



## BM83 MSPK2v1.3 Release Note

### VERSION1.3

#### Firmware updates:

| Items       | Version                                                               |
|-------------|-----------------------------------------------------------------------|
| 8051 Images | MSPKv2_1.03.0008_GFP<br>MSPKv2_1.03.0008_PBAP<br>MSPKv2_1.03.0008_SPP |
| DSP Image   | MSPK2.0_DSP_FW_V1.04.0006                                             |
| Host MCU    | 1.6.3                                                                 |

#### Utility Tool Updates:

| Items             | Version |
|-------------------|---------|
| Config GUI Tool   | 1.3.08  |
| isUpdate Tool     | 3.02    |
| SpkCommandSetTool | 206.003 |
| iOS Apps          | 1.6.4   |
| Android Apps      | 4.0.8   |

#### New Features and Feature Enhancement

- A2DP audio mixed with one of the following input : Aux-in/I2S/Microphone.  
New MMI action (0x80/0x81) commands control the mixer. Config Tool provide option for this feature.
- Microphone input as Line-in input to Concert master.
- New mechanism in Concert mode endless grouping to interleave between general access code (for new slave) and dedicated access code (for paired slave). New UART command (0x4B) control the endless grouping. Config Tool provide option for this feature.
- Fully support AVC vendor dependent 0x0B(0x4A) command and 0x1A(0x5D) event for AVC vendor dependent command / response.
- Enhance UART command 0x08 to provide project target version.
- Improved OTA/UART DFU flash validation performance
- Enhanced LDAC audio quality by reducing quantization noise floor and harmonic distortion
- Provided BT CoD setting in configuration tools
- MCLK can be enabled under I2S slave.
- 32 bytes vendor data can be stored in flash by Config GUI tools. Uart command (0x31 / 0x13) can retrieve/update the stored data.

#### Bug Fixed

- Ringtone volume with external codec in embedded mode
- Sometimes not able to increase/decrease volume from 2nd Concert Slave device.
- Firmware do not respond 0x4A uart command after many tries.
- Concert Slave standalone did not trigger auto power off after concert master auto power off.
- No audio output under embedded mode with "power on directly" enabled.
- Paired device list is not updated correctly after 9<sup>th</sup> device is paired.

- Embedded battery mode cannot auto power off with initial voltage below 3V
- Missing battery UART event and cannot auto power off mode under low power mode.
- Concert mode AAC cannot be used if A2DP do not support AAC.
- Sometime DSP reconfiguration of BCLK for different sampling rate, results in I2S left channel audio silence
- Isupdate v2.97 tool doesn't upgrade firmware through USB.

**Errata**

- Concert master seldomly cannot link back to iPhone SE (iOS 13.5) once it form concert group.  
➔ It can be recovered when trigger BT reconnection again.

**VERSION1.2**

The following are the attributes of this firmware version for specific system requirements and device settings. This release include 3 firmware variants and located at the following directory structure.

SPP: IS2083 Turnkey v1.2\Software\IS2083 Image\MSPK2v1.2\SPP

GFP: IS2083 Turnkey v1.2\Software\IS2083 Image\MSPK2v1.2\GFP

PBAP: IS2083 Turnkey v1.2\Software\IS2083 Image\MSPK2v1.2\PBAP

Details of these variants are discussed in BM83 application user guide.

**New Features and Feature Enhancement**

- Bluetooth Spec security vulnerability resolution
  - o SWEYNTTOOTH BLE vulnerabilities issues
  - o BIAS(Bluetooth Impersonation Attacks) vulnerability issue(CERT/CC VU#647177)
  - o Key Negotiation of Bluetooth(KNOB) BR/EDR Vulnerability(CERT VU#918987)
- Added New UART commands
  - o Host MCU DFU UART Command Sets
  - o AVRCP Vendor Dependent Command Sets
  - o New parameter type to Read BTM Version which include BTM FW version and DSP version details
  - o Battery Level Indication to support feature in Report Read Feature List Reply event
  - o Enable Device Into Test Mode (EDUTM) command.
  - o Re-introduced UART command to control GPIO
- New Configuration Parameters
  - o Enable AVRCP Browsing Feature (default Enable)
  - o Allow Users to Enable Device Under Test (default Disable)
  - o Auto Role Switch to BT Master (default Enable)
  - o Enable Role Switch in Link Policy (default Disable)
  - o Force As Bluetooth Slave Role (default Disable)
  - o Save MSPK Role When Connected (default Disable)
  - o MSPK Power Saving Grouping Interval
  - o Enable Concert Mode Master SPK Endless Grouping (default Disable)
  - o Allow Voice Prompt in MSPK Slave (default Disable)
- Config Tool improvement
  - o Drop down target selection(MSPK/GFP/PBAP/AT). Config tool will allow available configuration parameters to be customized.
  - o User data manipulation feature provided
- DFU process enhancement
- MBA App
  - o DSP OTA tuning scheme
- LDAC Codec Enhancement
  - o Passed with latest Sony LDAC conformance certification spec
  - o Extend media buffer to 32K Byte to meet Sony recommendation of Bluetooth high audio quality design

