

Example Configurations

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BOARD REFERENCE:	WM8523-6228-DT20-M
BOARD TYPE:	Customer Mini Board
WOLFSON DEVICE(S):	WM8523
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INTRODUCTION

The WM8523-6228-DT20-M Customer Mini Board is compatible with the 6228-EV1 customer evaluation board and together these provide a complete hardware platform for evaluation of the WM8523. The WM8523 Customer Mini Board can also be used independently and connected directly to a processor board using flying wires or appropriate headers. This document will cover both, but any performance data will be based on the Wolfson "system" with 6228-EV1 customer main board. Configurations covered are listed below:

- **Default setting** - Hardware Mode, USB Power, Electrical S/PDIF Input
- Hardware Mode – External Supply, Optical Input
- SPI Software Mode – External Supply, Electrical S/PDIF Input
- I²C Software Mode – USB Supply, Electrical S/PDIF Input
- I²C Software Mode – External Supply, Electrical S/PDIF Input.
- SPI Software Mode – UBS Supply, Electrical S/PDIF Input, Master Mode

This document should be used as a starting point for evaluation of WM8523 but it will not cover every possible configuration.

Assumptions:

1. The user is familiar with the 6228-EV1 customer main board and that the board is configured correctly for the path of interest (see related documents below)
2. The user has setup WISCE control software as per instruction and has control of the DUT (register settings provided in this document)

Related documents:

1. WM8523-6228-DT20-M Schematic & Layout
2. 6228-EV18 Schematic & Layout
3. WM8523 Datasheet (latest revision available from www.wolfsonmicro.com)
4. WISCE Quick Start Guide (installed as part of WISCE)

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BOARD CONFIGURATION STAND-ALONE

The WM8523 Customer Mini Board can be used a stand-alone module for direct connection to a processor board via flying leads or dedicated headers. This section will detail important considerations and provide all information required to do this without risking damage to the device.

CONNECTION DIAGRAM

Figure 1 below shows the connections required to power-up and control the WM8523 Customer Mini Board.

Please refer to the Table 1 for further detail on external I/O connections.

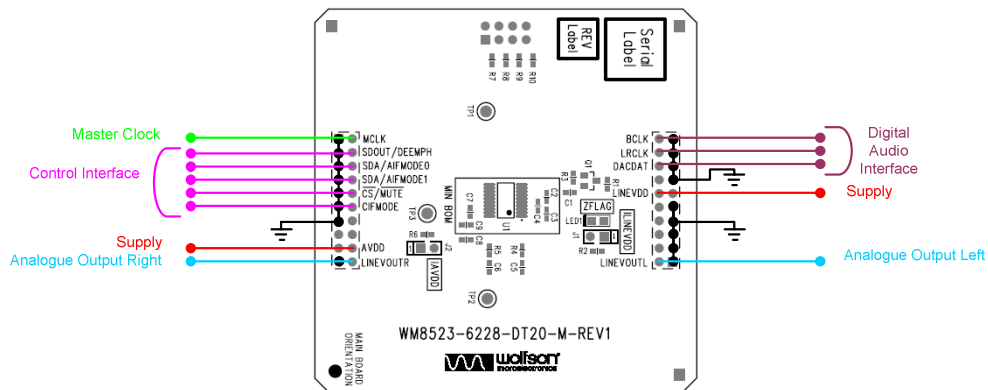


Figure 1 Stand-Alone Board Configuration

I/O TABLE

SIGNAL	BOARD REFERENCE	IMPORTANT NOTES		
Voltage Supplies				
LINEVDD	H2 [12]	LINEVDD = 2.97 to 3.63V		
AVDD	H1 [18]	AVDD = 2.97 to 3.63V		
Ground				
LINEGND		Analogue and digital grounds must always be within 0.3V of each other		
AGND				
Control Interface				
SDOUT/DEEMPH	H1 [4]	Hardware Mode Low (LINEGND) – No DE-EMPH High (LINEVDD) – DE-EMPH	SPI Mode Serial Data Output	I²C Mode Device address [1]
SDA / AIFMODE0	H1[6]	AIFMODE[1:0] 00 – LJ 24 bits 01 – I2S 24 bits 10 – RJ 16 bits 11 – RJ 24 bits		
SDA / AIFMODE1	H1[8]			
CS/ MUTE	H1 [10]	Hardware Mode Low (LINEGND) – Mute enabled High (LINEVDD) – Mute disabled	SPI Mode Chip Select	I²C Mode Device Address [0]
CIFMODE	H1 [12]	Low (LINEGND) = I ² C Compatible Mode High (LINEVDD) = SPI Compatible Mode Unconnected = Hardware Mode		
Master Clock				
MCLK	H1 [2]	Clock should swing between LINEVDD and LINEGND		
Primary Audio Interface				
BCLK	H2 [20]	Audio interface signals should swing between LINEVDD and LINEGND.		
LRCLK	H2 [18]			
DACDAT	H2 [16]			
Analogue Outputs				
LINEVOUTL	H2 [2]	Ground referenced line driver output		
LINEVOUTR	H1 [20]	Ground referenced line driver output		

