

NFC ANTENNA TECHNICAL REPORT

Radio Frequency Identification Systems

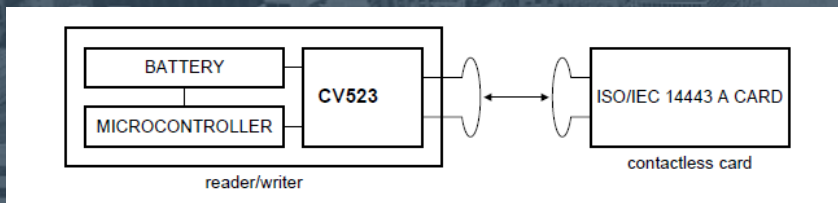
ZHENGZHOU MINIMUMIOT MICROMODULES CO,LTD

Completion Date:September 9, 2022

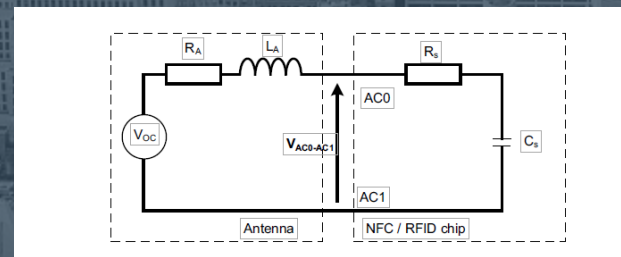
The module is designed according to ISO / IEC 14443 . The design starts with the simplified model shown in Figure 1. For a given antenna, R_{ant} , C_{ant} and L_{ant} are constants but the resulting impedance $Z_{ant}(R_{ant} // C_{ant} // L_{ant})$ is frequency dependent. At self-resonance frequency (f_{self_res}) the imaginary part of the antenna impedance is null and the antenna is purely resistive. Below the self-resonance frequency, the imaginary part of the antenna impedance is positive and the antenna behavior is inductive.

ANTENNA DESIGN

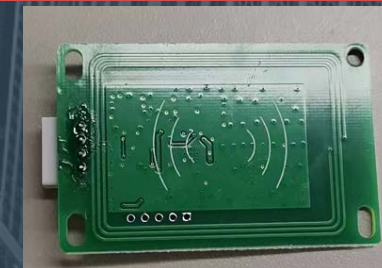
PROCEDURE



Module design principle



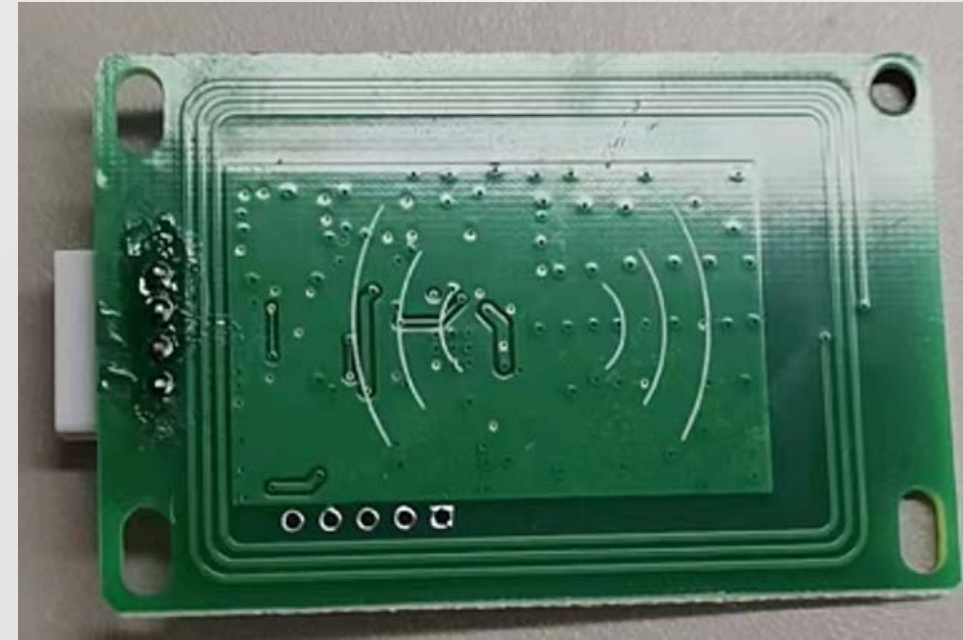
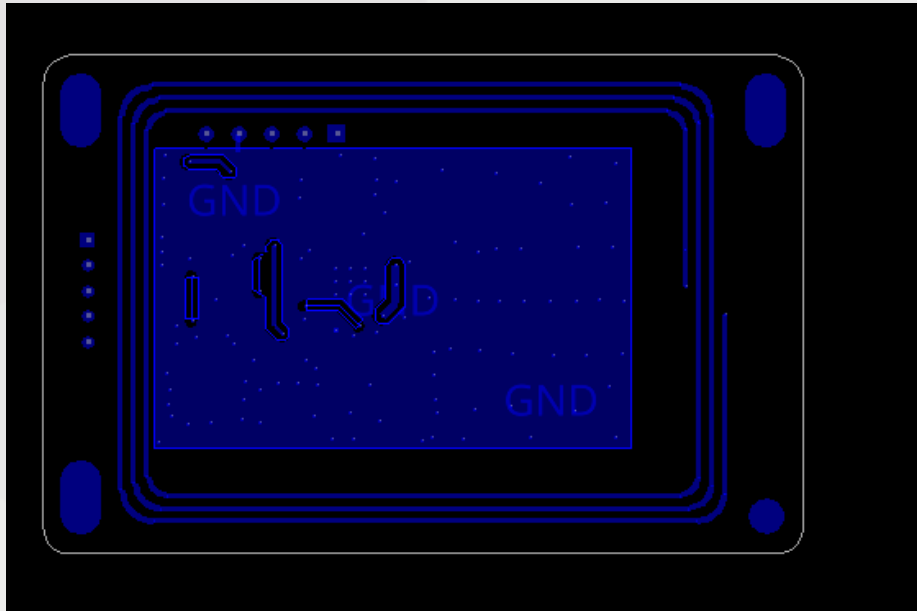
Equivalent model of an NFC / RFID tag in presence of a magnetic field





