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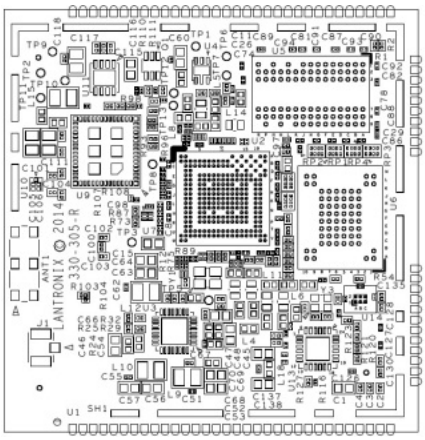

PW2050
Embedded Device Server
Integration Guide

Part Number 900-731-R
Revision A.2 October 2015

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This equipment has to be tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device is intended only for OEM Integrators. The OEM integrator should be aware of the following important considerations.

Labeling of the End Product

The label on the end product incorporating the PW2050 module must clearly state that it contains an FCC-approved RF module. Canada and Japan also require a similar statement.

For example, “This product contains RF transmitter ID # (put FCC, IC, and/or Japan module grant numbers here).” The label must include the ID numbers for the regions where the end product is installed. The grant numbers are below.

- PW2050 FCC ID number: R68PW2050
- PW2050 IC ID number: 3867A-PW2050
- PW2050 Japan ID numbers: TBD

RSS-GEN Sections 7.1.4 and 7.1.5 Statement for Devices with Detachable Antennas

This device has been designed to operate with the antennas listed in the Certificate, and having a maximum gain of 5.5 dBi. Antennas not included in this list or having a gain greater than 5.5 dBi are strictly prohibited for use with this device, unless system level approval is gained. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Integration Notes

This module is to be authorized under limited module approval specified to mobile host equipment. So, the antenna must be installed such that 20cm is maintained between the antenna and users.

The transmitter module may not be co-located with any other transmitter or antenna.

As long as the two conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

In the event that these conditions cannot be met (for example certain laptop configurations, general purpose PCMCIA or similar cards, or co-location with another transmitter) and obtaining a separate FCC authorization will be required, then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product (including the transmitter).

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

Note: *With the purchase of any PW2050 family product, the OEM agrees to an OEM firmware license agreement that grants the OEM a non-exclusive, royalty-free firmware license to use and distribute the binary firmware image provided, only to the extent necessary to use the PW2050 hardware. For further details, please see the PW2050 OEM firmware license agreement.*

Note: *Please refer to the PW2050 Data Sheet for the full compliance specification and requirements.*

Warranty

For details on the Lantronix warranty policy, please go to our Web site at www.lantronix.com/support/warranty.

Revision History

Date	Rev.	Comments
October 2015	A.2	Preliminary draft.

For the latest revision of this product document, please check our online documentation at www.lantronix.com/support/documentation.

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1: Introduction

About the Integration Guide

This user guide provides the information needed to integrate the Lantronix® PW2050™ family of products into customer-printed circuit boards. This manual is intended for engineers responsible for integrating the PW2050 module into their product. The scope of this document provides how to connect the various module pin function groups as well as general module placement and mounting. For detailed technical and compliance specifications please refer to the *PW2050 Embedded Device Server Data Sheet*.

The table below describes the integration guide sections.

Table 1-1 PW2050 Integration Guide Sections

Section	Description
PW2050 Features	Provides an overview of the module functions and mechanical drawing
PW2050 Block Diagram	Shows the module functional blocks
Signal Descriptions	Provides signal descriptions and pinout information
Antenna Interface	Lists the antennas pre-certified for use with the module
Antenna Placement	Provides a general recommendation for antenna placement
Using the RF1 Signal Pin	This section is reserved for a future off module antenna connection option
Serial Interface	Provides an example on how to connect the unit to external RS232/485/422 networks
Ethernet Interface	Gives an example on how to connect the module Ethernet
USB Device Port	Provides an example on how to connect the unit up as a USB device port
USB Host Port	Provides an example on how to connect the module USB host ports
LEDs	Describes the module LED connections
General Purpose IO Pins	Describes the module GPIO connections
Reset Pins	Describes the module RESET, DEFAULT, and WAKE pins
Mounting Instructions and PCB Footprint	Provides the module PCB footprint and solder profile
Product Information Label	Provides an image and description of the unit label contents
Evaluation Board Schematic	Provides the PW2050 Evaluation board schematic.

Additional Documentation

Visit the Lantronix web site at www.lantronix.com/support/documentation for the latest documentation and the following additional documentation.

Document	Description
PW2050 Embedded Device Server Data Sheet	Provides a unit description and all technical and compliance specifications for the module
PW2050 Embedded Device Server User Guide	Provides information needed to configure, use, and update the PW2050 firmware.
PW2050 Embedded Device Server Development Kit Quick Start	Provides the steps for getting the PW2050 and PW2050 evaluation kit up and running.
PW2050 Embedded Device Server Development Kit User Guide	Provides a detailed description of the PW2050 evaluation kit hardware
Notification Soldering Profile and Washing	Provides guidance in developing a manufacturing assembly process for various Lantronix embedded products.

2: Functional Description

Designed for quick integration with minimal engineering effort, the chip-sized PW2050 embedded device server provides simplicity and flexibility making it the easiest and fastest networking-enabling module on the market.

PW2050 device servers are extremely compact networking solution that enables Ethernet or Wireless connectivity on virtually any device with a serial interface. The included industry-proven Lantronix device server application and full IP stack allow seamless remote access to device data simplifying design integration while providing robust connectivity.

The PW2050 embedded device servers can be utilized in designs typically intended for chip solutions. A key difference with the PW2050 module is that there is virtually no need to write a single line of code, translating to a much lower development cost and faster time-to-market.

Table 2-1 PW2050 Part Numbers

Part Number	Description
TBD	PW2050 with on module U.FL— IEEE 802.11 ac/b/g/n Device Server Module, Extended Temp, Bulk, RoHS
TBD	PW2050 with on module chip antenna— IEEE 802.11 ac/b/g/n Device Server Module, Extended Temp, Bulk, RoHS
TBD	PW2050 — IEEE 802.11 ac/b/g/n Device Server Development Kit w/ on Module U.FL and RF Cable to External Antenna, RoHS
TBD	PW2050— IEEE 802.11 ac/b/g/n Device Server Development Kit w/ on Module Chip Antenna, RoHS

PW2050 Features

The PW2050 device server is built around a 400Mhz ARM9 processor with 32MB of DDR2 DRAM and 128MB of embedded Flash memory. Network connections are provided by a dual band 802.11 ac/b/g/n WLAN radio and 10/100Mbps Ethernet MAC and PHY.

