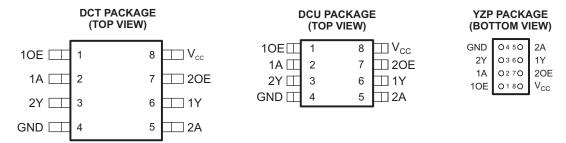




FEATURES

- Available in the Texas Instruments
 NanoFree[™] Package
- Optimized for 1.8-V Operation and Is 3.6-V I/O Tolerant to Support Mixed-Mode Signal Operation
- I_{off} Supports Partial-Power-Down Mode Operation
- Sub-1-V Operable
- Max t_{pd} of 1.9 ns at 1.8 V

- Low Power Consumption, 10 μA at 1.8 V
- ±8-mA Output Drive at 1.8 V
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)



See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

This dual bus buffer gate is operational at 0.8-V to 2.7-V V_{CC} , but is designed specifically for 1.65-V to 1.95-V V_{CC} operation.

The SN74AUC2G126 is a dual bus driver/line driver with 3-state outputs. The outputs are disabled when the associated output-enable (OE) input is low.

NanoFree™ package technology is a major breakthrough in IC packaging concepts, using the die as the package.

To ensure the high-impedance state during power up or power down, OE should be tied to GND through a pulldown resistor; the minimum value of the resistor is determined by the current-sourcing capability of the driver.

This device is fully specified for partial-power-down applications using I_{off}. The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

For more information about AUC Little Logic devices, please refer to the TI application report, *Applications of Texas Instruments AUC Sub-1-V Little Logic Devices*, literature number SCEA027.

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

NanoFree is a trademark of Texas Instruments.



ORDERING INFORMATION

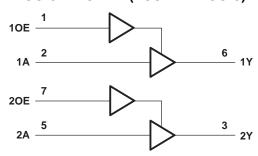
T _A	PACKAGE ⁽¹⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING(2)
	NanoFree™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free)	Reel of 3000	SN74AUC2G126YZPR	UN
–40°C to 85°C	SSOP - DCT	Reel of 3000	SN74AUC2G126DCTR	U26
	VSSOP - DCU	Reel of 3000	SN74AUC2G126DCUR	UN_

- Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.
- (2) DCT: The actual top-side marking has three additional characters that designate the year, month, and assembly/test site. DCU: The actual top-side marking has one additional character that designates the assembly/test site. YZP: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the assembly/test site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).

FUNCTION TABLE (EACH BUFFER)

INP	JTS	OUTPUT
OE	Α	Y
Н	Н	Н
Н	L	L
L	X	Z

LOGIC DIAGRAM (POSITIVE LOGIC)



Absolute Maximum Ratings⁽¹⁾

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
V _{CC}	Supply voltage range		-0.5	3.6	V
VI	Input voltage range ⁽²⁾		-0.5	3.6	V
Vo	Voltage range applied to any output in the h	igh-impedance or power-off state (2)	-0.5	3.6	V
Vo	Output voltage range ⁽²⁾		-0.5	V _{CC} + 0.5	V
I_{IK}	Input clamp current	V _I < 0		-50	mA
I _{OK}	Output clamp current	V _O < 0		-50	mA
Io	Continuous output current			±20	mA
	Continuous current through V _{CC} or GND			±100	mA
		DCT package		220	
θ_{JA}	Package thermal impedance (3)	DCU package		227	°C/W
		YZP package		102	
T _{stg}	Storage temperature range		-65	150	°C

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The package thermal impedance is calculated in accordance with JESD 51-7.

