



# ICS574

## Zero Delay, Low Skew Buffer

### Description

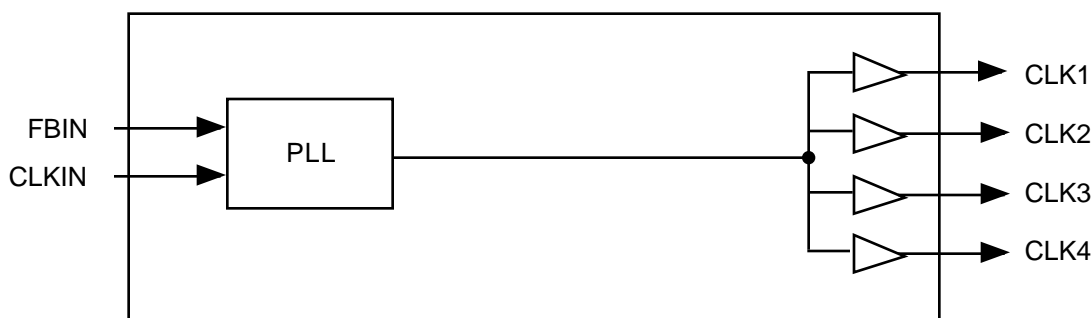
The ICS574 is a low jitter, low-skew, high performance PLL-based zero delay buffer for high speed applications. Based on ICS's proprietary low jitter Phase Locked Loop (PLL) techniques, the device provides four low skew outputs at speeds up to 160 MHz at 3.3 V. When one of the outputs is connected directly to FBIN, the rising edge of each output is aligned with the rising edge of the input clock. External delay elements connected in the feedback loops will cause the outputs to occur before the inputs by the amount of propagation delay of the external element.

ICS manufactures the largest variety of clock generators and buffers, and is the largest clock supplier in the world.

### Features

- Packaged in 8 pin narrow SOIC, Pb (lead) free available
- Zero input-to-output delay
- Four 1X outputs
- Output to output skew is less than 150 ps
- Output clocks up to 160 MHz at 3.3 V
- External feedback path for output edge placement
- Spread Smart™ technology works with spread spectrum clock generators
- Full CMOS outputs with 18 mA output drive capability at TTL levels at 3.3 V
- Advanced, low power, sub-micron CMOS process
- Operating voltage from 3.0 to 5.5 V
- Industrial temperature version available

### Block Diagram

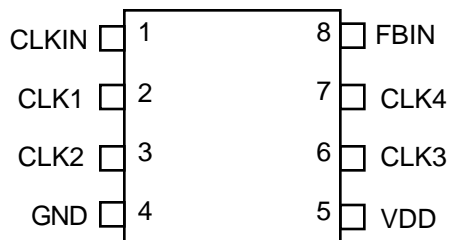




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### Pin Assignment



Standard 8 pin SOIC

### Pin Descriptions

Number	Name	Type	Description
1	CLKIN	I	Clock input. Connect to input clock source.
2, 3, 6, 7	CLK1:4	O	Four clock outputs.
5	VDD	P	Power supply. Connect both pins to same voltage (either 3.3V or 5V).
4	GND	P	Connect to ground.
8	FBIN	I	Feedback input.

Key: I = Input; O = output; P = power supply connection.

### External Components

The ICS574 requires a minimum number of external components for proper operation. Decoupling capacitors of 0.1 $\mu$ F should be connected between VDD and GND on pins 4 and 5, as close to the device as possible. A series termination resistor of 33  $\Omega$  may be used close to the pin for each clock output to reduce reflections.



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### Electrical Specifications

