

Customer User Manual

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INTRODUCTION

The 1700-EV1-REV1 customer evaluation board provides a complete hardware platform for the evaluation of all the WM7xxx microphone mini boards (coupons). The 1700-EV1-REV1 main board requires a 6220 compatible CODEC mini board e.g. WM1811A-6220-CS80-M-REVx board. The device kit includes a WISCE panel and configurations files which are written for WM1811A. WM1811, WM8994 and WM8958 can also be used with the 1700-EV1-REV1 board with their WISCE configuration files. Configurations covered are listed below:

- Digital or Analogue microphone loopback via ADC and DAC with headphone output
- Digital or Analogue microphone loopback via ADC and DAC with Line Out output
- Digital or Analogue microphone recording via S/PDIFF out
- Analogue microphone bypass to headphone output or Line Out output (full analogue path)
- Supports mono or stereo microphones (digital or analogue but not together)
- Supports Differential and single ended PGA circuit configuration, volume, mute controls.

This document should be used as a starting point for evaluation of 1700-EV1-REV1 but it will not cover every possible configuration.

Note: For the 6220 compatible CODEC mini board e.g. WM1811A-6220-CS80-M-REVx. The 'x' represents any revision preferably the latest revision.

Assumptions:

1. The user is familiar with the WM7xxx boards (see relevant documents below)
2. The user has installed the device kit for 1700-EV1-REV1 and has set up WISCE as per instructions and is controlling the WM1811A.

Note: The device kit requires WISCE pre-installed in your PC. You can download the latest version of WISCE from the following link:

www.wolfsonmicro.com/wisce/WISCESetup.zip

Related documents:

1. WM1811A datasheet
2. WISCE Quick Start Guide.pdf
3. WM7xxx example configurations and schematic.
4. 1700-EV1-REV1 schematic and layout pdf documents
5. WM1811A-6220-CS80-M-REVx schematic and layout pdf documents

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BLOCK DIAGRAM

This test system focuses on evaluation of the 1700-EV1-REV1 with the WOLFSON CODEC WM1811A. The block diagram of the 1700-EV1-REV1 main board with WM1811A-6220-CS80-M-REVx as complete test system is shown in Figure 1.

