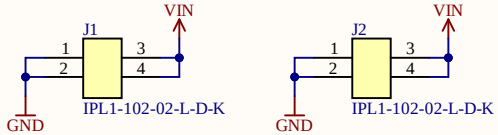
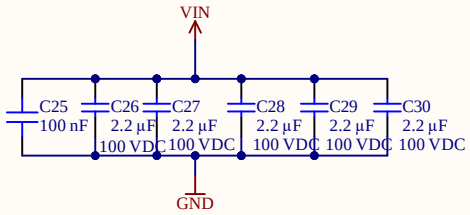
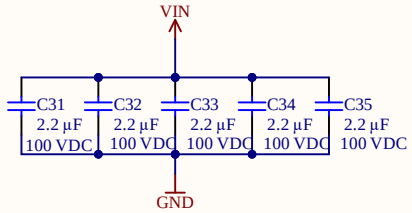
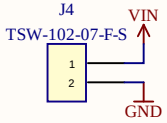
VIN -> 7V to 65V



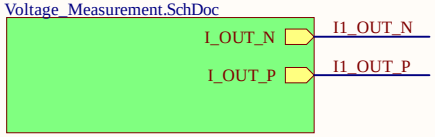




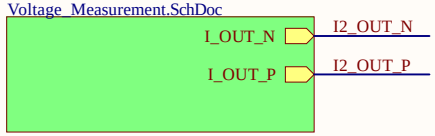
Alternative



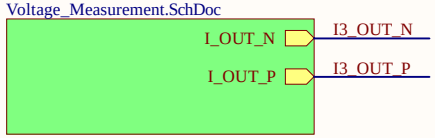
Measurement_1
Voltage_Measurement.SchDoc



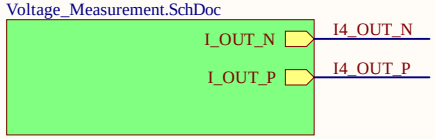
Measurement_2
Voltage_Measurement.SchDoc



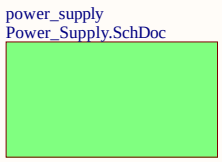
Measurement_3
Voltage_Measurement.SchDoc

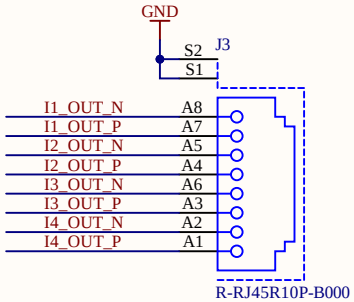


Measurement_4
Voltage_Measurement.SchDoc



power_supply
Power_Supply.SchDoc

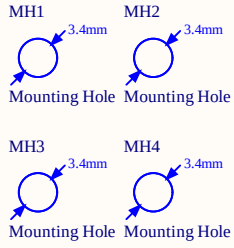




Serial1
Serial
Serialnumber 6.3 x 6.3 mm

INFO1
Project
ProjectRevision
AuthorParam
ProjectDate
Design Information

LOGO1
UltraZohm
UZ Logo



Title TopSheet.SchDoc		UltraZohm	
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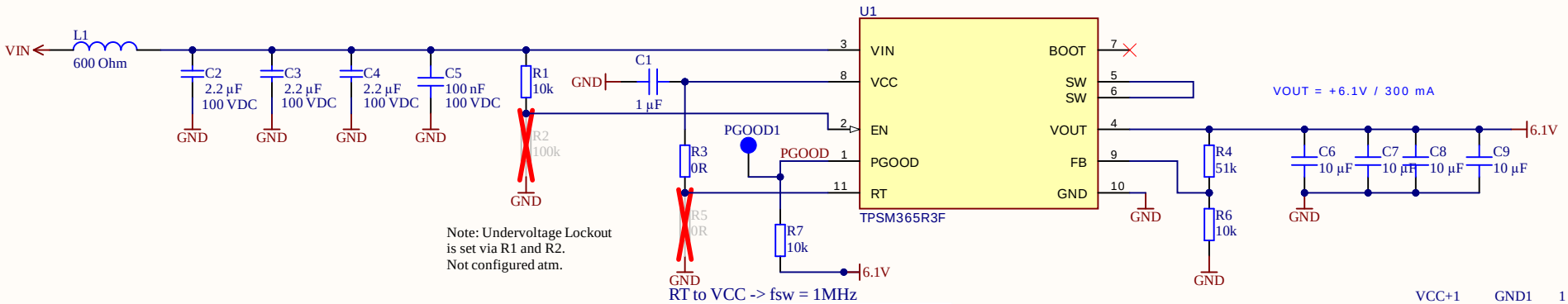
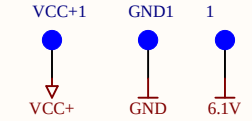
$$R_{FBT}[\mathrm{k\Omega}] = R_{FBB}[\mathrm{k\Omega}] \times \left(\frac{V_{OUT}[\mathrm{V}]}{1\,\mathrm{V}} - 1\right)$$

