



Interquip Electronics Co., Ltd

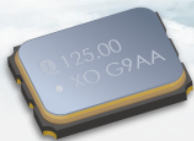
Company Profile

Since 1995

Shenzhen, China

Quartz Crystal Resonator | Oscillator

Manufacturer of Frequency Components



www.interquip.com

www.interquip-china.com

Email: marketing@interquip.com





AGENDA

1

Company Introduction

2

Product Series & Market Analysis

3

Management System

4

Future Development

| Background



Founded in 1995
in Shenzhen



HQ
Shenzhen, China



R&D Center
Shenzhen, China
Technical Support Center
Shenzhen, China



>40,000m²
Total area of Production Base
In Shenzhen-Shanwei Special
Cooperation Zone, China



Sales Office
Shenzhen,
Fuzhou, Suzhou,
Chongqing, Taiwan,
Hong Kong



Product Lines
Quartz Crystal
Resonator | Oscillator



Patents & Awards
53 invention patents
and utility model patents
China Hi-Tech Enterprise
National Innovative Technology and
Advanced Quality Management
Organization etc



Development Path



Established in Shenzhen

Shenzhen factory relocation
Monthly capacity **5,000,000 units**

Shenzhen factory accredited for ISO/TS 16949

Shenzhen factory accredited for ISO 14001

China Hi-Tech Enterprise

National Top 100 Electronic Component Enterprise
Guangdong Famous Brand
Shenzhen Hi-Tech Enterprise

Shenzhen factory accredited for IATF 16949:2016

New factory in Shenzhen
Expand production capacity to **150,000,000 units/month** in the next 3 years

Shenzhen factory accredited for ISO 9001

Introduced the world's first Epoxy SMD package products

Monthly capacity **10,000,000 units**

China Scientific Improvement Prize

Shenzhen Innovative Product certificate

Epoxy SMD package products popular
Monthly capacity **50,000,000 units**

New factory in Shenshan
Put into production
With production capacity **75,000,000 units/month**



Certificates: IATF 16949/ISO9001/ISO14001

Certificate IATF 0448839
Certificate CN23/00002370
The management system of

Shenshan Interquip Electronics Technology Co., Ltd.

East of Banan River, South of Innovative Avenue, Ebu Town, Shenzhen Special Cooperation Zone, Shenzhen City, Guangdong Province, P. R. China



has been assessed and certified as meeting the requirements of

IATF 16949:2016
Edition 1

For the following Scope:
Design and manufacture of quartz crystal resonators and oscillators



EXCLUSIONS: - None

3 Year certification is valid from 25 April 2022 until 24 April 2025 and remains valid subject to satisfactory surveillance audits.
Version no. 1. Current version updated 29 April 2023


Norman Sheng

Authorized by
Norman SHENG
Web Power Authority

Contacted Office: SGS United Kingdom Ltd, Station Road, Oakbury, 999 4LN, UK
Email: Neil.Hill@sgs.com

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Certificate CN22/00000665

The management system of

Shenshan Interquip Electronics Technology Co., Ltd.

United Social Credit Code: 9144190330320292E
Business Registration Address: East of Banan River, South of Innovative Avenue, Ebu Town, Shenzhen Special Cooperation Zone, Shenzhen City, Guangdong Province, P. R. China
Business Operation Address: East of Banan River, South of Innovative Avenue, Ebu Town, Shenzhen Special Cooperation Zone, Shenzhen City, Guangdong Province, P. R. China

has been assessed and certified as meeting the requirements of

ISO 9001:2015

For the following activities
Design and manufacture of quartz crystal resonators and oscillators



The certificate is valid from 25 April 2022 until 24 April 2025 and remains valid subject to satisfactory surveillance audits.
Issue 1. Certified since 25 April 2022.

Authorized by

Jonathan Hill

SGS United Kingdom Ltd
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The certification information can be verified on the web site of Certification and Accreditation Administration of the People's Republic of China www.cnca.gov.cn




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Certificate CN08/33026

The management system of

Shenshan Interquip Electronics Technology Co., Ltd. INTERQUIP ELECTRONICS (SHENZHEN) CO., LTD.

United Social Credit Code: 9144190330320292E
Business Registration Address: East of Banan River, South of Innovative Avenue, Ebu Town, Shenzhen Special Cooperation Zone, Shenzhen City, Guangdong Province, P. R. China
Business Operation Address: East of Banan River, South of Innovative Avenue, Ebu Town, Shenzhen Special Cooperation Zone, Shenzhen City, Guangdong Province, P. R. China

has been assessed and certified as meeting the requirements of

ISO 14001:2015

For the following activities
Design and manufacture of quartz resonators and oscillators



This certificate is valid from 19 January 2023 until 17 January 2026 and remains valid subject to satisfactory surveillance audits.
Issue 7. Certified since 18 January 2008
Multiple certificates have been issued for this scope. The main certificate is numbered CN0833026
Certificate activities performed for additional sites are listed on subsequent pages.

Jonathan Hill

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Clear Peer - Certification Services

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| Sales Network



-  **Interquip Headquarter**
-  **Factory at Shenzhen-Shanwei Special Cooperation Zone**
-  **Interquip Sales Offices**
-  **Interquip Agents/Distributors**
-  **Interquip Sales Representatives**

About Factory

Products

Crystal Resonator

Crystal Oscillator

Materials

Quartz blank

Self-developed material

Total Area

> 40,000 m²

Employees

> 400 ppl

Capacity

75KK pcs

Expansion

Production capacity

150,000,000 units/month

in the next 3 years

Automotive IATF16949
AEC-Q200

◀ Shenshan Factory



| About Factory

- Photovoltaic power generation:
> 1,200,000 kWh/year

| Factory Outside View





| Interquip Promo Video



| High Purification Cleanrooms

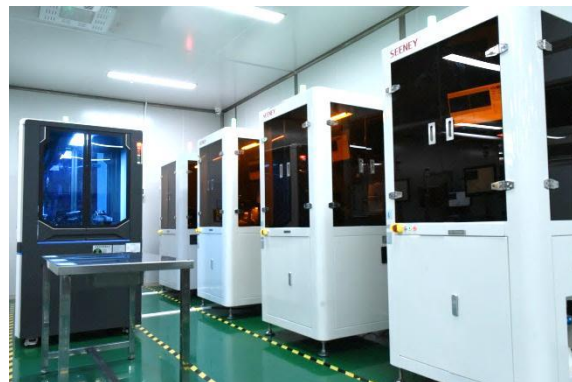


High-level Cleanrooms

- ✓ 4 High-level Cleanrooms
- ✓ Incl. High purification cleanroom production lines specialized in Automotive-grade crystals and oscillators
- ✓ Full intelligent monitoring



| Final Test Workshop and Semi-product Line





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Future Development

| New Product Road Map

Series	Item	Size (mm)	Year 2023												Year 2024											
			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Crystals	SMCE-1210	1.2x1.0																								
	SMCE-1008	1.0x0.8																								
	SMCM-1612	1.6x1.2																								
SPXO	SPXO-1612	1.6x1.2																								
VCXO	VCXO-2016	2.0x1.6																								
	VCXO-1612	1.6x1.2																								
TCXO	TCXO-1612	1.6x1.2																								
THR Series	THR-2016	2.0x1.6																								
	THR-1612	1.6x1.2																								