SN74AUC2G126



Recommended Operating Conditions⁽¹⁾

			MIN	MAX	UNIT
V_{CC}	Supply voltage		0.8	2.7	V
		V _{CC} = 0.8 V	V _{CC}		
V_{IH}	High-level input voltage	$V_{CC} = 1.1 \text{ V to } 1.95 \text{ V}$	$0.65 \times V_{CC}$		V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.7		
		$V_{CC} = 0.8 \text{ V}$		0	
V_{IL}	Low-level input voltage	$V_{CC} = 1.1 \text{ V to } 1.95 \text{ V}$		$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		0.7	
V_{I}	Input voltage		0	3.6	V
\/	Output valtage	Active state	0	V_{CC}	V
Vo	Output voltage	3-state	0	3.6	V
		V _{CC} = 0.8 V		-0.7	
		$V_{CC} = 1.1 \text{ V}$		-3	
I _{OH}	High-level output current	V _{CC} = 1.4 V		- 5	mA
		$V_{CC} = 1.65 \text{ V}$		-8	
		$V_{CC} = 2.3 \text{ V}$		-9	
		$V_{CC} = 0.8 \text{ V}$		0.7	
		$V_{CC} = 1.1 \text{ V}$		3	
I_{OL}	Low-level output current	$V_{CC} = 1.4 \text{ V}$		5	mA
		$V_{CC} = 1.65 \text{ V}$		8	
		$V_{CC} = 2.3 \text{ V}$		9	
		$V_{CC} = 0.8 \text{ V to } 1.65 \text{ V}^{(2)}$		20	
$\Delta t/\Delta v$	Input transition rise or fall rate	$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}^{(3)}$		20	ns/V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}^{(3)}$			
T_A	Operating free-air temperature		-40	85	°C

 ⁽¹⁾ All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.
 (2) The data was taken at C_L = 15 pF, R_L = 2 kΩ (see Figure 1).
 (3) The data was taken at C_L = 30 pF, R_L = 500 Ω (see Figure 1).



Electrical Characteristics

over recommended operating free-air temperature range (unless otherwise noted)

P#	ARAMETER	TEST CONDITION:	S	V _{cc}	MIN	TYP ⁽¹⁾	MAX	UNIT		
		$I_{OH} = -100 \mu A$		0.8 V to 2.7 V	V _{CC} - 0.1					
		$I_{OH} = -0.7 \text{ mA}$		0.8 V		0.55				
V		$I_{OH} = -3 \text{ mA}$		1.1 V	0.8			V		
V _{OH}		$I_{OH} = -5 \text{ mA}$		1.4 V	1			V		
		$I_{OH} = -8 \text{ mA}$		1.65 V	1.2					
		$I_{OH} = -9 \text{ mA}$		2.3 V	1.8					
		I _{OL} = 100 μA		0.8 V to 2.7 V			0.2			
		I _{OL} = 0.7 mA		0.8 V		0.25				
V		I _{OL} = 3 mA		1.1 V			0.3	V		
V _{OL}		I _{OL} = 5 mA	1.4 V			0.4	V			
		I _{OL} = 8 mA		1.65 V			0.45			
		I _{OL} = 9 mA		2.3 V			0.6			
I _I	A or OE inputs	V _I = V _{CC} or GND		0 to 2.7 V			±5	μΑ		
I _{off}		V_I or $V_O = 2.7 \text{ V}$		0			±10	μΑ		
I_{OZ}		$V_O = V_{CC}$ or GND		2.7 V			±10	μΑ		
I_{CC}		$V_I = V_{CC}$ or GND,	$I_O = 0$	0.8 V to 2.7 V			10	μΑ		
C _i		V _I = V _{CC} or GND		2.5 V		2.5		pF		
C _o		V _O = V _{CC} or GND		2.5 V		5.5		pF		

⁽¹⁾ All typical values are at $T_A = 25$ °C.