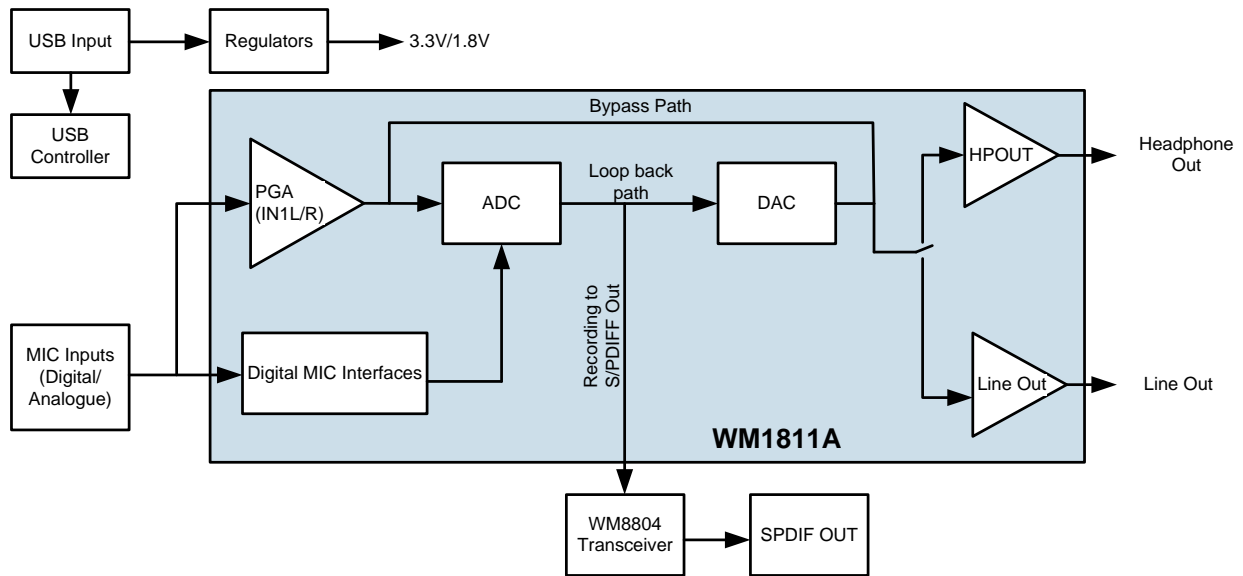


Figure 1 1700-EV1-REV1 Block Diagram

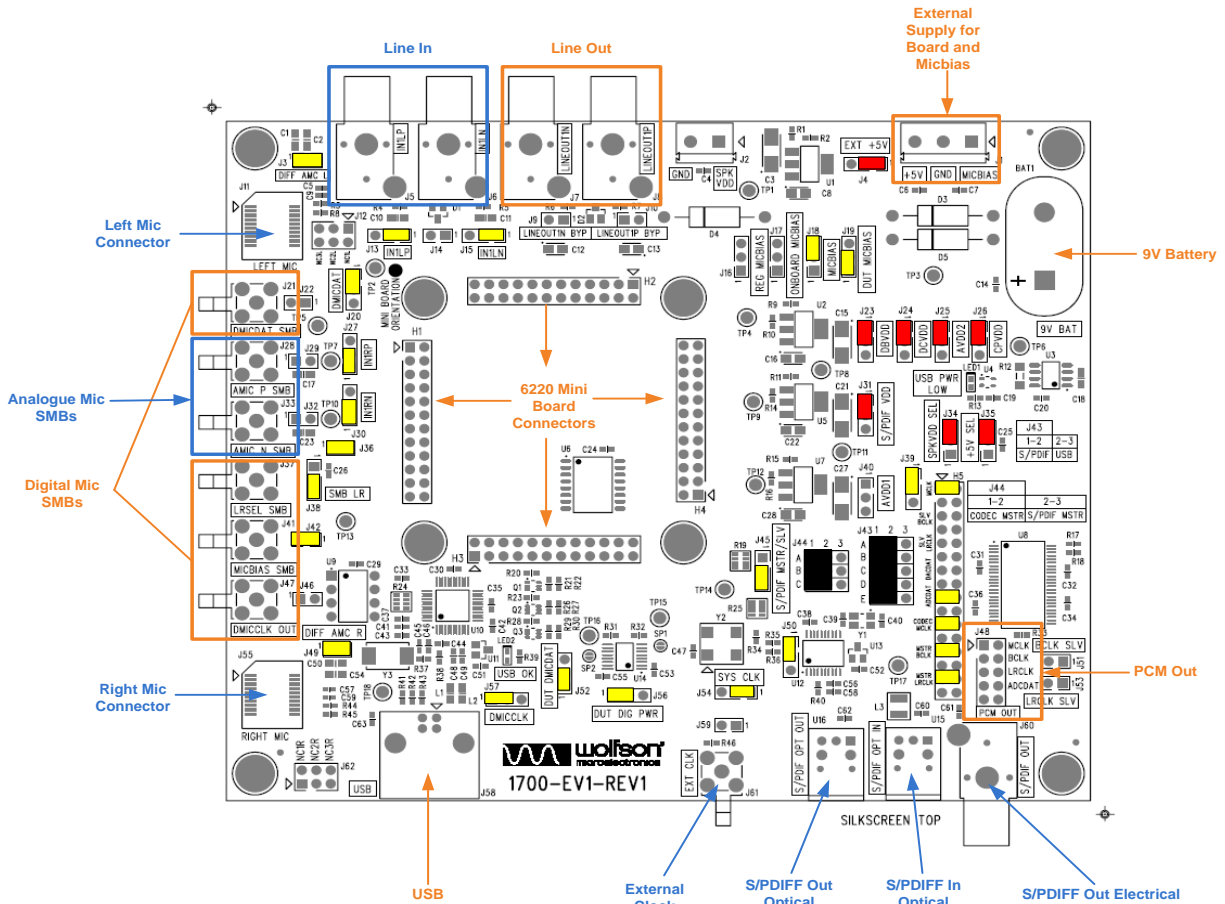


Figure 2 1700-EV1-REV1 Main Board

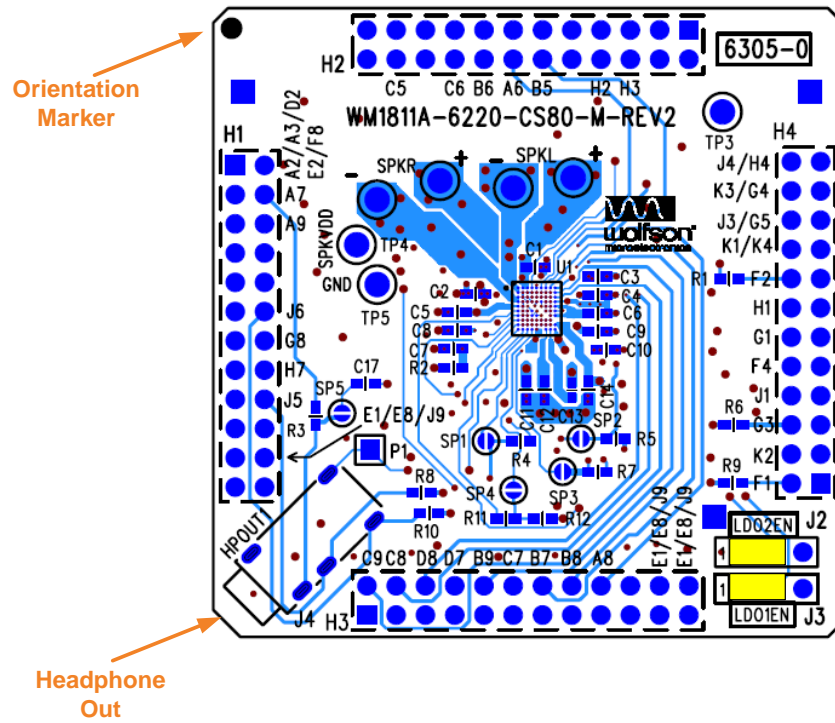


Figure 3 6220 Mini Board with WM1811A CODEC (WM1811A-6220-CS80-M-REVx)

GETTING STARTED

To get started, the following steps need to be followed:

- a) Follow the mini board orientation marker, insert the CODEC mini board (WM1811A-6220-CS80-M-REVx) onto the Main board (1700-EV1-REV1).
- b) Configure Jumpers (See Jumper Settings section).
- c) Insert/connect the analogue or digital microphones to the main board. These microphones could be Wolfson's mini microphone boards/coupons which could be inserted into the on-board microphone sockets. The analogue microphones can also be connected via Line In phono sockets.

If mini microphone boards/coupons are used then the acoustic port hole of the microphone coupon should face the arrow marked on the main board.
- d) Connect the main board to the PC/Laptop using a USB cable. The 1700-EV1-REV1 board is controlled via USB with Wolfson's in house software WISCE. By default the board is powered by USB as well. Check on the control bar to make sure USB control is connected to the board.
- e) Open WISCE and load corresponding device (if you have installed the device kit for the 1700-EV1-REV1 then you don't have to load the device, just open WISCE and the device will be pre-loaded).
- f) Load device register settings by loading appropriate txt file. If you have installed the device kit then you can just use the WISCE panel which has been created for WM1811A with various use cases for both analogue and digital microphones. Just click on the required microphone use case and it will automatically load the appropriate register settings. In order to access this panel go to WISCE -> Scenarios -> MEMS and select 'Mics Use Cases' page.

The following sections of this document will explain into details about the board and how to set it up to fulfil your evaluation.

