updated August 31th, 2019

PS-UN50

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 50V/6A, 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 different cake!
With us no "stressed" components, no RF, etc. Just plain, solid and pure power without fuzz.

PS-UN-50xx highlights:

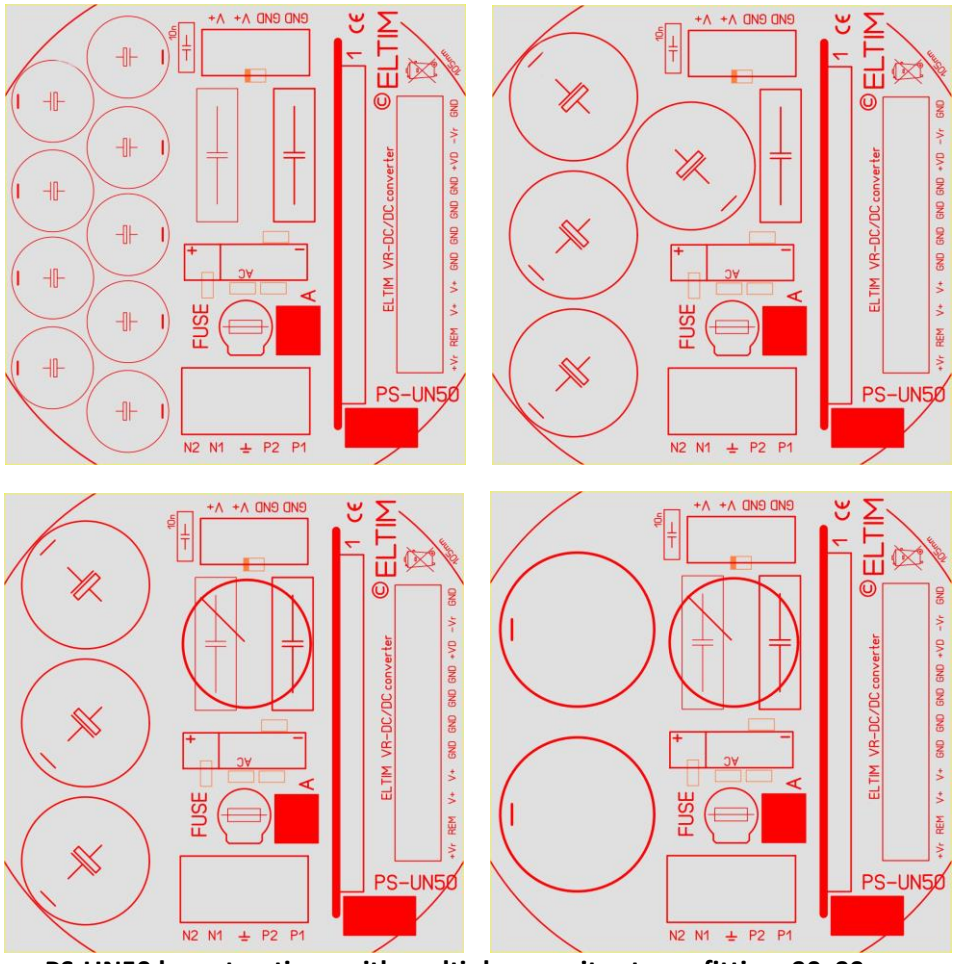
- European manufactured FR4 PCB, 35um copper, solder mask and parts printing
- 6A/140Vac rectifier with cooler
- PCB tracks are over dimensioned (10A)
- Several types of power supply capacitors fit:
  - 9x Ø16mm, pitch 7,5mm + one (EVO) or two MKT/MKP capacitors
  - 4x Ø25mm, pitch 10mm + one MKT/MKP capacitor
  - 3x Ø25mm, pitch 10mm + one (EVO) or two MKT/MKP capacitors
  - 2x Ø30mm, pitch 10mm + one (EVO) or two MKT/MKP capacitors
- OPTIONAL DC/DC converter/Voltage regulator with up to three low voltage supply outputs.

Picture soon

Introduction
With this PS-UN-50xx 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-UN50 module can handle up to **50 Volts** at a current of **4-6A max**.
This voltage limit is based on the rated voltage of the supply capacitors we use. Several types and numbers fit.
Note that in some models we needed to use 40V (Mundorf MLGO) since there are no 50V types available.
Use a quality transformer of 30V / 160VA or less (25Vac where MLGO 40V is mounted).
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 terminal can handle 3,3mm² wires for extraction of this significant current.



