drypack (Note 1) |                      | Level 1              |
| Flammability Rating Oxygen Index: 28 to 34                    |                      | UL 94 V-0 @ 0.125 in |
| Transistor Count                                              |                      | 137                  |
| Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test        |                      |                      |

1. For additional information, refer to Application Note AND8003/D.

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**Table 4. MAXIMUM RATINGS**

| Symbol        | Parameter                                | Condition 1           | Condition 2       | Rating      | Unit |
|---------------|------------------------------------------|-----------------------|-------------------|-------------|------|
| $V_{CC}$      | PECL Mode Power Supply                   | $V_{EE} = 0\text{ V}$ |                   | 6           | V    |
| $V_{EE}$      | NECL Mode Power Supply                   | $V_{CC} = 0\text{ V}$ |                   | -6          | V    |
| $V_I$         | PECL Mode Input Voltage                  | $V_{EE} = 0\text{ V}$ | $V_I \leq V_{CC}$ | 6           | V    |
|               | NECL Mode Input Voltage                  | $V_{CC} = 0\text{ V}$ | $V_I \geq V_{EE}$ | -6          | V    |
| $I_{out}$     | Output Current                           | Continuous<br>Surge   |                   | 50          | mA   |
|               |                                          |                       |                   | 100         | mA   |
| $T_A$         | Operating Temperature Range              |                       |                   | -40 to +85  | °C   |
| $T_{stg}$     | Storage Temperature Range                |                       |                   | -65 to +150 | °C   |
| $\theta_{JA}$ | Thermal Resistance (Junction-to-Ambient) | 0 lfpm                | SOIC-8            | 190         | °C/W |
|               |                                          | 500 lfpm              | SOIC-8            | 130         | °C/W |
| $\theta_{JC}$ | Thermal Resistance (Junction-to-Case)    | Standard Board        | SOIC-8            | 41 to 44    | °C/W |
| $\theta_{JA}$ | Thermal Resistance (Junction-to-Ambient) | 0 lfpm                | TSSOP-8           | 185         | °C/W |
|               |                                          | 500 lfpm              | TSSOP-8           | 140         | °C/W |
| $\theta_{JC}$ | Thermal Resistance (Junction-to-Case)    | Standard Board        | TSSOP-8           | 41 to 44    | °C/W |
| $T_{sol}$     | Wave Solder                              | <2 to 3 sec @ 248°C   |                   | 265         | °C   |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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**Table 5. 10EP DC CHARACTERISTICS, PECL**  $V_{CC} = 3.3\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 2)

| Symbol      | Characteristic                                                             | -40°C  |             |      | 25°C        |      |      | 85°C        |      |      | Unit          |
|-------------|----------------------------------------------------------------------------|--------|-------------|------|-------------|------|------|-------------|------|------|---------------|
|             |                                                                            | Min    | Typ         | Max  | Min         | Typ  | Max  | Min         | Typ  | Max  |               |
| $I_{EE}$    | Power Supply Current                                                       | 20     | 24          | 29   | 20          | 24   | 29   | 20          | 24   | 29   | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 3)                                               | 2165   | 2290        | 2415 | 2230        | 2355 | 2480 | 2290        | 2415 | 2540 | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 3)                                                | 1365   | 1490        | 1615 | 1430        | 1555 | 1680 | 1490        | 1615 | 1740 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)                                          | 2090   |             | 2415 | 2155        |      | 2480 | 2215        |      | 2540 | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)                                           | 1365   |             | 1690 | 1460        |      | 1755 | 1490        |      | 1815 | mV            |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 4) | 2.0    |             | 3.3  | 2.0         |      | 3.3  | 2.0         |      | 3.3  | V             |
| $I_{IH}$    | Input HIGH Current                                                         |        |             | 150  |             |      | 150  |             |      | 150  | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current                                                          | D<br>D | 0.5<br>-150 |      | 0.5<br>-150 |      |      | 0.5<br>-150 |      |      | $\mu\text{A}$ |

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.

- Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +0.3 V to -2.2 V.
- All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .
- $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ;  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**Table 6. 10EP DC CHARACTERISTICS, PECL**  $V_{CC} = 5.0\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 5)

| Symbol      | Characteristic                                                             | -40°C  |             |      | 25°C        |      |      | 85°C        |      |      | Unit          |
|-------------|----------------------------------------------------------------------------|--------|-------------|------|-------------|------|------|-------------|------|------|---------------|
|             |                                                                            | Min    | Typ         | Max  | Min         | Typ  | Max  | Min         | Typ  | Max  |               |
| $I_{EE}$    | Power Supply Current                                                       | 20     | 24          | 29   | 20          | 24   | 29   | 20          | 24   | 29   | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 6)                                               | 3865   | 3990        | 4115 | 3930        | 4055 | 4180 | 3990        | 4115 | 4240 | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 6)                                                | 3065   | 3190        | 3315 | 3130        | 3255 | 3380 | 3190        | 3315 | 3440 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)                                          | 3790   |             | 4115 | 3855        |      | 4180 | 3915        |      | 4240 | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)                                           | 3065   |             | 3390 | 3130        |      | 3455 | 3190        |      | 3515 | mV            |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 7) | 2.0    |             | 5.0  | 2.0         |      | 5.0  | 2.0         |      | 5.0  | V             |
| $I_{IH}$    | Input HIGH Current                                                         |        |             | 150  |             |      | 150  |             |      | 150  | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current                                                          | D<br>D | 0.5<br>-150 |      | 0.5<br>-150 |      |      | 0.5<br>-150 |      |      | $\mu\text{A}$ |

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.

- Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +2.0 V to -0.5 V.
- All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .
- $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ;  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

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**Table 7. 10EP DC CHARACTERISTICS, NECL**  $V_{CC} = 0\text{ V}$ ,  $V_{EE} = -5.5\text{ V}$  to  $-3.0\text{ V}$  (Note 8)

| Symbol      | Characteristic                                                              | -40°C                        |       |       | 25°C         |       |       | 85°C         |       |       | Unit          |
|-------------|-----------------------------------------------------------------------------|------------------------------|-------|-------|--------------|-------|-------|--------------|-------|-------|---------------|
|             |                                                                             | Min                          | Typ   | Max   | Min          | Typ   | Max   | Min          | Typ   | Max   |               |
| $I_{EE}$    | Power Supply Current                                                        | 20                           | 24    | 29    | 20           | 24    | 29    | 20           | 24    | 29    | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 9)                                                | -1135                        | -1010 | -885  | -1070        | -945  | -820  | -1010        | -885  | -760  | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 9)                                                 | -1935                        | -1810 | -1685 | -1870        | -1745 | -1620 | -1810        | -1685 | -1560 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)                                           | -1210                        |       | -885  | -1145        |       | -820  | -1085        |       | -760  | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)                                            | -1935                        |       | -1610 | -1870        |       | -1545 | -1810        |       | -1485 | mV            |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 10) | $V_{EE}+2.0$                 |       | 0.0   | $V_{EE}+2.0$ |       | 0.0   | $V_{EE}+2.0$ |       | 0.0   | V             |
| $I_{IH}$    | Input HIGH Current                                                          |                              |       | 150   |              |       | 150   |              |       | 150   | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current                                                           | $\frac{D}{D}$<br>0.5<br>-150 |       |       | 0.5<br>-150  |       |       | 0.5<br>-150  |       |       | $\mu\text{A}$ |

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.

8. Input and output parameters vary 1:1 with  $V_{CC}$ .

9. All loading with  $50\ \Omega$  to  $V_{CC} - 2.0\text{ V}$ .

10.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**Table 8. 100EP DC CHARACTERISTICS, PECL**  $V_{CC} = 3.3\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 11)

