Application Report
SBOA238–September 2017

TAS2555 End-System Integration Guide

ABSTRACT

This document describes how to integrate the TAS2555 device into an end system.

Contents

List of Figures

List of Tables

Trademarks

1 End-System Integration

The System Integration feature is used to dump the binary and coefficients required to program TAS2555 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 TAS2555 application.

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

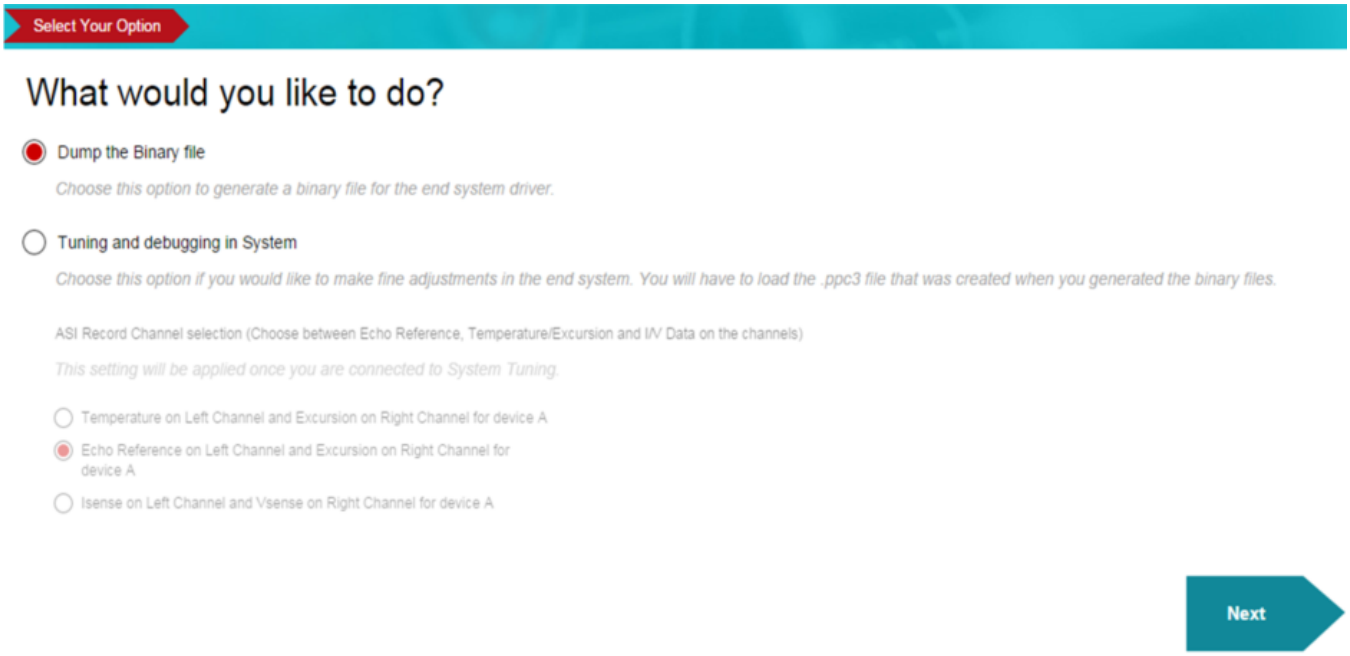

Figure 1. System Integration Page

2 Workflow

Figure 2 shows the workflow in the end-system integration.

