IS2083

IS2083 isUpdate Tool User's Guide

Introduction

The isUpdate tool is a Windows-based (Windows 7/8/10) tool used to update the device firmware, memory access function, and system configuration of Microchip Bluetooth® embedded systems. It supports the IS2083 through USB HID or RS232 interfaces. The operations include Flash update, Flash dump and creation of image files. This document mainly focuses on IS2083 operations and does not describe other operations such as EEPROM.

Memory access functions supported are:

- Update function – used to write data into the whole target memory for saving configurations by the `write memory` command.
- Rehex function – used to integrate all existing files and export to a single `*.HEX` file, which the data is aligned by 16 bytes and the address offset is arranged in ascending order.
- Dump function – used to read data from target devices by the `read memory` command. Result data is stored as `*.txt` files.
- Verify function – supported in Flash memory type and is used to compare the difference between readout data from device and data from an existing image file. This is used to confirm that the update procedure is done successfully.

Note: To perform the above operation on the BM83 EVB, refer to the BM83 Bluetooth Audio Development Board User Guide for EVB configurations.

Features

- Access Port
- Memory Type
- Code Information/Version
- Flash Update/Dump

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1. Quick References

1.1 Reference Documentation

For additional information, refer to the following documents:

- *IS2083 Bluetooth® Stereo Audio SoC Data Sheet*
- *BM83 Bluetooth® Audio Development Board User's Guide*
- *IS2083 SDK User's Guide (DS50002894)*

Note: These documents are available on the https://www.microchip.com/IS2083 or https://www.microchip.com/BM83 web pages.

1.2 Software Prerequisites

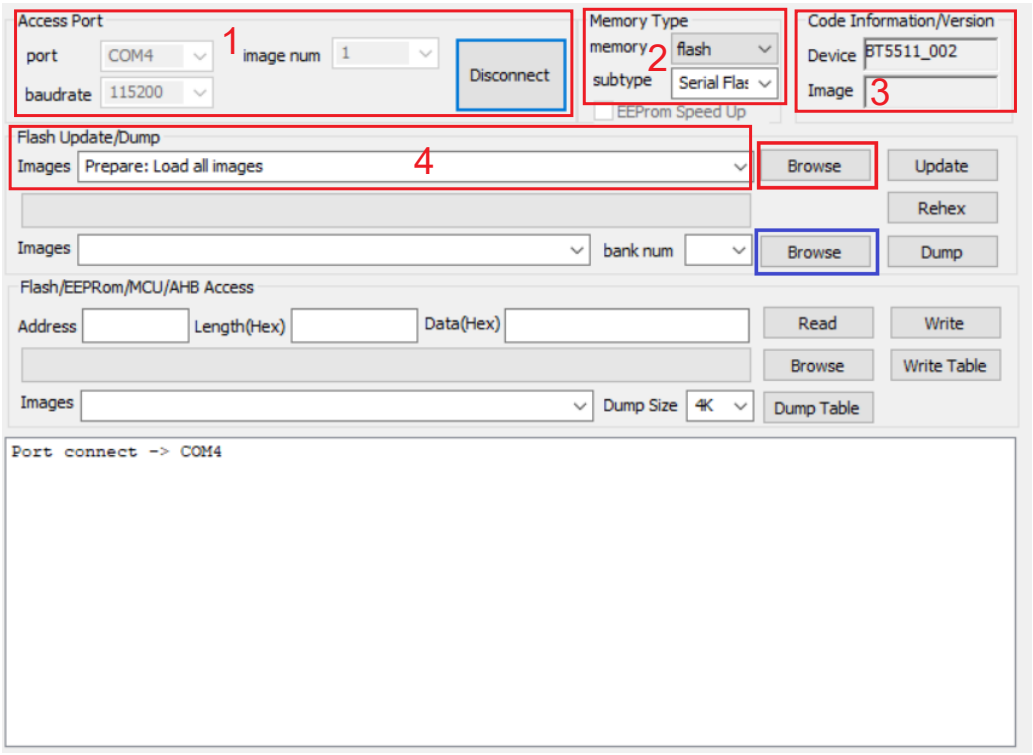
- isUpdate Tool (Part of the IS2083 Software Package)

Note: This package is available on the https://www.microchip.com/IS2083 or https://www.microchip.com/BM83 web pages.

