

MC10EL11, MC100EL11

5.0 V ECL 1:2 Differential Fanout Buffer

The MC10EL/100EL11 is a differential 1:2 fanout buffer. The device is functionally similar to the E111 device but with higher performance capabilities. The within-device skew and propagation delay is significantly improved over the E111.

The differential inputs of the EL11 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.

The 100 Series contains temperature compensation.

Features

- 265 ps Propagation Delay
- 5 ps Skew Between Outputs
- PECL Mode Operating Range: $V_{CC} = 4.2\text{ V to }5.7$ with $V_{EE} = 0\text{ V}$
- NECL Mode Operating Range: $V_{CC} = 0\text{ V}$ with $V_{EE} = -4.2\text{ V to }-5.7\text{ V}$
- Internal Input Pulldown Resistors
- Pb-Free Packages are Available

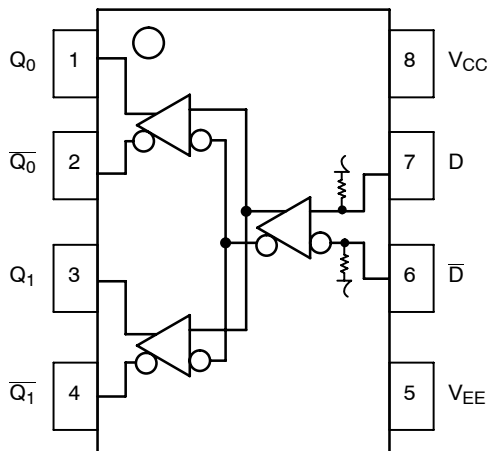


Figure 1. Logic Diagram and Pinout Assignment

Table 1. PIN DESCRIPTION

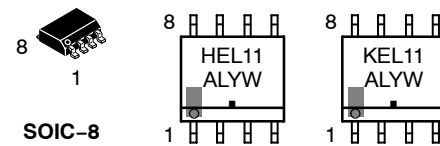
| PIN | FUNCTION |
|---|---|
| D, \bar{D} | ECL Data Inputs |
| Q_0 , \bar{Q}_0 ; Q_1 , \bar{Q}_1 | ECL Data Outputs |
| V_{CC} | Positive Supply |
| V_{EE} | Negative Supply |
| EP | Exposed pad must be connected to a sufficient thermal conduit. Electrically connect to the most negative supply or leave floating open. |



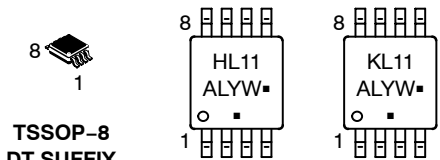
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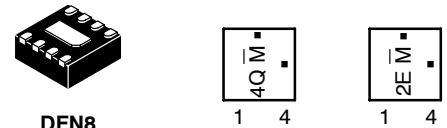
MARKING DIAGRAMS*



SOIC-8
D SUFFIX
CASE 751



TSSOP-8
DT SUFFIX
CASE 948R



DFN8
MN SUFFIX
CASE 506AA

H = MC10
K = MC100
4Q = MC10
2E = MC100
A = Assembly Location

L = Wafer Lot
Y = Year
W = Work Week
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*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 6 of this data sheet.

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Table 2. ATTRIBUTES

| Characteristics | Value |
|---|-----------------------------------|
| Internal Input Pulldown Resistor | 75 K Ω |
| Internal Input Pullup Resistor | N/A |
| ESD Protection | Human Body Model Machine Model |
| | > 1 KV > 100 V |
| 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 | 44 |
| Meets or Exceeds JEDEC Spec EIA/JESD78 IC Latchup Test | |