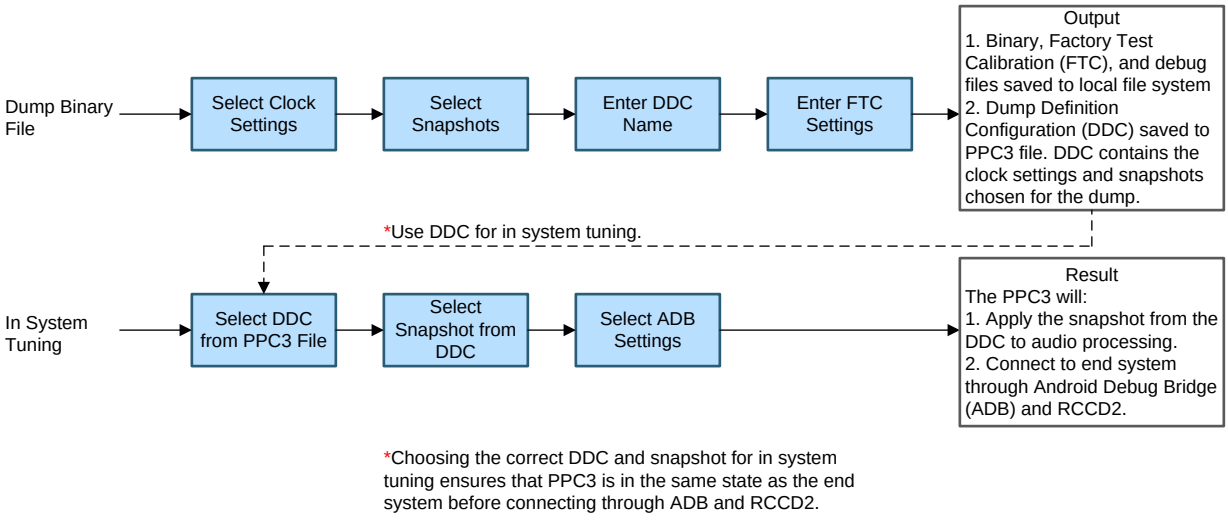

Figure 2. End-System Integration Workflow

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.

