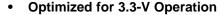


LOW-POWER TRIPLE SCHMITT-TRIGGER INVERTER

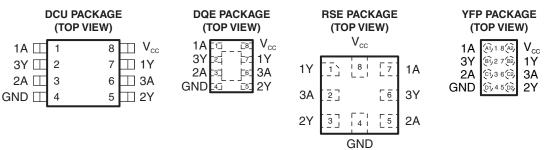
Check for Samples: SN74AUP3G14

FEATURES

- Available in the Texas Instruments NanoStar™ **Package**
- **Low Static-Power Consumption** $(I_{CC} = 0.9 \mu A Maximum)$
- Low Dynamic-Power Consumption $(C_{pd} = 4.3 pF Typ at 3.3 V)$
- Low Input Capacitance ($C_i = 1.5 pF Typical$)
- Low Noise Overshoot and Undershoot <10% of V_{CC}
- I_{off} Supports Partial-Power-Down Mode Operation
- Wide Operating V_{CC} Range of 0.8 V to 3.6 V



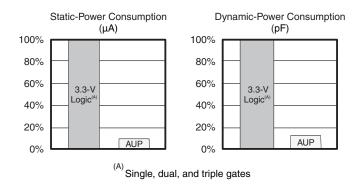
- 3.6-V I/O Tolerant to Support Mixed-Mode Signal Operation
- t_{pd} = 4.3 ns Maximum at 3.3 V
- Suitable for Point-to-Point Applications
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- **ESD Performance Tested Per JESD 22**
 - 2000-V Human-Body Model (A114-B, Class II)
 - 1000-V Charged-Device Model (C101)

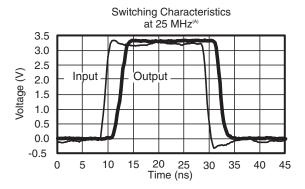


See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

The AUP family is TI's premier solution to the industry's low-power needs in battery-powered portable applications. This family ensures a very low static- and dynamic-power consumption across the entire V_{CC} range of 0.8 V to 3.6 V, resulting in increased battery life (see Figure 1). This product also maintains excellent signal integrity (see the very low undershoot and overshoot characteristics shown in Figure 2).





 $^{(A)}$ SN74AUP3Gxx data at C₁ = 15 pF.

Figure 1. AUP - The Lowest-Power Family

Figure 2. Excellent Signal Integrity

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. NanoStar is a trademark of Texas Instruments.



The SN74AUP3G14 contains three inverters and performs the Boolean function $Y = \overline{A}$. The device functions as three independent inverters but, because of Schmitt action, it may have different input threshold levels for positive-going (V_{T_+}) and negative-going (V_{T_-}) signals.

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

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.

ORDERING INFORMATION(1)

T _A	PACKAGE ⁽²⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING ⁽³⁾
	NanoStar™ – WCSP (DSBGA) 0.23-mm Large Bump – YFP (Pb-free)	Reel of 3000	SN74AUP3G14YFPR	HF_
-40°C to 85°C	uQFN – DQE	Reel of 5000	SN74AUP3G14DQER	TX
	QFN - RSE	Reel of 5000	SN74AUP3G14RSER	TX
	SSOP - DCU	Reel of 3000	SN74AUP3G14DCUR	H14_

⁽¹⁾ For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.

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⁽²⁾ Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

⁽³⁾ DCU: The actual top-side marking has one additional character that designates the wafer fab/assembly site.

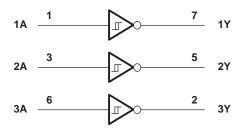
YFP: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the wafer fab/assembly site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).



FUNCTION TABLE

INPUT A	OUTPUT Y
Н	L
L	Н

LOGIC DIAGRAM (POSITIVE LOGIC)



Pin numbers shown are for the DCU and DQE package.

ABSOLUTE MAXIMUM RATINGS(1)

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

			MIN	MAX	UNIT	
V _{CC}	Supply voltage range		-0.5	4.6	V	
VI	Input voltage range ⁽²⁾		-0.5	4.6	V	
Vo	Voltage range applied to any output in the I	high-impedance or power-off state ⁽²⁾	-0.5	4.6	V	
Vo	Output voltage range in the high or low stat	te ⁽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	
lo	Continuous output current			±20	mA	
	Continuous current through V _{CC} or GND			±50	mA	
		DCU package		220		
•	5 (3)	DQE package		261	00.004	
θ_{JA}	Package thermal impedance (3)	RSE package		253	°C/W	
		YFP package		132		
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.

Product Folder Links: SN74AUP3G14

⁽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.



