EK92

Evaluation Kit

APPLICABLE PARTS (INCLUDED)

- AIC1605
- AIC1638

DESCRIPTION

The AIC1605 evaluation board can be used for evaluation of the Apex AIC1605 and the AIC1638. The board is designed to let the user adjust the external circuit around the AIC1605 freely and measure its behavior for any given application. Therefore, multiple selectable external components can be connected via jumpers with the AIC1605 simulating external loads or inputs.

To demonstrate the interface capabilities of the AIC1605, the AIC1638 is added to the evaluation board as an example of a sensing element which needs a high-voltage interface. Combining these two ICs, a light barrier application can be created which can be connected via a 2-, 3- or 4-wire interface and features status LEDs.

FEATURES

Power Section

- Adjusting the built-in buck converter or deactivating it
- Power source selection for the built-in 5V regulator
- Shunt resistor for measuring supply current and 2-wire operation demonstration
- Indicator LEDs for all power rails
- Selectable slow start network to compensate for slow supply voltage rise times

I/O Section

- Dummy loads are placed on the PCB for quick testing without connecting external loads or LEDs
- Removeable jumpers for measuring the output current of the on board or external loads
- Dummy input signals can be generated on board

Operational Amplifier Section

- Selectable dummy circuits for creating a square wave signal or hysteresis circuit using the built-in operational amplifiers

AIC1638 Photo Receiver Amplifier IC

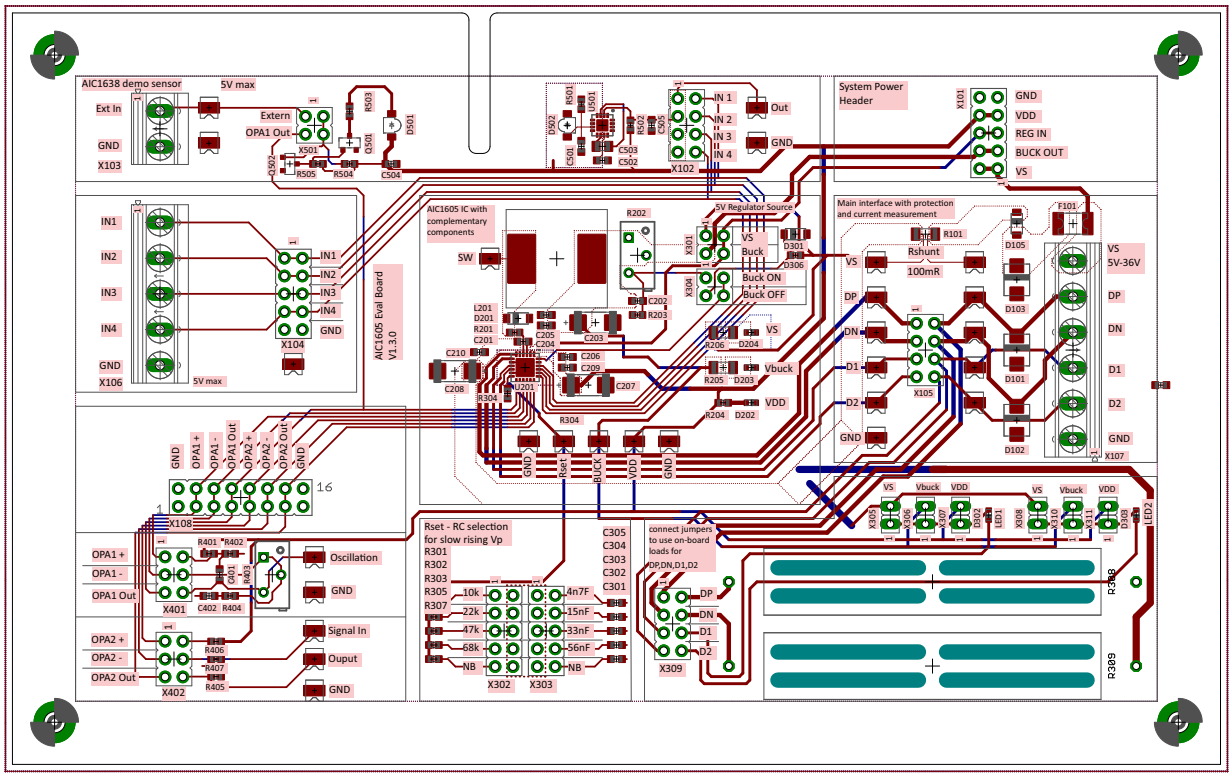
- Exciter circuit which can be powered by an external or internal signal
- Jumpers for re-routing the output of the AIC1638 to the input of the AIC1605
- Cut-out for obstacle to trigger light barrier application

GETTING STARTED

For direct start up, the PCB must be supplied at the VS pin headers (X101 or X107). The required voltage at the Vs pin header varies with the use of the buck and linear regulator. Please refer to the “Normal Operating Range” table in the AIC1605 datasheet for the required Vs voltage. The following jumpers are essential for operation:

- X304 – select “Buck OFF”, if buck converter is not used, select “Buck ON” to enable buck converter
- X301 – if buck converter is disabled by X304, select VS; else select either VS or buck

Figure 1: Evaluation PCB



With the jumpers connected, all three power LEDs turn on (VS, Vbuck, and VDD).

PARTS LIST

Reference	Manufacturer Part #	Description	QTY
Capacitors			
C304	C0603C153K5RAC7867	CAP CERAMIC_CAPACITOR 15n 50V X7R C0603 10%	1
C503	C0805X333J3GEC7800	CAP CERAMIC_CAPACITOR 33n 25V NP0 C0805 5%	1
C303	C0603C333K5RAC7867	CAP CERAMIC_CAPACITOR 33n 50V X7R C0603 10%	1
C302	C0603C563K5RAC7867	CAP CERAMIC_CAPACITOR 56n 50V X7R C0603 10%	1
C201, C202, C205, C206	C0603C223K5RAC7867	CAP CERAMIC_CAPACITOR 22n0 50V X7R C0603 20%	4
C401	C0603C102K5RAC7867	CAP CERAMIC_CAPACITOR 1n 50V X7R C0603 10%	1
C402, C505	C0603C103K5RAC7867	CAP CERAMIC_CAPACITOR 10n 50V X7R C0603 10%	2
C101, C204, C209, C210, C502, C504	C0603C104K5RACTU	CAP CERAMIC_CAPACITOR 100n 50V X7R C0603 10%	6
C305	C0603C472K5RAC7867	CAP CERAMIC_CAPACITOR 4n7 50V X7R C0603 10%	1
C203, C207, C208	TAJC475K050RNJ	CAP TANTALUM 4u7 50V 1.4R 10%	3
Diodes			
D501	VSMY2893SLX01	LED INFRARED 1.6V 100mA	1
D202, D203, D204, D302, D303	150060SS55040	LED red 2V 20mA 630nM	5
D502	VEMD2523SLX01	Vishay SMD Photodiode VEMD2523SLX01	1
D105, D201	PMEG6010CEGWX	Schottky 1A 60V 660mV 50uA	2
D101, D102, D103	SMAJ33CA-13-F	TVS 53.3V 33V 400W 150C	3
D301	BZT52C4V3-7-F	Zener 4.3V 7% 500mW 3uA	1
Active Devices			
U501	AIC1638	AIC1638 Photo-Receiver-Amplifier	1
U201	AIC1605	Apex AIC1605 Generic Sensor Interface	1
F101	MF-MSMF020/60-2	MF-MSMF Datasheet	1
Q501, Q502	2N7002-7-F	FET NCH 115mA 7,5R 60V	2
Resistors			
R203	ERJ-3EKF7501V	RES 7k5 0.1W 1% R0603	1
R305	ERJ-3EKF6802V	RES 68k 0.1W 1% R0603	1
R308, R309	SQP10AJB-680R	RES 680r 10W 5% SQP10A	2
R204	ERJ-3EKF5600V	RES 560r 0.1W 1% R0603	1
R404	ERJ-3EKF4702V	RES 47k0 0.1W 1% R0603	1
R303	ERJ-3EKF4702V	RES 47k 0.1W 1% R0603	1
R205, R206	CRCW12063K30FKEAHP	RES 3k3 3/4W 1% R1206	2
R201	ERJ-3EKF39R0V	RES 39r0 0.1W 1% R0603	1
R503	ERJ-3EKF2201V	RES 2k2 0.1W 1% R0603	1
R501	ERJ-3EKF2702V	RES 27k 0.1W 1% R0603	1
R304, R306	ERJ-3EKF2403V	RES 240k0 0.1W 1% R0603	2
R302	ERJ-3EKF2202V	RES 22k 0.1W 1% R0603	1

