Important Notes

Restrictions in Use

IDT's ZIOL2xxx Application Kit hardware and ZIOL2xxx Application Kit software are designed for IC evaluation, laboratory setup, and module development only.

The IDT ZIOL2xxx Application Kit hardware and software must *not* be used for module production or production test setups.

Disclaimer

Integrated Device Technology, Inc. (IDT) shall not be liable for any damages arising out of defects resulting from
(i) delivered hardware or software
(ii) non-observance of instructions contained in this manual and in any other documentation provided to user, or
(iii) misuse, abuse, use under abnormal conditions, or alteration by anyone other than IDT.

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Important Equipment Warning: If not followed properly, these procedures could result damage to the user's equipment. Only trained professionals should connect equipment. Ensure that all kit users have read and understood this document before using the kit.

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1 Setup and Installation

1.1 System Requirements

Recommendation: In order to avoid problems during the installation of the ZIOL2401 Evaluation Tools, do not connect the ZIOL2401 USB Stick or the ZIOL2401 Lab Kit until the ZIOL2401 Evaluation Tools Software has been installed on the user's PC.

Table 2.1 System Requirements

Component	Minimum Requirements
Processor	600 MHz CPU (depends on operating system used)
Hard disk space	22 MB + .NET Framework
RAM	128 MB
Operation system	Microsoft Windows® XP or higher and .NET 4.0
Other hardware requirements	USB port (recommended power supply 500 mA)

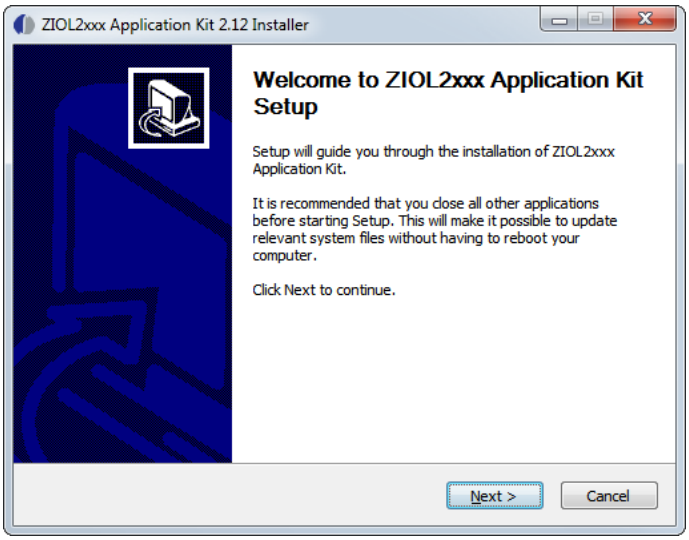
1.2 Software Installation

Follow the instructions in the *ZIOL2401 Evaluation Kit Startup Guide* included in the kit to download and install the ZIOL2401 Evaluation Tools. The minimum hard and software requirements for the ZIOL2401 Evaluation Tools are shown in Table 2.1. Before using the ZIOL2401 Evaluation Hardware, please download the latest ZIOL2401 Evaluation Tools Software from the IDT website.

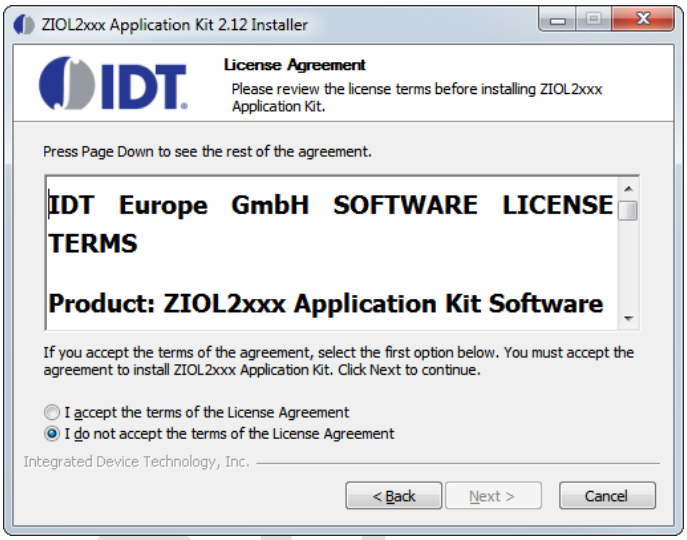
To start the installation, use the *ZIOL2xxx Application Kit-2.12-install.exe*. This program guides the user though the installation process. Administrator rights for the PC are required to execute the installation. If an older software version is already installed, the Install Manager will uninstall this software automatically. Figure 2.1 illustrates the installation of the GUI of the ZIOL2401 Kit.

Important: Be sure that the Microsoft® .NET Framework 4.0 or newer is already installed on your PC. Otherwise the .NET Framework is going to be downloaded and installed from the internet.

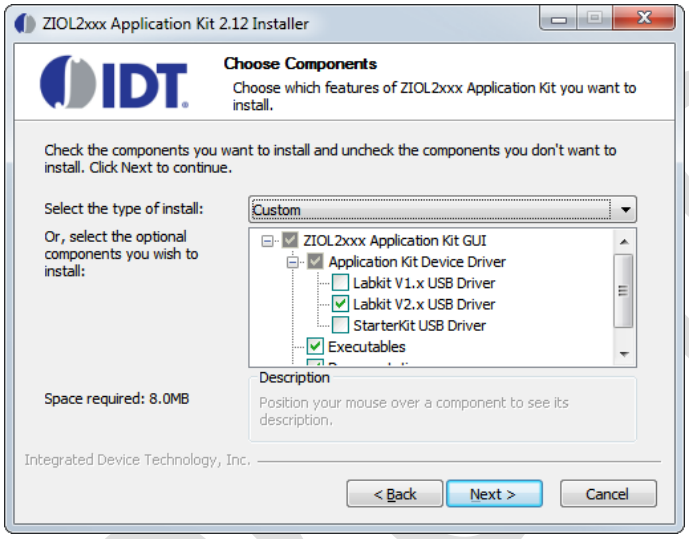
Figure 2.1 Software Installation Process



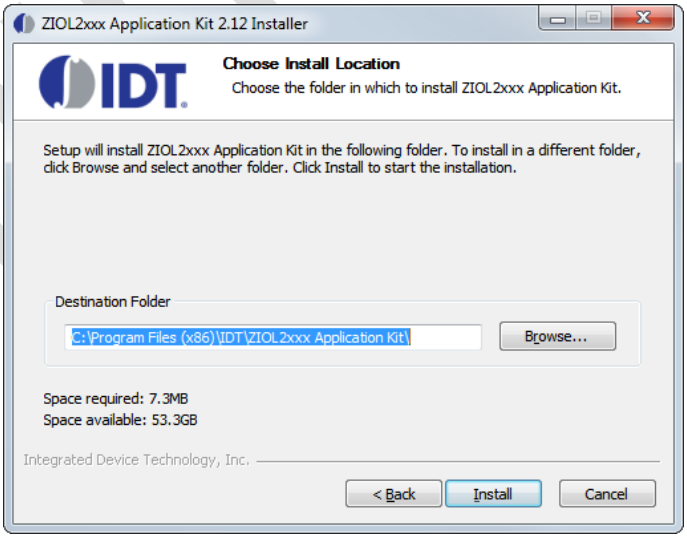
1. Click “Next” to continue with the installation process.



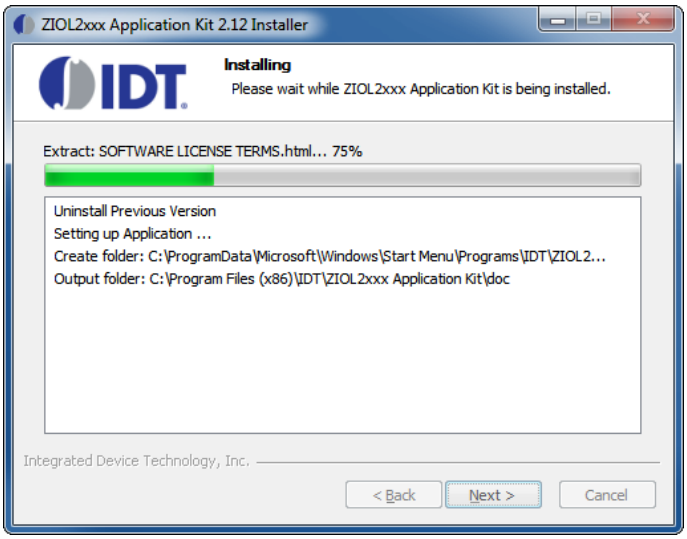
2. Read the “License Terms” carefully and accept the terms of the “License Agreement” to continue with the installation.



3. Select the components to be installed. Position the mouse pointer over an option to see its description. Then click “Next.”. Only de-select the drivers if there is a known reason not to install it.

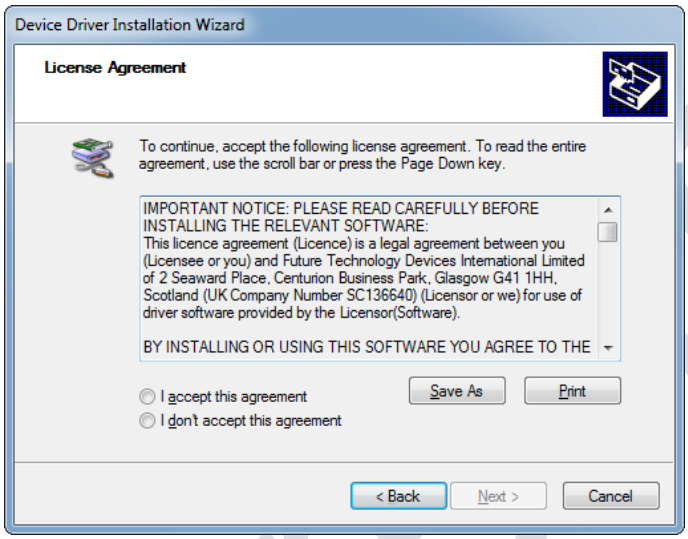


4. Select the “Destination Folder” and then click “Install” to start the installation.

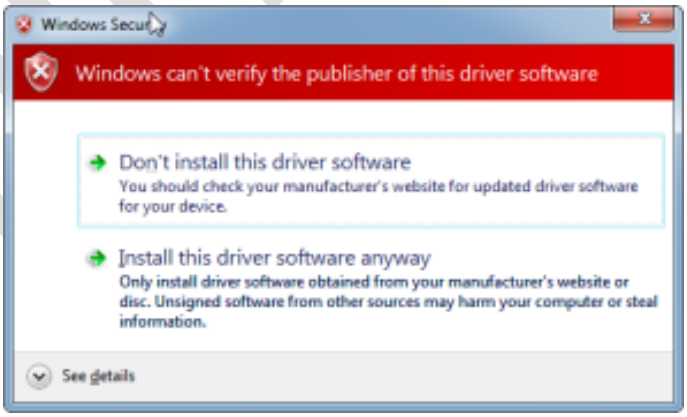


5. Wait while the installer automatically copies the files to the appropriate folder as selected during the installation process.

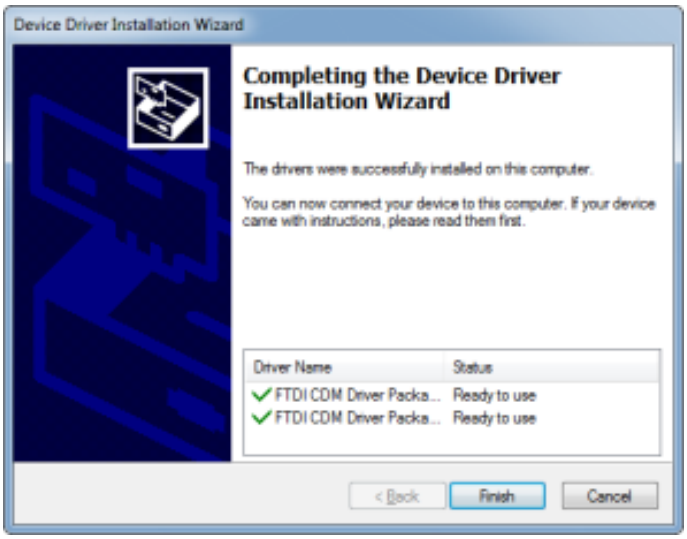
6. If selected in step 3, the device driver installer will pop-up and guide the user through the device driver installation procedure.



7. Read the “License Agreement” displayed by the Device Driver Installation Wizard carefully and accept the terms of the “License Agreement” to continue with the installation.

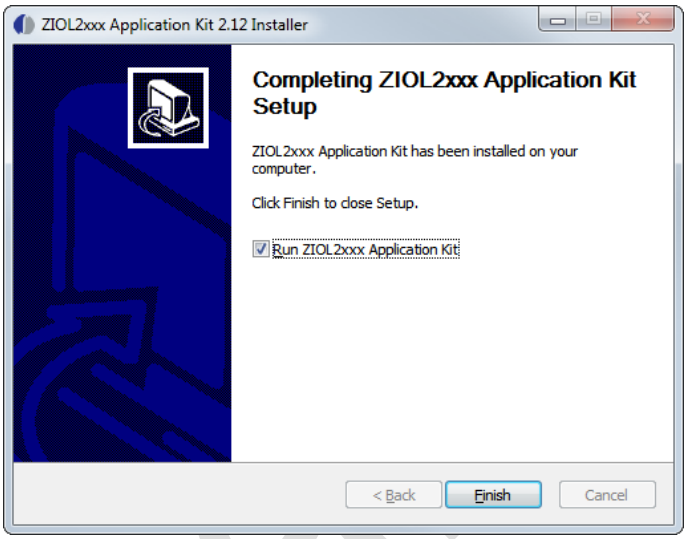


8. Read the “License Agreement” displayed by the Device Driver Installation Wizard carefully and accept the terms of the “License Agreement” to continue with the installation.



9. The device driver installer will finish with this dialog. A green checkmark will indicate a successful device driver installation.

   Note: In the event of errors, a log file is generated in the installer execution directory. If further installation support is needed, this installer log can be forwarded to IDT support at www.IDT.com/go/support.



10. When the wizard displays the message that installation of the software has been completed successfully, click “Finish” to close the installer.

