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Product Information

74HC/HCT4046A; Phase-locked-loop with VCO

Information as of 2002-02-18



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Description

The 74HC/HCT4046A are high-speed Si-gate CMOS devices and are pin compatible with the '4046' of the '4000B' series. They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT4046A are phase-locked-loop circuits that comprise a linear voltage-controlled oscillator (VCO) and three different phase comparators (PC1, PC2 and PC3) with a common signal input amplifier and a common comparator input.

The signal input can be directly coupled to large voltage signals, or indirectly coupled (with a series capacitor) to small voltage signals. A self-bias input circuit keeps small voltage signals within the linear region of the input amplifiers. With a passive low-pass filter, the '4046A' forms a second-order loop PLL. The excellent VCO linearity is achieved by the use of linear op-amp techniques.

The VCO requires one external capacitor C1 (between C1_A and C1_B) and one external resistor R1 (between R1 and GND) or two external resistors R1 and R2 (between R₁ and GND, and R₂ and GND). Resistor R1 and capacitor C1 determine the frequency range of the VCO. Resistor R2 enables the VCO to have a frequency offset if required.

The high input impedance of the VCO simplifies the design of low-pass filters by giving the designer a wide choice of resistor/capacitor ranges. In order not to load the low-pass filter, a demodulator output of the VCO input voltage is provided at pin 10 (DEM_{OUT}). In contrast to conventional techniques where the DEM_{OUT} voltage is one threshold voltage lower than the VCO input voltage, here the DEM_{OUT} voltage equals that of the VCO input. If DEMOUT is used, a load resistor (RS) should be connected from DEMOUT to GND; if unused, DEM_{OUT} should be left open. The VCO output (VCO_{OUT}) can be connected directly to the comparator input (COMP_{IN}), or connected via a frequency-divider. The VCO output signal has a duty factor of 50% (maximum expected deviation 1%), if the VCO input is held at a constant DC level. A LOW level at the inhibit input (INH) enables the VCO and demodulator, while a HIGH level turns both off to minimize standby power consumption.

The only difference between the HC and HCT versions is the input level specification of the INH input. This input disables the VCO section. The sections of the comparator are identical, so that there is no difference in the SIG_{IN} (pin 14) or COMP_{IN} (pin 3) inputs between the HC and HCT versions.

Features

- Low power consumption
- Centre frequency of up to 17 MHz (typ.) at VCC = 4.5 V
- Choice of three phase comparators: EXCLUSIVE-OR;
- edge-triggered JK flip-flop;
- edge-triggered RS flip-flop
- Excellent VCO frequency linearity
- VCO-inhibit control for ON/OFF keying and for low standby power consumption
- Minimal frequency drift
- Operating power supply voltage range:
- VCO section 3.0 to 6.0 V
- digital section 2.0 to 6.0 V
- Zero voltage offset due to op-amp buffering
- Output capability: standard
- ICC category: MSI

Datasheet

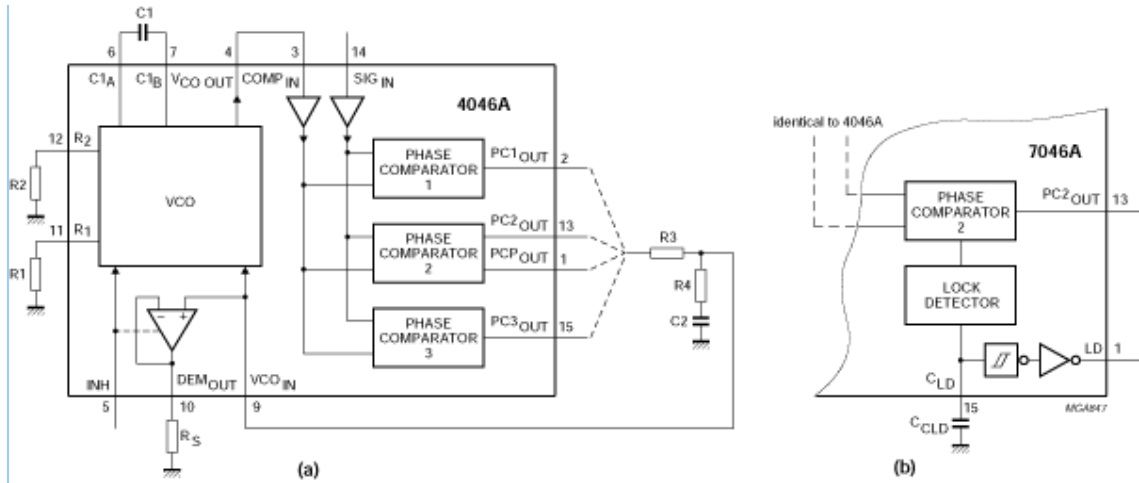
<u>Type number</u>	<u>Title</u>	<u>Publication release date</u>	<u>Datasheet status</u>	<u>Page count</u>	<u>File size (kB)</u>	<u>Datasheet</u>
74HC/HCT4046A	Phase-locked-loop with VCO	25-Nov-97	Product Specification	34	442	PDF Download

Additional datasheet info

To complete the device datasheet with package and family information, also download the following PDF files. The "Logic Package Information" document is required to determine in which package(s) this device is available.

