

TLx5572 Evalboard 3-Phase
Getting started guide

Revision V1.0

December 2025

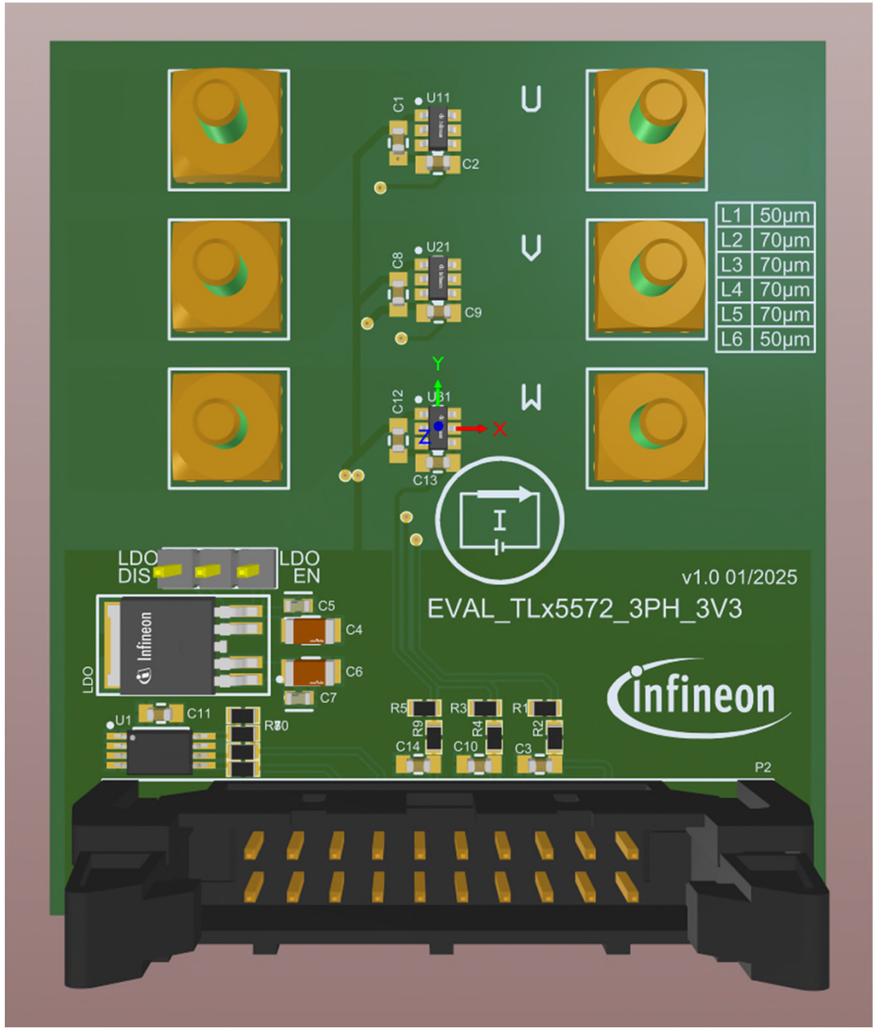
Key features of TLx5572 Eval board

- 3 phase system with low cost non-differential TMR sensors
- Cross talk minimizing current rail design
- $I_{primary}$ fullscale per phase = ~165 A
- $Number\ of\ phases = 3$
- $f_{currentrail} >= 120\ kHz$ (-3 dB) defined by current rail design

Ordering information:
Two versions available: 3.3 V and 5 V

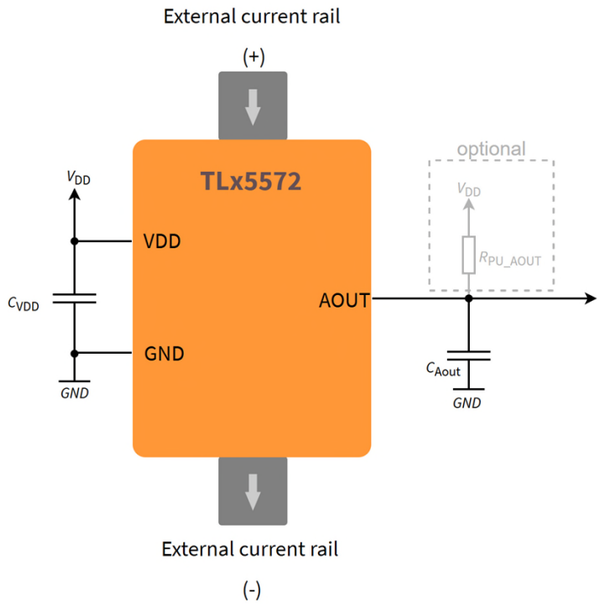
EVAL_TLX5572_3PH_5V - SP006179906
Used sensor: TLE5572-AE08E1-R-E0001 - SP006042510

