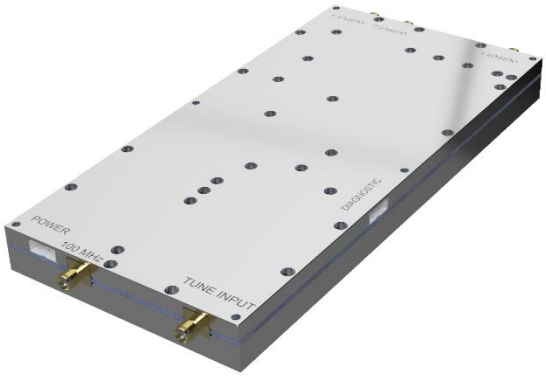
X13

Ultra low phase noise RF signal source

- Multiple output frequencies
- Ultra Low Phase Noise
- Ultra Low Jitter
- Phase coherent outputs
- Internal / external reference
- Diagnostic outputs
- output power up to 1W
- SMA in/out connectors
- aluminum case



Applications : research - time & frequency synchronisation - commercial - RADAR - test & measurement - FEL Master Oscillator

X13 Specifications	
Phase Noise [5 kHz – 500 kHz]	< - 160 dBc @ 1000 MHz
RMS jitter [1 kHz – 10 MHz]	< 2 fs typ. @ 1000 MHz
External reference input	10 MHz, 100 MHz + 4 …. + 10 dBm
External tuning voltage	0,2 …. 10 V
Standard RF output frequencies	100, 300, 500, 700, 1000 MHz + 10…+19 dBm 1300 MHz / + 16 … + 30 dBm
Diagnostic outputs	Master OCXO control voltage [V] Slave OCXO control voltage [V] OCXO drive current monitor voltage (1V = 1A)
Supply voltage	14.4 – 15.5 V DC
Supply current after warm-up	900 … 1370 mA (depending on output levels)
Excess supply current @ warm-up	400 mA typ.
RF input / output connectors	SMA
Dimensions	96,3 mm x 200 mm x 22 mm case only 96,3 mm x 215 mm x 22 mm incl. connectors
Operating temperature	- 20 …. + 50 deg. C

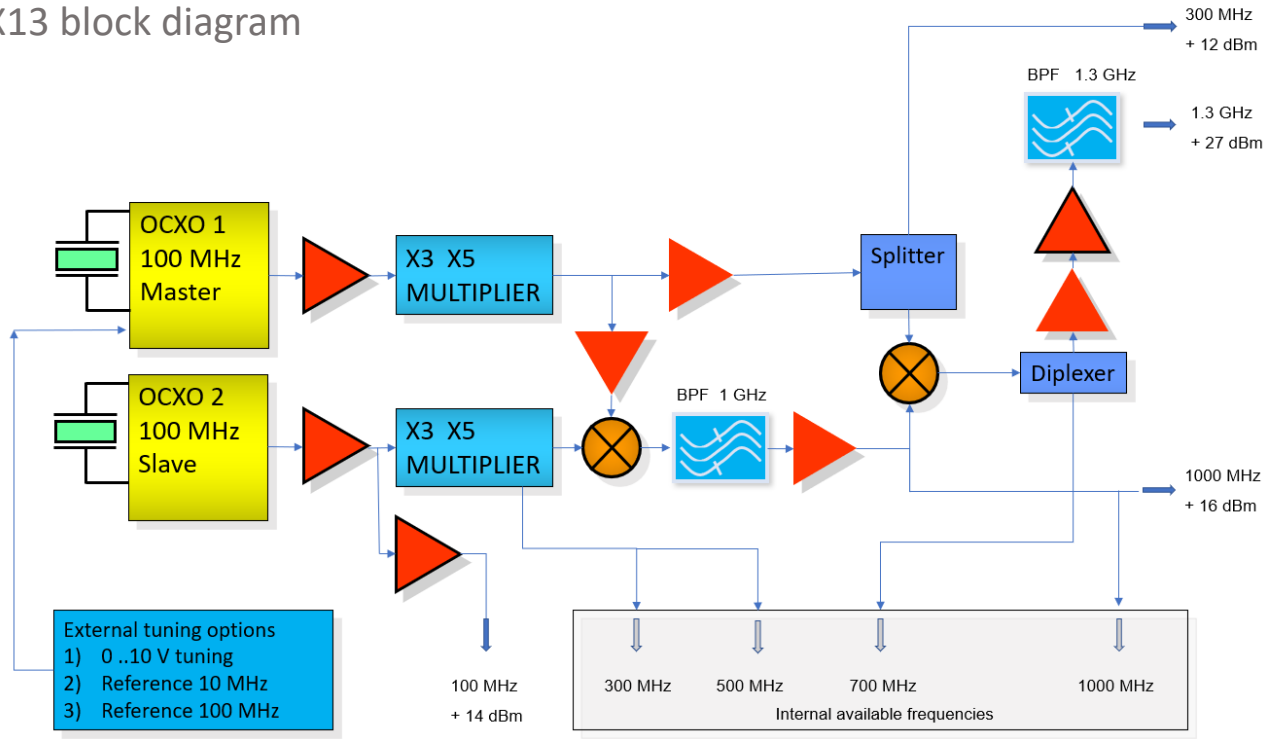
X13 – functional description

The RF signal source X13 was developed to produce a band of fixed-frequency signals with extremely low phase noise and integrated rms jitter. Such signals are necessary in various application fields e.g. research and radar applications where clocks have to be very pure and reliable for precise timing in frequency distribution systems.

