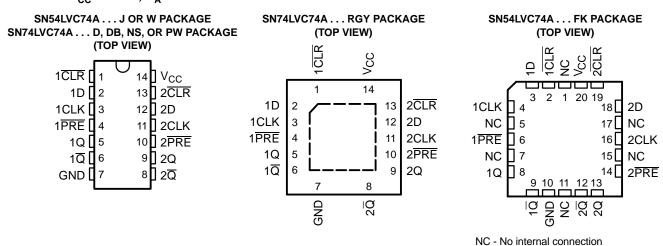
SCAS287S-JANUARY 1993-REVISED MAY 2005

FEATURES

- Operate From 1.65 V to 3.6 V
- Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 5.2 ns at 3.3 V
- Typical V_{OLP} (Output Ground Bounce)
 <0.8 V at V_{CC} = 3.3 V, T_A = 25°C
- Typical V_{OHV} (Output V_{OH} Undershoot)
 >2 V at V_{CC} = 3.3 V, T_A = 25°C

- 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 SN54LVC74A dual positive-edge-triggered D-type flip-flop is designed for 2.7-V to 3.6-V V_{CC} operation, and the SN74LVC74A dual positive-edge-triggered D-type flip-flop is designed for 1.65-V to 3.6-V V_{CC} operation.

ORDERING INFORMATION

T _A	PA	CKAGE ⁽¹⁾	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	QFN – RGY	Reel of 1000	SN74LVC74ARGYR	LC74A
		Tube of 50	SN74LVC74AD	
	SOIC - D	Reel of 2500	SN74LVC74ADR	LVC74A
		Reel of 250	SN74LVC74ADT	
-40°C to 85°C	SOP - NS	Reel of 2000	SN74LVC74ANSR	LCV74A
	SSOP - DB	Reel of 2000	SN74LVC74ADBR	LC74A
		Tube of 90	SN74LVC74APW	
	TSSOP - PW	Reel of 2000	SN74LVC74APWR	LC74A
		Reel of 250	SN74LVC74APWT	
	CDIP – J	Tube of 25	SNJ54LVC74AJ	SNJ54LVC74AJ
-55°C to 125°C	CFP – W	Tube of 150	SNJ54LVC74AW	SNJ54LVC74AW
	LCCC - FK	Tube of 55	SNJ54LVC74AFK	SNJ54LVC74AFK

(1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.



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.

SCAS287S-JANUARY 1993-REVISED MAY 2005



DESCRIPTION/ORDERING INFORMATION (CONTINUED)

A low level at the preset (PRE) or clear (CLR) inputs sets or resets the outputs, regardless of the levels of the other inputs. When PRE and CLR are inactive (high), data at the data (D) input meeting the setup time requirements is transferred to the outputs on the positive-going edge of the clock pulse. Clock triggering occurs at a voltage level and is not directly related to the rise time of the clock pulse. Following the hold-time interval, data at the D input can be changed without affecting the levels at the outputs.

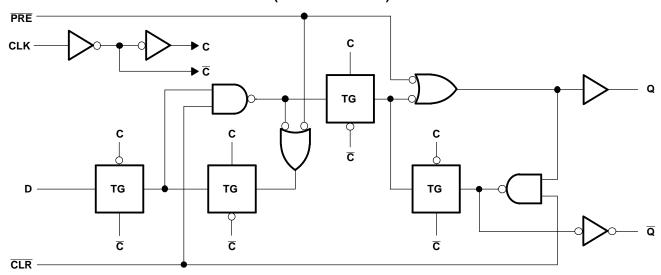
The data I/Os and control inputs are overvoltage tolerant. This feature allows the use of these devices for down-translation in a mixed-voltage environment.

FUNCTION TABLE

	INP	UTS		OUTI	PUTS
PRE	CLR	CLK	D	Q	Q
L	Н	Х	Х	Н	L
Н	L	X	Χ	L	Н
L	L	Χ	Χ	H ⁽¹⁾	H ⁽¹⁾
Н	Н	\uparrow	Н	Н	L
Н	Н	\uparrow	L	L	Н
Н	Н	L	X	Q_0	\overline{Q}_0

(1) This configuration is nonstable; that is, it does not persist when PRE or CLR returns to its inactive (high) level.

