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# High Q RF Inductor

2022

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## LTCC PRODUCT PORTFOLIO

### RF Component (Filter/Balun/Coupler/Diplexer)

BPF, LPF

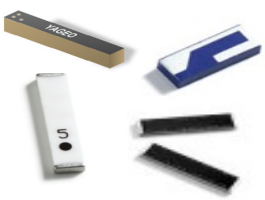
Balun

Diplexer / Triplexer

Balanced BPF

Coupler

### Ceramic Antenna

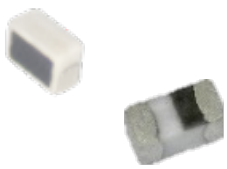


Chip Antenna

Patch Antenna

Active Antenna

### RF Chip Inductor



High-Q Series

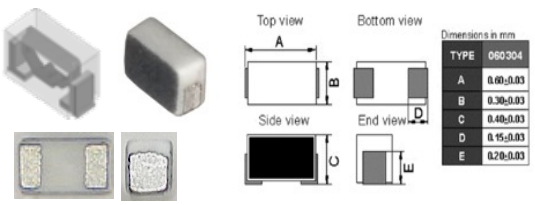
## HIGH-Q RF INDUCTOR

### High-Q RF Description

Thin-film inductor with L-shape terminations and optimization of inner coil structure using photolithography manufacturing

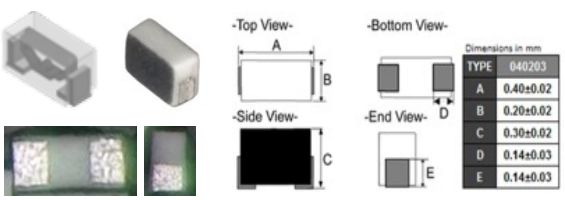
### BSPQ00060304 Series

| | |
|---|---|
| Size L x W x T (mm) | 0.6 x 0.3 x 0.4 |
| Inductance Range (nH) | 0.6 - 22 |
| Q @500MHz | Q ≥ 20 |




### BSPQ00040203 Series

| | |
|---|---|
| Size L x W x T (mm) | 0.4 x 0.2 x 0.3 |
| Inductance Range (nH) | 0.2 - 22 |
| Q @500MHz | Q ≥ 13 |




### Features

- Photolithography Technology
- Higher Q
- Tight Tolerance
- Low RDC

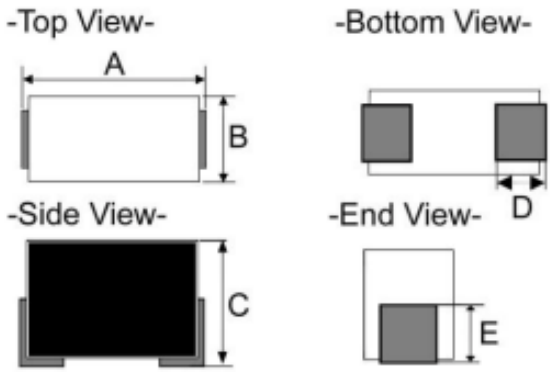
### Application

- Mobile Phones
- RF Modules (FEM, WiFi, PA)

| Series | Size L x W x H (mm) | Inductance Range (nH) | Q@500 (MHz) Min. | SRF Range (MHz) Min. | DCR Range (ohm) Max. | Rated current Range (mA) Max. | Status |
|---|---|---|---|---|---|---|---|
| BSPQ | 0.6 x 0.3 x 0.4 | 0.6 - 22 | 20 | 3000 - 20000 | 0.04 - 0.82 | 250 - 1100 | MP |
| BSPQ | 0.4 x 0.2 x 0.3 | 0.2 - 10 | 14 | 3000 - 17000 | 0.01 - 2.26 | 140 - 1000 | Sample |

