TAS2505, TAS2521 Codec Control EVM

This user's guide describes the operation of the Texas Instruments Codec Control software. Codec Control provides a graphical user interface for supported TI audio codecs. The software is compatible with Microsoft® Windows® XP, Vista and Windows 7.

The information in a caution or a warning is provided for your protection. Read each caution and warning carefully.

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1 Overview

1.1 Introduction

The Codec Control software is intended to facilitate evaluation of TI audio codecs. It includes a script interpreter, a block-diagram based graphical user interface (GUI), a register inspector and supplemental features (for example, a digital filter calculator) depending on codec capabilities.

2 PC + EVM

This chapter explains how to use the Codec Control software together with a TI audio codec EVM.

2.1 Control Software

The Codec Control software exposes most features of a supported TI audio codec EVM through an intuitive GUI.

NOTE: Before the PC running Windows can use the TI audio converter EVM as a sound card, the EVM must be configured (sampling rate, audio routing, internal amplifier settings, and so forth) with the Codec Control software. This happens automatically, once an EVM is detected by the Codec Control software.

2.2 Installation

Download the Codec Control software (slac366.exe) from the TI audio codec product folder at http://www.ti.com and launch the program (double click on slac366.exe).

This file is a self-extracting archive. The default target folder is:

C:\Program Files\Texas Instruments\CodecControl

Click the Unzip button to complete the installation.

The Codec Control software is now available in the target folder. The name of the executable is CodecControl.exe

Launch the CodecControl software by navigating to the target folder with Windows Explorer and double click CodecControl.exe.

2.3 Concepts

The CodecControl software presents a block diagram view of a supported TI audio codec EVM.

The block diagram consists of active objects that can react to user input (for example switches or amplifiers with variable gain that show a volume control on a mouse click event).

NOTE: **Active Objects:** Each active object becomes red if the mouse cursor is above the object. Clicking the object triggers its function.

Some active objects are linked to control register(s) of the TI audio codec. The Codec Control software updates the appropriate register(s) whenever an active object is triggered. If a register that is linked to an active object is changed via other components; for example, the script interpreter or the register inspector, the active object changes its state accordingly.

The Codec Control software automatically detects a supported TI audio codec EVM once it is connected to a USB port of the PC.

If no TI audio codec EVM is connected to the PC, the control software also supports an EVM simulation mode where it is possible to retrieve script commands based on user input within the block diagram.

Simulation mode is only available if no TI audio codec EVM is attached to the PC. Choose *File→New EVM simulation*… and select an EVM from the list of supported TI audio codec EVMs.

2.4 Quick Start

Included in the Codec Control software, are example configurations. View and quickly load these configurations by navigating to the *View* menu on the Toolbar. Under *View*, choose *Example Configurations*. Here you find a list of available configurations including *Playback through Class D speaker* and *Playback though the headphone jack*. After selecting the desired example configuration, load the script into the TAS2521/2505 by selecting the ProgramCodec buton.

The commented script is viewable by clicking the *Script* tab.

