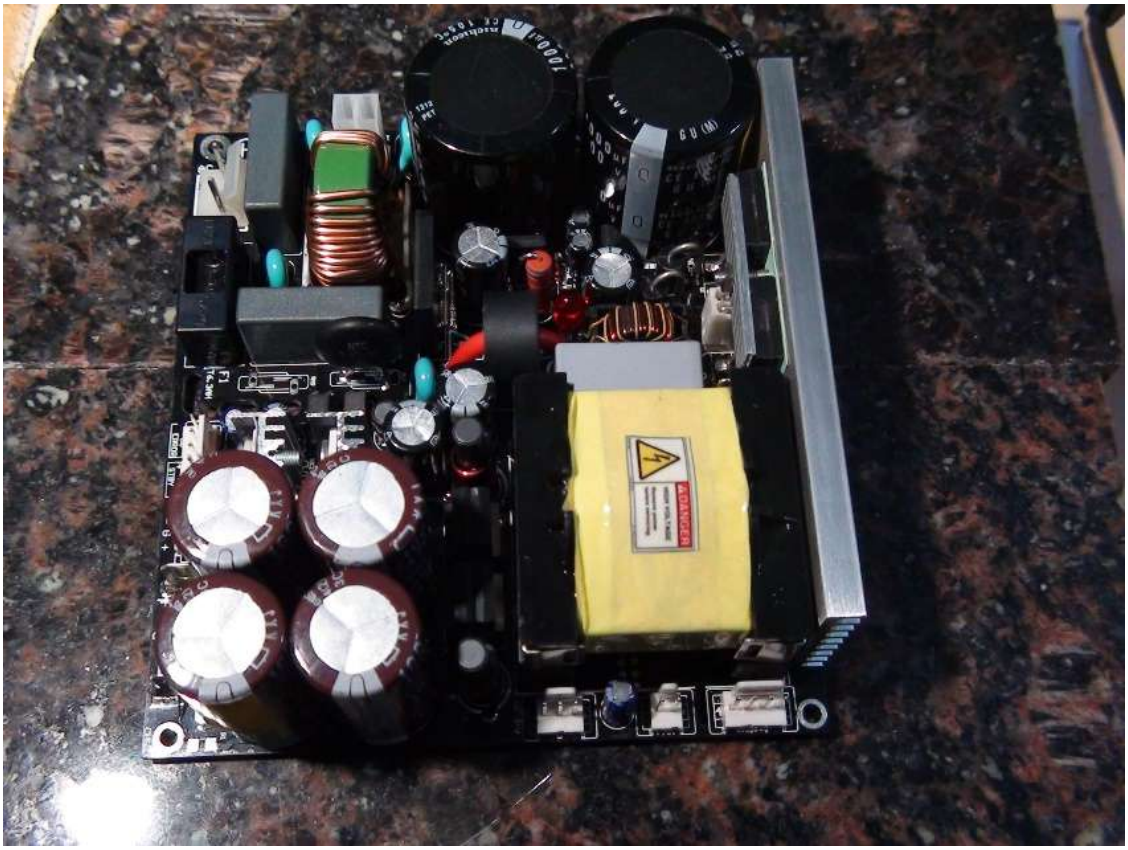
MICRO AUDIO

QUALITY, SERVICE, RELIABILITY



The SMPS-600W Specs

Input voltage 110 or 240 / selectable

Possible Output voltages: -

+-42, +- 55, +-65, +-78, +-85 (**Unregulated**) selectable upon ordering.

More output voltages will be available soon, +-61, +-25, +-35, +-30

AUX1: +-15VDC (Regulated) GND isolated from +- 55VDC

AUX2: +-24VDC (Unregulated) GND isolated from +- 55VDC

ALL AUX voltages can be changed the +- 15VDC output.

FAN output +12VDC

Power: 600W continuous (with cooling), 900W PEAK (see below graph for more details)

Size 12.4CM x 11.4CM

CRITICAL: -→ Attaching extra heatsink to the output diodes is REQUIRED in case of heavy loads

Protection (**Not auto recovery Except thermal**): Thermal, Over Current, Short Circuit.

DC-Error input, this input will put the SMPS into shutdown mode, and the SMPS will not auto recover once it has been triggered (shorted).

Stand by input, applying a maximum of 5VDC from **external power source**, will put the SMPS into standby mode. Removing the 5V supply will put the SMPS into **RUN** mode.

Display output: This output can be connected to an external LEDs, one for power OK, and one for SMPS protect, and can be attached to the front panel of your amplifier, therefore you can view the status of your SMPS without opening the amplifier!

