Datasheet

Rev. 0.2.d000921

PRODUCT: **CWFA105-x**

DESCRIPTION: **802.11b/g/n Wi-Fi**

Approved Signatures	鉅 景 科 技 股份有限公司
	Contact Person:

Item Numbering

Item Number	Description
CWFA105	2.4GHz 802.11 b/g/n Wi-Fi
CWFA105-w	2.4GHz 802.11 b/g/n Wi-Fi with WAPI

When communication services are getting popular and cheaper, consumers desire to purchase mobile devices with more integrated functions and compact size. For this reason, it is always a highly challenge to R&D engineers on embedding more state-of-art futures and shrinking devices' sizes.

Generally, engineers try to employee the latest IC components with more embedded functions for future products, and, thus, the process technology of IC components is the key on embedding more functions onto an IC chip. However, not all circuits, especially RF circuits, can be shrunk by the latest process technology. RF circuits require more layout areas for higher yields, and are frequently produced on individual IC chips. As the influences, engineers have to spend more time on routing and debugging circuit boards. Also, the costs of circuit boards are increased dramatically.

For the solutions, ChipSiP introduces the highly integrated CWFA105 for 2.4GHz 802.11b/g/n Wi-Fi applications. Moreover, the CWFA105 is a system-in-a-package (SiP) module, which is highly integrated several IC chips, filters and RLC components into a chip-like SMT package. For engineers, CWFA105 can simplify circuit designs and miniaturize circuit boards. Adopting CWFA105 can lower down BOM cost and shorten R&D time.

Key Features

- **Embedded Low Noise Amplifier, harmonic filter and Power Amplifier for RF transceiving circuit**
- **Embedded Positive Slope Power Detector (PSPD)**
- **Embedded ultra small multilayer Band-Pass filter.**
- **Embedded I^{2}C bus EEPROM**
- **Pre-amplified RX signal for Wi-Fi**
- **Simultaneous transceiving mode**
- **Compatible with 802.11b/g/n in the 2.4 GHz license-free band**
- **802.11n single spatial stream 2.4 GHz up to 72.2 Mbps**
- **Supports Access Point tethering functionality (Soft AP)**
- **WFA, WPA, WPA2 and WAPI security features for 802.11**
- **802.11n with MPDU, SDU, PSMP, STBC, RIFS, L-SIG TXOP, immediate block acknowledgement and link adaptation using MCS feedback for improved rates, ranges and performances**

● **SDIO interface for Wi-Fi Host application**

Applications

● **PDAs**
● **MP3 players**
● **WLAN televisions**
● **Digital still cameras**
● **WLAN refrigerators**
● **WLAN web cameras**
● **802.11 b DSSS WLAN**
● **802.11 g/n OFDM WLAN**
● **Voice over Wi-Fi phones**
● **Personal video recorders**
● **Personal gaming devices**
● **WLAN monitoring cameras**
● **Cellular and FMC handsets**
● **WLAN Security alarm systems**
● **Network digital video recorders**
● **Other portable devices**

General Descriptions

The chip, CWFA105, provides a complete 2.4 GHz WLAN solution in an ultra compact package. Also, this chip is designed for ease of use; all the critical matching and harmonic filters are embedded. In addition, the antenna port is set at 50 Ω for most of typical antennas. The chip, CWFA105, shown in figure 1, is compatible with 802.11b/g/n WLAN and is highly integrated with RF front-end circuit, digitalized baseband circuit.
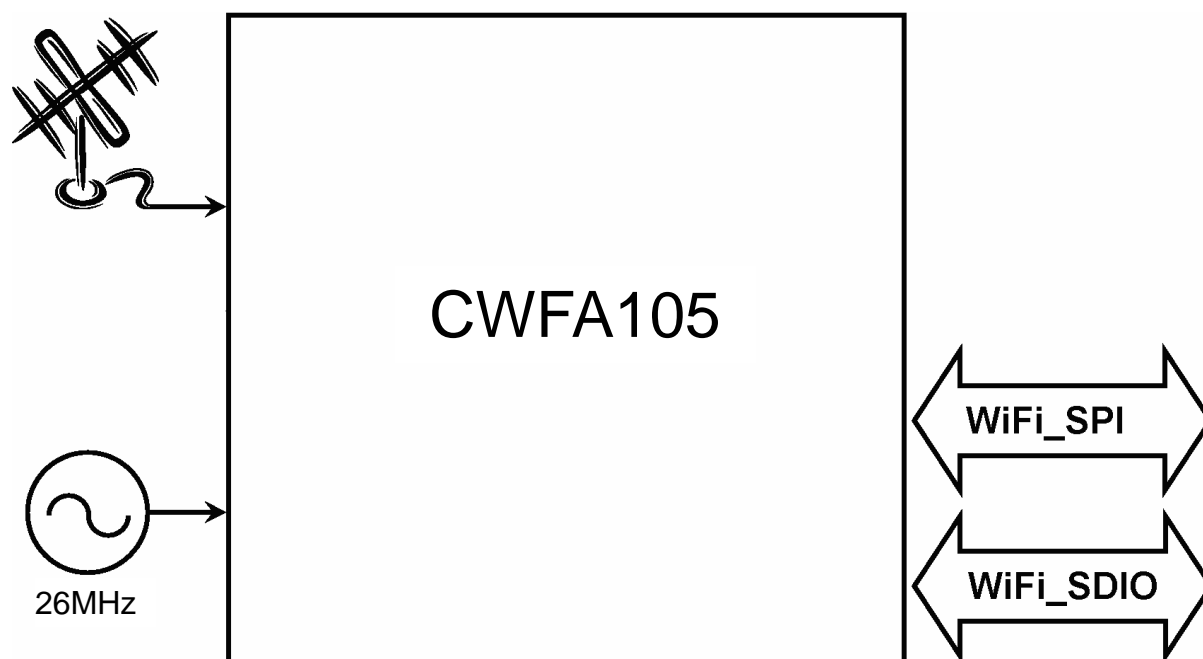
Figure 1: CWFA105 block diagram