| Symbol      | Characteristic                                                              | -40°C                        |      |      | 25°C        |      |      | 85°C        |      |      | Unit          |
|-------------|-----------------------------------------------------------------------------|------------------------------|------|------|-------------|------|------|-------------|------|------|---------------|
|             |                                                                             | Min                          | Typ  | Max  | Min         | Typ  | Max  | Min         | Typ  | Max  |               |
| $I_{EE}$    | Power Supply Current                                                        | 15                           | 25   | 32   | 17          | 27   | 36   | 19          | 28   | 38   | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 12)                                               | 2155                         | 2280 | 2405 | 2155        | 2280 | 2405 | 2155        | 2280 | 2405 | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 12)                                                | 1355                         | 1480 | 1605 | 1355        | 1480 | 1605 | 1355        | 1480 | 1605 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)                                           | 2075                         |      | 2420 | 2075        |      | 2420 | 2075        |      | 2420 | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)                                            | 1355                         |      | 1675 | 1355        |      | 1675 | 1355        |      | 1675 | mV            |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 13) | 2.0                          |      | 3.3  | 2.0         |      | 3.3  | 2.0         |      | 3.3  | V             |
| $I_{IH}$    | Input HIGH Current                                                          |                              |      | 150  |             |      | 150  |             |      | 150  | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current                                                           | $\frac{D}{D}$<br>0.5<br>-150 |      |      | 0.5<br>-150 |      |      | 0.5<br>-150 |      |      | $\mu\text{A}$ |

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.

11. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +0.3 V to -2.2 V.

12. All loading with  $50\ \Omega$  to  $V_{CC} - 2.0\text{ V}$ .

13.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

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**Table 9. 100EP DC CHARACTERISTICS, PECL**  $V_{CC} = 5.0\text{ V}$ ,  $V_{EE} = 0\text{ V}$  (Note 14)

| Symbol      | Characteristic                                                              | -40°C                           |      |      | 25°C        |      |      | 85°C        |      |      | Unit          |
|-------------|-----------------------------------------------------------------------------|---------------------------------|------|------|-------------|------|------|-------------|------|------|---------------|
|             |                                                                             | Min                             | Typ  | Max  | Min         | Typ  | Max  | Min         | Typ  | Max  |               |
| $I_{EE}$    | Power Supply Current                                                        | 15                              | 25   | 32   | 17          | 27   | 36   | 19          | 28   | 38   | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 15)                                               | 3855                            | 3980 | 4105 | 3855        | 3980 | 4105 | 3855        | 3980 | 4105 | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 15)                                                | 3055                            | 3180 | 3305 | 3055        | 3180 | 3305 | 3055        | 3180 | 3305 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)                                           | 3775                            |      | 4120 | 3775        |      | 4120 | 3775        |      | 4120 | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)                                            | 3055                            |      | 3375 | 3055        |      | 3375 | 3055        |      | 3375 | mV            |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 16) | 2.0                             |      | 5.0  | 2.0         |      | 5.0  | 2.0         |      | 5.0  | V             |
| $I_{IH}$    | Input HIGH Current                                                          |                                 |      | 150  |             |      | 150  |             |      | 150  | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current                                                           | $\frac{D}{\bar{D}}$ 0.5<br>-150 |      |      | 0.5<br>-150 |      |      | 0.5<br>-150 |      |      | $\mu\text{A}$ |

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.

14. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +2.0 V to -0.5 V.

15. All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .

16.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

**Table 10. 100EP DC CHARACTERISTICS, NECL**  $V_{CC} = 0\text{ V}$ ,  $V_{EE} = -5.5\text{ V}$  to  $-3.0\text{ V}$  (Note 17)

