

Operation description

Bluetooth

1. **Purpose:** The purpose of this document is to describe key component operations on Bluetooth.
2. **Key components:** CSR BlueCore 02 External BC212015B, Bluetooth Single Chip, AMD AM29LV400B(or AM29LV800B), Flash Memory, XC6204B182MR, XC6204B332MR High Speed LDO Regulators, PA2423L POWER AMPLIFIER, XM2400LB-PM0601 LOW NOISE AMPLIFIER, HWS-314 RF SWITCH.
3. **Operation Principle:** CSR BlueCore 02 External BC212015B, Bluetooth Single Chip
BlueCore2-External is a single chip radio and baseband IC for Bluetooth 2.4GHz systems. It is implemented in 0.18 μ m CMOS technology. When used with external flash containing the CSR Bluetooth software stack, it provides a fully compliant Bluetooth system for data and voice communications.
Operation at 2.7 ~ 3.3V supply.
Operation clock is provided by 16MHz oscillator.

Key Features

Radio

- Operation with common TX/RX terminals simplifies external matching circuitry and eliminates external antenna switch
- Extensive built-in self-test minimizes production test time
- No external trimming is required in production
- Full RF reference designs are available

Transmitter

- Up to +4dBm RF transmit power with level control from the on-chip 6-bit DAC over a dynamic range greater than 30dB
- Supports Class 2 and Class 3 radios without the need for an external power amplifier or TX/RX switch
- Support Class 1 radio with an external power amplifier (PA2423L) up to 21mW provided by a power control terminal controlled by an internal 8-bit voltage DAC and an external RF TX/RX switch (HWS-314)

Receiver

- Support Class1 radio with an external low noise amplifier (XM2400LB-PM0601)
- Integrated channel filters

- Digital demodulator for improved sensitivity and co-channel rejection
- Digitized RSSI available in real time over the HCI interface
- Fast AGC for enhanced dynamic range

Synthesizer

- Fully integrated synthesizer, no external VCO varactor diode or resonator
- Compatible with crystals between 8 and 32MHz (in multiples of 250KHz) or an external clock

Auxiliary Features

- Crystal oscillator with built-in digital trimming
- Power management includes digital shut down and wake up commands and an integrated low power oscillator for ultra-low Park/Sniff/Hold mode power consumption
- Devices can be used with an external Master oscillator and provides a clock request signal. To control external clock source.
- Uncommitted 8-bit ADC and 8-bit DAC are available to application programs

Baseband and software

- External 8Mbit flash for complete system solution and application flexibility
- 32kbyte on-chip RAM allows full speed Bluetooth data transfer, mixed voice and data, plus full 7 slaves Pico net operation
- Dedicated logic for forward error correction, header error control, access code correlation, demodulation, cyclic redundancy check, encryption bit-stream generation, whitening and transmit pulse shaping
- Transponders for A-law, μ -law and linear voice from host and A-law, μ -law and CVSD voice over air

Physical Interfaces

- Synchronous serial interface up to 4MBaud
- UART interface with programmable Baud rate up to 1.5MBaud
- Full speed USB interface supports OHCI and UHCI host interfaces. Compliant with USB v1.1
- Synchronous bi-directional serial programmable audio interface
- Operational I-CTM Compatible interface

Bluetooth Stack Running on an Internal Micro-controller

CSR's Bluetooth Protocol Stack runs on-chip in a variety of configurations:

- Standard HCI (UART or USB)
- Fully embedded to RFCOMM, thus reducing host CPU load

AMD AM29LV400B(AM29LV800B), Flash Memory

The Am29LV400B is a 4(8) Mbit, 3.0 volt-only Flash memory organized as 524,288

(1,048,576)bytes or 262,144(524,288) words. The devices are offered in 48-ball FBGA. The word-wide data (x16) appears on DQ15-DQ0; the byte-wide (x8) data appears on DQ7-DQ0. This device is designed to be programmed in-system using only a single 3.0 volt VCC supply. No Vpp is required for write or erase operations. The device can also be programmed in standard EEPROM programmers.

XC6204B182MR, High Speed LDO Regulators

The XC6204 series are highly precise, low noise, positive voltage LDO regulators **Maximum Output Current:** 150mA manufactured using CMOS processes. The series achieves high ripple rejection **Dropout Voltage:** 200mV (IOUT = 100mA) and low dropout and consists of a standard voltage source, an error correction, **Maximum Operation Voltage:** 10V current limiter and a phase compensation circuit plus a driver transistor. **Output Voltage Range:** 1.8V - 6.0V in 50mV increments Output voltage is selectable in 50mV increments within a range of 1.8V ~ 6.0V. **Highly Accurate:** $\pm 2\%$ the series is also compatible with low ESR ceramic capacitors which give added **Low Power Consumption:** TYP 70 μ A output stability. This stability can be maintained even during load fluctuations due **Standby Current:** less than 0.1 μ A to the excellent transient response of the series. **High ripple Rejection:** 70dB (10kHz) The Current limiter's feedback circuit also operates as a short protect for the output **Low Output Noise:** 30 μ Vrms current limiter and the output pin. **Operating Temperature Range:** -40 ~ +85 The CE function enables the output to be turned off, resulting in greatly reduced **Low ESR Capacitor Compatible:** Ceramic capacitor power consumption.