Table 1 I/O Configuration

BOARD CONFIGURATION WITH 6228-EV1 CUSTOMER MAIN BOARD

This section focuses on evaluation of the WM8523-6228-DT20-M Customer Mini Board in combination with the 6228-EV1 customer main board. This “system” is the reference platform for any measurement data contained in this document. Please note that only a limited number of usage modes will be covered. The system is configurable in both hardware and software mode and the device can also operate in both master and slave Modes. In the following examples no deemphasis or mute settings will be applied.

DEFAULT SETTING - HARDWARE MODE, USB POWER, ELECTRICAL S/PDIF INPUT

The customer test system as shown in Figure 2 below is configured to derive supply for the WM8523 from the on-board USB supply. Alternatively an external supply values can be applied via 4mm sockets (J1-J2) and moving the jumper link on J3 from pins 2-3 to 1-2. Please note that the board requires a +5V supply for normal operation.

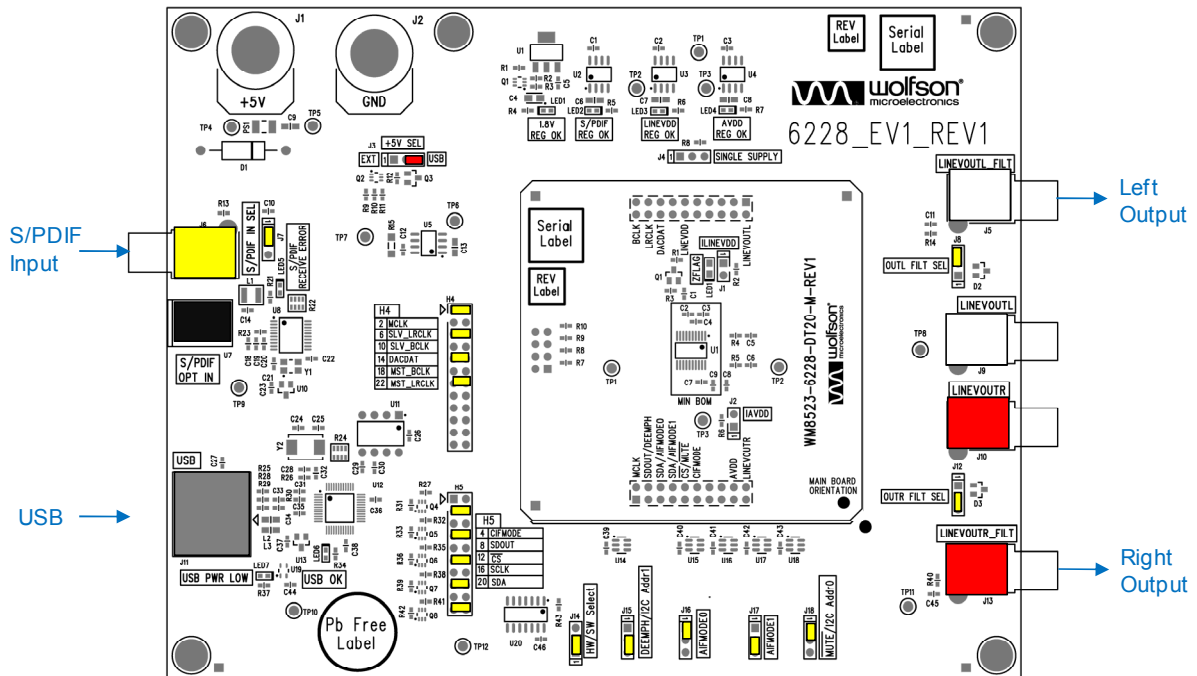


Figure 2 Hardware Mode, USB Power, Electrical S/PDIF Input, Filtered Outputs

HARDWARE MODE – EXTERNAL SUPPLY, OPTICAL INPUT

BOARD CONFIGURATION

The customer test system is configured as shown in Figure 3 below:

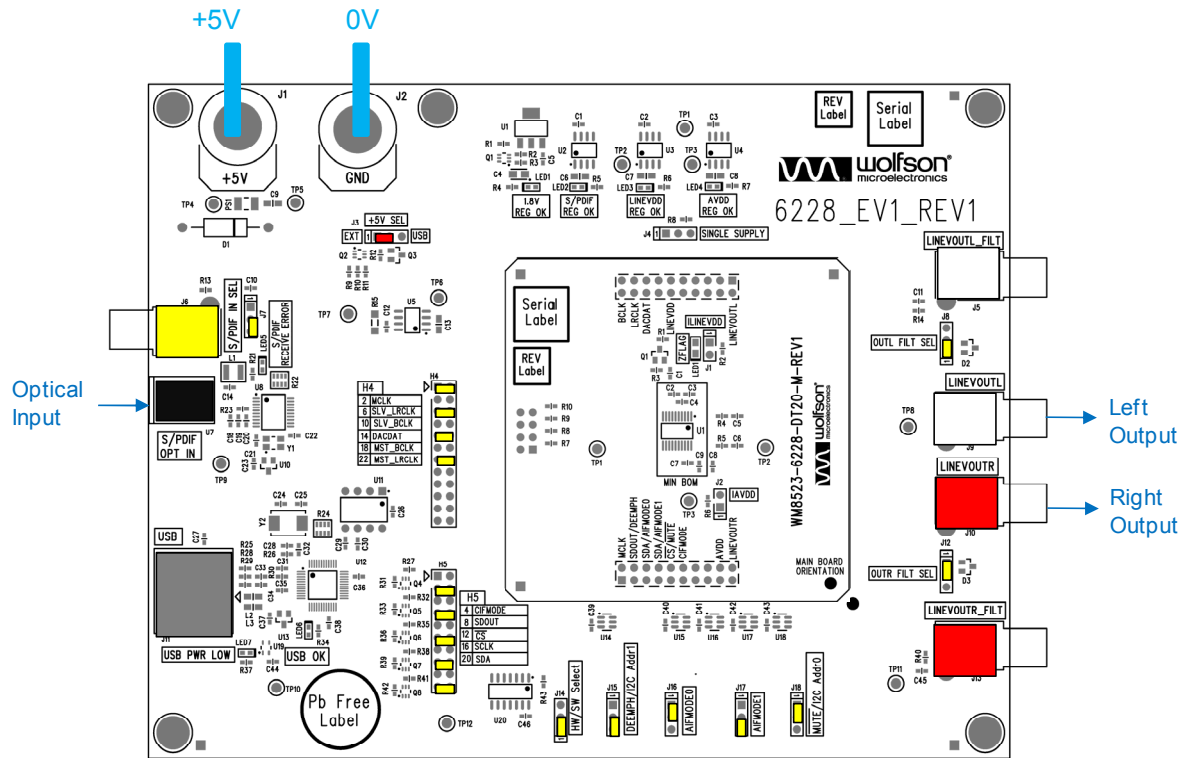


Figure 3 Hardware Mode, External Power, Optical S/PDIF Input, Unfiltered Outputs

SPI SOFTWARE MODE – EXTERNAL SUPPLY, ELECTRICAL S/PDIF INPUT

BOARD CONFIGURATION

The customer test system is configured as shown in Figure 4 below:

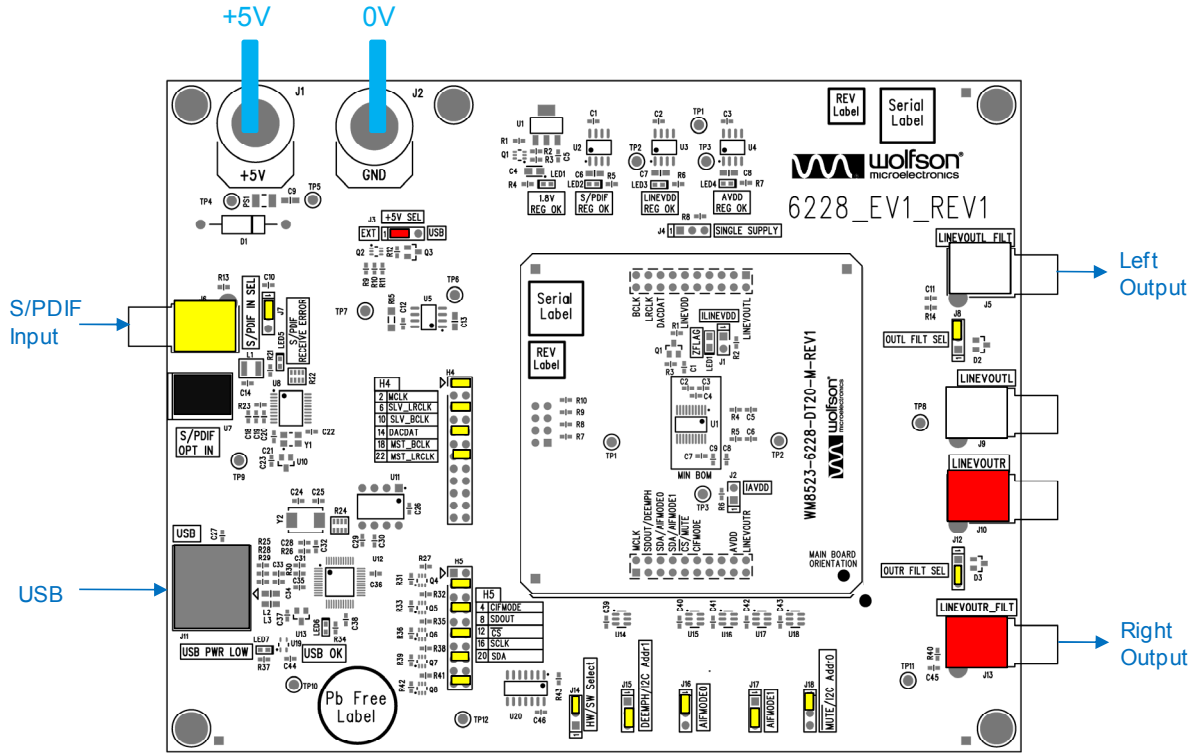


Figure 4 SPI Software Mode, External Power, Electrical S/PDIF Input, Filtered Outputs

REGISTER SETTINGS

Register settings provided below are simply the minimum requirement to configure the desired path and have not in any way been optimised.

REG INDEX	DATA VALUE	COMMENT
0x00	0x8523	Software Reset
0x02	0x0003	SYS_ENA=Enabled

I²C SOFTWARE MODE – USB SUPPLY, ELECTRICAL S/PDIF INPUT

BOARD CONFIGURATION

The customer test system is configured as shown in Figure 5 below.

Note: The WM8523 I²C write address is 0x36 and the read address is 0x37 in this example.