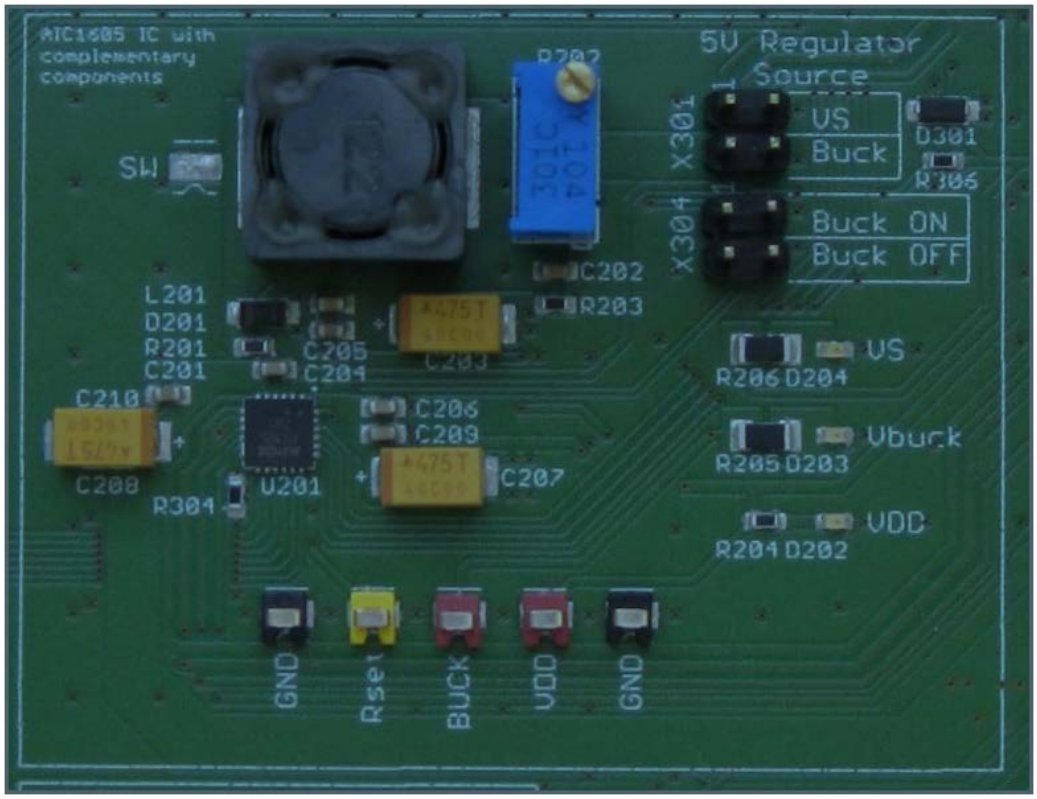
R405	ERJ-3EKF1004V	RES 1M 0.1W 1% R0603	1
R301, R504, R505	ERJ-3EKF1002V	RES 10k 0.1W 1% R0603	3
R101	ERJ-L08KF10CV	RES 100mR 1/3W 1% R1206	1
R401, R402, R406, R407	ERJ-3EKF1003V	RES 100k0 0.1W 1% R0603	4
R202, R403	PV36Y104C01B00	RES 100k 0,5W 10% POTI_BOURNS_PV36Y/Z	2
Inductors			
L201	SRR1208-122KL	L 1.2mH 0.4A 2.0R 125C	1
Transistors			
Q1	FCX790ATA	TRANS PNP 40V 2A SOT89-3	1
Q2	BC847C-13-F	TRANS NPN 45V 0.1A SOT23-3	1
Q3	BC857A-7-F	TRANS PNP 45V 0.1A SOT23-3	1
T1, T2	BC857BS-13-F	TRANS 2PNP 45V 0.1A SOT363	2
Hardware			
X305, X306, X307, X308, X310, X311	TSW-102-07-G-S	CON straight Male THT 2 Pin	6
X301, X304, X501	61300421121	CON Straight Male THT 4 Pin	3
X401, X402	61300621121	CON Straight Male THT 6 Pin	2
X102, X105, X309	61300821121	CON Straight Male THT 8 Pin	3
X101, X104, X302, X303	61301021121	CON Straight Male THT 10 Pin	4
X108	61301621121	CON Straight Male THT 16 Pin	1
X103	1729128	CON ANGLED Female THT 2 Pin	1
X106	1729157	CON ANGLED Female THT 5 Pin	1
X107	1729160	CON ANGLED Female THT 6 Pin	1
TP_BUCK2, TP_VDD2, TP_VP2, TP_VS1	5190TR	CON SMD Pin RED	4
TP_GND2, TP_GND3, TP_GND5, TP_GND6, TP_GND7, TP_GND8, TP_GND9, TP_GND10	5191TR	CON SMD Pin BLACK	8
TP_AIC1638_OUT, TP_D1, TP_D1_EXT, TP_D2, TP_D2_EXT, TP_DN, TP_DN_EXT, TP_DP, TP_DP_EXT, TP_EXT_IN, TP_HYST_IN, TP_HYST_OUT, TP_O-SZ_OUT, TP_RSET	5194TR	CON SMD Pin YELLOW	14
PCB	EVAL104	EVAL 104	1
Jumper	SPC02SVJN-RC	Jumper, Slip On	20
Standoff	2206	4-40 x 1.5” Standoff	4
Screw	91772A110	4-40 x 0.5” panhead	4

FUNCTION BLOCKS

POWER SECTION

The AIC1605 incorporates a buck converter and a linear regulator.

Figure 2: AIC1605 With Power Section



The buck converter's output voltage can be changed by adjusting the resistance of R202. The buck converter can be deactivated by applying a voltage greater than 3.5 volts to the feedback pin of the AIC1605. Using the header X304 it can be chosen if the buck converter is active or not. Do not leave this jumper open if the buck converter is not in use. Do not select "Buck ON" and "Buck OFF" at the same time.

The linear regulator can be supplied by the supply voltage (VS) directly, by the output of the buck converter, or by an externally applied voltage source. The source can be selected using the header X301. If an external source should be used, leave the header open and supply a voltage to the header X101 at "REG IN". The output of the linear regulator is internally connected with Vdd. If external 5 volts are applied directly to the "VDD" net via X101, also leave the jumper X301 open and do not connect to an external source at "REG IN". This deactivates the linear regulator since it is not needed if Vdd is supplied externally.

The LEDs D202, D203 and D204 light up if the associated voltage is present (Vdd, Vbuck and VS).

The internal modules of the AIC1605 need a reasonably fast rise time of the supply voltage. If the supply voltage rise time is too slow, an RC-network can be applied to the Rset pin, to delay the startup of the internal modules. This way, undefined states can be prevented. Using X302 and X303, different resistor + capacitor combinations can be applied. Consult the AIC1605 datasheet for more details.

