

# **Application Note of IS1678S Bluetooth Controller**

ISSC Technologies Corp.

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## 1. Introduction

This document gives the concepts when considering the application of IS1678S Bluetooth controller on SPP solution. IS1678S is a Bluetooth® controller complies with Bluetooth Core Specification v4.0, which supports BT3.0 BR/EDR and BT4.0 BLE dual mode. IS1678S is designed to connect with MCU through UART interface and several GPIOs. When communicating with the mobile device, IS1678S can auto-detect the standard SPP and MFi protocol and is able to switch between these different types of devices.

The first part of this document illustrates the overview on, and includes the block diagram, pin description, and definition of Bluetooth behavior modes. In Chapter.2, we focus on the UART interface since it is the main communication interface with MCU. In Chapter.3, we illustrate the control method of GPIOs, explain some function parameter related to E2PROM, and give some notes when utilizing BLE application. In the last chapter, we talk about some advanced topics you may be interested in.

### 1.1. Block Diagram

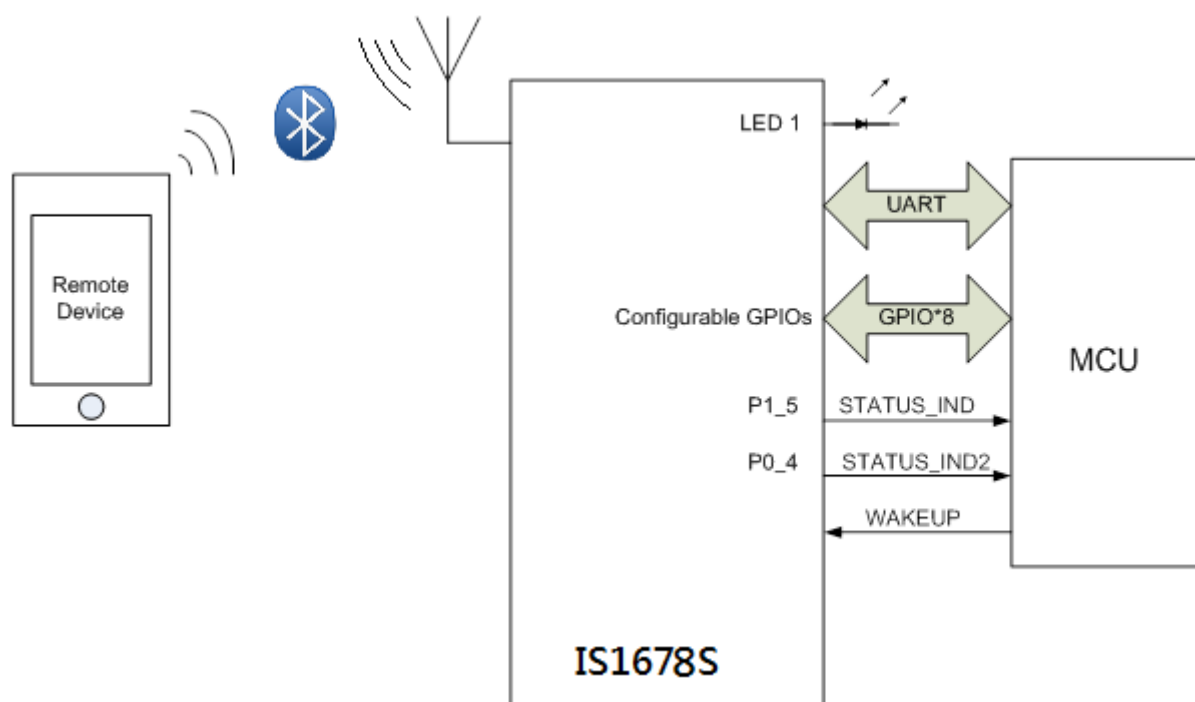


Fig1. IS1678S Block Diagram

## 1.2. State Machine Configuration

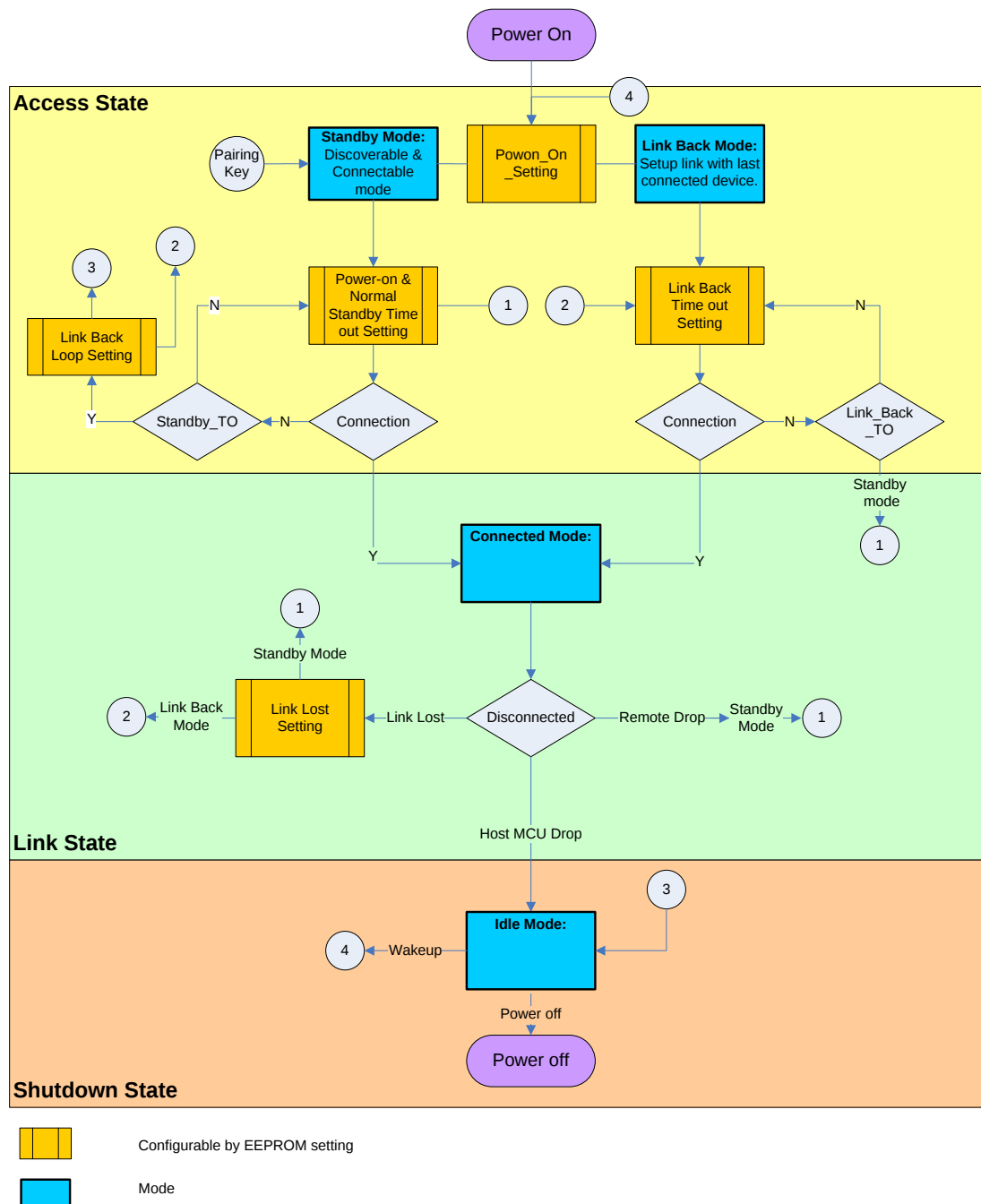


Fig2. IS1678S State Machine Diagram

### 1.3. State Definition

- **Access State:** is trying to setup Bluetooth Connection.
- **Link State:** is ready to exchange Host MCU UART traffic.
  - ◆ SPP: SPP link is established. (For Android 3.0)
  - ◆ BLE: BLE link is established and CCCD (Client Characteristic Configuration descriptor) of ISSC\_SPP\_TX characteristic is enabled. (For iOS/Android BLE)
- **Shut down State:** is shut down after Idle Mode.

### 1.4. BT Mode Definition

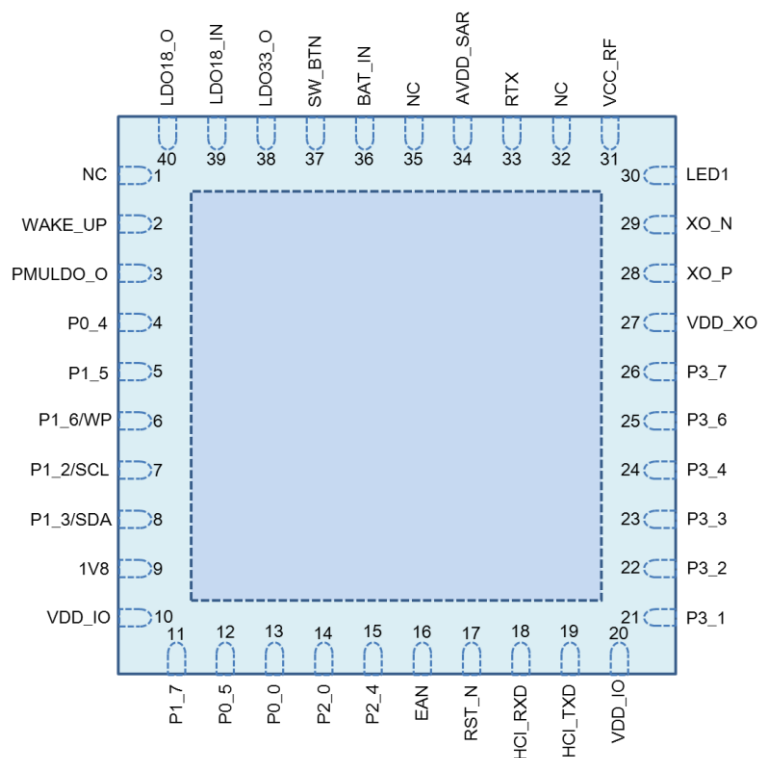
- **Idle Mode:** No any Bluetooth behavior.
- **Standby Mode:** is under Bluetooth discoverable and connectable mode. It can also be paired by another device in this mode.
  - ◆ Classic Bluetooth (BR/EDR): Enable the Inquiry Scan and Page Scan in this Mode.
  - ◆ Bluetooth Low Energy: Enable the Undirected Advertising in this Mode.
- **Link Back Mode:** tries to connect the last Bluetooth connection. can still be discoverable and connectable mode as an optional configuration.
  - ◆ Classic Bluetooth (BR/EDR): Enable Page Procedure to establish Bluetooth Link.
  - ◆ Bluetooth Low Energy: Enable Directed Advertising to allow the recorded host to setup Bluetooth Link.
- **Connected Mode:** Bluetooth connection is established successfully
  - ◆ Classic Bluetooth (BR/EDR): will use SPP protocol to exchange the application data.
  - ◆ Bluetooth Low Energy: will use GATT protocol to exchange the application data.

### 1.5. Supported Bluetooth Profiles

- Alternative Bluetooth v3.0+EDR and Bluetooth v4.0 Low Energy supported
- Embedded Bluetooth stack profiles included
  - ◆ BTv3.0: GAP, SPP, SDP, RFCOMM and L2CAP.
  - ◆ BTv4.0: GAP, GATT, ATT, SMP and L2CAP.
- Support iOS Core Bluetooth connection.
- Configurable GAP (General Access Profile) to meet different link establish scenario.
- Support peer to peer connection.

## 1.6. Pin Assignment

TABLE 2-1: IS1678S PIN DESCRIPTION



| pin | Symbol   | Type  | Description                                                                                                                                                                                                                |
|-----|----------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | NC       | NC    | NC                                                                                                                                                                                                                         |
| 2   | WAKEUP   | DI    | Wakeup from shutdown mode (active low)<br>(internal pull-up)                                                                                                                                                               |
| 3   | PMULDO_O | Power | Power management unit output.<br>Connect to 1uF (X5R/X7R) capacitor.                                                                                                                                                       |
| 4   | P0_4     | DO    | UART_TX_IND:<br>H: IS1678 indicate UART data will be transmitted out after certain timing.<br>(Setting by UI@ "MCU setting", default wait 5ms)<br>L: Otherwise.<br>STATUS_IND_2:<br>IS1678 State indication , refer to P15 |
| 5   | P1_5     | DO    | STATUS_IND_1:<br>Bluetooth link status indication                                                                                                                                                                          |
| 6   | P1_6/WP  | DO    | EEPROM WP (Do Not Connect)                                                                                                                                                                                                 |
| 7   | P1_2/SCL | DO    | I <sup>2</sup> C SCL to EEPROM                                                                                                                                                                                             |
| 8   | P1_3/SDA | DIO   | I <sup>2</sup> C SDA to EEPROM                                                                                                                                                                                             |
| 9   | 1V8      | Power | 1v8 input for digital Code power.<br>Connect to 1uF (X5R/X7R) capacitor.                                                                                                                                                   |
| 10  | VDD_IO   | Power | I/O positive supply input. Ensure VDD_IO and MCU I/O voltages are                                                                                                                                                          |

|    |          |       |                                                                                                                        |
|----|----------|-------|------------------------------------------------------------------------------------------------------------------------|
|    |          |       | compatible.<br>Connect to 1uF (X5R/X7R) capacitor.                                                                     |
| 11 | P1_7     | DIO   | Configurable Control or Indication pin or UART CTS (input)                                                             |
| 12 | P0_5     | DIO   | Configurable Control or Indication pin                                                                                 |
| 13 | P0_0     | DIO   | Configurable Control or Indication pin or UART RTS (output)                                                            |
| 14 | P2_0     | DI    | System configuration (internal pull-up)                                                                                |
| 15 | P2_4     | DI    | System configuration (internal pull-up)                                                                                |
| 16 | EAN      | DI    | System configuration (internal pull-up)<br>ROM :no connect<br>Flash :must connect 4.7K ohm to GND                      |
| 17 | RST_N    | DI    | Module reset (active low) (internal pull-up)<br>Apply a pulse of at least 63ns.<br>Connect to 1uF (X5R/X7R) capacitor. |
| 18 | HCI_RXD  | DI    | UART data input                                                                                                        |
| 19 | HCI_TXD  | DO    | UART data output                                                                                                       |
| 20 | VDD_IO   | Power | I/O positive supply input. Ensure VDD_IO and MCU I/O voltages are compatible.<br>Connect to 1uF (X5R/X7R) capacitor.   |
| 21 | P3_1     | DIO   | Configurable Control or Indication pin<br>(when configured as input: internal pull-up)                                 |
| 22 | P3_2     | DIO   | Configurable Control or Indication pin<br>(when configured as input: internal pull-up)                                 |
| 23 | P3_3     | DIO   | Configurable Control or Indication pin<br>(when configured as input: internal pull-up)                                 |
| 24 | P3_4     | DIO   | Configurable Control or Indication pin<br>(when configured as input: internal pull-up)                                 |
| 25 | P3_6     | DIO   | (Do Not Connect)                                                                                                       |
| 26 | P3_7     | DIO   | Configurable Control or Indication pin<br>(when configured as input: internal pull-up)                                 |
| 27 | VDD_XO   | Power | VDD for RF external 16MHz crystal.<br>Connect to 1uF (X5R/X7R) capacitor.                                              |
| 28 | XO_P     | AI    | Positive node for RF 16MHz crystal input.                                                                              |
| 29 | XO_N     | AI    | Negative node for RF 16MHz crystal input.                                                                              |
| 30 | LED1     | DO    | Status LED                                                                                                             |
| 31 | VCC_RF   | Power | Power input for VCO and RF.<br>Connect to 1uF (X5R/X7R) capacitor.                                                     |
| 32 | NC       | NC    | NC                                                                                                                     |
| 33 | RTX      | AIO   | External antenna connection (50 ohm)                                                                                   |
| 34 | AVDD_SAR | Power | 1v8 input for AVDD_SAR power.<br>Connect to 1uF (X5R/X7R) capacitor.                                                   |

|    |          |       |                                                                                    |
|----|----------|-------|------------------------------------------------------------------------------------|
| 35 | NC       | NC    | NC                                                                                 |
| 36 | BAT_IN   | Power | Battery Input. Main positive supply input.<br>Connect to 10uF (X5R/X7R) capacitor. |
| 37 | SW_BTN   | DI    | Software Button H: Power On / L: Power Off                                         |
| 38 | LDO33_O  | Power | Internal 3.3V LDO regulator output.<br>Connect to 10uF (X5R/X7R) capacitor.        |
| 39 | LDO18_IN | Power | Internal 1.8V LDO regulator output. connect with LDO33_O                           |
| 40 | LDO18_O  | Power | Internal 1.8V LDO regulator output.<br>Connect to 1uF (X5R/X7R) capacitor.         |
| 41 | EP       | Power | Exposed pad as ground                                                              |

Note 1: Pin type abbreviation: A = Analog, D = Digital, I = Input, O = Output

#### Definition of Configurable GPIOs:

| Item | I/O | Name         | Description                                                                                                                                                            |
|------|-----|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | I   | UART_CTS     | UART Flow Control set HIGH, to disable TX transmitter.<br><i>It can only be realized by P1_7.</i>                                                                      |
| 2    | O   | UART_RTS:    | UART Flow Control goes HIGH to disable host transmitter.<br>Open data session indication- Go Low when APP session is ready.<br><i>It can only be realized by P0_0.</i> |
| 3    | I   | Reserved     | Reserved                                                                                                                                                               |
| 4    | I   | LINK_DROP    | Host_MCU ask to drop SPP link under Link State;<br>One low pulse with 80ms duration low signal to trigger SPP disconnection. Otherwise it will be set as high always.  |
| 5    | I   | UART_RX_IND  | L: Inform IS1678 that UART data will be transmitted out after few us.<br>H: Otherwise.                                                                                 |
| 6    | I   | PAIRING_KEY  |                                                                                                                                                                        |
| 7    | O   | LOW_BATT_IND | L: Battery voltage is normal.<br>H: Battery voltage is lower than e2prom setting value.                                                                                |
| 8    | O   | RSSI_IND     | L: Received RF Signal Strength is weak<br>H: Received RF Signal Strength is normal                                                                                     |

\* I : signal input pin

O : signal output pin

P : power pin

I/O : signal input/output pin

RP : RF power pin

## 1.7. BLE Fundamental

When two BTLE devices need to be connected, one is in a central role and the other in a peripheral role. The peripheral advertises its connection status, while the central device starts the connection process. Once connected, either end of the connection can initiate the bond. Once bonded, all security-related keys will be saved and the security process will be waived when reconnecting. The bonded peripheral device can only perform direct advertise; therefore, it is no longer able to connect to devices other than its bonded peer.

Similar to Bluetooth Classic, BTLE uses the concept of profiles to ensure interoperability between different devices. However, unlike Bluetooth Classic, BTLE profiles are a collection of services. All BTLE services are built on top of the Generic Attribute Profile (GATT), where GATT defines the accessibility of attributes, which are called characteristics. Therefore, the main functionality of BTLE profiles is built around these characteristics. Devices that maintain the value of characteristics in a service are the “server” of the service. Conversely, devices that acquire data from their peer are considered the “client”.

Each service and its characteristics are identified by their Universally Unique Identifier (UUID). The UUID can either be short form (16-bit) or long form (128-bit). All Bluetooth SIG adopted services and characteristics have a short UUID, whereas a user-defined private UUID must be in long form.

For information on the Bluetooth SIG adopted services and characteristics, visit the Bluetooth Developer Portal at:

<https://developer.bluetooth.org/gatt/profiles/Pages/ProfilesHome.aspx>.

## 2. UART Interface

IS1678S provides UART communication interface with MCU. This chapter describes UART interface and communication protocol between and MCU.

### 2.1. Pin definition

| Name        | Pin Define | Type   | Description                                                                                          |
|-------------|------------|--------|------------------------------------------------------------------------------------------------------|
| UART_TX_IND | P0_4       | Output | Inform Host MCU that UART data will be transmitted out after few us (Setting by EEPROM, default 5ms) |

|             |              |        |                                                                     |
|-------------|--------------|--------|---------------------------------------------------------------------|
| UART_RX_IND | Configurable | Input  | Host MCU inform that UART data will be transmitted out after few us |
| UART_RTS    | P0_0         | Output | UART Flow Control<br>High: UART flow stop<br>Low: UART flow Go      |
| UART_CTS    | P1_7         | Input  | UART Flow Control<br>High: UART flow stop<br>Low: UART flow Go      |
| UART_TXD    | HCI_TXD      | Output |                                                                     |
| UART_RXD    | HCI_RXD      | Input  |                                                                     |

## 2.2. Packet Format

The UART packet format is shown as below diagram.

|             | HEAD      |                            | MID           | DATA            | CRC        |
|-------------|-----------|----------------------------|---------------|-----------------|------------|
|             | START     | LENGTH                     | COM/Event.ID  | COM/Event PARAM | CHKSUM     |
| BYTE NO     | 0         | 1 ~ 2                      | 3             | 4 ~ XX          | Length + 3 |
| SIZE (BYTE) | 1         | 2                          | 1             | 0 ~             | 1          |
| VALUE       | 0xAA      | 1 ~                        | COMMAND       | DATA            | CHK SUM    |
|             | SINC WORD | Check sum to be calculated |               |                 |            |
|             |           |                            | TARGET LENGTH |                 |            |

Check sum rule: Summation of every byte after START WORD(LENGTH, COM.ID, COM PARAM, CHK SUM) is 0xFF00

e.g.

|         | START | LENGTH(H) | LENGTH(L) | ID   | PARAM | CHKSUM |
|---------|-------|-----------|-----------|------|-------|--------|
| BYTE NO | 0     | 1         | 2         | 3    | 4     | 5      |
| VALUE   | 0xAA  | 0x00      | 0x02      | 0x01 | 0x00  | 0xFD   |

## 2.3. UART Setting

- UART supports baud rates from 1200 to 921600 bit.
- UART setting can be configured by E2PROM value change.
- System Configure Parameters:

- UART Baud rate setting:
- UART setting: Parity check

## 2.4. Support HCI UART mode

- Fix baud rate in 115200bps.
- Enter test mode for mass production and system configuration by E2PROM setting.

## 2.5. UART flow control

- CTS (P17) / RTS (P00) signal flow control scheme.
- UART flow control scheme can be configured by E2PROM setting.
- If UART\_CTS sets flow stop while data transmission, will stop transmit, and that won't transmit more than two bytes after flow stop.

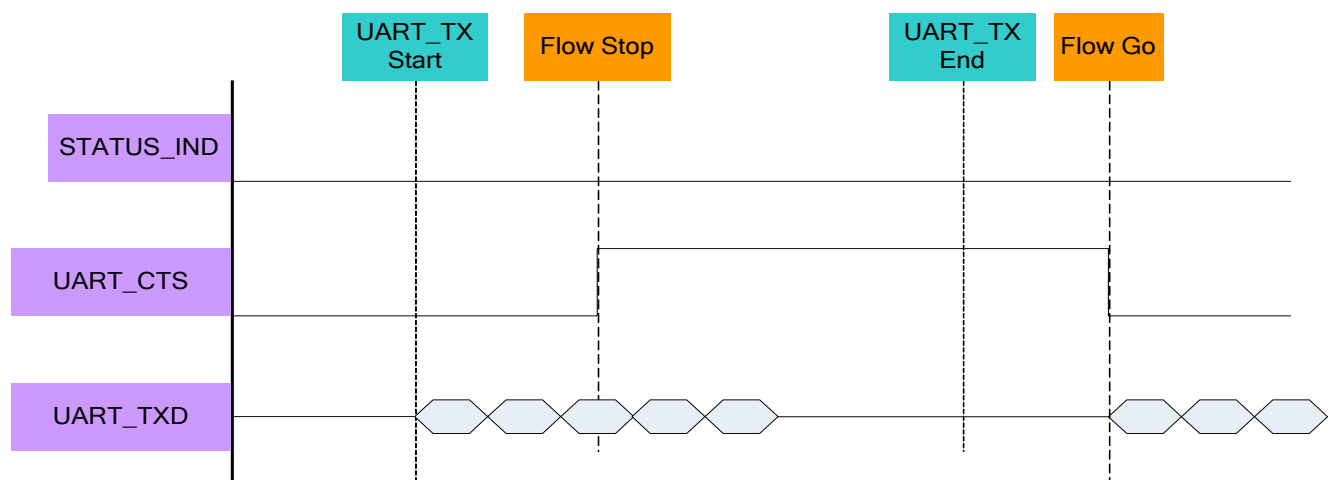


Fig.1. Host\_MCU indicate UART flow control timing diagram

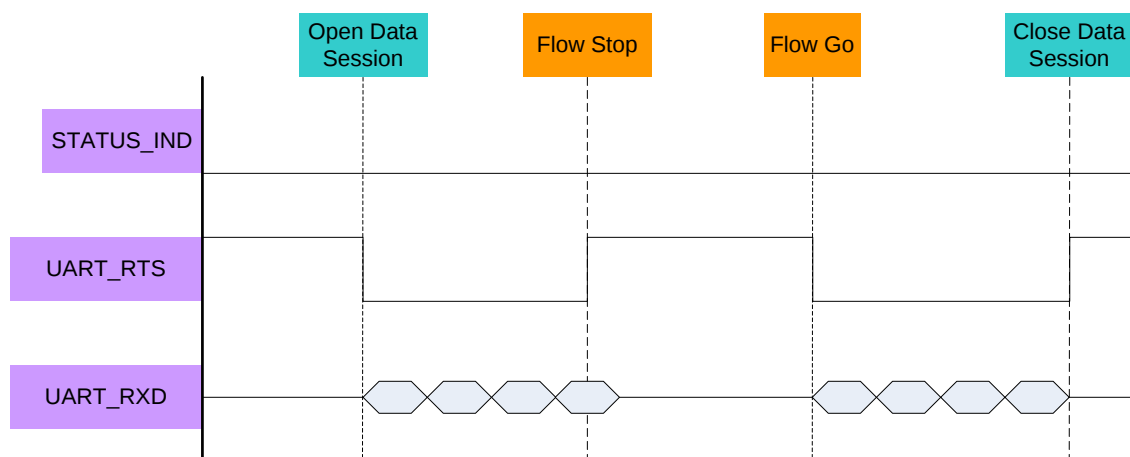
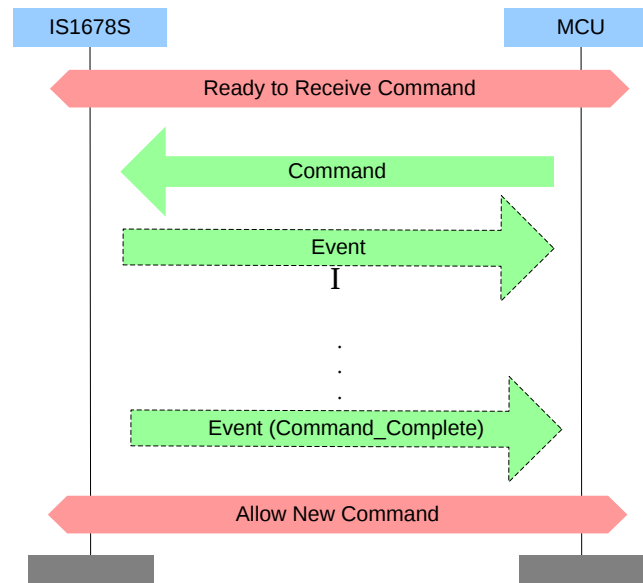


Fig.2 indicate Host\_MCU UART flow control timing diagram

## 2.6. Rules of MCU Command Assign

Most of command request sending by MCU will be replied by “Command\_Complete” event. Another new command request is allowed for MCU by receiving “Command\_Complete” event.



There are some exceptions that no Command\_Complete event is sent by the IS1678S to indicate that this command has been completed. Following are the exception commands:

- **Read\_BM77\_Status:**  
The BM77\_Status\_Report event indicates that this command has been completed.
- **SPP\_Create\_Link:**  
The SPP\_Connection\_Complete event indicates that this connection establishment has been completed. If IS1678S can't achieve the connection establishment, then the SPP\_Connection\_Complete event won't be sent to MCU. MCU can send SPP\_Create\_Link\_Cancel command to stop the action.
- **Reset:**  
MCU can know that the command has been completed by getting BM77\_Status\_Report event.
- **Disconnect:**  
The Disconnect\_Complete event indicates that this command has been completed.

