



VCXO and Set-Top Clock Source

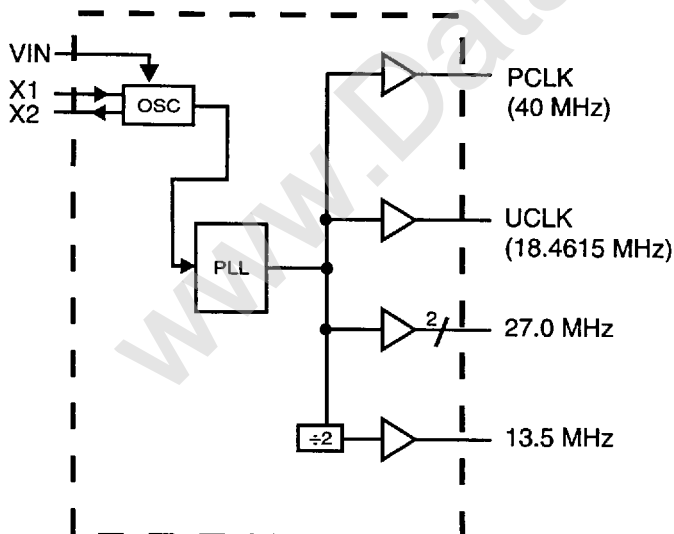
General Description

The ICS9112-05 is a low cost, low jitter, high performance VCXO and clock synthesizer designed for set-top boxes. The on-chip Voltage Controlled Crystal Oscillator accepts a 0 to 3V input voltage to cause the output clocks to vary by $+100$ ppm. The device uses an inexpensive 27.0 MHz crystal input to produce multiple output clocks including a 40MHz processor clock, a UART clock, a fixed 13.5 MHz, and two outputs of 27.0 MHz. All clocks are frequency locked to the 27.0 MHz output (and to each other) with zero ppm error, so any output can be used as the VCXO.

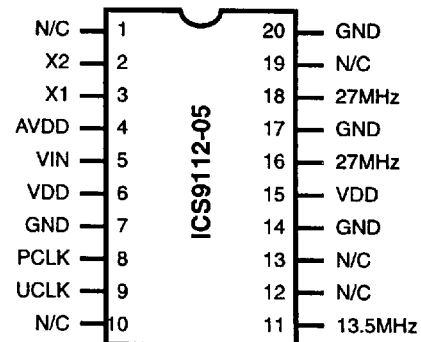
Features

- Packaged in 20 pin SOIC
- On-chip VCXO with pull range of 100ppm
- VCXO tuning voltage of 0 to 3V
- Processor frequency of 40MHz
- Zero ppm synthesis error-in all clocks (all exactly track 27.0 MHz VCXO)
- Advanced, low power, sub-micron CMOS process

Block Diagram



Pin Configuration



20-Pin SOIC



Advanced Information

Pin Descriptions

PIN NUMBER	PIN NAME	TYPE	DESCRIPTION
1	N/C	-	Not connected
2	X2	OUT	Crystal connection. Connect to a pullable 27.000MHz crystal
3	X1	IN	Crystal connection or external source.
4	AVDD	PWR	Analog VDD. Connect to +5V
5	VIN	IN	Voltage Input to VCXO. Controls the frequency of the VCXO
6	VDD	PWR	Connect to +5V.
7	GND	PWR	Connect to ground
8	PCLK	OUT	Processor clock output 40MHz
9	UCLK	OUT	UART clock output
10	N/C	-	Not connected
11	13.5MHz	OUT	13.5MHz clock output. Divide by two of the 27MHz VCXO output
12	N/C	-	Not connected
13	N/C	-	Not connected
14	GND	PWR	Connect to ground
15	VDD	PWR	Connect to +5V
16	27MHz	OUT	27.00 MHz VCXO clock output
17	GND	PWR	Connect to ground.
18	27MHz	OUT	27.00 MHz VCXO clock output
19	N/C	-	Not connected
20	GND	PWR	Connect to ground.

**Absolute Maximum Ratings**

Supply Voltage	7.0 V
Logic Inputs	GND -0.5 V to V _{DD} +0.5 V
Ambient Operating Temperature	0°C to +70°C
Storage Temperature	-65°C to +150°C

Stresses above those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These ratings are stress specifications only and functional operation of the device at these or any other conditions above those listed in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect product reliability.

