

VR-JSE08xx DC/DC Converter Voltage Regulator module

In many cases where a single, high voltage is available like in medium/high power Class-D designs, there are also low voltages required. Normally, people use a small separate power supply for that.

With this series of Voltage Regulator modules we use a professional DC/DC converter range, capable of transferring relative high voltages into regulated lower voltage(s) for low power electronics like preamplifiers, DAC's and digital circuits. So with these modules you only need a single supply now.

The range of 8W DC/DC converters as we use have a very wide input voltage range and are available as single 3,3V, 5V, 12V, 15V or 24V, and with symmetrical outputs $\pm 12V$ or $\pm 15V$.

The professional converter module is metal encapsulated and very small considering what its capable of. These switch mode modules are, unlike many others, doing all required in one on a high quality scale.

While developing our PS-UNxx Power Supply modules we wanted that these would have an option making it possible to get an extra, low voltage regulated output(s) as well. This can only be done by the use of switching DC/DC converter modules. They are available with one up to three regulated secondary voltages.

About regardless the input voltage and supply type, you now can have high quality symmetrical supply voltages for analogue electronics and/or voltages for digital circuits as well without extra electronics other than this VR-JSE08 module connected to a supply. We made them pin-compatible with our linear regulators. All our NEW switched mode Voltage Regulator modules fit on about all our ELTIM Power Supplies while using the versions with a 2x 26 pole header. While using the screw terminal version you can use them anywhere.

- Highlights of this VR-JSE08 Converter/Voltage Regulator module:
 - Tiny 24x14x8mm [JSE08 DC/DC converter module](#) with 8W capacity in DIP-16 housing.
 - Professional quality with expected MTBF of 1000000 hours.
 - Extremely high efficiency of 85%, switching at 370kHz with very low RF-residue.
 - Very wide input voltage ranges of 9-18Vdc, 18-36Vdc or 36-75Vdc.
 - Supplying input voltage can be single line or symmetrical ($-V + +V = V_{in}$).
 - Input and output circuits galvanic separated, can be overruled by a jumper wire / main PCB track.
 - Output single voltage variants: 3,3V; 5V; 12V; 15V; 24V.
 - Outputs symmetrical output variants: $\pm 12V$; $\pm 15V$.
 - Outputs extra filtered by an LC-circuit resulting in RF-free supply voltages.
 - Secondary overvoltage, over temperature (@105°C) and overload protection @150%.
 - All outputs are regulated independently within 1% accuracy and high dynamics.
 - Versions with a straight or angled header connector (3A pins). Fit on all our [PS-Unxx\(S\) Supplies](#).
 - For every output connection 6 pins are used, so $6 \times 3A = 18A$ (over)rated.
 - Pinning is compatible with our linear regulated VR-modules like [VR-3](#).
 - Versions with a 10A screw terminal and 2x M3 holes for separate module mounting.
 - PCB tracks and header/screw terminal calculated to handle $> 4,5A$ of current.
 - Only 30mm high, same as supply capacitors on our low profiled (LP) versions Power Supplies.
 - Professional FR4 board with dimensions of 75x30x10mm.



Models with 2x 26 pins matching other [ELTIM VR-modules](#)



Models with 11-pole screw terminal and 2x M3 holes

Boards are scaled 1 : 1

Converter / regulator module

We decided to use the professional XP-Power JSExx DC/DC converter/regulator module range in this design. Unlike cheap plastic DC/DC converter modules it has a very long lifespan, high switching frequency of 370kHz, not interfering with audio and digital electronics.

It is not only converting the supply voltage into another voltage(s), but also regulating it in a high quality / high dynamic way.

The life span (MTBF, Mean Time Between Failures) of the types we use is **1000000 hours** (100 years, 24/7). The efficiency is **85%**. So, max. 1,2W lost.

The unregularly very high switching frequency of **370kHz** leaves hardly any residue, but what's left is filtered out by LC-filters on both outputs on our PCB's.

