Henry 2k-4 Power Supply Up Grade:

The original Henry schematic can be found at BAMA.

The Upgraded Power Supply:
The original Henry power supply uses a 3,500 volt HV transformer feeding a FWB, an LC filter circuit with a resonant filter choke of 8 Henry's, and an oil-filled filter capacitor of 20 uF. The bleeder resistor system used three, 20k 100 Watt resistors for a bleeder current of 60 mA. This bleeder current forces the three bleeder resistors to dissipate 72 Watts each. So a lot of heat is generated via the bleeder resistors and the filter choke.

There was no soft start, or inrush protection circuit. Rather, the start current is limited by the HV transformer primary and secondary resistance and the choke resistance.

I removed the old Triad HV transformer, the FWB, the resonating choke, the bleeder resistors, and the oil-filled cap.

I obtained a **FAR** Power Supply Circuit board, a Hammond-Dahl HV Power transformer with a secondary voltage of 2,570 Volts@800 mA, and a Hammond Filament transformer of 10.5Volts@17 Amps with a center tap for bias.

The FAR power supply circuit board measures 5X 11" and is a "10" position circuit board. I.E., it has positions for 10 filter capacitors in series, 10 equalizer/bleeder resistors, and a FWB consisting of 20 diode positions (green board, last picture). In my configuration, I populated the board with 10, 450uF, 450V screw top electrolytic computer grade capacitors, 10, 47k, 7 Watt equalizer resistors, and 20 1N5408 HV diodes. **The power supply filter/rectifier board is protected from falling debris by an acrylic shield mounted above the PC board.**

The biasing zener is a 12 volts, 50 Watt stud mount Zener that replaced the old TO-3 cased Zener diode on the back panel.

Additional fusing was added to protect the various circuits as indicated on the first schematic.

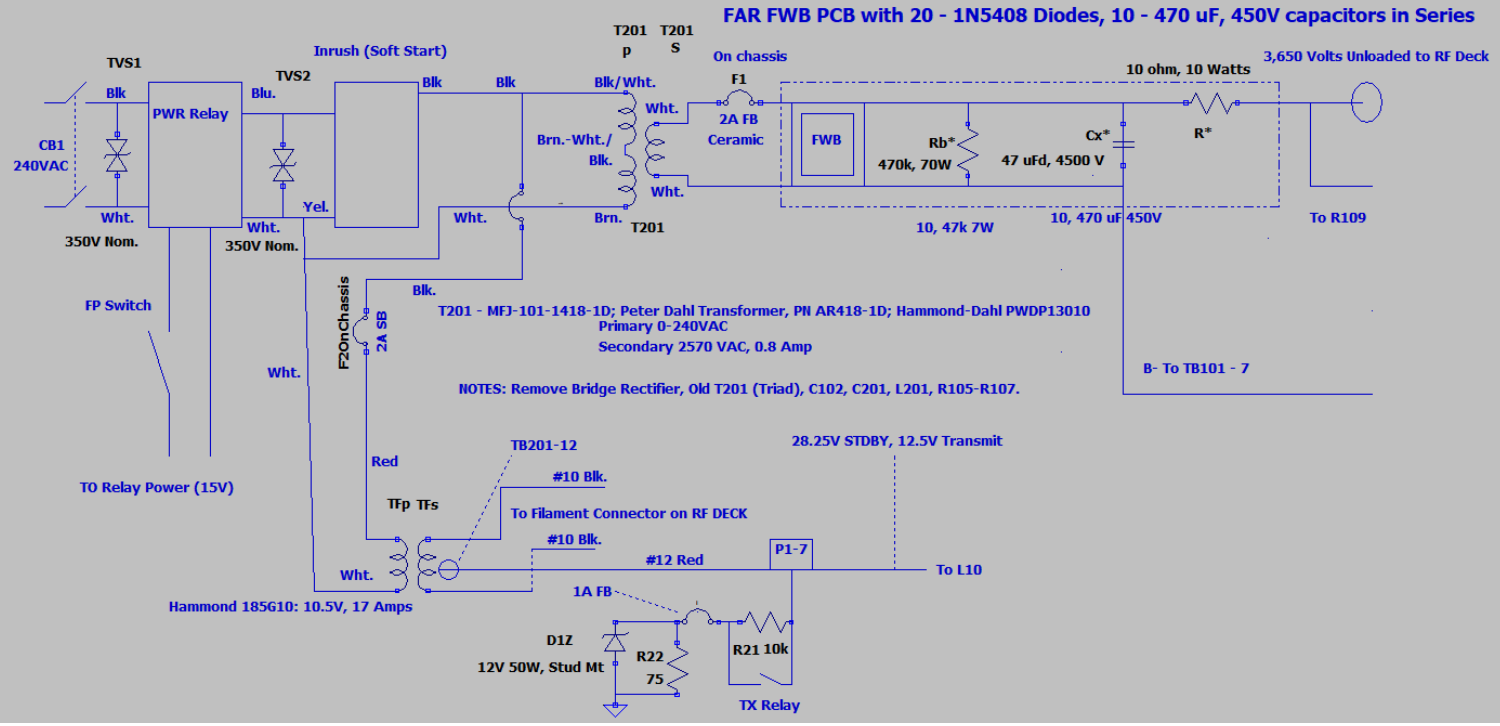
A new soft start circuit was incorporated to ramp up the supply current as indicated on the second and third schematics. This soft-start or inrush circuit is a necessity for capacitor filtered power supplies.