RECOMMENDED OPERATING CONDITIONS (1)

			MIN	MAX	UNIT	
V _{CC}	Supply voltage		0.8	3.6	٧	
VI	Input voltage		0	3.6	V	
Vo	Output voltage		0	V _{CC}	V	
		V _{CC} = 0.8 V		-20	μΑ	
		V _{CC} = 1.1 V		-1.1		
	High lavel autout avenue	V _{CC} = 1.4 V		-1.7		
I _{OH}	High-level output current	V _{CC} = 1.65		-1.9	mA	
		V _{CC} = 2.3 V		-3.1		
		V _{CC} = 3 V		-4		
		V _{CC} = 0.8 V		20	μΑ	
		V _{CC} = 1.1 V		1.1		
	Law law Law day day a summer	V _{CC} = 1.4 V		1.7		
I _{OL}	Low-level output current	V _{CC} = 1.65 V		1.9	mA	
		V _{CC} = 2.3 V		3.1		
		V _{CC} = 3 V		4		
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)

PARAMETER	TEST CONDITIONS	V	T _A	= 25°C	$T_A = -40^{\circ}C$	UNIT		
PARAMETEK	IESI CONDITIONS	V _{CC}	MIN	TYP MAX	MIN	MAX	UNII	
		0.8 V	0.3	0.6	0.3	0.6		
V_{T+}		1.1 V	0.53	0.9	0.53	0.9		
v _{T+} Positive-going		1.4 V	0.74	1.11	0.74	1.11	V	
input threshold		1.65 V	0.91	1.29	0.91	1.29	V	
voltage		2.3 V	1.37	1.77	1.37	1.77		
		3 V	1.88	2.29	1.88	2.29		
		0.8 V	0.1	0.6	0.1	0.6		
V_{T-}		1.1 V	0.26	0.65	0.26	0.65		
v _T Negative-going		1.4 V	0.39	0.75	0.39	0.75		
input threshold		1.65 V	0.47	0.84	0.47	0.84	V	
voltage		2.3 V	0.69	1.04	0.69	1.04		
		3 V	0.88	1.24	0.88	1.24		
		0.8 V	0.07	0.5	0.07	0.5		
		1.1 V	0.08	0.46	0.08	0.46		
ΔV_{T}		1.4 V	0.18	0.56	0.18	0.56	V	
Hysteresis $(V_{T+} - V_{T-})$		1.65 V	0.27	0.66	0.27	0.66		
\ · + • -/		2.3 V	0.53	0.92	0.53	0.92		
		3 V	0.79	1.31	0.79	1.31		
	I _{OH} = -20 μA	0.8 V to 3.6 V	V _{CC} - 0.1		V _{CC} - 0.1			
	I _{OH} = -1.1 mA	1.1 V	0.75 × V _{CC}		0.7 × V _{CC}			
	I _{OH} = -1.7 mA	1.4 V	1.11		1.03			
	I _{OH} = -1.9 mA	1.65 V	1.32		1.3			
V _{OH}	$I_{OH} = -2.3 \text{ mA}$		2.05		1.97		V	
	I _{OH} = -3.1 mA	2.3 V	1.9		1.85			
	$I_{OH} = -2.7 \text{ mA}$		2.72		2.67			
	$I_{OH} = -4 \text{ mA}$	3 V	2.6		2.55			
	I _{OL} = 20 μA	0.8 V to 3.6 V		0.1		0.1		
	I _{OL} = 1.1 mA	1.1 V		0.3 × V _{CC}		0.3 × V _{CC}		
	I _{OL} = 1.7 mA	1.4 V		0.31		0.37		
	I _{OL} = 1.9 mA	1.65 V		0.31		0.35		
V _{OL}	$I_{OL} = 2.3 \text{ mA}$			0.31		0.33	V	
	I _{OL} = 3.1 mA	2.3 V		0.44		0.45		
	$I_{OL} = 2.7 \text{ mA}$			0.31		0.33		
	$I_{OL} = 4 \text{ mA}$	3 V		0.44		0.45		
I _I A or B input		0 V to 3.6 V		0.1		0.5	μA	
I _{off}	$V_1 \text{ or } V_0 = 0 \text{ V to } 3.6 \text{ V}$	0 V		0.2		0.6	μA	
Δl _{off}	$V_1 \text{ or } V_0 = 0 \text{ V to } 3.6 \text{ V}$	0 V to 0.2 V		0.2		0.6	μA	
I _{cc}	$V_1 = GND \text{ or}$ $(V_{CC} \text{ to } 3.6 \text{ V}),$ $I_0 = 0$	0.8 V to 3.6 V		0.5		0.9	μA	
ΔI _{CC}	$V_1 = V_{CC} - 0.6 V^{(1)},$ $I_0 = 0$	3.3 V		40		50	μΑ	
		0 V		1.5				
C _i	$V_I = V_{CC}$ or GND	3.6 V		1.5			pF	
C _o	V _O = GND	0 V		3			pF	

