## Configurable Multifunction Gate

## NLV7SZ58

The NLV7SZ58 is an advanced high-speed CMOS multifunction gate. The device allows the user to choose logic functions AND, OR, NAND, NOR, XOR, INVERT and BUFFER.

## Features

- Designed for 1.65 V to $5.5 \mathrm{~V} \mathrm{~V}_{\mathrm{CC}}$ Operation
- 3.3 ns $\mathrm{t}_{\mathrm{PD}}$ at $\mathrm{V}_{\mathrm{CC}}=5 \mathrm{~V}$ (Typ)
- Inputs/Outputs Overvoltage Tolerant up to 5.5 V
- I IOFF Supports Partial Power Down Protection
- Sink 24 mA at 3.0 V
- Available in SC-88 Package
- Chip Complexity < 100 FETs
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are $\mathrm{Pb}-$ Free, Halogen Free/BFR Free and are RoHS Compliant



## SC-88

 CASE 419B-02$$
\begin{aligned}
& \text { XXX }=\text { Specific Device Code } \\
& \text { M } \quad=\text { Date Code } \\
& \text { - } \quad=\text { Pb-Free Package }
\end{aligned}
$$

(Note: Microdot may be in either location or may not be present)

> *Date Code orientation and/or position may vary depending upon manufacturing location.

## ORDERING INFORMATION

See detailed ordering and shipping information on page 8 of this data sheet.


Figure 1. Pinout (Top View)


Figure 2. Function Diagram

PIN ASSIGNMENT

| Pin | Function |
| :---: | :---: |
| 1 | B |
| 2 | GND |
| 3 | A |
| 4 | Y |
| 5 | $\mathrm{~V}_{\mathrm{CC}}$ |
| 6 | C |

FUNCTION TABLE*

| Input |  |  | Output |
| :---: | :---: | :---: | :---: |
| A | B | C | Y |
| L | L | L | L |
| L | L | H | H |
| L | H | L | L |
| L | H | H | L |
| $H$ | L | L | H |
| $H$ | L | H | H |
| $H$ | $H$ | L | H |
| $H$ | $H$ | $H$ | L |

*To select a logic function, please refer to "Logic Configurations section".

## LOGIC CONFIGURATIONS


$B-O J$
$C-O$
$C$

$B-O-$
$C \rightarrow$
$I$
C-I $O$


Figure 3. 2-Input NAND (When $A=$ " ${ }^{\prime}$ ")
Figure 4. 2-Input AND with Input B Inverted
(When A = "L")


Figure 5. 2-Input AND with Input C Inverted (When B = "H")
$B+T$
$C$
$I$
$I$


Figure 7. 2-Input XOR (When A = B)


Figure 6. 2-Input OR (When B = "L")


Figure 8. Buffer (When B = C = "L")
B



Figure 9. Inverter (When $A=$ " $L$ " and $C=$ " $H$ ")

MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
| :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | DC Supply Voltage | -0.5 to +7.0 | V |
| $\mathrm{V}_{\text {IN }}$ | DC Input Voltage | -0.5 to +7.0 | V |
| $\mathrm{V}_{\text {OUT }}$ | DC Output Voltage Active-Mode (High or Low State) <br> Tri-State Mode (Note 1)  <br> Power-Down Mode (VCC $=0 \mathrm{~V})$  | $\begin{gathered} -0.5 \text { to } V_{\mathrm{CC}}+0.5 \\ -0.5 \text { to }+7.0 \\ -0.5 \text { to }+7.0 \end{gathered}$ | V |
| $\mathrm{IIK}^{\prime}$ | DC Input Diode Current $\mathrm{V}_{\text {IN }}<$ GND | -50 | mA |
| lok | DC Output Diode Current $\quad \mathrm{V}_{\text {OUT }}<$ GND | -50 | mA |
| Iout | DC Output Source/Sink Current | $\pm 50$ | mA |
| $\mathrm{I}_{\text {CC }}$ or IGND | DC Supply Current per Supply Pin or Ground Pin | $\pm 100$ | mA |
| $\mathrm{T}_{\text {STG }}$ | Storage Temperature Range | -65 to +150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{L}}$ | Lead Temperature, 1 mm from Case for 10 Secs | 260 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{J}$ | Junction Temperature Under Bias | +150 | ${ }^{\circ} \mathrm{C}$ |
| $\theta_{\text {JA }}$ | Thermal Resistance (Note 2) SC-88 | 377 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| $\mathrm{P}_{\mathrm{D}}$ | Power Dissipation in Still Air SC-88 | 332 | mW |
| MSL | Moisture Sensitivity | Level 1 |  |
| $\mathrm{F}_{\mathrm{R}}$ | Flammability Rating Oxygen Oxygen Index: 28 to 34 | UL 94 V-0 @ 0.125 in |  |
| $\mathrm{V}_{\text {ESD }}$ | ESD Withstand Voltage (Note 3)Human Body Mode <br>  <br> Charged Device Model <br> Charged Device Model | $\begin{gathered} \hline>2000 \\ >200 \\ \text { N/A } \end{gathered}$ | V |
| ILATCHUP | Latchup Performance (Note 4) | $\pm 500$ | mA |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Applicable to devices with outputs that may be tri-stated.
2. Measured with minimum pad spacing on an FR4 board, using 10 mm -by- 1 inch, 2 ounce copper trace no air flow per JESD51-7.
3. CDM tested to EIA/JESD22-C101-F. JEDEC recommends that ESD qualification to EIA/JESD22-A115-A (Machine Model) be discontinued per JEDEC/JEP172A.
4. Tested to EIA/JESD78 Class II.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter |  | Min | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | Positive DC Supply Voltage |  | 1.65 | 5.5 | V |
| $\mathrm{V}_{\text {IN }}$ | DC Input Voltage |  | 0 | 5.5 | V |
| $\mathrm{V}_{\text {OUT }}$ | DC Output Voltage | Active-Mode (High or Low State) <br> Tri-State Mode (Note 1) Power-Down Mode ( $\mathrm{V}_{\mathrm{CC}}=0 \mathrm{~V}$ ) | 0 | 5.5 | V |
| $\mathrm{T}_{\text {A }}$ | Operating Free-Air Temperature |  | -55 | +125 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{t}_{\mathrm{r}}, \mathrm{t}_{\mathrm{f}}$ | Input Rise or Fall Rate | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}=1.65 \mathrm{~V} \text { to } 1.95 \mathrm{~V} \\ \mathrm{~V}_{\mathrm{CC}}=2.3 \mathrm{~V} \text { to } 2.7 \mathrm{~V} \\ \mathrm{~V}_{\mathrm{CC}}=3.0 \mathrm{~V} \text { to } 3.5 \mathrm{~V} \text { to } 5.5 \mathrm{~V} \end{gathered}$ | $\begin{aligned} & \hline 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | No Limit No Limit No Limit No Limit | nS/V |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | $\begin{aligned} & \mathrm{v}_{\mathrm{cc}} \\ & (\mathrm{~V}) \end{aligned}$ | $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ |  |  | $\begin{gathered} -40^{\circ} \mathrm{C} \leq \mathrm{T}_{\mathrm{A}} \leq \\ 85^{\circ} \mathrm{C} \end{gathered}$ |  | $\begin{gathered} -55^{\circ} \mathrm{C} \leq \mathrm{T}_{\mathrm{A}} \leq \\ 125^{\circ} \mathrm{C} \end{gathered}$ |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Min | Typ | Max | Min | Max | Min | Max |  |
| $\mathrm{V}_{\text {T+ }}$ | Positive Input Threshold Voltage |  | 1.65 | 0.79 | - | 1.16 | - | 1.16 | - | 1.16 | V |
|  |  |  | 2.3 | 1.11 | - | 1.56 | - | 1.56 | - | 1.56 |  |
|  |  |  | 3.0 | 1.5 | - | 1.87 | - | 1.87 | - | 1.87 |  |
|  |  |  | 4.5 | 2.16 | - | 2.74 | - | 2.74 | - | 2.74 |  |
|  |  |  | 5.5 | 2.61 | - | 3.33 | - | 3.33 | - | 3.33 |  |
| $\mathrm{V}_{\text {T- }}$ | Negative Input Threshold Voltage |  | 1.65 | 0.35 | - | 0.62 | 0.35 | - | 0.35 | - | V |
|  |  |  | 2.3 | 0.58 | - | 0.87 | 0.58 | - | 0.58 | - |  |