EVAL_TLX5572_3PH_3V - SP006179910
Used sensor: TLE5572-AE12E1-R-E0001 - SP006042517

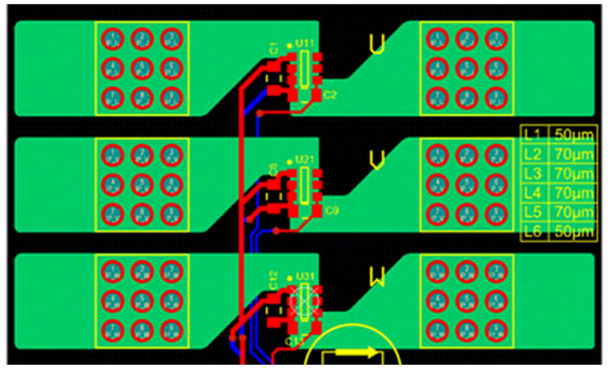


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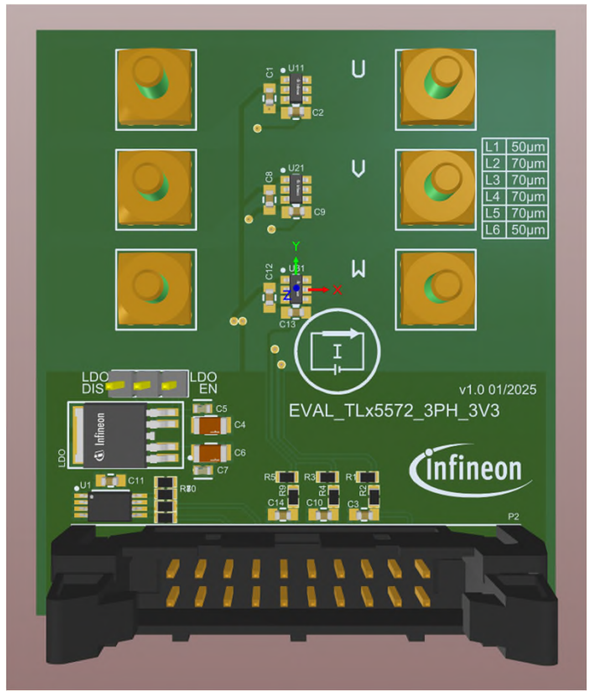
sensor + current rail = system



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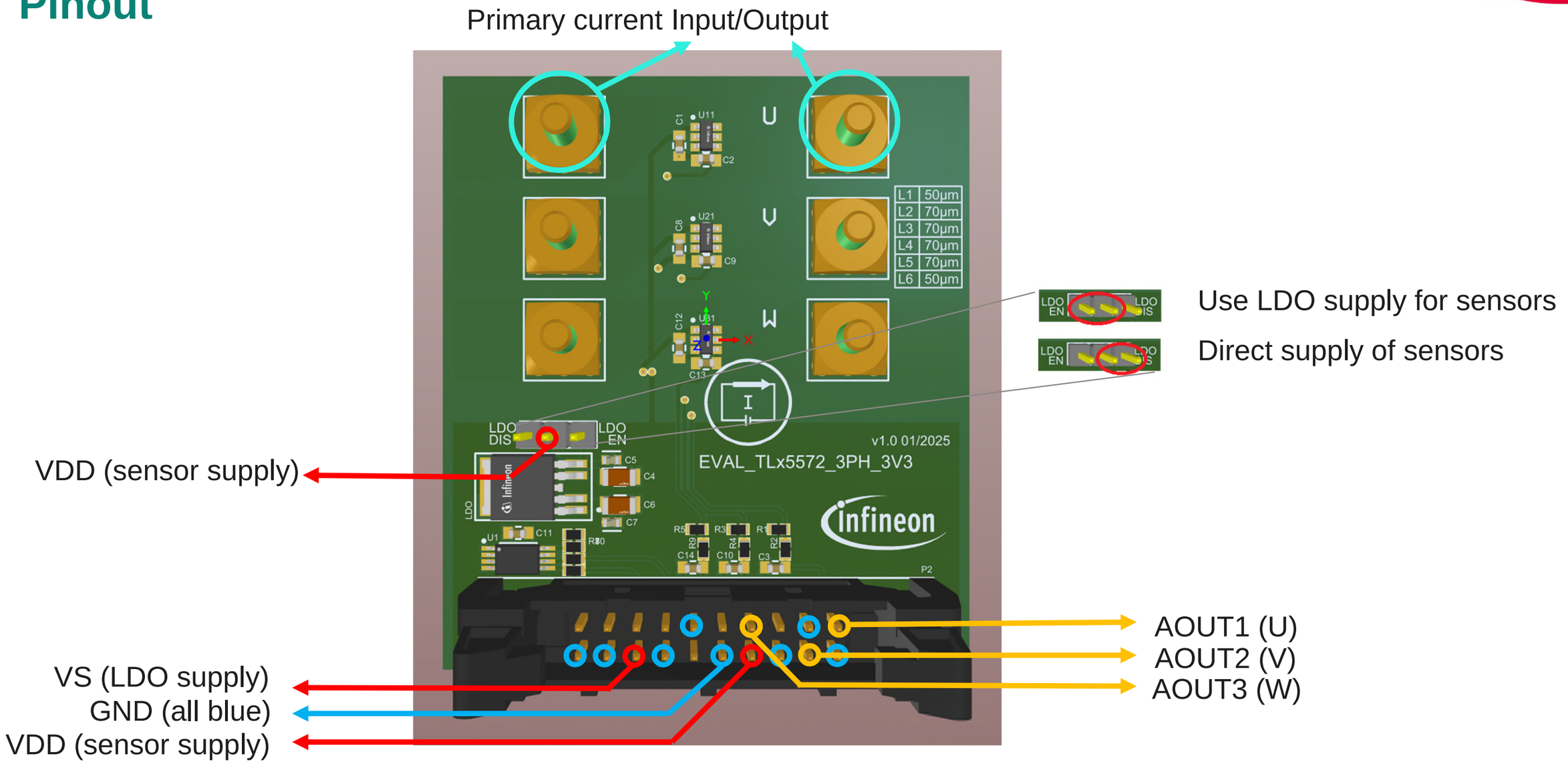


