**MARKING** 



# Quad 3-State Buffer with Low Enable

# **High-Performance Silicon-Gate CMOS**

# MC74AC125, MC74ACT125

#### **Features**

- Outputs Source/Sink
- 'ACT125 Has TTL Compatible Inputs
- These are Pb-Free Devices

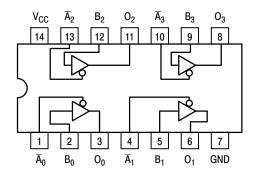


Figure 1. Pinout: 14-Lead Packages Conductors (Top View)

#### **PIN ASSIGNMENT**

PIN	FUNCTION
$\overline{A}_n$ , $B_n$	Inputs
On	Outputs

#### **FUNCTION TABLE**

Inputs		Output		
Ā <sub>n</sub>	B <sub>n</sub>	O <sub>n</sub>		
L	L	L		
L	Н	Н		
Н	X	Z		

NOTE: H = High Voltage Level;

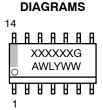
L = Low Voltage Level;

Z = High Impedance;

X = Immaterial

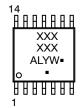


SOIC-14 D SUFFIX CASE 751A





TSSOP-14 DT SUFFIX CASE 948G



XXXXXX = Specific Device Code A = Assembly Location

WL or L = Wafer Lot Y = Year WW or W = Work Week G or ■ = 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 5 of this data sheet.

1

#### **MAXIMUM RATINGS**

Symbol	Parameter		Value	Unit
V <sub>CC</sub>	DC Supply Voltage		- 0.5 to +6.5	V
VI	DC Input Voltage		$-0.5 \le V_I \le V_{CC} + 0.5$	V
Vo	DC Output Voltage	(Note 1)	$-0.5 \le V_O \le V_{CC} + 0.5$	V
I <sub>IK</sub>	DC Input Diode Current		±20	mA
I <sub>OK</sub>	DC Output Diode Current		±50	mA
Io	DC Output Sink/Source Current		±50	mA
Icc	DC Supply Current per Output Pin		±50	mA
I <sub>GND</sub>	DC Ground Current per Output Pin		±50	mA
T <sub>STG</sub>	Storage Temperature Range		-65 to +150	°C
TL	Lead temperature, 1 mm from Case for 10 Seconds		260	°C
TJ	Junction temperature under Bias		+ 150	°C
$\theta_{\sf JA}$	Thermal Resistance (Note 2)	SOIC TSSOP	116 150	°C/W
P <sub>D</sub>	Power Dissipation in Still Air at 25°C	SOIC TSSOP	1077 833	mW
MSL	Moisture Sensitivity		Level 1	
F <sub>R</sub>	Flammability Rating Oxygen I	ndex: 30% - 35%	UL 94 V-0 @ 0.125 in	
V <sub>ESD</sub>		dy Model (Note 3) be Model (Note 4)	> 2000 > 1000	V
I <sub>Latch-Up</sub>	Latch-Up Performance Above V <sub>CC</sub> and Below GND	at 85°C (Note 5)	± 100	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. IO absolute maximum rating must be observed.
- The package thermal impedance is calculated in accordance with JESD51–7.
   Tested to EIA/JESD22–A114–A.
- 4. Tested to JESD22-C101-A.
- 5. Tested to EIA/JESD78.

#### RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Тур	Max	Unit
V	Supply Voltage	'AC	2.0	5.0	6.0	V
v <sub>CC</sub>	V <sub>CC</sub> Supply Voltage	'ACT	4.5	5.0	5.5	V
V <sub>in</sub> , V <sub>out</sub>	DC Input Voltage, Output Voltage (Ref. to GND)	0	-	V <sub>CC</sub>	V	
	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	V <sub>CC</sub> @ 3.0 V	=	150	-	
t <sub>r</sub> , t <sub>f</sub>		V <sub>CC</sub> @ 4.5 V	-	40	-	ns/V
	' '	V <sub>CC</sub> @ 5.5 V	=	25	-	
T <sub>A</sub>	Operating Ambient Temperature Range		-40	25	85	°C
I <sub>OH</sub>	Output Current - HIGH		-	-	-24	mA
I <sub>OL</sub>	Output Current – LOW		-	_	24	mA

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.

