Application Report

SBOA239–September 2017

TAS2557 and TAS2559 End-System Integration Guide

ABSTRACT

This document describes how to integrate the TAS2557 and TAS2559 devices into an end system.

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Trademarks

Android is a trademark of Google, Inc.
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1 End-System Integration

The System Integration feature is used to dump the binary and coefficients required to program TAS2557 and TAS2559 device based on the Tuning Snapshots created in Audio Processing. This feature can also be used to debug/tune audio on Android™ phone.

Figure 1 shows the System Integration page of the TAS2557 and TAS2559 application.

NOTE: The PPC3 screenshots and the information provided in this document are based on the PPC3 version 3.1.12.

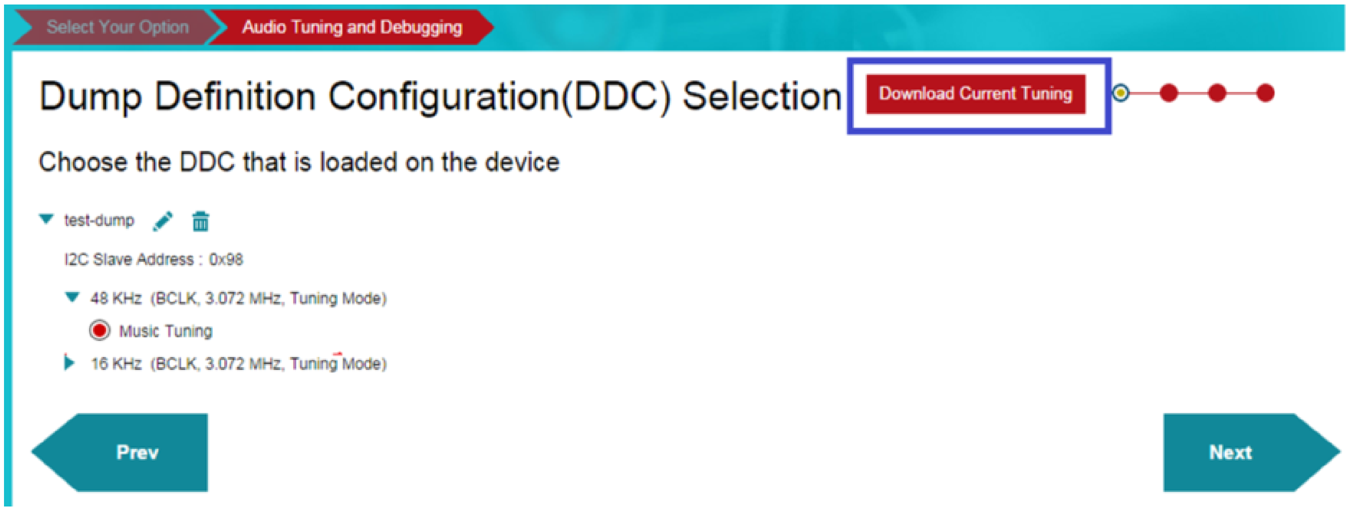

Select Your Option
Audio Tuning and Debugging
Dump Definition Configuration(DDC) Selection
Download Current Tuning
Choose the DDC that is loaded on the device
test-dump
I2C Slave Address : 0x98
48 KHz (BCLK, 3.072 MHz, Tuning Mode)
Music Tuning
16 KHz (BCLK, 3.072 MHz, Tuning Mode)
Prev
Next

Figure 1. System Integration Page

2 Workflow

Figure 2 shows the workflow of both options in the end-system integration.

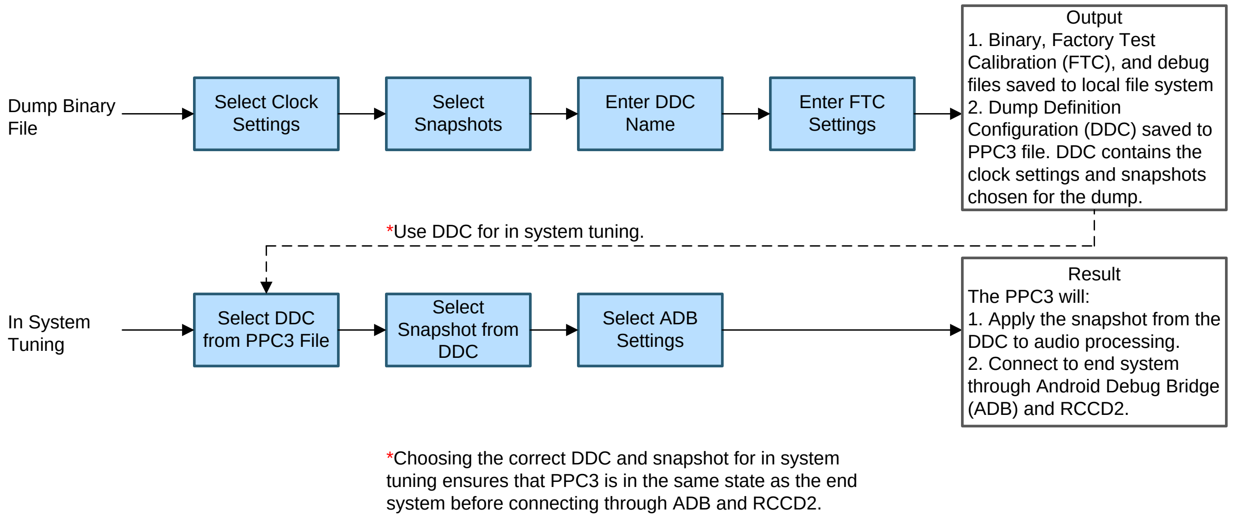

Dump Binary File
Select Clock Settings
Select Snapshots
Enter DDC Name
Enter FTC Settings
Output
1. Binary, Factory Test Calibration (FTC), and debug files saved to local file system
2. Dump Definition Configuration (DDC) saved to PPC3 file. DDC contains the clock settings and snapshots chosen for the dump.
*Use DDC for in system tuning.
In System Tuning
Select DDC from PPC3 File
Select Snapshot from DDC
Select ADB Settings
Result
The PPC3 will:
1. Apply the snapshot from the DDC to audio processing.
2. Connect to end system through Android Debug Bridge (ADB) and RCCD2.
*Choosing the correct DDC and snapshot for in system tuning ensures that PPC3 is in the same state as the end system before connecting through ADB and RCCD2.

Figure 2. End-System Integration Workflow

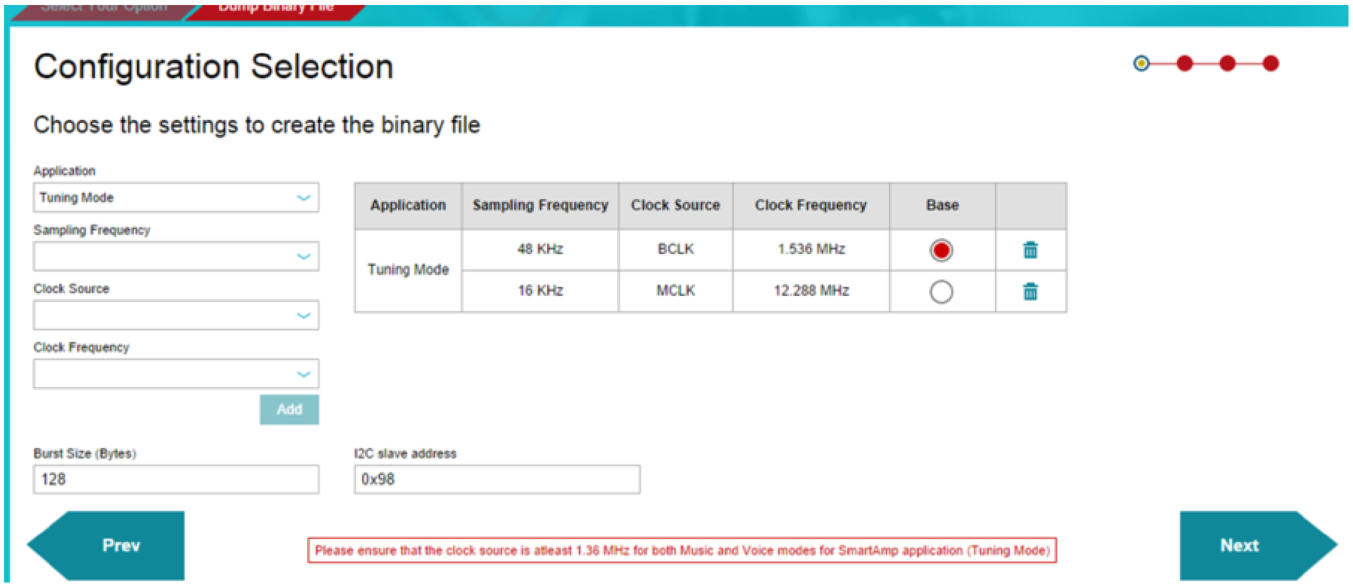
3 Dump Binary File

This section details the dump binary file wizard, the files that will be dumped, and how to use them.

