



SMPS1K-SN

DATA SHEET

Switching power supply for audio applications

Features

- 100VAC ~ 250VAC Input (PFC)
- Standby control input
- Amp enable output
- Trigger control
- Onboard standby power supply
- 22CM * 14CM * 6CM
- 0.3W Power consumption in standby

Typical applications

- * Professional audio systems
- * Consumer audio products
- * HiFi audio systems

Highlights

- * High reliability
- * High efficiency
- * Low EMI signature
- * Power factor corrector



Safety compliance

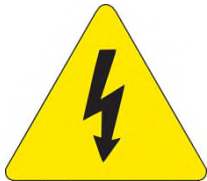
The **SMPS1K-SN** is safety tested according to the following standard:

- EN 62368-1:2020+A11:2020

Certificate number ET-24070856SC

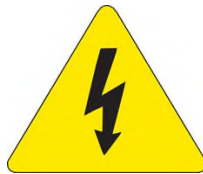
SMPS1K-SN

Safety Warning



The SMPS1K-SN operates at mains voltage and carries hazardous voltages up to **420VDC** at accessible parts. These parts may never be exposed to inadvertent touch.

Observe extreme care during installation and never touch any part of the unit while it is connected to the mains. Disconnect the unit from the mains and allow all capacitors to discharge for **15 minutes** before handling it.



IMPROPER HANDLING MAY RESULT IN PERSONAL INJURY



Ignoring the safety warning may lead to a nasty surprise on later stage!



SMPS1K2-SN

Introduction

The SMPS1K-SN is a high efficiency **Safety Class 2 unregulated** high efficiency switch mode power supply specifically designed for audio applications, where high system reliability is a required feature.

The SMPS1K-SN is a SMPS with power factor corrector front end, excellent PFC regulation guarantees low voltage drop at the output across the entire load curve.

SMPS1K-SN also features an advanced over current protection & thermal protection, AC-Line loss detection to immediately stop the SMPS once disconnected from the AC-LINE.

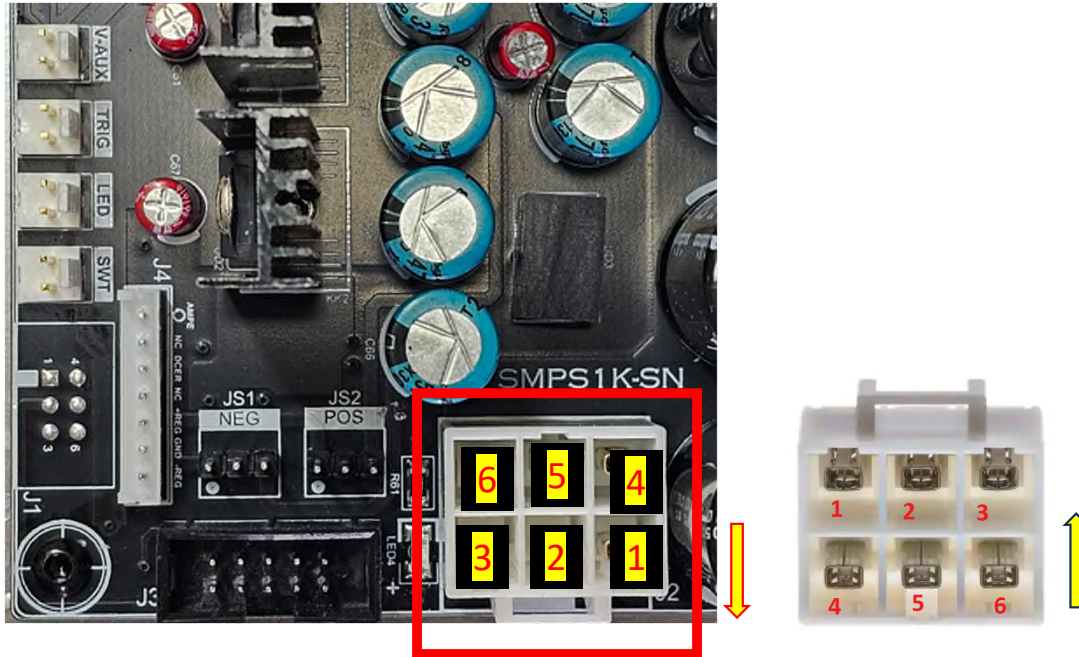
This SMPS is the result of countless hours of design, development, testing for each circuit to combine one reliable product.