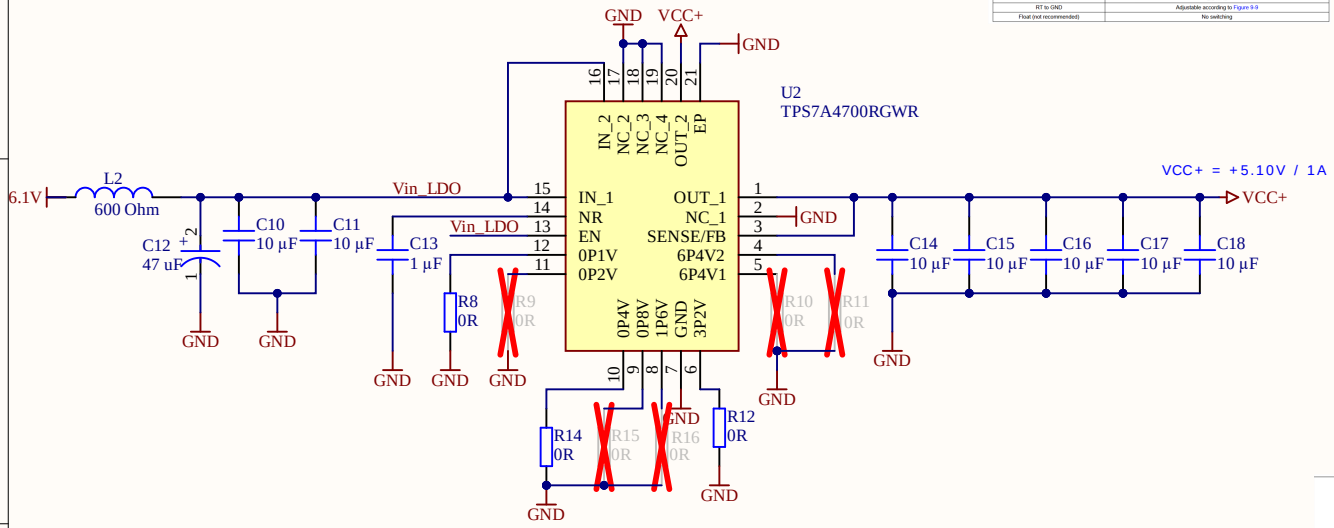


Note: Undervoltage Lockout is set via R1 and R2. Not configured atm.

Table 9-5. RT Pin Setting

RT/INPUT	SWITCHING FREQUENCY
VCC	1 MHz
GND	2.2 MHz
RT to GND	Adjustable according to Figure 9-9
Float (not recommended)	No switching