1.3 Hardware Installation for the ZIOL2401 Evaluation Tools

After successful installation of the software, the ZIOL2401 Starter Kit or the ZIOL2401 Lab Kit Rev 2.1 can be connected to the PC. The system will detect a new hardware device. If the automatic hardware detection process detects the ZIOL2401 Starter Kit or the ZIOL2401 Lab Kit Rev 2.1 successfully, the operating system will start the automatic setup dialog for new hardware devices.

Important: To install new hardware on a PC, elevated permissions are required.

2 Hardware

2.1 Operation Conditions

Table 2.1 Operating Conditions

Symbol	Parameter	Min	Typ	Max	Unit	Comments
VDD_IN_HV	*Supply voltage*	8.0		36	V	Input voltage on J102 in case of ZIOL2401 Starter Kit and J11/J12/J16 in case of ZIOL2401 Lab Kit **Important:** In case of powering though the USB port and the external supply pins at the same time the minimum external supply voltage should be higher than VDD_OUT.
VDD_IN_USB	*USB supply voltage*		5		V	Typical USB supply voltage
VDD_OUT	*Output Supply Voltage in Case of powering by USB*		24		V	Output voltage on J102 in case of ZIOL2401 Starter Kit and on J11/J12 in case of ZIOL2401 Lab Kit
I_{OUT}	*Output current in Case of powering by USB*			50	mA	Maximum available current for powering an external connected application.
$I_{OUT\_DC/DC}$	*Output current of the ZIOL2401 DC/DC converter*			50	mA	**Important:** In case of using the internal DC/DC converter the connection of an external power supply is required.

2.2 Board Description ZIOL2401 Starter Kit

Figure 2.1 Hardware Overview ZIOL2401 Starter Kit

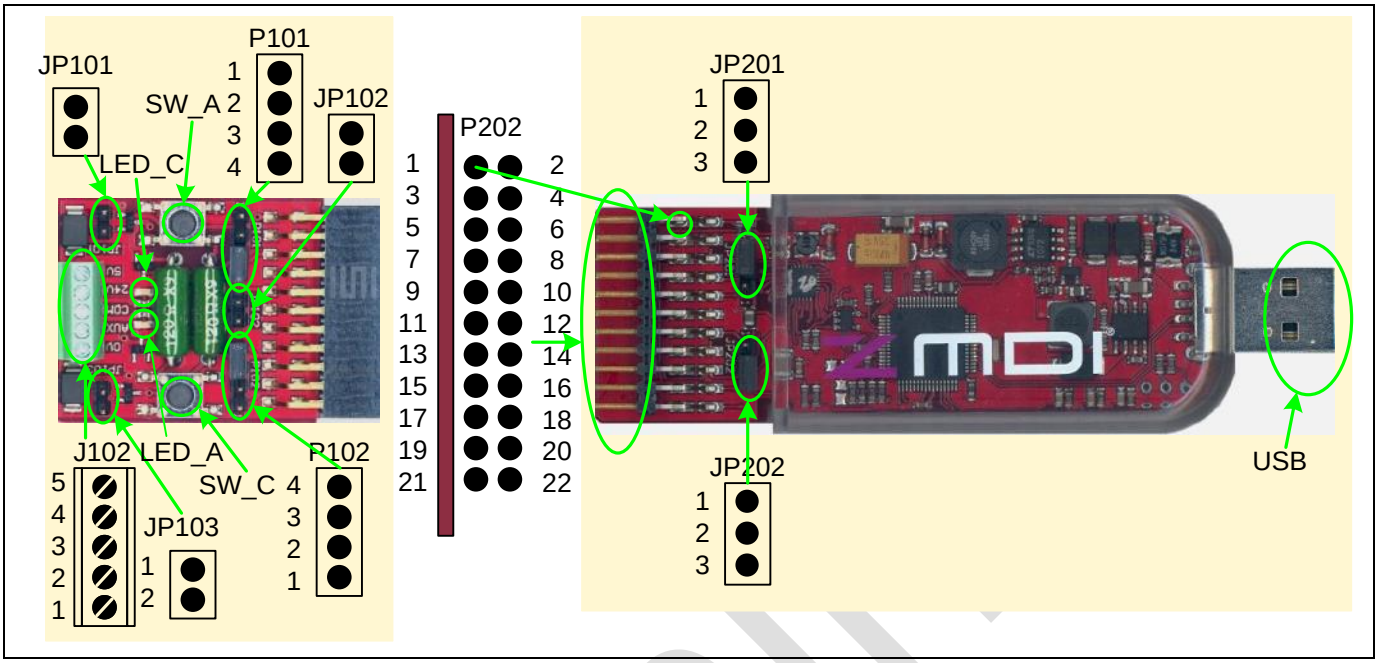


Table 2.2 Pin Description ZIOL2401 Starter Kit

PIN	Name	Function
JP101/JP103	*Protection Diode VDD/ Protection Diode VSS*	The jumpers JP101/J103 offers the possibility to enable/disable the reverse polarity protection diodes for the external power supply of the extension board (Pin 2 VDD and 5 VSS connector J102). If the jumpers are set, the reverse polarity protection is disabled by a shortcut over the protection diodes. The reverse polarity protection is designed to protect the ZIOL2401 USB Stick in case of using an external power supply. In case of powering an external application using the 24V power supply which is included on the ZIOL2401 USB Stick the reverse polarity protection needs to be disabled by setting the Jumper JP101 and JP103.
JP102	*AUX_O/COM_O*	Setting the Jumper JP102 will connect the COM_O and AUX_O to each other. Caused by this the COM and AUX driver of the ZIOL2401 works in tandem mode. In that case the ZIOL2401 USB Stick is able to drive up to 500mA(needs to be specified in the driver setup of the ZIOL2401) current using an external power supply
P101	*AUX_I/AUX_O*	The connector P101 provides an interconnection between the AUX line (Pin 4 of J102) of the external clamp (J102) and AUX_I or AUX_O or also to each other available.
1	connected to AUX_I pin of the ZIOL2401	
2/3	connected to pin 4 of J102	
4	connected to AUX_O pin of the ZIOL2401	

PIN	Name	Function
102	*COM_I/COM_O connector*	The connector P102 provides an interconnection between the COM line (Pin 3 of J102) of the external clamp (J102) and COM_I or COM_O or also to each other available.
1	connected to COM_I pin of the ZIOL2401	
2/3	connected to pin 3 of J102	
4	connected to COM_O pin of the ZIOL2401	
J102	*External Connector*	The external connector J102 provides the DC/DC converter Output, the COM and AUX channels and the Power supply on a screwing terminal for an interconnection between other devices or test hardware and the ZIOL2401 Starter Kit. The Power supply pins 2 (VDD) and 5 (VSS) are able to source an external connected device or to act as an Input for an external power source. In case of using the internal power supply, the stick is able to drive up to 50mA. If the connected application needs more than 50mA an external power supply is required. The ZIOL2401 Starter Kit detects automatically whether an external power supply is connected or not. In case of using an external supply the voltage should be higher than 24V. The Pins 3 (COM) and 4 (AUX) are the external pins of the 2 communication channels of the ZIOL2401. The connection between the ZIOL2401 and the external clamp is configurable using the Jumper JP101, JP102, JP103, P102 and P101. The pin1 (VOUT5V_DC/DC) is the output of the DC/DC converter which is included in the ZIOL2401. In case of the DC/DC converter is activated by setting the jumper JP201 the pin1 provides a Voltage 5V for external use with a maximum current of 50mA. In case of using the 5V DC/DC voltage an external power supply is required.
1	VOUT5V_DC/DC	
2	VDD	
3	COM	
4	AUX	
5	VSS	
JP201	*Enable/Disable DC/DC converter*	The Jumper JP201 offers the possibility to enable or disable the internal DC/DC converter of the ZIOL2401. A connection between pin 2 (ZIOL2401 PIN_FB) and pin 3 (Voltage divider) will enable the DC/DC converter. In that case a Voltage of 5V is available on the VOUT5V_DC/DC pin of the connectors J102, P202 and the Jumper JP202. If the DC/DC converter needs to be disabled the Jumper JP201 should connect pin 1 (ZIOL2401 PIN_LR_OUT) and pin 2 (ZIOL2401 PIN_FB) to each other. **Important:** Powering the IC without setting the Jumper J201 may damage the IC!
1	ZIOL2401 PIN_LR_OUT	
2	ZIOL2401 PIN_FB	
3	Voltage divider	
JP202	*select IC power supply DC/DC_output/VDD*	The Jumper allows choosing weather the ZIOL2401 is powered by the high voltage supply VDD or using the internal DC/DC converter of the IC. A connection between pin 2 and pin 3 will enable the high voltage supply option. If the pin 1 and pin 2 connected to each other, the IC is using the internal DC/DC converter as the power supply. **Important:** In case of using the internal DC/DC converter to supply the IC be sure that DC/DC converter is enabled by setting the Jumper JP201 to the enable position. Attention: Powering the IC without setting the Jumper J202, the IC may not work in the specified way!
1	VOUT5V_DC/DC	
2	ZIOL2401 PIN LR_OUT	
3	VDD	
P202	*Customer application/Extension board connector*	The connector P202 offers the possibility to connect the ZIOL2401 USB Stick to an external application or to the extension board which is part of the ZIOL2401 Starter Kit. Most of the Pins of the connector P202 are connected directly to the ZIOL2401 to use the IC in a customer application setup during the evaluation process. A connection of the ZIOL2401 USB Stick to the PC and to the customer application at the same time is possible as well as the

PIN	Name	Function
		connection to a customer application only. The operation mode will be sensed by the ZIOL2401 USB Stick automatically.
1	ZIOL2401 PIN DC_RDY	Direct connection to the DC_RDY Pin of the ZIOL2401.
2	VOUT5V_DC/DC	5V output of the integrated DC/DC converter of the ZIOL2401
3	ZIOL2401 PIN RST_L	Direct connection to the RST_L Pin of the ZIOL2401.
4	not connected	not connected
5	ZIOL2401 PIN AUX_EN	Direct connection to the AUX_EN Pin of the ZIOL2401.
6	ZIOL2401 PIN VDD	Direct connection to the VDD Pin of the ZIOL2401.
7	ZIOL2401 PIN AUX_TX	Direct connection to the AUX_TX Pin of the ZIOL2401.
8	ZIOL2401 PIN AUX_I	Direct connection to the AUX_I Pin of the ZIOL2401.
9	ZIOL2401 PIN AUX_RX	Direct connection to the AUX_RX Pin of the ZIOL2401.
10	ZIOL2401 PIN AUX_O	Direct connection to the AUX_O Pin of the ZIOL2401.
11	ZIOL2401 PIN COM_EN/SPI_CLK	Direct connection to the COM_EN/SPI_CLK Pin of the ZIOL2401.
12	ZIOL2401 PIN VSS	Direct connection to the VSS Pin of the ZIOL2401.
13	ZIOL2401 PIN COM_TX/SPI_MOSI	Direct connection to the COM_TX/SPI_MOSI Pin of the ZIOL2401.
14	ZIOL2401 PIN LR_IN	Direct connection to the LR_IN Pin of the ZIOL2401.
15	ZIOL2401 PIN COM_RX/SPI_MISO	Direct connection to the COM_RX/SPI_MISO Pin of the ZIOL2401.
16	ZIOL2401 PIN M_EN	Direct connection to the M_EN Pin of the ZIOL2401.
17	ZIOL2401 PIN SPI_EN	Direct connection to the SPI_EN Pin of the ZIOL2401.
18	ZIOL2401 PIN COM_O	Direct connection to the COM_O Pin of the ZIOL2401.
19	ZIOL2401 PIN INT_L	Direct connection to the INT_L Pin of the ZIOL2401.
20	ZIOL2401 PIN COM_I	Direct connection to the COM_I Pin of the ZIOL2401.
21	ZIOL2401 PIN WURQ_L	Direct connection to the WURQ_L Pin of the ZIOL2401.
22	ZIOL2401 PIN LR_OUT	Direct connection to the LR_OUT Pin of the ZIOL2401.
SW_A	*Switch Aux channel*	The SW_A offers the possibility to connect the Aux line on the extension board to ground using a 120 Ohm resistor.
LED_A	*LED Aux channel*	The LED_A Led shows weather the level on the Aux channel is high (LED_A lights green) or low (LED_A is switched off).
SW_C	*Switch Com channel*	The SW_C offers the possibility to connect the Com line on the extension board to ground using a 120 Ohm resistor.
LED_C	*LED Com channel*	The LED_C Led shows weather the level on the Com channel is high (LED_C lights green) or low (LED_C is switched off).
USB	*USB connector*	The USB connector connects the ZIOL2401 Starter Kit to a PC.

