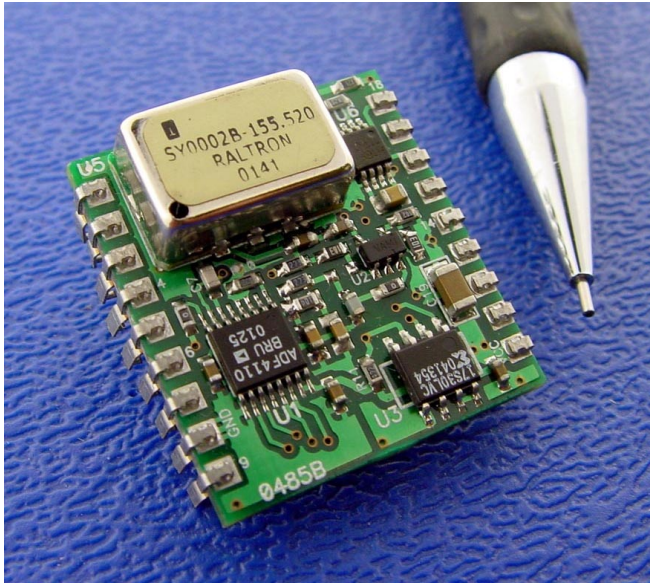


SY02-HPLL

Date: May 18, 2004



- **INTRODUCTION**

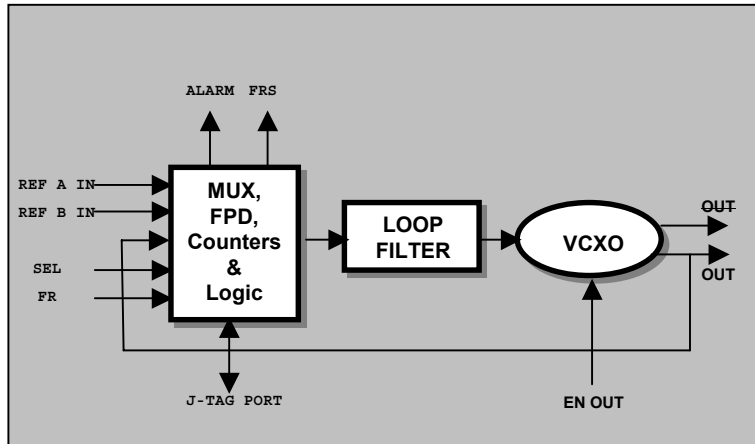
The SY02-HPLL is a high frequency crystal-based PLL synchronizer designed as a module level subsystem for easy incorporation into telecommunication equipment.

- **FEATURES**

- Low jitter output from intrinsically low jitter VCXO or VCXSO;
- Two references inputs from 8kHz to 77.76MHz; (see table on pg. 3)
- One high frequency LVPECL output with enable/disable function from 51.84MHz to 800MHz (see table on pg. 3)
- Alarms and status;
- Provides free running clock output;
- The unit changes timing modes in response to external events;
- J-TAG service port for re-programming and servicing;
- 3.3V DC power supply
- Small dimensions: 0.96" x 1.050"

- **APPLICATIONS**

- ATM
- SDH
- PDH
- SONET
- Other telecommunication equipment.



• DESCRIPTION

The SY02-HPLL is a High Frequency Phase Lock Loop has been designed as a module level subsystem for easy incorporation into telecommunication equipment. The module generates the high frequency (up to 622.08MHz) output from a low jitter VCXO or VCXO (SAW based oscillators). The output can be disabled externally by setting OUTEN pin high. The SY02-HPLL can be locked to one of two reference inputs frequencies of 8 kHz. The module has fast locking time and tolerates reference inputs with different duty cycles. The loop bandwidth is optimized according to used VCXO and wanted output performance. The ALARM output signals monitor the status of the phase loop LOL (Loss of Lock) and LOR (Loss of Reference). If the both references REFA and REFB are absent SY02-HPLL will automatically switch to free run mode and FRS output will indicate it. The SMD package dimensions are 0.96x1.050 inch and power supply is 3.3V.

- INPUT REFERENCE SELECTION

| SEL | Reference |
|-----|-----------|
| 0 | REF A |
| 1 | REF B |

- OUTPUT PROGRAMMING

| OUTEN | FR | OUTPUT |
|-------|----|---------------------|
| 0 | 0 | Locked to Reference |
| 1 | X | Output Disabled |
| 0 | 1 | Free-Run |

- ALARM STATES

| LOL | LOR | ALARM |
|-----|-----|----------|
| 0 | 0 | No alarm |
| 1 | 0 | 1 |
| 0 | 1 | 1 |

