



# THROUGH HOLE INDUCTORS

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## Through Hole Inductors

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# Through Hole Inductors General Information

## Leading-Edge Technology

Token Electronics brand passive component specializes in standard and custom solutions offering the latest in state-of-the-art low profile high power density inductor components. Token provides cost-effective, comprehensive solutions that meet the evolving needs of technology-driven markets.

In working closely with the industry leaders in chipset and core development, we remain at the forefront of innovation and new technology to deliver the optimal mix of packaging, high efficiency and unbeatable reliability. Our designs utilize high frequency, low core loss materials, new and custom core shapes in combination with innovative construction and packaging to provide designers with the highest performance parts available on the market.

### Find Inductor Solutions Faster

#### Find Your Inductor - [wt.moc.nekot@qfr](mailto:wt.moc.nekot@qfr)

Only timely and accurate information can help manage the changing needs of your customers. The Token InductorFinder puts you only a click away from all of the inductor information you need.

#### Find Your Solution - [wt.moc.nekot@qfr](mailto:wt.moc.nekot@qfr)

Selecting the correct inductor solution will not only save you time, but it will give you a competitive edge. At Token, we are committed to helping you find the most efficient alternative for your power design. Our inductor and power supply design experts can help you make that selection.

#### Please forward us:

- A brief description of your particular application's requirements.
- Details of an existing solution that you'd like to replace, enhance or find an alternative.
- Inquiries for feasibility to tailor a power transformer or inductor to your specific application.

We can also help you with any additional technical information you might need relating to any of our products.

#### Ask Us Today

# Fixed Inductor Terminology Glossary

## Inductor and Magnetic Product Terminology & Glossary

### Air Core Inductor (Ceramic Core Inductor)

Air core inductors are often referred to as “Ceramic Core” inductors. Air core inductor is most often used in high frequency applications where low inductance values, very low core losses and high Q values are required.

Ceramic has no magnetic properties. Thus, there is no increase in permeability due to the core material. Its main purpose is to provide a form for the coil. In some designs it also provides the structure to hold the terminals in place. Ceramic has a very low thermal coefficient of expansion. This allows for relatively high inductance stability over the operating temperature ranges.

### Axial Inductor

An inductor constructed on a core with concentric leads on opposite ends of the core. Axial inductors are available for both power applications and RF applications, and are available in many core materials including the basic phenolic, ferrite and powdered iron types. Both rod and bobbin shapes are utilized. Axial inductors are very suitable for tape and reel packaging for auto placement.

### RF Choke

Another name for a radio frequency inductor which is intended to filter or choke out signals.

### What is Inductor?

A passive component designed to resist changes in current. Inductors are often referred to as “AC Resistors”. The ability to resist changes in current and the ability to store energy in its magnetic field, account for the bulk of the useful properties of inductors. Current passing through an inductor will produce a magnetic field. A changing magnetic field induces a voltage which opposes the field-producing current. This property of impeding changes of current is known as inductance. The voltage induced across an inductor by a change of current is defined as:

**Equation  $V = L di/dt$  where V (Induced Voltage); L (Inductance Value).**

Thus, the induced voltage is proportional to the inductance value and the rate of current change.

## ▶ Inductor and Magnetic Product Terminology & Glossary

### DCR (DC Resistance)

The resistance of the inductor winding measured with no alternating current. The DCR is most often minimized in the design of an inductor. The unit of measure is ohms, and it is usually specified as a maximum rating.

### EMI

EMI is an acronym for Electromagnetic Interference. It is unwanted electrical energy in any form. EMI is often used interchangeably with “Noise”.

### Ferrite Core

Ferrite is a magnetic material which consists of a mixed oxide of iron and other elements that are made to have a crystalline molecular structure. The general composition of ferrites is  $xxFe_2O_4$  where xx represents one or several metals. The most popular metal combinations are manganese and zinc (MnZn) and nickel and zinc (NiZn). These metals can be easily magnetized.

### Impedance

The impedance of an inductor is the total resistance to the flow of current, including the AC and DC component. The DC component of the impedance is simply the DC resistance of the winding. The AC component of the impedance includes the inductor reactance. The following formula calculates the inductive reactance of an ideal inductor (i.e., one with no losses) to a sinusoidal AC signal.

**Equation  $Z = XL = 2\pi fL$ .**

This equation indicates that higher impedance levels are achieved by higher inductance values or at higher frequencies.

### Inductance & Tolerance

The property of a circuit element which tends to oppose any change in the current flowing through it. The inductance for a given inductor is influenced by the core material, core shape and size, the turns count and the shape of the coil. Inductors most often have their inductances expressed in microhenries ( $\mu H$ ).

| Tolerance Letter of Inductance Table |             |                                      |
|--------------------------------------|-------------|--------------------------------------|
| Letter                               | Tolerance   | Inductance                           |
| F                                    | $\pm 1 \%$  | 1 henry (H) = 106 $\mu H$            |
| G                                    | $\pm 2 \%$  |                                      |
| H                                    | $\pm 3 \%$  | 1 millihenry (mH) = 103 $\mu H$      |
| J                                    | $\pm 5 \%$  | 1 microhenry ( $\mu H$ ) = 1 $\mu H$ |
| K                                    | $\pm 10 \%$ |                                      |
| L                                    | $\pm 15 \%$ | 1 nanohenry (nH) = 10-3 $\mu H$      |
| M                                    | $\pm 20 \%$ |                                      |

## Matched Impedance

The condition that exists when two coupled circuits are adjusted so that the output impedance of one circuit equals the input impedance of the other circuit connected to the first. There is a minimum power loss between two circuits when their connecting impedances are equal.

## Multilayer Inductor

An inductor constructed by layering the coil between layers of core material. The coil typically consists of a bare metal material (no insulation). This technology is sometimes referred to as “non-wirewound”. The inductance value can be made larger by adding additional layers for a given spiral pattern.

## Quality Factor Q

The Q value of an inductor is a measure of the relative losses in an inductor. The Q is also known as the “quality factor” and is technically defined as the ratio of inductive reactance to effective resistance and is represented by: **Equation Q =  $X_L / R_e = 2\pi fL / R_e$**

Since  $X_L$  and  $R_e$  are functions of frequency, the test frequency must be given when specifying Q.  $X_L$  typically increases with frequency at a faster rate than  $R_e$  at lower frequencies, and vice versa at higher frequencies. This results in a bell shaped curve for Q vs frequency.  $R_e$  is mainly comprised of the DC resistance of the wire, the core losses and skin effect of the wire. Based on the above formula, it can be shown that the Q is zero at the self resonant frequency since the inductance is zero at this point.

## Rated Current

The level of continuous DC current that can be passed through the inductor. This DC current level is based on a maximum temperature rise of the inductor at the maximum rated ambient temperature. The rated current is related to the inductor’s ability to minimize the power losses in the winding by having a low DC resistance. It is also related to the inductor’s ability to dissipate this power lost in the windings. Thus, the rated current can be increased by reducing the DC resistance or increasing the inductor size. For low frequency current waveforms, the RMS current can be substituted for the DC rated current. The rated current is not related to the magnetic properties of the inductor.

## Saturation Current

The DC bias current flowing through the inductor which causes the inductance to drop by a specified amount from the initial zero DC bias inductance value. Common specified inductance drop percentages include 10 % and 20 %. It is useful to use the 10 % inductance drop value for ferrite cores and 20 % for powdered iron cores in energy storage applications.

The cause of the inductance to drop due to the DC bias current is related to the magnetic properties of the core. The core, and some of the space around the core, can only store a given amount of magnetic flux density. Beyond the maximum flux density point, the permeability of the core is reduced. Thus, the inductance is caused to drop. Core saturation does not apply to “air-core” inductors.

## Self-Resonant Frequency (SRF)

The frequency at which the inductor’s distributed capacitance resonates with the inductance. It is at this frequency that the inductance is equal to the capacitance and they cancel each other. The inductor will act purely resistive with a high impedance at the SRF point.

## Self-Resonant Frequency (SRF)

The frequency at which the inductor's distributed capacitance resonates with the inductance. It is at this frequency that the inductance is equal to the capacitance and they cancel each other. The inductor will act purely resistive with a high impedance at the SRF point.

The distributed capacitance is caused by the turns of wire layered on top of each other and around the core. This capacitance is in parallel to the inductance. At frequencies above the SRF, the capacitive reactance of the parallel combination will become the dominant component.

Also, the Q of the inductor is equal to zero at the SRF point since the inductive reactance is zero. The SRF is specified in MHz and is listed as a minimum value on product data sheets.

## Shielded Inductor

An inductor designed for its core to contain a majority of its magnetic field. Some inductor designs are self shielding. Examples of these are magnetic core shapes which include toroids, pot cores and E-cores. Magnetic core shapes such as slug cores and bobbins require the application of a magnetic sleeve or similar method to yield a shielded inductor.

It should be noted that magnetic shielding is a matter of degree. A certain percentage of the magnetic field will escape the core material. This is even applicable for toroidal cores as lower core permeabilities will have higher fringing fields than will high permeability toroidal cores.

## Toroidal Inductor

An inductor constructed by placing a winding(s) on a core that has a donut shaped surface. Toroidal cores are available in many magnetic core materials within the four basic types: Ferrite, Powdered Iron, Alloy and High Flux, and Tape Wound. Characteristics of toroidal inductors include: self shielding (closed magnetic path), efficient energy transfer, high coupling between windings, and early saturation.

# Measurements of Fixed Inductors

## Measurements of Fixed Inductors

### Inductance

The inductance is measured with a Q-meter, LCR meter or an impedance analyzer.

- Fixed inductors for signals: Use of a Q-meter in which the frequency is for direct readout of the inductance or at the specified frequency.
- Inductors for high current power line circuits: 1kHz or 100kHz.

### Q Factor

The unloaded Q is measured with a Q-meter, LCR meter or impedance analyzer. The frequency of measurement is that at which the inductance has been measured or at a different frequency as specified. However, for high current power line inductors, the resistance is measured and the Q may be neglected.

### DCR (DC Resistance), SRF (Self-Resonant Frequency)

DCR: A digital multimeter is used for measurement;

SRF: Measured with a Q-meter, impedance analyzer or network analyzer.

### Dielectric Strength

For specimen coil, apply 100V DC for 5 seconds between the shielding case and terminals. There should be no damage or abnormalities in the inductor.

### Maximum Allowable Current

The maximum allowable current is a DC Current which causes initial inductance to decrease by 10% or 30%. Or coil temperature to rise by 20°C or 40°C, whichever is smaller. (Reference ambient temperature: 20°C)



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## Solderability

After immersion of terminals in flux for 5 to 10 seconds, dip the terminals in the solder bath at 245±5°C for 2±0.5 seconds. Make certain that more than 3/4 of the surface of the terminals are coated with new solder.

## Dry Heat Test

The change in inductance, if any, is measured after exposure to 85±2°C in a test chamber for 500±12 hours and for 1 to 2 hours at room temperature.

## Shock Tests

The change in inductance, if any, is measured after the following tests.

- Free Fall Drop Test: A specimen coil is mounted on a test board and dropped freely 3 times from a height of 1 meter.
- Impact Tester: A specimen inductor is mounted on a test board and dropped 3 times in three directions with shock applied for 0.01 seconds at 981 m/s<sup>2</sup>. The change in inductance, if any, is measured after the tests.

## Vibration Test

The change in inductance, if any, is measured after the following condition:

- A specimen coil/inductor is mounted on a test board of vibration instrument.
- Overall amplitude: 1.5mm, frequency range: 10~55Hz, and swept in the (10~55~10)Hz order per minute for 2 hrs in each of the 3 directions for total of 6 hrs.

## Humidity Test

The change in inductance, if any, is measured after exposure in a test chamber to humidity of 90% to 95% R.H. at 60±2°C for 500±12 hours and 1 hour exposure at room temperature.

# EMI Line Filters

## EMI Line Filters for filtering common mode power line noise (TCUU)

### ▶ Preview

In recent times there has been a growing need for energy storage inductors for noise filtering in both mains line filters and DC chokes used in switched-mode power supplies. In mains line filter applications the filtering falls into two categories: common-mode noise and differential-mode noise.

The line filter arrangement consists of two sections bobbin between the mains supply and the equipment. Note that the common-mode filter is wound on a single core and the differential mode filter consists of two individual wound cores. The common-mode noise is in relation to ground and is common to both lines. Differential mode noise is the noise between the two lines. Both types of noise are usually present to varying degrees.

Token line filters TCUU series common mode choke coils are used in a wide range of prevention of radio frequency interference (RFI) and electromagnetic interference (EMI) from power supply lines and for prevention of malfunctioning of products such as measuring equipment and system equipment. Features wide range of selection, high impedance at applicable frequency, and high self-resonant frequency.

The TCUU series is designed to reduce stray capacity between windings by using a single-layer coil and two sections bobbin construction on high permeability ferrite core, which offer excellent high frequency characteristics. This series provides excellent noise suppression for high frequency ranges including the FM band. This filter can also be used as a signal line with excellent withstanding voltage, since the windings are divided into two sections.

Token is equipped to design and produce custom components to meet many design and reliability demands. Custom parts are available on request. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

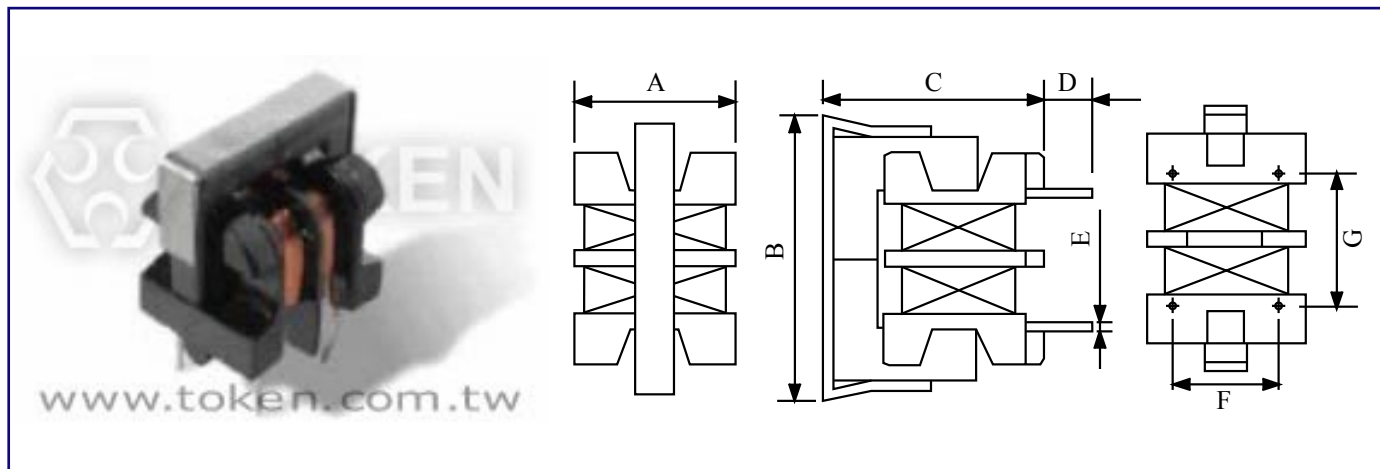
### Features :

- Easily inserted into PCB.
- Small size and inexpensive type.
- Highly reliable, compact & lightweight.
- Magnetic shielded construction available.
- Characteristics in Low Frequency Band.
- AC common mode choke coil which has excellent attenuation.

### Applications :

- Multi-Function Telephones.
- Common Mode Chokes for Effective AC line Noise Prevention.
- AC Adapters, Faxes Small Size Fluorescent Lights, VCRS, Color TVs.

## ▶ Magnetic Shielded Construction (TCUU98V) Configurations & Dimensions



| Type    | A (max) | B (max) | C (max) | D   | E    | F   | G   |
|---------|---------|---------|---------|-----|------|-----|-----|
| TCUU98V | 11.0    | 16.5    | 16.5    | 3.5 | Φ0.6 | 7.0 | 8.0 |

**Note:** Design as Customer's Requested Specifications.

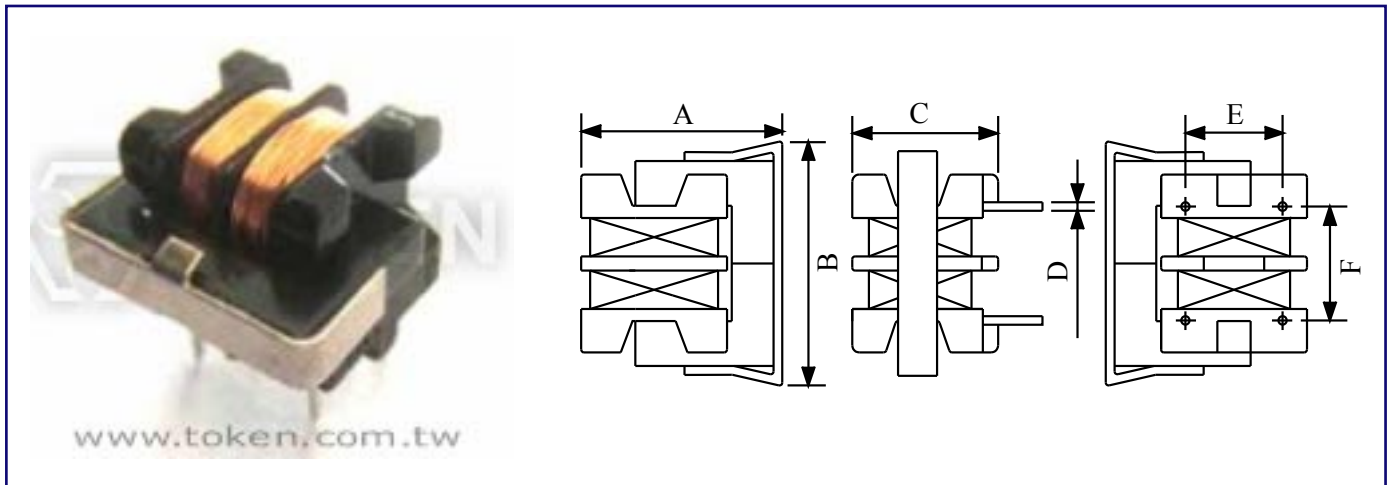
## ▶ Common Mode Chokes (TCUU98V) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCUU98H-471 | 0.47                 | 25                           | 0.15         | 1.00         |
| TCUU98H-681 | 0.68                 | 25                           | 0.25         | 0.85         |
| TCUU98H-102 | 1.0                  | 50                           | 0.35         | 0.70         |
| TCUU98H-222 | 2.2                  | 50                           | 0.7          | 0.50         |
| TCUU98H-392 | 3.9                  | 100                          | 1.20         | 0.38         |
| TCUU98H-472 | 4.7                  | 100                          | 1.60         | 0.34         |
| TCUU98H-682 | 6.8                  | 150                          | 2.50         | 0.25         |
| TCUU98H-103 | 10.0                 | 200                          | 4.00         | 0.20         |

**Note:** Test Freq.: 1.0kHz.

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ (TCUU98H) Configurations & Dimensions



| Type    | A (max) | B (max) | C (max) | D    | E   | F   |
|---------|---------|---------|---------|------|-----|-----|
| TCUU98H | 15.5    | 16.5    | 12.5    | Φ0.6 | 7.0 | 8.0 |

**Note:** Design as Customer's Requested Specifications.

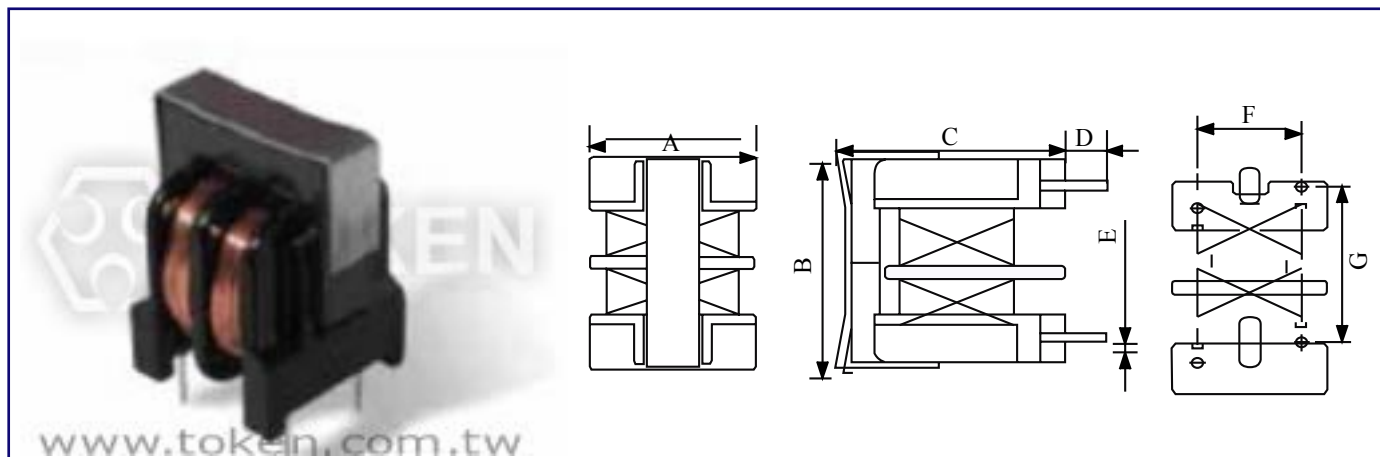
## ▶ Common Mode Chokes (TCUU98H) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCUU98H-471 | 0.47                 | 25                           | 0.15         | 1.00         |
| TCUU98H-681 | 0.68                 | 25                           | 0.25         | 0.85         |
| TCUU98H-102 | 1.0                  | 50                           | 0.35         | 0.70         |
| TCUU98H-222 | 2.2                  | 50                           | 0.7          | 0.50         |
| TCUU98H-392 | 3.9                  | 100                          | 1.20         | 0.38         |
| TCUU98H-472 | 4.7                  | 100                          | 1.60         | 0.34         |
| TCUU98H-682 | 6.8                  | 150                          | 2.50         | 0.25         |
| TCUU98H-103 | 10.0                 | 200                          | 4.00         | 0.20         |

Note: Test Freq.: 1.0kHz.

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ (TCUU10) Configurations & Dimensions



| Type   | A (max) | B (max) | C (max) | D   | E    | F    | G    |
|--------|---------|---------|---------|-----|------|------|------|
| TCUU10 | 17.0    | 18.5    | 23.0    | 4.0 | Φ0.7 | 10.0 | 13.0 |

**Note:** Design as Customer's Requested Specifications.

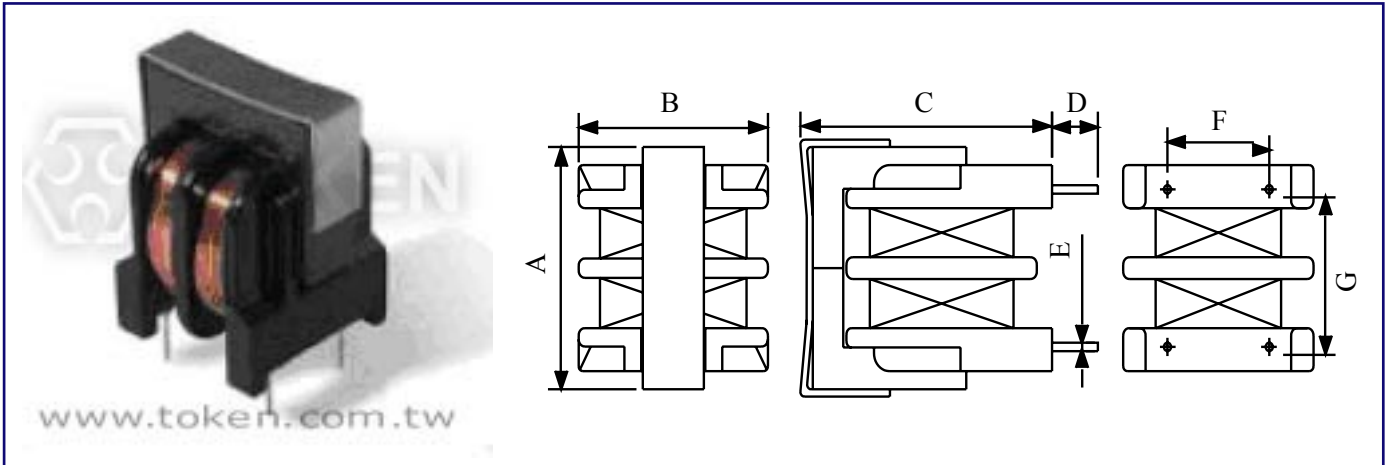
## ▶ Common Mode Chokes (TCUU10) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCUU10-332  | 3.3                  | 100                          | 0.71         | 0.65         |
| TCUU10-682  | 6.8                  | 200                          | 1.26         | 0.435        |
| TCUU10-123  | 12.0                 | 360                          | 2.20         | 0.34         |
| TCUU10-223  | 22.0                 | 440                          | 3.64         | 0.25         |
| TCUU10-333  | 33.0                 | 660                          | 5.74         | 0.20         |
| TCUU10-513  | 51.0                 | 1000                         | 9.12         | 0.15         |

**Note:** Test Freq.: 1.0kHz.

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ AC Common Mode Choke Coils (TCUU16) Configurations & Dimensions



| Type   | A (max) | B (max) | C (max) | D   | E    | F    | G    |
|--------|---------|---------|---------|-----|------|------|------|
| TCUU16 | 22.0    | 20.0    | 28.5    | 4.5 | Φ0.7 | 10.0 | 13.0 |

