

uFR Zero Online Round antenna

Version 1.0

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1. NFC antenna

NFC antenna is PCB coil with 3 turns.

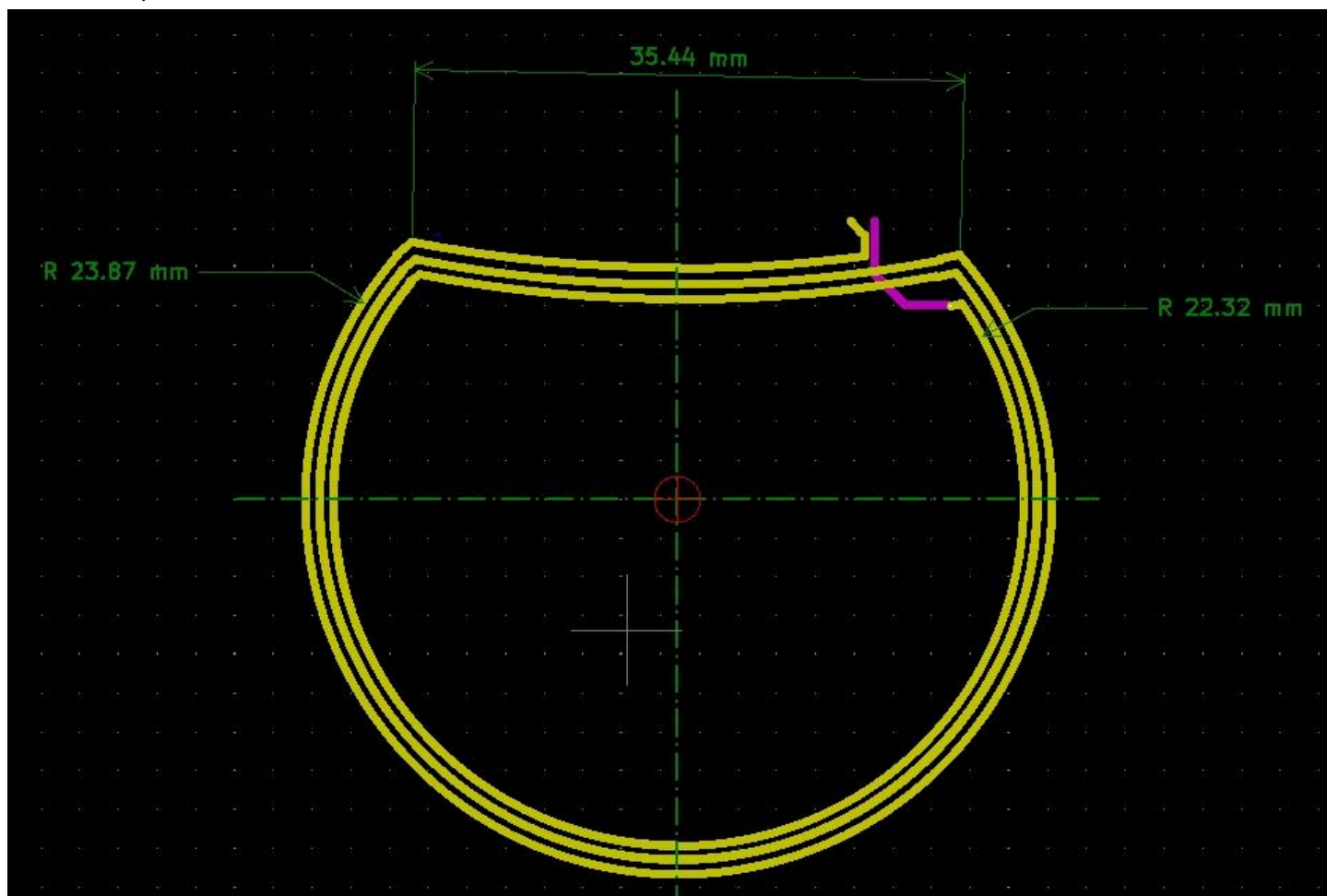
Outer radius is 23.87 mm

Track width is 0.5 mm, distance between tracks is 0.5 mm.

Operating frequency: 13.56MHz

Material: copper

Antenna layout



2. RF characteristics

2.1. ISO/IEC 14443 A

The carrier RF signal frequency is 13.56 MHz.

Transfer speeds are: 106 KBd, 212 KBd, and 424 KBd.

Reader/writer and cards use different types of modulation.

Reader/writer type of modulation is ASK 100% for all transfer speeds.

Reader/writer bit encoding is modified Miller encoding.

Reader/writer bit length:

- 106 KBd -> 128 periods of carrier signal (9.44 μ s)
- 212 KBd -> 64 periods of carrier signal (4.72 μ s)
- 424 KBd -> 32 periods of carrier signal (2.36 μ s)

Card type of modulation is subcarrier load modulation for all transfer speeds.

Card subcarrier frequency is 13.56 / 16 MHz (847.5 KHz).

Card bit encoding:

- 106 KBd -> Manchester encoding
- 212 KBd -> BPSK
- 424 KBd -> BPSK

2.2 ISO/IEC 14443 B

The carrier RF signal frequency is 13.56 MHz.

Transfer speed is 106 KBd.

Reader/writer type of modulation is ASK 10%.

Reader/writer bit encoding is NRZ-L.

Card type of modulation is subcarrier load modulation.

Card subcarrier frequency is 13.56 / 16 MHz (847.5 KHz).

Card bit encoding:

- 106 KBd -> BPSK

2.3 ISO/IEC 15693

The carrier RF signal frequency is 13.56 MHz.

Transfer speed is 53 Kbd.
Reader/writer type of modulation is ASK 100%

Revision history

Date	Version	Comment
2026-05-20	1.0	Base document