LOGIC DIAGRAM, EACH FLIP-FLOP (POSITIVE LOGIC)





SN54LVC74A, SN74LVC74A DUAL POSITIVE-EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH CLEAR AND PRESET

SCAS287S-JANUARY 1993-REVISED MAY 2005

Absolute Maximum Ratings⁽¹⁾

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

			MIN	MAX	UNIT
V_{CC}	Supply voltage range		-0.5	6.5	V
V_{I}	Input voltage range ⁽²⁾		-0.5	6.5	V
Vo	Output voltage range ⁽²⁾⁽³⁾		-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			±50	mA
	Continuous current through V _{CC} or GND			±100	mA
		D package ⁽⁴⁾		86	
		DB package ⁽⁴⁾		96	
θ_{JA}	Package thermal impedance	NS package ⁽⁴⁾		76	°C/W
		PW package (4)		113	
		RGY package (5)		47	
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 and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of V_{CC} is provided in the recommended operating conditions table.
- (4) The package thermal impedance is calculated in accordance with JESD 51-7.
- (5) The package thermal impedance is calculated in accordance with JESD 51-5.

Recommended Operating Conditions⁽¹⁾

			SN54LV	C74A	SN74L	VC74A	UNIT	
			MIN	MAX	MIN	MAX	UNII	
.,	Complexional	Operating	2	3.6	1.65	3.6	V	
V _{CC}	Supply voltage	Data retention only	1.5		1.5		V	
		V _{CC} = 1.65 V to 1.95 V			0.65 × V _{CC}			
V_{IH}	High-level input voltage	V _{CC} = 2.3 V to 2.7 V			1.7		V	
		V _{CC} = 2.7 V to 3.6 V	2		2			
		V _{CC} = 1.65 V to 1.95 V				$0.35 \times V_{CC}$		
V_{IL}	Low-level input voltage	V _{CC} = 2.3 V to 2.7 V				0.7	V	
		V _{CC} = 2.7 V to 3.6 V		0.8		0.8		
VI	Input voltage		0	5.5	0	5.5	V	
Vo	Output voltage		0	V _{CC}	0	V _{CC}	V	
		V _{CC} = 1.65 V				-4		
	High lovel output ourrent	V _{CC} = 2.3 V				-8	A	
I _{OH}	High-level output current	V _{CC} = 2.7 V		-12		-12	mA	
		V _{CC} = 3 V		-24		-24		
		V _{CC} = 1.65 V				4		
	Low level output ourrent	V _{CC} = 2.3 V				8	A	
I _{OL}	Low-level output current	V _{CC} = 2.7 V		12		12	mA	
		V _{CC} = 3 V		24		24		
Δt/Δν	Input transition rise or fall rate			10		10	ns/V	
T _A	Operating free-air temperature		-55	125	-40	85	°C	

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.

SN54LVC74A, SN74LVC74A DUAL POSITIVE-EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH CLEAR AND PRESET





Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V	SN54	LVC74A	SN74	ILVC74A		UNIT
PARAMETER	TEST CONDITIONS	V _{CC}	MIN	TYP ⁽¹⁾ MAX	MIN	TYP ⁽¹⁾ N	1AX	UNII
	1004	1.65 V to 3.6 V			V _{CC} - 0.2			
	$I_{OH} = -100 \mu A$	2.7 V to 3.6 V	V _{CC} - 0.2					
	$I_{OH} = -4 \text{ mA}$	1.65 V			1.2			
V _{OH}	$I_{OH} = -8 \text{ mA}$	2.3 V			1.7			V
	I - 12 mA	2.7 V	2.2		2.2			
	$I_{OH} = -12 \text{ mA}$	3 V	2.4		2.4			
	I _{OH} = -24 mA	3 V	2.2	2.2 2.2				
	I _{OL} = 100 μA	1.65 V to 3.6 V					0.2	
	Ι _{ΟL} = 100 μΑ	2.7 V to 3.6 V		0.2				
V	I _{OL} = 4 mA	1.65 V				(0.45	V
V _{OL}	I _{OL} = 8 mA	2.3 V					0.7	V
	I _{OL} = 12 mA	2.7 V		0.4			0.4	
	I _{OL} = 24 mA	3 V		0.55		(0.55	
I _I	V _I = 5.5 V or GND	3.6 V		±5			±5	μΑ
I _{cc}	$V_I = V_{CC}$ or GND, $I_O = 0$	3.6 V		10			10	μΑ
Δl _{CC}	One input at V _{CC} – 0.6 V, Other inputs at V _{CC} or GND	2.7 V to 3.6 V		500			500	μА
C _i	$V_I = V_{CC}$ or GND	3.3 V		5		5		pF

⁽¹⁾ All typical values are at V_{CC} = 3.3 V, T_A = 25°C.