**Note:** Design as Customer's Requested Specifications.

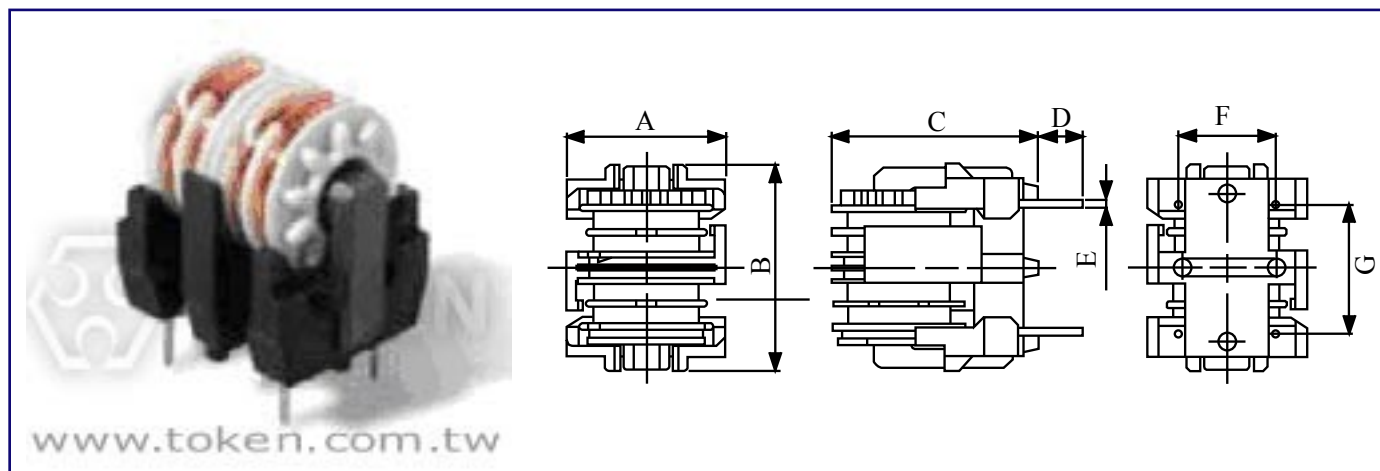
## ▶ Common Mode Chokes (TCUU16) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCUU16-152  | 1.5                  | 40                           | 0.125        | 1.90         |
| TCUU16-402  | 4.0                  | 60                           | 0.27         | 1.20         |
| TCUU16-802  | 8.0                  | 80                           | 0.46         | 0.90         |
| TCUU16-203  | 20.0                 | 150                          | 1.60         | 0.50         |
| TCUU16-303  | 30.0                 | 200                          | 2.50         | 0.40         |

**Note:** Test Freq.: 1.0kHz.

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ AC Common Mode Choke Coils (TCUT20) Configurations & Dimensions



| Type   | A (max) | B (max) | C (max) | D   | E    | F    | G    |
|--------|---------|---------|---------|-----|------|------|------|
| TCUT20 | 17.2    | 22.0    | 22.5    | 4.5 | Φ0.8 | 10.0 | 13.0 |

**Note:** Design as Customer's Requested Specifications.

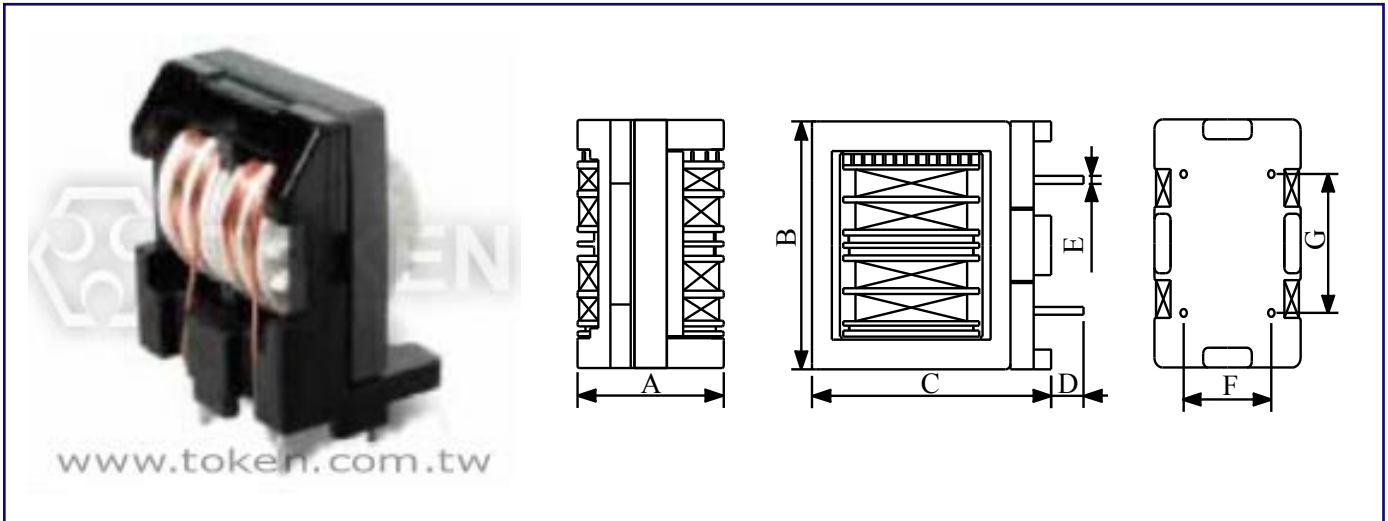
## ▶ Common Mode Chokes (TCUT20) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCUT20-222  | 2.2                  | 150                          | 0.24         | 1.30         |
| TCUT20-392  | 3.9                  | 150                          | 0.41         | 1.00         |
| TCUT20-103  | 10.0                 | 550                          | 1.00         | 0.60         |
| TCUT20-183  | 18.0                 | 600                          | 1.63         | 0.50         |
| TCUT20-223  | 22.0                 | 800                          | 2.04         | 0.40         |
| TCUT20-333  | 33.0                 | 800                          | 3.42         | 0.30         |

**Note:** Test Freq.: 1.0kHz.

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ Magnetic Shielded Core (TCET24B) Configurations & Dimensions



| Type    | A (max) | B(max) | C(max) | D   | E    | F    | G    |
|---------|---------|--------|--------|-----|------|------|------|
| TCET24B | 18.5    | 25.5   | 31.0   | 4.0 | Φ0.8 | 10.0 | 13.0 |

**Note:** Design as Customer's Requested Specifications.

## ▶ Common Mode Chokes (TCET24B) at 25°C Electrical Characteristics

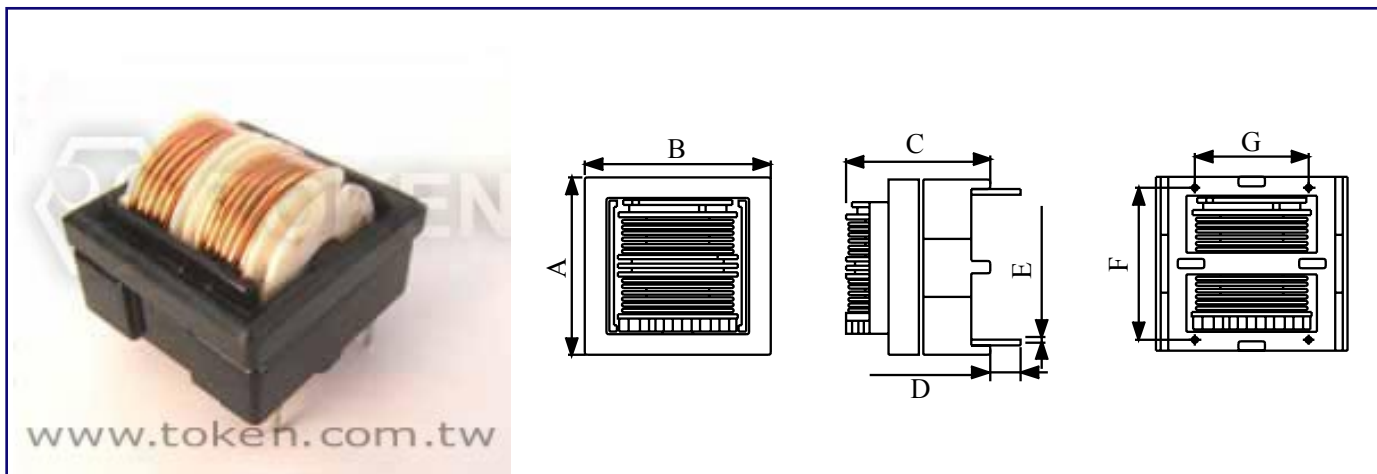
| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCET24B-252 | 2.5                  | 100                          | 0.13         | 2.00         |
| TCET24B-352 | 3.5                  | 150                          | 0.18         | 1.70         |
| TCET24B-452 | 4.5                  | 200                          | 0.21         | 1.50         |
| TCET24B-103 | 10.0                 | 300                          | 0.47         | 1.00         |
| TCET24B-153 | 15.0                 | 400                          | 0.73         | 0.80         |
| TCET24B-203 | 20.0                 | 600                          | 0.87         | 0.70         |
| TCET24B-353 | 35.0                 | 800                          | 1.58         | 0.60         |

**Note:** Test Freq.: 1.0kHz.

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C. (Ta=25°C)



## ▶ Magnetic Shielded Core (TCET24H) Configurations & Dimensions



| Type    | A (max) | B(max) | C(max) | D   | E    | F    | G    |
|---------|---------|--------|--------|-----|------|------|------|
| TCET24H | 18.5    | 25.5   | 31.0   | 4.0 | Φ0.8 | 10.0 | 13.0 |

**Note:** Design as Customer's Requested Specifications.

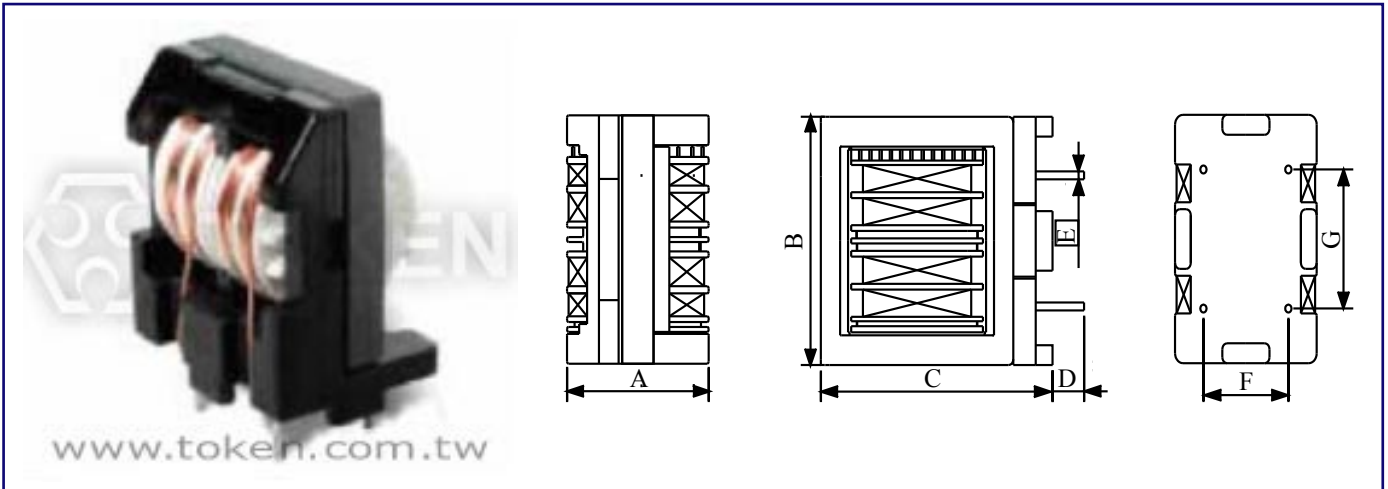
## ▶ Common Mode Chokes (TCET24H) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCET24H-252 | 2.5                  | 100                          | 0.13         | 2.00         |
| TCET24H-352 | 3.5                  | 150                          | 0.18         | 1.70         |
| TCET24H-452 | 4.5                  | 200                          | 0.21         | 1.50         |
| TCET24H-103 | 10.0                 | 300                          | 0.47         | 1.00         |
| TCET24H-153 | 15.0                 | 400                          | 0.73         | 0.80         |
| TCET24H-203 | 20.0                 | 600                          | 0.87         | 0.70         |
| TCET24H-353 | 35.0                 | 800                          | 1.58         | 0.60         |

**Note:** Test Freq.: 1.0kHz

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ Magnetic Shielded Core (TCET28B) Configurations & Dimensions



| Type    | A (max) | B(max) | C(max) | D   | E    | F    | G    |
|---------|---------|--------|--------|-----|------|------|------|
| TCET28B | 22.0    | 31.0   | 35.5   | 4.0 | Φ0.8 | 10.0 | 13.0 |

**Note:** Design as Customer's Requested Specifications.

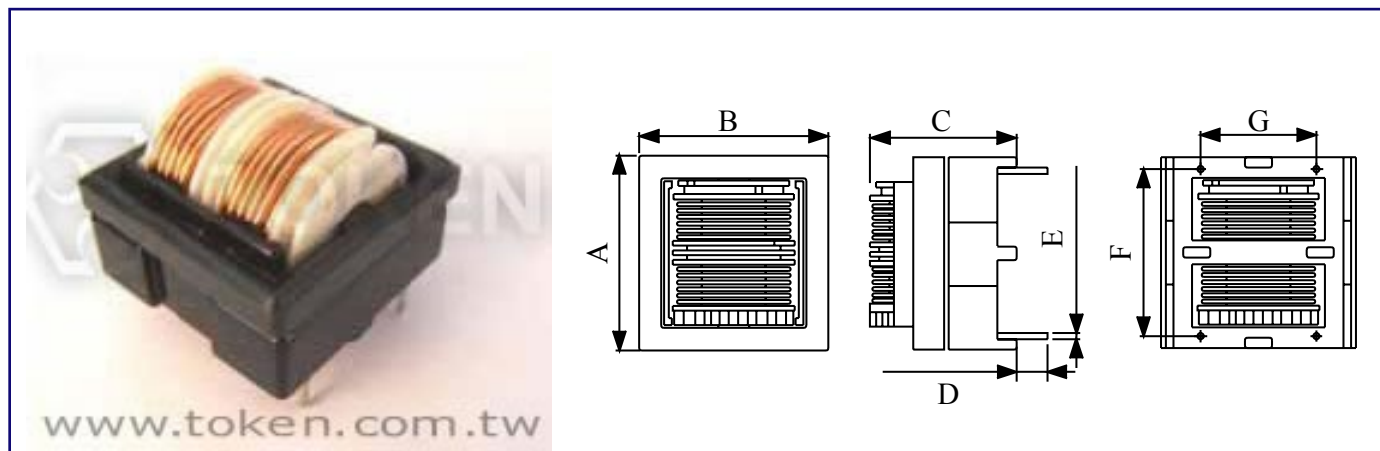
## ▶ Common Mode Chokes (TCET28B) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCET28B-182 | 1.8                  | 100                          | 0.072        | 2.60         |
| TCET28B-682 | 6.8                  | 200                          | 0.23         | 1.60         |
| TCET28B-123 | 12.0                 | 400                          | 0.38         | 1.20         |
| TCET28B-223 | 22.0                 | 500                          | 0.65         | 1.00         |
| TCET28B-393 | 39.0                 | 700                          | 1.43         | 0.70         |
| TCET28B-683 | 68.0                 | 850                          | 1.82         | 0.60         |

**Note:** Test Freq.: 1.0kHz

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

## ▶ Magnetic Shielded Core (TCET24H) Configurations & Dimensions



| Type    | A (max) | B(max) | C(max) | D         | E          | F          | G          |
|---------|---------|--------|--------|-----------|------------|------------|------------|
| TCET28H | 30.0    | 30.0   | 23.5   | 3.5 ± 0.5 | Φ0.8 ± 0.1 | 24.0 ± 0.5 | 20.0 ± 0.5 |

**Note:** Design as Customer's Requested Specifications.

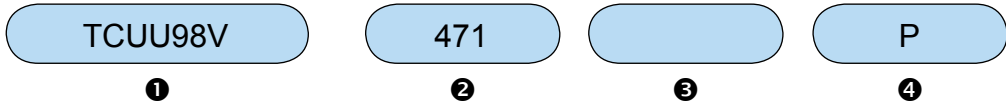
## ▶ Common Mode Chokes (TCET28H) at 25°C Electrical Characteristics

| Part Number | Inductance (mH)(min) | Inductance Balance (μH)(max) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------------|------------------------------|--------------|--------------|
| TCET28H-182 | 1.8                  | 100                          | 0.072        | 2.60         |
| TCET28H-682 | 6.8                  | 200                          | 0.23         | 1.60         |
| TCET28H-123 | 12.0                 | 400                          | 0.38         | 1.20         |
| TCET28H-223 | 22.0                 | 500                          | 0.65         | 1.00         |
| TCET28H-393 | 39.0                 | 700                          | 1.43         | 0.70         |
| TCET28H-683 | 68.0                 | 850                          | 1.82         | 0.60         |

**Note:** Test Freq.: 1.0kHz

Allowable Current : D.C. Current When Temperature of Coil Increased up to 40°C .(Ta=25°C )

**▶ (TCUU98V, TCUU98H, TCUU10, TCUU16) How to Order**



**1** Part Number: TCUU98V Vertical Type,  
TCUU98H Horizontal Type,  
TCUU10,  
TCUU16

**2** Inductance

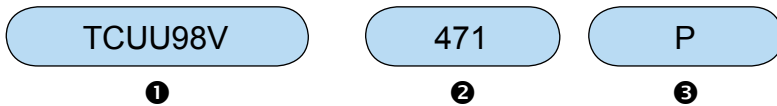
| Code | Inductance |
|------|------------|
| 471  | 0.47mH     |
| 681  | 0.68mH     |
| 102  | 1.0mH      |
| 222  | 2.2mH      |

**3** Winding

| Code | Tolerance         |
|------|-------------------|
| None | Standard Winding  |
| D    | Sectional Winding |

**4** Package : P ( Bulk )

**▶ (TCUT20, TCET24B, TCET24H, TCET28B, TCET28H) How to Order**



**1** Part Number: TCUT20,  
TCET24B,  
TCET24H,  
TCET28B,  
TCET28H

**2** Inductance

| Code | Inductance |
|------|------------|
| 222  | 2.2mH      |
| 392  | 3.9mH      |
| 103  | 10.0mH     |
| 183  | 20.0mH     |

**3** Package : P ( Bulk )

*Back to 1st Page - EMI Line Filters (TCUU)*

## Through Hole Fixed Inductors

**Token fixed inductors meet the needs of a variety of manufacturing methods (TCAL)**

### ▶ Preview

Token TCAL series fixed inductor utilizes the latest winding technology with special core material, sturdy construction, outer layer of epoxy resin processing, high Q value and self-resonance frequency, wide inductance range, high reliability, and low price.

The TCAL series is ideal for consumer electronics such as digital set-top boxes (DVB), digital video disc players (DVD), video cassette recorders (VCR), television (TV), computers, audio equipment, mobile communications, telephone, and various general-purpose electronic applications.

Token highly efficient automated production processes offer a full range of high-quality inductors products suitable for automatic plug-in operation. The TCAL provides 0204,0307,0410, and 0510 size varieties of different forming, such as Normal & Short Form, F Forming, U Forming, Pana Forming, and bulk products to meet the needs of a variety of manufacturing methods.

Token TCAL Series fixed inductors are full line conforming with RoHS specifications, Pb-free standards. Provide a complete inductor size and full range inductance, and custom parts are available on request. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

### Applications :

- TV, VCR.
- Computer Devices
- Electronics products.
- Communication equipment.

### Features :

- Low Cost.
- Coating epoxy resin that ensures the humidity resistance to be long life.



## Normal Form & Short Form

| Type      | $\Phi A(\text{max})$ | B(max) | $C \pm 3.0$ | $\Phi D \pm 0.05$ | $E \pm 1.5$ |
|-----------|----------------------|--------|-------------|-------------------|-------------|
| TCALN0204 | 2.8                  | 5.0    | 29.5        | 0.50              | 62.5        |
| TCALS0204 | 2.8                  | 5.0    | 16.0        | 0.50              | 36.5        |
| TCALN0307 | 3.0                  | 7.0    | 28.0        | 0.50              | 62.5        |
| TCALS0307 | 3.0                  | 7.0    | 15.0        | 0.50              | 36.5        |
| TCALN0410 | 4.0                  | 10.0   | 26.0        | 0.65              | 62.5        |
| TCALS0410 | 4.0                  | 10.0   | 14.0        | 0.65              | 36.5        |
| TCALN0510 | 5.0                  | 10.0   | 26.0        | 0.65              | 62.5        |
| TCALS0510 | 5.0                  | 10.0   | 14.0        | 0.65              | 36.5        |

## F Forming

| Sym.         | TCALFB0204  | TCALFB0307  | TCALFB0410  | TCALFB0510  |
|--------------|-------------|-------------|-------------|-------------|
| A (max)      | 2.80        | 3.00        | 4.00        | 5.00        |
| B (max)      | 5.00        | 7.00        | 10.00       | 10.00       |
| C (max)      | 6.00        | 6.00        | 6.00        | 6.00        |
| D (min)      | 3.60        | 3.60        | 4.00        | 4.00        |
| $W \pm 0.05$ | $0.50 \Phi$ | $0.50 \Phi$ | $0.65 \Phi$ | $0.65 \Phi$ |

## ► U Forming

TCALUB0204

TCALUB0307, TCALUB0410  
TCALUB0510

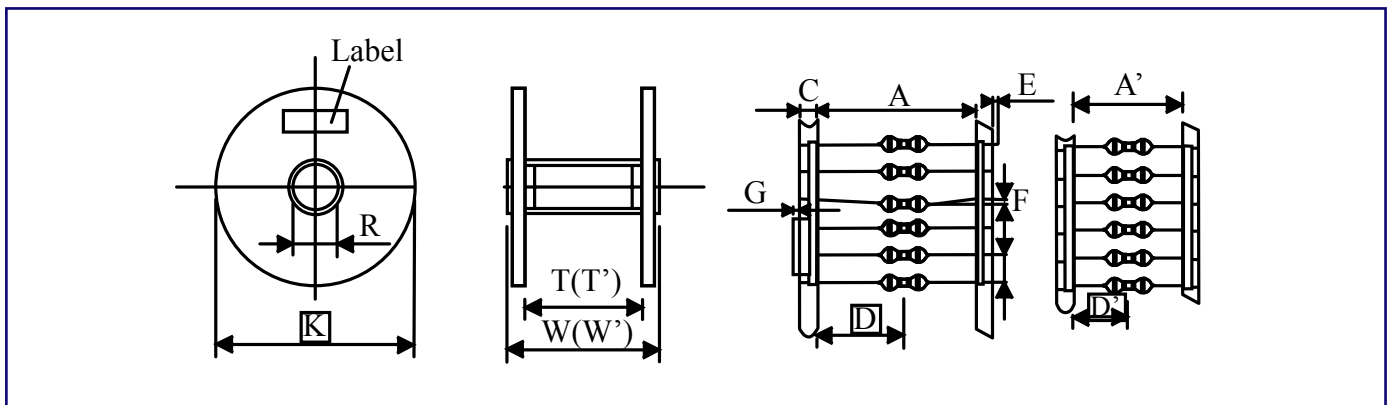
| Sym.     | TCALUB0204 | TCALUB0307 | TCALUB0410 | TCALUB0510 |
|----------|------------|------------|------------|------------|
| A (max)  | 2.80       | 3.00       | 4.00       | 5.00       |
| B (max)  | 5.00       | 7.00       | 10.00      | 10.00      |
| C (min)  | 3.60       | 3.60       | 3.60       | 3.60       |
| F        | 6 ~ 15     | 10 ~ 20    | 12.5 ~ 20  | 12.5 ~ 20  |
| W ± 0.05 | 0.50 Φ     | 0.50 Φ     | 0.65 Φ     | 0.65 Φ     |

## ► (TCAL 0307 Series) Pana Forming

Unit in mm

| A             | B             | C                      | D0       | F                      | H                       | H0        | H1                     | h                     | h1                    |
|---------------|---------------|------------------------|----------|------------------------|-------------------------|-----------|------------------------|-----------------------|-----------------------|
| 3.00<br>(max) | 7.00<br>(max) | 3.00<br>+0.00<br>-1.00 | 4.00±0.3 | 5.00<br>+0.80<br>-0.20 | 19.00<br>+1.00<br>-0.30 | 16.00±0.5 | 28.50<br>(max)         | 0.00<br>±2.0<br>(±5°) | 0.00<br>±2.0<br>(±5°) |
| P             | P0            | P1                     | P2       | T                      | W                       | W0        | W1                     | W2                    |                       |
| 12.7±1.0      | 12.7±0.3      | 3.85±0.7               | 6.35±1.3 | 0.7±0.2                | 18.00<br>+1.00<br>-0.50 | 13.00±1.0 | 9.00<br>+0.75<br>-0.50 | 4.00<br>(max)         |                       |

## (Axial Lead Type) Dimensions of Tape & Reel



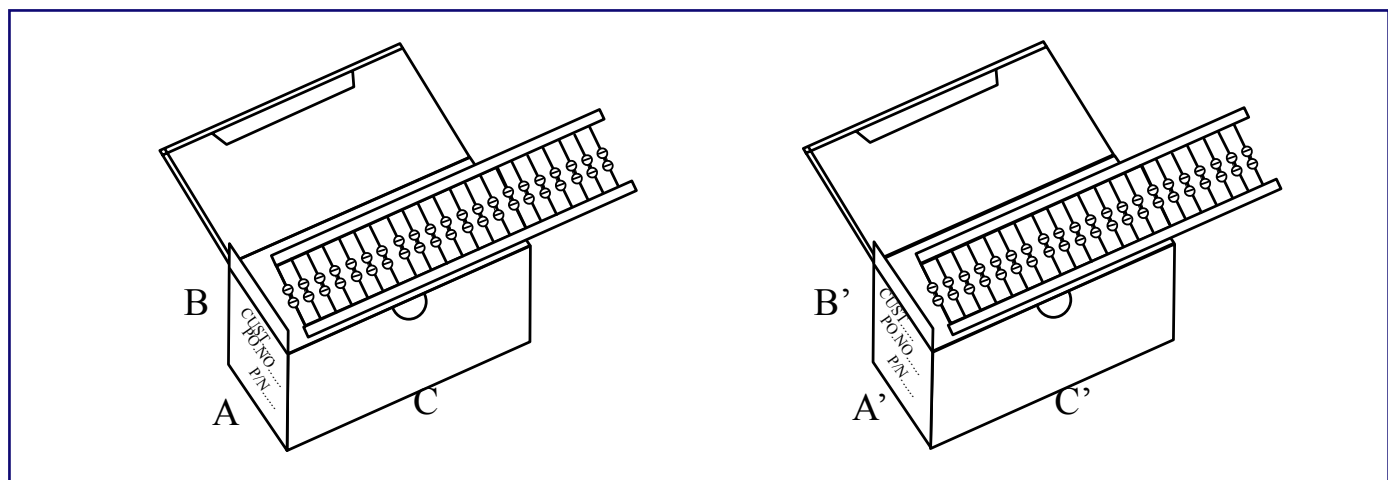
| Sym. | Dimensions   | Sym. | Dimensions    | Sym. | Dimensions   |
|------|--------------|------|---------------|------|--------------|
| A    | 52.00 ± 1.50 | E    | 0.00 ± 0.50   | T'   | 45.00 ± 0.50 |
| A'   | 26.00 ± 1.50 | F    | 1.00 (max)    | W    | 76.00 ± 0.50 |
| B    | 5.00 ± 0.50  | G    | 1.00 (max)    | W'   | 50.00 ± 0.50 |
| C    | 6.00 ± 1.00  | K    | 355.00 ± 0.50 |      |              |
| D    | 26.00 ± 0.50 | R    | 15.00 ± 0.50  |      |              |
| D'   | 13.00 ± 0.50 | T    | 71.00 ± 0.50  |      |              |