These switching modules are capable of transferring up to 75Vdc (as f.e. used in class-D power amplifiers already) into a range of low voltages (see table below) used in preamplifiers, DAC's, DSP's, etc.



So with these modules, you can combine the instant and solid power from a linear (single or symmetrical) power supply AND have clean voltage(s) for the driving electronics (Preamp, DAC, DSP, etc.) in one supply. Just as we believe is a missing link so far, so we made these compact solutions, filling this gap. With our [PS-UNxx modules](#) you have a rock solid supply where these modules fit on board.

Availability and pinning of output voltages

This 8W module is available in three input voltage ranges: 9-18Vdc / 18-36Vdc / 36-75Vdc.

For all three versions a range of output voltages is available: +3,3V, +5V, +12V, +15V, +24V, ±12V and ±15V.

The input and output circuits are galvanic separated (like a transformer), yet can be connected, see last page.

Header	26	25	24	23	22	21-22	19	18-9			8	7	6	5	4	3	2	1	
	ab	ab	ab	ab	ab	ab	ab	ab			ab	ab	ab	ab	ab	ab	ab	ab	
Screw con.	11	10 (V1)				-	9	8	7	6	5	4	3 (V3, not available)			2 (V2, duals only)			1
Module type	Input voltage range of 9 – 18Vdc, 12Vdc nominal:																		
JSE0812S3V3	+Vin	3,3V (1600mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0812S05	+Vin	5V (1600mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0812S12	+Vin	12V (665mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0812S15	+Vin	15V (535mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0812S24	+Vin	24V (335mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0812D12	+Vin	+12V (335mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			-12V (335mA)			-Vin
JSE0812D15	+Vin	+15V (265mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			-15V (265mA)			-Vin
Module type	Input voltage range of 18 – 36Vdc, 24Vdc nominal:																		
JSE0824S3V3	+Vin	3,3V (1600mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0824S05	+Vin	5V (1600mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0824S12	+Vin	12V (665mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0824S15	+Vin	15V (535mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0824S24	+Vin	24V (335mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0824D12	+Vin	+12V (335mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			-12V (335mA)			-Vin
JSE0824D15	+Vin	+15V (265mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			-15V (265mA)			-Vin
Module type	Input voltage range of 36 – 72Vdc, 48Vdc nominal:																		
JSE0848S3V3	+Vin	3,3V (1600mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0848S05	+Vin	5V (1600mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0848S12	+Vin	12V (665mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0848S15	+Vin	15V (535mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0848S24	+Vin	24V (335mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			n.c.			-Vin
JSE0848D12	+Vin	+12V (335mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			-12V (335mA)			-Vin
JSE0848D15	+Vin	+15V (265mA)				n.c.	n.c	+Vin	COM			-Vin	n.c			-15V (265mA)			-Vin

Galvanic separation

Without further precautions/actions, the input and output(s) are galvanic separated, see fig. 1 at next page and the [switching module's datasheet](#). Galvanic separation means that the input and output circuits are electrically not connected with each other, like f.e. with a transformer. Please note that the difference in voltages between in- and output is not allowed to be over 1500Vdc, which will hardly happen anywhere.

In order to drop the galvanic separation, meaning connecting the grounds of both the “mother” and “child” devices as f.e. required in an amplifier design, a link has to be made between the both grounds.

We made internal connections on our modules for simple linking:

For symmetrical host supplies: Just connect **GND** of the host to **COM** of our module (Fig 2).

For single, positive voltage host supplies: link **-Vin** (=Host GND) with **COM** of our module (fig 3).

For single, negative voltage host supplies: link **+Vin** (=Host GND) with **COM** of our module (fig 4).

While using a header version of our module, link 1ab (for pos. supplies) or 26ab (neg. supplies) to 8-18ab on the mother PCB as we have done on our power supply modules already.

While using a symmetrical host supply, just connect header COM pins 9-18ab to GND of the host PCB.

