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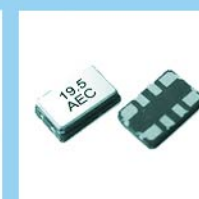
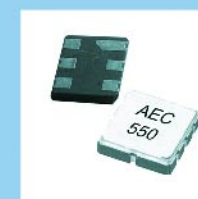
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AEC Electronics Company Limited

AEC

Company Introduction



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AEC Electronics Company Limited

(1) About AEC

AEC Electronics Company Limited (formerly named) Abundance Enterprise Company (AEC) was found in 1988 as a manufacturer and exporter of frequency control products. Headquartered in Hong Kong and with manufacturing facilities in Mainland China, AEC produces a wide range of frequency control components which are covering the requirements of four main electronics products categories in the recent market to satisfy the users needs all around the world. AEC is the abbreviation of our company, which is also our brand registered in Hong Kong. We use this brand to build up harmonic business relationships with our global customers.



P.2

Introduction and Application of 4 Major Categories Products

Due to the difference of materials, production processes, frequencies control ranges and functions, our frequency control components are divided into four major categories as follow:

- **Crystal Frequency Control Components**

Made of Quartz Crystal series

- **Ceramic Frequency Control Components**

Made of chemicals. Its production process is similar to other ceramic product production process

- **S.A.W. Frequency Control Components**

Work with the Surface Acoustic Wave Theory

- **Dielectric Frequency Control Components**

Made of Dielectric materials

Nowadays, these four main categories products are widely used in many typical applications:

Telecom, Information Technology

(e.g. Mobile Phone, wireless Station, Computer Products and blue-tooth devices)

Consumer AV products

(e.g. Television, DVD audio, Video Cam and Camera)

Safety, burglarproof and Security Products

(e.g. Security Monitors, Smoke Detectors, Automobile Security Devices and Fingerprint Recognition System)

High-Tech Military Equipment

GPS



Undoubtedly our frequency control components play an important role in this electronic era.

P.3

Productivity and Structure

We have three joint-venture plants in Mainland China with total area of 23,000-meter squares. Among 2,000 numbers of staff, more than 300 are engineering technicians. The factories involve more than 500 categories or part numbers of products. The monthly production volume of our factories for all kinds of frequency control components is more than 50 millions. With the aid of such strong supplying power, we assured that we could meet the requirement of customers from everywhere.



Technical Support and After Sales Service

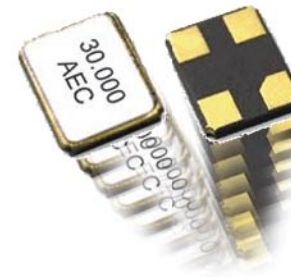
Caring about customers' developments and benefits are the continuous oriented idea of our company. This is the reason we always take the supporting and the technical interaction with our clients into main consideration. Our company shows the passion of business as follow:

- Provide suggestions, design adjustment solutions and technical co-operations when our customers proposing a new project.
- Treasure any suggestions by customer on our production techniques and design optimization to improve ourselves to satisfy the market
- Provide extra technical support once our customers have any specific requirements.
- Attach application instructions like soldering and reflow soldering guidance to any new user. This can prevent any problems during their application
- Explore with our customers, provide professional advices and do the best after sales service even if they are new to us.



Continuous Market-oriented Product Development

Because of the recent evolution of science technology, new products are exposed and promoted on the market continuously. This leads to the new trend of developing multi-functional products and smaller package size. As a result of these trends, we keep on new products development to fulfill the market demand. For example,



Crystal Frequency Control components

From 7050 series → 6035 series → 5032 series
→ 3225 series → 2016 series

S.A.W Frequency Control components

From 5.0x5.0 series → 5.0x3.5 series → 3.8x3.8 series → 3.0x3.0 series
→ 1.8x1.4 series → 1.4x1.1 → 1.1x0.9 series

Ceramic Frequency Control component

From 7.1x3.4 series → 4.7x4.1 series → 4.5x2.5 series
→ 3.7x3.1 series → 3.2x1.5 series → 2.5x2.0 series



By the efforts on widening the range of product functions and achieving the balance between high product quality and low cost, we can keep on developing more new products to catch up needs in current and future market.