3.1 *Dump Binary Wizard*

Follow these steps to dump the binary file:

1. Click Dump the binary file option and click Next. Configuration Selection page will appear as shown in Figure 3. In this page the user can choose the Sampling Frequency and Clocks that are available in the end system.



Configuration Selection

Choose the settings to create the binary file

Application: Tuning Mode

Sampling Frequency:

Clock Source:

Clock Frequency:

Application	Sampling Frequency	Clock Source	Clock Frequency	Base	
Tuning Mode	48 KHz	BCLK	1.536 MHz	●	🗑
	16 KHz	MCLK	12.288 MHz	○	🗑

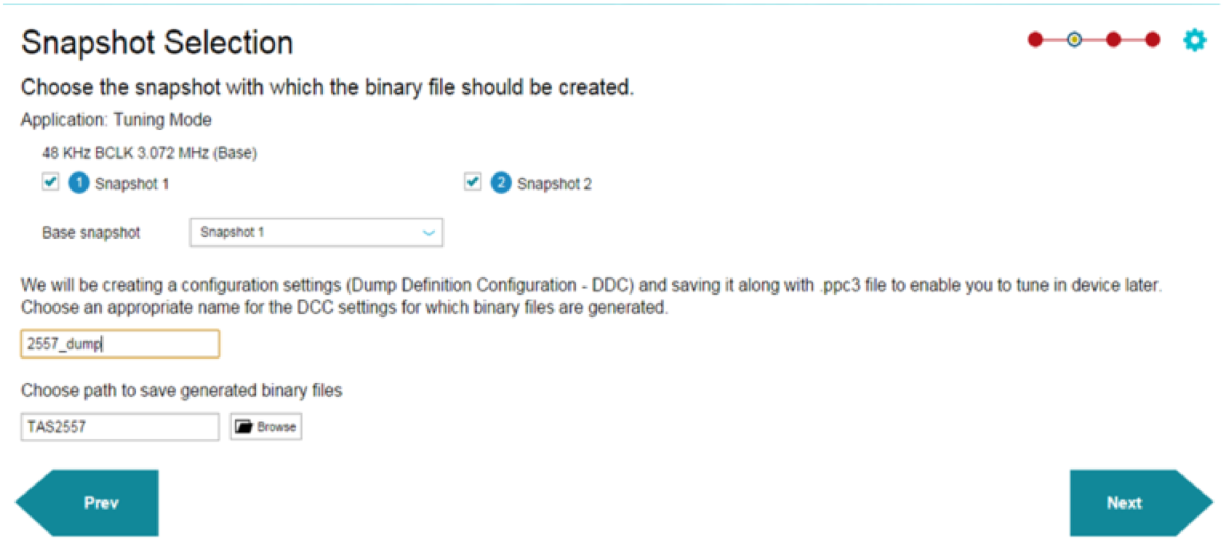
Burst Size (Bytes): 128

I2C slave address: 0x98

Please ensure that the clock source is atleast 1.36 MHz for both Music and Voice modes for SmartAmp application (Tuning Mode)

Figure 3. Dumping Binary File – Configuration Selection

2. Set the desired configuration values and click Next. Then, the Snapshot Selection wizard appears (see Figure 4 and Figure 5).



Snapshot Selection

Choose the snapshot with which the binary file should be created.

Application: Tuning Mode

48 KHz BCLK 3.072 MHz (Base)

✓ 1 Snapshot 1 ✓ 2 Snapshot 2

Base snapshot: Snapshot 1

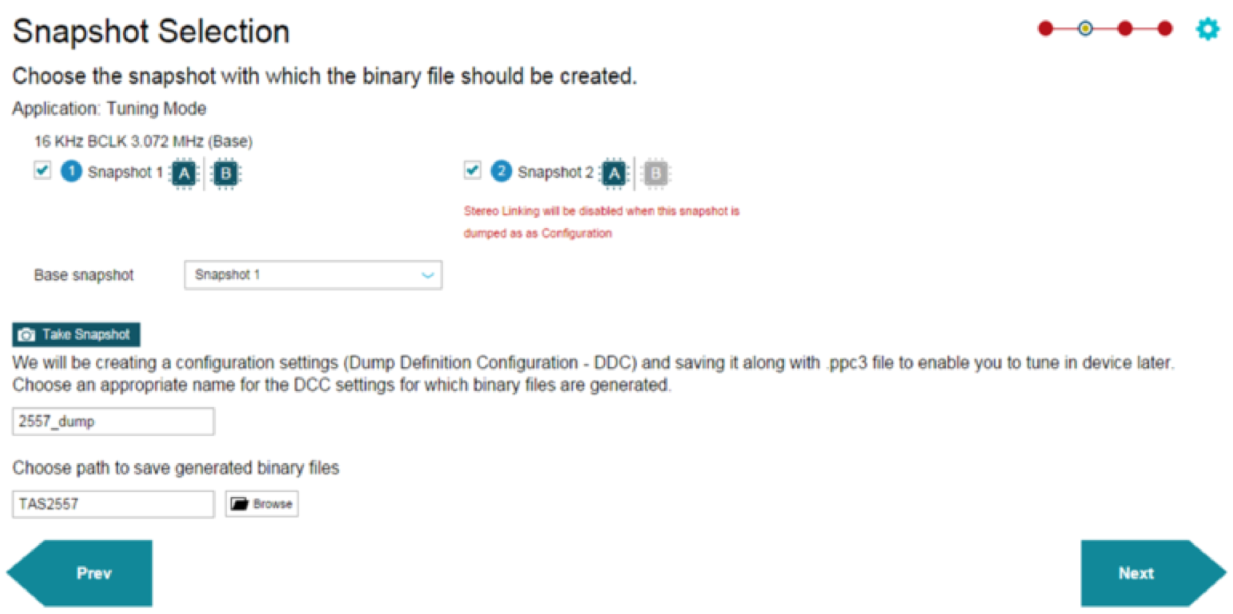
We will be creating a configuration settings (Dump Definition Configuration - DDC) and saving it along with .ppc3 file to enable you to tune in device later. Choose an appropriate name for the DCC settings for which binary files are generated.

2557_dump

Choose path to save generated binary files

TAS2557

Figure 4. Dumping Binary File – Snapshot Selection (1 of 2)


Snapshot Selection

Choose the snapshot with which the binary file should be created.

Application: Tuning Mode

16 KHz BCLK 3.072 MHz (Base)

✓ 1 Snapshot 1 A B

✓ 2 Snapshot 2 A B

Stereo Linking will be disabled when this snapshot is dumped as as Configuration

Base snapshot: Snapshot 1

We will be creating a configuration settings (Dump Definition Configuration - DDC) and saving it along with .ppc3 file to enable you to tune in device later. Choose an appropriate name for the DCC settings for which binary files are generated.