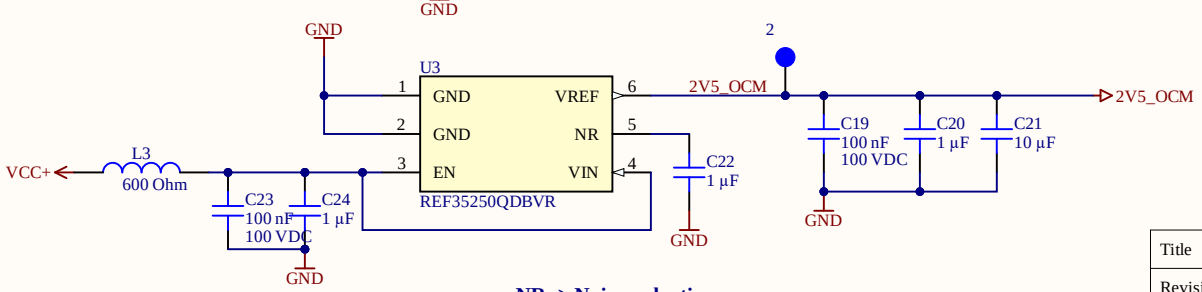
7.5.1 ANY-OUT Programmable Output Voltage

Both devices can be used in ANY-OUT mode. For ANY-OUT operation, the TPS7A4700 and TPS7A4701 do not use external resistors to set the output voltage, but use device pins 4, 5, 6, 8, 9, 10, 11, and 12 to program the regulated output voltage. Each pin is either connected to ground (active) or is left open (floating). The ANY-OUT programming is set by Equation 2 as the sum of the internal reference voltage ($V_{(REF)}$ = 1.4 V) plus the accumulated sum of the respective voltages assigned to each active pin; that is, 100 mV (pin 12), 200 mV (pin 11), 400 mV (pin 10), 800 mV (pin 9), 1.6 V (pin 8), 3.2 V (pin 6), 6.4 V (pin 5), or 6.4 V (pin 4). Table 1 summarizes these voltage values associated with each active pin setting for reference. By leaving all program pins open, or floating, the output is thereby programmed to the minimum possible output voltage equal to $V_{(REF)}$.

$$V_{OUT} = V_{REF} + (\Sigma \text{ ANY-OUT Pins to Ground}) \quad (2)$$

Table 1. ANY-OUT Programmable Output Voltage

ANY-OUT PROGRAM PINS (Active Low)	ADDITIVE OUTPUT VOLTAGE LEVEL
Pin 4 (6P4V2)	6.4 V
Pin 5 (6P4V1)	6.4 V
Pin 6 (3P2)	3.2 V
Pin 8 (1P6)	1.6 V
Pin 9 (0P8)	800 mV
Pin 10 (0P4)	400 mV
Pin 11 (0P2)	200 mV
Pin 12 (0P1)	100 mV



NR -> Noise reduction cap

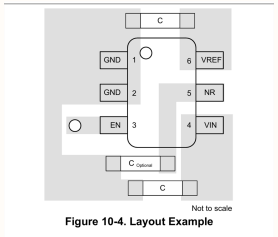
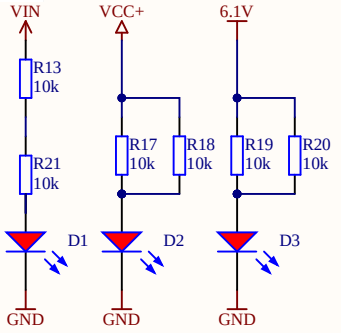