CRITICAL: -→ these outputs (DISPLAY OUTPUT) are coming from a none isolated area of the SMPS, and they are just safe to be attached to your amplifier front panel. Proper Isolation is NEEDED to attach them to the front panel of your amplifier. Heat shrink covering the WHOLE wires is a must, checking with Digital Multi meter for contact with your chassis WONT HURT!

More details

1- SMPS faces 6800uf per rail without entering the protection mode (AT POWER UP).

2-All AUX outputs are protected +-15VDC.

3- ZCS resonant SMPS in compact size.

4- Facing Full Load at start-up without entering protection mode.

5- 900W Peak power for 3 Seconds.

6- SMPS will not suffer from class AB amplifiers or class A amplifiers due biasing.

7- Very low noise at output in idle

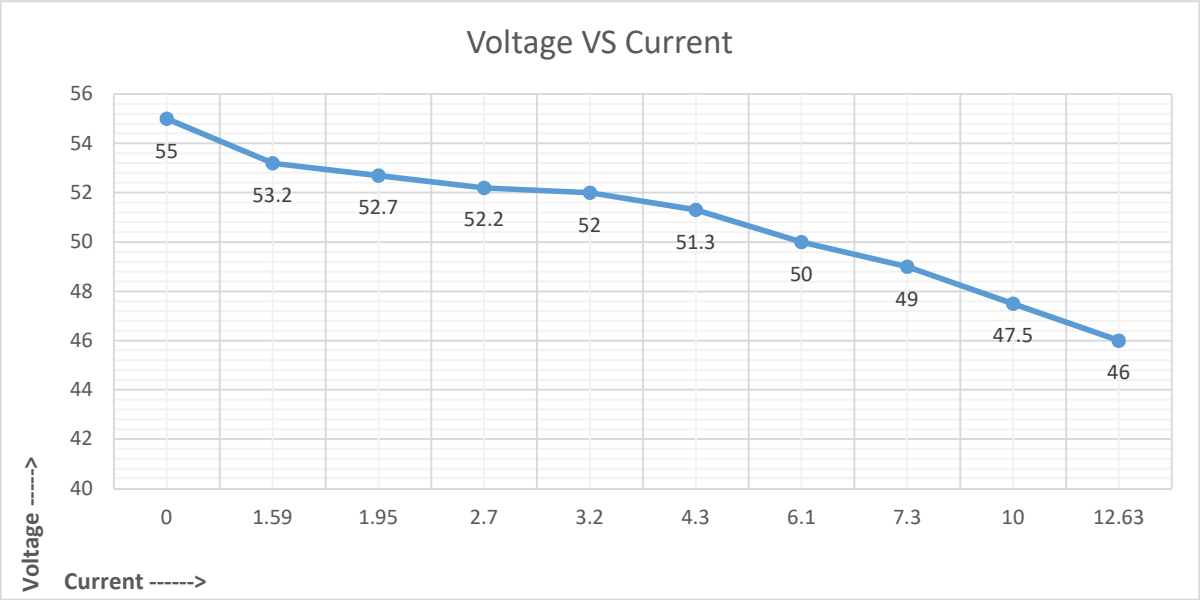
8- Low EMI Signature

9- Easy to repair in case of almost any fail, no need to send the SMPS back for service, or wait for long time, maximum cost is 20US$

Output voltage VS Current

SMPS output voltage and current draw, this graph tells many facts about the SMPS, for those who need it, it's very helpful for them.

As we can see that the voltage drop is around 5 VDC at 375W load, which is very good, and the voltage drop is almost linear.



Facts about the noise, ripple and buzz

All SMPS units will generate decent amount of noise (Spikes) at the output, in addition to the injected EMI.

The SMPS-600 has a very low EMI signature even under load.

The output of the SMPS is very clean in idle, almost no spikes.

