Test—PCB for Arduino—DAC

BLOCK DIAGRAM

ATX POWER SUPPLY

BOOST MODULE

SELF—HOLDING LATCH

DAC

SOFT—START IC

ARDUINO

12—36V 0—15V

12—36V 0—15V

set U

sense U, I

enable

enable

12V, 5V, GND

PWM (f.d%)

PWM (f.d%)

PCB A —— low voltage circuits

Plugs_and_Controls

Plugs_and_Controls.sch

Controller

Controller.sch

SMPS—12—36

SMPS—12—36.sch

RES_3

D13_16

BAK_INDICATOR

PWM_IN

ENBL

PWR_GOOD

VSB

SR

PB

PWR_ON

PWM_OUT

ENBL_OUT

SPI—SCK

SPI—MISO

SPI—MOSI

SPI—CS

SPI—CS

SPI—MOSI

SPI—MISO

SPI—SCK

HV stage on separate PCB to avoid EMI from transformer

HV stage connectors:
– Power input 5—40V
– Enable
– PWM signal

NOTES
— — — — —
Boost regulator has internal Vref=1.2V. Therefore set DAC VoutB=1.2V.
DAC VoutA maps directly N=0...4095 to Uset=0...36V.
DAC CS via Arduino pin 8.

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Sheet: /
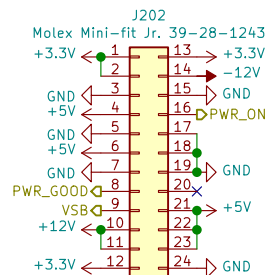File: Test—PCB_for_Arduino—DAC.sch

Title: Plasma—PSU_Eurocard_Flyback

Size: A4 | Date: 2020—04—08 | **Rev: 0.0.4**

KiCad E.D.A. kicad (5.1.2)—1 | Id: 1/4

POWER CONNECTORS

J202
Molex Mini-fit Jr. 39-28-1243

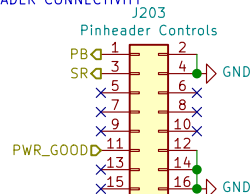| Left	Pin	Pin	Right
+3.3V	1	13	+3.3V
+3.3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PWR_ON
GND	5	17	
+5V	6	18	
GND	7	19	GND
PWR_GOOD	8	20	
VSB	9	21	+5V
+5V	10	22	+5V
+12V	11	23	
+3.3V	12	24	GND

Molex 5566 24-pin
ATX power connector
(max 75W to SMPS)

Additional PCIe 8-pin
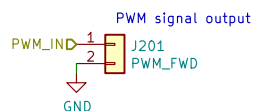power connector
for additional 150W
(75W if 6-pin connected)

Additional PCIe 8-pin
power connector
for additional 150W
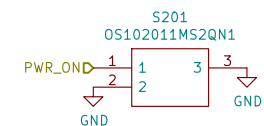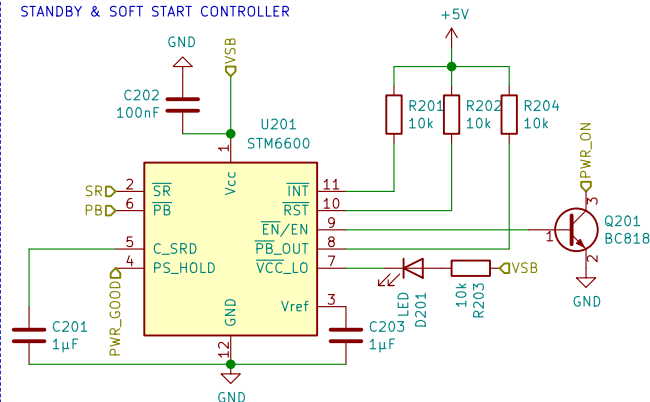(75W if 6-pin connected)

PINHEADER CONNECTIVITY

J203
Pinheader Controls

Left	Pin	Pin	Right
PB	1	2	GND
SR	3	4	GND
	5	6	
	7	8	
	9	10	
PWR_GOOD	11	12	
	13	14	
	15	16	GND

Pinheader configuration:
1-2 Power button
3-4 Reset button
5-6 –
7-8 –
9-10 –
11-12 LED Power on
13-14 –
15-16 –

CONNECTIVITY TOWARDS HV BOARD

PWM signal output

PWM_IN — J201
PWM_FWD
GND

STANDBY & SOFT START CONTROLLER

C202 100nF

U201
STM6600

Pin	Name	Pin	Name
2	SR	1	Vcc
6	PB	11	INT
5	C_SRD	10	RST
4	PS_HOLD	9	EN/EN
		8	PB_OUT
		7	VCC_LO
12	GND	3	Vref

