Audible noise in electronic circuitry

Where is noise come from?

The noise source come from Magnetic component (transformer, inductor…etc) and multilayer ceramic Capacitor (MLCC).

Why they are produce noise?

Magnetic component can produce audible noise due to,

- Percussion - The face of core pieces can scrape together when the magnetic flux is varied.
- Collision of movable elements (bobbin, core , wire ..etc.),
- Magnetostriction- The dimension of coil material is changed.
- Coil self Motion-The ripple current pass through coil produces attractive and repulsive force that to move the wires.

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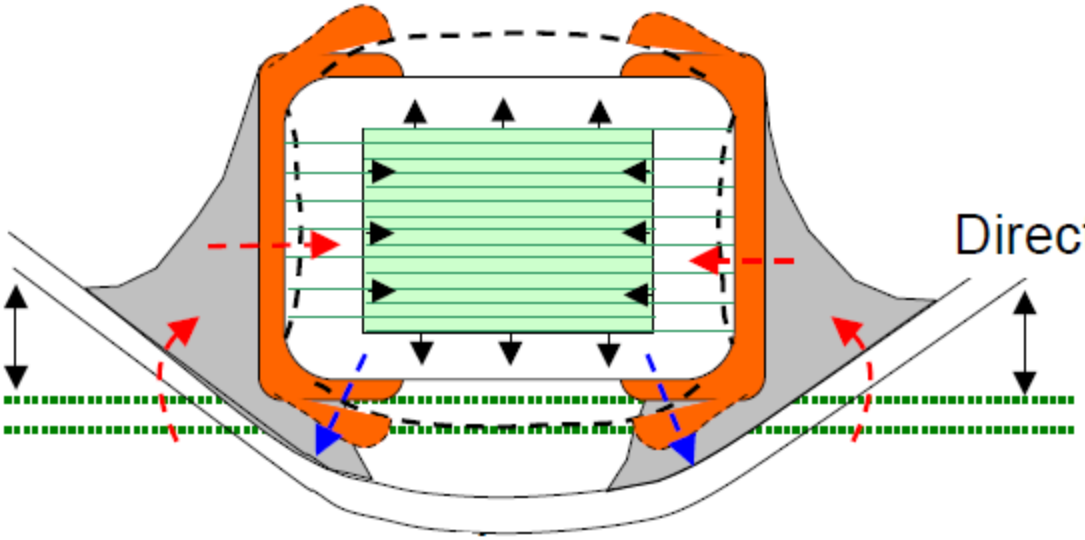
Multilayer ceramic Capacitor can produce audible noise due to,

- ❑Piezoelectric effect – Substrate vibrate with Voltage amplitude, and when the time amplitude cycle come to the bandwidth of auditory are, Harmony is recognized as a noise. Capacitor distortion transferred to the PCB acting as an amplifier



Audible noise MLCC

Direction of Electric Field

Audible noise in electronic circuitry

No method to eliminate, But we can reduce the noise level.

Method to reduce noise level for magnetic parts

- ❑**Reducing peak flux of magnetic as low as possible .**
- ❑**Potting the PCBA**
- ❑**Vacuum Varnish for magnetic parts.**

Method to reduce noise level for MLCCic parts

- ❑**Reduce capacitance value in a capacitor**
- ❑**Add a soft material to absolved the mechanical vibration.**
- ❑**Replace the MLCC with a plastic film (Polypropyleneor, Polyester…etc)**
- ❑**Potting : Pot the PCBA.**