updated August 31th, 2019

PS-UN80

Universal, single output Power Supply modules

In our universal Power Supply range this one is a high power, single voltage version.
It can develop up to 80V/15A, and so very suitable for single voltage power amplifier like most class-D designs are. Besides all the regular standard components of a linear power supply, we added several parts about nobody else does, but required as well in order to make a difference.

You can add one of our DC/DC converter/regulator modules, providing up to three (single, symmetrical and symmetrical/digital) regulated voltages for extra electronics. 3,3V; 5V; 12V; 15V.

With this Power Supply module we provide the proven design philosophy of a linear Power Supply, which is in dynamics performance way superior to the more and more used Switched Mode power supplies. High frequency (40-100kHz) ripple voltages of over 100mV is common, hardly useful in high quality audio, since this signal interferes with your precious audio gear.
Compared to all the (very) cheap linear supplies you'll find all over the internet, there is hardly any difference noticed indeed, but building it the way as it should be done with quality components and wide copper tracks on a solid FR4 board as we do, its becomes something completely different!
With us no "stressed" components, no RF, etc. Just plain, solid and pure power without fuzz.

PS-UN80xx highlights:

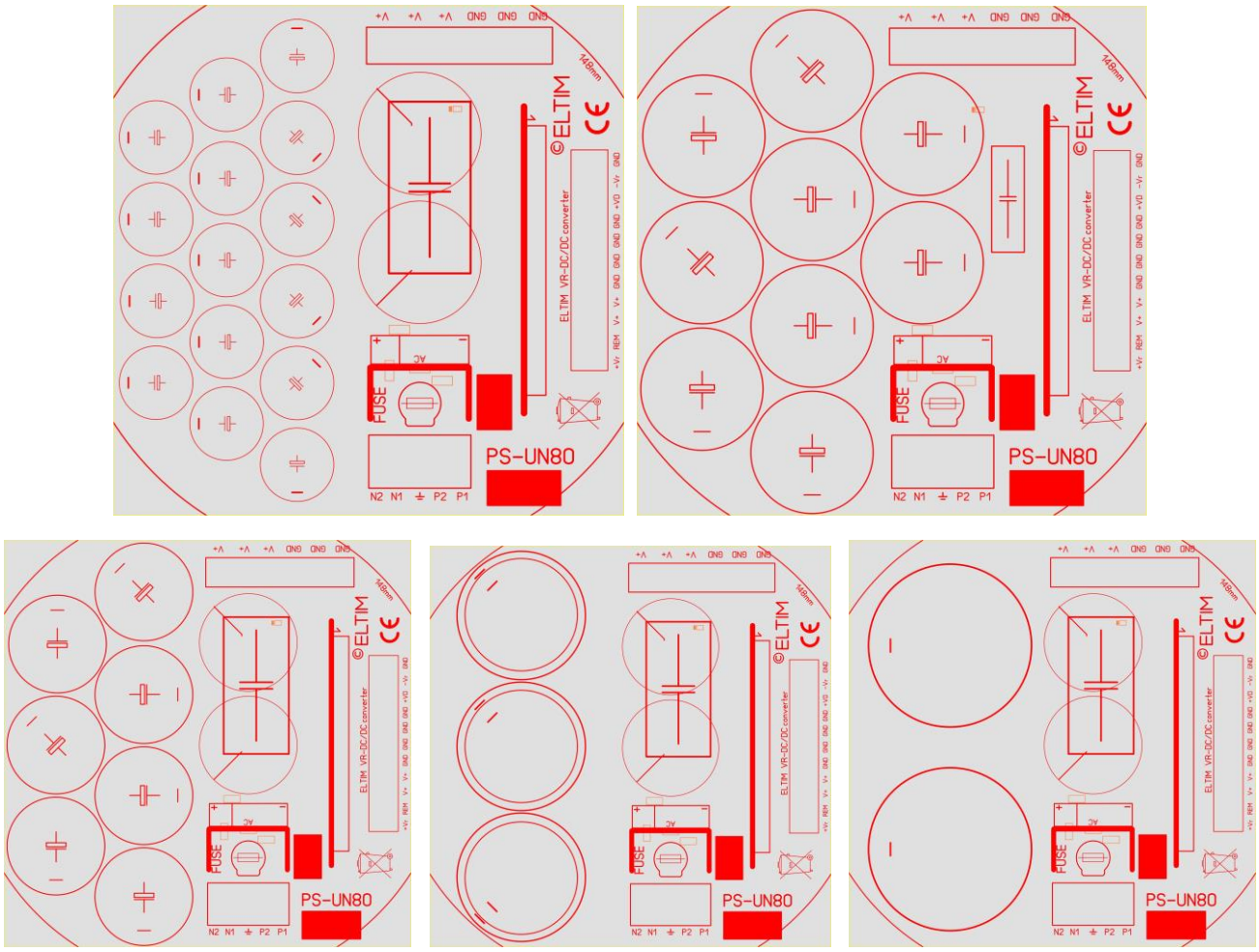
- European manufactured FR4 PCB, 35um copper, solder mask and parts printing
- 15A/600Vac rectifier with cooler
- PCB tracks are over dimensioned (30A)
- Several types of power supply capacitors fit:
  - 15x Ø16/18/20mm, pitch 7,5mm + large MKP or 2x MCAP EVO Ø30mm
  - 9x Ø25/30mm, pitch 10mm + 22,5mm pitch radial MKT/MKP capacitor
  - 7x Ø25/30mm, pitch 10mm + large MKP or 2x MCAP EVO Ø30mm
  - 3x Ø35mm, pitch 10mm + large MKP or 2x MCAP EVO Ø30mm
  - 3x Ø40mm, pitch 22,5mm/120º, 4-pin + large MKP or 2x MCAP EVO Ø30mm
  - 2x Ø50mm, pitch 22,5mm/120º, 4-pin + large MKP or 2x MCAP EVO Ø30mm
- OPTIONAL DC/DC converter/voltage regulator with up to three low voltage supply outputs.