Detailed description of specifications

- Active power factor corrector.
- Unregulated SMPS.
- Wide input voltage range (100 VAC ~ 250 VAC).
- Standby control switch input eliminates the need for mechanical switches.
- Trigger input.
- Onboard standby power supply (+12VDC or +5V 3W) **Always ON**.
- AC-Line loss detection
- Synchronous rectifier
- Wide output voltage range selection, +40, +-46, +-50,+-50,+-60,+-64,+-70,+-75...+-110
- Customizable to OEM specifications

SMPS1K2-SN

Connector Pinouts J2



J2				
Connector	Pin number	Type	Function	Notes
J2.1	1	Output	VDR+	Positive bootstrap driver voltage
J2.2	2	Output	HV+	Positive supply rail
J2.3	3	GND	GND	Ground
J2.4	4	Output	VDR-	Negative bootstrap driver voltage
J2.5	5	Output	HV-	Negative supply rail
J2.5	6	GND	GND	Ground

Bootstrap Driver Voltage (VDR)

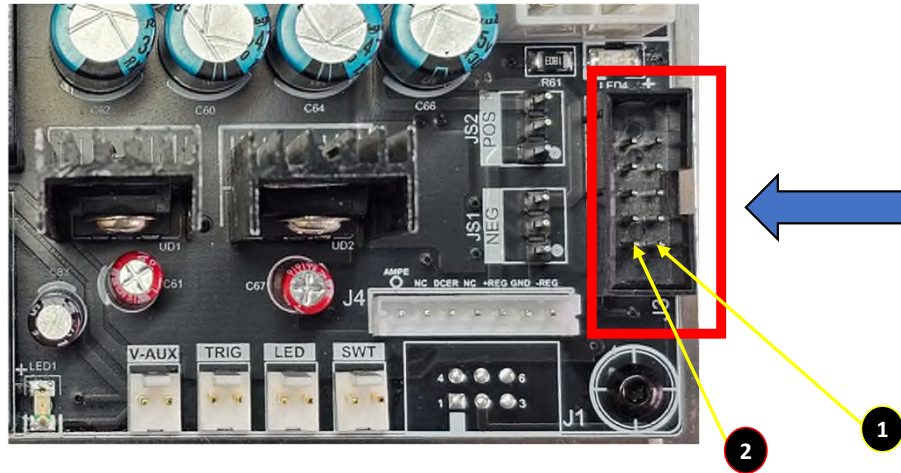
The SMPS1K-PFC provides a regulated Bootstrap Driver Voltage (VDR) which is used to power the driver circuit of any Class-D amplifier. Most amplifier modules need the VDR voltage referenced to the negative supply rail (HV-).

To achieve this, the VDR- **should be connected** to the main negative supply rail (HV-) at the amplifier side. The VDR+ must be connected to the amplifier VDR supply input. The Bootstrap Driver Voltage (VDR) can be specified at the order time 12V, 15V, 18V. The Bootstrap Driver Voltage (VDR) is an isolated output from all other outputs.

➡ Connector type equivalent: B06P-VL.
Matching cable part: VLP-06V.