Company Philosophy and Core Competitiveness

- Obey game rules of marketing. Keeping promise is a rule of thumb that we always stand for and never been ruined.
- Gain the customers' trust, highly focus and core on our quality of products. These are our targets from the very beginning
- Care about customers' development status and benefit from project management, technical support to after sales service. Providing suitable support and satisfying customer are our self-achievement and pleasure.
- Develop together with customer by close relationship interaction during the co-operation is our win-win target.

We insist on our core philosophy. The enhancement of our enterprise team culture is still ongoing: keep our promise, maintain our policy strictly, promote creativity and continuous learning, boost our team spirit and care among our staffs. This culture has directed us to the further development. Both of our "soft" and "hard" abilities are our concern to fulfill the needs under this new era. Our principle, special enterprise culture and the spectacular product displayed are the essential elements that built up AEC's brand and brought success to our business and market.

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(2) AEC Product







Crystal Components

- Cover all holder types (Dip and SMD types) on industry standard
- Frequency range from 1MHz to 160MHz in fundamental mode and overtone mode

Typical Applications:

- AV equipment,
- Radio Communication,
- Microprocessor system
- Consumer product
- Mobile Phone
- Remote control,
- Instrumentation,
- watch and clock,
- Set-top box,
- Cable modem,
- GPS, etc.
- Bluetooth Device
- Satellite System

Crystal Resonator (Dip Type)

| | | |
|---|---|---|
|  |  |  |
| AT309 | DT-38/ 26 | KT-308/206 |
|  |  |  |
| HC-49U | HC-49S | UM-1 |






Crystal Resonator (SMD Type)

| | | |
|---|---|---|
|  |  |  |
| HC-49S-SMD | SX-7050(2) | SX-5032(4) |
|  |  |  |
| SX-3225(4) | SX-2520(4) | SX2016 |

Crystal Oscillator

| | | |
|---|---|---|
|  |  |  |
| SO3225 | SO2520 | SO2016 |

VCXO, TCXO, OCXO

| | | |
|---|---|---|
|  |  |  |
| TC7050 | TCXO(DIP-DH) | VCXO(DIP-8) |
|  |  |  |
| VC7050 | VCXO(DIP14) | OCXO(DIP) |

P.7

Ceramic Components

- Including Ceramic Resonators and Filters.
- Provide Dip types and SMD types
- Low cost
- Selection for build in capacitor
- Wide range of band width

Typical Applications:

- Telecommunication
- Consumer Electronics
- Home Appliance

S.A.W. Components

- Including S.A.W. Resonators and Filters.
- Low insertion loss
- High load Q
- High frequency Stability

Typical Applications:

- Security system
- Satellite program receiver
- RF modulator,
- Wireless Remote-control
- Consumer electronics.




Ceramic Resonator

| | | |
|---|---|--|
|  |  |  |
| ZTTCP MG | ZTAWS MG | ZTT MX |
|  |  |  |
| ZTA CS/CV MT | ZTTCE | ZTTCW MX |

Ceramic Filter

| | | |
|---|---|--|
|  |  |  |
| LTC455_W | LT10.7M | LTS MCB |
|  |  |  |
| LTCA/CV10.7M | LTC455_U | LTCS |

S.A.W Resonator

| | | |
|---|---|--|
|  |  |  |
| TO-39 | F-11 | SMD Series (One Port) |

S.A.W Filter

| | | |
|---|---|--|
|  |  |  |
| QCC8C | QCC4A | DCC6C |



Dielectric Components

- Including Dielectric Resonators, Filters and Antenna
- Higher dielectric constant
- High quality factor
- Low temperature coefficient
- High attenuation
- Wide frequency range
- High gain
- Small package





Typical Application:

- Mobile phone
- GPS,
- Mobile station
- Bluetooth,
- Wireless LAN

Dielectric Resonator

| | |
|---|---|
|  |  |
| Round Type | Square Type |

Dielectric Filter

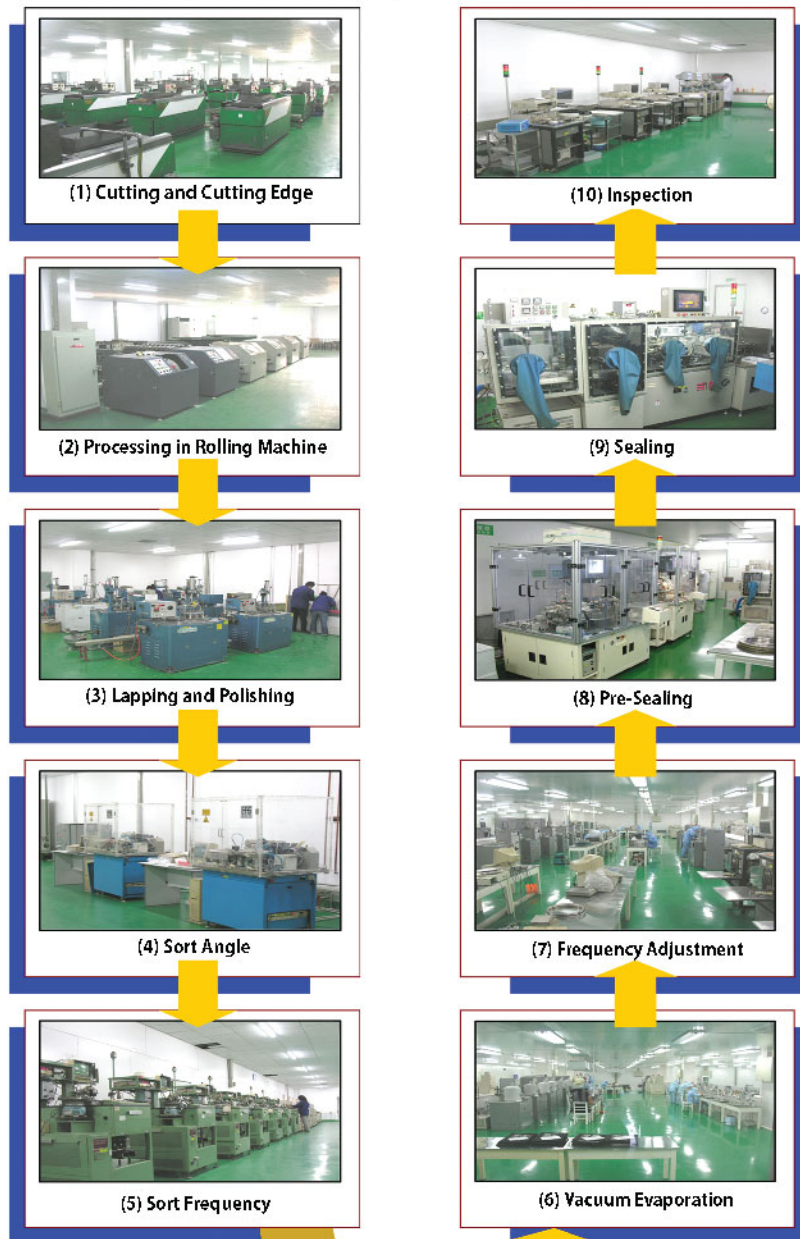
| | |
|---|---|
|  |  |
| Filter for Cordless phone | Filter for Wireless Communication |
|  |  |
| Filter for GPS | Multi Layer Filter |

Dielectric Antenna

| | |
|---|---|
|  |  |
| Dielectric Antenna for GPS | Dielectric Antenna for Communication |

(3) Production Process

For your understanding of the production ability and products quality of our company, please find our brief Production Process of crystal components:



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(4) Products Development History