Figure 10-4. Layout Example



Title Power_Supply.SchDoc		**UltraZohm**	
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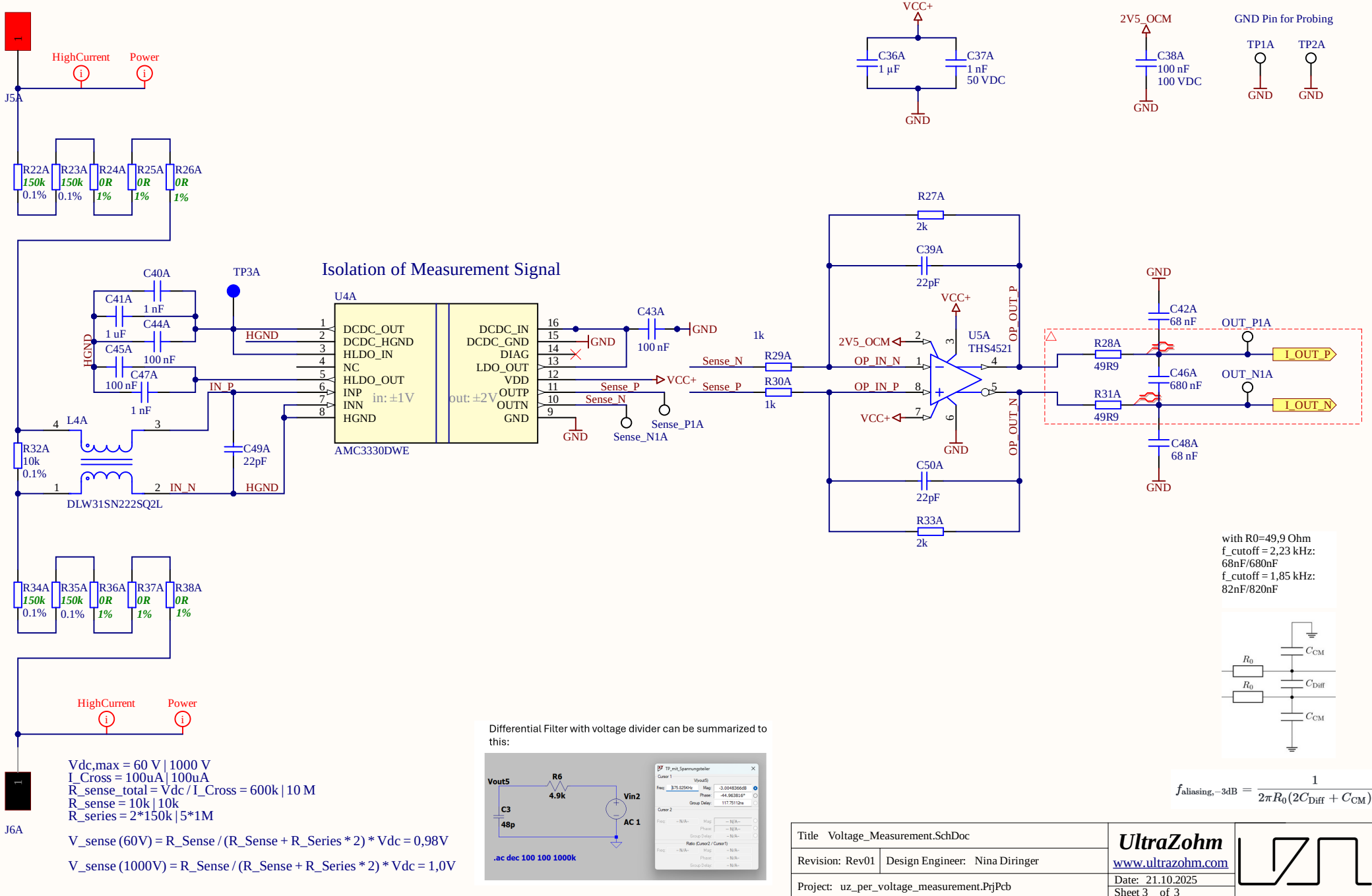

