

# SN74LV4066A Quadruple Bilateral Analog Switches

## 1 Features

- 1.65V to 5.5V  $V_{CC}$  operation
- Support mixed-mode voltage operation on all ports
- High on-off output-voltage ratio
- Low crosstalk between switches
- Individual switch controls
- Extremely low input current
- ESD protection exceeds JESD 22:
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 750-V Charged-Device Model (C101)

## 2 Applications

- [Telecommunications](#)
- [eCall](#)
- [Infotainment](#)

## 3 Description

This quadruple silicon-gate CMOS analog switch is designed for 1.65V to 5.5V  $V_{CC}$  operation.

These switches are designed to handle both analog and digital signals. Each switch permits signals with amplitudes up to 5.5V (peak) to be transmitted in either direction.

Each switch section has its own enable-input control (C). A high-level voltage applied to C turns on the associated switch section.

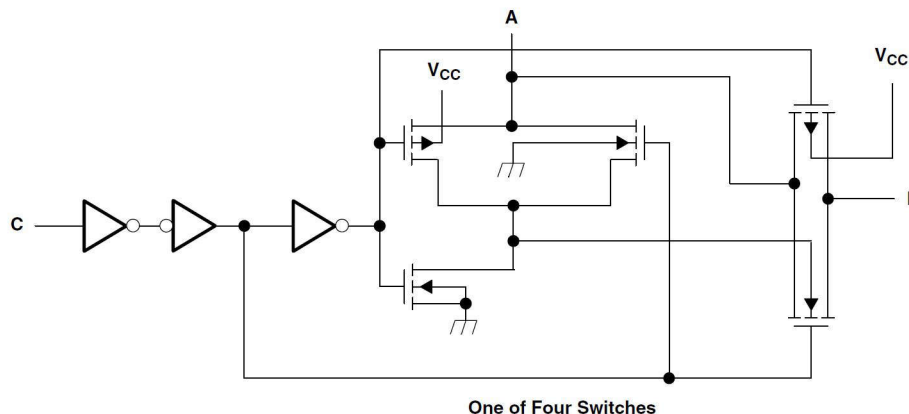
Applications include signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog-to-digital and digital-to-analog conversion systems.

### Package Information

PART NUMBER	PACKAGE <sup>(1)</sup>	PACKAGE SIZE <sup>(2)</sup>
SN74LV4066A	D (SOIC, 14)	8.65mm × 6mm
	PW (TSSOP, 14)	5mm × 6.4mm
	RGY (QFN, 14)	3.5mm × 3.5mm

(1) For more information, see [Section 10](#).

(2) The package size (length × width) is a nominal value and includes pins, where applicable.



Logic Diagram (Positive Logic)



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## 4 Pin Configuration and Functions

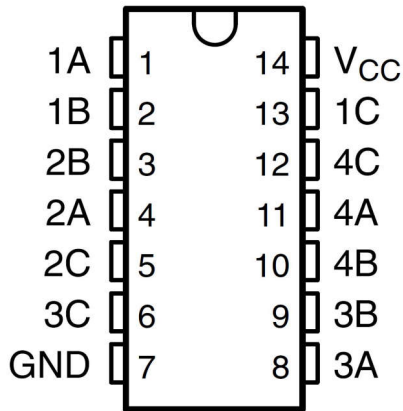


Figure 4-1. D or PW Package, 14-Pin SOIC or TSSOP (Top View)

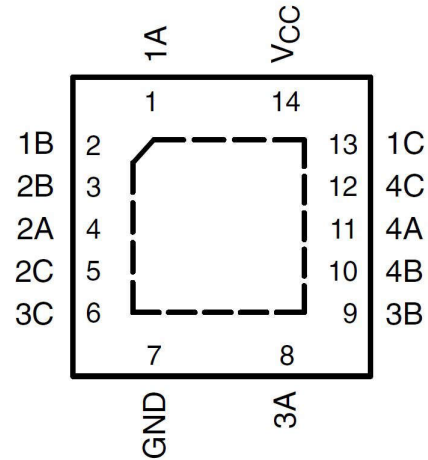


Figure 4-2. RGY Package, 14-Pin QFN (Top View)

Table 4-1. Pin Functions

PIN		TYPE <sup>(1)</sup>	DESCRIPTION
NAME	NO.		
1A	1	I/O	Input/Output to switch channel 1
1B	2	I/O	Input/Output to switch channel 1
2B	3	I/O	Input/Output to switch channel 2
2A	4	I/O	Input/Output to switch channel 2
2C	5	I	Control line for channel 2. Switch is ON when control pin is high.
3C	6	I	Control line for channel 3. Switch is ON when control pin is high.
GND	7	—	Ground (0V) reference
3A	8	I/O	Input/Output to switch channel 3
3B	9	I/O	Input/Output to switch channel 3
4B	10	I/O	Input/Output to switch channel 4
4A	11	I/O	Input/Output to switch channel 4
4C	12	I	Control line for channel 4. Switch is ON when control pin is high.
1C	13	I	Control line for channel 1. Switch is ON when control pin is high.
V <sub>CC</sub>	14	—	Positive power supply. This pin is the most positive power-supply potential. For reliable operation, connect a decoupling capacitor ranging from 0.1µF to 10µF between VDD and GND.
Thermal pad		—	It is recommended to tie the pad to GND for the best performance.

(1) Signal types: I = input, O = output, I/O = input or output.

## 5 Specifications

### 5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)<sup>(1) (3)</sup>

		MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage	-0.5	7.0	V
V <sub>I</sub>	Logic input voltage range	-0.5	7.0	V
V <sub>IO</sub>	Switch I/O voltage range <sup>(2) (3)</sup>	-0.5	V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Logic input clamp current	V <sub>I</sub> < 0		mA
I <sub>IOK</sub>	Switch path diode clamp current	V <sub>IO</sub> < 0 or V <sub>IO</sub> > V <sub>CC</sub>	50	mA
I <sub>T</sub>	Switch continuous current	V <sub>IO</sub> = 0 to V <sub>CC</sub>	±25	mA
	Continuous current through V <sub>CC</sub> or GND		±50	mA
T <sub>J</sub>	Junction temperature		150	°C
T <sub>stg</sub>	Storage temperature	-65	150	°C

- (1) Operation outside the *Absolute Maximum Ratings* may cause permanent device damage. Absolute maximum ratings do not imply functional operation of the device at these or any other conditions beyond those listed under *Recommended Operating Conditions*. If briefly operating outside the *Recommended Operating Conditions* but within the *Absolute Maximum Ratings*, the device may not sustain damage, but it may not be fully functional. Operating the device in this manner may affect device reliability, functionality, performance, and shorten the device lifetime.
- (2) Pins are diode-clamped to the power-supply rails. Over voltage signals must be voltage and current limited to maximum ratings.
- (3) This value is limited to 5.5V maximum

### 5.2 ESD Ratings

			VALUE	UNIT
V <sub>(ESD)</sub>	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/ JEDEC JS-001, all pins <sup>(1)</sup>	±2000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins <sup>(2)</sup>	±1000	

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

### 5.3 Thermal Information: SN74LV4066A

THERMAL METRIC <sup>(1)</sup>		SN74LV4066A			UNIT
		D (SOIC)	PW (TSSOP)	RGY (VQFN)	
		14 PINS	14 PINS	14 PINS	
R <sub>θJA</sub>	Junction-to-ambient thermal resistance	128.8	150.6	91.9	°C/W
R <sub>θJC(top)</sub>	Junction-to-case (top) thermal resistance	81.8	78.2	91.8	°C/W
R <sub>θJB</sub>	Junction-to-board thermal resistance	84.2	93.7	66.5	°C/W
Ψ <sub>JT</sub>	Junction-to-top characterization parameter	39.5	24.6	20.0	°C/W
Ψ <sub>JB</sub>	Junction-to-board characterization parameter	83.7	93.1	66.3	°C/W
R <sub>θJC(bot)</sub>	Junction-to-case (bottom) thermal resistance	N/A	N/A	50.0	°C/W

- (1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC Package Thermal Metrics](#) application report.