Timing Requirements

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1)

				SN54L	VC74A			
			V _{CC} =	2.7 V	V _{CC} = ± 0.	3.3 V 3 V	UNIT	
			MIN	MAX	MIN	MAX		
f _{clock}	Clock frequency			83		100	MHz	
	Pulse duration	PRE or CLR low	3.3		3.3	20		
t _w	ruise duration	CLK high or low	3.3		3.3		ns	
+	Setup time before CLK↑	Data	3.4		3		ns	
t _{su}	PRE or CLR inactive				2		115	
t _h	Hold time, data after CLK↑	·	1		1		ns	

SN54LVC74A, SN74LVC74A DUAL POSITIVE-EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH CLEAR AND PRESET

SCAS287S-JANUARY 1993-REVISED MAY 2005

Timing Requirements

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1)

						SN74L	VC74A				
			V _{CC} = ± 0.1	V _{CC} = 1.8 V ± 0.15 V V _{CC} = 2.5 V ± 0.2 V		2.5 V 2 V	V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
f _{clock}	Clock frequency			83		83		83		150	MHz
	Pulse duration	PRE or CLR low	4.1		3.3		3.3		3.3		20
ı _w	Fulse duration	CLK high or low	4.1		3.3		3.3		3.3		ns
	Catura tima hafara CLKA	Data	3.6		2.3		3.4		3		2
t _{su}	Setup time before CLK↑	PRE or CLR inactive	2.7		1.9		2.2		2		ns
t _h	Hold time, data after CLK↑		1		1		1		0		ns

Switching Characteristics

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		UNIT
			MIN	MAX	MIN	MAX	
f _{max}			83		100		MHz
•	CLK	Q or Q		6	1	5.2	20
t _{pd}	PRE or CLR	QUIQ		6.4	1	5.4	ns

Switching Characteristics

over recommended operating free-air temperature range (unless otherwise noted) (see Figure 1)

		TO (OUTPUT)	SN74LVC74A								
PARAMETER	FROM (INPUT)		V _{CC} = 1.8 V ± 0.15 V		$V_{CC} = 2.5 V$ $\pm 0.2 V$		V _{CC} = 2.7 V		V _{CC} = 3.3 V ± 0.3 V		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
f _{max}			83		83		83		150		MHz
4	CLK	Q or Q	1	7.1	1	4.4	1	6	1	5.2	no
t _{pd}	PRE or CLR		1	6.9	1	4.6	1	6.4	1	5.4	ns
t _{sk(o)}										1	ns

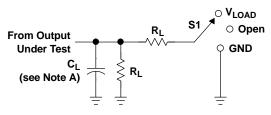
Operating Characteristics

 $T_A = 25$ °C

	PARAMETER	TEST	V _{CC} = 1.8 V	V _{CC} = 2.5 V	V _{CC} = 3.3 V	UNIT
	TANAMETEN	CONDITIONS	TYP	TYP	TYP	ONIT
C _{pd}	Power dissipation capacitance per flip-flop	f = 10 MHz	24	24	26	pF