I/O SECTION

Figure 3: Input Section

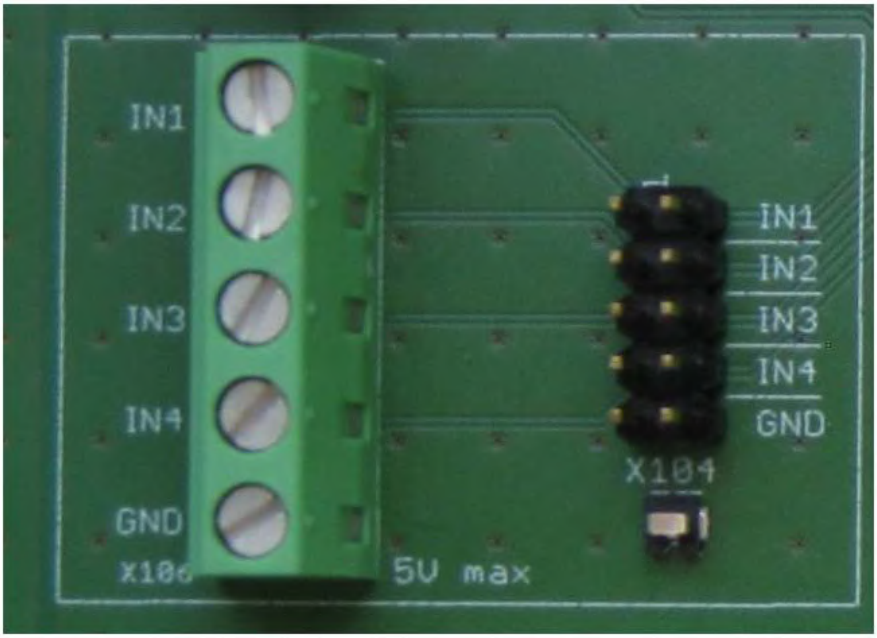


Figure 4: Output Section

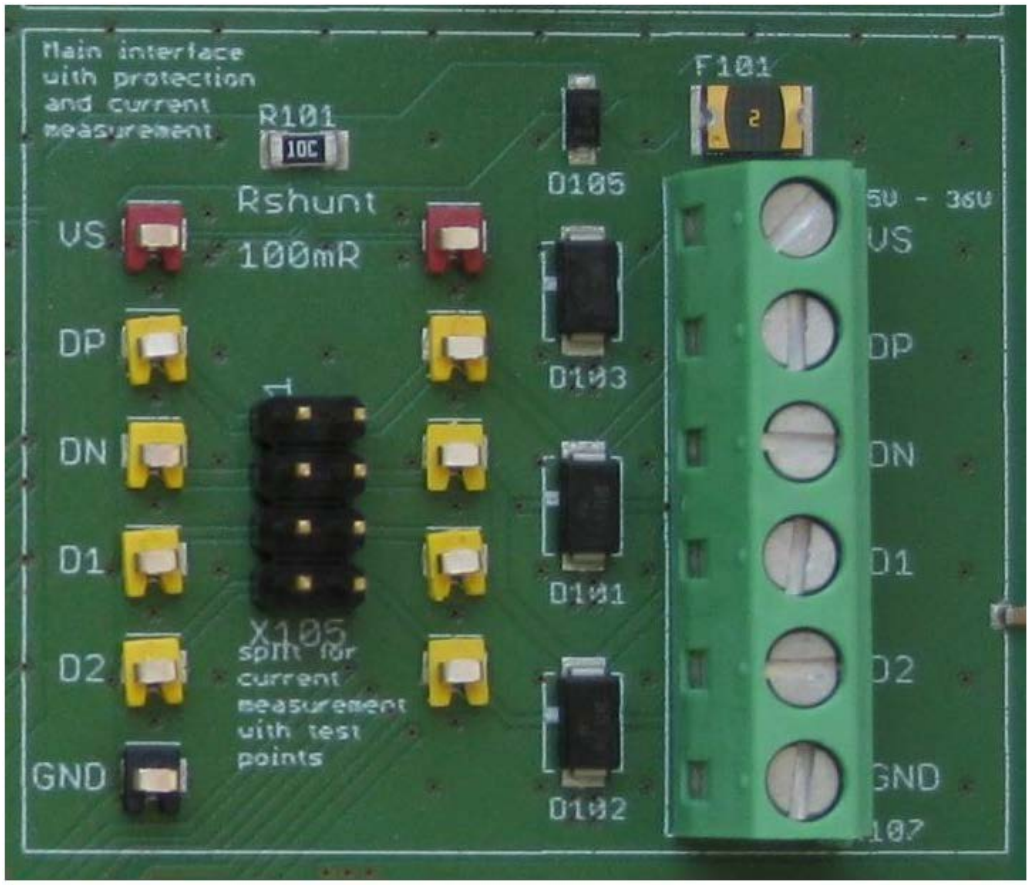
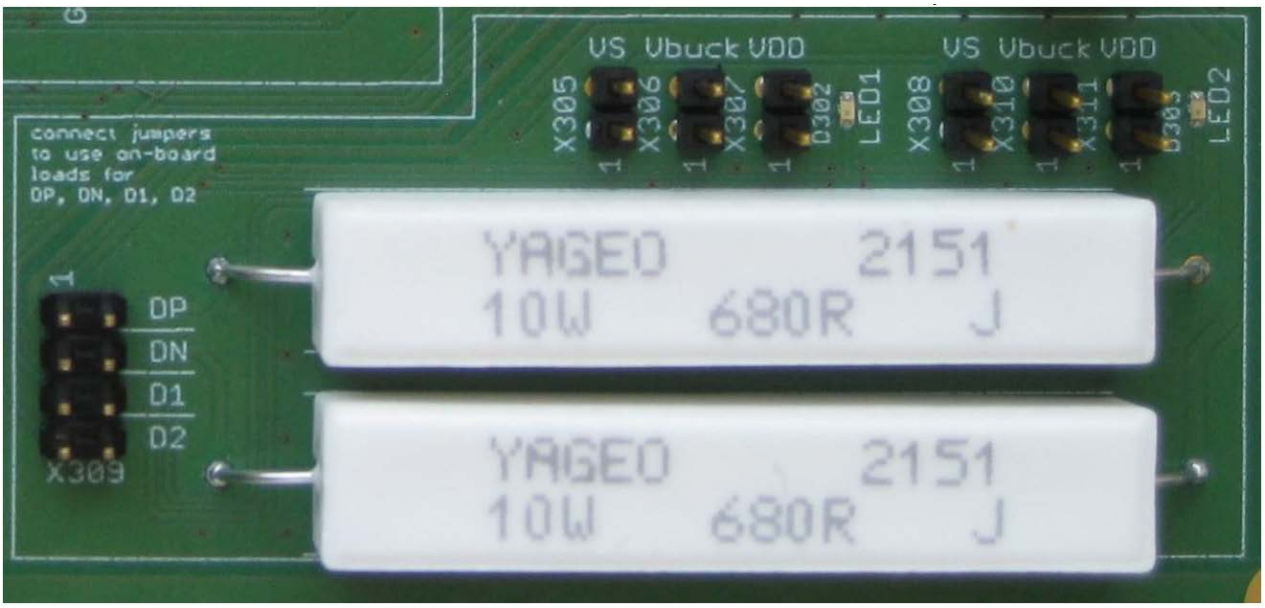


Figure 5: Load Section



The input is connected to the output via the following assignment.

Inputs				Outputs			
IN1	**IN2**	**IN3**	**IN4**	**LS**	**HS**	**LD1**	**LD2**
1							ON
0							OFF
	1				ON		
	0				OFF		
		1		ON			
		0		OFF			
			1			ON	
			0			OFF	

Since the inputs are pulled up internally to Vdd, the output stages are active if the inputs are left floating. To connect a load to the output, an external load can be connected to X107 or a dummy load can be connected via X309. The pins at X105 must be bridged by a jumper if no current is to be measured using these pins. For the outputs D1 and D2, a supply voltage must be chosen by bridging X305 to X307 for D1 and X308, X310 or X311 for D2.

Warning: Each LED should only be connected to one voltage supply (VS, Vbuck or VDD) at a time. Connecting multiple supplies simultaneously could damage the board.

As main loads, two 680 ohm cement resistors are placed on the PCB to dissipate heat. These resistor values create a current of 52 mA at VS = 36 volts.

Warning: driving the load resistors with VS values larger than 24 volts leads to excessive heat buildup after a few minutes because of the dissipated heat of up to 1.7W. Make sure to reduce the supply voltage or disconnect the load if not in use!

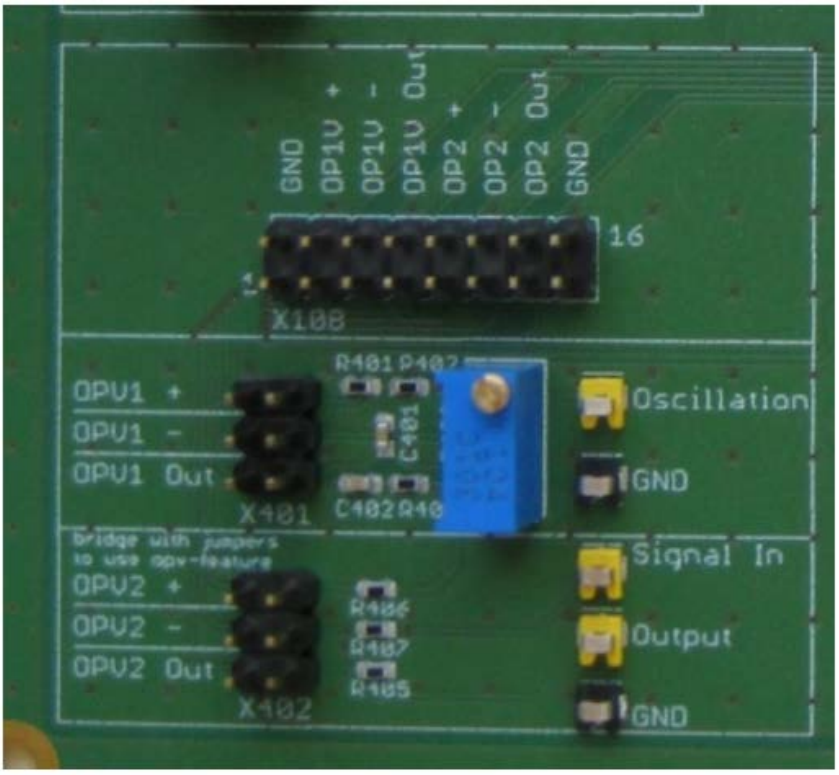
To demonstrate 2-wire mode, a 100 mΩ shunt resistor R101 is added in the supply line. This way, the load connected to DP or DN can be placed on the sensor application and the device must only be connected with 2 wires (VS and GND), since the voltage drop generated over the shunt resistor on the supply line indicates if the sensor is active or not.