1. For additional information, see Application Note AND8003/D.

Table 3. MAXIMUM RATINGS

| Symbol | Parameter | Condition 1 | Condition 2 | Rating | Unit |
|------------------|--|--|--|---------------|--------------|
| V _{CC} | PECL Mode Power Supply | V _{EE} = 0 V | | 8 | V |
| V _{EE} | NECL Mode Power Supply | V _{CC} = 0 V | | -8 | V |
| V _I | PECL Mode Input Voltage NECL Mode Input Voltage | V _{EE} = 0 V V _{CC} = 0 V | V _I ≤ V _{CC} V _I ≥ V _{EE} | 6 -6 | V V |
| I _{out} | Output Current | Continuous Surge | | 50 100 | mA mA |
| T _A | Operating Temperature Range | | | -40 to +85 | °C |
| T _{stg} | Storage Temperature Range | | | -65 to +150 | °C |
| θ _{JA} | Thermal Resistance (Junction-to-Ambient) | 0 lfpm 500 lfpm | SOIC-8 SOIC-8 | 190 130 | °C/W °C/W |
| θ _{JC} | Thermal Resistance (Junction-to-Case) | Standard Board | SOIC-8 | 41 to 44 | °C/W |
| θ _{JA} | Thermal Resistance (Junction-to-Ambient) | 0 lfpm 500 lfpm | TSSOP-8 TSSOP-8 | 185 140 | °C/W °C/W |
| θ _{JC} | Thermal Resistance (Junction-to-Case) | Standard Board | TSSOP-8 | 41 to 44 ± 5% | °C/W |
| θ _{JA} | Thermal Resistance (Junction-to-Ambient) | 0 lfpm 500 lfpm | DFN8 DFN8 | 129 84 | °C/W °C/W |
| T _{sol} | Wave Solder | Pb Pb-Free | <2 to 3 sec @ 248°C <2 to 3 sec @ 260°C | 265 265 | °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.

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Table 4. 10EL SERIES PECL DC CHARACTERISTICS $V_{CC} = 5.0\text{ V}$; $V_{EE} = 0.0\text{ V}$ (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 | | 26 | 31 | | 26 | 31 | | 26 | 31 | mA |
| V_{OH} | Output HIGH Voltage (Note 3) | 3920 | 4010 | 4110 | 4020 | 4105 | 4190 | 4090 | 4185 | 4280 | mV |
| V_{OL} | Output LOW Voltage (Note 3) | 3050 | 3200 | 3350 | 3050 | 3210 | 3370 | 3050 | 3227 | 3405 | mV |
| V_{IH} | Input HIGH Voltage (Single-Ended) | 3770 | | 4110 | 3870 | | 4190 | 3940 | | 4280 | mV |
| V_{IL} | Input LOW Voltage (Single-Ended) | 3050 | | 3500 | 3050 | | 3520 | 3050 | | 3555 | mV |
| V_{IHCMR} | Input HIGH Voltage Common Mode Range (Differential) (Note 4) | 2.5 | | 4.6 | 2.5 | | 4.6 | 2.5 | | 4.6 | V |
| I_{IH} | Input HIGH Current | | | 150 | | | 150 | | | 150 | μA |
| I_{IL} | Input LOW Current | 0.5 | | | 0.5 | | | 0.3 | | | μA |

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 +0.25 V / -0.5 V.
- Outputs are terminated through a 50 Ω resistor 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. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{ppmin} and 1 V.

Table 5. 10EL SERIES NECL DC CHARACTERISTICS $V_{CC} = 0.0\text{ V}$; $V_{EE} = -5.0\text{ V}$ (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 | | 26 | 31 | | 26 | 31 | | 26 | 31 | mA |
| V_{OH} | Output HIGH Voltage (Note 6) | -1080 | -990 | -890 | -980 | -895 | -810 | -910 | -815 | -720 | mV |
| V_{OL} | Output LOW Voltage (Note 6) | -1950 | -1800 | -1650 | -1950 | -1790 | -1630 | -1950 | -1773 | -1595 | mV |
| V_{IH} | Input HIGH Voltage (Single-Ended) | -1230 | | -890 | -1130 | | -810 | -1060 | | -720 | mV |
| V_{IL} | Input LOW Voltage (Single-Ended) | -1950 | | -1500 | -1950 | | -1480 | -1950 | | -1445 | mV |
| V_{IHCMR} | Input HIGH Voltage Common Mode Range (Differential) (Note 7) | -2.5 | | -0.4 | -2.5 | | -0.4 | -2.5 | | -0.4 | V |
| I_{IH} | Input HIGH Current | | | 150 | | | 150 | | | 150 | μA |
| I_{IL} | Input LOW Current | 0.5 | | | 0.5 | | | 0.3 | | | μA |

