

High-Speed CMOS Logic Quad Bilateral Switch

Features

- **Wide Analog-Input-Voltage Range** **0V - 10V**
- **Low "ON" Resistance**
 - $V_{CC} = 4.5V$ **25 Ω**
 - $V_{CC} = 9V$ **15 Ω**
- **Fast Switching and Propagation Delay Times**
- **Low "OFF" Leakage Current**
- **Wide Operating Temperature Range** . . . **-55°C to 125°C**
- **HC Types**
 - **2V to 10V Operation**
 - **High Noise Immunity: $N_{IL} = 30\%$, $N_{IH} = 30\%$ of V_{CC} at $V_{CC} = 5V$ and $10V$**
- **HCT Types**
 - **Direct LSTTL Input Logic Compatibility, $V_{IL} = 0.8V$ (Max), $V_{IH} = 2V$ (Min)**
 - **CMOS Input Compatibility, $I_I \leq 1\mu A$ at V_{OL} , V_{OH}**

Description

The 'HC4066 and CD74HCT4066 contain four independent digitally controlled analog switches that use silicon-gate CMOS technology to achieve operating speeds similar to LSTTL with the low power consumption of standard CMOS integrated circuits.

These switches feature the characteristic linear "ON" resistance of the metal-gate CD4066B. Each switch is turned on by a high-level voltage on its control input.

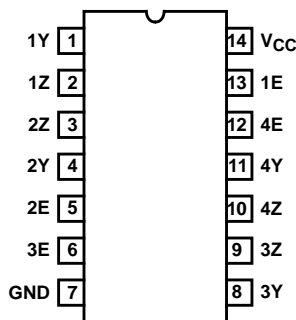
Ordering Information

| PART NUMBER | TEMP. RANGE (°C) | PACKAGE |
|----------------|------------------|--------------|
| CD54HC4066F3A | -55 to 125 | 14 Ld CERDIP |
| CD74HC4066E | -55 to 125 | 14 Ld PDIP |
| CD74HC4066M | -55 to 125 | 14 Ld SOIC |
| CD74HC4066MT | -55 to 125 | 14 Ld SOIC |
| CD74HC4066M96 | -55 to 125 | 14 Ld SOIC |
| CD74HC4066PW | -55 to 125 | 14 Ld TSSOP |
| CD74HC4066PWR | -55 to 125 | 14 Ld TSSOP |
| CD74HC4066PWT | -55 to 125 | 14 Ld TSSOP |
| CD74HCT4066E | -55 to 125 | 14 Ld PDIP |
| CD74HCT4066M | -55 to 125 | 14 Ld SOIC |
| CD74HCT4066MT | -55 to 125 | 14 Ld SOIC |
| CD74HCT4066M96 | -55 to 125 | 14 Ld SOIC |

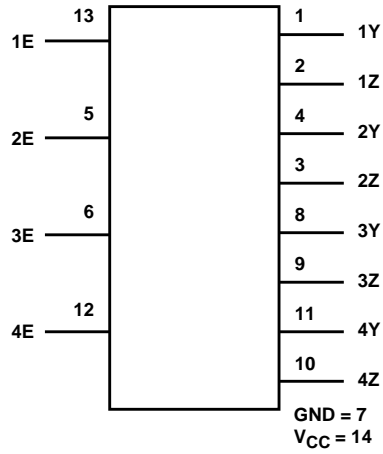
NOTE: When ordering, use the entire part number. The suffixes 96 and R denote tape and reel. The suffix T denotes a small-quantity reel of 250.

