MICROCLOCK Digital Still Camera Clock Source

Description

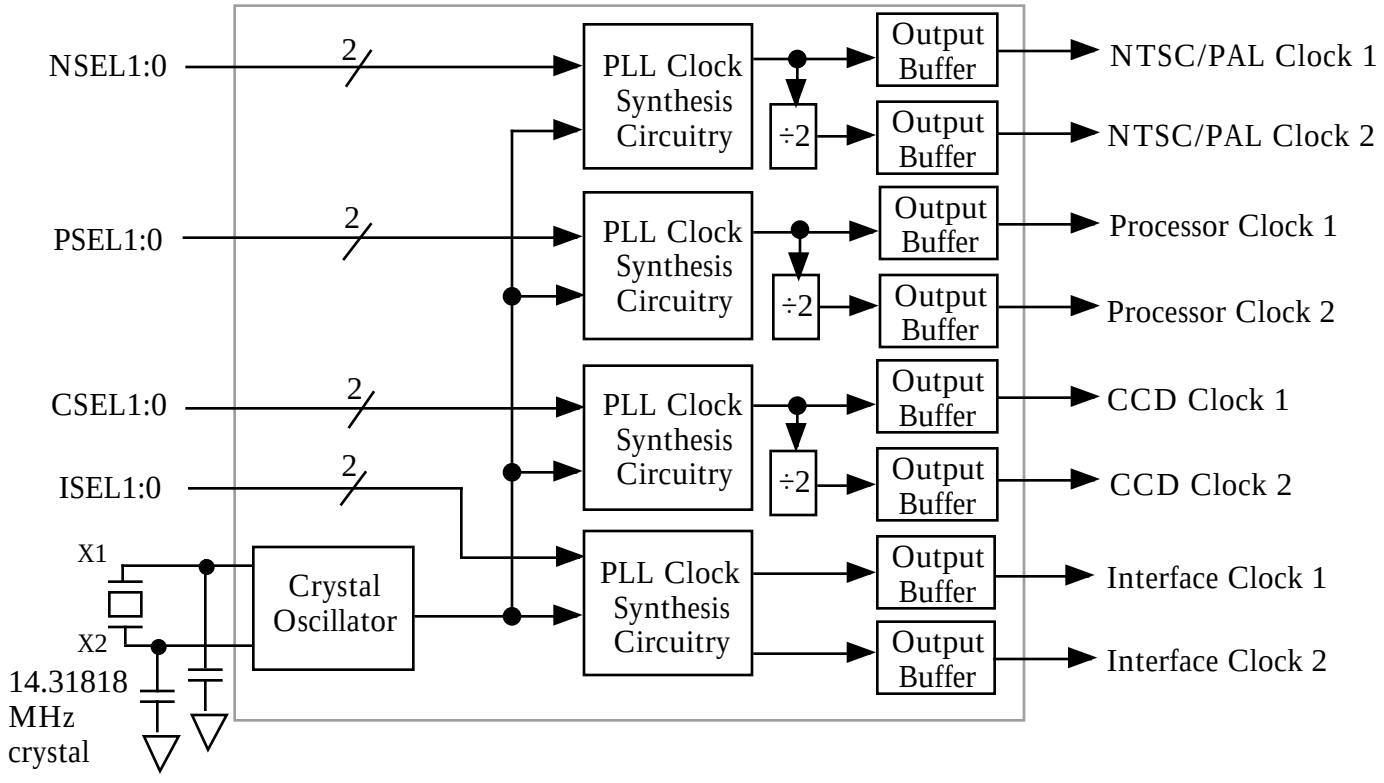
The ICS620-01 is a low cost, low jitter, high performance clock synthesizer for digital still cameras. Using analog Phase-Locked Loop (PLL) techniques, the device uses a 14.318 MHz crystal input to produce multiple output clocks required in the camera. It provides selectable NTSC/PAL clock, a selectable processor clock, a selectable CCD clock, and a selectable interface clocks. Most clocks are generated to a very low ppm synthesis error rate.

All clocks can be turned off using a power down mode. Custom versions with user-defined frequencies and power down modes are available in 6-8 weeks.

