Wireless Power Charging Solution for Transmitter with TX-A1 coil

Evaluation Board Manual

IDTP9030 "Qi" TX-A1 EVALUATION KIT

Features

- "Qi"Compliant Reference design
- Low-cost 4-layer PCB with 1 oz. copper traces
- Fully assembled with test points and stand-offs
- Single input operation with micro-USB
- USB to I²C hardware converter for PC connectivity
- EEPROM to store and load start-up script/firmware
- Software tool to monitor operation, settings control and R/W EEPROM
- 19V DC power adapter input.
- LED status indicators for most inputs and outputs
- 5W output power

Evaluation Kit Contents

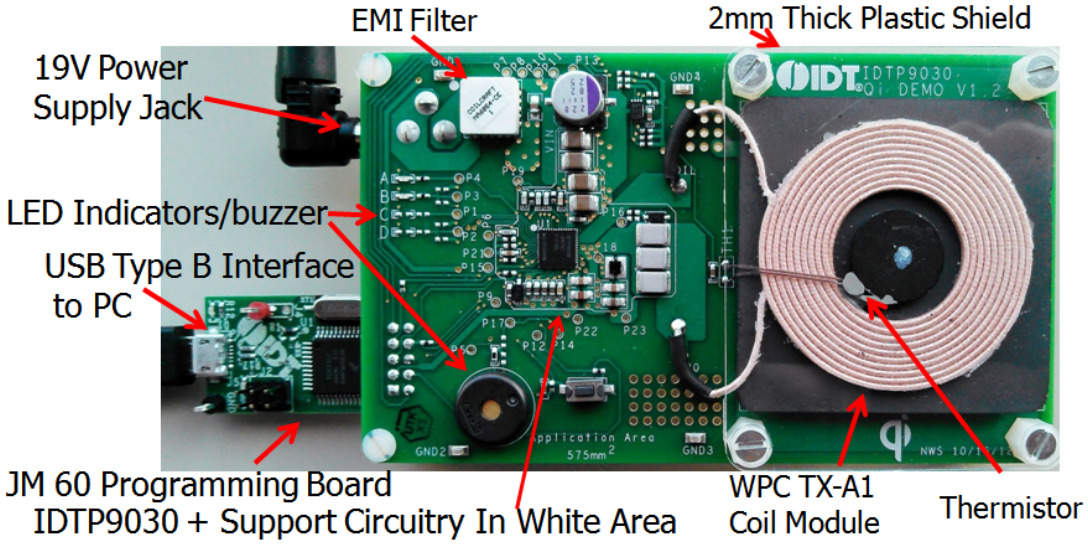
- IDTP9030-EVAL Evaluation board
- JM60 Programming Dongle
- USB type A to micro-USB type B cable
- 19V AC to DC Power Adapter
- WPC "Qi" Compatible RX Energizer Sleeve
- IDTP9030-EVAL evaluation board manual
- IDTP9030 Product Datasheet
- CD containing:
  - IDTP9030 control software tool
  - PC_USB Driver software
  - Reference layout Gerber Files
  - Reference layout Cadence Allegro board files
  - Electronic copy of IDTP9030-EVAL manual
  - Electronic copy of IDTP9030 Product Datasheet

Description

The IDTP9030 "Qi" evaluation board serves to demonstrate the features and performance of the IDTP9030 Wireless Power Charging solution for Base Station with TX-A1 Coil Transmitter. The board has been certified by an independent WPC testing facility for "Qi" compliance. The intuitive top-level layout and control switches simplify the user experience to emphasize the impressive level of integration and abundance of useful features that this device offers.

The device is powered by a 19V DC power adapter, and GUI (graphical user interface) software with a USB Type B cabled dongle board is provided to monitor and control the evaluation board. The evaluation board utilizes an external EEPROM which contains Tx firmware to enable programmability. The external EEPROM memory chip is pre-programmed with a standard start-up program that is automatically loaded when 19V power is applied. The EEPROM can be reprogrammed to suit the needs of your specific application using the IDTP9030 software tool. The MAIN tab of the software tool provides real time plots of Coil Current, PWM Frequency, and Duty Cycle including different states of the microcontroller and FOD (foreign object detection). The core layout is a 4-layer Cadence Allegro reference that can be copied and integrated into a larger system design.

Evaluation Board with Programmer and Power Supply



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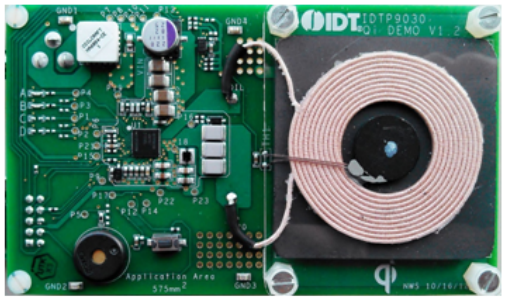
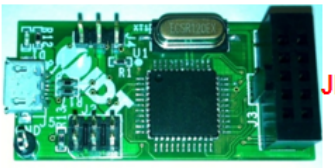


IDTP9030-EVAL

RX WPC Qi Load


JM60


Universal AC to DC Adaptor


USB Cable

USAGE GUIDE

This IDTP9030-EVAL demo board is designed to demonstrate the performance and functionality of the IDTP9030 wireless transmitter in a lab bench test environment. In most cases, this board can be wired into an existing system for evaluation. For complex or electrically sensitive situations, it is recommended to use the reference layout to integrate this design into the final system to eliminate hardware limitations or signal degradation introduced by long leads.

With no computer interface, this evaluation board can function in its pre-programmed mode of operation using a 19V power supply or AC adaptor. To evaluate the full potential of this device, a WinXP/7 PC with integrated USB ports is required. All other necessary items are included in this evaluation kit as shown on the previous page.

Quick-Start Guide

Follow these simple steps to power-up and enable the power management features of the IDTP9030:

1. Install the Wireless Power Demo Windows GUI software by executing the Setup.exe file in the folder "9030Tool_final" (Figure 2 and 5).
2. Connect the USB cable from a PC to the 1" x 2" JM60 programming board. The JM60 board has already been programmed at the factory.
3. Connect the JM60 to the underside connector of the IDTP9030 QFN DEMO PCB board (J1 Fig 1).
4. Plug the AC adapter into the wall (120 VAC) and connect the other end (19 VDC) into the adapter plug on the IDTP9030-DEMO board (J3 Figure 1).
5. Click Start >> All Programs >> IDT Wireless Power Solution (Folder) >> Wireless Power Demo (Application Icon) to open the GUI for IDTP9030 Wireless Power Transmitter Demo software Fig 3.
6. Without an RX load on the coil, note LED "A" and "B" are enabled on the eval board.

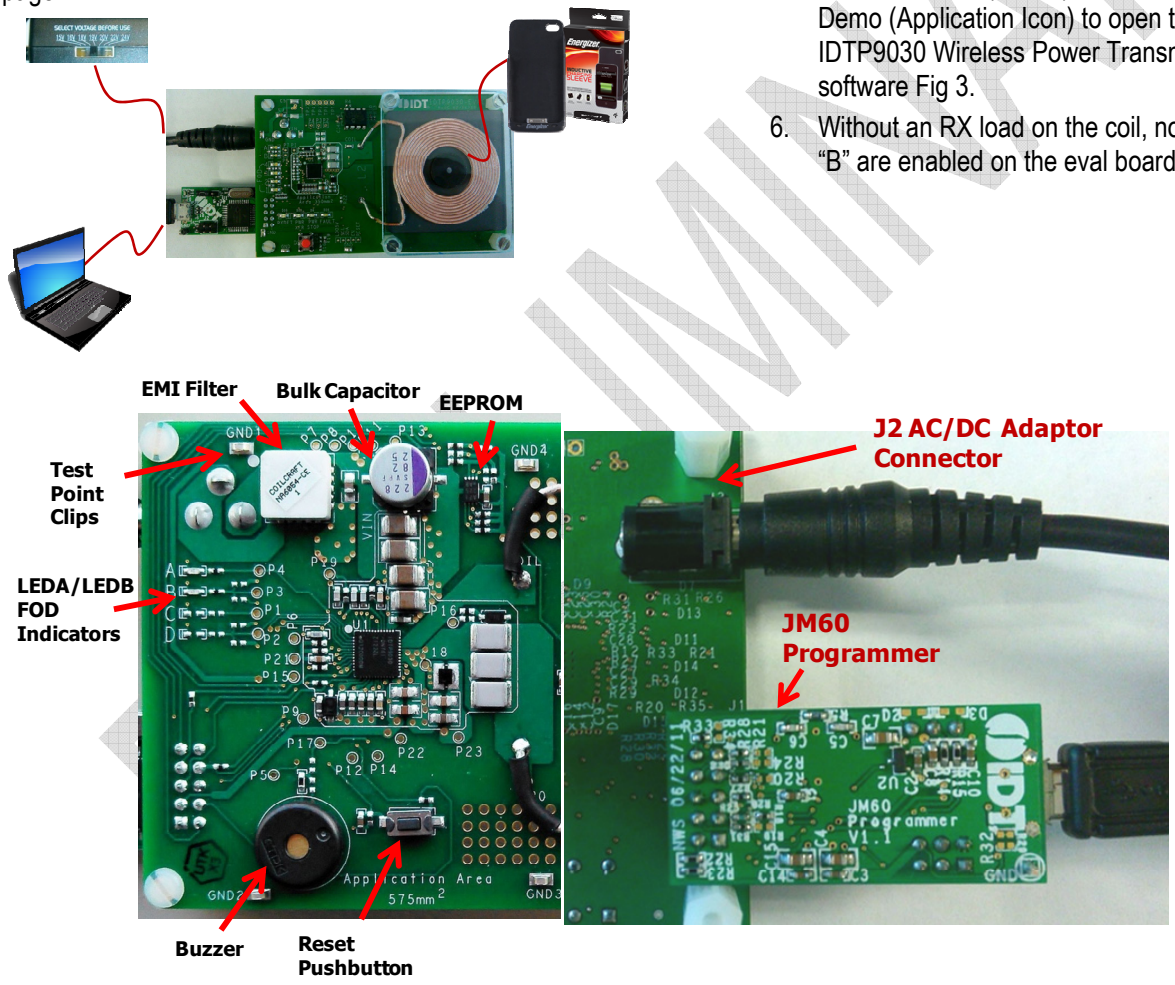


Figure 1. IDTP9030-EVAL JM60, AC Adaptor connections. The AC/DC Adaptor plug and JM60 connectors are on the backside of the board. The AC Adaptor must be set to 19V for proper operation.

