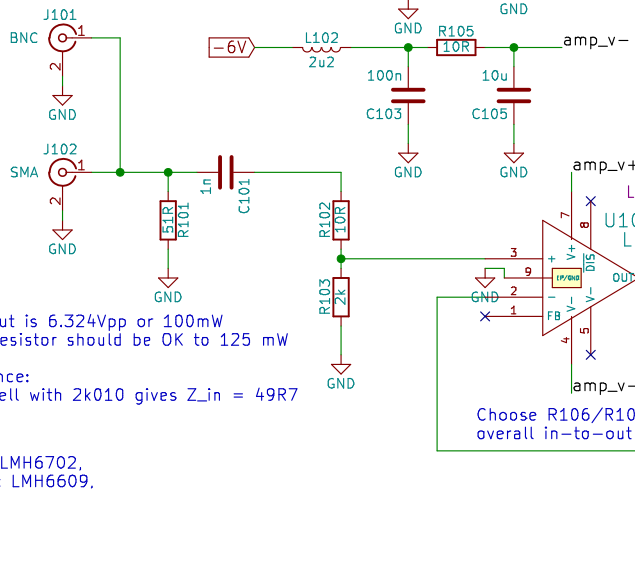


PCB for SMA or BNC R/A thru-hole connectors



Input Power:
 +20 dBm input is 6.324Vpp or 100mW
 0805-sized resistor should be OK to 125 mW

Input Impedance:
 51R in parallel with 2k010 gives $Z_{in} = 49R7$

Op-Amps:
 input-stage: LMH6702,
 output-stage: LMH6609.

Choose R106/R107 for 0 dB overall in-to-out gain

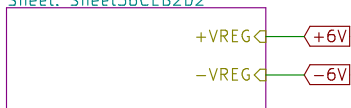
100pF added to reduce gain-peaking

8x OUTPUT

Overall Gain: ca 0 dB
 Input Impedance: ca 0 dB
 Input divider R102/R103: -0.04 dB
 U101 gain: +6.25 dB
 R201/202 divider: -6.06 dB
 U201 gain: +6.02 dB
 output impedance: -6.04 dB
 Total +0.12 dB

Power supply filtering & Voltage regulation

Sheet: Sheet56CEB2D2

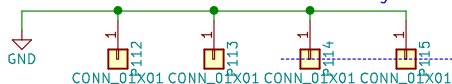


File: FDA_PSU.sch

Suggestions for next version:

- the long transmission line from U101 to output "rings". solved with 100pF cap, but is there a better way?
- matched-pair resistors where applicable?

Mounting-holes in corners of board
 3mm diameter
 5mm x 5mm in from board edge



Note: front-edge M3 mounting holes removed as of 2018-01 design revision (to make room for THT LEDs)

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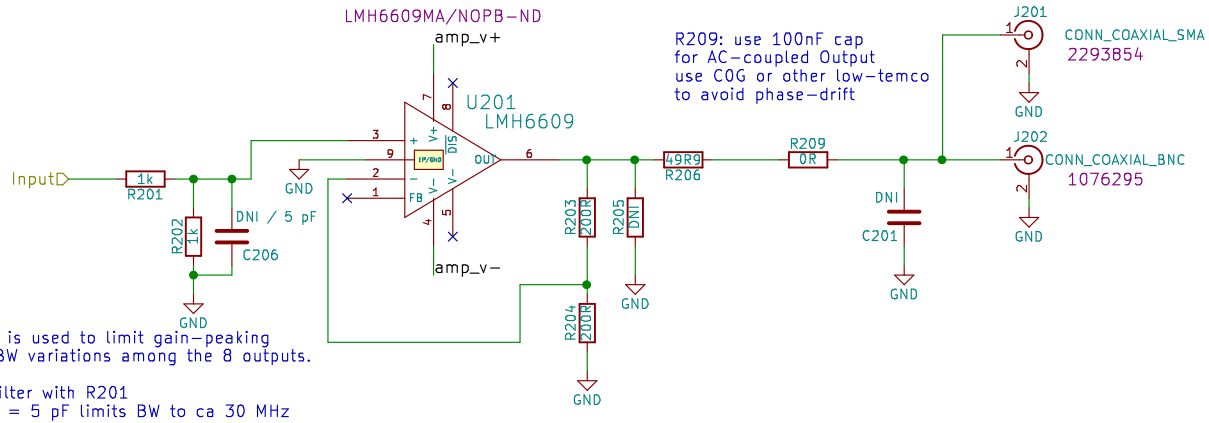
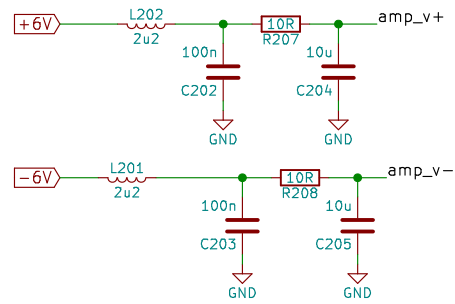
1dB compression @ 14.8 dBm, IP3 @ 31 dBm (10 MHz)
 reverse isolation 120 dB, channel-to-channel isolation 80dB
 measured <-162 dBc/Hz phase-noise at 10 MHz
 2017.01 design, 4pcs prototype-boards Jan 2017