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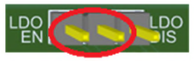
Pinout



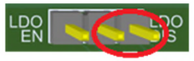
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Getting Started

- Choose the LDO for stabilized VDD
  - **Recommended** Option A) Sensor supply via LDO
    - Place jumper on LDO_EN



Use LDO supply for sensor

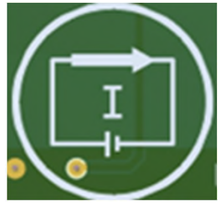


Direct supply of sensor

  - Option B) Directly supply of sensor (expert use only, V_{QC} and „*full scale range*“ will change)
    - VDD 3.3 V – 5 V
    - Place jumper on LDO_DIS

- Connect VS and GND
  - Set $V_s = V_{DD} + 0.3\ V$ (e.g. 3.6 V for 3.3 V board version)
  - Observe $V_{DD} = 3.3V\ or\ 5V$
  - Observe $V_{Aout}\ @(I_{primary} = 0\ A) = \frac{V_{DD}}{2} = V_{QC} = 1.65\ V\ or\ 2.5\ V$

- Connect Current terminals
  - Supply $I_{primary}$ through terminals (mind the sign convention on the board)
  - Observe (V_{Aout} - V_{QC}) changing proportionally to the $I_{primary}$



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First estimation 3.3V Board version

$$Average_Sensitivity_{TLx5572-EvalBoard-3V3} = \sim 8.2\ \frac{mV}{A}$$

$$V_{QC\ nominal\ 3V3} = \frac{V_{DD}}{2} = 1.65\ V$$

$$Current_{measured} = \frac{1}{Sensitivity_{TLx5572-EvalBoard-3V3}} \cdot (V_{Aout} - V_{QC}) = \frac{1}{8.2}\frac{A}{mV} \cdot (1.95\ V - 1.65\ V) = \sim 42.7\ A$$

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First estimation 5V Board version

$$Average_Sensitivity_{TLx5572-EvalBoard-5V} = \sim 13.1\ \frac{mV}{A}$$

$$V_{QC\ nominal\ 5V} = \frac{V_{DD}}{2} = 2.5\ V$$

$$Current_{measured} = \frac{1}{Sensitivity_{TLx5572-EvalBoard-5V}} \cdot (V_{Aout} - V_{QC}) = \frac{1}{13.1}\frac{A}{mV} \cdot (2.85\ V - 2.5\ V) = \sim 26.7\ A$$

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Offset and sensitivity calibration

- Single point sensitivity calibration per phase
  - Offset calibration
    - Measure $V_{QC} = V_{Aout}$ @ $(I_{primary} = 0)$
  - Sensitivity calibration
    - Pulse eg. $I_{primary} = 25A$ to keep selfheating at a minimum
      (Recommendation is app 20% of full scale range to have good balance between self heating and accuracy)
    - Measure V_{Aout} @ $(I_{primary} = 25A)$
    - Calculate $Sensitivity_{TLx5572-EvalBoard} = \frac{V_{Aout} - V_{QC}}{I_{primary}}$ in $\frac{mV}{A}$ for this specfic board

Use these parameters V_{QC} and $Sensitivity_{TLx5572-EvalBoard}$ for the calculation of the actual current

$$I_{primary_{measured}} = \frac{1}{Sensitivity_{TLx5572-EvalBoard}} \cdot (V_{Aout} - V_{QC})$$

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Sensitivity calculation

The sensitivity depends on two factors.

