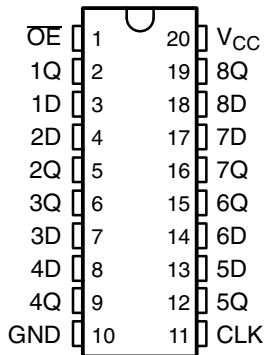


# SN54LV374A, SN74LV374A OCTAL EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH 3-STATE OUTPUTS

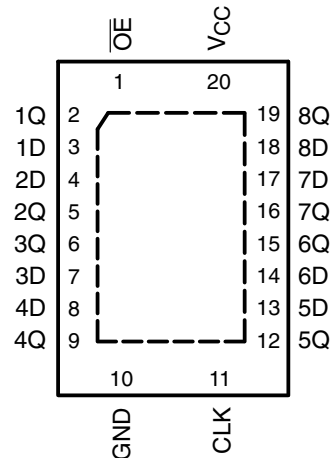
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- 2-V to 5.5-V  $V_{CC}$  Operation
- Max  $t_{pd}$  of 9.5 ns at 5 V
- Typical  $V_{OLP}$  (Output Ground Bounce) <0.8 V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot) >2.3 V at  $V_{CC} = 3.3$  V,  $T_A = 25^\circ\text{C}$
- Support Mixed-Mode Voltage Operation on All Ports
- $I_{off}$  Supports Partial-Power-Down Mode Operation
- 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)

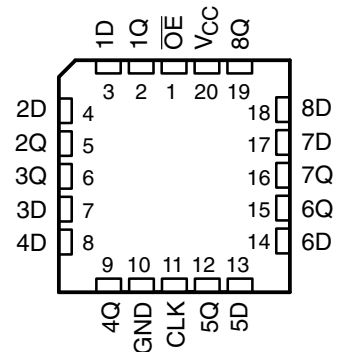
SN54LV374A . . . J OR W PACKAGE  
SN74LV374A . . . DB, DGV, DW, NS,  
OR PW PACKAGE  
(TOP VIEW)



SN74LV374A . . . RGY PACKAGE  
(TOP VIEW)



SN54LV374A . . . FK PACKAGE  
(TOP VIEW)



## description/ordering information

The 'LV374A devices are octal edge-triggered D-type flip-flops designed for 2-V to 5.5-V  $V_{CC}$  operation.

### ORDERING INFORMATION

$T_A$	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
-40°C to 85°C	QFN – RGY	Reel of 1000	SN74LV374ARGYR	LV374A
	SOIC – DW	Tube of 25	SN74LV374ADW	LV374A
		Reel of 2000	SN74LV374ADWR	
	SOP – NS	Reel of 2000	SN74LV374ANSR	74LV374A
	SSOP – DB	Reel of 2000	SN74LV374ADBR	LV374A
	TSSOP – PW	Tube of 70	SN74LV374APW	LV374A
		Reel of 2000	SN74LV374APWR	LV374A
		Reel of 250	SN74LV374APWT	LV374A
TVSOP – DGV	Reel of 2000	SN74LV374ADGVR	LV374A	
VFBGA – GQN	Reel of 1000	SN74LV374AGQNR	LV374A	
-55°C to 125°C	CDIP – J	Tube of 20	SNJ54LV374AJ	SNJ54LV374AJ
	CFP – W	Tube of 85	SNJ54LV374AW	SNJ54LV374AW
	LCCC – FK	Tube of 55	SNJ54LV374AFK	SNJ54LV374AFK

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



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UNLESS OTHERWISE NOTED this document contains PRODUCTION DATA information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS  
INSTRUMENTS**

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# SN54LV374A, SN74LV374A OCTAL EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH 3-STATE OUTPUTS

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## description/ordering information (continued)

These devices feature 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

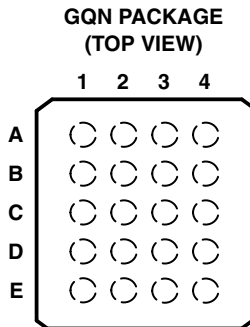
On the positive transition of the clock (CLK) input, the Q outputs are set to the logic levels set up at the data (D) inputs.