## 5.4 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

		MIN	NOM	MAX	UNIT
V <sub>CC</sub>	Supply voltage	1.65		5.5	V
V <sub>IH</sub>	High-level input voltage, logic control inputs	V <sub>CC</sub> = 2V	1.5	5.5	V
		V <sub>CC</sub> = 2.3V to 2.7V	V <sub>CC</sub> × 0.7	5.5	
		V <sub>CC</sub> = 3V to 3.6V	V <sub>CC</sub> × 0.7	5.5	
		V <sub>CC</sub> = 4.5V to 5.5V	V <sub>CC</sub> × 0.7	5.5	
V <sub>IL</sub>	Low-level input voltage, logic control inputs	V <sub>CC</sub> = 2V	0	0.5	V
		V <sub>CC</sub> = 2.3V to 2.7V	0	V <sub>CC</sub> × 0.3	
		V <sub>CC</sub> = 3V to 3.6V	0	V <sub>CC</sub> × 0.3	
		V <sub>CC</sub> = 4.5V to 5.5V	0	V <sub>CC</sub> × 0.3	
V <sub>I</sub>	Logic control input voltage	0		5.5	V
V <sub>IO</sub>	Switch input or output voltage	0		V <sub>CC</sub>	V
Δt/ΔV	Logic input transition rise or fall rate	V <sub>CC</sub> = 2.3V to 2.7V		200	ns/V
		V <sub>CC</sub> = 3V to 3.6V		100	
		V <sub>CC</sub> = 4.5V to 5.5V		20	
T <sub>A</sub>	Ambient temperature	–40		125	°C

(1) All unused inputs of the device must be held at V<sub>CC</sub> or GND for proper device operation. Refer to TI application report *Implications of Slow or Floating CMOS Inputs*, SCBA004.

## 5.5 Electrical Characteristics (LV)

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

PARAMETER	CONDITIONS	T <sub>A</sub>	V <sub>CC</sub>	MIN	TYP	MAX	UNIT	
r <sub>ON</sub>	ON-state switch resistance	I <sub>T</sub> = 2mA, V <sub>I</sub> = V <sub>CC</sub> or GND, V <sub>INH</sub> = V <sub>IL</sub> (see Figure 6-1)	1.65V		25°C	60	150	Ω
					–40°C to 85°C		225	
					–40°C to 125°C		225	
			25°C	38	180			
			–40°C to 85°C		225			
			–40°C to 125°C		225			
			3V		25°C	29	150	Ω
					–40°C to 85°C		190	
					–40°C to 125°C		190	
			4.5V		25°C	21	75	Ω
					–40°C to 85°C		100	
					–40°C to 125°C		100	

## 5.5 Electrical Characteristics (LV) (continued)

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

PARAMETER		CONDITIONS	T <sub>A</sub>	V <sub>CC</sub>	MIN	TYP	MAX	UNIT	
r <sub>ON(p)</sub>	Peak ON-state resistance	I <sub>T</sub> = 2mA, V <sub>I</sub> = GND to V <sub>CC</sub> , V <sub>INH</sub> = V <sub>IL</sub>	25°C	1.65V			130	600	Ω
			–40°C to 85°C				700		
			–40°C to 125°C				700		
			25°C	2.3V			143	500	
			–40°C to 85°C				600		
			–40°C to 125°C				600		
			25°C	3V			57	180	Ω
			–40°C to 85°C				225		
			–40°C to 125°C				225		
			25°C	4.5V			31	100	Ω
			–40°C to 85°C				125		
			–40°C to 125°C				125		
Δr <sub>ON</sub>	Difference in ON-state resistance between switches	I <sub>T</sub> = 2mA, V <sub>I</sub> = GND to V <sub>CC</sub> , V <sub>INH</sub> = V <sub>IL</sub>	25°C	1.65V			2.5	Ω	
			–40°C to 85°C				3		
			–40°C to 125°C				3		
			25°C	2.3V			3		30
			–40°C to 85°C				40		
			–40°C to 125°C				40		
			25°C	3V			3	20	Ω
			–40°C to 85°C				30		
			–40°C to 125°C				30		
			25°C	4.5V			2	15	Ω
			–40°C to 85°C				20		
			–40°C to 125°C				20		
I <sub>IH</sub> I <sub>IL</sub>	Control input current	V <sub>I</sub> = 5.5V or GND	25°C	0 to 5.5V			0.1	μA	
			–40°C to 85°C				1		
			–40°C to 125°C				1		
I <sub>S(off)</sub>	OFF-state switch leakage current	V <sub>I</sub> = V <sub>CC</sub> and V <sub>O</sub> = GND, or V <sub>I</sub> = GND and V <sub>O</sub> = V <sub>CC</sub> , V <sub>INH</sub> = V <sub>IH</sub> (see Figure 6-2)	25°C	5.5V			±0.1	μA	
			–40°C to 85°C				±1		
			–40°C to 125°C				±1		
I <sub>S(on)</sub>	ON-state switch leakage current	V <sub>I</sub> = V <sub>CC</sub> or GND, V <sub>INH</sub> = V <sub>IL</sub> (see Figure 6-3)	25°C	5.5V			±0.1	μA	
			–40°C to 85°C				±1		
			–40°C to 125°C				±1		
I <sub>CC</sub>	Supply current	V <sub>I</sub> = V <sub>CC</sub> or GND V <sub>INH</sub> = 0V	25°C	5.5V			0.01	μA	
			–40°C to 85°C				20		
			–40°C to 125°C				20		
C <sub>IC</sub>	Control input capacitance	f = 10MHz	25°C	3.3V		4	pF		
C <sub>IS</sub>	Switch terminal capacitance	f = 10MHz	25°C	3.3V		5.5	pF		
C <sub>OS(on)</sub>	Common terminal ON-capacitance	f = 10MHz	25°C	3.3V		5.5	pF		
C <sub>F</sub>	Feedthrough capacitance	f = 10MHz	25°C	3.3V		0.5	pF		

### 5.5 Electrical Characteristics (LV) (continued)

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

PARAMETER		CONDITIONS	T <sub>A</sub>	V <sub>CC</sub>	MIN	TYP	MAX	UNIT
C <sub>PD</sub>	Power dissipation capacitance	C <sub>L</sub> = 50pF, f = 10MHz	25°C	3.3V		4.5		pF