The X13 module family is considered to be the core source of up to 7 different phase coherent fixed-frequency signals for direct usage as well as to support frequency synthesizers up to 20GHz and beyond to enable frequency agile ultra-low noise systems.

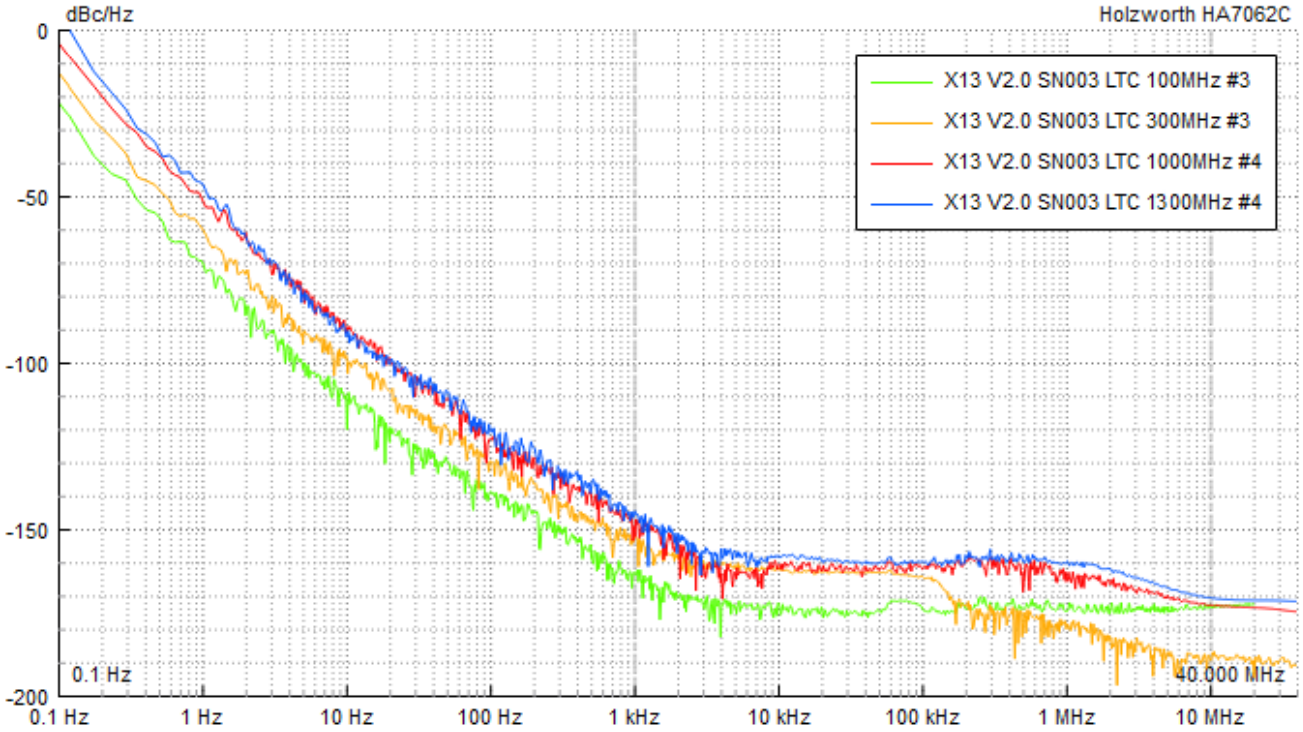
Apart of the standard frequencies of 100MHz, 300MHz, 500MHz, 700MHz, 1000MHz and 1300MHz it is possible to generate any other OCXO based band of frequencies. The X13 is able to lock either to 10MHz or 100MHz, or optionally to other external reference signals. Another feature is frequency control of internally provided RF output signals, tuned externally by control voltages from 0.2 …10V. RF power level of generated output signals reaches up to 1 Watt, still meeting an integrated rms jitter within 1…2 fs range.