## BSPQ00060304

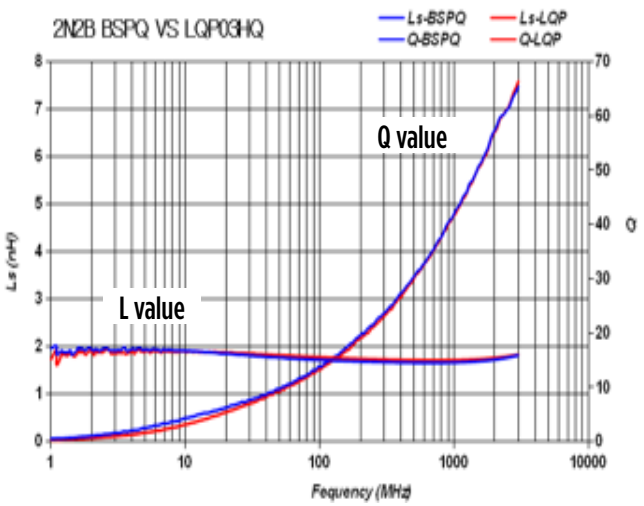
• Dimensions



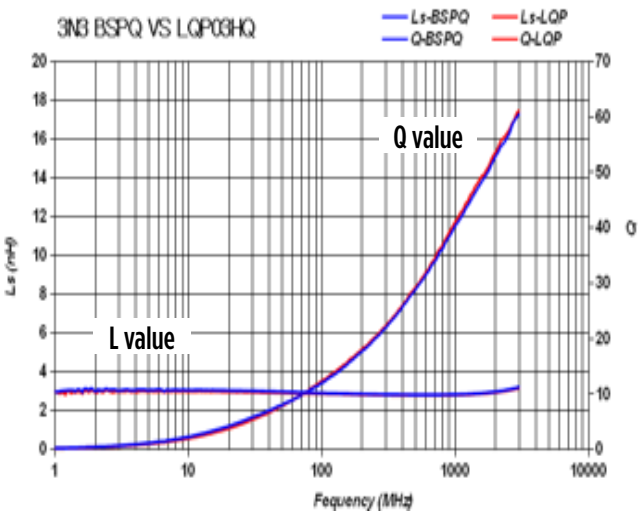

| Type | 060304 |
|---|---|
| A | 0.60±0.03 |
| B | 0.30±0.03 |
| C | 0.40±0.03 |
| D | 0.15±0.03 |
| E | 0.20±0.03 |