For rare purposes where “mother” and “child” should be separated don't connect GND and COM with each other. In that case we only use some energy from the “mother” source supply and both units function completely separated from each other.

V1 = Positive output voltage

V2 = Negative output voltage (dual versions only)

V3 = Not used here. Third, digital (3,3/5Vdc) high current supply voltage, JTL030T only.

[Datasheet XP-Power JSE08](#) DC/DC converter/regulator

[Comparison chart](#) for all ELTIM Converter / regulator modules

*These designs are copyrighted by ELTIM audio BV
Louis Timmers 2019 © PE1LTM*

www.eltim.eu

Examples of connecting ELTIM switched mode regulator modules:

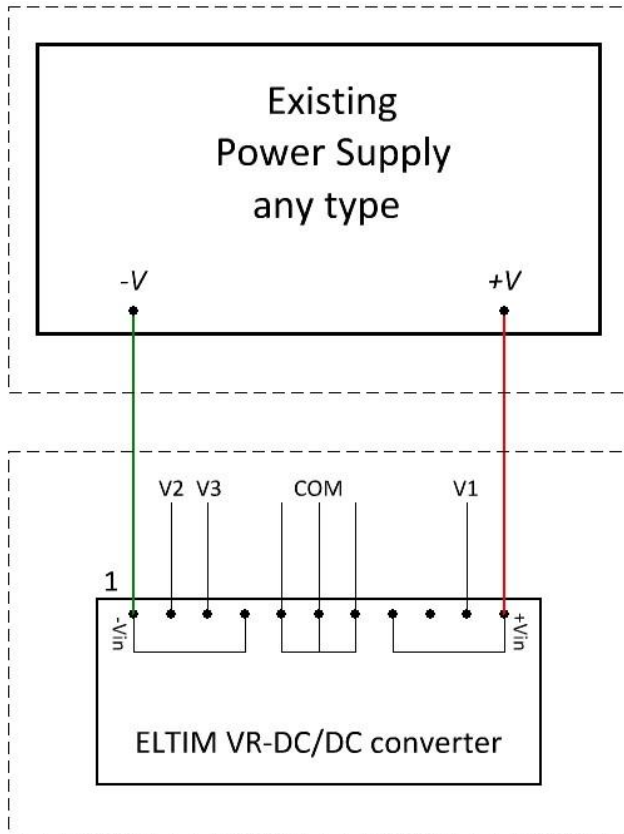


Fig 1: Galvanic separated host / guest supplies

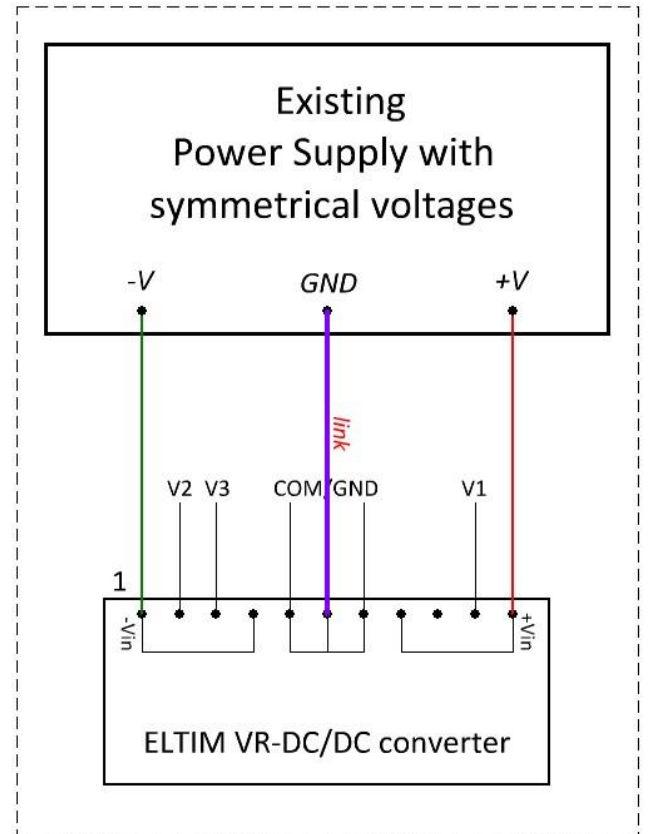


Fig 2: Symmetrical host supply, with common ground

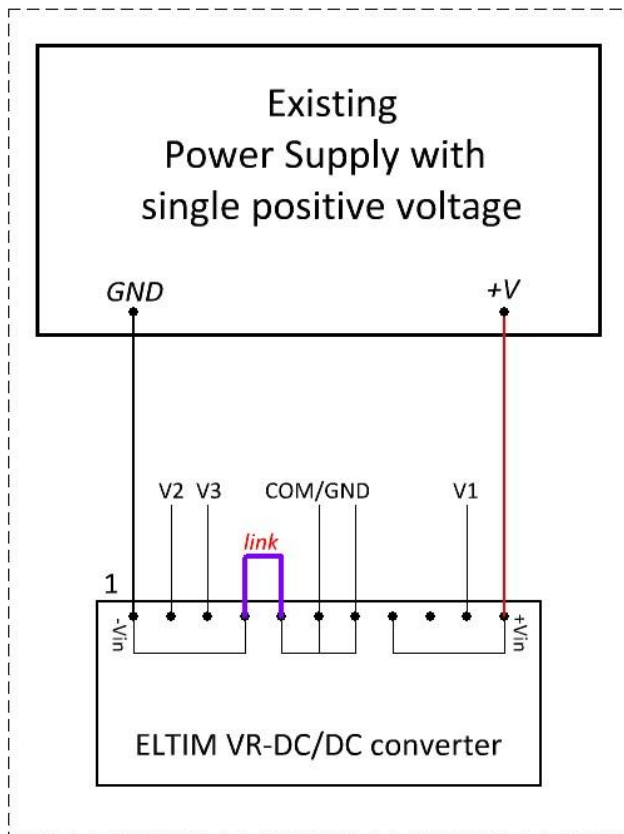


Fig 3: Single positive supply host, with common ground

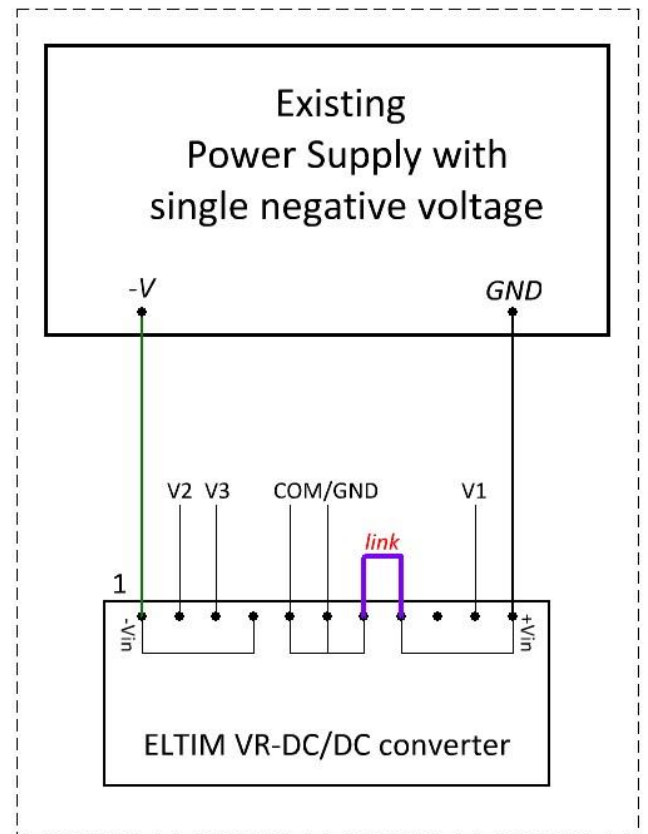


Fig 4: Single negative supply host, with common ground