|  |  |  | 3.0 | 0.84 | - | 1.19 | 0.84 | - | 0.84 | - |  |
|  |  |  | 4.5 | 1.41 | - | 1.9 | 1.41 | - | 1.41 | - |  |
|  |  |  | 5.5 | 1.78 | - | 2.2 | 1.78 | - | 1.78 | - |  |
| $\mathrm{V}_{\mathrm{H}}$ | Negative Input Threshold Voltage |  | 1.65 | 0.3 | - | 0.62 | 0.3 | 0.62 | 0.3 | 0.62 | V |
|  |  |  | 2.3 | 0.4 | - | 0.8 | 0.4 | 0.8 | 0.4 | 0.8 |  |
|  |  |  | 3.0 | 0.53 | - | 0.87 | 0.53 | 0.87 | 0.53 | 0.87 |  |
|  |  |  | 4.5 | 0.71 | - | 1.04 | 0.71 | 1.04 | 0.71 | 1.04 |  |
|  |  |  | 5.5 | 0.8 | - | 1.2 | 0.8 | 1.2 | 0.8 | 1.2 |  |
| $\mathrm{V}_{\mathrm{OH}}$ | High-Level Output Voltage$\mathrm{V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IH}} \text { or } \mathrm{V}_{\mathrm{IL}}$ | $\mathrm{I}_{\mathrm{OH}}=-50 \mu \mathrm{~A}$ | $\begin{array}{\|c} 1.65 \text { to } \\ 5.5 \end{array}$ | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}- \\ 0.1 \end{gathered}$ | $\mathrm{V}_{\mathrm{CC}}$ | - | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}- \\ 0.1 \end{gathered}$ | - | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}- \\ 0.1 \end{gathered}$ | - | V |
|  |  | $\mathrm{I}_{\mathrm{OH}}=-4 \mathrm{~mA}$ | 1.65 | 1.20 | 1.52 | - | 1.20 | - | 1.20 | - |  |
|  |  | $\mathrm{I}_{\mathrm{OH}}=-8 \mathrm{~mA}$ | 2.3 | 1.9 | 2.1 | - | 1.9 | - | 1.9 | - |  |
|  |  | $\mathrm{I}_{\mathrm{OH}}=-16 \mathrm{~mA}$ | 3 | 2.4 | 2.7 | - | 2.4 | - | 2.4 | - |  |
|  |  | $\mathrm{I}_{\mathrm{OH}}=-24 \mathrm{~mA}$ | 3 | 2.3 | 2.5 | - | 2.3 | - | 2.3 | - |  |
|  |  | $\mathrm{IOH}^{\text {a }}$ - 32 mA | 4.5 | 3.8 | 4 | - | 3.8 | - | 3.8 | - |  |
| VOL | Low-Level Output Voltage$\mathrm{V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IH}} \text { or } \mathrm{V}_{\mathrm{IL}}$ | $\mathrm{I}_{\mathrm{OL}}=100 \mu \mathrm{~A}$ | $\begin{array}{\|c\|c} 1.65 \text { to } \\ 5.5 \end{array}$ | - | - | 0.1 | - | 0.1 | - | 0.1 | V |
|  |  | $\mathrm{I}_{\mathrm{OL}}=4 \mathrm{~mA}$ | 1.65 | - | 0.08 | 0.45 | - | 0.45 | - | 0.45 |  |
|  |  | $\mathrm{I}_{\mathrm{OL}}=8 \mathrm{~mA}$ | 2.3 | - | 0.2 | 0.3 | - | 0.3 | - | 0.4 |  |
|  |  | $\mathrm{I}_{\mathrm{OL}}=16 \mathrm{~mA}$ | 3 | - | 0.28 | 0.4 | - | 0.4 | - | 0.5 |  |
|  |  | $\mathrm{I}_{\mathrm{OL}}=24 \mathrm{~mA}$ | 3 | - | 0.38 | 0.55 | - | 0.55 | - | 0.55 |  |
|  |  | $\mathrm{I}_{\mathrm{OL}}=32 \mathrm{~mA}$ | 4.5 | - | 0.42 | 0.55 | - | 0.55 | - | 0.65 |  |
| In | Input Leakage Current | $\begin{aligned} & \mathrm{V}_{\mathrm{IN}}=5.5 \mathrm{~V} \text { or } \\ & \text { GND } \end{aligned}$ | $\begin{array}{\|c} 1.65 \text { to } \\ 5.5 \end{array}$ | - | - | +0.1 | - | +1.0 | - | +1.0 | $\mu \mathrm{A}$ |
| IoFF | Power Off Leakage Current | $\begin{aligned} & \mathrm{V}_{\text {IN }}=5.5 \mathrm{~V} \text { or } \\ & \mathrm{V}_{\text {OUT }}=5.5 \mathrm{~V} \end{aligned}$ | 0 | - | - | 1.0 | - | 10 | - | 10 | $\mu \mathrm{A}$ |
| $\mathrm{I}_{\mathrm{CC}}$ | Quiescent Supply Current | $\begin{aligned} & \mathrm{V}_{1 N}=5.5 \mathrm{~V} \text { or } \\ & \text { GND } \end{aligned}$ | 5.5 | - | - | 1.0 | - | 10 | - | 10 | $\mu \mathrm{A}$ |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | $\mathrm{V}_{\mathrm{cc}}(\mathrm{V})$ | $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ |  |  | $\begin{gathered} -40^{\circ} \mathrm{C} \leq \mathrm{T}_{\mathrm{A}} \leq \\ 85^{\circ} \mathrm{C} \end{gathered}$ |  | $\begin{gathered} -55^{\circ} \mathrm{C} \leq \mathrm{T}_{\mathrm{A}} \leq \\ 125^{\circ} \mathrm{C} \end{gathered}$ |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Min | Typ | Max | Min | Max | Min | Max |  |
| $\mathrm{t}_{\text {PLH }}$, $\mathrm{t}_{\text {PHL }}$ | Propagation Delay, (A or B or C) to Y (Figures 10 and 11) | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega, \\ & \mathrm{C}_{\mathrm{L}}=30 \mathrm{pF} \end{aligned}$ | 1.65 to 1.95 | - | 8.6 | 14.4 | - | 14.4 | - | 14.4 | ns |
|  |  | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=500 \Omega, \\ & \mathrm{CL}=30 \mathrm{pF} \end{aligned}$ | 2.3 to 2.7 | - | 5.1 | 8.3 | - | 8.3 | - | 8.3 |  |
|  |  | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=500 \Omega, \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ | 3.0 to 3.6 | - | 3.9 | 6.3 | - | 6.3 | - | 6.3 |  |
|  |  |  | 4.5 to 5.5 | - | 3.3 | 5.1 | - | 5.1 | - | 5.1 |  |

CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Condition | Typical | Unit |
| :---: | :---: | :---: | :---: | :---: |
| $\mathrm{C}_{\text {IN }}$ | Input Capacitance | $\mathrm{V}_{\mathrm{CC}}=5.5 \mathrm{~V}, \mathrm{~V}_{\text {IN }}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 2.5 | pF |
| Cout | Output Capacitance | $\mathrm{V}_{\mathrm{CC}}=5.5 \mathrm{~V}, \mathrm{~V}_{\text {IN }}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 4.0 | pF |
| $\mathrm{C}_{\text {PD }}$ | Power Dissipation Capacitance (Note 5) | $\begin{aligned} & 10 \mathrm{MHz}, \mathrm{~V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=0 \mathrm{~V} \text { or } \mathrm{V}_{\mathrm{CC}} \\ & 10 \mathrm{MHz}, \mathrm{~V}_{\mathrm{CC}}=5.0 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=0 \mathrm{~V} \text { or } \mathrm{V}_{\mathrm{CC}} \end{aligned}$ | $\begin{gathered} \hline 16 \\ 19.5 \end{gathered}$ | pF |

5. $\mathrm{C}_{\mathrm{PD}}$ is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $\mathrm{I}_{\mathrm{CC}(\mathrm{OPR})}=\mathrm{C}_{P D} \cdot \mathrm{~V}_{\mathrm{CC}} \cdot \mathrm{f}_{\mathrm{in}}+\mathrm{I}_{\mathrm{CC}}$. $\mathrm{C}_{\mathrm{PD}}$ is used to determine the no-load dynamic power consumption; $\mathrm{P}_{\mathrm{D}}=\mathrm{C}_{\mathrm{PD}} \cdot \mathrm{V}_{\mathrm{CC}}{ }^{2} \cdot \mathrm{f}_{\mathrm{in}}+\mathrm{I}_{\mathrm{CC}} \cdot \mathrm{V}_{\mathrm{CC}}$.


