

SN74LV4066A クワッド双方向アナログスイッチ

1 特長

- 1.65V～5.5V の V_{CC} で動作
- すべてのポートで混在モード電圧動作をサポート
- 高いオン/オフ出力電圧比
- スイッチ間の低いクロストーク
- スイッチの個別制御
- 非常に低い入力電流
- JESD 22 を上回る ESD 保護:
 - 2000V 人体モデル (A114-A)
 - マシン モデルで 200V (A115-A)
 - 750V 荷電デバイス モデル (C101)

2 アプリケーション

- [テレコミュニケーション](#)
- [eCall](#) (車載用緊急通報システム)
- [インフォテインメント](#)

3 概要

このクワッド シリコンゲート CMOS アナログ スイッチは、1.65V～5.5V の V_{CC} で動作するように設計されています。

このスイッチは、アナログとデジタルの両方の信号を扱うことができます。各スイッチは、最大 5.5V (ピーク) までの振幅の信号をどちらの方向にも伝送できます。

それぞれのスイッチ セクションには、独自のイネーブル入力制御 (C) が存在します。C に HIGH レベルの電圧が印加されると、対応するスイッチ セクションがオンになります。

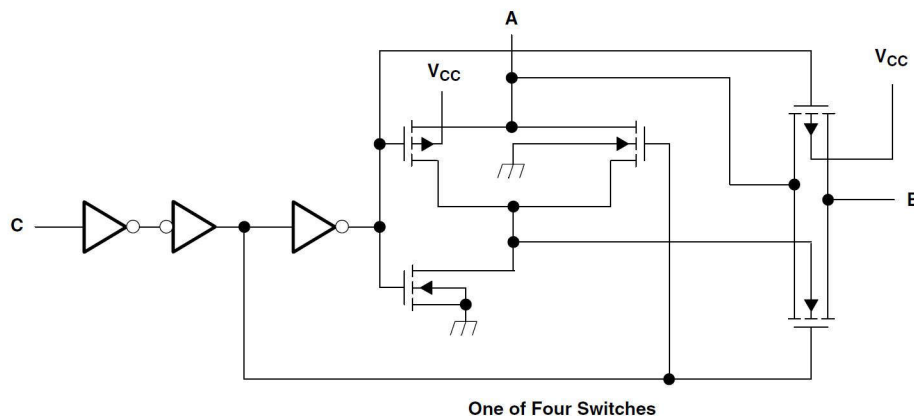
信号ゲーティング、チョッピング、変調または復調 (モデム)、およびアナログ / デジタルやデジタル / アナログ変換システム用の信号多重化などのアプリケーションに使用できます。

パッケージ情報

| 部品番号 | パッケージ (1) | パッケージ サイズ(2) |
|-------------|----------------|---------------|
| SN74LV4066A | D (SOIC, 14) | 8.65mm × 6mm |
| | PW (TSSOP, 14) | 5mm × 6.4mm |
| | RGY (QFN, 14) | 3.5mm × 3.5mm |

(1) 詳細については、[セクション 10](#) を参照してください。

(2) パッケージ サイズ (長さ × 幅) は公称値であり、該当する場合はピンも含まれます。



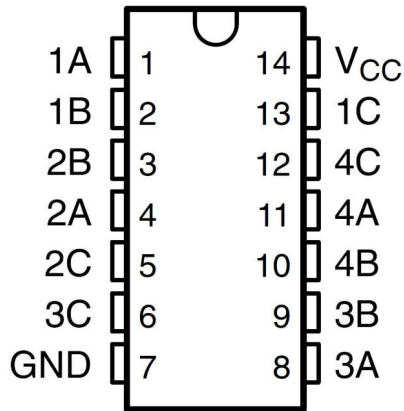
論理図 (正論理)



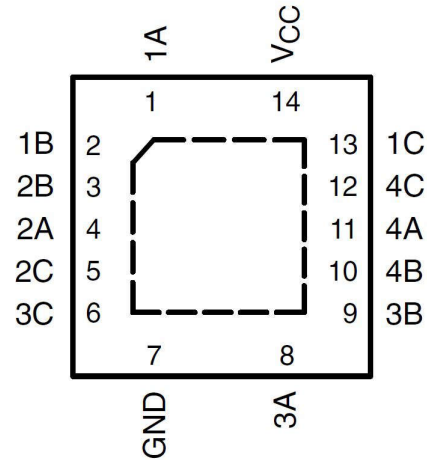
Table of Contents

| | | | |
|---|----------|--|-----------|
| 1 特長 | 1 | 6 Parameter Measurement Information | 10 |
| 2 アプリケーション | 1 | 7 Detailed Description | 14 |
| 3 概要 | 1 | 7.1 Functional Block Diagram..... | 14 |
| 4 Pin Configuration and Functions | 3 | 7.2 Device Functional Modes..... | 14 |
| 5 Specifications | 4 | 8 Device and Documentation Support | 15 |
| 5.1 Absolute Maximum Ratings..... | 4 | 8.1 ドキュメントの更新通知を受け取る方法..... | 15 |
| 5.2 ESD Ratings..... | 4 | 8.2 サポート・リソース..... | 15 |
| 5.3 Thermal Information: SN74LV4066A..... | 4 | 8.3 Trademarks..... | 15 |
| 5.4 Recommended Operating Conditions..... | 5 | 8.4 静電気放電に関する注意事項..... | 15 |
| 5.5 Electrical Characteristics (LV)..... | 5 | 8.5 用語集..... | 15 |
| 5.6 Timing Characteristics $V_{CC} = 2.5V \pm 0.2V$ | 7 | 9 Revision History | 15 |
| 5.7 Timing Characteristics $V_{CC} = 3.3V \pm 0.3V$ | 7 | 10 Mechanical, Packaging, and Orderable Information | 15 |
| 5.8 Timing Characteristics $V_{CC} = 5V \pm 0.5V$ | 8 | | |
| 5.9 AC Characteristics..... | 8 | | |

