

Higher than expectation



## RF IDENTIFICATION

### SIC 931 HiRead-R

#### Single-Chip Long-Range Multi-Standard 13.56 MHz Reader ASIC

The Hi Read-R<sup>®</sup> is Silicon Craft's latest multi-standard high performance RFID reader IC suitable for a wide range of high frequency RFID applications. Hi-Read-R<sup>®</sup>'s functionality is maintained across all globally accepted standards. This versatility establishes Hi Read-R<sup>®</sup> as the prime choice for mass deployment in complex multi-standard RFID networks.

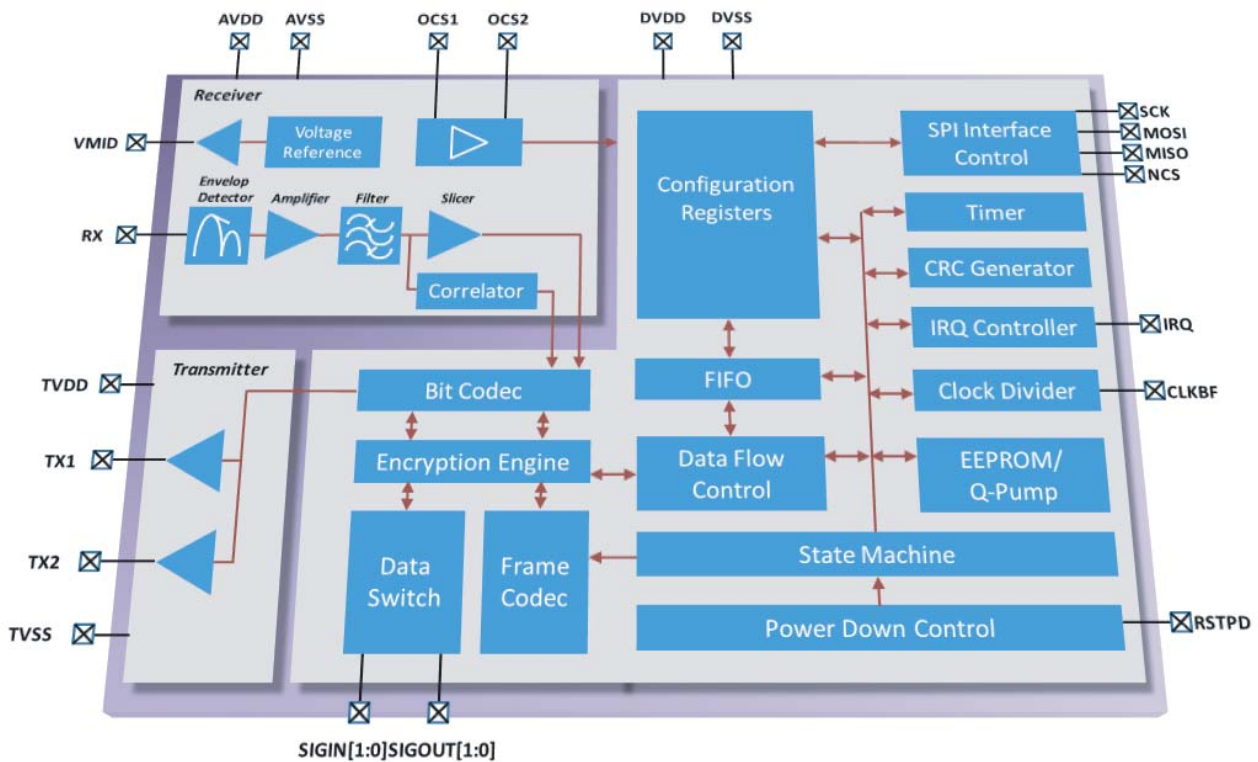
#### General Description

The SIC931 HiRead-R<sup>®</sup> is the most advanced single-chip long-range reader ASIC for all popular contactless HF standard protocols. The HiRead-R<sup>®</sup> supports all major global secured baseband ISO standards including 14443 Type A, Type B, MiFare Classic cards, and Smartlabel ISO15693. The chip is highly versatile and well suited for mobile devices due to its low power and wide supply voltages.

The HiRead-R<sup>®</sup>'s receiver circuit incorporates a full AGC loop and the integrated signal strength indicator (SSI) allowing a wide range of RF input signal levels. The high-powered differential transmitters can accept a wide range of operating supply voltages with drive currents up to 220 mA.

To facilitate the operation of the companion microcontroller, the HiRead-R<sup>®</sup> is equipped with on-chip periphery device support such as a voltage reference, an RF-trig timer, a host interrupt generator, and a clock divider. The chip's embedded 256-byte EPPROM stores predefined re-loadable registry values for ease of reader setup and the crypto key for encryption mode.

The SIC931 is offered in a slim-line QFN package with excellent heat dissipation when self-mounted on PCB.



SIC 931- HiRead-R<sup>®</sup> Block Diagram

## Applications

- o Proximity to Mid-Range RFID base station
- o Contactless payment system
- o Secured access control/Passport
- o PC peripheral device
- o Mobile/Handheld RFID reader

## Interface and Peripheral

- o SPI Interface up to 10 Mbps
- o 64-byte send and receive FIFO-buffer
- o 64-byte addressing user-configurable registers
- o Interrupt (IRQ) PIN available
- o Programmable timer
- o Programmable clock divider for external MCU
- o Low jitter on-chip oscillator buffer

## Other Benefits/Features

- o Embedded 256-byte EEPROM stores predefined re-loadable register
- o Support HiRead-T<sup>®</sup> Hi-speed 53 Kb/s Manchester Protocol
- o 60 mA rated on-chip 3.3 V regulators for external device
- o 5  $\mu$ A in power-down mode
- o QFN slim-line package

## Protocols Supported

- o ISO14443A/B all bit rates  
> 106,212,424 and 848 kbps
- o Compatible to MiFare Classic
- o ISO15693 all modes  
> 1.65/6.6 & 26.5 kbps  
> Uplink 1 & 2 sub-carrier

## Receiver

- o Rx sensitivity down to 1 mVrms
- o Rx Automatic Gain Control (AGC)
- o Accept external baseband signal from external circuitry for frame level processing
- o Integrated signal strength indicator (SSI)
- o On-chip Framing handler for supported standard

## Transmitter

- o Typical Proximity operating distance up to 100 mm.
- o Software configurable modulation index
- o Maximum driving current up to 200 mA/ PIN @ 5V
- o Accept external baseband signal for RF modulation
- o On-chip Framing coder
- o Wide Transmitter driver supply range from 2.7-7.0 V

**Address:**

**1 Soi Kosumruamjai 1, Kosumruamjai Rd.,  
Sikan, Donmueang, Bangkok 10210, Thailand.**

**Tel:**

**+66(0)2-985-4925**

**Fax:**

**+66(0)2-985-4949**

**E-mail:**

**requestinfo@sic.co.th**

  
**Silicon Craft**  
Intelligence & Innovation

**WWW.SIC.CO.TH**