Quick-Start Guide (continued)

7. Place an RX load such as an existing "Qi" compliant device or the IDTP9020 RX demo board onto the TX coil surface and notice the power transfer LED "B" is slowly flashing on/off. The LEDs are defined on page 8, Figure 8 and Table 1. Also, the buzzer will beep (see page 10).
8. Observe the different real time signals propagating on the "MAIN" tab of the GUI (Figure 4).
9. Add a 5W load to the to the RX device or IDTP9020 RX demo board and observe the current increasing and frequency change (Figure 4)
10. Place 4 to 5 coins on the TX coil plastic cover surface and observe the FOD 3 indicator, the LED "A" flashes on/off and the buzzer beeps.
11. Any problems see Troubleshooting page 8.

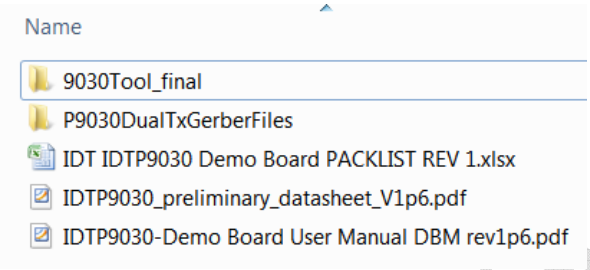


Figure 2. File folder structure on the CDROM.

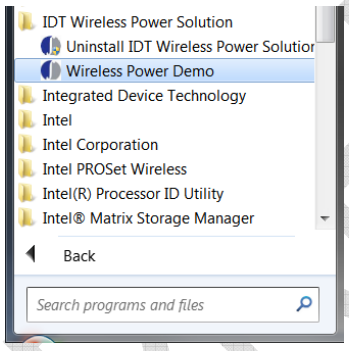


Figure 3. Starting the Graphical User Interface

Verifying Connectivity

You can verify that the IDTP9030 is properly connected to your computer and able to communicate to the evaluation board by looking at the lower left of Figure 4. It should state "USB Connected". Otherwise it will state in Red letters: "USB Disconnected – Check Connection".

If it states USB Disconnected, it might be that the driver was not properly installed on the PC. Check to see that a USB Connector icon appears and disappears, at the lower right of the Taskbar, as the Cable's USB Connector is plugged and unplugged from the USB port. If it does not appear, then proceed to Troubleshooting section, item 4.

1) The MAIN tab of GUI provides 3 real time signals: PWM Frequency, Coil Current, and Duty Cycle.
2) Placing different objects and loads onto the coil will change the real time signals, and it will change the location of the Blue dot at the left side of the GUI's MAIN tab (Figure 4). For example, when the system is first turned-on, and without a load on the coil, the Blue dot will flash, i.e, "ping", at the WPC Ping text location, at the very top left hand side of GUI. Then, when a load is placed on the coil, the flashing Blue dot at WPC Ping will cease and a solid Blue dot will appear at the Power Transfer Line text location on the left hand side of the GUI. Also, it should be noted that the blue LED will be lit on the eval board. Note, however, that if the load is not perfectly centered on the coil, the blue dot on the eval board will not be lit. In this case, readjust the load to make sure it is very well centered. Also, once the RX has established good communication with the evaluation board, both the RXDET and PWR XFR LEDs should be glowing on the eval board, and this should correspond with the Rx Detected and Power Transfer "non flashing" solid Blue dots located just below the real time signals on the MAIN tab of the GUI.

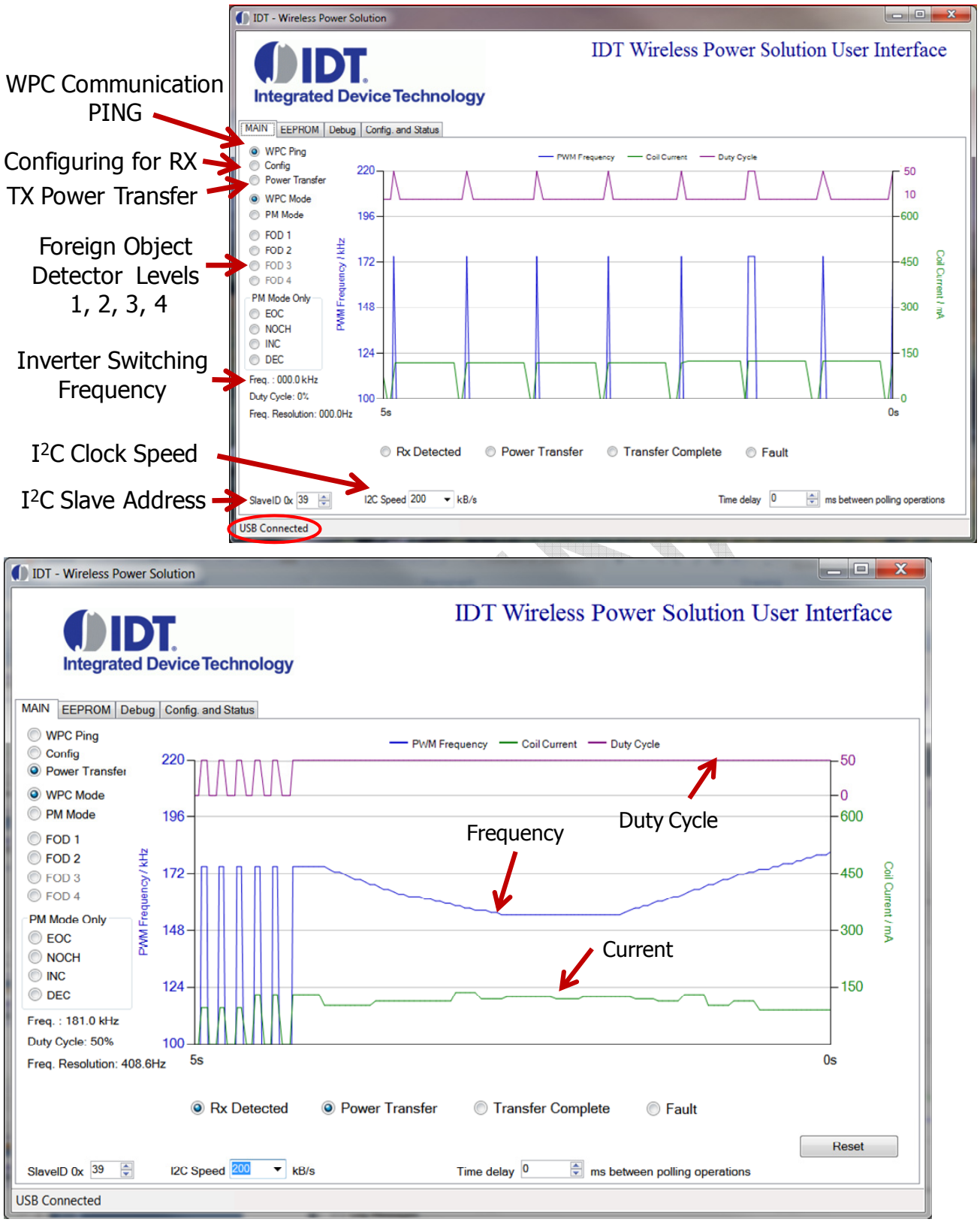


Figure 4. Windows GUI MAIN Tab Details and Signals.

Installing the Windows GUI

For the first time use of the IDTP9030-DEMO board or to write a new .bin file into the EEPROM, the Windows Drivers and GUI must be installed to communicate with the JM60 USB to I²C controller that is located on the JM60 Programmer Dongle board. The JM60 Dongle board is attached to the left side of the DEMO board, and is connected via a 10pin keyed header on the bottom side of the board. The purpose of this controller is to be able to write different .bin files into the EEPROM on the DEMO board, and to be able to acquire real time signals showing system operation. Different .bin files can be made available, for example, when a different output power setting test is desired.

Example installation of the Windows USB-to I²C-Drivers on a Win7 32-bit or 64-bit system is shown in the following steps:

To install the GUI, open the IDTP9030-DEMO CD and run the file: setup-1.0.0.11.exe within the 9030Tool_final folder. I.e. the path is 9030Tool_final/setup-1.0.0.11.exe shown in figure 5. Follow the Setup Wizard instruction shown in Figure 6. This will install the GUI and driver automatically. After the installation process is complete, you may connect the evaluation board to the computer with the USB cable, via the Dongle, and use the software tool. *At this point, a little USB icon should appear at the lower right of the desktop screen. If it does not, then the machine being used should be rebooted. Now connect the JM60 dongle board into the evaluation board and then connect the 19V supply.* Now plug the USB cable into the dongle board, and plug the USB cable into the PC.

