

An Electrically Small Silver Ink Printed FR4 Antenna for RF Transceiver Chip CC1101

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Abstract : An electrically small meander line antenna is designed for impedance matching with RF transceiver chip CC1101. The design provides the flexibility of tuning the reactance of the antenna over a wide range of values: highly capacitive to highly inductive. The antenna was printed with silver ink on FR4 substrate using the screen printing design process. The antenna impedance was perfectly matched to CC1101 at 433 MHz. The measured radiation efficiency of the antenna was 81.3% at resonance. The 3 dB and 10 dB fractional bandwidth of the antenna was 14.5% and 4.78%, respectively. The read range of the antenna was compared with a copper wire monopole antenna over a distance of five meters. The antenna, with a perfect impedance match with RF transceiver chip CC1101, shows improvement in the read range compared to a monopole antenna over the specified distance.

Keywords : meander line antenna, RFID, silver ink printing, impedance matching

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