OPERATIONAL AMPLIFIER SECTION

To demonstrate the capabilities of the built-in operational amplifiers, two different general-purpose circuits are added to the PCB.

The circuits are connected to the AIC1605 pins by bridging the pins of the headers X401 and X402. X108 can be used to connect external signals to the AIC1605 or to measure the signals.

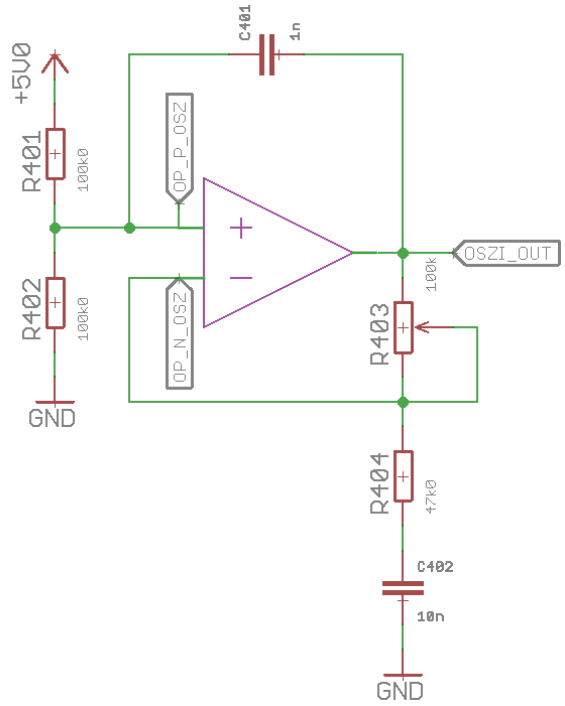
Figure 6: PCB



OSCILLATOR CIRCUIT

The oscillator circuit lets the user create a square wave signal using the internal op amps and lets them adjust the frequency using a potentiometer.

Figure 7: Oscillator Circuit



Parameter	Value
Frequency	7kHz to 50kHz
Voh	+5VDC
Vol	0V

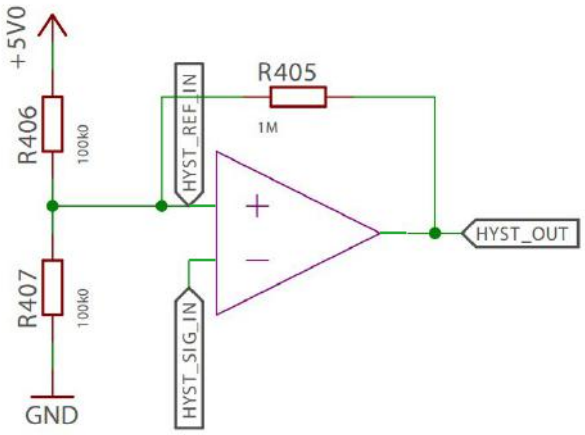
The output of the oscillation circuit can be connected to the input of the AIC1605 by connecting X108 “OPA1 Out” with an input at X104.

Alternatively, the output can be used as a signal source for the AIC1638 demonstration circuit. Therefore, the jumper “OPA1 Out” at X501 must be used.

HYSTERESIS CIRCUIT

Another simple but useful application for the built-in operational amplifiers is the creation of a hysteresis circuit.

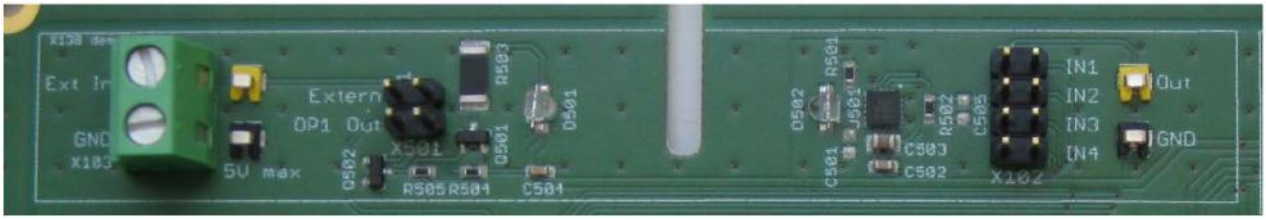
Figure 8: Hysteresis Circuit



A reference voltage is created using 100 kΩ resistors and the Vdd voltage net. R405 is used to add the hysteresis to the reference. The user must apply an analog signal to the “Signal In” test point.

Parameter	Value
Hysteresis Voltage	±0.12V
Thershold	2.5V ± 0.12V
Voh	+5VDC
Vol	0V

Figure 9: AIC1638 Photodiode Amplifier



DESCRIPTION

The AIC1638 is a compact, integrated receiver amplifier designed for high-sensitivity photo diodes used in applications like light barriers, smoke detectors, light curtains, and similar. Filtering out ambient light and amplifying the detected pulses from a photo diode, the conditioned signals are used for driving an open-drain output stage. Implementing integrated polarity protection, the device can be used in a multiplexed configuration, simplifying the wiring of the application. Optimized to minimize the need for external components, AIC1638 can be used for light sensing applications ranging from a few millimeters to several meters.

A light-emitting diode (D501) emits light pulses that are received by a photo diode (D502). If there is no obstacle between D501 and D502, the light pulse generates a current pulse received at pin PD of AIC1638 proportional to the intensity of the received light pulse. If the current of the received pulse exceeds the detection threshold of 80 nA, AIC1638 will pull its output low for 22 µs.

As a practical demonstration of the interface capabilities of the AIC1605, the AIC1638 is placed on the board. Representing a typical sensor IC, the AIC1638 is not capable of being connected directly to a control unit, but requires additional external circuits in order to output a strong signal. Combining these two ICs, a light barrier application can be created which can be connected via a 2-, 3- or 4-wire interface and features status LEDs.

Typical industrial sensors use a 3-/4-wire connection, containing the following signals:

Signal Name	**Function**
Supply Voltage	+12VDC to +36VDC
GND	System ground
Signal NPN/PNP	NC/NO high-/low side switch, capable of driving up to 100mA with 100Hz or faster

The AIC1605 is able to convert the supply voltage to 5 volts, which many sensor ICs require, and is able to amplify digital output signals up to a speed of 200kHz. The inclusion of a buck converter is helpful to mitigate the heat generated if the sensor application requires moderate amounts of current at a low voltage compared to a linear regulator. Furthermore, if the sensor application requires general purpose op amps, the AIC1605 can provide two pieces.

The AIC1638 provides an open drain output, which can switch up to 10 mA up to 5 Volt. If higher requirements are stated, this output has to be amplified. This can be achieved by using the DP and DN outputs of the AIC1605 (up to 100mA, 36V). Additionally, the output signal can be displayed on the D1 or D2 outputs, to realize a status LED for the sensor.

As an input signal, a pulsing light is required for the AIC1638 to differentiate between a signal and the background light. This can be achieved by creating an oscillation circuit using the AIC1605's op amp and a small discrete driver-circuit (if 2mA diode current is enough, the D1 or D2 output of the AIC1605 could also be used for this function).

USAGE

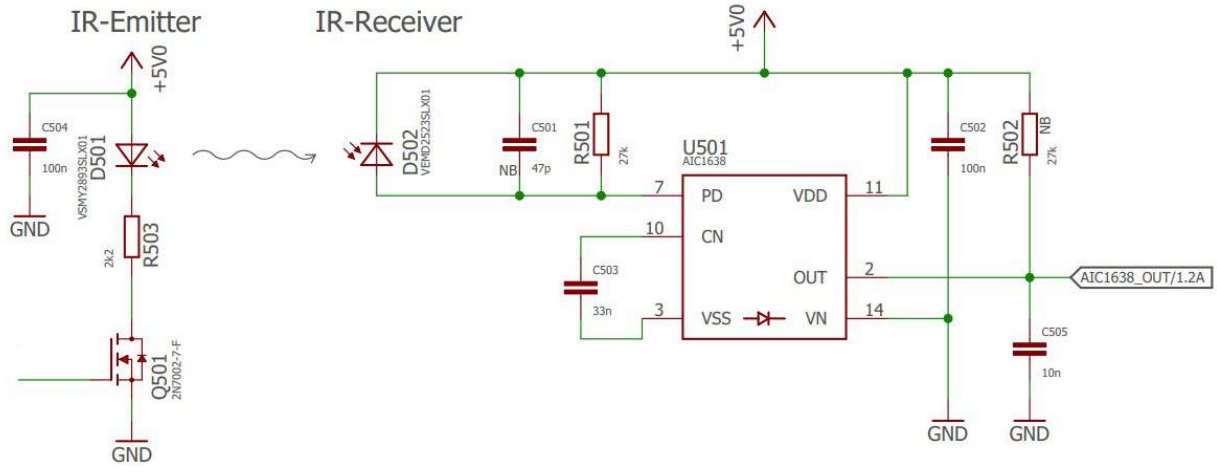
To create this application the following jumpers must be applied:

Action	Function
X401: apply all jumpers	OpAmp1 is connected to oscillator circuit
X501: apply jumper on “OPA1 Out”	Select OpAmp1 output as s source for IR-LED
X102: apply jumper on “IN4”	Route output of AIC1638 to input IN4 of AIC1605
X105: apply jumper on “D1”	Bridge current measurement contacts for output D1
X309: apply jumper on “D1”	Attach dummy LED1 to output D1
Apply jumper X305, X306 or X307	Select supply voltage for dummy LED1

If the pulsed signal from D501 is received by D502, the output of the AIC1638 is pulled low for 20 µs for every pulse received (pulses received during the 130 µs dead time after a received pulse are not displayed at the output). Interrupting the path between the IR-LED and the photodiode results in the output of the AIC1638 staying high, enabling the dummy LED1 at the output of the AIC1605.

