

WM8804 to CS8412 Converter Board Technical Details

Version2 – Jan 2022

1. Pin Assignment:

Pin Number	Description	Pin Number	Description
1	No Connection	28	No Connection
2	No Connection	27	No Connection
3	De-emphasis preset high or low	26	SDATA – Serial Data out
4	No Connection	25	ERF – Error active high
5	No Connection	24	No Connection
6	No Connection	23	No Connection
7	+VD – Digital Supply 5V	22	VA+ - Analogy Supply 5V
8	DGND	21	AGND
9	RXP	20	No Connection
10	RXN	19	MCK – Master clock 256Fs out
11	FSYNC – word clock out	18	No Connection
12	SCK – bit clock out	17	No Connection
13	No Connection	16	No Connection
14	No Connection	15	No Connection

Note: Digital Output voltages in CMOS 3.3V levels.

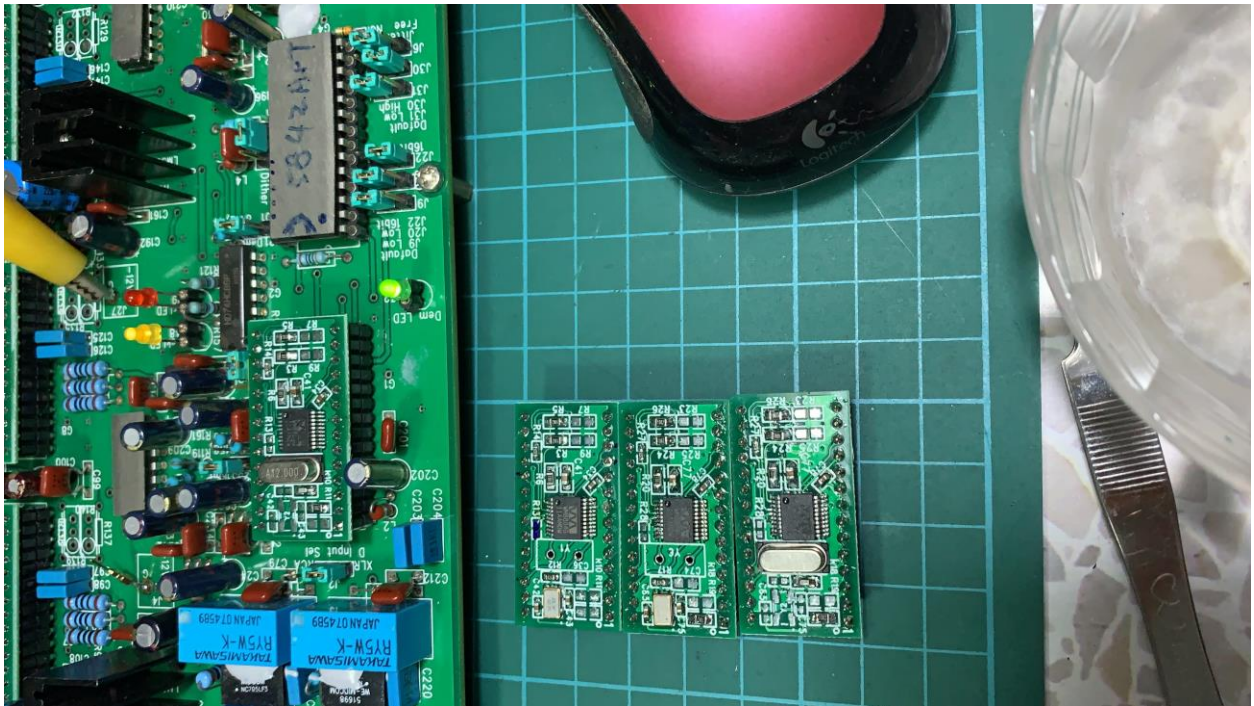
2. Output Mode Selection: (Refer to the last page silk screen image)

Mode	R3/R24	R9/R25	R5/R26	R7/R23	Description
1	Y	NC	Y	NC	16-bit Right-Justified Mode
2	Y	NC	NC	Y	24-bit Left-Justified Mode
3	NC	Y	Y	NC	24-bit I2S
4	NC	Y	NC	Y	16-bit I2S

Notes:

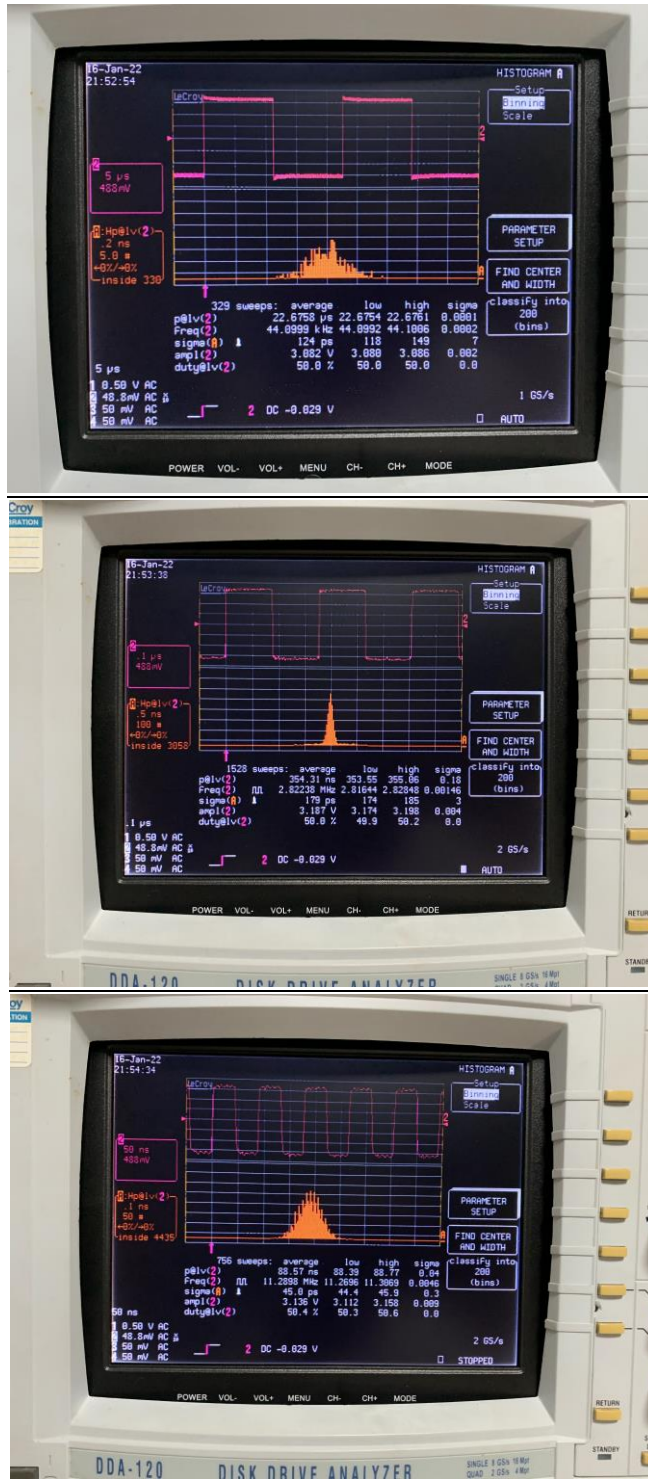
- NC = No connection.
- All resistors value is 10k ohm 0805 size.
- Y = soldered.

3. Photos:



Version 2 changes:

1. Added preset for De-emphasis select resistors for pin 3 output.
2. Mute tie to more errors to ensure better mute.
3. SCLK tie to high.
4. Option to use XO or TCXO (5 x 3.2mm or 3.2 x 2.5mm size) besides using 12Mhz crystal.



5. Jumper settings:

The only mode that can work with D1 DAC is using the 16bit Right Justify mode for SM5842. Thus both pin 5 and 10 of SM5842 must be set to high (+5V).

D1V3 and D1V33 - Note that the modification for DIR9001 in 24 bit mode should be reverted back to original design. That is the level at pin 10 of SM5842 should be at 5V level (HIGH). The rest of jumpers are set as shown above.

D1V2 – PCB marking “Bal PCM63 DAC, 2007-4-V30 and DIY FUN-CSK”. Pin 5 of SM5842 should be isolated from ground (need to cut the traces – 4 thermals on top side) and tie to +5V – pin 10 of SM5842. Also Pin 3 of WM8804 converter board is connected to ground (low) to turn off de-emphasis mode. Output mode set to 16bit RJ – same as D1V33 mode.