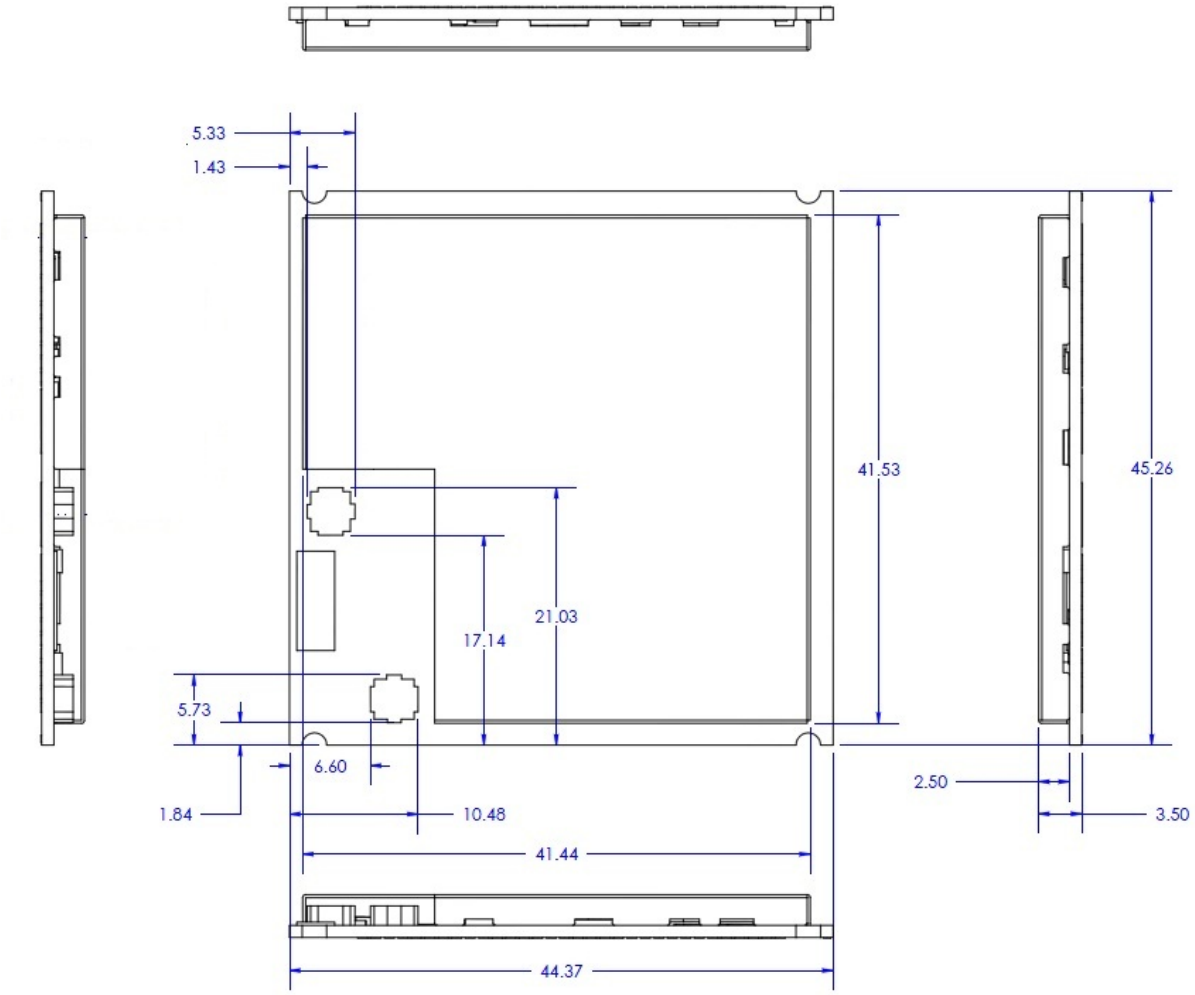
The PW2050 embedded device server also supports the following:

- 400Mhz ARM9 CPU
- 32MB DDR2 DRAM
- 128MB NAND Flash
- 802.11AC/BGN wireless with option for on module antenna or on module U.FL
- On module 10/100Mbps Ethernet MAC/PHY. External magnetic and RJ45 required.
- One USB2.0 High Speed Host/Device interface.
- One USB2.0 High Speed Host only port
- One USB2.0 Full Speed Host only port
- Two 3.3-volt serial interface

- 13 Configurable I/O pins
- Power supply filters
- Reset circuit
- Integrated wake up and shutdown for sleep and standby states
- Interface for connection to an external JTAG software debugger.
- Dedicated two wire serial port for debug

The PW2050 Wi-Fi embedded device server requires +5-volt DC power and is designed to operate in an extended temperature range (see PW2050 data sheet for all technical specifications).

Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-1 PW2050 Dimensions and Views**



Signal Descriptions

The PW2050 embedded device server has a serial interface compatible with data rates up to 921,600 bps (in high-performance mode). All of the logic IO pins are 3.3V tolerant. The serial signals usually connect to an internal device, such as a UART. For applications requiring an external cable running with RS-232 or RS422/485 voltage levels, the PW2050 must interface to a serial transceiver chip.

An on module 10/100Mbps Ethernet MAC and PHY are included on the module. For connection to an external Ethernet network external magnetics and an RJ45 are required.

The module has options for an on-module chip antenna and an external antenna via an on-module U.FL connection.

Table 2-2 PW2050 Wi-Fi SMT PCB Interface Signals

Signal Name	PW2050 Pin #	Primary Function	Reset State	Internal Pull-up /Pull-down	Driver Strength
RF1	2	RF signal to PCB trace when RF1_CTL is asserted low (Future module versions only)			
RF2	4	RF signal to PCB trace when RF1_CTL is asserted low (Future module versions only)			
CP3/MISO	12	Configurable GPIO / SPI Master serial data input, SPI Slave serial data output			
CP4/MOSI	13	Configurable GPIO / SPI Master serial data output, SPI Slave serial data input			
CP7/SCK	14	Configurable GPIO / SPI clock			
CP8/CS	15	Configurable GPIO, multiplexed with SPI interface Chip Select			
CP5	16	Configurable GPIO / I2C Data		10K PU	
CP6	17	Configurable GPIO / I2C Clock		10K PU	
USB1+/DDP	18	USB (Positive) USB High Speed Host/Device Port			
USB1-/DDM	19	USB (Negative) USB High Speed Host/Device Port			
USB2+	21	USB (Positive) USB High Speed Host Port			

Signal Name	PW2050 Pin #	Primary Function	Reset State	Internal Pull-up /Pull-down	Driver Strength
USB2-	22	USB (Negative) USB High Speed Host Port			
RTS2	24	UART2 serial ready to send output			
CTS2	25	UART2 clear to send input			
CP9	26	Configurable GPIO			
DBTX	27	Debug UART serial transmit data output			
DBRX	28	Debug UART serial receive data input		10K PU	
ETXP (ETH1+)	34	Ethernet TX (positive) Future Gbit pair 1 (pos)			
ETXM (ETH1-)	35	Ethernet TX (negative) Future Gbit pair 1 (net)			
TXCT (ECT1)_	37	Center Tap connection for Ethernet TX pair			
RXCT (ECT2)	38	Center Tap connection for Ethernet RX pair			
ERXP (ETH2+)	40	Ethernet RX (positive) Future Gbit pair 2 (pos)			
ERXM (ETH2-)	41	Ethernet RX (negative) Future Gbit pair 2 (neg)			
ETH3+	43	Reserved for future Gbit Ethernet pair 3 (positive)			
ETH3-	44	Reserved for future Gbit Ethernet pair 3 (negative)			
ETH4+	46	Reserved for future Gbit Ethernet pair 4 (positive)			
ETH4-	47	Reserved for future Gbit Ethernet pair 4 (negative)			
ECT3	49	Reserved for future Gbit center tap 3 connection			
ECT4	50	Reserved for future Gbit center tap 4 connection			