Besides some command request are allowed for MCU without waiting Command\_Complete event after last command

request was sending. Those commands are listed as below:

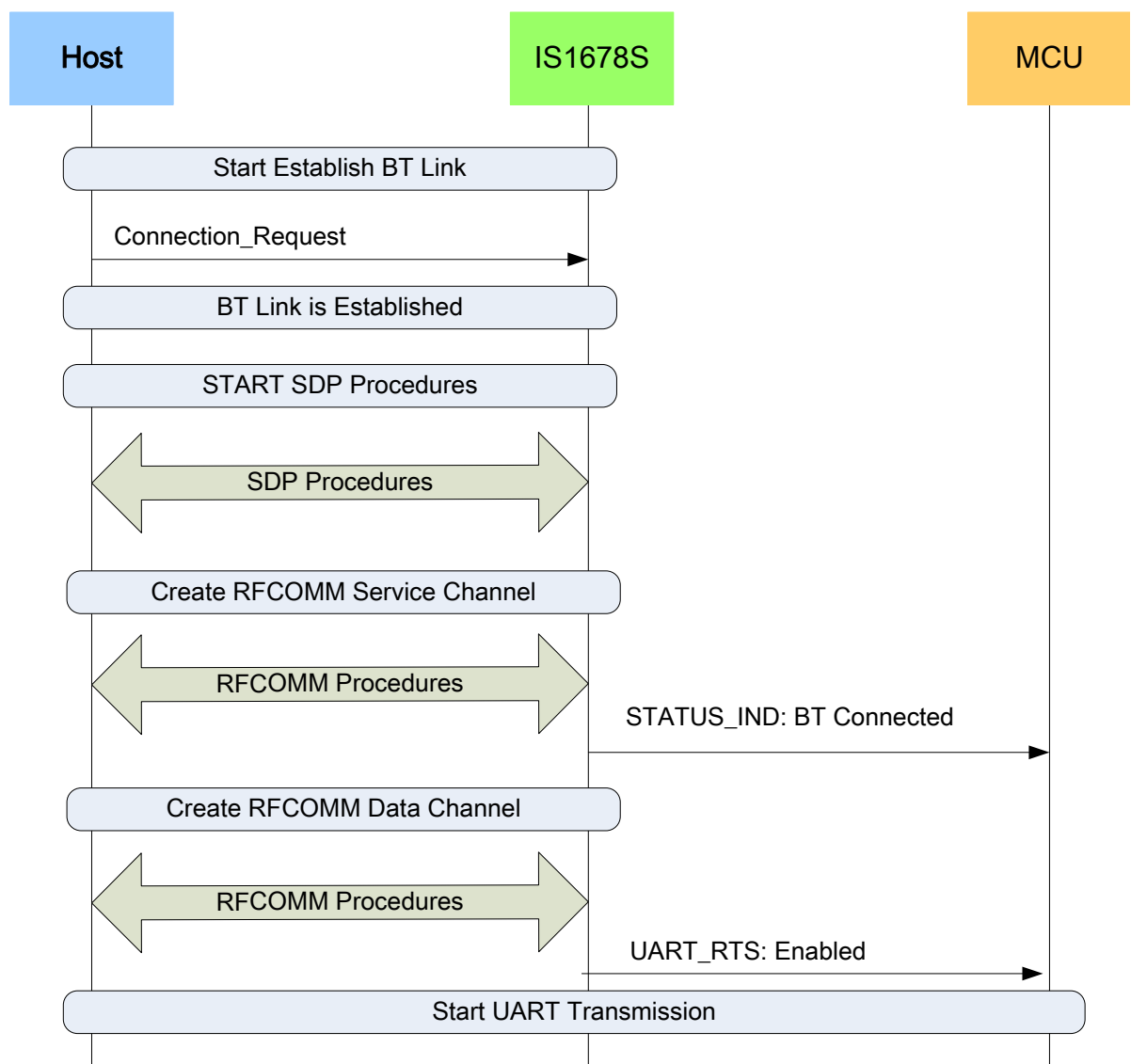
- **SPP\_Create\_Link\_Cancel**
- **Disconnect**
- **Reset**

## 2.7. The reliable of data transmission

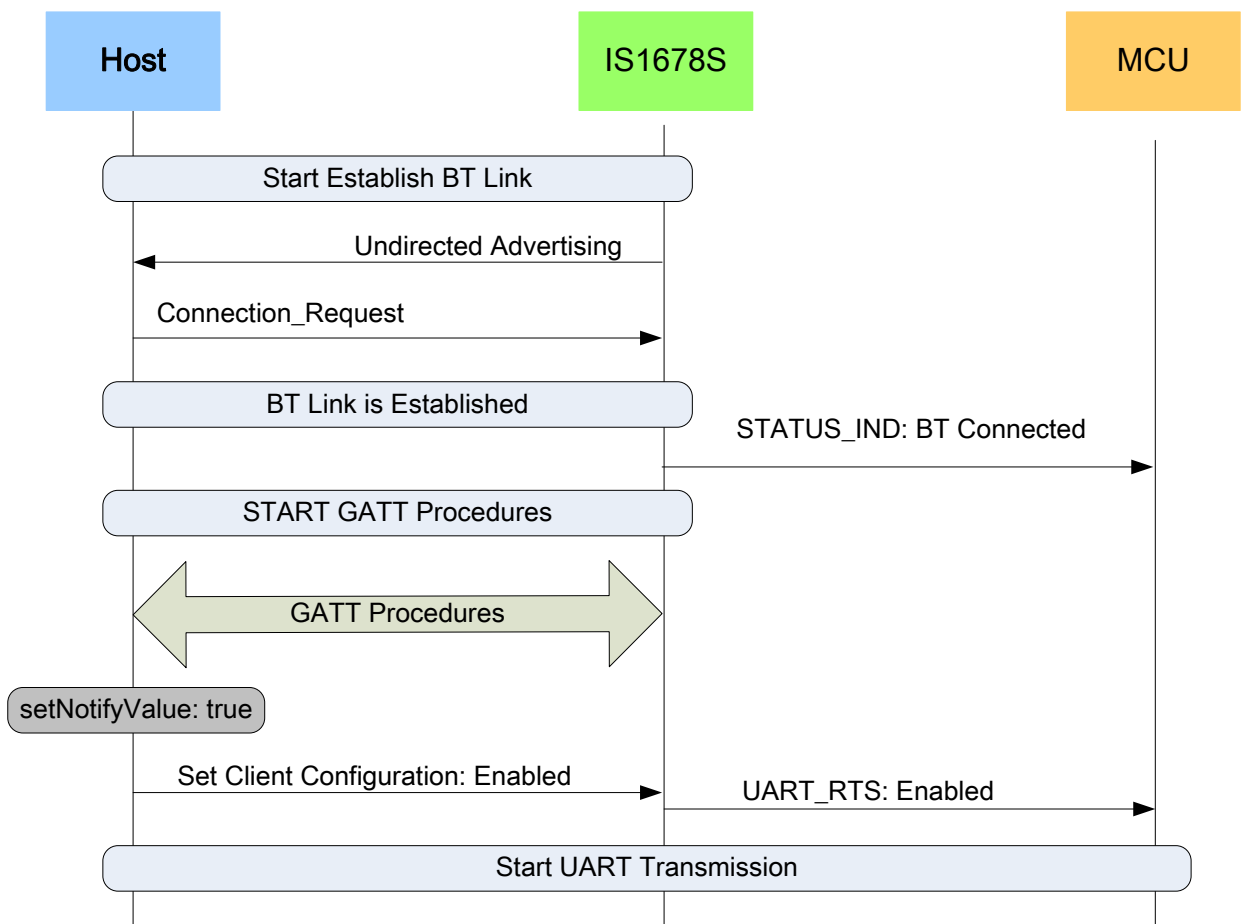
The UART data delivery order is first in, first out. End-to-end delivery of data is normally reliable, but not absolutely guaranteed, so MCU and App protocols must be designed to recover from loss of data.

## 2.8. Connection Establishment

### 2.8.1 SPP



## 2.8.2 iOS CoreBluetooth



## 2.9. Command Definition

| Command Type  | Op Code | Command                | Return Event       | Auto Pattern | Manual Pattern |
|---------------|---------|------------------------|--------------------|--------------|----------------|
| <b>Common</b> | 0x01    | Read_Local_Information | Command_Complete   | F            |                |
|               | 0x02    | Reset                  |                    | N/A          |                |
|               | 0x03    | Read_BM77_Status       | BM77_Status_Report | N/A          |                |
|               | 0x05    | Into_Power_Down_Mode   | Command_Complete   | N/A          |                |

|                                 |      |                                         |                             |     |     |
|---------------------------------|------|-----------------------------------------|-----------------------------|-----|-----|
|                                 | 0x07 | Read_Device_Name                        | Command_Complete            | F   |     |
|                                 | 0x08 | Write_Device_Name                       | Command_Complete            | F   | I   |
|                                 | 0x09 | Erase_all_Paired_Device_Inf<br>ormation | Command_Complete            | F   | I   |
|                                 | 0x0A | Read_Pairing_Mode_Setting               | Command_Complete            | F   |     |
|                                 | 0x0B | Write_Pairing_Mode_Setting              | Command_Complete            | F   | I   |
|                                 | 0x0C | Read_All_Paired_Device_Inf<br>ormation  | Command_Complete            | F   |     |
|                                 | 0x0D | Delete_Paired_Device                    | Command_Complete            | F   | I   |
| <b>GAP</b>                      | 0x10 | Read_RSSI_Value                         | Command_Complete            | N/A | CM  |
|                                 | 0x11 | Write_Adv_Data                          | Command_Complete            | F   | I   |
|                                 | 0x12 | Write_Scan_Res_Data                     | Command_Complete            | F   | I   |
|                                 | 0x13 | Set_Advertising_Parameter               | Command_Complete            | F   | I   |
|                                 | 0x1B | Disconnect                              | Disconnection_Complete      | N/A | CM  |
|                                 | 0x1C | Invisible_Setting                       | Command_Complete            | N/A | I   |
|                                 | 0x1D | SPP_Create_Link                         | SPP_Connection_Compl<br>ete | N/A | I   |
|                                 | 0x1E | SPP_Create_Link_Cancel                  | Command_Complete            | N/A | I   |
|                                 | 0x1F | Read_Remote_Device_Nam<br>e             | Command_Complete            | N/A | CM  |
| <b>SPP/GATT<br/>Transparent</b> | 0x3a | Send_Transparent_Data                   | Command_Complete            | N/A | CM  |
| <b>Pairing</b>                  | 0x40 | Passkey_Entry_Res                       | Command_Complete            | CP  | CP  |
|                                 | 0x41 | User_Confirm_Res                        | Command_Complete            | CP  | CP  |
| <b>Common_2</b>                 | 0x50 | Read_PIN_Code                           | Command_Complete            | F   | I   |
|                                 | 0x51 | Write_PIN_Code                          | Command_Complete            | F   | I   |
|                                 | 0x52 | Leave_Configure_Mode                    | Command_Complete            | F   | N/A |

\*I: Available in Idle Mode

\*CP: Available in Connected Mode with Pairing Procedure.

\*F: Available in Configure Mode

\*CM: Available in Connected Mode with Manual Pattern

## 2.10. Common\_1 Commands

MCU sends the Common Command to for specific purpose. will reply the Command\_Complete event to notify the command process result.

### 2.10.1 Read\_Local\_Information (0x01)

| Command | Op Code | Command Parameters | Return Parameters |
|---------|---------|--------------------|-------------------|
|---------|---------|--------------------|-------------------|

|                        |      |      |                          |
|------------------------|------|------|--------------------------|
| Read_Local_Information | 0x01 | None | Status, Version, BD_ADDR |
|------------------------|------|------|--------------------------|

#### Description:

This command is used to read local information of .

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

VERSION:

SIZE: 5 BYTES

| Value           | Parameter Description  |
|-----------------|------------------------|
| 0XXXXXXXXX<br>X | Version information of |

BD\_ADDR:

SIZE: 6 BYTES

| Value             | Parameter Description |
|-------------------|-----------------------|
| 0XXXXXXXXX<br>XXX | Bluetooth address     |

[\[Return to Command Table\]](#)

### 2.10.2 Reset (0x02)

| Command | Op Code | Command Parameters | Return Parameters |
|---------|---------|--------------------|-------------------|
| Reset   | 0x02    | None               | Status            |

#### Description:

This command is used to reset.

#### Command Parameters:

None

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

### 2.10.3 Read\_BM77\_Status (0x03)

| Command | Op Code | Command Parameters | Return Parameters |
|---------|---------|--------------------|-------------------|
|---------|---------|--------------------|-------------------|

|                      |      |      |
|----------------------|------|------|
| Read_BM77_Statu<br>s | 0x03 | None |
|----------------------|------|------|

#### Description:

This command is used to read status of IS17648S . And the status of IS17648S will be informed by “[BM77\\_Status\\_Report](#)” event.

#### Command Parameters:

None

#### Return Parameters:

None

[\[Return to Command Table\]](#)

### 2.10.4 Into\_Power\_Down\_Mode (0x05)

| Command                  | Op Code | Command Parameters | Return Parameters |
|--------------------------|---------|--------------------|-------------------|
| Into_Power_Down<br>_Mode | 0x05    |                    |                   |

#### Description:

This command is used to drive into power down mode directly. IS17648S will into power down mode after Command\_Complete is replied.

This command is valid while IS17648S is in Idle Mode only.

#### Command Parameters:

None

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

### 2.10.5 Read\_Device\_Name (0x07)

| Command              | Op Code | Command Parameters | Return Parameters   |
|----------------------|---------|--------------------|---------------------|
| Read_Device_Nam<br>e | 0x07    |                    | Status, Device_Name |

#### Description:

This command is used to read device name of IS17648S.

#### Command Parameters:

None

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

DEVICE\_NAME:

SIZE: XX BYTES

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Device name of        |

[\[Return to Command Table\]](#)

## 2.10.6 Write\_Device\_Name (0x08)

| Command           | Op Code | Command Parameters       | Return Parameters |
|-------------------|---------|--------------------------|-------------------|
| Write_Device_Name | 0x08    | Store_Option,Device_Name | Status            |

### Description:

This command is used to write device name of IS17648S.

### Command Parameters:

STORE\_OPTION:

SIZE: 1 BYTE

| Value | Parameter Description            |
|-------|----------------------------------|
| 0x00  | The change won't store to E2prom |
| 0x01  | The change will store to E2prom  |

DEVICE\_NAME:

SIZE: XX BYTES

| Value | Parameter Description   |
|-------|-------------------------|
| 0xXX  | Device name of IS17648S |

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.10.7 Erase\_All\_Paired\_Device\_Information (0x09)

| Command                             | Op Code | Command Parameters | Return Parameters |
|-------------------------------------|---------|--------------------|-------------------|
| Erase_All_Paired_Device_Information | 0x09    |                    | Status            |

### Description:

This command is used to erase all of the paired device information saved in IS17648S e2prom and it is valid while IS17648S is in Idle Mode only

### Command Parameters:

None

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.10.8 Read\_Pairing\_Mode\_Setting (0x0A)

| Command                   | Op Code | Command Parameters | Return Parameters    |
|---------------------------|---------|--------------------|----------------------|
| Read_Pairing_Mode_Setting | 0x0A    |                    | Status, Pairing_Mode |

### Description:

This command is used to read pairing mode setting of IS17648S.

### Command Parameters:

None

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

PAIRING\_MODE:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | PIN Code Entry        |
| 0x01  | Just Work             |
| 0x02  | Passkey_Entry         |
| 0x03  | User Confirm          |

[\[Return to Command Table\]](#)

## 2.10.9 Write\_Pairing\_Mode\_Setting (0x0B)

| Command                    | Op Code | Command Parameters         | Return Parameters    |
|----------------------------|---------|----------------------------|----------------------|
| Write_Pairing_Mode_Setting | 0x0B    | Store_Option, Pairing_Mode | Status, Pairing_Mode |

### Description:

This command is used to write pairing mode setting of IS17648S and it is valid while IS17648S is in Idle Mode only.

### Command Parameters:

STORE\_OPTION:

SIZE: 1 BYTE

| Value | Parameter Description            |
|-------|----------------------------------|
| 0x00  | The change won't store to E2prom |
| 0x01  | The change will store to E2prom  |

PAIRING\_MODE:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | PIN Code Entry        |
| 0x01  | Just Work             |
| 0x02  | Passkey_Entry         |
| 0x03  | User Confirm          |

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.10.10 Read\_All\_Paired\_Device\_Information (0x0C)

| Command                            | Op Code | Command Parameters | Return Parameters                               |
|------------------------------------|---------|--------------------|-------------------------------------------------|
| Read_All_Paired_Device_Information | 0x0C    |                    | Status,<br>Num_Of_Paired_Device,<br>Device_List |

### Description:

This command is used to read all paired devices information of IS17648S and it is valid while IS17648S is in Idle Mode only.

### Command Parameters:

None

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Command succeeded     |

|             |                                                              |
|-------------|--------------------------------------------------------------|
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |
|-------------|--------------------------------------------------------------|

NUM\_OF\_PAIRING\_DEVICE: SIZE: 1 BYTE

| Value | Parameter Description    |
|-------|--------------------------|
| 0xXX  | Number of paired devices |

#### DEVICE\_LIST: MAX TO 4 SETS

DEVICE\_INDEX: SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Paired device index   |

PRIORITY: SIZE: 1 BYTE

| Value | Parameter Description                     |
|-------|-------------------------------------------|
| 0xXX  | Link priority(0x01: Latest linked device) |

DEVICE\_ADDRESS: SIZE: 6 BYTES

| Value      | Parameter Description           |
|------------|---------------------------------|
| 0XXXXXXXXX | Paired device Bluetooth address |
| XXX        |                                 |

[\[Return to Command Table\]](#)

### 2.10.11 Delete\_Paired\_Device (0x0D)

| Command              | Op Code | Command Parameters | Return Parameters |
|----------------------|---------|--------------------|-------------------|
| Delete_Paired_Device | 0x0D    | Device_Index       | Status            |

#### Description:

This command is used to delete paired device from IS17648S and it is valid while IS17648S is in Idle Mode only.

#### Command Parameters:

DEVICE\_INDEX: SIZE: 1 BYTE

| Value | Parameter Description                     |
|-------|-------------------------------------------|
| 0xXX  | The range of device index is from 0 to 3. |

#### Return Parameters:

STATUS: SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.11. GAP Commands

### 2.11.1 Read\_RSSI\_Value (0x10)

| Command         | Op Code | Command Parameters | Return Parameters  |
|-----------------|---------|--------------------|--------------------|
| Read_RSSI_Value | 0x10    | Connection_Handle  | Status, RSSI_Value |

#### Description:

This command is used to read RSSI value for peer connection.

This command is valid while IS17648S is in Connected Mode only.

#### Command Parameters:

CONNECTION\_HANDLE:

SIZE: 2 BYTES

| Value  | Parameter Description |
|--------|-----------------------|
| 0XXXXX | Connection Handle     |

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

RSSI\_VALUE:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | RSSI Value            |

[\[Return to Command Table\]](#)

### 2.11.1 Write\_Adv\_Data (0x11)

| Command        | Op Code | Command Parameters             | Return Parameters |
|----------------|---------|--------------------------------|-------------------|
| Write_Adv_Data | 0x11    | Store_Option, Advertising_Data | Status            |

#### Description:

This command is used to update the advertise data.

This command is valid while IS17648S is in Idle Mode only.

\* Maximum length of advertising data in IS17648S is 24 bytes

#### Command Parameters:

STORE\_OPTION:

SIZE: 1 BYTE

| Value | Parameter Description            |
|-------|----------------------------------|
| 0x00  | The change won't store to E2prom |

|      |                                 |
|------|---------------------------------|
| 0x01 | The change will store to E2prom |
|------|---------------------------------|

ADVERTISING\_DATA

SIZE: 1 TO 31 OCTETS

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Advertising Data      |

### Return Parameters:

STATUS:

SIZE: 1 OCTET

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.11.2 Write\_Scan\_Res\_Data (0x12)

| Command             | Op Code | Command Parameters          | Return Parameters |
|---------------------|---------|-----------------------------|-------------------|
| Write_Scan_Res_Data | 0x12    | Store_Option, Scan_Res_Data | Status            |

### Description:

This command is used to update the Scan\_Res data.

This command is valid while IS17648S is in Idle Mode only.

### Command Parameters:

STORE\_OPTION:

SIZE: 1 BYTE

| Value | Parameter Description            |
|-------|----------------------------------|
| 0x00  | The change won't store to E2prom |
| 0x01  | The change will store to E2prom  |

SCAN\_RES\_DATA

SIZE: 1 TO 31 OCTETS

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Scan Response Data    |

### Return Parameters:

STATUS:

SIZE: 1 OCTET

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.11.3 Set Advertising Parameter (0x13)

| Command | Op Code | Command Parameters | Return Parameters |
|---------|---------|--------------------|-------------------|
|---------|---------|--------------------|-------------------|

|                              |      |                                                                                      |        |
|------------------------------|------|--------------------------------------------------------------------------------------|--------|
| Advertising_Mode<br>_Setting | 0x13 | Advertising_Interval<br>Advertising_Type,<br>Direct_Address_Type,<br>Direct_Address, | Status |
|------------------------------|------|--------------------------------------------------------------------------------------|--------|

### Description:

This command is used to set advertising parameters and it is valid while BLEDK is in Idle Mode only.

### Command Parameters:

ADVERTISING\_INTERVAL:

SIZE: 2 OCTET

| Value  | Parameter Description                                                                                                                                                         |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0xFFFF | Advertising interval for non-directed advertising.<br>Range: 0x0020 to 0x4000<br>Default: N = 0x0800 (1.28 second)<br>Time = N * 0.625 msec<br>Time Range: 20 ms to 10.24 sec |

ADVERTISING\_TYPE:

SIZE: 1 OCTET

| Value | Parameter Description                                                                                                                                                                                            |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0x00  | Connectable undirected advertising. It is used to make BM77 into standby mode.                                                                                                                                   |
| 0x01  | Connectable directed advertising. It is used to make BM77 into link back mode.                                                                                                                                   |
| 0x02  | Scannable undirected advertising. It is used to make BLEDK into broadcast mode.<br>And it will reply advertising packet only for the observer passive scanning or active scanning to receive advertising events. |
| 0x03  | Non connectable undirected advertising. It is used to make BM77 into broadcast mode.                                                                                                                             |
| 0x04  | Proprietary Beacon Setting                                                                                                                                                                                       |

DIRECT\_ADDRESS\_TYPE:

SIZE: 1 OCTET

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Public Device Address |
| 0x01  | Random Device Address |

DIRECT\_ADDRESS:

SIZE: 6 OCTETS

| Value             | Parameter Description                                                           |
|-------------------|---------------------------------------------------------------------------------|
| 0XXXXXXXXX<br>XXX | Public Device Address or Random Device Address of the device<br>to be connected |

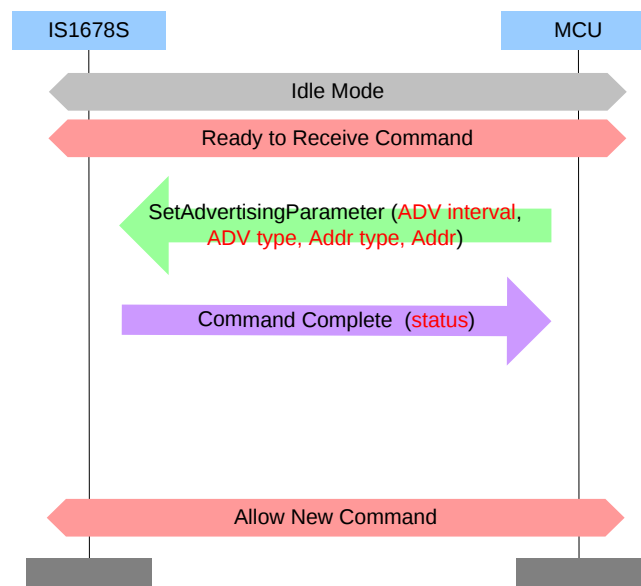
### Return Parameters:

STATUS:

SIZE: 1 OCTET

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Command succeeded     |

0x01 – 0xFF Command failed. See listing of Error Codes.



[\[Return to Command Table\]](#)

#### 2.11.4 Disconnect (0x1B)

| Command    | Op Code | Command Parameters | Return Parameters |
|------------|---------|--------------------|-------------------|
| Disconnect | 0x1B    | Reserved           |                   |

##### Description:

This command is used to terminate a connection. And it is valid while IS17648S is in Connected Mode only.

##### Command Parameters:

RESERVED:

SIZE: 1 BYTE

| Value | Parameter Description     |
|-------|---------------------------|
| 0x00  | Always set this byte to 0 |

##### Return Parameters:

None.

Note: No Command\_Complete event is sent by the to indicate that this command has been completed. Instead, the Disconnection\_Complete event indicates that this command has been completed.

[\[Return to Command Table\]](#)

#### 2.11.5 Invisible\_Setting (0x1C)

| Command           | Op Code | Command Parameters | Return Parameters |
|-------------------|---------|--------------------|-------------------|
| Invisible_Setting | 0x1C    | Mode               | Status            |

##### Description:

This command is used to configure SPP invisible and it is valid while IS17648S is in Idle Mode only.

### Command Parameters:

MODE:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Leave Standby Mode    |
| 0x01  | Enter Standby Mode    |

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.11.6 SPP\_Create\_Link (0x1D)

| Command         | Op Code | Command Parameters | Return Parameters |
|-----------------|---------|--------------------|-------------------|
| SPP_Create_Link | 0x1D    | Device_Index       | Status            |

### Description:

This command is used to establish with host and it is valid while IS17648S is in Idle Mode only.

### Command Parameters:

DEVICE\_INDEX:

SIZE: 1 BYTE

| Value | Parameter Description                                                                                                                                                                   |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0xXX  | The range of device index is from 0 to 3 (Device_Index only valid if paired information exists in).<br><br>Set this value to 0xff, IS17648S will create link with latest paired device. |

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.11.7 SPP\_Create\_Link\_Cancel (0x1E)

| Command                | Op Code | Command Parameters | Return Parameters |
|------------------------|---------|--------------------|-------------------|
| SPP_Create_Link_Cancel | 0x1E    |                    | Status            |

### Description:

This command is used to cancel the link establishment with host and it is valid while IS17648S is in Link Back

Mode only.

### Command Parameters:

NONE

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.11.8 Read\_Remote\_Device\_Name (0x1F)

| Command                     | Op Code | Command Parameters | Return Parameters   |
|-----------------------------|---------|--------------------|---------------------|
| Read_Remote_Dev<br>ice_Name | 0x1F    |                    | Status, Device_Name |

### Description:

This command is used to read remote device name.

### Command Parameters:

NONE

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                       |
|-------------|---------------------------------------------|
| 0x00        | Command succeeded                           |
| 0x01 – 0xFF | Command failed. See listing of Error Codes. |

DEVICE\_NAME:

SIZE: XX BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Remote Device Name    |

[\[Return to Command Table\]](#)

## 2.12. SPP/GATT Transparent Commands

### 2.12.1 Send\_Transparent\_Data (0x3a)

| Command                   | Op Code | Command Parameters            | Return Parameters |
|---------------------------|---------|-------------------------------|-------------------|
| Send_Transparent_<br>Data | 0x3a    | Reserved,<br>Transparent_Data | Status            |

### Description:

This command is used to send transparent data by ISSC\_TRANS\_TX service or SPP profile.

### Command Parameters:

RESERVED:

SIZE: 1 BYTE

| Value | Parameter Description        |
|-------|------------------------------|
| 0x00  | Always set this byte to be 0 |

TRANSPARENT\_DATA:

SIZE: N BYTES

| Value | Parameter Description                                              |
|-------|--------------------------------------------------------------------|
| 0xXX  | Transparent_Data. Maximum length of transparent data is 1000 bytes |

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.13. Pairing Commands

### 2.13.1 Passkey\_Entry\_Res (0x40)

| Command           | Op Code | Command Parameters                    | Return Parameters |
|-------------------|---------|---------------------------------------|-------------------|
| Passkey_Entry_Res | 0x40    | Notification_Type,<br>Entered_Passkey | Status            |

### Description:

This command is used to response SSP passkey entry request from .

### Command Parameters:

NOTIFICATION\_TYPE:

SIZE: 1 BYTE

| Value | Parameter Description   |
|-------|-------------------------|
| 0x01  | Passkey digit entered   |
| 0x02  | Passkey digit erased    |
| 0x03  | Passkey cleared         |
| 0x04  | Passkey entry completed |

ENTERED\_PASSKEY:

SIZE: 1 BYTE

| Value | Parameter Description                                                                                           |
|-------|-----------------------------------------------------------------------------------------------------------------|
| 0xXX  | Entered Digital Passkey character. It is valid only while the Notification_type is 0x01.<br>0x30~0x39: "0" ~"9" |

### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

### 2.13.2 User\_Confirm\_Res (0x41)

| Command          | Op Code | Command Parameters | Return Parameters |
|------------------|---------|--------------------|-------------------|
| User_Confirm_Res | 0x41    | option             | Status            |

#### Description:

This command is used to response SSP passkey entry request from .

#### Command Parameters:

NOTIFICATION\_TYPE:

SIZE: 1 BYTE

| Value | Parameter Description      |
|-------|----------------------------|
| 0x00  | Entered information is Yes |
| 0x01  | Entered information is No  |

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                       |
|-------------|---------------------------------------------|
| 0x00        | Command succeeded                           |
| 0x01 – 0xFF | Command failed. See listing of Error Codes. |

[\[Return to Command Table\]](#)

## 2.14. Common\_2\_Commands

### 2.14.1 Read\_PIN\_Code (0x50)

| Command       | Op Code | Command Parameters | Return Parameters |
|---------------|---------|--------------------|-------------------|
| Read_PIN_Code | 0x50    |                    | Status, PIN_Code  |

#### Description:

This command is used to read PIN code of .

#### Command Parameters:

None

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Command succeeded     |

|             |                                                              |
|-------------|--------------------------------------------------------------|
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |
|-------------|--------------------------------------------------------------|

PIN\_CODE:

SIZE: 4 OR 6 BYTES

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | PIN Code of           |

[\[Return to Command Table\]](#)

### 2.14.2 Write\_PIN\_Code (0x51)

| Command        | Op Code | Command Parameters     | Return Parameters |
|----------------|---------|------------------------|-------------------|
| Write_PIN_Code | 0x51    | Store_Option, PIN_Code | Status            |

#### Description:

This command is used to write PIN code of IS17648S and it is valid while IS17648S is in Idle Mode only.

#### Command Parameters:

STORE\_OPTION:

SIZE: 1 BYTE

| Value | Parameter Description            |
|-------|----------------------------------|
| 0x00  | The change won't store to E2prom |
| 0x01  | The change will store to E2prom  |

PIN\_CODE:

SIZE: 4 OR 6 BYTES

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | PIN Code of IS17648S  |

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

### 2.14.3 Leave\_Configure\_Mode (0x52)

| Command              | Op Code | Command Parameters | Return Parameters |
|----------------------|---------|--------------------|-------------------|
| Leave_Configure_Mode | 0x52    | Option             | Status            |

#### Description:

will leave configure mode if "Leave\_Configure\_Mode" command is received.