| Symbol      | Characteristic                                                              | -40°C                           |       |       | 25°C         |       |       | 85°C         |       |       | Unit          |
|-------------|-----------------------------------------------------------------------------|---------------------------------|-------|-------|--------------|-------|-------|--------------|-------|-------|---------------|
|             |                                                                             | Min                             | Typ   | Max   | Min          | Typ   | Max   | Min          | Typ   | Max   |               |
| $I_{EE}$    | Power Supply Current                                                        | 15                              | 25    | 32    | 17           | 27    | 36    | 19           | 28    | 38    | mA            |
| $V_{OH}$    | Output HIGH Voltage (Note 18)                                               | -1145                           | -1020 | -895  | -1145        | -1020 | -895  | -1145        | -1020 | -895  | mV            |
| $V_{OL}$    | Output LOW Voltage (Note 18)                                                | -1945                           | -1820 | -1695 | -1945        | -1820 | -1695 | -1945        | -1820 | -1695 | mV            |
| $V_{IH}$    | Input HIGH Voltage (Single-Ended)                                           | -1225                           |       | -880  | -1225        |       | -880  | -1225        |       | -880  | mV            |
| $V_{IL}$    | Input LOW Voltage (Single-Ended)                                            | -1945                           |       | -1625 | -1945        |       | -1625 | -1945        |       | -1625 | mV            |
| $V_{IHCMR}$ | Input HIGH Voltage Common Mode Range (Differential Configuration) (Note 19) | $V_{EE}+2.0$                    |       | 0.0   | $V_{EE}+2.0$ |       | 0.0   | $V_{EE}+2.0$ |       | 0.0   | V             |
| $I_{IH}$    | Input HIGH Current                                                          |                                 |       | 150   |              |       | 150   |              |       | 150   | $\mu\text{A}$ |
| $I_{IL}$    | Input LOW Current                                                           | $\frac{D}{\bar{D}}$ 0.5<br>-150 |       |       | 0.5<br>-150  |       |       | 0.5<br>-150  |       |       | $\mu\text{A}$ |

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.

17. Input and output parameters vary 1:1 with  $V_{CC}$ .

18. All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .

19.  $V_{IHCMR}$  min varies 1:1 with  $V_{EE}$ ,  $V_{IHCMR}$  max varies 1:1 with  $V_{CC}$ . The  $V_{IHCMR}$  range is referenced to the most positive side of the differential input signal.

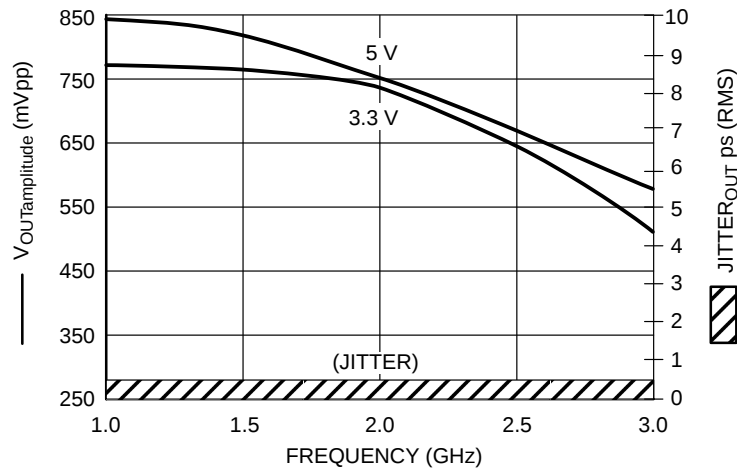
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**Table 11. AC CHARACTERISTICS**  $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -3.0\text{ V to } -5.5\text{ V}$  or  $V_{CC} = 3.0\text{ V to } 5.5\text{ V}$ ;  $V_{EE} = 0\text{ V}$  (Note 20)

| Symbol                   | Characteristic                                        | -40°C |     |      | 25°C |     |      | 85°C |     |      | Unit |
|--------------------------|-------------------------------------------------------|-------|-----|------|------|-----|------|------|-----|------|------|
|                          |                                                       | Min   | Typ | Max  | Min  | Typ | Max  | Min  | Typ | Max  |      |
| $f_{\max}$               | Maximum Frequency<br>(Figure 2)                       |       | > 3 |      |      | > 3 |      |      | > 3 |      | GHz  |
| $t_{PLH}$ ,<br>$t_{PHL}$ | Propagation Delay to<br>Output Differential           | 160   | 210 | 260  | 170  | 220 | 270  | 210  | 260 | 320  | ps   |
| $t_{JITTER}$             | Random Clock Jitter<br>(Figure 2)                     |       | 0.2 | < 1  |      | 0.2 | < 1  |      | 0.2 | 1.5  | ps   |
| $V_{PP}$                 | Input Voltage Swing (Differential Con-<br>figuration) | 150   | 800 | 1200 | 150  | 800 | 1200 | 150  | 800 | 1200 | mV   |
| $t_r$<br>$t_f$           | Output Rise/Fall Times<br>(20% – 80%) Q               | 70    | 120 | 170  | 80   | 130 | 180  | 100  | 150 | 200  | ps   |