### 5.6 Timing Characteristics V<sub>CC</sub> = 2.5V ± 0.2V

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

V<sub>CC</sub> = 2V ± 0.2V (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	T <sub>A</sub>	MIN	TYP	MAX	UNIT
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay time	COM or Y <sub>n</sub>	Y <sub>n</sub> or COM	C <sub>L</sub> = 15pF (see Figure 6-4)	25°C		1.2	10	ns
					-40°C to 85°C			16	
					-40°C to 125°C			18	
t <sub>PZH</sub> t <sub>PZL</sub>	Enable delay time	INH	COM or Y <sub>n</sub>	C <sub>L</sub> = 15pF (see Figure 6-5)	25°C		3.3	15	ns
					-40°C to 85°C			20	
					-40°C to 125°C			20	
t <sub>PHZ</sub> t <sub>PLZ</sub>	Disable delay time	INH	COM or Y <sub>n</sub>	C <sub>L</sub> = 15pF (see Figure 6-5)	25°C		6	15	ns
					-40°C to 85°C			23	
					-40°C to 125°C			23	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay time	COM or Y <sub>n</sub>	Y <sub>n</sub> or COM	C <sub>L</sub> = 50pF (see Figure 6-4)	25°C		2.6	12	ns
					-40°C to 85°C			18	
					-40°C to 125°C			18	
t <sub>PZH</sub> t <sub>PZL</sub>	Enable delay time	INH	COM or Y <sub>n</sub>	C <sub>L</sub> = 50pF (see Figure 6-5)	25°C		4.2	25	ns
					-40°C to 85°C			32	
					-40°C to 125°C			32	
t <sub>PHZ</sub> t <sub>PLZ</sub>	Disable delay time	INH	COM or Y <sub>n</sub>	C <sub>L</sub> = 50pF (see Figure 6-5)	25°C		9.6	25	ns
					-40°C to 85°C			32	
					-40°C to 125°C			32	

### 5.7 Timing Characteristics V<sub>CC</sub> = 3.3V ± 0.3V

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

V<sub>CC</sub> = 3.3V ± 0.3V (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	T <sub>A</sub>	MIN	TYP	MAX	UNIT
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay time	COM or Y <sub>n</sub>	Y <sub>n</sub> or COM	C <sub>L</sub> = 15pF (see Figure 6-4)	25°C		0.8	6	ns
					-40°C to 85°C			10	
					-40°C to 125°C			10	
t <sub>PZH</sub> t <sub>PZL</sub>	Enable delay time	INH	COM or Y <sub>n</sub>	C <sub>L</sub> = 15pF (see Figure 6-5)	25°C		2.3	11	ns
					-40°C to 85°C			15	
					-40°C to 125°C			15	
t <sub>PHZ</sub> t <sub>PLZ</sub>	Disable delay time	INH	COM or Y <sub>n</sub>	C <sub>L</sub> = 15pF (see Figure 6-5)	25°C		4.5	11	ns
					-40°C to 85°C			15	
					-40°C to 125°C			15	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay time	COM or Y <sub>n</sub>	Y <sub>n</sub> or COM	C <sub>L</sub> = 50pF (see Figure 6-4)	25°C		1.5	9	ns
					-40°C to 85°C			12	
					-40°C to 125°C			12	

### 5.7 Timing Characteristics $V_{CC} = 3.3V \pm 0.3V$ (continued)

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

 $V_{CC} = 3.3V \pm 0.3V$  (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	$T_A$	MIN	TYP	MAX	UNIT
$t_{PZH}$ $t_{PZL}$	Enable delay time	INH	COM or Yn	$C_L = 50pF$ (see Figure 6-5)	25°C		8	18	ns
					-40°C to 85°C			22	
					-40°C to 125°C			22	
$t_{PHZ}$ $t_{PLZ}$	Disable delay time	INH	COM or Yn	$C_L = 50pF$ (see Figure 6-5)	25°C		7.2	18	ns
					-40°C to 85°C			22	
					-40°C to 125°C			22	

### 5.8 Timing Characteristics $V_{CC} = 5V \pm 0.5V$

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

 $V_{CC} = 5V \pm 0.5V$  (unless otherwise noted)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	CONDITIONS	$T_A$	MIN	TYP	MAX	UNIT
$t_{PLH}$ $t_{PHL}$	Propagation delay time	COM or Yn	Yn or COM	$C_L = 15pF$ (see Figure 6-4)	25°C		0.6	4	ns
					-40°C to 85°C			7	
					-40°C to 125°C			7	
$t_{PZH}$ $t_{PZL}$	Enable delay time	INH	COM or Yn	$C_L = 15pF$ (see Figure 6-5)	25°C		3.5	8	ns
					-40°C to 85°C			10	
					-40°C to 125°C			11	
$t_{PHZ}$ $t_{PLZ}$	Disable delay time	INH	COM or Yn	$C_L = 15pF$ (see Figure 6-5)	25°C		4.4	8	ns
					-40°C to 85°C			10	
					-40°C to 125°C			10	
$t_{PLH}$ $t_{PHL}$	Propagation delay time	COM or Yn	Yn or COM	$C_L = 50pF$ (see Figure 6-4)	25°C		0.8	6	ns
					-40°C to 85°C			8	
					-40°C to 125°C			8	
$t_{PZH}$ $t_{PZL}$	Enable delay time	INH	COM or Yn	$C_L = 50pF$ (see Figure 6-5)	25°C		7	13	ns
					-40°C to 85°C			16	
					-40°C to 125°C			16	
$t_{PHZ}$ $t_{PLZ}$	Disable delay time	INH	COM or Yn	$C_L = 50pF$ (see Figure 6-5)	25°C		6.2	13	ns
					-40°C to 85°C			16	
					-40°C to 125°C			16	

### 5.9 AC Characteristics

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	Device	CONDITIONS	MIN	TYP	MAX	UNIT
Frequency response (switch on)	COM or Yn	Yn or COM	4066	$C_L = 50pF$ , $R_L = 50\Omega$ , $F_{in} = 1MHz$ (sine wave) (see Figure 6-6) (1)	$V_{CC} = 2.3V$		60	MHz
					$V_{CC} = 3V$		75	
					$V_{CC} = 4.5V$		100	
Charge Injection (control input to signal output)	INH	COM or Yn	ALL	$C_L = 50pF$ , $F_{in} = 1MHz$ (sine wave) (see Figure 6-7)	$V_{CC} = 2.3V$		15	mV
					$V_{CC} = 3V$		20	
					$V_{CC} = 4.5V$		50	



## 5.9 AC Characteristics (continued)

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	Device	CONDITIONS	MIN	TYP	MAX	UNIT
Feedthrough attenuation (switch off)	COM or Yn	Yn or COM	ALL	C <sub>L</sub> = 50pF, R <sub>L</sub> = 50Ω, F <sub>in</sub> = 1MHz (sine wave) (see <a href="#">Figure 6-8(2)</a> )	V <sub>CC</sub> = 2.3V		-40	dB
					V <sub>CC</sub> = 3V		-40	
					V <sub>CC</sub> = 4.5V		-40	
Crosstalk (between any switches)	COM or Yn	Yn or COM	ALL	C <sub>L</sub> = 50pF, R <sub>L</sub> = 50Ω, F <sub>in</sub> = 1MHz (sine wave) (see <a href="#">Figure 6-9(2)</a> )	V <sub>CC</sub> = 2.3V		-45	dB
					V <sub>CC</sub> = 3V		-45	
					V <sub>CC</sub> = 4.5V		-45	
Sine-wave distortion	COM or Yn	Yn or COM	ALL	C <sub>L</sub> = 50pF, R <sub>L</sub> = 10kΩ, F <sub>in</sub> = 1kHz (sine wave) (see <a href="#">Figure 6-10</a> )	V <sub>I</sub> = 2V <sub>p-p</sub> , V <sub>CC</sub> = 2.3V		0.1	%
					V <sub>I</sub> = 2.5V <sub>p-p</sub> , V <sub>CC</sub> = 3V		0.1	
					V <sub>I</sub> = 4V <sub>p-p</sub> , V <sub>CC</sub> = 4.5V		0.1	