2.5 EVM Window

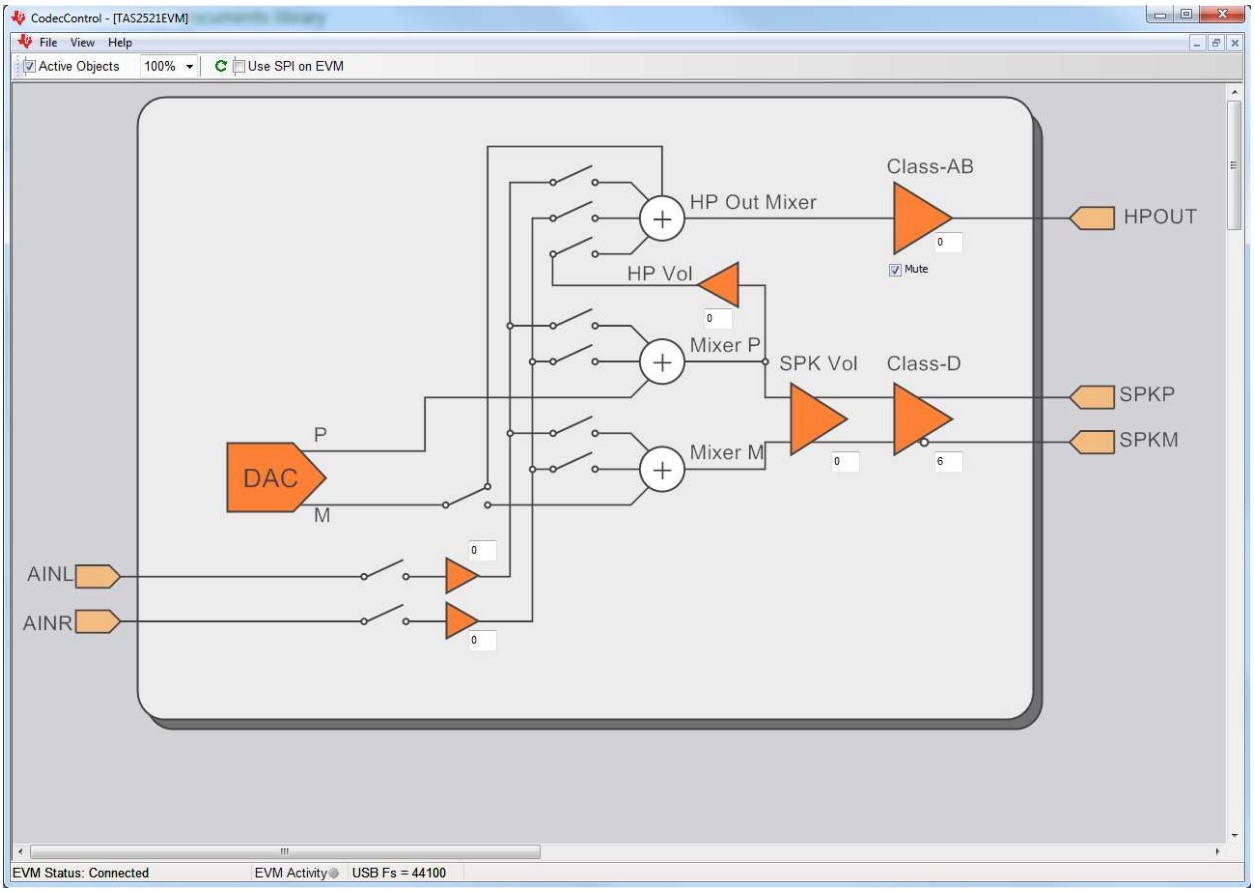


Figure 1. EVM Window

In addition to running scripts, the DAC is programmed directly by clicking on blocks in the interactive block diagram in the EVM Window.

The toolbar contains a control that determines the zoom factor. Change the zoom by selecting the desired zoom factor.

Move the block diagram by clicking on a blank area within the block diagram and dragging the diagram with the mouse.

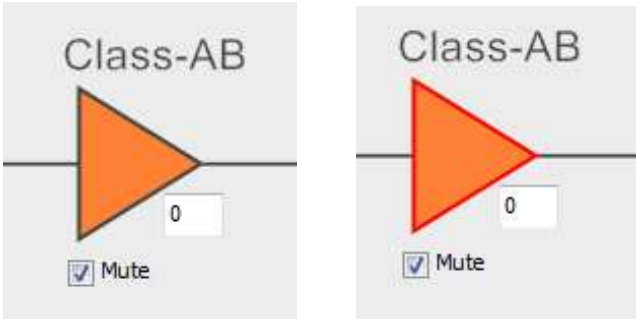
At the bottom of the EVM window is a status bar that provides information about the state of the communication between the control software and the TI audio codec EVM. It also shows hints about elements in the block diagram, for example the I^{2}C™ page and register or bit location of a selected switch.

Audio signal paths (both digital and analog) change color from black, once they are activated via switches. This feature visualizes all audio paths and immediately highlights if a path is enabled.

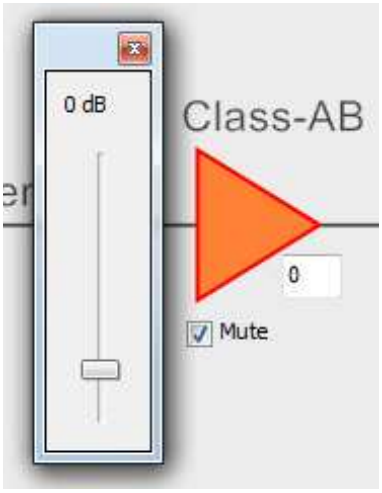
2.5.1 Using Active Objects

Moving the mouse pointer over an active object lights up the active object (the color of the object turns red).