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 +0.25 V / -0.5 V.
- Outputs are terminated through a 50 Ω resistor 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. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{ppmin} and 1 V.

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Table 6. 100EL SERIES PECL DC CHARACTERISTICS $V_{CC} = 5.0\text{ V}$; $V_{EE} = 0.0\text{ V}$ (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 | | 26 | 31 | | 26 | 31 | | 30 | 36 | mA |
| V_{OH} | Output HIGH Voltage (Note 9) | 3915 | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4050 | 4120 | mV |
| V_{OL} | Output LOW Voltage (Note 9) | 3170 | 3305 | 3445 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | mV |
| V_{IH} | Input HIGH Voltage (Single-Ended) | 3835 | | 4120 | 3835 | | 4120 | 3835 | | 4120 | mV |
| V_{IL} | Input LOW Voltage (Single-Ended) | 3190 | | 3525 | 3190 | | 3525 | 3190 | | 3525 | mV |
| V_{IHCMR} | Input HIGH Voltage Common Mode Range (Differential) (Note 10) | 2.5 | | 4.6 | 2.5 | | 4.6 | 2.5 | | 4.6 | V |
| I_{IH} | Input HIGH Current | | | 150 | | | 150 | | | 150 | μA |
| I_{IL} | Input LOW Current | 0.5 | | | 0.5 | | | 0.5 | | | μA |

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} . V_{EE} can vary +0.8 V / -0.5 V.

9. Outputs are terminated through a 50 Ω resistor 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. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{ppmin} and 1 V.

Table 7. 100EL SERIES NECL DC CHARACTERISTICS $V_{CC} = 0.0\text{ V}$; $V_{EE} = -5.0\text{ V}$ (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 | | 26 | 31 | | 26 | 31 | | 30 | 36 | mA |
| V_{OH} | Output HIGH Voltage (Note 12) | -1085 | -1005 | -880 | -1025 | -955 | -880 | -1025 | -955 | -880 | mV |
| V_{OL} | Output LOW Voltage (Note 12) | -1830 | -1695 | -1555 | -1810 | -1705 | -1620 | -1810 | -1705 | -1620 | mV |
| V_{IH} | Input HIGH Voltage (Single-Ended) | -1165 | | -880 | -1165 | | -880 | -1165 | | -880 | mV |
| V_{IL} | Input LOW Voltage (Single-Ended) | -1810 | | -1475 | -1810 | | -1475 | -1810 | | -1475 | mV |
| V_{IHCMR} | Input HIGH Voltage Common Mode Range (Differential) (Note 13) | -2.5 | | -0.4 | -2.5 | | -0.4 | -2.5 | | -0.4 | V |
| I_{IH} | Input HIGH Current | | | 150 | | | 150 | | | 150 | μA |
| I_{IL} | Input LOW Current | 0.5 | | | 0.5 | | | 0.5 | | | μA |

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 +0.8 V / -0.5 V.

12. Outputs are terminated through a 50 Ω resistor 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. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{ppmin} and 1 V.