## 6 Parameter Measurement Information

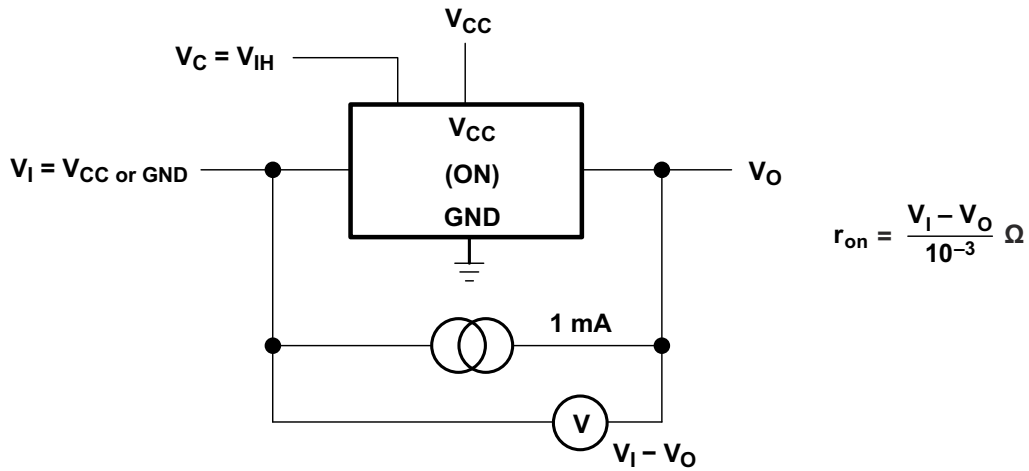
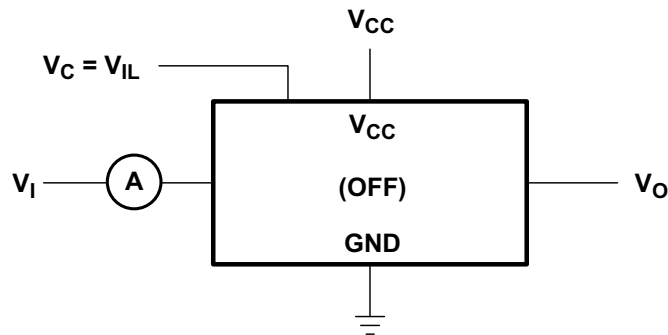
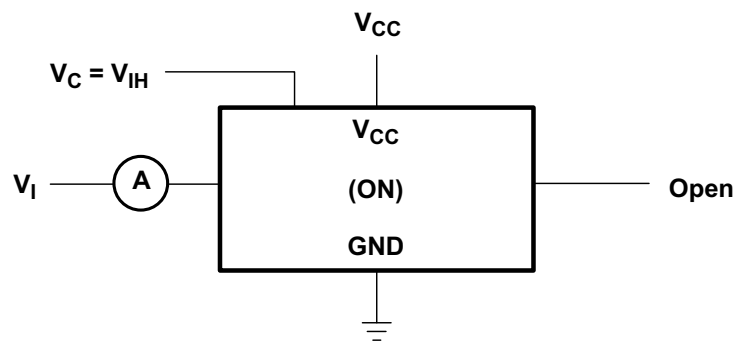


Figure 6-1. ON-State Resistance Test Circuit



Condition 1:  $V_I = 0, V_O = V_{CC}$   
 Condition 2:  $V_I = V_{CC}, V_O = 0$

Figure 6-2. OFF-State Switch Leakage-Current Test Circuit



$V_I = V_{CC} \text{ or } GND$

Figure 6-3. ON-State Leakage-Current Test Circuit

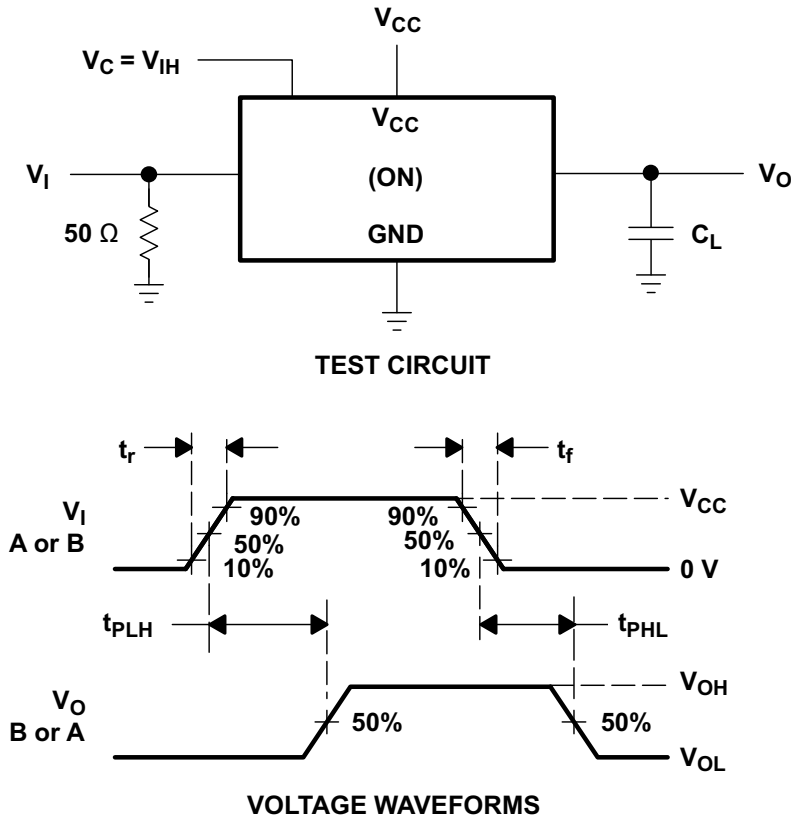
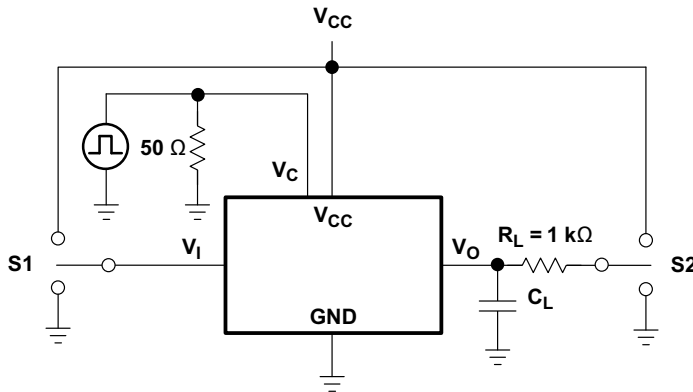
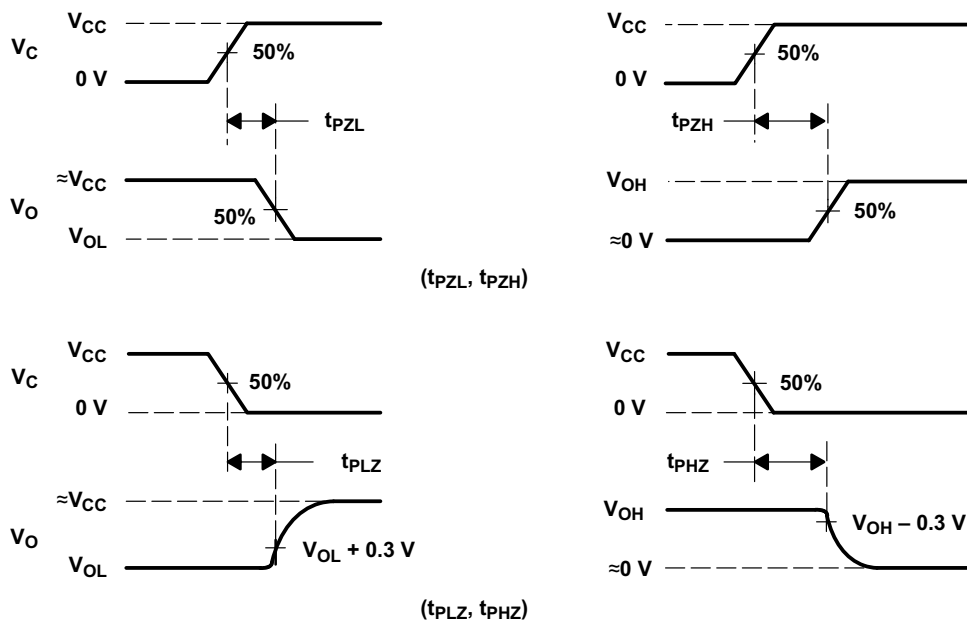