Signal Name	PW2050 Pin #	Primary Function	Reset State	Internal Pull-up /Pull-down	Driver Strength
USB3+	52	USB (Positive) USB Full Speed Host Port			
USB3-	53	USB (Negative) USB Full Speed Host Port			
SPEED_LED	56	Ethernet Speed LED, Active low for 100Mbps			
CP13	57	Configurable GPIO			
CP12	58	Configurable GPIO			
CP11	59	Configurable GPIO			
CP10	60	Configurable GPIO			
WAKE	65	CPU Wake up input. Module wakes from low power state on a rising edge		100K PU	
DEFAULT#	66	Unit reset to default, active low. Drive low for xx seconds to reset unit to default settings.			
SYS_LED	67	System Status LED, Active High			
CP2/INT	68	Configurable GPIO / SPI interrupt External Interrupt input			
CP1	71	Configurable GPIO			
LINK_ACT	72	Ethernet Link/Activity LED Active low for link. Toggle for activity.			
WLAN LED	73	LED function for WLAN Link indication, Active Low			
RESET#	77	Unit hardware reset, active low. Drive low to reboot unit		35K PU	
RXD2	78	UART2 serial receive data input			
TXD2	79	UART2 serial transmit data output			
CTS1	80	UART1 clear to send input			
RTS1	81	UART1 serial ready to send output			

Signal Name	PW2050 Pin #	Primary Function	Reset State	Internal Pull-up /Pull-down	Driver Strength
RXD1	82	UART1 Serial receive data input			
TXD1	83	UART1 serial transmit data output			
SHDN	88	Indicates when module is in standby state. Use to power off external devices			
RF1_CTL	97	Antenna Switch control. Pull low to select an external antenna connected to the RF1 pad (pin 2) and RF2 pad (pin 4). This is for a future module revision			
TRST	100	TRST signal for external debugger			
TDO	101	TDO signal for external debugger			
TDI	104	TDI signal for external debugger			
TCK	105	TCK signal for external debugger			
TMS	106	TMS signal for external debugger			
VCC	29,30,31	5V Power Input			
GND	1,3,5,20,23,32, 33,36,39,42,45, 48,51,54,55,61, 64,84,86,87,94, 95,96,98,99,102, 103,107,108,109, 110,111,112,113, 114,115,116,117, 118,119,120,121, 122,123,124	Signal Ground			
RSVD	2,4,6,7,8,9,10,11, 43,44,46,47,49,50, 62,63,69,70,74, 75,76,85,89,90, 91,92,93,	Reserved for Future Use. Leave unconnected.			

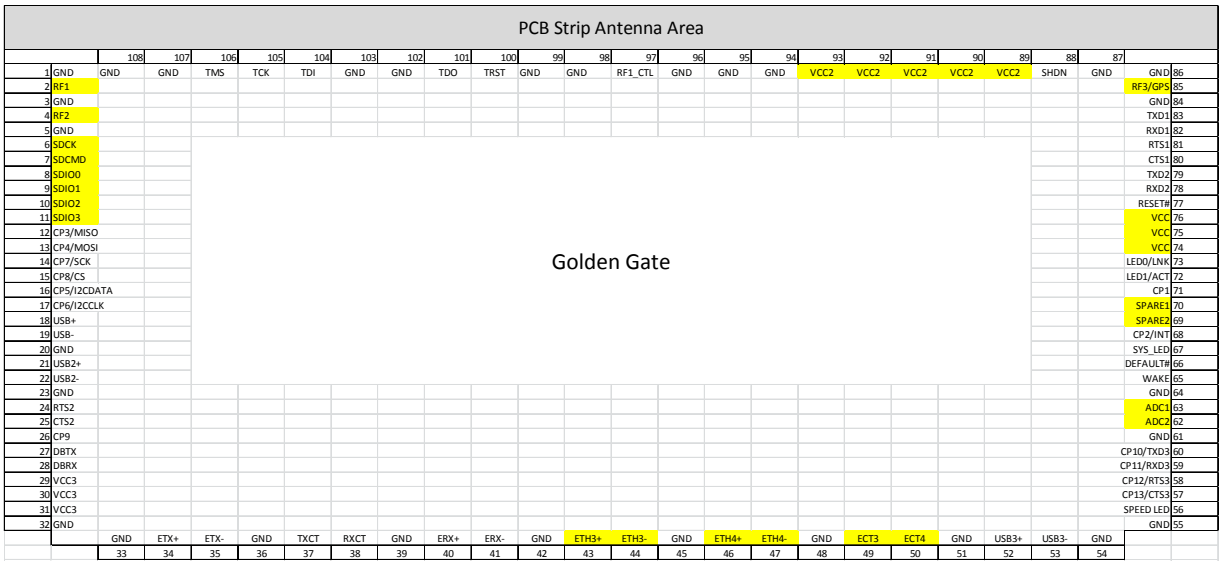
Note1: The current module supports 10/100Mbps Ethernet. Additional pins have been called out for a future Gigabit Ethernet module.

Note2: The logic IO pins are 3.3V tolerant.

Note3: Pins 109 to 124 are the large ground pads under the module. These pads should be connected to ground. These pads also provide thermal relief for the module. It is recommended that multiple vias for each pad be used to connect the ground pads to the ground plane.

Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-2 PW2050 Wi-Fi SMT Pin Locations**

Note: *Pins 109 to 124 are the large pads under the module. Pins 109 to 124 should be connected to GND. The pads in yellow are for future module revisions and should be left unconnected.*



Antenna Interface

The PW2050 Wi-Fi module has been certified using the external antennas listed below. Per FCC guidelines, the PW2050 Wi-Fi certification remains valid if using an antenna of similar type to the antennas below. If using an antenna of similar type to one of the antennas below, but from a different manufacturer part number the antenna gain must be equal to or less than specified in the table. Refer to the PW2050 Wi-Fi SMT Embedded Device Server Data Sheet for full compliance instructions and information. Consult with your certification lab for more details.

