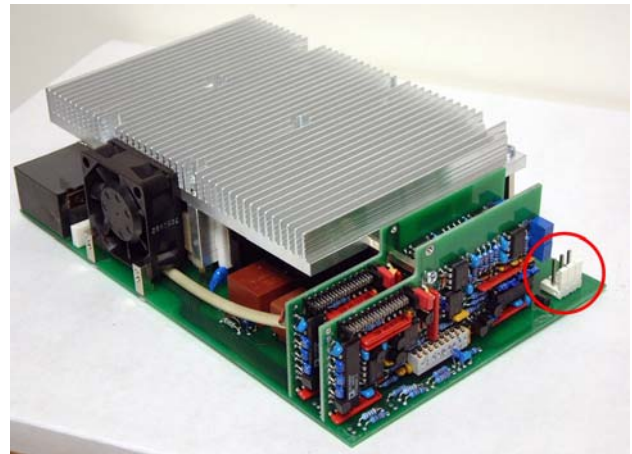


MNPFC-16 Diode Upgrade

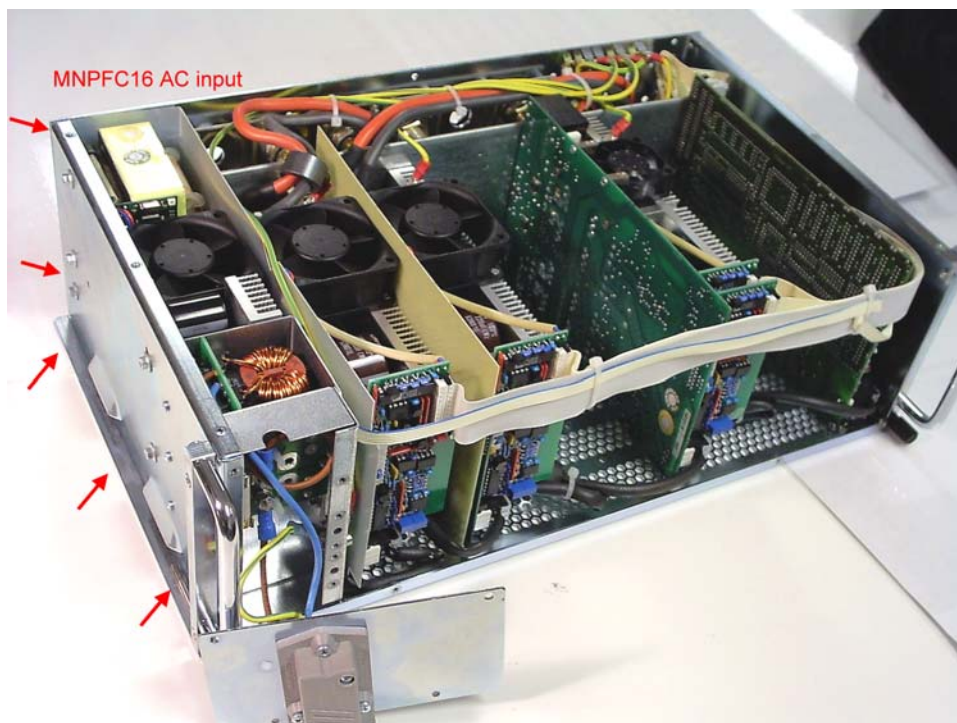
- 1) Disconnect Power Supply from AC line and place power supply on top and remove half shell with AC connector (Screws are marked with red arrows)