Some images: -

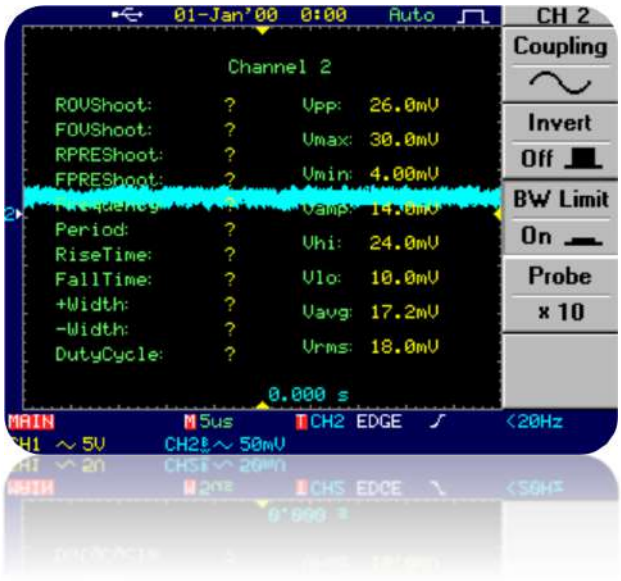
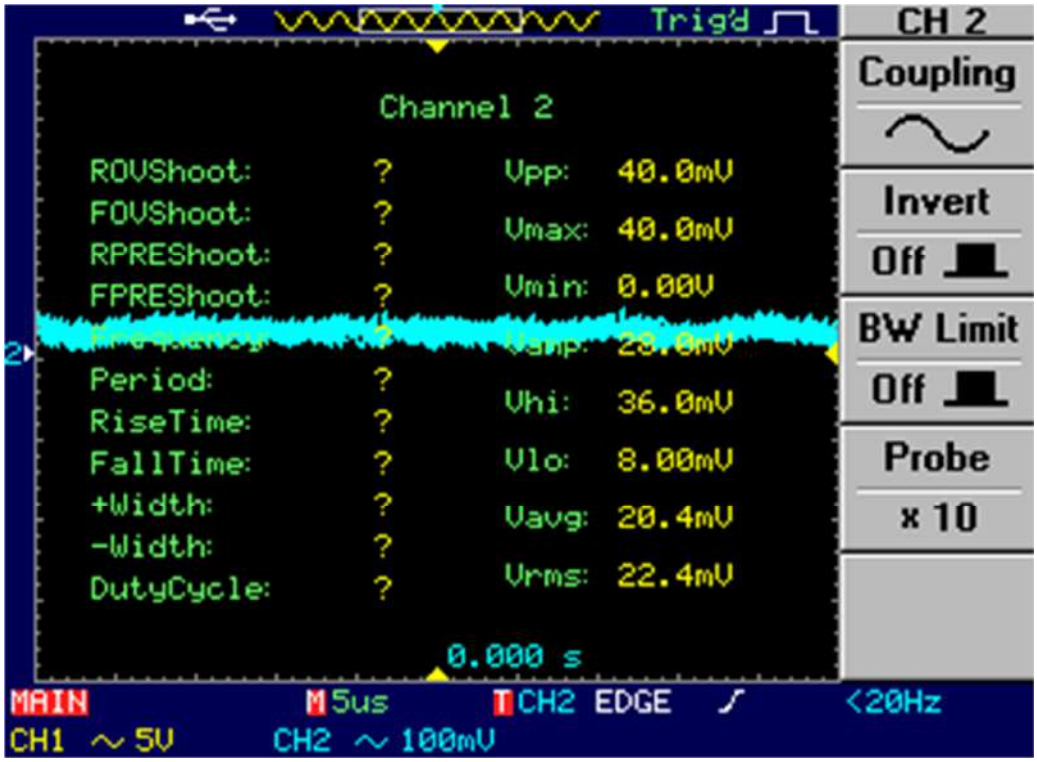
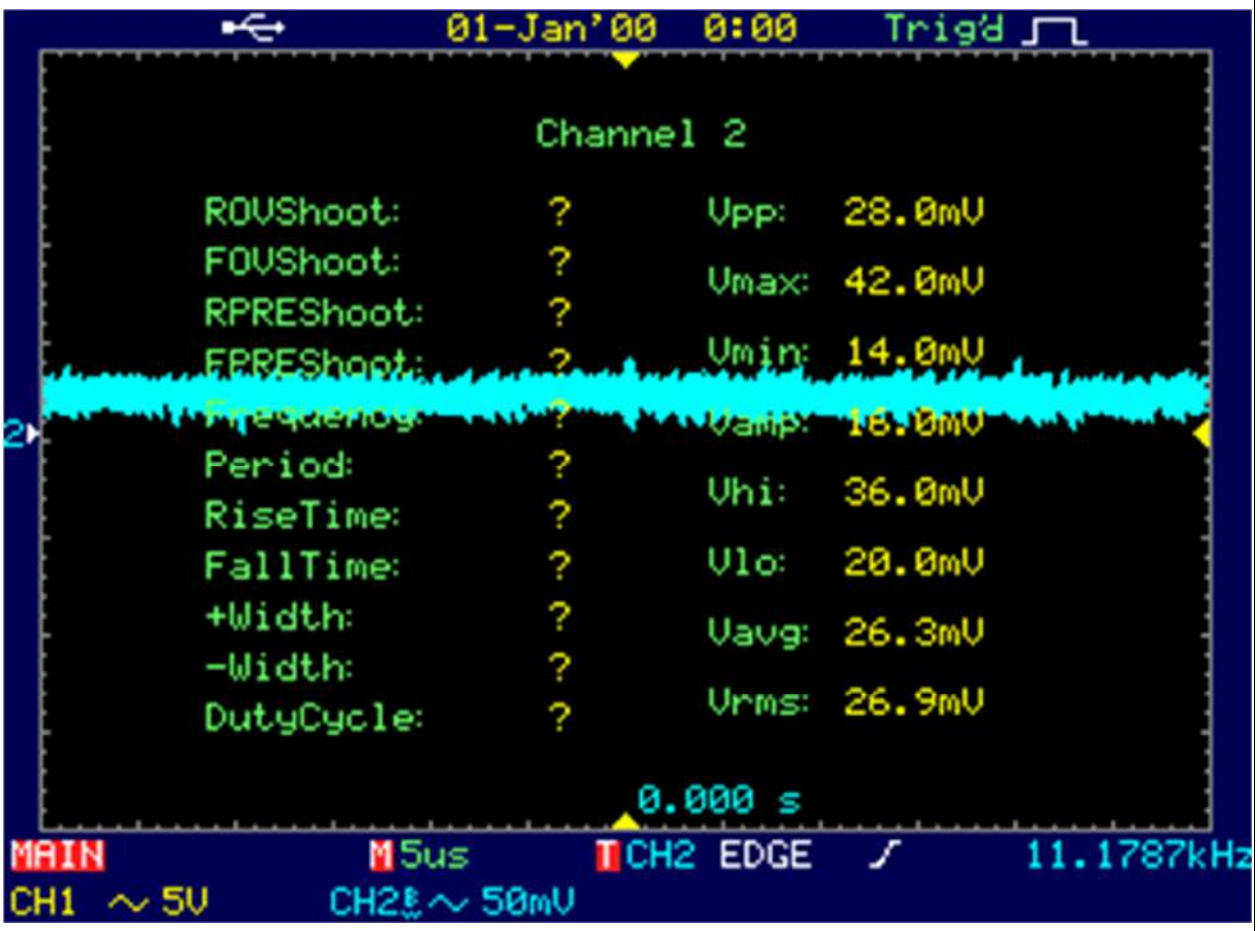