2.3 Board Description ZIOL2401 Lab Kit Rev 2.1

Figure 2.2 Hardware Overview ZIOL2401 Lab Kit Rev 2.1

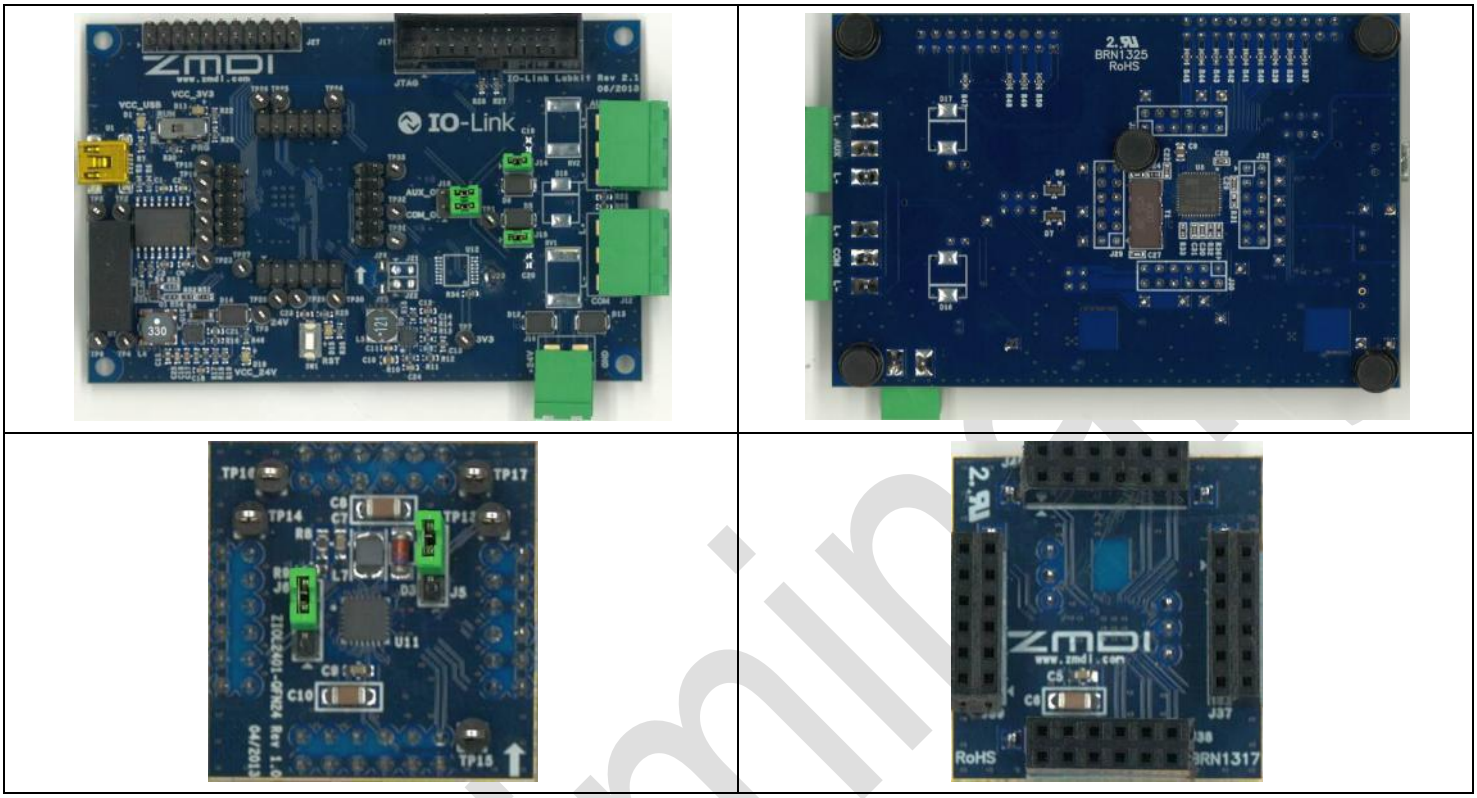


Table 2.3 Device Description ZIOL2401 Lab Kit MCU Board

Reference	Device/Value	Function
D1	Green LED	Indicate 5V USB voltage
D5	10BQ040PBF 40V/1A	Reverse polarity protection
D6	10BQ040PBF 40V/1A	Reverse polarity protection
D7	BAT64-04	Damp signal over-/undershoots and protect output driver
D8	BAT64-04	Damp signal over-/undershoots and protect output driver
D11	Green LED	Indicate 3V3 voltage
D15	Red LED	Indicate Reset caused by SW1
D16	Transient voltage suppressor diode	Not populated
D17	Transient voltage suppressor diode	Not populated
D19	Green LED	Indicate 24V voltage
J11	AUX cable connector	Connect cable to AUX_IO channel of ZIOL2401
J12	COM cable connector	Connect cable to COM_IO channel of ZIOL2401
J14	Jumper	Disable reverse polarity diode D6 by setting jumper
J15	Jumper	Disable reverse polarity diode D5 by setting jumper

Reference	Device/Value	Function
J16	24V/GND	External power supply connector
J17	JTAG/SWD connector	20Pin standard ARM JTAG/SWD interface
J18	COM/AUX Output mode	Select output mode of COM and AUX channel - Separate outputs for device applications - Combined outputs for master applications
J21	WURQ_L pin header	For IDT internal use only, not populated
J22	INT_L pin header	For IDT internal use only, not populated
J23	PFD connection	Connect PFD to external voltage divider
J25	WURQ_L connection	Connect WURQ_L to MCU
J26	INT_L connection	Connect INT_L to MCU
J27	GPIO Pin header	Connect customer application to Microcontroller
J29	Pin 1: COM_O Pin 3,7,9: GND Pin 5: PFD Pin 11: AUX_O Pin 2,4,6,8,10,12: GND	Connect to ZIOL24xx Device Board
J30	Pin 1: SPI_EN_L Pin 3: INT_L Pin 5: WURQ_L Pin 7: LR_OUT Pin 9: VCC_24V Pin 11: COM_I Pin 2,4,6,8,10,12: GND	Connect to ZIOL24xx Device Board
J31	Pin 1: AUX_I Pin 3, 5: VCC_24V Pin 7: DCDC_OUT (5V) Pin 9: DC_RDY Pin 11: RST_L Pin 2,4,6,8,10,12: GND	Connect to ZIOL24xx Device Board
J32	Pin 1: AUX_EN Pin 3: AUX_TX Pin 5: AUX_RX Pin 7: TX_EN/SPI_CLK Pin 9: TX/MOSI Pin 11: RX/MISO Pin 2,4,6,8,10,12: GND	Connect to ZIOL24xx Device Board
RV1	Varistor	Not populated
RV2	Varistor	Not populated
SW1	MCU reset switch	Resets the Fujitsu FM3 MCU
SW3	RUN/PRG switch	Selects MCU state: RUN or Programming mode
TP1	VCC_24V	24V, from cable or external supply or boost converter U10
TP2	VCC_USB	USB voltage (5V)
TP3	VCC_24V	24V, from cable or external supply or boost converter U10

Reference	Device/Value	Function
TP4	VCC_USB_5V	Isolated 5V voltage (5V)
TP5	GND_USB	USB Ground
TP6	GND	Isolated GND
TP7	VCC_3V3	Test point 3.3V MCU supply voltage (3.3V), derived from VCC_24V
TP18	AUX_EN	Test point
TP19	AUX_TX	Test point
TP20	AUX_RX	Test point
TP21	TX_EN/SPI_CLK	Test point
TP22	TX/MOSI	Test point
TP23	RX/MISO	Test point
TP24	AUX_I	Test point
TP25	DC_RDY	Test point
TP26	RST_L	Test point
TP27	SPI_EN_L	Test point
TP28	INT_L	Test point
TP29	WURQ_L	Test point
TP30	COM_I	Test point
TP31	COM_O	Test point
TP32	PFD	Test point
TP33	AUX_O	Test point
U1	Mini B USB connector	Connects the Lab Kit via USB cable to the PC
U2	ADuM3160	USB galvanic isolator
U7	TMH0505S	Isolated DC/DC converter to decouple Lab Kit from PC power system
U8	Fujitsu MB9BF524K FM3 Cortex M3 Microcontroller	
U9	TPS54061	24V to 3.3V buck DC/DC converter
U10	TPS55340	5V to 24V boost DC/DC converter
U12	ADG5436 analog switch	For IDT internal use only, not populated

Table 2.4 Device Description ZIOL2401 Lab Kit Device Board

Reference	Device/Value	Function
C5	100nF / 50V	Low ESR recommended
C6	10uF / 50V	Low ESR required
C7	100nF / 10V	Low ESR recommended
C8	10uF / 10V	Low ESR required
C9	100nF /10V	Low ESR recommended
C10	10uF / 10V	Low ESR required
D3	TMMBAT48 40V/0.2A	DCDC free-wheeling diode
J5	LR_IN	Supply LR_IN with: 1-2: DCDC_OUT (5V) 2-3: VDD (24V)
J6	FB	Connect FB to: 1-2: LR_OUT to disable DCDC converter 2-3: Voltage divider to enable DCDC converter (5V)
J37	Pin 1: AUX_EN Pin 3: AUX_TX Pin 5: AUX_RX Pin 7: TX_EN/SPI_CLK Pin 9: TX/MOSI Pin 11: RX/MISO Pin 2,4,6,8,10,12: GND	Connect to Lab Kit Microcontroller Board
J38	Pin 1: SPI_EN_L Pin 3: INT_L Pin 5: WURQ_L Pin 7: LR_OUT Pin 9: VCC_24V Pin 11: COM_I Pin 2,4,6,8,10,12: GND	Connect to Lab Kit Microcontroller Board
J39	Pin 1: COM_O Pin 3,7,9: GND Pin 5: PFD Pin 11: AUX_O Pin 2,4,6,8,10,12: GND	Connect to Lab Kit Microcontroller Board
J40	Pin 1: AUX_I Pin 3, 5: VCC_24V Pin 7: DCDC_OUT (5V) Pin 9: DC_RDY Pin 11: RST_L Pin 2,4,6,8,10,12: GND	Connect to Lab Kit Microcontroller Board
L7	Murata LQH32CN100k33L 10uH	
R8	38k3, 1%	FB voltage divider

Reference	Device/Value	Function
R9	12k4, 1%	FB voltage divider
TP13	LR_IN	Linear Regulator input 4.5V to VDD
TP14	GND	
TP15	LR_OUT	Linear Regulator output 3.3V, 10mA
TP16	DCDC_OUT	DCDC converter output voltage 5V, 50mA
TP17	VDD	Main supply voltage 24V
U1	ZIOL2401B	QFN24 package

2.4 Hardware Setup

Figure 2.3 Bidirectional Communication Setup

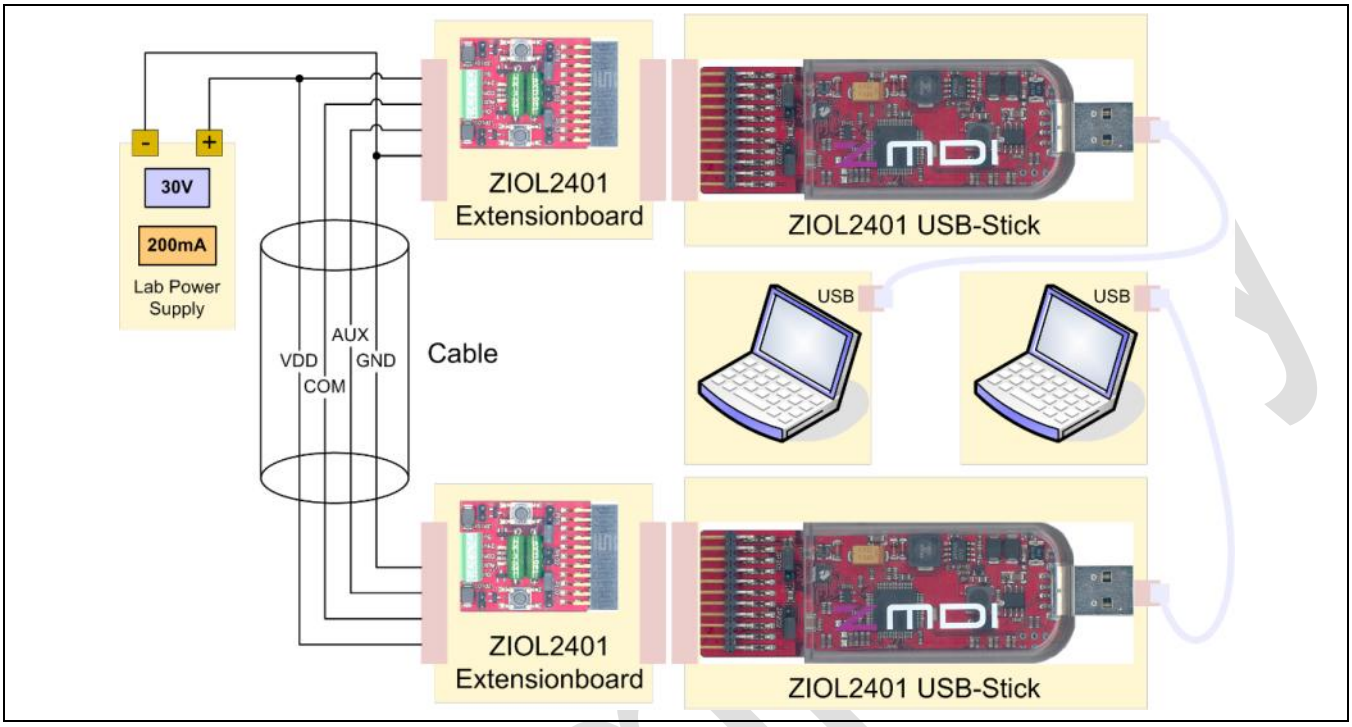
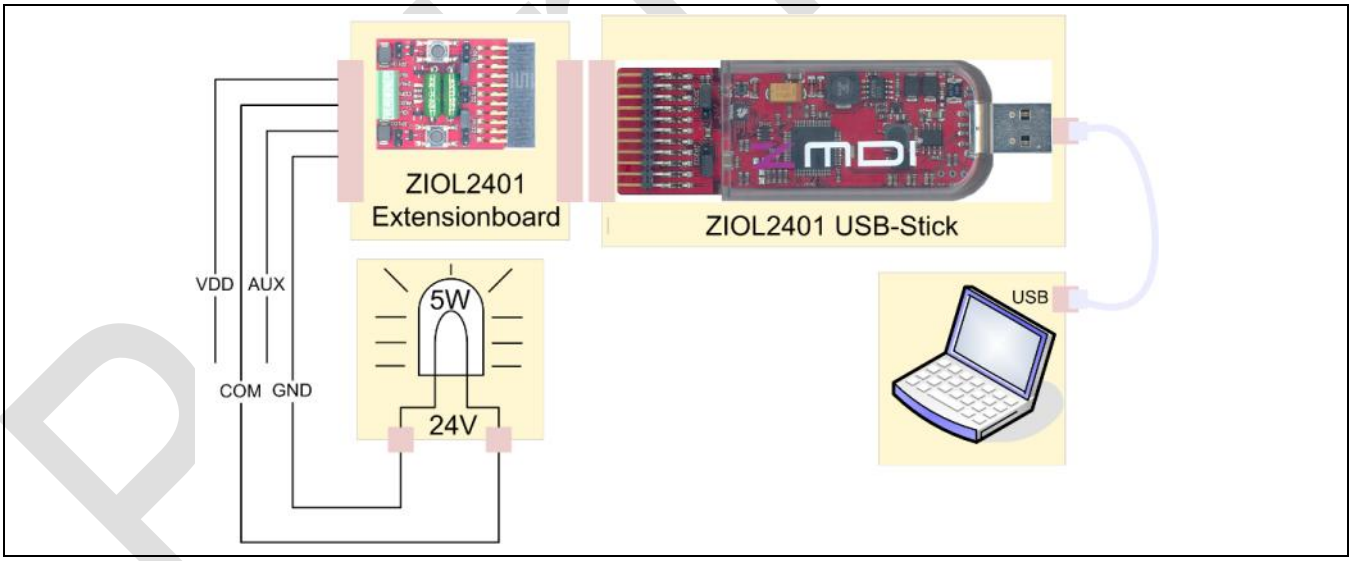