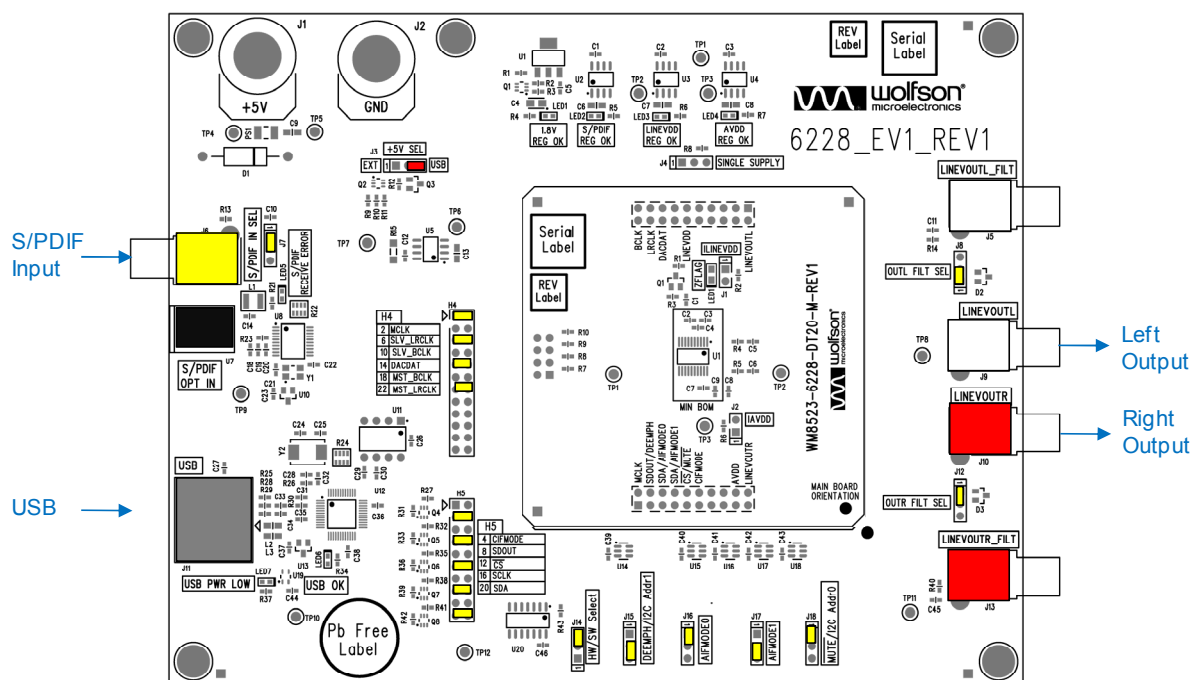


Figure 5 I²C Software Mode, USB Power, Electrical S/PDIF Input, Unfiltered Outputs

REGISTER SETTINGS

Register settings provided below are simply the minimum requirement to configure the desired path and have not in any way been optimised.

REG INDEX	DATA VALUE	COMMENT
0x00	0x8523	Software reset
0x01	0x0003	SYS_ENA=Enabled

I²C SOFTWARE MODE – EXTERNAL SUPPLY, ELECTRICAL S/PDIF INPUT

BOARD CONFIGURATION

The customer test system is configured as shown in Figure 6 below:

Note: The WM8523 I²C write address is 0x36 and the read address is 0x37 in this example.

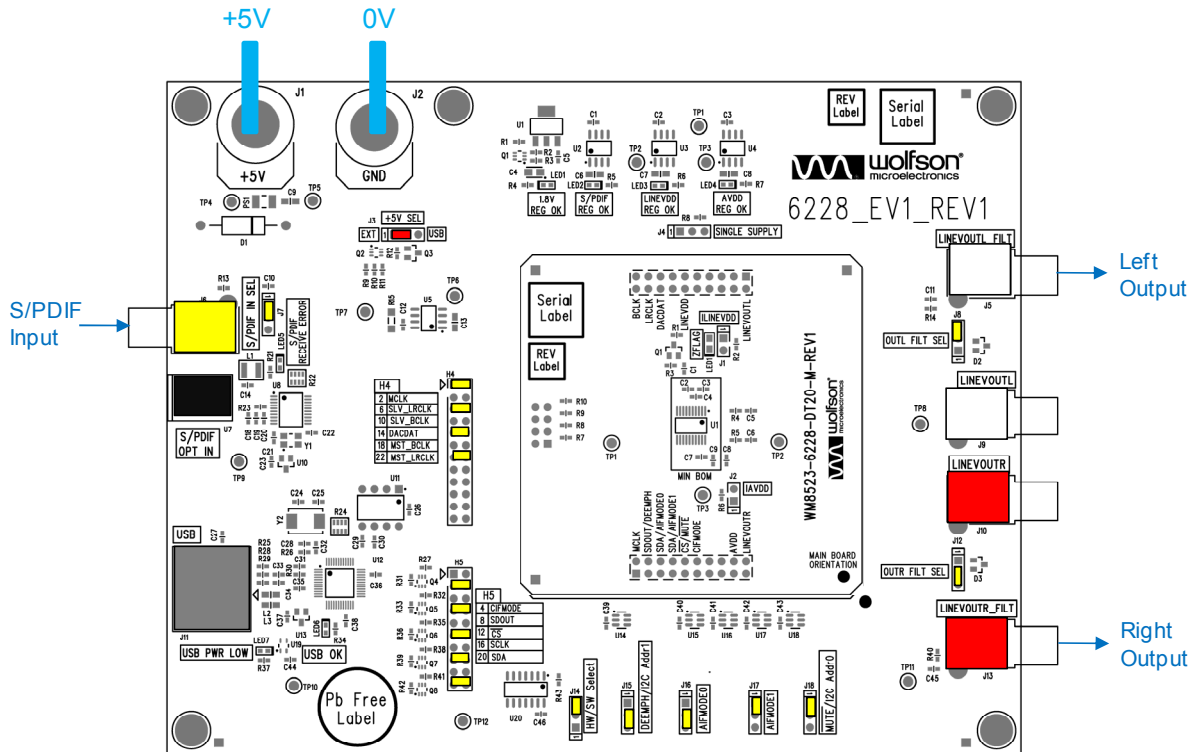


Figure 6 I²C Software Mode, USB Power, Electrical S/PDIF Input, Unfiltered Outputs

REGISTER SETTINGS

Register settings provided below are simply the minimum requirement to configure the desired path and have not in any way been optimised.

