

# OCXO ULN HF D

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

▣ Features.....	2
▣ Applications .....	2
▣ Environmental conditions .....	2
▣ Mechanical characteristics .....	3
▣ Performance characteristics.....	4

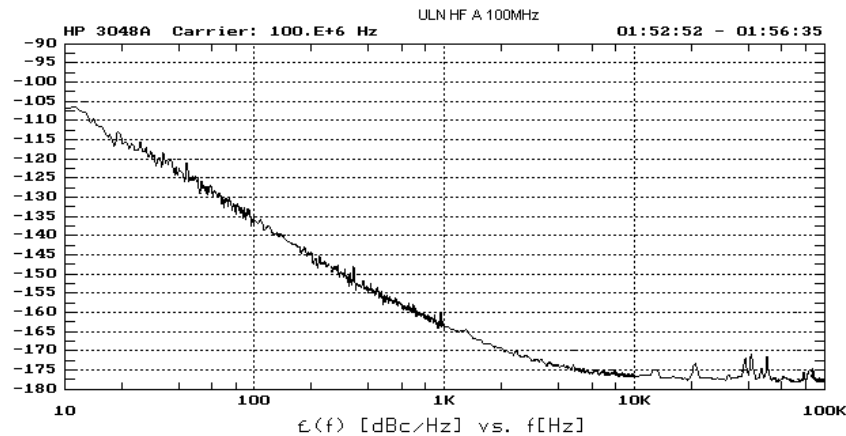
# OCXO ULN HF D

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

December 5<sup>th</sup>, 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		

# OCXO ULN HF D

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

December 5<sup>th</sup>, 2007

## ▣ Mechanical characteristics

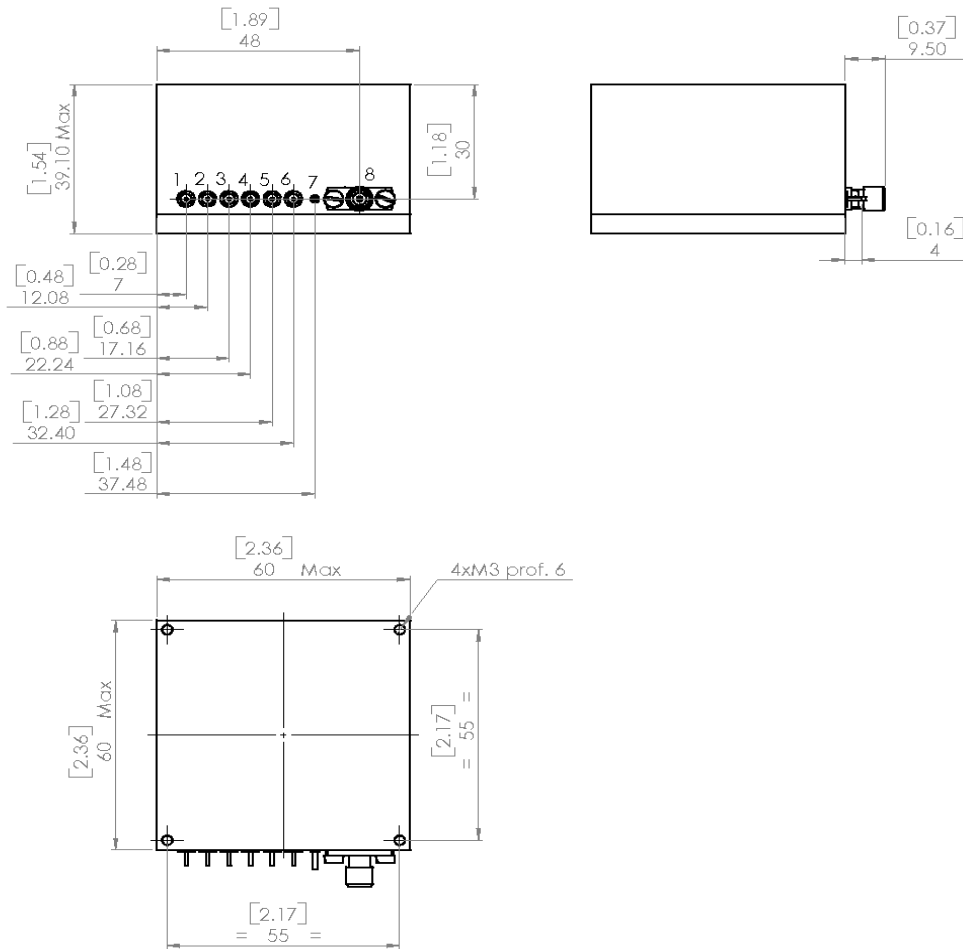


Figure 1 : Oscillator outline

### 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

# OCXO ULN HF D

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

December 5<sup>th</sup>, 2007

## □ Performance Characteristics

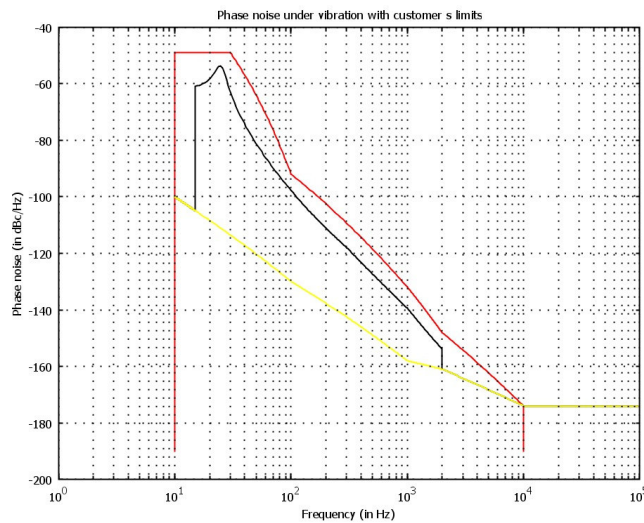
Electrical Parameters	Unit	Minimum	Typical	Maximum
<b>Frequency output (SMA Connector)</b>				
Nominal frequency range	MHz	80	100	125
Output level (50 Ω load)	dBm	11	13	15
Output VSWR (Fo ± 1.5 MHz)	-			2:1
Harmonics level	dBc			- 30
Spurious (offset > 50 Hz)	dBc			- 70
<b>Phase noise in static conditions @ 100 MHz</b>				