Picture soon

Introduction
With this PS-UN80xx range we provide linear power supply modules with all the parts these kind of supplies should have and all have a function. Leaving some out, as many do, would degrade its quality level.
Our module is instant powerful with a high/wide dynamic range, low ESR and free of noise and RF signals.

As an ELTIM built module, this PS-UN80 module can handle up to **80 Volts** at a current of 1**0-15A max**.
This voltage/current limit is based on the rated voltage of the supply capacitors we use.
Use a quality transformer of 55V / 625VA or less. Our PS-UN80 could fit on top of it.
The max. current varies with the available storage capacity on board, depending on the model.

Kit builders can use other voltages/values as well, since with our kits the supply capacitors have to be bought separately in order to give you maximum freedom of choice. We have a lot to choose from.
The V+ and GND screw terminals can handle 3,3mm² wires for extraction of this significant current.

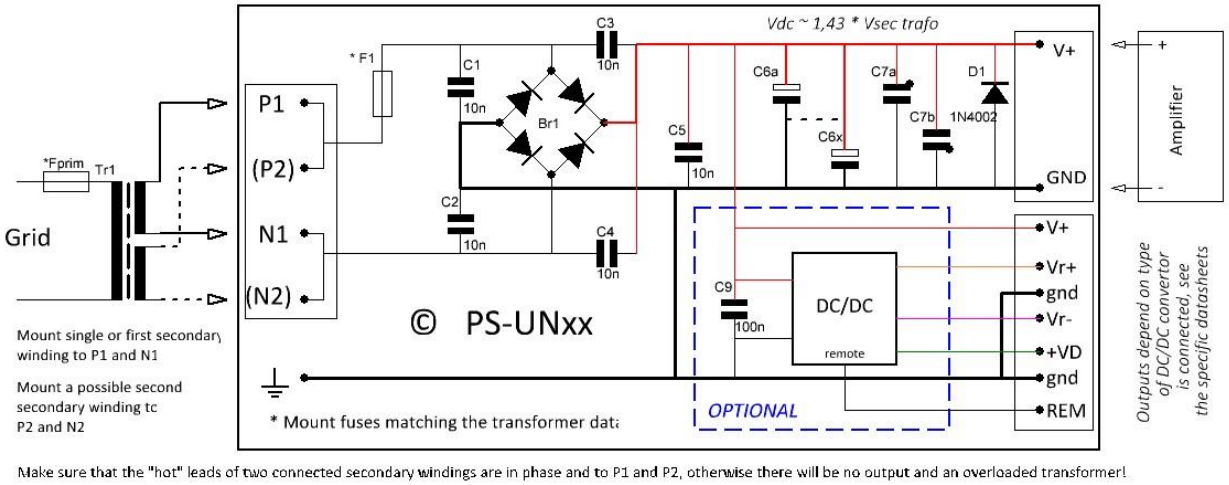


PS-UN80 layout, with multiple capacitor types fitting, 125x125mm

Schematics explanation
The secondary windings of a suitable transformer (not included) are connected to P1 – N1 and P2 – N2.
As recommended by most transformer manufacturers, the paralleled windings are fused.
The 50/60Hz AC power is rectified by an 15A/600Vac bridge rectifier. It has a cooler, so it can handle 15A.
As it always should be, every diode of this bridge is decoupled with a small capacitor (C1-4) in order to avoid noise and sparks. The rectifier will charge the capacitors to the Vac peak level, being **√2 (1,414) higher** as listed (=Veff) in the transformer specifications! For beginners: The required transformer can be calculated as **Uac = Udc/√2+1**. So, f.e. for 80Vdc you need 80/1,42 +1 = 55Vac. The Vac of the trafo is given as an effective voltage (giving the same power as a dc voltage of this value would give). Calculate with “free running” values!
While using f.e. a TALEMA 625VA/55V transformer, it’s free running voltage is 55Veff. After rectifying there will be around 78V over the 80V storage capacitors. We prefer to do some less actually.

Normally transformers with two secondary windings are used. With a single supply voltage as we use here they are mostly paralleled. Wiring of those as in the schematics below. However, for relatively high voltages we use here, there could be no suitable transformer available. In that case you could connect the two windings in series instead. Note that with 2x 25Vac in series there will be 80Vdc output, being max. allowed.
At the last page we give a wiring diagram where serial as well as parallel trafo connections are shown.

This PS-UN80 module fits over a Ø150mm (625VA) toroidal transformer.



Make sure that the "hot" leads of two connected secondary windings are in phase and to P1 and P2, otherwise there will be no output and an overloaded transformer!

The power reserve comes from C6a/C6x, with different number, values and qualities depending the model. Here we have a huge difference compared to SM supplies: we already have the power reserve available in the capacitors. Also the ESR value ("internal resistance") is way lower, noticed by f.e. more solid bass response. We also added a small and a (or two) large MKP capacitor over these caps. You can use several High-End types. Adding a MKP capacitor over the voltage rails significantly improves high frequency resolution and definition, So if you decide to add one (or two MCAP EVO, antiparallel connected), mount the best ones you can afford.

Models/specifications

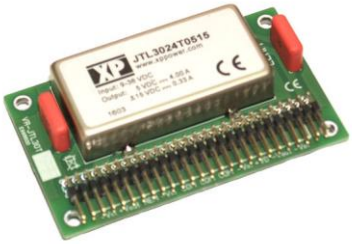
Max. output voltage of +100V, 25 amps max. (transformer max. 65V). Board size: 150x150mm.