2. isUpdate Tool Window

The following interface appears after the isUpdate tool is launched.

Figure 2-1. isUpdate Tool Window



1. Access Port – both COM port and *USB HID* interfaces can be chosen, and baudrate is supported up to 921600.
2. Memory Type – IS2083 have an internal SQI (Serial Quad I/O) Flash. The user needs to choose *flash* in the memory field and *Serial Flash* as the subtype.
3. Code Information/Version – the target device firmware code information is displayed in the "Device" field once the tool is successfully connected to the IS2083. "Image field" is not used in the IS2083.
4. Flash Update/Dump – once the tool is connected, the user can update or dump the Flash memory (firmware) by clicking on the respective **Browse** button:
   - The red **Browse** button is used for programming the target device with select `.hex files`.
   - The blue **Browse** button is used for selecting a PC folder to save the firmware `.hex files` of the target device.
   - During Flash Update and Dump, the progress bar shows the progress of the related operation. The **Rehex** button imports firmware images and generates a `.hex` file, and the data of each line is aligned to 32 bytes and a `.bin` file. The `Rehex.ini` option is used to regenerate a `.hex` file for the IS2083 and BM83.

3. Device Firmware Update

This section describes the firmware update of the BM83 module over UART and USB. The IS2083 contains three files: the 8051 image file, DSP image file and `.hex` configuration settings file. These three files are loaded into the IS2083.

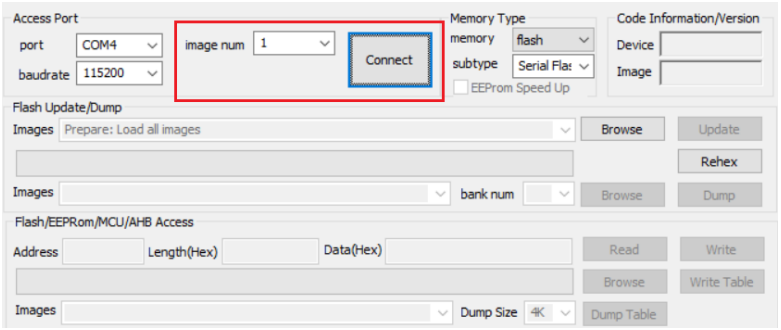
The user can choose to upload a single file or all three image files using the isUpdate tool. In order to upload one file, the image num settings in the isUpdate tool must be set to 1 (refer to the following figure); whereas to upload 3 files, the image num setting must be set to 3. The following examples describes the various image and configuration files available.

Example 1– Loading a single file.

One of the following files can be loaded into the target device:

- 8051 image – the user can modify the feature set related to the 8051 image
- DSP image – the user can modify the feature set to the DSP image
- Configuration file – user can modify the feature set related to the configuration file
- Rehex file – the user can combine all the files together and send it to testing

Figure 3-1. Loading a Single File

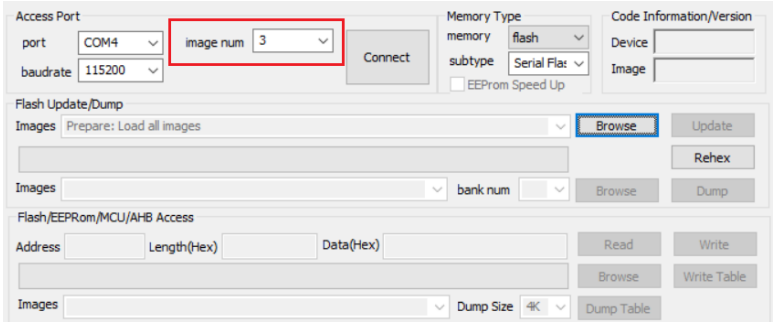


Example 2 – Loading multiple files.

