

## 13.56-MHz Multi-Standard RFID/EMV Reader Reference Design

### Features Summary

#### RFID Front-End Chip

- SIC9410

#### Supported Protocols

- ISO14443A/B, all bit rates: 106, 212, 424 and 848 kbps
- ISO15693, all modes
  - Downlink 1 of 4 and 1 of 256
  - Uplink 6.6/13/26/53 kbps with 1 & 2 sub-carrier
- MIFARE Classic / UL/UL C
- NFC tag type 1 (Topaz)
- PICO Tag ( UID )
- Felica ( UID ), all bit rates : 212 to 424 kbps

#### Card Compatibilities

- ISO14443A
  - MIFARE 1k, 4k, Mini, Ultralight, Ultralight C
  - Smartcard ISO14443A
- ISO14443B
  - Smartcard ISO14443B, SRI4K, SRI512
- ISO15693
  - SIC5600,
  - ICODE-SLI, ICODE-SLI-L, ICODE-SLI-S
- NFC tag type 1 (Topaz)
- Felica

#### Hardware Features

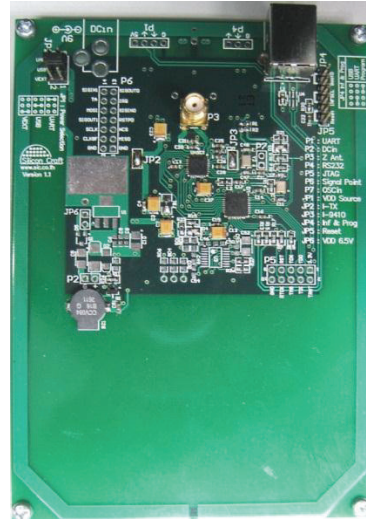
- Closed Coupling Antenna : size 13.2 x 9.5 cm
- Read Range
  - MIFARE : 7 cm
  - ISO15693 : 16 cm
- Host interface by jumper
  - 3.3V RS232/UART: 115,200 kbps
  - USB 2.0 Full speed
- High power transmitter
  - 200 mA @ 5V TVDD
  - 300 mA @ 7V TVDD
- LED Status
- Dimension : 95 mm x 133 mm x 14 mm
- Selectable power input source
- On-board voltage regulator

#### Operating Conditions

- Storage temperature from -40 to 85°C
- Operating temperature from -40 to 85°C
- Input operating voltage from 4.5-5.5V
- Power consumption 170 mA in active mode

#### Information Support

- Visual C# demonstration software
- Protocol Information



**Pi-931-EMV, A multi-standard RFID/EMV Reader reference design**

#### General Description

The Pi-931-EMV is a reference design of SIC9410, a high-performance RFID contactless reader IC from Silicon Craft technology. The Pi-931-EMV supports all major global secured baseband ISO standards, including 14443 Type A, Type B, MIFARE classic cards, and smart label ISO15693. All data rates in ISO14443A/B, ranging from 106 to 848 kbps, are supported. For ISO15693, all data rates used in uplink, downlink, and ultra-high speed can be performed. Typical read range for MIFARE card is 7 cm whereas typical for ISO15693 49x49mm label is 16 cm.

Equipped with a powerful 32-bit ARM-CORTEX STM32F10x microcontroller, the Pi-931-EMV is able to effectively handle RF activities through designed module protocols. Embedded with ISO14443-and ISO15693 supporting routines, the Pi-931-EMV can perform not only elementary commands but also one-stop combo commands, such as reading data through MIFARE encryption, which are available to ease the development for the beginners.

Base on pin selection, physical interface of the module can be either a simple 3.3V-RS232 or a USB. Also, the Pi-931-EMV can be powered from either USB or external power supply. Samples of VC# source codes are provided to guide and demonstrate the users to realize applications based on module protocols.

Moreover, Pi-931-EMV has the additional functions for EMV testing. The EMV testing routines as well as the supported tools are also provided in the demonstration software.

### Applications

- Contactless payment system
- NFC Reader
- Secure access control
- RFID based station
- PC peripheral device
- Handheld/ Mid-range RFID reader

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