Table 2-3 PW2050 Wi-Fi On Module Antenna

Antenna Type	Peak Gain Typical	Lantronix Part Number	Vendor	Vendor Part Number	Approved Region
Ceramic Antenna	2.17dBi, 2.4Ghz to 2.5Ghz 2.74dBi, 4.9Ghz to 5.8Ghz	N/A	N/A	N/A	FCC, IC, EU, AUS/NZS, JPN, China,

Antenna Type	Peak Gain Typical	Lantronix Part Number	Vendor	Vendor Part Number	Approved Region
					Mexico

Table 2-4 PW2050 Wi-Fi External Antenna Options via On Module U.FL

Antenna Type	Peak Gain Typical	Lantronix Part Number	Vendor	Vendor Part Number	Approved Region
PCB Strip Antenna with 50mm cable to U.FL connector With tape backing	2.5dBi, 2.39 Ghz to 2.49 Ghz 5dBi, 4.9Ghz to 5.9Ghz	XPW100A 003-01-B 50 piece bulk pack	Ethertronics ®	1001077	FCC, IC, EU, AUS/NZS, JPN, China, Mexico
PCB Strip Antenna with 50mm cable to U.FL connector Without tape backing	2.5dBi, 2.39 Ghz to 2.49 Ghz 5dBi, 4.9Ghz to 5.9Ghz		Ethertronics	1000668	FCC, IC, EU, AUS/NZS, JPN, China, Mexico
Swivel type antenna, with RP-SMA(M) connector	2 dBi, 2.4 Ghz to 2.5 Ghz, 2 dBi, 5.15 Ghz to 5.85 Ghz	930-033-R-ACC 50 piece bulk pack	Wanshih	WSS002	FCC, IC, EU, AUS/NZS, JPN, China, Mexico
Swivel type antenna, with RP-SMA(M) connector	3.8 dBi, 2.4Ghz to 2.5Ghz, 5.5 dBi, 4.9 Ghz to 5.8Ghz		Taoglas	GW.71.5153 (Not for EU use)	FCC, IC, AUS/NZS, JPN, China, Mexico

Note: *The PCB strip antenna is available from Ethertronics with or without adhesive tape backing for mounting to a plastic case. The antennas Lantronix supplies include an adhesive backing. For the component without tape backing a non-conductive double sided adhesive tape can be used to fix the antenna in place. The Ethertronics part numbers listed above come with a 50mm U.FL cable attached to the PCB strip antenna. The 50mm cable length is the minimum allowed cable length for use with the PW2050 Wi-Fi embedded device server. For similar PCB strip antennas with longer cables consult with Ethertronics (www.ethertronics.com).*

Note: *In order to use the on module U.FL connector signal RF1_CTL (pin 97) should be pulled high or left floating.*

Lantronix provides a U.FL to Reverse SMA antenna cable in with the evaluation board and sample kits for development work. These cables can be purchased from Lantronix for production or supplied by an RF cable manufacturer. External antennas can be purchased from an antenna vendor. Components for cable design should be selected for low loss over the entire 2.4Ghz to 5.9Ghz signal range. The cable target impedance should be 50 ohms.

Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-3 Reverse-SMA to U.FL (Long) (Lantronix Part Number 500-180-R-ACC)**

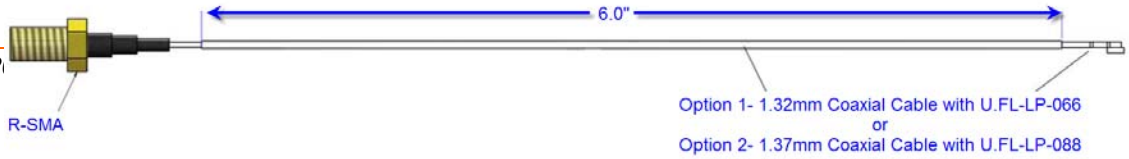


Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-4 U.FL to U.FL Cable (Lantronix Part Number 500-181-R-ACC*)***

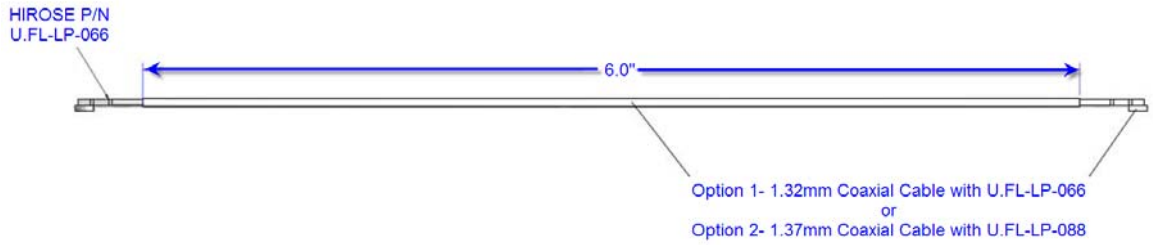
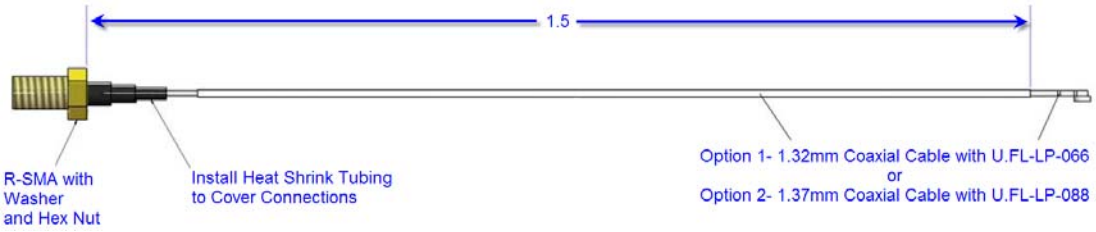


Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-5 Reverse-SMA to U.FL (short) (Lantronix Part Number 500-182-R-ACC)**



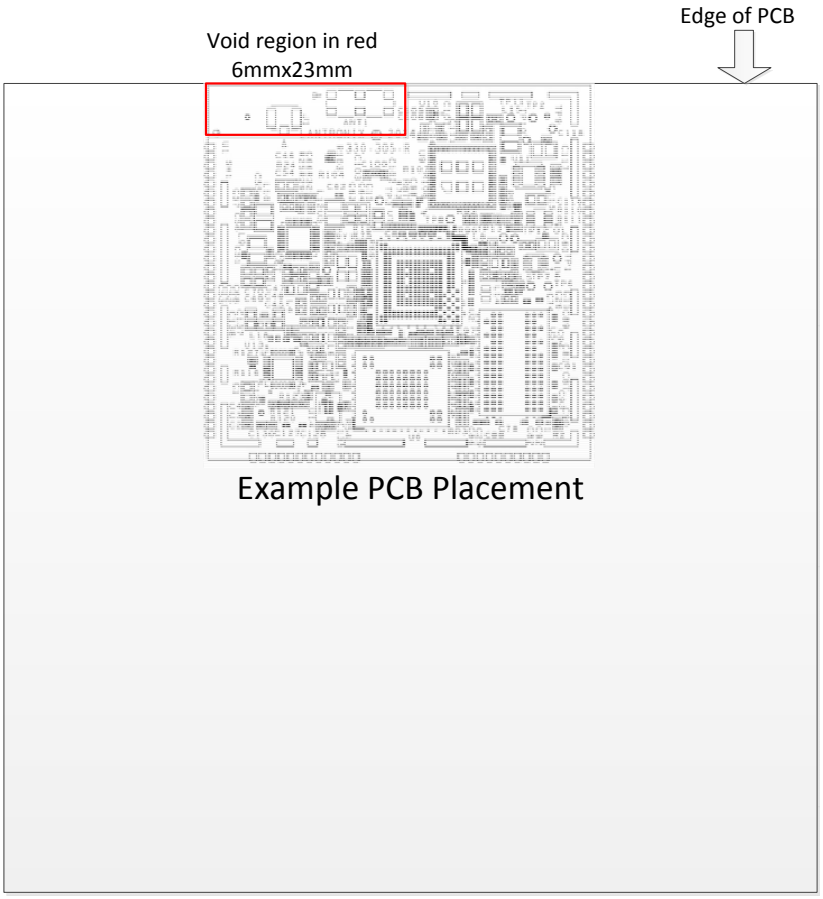
Antenna Placement

When designing the PW2050 Wi-Fi module to a mating board, it is important to consider the final installation of the unit and its location with respect to connecting access points. The antenna should be placed so that it has as clear as possible path to the connecting access point for maximum range. Avoid placing the antenna such that it is blocked by metal walls or ground planes of adjacent circuit boards.