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Table 8. AC CHARACTERISTICS $V_{CC} = 5.0\text{ V}$; $V_{EE} = 0.0\text{ V}$ or $V_{CC} = 0.0\text{ V}$; $V_{EE} = -5.0\text{ V}$ (Note 14)

| Symbol | Characteristic | -40°C | | | 25°C | | | 85°C | | | Unit |
|--------------------------------------|---|-------|--------|------|------|--------|----------|------|--------|----------|------|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| f_{max} | Maximum Toggle Frequency | | | | | 1.5 | | | | | GHz |
| t_{PLH} t_{PHL} | Propagation Delay to Output | 135 | 260 | 385 | 190 | 265 | 340 | 215 | 29*0 | 365 | ps |
| t_{SKEW} | Within-Device Skew (Note 15) Duty Cycle Skew (Note 16) | | 5 5 | | | 5 5 | 20 20 | | 5 5 | 20 20 | ps |
| t_{JITTER} | Random Clock Jitter (RMS) | | | | | 0.6 | | | | | ps |
| V_{PP} | Input Swing (Note 17) | 150 | | 1000 | 150 | | 1000 | 150 | | 1000 | mV |
| t_{r} t_{f} | Output Rise/Fall Times Q (20% – 80%) | 100 | 225 | 350 | 100 | 225 | 350 | 100 | 225 | 350 | 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.

14. 10 Series: V_{EE} can vary +0.25 V / -0.5 V.

100 Series: V_{EE} can vary +0.8 V / -0.5 V.

15. Within-device skew defined as identical transitions on similar paths through a device.

16. Duty cycle skew is the difference between a t_{PLH} and t_{PHL} propagation delay through a device.

17. $V_{\text{PP}}(\text{min})$ is minimum input swing for which AC parameters guaranteed. The device has a DC gain of ≈ 40 .

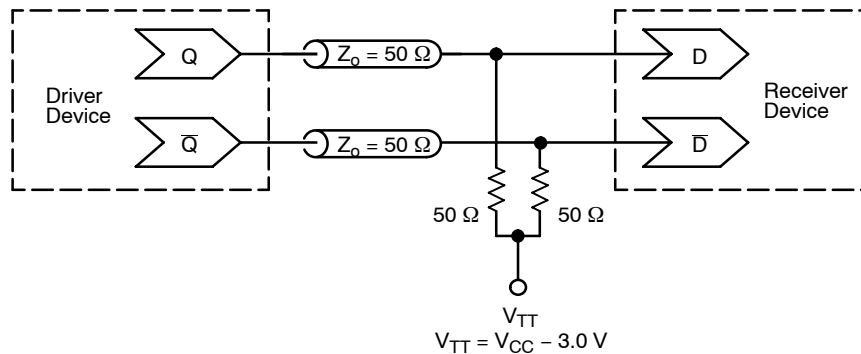


Figure 2. Typical Termination for Output Driver and Device Evaluation
(See Application Note AND8020/D – Termination of ECL Logic Devices.)

MC10EL11, MC100EL11

ORDERING INFORMATION

| Device | Package | Shipping† |
|----------------|----------------------|--------------------|
| MC10EL11D | SOIC-8 | 98 Units / Rail |
| MC10EL11DG | SOIC-8 (Pb-Free) | 98 Units / Rail |
| MC10EL11DR2 | SOIC-8 | 2500 / Tape & Reel |
| MC10EL11DR2G | SOIC-8 (Pb-Free) | 2500 / Tape & Reel |
| MC10EL11DT | TSSOP-8 | 100 Units / Rail |
| MC10EL11DTG | TSSOP-8 (Pb-Free) | 100 Units / Rail |
| MC10EL11DTR2 | TSSOP-8 | 2500 / Tape & Reel |
| MC10EL11DTR2G | TSSOP-8 (Pb-Free) | 2500 / Tape & Reel |
| MC10EL11MNR4 | TSSOP-8 | 2500 / Tape & Reel |
| MC10EL11MNR4G | TSSOP-8 (Pb-Free) | 2500 / Tape & Reel |
| MC100EL11D | SOIC-8 | 98 Units / Rail |
| MC100EL11DG | SOIC-8 (Pb-Free) | 98 Units / Rail |
| MC100EL11DR2 | SOIC-8 | 2500 / Tape & Reel |
| MC100EL11DR2G | SOIC-8 (Pb-Free) | 2500 / Tape & Reel |
| MC100EL11DT | TSSOP-8 | 100 Units / Rail |
| MC100EL11DTG | TSSOP-8 (Pb-Free) | 100 Units / Rail |
| MC100EL11DTR2 | TSSOP-8 | 2500 / Tape & Reel |
| MC100EL11DTR2G | TSSOP-8 (Pb-Free) | 2500 / Tape & Reel |
| MC100EL11MNR4 | TSSOP-8 | 2500 / Tape & Reel |
| MC100EL11MNR4G | TSSOP-8 (Pb-Free) | 2500 / 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.