For example, the Class-AB HP Driver amplifier active object turns from its inactive state to its active state when the mouse pointer enters the amplifier symbol:



Clicking the activated object triggers its function. In the case of the amplifier active object, the function is a volume control. Moving the volume control slider changes the volume setting of the amplifier (it is also possible to change the volume by clicking on the number within the amplifier symbol and typing the new gain setting).The Codec Control software updates the appropriate register in the TI audio codec and as a result, the volume on the headphone output changes accordingly.



2.6 Digital and Analog Settings

In addition to the interactive block diagram, other digital and analog settings can be controlled by navigating to the Toolbar and selecting *Analog* or *Digital* Settings. This brings up an additional window with interactive elements to control things such as the PLL, Audio Digital Serial Interface, and so forth.

2.7 Dialogs and Active Objects

The Codec Control software contains several dialog windows that give access to additional features.

Most dialogs are linked to active objects and are opened by clicking on the active object.

A few dialogs are not linked to active objects and are opened using the *View* menu.

2.7.1 Command Dialog

Open the command dialog (*View→Command*…) to write, edit, load, save and run command scripts. Command scripts are text files that contain commands to communicate with the TI audio codec.

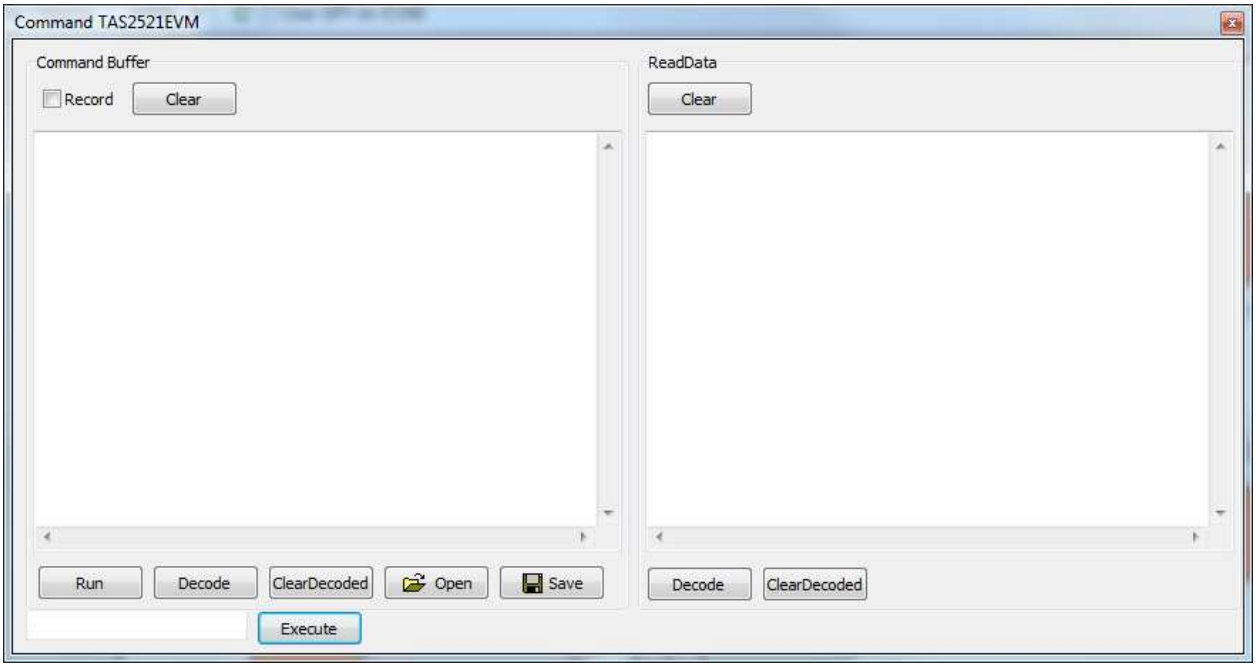


Figure 2. Command Dialog

- The main area of the command dialog is the command buffer (editable text) which contains the command script. Run the command script by clicking the **Run** button.
- The read only text area on the right side of the command dialog displays control data read from the TI audio codec. The **Clear** button clears the *Read Data* field.
- The one line text edit field on the bottom left allows single command execution.
- The *Record* check box enables recording of commands generated by the control software.