X13 block diagram

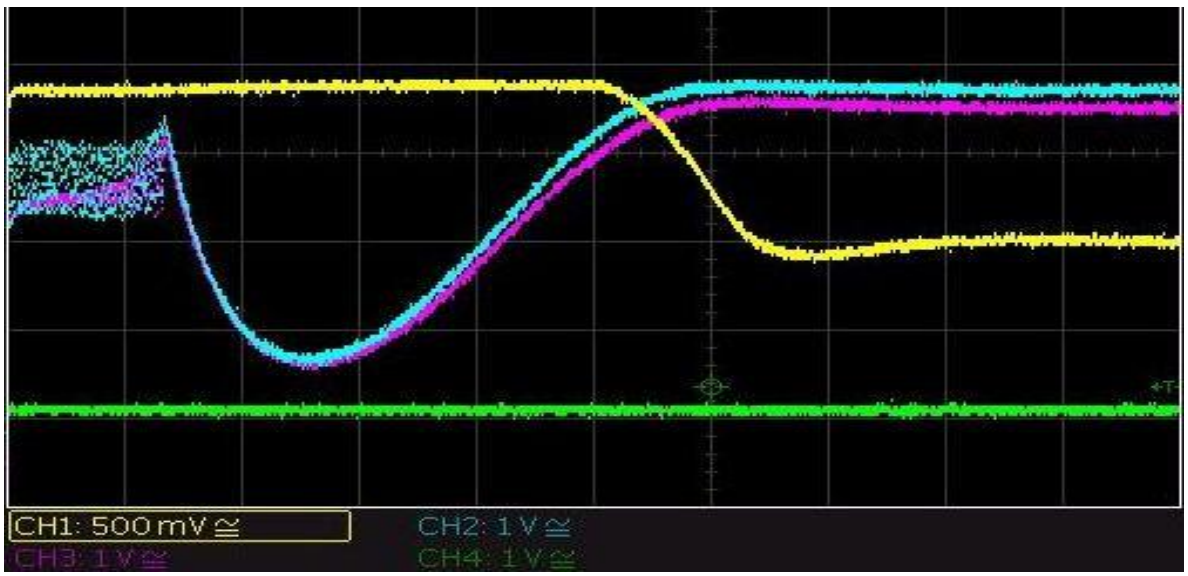


X13

Phase noise plot



Diagnostic signals read-out after switch on (10s / Div)



OCXO control voltages

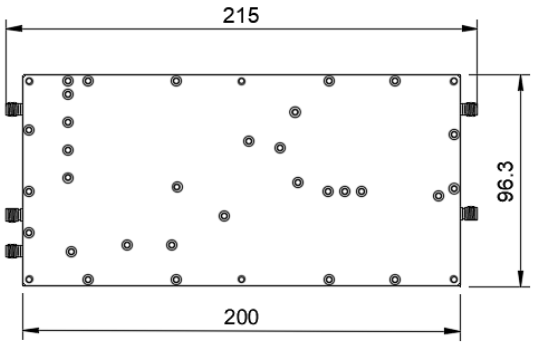
OCXO current

0 V

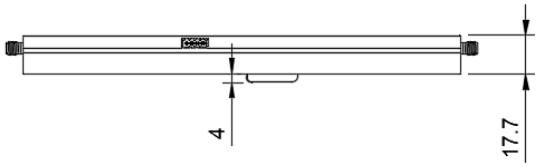
Pin	Connector X1	Power supply
1	VCC	14.4 – 15.5 V DC / 900 … 1770 mA typ.
2	VCC	
3	GND	0 V
4	GND	
DC Connector type		PTSM 0,5/ 4-HH0-2,5-SMD Phoenix Contact
Matching connector Phoenix Contact Mouser order number		PTSM 0,5/ 4-P-2,5 WH Art. Nr. 1704857 651-1704857

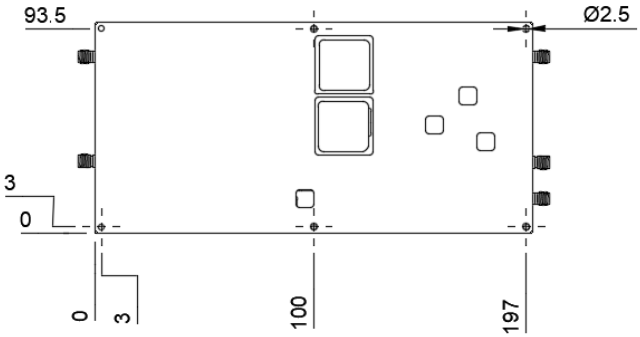
Pin	Connector X2	Diagnostic outputs
1	Master OCXO lock or tuning voltage	0 … 10 V
2	Slave OCXO lock or tuning voltage	0 … 10 V
3	OCXO current monitor voltage	0 … 2 V with 1 V = 1 A
4	GND	0 V

Options / order information	

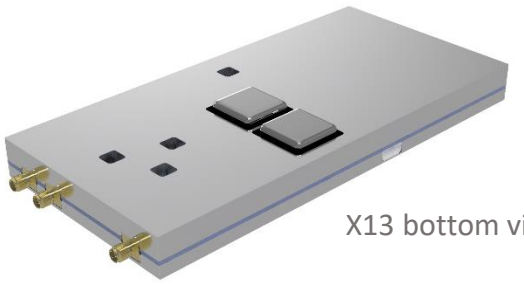


all dimensions in [mm]





6 x Ø 2.5 mm
mounting holes



X13 bottom view