#### Command Parameters:

OPTION:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
|-------|-----------------------|

|      |                                |
|------|--------------------------------|
| 0x00 | None                           |
| 0x01 | Disable configure mode forever |

#### Return Parameters:

STATUS:

SIZE: 1 BYTE

| Value       | Parameter Description                                        |
|-------------|--------------------------------------------------------------|
| 0x00        | Command succeeded                                            |
| 0x01 – 0xFF | Command failed. See listing of <a href="#">Error Codes</a> . |

[\[Return to Command Table\]](#)

## 2.15. List of Command Status Error Code

| Error Code | Description                                              |
|------------|----------------------------------------------------------|
| 0x00       | Command succeeded                                        |
| 0x01       | Unknown Command                                          |
| 0x02       | Unknown Connection Identifier                            |
| 0x03       | Hardware Failure                                         |
| 0x05       | Authentication Failure                                   |
| 0x06       | PIN or Key Missing                                       |
| 0x07       | Memory Capacity Exceeded                                 |
| 0x08       | Connection Timeout                                       |
| 0x09       | Connection Limit Exceeded                                |
| 0x0B       | ACL Connection Already Exists                            |
| 0x0C       | Command Disallowed                                       |
| 0x0D       | Connection Rejected due to Limited Resources             |
| 0x0E       | Connection Rejected Due To Security Reasons              |
| 0x0F       | Connection Rejected due to Unacceptable BD_ADDR          |
| 0x10       | Connection Accept Timeout Exceeded                       |
| 0x11       | Unsupported Feature or Parameter Value                   |
| 0x12       | Invalid Command Parameters                               |
| 0x13       | Remote User Terminated Connection                        |
| 0x14       | Remote Device Terminated Connection due to Low Resources |
| 0x15       | Remote Device Terminated Connection due to Power Off     |
| 0x16       | Connection Terminated By Local Host                      |
| 0x18       | Pairing Not Allowed                                      |
| 0x1F       | Unspecified Error                                        |
| 0x28       | Instant Passed                                           |
| 0x29       | Pairing With Unit Key Not Supported                      |
| 0x2F       | Insufficient Security                                    |
| 0x39       | Connection Rejected due to No Suitable Channel Found     |

|             |                                          |
|-------------|------------------------------------------|
| <b>0x3A</b> | Controller Busy                          |
| <b>0x3B</b> | Unacceptable Connection Interval         |
| <b>0x3C</b> | Directed Advertising Timeout             |
| <b>0x3D</b> | Connection Terminated due to MIC Failure |
| <b>0x3E</b> | Connection Failed to be Established      |
| <b>0x81</b> | Invalid Handle                           |
| <b>0x82</b> | Read Not Permitted                       |
| <b>0x83</b> | Write Not Permitted                      |
| <b>0x84</b> | Invalid PDU                              |
| <b>0x85</b> | Insufficient Authentication              |
| <b>0x86</b> | Request Not Supported                    |
| <b>0x77</b> | Invalid Offset                           |
| <b>0x88</b> | Insufficient Authorization               |
| <b>0x89</b> | Prepare Queue Full                       |
| <b>0x8A</b> | Attribute Not Found                      |
| <b>0x8B</b> | Attribute Not Long                       |
| <b>0x8C</b> | Insufficient Encryption Key Size         |
| <b>0x8D</b> | Invalid Attribute Value Length           |
| <b>0x8E</b> | Unlikely Error                           |
| <b>0x8F</b> | Insufficient Encryption                  |
| <b>0x90</b> | Unsupported Grout Type                   |
| <b>0x91</b> | Insufficient Resources                   |
| <b>0xFF</b> | UART_Check_Sum_Error                     |

## 2.16. Event Definition

| Event Type                  | Op Code | Event                                     |
|-----------------------------|---------|-------------------------------------------|
| <b>Pairing</b>              | 0x60    | <a href="#">Passkey Entry Req</a>         |
|                             | 0x61    | <a href="#">Pairing Complete</a>          |
|                             | 0x62    | <a href="#">Passkey DisplayYesNo Req</a>  |
| <b>GAP</b>                  | 0x71    | <a href="#">LE Connection Complete</a>    |
|                             | 0x72    | <a href="#">Disconnection Complete</a>    |
|                             | 0x74    | <a href="#">SPP Connection Complete</a>   |
| <b>Common</b>               | 0x80    | <a href="#">Command Complete</a>          |
|                             | 0x81    | <a href="#">BM77 Status Report</a>        |
|                             | 0x8f    | <a href="#">Configure Mode Status</a>     |
| <b>SPP/GATT Transparent</b> | 0x9a    | <a href="#">Received Transparent Data</a> |

## 2.17. Pairing Event

### ● Passkey\_Entry\_Req (0x60)

| Event                 | OpCode | Event Parameters |
|-----------------------|--------|------------------|
| SSP_Passkey_Entry_Req | 0x60   |                  |

#### Description:

This event is used to inform MCU that IS1678S has received Passkey Request.

#### Event Parameters:

NONE

[\[Return to Event Table\]](#)

### ● Pairing\_Complete (0x61)

| Event            | OpCode | Event Parameters |
|------------------|--------|------------------|
| Pairing_Complete | 0x61   | Result           |

#### Description:

This event is used to inform MCU that IS1678S pairing process has been finished.

#### Event Parameters:

RESULT:

SIZE: 1 OCTETS

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Pairing Complete      |
| 0x01  | Pairing Fail          |
| 0x02  | Pairing Timeout       |

[\[Return to Event Table\]](#)

### ● Passkey\_DisplayYexNo\_Req (0x62)

| Event                 | OpCode | Event Parameters  |
|-----------------------|--------|-------------------|
| SSP_Passkey_Entry_Req | 0x62   | Displayed_Passkey |

#### Description:

This event is used to inform MCU that IS1678S has received user confirm request.

#### Event Parameters:

DISPLAYED\_PASSKEY:

SIZE: 1 OCTETS

| Value | Parameter Description |
|-------|-----------------------|
|-------|-----------------------|

|      |                            |
|------|----------------------------|
| 0xXX | Numeric for MCU to display |
|------|----------------------------|

[\[Return to Event Table\]](#)

## 2.18 GAP Event

### ● LE\_Connection\_Complete (0x71)

| Event                  | OpCode | Event Parameters                                                                                                    |
|------------------------|--------|---------------------------------------------------------------------------------------------------------------------|
| LE_Connection_Complete | 0x71   | Status, Connection_Handle, Role, Peer_Address_Type, Peer_Address, Conn_Interval, Conn_Latency, Supervision_Timeout, |

#### Description:

This event is used to inform MCU that a LE connection has been created.

#### Event Parameters:

STATUS: SIZE: 1 OCTET

| Value     | Parameter Description              |
|-----------|------------------------------------|
| 0x00      | Connection successfully completed. |
| 0x01~0xff | Connection failed to complete.     |

CONNECTION\_HANDLE: SIZE: 1 OCTETS

| Value | Parameter Description                                                               |
|-------|-------------------------------------------------------------------------------------|
| 0xXX  | Connection_Handle to be used to identify a connection between two Bluetooth devices |

ROLE: SIZE: 1 OCTET

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Connection is master  |
| 0x01  | Connection is slave   |

PEER\_ADDRESS\_TYPE: SIZE: 1 OCTET

| Value | Parameter Description                 |
|-------|---------------------------------------|
| 0x00  | Peer is using a Public Device Address |
| 0x01  | Peer is using a Random Device Address |

PEER\_ADDRESS: SIZE: 6 OCTETS

| Value     | Parameter Description                                      |
|-----------|------------------------------------------------------------|
| 0XXXXXXXX | Public Device Address or Random Device Address of the peer |
| XXX       | device                                                     |

CONN\_INTERVAL: SIZE: 2 OCTETS

| Value  | Parameter Description                                                                           |
|--------|-------------------------------------------------------------------------------------------------|
| 0XXXXX | Connection interval used on this connection.<br>Range: 0x0006 to 0x0C80<br>Time = N * 1.25 msec |

|                                    |
|------------------------------------|
| Time Range: 7.5 msec to 4000 msec. |
|------------------------------------|

CONN\_LATENCY:

SIZE: 2 OCTETS

| Value  | Parameter Description                                                                                                            |
|--------|----------------------------------------------------------------------------------------------------------------------------------|
| 0xFFFF | Connection latency for this connection.<br>Range: 0x0006 to 0x0C80<br>Time = N * 1.25 msec<br>Time Range: 7.5 msec to 4000 msec. |

SUPERVISION\_TIMEOUT:

SIZE: 2 OCTETS

| Value  | Parameter Description                                                                                                  |
|--------|------------------------------------------------------------------------------------------------------------------------|
| 0xFFFF | Connection supervision timeout.<br>Range: 0x000A to 0x0C80<br>Time = N * 10 msec<br>Time Range: 100 msec to 32 seconds |

[\[Return to Event Table\]](#)

#### ● Disconnection\_Complete (0x72)

| Event                  | OpCode | Event Parameters          |
|------------------------|--------|---------------------------|
| Disconnection_Complete | 0x72   | Connection Handle, Reason |

#### Description:

This event is used to inform that the connection has been terminated.

#### Event Parameters:

CONNECTION\_HANDLE:

SIZE: 1 OCTETS

| Value | Parameter Description                                                               |
|-------|-------------------------------------------------------------------------------------|
| 0xFF  | Connection Handle to be used to identify a connection between two Bluetooth devices |

REASON:

SIZE: 1 OCTET

| Value | Parameter Description                             |
|-------|---------------------------------------------------|
| 0xFF  | Disconnection reason. See listing of Error Codes. |

[\[Return to Event Table\]](#)

#### ● SPP\_Connection\_Complete (0x74)

| Event                   | OpCode | Event Parameters                        |
|-------------------------|--------|-----------------------------------------|
| SPP_Connection_Complete | 0x74   | Status, Connection_Handle, Peer Address |

#### Description:

This event is used to inform MCU that a SPP connection has been created.

### Event Parameters:

STATUS: SIZE: 1 OCTETS

| Value     | Parameter Description              |
|-----------|------------------------------------|
| 0x00      | Connection successfully completed. |
| 0x01~0xff | Connection failed to complete.     |

CONNECTION\_HANDLE: SIZE: 1 OCTETS

| Value | Parameter Description                                                               |
|-------|-------------------------------------------------------------------------------------|
| 0xxx  | Connection Handle to be used to identify a connection between two Bluetooth devices |

PEER\_ADDRESS: SIZE: 6 OCTETS

| Value      | Parameter Description                                      |
|------------|------------------------------------------------------------|
| 0xxxxxxxxx | Public Device Address or Random Device Address of the peer |
| xxx        | device                                                     |

[\[Return to Event Table\]](#)

## 2.19 Common Event

### 2.19.1 Command\_Complete (0x80)

| Event            | OpCode | Event Parameters                  |
|------------------|--------|-----------------------------------|
| Command_Complete | 0x80   | Command_OpCode, Return_Parameters |

### Description:

This event is used to response of commands.

### Event Parameters:

COMMAND\_OPCODE: SIZE: 1 OCTETS

| Value | Parameter Description                          |
|-------|------------------------------------------------|
| 0xxx  | Opcode of the command which caused this event. |

RETURN\_PARAMETERS SIZE:

DEPENDS ON COMMAND

| Value | Parameter Description                          |
|-------|------------------------------------------------|
| 0xxx  | Opcode of the command which caused this event. |

[\[Return to Event Table\]](#)

### 2.19.2 BM77\_Status\_Report (0x81)

| Event              | OpCode | Event Parameters |
|--------------------|--------|------------------|
| BM77_Status_Report | 0x81   | Status           |

### Description:

This event is used to inform MCU status of IS1678S while status is changed and response of “[Read\\_BM77\\_Status](#)” command.

### Event Parameters:

STATUS: SIZE: 1 OCTET

| Value | Parameter Description       |
|-------|-----------------------------|
| 0xXX  | See listing of BM77 Status. |

[\[Return to Event Table\]](#)

## 2.19.3 Configure\_Mode\_Status (0x8f)

| Event                     | OpCode | Event Parameters |
|---------------------------|--------|------------------|
| Configure_Mode_S<br>tatus | 0x8f   | Status           |

### Description:

This event is used to inform MCU Configure Mode status of .

### Event Parameters:

STATUS: SIZE: 1 OCTET

| Value | Parameter Description       |
|-------|-----------------------------|
| 0x00  | Configure Mode is Disabled. |
| 0x01  | Configure Mode is Enabled   |

[\[Return to Event Table\]](#)

## 2.20SPP/GATT Transparent Event

### 2.20.1 Recieved\_Transparent\_Data (0x9a)

| Event                         | OpCode | Event Parameters           |
|-------------------------------|--------|----------------------------|
| Received_Transparen<br>t_Data | 0x9a   | Reserved, Transparent_Data |

### Description:

This event is used to inform MCU that IS1678S has received transparent data by ISSC\_TRANS\_RX service or SPP profile.

### Event Parameters:

RESERVED: SIZE: 1 BYTE

| Value | Parameter Description        |
|-------|------------------------------|
| 0x00  | Always set this byte to be 0 |

TRANSPARENT\_DATA:

SIZE: N OCTETS

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Transparent data      |

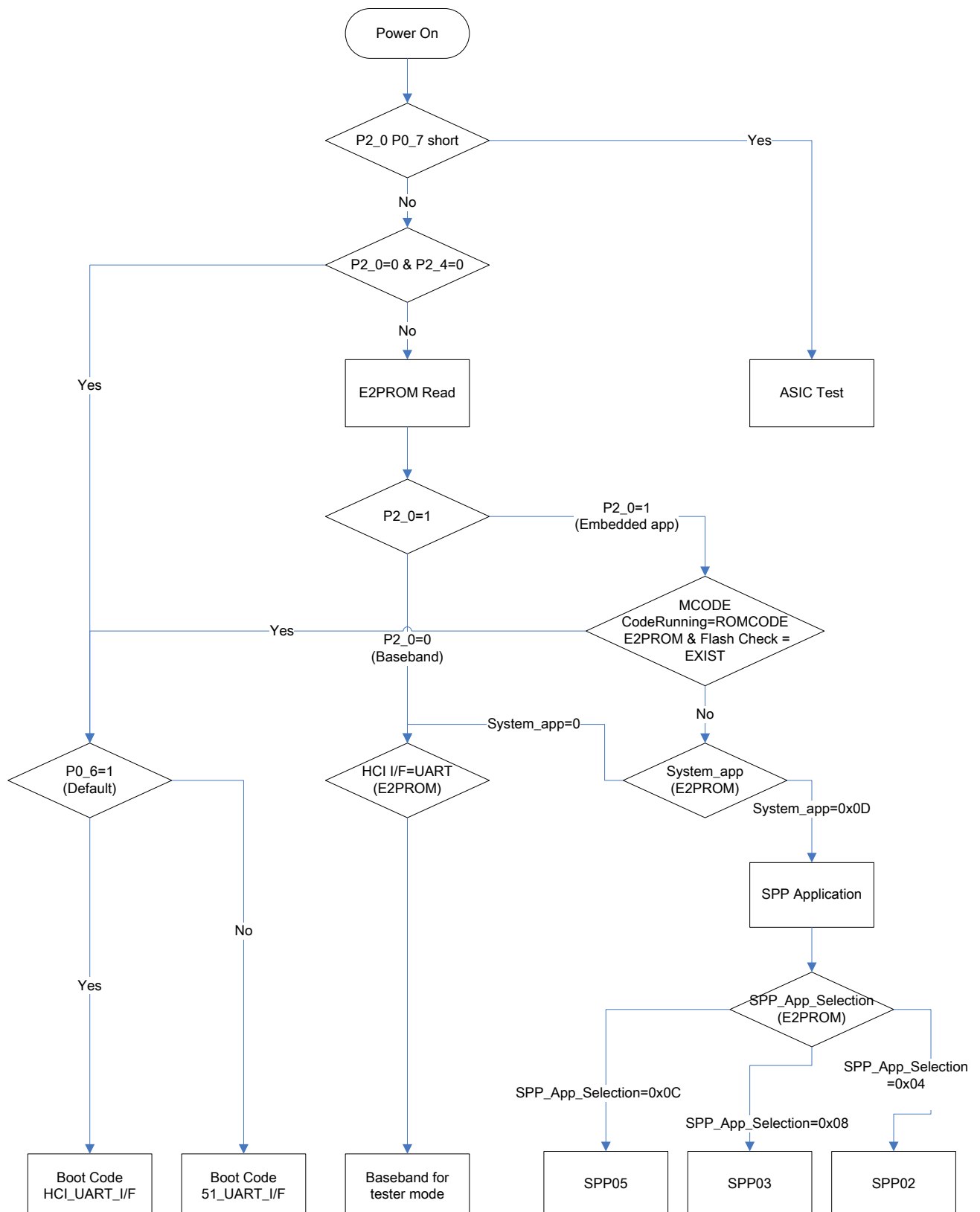
[\[Return to Event Table\]](#)

## 2.21 List of BT Status

| BT Status   | Description                                                 |
|-------------|-------------------------------------------------------------|
| <b>0x00</b> | Power On                                                    |
| <b>0x03</b> | Standby Mode                                                |
| <b>0x04</b> | Link Back Mode                                              |
| <b>0x07</b> | SPP Connected Mode                                          |
| <b>0x08</b> | LE Connected Mode                                           |
| <b>0x09</b> | Idle Mode                                                   |
| <b>0x0a</b> | Shutdown Mode. <b>BM77</b> go to power down mode (S2 mode). |

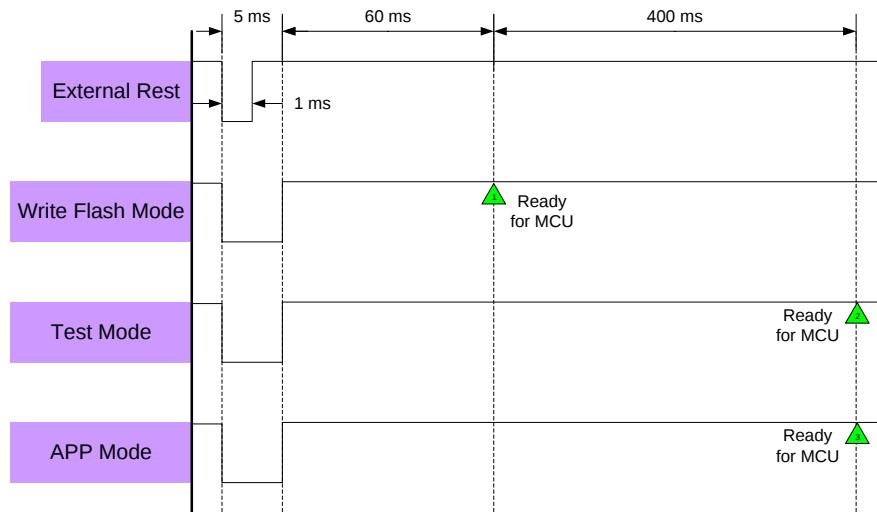
### 3. GPIO & Other Application

#### 3.1. Flow Chart of System Initialization



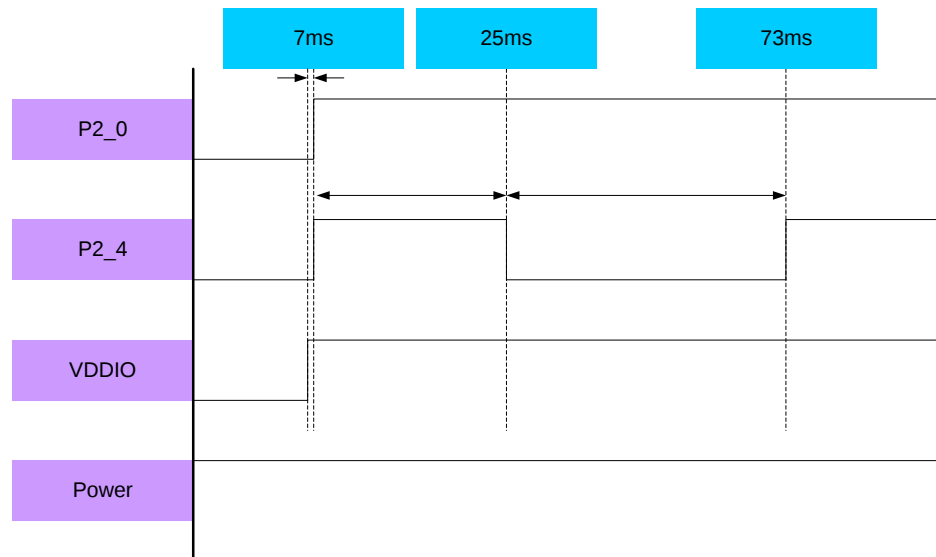
### 3.2. Power on Timing Sequence

- RST\_N



RST\_N Timing Diagram

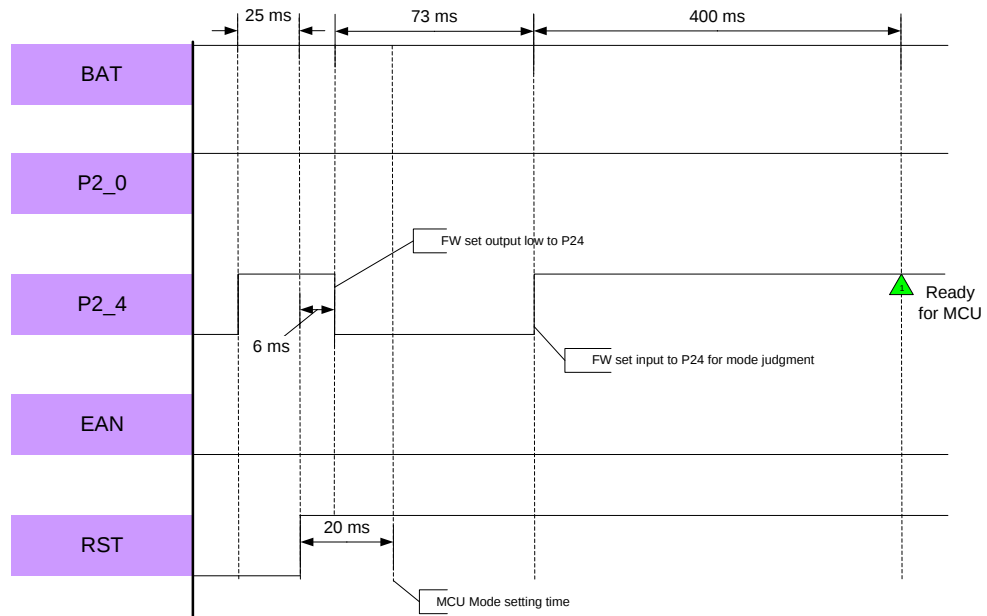
- P2\_0/P2\_4/VDDIO



P2\_0, P2\_4, VDDIO Timing Diagram (In APP Mode)

- APP mode

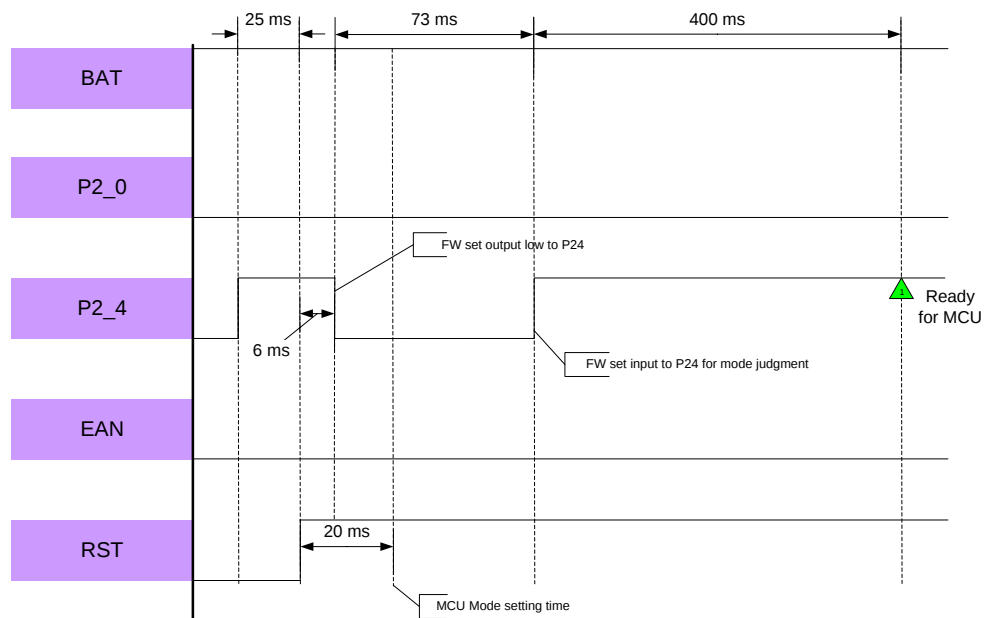
MCU sets P2\_0, P2\_4 and EAN as input or floating.



APP Mode Timing Diagram

- IBDK mode:

MCU output low to P2\_0, P2\_4 and EAN.

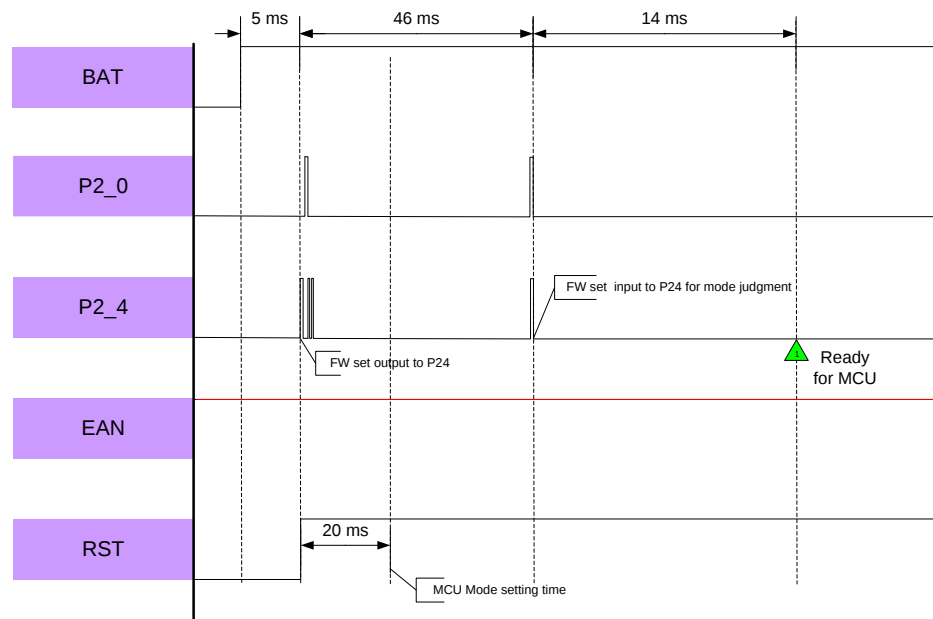


IBDK Mode(Test Mode) Timing Diagram

- Boot mode:

MCU set output low to P2\_0 and P2\_4

### MCU set output high to EAN before BAT power on; Boot by ROM



Boot Mode(Write Flash Mode) Timing Diagram

### 3.3. Configurable GPIO

GPIO pins P0\_0, P0\_5, P1\_7, P3\_1, P3\_2, P3\_3, P3\_4 and P3\_7 are configurable control and indication I/O. Control signals are input to the and indication signals are output from the . Table below shows the configurable I/O pins assignment to control and indication signals.

Please note that UART\_RTS can only be assigned to P0\_0 and UART\_CTS can only be assigned to P1\_7 respectively.

|      | N/C     | UART_RTS | UART_CTS | LOW_BATTERY_IND | LINK_QUALITY_IND | DISCONNECT_CONTROL | UART_TX_IND | UART_RX_IND??? | DISCOVERY_CONTROL | INQUIRY CONTROL | PROFILE_IND |
|------|---------|----------|----------|-----------------|------------------|--------------------|-------------|----------------|-------------------|-----------------|-------------|
| P0_0 |         | Fixed    |          |                 |                  |                    |             | ?              |                   |                 |             |
| P0_5 | Default |          |          |                 |                  |                    |             | ?              |                   |                 |             |
| P1_7 |         |          | Fixed    |                 |                  |                    |             | ?              |                   |                 |             |
| P3_1 |         |          |          |                 |                  |                    |             | ?              |                   | Default         |             |
| P3_2 |         |          |          |                 |                  | Default            |             | ?              |                   |                 |             |
| P3_3 | Default |          |          |                 |                  |                    |             | ?              |                   |                 |             |
| P3_4 | Default |          |          |                 |                  |                    |             | ?              |                   |                 |             |
| P3_7 |         |          |          | Default         |                  |                    |             | ?              |                   |                 |             |

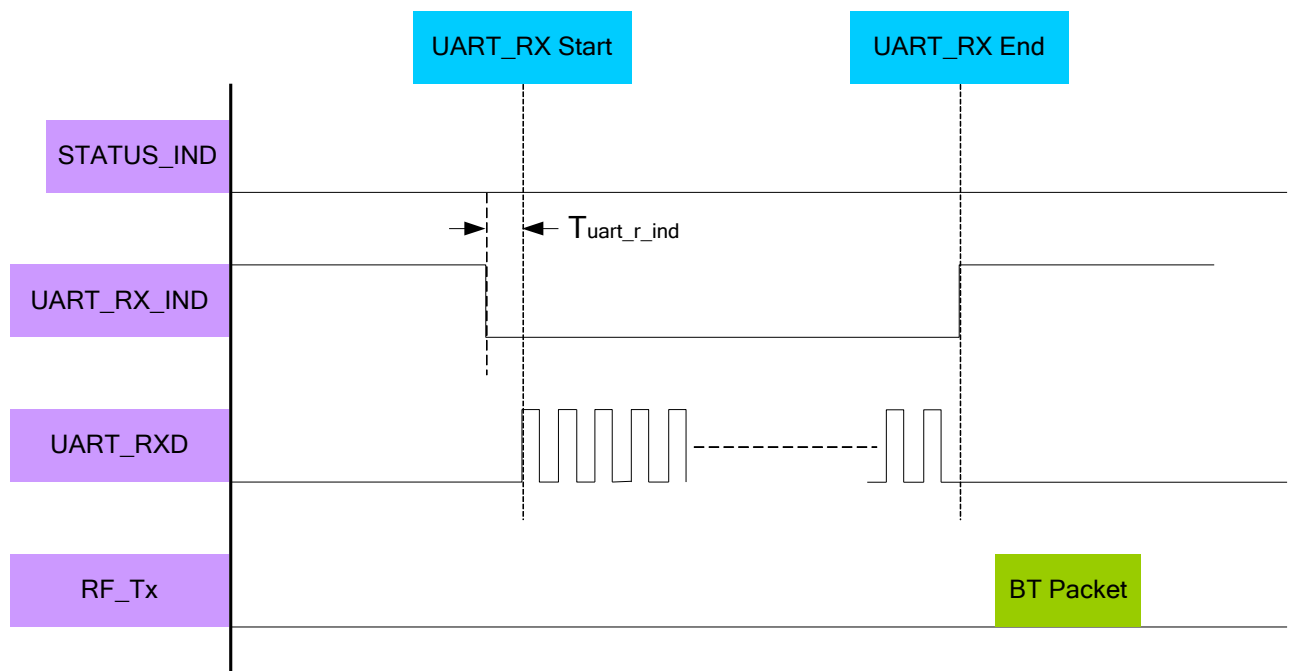
P1\_5 and P0\_4 are dedicated I/O assigned to "Status Indicator 1 and 2". Together they provide status information of IS1678S to the MCU as the table shown below.

| P1_5/STATUS_IND_1 | P0_4/STATUS_IND_2 | Indication |
|-------------------|-------------------|------------|
|-------------------|-------------------|------------|

|   |   |                                       |
|---|---|---------------------------------------|
| H | H | Power default / Shutdown state        |
| H | L | Access state                          |
| L | H | Link state ( UART data transmitted)   |
| L | L | Link state (NO UART data transmitted) |

### 3.4. Low Power Mode Connection

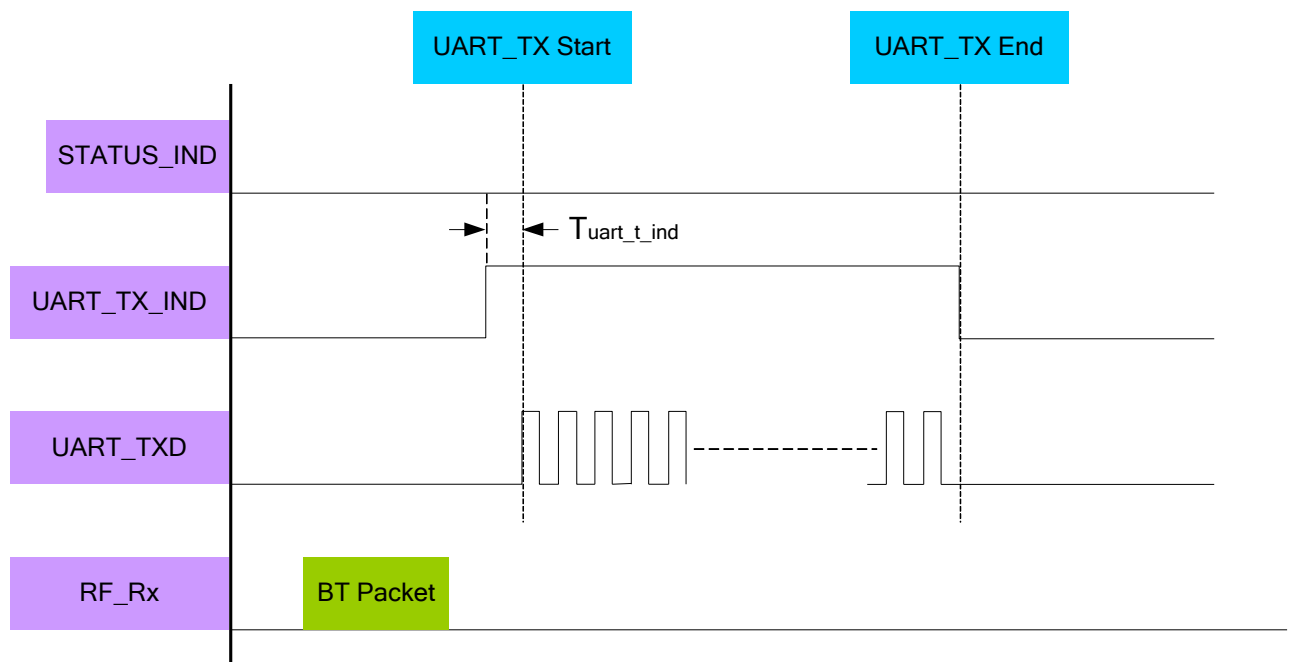
- ◆ Optional feature for continuous Bluetooth connection.
- ◆ Bluetooth Sniff mode supported and configurable Sniff mode parameters by E2PROM setting.
- ◆ Configurable Bluetooth Low Energy Connection parameters.
- ◆ For Bluetooth 3.0, in order to enter low power mode, Sniff interval and UART RX\_IND (default setting PIN: P3\_3 in EEPROM) should be enabled by E2PROM setting.
- ◆ For Bluetooth 4.0, UART RX\_IND should be enabled by E2PROM setting to enter low power mode.
- ◆ Fig.2 shows the related timing (Bluetooth 3.0 and 4.0 UART data transmission), when UART RX\_IND function is enabled.