## (Axial Lead Type) Packing Unit for Reel

| Item              | TCAL0204        | TCAL0307        | TCAL0410        | TCAL0510        |
|-------------------|-----------------|-----------------|-----------------|-----------------|
| Q' TY/ Reel       | 5,000 PCS       | 5,000 PCS       | 5,000 PCS       | 3,000 PCS       |
| GW/Reel (Approx.) | 1.4 Kgm         | 1.6 Kgm         | 2.0 Kgm         | 2.0 Kgm         |
| Q' TY/CTN.        | 25,000 PCS      | 25,000 PCS      | 25,000 PCS      | 15,000 PCS      |
| NW/CTN. (Approx.) | 7.0 Kgm         | 8.0 Kgm         | 10.0 Kgm        | 10.0 Kgm        |
| GW/CTN. (Approx.) | 8.0 Kgm         | 9.0 Kgm         | 11.0 Kgm        | 11.0 Kgm        |
| Carton Size (mm)  | 397 × 397 × 479 | 397 × 397 × 479 | 397 × 397 × 479 | 397 × 397 × 479 |



**▶ (Axial Lead Type) Dimensions of Ammo Box**



| Sym. | Dimensions   | Sym. | Dimensions    | Sym. | Dimensions    |
|------|--------------|------|---------------|------|---------------|
| A    | 74.00 ± 0.30 | B    | 108.00 ± 0.30 | C    | 260.00 ± 0.30 |
| A'   | 48.00 ± 0.30 | B'   | 105.00 ± 0.30 | C'   | 255.00 ± 0.30 |

**▶ (Axial Lead Type) Packing Unit for Box**

| Item                | TCAL0204        | TCAL0307        | TCAL0410         | TCAL0510        |
|---------------------|-----------------|-----------------|------------------|-----------------|
| Q' TY / Ammo Box    | 3,000 PCS       | 3,000 PCS       | 2,000 PCS        | 1,500 PCS       |
| GW / Box(Approx.)   | 0.8 KGM         | 0.9 KGM         | 1.0 KGM          | 0.7 KGM         |
| Q' TY / CTN.        | 30,000 PCS      | 30,000 PCS      | 20,000 PCS       | 10,000 PCS      |
| NW / CTN. (Approx.) | 6.0 Kgm         | 7.0 Kgm         | 8.0 Kgm          | 5.0 Kgm         |
| GW / CTN.(Approx.)  | 8.0 Kgm         | 9.0 Kgm         | 10.0 Kgm         | 7.0 Kgm         |
| Carton Size (mm)    | 438 × 295 × 270 | 438 × 295 × 270 | 438 × 295 × 270s | 438 × 295 × 270 |

**▶ (Axial Lead Type) Packing Unit for Bulk**

| Item               | TCAL0204  | TCAL0307  | TCAL0410  | TCAL0510 |
|--------------------|-----------|-----------|-----------|----------|
| Q' TY / Bag        | 1,000 PCS | 1,000 PCS | 1,000 PCS | 500 PCS  |
| GW / Bag (Approx.) | 0.1 Kgm   | 0.15 Kgm  | 0.3 Kgm   | 0.3 Kgm  |

## How to Order



❶ Part Number: TCAL

❷ Form

| Code | Form                                      |
|------|---|
| N    | Normal Form                               |
| S    | Short Form                                |
| F    | F Forming                                 |
| U    | U Forming                                 |
| P    | Pana Forming without coating of lead wire |
| PC   | Pana Forming with coating of lead wire    |

❸ Package

| Code | Package     |
|------|-------------|
| P    | Bulk        |
| TR   | Taping Reel |
| TB   | Taping Box  |

❹ Size

| Code | Size       |
|------|------------|
| 0204 | 2.8×5.0mm  |
| 0307 | 3.0×7.0mm  |
| 0410 | 4.0×10.0mm |
| 0510 | 5.0×10.0mm |

❺ Inductance

| Code | Inductance |
|------|------------|
| R10  | 0.10μH     |
| 1R0  | 1.00μH     |
| 100  | 10.00μH    |
| 101  | 100.00μH   |
| 102  | 1000.00μH  |

❻ Tolerance

| Code | Tolerance |
|------|-----------|
| J    | 5%        |
| K    | 10%       |
| M    | 20%       |

## ▶ How to Select a fixed inductor

Perfectly, inductors should have zero resistance and capacitance. This is not practically possible, as the conducting copper wires, used for fixed inductors, have small internal resistance.

### Important criteria for the selection are:

- **Inductance Range (H):**  
The rated inductance range of the inductor. This is designated by  $\pm 10\%$  of the inductance.
- **Quality Factor (Q):**  
The Q value of an inductor is a measure of the relative losses in an inductor. The Q is also known as the “quality factor” and is technically defined as the ratio of inductive reactance to effective resistance.
- **Self-Resonant Frequency (SRF):**  
The frequency at which the inductor’s distributed capacitance resonates with the inductance. It is at this frequency that the inductance is equal to the capacitance and they cancel each other. The inductor will act purely resistive with a high impedance at the SRF point.
- **Permissible DC Current:**  
Measured in Ohms, it is the maximum DC current that the inductor should be exposed to.

## (TCAL0204) Characteristics

| Part Number     | Inductance (μH) | Q (min) | Freq. (MHz) | SRF (MHz)(min) | DCR (Ω)(max) | RDC (mA)(max) |
|-----------------|-----------------|---------|-------------|----------------|--------------|---------------|
| TCAL**0204-R22M | 0.22±20%        | 40      | 25.2        | 175            | 0.20         | 705           |
| TCAL**0204-R27M | 0.27±20%        | 40      | 25.2        | 160            | 0.22         | 670           |
| TCAL**0204-R33M | 0.33±20%        | 40      | 25.2        | 150            | 0.24         | 645           |
| TCAL**0204-R39M | 0.39±20%        | 50      | 25.2        | 150            | 0.27         | 605           |
| TCAL**0204-R47M | 0.47±20%        | 50      | 25.2        | 150            | 0.30         | 575           |
| TCAL**0204-R56M | 0.56±20%        | 50      | 25.2        | 150            | 0.34         | 540           |
| TCAL**0204-R68M | 0.68±20%        | 50      | 25.2        | 150            | 0.38         | 510           |
| TCAL**0204-R82M | 0.82±20%        | 50      | 25.2        | 150            | 0.43         | 480           |
| TCAL**0204-1R0K | 1.0±10%         | 50      | 25.2        | 150            | 0.46         | 465           |
| TCAL**0204-1R2K | 1.2±10%         | 50      | 7.96        | 110            | 0.52         | 435           |
| TCAL**0204-1R5K | 1.5±10%         | 50      | 7.96        | 80             | 0.57         | 415           |
| TCAL**0204-1R8K | 1.8±10%         | 50      | 7.96        | 66             | 0.60         | 405           |
| TCAL**0204-2R2K | 2.2±10%         | 50      | 7.96        | 60             | 0.65         | 390           |
| TCAL**0204-2R7K | 2.7±10%         | 50      | 7.96        | 54             | 0.73         | 370           |
| TCAL**0204-3R3K | 3.3±10%         | 50      | 7.96        | 48             | 0.82         | 345           |
| TCAL**0204-3R9K | 3.9±10%         | 50      | 7.96        | 44             | 0.90         | 330           |
| TCAL**0204-4R7K | 4.7±10%         | 50      | 7.96        | 38             | 1.00         | 315           |
| TCAL**0204-5R6K | 5.6±10%         | 50      | 7.96        | 34             | 1.10         | 300           |
| TCAL**0204-6R8K | 6.8±10%         | 50      | 7.96        | 30             | 1.20         | 285           |
| TCAL**0204-8R2K | 8.2±10%         | 50      | 7.96        | 26             | 1.30         | 275           |
| TCAL**0204-100K | 10±10%          | 50      | 7.96        | 24             | 1.40         | 265           |
| TCAL**0204-120K | 12±10%          | 50      | 2.52        | 22             | 1.50         | 255           |
| TCAL**0204-150K | 15±10%          | 50      | 2.52        | 20             | 1.65         | 245           |
| TCAL**0204-180K | 18±10%          | 50      | 2.52        | 18             | 1.90         | 225           |
| TCAL**0204-220K | 22±10%          | 50      | 2.52        | 17             | 2.20         | 210           |
| TCAL**0204-270K | 27±10%          | 50      | 2.52        | 16             | 2.50         | 200           |
| TCAL**0204-330K | 33±10%          | 50      | 2.52        | 14             | 3.80         | 160           |
| TCAL**0204-390K | 39±10%          | 50      | 2.52        | 13             | 4.20         | 150           |
| TCAL**0204-470K | 47±10%          | 50      | 2.52        | 12             | 4.60         | 145           |
| TCAL**0204-560K | 56±10%          | 40      | 2.52        | 11             | 5.10         | 140           |
| TCAL**0204-680K | 68±10%          | 40      | 2.52        | 10             | 5.60         | 130           |
| TCAL**0204-820K | 82±10%          | 40      | 2.52        | 9.5            | 9.60         | 100           |
| TCAL**0204-101K | 100±10%         | 40      | 2.52        | 8.0            | 10.8         | 95            |
| TCAL**0204-121K | 120±10%         | 40      | 0.796       | 6.5            | 12.5         | 85            |
| TCAL**0204-151K | 150±10%         | 40      | 0.796       | 6.0            | 14.5         | 80            |
| TCAL**0204-181K | 180±10%         | 40      | 0.796       | 5.5            | 16.3         | 75            |
| TCAL**0204-221K | 220±10%         | 40      | 0.796       | 5.0            | 20.0         | 70            |

## ▶ (TCAL0307) Characteristics

| Part Number     | Inductance( $\mu$ H) | Q(min) | Freq.(MHz) | SRF(MHz)(min) | DCR( $\Omega$ )(max) | RDC(mA)(max) |
|-----------------|----------------------|--------|------------|---------------|----------------------|--------------|
| TCAL**0307-R22M | 0.22 $\pm$ 20%       | 30     | 25.2       | 380           | 0.075                | 1150         |
| TCAL**0307-R27M | 0.27 $\pm$ 20%       | 30     | 25.2       | 360           | 0.08                 | 1110         |
| TCAL**0307-R33M | 0.33 $\pm$ 20%       | 30     | 25.2       | 350           | 0.08                 | 1110         |
| TCAL**0307-R39M | 0.39 $\pm$ 20%       | 30     | 25.2       | 320           | 0.09                 | 1000         |
| TCAL**0307-R47M | 0.47 $\pm$ 20%       | 30     | 25.2       | 300           | 0.10                 | 1000         |
| TCAL**0307-R56M | 0.56 $\pm$ 20%       | 30     | 25.2       | 280           | 0.11                 | 950          |
| TCAL**0307-R68M | 0.68 $\pm$ 20%       | 30     | 25.2       | 250           | 0.12                 | 900          |
| TCAL**0307-R82M | 0.82 $\pm$ 20%       | 30     | 25.2       | 200           | 0.12                 | 900          |
| TCAL**0307-1R0K | 1.0 $\pm$ 10%        | 40     | 25.2       | 180           | 0.15                 | 815          |
| TCAL**0307-1R2K | 1.2 $\pm$ 10%        | 40     | 7.96       | 165           | 0.18                 | 740          |
| TCAL**0307-1R5K | 1.5 $\pm$ 10%        | 40     | 7.96       | 150           | 0.20                 | 700          |
| TCAL**0307-1R8K | 1.8 $\pm$ 10%        | 50     | 7.96       | 125           | 0.23                 | 655          |
| TCAL**0307-2R2K | 2.2 $\pm$ 10%        | 50     | 7.96       | 110           | 0.25                 | 630          |
| TCAL**0307-2R7K | 2.7 $\pm$ 10%        | 50     | 7.96       | 95            | 0.28                 | 595          |
| TCAL**0307-3R3K | 3.3 $\pm$ 10%        | 50     | 7.96       | 70            | 0.30                 | 575          |
| TCAL**0307-3R9K | 3.9 $\pm$ 10%        | 45     | 7.96       | 65            | 0.32                 | 555          |
| TCAL**0307-4R7K | 4.7 $\pm$ 10%        | 45     | 7.96       | 50            | 0.35                 | 530          |
| TCAL**0307-5R6K | 5.6 $\pm$ 10%        | 45     | 7.96       | 40            | 0.40                 | 500          |
| TCAL**0307-6R8K | 6.8 $\pm$ 10%        | 40     | 7.96       | 30            | 0.45                 | 470          |
| TCAL**0307-8R2K | 8.2 $\pm$ 10%        | 40     | 7.96       | 28            | 0.55                 | 425          |
| TCAL**0307-100K | 10 $\pm$ 10%         | 40     | 7.96       | 22            | 0.72                 | 370          |
| TCAL**0307-120K | 12 $\pm$ 10%         | 40     | 2.52       | 20            | 0.80                 | 350          |
| TCAL**0307-150K | 15 $\pm$ 10%         | 50     | 2.52       | 16            | 0.88                 | 335          |
| TCAL**0307-180K | 18 $\pm$ 10%         | 50     | 2.52       | 15            | 1.00                 | 315          |
| TCAL**0307-220K | 22 $\pm$ 10%         | 50     | 2.52       | 13            | 1.20                 | 285          |
| TCAL**0307-270K | 27 $\pm$ 10%         | 50     | 2.52       | 11            | 1.35                 | 270          |
| TCAL**0307-330K | 33 $\pm$ 10%         | 50     | 2.52       | 10            | 1.50                 | 255          |
| TCAL**0307-390K | 39 $\pm$ 10%         | 50     | 2.52       | 9.5           | 1.70                 | 240          |
| TCAL**0307-470K | 47 $\pm$ 10%         | 60     | 2.52       | 8.5           | 2.30                 | 205          |
| TCAL**0307-560K | 56 $\pm$ 10%         | 60     | 2.52       | 7.5           | 2.60                 | 195          |
| TCAL**0307-680K | 68 $\pm$ 10%         | 60     | 2.52       | 6.5           | 2.90                 | 185          |
| TCAL**0307-820K | 82 $\pm$ 10%         | 60     | 2.52       | 6.0           | 3.20                 | 175          |
| TCAL**0307-101K | 100 $\pm$ 10%        | 60     | 2.52       | 5.5           | 3.50                 | 165          |
| TCAL**0307-121K | 120 $\pm$ 10%        | 60     | 0.796      | 5.4           | 3.80                 | 160          |
| TCAL**0307-151K | 150 $\pm$ 10%        | 60     | 0.796      | 4.75          | 4.40                 | 150          |
| TCAL**0307-181K | 180 $\pm$ 10%        | 60     | 0.796      | 4.35          | 5.00                 | 140          |
| TCAL**0307-221K | 220 $\pm$ 10%        | 60     | 0.796      | 4.0           | 5.70                 | 130          |
| TCAL**0307-271K | 270 $\pm$ 10%        | 60     | 0.796      | 3.7           | 6.50                 | 120          |
| TCAL**0307-331K | 330 $\pm$ 10%        | 60     | 0.796      | 3.4           | 9.50                 | 100          |
| TCAL**0307-391K | 390 $\pm$ 10%        | 60     | 0.796      | 2.8           | 10.5                 | 95           |
| TCAL**0307-471K | 470 $\pm$ 10%        | 60     | 0.796      | 2.55          | 11.6                 | 90           |
| TCAL**0307-561K | 560 $\pm$ 10%        | 60     | 0.796      | 2.35          | 13.0                 | 85           |
| TCAL**0307-681K | 680 $\pm$ 10%        | 60     | 0.796      | 2.0           | 18.0                 | 75           |
| TCAL**0307-821K | 820 $\pm$ 10%        | 60     | 0.796      | 1.5           | 23.0                 | 65           |
| TCAL**0307-102K | 1000 $\pm$ 10%       | 60     | 0.796      | 1.2           | 26.0                 | 60           |

## ▶ (TCAL0410) Characteristics

| Part Number     | Inductance( $\mu$ H) | Q(min) | Freq.(MHz) | SRF(MHz)(min) | DCR( $\Omega$ )(max) | RDC(mA)(max) |
|-----------------|----------------------|--------|------------|---------------|----------------------|--------------|
| TCAL**0410-R22M | 0.22 $\pm$ 20%       | 25     | 25.2       | 380           | 0.21                 | 880          |
| TCAL**0410-R27M | 0.27 $\pm$ 20%       | 25     | 25.2       | 340           | 0.24                 | 800          |
| TCAL**0410-R33M | 0.33 $\pm$ 20%       | 25     | 25.2       | 300           | 0.28                 | 750          |
| TCAL**0410-R39M | 0.39 $\pm$ 20%       | 25     | 25.2       | 280           | 0.32                 | 680          |
| TCAL**0410-R47M | 0.47 $\pm$ 20%       | 25     | 25.2       | 250           | 0.36                 | 650          |
| TCAL**0410-R56M | 0.56 $\pm$ 20%       | 25     | 25.2       | 230           | 0.41                 | 600          |
| TCAL**0410-R68M | 0.68 $\pm$ 20%       | 25     | 25.2       | 210           | 0.47                 | 550          |
| TCAL**0410-R82M | 0.82 $\pm$ 20%       | 45     | 25.2       | 172           | 0.17                 | 980          |
| TCAL**0410-1R0K | 1.0 $\pm$ 10%        | 45     | 25.2       | 157           | 0.19                 | 920          |
| TCAL**0410-1R2K | 1.2 $\pm$ 10%        | 50     | 7.96       | 144           | 0.21                 | 880          |
| TCAL**0410-1R5K | 1.5 $\pm$ 10%        | 50     | 7.96       | 131           | 0.23                 | 830          |
| TCAL**0410-1R8K | 1.8 $\pm$ 10%        | 55     | 7.96       | 121           | 0.25                 | 790          |
| TCAL**0410-2R2K | 2.2 $\pm$ 10%        | 55     | 7.96       | 110           | 0.28                 | 750          |
| TCAL**0410-2R7K | 2.7 $\pm$ 10%        | 60     | 7.96       | 100           | 0.30                 | 720          |
| TCAL**0410-3R3K | 3.3 $\pm$ 10%        | 60     | 7.96       | 94            | 0.34                 | 670          |
| TCAL**0410-3R9K | 3.9 $\pm$ 10%        | 60     | 7.96       | 86            | 0.37                 | 640          |
| TCAL**0410-4R7K | 4.7 $\pm$ 10%        | 60     | 7.96       | 80            | 0.39                 | 620          |
| TCAL**0410-5R6K | 5.6 $\pm$ 10%        | 60     | 7.96       | 74            | 0.43                 | 590          |
| TCAL**0410-6R8K | 6.8 $\pm$ 10%        | 60     | 7.96       | 68            | 0.48                 | 550          |
| TCAL**0410-8R2K | 8.2 $\pm$ 10%        | 60     | 7.96       | 53            | 0.52                 | 530          |
| TCAL**0410-100K | 10 $\pm$ 10%         | 60     | 7.96       | 45            | 0.58                 | 500          |
| TCAL**0410-120K | 12 $\pm$ 10%         | 60     | 2.52       | 34            | 0.63                 | 480          |
| TCAL**0410-150K | 15 $\pm$ 10%         | 60     | 2.52       | 20            | 0.72                 | 460          |
| TCAL**0410-180K | 18 $\pm$ 10%         | 60     | 2.52       | 14            | 0.77                 | 430          |
| TCAL**0410-220K | 22 $\pm$ 10%         | 60     | 2.52       | 9.9           | 0.84                 | 410          |
| TCAL**0410-270K | 27 $\pm$ 10%         | 50     | 2.52       | 7.6           | 0.94                 | 390          |
| TCAL**0410-330K | 33 $\pm$ 10%         | 50     | 2.52       | 6.3           | 1.03                 | 370          |
| TCAL**0410-390K | 39 $\pm$ 10%         | 50     | 2.52       | 6.3           | 1.12                 | 350          |
| TCAL**0410-470K | 47 $\pm$ 10%         | 50     | 2.52       | 6.3           | 1.22                 | 340          |
| TCAL**0410-560K | 56 $\pm$ 10%         | 40     | 2.52       | 6.2           | 1.34                 | 320          |
| TCAL**0410-680K | 68 $\pm$ 10%         | 40     | 2.52       | 5.7           | 1.47                 | 305          |
| TCAL**0410-820K | 82 $\pm$ 10%         | 35     | 2.52       | 5.3           | 1.62                 | 290          |
| TCAL**0410-101K | 100 $\pm$ 10%        | 35     | 2.52       | 4.8           | 1.80                 | 275          |
| TCAL**0410-121K | 120 $\pm$ 10%        | 60     | 0.796      | 3.8           | 3.70                 | 185          |
| TCAL**0410-151K | 150 $\pm$ 10%        | 60     | 0.796      | 3.5           | 4.20                 | 175          |
| TCAL**0410-181K | 180 $\pm$ 10%        | 60     | 0.796      | 3.3           | 4.60                 | 165          |
| TCAL**0410-221K | 220 $\pm$ 10%        | 60     | 0.796      | 3.0           | 5.10                 | 155          |
| TCAL**0410-271K | 270 $\pm$ 10%        | 60     | 0.796      | 2.8           | 5.80                 | 145          |
| TCAL**0410-331K | 330 $\pm$ 10%        | 60     | 0.796      | 2.6           | 6.40                 | 137          |
| TCAL**0410-391K | 390 $\pm$ 10%        | 60     | 0.796      | 2.4           | 7.00                 | 133          |
| TCAL**0410-471K | 470 $\pm$ 10%        | 60     | 0.796      | 2.25          | 7.70                 | 126          |
| TCAL**0410-561K | 560 $\pm$ 10%        | 60     | 0.796      | 2.1           | 8.50                 | 120          |
| TCAL**0410-681K | 680 $\pm$ 10%        | 55     | 0.796      | 1.95          | 9.40                 | 113          |
| TCAL**0410-821K | 820 $\pm$ 10%        | 55     | 0.796      | 1.85          | 10.5                 | 100          |
| TCAL**0410-102K | 1000 $\pm$ 10%       | 50     | 0.796      | 1.4           | 14.0                 | 100          |

## Fixed Inductors (TCAL0510) Characteristics

| Part Number     | Inductance( $\mu$ H) | Q(min) | Freq.(MHz) | SRF(MHz)(min) | DCR( $\Omega$ )(max) | RDC(mA)(max) |
|-----------------|----------------------|--------|------------|---------------|----------------------|--------------|
| TCAL**0510-R56M | 0.56 $\pm$ 10%       | 50     | 25.2       | 280           | 0.14                 | 1150         |
| TCAL**0510-R68K | 0.68 $\pm$ 10%       | 50     | 25.2       | 250           | 0.15                 | 1100         |
| TCAL**0510-R82M | 0.82 $\pm$ 10%       | 50     | 25.2       | 220           | 0.22                 | 900          |
| TCAL**0510-1R0K | 1.0 $\pm$ 10%        | 50     | 25.2       | 200           | 0.29                 | 785          |
| TCAL**0510-1R2K | 1.2 $\pm$ 10%        | 33     | 7.96       | 180           | 0.42                 | 650          |
| TCAL**0510-1R5K | 1.5 $\pm$ 10%        | 33     | 7.96       | 160           | 0.50                 | 600          |
| TCAL**0510-1R8K | 1.8 $\pm$ 10%        | 33     | 7.96       | 150           | 0.65                 | 525          |
| TCAL**0510-2R2K | 2.2 $\pm$ 10%        | 33     | 7.96       | 135           | 0.95                 | 435          |
| TCAL**0510-2R7K | 2.7 $\pm$ 10%        | 33     | 7.96       | 120           | 1.5                  | 385          |
| TCAL**0510-3R3K | 3.3 $\pm$ 10%        | 33     | 7.96       | 110           | 2.0                  | 300          |
| TCAL**0510-3R9K | 3.9 $\pm$ 10%        | 33     | 7.96       | 100           | 2.3                  | 280          |
| TCAL**0510-4R7K | 4.7 $\pm$ 10%        | 33     | 7.96       | 90            | 2.8                  | 260          |
| TCAL**0510-5R6K | 5.6 $\pm$ 10%        | 45     | 7.96       | 60            | 0.32                 | 495          |
| TCAL**0510-6R8K | 6.8 $\pm$ 10%        | 45     | 7.96       | 55            | 0.5                  | 395          |
| TCAL**0510-8R2K | 8.2 $\pm$ 10%        | 45     | 7.96       | 50            | 0.6                  | 360          |
| TCAL**0510-100K | 10 $\pm$ 10%         | 45     | 7.96       | 45            | 0.9                  | 290          |
| TCAL**0510-120K | 12 $\pm$ 10%         | 60     | 2.52       | 42            | 1.2                  | 265          |
| TCAL**0510-150K | 15 $\pm$ 10%         | 65     | 2.52       | 40            | 1.7                  | 240          |
| TCAL**0510-180K | 18 $\pm$ 10%         | 65     | 2.52       | 34            | 2.3                  | 185          |
| TCAL**0510-220K | 22 $\pm$ 10%         | 65     | 2.52       | 30            | 2.6                  | 175          |
| TCAL**0510-270K | 27 $\pm$ 10%         | 45     | 2.52       | 25            | 2.0                  | 170          |
| TCAL**0510-330K | 33 $\pm$ 10%         | 45     | 2.52       | 19            | 2.3                  | 165          |
| TCAL**0510-390K | 39 $\pm$ 10%         | 45     | 2.52       | 15            | 2.5                  | 165          |
| TCAL**0510-470K | 47 $\pm$ 10%         | 45     | 2.52       | 14            | 2.6                  | 165          |
| TCAL**0510-560K | 56 $\pm$ 10%         | 50     | 2.52       | 12            | 3.0                  | 164          |
| TCAL**0510-680K | 68 $\pm$ 10%         | 50     | 2.52       | 11            | 3.3                  | 156          |
| TCAL**0510-820K | 82 $\pm$ 10%         | 50     | 2.52       | 10            | 3.9                  | 143          |
| TCAL**0510-101K | 100 $\pm$ 10%        | 50     | 2.52       | 9             | 4.5                  | 133          |
| TCAL**0510-121K | 120 $\pm$ 10%        | 60     | 0.796      | 8.5           | 5.2                  | 124          |
| TCAL**0510-151K | 150 $\pm$ 10%        | 40     | 0.796      | 7.8           | 6.18                 | 114          |
| TCAL**0510-181K | 180 $\pm$ 10%        | 60     | 0.796      | 7.0           | 6.8                  | 108          |
| TCAL**0510-221K | 220 $\pm$ 10%        | 60     | 0.796      | 6.2           | 7.5                  | 103          |
| TCAL**0510-271K | 270 $\pm$ 10%        | 60     | 0.796      | 5.6           | 8.2                  | 103          |
| TCAL**0510-331K | 330 $\pm$ 10%        | 60     | 0.796      | 5.0           | 9.1                  | 102          |
| TCAL**0510-391K | 390 $\pm$ 10%        | 60     | 0.796      | 4.5           | 10                   | 102          |
| TCAL**0510-471K | 470 $\pm$ 10%        | 60     | 0.796      | 4.0           | 11                   | 100          |
| TCAL**0510-561K | 560 $\pm$ 10%        | 60     | 0.796      | 3.6           | 12.3                 | 85           |
| TCAL**0510-681K | 680 $\pm$ 10%        | 60     | 0.796      | 3.6           | 13.7                 | 81           |
| TCAL**0510-821K | 820 $\pm$ 10%        | 60     | 0.796      | 1.32          | 3.1                  | 180          |
| TCAL**0510-102K | 1000 $\pm$ 10%       | 60     | 0.796      | 1.25          | 4.1                  | 156          |

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# Large Current Power Inductor

Large Current Power Inductor, Low DCR - TCDA Series

Technology of Diagonal Through Hole Power Inductor Design (TCDA)

## ▶ Preview

Token's TCDA Large Current Series power inductors feature with high current, low DC resistance, high frequency, easy heat dissipation, and high reliability advantages.

