SPACE OCXO plus

Space Qualified OCXO Plus – Oven Controlled Crystal Oscillator,
General Specification (rev1)

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December, 5th 2007

▣ Features

- Case type (s) : 50x50 height 30mm
- Frequency range : 10 MHz to 40 MHz
- Overall frequency stability vs. temperature range from +/- 2ppb to +/-0.5 ppb under vacuum
- Frequency Control Range : depending on spec
- Ageing per year : +/- 20 ppb first year
- Output wave form : sine 50 Ohms
- Output level : 10 dBm
- Supply Voltage : +10V or +15V
- Power consumption during Warm Up : 6W
- Power consumption steady state : 4W atmospheric pressure ; 2W under vacuum
- Environmental conditions depending on customer request
- Radiation : TDR from 50kRad up to 100 kRad (Si)
- FM in accordance with MIL-PRF-55310 rev D

▣ Applications

Recommended for space clock applications, navigation and positioning onboard systems

▣ Environmental conditions

Parameters	Unit	Minimum	Typical	Maximum
Operating temperature range	℃	– 20		+ 70
Storage temperature range	℃	– 55		+ 125
Sine vibration		20g as per MIL-STD-202, Method 204, Condition D		
Random vibration		50 Grms ; 1,7g²/Hz from 100 Hz to 1000Hz		
Acceleration		25g		
Shocks (pyrotechnic shock)		1500g @ 1.5kHz		
Shocks (sawtooth) Shocks (half sine)		50g, 11ms 1200g, 11ms		
Radiation		Up to 100 kRad total dose		

⬛ **Mechanical characteristics**
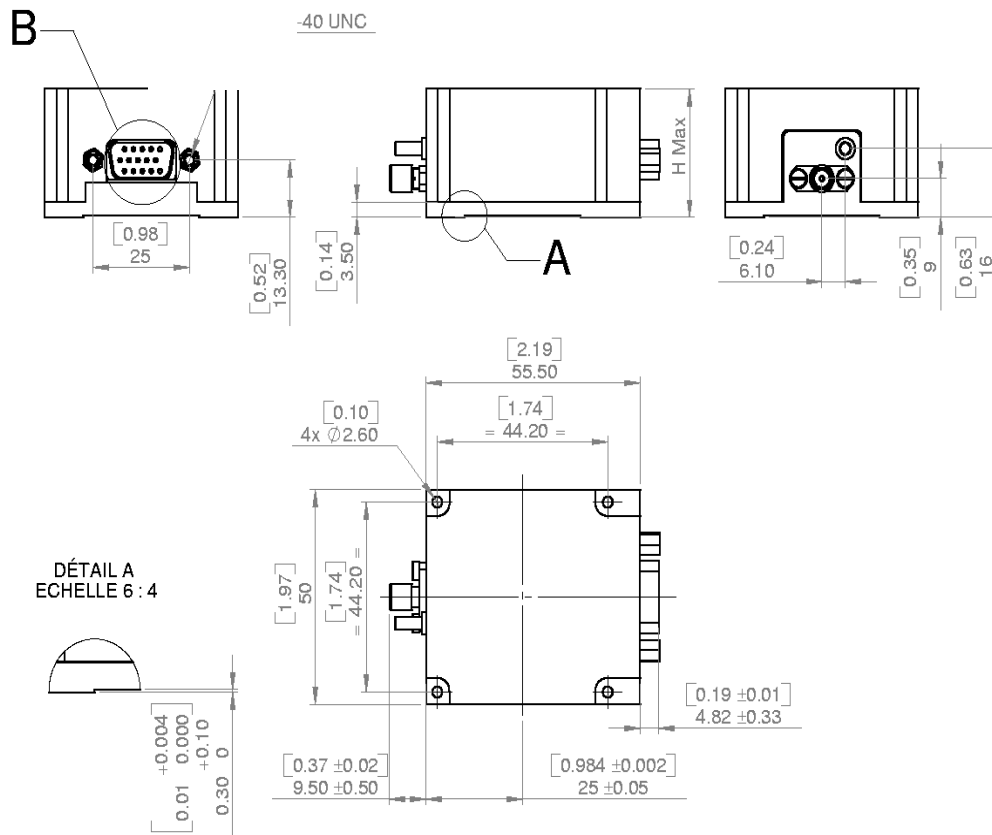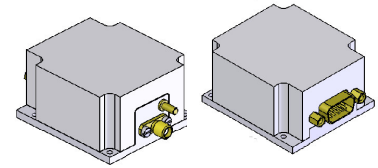
Figure 1 : Oscillator outline 1

Pin number	Name	Function
1	Vc	Voltage control for electrical tuning
2 – 3 – 4 - 12	NC	Electrical & mechanical ground
6 – 7 – 8 – 13 – 14 – 15	GND	Electrical & Mechanical ground
9 – 10 - 5	Vcc	Power supply
11	Vref	Reference voltage
SMA connector	Fout	Frequency output