Pinout

CD54HC4066 (CERDIP)
 CD74HC4066 (PDIP, SOIC, TSSOP)
 CD74HCT4066 (PDIP, SOIC)
 TOP VIEW



Functional Diagram

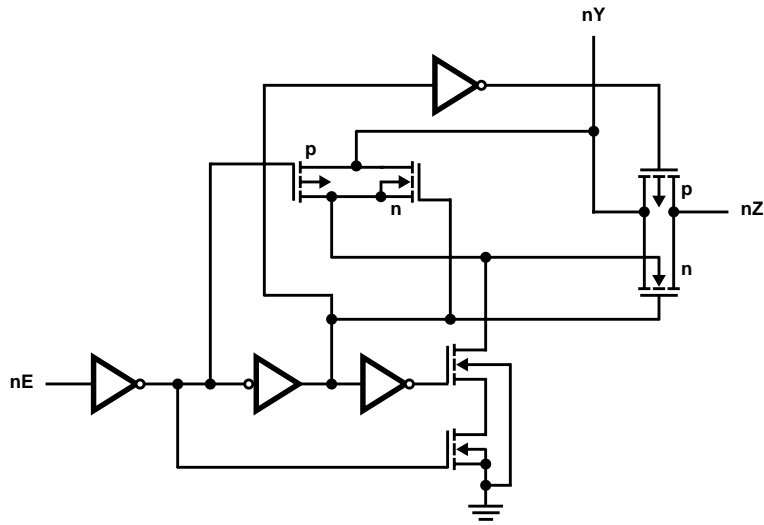


TRUTH TABLE

| INPUT nE | SWITCH |
|-------------|--------|
| L | Off |
| H | On |

H= High Level
 L= Low Level

Logic Diagram



CD54HC4066, CD74HC4066, CD74HCT4066

Absolute Maximum Ratings

| | |
|--|----------------|
| DC Supply Voltage, V_{CC} | |
| HCT Types | -0.5V to 7V |
| HC Types | -0.5V to 10.5V |
| DC Input Diode Current, I_{IK} | |
| For $V_I < -0.5V$ or $V_I > V_{CC} + 0.5V$ | $\pm 20mA$ |
| DC Switch Current, I_O (Note 1) | |
| For $-0.5V < V_O < V_{CC} + 0.5V$ | $\pm 25mA$ |
| DC Output Diode Current, I_{OK} | |
| For $V_O < -0.5V$ or $V_O > V_{CC} + 0.5V$ | $\pm 20mA$ |
| DC Output Source or Sink Current per Output Pin, I_O | |
| For $V_O > -0.5V$ or $V_O < V_{CC} + 0.5V$ | $\pm 25mA$ |
| DC V_{CC} or Ground Current, I_{CC} | $\pm 50mA$ |

Thermal Information

| | |
|--|----------------|
| Thermal Resistance (Typical, Note 2) | θ_{JA} |
| E (PDIP) Package | 80°C/W |
| M (SOIC) Package | 86°C/W |
| PW (TSSOP) Package | 113°C/W |
| Maximum Junction Temperature (Hermetic Package or Die) | 175°C |
| Maximum Junction Temperature (Plastic Package) | 150°C |
| Maximum Storage Temperature Range | -65°C to 150°C |
| Maximum Lead Temperature (Soldering 10s) | 300°C |
| (SOIC - Lead Tips Only) | |

Operating Conditions

| | |
|--|----------------|
| Temperature Range, T_A | -55°C to 125°C |
| Supply Voltage Range, V_{CC} | |
| HC Types | 2V to 10V |
| HCT Types | 4.5V to 5.5V |
| DC Input or Output Voltage, V_I, V_O | 0V to V_{CC} |
| Input Rise and Fall Time | |
| 2V | 1000ns (Max) |
| 4.5V | 500ns (Max) |
| 6V | 400ns (Max) |

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTES:

- In certain applications, the external load-resistor current may include both V_{CC} and signal-line components. To avoid drawing V_{CC} current when switch current flows into the transmission gate inputs, (terminals 1, 4, 8 and 11) the voltage drop across the bidirectional switch must not exceed 0.6V (calculated from R_{ON} values shown in the DC Electrical Specifications Table). No V_{CC} current will flow through R_L if the switch current flows into terminals 2, 3, 9 and 10.
- The package thermal impedance is calculated in accordance with JESD 51-7.

