

## **A Study on the Improvement of Mobile Device Call Buzz Noise Caused by Audio Frequency Ground Bounce**

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**Abstract :** The market demand for audio quality in mobile devices continues to increase, and audible buzz noise generated in time division communication is a chronic problem that goes against the market demand. In the case of time division type communication, the RF Power Amplifier (RF PA) is driven at the audio frequency cycle, and it makes various influences on the audio signal. In this paper, we measured the ground bounce noise generated by the peak current flowing through the ground network in the RF PA with the audio frequency; it was confirmed that the noise is the cause of the audible buzz noise during a call. In addition, a grounding method of the microphone device that can improve the buzzing noise was proposed. Considering that the level of the audio signal generated by the microphone device is -38dBV based on 94dB Sound Pressure Level (SPL), even ground bounce noise of several hundred  $\mu\text{V}$  will fall within the range of audible noise if it is induced by the audio amplifier. Through the grounding method of the microphone device proposed in this paper, it was confirmed that the audible buzz noise power density at the RF PA driving frequency was improved by more than 5dB under the conditions of the Printed Circuit Board (PCB) used in the experiment. A fundamental improvement method was presented regarding the buzzing noise during a mobile phone call.

**Keywords :** audio frequency, buzz noise, ground bounce, microphone grounding

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