ON Semiconductor

Is Now

Onsemi

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2-Bit Translating Bus Switch

7WBD3306

The 7WBD3306 is an advanced high-speed low-power 2-bit translating bus switch in ultra-small footprints.

Features

- High Speed: $t_{PD} = 0.25 \text{ ns} (Max) @ V_{CC} = 4.5 \text{ V}$
- 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-



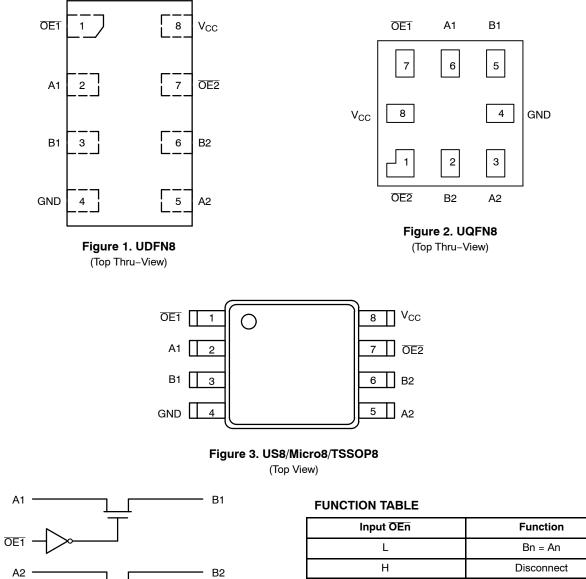
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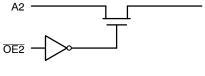
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				ARKING AGRAMS
1	UDF MU SU CASE 5	FFIX	0	AHM •
	1.95	FN8 x 1.0 517CA	1 •	ХМ
	DM S	cro8 UFFIX E 846A		8 D125 AYW• O •
1 8	UQF MU SU CASE 5	FFIX	1	o AH M*∎ ∎
THE	US US SU CASE	FFIX		AF ALYW 0
	TSS DT SL CASE	JFFIX	8	
AH, X, D125, AF M A L Y W	F, AAE	= Specif = Date C = Assem = Lot Cc = Year C = Work V = Pb-Fr	Code Ibly Lo Ide Code Week	Code
(Note: Microdot *Date Code orie upon manufact	ntation m	ay vary de	ation) ependi	ing

ORDERING INFORMATION

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







Input OEn	Function
L	Bn = An
Н	Disconnect

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
Ι _{ΙΚ}	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
Ι _Ο	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
TL	Lead Temperature, 1 mm from Case for 10 Second	ds	260	°C
TJ	Junction Temperature Under Bias		150	°C
θ _{JA}	Thermal Resistance	US8 (Note 1) UDFN8 UQFN8 Micro8 TSSOP8	251 111 208 392 150	°C/W
P _D	Power Dissipation in Still Air at 85°C	US8 UDFN8 UQFN8 Micro8 TSSOP8	498 1127 601 319 833	mW
MSL	Moisture Sensitivity		Level 1	
F _R	Flammability Rating Oxygen Index: 28 to 34		UL 94 V-0 @ 0.125 in	
V _{ESD}	Ma	Body Mode (Note 2) chine Model (Note 3) evice Model (Note 4)	> 2000 > 200 N/A	V
ILATCHUP	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.

Tested to JESD22-C101-A.
 Tested to EIA / JESD78.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter			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			5.5	V
T _A	Operating Free-Air Temperature		-55	+125	°C
Δt / ΔV	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