Below you find a estimation of your the two board designs

- $Sensitivity_{TLx5572} = gain_{currentrail} \cdot gain_{TLx5572}$
- $Sensitivity_{TLx5572\ 3V3\ S3} = 75\,\frac{uT}{A} \cdot \frac{109\,mV}{mT} = \sim 8.2\,\frac{mV}{A}$
- $Sensitivity_{TLx5572\ 5V\ S4} = 75\,\frac{uT}{A} \cdot \frac{174\,mV}{mT} = \sim 13.1\,\frac{mV}{A}$

$gain_{currentrail}$ ...can be obtained by simulation (tools offered on our website

$gain_{TLx5572}$ ...Datasheet parameter sensitvity (subject to part to part variation)

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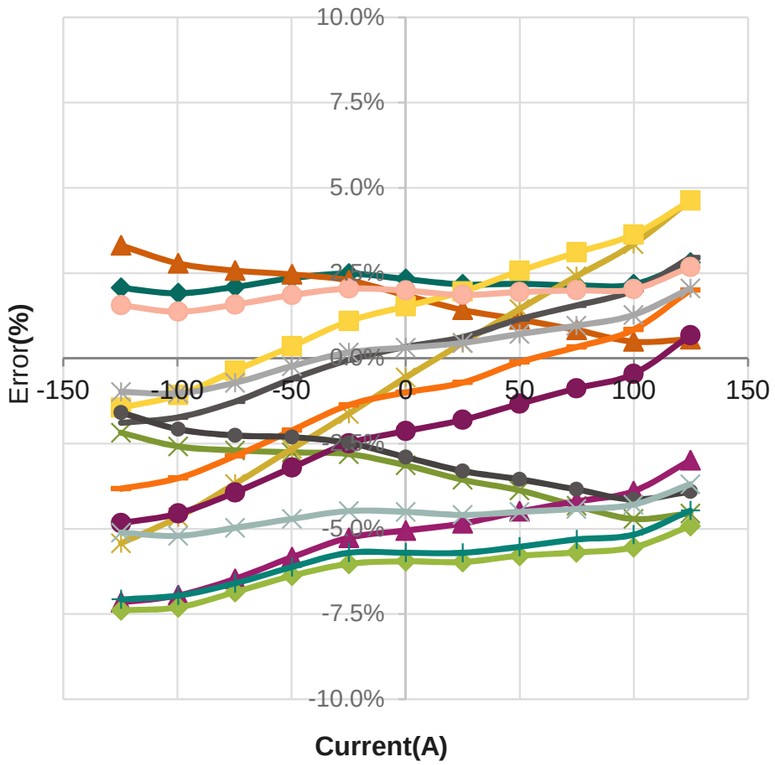
Importance of calibration:

A calibration of each sensor will improve the accuracy significantly

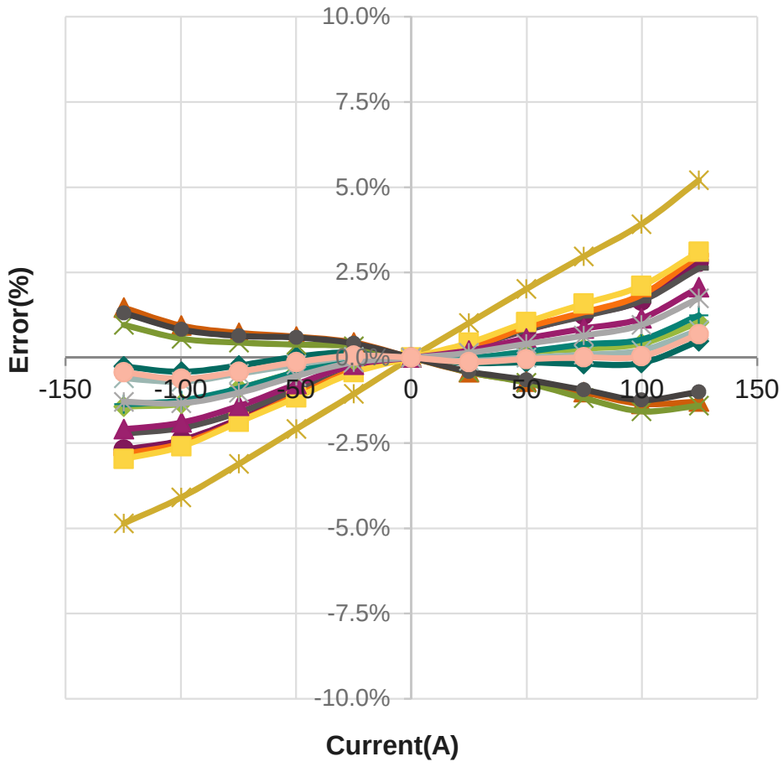
Here 3 stages of calibration and their respective accuracy

