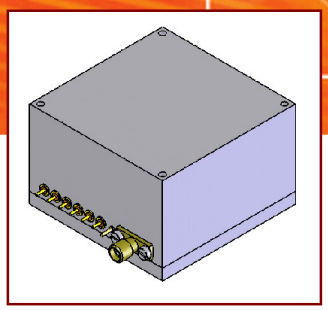

OCXO ULN HF D

Ultra Low Noise Oven Controlled Crystal Oscillator,
General Specification (rev1)

OCXO ULN HF D

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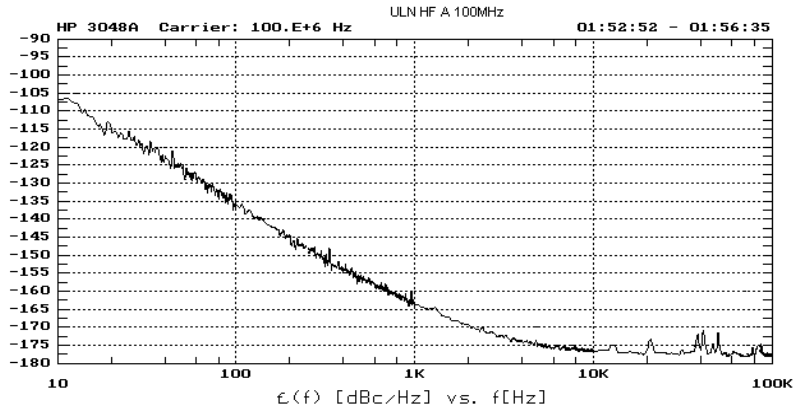
December 5th, 2007

Features

- Ultra Low Noise (ULN), Oven Controlled, Voltage Controlled, Crystal Oscillator (OCVCXO)
- Frequency range : 80 to 125 MHz
- Ultra low phase noise @ 100 MHz : - 158 dBc/Hz @ 1 kHz offset
  - 174 dBc/Hz @ 10 kHz offset (noise floor)
- Operating temperature range : [–40 – +85 °C]
- Supply voltage up to 28 V
- Airborne environment
- 7-pin machined package with inner shock absorbers + SMA connector for the frequency output
- Typical phase noise @ 100 MHz (static conditions):



Applications

Airborne military equipment
Radar & Telecom

Environmental conditions

Parameters	Unit	Minimum	Typical	Maximum
Operating temperature range 1	°C	– 20		+ 70
Operating temperature range 2	°C	– 40		+ 85
Storage temperature range	°C	– 55		+ 125
Relative humidity		Up to 100% at Ta = 0°C to 85°C without condensing		
Vibration, random		As per MIL-STD-810, Issue F (cat 5)		
Vibration, sine		As per MIL-STD-810, method 519.5 procedure IV		
Acceleration		As per MIL-STD-810, method 513.5 procedures I,II and III		
Shock (half sine)		As per MIL-STD-810, method 516.5 procedure I		

Mechanical characteristics

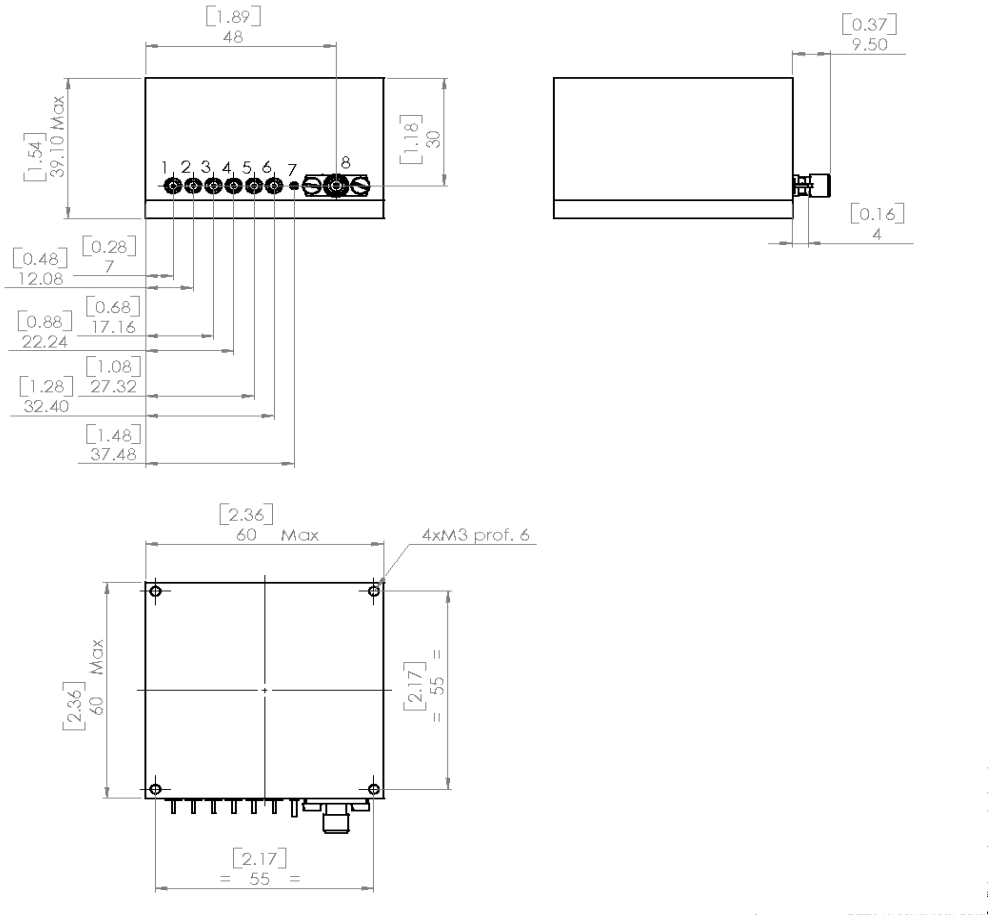


Figure 1 : Oscillator outline

Pin description

Pin number	Name	Function
1	Vcc oven	Supply voltage of oven
2	Ground oven	Ground of oven
3	Oven alarm	Oven alarm
4	Vcc RF	Supply voltage
5	Vc	Electrical & mechanical ground
6	Vref	Reference voltage
7	Ground, case	Ground of RF
8	SF	Output signal

