

# 7WB3126

## 2-Bit Bus Switch

The 7WB3126 is an advanced high-speed low-power 2-bit bus switch in ultra-small footprints.

### Features

- High Speed:  $t_{PD} = 0.25$  ns (Max) @  $V_{CC} = 4.5$  V
- $3\ \Omega$  Switch Connection Between 2 Ports
- Power Down Protection Provided on Inputs
- Zero Bounce
- TTL-Compatible Control Inputs
- Ultra-Small Pb-Free Packages
- These are Pb-Free Devices



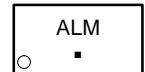
**ON Semiconductor®**

<http://onsemi.com>

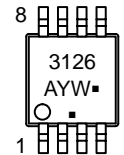
### MARKING DIAGRAMS



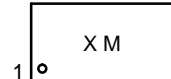
**UDFN8**  
**MU SUFFIX**  
**CASE 517AJ**



**Micro8™**  
**DM SUFFIX**  
**CASE 846A**



**UDFN8**  
**1.95 x 1.0**  
**CASE 517CA**



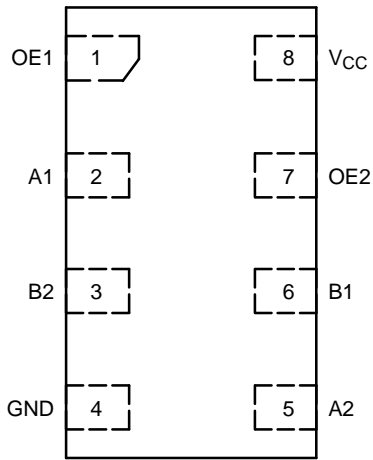
- A = Assembly Location
- Y = Year
- W = Work Week
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

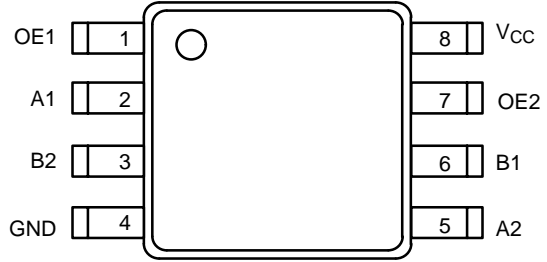
### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

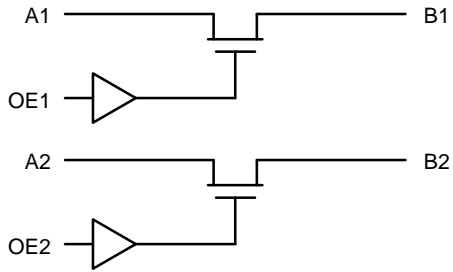
# 7WB3126



**Figure 1. UDFN8**  
(Top Thru-View)



**Figure 2. Micro8**  
(Top View)



**Figure 3. Logic Diagram**

### FUNCTION TABLE

Input OEn	Function
L	Disconnect
H	$B_n = A_n$

# 7WB3126

## MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	DC Supply Voltage	-0.5 to +7.0	V
$V_{IN}$	Control Pin Input Voltage	-0.5 to +7.0	V
$V_{I/O}$	Switch Input / Output Voltage	-0.5 to +7.0	V
$I_{IK}$	Control Pin DC Input Diode Current $V_{IN} < GND$	-50	mA
$I_{OK}$	Switch I/O Port DC Diode Current $V_{I/O} < GND$	-50	mA
$I_O$	ON-State Switch Current	$\pm 128$	mA
	Continuous Current Through $V_{CC}$ or GND	$\pm 150$	mA
$I_{CC}$	DC Supply Current Per Supply Pin	$\pm 150$	mA
$I_{GND}$	DC Ground Current per Ground Pin	$\pm 150$	mA
$T_{STG}$	Storage Temperature Range	-65 to +150	°C
$T_L$	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C
$T_J$	Junction Temperature Under Bias	150	°C
$\theta_{JA}$	Thermal Resistance UDFN8 (Note 1) Micro8	111	°C/W
		392	
$P_D$	Power Dissipation in Still Air at 85°C UDFN8 Micro8	1127	mW
		319	
MSL	Moisture Sensitivity	Level 1	
$F_R$	Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
$V_{ESD}$	ESD Withstand Voltage Human Body Mode (Note 2) Machine Model (Note 3) Charged Device Model (Note 4)	> 2000	V
		> 200	
		N/A	
$I_{LATCHUP}$	Latchup Performance Above $V_{CC}$ and Below GND at 125°C (Note 5)	$\pm 200$	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. Measured with minimum pad spacing on an FR4 board, using 10 mm-by-1 inch, 2 ounce copper trace no air flow.
2. Tested to EIA / JESD22-A114-A.
3. Tested to EIA / JESD22-A115-A.
4. Tested to JESD22-C101-A.
5. Tested to EIA / JESD78.

