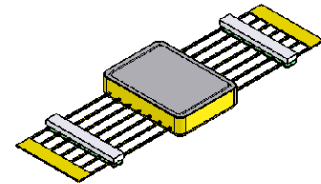




SPACE XO Series 120

Space qualified XO – Crystal Oscillator,
General Specification (rev 26 January 2010)



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Features

- Frequency Range : 2.5 MHz to 100 MHz
- Low consumption: 20 mA
- Supply Voltage : +3.3V or +5V
- Overall Frequency Stability over 15 years < +/- 100ppm
- Output Wave Form : square CMOS compatible or Sine
- Manufacturing in accordance with:
 - MIL-PRF-55310 (Class 1, type 1, level S or B)
 - ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C

▣ Applications

- Digital cards
- FPGA clock

▣ Environmental conditions

Parameters	Unit	Minimum	Typical	Maximum
Operating temperature range	°C	- 55		+ 105
Storage temperature range	°C	- 55		+ 125
Shocks (half sine)		1500g, 0.5ms		
Sine vibration		20g as per MIL-STD-202, Method 204, Condition D		
Random vibration		37.8 grms as per MIL-STD-202, Method 214, Condition I-J		
Radiation		Up to 100 krad total dose		

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▣ Mechanical characteristics

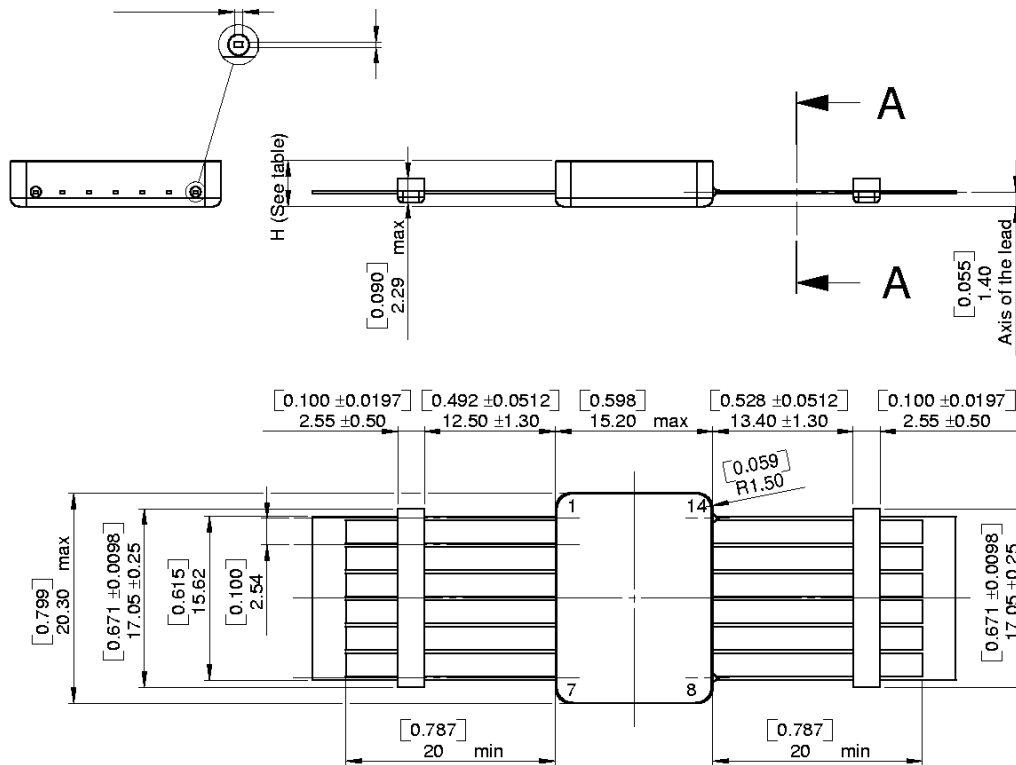


Figure 1 : Oscillator outline

H	Hauteur maximum du boîtier sous pression atmosphérique Maximum package height under atmospheric pressure
	4.9 [0.193] max
	Hauteur maximum du boîtier sous dépression Maximum package height under underpressure
	5 [0.197] max

Pin description

Pin number	Name	Function
7	Ground	Electrical and mechanical Ground
8	Fout	Frequency output
14	Vcc	Supply voltage input
others		Not connected



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▣ Performance Characteristics

