

# MC10EL31, MC100EL31

## 5 V ECL D Flip-Flop With Set and Reset

The MC10EL/100EL31 is a D flip-flop with set and reset. The device is functionally equivalent to the E131 device with higher performance capabilities. With propagation delays and output transition times significantly faster than the E131, the EL31 is ideally suited for those applications which require the ultimate in AC performance.

Both set and reset inputs are asynchronous, level triggered signals. Data enters the master portion of the flip-flop when clock is LOW and is transferred to the slave, and thus the outputs, upon a positive transition of the clock.

The 100 Series contains temperature compensation.

### Features

- 475 ps Propagation Delay
- 2.8 GHz Toggle Frequency
- ESD Protection: > 1 kV Human Body Model, > 100 V Machine Model
- PECL Mode Operating Range:  $V_{CC} = 4.2\text{ V}$  to  $5.7\text{ V}$  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 on D, CLK, S, and R
- Meets or Exceeds JEDEC Spec EIA/JESD78 IC Latchup Test
- Moisture Sensitivity Level 1  
For Additional Information, see Application Note AND8003/D
- Flammability Rating: UL 94 V-0 @ 0.125 in, Oxygen Index: 28 to 34
- Metastability 125 ps (see Application Note AN1504)
- Transistor Count = 79 devices
- Pb-Free Packages are Available



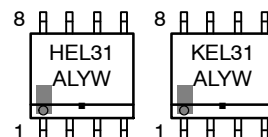
ON Semiconductor®

<http://onsemi.com>

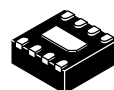
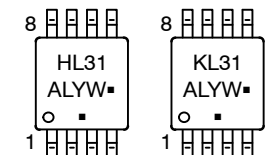
### MARKING DIAGRAMS\*



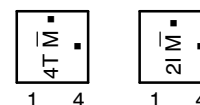
SOIC-8  
D SUFFIX  
CASE 751



TSSOP-8  
DT SUFFIX  
CASE 948R



DFN8  
MN SUFFIX  
CASE 506AA



H = MC10                      L = Wafer Lot  
K = MC100                    Y = Year  
4T = MC10                    W = Work Week  
2I = MC100                   M̄ = Date Code  
A = Assembly Location      ■ = 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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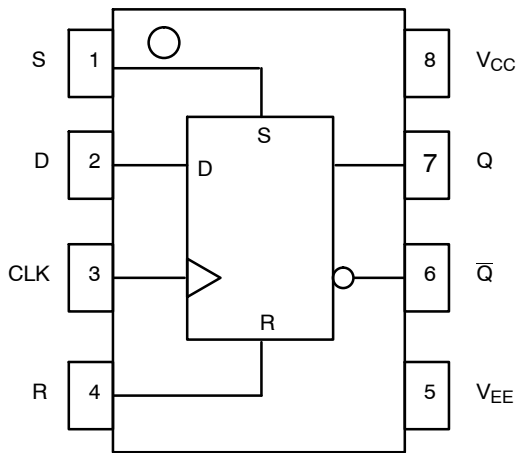


Figure 1. Logic Diagram and Pinout Assignment

Table 1. TRUTH TABLE

| D | S* | R* | CLK | Q     |
|---|----|----|-----|-------|
| L | L  | L  | Z   | L     |
| H | L  | L  | Z   | H     |
| X | H  | L  | X   | H     |
| X | L  | H  | X   | L     |
| X | H  | H  | X   | Undef |

Z = LOW to HIGH Transition

\* Pins will default low when left open.

Table 2. PIN DESCRIPTION

| PIN             | FUNCTION   |
|-----------------|--|
| S               | ECL Set Input  |
| D               | ECL Data Input   |
| R               | ECL Reset Input  |
| CLK             | ECL Clock Input  |
| Q, $\bar{Q}$    | ECL Data Outputs   |
| V <sub>CC</sub> | Positive Supply  |
| V <sub>EE</sub> | Negative Supply  |
| EP              | (DFN8 only) Thermal exposed pad must be connected to a sufficient thermal conduit. Electrically connect to the most negative supply (GND) or leave unconnected, floating open. |