Table 1 : Pin description 1

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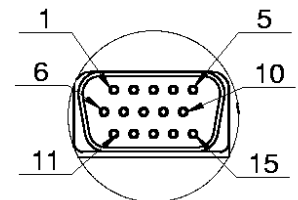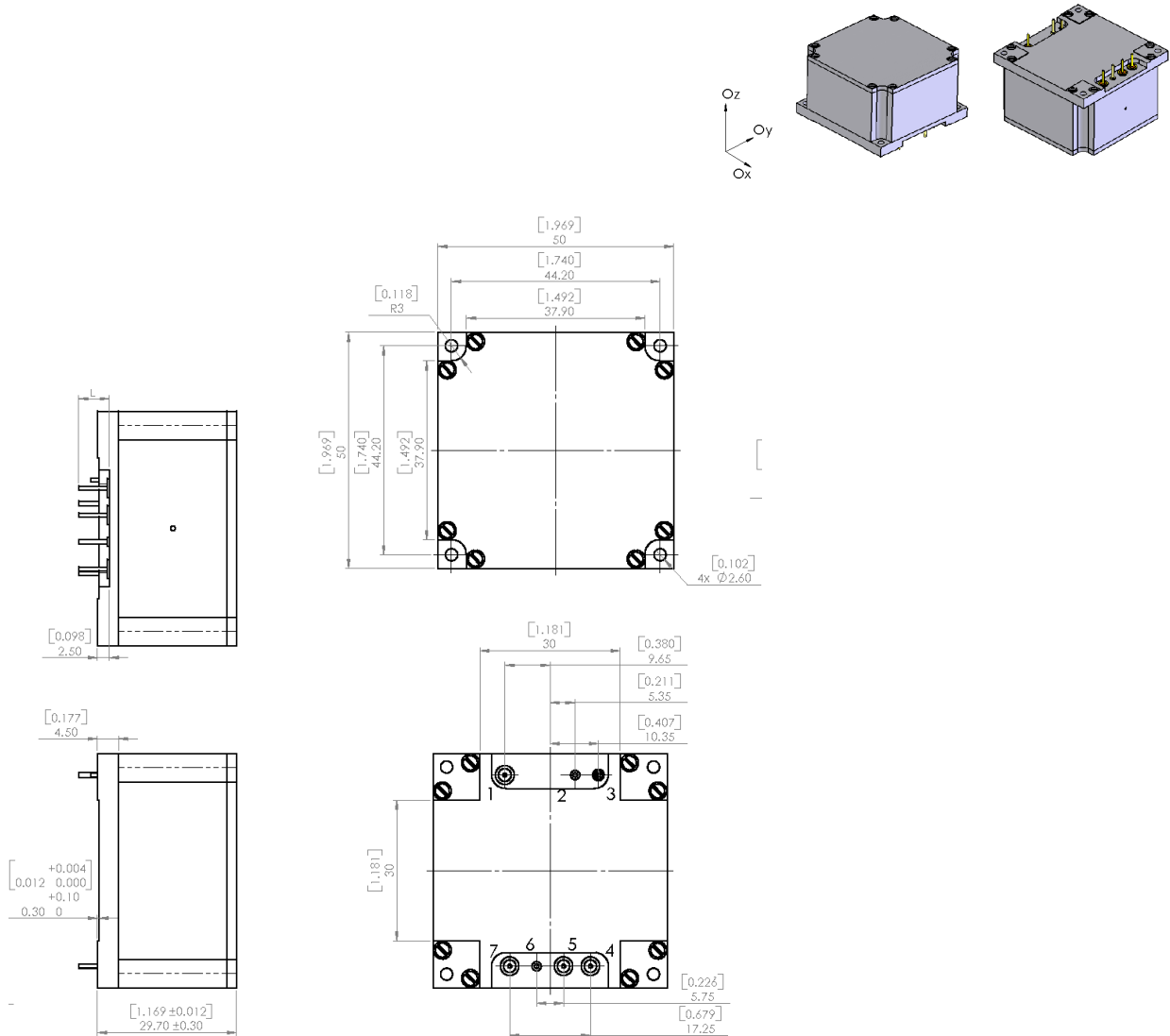

Figure 2 : Oscillator outline 2

Pin number	Name	Function
1		Oven Alarm
2 – 6	GND	Electrical & mechanical ground
3	Fout	Frequency output
4	Vc	Voltage control for electrical tuning
5	Vref	Reference voltage
7	Vcc	Supply voltage

Table 2 : Pin description 1

Figure 3 : Oscillator outline 3

Pin number	Name	Function
1		Oven Alarm
2 – 6	GND	Electrical & mechanical ground
3	Fout	Frequency output
4	Vc	Voltage control for electrical tuning
5	Vref	Reference voltage
7	Vcc	Supply voltage

