

August 13, 2004

- **INTRODUCTION**

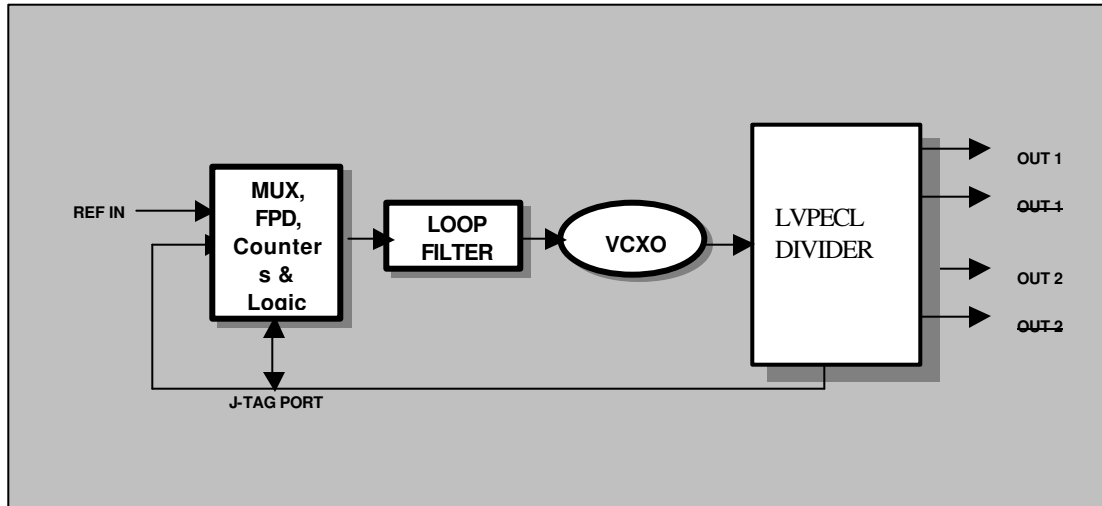
The SY02-HP20 is a high frequency crystal-based PLL synchronizer designed as a module level subsystem for easy incorporation into telecommunication equipment.

- **FEATURES**

- Low jitter output from intrinsically low jitter VCXO or VCXSO;
- One pre-selected input reference of **8kHz to 77.76MHz** (CMOS levels);
- Two pairs of high frequency differential LVPECL outputs up to **800MHz**. (must be at the same frequency)
- 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: 0.75" x 1.20" SMT pkg.

- **APPLICATIONS**

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



### DESCRIPTION

The SY02-HP20 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 800.00MHz) output from a low jitter VCXO or VCSO (SAW based oscillators). The SY02-HP20 can be locked to one reference of a pre-selected input frequency between 8 kHz to 77.76MHz. 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 SMD package dimensions are 0.75x1.20 inch and power supply is 3.3V. Parts are assembled using high temperature solder to withstand surface mount reflow process.

### PIN DESCRIPTION

Pin	Name	Description	Signal Technology	VL			VH/ DC Voltage		
				Min	Typ	Max	Min	Typ	Max
1	1	NC	----	----	----	----	----	----	----
2	2	REF IN	HCMOS (3.3 Tolerable)	0	----	0.5 (0.3)	4.5 (2.97)	----	----
3	**3	TDO	----	----	----	----	----	----	----
4	4	GND	----	----	----	----	----	----	----
5	5	OUT-1	LV/PECL	Vcc-1.680	Vcc-1.620	Vcc-1.560	Vcc-1.085	Vcc-1.025	Vcc-0.885
6	6	OUT 1	LV/PECL	Vcc-1.680	Vcc-1.620	Vcc-1.560	Vcc-1.085	Vcc-1.025	Vcc-0.885
7	7	Vcc	DC - 5V (3.3V)	----	----	----	4.5 (2.97)	5.0 (3.3)	5.25 (3.465)
8	8	GND	----	----	----	----	----	----	----
9	9	NC	----	----	----	----	----	----	----
10	10	NC	----	----	----	----	----	----	----
11	11	OUT 2	LV/PECL	Vcc-1.680	Vcc-1.620	Vcc-1.560	Vcc-1.085	Vcc-1.025	Vcc-0.885
12	12	OUT-2	LV/PECL	Vcc-1.680	Vcc-1.620	Vcc-1.560	Vcc-1.085	Vcc-1.025	Vcc-0.885
13	13	GND	----	----	----	----	----	----	----
14	14	GND	----	----	----	----	----	----	----
15	15	Vcc	3.3V	----	----	----	2.97	3.3	3.465
16	**16	TDI	----	----	----	----	----	----	----
17	**17	TCK	----	----	----	----	----	----	----
18	**18	TMS	----	----	----	----	----	----	----
**18	TMS	J-TAG port for factory usage - TMS	----	----	----	----	----	----	----
19	GND	Ground	----	----	----	----	----	----	----
20	NC	Not Connected	----	----	----	----	----	----	----

\*\* Do not Connect Pin

• **ORDERING INFORMATION**

- Input Frequencies available;

Frequency	Suffix	Frequency	Suffix	Frequency	Suffix
8KHz	F8	19.44MHz	O1	77.76MHz	O3
1.544MHz	T1	24.704MHz	T3		
2.048MHz	E1	32.768MHz	E4		
8.192MHz	E3	38.88MHz	O2		
12.352MHz	T4	51.84MHz	D2		
16.384MHz	E4	62.50MHz	G5		

- Output Frequencies available (in MHz);

Frequency	Suffix	Frequency	Suffix
51.84	D2	156.25	G6
62.50	G5	166.1328	B9
77.76	O3	622.08	O6
125	G2	666.5143	C10
133	G4		
155.52	O4		