⁽¹⁾ One input at $\rm V_{CC} - 0.6~V,$ other input at $\rm V_{CC}$ or GND

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SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $C_L = 5 pF$ (unless otherwise noted) (see Figure 3 and Figure 4)

DADAMETED	FROM	то	V	T,	4 = 25°C	;	$T_A = -40$ °C 1	to 85°C	UNIT
PARAMETER	(INPUT)	(OUTPUT)	V _{CC}	MIN	TYP	MAX	MIN	MAX	UNII
			0.8 V		18				
		1.2 V ± 0.1 V	2.6	7.3	12.8	2.1	15.6		
	Λ or D		1.5 V ± 0.1 V	1.4	5.2	8.7	0.9	10.3	
l pd	t _{pd} A or B Y	Ť	1.8 V ± 0.15 V	1	4.2	6.6	0.5	8.2	ns
			2.5 V ± 0.2 V	1	3	4.4	0.5	5.5	
			3.3 V ± 0.3 V	1	2.4	3.5	0.5	4.3	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, C_L = 10 pF (unless otherwise noted) (see Figure 3 and Figure 4)

PARAMETER	FROM	то	V	T,	λ = 25°C	;	$T_A = -40^{\circ}C t$	o 85°C	UNIT
PARAMETER	(INPUT)	(OUTPUT)	V _{CC}	MIN	TYP	MAX	MIN	MAX	UNII
		0.8 V		18.4					
			1.2 V ± 0.1 V	4.6	7.9	13.4	1.3	16.7	1
	Α	V	1.5 V ± 0.1 V	4	6	9.6	2.2	11.8	no
^l pd	A	1	1.8 V ± 0.15 V	3.6	5	7.9	2.4	9.5	ns
			2.5 V ± 0.2 V	3.2	4	5.5	2.3	6.8	
			3.3 V ± 0.3 V	2.9	3.5	4.6	2.1	5.6	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, C_L = 15 pF (unless otherwise noted) (see Figure 3 and Figure 4)

PARAMETER FROM TO		V	T _A = 25°C		;	$T_A = -40^{\circ}C t$	o 85°C	LINUT	
PARAMETER	(INPUT)	(OUTPUT)	V _{CC}	MIN	TYP	MAX	MIN	MAX	UNIT
	t _{pd} A or B Y	0.8 V		24					
			1.2 V ± 0.1 V	3.6	9.9	16.3	3.1	19.9	
		V	1.5 V ± 0.1 V	2.3	7.2	11.1	1.8	13.2	
l pd		Ť	1.8 V ± 0.15 V	1.6	5.8	8.7	1.1	10.6	ns
		2.5 V ± 0.2 V	1	4.3	5.9	0.5	7.3		
			3.3 V ± 0.3 V	1	3.4	4.8	0.5	5.9	

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, C_L = 30 pF (unless otherwise noted) (see Figure 3 and Figure 4)

PARAMETER	FROM	то	V _{cc}	T,	₄ = 25°C		$T_A = -40^{\circ}C$ to	85°C	UNIT
PARAMETER	(INPUT)	(OUTPUT)		MIN	TYP	MAX	MIN	MAX	UNIT
	t _{od} A or B		0.8 V		32.8				
		Υ	1.2 V ± 0.1 V	4.9	13.1	20.9	4.4	25.5	
			1.5 V ± 0.1 V	3.4	9.5	14.2	2.9	16.9	
t _{pd}	AUIB		1.8 V ± 0.15 V	2.5	7.7	11	2	13.5	ns
			2.5 V ± 0.2 V	1.8	5.7	7.6	1.3	9.4	
			3.3 V ± 0.3 V	1.5	4.7	6.2	1	7.5	

Product Folder Links: SN74AUP3G14

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OPERATING CHARACTERISTICS

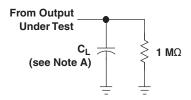
 $T_A = 25$ °C

	PARAMETER	TEST CONDITIONS	V _{cc}	TYP	UNIT
			0.8 V	4	
			1.2 V ± 0.1 V	4	pF
_	Davies discipation consistence	f = 10 MHz	1.5 V ± 0.1 V	4	
C _{pd}	Power dissipation capacitance		1.8 V ± 0.15 V	4	
			2.5 V ± 0.2 V	4.1	
			3.3 V ± 0.3 V	4.3	

