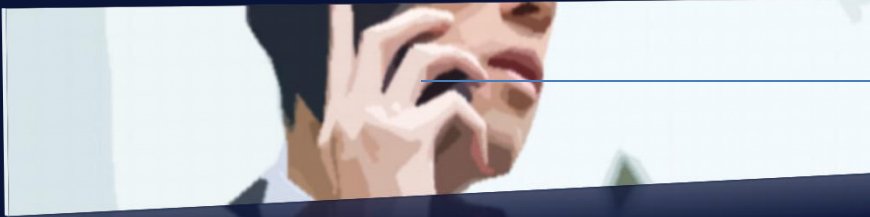


“Smart Crystal” facilitate the future evolution





smartphone (GPS, RF)

Smaller, Thinner,
Higher precision

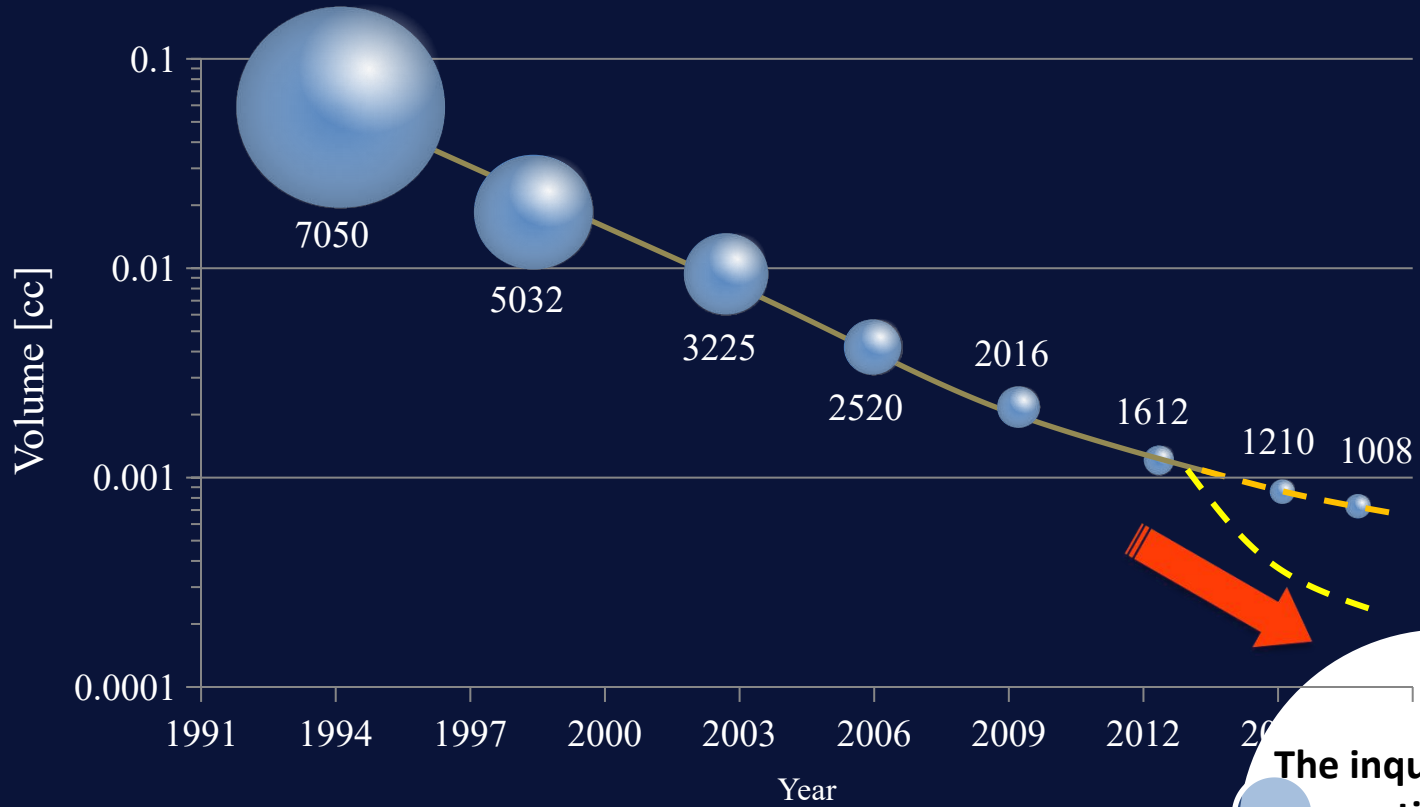
car (ADAS : V2X, microwave, etc.)