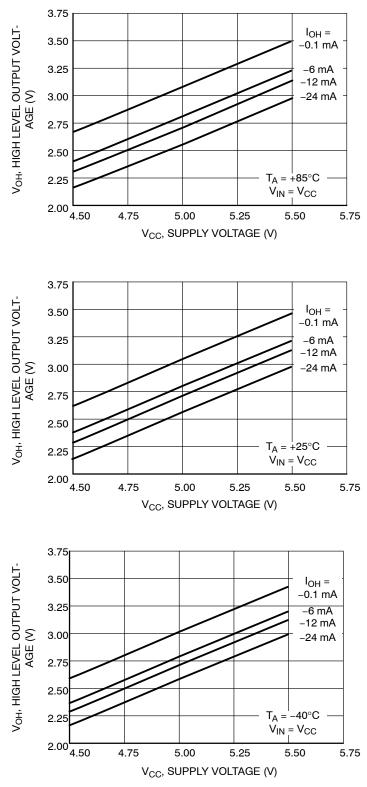
			V _{cc}	T _A = 25°C		C	T _A = –55°C to +125°C		
Symbol	Parameter	Conditions	(V)	Min	Тур	Max	Min	Max	Unit
V _{IK}	Clamp Diode Voltage	I _{I/O} = -18 mA	4.5			-1.2		-1.2	V
V _{IH}	High-Level Input Voltage (Control)		4.0 to 5.5	2.0			2.0		V
V _{IL}	Low-Level Input Voltage (Control)		4.0 to 5.5			0.8		0.8	V
V _{OH}	Output Voltage High	See Figure 5							
I _{IN}	Input Leakage Current	$0 \le V_{IN} \le 5.5 V$	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	μΑ
I _{CC}	Quiescent Supply Current	$I_{O} = 0,$ $V_{IN} = V_{CC} \text{ or } 0 \text{ V}$ $\overline{OE1} = \overline{OE2} = \text{GND}$ $\overline{OE1} = \overline{OE2} = V_{CC}$	5.5			±1.0 ±0.1		±1.0 ±1.0	mA 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	$V_{I/O} = 0,$ $I_{I/O} = 64 \text{ mA}$ $I_{I/O} = 30 \text{ mA}$	4.5		3 3	7 7		7 7	Ω
		V _{I/O} = 2.4, I _{I/O} = 15 mA			15	50		50	
		V _{I/O} = 2.4, I _{I/O} = 15 mA	4.0		50	70		70	

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

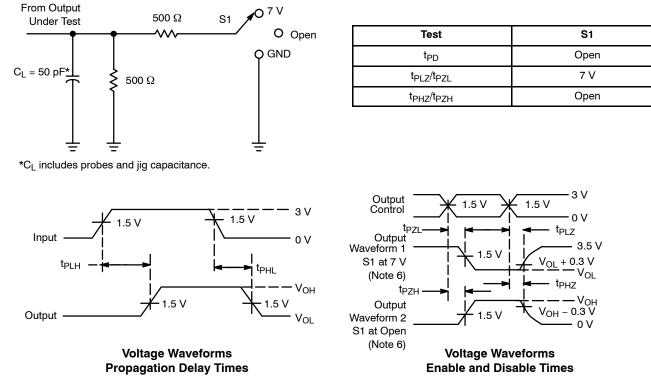
			V _{CC}	T _A = 25 °C		T _A = −55°C to +125°C			
Symbol	Parameter	Test Condition	(V)	Min	Тур	Мах	Min	Max	Unit
t _{PD}	Propagation Delay, Bus to Bus	See Figure 6	4.0 to 5.5			0.25		0.25	ns
t _{EN}	Output Enable Time	See Figure 6	4.5 to 5.5	0.8	2.5	4.2	0.8	4.2	ns
			4.0	0.8	3.0	4.6	0.8	4.6	
t _{DIS}	Output 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

TYPICAL DC CHARACTERISTICS





AC LOADING AND WAVEFORMS



Parameter Measurement Information

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 All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, Z₀ = 50 Ω , t_r \leq 2.5 ns, t_f \leq 2.5 ns. 7.
- 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} .