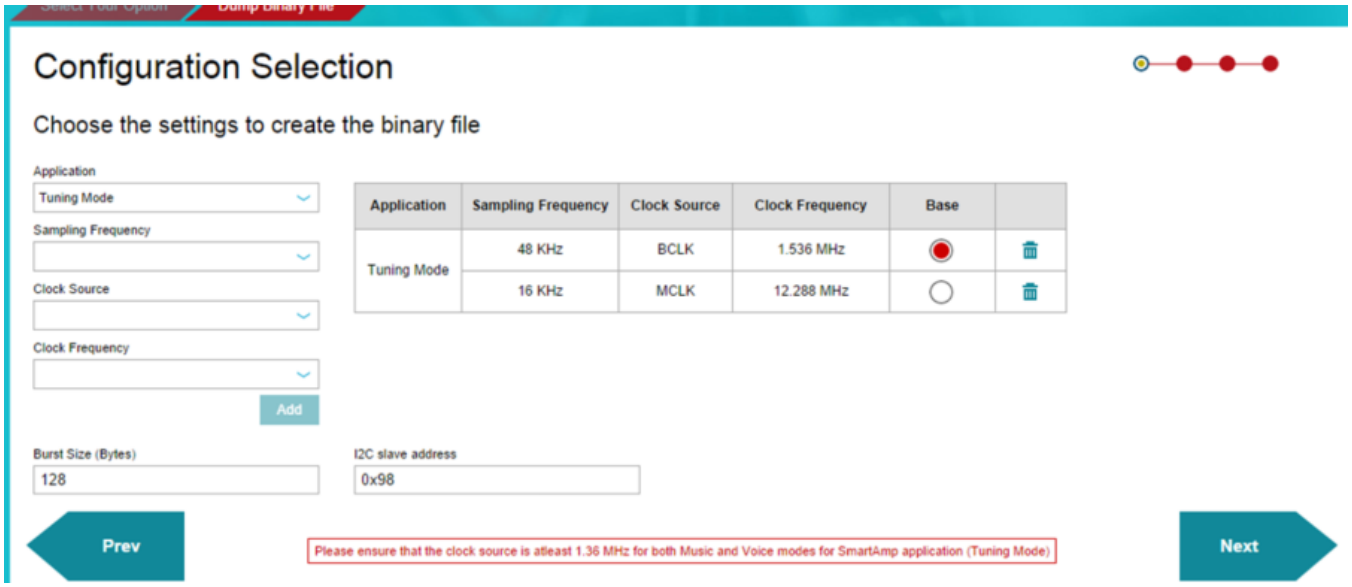

Figure 3. Dumping Binary File – Configuration Selection

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

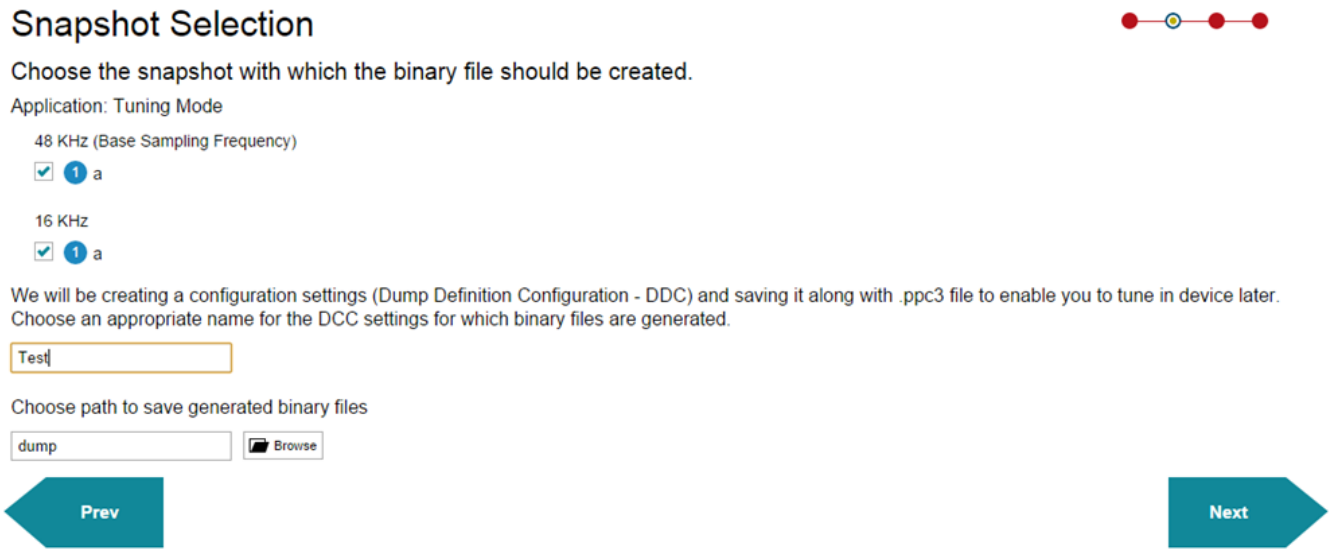

Figure 4. Dumping Binary File – Snapshot Selection

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 5).

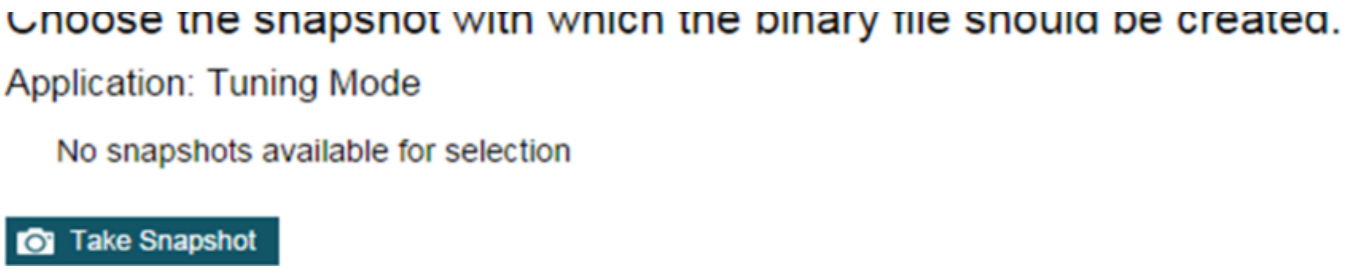

Figure 5. Dumping Binary File – Take a New Snapshot

4. 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.

Figure 6. Dumping Binary File – Choose Target Device

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

Figure 7. 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.