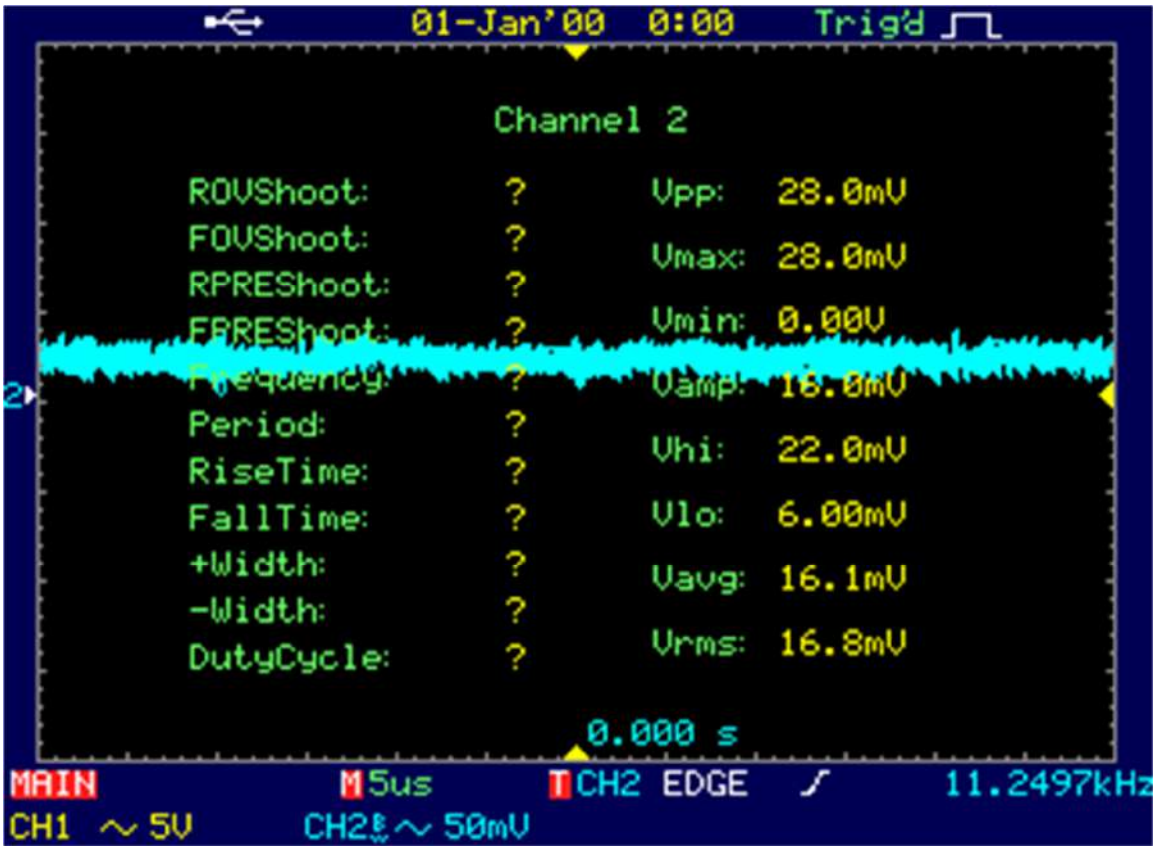
Image above is for oscilloscope noise floor, while the SMPS is completely OFF-LINE, and its capacitors are fully discharged.

