CENTUMrakon

Global Presence

8 Manufacturing and design center
14 Customer support offices

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CENTUMrakon

SPACE

Frequency Control Products

- Oven Controlled Crystal Oscillators (OCXO)
- Temperature Compensated Crystal Oscillators (TCXO)
- Voltage Controlled Crystal Oscillators (VCXO)
- Clock Oscillators (XO)
- Crystal Filters
- Quartz Crystals (XTAL)

INTRODUCTION

Centum Rakon is a joint venture between Centum Electronics Ltd Bangalore, India and Rakon Ltd, New Zealand. Two world class companies providing the design and manufacturing of high performance crystals and crystal oscillators including XO, VCXO, TCXO and OCXO's globally. Centum Rakon provides products to the Space, Defence, Aerospace, Communications and Mobile markets.

- Leader in the design and manufacturing of crystals and crystal oscillators including XO,VCXO,TCXO and OCXO.
- One of the largest design and manufacturing company for OCXO's in the world
- World class manufacturing processes including quartz crystal processing
- High quality custom built products processes conforming to MIL-PRF-38534, MIL-STD-883E,MIL-PRF-55310, ISRO-PAX 300,ISO 9001-2008, ISO-14000 standards

VISION

To Create Value by contributing to the Success of its Customers, by providing best-in-class Electronics Design and Manufacturing Solutions in high technology areas

QUALITY POLICY

"All our products and services shall meet the expectations of our customers and stake-holders in quality, technology and value. This commitment is achieved through effective teamwork of every employee, supplier and customer.

We shall develop, maintain and continually improve a documented system and enhance quality of all our products, processes and services and promote customer trust and satisfaction".

HERITAGE

- Hi-Rel products conforming to the most stringent Space standards for prestigious projects like INSAT/GSAT series, IRS series, Chandrayaan, MARS Mission.
- Approved by ISRO centers like SAC, VSSC and ISAC for payload, launch vehicles & other satellite applications.

COMPLETE FCP OFFERING

Crystals

Wide range of standard and custom solutions

High Reliable

CSX2521S CSX2213S

XO

High frequency, low jitter performance

CVX8520S

VCXO

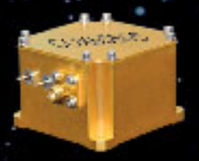
High frequency, low jitter performance

CTX3825S CTX3520S

Extreme performance

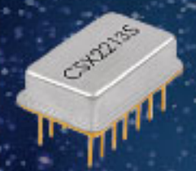
TCXO

Up to ±1.0ppm over wide temperature ranges in high volume



OCXO

Broad product range



CSX2213S — XO

PACKAGE	STABILITY	SUPPLY VOLTAGE	FEATURES
22x13x5mm	-55 to +125°C ±50ppm Other custom reqirements are also available.	+5.0V,upto 15.0Volts	Low jitter, Wide frequency range
FREQUENCY RANGE		**OUTPUT TYPE**	
0.160 to 100.0MHz		HCMOS,ACMOS, TTL, Sine	

CSX2521S

PACKAGE	STABILITY	SUPPLY VOLTAGE	FEATURES
25.4x21x10mm	-55 to +125°C ±50ppm Other custom reqirements are also available.	+5.0V,upto 15.0Volts	Low jitter, Wide frequency range
FREQUENCY RANGE		**OUTPUT TYPE**	
0.160 to 250.0MHz		HCMOS, ACMOS, TTL, Sine, ECL	

CVX3520S — VCXO

PACKAGE	INPUT VOLTAGE	PULLING RANGE	FRENQUENCY STABILITY
34.5X20.19X10mm	+3.3V,+5.0V,upto 15.0Volts	±30 to ±100ppm	0 to 50°C ±10ppm 0 to 70°C ±10ppm -10 to 70°C ±10ppm -20 to 70°C ±20ppm -40 to 85°C ±20ppm
FREQUENCY RANGE	**OUTPUT TYPE**		
0.160 to 100.0MHz	SINE		

CTX3520S — TCXO

PACKAGE	STABILITY	SUPPLY VOLTAGE	FEATURES
35X20X15mm	-10 to 60°C ±1.0ppm -20 to 70°C ±2.0ppm Other custom requirements are also available	+5.0V,+9.0V,12.0V, 15.0Volts	Excellent phase noise, Frequency select option, Low jitter, Wide frequency range
FREQUENCY RANGE	**OUTPUT TYPE**		
5.0-375.0MHz	HCMOS, ACMOS, TTL, Sine		

CTX3825S

PACKAGE	STABILITY	SUPPLY VOLTAGE	FEATURES
39.3x25.6x7mm	-10 to 60°C ±1.0ppm -20 to 70°C ±2.0ppm Other custom requirements are also available	+5.0V,+9.0V,12.0V, 15.0Volts	Excellent phase noise, Frequency select option, Low jitter, Wide frequency range
FREQUENCY RANGE	**OUTPUT TYPE**		
5.0-375.0MHz	HCMOS, ACMOS, TTL, Sine		

COX5555S — OCXO

PACKAGE	STABILITY	SUPPLY VOLTAGE	FEATURES
55X55X35mm	-10 to 60°C ±10ppb Other custom requirements are also available	+9.0V,12.0V and 15.0V	Excellent phase noise, Frequency select option, Low jitter, Wide frequency range
FREQUENCY RANGE	**OUTPUT TYPE**		
UPTO 130MHz	Sine		