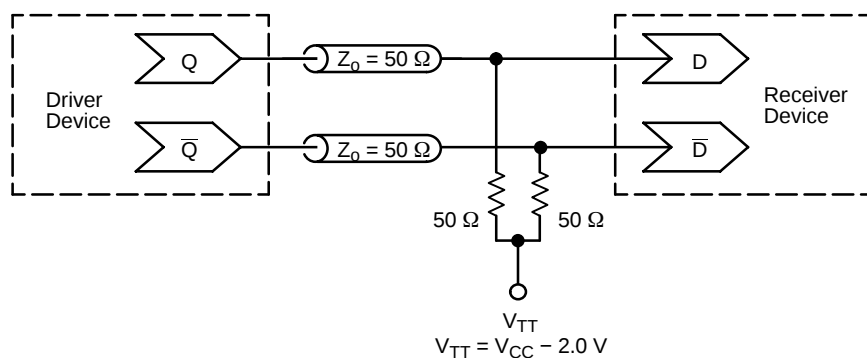
NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional 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.

20. Measured using a 750 mV source, 50% duty cycle clock source. All loading with 50  $\Omega$  to  $V_{CC} - 2.0\text{ V}$ .



**Figure 2.  $F_{\max}$ /Jitter @ 25°C**

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**Figure 3. Typical Termination for Output Driver and Device Evaluation**  
(See Application Note AND8020/D – Termination of ECL Logic Devices.)

### ORDERING INFORMATION

| Device        | Package             | Shipping <sup>†</sup> |
|---------------|---------------------|-----------------------|
| MC10EP05D     | SOIC-8              | 98 Units / Rail       |
| MC10EP05DG    | SOIC-8<br>(Pb-Free) | 98 Units / Rail       |
| MC10EP05DR2   | SOIC-8              | 2500 / Tape & Reel    |
| MC10EP05DT    | TSSOP-8             | 100 Units / Rail      |
| MC10EP05DTR2  | TSSOP-8             | 2500 / Tape & Reel    |
| MC100EP05D    | SOIC-8              | 98 Units / Rail       |
| MC100EP05DR2  | SOIC-8              | 2500 / Tape & Reel    |
| MC100EP05DT   | TSSOP-8             | 100 Units / Rail      |
| MC100EP05DTR2 | TSSOP-8             | 2500 / Tape & Reel    |

<sup>†</sup>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.

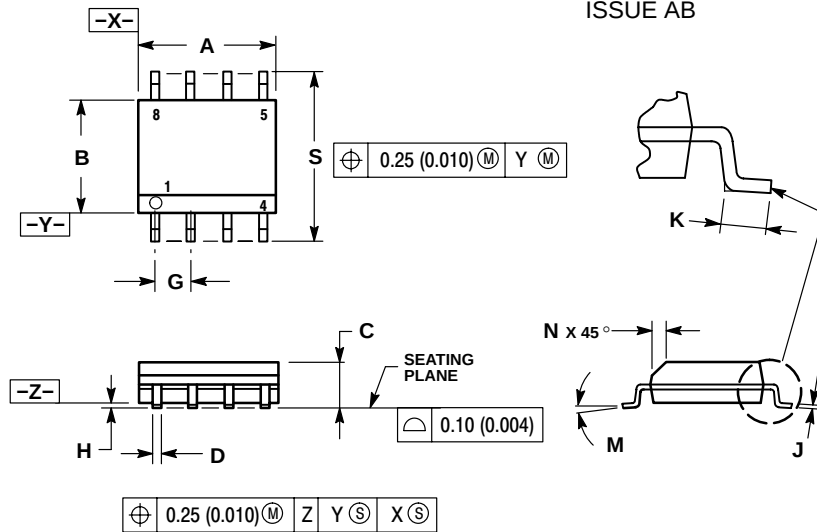
### Resource Reference of Application Notes