\*  $T_{uart\_r\_ind} > 2ms$

Fig1. Host\_MCU indicate UART data timing diagram

- Fig.3 shows the related timing, when indicates HOST MCU UART data transmission. This function works under both Bluetooth 3.0 and 4.0 modes. If MCU doesn't need UART\_TX\_IND, please keeps this pin (P0\_4) floating.



\*  $T_{uart\_t\_ind}$ : by E2PROM setting (Default 5ms)

Fig2. Indicate Host\_MCU UART data timing diagram

### 3.5. Other Utility features

- ◆ State indication by P1\_5 (STATUS\_IND) and P0\_4 (STATUS\_IND\_2).

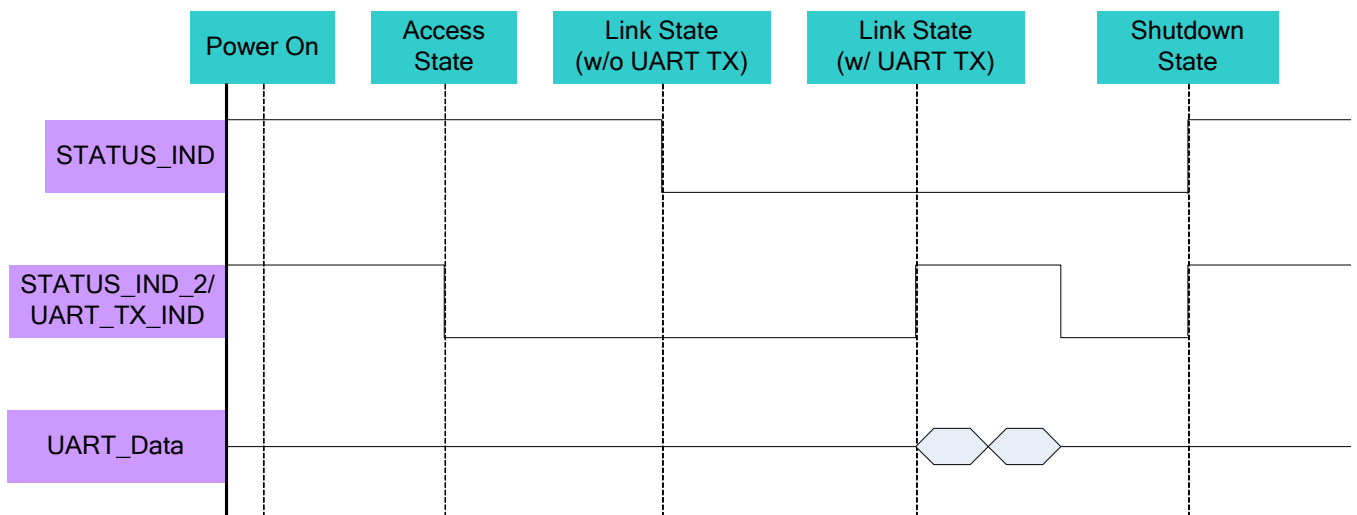


Fig3. State shown by STATUS\_IND Pin status

- ◆ Drop Bluetooth connection by LINK\_DROP control.

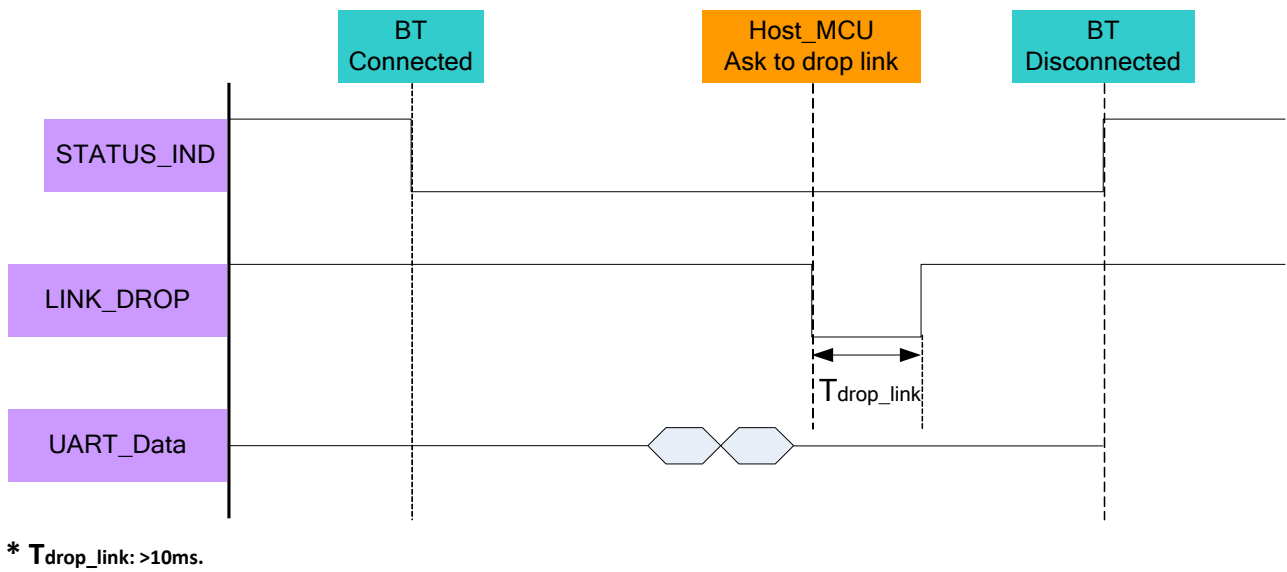
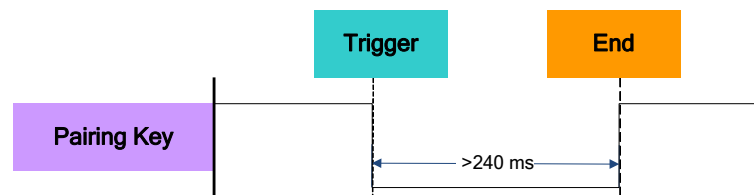
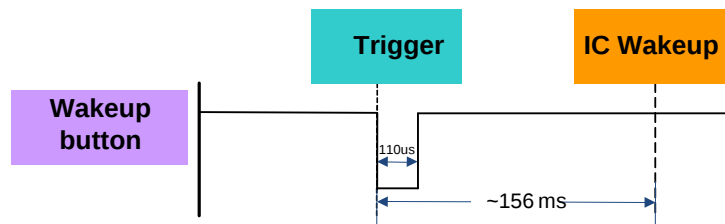


Fig4. Host\_MCU ask to drop link timing diagram

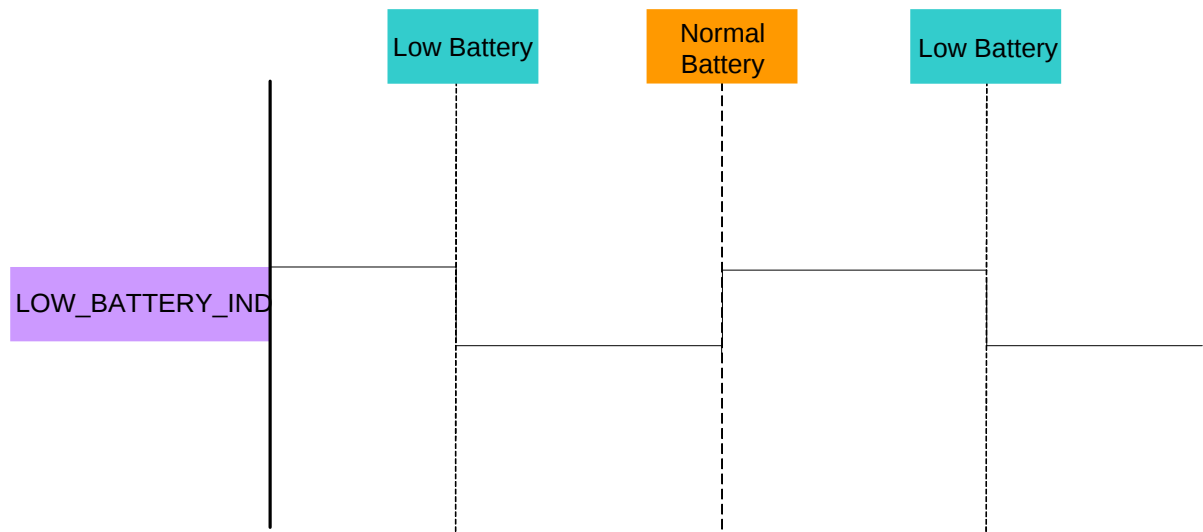
- ◆ Force device into Standby Mode by trigger Pairing Key (Condition: pull low over 240ms)



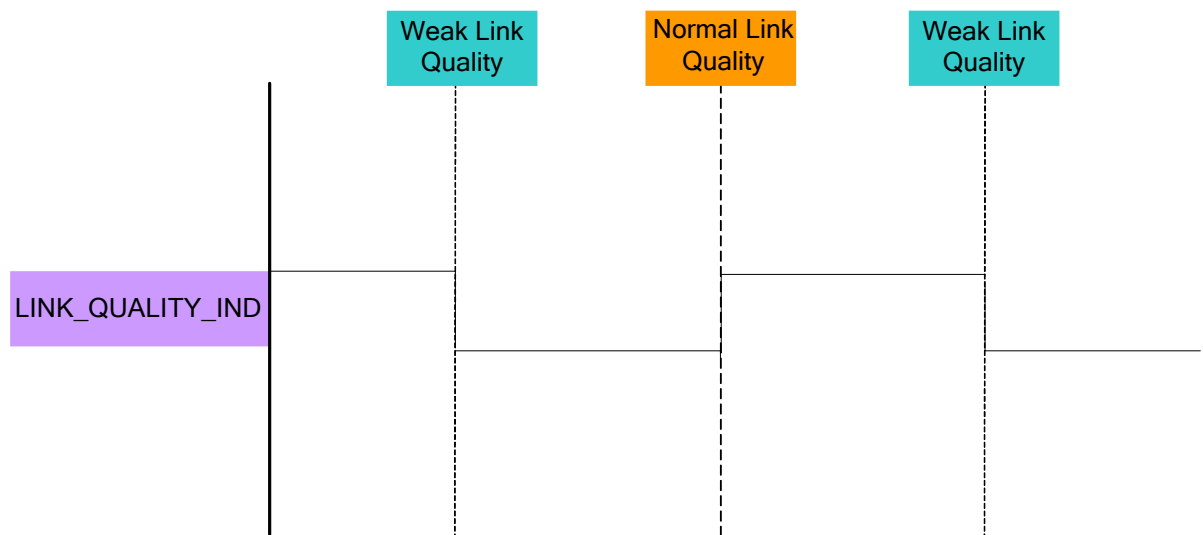
- ◆ Resume from Shutdown State by WAKEUP low active control.



- ◆ Low battery indication by LOW\_BATTERY\_IND.



◆ Weak link quality indication by **WEAK\_LINK\_QUALITY\_IND**

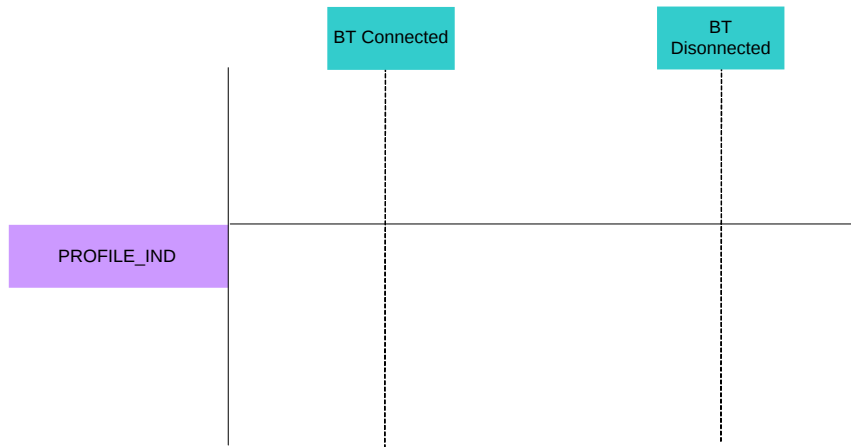


### 3.6. Profile Indication

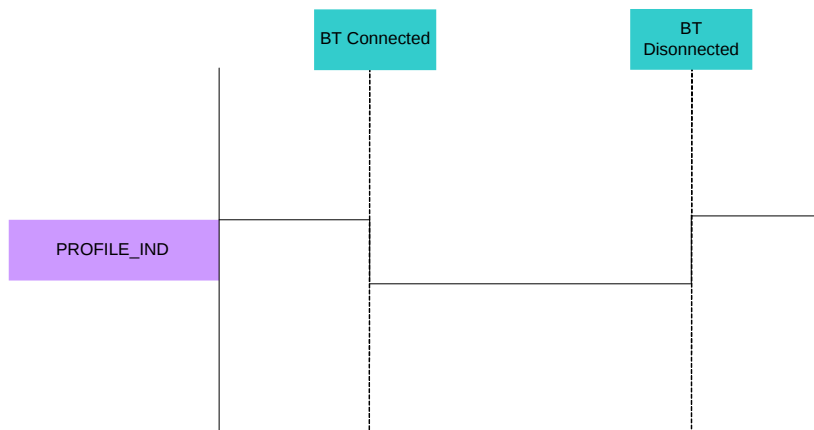
Profile indication (Configurable GPIO) can be configured by E2PROM. It is used for BT connection indication. If the link is established under BR/EDR, **PROFILE\_IND** outputs as HIGH. Otherwise if the link is established under BLE, **PROFILE\_IND**

outputs as LOW. It is valid only when the BT is connected (Link State).

- BT connection is established under BR/EDR

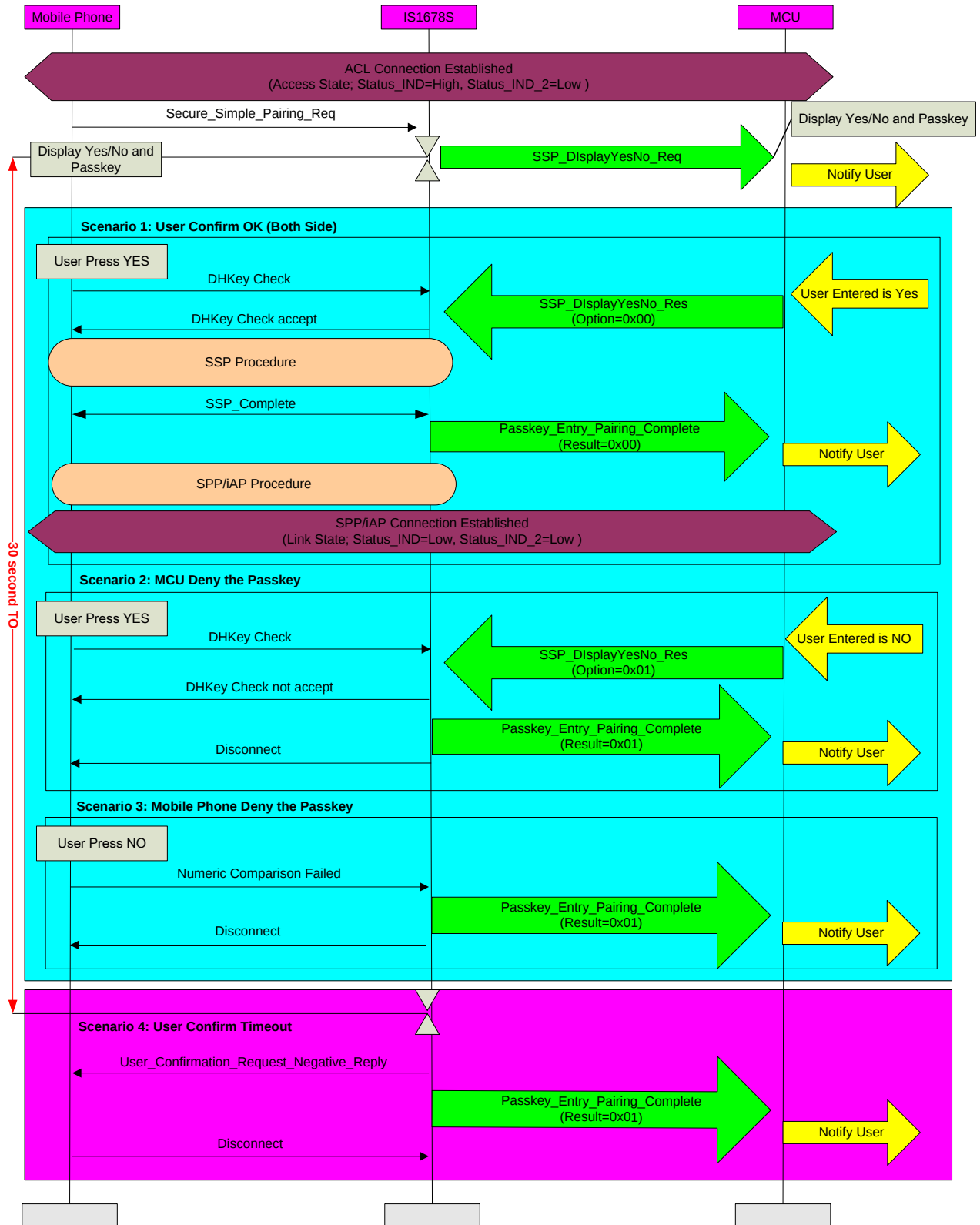


- BT connection is established under BLE

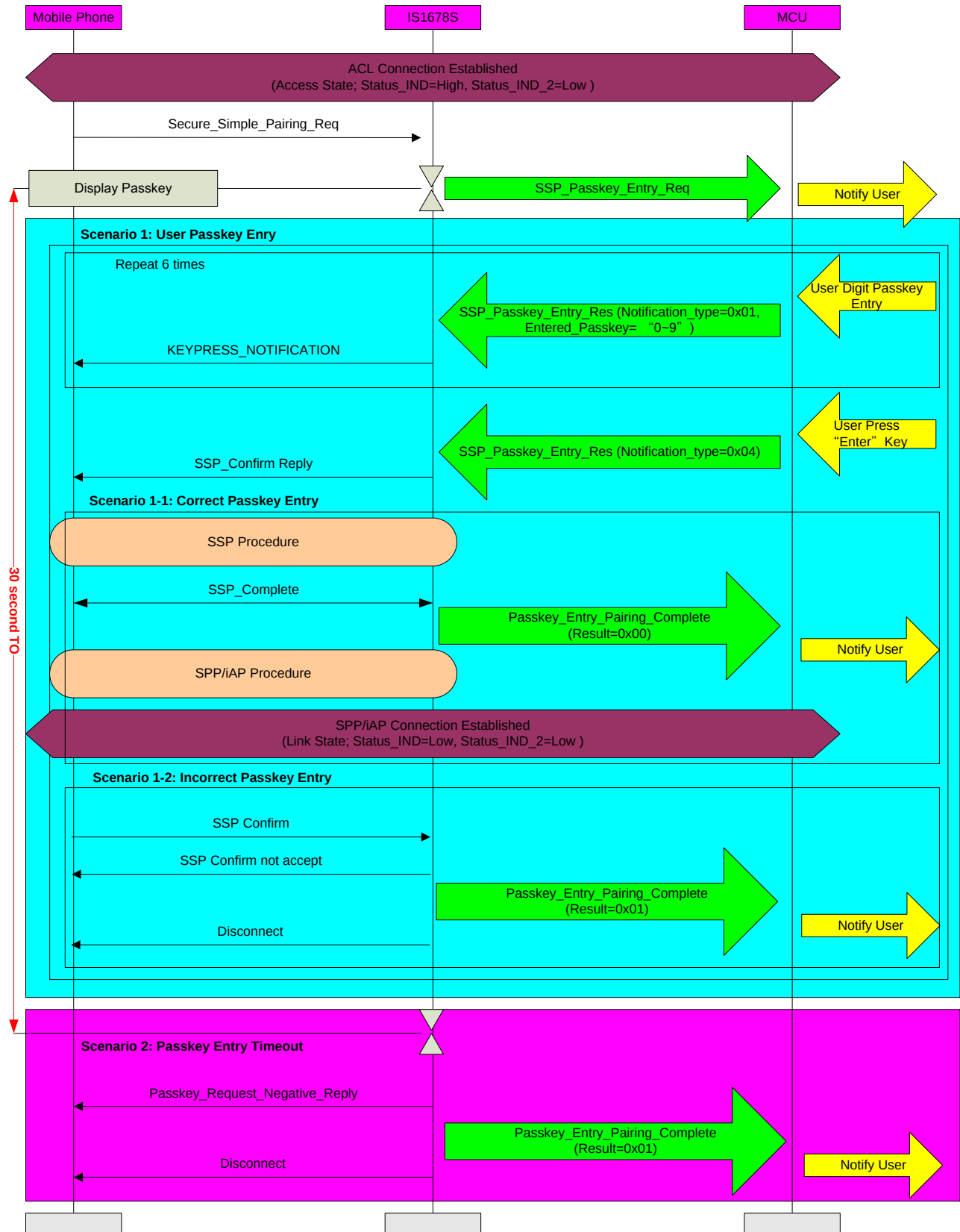


### 3.7. Security MSC

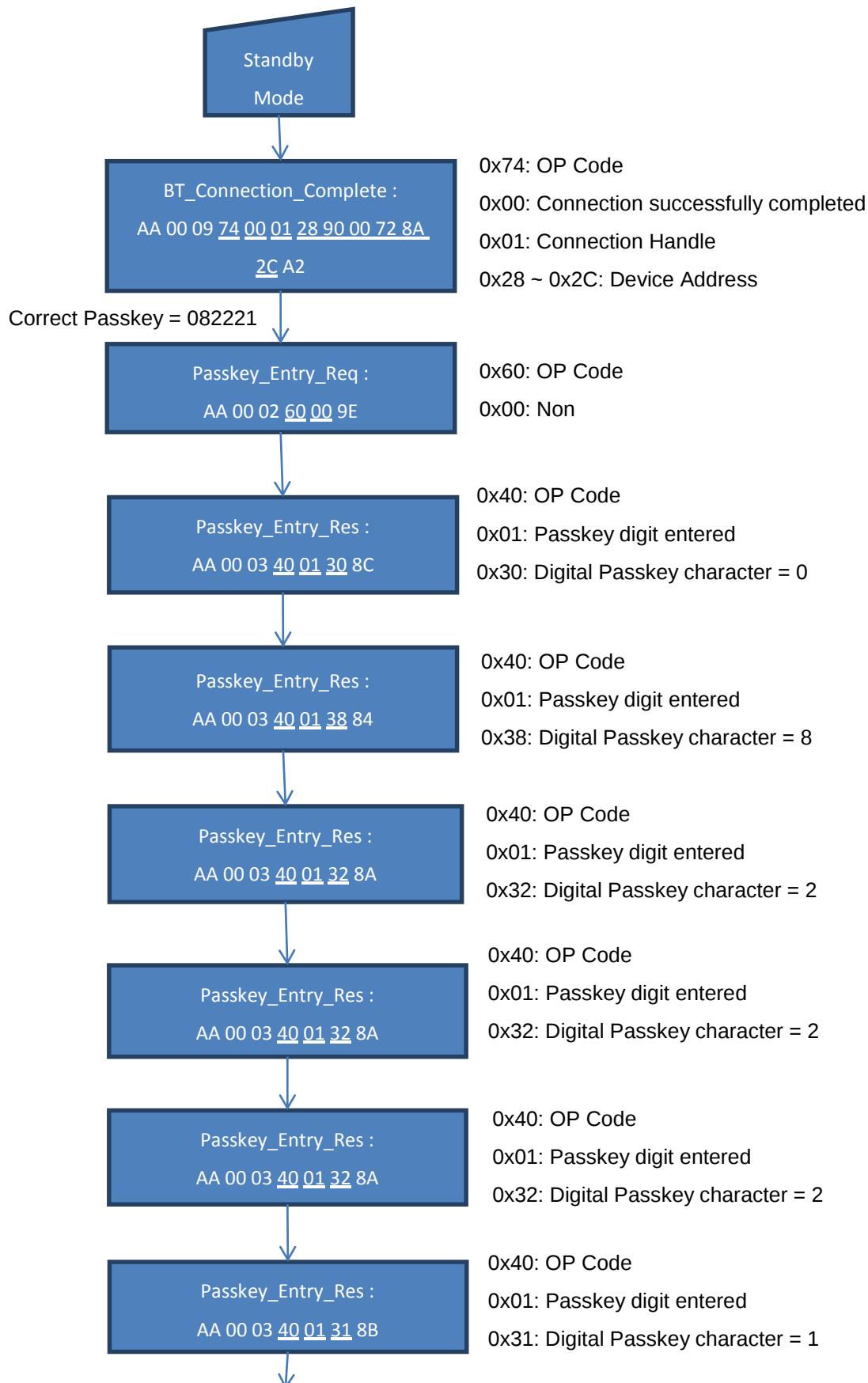
#### 3.8.1 SPP Pairing (User Confirm)