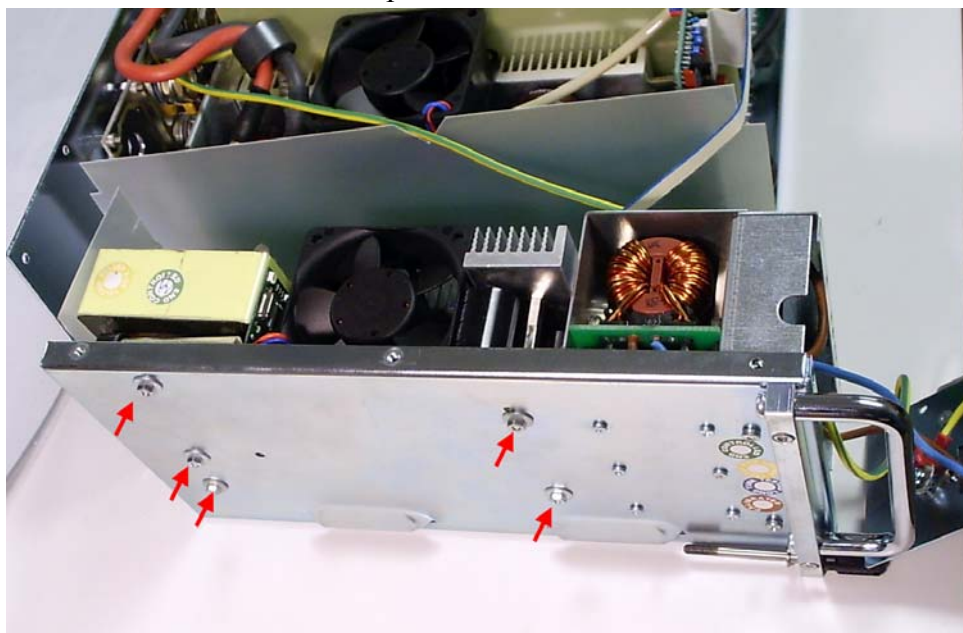
- 2) Discharge DC (380V!!!) with an isolated 100ohm / 10W resistor on the two outer pins of the DC connector of any of the power modules (Waiting a few minutes after disconnecting from AC there should be not DC present, but it is suggested to discharge and /or measure the DC)



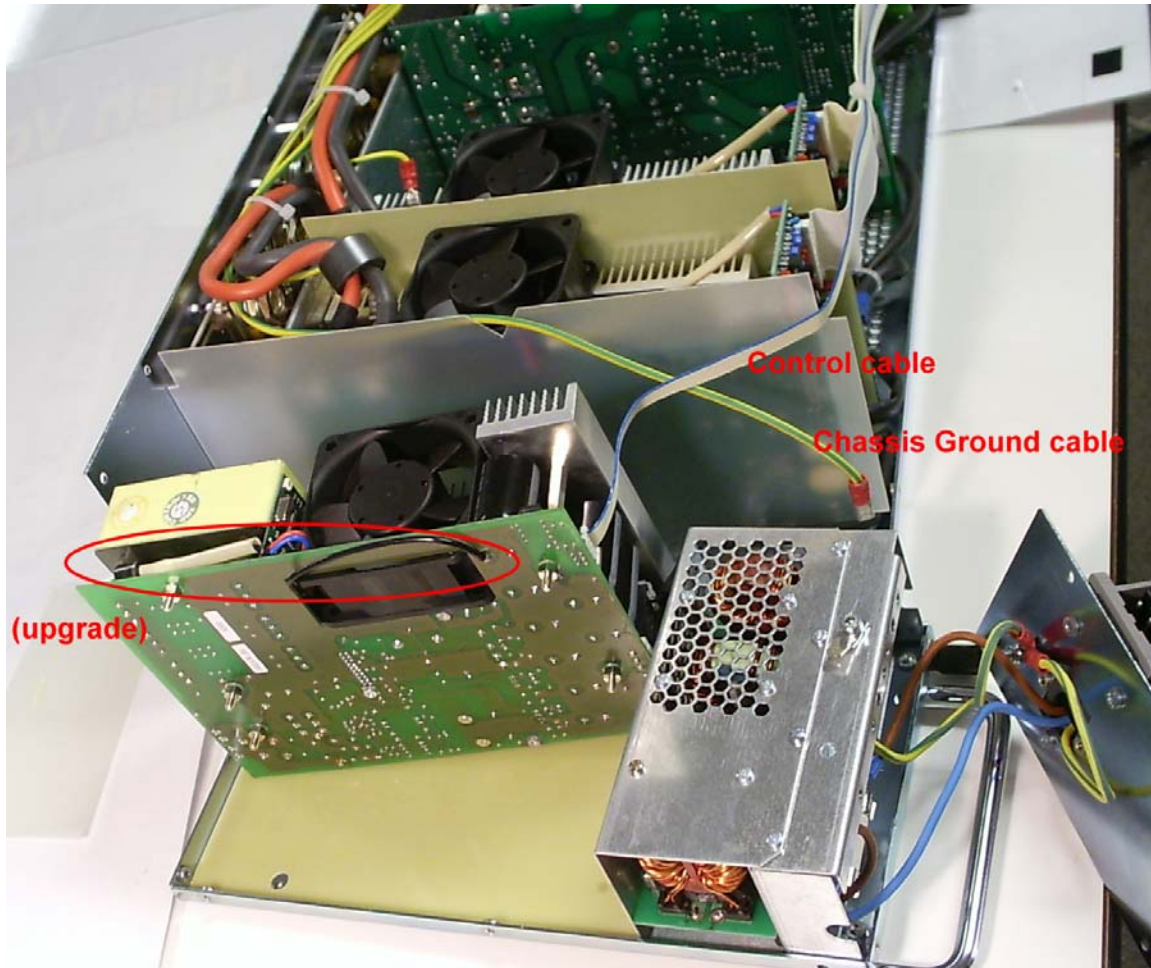
- 3) Remove screws for side panel holding the MNPFC16 AC Input