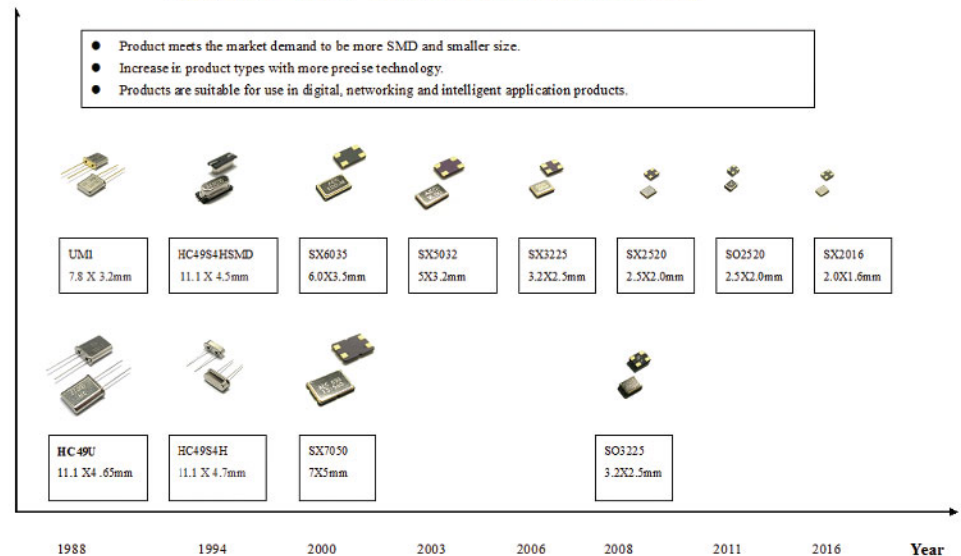
We started our business about Piezo-Crystal components in 1988.

For three years, AEC introduced the new production lines and technique to upgrade the production capability and product quantity. In 1998, the production technique goes to the direction of SMD and smaller size with full upgrade and development. After several years, the new product technique and new product types are developed to suit the market needs and become popular products.

- Crystal Resonator smaller size development from 7050(7x5x1.3mm) to current 2016(2.0x1.6x0.5mm) and 1612(1.6X1.2X0.35mm) new product
- Ceramic Resonator from Dip type to SMD type with the size from 7.4X3.4x1.8mm develops to current 2.5X2.0x1.1mm size.
- SAW components develop from Dip type to SMD type from 5X5X1.35mm to current size 1.8x1.4mmX0.65 (tiny size)

The product application ranges from household applicant, computer and accessories, office equipment, business equipment and instruments, wireless communication product, security system, car navigation, medical equipment, satellite communication equivalent to cover full range of application. Currently, we are continuously developing new product types to meet market needs such as three system (Beidou-Compass /GPS/GLONASS) combined GPS filter, infra Red sensors and etc available in the market. AEC is continuously developing the new technology to go with the market.

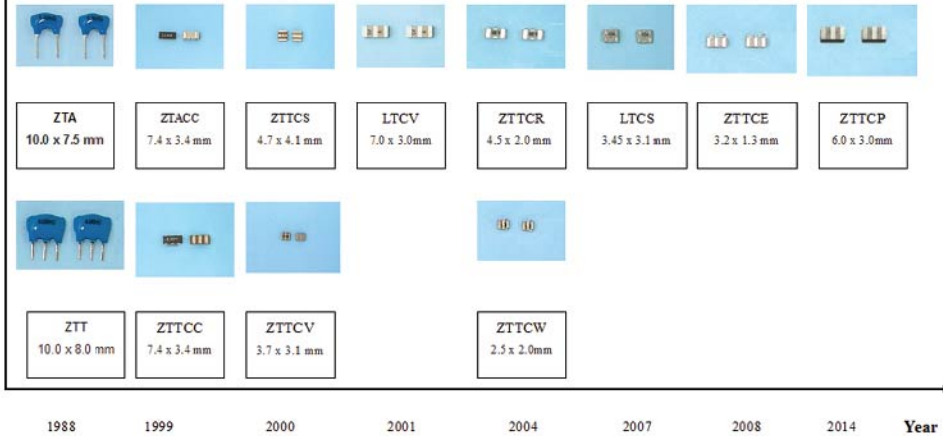
Crystal Resonator and Filter Development History