• Electrical Characteristics

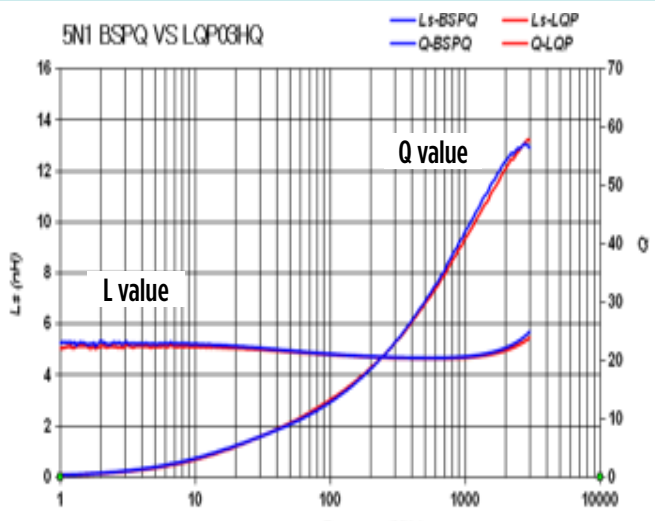
### BSPQ000603042N2B




### BSPQ000603043N3H

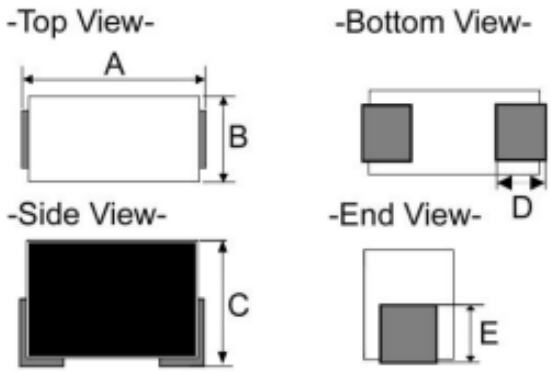



### BSPQ000603045N1H



## BSPQ00040203

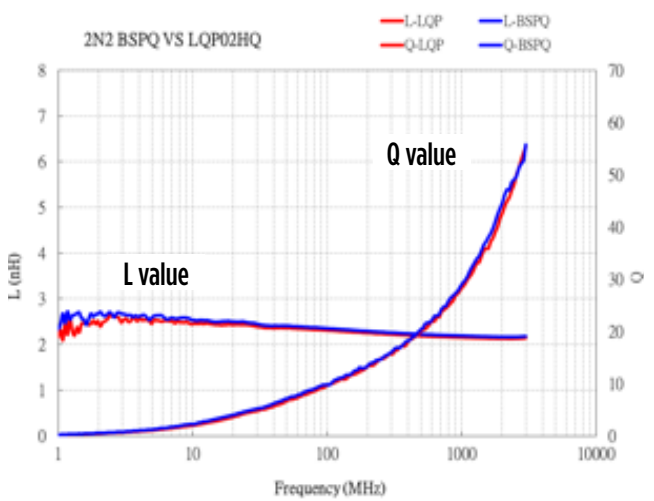
• Dimensions



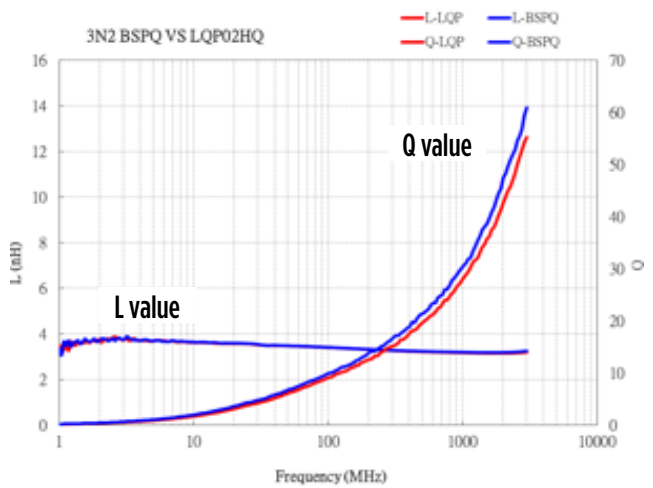

| Type | 040203 |
|---|---|
| A | 0.40±0.02 |
| B | 0.20±0.02 |
| C | 0.30±0.02 |
| D | 0.14±0.03 |
| E | 0.14±0.03 |