**PBAP**

- Created PBAP image and added in the release
- Resolved PABP connection issue

**Google Fast Pair**

- Created GFP and added in the release
- Compatible with existing MBA mobile App feature
- Include Google Fast Pair option into application layer general pairing procedure.
- New Configuration Parameters
  - o Google Fast Pair (default Enable)
  - o Google Fast Pair Model ID
  - o Google Fast Pair Private Key
  - o Google Fast Pair TX Power
  - o Battery Notification (default Disable)

## Error Resolution

- Audio Issue fix
  - o EQ parameter setting timing error results in EQ mode ineffective
  - o Audio break issues under WCT or/and general A2DP mode corner cases resolved
  - o WCT volume sync under MCU mode error.
  - o Disabling MCLK, disable signal at MCLK1 pin
- Tone/ Voice Prompt issues fixed
  - o Tone play abnormal with line-in enable while powering off
  - o Maximum volume causes voice prompt and sine tone disappear
  - o Tone playing abnormal with BLE link exists
- Bluetooth connectivity issue fixed
  - o Revised profiles/ACL disconnection handling to avoid state machine transition incorrect
  - o Bluetooth stack and profile defects result in profiles connection failure
  - o SCO link handling incorrect make voice dial and voice transfer abnormal.
- Application behavior enhancement
  - o Revise power down flow. Delay PMU power down after power off DSP to avoid AMP pop noise.
  - o Revise MFB button detection for power on pairing flow
  - o Revise report battery level flow
  - o Revise audio source switching flow between A2DP and line-in result in incorrect source reported
  - o Revise CV mode charging flow to make charging curve lower down smoothly as expected.
  - o Memory leak in A2DP connection

## Errata

- I2S should be configured as I2S Master for both master and slave speakers when BM83 Concert speakers configured as I2S out. I2S slave is not recommended as Audio discontinuity and unsync between master and slave speakers are observed when configured as I2S slave. There is no restriction on I2S (Master/Slave) in single speaker case.
- BM83 will try to be Bluetooth Slave role during LDAC playback:
  - ⇒ Some mobiles (e. g. Samsung S8) do not receive ACK properly BM83 is Bluetooth Master role during LDAC playback. It will cause audio break because of lower throughput. To have better performance in this circumstance, BM83 will try to be Slave role once LDAC codec is selected.
- Only support max to 2 A2DP links while A2DP LDAC decode playback:
  - ⇒ Because of above, while second ACL link was created, it would become a scatternet topology. Under this scenario, only 2 A2DP links can be served.
- Coexistence of BLE and SCO link in OTA DSP tuning:
  - ⇒ While performing "Voice" OTA DSP tuning via BLE, SCO link is created for transmitting/receiving SCO voice and the voice waveform was captured to measure DSP parameter effect. We suggest customers do not perform tuning and transmit/receive SCO voice simultaneously if BLE master and SCO receiver are not in the same device. Otherwise, BLE disconnection might be observed.
- One shot audio break occurred while using Android Phone playing A2DP music and trigger BLE connection.
  - ⇒ We observed Android phone will change Bluetooth Low Energy Connection Interval as 7.5 ms to query GATT Service Table. It will cause audio break because of lower throughput of A2DP streaming.
- A2DP / Aux-in source switch in A2DP suppress Aux-in case
  - ⇒ While configured to A2DP has higher priority than line-in, switching audio source to line-in from A2DP by MBA could not make line-in music play immediately. This is because most phone will transmit silence A2DP music after paused A2DP. Due to configured to A2DP has higher priority than line-in, the silence music is still decoding but unable heard, this make line-in music delay to play until A2DP silence music is really terminated. The delay time is various by different phone brand. Sometimes it could be longest to more than 10 seconds.

- iPhone do not display battery level icon for Bluetooth accessory
  - ⇒ We observed iPhone do not display battery level if CoD (Class of Deive) of BM83 is 0x240414 (for minor device class is 0x14 Loudspeaker). But iPhone would display battery level if CoD of BM83 was setting to 0x240404 (for minor device class is 0x04 Wearable Headset Device).

**VERSION1.0**

The following are the attributes of this firmware version for specific system requirements and device settings

- OTA DFU feature enabled using MBA app(Android & iOS)
- LDAC support enabled
- MCLK can be enabled/disabled in Config Tool
- PBAP 1.2 enabled
- Digital microphone support is enabled
- AAC codec support added for MSPK
- AVRCP browsing feature enabled
- DSP OTA tuning enabled
- Software Development Kit(SDK) enabled
- SPKCommandsetTool crashing issue fixed
- BLE disconnection issue with Samsung S10E resolved
- Connection issue after connection is rejected is resolved
- Fixed BLE and Bluetooth classic disconnect when phone call is disconnected
- SW I2C driver Added

## 1. Document Revision History

| Revision | Date       | Section  | Description                |
|----------|------------|----------|----------------------------|
| 1        | 4/19/2019  | Document | Initial Revision           |
| 1.1      | 06/30/2019 | V1.0     | Added v1.0 release details |
| 1.2      | 05/08/2020 | V1.2     | Added v1.2 release details |
| 1.3      | 8/28/2020  | V1.3     | Added V1.3 release details |

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