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Performance Characteristics

Electrical Parameters	Unit	Minimum	Typical	Maximum
Frequency output (SMA Connector)				
Nominal frequency range	MHz	80	100	125
Output level (50 Ω load)	dBm	11	13	15
Output VSWR (Fo ± 1.5 MHz)	-			2:1
Harmonics level	dBc			– 30
Spurious (offset > 50 Hz)	dBc			– 70
Phase noise in static conditions @ 100 MHz				
@ 10 Hz offset	dBc/Hz		-105	- 100
@ 100 Hz offset	dBc/Hz		-135	- 130
@ 1 kHz offset	dBc/Hz		-163	- 158
@ 10 kHz offset or greater	dBc/Hz		-176	- 174
Phase noise in static conditions @ 120 MHz				
@ 10 Hz offset	dBc/Hz			- 93
@ 100 Hz offset	dBc/Hz			- 123
@ 1 kHz offset	dBc/Hz			- 155
@ 10 kHz offset or greater	dBc/Hz			- 172
g-sensitivity				
@ 25 Hz offset (resonance)	/g			$2.5\ 10^{-9}$
@ 100 Hz offset	/g			$4.5\ 10^{-11}$
@ 1 kHz offset	/g			$2.5\ 10^{-12}$
Free running mode (Vctrl pin NC)				
Initial setting	ppm		± 0.15	± 0.25
Stability vs. temperature (op temp range 1)	ppm		± 0.02	± 0.05
Stability vs. temperature (op temp range 2)	ppm		± 0.2	± 0.7
Stability vs. 5 % supply voltage variation	ppm			± 0.01
Stability vs. 10 % load variation	ppm			± 0.01
Aging over first year	ppm			± 0.5
Aging over 10 year	ppm			± 2
Retrace	ppm			± 0.1
Electrical tuning (Vctrl pin)				
Relative pulling frequency range	ppm			± 2
Input impedance	Ω	10 k		
Voltage range Option A	V_{DC}	- 5		5
Voltage range Option B	V_{DC}	0		10
Reference voltage (Vref pin)				
Nominal value	V_{DC}	9.5	10	10.5
Relative variation vs. temperature	%			± 1
Relative variation over 10 years	%			± 1

Electrical Parameters	Unit	Minimum	Typical	Maximum
Supply voltage (Vcc pin)				
Voltage range	V_{DC}	14.5	15	15.5
Supply current @ 25 °C	mA		150	170
Supply current @ warm up	mA		470	530
Warm up time	mn			5

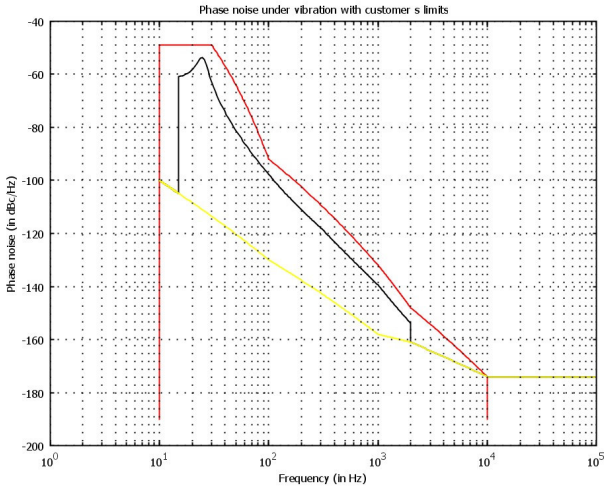

Figure 2 : Phase noise curves @ 100 MHz

Above is represented in yellow, the theoritical curve of the phase noise in static conditions and in black the phase noise in dynamic conditions.

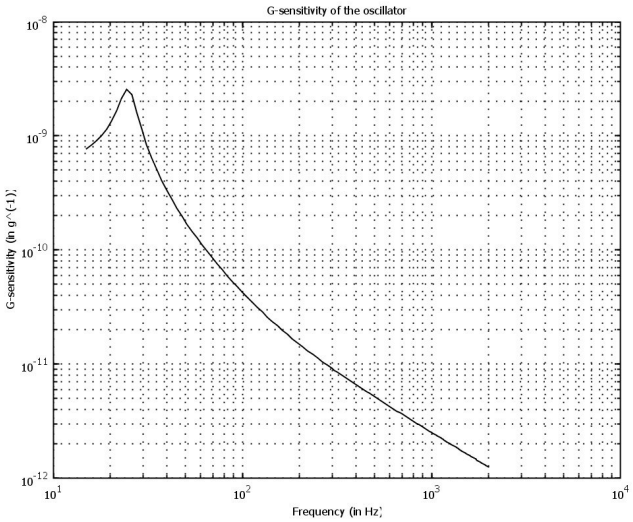

Figure 3 : G-sensitivity of the oscillator

Above is represented the g-sensitivity of the oscillator