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Connector Pinouts J3

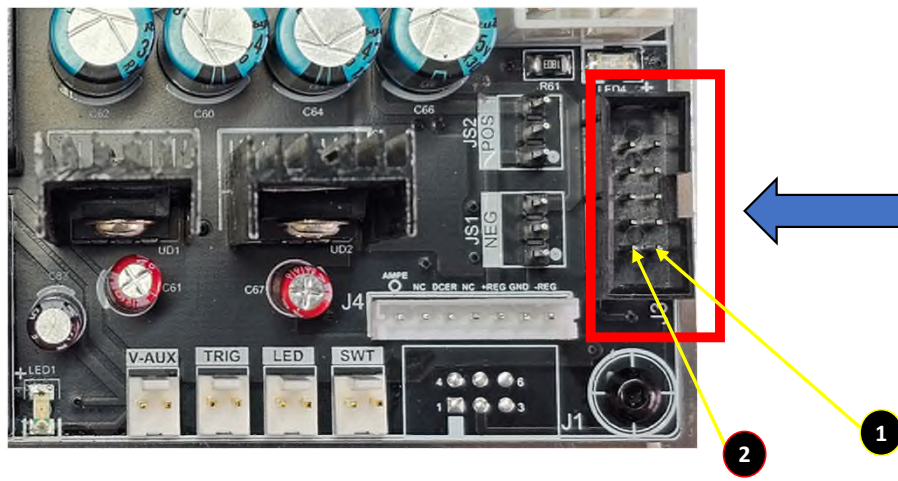


Connector J3				
Connector	Pin number	Type	Function	Notes
J3.1	1	Output	Positive Output	Select able Output (VAUX / UNREG,REG)
J3.2	2	Output	Negative Output	Délectable Output (VAUX / UNREG,REG)
J3.3	3	GND	GND	Ground
J3.4	4	NC	NC	Do not connect
J3.5	5	Output	Emitter	Amplifier enable (Opto isolated) E
J3.6	6	Output	Collector	Amplifier enable (Opto isolated) C
J3.7	7	NC	NC	Do not connect
J3.8	8	NC	NC	Do not connect
J3.9	9	GND	GND	Ground
J3.10	10	Input	DC-Error	DC-Error trigger input

➡ Connector type equivalent: **2510-6002UB**.
 Matching cable part: **89110-0101HA** .

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Connector Pinouts JS1 & JS2



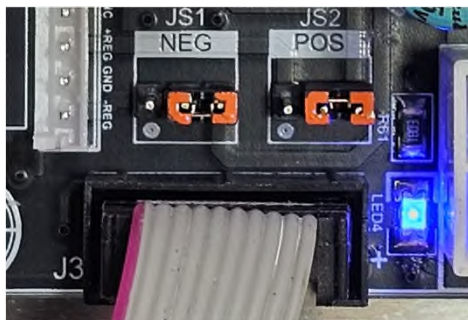
Jumpers JS1 & JS2 description

Jumper Setting (VAUX Regulated or Unregulated)

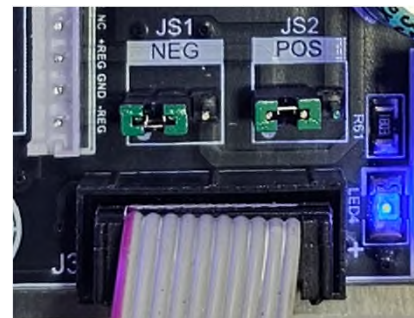
Jumpers JS1 & JS2 settings will reflect the output voltage at J3

JS1 (Negative rail **Pin2 J3.2**) and JS2 (Positive rail on **Pin1 J3.1**) are used to select the output voltage on pin **J3.1** and **J3.2**, two options are possible

- Position 2-3: Unregulated VAUX
- Position 1-2: Regulated VAUX



Unregulated VAUX Selected



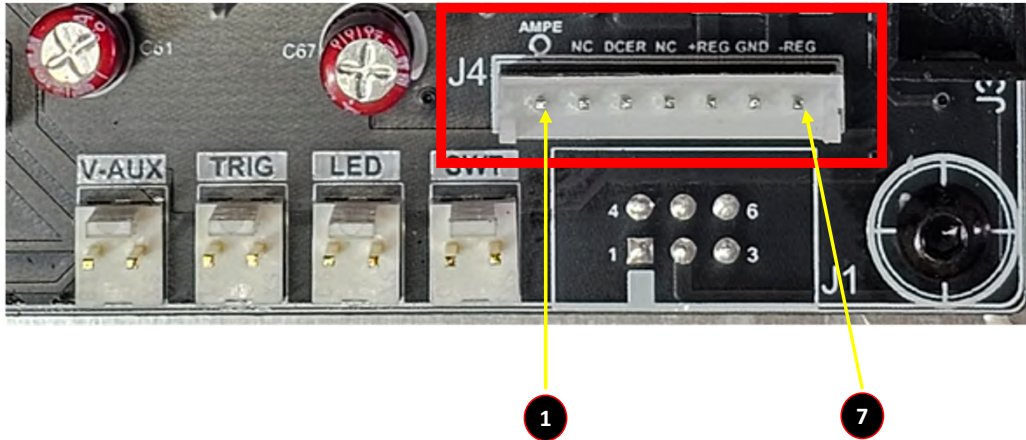
Regulated VAUX Selected



Connector type equivalent: 90120-0122.
Shunt part: 0015381024.