Product Portfolio

Crystal Resonators

Thermistor Crystals

THR Series
16MHz ~ 96MHz




Self-material Crystals

SMCM Series
8MHz ~ 54MHz



Seam Welded Crystals

 SMCE Series
6MHz ~ 156.25MHz
Ideal for ADAS , TPMS , NOA



SMAC Series
3.5MHz ~ 8MHz



AT Cut Crystals

49B/49S/49N Series
3.5MHz ~ 40MHz (Fundamental)
30MHz ~ 80MHz (3rd Overtone)




32.768KHz Tuning Fork

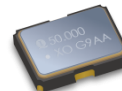
SMLF Series
32.768KHz



Crystal Oscillators

SPXO

 CMOS Output
32.768KHz, 1MHz ~ 200MHz



Differential Output

LVPECL/LVDS Output
Ultra-low phase jitter available
Offer 125MHz , 156.25MHz etc.
Phase Jitter (12KHz~20MHz): 0.1 ps



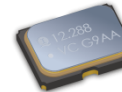
TCXO

Temperature Compensated
9.5MHz ~ 70MHz



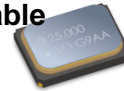
VCXO


Voltage Controlled
2MHz ~ 66MHz



Programmable

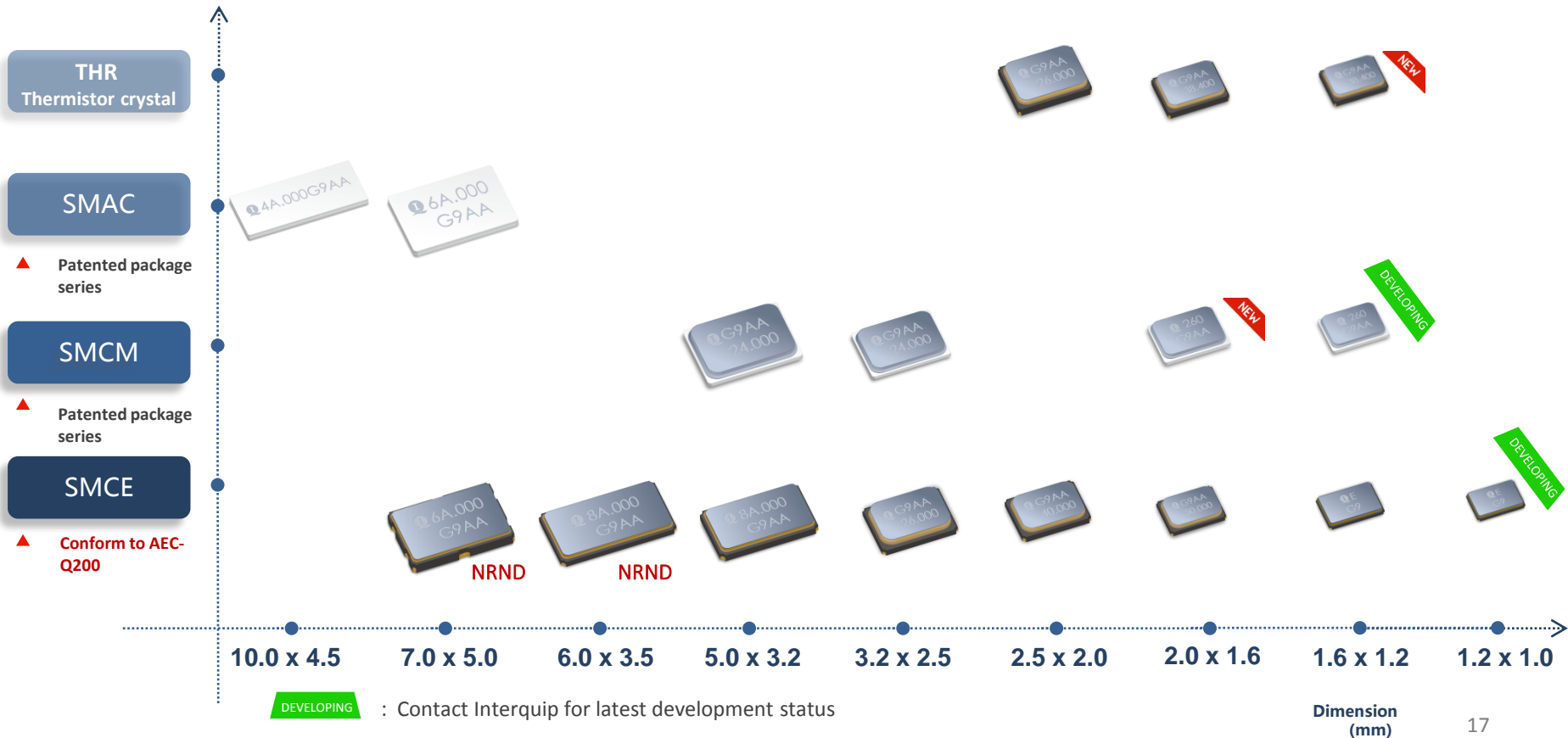
1MHz ~ 200MHz



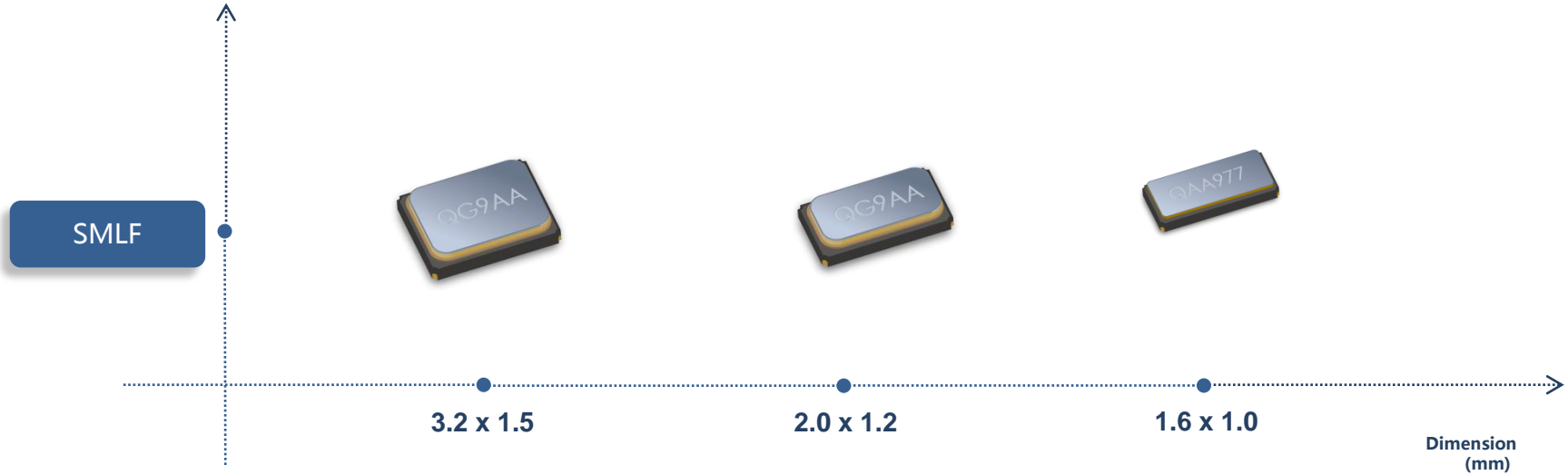
 Automotive-grade, conforms to AEC-Q200

 Ideal for 5G applications

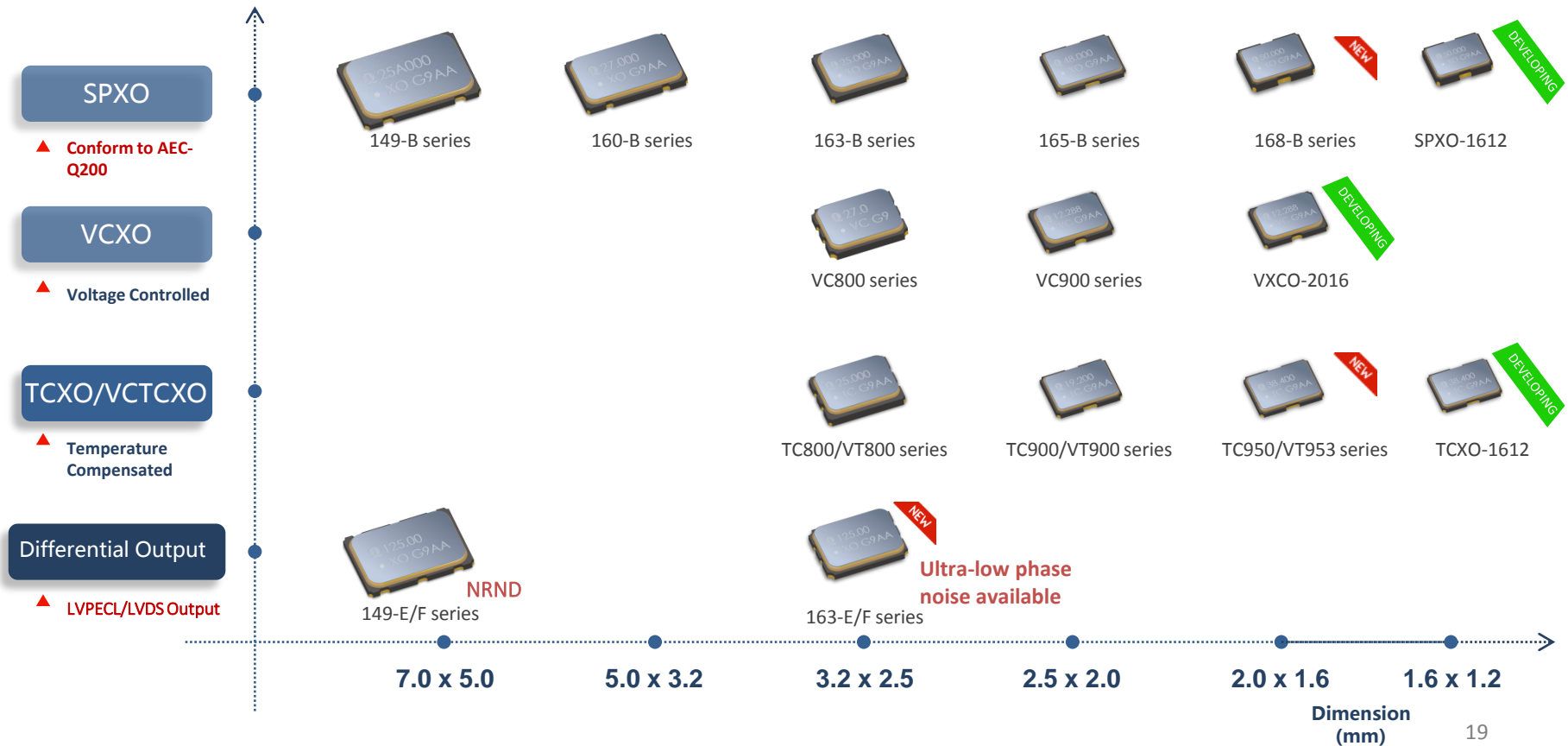
Quartz Crystal Resonator



Quartz Crystal Resonator – 32.768KHz Tuning Fork Crystal

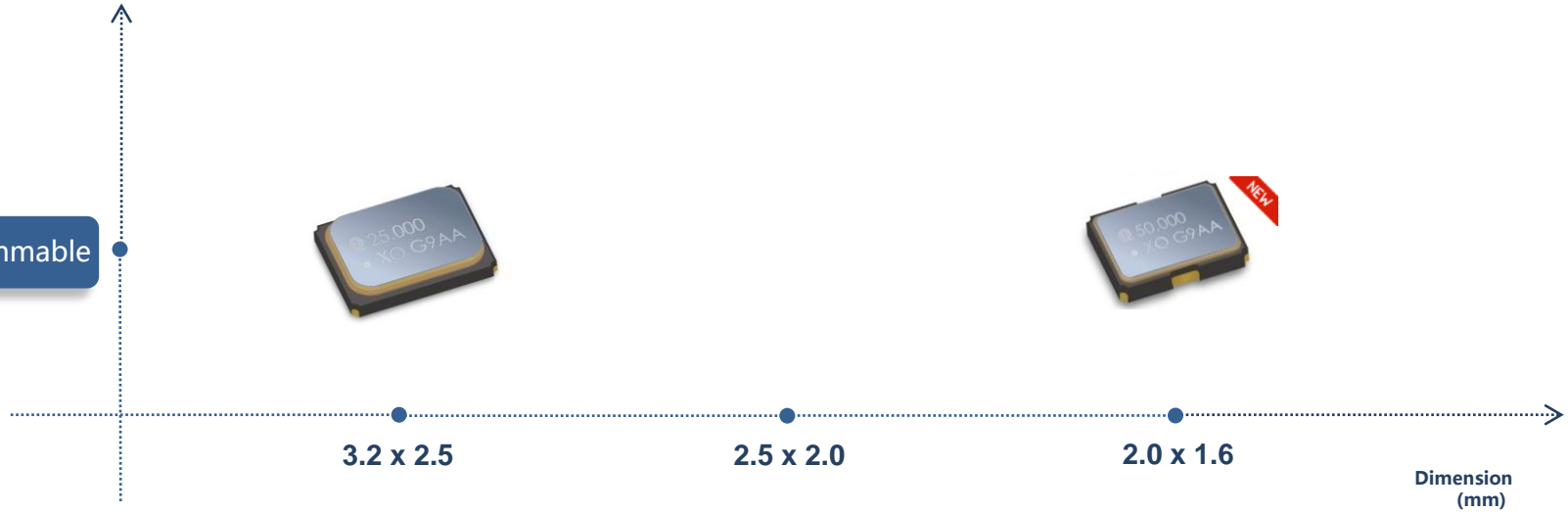


Quartz Crystal Oscillator



| Quartz Crystal Oscillator

Programmable





Quartz Crystal Resonator

AEC-Q200
Automotive