Figure 6-4. Propagation Delay Time, Signal Input to Signal Output



TEST CIRCUIT

TEST	S1	S2
$t_{PZL}$	GND	$V_{CC}$
$t_{PZH}$	$V_{CC}$	GND
$t_{PLZ}$	GND	$V_{CC}$
$t_{PHZ}$	$V_{CC}$	GND



VOLTAGE WAVEFORMS

Figure 6-5. Switching Time ( $t_{PZL}$ ,  $t_{PLZ}$ ,  $t_{PZH}$ ,  $t_{PHZ}$ ), Control to Signal Output

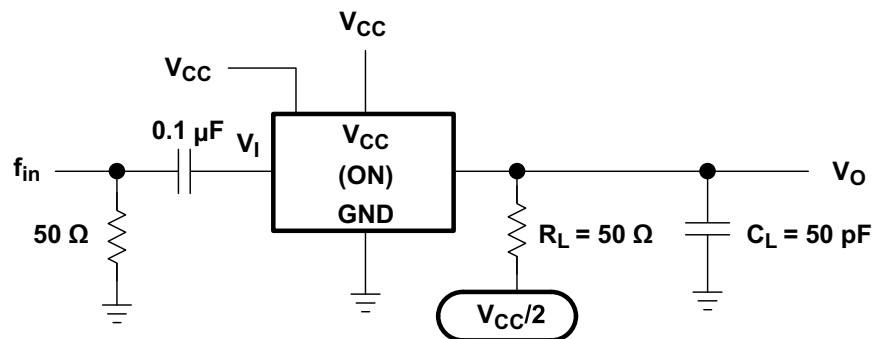


Figure 6-6. Frequency Response (Switch ON)

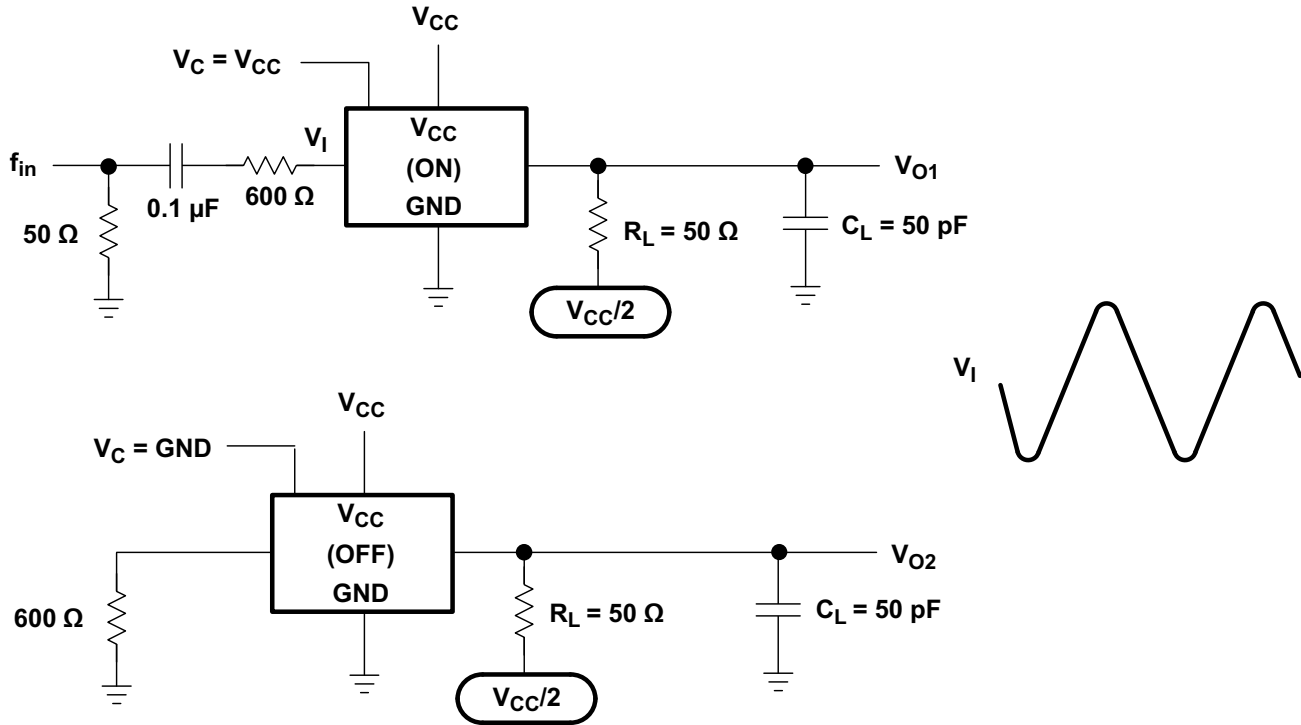


Figure 6-7. Crosstalk Between Any Two Switches

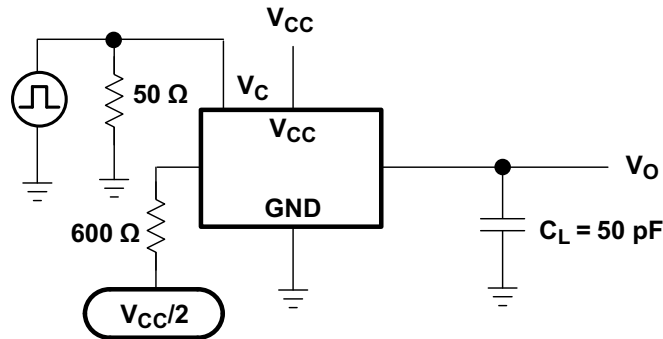


Figure 6-8. Crosstalk (Control Input – Switch Output)