Features

- Packaged in 28 pin, 150 mil wide SSOP (QSOP)
- Provides all clocks necessary for many digital still camera systems
- All clocks are frequency locked together
- Interface clock for USB, P1394, or UART
- Saves space over multiple crystals and oscillators
- Clocks power down when all select pins are low
- Full CMOS outputs also compatible with TTL levels
- +3.3 V or +5 V operation
- Low power, sub-micron CMOS process
- Custom versions available

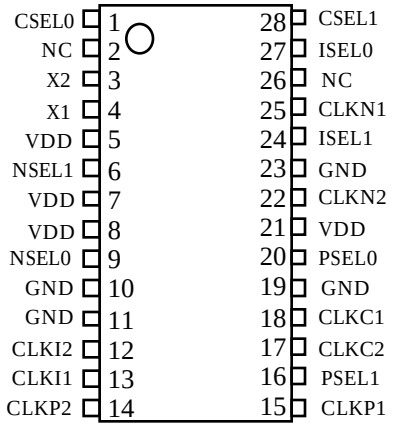
Block Diagram



Integrated Circuit Systems • 1271 Parkmoor Ave.•San Jose•CA•95126•(408)295-9800tel•(408)295-9818fax

MICROCLOCK Digital Still Camera Clock Source

Pin Assignment



Clock C Frequency Select Table (MHz)

CSEL1	CSEL0	CLKC1	CLKC2	Actual error
0	0	Power Down - both outputs stop low		
0	M	14.31818	7.15909	0 ppm
0	1	9.81818	4.90909	0 ppm
M	0	7.3728	3.6864	31 ppm high
M	M	27	13.5	0 ppm
M	1	8	4	0.017% high
1	0	28	14	0 ppm
1	M	24.54545	12.272725	11 ppm high
1	1	32	16	0.017% high

Key: 0 = connect to ground, 1 = connect to VDD,
M = leave unconnected (floating).

Processor Clock Select (MHz)

PSEL1	PSEL0	CLKP1	CLKP2
0	0	Power down both	
0	1	20.50	10.25
1	0	23.96	11.98
1	1	24.5455	12.2727

Interface Clock Select (MHz)

ISEL1	ISEL0	CLKI1	CLKI2
0	0	Power down both	
0	1	36.864	18.432
1	0	24.576	8.192
1	1	48	12

NTSC/PAL Clock Select (MHz)

NSEL1	NSEL0	CLKN1	CLKN2	Error
0	0	Power down		
0	M	8.8672	4.43361	2 ppm low
0	1	27	13.5	0 ppm
1	0	35.4688	17.7344	2 ppm low
1	M	7.1591	3.5795	0 ppm
1	1	28.6364	14.3182	0 ppm

Pin Descriptions

Pin #	Name	Type	Description
1	CSEL0	TI	C clock SELect pin 0.
2, 26	NC	-	No Connect. Nothing is connected internally to this pin.
3	X2	XO	Crystal connection. Connect to a 14.31818 MHz crystal or input clock.
4	X1	XI	Crystal connection. Connect to a 14.31818 MHz crystal, or leave unconnected for clock.
5, 7, 8, 21	VDD	P	Connect to +3.3V or +5V. Must be same voltage on all pins.
6	NSEL1	I	NTSC/PAL SELect pin 1.
9	NSEL0	TI	NTSC/PAL SELect pin 0.
10, 11, 19, 23	GND	P	Connect to Ground.
12	CLKI2	O	Interface CLocK output 2.
13	CLKI1	O	Interface CLocK output 1.
14	CLKP2	O	Processor CLocK output 2.
15	CLKP1	O	Processor CLocK output 1.
16	PSEL1	I	Processor clock SELect pin 1.
17	CLKC2	O	C CLocK output 2.
18	CLKC1	O	C CLocK output 1.
20	PSEL0	I	Processor clock SELect pin 0.
22	CLKN2	O	NTSC/PAL CLocK output 2.
24	ISEL1	I	Interface clock SELect pin 1.
25	CLKN1	O	NTSC/PAL CLocK output 1. Output may stop high or low during power down.
27	ISEL0	I	Interface clock SELect pin 0.
28	CSEL1	TI	C clock SELect pin 1.

Key: I = Input, O = Output, P = Power supply connection, TI = tri-level input (automatically biased to M level if unconnected).
Internal pull-ups are on pins 6, 16, 20, 24, and 27.

