AGFA

Medical Imaging

From: Jan Vercammen (6233) – R&D Mortsel Electronics

Date: July 10, 2019

Operational description RFID (concerns FCC ID: HPL-DR100SRFID)

The RFID tag reader - or reader for short - reader is a small printed circuit board with local shielding, local power supply regulation, I/O buffering, antenna matching and a fixed 4-turn coil PCB antenna. There are other circuits (a push-button and 8x LED indicators), but these are not part of the radio device, but rather are connected to the digital part. These digital circuits are not electrical connected to the radio part circuits.

The reader is an intentional radiator that is based on inductive coupling to power a single passive tag using ISO/IEC 14443 A protocol. The carrier frequency is 13.56MHz. The RFID reader chip is an NXP PN7150. The RFID reader device is impedance matched to the antenna coil.

The reader is integrated into mobile medical imaging units (manufactured by Agfa NV) using a modular approval.

The block diagram is shown in the file “RFID FCC Block Diagram.pdf”.

The external power supply delivers 5V+/-10%. The local regulator derives a stable power supply of 3.3V+/-5% (LDO, U2). A PN7150 NFC controller (U1) controls the RFID interface and communicates with the host (digital part) over a buffered I2C interface (U3).

The PN7150 (and its 27.12MHz crystal clock Y1) has a local (surface mount) metal printed circuit board shielding. The PN7150 transmitter is matched to the inductive coil by means of a (passive) matching network.

An additional EMI measure is a common-mode choke L1 on the external +5V power supply (L1 is not shown in the block diagram, refer to schematic for details).

The host connector CF1A connects the power supply (5V, GND) and the I2C interface.

The connector CF1A also supports low-activity signals (the push-button) which is not part of the radio device and which is not electrical connected to the radio device circuit.

The 2nd connector CF2A connects the LED light indicator signals, these signals too are not part of the radio device and are not electrical connected to the radio device circuit.

END of Document