2.7.2 Register Inspector

The register inspector dialog (*View→Register Inspector*…) gives access to all registers of the TI audio codec.

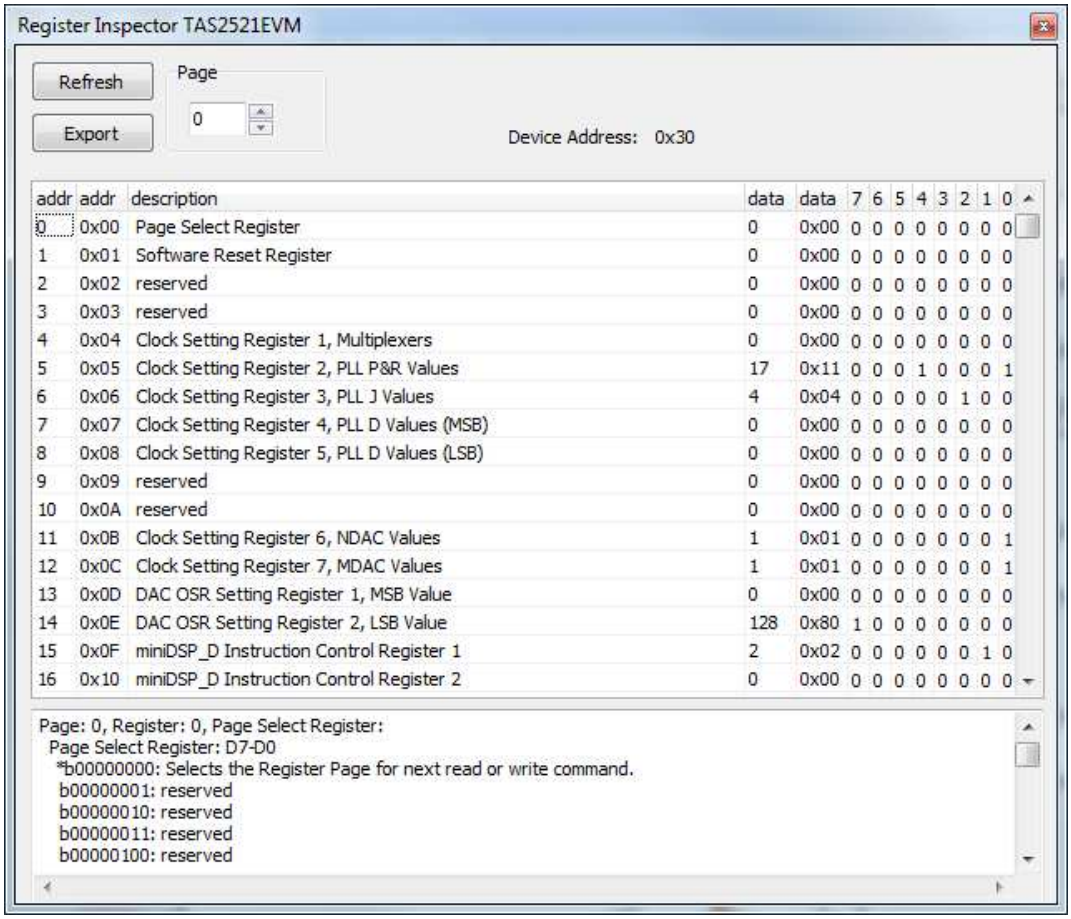


Figure 3. Register Inspector

The register inspector displays the content of the TI audio codec registers. Trigger reading of the content of one page by clicking the **Refresh** button.

- The *Page* edit field selects the page to be displayed.
- The *addr* column shows the address of the registers within the selected page in decimal notation.
- The *description* column contains a description for each register. If the register has no function assigned, it is declared Reserved.
- The *data* columns show the data of each register (one byte). The first data column uses decimal notation, the second uses hexadecimal notation. It is possible to change the register value by clicking into one of the data fields and typing the new value (either decimal or hexadecimal).
- The numbered columns show the register content in binary notation. Read/Write bits are shown solid black or red; read only bits are gray or dark red. Red numbers represent bits that recently changed. To change a single writeable bit, click on the bit and it flips.

2.8 Firmware Update

TI may publish new firmware for TI audio codec EVMs. To program the new firmware to a TI audio codec EVM, choose *File→Update Firmware*…, and select the new firmware file.