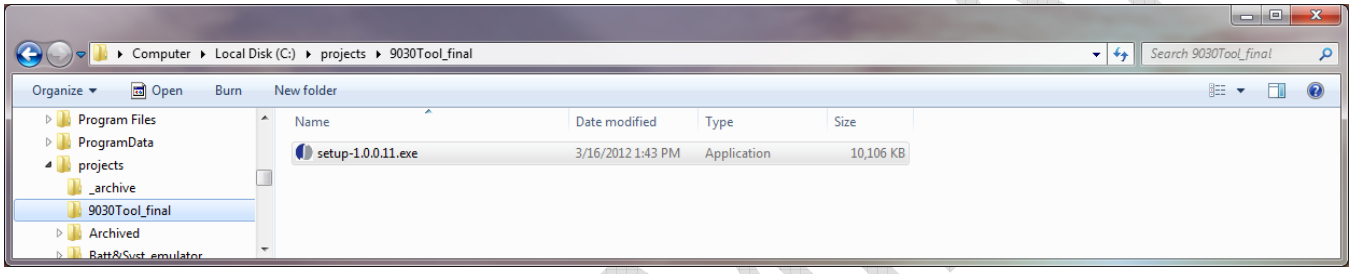


Figure 5. Path to driver setup.exe.

Figure 6. Setup Wizard.

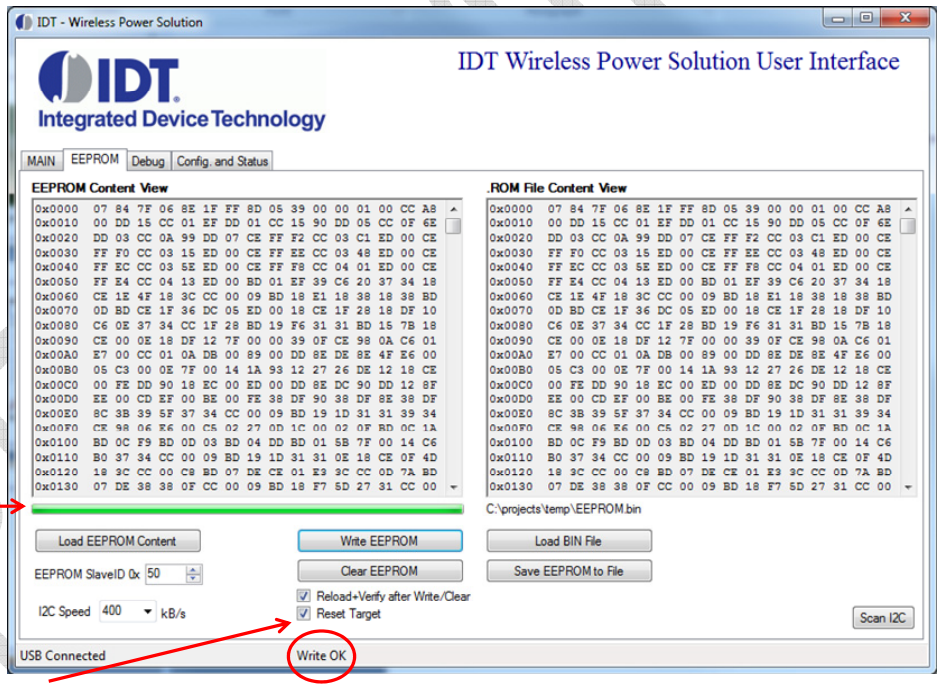
Writing to the EEPROM

Loading the .bin File

As mentioned, the EEPROM already comes with a standard BIN file programmed into it, which gets downloaded to the IDTP9030 upon power up. However, if another one has been provided by the factory, for instance, for perhaps a higher output power, the way to write it into the EEPROM is as follows:

1) Plug the USB cable from the computer to the dongles USB type B connector.
2) Plug the dongle into the IDTP9030 Demo board. Make sure only a jumper exists on J4 of the dongle in a position closest to the USB connector.
3) Plug the 19V power supply into the IDTP9030 Demo Board.
4) Click Start >> All Programs >> Integrated Device Technology (Folder) >> Wireless Power Demo.
5) Click on the EEPROM tab directly right of the MAIN tab.
6) Click on the Load Bin file and browse to the path where the new bin file is located, for example, on the CD (type .bin).
7) Set the EEPROM Slave ID to 52 and select the Scan I2C button (Fig 7 lower right) and check that the slave address for the EEPROM appears as 0x52and then.
8) Click the Write EEPROM button, the green progress bar should increase in size from left to right and two **green passes** should be observed as the file is written to the EEPROM and then the Write OK should appear at the bottom of the screen. If not, click the Write EEPROM button again until Write OK appears.
9) Finally, to get the LEDs on the DEMO board to start flashing, the Reset Target check mark has to be unchecked. Uncheck it and the various LEDs will start flashing.

If a Write OK is not shown in step 8, then refer to the Troubleshooting section on page 10. "Error Writing" is shown in place of "Write OK", and it should be easily visible that FF's will be shown across the entire 0x0000 address row or simply that the EEPROM Content View doesn't match the .ROM File Content View. Note: The left Content view shows the current EEPROM contents and can be seen by clicking on the Load EEPROM Content. The Right side Content view is the Bin file that was loaded.



Reset Target field needs to be unchecked after Write OK! It also serves as a very convenient system reset tool if the I²C bus disconnects. Check the box and then uncheck it to reset the system.

Figure 7. After Loading a BIN File and Writing to the EEPROM.

Overview of GPIO Usage

There are 7 GPIO's on the IDTP9030 transmitter IC, of which four are available for use as follows:

• GPIO3: Green LEDB to indicate standby, power transfer, and power complete. Also includes external resistors or internal pull up/down optioning to select LED modes. See Table 1, eight of the 10 LED modes (those associated with advanced charging modes) are currently designated as "Future" modes.

• GPIO0: Red LEDA to indicate standby, fault conditions, and FOD warnings, see table 1.

• GPIO4: AC or DC buzzer (optional) with resistor optioning for different buzzer configurations (Not Yet Available)

• GPIO2: Temperature sensor input

• GPIO5 LEDC and GPIO6 LEDD are for future development and currently not supported.

LED FUNCTIONS

GPIO0 and GPIO3 are used to drive LEDs which indicate, through various on/off and illumination options, the state of charging and some possible fault conditions.

The Red LEDA indicates various Fault and FOD ("Foreign Object Detection") states. The Green LEDB indicates Power Transfer and Charge Complete state information. Upon power up, the two LEDs together indicate the Standby State and remain in this state until another of the defined Operational States occurs. See Figure 22.

As shown in Figure 8, one or two resistors Ra (Pull Up) and Rb (Pull Down) configure the defined LED option combinations (R14 and R15 in the schematic Figure 13). The DC voltage set in this way is read one time during power-on to determine the LED configuration. There are 10 valid LED option combinations which are selected through the use of two 1% resistors that create a resistor divider value that are read from the GPIOs – two of the LED options are achieved through only one pull-down or one pull-up resistor. The LED configuration options are detailed in the Table 1.

Figure 8. IDTP9030 LED Resistor Options. The IDTP9030 LED indicators are connected to GPIO0,3. Currently only LEDA and LEDB are operational and only Green LEDB contains the resistor options.

LED Pattern Operational Status Definitions:

Blink Slow: 1s ON, 1s OFF, repeat

Blink Fast: 0.4s ON, 0.8s OFF, 0.4s ON, 0.8s OFF, repeat

The red FOD warning LED is synchronized with the buzzer (if implemented) such that a 0.4s tone corresponds with FOD red LED illumination and 0.8s off (no sound) corresponds with LED being off. During the 30s that the buzzer is off/silenced, the FOD LED should continue to blink.

Table 1 – IDTP9030 LED Resistor Optioning (Not all options supported, shaded rows are for future development).

LED Control Option	LED Select Resistor Value	Description	LED #/ Color	Operational Status				FOD Warning
				Standby	Power Transfer	Charge Complete	Fault Condition	
1	Pull Down	Standby LEDs ON	LEDB- Green	ON	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	ON	OFF	OFF	ON	BLINK FAST
2	R1	Standby LEDs ON plus	LEDB- Green	ON	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	ON	OFF	OFF	ON	BLINK FAST
3	R2	Standby LEDs ON plus	LEDB- Green	ON	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	ON	OFF	OFF	ON	BLINK FAST
4	R3	Standby LEDs ON plus	LEDB- Green	ON	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	ON	OFF	OFF	ON	BLINK FAST
5	R4	Standby LEDs ON plus	LEDB- Green	ON	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	ON	OFF	OFF	ON	BLINK FAST
6	Pull Up	Standby LEDs OFF	LEDB- Green	OFF	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	OFF	OFF	OFF	ON	BLINK FAST
7	R5	Standby LEDs OFF plus	LEDB- Green	OFF	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	OFF	OFF	OFF	ON	BLINK FAST
8	R6	Standby LEDs OFF plus	LEDB- Green	OFF	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	OFF	OFF	OFF	ON	BLINK FAST
9	R7	Standby LEDs OFF plus	LEDB- Green	OFF	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	OFF	OFF	OFF	ON	BLINK FAST
10	R8	Standby LEDs OFF plus	LEDB- Green	OFF	BLINK SLOW	ON	OFF	OFF
			LEDA- Red	OFF	OFF	OFF	ON	BLINK FAST
R1-R8 are created using combination of two 1% resistors.								
Designates Future Option								

Buzzer Function

An optional buzzer feature is supported on GPIO4. The default configuration is an "AC" buzzer. The signal is created by toggling GPIO4 active-high/active-low at a 2kHz frequency.

Buzzer Action: Power Transfer Indication
The IDTP9030 supports audible notification when the device operation successfully reaches the Power Transfer state. The duration of the power transfer indication sound is 0.4secs. The latency between reaching the Power Transfer state and the actual buzzer sounding does not exceed 0.5sec. Additionally, the buzzer sound is concurrent within +/-0.25sec of any change to the LED configuration indicating starting the Power Transfer state.

Buzzer Action: No Power Transfer due to Foreign Object Detected (FOD)
When a major FOD case is detected such that for safety reasons, power transfer is not commenced or that power transfer is terminated, the buzzer is sounded in a repeating sequence:

For 30 seconds: 0.4s on, 0.8s off, 0.4s on, 0.8s off, repeat
Next 30 seconds: OFF/silence (but no change to LED ON/OFF patterns)
The pattern is repeated while the error condition exists

The buzzer is synchronized with the FOD LEDA such that the 0.4s on tone corresponds with the Red LEDA is ON or illuminated and 0.8s off (no sound) corresponds with the Red LEDA OFF.