DC Electrical Specifications

| PARAMETER | SYMBOL | TEST CONDITIONS | | V_{CC} (V) | 25°C | | | -40°C TO 85°C | | -55°C TO 125°C | | UNITS |
|-------------------------------------|----------|-----------------|-----------------|--------------|------|-----|-----------|---------------|---------|----------------|---------|---------|
| | | V_I (V) | V_{IS} (V) | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| HC TYPES | | | | | | | | | | | | |
| High Level Input Voltage | V_{IH} | - | - | 2 | 1.5 | - | - | 1.5 | - | 1.5 | - | V |
| | | | | 4.5 | 3.15 | - | - | 3.15 | - | 3.15 | - | V |
| | | | | 9 | 6.3 | - | - | 6.3 | - | 6.3 | - | V |
| Low Level Input Voltage | V_{IL} | - | - | 2 | - | - | 0.5 | - | 0.5 | - | 0.5 | V |
| | | | | 4.5 | - | - | 1.35 | - | 1.35 | - | 1.35 | V |
| | | | | 9 | - | - | 2.7 | - | 2.7 | - | 2.7 | V |
| Input Leakage Current (Any Control) | I_{IL} | V_{CC} or GND | - | 10 | - | - | ± 0.1 | - | ± 1 | - | ± 1 | μA |
| Off-Switch Leakage Current | I_Z | V_{IL} | V_{CC} or GND | 10 | - | - | ± 0.1 | - | ± 1 | - | ± 1 | μA |

CD54HC4066, CD74HC4066, CD74HCT4066

DC Electrical Specifications (Continued)

| PARAMETER | SYMBOL | TEST CONDITIONS | | V _{CC} (V) | 25°C | | | -40°C TO 85°C | | -55°C TO 125°C | | UNITS |
|--|------------------------------|--------------------------|------------------------|---------------------|------|------|------|---------------|-----|----------------|-----|-------|
| | | V _I (V) | V _{IS} (V) | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| "ON" Resistance I _O = 1mA (Figure 1) | R _{ON} | V _{CC} | V _{CC} or GND | 4.5 | - | 25 | 80 | - | 106 | - | 128 | Ω |
| | | | | 6 | - | 20 | 75 | - | 94 | - | 113 | Ω |
| | | | | 9 | - | 15 | 60 | - | 78 | - | 95 | Ω |
| | | V _{CC} to GND | 4.5 | - | 35 | 95 | - | 118 | - | 142 | Ω | |
| | | | 6 | - | 24 | 84 | - | 105 | - | 126 | Ω | |
| | | | 9 | - | 16 | 70 | - | 88 | - | 105 | Ω | |
| "ON" Resistance Between Any Two Switches | ΔR _{ON} | V _{CC} | - | 4.5 | - | 1 | - | - | - | - | - | Ω |
| | | | | 6 | - | 0.75 | - | - | - | - | - | Ω |
| | | | | 9 | - | 0.5 | - | - | - | - | - | Ω |
| Quiescent Device Current | I _{CC} | V _{CC} or GND | - | 6 | - | - | 2 | - | 20 | - | 40 | μA |
| | | | | 10 | - | - | 16 | - | 160 | - | 320 | μA |
| HCT TYPES | | | | | | | | | | | | |
| High Level Input Voltage | V _{IH} | - | - | 4.5 to 5.5 | 2 | - | - | 2 | - | 2 | - | V |
| Low Level Input Voltage | V _{IL} | - | - | 4.5 to 5.5 | - | - | 0.8 | - | 0.8 | - | 0.8 | V |
| Input Leakage Current (Any Control) | I _{IL} | V _{CC} or GND | - | 5.5 | - | - | ±0.1 | - | ±1 | - | ±1 | μA |
| Off-Switch Leakage Current | I _Z | V _{IL} | V _{CC} or GND | 5.5 | - | - | ±0.1 | - | ±1 | - | ±1 | μA |
| "ON" Resistance I _O = 1mA (Figure 1) | R _{ON} | V _{CC} | V _{CC} or GND | 4.5 | - | 25 | 80 | - | 106 | - | 128 | Ω |
| | | | V _{CC} to GND | 4.5 | - | 35 | 95 | - | 118 | - | 142 | Ω |
| "ON" Resistance Between Any Two Switches | ΔR _{ON} | V _{CC} | - | 4.5 | - | 1 | - | - | - | - | - | Ω |
| Quiescent Device Current | I _{CC} | V _{CC} or GND | - | 5.5 | - | - | 2 | - | 20 | - | 40 | μA |
| Additional Quiescent Device Current Per Input Pin: 1 Unit Load | ΔI _{CC} (Note 3) | V _{CC} - 2.1 | - | 4.5 to 5.5 | - | 100 | 360 | - | 450 | - | 490 | μA |

NOTE:

3. For dual-supply systems theoretical worst case (V_I = 2.4V, V_{CC} = 5.5V) specification is 1.8mA.

HCT Input Loading Table

| INPUT | UNIT LOADS |
|-------|------------|
| All | 1 |

NOTE: Unit Load is ΔI_{CC} limit specified in DC Electrical Specifications table, e.g., 360μA max at 25°C.

