



Product Specification

CLASS II

BC04 FLASH MODULE

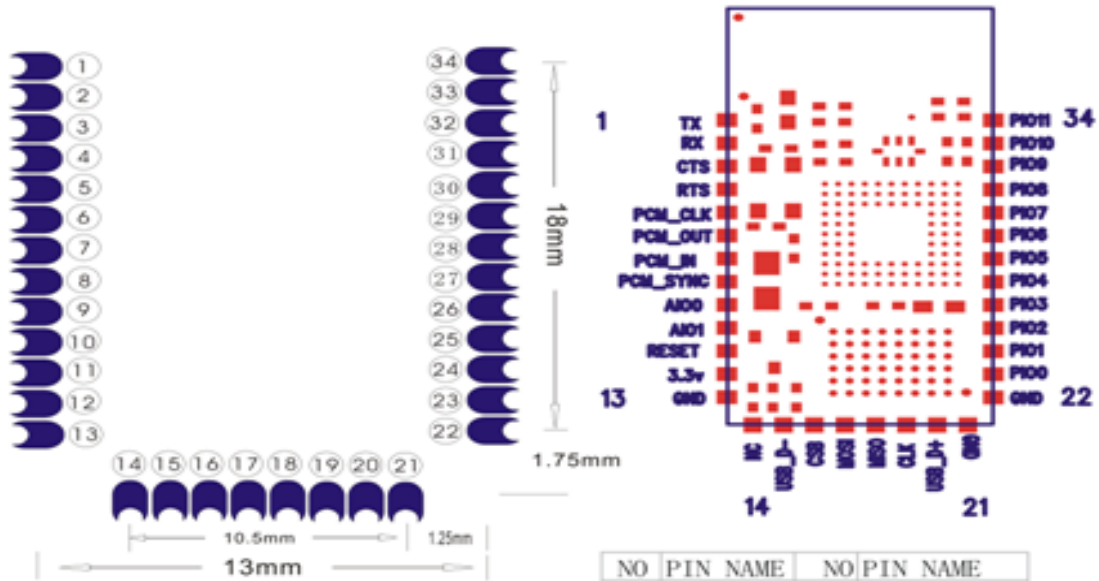
| | | | |
|---------------------|----------|--|--|
| DRAWN BY : | HuiWen | | MODEL : DK-202M |
| CHECKED BY : | Linda | | DESCRIPTION : BC04 +8M Flash +EDR MODULE |
| APPD. BY: | Zed Zeng | | REV : 2.0 |



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1. Product Photo



| NO | PIN NAME | NO | PIN NAME |
|----|----------|----|----------|
| 1 | TX | 20 | USB D+ |
| 2 | RX | 21 | GND |
| 3 | CTS | 22 | GND |
| 4 | RTS | 23 | PI00 |
| 5 | PCM CLK | 24 | PI01 |
| 6 | PCM OUT | 25 | PI02 |
| 7 | PCM IN | 26 | PI03 |
| 8 | PCM SYNC | 27 | PI04 |
| 9 | AIO0 | 28 | PI05 |
| 10 | AIO1 | 29 | PI06 |
| 11 | RESET | 30 | PI07 |
| 12 | 3.3V | 31 | PI08 |
| 13 | GND | 32 | PI09 |
| 14 | NC | 33 | PI010 |
| 15 | USB D- | 34 | PI011 |
| 16 | CSB | | |
| 17 | MOSI | | |
| 18 | MISO | | |
| 19 | CLK | | |

PCB Layout 请参考实物



27mm × 13mm × 2mm



2. Feature

● Radio Transceiver

- Typical -80dBm sensitivity
- Up to +4dBm RF transmit power with power level control
- Fully Qualified Bluetooth V2.0+EDR(Enhanced Data Rate) 2Mbps Modulation
- Integrated 15-bit Linear 8KHz Sample Frequency Audio CODEC in one chip
- Internal 6Mbit ROM
- Low Power 1.8V Operation
- Integrated Switch-Mode Regulator (DC To DC)
- Integrated Battery Charger With Programmable Current
- PIO control
- Standard HCI(UART or USB)
- 4.2V Tolerant LED Drivers With Intensity Control
- UART interface with programmable baud rate
- Basic module without antenna
- Basic module as SMD type
- With Audio Out & Audio in

● Package option

- Edge connector

3. Summary of Benefit

● Complete Bluetooth Solution

- Complete 2.4GHz radio transceiver and baseband
- CSR Bluecore 04-Audio ROM, single chip bluetooth system with CMOS technology
- Adaptive frequency hopping feature (AFH)
- Smallest footprint, 13.5mmX17.5mm
- Simplify overall design/development cycle
- Full speed Class 2 bluetooth operation
- Class I support using external power amplifier

● Low power standby modes to enable high efficient power management

● High performance radio transceiver

● Low overall system cost



- **Application**
 - Headset
 - Automotive Hands-Free Kits
 - Cordless headsets
- **Software**
 - Support CSR bluetooth stack
 - Design for Client

4. Device Terminal Function

| PIN Name | PIN # | Pad type | Description | Note |
|----------------|-------|---------------------------------|---|------|
| GND | 13 | VSS | Ground pot | |
| | 21 | | | |
| | 22 | | | |
| 3.3 VCC | 12 | 3.3V | Integrated 3.3V (+) supply with On-chip linear regulator output within 3.15-3.3V | |
| AIO0 | 9 | Bi-Directional | Programmable input/output line | |
| AIO1 | 10 | Bi-Directional | Programmable input/output line | |
| PIO0 | 23 | Bi-Directional RX EN | Programmable input/output line, control output for LNA(if fitted) | |
| PIO1 | 24 | Bi-Directional TX EN | Programmable input/output line, control output for PA(if fitted) | |
| PIO2 | 25 | Bi-Directional | Programmable input/output line | |
| PIO3 | 26 | Bi-Directional | Programmable input/output line | |
| PIO4 | 27 | Bi-Directional | Programmable input/output line | |
| PIO5 | 28 | Bi-Directional | Programmable input/output line | |
| PIO6 | 29 | Bi-Directional | Programmable input/output line | |
| PIO7 | 30 | Bi-Directional | Programmable input/output line | |
| PIO8 | 31 | Bi-Directional | Programmable input/output line | |
| PIO9 | 32 | Bi-Directional | Programmable input/output line | |
| PIO10 | 33 | Bi-Directional | Programmable input/output line | |
| PIO11 | 34 | Bi-Directional | Programmable input/output line | |



| | | | | |
|-----------------|-----------|---|--|--|
| RESETB | 11 | | | |
| UART_RTS | 4 | CMOS output, tri-stable with weak internal pull-up | UART request to send, active low | |
| UART_CTS | 3 | CMOS input with weak internal pull-down | UART clear to send, active low | |
| UART_RX | 2 | CMOS input with weak internal pull-down | UART Data input | |
| UART_TX | 1 | CMOS output, Tri-stable with weak internal pull-up | UART Data output | |
| SPI_MOSI | 17 | CMOS input with weak internal pull-down | Serial peripheral interface data input | |
| SPI_CSB | 16 | CMOS input with weak internal pull-up | Chip select for serial peripheral interface, active low | |
| SPI_CLK | 19 | CMOS input with weak internal pull-down | Serial peripheral interface clock | |
| SPI_MISO | 18 | CMOS input with weak internal pull-down | Serial peripheral interface data Output | |
| USB_- | 15 | Bi-Directional | | |



| | | | | |
|-----------------|-----------|-----------------------|------------------------------------|--|
| USB_+ | 20 | Bi-Directional | | |
| NC | 14 | | | |
| PCM_CLK | 5 | Bi-Directional | Synchronous PCM data clock | |
| PCM_OUT | 6 | CMOS output | Synchronous PCM data output | |
| PCM_IN | 7 | CMOS Input | Synchronous PCM data input | |
| PCM_SYNC | 8 | Bi-Directional | Synchronous PCM data strobe | |



5. Electrical Specification:

- Recommended Operating condition

| Radio Characteristics | VDD = 1.8V | | | Temperature = +20°C | |
|---|------------|------|-----|------------------------------|----------|
| | Min | Typ | Max | Bluetooth Specification | Unit |
| Maximum RF transmit power ^(a) (b) | - | 2.5 | - | -6 to +4 ^(c) | dBm |
| RF power variation over temperature range with compensation enabled ^(±) ^(d) | - | 1.5 | - | - | dB |
| RF power variation over temperature range with compensation disabled ^(±) | - | 2 | - | - | dB |
| RF power control range | - | 35 | - | ≥16 | dB |
| RF power range control resolution ^(e) | - | 0.5 | - | - | dB |
| 20dB bandwidth for modulated carrier | - | 780 | - | ≤1000 | kHz |
| Adjacent channel transmit power F = F ₀ ± 2MHz ^(f) (g) | - | -40 | - | ≤-20 | dBm |
| Adjacent channel transmit power F = F ₀ ± 3MHz | - | -45 | - | ≤-40 | dBm |
| Adjacent channel transmit power F = F ₀ ± > 3MHz | - | -50 | - | ≤-40 | dBm |
| Δf _{avg} Maximum Modulation | - | 165 | - | 140 < f _{avg} < 175 | kHz |
| Δf _{max} Minimum Modulation | - | 150 | - | ≥115 | kHz |
| Δf _{avg} /Δf _{max} | - | 0.97 | - | ≥0.80 | - |
| Initial carrier frequency tolerance | - | 6 | - | ±75 | kHz |
| Drift Rate | - | 8 | - | ≤20 | kHz/50μs |
| Drift (single slot packet) | - | 7 | - | ≤25 | kHz |
| Drift (five slot packet) | - | 9 | - | ≤40 | kHz |
| 2 nd Harmonic Content | - | -65 | - | ≤-30 | dBm |
| 3 rd Harmonic Content | - | -45 | - | ≤-30 | dBm |



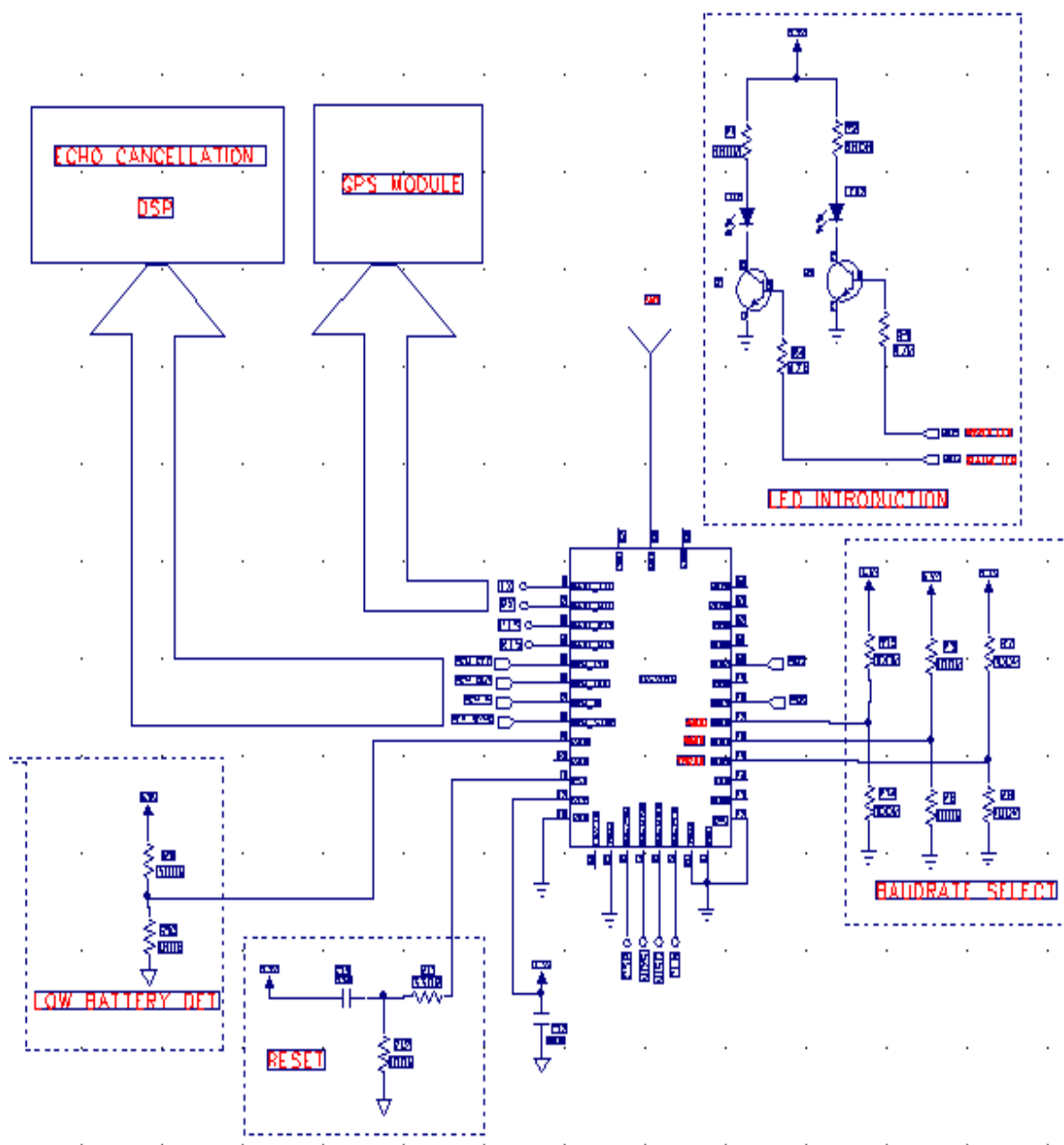
● Transmitter

| Radio Characteristics | VDD = 1.8V | | | Temperature = +20°C | |
|---|------------|------|-----|------------------------------|----------|
| | Min | Typ | Max | Bluetooth Specification | Unit |
| Maximum RF transmit power ^{(a) (b)} | - | 2.5 | - | -6 to +4 ^(c) | dBm |
| RF power variation over temperature range with compensation enabled ^{(±)(d)} | - | 1.5 | - | - | dB |
| RF power variation over temperature range with compensation disabled ^(±) | - | 2 | - | - | dB |
| RF power control range | - | 35 | - | ≥16 | dB |
| RF power range control resolution ^(e) | - | 0.5 | - | - | dB |
| 20dB bandwidth for modulated carrier | - | 780 | - | ≤1000 | kHz |
| Adjacent channel transmit power F = F ₀ ± 2MHz ^{(f) (g)} | - | -40 | - | ≤-20 | dBm |
| Adjacent channel transmit power F = F ₀ ± 3MHz | - | -45 | - | ≤-40 | dBm |
| Adjacent channel transmit power F = F ₀ ± > 3MHz | - | -50 | - | ≤-40 | dBm |
| Δf _{avg} Maximum Modulation | - | 165 | - | 140 < f _{avg} < 175 | kHz |
| Δf _{max} Minimum Modulation | - | 150 | - | ≥115 | kHz |
| Δf _{avg} /Δf _{avg} | - | 0.97 | - | ≥0.80 | - |
| Initial carrier frequency tolerance | - | 6 | - | ±75 | kHz |
| Drift Rate | - | 8 | - | ≤20 | kHz/50μs |
| Drift (single slot packet) | - | 7 | - | ≤25 | kHz |
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| 2 nd Harmonic Content | - | -65 | - | ≤-30 | dBm |
| 3 rd Harmonic Content | - | -45 | - | ≤-30 | dBm |