Anders Wallin ([anders.e.e.wallin "at" gmail.com](mailto:anders.e.e.wallin@atgmail.com))

Sheet: /
 File: fda_2017.03.sch

Title: Anders' Frequency Distribution Amplifier 2018.11

Size: A4	Date: 2018-11-27	Rev: 2018.11
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1	Id: 1/10	

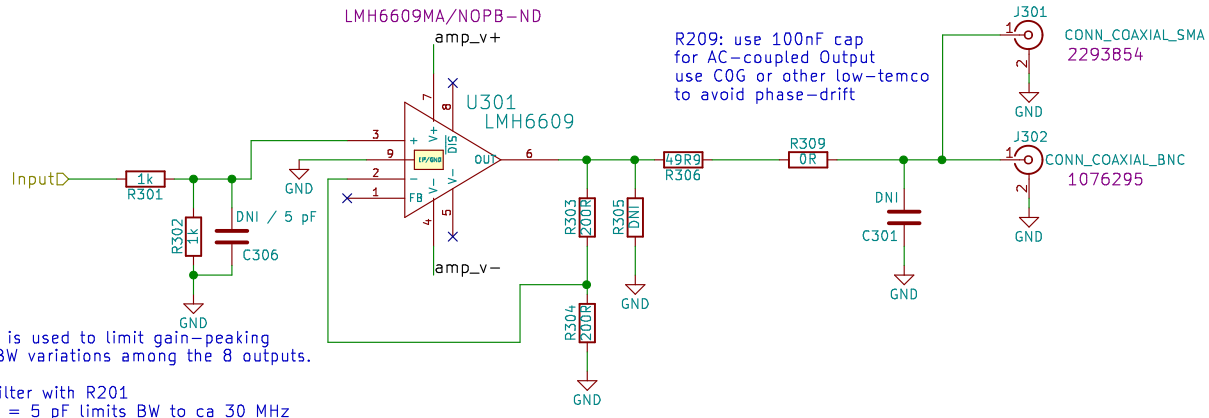
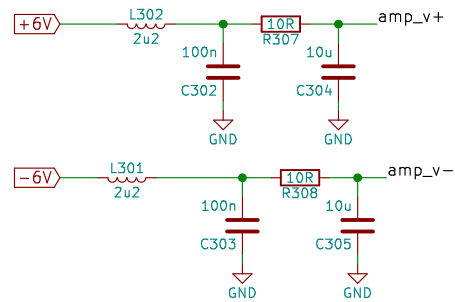


C206 is used to limit gain-peaking and BW variations among the 8 outputs.
 RC-filter with R201
 C206 = 5 pF limits BW to ca 30 MHz

R209: use 100nF cap for AC-coupled Output use COG or other low-tempco to avoid phase-drift

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gain-peaking inceases from ch1 -> ch8		
Anders Wallin (anders.e.e.wallin "at" gmail.com)		
Sheet: /out1/		
File: output_stage.sch		
Title: Anders' Frequency Distribution Amplifier 2017.03		
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1	Id: 2/10	