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
$V_{CC}$	Positive DC Supply Voltage	4.0	5.5	V
$V_{IN}$	Control Pin Input Voltage	0	5.5	V
$V_{I/O}$	Switch Input / Output Voltage	0	5.5	V
$T_A$	Operating Free-Air Temperature	-55	+125	°C
$\Delta t/\Delta V$	Input Transition Rise or Fall Rate Control Input Switch I/O	0	5	nS/V
		0	DC	

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	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
V <sub>IK</sub>	Clamp Diode Voltage	I <sub>I/O</sub> = -18 mA	4.5			-1.2		-1.2	V
V <sub>IH</sub>	High-Level Input Voltage (Control)		4.0 to 5.5	2.0			2.0		V
V <sub>IL</sub>	Low-Level Input Voltage (Control)		4.0 to 5.5			0.8		0.8	V
V <sub>OH</sub>	Output Voltage High	See Figure 4							
I <sub>IN</sub>	Input Leakage Current	0 ≤ V <sub>IN</sub> ≤ 5.5 V	5.5			±0.1		±1.0	μA
I <sub>OFF</sub>	Power Off Leakage Current	V <sub>I/O</sub> = 0 to 5.5 V	0			±0.1		±1.0	μA
I <sub>CC</sub>	Quiescent Supply Current	I <sub>O</sub> = 0, V <sub>IN</sub> = V <sub>CC</sub> or 0 V	5.5			±0.1		±1.0	μA
ΔI <sub>CC</sub>	Increase in Supply Current (Control Pin)	One input at 3.4 V; Other inputs at V <sub>CC</sub> or GND	5.5					2.5	mA
R <sub>ON</sub>	Switch ON Resistance	V <sub>I/O</sub> = 0, I <sub>I/O</sub> = 64 mA I <sub>I/O</sub> = 30 mA	4.5		3 3	7 7		7 7	Ω
		V <sub>I/O</sub> = 2.4, I <sub>I/O</sub> = 15 mA			6	15		15	
		V <sub>I/O</sub> = 2.4, I <sub>I/O</sub> = 15 mA	4.0		10	20		20	

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	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25 °C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
t <sub>PD</sub>	Propagation Delay, Bus to Bus	See Figure 5	4.0 to 5.5			0.25		0.25	ns
t <sub>EN</sub>	Output Enable Time	See Figure 5	4.5 to 5.5	0.8	2.5	4.2	0.8	4.2	ns
			4.0	0.8	3.0	4.6	0.8	4.6	
t <sub>DIS</sub>	Output Disable Time		4.5 to 5.5	0.8	3.0	4.8	0.8	4.8	ns
			4.0	0.8	2.9	4.4	0.8	4.4	
C <sub>IN</sub>	Control Input Capacitance	V <sub>IN</sub> = 5 or 0 V	5.0		2.5				pF
C <sub>IO(ON)</sub>	Switch On Capacitance	Switch ON	5.0		10				pF
C <sub>IO(OFF)</sub>	Switch Off Capacitance	Switch OFF	5.0		5				pF