Bulk Cap

A laboratory test set-up typically consists of two long wires running from the bench power supply to the evaluation board input voltage pins. The inductance of these wires, along with the low-ESR ceramic input capacitor, can create a high Q network that may affect converter performance. This problem often becomes apparent in the form of excessive ringing in the output voltage during load transients. Since the inductance of a short PCB trace feeding the input voltage is significantly lower than the power leads from the bench power supply, most applications do not exhibit this problem. In applications where the input power source lead inductance cannot be reduced to a level that does not affect the device performance, a high ESR tantalum or aluminum electrolytic should be placed in parallel with the low ESR/ESL bypass ceramic capacitor. This dampens the high Q network and stabilizes the system. Space on the evaluation board is available for this bulk cap and can be placed between the landing pads IN and PGND at the upper left of the evaluation board. See top of Figure 1.

Troubleshooting

The IDTP9030 demo board was designed to quickly show the performance of the IDTP9030. However, if you are experiencing trouble getting started, here are some tips to help accelerate setup and connectivity.

1. Check to make sure that the PC shows it is connected to the demo board. USB connected should always show at the lower left of the Dongle GUI. If it doesn't it is always good practice to disconnect and reconnect the USB cable, and to disconnect and reconnect the 19V power supply. Unplugging and plugging the USB cable should show an icon appearing and disappearing at the lower right of your computer screen.
2. Depress and release the Reset button. This is the RED button on the demo board. If everything in 1 above is connected and the real time signals are still not streaming across the screen, depress the Red button. Also, enabling then disabling the "Reset Target" box on, then off, in the EEPROM Tab (Figure 7) will restart the device. Target field box can be used for clearing GUI I^2C Read Errors or other system errors.
3. Select the Scan I2C button (Fig 7 lower right) and check that the slave address for the EEPROM appears as 0x52

4. Reload the .bin file and re-write it. Make sure WRITE OK shows at the middle of the display after a write takes place.

5. **Update the Driver.** If you have a previous version of the eval tool, the driver will probably need to be updated. The way to check on the version of the driver is to open up the Device Manager as shown in Figure 9. Expand the USB Bridge Devices and double click on it. Click on the Driver Tab, and be sure its' Driver Date is 7/5/2009 and Version is 7.0.0.0. See Figure 10 and 11. If it is not version 7.0.0.0 then go to directory C:\Program Files\IDT Wireless Power Solution\Drv as shown in Figure 12 and double click the DPInst.exe file. The system will then go through a driver update install. Be sure to reboot your machine once the install is complete.

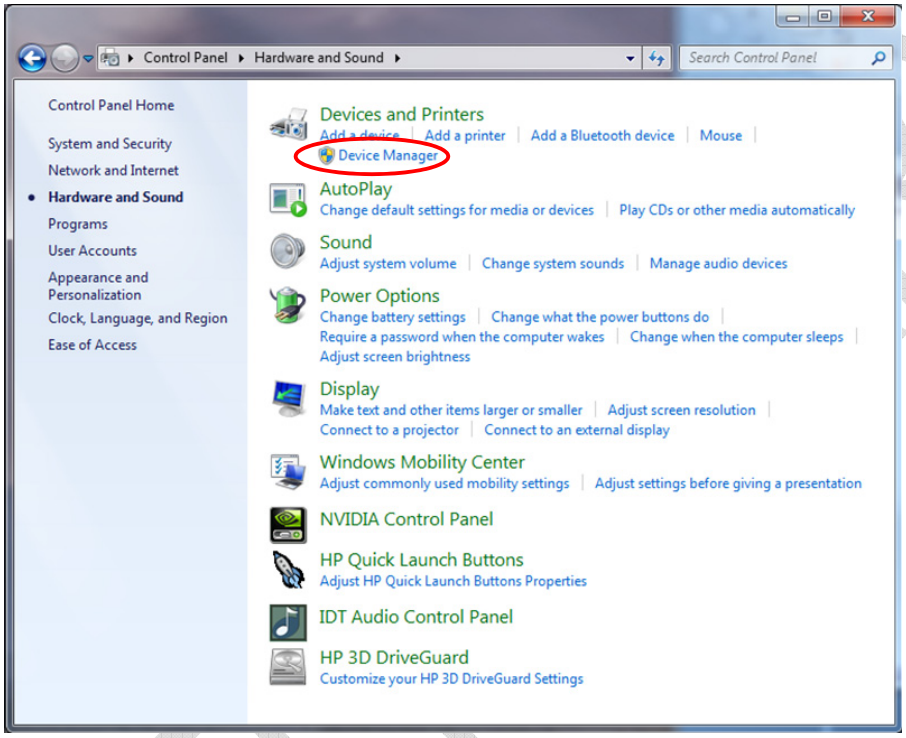


Figure 9. Checking the revision of the driver using Device Manager, shown is a Win7 PC.

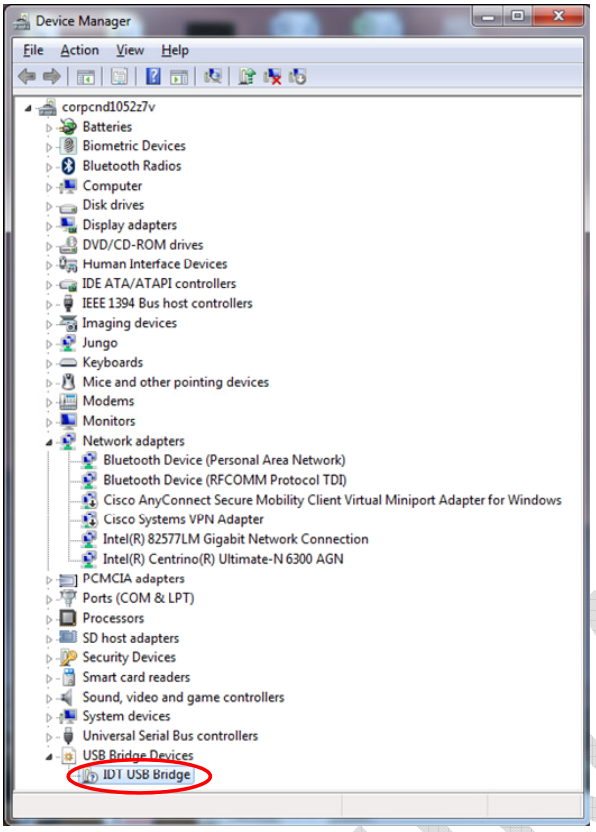


Figure 10. Checking the revision of the driver in Device Manager.

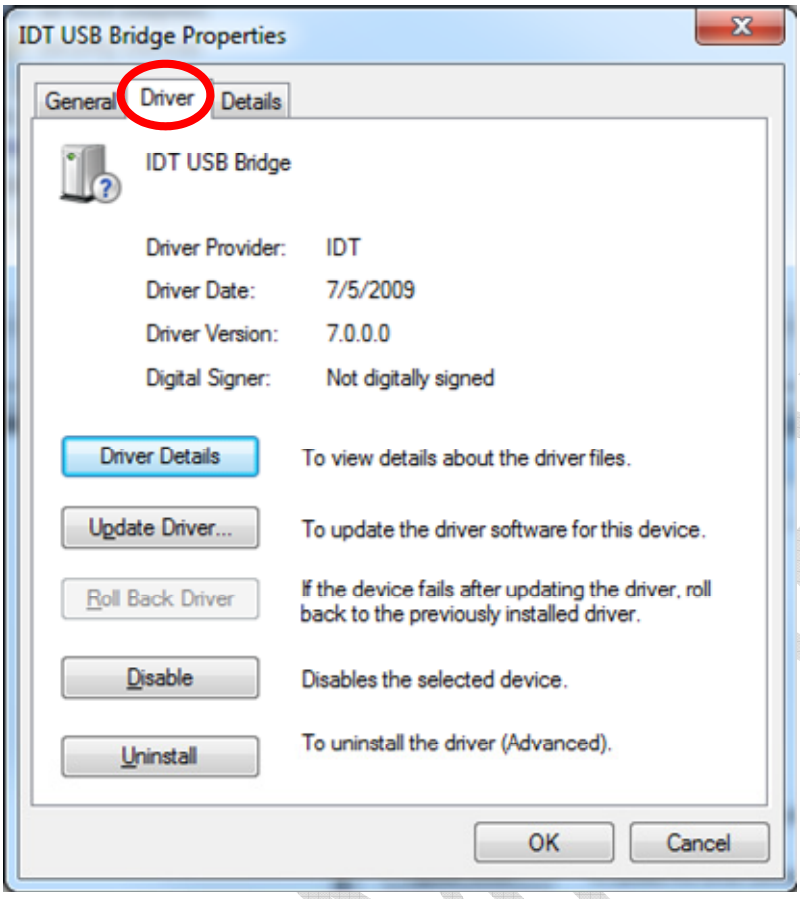


Figure 11. Checking that the revision of the driver is correct.