Document	Description
1 PDF HCT FAMILY SPECIFICATIONS	HC/T Family Specifications, The IC06 74HC/HCT/HCMOS Logic Family Specifications
2 PDF HCT PACKAGE INFO	HC/T Package Info, The IC06 74HC/HCT/HCMOS Logic Package Information
3 PDF HCT PACKAGE OUTLINES	HC/T Package Outlines, The IC06 74HC/HCT/HCMOS Logic Package Outlines

Blockdiagram(s)



■ Parametrics

Type number	Package	Desired Maximum Propagation Delay Range (ns)	Series	Voltage	Speed	Function	No. of Pins	Package Material	Power Dissipation Considerations	Logic Switching Levels	Bit Width
74HC4046AD	SOT109 (SO16)	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	Low Power or Battery Applications	TTL	Other
74HC4046ADB	SOT338	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	None	TTL	Other
74HC4046AN	SOT38	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	None	TTL	Other
74HC4046APW	SOT403	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	Low Power or Battery Applications	TTL	Other
74HCT4046AD	SOT109 (SO16)	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	None	TTL	Other
74HCT4046ADB	SOT338	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	None	CMOS	Other
74HCT4046AN	SOT38	15 to 50	HC/T	5 Volt+	Low	Phase Lock Loops	16	Plastic	Low Power or Battery Applications	CMOS	Other

■ Products, packages, availability and ordering

Type number	North American Type number	Order code (12nc)	marking/ packing PDF Discretes packing info	package	device status	buy online
74HC4046AD	74HC4046AD	9338 095 50652	Standard Marking * Bulk Pack, CECC	SOT109 (SO16)	Full production	BUY ONLINE

	74HC4046AD-T	9338 095 50653	Standard Marking * Reel Pack, SMD, 13", CECC	SOT109 (SO16)	Full production	BUY ONLINE 
74HC4046ADB	74HC4046ADB	9351 874 50112	Standard Marking * Bulk Pack	SOT338-1 (SSOP16)	Full production	BUY ONLINE 
	74HC4046ADB-T	9351 874 50118	Standard Marking * Reel Pack, SMD, 13"	SOT338-1 (SSOP16)	Full production	BUY ONLINE 
74HC4046AN	74HC4046AN	9338 095 40652	Standard Marking * Bulk Pack, CECC	SOT38-1 (DIP16)	Full production	BUY ONLINE 
74HC4046APW	74HC4046APW	9351 874 60112	Standard Marking * Bulk Pack	SOT403-1 (TSSOP16)	Full production	BUY ONLINE 
	74HC4046APW-T	9351 874 60118	Standard Marking * Reel Pack, SMD, 13"	SOT403-1 (TSSOP16)	Full production	BUY ONLINE 
74HC4046AU		9338 257 70005	No Marking * Chips on Wafer, Pre-Sawn, On FFC	-	Full production	-
74HCT4046AD	74HCT4046AD	9338 095 70112	Standard Marking * Bulk Pack	SOT109 (SO16)	Full production	BUY ONLINE 
	74HCT4046AD-T	9338 095 70118	Standard Marking * Reel Pack, SMD, 13"	SOT109 (SO16)	Full production	BUY ONLINE 
74HCT4046ADB	74HCT4046ADB	9351 749 40112	Standard Marking * Bulk Pack	SOT338-1 (SSOP16)	Full production	BUY ONLINE 
	74HCT4046ADB-T	9351 749 40118	Standard Marking * Reel Pack, SMD, 13"	SOT338-1 (SSOP16)	Full production	BUY ONLINE 
74HCT4046AN	74HCT4046AN	9338 095 60112	Standard Marking * Bulk Pack	SOT38-1 (DIP16)	Full production	BUY ONLINE 
74HCT4046AU		9338 257 80005	No Marking * Chips on Wafer, Pre-Sawn, On FFC	-	Full production	-

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Support & tools

 **PDF** [HC/T Family Specifications, The IC06 74HC/HCT/HCMOS Logic Family Specifications](#)(date 01-Mar-98)

 **PDF** [HC/T User Guide](#)(date 01-Nov-97)

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