4 Pin Configuration and Functions



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



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

表 4-1. Pin Functions

| PIN | | TYPE ⁽¹⁾ | 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 _{CC} | 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)^{(1) (3)}

| | | MIN | MAX | UNIT |
|------------------|---|--|-----------------------|------|
| V _{CC} | Supply voltage | -0.5 | 7.0 | V |
| V _I | Logic input voltage range | -0.5 | 7.0 | V |
| V _{IO} | Switch I/O voltage range ^{(2) (3)} | -0.5 | V _{CC} + 0.5 | V |
| I _{IK} | Logic input clamp current | V _I < 0 | | mA |
| I _{IOK} | Switch path diode clamp current | V _{IO} < 0 or V _{IO} > V _{CC} | 50 | mA |
| I _T | Switch continuous current | V _{IO} = 0 to V _{CC} | ±25 | mA |
| | Continuous current through V _{CC} or GND | | ±50 | mA |
| T _J | Junction temperature | | 150 | °C |
| T _{stg} | 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 _(ESD) | Electrostatic discharge | Human body model (HBM), per ANSI/ESDA/ JEDEC JS-001, all pins ⁽¹⁾ | ±2000 | V |
| | | Charged device model (CDM), per JEDEC specification JESD22-C101, all pins ⁽²⁾ | ±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 ⁽¹⁾ | | SN74LV4066A | | | UNIT |
|-------------------------------|--|-------------|------------|------------|------|
| | | D (SOIC) | PW (TSSOP) | RGY (VQFN) | |
| | | 14 PINS | 14 PINS | 14 PINS | |
| R _{θJA} | Junction-to-ambient thermal resistance | 128.8 | 150.6 | 91.9 | °C/W |
| R _{θJC(top)} | Junction-to-case (top) thermal resistance | 81.8 | 78.2 | 91.8 | °C/W |
| R _{θJB} | Junction-to-board thermal resistance | 84.2 | 93.7 | 66.5 | °C/W |
| Ψ _{JT} | Junction-to-top characterization parameter | 39.5 | 24.6 | 20.0 | °C/W |
| Ψ _{JB} | Junction-to-board characterization parameter | 83.7 | 93.1 | 66.3 | °C/W |
| R _{θJC(bot)} | 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)⁽¹⁾

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

(1) All unused inputs of the device must be held at V_{CC} 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 _A | V _{CC} | MIN | TYP | MAX | UNIT | |
|-----------------|----------------------------|--|-----------------|-----|----------------|-----|------|---|
| r _{ON} | ON-state switch resistance | I _T = 2mA, V _I = V _{CC} or GND, V _{INH} = V _{IL} (see Figure 6-1) | 1.65V | | 25°C | 60 | 150 | Ω |
| | | | | | –40°C to 85°C | | 225 | |
| | | | | | –40°C to 125°C | | 225 | |
| | | | 2.3V | | 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) (続き)

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

| PARAMETER | | CONDITIONS | T _A | V _{CC} | MIN | TYP | MAX | UNIT | |
|------------------------------------|--|---|----------------|-----------------|-----|-----|------|------|----|
| r _{ON(p)} | Peak ON-state resistance | I _T = 2mA, V _I = GND to V _{CC} , V _{INH} = V _{IL} | 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 _{ON} | Difference in ON-state resistance between switches | I _T = 2mA, V _I = GND to V _{CC} , V _{INH} = V _{IL} | 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 _{IH} I _{IL} | Control input current | V _I = 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 _{S(off)} | OFF-state switch leakage current | V _I = V _{CC} and V _O = GND, or V _I = GND and V _O = V _{CC} , V _{INH} = V _{IH} (see 図 6-2) | 25°C | 5.5V | | | ±0.1 | μA | |
| | | | –40°C to 85°C | | | | ±1 | | |
| | | | –40°C to 125°C | | | | ±1 | | |
| I _{S(on)} | ON-state switch leakage current | V _I = V _{CC} or GND, V _{INH} = V _{IL} (see 図 6-3) | 25°C | 5.5V | | | ±0.1 | μA | |
| | | | –40°C to 85°C | | | | ±1 | | |
| | | | –40°C to 125°C | | | | ±1 | | |
| I _{CC} | Supply current | V _I = V _{CC} or GND V _{INH} = 0V | 25°C | 5.5V | | | 0.01 | μA | |
| | | | –40°C to 85°C | | | | 20 | | |
| | | | –40°C to 125°C | | | | 20 | | |
| C _{IC} | Control input capacitance | f = 10MHz | 25°C | 3.3V | | | 4 | pF | |
| C _{IS} | Switch terminal capacitance | f = 10MHz | 25°C | 3.3V | | | 5.5 | pF | |
| C _{OS(on)} | Common terminal ON-capacitance | f = 10MHz | 25°C | 3.3V | | | 5.5 | pF | |

5.5 Electrical Characteristics (LV) (続き)

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

| PARAMETER | | CONDITIONS | T _A | V _{CC} | MIN | TYP | MAX | UNIT |
|-----------------|-------------------------------|----------------------------------|----------------|-----------------|-----|-----|-----|------|
| C _F | Feedthrough capacitance | f = 10MHz | 25°C | 3.3V | | 0.5 | | pF |
| C _{PD} | Power dissipation capacitance | C _L = 50pF, f = 10MHz | 25°C | 3.3V | | 4.5 | | pF |