When using the on board chip antenna it is recommended to place the module such that the antenna region is along the edge of the board or extending outward from the edge of the board. The area under the chip antenna region should be voided of all signals and planes

See the figure images below showing recommended placement with the module chip antenna.

Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-6 Module with Chip Antenna Board Edge Mounting**



Note: *The chip antenna region of the module shown in red above is at the top edge of the PCB. The area in red should be voided to optimize antenna performance.*

Using the RF1 Signal Pin

Instructions TBD.

Serial Interface

The PW2050 Wi-Fi SMT embedded device servers has two external serial interfaces. The

signal levels on the serial interface are 3.3V tolerant. The serial interfaces require an external transceiver in order to connect to external RS232, RS485, or RS422 networks. The signals of the Serial Ports may be connected as shown in the reference schematic below. The transceiver shown in the reference schematic is of type Exar, part number SP336. This transceiver is a multiprotocol RS232, RS485, RS422 transceiver. Single protocol transceivers may be used as required. The PW2050 interface may also be directly connected to the UART interface of an external CPU.

Table 2-5 PW2050 Serial Port Signals

Signal	Module Pin	Description
TXD1	83	Serial Transmit Data output
RTS1	81	Serial Ready-to-Send / Serial Transmit enable
RXD1	82	Serial Receive Data input
CTS1	80	Serial Clear-to-Send
TXD2	79	Serial Transmit Data output 2
RTS2	24	Serial Ready-to-Send / Serial Transmit enable
RXD2	78	Serial Receive Data input 2
CTS2	25	Serial Clear-to-Send

Table 2-6 Example RS232 Connections (Serial Transceiver Required)

PW2050 Signal		DTE Connector			DCE Connector		
Signal (Logic)	Description	DB9	DB25	Signal	DB9	DB25	Signal
RXDx	Data In	2	3	RXDx	3	2	TXDx
TXDx	Data Out	3	2	TXDx	2	3	RXDx
RTSx	H/W Flow Control Output	7	4	RTSx	8	5	CTSx
CTSx	H/W Flow Control Input	8	5	CTSx	7	4	RTSx
CPx	Modem Control Input	1	8	DCDx	4	20	DTRx
CPy	Modem Control Output	4	20	DTRx	1	8	DCDx

Table 2-7 Example RS422/485 Connections (Serial Transceiver Required)

PW2050 Signal (logic)	Description	RS485 Signal	DB25 4 Wire	DB25 2 Wire	DB9 4 wire	DB9 2 wire
TXDx	Data Out	TX+485	14	14	7	7
TXDx	Data Out	TX-485	15	15	3	3
RXDx	Data In	RX+485	21	14	2	7
RXDx	Data In	RX-485	22	15	8	3
RTSx	TX Enable					
CPx	RS485 Select					
CPy	RS485 2-wire					

Note: *The IO pins for PW2050 Wi-Fi SMT unit are set to floating input on power up until configured by unit firmware. An external 100K ohm pull-up may be required on the serial transmit signal to prevent downstream UART devices from detecting false characters on initial power up.*

Ethernet Interface

The unit provides a 10/100 Mbps Ethernet interface for connection to an external network through external magnetics and an external RJ45. The figure below shows the Ethernet connections to a 10/100 Ethernet RJ45 Jack with Magnetics, J5 in the figure. The RJ45 Magnetic Jack is Belfuse part number 08B0-1D1T-06-F.

The Ethernet differential pair signals, ERXM/ERXP and ETXM/ETXP should be routed as 100-ohm differential pairs on a layer next to the signal ground plane. The use of vias on these signals should be minimized. Center tap signals RXCT and TXCT should be routed with at least 20 mil trace thickness. The area underneath the RJ45 magnetic jack should be void of all signals and planes. The connector shield should be connected to chassis. It is recommended that 1206 resistor pads from chassis ground to signal ground be placed next to each of the shield tabs. The resistor pads allow for 0 ohm jumper, ferrite beads, or decoupling caps to be installed as needed for EMI/EMC improvement.

The Ethernet LED signals should be routed to discrete LEDs or to the LED pins on the RJ45 through 220 ohm or larger resistors. The LED signals are active low.

Also shown in the figure is an optional active choke that can be used to improve ESD, EFT, and EMI/EMC performance in harsh environments. The device is shown as U22 in the figure and is Akros part number AS1602. This device features route through pin assignments allowing for the Ethernet differential signal pairs to be routed without altering the trace impedance or adding vias. Due to this routing the device could be installed or depopulated as needed. Lantronix has performed all certification to FCC Class B without U22 populated.

The Ethernet signals may be left unconnected if unused.

See the Lantronix app note, “How to Connect a Lantronix Embedded Module to a Wired Ethernet Port” for more details on Ethernet connection and routing, http://www.lantronix.com/pdf/appnotes/Connect-LTRX-Embed-Module-to-Wired-Ethernet_AN.pdf.

Table 2-8 Ethernet Port Signals

Pin Name	Description	PW2050 Pins	Signal Requirement	RJ45 MagJack Belfuse, 08B0-1D1T-06-F Pin assignment
ERXM	Ethernet Receive Negative signal.	41	100 ohm differential pair with ERXP	5
EXRP	Ethernet Receive Positive signal.	40	100 ohm differential pair with ERXM	4
ETXM	Ethernet Transmit Negative signal.	35	100 ohm differential pair with ETXP	3

Pin Name	Description	PW2050 Pins	Signal Requirement	RJ45 MagJack Belfuse, 08B0-1D1T-06-F Pin assignment
ETXP	Ethernet Transmit Positive signal.	34	100 ohm differential pair with ETXM	2
RXCT	Center tap for receive pair.	38	Route > 20 mil width	6
TXCT	Center tap for transmit pair	37	Route > 20 mil width	1
Chassis	Unit chassis	-	RJ45 connector shield	Shield tabs
E_LNKACT	Link / activity LED. Active low. Solid for link, blink for activity.	72	Route to LED cathode through 220 ohm or greater.	9
E_SPEED	Link Speed Active low for 100Mbps, Off (high) for 10Mbps.	56	Route to LED cathode through 220 ohm or greater.	7
3V3	3.3 V power	3V3	3.3V power, connect to LED anodes.	8, 10

USB Device Port

The PW2050 embedded device server has one USB 2.0 device port interface for connection to an upstream USB device. The port consists of a differential pair, signals DDP and DDM. These signals should be routed as a 90 ohm differential pair on a signal layer next to the signal ground plane. The use of vias should be minimized on these signals. The USB signals can be connected to a USB Mini Type B USB port or directly to an IC with a USB host port. If connecting to an external port that is user accessible it is recommended to add a TVS diode array to the signal nets for ESD protection. The ESD array shown in the figure is of type SEMTECH RClamp0502A. This device features through pin routing to minimize trace impedance changes and simplify routing. The footprint for the TVS array can be added to the PCB and the part can be depopulated if it is not needed. It is recommended that the power drawn off the USB Mini Type B connector be limited to less than 500mA per USB requirements. If the USB device port is unused the DDP and DDM pins may be left unconnected.

Table 2-9 USB Device Port Signals

Pin Name	Description	Module Pins	Signal Requirement	Mini Type B USB Device connector pin
USB+/DDP	USB Device Port Positive pin	18	Route as 90 ohm differential pair with DDM signal	3
USB-/DDM	USB Device Port Negative pin	19	Route as 90 ohm differential pair with DDP signal	2
5V	5V power from USB cable		Current limit to 500 mA per port	1
Ground	Signal Ground	Ground	Ground plane	5

USB Host Port

The PW2050 Module has two USB 2.0 Host port interfaces for connection to downstream USB devices. Each port consists of a differential pair. Port USB2 is a high speed port and port USB3 is a full speed port. These signals should be routed as 90 ohm differential pairs on a signal layer next to the signal ground plane. The use of vias should be minimized on these signals. The USB signals can be connected to a USB Type A dual USB port as shown in the figure below or directly to an IC with a USB device port. If connecting to an external port that is user accessible it is recommended to add a TVS diode array to the signal nets for ESD protection. The ESD array shown in the figure is of type NXP, IP4234CZ6. If connecting to an off board device that needs power add a USB power switch to current limit the 5V power connection at the connector. USB requires that each port be limited to 500 mA maximum sustained current. If using the USB host ports the end system must take into account the amount of power consumed by the PW2050 module and each USB device connected to the host ports. The schematic below shows how to connect 5V to a USB host connector using an ST, STMPS2151 Power Distribution Switch. The USB host port 5V power is not provided by the PW2050 module. If the USB host ports are unused their pins may be left unconnected.

Table 2-10 USB Host Port Signals

Pin Name	Description	PW2050 Pins	Signal Requirement	Type A USB Host connector pin
USB2+/HHSDPB	USB HS Host Port A Positive pin	21	Route as 90 ohm differential pair	B3
USB2-/HHSDPM	USB HS Host Port A Negative pin	22	Route as 90 ohm differential pair	B2
USB3+/HFSDPC	USB FS Host Port B Positive pin	52	Route as 90 ohm differential pair	A3
USB3-/HFSDMC	USB FS Host Port B Negative pin	53	Route as 90 ohm differential pair	A2
5V(User supplied)	5V power for USB connector		Current limit to 500 mA per port	A1, B1
Ground	Signal Ground	Ground	Ground plane	A4, B4

LEDs

The PW2050 embedded device server contains several external signals that are intended to drive external status LEDs. The LEDs are listed below. The signals may be connected as shown in the reference schematic figure below.

Note: *The System LED usually remains **on**. When the **Default** button is pressed for 5-6 seconds, the System LED starts blinking every second to indicate the default button can be released to complete resetting the unit to factory default. The unit reboots after*

*release of the **Default** button. A lit WLAN LED indicates the STA interface is associated with an access point.*

Table 2-11 PW2050 Wi-Fi Status LED Output Signals

Signal	Pin	Description
WI-FI LED	73	WI-FI Status LED, active low
SYS_LED	67	System status LED, active high
ETH SPEED	56	Ethernet 100Mbps ON (Active low), 10Mbps OFF
ETH LINK/ACT	72	Ethernet link ON (Active low) Ethernet activity Blink (toggle)

General Purpose I/O Pins

PW2050 Wi-Fi SMT unit contains 13 pins which may be used as configurable inputs or outputs. Listed below are the configurable I/O pins. These pins are 3.3V tolerant.

Table 2-12 Ethernet Interface PW2050 Serial Port Signals

Signal	Pin	Description PW2050 Wi-Fi	Reset State
CP1	71	Configurable I/O	Input
CP2/INT	68	Configurable I/O-SPI interrupt input	Input
CP3	12	Configurable I/O- SPI MISO	Input
CP4	13	Configurable I/O-SPI MOSI	Input
CP5	16	Configurable I/O	Input
CP6	17	Configurable I/O	Input
CP7	14	Configurable I/O-SPI Clock	Input
CP8	15	Configurable I/O-SPI Chip Select	Input
CP9	26	Configurable I/O	Input
CP10	60	Configurable I/O	Input
CP11	59	Configurable I/O	Input
CP12	58	Configurable I/O	Input
CP13	57	Configurable I/O	Input

Reset Pins

PW2050 embedded device servers have two signals for use as reset signals. Signal EXT_RESET# is a hardware controlled input signal that will reboot the PW2050 processor when asserted low. Signal DEFAULT# is polled by the PW2050 software. When DEFAULT# is asserted low for six seconds, the unit will reset the system to the default manufacturing settings and reboot the unit. PW2050 has an additional signal that can be used to wake up the unit processor when the unit is in a sleep or power down state. The SHDN signal is active when the module is in the shutdown state. Use the SHDN signal to gate off external logic when the module is in the shutdown state to minimize power

Table 2-13 PW2050 Reset Signals

Signal	Pin	Description	Reset State
EXT_RESET#	77	Unit hardware reset, active low. Drive low for 50ms to reboot unit. Signal should be driven high or left floating after reset.	Input
DEFAULT#	66	Unit reset to default, active low. Drive low for 5 to 6 seconds to reset unit to default settings.	Input
WAKE	65	Toggle signal from low to high to WAKE from SLEEP or Power down state	Input
SHDN	88	Active when module is in the shutdown state	

3: PCB Footprint and Module Dimensions

The module recommended footprint is shown below. The antenna region should ideally be placed on the edge of the board. The area under the antenna region should be void of all signals and planes. The antenna location inside of the end unit and installation should be chosen such that the antenna has as clear as possible line of site to the connecting WLAN devices. The antenna path should be as clear as possible from metal, ground and power planes from adjacent PCBs and other objects that can interfere with the signal path to the connecting WLAN devices.

To Access CAD Files

1. Go to http://www.lantronix.com/products/cad-visio.html.
2. Click **Download CAD files here** to access the **Registration Form**.