Moreover, this chip is built up by the latest process-technology IC components for less power consumption and higher performance. Because of the smallest components are selected, the chip requires only 49 LGA pins. In addition, the chip size is limited at 9.0mm (length) x 9.0mm (width) x 1.14mm (height) for most of portable device designs.

For the RF front-end circuit, CWFA105 provides a single antenna port for Wi-Fi applications. An ultra-small two-way multilayer band pass filter is deployed at the antenna port for filtering out undesired frequencies and noises.

A two-way RF selector is set after BPF for selecting RF signals, TX & RX signals. Therefore, only a single antenna is required for Wi-Fi. The CWFA105 includes a low noise amplifier (LNA) to increase the receive sensitivity of embedded solutions to improve receiving range or to overcome the insertion losses from circuit board.

Also, a power detector, filter and power amplifier is adopted for raising the power level of TX signal. The positive slope power detector, for TX signal, can detect 22 dB of dynamic power range and digitally control the power ramp; the typical raise or fall time of power ramp is 0.5µ Second, fast enough for most of application.
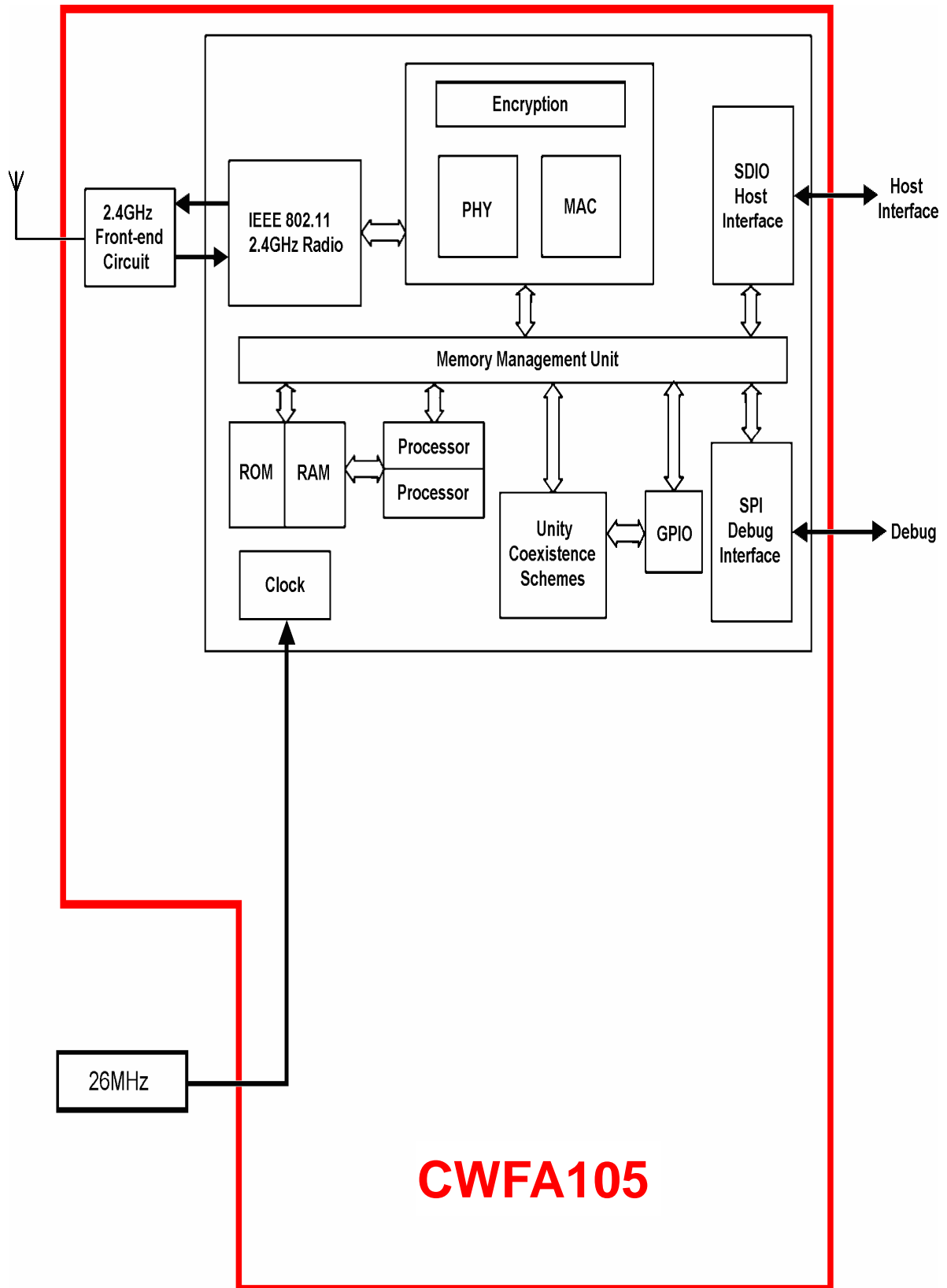
Figure 2: RF and baseband block diagram