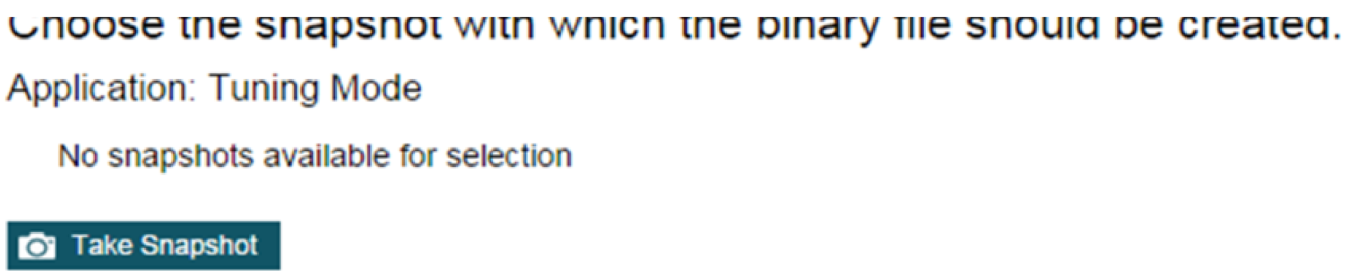
2557_dump

Choose path to save generated binary files

TAS2557

Figure 5. Dumping Binary File – Snapshot Selection (2 of 2)

3. Choose an existing snapshot from the options available (if any) or take a new snapshot by clicking the Take Snapshot button (shown in Figure 6).

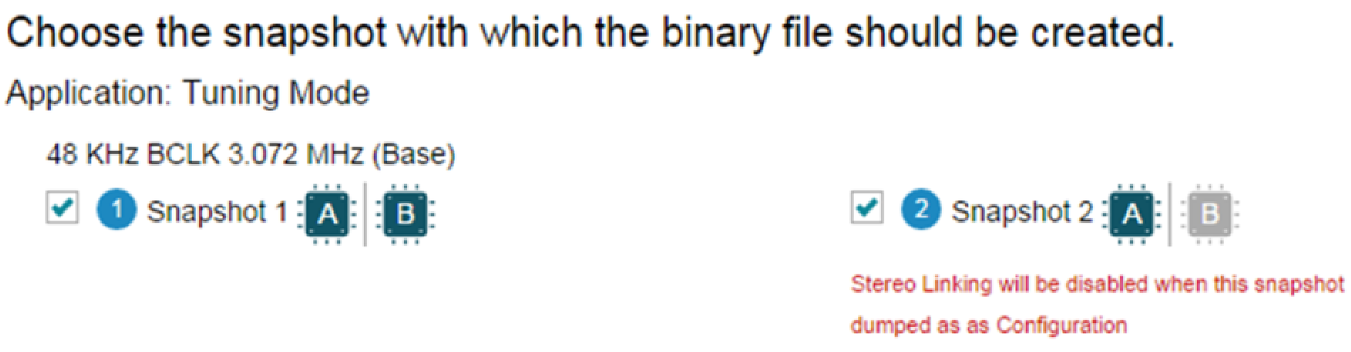

Choose the snapshot with which the binary file should be created.

Application: Tuning Mode

No snapshots available for selection

Figure 6. Dumping Binary File – Take a New Snapshot

4. Choose the devices that will be used in the snapshot for the TAS2557 Dual Mono and TAS2559 applications.


Choose the snapshot with which the binary file should be created.

Application: Tuning Mode

48 KHz BCLK 3.072 MHz (Base)

✓ 1 Snapshot 1 A B

✓ 2 Snapshot 2 A B

Stereo Linking will be disabled when this snapshot dumped as as Configuration

Figure 7. Dumping Binary File – Select Device in the Snapshot

5. Choose the Base snapshot that becomes the first Tuning Configuration in the End System. This configuration can be set as the boot configuration in the end system.

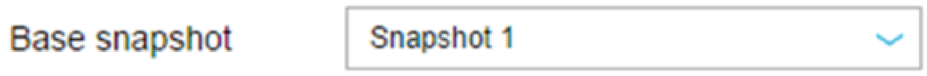
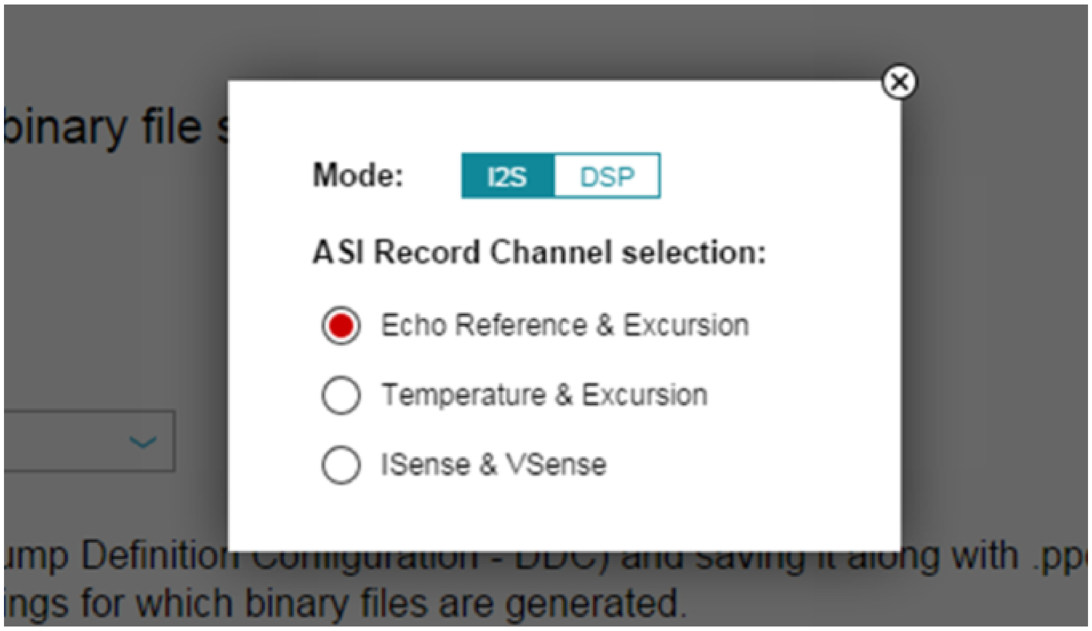

Base snapshot: Snapshot 1

Figure 8. Dumping Binary File – Choose Target Device

6. Change the ASI Record Channel by clicking the settings icon in the top-right corner (see Figure 9). Choose the record channel from the popup. (This is applicable only for the TAS2557, not for the TAS2559.)


Mode: [✓ I2S] DSP

ASI Record Channel selection:

- [✓ Echo Reference & Excursion]
- Temperature & Excursion
- ISense & VSense

Figure 9. Dumping Binary File – A-SI Record Channel Selection

7. Enter the DDC name and path once a snapshot is chosen, then click Next (see Figure 10).

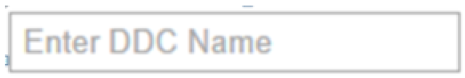
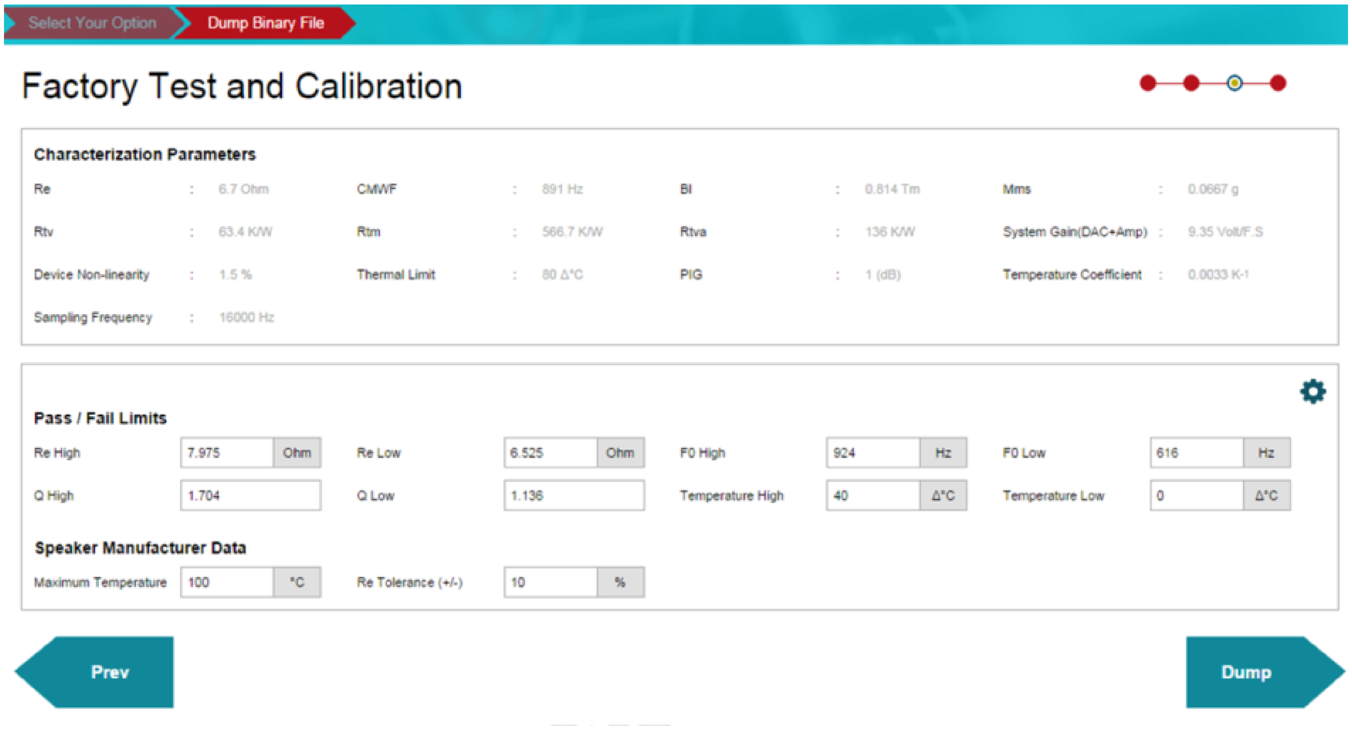


Figure 10. Dumping Binary File – Enter DDC Name

The data captured in the Factory Test and Calibration page generate a <DDC Name>.ftcfg file at the end of the wizard. A device driver on the end system uses the .ftcfg file to run the factory calibration.



Factory Test and Calibration

Characterization Parameters

Re	6.7 Ohm	CMWF	891 Hz	Bl	0.814 Tm	Mms	0.0667 g
Rtv	63.4 K/W	Rtm	566.7 K/W	Rtva	136 K/W	System Gain(DAC+Amp)	9.35 Volt/F.S
Device Non-linearity	1.5 %	Thermal Limit	80 Δ°C	PIG	1 (dB)	Temperature Coefficient	0.0033 K-1
Sampling Frequency	16000 Hz						

Pass / Fail Limits

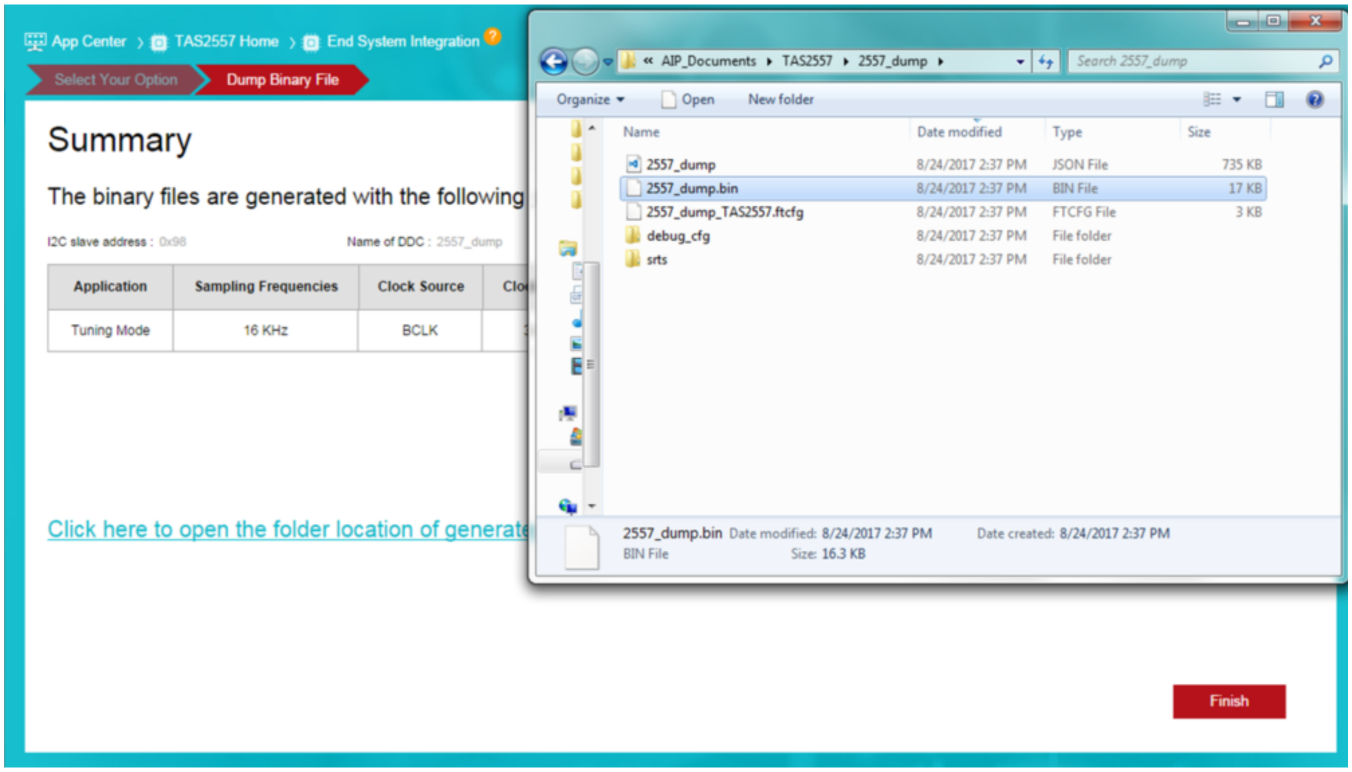
Re High	7.975 Ohm	Re Low	6.525 Ohm	F0 High	924 Hz	F0 Low	616 Hz
Q High	1.704	Q Low	1.136	Temperature High	40 Δ°C	Temperature Low	0 Δ°C

Speaker Manufacturer Data

Maximum Temperature	100 °C	Re Tolerance (+/-)	10 %

Figure 11. Factory Test and Calibration

Figure 12 shows the result of binary file and associated file generation.