Table 3. MAXIMUM RATINGS

| Symbol           | Parameter  | Condition 1                                    | Condition 2  | Rating        | Unit         |
|------------------|--|--|--|---------------|--------------|
| V <sub>CC</sub>  | PECL Mode Power Supply                             | V <sub>EE</sub> = 0 V                          |  | 8             | V            |
| V <sub>EE</sub>  | NECL Mode Power Supply                             | V <sub>CC</sub> = 0 V                          |  | -8            | V            |
| V <sub>I</sub>   | PECL Mode Input Voltage<br>NECL Mode Input Voltage | V <sub>EE</sub> = 0 V<br>V <sub>CC</sub> = 0 V | V <sub>I</sub> ≤ V <sub>CC</sub><br>V <sub>I</sub> ≥ V <sub>EE</sub> | 6<br>-6       | V<br>V       |
| I <sub>out</sub> | Output Current                                     | Continuous<br>Surge                            |  | 50<br>100     | mA<br>mA     |
| T <sub>A</sub>   | Operating Temperature Range                        |  |  | -40 to +85    | °C           |
| T <sub>stg</sub> | Storage Temperature Range                          |  |  | -65 to +150   | °C           |
| θ <sub>JA</sub>  | Thermal Resistance (Junction-to-Ambient)           | 0 lfpm<br>500 lfpm                             | SOIC-8<br>SOIC-8   | 190<br>130    | °C/W<br>°C/W |
| θ <sub>JC</sub>  | Thermal Resistance (Junction-to-Case)              | Standard Board                                 | SOIC-8   | 41 to 44      | °C/W         |
| θ <sub>JA</sub>  | Thermal Resistance (Junction-to-Ambient)           | 0 lfpm<br>500 lfpm                             | TSSOP-8<br>TSSOP-8   | 185<br>140    | °C/W<br>°C/W |
| θ <sub>JC</sub>  | Thermal Resistance (Junction-to-Case)              | Standard Board                                 | TSSOP-8  | 41 to 44 ± 5% | °C/W         |
| θ <sub>JA</sub>  | Thermal Resistance (Junction-to-Ambient)           | 0 lfpm<br>500 lfpm                             | DFN8<br>DFN8   | 129<br>84     | °C/W<br>°C/W |
| T <sub>sol</sub> | Wave Solder  | Pb<br>Pb-Free                                  | <2 to 3 sec @ 248°C<br><2 to 3 sec @ 260°C                           | 265<br>265    | °C           |
| θ <sub>JC</sub>  | Thermal Resistance (Junction-to-Case)              | (Note 1)                                       | DFN8   | 35 to 40      | °C/W         |

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.

1. JEDEC standard multilayer board – 2S2P (2 signal, 2 power)

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**Table 4. 10EL SERIES PECL DC CHARACTERISTICS**  $V_{CC} = 5.0\text{ V}$ ;  $V_{EE} = 0\text{ V}$  (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         |       | 27   | 32   |      | 27   | 32   |      | 27   | 32   | mA            |
| $V_{OH}$ | Output HIGH Voltage (Note 5) | 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           | 3770  |      | 4110 | 3870 |      | 4190 | 3940 |      | 4280 | mV            |
| $V_{IL}$ | Input LOW Voltage            | 3050  |      | 3500 | 3050 |      | 3520 | 3050 |      | 3555 | mV            |
| $I_{IH}$ | Input HIGH Current           |       |      | 150  |      |      | 150  |      |      | 150  | $\mu\text{A}$ |
| $I_{IL}$ | Input LOW Current            | 0.5   |      |      | 0.5  |      |      | 0.3  |      |      | $\mu\text{A}$ |

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 +0.25 V / -0.5 V.
- Outputs are terminated through a 50 ohm resistor to  $V_{CC}$ -2 volts.

**Table 5. 10EL SERIES NECL DC CHARACTERISTICS**  $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -5.0\text{ V}$  (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         |       | 27    | 32    |       | 27    | 32    |       | 27    | 32    | mA            |
| $V_{OH}$ | Output HIGH Voltage (Note 5) | -1080 | -990  | -890  | -980  | -895  | -810  | -910  | -815  | -720  | mV            |
| $V_{OL}$ | Output LOW Voltage (Note 5)  | -1950 | -1800 | -1650 | -1950 | -1790 | -1630 | -1950 | -1773 | -1595 | mV            |
| $V_{IH}$ | Input HIGH Voltage           | -1230 |       | -890  | -1130 |       | -810  | -1060 |       | -720  | mV            |
| $V_{IL}$ | Input LOW Voltage            | -1950 |       | -1500 | -1950 |       | -1480 | -1950 |       | -1445 | mV            |
| $I_{IH}$ | Input HIGH Current           |       |       | 150   |       |       | 150   |       |       | 150   | $\mu\text{A}$ |
| $I_{IL}$ | Input LOW Current            | 0.5   |       |       | 0.5   |       |       | 0.3   |       |       | $\mu\text{A}$ |

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 +0.25 V / -0.5 V.
- Outputs are terminated through a 50 ohm resistor to  $V_{CC}$ -2 volts.

