CONNECTORIZED PACKAGE OCXO

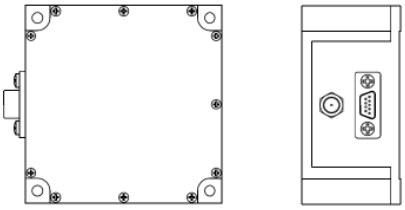
Datasheet

AXIOM6060 — OCXO WITH LOW PHASE NOISE FOR SPACE APPLICATION

FEATURES

- Connectorized Package, size 60 x 60 x 30 mm
- Radiation hard up to 100 kRad total dose
- Low Phase Noise
- Space Qualified OCXO

60 x 60 x 30 mm max.



Parameter	min.	typ.	max.	Unit	Condition
Nominal frequency		100.000		MHz	
Frequency stability					
Initial tolerance before screening test		± 10	± 50	ppb	@+25°C
Initial tolerance after screening test			± 500	ppb	@+25°C
vs. operating temperature range			± 50	ppb	-30°C~+70°C
vs. supply voltage variation			± 5	ppb	V_S ± 5%
vs. load change			± 5	ppb	R_L ± 10%
Long term (aging) per day			± 2	ppb/day	
Long term (aging) 1st year			± 50	ppb	
Long term (aging) following 9 years			± 200	ppb	
RF output					
Signal waveform		Sine wave			
Load R_L		50		Ω	
Output level	+ 12	+13	+14	dBm	
Harmonics			-35	dBc	
Spurious			-80 -80	dBc dBc	f_0 ± 1 MHz DC to 1.6 GHz
Warm-up time @+25°C @-30°C			20 20	min min	Df/f_0 < ± 1 ppb Df/f_0 < ± 10 ppb
Phase noise in quiet state			-70 -100 -130 -153 -160	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	@ 1 Hz @ 10 Hz @ 100 Hz @ 1 kHz @ 10 kHz
Short term stability (Allan deviation)		$1 \cdot 10^{-10}$			@ t = 1 sec
Acceleration sensitivity (2G tip-over)		1		ppb/G	each axis
Supply voltage V_S	11.4	12	12.6	V	
Current consumption (steady state)		350 450		mA mA	@ +25°C @ -30°C
Current consumption (warm-up)			800	mA	
Operable temperature range	-35		+70	°C	
Storage temperature range	-40		+80	°C	

Enclosure (L x W x H)	60 x 60 x 30		mm	See drawing
Weight	150	200	gram	
Case material	Aluminium alloy			
Case finish (Note 4)	1.78 µm < Ni < 5.71 µm 1.27 µm < Au < 5.71 µm			MIL-PRF-55310, Clause 6.5.3 & 6.5.4
RF output connector	SMA-F			
DC connector	Micro-D (M83513/03)			
Available product categories	EM: Engineering Model FM: Flight Model LAT: Lot Acceptance Test Model			See ordering code