Interquip X'tal Product	THR Series	SMCM Series	SMAC Series	SMCE Series	32.768KHz Series
Package Size (L x W x H, mm)	1.6*1.2*0.4 2.0*1.6*0.8 2.5*2.0*1.0	2.0*1.6*0.7 3.2*2.5*0.8 5.0*3.2*1.1	7.0*5.0*1.2 10.0*4.5*1.4	1.2*1.0*0.3 1.6*1.2*0.4 2.0*1.6*0.5 2.5*2.0*0.6 3.2*2.5*0.8 5.0*3.2*0.8	1.6*1.0*0.5 2.0*1.2*0.6 3.2*1.5*0.9
Frequency Range	16MHz ~ 96MHz	6MHz ~ 54MHz	3.5MHz ~ 8MHz	6MHz ~ 156.25MHz	32.768KHz
Frequency Tol. @ 25°C	±10ppm	±10ppm, ±20ppm, ±30ppm	±20ppm, ±30ppm	±10ppm, ±20ppm	±20ppm
Load Capacitance	7pF, 9pF or specify	6pF, 10pF, 12pF, 18pF or specify	18pF or specify	6pF, 10pF, 18pF or specify	12.5pF or specify
Operating Temperature	-30°C ~ +85°C -40°C ~ +85°C	-20°C ~ +70°C -20°C ~ +85°C or specify	-20°C ~ +70°C -20°C ~ +85°C or specify	-20°C ~ +70°C -40°C ~ +85°C -40°C ~ +125°C or specify	-20°C ~ +70°C -40°C ~ +85°C
Features	Thermistor Crystal; Excellent temperature tracking	Self-developed material; Best cost-performance option	All ceramic SMD package Thinnest package for low frequency	Automotive-grade, conforms to AEC-Q200 (Optional) Ideal for ADAS, TPMS, NOA, IoV, BMS, NFC, BLE/WIFI 6, and Smart home etc.	Suitable for IoT and wearable devices

Applications



Consumer



Communication



Automotive



Security



Medical



Industrial



IC



Quartz Crystal Oscillator

**AEC-Q200
Automotive**