MODEL	C6 capacitors mounted	C6 size
PS-UN80 ELP	9x RND ELP 6800uF/80V, 85ºC, ??? hours	Ø30x50
PS-UN80 UFG	15x NICHICON UFG "Fine Gold", 105ºC, 470uF/80V, 1000 hours	Ø16x36
PS-UN80 UHW	15x NICHICON UHW , 85ºC, 1800uF/80V, 10000 hours	Ø18x40
PS-UN80 LKG1	9x NICHICON LKG 1500uF/80V 85ºC, 1000 hours	Ø30x30
PS-UN80 LKS	7x NICHICON LKS, 5600uF/80V, 85ºC, 1000 hours	Ø35x50
PS-UN80 LKG2	2x NICHICON LKG 15000uF/80V, 85ºC, 1000 hours	Ø50x100
PS-UN80 KMH	3x United ChemiCon 10000uF/80V, 105ºC, 2000 hours	Ø40x63
PS-UN80 MLGO	3x MUNDORF MLGO, 10000uF/80V, 125ºC, 8000 hours	Ø35x50
PS-UN80 KIT	PCB and all parts, except C6 and C7 capacitors. Use the ones you want.	

MLGO capacitors are glued to the PCB, have extreme low ESR values and a very long lifespan.
With none of the models listed there are C7 MKP capacitors mounted. Add these optional, there are many options!

Regulated, single and/or symmetrical output voltage(s)
In February 2018 we developed a wide range of switching DC/DC converter/regulator modules. With these, one can extract up to three independent voltages from about any available voltage.

We modified our PS-UNxx modules in a way that these switching modules can be mounted on these Power Supply boards. There are ranges in 8, 10, 12, 15, 20, 30 and 40W. Input voltage ranges from 9Vdc to 256Vdc. Available voltages are 3,3V; 5V; 12V and 15V as single, symmetrical and symmetrical + digital supply voltage. While using a version with a header connector you can mount them on about any of our Power Supplies. So, while having one of our PS-UNxx modules, you also can have supply voltages for preamplifier, DSP, etc.



Single/dual version with header

Triple version with screw connector

This sounds interesting to you, but you already have a power supply? Then select the screw terminal option and receive a separate module which can be mounted with 4x M3 bolts and connected with the other electronics by a screw terminal instead of a header.
Just connect it to about any power supply and have the low voltage supply voltage(s) you require as well. Actually, you could even use a 12/24V battery from, f.e. a car or boat and make f.e. ±15V and +5V with it.

As by now people expect from us, we use the best DC/DC converters we could find, not the cheapest ones. These last a lifetime, have an efficiency of around 90% and use a harmless high (>300kHz) switching frequency.

Of course, as it always should be while using high frequency devices, it is metal shielded/grounded, so ours don't spread around magnetic fields at the switching frequency all around, causing oscillations, etc.

Extra DIY info
An 15A/600Vac block rectifier is mounted, meaning that a kit builder could mount 80V or even higher capacitors as well. With higher voltage, also the current increases, so make sure that this will not exceed the 15A. The cooler is also used as a ground bridge by soldering it to the PCB. While doing so, even the PCB itself acts as a cooling surface. There are holes beneath the cooler. Due to these holes in the PCB, there is a natural air flow over the full board from under to PCB.

The secondary fuse is in a covered, dust protecting holder. Use the value given in the transformer datasheet. Sometimes the value is written on the transformer itself. Ø5mm types fit.
We didn't believe it (as well) first, but using AHP fuses makes a difference indeed.
Don't forget to fuse the primary side of the transformer as well with a correct value fuse and apply all the safety and legal rules for connecting electronics to the power grid! They differ from country to country.