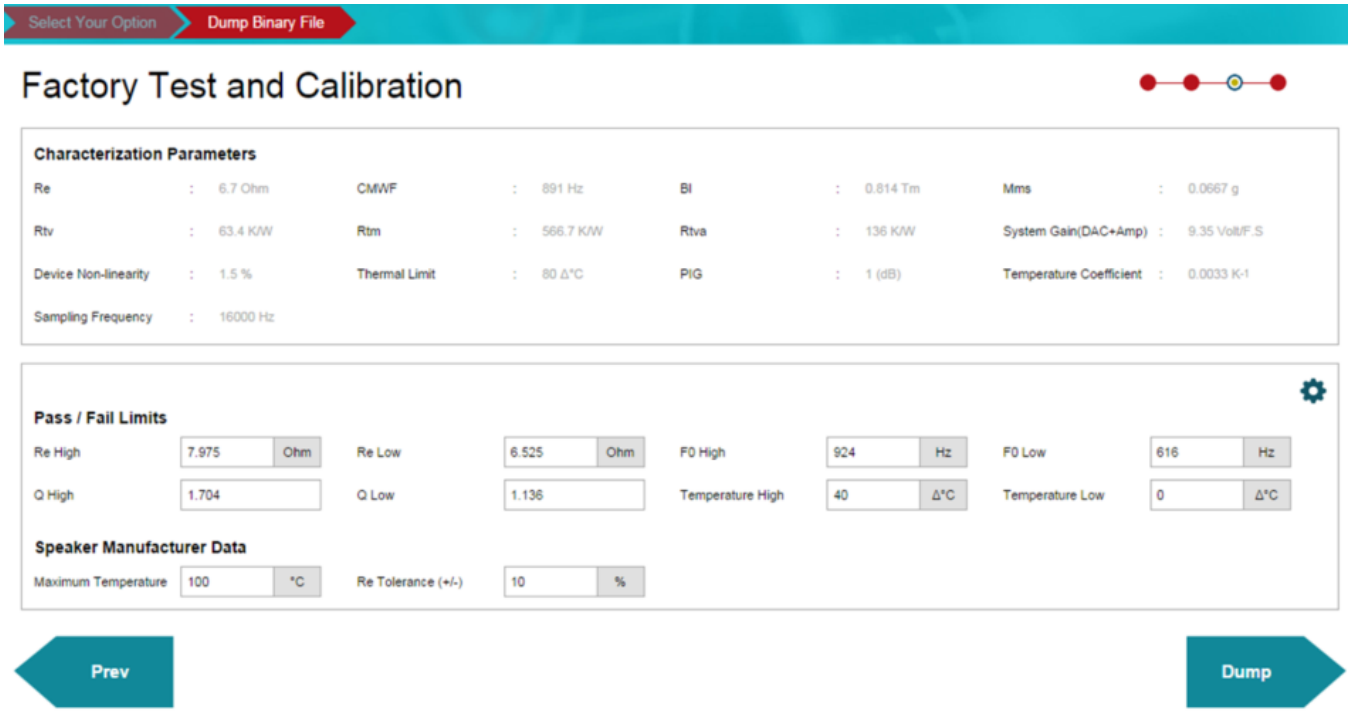

Figure 8. Factory Test and Calibration

Figure 9 shows the result of binary file and associated file generation.