A combination of any of the following files or a combination of them all:

- 8051 image – the user can modify the feature set related to the 8051 image
- DSP image – the user can modify the feature set to the DSP image
- Configuration file – the user can modify the feature set related to the configuration file

Figure 3-2. Loading Multiple Files



Note: Depending upon the number of files to be uploaded into the target device, image num varies as shown in the preceding examples.

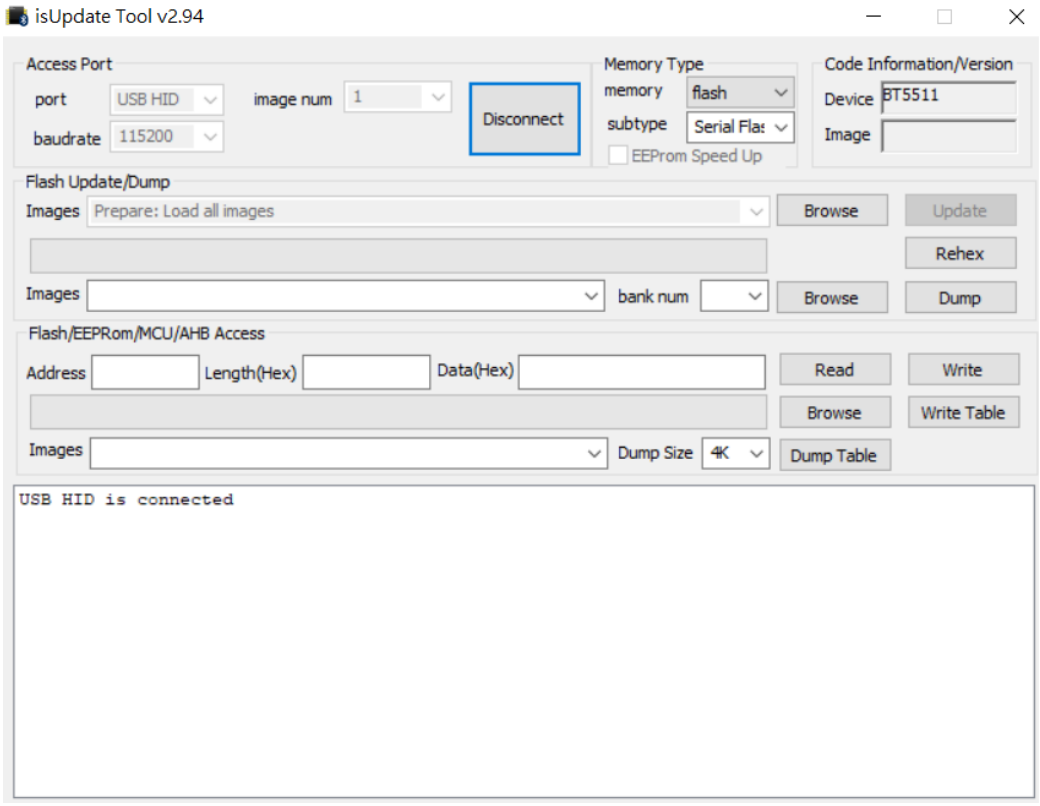
3.1 Flash Firmware Update by UART (Test Mode)

The IS2083 firmware can be updated in Test mode using a UART. For more details on Test mode programming, refer to the *IS2083 Bluetooth Stereo Audio SoC Data Sheet (DS70005403)*. The user can follow the procedures described in the *BM83 Bluetooth® Audio Development Board User's Guide (DS50002902)* to perform the device firmware update with the BM83 EVB.

3.2 Flash Firmware Update by USB (Application Mode)

The IS2083 firmware can be updated in Application mode using USB. The user must choose *USD HID* in the port field and choose the USB port in the BM83 EVB. Once a USB is connected, the 8051 application code receives an event to trigger the USB firmware update. The user can follow the procedures described in the *BM83 Bluetooth® Audio Development Board User's Guide (DS50002902)* to perform the device firmware update with the BM83 EVB.