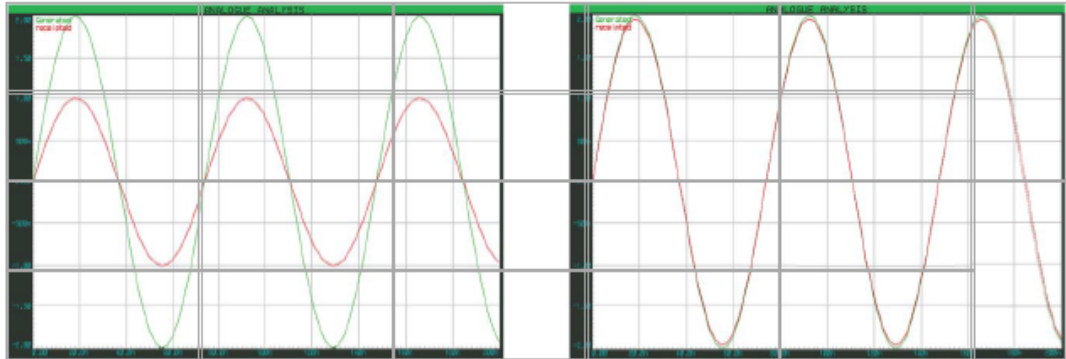
Antenna Detail

The antenna is a board antenna, which is square in shape and made of copper.



ANTENNA LENGTH : 48 MM
ANTENNA WIDTH : 34MM
WIDTH OF TRACKS :0.5mm
SPACING BETWEEN TURNS :1MM

MEASUREMENT WITH STANDARD EQUIPMENT



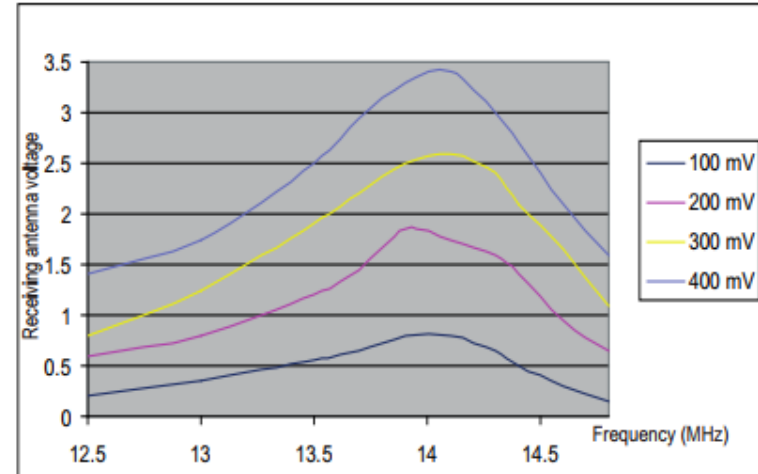
Transmission: 0.2 V sine (13.56 MHz)
Reception: 0.1 V sine (13.56 MHz)

Transmission: 0.2 V sine (14.3 MHz)
Reception: 0.2 V sine (14.3 MHz)

----- Transmission

----- Reception

OSCILLOSCOPE VIEWS



SYNTHESIS OF RESONANCE TRACES FOR DIFFERENT VOLTAGES