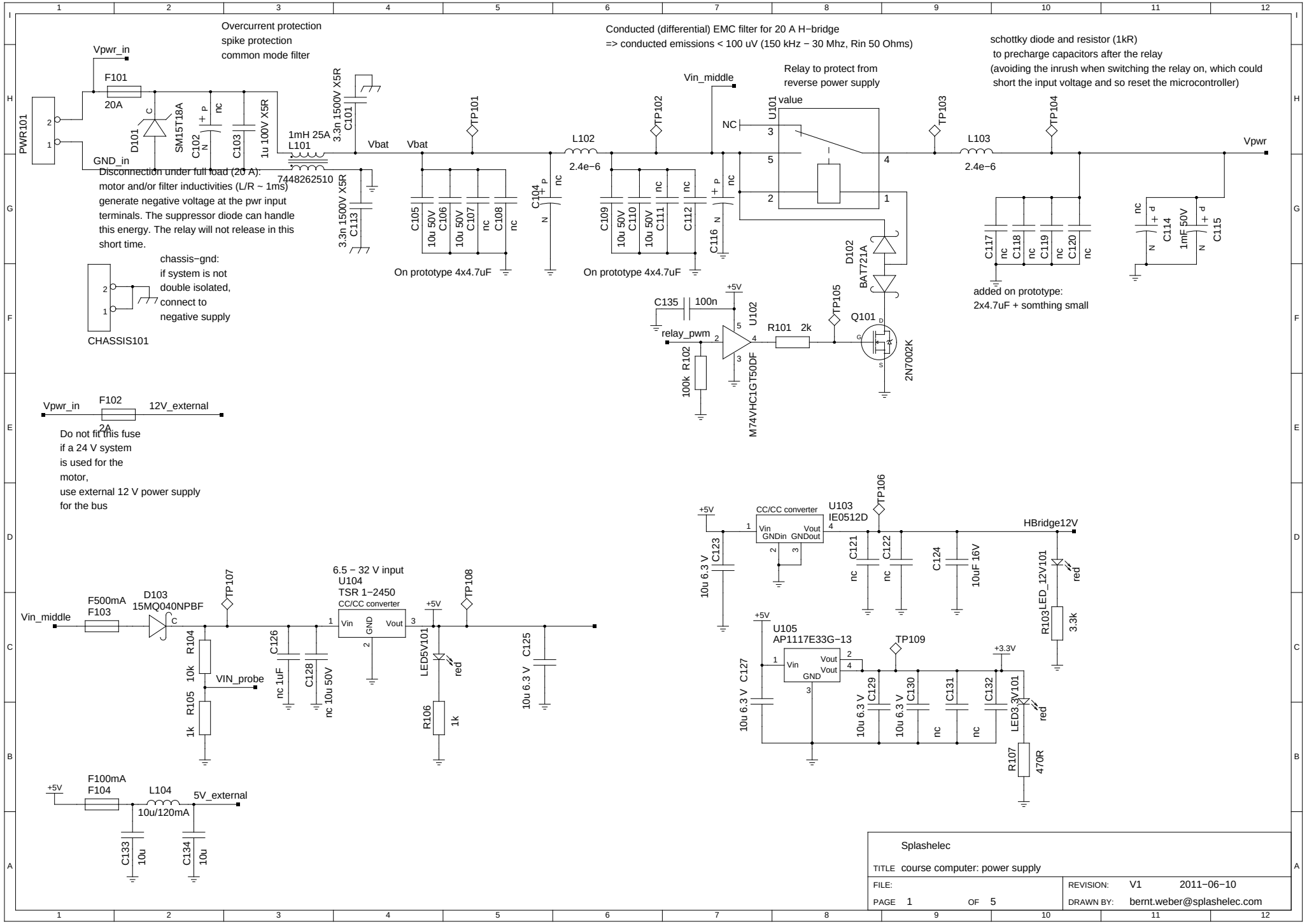
Overcurrent protection
spike protection
common mode filter
Conducted (differential) EMC filter for 20 A H−bridge
=> conducted emissions < 100 uV (150 kHz − 30 Mhz, Rin 50 Ohms)
schottky diode and resistor (1kR)
to precharge capacitors after the relay
(avoiding the inrush when switching the relay on, which could
short the input voltage and so reset the microcontroller)
Relay to protect from
reverse power supply
Vpwr_in
F101
20A
PWR101
D101
SM15T18A
C102
nc
C103
1u 100V X5R
3.3n 1500V X5R
C101
1mH 25A
L101
7448262510
3.3n 1500V X5R
C113
GND_in
Disconnection under full load (20 A):
motor and/or filter inductivities (L/R ~ 1ms)
generate negative voltage at the pwr input
terminals. The suppressor diode can handle
this energy. The relay will not release in this
short time.
chassis−gnd:
if system is not
double isolated,
connect to
negative supply
CHASSIS101
Vbat
Vbat
TP101
C105
10u 50V
C106
10u 50V
C107
nc
C108
nc
On prototype 4x4.7uF
C104
nc
L102
2.4e−6
TP102
C109
10u 50V
C110
10u 50V
C111
nc
C112
nc
On prototype 4x4.7uF
C116
nc
Vin_middle
NC
U101
value
TP103
L103
2.4e−6
TP104
Vpwr
C117
nc
C118
nc
C119
nc
C120
nc
C114
nc
1mF 50V
C115
added on prototype:
2x4.7uF + somthing small
D102
BAT721A
TP105
Q101
2N7002K
C135
100n
+5V
U102
relay_pwm
R101
2k
R102
100k
M74VHC1GT50DF
Vpwr_in
F102
2A
12V_external
Do not fit this fuse
if a 24 V system
is used for the
motor,
use external 12 V power supply
for the bus
Vin_middle
F500mA
F103
D103
15MQ040NPBF
TP107
R104
10k
VIN_probe
R105
1k
C126
nc 1uF
C128
nc 10u 50V
6.5 − 32 V input
U104
TSR 1−2450
CC/CC converter
Vin
GND
Vout
+5V
TP108
LED5V101
red
R106
1k
C125
10u 6.3 V
+5V
F100mA
F104
L104
10u/120mA
5V_external
C133
10u
C134
10u
+5V
CC/CC converter
U103
IE0512D
Vin
GNDin
Vout
GNDout
TP106
HBridge12V
C123
10u 6.3 V
C121
nc
C122
nc
C124
10uF 16V
R103
3.3k
LED_12V101
red
+5V
U105
AP1117E33G−13
Vin
Vout
Vout
GND
TP109
+3.3V
C127
10u 6.3 V
C129
10u 6.3 V
C130
10u 6.3 V
C131
nc
C132
nc
LED3.3V101
red
R107
470R
Splashelec
TITLE course computer: power supply
FILE:
PAGE 1 OF 5
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