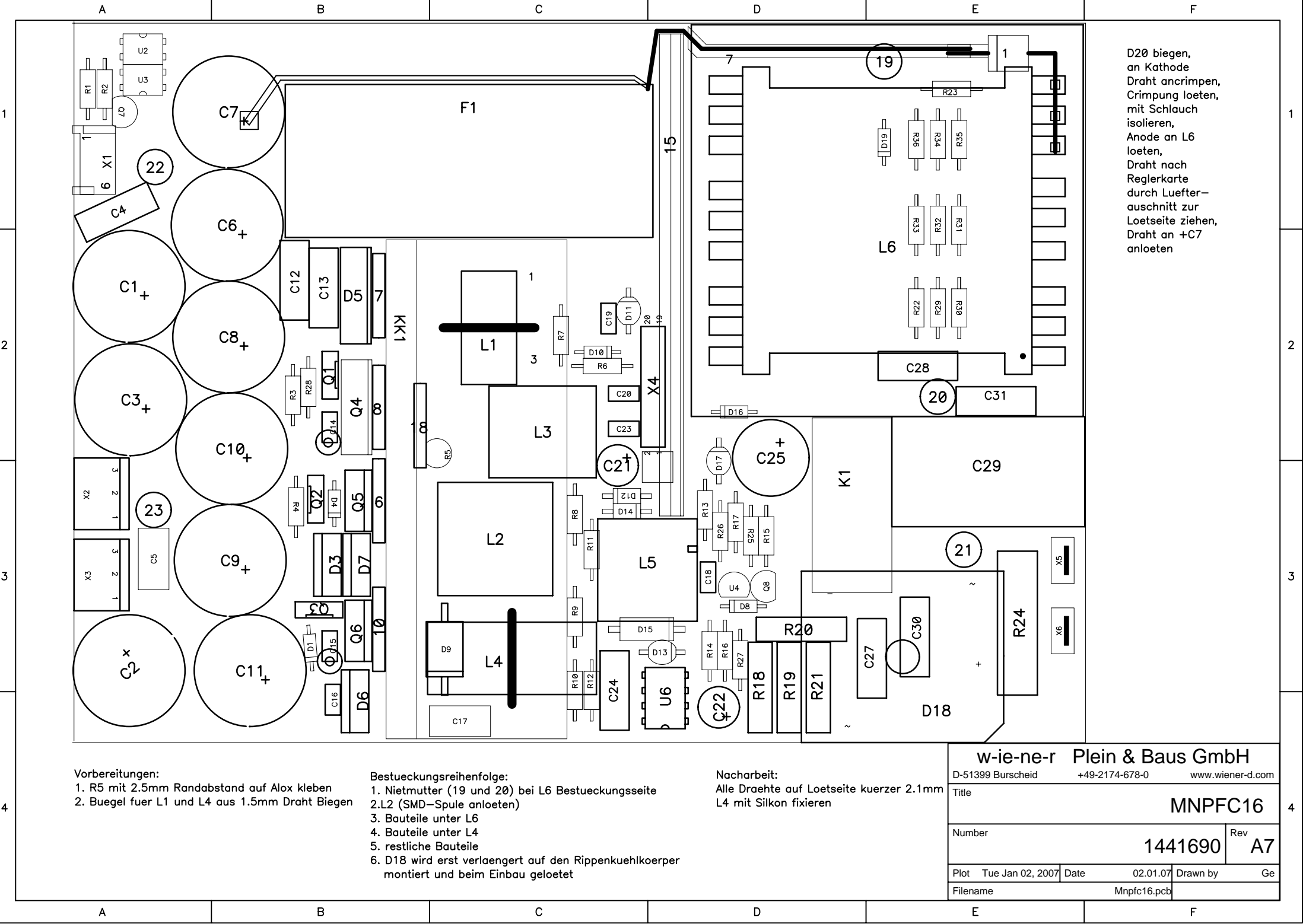


- 4) Remove the 5 nuts on the side panel to release the MNPFC16



- 5) Set the AC input module upright and add the diode as shown on the pictures of the next page.
- 6) Assemble the power supply, make sure that all cables are connected properly, in particular the control cable (flat cable), chassis ground, DC and AC.
- 7) Working on the AC-input requires HIPOT testing (1 minute 2.2kV DC between bridged phases and chassis ground)





D20 biegen,
an Kathode
Draht ancrimpen,
Crimpung loeten,
mit Schlauch
isolieren,
Anode an L6