JUMPER SETTINGS

Figure 4 shows the default jumper settings for the 1700-EV1-REV1 main board with the WM1811A-6220-CS80-M-REVx mini board attached to it as complete system.

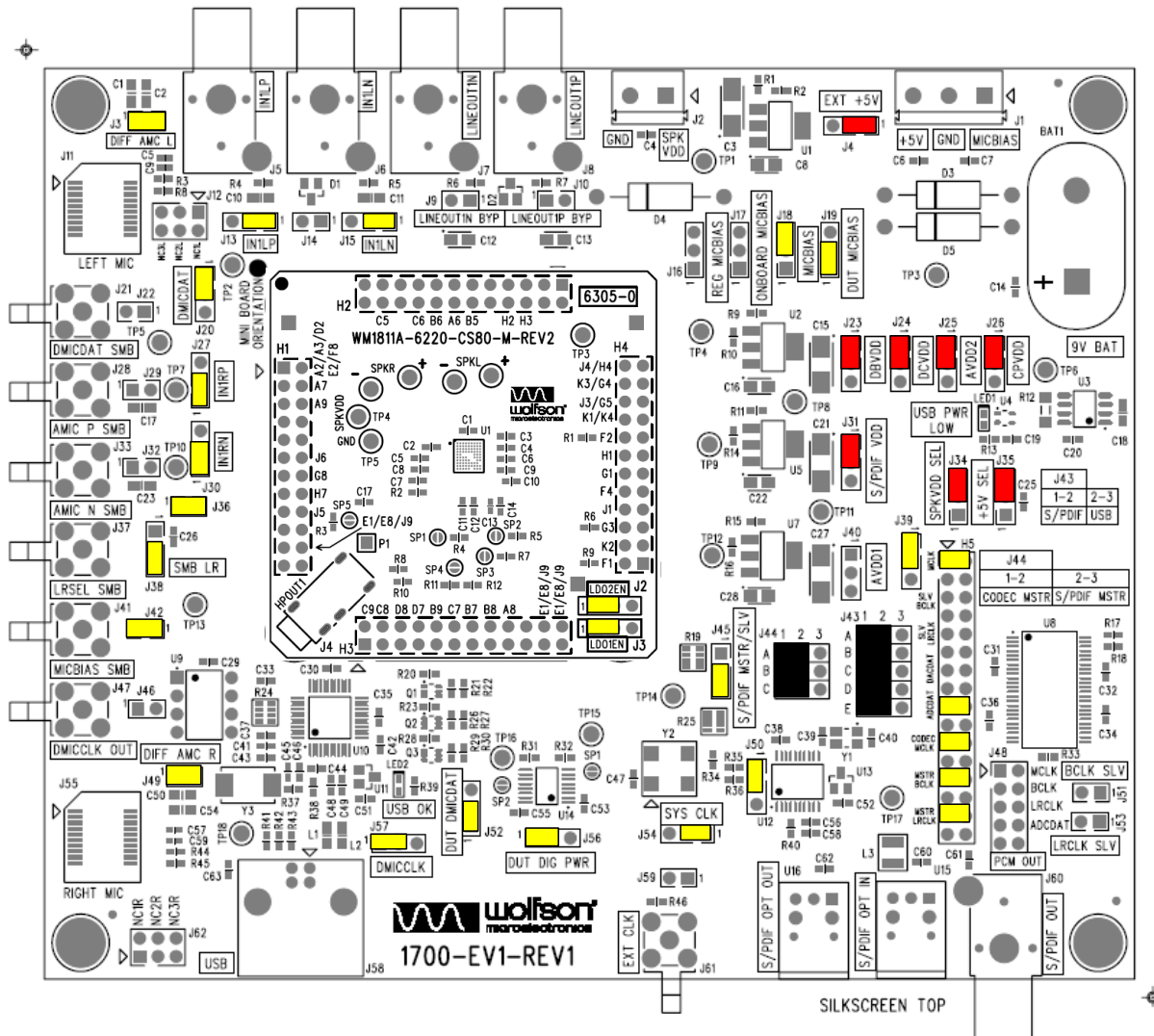


Figure 4 Default Jumper Settings

The 1700-EV1-REV1 offers flexibility for different types of inputs and outputs to be connected/used. The following figure shows different jumper settings for possible I/O board connections.