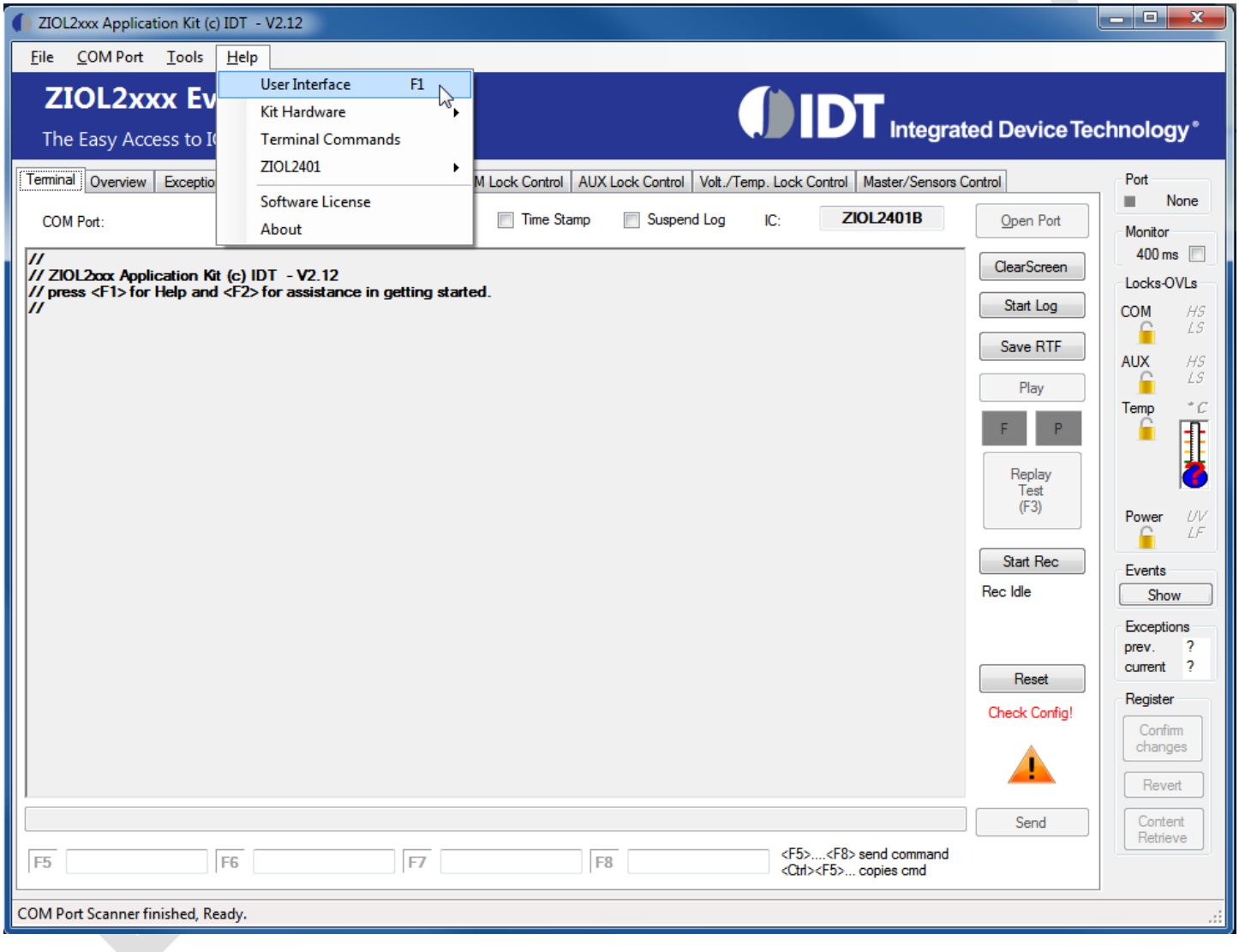
Figure 2.4 5W Lamp Switch Setup



3 Software

The ZIOL2401 Evaluation Tools are controlled by a PC which is connected to these tools via an USB connection. In general there exist two possibilities to control the functions of ZIOL2401 Evaluation Tools using a PC. The first possibility is to use ZIOL2401 Evaluation Software which is part of the evaluation tools. Information how to install the graphical user interface can be found in section 1.2. The documentation of the graphical user interface is not part of this user manual. Figure 3.1 shows the locations of the graphical user interface manual.

Figure 3.1 Documentation for the Graphical User Interface



The Software Manual is located in the Windows® Start Menu under “IDT ZIOL2401 KIT” → Manual in case of standard installation setup. Another possibility to get access to the Manual is to use the help function which is included directly in the Graphical User Interface by clicking on the Help button like shown in the right picture or to push the button F1 on your Keyboard while the Software is running

The communication between the PC and the ZIOL2401 Starter Kit or the ZIOL2401 Lab Kit Rev 2.1 uses a Terminal based communication protocol. For that reason the ZIOL2401 Evaluation Tools can be controlled by each standard Terminal Program. The Communication protocol is based on ASCII Commands. A list of available Terminal Commands is shown in the Appendix **Fehler! Verweisquelle konnte nicht gefunden werden.**.

4 Schematic and Layout of ZIOL2401 Starter Kit

4.1 Schematic for the ZIOL2401 Starter Kit

Figure 4.1 Schematic for the ZIOL2401 Starter Kit Power Supply

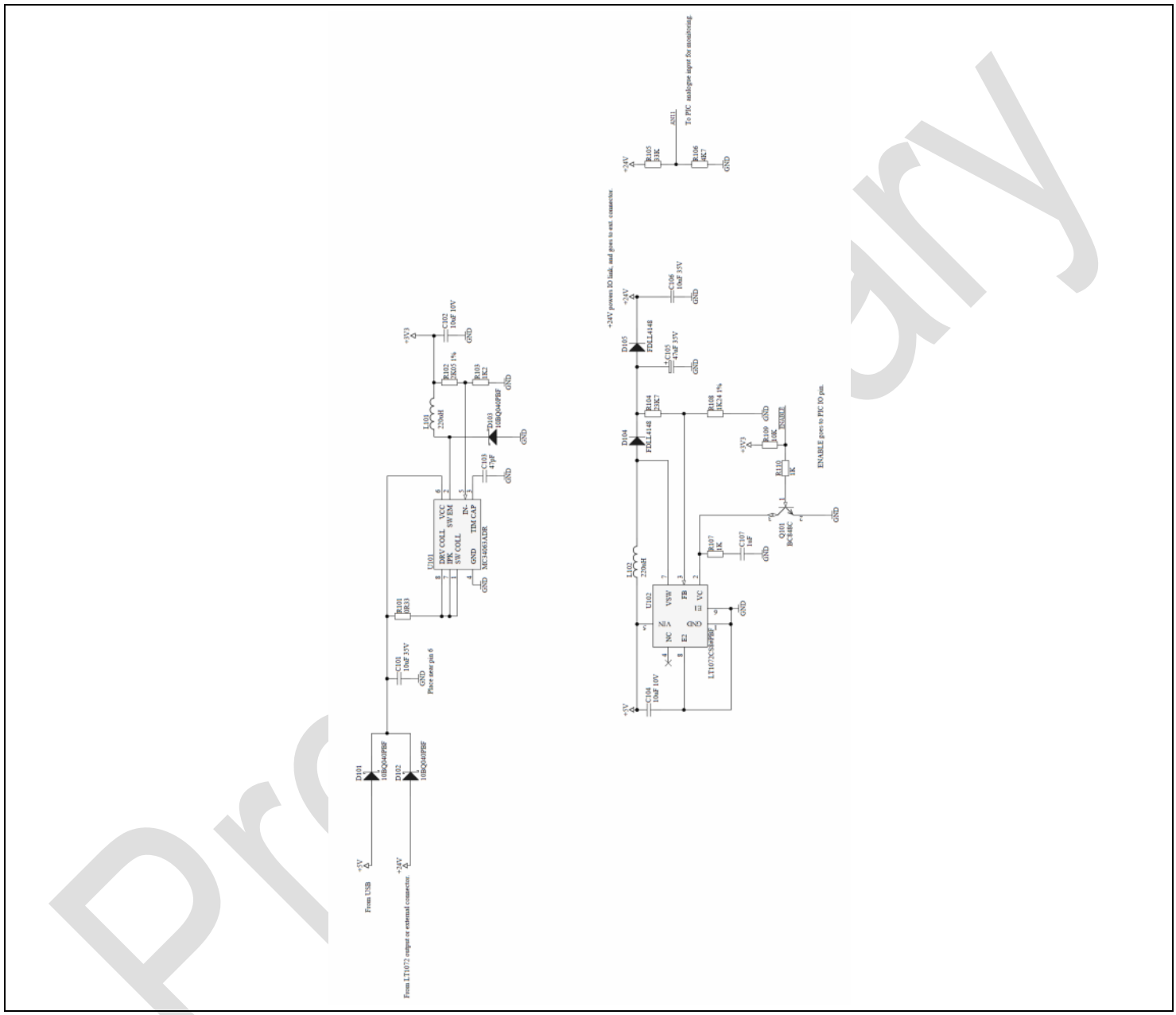


Figure 4.2 Schematic for the ZIOL2401 Starter Kit Control Unit

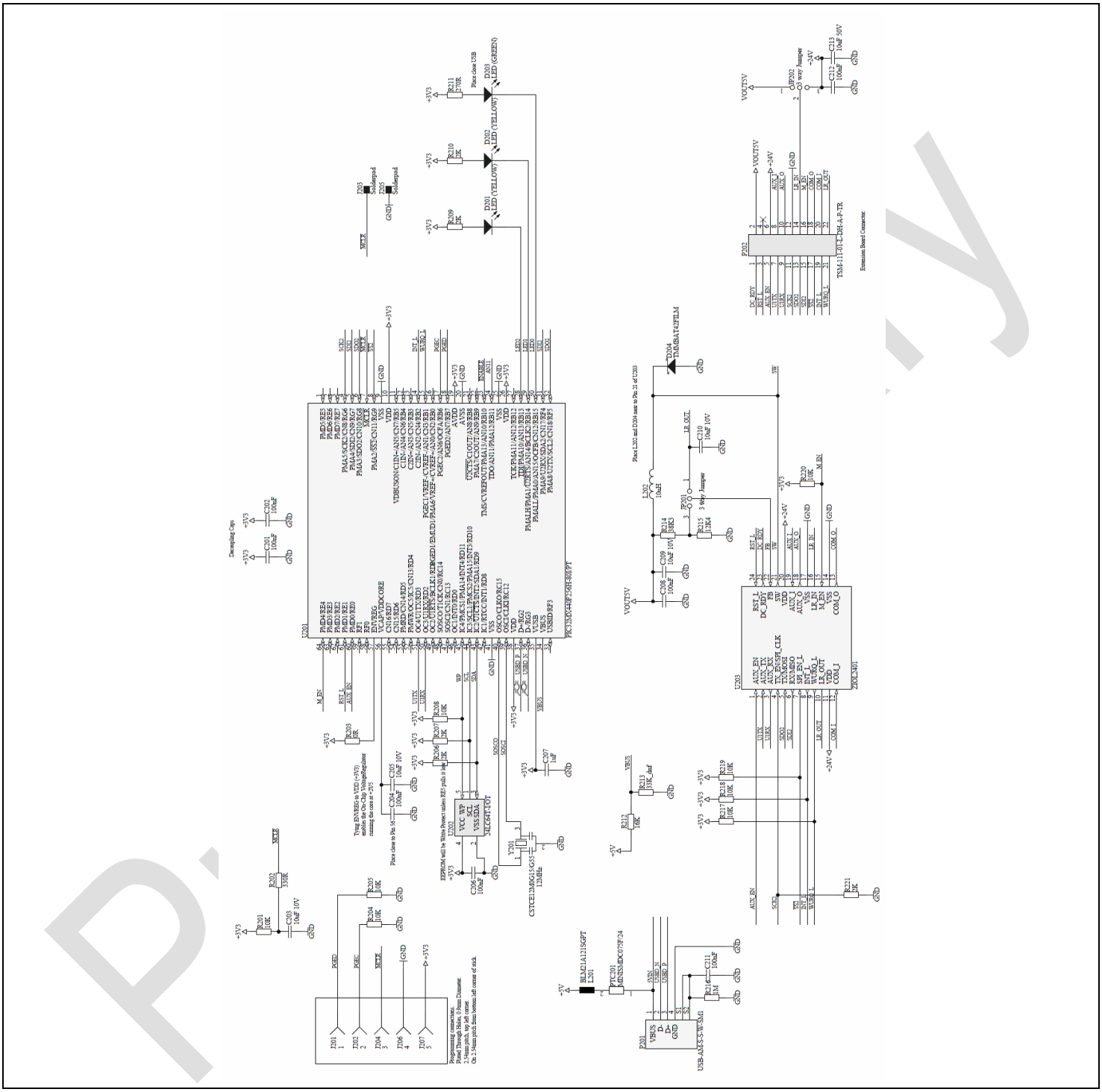
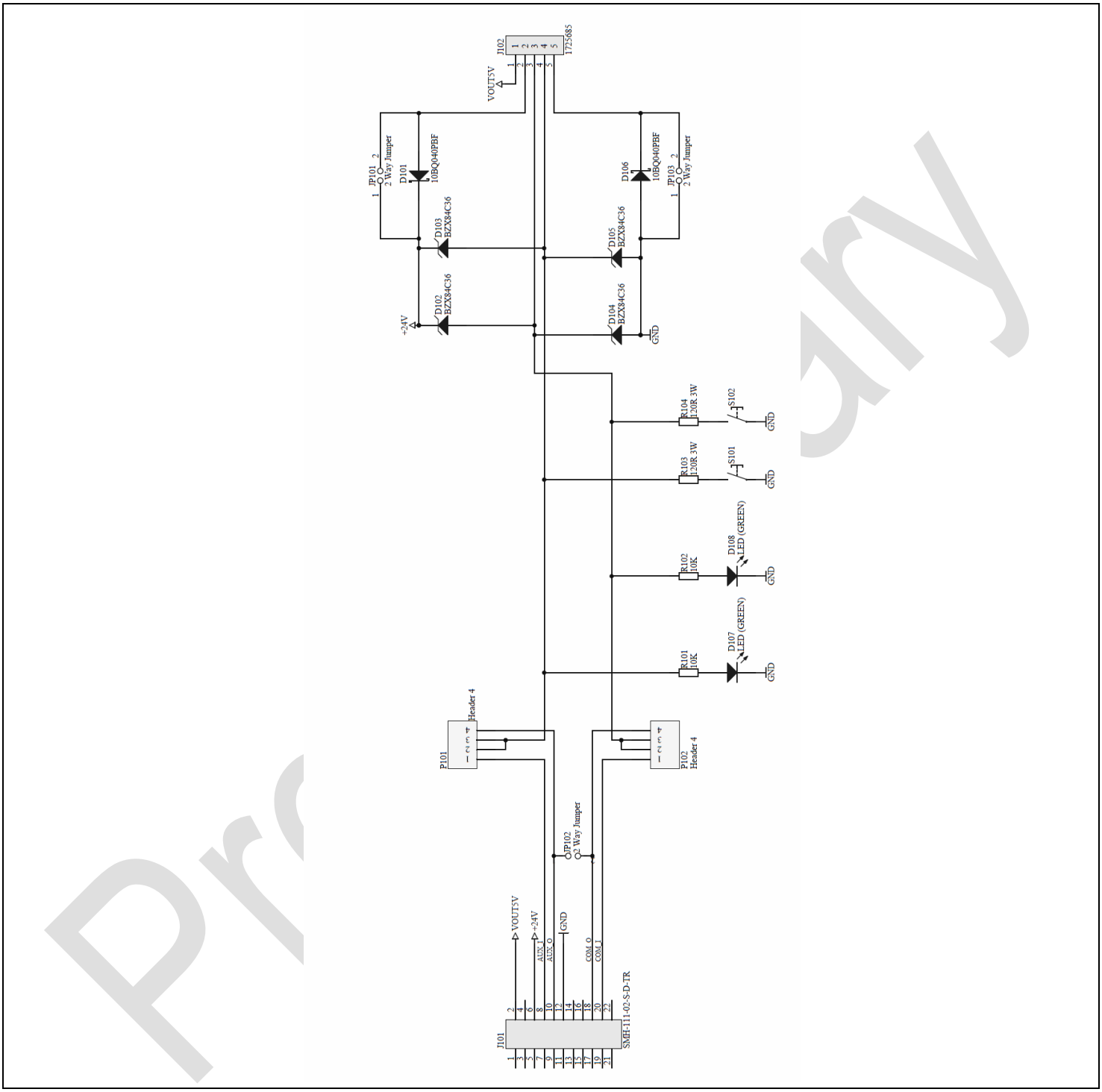


