



Description

The ICS615 is a low cost, low jitter, high performance PLL clock synthesizer designed to replace 13.5, 27, and 54MHz crystals and oscillators. Using analog/digital Phase-Locked Loop (PLL) techniques, the device uses an inexpensive external 13.5 MHz crystal or clock input to produce output clocks of 13.5 MHz, 27 MHz, and 54 MHz.

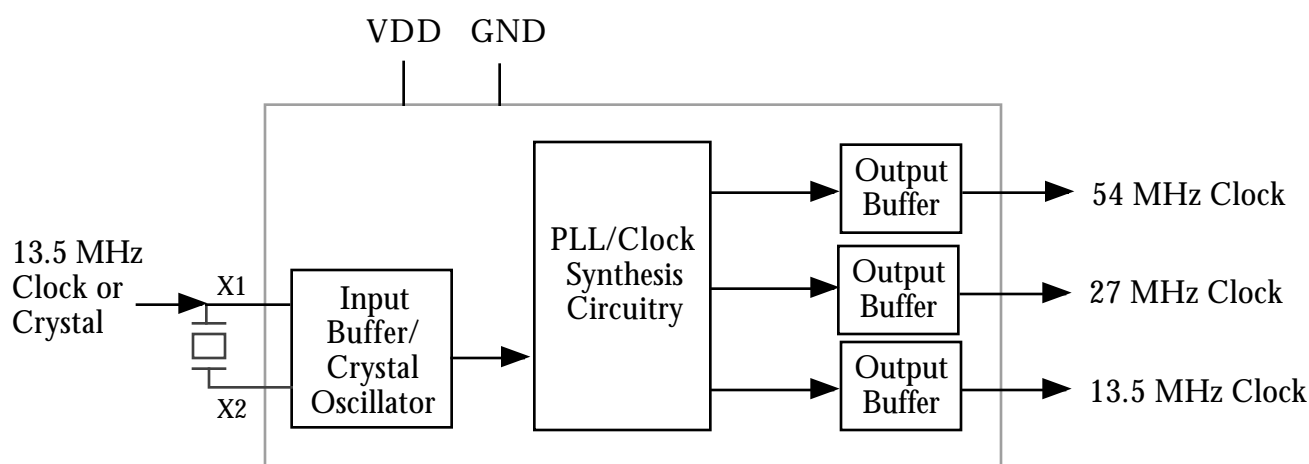
ICS/MicroClock manufactures the largest variety of Set-Top Box and multimedia clock synthesizers for all applications. Our patented integrated VCXO further reduces component count and cost (see the MK2720). If more than three clock outputs are needed, see the MK277x family of parts. Consult ICS/MicroClock to eliminate VCXOs, PLLs, crystals and oscillators from your board.

Features

- Packaged in 8 pin narrow SOIC
- Output clocks of 54, 27, and 13.5MHz
- Uses a 13.500 MHz clock or external crystal
- Full CMOS outputs with 25mA output drive capability at TTL levels
- Low skew outputs
- Advanced, low power, sub-micron CMOS process
- +3.3V or +5V operating voltage
- See the MK2720 for these frequencies plus the VCXO function, in an 8 pin SOIC.

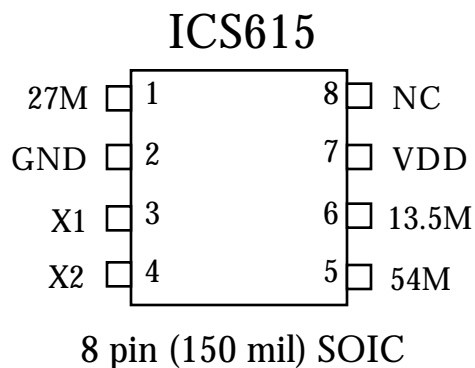


Block Diagram





Pin Assignment



Pin Descriptions

| Number | Name | Description |
|--------|-------|---|
| 1 | 27M | 27 MHz clock output. |
| 2 | GND | Connect to ground. |
| 3 | X1 | Crystal connection. Connect to a 13.5 MHz clock or crystal. |
| 4 | X2 | Crystal connection. Connect to a 13.5 MHz crystal. Leave unconnected for clock input. |
| 5 | 54M | 54 MHz clock output. |
| 6 | 13.5M | 13.5 MHz clock output. |
| 7 | VDD | VDD. Connect to +3.3V or +5V. |
| 8 | NC | No Connect. This is an unused power down pin for 27 MHz clock |