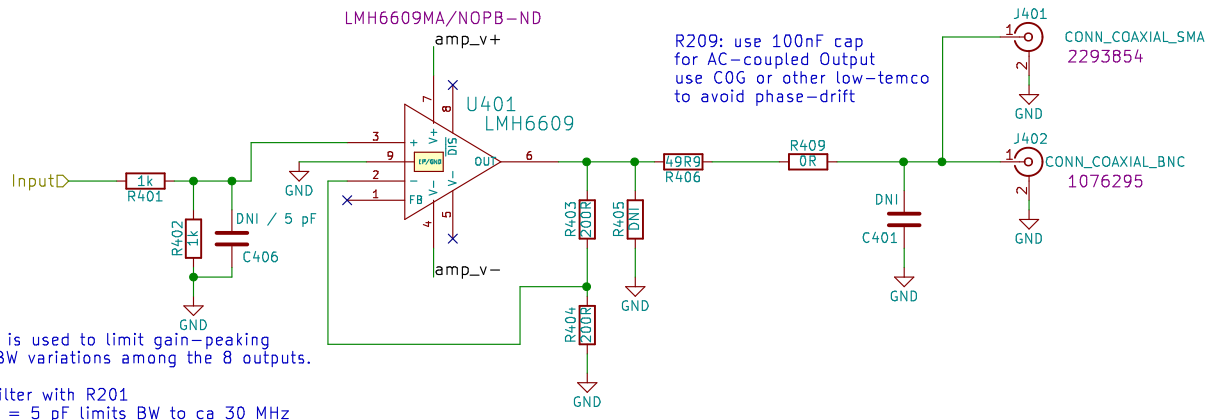
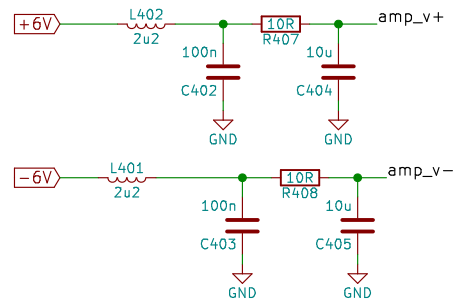


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 RC-filter with R201
 C206 = 5 pF limits BW to ca 30 MHz

R209: use 100nF cap for AC-coupled Output use COG or other low-tempco to avoid phase-drift

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gain-peaking inceases from ch1 -> ch8		
Anders Wallin (anders.e.e.wallin "at" gmail.com)		
Sheet: /out2/		
File: output_stage.sch		
Title: Anders' Frequency Distribution Amplifier 2017.03		
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 3/10



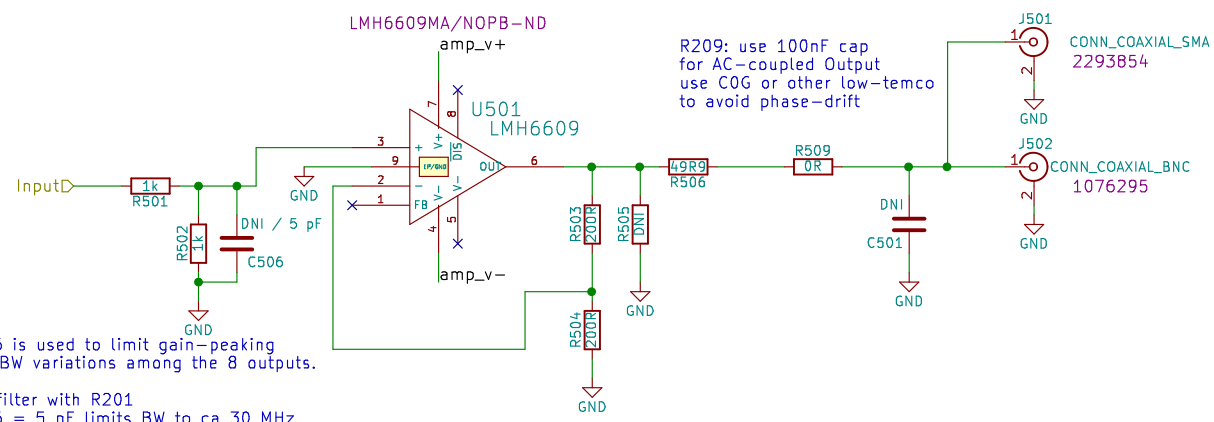
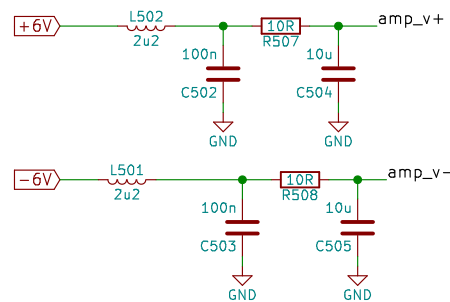
C206 is used to limit gain-peaking and BW variations among the 8 outputs.
 RC-filter with R201
 C206 = 5 pF limits BW to ca 30 MHz