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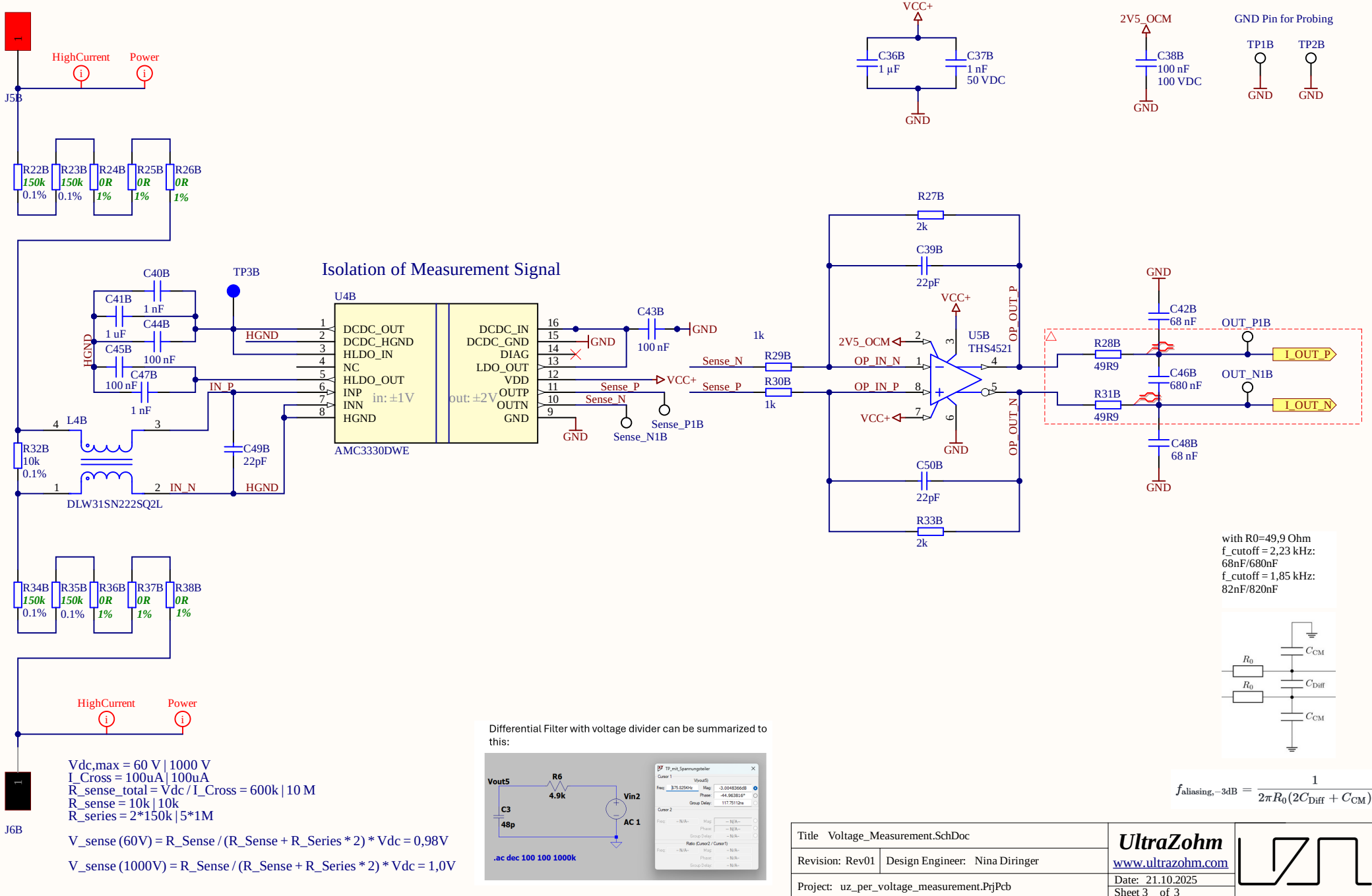

Vdc,max = 60 V | 1000 V
I_Cross = 100uA | 100uA
R_sense_total = Vdc / I_Cross = 600k | 10 M
R_sense = 10k | 10k
R_series = 2*150k | 5*1M

V_sense (60V) = R_Sense / (R_Sense + R_Series * 2) * Vdc = 0,98V

V_sense (1000V) = R_Sense / (R_Sense + R_Series * 2) * Vdc = 1,0V

Differential Filter with voltage divider can be summarized to this:

with R0=49,9 Ohm
f_cutoff = 2,23 kHz:
68nF/680nF
f_cutoff = 1,85 kHz:
82nF/820nF

$$f_{aliasing,-3dB} = \frac{1}{2\pi R_0 (2C_{Diff} + C_{CM})}$$

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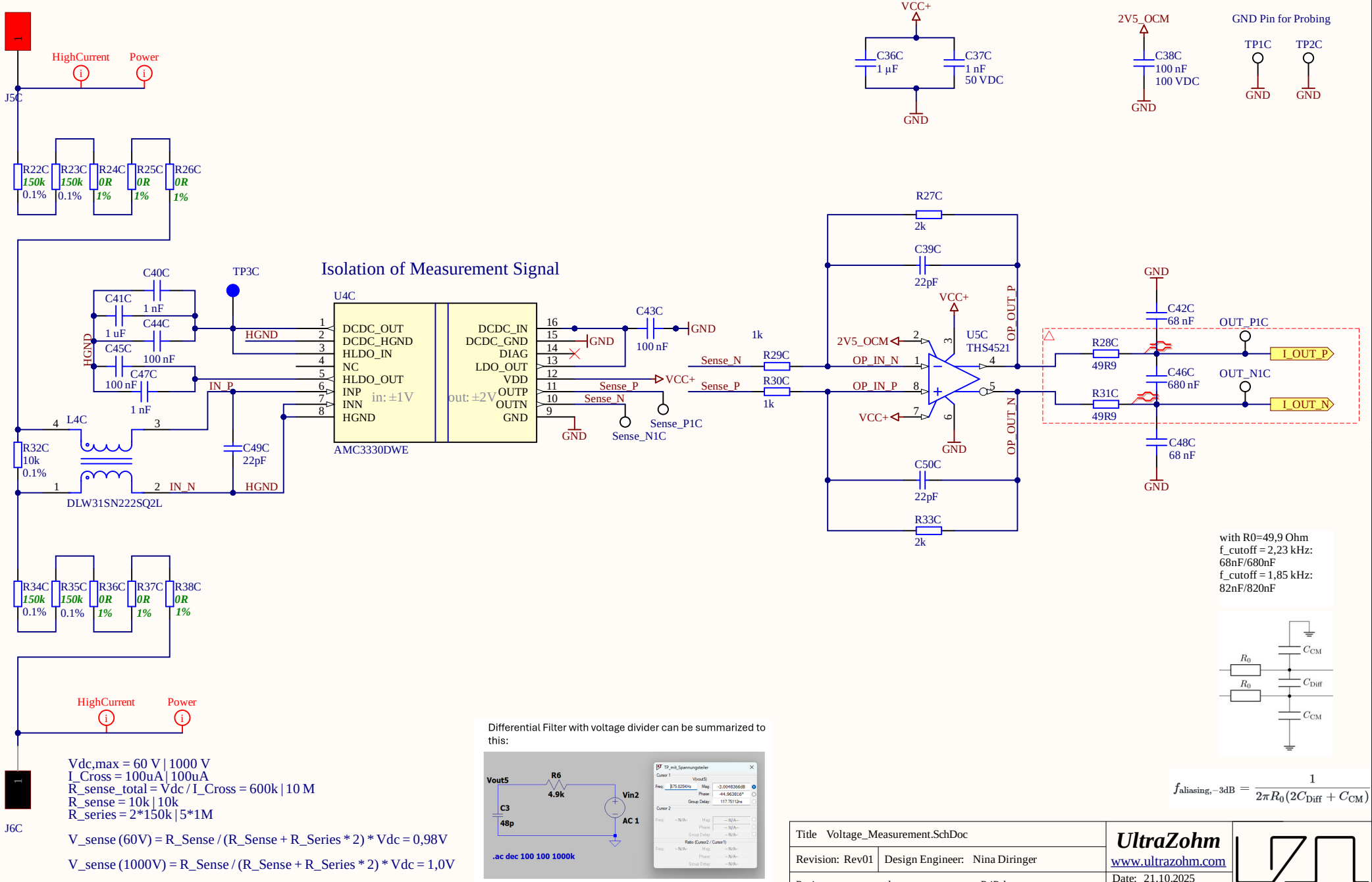
Isolation of Measurement Signal
HighCurrent
Power
J5C
R22C 150k 0.1%
R23C 150k 0.1%
R24C 0R 1%
R25C 0R 1%
R26C 0R 1%
C40C 1 nF
C41C 1 uF
C44C 100 nF
C45C 100 nF
C47C 1 nF
HGND
TP3C
U4C
DCDC_OUT
DCDC_HGND
HLDO_IN
NC
HLDO_OUT
INP
INN
HGND
in: ±1V
DCDC_IN
DCDC_GND
DIAG
LDO_OUT
VDD
OUTP
OUTN
GND
out: ±2V
AMC3330DWE
C43C 100 nF
Sense_P
Sense_N
Sense_P1C
Sense_N1C
IN_P
IN_N
L4C
DLW31SN222SQ2L
R32C 10k 0.1%
C49C 22pF
R29C 1k
R30C 1k
VCC+
C36C 1 µF
C37C 1 nF 50 VDC
GND
2V5_OCM
C38C 100 nF 100 VDC
GND Pin for Probing
TP1C
TP2C
R27C 2k
C39C 22pF
U5C THS4521
OP_IN_N
OP_IN_P
OP_OUT_P
OP_OUT_N
C50C 22pF
R33C 2k
R28C 49R9
R31C 49R9
C42C 68 nF
C46C 680 nF
C48C 68 nF
OUT_P1C
OUT_N1C
I_OUT_P