Token utilizes the latest technology of diagonal through hole power inductor design enabling the most cost-effective propose in manufacturing TCDA Products.

Token will also produce devices outside these specifications to meet customer requirements, with comprehensive application engineering and design support available for customers worldwide.

The TCDA series is lead-free and RoHS compliant. Detailed specifications, both mechanical and electrical, please contact our sales representative for more information.

## Features :

- Low DCR.
- High Frequency (up to 1MHz).
- Low Profile: 7.5mm ~ 10.0mm
- For Large Current Use: 12 ~ 45 amp.
- Diagonal Through Hole Power Inductor.

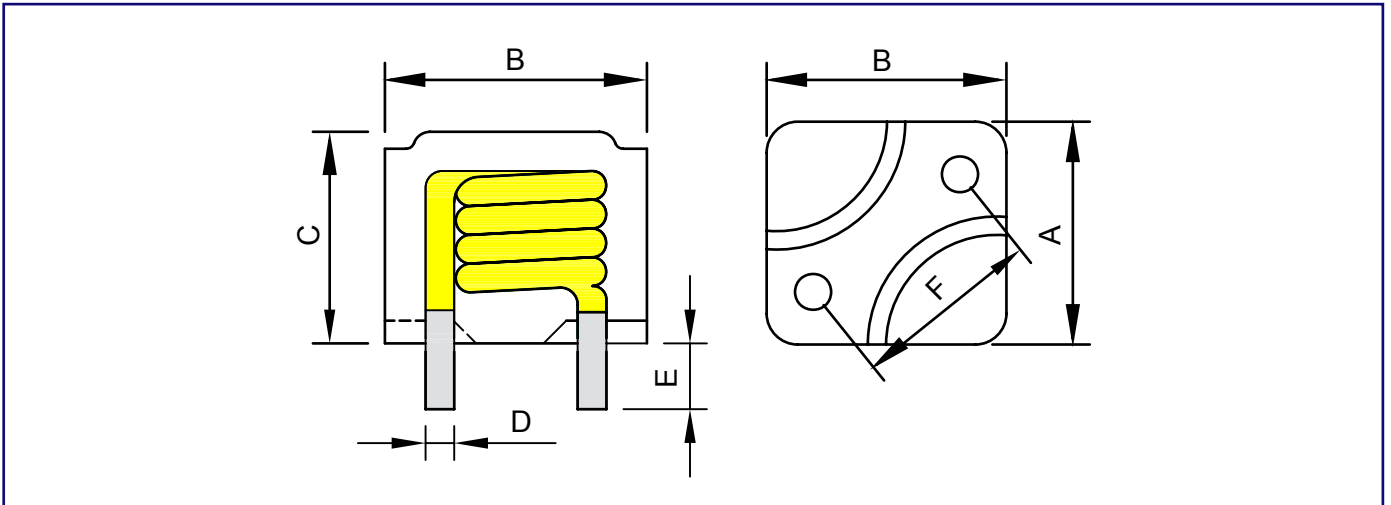
## Applications :

- Graphic Card/ VGA Module.
- Inductor for general purpose use.
- Laptop Computer / Notebook Computer.
- DC/DC converter or VRM applications.
- Thin type on-board power supply module for exchanger.



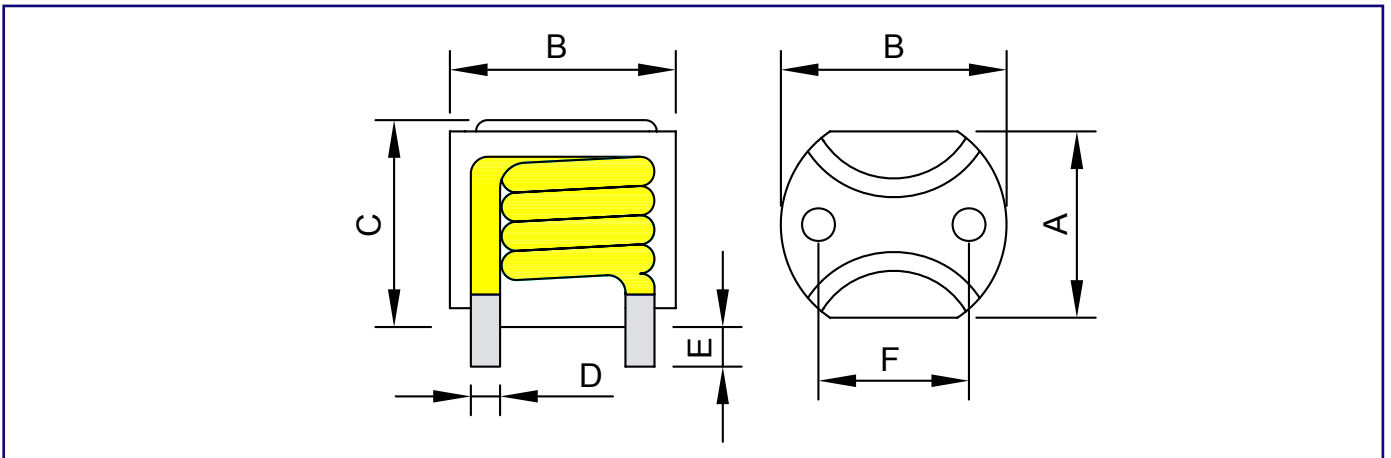


► (TCDA1312) Configurations & Dimensions



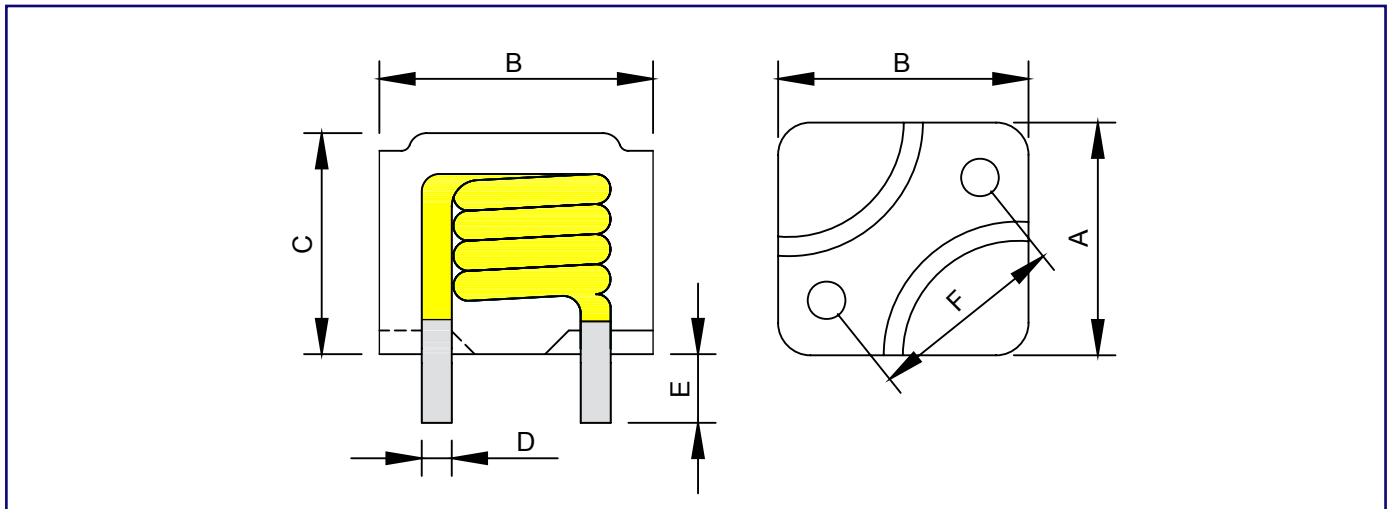
| Type     | A          | B          | C           | D           | E         | F          |
|----------|------------|------------|-------------|-------------|-----------|------------|
| TCDA1312 | 12.0 ± 0.5 | 13.0 ± 0.5 | by each P/N | by each P/N | 3.4 ± 0.5 | 10.0 ± 0.5 |

► (TCDA1210) Configurations & Dimensions



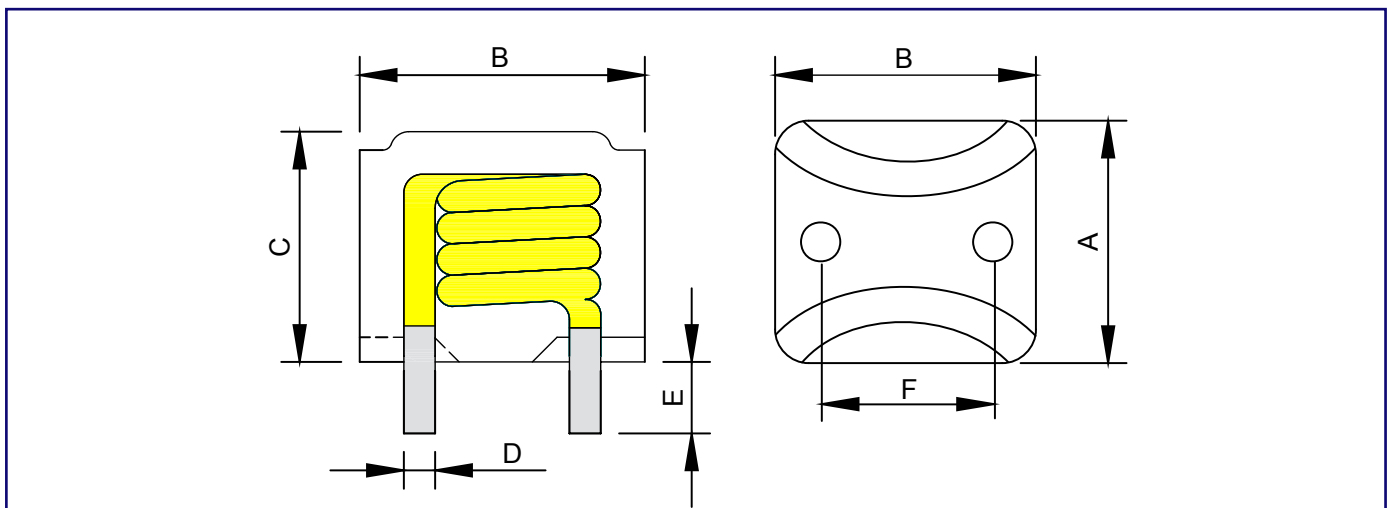
| Type     | A          | B          | C           | D           | E         | F         |
|----------|------------|------------|-------------|-------------|-----------|-----------|
| TCDA1210 | 10.2 ± 0.5 | 12.3 ± 0.5 | by each P/N | by each P/N | 3.5 ± 0.5 | 8.0 ± 0.5 |

## ▶ (TCDA1109 & TCDA1090) Configurations & Dimensions



| Type     | A          | B          | C           | D           | E         | F         |
|----------|------------|------------|-------------|-------------|-----------|-----------|
| TCDA1109 | 11.0 ± 0.5 | 11.0 ± 0.5 | by each P/N | by each P/N | 3.4 ± 0.5 | 8.5 ± 0.5 |
| TCDA1090 | 11.0 max   | 11.0 max   | by each P/N | by each P/N | 3.4 ± 0.5 | 7.5 ± 0.5 |

## ▶ Large Current (TCDA0707) Configurations & Dimensions



| Type     | A         | B         | C           | D           | E         | F         |
|----------|-----------|-----------|-------------|-------------|-----------|-----------|
| TCDA0707 | 7.4 ± 0.5 | 7.4 ± 0.5 | by each P/N | by each P/N | 3.5 ± 0.5 | 5.0 ± 0.5 |

## ▶ (TCDA1312) Electrical Characteristics

| Part Number   | L0 Inductance (μH)<br>±20% @0A | C (max) (mm) | D ± 0.1 (mm) | DCR (mΩ)  |       | Heat Rating Current Idc (Amp) Typical | Saturation Current Isat (Amp) Typical |
|---------------|--------------------------------|--------------|--------------|-----------|-------|---------------------------------------|---------------------------------------|
|               |                                |              |              | (Typical) | (Max) |                                       |                                       |
| TCDA1312-R22M | 0.22                           | 9            | 1.7          | 0.40      | 0.55  | 45                                    | 60                                    |
| TCDA1312-R30M | 0.30                           | 9            | 1.7          | 0.55      | 0.70  | 40                                    | 60                                    |
| TCDA1312-R33M | 0.33                           | 9            | 1.7          | 0.55      | 0.70  | 40                                    | 60                                    |
| TCDA1312-R39M | 0.39                           | 9            | 1.7          | 0.55      | 0.70  | 40                                    | 60                                    |
| TCDA1312-R47M | 0.47                           | 10           | 1.7          | 0.70      | 0.80  | 40                                    | 60                                    |
| TCDA1312-R50M | 0.50                           | 10           | 1.7          | 0.70      | 0.80  | 40                                    | 60                                    |
| TCDA1312-R56M | 0.56                           | 10           | 1.7          | 0.70      | 0.80  | 40                                    | 60                                    |
| TCDA1312-R60M | 0.60                           | 10           | 1.7          | 0.70      | 0.80  | 40                                    | 60                                    |
| TCDA1312-R68M | 0.68                           | 10           | 1.7          | 0.70      | 0.80  | 40                                    | 50                                    |
| TCDA1312-R80M | 0.8                            | 10           | 1.7          | 0.70      | 0.85  | 40                                    | 50                                    |
| TCDA1312-1R0M | 1.0                            | 10           | 1.5          | 1.20      | 1.35  | 30                                    | 50                                    |
| TCDA1312-1R2M | 1.2                            | 10           | 1.5          | 1.20      | 1.50  | 30                                    | 40                                    |
| TCDA1312-1R5M | 1.5                            | 10           | 1.4          | 1.50      | 1.70  | 25                                    | 30                                    |
| TCDA1312-2R0M | 2.0                            | 10           | 1.2          | 2.90      | 3.30  | 17                                    | 25                                    |
| TCDA1312-2R2M | 2.2                            | 10           | 1.2          | 2.90      | 3.30  | 17                                    | 25                                    |

Note: All test Data is referenced to 25°C ambient.

Typical Heat Rating DC Current would cause an approximately ΔT of 40°C.

Typical Saturation DC Current would cause Lo to drop approximately 20%.

Operating Temperature Range: -25°C to +125°C.

## ▶ (TCDA1210) Electrical Characteristics

| Part Number   | L0 Inductance (μH)<br>±20% @0A | C (max) (mm) | D ± 0.1 (mm) | DCR (mΩ)  |       | Heat Rating Current I <sub>dc</sub> (Amp) Typical | Saturation Current I <sub>sat</sub> (Amp) Typical |
|---------------|--------------------------------|--------------|--------------|-----------|-------|---|---|
|               |                                |              |              | (Typical) | (Max) |   |   |
| TCDA1210-R22M | 0.22                           | 7.5          | 1.4          | 0.5       | 0.6   | 38  | 56  |
| TCDA1210-R33M | 0.33                           | 8.6          | 1.4          | 0.7       | 0.8   | 33  | 48  |
| TCDA1210-R39M | 0.39                           | 8.6          | 1.4          | 0.7       | 0.8   | 33  | 45  |
| TCDA1210-R47M | 0.47                           | 10           | 1.5          | 0.85      | 1.0   | 30  | 40  |
| TCDA1210-R56M | 0.56                           | 10           | 1.5          | 0.85      | 1.0   | 30  | 40  |
| TCDA1210-R68M | 0.68                           | 10           | 1.5          | 0.85      | 1.0   | 30  | 40  |
| TCDA1210-R80M | 0.8                            | 10           | 1.4          | 1.25      | 1.45  | 26  | 36  |
| TCDA1210-1R0M | 1.0                            | 10           | 1.2          | 1.75      | 2.0   | 24  | 32  |
| TCDA1210-1R2M | 1.0                            | 10           | 1.2          | 1.75      | 2.0   | 24  | 30  |
| TCDA1210-1R5M | 1.5                            | 10           | 1.0          | 3.0       | 3.5   | 22  | 30  |
| TCDA1210-2R2M | 2.2                            | 10           | 1.0          | 3.8       | 4.6   | 20  | 25  |
| TCDA1210-2R8M | 2.8                            | 10           | 1.0          | 4.5       | 5.0   | 18  | 20  |
| TCDA1210-3R3M | 3.3                            | 10           | 0.8          | 6.4       | 7.2   | 14  | 16  |
| TCDA1210-4R7M | 4.7                            | 10           | 0.8          | 8.3       | 9.8   | 12  | 15  |

Note: All test Data is referenced to 25°C ambient.

Typical Heat Rating DC Current would cause an approximately ΔT of 40°C.

Typical Saturation DC Current would cause Lo to drop approximately 20%.

Operating Temperature Range: -25°C to +125°C.

## ▶ (TCDA1109) Electrical Characteristics

| Part Number   | L0 Inductance ( $\mu\text{H}$ )<br>$\pm 20\%$ @0A | C (max) (mm) | D $\pm$ 0.1 (mm) | DCR (m $\Omega$ ) |       | Heat Rating Current Idc (Amp) Typical | Saturation Current Isat (Amp) Typical |
|---------------|---|--------------|------------------|-------------------|-------|---------------------------------------|---------------------------------------|
|               |   |              |                  | (Typical)         | (Max) |                                       |                                       |
| TCDA1109-R25M | 0.25 (T1.5)                                       | 8            | 1.4              | 0.50              | 0.60  | 50                                    | 60                                    |
| TCDA1109-R25M | 0.25 (T2.5)                                       | 8            | 1.5              | 0.70              | 0.80  | 45                                    | 60                                    |
| TCDA1109-R30M | 0.30  | 8            | 1.5              | 0.70              | 0.80  | 45                                    | 60                                    |
| TCDA1109-R33M | 0.33  | 8            | 1.5              | 0.70              | 0.80  | 45                                    | 60                                    |
| TCDA1109-R36M | 0.36  | 8            | 1.5              | 0.70              | 0.80  | 45                                    | 60                                    |
| TCDA1109-R40M | 0.40  | 8            | 1.5              | 0.70              | 0.80  | 45                                    | 60                                    |
| TCDA1109-R47M | 0.47  | 9            | 1.5              | 0.90              | 1.00  | 40                                    | 60                                    |
| TCDA1109-R50M | 0.50  | 9            | 1.5              | 0.90              | 1.00  | 40                                    | 60                                    |
| TCDA1109-R56M | 0.56  | 9            | 1.5              | 0.90              | 1.00  | 40                                    | 50                                    |
| TCDA1109-R60M | 0.60  | 9            | 1.5              | 0.90              | 1.00  | 40                                    | 50                                    |
| TCDA1109-R68M | 0.68  | 9            | 1.5              | 0.90              | 1.00  | 40                                    | 40                                    |
| TCDA1109-R80M | 0.8   | 10           | 1.4              | 1.30              | 1.60  | 25                                    | 45                                    |
| TCDA1109-1R0M | 1.0   | 10           | 1.4              | 1.40              | 1.80  | 25                                    | 45                                    |
| TCDA1109-1R5M | 1.5   | 10           | 1.2              | 2.20              | 2.50  | 21                                    | 32                                    |
| TCDA1109-2R0M | 2.0   | 10           | 1.0              | 3.30              | 4.00  | 15                                    | 27                                    |
| TCDA1109-2R2M | 2.2   | 10           | 1.0              | 4.50              | 5.00  | 15                                    | 40                                    |
| TCDA1109-2R5M | 2.5   | 10           | 1.0              | 4.50              | 5.00  | 15                                    | 30                                    |

Note: All test Data is referenced to 25°C ambient.

Typical Heat Rating DC Current would cause an approximately  $\Delta T$  of 40°C.

Typical Saturation DC Current would cause Lo to drop approximately 20%.

Operating Temperature Range: -25°C to +125°C.

## ▶ (TCDA1090) Electrical Characteristics

| Part Number   | L0 Inductance ( $\mu\text{H}$ )<br>$\pm 20\%$ @0A | C (max) (mm) | D $\pm$ 0.1 (mm) | DCR ( $\text{m}\Omega$ ) |       | Heat Rating Current I <sub>dc</sub> (Amp) Typical | Saturation Current I <sub>sat</sub> (Amp) Typical |
|---------------|---|--------------|------------------|--------------------------|-------|---|---|
|               |   |              |                  | (Typical)                | (Max) |   |   |
| TCDA1090-R15M | 0.15  | 9            | 1.4              | 0.45                     | 0.60  | 40  | 60  |
| TCDA1090-R20M | 0.20  | 9            | 1.4              | 0.45                     | 0.60  | 40  | 60  |
| TCDA1090-R25M | 0.25 (1.5T)                                       | 9            | 1.4              | 0.45                     | 0.60  | 40  | 50  |
| TCDA1090-R25M | 0.25 (2.5T)                                       | 10           | 1.4              | 0.65                     | 0.75  | 40  | 60  |
| TCDA1090-R30M | 0.30  | 10           | 1.4              | 0.65                     | 0.75  | 40  | 60  |
| TCDA1090-R33M | 0.33  | 10           | 1.4              | 0.65                     | 0.75  | 40  | 60  |
| TCDA1090-R36M | 0.36  | 10           | 1.4              | 0.65                     | 0.75  | 40  | 50  |
| TCDA1090-R39M | 0.39  | 10           | 1.4              | 0.65                     | 0.75  | 40  | 50  |
| TCDA1090-R47M | 0.47 (2.5T)                                       | 10           | 1.4              | 0.65                     | 0.75  | 40  | 50  |
| TCDA1090-R47M | 0.47 (3.5T)                                       | 10           | 1.4              | 0.90                     | 1.10  | 35  | 50  |
| TCDA1090-R60M | 0.60  | 10           | 1.4              | 0.90                     | 1.10  | 35  | 50  |
| TCDA1090-R68M | 0.68  | 10           | 1.4              | 0.90                     | 1.10  | 35  | 40  |
| TCDA1090-R80M | 0.8   | 10           | 1.4              | 1.10                     | 1.30  | 33  | 40  |
| TCDA1090-1R0M | 1.0   | 10           | 1.2              | 1.55                     | 1.80  | 27  | 40  |
| TCDA1090-1R2M | 1.2   | 10           | 1.2              | 1.90                     | 2.20  | 25  | 30  |
| TCDA1090-1R5M | 1.5   | 10           | 1.0              | 2.70                     | 3.00  | 21  | 30  |
| TCDA1090-1R8M | 1.8   | 10           | 1.0              | 2.70                     | 3.00  | 21  | 30  |
| TCDA1090-2R2M | 2.2   | 10           | 1.2              | 3.70                     | 4.00  | 18  | 30  |

Note: All test Data is referenced to 25°C ambient.

Typical Heat Rating DC Current would cause an approximately  $\Delta T$  of 40°C.

Typical Saturation DC Current would cause L<sub>0</sub> to drop approximately 20%.

Operating Temperature Range: -25°C to +125°C.

## ▶ (TCDA0707) Electrical Characteristics

| Part Number   | L0 Inductance ( $\mu\text{H}$ ) $\pm 20\%$ @0A | C (max) (mm) | D $\pm 0.1$ (mm) | DCR (m $\Omega$ ) |       | Heat Rating Current Idc (Amp) Typical | Saturation Current Isat (Amp) Typical |
|---------------|--|--------------|------------------|-------------------|-------|---------------------------------------|---------------------------------------|
|               |  |              |                  | (Typical)         | (Max) |                                       |                                       |
| TCDA0707-R30M | 0.30   | 8            | 0.8              | 1.80              | 2.60  | 20                                    | 36                                    |
| TCDA0707-R36M | 0.36   | 8            | 0.8              | 1.80              | 2.60  | 20                                    | 34                                    |
| TCDA0707-R39M | 0.39   | 8            | 0.8              | 1.80              | 2.60  | 20                                    | 32                                    |
| TCDA0707-R47M | 0.47   | 8            | 0.8              | 2.40              | 3.30  | 18                                    | 30                                    |
| TCDA0707-R60M | 0.60   | 8            | 0.8              | 2.40              | 3.30  | 18                                    | 28                                    |
| TCDA0707-R68M | 0.68   | 8            | 0.8              | 2.40              | 3.30  | 18                                    | 27                                    |
| TCDA0707-R80M | 0.8  | 8            | 0.8              | 3.30              | 4.50  | 16                                    | 26                                    |
| TCDA0707-1R0M | 1.0  | 8            | 0.8              | 3.30              | 4.50  | 16                                    | 25                                    |
| TCDA0707-1R2M | 1.2  | 8.5          | 0.8              | 3.30              | 4.50  | 16                                    | 24                                    |
| TCDA0707-1R5M | 1.5  | 8.5          | 0.8              | 4.00              | 4.80  | 15                                    | 20                                    |
| TCDA0707-1R8M | 1.8  | 9            | 0.8              | 4.00              | 4.80  | 15                                    | 20                                    |
| TCDA0707-2R2M | 2.2  | 10           | 0.8              | 5.00              | 6.00  | 10                                    | 15                                    |

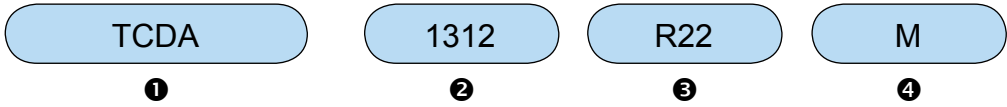
**Note:** All test Data is referenced to 25°C ambient.

Typical Heat Rating DC Current would cause an approximately  $\Delta T$  of 40°C.

Typical Saturation DC Current would cause Lo to drop approximately 20%.

Operating Temperature Range: -25°C to +125°C.