Great reliability, Robustness against high temperature



wireless (IoT: WiFi, sensor)

High frequency Fast start



The inquiry for next generation is smaller and thinner



DSX Series (Resonators)
DST Series (Tuning Fork)
DSO/V Series (SP, VCXO)
DSA/B Series (TCXO)



New Solution

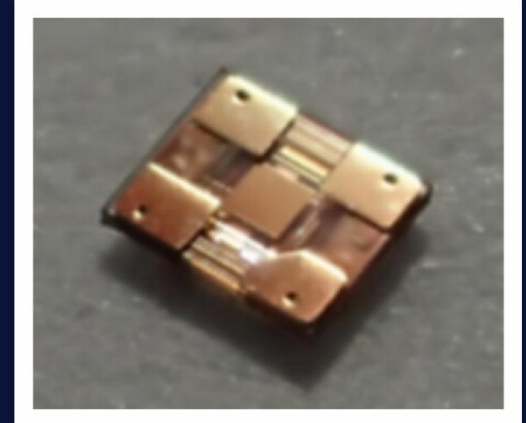
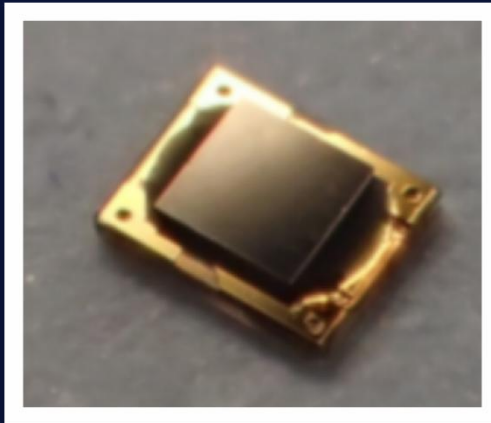
DXシリーズ (Resonators)
DSシリーズ (SPXO)
DA/Bシリーズ (TCXO)

Arch. 3G



Feature of Structure

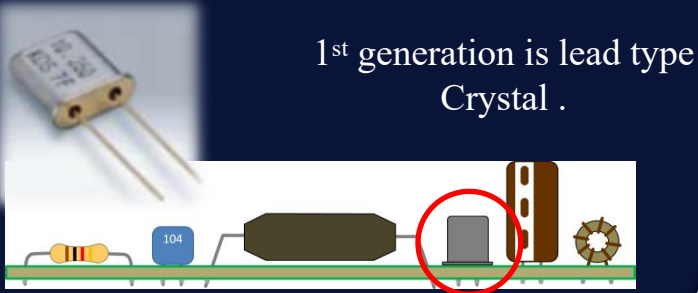
- ❑ No conventional ceramic package
- ❑ No organic type conductive adhesive
- ❑ Three-layered quartz structure
- ❑ Hermetic sealed package by Au metal bonding
- ❑ Flexible design for External electrode



Arch. 3G

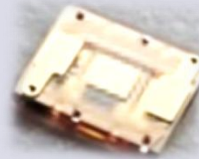
Changes in packaging technology

1G : Lead type



3G : Embedded type

3rd generation is embedded Crystal in IC package.