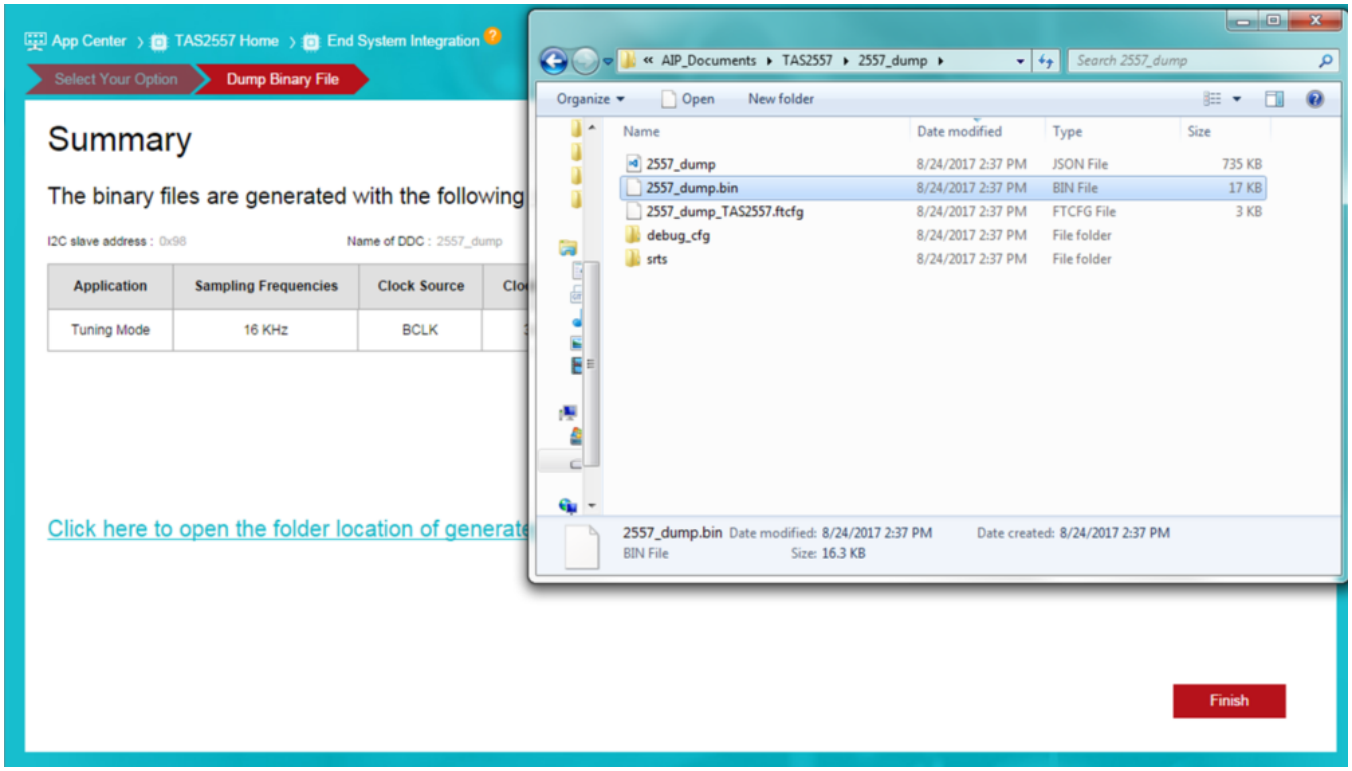

Figure 9. Summary Page

3.2 Overview of Files Dumped by PPC3

Figure 10 shows the dumped files.

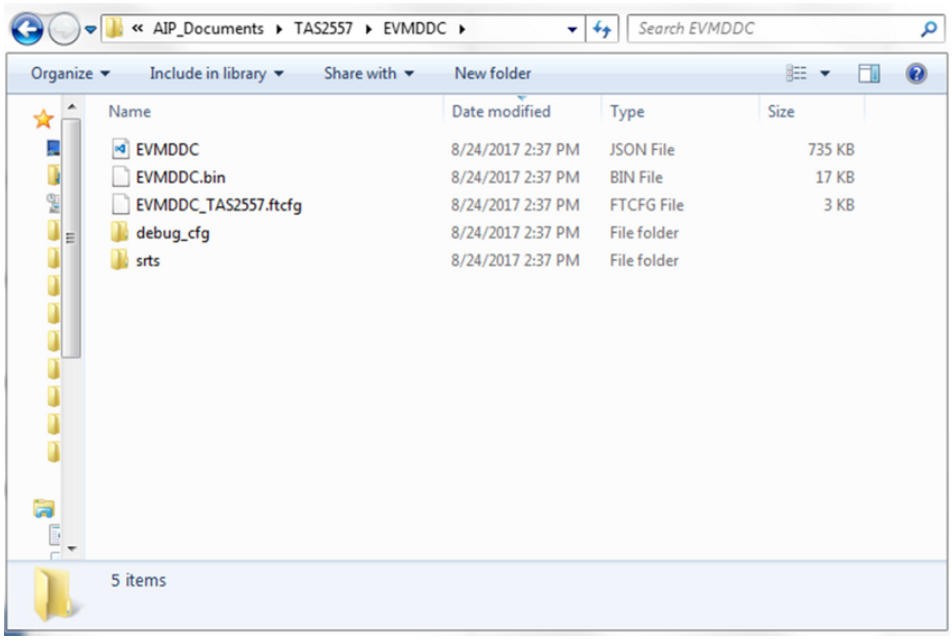

Figure 10. Dumped Files

3.2.1 Description of Files Dumped

3.2.1.1 EVMDDC.bin

The EVMDDC.bin file is recommended to use in platforms with file systems. The file contains all of the information required to program the TAS2555 except power and mute sequences. All Android devices with the TAS2555 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.