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gain-peaking inceases from ch1 -> ch8		
Anders Wallin (anders.e.e.wallin "at" gmail.com)		
Sheet: /out3/		
File: output_stage.sch		
Title: Anders' Frequency Distribution Amplifier 2017.03		
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 4/10

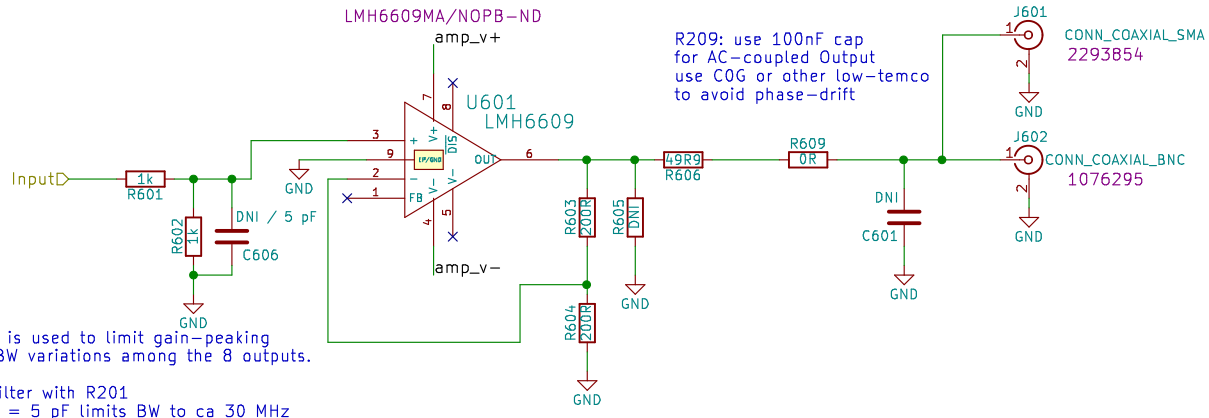
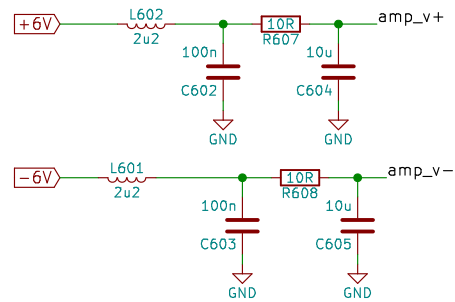


C206 is used to limit gain-peaking and BW variations among the 8 outputs.
 RC-filter with R201
 C206 = 5 pF limits BW to ca 30 MHz

R209: use 100nF cap for AC-coupled Output use COG or other low-tempco to avoid phase-drift

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gain-peaking inceases from ch1 -> ch8		
Anders Wallin (anders.e.e.wallin "at" gmail.com)		
Sheet: /out4/		
File: output_stage.sch		
Title: Anders' Frequency Distribution Amplifier 2017.03		
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 5/10

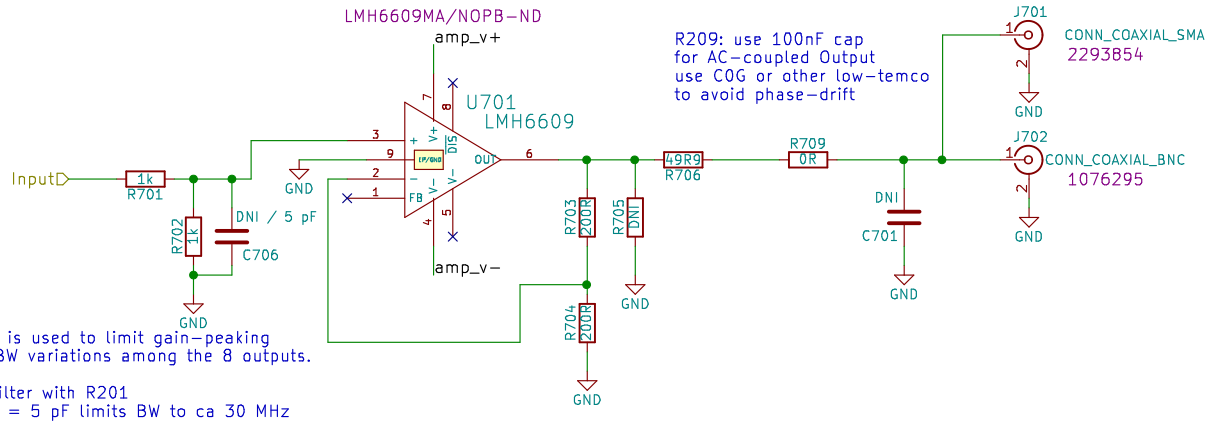
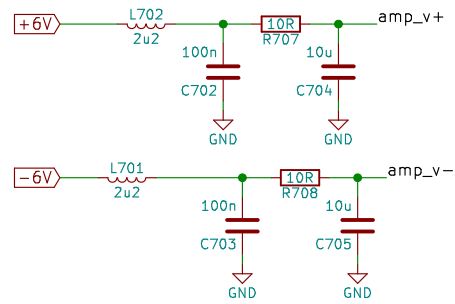