CD54HC4066, CD74HC4066, CD74HCT4066

Switching Specifications Input $t_r, t_f = 6\text{ns}$

| PARAMETER | SYMBOL | TEST CONDITIONS | V_{CC} (V) | 25°C | | | -40°C TO 85°C | | -55°C TO 125°C | | UNITS |
|---|--------------------|---------------------|--------------|------|-----|-----|---------------|-----|----------------|-----|-------|
| | | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| HC TYPES | | | | | | | | | | | |
| Propagation Delay Time Switch In to Out | t_{PLH}, t_{PHL} | $C_L = 50\text{pF}$ | 2 | - | - | 60 | - | 75 | - | 90 | ns |
| | | | 4.5 | - | - | 12 | - | 15 | - | 18 | ns |
| | | | 9 | - | - | 8 | - | 11 | - | 13 | ns |
| | | $C_L = 15\text{pF}$ | 5 | - | 4 | - | - | - | - | - | ns |
| Propagation Delay Time Switch Turn On Delay | t_{PZH}, t_{PZL} | $C_L = 50\text{pF}$ | 2 | - | - | 100 | - | 125 | - | 150 | ns |
| | | | 4.5 | - | - | 20 | - | 25 | - | 30 | ns |
| | | | 9 | - | - | 12 | - | 15 | - | 18 | ns |
| | | $C_L = 15\text{pF}$ | 5 | - | 8 | - | - | - | - | - | ns |
| Propagation Delay Time Switch Turn Off Delay | t_{PHZ}, t_{PLZ} | $C_L = 50\text{pF}$ | 2 | - | - | 150 | - | 190 | - | 225 | ns |
| | | | 4.5 | - | - | 30 | - | 38 | - | 45 | ns |
| | | | 9 | - | - | 24 | - | 30 | - | 36 | ns |
| | | $C_L = 15\text{pF}$ | 5 | - | 12 | - | - | - | - | - | ns |
| Input (Control) Capacitance | C_I | - | - | - | 10 | - | 10 | - | 10 | pF | |
| Power Dissipation Capacitance (Notes 4, 5) | C_{PD} | - | 5 | - | 25 | - | - | - | - | pF | |
| HCT TYPES | | | | | | | | | | | |
| Propagation Delay Time Switch In to Out | t_{PLH}, t_{PHL} | $C_L = 50\text{pF}$ | 4.5 | - | - | 12 | - | 15 | - | 18 | ns |
| | | $C_L = 15\text{pF}$ | 5 | - | 4 | - | - | - | - | - | ns |
| Propagation Delay Time Switch Turn On Delay | t_{PZH}, t_{PZL} | $C_L = 50\text{pF}$ | 4.5 | - | - | 24 | - | 30 | - | 36 | ns |
| | | $C_L = 15\text{pF}$ | 5 | - | 9 | - | - | - | - | - | ns |
| Propagation Delay Time Switch Turn Off Delay | t_{PHZ}, t_{PLZ} | $C_L = 50\text{pF}$ | 4.5 | - | - | 35 | - | 44 | - | 53 | ns |
| | | $C_L = 15\text{pF}$ | 5 | - | 14 | - | - | - | - | - | ns |
| Input (Control) Capacitance | C_I | - | - | - | 10 | - | 10 | - | 10 | pF | |
| Power Dissipation Capacitance (Notes 4, 5) | C_{PD} | - | 5 | - | 38 | - | - | - | - | pF | |

NOTES:

- C_{PD} is used to determine the dynamic power consumption, per package.
- $P_D = C_{PD} V_{CC}^2 f_i + \sum (C_L + C_S) V_{CC}^2 f_o$ where f_i = input frequency, f_o = output frequency, C_L = output load capacitance, C_S = switch capacitance, V_{CC} = supply voltage.

