7WB383

Bus Exchange Switch

The 7WB383 is an advanced high−speed low−power bus exchange switch in ultra−small footprints.

Features

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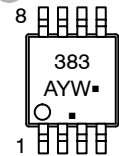- These are Pb−Free Devices

ON Semiconductor®

http://onsemi.com
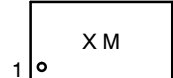
MARKING DIAGRAMS

UDFN8
MU SUFFIX
CASE 517AJ

| APM ■ |

Micro8™
DM SUFFIX
CASE 846A

| 383 AYW■ |

UDFN8
1.95 x 1.0
CASE 517CA

| X M |

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.

DISCONTINUED

THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
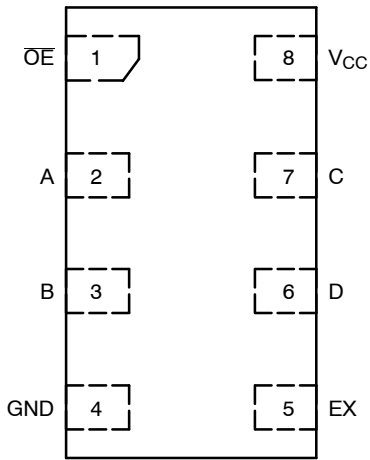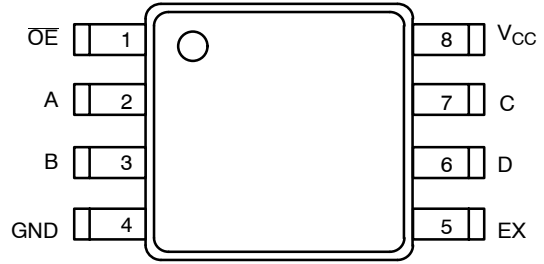PLEASE CONTACT YOUR onsemi
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Publication Order Number:
7WB383/D

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Figure 1. UDFN8
(Top Thru−View)

Figure 2. Micro8
(Top View)
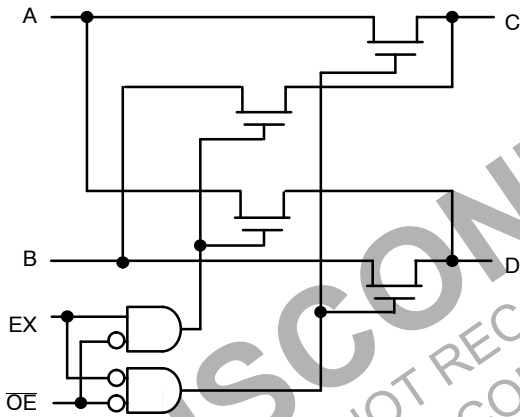
Figure 3. Logic Diagram

FUNCTION TABLE

Input $\overline{OE}$	Input EX	Function
L	L	A = C; B = D
L	H	A = D; B = C
H	X	Disconnect

7WB383

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		±128	mA
	Continuous Current Through V_{CC} or GND		±150	mA
I_{CC}	DC Supply Current Per Supply Pin		±150	mA
I_{GND}	DC Ground Current per Ground Pin		±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
θ_{JA}	Thermal Resistance	UDFN8 (Note 1) Micro8	111 392	°C/W
P_D	Power Dissipation in Still Air at 85°C	UDFN8 Micro8	1127 319	mW
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 > 200 N/A	V
$I_{LATCHUP}$	Latchup Performance Above V_{CC} and Below GND at 125 °C (Note 5)		±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 0	5 DC	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	Conditions	V$_{CC}$ (V)	T$_A$ = 25°C			T$_A$ = −55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
V$_{IK}$	Clamp Diode Voltage	I$_{I/O}$ = −18 mA	4.5			−1.2		−1.2	V
V$_{IH}$	High−Level Input Voltage (Control)		4.0 to 5.5	2.0			2.0		V
V$_{IL}$	Low−Level Input Voltage (Control)		4.0 to 5.5			0.8		0.8	V
V$_{OH}$	Output Voltage High	See Figure 4							
I$_{IN}$	Input Leakage Current	0 ≤ V$_{IN}$ ≤ 5.5 V	5.5			± 0.1		± 1.0	μA
I$_{OFF}$	Power Off Leakage Current	V$_{I/O}$ = 0 to 5.5 V	0			± 0.1		± 1.0	μA
I$_{CC}$	Quiescent Supply Current	I$_O$ = 0, V$_{IN}$ = V$_{CC}$ or 0 V	5.5			± 0.1		± 1.0	μA
ΔI$_{CC}$	Increase in Supply Current (Control Pin)	One input at 3.4 V; Other inputs at V$_{CC}$ or GND	5.5					2.5	mA
R$_{ON}$	Switch ON Resistance	V$_{I/O}$ = 0, I$_{I/O}$ = 64 mA, I$_{I/O}$ = 30 mA	4.5		3, 3	7, 7		7, 7	Ω
		V$_{I/O}$ = 2.4, I$_{I/O}$ = 15 mA			6	15		15	
		V$_{I/O}$ = 2.4, I$_{I/O}$ = 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$_{CC}$ (V)	T$_A$ = 25 °C			T$_A$ = −55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
t$_{PD}$	Propagation Delay, Bus to Bus	See Figure 5	4.0 to 5.5			0.25		0.25	ns
t$_{PD−EX}$	Propagation Delay, EX to Bus	See Figure 5 and Figure 6	4.0 to 5.5			4.5		4.5	ns
t$_{EN}$	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$_{DIS}$	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$_{IN}$	Control Input Capacitance	V$_{IN}$ = 5 or 0 V	5.0		2.5				pF
C$_{IO(ON)}$	Switch On Capacitance	Switch ON	5.0		10				pF
C$_{IO(OFF)}$	Switch Off Capacitance	Switch OFF	5.0		5				pF