R201 10k
R202 10k
R204 10k

Q201 BC818

LED D201
10k R203
VSB

C201 1µF
C203 1µF

+5V

S201
OS102011MS2QN1

PWR_ON — 1 — 3 — GND
GND

In case of soft-start IC malfunction,
turn ATX supply on/off using switch

On-board control LEDs
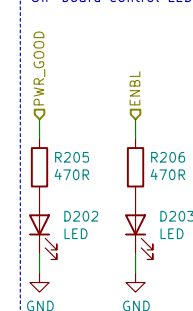
PWR_GOOD
R205 470R
D202 LED
GND

ENBL
R206 470R
D203 LED
GND

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Sheet: /Plugs_and_Controls/
File: Plugs_and_Controls.sch

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Sheet: /SMPS-12-36/
File: SMPS-12-36.sch

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| KiCad E.D.A. kicad (5.1.2)-1 | | | Id: 3/4 |

Components and labels visible:

- J301 U-Sense_int
- +5V
- C304 10µF, C305 100nF
- U302 MCP4822
- SPI-SCK, SPI-MISO, SPI-MOSI, SPI-CS
- SCK, LDAC, SDI, CS
- Vdd, VA, VB, Vss
- CNTRL, DAC, DAC
- R301 100k, R302 100k
- U301A MCP602
- R303 100k
- U301B MCP602
- C306 100nF
- J304 VFB
- *Route away from noise!!*
- J302 Probe_DAC_A
- J303 Probe_DAC_B
- +5V
- C301 220uF, C302 100nF, C303 10nF
- U301C MCP602
- GND

Configuration:
PWM via timer1 on D8 / pin11)
ENBL signal on D9 / pin 12
U-CTRL via SPI with CS on pin 8
U sensing on A6 / pin 25
I sensing on A7 / pin 26
UART on D0 & D1 / pin 2 & 1
I2C signal on A4 & A5 / pin 23 & 24

UART

RX
TX
+5V
GND

UART
J403

J401
Arduino_Pinout_01-15

+5V

VIN   3V3 +5V
30   17   27

D0/RX
D1/TX
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13

RESET 28
RESET 3

AREF 18

A0 19
A1 20
A2 21
A3 22
A4 23
A5 24
A6 25
A7 26

GND GND
4   29

A401
Arduino_Nano_v3.x

RES_3
GND

D13_16

J406
Arduino_Pinout_16-30

GND

PWM_OUT
ENBL_OUT
D13_16

GND

SPI-SCK
SPI-MISO
SPI-MOSI
SPI-CS

SPI

SCK
MISO
MOSI
CS
+5V
GND

GND +5V

J402
SPI

J404 +5V
A6+7 +5V

R401
4.8k

R402
4.8k

GND

C401
100n

C402
100n

GND

+5V
GND

I2C

J405 SCL
I2C SDA
+5V
GND

+5V
GND

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Sheet: /Controller/
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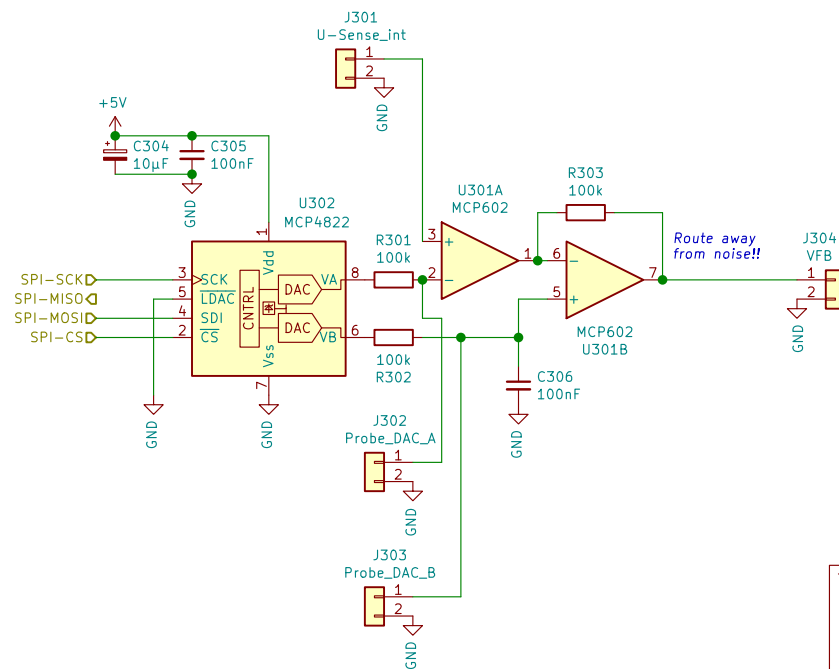
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