➤ **P/N System**

**SY02-HP20- IP < Input Frequency> - OU1&2<Output Frequency>- S-T<Temp. Range>**

- 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;  
**2** - 5V  
**4** - 3.3V

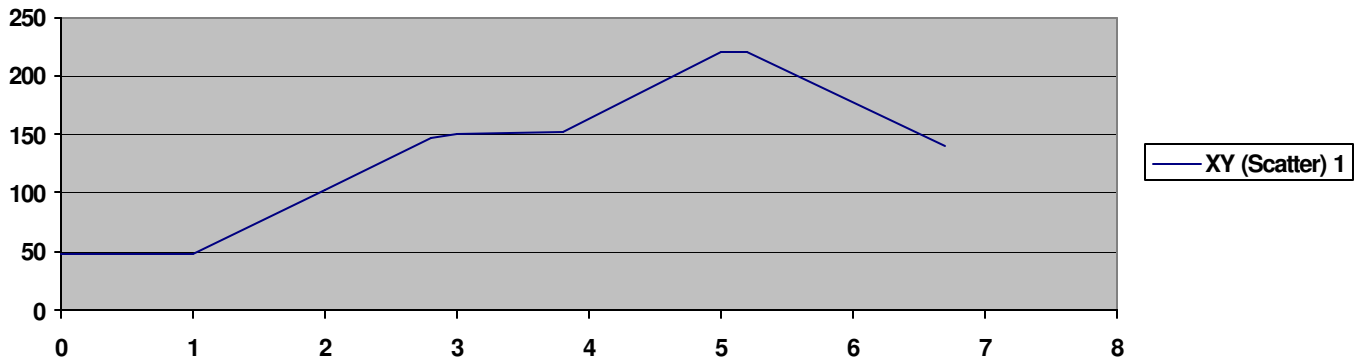
- Operating Temperature Range;  
**C** - 0°C to 70°C  
**I** - -40°C to +85°C

- For other frequencies contact the factory!

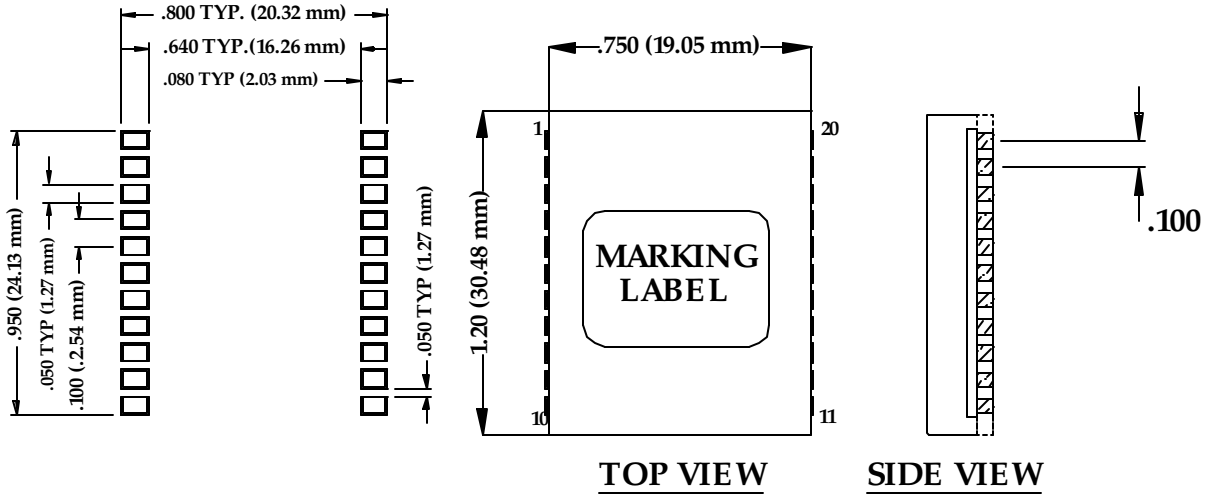
• **SPECIFICATION**

General Specifications	Mechanical	0.75" x 1.20"	SMT Module FR4 20 pins dual-in-line, withstand SMD reflow process.
	Power Environment	3.3VDC+/-5%, <200mA	Regulated 0°C to 70°C
	Internal Oscillators	Operating Temperature Humidity VCXO or VCXO	5% to 95% non-condensing Depend of the frequency
Input Signals	Number of Reference Inputs	1	
	Input reference frequency	8kHz to 77.76MHz	
	Signal Level	HCMOS/TTL Compatible	
Output Signals	Number of Outputs	2	
	Output 1	See above Table	Other frequency contact RAMI
	Output 1 Signal Level	LVPECL	50%+/-10% (std Duty Cycle); 50%+/-5% (upon request) Rise/Fall Time 350pS max (@ 155.52MHz) VOH - 2.272Vdc min; VOL - 1.68Vdc max.
	Tracking/Capture Range	±25ppm min	
Signal Quality Performance	Jitter generation	<1pS RMS, 10ps pk-pk	Jitter based on SONET OC-48 B.W - 12KHz to 20MHz
	Jitter tolerance	2 μs, 10 Hz (0.05UI @ 8kHz)	
	Input Jitter tolerance	6.25uS max.	

• **REFLOW PROFILE**



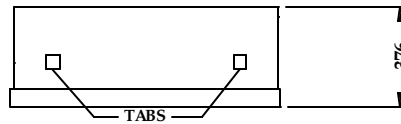
• **OUTLINE DRAWING**



PCB FOOTPRINT

TOP VIEW

SIDE VIEW



FRONT VIEW