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TYPICAL DC CHARACTERISTICS
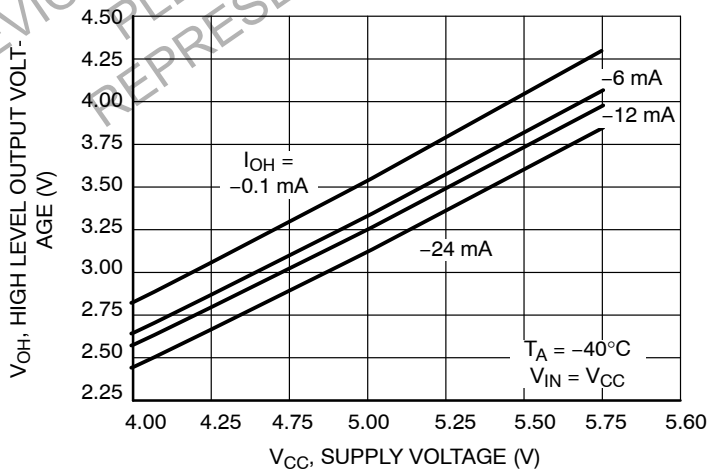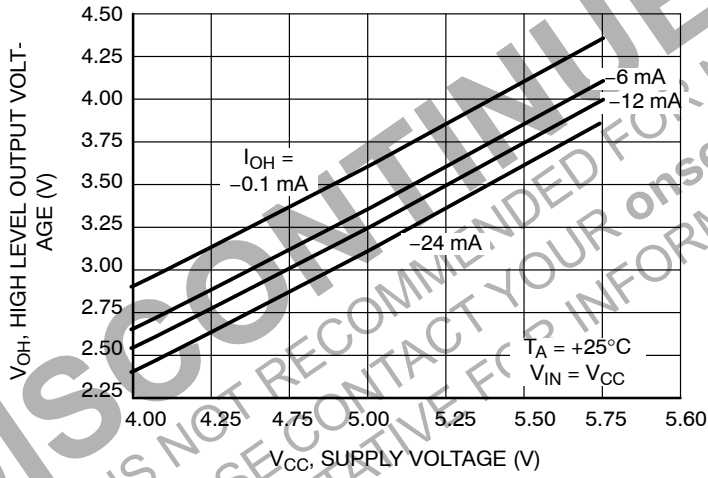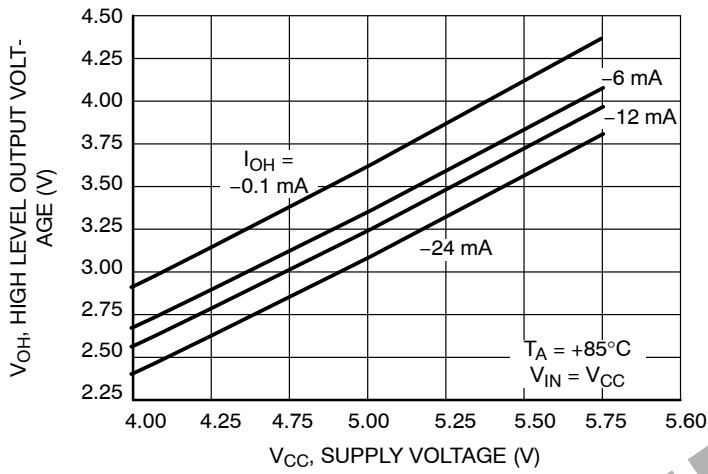
Figure 4. Output Voltage High vs Supply Voltage
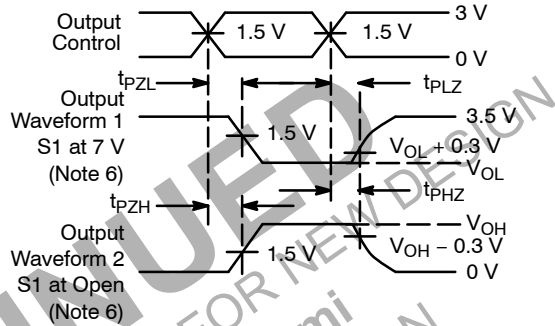
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AC LOADING AND WAVEFORMS