For the ALC bias, the FAR board is tapped at the 1,100 volt position, which is not shown on the schematic.

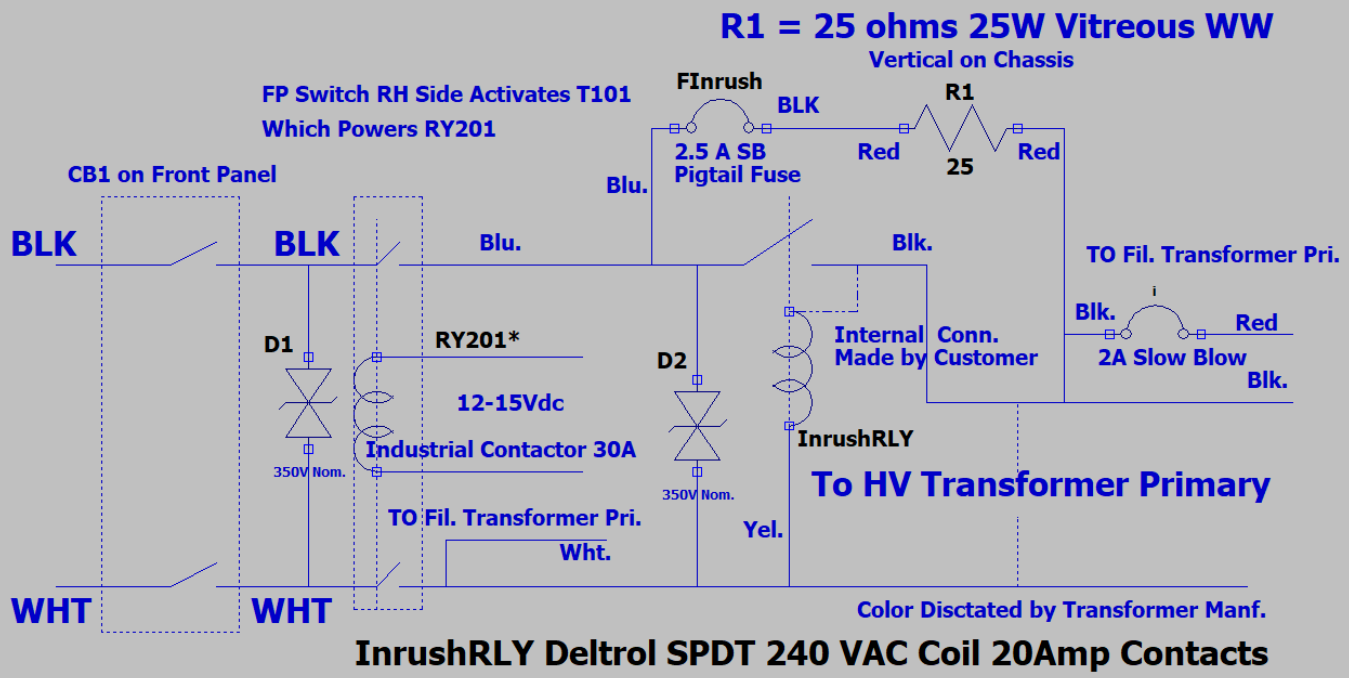
The no-load DC plate voltage is now 3,650 volts. At an exciter power of 15 Watts, the loaded DC plate voltage is 3,450 volts@250 mA with 200 Watts of carrier, giving an approx. power gain of 12 dB.