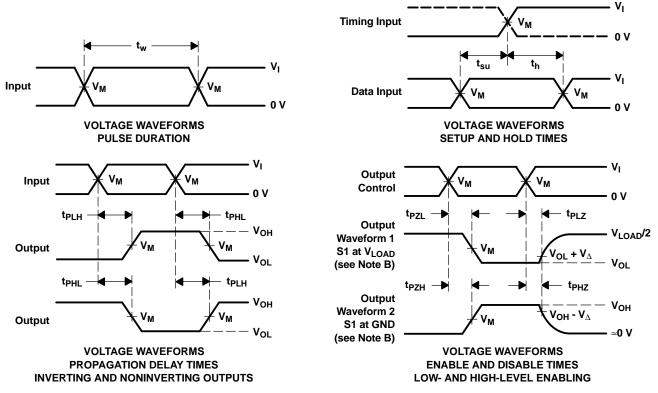
PARAMETER MEASUREMENT INFORMATION



TEST	S1
t _{PLH} /t _{PHL}	Open
t _{PLZ} /t _{PZL}	V _{LOAD}
t _{PHZ} /t _{PZH}	GND

•	\sim	Λ	п	CI	D	\sim 1	ш	т
L		м	u		к	w	JI	

.,	INI	PUTS	.,	.,		_	.,
V _{CC}	VI	t _r /t _f	V _M	V _{LOAD}	CL	R _L	$oldsymbol{V}_\Delta$
1.8 V ± 0.15 V	V _{CC}	≤2 ns	V _{CC} /2	2×V _{CC}	30 pF	1 kΩ	0.15 V
2.5 V \pm 0.2 V	V _{CC}	≤2 ns	V _{CC} /2	2×V _{CC}	30 pF	500 Ω	0.15 V
2.7 V	2.7 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V
3.3 V \pm 0.3 V	2.7 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 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, $Z_0 = 50 \ \Omega$.
- 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

23-Mar-2012

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)
5962-9761601Q2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	Call TI	
5962-9761601QCA	ACTIVE	CDIP	J	14	1	TBD	Call TI	Call TI	
5962-9761601QDA	ACTIVE	CFP	W	14	1	TBD	Call TI	Call TI	
5962-9761601V2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
5962-9761601VCA	ACTIVE	CDIP	J	14	25	TBD	A42	N / A for Pkg Type	
5962-9761601VDA	ACTIVE	CFP	W	14	25	TBD	A42	N / A for Pkg Type	
SN74LVC74AD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADBLE	OBSOLETE	SSOP	DB	14		TBD	Call TI	Call TI	
SN74LVC74ADBR	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADBRG4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADT	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADTE4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ADTG4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ANSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ANSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	





23-Mar-2012

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
SN74LVC74APW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWE4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWG4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWLE	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	
SN74LVC74APWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWRG3	PREVIEW	TSSOP	PW	14	2000	TBD	Call TI	Call TI	
SN74LVC74APWRG4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWT	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWTE4	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74APWTG4	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LVC74ARGYR	ACTIVE	VQFN	RGY	14	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	
SN74LVC74ARGYRG4	ACTIVE	VQFN	RGY	14	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	
SNJ54LVC74AFK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	
SNJ54LVC74AJ	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type	
SNJ54LVC74AW	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type	

⁽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.



PACKAGE OPTION ADDENDUM

23-Mar-2012

(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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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.

OTHER QUALIFIED VERSIONS OF SN54LVC74A. SN54LVC74A-SP. SN74LVC74A:

Catalog: SN74LVC74A, SN54LVC74A

Automotive: SN74LVC74A-Q1, SN74LVC74A-Q1

■ Enhanced Product: SN74LVC74A-EP. SN74LVC74A-EP

Military: SN54LVC74A

www.ti.com

Space: SN54LVC74A-SP

NOTE: Qualified Version Definitions:

- Catalog TI's standard catalog product
- Automotive Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product Supports Defense, Aerospace and Medical Applications





23-Mar-2012

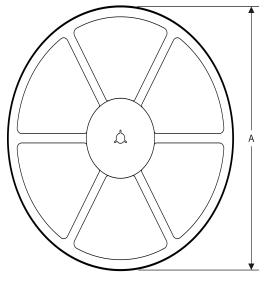
- Military QML certified for Military and Defense Applications
- Space Radiation tolerant, ceramic packaging and qualified for use in Space-based application

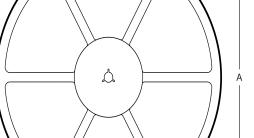
PACKAGE MATERIALS INFORMATION

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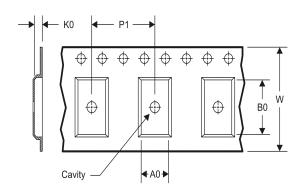
TAPE AND REEL INFORMATION