The update process takes a few seconds (there is no progress bar) and is finished once the update firmware dialog disappears.

The EVM must be disconnected and reconnected to complete the firmware update process.

2.9 Schematics

Figure 4 through Figure 6 illustrate the schematic for this EVM.

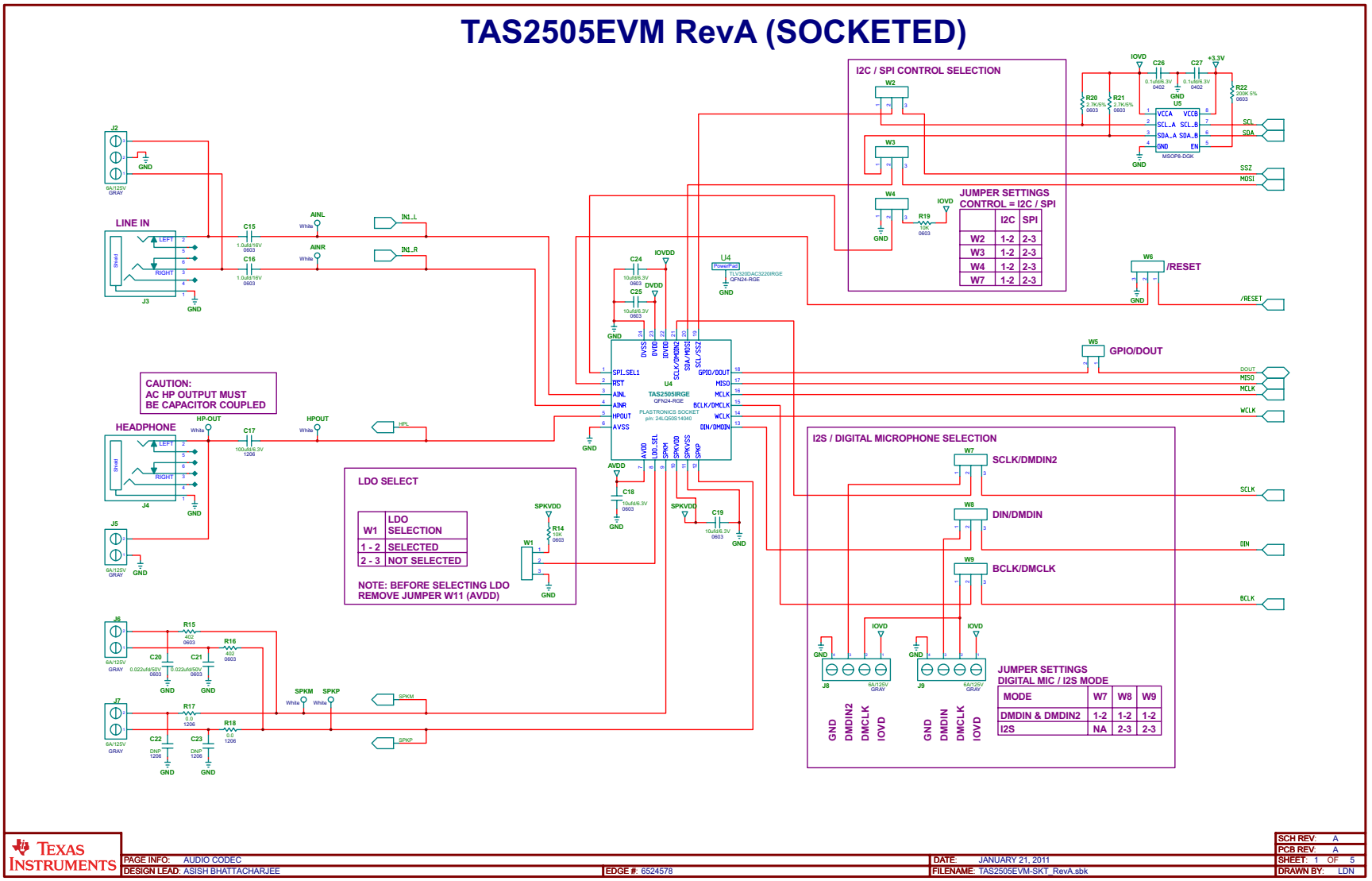


Figure 4. TAS2505, TAS2521 Codec Control EVM (Page 1 of 3)

