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.

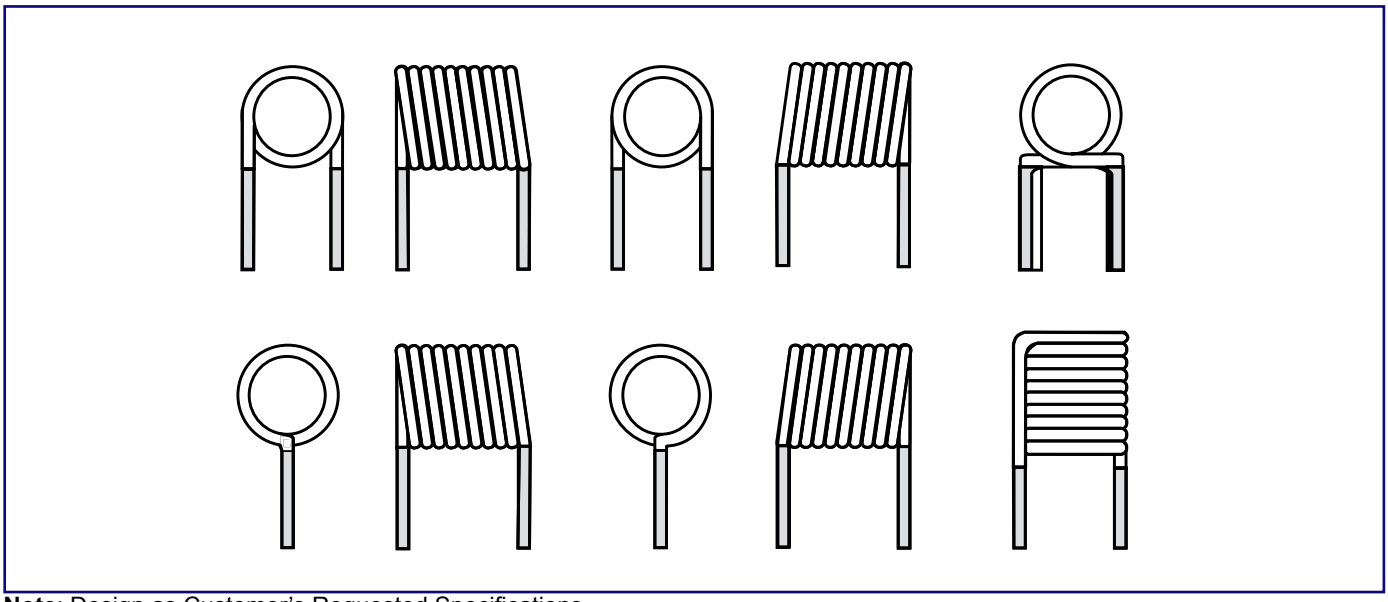
Features :

- 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: $L = r^2N^2 / (9r + 10A)$; $N = (L(9r + 10A) / r^2)^{1/2}$

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

TCAC	R	0.8	3.1	8.5
❶	❷	❸	❹	❺

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

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