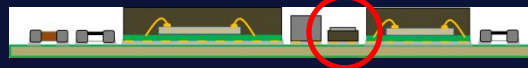


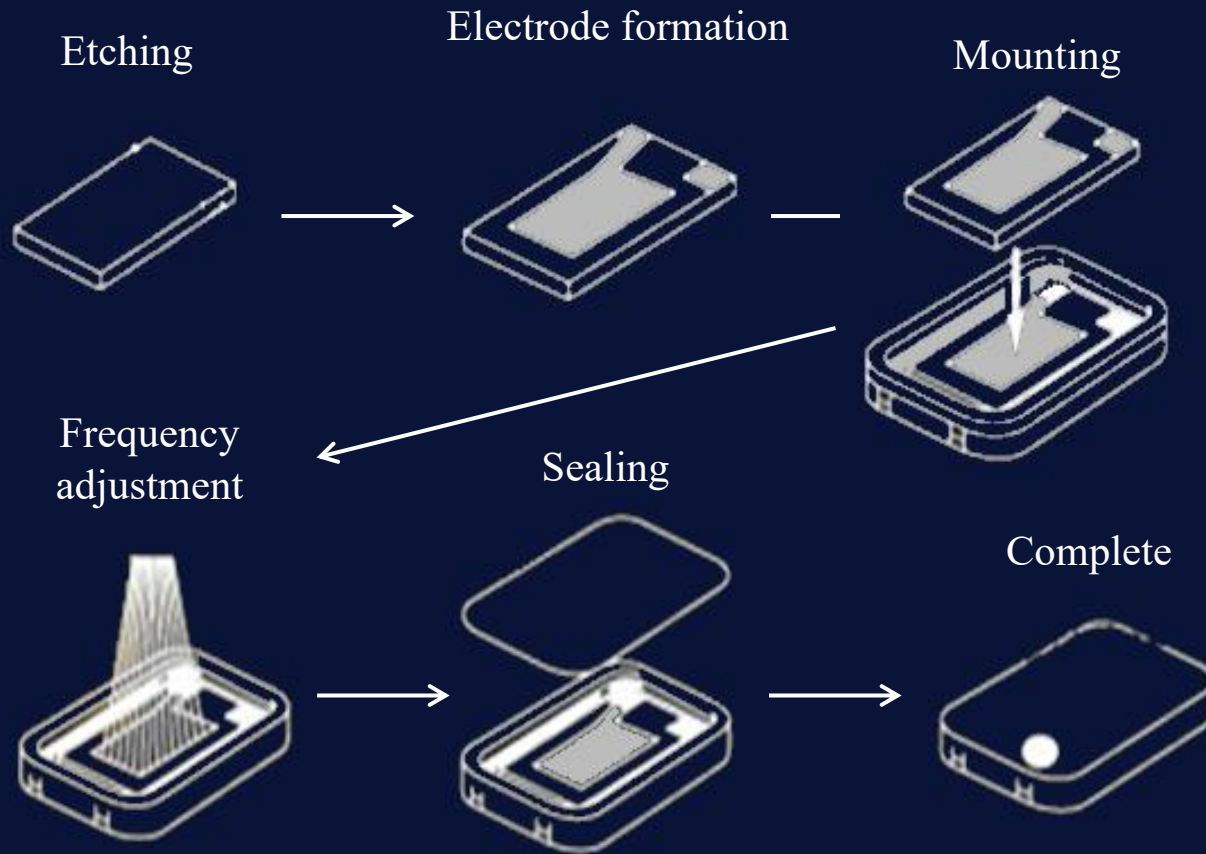
Arch. 3G



2G : SMD

2nd generation is surface mounted type Crystal.