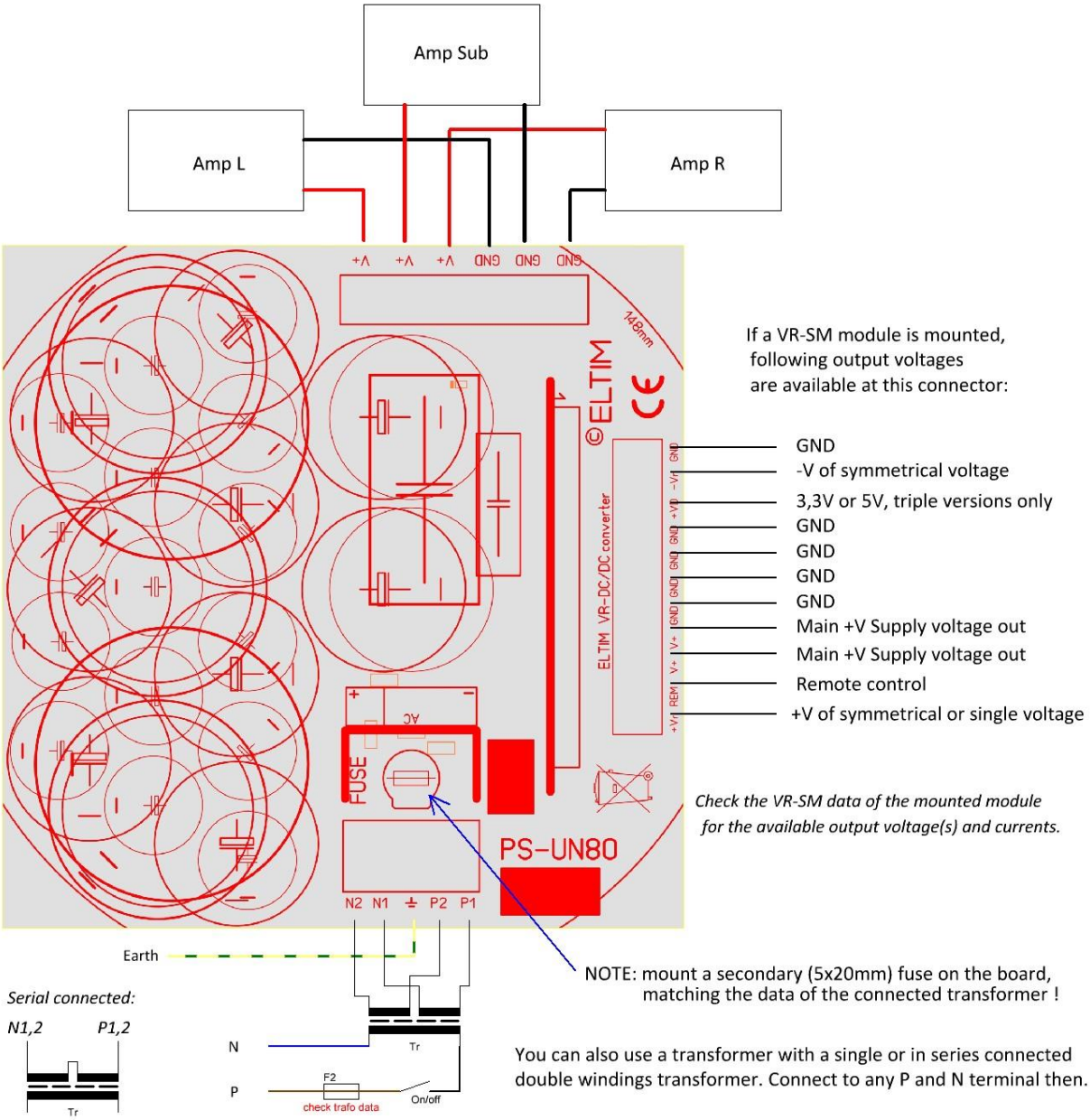
Together with a suitable transformer it will fit in most MODU cabinets.

Some thoughts about SMPS
Please note that a power supply is part of the AC-chain, just like your cables, connectors, etc.
SO: why use cheap SM-supplies and be sure that this is the weakest chain???!!!
Poor bass? Chill mids? Irritating, "hishing" highs? "Spontaneous" oscillations?
Kick out your SM supply, use one of ours instead, and enjoy your music.
If you use it for energy saving reasons we have a surprise: SMPS aprox. 70%, lineair is around 95% efficient.

Check our website for ordering. Dealers and OEM are welcome.

www.eltim.eu

PS-UN80 wiring diagram:



ELTIM audio BV is using parts, matching common rules of VDE, UL, CE, RoHs, etc.
The transformer and the primary side wiring of it needs to comply local rules, laws, etc.

ELTIM audio BV cannot be held accountable for inappropriate wiring, nor any physical, mechanical, financial, etc. damage whatsoever. Be aware of shock and fire hazard !

The person and/or company mounting this device is single responsible !