Parameter	Conditions	Minimum	Typical	Maximum	Units
<b>ABSOLUTE MAXIMUM RATINGS (note 1)</b>					
Supply voltage, VDD	Referenced to GND	-0.5		7	V
Inputs and Clock Outputs	Referenced to GND	-0.5		VDD+0.5	V
Electrostatic Discharge	MIL-STD-883	2000			V
Ambient Operating Temperature		-40		85	°C
Soldering Temperature	Max of 10 seconds			260	°C
Junction temperature				150	°C
Storage temperature		-65		150	°C
<b>DC CHARACTERISTICS (VDD = 3.3 V unless specified otherwise)</b>					
Operating Voltage, VDD		3.00		5.50	V
Input High Voltage, VIH		VDD/2+1			V
Input Low Voltage, VIL				VDD/2-1	V
Output High Voltage, VOH	IOH=-18 mA	2.4			V
Output Low Voltage, VOL	IOL=18 mA			0.4	V
Output High Voltage, VOH, CMOS level	IOH=-5 mA	VDD-0.4			V
Operating Supply Current, IDD (Note 2)	No Load		36		mA
Short Circuit Current	Each output		±65		mA
Input Capacitance			7		pF
<b>AC CHARACTERISTICS (VDD = 3.3 V unless specified otherwise)</b>					
Input Clock Frequency	FBIN to CLK1	20		160	MHz
Output Clock Frequency	FBIN to CLK1	20		160	MHz
Output Clock Rise Time, CL=30pF	0.8 to 2.0V			1.5	ns
Output Clock Fall Time, CL=30pF	2.0 to 0.8V			1.5	ns
Output Clock Duty Cycle, VDD=3.3V	At 1.4V	40	50	60	%
Device to Device Skew, equally loaded	rising edges at VDD/2			700	ps
Output to Output Skew, equally loaded	rising edges at VDD/2			150	ps
Maximum Absolute Jitter			170		ps
Cycle to Cycle Jitter, 30pF loads	66.67 MHz outputs			250	ps

- Notes: 1. Stresses beyond those listed under Absolute Maximum Ratings could cause permanent damage to the device. Prolonged exposure to levels above the operating limits but below the Absolute Maximums may affect device reliability.
2. With CLKIN = 160 MHz, FBIN to CLK4

### Using Spread Spectrum Input Clocks

The ICS574 uses ICS' Spread Smart technology, allowing it to accurately track (pass through) any clocks that implement spread spectrum techniques.



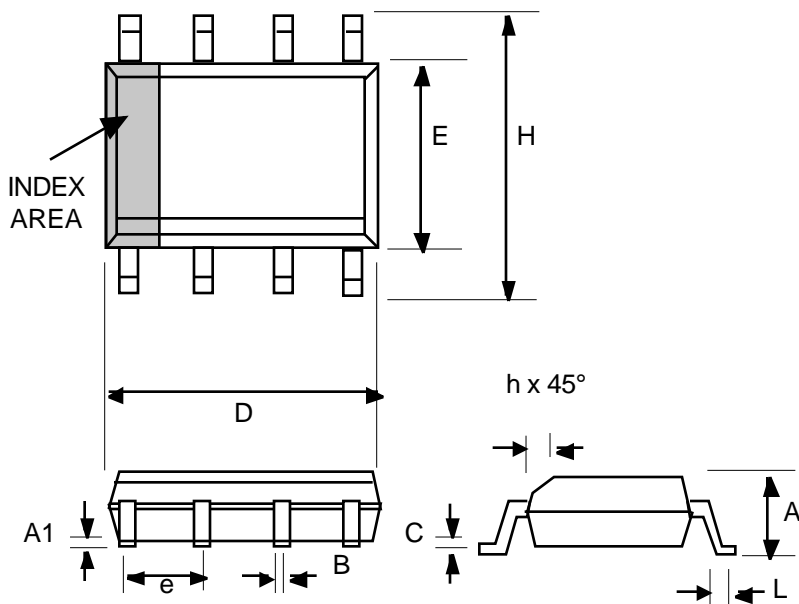
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### Package Outline and Package Dimensions

(For current dimensional specifications, see JEDEC Publication No. 95.)

#### 8 pin SOIC



Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0532	0.0688	1.35	1.75
A1	0.0040	0.0098	0.10	0.24
B	0.0130	0.0200	0.33	0.51
C	0.0075	0.0098	0.19	0.24
D	0.1890	0.1968	4.80	5.00
E	0.1497	0.1574	3.80	4.00
e	.050 BSC		1.27 BSC	
H	0.2284	0.2440	5.80	6.20
h	0.0099	0.0195	0.25	0.50
L	0.0160	0.0500	0.41	1.27

### Ordering Information

Part/Order Number	Marking	Shipping packaging	Package	Temperature
ICS574M	ICS574M	tubes	8 pin SOIC	0-70 °C
ICS574MT	ICS574M	tape and reel	8 pin SOIC	0-70 °C
ICS574MI	ICS574MI	tubes	8 pin SOIC	-40-85°C
ICS574MIT	ICS574MI	tape and reel	8 pin SOIC	-40-85°C
ICS574MLF	574MLF	tubes	8 pin SOIC	0 to 70°C
ICS574MLFT	574MLF	tape and reel	8 pin SOIC	0 to 70°C
ICS574MILF	574MILF	tubes	8 pin SOIC	-40 to 85°C
ICS574MILFT	574MILF	tape and reel	8 pin SOIC	-40 to 85°C

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