5.6 Timing Characteristics V_{CC} = 2.5V ± 0.2V

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

V_{CC} = 2V ± 0.2V (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 6-4) | 25°C | | 1.2 | 10 | ns |
| | | | | | -40°C to 85°C | | | 16 | |
| | | | | | -40°C to 125°C | | | 18 | |
| t _{PZH} t _{PZL} | Enable delay time | INH | COM or Yn | C _L = 15pF (see 6-5) | 25°C | | 3.3 | 15 | ns |
| | | | | | -40°C to 85°C | | | 20 | |
| | | | | | -40°C to 125°C | | | 20 | |
| t _{PHZ} t _{PLZ} | Disable delay time | INH | COM or Yn | C _L = 15pF (see 6-5) | 25°C | | 6 | 15 | ns |
| | | | | | -40°C to 85°C | | | 23 | |
| | | | | | -40°C to 125°C | | | 23 | |
| t _{PLH} t _{PHL} | Propagation delay time | COM or Yn | Yn or COM | C _L = 50pF (see 6-4) | 25°C | | 2.6 | 12 | ns |
| | | | | | -40°C to 85°C | | | 18 | |
| | | | | | -40°C to 125°C | | | 18 | |
| t _{PZH} t _{PZL} | Enable delay time | INH | COM or Yn | C _L = 50pF (see 6-5) | 25°C | | 4.2 | 25 | ns |
| | | | | | -40°C to 85°C | | | 32 | |
| | | | | | -40°C to 125°C | | | 32 | |
| t _{PHZ} t _{PLZ} | Disable delay time | INH | COM or Yn | C _L = 50pF (see 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_{CC} = 3.3V ± 0.3V

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

V_{CC} = 3.3V ± 0.3V (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 6-4) | 25°C | | 0.8 | 6 | ns |
| | | | | | -40°C to 85°C | | | 10 | |
| | | | | | -40°C to 125°C | | | 10 | |
| t _{PZH} t _{PZL} | Enable delay time | INH | COM or Yn | C _L = 15pF (see 6-5) | 25°C | | 2.3 | 11 | ns |
| | | | | | -40°C to 85°C | | | 15 | |
| | | | | | -40°C to 125°C | | | 15 | |
| t _{PHZ} t _{PLZ} | Disable delay time | INH | COM or Yn | C _L = 15pF (see 6-5) | 25°C | | 4.5 | 11 | ns |
| | | | | | -40°C to 85°C | | | 15 | |
| | | | | | -40°C to 125°C | | | 15 | |
| t _{PLH} t _{PHL} | Propagation delay time | COM or Yn | Yn or COM | C _L = 50pF (see 6-4) | 25°C | | 1.5 | 9 | ns |
| | | | | | -40°C to 85°C | | | 12 | |
| | | | | | -40°C to 125°C | | | 12 | |

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

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 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 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 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 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 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 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 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 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 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 6-7) | $V_{CC} = 2.3V$ | | 15 | mV |
| | | | | | $V_{CC} = 3V$ | | 20 | |
| | | | | | $V_{CC} = 4.5V$ | | 50 | |

5.9 AC Characteristics (続き)

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 _L = 50pF, R _L = 50Ω, F _{in} = 1MHz (sine wave) (see Figure 6-8(2)) | V _{CC} = 2.3V | -40 | | dB |
| | | | | | V _{CC} = 3V | -40 | | |
| | | | | | V _{CC} = 4.5V | -40 | | |
| Crosstalk (between any switches) | COM or Yn | Yn or COM | ALL | C _L = 50pF, R _L = 50Ω, F _{in} = 1MHz (sine wave) (see Figure 6-9(2)) | V _{CC} = 2.3V | -45 | | dB |
| | | | | | V _{CC} = 3V | -45 | | |
| | | | | | V _{CC} = 4.5V | -45 | | |
| Sine-wave distortion | COM or Yn | Yn or COM | ALL | C _L = 50pF, R _L = 10kΩ, F _{in} = 1kHz (sine wave) (see Figure 6-10) | V _I = 2V _{p-p} V _{CC} = 2.3V | 0.1 | | % |
| | | | | | V _I = 2.5V _{p-p} V _{CC} = 3V | 0.1 | | |
| | | | | | V _I = 4V _{p-p} V _{CC} = 4.5V | 0.1 | | |

6 Parameter Measurement Information

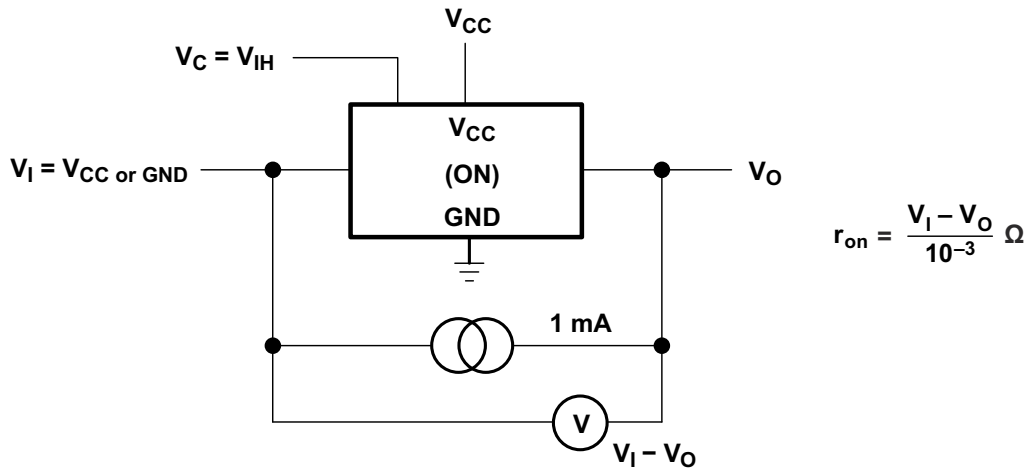
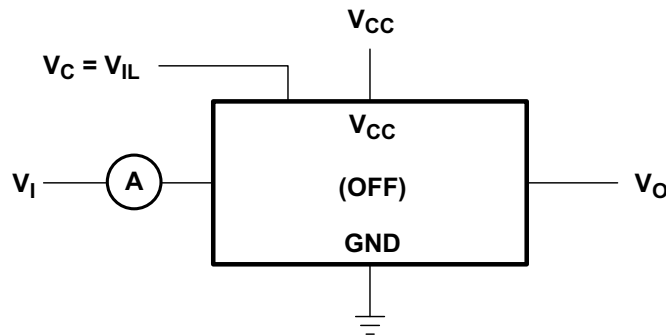