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Connector Pinouts J4



J4				
Connector	Pin number	Type	Function	Notes
J4.1	1	Output	AMPE	Amplifier enable
J4.2	2	NC	NC	Do not connect
J4.3	3	Input	DCER	DC Error input
J4.4	4	NC	NC	Do not connect
J4.5	5	Output	Positive Output	REGULATED output Subject to the selected VAUX regulators
J4.6	6	GND	Ground	
J4.7	7	Output	Negative Output	REGULATED output Subject to the selected VAUX regulators

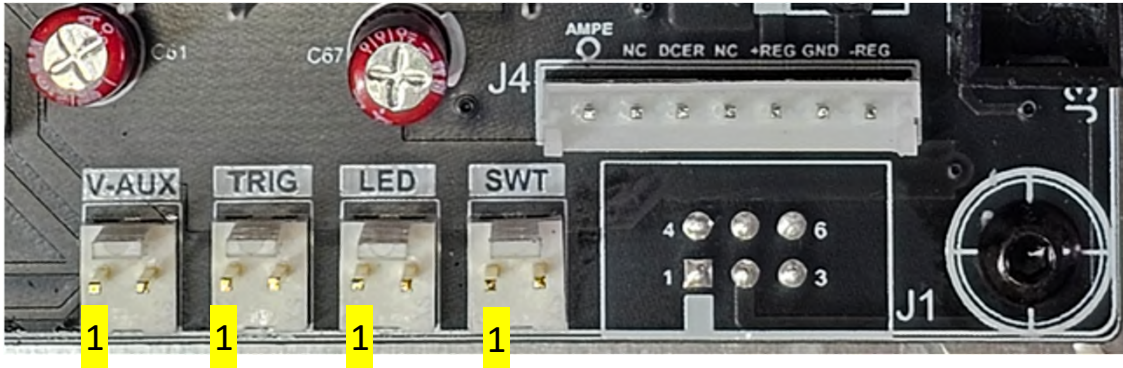


Connector type equivalent: **B7B-EH-A(LF)(SN)**.
Matching cable part : **EHR-7**.



Black 22 AWG Jumper Lead Socket to Socket Tin 12.0"
(304.8mm) pat: **ASEHSEH22K305**

Connector Pinouts



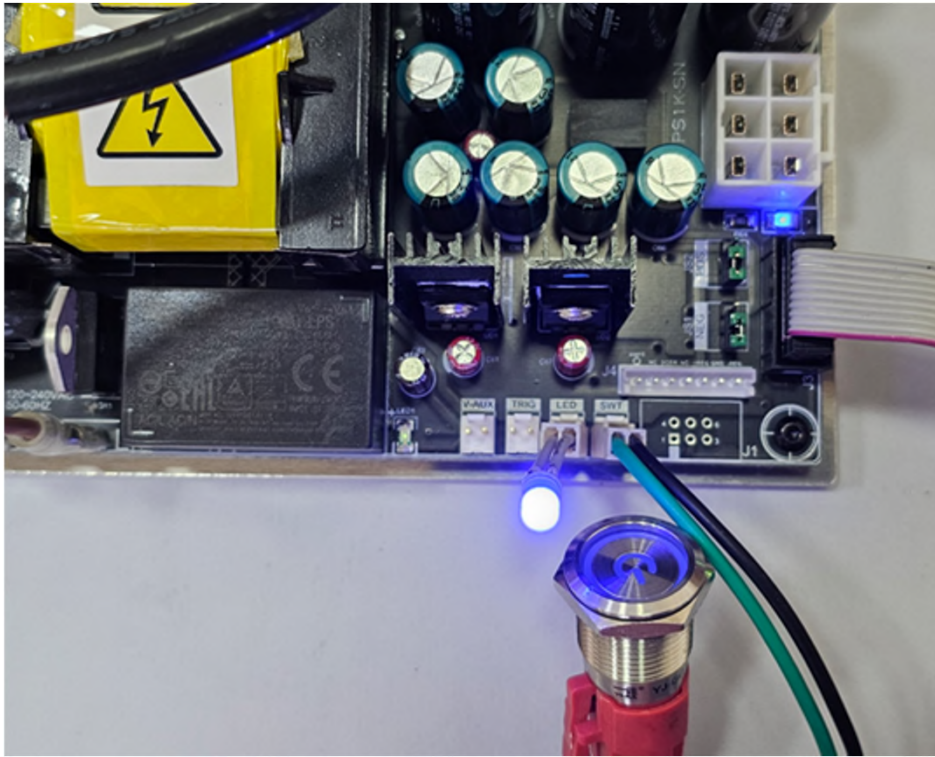
V-AUX connector				
Connector	Pin number	Type	Function	Notes
V-AUX	1	GND	GND	Ground
V-AUX	2	Output	+12 / +5 VDC	Positive rail
SWT connector				
Connector	Pin number	Type	Function	Notes
SWT	1	Input	Standby	Standby input control
SWT	2	GND	GND	GND
TRIG connector				
Connector	Pin number	Type	Function	Notes
TRIG	2	Input	Trigger	Trigger input from 8V ~ 12V
TRIG	1	GND	GND	GND (Of the 8 ~ 12V trigger)
LED connector				
Connector	Pin number	Type	Function	Notes
LED OUT	1	Output	-	LED - output
LED OUT	2	Output	+	LED+ output