Switching Characteristics

over recommended operating free-air temperature range, C_L = 15 pF (unless otherwise noted) (see Figure 1)

PARAMETER	PARAMETER FROM TO (OUTPUT)		V _{CC} = 0.8 V	V _{CC} = ± 0.	1.2 V 1 V	V _{CC} = ± 0.		V _{CC} = 1.8 V ± 0.15 V			V_{CC} = 2.5 V \pm 0.2 V		UNIT
	(INPOT)	(OUTPUT)	TYP	MIN	MAX	MIN	MAX	MIN	TYP	MAX	MIN	MAX	
t _{pd}	Α	Υ	5.4	1	3.5	0.7	2.3	0.6	1.1	1.9	0.5	1.4	ns
t _{en}	OE	Υ	5.3	0.9	3.7	0.7	2.4	0.6	1.2	1.9	0.6	1.4	ns
t _{dis}	OE	Y	5.9	2.2	4.4	1.9	3.4	0.7	2.9	3.7	1.5	2.9	ns

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 30 \text{ pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _C	_C = 1.8 \ : 0.15 V	٧	V _{CC} = : ± 0.2	2.5 V 2 V	UNIT
	(INFOT)	(001F01)	MIN	TYP	MAX	MIN	MAX	
t _{pd}	A	Υ	0.8	1.6	2.3	0.7	1.8	ns
t _{en}	OE	Υ	0.8	1.7	2.4	0.8	2.2	ns
t _{dis}	OE	Υ	1.9	2.5	3.3	0.9	1.8	ns





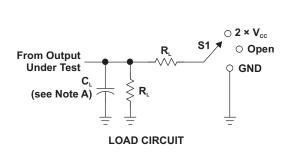
Operating Characteristics

 $T_A = 25^{\circ}C$

	PARAMETER	TEST CONDITIONS	V _{CC} = 0.8 V TYP	V _{CC} = 1.2 V TYP	V _{CC} = 1.5 V TYP	V _{CC} = 1.8 V TYP	V _{CC} = 2.5 V TYP	UNIT
C_{pd}	Power dissipation capacitance	f = 10 MHz	16	16	16	17	18	pF

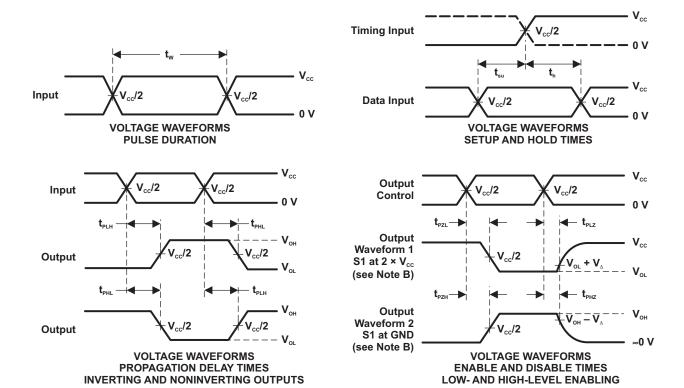


PARAMETER MEASUREMENT INFORMATION



TEST	S1
t _{PLH} /t _{PHL}	Open
t_{PLZ}/t_{PZL}	2 × V _{cc}
t_{PHZ}/t_{PZH}	GND

V _{cc}	C _L	R _L	V _Δ
0.8 V	15 pF	2 k Ω	0.1 V
1.2 V ± 0.1 V	15 pF	2 k Ω	0.1 V
1.5 V ± 0.1 V	15 pF	2 k Ω	0.1 V
1.8 V ± 0.15 V	15 pF	2 k Ω	0.15 V
2.5 V ± 0.2 V	15 pF	2 k Ω	0.15 V
1.8 V ± 0.15 V	30 pF	1 k Ω	0.15 V
2.5 V ± 0.2 V	30 pF	500 Ω	0.15 V



NOTES: A. C_L includes probe and jig capacitance.

- B. 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.
- C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, Z_o = 50 Ω , slew rate \geq 1 V/ns.
- D. The outputs are measured one at a time, with one transition per measurement.
- E. $t_{\text{\tiny PLZ}}$ and $\dot{t}_{\text{\tiny PHZ}}$ are the same as $t_{\text{\tiny dis}}$.
- F. $t_{\mbox{\tiny PZL}}$ and $t_{\mbox{\tiny PZH}}$ are the same as $t_{\mbox{\tiny en}}.$
- G. $t_{Pl\,H}$ and t_{PHl} are the same as t_{pd} .

