Billions of Connections, One Solution

Skyworks has been enabling wireless connectivity for over a decade. However, given growing consumer demand for wireless ubiquity and the desire for anytime, anywhere access, there are billions of connections yet to be made.

With our high-performance analog semiconductors, Skyworks is linking people, places, and things across a growing number of markets and applications – bringing everyone closer to vital information wherever it is needed.

Skyworks is a global company with engineering, marketing, operations, sales and support facilities located throughout Asia, Europe and North America. For more information, please visit Skyworks’ website at www.skyworksinc.com.

A Leader in Advanced Technical Ceramics

Skyworks Solutions, through its wholly-owned subsidiary Trans-Tech, is the industry leader in technical ceramics. With over 60 years of experience, we offer a wide variety of materials available for antenna applications. These include our entire suite of dielectric materials (D-125, D-73XX, D-9000 and the MCT series), as well as hexagonal ferrites for high frequency magneto-dielectric antennas. We can also deliver an enhanced Co\textsubscript{2}Z material when higher Q values for the 300–700 MHz range are required.

Specialty Materials

Dielectrics

Materials

- D-125
- D-73XX
- D-88XX
- D-9000
- MCT Series

Advantages

- Best miniaturization factor
- Good combination of miniaturization factor and Q
- Good Q (low loss)
- Permittivities extend to above RF
- Best above 1 GHz
- Long production history

Magnetics (Magneto-Dielectric)

Materials

- Z-Phase Hexaferrites (Ba\textsubscript{2}M\textsuperscript{II}Fe\textsubscript{24}O\textsubscript{41}) where M\textsuperscript{II} = Mn, Mg, Zn, Co, Ni or Cu
- Y Type Hexaferrites (Ba\textsubscript{2}M\textsuperscript{II}Fe\textsubscript{12}O\textsubscript{22}) where M\textsuperscript{II} = Mn, Mg, Zn, Co, Ni or Cu
- Enhanced Co\textsubscript{2}Z: (TTZ-500 materials)
- Submicron to 100 mesh (powder form) or sintered

Advantages

- Good miniaturizing factors = (\mu\textsuperscript{*}\varepsilon\textsuperscript{t})\textsuperscript{1/2}
- Reducing field concentration
- Better impedance match (\mu/\varepsilon = 1)
- Better in 100 MHz – 1 GHz range
- Good efficiency and bandwidth
Hexagonal Ferrites

Applications
Antenna, absorber, transformer and inductor applications for military and commercial markets

Features
- \((\text{Zn,Co})_2\text{Z}\) (TTZ-100)
  - Designed for 100 MHz antenna applications
- \(\text{Co}_2\text{Z:K}\) (TTZ-500)
  - Highest frequency resonance of any Z-phase material in the market
  - Designed for 500 MHz antenna applications
- \((\text{Sr-Co}_2\text{Y})\) (TTZ-1000)
  - Designed for up to 1 GHz antenna applications
- TTZ-133
  - Optimized for 13.56 MHz medical RFID frequency

TTZ-100 and TTZ-500
The TTZ-100 is a composition based on the Z-type hexagonal ferrite material with permeability \((\mu^\prime) > 13\) and a magnetic Q factor \((Q) (\mu^\prime\mu^\prime\prime) > 30\) (at 100 MHz) that is specifically designed for antenna applications around 100 MHz. The TTZ-100 may be supplied either in powder form with custom particle sizes, or as a sintered ceramic product with dimensions up to 4 x 4 inch squares.

The TTZ-500 is a composition based on the Z-type hexagonal ferrite material with permeability \((\mu^\prime) > 7\) and a magnetic Q \((\mu^\prime\mu^\prime\prime) > 15\) (at 500 MHz) that is specifically designed for antenna applications around 500 MHz. The TTZ-500 may be supplied either in powder form with custom particle sizes, or as a sintered ceramic product in shapes with dimensions up to 4 x 4 inch squares.

Blends of the TTZ-100 and TTZ-500 are also available for applications in the intermediate frequency range. Although the TTZ-500 may be used for applications up to 800 MHz, the magnetic Q decreases with frequency. For applications below 100 MHz, the TT1 and TT2 series of spinels would be most suitable.

TTZ-1000
TTZ-1000 is a composition designed to provide greater magnetic Q at frequencies up to 1 GHz \((Q > 20)\).

TTZ-1000 is specifically designed for military and aircraft antenna applications with a high miniaturization factor and large bandwidth.
Antenna Solutions / Specialty Materials

| Microwave Absorbers |
We offer a number of oxide-based materials available for RF absorbers over a range of frequencies and temperatures. These materials are available as formed and fired ceramics, powders suitable for plasma spraying, as well as powders suitable for blending with polymeric materials.

Spinels
- TT2-111R: Suitable for broadband absorption below 500 MHz
- Ferrite 50: Suitable for broadband absorption from 800 MHz to 12 GHz
- Custom Ferrites: Narrow band materials for applications below 2 GHz

Hexagonal Ferrites
- Co2Z: Excellent absorber in the 1–5 GHz range
- Substituted M Type Ferrites: BaFe12−2xMIIxTi6O19 (MII = Mn or Co)
  - Select frequency bands in the 10–50 GHz range
- Custom Hexagonal Compositions Available
  - Y Type: Ba2MII3Fe12O22
  - Z Type: Ba3MII4Fe24O41
  - W Type: BaMII12Fe16O27
  - MII = Mn, Mg, Zn, Co, Ni or Cu

Contact Us
Find out how we can work together to provide you with high-performance solutions designed to meet your particular specifications by contacting us at rfceramics@skyworksinc.com

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