Figure 4.3 Schematic for the ZIOL2401 Starter Kit Extension Board



4.2 Layout of ZIOL2401 Starter Kit

Figure 4.4 Layout Top Layer ZIOL2401 Starter Kit USB Stick

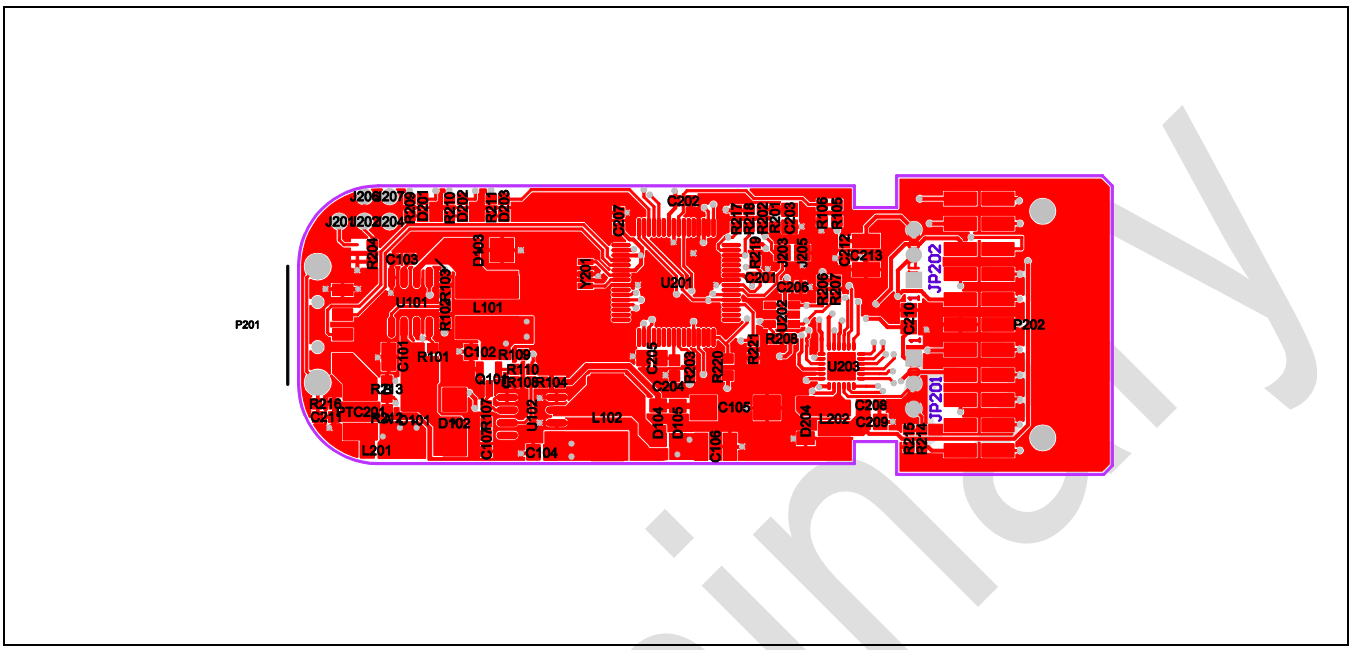


Figure 4.5 Layout Bottom Layer ZIOL2401 Starter Kit USB Stick

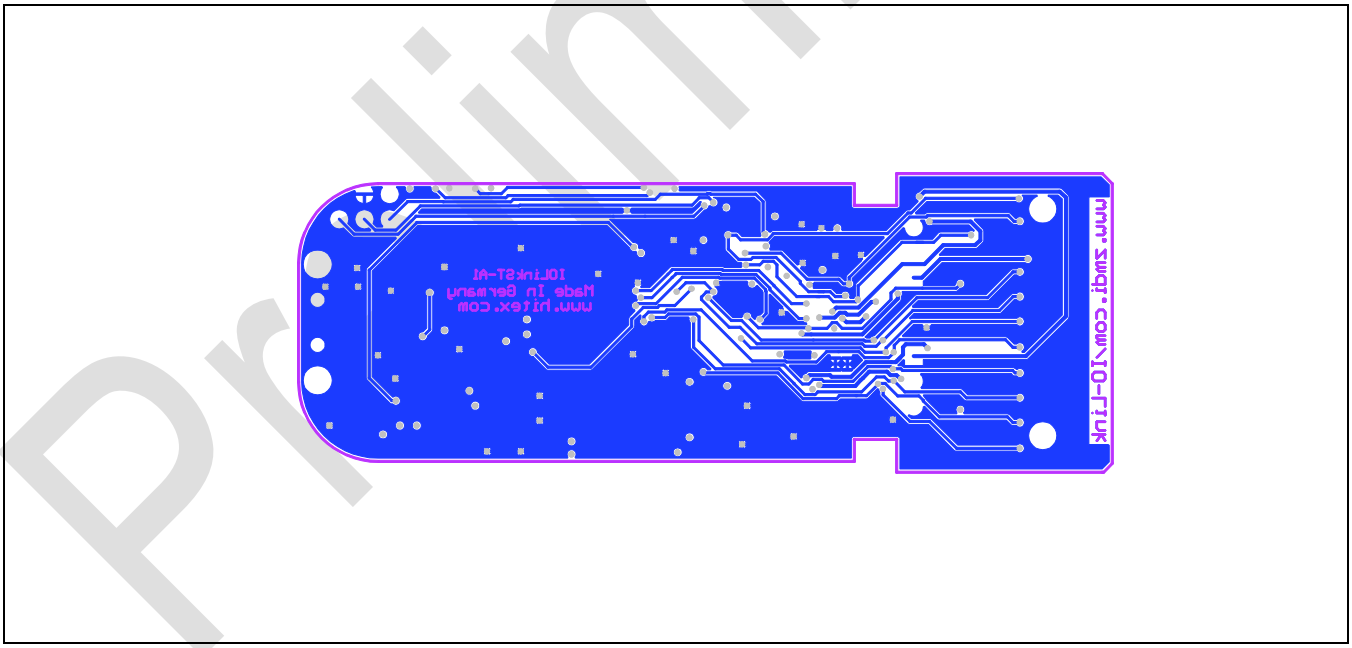


Figure 4.6 Layout Ground Layer ZIOL2401 Starter Kit USB Stick

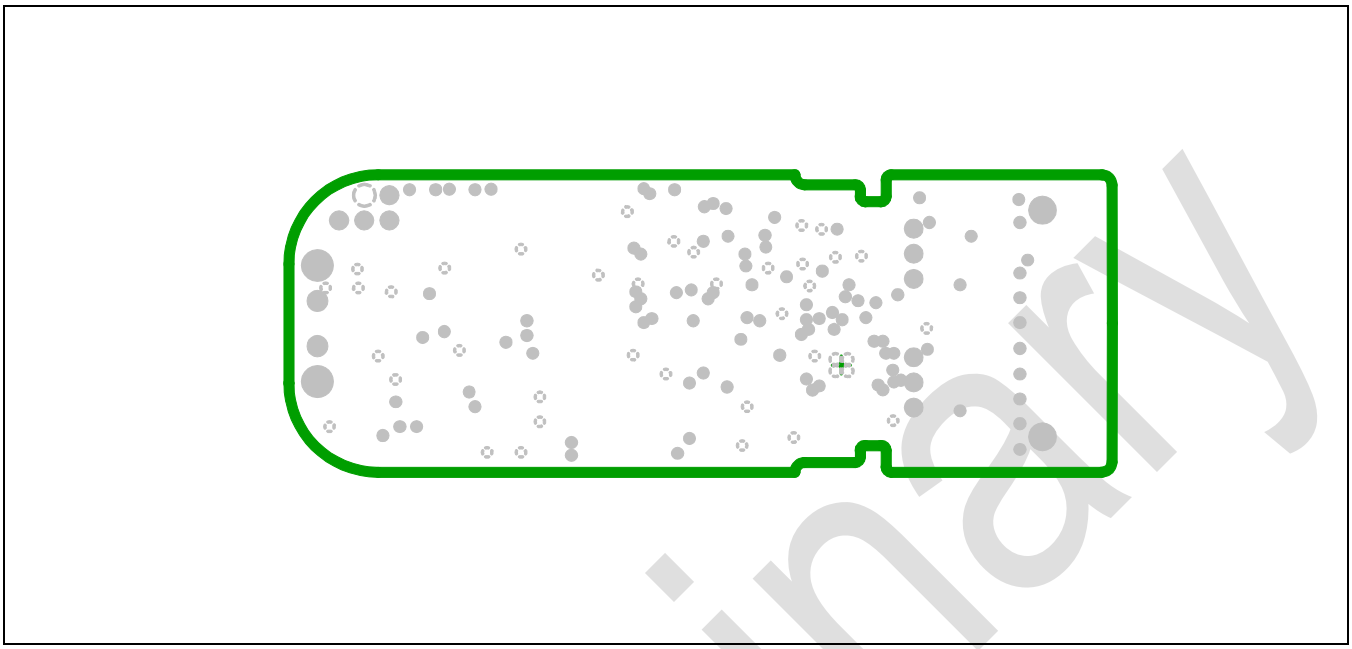


Figure 4.7 Layout Power Layer ZIOL2401 Starter Kit USB Stick

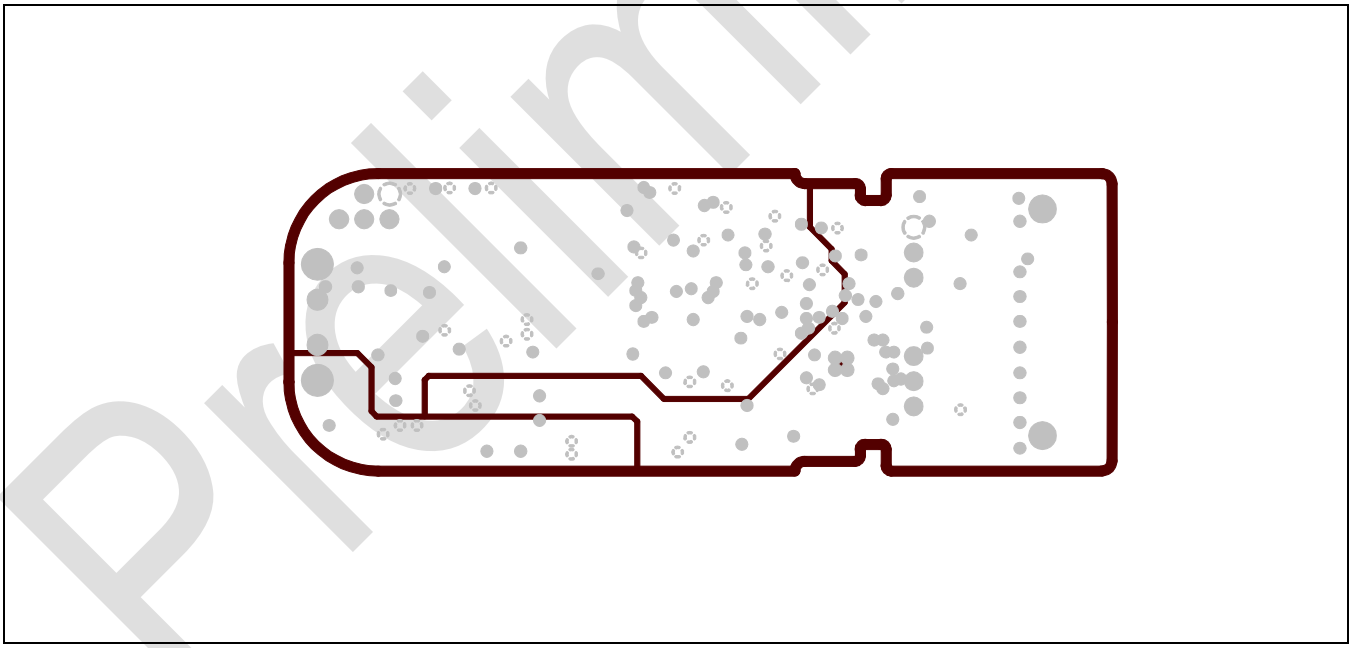


Figure 4.8 Layout Top Layer ZIOL2401 Starter Kit Extension Board

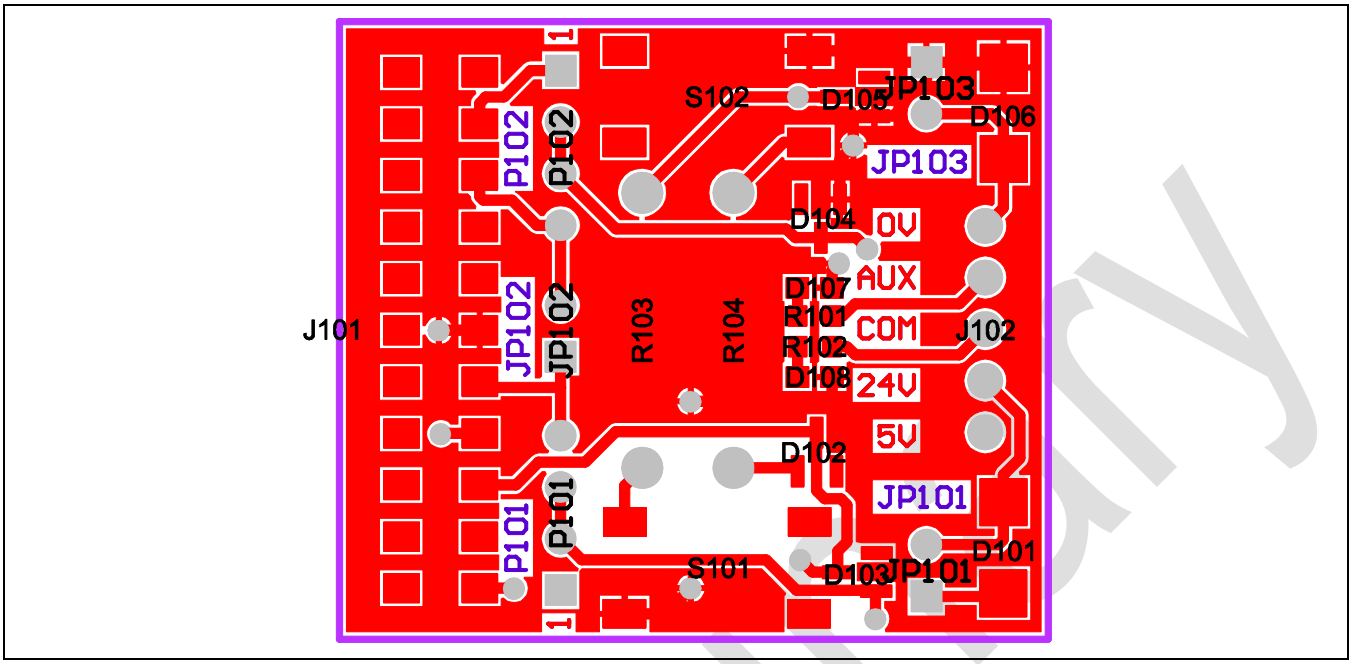
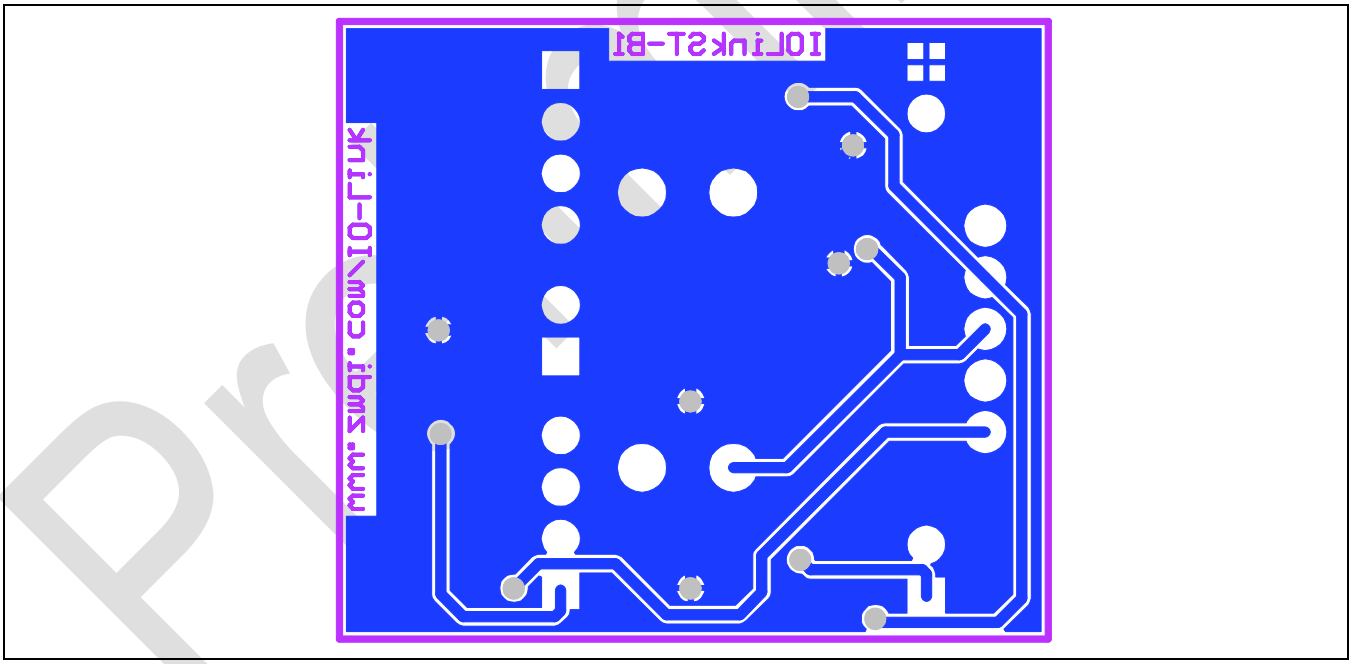