▶ (TCUU98V, TCUU98H, TCUU10, TCUU16) How to Order



① Part Number: TCDA

② Size

| Code | Size        |
|------|-------------|
| 1312 | 12.0×13.0mm |
| 1210 | 10.2×12.3mm |
| 1109 | 11.0×11.0mm |
| 1090 | 11.0×11.0mm |
| 0707 | 7.4×7.4mm   |

③ Inductance

| Code | Inductance |
|------|------------|
| R22  | 0.22μH     |
| 1R0  | 1.00μH     |

④ Tolerance

| Code | Tolerance |
|------|-----------|
| M    | 20%       |

*Back to 1st Page - Large Current Power Inductor Through Hole (TCDA)*



## Coil Choke Inductors

**Radial Choke Coils with open magnetic circuit construction design makes better TCR (TCRB)**

### ▶ Preview

Token TCRB series structure with open magnetic circuit construction design and protect by UL or PVC Heat-shrinkable tube. The TCRB features with small size, space savings, low cost, wide inductance range, high Q value, high availability of a large induced current, high self-resonance frequency, small magnetic flux leakage and so on.

Choke coils, also known as: Choke, differential mode inductors, is used to limit the alternating current through the coil, high-frequency and low frequency choke coils.

The TCRB is ideal for broadband modems, game consoles, lighting equipment, notebook computers, inkjet printers, photocopying machines, color TV, VCR, camera, microwave ovens, display monitors, mobile phones, automotive electronics products.

Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

### Features :

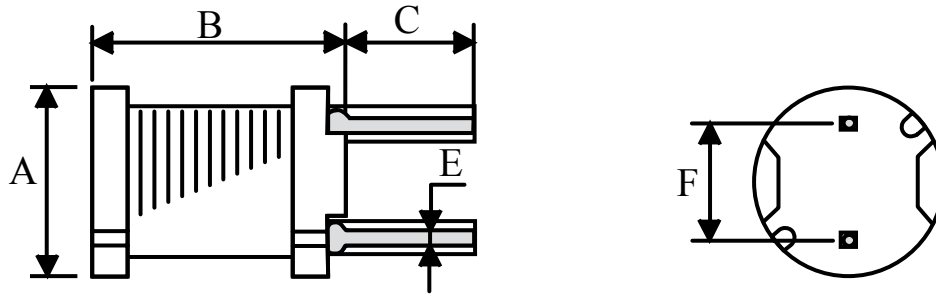
- Open magnetic circuit construction
- Low cost and high reliability

### Applications :

- Video Camera, Video Tape Recorder,
- Notebook, Inkjet Printer, Copying Machine,
- Display Monitor, Cellular Phone, ADSL Modem,
- Microwave Oven, Lighting and Car Electronics.



## Configurations & Dimensions



| Type     | $\Phi A(\text{max})$ | B(max) | $C \pm 1.0$ | $E \pm 0.05$ | $F \pm 0.5$ |
|----------|----------------------|--------|-------------|--------------|-------------|
| TCRB0605 | 6.5                  | 5.5    | 4.0         | 0.50         | 4.0         |
| TCRB0606 | 6.5                  | 6.5    | 4.0         | 0.50         | 4.0         |
| TCRB0805 | 8.3                  | 5.5    | 5.0         | 0.65         | 5.0         |
| TCRB0807 | 8.3                  | 7.5    | 5.0         | 0.65         | 5.0         |
| TCRB0809 | 8.3                  | 9.5    | 5.0         | 0.65         | 5.0         |

**Note:** Design as Customer's Requested Specifications.

## TCRB0605) Electrical Characteristics

| Part Number     | Inductance ( $\mu\text{H}$ ) | Test Freq. (KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|------------------------------|------------------|-----------------------|--------------|
| TCRB0605 - 220M | 22.00                        | 1                | 0.180                 | 0.90         |
| TCRB0605 - 270M | 27.00                        | 1                | 0.210                 | 0.81         |
| TCRB0605 - 330M | 33.00                        | 1                | 0.270                 | 0.74         |
| TCRB0605 - 390M | 39.00                        | 1                | 0.290                 | 0.68         |
| TCRB0605 - 470M | 47.00                        | 1                | 0.340                 | 0.62         |
| TCRB0605 - 560M | 56.00                        | 1                | 0.420                 | 0.57         |
| TCRB0605 - 680M | 68.00                        | 1                | 0.480                 | 0.51         |
| TCRB0605 - 820M | 82.00                        | 1                | 0.550                 | 0.47         |
| TCRB0605 - 101M | 100.00                       | 1                | 0.680                 | 0.42         |
| TCRB0605 - 121M | 120.00                       | 1                | 0.770                 | 0.39         |
| TCRB0605 - 151M | 150.00                       | 1                | 0.950                 | 0.35         |
| TCRB0605 - 181M | 180.00                       | 1                | 1.150                 | 0.32         |
| TCRB0605 - 221M | 220.00                       | 1                | 1.300                 | 0.29         |
| TCRB0605 - 271M | 270.00                       | 1                | 1.550                 | 0.26         |
| TCRB0605 - 331M | 330.00                       | 1                | 2.180                 | 0.23         |
| TCRB0605 - 391M | 390.00                       | 1                | 2.470                 | 0.21         |
| TCRB0605 - 471M | 470.00                       | 1                | 2.920                 | 0.20         |
| TCRB0605 - 561M | 560.00                       | 1                | 3.970                 | 0.18         |
| TCRB0605 - 681M | 680.00                       | 1                | 4.570                 | 0.16         |
| TCRB0605 - 821M | 820.00                       | 1                | 5.280                 | 0.15         |
| TCRB0605 - 102M | 1000.00                      | 1                | 7.060                 | 0.13         |

Note: Test Freq.: 1KHz / 0.25V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## ▶ (TCRB0606) Electrical Characteristics

| Part Number     | Inductance ( $\mu$ H) | Test Freq. (KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|-----------------------|------------------|-----------------------|--------------|
| TCRB0606 - 220M | 22.00                 | 1                | 0.110                 | 1.27         |
| TCRB0606 - 270M | 27.00                 | 1                | 0.140                 | 1.14         |
| TCRB0606 - 330M | 33.00                 | 1                | 0.170                 | 1.03         |
| TCRB0606 - 390M | 39.00                 | 1                | 0.190                 | 0.95         |
| TCRB0606 - 470M | 47.00                 | 1                | 0.230                 | 0.87         |
| TCRB0606 - 560M | 56.00                 | 1                | 0.260                 | 0.80         |
| TCRB0606 - 680M | 68.00                 | 1                | 0.280                 | 0.72         |
| TCRB0606 - 820M | 82.00                 | 1                | 0.390                 | 0.66         |
| TCRB0606 - 101M | 100.00                | 1                | 0.430                 | 0.59         |
| TCRB0606 - 121M | 120.00                | 1                | 0.540                 | 0.54         |
| TCRB0606 - 151M | 150.00                | 1                | 0.640                 | 0.48         |
| TCRB0606 - 181M | 180.00                | 1                | 0.740                 | 0.44         |
| TCRB0606 - 221M | 220.00                | 1                | 0.960                 | 0.40         |
| TCRB0606 - 271M | 270.00                | 1                | 1.120                 | 0.36         |
| TCRB0606 - 331M | 330.00                | 1                | 1.480                 | 0.33         |
| TCRB0606 - 391M | 390.00                | 1                | 1.660                 | 0.30         |
| TCRB0606 - 471M | 470.00                | 1                | 1.910                 | 0.27         |
| TCRB0606 - 561M | 560.00                | 1                | 2.310                 | 0.25         |
| TCRB0606 - 681M | 680.00                | 1                | 2.670                 | 0.23         |
| TCRB0606 - 821M | 820.00                | 1                | 3.100                 | 0.21         |
| TCRB0606 - 102M | 1000.00               | 1                | 4.450                 | 0.19         |

**Note:** Test Freq.: 1KHz / 0.25V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## ▶ (TCRB0805) Electrical Characteristics

| Part Number     | Inductance (μH) | Test Freq. (KHz) | DCR (Ω)(max) | IDC (A)(max) |
|-----------------|-----------------|------------------|--------------|--------------|
| TCRB0805 - 100M | 10.00           | 1                | 0.070        | 2.50         |
| TCRB0805 - 120M | 12.00           | 1                | 0.080        | 2.40         |
| TCRB0805 - 150M | 15.00           | 1                | 0.090        | 2.10         |
| TCRB0805 - 180M | 18.00           | 1                | 0.100        | 2.00         |
| TCRB0805 - 220M | 22.00           | 1                | 0.120        | 1.70         |
| TCRB0805 - 270M | 27.00           | 1                | 0.140        | 1.60         |
| TCRB0805 - 330M | 33.00           | 1                | 0.170        | 1.40         |
| TCRB0805 - 390M | 39.00           | 1                | 0.210        | 1.30         |
| TCRB0805 - 470M | 47.00           | 1                | 0.240        | 1.20         |
| TCRB0805 - 560M | 56.00           | 1                | 0.310        | 1.10         |
| TCRB0805 - 680M | 68.00           | 1                | 0.340        | 1.00         |
| TCRB0805 - 820M | 82.00           | 1                | 0.400        | 0.93         |
| TCRB0805 - 101M | 100.00          | 1                | 0.520        | 0.81         |
| TCRB0805 - 121M | 120.00          | 1                | 0.590        | 0.76         |
| TCRB0805 - 151M | 150.00          | 1                | 0.710        | 0.67         |
| TCRB0805 - 181M | 180.00          | 1                | 0.890        | 0.62         |
| TCRB0805 - 221M | 220.00          | 1                | 1.040        | 0.54         |
| TCRB0805 - 271M | 270.00          | 1                | 1.280        | 0.49         |
| TCRB0805 - 331M | 330.00          | 1                | 1.470        | 0.44         |
| TCRB0805 - 391M | 390.00          | 1                | 1.670        | 0.41         |
| TCRB0805 - 471M | 470.00          | 1                | 1.950        | 0.38         |
| TCRB0805 - 561M | 560.00          | 1                | 2.830        | 0.35         |
| TCRB0805 - 681M | 680.00          | 1                | 3.250        | 0.32         |
| TCRB0805 - 821M | 820.00          | 1                | 3.820        | 0.31         |
| TCRB0805 - 102M | 1000.00         | 1                | 5.280        | 0.25         |
| TCRB0805 - 122M | 1200.00         | 1                | 6.030        | 0.23         |
| TCRB0805 - 152M | 1500.00         | 1                | 7.150        | 0.21         |
| TCRB0805 - 182M | 1800.00         | 1                | 8.260        | 0.20         |
| TCRB0805 - 222M | 2200.00         | 1                | 11.100       | 0.18         |
| TCRB0805 - 272M | 2700.00         | 1                | 13.100       | 0.16         |
| TCRB0805 - 332M | 3300.00         | 1                | 15.900       | 0.14         |
| TCRB0805 - 392M | 3900.00         | 1                | 18.000       | 0.13         |
| TCRB0805 - 472M | 4700.00         | 1                | 23.900       | 0.12         |
| TCRB0805 - 562M | 5600.00         | 1                | 26.800       | 0.11         |
| TCRB0805 - 682M | 6800.00         | 1                | 31.700       | 0.098        |
| TCRB0805 - 822M | 8200.00         | 1                | 46.500       | 0.088        |
| TCRB0805 - 103M | 10000.00        | 1                | 55.700       | 0.081        |

Note: Test Freq.: 1KHz / 0.25V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## ▶ (TCRB0807) Electrical Characteristics

| Part Number     | Inductance ( $\mu\text{H}$ ) | Test Freq. (KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|------------------------------|------------------|-----------------------|--------------|
| TCRB0807 - 100M | 10.00                        | 1                | 0.050                 | 2.90         |
| TCRB0807 - 120M | 12.00                        | 1                | 0.060                 | 2.50         |
| TCRB0807 - 150M | 15.00                        | 1                | 0.070                 | 2.20         |
| TCRB0807 - 180M | 18.00                        | 1                | 0.080                 | 1.90         |
| TCRB0807 - 220M | 22.00                        | 1                | 0.090                 | 1.80         |
| TCRB0807 - 270M | 27.00                        | 1                | 0.110                 | 1.70         |
| TCRB0807 - 330M | 33.00                        | 1                | 0.130                 | 1.50         |
| TCRB0807 - 390M | 39.00                        | 1                | 0.140                 | 1.30         |
| TCRB0807 - 470M | 47.00                        | 1                | 0.150                 | 1.30         |
| TCRB0807 - 560M | 56.00                        | 1                | 0.180                 | 1.20         |
| TCRB0807 - 680M | 68.00                        | 1                | 0.200                 | 1.10         |
| TCRB0807 - 820M | 82.00                        | 1                | 0.240                 | 1.00         |
| TCRB0807 - 101M | 100.00                       | 1                | 0.280                 | 0.89         |
| TCRB0807 - 121M | 120.00                       | 1                | 0.360                 | 0.81         |
| TCRB0807 - 151M | 150.00                       | 1                | 0.420                 | 0.72         |
| TCRB0807 - 181M | 180.00                       | 1                | 0.570                 | 0.66         |
| TCRB0807 - 221M | 220.00                       | 1                | 0.630                 | 0.57         |
| TCRB0807 - 271M | 270.00                       | 1                | 0.880                 | 0.51         |
| TCRB0807 - 331M | 330.00                       | 1                | 1.050                 | 0.46         |
| TCRB0807 - 391M | 390.00                       | 1                | 1.170                 | 0.44         |
| TCRB0807 - 471M | 470.00                       | 1                | 1.340                 | 0.41         |
| TCRB0807 - 561M | 560.00                       | 1                | 1.720                 | 0.36         |
| TCRB0807 - 681M | 680.00                       | 1                | 1.960                 | 0.33         |
| TCRB0807 - 821M | 820.00                       | 1                | 2.560                 | 0.30         |
| TCRB0807 - 102M | 1000.00                      | 1                | 2.940                 | 0.27         |
| TCRB0807 - 122M | 1200.00                      | 1                | 4.040                 | 0.24         |
| TCRB0807 - 152M | 1500.00                      | 1                | 4.700                 | 0.22         |
| TCRB0807 - 182M | 1800.00                      | 1                | 5.050                 | 0.20         |
| TCRB0807 - 222M | 2200.00                      | 1                | 6.250                 | 0.18         |
| TCRB0807 - 272M | 2700.00                      | 1                | 8.720                 | 0.16         |
| TCRB0807 - 332M | 3300.00                      | 1                | 10.600                | 0.15         |
| TCRB0807 - 392M | 3900.00                      | 1                | 14.200                | 0.14         |
| TCRB0807 - 472M | 4700.00                      | 1                | 16.700                | 0.12         |
| TCRB0807 - 562M | 5600.00                      | 1                | 18.700                | 0.11         |
| TCRB0807 - 682M | 6800.00                      | 1                | 21.800                | 0.10         |
| TCRB0807 - 822M | 8200.00                      | 1                | 28.700                | 0.093        |
| TCRB0807 - 103M | 10000.00                     | 1                | 33.000                | 0.084        |

Note: Test Freq.: 1KHz / 0.25V.

Operating Temp.:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$

Inductance drop = 10% typ. at IDC.

## ▶ (TCRB0809) Electrical Characteristics

| Part Number     | Inductance (μH) | Test Freq. (KHz) | DCR (Ω)(max) | IDC (A)(max) |
|-----------------|-----------------|------------------|--------------|--------------|
| TCRB0809 - 100M | 10.00           | 1                | 0.040        | 2.60         |
| TCRB0809 - 120M | 12.00           | 1                | 0.040        | 2.60         |
| TCRB0809 - 150M | 15.00           | 1                | 0.050        | 2.10         |
| TCRB0809 - 180M | 18.00           | 1                | 0.050        | 2.00         |
| TCRB0809 - 220M | 22.00           | 1                | 0.060        | 1.70         |
| TCRB0809 - 270M | 27.00           | 1                | 0.060        | 1.60         |
| TCRB0809 - 330M | 33.00           | 1                | 0.070        | 1.40         |
| TCRB0809 - 390M | 39.00           | 1                | 0.080        | 1.40         |
| TCRB0809 - 470M | 47.00           | 1                | 0.100        | 1.30         |
| TCRB0809 - 560M | 56.00           | 1                | 0.110        | 1.20         |
| TCRB0809 - 680M | 68.00           | 1                | 0.140        | 1.10         |
| TCRB0809 - 820M | 82.00           | 1                | 0.160        | 1.00         |
| TCRB0809 - 101M | 100.00          | 1                | 0.190        | 0.90         |
| TCRB0809 - 121M | 120.00          | 1                | 0.220        | 0.82         |
| TCRB0809 - 151M | 150.00          | 1                | 0.270        | 0.74         |
| TCRB0809 - 181M | 180.00          | 1                | 0.310        | 0.71         |
| TCRB0809 - 221M | 220.00          | 1                | 0.380        | 0.64         |
| TCRB0809 - 271M | 270.00          | 1                | 0.530        | 0.57         |
| TCRB0809 - 331M | 330.00          | 1                | 0.610        | 0.51         |
| TCRB0809 - 391M | 390.00          | 1                | 0.690        | 0.48         |
| TCRB0809 - 471M | 470.00          | 1                | 0.890        | 0.43         |
| TCRB0809 - 561M | 560.00          | 1                | 1.010        | 0.40         |
| TCRB0809 - 681M | 680.00          | 1                | 1.180        | 0.35         |
| TCRB0809 - 821M | 820.00          | 1                | 1.570        | 0.32         |
| TCRB0809 - 102M | 1000.00         | 1                | 1.840        | 0.30         |
| TCRB0809 - 122M | 1200.00         | 1                | 2.100        | 0.27         |
| TCRB0809 - 152M | 1500.00         | 1                | 2.800        | 0.23         |
| TCRB0809 - 182M | 1800.00         | 1                | 3.210        | 0.21         |
| TCRB0809 - 222M | 2200.00         | 1                | 4.210        | 0.19         |
| TCRB0809 - 272M | 2700.00         | 1                | 4.940        | 0.17         |
| TCRB0809 - 332M | 3300.00         | 1                | 6.160        | 0.15         |
| TCRB0809 - 392M | 3900.00         | 1                | 6.840        | 0.14         |
| TCRB0809 - 472M | 4700.00         | 1                | 7.890        | 0.13         |
| TCRB0809 - 562M | 5600.00         | 1                | 11.500       | 0.12         |
| TCRB0809 - 682M | 6800.00         | 1                | 13.200       | 0.11         |
| TCRB0809 - 822M | 8200.00         | 1                | 15.200       | 0.10         |
| TCRB0809 - 103M | 10000.00        | 1                | 22.000       | 0.089        |
| TCRB0809 - 123M | 12000.00        | 1                | 25.000       | 0.073        |
| TCRB0809 - 153M | 15000.00        | 1                | 29.100       | 0.068        |
| TCRB0809 - 183M | 18000.00        | 1                | 38.900       | 0.066        |

Continued on the following page. 

↑ Continued from the preceding page.

| Part Number     | Inductance (μH) | Test Freq. (KHz) | DCR (Ω)(max) | IDC (A)(max) |
|-----------------|-----------------|------------------|--------------|--------------|
| TCRB0809 - 223M | 22000.00        | 1                | 44.900       | 0.059        |
| TCRB0809 - 273M | 27000.00        | 1                | 55.700       | 0.052        |
| TCRB0809 - 333M | 33000.00        | 1                | 64.200       | 0.048        |
| TCRB0809 - 393M | 39000.00        | 1                | 74.200       | 0.042        |
| TCRB0809 - 473M | 47000.00        | 1                | 96.400       | 0.038        |

Note: Test Freq.: 1KHz / 0.25V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## ▶ How to Order

TCRB

❶

UL

❷

0605

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220

❹

220

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❶ Part Number: TCRB

❷ TUBE

| Code | TUBE    |
|------|---------|
| V    | UL      |
| P    | PVC     |
| NONE | NO TUBE |

❸ Size

| Code | Size        |
|------|-------------|
| 0605 | 6.50×5.5mm  |
| 0606 | 6.50×6.50mm |
| 0805 | 8.30×5.5mm  |
| 0807 | 8.30×7.50mm |
| 0809 | 8.30×9.50mm |

❹ Inductance

| Code | Inductance |
|------|------------|
| 1R0  | 1.00μH     |
| 100  | 10.00μH    |
| 101  | 100.00μH   |
| 102  | 1000.00μH  |

❺ Tolerance

| Code | Tolerance |
|------|-----------|
| J    | 5%        |
| K    | 10%       |
| L    | 15%       |
| M    | 20%       |
| N    | 30%       |
| Y    | min       |

*Back to 1st Page - Coil Choke Inductors Radial (TCRB)*

# Choke Coil Inductors

**Limit the alternating current through the choke coils (TCRC)**

## ▶ Preview

Choke coils, also known as: Choke, differential mode inductors, is used to limit the alternating current through the coil, high-frequency and low frequency choke coils.

Token TCRC series structure with open magnetic circuit design and protect by UL or PVC Heat-shrinkable tube. The TCRC features with small size, high Q value, low cost, high self-resonance frequency, high availability of a large induced current, small magnetic flux leakage and so on.

The TCRC is ideal for notebook computers, inkjet printers, photocopying machines, display monitors, mobile phones, broadband modems, game consoles, color TV, VCR, camera, microwave ovens, lighting equipment, automotive electronics products.

Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

### Features :

- Open magnetic circuit construction
- Low cost and high reliability

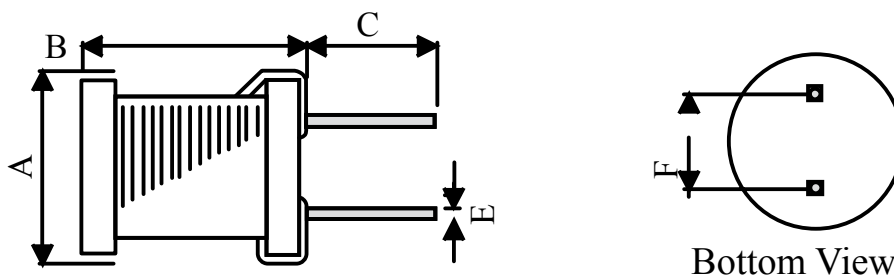
### Applications :

- Notebook, Inkjet printer, Copying machine,
- Display Monitor, Cellular Phone, ADSL Modem,
- Gaming machine, Color TV, Video tape recorder,
- Microwave Oven, Lighting and Car Electronics.





## Configurations & Dimensions



Bottom View

| Type     | $\Phi A(\text{max})$ | $B(\text{max})$ | $C \pm 1.5$ | $\Phi E \pm 0.05$ | $F \pm 0.5$ |
|----------|----------------------|-----------------|-------------|-------------------|-------------|
| TCRC0406 | 4.0                  | 6.0             | 14.0        | 0.50              | 2.0         |
| TCRC0608 | 6.0                  | 8.3             | 14.0        | 0.60              | 3.0         |
| TCRC0810 | 8.0                  | 10.0            | 14.0        | 0.60              | 5.0         |
| TCRC0912 | 9.0                  | 12.0            | 14.0        | 0.60              | 5.0         |
| TCRC1012 | 10.0                 | 12.0            | 14.0        | 0.60              | 5.0         |
| TCRC1016 | 10.0                 | 16.0            | 14.0        | 0.60              | 5.0         |

Note: Design as Customer's Requested Specifications.