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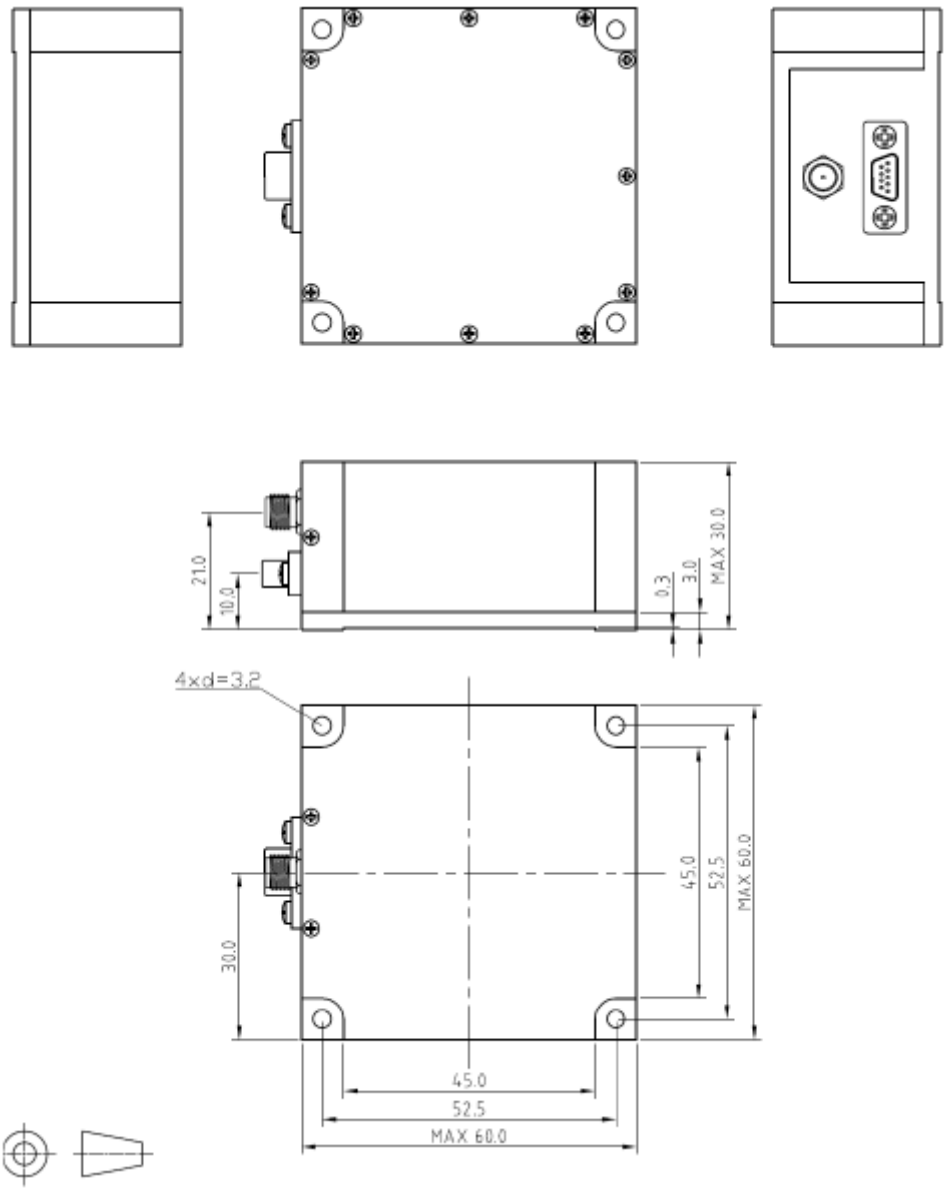
Notes:

1. Terminology and test conditions are according to IEC standard IEC60679-1, MIL-PRF-55310 and ESCC21300, unless otherwise stated
2. Classification (MIL-PRF55310): Type 4 (OCXO), Class 1 (discrete technology), Product level S
3. Selection of materials is based on ECSS-Q-ST-70C and ECSS-Q-70-71
4. Only FM and LAT model

Enclosure drawing



Model (Specification)	Product Category	Frequency [MHz]
AXIOM6060	EM FM LAT	100.000

Example: AXIOM6060-FM – 100.000 MHz

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Environmental conditions

Test	Reference	Test conditions
Radiation*		available up to 100 kRad (Si) total dose
Vibration, random, non operating*	MIL-STD-202F, Method 214	Cond. I, Letter J, PSD 1.0 G^2/Hz, 37.8 G rms, 3 min per axis
Vibration, high frequency, non operating*	MIL-STD-202F, Meth.204	Cond. D. 20G, 10 Hz ~ 2000 Hz, 20 min per cycle, 12 cycles each axis
Mechanical shock*	MIL-STD-202F, Method 213	Cond. F, 1500 G, 0.5 ms, half-sine
Ambient Pressure	MIL-STD-202F,	Between 1 atm and hard vacuum
Constant Acceleration*	MIL-STD-202F, Method 212	10G, 0.5G/sec, duration 2 min
Humidity*	MIL-STD-202F, Method 103	60 % RH @ 40°C for 96 hours