Product Folder Links: SN74AUP3G14

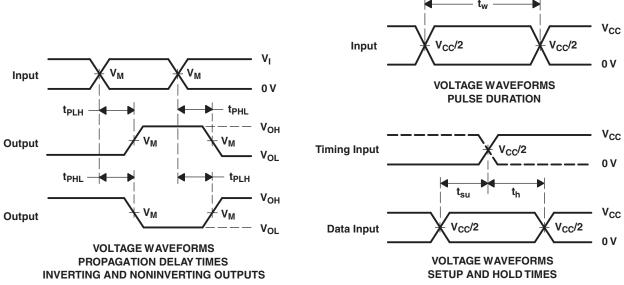


PARAMETER MEASUREMENT INFORMATION (Propagation Delays, Setup and Hold Times, and Pulse Width)



LOAD CIRCUIT

	V _{CC} = 0.8 V	V _{CC} = 1.2 V ± 0.1 V	V _{CC} = 1.5 V ± 0.1 V	V_{CC} = 1.8 V \pm 0.15 V	V_{CC} = 2.5 V \pm 0.2 V	V _{CC} = 3.3 V ± 0.3 V
C _L V _M	5, 10, 15, 30 pF V _{CC} /2 V _{CC}	5, 10, 15, 30 pF V _{CC} /2 V _{CC}	5, 10, 15, 30 pF V _{CC} /2 V _{CC}	5, 10, 15, 30 pF V _{CC} /2 V _{CC}	5, 10, 15, 30 pF V _{CC} /2 V _{CC}	5, 10, 15, 30 pF V _{CC} /2 V _{CC}



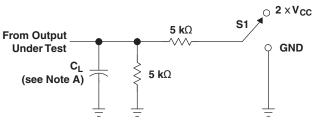
- A. C_I includes probe and jig capacitance.
- B. Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $Z_O = 50~\Omega$, for propagation delays $t_r/t_f = 3$ ns, for setup and hold times and pulse width $t_r/t_f = 1.2$ ns.
- D. The outputs are measured one at a time, with one transition per measurement.
- E. t_{PLH} and t_{PHL} are the same as t_{pd} .
- F. All parameters and waveforms are not applicable to all devices.

Figure 3. Load Circuit and Voltage Waveforms

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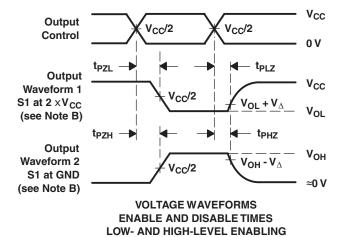
PARAMETER MEASUREMENT INFORMATION (Enable and Disable Times)



TEST	S1
t _{PLZ} /t _{PZL}	2×V _{CC}
t _{PHZ} /t _{PZH}	GND

LOAD CIRCUIT

	V _{CC} = 0.8 V	V _{CC} = 1.2 V ± 0.1 V	V _{CC} = 1.5 V ± 0.1 V	V _{CC} = 1.8 V ± 0.15 V	V_{CC} = 2.5 V \pm 0.2 V	V_{CC} = 3.3 V \pm 0.3 V
C _L	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF	5, 10, 15, 30 pF
V _M	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2	V _{CC} /2
V _I	V _{CC}	V _{CC}	V _{CC}	V _{CC}	V _{CC}	V _{CC}
V _∆	0.1 V	0.1 V	0.1 V	0.15 V	0.15 V	0.3 V



- 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, $Z_O = 50 \Omega$, $t_f/t_f = 3$ 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_{PLH} and t_{PHL} are the same as t_{pd} .
- G. All parameters and waveforms are not applicable to all devices.

Figure 4. Load Circuit and Voltage Waveforms

Product Folder Links: SN74AUP3G14

SCES764D - SEPTEMBER 2009-REVISED AUGUST 2012



REVISION HISTORY

CI	Changes from Revision C (July 2010) to Revision D						
•	Deleted input transition rise or fall rate (Δt/Δv) paramater from Recommended Operation Conditons table	4					

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PACKAGING INFORMATION

Orderable part number	Status	Material type	Package Pins	Package qty Carrier	RoHS	Lead finish/ Ball material	MSL rating/ Peak reflow	Op temp (°C)	Part marking
	(1)	(2)			(3)	(4)	(5)		(6)
SN74AUP3G14DCUR	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H14R
SN74AUP3G14DCUR.B	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H14R
SN74AUP3G14DCURG4	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H14R
SN74AUP3G14DCURG4.B	Active	Production	VSSOP (DCU) 8	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	H14R
SN74AUP3G14DQER	Active	Production	X2SON (DQE) 8	5000 LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	TX
SN74AUP3G14DQER.B	Active	Production	X2SON (DQE) 8	5000 LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	TX
SN74AUP3G14RSER	Active	Production	UQFN (RSE) 8	5000 LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	TX
SN74AUP3G14RSER.B	Active	Production	UQFN (RSE) 8	5000 LARGE T&R	Yes	NIPDAUAG	Level-1-260C-UNLIM	-40 to 85	TX
SN74AUP3G14YFPR	Active	Production	DSBGA (YFP) 8	3000 LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	HFN
SN74AUP3G14YFPR.B	Active	Production	DSBGA (YFP) 8	3000 LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	HFN

⁽¹⁾ Status: For more details on status, see our product life cycle.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative

⁽²⁾ Material type: When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ RoHS values: Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

⁽⁴⁾ Lead finish/Ball material: Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.