Note: The output of the AIC1638 is equipped with an optional resistor and capacitor, defining the output behavior. Since, for this application, a static HIGH/LOW is desired, only the capacitor C505 is equipped to keep the signal at a low voltage while the output of the AIC1638 is closed during its deadtime. If the output stays HIGH, the capacitor C505 is charged via a pullup resistor inside the AIC1605 input circuit.

Figure 10: IR-Emitter and IR-Receiver



TERMINAL CONNECTORS

X103 - External input for AIC1638

Signal	Type	Range	Comment
Ext In	External input signal	0V - 5VDC	Input for AIC1638 exciter circuit, 10k pull up
GND	System GND		

X106 - Signal input

Signal	Type	Range	Comment
IN1	Input signal	0V - 5VDC	Weak pull up to 5VDC in AIC1605
IN2	Input signal	0V - 5VDC	Weak pull up to 5VDC in AIC1605
IN3	Input signal	0V - 5VDC	Weak pull up to 5VDC in AIC1605
IN4	Input signal	0V - 5VDC	Weak pull up to 5VDC in AIC1605
GND	System GND		

X107 - Main interface

Signal	Type	Range	Comment
VS	Supply voltage input	5VDC to 36VDC	Includes PTC fuse, polarity protection and 100mR shunt resistor, see schematic page 1, b6
DP	Current source	Up to 100mA	Current limited by load, supply voltage and overcurrent protection by the AIC1605
DN	Current sink	Up to -100mA	Current limited by load, supply voltage and overcurrent protection by the AIC1605
D1	Current sink	Up to -2mA	Connect status led; current controlled by the AIC1605
D2	Current sink	Up to -2mA	Connect status led; current controlled by the AIC1605
GND	System GND		

PINHEADER/JUMPER

Disclaimer: only 2.54mm pitched headers are used. Please read the description of each header before connecting signals or loads to prevent damaging the PCB. Generic header for measuring/providing different system voltages. Both pins per row are tied to the labeled signal.

X101 - System Power Header

Signal	Connection Type	Range	Comment
GND	Power		
VDD	Power/measurement	5VDC	Only supply power, if no jumper is applied on X301 and no power is supplied via the REG IN pin on the header. Tied to Pin Vdd on AIC1605
REG IN	Power/measurement	5VDC - 36VDC	Only supply power, if no jumper is applied on X301 Tied to Pin VL on AIC1605
BUCK OUT	Measurement and external loads only		Output of buck regulator – max. 50mA
VS	Power/measurement	5VDC - 36VDC	Is equal to VS on X107

X102 - AIC1638 output to AIC1605 input selection

Used to select which input of the AIC1605 the AIC1638 output signal shall be connected. The left row is connected to the AIC1638 output, the right row to the AIC1605 inputs. Multiple jumpers can be applied at the same time (resulting in a stronger pull up).

Signal	Connection Type	Range	Comment
IN1	Jumper	0V - 5VDC	Apply jumper horizontal to select IN1
IN2	Jumper	0V - 5VDC	Apply jumper horizontal to select IN2
IN3	Jumper	0V - 5VDC	Apply jumper horizontal to select IN3
IN4	Jumper	0V - 5VDC	Apply jumper horizontal to select IN4

X104 - Input header

Generic header for measuring or signal input. Both pins per row are tied to the labeled signal.

Signal	Connection Type	Range	Comment
IN1	Measurement/Signal	0V - 5VDC	
IN2	Measurement/Signal	0V - 5VDC	
IN3	Measurement/Signal	0V - 5VDC	
IN4	Measurement/Signal	0V - 5VDC	
GND	System GND		

X105 - Output current measurement header

Header for output current. The left row is connected to AIC1605, the right row to X107 and X309

Signal	Connection Type	Range	Comment
DP	Measurement	-	Connect horizontal pins with an amperemeter or bridge with a jumper. Leave open to detach output from AIC1605
DN	Measurement	-	
D1	Measurement	-	
D2	Measurement	-	

X108 - op amp header

Generic header for measuring or signal input. Both pins per column are tied to the labeled signal.

Signal	Connection Type	Range	Comment
GND	System GND		
OP1A +	Measurement/Signal input	0V - 5VDC	Pins are connected to AIC1605 op amp pins as well as X401 and X402 op amp demo circuit selectors.
OP1A -			
OP1A Out			
OP2A +			
OP2A -			
OP2A Out			

X301 - Vdd regulator selection

Select which voltage source should be used by the linear regulator of the AIC1605. The left row is connected to the regulator input of the AIC1605, the right row is connected to the labeled supply voltages. Apply only one jumper at a time!

Signal	Connection Type	Range	Comment
VS	Jumper	-	VS is used as the source for the linear regulator
Buck	Jumper	-	Buck converter output is used as the source for the linear regulator

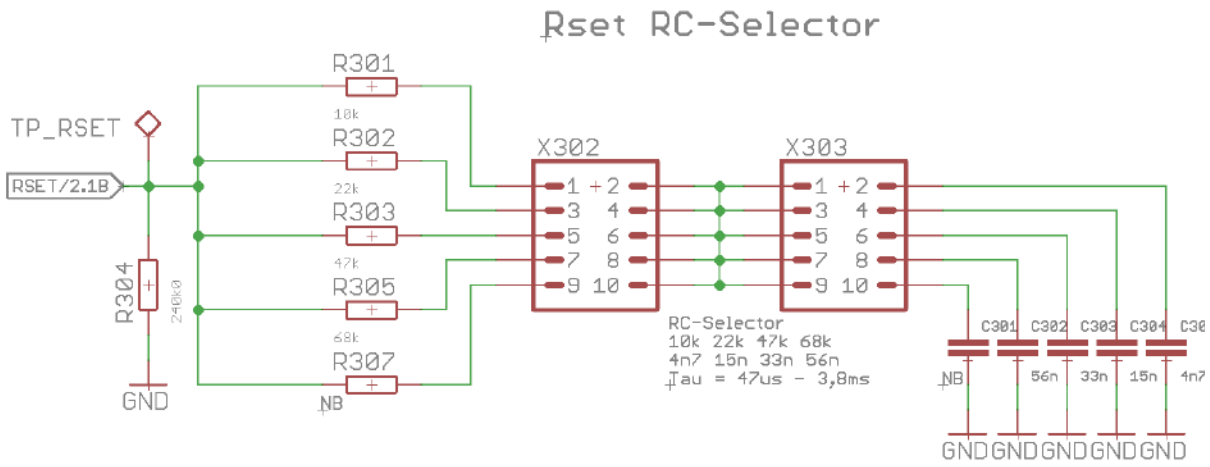
X302, X303 - startup delay resistor selection

R304 (240k) is mandatory for AIC1605 operation

Select which RC network shall be applied to the Rset pin to adjust the time delay. Multiple resistors or capacitors can be combined by using multiple jumpers.

Signal	Connection Type	Range	Comment
Resistor	Jumper	-	See AIC1605 datasheet for more information
Capacitor	Jumper	-	

Figure 11: Rset RC-Selector



X304 - Buck converter operating mode selection

Select if the buck regulator is active or not. The left row is connected to the feedback input of the AIC1605, the right pins are connected to the feedback resistor-network (ON) and a 4.3V voltage reference (OFF). Apply only one jumper at a time!

Signal	Connection Type	Range	Comment
Buck ON	Jumper	-	Connects feedback resistors to feedback pin of AIC1605
Buck OFF	Jumper	max 5V	Connect feedback pin of AIC1605 to 4.3V reference, to deactivate the buck converter

X305 to X308, X310, X311 - D1, D2 Dummy load LED supply voltage selection

Select the supply voltage for the dummy LEDs for AIC1605 output D1 and D2. Apply only one jumper per LED at a time. Dummy LED must be selected with X309 to get active.