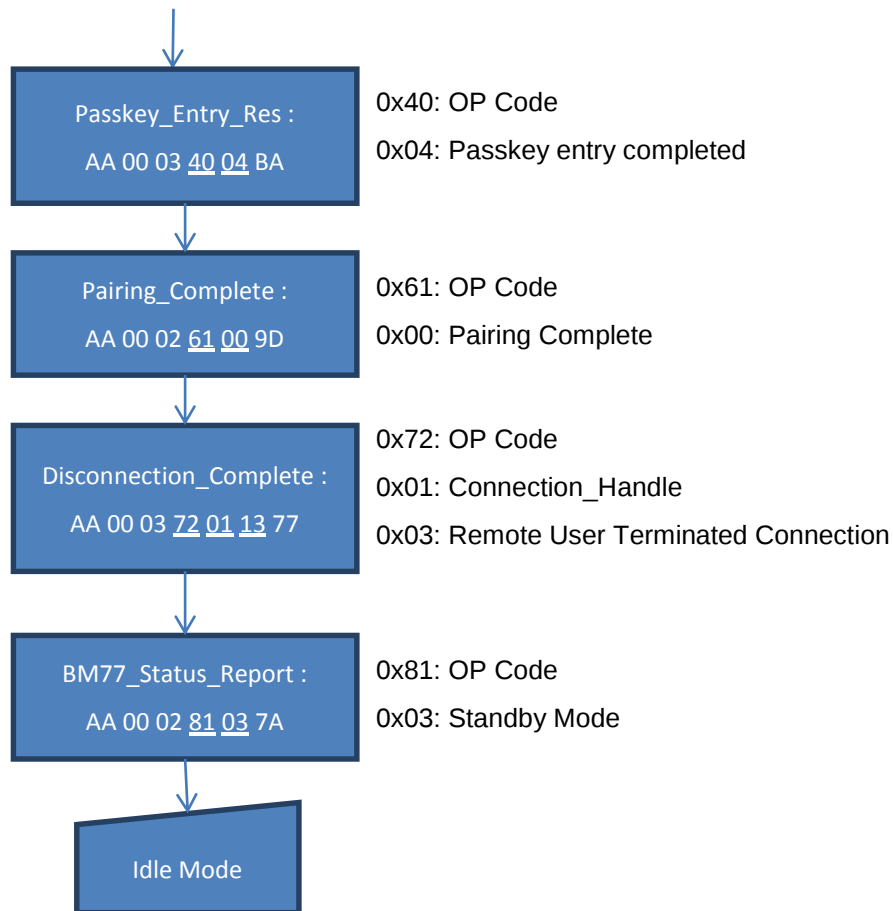


### 3.8.2 SPP Pairing (Passkey Entry)

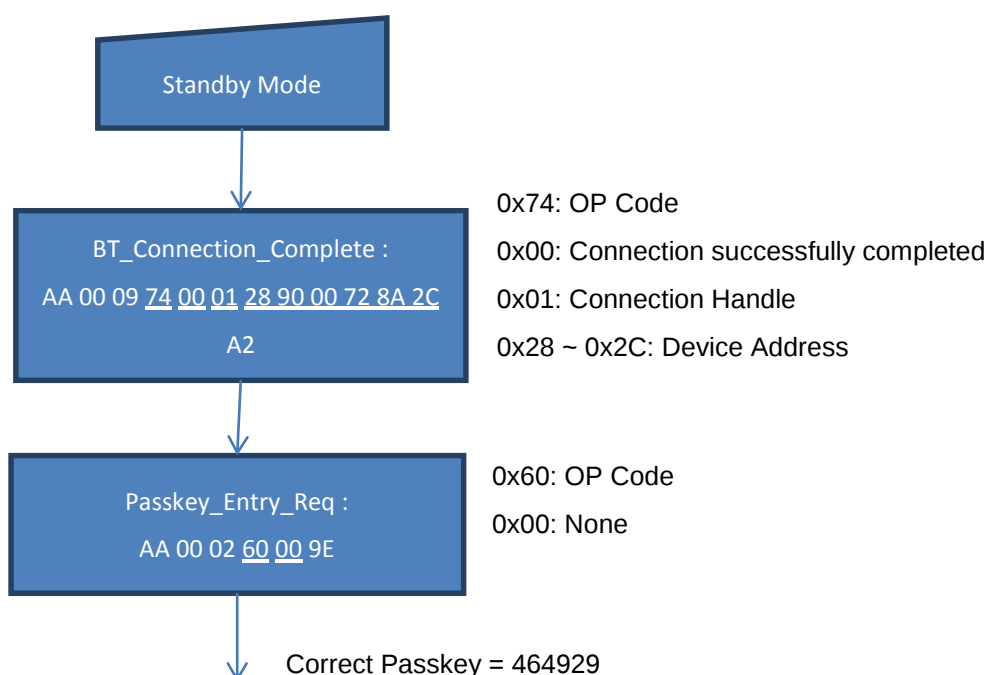


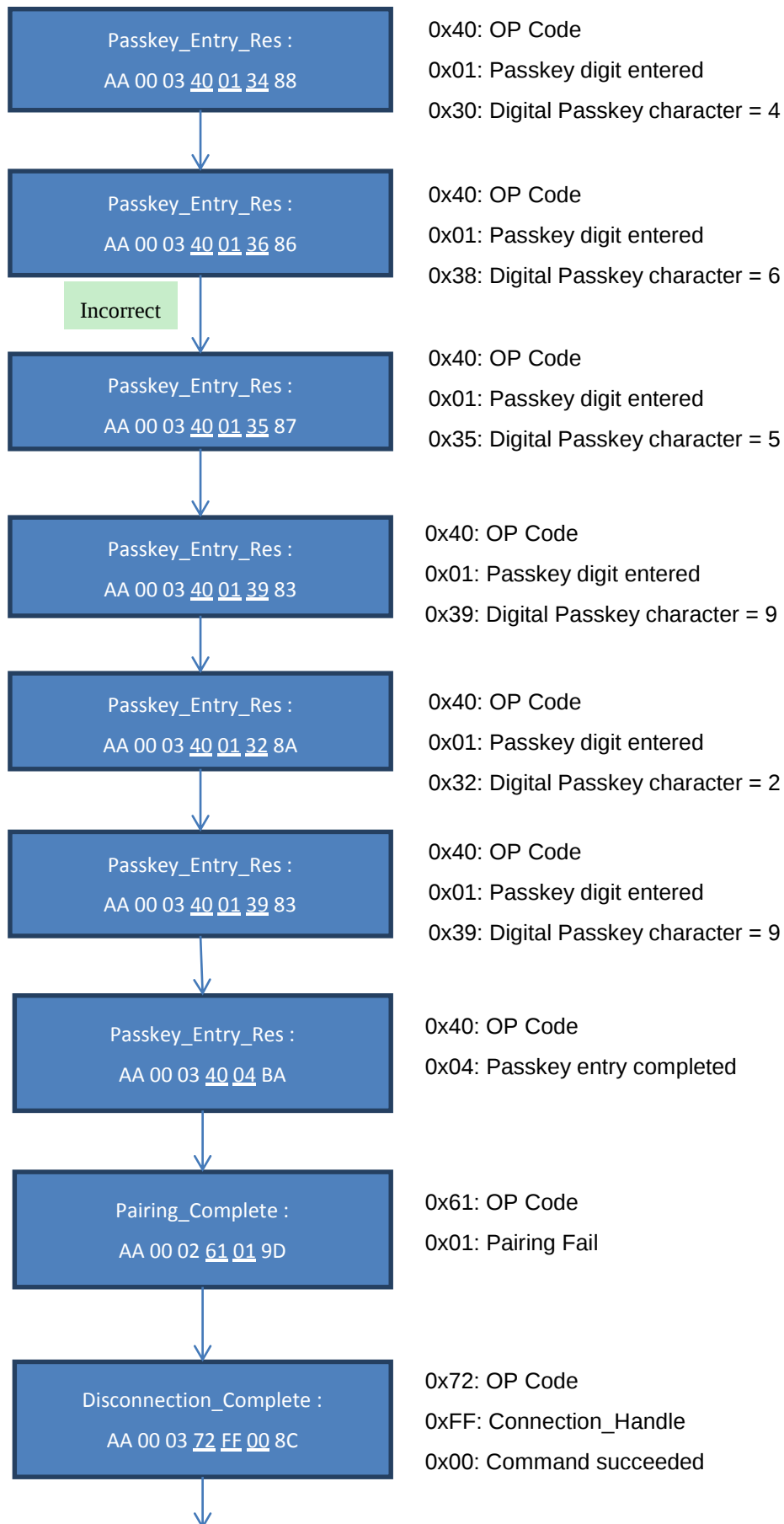
### 3.8.3 Correct Passkey Entry Procedure

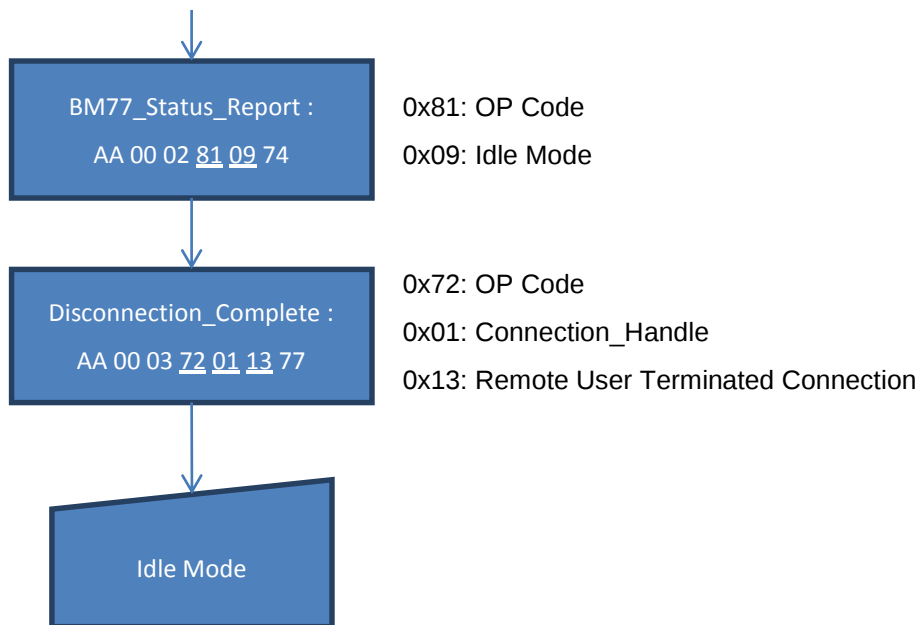




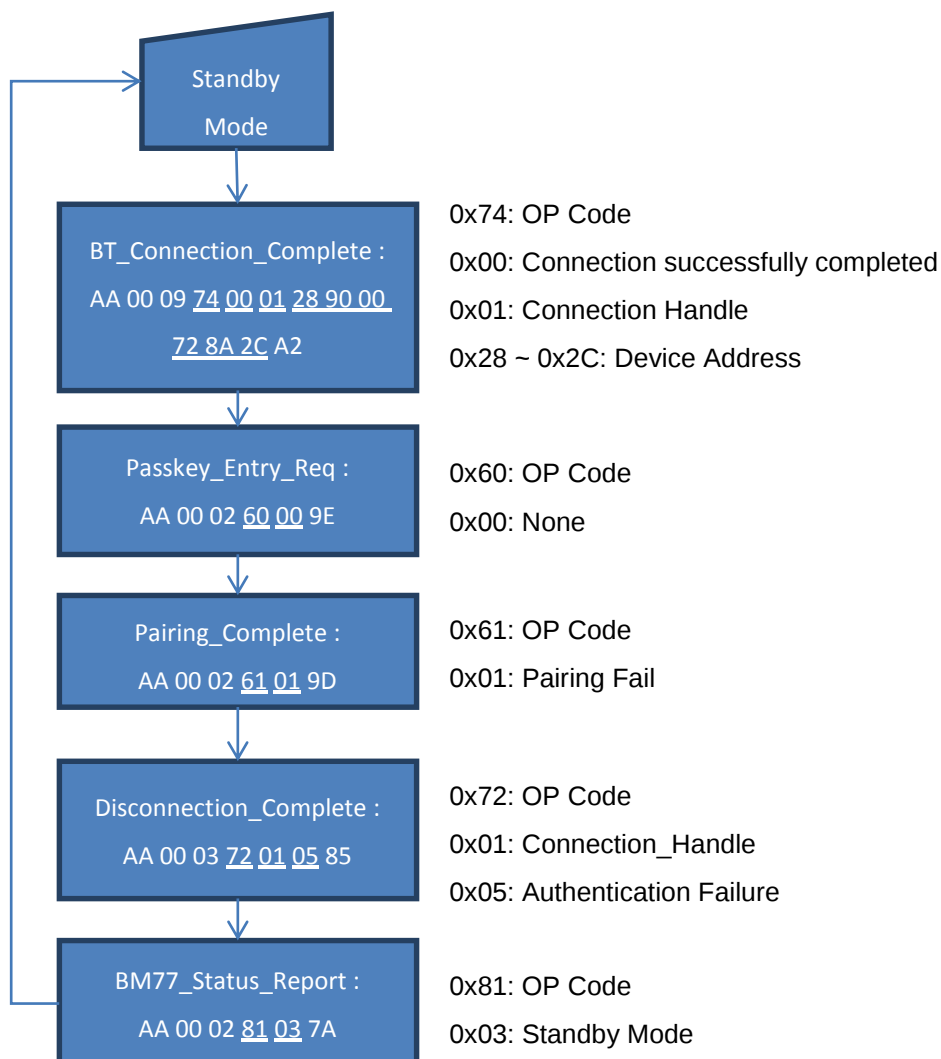
### 3.8.4 Incorrect Passkey Entry Procedure



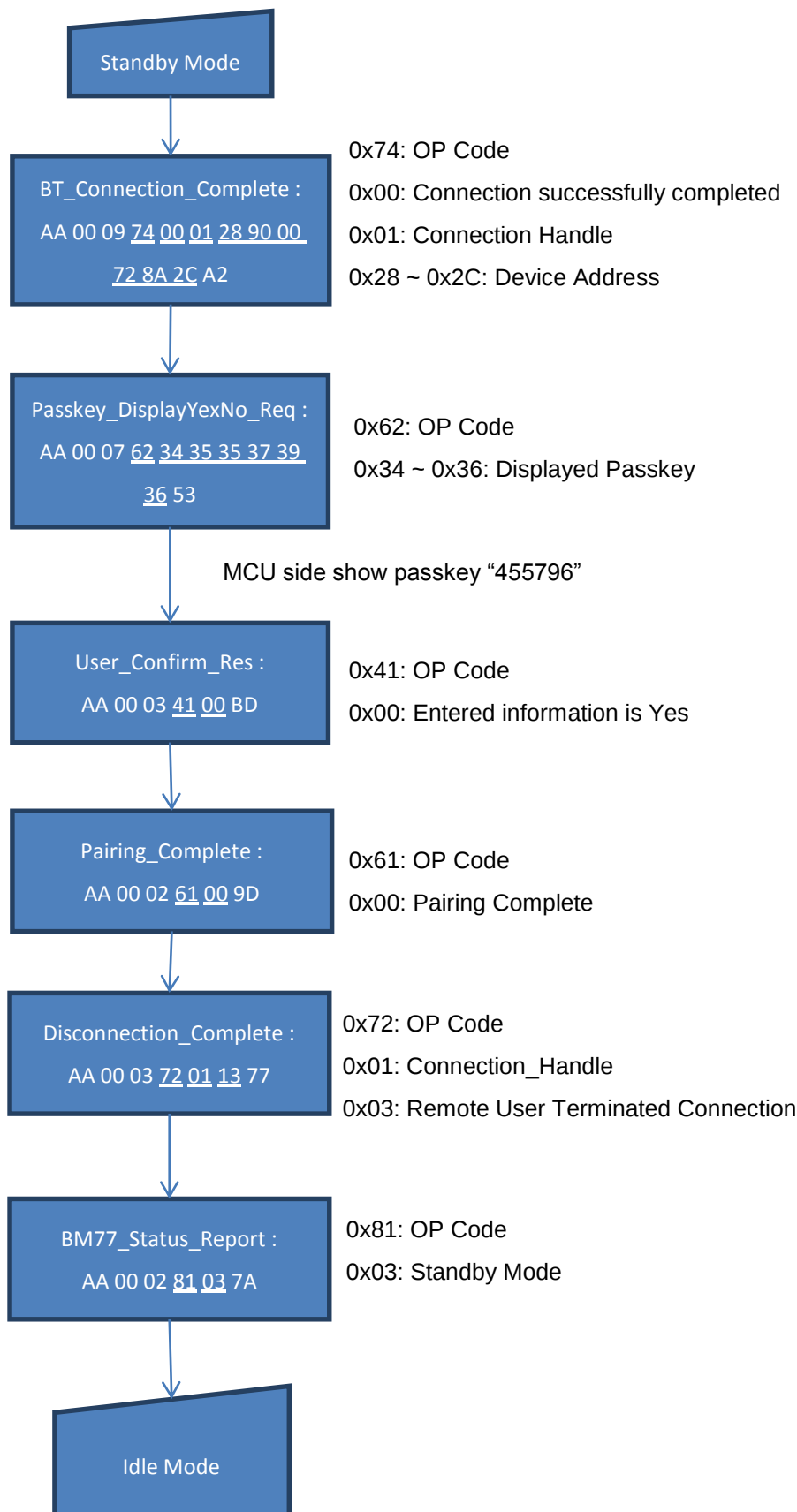




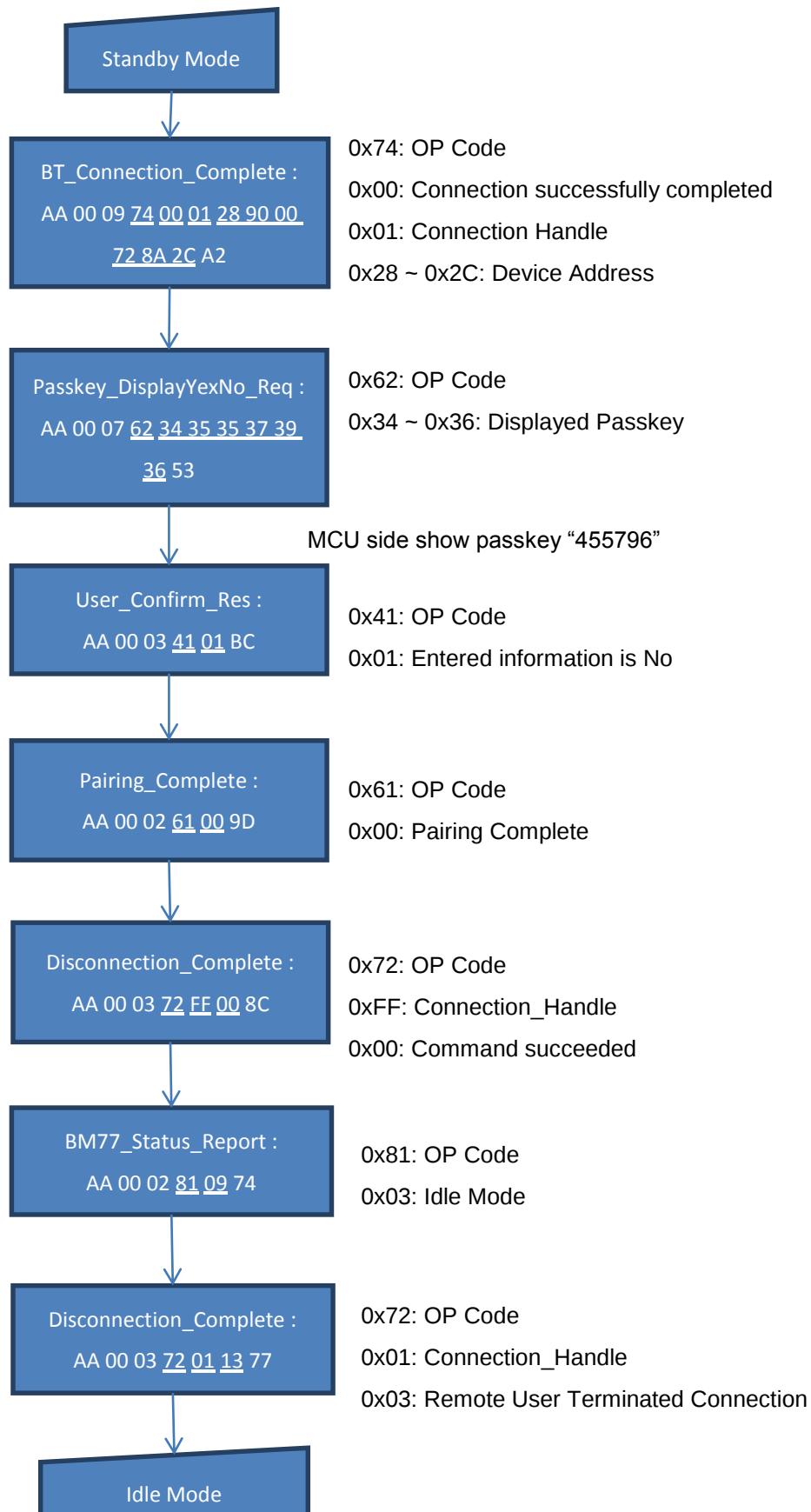
### 3.8.5 Timeout Passkey Entry Procedure



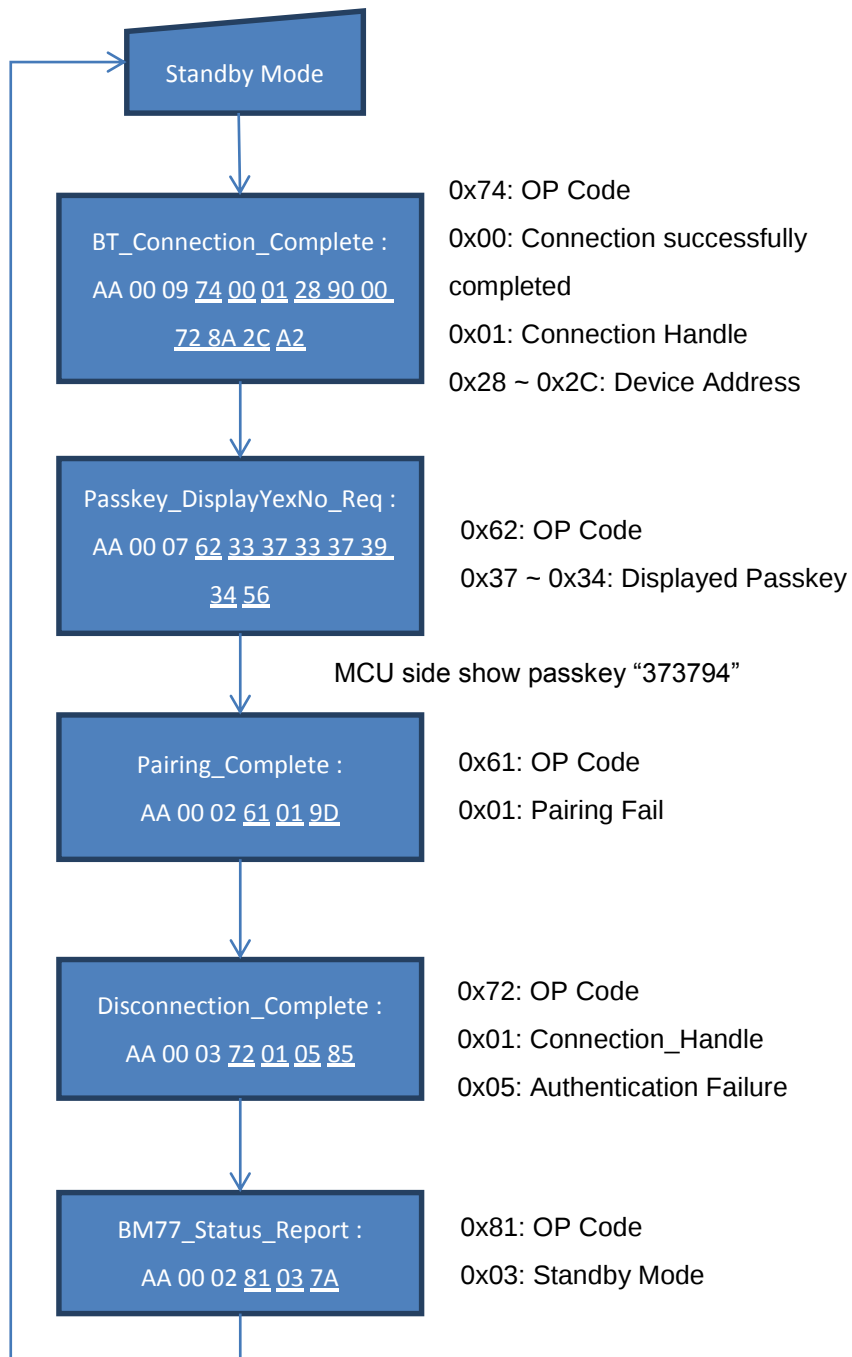
### 3.8.6 Passkey Confirm Pass Procedure



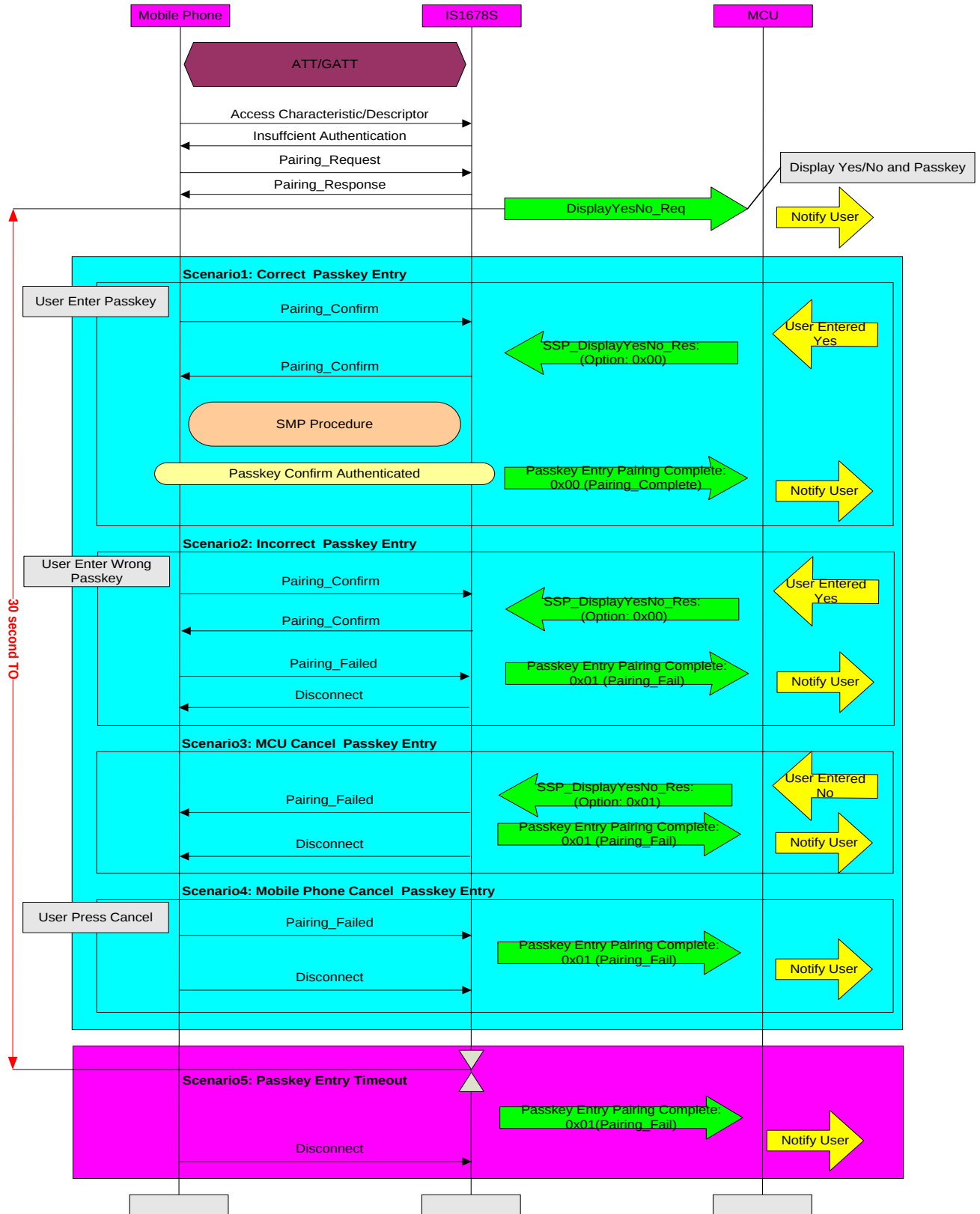
### 3.8.7 Passkey Confirm Denied Procedure



### 3.8.8 Passkey Confirm Timeout Procedure



### 3.8.9 BLE SMP<sup>1</sup> (Passkey Confirm)

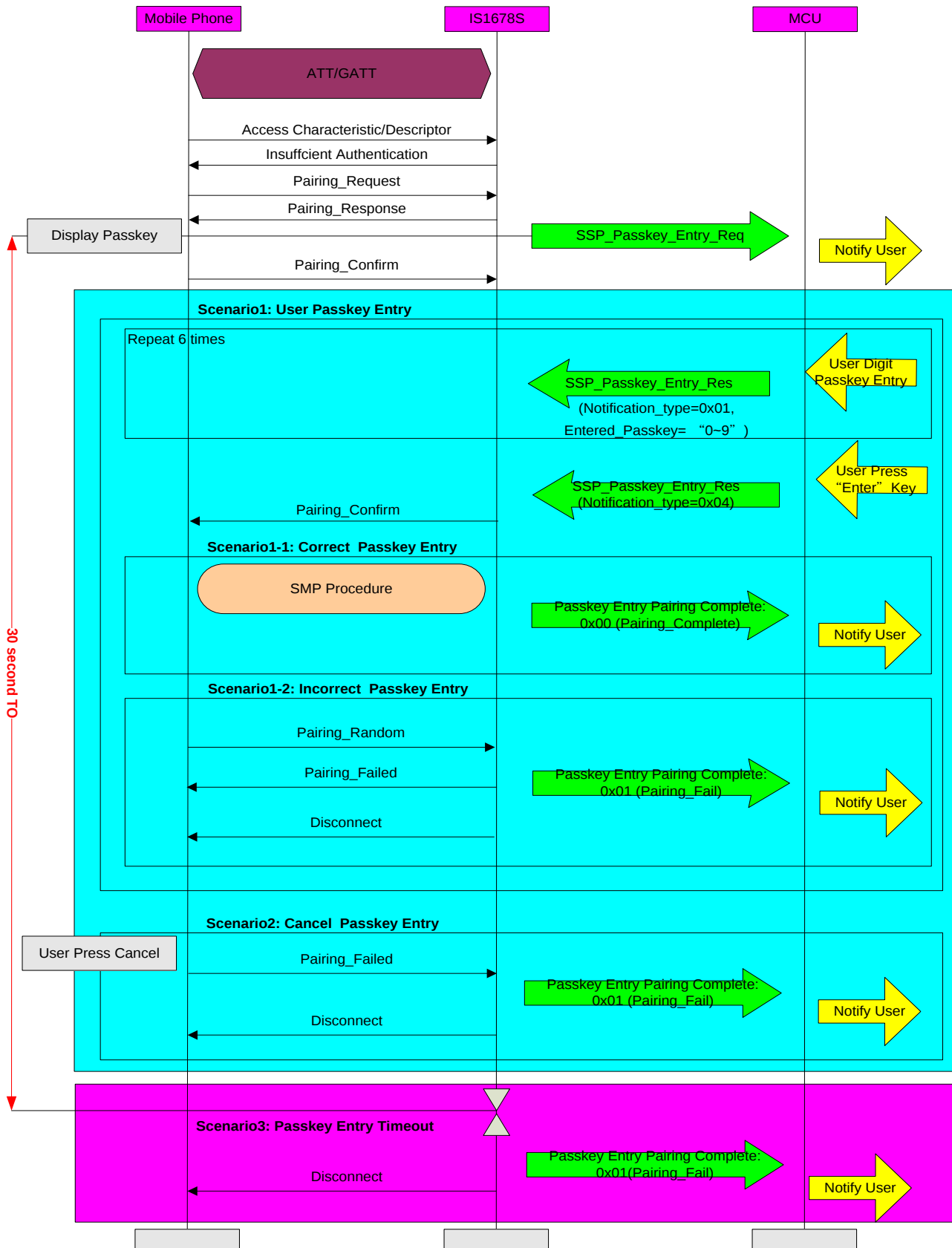


1: Security manager protocol (SMP)