PACKAGE OPTION ADDENDUM

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and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

PACKAGE MATERIALS INFORMATION

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TAPE AND REEL INFORMATION





A0	Dimension designed to accommodate the component width
В0	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
SN74AUP3G14DCUR	VSSOP	DCU	8	3000	180.0	8.4	2.25	3.35	1.05	4.0	8.0	Q3
SN74AUP3G14DCURG4	VSSOP	DCU	8	3000	180.0	8.4	2.25	3.35	1.05	4.0	8.0	Q3
SN74AUP3G14DQER	X2SON	DQE	8	5000	180.0	8.4	1.2	1.6	0.55	4.0	8.0	Q1
SN74AUP3G14RSER	UQFN	RSE	8	5000	180.0	8.4	1.7	1.7	0.7	4.0	8.0	Q2
SN74AUP3G14YFPR	DSBGA	YFP	8	3000	178.0	9.2	0.9	1.75	0.6	4.0	8.0	Q1



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*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AUP3G14DCUR	VSSOP	DCU	8	3000	202.0	201.0	28.0
SN74AUP3G14DCURG4	VSSOP	DCU	8	3000	202.0	201.0	28.0
SN74AUP3G14DQER	X2SON	DQE	8	5000	202.0	201.0	28.0
SN74AUP3G14RSER	UQFN	RSE	8	5000	202.0	201.0	28.0
SN74AUP3G14YFPR	DSBGA	YFP	8	3000	220.0	220.0	35.0



SMALL OUTLINE PACKAGE



NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

 2. This drawing is subject to change without notice.

 3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not
- exceed 0.15 mm per side.
 4. Reference JEDEC registration MO-187 variation CA.



SMALL OUTLINE PACKAGE



NOTES: (continued)

- 5. Publication IPC-7351 may have alternate designs.
- 6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



SMALL OUTLINE PACKAGE



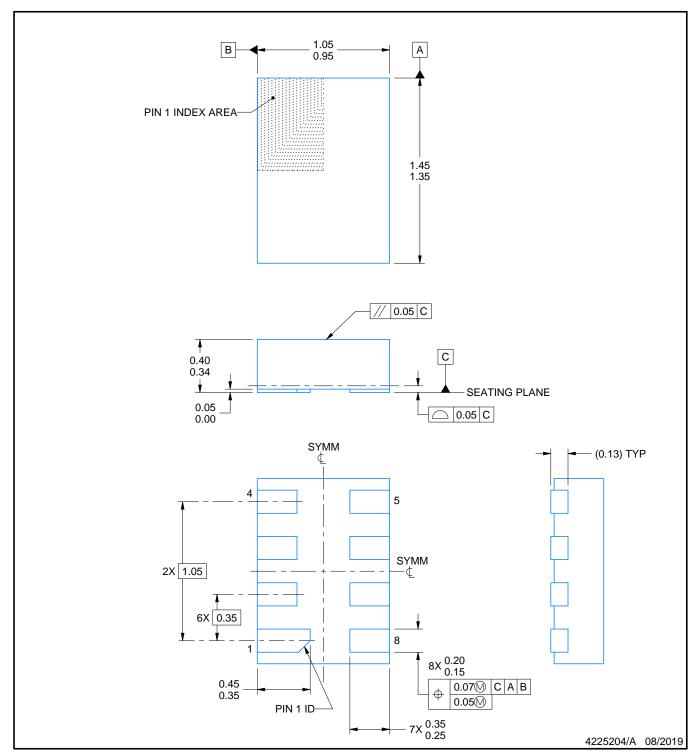
NOTES: (continued)

- 7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
- 8. Board assembly site may have different recommendations for stencil design.