# 7WB3126

## TYPICAL DC CHARACTERISTICS

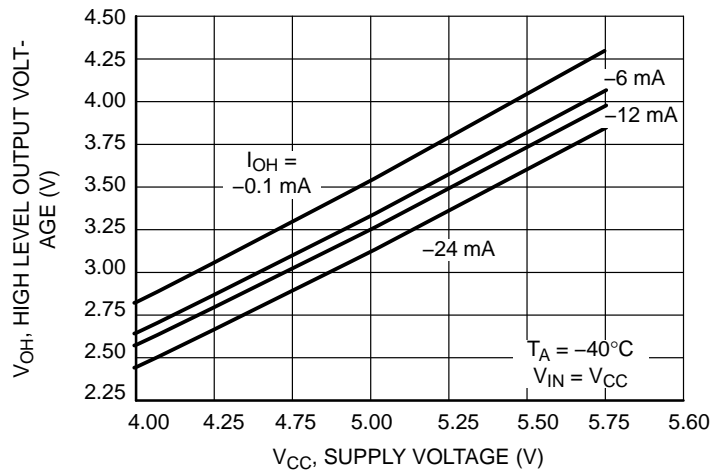
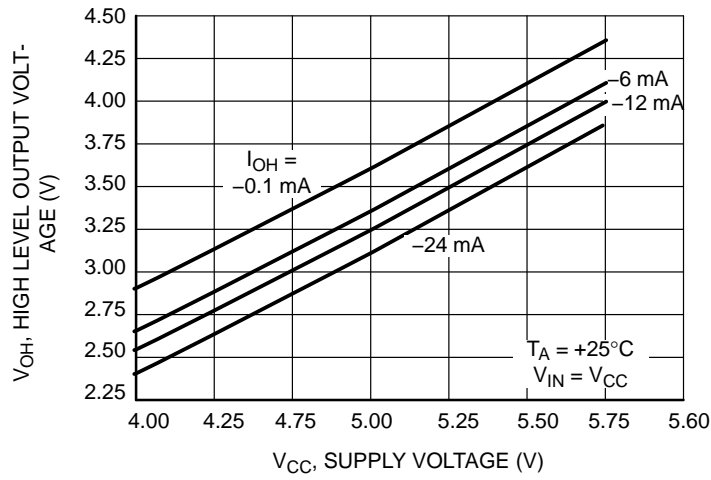
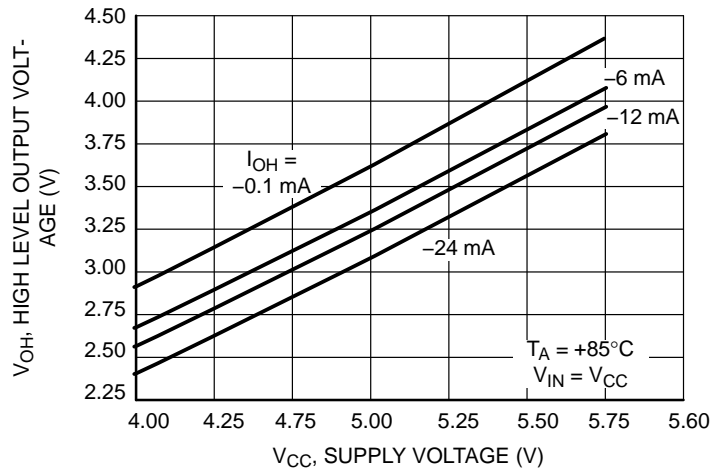
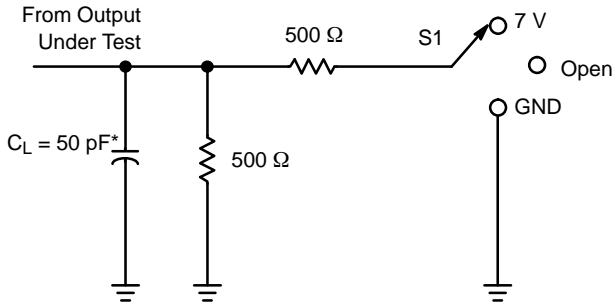


Figure 4. Output Voltage High vs Supply Voltage

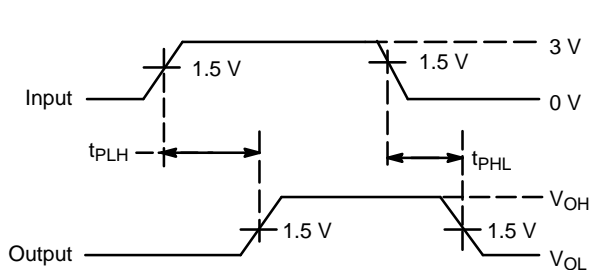
AC LOADING AND WAVEFORMS

Parameter Measurement Information

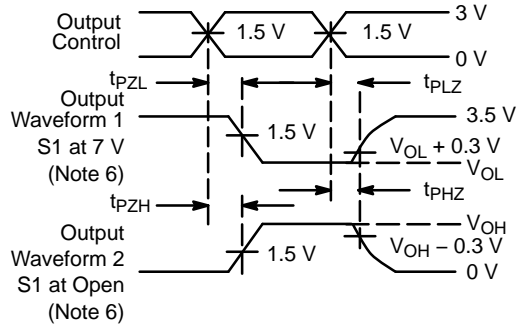


\* $C_L$  includes probes and jig capacitance.