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General Performance Data

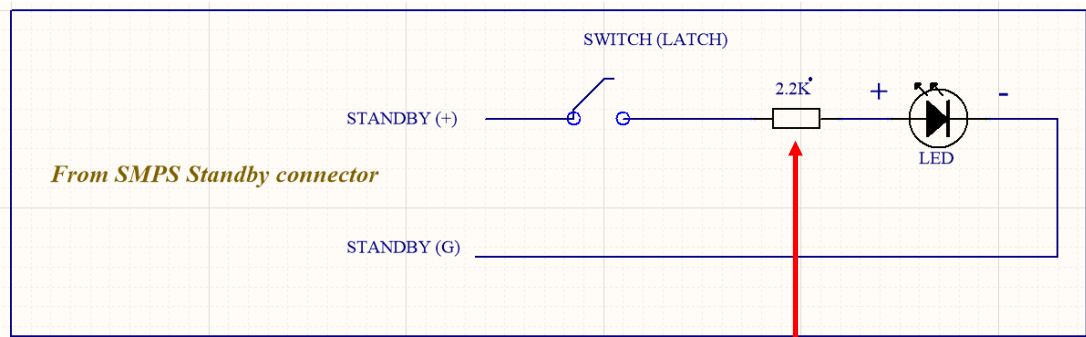
Parameter	Symbol	Min	Typ	Max	Unit	Note-1	Note-2
Input voltage	VAC_range_lo	100	*	250	V _{Ac}		
Input frequency		47	50	63	Hz		
Switching frequency	F_sw	*	65	*	KHz		
Output voltage main	V_main output	+/-40		+/-100	V _{DC}	Unregulated	Selectable
Output current (Continuous)	I_main output	*	4	*	A _{DC}		
Output current (Peak)	IPK_main output	*	*	13	A _{DC}	15A Limit @ 240VAC	10A Limit @ 100V AC
Output power main	Pout	*	350	1500	W		
Over current triggers @	OCP_trigger	*	14	16	A _{DC}		
Thermal trigger	TH_trigger	*	70	75	C		
Output voltage (12V)	VAux1_reg	11.7	11.8	12.3	V _{DC}	Regulated	
In-rush current	5R NTC	15	18	30	A		
Efficiency	Full power	87	90	91	%		
Idle Losses	SMPS not loaded	*	7.5	10	W		SMPS is ON
Stand-by loss		0.09	0.1	0.250	W		SMPS in Stand By

Connection example 1



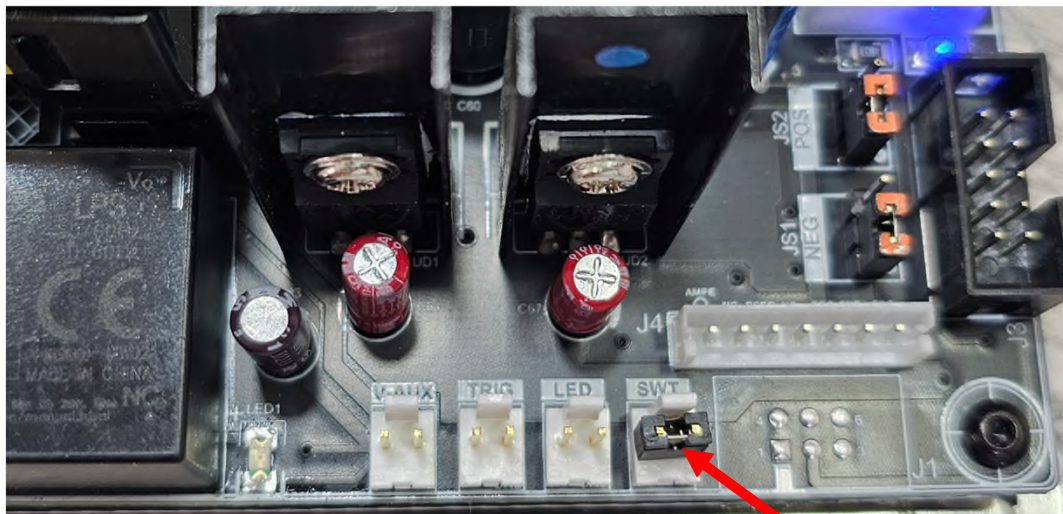
In this example the SMPS control is done via low current control switch with LED inside the switch.