Signal	Connection Type	Range	Comment
VS	Jumper	-	Connects LEDx anode to VS
Vbuck	Jumper	-	Connects LEDx anode to Vbuck
Vdd	Jumper	-	Connects LEDx anode to Vdd

X309 - Dummy load selection

Select which dummy load gets connected to the output pin of this PCB. Right pins are connected to the dummy loads, left pins are connected to X107 and X105.

Signal	Connection Type	Range	Comment
DP	Jumper	-	Connect dummy load to output DP
DN	Jumper	-	Connect dummy load to output DN
D1	Jumper	-	Connect dummy LED to output D1
D2	Jumper	-	Connect dummy LED to output D2

X401 - OPA oscillator selection

Connect AIC1605 op amp pins with an oscillator demo circuit. Right pins are connected to the demo circuit, left pins are connected to the AIC1605 (and X108). Apply all jumpers horizontally at the same time.

Signal	Connection Type	Range	Comment
OPA1 +	Jumper	-	-
OPA1 -	Jumper	-	-
OPA1 Out	Jumper	-	-

X402 - OPA hysteresis selection

Connect AIC1605 op amp pins with an oscillator demo circuit. Right pins are connected to the demo circuit, left pins are connected to the AIC1605 (and X108). Apply all jumpers horizontally at the same time.

Signal	Connection Type	Range	Comment
OPA2 +	Jumper	-	-
OPA2 -	Jumper	-	-
OPA2 Out	Jumper	-	-

X501 - AIC1638 exciter source selection

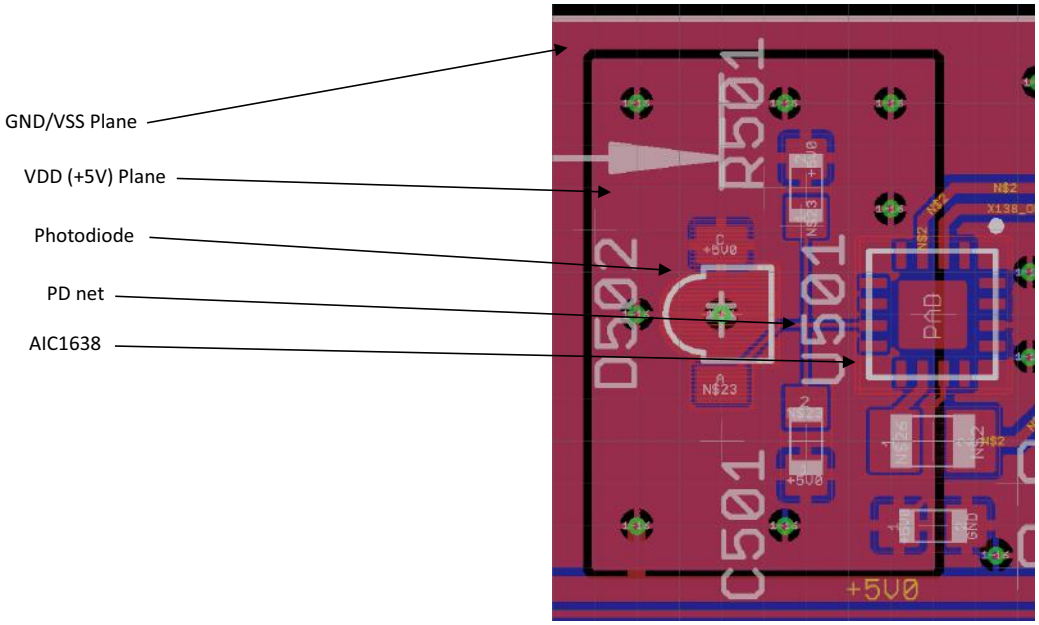
Select which input shall be used as the signal source for the exciter of the AIC1638 demo circuit. Right pins are connected to the gate of the IR-LED switching FET, left pins to the labeled signals. Applying a signal frequency of more than 7.5kHz has no effect on the output, since signals received during the deadtime of the AIC1638 are ignored.

Signal	Connection Type	Range	Comment
Extern	Jumper/signal	0V - 5V	Connects an external signal source with the AIC1638 exciter circuit
OPA1 Out	Jumper	-	Connects the OPA1 Out pin of the AIC1605 with the AIC1638 exciter circuit