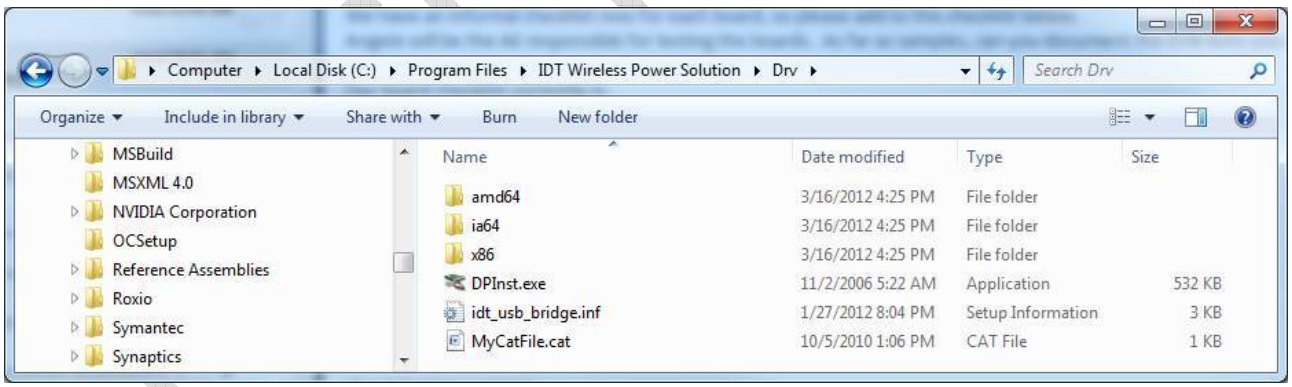


Figure 12. Installed Device Driver Directory.

SCHEMATIC

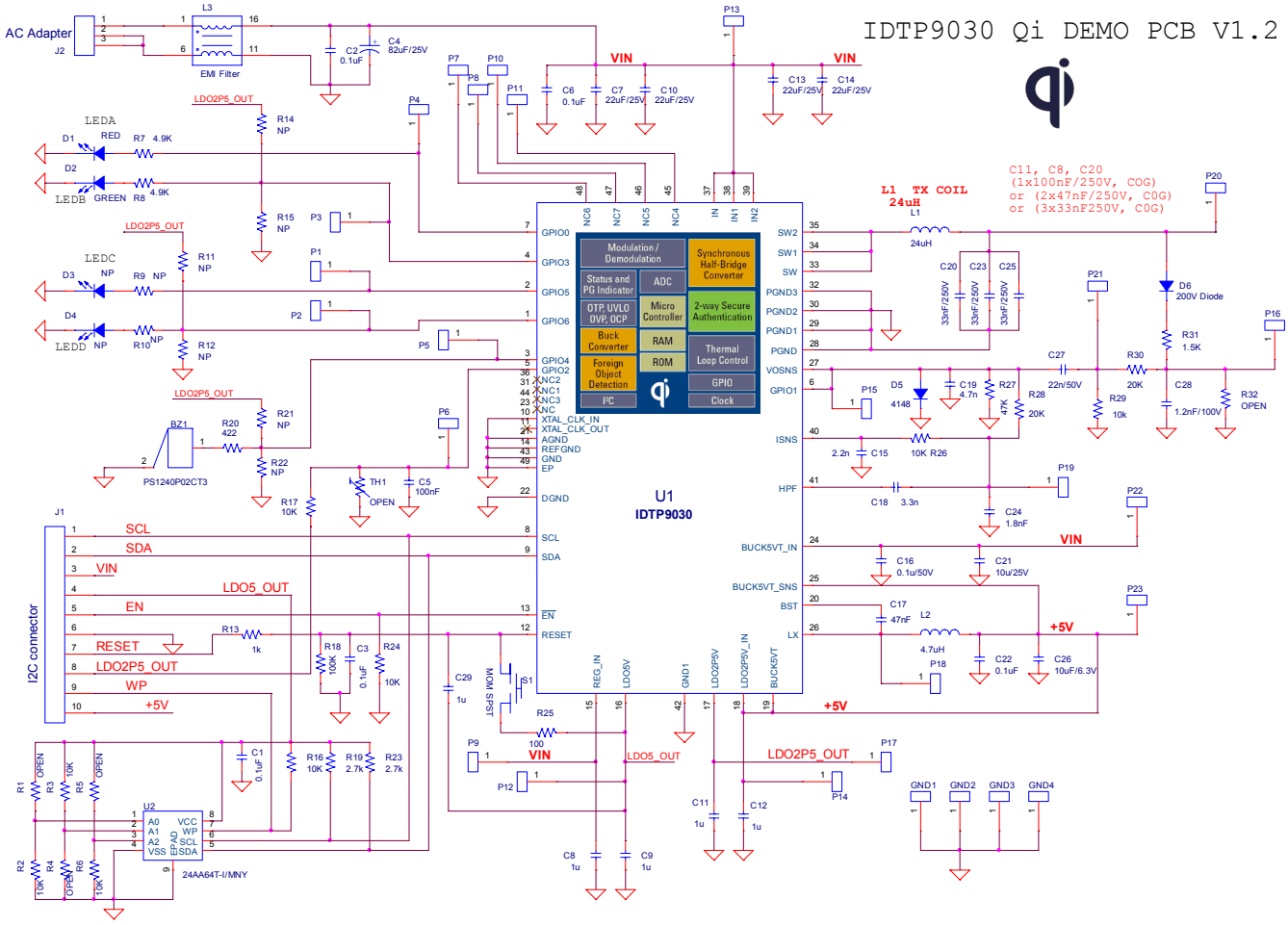


Figure 13. IDTP9030 Eval Kit Board Schematic

Table 2. Bill of materials

Item#	Qty	Reference Designator	Description	Manufacturer	Part Number	PCB Footprint
1	1	BZ1	BUZZER PIEZO 4KHZ 12.2MM PC MNT	TDK	PS1240P02CT3	buzz_ps1240
2	4	C1,C3,C5,C6	CAP CER 0.1UF 50V 10% X7R 0603	Murata	GRM188R71H104KA93D	603
3	3	C2,C16,C22	CAP CER 0.1UF 50V 10% X7R 0805	TDK	C2012X7R1H104K/0.85	805
4	1	C4	OSCON 82UF 25V 20% 105DEGC	Panasonic	25SVPF82M	E7_cap_polarize
5	5	C8,C9,C11,C12,C29	CAP CER 1UF 25V 10% X7R 0603	Taiyo Yuden	TMK107B7105KA-T	603
6	4	C7,C10,C13,C14	CAP CER 22UF 25V 20% X7R 1210	Taiyo Yuden	TMK325B7226MM-TR	1210
7	1	C15	CAP CER 2200PF 16V 10% X7R 0603	AVX	0603YC222KAT2A	603
8	1	C17	CAP CER 0.047UF 16V 10% X7R 0603	Murata	GRM188R71C473KA01D	603
9	1	C18	CAP CER 3300PF 50V 5% NP0 0603[1]	Murata	GCM1885C1H332JA16D	603
10	1	C19	CAP CER 4700PF 50V 5% NP0 0603[1]	TDK	CGJ3E2C0G1H472J	603
11	3	C20,C23, C25	CAP CER 0.033UF 250V 5% NP0 1812[1]	TDK	C4532C0G2E333J	1812
12	1	C21	CAP CER 10UF 25V 10% X5R 0805	TDK	C2012X5R1E106K	805
13	1	C24	CAP CER 1800PF 50V 5% NP0 0603[1]	Murata	GRM1885C1H182JA01D	603
14	1	C26	CAP CER 10UF 6.3V 10% X7R 0805	Taiyo Yuden	JMK212B7106KG-T	805
15	1	C27	CAP CER 0.022UF 50V 10% X7R 0603	TDK	C1608X7R1H223K	603
16	1	C28	CAP CER 1200PF 100V 5% NP0 0603[1]	TDK	C1608C0G2A122J	603
17	1	D1	LED SMARTLED 630NM RED 0603 SMD	OSRAM	L29K-G1J2-1-0-2-R18-Z	0603_DIODE
18	1	D2	LED SMARTLED GREEN 570NM 0603	OSRAM	LG L29K-G2J1-24-Z	0603_DIODE
19	1	D3	NP		OPEN	0603_DIODE
20	1	D4	NP		OPEN	0603_DIODE
21	1	D5	DIODE SWITCH 100V 150MA SOD123	Micro Comm	1N4148W-TP	sod123
22	1	D6	DIODE SWITCH 200V 250MW SOD123	Diodes Inc.	BAV21W-7-F	sod123
23	4	GND1,GND2,GND3,GND4	TEST POINT		5015	TEST_PT_SM_135X70
24	1	J1	I2C CONN HEADER LOPRO STR 10POS GOLD	TE Connectivity	5103308-1	LOPRO8PIN01INREVB
25	1	J2	CONN POWER JACK 2.1X5.5MM HI CUR	CUI Inc.	PJ-002AH	CONN_POWER_JACK5_5MM
26	1	L1	WPC 24uH TX-A1 Coil	E&E Inc. TDK Wurth	Y31-60014F TTx-52-T2V 760308101	50mmX50mm
27	1	L2	Shielded Power Inductor 4.7uH	Coilcraft	XPL2010-472ML_	
28	1	L3	SMT EMI FILTER 330uH, 104mOHM,1.5A	Coilcraft	NA6054-CE_	
29	23	P1,P2,P3,P4,P5,P6,P7,P8,	TEST POINT		OPEN	test_pt30dpad
		P9,P10,P11,P12,P13,P14,			OPEN	
		P15,P16,P17,P18,P19,P20,			OPEN	
		P21,P22,P23			OPEN	
30	4	R1,R4,R5,R32	OPEN		OPEN	402
31	1	R29	RES 10.0K OHM 1/10W 1% 0603 SMD	Panasonic	ERJ-3EKF1002V	603
32	7	R2,R3,R6,R16,R17,R24,R26	RES 10.0K OHM 1/16W 1% 0402 SMD	Yageo	RC0402FR-0710KL	402
33	2	R7,R8	RES 4.99K OHM 1/10W 1% 0402 SMD	Panasonic	ERJ-2RKF4991X	402
34	2	R9,R10	NP		OPEN	402
35	6	R11,R12,R14,R15,R21,R22	NP		OPEN	402
36	1	R13	RES 1.0K OHM 1/10W 5% 0402 SMD	Panasonic	ERJ-2GEJ102X	402
37	1	R18	RES 100K OHM 1/16W 1% 0402 SMD	Yageo	RC0402FR-07100KL	402
38	2	R19,R23	RES 2.7K OHM 1/10W 5% 0402 SMD	Panasonic	ERJ-2GEJ272X	402
39	1	R20	RES 422 OHM 1/10W 1% 0603 SMD	Panasonic	ERJ-3EKF4220V	603
40	1	R25	RES 100 OHM 1/16W 1% 0402 SMD	Yageo	RC0402FR-07100RL	402
41	3	R15,R22,R27	RES 47K OHM 1/10W 5% 0402 SMD	Panasonic	ERJ-2GEJ473X	402
42	2	R28,R30	RES 20.0K OHM 1/10W 1% 0603 SMD	Panasonic	ERJ-3EKF2002V	603
43	1	R31	RES 1.50K OHM 1/10W 1% 0603 SMD	Panasonic	ERJ-3EKF1501V	603
44	1	S1	WS-TRS 6,0x3,5mm Tact Switch_SMD	Wurth	434 121 043 816	6.0x3.5mm
45	1	TH1	THERMISTOR NTC 10K OHM 1% RAD	TDK	B57551G0103F000	Through-hole
46	1	U1	IC EEPROM 64KBIT 400KHZ 8TDFN	Microchip	24AA64T-I/MNY	DFN8
47	1	U2	IC Power Transmitter IC for TX-A1	IDT Inc.	IDTP9030	QFN_48LD_6X6MM_0P4PITCH