Electrical Parameters	Unit	Minimum	Typical	Maximum
Frequency output				
Nominal frequency range	MHz	2.5		100
Square CMOS Wave (C option)				
High level	V	90% Vcc		
Low level	V			10% Vcc
Rise time/Fall time	ns			5
Sine Wave (S option available under 5V or12V)				
Level	dBm	0		
harmonics	dBc	20		
Load	ohms	45		55
Free running mode				
Initial setting	ppm			±10
Stability vs. temperature (-40°C to + 85°C)	ppm			±2 0
Stability vs. 5 % supply voltage variation	ppm			±5
Stability vs. 10 % load variation	ppm			±5
Aging over first year	ppm			3
Aging over 15 years	ppm			±20
Supply voltage (Vcc pin)				
Voltage range ±5% (1)	Vcc	3.3		5
Supply power	mA			25
Start up time	ms			10

Note 1: XO with sine output are available with supply voltage of 5V and 12V

▣ Proposed Components quality levels

- Full ESA ECSS-Q-ST-60C components
- Full ESA ECSS-Q-ST-60C components with specific radiation test

▣ Screening options according to MIL PRF55310

- Full Level S
- Level S with combined burn in aging of 480 hours
- Full Level B
- Level B with combined burn in aging of 480 hours



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▣ Model philosophy

Representativeness	DM	EM	EQM	QM	FM	FM-C
Component	Commercial parts	Passive commercial parts Active parts from the same manufacturer of HiRel parts	Mil Grade parts procured from the same manufacturer of HiRel parts	HiRel Parts	HiRel Parts	HiRel Parts
Crystal material	HiQ	HiQ	HiQ	Swept ESA-SCC3501	Swept ESA-SCC3501	Swept ESA-SCC3501
Resonator stabilization	Not stabilized	Stabilized	Stabilized	Stabilized & Aged as per specification	Stabilized & Aged as per specification	Stabilized & Aged as per specification
Mechanical interface	Size & shape could not be representative	Flight representative in form-fit-function	Flight representative in form-fit-function	Flight design	Flight design	Flight design
Electrical interface	Total conformity with functional electrical	Flight design without HiRel parts	Flight design without HiRel parts	Flight design	Flight design	Flight design
Other tests	Development testing	Partial functional qualification testing	Functional Qualification testing & Environment	Acceptance + Qualification testing	Acceptance testing	Acceptance testing + group C
Workmanship	IPC610	IPC610	ECSS-Q-ST-70-08 & 70-38	ECSS-Q-ST-70-08 & 70-38	ECSS-Q-ST-70-08 & 70-38	ECSS-Q-ST-70-08 & 70-38



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▣ Standard Tests

DXOxxxxFM	SN/YYWW		Initial Tests	Final Tests	Visual tests group A	Ageing test group B	Health Tests
CONDITIONS		PARAMETERS	GO NO-GO	GO GO	GO NO-GO	GO NO-GO	GO NO-GO
24°C ±2°C		Frequency	GO	GO	NA	GO	GO
24°C ±2°C Vs=Vnom		Output Signal	GO	NA	NA	NA	GO
24°C ±2°C Vs=Vmin			NA	GO	NA	NA	NA
24°C ±2°C Vs=Vmax			NA	GO	NA	NA	NA
-20°C ±2°C Vs=Vmin			NA	GO	NA	NA	NA
-20°C ±2°C Vs=Vmax			NA	GO	NA	NA	NA
70°C ±2°C Vs=Vmin			NA	GO	NA	NA	NA
70°C ±2°C Vs=Vmax			NA	GO	NA	NA	NA
24°C ±2°C Vs=Vnom			Consumption	GO	NA	NA	NA
24°C ±2°C Vs=Vmax		NA		GO	NA	NA	NA
-20°C ±2°C Vs=Vmax		NA		GO	NA	NA	NA
70°C ±2°C Vs=Vmax		NA		GO	NA	NA	NA
-40°C to +85°C		Frequency vs. Temperature	GO	GO	NA	NA	NA
-20°C to +70°C			GO	GO	NA	NA	NA
24°C ±2°C		Jitter, phase noise	GO	GO	NA	NA	NA
24°C ±2°C		Frequency Available	GO	GO	NA	NA	NA
-20°C ±2°C			NA	GO	NA	NA	NA
70°C ±2°C			NA	GO	NA	NA	NA
24°C ±2°C		Frequency at start up	GO	GO	NA	NA	NA
-20°C ±2°C			NA	GO	NA	NA	NA
70°C ±2°C			NA	GO	NA	NA	NA
24°C ±2°C		Frequency vs. supply variation	GO	GO	NA	NA	NA
-20°C ±2°C			NA	GO	NA	NA	NA
70°C ±2°C			NA	GO	NA	NA	NA
		Dimensions	NA	NA	GO	NA	NA
		Marking	NA	NA	Not Tested	NA	NA
		Weight	NA	NA	GO	NA	NA
		Seal Test	NA	NA	GO	NA	NA



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Ordering part number definition

The part number breakdown is defined as follows:

