



# **BT6038A programming user guide**

Release 1.0.2

# Table of contents

|          |                                                             |           |
|----------|-------------------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction</b>                                         | <b>1</b>  |
| 1.1      | Release note                                                | 1         |
| 1.2      | Description                                                 | 1         |
| 1.3      | Module default settings                                     | 2         |
| <b>2</b> | <b>Hardware description</b>                                 | <b>3</b>  |
| 2.1      | Pin diagram                                                 | 3         |
| 2.2      | Pin description                                             | 4         |
| 2.3      | Hardware design notes                                       | 9         |
| <b>3</b> | <b>Function description</b>                                 | <b>10</b> |
| 3.1      | Profiles                                                    | 10        |
| 3.2      | GATT Default service and characteristic                     | 11        |
| <b>4</b> | <b>Command description</b>                                  | <b>12</b> |
| 4.1      | Terms                                                       | 12        |
| 4.2      | Command format                                              | 12        |
| 4.3      | Event format                                                | 13        |
| <b>5</b> | <b>Commands table</b>                                       | <b>14</b> |
| 5.1      | General commands                                            | 14        |
| 5.1.1    | AT+HELP - List firmware information and all support command | 14        |
| 5.1.2    | AT+VER - Get firmware version information                   | 14        |
| 5.1.3    | AT+BAUD - Get/Set uart baudrate                             | 15        |
| 5.1.4    | AT+I2SCFG - Get/Set I2S configuration                       | 16        |
| 5.1.5    | AT+MICGAIN - Get/Set input gain                             | 17        |
| 5.1.6    | AT+REBOOT - Soft reboot                                     | 17        |
| 5.1.7    | AT+RESTORE - Restore factory settings                       | 17        |
| 5.1.8    | AT+BTEN - Get/Set bluetooth state                           | 18        |
| 5.1.9    | AT+LECFG - Get/Set random BLE address state                 | 18        |

|        |                                                        |    |
|--------|--------------------------------------------------------|----|
| 5.1.10 | AT+PROFILE - Get/Set bluetooth profile . . . . .       | 19 |
| 5.1.11 | AT+AUTOCONN - Get/Set poweron auto reconnect . . . . . | 20 |
| 5.1.12 | AT+STAT - Get all state . . . . .                      | 20 |
| 5.1.13 | AT+DEVSTAT - Get device state . . . . .                | 20 |
| 5.1.14 | AT+ADDR - Get BR/EDR MAC address . . . . .             | 21 |
| 5.1.15 | AT+LEADDR - Get BLE MAC address . . . . .              | 21 |
| 5.1.16 | AT+NAME - Get/Set BR/EDR name . . . . .                | 21 |
| 5.1.17 | AT+LENAM - Get/Set BLE name . . . . .                  | 22 |
| 5.1.18 | AT+ADVDATA - Get/Set BLE advertising data . . . . .    | 22 |
| 5.1.19 | AT+COD - Get/Set class of device . . . . .             | 22 |
| 5.1.20 | AT+PAIR - Get/Set BR/EDR visibility . . . . .          | 23 |
| 5.1.21 | AT+SCAN - Scan nearby devices . . . . .                | 23 |
| 5.1.22 | AT+PLIST - Get/Delete paired list . . . . .            | 24 |
| 5.1.23 | AT+DSCA - Release all connections . . . . .            | 24 |
| 5.1.24 | AT+TPMODE - Get/Set throughput mode . . . . .          | 25 |
| 5.1.25 | AT+AUXCFG - Get/Set audio input mode . . . . .         | 25 |
| 5.1.26 | AT+LINKKEY - Get remote device link key . . . . .      | 26 |
| 5.1.27 | AT+RSSI - Get remote device rssi . . . . .             | 26 |
| 5.1.28 | AT+LINKCFG - Get/Set auto scan and connect . . . . .   | 26 |
| 5.1.29 | AT+AUDMODE - Get/Set audio mode . . . . .              | 27 |
| 5.1.30 | AT+PRINT - Get/Set report mode . . . . .               | 27 |
| 5.2    | HFP commands . . . . .                                 | 27 |
| 5.2.1  | AT+HFPSTAT - Get HFP state . . . . .                   | 27 |
| 5.2.2  | AT+HFPCONN - Establish HFP connection . . . . .        | 27 |
| 5.2.3  | AT+HFPPDISC - Release HFP connection . . . . .         | 28 |
| 5.2.4  | AT+HFPPRING - Simulate incoming call . . . . .         | 28 |
| 5.2.5  | AT+HFPANSW - Pick up incoming call . . . . .           | 28 |
| 5.2.6  | AT+HFPCHUP - Reject/Hung up call . . . . .             | 28 |
| 5.2.7  | AT+HFPAUDIO - Establish/Release voice audio . . . . .  | 29 |
| 5.2.8  | AT+HFPWBS - Get/Set hfp codec negotiation . . . . .    | 29 |
| 5.2.9  | AT+HFPNREC - Get/Set hfp cvc . . . . .                 | 29 |
| 5.3    | A2DP/AVRCP commands . . . . .                          | 29 |
| 5.3.1  | AT+A2DPSTAT - Get A2DP state . . . . .                 | 30 |
| 5.3.2  | AT+A2DPCONN - Establish A2DP connection . . . . .      | 30 |
| 5.3.3  | AT+A2DPDISC - Release A2DP connection . . . . .        | 30 |
| 5.3.4  | AT+A2DPCFG - Get/Set A2DP configuration . . . . .      | 31 |
| 5.3.5  | AT+A2DPENC - Get A2DP encoder . . . . .                | 32 |

|          |                                                                                          |           |
|----------|------------------------------------------------------------------------------------------|-----------|
| 5.3.6    | AT+A2DPAUDIO - Establish/Release A2DP audio connection . . . . .                         | 32        |
| 5.3.7    | AT+AVRCPSTAT - Get AVRCP state . . . . .                                                 | 32        |
| 5.3.8    | AT+AVRCPCONN - Establish AVRCP connection . . . . .                                      | 32        |
| 5.3.9    | AT+AVRCPDISC - Release AVRCP connection . . . . .                                        | 33        |
| 5.3.10   | AT+AVRCPSPKVOL - Get/Set remote volume . . . . .                                         | 33        |
| 5.4      | GATT commands . . . . .                                                                  | 33        |
| 5.4.1    | AT+GATTSTAT - Get GATT state . . . . .                                                   | 33        |
| 5.4.2    | AT+GATTSEND - Send data via GATT . . . . .                                               | 34        |
| 5.5      | SPP commands . . . . .                                                                   | 34        |
| 5.5.1    | AT+SPPSTAT - Get SPP state . . . . .                                                     | 34        |
| 5.5.2    | AT+SPPDISC - Release SPP connection . . . . .                                            | 34        |
| 5.5.3    | AT+SPPSEND - Send data via SPP . . . . .                                                 | 34        |
| 5.6      | LE Audio commands . . . . .                                                              | 34        |
| 5.6.1    | AT+LEASTAT - Get Le Audio state . . . . .                                                | 35        |
| 5.6.2    | AT+LEADISC - Release Le Audio connection . . . . .                                       | 35        |
| 5.6.3    | AT+LEACONN - Establish le audio connection . . . . .                                     | 35        |
| <b>6</b> | <b>Events table</b>                                                                      | <b>36</b> |
| 6.1      | General events . . . . .                                                                 | 36        |
| 6.1.1    | +VER - Frmware version information . . . . .                                             | 36        |
| 6.1.2    | +DEVSTAT - Device state . . . . .                                                        | 37        |
| 6.1.3    | +SCAN - Scan result . . . . .                                                            | 38        |
| 6.1.4    | +PAIRED - Pair result . . . . .                                                          | 38        |
| 6.1.5    | +I2SSR - I2S sample rate . . . . .                                                       | 38        |
| 6.2      | HFP events . . . . .                                                                     | 38        |
| 6.2.1    | +HFPSTAT - HFP state . . . . .                                                           | 39        |
| 6.2.2    | +HFPDEV - HFP remote device information . . . . .                                        | 39        |
| 6.2.3    | +HFPCONN - HFP connecting . . . . .                                                      | 39        |
| 6.2.4    | +HFPAUDIO - HFP voice audio State . . . . .                                              | 40        |
| 6.2.5    | +HFPCID - HFP call phone number . . . . .                                                | 40        |
| 6.2.6    | +HFPSR - HFP sample rate . . . . .                                                       | 40        |
| 6.2.7    | +HFPHUNG - HFP remote device reject an incoming call or end an<br>ongoing call . . . . . | 40        |
| 6.2.8    | +HFPVGS - HFP remote device spker gian . . . . .                                         | 40        |
| 6.2.9    | +HFPVGM - HFP remote device microphone gian . . . . .                                    | 41        |
| 6.3      | A2DP/AVRCP events . . . . .                                                              | 41        |
| 6.3.1    | +A2DPSTAT - A2DP state . . . . .                                                         | 41        |

|          |                                            |           |
|----------|--------------------------------------------|-----------|
| 6.3.2    | +A2DPENC - A2DP encoder                    | 41        |
| 6.3.3    | +A2DPDEV - A2DP remote device information  | 42        |
| 6.3.4    | +A2DPCONN - A2DP connecting                | 42        |
| 6.3.5    | +A2DPSR - A2DP codec sample rate           | 42        |
| 6.3.6    | +AVRCPSTAT - AVRCP state                   | 42        |
| 6.3.7    | +AVRCPCONN - AVRCP connecting              | 43        |
| 6.3.8    | +SPKVOL - Remote spker volume change       | 43        |
| 6.3.9    | +CTVOLUP - volume up                       | 43        |
| 6.3.10   | +CTVOLDN - volume down                     | 43        |
| 6.3.11   | +CTPLAY - Track play                       | 43        |
| 6.3.12   | +CTPAUSE - Track pause                     | 43        |
| 6.3.13   | +CTSTOP - Track stop                       | 44        |
| 6.3.14   | +CTFWD - Track forward                     | 44        |
| 6.3.15   | +CTBACK - Track backward                   | 44        |
| 6.4      | LE Audio events                            | 44        |
| 6.4.1    | +LEASTAT - LE Audio state                  | 44        |
| 6.4.2    | +LEASR - LE Audio sample rate              | 45        |
| 6.5      | GATT events                                | 45        |
| 6.5.1    | +GATTSTAT - GATT state                     | 45        |
| 6.5.2    | +GATTDATA - GATT received incoming data    | 45        |
| 6.6      | SPP events                                 | 45        |
| 6.6.1    | +SPPSTAT - SPP state                       | 46        |
| 6.6.2    | +SPPDATA - SPP received incoming data      | 46        |
| 6.6.3    | +SPPDEV - SPP remote device information    | 46        |
| <b>7</b> | <b>Application scenarios</b>               | <b>47</b> |
| 7.1      | profiles initializing and change parameter | 47        |
| 7.2      | Source mode connection                     | 49        |
| 7.3      | Le Audio broadcast mode                    | 50        |
| 7.4      | Le Audio unicast mode                      | 51        |
| 7.5      | SPP data transfer                          | 52        |
| 7.6      | GATT data transfer                         | 53        |
| <b>8</b> | <b>Appendix</b>                            | <b>54</b> |
| 8.1      | Download PDF Document                      | 54        |

# Chapter 1

## Introduction

### 1.1 Release note

| Index | Version | Date       | Description                                                          |
|-------|---------|------------|----------------------------------------------------------------------|
| 1     | V1.0.0  | 2024/05/23 | First edition                                                        |
| 2     | V1.0.1  | 2024/07/09 | Add le audio description<br>Add GATT description<br>Fix known issues |
| 3     | V1.0.2  | 2025/01/07 | Fix known issues<br>Add some command and event descriptions          |

### 1.2 Description

This design guide is suitable for engineers to develop FSC-BT6038A series bluetooth modules

## 1.3 Module default settings

|                           |                |
|---------------------------|----------------|
| <b>BR/EDR Name</b>        | FSC-BT6038A    |
| <b>BLE Name</b>           | FSC-BT6038A-LE |
| <b>UART configuration</b> | 115200/8/N/1   |

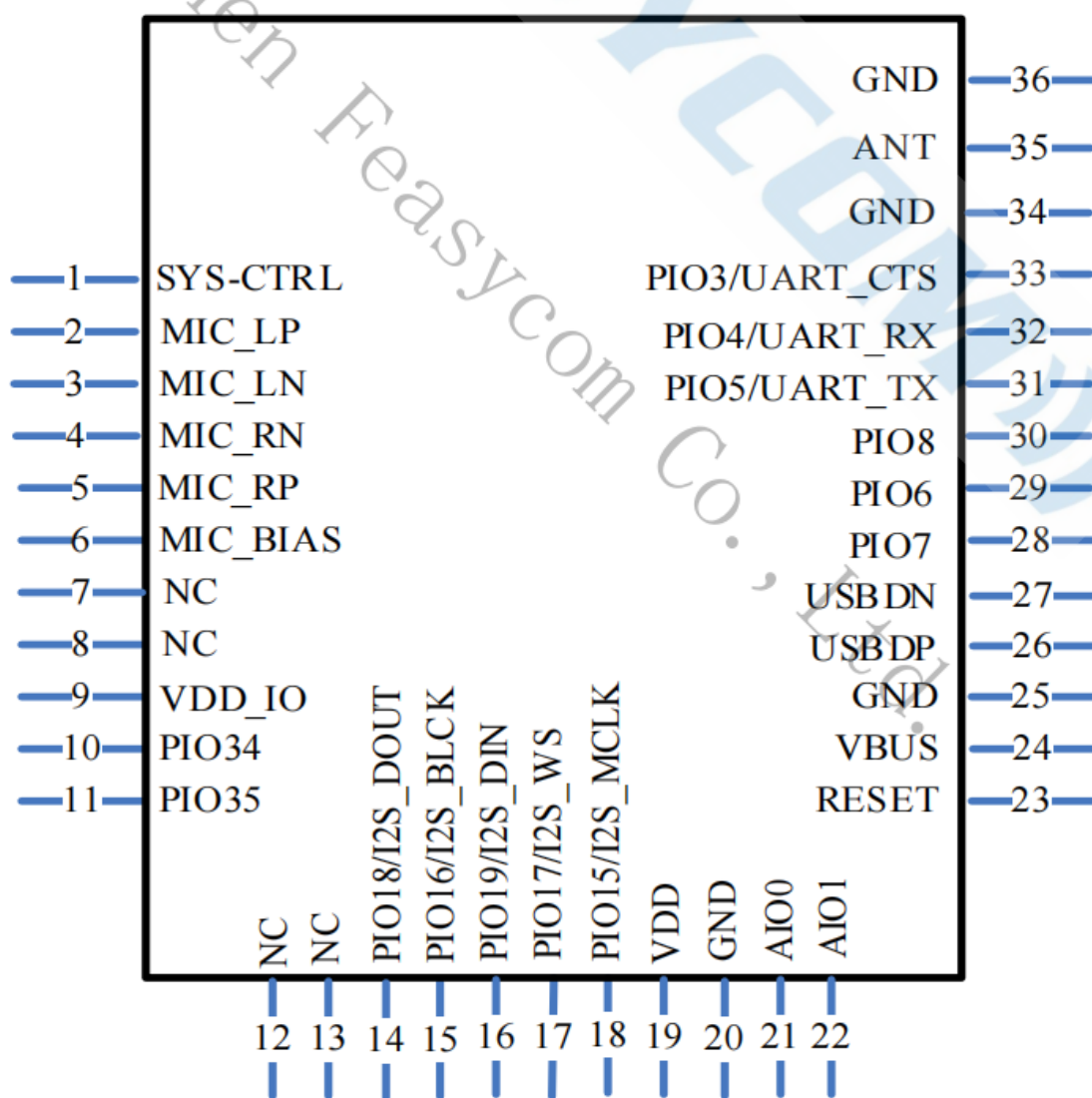
## Chapter 2

### Hardware description

#### 2.1 Pin diagram

FSC-BT6038A as an example:





| Pin | Name     | Type | Descriptions                                                                                       |
|-----|----------|------|----------------------------------------------------------------------------------------------------|
| 1   | SYS_CTRL | I    | Typically connected to an ON/OFF push button<br>Also usable as a digital input in normal operation |

continues on next page

Table 1 – continued from previous page

| Pin | Name             | Type | Descriptions                                                                           |
|-----|------------------|------|----------------------------------------------------------------------------------------|
| 2   | MIC_LP           | A    | Microphone differential 1 input, positive<br>Differential audio line input 1, positive |
| 3   | MIC_LN           | A    | Microphone differential 1 input, negative<br>Differential audio line input 1, negative |
| 4   | MIC_RN           | A    | Microphone differential 2 input, negative<br>Differential audio line input 2, negative |
| 5   | MIC_RP           | A    | Microphone differential 2 input, positive<br>Differential audio line input 2, positive |
| 6   | MIC_BIAS         | A    | Mic bias output                                                                        |
| 7   | NC               | N    | Not connect                                                                            |
| 8   | NC               | N    | Not connect                                                                            |
| 9   | VDD_IO           | P    | I/O port supply                                                                        |
| 10  | PIN34<br>I2C_SDA | I/O  | Programmable I/O<br>Alternative function I2C_SDA                                       |

continues on next page

Table 1 – continued from previous page

| Pin | Name              | Type | Descriptions                                      |
|-----|-------------------|------|---------------------------------------------------|
| 11  | PIN35<br>I2S_SCL  | I/O  | Programmable I/O<br>Alternative funciton I2C_SCL  |
| 12  | NC                | N    | Not connect                                       |
| 13  | NC                | N    | Not connect                                       |
| 14  | PIO18<br>I2S_DOUT | I/O  | Programmable I/O<br>Alternative funciton I2S_DOUT |
| 15  | PIO16<br>I2S_BCLK | I/O  | Programmable I/O<br>Alternative funciton I2S_BCLK |
| 16  | PIO19<br>I2S_DIN  | I/O  | Programmable I/O<br>Alternative funciton I2S_DIN  |
| 17  | PIO17<br>I2S_WS   | I/O  | Programmable I/O<br>Alternative funciton I2S_WS   |
| 18  | PIO15<br>I2S_MCLK | I/O  | Programmable I/O<br>Alternative funciton I2S_MCLK |
| 19  | VDD               | P    | Power supply                                      |

continues on next page

Table 1 – continued from previous page

| Pin | Name              | Type | Descriptions                                          |
|-----|-------------------|------|-------------------------------------------------------|
| 20  | GND               | P    | Power ground                                          |
| 21  | AIO0              | I/O  | General-purpose analog/digital input or OD LED output |
| 22  | AIO1              | I/O  | General-purpose analog/digital input or OD LED output |
| 23  | RESET             | I    | External reset input                                  |
| 24  | VBUS              | P    | USB power                                             |
| 25  | GND               | P    | Power ground                                          |
| 26  | USB_DP            | I/O  | USB data positive                                     |
| 27  | USB_DN            | I/O  | USB data negative                                     |
| 28  | PIN7<br>TRBI_MISO | I/O  | Programmable I/O<br>TRBI_MISO                         |

continues on next page

Table 1 – continued from previous page

| Pin | Name                         | Type | Descriptions                                                  |
|-----|------------------------------|------|---------------------------------------------------------------|
| 29  | PIN6<br>TRBI_MOSI            | I/O  | Programmable I/O<br>TRBI_MOSI                                 |
| 30  | PIN8<br>TRBI_CLK             | I/O  | Programmable I/O<br>TRBI_CLK                                  |
| 31  | PIO5<br>UART_TX              | I/O  | Programmable I/O<br>Alternative funciton UART_TX              |
| 32  | PIO4<br>UART_RX              | I/O  | Programmable I/O<br>Alternative funciton UART_RX              |
| 33  | PIO3<br>UART_CTS<br>SPDIF_IN | I/O  | Programmable I/O<br>Alternative funciton UART_CTS<br>SPDIF_IN |
| 34  | GND                          | P    | Power ground                                                  |
| 35  | EXT_ANT                      | A    | Antenna                                                       |
| 36  | GND                          | P    | Power ground                                                  |

## 2.3 Hardware design notes

- The simple test of the module only needs to connect VDD/VDD\_IO/VBUS/GND/UART\_RX/UART\_TX to use
- After drawing, please send it to feasy.com for review so as not to have the best bluetooth distance

Shenzhen Feasycom Technology Co., Ltd.

# Chapter 3

## Function description

### 3.1 Profiles

- SPP (Serial Port Profile)
- GATTs (Generic Attribute Profile LE-Peripheral)
- GATTC (Generic Attribute Profile LE-Central)
- HFP-HF (Hands-Free Profile)
- HFP-AG (Hands-Free-AG Profile)
- A2DP-Sink (Advanced Audio Distribution Profile)
- A2DP-Source (Advanced Audio Distribution Profile)
- AVRCP-Controller (Audio/Video remote controller Profile)
- AVRCP-Target (Audio/Video remote controller Profile)
- HID-DEVICE (Human Interface Profile)
- PBAP (Phonebook Access Profile)
- LEA (Le Audio Profile)

### 3.2 GATT Default service and characteristic

|                 |                 |                                 |                                    |
|-----------------|-----------------|---------------------------------|------------------------------------|
| Type<br>Service | UUID<br>0xFFFF0 | Characteristic                  | Description<br>throughput services |
| Write           | 0xFFFF2         | Write<br>Write Without Response | app send to module                 |
| Notify          | 0xFFFF1         | Notify                          | module send to app                 |



# Chapter 4

## Command description

### 4.1 Terms

- Throughout this specification:
- Content between { } is optional
- Content behind << represents a command from host
- Content behind >> represents a response/event to host

### 4.2 Command format

**AT+Command{=Param1{,Param2{,Param3...}}}<CR><LF>**

- All commands start with “AT” , end with <CR><LF>
- <CR> means “carriage return” , corresponds to hex value 0x0D
- <LF> means “line feed” , corresponds to hex value 0x0A
- If command has parameter, parameter follows behind ‘=’
- If command has multiple parameters, parameter must be separated by ‘,’
- If command has response, response starts with <CR><LF>, ends with <CR><LF>
- Module will always report command’ s execution result by using “OK” for success or “ERROR” for failure

Example: Get module's BR/EDR name

<< AT+NAME

>> +NAME=FSC-BT6038A

>> OK

Example: Pick up an incoming call when no call incoming actually

<< AT+HFPANSW

>> ERROR

### 4.3 Event format

<CR><LF>+Event{=Param1{,Param2{,Param3...}}}<CR><LF>

- All events start with <CR><LF>, end with <CR><LF>
- If event has parameter, parameter follow behind '='
- If event has multiple parameters, parameter must be separated by ','

Example: Received "1234567890" from mobile phone via SPP profile

>> +SPPDATA=10,1234567890

## Chapter 5

### Commands table

#### 5.1 General commands

##### 5.1.1 AT+HELP - List firmware information and all support command

| Command  | AT+HELP                                                                                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Response | <FIRMWARE FUNCTION: appropriate working scenario><br><OTA PATH: latest suitable firmware path on server for upgrade On-The-Air><br><ENABLED PROFILES: LINKS: ON/OFF><br>...<br>...<br><COMMAND SUMMARY: DESCRIPTION: PROFILE CATEGORY> |

##### 5.1.2 AT+VER - Get firmware version information

| Command     | AT+VER                                    |
|-------------|-------------------------------------------|
| Response    | +VER=Param1,Param2,Param3                 |
| Description | +VER - <i>Frmware version information</i> |

### 5.1.3 AT+BAUD - Get/Set uart baudrate

| Command     | AT+BAUD{=Param}                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------|
| Param       | 9600/ 19200/ 38400/ 57600/ 115200/ 230400/ 460800<br>500000/ 921600/ 1000000/ 1382400/ 1500000/ 2000000 |
| Response    | +BAUD=Param                                                                                             |
| Param       | Current baudrate                                                                                        |
| Description | It takes effect immediately and does not need to be restarted                                           |

### 5.1.4 AT+I2SCFG - Get/Set I2S configuration

| Command            | AT+I2SCFG{=Param}                                                    |
|--------------------|----------------------------------------------------------------------|
| Param              | A base-10 representation of a bit field, for each bit                |
| BIT[0]             | 0: disable<br>1: enable                                              |
| BIT[1]             | 0: master<br>1: slave                                                |
| BIT[2]             | 0: 48000Hz<br>1: 44100Hz                                             |
| BIT[3]             | 0: left justified<br>1: right justified                              |
| BIT[4]             | 0: data 1 bit delay<br>1: data no delay                              |
| BIT[5:6]           | 00: bit depth=16bits<br>01: bit depth=24bits<br>10: bit depth=32bits |
| <b>Response</b>    | <b>+I2SCFG=Param</b>                                                 |
| Param              | Current I2S configuration                                            |
| <b>Description</b> | It takes effect after the restart                                    |

### 5.1.5 AT+MICGAIN - Get/Set input gain

| Command     | AT+MICGAIN{=Param}                                                                                                                |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Param       | 0 ~ 10: Set target value<br>+: Increase<br>-: Decrease                                                                            |
| Response    | +MICGAIN=Param                                                                                                                    |
| Param       | Current input gain                                                                                                                |
| Description | In usb input mode, the parameter only be +/-, and get the parameter is invalid<br>In I2S/SPDIF input mode, the command is invalid |

### 5.1.6 AT+REBOOT - Soft reboot

| Command     | AT+REBOOT                                       |
|-------------|-------------------------------------------------|
| Description | Module will disconnect all profiles then reboot |

### 5.1.7 AT+RESTORE - Restore factory settings

| Command     | AT+RESTORE                                      |
|-------------|-------------------------------------------------|
| Description | Module restore all factory settings then reboot |

### 5.1.8 AT+BTEN - Get/Set bluetooth state

| Command  | AT+BTEN{=Param}         |
|----------|-------------------------|
| Param    | 0: Disable<br>1: Enable |
| Response | +BTEN=Param             |
| Param    | Current bluetooth state |

### 5.1.9 AT+LECFG - Get/Set random BLE address state

| Command  | AT+LECFG{=Param}        |
|----------|-------------------------|
| Param    | 0: Disable<br>1: Enable |
| Response | +LECFG=Param            |
| Param    | Current state           |

### 5.1.10 AT+PROFILE - Get/Set bluetooth profile

| Command            | AT+PROFILE{=Param}                                                                                                                                                                    |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Param              | A base-10 representation of a bit field, for each bit:                                                                                                                                |
| BIT[0]             | SPP (Serial Port Profile)                                                                                                                                                             |
| BIT[1]             | GATT Server (Generic Attribute Profile)                                                                                                                                               |
| BIT[2]             | GATT Client (Generic Attribute Profile)                                                                                                                                               |
| BIT[3]             | HFP-HF (Hands-Free Profile Handsfree)                                                                                                                                                 |
| BIT[4]             | HFP-AG (Hands-Free Profile Audio Gateway)                                                                                                                                             |
| BIT[5]             | A2DP Sink (Advanced Audio Distribution Profile)                                                                                                                                       |
| BIT[6]             | A2DP Source (Advanced Audio Distribution Profile)                                                                                                                                     |
| BIT[7]             | AVRCP Controller (Audio/Video remote controller Profile)                                                                                                                              |
| BIT[8]             | AVRCP Target (Audio/Video remote controller Profile)                                                                                                                                  |
| BIT[9]             | HID Keyboard (Human Interface Profile)                                                                                                                                                |
| BIT[10]            | PBAP Server (Phonebook Access Profile)                                                                                                                                                |
| BIT[11]            | LE Audio (LE Audio Profile)                                                                                                                                                           |
| <b>Response</b>    | <b>+PROFILE=Param</b>                                                                                                                                                                 |
| Param              | Current profile selection                                                                                                                                                             |
| <b>Description</b> | <p>If modify profile, the module will reboot</p> <p>BT6038A only support SPP, HFP-AG, A2DP Source, AVRCP Target, LEA, GATT Server</p> <p>LEA, GATT Server cannot be uesd together</p> |



### 5.1.11 AT+AUTOCONN - Get/Set poweron auto reconnect

| Command     | AT+AUTOCONN{=Param}                          |
|-------------|----------------------------------------------|
| Param       | 0: Disable<br>1 ~ 15: Reconnect times        |
| Response    | +AUTOCONN=Param                              |
| Param       | Current auto reconnect configuration         |
| Description | In Le Audio, the setting will be invalidated |

### 5.1.12 AT+STAT - Get all state

| Command  | AT+STAT                                                |
|----------|--------------------------------------------------------|
| Response | +STAT=Param1,Param2,Param3,Param4,Param5,Param6,Param7 |
| Param1   | <i>+DEVSTAT - Device state</i>                         |
| Param2   | <i>+SPPSTAT - SPP state</i>                            |
| Param3   | <i>+GATTSTAT - GATT state</i>                          |
| Param4   | <i>+HFPSTAT - HFP state</i>                            |
| Param5   | <i>+A2DPSTAT - A2DP state</i>                          |
| Param6   | <i>+AVRCPSTAT - AVRCP state</i>                        |
| Param7   | <i>+LEASTAT - LE Audio state</i>                       |

### 5.1.13 AT+DEVSTAT - Get device state

| Command  | AT+DEVSTAT                     |
|----------|--------------------------------|
| Response | +DEVSTAT=Param                 |
| Param    | <i>+DEVSTAT - Device state</i> |

### 5.1.14 AT+ADDR - Get BR/EDR MAC address

|                 |                                              |
|-----------------|----------------------------------------------|
| <b>Command</b>  | <b>AT+ADDR</b>                               |
| <b>Response</b> | <b>+ADDR=Param</b>                           |
| Param           | Module' s BR/EDR MAC address(12 bytes ASCII) |

### 5.1.15 AT+LEADDR - Get BLE MAC address

|                 |                                          |
|-----------------|------------------------------------------|
| <b>Command</b>  | <b>AT+LEADDR</b>                         |
| <b>Response</b> | <b>+LEADDR=Param</b>                     |
| Param           | Module' s LE MAC address(12 bytes ASCII) |

### 5.1.16 AT+NAME - Get/Set BR/EDR name

|                    |                                                                                        |
|--------------------|----------------------------------------------------------------------------------------|
| <b>Command</b>     | <b>AT+NAME{=Param1{,Param2}}</b>                                                       |
| Param1             | BR/EDR name                                                                            |
| Param2             | 0: Disable suffix<br>1: Enable suffix “XXXX” (lower 4 bytes of MAC address) after name |
| <b>Response</b>    | <b>+NAME=Param</b>                                                                     |
| Param              | BR/EDR name                                                                            |
| <b>Description</b> | The name contains a maximum of 31 bytes                                                |

### 5.1.17 AT+LENAM - Get/Set BLE name

| Command     | AT+LENAM{=Param1{,Param2}}                                                             |
|-------------|----------------------------------------------------------------------------------------|
| Param1      | BLE name                                                                               |
| Param2      | 0: Disable suffix<br>1: Enable suffix "XXXX" (lower 4 bytes of MAC address) after name |
| Response    | +LENAM=Param                                                                           |
| Param       | BLE name                                                                               |
| Description | The name contains a maximum of 31 bytes                                                |

### 5.1.18 AT+ADVDATA - Get/Set BLE advertising data

| Command     | AT+ADVDATA{=Param}                                                                                                 |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Param       | advertising data                                                                                                   |
| Response    | +ADVDATA=Param                                                                                                     |
| Param       | advertising data                                                                                                   |
| Description | This parameter must be a hexadecimal string<br>Must be an even length and a maximum of 62 bytes hexadecimal string |

### 5.1.19 AT+COD - Get/Set class of device

| Command     | AT+COD=Param                                  |
|-------------|-----------------------------------------------|
| Param       | Class of device(6 bytes ASCII)                |
| Response    | +COD=Param                                    |
| Param       | Current class of device                       |
| Description | Class of device reference <a href="#">COD</a> |

### 5.1.20 AT+PAIR - Get/Set BR/EDR visibility

| Command  | AT+PAIR=Param                                                         |
|----------|-----------------------------------------------------------------------|
| Param    | 0: Exit BR/EDR discoverable mode<br>1: Enter BR/EDR discoverable mode |
| Response | +PAIR=Param                                                           |
| Param    | Current BR/EDR visibility                                             |

### 5.1.21 AT+SCAN - Scan nearby devices

| Command     | AT+SCAN=Param1{,Param2}{,Param3}                                                                      |
|-------------|-------------------------------------------------------------------------------------------------------|
| Param1      | 0: Stop scan<br>1: Scan nearby BR/EDR devices<br>2: Scan nearby BLE devices                           |
| Param2      | Scan time less than 255 (Unit: s)                                                                     |
| Param3      | 0: BLE report like BR/EDR<br>1: BLE report advertising data<br>2: Only report support le audio device |
| Description | +SCAN - Scan result                                                                                   |

### 5.1.22 AT+PLIST - Get/Delete paired list

| Command            | AT+PLIST{=Param}                                                                                                                                   |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Param              | 0: Clear all paired record<br>1 ~ 8: Clear specific paired record with index<br>MAC(12 bytes ASCII): Clear specific paired record with MAC address |
| <b>Response1</b>   | <b>+PLIST=Param1, Param2{,Param3}</b>                                                                                                              |
| Param1             | Paired device' s index                                                                                                                             |
| Param2             | Paired device' s MAC address                                                                                                                       |
| Param3             | Paired device' s name(UTF8)                                                                                                                        |
| <b>Response2</b>   | <b>+PLIST=E</b>                                                                                                                                    |
| <b>Description</b> | If parameter not exist then list all paired devices                                                                                                |

### 5.1.23 AT+DSCA - Release all connections

| Command            | AT+DSCA                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------|
| <b>Description</b> | This command only initiates a disconnect request<br>The actual status depends on the query |

### 5.1.24 AT+TPMODE - Get/Set throughput mode

| Command     | AT+TPMODE{=Param}                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Param       | 0: Disable<br>1: Enable                                                                                                                               |
| Response    | +TPMODE=Param                                                                                                                                         |
| Param       | Current throughput mode                                                                                                                               |
| Description | When SPP/GATT profile connected and throughput mode is on<br>The command will be de-active, every byte received via physical UART will be sent to air |

### 5.1.25 AT+AUXCFG - Get/Set audio input mode

| Command     | AT+AUXCFG{=Param}                                                            |
|-------------|------------------------------------------------------------------------------|
| Param       | 0: USB<br>1: Analog<br>2: SPDIF<br>3: I2S                                    |
| Response    | +AUXCFG=Param                                                                |
| Param       | Current audio input mode                                                     |
| Description | It takes effect after the restart<br>In le audio only support usb and analog |

### 5.1.26 AT+LINKKEY - Get remote device link key

|                 |                                              |
|-----------------|----------------------------------------------|
| <b>Command</b>  | <b>AT+LINKKEY=Param</b>                      |
| Param           | MAC address of target device(12 bytes ASCII) |
| <b>Response</b> | <b>+LINKKEY=Param1,Param2</b>                |
| Param1          | MAC address of target device(12 bytes ASCII) |
| Param2          | Target device' s link key(32 bytes ASCII)    |

### 5.1.27 AT+RSSI - Get remote device rssi

|                    |                                              |
|--------------------|----------------------------------------------|
| <b>Command</b>     | <b>AT+RSSI=Param</b>                         |
| Param              | MAC address of target device(12 bytes ASCII) |
| <b>Response</b>    | <b>+RSSI=Param1,Param2</b>                   |
| Param1             | MAC address of target device(12 bytes ASCII) |
| Param2             | Target device' s RSSI                        |
| <b>Description</b> | If 0 is returned, the acquisition failed     |

### 5.1.28 AT+LINKCFG - Get/Set auto scan and connect

|                |                                                                               |
|----------------|-------------------------------------------------------------------------------|
| <b>Command</b> | <b>AT+LINKCFG{=Param1{,Param2}}</b>                                           |
| Param1         | 0: Disable<br>1: Enable                                                       |
| Param2         | 0: Scan all devices<br>1: Only scan major service class is rendering or audio |

### 5.1.29 AT+AUDMODE - Get/Set audio mode

| Command     | AT+AUDMODE{=Param1}                                                      |
|-------------|--------------------------------------------------------------------------|
| Param1      | 0: BR/EDR mode<br>1: LE audio broadcast mode<br>2: LE audio unicast mode |
| Description | Change this setting module will reboot                                   |

### 5.1.30 AT+PRINT - Get/Set report mode

| Command     | AT+PRINT{=Param1}                       |
|-------------|-----------------------------------------|
| Param1      | 0: Disable<br>1: Enable                 |
| Description | On/Off module actively report a message |

## 5.2 HFP commands

### 5.2.1 AT+HFPSTAT - Get HFP state

|          |                             |
|----------|-----------------------------|
| Command  | AT+HFPSTAT                  |
| Response | +HFPSTAT=Param              |
| Param    | <i>+HFPSTAT - HFP state</i> |

### 5.2.2 AT+HFPCONN - Establish HFP connection

| Command     | AT+HFPCONN{=Param}                                  |
|-------------|-----------------------------------------------------|
| Param       | MAC address of target device(12 bytes ASCII)        |
| Description | Reconnect to last HFP device if parameter not exist |



### 5.2.3 AT+HFPDISC - Release HFP connection

| Command     | AT+HFPDISC                                                                                 |
|-------------|--------------------------------------------------------------------------------------------|
| Description | This command only initiates a disconnect request<br>The actual status depends on the query |

### 5.2.4 AT+HFPRING - Simulate incoming call

| Command     | AT+HFPRING{=Param}                                                                                           |
|-------------|--------------------------------------------------------------------------------------------------------------|
| Param       | Phone number(ASCII)                                                                                          |
| Description | The phone number contains a maximum of 15 bytes<br>Dial specific number if parameter exist, otherwise redial |

### 5.2.5 AT+HFPANSW - Pick up incoming call

| Command | AT+HFPANSW |
|---------|------------|
|---------|------------|

### 5.2.6 AT+HFPCHUP - Reject/Hung up call

| Command | AT+HFPCHUP |
|---------|------------|
|---------|------------|

### 5.2.7 AT+HFPAUDIO - Establish/Release voice audio

| Command | AT+HFPAUDIO=Param                                                                                                                |
|---------|----------------------------------------------------------------------------------------------------------------------------------|
| Param   | 0: Release voice audio connection with remote hfp sink device<br>1: Establish voice audio connection with remote hfp sink device |

### 5.2.8 AT+HFPWBS - Get/Set hfp codec negotiation

| Command         | AT+HFPWBS{=Param}                                                   |
|-----------------|---------------------------------------------------------------------|
| Param           | 0: Disable hfp codec negotiation<br>1: Enable hfp codec negotiation |
| <b>Response</b> | <b>+HFPWBS=Param</b>                                                |
| <b>Param</b>    | Current state                                                       |

### 5.2.9 AT+HFPNREC - Get/Set hfp cvc

| Command         | AT+HFPNREC{=Param}                      |
|-----------------|-----------------------------------------|
| Param           | 0: Disable hfp cvc<br>1: Enable hfp cvc |
| <b>Response</b> | <b>+HFPNREC=Param</b>                   |
| <b>Param</b>    | Current state                           |

## 5.3 A2DP/AVRCP commands

### 5.3.1 AT+A2DPSTAT - Get A2DP state

|                 |                               |
|-----------------|-------------------------------|
| <b>Command</b>  | AT+A2DPSTAT                   |
| <b>Response</b> | +A2DPSTAT=Param               |
| <b>Param</b>    | <i>+A2DPSTAT - A2DP state</i> |

### 5.3.2 AT+A2DPCONN - Establish A2DP connection

|                    |                                                      |
|--------------------|------------------------------------------------------|
| <b>Command</b>     | AT+A2DPCONN{=Param}                                  |
| Param              | MAC address of target device(12 bytes ASCII)         |
| <b>Description</b> | Reconnect to last A2DP device if parameter not exist |

### 5.3.3 AT+A2DPDISC - Release A2DP connection

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| <b>Command</b>     | AT+A2DPDISC                                                                                |
| <b>Description</b> | This command only initiates a disconnect request<br>The actual status depends on the query |

### 5.3.4 AT+A2DPCFG - Get/Set A2DP configuration

| Command            | AT+A2DPCFG{=Param}                                    |
|--------------------|-------------------------------------------------------|
| Param              | A base-10 representation of a bit field, for each bit |
| BIT[0]             | 0: Disable AAC<br>1: Enable AAC                       |
| BIT[1]             | 0: Disable APTX<br>1: Enable APTX                     |
| BIT[2]             | 0: Disable APTX-LL<br>1: Enable APTX-LL               |
| BIT[3]             | 0: Disable APTX-HD<br>1: Enable APTX-HD               |
| BIT[4]             | 0: Disable APTX-AD<br>1: Enable APTX-AD               |
| BIT[5]             | 0: Disable LDAC<br>1: Enable LDAC                     |
| <b>Response</b>    | Current A2DP configuration                            |
| <b>Description</b> | BT6038A only support APTX, APTX-AD, APTX-HD           |

### 5.3.5 AT+A2DPENC - Get A2DP encoder

|                 |                                |
|-----------------|--------------------------------|
| <b>Command</b>  | <b>AT+A2DPENC</b>              |
| <b>Response</b> | <b>+A2DPENC=Param</b>          |
| Param           | <i>+A2DPENC - A2DP encoder</i> |

### 5.3.6 AT+A2DPAUDIO - Establish/Release A2DP audio connection

|                |                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b> | <b>AT+A2DPAUDIO=Param</b>                                                                                                        |
| Param          | 0: Release A2DP audio connection with remote a2dp sink device<br>1: Establish A2DP audio connection with remote a2dp sink device |

### 5.3.7 AT+AVRCPSTAT - Get AVRCP state

|                 |                                 |
|-----------------|---------------------------------|
| <b>Command</b>  | <b>AT+AVRCPSTAT</b>             |
| <b>Response</b> | <b>+AVRCPSTAT=Param</b>         |
| Param           | <i>+AVRCPSTAT - AVRCP state</i> |

### 5.3.8 AT+AVRCPCONN - Establish AVRCP connection

|                    |                                                 |
|--------------------|-------------------------------------------------|
| <b>Command</b>     | <b>AT+AVRCPCONN{=Param}</b>                     |
| Param              | MAC address of target device(12 bytes ASCII)    |
| <b>Description</b> | Reconnect to last device if parameter not exist |

### 5.3.9 AT+AVRCPDISC - Release AVRCP connection

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| <b>Command</b>     | AT+AVRCPDISC                                                                               |
| <b>Description</b> | This command only initiates a disconnect request<br>The actual status depends on the query |

### 5.3.10 AT+AVRCPSPKVOL - Get/Set remote volume

|                    |                                                                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b>     | AT+AVRCPSPKVOL{=Param}                                                                                                                           |
| Param              | Volume value(0 - 15)                                                                                                                             |
| <b>Description</b> | Set remote volume<br><br>The command must be sent after AVRCP connection is established<br><br>And the remote device must support volume control |

## 5.4 GATT commands

### 5.4.1 AT+GATTSTAT - Get GATT state

|                 |                               |
|-----------------|-------------------------------|
| <b>Command</b>  | AT+GATTSTAT                   |
| <b>Response</b> | +GATTSTAT=Param               |
| Param           | <i>+GATTSTAT - GATT state</i> |

## 5.4.2 AT+GATTSEND - Send data via GATT

| Command     | AT+GATTSEND=Param1,Param2                           |
|-------------|-----------------------------------------------------|
| Param1      | Payload length(1 ~ 236)                             |
| Param2      | Payload(1~236 bytes)                                |
| Description | If throughput mode is on, this command is de-active |

## 5.5 SPP commands

### 5.5.1 AT+SPPSTAT - Get SPP state

| Command  | AT+SPPSTAT                  |
|----------|-----------------------------|
| Response | +SPPSTAT=Param              |
| Param    | <i>+SPPSTAT - SPP state</i> |

### 5.5.2 AT+SPPDISC - Release SPP connection

| Command     | AT+SPPDISC                                                                                 |
|-------------|--------------------------------------------------------------------------------------------|
| Description | This command only initiates a disconnect request<br>The actual status depends on the query |

### 5.5.3 AT+SPPSEND - Send data via SPP

| Command     | AT+SPPSEND=Param1,Param2                            |
|-------------|-----------------------------------------------------|
| Param1      | Payload length(1 ~ 236)                             |
| Param2      | Payload(1~236 bytes)                                |
| Description | If throughput mode is on, this command is de-active |

## 5.6 LE Audio commands

### 5.6.1 AT+LEASTAT - Get Le Audio state

|                 |                                  |
|-----------------|----------------------------------|
| <b>Command</b>  | <b>AT+LEASTAT</b>                |
| <b>Response</b> | +LEASTAT=Param                   |
| Param           | <i>+LEASTAT - LE Audio state</i> |

### 5.6.2 AT+LEADISC - Release Le Audio connection

|                    |                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b>     | <b>AT+LEADISC</b>                                                                                                                                  |
| <b>Description</b> | <p>This command only initiates a disconnect request</p> <p>The actual status depends on the query</p> <p>Only In le audio unicast mode support</p> |

### 5.6.3 AT+LEACONN - Establish le audio connection

|                    |                                              |
|--------------------|----------------------------------------------|
| <b>Command</b>     | <b>AT+LEACONN=Param1</b>                     |
| Param1             | MAC address of target device(12 bytes ASCII) |
| <b>Description</b> | Only In le audio unicast mode support        |



## Chapter 6

### Events table

#### 6.1 General events

##### 6.1.1 +VER - Frmware version information

| Event  | +VER=Param1,Param2,Param3 |
|--------|---------------------------|
| Param1 | Module type               |
| Param2 | Firmware version          |
| Param3 | Firmware compile time     |

### 6.1.2 +DEVSTAT - Device state

| Event  | +DEVSTAT=Param                                         |
|--------|--------------------------------------------------------|
| Param  | A base-10 representation of a bit field, for each bit: |
| BIT[0] | 0: Power off<br>1: Power on                            |
| BIT[1] | 0: BR/EDR not discoverable<br>1: BR/EDR discoverable   |
| BIT[2] | 0: BLE not advertising<br>1: BLE advertising           |
| BIT[3] | 0: BR/EDR not scanning<br>1: BR/EDR scanning           |
| BIT[4] | 0: BLE not scanning<br>1: BLE scanning                 |

### 6.1.3 +SCAN - Scan result

| Event1      | +SCAN =Param1,Param2,Param3,Param4,Param5{,Param6{,Param7}}       |
|-------------|-------------------------------------------------------------------|
| Param1      | Index                                                             |
| Param2      | 0: LE public address<br>1: LE random address<br>2: BR/EDR address |
| Param3      | MAC address(12 bytes ASCII)                                       |
| Param4      | RSSI(-127 ~ -1)                                                   |
| Param5      | Size of Param6 if exist                                           |
| Param6      | Device name for BR/EDR devices or advertising data for LE devices |
| Param7      | Class of device                                                   |
| Event2      | +SCAN=E                                                           |
| Description | Scan finish                                                       |

### 6.1.4 +PAIRED - Pair result

| Event | +PAIRED=Param                                         |
|-------|-------------------------------------------------------|
| Param | MAC address(12 bytes ASCII) of current pairing device |

### 6.1.5 +I2SSR - I2S sample rate

| Event | +I2SSR=Param    |
|-------|-----------------|
| Param | I2S sample rate |

## 6.2 HFP events

### 6.2.1 +HFPSTAT - HFP state

| Event  | +HFPSTAT=Param                                                                                                          |
|--------|-------------------------------------------------------------------------------------------------------------------------|
| Param1 | 0: Unsupported<br>1: Standby<br>2: Connecting<br>3: Connected<br>4: Outgoing call<br>5: Incoming call<br>6: Active call |

### 6.2.2 +HFPDEV - HFP remote device information

| Event  | +HFPDEV=Param1{,Param2}                                      |
|--------|--------------------------------------------------------------|
| Param1 | Remote MAC address(12 bytes ASCII) of current HFP connection |
| Param2 | Remote device name(UTF8) of current HFP connection           |

### 6.2.3 +HFPCONN - HFP connecting

| Event | +HFPCONN=Param                                               |
|-------|--------------------------------------------------------------|
| Param | Remote MAC address(12 bytes ASCII) of current HFP connecting |

### 6.2.4 +HFPAUDIO - HFP voice audio State

| Event | +HFPAUDIO=Param                                                                                                                                      |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Param | 0: HFP voice audio disconnected, audio input/output routed to remote device<br><br>1: HFP voice audio connected, audio input/output routed to module |

### 6.2.5 +HFPCID - HFP call phone number

| Event | +HFPCID=Param       |
|-------|---------------------|
| Param | Phone number(ASCII) |

### 6.2.6 +HFPSR - HFP sample rate

| Event | +HFPSR=Param |
|-------|--------------|
| Param | Sample rate  |

### 6.2.7 +HFPHUNG - HFP remote device reject an incoming call or end an ongoing call

| Event | +HFPHUNG |
|-------|----------|
|-------|----------|

### 6.2.8 +HFPVGS - HFP remote device spker gian

| Event | +HFPVGS=Param            |
|-------|--------------------------|
| Param | Remote device spker gain |

### 6.2.9 +HFPVGM - HFP remote device microphone gain

| Event | +HFPVGM=Param                 |
|-------|-------------------------------|
| Param | Remote device microphone gain |

## 6.3 A2DP/AVRCP events

### 6.3.1 +A2DPSTAT - A2DP state

| Event | +A2DPSTAT=Param                                                                            |
|-------|--------------------------------------------------------------------------------------------|
| Param | 0: Unsupported<br>1: Standby<br>2: Connecting<br>3: Connected<br>4: Streaming<br>5: Paused |

### 6.3.2 +A2DPENC - A2DP encoder

| Event | +A2DPENC=Param                            |
|-------|-------------------------------------------|
| Param | 1:SBC<br>2:APTX<br>3:APTX-HD<br>4:APTX-AD |

### 6.3.3 +A2DPDEV - A2DP remote device information

| Event  | +A2DPDEV=Param1{,Param2}                                               |
|--------|------------------------------------------------------------------------|
| Param1 | Remote device's MAC address(12 bytes ASCII) of current A2DP connection |
| Param2 | Remote device's name(UTF8) of current A2DP connection                  |

### 6.3.4 +A2DPCONN - A2DP connecting

| Event | +A2DPCONN=Param                                               |
|-------|---------------------------------------------------------------|
| Param | Remote MAC address(12 bytes ASCII) of current A2DP connecting |

### 6.3.5 +A2DPSR - A2DP codec sample rate

| Event | +A2DPSR=Param          |
|-------|------------------------|
| Param | A2DP codec sample rate |

### 6.3.6 +AVRCPSTAT - AVRCP state

| Event | +AVRCPSTAT=Param                                              |
|-------|---------------------------------------------------------------|
| Param | 0: Unsupported<br>1: Standby<br>2: Connecting<br>3: Connected |

### 6.3.7 +AVRCPCONN - AVRCP connecting

| Event | +AVRCPCONN=Param                                               |
|-------|----------------------------------------------------------------|
| Param | Remote MAC address(12 bytes ASCII) of current AVRCP connecting |

### 6.3.8 +SPKVOL - Remote spker volume change

| Event | +SPKVOL=Param       |
|-------|---------------------|
| Param | Remote spker volume |

### 6.3.9 +CTVOLUP - volume up

| Event       | +CTVOLUP                  |
|-------------|---------------------------|
| Description | Receive volume up command |

### 6.3.10 +CTVOLDN - volume down

| Event       | +CTVOLDN                    |
|-------------|-----------------------------|
| Description | Receive volume down command |

### 6.3.11 +CTPLAY - Track play

| Event       | +CTPLAY              |
|-------------|----------------------|
| Description | Receive play command |

### 6.3.12 +CTPAUSE - Track pause

| Event       | +CTPAUSE              |
|-------------|-----------------------|
| Description | Receive pause command |



### 6.3.13 +CTSTOP - Track stop

|                    |                      |
|--------------------|----------------------|
| <b>Event</b>       | <b>+CTSTOP</b>       |
| <b>Description</b> | Receive stop command |

### 6.3.14 +CTFWD - Track forward

|                    |                         |
|--------------------|-------------------------|
| <b>Event</b>       | <b>+CTFWD</b>           |
| <b>Description</b> | Receive forward command |

### 6.3.15 +CTBACK - Track backward

|                    |                          |
|--------------------|--------------------------|
| <b>Event</b>       | <b>+CTBACK</b>           |
| <b>Description</b> | Receive backward command |

## 6.4 LE Audio events

### 6.4.1 +LEASTAT - LE Audio state

|               |                                                                                           |
|---------------|-------------------------------------------------------------------------------------------|
| <b>Format</b> | <b>+LEASTAT=Param</b>                                                                     |
| Param         | 0: Unsupported<br>1: Standby<br>2: Connecting<br>3: Connected<br>4: Streaming<br>5: Pause |

## 6.4.2 +LEASR - LE Audio sample rate

| Format | +LEASR=Param |
|--------|--------------|
| Param  | Sample rate  |

## 6.5 GATT events

### 6.5.1 +GATTSTAT - GATT state

| Format | +GATTSTAT=Param                                               |
|--------|---------------------------------------------------------------|
| Param  | 0: Unsupported<br>1: Standby<br>2: Connecting<br>3: Connected |

### 6.5.2 +GATTDATA - GATT received incoming data

| Format | +GATTDATA=Param1,Param2 |
|--------|-------------------------|
| Param1 | Payload length          |
| Param2 | Payload                 |

## 6.6 SPP events

### 6.6.1 +SPPSTAT - SPP state

| Format | +SPPSTAT=Param                                                |
|--------|---------------------------------------------------------------|
| Param  | 0: Unsupported<br>1: Standby<br>2: Connecting<br>3: Connected |

### 6.6.2 +SPPDATA - SPP received incoming data

| Format | +SPPDATA=Param1,Param2 |
|--------|------------------------|
| Param1 | Payload length         |
| Param2 | Payload                |

### 6.6.3 +SPPDEV - SPP remote device information

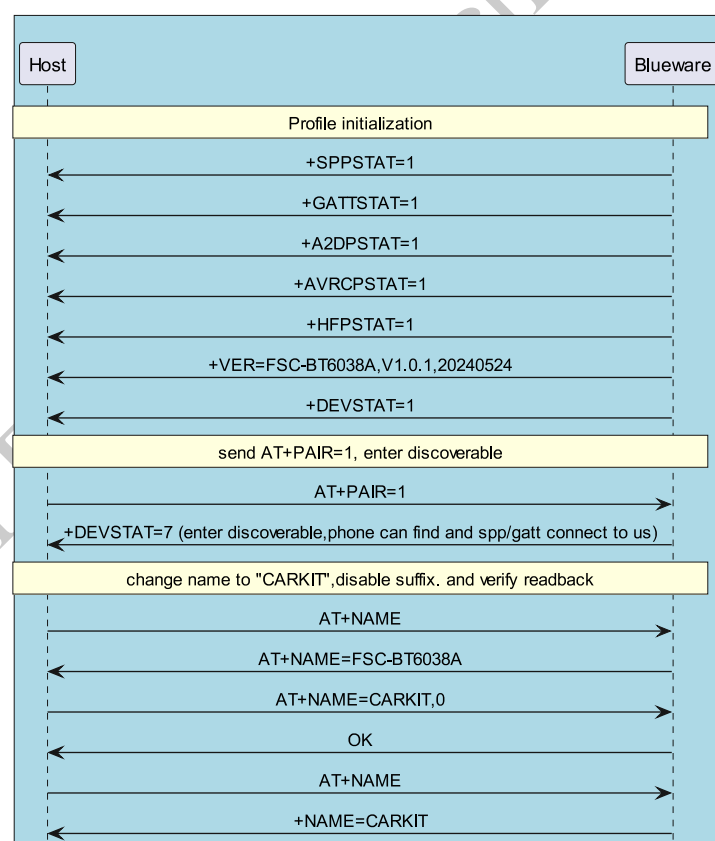
| Event  | +SPPDEV=Param1                                                         |
|--------|------------------------------------------------------------------------|
| Param1 | Remote device' s MAC address(12 bytes ASCII) of current SPP connection |

## Chapter 7

### Application scenarios

#### 7.1 profiles initializing and change parameter

The following figure shows Profile initialization and name modification



MCU change device name CARKIT reference code:

```

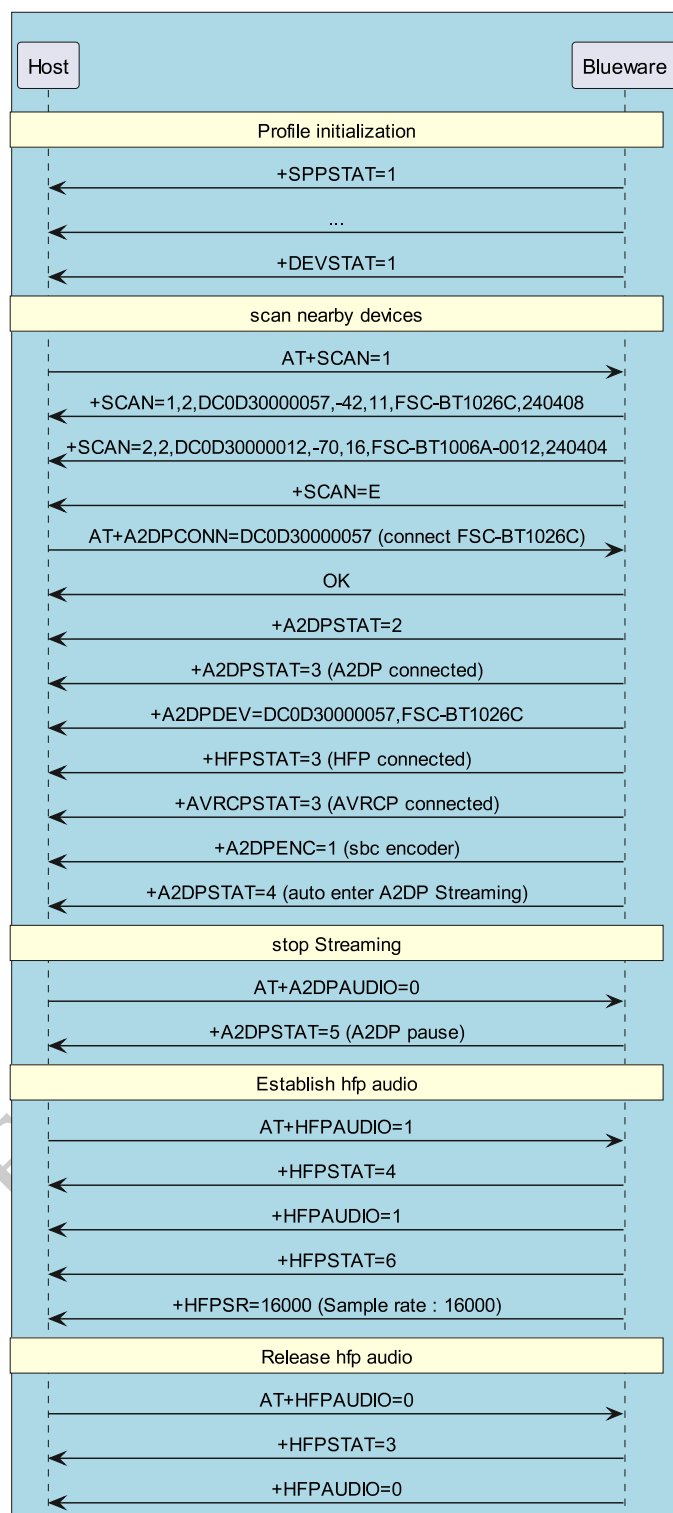
1 void change_name(void)
2 {
3     uart_send("AT+NAME\r\n");
4     if(uart_read("+NAME", name_buf))
5     {
6         if(memcmp(name_buf, "CARKIT", 6))
7         {
8             uart_send("AT+NAME=CARKIT,0\r\n");           //defalut_
9             disable MAC address suffix
10            uart_send("AT+NAME\r\n"); // read bt name
11            if(uart_read("+NAME", name_buf))
12            {
13                if(memcmp(name_buf, "CARKIT", 6))
14                {
15                    //change name fail
16                }
17                else
18                {
19                    //change name success
20                }
21            }
22        }
23    }

```

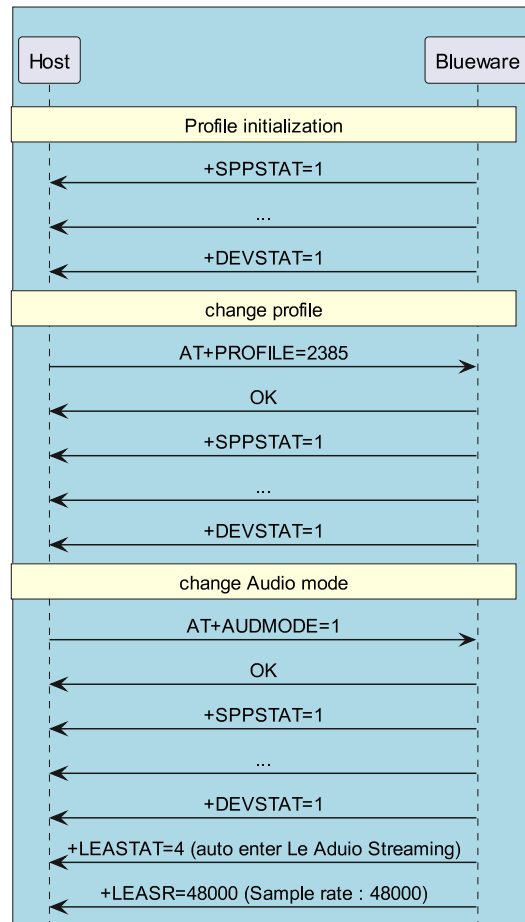
#### Note

modify any parameters, it is recommended to query first and then modify the final verification

## 7.2 Source mode connection



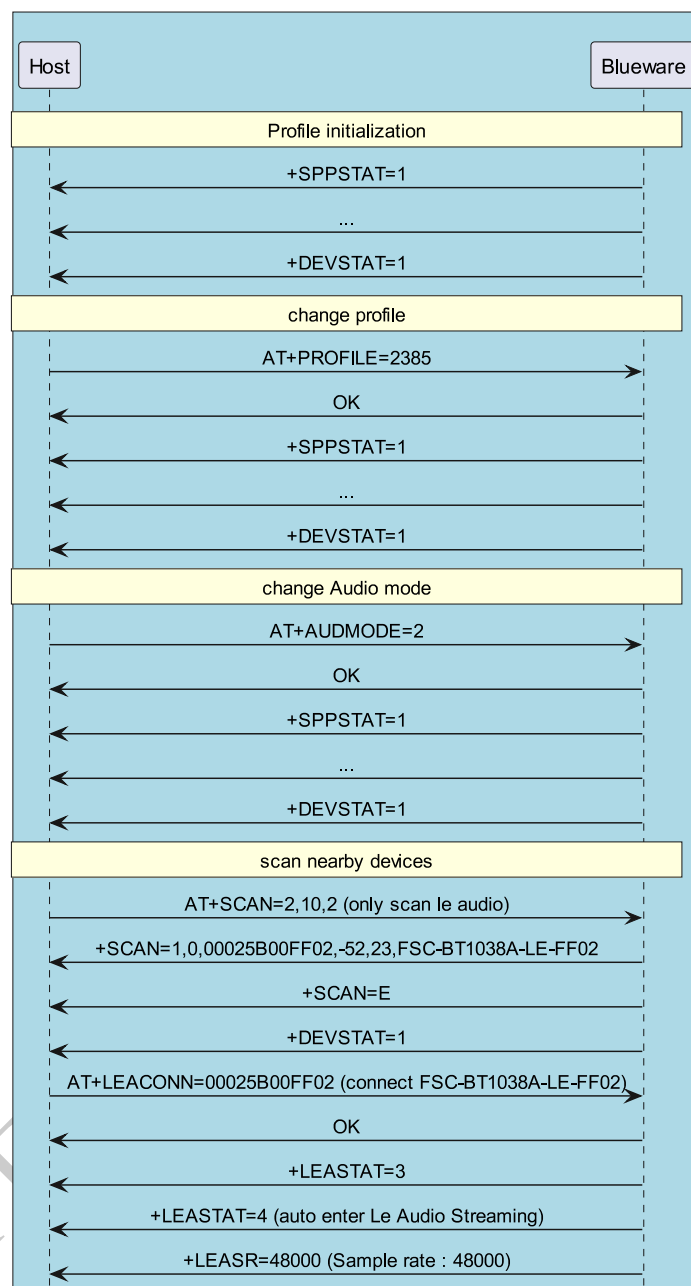
### 7.3 Le Audio broadcast mode



#### **Note**

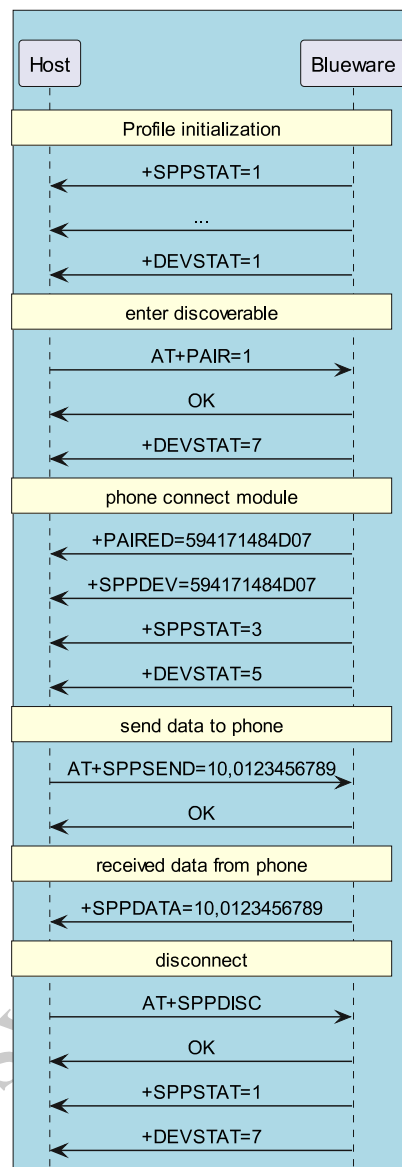
Now scan broadcast data using other sink devices that support le audio

## 7.4 Le Audio unicast mode





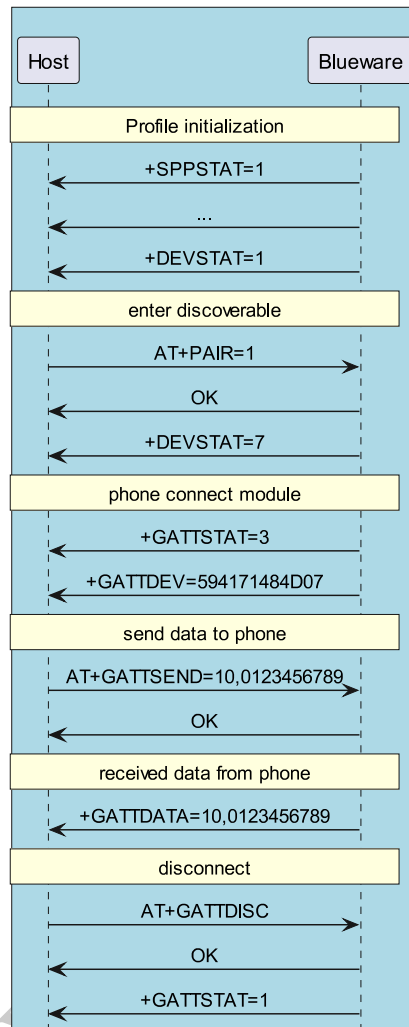
## 7.5 SPP data transfer



### **Note**

SPP connect is not supported iphone

## 7.6 GATT data transfer



## Chapter 8

## Appendix

### 8.1 Download PDF Document

Download PDF Document