Connection is done via two wires only for the LED & the switch.



The 2.2K resistor can be eliminated for switches with internal resistor.

Connection example 2



Shunt or jumper

In this example the SMPS control is disabled and the SMPS is **ALWAYS ON**.

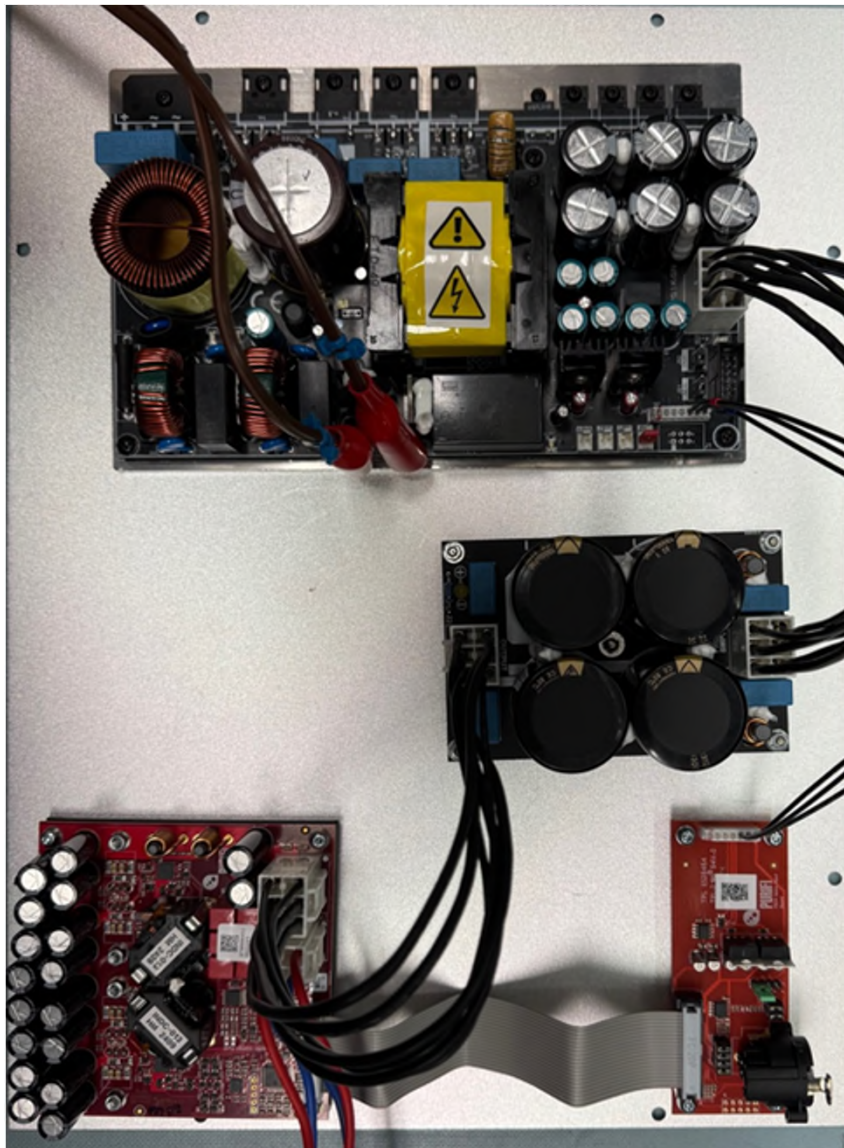
And the SMPS power up is done by applying the AC voltage directly.

