

The Combo384SE is a variant of the classic Combo384 and it interfaces USB Bus to PCM I2S devices with options for S/PDIF and DSD.

The S/PDIF chipset is a WM8804 that can work as transmitter or receiver.

TX MODE

The S/PDIF output supports 192Khz and a dedicated connector with impedance 75 ohm will output capacitive isolated digital output. The PCM data received from USB will be available on the I2S output connector and at same time on S/PDIF output connector. When PCM 384Khz or DSD streaming are incoming the S/PDIF output will be muted.

RX MODE

The WM8804 will be in RX mode when dedicated PIN 16 (D64) on the I2S output connector will be grounded. In this case the received I2S from the incoming S/PDIF stream will be redirected on the I2S data lines of the main connector.

When

in	PIN16 D64=1	<i>USB stream in output as I2S and output as SPDIF/TX</i>
in	PIN16 D64=0	<i>SPDIF/RX in output as I2S and repeated in output SPDIF/TX</i>
out	PIN10 AUX_SEL	<i>when 1 indicates USB output when 0 indicates SPDIF/RX output.</i>
out	PIN11 MUTE	<i>asserted 50ms before and 50ms after the USB/SPDIF switch.</i>

F0,F1,F2,F3 LINES

Sample rate indicator are lines F0,F1,F2,F3 of the main output connector. DSDOE pin indicates when asserted that the incoming stream is DSD otherwise is PCM.

When in RX MODE mode F0,F1,F2,F3 will indicate always the USB Sample Rate.

PCM DSDOE=0

0 (F3), 0 (F2), 0(F1), 0(F0)	-> 32kHz
0 (F3), 0 (F2), 0(F1), 1(F0)	-> 44.1kHz
0 (F3), 0 (F2), 1(F1), 0(F0)	-> 48kHz
0 (F3), 0 (F2), 1(F1), 1(F0)	-> 88.2kHz
0 (F3), 1 (F2), 0(F1), 0(F0)	-> 96kHz
0 (F3), 1 (F2), 0(F1), 1(F0)	-> 176.4kHz
0 (F3), 1 (F2), 1(F1), 0(F0)	-> 192kHz
0 (F3), 1 (F2), 1(F1), 1(F0)	-> 352.8kHz
1 (F3), 0 (F2), 0(F1), 0(F0)	-> 384kHz

DSD DSDOE=1

//1 (F3), 0 (F2), 0(F1), 1(F0)	-> DSD64
//1 (F3), 0 (F2), 1(F1), 0(F0)	-> DSD128
//1 (F3), 0 (F2), 1(F1), 1(F0)	-> DSD256
//1 (F3), 1 (F2), 0(F1), 0(F0)	-> DSD512

I2S/DSD OUTPUT CONNECTOR
Header 10x2 Row Pin 2.54 mm pitch

1	USB Cable Plugged	OUT	It's 1 When the USB cable is plugged
2	I2C SCL	OUT	I2C Clock Master
3	I2S DATA/DSD1	OUT	I2S PCM or DSD Data Stream LVCMOS 3.3V 47ohm
4	I2S CLK/DSD CLK	OUT	PCM BIT CLOCK
5	I2S FSCLK/DSD2	OUT	PCM WORD SYNC or DSD2 channel
6	MCLK	IN/OUT	24.576Mhz or 22.5792Mhz when S/PDIF RX MCLK from WM8804
7	DSDOE	OUT	It's 1 when a DSD stream is in output
8	GND	POWER	Ground Terminal
9	3.3V	POWER	Ground Terminal
10	AUX SEL	OUT	When 0 indicates output from USB Stream When 1 indicates output from S/PDIF RX
11	MUTE	OUT	Asserted when sample rate changes or PCM/DSD/SPDIF switch
12	I2C SDA	OUT	I2S Master Data
13	GND	POWER	Ground Terminal
14	GND	POWER	Ground Terminal
15	GND	POWER	Ground Terminal
16	S/PDIF RX ENABLE	IN	When 0 the S/PDIF Receiver Enabled and redirected to I2S output connector.
17	F0	OUT	Sample Rate Indicator
18	F1	OUT	Sample Rate Indicator
19	F2	OUT	Sample Rate Indicator
20	F3	OUT	Sample Rate Indicator

P3 CONNECTOR

It's a 3 pin Header 2.54mm pitch

Use this connector to erase the CPU flash and reprogram the firmware with the Maintenance Tool. On an embedded system is recommended a service menu connected to this connector.

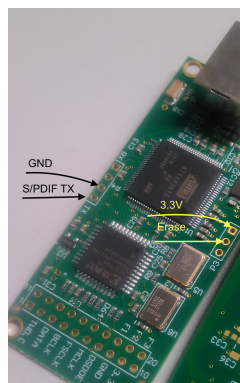
1	3.3V	POWER	
2	Erase PIn	IN	Short Bridge with pin 1 3.3V to erase the CPU flash
3	GND	POWER	

P4 CONNECTOR

S/PDIF(AES3) IN OUT connector, it's a digital output at 75ohm with capacitive isolation.

It's possible to connect it directly to a RCA connector or with a galvanic isolator.

1	S/PDIF RX	IN	75 ohm with 0.1 uF capacitor see WM8804 datasheet
2	GND	POWER	
3	GND	POWER	
4	S/PDIF TX	OUT	75 ohm with 0.1 uF capacitor 1Vpp (AES3) see WM8804 datasheet



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This is a preliminary datasheet and is not complete.