I_OUT_N
R34C 150k 0.1%
R35C 150k 0.1%
R36C 0R 1%
R37C 0R 1%
R38C 0R 1%
HighCurrent
Power
J6C
Vdc,max = 60 V | 1000 V
I_Cross = 100uA | 100uA
R_sense_total = Vdc / I_Cross = 600k | 10 M
R_sense = 10k | 10k
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Differential Filter with voltage divider can be summarized to this:
Vout5
R6
4.9k
C3
48p
Vin2
AC 1
.ac dec 100 100 1000k
with R0=49,9 Ohm
f_cutoff = 2,23 kHz:
68nF/680nF
f_cutoff = 1,85 kHz:
82nF/820nF
$f_{aliasing,-3dB} = \frac{1}{2\pi R_0(2C_{Diff} + C_{CM})}$
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Design Engineer: Nina Diringer
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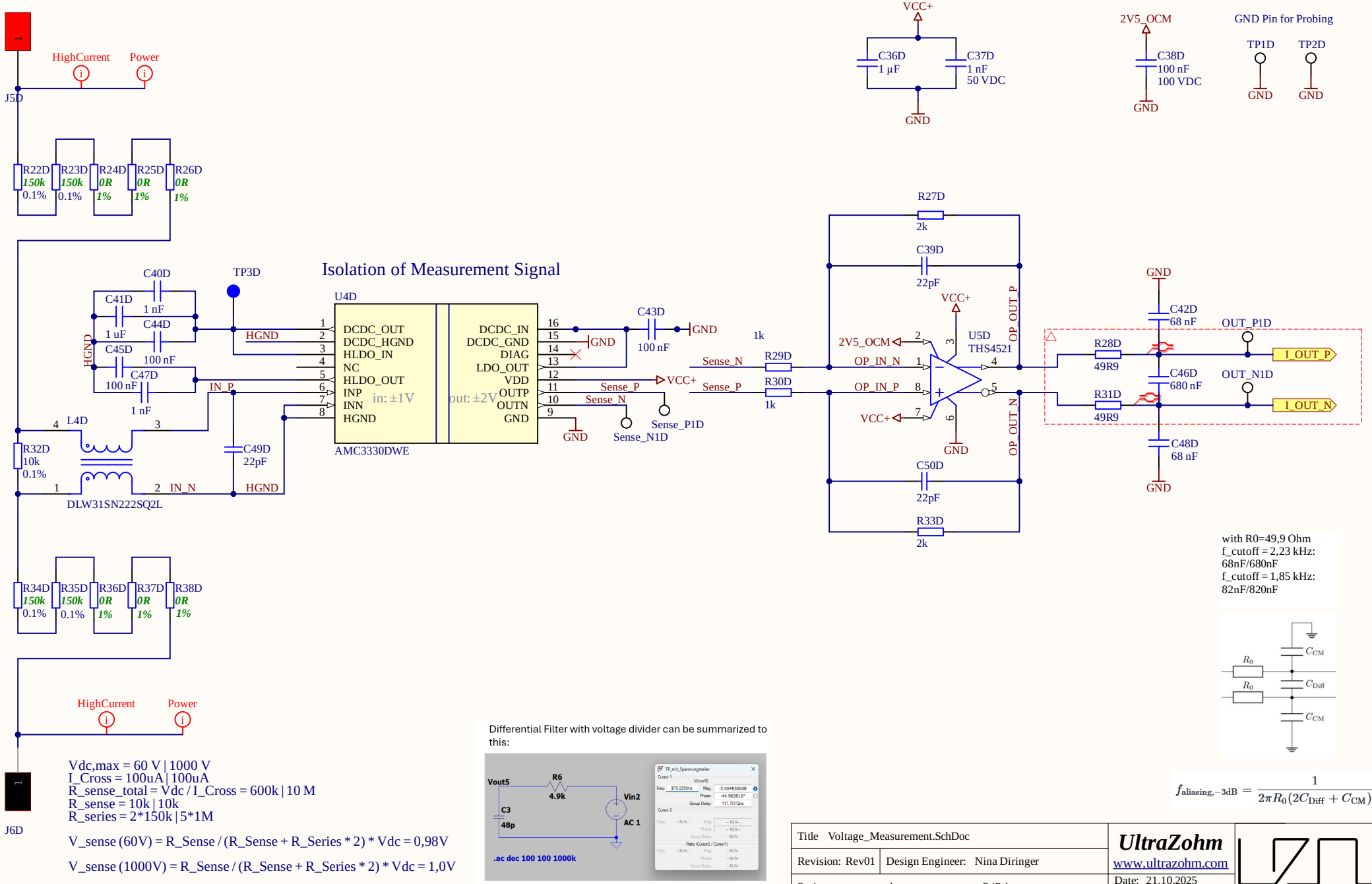
Isolation of Measurement Signal
HighCurrent
Power
J5D
R22D 150k 0.1%
R23D 150k 0.1%
R24D 0R 1%
R25D 0R 1%
R26D 0R 1%
C40D
C41D 1 nF
C44D 1 uF
C45D 100 nF
C47D 100 nF
1 nF
HGND
TP3D
IN_P
IN_N
L4D
R32D 10k 0.1%
DLW31SN222SQ2L
C49D 22pF