• Electrical Characteristics

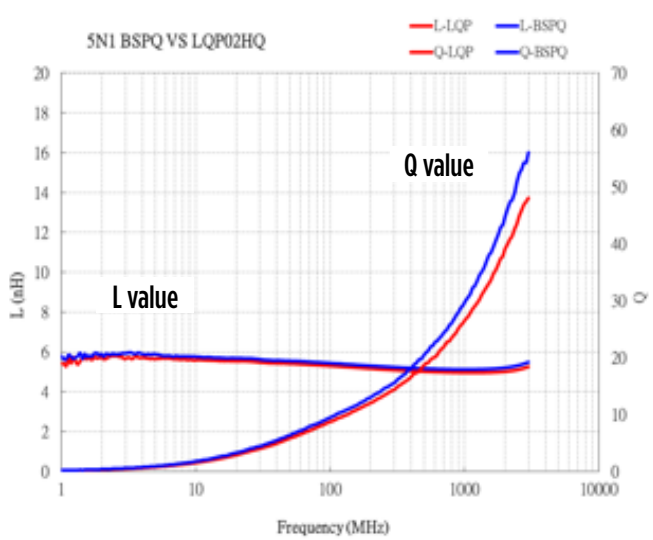
### BSPQ000402032N2B




### BSPQ000402033N2B




### BSPQ000402035N1H



## CODING RULE

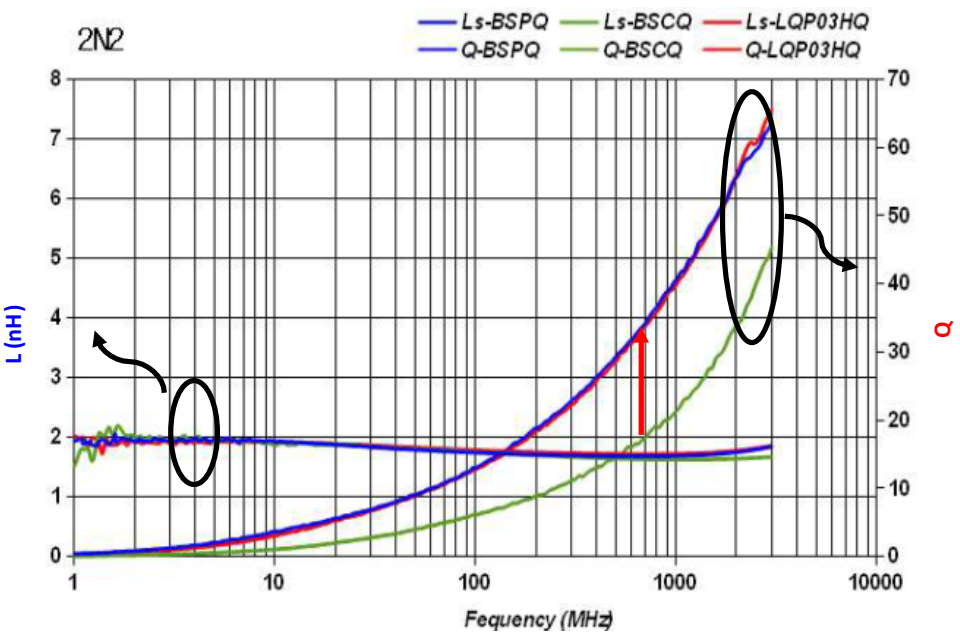
| 1 | 2 | 3 4 | 5 6 | 7 8 9 10 11 12 | 13 14 15 | 16 | 17 18 |
|---|---|---|---|---|---|---|---|
| B | S | P Q | 0 0 | 06 03 04 | 1 N 0 | B | 0 0 |

- 1: Grade
  - A AEC-Q200 Qualified
  - B General
- 2:

| Code | Technology |
|---|---|
| S | Multilayer Chip Inductor |
| T | Antenna + LTCC |

- 3 4: Series
- 5 6: Design Code, Defaut value: 00
- 7 8 9 10 11 12: Site Code (Inductor)
  060304 (0.6 x 0.3 x 0.4) ⟶ 060304
  040203 (0.4 x 0.2 x 0.3) ⟶ 040203
  - Multilayer/Antenna/LTCC : 0.1mm unit
  - Series Size : Lx W or L x W x T
- 13 14 15: • Inductance Value
- 16: Tolerance
  B=±0.1nH
  C=±0.2nH
  H=±3%
  J=±5%
- 17 18: Control Code
  Version
  Default value : 00

## PERFORMANCE BENCHMARK




Based on the same inductance 2.2nH

- High-Q series has significant increase in Q value, compared to general series.
- Pulse (Chilisin) high-Q RF series is competitive with equivalent Q value to that of muRata.

- High-Q RF chip inductor series is produced with lithography process, has properties of Low ΔL , high Q value, and excellent rating current compared to general RF chip inductor.