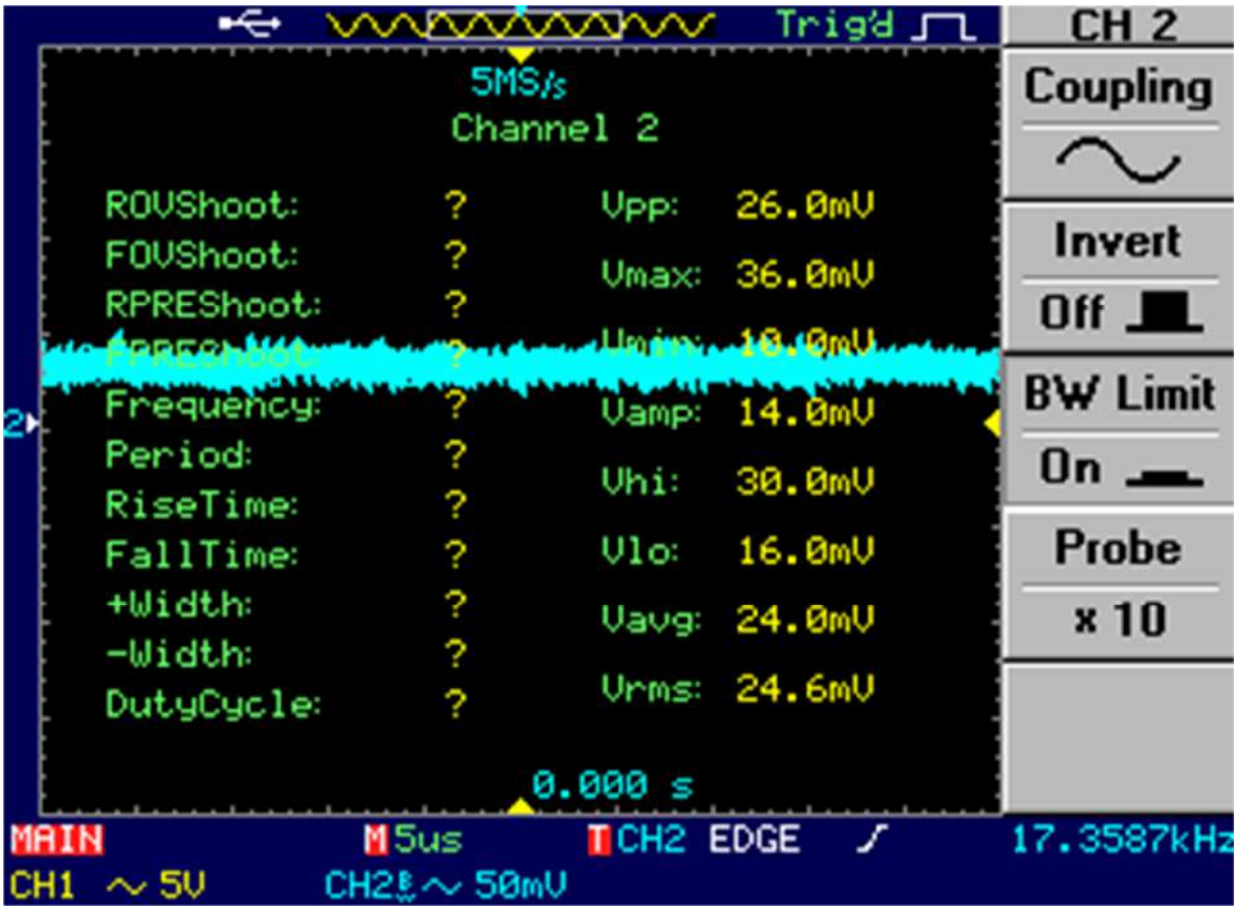
Image above is taken from another SMPS unit, while it's in Idle, no load at the output, spikes are clear for your reference.

Images below, showing many shots taken while the SMPS is ON-LINE, and no load is connected. Starting from Page 8 to page 13.