Assumed application full scale Range = 125 A

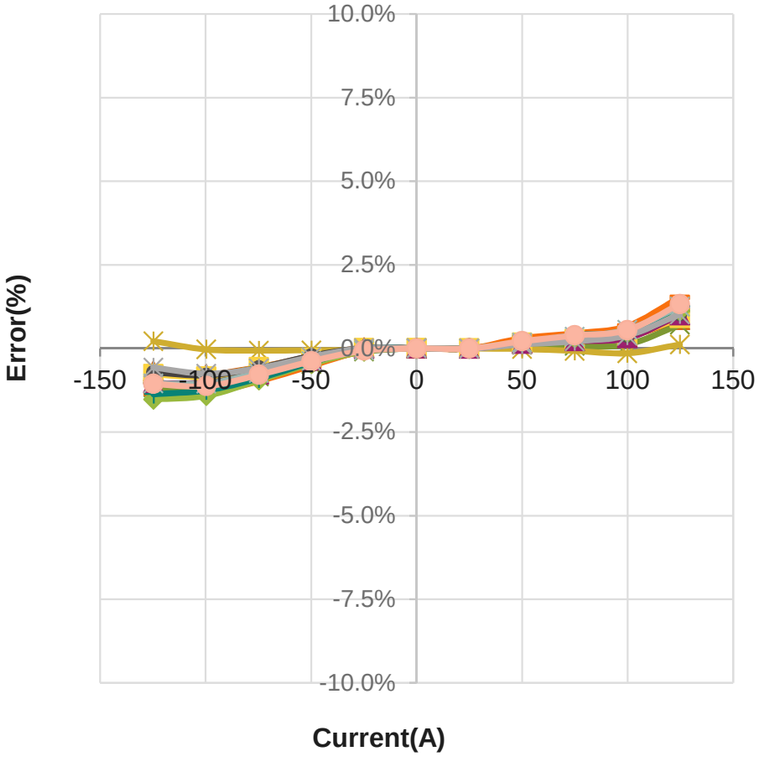
Accuracy (%)
offset uncalibrated
mean sensitivity 8.2 mV/A used



Accuracy (%)
offset calibrated @0 A
mean sensitivity 8.2 mV/A used



Accuracy (%)
offset calibrated @0 A
sensitivity calibrated @25 A



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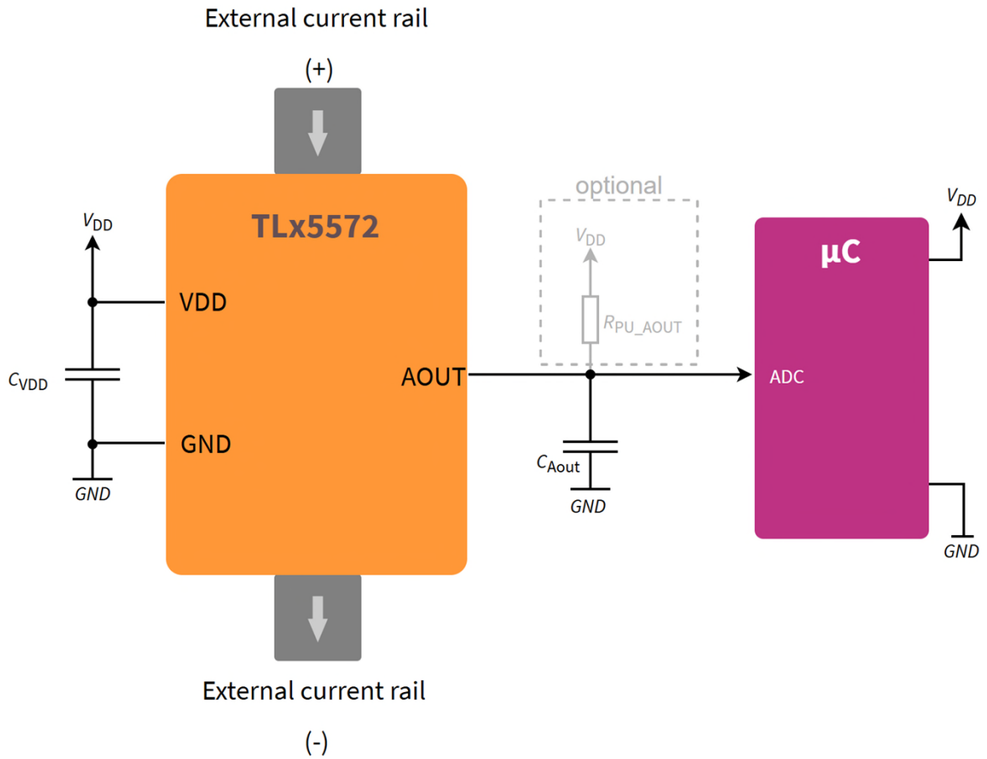
Considerations:

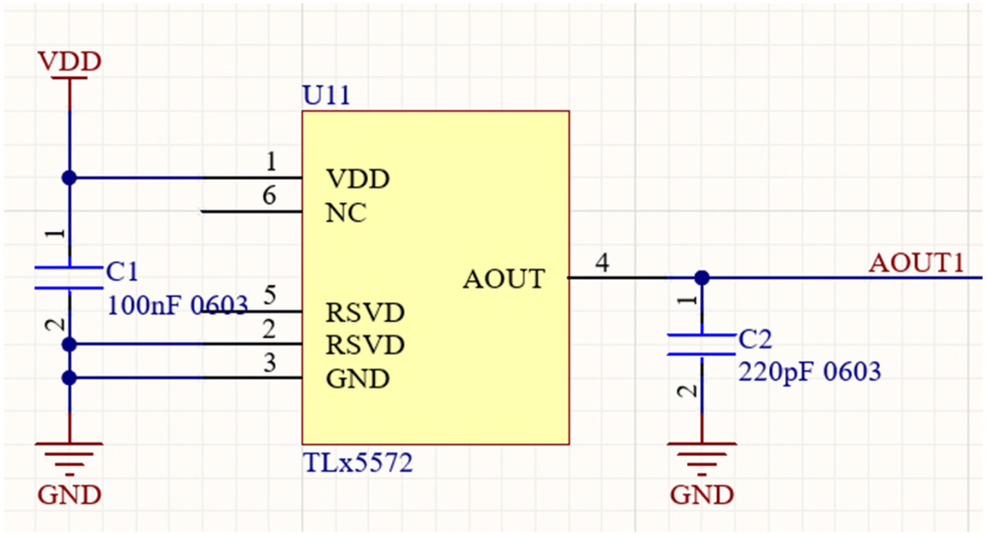
- Part placement tolerances during soldering will affect the sensitivity of each sensor
- Different copper thicknesses will influence sensitivity
- External magnetic stray-fields can influence the offset and sensitivity
- Make sure cables primary current cables are straight and do not cross above or below the sensors

Sensor	Sensitivity (mV/A)	Part to Part Sensitivity error (%)
B1U	7.941071	-2.4
B1V	8.098112	-0.4
B1W	8.104997	-0.4
B2U	8.223202	1.1
B2V	8.281970	1.8
B2W	8.190713	0.7
B3U	8.517842	4.7
B3V	8.238523	1.3
B3W	8.225054	1.1
B4U	8.042626	-1.1
B4V	7.932452	-2.5
B4W	7.934044	-2.5
B5U	8.069961	-0.8
B5V	8.163232	0.4
B5W	8.053991	-1.0

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Block Diagram vs schematic of TLx5572