Figure 3-3. USB HID Status



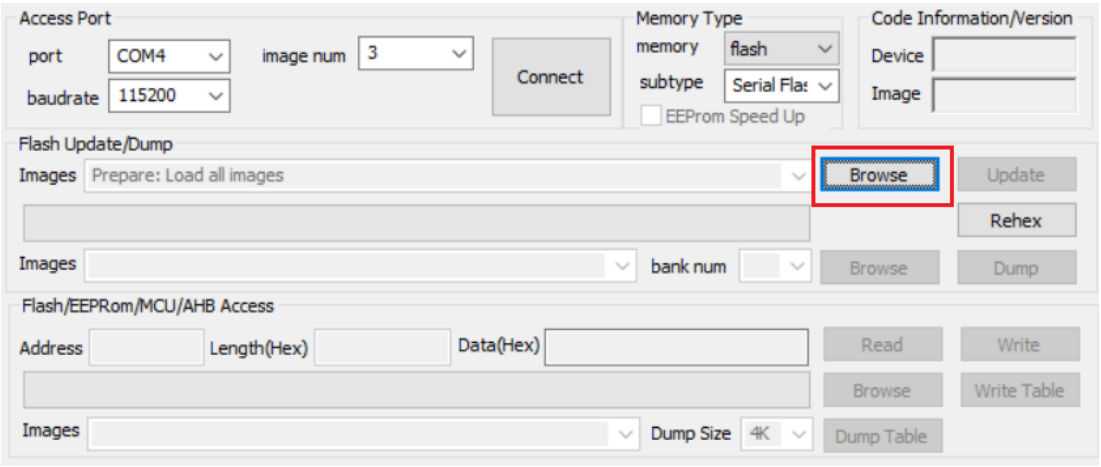
4. Combining the Images

The user can opt to load multiple files or opt to combine multiple files into a single file using the isUpdate tool. This file is called the `.Rehex` file. This section describes how to combine multiple files into a single file.

Perform the following steps to combine the three files: the 8051 image, DSP image, and configuration file:

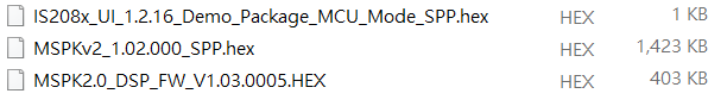
1. Launch the isUpdate tool
2. Set image num to 3 as three files are going to be combined
3. Click on the **Browse** button without connecting to the BM83

Figure 4-1. Image Selection



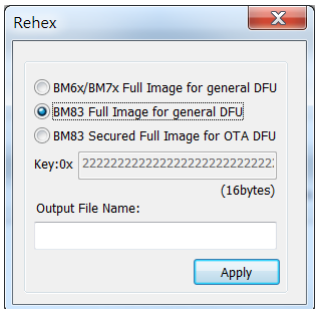
1. Select the 8051, DSP and configuration hex files.