4.1 Case One

Programming the TAS2555 for the first time:

Use case: device initialization during system boot up.

Assume that users are programming configuration 0.

Steps to playback:

1. Hardware reset.
2. Software reset.
3. Download the program that accommodates configuration 0.
   EVMDDC_program_0_Tuning Mode.cfg
4. Download the PLL that accommodates configuration 0.
   EVMDDC_pll_0_TuningMode_48KHz.cfg
5. Download the predata that accommodates configuration 0.
   EVMDDC_configuration_0_TuningMode_48KHz_DEV_A_PRE.cfg
6. Feed the PLL clock. Audio stream may start any time after this step.
7. Power on the TAS2555.
8. Download the post power power up block that accommodates configuration 0.
   Configuration 0 does not have a post power up block.
9. Unmute the TAS2555 device.

Steps to sleep:

1. Mute and shutdown the TAS2555 device.

4.2 Case Two

TAS2555 has been programmed and there is no need to change the configuration.

Use case: device power up to play music.

Steps to playback:

1. Feed the PLL clock. Audio stream may start any time after the PLL clock is available.
2. Power on the TAS2555 device.
3. Download the post power up block if present (this should accommodate to the current configuration).
4. Unmute the TAS2555 device.

Steps to sleep:

1. Mute and shut down the TAS2555 device.

4.3 Case Three

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

Assume users are going to program configuration 1.

Steps to playback:

NOTE: If the music is playing and the TAS2555 device is running, go to step 4.

1. Feed the PLL clock.
2. Power on the TAS2555 device.
3. Download the post power up block that accommodates configuration 1.
   Configuration 1 does not have a post power up block.
4. Download coefficient that accommodates configuration 1.
   EVMDDC_configuration_1_TuningMode_48KHz_DEV_A_COEFF.cfg

Steps to sleep:

1. Mute and shutdown the TAS2555 device.

4.4 Case Four

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

Assume users are going to program configuration 2.

If the music is playing and the TAS2555 device is running, mute the shut down the TAS255 device.

1. Download a new PLL that accommodates configuration 2.
   EVMDDC_pll_1_TuningMode_44.1KHz.cfg
2. Download new configuration predata that accommodates configuration 2.
   EVMDDC_configuration_2_TuningMode_44.1KHz_DEV_A_PRE.cfg
3. Feed the PLL clock.
4. Power on the TAS2555 device.
5. Download the post power up block that accommodates configuration 2.
   Configuration 2 does not have a post power up block.
6. Download the coefficient that accommodates configuration 2.
   EVMDDC_configuration_2_TuningMode_44.1KHz_DEV_A_COEFF.cfg

Steps to sleep:

1. Mute and shutdown the TAS2555 device.

4.5 Case Five

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

For example, switching to ROM mode1.

Assume users are going to program configuration 3.

Steps to playback:

If music is playing and the TAS2555 device is running, mute and shut down the TAS2555 device.

1. Hardware reset.
2. Software reset.
3. Download the program that accommodates configuration 3.
   EVMDDC_program_1_ROM1Mode.cfg
4. Download the PLL that accommodates configuration 3.
   EVMDDC_pll_2_ROM1Mode_48KHz.cfg
5. Download the configuration predata that accommodates configuration 3.
   EVMDDC_configuration_3_ROM!Mode_48KHz_DEV_A_PRE.cfg
6. Feed the PLL clock. Audio stream may start any time after this step.
7. Power on the TAS2555 device.
8. Download the post power up block that accommodates configuration 3.
   EVMDDC_configuration_3_ROMMode1_48KHz_POST_POWER_UP.cfg
9. Unmute the TAS2555 device.

Steps to sleep:

1. Mute and shutdown the TAS2555 device.

4.6 Power Management Scripts

See tas2555-android-driver.