Figure 3-1 PW2050 Module Dimensions

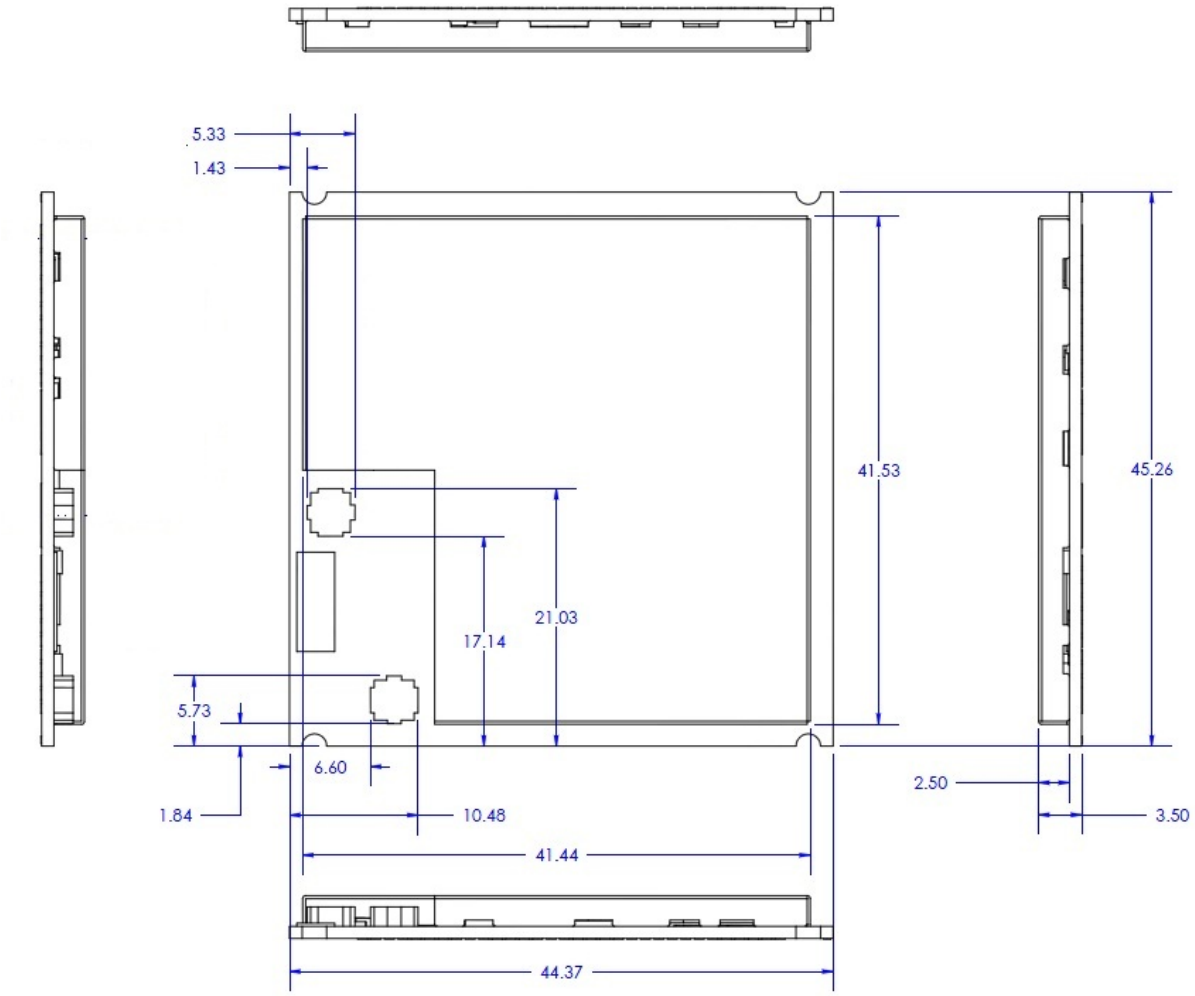
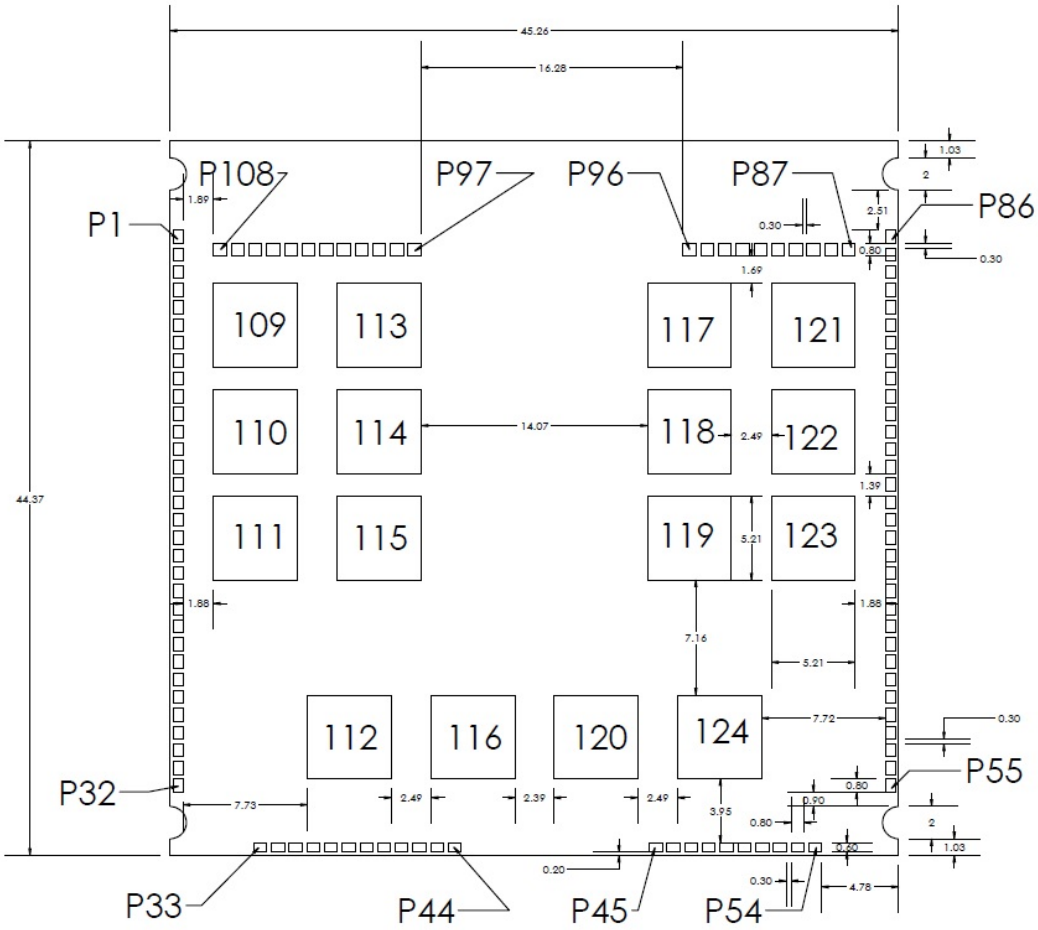


Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-2 PW2050 Recommended Footprint**



The internal ground pads are used for module signal ground and thermal relief. The outer layers should be flooded with ground and the ground pads should have many vias to the internal ground layers.

Soldering coverage should be maximized and checked via x-ray for proper design. There is a trade-off between providing enough soldering for conductivity and applying too much, which allows the module to “float” on the pads creating reliability issues. Lantronix recommends 60% or more full contact solder coverage on each of the internal ground pads after reflow. In addition, Lantronix recommends that the solder wicks up at least 50% of the external LGA pads for proper signal connection.