Figure 4-2. hex Files



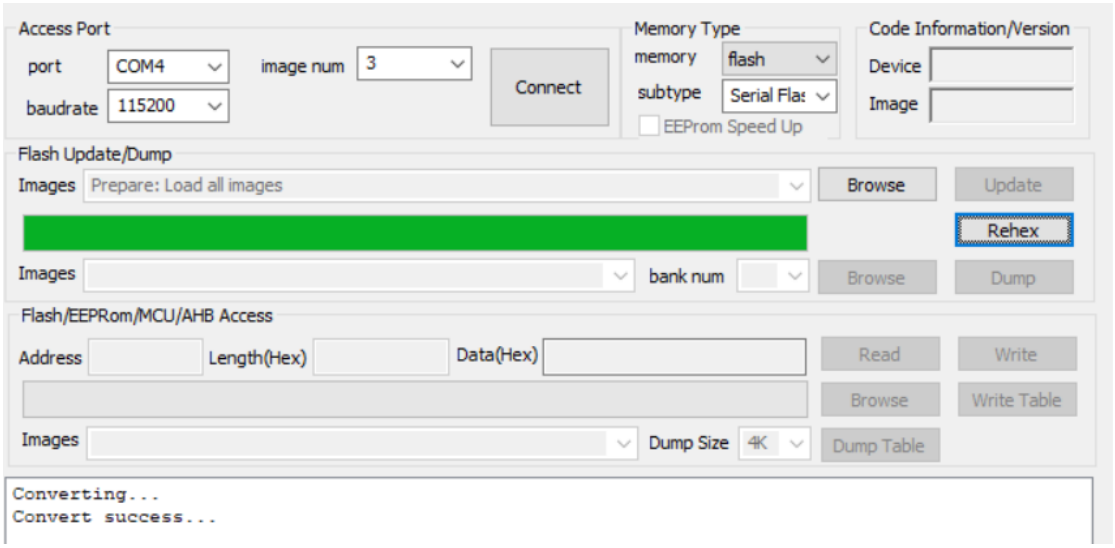
2. Once the number of files is selected, click on the **Rehex** button and select the appropriate option from the following:
   - For general DFU full image creation, choose *BM83 General Use*
   - For secured OTA DFU full image creation, through Bluetooth Low Energy, choose *BM83 OTA DFU Use*
   - Enter the file name in the Output File Name or the name of the rehex file must be same as the source image file with checksum

Figure 4-3. Rehex Window



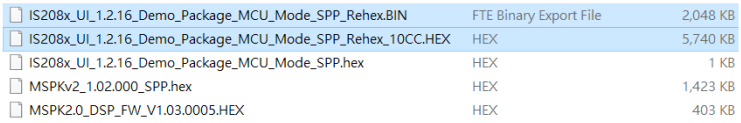
3. Click on the **Apply** button to generate a rehex file.

Figure 4-4. Image Conversion Process



4. The newly generated rehex file is stored in the same directory with the .hex file extension.

Figure 4-5. Generated Rehex Files



5. Image Dump

The isUpdate tool can also dump the images from the IS2083 through UART. To start the image dump, the user needs to put the IS2083 in Test mode and dump the images. Refer to 3.1 Flash Firmware Update by UART (Test Mode) to enter IS2083 Test mode.

1. Once the connection is established with the IS2083 device, perform the following steps to dump the file:
   1.1. Set the bank num to *1*
   1.2. Click on the **Browse** button, which is next to bank num, to choose the location
   1.3. Choose the location and enter the file name to save the file
2. Click on the **Dump** button, and the Dump window appears. Select the information type that needs to be dumped.