1. V<sub>in</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.

2. V<sub>in</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

### **DC CHARACTERISTICS**

			74	AC	74AC		
		V <sub>cc</sub>	T <sub>A</sub> = +	+25°C	T <sub>A</sub> = -40°C to +85°C		
Symbol	Parameter	(V)	Тур	Guar	anteed Limits	Unit	Conditions
$V_{IH}$	Minimum High Level	3.0	1.5	2.1	2.1		V <sub>OUT</sub> = 0.1 V
	Input Voltage	4.5	2.25	3.15	3.15	V	or V <sub>CC</sub> – 0.1 V
		5.5	2.75	3.85	3.85		
$V_{IL}$	Maximum Low Level	3.0	1.5	0.9	0.9		V <sub>OUT</sub> = 0.1 V
	Input Voltage	4.5	2.25	1.35	1.35	V	or V <sub>CC</sub> – 0.1 V
		5.5	2.75	1.65	1.65		
V <sub>OH</sub>	Minimum High Level	3.0	2.99	2.9	2.9		I <sub>OUT</sub> = – 50 μA
	Output Voltage	4.5	4.46	4.4	4.4	V	
		5.5	5.49	5.4	5.4		
		3.0 4.5 5.5	- - -	2.56 3.86 4.86	2.46 3.76 4.76	٧	$V_{IN} = V_{IL} \text{ or } V_{IH}$ $-12 \text{ mA}$ $V_{IOH} - 24 \text{ mA}$ $-24 \text{ mA}$
V <sub>OL</sub>	Minimum Low Level	3.0	0.002	0.1	0.1		Ι <sub>ΟUT</sub> = 50 μΑ
92	Output Voltage	4.5	0.001	0.1	0.1	V	,
		5.5	0.001	0.1	0.1		
		3.0 4.5 5.5	- - -	0.36 0.36 0.36	0.44 0.44 0.44	V	$^*V_{IN} = V_{IL} \text{ or } V_{IH}$ 12 mA $I_{OL}$ 24 mA 24 mA
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	_	±0.1	±1.0	μΑ	V <sub>I</sub> = V <sub>CC</sub> , GND
I <sub>OZ</sub>	$\begin{aligned} &V_{I}\left(OE\right)=V_{IL},V_{IH}\\ &V_{I}=V_{CC},GND\\ &V_{O}=V_{CC},GND \end{aligned}$	5.5	-	±0.5	±5.0	μΑ	$\begin{aligned} &V_{I}\left(OE\right) = V_{IL},  V_{IH} \\ &V_{I} = V_{CC},  GND \\ &V_{O} = V_{CC},  GND \end{aligned}$
I <sub>OLD</sub>	†Minimum Dynamic	5.5	-	_	75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>	Output Current	5.5	-	_	-75	mA	V <sub>OHD</sub> = 3.85 V Min
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μΑ	$V_{IN} = V_{CC}$ or GND

\*All outputs loaded; thresholds on input associated with output under test. †Maximum test duration 2.0 ms, one input loaded at a time.

NOTE: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V.

### **AC CHARACTERISTICS**

			74AC		74AC		
		V <sub>CC</sub> *		⊦25°C 50 pF	to +8	-40°C 85°C 50 pF	
Symbol	Parameter	(V)	Min	Max	Min	Max	Unit
t <sub>PLH</sub>	Propagation Delay Data to Output	3.3 5.0	1.0 1.0	9.0 7.0	1.0 1.0	10 7.5	ns
t <sub>PHL</sub>	Propagation Delay Data to Output	3.3 5.0	1.0 1.0	9.0 7.0	1.0 1.0	10 7.5	ns
t <sub>PZH</sub>	Output Enable Time	3.3 5.0	1.0 1.0	10.5 7.0	1.0 1.0	11 8.0	ns
t <sub>PZL</sub>	Output Enable Time	3.3 5.0	1.0 1.0	10 8.0	1.0 1.0	11 8.5	ns
t <sub>PHZ</sub>	Output Disable Time	3.3 5.0	1.0 1.0	10 9.0	1.0 1.0	10.5 9.5	ns
t <sub>PLZ</sub>	Output Disable Time	3.3 5.0	1.0 1.0	10.5 9.0	1.0 1.0	11.5 9.5	ns

