

1. General Description

RDA5991 integrates 802.11b/g/n MAC, PHY, 2.4GHz radio, Power Amplifier and antenna switch into one chip and is optimized for mobile applications. WLAN, Bluetooth and FM can work simultaneously and independently, with low power consumption levels target to battery powered devices. For the highest integration level, the required board space has been minimized and customer cost has been reduced. Manufacturers can easily and fast integrate RDA5991 on their product to enable a rapid time to market.

RDA5991 uses a compact 4*4 BGA package.

1.1 WLAN Features

- CMOS single-chip fully-integrated radio, PHY and MAC
- Single-band 2.4GHz IEEE 802.11b/g/n
- IEEE 802.11n features
 - ✓ Single-stream
 - ✓ HT-mixed/HT-greenfiled
 - ✓ Full/Half guard interval
 - ✓ Frame aggregation
- Support data rates
 - ✓ IEEE 802.11n 1-11Mbps
 - ✓ IEEE 802.11g 6-54Mbps
 - ✓ IEEE 802.11b 1-11Mbps
- Support WEP, WPA/WPA2, WAPI
- WAPI hardware accelerated
- Industry Standard QoS schemes(802.11e,WMM) support
- Shared Bluetooth and WLAN receive signal path
- Shared Bluetooth and WLAN crystal
- Build-In IEEE 802.15.2 coexistence scheme
- Support host interfaces: SDIO v1.2, SPI
- Advance sleep and wakeup for power saving
- Smallest WLAN solution footprint
- No external EEPROM needed
- Support battery voltage range from 3v to 5v

1.2 Bluetooth Features

- CMOS single-chip fully-integrated radio and baseband
- Compliant with Bluetooth 2.1 + EDR specification
- Bluetooth Piconet and Scatternet support
- ARM7-based mcu with on-chip ROM and RAM
- Meet class 1/2/3 transmitting power requirement, support class1 operation with external power amplifier
- Provides +20dbm transmitting power
- NZIF receiver with -90dBm sensitivity
- Battery power supply directly with internal LDO
- Support DCXO with internal oscillator circuit

- Up-to 4Mbps high speed UART HCI support
- Support AFH
- Build-In 3-wire WIFI Co-existence
- handshake signals
- Low power consumption
- Minimum external component

1.3 FM Features

- CMOS single-chip FM receiver/transmitter
- Low power consumption
 - ✓ Total current consumption lower than 20mA at 3.0V power supply
- Support worldwide frequency band
 - ✓ 50 -115 MHz
- Support flexible channel spacing mode
 - 100KHz, 200KHz, 50KHz and 25KHz
- Support RDS/RBDS
- Digital low-IF tuner
 - ✓ Image-reject down-converter
 - ✓ High performance A/D converter
 - ✓ IF selectivity performed internally
- Fully integrated digital frequency synthesizer
 - ✓ Fully integrated on-chip RF and IF VCO
- ✓ Fully integrated on-chip loop filter
- Autonomous search tuning
- Support 32.768KHz crystal oscillator
- Digital auto gain control (AGC) Digital adaptive noise cancellation
 - ✓ Mono/stereo switch
 - ✓ Soft mute
 - ✓ High cut
- Programmable de-emphasis (50/75 μ s)
- Receive signal strength indicator (RSSI)
- Bass boost
- Volume control
- Line-level analog output voltage
- I2C control bus interface
- Directly support 32 Ω resistance loading
- Integrated LDO regulator
 - ✓ 1.8 to 5.5 V operation voltage

1.4 Applications

- Mobile handset
- MP3,MP4 and PMP
- PDA
- Cordless phone