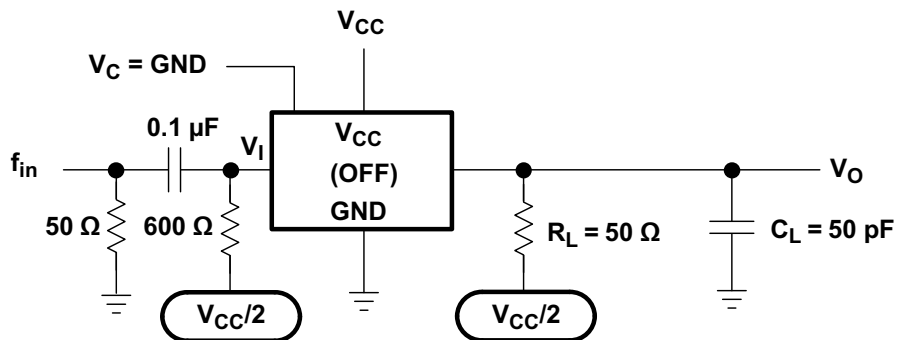


Figure 6-9. Feed-Through Attenuation (Switch OFF)

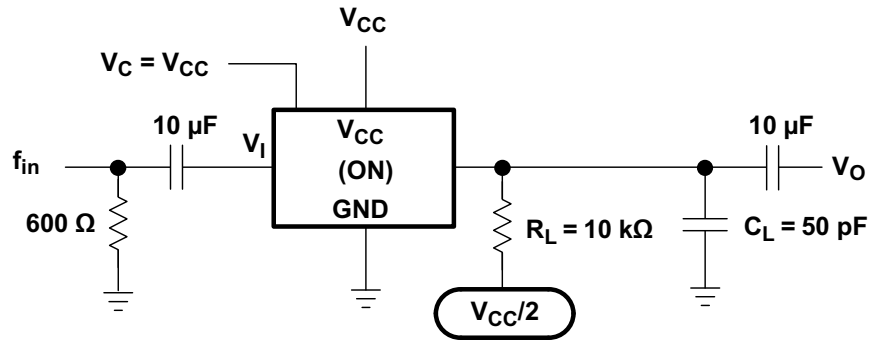


Figure 6-10. Sine-Wave Distortion

## 7 Detailed Description

### 7.1 Functional Block Diagram

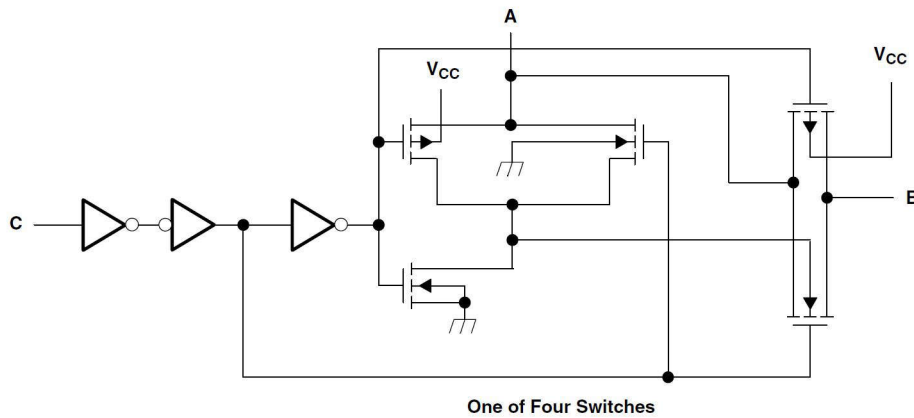


Figure 7-1. Logic Diagram (Positive Logic)

### 7.2 Device Functional Modes

Table 7-1. Function Table

Input Control (C)	Switch
L	OFF
H	ON

## 8 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

### 8.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](http://ti.com). Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

### 8.2 Support Resources

[TI E2E™ support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

### 8.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.  
All trademarks are the property of their respective owners.

### 8.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 8.5 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

## 9 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision I (April 2006) to Revision J (February 2024)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1
• Removed the SN54LV4066A information from the data sheet.....	1
• Increased $V_{CC}$ operation from: 2V to 5.5V to: 1.65V to 5.5V, and updated specifications such as $r_{ON}$ , $r_{ON(p)}$ $\Delta r_{ON}$ accordingly.....	1
• Changed RL value from: 600Ω to: 50Ω for frequency response, crosstalk, and feed-through attenuation, and their associated figures.....	10

## 10 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

**PACKAGING INFORMATION**

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN74LV4066AD	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI	-40 to 85	LV4066A	
SN74LV4066ADBR	NRND	SSOP	DB	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	
SN74LV4066ADGVR	NRND	TVSOP	DGV	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	LW066A	
SN74LV4066ADR	ACTIVE	SOIC	D	14	2500	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LV4066A	Samples
SN74LV4066AN	NRND	PDIP	N	14	25	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74LV4066AN	
SN74LV4066ANSR	NRND	SOP	NS	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	74LV4066A	
SN74LV4066APW	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 85	LW066A	
SN74LV4066APWR	ACTIVE	TSSOP	PW	14	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	LW066A	Samples
SN74LV4066APWT	OBSOLETE	TSSOP	PW	14		TBD	Call TI	Call TI	-40 to 85	LW066A	
SN74LV4066ARGYR	ACTIVE	VQFN	RGY	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 125	LW066A	Samples
SN74LV4066ARGYRG4	ACTIVE	VQFN	RGY	14	3000	RoHS & Green	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	LW066A	Samples

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.



<sup>(5)</sup> Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

<sup>(6)</sup> Lead finish/Ball material - Orderable Devices 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.

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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.

**TAPE AND REEL INFORMATION**

**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**


\*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
SN74LV4066ADBR	SSOP	DB	14	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74LV4066ADGVR	TVSOP	DGV	14	2000	330.0	12.4	6.8	4.0	1.6	8.0	12.0	Q1
SN74LV4066ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV4066ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74LV4066ANSR	SOP	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
SN74LV4066APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV4066APWR	TSSOP	PW	14	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74LV4066ARGYR	VQFN	RGY	14	3000	330.0	12.4	3.75	3.75	1.15	8.0	12.0	Q1

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV4066ADBR	SSOP	DB	14	2000	356.0	356.0	35.0
SN74LV4066ADGVR	TVSOP	DGV	14	2000	356.0	356.0	35.0
SN74LV4066ADR	SOIC	D	14	2500	356.0	356.0	35.0
SN74LV4066ADR	SOIC	D	14	2500	353.0	353.0	32.0
SN74LV4066ANSR	SOP	NS	14	2000	356.0	356.0	35.0
SN74LV4066APWR	TSSOP	PW	14	2000	356.0	356.0	35.0
SN74LV4066APWR	TSSOP	PW	14	2000	353.0	353.0	32.0
SN74LV4066ARGYR	VQFN	RGY	14	3000	367.0	367.0	35.0

**TUBE**


\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
SN74LV4066AN	N	PDIP	14	25	506	13.97	11230	4.32
SN74LV4066AN	N	PDIP	14	25	506	13.97	11230	4.32

N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



4040049/E 12/2002

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - (C) Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - (D) The 20 pin end lead shoulder width is a vendor option, either half or full width.