Integrated Circuit Systems • 1271 Parkmoor Ave.•San Jose•CA•95126•(408)295-9800tel•(408)295-9818fax

Electrical Specifications

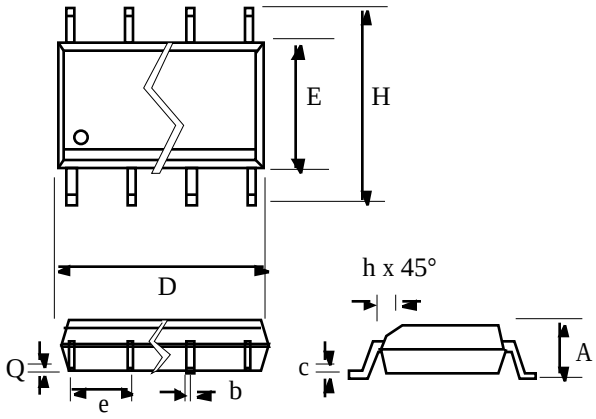
Parameter	Conditions	Minimum	Typical	Maximum	Units
ABSOLUTE MAXIMUM RATINGS					
Supply Voltage, VDD	Referenced to GND			7	V
Inputs and Clock Outputs	Referenced to GND	-0.5		VDD+0.5	V
Ambient Operating Temperature		0		70	°C
Soldering Temperature	Max of 10 seconds			260	°C
Storage temperature		-65		150	°C
DC CHARACTERISTICS					
Operating Voltage, VDD		3		5.5	V
Input High Voltage, VIH	Pins 6, 16, 20, 24, 27	2			V
Input Low Voltage, VIL	Pins 6, 16, 20, 24, 27			0.8	V
Input High Voltage, VIH	Pins 1, 9, 28	VDD-0.5			V
Input Mid-level Voltage	Pins 1, 9, 28	Leave pin unconnected or tri-stated			V
Input Low Voltage, VIL	Pins 1, 9, 28			0.5	V
Output High Voltage, VOH	IOH=-4mA	VDD-0.4			V
Output High Voltage, VOH	IOH=-25mA	2.4			V
Output Low Voltage, VOL	IOL=25mA			0.4	V
Operating Supply Current, IDD	No Load		TBD		mA
Short Circuit Current	Each output		±70		mA
On-Chip Pull-up Resistor	Pins 6, 16, 20, 24, 27		250		kΩ
Input Capacitance	All inputs but X1		7		pF
AC CHARACTERISTICS					
Input Frequency			14.31818		MHz
Output Clock Rise Time	0.8 to 2.0V			TBD	ns
Output Clock Fall Time	2.0 to 0.8V			TBD	ns
Output Clock Duty Cycle	at VDD/2	45	49 to 51	55	%
Absolute Jitter			TBD		ps

Note:
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.

External Components

The ICS620-01 requires some inexpensive external components for proper operation. Decoupling capacitors of 0.1µF should be connected on VDD pins 5, 7+8, and 21 to ground, as close to the ICS620-01 as possible. A series termination resistor of 33Ω should be used for each clock output. The 14.31818 MHz crystal should be parallel resonant with an accuracy of 30ppm or better. For tuning, the formula $2•(C_L-6)$ gives the value of each capacitor that should be connected between X1 and ground and X2 and ground, where C_L = the crystal load (or "correlation") capacitance.

Package Outline and Package Dimensions



28 pin SSOP

	Inches		Millimeters	
Symbol	Min	Max	Min	Max
A	0.061	0.068	1.55	1.73
b	0.008	0.012	0.203	0.305
c	0.007	0.010	0.190	0.254
D	0.385	0.400	9.780	10.160
E	0.150	0.160	3.810	4.064
H	0.230	0.245	5.840	6.223
e	.025 BSC		0.635 BSC	
h		0.016		0.410
Q	0.004	0.01	0.127	0.254

Ordering Information

Part/Order Number	Marking	Package	Temperature
ICS620-01R	ICS620-01R	28 pin SSOP	0-70°C
ICS620-01RT	ICS620-01R	Add Tape & Reel	-

While the information presented herein has been checked for both accuracy and reliability, ICS Incorporated assumes no responsibility for either its use or for the infringement of any patents or other rights of third parties, which would result from its use. No other circuits, patents, or licenses are implied. This product is intended for use in normal commercial applications. Any other applications such as those requiring extended temperature range, high reliability, or other extraordinary environmental requirements are not recommended without additional processing by ICS. ICS reserves the right to change any circuitry or specifications without notice. ICS does not authorize or warrant any ICS product for use in life support devices or critical medical instruments.

Integrated Circuit Systems • 1271 Parkmoor Ave.•San Jose•CA•95126•(408)295-9800tel•(408)295-9818fax