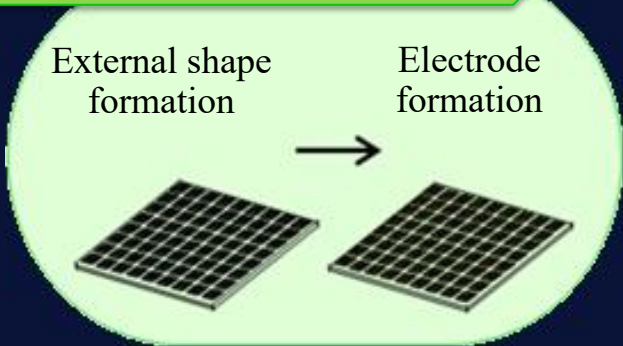






Arch. 3G

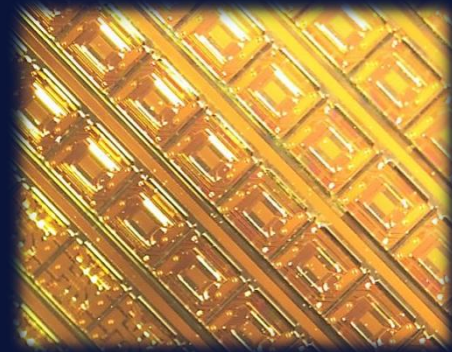
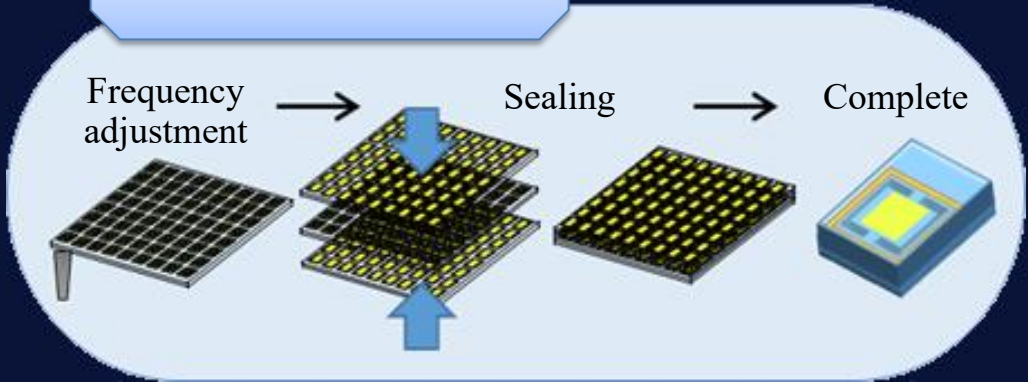
Photolithography process