Interquip XO Product	VCXO Series	TCXO Series	SPXO	Programmable Series
Package Size (L x W x H, mm)	2.5*2.0*0.9 3.2*2.5*1.0	2.0*1.6*0.9 2.5*2.0*0.9 3.2*2.5*1.0	2.0*1.6*0.9 2.5*2.0*1.0 3.2*2.5*1.2 5.0*3.2*1.3 7.0*5.0*1.4	2.0*1.6*0.9 3.2*2.5*1.2
Output Wave	CMOS	Clipped Sine	CMOS, LVPECL, LVDS	CMOS
Frequency Range	2MHz ~ 66MHz	9.5MHz ~ 70MHz	32.768KHz, 1MHz ~ 200MHz	1MHz ~ 200MHz
Supply Voltage (Vdd)	2.8V, 3.3V	1.8V ~ 3.3V	1.0V ~ 3.3V, 1.0V ~ 5.0V, 2.5V ~ 3.3V	1.8V ~ 3.3V
Overall Freq. Stability	±25ppm, ±50ppm or specify	Frequency Stability vs. Operating Temp.: ±0.5ppm, ±1.0ppm, ±2.0ppm	±25ppm, ±30ppm, ±50ppm or specify	±25ppm, ±30ppm or specify
Operating Temperature	-20°C ~ +70°C -40°C ~ +85°C	-20°C ~ +70°C -40°C ~ +85°C	-20°C ~ +70°C -40°C ~ +85°C -40°C ~ +125°C	-20°C ~ +70°C -40°C ~ +85°C
Features	High reliability; Voltage Controlled Crystal Oscillators	Temperature Compensated ; Low phase noise: -130dBc/Hz Typ. ; Voltage Control applicable; Ideal for mobile phone baseband, IOV, UWB, GPS, FRS, Automatic meter reading etc.	Differential output ultra-low phase jitter version available; Automotive-grade (optional); Offer 32.768KHz, 125MHz, 156.25MHz, Ideal for 5G, SONET/SDH, FTTx, Netcom Terminal, Fiber channel, 10Gbit Ethernet	Programmable (Quick-Turn) High precision application; Short lead time and high flexibility

