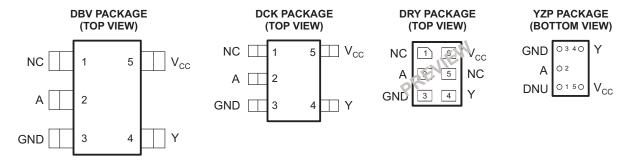


FEATURES

- 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 2.5 ns at 1.8 V

- Low Power Consumption, 10-μA Max I_{CC}
- ±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.

DNU – Do not use

NC – No internal connection

DESCRIPTION/ORDERING INFORMATION

This single buffer/driver 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 output of the SN74AUC1G07 is open drain and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

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

ORDERING INFORMATION

T _A	PACKAGE ⁽¹⁾⁽²⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING ⁽³⁾
	NanoFree™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free)	Reel of 3000	SN74AUC1G07YZPR	UV_
-40°C to 85°C	SON - DRY	Reel of 5000	SN74AUC1G07DRYR	PREVIEW
	SOT (SOT-23) – DBV	Reel of 3000	SN74AUC1G07DBVR	U07_
	SOT (SC-70) - DCK	Reel of 3000	SN74AUC1G07DCKR	UV_

- (1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.
- (2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.
- (3) DBV/DCK/DRY: The actual top-side marking has one additional character that designates the wafer fab/assembly 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 wafer fab/assembly site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, = Pb-free).



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NanoFree is a trademark of Texas Instruments.

SCES373Q-SEPTEMBER 2001-REVISED JULY 2007



DESCRIPTION/ORDERING INFORMATION (CONTINUED)

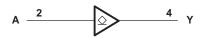
This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

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.

FUNCTION TABLE

INPUT A	OUTPUT Y
Н	Н
L	L

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	Supply voltage range			
VI	Input voltage range ⁽²⁾		-0.5	3.6	V
Vo	Output voltage range ⁽²⁾		-0.5	3.6	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
		DBV package		206	
^	Dealtage the world insured as as (3)	DCK package		252	C/M/
θ_{JA}	Package thermal impedance (3)	DRY package		234	C/W
		YZP package		132	
T _{stg}	Storage temperature range		-65	150	С

⁽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.

SN74AUC1G07



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 V to 1.95 V	$0.65 \times V_{CC}$		V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.7		
		V _{CC} = 0.8 V		0	
V_{IL}	Low-level input voltage $V_{CC} = 1.1 \text{ V to } 1$			$0.35 \times V_{CC}$	V
		V _{CC} = 2.3 V to 2.7 V		0.7	
V_{I}	Input voltage		0	3.6	V
Vo	Output voltage		0	3.6	V
		V _{CC} = 0.8 V		0.7	
		V _{CC} = 1.1 V		3	
I_{OL}	Low-level output current	V _{CC} = 1.4 V		5	mA
		V _{CC} = 1.65 V		8	
		V _{CC} = 2.3 V		9	
Δt/Δν	Input transition rise or fall rate			15	ns/V
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.

Electrical Characteristics

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

PA	RAMETER	TEST CONDITIONS	V _{cc}	MIN TYP ⁽¹⁾ MAX	UNIT
		I _{OL} = 100 μA	0.8 V to 2.7 V	0.2	
		$I_{OL} = 0.7 \text{ mA}$	0.8 V	0.25	
\/		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	A input	$V_I = V_{CC}$ or GND	0 to 2.7 V	±5	μΑ
I_{off}		V_I or $V_O = 2.7 V$	0	±10	μΑ
I_{CC}		$V_I = V_{CC}$ or GND, $I_O = 0$	0.8 V to 2.7 V	10	μΑ
Ci		$V_I = V_{CC}$ or GND	2.5 V	3	pF
Co		$V_O = V_{CC}$ or GND	2.5 V	3.5	pF

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

SN74AUC1G07 SINGLE BUFFER/DRIVER WITH OPEN-DRAIN OUTPUT

SCES373Q-SEPTEMBER 2001-REVISED JULY 2007



Switching Characteristics

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 0.8 V	V _{CC} = ± 0.	1.2 V 1 V	V _{CC} = ± 0.			_C = 1.8 : 0.15 V		V _{CC} = ± 0.		UNIT
	(1141 01)	PUT) (OUTPUT) TYP	TYP	MIN	MAX	MIN	MAX	MIN	TYP	MAX	MIN	MAX	
t _{pd}	Α	Y	4.7	0.3	3.3	0.2	2.4	0.2	1.1	2.3	0.2	1.8	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)		_C = 1.8 : 0.15 V		V _{CC} = 2.5 \ ± 0.2 V		UNIT
	(INPUT)	(001701)	MIN	TYP	MAX	MIN	MAX	
t _{pd}	A	Υ	0.8	1.9	2.5	0.2	1.8	ns

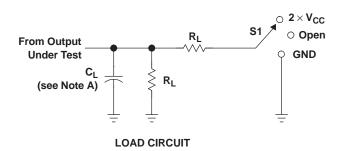
Operating Characteristics

 $T_A = 25^{\circ}C$

PARAMETER		TEST	V _{CC} = 1.2 V	V _{CC} = 1.5 V	V _{CC} = 1.8 V	V _{CC} = 2.5 V	UNIT
	PARAMETER	CONDITIONS	TYP	TYP	TYP	TYP	UNII
C _{pd}	Power dissipation capacitance	f = 10 MHz	2	3	3	5	pF