The baseband circuit adopts several CMOS IC dices from industrial-leading IC design houses. The IC dices meet the requirements of mobile embedded systems, consume less power than competitors' dices and optimizes system performances.

From figure 3, the single spatial stream modulations of 802.11n enable support for embedded mobile devices without requiring multiple antennas. Support for optional 802.11n features provides enhanced rate, range and performance.
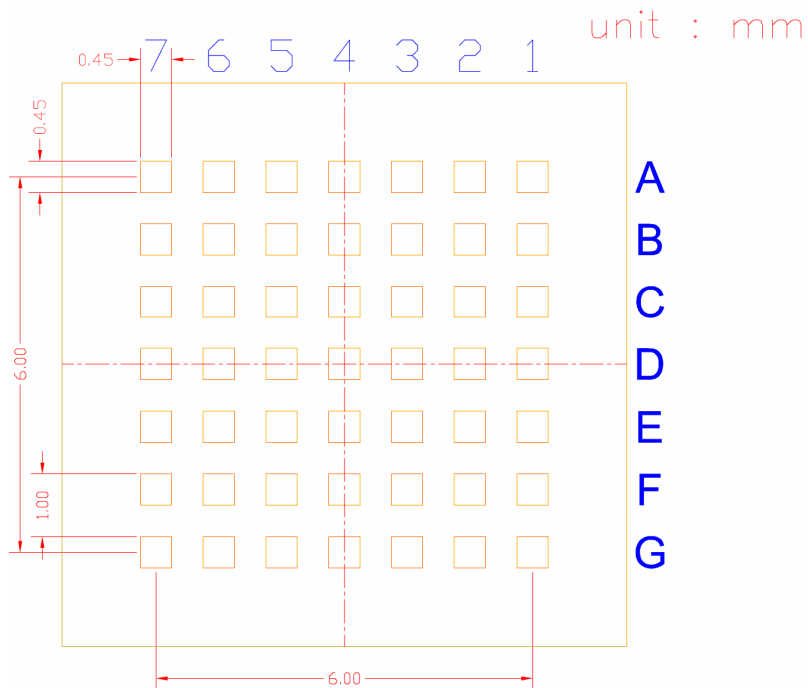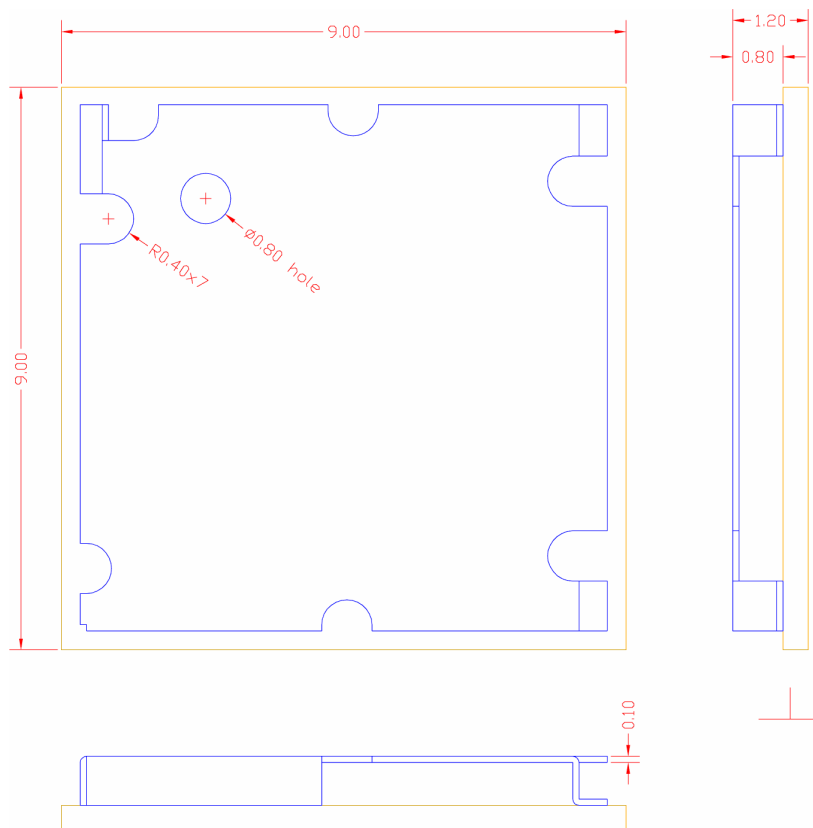
Hardware encryption support for WEP40/64, WEP104/128, TKIP, CCMP (AES), BIP and CKIP provides functionality for WPA, WPA2, 802.11i, 802.11w and CCX advanced security mechanisms.