### 3.8.10 BLE SMP (Passkey Confirm “refer to pin code”- by UI setting)

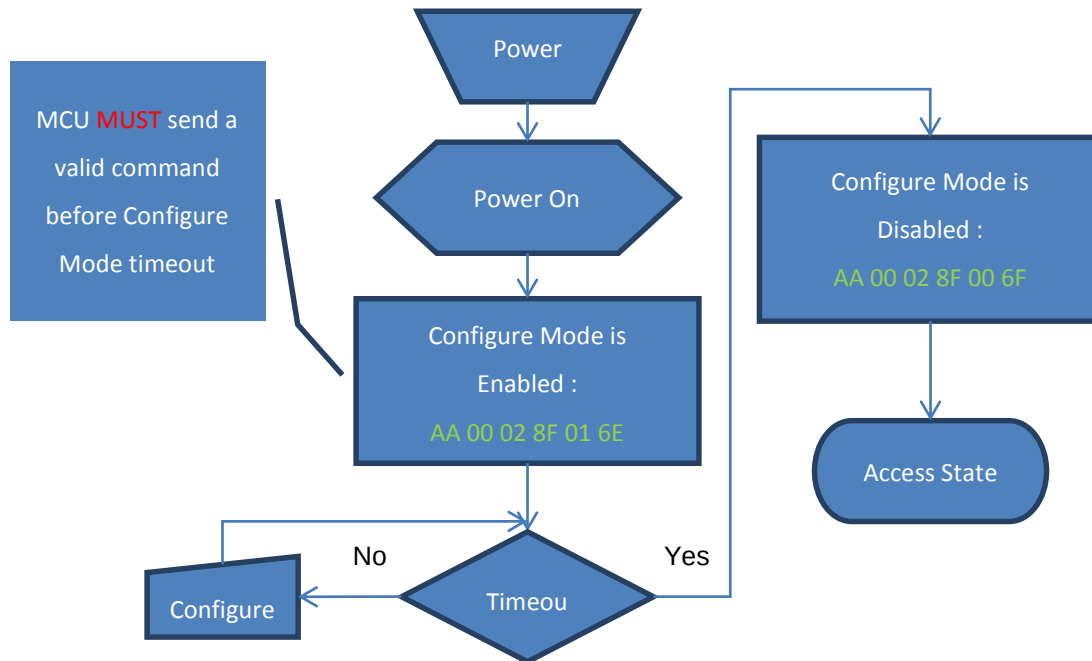


### 3.8.11 BLE SMP (Passkey Entry)

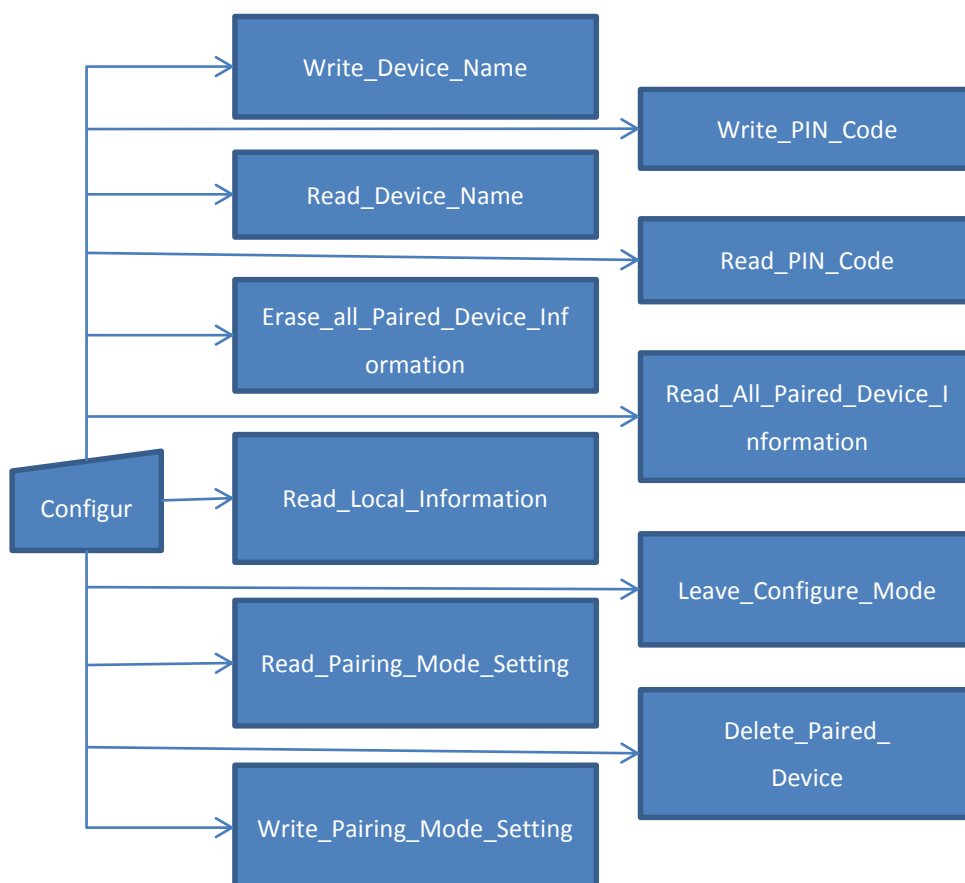


### 3.9. Standard Operating Procedure

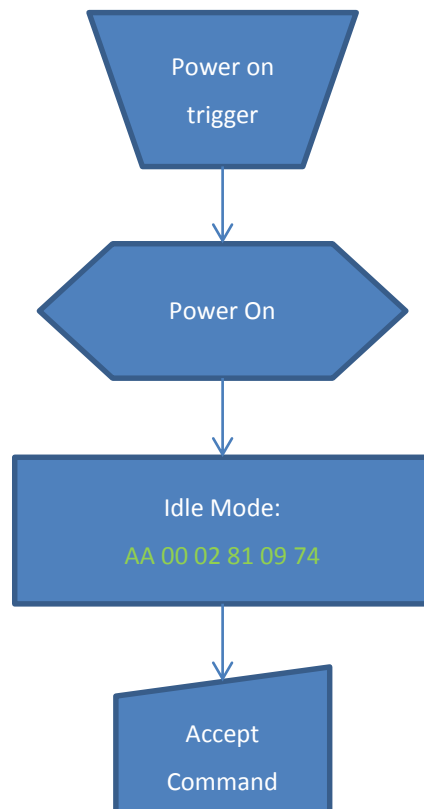
#### 3.10.2 Auto pattern w/ Configure Mode



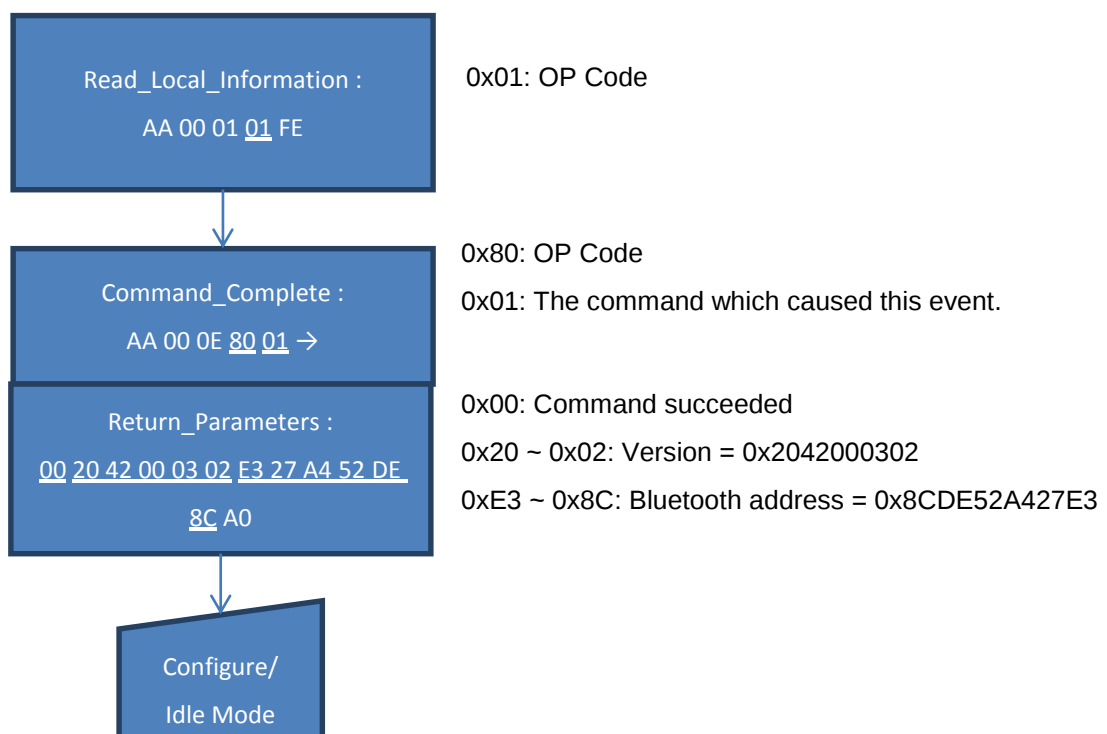
#### 3.10.2 Configure Mode



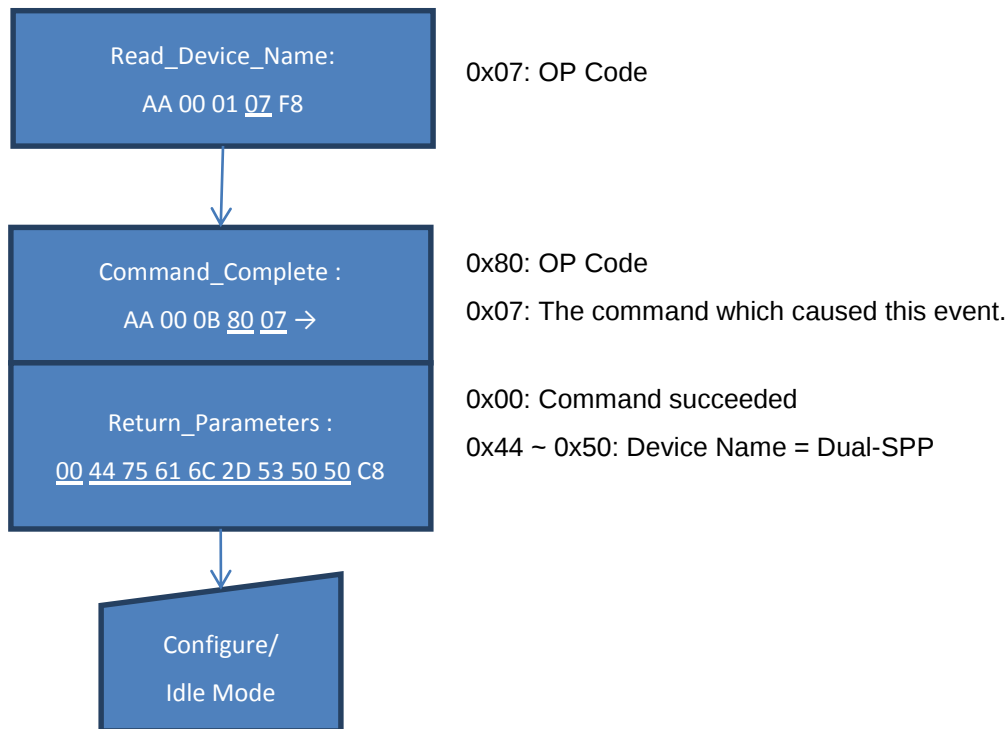
### 3.10.2 Manual pattern



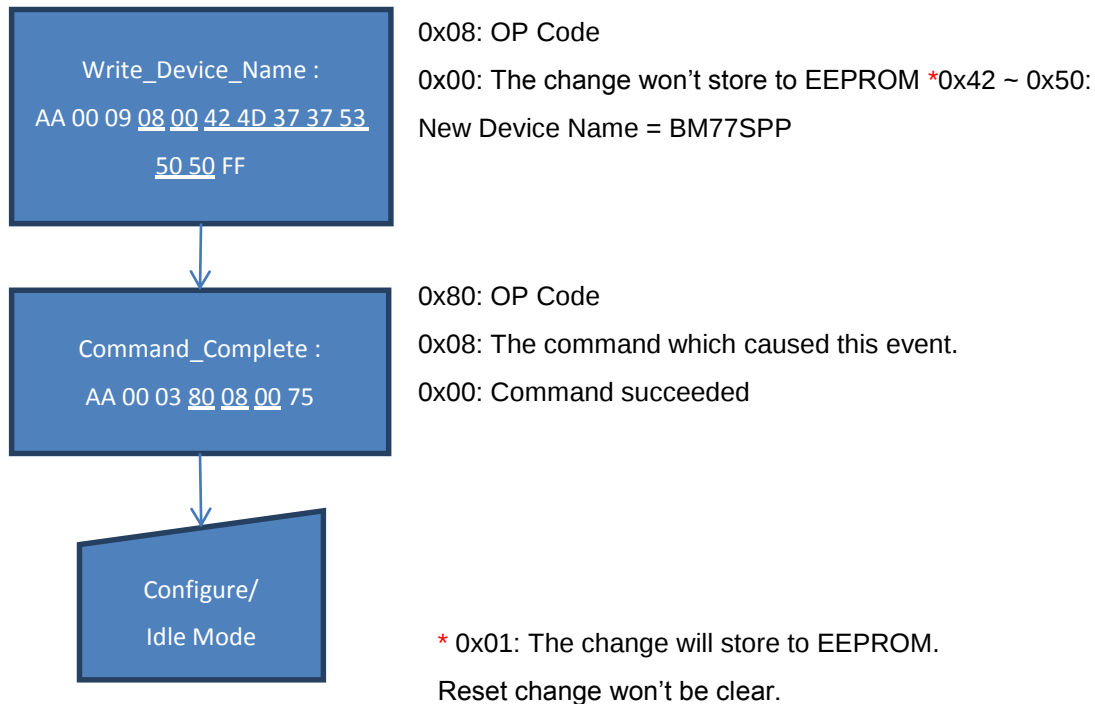
### 3.10.2 Read\_Local\_Information



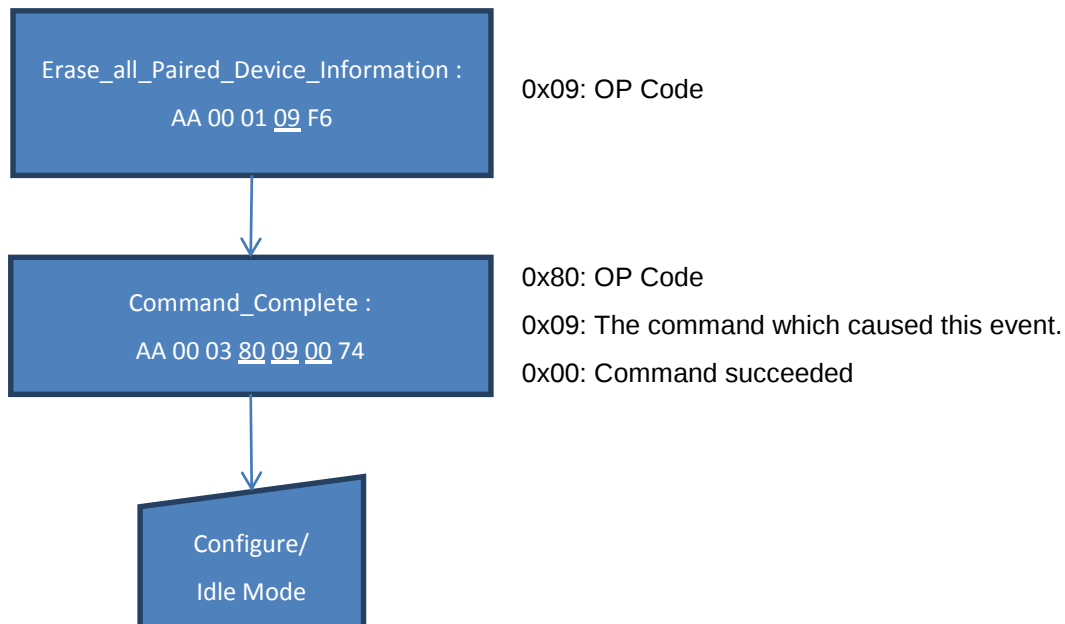
### 3.10.2 Read\_Device\_Name



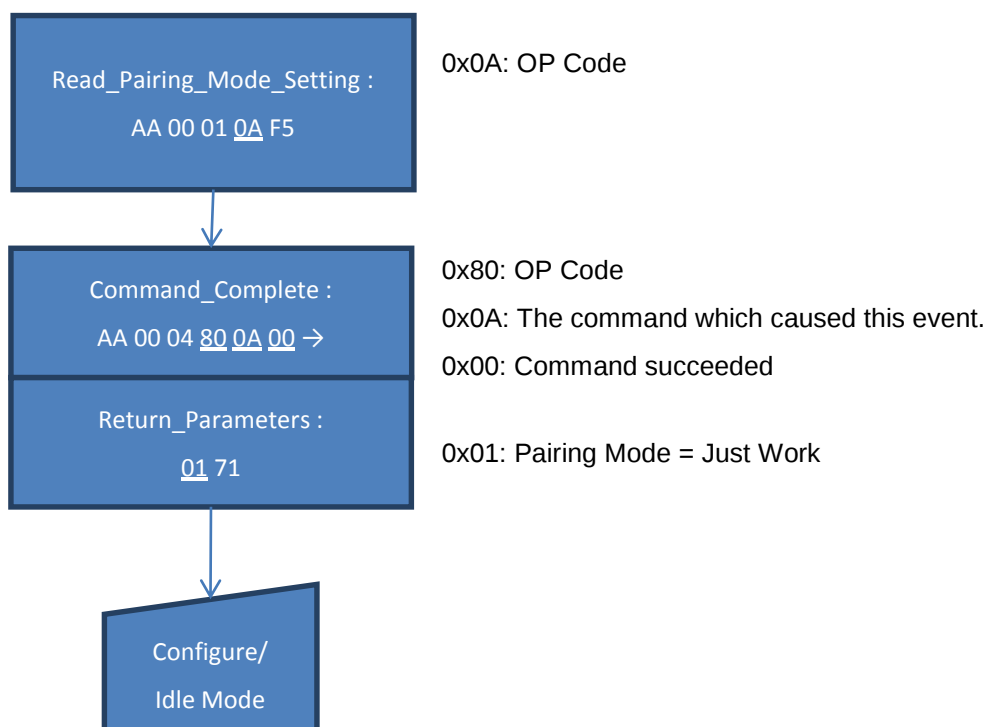
### 3.10.2 Write\_Device\_Name



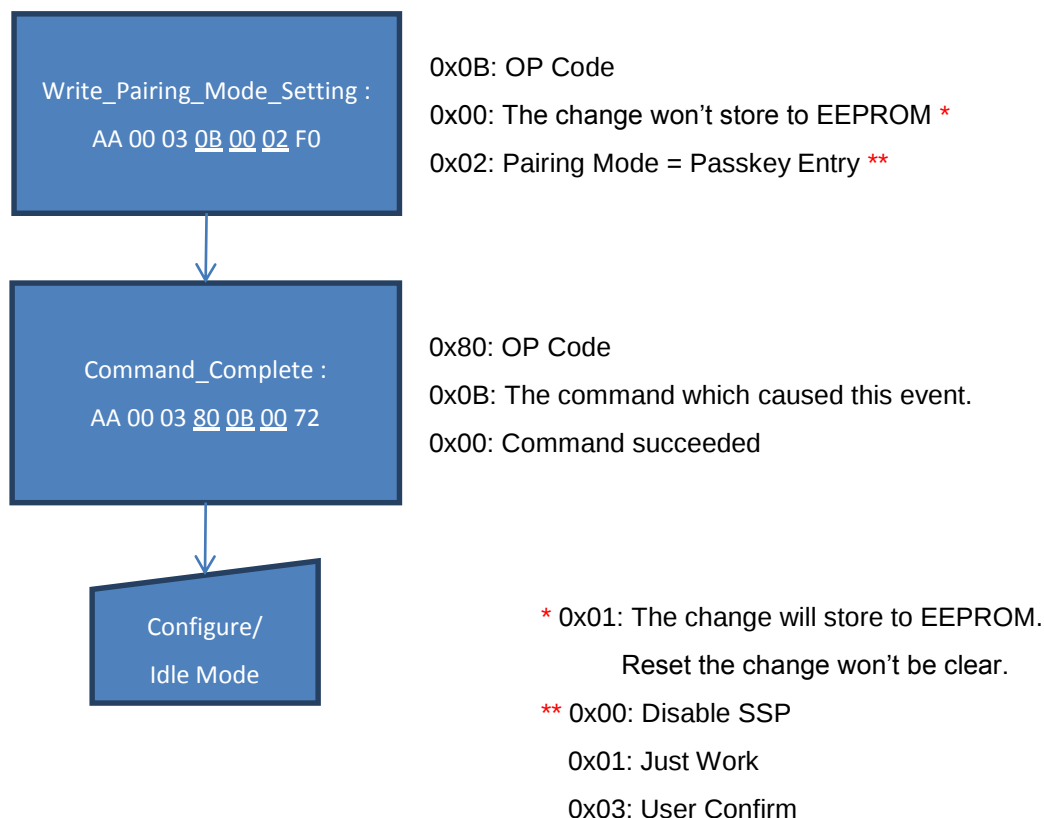
### 3.10.2 Erase\_all\_Paired\_Device\_Information



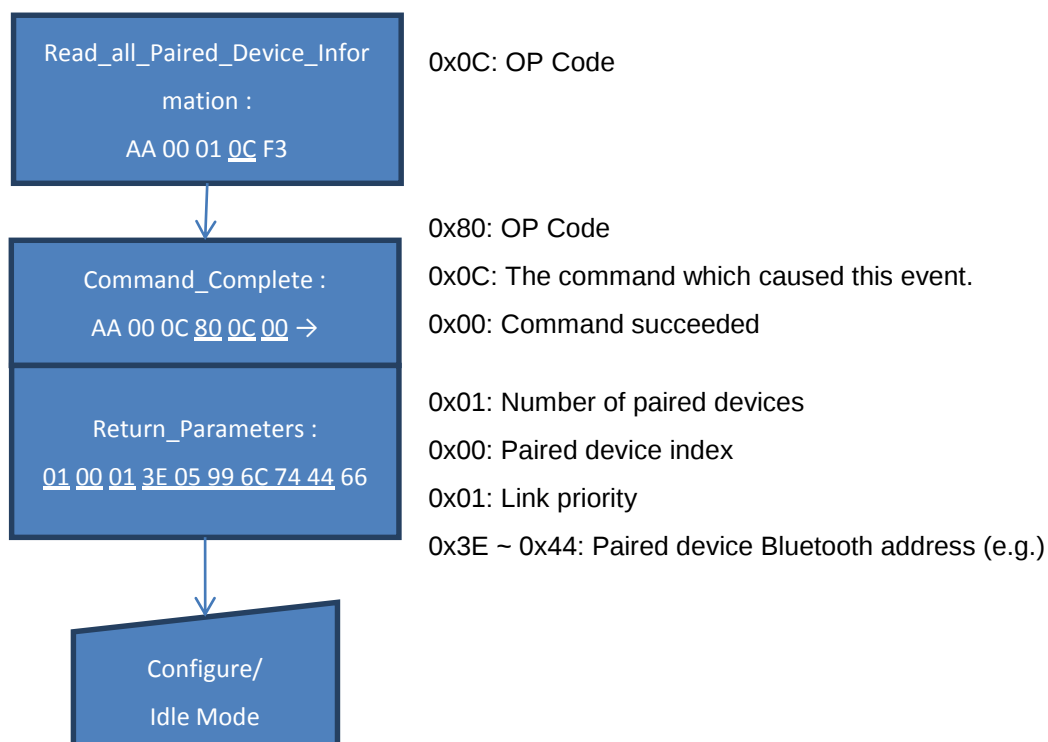
### 3.10.2 Read\_Pairing\_Mode\_Setting



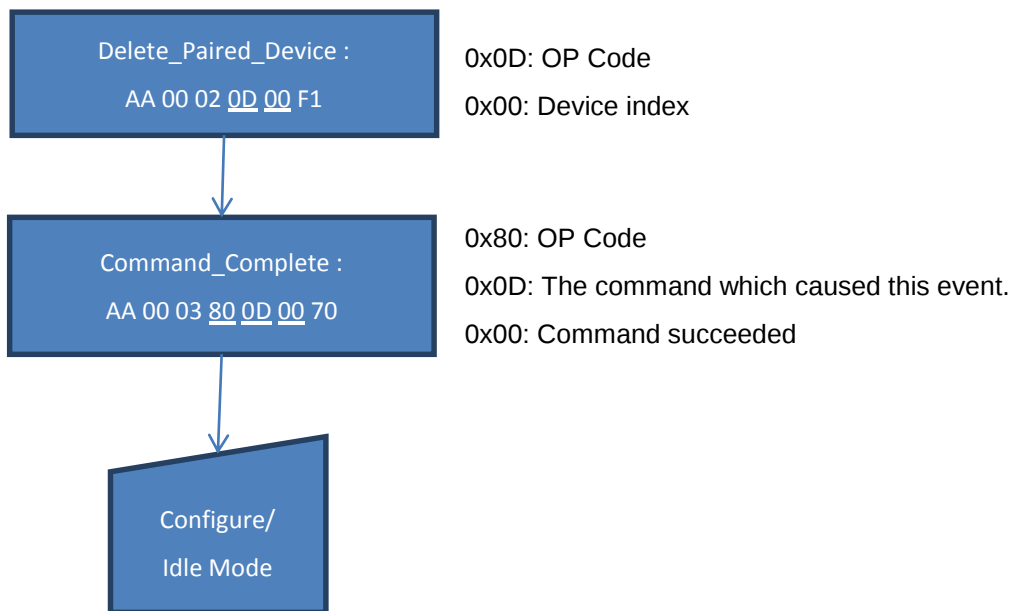
### 3.10.2 Write\_Pairing\_Mode\_Setting



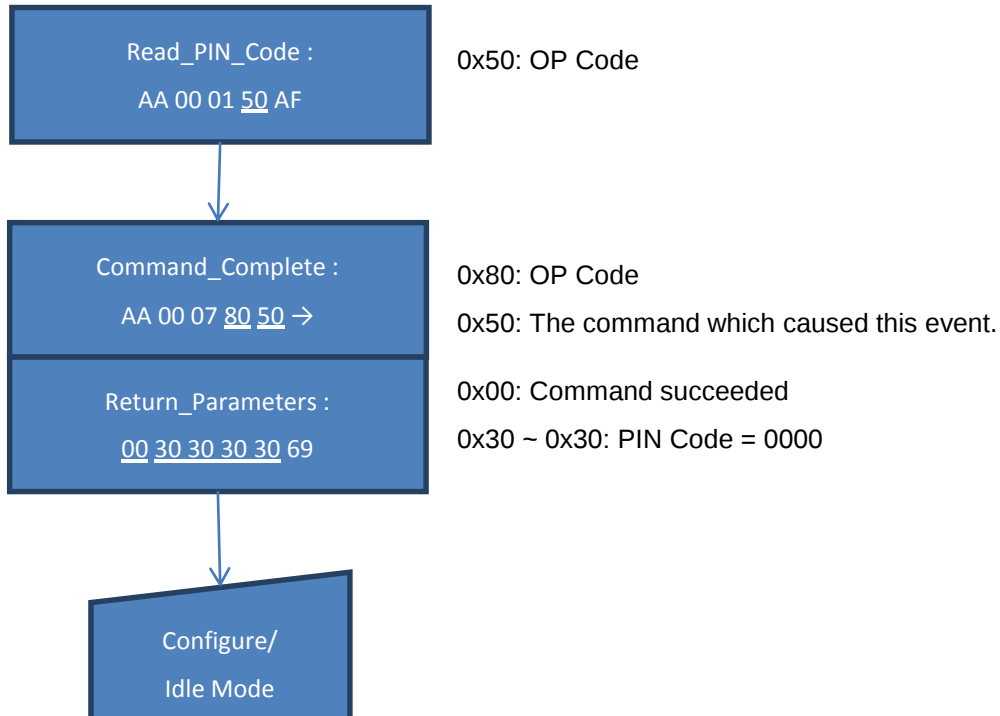
### 3.10.2 Read\_all\_Paired\_Device\_Information