图 6-1. ON-State Resistance Test Circuit



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

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

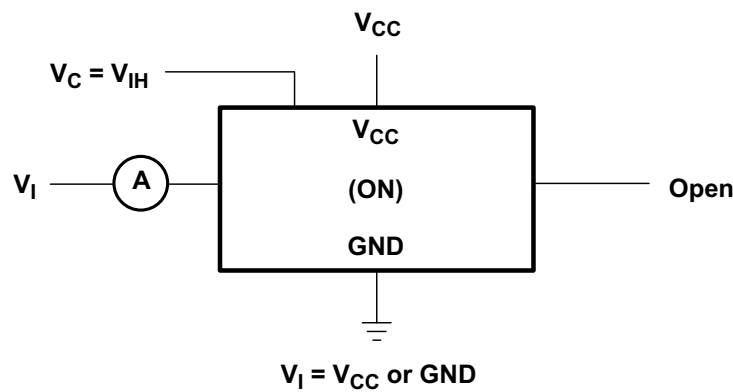
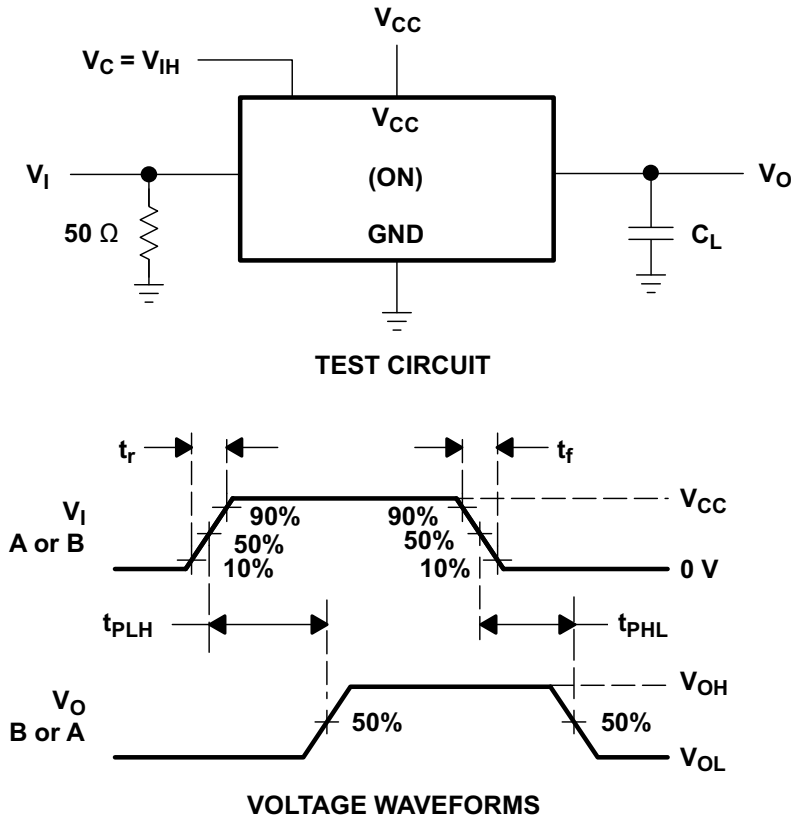