The CWFA105-w adds SMS4 encryption hardware for WAPI security in China. Full support for 802.11e QoS with WMM Power Save ensures that mobile solutions can achieve optimal battery life.

The CWFA105, also, supports SDIO 4-bit and 1-bit, SD SPI and CSPI host interfaces enables industry leading throughput in embedded designs. In addition, the chip has a very small package size and extremely low BOM cost, which enables easy integration into mobile devices.

Package Dimension

Top view

9.00

1.20

0.80

9.00

R0.40×7

ø0.80 hole

0.10

unit : mm

0.45

0.45

7 6 5 4 3 2 1

A
B
C
D
E
F
G

6.00

1.00

6.00

Bottom view

Status Information

The status of this data brochure is brief Information.

Information for designers concerning ChipSiP products in development.

All specified values are the target values of the design. Minimum and maximum values specified are only given as guidance to the final specification limits and must not be considered as the final values.

All detailed specifications including pin outs and electrical specifications may be changed by ChipSiP without notice.

Pre-production Information

Pin outs and mechanical dimension specifications may not finalize. All values specified are the target values of the design. Minimum and maximum values specified are only given as guidance to the final specification limits and must not be considered as the final values.

All electrical specifications may be changed by ChipSiP without notice.

Life Support Policy and Use in Safety-critical Applications

ChipSiP products are not authorized for use in life-support or safety-critical applications. Use in such applications is done at the sole discretion of the customer. ChipSiP will not warrant the use of its devices in such applications.

Trademarks, Patents and Licenses

Unless otherwise stated, words and logos marked with ™ or ® are trademarks registered or owned by ChipSiP or its affiliates. Bluetooth® and the Bluetooth logos are trademarks owned by Bluetooth SIG, Inc.

Wi-Fi ®, Wi-Fi Alliance®, WMM®, Wi-Fi Protected Access®, WPA®, WPA2®, Wi-Fi Protected Setup™ and Wi-Fi Multimedia™ are trademarks of the Wi-Fi Alliance.

Other products, services and names used in this document may have been trademarked by their respective owners.

The publication of this information does not imply that any license is granted under any patent or other rights owned by ChipSiP. ChipSiP reserves the right to make technical changes to products as part of development programs.

While every care has been taken to ensure the accuracy of the contents of this document, ChipSiP cannot accept responsibility for any errors.

ChipSiP products are not authorized for use in life-support or safety-critical applications. Please refer to www.chipsip.com for compliance and conformance to standards information.