| Radio Characteristics | | VDD = 1.8V | | | Temperature = +20°C | |
|--|-----------------|------------|------|-----|-------------------------|--------|
| | Frequency (GHz) | Min | Typ | Max | Bluetooth Specification | Unit |
| Sensitivity at 0.1% BER for all packet types | 2.402 | - | -84 | - | ≤-70 | dBm |
| | 2.441 | - | -84 | - | | |
| | 2.480 | - | -85 | - | | |
| Maximum received signal at 0.1% BER | | - | 10 | - | ≤-20 | dBm |
| | Frequency (MHz) | Min | Typ | Max | Bluetooth Specification | Unit |
| Continuous power required to block Bluetooth reception (for input power of -67dBm with 0.1% BER) measured at the unbalanced port of the balun. | 30-2000 | - | -6 | - | ≤-10 | dBm |
| | 2000-2400 | - | 0 | - | ≤-27 | |
| | 2500-3000 | - | 0 | - | ≤-27 | |
| C/I co-channel | | - | 6 | - | ≤11 | dB |
| Adjacent channel selectivity C/I F = F ₀ + 1MHz ^(a) (b) | | - | -5 | - | ≤0 | dB |
| Adjacent channel selectivity C/I F = F ₀ - 1MHz | | - | -4 | - | ≤0 | dB |
| Adjacent channel selectivity C/I F = F ₀ + 2MHz | | - | -38 | - | ≤-30 | dB |
| Adjacent channel selectivity C/I F = F ₀ - 2MHz | | - | -23 | - | ≤-20 | dB |
| Adjacent channel selectivity C/I F = F ₀ + 3MHz | | - | -45 | - | ≤-40 | dB |
| Adjacent channel selectivity C/I F = F ₀ - 5MHz | | - | -44 | - | ≤-40 | dB |
| Adjacent channel selectivity C/I F = F _{image} | | - | -22 | - | ≤-9 | dB |
| Maximum level of intermodulation interferers ^(c) | | - | -30 | - | ≥-39 | dBm |
| Spurious output level ^(d) | | - | -150 | - | - | dBm/Hz |