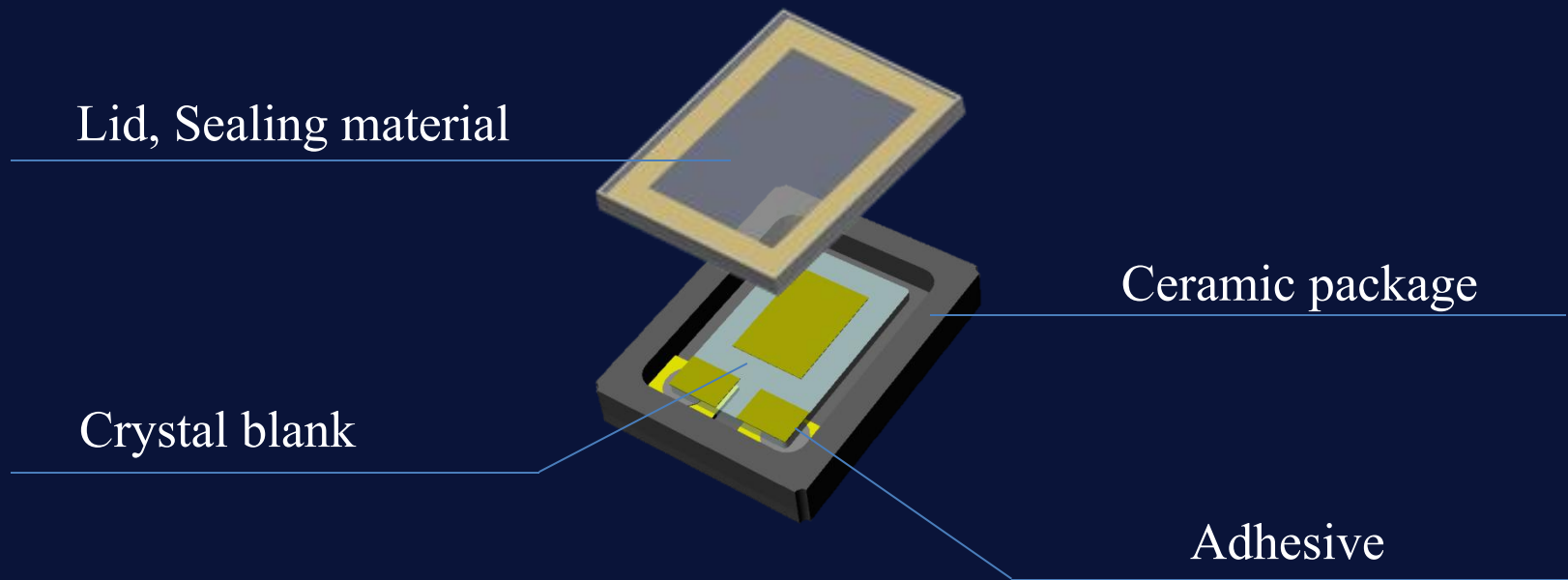


- Fully automatic assembly
- Assembly process in vacuum
- Wafer Level Package

“ Zero ” defect Quality
High Frequency Support

Process in vacuum

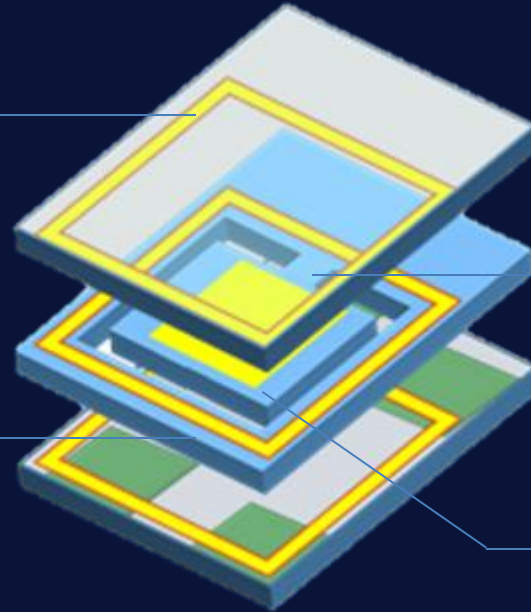




- ❑ the smaller the product the more difficult it is to secure margins for application accuracy of a conductive adhesive and mounting position
- ❑ Even with the conventional structure, it is possible to be smaller and thinner by thinning the package and the lid, but strength and hermeticity reliability are lowered and assembly becomes difficult.



Fine Seal tech.



monoclamp tech.