loeten,
Draht nach
Reglerkarte
durch Luefter-
ausschnitt zur
Loetseite ziehen,
Draht an +C7
anloeten

- Vorbereitungen:**

 1. R5 mit 2.5mm Randabstand auf Alox kleben
 2. Buegel fuer L1 und L4 aus 1.5mm Draht Biegen
- Bestueckungsreihenfolge:**

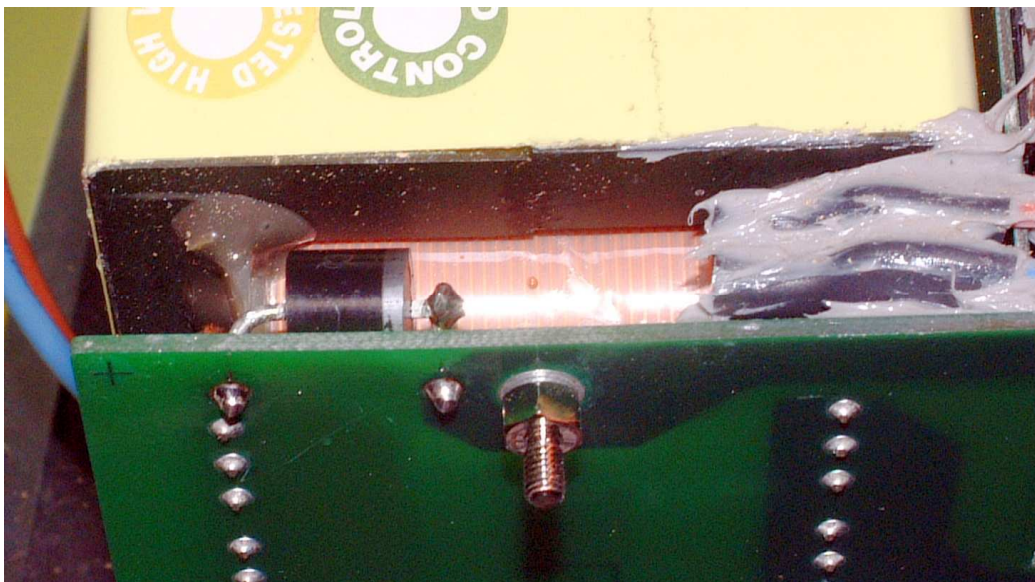
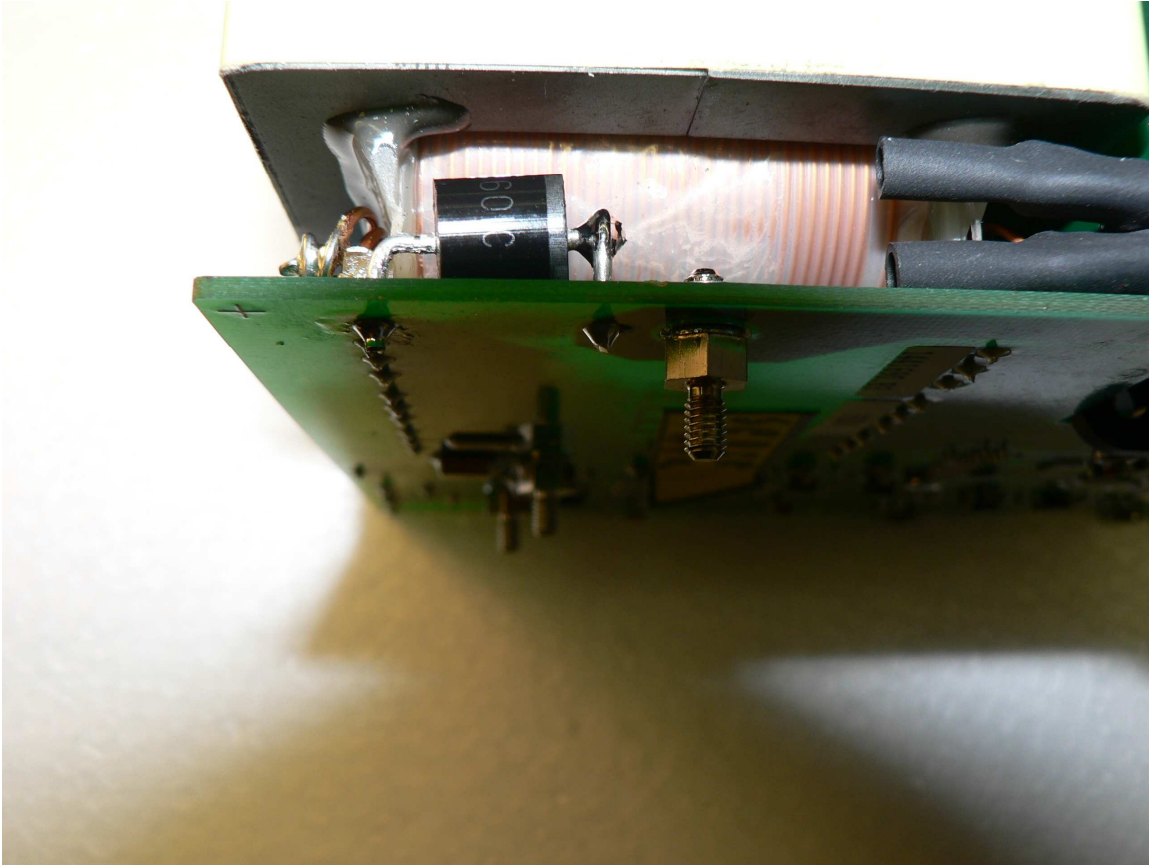
 1. Nietmutter (19 und 20) bei L6 Bestueckungsseite
 2. L2 (SMD-Spule anloeten)
 3. Bauteile unter L6
 4. Bauteile unter L4
 5. restliche Bauteile
 6. D18 wird erst veraelngert auf den Rippenkuehlkoerper montiert und beim Einbau geloetet

