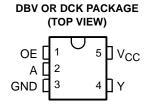
SCLS380I - AUGUST 1997 - REVISED JANUARY 2003

- Operating Range of 4.5 V to 5.5 V
- Max t<sub>pd</sub> of 6 ns at 5 V
- Low Power Consumption, 10-μA Max I<sub>CC</sub>
- ±8-mA Output Drive at 5 V
- Inputs Are TTL-Voltage Compatible
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)



#### description/ordering information

The SN74AHCT1G126 is a single bus buffer gate/line driver with 3-state output. The output is disabled when the output-enable (OE) input is low. When OE is high, true data is passed from the A input to the Y output.

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.

#### ORDERING INFORMATION

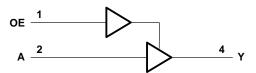
TA	PACKAGE	<u></u> †	ORDERABLE PART NUMBER	TOP-SIDE MARKING‡		
	SOT (SOT-23) – DBV	Reel of 3000	SN74AHCT1G126DBVR	B26		
4000 1- 0500	301 (301-23) – DBV	Reel of 250	SN74AHCT1G126DBVT	D20_		
-40°C to 85°C	COT (CC 70) DCV	Reel of 3000	SN74AHCT1G126DCKR	DN		
	SOT (SC-70) – DCK	Reel of 250	SN74AHCT1G126DCKT	BN_		

<sup>†</sup> Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

#### **FUNCTION TABLE**

INPU	JTS	OUTPUT
OE	Α	Y
Н	Н	Н
Н	L	L
L	Χ	Z

#### logic diagram (positive logic)





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.



<sup>‡</sup>The actual top-side marking has one additional character that designates the assembly/test site.

#### SN74AHCT1G126 SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

SCLS380I - AUGUST 1997 - REVISED JANUARY 2003

#### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V <sub>CC</sub>	–0.5 V to 7 V
Input voltage range, V <sub>I</sub> (see Note 1)	0.5 V to 7 V
Output voltage range, V <sub>O</sub> (see Note 1)	$\dots$ -0.5 V to V <sub>CC</sub> + 0.5 V
Input clamp current, I <sub>IK</sub> (V <sub>I</sub> < 0)	–20 mA
Output clamp current, I <sub>OK</sub> (V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>CC</sub> )	±20 mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ )	±25 mA
Continuous current through V <sub>CC</sub> or GND	±50 mA
Package thermal impedance, $\theta_{JA}$ (see Note 2): DBV package	206°C/W
DCK package	252°C/W
Storage temperature range, T <sub>Sto</sub>	–65°C to 150°C

<sup>†</sup> 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.

#### recommended operating conditions (see Note 3)

		MIN	MAX	UNIT
VCC	Supply voltage	4.5	5.5	V
٧ıH	High-level input voltage	2		V
$V_{IL}$	Low-level input voltage		0.8	V
٧ <sub>I</sub>	Input voltage	0	5.5	V
٧o	Output voltage	0	VCC	V
ІОН	High-level output current		-8	mA
lOL	Low-level output current		8	mA
Δt/Δν	Input transition rise or fall rate		20	ns/V
T <sub>A</sub>	Operating free-air temperature	-40	85	°C

NOTE 3: All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

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

PARAMETER	TEST CONDITIONS	Vaa	T,	ղ = 25°C	;	MIN	MAX	UNIT	
PARAWETER	TEST CONDITIONS	vcc	MIN	TYP	MAX	IVIIIV	IVIAA	ONII	
VOH	$I_{OH} = -50 \mu A$	4.5 V	4.4	4.5		4.4		<b>&gt;</b>	
VOH	$I_{OH} = -8 \text{ mA}$	4.5 V	3.94			3.8		V	
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	4.5 V			0.1		0.1	<	
VOL	$I_{OL} = 8 \text{ mA}$	4.5 V			0.36		0.44	V	
lį	V <sub>I</sub> = 5.5 V or GND	0 V to 5.5 V			±0.1		±1	μΑ	
loz	$V_O = V_{CC}$ or GND	5.5 V			±0.25		±2.5	μΑ	
Icc	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			1		10	μΑ	
Δl <sub>CC</sub> ‡	One input at 3.4 V, Other input at V <sub>CC</sub> or GND	5.5 V			1.35		1.5	mA	
C <sub>i</sub>	$V_I = V_{CC}$ or GND	5 V		4	10		10	pF	
Co	$V_O = V_{CC}$ or GND	5 V		10				pF	

<sup>‡</sup> This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0 V or VCC.



NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

<sup>2.</sup> The package thermal impedance is calculated in accordance with JESD 51-7.

SCLS380I - AUGUST 1997 - REVISED JANUARY 2003

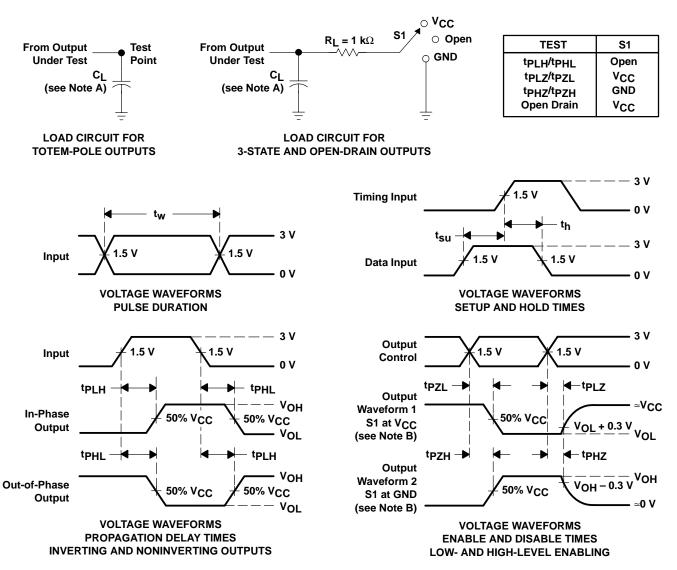
# switching characteristics over recommended operating free-air temperature range, $V_{CC}$ = 5 V $\pm$ 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	то	LOAD	T	λ = 25°C	;	MIN	MAX	UNIT
PARAMETER	(INPUT)	(OUTPUT)	CAPACITANCE	MIN	TYP	MAX	IVIIIN	WAX	UNIT
<sup>t</sup> PLH	А	Y	C <sub>I</sub> = 15 pF		3.8	5.5	1	6.5	ns
tPHL	^	!	OL = 13 bi		3.8	5.5	1	6.5	110
<sup>t</sup> PZH	OE	Y	C <sub>L</sub> = 15 pF		3.6	5.1	1	6	ns
<sup>t</sup> PZL	OE	ı	OL = 13 pr		3.6	5.1	1	6	10
<sup>t</sup> PHZ	OE	Y	C <sub>L</sub> = 15 pF		4.6	6.8	1	8	ns
<sup>t</sup> PLZ	OL	ı	OL = 15 pr		4.6	6.8	1	8	115
<sup>t</sup> PLH	А	Y	C: - 50 pE		5.3	7.5	1	8.5	no
t <sub>PHL</sub>	A	ī	C <sub>L</sub> = 50 pF		5.3	7.5	1	8.5	ns
<sup>t</sup> PZH	OE	Y	C: - 50 pF		5.1	7.1	1	8	20
t <sub>PZL</sub>	OE	Ĭ	C <sub>L</sub> = 50 pF		5.1	7.1	1	8	ns
<sup>t</sup> PHZ	OE	Y	C: - 50 pF		6.1	8.8	1	10	nc
tPLZ	OE	r	C <sub>L</sub> = 50 pF		6.1	8.8	1	10	ns

# operating characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C

		PARAMETER	TEST C	ONDITIONS	TYP	UNIT
Г	C <sub>pd</sub>	Power dissipation capacitance	No load,	f = 1 MHz	14	pF

#### PARAMETER MEASUREMENT INFORMATION



- 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  $\leq$  1 MHz,  $Z_O = 50 \Omega$ ,  $t_f \leq 3$  ns.  $t_f \leq 3$  ns.
  - D. The outputs are measured one at a time with one input transition per measurement.
  - E. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms







10-Jun-2014

#### PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking (4/5)	Samples
74AHCT1G126DBVRE4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(B263 ~ B26G ~ B26J ~ B26S)	Samples
74AHCT1G126DBVRG4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(B263 ~ B26G ~ B26J ~ B26S)	Samples
74AHCT1G126DBVTG4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(B263 ~ B26G ~ B26S)	Samples
74AHCT1G126DCKRG4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(BN3 ~ BNG ~ BNJ ~ BNL ~ BNS ~ BNU ~ BNY)	Samples
74AHCT1G126DCKTG4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(BN3 ~ BNG ~ BNL ~ BNS)	Samples
SN74AHCT1G126DBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(B263 ~ B26G ~ B26J ~ B26S)	Samples
SN74AHCT1G126DBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(B263 ~ B26G ~ B26S)	Samples
SN74AHCT1G126DCKR	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(BN3 ~ BNG ~ BNJ ~ BNL ~ BNS ~ BNU ~ BNY)	Samples
SN74AHCT1G126DCKT	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	(BN3 ~ BNG ~ BNL ~ BNS)	Samples

<sup>(1)</sup> 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.

**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)

<sup>(2)</sup> 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.





10-Jun-2014

- (3) MSL, Peak Temp. The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.
- (4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.
- (5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.
- (6) Lead/Ball Finish Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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#### OTHER QUALIFIED VERSIONS OF SN74AHCT1G126:

Automotive: SN74AHCT1G126-Q1

NOTE: Qualified Version Definitions:

Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

PACKAGE MATERIALS INFORMATION

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#### TAPE AND REEL INFORMATION



# TAPE DIMENSIONS + K0 - P1 - B0 W Cavity - A0 -

	Dimension designed to accommodate the component width
	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



#### \*All dimensions are nominal

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
SN74AHCT1G126DBVR	SOT-23	DBV	5	3000	180.0	8.4	3.23	3.17	1.37	4.0	8.0	Q3
SN74AHCT1G126DBVR	SOT-23	DBV	5	3000	178.0	9.2	3.3	3.2	1.55	4.0	8.0	Q3
SN74AHCT1G126DBVT	SOT-23	DBV	5	250	178.0	9.2	3.3	3.2	1.55	4.0	8.0	Q3
SN74AHCT1G126DBVT	SOT-23	DBV	5	250	178.0	9.0	3.3	3.2	1.4	4.0	8.0	Q3
SN74AHCT1G126DCKR	SC70	DCK	5	3000	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3
SN74AHCT1G126DCKR	SC70	DCK	5	3000	180.0	9.2	2.3	2.55	1.2	4.0	8.0	Q3
SN74AHCT1G126DCKR	SC70	DCK	5	3000	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AHCT1G126DCKT	SC70	DCK	5	250	178.0	9.2	2.4	2.4	1.22	4.0	8.0	Q3
SN74AHCT1G126DCKT	SC70	DCK	5	250	180.0	9.2	2.3	2.55	1.2	4.0	8.0	Q3
SN74AHCT1G126DCKT	SC70	DCK	5	250	178.0	9.0	2.4	2.5	1.2	4.0	8.0	Q3

www.ti.com 30-Dec-2013



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AHCT1G126DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74AHCT1G126DBVR	SOT-23	DBV	5	3000	180.0	180.0	18.0
SN74AHCT1G126DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74AHCT1G126DBVT	SOT-23	DBV	5	250	180.0	180.0	18.0
SN74AHCT1G126DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AHCT1G126DCKR	SC70	DCK	5	3000	205.0	200.0	33.0
SN74AHCT1G126DCKR	SC70	DCK	5	3000	180.0	180.0	18.0
SN74AHCT1G126DCKT	SC70	DCK	5	250	180.0	180.0	18.0
SN74AHCT1G126DCKT	SC70	DCK	5	250	205.0	200.0	33.0
SN74AHCT1G126DCKT	SC70	DCK	5	250	180.0	180.0	18.0

DBV (R-PDSO-G5)

#### 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. Mold flash and protrusion shall not exceed 0.15 per side.
- D. Falls within JEDEC MO-178 Variation AA.



# DBV (R-PDSO-G5)

#### PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
- D. Publication IPC-7351 is recommended for alternate designs.
- E. 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. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.



# DCK (R-PDSO-G5)

#### 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. Mold flash and protrusion shall not exceed 0.15 per side.
- D. Falls within JEDEC MO-203 variation AA.



# DCK (R-PDSO-G5)

#### PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
- D. Publication IPC-7351 is recommended for alternate designs.
- E. 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. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.



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