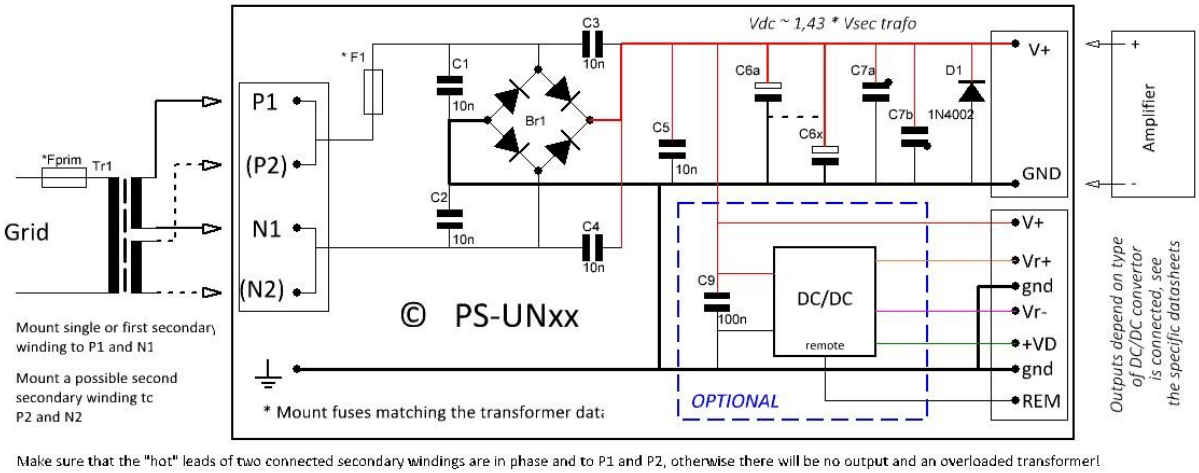
PS-UN50 layout options with multiple capacitor types fitting, 90x90mm

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 on board.
Due to different possibilities we do not install a fuse, buy the the matching value/quality separately.
The 50/60Hz AC power is rectified by an 8A/70Vac bridge rectifier. It has a cooler, so it can handle 8A.
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 60Vdc you need 60/1,42 +1 = 43Vac. 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 160VA/30V transformer, it's free running voltage is 32,8Veff. After rectifying there will be around 46,6V over the 50V storage capacitors. We ourselves would use a 25V trafo to play safe, especially if you use transformers with a lower power rate. Due to their higher internal resistance, their free running voltages are higher and after rectifying most probably will exceed the 50V the capacitors can handle. 25V versions are always at the safe side! While loaded there will be around 37V available.
This PS-UN50 module fits over a Ø105mm (160VA) toroidal 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.



Models/specifications

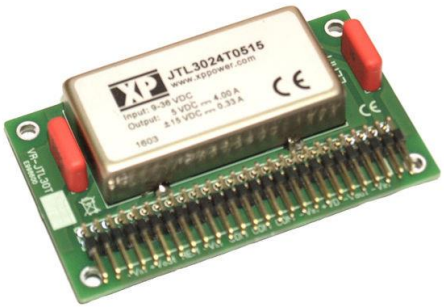
Max. output voltage of +50V, 6 amps max. (transformer max. 30V). Board size: 90x90mm.

MODEL	C6 capacitors mounted	C6 size
PS-UN50 ELP	2x RND ELP, 15000F/50V, 85ºC, 1000 hours	Ø30x50
PS-UN50 UFG	9x NICHICON UFG "fine gold", 1000uF/50V, 85ºC, 1000 hours	Ø16x32
PS-UN50 UKW	9x NICHICON UKW, 2200uF/50V, 85ºC, 2000 hours	Ø16x36
PS-UN50 LKG1	4x NICHICON LKG, 2200uF/50V, 85ºC, 1000 hours	Ø25x30
PS-UN50 LKG2	2x NICHICON LKG, 10000uF/50V, 85ºC, 1000 hours	Ø30x45
PS-UN50 MLGO1	3x MUNDORF MLGO, 4700uF/**40V**, 125ºC, 8000 hours	Ø25x30
PS-UN50 MLGO2	2x MUNDORF MLGO, 10000uF/**40V**, 125ºC, 8000 hours	Ø30x40
PS-UN50 MLGO3	2x MUNDORF MLGO, 10000uF/**63V**, 125ºC, 8000 hours	Ø30x50
PS-UN50 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.
Note that there is also space to mount one or even two quality MKP capacitors for C7. This improves sound quality.
These C7 capacitor(s) are not supplied/mounted unless you ask us to in the order form comment line.

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.