P.11

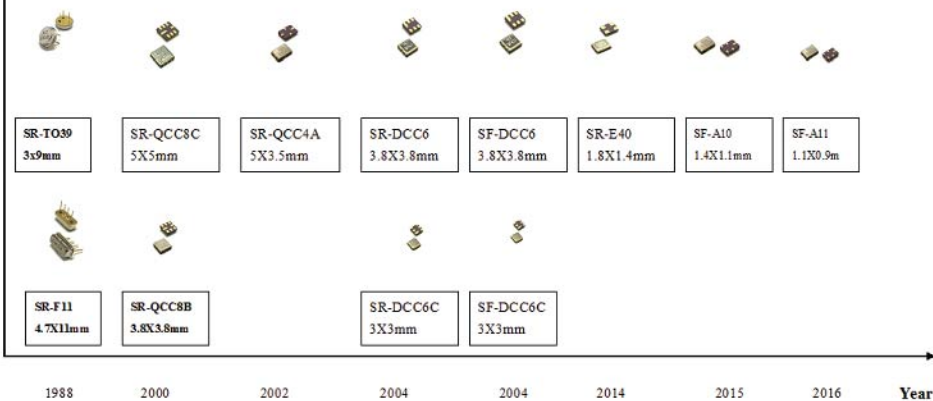
Ceramic Resonator and Filter Development History

- Products develop from dip type to SMD and to be smaller size.
- Increase in product types development with more precise technology.
- From type to function, products are suitable for replacement of other brand name products.



SAW Resonator(SR) and Filter (SF)Development History

- Products develop to be smaller size and more precise.
- Increase in product type development each year.
- High Frequency, high precision, multi function products are suitable for meeting the requirement of communication equipment.



(5) Typical Application

GPS System

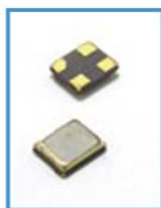
Security System



Car Security

Energy Meter

(6) Hot Product



Crystal Resonator SX2520

| | |
|-----------------|------------------------------|
| Frequency Range | 16.0 - 50.0 MHz |
| Applications | Cell Phone, Dect Phone, etc. |

Crystal Resonator SX3225(4)SMD

| | |
|-----------------|---|
| Frequency Range | 12.00-48.00MHz |
| Applications | Bluetooth Headset, Bluetooth Handfree, Bluetooth IC CSR, etc. |



Crystal Oscillator SO2520(4)SMD

| | |
|-----------------|------------------------------------|
| Frequency Range | 16.0-60.0MHz |
| Applications | Small Telecommunication equipment. |

Crystal Oscillator SO3225

| | |
|-----------------|-----------------------|
| Frequency Range | 1.0 ~ 60.0 MHz |
| Applications | Cell Phone, GPS, etc. |



Crystal Resonator ZM146

| | |
|-----------------|---|
| Frequency Range | 32.768KHz |
| Applications | Watch and Clock, Remote Control, Telecom Equipment, Consumer electronics etc. |



ZM315

| | |
|-----------------|---|
| Frequency Range | 32.768KHz |
| Applications | Watch and Clock, Remote Control, Telecom Equipment, Consumer electronics etc. |

TCXO/ VCTCXO – TC5032

| | |
|-----------------|---|
| Frequency Range | 12-20MHz |
| Applications | Cell Phone, GPS, PHS, Telecom Equipment, etc. |



Ceramic Resonator ZTTCR MG Series

| | |
|-----------------|--|
| Frequency Range | 4-8MHz |
| Applications | Consumer Electronics, AV Products, Automotive Electronics, Cordless phone etc. |

Ceramic Resonator ZTTCW MX Series

| | |
|-----------------|----------------------------|
| Frequency Range | 20-60MHz |
| Applications | Consumer Electronics, etc. |



S.A.W. Resonator SRM DCC6C Series 3.0X3.0mm



| | |
|-----------------|--|
| Frequency Range | 260-980MHz |
| Applications | Remote Control, Security System, Satellite program receiver, Consumer Electronics, RF Modulator etc. |

(7) R&D New product Series

SMD Power inductor

SMD Power inductors are the new series product of AEC.
It has several features and application with different size available.