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**Table 6. 100EL SERIES PECL DC CHARACTERISTICS**  $V_{CC} = 5.0\text{ V}$ ;  $V_{EE} = 0\text{ V}$  (Note 6)

| Symbol   | Characteristic               | -40°C |      |      | 25°C |      |      | 85°C |      |      | Unit          |
|----------|------------------------------|-------|------|------|------|------|------|------|------|------|---------------|
|          |                              | Min   | Typ  | Max  | Min  | Typ  | Max  | Min  | Typ  | Max  |               |
| $I_{EE}$ | Power Supply Current         |       | 27   | 32   |      | 27   | 32   |      | 31   | 37   | mA            |
| $V_{OH}$ | Output HIGH Voltage (Note 7) | 3915  | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4050 | 4120 | mV            |
| $V_{OL}$ | Output LOW Voltage (Note 7)  | 3170  | 3305 | 3445 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | mV            |
| $V_{IH}$ | Input HIGH Voltage           | 3835  |      | 4120 | 3835 |      | 4120 | 3835 |      | 4120 | mV            |
| $V_{IL}$ | Input LOW Voltage            | 3190  |      | 3525 | 3190 |      | 3525 | 3190 |      | 3525 | mV            |
| $I_{IH}$ | Input HIGH Current           |       |      | 150  |      |      | 150  |      |      | 150  | $\mu\text{A}$ |
| $I_{IL}$ | Input LOW Current            | 0.5   |      |      | 0.5  |      |      | 0.5  |      |      | $\mu\text{A}$ |

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.

6. Input and output parameters vary 1:1 with  $V_{CC}$ .  $V_{EE}$  can vary +0.8 V / -0.5 V.

7. Outputs are terminated through a 50 ohm resistor to  $V_{CC}$ -2 volts.

**Table 7. 100EL SERIES NECL DC CHARACTERISTICS**  $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -5.0\text{ V}$  (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         |       | 27    | 32    |       | 27    | 32    |       | 31    | 37    | mA            |
| $V_{OH}$ | Output HIGH Voltage (Note 9) | -1085 | -1005 | -880  | -1025 | -955  | -880  | -1025 | -955  | -880  | mV            |
| $V_{OL}$ | Output LOW Voltage (Note 9)  | -1830 | -1695 | -1555 | -1810 | -1705 | -1620 | -1810 | -1705 | -1620 | mV            |
| $V_{IH}$ | Input HIGH Voltage           | -1165 |       | -880  | -1165 |       | -880  | -1165 |       | -880  | mV            |
| $V_{IL}$ | Input LOW Voltage            | -1810 |       | -1475 | -1810 |       | -1475 | -1810 |       | -1475 | mV            |
| $I_{IH}$ | Input HIGH Current           |       |       | 150   |       |       | 150   |       |       | 150   | $\mu\text{A}$ |
| $I_{IL}$ | Input LOW Current            | 0.5   |       |       | 0.5   |       |       | 0.5   |       |       | $\mu\text{A}$ |

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

9. Outputs are terminated through a 50 ohm resistor to  $V_{CC}$ -2 volts.

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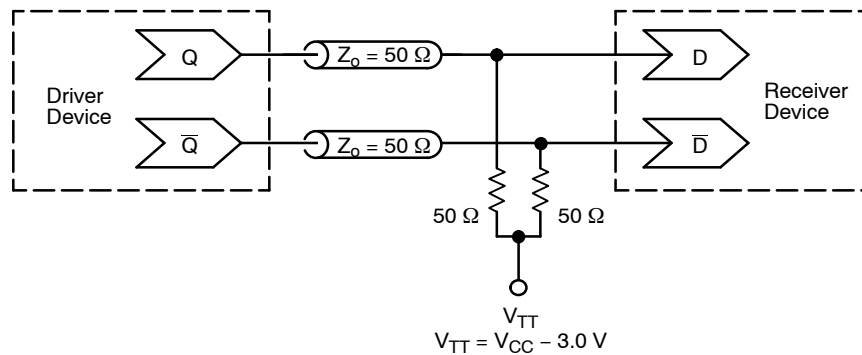
**Table 8. AC CHARACTERISTICS**  $V_{CC} = 5.0\text{ V}$ ;  $V_{EE} = 0\text{ V}$  or  $V_{CC} = 0\text{ V}$ ;  $V_{EE} = -5.0\text{ V}$  (Note 10)