6. Schematic Diagram



7. Block Diagram

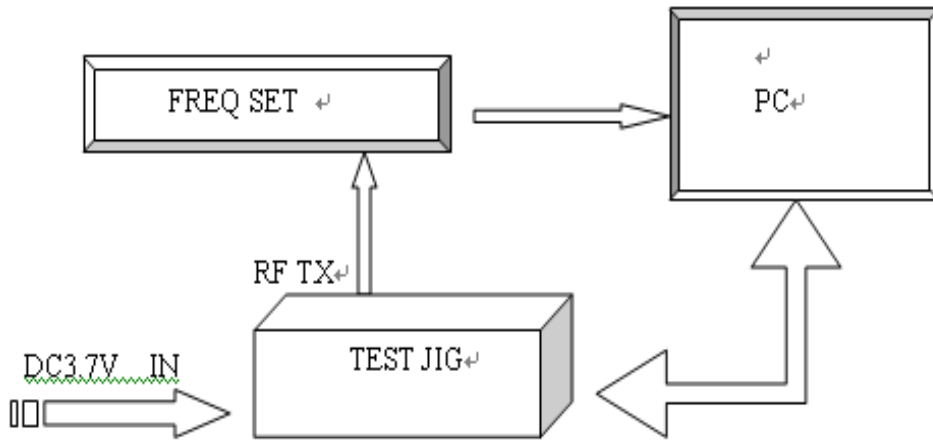


Fig 1 Programming and Freq. Alignment Test Procedure

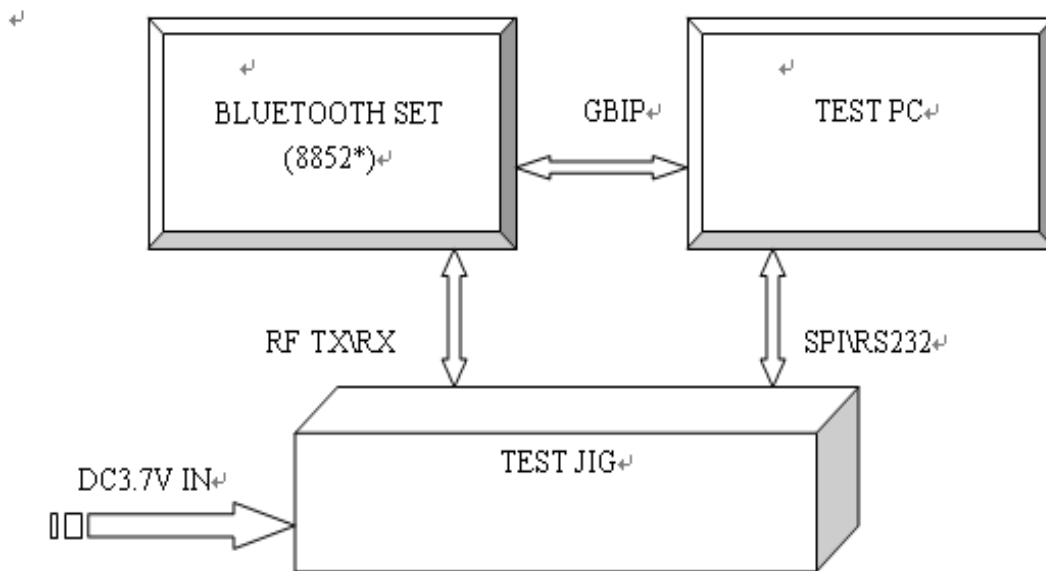


Fig 2 RF Parameter Test procedure

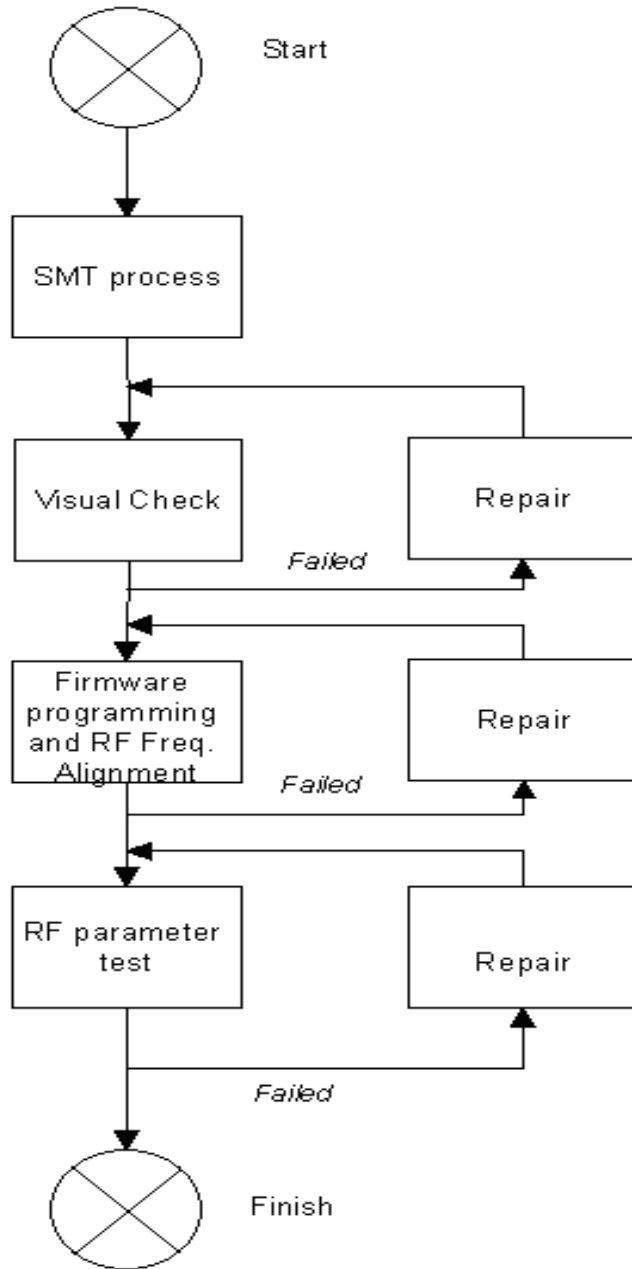


Fig 3 Assemble/Alignment/Testing Flow Chart