Nacharbeit:
Alle Draehnte auf Loetseite kuerzer 2.1mm
L4 mit Silikon fixieren

w-ie-ne-r				Plein & Baus GmbH	
D-51399 Burscheid		+49-2174-678-0		www.wiener-d.com	
Title				MNPFC16	
Number			1441690		Rev A7
Plot	Tue Jan 02, 2007	Date	02.01.07	Drawn by	Ge
Filename		Mnpfc16.pcb			

MNPFC 1441690.B3 Version (since 07/2008)

All MNFC16 B3 versions are outfitted with protection diode since 02/2008. Older units should be upgraded. The PCB of the B3 version has soldering pads / holes for the protection diode (D14) below the main transformer.



Power Supplies connected to highly fluctuating mains.

WIENER power supplies with sinusoidal input current use a common circuit (MNPFC). Due to some failures in the past, which occurred after mains disturbances during thunder storms, we investigated the MNPFCs behavior in such operation conditions.

We detected that if the mains input voltage is rising very fast (during 10 milliseconds) to a value higher than the internal DC operating voltage (385V during normal operation), a very high current (above 200 A under some conditions) is drawn if the external fuse does not release.

The described situation does only occur if the power supply is operating. During (normal) startup, the current is limited by resistors.

Details

The MNPFC principle is shown in Figure 1.