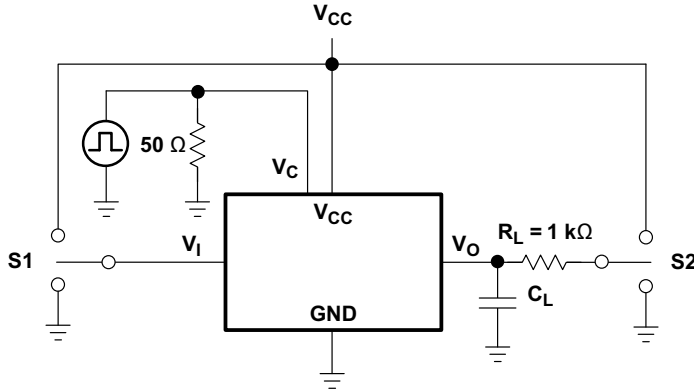


图 6-3. ON-State Leakage-Current Test Circuit

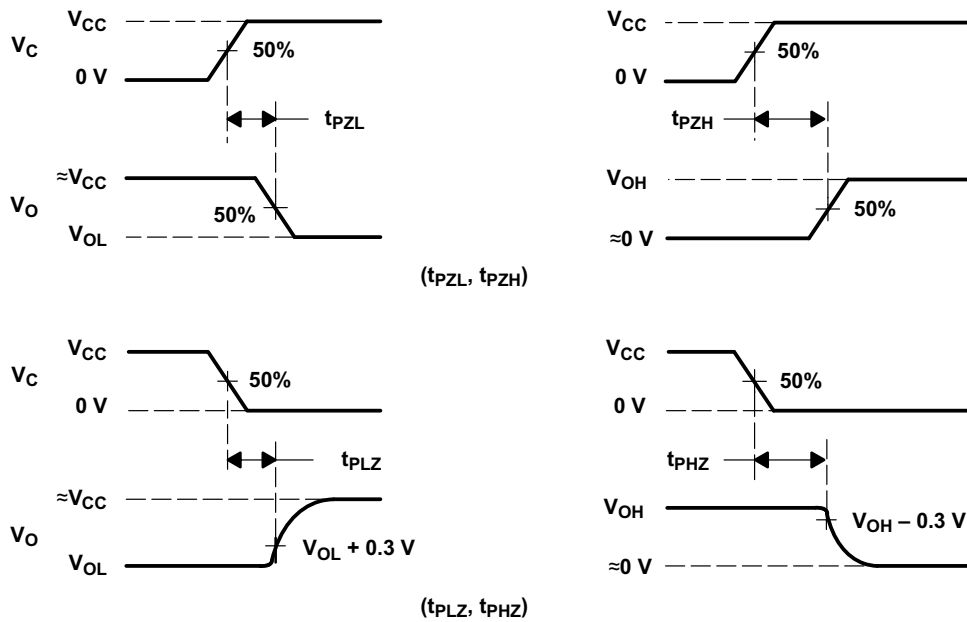



6-4. Propagation Delay Time, Signal Input to Signal Output



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

TEST CIRCUIT



VOLTAGE WAVEFORMS

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

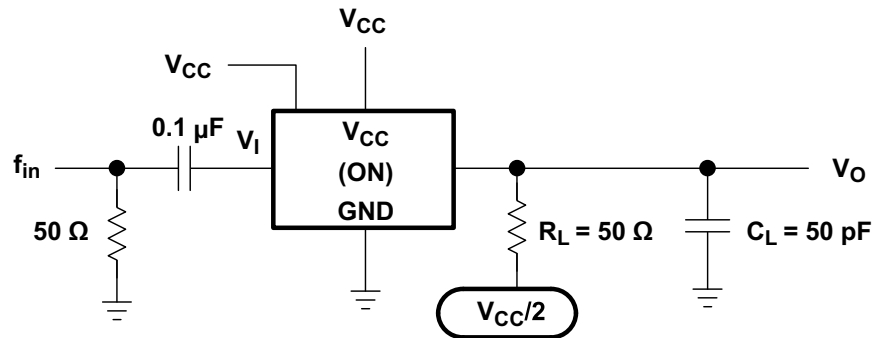


图 6-6. Frequency Response (Switch ON)

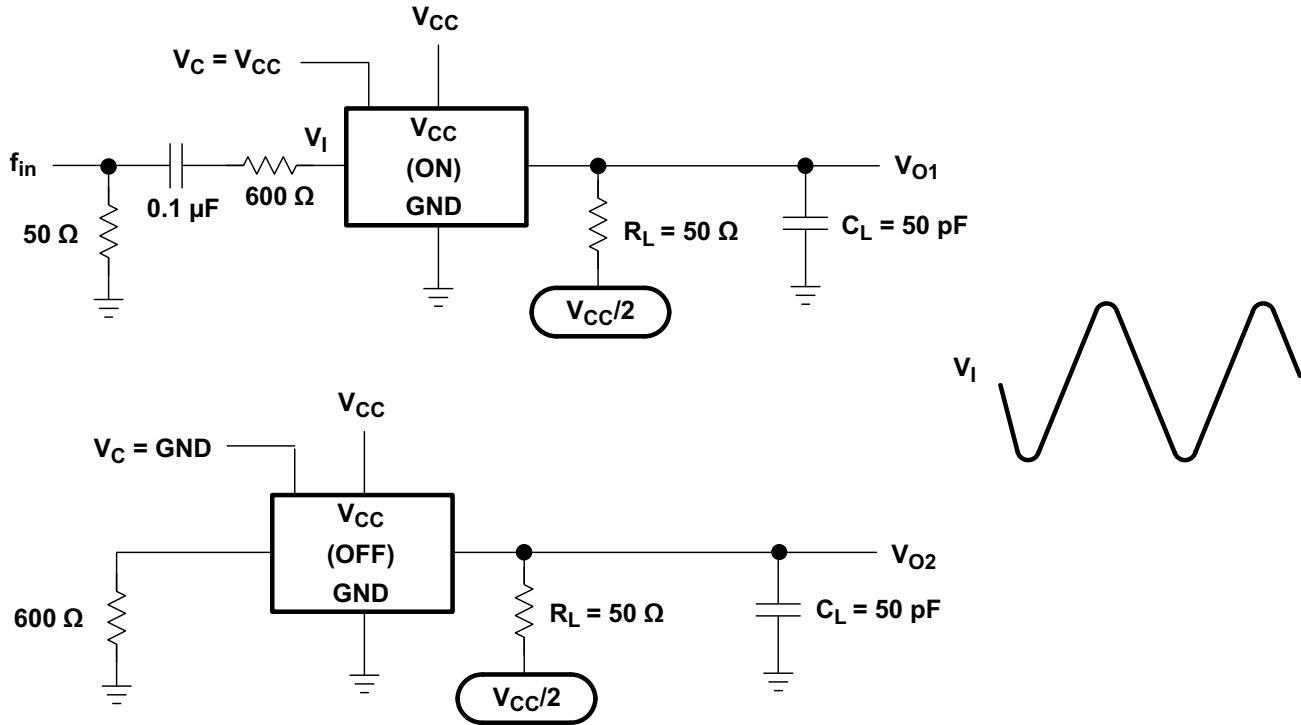


図 6-7. Crosstalk Between Any Two Switches

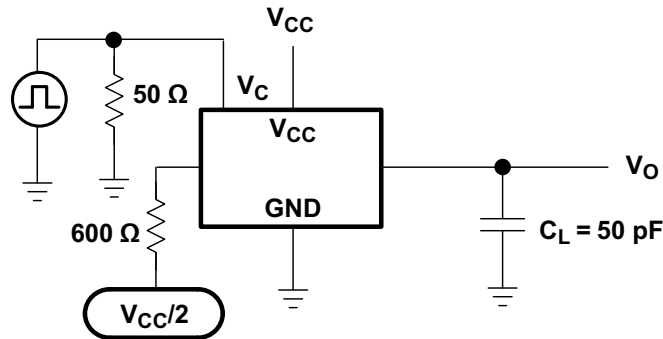


図 6-8. Crosstalk (Control Input - Switch Output)

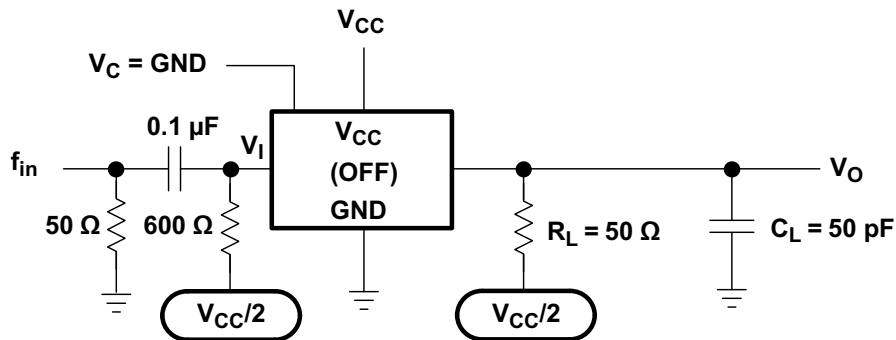


図 6-9. Feed-Through Attenuation (Switch OFF)