Figure 5-1. Dump Window

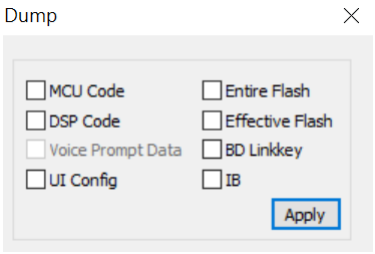


Table 5-1. IS2083 Image Dump Options

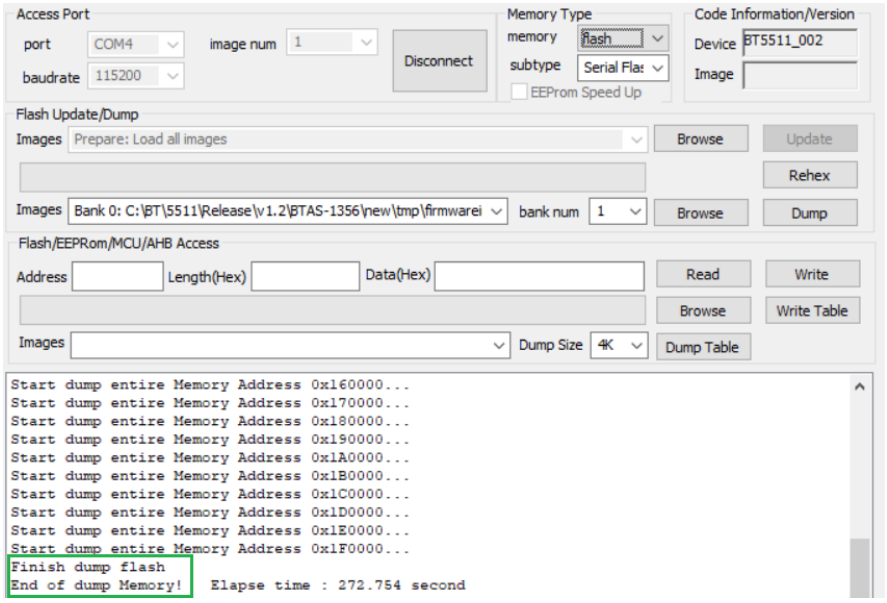
Dump Options	Description
MCU Code	Dumps the changes that are applicable to 8051 images[1]
DSP Code	Dumps the changes that are applicable to DSP images[1]
Voice Prompt Data	Dumps the changes that are applicable to Voice Prompt Data[1]
UI Config	Dumps the changes that are applicable to the Configuration file[1]
Entire Flash	Dumps the changes that are applicable to both banks' contents[1]
Effective Flash	Dumps the changes that are applicable to a specific bank's content[1]
BD Linkkey	Dumps the BD linkkey of all the paired devices[1]
IB	Dumps the changes that are applicable to information blocks and calibration[1]

Note:

1. For SQI Flash layout and content addressing, refer to the *IS2083 SDK User's Guide (DS50002894)*. For more details on Flash and Dumped files, refer to 6. Flash and Dumped Files

3. Choose *Entire Flash* and click on the **Apply** button to start the dumping process until it reaches the whole memory address.

Figure 5-2. Image Dump Process



4. Once the process is finished, the tool displays `Finish dump flash` and `End of dump Memory!`. The user can find the dumped file in the location selected in Step 1.

6. Flash and Dumped Files

BM83 Flash contains swapped banks for Flash header, runtime configuration, 8051 MCU image, DSP image, and voice prompt. Flash header contains information to select the blocks (B0 or B1) to be used during system boot-up. For more details on the Flash layout, refer to the *IS2083 SDK User's Guide (DS50002894)*.

Refer to the Figure 5-1 figure for details of the following scenarios:

- If the *Effective Flash* scenario is selected, the tool dumps either B0 or B1 with other components, see the Figure 6-1 figure for details.
- If the *Entire Flash* scenario is selected, the tool dumps both B0 and B1 with other components, see the Figure 6-2 figure for details.

In other conditions, if a module is loaded with a rehex file, th isUpdate tool clears bank-1 and writes the data in bank-0. In this scenario, if the entire Flash is dumped, the tool dumps only B0.