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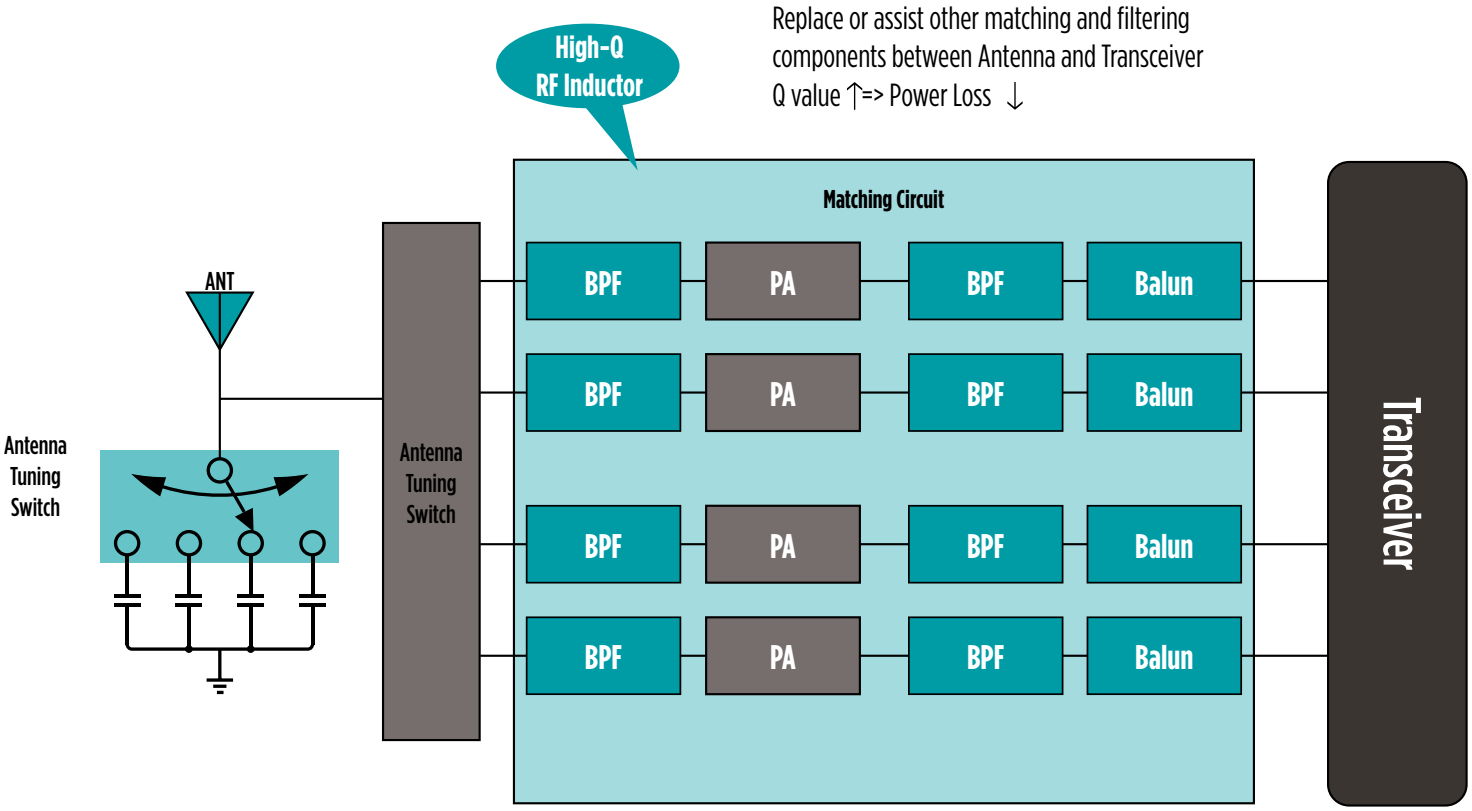
## HIGH-Q INDUCTORS ARE NECESSARY IN MODERN RF ARCHITECTURE