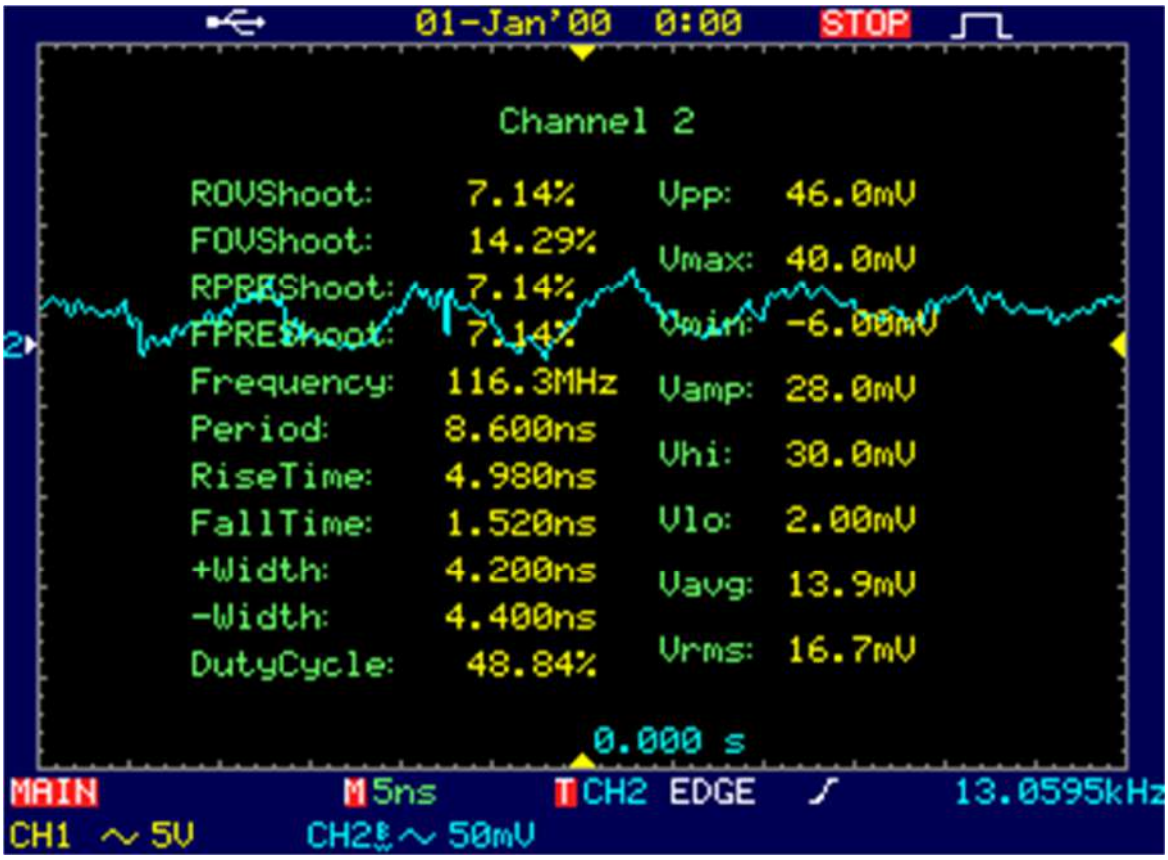

Trig'd
CH 2
Coupling
Channel 2
ROVShoot: ?
FOVShoot: ?
RPREShoot: ?
FPREShoot: ?
Vpp: 40.0mV
Vmax: 40.0mV
Vmin: 0.00V
Invert
Off
BW Limit
Off
Period: ?
RiseTime: ?
FallTime: ?
+Width: ?
-Width: ?
DutyCycle: ?
Vhi: 36.0mV
Vlo: 8.00mV
Vavg: 20.4mV
Vrms: 22.4mV
Probe
x 10
0.000 s
MAIN
M 5us
T CH2 EDGE
<20Hz
CH1 5V
CH2 100mV


01-Jan'00 0:00 Trig'd
Channel 2
ROVShoot: ?
FOVShoot: ?
RPREShoot: ?
FPREShoot: ?
Frequency: ?
Period: ?
RiseTime: ?
FallTime: ?
+Width: ?
-Width: ?
DutyCycle: ?
Vpp: 28.0mV
Vmax: 42.0mV
Vmin: 14.0mV
Vamp: 18.0mV
Vhi: 36.0mV
Vlo: 20.0mV
Vavg: 26.3mV
Vrms: 26.9mV
0.000 s
MAIN
M5us
TCH2 EDGE
11.1787kHz
CH1 ~ 5V
CH2 ~ 50mV