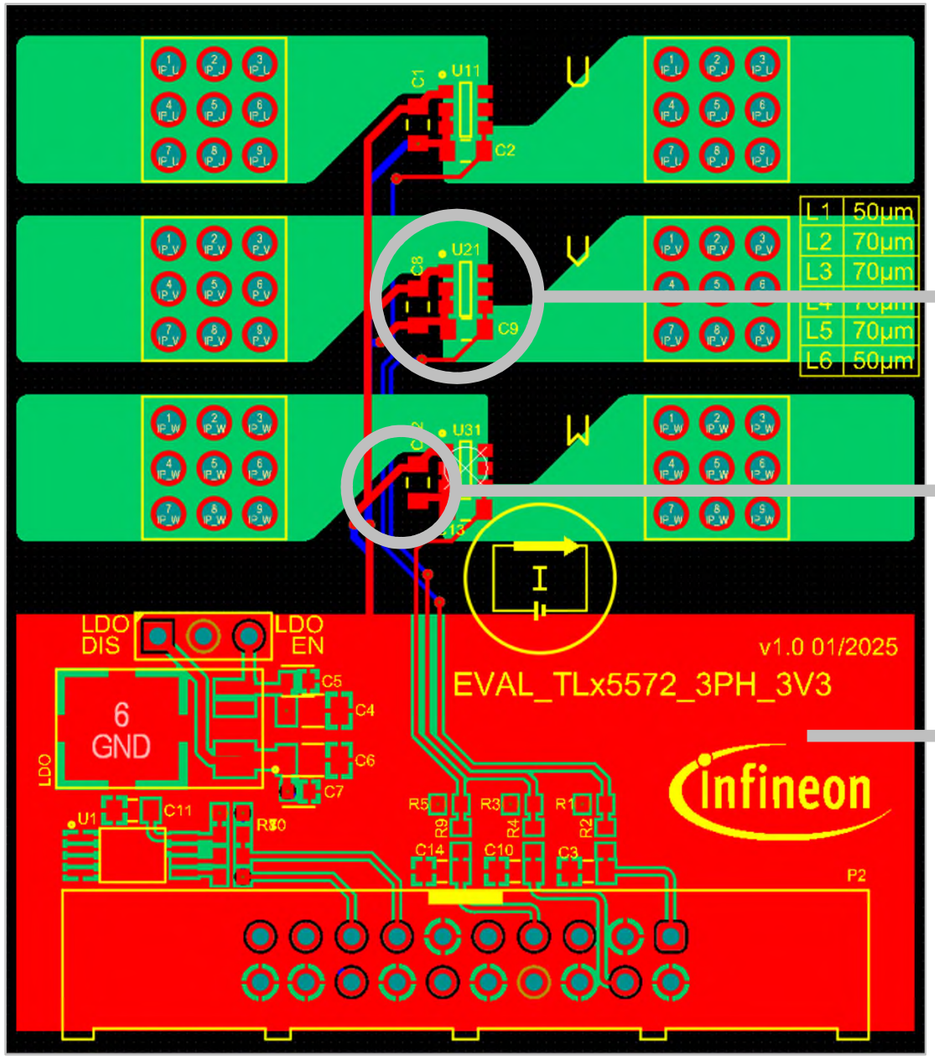


The optional pullup can be used to increase safety coverage of Aout pin

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More Details.

Component placement – Capacitors' footprint should not overlay current rail



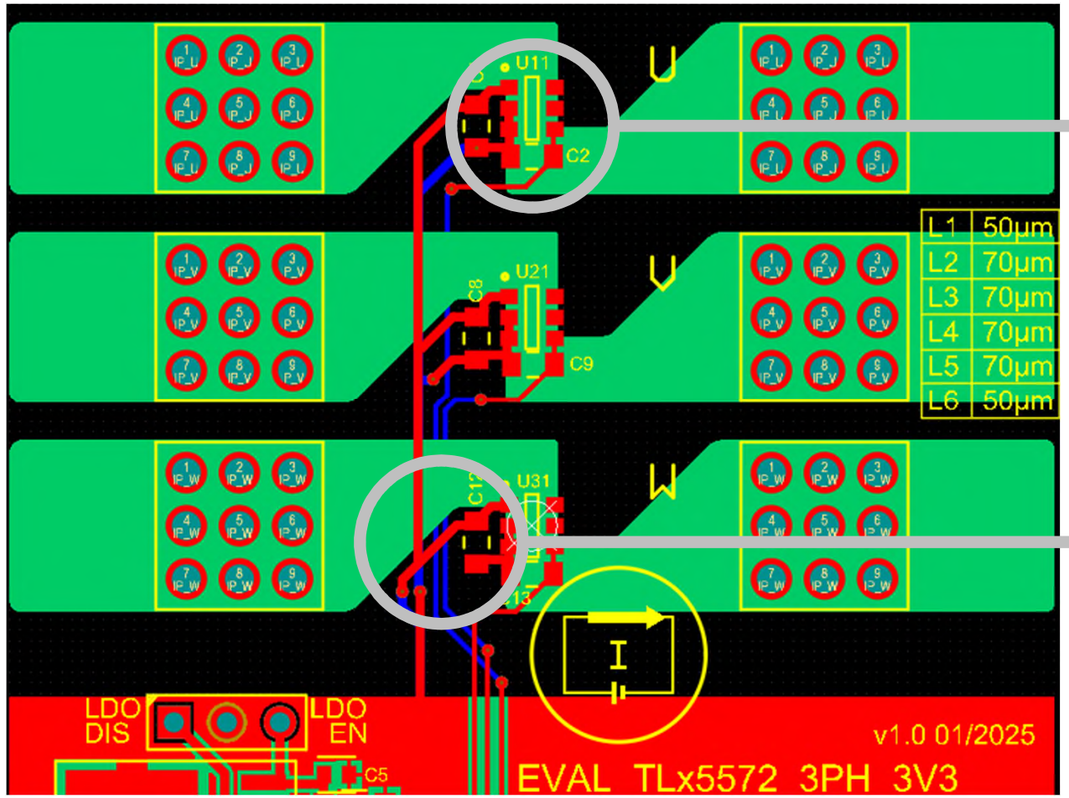
Sensor in the center of current rail.