Applications



Consumer



Communication



Automotive



Security



Medical

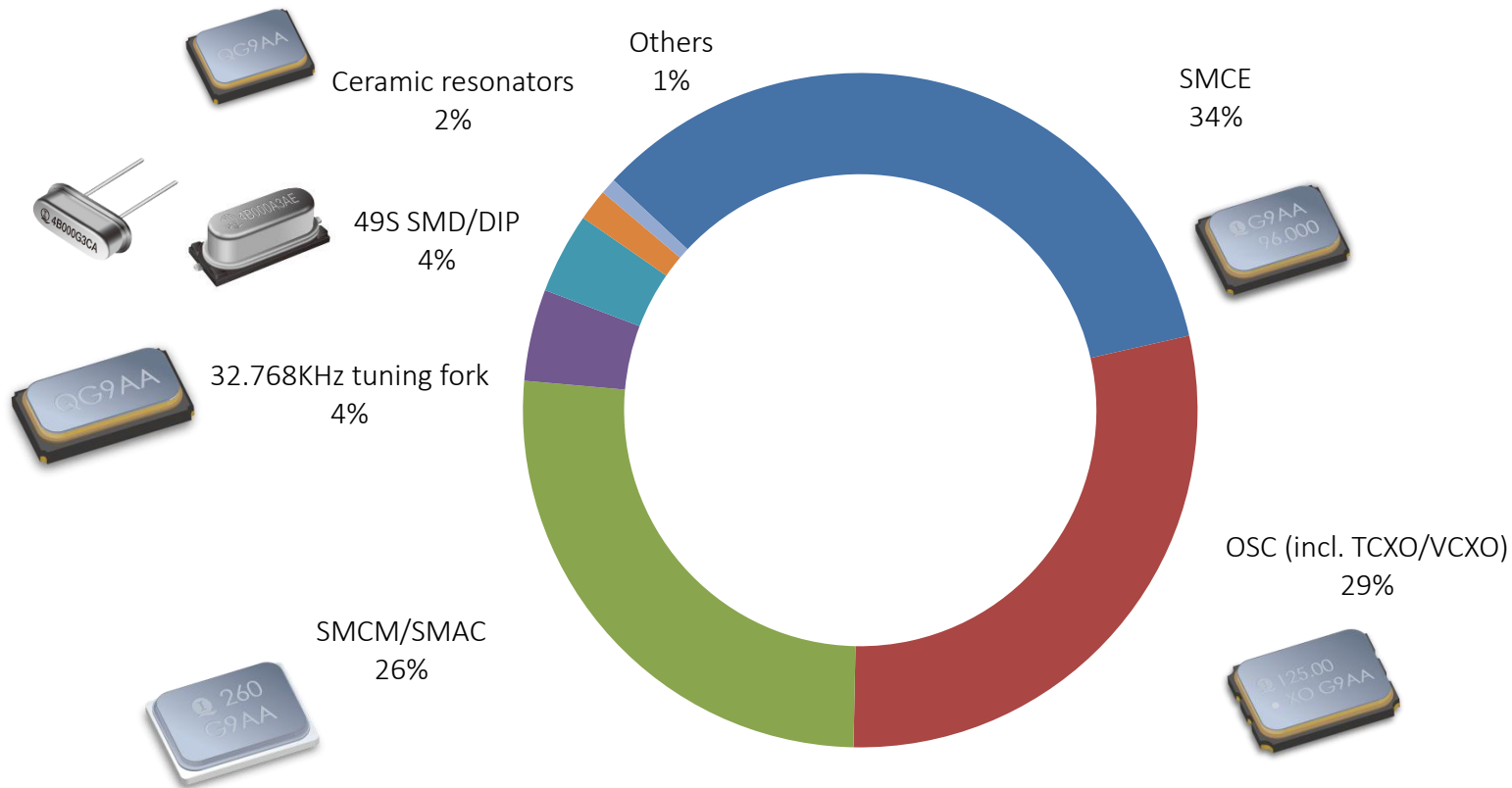


Industrial

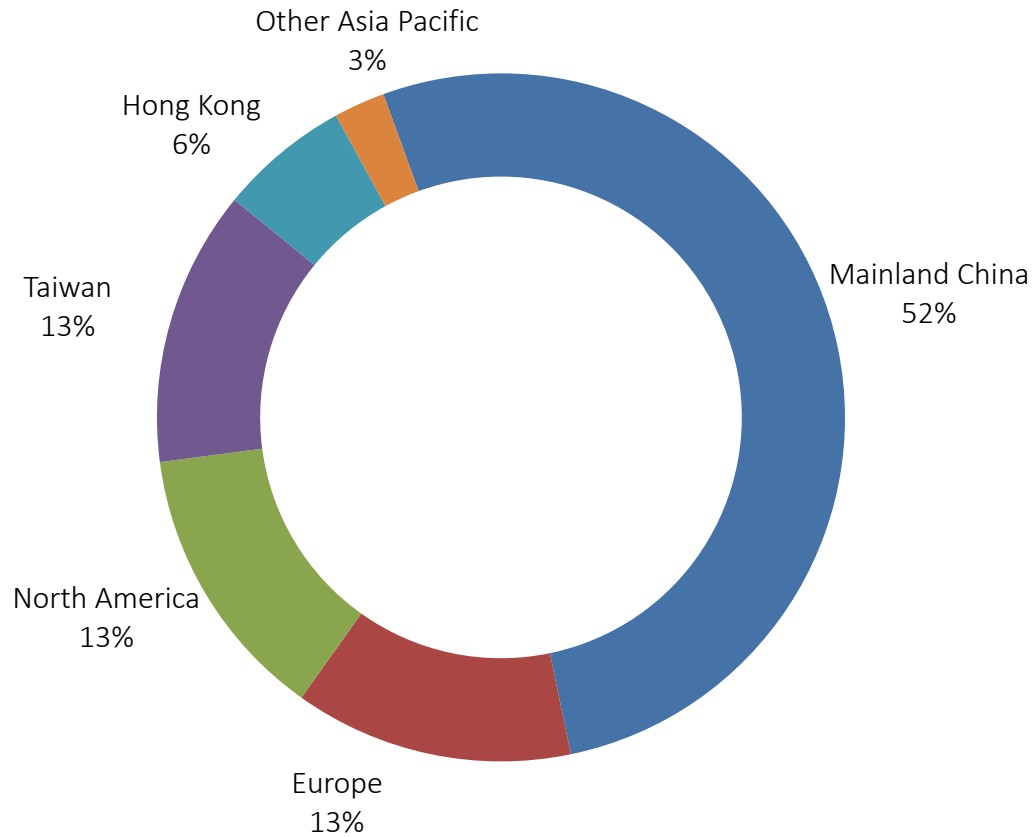


IC

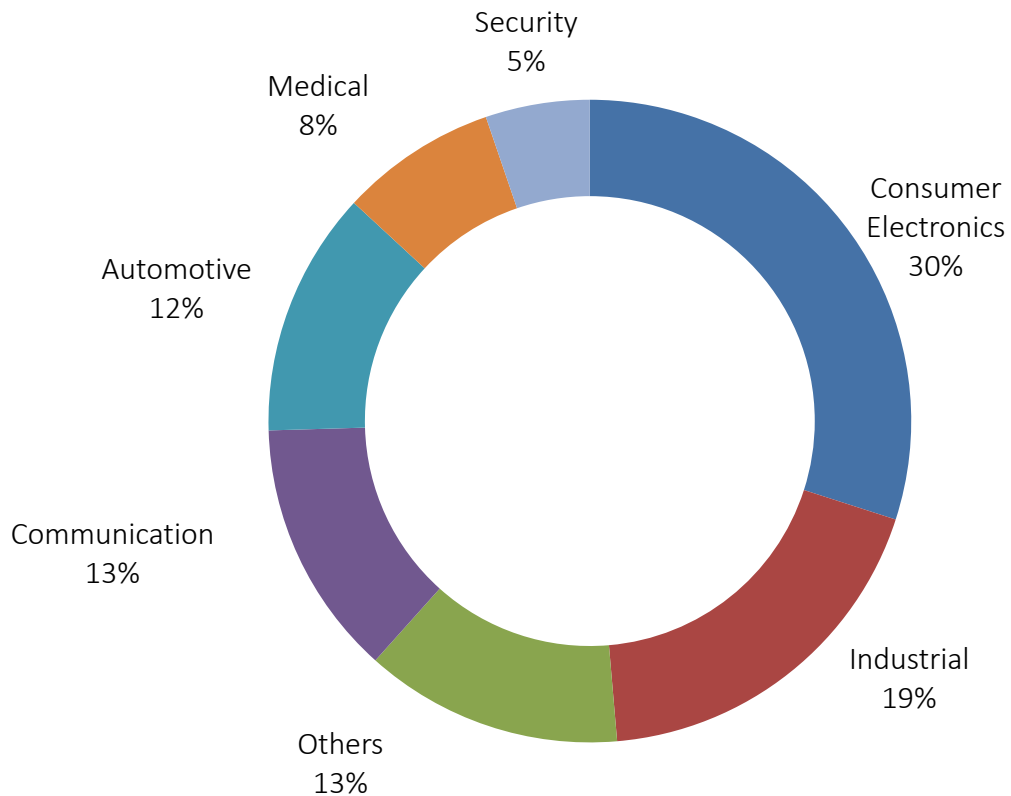
| Products Distribution



| Geographical Distribution



| Application Distribution





AGENDA

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Company Introduction

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Product Series & Market Analysis

