SynFox
HIGH RESOLUTION
Frac-N SYNTHESIZER

SynFox is a high performance dual synthesizer module based on *High Resolution Multi-Accumulator Fractional-N synthesis* technology and comprising a narrow band 950MHz-1050MHz and a wide band 800MHz-2GHz fast and ultra low noise loop (standard configuration). Frequency plan can be extended from 0 to 3 GHz on customer request.

It exhibits outstanding performance of high resolution (1Hz steps), low phase noise (Better than -100dBc/Hz @ 1kHz) and very short lock times (40us for 1MHz step). It includes all the necessary circuitry to support FM/GMSK Dual port modulation from the narrowband PLL as well as generate 4 output clocks from the main crystal (/1, /2, /4, /8).

This module is ideally fitted for various radio product designs, ranging from low cost *RF generator*, to *spectrum analyzer*, *high accuracy sources*, or *Software Definable Radio (SDR) transceivers*. It provides a very attractive replacement for **DDS** based systems at much reduced cost for equivalent or better performance.
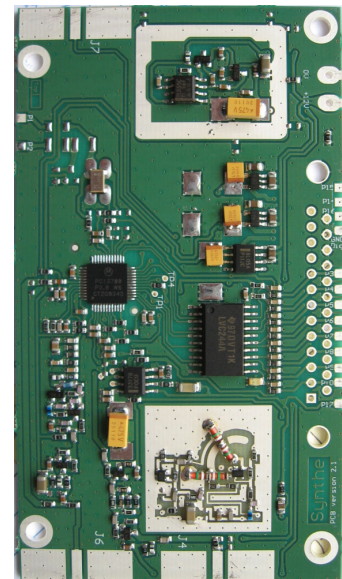
SynFox Highlights

- *Dual Frac-N synthesizers 0-3GHz*
- *Outstanding 1Hz resolution thanks to Sigma Delta Frac-N technology*
- *best in class resolution (1Hz), phase noise & lock time*
- *Programming support available for various µC, Windows, or Linux*
- *High performance & Low Cost alternative to DDS-based synthesizers & generators*

APPLICATIONS *: RF GENERATORS, SPECTRUM ANALYZERS, SOFTWARE DEFINABLE RADIOS, HIGH ACCURACY RF and MICROWAVE SOURCES*

Metal housing version

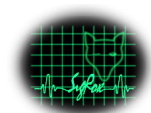**Order Entry :**

Part number	packaging	description
SynFox-0.8/2-1G	PCB Metal Housing	One wide band loop 0.8 to 2GHz One Narrow loop 950 to 1050MHz)
SynFox-0.8/2-G	Metal Housing	One single 0.8 to 2GHz Loop
SynFox-x/x-xG Upon customer request	Metal Housing	Frequency plan on demand from 0 to 3GHZ either in single loop or dual loop configuration

SPECIFICATIONS
Wide band Synthesizer

Parameter	Unit	Value	Comment
Minimum frequency	MHz	800	
Maximum frequency	MHz	2000	
Minimum frequency step	Hz	1.16	1 Hz software interpolation All other kind of steps configurable by Software
Reference frequency	MHz	26	
Output power	dBm	10	
Phase Noise	dB/ Hz	Typ : -105 dBc / Hz	Within the loop bandwidth
Discrete Spurious	dBc	-80	ΔF > 600 KHz
Kvco	MHz / V	40 to 60	
Loop filter bandwidth	KHz	200	
Settling time	µs	500 typ	10 MHz step
Tests mode	-	Force Up, Down Accumulator number Current reduction Decade tuning	Min or Max frequency. 0, 1, 2 or 3 accumulators. Current / Max. freq. Reduction. Possibility to tune 'decade' frequency.

Auxiliary Synthesizer with FM / GMSK / Dual Port modulation

Parameter	Unit	Value	Comment
Minimum frequency	MHz	950	
Maximum frequency	MHz	1050	
Minimum frequency step	Hz	1.55	1 Hz software interpolation All other kind of steps configurable by Software
Reference frequency	MHz	26	
Output power	dBm	8	
Phase Noise	dB/ Hz	Typ : -105 dBc / Hz	Within the loop bandwidth
Discrete Spurious	dBc	-79	ΔF > 600 KHz
Loop filter bandwidth	KHz	150	
Settling time	µs	100 max	100 MHz step
Total phase Error with internal GMSK	deg	1.2 max	Can also easily be modulated through the crystal within a 0 to 100 KHz BW
Modulation mask @ 400 KHz for typical GSM modulation (GMSK)	dBc	-70 dBc N/A N/A	With the Dual Port Without the Dual Port Dual Port alone
PLL Tests mode	-	Modulation Accumulator number Charge-pump Current Current reduction Notch	Random, '0101', or High-Z 0, 1, 2 or 3 accumulators. From 0 to 600µA Current / Max. Freq. Reduction. Phase noise reduction @ 400 KHz
Dual Port test	-	DP-Gain, DP-Delay and DP-Gain-ana	For Dual Port optimization
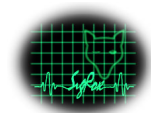
Output CLOCKs

Parameter	Unit	Value	Comment
Clocks number	-	1 from 4 on the IC	
Mode	-	ON, OFF (high-Z) Analog or Digital CMOS	
Division ratio	-	1, 2, 4 or 8	
Clock output voltage	Vpp	1 Logic_VCC	Analog mode (sinewave) CMOS mode (square)
Clock output mean value	V	Logic_VCC / 2	0.9 V if Logic_VCC = 1.8V
Filtering	-	-	Internal lowpass

Physical parameters

Parameter	Unit	Value	Comment
PCB dimensions	mm	105 x 59	Max dimensions
Interface connector	-	SubD 25 compatible	Male connector must be mounted for PC Centronic compatibility
RF outputs	-	Connector or cable	Compatible with PCB mounted SMA, BNC or 50 Ohms cables