Test	S1
$t_{PD}$	Open
$t_{PLZ}/t_{PZL}$	7 V
$t_{PHZ}/t_{PZH}$	Open



Voltage Waveforms  
Propagation Delay Times



Voltage Waveforms  
Enable and Disable Times

6. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.  
Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control
7. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 10 \text{ MHz}$ ,  $Z_O = 50 \Omega$ ,  $t_r \leq 2.5 \text{ ns}$ ,  $t_f \leq 2.5 \text{ ns}$ .
8. The outputs are measured one at a time, with one transition per measurement.
9.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{DIS}$ .
10.  $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{EN}$ .
11.  $t_{PHL}$  and  $t_{PLH}$  are the same as  $t_{PD}$ .

Figure 5.  $t_{PD}$ ,  $t_{EN}$ ,  $t_{DIS}$  Loading and Waveforms

# 7WB3126

## ORDERING INFORMATION

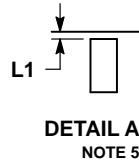
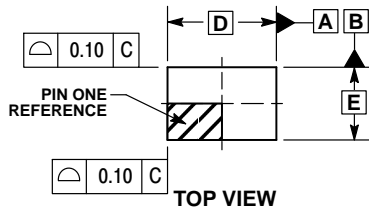
Device	Package	Shipping†
7WB3126MUTAG	UDFN8 (Pb-Free)	3000 / Tape & Reel
7WB3126DMR2G	Micro8 (Pb-Free)	4000 / Tape & Reel
7WB3126DMUTCG	UDFN8, 1.95 x 1.0, 0.5 mm Pitch (Pb-Free)	3000 / Tape & Reel

†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.

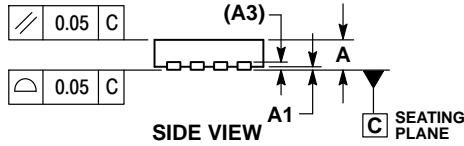
# 7WB3126

## PACKAGE DIMENSIONS

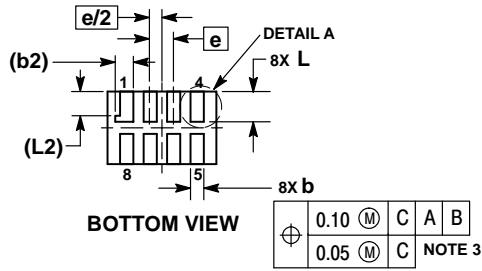
UDFN8 1.8 x 1.2, 0.4P  
CASE 517AJ  
ISSUE O



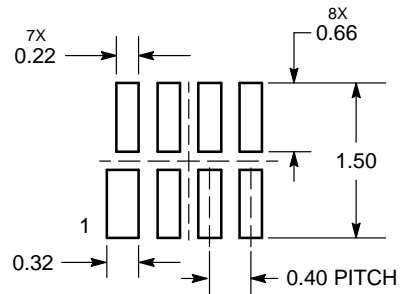
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: MILLIMETERS.
  3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM TERMINAL TIP.
  4. MOLD FLASH ALLOWED ON TERMINALS ALONG EDGE OF PACKAGE. FLASH MAY NOT EXCEED 0.03 ONTO BOTTOM SURFACE OF TERMINALS.
  5. DETAIL A SHOWS OPTIONAL CONSTRUCTION FOR TERMINALS.



MILLIMETERS		
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.127	REF
b	0.15	0.25
b2	0.30	REF
D	1.80	BSC
E	1.20	BSC
e	0.40	BSC
L	0.45	0.55
L1	0.00	0.03
L2	0.40	REF



### MOUNTING FOOTPRINT\* SOLDERMASK DEFINED



DIMENSIONS: MILLIMETERS

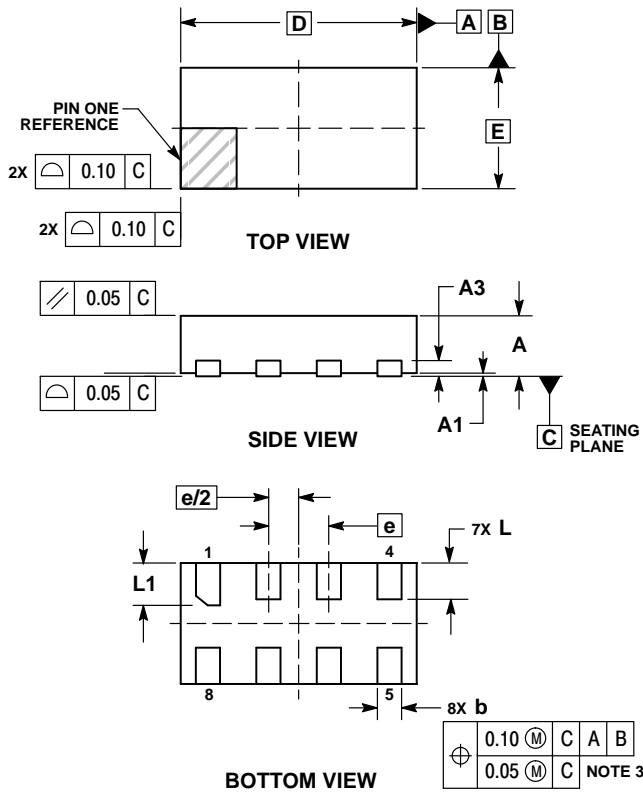
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