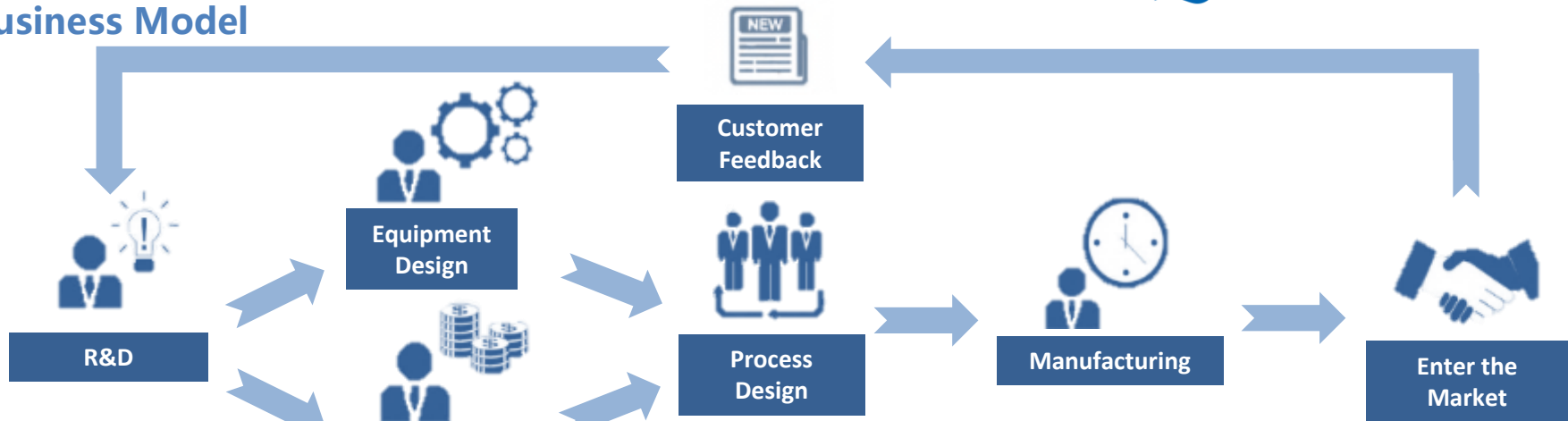
3

Management System

4

Future Development

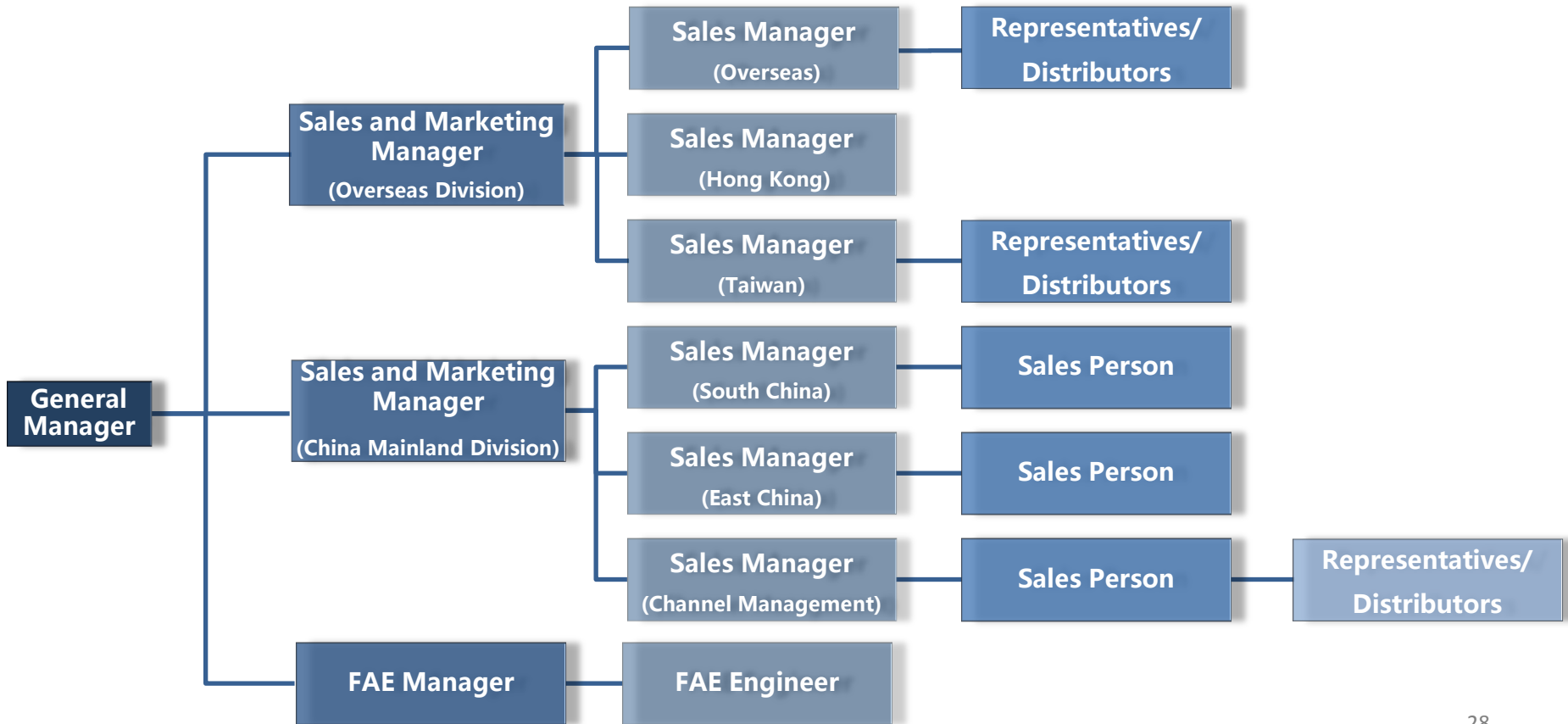
| Business Model



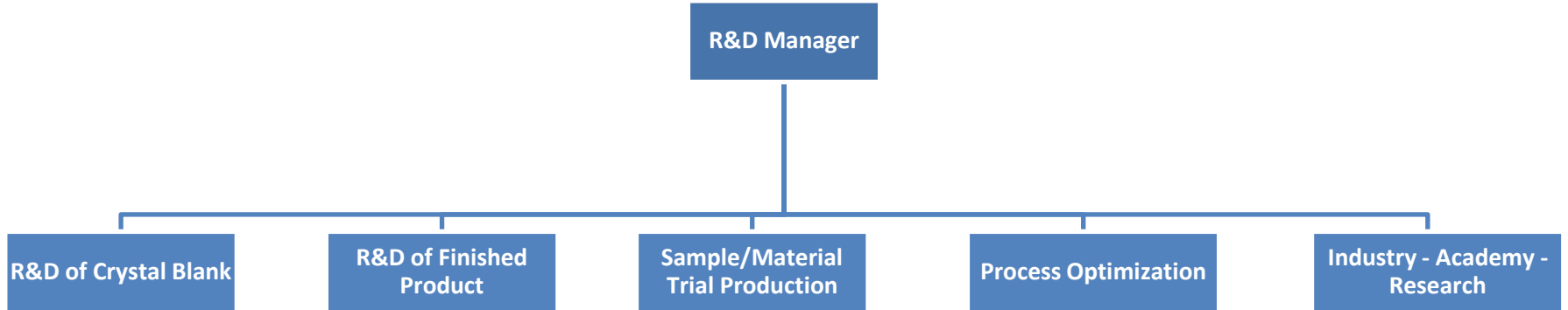
Vertical Integrated Business Model
Increases the operation efficiency and ensure the product quality simultaneously



| Sales and Marketing Center



| R&D Center



| Technical Services



Match Test

Offer matching services for circuits and crystals, saving time for clients to choose a frequency components



Technical Support

Provide technical support and new product training for clients



Design-in

Plan in advance and get crystals and oscillators approved by chip platforms

| R&D Advantages

- Develop high-precision (<+/-10ppm), ultra-miniature (1210, 1008 package), and high reliability (conform to AEC-Q200) crystal products
- Professional R&D team, customized specifications can be fulfilled
- **Professional FAE team, quickly provide matching services for circuits and crystals**