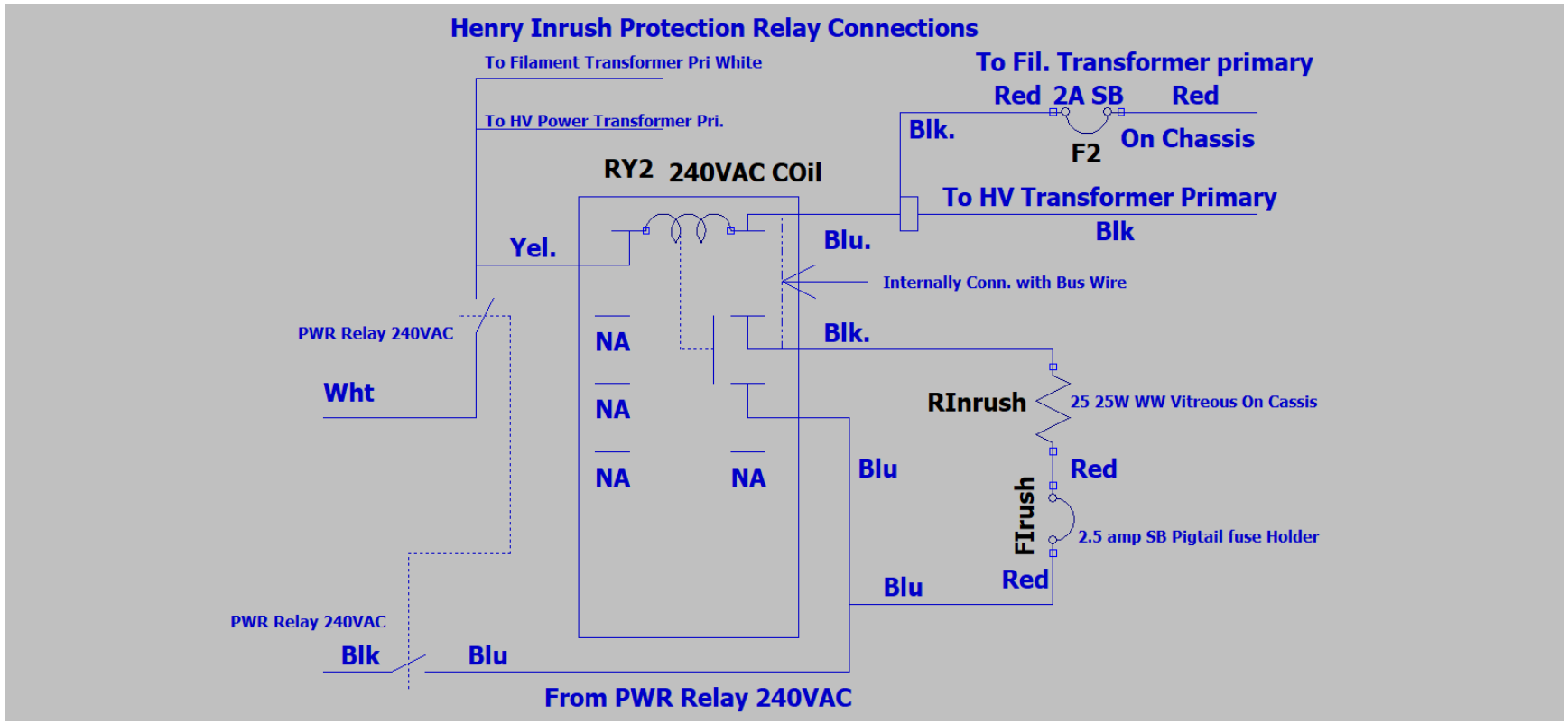
Henry 2K-4 Power Supply Modifications

Caution: Contact with High Voltage is Lethal



Henry 2K-4 Inrush Protection Circuit (added)



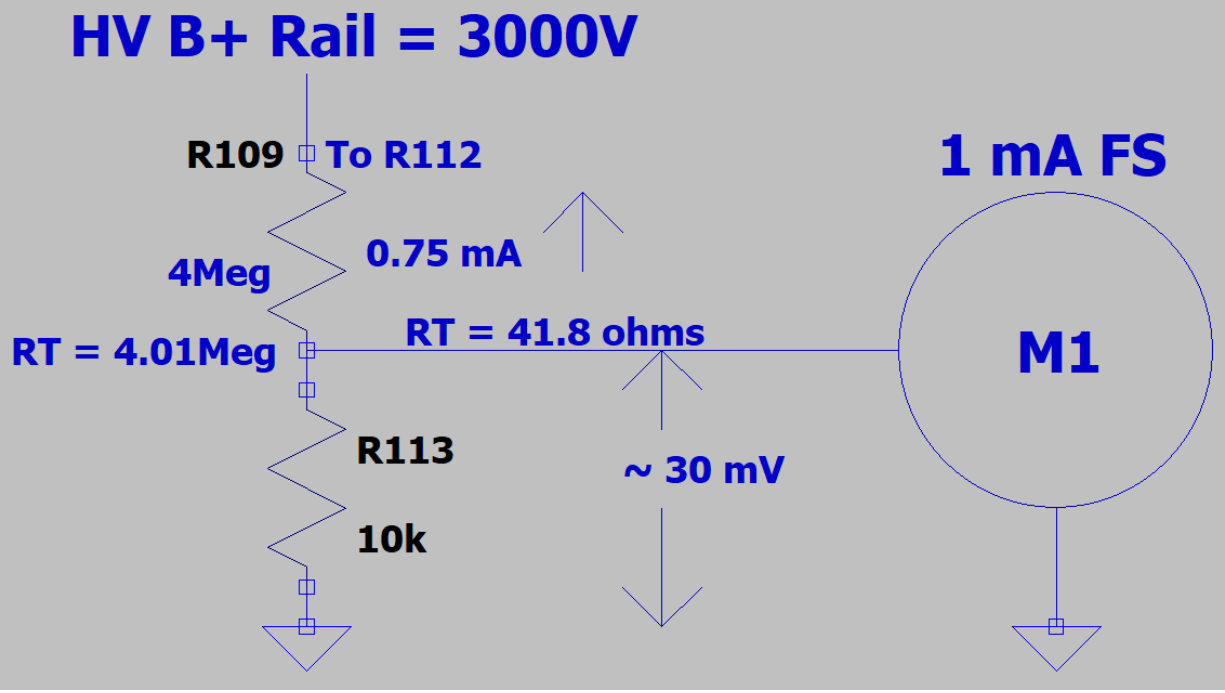

Henry Inrush Protection Relay Connections
To Filament Transformer Pri White
To HV Power Transformer Pri.
To Fil. Transformer primary
Red
2A SB
Red
Blk.
F2
On Chassis
RY2
240VAC COil
To HV Transformer Primary
Blk
Yel.
Blu.
Internally Conn. with Bus Wire
PWR Relay 240VAC
NA
Blk.
Wht
NA
RInrush
25 25W WW Vitreous On Cassis
NA
NA
Blu
Red
FIrush
2.5 amp SB Pigtail fuse Holder
Blu
Red
PWR Relay 240VAC
Blk
Blu
From PWR Relay 240VAC

he Plate Current and Multimeter appears to both be 1 mA Full Scale with a Simpson Model number of SK525-447-3 number on the LLHS and is identical for the two meters.