Summary

The binary files are generated with the following

I2C slave address : 0x98 Name of DDC : 2557_dump

Application	Sampling Frequencies	Clock Source	Clo
Tuning Mode	16 KHz	BCLK	

Click here to open the folder location of generate

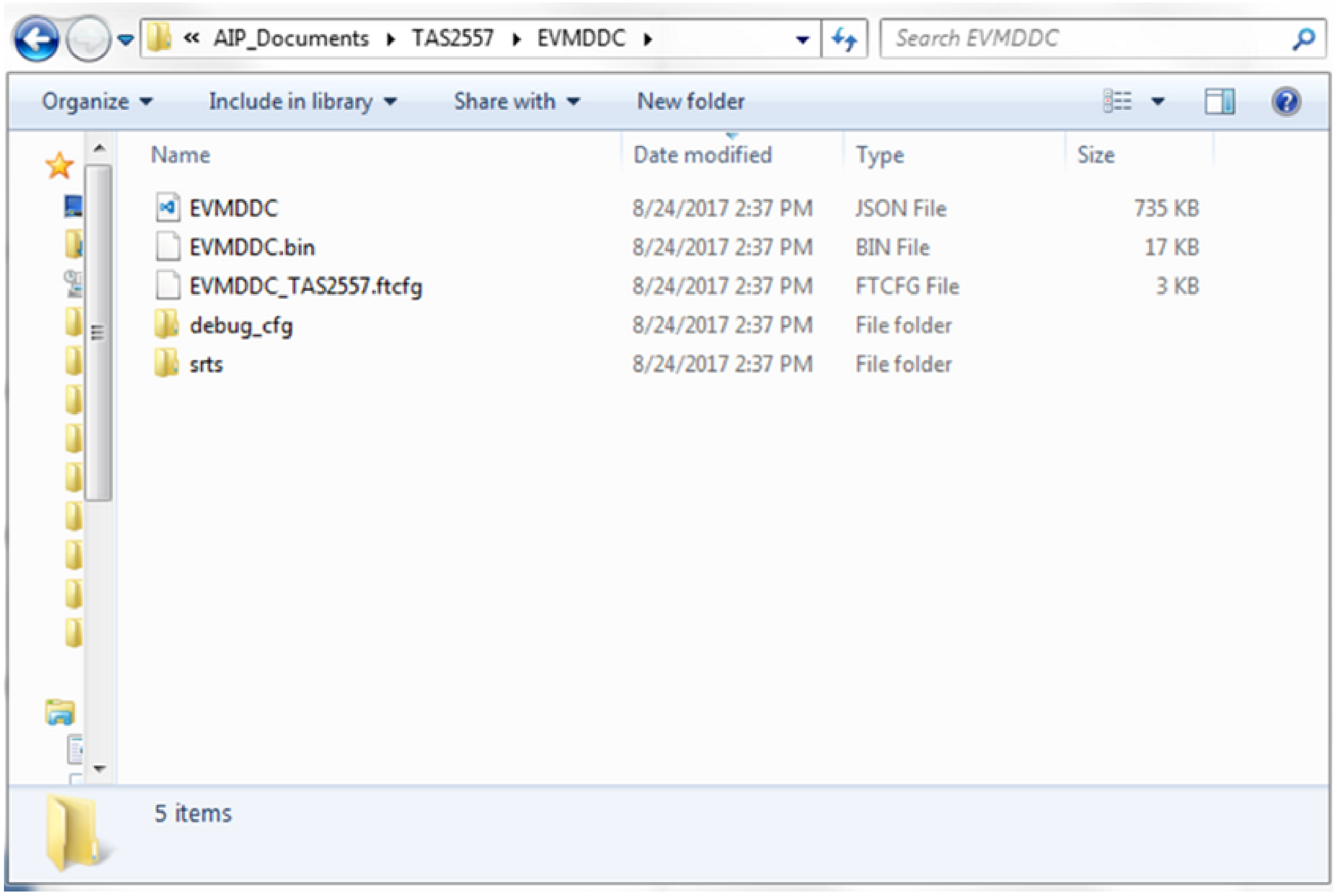
Name	Date modified	Type	Size
2557_dump	8/24/2017 2:37 PM	JSON File	735 KB
2557_dump.bin	8/24/2017 2:37 PM	BIN File	17 KB
2557_dump_TAS2557.ftcfg	8/24/2017 2:37 PM	FTCFG File	3 KB
debug_cfg	8/24/2017 2:37 PM	File folder	
srts	8/24/2017 2:37 PM	File folder	

2557_dump.bin Date modified: 8/24/2017 2:37 PM Date created: 8/24/2017 2:37 PM
BIN File Size: 16.3 KB

Figure 12. Summary Page

3.2 Overview of Files Dumped by PPC3

Figure 13 shows the dumped files.



Name	Date modified	Type	Size
EVMDDC	8/24/2017 2:37 PM	JSON File	735 KB
EVMDDC.bin	8/24/2017 2:37 PM	BIN File	17 KB
EVMDDC_TAS2557.ftcfg	8/24/2017 2:37 PM	FTCFG File	3 KB
debug_cfg	8/24/2017 2:37 PM	File folder	
srts	8/24/2017 2:37 PM	File folder	

Figure 13. Dumped Files

3.2.1 Description of Files Dumped

3.2.1.1 EVMDDC.bin

The EVMDDC.bin file is recommended for use in platforms with file systems. The file contains all required information (except power and mute sequence) to program the TAS2557 and TAS2559 devices. Most Android phones with the TAS2557 and TAS2559 use this file format.

3.2.1.2 EVMDDC.ftcfg

Device driver uses this file to get the characterization data of the speaker to run the factory line calibration process on the end system.

3.2.1.3 Debug Files

The following debug files are dumped in addition to the EVMDDC.ftcfg and EVMDDC.bin files: EVMDDC.json, debug_cfg, debug.cfg, and more.

4 Device Driver Integration

This section describes the sequence of programming by the device driver in the end system. The sequence of programming depends on the state in which the end system is currently in. This section lists the sequence of programming for each such state.

Example device driver code is available with TI. Users can use the example driver to port to their platform.

The dumped .bin file has various blocks (see the following code snippet).

```
Block types within the binary file are:
#define TAS2557_BLOCK_PLL                    0x00
#define TAS2557_BLOCK_PGM_ALL                0x0d
#define TAS2557_BLOCK_PGM_DEV_A              0x01
#define TAS2557_BLOCK_PGM_DEV_B              0x08
#define TAS2557_BLOCK_CFG_COEFF_DEV_A        0x03
#define TAS2557_BLOCK_CFG_COEFF_DEV_B        0x0a
#define TAS2557_BLOCK_CFG_PRE_DEV_A          0x04
#define TAS2557_BLOCK_CFG_PRE_DEV_B          0x0b
#define TAS2557_BLOCK_CFG_POST               0x05
#define TAS2557_BLOCK_CFG_POST_POWER         0x06
#define TAS2559_BLOCK_PST_POWERUP_DEV_B      0x0e
#define TAS2557_BLOCK_CFG_CAL_A              0x10
#define TAS2557_BLOCK_CFG_CAL_B              0x20
```

Because of different applications (such as TAS2557, TAS2557 Dual-Mono, and TAS2559), it is possible that not all blocks are present in one application. If a block is not there, that step can be skipped.

Use the following references for Section 4.1 through Section 4.5.

[A]: applies to device A.

[B]: applies to device B.

[AB]: applies to device A and device B. For TAS2559 applications, device A refers to the TAS2559, and device B refers to the TAS2560.

4.1 Case One

Programming the TAS2557 and TAS2559 for the first time:

Use case: device initialization during system boot up.

In this case, the DSP program memory and coefficiency memory are empty. For better understanding, use configuration 0 as default tuning data.

Steps to playback:

1. [AB]Hardware reset

   Hardware reset is strongly recommended for reliable operations afterward.
2. [AB]Software reset
3. Initialize

   This is not part of the binary file. This initialization is about ASI format, IRQ configuration, and other configurations.
   - [A]TAS2557 mono applications:

     See tas2557-android-driver.
   ```
   int tas2557_load_default(struct tas2557_priv *pTAS2557)
   ```
   - [AB]TAS2557 stereo applications:

     See tas2557-stereo-driver.
   ```
   int yas2557_load_default(struct tas2557_priv *pTAS2557)
   ```
   - [AB]TAS2559 applications:

     See tas2559-android-driver.
   ```
   int tas2559_load_default(struct tas2559_priv *pTAS2559)
   ```

4. Download the program.
   - [AB]Load TAS2557_BLOCK_PGM_ALL of configuration 0 in broadcasting mode
   - [A]Load TAS2557_BLOCK_PGM_DEV_A of configuration 0
   - [B]Load TAS2557_BLOCK_PGM_DEV_B of configuration 0
5. Download the PLL.
   - For TAS2557 mono applications: [A] Load TAS2557_BLOCK_PLL of configuration 0
   - For TAS2557 stereo applications: [AB] Load TAS2557_BLOCK_PLL of configuration 0
   - For TAS2559 applications: [A] Load TAS2557_BLOCK_PLL of configuration 0
6. Download the predata of the configuration.
   - [A]Load TAS2557_BLOCK_CFG_PRE_DEV_A of configuration 0
   - [B]Load TAS2557_BLOCK_CFG_PRE_DEV_B of configuration 0
7. Download the coefficient.
   - [A]Load TAS2557_BLOCK_CFG_COEFF_DEV_A of configuration 0
   - [B]Load TAS2557_BLOCK_CFG_COEFF_DEV_B of configuration 0
8. Download calibration data if present.
   - [A]Load TAS2557_BLOCK_CFG_CAL_A of configuration 0
   - [B]Load TAS2557_BLOCK_CFG_CAL_B of configuration 0

   Stop here unless playback is required. If playback is required, proceed to Step 10.
9. Feed the PLL clock. Audio stream may start any time after this step.
10. [AB]Power on TAS devices.