# 7WB3126

## PACKAGE DIMENSIONS

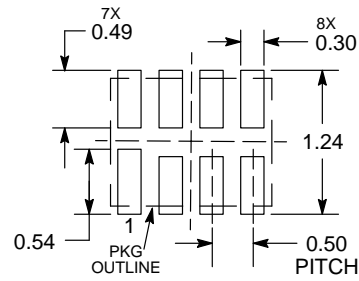
UDFN8 1.95x1.0, 0.5P  
CASE 517CA  
ISSUE O



- 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 0.15 AND 0.20 MM FROM TERMINAL TIP.
  4. PACKAGE DIMENSIONS EXCLUSIVE OF BURRS AND MOLD FLASH.

MILLIMETERS		
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.13 REF	
b	0.15	0.25
D	1.95 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.25	0.35
L1	0.30	0.40

### RECOMMENDED SOLDERING FOOTPRINT\*



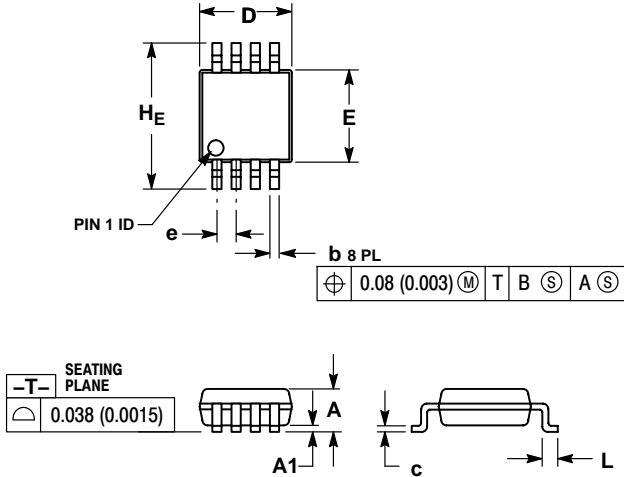
DIMENSIONS: MILLIMETERS

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

# 7WB3126

## PACKAGE DIMENSIONS

Micro8™  
CASE 846A  
ISSUE H

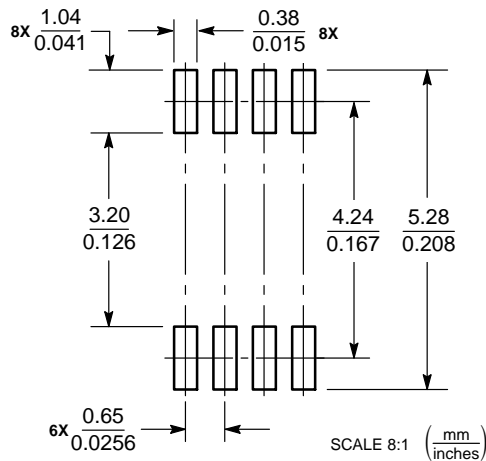


### NOTES:

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, PROTRUSIONS 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. 846A-01 OBSOLETE, NEW STANDARD 846A-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.05	0.08	0.15	0.002	0.003	0.006
b	0.25	0.33	0.40	0.010	0.013	0.016
c	0.13	0.18	0.23	0.005	0.007	0.009
D	2.90	3.00	3.10	0.114	0.118	0.122
E	2.90	3.00	3.10	0.114	0.118	0.122
e	0.65 BSC			0.026 BSC		
L	0.40	0.55	0.70	0.016	0.021	0.028
HE	4.75	4.90	5.05	0.187	0.193	0.199

### SOLDERING FOOTPRINT\*



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

Micro8 is a trademark of International Rectifier.

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

### PUBLICATION ORDERING INFORMATION

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

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local Sales Representative