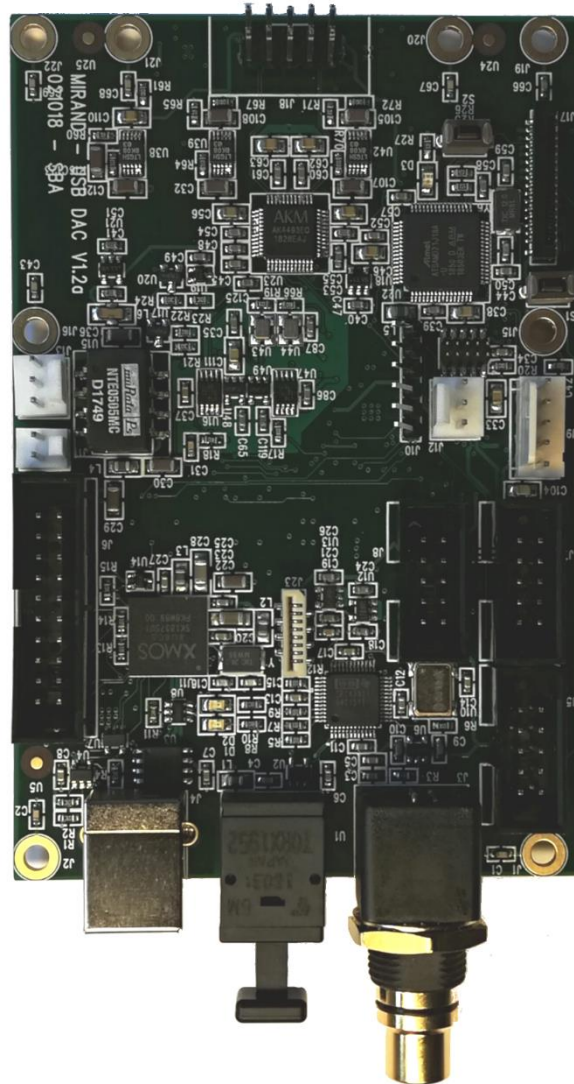




MIRAND USB Audio DAC V1.2A





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Overall description.

Our OEM Audio DAC supports both PCM and DSD.

It supports to PCM 384KHz/32 bit and up to DOP128 or native DSD256. It features 4 inputs, USB, 1 x TOSLINK, 1 x RCA SPDIF input, 1 x I2S port and it is fitted with a galvanic isolation on USB.

Connector for additional two SPDIF/AES channel is available

Flexibility:

Easy interface to external peripheral via I2C and SPI interface. Onboard microcontroller can be used to control LED drivers, displays, key, or just sending status of interface, bit rates and data type.

It is possible to use this DAC as a controller for a complete Preamp/DAC by only adding the interfaces like Display, Encoder, IR receiver. The build in microcontroller with its 256Kbyte flash and 32Kbyte SRAM has plenty of capacity for handling those peripherals.

Output Stage:

The IV stage is not fitted on the mainboard to tailor the customers needs for a certain sound profile.

Performance by design:

With its 13 low noise voltage regulators, galvanic isolation, reclocking and galvanic isolation of the USB Port, we have maximized the performance possible in the compact size of this DAC mainboard of only 73x110x22mm.