    (a) Load the start-up sequence; this is not part of the binary file.

    For TAS2559 applications, the TAS2559 must be turned on first, then followed by a TAS2560 0.2-ms delay required in between.
    - TAS2557 mono applications:

      See tas2557-android-driver.
    ```
    static unsigned int p_tas2557_startup_data[] =
    ```
    - TAS2557 stereo applications:

      See tas2557-stereo-driver.
    ```
    static unsigned int p_tas2557_startup_data[]
    ```
    - TAS2559 applications:

      See tas2559-android-driver.
    ```
    static unsigned int p_tas2559_startup_data[]
    ```
11. Download the power power up block.
    - [B]Load TAS2559_BLOCK_PST_POWERUP_DEV_B of configuration 0

      This block is only present for TAS2559 applications.
12. [AB]Unmute TAS devices.

    (a) Load the unmute sequence; this is not part of the binary file.
    - TAS2557 mono applications:

      See tas2557-android-driver.
    ```
    static unsigned int p_tas2557_unmute_data[] =
    ```
    - TAS2557 stereo applications:

      See tas2557-stereo-driver.
    ```
    static unsigned int p_tas2557_unmute_data[]
    ```
    - TAS2559 applications:

      See tas2559-android-driver.
    ```
    static unsigned int p_tas2559_unmute_data[]
    ```

Steps to sleep:

1. [AB]Mute and shutdown TAS devices.
   (a) Load the shutdown sequence; this is not part of the binary file.
   - TAS2557 mono applications:
     See tas2557-android-driver.
   ```
   static unsigned int p_tas2557_shutdown_data[] =
   ```
   - TAS2557 stereo applications:
     See tas2557-stereo-driver.
   ```
   static unsigned int p_tas2557_shutdown_data[]
   ```
   - TAS2559 applications:
     See tas2559-android-driver.
   ```
   static unsigned int p_tas2559_shutdown_data[]
   ```
2. Turn off the PLL clock.

4.2 Case Two

TAS2557 and TAS2559 has been programmed and there is no need to change the configuration.

Use case: device power up to play music.

The DSP program memory has been programmed and the coefficient memory has been programmed.

Steps to playback:

1. Feed the PLL clock. Audio stream may start any time after this step.
2. [AB]Power on TAS devices.
   (a) Load the start-up sequence; this is not part of the binary file.
   For TAS2559 applications, the TAS2559 must be turned on first, then followed by a TAS2560 0.2-ms delay required in between.
   - TAS2557 mono applications:
     See tas2557-android-driver.
   ```
   static unsigned int p_tas2557_startup_data[] =
   ```
   - TAS2557 stereo applications:
     See tas2557-stereo-driver.
   ```
   static unsigned int p_tas2557_startup_data[]
   ```
   - TAS2559 applications:
     See tas2559-android-driver.
   ```
   static unsigned int p_tas2559_startup_data[]
   ```
3. Download the post power up block.
   - [B]Load TAS2559_BLOCK_PST_POWERUP_DEV_B of current configuration
     This block is only present for TAS2559 applications.

4. [AB]Unmute TAS devices.

   (a) Load the unmute sequence; this is not part of the binary file.

   - TAS2557 mono applications:

     See tas2557-android-driver.

     `static unsigned int p_tas2557_unmute_data[] =`

   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

     `static unsigned int p_tas2557_unmute_data[]`

   - TAS2559 applications:

     See tas2559-android-driver.

     `static unsigned int p_tas2559_unmute_data[]`

Steps to sleep:

1. [AB]Mute and shut down TAS devices.

   (a) Load the shutdown sequence; this is not part of the binary file.

   - TAS2557 mono applications:

     See tas2557-android-driver.

     `static unsigned int p_tas2557_shutdown_data[] =`

   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

     `static unsigned int p_tas2557_shutdown_data[]`

   - TAS2559 applications:

     See tas2559-android-driver.

     `static unsigned int p_tas2559_shutdown_data[]`

2. Turn off the PLL clock.

4.3 Case Three

Need to change to a new configuration with the same program and same PLL.

Use case: switch to another tuning (PPC3 snapshot) during music playback. Assume the new configuration is x.

Steps to playback:

NOTE: If the music is playing and TAS devices are running, skips Steps 3, 4, 5, and 6. If the music is not playing, stop after completing Step 2.

1. Download the coefficient.
   - [A]Load TAS2557_BLOCK_CFG_COEFF_DEV_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_COEFF_DEV_B of configuration x
2. Download the calibration data if present.
   - [A]Load TAS2557_BLOCK_CFG_CAL_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_CAL_B of configuration x
3. Feed the PLL clock. The audio stream may start any time after this step.

4. [AB]Power on TAS devices.
   (a) Load the start up sequence; this is not part of the binary file.

   For TAS2559 applications, the TAS2559 must be turned on first, then followed by a TAS2560 0.2-ms delay required in between.

   - TAS2557 mono applications:

     See tas2557-android-driver.

   `static unsigned int p_tas2557_startup_data[] =`

   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

   `static unsigned int p_tas2557_startup_data[]`

   - TAS2559 applications:

     See tas2559-android-driver.

   `static unsigned int p_tas2559_startup_data[]`
5. Download the post power up block.
   - [B]Load TAS2559_BLOCK_PST_POWERUP_DEV_B of current configuration

     This block is only present for TAS2559 applications.
6. Load the unmute sequence; this is not part of the binary file.
   - TAS2557 mono applications:

     See tas2557-android-driver.

   `static unsigned int p_tas2557_unmute_data[] =`

   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

   `static unsigned int p_tas2557_unmute_data[]`

   - TAS2559 applications:

     See tas2559-android-driver.

   `static unsigned int p_tas2559_unmute_data[]`

Steps to sleep:

1. [AB]Mute and shutdown TAS devices.
   (a) Load the shutdown sequence; this is not part of the binary file.

   - TAS2557 mono applications:

     See tas2557-android-driver.

   `static unsigned int p_tas2557_shutdown_data[] =`

   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

   `static unsigned int p_tas2557_shutdown_data[]`

   - TAS2559 applications:

     See tas2559-android-driver.

   `static unsigned int p_tas2559_shutdown_data[]`
2. Turn off the PLL clock.

4.4 Case Four

Need to change to a ne configuration with the same program and different PLL.

Use case: device is playing with a 48-kHz sample rate and switches to music playback with a 44.1-kHz sample rate.

Assume the new configuration index is x.

NOTE: [AB]If the music is playing and TAS devices are running, load the shutdown sequence. If the music is not playing, skip steps 5, 6, 7, and 8.

The shutdown sequence is not part of the binary file.

- TAS2557 mono applications:

  See tas2557-android-driver.

```
static unsigned int p_tas2557_shutdown_data[] =
```

- TAS2557 stereo applications:

  See tas2557-stereo-driver.

```
static unsigned int p_tas2557_shutdown_data[]
```

- TAS2559 applications:

  See tas2559-android-driver.

```
static unsigned int p_tas2559_shutdown_data[]
```

1. Download the PLL.
   - For TAS2557 mono applications:
     [A]Load TAS2557_BLOCK_PLL of configuration x
   - For TAS2557 stereo applications:
     [AB]Load TAS2557_BLOCK_PLL of configuration x
   - For TAS2559 applications:
     [A]Load TAS2557_BLOCK_PLL of configuration x
2. Download the configuration predata.
   - [A]Load TAS2557_BLOCK_CFG_PRE_DEV_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_PRE_DEV_B of configuration x
3. Download the coefficient.
   - [A]Load TAS2557_BLOCK_CFG_COEFF_DEV_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_COEFF_DEV_B of configuration x
4. Download the calibration data if present.
   - [A]Load TAS2557_BLOCK_CFG_CAL_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_CAL_B of configuration x
5. Feed the PLL clock. The audio stream may start any time after this step.

