YC1021

Bluetooth 4.1 + 3.0 (EDR) + 2.4GHz-Proprietary

Preliminary Brief

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General Description

The YC1021 is a very low power, high performance and highly integrated Bluetooth 4.1 BR/EDR + BLE + 2.4G Proprietary triple-mode solution, designed for operation over the 2400MHz to 2483.5Mhz ISM frequency band.

YC1021 is manufactured using advanced 55nm CMOS low leakage process, which offers highest integration, lowest power consumption, lowest leakage current and reduced BOM cost while simplifying the overall system design. Rich peripherals including an 8 channel general purpose ADC, power-on-reset (POR), Arithmetic Accelerators, USB2.0, 3axis Q-decoder, ISO7816, UART/SPI/I2C and up to 32 GPIOs, which further reduce overall system cost and size.

YC1021 operates with a power supply range from 1.8 to 5.5V and has very low power consumption in both Tx and Rx modes, enabling long lifetimes in battery-operated systems while maintaining excellent RF performance. The device can enter an ultra low power sleep mode in which the registers and retention memory content are retained while low power Oscillator and sleep timer is ON.

Different package from QFN4x4_32L(upto 17 GPIOs) to QFN7x7_56L (upto 32 GPIOs) is available.

Key Features

- Bluetooth 4.1 BR/EDR+BLE+2.4GHz-Proprietary triple-mode RF SOC
- Very Low Power Consumption
  - 10nA shut down mode (external interrupts)
  - 620nA sleep mode (32kHz RC OSC, sleep timer and register ON)
  - 2uA retention mode (32kHz RC OSC, sleep timer, 2k retention memory and register ON)
  - Rx peak current @3V (ideal DCDC)
    - 6.75mA in BLE/2.4G mode
    - 7.25mA in in 3.0(EDR) mode
  - Tx peak current @3V (-2dBm, ideal DCDC)
    - 16.5mA in BLE/2.4G mode
    - 17mA in in 3.0(EDR) mode
  - Rx peak current w/o DCDC
    - 16mA in BLE/2.4G mode
    - 17mA in 3.0(EDR) mode
  - Tx peak current w/o DCDC @ -2dBm
    - 22mA in BLE/2.4G mode
    - 23mA in 3.0(EDR) mode
  - <25uA avg, 500ms sniff hold connection
- 2.4GHz Transceiver
  - Single-end RFIO
  - -93dBm in BLE mode
  - support 250kbps, 1/2/3Mbps data rates
  - Tx Power upto +6dBm
- Oscillators
  - 16M/24M/32M XTAL supported (default 24M)
  - 50M RC oscillator
  - Low Jitter 32K RC oscillator
- Dual Core Digital Architecture
  - 8051 Core for application
    - 16kB code RAM
  - 32bit-Risc Core for link management
    - 80kB code ROM
    - 8kB code RAM
    - All RAMs can be set to retention mode
- Arithmetic Accelerators *[Accuracy : (sign, 15b.16b)]*
  - $\sin/\cos/\tan/\sin^{-1}/\cos^{-1}/\tan^{-1}/$ multi/div/sqrt
- Analog Peripherals
  - 8 channel ADC with 10 bit accuracy/3Msps
- Digital Peripherals
  - USB 2.0 full speed (12Mbps)
  - Two-wire Master (I2C compatible), upto 400kbps; UART(RTS/CTS) with HCI-H5 protocol, upto 3.25Mbps; SPI Master, upto 24Mbps
  - ISO7816
  - AES128 HW encryption
  - LED drive capability
  - PWM
  - 20x8 keyscan
  - 3 axis Q-decoder

Package Variants

- QFN 7x7 56L
- QFN 6x6 48L
- QFN 4x4 32L
- Die

Applications

- Sports & Fitness
- Healthcare & medical
- Remote control
- PC peripherals (mouse, keyboard)
- Game control
- Mobile phone accessories
- TV Setup Boxs
- SPP
- 3D Glasses