Feature

- A coil embedded inductor with Metal alloy power. Shielded construction
- Superior DC current characteristics, suitable for large current application.
- Low loss realized with low DC resistance.
- Ultra low Buzz noise.

| | |
|---|---|
|  |  |
| AMPLF0420 | AMPLF0530 |
|  |  |
| AMPLF0620 | AMPLF0624 |
|  |  |
| AMPLF0630 | AMPLF0640 |
|  |  |
| AMPLB/F1250 | AMPLB/F1260 |

Application

Ideal for DC/DC converters in personal computer notebook PC, VTR and set Top Box etc.
High current POL converters DC/DC converters in other portable game device, communication equipments and office Automation equipments.

Infra Red Sensor.

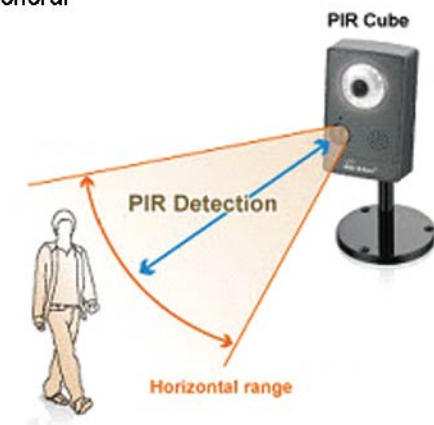
Pyroelectric infrared sensors detect infrared rays using the pyroelectric effect of pyroelectric ceramics, a kind of piezoelectric ceramics.
They are the new series product of AEC with several features and applications.

Feature

- Deliver high sensitivity.
- Reliable performance.

Application

The human body detection for Security.
Sensor in security application and general consumer equipment.



The human body detection for Security.

(7) R&D New product Series

Piezoelectric ceramics components

Piezoelectric ceramics components are the new series of AEC product.

It has been widely applied in our daily life such as medical, industrial and other fields by utilizing the piezoelectric phenomena and ultrasonic theory.

All these below applications use the piezo element's so called direct piezoelectric effect. a piezo element converts mechanical forces into a measurable voltage or the inverse piezoelectric effect, a piezo element is deformed when a voltage is applied to it, thus generating mechanical motion or oscillation.



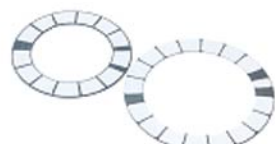
Ultrasonic Massage



Ultrasonic Humidifier



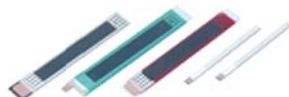
Screw Fastener Sensors



Ultrasonic Electromotor



Ultrasonic element for flow measurement



Piezoelectric Bimorph



Single Chip



Power Generation



Composite Piezoelectric Ceramics



Ultrasonic Transducer
(liquid flow)



Ultrasonic sensor (distance detection and obstacle avoidance)



Tuning fork Liquid Level control element



Medical Application



Industrial Atomization Components



Ultrasonic Transducer
(gas flow)



Ultrasonic sensor (liquid level meter/material instrument)

[8] RoHS and SGS Certificate



In the recently years, as the civilization and globalization develop very fast, the environmental protection have become highly concerned. Human Beings require healthy and green environment. Environmental protection has become one of the most important topics in the new century. AEC is the loyal supporter to it so our products had got all SGS certificates from the beginning to ensure the achievement of the European Union Standard



Before shipping out the products to our customers, we will stick Pb-free or RoHS label on the package of the products to convince our customer that our products have reached RoHS standard.



To better protect our environment, European Union and other countries have published more measures, such as REACH, which is used to measure the content of harmful chemicals in the product to prevent human from being harmed. Our products have achieved this new standard level. As a green partner of environment, we would like to be a soldier of environment protection, which is also a promise to our customer.