1700-EV1 Jumper Settings			
Connection	Connector Type	Location	Jumper Settings
Analogue Mic	Mic Socket (Default)	Left Mic Socket (J11)	Set J13 to position 1-2 Set J15 to position 1-2
		Right Mic Socket (J55)	Set J27 to position 1-2 Set J30 to position 1-2
	SMBs (Only Right Mic Possible)	AMIC_P (J28)	Set J27 to position 2-3
		AMIC_N (J33)	Set J30 to position 2-3
Line In via Phono Connectors (Only Left Mic Possible)	IN1LP (J5) IN1LN (J6)	Set J13 to position 2-3 Set J15 to position 2-3	
Digital Mic	Mic Socket (Default)	Left Mic Socket (J11) Or Right Mic (J55)	Set J20 to position 1-2 Set J57 to position 1-2
	SMBs (Left Or Right Mic Possible depending on the LRSEL)	LRSEL_SMB (J37)	Set J20 to position 2-3
		DMICDAT_SMB (J21) DMICCLK_OUT (J47) MICBIAS_SMB (J41)	Set J57 to position 2-3
* For LRSEL_SMB (J37) set J38 to position 1-2 for LR High and position 2-3 for LR Low			
S/PDIFF Out	Optical	U16	Set J50 to position 2-3
	Electrical (Default)	J60	Set J50 to position 1-2
Supply Voltage	USB	J58	Set J35 to position 2-3
	External +5V	J1	Set J35 to position 1-2 Set J4 to position 1-2
		BAT1	Set J35 to position 1-2 Set J4 to position 2-3
MICBIAS	From CODEC (Default)	MICBIAS1	Set J18 to position 2-3 Set J19 to position 1-2
		MICBIAS2	Set J18 to position 2-3 Set J19 to position 2-3
	External MICBIAS Supply	J1	Set J18 to position 1-2 Set J17 to position 2-3
MICBIAS From Onboard Regulators	1.8V or 3.3V	Set J18 to position 1-2 Set J17 to position 1-2 For 1.8V Set J16 to position 1-2 For 3.3V Set J16 to position 2-3	
Master Clock	External MCLK via SMB or On Board oscillator	External MCLK via J61	Set J54 to position 2-3
		On Board Oscillator Y2	Set J54 to position 1-2



Figure 5 1700-EV1-REV1 Jumper Settings for Different Inputs and Outputs

The 1700-EV1-REV1 test system by default is powered up via USB but it can also be powered via external power supply of +5V or by 9V battery. In this system, the WM1811A is operating in master mode and by default the MCLK is provided by an on-board oscillator of 12.288MHz. This MCLK can also be provided externally via an SMB cable. Similarly, by default the analogue and digital microphones are powered up by Micbias1 from WM811A CODEC. External Micbias or on-board Micbias via on-board regulators are the other possibilities. For all these hardware configurations, see the jumper settings in Figure 5.

Figure 7 shows the WISCE panel for different microphone use cases, available on 'MEMS' tab to support different configuration paths on WM1811A (shown in figure 6) for analogue and digital microphones.