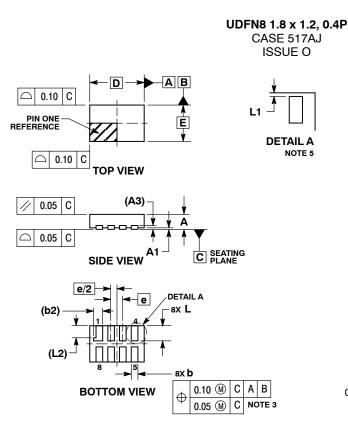


ORDERING INFORMATION

Device	Package	Shipping [†]
7WBD3306USG	US8 (Pb–Free)	3000 / Tape & Reel
7WBD3306MUTAG	UDFN8 (Pb-Free)	3000 / Tape & Reel
7WBD3306AMUTCG	UQFN8 (Pb-Free)	3000 / Tape & Reel
7WBD3306DMR2G	Micro8 (Pb-Free)	4000 / Tape & Reel
7WBD3306DTR2G	TSSOP8 (Pb-Free)	4000 / Tape & Reel
7WBD3306DMUTCG	UDFN8, 1.95 x 1.0, 0.5P (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.

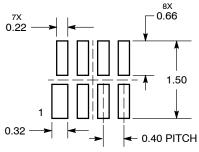
PACKAGE DIMENSIONS



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

	MILLIMETERS				
DIM	MIN	MAX			
Α	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			
Е	1.20	BSC			
е	0.40	BSC			
L	0.45	0.55			
L1	0.00	0.03			
L2	0.40	REF			