Note 1 - Recommended capacitor temperature/dielectric and voltage ratings. 250V capacitors are recommended for C20, C23 and C25 since 200Vp-p voltage levels may appear on the resonant capacitors as stated in the WPC specification. Furthermore, C0G/NPO-type capacitor values stay constant with voltage while X7R and X5R capacitor values derate from 40% to over 80%. The decision to use lower voltage 100V capacitors or other type temperature/dielectric capacitors is left to the end user.

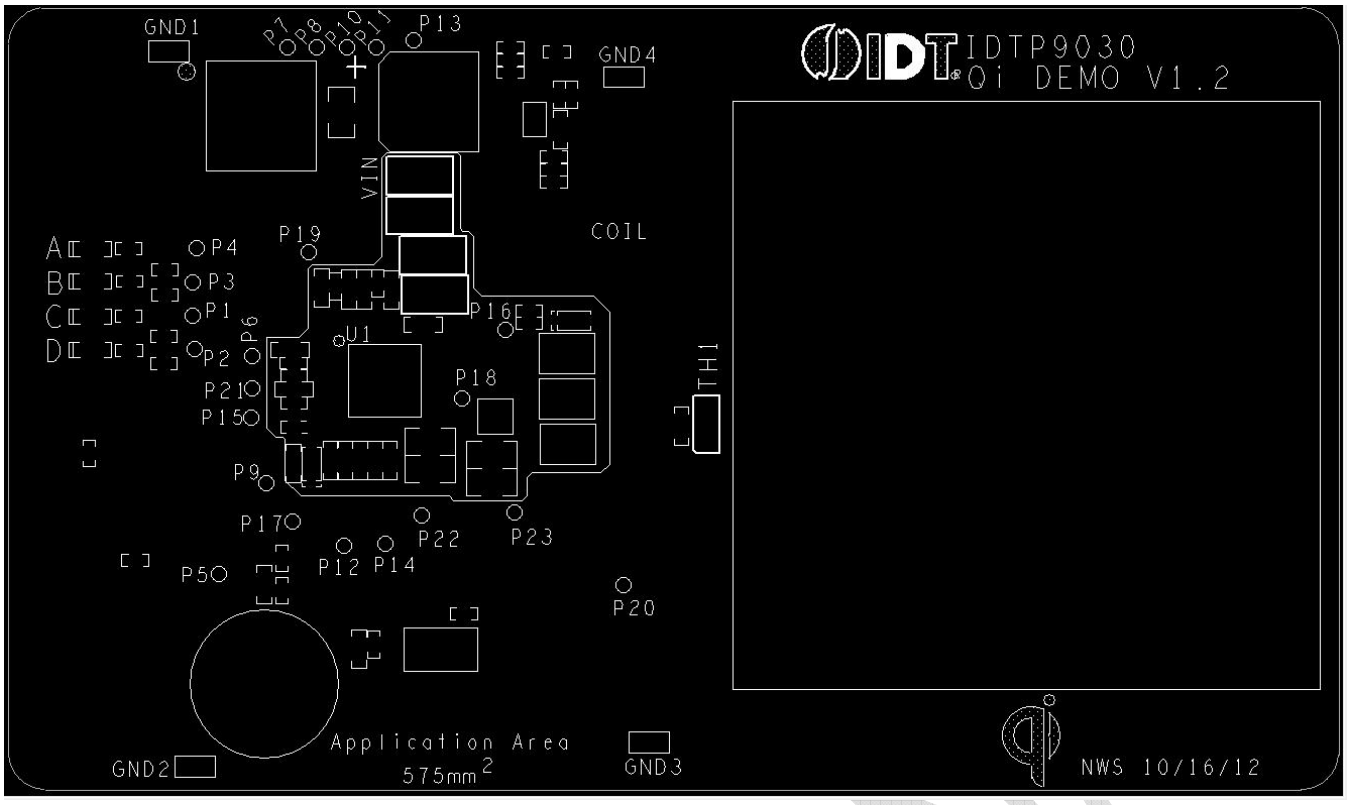


Figure 14. Top Silkscreen

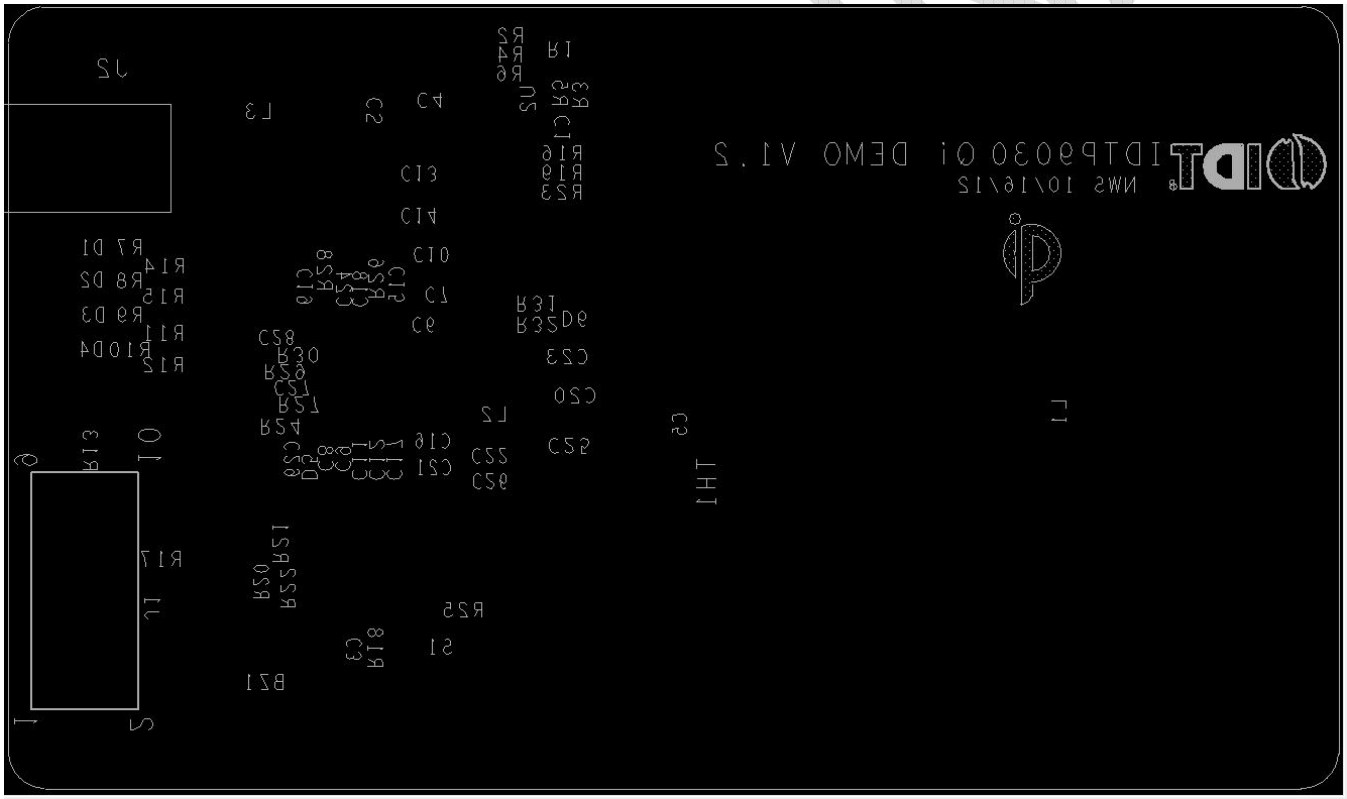


Figure 15. Bottom Silkscreen.

