

Ferrite Chip Beads—MMZ-E Series

GHZ noise countermeasure (general & high-speed signal lines) - consumer & automotive applications

Consumer Datasheets: [0603](#) [1005](#)

Automotive Datasheets: [1005](#)



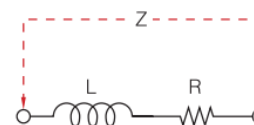
TDK's MMZ-E Series ferrite chip beads are used to suppress noise in both signal and power supply circuits. They are effective at reducing noise simply by being placed into the circuit in series. Multilayer chip beads consist of ferrite material and a conductive paste layered together. The equivalent 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 four material types which provide various frequency characteristics for MMZ-E 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 and high-speed signals - SRF is increased to the GHZ bands to countermeasure noise at wide frequencies with one element (as compared to the MMZ series) - High impedance can be attained at the GHz bands - 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: 0603 & 1005	- Case size: 1005 - AEC-Q200 compliant

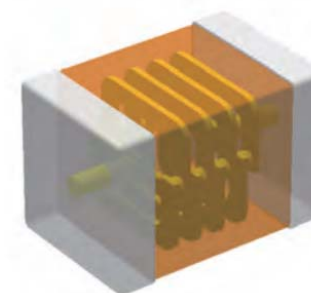
Applications	
Consumer	Automotive
- Mobile devices, including smartphone and tablet terminals - PCs and recorders, household appliances such as STBs, smart grids, and industrial equipment	- ECU's, powertrain, and body control - Car multimedia (telematics)

Equivalent Circuit Diagram of a Chip Bead



$$X = \omega L = 2\pi fL \quad f: \text{Frequency}$$

Internal Structure Diagrams of a Multilayer Chip Bead



High Frequency Ferrite Bead (Horizontal Structure)

MMZ-E Series Material Selection Guide

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.**

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).

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.**

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.**

■ TYPICAL MATERIAL IMPEDANCE CHARACTERISTICS