Setup example 1



Fully assembled amplifier

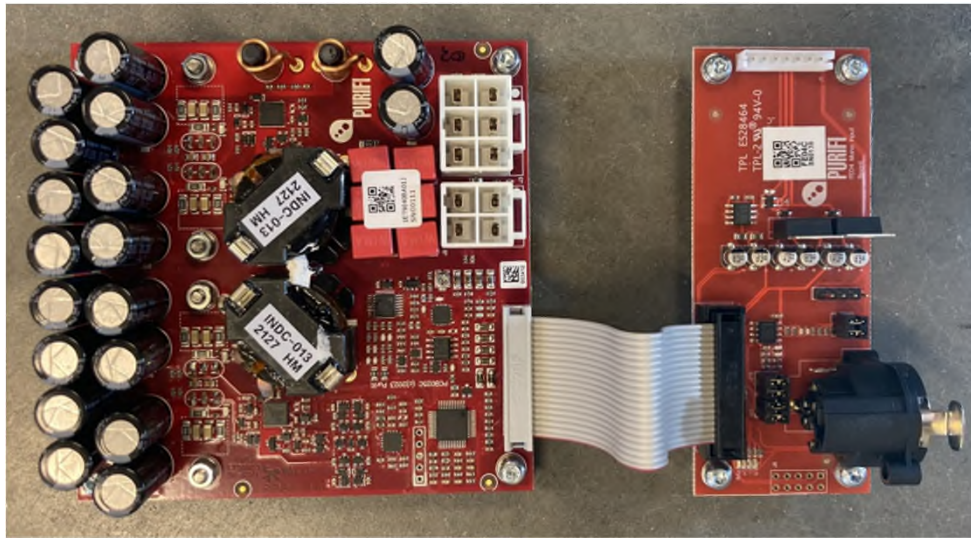
Setup example 2



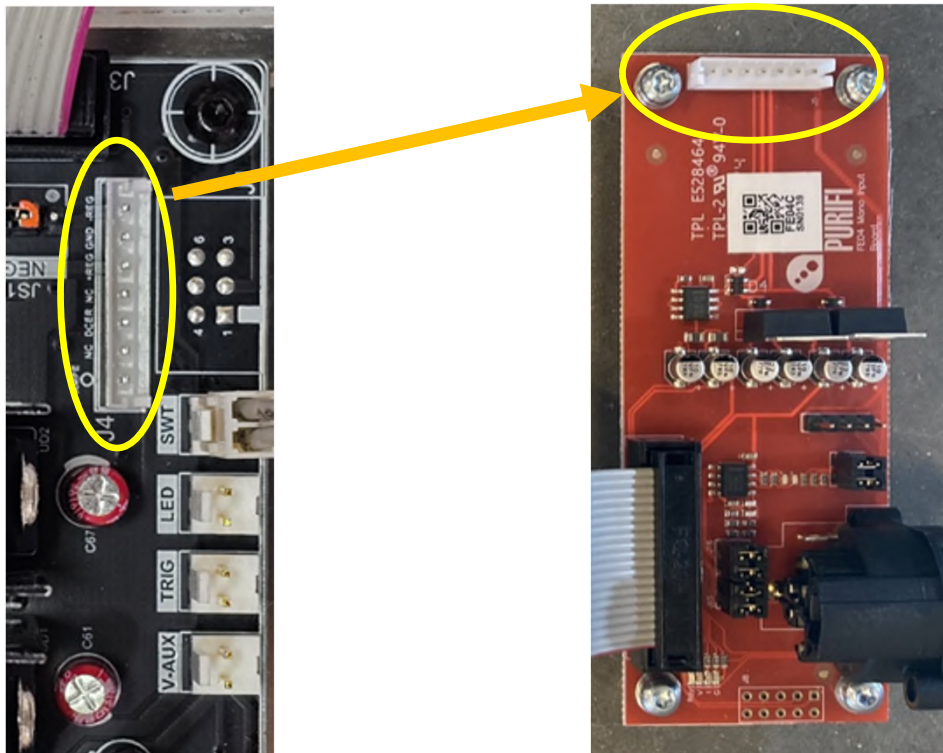
SMPS1K-SN with extra capacitors PCB driving the Purifi EVAL-4

In the above example the DC-ERROR & AMPON is **NOT** connected for testing purposes

General notes



SMPS1K-SN is pin to pin compatible with the Purifi EVAL-4
Plug and play solution



SMPSIK-SN

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