A buffered output-enable ( $\overline{OE}$ ) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and the increased drive provide the capability to drive bus lines without need for interface or pullup components.

$\overline{OE}$  does not affect internal operations of the latch. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

To ensure the high-impedance state during power up or power down,  $\overline{OE}$  should be tied to  $V_{CC}$  through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

These devices are fully specified for partial-power-down applications using  $I_{off}$ . The  $I_{off}$  circuitry disables the outputs, preventing damaging current backflow through the devices when they are powered down.



## terminal assignments

	1	2	3	4
A	1Q	$\overline{OE}$	$V_{CC}$	8Q
B	2D	7D	1D	8D
C	3Q	2Q	6Q	7Q
D	4D	5D	3D	6D
E	GND	4Q	CLK	5Q

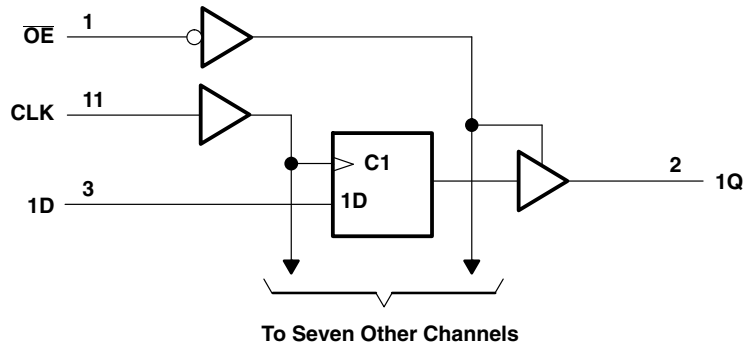
## FUNCTION TABLE (each flip-flop)

INPUTS			OUTPUT
$\overline{OE}$	CLK	D	Q
L	↑	H	H
L	↑	L	L
L	L	X	$Q_0$
H	X	X	Z

# SN54LV374A, SN74LV374A OCTAL EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH 3-STATE OUTPUTS

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## logic diagram (positive logic)



Pin numbers shown are for the DB, DGV, DW, FK, J, NS, PW, RGY, and W packages.

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

Supply voltage range, $V_{CC}$ .....	-0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1) .....	-0.5 V to 7 V
Voltage range applied to any output in the high-impedance or power-off state, $V_O$ (see Note 1) .....	-0.5 V to 7 V
Output voltage range, $V_O$ (see Notes 1 and 2) .....	-0.5 V to $V_{CC} + 0.5$ V
Input clamp current, $I_{IK}$ ( $V_I < 0$ ) .....	-20 mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ ) .....	-50 mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ ) .....	$\pm 35$ mA
Continuous current through $V_{CC}$ or GND .....	$\pm 70$ mA
Package thermal impedance, $\theta_{JA}$ (see Note 3): DB package .....	70°C/W
(see Note 3): DGV package .....	92°C/W
(see Note 3): DW package .....	58°C/W
(see Note 3): GQN package .....	78°C/W
(see Note 3): NS package .....	60°C/W
(see Note 3): PW package .....	83°C/W
(see Note 4): RGY package .....	37°C/W
Storage temperature range, $T_{stg}$ .....	-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.

- NOTES:
1. The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
  2. This value is limited to 5.5 V maximum.
  3. The package thermal impedance is calculated in accordance with JESD 51-7.
  4. The package thermal impedance is calculated in accordance with JESD 51-5.