4.7 Power On Sequence

p_tas2555_startup_data

4.8 Unmute Sequence

p_tas2555_unmute_data

4.9 Mute and Shutdown Sequence

p_tas2555_shutdown_data

4.10 EVMDDC.bin Parser

See tas2555-android-driver.

fw_parse()

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 11 and Figure 12.

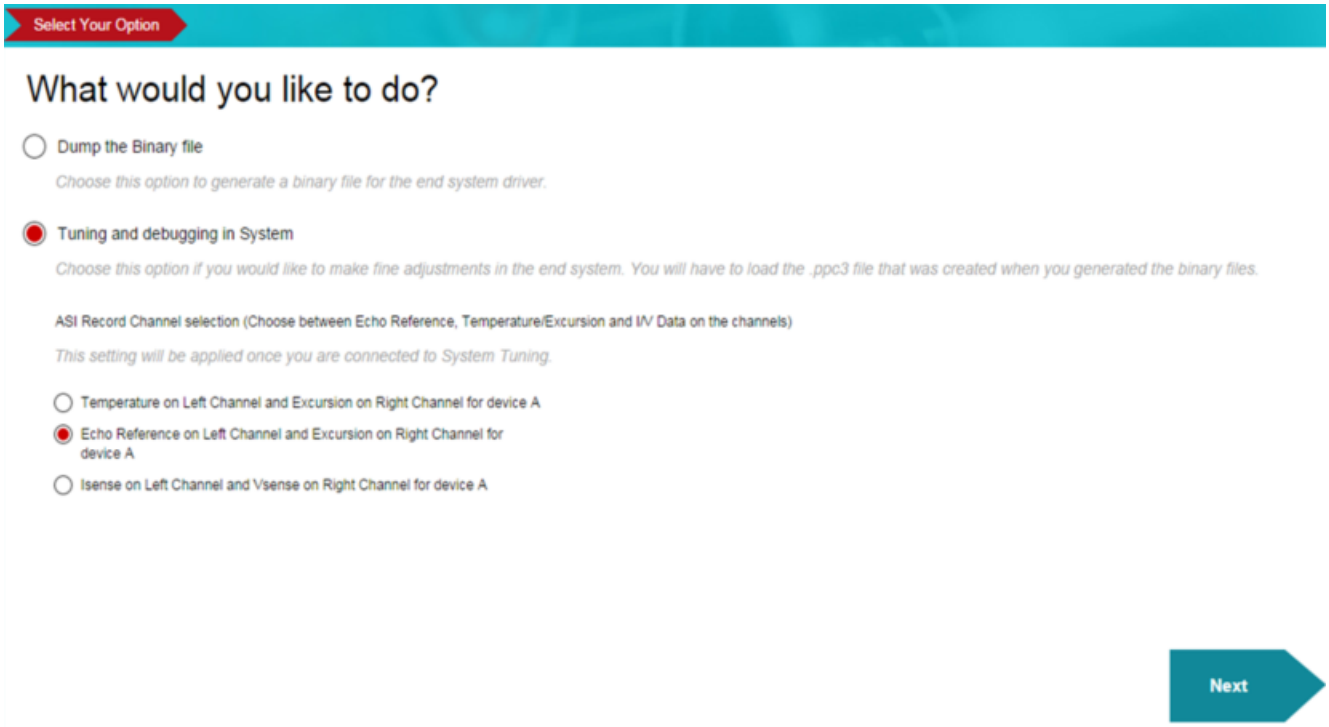

Figure 11. Tuning and Debugging in System

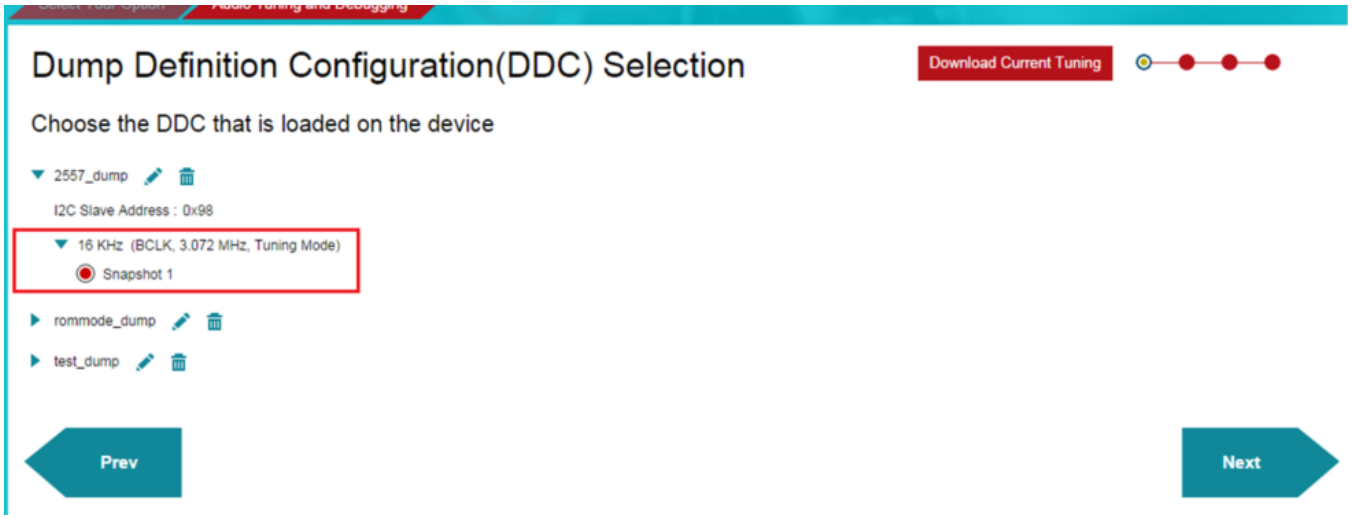