**New Product
Development
Dept.**

**New Material
Development
Dept.**

- Innovative materials, as one of the rare companies with independent packaging materials
- **Independent R&D of key materials, stable delivery, breaking the monopoly of Japanese material suppliers**
- The first to introduce Epoxy SMD package products

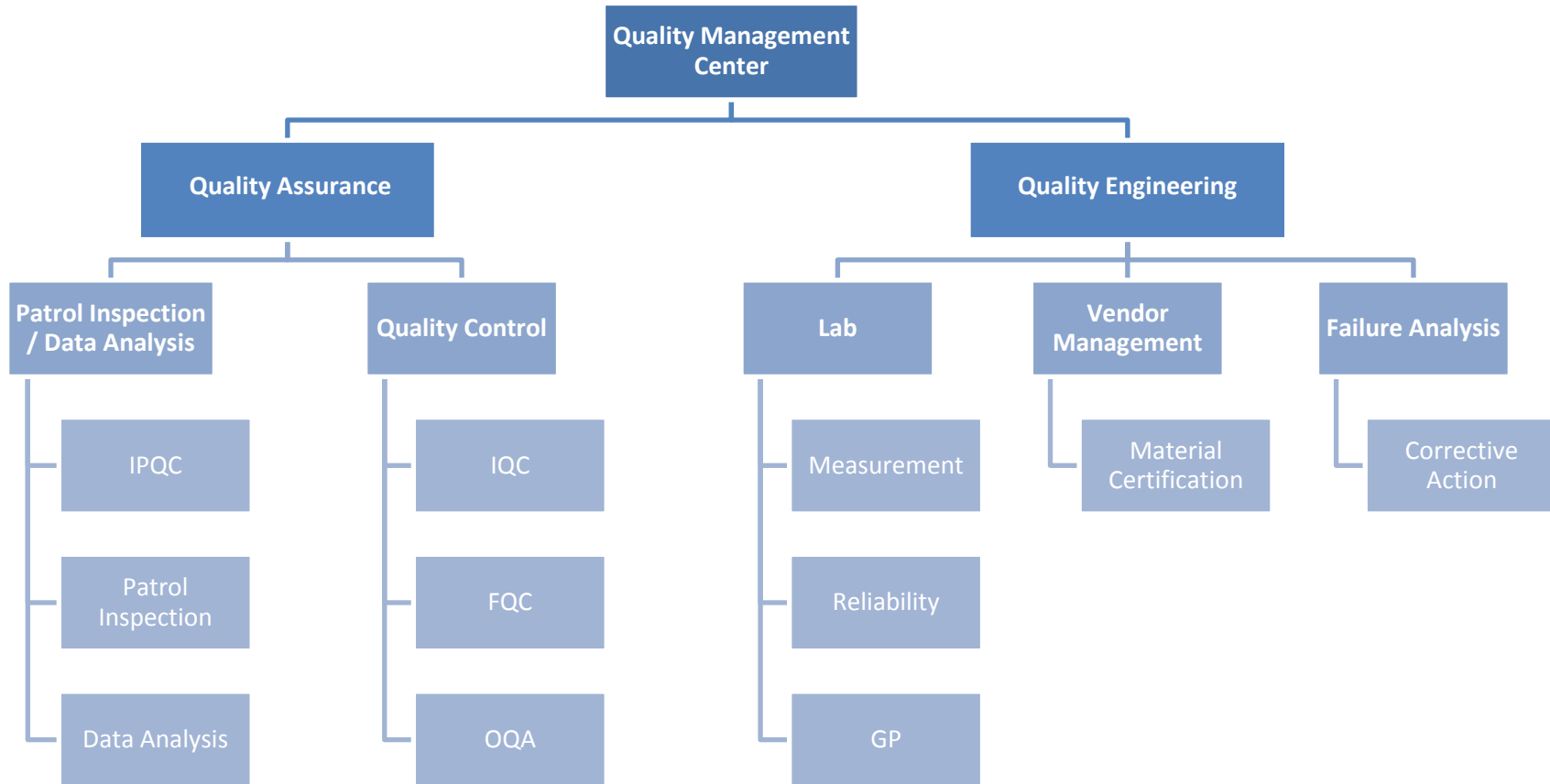
- Cooperate with universities on R&D projects related to new processes and new products, using the school's more advanced technical conditions to break the bottleneck of traditional processing technology, to upgrade the processing technology
- Conduct feasibility technical solution study for the development of high-frequency new products

**Industry -
Academy -
Research**

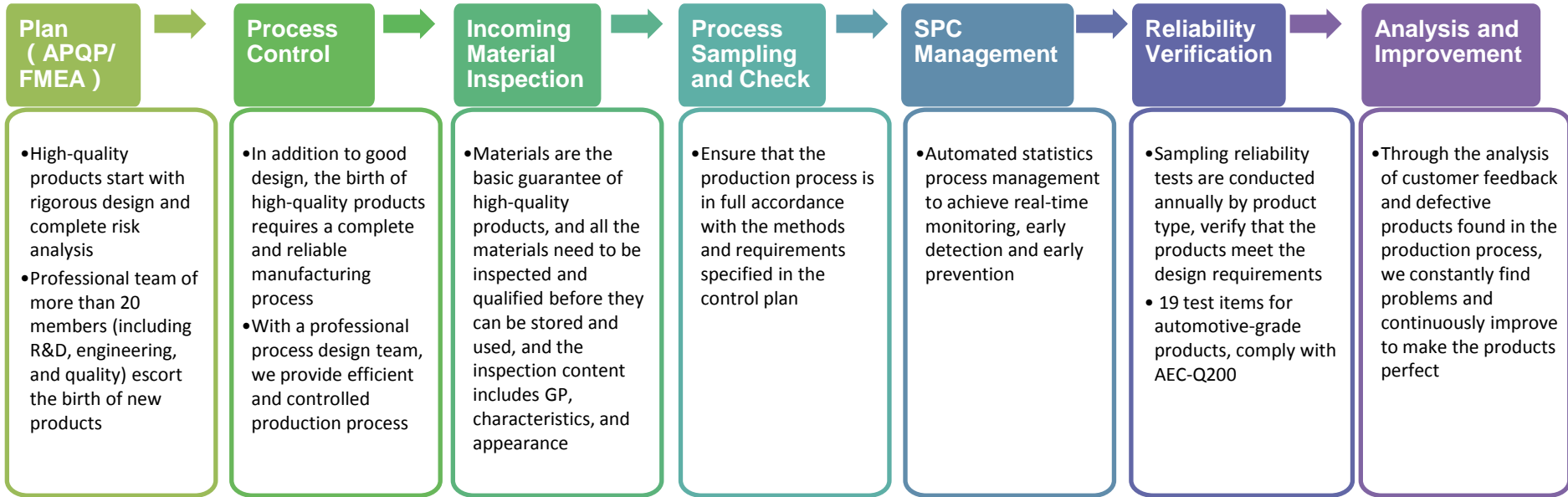
**Material
Laboratory**

- In-depth analysis of existing materials to improve performance
- Provide circuit matching and testing services for customers
- **Self-control materials to reduce cost, control the qualified rate of incoming materials**