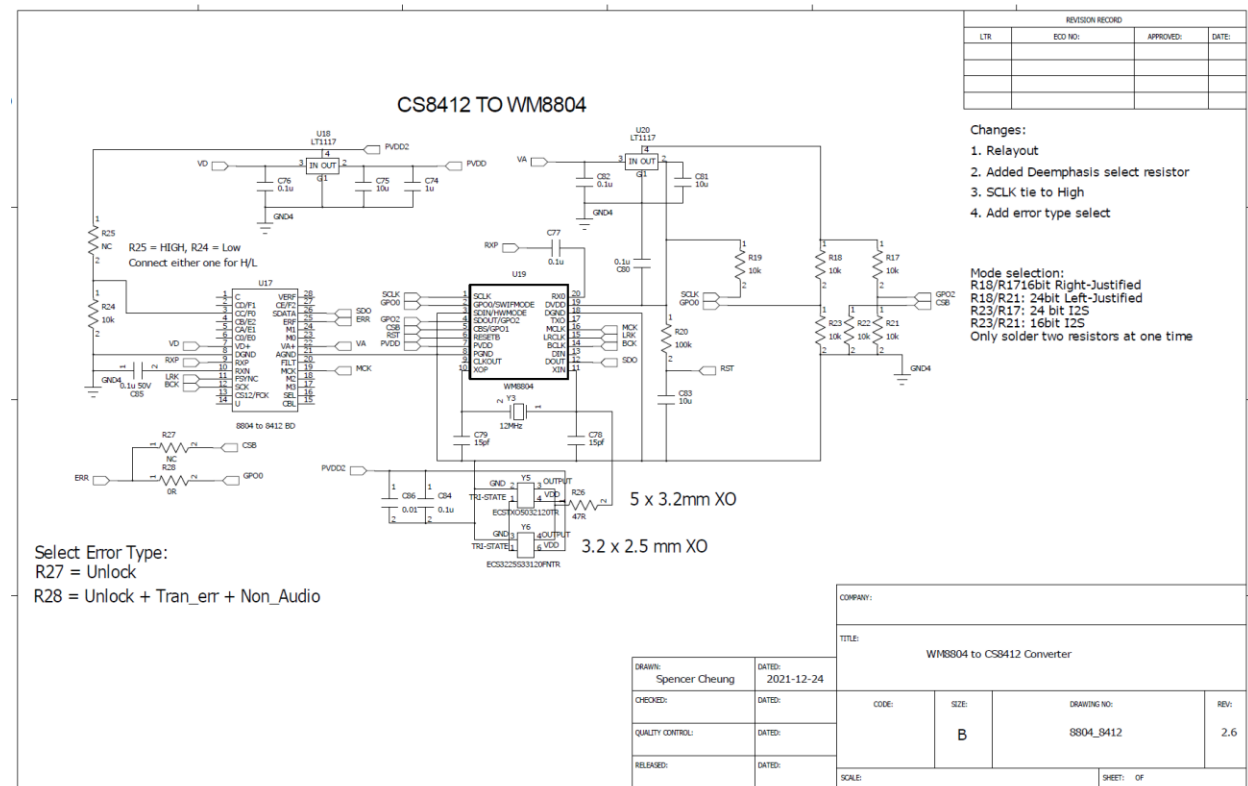
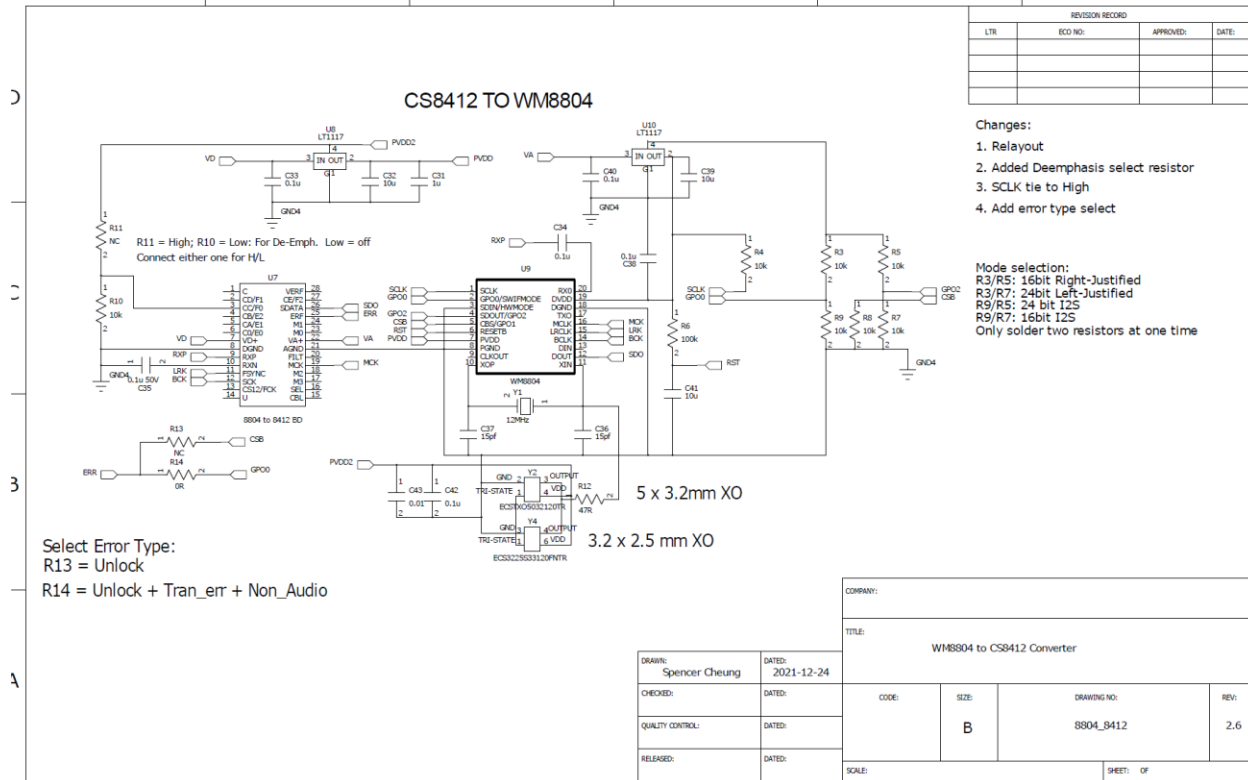
TDA1541 Philips Standard – Use I2S 24 bit or 16 bit output mode on WM8804 converter board.