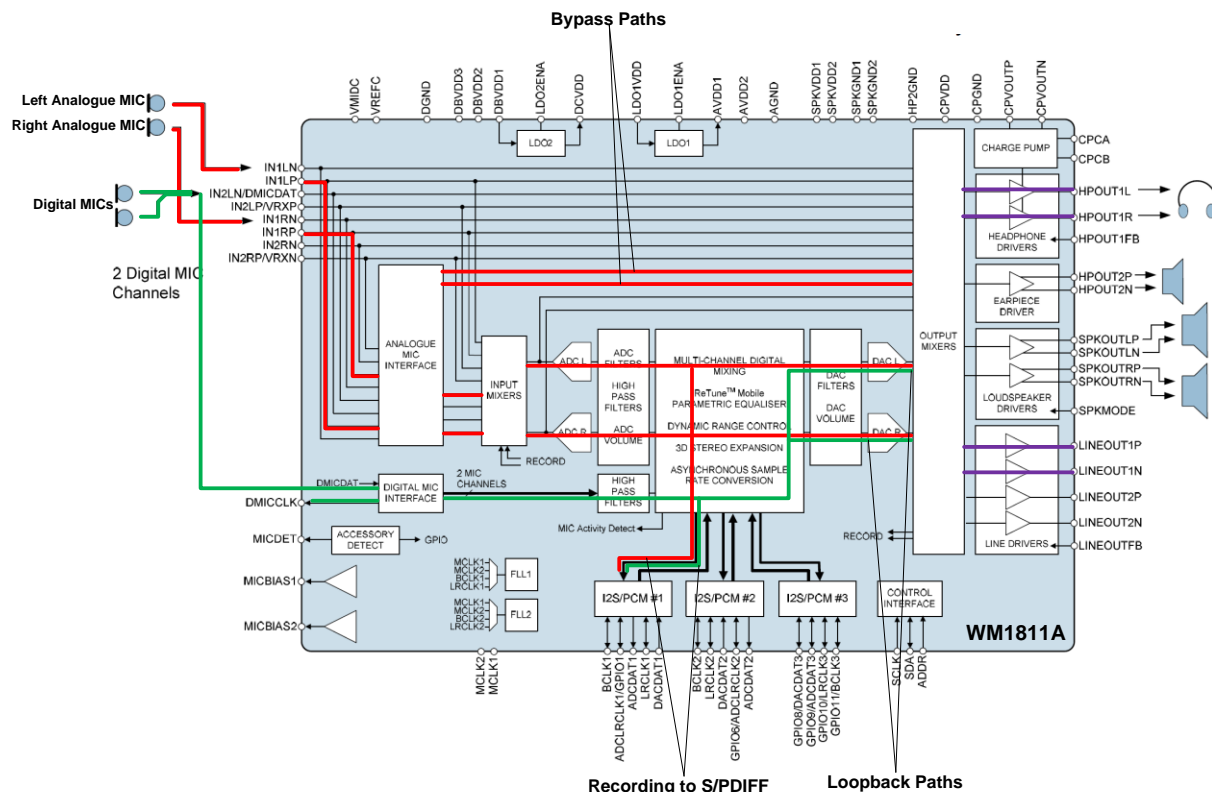
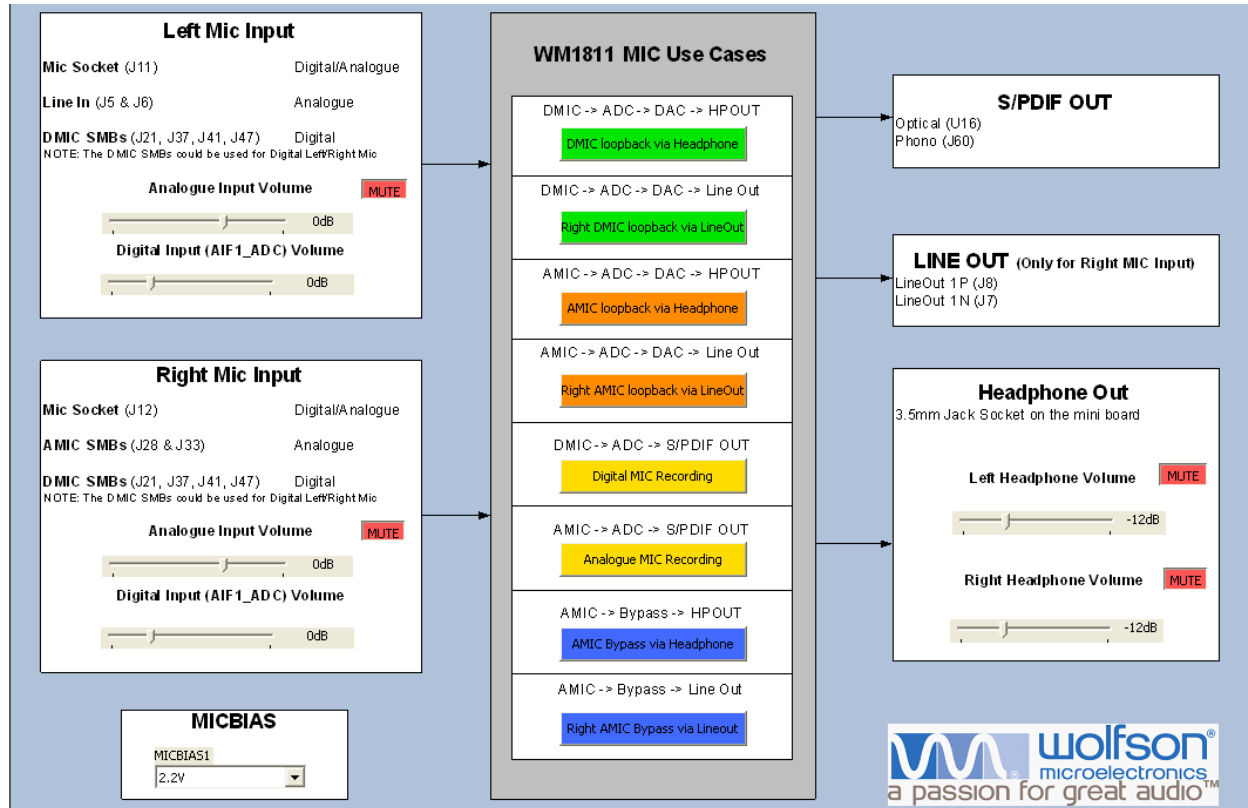