## ▶ (TCRC0406) Electrical Characteristics

| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRC0406 - 1R0N | 1.00                 | 1               | 0.030                 | 3.00         |
| TCRC0406 - 1R5N | 1.50                 | 1               | 0.035                 | 2.80         |
| TCRC0406 - 1R8N | 1.80                 | 1               | 0.040                 | 2.70         |
| TCRC0406 - 2R2N | 2.20                 | 1               | 0.045                 | 2.50         |
| TCRC0406 - 2R7N | 2.70                 | 1               | 0.050                 | 2.50         |
| TCRC0406 - 3R3N | 3.30                 | 1               | 0.055                 | 2.20         |
| TCRC0406 - 3R9N | 3.90                 | 1               | 0.055                 | 2.20         |
| TCRC0406 - 4R7N | 4.70                 | 1               | 0.065                 | 2.00         |
| TCRC0406 - 5R6N | 5.60                 | 1               | 0.070                 | 1.80         |
| TCRC0406 - 6R8N | 6.80                 | 1               | 0.080                 | 1.70         |
| TCRC0406 - 8R2N | 8.20                 | 1               | 0.090                 | 1.50         |
| TCRC0406 - 100M | 10.00                | 1               | 0.110                 | 1.40         |
| TCRC0406 - 120M | 12.00                | 1               | 0.140                 | 1.20         |
| TCRC0406 - 150M | 15.00                | 1               | 0.160                 | 1.00         |
| TCRC0406 - 180M | 18.00                | 1               | 0.180                 | 1.00         |
| TCRC0406 - 220M | 22.00                | 1               | 0.250                 | 0.90         |
| TCRC0406 - 270M | 27.00                | 1               | 0.370                 | 0.80         |
| TCRC0406 - 330M | 33.00                | 1               | 0.420                 | 0.70         |
| TCRC0406 - 390M | 39.00                | 1               | 0.450                 | 0.70         |
| TCRC0406 - 470M | 47.00                | 1               | 0.500                 | 0.60         |
| TCRC0406 - 560M | 56.00                | 1               | 0.560                 | 0.60         |
| TCRC0406 - 680M | 68.00                | 1               | 0.630                 | 0.55         |
| TCRC0406 - 820M | 82.00                | 1               | 0.770                 | 0.50         |
| TCRC0406 - 101M | 100.00               | 1               | 0.850                 | 0.40         |
| TCRC0406 - 121M | 120.00               | 1               | 1.300                 | 0.40         |
| TCRC0406 - 151M | 150.00               | 1               | 1.400                 | 0.30         |
| TCRC0406 - 181M | 180.00               | 1               | 2.200                 | 0.30         |
| TCRC0406 - 221M | 220.00               | 1               | 2.500                 | 0.28         |
| TCRC0406 - 271M | 270.00               | 1               | 2.700                 | 0.25         |
| TCRC0406 - 331M | 330.00               | 1               | 3.000                 | 0.22         |
| TCRC0406 - 391M | 390.00               | 1               | 3.400                 | 0.21         |
| TCRC0406 - 471M | 470.00               | 1               | 3.900                 | 0.20         |
| TCRC0406 - 561M | 560.00               | 1               | 5.000                 | 0.16         |
| TCRC0406 - 681M | 680.00               | 1               | 7.000                 | 0.15         |
| TCRC0406 - 821M | 820.00               | 1               | 7.700                 | 0.14         |
| TCRC0406 - 102M | 1000.00              | 1               | 8.700                 | 0.12         |

**Note:** Test Freq.: 1KHz / 0.25V.  
 Operating Temp.: -40°C ~ +85°C  
 Inductance drop = 10% typ. at IDC.

## ▶ (TCRC0608) Electrical Characteristics

| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRC0608 - 1R0N | 1.00                 | 1               | 0.015                 | 3.00         |
| TCRC0608 - 1R2N | 1.20                 | 1               | 0.015                 | 2.80         |
| TCRC0608 - 1R5N | 1.50                 | 1               | 0.015                 | 2.70         |
| TCRC0608 - 2R2N | 2.20                 | 1               | 0.015                 | 2.60         |
| TCRC0608 - 2R7N | 2.70                 | 1               | 0.020                 | 2.50         |
| TCRC0608 - 3R3N | 3.30                 | 1               | 0.020                 | 2.50         |
| TCRC0608 - 3R9N | 3.90                 | 1               | 0.025                 | 2.50         |
| TCRC0608 - 4R7N | 4.70                 | 1               | 0.025                 | 2.30         |
| TCRC0608 - 5R6N | 5.60                 | 1               | 0.030                 | 2.10         |
| TCRC0608 - 6R8N | 6.80                 | 1               | 0.030                 | 1.80         |
| TCRC0608 - 8R2N | 8.20                 | 1               | 0.035                 | 1.20         |
| TCRC0608 - 100M | 10.00                | 1               | 0.045                 | 1.00         |
| TCRC0608 - 120M | 12.00                | 1               | 0.050                 | 1.00         |
| TCRC0608 - 150M | 15.00                | 1               | 0.055                 | 0.90         |
| TCRC0608 - 180M | 18.00                | 1               | 0.090                 | 0.90         |
| TCRC0608 - 220M | 22.00                | 1               | 0.095                 | 0.80         |
| TCRC0608 - 270M | 27.00                | 1               | 0.110                 | 0.75         |
| TCRC0608 - 330M | 33.00                | 1               | 0.125                 | 0.70         |
| TCRC0608 - 390M | 39.00                | 1               | 0.140                 | 0.65         |
| TCRC0608 - 470M | 47.00                | 1               | 0.160                 | 0.60         |
| TCRC0608 - 560M | 56.00                | 1               | 0.180                 | 0.60         |
| TCRC0608 - 680M | 68.00                | 1               | 0.200                 | 0.56         |
| TCRC0608 - 820M | 82.00                | 1               | 0.270                 | 0.48         |
| TCRC0608 - 101M | 100.00               | 1               | 0.310                 | 0.45         |
| TCRC0608 - 121M | 120.00               | 1               | 0.370                 | 0.43         |
| TCRC0608 - 151M | 150.00               | 1               | 0.470                 | 0.40         |
| TCRC0608 - 181M | 180.00               | 1               | 0.540                 | 0.40         |
| TCRC0608 - 221M | 220.00               | 1               | 0.730                 | 0.38         |
| TCRC0608 - 271M | 270.00               | 1               | 0.830                 | 0.32         |
| TCRC0608 - 331M | 330.00               | 1               | 0.950                 | 0.30         |
| TCRC0608 - 391M | 390.00               | 1               | 1.220                 | 0.25         |
| TCRC0608 - 471M | 470.00               | 1               | 1.630                 | 0.22         |
| TCRC0608 - 561M | 560.00               | 1               | 1.800                 | 0.20         |
| TCRC0608 - 681M | 680.00               | 1               | 2.100                 | 0.18         |
| TCRC0608 - 821M | 820.00               | 1               | 2.900                 | 0.17         |
| TCRC0608 - 102M | 1000.00              | 1               | 3.200                 | 0.15         |

**Note:** Test Freq.: 1KHz / 0.25V.  
 Operating Temp.: -40°C ~ +85°C  
 Inductance drop = 10% typ. at IDC.

## ▶ (TCRC0810) Electrical Characteristics

| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRC0810 - 1R0N | 1.00                 | 1               | 0.015                 | 4.50         |
| TCRC0810 - 1R5N | 1.50                 | 1               | 0.020                 | 4.50         |
| TCRC0810 - 2R2N | 2.20                 | 1               | 0.020                 | 4.20         |
| TCRC0810 - 2R7N | 2.70                 | 1               | 0.020                 | 4.20         |
| TCRC0810 - 3R3N | 3.30                 | 1               | 0.020                 | 4.00         |
| TCRC0810 - 3R9N | 3.90                 | 1               | 0.020                 | 4.00         |
| TCRC0810 - 4R7N | 4.70                 | 1               | 0.025                 | 4.00         |
| TCRC0810 - 5R6N | 5.60                 | 1               | 0.025                 | 4.00         |
| TCRC0810 - 6R8N | 6.80                 | 1               | 0.025                 | 4.00         |
| TCRC0810 - 8R2N | 8.20                 | 1               | 0.035                 | 3.80         |
| TCRC0810 - 100M | 10.00                | 1               | 0.040                 | 3.80         |
| TCRC0810 - 120M | 12.00                | 1               | 0.040                 | 3.20         |
| TCRC0810 - 150M | 15.00                | 1               | 0.045                 | 2.80         |
| TCRC0810 - 180M | 18.00                | 1               | 0.060                 | 2.50         |
| TCRC0810 - 220M | 22.00                | 1               | 0.070                 | 2.10         |
| TCRC0810 - 270M | 27.00                | 1               | 0.085                 | 2.00         |
| TCRC0810 - 330M | 33.00                | 1               | 0.090                 | 1.80         |
| TCRC0810 - 390M | 39.00                | 1               | 0.100                 | 1.60         |
| TCRC0810 - 470M | 47.00                | 1               | 0.110                 | 1.50         |
| TCRC0810 - 560M | 56.00                | 1               | 0.150                 | 1.30         |
| TCRC0810 - 680M | 68.00                | 1               | 0.190                 | 1.00         |
| TCRC0810 - 820M | 82.00                | 1               | 0.210                 | 0.90         |
| TCRC0810 - 101M | 100.00               | 1               | 0.240                 | 0.80         |
| TCRC0810 - 121M | 120.00               | 1               | 0.260                 | 0.80         |
| TCRC0810 - 151M | 150.00               | 1               | 0.310                 | 0.75         |
| TCRC0810 - 181M | 180.00               | 1               | 0.380                 | 0.70         |
| TCRC0810 - 221M | 220.00               | 1               | 0.430                 | 0.65         |
| TCRC0810 - 271M | 270.00               | 1               | 0.490                 | 0.63         |
| TCRC0810 - 331M | 330.00               | 1               | 0.660                 | 0.60         |
| TCRC0810 - 391M | 390.00               | 1               | 0.790                 | 0.58         |
| TCRC0810 - 471M | 470.00               | 1               | 0.910                 | 0.52         |
| TCRC0810 - 561M | 560.00               | 1               | 1.130                 | 0.50         |
| TCRC0810 - 681M | 680.00               | 1               | 1.300                 | 0.40         |
| TCRC0810 - 821M | 820.00               | 1               | 1.530                 | 0.30         |
| TCRC0810 - 102M | 1000.00              | 1               | 1.800                 | 0.27         |

**Note:** Test Freq.: 1KHz / 0.25V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## ▶ (TCRC0912) Electrical Characteristics

| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRC0912 - 1R0N | 1.00                 | 1               | 0.015                 | 5.00         |
| TCRC0912 - 1R5N | 1.50                 | 1               | 0.015                 | 5.00         |
| TCRC0912 - 1R8N | 1.80                 | 1               | 0.015                 | 5.00         |
| TCRC0912 - 2R2N | 2.20                 | 1               | 0.015                 | 5.00         |
| TCRC0912 - 3R3N | 3.30                 | 1               | 0.020                 | 4.80         |
| TCRC0912 - 3R9N | 3.90                 | 1               | 0.020                 | 4.80         |
| TCRC0912 - 4R7N | 4.70                 | 1               | 0.020                 | 4.50         |
| TCRC0912 - 5R6N | 5.60                 | 1               | 0.025                 | 4.00         |
| TCRC0912 - 6R8N | 6.80                 | 1               | 0.025                 | 3.90         |
| TCRC0912 - 8R2N | 8.20                 | 1               | 0.025                 | 3.50         |
| TCRC0912 - 100M | 10.00                | 1               | 0.030                 | 3.40         |
| TCRC0912 - 120M | 12.00                | 1               | 0.030                 | 3.20         |
| TCRC0912 - 150M | 15.00                | 1               | 0.040                 | 3.00         |
| TCRC0912 - 180M | 18.00                | 1               | 0.045                 | 2.80         |
| TCRC0912 - 220M | 22.00                | 1               | 0.050                 | 2.70         |
| TCRC0912 - 270M | 27.00                | 1               | 0.055                 | 2.50         |
| TCRC0912 - 330M | 33.00                | 1               | 0.055                 | 2.50         |
| TCRC0912 - 390M | 39.00                | 1               | 0.060                 | 2.00         |
| TCRC0912 - 470M | 47.00                | 1               | 0.070                 | 1.80         |
| TCRC0912 - 560M | 56.00                | 1               | 0.080                 | 1.70         |
| TCRC0912 - 680M | 68.00                | 1               | 0.090                 | 1.50         |
| TCRC0912 - 820M | 82.00                | 1               | 0.110                 | 1.40         |
| TCRC0912 - 101M | 100.00               | 1               | 0.160                 | 1.20         |
| TCRC0912 - 121M | 120.00               | 1               | 0.170                 | 1.10         |
| TCRC0912 - 151M | 150.00               | 1               | 0.200                 | 1.00         |
| TCRC0912 - 181M | 180.00               | 1               | 0.220                 | 0.90         |
| TCRC0912 - 221M | 220.00               | 1               | 0.260                 | 0.80         |
| TCRC0912 - 271M | 270.00               | 1               | 0.390                 | 0.70         |
| TCRC0912 - 331M | 330.00               | 1               | 0.450                 | 0.50         |
| TCRC0912 - 391M | 390.00               | 1               | 0.490                 | 0.45         |
| TCRC0912 - 471M | 470.00               | 1               | 0.620                 | 0.43         |
| TCRC0912 - 561M | 560.00               | 1               | 0.640                 | 0.40         |
| TCRC0912 - 681M | 680.00               | 1               | 0.790                 | 0.38         |
| TCRC0912 - 821M | 820.00               | 1               | 1.340                 | 0.35         |
| TCRC0912 - 102M | 1000.00              | 1               | 1.820                 | 0.30         |

**Note:** Test Freq.: 1KHz / 0.25V.  
 Operating Temp.: -40°C ~ +85°C  
 Inductance drop = 10% typ. at IDC.

## ▶ (TCRC1012) Electrical Characteristics

| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRC1012 - 1R0N | 1.00                 | 1               | 0.010                 | 6.00         |
| TCRC1012 - 1R5N | 1.50                 | 1               | 0.010                 | 6.00         |
| TCRC1012 - 1R8N | 1.80                 | 1               | 0.015                 | 6.00         |
| TCRC1012 - 2R7N | 2.70                 | 1               | 0.015                 | 5.50         |
| TCRC1012 - 3R3N | 3.30                 | 1               | 0.015                 | 5.50         |
| TCRC1012 - 3R9N | 3.90                 | 1               | 0.020                 | 5.00         |
| TCRC1012 - 4R7N | 4.70                 | 1               | 0.020                 | 5.00         |
| TCRC1012 - 5R6N | 5.60                 | 1               | 0.025                 | 4.80         |
| TCRC1012 - 6R8N | 6.80                 | 1               | 0.025                 | 4.80         |
| TCRC1012 - 8R2N | 8.20                 | 1               | 0.025                 | 4.50         |
| TCRC1012 - 100M | 10.00                | 1               | 0.025                 | 4.50         |
| TCRC1012 - 120M | 12.00                | 1               | 0.025                 | 4.30         |
| TCRC1012 - 150M | 15.00                | 1               | 0.035                 | 4.30         |
| TCRC1012 - 180M | 18.00                | 1               | 0.040                 | 4.00         |
| TCRC1012 - 220M | 22.00                | 1               | 0.045                 | 3.70         |
| TCRC1012 - 270M | 27.00                | 1               | 0.045                 | 3.50         |
| TCRC1012 - 330M | 33.00                | 1               | 0.055                 | 3.00         |
| TCRC1012 - 390M | 39.00                | 1               | 0.060                 | 2.50         |
| TCRC1012 - 470M | 47.00                | 1               | 0.080                 | 2.30         |
| TCRC1012 - 560M | 56.00                | 1               | 0.085                 | 2.00         |
| TCRC1012 - 680M | 68.00                | 1               | 0.095                 | 2.00         |
| TCRC1012 - 820M | 82.00                | 1               | 0.110                 | 1.80         |
| TCRC1012 - 101M | 100.00               | 1               | 0.140                 | 1.70         |
| TCRC1012 - 121M | 120.00               | 1               | 0.160                 | 1.50         |
| TCRC1012 - 151M | 150.00               | 1               | 0.180                 | 1.40         |
| TCRC1012 - 181M | 180.00               | 1               | 0.250                 | 1.30         |
| TCRC1012 - 221M | 220.00               | 1               | 0.280                 | 1.00         |
| TCRC1012 - 271M | 270.00               | 1               | 0.420                 | 0.90         |
| TCRC1012 - 331M | 330.00               | 1               | 0.540                 | 0.80         |
| TCRC1012 - 391M | 390.00               | 1               | 0.600                 | 0.80         |
| TCRC1012 - 471M | 470.00               | 1               | 0.660                 | 0.70         |
| TCRC1012 - 561M | 560.00               | 1               | 0.740                 | 0.60         |
| TCRC1012 - 681M | 680.00               | 1               | 0.840                 | 0.50         |
| TCRC1012 - 821M | 820.00               | 1               | 1.080                 | 0.50         |
| TCRC1012 - 102M | 1000.00              | 1               | 1.390                 | 0.50         |

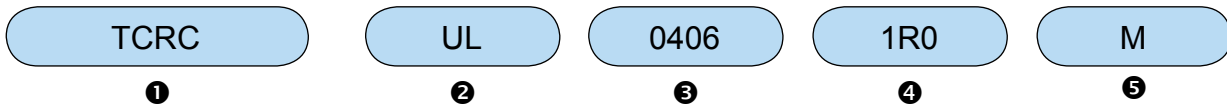
**Note:** Test Freq.: 1KHz / 0.25V.  
 Operating Temp.: -40°C ~ +85°C  
 Inductance drop = 10% typ. at IDC.

## ▶ (TCRC1016) Electrical Characteristics

| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRC1016 - 1R0N | 1.00                 | 1               | 0.010                 | 9.00         |
| TCRC1016 - 1R5N | 1.50                 | 1               | 0.015                 | 9.00         |
| TCRC1016 - 1R8N | 1.80                 | 1               | 0.015                 | 9.00         |
| TCRC1016 - 2R7N | 2.70                 | 1               | 0.015                 | 9.00         |
| TCRC1016 - 3R3N | 3.30                 | 1               | 0.015                 | 8.50         |
| TCRC1016 - 3R9N | 3.90                 | 1               | 0.015                 | 8.00         |
| TCRC1016 - 4R7N | 4.70                 | 1               | 0.020                 | 7.50         |
| TCRC1016 - 5R6N | 5.60                 | 1               | 0.025                 | 7.50         |
| TCRC1016 - 6R8N | 6.80                 | 1               | 0.025                 | 7.50         |
| TCRC1016 - 8R2N | 8.20                 | 1               | 0.025                 | 7.20         |
| TCRC1016 - 100M | 10.00                | 1               | 0.030                 | 7.20         |
| TCRC1016 - 120M | 12.00                | 1               | 0.030                 | 7.00         |
| TCRC1016 - 150M | 15.00                | 1               | 0.035                 | 6.50         |
| TCRC1016 - 180M | 18.00                | 1               | 0.035                 | 6.30         |
| TCRC1016 - 220M | 22.00                | 1               | 0.045                 | 5.50         |
| TCRC1016 - 270M | 27.00                | 1               | 0.050                 | 4.50         |
| TCRC1016 - 330M | 33.00                | 1               | 0.070                 | 4.00         |
| TCRC1016 - 390M | 39.00                | 1               | 0.070                 | 3.80         |
| TCRC1016 - 470M | 47.00                | 1               | 0.070                 | 3.60         |
| TCRC1016 - 560M | 56.00                | 1               | 0.080                 | 3.20         |
| TCRC1016 - 680M | 68.00                | 1               | 0.090                 | 3.00         |
| TCRC1016 - 820M | 82.00                | 1               | 0.095                 | 2.60         |
| TCRC1016 - 101M | 100.00               | 1               | 0.120                 | 2.50         |
| TCRC1016 - 121M | 120.00               | 1               | 0.140                 | 2.30         |
| TCRC1016 - 151M | 150.00               | 1               | 0.170                 | 2.10         |
| TCRC1016 - 181M | 180.00               | 1               | 0.190                 | 2.00         |
| TCRC1016 - 221M | 220.00               | 1               | 0.250                 | 1.80         |
| TCRC1016 - 271M | 270.00               | 1               | 0.340                 | 1.50         |
| TCRC1016 - 331M | 330.00               | 1               | 0.450                 | 1.50         |
| TCRC1016 - 391M | 390.00               | 1               | 0.510                 | 1.30         |
| TCRC1016 - 471M | 470.00               | 1               | 0.560                 | 1.20         |
| TCRC1016 - 561M | 560.00               | 1               | 0.640                 | 1.00         |
| TCRC1016 - 681M | 680.00               | 1               | 0.710                 | 1.00         |
| TCRC1016 - 821M | 820.00               | 1               | 1.010                 | 0.90         |
| TCRC1016 - 102M | 1000.00              | 1               | 1.200                 | 0.80         |

**Note:** Test Freq.: 1KHz / 0.25V.  
 Operating Temp.: -40°C ~ +85°C  
 Inductance drop = 10% typ. at IDC.

## How to Order



❶ Part Number: TCRC

❷ TUBE

| Code | TUBE    |
|------|---------|
| V    | UL      |
| P    | PVC     |
| NONE | NO TUBE |

❸ Size

| Code | Size        |
|------|-------------|
| 0406 | 6.0×9.5mm   |
| 0608 | 8.0×11.5mm  |
| 0810 | 10.0×14.0mm |
| 0912 | 11.0×16.5mm |
| 1012 | 12.0×16.5mm |
| 1016 | 12.5×21.0mm |

❹ Inductance

| Code | Inductance |
|------|------------|
| 1R0  | 1.00μH     |
| 100  | 10.00μH    |
| 101  | 100.00μH   |
| 102  | 1000.00μH  |

❺ Tolerance

| Code | Tolerance |
|------|-----------|
| J    | 5%        |
| K    | 10%       |
| L    | 15%       |
| M    | 20%       |
| N    | 30%       |
| Y    | min       |

*Back to 1st Page - Choke Coil Inductors Radial (TCRC)*



# Radial Shielded Choke Coil Inductors

**Choke coils shielded construction design  
for higher frequency (TCRS)**

## ▶ Preview

Token TCRS series structure with magnetic shielded construction design and protect by UL or PVC Heat-shrinkable tube. The TCRS features with small size, space savings, wide inductance range, high Q value, low cost, high availability of a large induced current, high self-resonance frequency, small magnetic flux leakage and so on.

Choke coils, also known as: Choke, differential mode inductors, is used to limit the alternating current through the coil, high-frequency and low frequency choke coils.

The TCRS is ideal for notebook computers, inkjet printers, photocopying machines, color TV, VCR, camera, microwave ovens, display monitors, mobile phones, broadband modems, game consoles, lighting equipment, automotive electronics products.

Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

## Features :

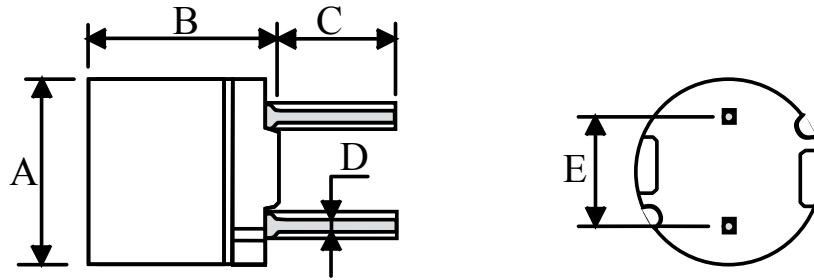
- Magnetic shielded construction.
- Ideal for use as an inductor for high current power supplies in all types of electronic instruments.

## Applications :

- Notebook, Inkjet printer, Copying machine,
- Display Monitor, Cellular Phone, ADSL Modem,
- Gaming machine, Color TV, Video tape recorder,
- Microwave Oven, Lighting and Car Electronics.



## Configurations & Dimensions



| Type     | $\Phi A$ (max) | B (max) | $C \pm 1.0$ | $D \pm 0.05$ | $E \pm 0.5$ |
|----------|----------------|---------|-------------|--------------|-------------|
| TCRS0606 | 6.5            | 6.5     | 4.0         | 0.50         | 4.0         |
| TCRS0807 | 8.3            | 7.5     | 5.0         | 0.65         | 5.0         |

**Note:** Design as Customer's Requested Specifications.

## (TCRS0606) Electrical Characteristics

| Part Number     | Inductance( $\mu\text{H}$ ) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|-----------------------------|-----------------|-----------------------|--------------|
| TCRS0606 - 220M | 22.00                       | 1               | 0.130                 | 0.96         |
| TCRS0606 - 270M | 27.00                       | 1               | 0.180                 | 0.87         |
| TCRS0606 - 330M | 33.00                       | 1               | 0.210                 | 0.78         |
| TCRS0606 - 390M | 39.00                       | 1               | 0.260                 | 0.72         |
| TCRS0606 - 470M | 47.00                       | 1               | 0.290                 | 0.66         |
| TCRS0606 - 560M | 56.00                       | 1               | 0.330                 | 0.60         |
| TCRS0606 - 680M | 68.00                       | 1               | 0.360                 | 0.55         |
| TCRS0606 - 820M | 82.00                       | 1               | 0.390                 | 0.50         |
| TCRS0606 - 101M | 100.00                      | 1               | 0.540                 | 0.45         |
| TCRS0606 - 121M | 120.00                      | 1               | 0.620                 | 0.41         |
| TCRS0606 - 151M | 150.00                      | 1               | 0.720                 | 0.37         |
| TCRS0606 - 181M | 180.00                      | 1               | 0.880                 | 0.34         |
| TCRS0606 - 221M | 220.00                      | 1               | 0.990                 | 0.30         |
| TCRS0606 - 271M | 270.00                      | 1               | 1.520                 | 0.27         |
| TCRS0606 - 331M | 330.00                      | 1               | 1.690                 | 0.25         |
| TCRS0606 - 391M | 390.00                      | 1               | 1.850                 | 0.23         |
| TCRS0606 - 471M | 470.00                      | 1               | 2.850                 | 0.21         |
| TCRS0606 - 561M | 560.00                      | 1               | 3.210                 | 0.19         |
| TCRS0606 - 681M | 680.00                      | 1               | 3.600                 | 0.17         |
| TCRS0606 - 821M | 820.00                      | 1               | 4.870                 | 0.16         |
| TCRS0606 - 102M | 1000.00                     | 1               | 5.560                 | 0.14         |

**Note:** Test Freq.: 1KHz / 0.25V.

Operating Temp.:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$

Inductance drop = 10% typ. at IDC.

## ▶ (TCRS0807) Electrical Characteristics

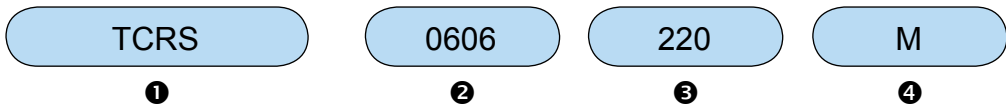
| Part Number     | Inductance( $\mu$ H) | Test Freq.(KHz) | DCR ( $\Omega$ )(max) | IDC (A)(max) |
|-----------------|----------------------|-----------------|-----------------------|--------------|
| TCRS0807 - 220M | 22.00                | 1               | 0.080                 | 1.60         |
| TCRS0807 - 270M | 27.00                | 1               | 0.100                 | 1.40         |
| TCRS0807 - 330M | 33.00                | 1               | 0.140                 | 1.30         |
| TCRS0807 - 390M | 39.00                | 1               | 0.150                 | 1.20         |
| TCRS0807 - 470M | 47.00                | 1               | 0.170                 | 1.10         |
| TCRS0807 - 560M | 56.00                | 1               | 0.190                 | 0.99         |
| TCRS0807 - 680M | 68.00                | 1               | 0.210                 | 0.89         |
| TCRS0807 - 820M | 82.00                | 1               | 0.270                 | 0.81         |
| TCRS0807 - 101M | 100.00               | 1               | 0.320                 | 0.74         |
| TCRS0807 - 121M | 120.00               | 1               | 0.360                 | 0.67         |
| TCRS0807 - 151M | 150.00               | 1               | 0.510                 | 0.60         |
| TCRS0807 - 181M | 180.00               | 1               | 0.570                 | 0.55         |
| TCRS0807 - 221M | 220.00               | 1               | 0.760                 | 0.50         |
| TCRS0807 - 271M | 270.00               | 1               | 0.860                 | 0.45         |
| TCRS0807 - 331M | 330.00               | 1               | 0.970                 | 0.41         |
| TCRS0807 - 391M | 390.00               | 1               | 1.280                 | 0.37         |
| TCRS0807 - 471M | 470.00               | 1               | 1.440                 | 0.34         |
| TCRS0807 - 561M | 560.00               | 1               | 1.610                 | 0.31         |
| TCRS0807 - 681M | 680.00               | 1               | 2.070                 | 0.28         |
| TCRS0807 - 821M | 820.00               | 1               | 2.330                 | 0.26         |
| TCRS0807 - 102M | 1000.00              | 1               | 2.720                 | 0.23         |
| TCRS0807 - 122M | 1200.00              | 1               | 3.980                 | 0.21         |
| TCRS0807 - 152M | 1500.00              | 1               | 4.500                 | 0.19         |
| TCRS0807 - 182M | 1800.00              | 1               | 6.810                 | 0.17         |
| TCRS0807 - 222M | 2200.00              | 1               | 7.560                 | 0.16         |
| TCRS0807 - 272M | 2700.00              | 1               | 8.540                 | 0.14         |
| TCRS0807 - 332M | 3300.00              | 1               | 9.740                 | 0.13         |
| TCRS0807 - 392M | 3900.00              | 1               | 12.900                | 0.12         |
| TCRS0807 - 472M | 4700.00              | 1               | 14.700                | 0.11         |
| TCRS0807 - 562M | 5600.00              | 1               | 20.400                | 0.099        |
| TCRS0807 - 682M | 6800.00              | 1               | 23.000                | 0.089        |
| TCRS0807 - 822M | 8200.00              | 1               | 30.600                | 0.081        |
| TCRS0807 - 103M | 10000.00             | 1               | 35.000                | 0.074        |

**Note:** Test Freq.: 1KHz / 0.25V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## How to Order



❶ Part Number: TCRS

❷ Size

| Code | Size      |
|------|-----------|
| 0606 | 6.5×6.5mm |
| 0807 | 8.5×7.3mm |

❸ Inductance

| Code | Inductance |
|------|------------|
| 220  | 22.00μH    |
| 101  | 100.00μH   |
| 102  | 1000.00μH  |
| 103  | 10000.00μH |

❹ Tolerance

| Code | Tolerance |
|------|-----------|
| J    | 5%        |
| K    | 10%       |
| L    | 15%       |
| M    | 20%       |
| N    | 30%       |
| Y    | min       |

*Back to 1st Page - Choke Coil Inductors Radial (TCRS)*

# Through Hole Gap Toroidal Inductors

## Through Hole Gap Toroidal Coils Make Your Design More Cost-Effective (TC19)

### ▶ Preview

Gapped toroidal coils usually require that the gap be filled with some type of insulating material to facilitate the winding process. Split core current coils can be assembled directly on a conductor while toroids must be passed over a disconnected end of the conductor.