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CRYSTAL FILTERS

Frequency range: 5MHz to 250MHz

Bandwidth: 0.001% to 1%

High selectivity

Insertion Loss: 2 to 8 dB

2 to 8 poles

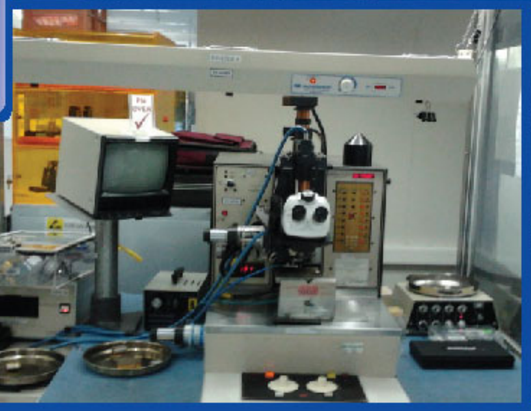
Shape factor (60dB/3dB): 1.2 min

Out-of-band rejection: 100 dB max

Temperature Range: -45°C to +90°C

Space: -10 c to +60 C

HYBRID MICRO CIRCUIT MANUFACTURING FACILITY



WORLD CLASS PRODUCTION AND TEST

- Class 1000 and 100K clean room for crystals and oscillator manufacturing
- Dedicated line and people for handing space grade products
- Dedicated simulation software for crystals and oscillator designs
- In house substrate manufacturing capability using very latest techniques
- In house chip and wire bonding facility using very latest techniques
- Complete testing facility including temperature test chamber
- High end phase noise setup(cross correlation method)
- Complete screening facility including vibration & Thermo Vacuum
- Space grade approved Single, Double sided & Multilayer Thick film process, it includes printing firing & Resistor Trimming
- Space Grade approved & MIL Certified Established Manual Soldering Process

CRYSTAL MANUFACTURING PROCESS

SCREENING OPTIONS

Operation	Requirements & Conditions	Class S (MIL-PRF-55310 Product level S)	Class B (MIL-PRF-55310 Product level B)	Engineering Model
Non-Destruct Bond Pull	MIL-STD-883, Meth 2023	√	NA	NA
Internal Visual	MIL-STD-883, Meth 2017, Class K, Meth 2032, Class K	√	√	√
Stabilization (Vacuum) Bake	MIL-STD-883, Meth 1008 Cond C, 150° C,	48 hours min	24 hours min	if required
Thermal Shock	MIL-STD-883, Meth 1011, Cond A	√	NA	NA
Temperature Cycle	MIL-STD-883, Meth 1010, Cond B, 10 cycles	√	√	√
Constant Acceleration	MIL-STD-883, Meth 2001, Cond A, Y1 Plane only, 5000 g's	√	√	NA
Seal:Fine Leak	MIL-STD-883, Meth 1014,Cond A2	√	√	√
Seal- Gross Leak	MIL-STD-202, Meth 112, Cond D	√	√	√
Particle Impact Noise Detection(PIND)	MIL-STD-883, Meth 2020, Cond B	√	NA	NA
Electrical Testing, Pre Burn-In				
Input Current-power	MIL-PRF-55310,Par. 4.8.5	√	NA	NA
Output waveform	MIL-PRF-55310,Par. 4.8.20	√	NA	NA
Output voltage-power	MIL-PRF-55310,Par. 4.8.21	√	NA	NA
As specified	Customer PO	Customer PO	Customer PO	Customer PO
Burn-In(load)	+125°C,nominal supply voltage and burn-in-load	240 hours minimum	160 hours minimum	NA
Electrical Testing, Pre Burn-In	Nominal and extreme supply voltages,specified load, +23°C and temperature extremes			
Input Current-power	MIL-PRF-55310,Par. 4.8.5	√	√	√
Output waveform	MIL-PRF-55310,Par. 4.8.20			
Output voltage-power	MIL-PRF-55310,Par. 4.8.21			
As specified	Customer PO			
Radiographic Inspection	MIL-STD-883, Meth 2012	√	NA	NA

TEST CAPABILITIES

In-House Testing	MIL-STD-202		MIL-STD-883	
	Method	Test Cond	Method	Test Cond
Temperture Cycling	102	C	1010	A,B,C
Humidity	103	A,B		
Moisture Resistance	106		1004	
Thermal Shock	107	All	1011	All
Life	108	A,B,C,D	1005	
Seal	112	All	1014	A,C
Vibration,Sine	204	All		A,B,C
Vibration,Random	214	All	2007	
Radiographic(Real Time)	209		2012	A,B,C,D,E,F
Acceleration	212	A,B,C	2001	
Shock	213	All	2002	A,B
PIND			2020	
Resistance to Soldering Heat	210	B,C		
Aging at Room Temperature				
Aging at Elevated Temperature				
Die Shear Testing			2019	
Terminal Strength	211	A,B,C		
Phase Noise Under Vibration				
g Sensitivity				
Wirebond Pull Testing			2023, 2011	
DPA				
Outside Testing				
XRF(no Pure Tin)				
Radiation				
Pyrotechnic Shock(SRS)				
Class S/K Element Evaluation				

ENVIRONMENTAL STRESS SCREENING (ESS) FACILITY

NOTES