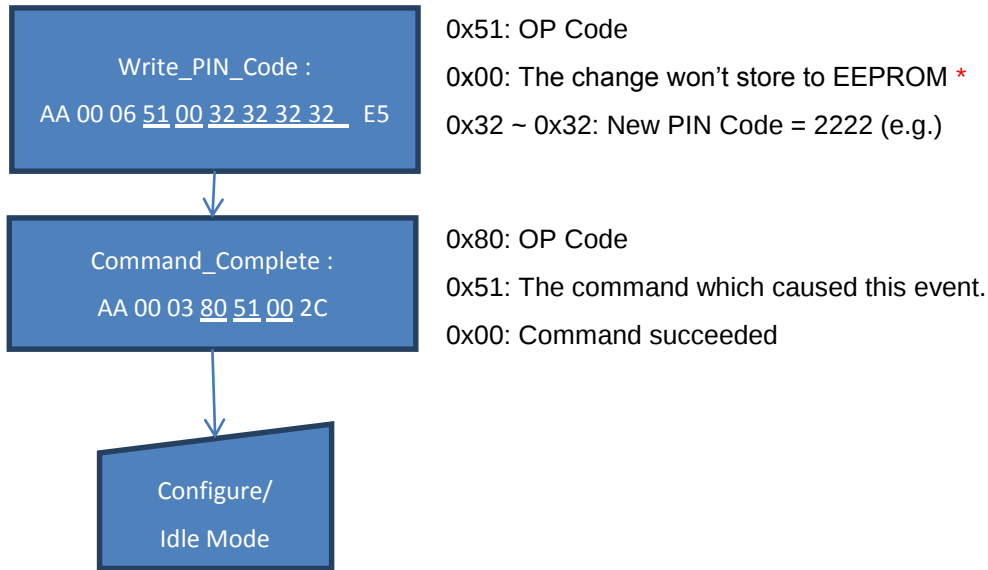
### 3.10.2 Delete\_Paired\_Deviceg



### 3.10.2 Read\_PIN\_Code

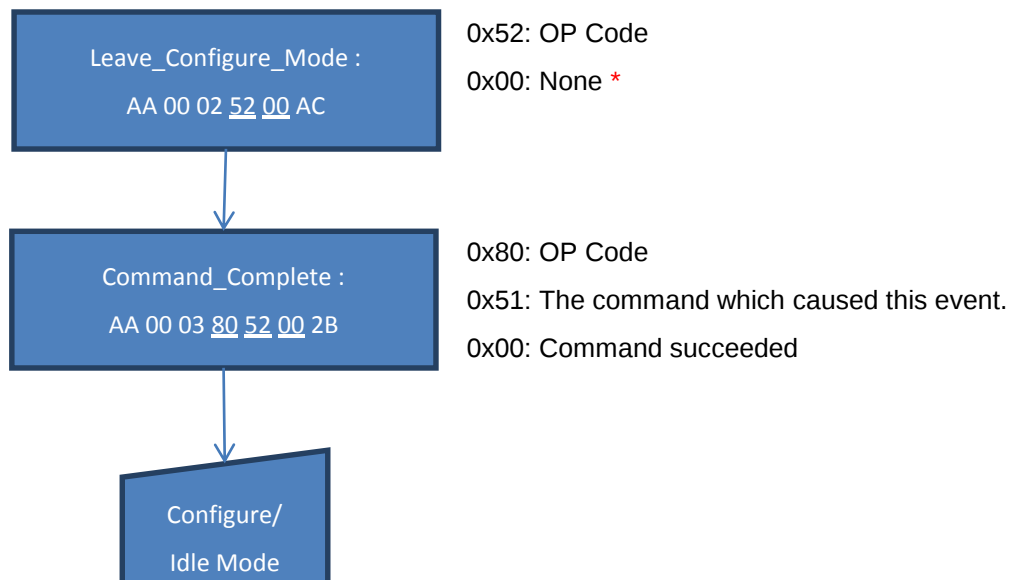


### 3.10.2 Write\_PIN\_Code



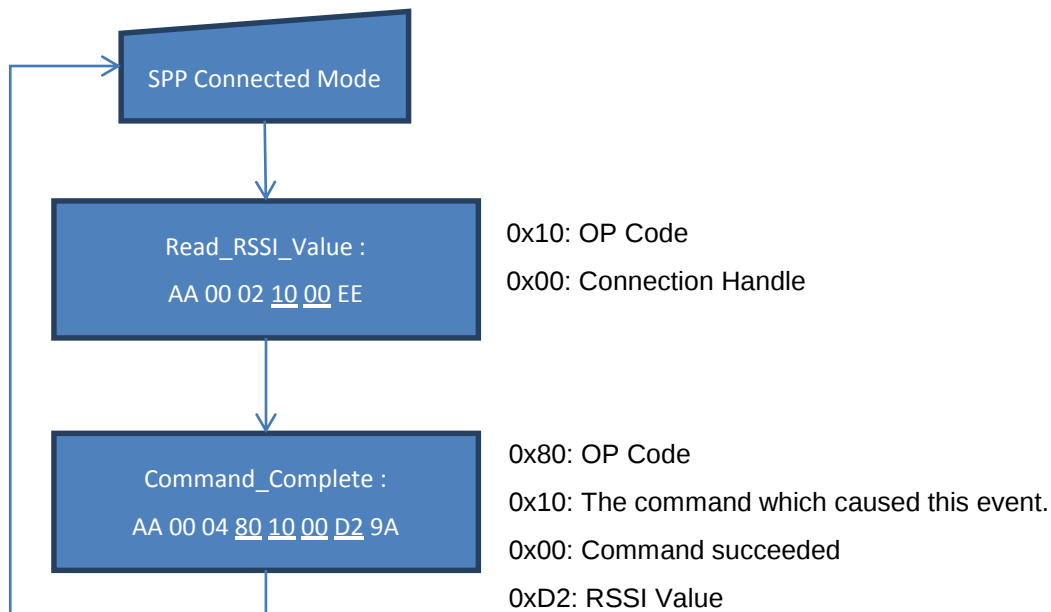
\* 0x01: The change will store to EEPROM.  
Then reset the change won't be clear.

### 3.10.2 Leave\_Configure\_Mode

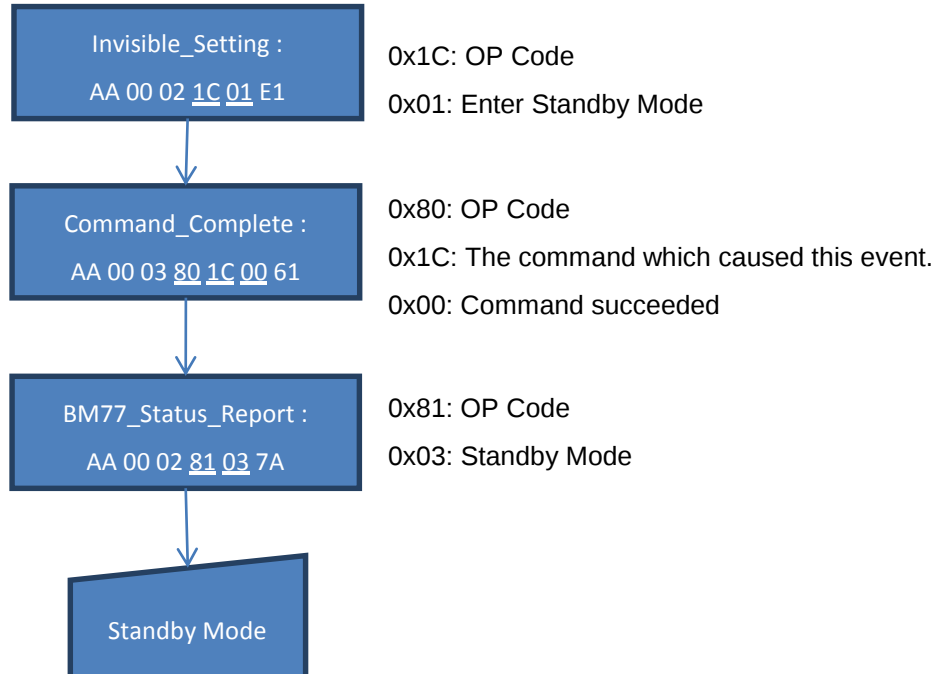


\* 0x01: Disable configure mode forever

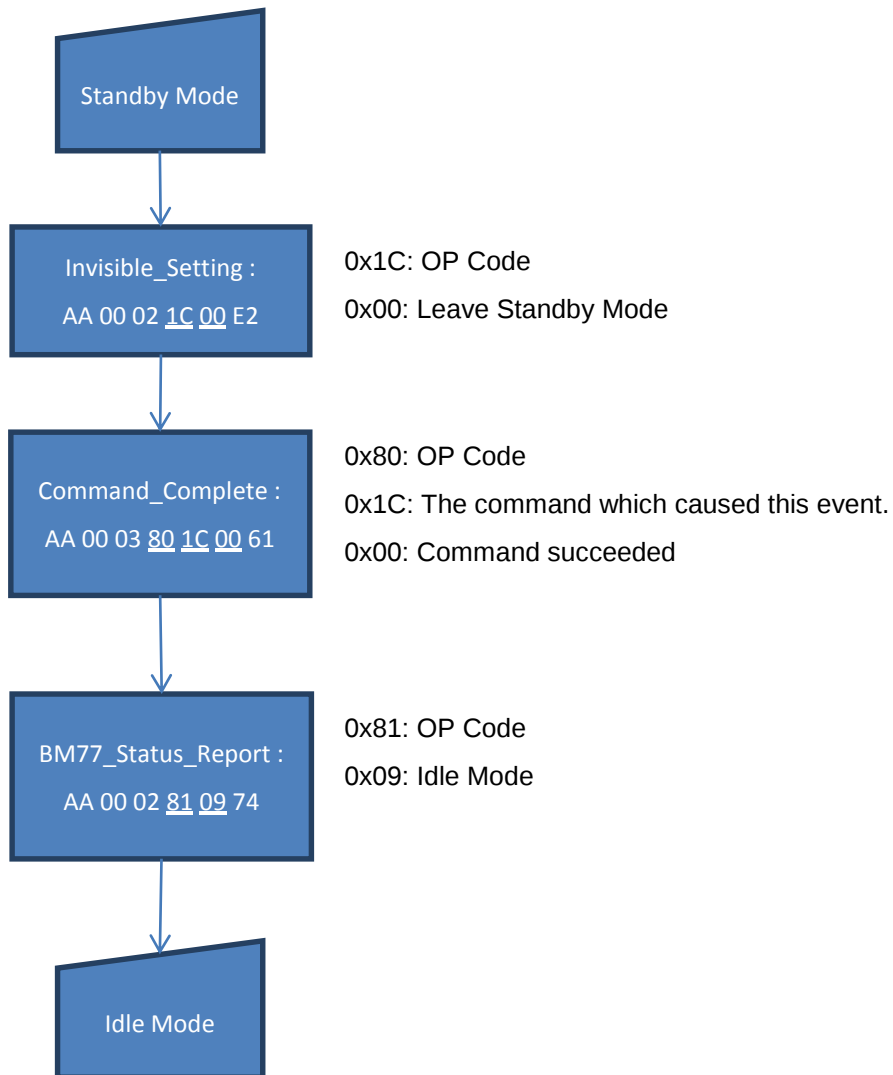
### 3.10.2 Read\_RSSI\_Value



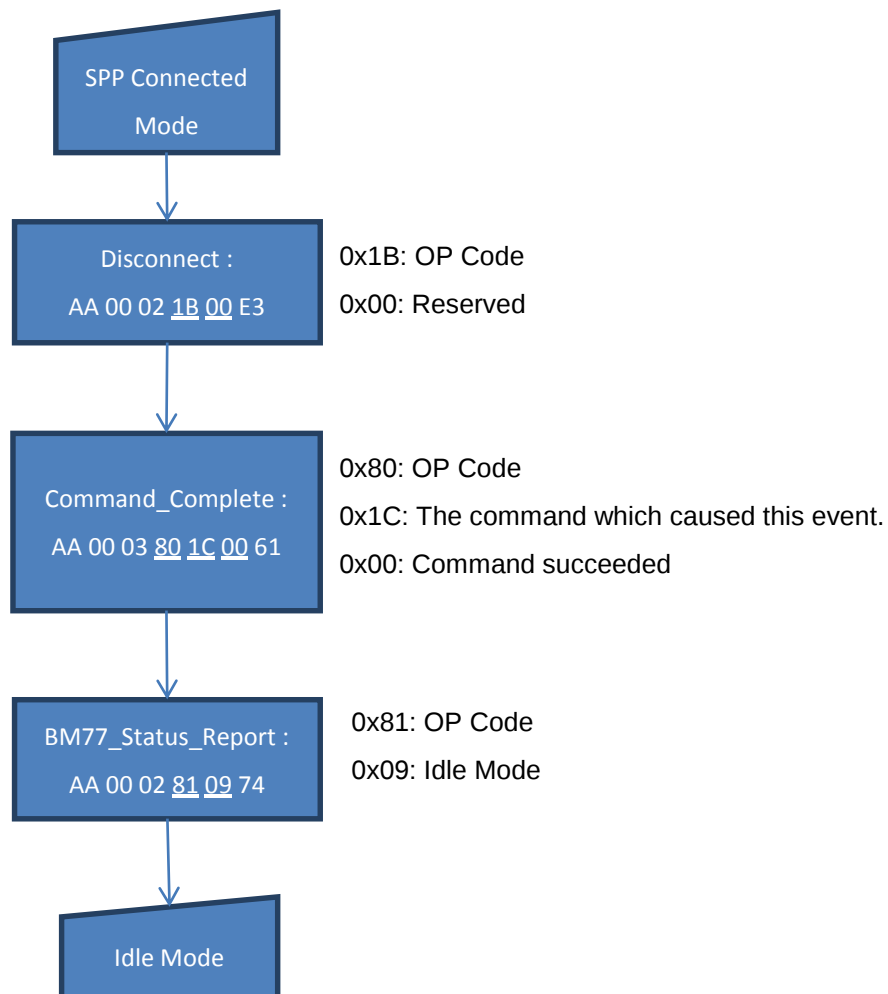
### 3.10.2 Invisible\_Setting (1)



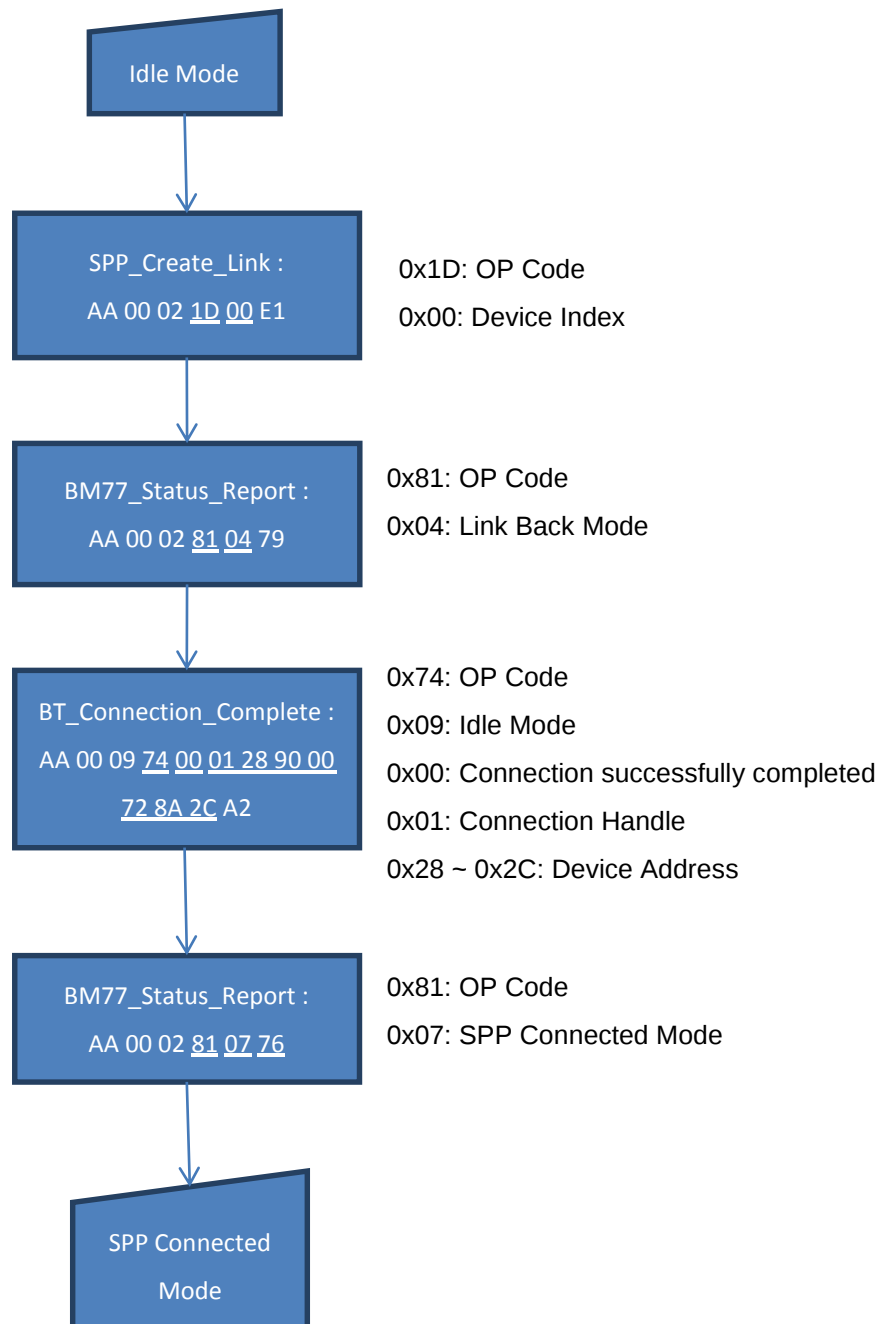
### 3.10.2 Invisible\_Setting (2)



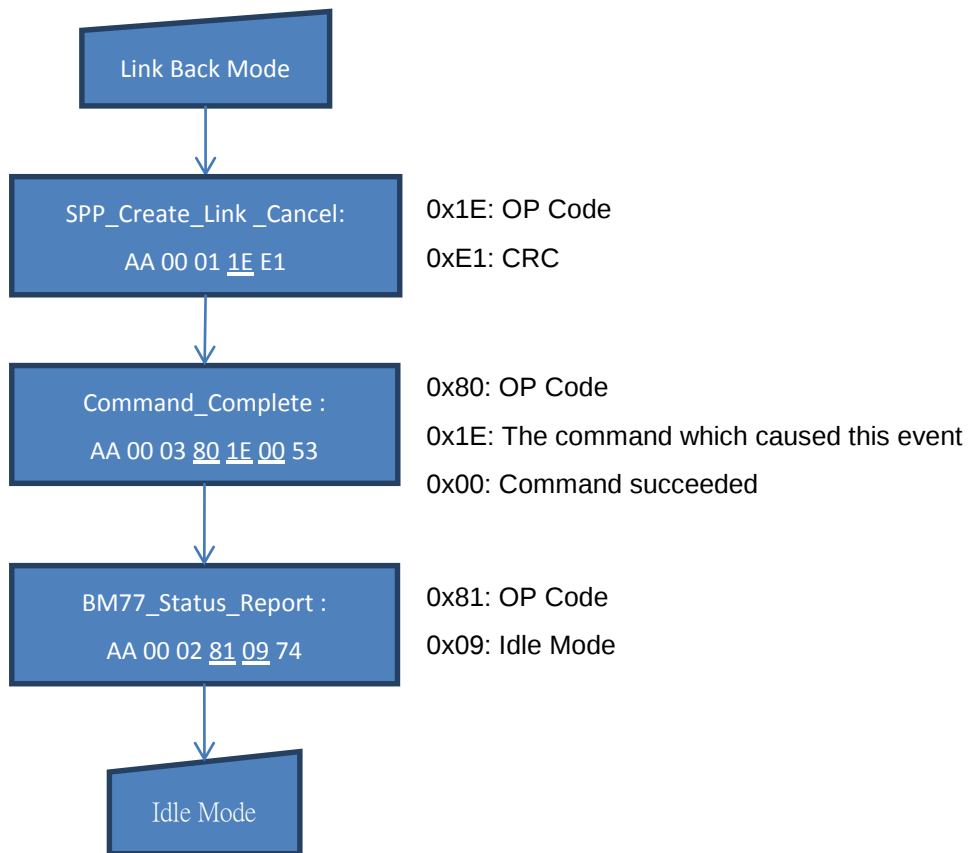
### 3.10.2 Disconnect



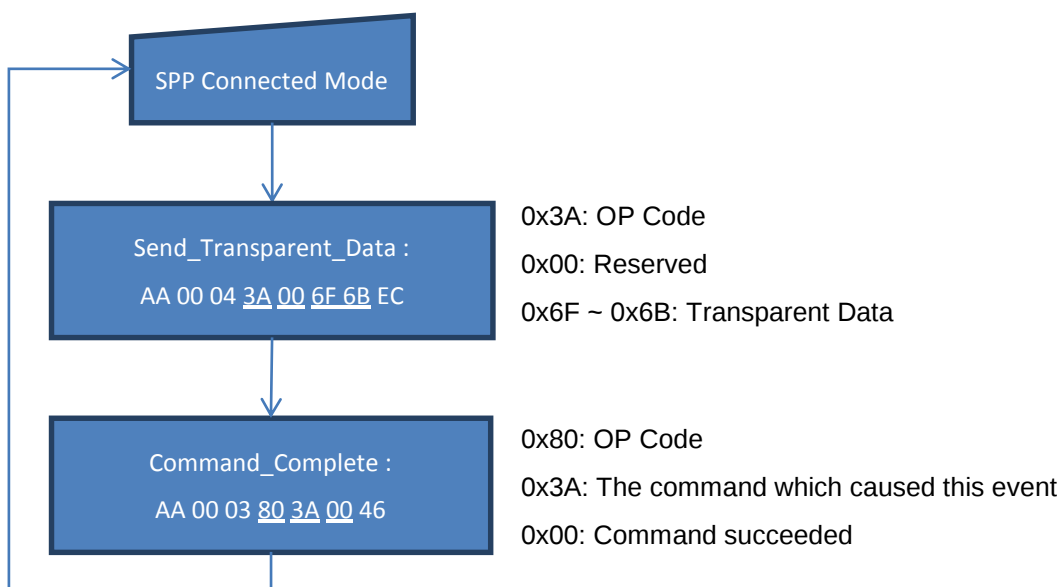
### 3.10.2 SPP\_Create\_Link



### 3.10.2 SPP\_Create\_Link\_Cancel

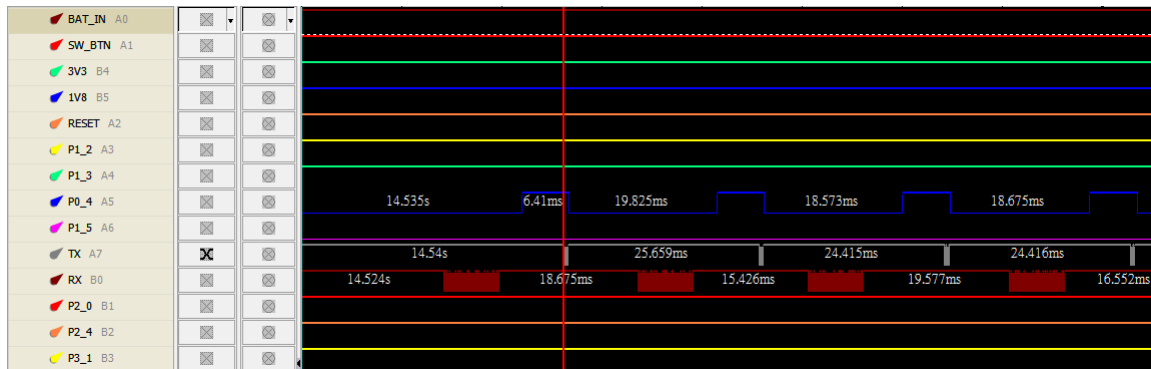


### 3.10.2 Send\_Transparent\_Data

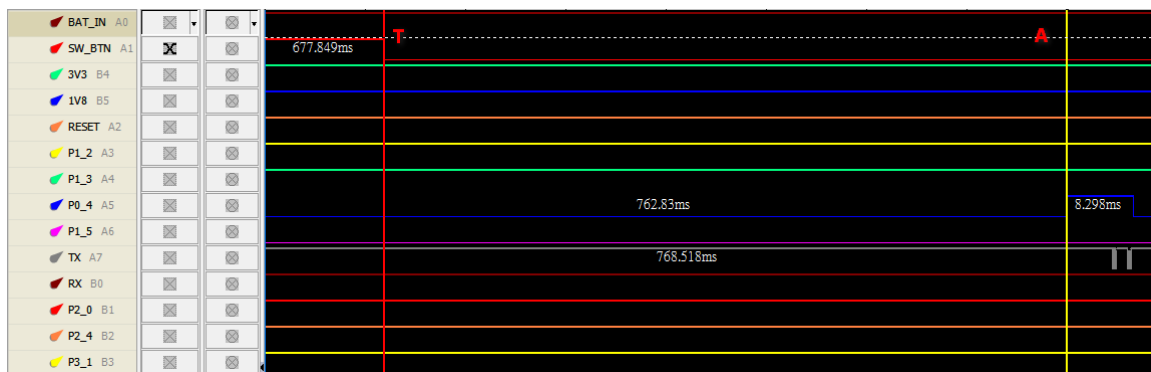


## 3.10. Timing Diagram

### 3.10.2 Manual Pattern Transmit



### 3.10.2 Manual Pattern in Soft Power Down



T – A: 85ms

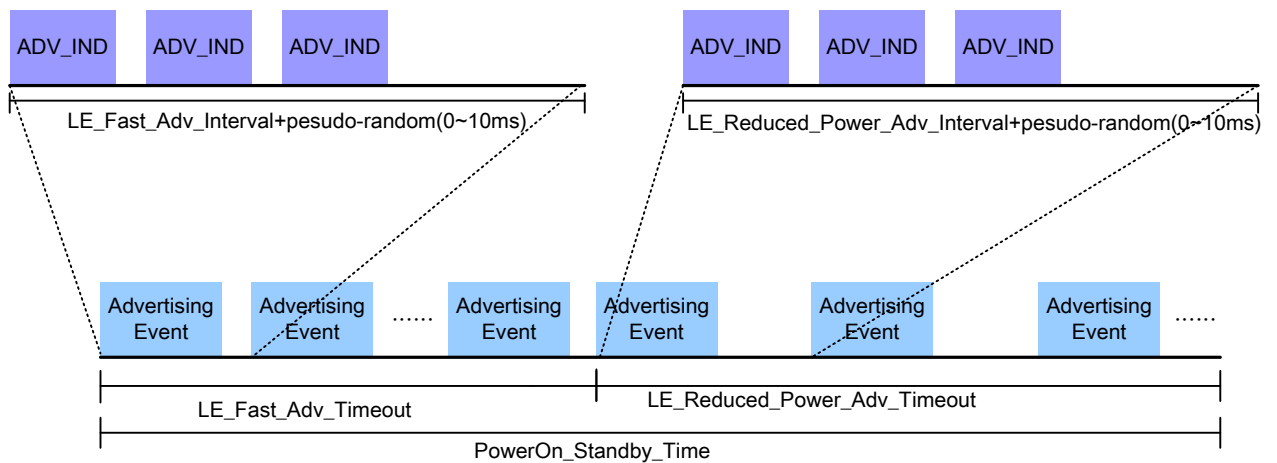
## 4. Advanced Topic

### 4.9. BLE Standby & Link Back Explanation:

The advertising interval and time to perform advertising can be configured with consideration for user expectations of connection establishment time.

- Standby: Undirected Advertising

The interval values “LE\_Fast\_Adv\_Interval” is designed to attempt fast connection during the limited time “LE\_Fast\_Adv\_Timeout”. If a connection is not established within that time, the interval value “LE\_Reduced\_Power\_Adv\_Interval” is designed to reduce power consumption for devices that continues to advertise.

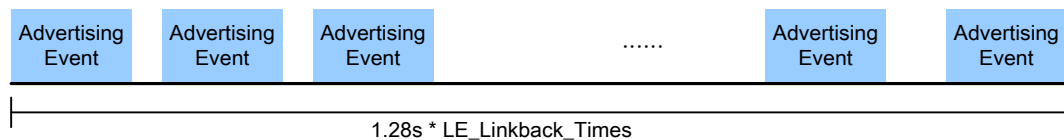


- Link Back: Directed Advertising

For dedicate central BD\_ADDR.

Two cases can execute Link Back:

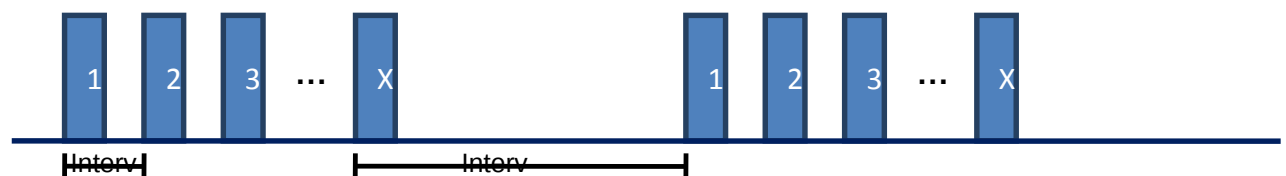
- ◆ Central BD\_ADDR is Public Address
- ◆ Central BD\_ADDR is Non-Resolvable Address and the address will be written in the reconnection address characteristic in Peripheral.



## 4.10. BLE Packet Divider

E2PROM Setting: Check\_RX\_Data\_Interval Max: 160ms (Unit: 0.625ms)

UART RX Packet



Interval<Check RX Data Int      Interval>Check RX Data Int

X<=20 BLE RF Packet



X>20 BLE RF Packet



#### 4.11. BLE supports passkey entry and user confirm for pairing process

| PAIRING_REQUEST_ENABLE/ GATT_TABLE_PERMISSION_ENABLE |                                                             |
|------------------------------------------------------|-------------------------------------------------------------|
| ENABLE_PASSKEY_ENTRY=1                               | iocapability: KeyboardDisplay<br>MITM: Yes<br>Authenticated |
| ENABLE_USER_CONFIRM=1                                | iocapability: DisplayYesNo<br>MITM: Yes<br>Authenticated    |
| ENABLE_PASSKEY_ENTRY=0<br>ENABLE_USER_CONFIRM=0      | iocapability: NoInputOutput<br>MITM: No<br>Unauthenticated  |

#### 4.12. BLE throughput enhancement

Use proprietary protocol to increase BLE RX throughput by adding a new command

“Read\_MTU\_Size\_And\_Enable\_Credit\_Ctrl” of air patch characteristic.