*test conditions for Group C inspection and for endurance tests

Screening Procedure (MIL-PRF-55310 Product Level S)

Test	Reference	Test conditions
Electrical Measurement at room temperature	Table 1	
Random Vibration	MIL-STD-202F, Meth. 214, Cond. 1-B	PSD = 0.04 G^2/Hz, 7.56 Grms, 5 min per axis
Thermal Shock	MIL-STD-202F, Meth. 107, Cond. A1	-40°C ~ +80°C, 25 cycles, non-operating, 5 min transfer time, 15 min dwell time
Electrical Measurement at room temperature	Table 1	
Burn-In (Load)	MIL-PRF-55310	@ 85°C over 240 hours, Df/f < ± 1 ppm
Electrical Measurement at room temperature	Table 1	@-35°C, +25°C, +70°C, Df/f < ± 50 ppb, Output level (13±1) dB
Electrical Measurement at High and Low Temperature		@-30°C, +25°C, +70°C, Df/f < ± 50 ppb, Output level (13±1) dB
Seal Test (Gross Leak)	MIL-STD-202F, Meth. 112, Cond. D	
Radiographic Inspection	MIL-STD-202F, Meth. 209	
External Visual Inspection	MIL-STD-883 Meth. 2009	ESCC 20500

Group A Inspection

Test	Reference	Test conditions
Group A Inspection 100 %	MIL-PRF-55310 Clause 4.7.1.4	Table 5, Product Level S

Note:
Electrical measurements performed during screening are not repeated during Group A inspection

Group B Inspection (Aging Test)

Test	Reference	Test conditions
Group B Inspection 100 %	MIL-PRF-55310 Clause 4.7.1.5	Table 5, Product Level S
Final Electrical Measurement at room temperature	Table 1	

Group C Inspection (LAT) on 2 pieces

Test	Reference	Test conditions
Random Vibration	MIL-STD-202F, Meth. 214, Cond. 1 J	PSD = 1.0 G^2/Hz, 37.8 Grms, 3 min per axis
Mechanical Shock	MIL-STD-202F, Meth. 213, Cond. F	1500 G, 0.5 ms, half-sine
Thermal Shock	MIL-STD-202F, Meth. 107, Cond. B1	-65°C ~ +125°C, 25 cycles, non-operating, 5 min transfer time, 15 min dwell time
High Temperature Storage	-	24 hours @ -30°C, 24 hours @ 70°C, 2 hours min. at ambient temperature
Electrical Measurement at room temperature	Table 1	
Seal Test (Gross Leak)	MIL-STD-202F, Meth. 112, Cond. D	
External Visual Inspection	MIL-STD-883 Meth. 2009	ESCC 20500

Model Constructions

Item	Engineering Model (EM)	Qualification Model (QM)	Flight Model (FM)	Lot Acceptance Models (LAT)
Quartz Crystal	Synthetic HiQ Quartz, SC-cut, HC-35/U4-point	Synthetic HiQ Swept Quartz IAW ESCC3501, SC-cut, HC-35/U 4-point	Synthetic HiQ Swept Quartz IAW ESCC3501, SC cut, HC-35/U 4-point	Synthetic HiQ Swept Quartz IAW ESCC 3501, SC cut, HC-35/U 4-point
Electrical Components	Passives: COTS Actives: from same manufacturer as the HiRel parts	HiRel Parts	HiRel Parts	HiRel Parts
Mechanical Components	Form-Fit Function, Al body with Ni finish	As FM	NiAu surface finish	As FM
Workmanship	IPC610	ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C	ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C	ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C
Tests	Acceptance Testing	Screening and Qualification Testing	Screening and Acceptance Testing	Screening and Acceptance Testing and LAT (Group C)

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