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OMNIKEY 5127 CK

BLOCK DIAGRAM AND DESCRIPTION OF OPERATION

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Contents

1 Introduction

This document includes a block diagram and a general description of operation of the OMNIKEY 5127 CK smart card reader.

3 Description of operation

The reader circuit is mainly subdivided into four parts:

- The main controller part
- The Smart Card reader interface
- The HF controller part (13,56MHz)
- The LF controller part (125kHz)

The main controller part is composed of an Atmel ARM microcontroller and an USB connector.

The Atmel controller drives an Smart Card Controller IC which provides an ISO7816 interfaces for the SIO Processor.

The Atmel controller is also driving the HF controller, a NXP RC663 RFID reader chip. This controller is emitting the 13,56MHz carrier signal, which taken through the EMC filter to the transmitter. In the transmitter part an impedance matching circuit has been implemented to get the resonance of the antenna at 13,56MHz. The reader components are mounted on both sides of a four layer PCB with a solid ground plane. The antenna is split up into two turns in one layers with an approximately dimension of 52 * 60mm. The measured average inductance is 580nH with an 1,26Ohm impedance. The antenna gain is 1.

The LF circuit is also driven by the Atmel controller. The controller for the Software Defined Reader (SDR) is an MSP from TI. The carrier signal is 125kHz. The reader components are mounted on both sides of a four layer PCB with a solid ground plane. The antenna is an air wound coil (82 turns) with an approximate dimension of 32*55mm. The average inductance is 819µH, the DC resistance is 32Ohm. The antenna gain is 1.