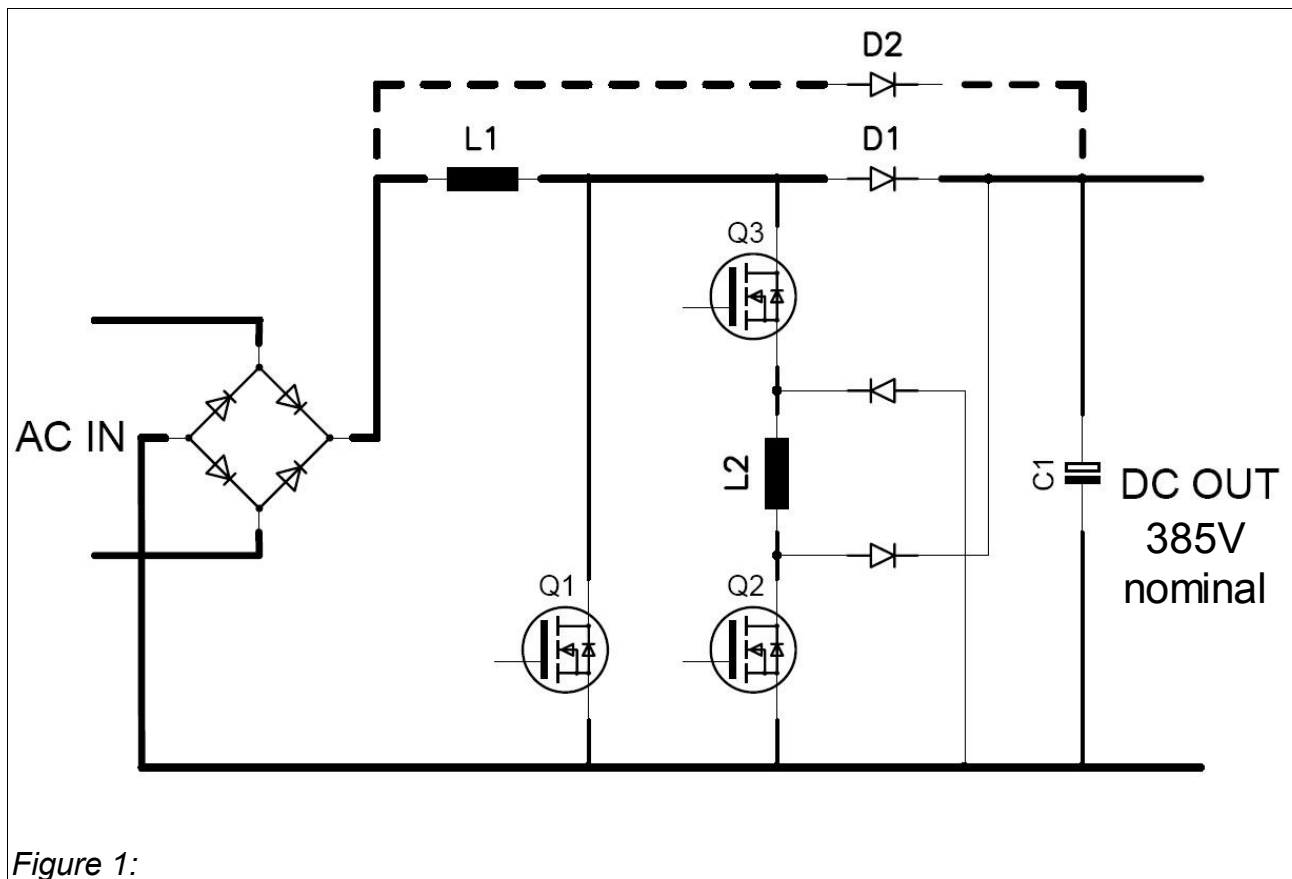


Figure 1:

If the AC_IN voltage is higher than the DC_OUT voltage, diode D1 is conducting and the high current will directly go through L1 and D1 to the output capacitor C1. This current may be much larger than the normal operating current, we measured more than 200A in some cases.

The coil L1 is saturated by this current (inductance goes to zero). If the soft-switching stage (Q3/Q4) or the main switch (Q1) is switched on in this situation, the switch current is no longer limited by L1. The switch directly short-circuits AC_IN. Of course this is only for a very short time, but especially the soft switching stage is extremely overloaded and may be in danger to be destroyed.

Solution

For power supplies which are operated in areas where such mains conditions can occur, we recommend the following modification:

A power diode D2 is added between the rectified AC_IN and the output.

During normal operation the DC_OUT voltage is always higher than AC_IN, so the diode is not conducting.

If AC_IN is higher than DC_OUT, D2 will take over the current (the threshold voltage of the power diode D2 is lower than the threshold voltage of the fast D1). L1 is not saturated and protects the switch stage as normal.