Quality Management Center



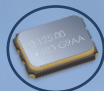
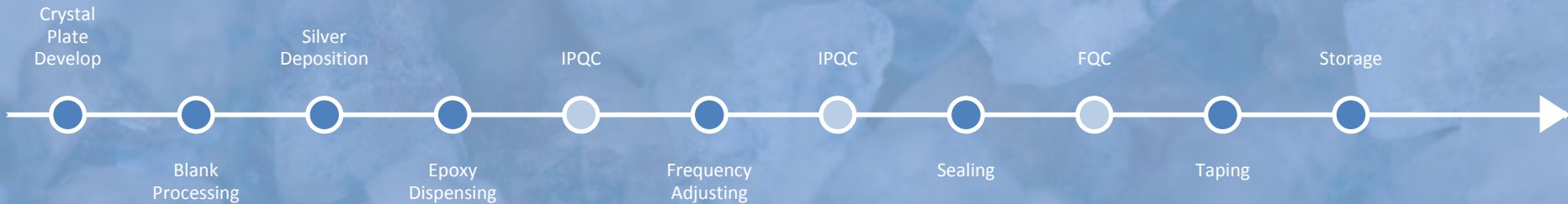
| Quality Control



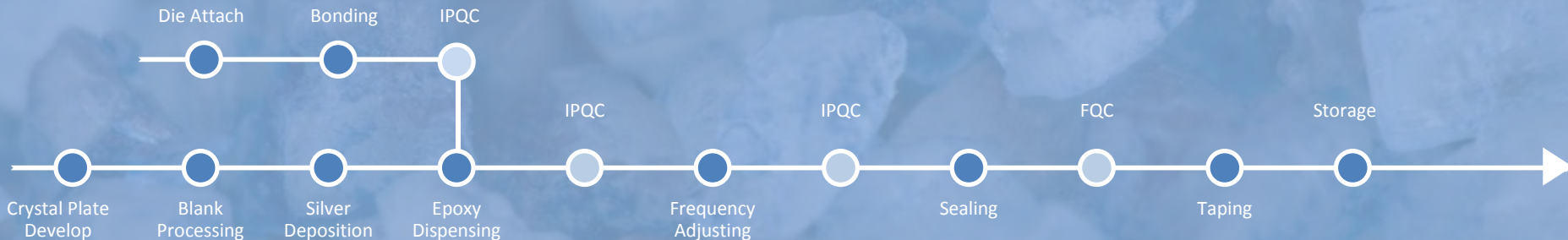
| Manufacturing Process and Quality Control



Crystal resonator manufacturing process



Crystal oscillator manufacturing process



| Test Equipment: Products QA



X-ray film thickness tester
Function:
Film thickness test



Crystal blank angle sorting machine
Function: Blank angle sort



Crystal blank shape tester
Function:
Blank dimension measuring



Programmable temperature and humidity chamber
Function: Reliability test



Vibration test chamber
Function:
Reliability test



Vibration test chamber
Function:
Crystal resonator test



XRF Spectrometer
Function:
ROHS material test



Optical meter
Function:
Length, curvature, area. Accuracy: $\pm 5\mu\text{m}$

| Test Equipment: Customer Service



Network analyzer
Function: Frequency and resistance test



3D electronics microscope
Function: Magnification rate :1200 times, Accuracy: 0.005mm



Pi-network crystal test system
Function: Frequency, DLD and resistance test



Resonance tester
Function: Crystal resonator test



Automated crystal oscillator test machine
Function: Crystal resonator test



Digital oscilloscope
Function : Waveform test



Stabilized voltage supplier
Function : Provide DC voltage



AGENDA

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Product Series & Market Analysis

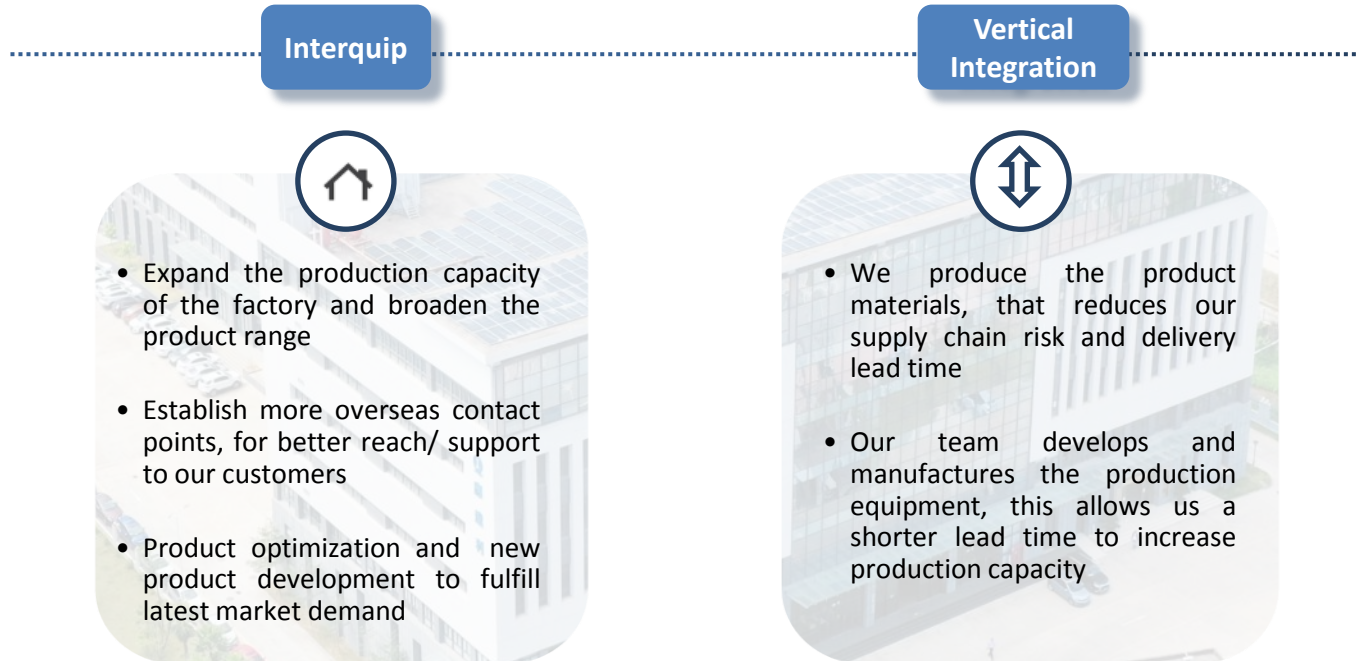
3

Management System

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Future Development

| Future Development – Corporation



| Future Development - Product

Product Portfolio



- We have the most up-to-date product portfolio of all crystal companies in China
- Interquip constantly gathers market intelligence from customers and electronics industry to develop products to meet market demand

Resonator



- Extend the application market of Epoxy sealed products
- Extend the supported frequencies of SMCM-3225 and SMCM-2016
- Small package (1612, 1210, 1008, SMCE) to meet the 5G, medical and automotive market
- Improve the production process of THR 2016 and manage the project of THR 1612

Oscillator



- Extend product lines of differential output oscillators, especially ultra-low phase noise LVPECL/LVDS output
- 1612 XO in development
- TCXO-1612 and VCXO-2016 in development



THANK YOU



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www.interquip-china.com
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Scan to check our website!