Read\_MTU\_Size\_And\_Enable\_Credit\_Ctrl (0x24)

| Command                              | ID   | Command Parameters | Return Parameters           |
|--------------------------------------|------|--------------------|-----------------------------|
| Read_MTU_Size_And_Enable_Credit_Ctrl | 0x24 | None               | Status, ID, Max_MTU, Credit |

##### Return Parameters:

STATUS: SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0x00  | Command succeeded     |

ID: SIZE: 1 BYTE

| Value | Parameter Description                                       |
|-------|-------------------------------------------------------------|
| 0x24  | Returned Command ID is Read_MTU_Size_And_Enable_Credit_Ctrl |

MAX\_MTU: SIZE: 2 BYTE

| Value | Parameter Description |
|-------|-----------------------|
|-------|-----------------------|

|        |                          |
|--------|--------------------------|
| 0xFFFF | Maximum transmission MTU |
|--------|--------------------------|

CREDIT:

SIZE: 1 BYTE

| Value | Parameter Description |
|-------|-----------------------|
| 0xXX  | Credit Number         |

#### 4.13. BLE Random Device Address Notification

A device in Central may support the privacy feature by use of the non-resolvable address or the reconnection address as the device address. When a Central connects to privacy enabled Peripheral with the reconnection address characteristic, the Central shall write a new reconnect address in the reconnection address characteristic in the Peripheral. In iOS5 and above design, iDevice will uses the non-resolvable address and won't write reconnection address in the reconnection address characteristic in. So **IS1678S won't enter link back mode while the last connected devices are iDevices.**

#### 4.14. BLE Connection Parameter Update Explanation:

LE Slave can request a set of new connection parameters by sending Connection Parameter Update Request to LE Master. LE Master may accept the requested parameters and deliver the requested parameters to its Controller or reject the request. The actual connection parameters are determined by LE Master. And iPhone4s will refer LE\_Connection\_Interval\_Max as the connection interval.

There are four parameters need to be configured if connection parameters need to be updated.

- LE\_Connection\_Interval\_Min
- LE\_Connection\_Interval\_Max
- LE\_Slave\_Latency
- LE\_Supervision\_Timeout

Following are the example of the connection parameters and maximum throughput

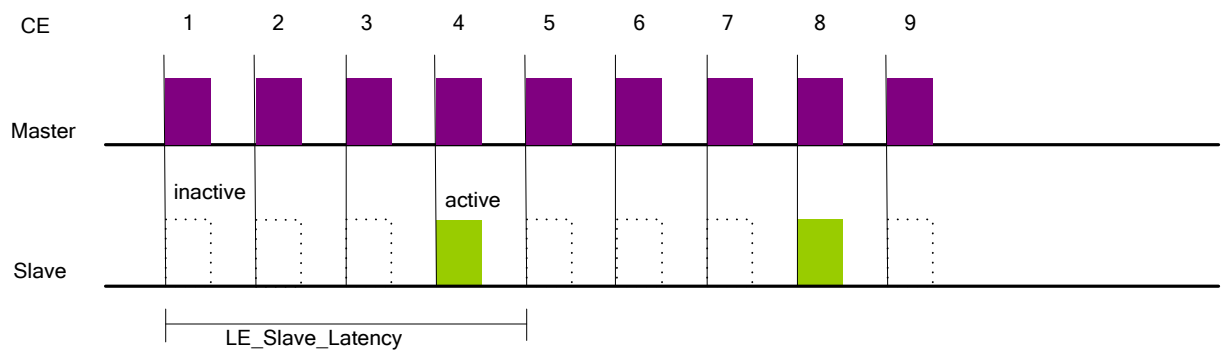
| LE_Connection_Interval_Min<br>(Unit: 1.25 ms) | LE_Connection_Interval_Max<br>(Unit: 1.25 ms) | LE_Slave_Latency | LE_Supervision_Timeout<br>(Unit: 10 ms) | Maximum<br>Throughput<br>( to iDevice) |
|-----------------------------------------------|-----------------------------------------------|------------------|-----------------------------------------|----------------------------------------|
| 0x0008                                        | 0x0010                                        | 0x0004           | 0x0200                                  | 1K *4 bytes/sec                        |
| 0x0008                                        | 0x0030                                        | 0x0004           | 0x0200                                  | 320 *4 bytes/sec                       |
| 0x0008                                        | 0x0190                                        | 0x0002           | 0x0200                                  | 40 * 4 bytes/sec<br>(Default setting)  |

#### 4.15. BLE\_Slave\_Latency Explanation:

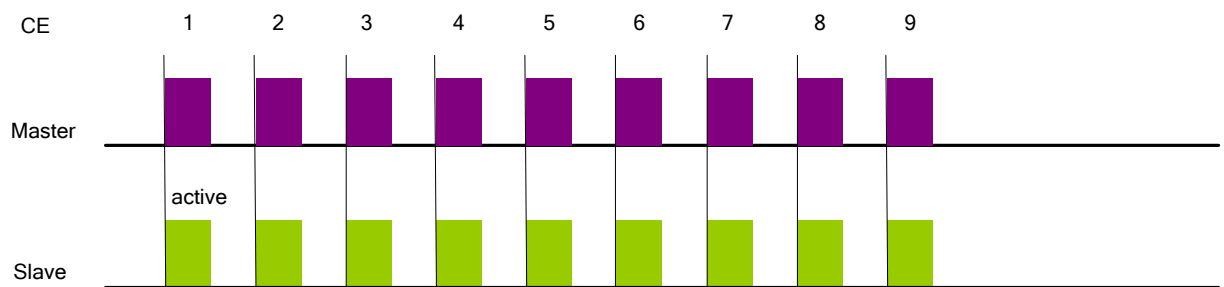
Slave latency allows a slave to use a reduced number of connection events. The LE\_Slave\_Latency parameter defines the number of consecutive connection events that the slave device is not required to listen for the master.

For example of LE\_Slave\_Latency = 0x0003:

- Case 1: No data traffic between Master and Slave:

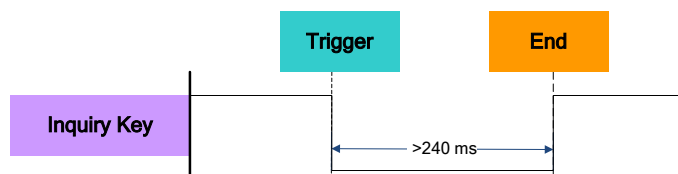


- Case 2: With data traffic between Master and Slave:

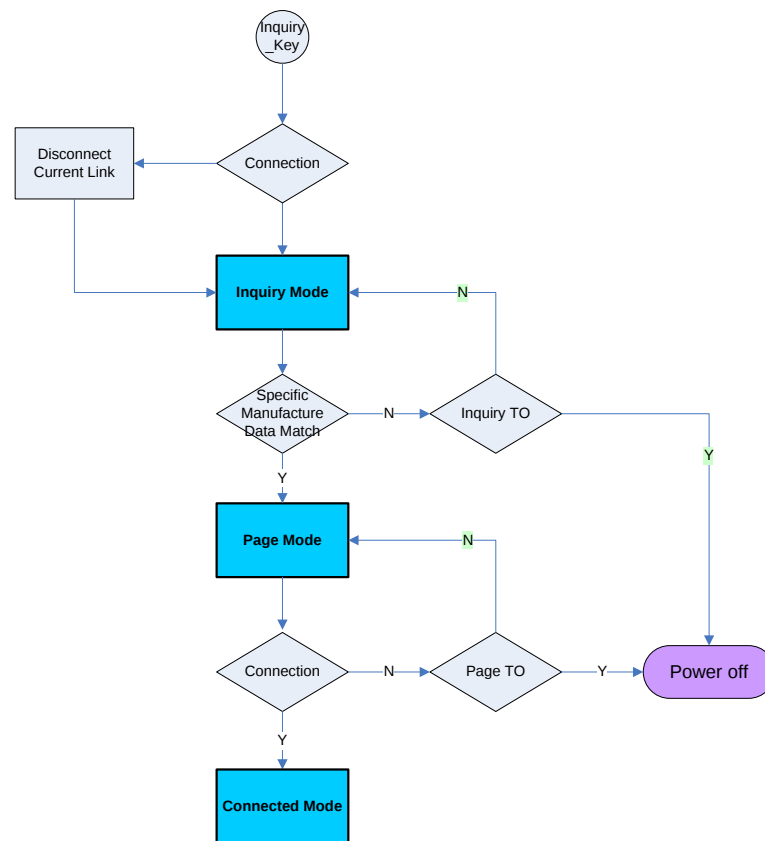


#### 4.16. Support Proprietary Master/Slave SPP link setup procedure

- Scheme:
  - Find dedicate peer device by EIR.
  - Setup SPP link for both devices.
- Force device into Inquiry Mode by trigger Inquiry Key (Condition: pull low over 240ms)



- System Configure Parameters:
  - GPIO Configuration
  - EIR Manufacture Data
  - Inquiry Timeout
- Inquiry State Machine:



**\*Note:** Pairing procedure won't be executed under this condition. And the linked device won't be recorded.

#### 4.17. Add two customization characteristics in DIS

Both of the characteristics UUID and characteristics can be configured by E2prom setting. And the format of characteristic UUID is 16-bit, max length of characteristic value is 16 bytes.

#### 4.18. Add customization Service and characteristic

The customization service UUID and characteristic UUID can be configured by E2prom setting. The format of this service and characteristics are 128-bit.

There's only one proprietary service can be used at the same time. If the 128-bit customization service is enabled, then the 16-bit customization service and ISSC transparent service will be disabled.

#### 4.19. ISSC Proprietary Service and Specific Service

All ISSC Proprietary Service and characteristic UUIDs are defined by ISSC, and those are used as 16 bytes format. Besides ISSC Proprietary Service, also provides Specific Service for customization. The specific service and characteristic UUIDs can be configured by E2PROM. The Specific Service UUIDs are used as 2 bytes format. And there's only one transparent instance exists at the same time. If Specific Service is assigned, ISSC Proprietary transparent characteristics will be disabled.

#### 4.20. Definition of ISSC Proprietary Service

- ISSC Proprietary Service



**UUID:** 49535343-FE7D-4AE5-8FA9-9FAFD205E455

**Summary:** The ISSC\_PROPRIETAYR\_SERVICE service is used for ISSC proprietary service.

### Service Characteristics:

| Overview                                                                              | Properties                                                                                                                                                                                                                                                                                                                                                                                                                                | Security    | Descriptors |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|------|-----------|-------|-----------|----------------------|-----------|-------------|----------|--------|-----------|----------|----------|---------------------|----------|-----------|----------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|------|-----------|-------|-----------|--|--|
| <div>Name:</div> <div>ISSC_TRANS_TX</div>                                             | <table><tr><th>Property</th><th>Requirement</th></tr><tr><td>Read</td><td>Excluded</td></tr><tr><td>Write</td><td>Excluded</td></tr><tr><td>WriteWithoutResponse</td><td>Excluded</td></tr><tr><td>SignedWrite</td><td>Excluded</td></tr><tr><td>Notify</td><td>Mandatory</td></tr><tr><td>Indicate</td><td>Excluded</td></tr><tr><td>WritableAuxiliaries</td><td>Excluded</td></tr><tr><td>Broadcast</td><td>Excluded</td></tr></table>  | Property    | Requirement | Read | Excluded  | Write | Excluded  | WriteWithoutResponse | Excluded  | SignedWrite | Excluded | Notify | Mandatory | Indicate | Excluded | WritableAuxiliaries | Excluded | Broadcast | Excluded | None | <table><tr><th>Overview</th><th>Permissions</th></tr><tr><td><div>Name:</div><div>Client</div><div>Characteristic</div><div>Configuration</div></td><td><table><tr><th>Permission</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr></table></td></tr><tr><td></td><td></td></tr></table> | Overview | Permissions | <div>Name:</div> <div>Client</div> <div>Characteristic</div> <div>Configuration</div> | <table><tr><th>Permission</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr></table> | Permission | Requirement | Read | Mandatory | Write | Mandatory |  |  |
|                                                                                       | Property                                                                                                                                                                                                                                                                                                                                                                                                                                  | Requirement |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Read                                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Write                                                                                                                                                                                                                                                                                                                                                                                                                                     | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | WriteWithoutResponse                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | SignedWrite                                                                                                                                                                                                                                                                                                                                                                                                                               | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Notify                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                  | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | WritableAuxiliaries                                                                                                                                                                                                                                                                                                                                                                                                                       | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Broadcast                                                                                                                                                                                                                                                                                                                                                                                                                                 | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Overview                                                                              | Permissions                                                                                                                                                                                                                                                                                                                                                                                                                               |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| <div>Name:</div> <div>Client</div> <div>Characteristic</div> <div>Configuration</div> | <table><tr><th>Permission</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr></table>                                                                                                                                                                                                                                                                                          | Permission  | Requirement | Read | Mandatory | Write | Mandatory |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Permission                                                                            | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                               |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Read                                                                                  | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Write                                                                                 | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| <div>Name:</div> <div>ISSC_TRANS_RX</div>                                             | <table><tr><th>Property</th><th>Requirement</th></tr><tr><td>Read</td><td>Excluded</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td>WriteWithoutResponse</td><td>Mandatory</td></tr><tr><td>SignedWrite</td><td>Excluded</td></tr><tr><td>Notify</td><td>Excluded</td></tr><tr><td>Indicate</td><td>Excluded</td></tr><tr><td>WritableAuxiliaries</td><td>Excluded</td></tr><tr><td>Broadcast</td><td>Excluded</td></tr></table> | Property    | Requirement | Read | Excluded  | Write | Mandatory | WriteWithoutResponse | Mandatory | SignedWrite | Excluded | Notify | Excluded  | Indicate | Excluded | WritableAuxiliaries | Excluded | Broadcast | Excluded | None | None                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Property                                                                                                                                                                                                                                                                                                                                                                                                                                  | Requirement |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Read                                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Write                                                                                                                                                                                                                                                                                                                                                                                                                                     | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | WriteWithoutResponse                                                                                                                                                                                                                                                                                                                                                                                                                      | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | SignedWrite                                                                                                                                                                                                                                                                                                                                                                                                                               | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Notify                                                                                                                                                                                                                                                                                                                                                                                                                                    | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                  | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | WritableAuxiliaries                                                                                                                                                                                                                                                                                                                                                                                                                       | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Broadcast                                                                                                                                                                                                                                                                                                                                                                                                                                 | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| <div>Name:</div> <div>ISSC_UPDATE_CONNECTION_PARAMETER</div>                          | <table><tr><th>Property</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td>WriteWithoutResponse</td><td>Excluded</td></tr><tr><td>SignedWrite</td><td>Excluded</td></tr><tr><td>Notify</td><td>Excluded</td></tr><tr><td>Indicate</td><td>Excluded</td></tr><tr><td>WritableAuxiliaries</td><td>Excluded</td></tr></table>                                             | Property    | Requirement | Read | Mandatory | Write | Mandatory | WriteWithoutResponse | Excluded  | SignedWrite | Excluded | Notify | Excluded  | Indicate | Excluded | WritableAuxiliaries | Excluded | None      | None     |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Property                                                                                                                                                                                                                                                                                                                                                                                                                                  | Requirement |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Read                                                                                                                                                                                                                                                                                                                                                                                                                                      | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Write                                                                                                                                                                                                                                                                                                                                                                                                                                     | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | WriteWithoutResponse                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | SignedWrite                                                                                                                                                                                                                                                                                                                                                                                                                               | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Notify                                                                                                                                                                                                                                                                                                                                                                                                                                    | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                  | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                       | WritableAuxiliaries                                                                                                                                                                                                                                                                                                                                                                                                                       | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                       |          |             |                                                                                       |                                                                                                                                                  |            |             |      |           |       |           |  |  |

|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------|-------------|-------|-----------|-------|-----------|----------------------|----------|-------------|----------|--------|-----------|----------|----------|---------------------|----------|-----------|----------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|----------|-------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|------|-----------|-------|-----------|--|--|--|--|--|--|
|                                                                           | <table><tr><td>Broadcast</td><td>Excluded</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                             | Broadcast   | Excluded    |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
| Broadcast                                                                 | Excluded                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
| <div><div>Name:</div><div>ISSC_AIR_PATCH</div></div>                      | <table><tr><td colspan="2"></td></tr><tr><td>Property</td><td>Requirement</td></tr><tr><td>Read</td><td>Excluded</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td>WriteWithoutResponse</td><td>Excluded</td></tr><tr><td>SignedWrite</td><td>Excluded</td></tr><tr><td>Notify</td><td>Mandatory</td></tr><tr><td>Indicate</td><td>Excluded</td></tr><tr><td>WritableAuxiliaries</td><td>Excluded</td></tr><tr><td>Broadcast</td><td>Excluded</td></tr></table> |             |             | Property | Requirement | Read  | Excluded  | Write | Mandatory | WriteWithoutResponse | Excluded | SignedWrite | Excluded | Notify | Mandatory | Indicate | Excluded | WritableAuxiliaries | Excluded | Broadcast | Excluded | None | <table><tr><td colspan="2"></td></tr><tr><td>Overview</td><td>Permissions</td></tr><tr><td rowspan="5"><div><div>Name:</div><div>Client Characteristic Configuration</div></div></td><td><table><tr><td>Permission</td><td>Requirement</td></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td colspan="2"></td></tr><tr><td colspan="2"></td></tr></table></td></tr><tr><td></td><td></td></tr></table> |  |  | Overview | Permissions | <div><div>Name:</div><div>Client Characteristic Configuration</div></div> | <table><tr><td>Permission</td><td>Requirement</td></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td colspan="2"></td></tr><tr><td colspan="2"></td></tr></table> | Permission | Requirement | Read | Mandatory | Write | Mandatory |  |  |  |  |  |  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Property                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Requirement |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Read                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Excluded    |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Write                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Mandatory   |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | WriteWithoutResponse                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Excluded    |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | SignedWrite                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Excluded    |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Notify                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mandatory   |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Excluded    |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | WritableAuxiliaries                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Excluded    |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
| Broadcast                                                                 | Excluded                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
| Overview                                                                  | Permissions                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
| <div><div>Name:</div><div>Client Characteristic Configuration</div></div> | <table><tr><td>Permission</td><td>Requirement</td></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td colspan="2"></td></tr><tr><td colspan="2"></td></tr></table>                                                                                                                                                                                                                                                            | Permission  | Requirement | Read     | Mandatory   | Write | Mandatory |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Permission                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Requirement |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Read                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mandatory   |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           | Write                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Mandatory   |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |             |          |             |       |           |       |           |                      |          |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |          |             |                                                                           |                                                                                                                                                                                                              |            |             |      |           |       |           |  |  |  |  |  |  |

## 4.21. ISSC Proprietary Characteristics

- ISSC\_TRANS\_TX

**UUID:** 49535343-1E4D-4BD9-BA61-23C647249616

**Summary:** The ISSC\_TRANS\_TX characteristic is used for UART or SPI transparent TX path.

**Value Fields:**

| Names    | Field Requirement | Format  | Minimum Value | Maximum Value | Additional Information |
|----------|-------------------|---------|---------------|---------------|------------------------|
| Trans TX | Mandatory         | Unit8[] | N/A           | N/A           | None                   |

- ISSC\_TRANS\_RX

**UUID:** 49535343-8841-43F4-A8D4-ECBE34729BB3

**Summary:** The ISSC\_TRANS\_RX characteristic is used for UART or SPI transparent RX path.

**Value Fields:**

| Names    | Field Requirement | Format  | Minimum Value | Maximum Value | Additional Information |
|----------|-------------------|---------|---------------|---------------|------------------------|
| Trans RX | Mandatory         | Unit8[] | N/A           | N/A           | None                   |

- ISSC\_UPDATE\_CONNECTION\_PARAMETER

**UUID:** 49535343-6DAA-4D02-ABF6-19569ACA69FE

**Summary:** The ISSC\_UPDATE\_CONNECTION\_PARAMETER characteristic is used to change connection parameters.

**Value Fields:**

| Names | Field Requirement | Format | Minimum Value | Maximum Value | Additional Information |
|-------|-------------------|--------|---------------|---------------|------------------------|
|       |                   |        |               |               |                        |

| Status             | Mandatory | Unit8  | N/A | N/A | Enumerations |                    |
|--------------------|-----------|--------|-----|-----|--------------|--------------------|
|                    |           |        |     |     | Key          | Value              |
|                    |           |        |     |     | 0            | Update Finish      |
|                    |           |        |     |     | 1            | Update In Progress |
|                    |           |        |     |     | 2 - 255      | Reserved           |
| Interval Min       | Mandatory | Unit16 | N/A | N/A | None         |                    |
| Interval Max       | Mandatory | Unit16 | N/A | N/A | None         |                    |
| Slave Latency      | Mandatory | Unit16 | N/A | N/A | None         |                    |
| Timeout Multiplier | Mandatory | Unit16 | N/A | N/A | None         |                    |

- ISSC\_AIR\_PATCH

**UUID:** 49535343-ACA3-481C-91EC-D85E28A60318

**Summary:** The ISSC\_AIR\_PATCH characteristic is used for air patch vendor commands.

**Value Fields:**

#### Write Path Field

| Names              | Field Requirement | Format  | Minimum Value | Maximum Value | Additional Information                      |
|--------------------|-------------------|---------|---------------|---------------|---------------------------------------------|
| Command ID         | Mandatory         | Unit8   | N/A           | N/A           | Refers to ISSC BT4.0 Functional Tester doc. |
| Command Parameters | Mandatory         | Unit8[] | N/A           | N/A           | Refers to ISSC BT4.0 Functional Tester doc. |

#### Notify Path Field

| Names            | Field Requirement | Format  | Minimum Value | Maximum Value | Additional Information                      |
|------------------|-------------------|---------|---------------|---------------|---------------------------------------------|
| Status           | Mandatory         | Unit8   | N/A           | N/A           | Refers to ISSC BT4.0 Functional Tester doc. |
| Return ID        | Mandatory         | Unit8   | N/A           | N/A           | Refers to ISSC BT4.0 Functional Tester doc. |
| Return Parameter | Mandatory         | Unit8[] | N/A           | N/A           | Refers to ISSC BT4.0 Functional Tester doc. |

## 4.22. Definition of Specific Service

- Specific Service

**UUID:** Configured by E2PROM

**Summary:** The Specific service is used for specific UART transparent service.

**Service Characteristics:**

| Overview                                                                                      | Properties                                                                                                                                                                                                                                                                                                                                                                                                                                | Security    | Descriptors |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|------|-----------|-------|-----------|----------------------|-----------|-------------|----------|--------|-----------|----------|----------|---------------------|----------|-----------|----------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|------|-----------|-------|-----------|--|--|
| <div><div>Name:</div><div>TRANS_TX</div></div>                                                | <table><tr><th>Property</th><th>Requirement</th></tr><tr><td>Read</td><td>Excluded</td></tr><tr><td>Write</td><td>Excluded</td></tr><tr><td>WriteWithoutResponse</td><td>Excluded</td></tr><tr><td>SignedWrite</td><td>Excluded</td></tr><tr><td>Notify</td><td>Mandatory</td></tr><tr><td>Indicate</td><td>Excluded</td></tr><tr><td>WritableAuxiliaries</td><td>Excluded</td></tr><tr><td>Broadcast</td><td>Excluded</td></tr></table>  | Property    | Requirement | Read | Excluded  | Write | Excluded  | WriteWithoutResponse | Excluded  | SignedWrite | Excluded | Notify | Mandatory | Indicate | Excluded | WritableAuxiliaries | Excluded | Broadcast | Excluded | None | <table><tr><th>Overview</th><th>Permissions</th></tr><tr><td><div><div>Name:</div><div>Client</div><div>Characteristic</div><div>Configuration</div></div></td><td><table><tr><th>Permission</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr></table></td></tr><tr><td></td><td></td></tr></table> | Overview | Permissions | <div><div>Name:</div><div>Client</div><div>Characteristic</div><div>Configuration</div></div> | <table><tr><th>Permission</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr></table> | Permission | Requirement | Read | Mandatory | Write | Mandatory |  |  |
|                                                                                               | Property                                                                                                                                                                                                                                                                                                                                                                                                                                  | Requirement |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Read                                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Write                                                                                                                                                                                                                                                                                                                                                                                                                                     | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | WriteWithoutResponse                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | SignedWrite                                                                                                                                                                                                                                                                                                                                                                                                                               | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Notify                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                  | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | WritableAuxiliaries                                                                                                                                                                                                                                                                                                                                                                                                                       | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Broadcast                                                                                                                                                                                                                                                                                                                                                                                                                                 | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Overview                                                                                      | Permissions                                                                                                                                                                                                                                                                                                                                                                                                                               |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| <div><div>Name:</div><div>Client</div><div>Characteristic</div><div>Configuration</div></div> | <table><tr><th>Permission</th><th>Requirement</th></tr><tr><td>Read</td><td>Mandatory</td></tr><tr><td>Write</td><td>Mandatory</td></tr></table>                                                                                                                                                                                                                                                                                          | Permission  | Requirement | Read | Mandatory | Write | Mandatory |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Permission                                                                                    | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                               |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Read                                                                                          | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| Write                                                                                         | Mandatory                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
| <div><div>Name:</div><div>TRANS_RX</div></div>                                                | <table><tr><th>Property</th><th>Requirement</th></tr><tr><td>Read</td><td>Excluded</td></tr><tr><td>Write</td><td>Mandatory</td></tr><tr><td>WriteWithoutResponse</td><td>Mandatory</td></tr><tr><td>SignedWrite</td><td>Excluded</td></tr><tr><td>Notify</td><td>Excluded</td></tr><tr><td>Indicate</td><td>Excluded</td></tr><tr><td>WritableAuxiliaries</td><td>Excluded</td></tr><tr><td>Broadcast</td><td>Excluded</td></tr></table> | Property    | Requirement | Read | Excluded  | Write | Mandatory | WriteWithoutResponse | Mandatory | SignedWrite | Excluded | Notify | Excluded  | Indicate | Excluded | WritableAuxiliaries | Excluded | Broadcast | Excluded | None | None                                                                                                                                                                                                                                                                                                                                                             |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Property                                                                                                                                                                                                                                                                                                                                                                                                                                  | Requirement |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Read                                                                                                                                                                                                                                                                                                                                                                                                                                      | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Write                                                                                                                                                                                                                                                                                                                                                                                                                                     | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | WriteWithoutResponse                                                                                                                                                                                                                                                                                                                                                                                                                      | Mandatory   |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | SignedWrite                                                                                                                                                                                                                                                                                                                                                                                                                               | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Notify                                                                                                                                                                                                                                                                                                                                                                                                                                    | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                  | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | WritableAuxiliaries                                                                                                                                                                                                                                                                                                                                                                                                                       | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |
|                                                                                               | Broadcast                                                                                                                                                                                                                                                                                                                                                                                                                                 | Excluded    |             |      |           |       |           |                      |           |             |          |        |           |          |          |                     |          |           |          |      |                                                                                                                                                                                                                                                                                                                                                                  |          |             |                                                                                               |                                                                                                                                                  |            |             |      |           |       |           |  |  |

## 4.23. Specific Service Characteristics

- TRANS\_TX

**UUID:** Configured by E2PROM

**Summary:** The TRANS\_TX characteristic is used for UART transparent TX path.

**Value Fields:**

| Names    | Field Requirement | Format  | Minimum Value | Maximum Value | Additional Information |
|----------|-------------------|---------|---------------|---------------|------------------------|
| Trans TX | Mandatory         | Unit8[] | N/A           | N/A           | None                   |

- TRANS\_RX

**UUID:** Configured by E2PROM

**Summary:** The TRANS\_RX characteristic is used for UART transparent RX path.

#### Value Fields:

| Names    | Field Requirement | Format  | Minimum Value | Maximum Value | Additional Information |
|----------|-------------------|---------|---------------|---------------|------------------------|
| Trans RX | Mandatory         | Unit8[] | N/A           | N/A           | None                   |

#### Appendix: Security Maps

| Command                                                                                                                                  | UI Setting                                                                          | SPP           | BLE <sup>#1</sup> |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|-------------------|
| 1. <b>Write Pairing Mode</b> : Just Work<br>2. <b>Write Pairing Mode</b> : Disable SSP<br>+ UI Setting - BT3.0 Security(Disable SSP)     | <b>Pairing Method</b> : Just Work<br><b>BT3.0 Security Mode</b> : Disable SSP       | Disable SSP   | Just Work         |
| 1. <b>Write Pairing Mode</b> : Passkey Entry<br>2. <b>Write Pairing Mode</b> : Disable SSP<br>+ UI Setting - BT3.0 Security(Disable SSP) | <b>Pairing Method</b> :Passkey Entry<br><b>BT3.0 Security Mode</b> : Disable SSP    | Disable SSP   | Passkey Entry     |
| 1. <b>Write Pairing Mode</b> : User Confirm<br>2. <b>Write Pairing Mode</b> : Disable SSP<br>+ UI Setting - BT3.0 Security(Disable SSP)  | <b>Pairing Method</b> : User Confirm<br><b>BT3.0 Security Mode</b> : Disable SSP    | Disable SSP   | User Confirm      |
| 1. <b>Write Pairing Mode</b> : Just Work<br>2. <b>Write Pairing Mode</b> : Disable SSP<br>+ UI Setting - BT3.0 Security Mode(SM3)        | <b>Pairing Method</b> : Just Work<br><b>BT3.0 Security Mode</b> : SM3 <sup>#2</sup> | SM3           | Just Work         |
| 1. <b>Write Pairing Mode</b> : Passkey Entry<br>2. <b>Write Pairing Mode</b> : Disable SSP<br>+ UI Setting - BT3.0 Security Mode(SM3)    | <b>Pairing Method</b> :Passkey Entry<br><b>BT3.0 Security Mode</b> : SM3            | SM3           | Passkey Entry     |
| 1. <b>Write Pairing Mode</b> : User Confirm<br>2. <b>Write Pairing Mode</b> : Disable SSP<br>+ UI Setting - BT3.0 Security Mode(SM3)     | <b>Pairing Method</b> : User Confirm<br><b>BT3.0 Security Mode</b> : SM3            | SM3           | User Confirm      |
| <b>Write Pairing Mode</b> : Just Work                                                                                                    | <b>Pairing Method</b> : Just Work<br><b>BT3.0 Security Mode</b> : SM4               | Just Work     | Just Work         |
| <b>Write Pairing Mode</b> : Passkey Entry                                                                                                | <b>Pairing Method</b> : Passkey Entry<br><b>BT3.0 Security Mode</b> : SM4           | Passkey Entry | Passkey Entry     |
| <b>Write Pairing Mode</b> : User Confirm                                                                                                 | <b>Pairing Method</b> : User Confirm<br><b>BT3.0 Security Mode</b> : SM4            | User Confirm  | User Confirm      |

# 1: This column available if BLE Security set to enabled (UI Setting)

# 2: UI Setting Only (IS1678SPP UI v100.106)

## Reversion History

| Date       | Revision Content    | Version |
|------------|---------------------|---------|
| 2015/04/08 | Preliminary Version | 0.1     |