Analog Channel Specifications $T_A = 25^\circ\text{C}$

| PARAMETER | TEST CONDITIONS | V_{CC} (V) | HC4066 | CD74HCT4066 | UNITS |
|---|--|--------------|--------|-------------|-------|
| Switch Frequency Response Bandwidth at -3dB Figure 2 | Figure 5, Notes 6, 7 | 4.5 | 200 | 200 | MHz |
| Cross Talk Between Any Two Switches Figure 3 | Figure 4, Notes 7, 8 | 4.5 | -72 | -72 | dB |
| Total Harmonic Distortion | Figure 6, 1kHz, $V_{IS} = 4V_{P-P}$ | 4.5 | 0.022 | 0.023 | % |
| | Figure 6, 1kHz, $V_{IS} = 8V_{P-P}$ | 9 | 0.008 | N/A | % |

CD54HC4066, CD74HC4066, CD74HCT4066

Analog Channel Specifications $T_A = 25^\circ\text{C}$ (Continued)

| PARAMETER | TEST CONDITIONS | V_{CC} (V) | HC4066 | CD74HCT4066 | UNITS |
|--|----------------------|--------------|--------|-------------|-------|
| Control to Switch Feedthrough Noise | Figure 7 | 4.5 | 200 | 130 | mV |
| | | 9 | 550 | N/A | mV |
| Switch "OFF" Signal Feedthrough Figure 3 | Figure 8, Notes 7, 8 | 4.5 | -72 | -72 | dB |
| Switch Input Capacitance, C_S | | - | 5 | 5 | pF |

NOTES:

6. Adjust input level for 0dBm at output, $f = 1\text{MHz}$.
7. V_{IS} is centered at $V_{CC}/2$.
8. Adjust input for 0dBm at V_{IS} .

