Ferrite Chip Beads—MMZ Series

For general signal line use in consumer & automotive applications

Consumer Datasheets: 0402 0603 1005 1608 2012
Automotive Datasheets: 1005 1608 2012



TDK's MMZ Series ferrite chip beads are used to suppress noise in both signal and power supply circuits. They are effective at reducing noise simply by being placed into the circuit in series. Multilayer chip beads consist of ferrite material and a conductive paste layered together. The equivalent circuit diagram of a chip bead consists of a reactance component, X, and a resistive component, R. The combined impedance of X and R is denoted as impedance Z. The static characteristics of a chip bead are typically described as the impedance value Z at a frequency of 100MHz. While several different chip beads could have the same impedance value at 100MHz, it is important to look at their individual frequency characteristics to determine which bead will work best for the circuit within the required frequency range. TDK offers up to eight material types which provide various frequency characteristics for MMZ series chip beads in a variety of case sizes, each suited to different applications. Availability of materials varies with case size.

Features

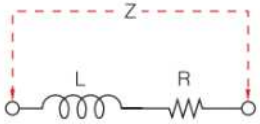
- Noise reduction solution for general signal line
- Various frequency characteristics with 8 materials of different features
- Countermeasures from general signals to high-speed signals
- Conforms to RoHS directive, halogen free, & compatible with lead-free soldering
- Standard operating temperature range of –55°C to +125°C
- Storage temperature range of –55°C to 125°C (after PC board mounting)

Consumer	Automotive
• Case sizes: 0402, 0603, 1005, 1608, & 2012	• Case sizes: 1005, 1608, & 2012 • AEC-Q200 compliant

Applications

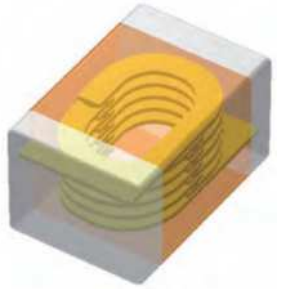
Consumer	Automotive
• Mobile Devices, including Smartphone and Tablet PCs • Recorders, Household Appliances, STBs, Industrial Equipment, and Smart Meters	• ECU's, Powertrain, and Body Control • Car Multimedia (telematics)

Equivalent Circuit Diagram of a Chip Bead



$X = \omega L = 2\pi fL$ f: Frequency

Internal Structure Diagrams of a Multilayer Chip Bead



Standard Ferrite Bead (Lengthwise Structure)

MMZ Series Material Selection Guide

B material — Fast Digital Signals

This material is perfectly suited for fast digital signals. By equalizing R and X components that beads possess at a frequency of 5MHz, it is able to suppress overshooting, undershooting, and ringing of fast digital signals.

A material — High-Impedance

This high-impedance product is based on the impedance frequency characteristics of our Y-material. **The product offers excellent impedance characteristics, which is greater than 2500Ω, in the vicinity of 100MHz range** (MMZ1608A252B).

R material — Wide Frequency & Good Waveform Integrity

For wide frequency applications calling for broad impedance characteristics. For digital signal line applications for requiring good waveform integrity. **Impedance values selected for effectiveness at 10 to 200MHz.**

Q material — High-Band Applications (100MHz & Above)

For high-band applications designed for 100MHz and above. **Impedance values selected for effectiveness at 100 to 800MHz.**

S material — Signal line applications in which the blocking region is near 100MHz

Standard type that features impedance characteristics similar to those of a typical ferrite core. For signal line applications in which the blocking region is near 100MHz. **Impedance values selected for effectiveness at 40 to 300MHz**.

D material — Low Insertion Loss at Low Frequency & High Impedance at High Frequency

For applications calling for low insertion loss at low frequency and sharply increasing impedance at high frequencies. **Designed for high impedance at high frequencies (300MHz to 1GHz) for signal line applications.**

Y material — High Frequency (100MHz & Above)

High frequency range type intended for the 100MHz region and above. For single line applications in which the signal frequency is far from the cutoff frequency. **Impedance values selected for effectiveness at 80 to 400MHz.**

F material — High Impedance Peak Frequency (600MHz & Above)

This new product inherits the characteristic of our D-material, namely its sharp impedance rise time, and its impedance peak frequency has been shifted higher into range. **The product offers excellent noise suppression from 600MHz to as high as in the GHz range.**