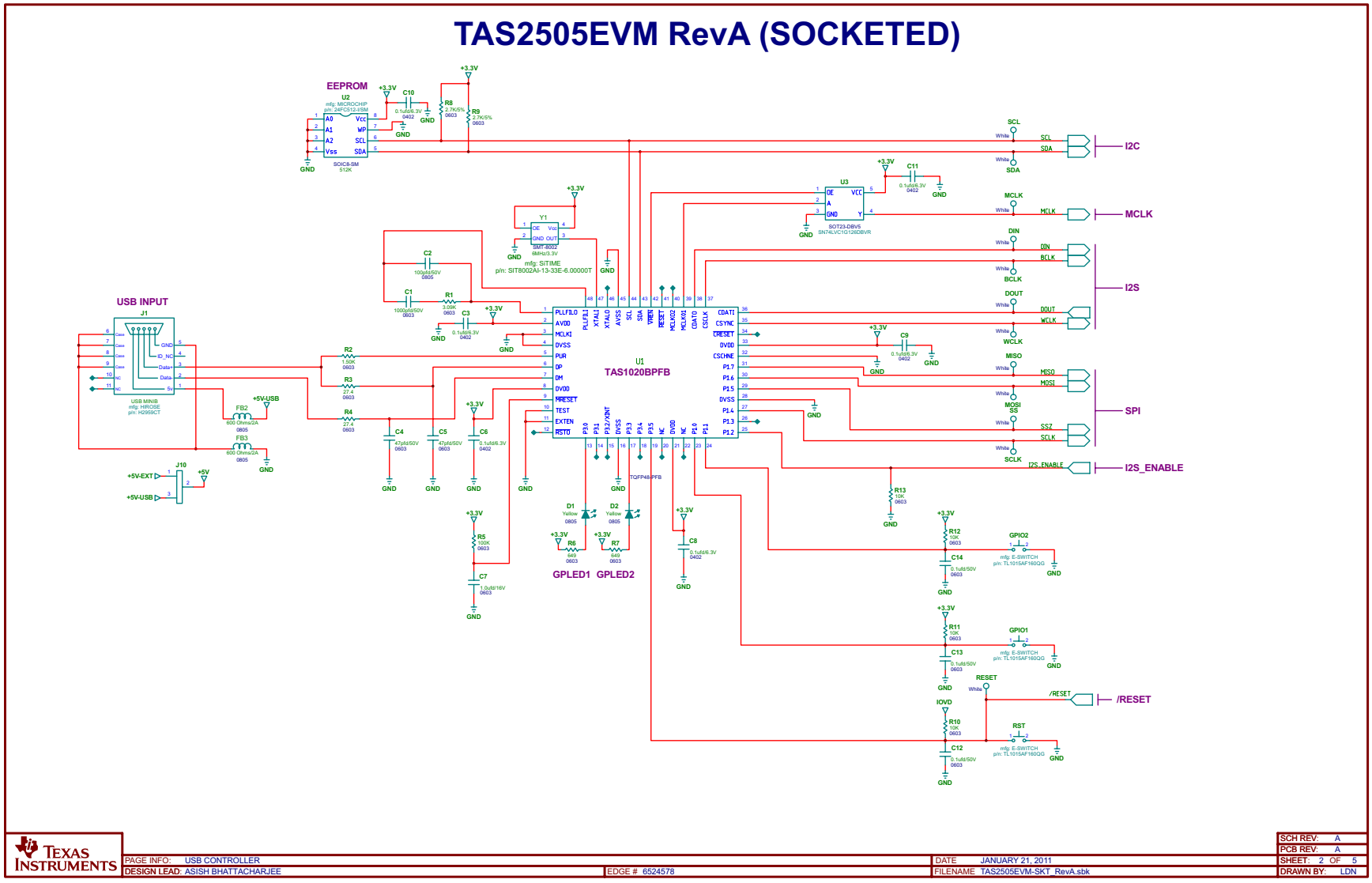


Figure 5. TAS2505, TAS2521 Codec Control EVM (Page 2 of 3)