- PIN DESCRIPTION**

| Pin # | Name | Description |
|-------|---------|---|
| 1 | ENABLE | Output Enable -> the input pin to enable the output, active low |
| 2 | TCK | J-TAG port for factory usage – TCK |
| 3 | TDO | J-TAG port for factory usage – TDO |
| 4 | REFA IN | Reference A Input -> Reference A input signal |
| 5 | SEL | Select Input Reference -> input to select A (SEL=0) or B (SEL=1) |
| 6 | RESET | Reset input -> Reset active high |
| 7 | REFB IN | Reference B Input -> Reference B input signal |
| 8 | GND | Ground |
| 9 | FRS | Free-Run Status -> Output indicates that the module is in free run, active high |
| 10 | Vcc | Positive supply voltage |
| 11 | NC | Not Connected |
| 12 | ALARM | Alarm -> Alarm output indicates loss of reference or loss of lock |
| 13 | FR | Free-Run -> Control input to select free run of the module, active high |
| 14 | TDI | J-TAG port for factory usage – TDI |
| 15 | TMS | J-TAG port for factory usage – TMS |
| 16 | OUT | Oscillator Output -> Output of the module |
| 17 | GND | Ground |
| 18 | OUT | Oscillator Complementary Output -> Output of the module |

- ORDERING INFORMATION**

- Output Frequencies available;

| Frequency | Suffix | Frequency | Suffix |
|-------------|--------|-------------|--------|
| 51.8400MHz | D2 | 167.3316MHz | C1 |
| 61.4400MHz | U1 | 168.0407MHz | C2 |
| 62.5000MHz | G5 | 175.0000MHz | C3 |
| 65.5360MHz | B2 | 178.9440MHz | C4 |
| 77.7600MHz | O3 | 184.3200MHz | C5 |
| 78.125MHz | B3 | 311.0400MHz | O6 |
| 78.6432MHz | B4 | 622.0800MHz | O7 |
| 82.9440MHz | B5 | 625.000MHz | C8 |
| 92.6000MHz | U3 | 644.5312MHz | C9 |
| 100.000MHz | B6 | 666.5143MHz | C10 |
| 112.000MHz | B7 | 669.1281MHz | F1 |
| 114.000MHz | B8 | 669.3266MHz | F2 |
| 125.000MHz | G2 | 690.5692MHz | F3 |
| 133.000MHz | G4 | 710.9486MHz | F4 |
| 139.264MHz | E6 | 719.7344MHz | F5 |
| 155.520MHz | O4 | 777.6000MHz | F6 |
| 156.250MHz | G6 | | |
| 161.1328MHz | B9 | | |
| 166.6286MHz | B10 | | |

➤ Input Frequencies;

| Frequency | Suffix | Frequency | Suffix |
|------------|--------|------------|--------|
| 8KHz | F8 | 20.4800MHz | A4 |
| 1.024MHz | E0 | 22.2171MHz | A5 |
| 1.544MHz | T1 | 26.0000MHz | G2 |
| 2.048MHz | E1 | 27.0000MHz | A6 |
| 4.096MHz | E2 | 29.4912MHz | A7 |
| 6.1760MHz | T2 | 32.768MHz | E4 |
| 6.480MHz | D1 | 34.560MHz | A8 |
| 8.192MHz | E3 | 37.0560MHz | A9 |
| 10.000MHz | A1 | 38.880MHz | O2 |
| 12.800MHz | S1 | 44.4343MHz | B1 |
| 13.000MHz | G1 | 44.7360MHz | T3 |
| 15.000MHz | A2 | 51.8400MHz | D1 |
| 16.384MHz | E4 | 61.4400MHz | U1 |
| 19.440MHz | O1 | 62.5000MHz | G1 |
| 20.000MHz | M1 | 65.5360MHz | B2 |
| 20.1416MHz | A3 | 77.7600MHz | O3 |

➤ P/N System

SY02-HPLL- IP < Input Frequency> - OU<Output Frequency>-S-T<Temp. Range>-P <Package Option>

➤ See above Chart

If not listed Place **NL** and state the Freq.)

➤ See above Chart

(If Output Freq. Not applied place **NA** and state the Freq.)

➤ Supply Voltage;

4 - 3.3V

➤ Operating Temperature Range;

C - 0°C to 70°C

I - 40°C to +85°C

➤ Package Option;

J - J Lead

S1 - SMT Option 1 **

S2 - SMT Option 2

For other Options please contact the factory!

