ICS408

PC PERIPHERAL CLOCK

Description

The ICS408 is a cost-effective clock synthesizer developed to minimize component count for PC peripheral applications. The device supports a common, low cost 14.31818 MHz crystal using an on-chip crystal oscillator. The device locks all output frequencies to enhance system performance. By supporting common PC peripheral interface frequencies of 25MHz, 24.576 MHz, and 40/80 MHz, the ICS408 lowers chip count, reducing system cost and improving reliability.

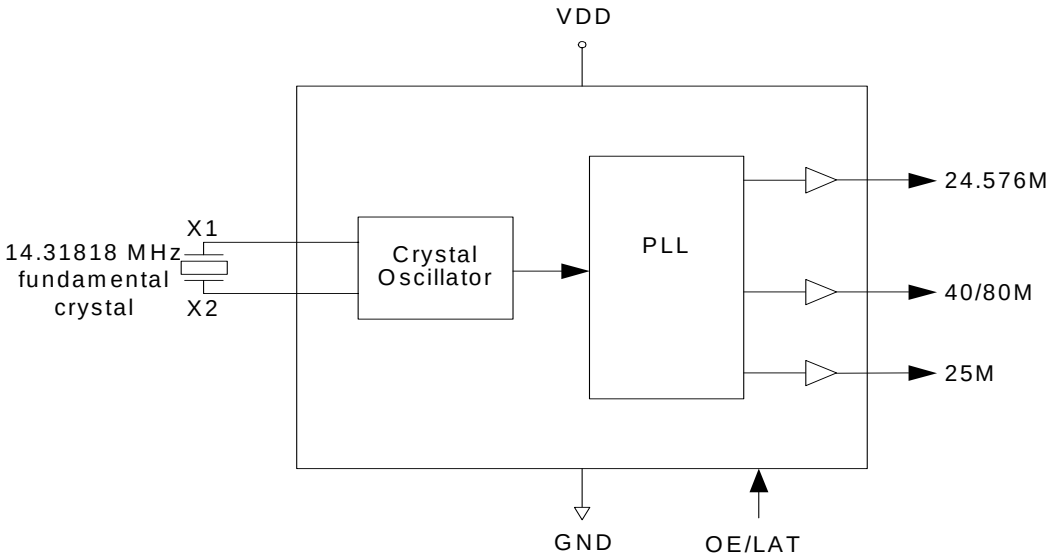
The ICS408 utilizes a low pin count 8-pin SOIC package to optimize board space.

ICS is a leader in low jitter and low power consumer application clock sources. These devices are capable of supporting CCD, video, audio, USB, CPU, and other peripherals.

Features

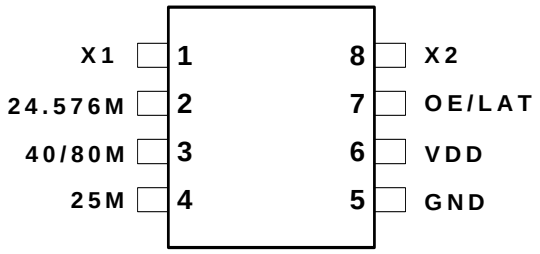
- Low operating voltage of 3.3V
- On-chip oscillator supports 14.31818 MHz crystal
- Fixed 24.576 MHz clock
- Fixed 25MHz clock
- 40/80 MHz selected on rising edge of OE/LAT pin
- Power consumption of 15 mA (typ) extends battery life
- Duty cycle of 45 to 55%
- Packaged in 8 pin SOIC
- Contact ICS for custom frequency requirements

Block Diagram



Integrated Circuit Systems ı 525 Race Street, San Jose, CA 95126 ı tel (408) 295-9800 ı www.icst.com

Pin Assignment



8 Pin (150 mil) SOIC

40/80M Frequency Selection

At Power Up	Pin 3* (40/80)
0	40M
1	80M

* Frequency after power up

Pin Descriptions

Pin Number	Pin Name	Pin Type	Pin Description
1	X1	Input	Crystal connection. Connect to 14.31818 MHz parallel mode crystal.
2	24.576M	Output	24.576 MHz clock output.
3	40/80M	Input/ Output	40M or 80M selectable clock output. Latched on rising edge of OE
4	25M	Output	25 MHz clock output.
5	GND	Power	Connect to ground.
6	VDD	Power	Connect to voltage supply.
7	OE/LAT	Input	Output selects/disable 40/80M output and 24.576M output.
8	X2	Input	Crystal connection. Connect to 14.31818 MHz parallel mode crystal.

External Components

A minimum number of external components are required for proper operation. A decoupling capacitors of 0.01 µF should be connected between VDD and GND as close to the device as possible. A 33 Ω series terminating resistor may be used on each output.

Operation of OE/LAT

The 40/80M output clock is selected by pulling pin 3 high (or low) during power up. On power up the rising edge on OE latches in the high or low level on pin 3 which starts the appropriate frequency. Any low-to-high transistion on OE/LAT after power up will latch the then current logic level on pin 3.