Electrical Specifications

| Parameter | Conditions | Minimum | Typical | Maximum | Units |
|---|----------------------|---------|---------|---------|-------|
| ABSOLUTE MAXIMUM RATINGS (note 1) | | | | | |
| 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 (VDD = 5.0V unless noted) | | | | | |
| Operating Voltage, VDD | | 3.00 | | 5.50 | V |
| Output High Voltage, VOH | IOH=-4mA | 2.4 | | | V |
| Output Low Voltage, VOL | IOL=4mA | | | 0.4 | V |
| Output High Voltage, VOH, CMOS level | IOH=-4mA | VDD-0.4 | | | V |
| Operating Supply Current, IDD | No Load | | 30 | | mA |
| Short Circuit Current | | | ±30 | | mA |
| AC CHARACTERISTICS (VDD = 5.0V unless noted) | | | | | |
| Input Clock | | | 13.5 | | MHz |
| Output Clock Rise Time | 0.4 to 2.4V, CL=25pF | | 1.5 | 2.5 | ns |
| Output Clock Fall Time | 2.4 to 0.4V, CL=25pF | | 1.5 | 2.5 | ns |
| Output Clock Duty Cycle | At 1.4V | 45 | 50 | 55 | % |
| Skew between any two outputs | | | | 1 | ns |
| Maximum Absolute Jitter, short term | | | 250 | | ps |

Note: 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.

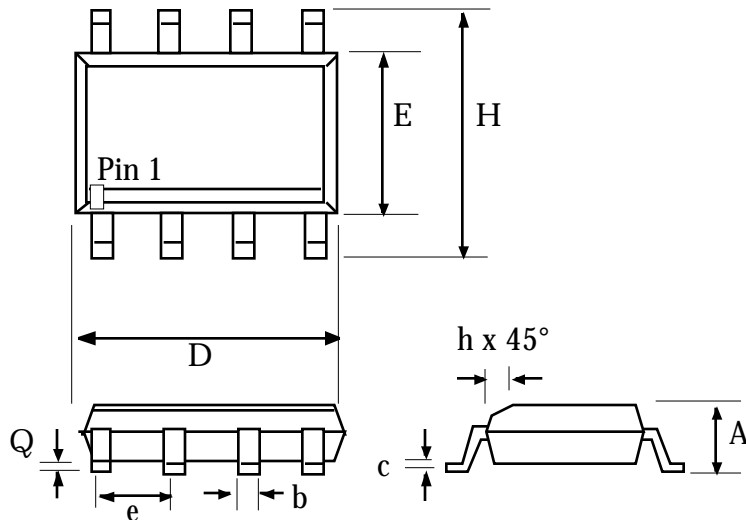
External Components

The ICS615 requires a minimum number of external components for proper operation. A decoupling capacitor of 0.1μF should be connected between VDD and GND on pins 7 and 2, as close to the ICS615 as possible. A series termination resistor of 33Ω may be used for the clock outputs. The normal use is with a clock input into pin 3, with pin 4 left unconnected. For a crystal input, consult ICS/MicroClock.



Package Outline and Package Dimensions

8 pin SOIC



| Symbol | Inches | | Millimeters | |
|--------|----------|-------|-------------|--------|
| | Min | Max | Min | Max |
| A | 0.055 | 0.068 | 1.397 | 1.7272 |
| b | 0.013 | 0.019 | 0.330 | 0.483 |
| D | 0.185 | 0.200 | 4.699 | 5.080 |
| E | 0.150 | 0.160 | 3.810 | 4.064 |
| H | 0.225 | 0.245 | 5.715 | 6.223 |
| e | .050 BSC | | 1.27 BSC | |
| h | | 0.015 | | 0.381 |
| Q | 0.004 | 0.01 | 0.102 | 0.254 |

Ordering Information

| Part/Order Number | Marking | Shipping packaging | Package | Temperature |
|-------------------|---------|--------------------|------------|-------------|
| ICS615M | ICS615M | tubes | 8 pin SOIC | 0-70°C |
| ICS615MT | ICS615M | tape and reel | 8 pin SOIC | 0-70°C |

CHANGE HISTORY

| Version | Date first published | Status | Comments |
|---------|----------------------|-------------|----------|
| A | 5/20/98 | Preliminary | Original |

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