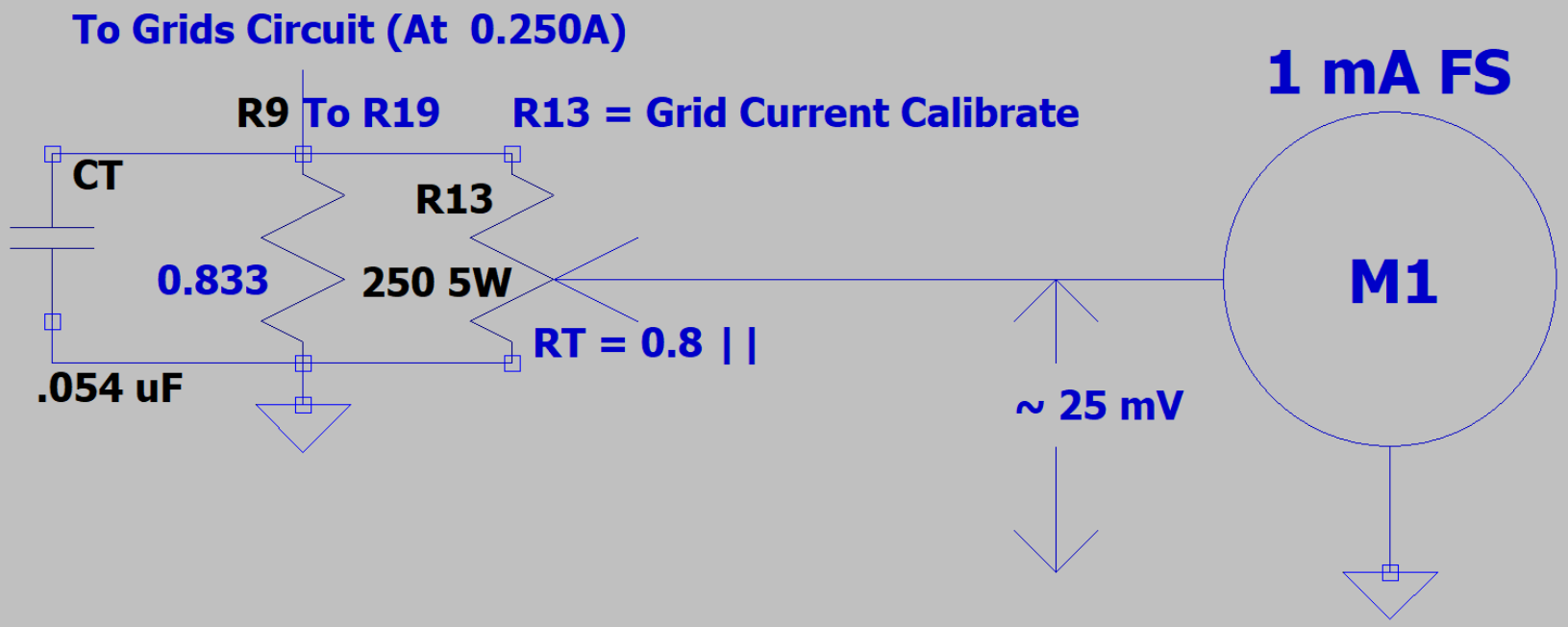
Both meters have a Face Width of 3.95". Face Height is 2.685". Meter movement barrel (Mounting Hole) has a diameter of 2.150" according to my digital micrometer.