6. Sound:

More refined, warmer, better 3D and smoother relative to DIR9001 due to better jitter performance. Bass is improved deeper than before. Simple upgrade for all D1V3, D1V33 DIY DACs is possible with excellent results and musical sound.

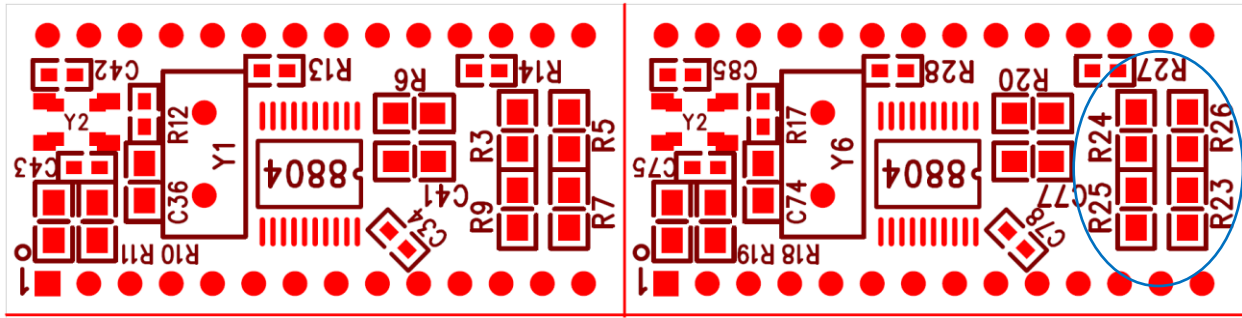
This converter board can also be used in other DAC with CS8412 or CS8414 chip build-in in DIP socket as long as the pin assignment is same as CS8412. The only control that is missing is the de-emphasis output at pin 3 due to lack of this function in WM8804 hardware mode.