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 6A/140Vac block rectifier is mounted, meaning that a DIY kit builder could mount 63/80V capacitors as well. With higher voltage, also the current increases, so make sure that this will not exceed the 6A. This means that you can use it in 8 ohms systems @ 63V only. We have the PS-UN63xx for 4 ohms purposes.
There are holes under the rectifier. 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.

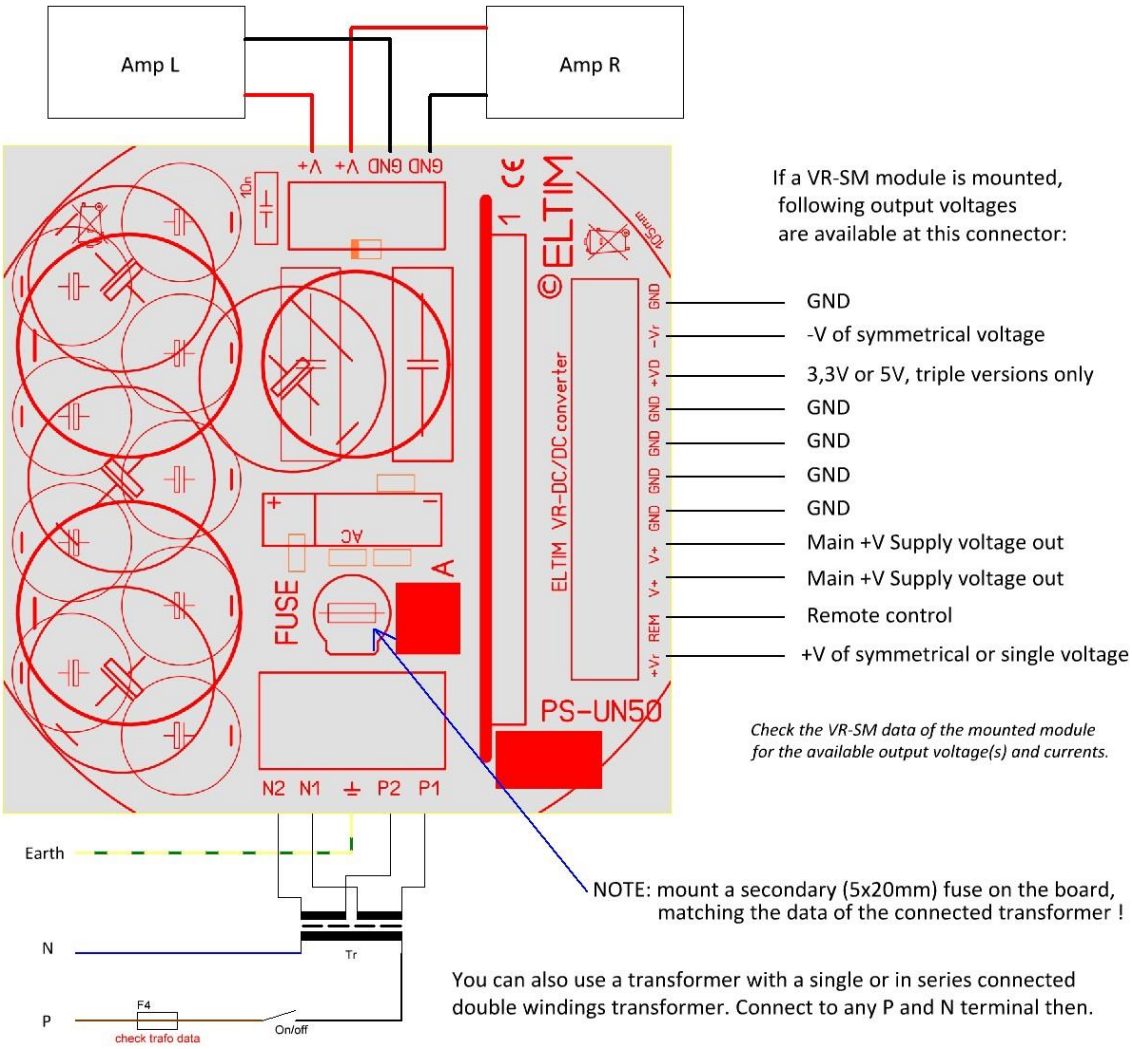
Together with a suitable transformer it will fit in all MODU Galaxy cabinets, even the 124mm wide ones.

A thought
Why use cheap SMPS-supplies and be sure that this is the weakest chain???!!!
Poor bass? Chill mids? Irritating, "hishing" (tsjjj, tsjjjj, not tinnnnng) cymbals as we hear about everywhere? "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% eff.

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

www.eltim.eu

PS-UN50 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 !