6. [AB]Power on the TAS devices.
   (a) Load the startup sequence; this is not part of the binary file.
   For TAS2559 applications, the TAS2559 must be turned on first, then followed by a TAS2560 0.2-ms delay required in between.
   - TAS2557 mono applications:
     See tas2557-android-driver.
   ```
   static unsigned int p_tas2557_startup_data[] =
   ```
   - TAS2557 stereo applications:
     See tas2557-stereo-driver.
   ```
   static unsigned int p_tas2557_startup_data[]
   ```
   - TAS2559 applications:
     See tas2559-android-driver.
   ```
   static unsigned int p_tas2559_startup_data[]
   ```
7. Download the post power up block.
   - [B]Load TAS2559_BLOCK_PST_POWERUP_DEV_B of configuration x
     This block is only present for TAS2559 applications.
8. [AB]Unmute TAS devices.
   Load the unmute sequence; this is not part of the binary file.
   - TAS2557 mono applications:
     See tas2557-android-driver.
   ```
   static unsigned int p_tas2557_unmute_data[] =
   ```
   - TAS2557 stereo applications:
     See tas2557-stereo-driver.
   ```
   static unsigned int p_tas2557_unmute_data[]
   ```
   - TAS2559 applications:
     See tas2559-android-driver.
   ```
   static unsigned int p_tas2559_unmute_data[]
   ```

Steps to sleep:

1. [AB]Mute and shutdown TAS devices.
   Load the shutdown sequence; this is not part of the binary file.
   - TAS2557 mono applications:
     See tas2557-android-driver.
   ```
   static unsigned int p_tas2557_shutdown_data[] =
   ```
   - TAS2557 stereo applications:
     See tas2557-stereo-driver.
   ```
   static unsigned int p_tas2557_shutdown_data[]
   ```
   - TAS2559 applications:
     See tas2559-android-driver.
   ```
   static unsigned int p_tas2559_shutdown_data[]
   ```
2. Turn off the PLL clock.

4.5 Case Five

Need to change to a new configuration with a different program.

Use case: from speaker protection mode (tuning mode), change to ROM1 mode for factory test. Assume the new configuration index is x.

Steps to playback:

[AB]If music is playing and TAS devices are running, load the shutdown sequence. The shutdown sequence is not part of the binary file.

- TAS2557 mono applications:

  See tas2557-android-driver.

```
static unsigned int p_tas2557_shutdown_data[] =
```

- TAS2557 stereo applications:

  See tas2557-stereo-driver.

```
static unsigned int p_tas2557_shutdown_data[]
```

- TAS2559 applications:

  See tas2559-android-driver.

```
static unsigned int p_tas2559_shutdown_data[]
```

1. [AB]Hardware reset.

   Hardware reset is strongly recommended for reliable operations afterward.
2. [AB]Software reset.
3. [AB]Initialize.

   This is not part of the binary file. This initialization is about ASI format, IRQ configuration, and some other configurations.
   - TAS2557 mono applications:

     See tas2557-android-driver.

   ```
   int tas2557_load_default(struct tas2557_priv *pTAS2557)
   ```
   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

   ```
   int tas2557_load_default(struct tas2557_priv *pTAS2557)
   ```
   - TAS2559 applications:

     See tas2559-android-driver.

   ```
   int tas2559_load_default(struct tas2559_priv *pTAS2559)
   ```
4. Download the program.
   - [AB]Load TAS2557_BLOCK_PGM_ALL of configuration x in broadcasting mode
   - [A]Load TAS2557_BLOCK_PGM_DEV_A of configuration x
   - [B]Load TAS2557_BLOCK_PGM_DEV_B of configuration x

5. Download the PLL.
   - For TAS2557 mono applications:

     [A]Load TAS2557_BLOCK_PLL of configuration x
   - For TAS2557 stereo applications:

     [AB]Load TAS2557_BLOCK_PLL of configuration x
   - For TAS2559 applications:

     [A]Load TAS2557_BLOCK_PLL of configuration x
6. Download the configuration predata.
   - [A]Load TAS2557_BLOCK_CFG_PRE_DEV_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_PRE_DEV_B of configuration x
7. Download the coefficient.
   - [A]Load TAS2557_BLOCK_CFG_COEFF_DEV_A of configuration x
   - [B]Load TAS2557_BLOCK_CFG_COEFF_DEV_B of configuration x
8. Download the calibration data if present.
   - [A]Load TAS2557_BLOCK_CFG_CAL_A of configuration x
   - [A]Load TAS2557_BLOCK_CFG_CAL_A of configuration x

   Continue to Step 11 if music is playing. If music is not playing, stop at Step 10.

   Refer to Step 1.
9. Feed the PLL clock.

   The PLL clock should run at this time.
10. [AB]Power on TAS devices.

    Load the startup sequence; this is not part of the binary file.

    For TAS2559 applications, the TAS2559 must be turned on first, then followed by a TAS2560 0.2-ms delay required in between.
    - TAS2557 mono applications:

      See tas2557-android-driver.

    ```
    static unsigned int p_tas2557_startup_data[] =
    ```
    - TAS2557 stereo applications:

      See tas2557-stereo-driver.

    ```
    static unsigned int p_tas2557_startup_data[]
    ```
    - TAS2559 applications:

      See tas2559-android-driver.

    ```
    static unsigned int p_tas2559_startup_data[]
    ```
11. Download the post power up block.
    - [B]Load TAS2559_BLOCK_PST_POWERUP_DEV_B of configuration x

      This block is only present for TAS2559 applications.

12. [AB]Unmute TAS devices.

    Load the unmute sequence; this is not part of the binary file.

    - TAS2557 mono applications:

      See tas2557-android-driver.

    ```
    static unsigned int p_tas2557_unmute_data[] =
    ```

    - TAS2557 stereo applications:

      See tas2557-stereo-driver.

    ```
    static unsigned int p_tas2557_unmute_data[]
    ```

    - TAS2559 applications:

      See tas2559-android-driver.

    ```
    static unsigned int p_tas2559_unmute_data[]
    ```

Steps to sleep:

1. [AB]Mute and shutdown TAS devices.

   Load the shutdown sequence; this is not part of the binary file.

   - TAS2557 mono applications:

     See tas2557-android-driver.

   ```
   static unsigned int p_tas2557_shutdown_data[] =
   ```

   - TAS2557 stereo applications:

     See tas2557-stereo-driver.

   ```
   static unsigned int p_tas2557_shutdown_data[]
   ```

   - TAS2559 applications:

     See tas2559-android-driver.

   ```
   static unsigned int p_tas2559_shutdown_data[]
   ```

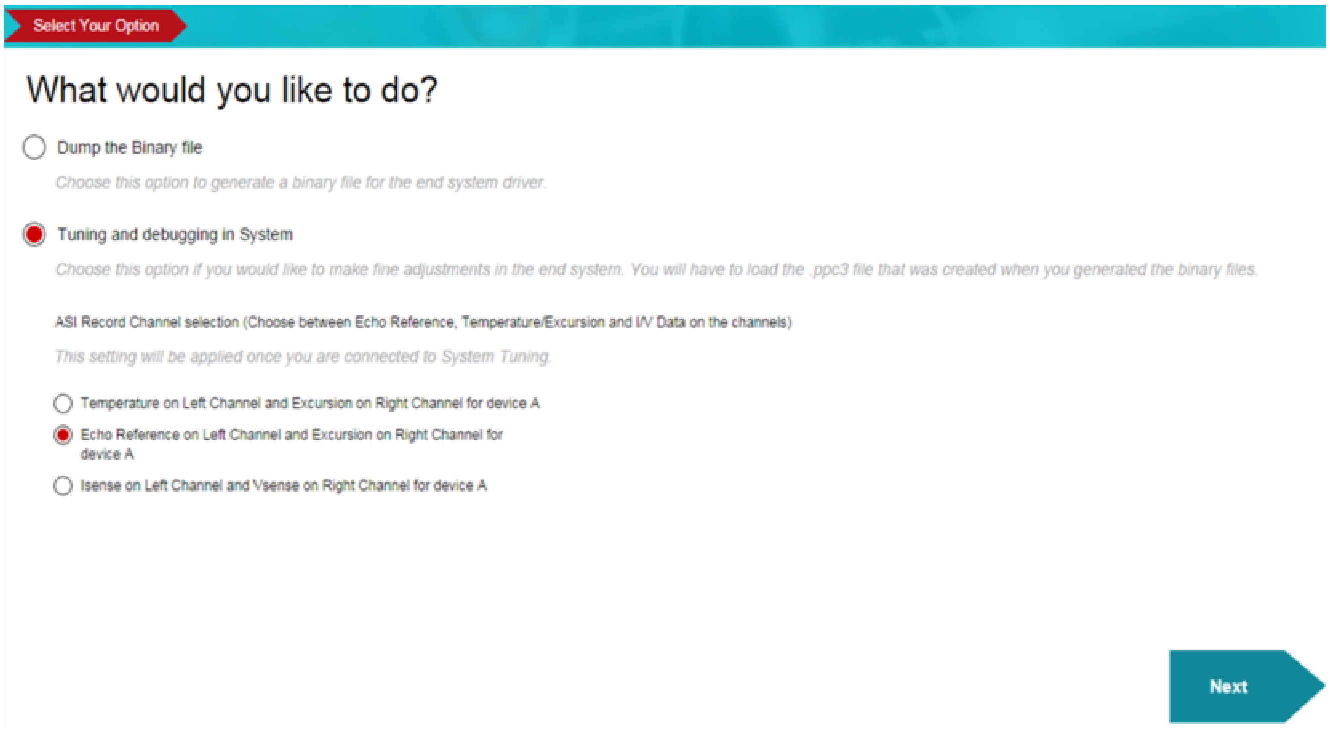
2. Turn off the PLL clock.