WM8804 to CS8412 V2 BOM:										
Item	Qty	Ref Des Set 1	Ref Des Set 2	Part Name	Mfg	Description	PCB Decal	Value	Voltage	Converter Board
1	2	C36 C37	C74 C76	CAP0603,15pf,	TDK or Murata	SURFACE MOUNT CAPACITOR 0603	0805	15pf	50V	For Y1 only
2	1	C43	C75	CAP0805,0.01,	Walsin or Samsung	SMD X7R	0603	0.01u	50V	For XO or TCXO ONLY
3	3	C33 C38	C79 C82	CAP0805,0.1u,	Walsin or Samsung	Capacitor multilayer ceramic	0805	0.1u	16V	ALL
4	1	C34	C78	CAP0805,0.1u,	Walsin or Samsung	Capacitor multilayer ceramic	0603	0.1u	16V	ALL
5	1	C42	C85	CAP0805,0.1u,	Walsin or Samsung	SMD X7R	0603	0.1u	50V	For XO or TCXO ONLY
6	1	C35	C83	CAP0805,0.1u	Walsin or Samsung	SMD X7R	0603	0.1u	50V	ALL
7	1	C31	C81	CAP0805,1u,10%	Walsin or Samsung	Capacitor multilayer ceramic	0805	1u	16V	ALL
8	3	C32 C39 C41	C80 C84 C77	CAP1005,10u,	Walsin or Samsung	Capacitor multilayer ceramic	0805	10u	10V	ALL
16	1	Y2	Y2	ECS3225S3120FNTR	ECS	12 Mhz XO or TCXO CMOS	3.2 x 2.5 mm	12MHz	3.3V	Alternate for Y1
17	1	Y2	Y2	ASFL1-12.000MHZ-EK-T or 510CBA12M0000BAG	Abracon or Skyworks	12 Mhz XO or TCXO CMOS	5 x 3.2mm size	12MHz	3.3V	Alternate for Y1
18	1	Y1	Y6	XTAL1,12MHz	TXC	CRYSTAL	XTAL2	12MHz		with C36 and C37
19	2	U8 U10	U18 U19	LT1117,	Semtech	Regulator 3.3V	SOT223	AMS1117-3.3		ALL
24	1	R14	R27	RES0603,0R,1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0603	0R		For error, nonaudio, unlock Mute
25	1	R6	R20	RES0603,100k, 1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0805	100k		ALL
26	2	R3 R5 R7 R9	R24 R26 R25 R23	RES0603,10k,1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0805	10k		For set output mode, use 2 only
27	2	R4 R8	R22 R21	RES0603,10k, 1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0805	10k		ALL
28	1	R12	R17	RES0603,47R,1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0603	47R		For XO or TCXO ONLY
29	1	R10 R11	R18 R19	RES0603,NC,1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0805	10k		For De-emphasis default, use 1
30	1	R13	R28	RES0603,NC,1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0603	NC		For unlock Mute only
31	1	R1	R16	RES0603,OC,1%	Walsin or ASJ	SURFACE MOUNT RESISTOR 0805	0603	OC		PCM1704 only
32	1	U9	U9	WM8804,WM8804	Wolfson	Digital Receiver	SSOP20-1	WM8804		ALL
33	1	WM88804 V2	WM88804 V2		FETAudio	63BD V2.9	DIP-28	WM8804		ALL
		Use XO part								
		Use Crystal part								

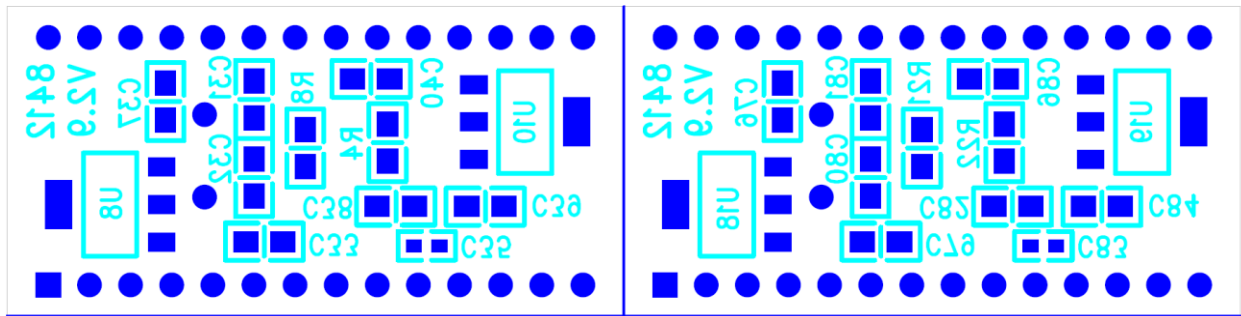


Note: Circuit may have the wrong part designation on second schematic.

Top:



Bottom:



*** END ***