*C$_L$ includes probes and jig capacitance.
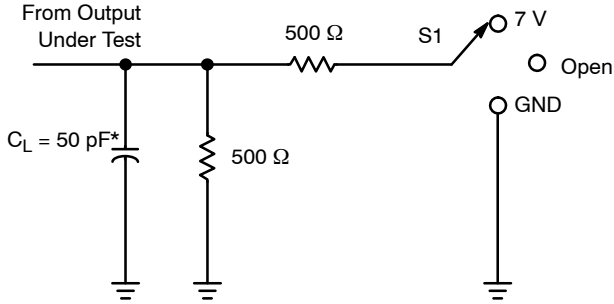
Test	S1
t$_{PD}$	Open
t$_{PLZ}$/t$_{PZL}$	7 V
t$_{PHZ}$/t$_{PZH}$	Open
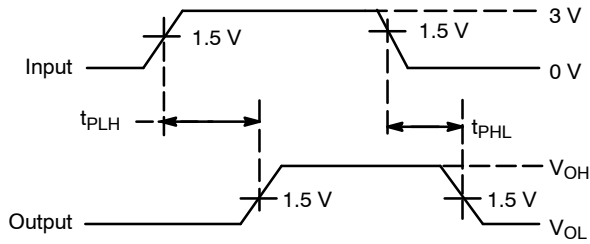
**Voltage Waveforms
Propagation Delay Times**

**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 ≤ 10 MHz, Z$_O$ = 50 Ω, t$_r$ ≤ 2.5 ns, t$_f$ ≤ 2.5 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. $_{PD}$, t$_{EN}$, t$_{DIS}$ Loading and Waveforms
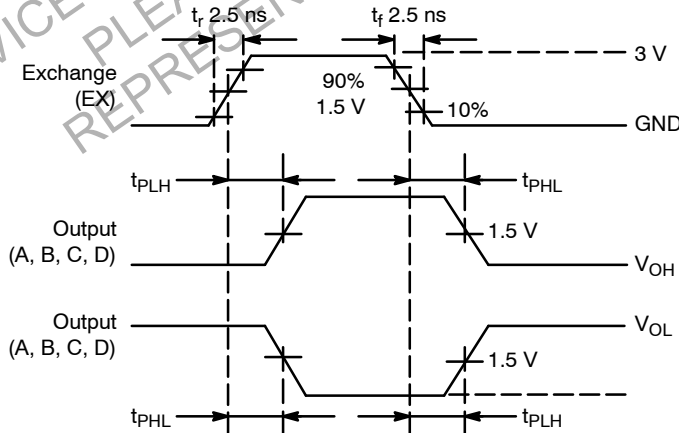
Figure 6. t$_{PD-EX}$ Waveforms

DISCONTINUED
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ORDERING INFORMATION

| Device	Package	Shipping†
7WB383MUTAG	UDFN8 (Pb−Free)	3000 / Tape & Reel
7WB383DMR2G	Micro8 (Pb−Free)	4000 / Tape & Reel
7WB383DMUTCG	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.

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PACKAGE DIMENSIONS

**UDFN8 1.8 x 1.2, 0.4P**
CASE 517AJ
ISSUE O
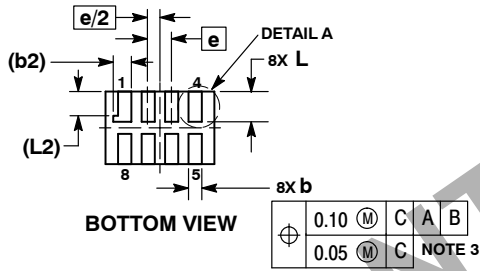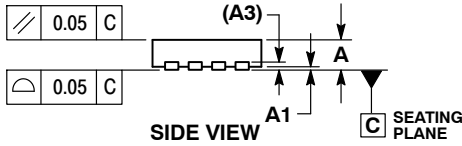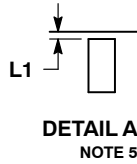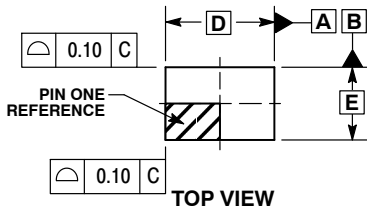
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM TERMINAL TIP.
4. MOLD FLASH ALLOWED ON TERMINALS ALONG EDGE OF PACKAGE. FLASH MAY NOT EXCEED 0.03 ONTO BOTTOM SURFACE OF TERMINALS.
5. DETAIL A SHOWS OPTIONAL CONSTRUCTION FOR TERMINALS.