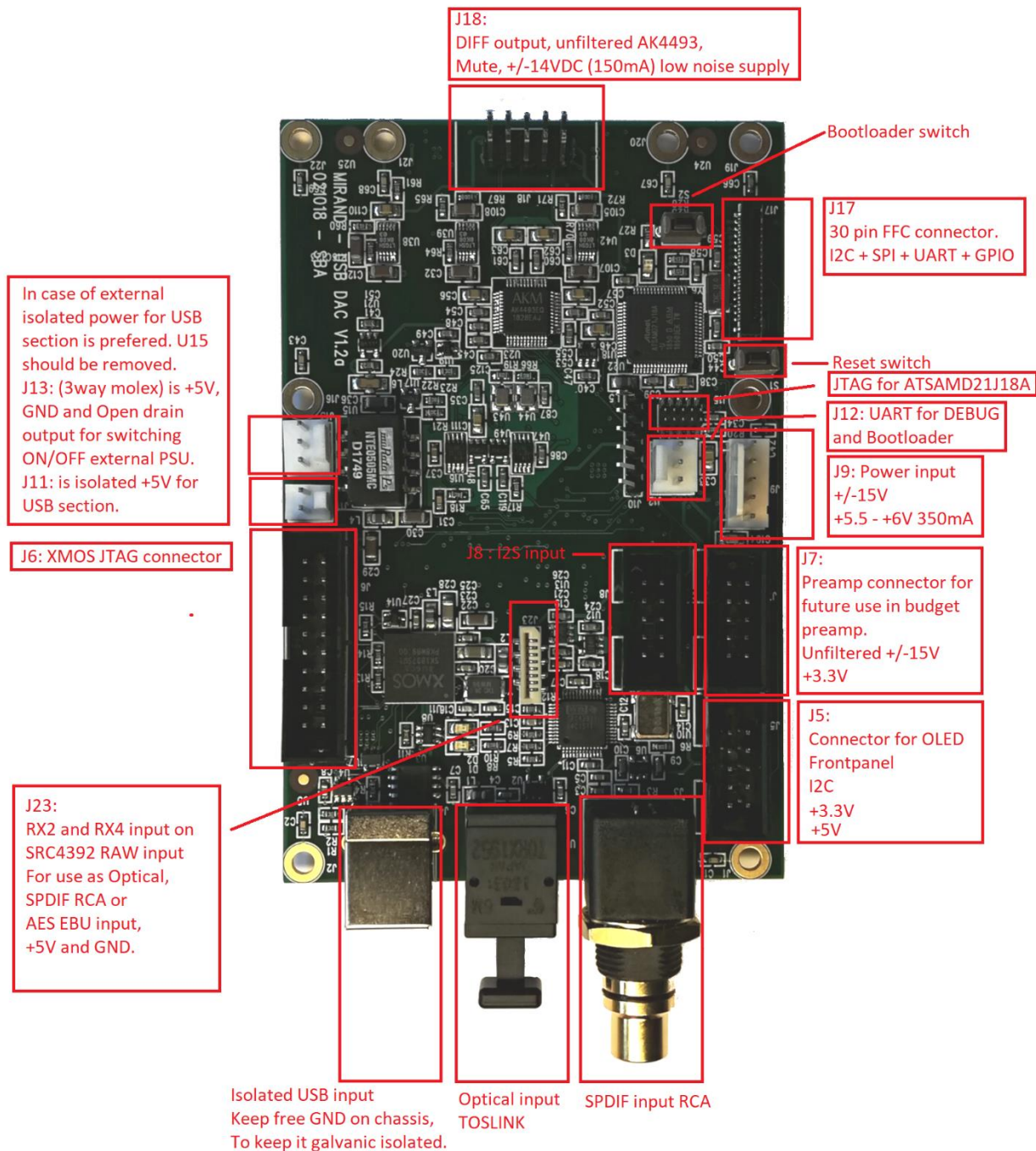
Specification:

- WxLxH : 122x89x15mm
- DAC chip AK4493 unfiltered out + mute on 10 way header
- 1 x RCA SPDIF , 192KHz 24Bit
- 1 x Toslink SPDIF, 48KHz 24Bit
- 1 x I2S port, 192KHz 24Bit
- 2 x optional Serial Audio ports, 192KHz 24Bit
- 1 x USB UAC 2.0, Galvanic isolated
 - PCM 384KHz 32Bit
 - DOP64,128
 - DSD64,128,256
- Onboard microcontroller
 - Cortex M0+, 256Kbyte Flash
- SPI interface, 24MHz
 - 7 GPIO for CHIP select or standard GPIO.
- I2C interface, 400KHz.
- Power requirement.
 - +5.5V, 350mA
 - +15V, 160mA (10mA for DAC chip)
 - -15V, 150mA
- 30 pol FFC header for system connection.
- 10 way IDC header for optional OLED frontpanel.
- 10 way IDC header for optional Preamp section
- 5 way Molex KK grid connector for Power
- Optional output stage 4 variants
 - Fully Discrete JFET folded cascode in differential or single-ended output
 - OPA1642 based in differential or single-ended output.

