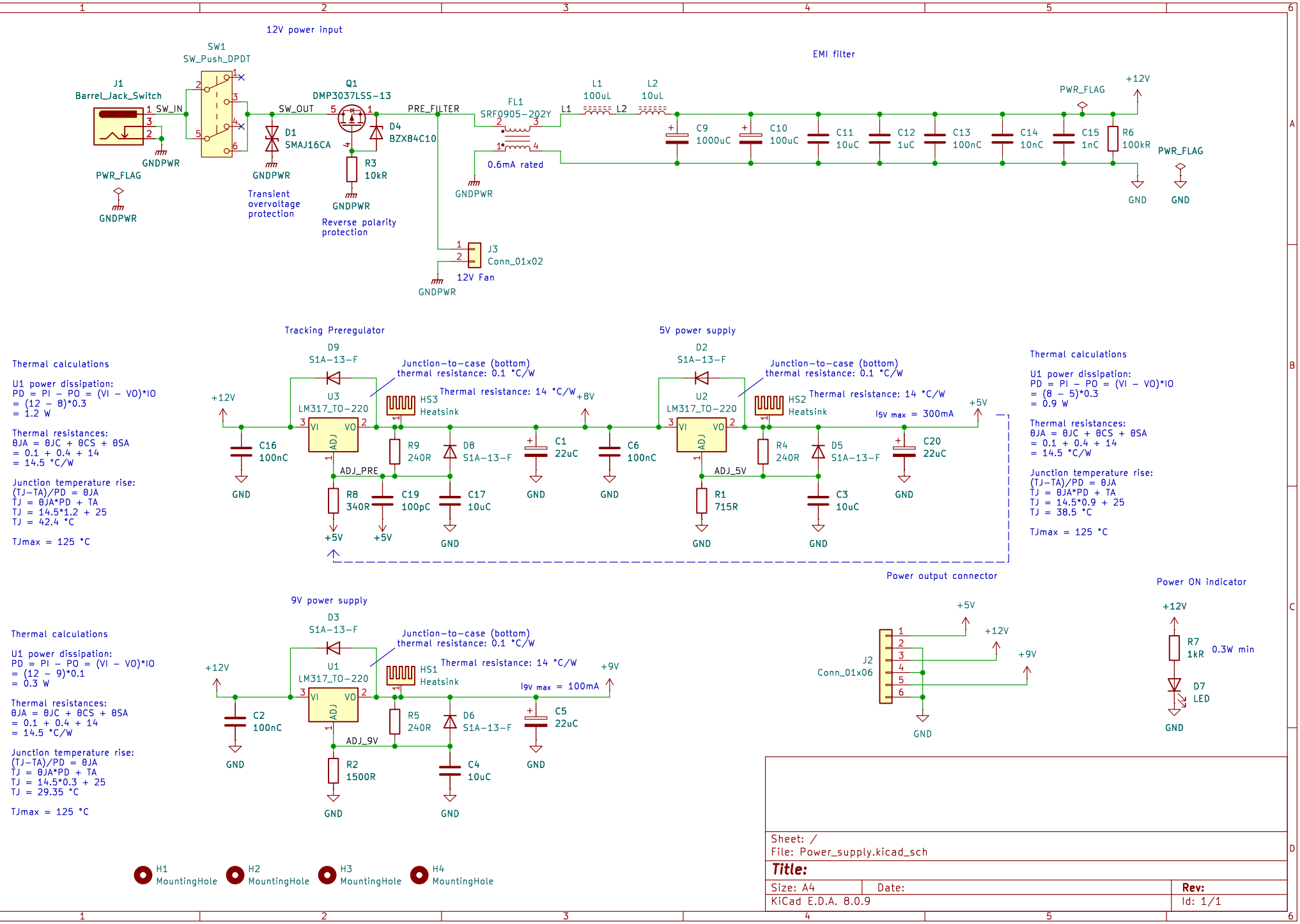
12V power input
SW1
SW_Push_DPDT
J1
Barrel_Jack_Switch
SW_IN
GNDPWR
PWR_FLAG
GNDPWR
SW_OUT
D1
SMAJ16CA
GNDPWR
Transient overvoltage protection
Q1
DMP3037LSS-13
D4
BZX84C10
R3
10kR
GNDPWR
Reverse polarity protection
PRE_FILTER
FL1
SRF0905-202Y
0.6mA rated
GNDPWR
EMI filter
L1
100uL
L2
10uL
C9
1000uC
C10
100uC
C11
10uC
C12
1uC
C13
100nC
C14
10nC
C15
1nC
R6
100kR
PWR_FLAG
+12V
GND
PWR_FLAG
GND
J3
Conn_01x02
12V Fan
GNDPWR
Tracking Preregulator
D9
S1A-13-F
Junction-to-case (bottom) thermal resistance: 0.1 °C/W
U3
LM317_TO-220
HS3
Heatsink
Thermal resistance: 14 °C/W
+12V
+8V
C16
100nC
R9
240R
D8
S1A-13-F
C1
22uC
C6
100nC
ADJ_PRE
R8
340R
C19
100pC
C17
10uC
+5V
+5V
GND
GND
GND
5V power supply
D2
S1A-13-F
Junction-to-case (bottom) thermal resistance: 0.1 °C/W
U2
LM317_TO-220
HS2
Heatsink
Thermal resistance: 14 °C/W
I5V max = 300mA
+5V
C20
22uC
R4
240R
D5
S1A-13-F
ADJ_5V
R1
715R
C3
10uC
GND
GND
GND
Thermal calculations
U1 power dissipation:
PD = PI − PO = (VI − VO)*IO
= (12 − 8)*0.3
= 1.2 W
Thermal resistances:
θJA = θJC + θCS + θSA
= 0.1 + 0.4 + 14
= 14.5 °C/W
Junction temperature rise:
(TJ−TA)/PD = θJA
TJ = θJA*PD + TA
TJ = 14.5*1.2 + 25
TJ = 42.4 °C
TJmax = 125 °C
Thermal calculations
U1 power dissipation:
PD = PI − PO = (VI − VO)*IO
= (8 − 5)*0.3
= 0.9 W
Thermal resistances:
θJA = θJC + θCS + θSA
= 0.1 + 0.4 + 14
= 14.5 °C/W
Junction temperature rise:
(TJ−TA)/PD = θJA
TJ = θJA*PD + TA
TJ = 14.5*0.9 + 25
TJ = 38.5 °C
TJmax = 125 °C
9V power supply
D3
S1A-13-F
Junction-to-case (bottom) thermal resistance: 0.1 °C/W
U1
LM317_TO-220
HS1
Heatsink
Thermal resistance: 14 °C/W
+12V
+9V
I9V max = 100mA
C2
100nC
R5
240R
D6
S1A-13-F
C5
22uC
ADJ_9V
R2
1500R
C4
10uC
GND
GND
GND
Thermal calculations
U1 power dissipation:
PD = PI − PO = (VI − VO)*IO
= (12 − 9)*0.1
= 0.3 W
Thermal resistances:
θJA = θJC + θCS + θSA
= 0.1 + 0.4 + 14
= 14.5 °C/W
Junction temperature rise:
(TJ−TA)/PD = θJA
TJ = θJA*PD + TA
TJ = 14.5*0.3 + 25
TJ = 29.35 °C
TJmax = 125 °C
Power output connector
+5V
+12V
+9V
J2
Conn_01x06
GND
Power ON indicator
+12V
R7
1kR
0.3W min
D7
LED
GND
H1
MountingHole
H2
MountingHole
H3
MountingHole
H4
MountingHole
Sheet: /
File: Power_supply.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 8.0.9
Id: 1/1