PLASTIC SMALL OUTLINE - NO LEAD



NOTES:

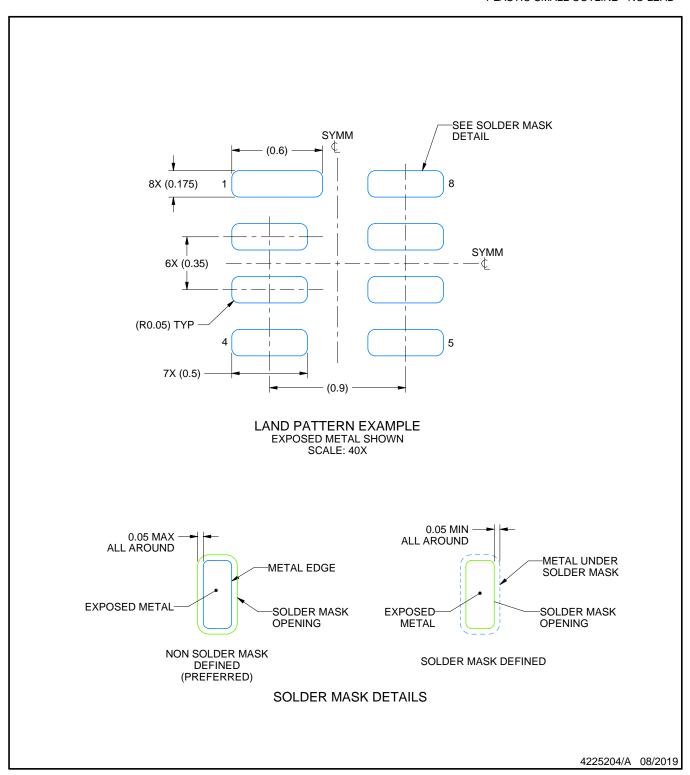
- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

 2. This drawing is subject to change without notice.

 3. This package complies to JEDEC MO-287 variation X2EAF.



PLASTIC SMALL OUTLINE - NO LEAD

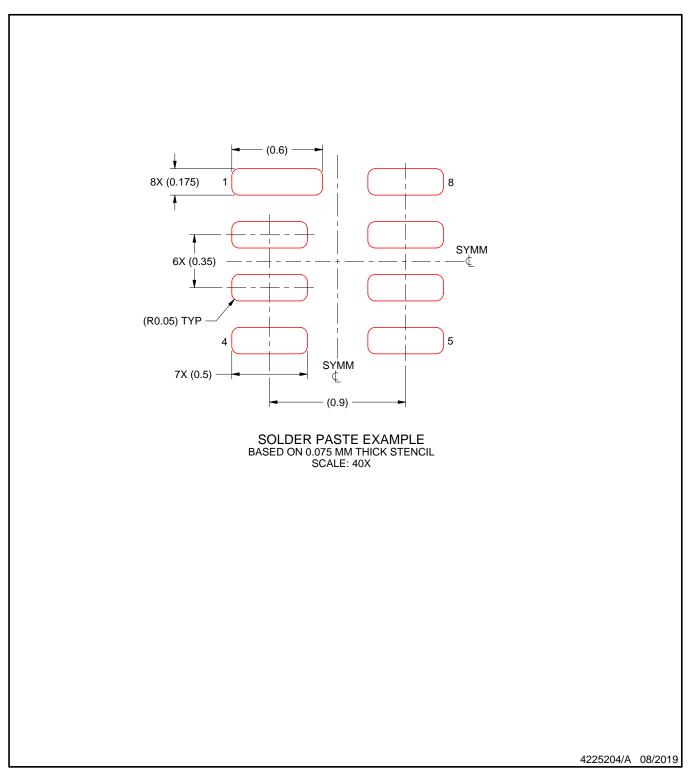


NOTES: (continued)

4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).



PLASTIC SMALL OUTLINE - NO LEAD



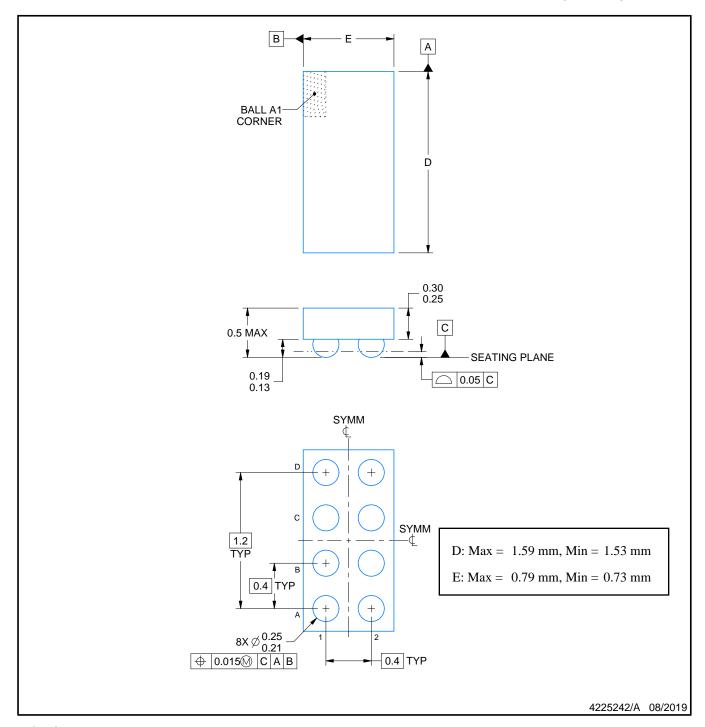
NOTES: (continued)

5. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.