Electrical Characteristics at 5.0V

V_{DD} = 5.0V, T_A = 0 - 70°C unless otherwise stated

DC Characteristics						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Operating Voltage,	VDD		4.75		5.25	V
Input High Voltage	V _{IH} , X1 pin only		3.5	2.5		V
Input Low Voltage	V _{IL} , X1 pin only			2.5	1.5	V
Input High Voltage	V _{IH}		2			V
Input Low Voltage	V _{IL}				0.8	V
Output High Voltage	V _{OH}	I _{OH} =25mA	2.4			V
Output Low Voltage	V _{OL}	TBD			0.4	V
Output High Voltage	V _{OH} , CMOS	TBD	V _{DD} -0.4			V
Operating Supply Current	I _{DD}	No Load, note 2		60		mA
Input Capacitance				7		pF
Frequency synthesis error		All clocks			0	ppm
V _{IN} , VCXO control voltage			TBD		3	V
AC Characteristics						
Input Frequency				27.000		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 1.4V	40		60	%
Maximum Absolute Jitter, short term				200		ps
Skew of 27 MHz outputs		Rising edges at 1.4V	TBD	0	TBD	ps
27MHz output pullability, note 3		TBD ≤ V _{IN} ≤ 3V		±100		ppm

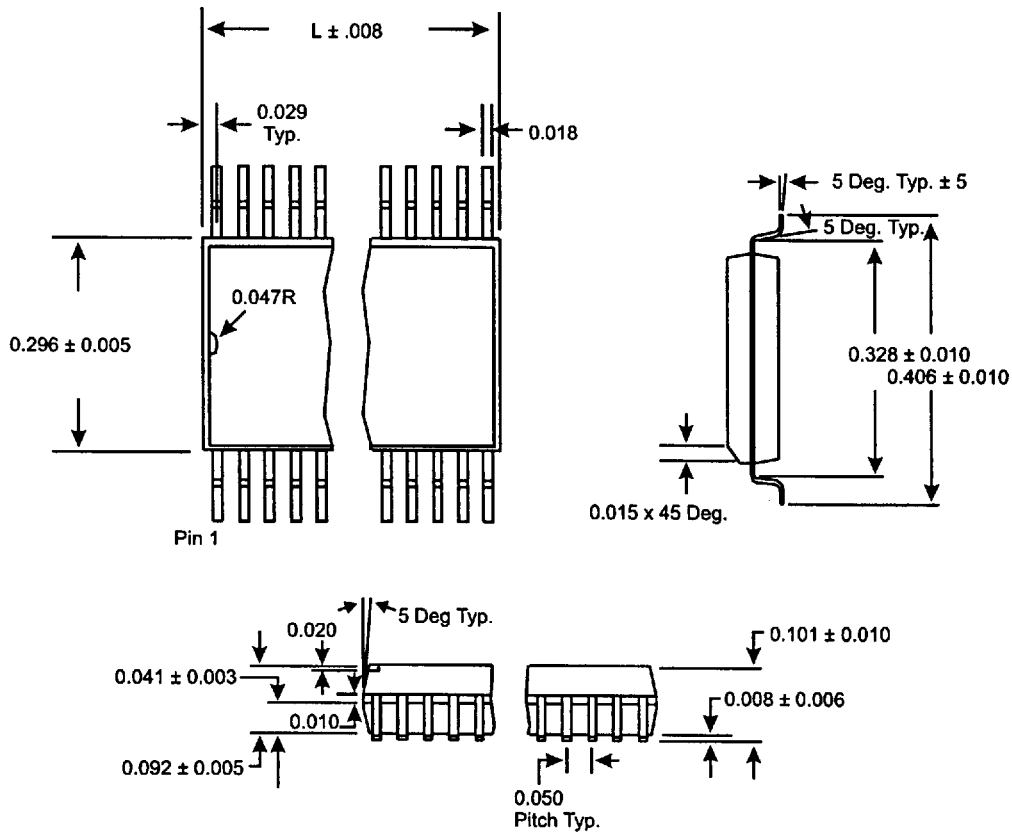
Note 1: Parameter is guaranteed by design and characterization. Not 100% tested in production.

Note 2: With PCLK at 40MHz

Note 3: With a ±125 or ±150ppm pullable crystal.



Advanced Information



**SOIC Package
(wide body)**

LEAD COUNT	20L
DIMENSION L	0.504

Ordering Information

ICS9112M-05

Example:

ICS XXXX M - PPP