Figure 12. DDC Selection for Tuning on End System (1 of 2)

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 13).

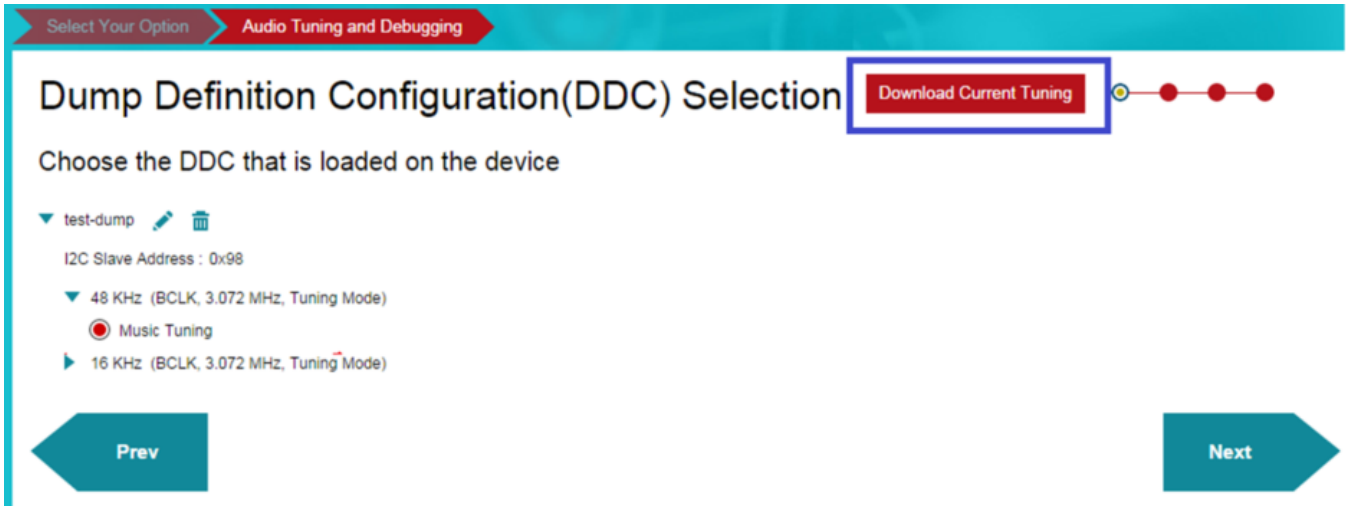

Figure 13. DDC Selection for Tuning on End System (2 of 2)

After selecting one of the options in Figure 13, 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

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