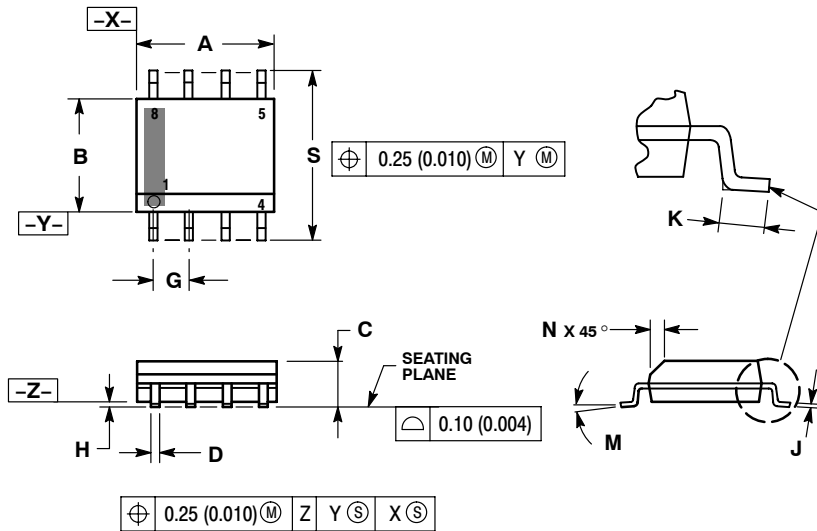
Resource Reference of Application Notes

- 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

MC10EL11, MC100EL11

PACKAGE DIMENSIONS

SOIC-8 NB
CASE 751-07
ISSUE AH

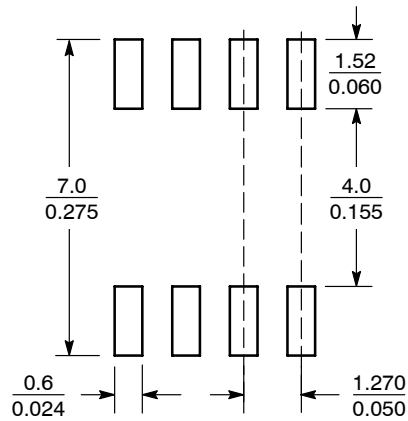


NOTES:

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*



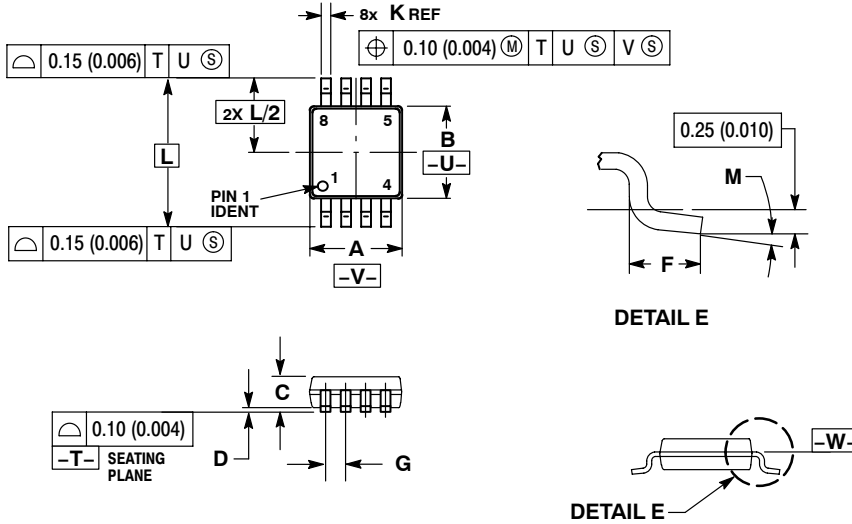
SCALE 6:1 ($\frac{\text{mm}}{\text{inches}}$)

