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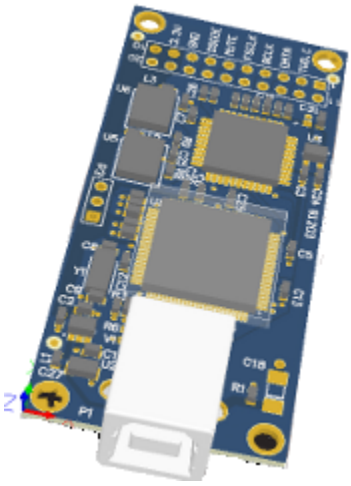
COMBO384 Version PCM to I2S Input

revised datasheet
version 2018/11/28

FEATURES



- **Core**
  ARM® Cortex®-M3 ATSAM3Uxxx-AU
  CPLD XILINX® XC2C64A
- **OSCILLATORS**
  24.5760 Mhz Low phase noise
  22.5792 Mhz Low phase noise
- **USB**
  USB 2.0 High Speed dedicated 12Mhz crystal

  Class 2 compatible
  No drivers for Mac OSX® 10.6+
  No drivers for Linux with UAC2 Kernel compliant
  No drivers for MS Windows® 10+
- **AUDIO**

  PCM over USB sample rates 44.1Khz 48Khz, 88,2Khz,96Khz,192Khz
  352.8Khz, 384Khz I2S input
- **INPUT**
  LVCMOS33
- **Powered by USB 5V bus. Power Consumption is 605 mW at max speed.**
  The module mounts an ultra low noise LDO ADP-15x-3.3V
- **ROHS and CE certified**

DESCRIPTION

The Combo384 is an USB audio device adapter for OEM applications.
I2S PCM audio data (2 Channels) accepted in input are converted in an USB stream. The PCM sample rates supported are 44.1 Khz, 48 Khz, 88,2 Khz, 96 Khz, 176,4 Khz, 192 Khz, 352,8 Khz, 384 Khz.

Erase connector

Header P3 3x1 raw 2.54mm pitch

1	Squared hole	Power	3,3V
2	Circular hole	In	Flash Erase Pin, Connect to 3.3V to erase the flash 100 ms
3	Circular hole	Power	Ground Terminal

It's recommended to make P3 accessible for eventual future firmware update procedure. Use a button or an Option in a Service Menu. In case of long wires on P3 install a Pull Down resistor 10kOhm between pin 2 and 3.

The input connector follows the European numbering and not the alternating one.

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Input connector

header 10x2 raw 2.54mm pitch

1	Cable Plugged	-	It's "1" When the usb cable is plugged
2	Reserved	-	
3	I2S DATA	In	In Data stream LVCMOS 3.3V 75 ohm
4	I2S CLK	In	Bit Clock LVCMOS 3.3V 75 ohm
5	I2S FSCLK	In	Frame sync LRCLK LVCMOS 3.3V 75 ohm
6	MCLK	Out	Actual Master Clock 24.576Mhz or 22.5792Mhz
7	DSD ON	.	Reserved
8	GND	Power	Ground Terminal
9	3.3V output (max 50mA)	Power Out	This output can be used to power an isolator or it can be used to detect when the usb is connected to the PC.
10	Reserved	-	Reserved for s/pdif version
11	MUTE	Out	Reserved
12	Reserved	-	
13	GND	Power	Ground Terminal
14	GND	Power	Ground Terminal
15	GND	Power	Ground Terminal
16	DSD64_128	Out	Reserved
17	F0	Out	Sample rate indicator see table below
18	F1	Out	Sample rate indicator see table below
19	F2	Out	Sample rate indicator see table below
20	F3	Out	Sample rate indicator see table below

Output Connector pinout

[11] **Mute**	[12] **SDA**	[13]**GND**	[14]**GND**	[15]**GND**	[16]**DSD64**	[17]**F0**	[18]**F1**	[19]**F2**	[20]**F3**
[1] **Plug**	[2] **SCL**	[3] **DATA**	[4] **CLK**	[5]**FSCLK**	[6] **MCLK**	[7]**DSDOE**	[8]**GND**	[9]**3.3V**	[10]**N.C.**

The module works in Slave Mode Only. I2S frame signals must be externally generated.

ELECTRICAL CHARACTERISTICS

ABSOLUTE RATINGS*

Storage Temperature.....-40°C to + 85°C
Maximum Operating Voltage .....5.5V USB supply

***NOTICE: Stresses beyond those listed under "Absolute Maximum**
Ratings" may cause permanent damage to the device.
This is a stress rating only and functional operation of the
device at these or other conditions beyond those indicated
in the operational sections of this specification is

not implied. **Exposure to absolute maximum rating conditions for extended periods may affect device reliability**

Sample Rate Indicators

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

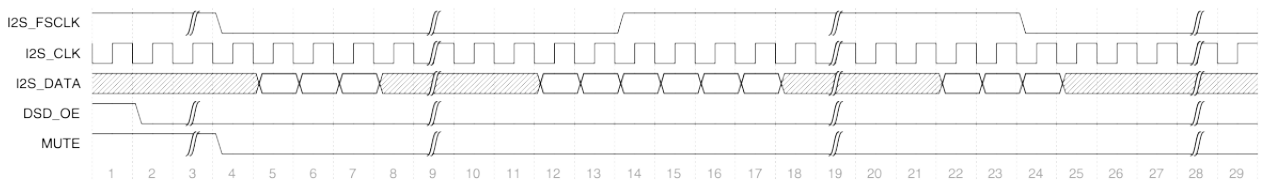
The F0..F3 indicate the sample rate the host PC is requiring.

DC Characteristics

VCCIO 3.3V

Symbol	Parameter	Min	Max
VOH	High level output voltage	VCCIO – 0.4V (Ioh=-8mA)	-
VOL	Low level output voltage	_	0.4 V (Iol=8mA)
Pdc	Power consumption at 32/384Khz		605mW

Timing Diagrams



I2S Mode

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MECHANICAL CHARACTERISTIC

distances are in mm

NOTICE
This product is ROHS and CE certified.

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