Figure 6 WM1811A Block Diagram



Mics Use Cases

Figure 7 Microphone Use Cases Page in the MEMS WISCE Panel

It should be noted that on the panel, the 'Analogue Input Volume' for the analogue microphones refer to the input PGA volume IN1L and IN1R of the WM1811A CODEC. The 'Digital Input (AIF1_ADC) Volume' refers to the audio interface volume and it is only applicable for the 'Recording to S/PDIF' path (See Figure 6). It should also be noted that if you are powering up the microphones via external Micbias then 'MICBIAS' value should be adjusted accordingly on panel.

It should also be noted that there is only one Line Out on the main board, therefore; only one channel of the CODEC can has its output via Lineout. For the Lineout, the register settings on the microphone use case WISCE panel are configured to output only the Right Channel of the CODEC. So, regardless of digital or analogue microphone, if line out is required, then attach the microphone to the right channel.

For optimum performance the analogue microphones are configured in the pseudo-differential mode. The analogue microphones can also be configured in the single-ended mode but for simplicity the default jumper settings and WISCE panel caters only pseudo-differential mode. For differential and single ended mode please see the schematic diagram of 1700-EV1-REV1 and the datasheet of WM1811A.

On the 1700-EV1-REV1 board, the LRSEL on the left microphone socket is tied to Micbias (logic high) while for the right microphone socket it is tied to GND (logic low). For the digital microphone SMBs connection, the LRSEL can be tied high or low by adjusting the jumper settings on J38 (see Figure 5).

The 1700-EV1-REV1 along with WM1811A system is configured to provide the DMICCLK frequency of 3.072MHz. In all the use cases of digital microphones on the WISCE panel, the DMICCLK frequency of 3.072 has been used. For further details of other possible DMICCLK frequencies please see the WM1811A datasheet.

TECHNICAL SUPPORT

If you require more information or require technical support, please contact the nearest Wolfson Microelectronics regional office:

<http://www.wolfsonmicro.com/contact>

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