Silicon Labs Si5351: VFOs on the cheap and easy

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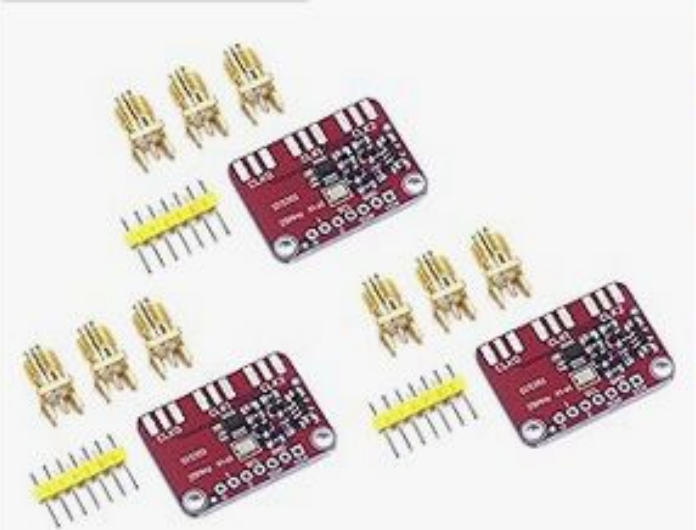
Why should you care

- VFO for radio frequencies
- Well established - NanoVNA, QRP Labs, etc
- Affordable COTS breakout boards



Si5351A S
Wave Freq

12^{88}

✓prime
FREE delivery

Si5351A I2C
Brand New

$2.19
Was: ~~$2.44~~
or Best Offer
Free shipping
from China
Free returns
112 sold

Features overview

- Original purpose: computer system clock generator
- 3 squarewave clock outputs
- Versatile - 8 kHz to at least 160 MHz
- Supports arbitrary phase shifts
- I^2C interface - any typical microcontroller

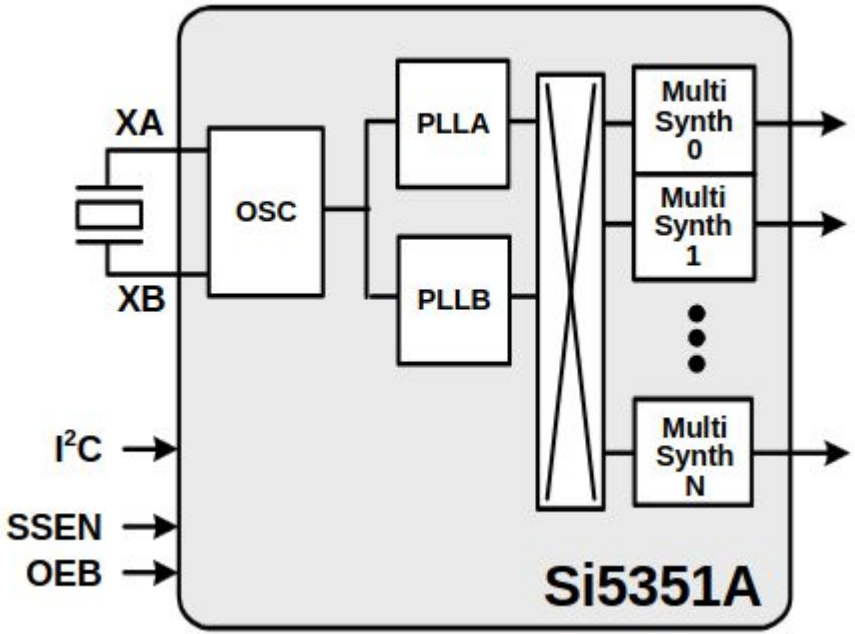
Libraries

- ~~Adafruit~~ - obsolete and little hardware abstraction
- Etherkit - simple for basic functionality

```
si5351.init //setup hardware options
si5351.drive_strength //output power*
si5351.set_freq
si5351.output_enable
```

More detail under the hood

- Typically 25 MHz external quartz oscillator
- Each PLL multiplies the 25 MHz source independently by a factor **m + (n/d)**
  - 15 ≤ **m** ≤ 90
  - **n** and **d** are 20 bit binary numbers: 0 - 1,048,575
- Each output is driven by a “multi-synth”
- PLL A or B input specified for each multisynth
- Input frequency divided by a similar factor
  - In this case, 4 ≤ **m** ≤ 900
  - **n** and **d** are also 20 bit, as above
- Finally the multisynth divides further by power of 2, from 1 to 128



Example projects/uses

- Test VFO source
- FSK transmitter
  - RTTY, WSPR, FT8, etc.
- Quadrature local oscillator for quadrature SSB modulator