# SN54LV374A, SN74LV374A OCTAL EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH 3-STATE OUTPUTS

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## recommended operating conditions (see Note 5)

		SN54LV374A		SN74LV374A		UNIT	
		MIN	MAX	MIN	MAX		
$V_{CC}$	Supply voltage	2	5.5	2	5.5	V	
$V_{IH}$	High-level input voltage	$V_{CC} = 2\text{ V}$	1.5	1.5		V	
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	$V_{CC} \times 0.7$	$V_{CC} \times 0.7$			
		$V_{CC} = 3\text{ V to }3.6\text{ V}$	$V_{CC} \times 0.7$	$V_{CC} \times 0.7$			
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$	$V_{CC} \times 0.7$	$V_{CC} \times 0.7$			
$V_{IL}$	Low-level input voltage	$V_{CC} = 2\text{ V}$		0.5	0.5	V	
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$		$V_{CC} \times 0.3$	$V_{CC} \times 0.3$		
		$V_{CC} = 3\text{ V to }3.6\text{ V}$		$V_{CC} \times 0.3$	$V_{CC} \times 0.3$		
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$		$V_{CC} \times 0.3$	$V_{CC} \times 0.3$		
$V_I$	Input voltage	0	5.5	0	5.5	V	
$V_O$	Output voltage	High or low state	0	$V_{CC}$	0	$V_{CC}$	V
		3-state	0	5.5	0	5.5	
$I_{OH}$	High-level output current	$V_{CC} = 2\text{ V}$		-50	-50	$\mu\text{A}$	
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$		-2	-2		
		$V_{CC} = 3\text{ V to }3.6\text{ V}$		-8	-8	mA	
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$		-16	-16		
$I_{OL}$	Low-level output current	$V_{CC} = 2\text{ V}$		50	50	$\mu\text{A}$	
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$		2	2		
		$V_{CC} = 3\text{ V to }3.6\text{ V}$		8	8	mA	
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$		16	16		
$\Delta t/\Delta v$	Input transition rise or fall rate	$V_{CC} = 2.3\text{ V to }2.7\text{ V}$		200	200	ns/V	
		$V_{CC} = 3\text{ V to }3.6\text{ V}$		100	100		
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$		20	20		
$T_A$	Operating free-air temperature	-55	125	-40	85	$^{\circ}\text{C}$	

NOTE 5: 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	$V_{CC}$	SN54LV374A			SN74LV374A			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
$V_{OH}$	$I_{OH} = -50\ \mu\text{A}$	2 V to 5.5 V	$V_{CC}-0.1$			$V_{CC}-0.1$			V
	$I_{OH} = -2\ \text{mA}$	2.3 V	2			2			
	$I_{OH} = -8\ \text{mA}$	3 V	2.48			2.48			
	$I_{OH} = -16\ \text{mA}$	4.5 V	3.8			3.8			
$V_{OL}$	$I_{OL} = 50\ \mu\text{A}$	2 V to 5.5 V						0.1	V
	$I_{OL} = 2\ \text{mA}$	2.3 V						0.4	
	$I_{OL} = 8\ \text{mA}$	3 V						0.44	
	$I_{OL} = 16\ \text{mA}$	4.5 V						0.55	
$I_I$	$V_I = 5.5\text{ V or GND}$	0 to 5.5 V						$\pm 1$	$\mu\text{A}$
$I_{OZ}$	$V_O = V_{CC}\text{ or GND}$	5.5 V						$\pm 5$	$\mu\text{A}$
$I_{CC}$	$V_I = V_{CC}\text{ or GND, } I_O = 0$	5.5 V						20	$\mu\text{A}$
$I_{off}$	$V_I\text{ or }V_O = 0\text{ to }5.5\text{ V}$	0						5	$\mu\text{A}$
$C_i$	$V_I = V_{CC}\text{ or GND}$	3.3 V		2.9				2.9	pF

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**timing requirements over recommended operating free-air temperature range,  $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$  (unless otherwise noted) (see Figure 1)**

		$T_A = 25^\circ\text{C}$		SN54LV374A		SN74LV374A		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
$t_w$	Pulse duration, CLK high or low	6		7		7		ns
$t_{su}$	Setup time, data before CLK $\uparrow$	5		5.5		5.5		ns
$t_h$	Hold time, data after CLK $\uparrow$	2.5		2.5		2.5		ns

**timing requirements over recommended operating free-air temperature range,  $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$  (unless otherwise noted) (see Figure 1)**