Table 3 : Pin description 3

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Space Qualified OCXO Plus – Oven Controlled Crystal Oscillator,
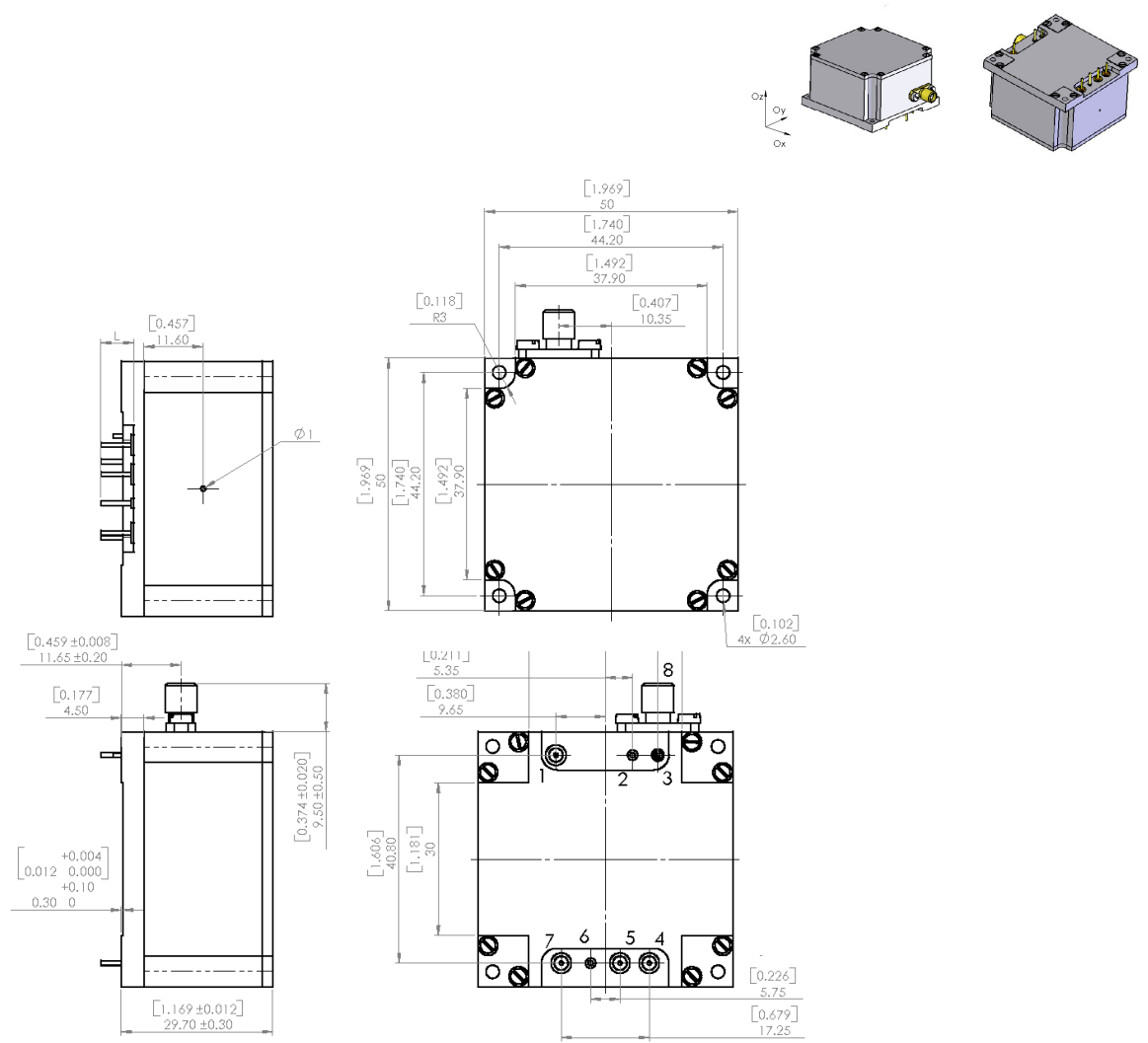General Specification (rev1)

◙ Performance characteristics

Electrical Parameters	Unit	Minimum	Typical	Maximum
Frequency output				
Nominal frequency range	MHz	5	10	40
Output level (50 Ω load)	dBm	5		8
Harmonics level	dBc			– 40
Spurious (offset > 50 Hz)	dBc			– 80
Phase noise in static conditions @ 10 MHz				
@ 1 Hz offset	ppb			– 110
@ 10 Hz offset	ppb			– 135
@ 100 Hz offset	ppb			– 145
@ 1 kHz offset	ppb			– 150
@ 10 kHz offset or greater	ppb			– 155
Allan variance				
@ 0.1 s	ppb			0.002
@ 1 s	ppb			0.002
@ 10 s	ppb			0.01
Free running mode (Vctrl pin NC)				
Initial setting	ppb			10
Stability vs. temperature	ppb			±1
Stability vs. 5 % supply voltage variation	ppb			0.1
Stability vs. 10 % load variation	ppb			0.1
Aging over first year	ppb			20
Retrace	ppb			2
Electrical tuning (Vctrl pin)				
Relative pulling frequency range	ppb	±200		±500
Input impedance	Ω	10k		
Voltage range Option	V_{DC}	0		8
Reference voltage (Vref pin)				
Nominal value	V_{DC}	7.5		8.5
Supply voltage (Vcc pin)				
Voltage range	V_{DC}	9.5	12	15.75
Supply power @ 25 °C under vacuum	W			2
Supply power @ warm up	W			7