REG INDEX	DATA VALUE	COMMENT
0x00	0x8523	Software reset
0x01	0x0003	SYS_ENA=Enabled

SPI SOFTWARE MODE – USB SUPPLY, MASTER MODE

BOARD CONFIGURATION

The customer test system is configured as shown in Figure 7 below.

Note: A hardware modification under the MINI board is required to use this configuration, and so the MINI board is not shown connected to the MAIN board in the diagram below. However, the MINI board should be reconnected after the modification is made and before the stimulus is applied to the boards.

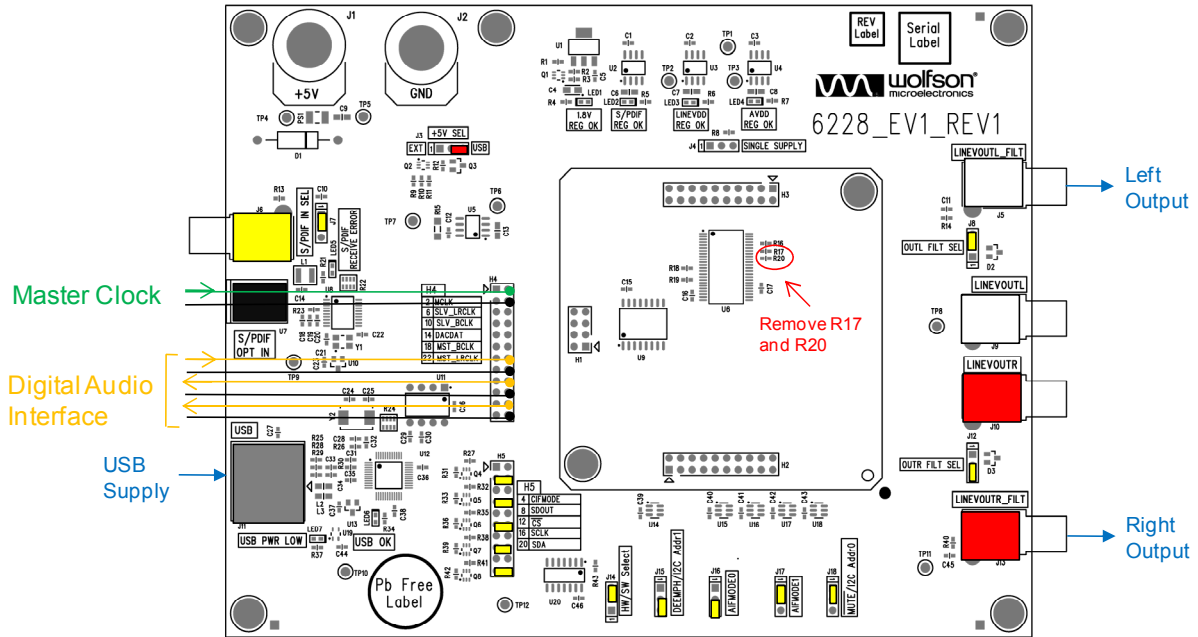


Figure 7 SPI Software Mode, USB Power, Electrical S/PDIF Input, Filtered Outputs

REGISTER SETTINGS

Register settings provided below are simply the minimum requirement to configure the desired path and have not in any way been optimised.

REG INDEX	DATA VALUE	COMMENT
0x00	0x8523	Software reset
0x04	0x0003	BCLK Frequency = MCLK/4, MCLK:LRCLK ratio = 256fs
0x03	0x1892	Master Mode, Word Length=24-bits, Format=I ² S
0x02	0x0003	SYS_ENA=Enabled

APPLICATION SUPPORT

If you require more information or require technical support, please contact the Wolfson Microelectronics Applications group through the following channels:

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or contact your local Wolfson representative.

Additional information may be made available on our web site at:

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