RF Front End in mobile phones

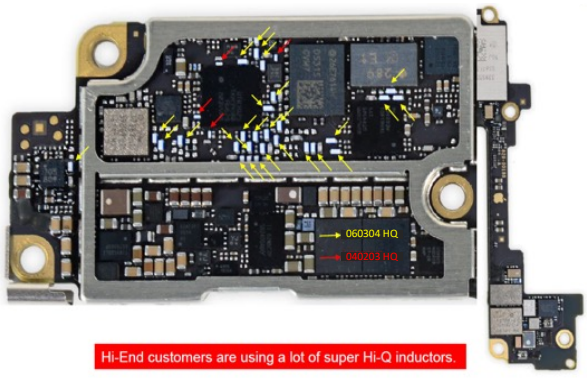
## KEY APPLICATION

### Focused Segments


Automotive Electronics


Networking /Server


Mobile Devices

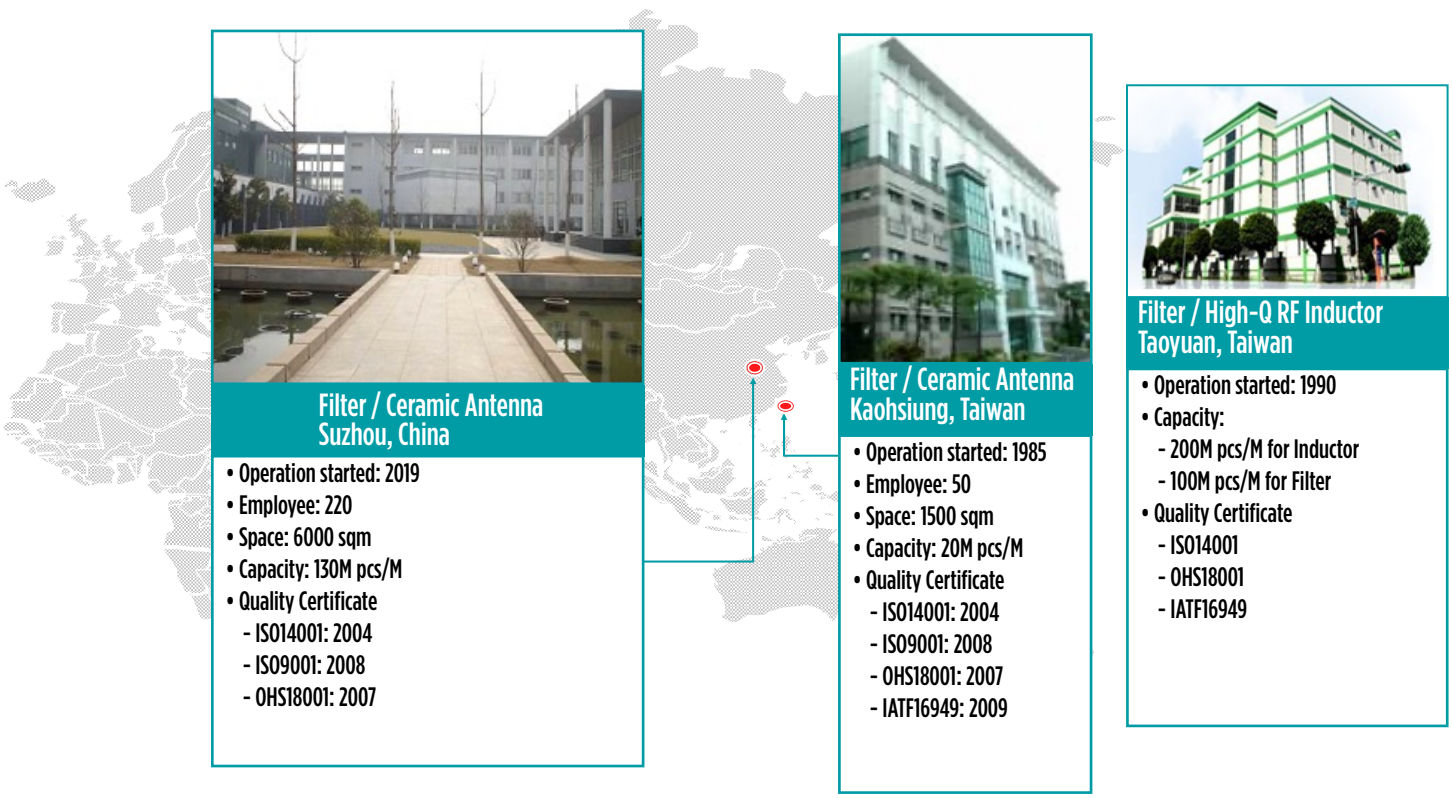



### Focused End Product

- Wireless application: Mobile phone, Wifi Netcom, Bluetooth, ront-End Modules, PA
- In COST DOWN RF-wound inductors (EMS foundry) (ODM dominates BOM), we can introduce our products to replace competitors products

High-end 5G and high-end wifi 6 mobile phone using high-Q-RF inductors:
The total design with RF inductors in the mobile phones in 100-110pcs/set and about 30% high-Q RF inductors

## LTCC MANUFACTURING BASE





**Filter / Ceramic Antenna**
**Suzhou, China**

- Operation started: 2019
- Employee: 220
- Space: 6000 sqm
- Capacity: 130M pcs/M
- Quality Certificate
  - ISO14001: 2004
  - ISO9001: 2008
  - OHS18001: 2007



**Filter / Ceramic Antenna**
**Kaohsiung, Taiwan**

- Operation started: 1985
- Employee: 50
- Space: 1500 sqm
- Capacity: 20M pcs/M
- Quality Certificate
  - ISO14001: 2004
  - ISO9001: 2008
  - OHS18001: 2007
  - IATF16949: 2009



**Filter / High-Q RF Inductor**
**Taoyuan, Taiwan**

- Operation started: 1990
- Capacity:
  - 200M pcs/M for Inductor
  - 100M pcs/M for Filter
- Quality Certificate
  - ISO14001
  - OHS18001
  - IATF16949