<sup>\*</sup>Voltage Range 3.3 V is 3.3 V  $\pm 0.3$  V. Voltage Range 5.0 V is 5.0 V  $\pm 0.5$  V.

### **DC CHARACTERISTICS**

			74	CT	74ACT		
		V <sub>cc</sub>	T <sub>A</sub> = -	+25°C	T <sub>A</sub> = -40°C to +85°C		
Symbol	Parameter	(V)	Тур	Guara	anteed Limits	Unit	Conditions
V <sub>IH</sub>	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.2 2.0	2.0 2.0	٧	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V
V <sub>IL</sub>	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
V <sub>OH</sub>	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V	I <sub>OUT</sub> = – 50 μA
		4.5 5.5	- -	3.86 4.86	3.76 4.76	٧	$^{*}V_{IN} = V_{IL} \text{ or } V_{IH}$ $-24 \text{ mA}$ $_{IOH}$ $-24 \text{ mA}$
V <sub>OL</sub>	Minimum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V	I <sub>OUT</sub> = – 50 μA
		4.5 5.5	-	0.36 0.36	0.44 0.44	٧	$^*V_{IN} = V_{IL} \text{ or } V_{IH}$ $I_{OH} - 24 \text{ mA}$ $- 24 \text{ mA}$
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μΑ	V <sub>I</sub> = V <sub>CC</sub> , GND
I <sub>OZ</sub>	$V_{I}$ (OE) = $V_{IL}$ , $V_{IH}$ $V_{I}$ = $V_{CC}$ , GND $V_{O}$ = $V_{CC}$ , GND	5.5	-	±0.5	±5.0	μΑ	$V_{I}$ (OE) = $V_{IL}$ , $V_{IH}$ $V_{I}$ = $V_{CC}$ , GND $V_{O}$ = $V_{CC}$ , GND
$\Delta I_{CCT}$	Additional Max. I <sub>CC</sub> /Input	5.5	0.6	_	1.5	mA	V <sub>I</sub> = V <sub>CC</sub> – 2.1 V
I <sub>OLD</sub>	†Minimum Dynamic	5.5	-	_	75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>	Output Current	5.5	_	-	<b>-75</b>	mA	V <sub>OHD</sub> = 3.85 V Min
Icc	Maximum Quiescent Supply Current	5.5	-	8.0	80	μΑ	$V_{IN} = V_{CC}$ or GND

<sup>\*</sup>All outputs loaded; thresholds on input associated with output under test. †Maximum test duration 2.0 ms, one input loaded at a time.

### **AC CHARACTERISTICS**

			74ACT  T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF		T <sub>A</sub> = -40°C T <sub>A</sub> = +25°C to +85°C		
		V <sub>cc</sub> *					
Symbol	Parameter	(V)	Min	Max	Min	Max	Unit
t <sub>PLH</sub>	Propagation Delay Data to Output	5.0	1.0	9.0	1.0	10	ns
t <sub>PHL</sub>	Propagation Delay Data to Output	5.0	1.0	9.0	1.0	10	ns
t <sub>PZH</sub>	Output Enable Time	5.0	1.0	8.5	1.0	9.5	ns
t <sub>PZL</sub>	Output Enable Time	5.0	1.0	9.5	1.0	10.5	ns
t <sub>PHZ</sub>	Output Disable Time	5.0	1.0	9.5	1.0	10.5	ns
t <sub>PLZ</sub>	Output Disable Time	5.0	1.0	10	1.0	10.5	ns

<sup>\*</sup>Voltage Range 5.0 V is 5.0 V  $\pm$ 0.5 V.