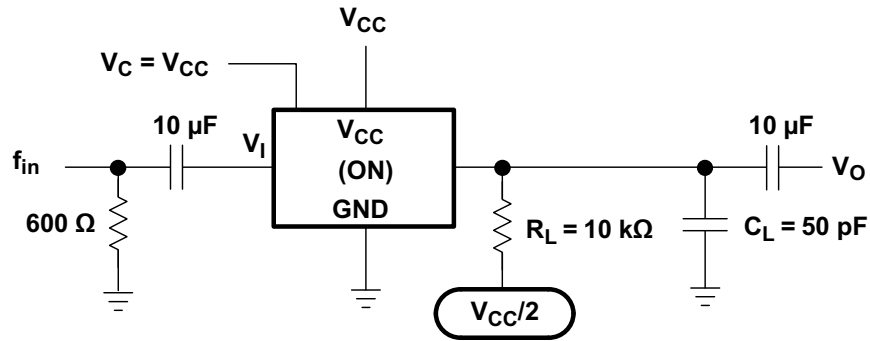


図 6-10. Sine-Wave Distortion

7 Detailed Description

7.1 Functional Block Diagram

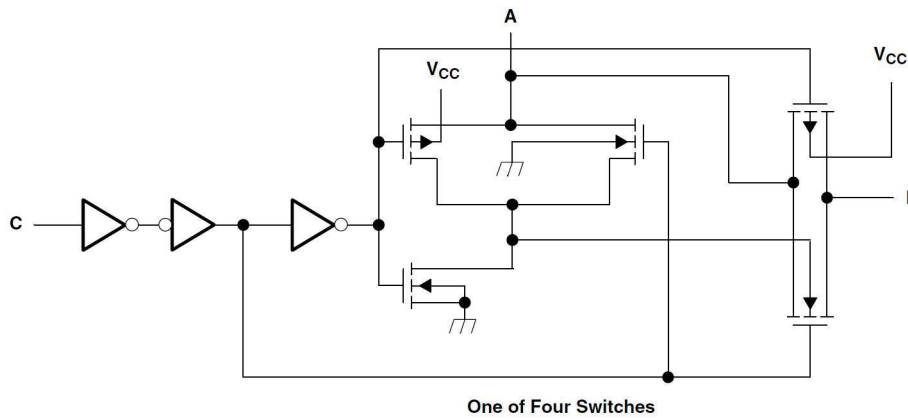


図 7-1. Logic Diagram (Positive Logic)

7.2 Device Functional Modes

表 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 ドキュメントの更新通知を受け取る方法

ドキュメントの更新についての通知を受け取るには、www.tij.co.jp のデバイス製品フォルダを開いてください。[通知] をクリックして登録すると、変更されたすべての製品情報に関するダイジェストを毎週受け取ることができます。変更の詳細については、改訂されたドキュメントに含まれている改訂履歴をご覧ください。

8.2 サポート・リソース

テキサス・インスツルメンツ E2E™ サポート・フォーラムは、エンジニアが検証済みの回答と設計に関するヒントをエキスパートから迅速かつ直接得ることができる場所です。既存の回答を検索したり、独自の質問をしたりすることで、設計に必要な支援を迅速に得ることができます。

リンクされているコンテンツは、各寄稿者により「現状のまま」提供されるものです。これらはテキサス・インスツルメンツの仕様を構成するものではなく、必ずしもテキサス・インスツルメンツの見解を反映したものではありません。テキサス・インスツルメンツの[使用条件](#)を参照してください。

8.3 Trademarks

テキサス・インスツルメンツ E2E™ is a trademark of Texas Instruments.

すべての商標は、それぞれの所有者に帰属します。

8.4 静電気放電に関する注意事項



この IC は、ESD によって破損する可能性があります。テキサス・インスツルメンツは、IC を取り扱う際には常に適切な注意を払うことを推奨します。正しい取り扱いおよび設置手順に従わない場合、デバイスを破損するおそれがあります。

ESD による破損は、わずかな性能低下からデバイスの完全な故障まで多岐にわたります。精密な IC の場合、パラメータがわずかに変化するだけで公表されている仕様から外れる可能性があるため、破損が発生しやすくなっています。

8.5 用語集

[テキサス・インスツルメンツ用語集](#) この用語集には、用語や略語の一覧および定義が記載されています。

9 Revision History

資料番号末尾の英字は改訂を表しています。その改訂履歴は英語版に準じています。

| Changes from Revision I (April 2006) to Revision J (February 2024) | Page |
|--|------|
| ドキュメント全体にわたって表、図、相互参照の採番方法を更新..... | 1 |
| データシートから SN54LV4066A の情報を削除..... | 1 |
| V _{CC} 動作を「2V~5.5V」から「1.65V~5.5V」に変更、それに応じて、r _{ON} 、r _{ON(p)} 、Δr _{ON} などの仕様を更新 | 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.

重要なお知らせと免責事項

テキサス・インスツルメンツは、技術データと信頼性データ(データシートを含みます)、設計リソース(リファレンス デザインを含みます)、アプリケーションや設計に関する各種アドバイス、Web ツール、安全性情報、その他のリソースを、欠陥が存在する可能性のある「現状のまま」提供しており、商品性および特定目的に対する適合性の黙示保証、第三者の知的財産権の非侵害保証を含むいかなる保証も、明示的または黙示的にかかわらず拒否します。

これらのリソースは、テキサス・インスツルメンツ製品を使用する設計の経験を積んだ開発者への提供を意図したものです。(1) お客様のアプリケーションに適したテキサス・インスツルメンツ製品の選定、(2) お客様のアプリケーションの設計、検証、試験、(3) お客様のアプリケーションに該当する各種規格や、その他のあらゆる安全性、セキュリティ、規制、または他の要件への確実な適合に関する責任を、お客様のみが単独で負うものとします。