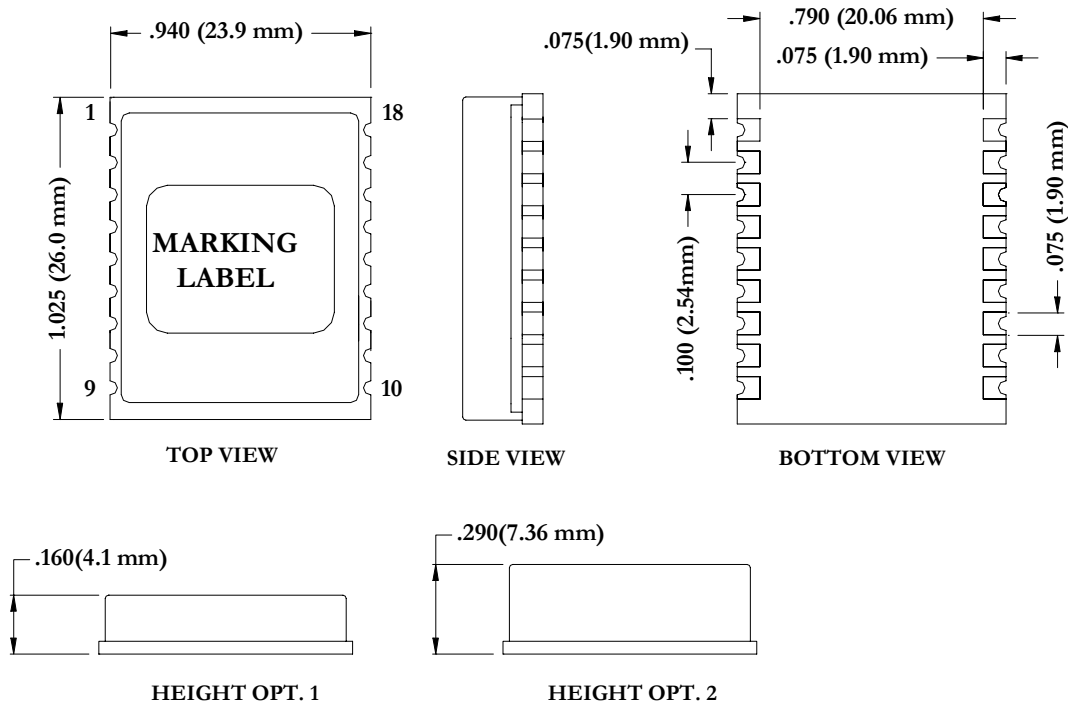
** S1 May not be available at all frequency options, please consult factory

• SPECIFICATION

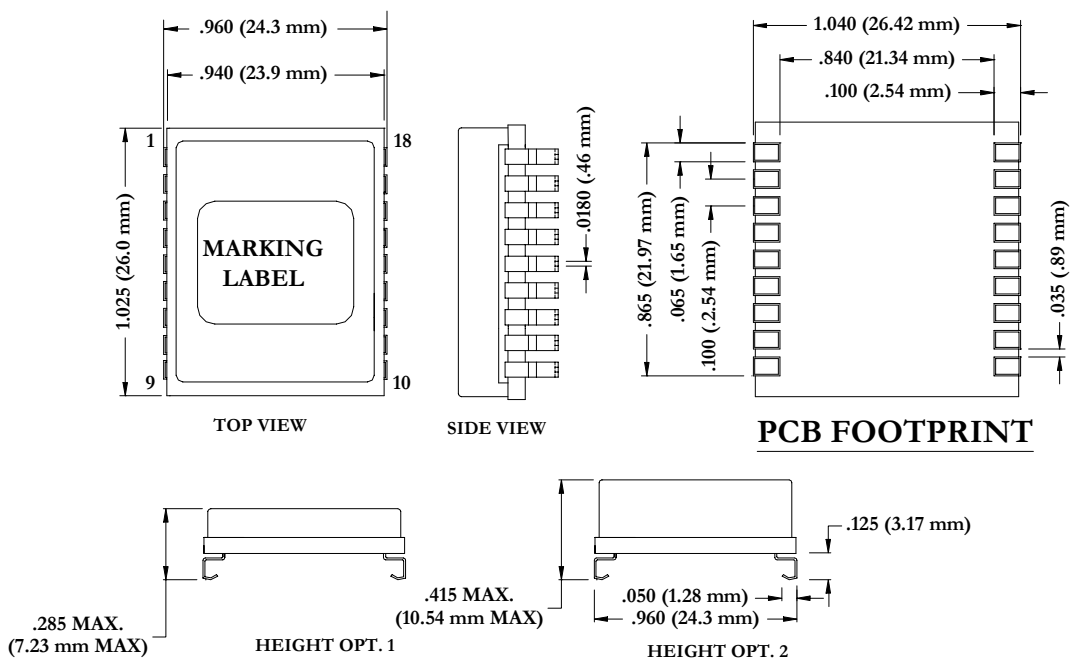
| | | | |
|------------------------------|----------------------------|---|---|
| General Specifications | Mechanical | 0.96" x 1.050" | SMT Module FR4 18 pins dual-in-line |
| | Power Environment | 3.3VDC, <200mA Operating Temperature Humidity | Regulated 0°C to 70°C 5% to 95% non-condensing Depend of the frequency |
| | Internal Oscillators | VCXO or VCSO | |
| Input Signals | Number of Reference Inputs | 2 | |
| | Input reference frequency | 8kHz | |
| | Signal Level | HCMOS/TTL Compatible | |
| Output Signals | Number of Outputs | 1 | |
| | Output 1 | 51.84MHz to 800MHz | other frequency contact Raltron |
| | Output 1 Signal Level | LVPECL | |
| | Tracking/Capture Range | ±25ppm min | |
| Signal Quality Performance | Jitter generation | <0.03Uip-p | |
| | Jitter tolerance | 2 μs, 10 Hz (0.05 UI @ 8KHz) | |
| Frequency Output Performance | Free run accuracy | ±32ppm max. @ 25°C | No reference signal |

• **OUTLINE DRAWING**

SMT Version



J-Lead Version



NOTES:
1. UNLESS OTHERWISE SPECIFIED,
DIMENSIONAL TOLERANCES ARE ± 0.10