AEC Product Element Content:

| Hazardous Substances | Maximum Substance Limits % by Weight (1) |
|-----------------------------|---|
| Mercury (Hg) | < 2ppm by weight |
| Cadmium (Cd) | < 2ppm by weight |
| Hexavalent Chrome (Cr 6+) | < 2ppm by weight |
| Lead (Pb) | < 8ppm by weight |

[9] Customer Distribution

AEC Customers are located in different nations and countries. The distribution pattern is shown by the following figure:



Most of our customers have the following two common features:

- 1) Establish a stable business relationship with us over 20 years
- 2) Be a successful well-known brand in the world

Here we quote some of our customers as a reference:



A leading Electronics Manufacturing Services (EMS) provider



A major American multinational security products manufacturer group



One of the world largest famous electronics components distributor



The worldwide Smart energy meter manufacturer



One of the world's largest suppliers of corded and cordless telephones and a leading supplier of electronic learning products



A famous distributor electronics components in Europe

[10] Why choose AEC?

- 1) The rule of our enterprise culture with the slogan
'Trust, quality and customer satisfaction are our first priority'
- 2) The price we offer gives our customers
plenty room of space to adjust their profit
- 3) We have almost 20 years experience
in the frequency control products field
- 4) Four main types of products including thousand of models,
the items that you need are just inside!
- 5) From Dip type to SMD type, all sizes range of our product's
packages, you can pick the one you need in a simple way
- 6) For your convenience to purchase, our products are
all under **RoHS** Compliant with **SGS certificates**
- 7) Our technical departments are always
here to suit your products' needs
- 8) Strong R&D team to meet the market trend
- 9) Hi-tech factory facilities (equipment imported from Japanese, USA and
Germany company) are introduced to enhance the capability and quality
- 10) Total Quality Management (3 steps: Vendor appraisal,
in-processing test and final test) ensure our quality
can satisfy the customer requirement

[11] Future

With the heartfelt thanks to our customers from all over the world in the past twenty years, AEC promise to keep on contributing our best in the crystal industry. As in the past, AEC will be the most friendly and stable suppliers to our customers in order to achieve the win-win situation.

In the future, AEC will continue to strive toward our goal by three aphorisms:

- (1) Our diection is to develop high-end and new products
- (2) Our lead is to innovate techniques and so as our products
- (3) Our core principle is to guarantee quality and environmental friendly

We believe that our products can be widely used in Telecommunication, Car electronic, Instrument, Security and GPS, etc. Our goal is to build up a global cooperation network and realize a long-lasting development eventually.





**Quality and Customer Satisfaction
are our first priority**

CONTACT US!

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AEC
Ceramic Component

- ◆ SMD Ceramic Resonators
- ◆ Ceramic Resonators
- ◆ Ceramic Filters
- ◆ Ceramic Traps
- ◆ Ceramic Discriminators

Manufacturer & Exporter
Abundance Enterprise Company <http://www.aeccrystal.com>
Tel: (852) 2856 0000 (Series) Fax: (852) 2561 2161 Email: info@aeccrystal.com

AEC
S.A.W. Component

- ◆ S.A.W. Resonators
- ◆ S.A.W. Filters

Manufacturer & Exporter
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Tel: (852) 2856 0000 (Series) Fax: (852) 2561 2161 Email: info@aeccrystal.com

AEC
Dielectric Component

- ◆ Dielectric Resonators
- ◆ Dielectric Filters
- ◆ Dielectric Antennas
- ◆ Multilayer Dielectric Filters

Manufacturer & Exporter
Abundance Enterprise Company <http://www.aeccrystal.com>
Tel: (852) 2856 0000 (Series) Fax: (852) 2561 2161 Email: info@aeccrystal.com

AEC
Crystal Component

- ◆ Crystal Resonators
- ◆ Crystal Filters
- ◆ Crystal Oscillators
- ◆ Voltage Controlled Crystal Oscillator (VCXO)
- ◆ Temperature Compensated Crystal Oscillator (TCXO)
- ◆ Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO)

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