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

MC10EL11, MC100EL11

PACKAGE DIMENSIONS

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



NOTES:

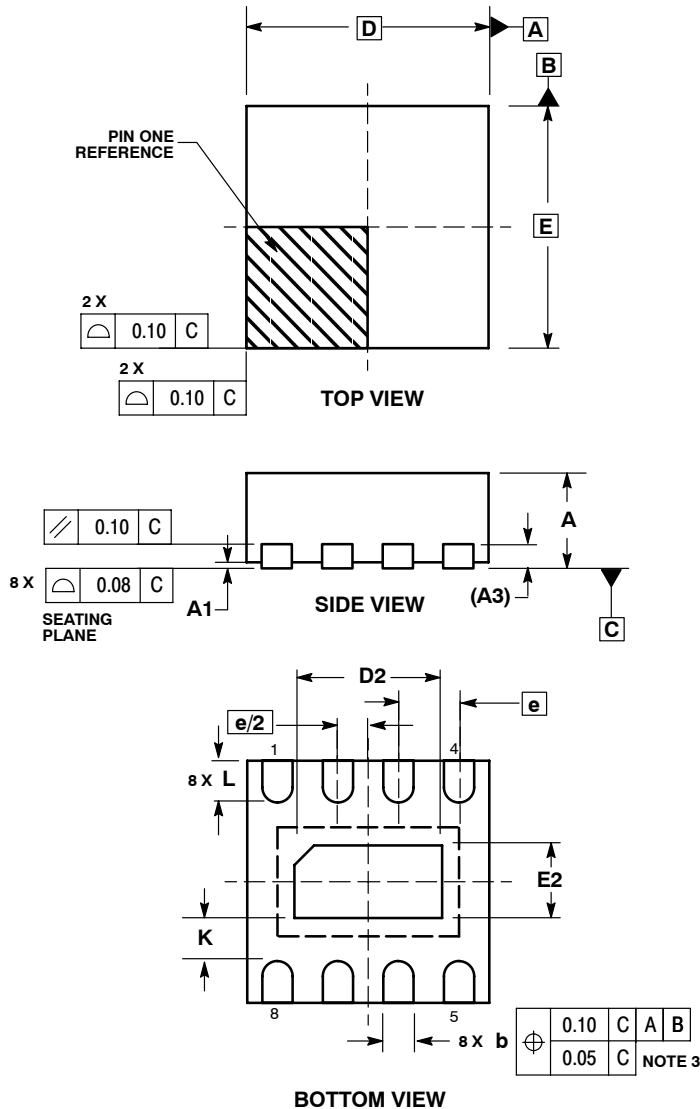
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD 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° |

MC10EL11, MC100EL11

PACKAGE DIMENSIONS

DFN8
CASE 506AA-01
ISSUE D



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994 .
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.25 AND 0.30 MM FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | MIN | MAX |
| A | 0.80 | 1.00 |
| A1 | 0.00 | 0.05 |
| A3 | 0.20 REF | |
| b | 0.20 | 0.30 |
| D | 2.00 BSC | |
| D2 | 1.10 | 1.30 |
| E | 2.00 BSC | |
| E2 | 0.70 | 0.90 |
| e | 0.50 BSC | |
| K | 0.20 | --- |
| L | 0.25 | 0.35 |

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