Sensor capacitors overlaying current rails will increase capacitive coupling. Can be avoided with cutouts.

Signal layer with external EEPROM and LDO

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Signal routing – Route signals as far as possible from current rail center, avoiding overlays with it.

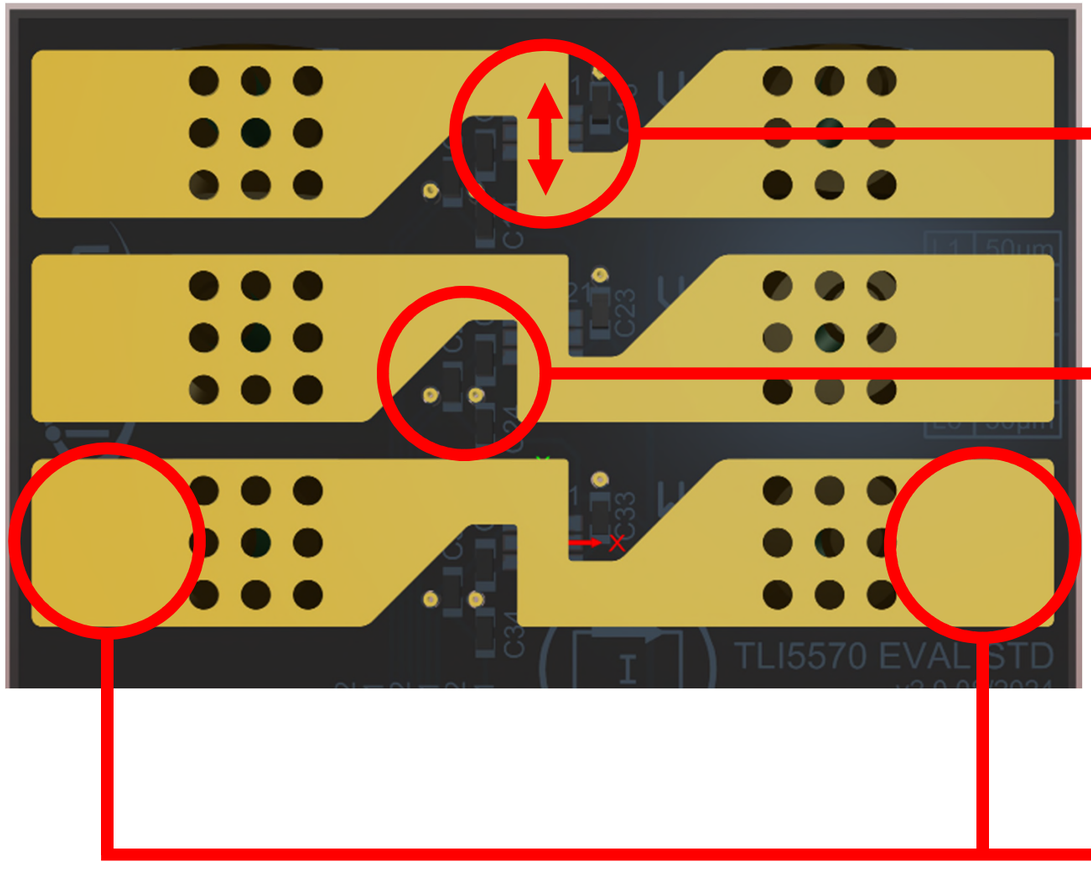


Routing outside of current rail overlay area.

When overlay happens, avoid the center of current rail.

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Current rail shape – Right shape can reduce crosstalk, increase bandwidth and reduce capacitive coupling



Vertical current rail to cancel most of crosstalk effects.

Cutouts to avoid overlay of signal on the current rail, reducing capacitive coupling.

Simulation shows higher Bandwidth compared to slits approach (slim linear cutout).

Extra copper only to improve thermal dissipation.

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Further questions

For further questions please contact us.

We offer design-in support and simulation services for current rail design.

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