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. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.

# EXAMPLE BOARD LAYOUT

PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220202/B 12/2023

NOTES: (continued)

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

# EXAMPLE STENCIL DESIGN

PW0014A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220202/B 12/2023

NOTES: (continued)

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



## GENERIC PACKAGE VIEW

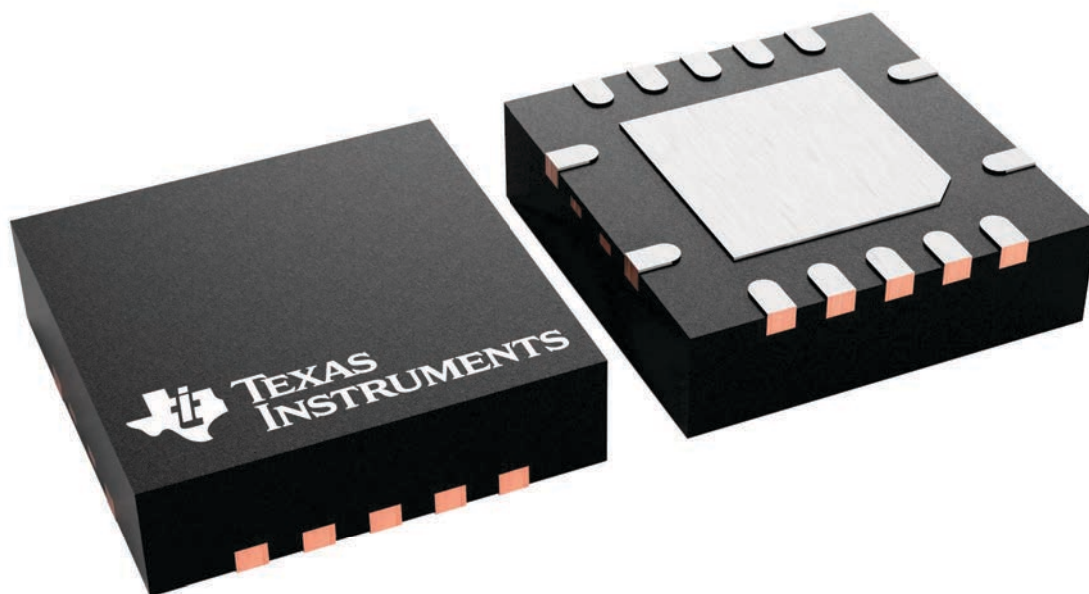
**RGY 14**

**VQFN - 1 mm max height**

3.5 x 3.5, 0.5 mm pitch

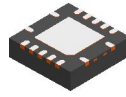
PLASTIC QUAD FLATPACK - NO LEAD

This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



4231541/A

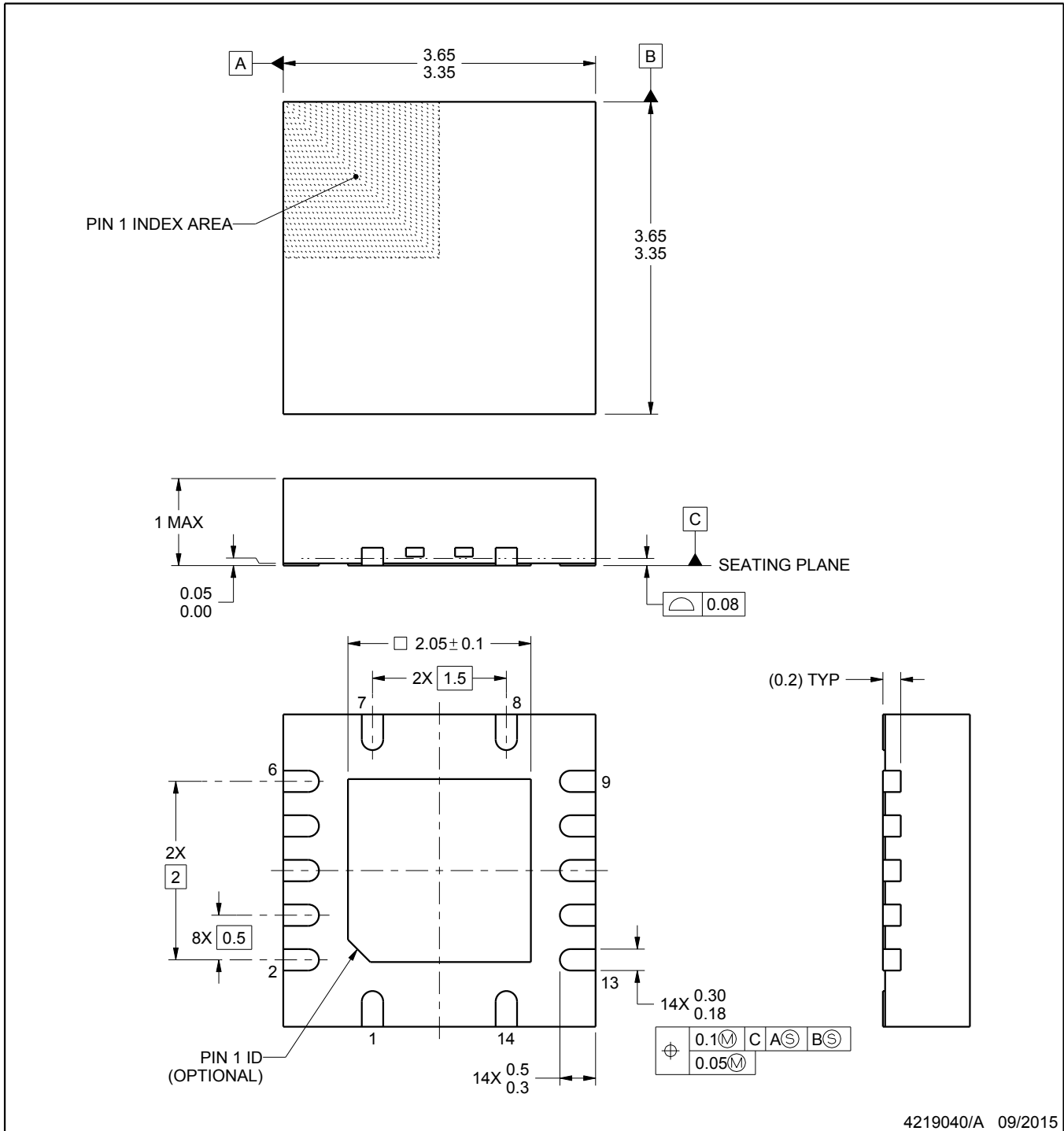
RGY0014A



PACKAGE OUTLINE

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



4219040/A 09/2015

NOTES:

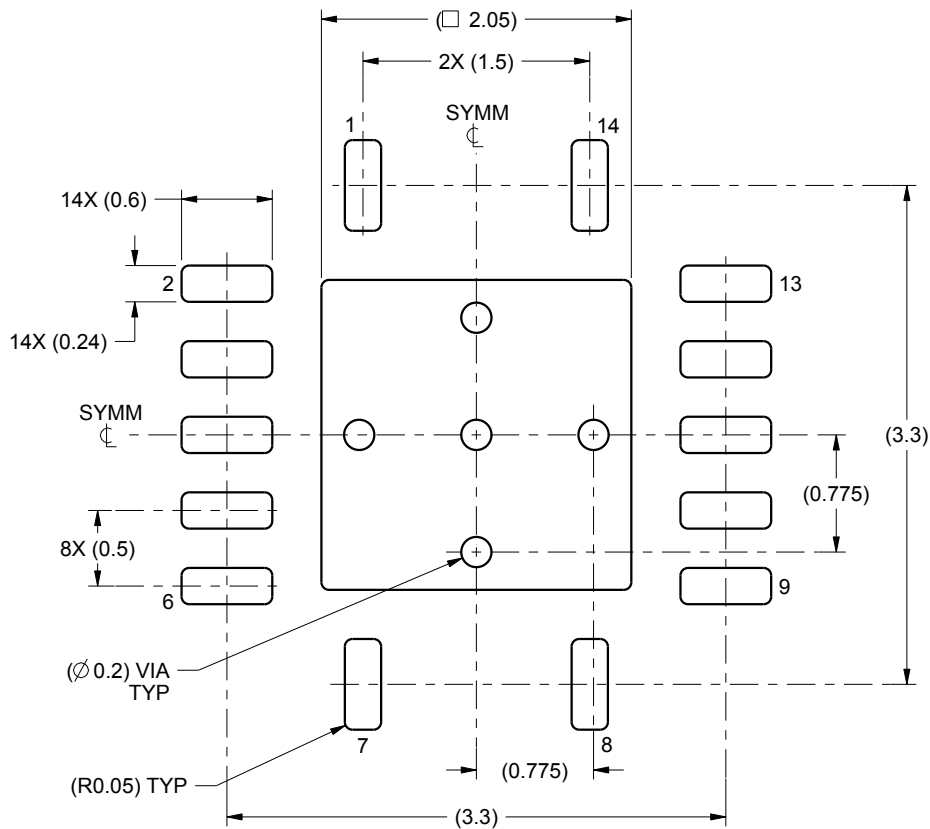
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

# EXAMPLE BOARD LAYOUT

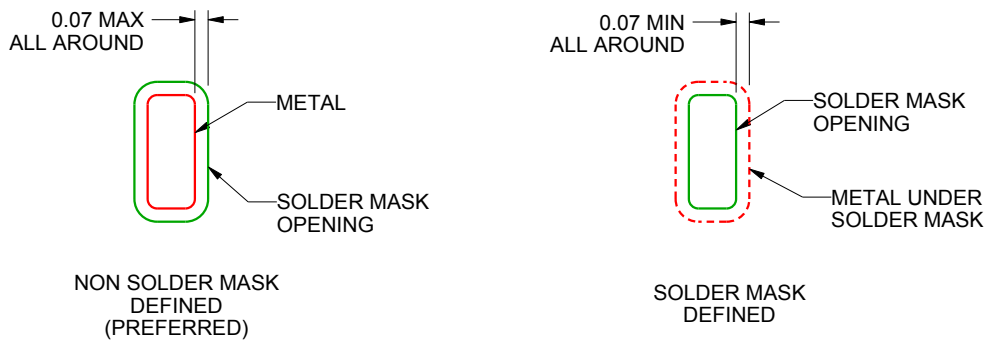
RGY0014A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



LAND PATTERN EXAMPLE  
SCALE:20X



SOLDER MASK DETAILS

4219040/A 09/2015

NOTES: (continued)

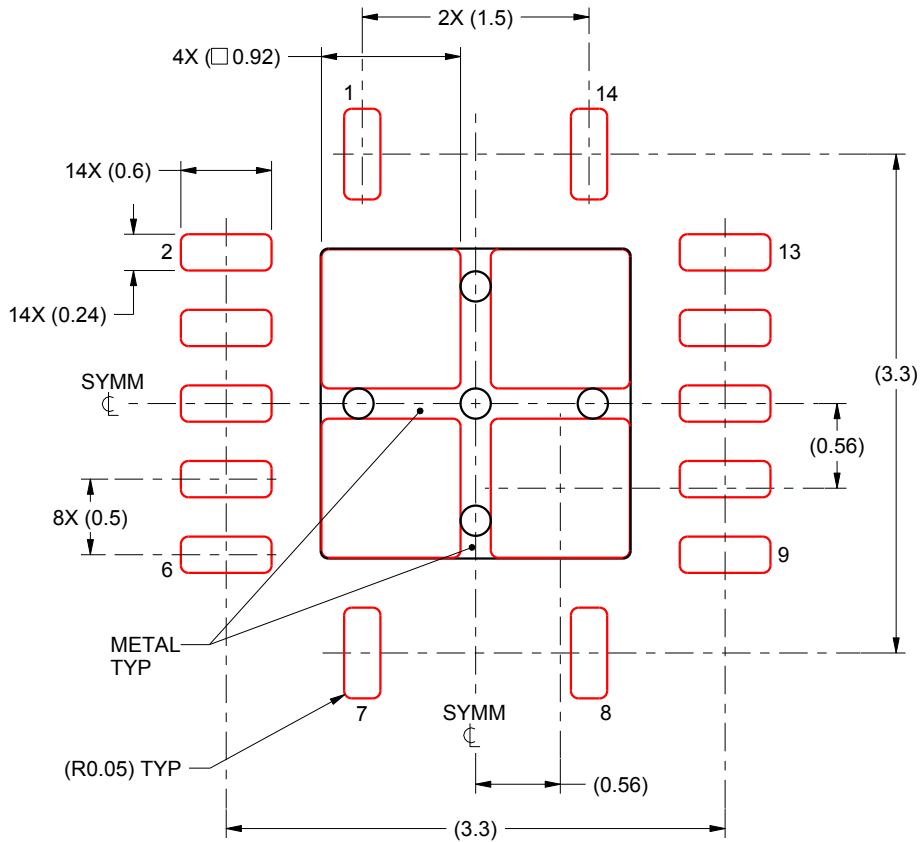
4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 ([www.ti.com/lit/slue271](http://www.ti.com/lit/slue271)).

# EXAMPLE STENCIL DESIGN

RGY0014A

VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



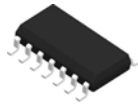
**SOLDER PASTE EXAMPLE**  
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD  
80% PRINTED SOLDER COVERAGE BY AREA  
SCALE:20X

4219040/A 09/2015

NOTES: (continued)

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



# D0014A

# PACKAGE OUTLINE

## SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

### NOTES:

1. All linear dimensions are in millimeters. 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. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.

# EXAMPLE BOARD LAYOUT

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE  
SCALE:8X



SOLDER MASK DETAILS

4220718/A 09/2016

NOTES: (continued)

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

# EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:8X

4220718/A 09/2016

NOTES: (continued)

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

# 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.



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

PLASTIC SMALL-OUTLINE

24 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 per side.  
 D. Falls within JEDEC: 24/48 Pins – MO-153  
 14/16/20/56 Pins – MO-194

# DB0014A



# PACKAGE OUTLINE

## SSOP - 2 mm max height

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-150.

# EXAMPLE BOARD LAYOUT

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220762/A 05/2024

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.

# EXAMPLE STENCIL DESIGN

DB0014A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220762/A 05/2024

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.

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