DIE SIZE BALL GRID ARRAY



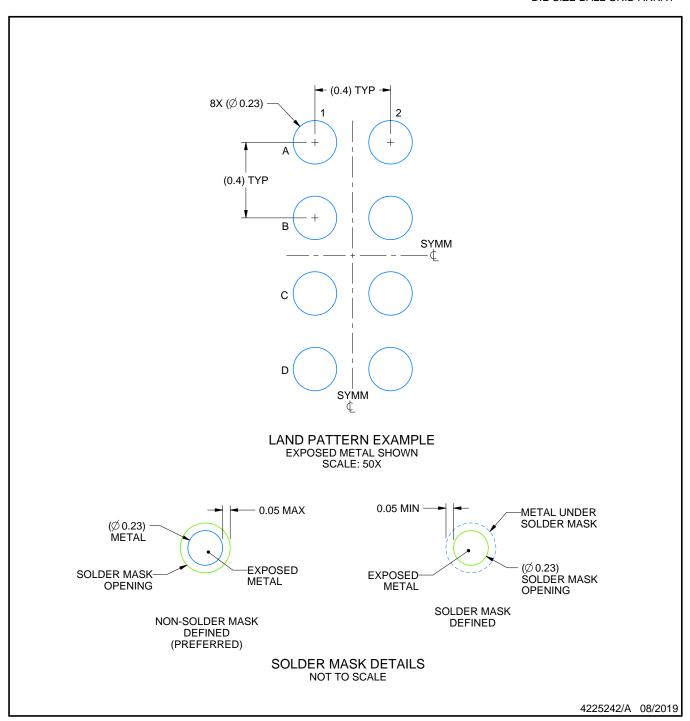
NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

 2. This drawing is subject to change without notice.



DIE SIZE BALL GRID ARRAY

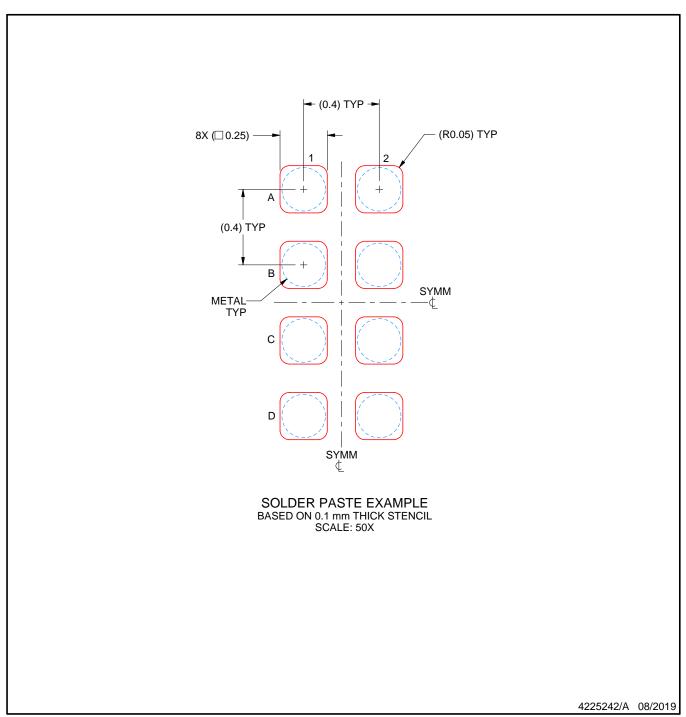


NOTES: (continued)

Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. See Texas Instruments Literature No. SNVA009 (www.ti.com/lit/snva009).