01-Jan'00 0:00
Trig'd
Channel 2
ROVShoot: ?
FOVShoot: ?
RPREShoot: ?
FPREShoot: ?
Frequency: ?
Period: ?
RiseTime: ?
FallTime: ?
+Width: ?
-Width: ?
DutyCycle: ?
Vpp: 28.0mV
Vmax: 28.0mV
Vmin: 0.00V
Vamp: 16.0mV
Vhi: 22.0mV
Vlo: 6.00mV
Vavg: 16.1mV
Vrms: 16.8mV
0.000 s
MAIN
M 5us
T CH2 EDGE
11.2497kHz
CH1 5V
CH2 50mV


Trig'd
CH 2
Coupling
Invert
Off
BW Limit
On
Probe
x 10
5MS/s
Channel 2
ROVShoot: ?
FOVShoot: ?
RPREShoot: ?
FPREShoot: ?
Frequency: ?
Period: ?
RiseTime: ?
FallTime: ?
+Width: ?
-Width: ?
DutyCycle: ?
Vpp: 26.0mV
Vmax: 36.0mV
Vmin: 10.0mV
Vamp: 14.0mV
Vhi: 30.0mV
Vlo: 16.0mV
Vavg: 24.0mV
Vrms: 24.6mV
0.000 s
MAIN
M 5us
T CH2 EDGE
17.3587kHz
CH1 ~ 5V
CH2 ~ 50mV


01-Jan'00 0:00
STOP
Channel 2
ROVShoot: ?
FOVShoot: 0.00%
RPREShoot: 0.00%
FPREShoot: ?
Frequency: 24.95MHz
Period: 40.08ns
RiseTime: 4.640ns
FallTime: 32.76ns
+Width: 4.578ns
-Width: 32.40ns
DutyCycle: 11.42%
Vpp: 44.0mV
Vmax: 30.0mV
Vmin: -14.0mV
Vamp: 28.0mV
Vhi: 20.0mV
Vlo: -8.00mV
Vavg: 8.72mV
Vrms: 10.9mV
0.000 s
MAIN
M 10ns
T CH2 EDGE
20.0939kHz
CH1 ~ 5V
CH2 ~ 50mV


01-Jan'00 0:00
STOP
Channel 2
ROVShoot: 7.14%
FOVShoot: 14.29%
RPREShoot: 7.14%
FPREShoot: 7.14%
Frequency: 116.3MHz
Period: 8.600ns
RiseTime: 4.980ns
FallTime: 1.520ns
+Width: 4.200ns
-Width: 4.400ns
DutyCycle: 48.84%
Vpp: 46.0mV
Vmax: 40.0mV
Vmin: -6.00mV
Vamp: 28.0mV
Vhi: 30.0mV
Vlo: 2.00mV
Vavg: 13.9mV
Vrms: 16.7mV
0.000 s
MAIN
M 5ns
T CH2 EDGE
13.0595kHz
CH1 5V
CH2 50mV

Below tests were made at LAB, and it's no recommended to repeat them, Maximum VALUE of extra capacitance should NOT exceed 6800uF Per rail, in real application for the 600W SMPS.

Ripple at output of the SMPS under LOAD

The ripple at the SMPS output is available, and cannot be avoided, as this is an Un Regulated Switching Power Supply, adding extra capacitance at the SMPS output, will greatly lower the ripple, 6800uf Per rail is the MAXIMUM you can use.

See Images Below taken at the specified load.

SMPS Voltage in idle is 109VDC no load, Ripple above at the SMPS output while it is LOADED 620W ==➔ 96.9VDC @ 6.46A No Extra capacitors used.

SMPS Voltage in idle is 109VDC no load, Ripple above at the SMPS output while it is LOADED 956W ==➔ 93VDC @ 10.29A No Extra capacitors used.

SMPS Voltage in idle is 109VDC no load, Ripple above at the SMPS output while it is LOADED 1116W ==➔ 90VDC @ 12.4A No Extra capacitors used.

Images below shows the ripple at the SMPS output, with extra 8200uF per rail.

SMPS Voltage in idle is 109VDC no load, Ripple above at the SMPS output while it is LOADED 620W ==➔ 96.9VDC @ 6.46A

WITH Extra capacitors used.

SMPS Voltage in idle is 109VDC no load, Ripple above at the SMPS output while it is LOADED 956W ==➔ 93VDC @ 10.29A.

WITH Extra capacitors used.

SMPS Voltage in idle is 109VDC no load, Ripple above at the SMPS output while it is LOADED 1116W ==➔ 90VDC @ 12.4A.

WITH Extra capacitors used.

Buzz and ground loop problems

Ground loops and buzz problems is a painful problem in the pro audio field, and sometime it's impossible to solve in short time.