		$T_A = 25^\circ\text{C}$		SN54LV374A		SN74LV374A		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
$t_w$	Pulse duration, CLK high or low	5		5.5		5.5		ns
$t_{su}$	Setup time, data before CLK $\uparrow$	4.5		4.5		4.5		ns
$t_h$	Hold time, data after CLK $\uparrow$	2		2		2		ns

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

		$T_A = 25^\circ\text{C}$		SN54LV374A		SN74LV374A		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	
$t_w$	Pulse duration, CLK high or low	5		5		5		ns
$t_{su}$	Setup time, data before CLK $\uparrow$	3		3		3		ns
$t_h$	Hold time, data after CLK $\uparrow$	2		2		2		ns

**switching characteristics over recommended operating free-air temperature range,  $V_{CC} = 2.5\text{ V} \pm 0.2\text{ V}$  (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN54LV374A		SN74LV374A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$f_{max}$			$C_L = 15\text{ pF}$	60*	105*		50*		50	MHz	
			$C_L = 50\text{ pF}$	50	85		40		40		
$t_{pd}$	CLK	Q	$C_L = 15\text{ pF}$	9.7*	16.3*		1*	19*	1	19	ns
$t_{en}$	OE	Q		8.9*	15.9*		1*	19*	1	19	
$t_{dis}$	$\overline{\text{OE}}$	Q		6.3*	12.6*		1*	15*	1	15	
$t_{pd}$	CLK	Q	$C_L = 50\text{ pF}$	11.8	19.3		1	23	1	23	ns
$t_{en}$	$\overline{\text{OE}}$	Q		10.9	18.8		1	22	1	22	
$t_{dis}$	$\overline{\text{OE}}$	Q		8.2	17.3		1	19	1	19	
$t_{sk(o)}$										2	

\* On products compliant to MIL-PRF-38535, this parameter is not production tested.

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switching characteristics over recommended operating free-air temperature range,  $V_{CC} = 3.3 V \pm 0.3 V$  (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ C$			SN54LV374A		SN74LV374A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$f_{max}$			$C_L = 15 \text{ pF}$	80*	150*		70*		70		MHz
			$C_L = 50 \text{ pF}$	55	110		50		50		
$t_{pd}$	CLK	Q	$C_L = 15 \text{ pF}$		6.8*	12.7*	1*	15*	1	15	ns
$t_{en}$	$\overline{OE}$	Q			6.3*	11*	1*	13*	1	13	
$t_{dis}$	$\overline{OE}$	Q			4.7*	10.5*	1*	12.5*	1	12.5	
$t_{pd}$	CLK	Q	$C_L = 50 \text{ pF}$		8.3	16.2	1	18.5	1	18.5	ns
$t_{en}$	$\overline{OE}$	Q			7.7	14.5	1	16.5	1	16.5	
$t_{dis}$	$\overline{OE}$	Q			5.9	14	1	16	1	16	
$t_{sk(o)}$							1.5			1.5	

\* On products compliant to MIL-PRF-38535, this parameter is not production tested.

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 (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ C$			SN54LV374A		SN74LV374A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$f_{max}$			$C_L = 15 \text{ pF}$	130*	205*		110*		110		MHz
			$C_L = 50 \text{ pF}$	85	170		75		75		
$t_{pd}$	CLK	Q	$C_L = 15 \text{ pF}$		4.9*	8.1*	1*	9.5*	1	9.5	ns
$t_{en}$	$\overline{OE}$	Q			4.6*	7.6*	1*	9*	1	9	
$t_{dis}$	$\overline{OE}$	Q			3.4*	6.8*	1*	8*	1	8	
$t_{pd}$	CLK	Q	$C_L = 50 \text{ pF}$		5.9	10.1	1	11.5	1	11.5	ns
$t_{en}$	$\overline{OE}$	Q			5.5	9.6	1	11	1	11	
$t_{dis}$	$\overline{OE}$	Q			4	8.8	1	10	1	10	
$t_{sk(o)}$							1			1	

\* On products compliant to MIL-PRF-38535, this parameter is not production tested.