5 Tuning and Debugging in System

With the In System Tuning feature available in PPC3, the user can connect the end system to the PPC3 through an Android Debug Bridge (ADB). Once connected, the user can start tuning audio directly on the end system.

5.1 Download Tuning Data to End System

Use the PPC3 file that contains the Dump Definition Configuration (DDC) used for generating the binary file in Section 3.1. Select Tuning and debugging in System and select the required snapshot in the DDC to tune on the end system. See Figure 14 and Figure 15.



What would you like to do?

○ Dump the Binary file

Choose this option to generate a binary file for the end system driver.

[✓ Tuning and debugging in System]

Choose this option if you would like to make fine adjustments in the end system. You will have to load the .ppc3 file that was created when you generated the binary files.

ASI Record Channel selection (Choose between Echo Reference, Temperature/Excursion and I/V Data on the channels)

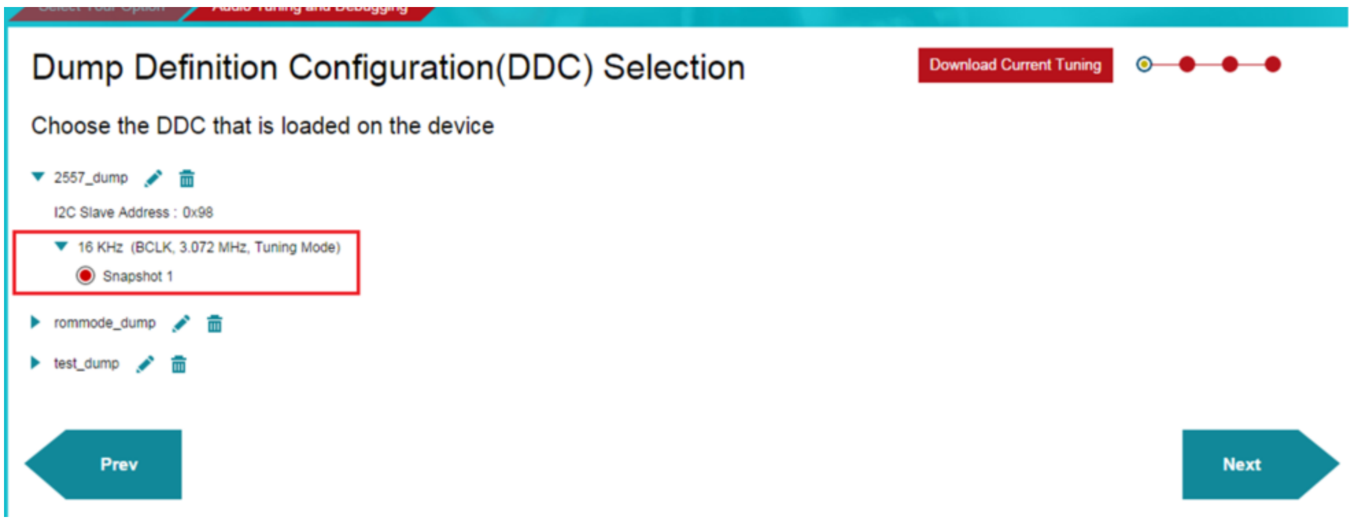
This setting will be applied once you are connected to System Tuning.

○ Temperature on Left Channel and Excursion on Right Channel for device A

[✓ Echo Reference on Left Channel and Excursion on Right Channel for device A]

○ Isense on Left Channel and Vsense on Right Channel for device A

Figure 14. Tuning and Debugging in System



Dump Definition Configuration(DDC) Selection

Choose the DDC that is loaded on the device

2557_dump

I2C Slave Address : 0x98

16 KHz (BCLK, 3.072 MHz, Tuning Mode)

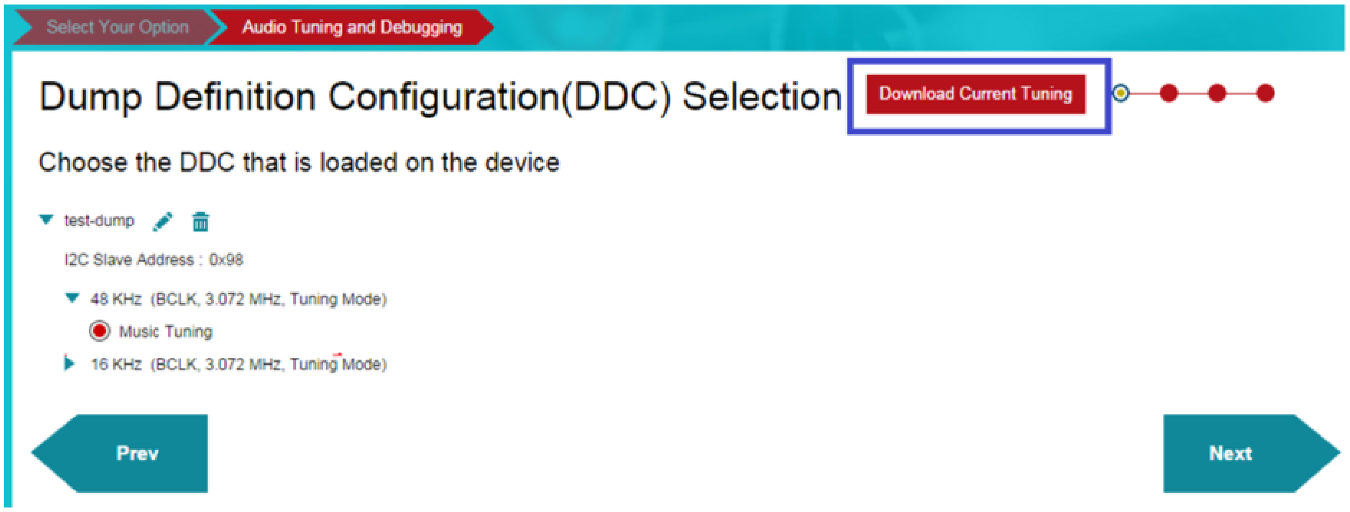
[✓ Snapshot 1]

rommode_dump

test_dump

Figure 15. DDC Selection for Tuning on End System

Alternatively, users can download the current GUI settings to the end system instead of the DDC by clicking on the Download Current Tuning (see Figure 16).



Dump Definition Configuration(DDC) Selection

Choose the DDC that is loaded on the device

test-dump

I2C Slave Address : 0x98

48 KHz (BCLK, 3.072 MHz, Tuning Mode)

Music Tuning

16 KHz (BCLK, 3.072 MHz, Tuning Mode)

Figure 16. DDC Selection for Tuning on End System

After selecting one of the options in Figure 16, users can click the Tuning and Audio Processing to tune the end system.

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Date	Version	Description
September 2017	*	Initial release