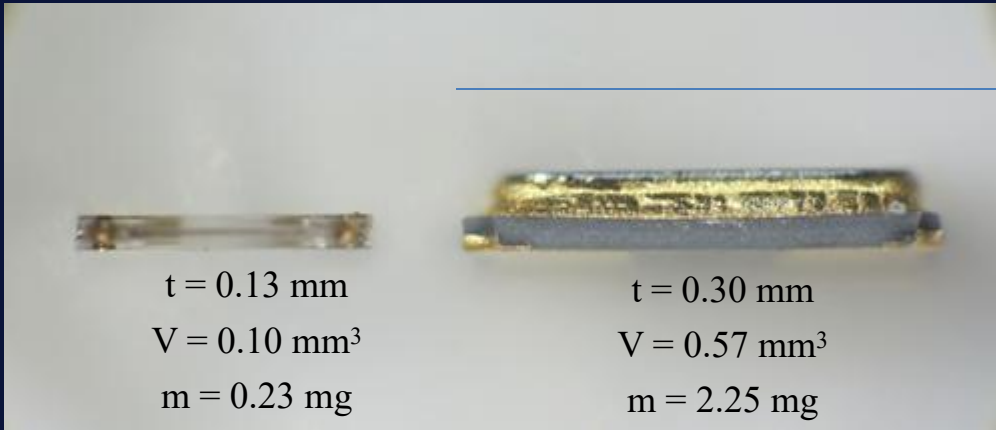
Q-monolith

μ - cavity tech.

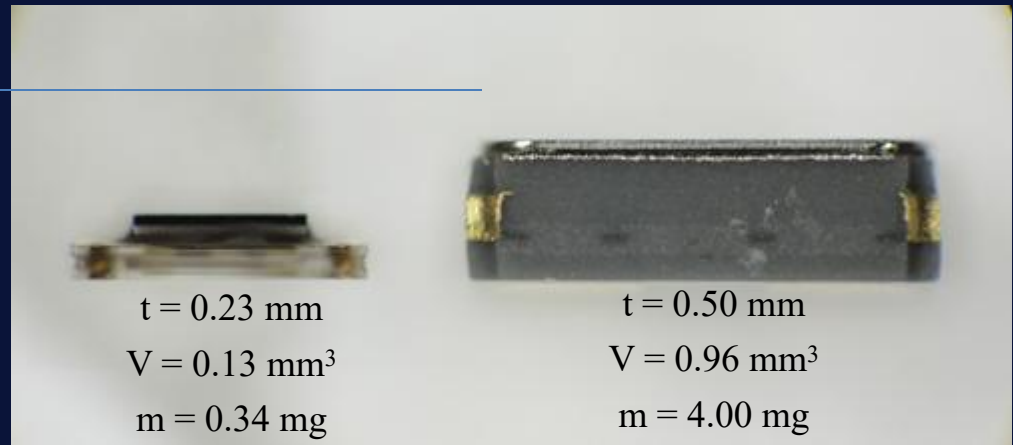
- ❑ The structure of the crystal resonator is composed of only three layer crystal wafers and metal thin films.
- ❑ Realization of the world' s thinnest



Crystal Resonators



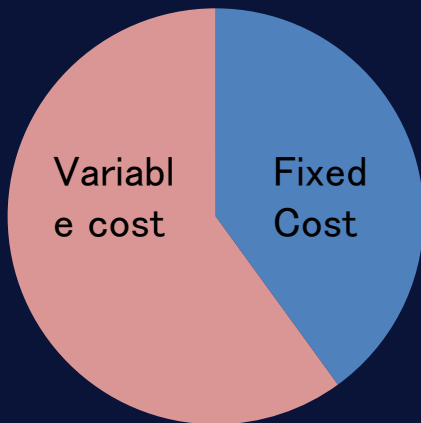
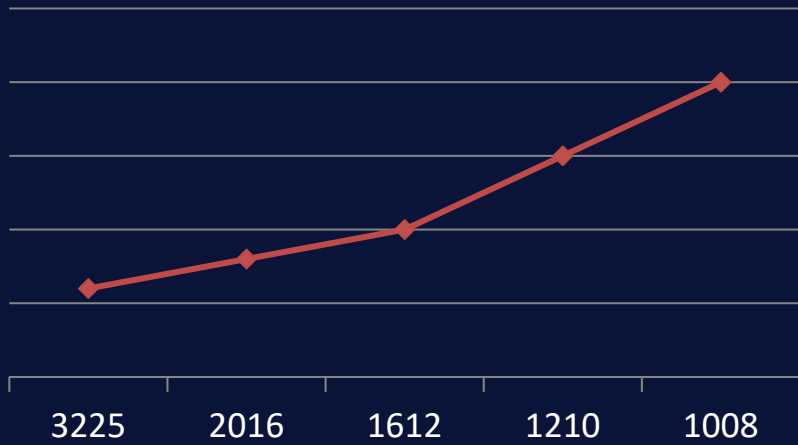
Crystal Oscillators