| Symbol                               | Characteristic                             | -40°C      |            |            | 25°C       |            |            | 85°C       |            |            | Unit |
|--------------------------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------|
|                                      |  | Min        | Typ        | Max        | Min        | Typ        | Max        | Min        | Typ        | Max        |      |
| $f_{\max}$                           | Maximum Toggle Frequency                   | 2.0        | 2.5        |            | 2.2        | 2.8        |            | 2.2        | 2.8        |            | GHz  |
| $t_{\text{PLH}}$<br>$t_{\text{PHL}}$ | Propagation Delay to Output<br>CLK<br>S, R | 315<br>295 | 465<br>455 | 630<br>630 | 375<br>355 | 475<br>465 | 590<br>590 | 430<br>400 | 530<br>510 | 645<br>645 | ps   |
| $t_S$<br>$t_H$                       | Setup Time<br>Hold Time                    | 150<br>250 | 0<br>100   |            | 150<br>250 | 0<br>100   |            | 150<br>250 | 0<br>100   |            | ps   |
| $t_{\text{RR}}$                      | Set/Reset Recovery                         | 400        | 200        |            | 400        | 200        |            | 400        | 200        |            | ps   |
| $t_{\text{PW}}$                      | Minimum Pulse Width<br>CLK, Set, Reset     | 400        |            |            | 400        |            |            | 400        |            |            | ps   |
| $t_{\text{JITTER}}$                  | Cycle-to-Cycle Jitter                      |            | TBD        |            |            | TBD        |            |            | TBD        |            | ps   |
| $t_r$<br>$t_f$                       | Output Rise/Fall Times Q<br>(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.

10.10 Series:  $V_{EE}$  can vary +0.25 V / -0.5 V.

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



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

# MC10EL31, MC100EL31

## ORDERING INFORMATION

| Device         | Package              | Shipping†          |
|----------------|----------------------|--------------------|
| MC10EL31D      | SOIC-8               | 98 Units / Rail    |
| MC10EL31DG     | SOIC-8<br>(Pb-Free)  | 98 Units / Rail    |
| MC10EL31DR2    | SOIC-8               | 2500 / Tape & Reel |
| MC10EL31DR2G   | SOIC-8<br>(Pb-Free)  | 2500 / Tape & Reel |
| MC10EL31DT     | TSSOP-8              | 100 Units / Rail   |
| MC10EL31DTG    | TSSOP-8<br>(Pb-Free) | 100 Units / Rail   |
| MC10EL31DTR2   | TSSOP-8              | 2500 / Tape & Reel |
| MC10EL31DTR2G  | TSSOP-8<br>(Pb-Free) | 2500 / Tape & Reel |
| MC10EL31MNR4   | DFN8                 | 1000 / Tape & Reel |
| MC10EL31MNR4G  | DFN8<br>(Pb-Free)    | 1000 / Tape & Reel |
| MC100EL31D     | SOIC-8               | 98 Units / Rail    |
| MC100EL31DG    | SOIC-8<br>(Pb-Free)  | 98 Units / Rail    |
| MC100EL31DR2   | SOIC-8               | 2500 / Tape & Reel |
| MC100EL31DR2G  | SOIC-8<br>(Pb-Free)  | 2500 / Tape & Reel |
| MC100EL31DT    | TSSOP-8              | 100 Units / Rail   |
| MC100EL31DTG   | TSSOP-8<br>(Pb-Free) | 100 Units / Rail   |
| MC100EL31DTR2  | TSSOP-8              | 2500 / Tape & Reel |
| MC100EL31DTR2G | TSSOP-8<br>(Pb-Free) | 2500 / Tape & Reel |
| MC100EL31MNR4  | DFN8                 | 1000 / Tape & Reel |
| MC100EL31MNR4G | DFN8<br>(Pb-Free)    | 1000 / 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.