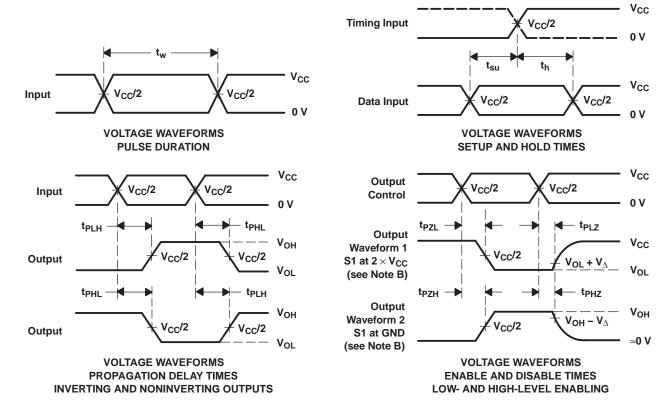


PARAMETER MEASUREMENT INFORMATION



TEST	S1
t _{PLH} /t _{PHL}	Open
t _{PLZ} /t _{PZL}	$2 \times V_{CC}$
t _{PHZ} /t _{PZH}	GND

V _{CC}	CL	R _L	${f V}_{\Delta}$
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 \pm 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 \pm 0.2 V	30 pF	500 Ω	0.15 V



NOTES: A. C_I 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, $Z_0 = 50 \Omega$, slew rate \geq 1 V/ns.
- D. The outputs are measured one at a time, with one transition per measurement.
- E. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- F. t_{PZL} and t_{PZH} are the same as t_{en}.
- G. t_{PLH} and t_{PHL} are the same as t_{pd}.
- H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

PACKAGE OPTION ADDENDUM





PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74AUC1G07DBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DBVRE4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DBVRG4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DBVTE4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DBVTG4	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DCKR	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DCKRG4	ACTIVE	SC70	DCK	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DCKT	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DCKTE4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07DCKTG4	ACTIVE	SC70	DCK	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74AUC1G07YZPR	ACTIVE	WCSP	YZP	5	3000	Green (RoHS & no Sb/Br)	SNAGCU	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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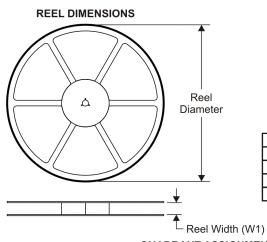
PACKAGE OPTION ADDENDUM

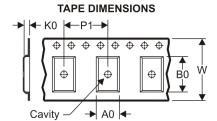
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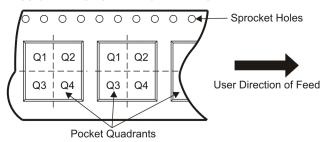
TAPE AND REEL INFORMATION





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

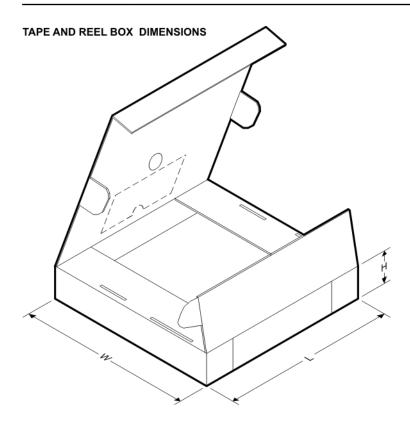
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

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
SN74AUC1G07DBVR	SOT-23	DBV	5	3000	180.0	9.2	3.23	3.17	1.37	4.0	8.0	Q3
SN74AUC1G07DBVT	SOT-23	DBV	5	250	180.0	9.2	3.23	3.17	1.37	4.0	8.0	Q3
SN74AUC1G07DCKR	SC70	DCK	5	3000	180.0	9.2	2.24	2.34	1.22	4.0	8.0	Q3
SN74AUC1G07DCKT	SC70	DCK	5	250	180.0	9.2	2.24	2.34	1.22	4.0	8.0	Q3





*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AUC1G07DBVR	SOT-23	DBV	5	3000	202.0	201.0	28.0
SN74AUC1G07DBVT	SOT-23	DBV	5	250	202.0	201.0	28.0
SN74AUC1G07DCKR	SC70	DCK	5	3000	202.0	201.0	28.0
SN74AUC1G07DCKT	SC70	DCK	5	250	202.0	201.0	28.0

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.



DCK (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



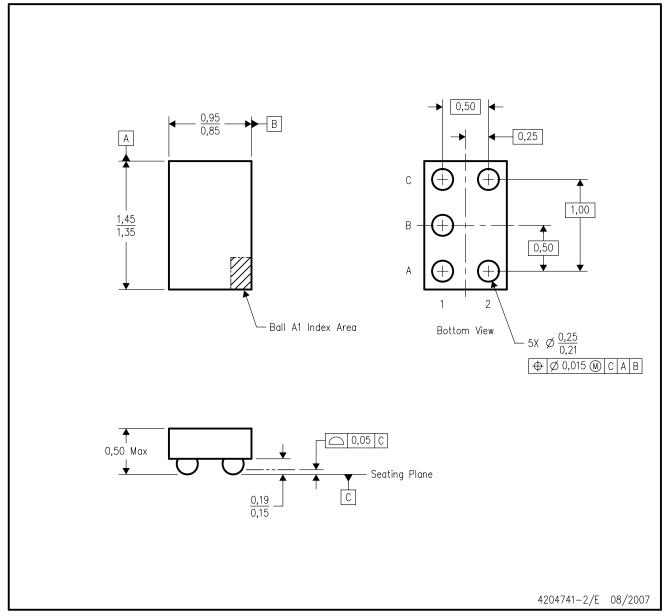
NOTES: A. All linear dimensions are in millimeters.

- 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.



YZP (R-XBGA-N5)

DIE-SIZE BALL GRID ARRAY



NOTES: A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
- C. NanoFree $^{\text{TM}}$ package configuration.
- D. This package is lead-free. Refer to the 5 YEP package (drawing 4204725) for tin-lead (SnPb).

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