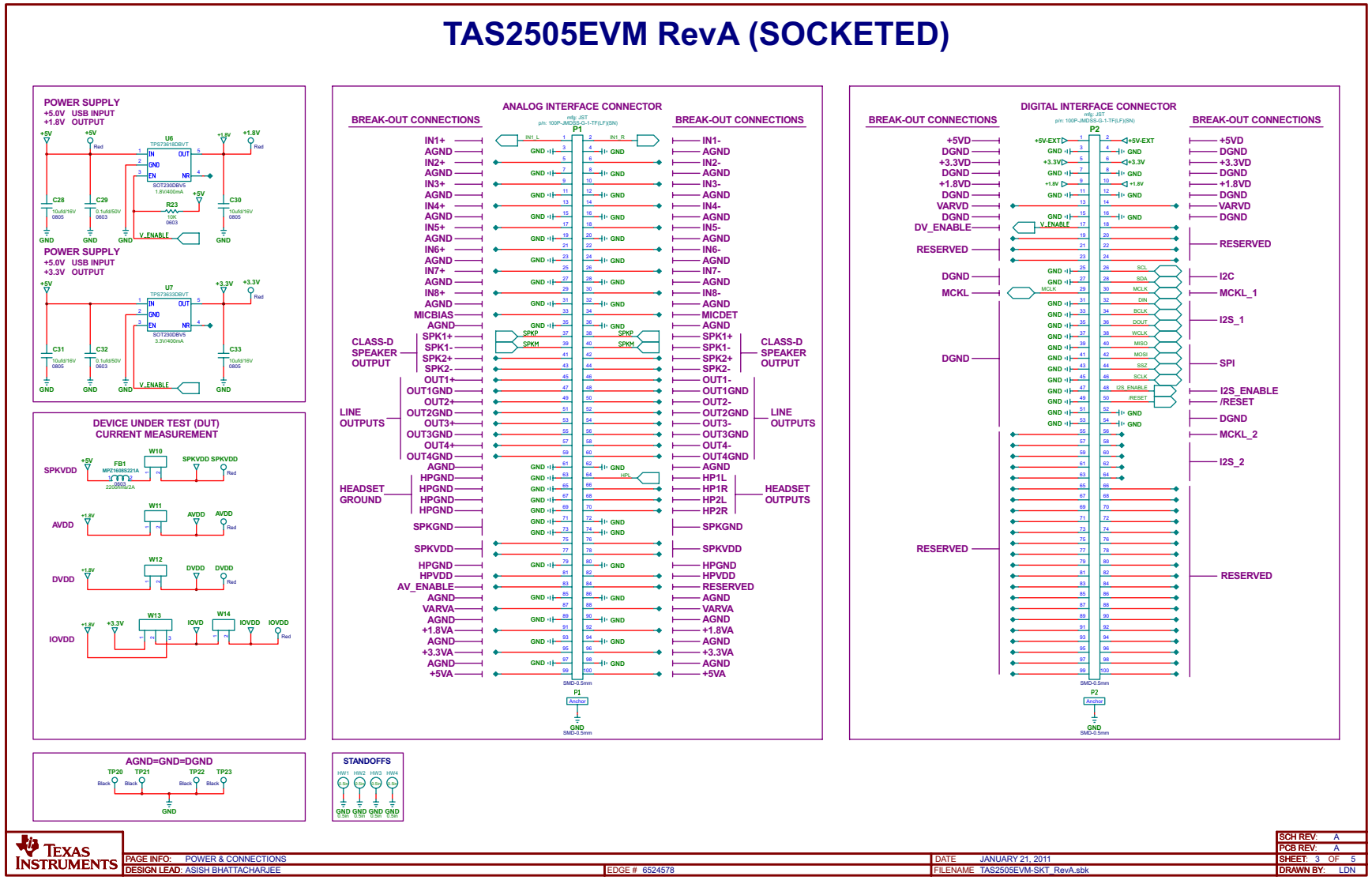


Figure 6. TAS2505, TAS2521 Codec Control EVM (Page 3 of 3)

Revision History

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

Changes from Original (April 2013) to A Revision	Page
• Changed the device number in Figure 4 From: TLV320DAC3220IRGE To: TAS2505IRGE	7

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      This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

      Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

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3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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10. *Governing Law:* These terms and conditions shall be governed by and interpreted in accordance with the laws of the State of Texas, without reference to conflict-of-laws principles. User agrees that non-exclusive jurisdiction for any dispute arising out of or relating to these terms and conditions lies within courts located in the State of Texas and consents to venue in Dallas County, Texas. Notwithstanding the foregoing, any judgment may be enforced in any United States or foreign court, and TI may seek injunctive relief in any United States or foreign court.

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