C206 is used to limit gain-peaking and BW variations among the 8 outputs.
 RC-filter with R201
 C206 = 5 pF limits BW to ca 30 MHz

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gain-peaking inceases from ch1 -> ch8		
Anders Wallin (anders.e.e.wallin "at" gmail.com)		
Sheet: /out5/		
File: output_stage.sch		
Title: Anders' Frequency Distribution Amplifier 2017.03		
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 6/10



C206 is used to limit gain-peaking and BW variations among the 8 outputs.

RC-filter with R201
C206 = 5 pF limits BW to ca 30 MHz

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gain-peaking inceases from ch1 -> ch8

Anders Wallin ([anders.e.e.wallin "at" gmail.com](mailto:anders.e.e.wallin@atgmail.com))

Sheet: /out6/

File: output_stage.sch

Title: Anders' Frequency Distribution Amplifier 2017.03

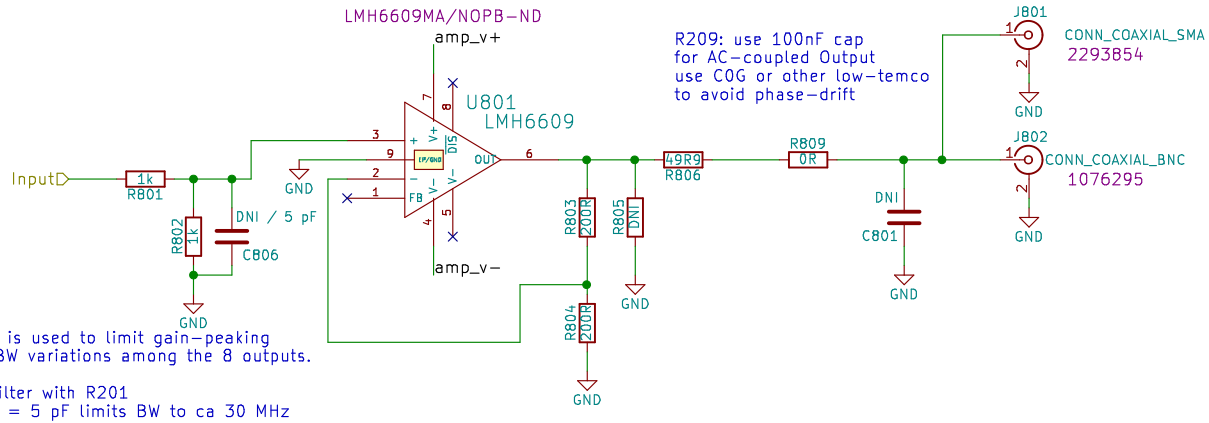
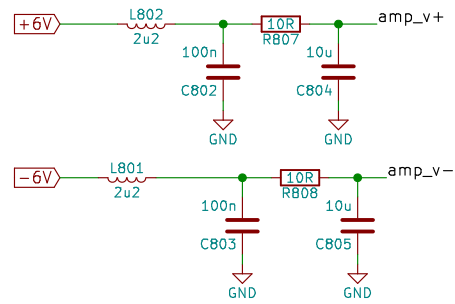
Size: A4

Date: 2017-01-28

Rev: 2017.01

KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1

Id: 7/10



C206 is used to limit gain-peaking and BW variations among the 8 outputs.