Typical Performance Curves



FIGURE 1. TYPICAL "ON" RESISTANCE vs INPUT SIGNAL VOLTAGE

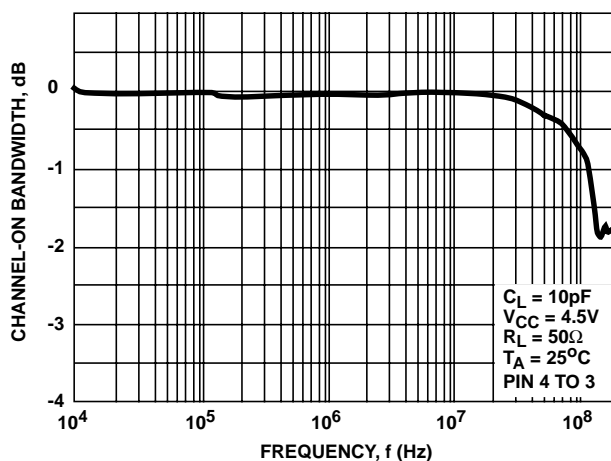


FIGURE 2. SWITCH FREQUENCY RESPONSE, $V_{CC} = 4.5\text{V}$

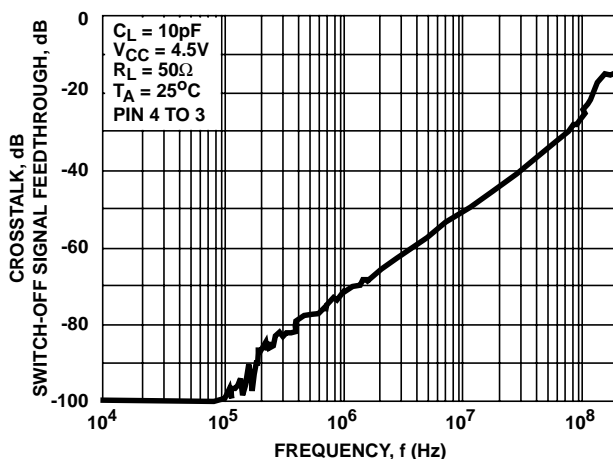


FIGURE 3. SWITCH-OFF SIGNAL FEEDTHROUGH AND CROSSTALK vs FREQUENCY, $V_{CC} = 4.5\text{V}$

Analog Test Circuits

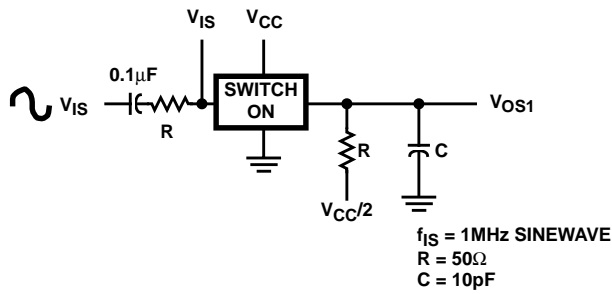


FIGURE 4. CROSTALK BETWEEN TWO SWITCHES TEST CIRCUIT

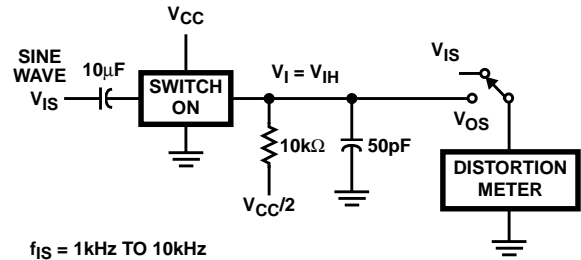
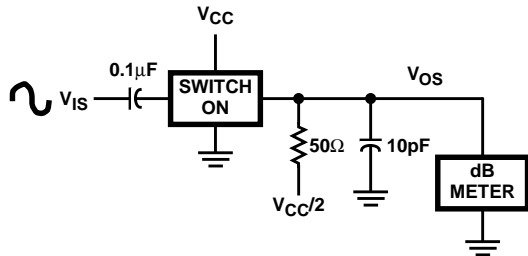
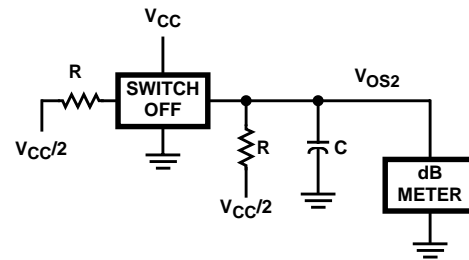