Figure 1. Load Circuit and Voltage Waveforms





30-Jul-2011

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
74AUC2G126DCTRE4	ACTIVE	SM8	DCT	8	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
74AUC2G126DCURE4	ACTIVE	US8	DCU	8	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
74AUC2G126DCURG4	ACTIVE	US8	DCU	8	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AUC2G126DCTR	ACTIVE	SM8	DCT	8	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74AUC2G126DCUR	ACTIVE	US8	DCU	8	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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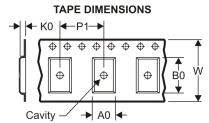
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PACKAGE MATERIALS INFORMATION

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TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
	Dimension designed to accommodate the component length
	Dimension designed to accommodate the component thickness
	Overall width of the carrier tape
P1	Pitch between successive cavity centers

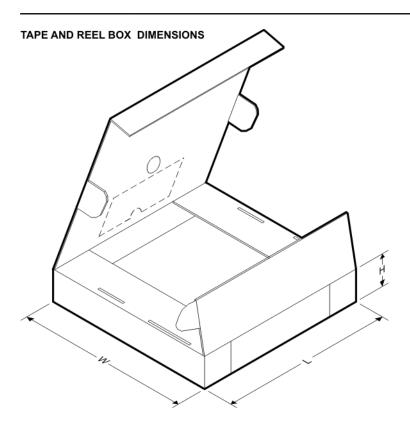
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AUC2G126DCUR	US8	DCU	8	3000	180.0	8.4	2.25	3.35	1.05	4.0	8.0	Q3

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*All dimensions are nominal

Device	Device Package Type		Pins	SPQ	Length (mm)	Width (mm)	Height (mm)	
SN74AUC2G126DCUR	US8	DCU	8	3000	202.0	201.0	28.0	

DCT (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion
- D. Falls within JEDEC MO-187 variation DA.

DCT (R-PDSO-G8)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



DCU (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE (DIE DOWN)



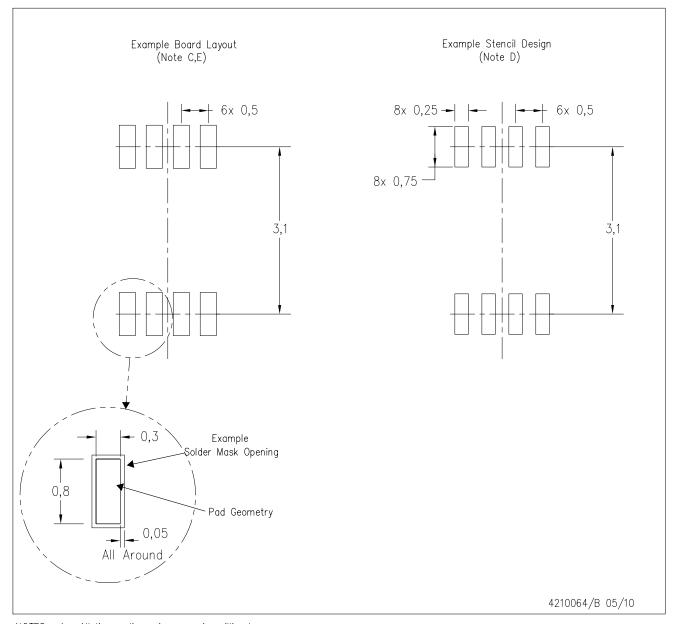
NOTES:

- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
 - D. Falls within JEDEC MO-187 variation CA.



DCU (S-PDSO-G8)

PLASTIC SMALL OUTLINE PACKAGE (DIE DOWN)



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



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