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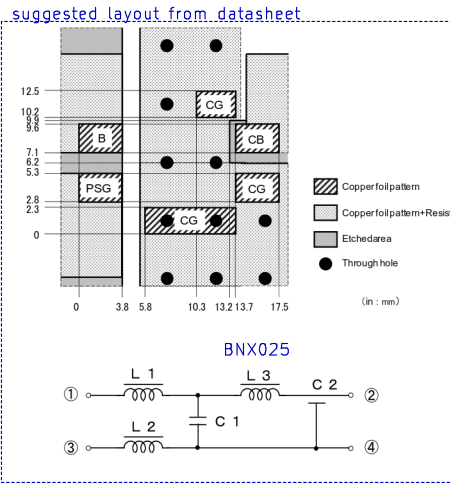
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gain-peaking inceases from ch1 -> ch8
Anders Wallin ([anders.e.e.wallin "at" gmail.com](mailto:anders.e.e.wallin@atgmail.com))

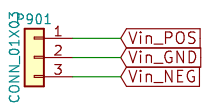
Sheet: /out7/
File: output_stage.sch

Title: Anders' Frequency Distribution Amplifier 2017.03

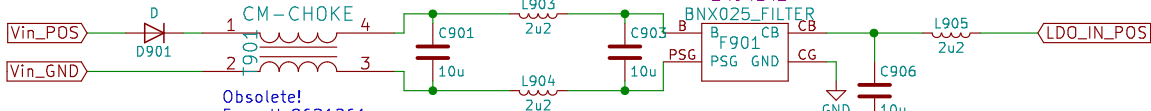
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 8/10



DC INPUT



Farnell 9555986
DO-214AC
9555986

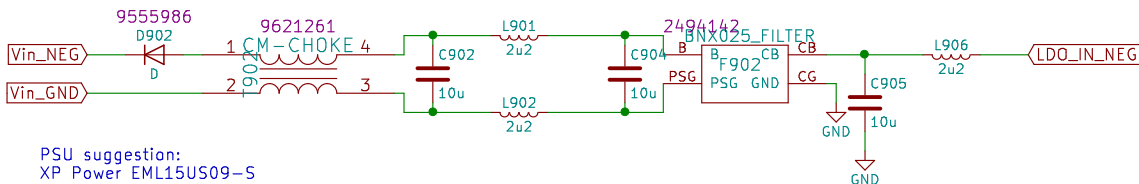


Obsolete!
Farnell 9621261
TDK ZJYS51R5-2PT-01
Obsolete!

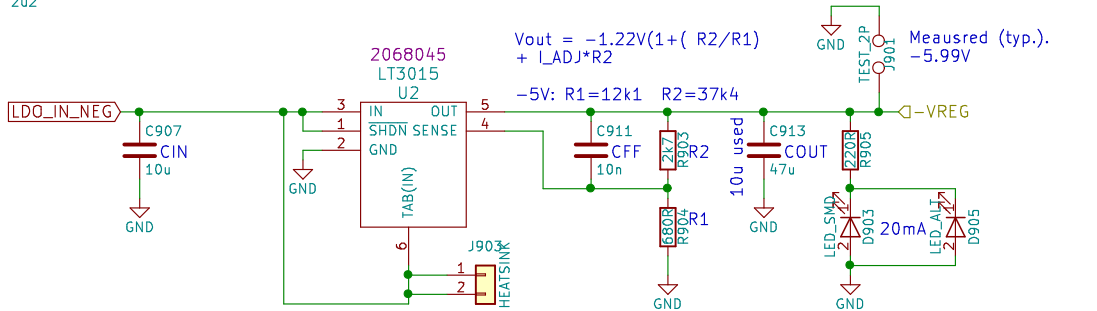
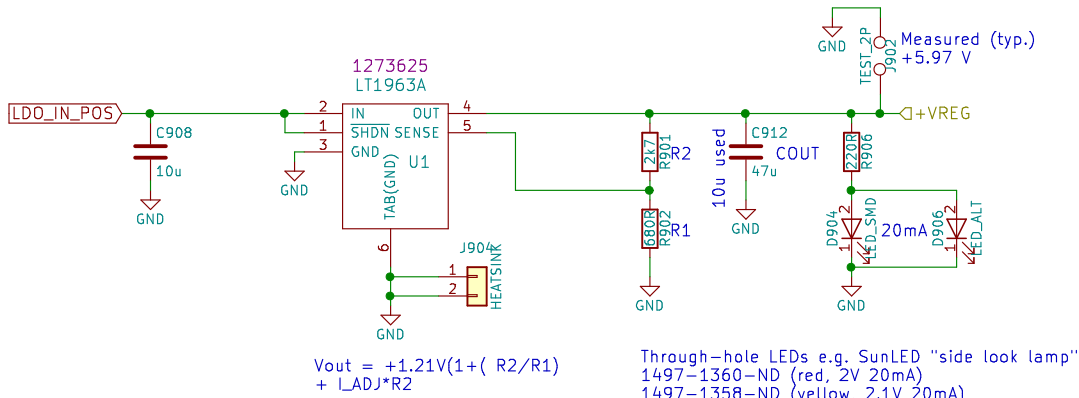
Replacement:
SRF0905-100YCT-ND