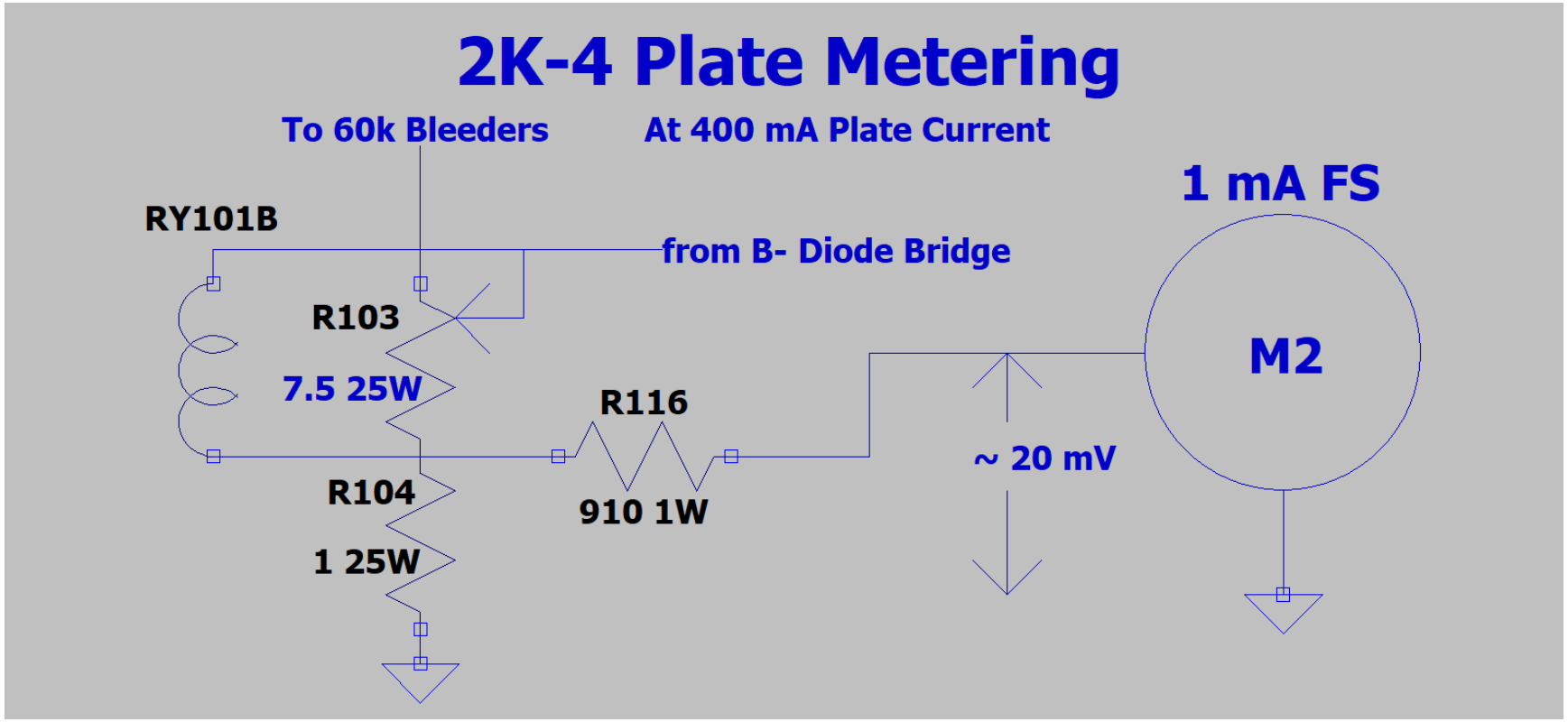
Both meters show a resistance of 42 ohms.

2K-4 B+ Metering



2K-4 Grid Metering




2K-4 Plate Metering
To 60k Bleeders
At 400 mA Plate Current
1 mA FS
RY101B
from B- Diode Bridge
R103
7.5 25W
R116
M2
~ 20 mV
R104
910 1W
1 25W