noise characteristics,  $V_{CC} = 3.3 V$ ,  $C_L = 50 \text{ pF}$ ,  $T_A = 25^\circ C$  (see Note 6)

PARAMETER				SN74LV374A			UNIT
				MIN	TYP	MAX	
$V_{OL(P)}$	Quiet output, maximum dynamic $V_{OL}$				0.6	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic $V_{OL}$				-0.5	-0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic $V_{OH}$				2.9		V
$V_{IH(D)}$	High-level dynamic input voltage				2.31		V
$V_{IL(D)}$	Low-level dynamic input voltage					0.99	V

NOTE 6: Characteristics are for surface-mount packages only.

operating characteristics,  $T_A = 25^\circ C$

PARAMETER		TEST CONDITIONS	$V_{CC}$	TYP	UNIT	
$C_{pd}$	Power dissipation capacitance	Outputs enabled	$C_L = 50 \text{ pF}$ , $f = 10 \text{ MHz}$	3.3 V	21.1	pF
				5 V	22.8	

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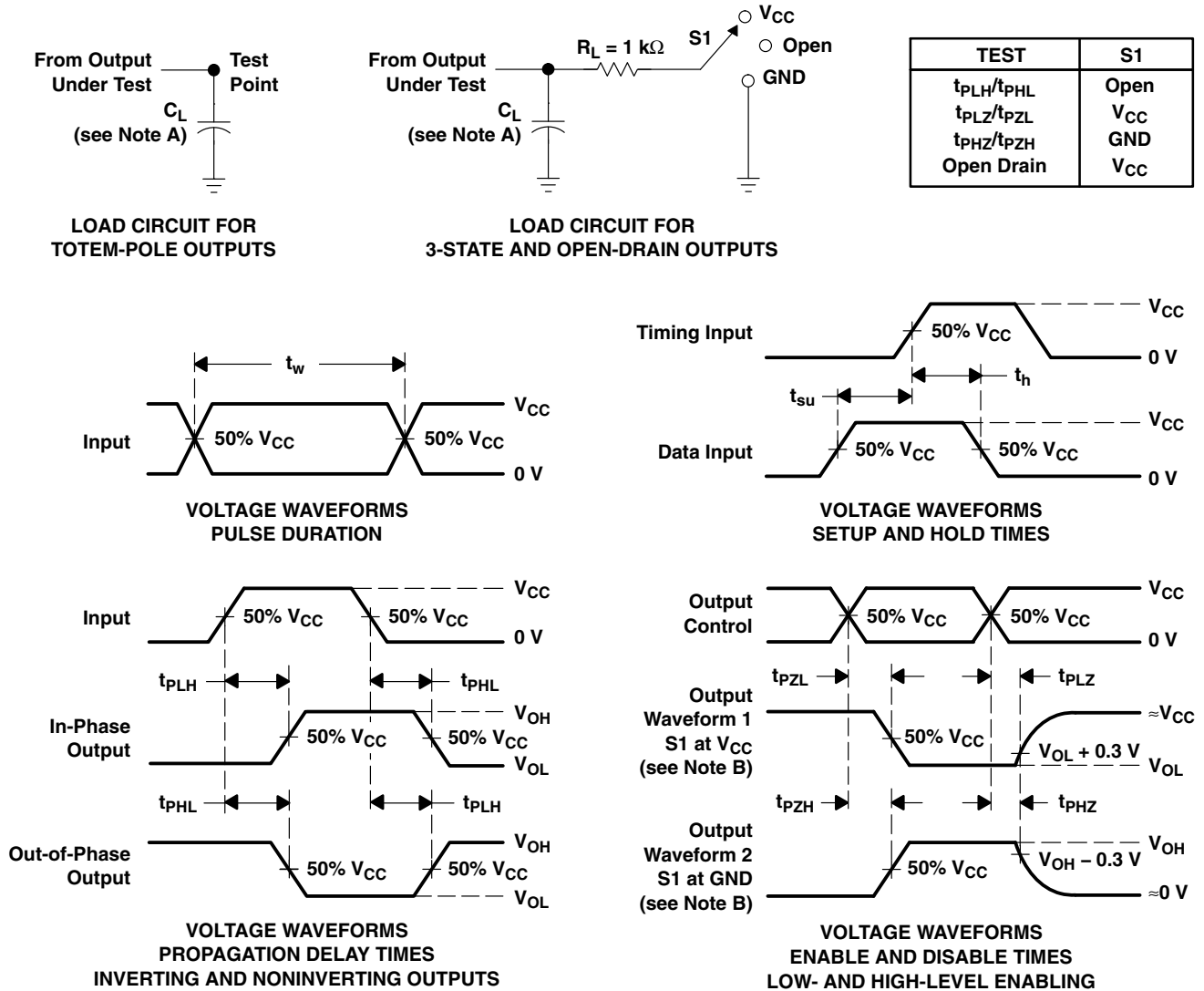