Order code:
OEM-V12A-AK4493
OEM-V12A-AK4493-OPA1642-DIFF
OEM-V12A-AK4493-OPA1642-SE
OEM-V12A-AK4493-DISCRETE-DIFF
OEM-V12A-AK4493-DISCRETE-SE



Overview of connectors.





Dimension drawing.





Connector pinout.

J9: Power input

Pin number.	Description.
1	+5.5V
2	GND
3	+15V
4	GND
5	-15V

J5: Frontpanel header

Pin number.	Description.
1	+3.3V
2	SDA3
3	GND
4	SCL3
5	+5V
6	NC
7	PB06
8	NC
9	/BOOT
10	PA22

J7: Preamp Header

Pin number.	Description.
1	+15V
2	SDA3
3	+3.3V
4	SCL3
5	PB07
6	MISO
7	GND
8	MOSI
9	-15V
10	SCK

J6: XMOS JTAG

J10: XILINX JTAG

J15: ATSAMD21J18 JTAG

J8: I2S

Pin number.	Description.
1	+3.3V_SRC
2	GND
3	SDOUTA
4	GND
5	SDINA
6	GND
7	LRCKA
8	GND
9	BCKA
10	GND

J23: SPDIF channel 2,4

Pin number.	Description.
1	+5V
2	GND
3	RX2+
4	RX2-
5	RX4+
6	RX4-
7	GND
8	NC

J18: AK4493 output

Pin number.	Description.
1	USBLOUT+
2	+14V
3	USBLOUT-
4	/MUTE
5	GND
6	PB30
7	USBROUT-
8	+5V
9	USBROUT+
10	-14V

J12: DEBUG/FIRMWARE UPGRADE uart

Pin number.	Description.
1	TXD
2	RXD
3	GND



J13: External +5V USB ENABLE

Pin number.	Description.
1	+5V USB POWER
2	OPEN DRAIN /EN
3	GND

J11: External +5V USB Input

Pin number.	Description.
1	+5V Isolated
2	GND Isolated

J11: Expansion header FFC 0.5mm

Pin number.	Description.
1	+3.3V
2	+3.3V
3	GND
4	GND
5	PA10
6	PA11
7	ENC_CHA
8	ENC_CHB
9	PB12 (SERCOM4)
10	PB13 (SERCOM4)
11	PB14 (SERCOM4)
12	PB15 (SERCOM4)
13	PA12
14	IR_DATA
15	PA19 (SERCOM3)
16	/BOOT (SERCOM3)
17	SCL3 (SERCOM3)
18	SDA3 (SERCOM3)
19	PB00 (SERCOM5)
20	PB01 (SERCOM5)
21	PB02 (SERCOM5)
22	PB03 (SERCOM5)
23	PB22
24	PB23
25	PA27
26	PA28
27	+5V
28	+5V
29	GND
30	GND



Electric specification.

Parameter:	Symbol:	Typical:
Power input voltage		
	+5.5V	+5.2 to +6V
	+15V	+14.5 to +20V
	-15V	-14.5 to -20V
Power input current	+5.5V	350mA
	+15V	10mA
	-15V	2mA
I2S Voltage	SDOUTA	+3.3V LVC
	SDINA	+3.3V LVC
	BCKA	+3.3V LVC
	LRCKA	+3.3V LVC
All GPIO, I2C, SPI	Voltage level	+3.3V LVC
DUBUG/FIRMARE PORT	Voltage level	RS232 compliant
AK4493 USB Output level	DC voltage	+2.5V
	Voltage swing PCM/DSD	2.8Vpp/pin
	Minimum Load	450Ohm
	+14V current capacity	150mA
	-14V current capacity	150mA



MIRAND IVS
PCB Services.

May 2019

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