| Test | Switch <br> Position | $\mathbf{C}_{\mathrm{L}}, \mathbf{p F}$ | $\mathbf{R}_{\mathrm{L}}, \boldsymbol{\Omega}$ | $\mathbf{R}_{\mathbf{1}}, \boldsymbol{\Omega}$ |
| :---: | :---: | :---: | :---: | :---: |
| $\mathrm{t}_{\mathrm{PLH}} / \mathrm{t}_{\mathrm{PHL}}$ | Open | See AC Characteristics Table |  |  |
| $\mathrm{t}_{\mathrm{PLZ}} / \mathrm{t}_{\mathrm{PZL}}$ | $2 \times \mathrm{V}_{\mathrm{CC}}$ | 50 | 500 | 500 |
| $\mathrm{t}_{\mathrm{PHZ}} / \mathrm{t}_{\mathrm{PZH}}$ | GND | 50 | 500 | 500 |

X = Don't Care
$\mathrm{C}_{\mathrm{L}}$ includes probe and jig capacitance
$R_{T}$ is $Z_{\text {OUT }}$ of pulse generator (typically $50 \Omega$ )
$\mathrm{f}=1 \mathrm{MHz}$
Figure 10. Test Circuit


Figure 11. Switching Waveforms

| $\mathbf{V}_{\mathbf{C C}}, \mathbf{v}$ | $\mathbf{V}_{\mathbf{m o}}, \mathbf{V}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathbf{t}_{\mathbf{P Z L}}, \mathbf{t}_{\mathbf{P L Z}}, \mathbf{t}_{\mathbf{P Z H}}, \mathbf{t}_{\mathbf{P H Z}}$ | $\mathbf{v}_{\mathbf{Y},} \mathbf{V}$ |
|  | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.15 |
| 2.3 to 2.7 | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.15 |
| 3.0 to 3.6 | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.3 |
| 4.5 to 5.5 | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | $\mathrm{~V}_{\mathrm{CC}} / 2$ | 0.3 |

ORDERING INFORMATION

| Device | Package | Specific Device Code | Pin 1 Orientation <br> (See below) | Shipping $^{\dagger}$ |
| :---: | :---: | :---: | :---: | :---: |
| NLV7SZ58DFT2G* | SC-88 <br> $($ Pb-Free $)$ | Q4 | $3000 /$ Tape \& Reel |  |

$\dagger$ 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.
*NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

PIN 1 ORIENTATION IN TAPE AND REEL
Direction of Feed


## PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH,
PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 PER END.
3. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AND DATUM H.
. DATUMS A AND B ARE DETERMINED AT DATUM H.
4. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP
5. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION b AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.

| DIM | MILLIMETERS |  |  | INCHES |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | MIN | NOM | MAX | MIN | NOM | MAX |
| A | --- | --- | 1.10 | --- | --- | 0.043 |
| A1 | 0.00 | --- | 0.10 | 0.000 | --- | 0.004 |
| A2 | 0.70 | 0.90 | 1.00 | 0.027 | 0.035 | 0.039 |
| b | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |
| C | 0.08 | 0.15 | 0.22 | 0.003 | 0.006 | 0.009 |
| D | 1.80 | 2.00 | 2.20 | 0.070 | 0.078 | 0.086 |
| E | 2.00 | 2.10 | 2.20 | 0.078 | 0.082 | 0.086 |
| E1 | 1.15 | 1.25 | 1.35 | 0.045 | 0.049 | 0.053 |
| e | 0.65 BSC |  |  | 0.026 BSC |  |  |
| L | 0.26 | 0.36 | 0.46 | 0.010 | 0.014 | 0.018 |
| L2 | 0.15 BSC |  |  | 0.006 BSC |  |  |
| aaa | 0.15 |  |  | 0.006 |  |  |
| bbb | 0.30 |  |  | 0.012 |  |  |
| ccc | 0.10 |  |  | 0.004 |  |  |
| ddd | 0.10 |  |  |  |  |  |

RECOMMENDED SOLDERING FOOTPRINT*

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


#### Abstract

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