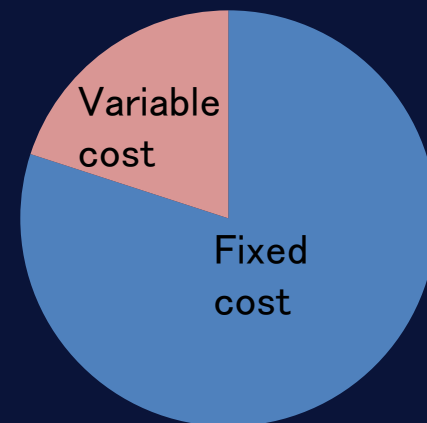
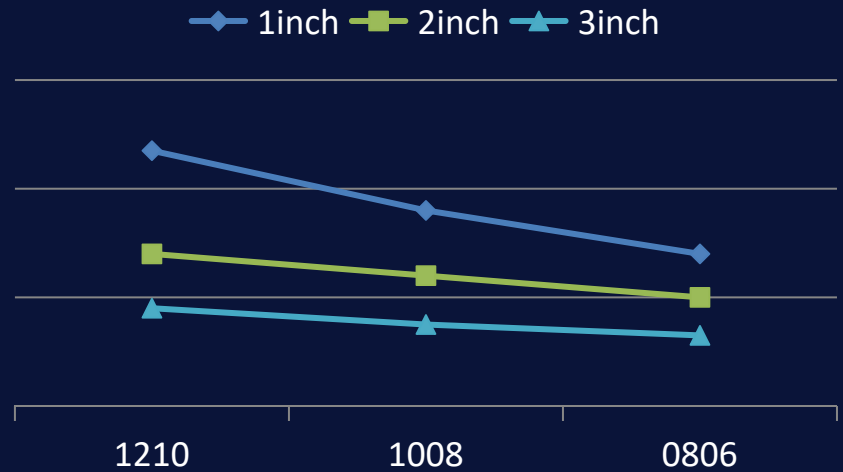
		Types	Size (typ)	Height (typ)	Frequency range
Resonators	Arch.3G	DX1008J	1.0 × 0.8mm	0.13mm	100MHz
		DX0806J	0.8 × 0.6mm	0.13mm	100MHz
	Conventional	DSX1612SL	1.6 × 1.2mm	0.30mm	52MHz
SPXO	Arch.3G	DS1008J	1.0 × 0.8mm	0.23mm	100MHz
	Conventional	DSO1612AR	1.6 × 1.2mm	0.5mm	80MHz
TCXO	Arch.3G	DB1008J	1.0 × 0.8mm	0.23mm	
	Conventional	DSB1612SDN	1.6 × 1.2mm	0.49mm	52MHz



【Conventional】



【Arch.3G】

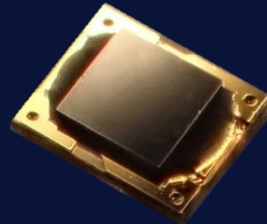




Quality

Automotive application like ADAS

KDS



Arch. 3G

High
Frequency

WiFi and Network application
required higher frequency

Thinness

Embedding in SiP module and
IC packages

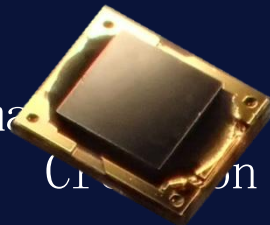


Quality

Automotive application like ADAS

KDS

Image and
Circulation



Arch. 3G

High
Frequency

WiFi and Network application
required higher frequency

Thinness

Embedding in SiP module and
IC packages