#### **CAPACITANCE**

Symbol	Parameter	Value Typ	Unit	Test Conditions
C <sub>IN</sub>	Input Capacitance	4.5	pF	V <sub>CC</sub> = 5.0 V
C <sub>PD</sub>	Power Dissipation Capacitance	45	pF	V <sub>CC</sub> = 5.0 V

#### **ORDERING INFORMATION**

Device	Marking	Package	Shipping <sup>†</sup>
MC74AC125DG	AC125	SOIC-14	55 Units / Rail
MC74AC125DR2G	AC125	(Pb-Free)	2500 / Tape & Reel
MC74AC125DTR2G	AC 125	TSSOP-14 (Pb-Free)	2500 / Tape & Reel
MC74ACT125DG	ACT125	SOIC-14	55 Units / Rail
MC74ACT125DR2G	ACT125	(Pb-Free)	2500 / Tape & Reel
MC74ACT125DTR2G	ACT 125	TSSOP-14 (Pb-Free)	2500 / Tape & Reel

<sup>†</sup>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.

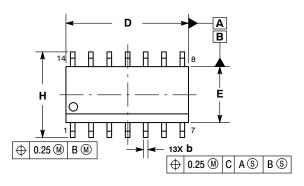


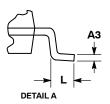


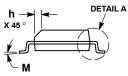
△ 0.10

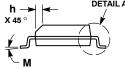
SOIC-14 NB CASE 751A-03 ISSUE L

**DATE 03 FEB 2016** 





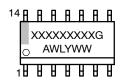




- NOTES:
  1. DIMENSIONING AND TOLERANCING PER
  - ASME Y14.5M, 1994.
    CONTROLLING DIMENSION: MILLIMETERS.
  - DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.13 TOTAL IN EXCESS OF AT
  - MAXIMUM MATERIAL CONDITION.
    DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSIONS.
- 5. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE

	MILLIN	IETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
Α	1.35	1.75	0.054	0.068	
A1	0.10	0.25	0.004	0.010	
АЗ	0.19	0.25	0.008	0.010	
b	0.35	0.49	0.014	0.019	
D	8.55	8.75	0.337	0.344	
Е	3.80	4.00	0.150	0.157	
œ	1.27	BSC	0.050 BSC		
Н	5.80	6.20	0.228	0.244	
h	0.25	0.50	0.010	0.019	
L	0.40	1.25	0.016	0.049	
М	0 °	7°	0 °	7°	

#### **GENERIC MARKING DIAGRAM\***



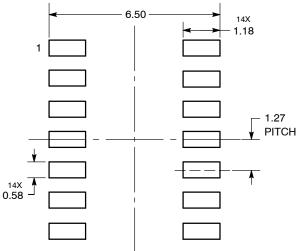
XXXXX = Specific Device Code Α = Assembly Location

WL = Wafer Lot Υ = Year WW = Work Week = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present. Some products may not follow the Generic Marking.

# **SOLDERING FOOTPRINT\***

C SEATING PLANE



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

#### **STYLES ON PAGE 2**

DOCUMENT NUMBER:	98ASB42565B	Electronic versions are uncontrolled except when accessed directly from the Document Reportant Versions are uncontrolled except when stamped "CONTROLLED COPY" in red.				
DESCRIPTION:	SOIC-14 NB		PAGE 1 OF 2			

onsemi and ONSEMI. are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** 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. onsemi does not convey any license under its patent rights nor the rights of others.