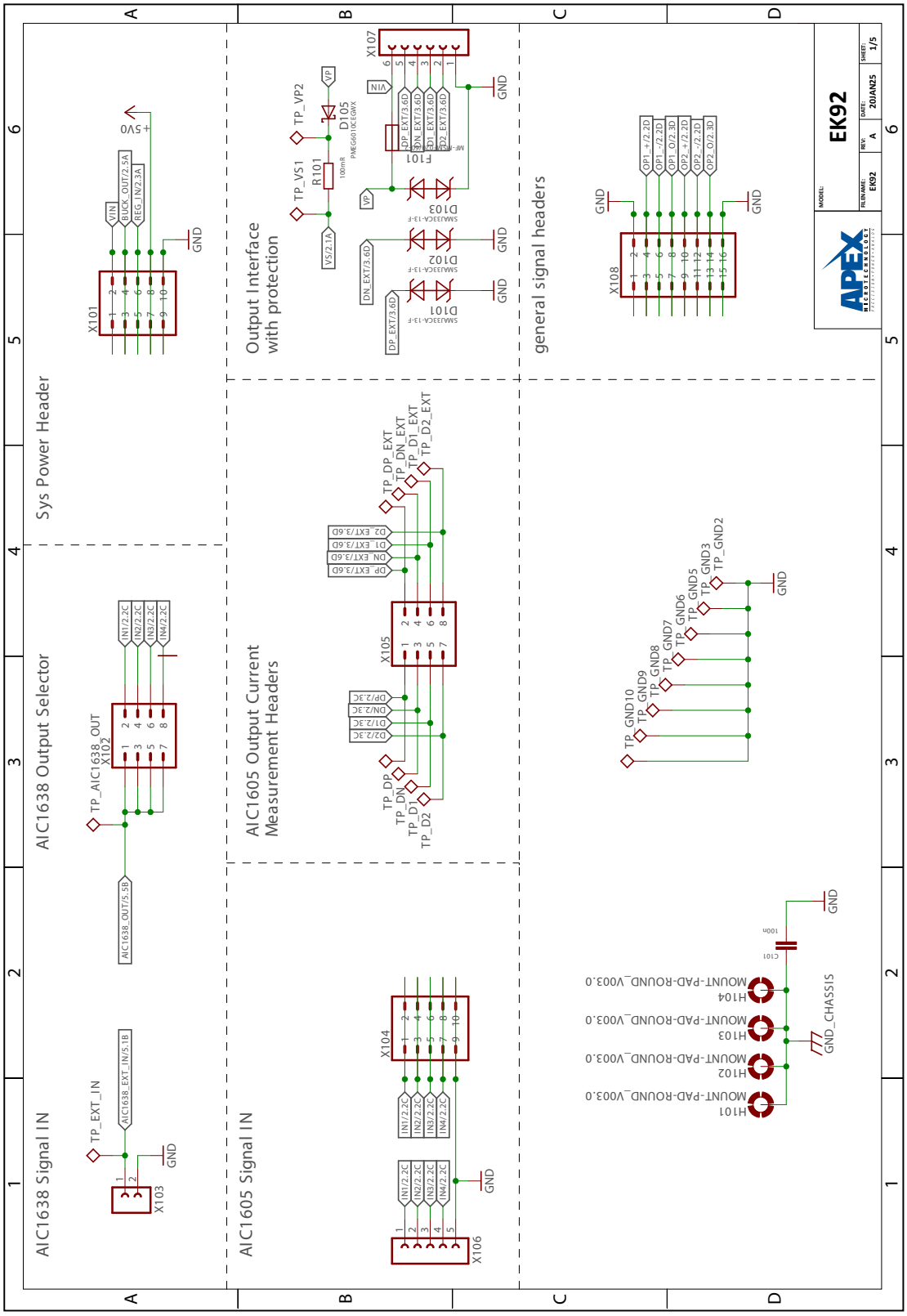
LAYOUT RECOMMENDATION

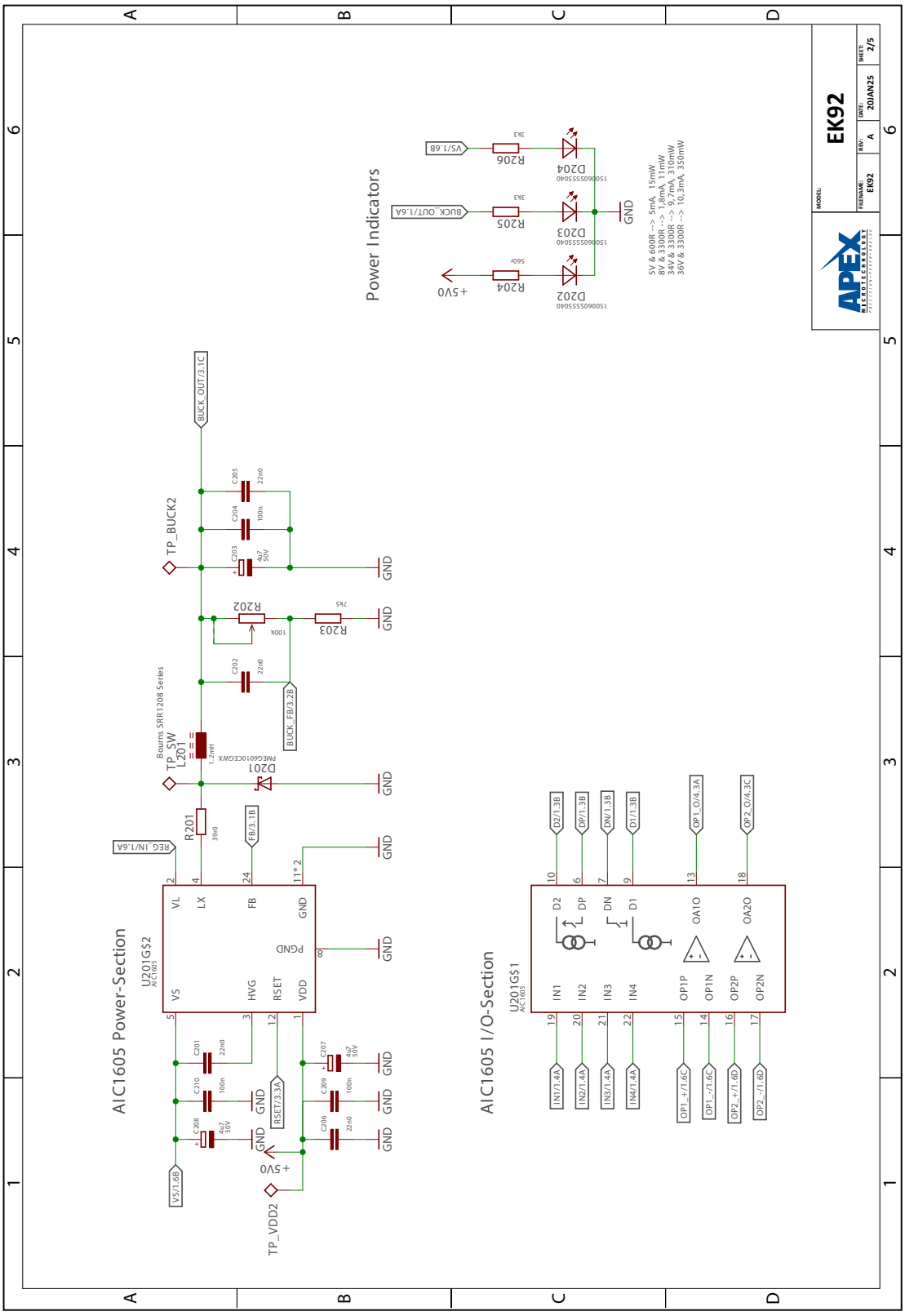
The AIC1638 works by measuring small ac currents on the PD pin. To reduce the noise picked up by this pin, the capacitance between PD and VSS must be as small as possible. This can be achieved by keeping the trace connecting this pin to the photodiode and the pull-up resistor as short as possible, and surround this net with a VDD plane instead of a VSS plane. It is recommended to fill the layer beneath this net also with a VDD plane. If the capacitance between PD and VDD gets too large, the sensitivity is negatively influenced. Please consult the AIC1638 datasheet for more detailed information.