digkey 587-1754-1-ND
ferrite bead 1210-size
alternative: 2u2 Inductor

Farnell 9555986
DO-214AC



PSU suggestion:
XP Power EML15US09-S
Digikey: 1470-2615-ND
(two pcs. outputs in series for -Vin, GNDin, +Vin)



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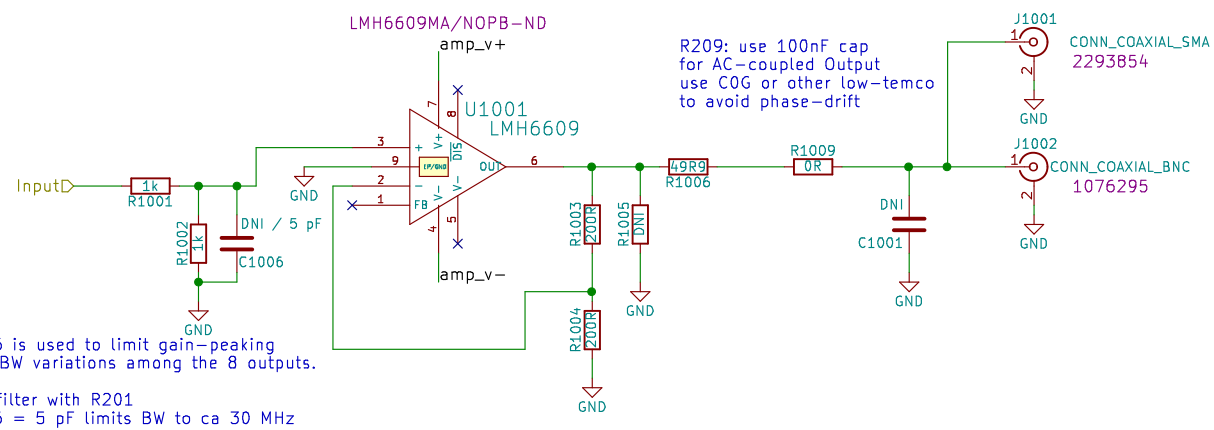
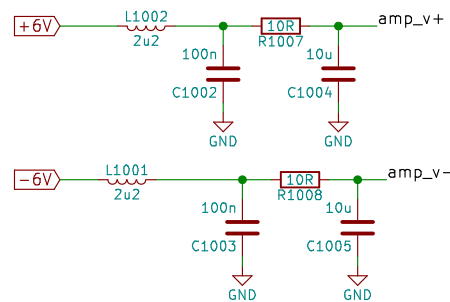
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vregs get quite hot - improve cooling or deruce heating in next version
 FB: 1210-size FERRITE 2kOhm @ 100MHz
 not installed. C901, C902, C903, C904
Anders Wallin (anders.e.e.wallin "at" gmail.com)

Sheet: /Sheet56CEB2D2/
 File: FDA_PSU.sch

Title: Anders' Frequency Distribution Amplifier 2017.03

Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 9/10



C206 is used to limit gain-peaking and BW variations among the 8 outputs.
 RC-filter with R201
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gain-peaking inceases from ch1 -> ch8		
Anders Wallin (anders.e.e.wallin "at" gmail.com)		
Sheet: /out8/		
File: output_stage.sch		
Title: Anders' Frequency Distribution Amplifier 2017.03		
Size: A4	Date: 2017-01-28	Rev: 2017.01
KiCad E.D.A. kicad 5.0.1-33cea8e68ubuntu16.04.1		Id: 10/10