Figure 6-1. BM83 Effective Flash Layout

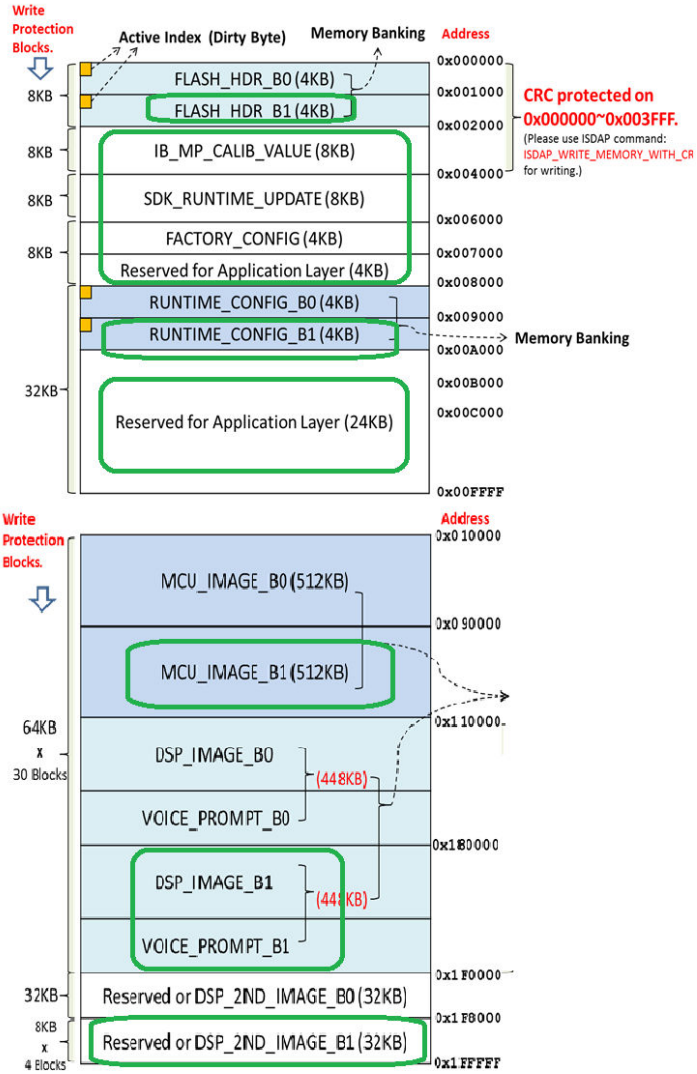
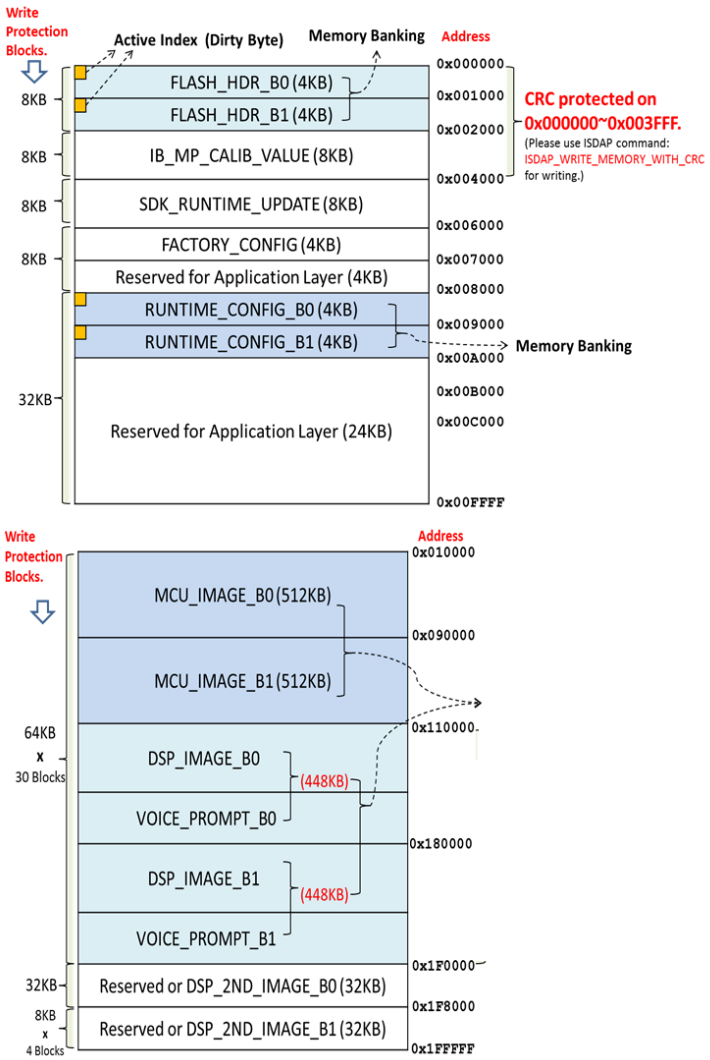


Figure 6-2. BM83 Entire Flash Layout



7. Document Revision History

Revision	Date	Section	Description
A	06/2020	Document	Initial Revision

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