REEL DIMENSIONS





TAPE DIMENSIONS



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

TAPE AND REEL INFORMATION

*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
SN74LVC74ADBR	SSOP	DB	14	2000	330.0	16.4	8.2	6.6	2.5	12.0	16.0	Q1
SN74LVC74ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LVC74ADT	SOIC	D	14	250	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LVC74ANSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74LVC74APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LVC74APWR	TSSOP	PW	14	2000	330.0	12.4	7.0	5.6	1.6	8.0	12.0	Q1
SN74LVC74APWT	TSSOP	PW	14	250	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LVC74ARGYR	VQFN	RGY	14	3000	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1

www.ti.com 7-Mar-2012



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LVC74ADBR	SSOP	DB	14	2000	346.0	346.0	33.0
SN74LVC74ADR	SOIC	D	14	2500	346.0	346.0	33.0
SN74LVC74ADT	SOIC	D	14	250	346.0	346.0	33.0
SN74LVC74ANSR	SO	NS	14	2000	346.0	346.0	33.0
SN74LVC74APWR	TSSOP	PW	14	2000	346.0	346.0	29.0
SN74LVC74APWR	TSSOP	PW	14	2000	364.0	364.0	27.0
SN74LVC74APWT	TSSOP	PW	14	250	346.0	346.0	29.0
SN74LVC74ARGYR	VQFN	RGY	14	3000	346.0	346.0	29.0

14 LEADS SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within MIL STD 1835 GDFP1-F14 and JEDEC MO-092AB



FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a metal lid.
- D. Falls within JEDEC MS-004



D (R-PDSO-G14)

PLASTIC SMALL OUTLINE

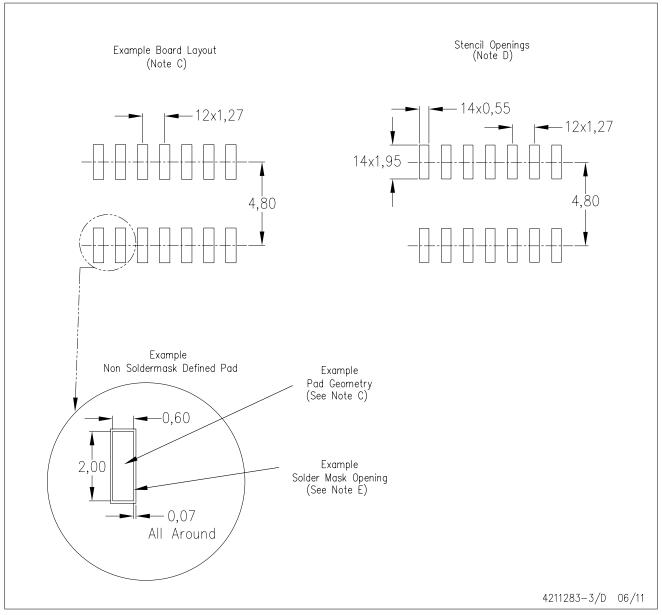


- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AB.



D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



- 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 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



PW (R-PDSO-G14)

PLASTIC SMALL OUTLINE

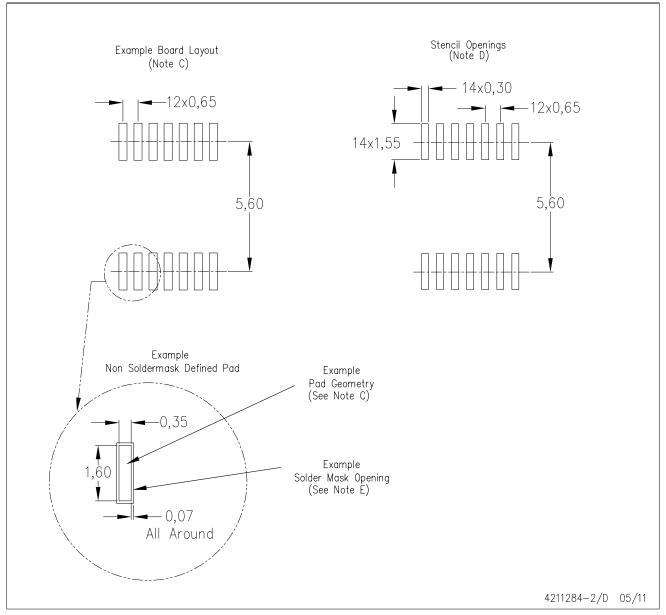


- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- B. This drawing is subject to change without notice.
 - Sody length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
- E. Falls within JEDEC MO-153



PW (R-PDSO-G14)

PLASTIC SMALL OUTLINE



- 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 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.