@ 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
<b>Phase noise in static conditions @ 120 MHz</b>				
@ 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
<b>g-sensitivity</b>				
@ 25 Hz offset (resonance)	/g			2.5 10 <sup>-9</sup>
@ 100 Hz offset	/g			4.5 10 <sup>-11</sup>
@ 1 kHz offset	/g			2.5 10 <sup>-12</sup>
<b>Free running mode (Vctrl pin NC)</b>				
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
<b>Electrical tuning (Vctrl pin)</b>				
Relative pulling frequency range	ppm			± 2
Input impedance	Ω	10 k		
Voltage range Option A	V <sub>DC</sub>	- 5		5
Voltage range Option B	V <sub>DC</sub>	0		10
<b>Reference voltage (Vref pin)</b>				
Nominal value	V <sub>DC</sub>	9.5	10	10.5
Relative variation vs. temperature	%			± 1
Relative variation over 10 years	%			± 1

# OCXO ULN HF D

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

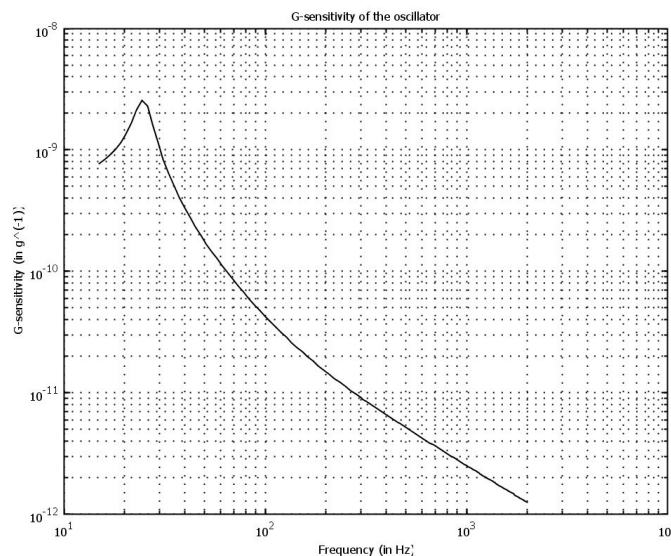
December 5<sup>th</sup>, 2007

Electrical Parameters	Unit	Minimum	Typical	Maximum
<b>Supply voltage (Vcc pin)</b>				
Voltage range	V <sub>DC</sub>	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 theoretical 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