So before you try to solve the problem, you need to describe it. By answering questions like: -

1- Is it a fixed noise at the speaker while the amplifier is in idle?
2- Short the amplifier input, noise still presented?
3- Disconnect your audio source, noise still presented?
4- Noise is showing when connecting the source?
5- Are you powering two amplifier channels with one power supply?

If you are unable to solve the BUZZ problem, contact us for more details and help.

Mounting the SMPS into your amplifier

Mounting the SMPS into your amplifier requires minimum effort, as that was taken into account at the design stage. Just mark the wholes on the chassis, drill them, and you are done.

PCB spacers like the ones below is just perfect!

Clearance

A minimum of 5mm space between the SMPS PCB and your amplifier chassis is REQUIRED, and it would be great if you use some material underneath the SMPS PCB as extra safety. A suggest isolation tape is shown below

SMPS stability with temperature

The SMPS was tested under ambient temperature of 40C, and it was stable, no issues were reported, that never means to overheat the SMPS beyond its limits. As you will destroy it.

The SMPS itself will live in the temperate created by the transformer and other components on the PCB, and may hit 55C in idle and that's normal.

Reaching higher operating temperatures will definitely require the FAN to run.

However, the FAN output on the SMPS is there to be used if your setup matches with one or more of the below situations.

1- You are using the SMPS with an amplifier bias more than 300mA per channel.
2- You are using the SMPS inside a powered speaker, closed box without air circulation.
3- You are driving two amplifier channels even if the power is less than 600W.
4- Your ambient temperature is 35C and above.
5- The SMPS will drive an amplifier for DJ use, not home use.

Using a FAN won't hurt or affect your setup at all, and it will increase the life of your SMPS, by increasing the life of your capacitors and other components.

You can just use a 24VDC FAN connected to the 12VDC output on SMPS, and it will run silent, and will provide nice air flow.

WARNING

Trying to play with the SMPS while its ON-LINE will just increase the chance by getting a nasty electric shock. And may cause serious injury. And may be death due the high voltage stored at the primary side capacitors.

GND hole on the PCB near the AC-INPUT connector

This is where the GND of your AC Mains should be connected, however, you need to try best option that works for, lifting this GND is not a good idea.

CHS hole near the output side of the SMPS

In reality, this by default is NOT connected, there is two pads on the PCB is still OPEN.

This connects the GND of the SMPS output to your chassis, so don't connect it If you don't need it. It won't cause any harm.

You can make it connected by soldering the two pads.

SMPS continuous load test

The SMPS-600 is designed for audio applications use, audio signal use, and it's NOT designed for continuous current draw, this is not an LED power supply. SMPS was tested for 10 minutes with forced air cooling under full load, with EXTRA heatsink attached to the output diodes. Just for testing purposes.

So, drawing full load from the SMPS for long time without proper cooling will just result in two things

1- The SMPS will die, and it may cannot be repaired
2- The SMPS may enter protection mode.

Over Current Detection System

The SMPS-600 uses a simple, efficient, fast over current detection system, because it's based on many components we call it system. It's not based on one component.

The Over current will trigger and immediately shutdown the SMPS once the threshold has been reached.

That never means if you have a fault in your amplifier that is drawing 8A continuous will make the SMPS to enter the protection mode, it will NOT. The SMPS will continue working supplying current until something smokes into your amplifier, or the threshold of the over current circuit will be reached.

Once the over current circuit triggers, it will NOT auto recover, why not auto recovery? I made that decision because I believe that drawing double the

maximum amount of current from the SMPS means there is a fault, this 600W SMPS will deliver up to 15A of output current.

You must disconnect the SMPS from the 110/240VAC line and wait the RED LED to turn off in order to start the SMPS again.

SMPS modification

Trying to modify the SMPS for any reason will simply void the warranty on the SMPS.

Warranty

In reality, warranty is a challenging thing to deal with, but!

The SMPS-600 has one-year TRUE warranty, true warranty means many things indeed, like Support, and Support and Support. No support? product will go to hell, it's just that simple.

I don't believe into asking the customer to SEND THE SMPS BACK for repair? What a request is that being asked from large scale companies?

After they get paid, they just blame the user.

So, if you have any problem with the SMPS, your first action should be contacting us by email, we will replay in less than 12 hours. Usually in 6 hours.

We will try our best to solve any problem in the SMPS with maximum effort possible from our side, we can go over Skype for support, phone call, whatever it takes to solve the problem.

We don't like to see any unhappy customer.

We have many options to recover you:

1- Trying to solve the problem with maximum effort.
2- Help you repair the SMPS, no company in the world can offer this service.
3- Refund you the money.
4- Sending you free SMPS, based on returning the old one. Shipping cost to be discussed.
5- We may ask for pictures, videos showing the problem, in order to provide proper support.

==== End of sheet===