Toroidal inductors are electronic components with the high performers among inductors, typically consisting of a circular ring-shaped magnetic core of iron powder, ferrite, or other material around which wire is coiled to make an inductor. Their windings cool better because of the proportionally larger surface area. Toroidal inductors with a round core cross section are better performers than toroidal inductors with a rectangular cross section.

Token utilizes the latest micro gap toroid technology enabling the most cost-effective designs in manufacturing through hole (TC19) products. Token's TC19 Toroidal Series manufactured by Low loss powdered iron cores offer the compact size and lower electromagnetic interference (EMI). Token toroidal can have higher Q factors and higher inductance than similarly constructed solenoid coils. This is due largely to the smaller number of turns required when the core provides a closed magnetic path. The magnetic flux in a toroid is largely confined to the core, preventing its energy from being absorbed by nearby objects, making toroidal cores essentially self-shielding. The TC19 series is suitable for a broad range of applications, such as high-frequency coils and transformers.

Full line products meet RoHS compliant. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

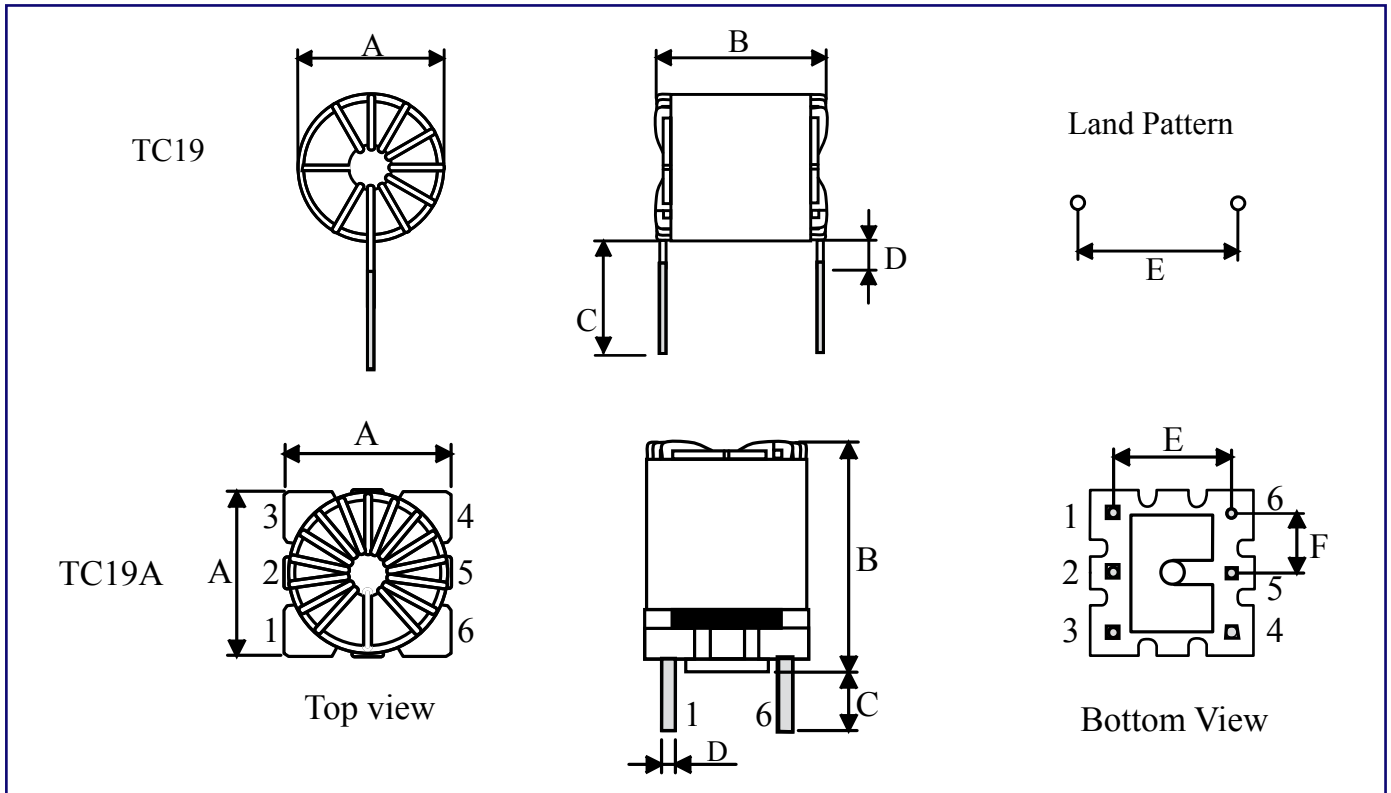
### Features :

- Micro gap toroid technology.
- Not easy magnetic saturation.

### Applications :

- VCD, DVD.

## Configurations & Dimensions



| Type  | A           | B           | C          | D          | E         | F         |
|-------|-------------|-------------|------------|------------|-----------|-----------|
| TC19  | 10.0 (Ref.) | 11.5 (Ref.) | 15.0 ± 5.0 | 2.0 (max)  | 11.0      | -         |
| TC19A | 11.0 (Ref.) | 15.0 (Ref.) | 3.5 ± 1.0  | 0.6 ± 0.05 | 7.0 ± 0.5 | 3.5 ± 0.5 |

**Note:** Design as Customer's Requested Specifications.

## Electrical Characteristics

| Part Number | Inductance(μH) | Test Freq.(KHz) | DCR (Ω)(max) | IDC (A)(max) |
|-------------|----------------|-----------------|--------------|--------------|
| TC19        | 19.5           | 100             | 0.093        | 3.00         |
| TC19A       | 19.5           | 100             | 0.093        | 3.00         |

**Note:** Test Freq.: 100KHz / 0.1V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at IDC.

## How to Order

TC19

❶

0606

❷

❶ Power Inductor Through Hole Gap Toroidal Coils: TC19, TC19A

*Back to 1st Page - Power Inductor Gap Toroidal coils (TC19)*

# Through Hole Choke Coils Inductors

## Choke Coils Lot of Dimensions to Choose (TCPC)

### ▶ Preview

Token TCPC series structure with epoxy resin encapsulated mould sealed and are available with vertical and horizontal type. The TCPC features with small size, high Q value, low cost, high self-resonance frequency, high availability of a large induced current, small magnetic flux leakage.

The TCPC is suitable for display monitors, camera, microwave ovens, lighting equipment, mobile phones, broadband modems, game consoles, color TV, VCR, notebook computers, inkjet printers, photocopying machines, automotive electronics products.

Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

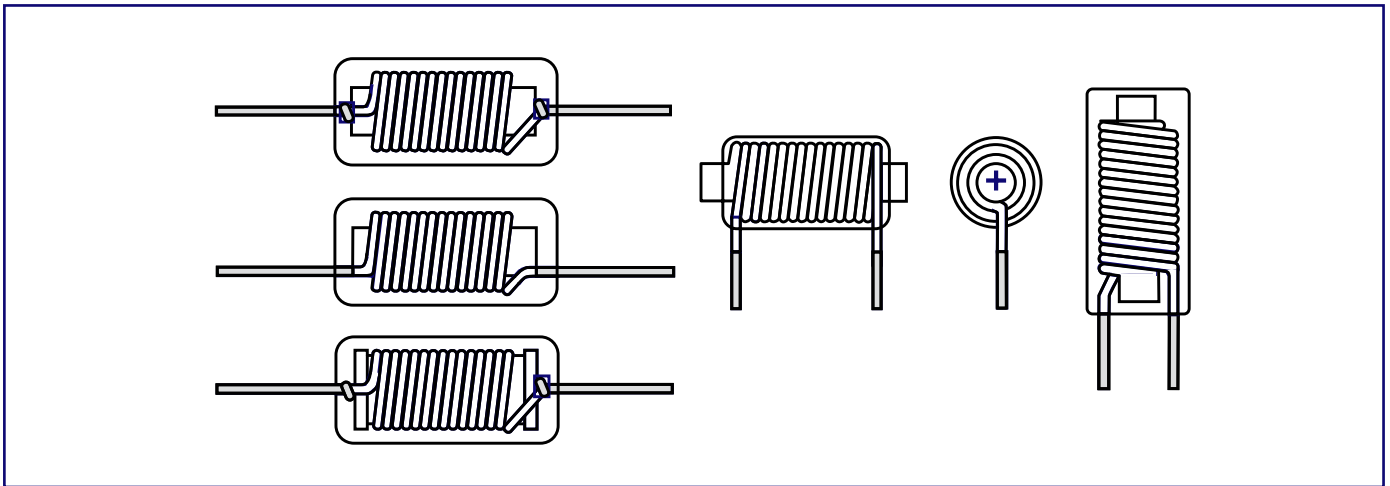
### Features :

- High rated current for high current circuits.
- Have lot of dimensions to choose.

### Applications :

- Switching Regulators, Power amplifiers.
- Power Suppliers, Typewriter, Car Electronics.

## Configurations & Dimensions



## How to Order

TCPC

①

0513

②

101

③

K

④

- ① Part Number: TCPC
- ② Core Dimension: Outside Diameter & Height
- ③ Inductance
- ④ Tolerance

| Code | Tolerance |
|------|-----------|
| J    | 5%        |
| K    | 10%       |
| L    | 15%       |
| M    | 20%       |
| N    | 30%       |
| Y    | min       |

*Back to 1st Page - Choke Coils Through Hole (TCPC)*



# Through Hole Power Inductors

## Token Develops High-Efficiency Coiled Power Inductors (TC1213)

### ▶ Preview

Token has announced a wire-wound power inductor designed for use in the Mother Board of PC and Notebook and various other power devices. The TC1213, measures only 14.0 x 14.5 mm, with a maximum height of 9.5 mm.

Most conventional DC-DC converters use inductors with cores made of relatively expensive metallic materials. By contrast, this product, with a ferrite material, realizes the same DC bias characteristics and other performance features as same-size inductors made with more expensive materials. The TC1213 offers customers much greater design freedom with large current and low DCR by meeting the need to replace power inductors.

Full line products meet RoHS compliant. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

### Features :

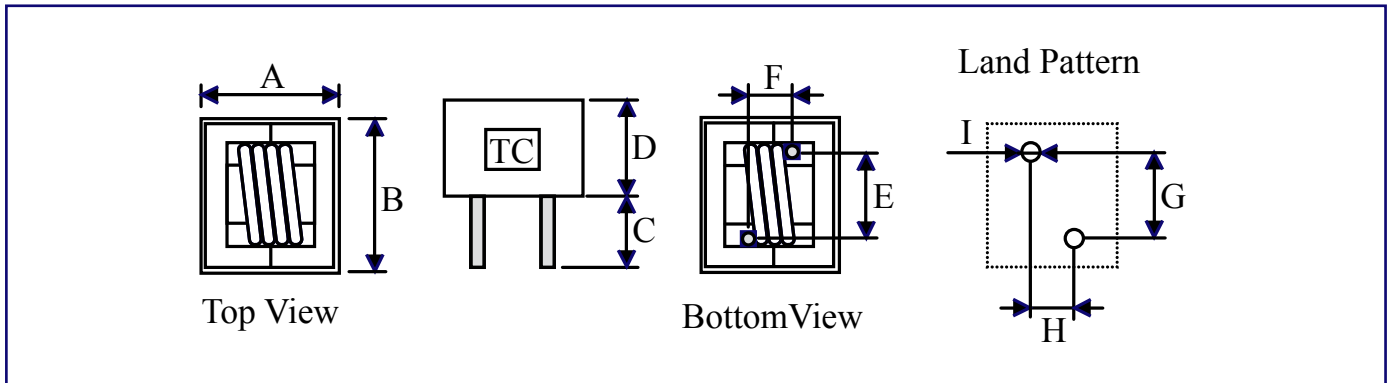
- Large Current and Low DCR.

### Applications :

- Mother Board of PC.
- Mother Board of Notebook.



## Configurations & Dimensions



| Type    | A(max) | B(max) | C ± 1.0 | D(max) | E(Ref.) | F(Ref.) | G   | H   | I   |
|---------|--------|--------|---------|--------|---------|---------|-----|-----|-----|
| TC1213  | 14.0   | 14.5   | 5.0     | 9.5    | 7.0     | 5.0     | 7.5 | 5.5 | 1.8 |
| TC1213A | 14.0   | 14.5   | 5.0     | 9.5    | 7.0     | 5.0     | 7.5 | 5.5 | 1.8 |
| TC1213B | 14.5   | 14.5   | 5.0     | 9.5    | 7.0     | 5.0     | 7.5 | 5.5 | 1.8 |

**Note:** Design as Customer's Requested Specifications.

## Electrical Characteristics

| Part Number    | Inductance(μH) | Test Freq.(KHz) | DCR (Ω)(max) | Peak Current (A) (max) | Irms (A)(max) |
|----------------|----------------|-----------------|--------------|------------------------|---------------|
| TC1213 - R68N  | 0.68           | 100             | 0.0015       | 40.00                  | 20.00         |
| TC1213A - R33N | 0.33           | 100             | 0.0015       | 40.00                  | 20.00         |
| TC1213B - 1R0N | 1.00           | 100             | 0.0015       | 35.00                  | 20.00         |

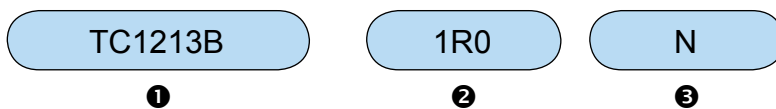
**Note:** Test Freq.: 100KHz / 0.1V.

Operating Temp.: -40°C ~ +85°C

Inductance drop = 10% typ. at Peak Current.

ΔT=40°C rise at Irms.

## How to Order



❶ Part Number: TC1213, TC1213A, TC1213B

❷ Inductance

| Code | Inductance |
|------|------------|
| R68  | 0.68μH     |
| 1R0  | 1.00μH     |

❸ Tolerance

| Code | Tolerance |
|------|-----------|
| N    | 30%       |

*Back to 1st Page - Power Inductors Through Hole (TC1213)*

# Large Current Power Inductors

**Token introduces high-current & high saturation flux density compact power inductor (TCLP/TCVP)**

▶ **Preview**

Token Electronics Power Solutions has enhanced its toroidal surface-mount and radial lead inductor portfolios with the addition of four new ranges of RoHS compliant components. The surface mount (TCLP/TCVP) series are general-purpose radial leaded inductors suitable for providing high saturation flux density and higher current ratings applications such as those found in power supplies.

The (TCLP/TCVP) series of toroidal surface-mount inductors meanwhile are designed for use in switching AC/DC power supplies and DC/DC converters. Both of TCLP and TCVP version secure 4 terminal mounting inductor more versatile inductance combination by series or parallel connections. Token (TCLP/TCVP) surface mount magnetics that can be used as single, or coupled inductors, or 1:1 transformers that provide isolation between two windings are designed around high frequency low loss material.

The (TCLP/TCVP) series toroidal surface-mount inductors have compact overall dimensions with a maximum overall height of less than 13 mm and 21 mm. The toroidal construction of the new inductors aids design engineers by helping minimise EMI issues.

Custom parts are available on request. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

**Features :**

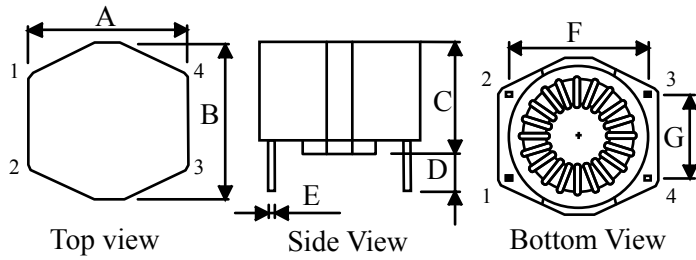
- high saturation for surface mounting.
- Large Current and Low DCR.

**Applications :**

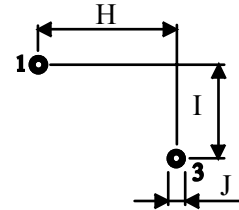
- TV BOX.
- Power supply applications.
- Output Ripple Current Filter.

## Configurations & Dimensions

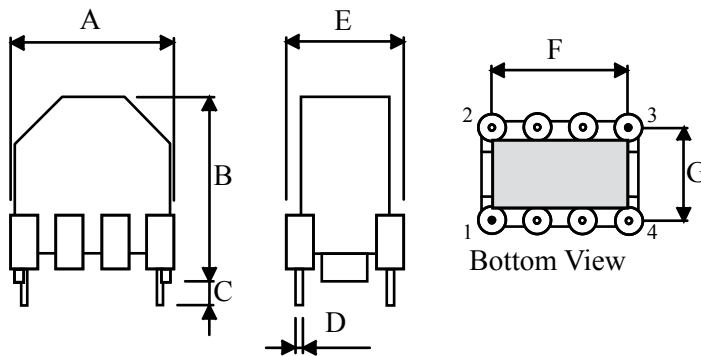
TCLP



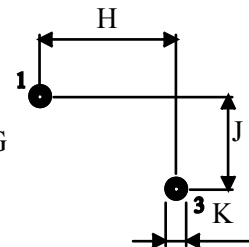
Land Pattern



TCVP



Land Pattern



| Type | A(max) | B(max) | C         | D         | E          | F          | G          | H    | I    | J    |
|------|--------|--------|-----------|-----------|------------|------------|------------|------|------|------|
| TCLP | 18.03  | 18.03  | 13.0(max) | 4.0 ± 1.0 | 0.64 ± 0.2 | 15.3 ± 0.5 | 10.2 ± 0.5 | 15.3 | 10.2 | 1.78 |
| TCVP | 19.00  | 21.00  | 4.0 ± 1.0 | 0.7 ± 0.3 | 14.0(max)  | 15.0 ± 0.5 | 10.0 ± 0.5 | 15.0 | 10.0 | 1.78 |

**Note:** Design as Customer's Requested Specifications.

## Electrical Characteristics

| Part Number       | Inductance(μH) | Test Freq.(KHz) | L@IDC(μH)(min) | DCR (Ω)(max) | IDC (A)(max) |
|-------------------|----------------|-----------------|----------------|--------------|--------------|
| TC*P - 60E - 151M | 150            | 100             | 125            | 0.210        | 1.70         |
| TC*P - 60E - 221M | 220            | 100             | 180            | 0.250        | 1.50         |
| TC*P - 60E - 331M | 330            | 100             | 280            | 0.480        | 1.00         |
| TC*P - 60E - 471M | 470            | 100             | 400            | 0.660        | 0.90         |
| TC*P - 60E - 681M | 680            | 100             | 590            | 0.930        | 0.85         |
| TC*P - 60E - 821M | 820            | 100             | 700            | 1.300        | 0.75         |
| TC*P - 60E - 102M | 1000           | 100             | 930            | 1.600        | 0.50         |

## ▶ How to Order

TCLP

❶

60E

❷

151

❸

M

❹

❶ Part Number: TCLP, TCVP

❷ Core Material

❸ Inductance

| Code | Inductance      |
|------|-----------------|
| 151  | 150 $\mu$ Hc    |
| 471  | 470.00 $\mu$ H  |
| 102  | 1000.00 $\mu$ H |

❹ Tolerance

| Code | Tolerance |
|------|-----------|
| M    | 20%       |
| N    | 30%       |

*Back to 1st Page - Large Current Power Inductors (TCLP/TCVP)*

## Air Coils Inductors

**Air Coils Inductors, Spring Coils - TCAC Series**

**Token will do any custom coil windings of Air Coils for you (TCAC)**

### ▶ Preview

Token manufactures all types of air coils inductors. Air Coils' another name is Spring Coils. Token's Air Core Coil TCAC Series has advantages of free from iron losses, non-linearity, single layer coils structure, low self-capacitance, and self-resonant frequency.

TCAC's inductance is unaffected by the current it carries. This contrasts with the situation with coils using ferromagnetic cores whose inductance tends to reach a peak at moderate field strengths before dropping towards zero as saturation approaches. Sometimes non-linearity in the magnetization curve can be tolerated; for example in switching converters. In circuits such as audio cross over networks in Hi-Fi speaker systems you must avoid distortion; then you need an air coil. Most radio transmitters rely on air coils to prevent the production of harmonics.

Token's TCAC Series is custom coil windings. Please call Token Sales for your requirements to have high quality work at a reasonable tooling cost and low cost volume production.

### Features :

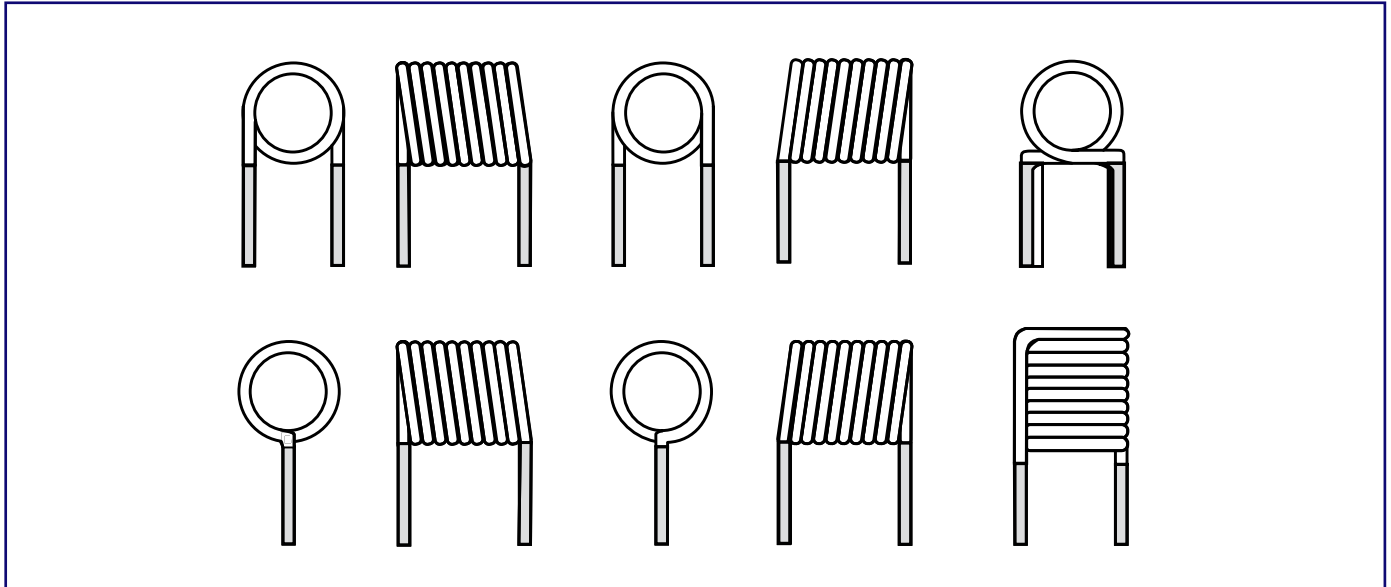
- High Q values
- High frequency

### Applications :

- Set up box, CATV & Electronic Products.



► Configurations



**Note:** Design as Customer's Requested Specifications.

## ▶ Winding Formula & Q Factor

### Single layer air coil winding formula Methods and Increasing Q Factor

The following single layer air coil formula is most accurate when the coil length is greater than  $0.67r$  and the frequency is less than 10 MHz. As the frequency goes above 10MHz, the formula becomes less accurate, because parasitics dominate the circuit. In all cases, the length is 4 times the radius.

**Formula in Inch Units:**  $L = r^2 N^2 / (9r + 10A)$ ;  $N = (L(9r + 10A) / r^2)^{1/2}$

**Formula in Metric Units:**  $L = 0.394r^2 N^2 / (9r + 10A)$ ;  $N = (L(9r + 10A) / 0.394r^2)^{1/2}$  Where:

- L = inductance (in microhenries).
- r = radius of coil (in inches or cm).
- N = number of turns.
- A = length of winding (in inches or cm).

The Q or Quality Factor of an inductor is the ratio of its inductive reactance  $X_L$  to its series resistance  $R_S$ . The larger the ratio, the better the inductor.

**Formula:**  $Q = X_L / R_S$ , Where:

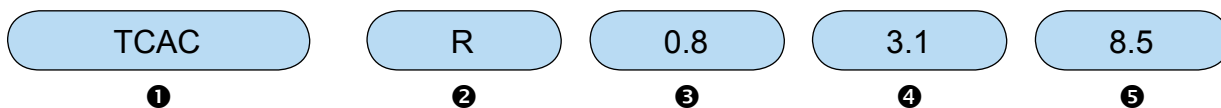
- $X_T = 2\pi fL$ . where  $f$  = Frequency (Hz); L = Inductance in Henries.
- $R_S$  is determined by multiplying the length of the wire used to wind the coil by the D.C. resistance per unit length for the wire gage used.
- Q changes dramatically as a function of frequency.
- At lower frequencies, Q is very good because only the D.C. resistance of the windings has an effect which is very low.
- As frequency goes up, Q will increase up to about the point where the skin effect and the combined distributed capacitances begin to dominate.
- From then on, Q falls rapidly and becomes 0 at the self resonance frequency of the coil.

### Increasing Q of Inductors:

- Spread the windings. Air gaps between the windings decrease the distributed capacitances.
- Use a ferrite core or powdered iron to wind the coil on. This will increase the permeability of the space around the core.
- Decrease the series resistance of the windings by increasing the wire gage used. Larger wire has a lower resistance per unit length.