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. QFN (Quad Flatpack No-Lead) package configuration.
- D. The package thermal pad must be soldered to the board for thermal and mechanical performance.
- E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
- Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
- G. Package complies to JEDEC MO-241 variation BA.



RGY (S-PVQFN-N14)

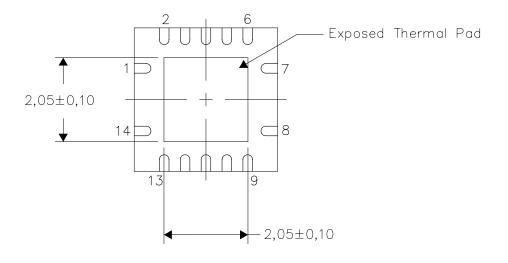
PLASTIC QUAD FLATPACK NO-LEAD

THERMAL INFORMATION

This package incorporates an exposed thermal pad that is designed to be attached directly to an external heatsink. The thermal pad must be soldered directly to the printed circuit board (PCB). After soldering, the PCB can be used as a heatsink. In addition, through the use of thermal vias, the thermal pad can be attached directly to the appropriate copper plane shown in the electrical schematic for the device, or alternatively, can be attached to a special heatsink structure designed into the PCB. This design optimizes the heat transfer from the integrated circuit (IC).

For information on the Quad Flatpack No-Lead (QFN) package and its advantages, refer to Application Report, QFN/SON PCB Attachment, Texas Instruments Literature No. SLUA271. This document is available at www.ti.com.

The exposed thermal pad dimensions for this package are shown in the following illustration.



Bottom View

Exposed Thermal Pad Dimensions

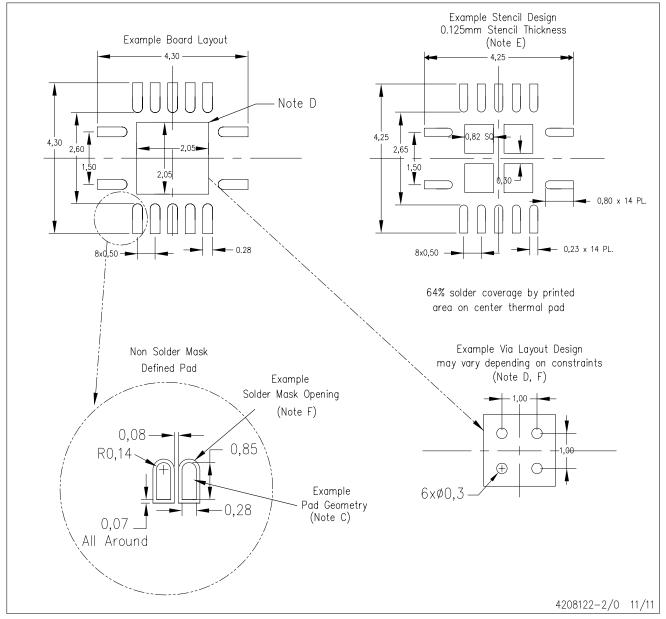
4206353-2/0 11/11

NOTE: All linear dimensions are in millimeters



RGY (S-PVQFN-N14)

PLASTIC QUAD FLATPACK NO-LEAD



- 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. This package is designed to be soldered to a thermal pad on the board. Refer to Application Note, Quad Flat—Pack QFN/SON PCB Attachment, Texas Instruments Literature No. SLUA271, and also the Product Data Sheets for specific thermal information, via requirements, and recommended board layout. These documents are available at www.ti.com http://www.ti.com.
- 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. Refer to IPC 7525 for stencil design considerations.
- F. Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.



MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- 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, not to exceed 0,15.



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



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 not to exceed 0,15.

D. Falls within JEDEC MO-150

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