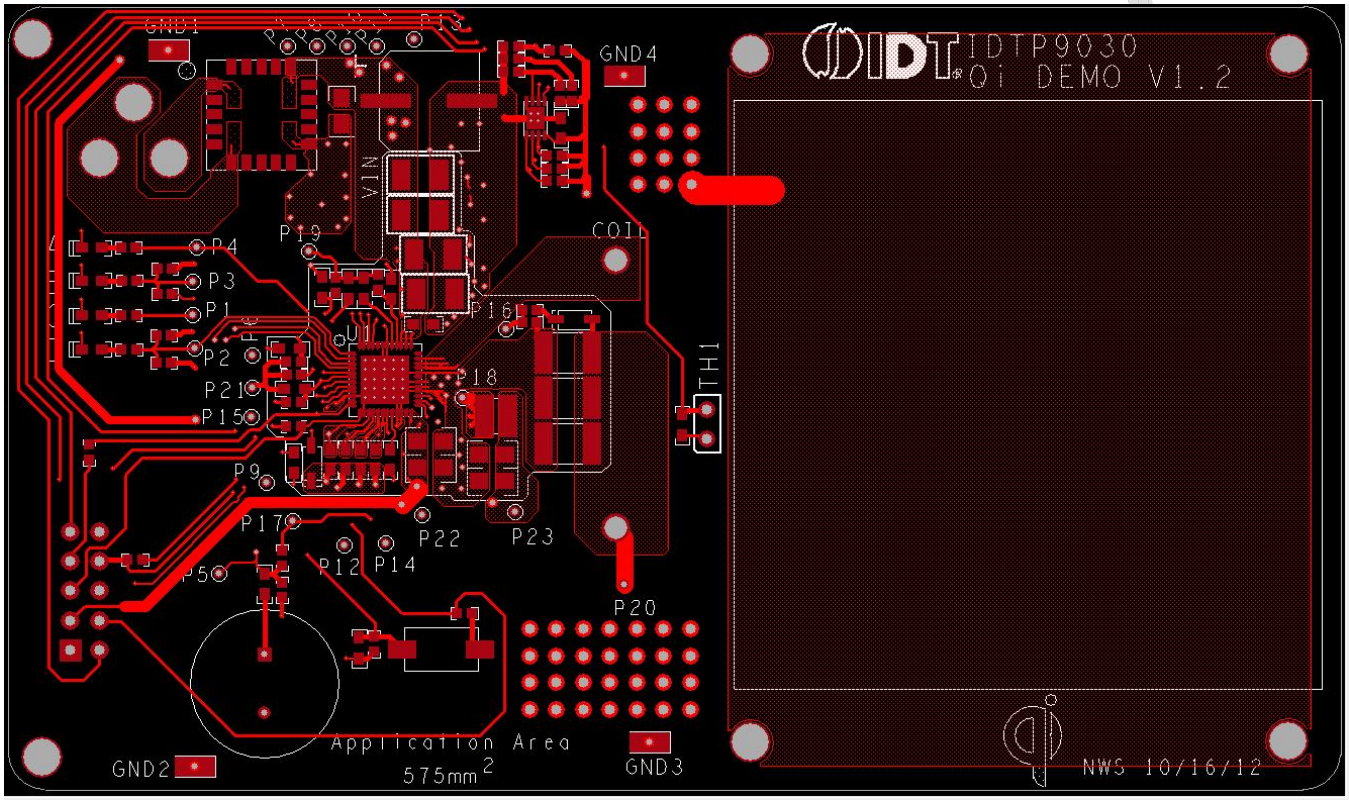


Figure 16. Top and Top Silkscreen Layer

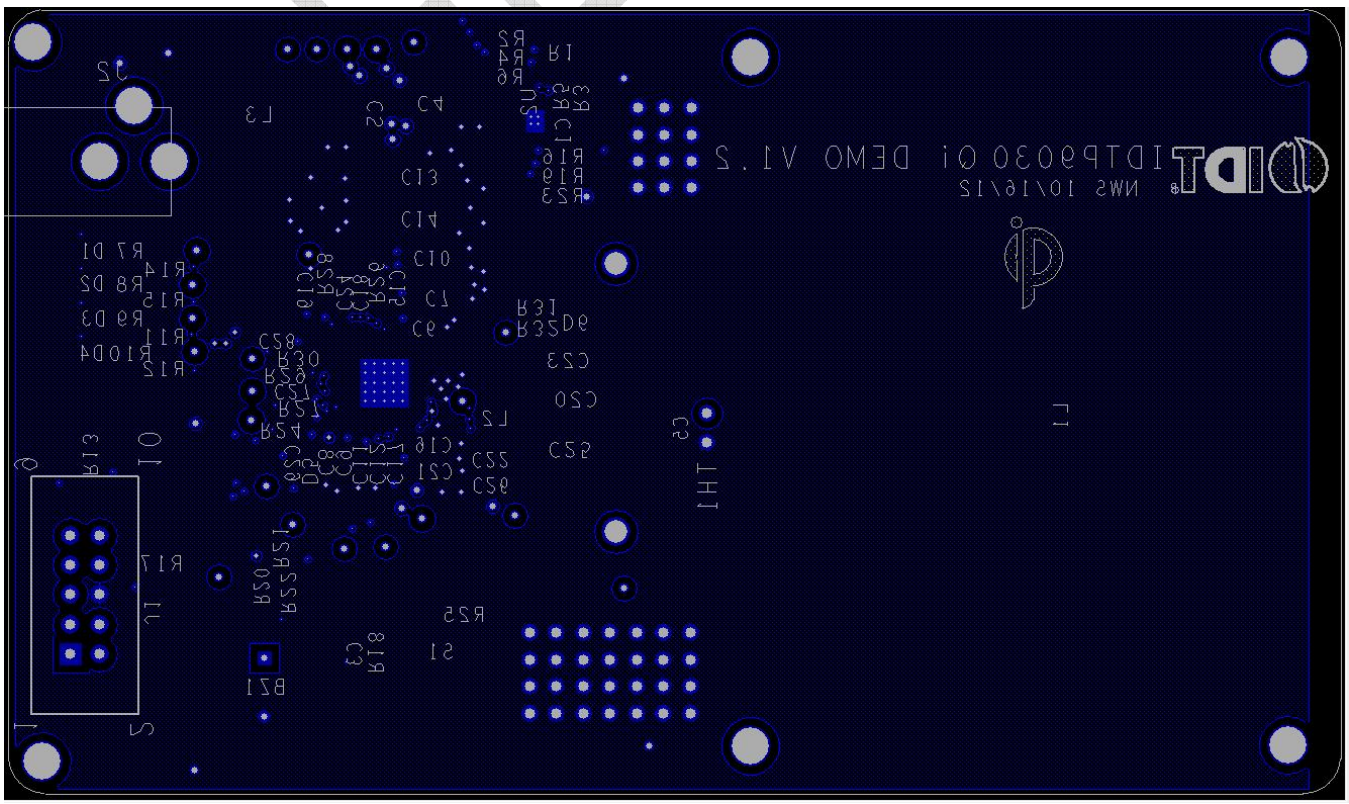


Figure 17. Bottom and Bottom Silkscreen Layer

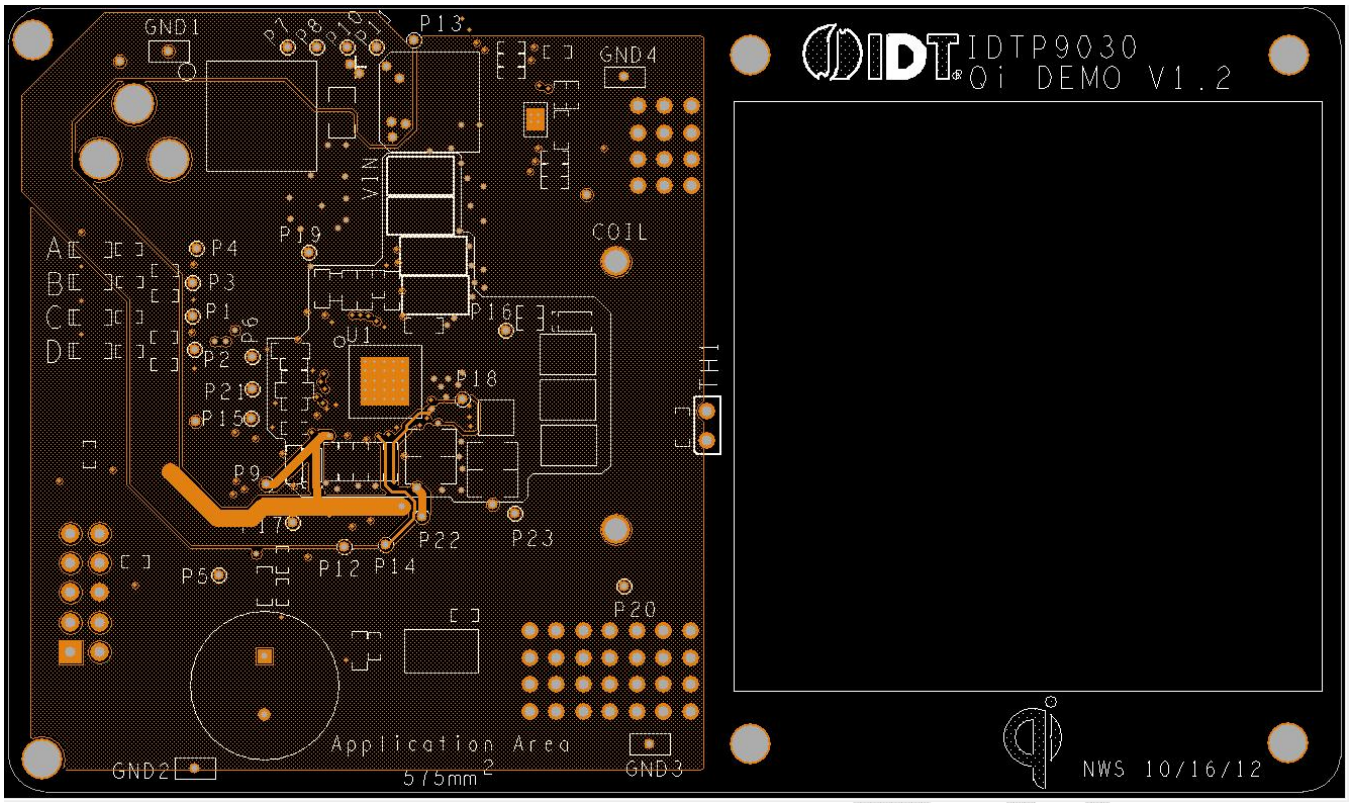


Figure 18. Mid 1 Layer

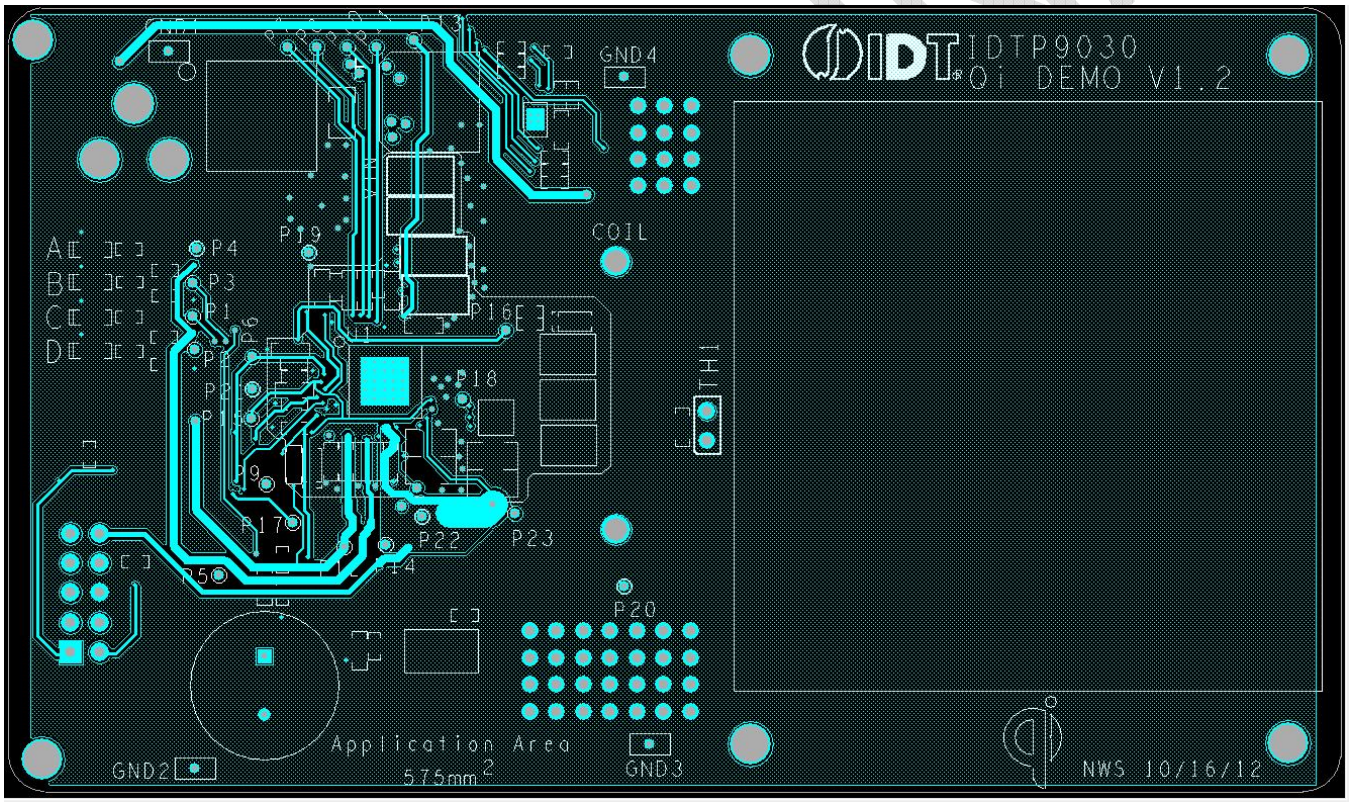


Figure 19. Mid 2 Layer

Reference: Debug and Configuration Tabs

These Tabs are for development purposes. One of the features of the Debug tab is the ability to view Real Time System Messages depending upon which of the three fields at the left of the message window is chosen. The Config and Status Tab indicate the status register readings from the device.

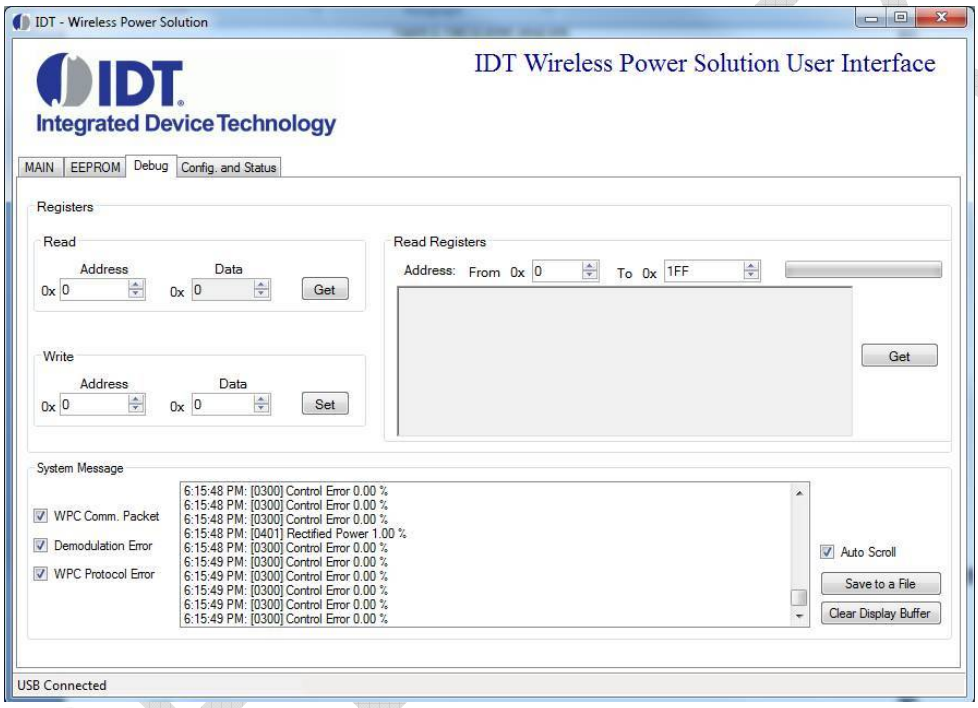


Figure 20 – Debug Tab

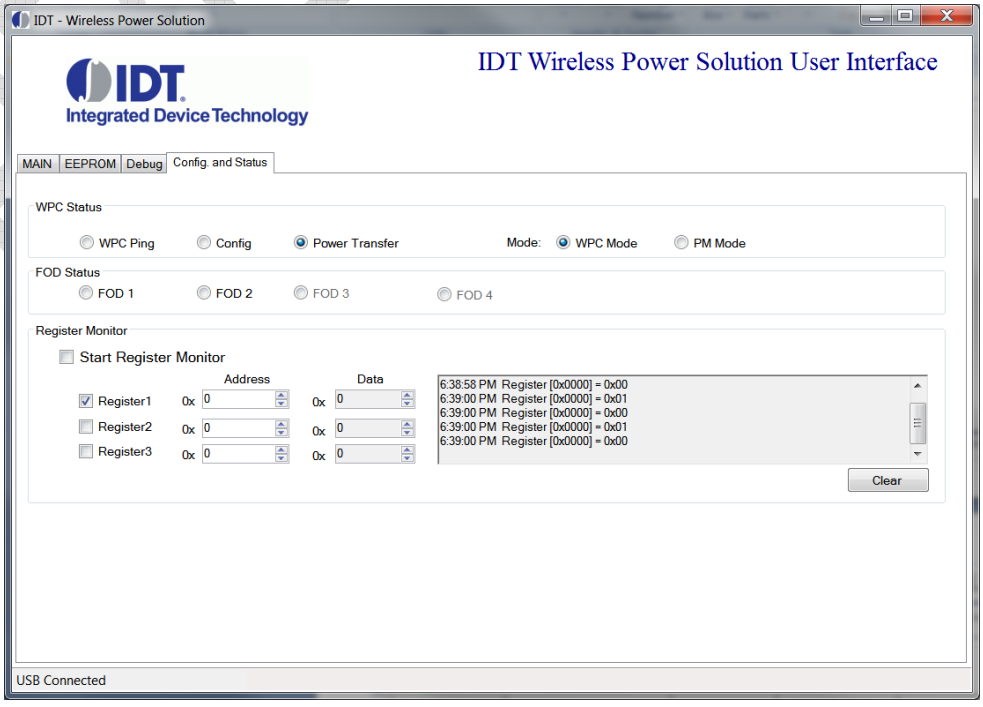


Figure 21 – Configuration and Status Tab

ORDERING GUIDE

Table 3. Ordering Summary

PART NUMBER	MARKING	PRICE	AMBIENT TEMP. RANGE	SHIPPING CARRIER	QUANTITY
IDTP9030-EVAL	IDTP9030 "Qi" DEMO V1.0	$149.00	0°C to +70°C	Box 14"x10"x2"	1

Revision History

January 16, 2012 Version 1.0

January 24, 2012 Version 1.1 – Update to Dual mode version of board

January 26, 2012 Version 1.2 - Add Figures 1 and 6,correct quick setup steps.

January 30, 2012 Version 1.3 - Add 64-bit driver and installation instructions.

February 27, 2012 Version 1.4 – Update to new board revision C.

March 16, 2012 Version 1.5 – Complete revision for first 4 tab GUI associated with new board revision C.

April 2, 2012 Version 1.6 – Error correction

June 19, 2012 Version 1.7 – Update to IDTP9030 "Qi" V1.0 WPC compliant demo board.

June 20, 2012 Version 1.8 – Connect pin 42 to GND, correct ordering information.

June 22, 2012 Version 1.9 – Add R15 and R22, add further LED descriptions.

July 23, 2012 Version 2.0 – Add additional setup procedures in quick-start guide.

August 10, 2012 Version 2.1 – Update Schematic, BOM and Layout to version V1.1 WPC compliant demo board.

September 7, 2012 Version 2.2 – Changed L2 to XPL2010-472ML_

October 23, 2012 Version 2.3 – Added IDTP9030 Datasheet to packing list

October 26, 2012 Version 2.4 – Added Wurth A1 coil to the BOM.

December 7, 2012 Version 2.5 – Updated to board version V1.2, added EMI filter to Schematic and BOM.

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