Figure 4.9 Layout Bottom Layer ZIOL2401 Starter Kit Extension Board



4.3 Schematic and Layout of ZIOL2401 Lab Kit Rev 2.1

4.3.1 Schematic of ZIOL2401 Lab Kit Rev 2.1

Figure 4.10 Schematic ZIOL2401 Lab Kit Rev 2.1 Power Supply

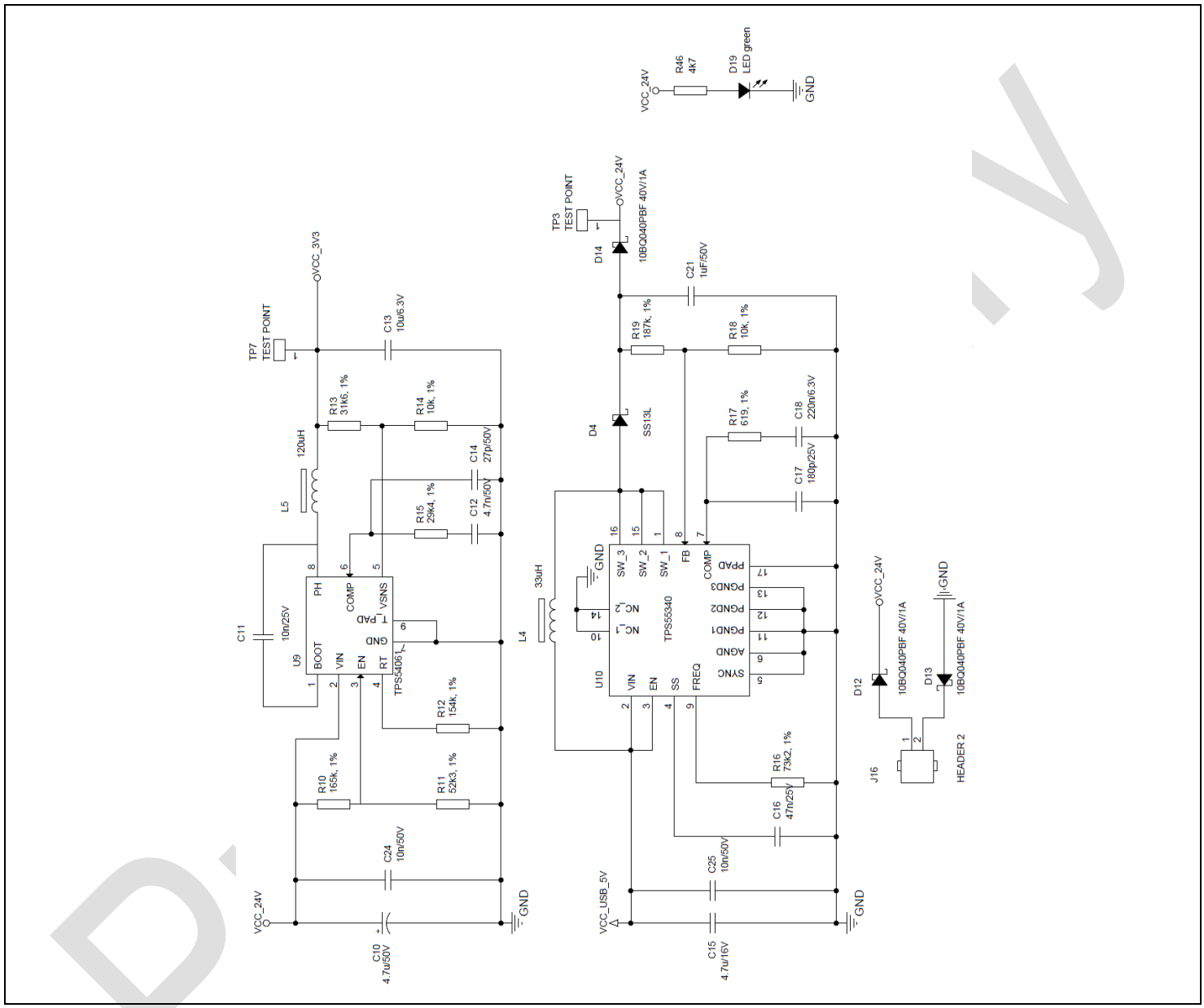


Figure 4.11 Schematic ZIOL2401 Lab Kit Rev 2.1 Cable Interface