MOUNTING FOOTPRINT* SOLDERMASK DEFINED

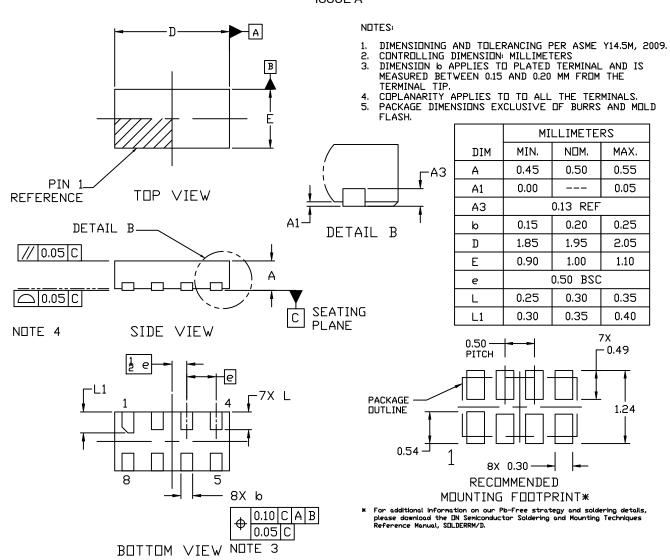


DIMENSIONS: MILLIMETERS

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

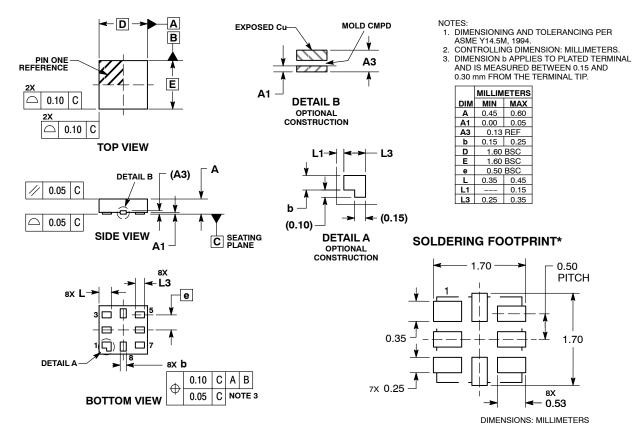
PACKAGE DIMENSIONS

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



PACKAGE DIMENSIONS

UQFN8, 1.6x1.6, 0.5P CASE 523AN ISSUE O



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

0.50

¥

8X

0.53

PITCH

1.70

PACKAGE DIMENSIONS

US8 **CASE 493** ISSUE D

INCHES

MIN MAX

0.024 0.035

0.008 0.014

0.020 BSC

0.016 REF

0.004 0.007

0.009 0.013

0.005 BSC

0.083

0.094

0.010

0.004

0.128

6

10 °

0.013

0.075

0.087

0.007

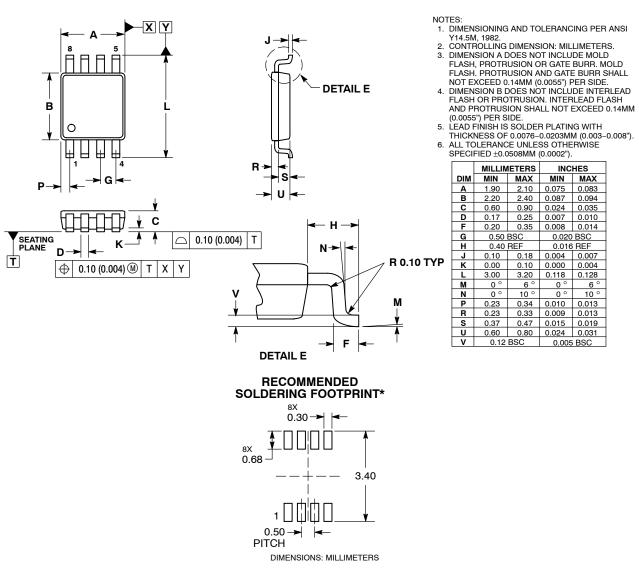
0.000

0.118

0

0.010

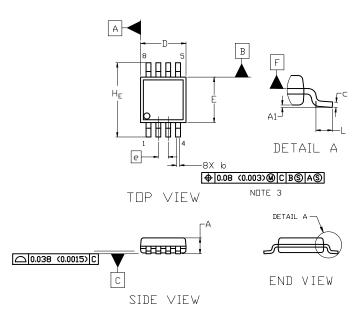
0 °



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

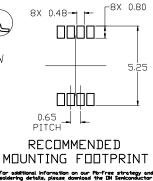
PACKAGE DIMENSIONS

Micro8 CASE 846A ISSUE K



NDTES:

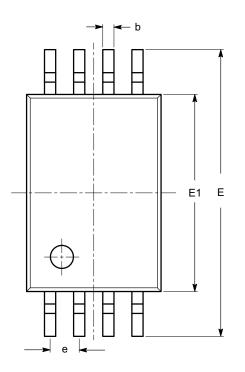
- 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
- 2. CONTROLLING DIMENSION: MILLIMETERS
- DIMENSION & DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.10 mm IN EXCESS OF MAXIMUM MATERIAL CONDITION.
- 4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.15 mm PER SIDE. DIMENSION E DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 mm PER SIDE. DIMENSIONS D AND E ARE DETERMINED AT DATUM F.
- 5. DATUMS A AND B ARE TO BE DETERMINED AT DATUM F.
- 6. AI IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.



DIM	MILLIMETERS					
DIM	MIN. NDM.		MAX.			
A			1.10			
A1	0.05	0.08	0.15			
ø	0.25	0.33	0.40			
С	0.13	0.18	0.23			
D	2.90	3.00	3.10			
E	2.90	3.00	3.10			
e	0.65 BSC					
HE	4.75	4.90	5.05			
L	0.40	0.55	0.70			

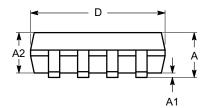
PACKAGE DIMENSIONS

TSSOP8, 4.4x3 CASE 948AL ISSUE O



SYMBOL	MIN	NOM	MAX		
А			1.20		
A1	0.05		0.15		
A2	0.80	0.90	1.05		
b	0.19		0.30		
с	0.09		0.20		
D	2.90	3.00	3.10		
E	6.30	6.40	6.50		
E1	4.30	4.40	4.50		
е	0.65 BSC				
L	1.00 REF				
L1	0.50	0.60	0.75		
θ	0°		8°		





SIDE VIEW



END VIEW

Notes:

(1) All dimensions are in millimeters. Angles in degrees.

(2) Complies with JEDEC MO-153.

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