FIGURE 5. FREQUENCY RESPONSE TEST CIRCUIT

FIGURE 6. TOTAL HARMONIC DISTORTION TEST CIRCUIT

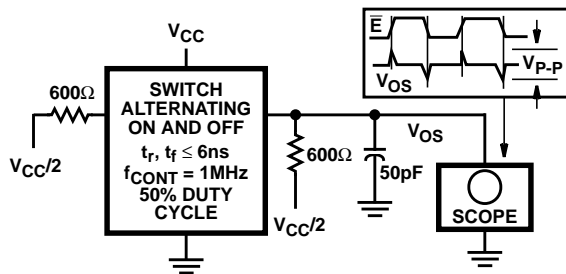


FIGURE 7. CONTROL-TO-SWITCH FEEDTHROUGH NOISE TEST CIRCUIT

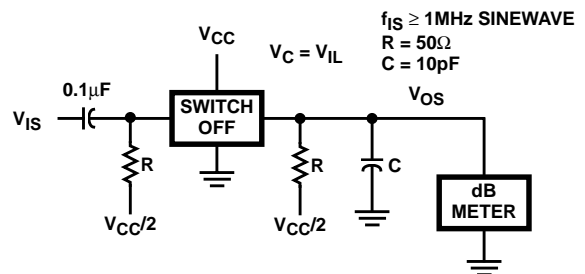


FIGURE 9. HC TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC

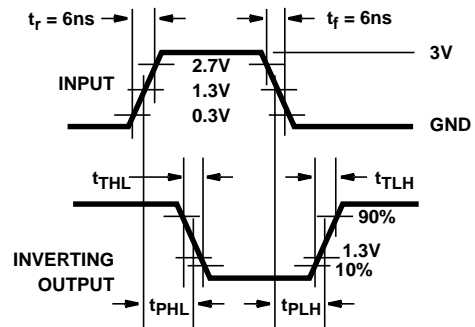


FIGURE 10. HCT TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC

Test Circuits and Waveforms

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|-------------------------|----------------------|--------------|---------------------------------|-------------------------|
| 5962-8950701CA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 5962-8950701CA CD54HC4066F3A | Samples |
| CD54HC4066F3A | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | 5962-8950701CA CD54HC4066F3A | Samples |
| CD74HC4066E | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC4066E | Samples |
| CD74HC4066EE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HC4066E | Samples |
| CD74HC4066M | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066M96 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066M96E4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066M96G4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066ME4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066MG4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066MT | ACTIVE | SOIC | D | 14 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HC4066M | Samples |
| CD74HC4066PW | ACTIVE | TSSOP | PW | 14 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HP4066 | Samples |
| CD74HC4066PWG4 | ACTIVE | TSSOP | PW | 14 | 90 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HP4066 | Samples |
| CD74HC4066PWR | ACTIVE | TSSOP | PW | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HP4066 | Samples |
| CD74HC4066PWRG4 | ACTIVE | TSSOP | PW | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HP4066 | Samples |
| CD74HC4066PWT | ACTIVE | TSSOP | PW | 14 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HP4066 | Samples |
| CD74HCT4066E | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | -55 to 125 | CD74HCT4066E | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|-------------------------|----------------------|--------------|-------------------------|-------------------------|
| CD74HCT4066M | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT4066M | Samples |
| CD74HCT4066M96 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT4066M | Samples |
| CD74HCT4066M96G4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT4066M | Samples |
| CD74HCT4066ME4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT4066M | Samples |
| CD74HCT4066MT | ACTIVE | SOIC | D | 14 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT4066M | Samples |
| CD74HCT4066MTG4 | ACTIVE | SOIC | D | 14 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HCT4066M | Samples |
| HPA01008PWR | ACTIVE | TSSOP | PW | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | HP4066 | 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) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

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

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OTHER QUALIFIED VERSIONS OF CD54HC4066, CD74HC4066, CD74HCT4066 :

- Catalog: [CD74HC4066](#)
- Automotive: [CD74HCT4066-Q1](#)
- Military: [CD54HC4066](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military - QML certified for Military and Defense Applications

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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74HC4066M96 | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| CD74HC4066MT | SOIC | D | 14 | 250 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| CD74HC4066PWR | TSSOP | PW | 14 | 2000 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |
| CD74HC4066PWT | TSSOP | PW | 14 | 250 | 330.0 | 12.4 | 6.9 | 5.6 | 1.6 | 8.0 | 12.0 | Q1 |
| CD74HCT4066M96 | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| CD74HCT4066MT | SOIC | D | 14 | 250 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 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) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74HC4066M96 | SOIC | D | 14 | 2500 | 367.0 | 367.0 | 38.0 |
| CD74HC4066MT | SOIC | D | 14 | 250 | 367.0 | 367.0 | 38.0 |
| CD74HC4066PWR | TSSOP | PW | 14 | 2000 | 367.0 | 367.0 | 35.0 |
| CD74HC4066PWT | TSSOP | PW | 14 | 250 | 367.0 | 367.0 | 35.0 |
| CD74HCT4066M96 | SOIC | D | 14 | 2500 | 367.0 | 367.0 | 38.0 |
| CD74HCT4066MT | SOIC | D | 14 | 250 | 367.0 | 367.0 | 38.0 |

D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



4040047-5/M 06/11

- 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



4211283-3/E 08/12

- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - 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.
 - 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:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - 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.
 - 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.
 - $\triangle C$ Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
 - $\triangle D$ The 20 pin end lead shoulder width is a vendor option, either half or full width.

J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---------------|------------------------|------------------------|------------------------|------------------------|
| A | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC |
| B MAX | 0.785 (19,94) | .840 (21,34) | 0.960 (24,38) | 1.060 (26,92) |
| B MIN | — | — | — | — |
| C MAX | 0.300 (7,62) | 0.300 (7,62) | 0.310 (7,87) | 0.300 (7,62) |
| C MIN | 0.245 (6,22) | 0.245 (6,22) | 0.220 (5,59) | 0.245 (6,22) |



4040083/F 03/03

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

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