**▶ How to Order**



❶ Part Number: TCAC

❷ Type of Winding

| Code | Type of Winding           |
|------|---------------------------|
| R    | Clockwise winding         |
| L    | Counter clockwise winding |

❸ Wire Diameter(mm)

❹ Inner Diameter(mm)

❺ Number of Turns

*Back to 1st Page - Air Coils Inductors, Spring Coils (TCAC)*

# Common Mode Choke Coil Inductors

**Leaded type common mode inductor Chokes  
clean up high-speed signals (TCB7T)**

▶ **Preview**

Token TCB7T series wire-wound common-mode choke coil includes a magnetic core having a winding core portion and a pair of flanges provided at respective ends of the winding core portion, external electrodes provided on the respective flanges, a pair of windings wound around the winding core portion, each end of the pair of the windings being extended and connected to the external electrode.

For designers seeking to suppress common mode noise on high speed differential signal lines, without distortion, Token has announced the TCB7T Series of compact through hole common-mode choke coils. Taking advantage of Token's advanced winding technology and superior ferrite materials, the TCB7T coils are ultracompact and provide accurate transmission of high-speed differential signals.

Common mode choke coil circuits are increasingly being used for the effective suppression of common mode noise without distorting the waveform of high-speed signals. The TCB7T wirewound coils measure just 7.2 x 7.1 x 4.5 mm in maximum profile, with a tight  $\pm 0.5$  mm dimensional tolerance, making them ideal for today's high speed products, particularly those incorporating double balance mixers, impedance transformers, broad-band transformers applications.

Custom parts are available on request. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

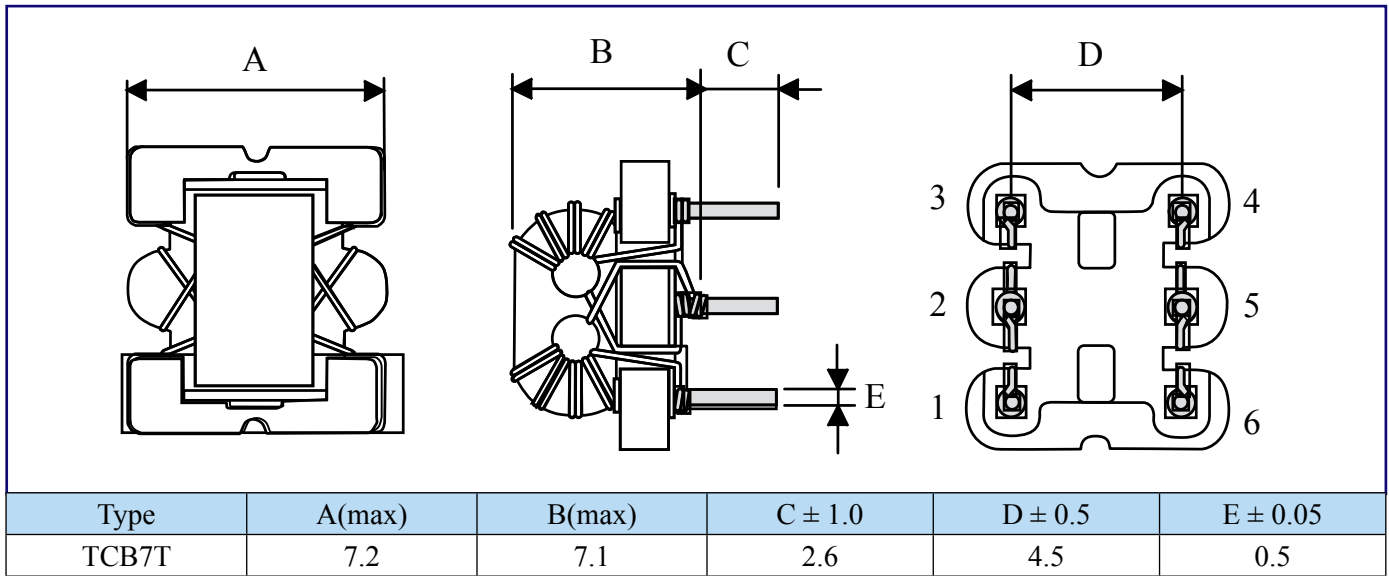
**Features :**

- Pair wire coil for high stability.

**Applications :**

- Double balance mixers, impedance transformers.
- broad-band transformers.

## Configurations & Dimensions

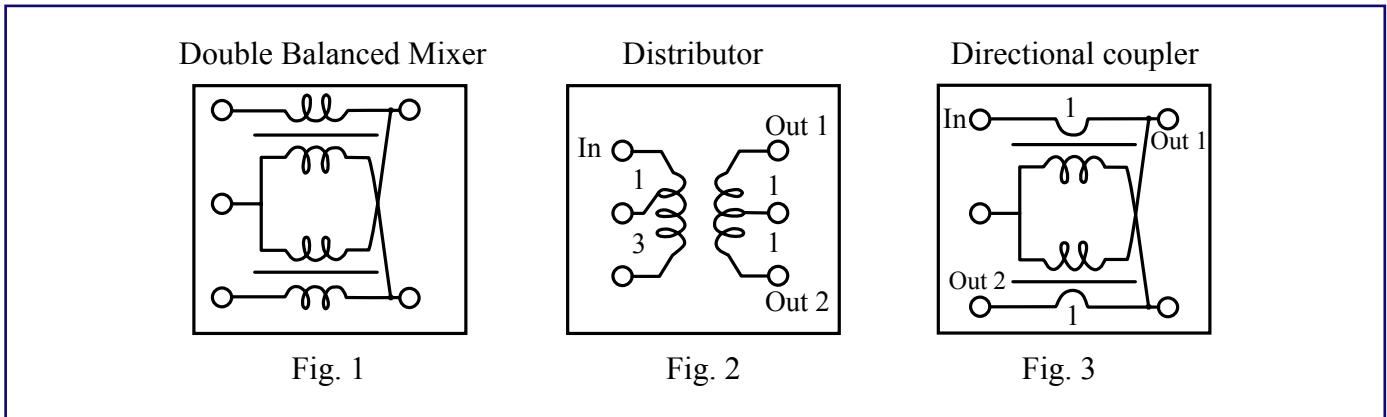


**Note:** Design as Customer's Requested Specifications

## Electrical Characteristics

| Part Number                  | Winding Turns | Operating Freq. Ranges ( MHz ) | Insertion Loss (dB)   | Figure |
|------------------------------|---------------|--------------------------------|---|--------|
| <b>Double balanced mixer</b> |               |                                |   |        |
| TCB7T - 456DB1013            | 1             | 50 ~ 400                       | 10dB(max)   | 1      |
| TCB7T - 456DB1014            | 2             | 10 ~ 1.0 GHz                   | 6dB(max)  | 1      |
| TCB7T - 456DB1005            | 3             | 8 ~ 800                        | 3.5dB(max)  | 1      |
| TCB7T - 456DB1006            | 4             | 6 ~ 600                        | 2.5dB(max)  | 1      |
| TCB7T - 456DB1007            | 5             | 5 ~ 500                        | 2dB(max)  | 1      |
| TCB7T - 456DB1009            | 2             | 400 ~ 1.3 GHz                  | 4dB(max)  | 1      |
| <b>Distributor</b>           |               |                                |   |        |
| TCB7T - 456DS1012            | -             | 20 ~ 600                       | In to Out-1,2<br>4.5dB(max)<br>Out-1 to Out-2<br>(Isolation)10dB(min) | 2      |
| <b>Directional coupler</b>   |               |                                |   |        |
| TCB7T - 456PS1015            | 4             | 6 ~ 600                        | In to Out-1 1.3dB(max)<br>In to Out-2 11dB-14dB                       | 3      |
| TCB7T - 456PS1016            | 5             | 6 ~ 600                        | In to Out-1 0.9dB(max)<br>In to Out-2 13dB-16dB                       | 3      |
| TCB7T - 456PS1011            | 6             | 6 ~ 600                        | In to Out-1 0.8dB(max)<br>In to Out-2 15dB-17dB                       | 3      |

## Pin connections Diagram



## How to Order

TCB7T

❶

❶ Part Number: TCB7T

456DB1013

❷

❷ Type

| Code  | Type                 |
|-------|----------------------|
| 456DS | Distributor          |
| 456PS | Directional coupler  |
| 456DB | Double balance mixer |

*Back to 1st Page - Common Mode Choke Coil Inductors (TCB7T)*

# Toroidal Coil Power Inductor

**Toroidal Inductors with closed magnetic circuit  
for lowest EMI (TCTK)**

▶ **Preview**

Toroidal coils are electronic components with the high performers among inductors, typically consisting of a circular ring-shaped magnetic core of iron powder, ferrite, or other material around which wire is coiled to make an inductor. Their windings cool better because of the proportionally larger surface area. Toroidal inductors with a round core cross section are better performers than toroidal inductors with a rectangular cross section.

With vertical base mounted Token TCTK series toroidal coils introduces advanced materials of iron core and special-purpose resins to produce the greatest inductance, high current, Lowest EMI, and Low cost. The TCTK is the most common kind of power inductors. Token TCTK utilizes closed magnetic circuit design enabling the lowest EMI and is suitable for Copying Machine, Display Monitor, ADSL Modem, Refrigerator, Laundry Machine, Microwave Oven, Car Electronics, Gaming Machine, Color TV, Video Camera, and Air Conditioner.

Full line products meet RoHS compliant. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

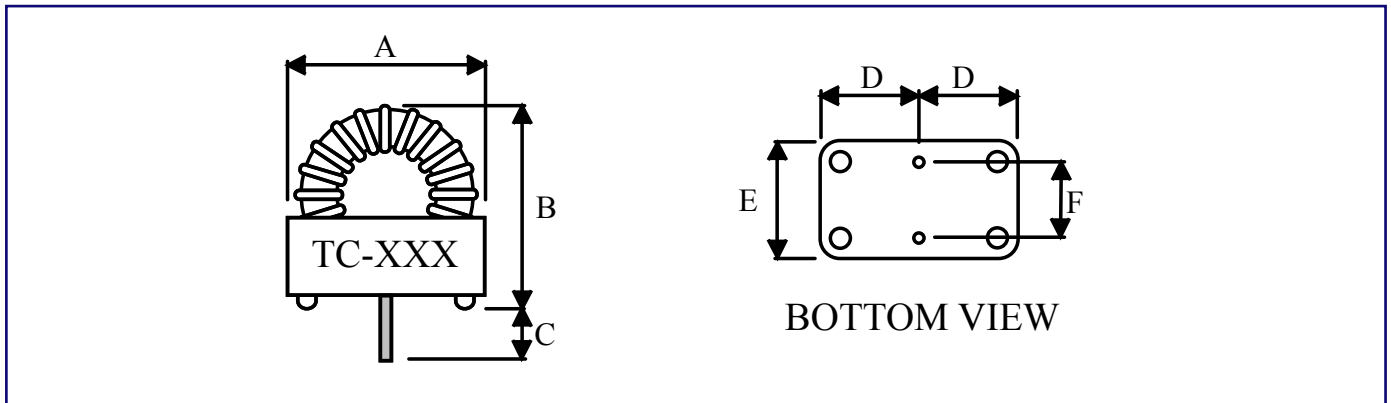
**Features :**

- Vertical base mounted.
- Low cost, High current.
- Closed magnetic circuit for lowest EMI.

**Applications :**

- Copying Machine, Display Monitor, ADSL Modem,
- Gaming Machine, Color TV, Video Camera, Air Conditioner,
- Refrigerator, Laundry Machine, Microwave Oven and Car Electronics.

## Configurations & Dimensions



| Type     | A $\pm$ 0.5 | B(max) | C $\pm$ 1.0 | D (ref.) | E $\pm$ 0.05 | F $\pm$ 0.05 |
|----------|-------------|--------|-------------|----------|--------------|--------------|
| TCTK4452 | 14.7        | 17.0   | 5.0         | 7.35     | 8.6          | 5.6          |
| TCTK5052 | 16.5        | 18.0   | 5.0         | 8.25     | 11.4         | 7.6          |
| TCTK6852 | 21.0        | 25.0   | 5.0         | 10.50    | 11.4         | 7.6          |
| TCTK8052 | 24.1        | 27.5   | 5.0         | 12.05    | 15.2         | 11.4         |

**Note:** Design as Customer's Requested Specifications

## How to Order

TCTK4452

❶

1R0

❷

1R0

❸

❶ Part Number: TCTK4452, TCTK5052, TCTK6852, TCTK8052

❷ Inductance

❸ Tolerance

| Code | Tolerance |
|------|-----------|
| K    | 10%       |
| L    | 15%       |
| M    | 20%       |
| N    | 30%       |
| Y    | minS      |

*Back to 1st Page - Power Inductor Toroidal Coils (TCTK)*

# High Current Toroidal Inductor

**Low Loss Powdered Iron Cores, Low EMI  
Toroidal Coils (TCTC)**

## ▶ Preview

Toroidal inductors and transformers are electronic components with the high performers among inductors, typically consisting of a circular ring-shaped magnetic core of iron powder, ferrite, or other material around which wire is coiled to make an inductor. Their windings cool better because of the proportionally larger surface area. Toroidal inductors with a round core cross section are better performers than toroidal inductors with a rectangular cross section.

Token's TCTC Toroidal Series manufactured by Low loss powdered iron cores offer the smallest size by volume and weight, and lower electromagnetic interference (EMI). Token toroidal can have higher Q factors and higher inductance than similarly constructed solenoid coils. This is due largely to the smaller number of turns required when the core provides a closed magnetic path. The magnetic flux in a toroid is largely confined to the core, preventing its energy from being absorbed by nearby objects, making toroidal cores essentially self-shielding. The TCTC series is suitable for a broad range of applications, such as high-frequency coils and transformers.

Full line products meet RoHS compliant. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

### Features :

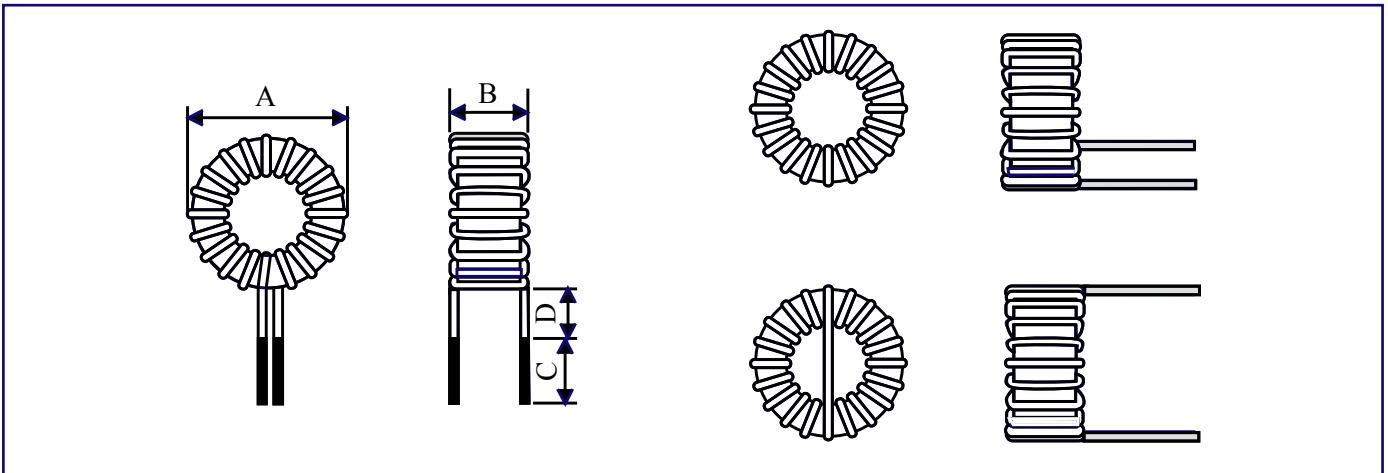
- Low EMI.
- Low Cost.
- High Current.

### Applications :

- Notebook, Inkjet Printer, Copying Machine,
- Copying Machine, Display Monitor, ADSL Modem,
- Color TV, Video Camera, Air Conditioner, Refrigerator,
- Laundry Machine, Microwave Oven and Car Electronics, etc..



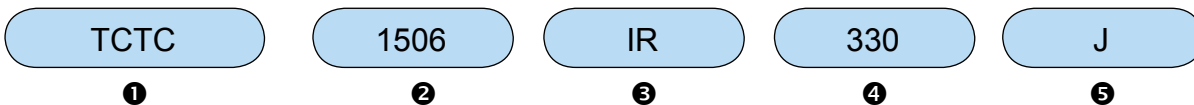
## Configurations & Dimensions



| Part Number      | Dimensions (mm) |        |        |        |           | Turns | Inductance L (μH) | RDC (mΩ) |
|------------------|-----------------|--------|--------|--------|-----------|-------|-------------------|----------|
|                  | A max.          | B max. | C max. | D max. | Wire Dia. |       |                   |          |
| TCTC1005IR-330-J | 12.0            | 7.0    | 25.0   | 3.0    | Φ0.4      | 25    | 33                | 59       |
| TCTC1104IR-300-J | 13.5            | 7.5    | 25.0   | 3.0    | Φ0.4      | 25    | 30                | 62       |
| TCTC1305IR-330-J | 15.5            | 8.5    | 25.0   | 3.0    | Φ0.4      | 28    | 33                | 71       |
| TCTC1306IR-300-J | 17.0            | 9.5    | 25.0   | 3.0    | Φ0.6      | 26    | 30                | 30       |
| TCTC1506IR-330-J | 19.0            | 10.0   | 25.0   | 3.0    | Φ0.6      | 24    | 33                | 40       |
| TCTC1806IR-390-J | 21.0            | 10.0   | 25.0   | 3.0    | Φ0.6      | 25    | 39                | 33       |
| TCTC2006IR-430-J | 25.0            | 11.0   | 25.0   | 3.0    | Φ0.8      | 29    | 43                | 31       |
| TCTC2310IR-960-J | 27.0            | 13.5   | 25.0   | 3.0    | Φ0.8      | 30    | 96                | 42       |
| TCTC2711IR-121-J | 32.0            | 17.0   | 25.0   | 3.0    | Φ1.0      | 30    | 120               | 37       |
| TCTC3311IR-141-J | 40.0            | 17.0   | 25.0   | 3.0    | Φ1.0      | 40    | 140               | 37       |

Note: Design as Customer's Requested Specifications.

## How to Order



- ❶ Part Number: TCTC
- ❷ Core Size
- ❸ Core Type
- ❹ Inductance

| Code | Inductance |
|------|------------|
| 330  | 33μH       |
| 121  | 120μH      |

- ❺ Tolerance

| Code | Tolerance |
|------|-----------|
| J    | 5%        |
| K    | 10%       |
| L    | 15%       |
| M    | 20%       |
| N    | 30%       |
| Y    | minS      |

[Back to 1st Page - Toroidal Inductors \(TCTC\)](#)



# Inductor Filter Ferrite Beads

## Ferrite Beads Filter Radio Frequency Interference and Noise (TCFB)

### ▶ Preview

Ferrite bead is a kind of anti-jamming applications the fastest growing components, cheap, easy to use, filtering high-frequency noise were improved significantly.

Ferrite beads commonly used in filtering and electromagnetic noise reduction, Token's Ferrite Beads TCFB series manufactured by using iron, nickel, zinc oxide mixture made with high resistivity and high magnetic permeability. Ferrite bead in series with the signal or power path, it can be used to suppress differential mode noise.

By comparing with traditional inductors, Token's TCFB has better high-frequency filter characteristics. Ferrites at high frequencies showed resistance characteristics at high frequencies, equivalent to a low inductor quality factor, it can be quite a wide frequency range, to maintain a high impedance, thereby enhancing the effectiveness of high-frequency filter.

The TCFB series is lead-free and RoHS compliant. Detailed specifications, both mechanical and electrical, please contact our sales representative for more information.

### Features :

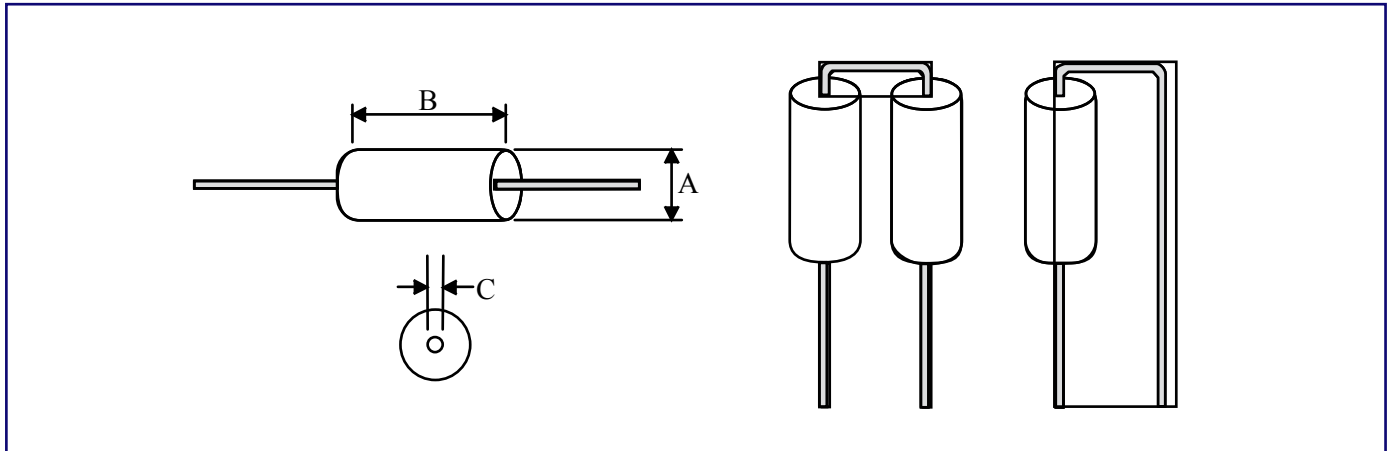
- Low cost, high reliability.
- Reducing radio frequency interference and noise.

### Applications :

- VGA card, EGA card, Mother board, TV game.



## Configurations & Dimensions



| Type       | A        | B        | C    | Impedance ( $\Omega$ ) Min. |        |
|------------|----------|----------|------|-----------------------------|--------|
|            |          |          |      | 10MHz                       | 100MHz |
| TCFB*2515* | 2.5±0.15 | 1.5±0.15 | 0.65 | 5.0                         | 20.0   |
| TCFB*2530* | 2.5±0.15 | 3.0±0.20 | 0.65 | 8.0                         | 25.0   |
| TCFB*2540* | 2.5±0.15 | 4.0±0.20 | 0.65 | 12.0                        | 32.0   |
| TCFB*2575* | 2.5±0.15 | 7.0±0.30 | 0.65 | 20.0                        | 58.0   |
| TCFB*3530* | 3.5±0.20 | 3.0±0.20 | 0.65 | 13.0                        | 65.0   |
| TCFB*3545* | 3.5±0.20 | 4.5±0.20 | 0.65 | 20.0                        | 45.0   |
| TCFB*3547* | 3.5±0.20 | 4.7±0.20 | 0.65 | 20.0                        | 45.0   |
| TCFB*3550* | 3.5±0.20 | 5.0±0.20 | 0.65 | 20.0                        | 50.0   |
| TCFB*3560* | 3.5±0.20 | 6.0±0.20 | 0.65 | 20.0                        | 80.0   |
| TCFB*3578* | 3.5±0.20 | 7.8±0.30 | 0.65 | 28.0                        | 90.0   |
| TCFB*3583* | 3.5±0.20 | 8.3±0.30 | 0.65 | 30.0                        | 100.0  |
| TCFB*3590* | 3.5±0.20 | 9.0±0.40 | 0.65 | 60.0                        | 100.0  |
| TCFB*3510* | 3.5±0.20 | 10.0±0.4 | 0.65 | 50.0                        | 130.0  |
| TCFB*3512* | 3.5±0.20 | 12.0±0.5 | 0.65 | 45.0                        | 145.0  |
| TCFB*3514* | 3.5±0.20 | 14.0±0.5 | 0.65 | 60.0                        | 150.0  |

**Note:** Only available some sizes for Radial Double & Single core type.

## ▶ How to Order

TCFB

❶

R

❷

3547

❸

TB

❹

❶ Part Number: TCFB

❷ Form

| Code | Type of Winding         |
|------|-------------------------|
| A    | Axial Type              |
| D    | Radial double core type |
| S    | Radial single core type |

❸ Outside Diameter “A” & Length “B”

❹ Inductance

| Code | Type of Winding |
|------|-----------------|
| P    | Bulk            |
| TR   | Taping Reel     |
| TB   | Tapping Box     |

*Back to 1st Page - Inductor Filter Ferrite Beads (TCFB)*

# Broadband Choke Inductors

**Excellent EMI Suppression Capability  
Inductor Filter Coils Wide Band Chokes (TCWB)**

▶ **Preview**

Broadband choke inductors, also known as choke coils, is a common mode ferrite as the core of the interference suppression devices. It consists of two same size, the same number of turns of coils, symmetrically wound on the same ferrite toroidal cores, and forming a four-terminal device.

Shown on the common-mode signal inhibits the growth of large inductor, but for differential-mode signal showing a small leakage inductance is almost ineffective. Choke coils used in a balanced circuit can effectively suppress common mode interference signals (such as lightning interference), while the normal transmission line differential-mode signal has no effect.

Token's TCWB series use of insulation between the coil core winding method. To ensure that the transient over-voltage under the action of short circuit breakdown does not occur. And when the instantaneous high currents flowing through the coil, the core is not saturated. The wide band choke cores mainly used in the PC boards to filters the EMI from the outsides.

Token utilizes the latest winding technology reducing parasitic capacitance of the coil and enhancing the ability of transient over-voltage. Token Electronics will also produce devices outside these specifications to meet customer requirements, with comprehensive application engineering and design support available for customers worldwide.

**Features :**

- Ferrite core construction of low cost.

**Applications :**

- VGA card, EGA card, Mother board, TV game.



## Configurations & Dimensions

| Type                | $\Phi A \pm 0.5$ | $B \pm 0.5$ | $C \pm 3.0$ | $\Phi D \pm 0.05$ |
|---------------------|------------------|-------------|-------------|-------------------|
| TCWBR6H - 1.5Ts     | 6.0              | 10.0        | 25.0        | 0.5 / 0.6         |
| TCWBR6H - 2.5Ts     | 6.0              | 10.0        | 25.0        | 0.5 / 0.6         |
| TCWBR6H - 3.0Ts     | 6.0              | 10.0        | 25.0        | 0.5 / 0.6         |
| TCWBR6H - 1.5+1.5Ts | 6.0              | 10.0        | 25.0        | 0.5 / 0.6         |

**Note:** Design as Customer's Requested Specifications.

## How to Order

TCWB

❶

R6H

❷

2.5

❸

❶ Part Number: TCWB

❷ Hole

| Code | Type of Winding |
|------|-----------------|
| R6H  | 6 holes         |
| R8H  | 8 holes         |

❸ No. of Turns

*Back to 1st Page - Broadband Choke Inductors (TCWB)*