V = I x R
R = V / I
I = V / R

Main input = 240vAC

BTA26:
Igmax = 4A
Vgt = 1.3v
Igt = 100mA
Vgd = 0.2v

R1 = 3.4k (by experiment)

Ir1 = 240 / 3400
Ir1 = 0.0706
Ir1 = 70.6mA

VR1ptot = 0.2W
VR1 = 22k lin (by experiment)

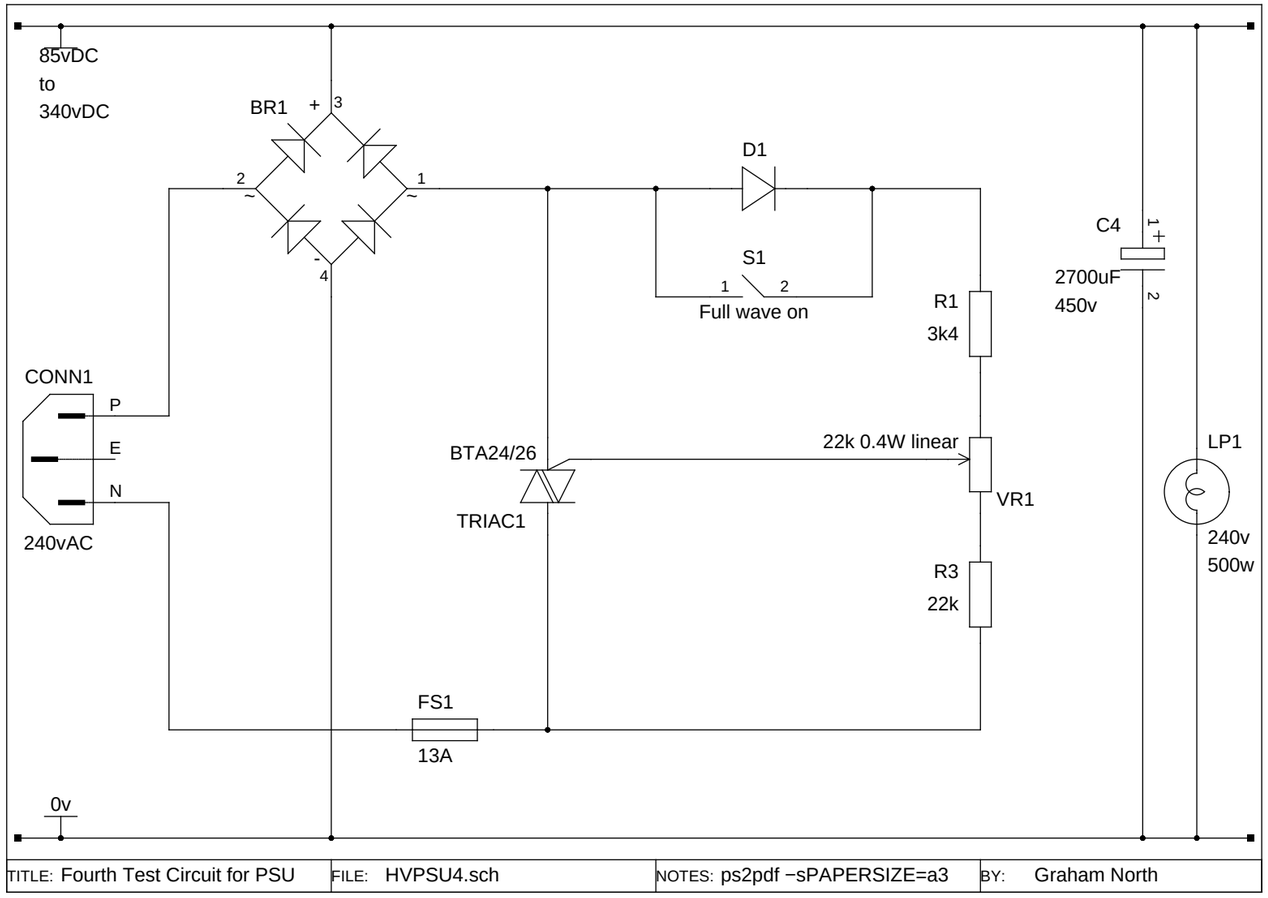
P = V x I
I = P / V

Ivr1max = 0.2 / 240
Ivr1max= 0.00083
Ivr1max= 83mA

This is more than the max 70.6mA so were good.

I = V / R
I = 240 / (3.4k + 22k)
I = 240 / (3400 + 22000)
I = 240 / 25400
I = 0.00945A
I = 9.4mA

By experiment I found this just triggers



NiMH cell has an internal resistance of 0.17 ohms

We have 38 of 6 cells so 228 cells.

Total resistance is
R = 228 * 0.17
R = 38.76 ohms

NiMH cell has a voltage of 1.2v per cell, so
Vbatt = 1.2 * 228
Vbatt = 273.6v

Terminal voltage was actually 285v so the cell voltage is actually 1.25v.
I believe this the no-load voltage.

The battery potential is raised from 285 to about 298 so

Vcharge = 298 - 285
Vcharge = 13v

I = V / R
I = 13 / 38.76
I = 0.335A
I = 335mA

This is about C/20 so sub-trickle charge,
but higher than a maintainence (C/100)

Capacity of a cell is 6.5Ah so charge time is

t = C / Icharge * 1.2
t = 6.5 / 0.335 * 1.2
t = 23.3 hours