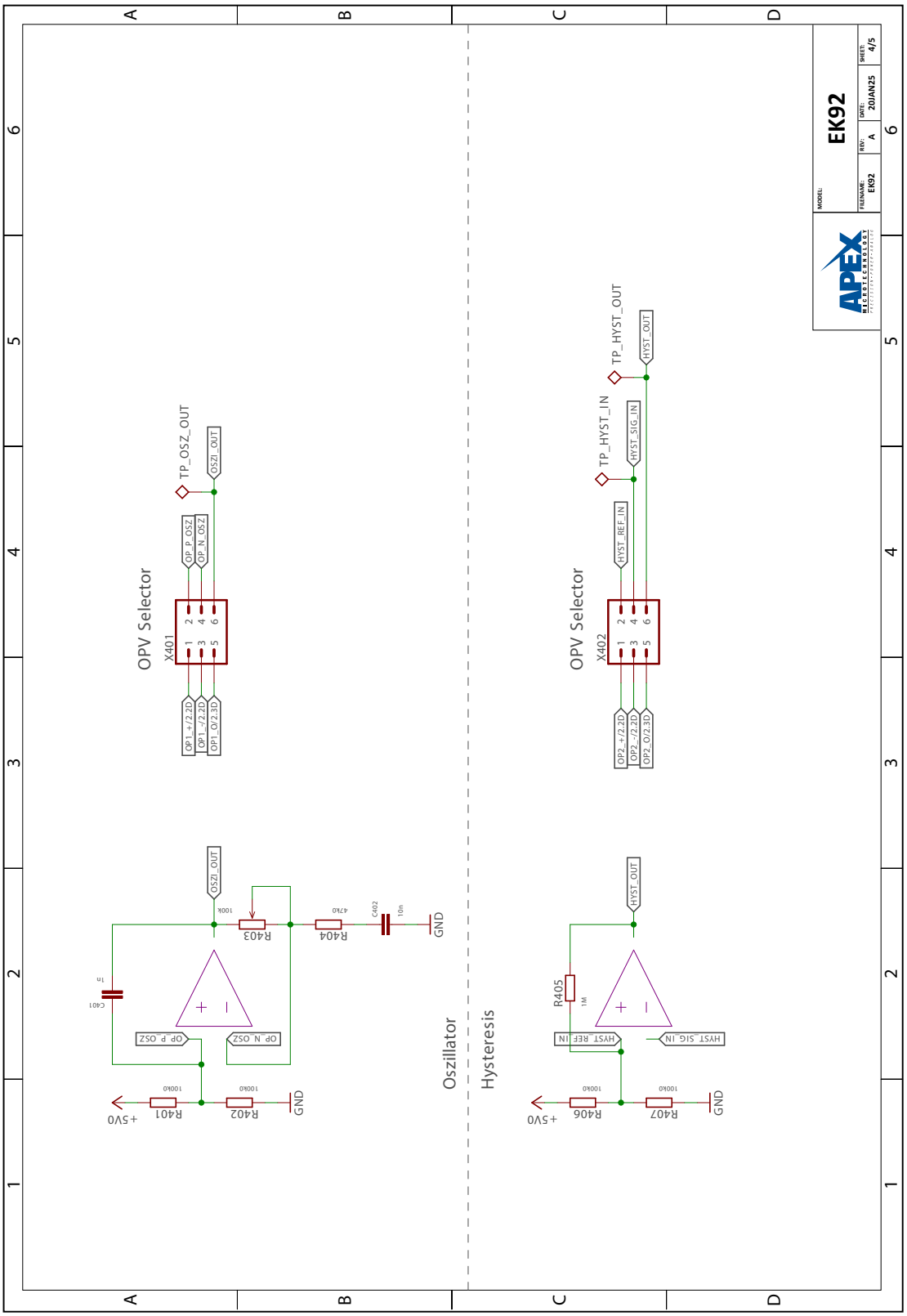
Figure 12: Layout

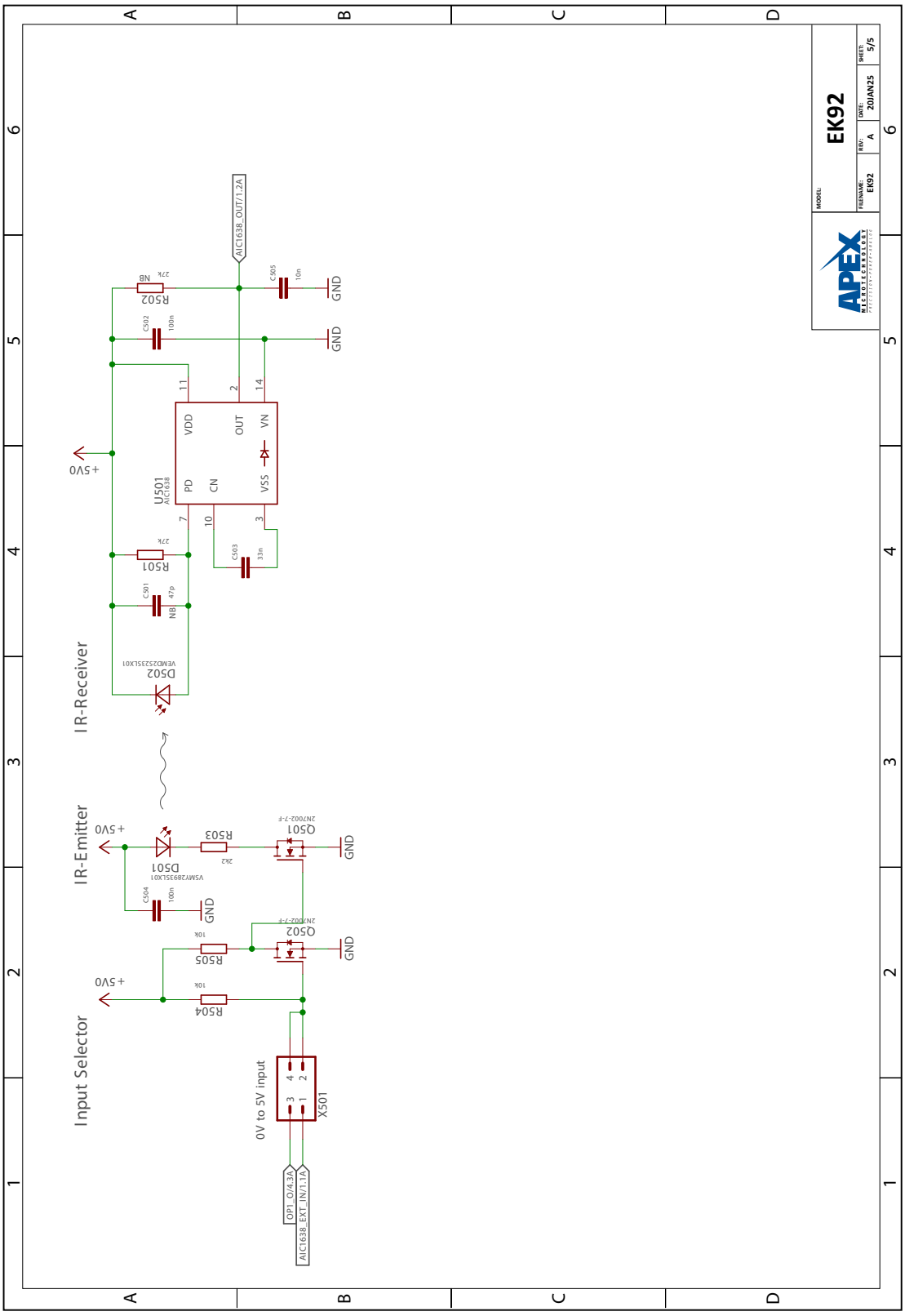


EVALUATION SCHEMATICS



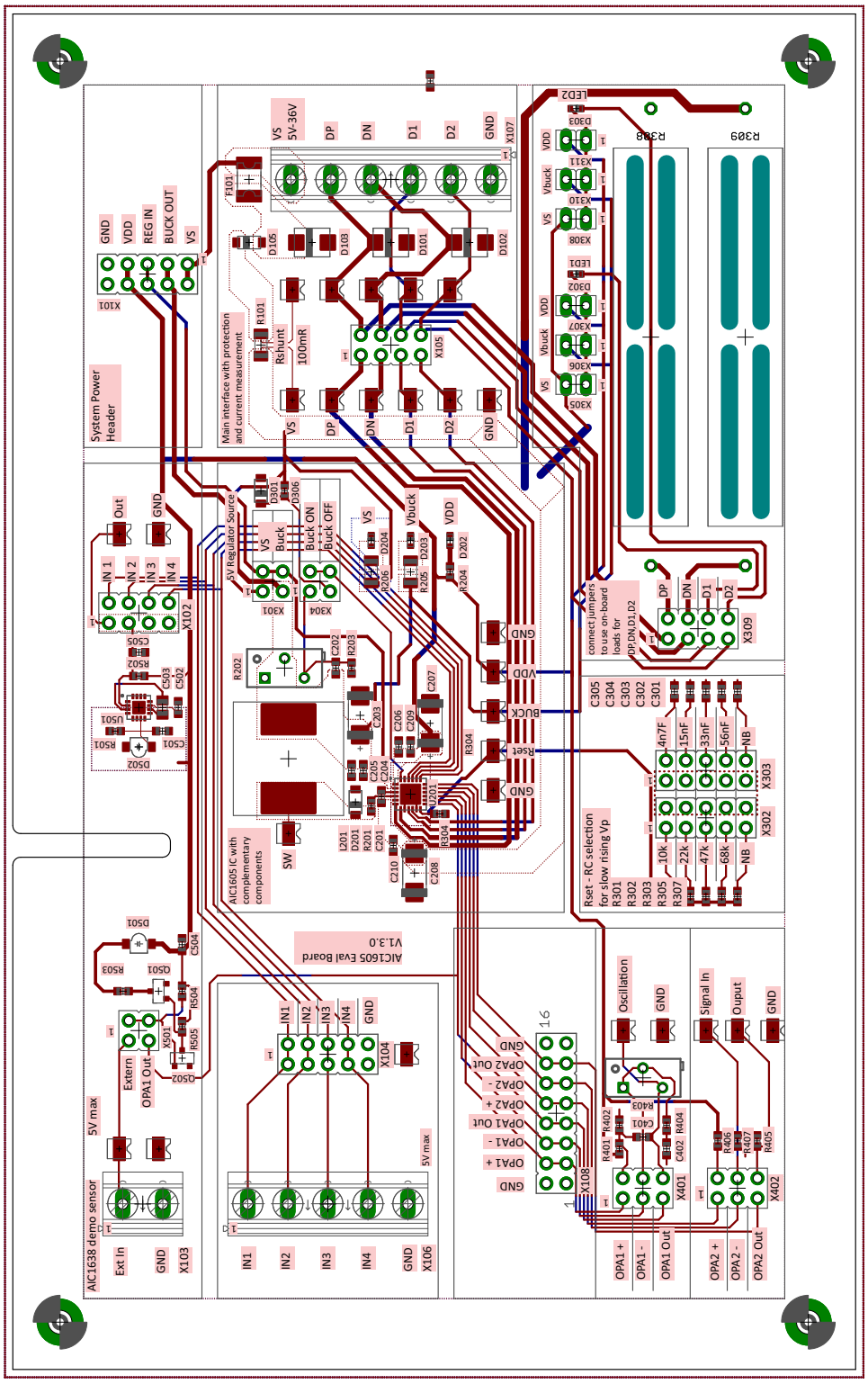

EK92
Power Indicators
AIC1605 Power-Section
AIC1605 I/O-Section
TP_BUCK2
TP_SW
TP_VDD2
GND
+5V0
BUCK_OUT/3.1C
BUCK_FB/3.2B
RST/3.3A
REG_IN/1.6A
VS/1.6B
BUCK_OUT/1.6A
5V & 600R --> 5mA, 15mW
8V & 3300R --> 1,8mA, 11mW
34V & 3300R --> 9,7mA, 310mW
36V & 3300R --> 10,3mA, 350mW


EK92
MODEL:
FILENAME: EK92
REV: A
DATE: 20JAN25
SHEET: 4/5
TP_OSZ_OUT
OSZI_OUT
OPV Selector
X401
OP_P_OSZ
OP_N_OSZ
OP1_+/2.2D
OP1_-/2.2D
OP1_O/2.3D
TP_HYST_OUT
HYST_OUT
TP_HYST_IN
HYST_SIG_IN
HYST_REF_IN
OPV Selector
X402
OP2_+/2.2D
OP2_-/2.2D
OP2_O/2.3D
R403
100k
R404
47k0
C402
10n
GND
C401
1n
OP_P_OSZ
OP_N_OSZ
+5V0
R401
100k0
R402
100k0
GND
Oszillator
Hysteresis
HYST_OUT
R405
1M
HYST_REF_IN
HYST_SIG_IN
+5V0
R406
100k0
R407
100k0
GND


EK92
AIC1638_OUT/1.2A
R502
NB
C505
10n
GND
C502
100n
U501
AIC1638
VDD
OUT
VN
PD
CN
VSS
+5V0
R501
27k
C501
NB
470p
C503
33n
D502
VEMD2523SLX01
IR-Receiver
IR-Emitter
D501
VSMY2893SLX01
R503
2k2
Q501
2N7002-7-F
C504
100n
R505
10k
Q502
R504
Input Selector
0V to 5V input
X501
OP1_O/4.3A
AIC1638_EXT_IN/1.1A

APPENDIX

Figure 13: Evaluation PCB Enlarged



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