上記の各種リソースは、予告なく変更される可能性があります。これらのリソースは、リソースで説明されているテキサス・インスツルメンツ製品を使用するアプリケーションの開発の目的でのみ、テキサス・インスツルメンツはその使用をお客様に許諾します。これらのリソースに関して、他の目的で複製することや掲載することは禁止されています。テキサス・インスツルメンツや第三者の知的財産権のライセンスが付与されている訳ではありません。お客様は、これらのリソースを自身で使用した結果発生するあらゆる申し立て、損害、費用、損失、責任について、テキサス・インスツルメンツおよびその代理人を完全に補償するものとし、テキサス・インスツルメンツは一切の責任を拒否します。

テキサス・インスツルメンツの製品は、[テキサス・インスツルメンツの販売条件](#)、または [ti.com](https://www.ti.com) やかかるテキサス・インスツルメンツ製品の関連資料などのいずれかを通じて提供する適用可能な条項の下で提供されています。テキサス・インスツルメンツがこれらのリソースを提供することは、適用されるテキサス・インスツルメンツの保証または他の保証の放棄の拡大や変更を意味するものではありません。

お客様がいかなる追加条項または代替条項を提案した場合でも、テキサス・インスツルメンツはそれらに異議を唱え、拒否します。

郵送先住所: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2024, Texas Instruments Incorporated

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 | LIFEBUY | SOIC | D | 14 | 50 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LV4066A | |
| SN74LV4066ADBR | ACTIVE | SSOP | DB | 14 | 2000 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LW066A | Samples |
| SN74LV4066ADGVR | ACTIVE | TVSOP | DGV | 14 | 2000 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LW066A | Samples |
| SN74LV4066ADR | ACTIVE | SOIC | D | 14 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LV4066A | Samples |
| SN74LV4066AN | ACTIVE | PDIP | N | 14 | 25 | RoHS & Green | NIPDAU | N / A for Pkg Type | -40 to 85 | SN74LV4066AN | Samples |
| SN74LV4066ANSR | ACTIVE | SO | NS | 14 | 2000 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 74LV4066A | Samples |
| SN74LV4066APW | LIFEBUY | TSSOP | PW | 14 | 90 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LW066A | |
| SN74LV4066APWR | ACTIVE | TSSOP | PW | 14 | 2000 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LW066A | Samples |
| SN74LV4066APWT | LIFEBUY | TSSOP | PW | 14 | 250 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | LW066A | |
| SN74LV4066ARGYR | ACTIVE | VQFN | RGY | 14 | 3000 | RoHS & Green | NIPDAU | Level-2-260C-1 YEAR | -40 to 85 | 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.

⁽⁵⁾ 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.

⁽⁶⁾ 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.

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 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.

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 |
| SN74LV4066ANSR | SO | 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 |
| SN74LV4066APWT | TSSOP | PW | 14 | 250 | 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 |
| SN74LV4066ANSR | SO | NS | 14 | 2000 | 356.0 | 356.0 | 35.0 |
| SN74LV4066APWR | TSSOP | PW | 14 | 2000 | 356.0 | 356.0 | 35.0 |
| SN74LV4066APWT | TSSOP | PW | 14 | 250 | 356.0 | 356.0 | 35.0 |
| 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) |
|---------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| SN74LV4066AD | D | SOIC | 14 | 50 | 506.6 | 8 | 3940 | 4.32 |
| SN74LV4066AN | N | PDIP | 14 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LV4066AN | N | PDIP | 14 | 25 | 506 | 13.97 | 11230 | 4.32 |
| SN74LV4066APW | PW | TSSOP | 14 | 90 | 530 | 10.2 | 3600 | 3.5 |

RGY (S-PVQFN-N14)

PLASTIC QUAD FLATPACK NO-LEAD



4203539-2/1 06/2011

- NOTES:
- All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - This drawing is subject to change without notice.
 - QFN (Quad Flatpack No-Lead) package configuration.
 - The package thermal pad must be soldered to the board for thermal and mechanical performance.
 - 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.
 - Package complies to JEDEC MO-241 variation BA.

RGY (S-PVQFN-N14)