U4D
DCDC_OUT
DCDC_HGND
HLDO_IN
NC
HLDO_OUT
INP
INN
HGND
in: ±1V
DCDC_IN
DCDC_GND
DIAG
LDO_OUT
VDD
OUTP
OUTN
GND
out: ±2V
AMC3330DWE
C43D 100 nF
Sense_P
Sense_N
Sense_P1D
Sense_N1D
VCC+
R29D 1k
R30D 1k
R27D 2k
C39D 22pF
R33D 2k
C50D 22pF
U5D THS4521
2V5_OCM
OP_IN_N
OP_IN_P
OP_OUT_P
OP_OUT_N
C42D 68 nF
C46D 680 nF
C48D 68 nF
R28D 49R9
R31D 49R9
OUT_P1D
OUT_N1D
I_OUT_P
I_OUT_N
C36D 1 µF
C37D 1 nF 50 VDC
C38D 100 nF 100 VDC
2V5_OCM
GND Pin for Probing
TP1D
TP2D
R34D 150k 0.1%
R35D 150k 0.1%
R36D 0R 1%
R37D 0R 1%
R38D 0R 1%
J6D
Vdc,max = 60 V | 1000 V
I_Cross = 100uA | 100uA
R_sense_total = Vdc / I_Cross = 600k | 10 M
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Vout5
R6
4.9k
C3
48p
Vin2
AC 1
.ac dec 100 100 1000k
with R0=49,9 Ohm
f_cutoff = 2,23 kHz:
68nF/680nF
f_cutoff = 1,85 kHz:
82nF/820nF
$f_{aliasing,-3dB} = \frac{1}{2\pi R_0(2C_{Diff} + C_{CM})}$
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