DIE SIZE BALL GRID ARRAY



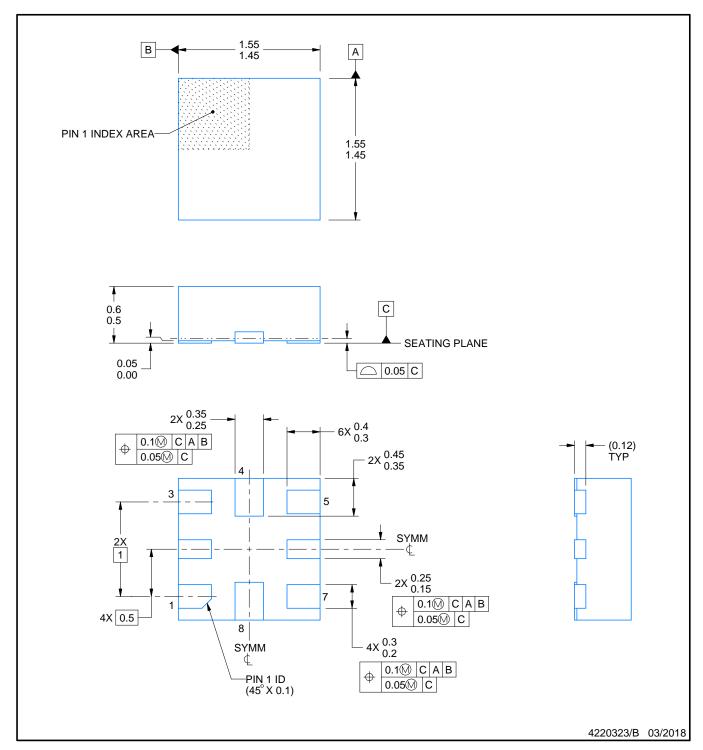
NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.





PLASTIC QUAD FLATPACK - NO LEAD

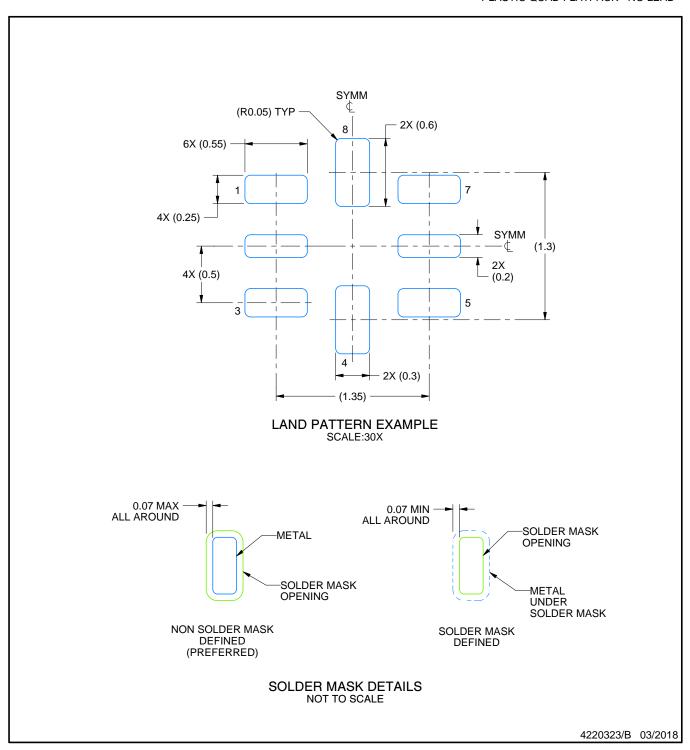


NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- 2. This drawing is subject to change without notice.



PLASTIC QUAD FLATPACK - NO LEAD

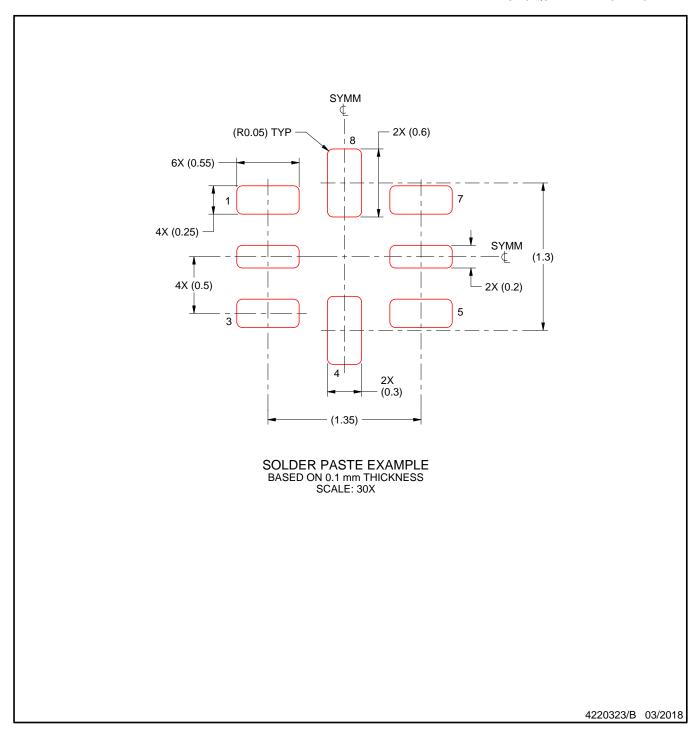


NOTES: (continued)

3. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).



PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

5. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.



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Last updated 10/2025