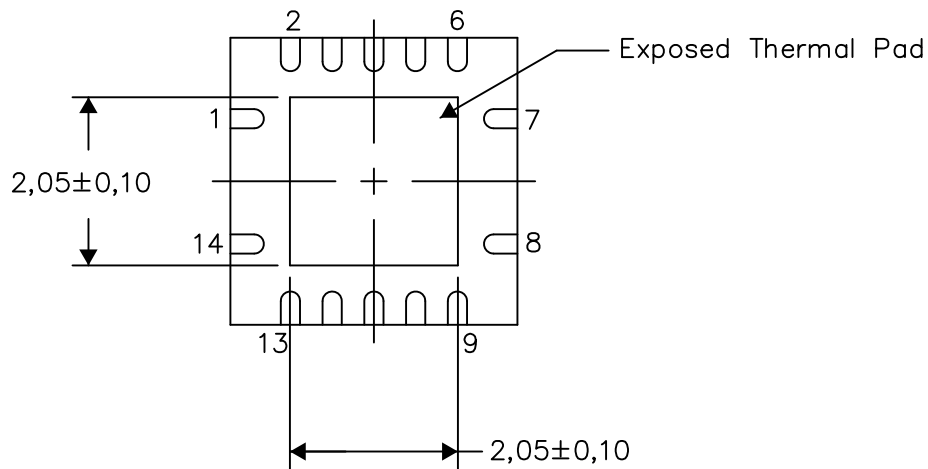
PLASTIC QUAD FLATPACK NO-LEAD

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

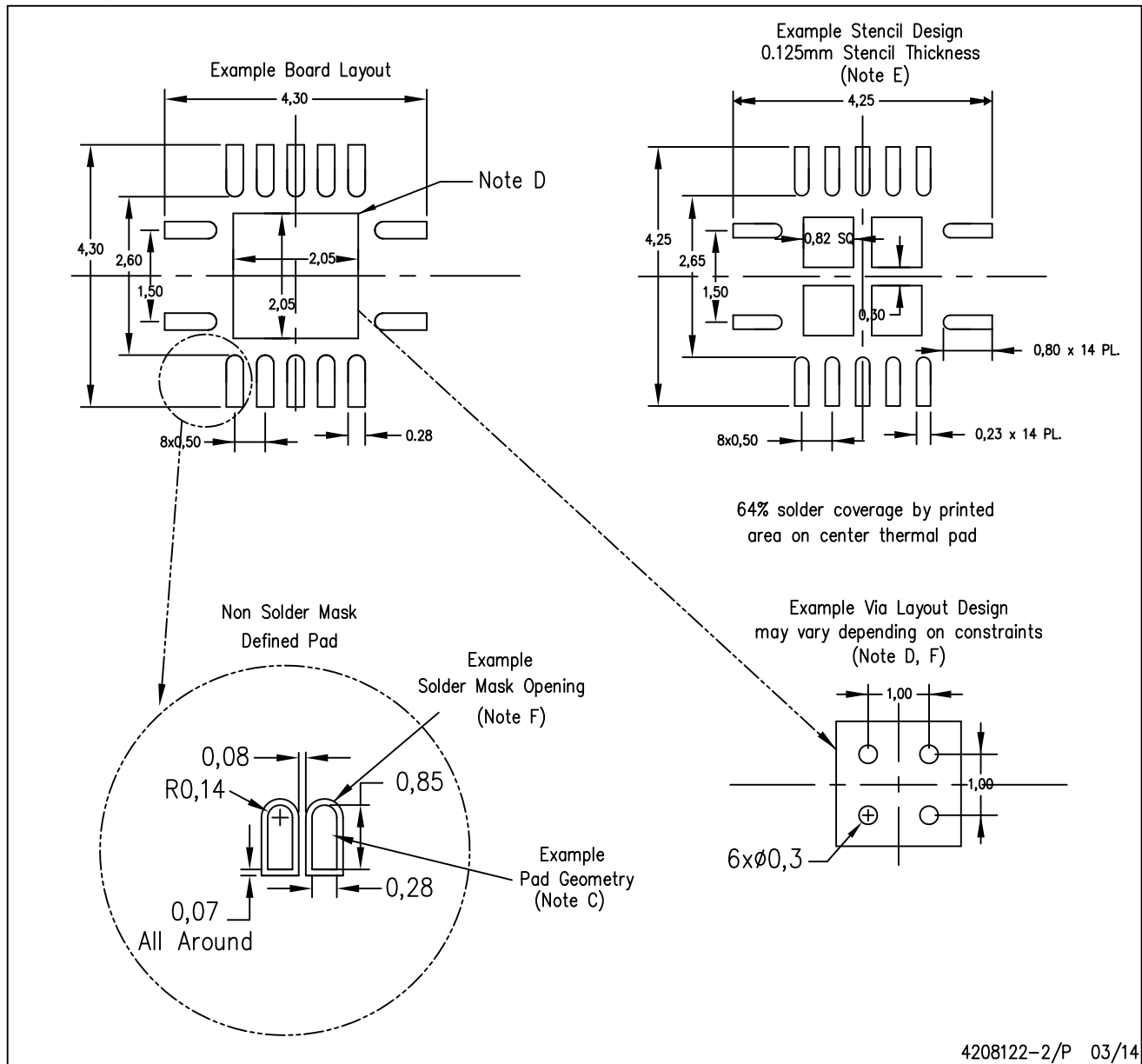
Exposed Thermal Pad Dimensions

4206353-2/P 03/14

NOTE: All linear dimensions are in millimeters

RGY (S-PVQFN-N14)

PLASTIC QUAD FLATPACK NO-LEAD



4208122-2/P 03/14

- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - 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>>.
 - 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.
 - Customers should contact their board fabrication site for minimum solder mask web tolerances between 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.

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

D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



- NOTES:
- 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



- 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 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



4040064-3/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-G14)

PLASTIC SMALL OUTLINE



4211284-2/G 08/15

- 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 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.

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- 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.

4040049/E 12/2002

重要なお知らせと免責事項

TI は、技術データと信頼性データ(データシートを含みます)、設計リソース(リファレンス・デザインを含みます)、アプリケーションや設計に関する各種アドバイス、Web ツール、安全性情報、その他のリソースを、欠陥が存在する可能性のある「現状のまま」提供しており、商品性および特定目的に対する適合性の黙示保証、第三者の知的財産権の非侵害保証を含むいかなる保証も、明示的または黙示的にかかわらず拒否します。

これらのリソースは、TI 製品を使用する設計の経験を積んだ開発者への提供を意図したものです。(1) お客様のアプリケーションに適した TI 製品の選定、(2) お客様のアプリケーションの設計、検証、試験、(3) お客様のアプリケーションに該当する各種規格や、その他のあらゆる安全性、セキュリティ、規制、または他の要件への確実な適合に関する責任を、お客様のみが単独で負うものとし、

上記の各種リソースは、予告なく変更される可能性があります。これらのリソースは、リソースで説明されている TI 製品を使用するアプリケーションの開発の目的でのみ、TI はその使用をお客様に許諾します。これらのリソースに関して、他の目的で複製することや掲載することは禁止されています。TI や第三者の知的財産権のライセンスが付与されている訳ではありません。お客様は、これらのリソースを自身で使用した結果発生するあらゆる申し立て、損害、費用、損失、責任について、TI およびその代理人を完全に補償するものとし、TI は一切の責任を拒否します。

TI の製品は、[TI の販売条件](#)、または [ti.com](#) やかかる TI 製品の関連資料などのいずれかを通じて提供する適用可能な条項の下で提供されています。TI がこれらのリソースを提供することは、適用される TI の保証または他の保証の放棄の拡大や変更を意味するものではありません。

お客様がいかなる追加条項または代替条項を提案した場合でも、TI はそれらに異議を唱え、拒否します。

郵送先住所 : Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2024, Texas Instruments Incorporated