- 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
- AN1642/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

# MC10EP05, MC100EP05

## PACKAGE DIMENSIONS

### SOIC-8 NB D SUFFIX PLASTIC SOIC PACKAGE CASE 751-07 ISSUE AB

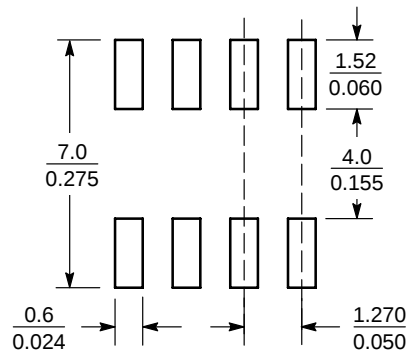


#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 4.80        | 5.00 | 0.189     | 0.197 |
| B   | 3.80        | 4.00 | 0.150     | 0.157 |
| C   | 1.35        | 1.75 | 0.053     | 0.069 |
| D   | 0.33        | 0.51 | 0.013     | 0.020 |
| G   | 1.27 BSC    |      | 0.050 BSC |       |
| H   | 0.10        | 0.25 | 0.004     | 0.010 |
| J   | 0.19        | 0.25 | 0.007     | 0.010 |
| K   | 0.40        | 1.27 | 0.016     | 0.050 |
| M   | 0°          | 8°   | 0°        | 8°    |
| N   | 0.25        | 0.50 | 0.010     | 0.020 |
| S   | 5.80        | 6.20 | 0.228     | 0.244 |

### SOLDERING FOOTPRINT\*



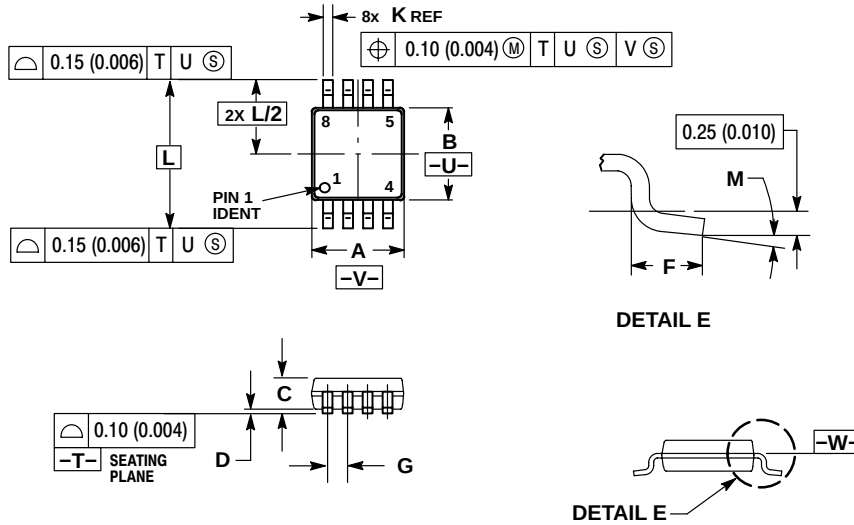
SCALE 6:1 (mm/inches)

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

# MC10EP05, MC100EP05

## PACKAGE DIMENSIONS

### TSSOP-8 DT SUFFIX PLASTIC TSSOP PACKAGE CASE 948R-02 ISSUE A



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSION A DOES NOT INCLUDE MOLD FLASH OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
  4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
  5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
  6. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 2.90        | 3.10 | 0.114     | 0.122 |
| B   | 2.90        | 3.10 | 0.114     | 0.122 |
| C   | 0.80        | 1.10 | 0.031     | 0.043 |
| D   | 0.05        | 0.15 | 0.002     | 0.006 |
| F   | 0.40        | 0.70 | 0.016     | 0.028 |
| G   | 0.65 BSC    |      | 0.026 BSC |       |
| K   | 0.25        | 0.40 | 0.010     | 0.016 |
| L   | 4.90 BSC    |      | 0.193 BSC |       |
| M   | 0°          | 6°   | 0°        | 6°    |

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