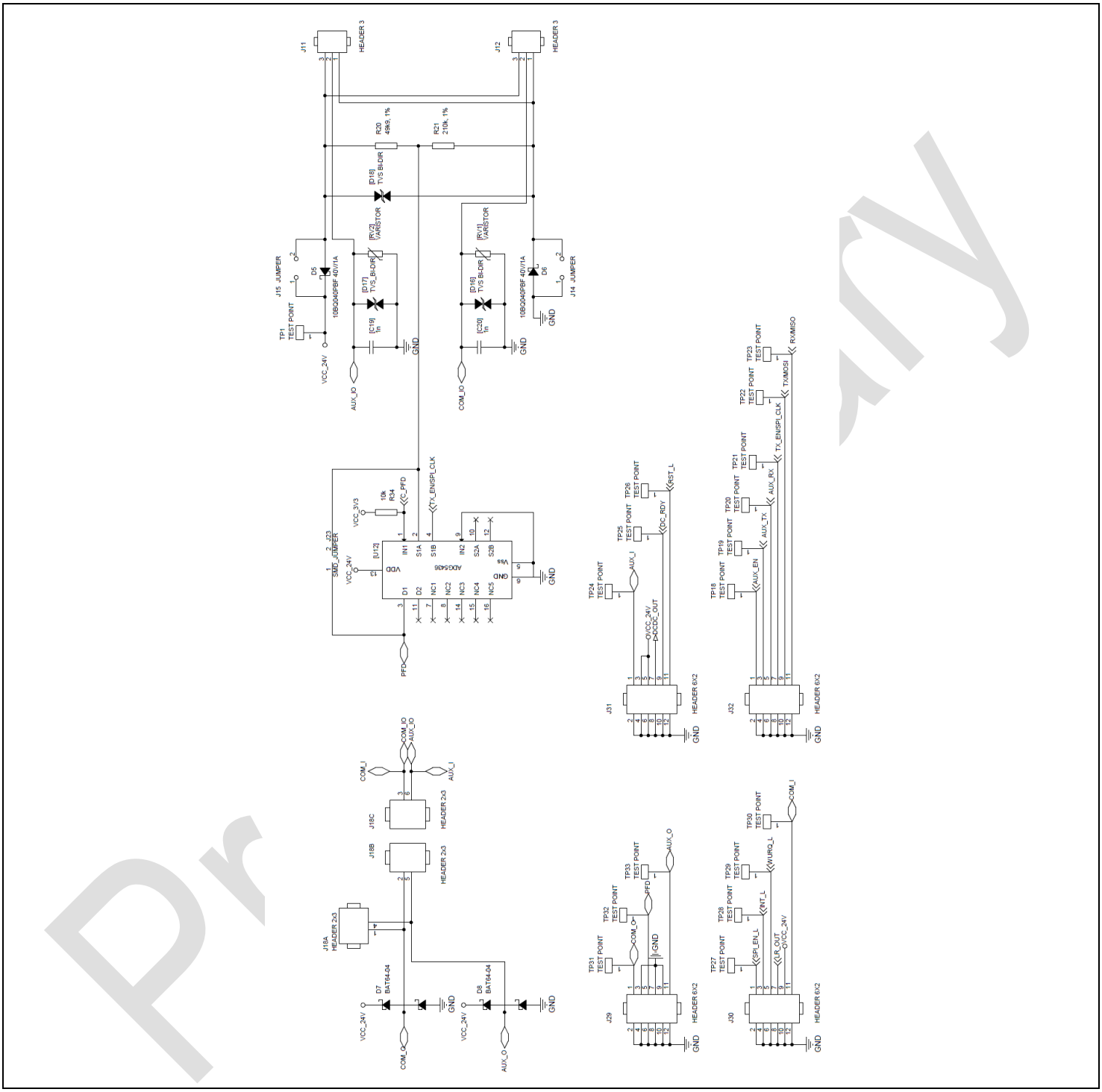


Figure 4.12 Schematic ZIOL2401 Lab Kit Rev 2.1 Microcontroller Board

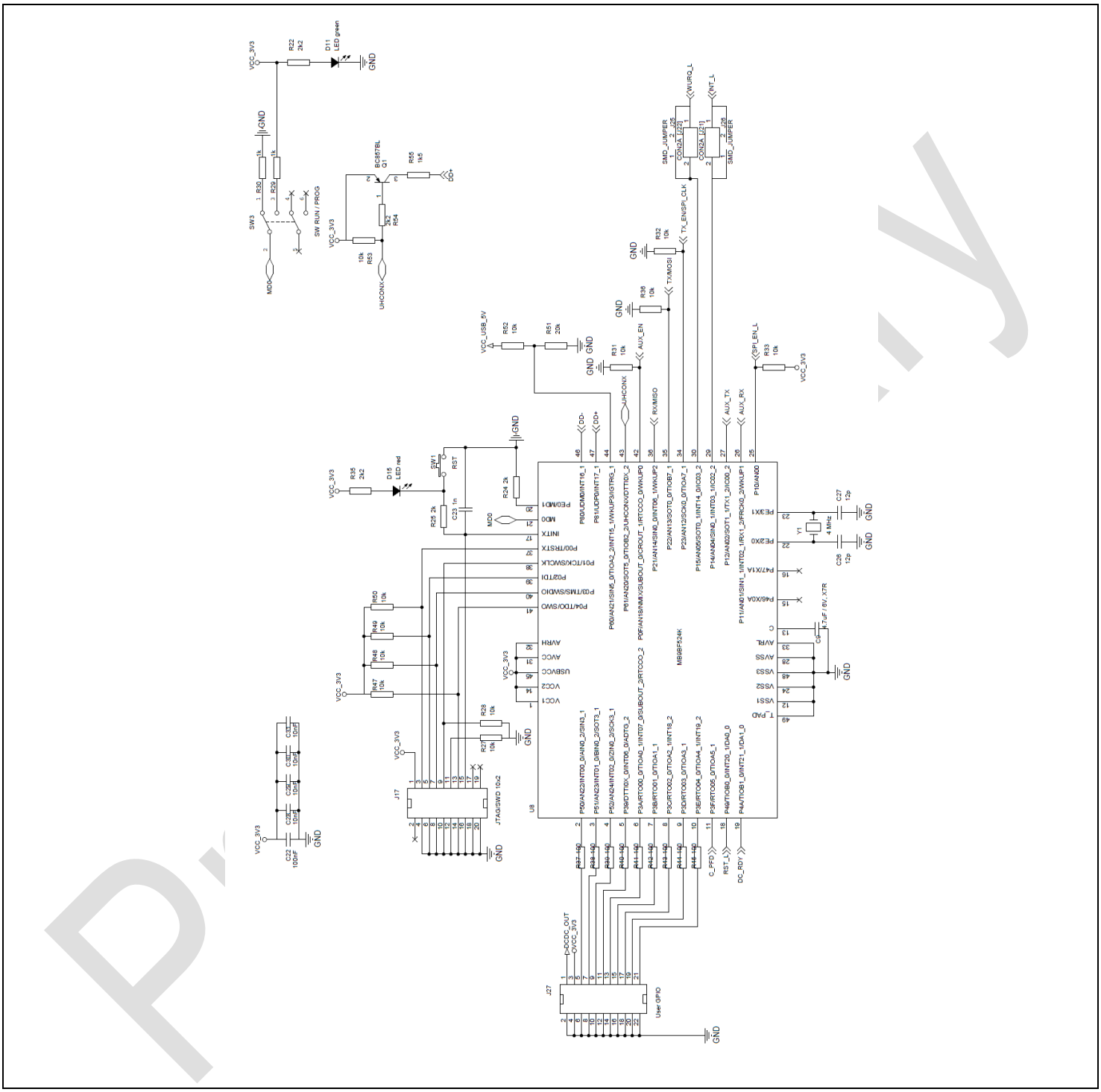


Figure 4.13 Schematic ZIOL2401 Lab Kit Rev 2.1 Galvanic Isolation, USB Interface

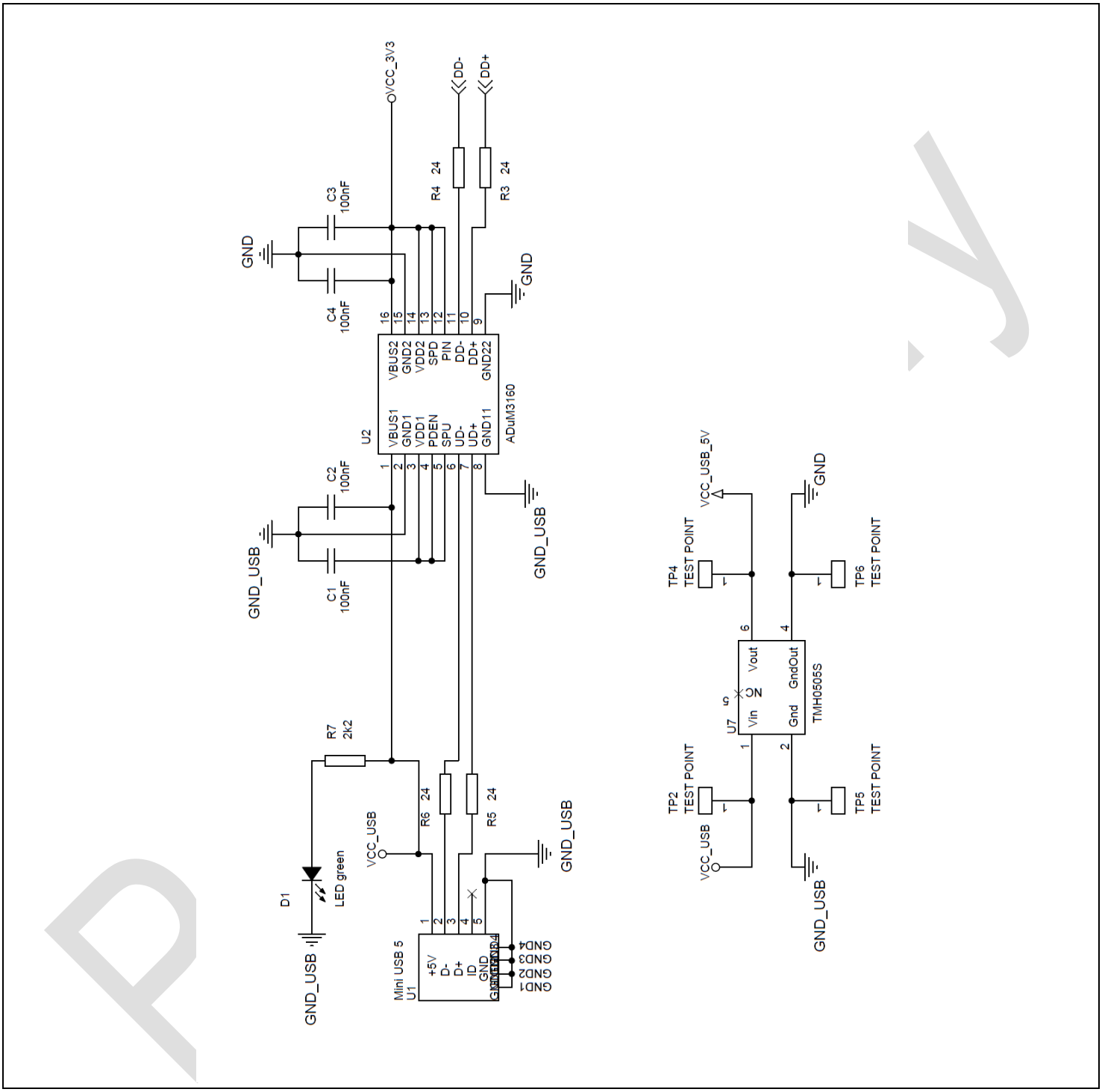
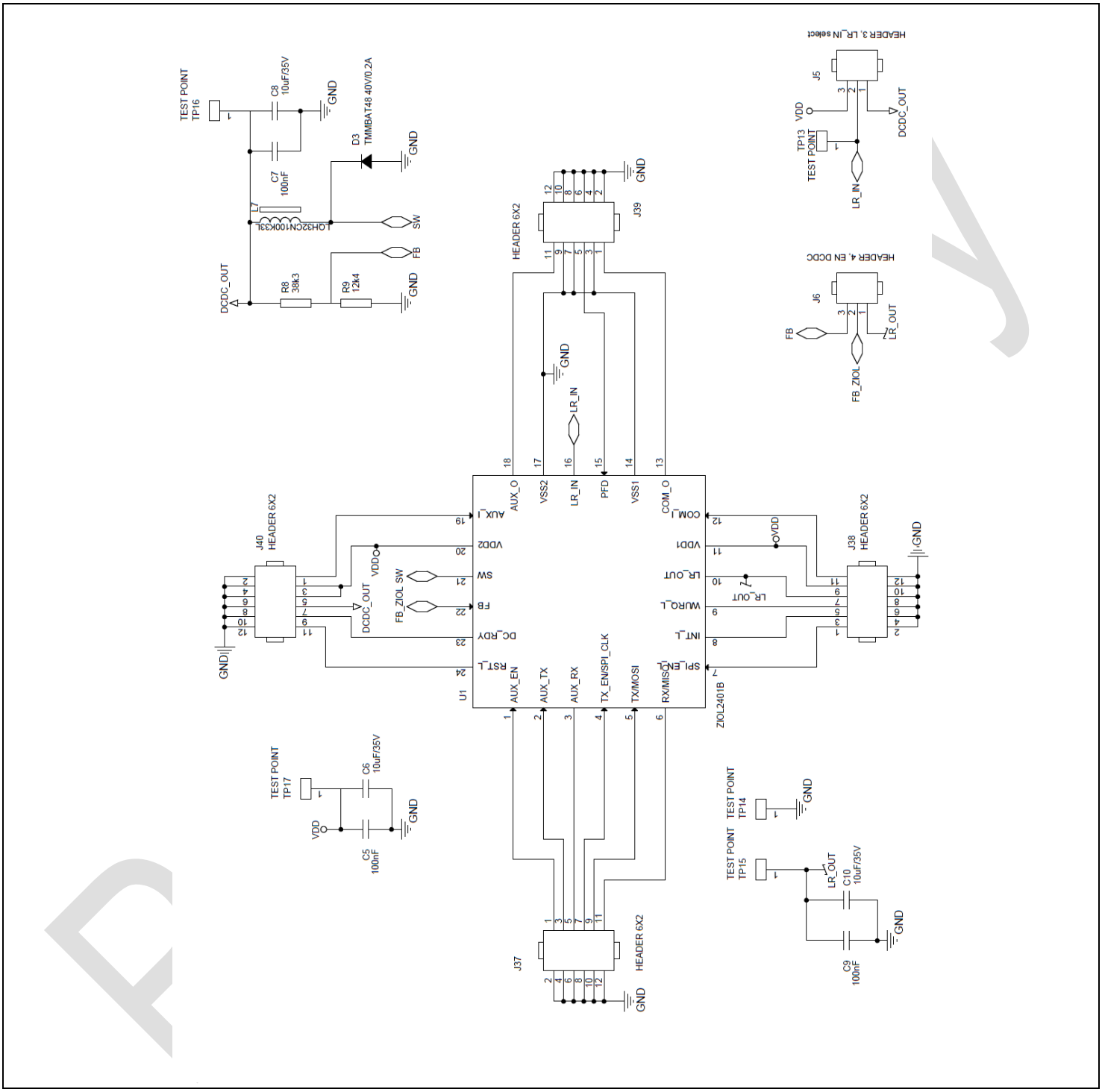
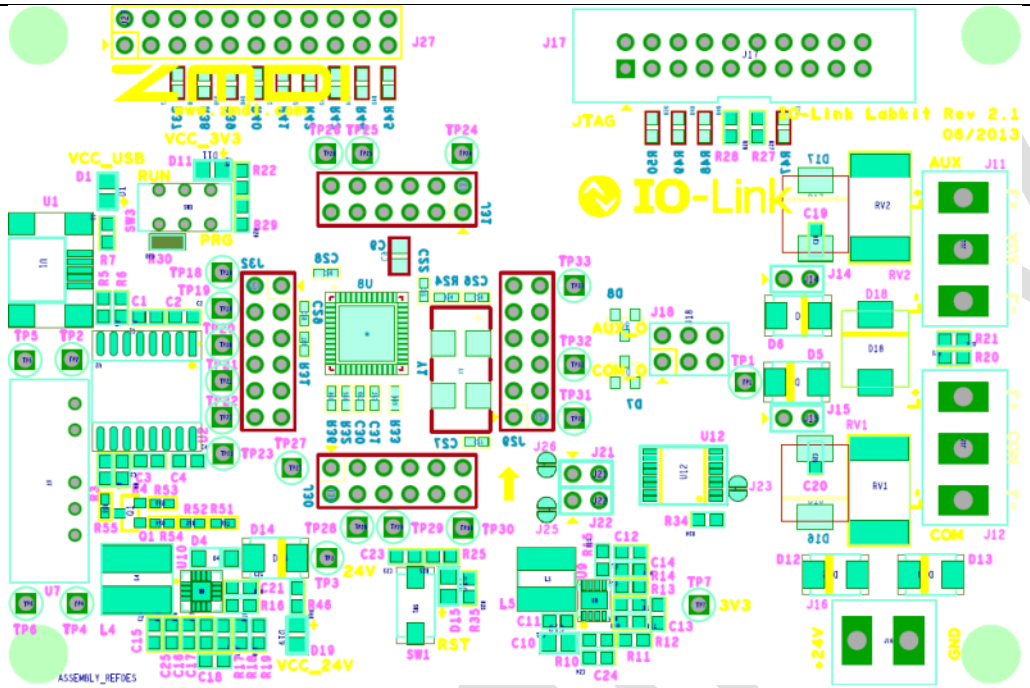