TOP VIEW

PIN ONE REFERENCE

DETAIL A
NOTE 5

SIDE VIEW

SEATING PLANE

BOTTOM VIEW

NOTE 3

DETAIL A

DIM	MILLIMETERS	
	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

7X 0.22

8X 0.66

1.50

0.32

1

0.40 PITCH

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.

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PACKAGE DIMENSIONS

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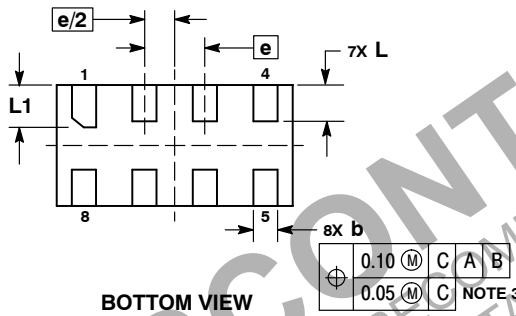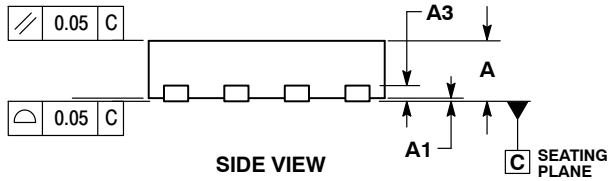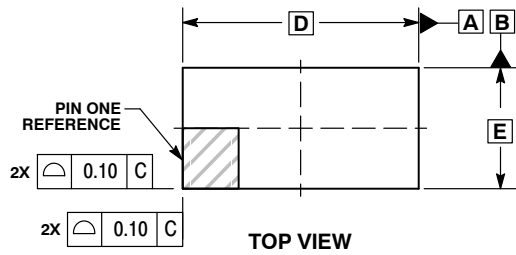
TOP VIEW

SIDE VIEW

BOTTOM VIEW

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.

DIM	MILLIMETERS	
	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*
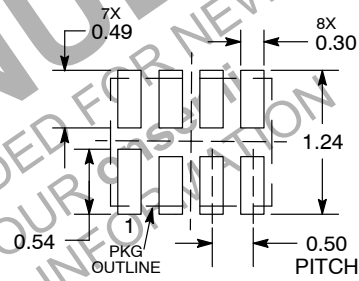
DIMENSIONS: MILLIMETERS

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

PACKAGE DIMENSIONS

Micro8™
CASE 846A
ISSUE H
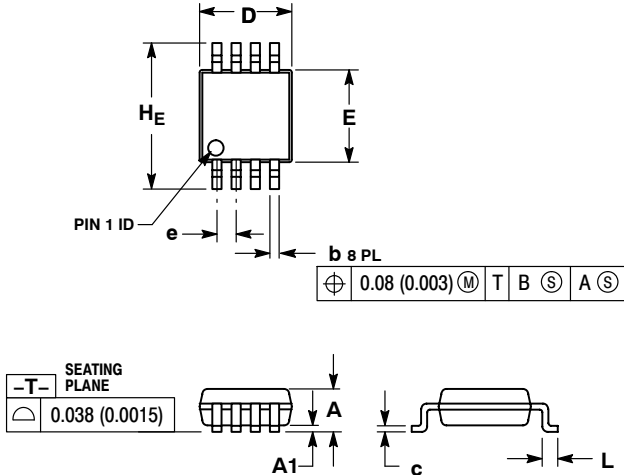
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. 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
H_E	4.75	4.90	5.05	0.187	0.193	0.199
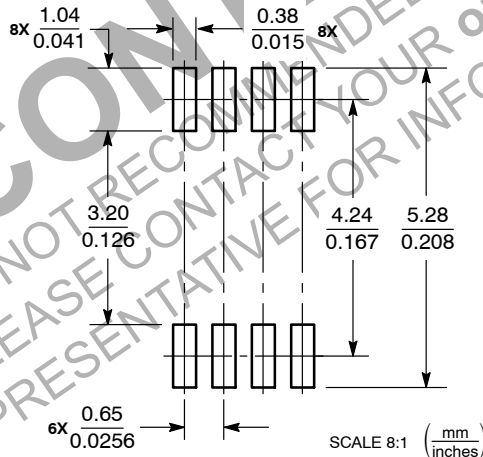
⊕ 0.08 (0.003) Ⓜ T B Ⓢ A Ⓢ

SEATING PLANE
-T-
◁ 0.038 (0.0015)

SOLDERING FOOTPRINT*

SCALE 8:1 (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.

Micro8 is a trademark of International Rectifier.

PUBLICATION ORDERING INFORMATION