Solder Profile and Wash Instructions

The reflow profile is dependent on many factors including flux selection, solder composition, and the capability of user's reflow equipment.

General guidelines are as follows:

The solder composition typically sets the peak temperatures of the profile. Recommend lead free solder pastes SAC305: Type 4, water soluble or no clean are acceptable.

Reflow equipment needed at least nine heater zones. Recommend forced air type reflow oven with nitrogen.

It is recommended that the peak temperature at the solder joint be within 235°C ~ 245°C and the maximum component temperature should not exceed 245°C.

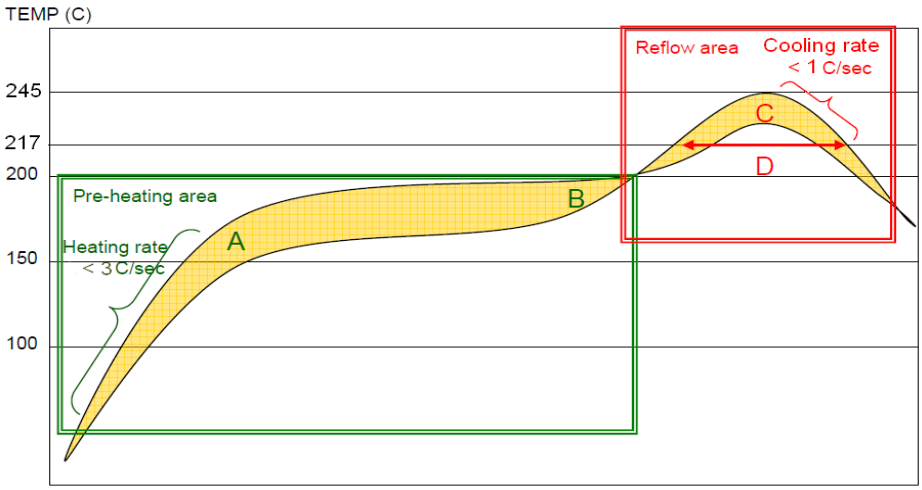
It is recommended that time above 217°C for the solder joints is between 40-90 seconds, and with a minimum of 40 seconds.

Excessive ramp/cooling rates >3°C per second should be avoided.

To develop the reflow profile, it is recommended that the user place thermocouples at various locations on the assembly to confirm that all locations meet the profile requirements. The critical locations are the solder joints of SiP Module.

When developing the reflow profile, it is recommended that the actual fully loaded assembly be used to make sure that the total thermal mass is accounted for.

Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-3 Recommended Reflow Profile**



(1) Solder paste alloy: SAC305(Sn96.5/Ag3.0/Cu0.5)(Lead free solder paste is recommended.)

(2) A-B. Temperature (pre-heat): 150~200°C; soak time: 60~120 seconds

(3) C. Peak temperature: 245°C

(4) D. Time above 217°C: 40~90 seconds

(5) Suggestion: Optimal cooling rate is 1°C per second from peak to 217°C

(6) Nine heater zones at least for reflow equipment.

(7) Nitrogen usage is recommended and the oxygen concentration is controlled less than 1500 parts per million.

Note: *Need to inspect solder joint by X-ray post reflow.*

Product Information Label

The product information label contains important information about your specific unit, such as its part number, revision, manufacturing date code, product model, country of origin, datamatrix barcode and MAC address.

Figure 錯誤! 使用 [常用] 索引標籤將 Heading 1 套用到您想要在此處顯示的文字。**-4 PW2050 Product Label**

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as **2** conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: *In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.*

End Product Labeling
This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: R68PW2050". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement:

This device complies with RSS-247 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ce dispositif est conforme à la norme CNR-247 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This device is intended only for OEM integrators under the following conditions: (For module device use)
1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)
1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:
In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:
Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling
This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:
“Contains IC: 3867A-PW2050”.

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 3867A-PW2050".

Manual Information To the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final
L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.
Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Caution :

(i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

(iii) the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

(iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5250 à 5 350 MHz et de 5470 à 5725 MHz doit être conforme à la limite de la p.i.r.e;

(iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5 725 à 5 850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée pour l'exploitation point à point et l'exploitation non point à point, selon le cas;

(iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

(Safety)
EN 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
Safety of Information Technology Equipment

(MPE)
- EN 62311:2008
Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz-300 GHz) (IEC 62311:2007 (Modified))

(Radio)
EN 300 328 V1.9.1:2015
Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2.4GHz ISM band andusing wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

- EN 301 893 V1.8.1:2015

Broadband Radio Access Networks (BRAN); 5GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

(EMC)

- EN 301 489-1 V1.9.2:2011
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

- EN 301 489-3 V1.6.1:2013
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz

- EN 301 489-17 V2.2.1:2012
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems

<Insert CE mark + notified body number + alert mark here>

CE 0560 !

(除 5G 未調和要放驚嘆號)

cs Česky [Czech]	[Jméno výrobce] tímto prohlašuje, že tento [typ zařízení] je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede [fabrikantens navn] erklærer herved, at følgende udstyr [udstyrets typebetegnelse] overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt [Name des Herstellers], dass sich das Gerät [Gerätetyp] in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab [tootja nimi = name of manufacturer] seadme [seadme tüüp = type of equipment] vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist

	tulenevatele teistele asjakohastele sätetele.
en English	Hereby, [name of manufacturer], declares that this [type of equipment] is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente [nombre del fabricante] declara que el [clase de equipo] cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ [name of manufacturer] ΔΗΛΩΝΕΙ ΟΤΙ [type of equipment] ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr Français [French]	Par la présente [nom du fabricant] déclare que l'appareil [type d'appareil] est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
it Italiano [Italian]	Con la presente [nome del costruttore] dichiara che questo [tipo di apparecchio] è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo [name of manufacturer / izgatavotāja nosaukums] deklarē, ka [type of equipment / iekārtas tips] atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo [manufacturer name] deklaruoja, kad šis [equipment type] atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl Nederlands [Dutch]	Hierbij verklaart [naam van de fabrikant] dat het toestel [type van toestel] in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt Malti [Maltese]	Hawnhekk, [isem tal-manifattur], jiddikjara li dan [il-mudel tal-prodott] jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, [gyártó neve] nyilatkozom, hogy a [... típus] megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
pl Polski [Polish]	Niniejszym [nazwa producenta] oświadcza, że [nazwa wyrobu] jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	[Nome do fabricante] declara que este [tipo de equipamento] está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko	[Ime proizvajalca] izjavlja, da je ta [tip opreme] v skladu z bistvenimi zahtevami in ostalimi

[Slovenian]	relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	[Meno výrobcu] týmto vyhlasuje, že [typ zariadenia] spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	[Valmistaja = manufacturer] vakuuttaa täten että [type of equipment = laitteen tyyppimerkintä] tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar [företag] att denna [utrustningstyp] står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

查詢 NB no.

http://ec.europa.eu/enterprise/newapproach/nando/index.cfm?fuseaction=notifiedbody.main