#### SOIC-14 CASE 751A-03 ISSUE L

### DATE 03 FEB 2016

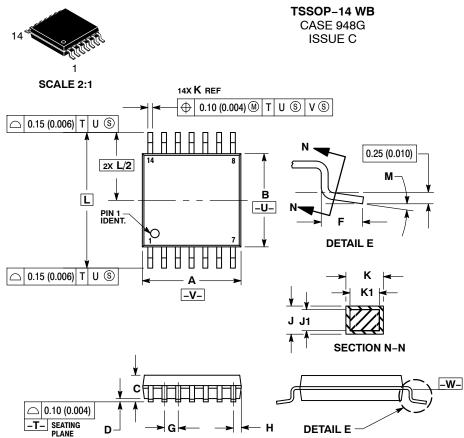
STYLE 1: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. NO CONNECTION 7. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. NO CONNECTION 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 2: CANCELLED	STYLE 3: PIN 1. NO CONNECTION 2. ANODE 3. ANODE 4. NO CONNECTION 5. ANODE 6. NO CONNECTION 7. ANODE 8. ANODE 9. ANODE 10. NO CONNECTION 11. ANODE 12. ANODE 13. NO CONNECTION 14. COMMON CATHODE	STYLE 4: PIN 1. NO CONNECTION 2. CATHODE 3. CATHODE 4. NO CONNECTION 5. CATHODE 6. NO CONNECTION 7. CATHODE 8. CATHODE 9. CATHODE 10. NO CONNECTION 11. CATHODE 12. CATHODE 13. NO CONNECTION 14. COMMON ANODE
STYLE 5: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. NO CONNECTION 7. COMMON ANODE 8. COMMON CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 6: PIN 1. CATHODE 2. CATHODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE 7. CATHODE 8. ANODE 9. ANODE 10. ANODE 11. ANODE 12. ANODE 13. ANODE 14. ANODE	STYLE 7: PIN 1. ANODE/CATHODE 2. COMMON ANODE 3. COMMON CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. ANODE/CATHODE 7. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. COMMON CATHODE 12. COMMON ANODE 13. ANODE/CATHODE 14. ANODE/CATHODE	STYLE 8: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. ANODE/CATHODE 7. COMMON ANODE 8. COMMON ANODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. NO CONNECTION 12. ANODE/CATHODE 13. ANODE/CATHODE 14. COMMON CATHODE

DOCUMENT NUMBER:	98ASB42565B	Electronic versions are uncontrolled except when accessed directly from the Document Repositor Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	SOIC-14 NB		PAGE 2 OF 2

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi 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. onsemi does not convey any license under its patent rights nor the rights of others.

**DATE 17 FEB 2016** 





- 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.
  DIMENSION B DOES NOT INCLUDE
- INTERLEAD FLASH OR PROTRUSION.
  INTERLEAD FLASH OR PROTRUSION SHALL
- INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.

  DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION.

  TERMINAL NUMBERS ARE SHOWN FOR DEEEDENIC OMITY.
- REFERENCE ONLY.
  DIMENSION A AND B ARE TO BE
- DETERMINED AT DATUM PLANE -W-.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α	4.90	5.10	0.193	0.200
В	4.30	4.50	0.169	0.177
С		1.20		0.047
D	0.05	0.15	0.002	0.006
F	0.50	0.75	0.020	0.030
G	0.65 BSC		0.026 BSC	
Н	0.50	0.60	0.020	0.024
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.19	0.30	0.007	0.012
K1	0.19	0.25	0.007	0.010
L	6.40 BSC		0.252 BSC	
м	o °	8 °	o °	a °

#### **GENERIC MARKING DIAGRAM\***



= Assembly Location

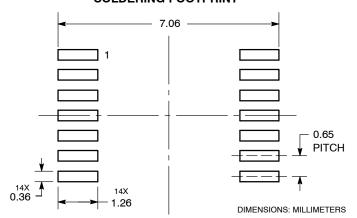
= Wafer Lot = Year

= Work Week W = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present. Some products may not follow the Generic Marking.

#### **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.

DOCUMENT NUMBER:	98ASH70246A	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.		
DESCRIPTION:	TSSOP-14 WB		PAGE 1 OF 1	

onsemi and ONSEMI. are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi 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. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, ONSEMI., and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <a href="www.onsemi.com/site/pdf/Patent-Marking.pdf">www.onsemi.com/site/pdf/Patent-Marking.pdf</a>. onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi 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. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** 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. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems. or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** 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 **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

#### ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

 $\textbf{Technical Library:} \ \underline{www.onsemi.com/design/resources/technical-documentation}$ 

onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at

www.onsemi.com/support/sales