Absolute Maximum Ratings

Stresses above the ratings listed below can cause permanent damage to the ICS408. These ratings, which are standard values for ICS commercially rated parts, are stress ratings only. Functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods can affect product reliability. Electrical parameters are guaranteed only over the recommended operating temperature range.

Item	Rating
Supply Voltage, VDD	7 V
All Inputs and Outputs	-0.5 V to VDD+0.5 V
Ambient Operating Temperature	0 to +70 °C
Storage Temperature	-65 to +150 °C
Junction Temperature	175 °C
Soldering Temperature	260 °C

Recommended Operation Conditions

Parameter	Min.	Typ.	Max.	Units
Ambient Operating Temperature	0	–	+70	°C
Power Supply Voltage (measured in respect to GND)	+3.00		+3.60	V

DC Electrical Characteristics

VDD=3.3V ±10%

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Operating Voltage	VDD		3.0		3.6	V
Input High Voltage	V_{IH}		VDD-0.5			V
Input Low Voltage	V_{IL}				0.5	V
Output High Voltage	V_{OH}	I_{OH} = -20 mA	2.4			V
Output Low Voltage	V_{OL}	I_{OL} = 20 mA			0.8	V
Operating Supply Current	IDD	No load on outputs		15		mA
Short Circuit Current	I_{OS}	Each output		60		mA

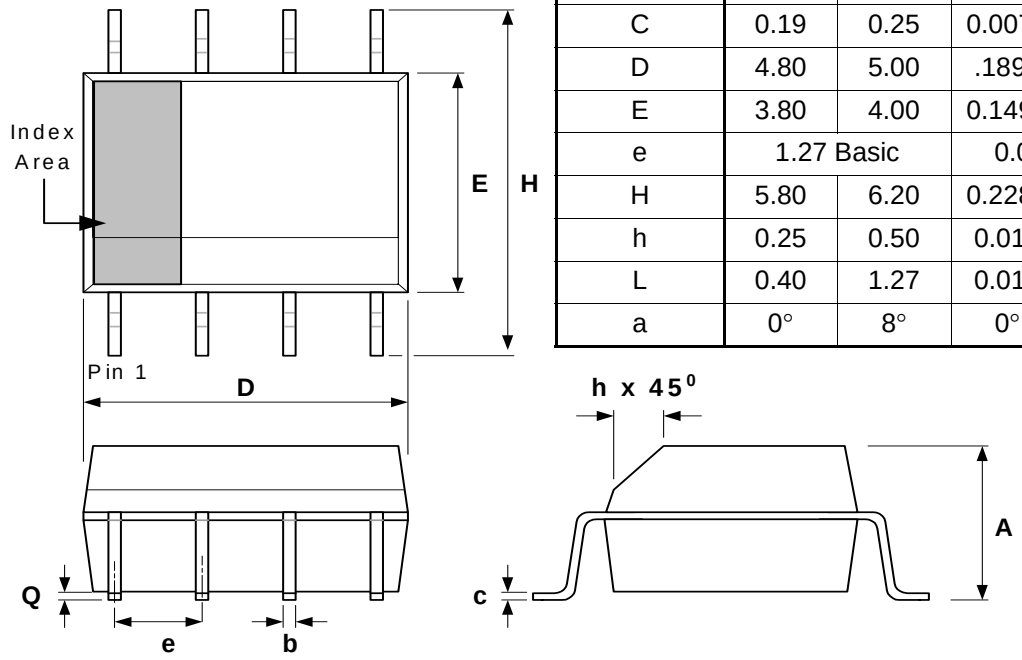
AC Electrical Characteristics

VDD = 3.3V ±10%, Ambient Temperature 0 to +70° C

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Input Frequency				14.318		MHz
Output Rise Time	t_{OR}	0.8 to 2.0 V, C_L=15 pF		1		ns
Output Fall Time	t_{OF}	2.0 to 0.8 V, C_L=15 pF		1		ns
Output Clock Duty Cycle		at VDD/2	45	50	55	%
Absolute Jitter, Short Term		variation from mean		350		ps
One Sigma Jitter				120		ps

Package Outline and Package Dimensions (8 pin SOIC, 150 Mil. Narrow Body)

Package dimensions are kept current with JEDEC Publication No. 95



	Millimeters		Inches	
Symbol	Min	Max	Min	Max
A	1.35	1.75	0.0532	0.0688
A1	1.10	0.25	0.0040	0.0098
B	0.33	0.51	0.013	0.020
C	0.19	0.25	0.0075	0.0098
D	4.80	5.00	.1890	.1968
E	3.80	4.00	0.1497	0.1574
e	1.27 Basic		0.050 Basic	
H	5.80	6.20	0.2284	0.2440
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
a	0°	8°	0°	8°

Ordering Information

Part / Order Number	Marking	Shipping Packaging	Package	Temperature
ICS408M	ICS408	Tubes	8 pin SOIC	0 to 70 °C
ICS408MT	ICS408	Tape and Reel	8 pin SOIC	0 to 70 °C