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## PARAMETER MEASUREMENT INFORMATION



- 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,  $Z_O = 50\ \Omega$ ,  $t_r \leq 3$  ns,  $t_f \leq 3$  ns.
  - D. The outputs are measured one at a time, with one input 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.  $t_{PHL}$  and  $t_{PLH}$  are the same as  $t_{pd}$ .
  - H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/ Ball Finish	MSL Peak Temp <sup>(3)</sup>	Samples (Requires Login)
SN74LV374ADBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADBRG4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ADWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ANSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ANSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374ANSRG4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	



Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/ Ball Finish	MSL Peak Temp <sup>(3)</sup>	Samples (Requires Login)
SN74LV374APWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWT	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWTE4	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
SN74LV374APWTG4	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	

<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.

<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.

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

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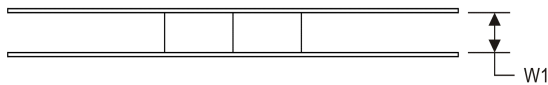
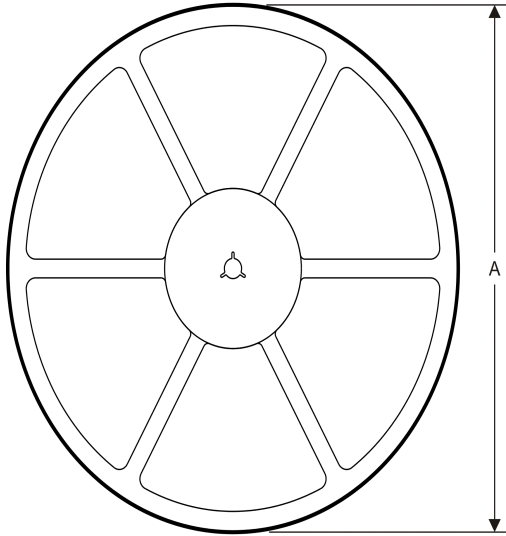
#### OTHER QUALIFIED VERSIONS OF SN74LV374A :

- Automotive: [SN74LV374A-Q1](#)

- Enhanced Product: [SN74LV374A-EP](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications

**TAPE AND REEL INFORMATION**
**REEL DIMENSIONS**

**TAPE DIMENSIONS**


A0	Dimension designed to accommodate the component width
B0	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	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LV374ADBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74LV374ADWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
SN74LV374ANSR	SO	NS	20	2000	330.0	24.4	8.2	13.0	2.5	12.0	24.0	Q1
SN74LV374APWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
SN74LV374APWT	TSSOP	PW	20	250	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV374ADBR	SSOP	DB	20	2000	367.0	367.0	38.0
SN74LV374ADWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74LV374ANSR	SO	NS	20	2000	367.0	367.0	45.0
SN74LV374APWR	TSSOP	PW	20	2000	367.0	367.0	38.0
SN74LV374APWT	TSSOP	PW	20	250	367.0	367.0	38.0

DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - Falls within JEDEC MS-013 variation AC.

DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



4209202-4/E 07/11

- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Refer to IPC7351 for alternate board design.
  - 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.

PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE

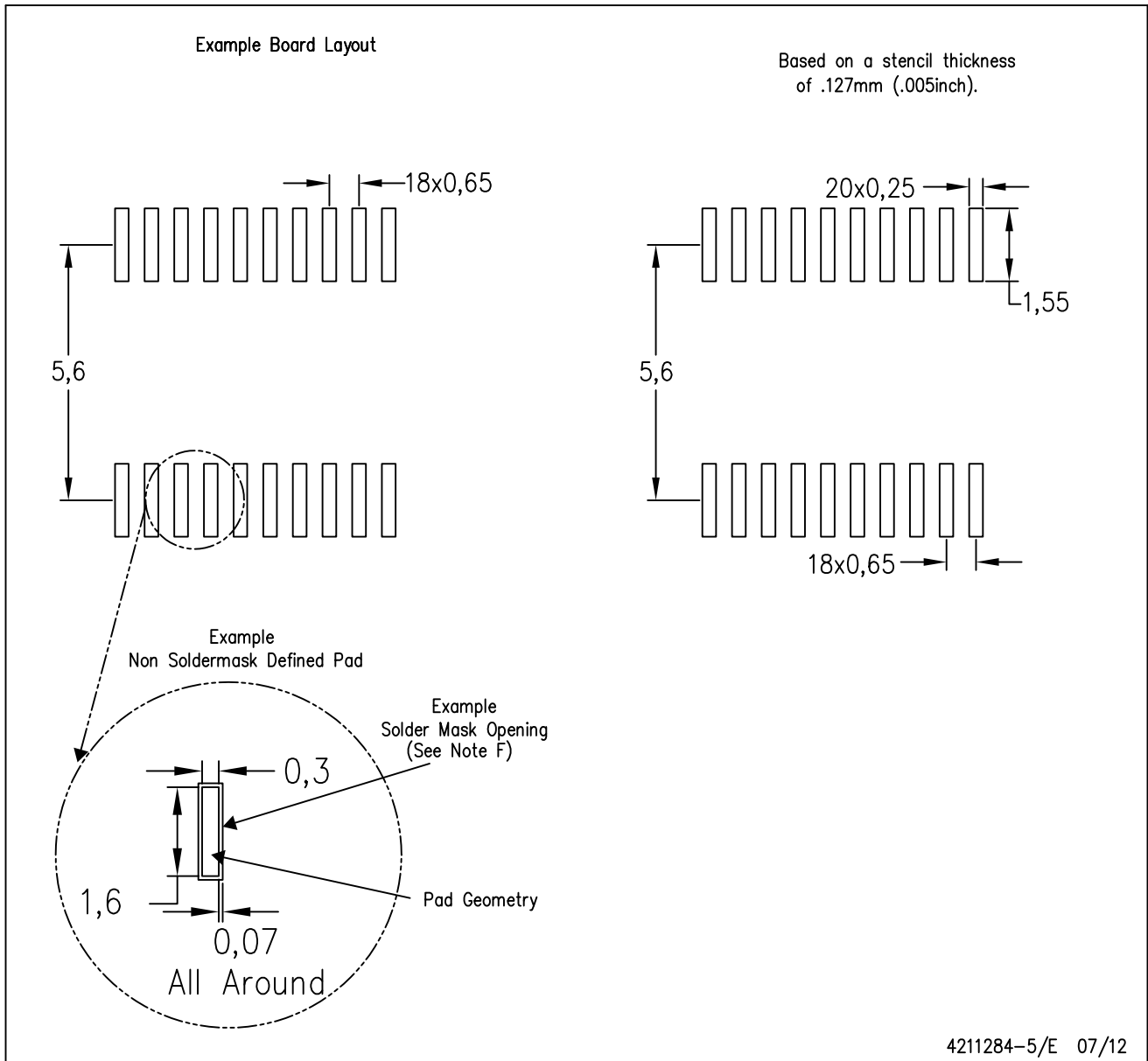


4040064-5/G 02/11

- 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. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
  - D. 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-G20)

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 design.
  - 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.



# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-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.

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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