Figure 4.14 Schematic ZIOL2401 Lab Kit Rev 2.1 Device Board



4.3.2 Layout of ZIOL2401 Lab Kit Rev 2.1

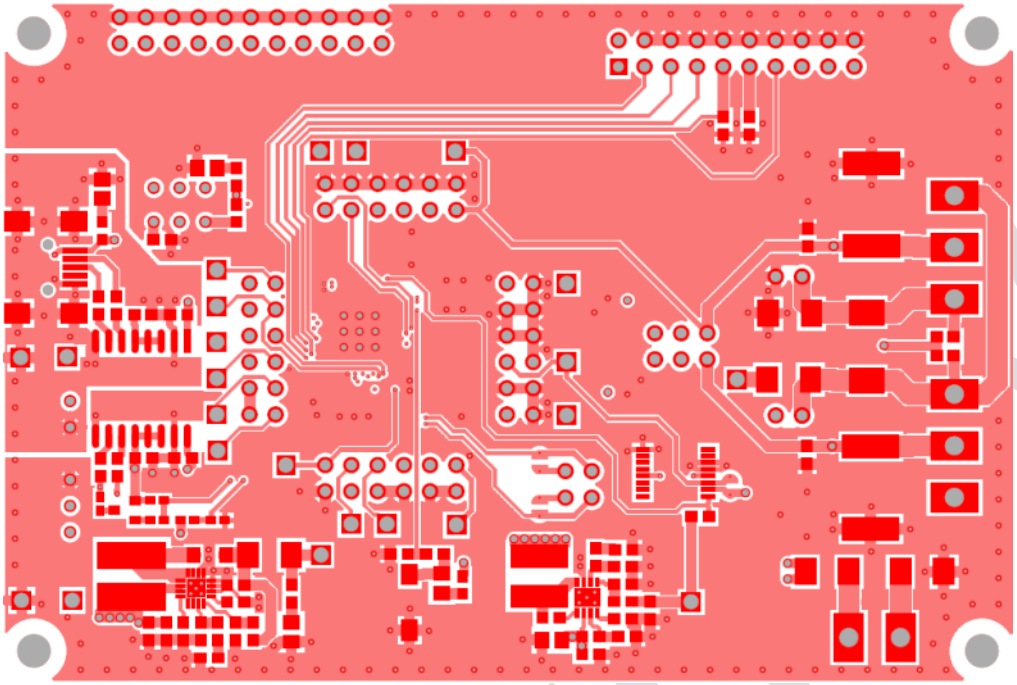
Figure 4.15 Layout ZIOL2401 Lab Kit Rev 2.1 Microcontroller Board



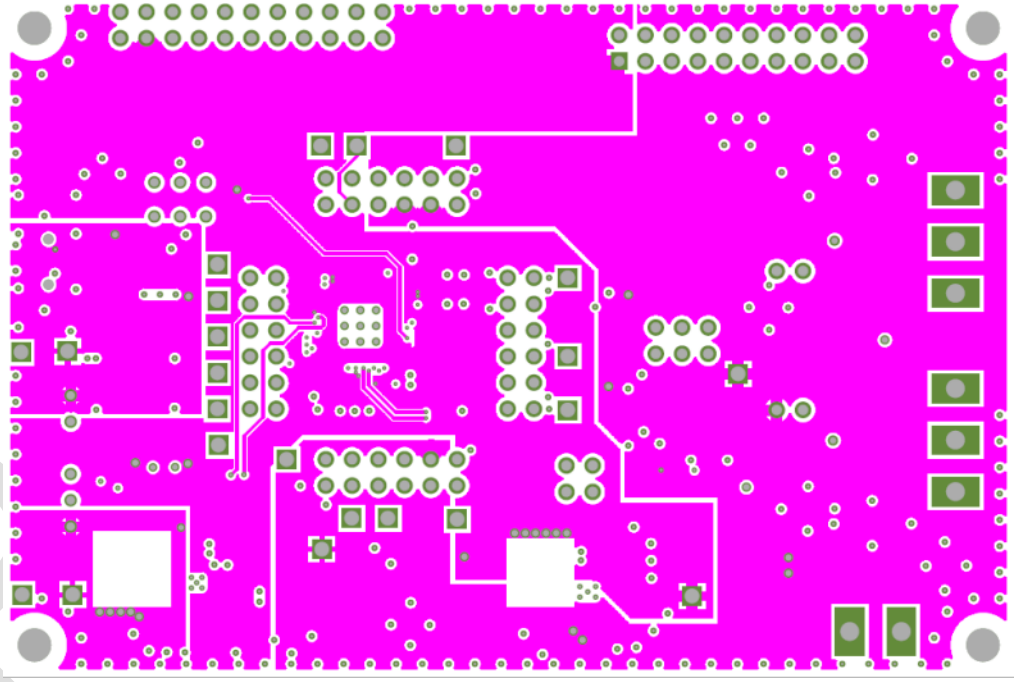
Assembly Drawing

Blue is Top Layer

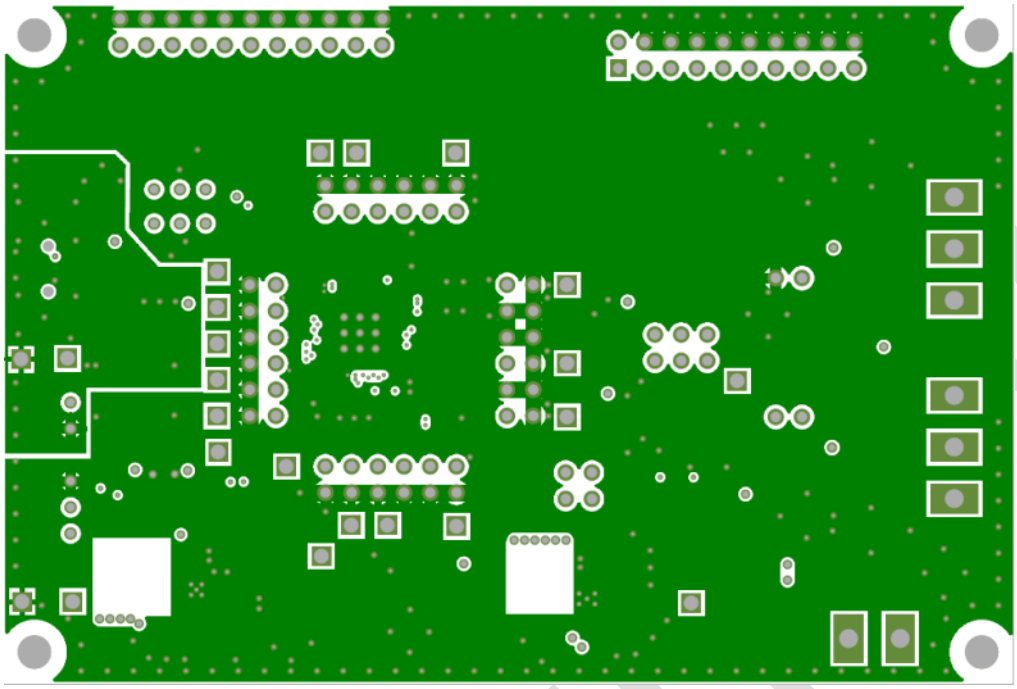
Red is Bottom Layer



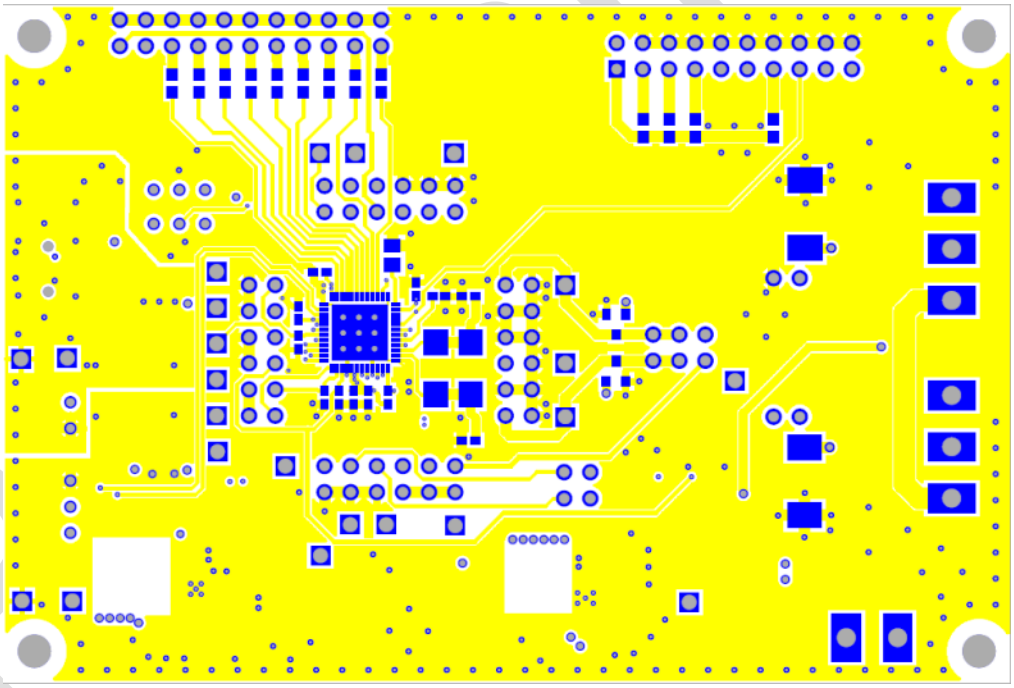
Top Layer



Inner Layer, Power

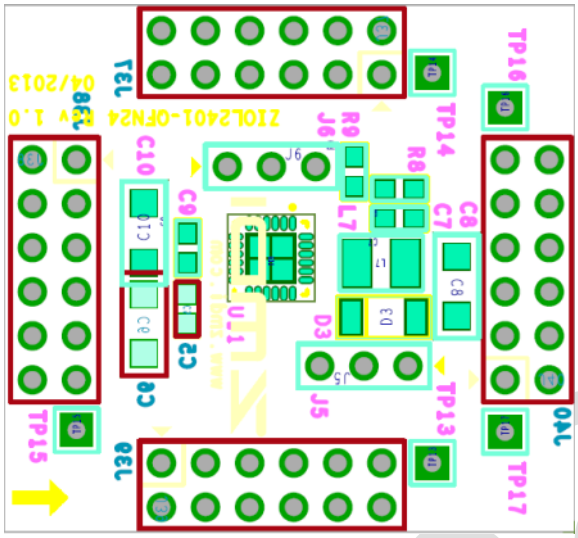


Inner Layer, Ground



Bottom Layer

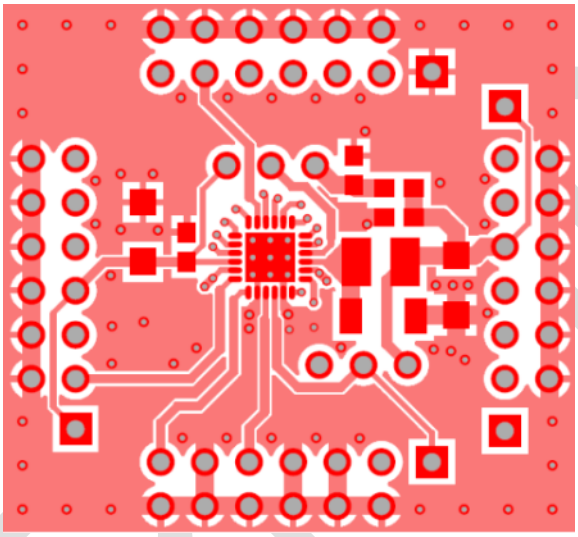
Figure 4.16 Layout ZIOL2401 Lab Kit Rev 2.1 Device Board



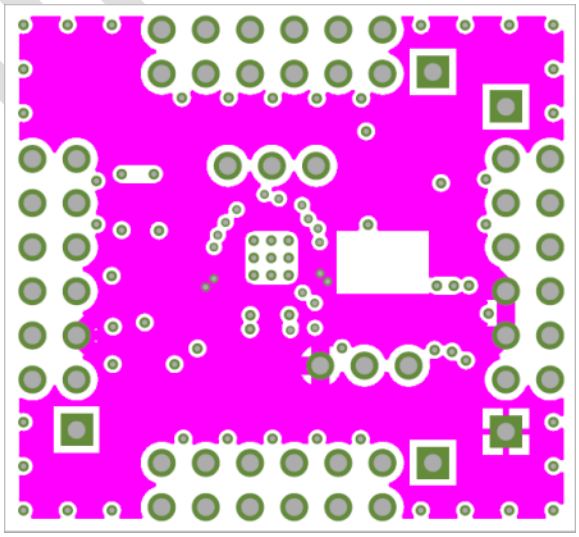
Assembly Drawing

Blue is Top Layer

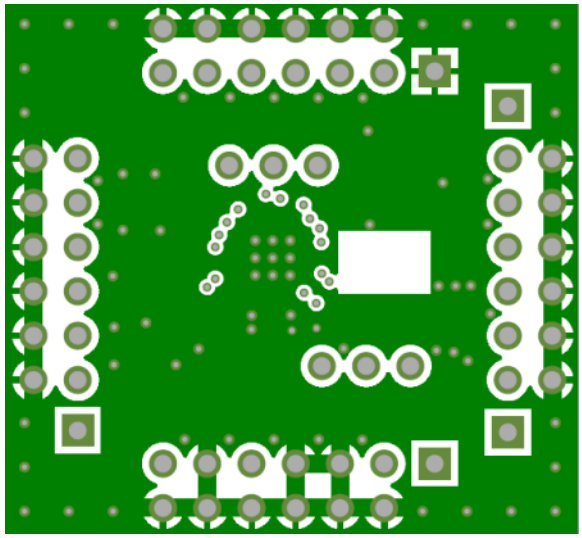
Red is Bottom Layer



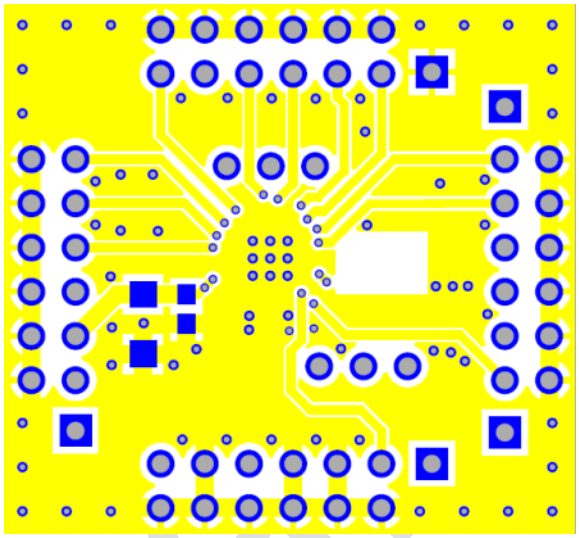
Top Layer



Inner Layer, Power



Inner Layer, Ground



Bottom Layer

5 Revision History

Revision Date	Description of Change
June 14, 2011	Initial release
August 08, 2015	Full content review Labkit V2.1 added
August 24, 2016	Changed to IDT branding

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