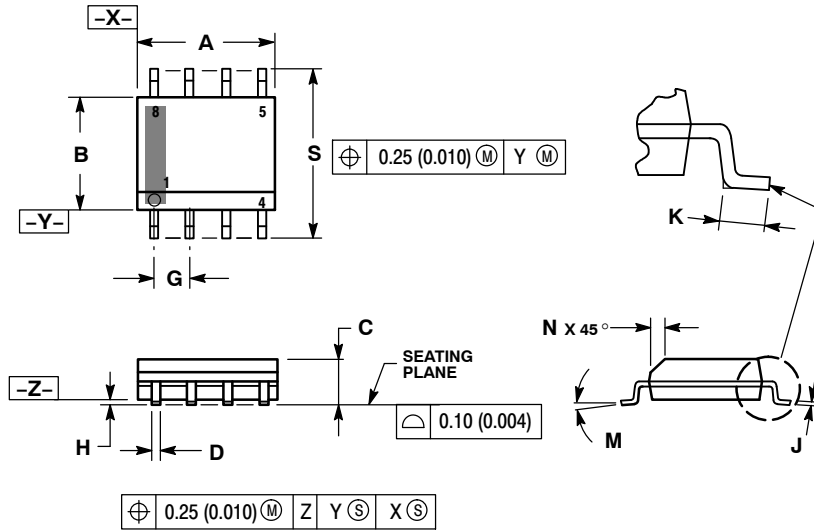
### Resource Reference of Application Notes

- 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

# MC10EL31, MC100EL31

## PACKAGE DIMENSIONS

SOIC-8 NB  
CASE 751-07  
ISSUE AH

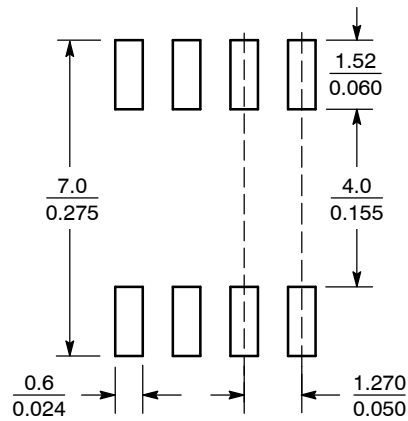


NOTES:

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\*



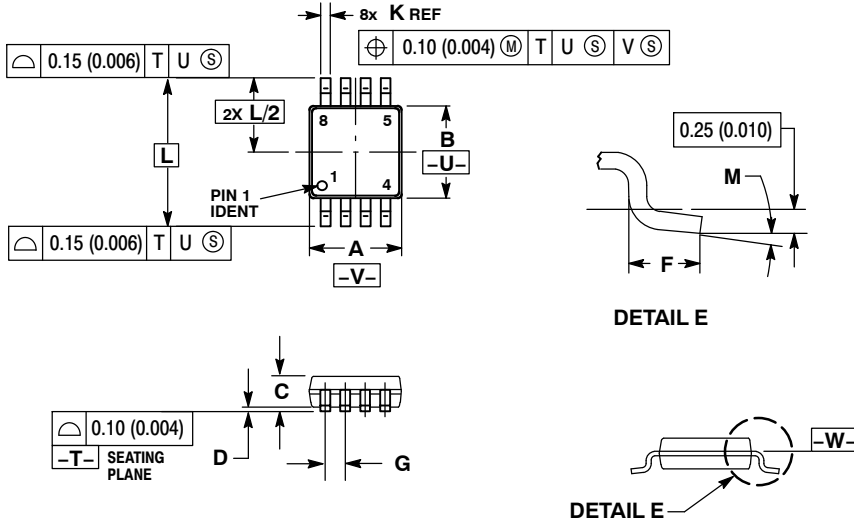
SCALE 6:1 (mm/inches)

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

# MC10EL31, MC100EL31

## 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-.

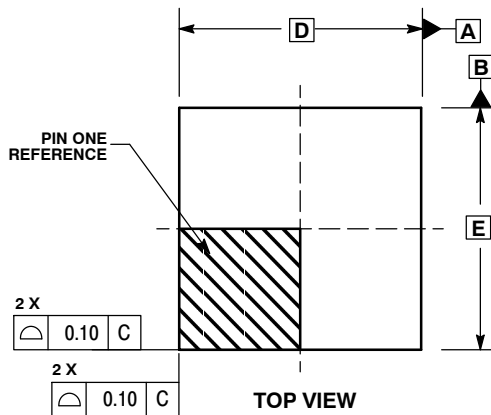
| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 2.90        | 3.10 | 0.114     | 0.122 |
| B   | 2.90        | 3.10 | 0.114     | 0.122 |
| C   | 0.80        | 1.10 | 0.031     | 0.043 |
| D   | 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°    |



# MC10EL31, MC100EL31

## 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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