



BTM430/431 DATA MODULE

Datasheet

Version 5.4

global solutions: local support™

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REVISION HISTORY

Revision	Date	Description	Approved By
1.0	3 Jan 2012	Initial Release	Jonathan Kaye
2.0	20 Mar 2012	Updates to firmware v11.28.1.0	Jonathan Kaye
3.0	11 May 2012	Formatting and general editing	Jonathan Kaye
4.0	7 Jan 2013	Updated FCC Statement, new mech. drawings, general editing / formatting	Jonathan Kaye
4.1	15 Mar 2013	Converted to Laird formatting	Sue White
5.0	04 Feb 2014	Separated into two separate docs (Hardware Integration Guide and User Guide). Added a Related Documents section.	Sue White
5.1	06 Feb 2014	Updated the Bluetooth SIG Qualification section.	Jonathan Kaye
5.2	15 Aug 2014	Updated shipping tray image and added module package dimension image.	Jonathan Kaye
5.3	3 Sept 2014	Updated EU Declaration of Conformity	Jonathan Kaye
5.4	30 Nov 2016	Updated to Datasheet from Hardware Integration Guide	Sue White

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1 OVERVIEW AND KEY FEATURES

The BTM430 and BTM431 Bluetooth® modules from Laird Technologies have been designed to meet the needs of developers who wish to add robust, short range Bluetooth data connectivity to their products. They are based on the market leading Cambridge Silicon Radio BC04 chipset, providing exceptionally low power consumption with outstanding range.

With physical sizes as small as 12.5 x 18.0mm and best of class, low-power operation, these modules are the ideal choice for applications where designers need both performance and minimum size. For maximum flexibility in systems integration, the modules are designed to support a separate power supply for I/O.

To aid product development and integration, Laird Technologies has integrated a complete Bluetooth protocol stack within the modules, including support for the Bluetooth Serial Port Profile. The modules are fully qualified as Bluetooth End Products, allowing designers to integrate them within their own products with no further Bluetooth Qualification. They can then list and promote their products on the Bluetooth website free of charge.

A comprehensive AT command interface is included, which simplifies firmware integration. Combined with a low cost developer's kit, this ensures that the choice of Laird Technologies Bluetooth modules guarantees the fastest route to market.

1.1 FEATURES AND BENEFITS



- Bluetooth® v2.0+EDR
- Adaptive Frequency Hopping to cope with interference from other wireless devices
- External or internal antenna options
- Comprehensive AT interface for simple programming
- Bluetooth® END Product Qualified
- Compact size
- Class 2 output – 4dBm
- Low power operation
- UART interface
- PCM and SCO for external codec
- GPIO lines under AT control
- Support for multiple profiles
- Wi-Fi co-existence

1.2 APPLICATIONS

- Embedded Devices
- Phone Accessories
- Security Devices
- Medical and Wellness Devices
- Automotive Applications
- Bluetooth Advertising
- ePOS

2 SPECIFICATIONS

2.1 Detailed Specifications

Table 1: Detailed specifications

Categories	Feature	Implementation
Wireless Specification	Bluetooth®	Version 2.0+EDR
	Transmit Class	Class 2
	Frequency	2.402 – 2.480 GHz
	Channels	79 channels Frequency Hopping Adaptive Frequency Hopping
	Max Transmit Power	+4 dBm at antenna pad – BTM430 +4 dBm from integrated antenna – BTM431
	Min Transmit Power	-27 dBm at antenna pad – BTM430 -27 dBm from integrated antenna – BTM431
	Receive Sensitivity	-84dBm
	Range	30m
	Data Transfer Rate	Up to 300 kbps
	Antenna Modes	External Antenna
Integrated Antenna (option)		+0dBi multilayer ceramic – BTM431
UART Interface	Serial Interface	RS-232 bi-directional for commands and data 16550 compatible
	Baud Rate	Configurable from 1,200 to 921,600bps Non-standard baud rates supported
	Bits	8
	Parity	Odd, even, none
	Stop bits	1
	Default Serial parameters	9600,n,8,1
	Levels	Set by VDD_USB input
	Modem Control	DTR, DSR, DCD, RI, RTS, CTS
General Purpose Interface	I/O	8 general purpose I/O pins
Audio	Support	1 PCM channel @ 64kbps
	SCO Channels	Support SCO and eSCO
	PCM Interface	Configurable as master or slave 8 bit A-law 8 bit μ -law 13 bit linear PCM Clock available when in slave mode
Protocols and Firmware	Bluetooth Stack	V2.0 compliant. Fully integrated.
	Profiles	GAP Generic Access Profile SDP Service Discovery Profile

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Categories	Feature	Implementation
		SPP Serial Port Profile DUN Dial Up Networking FTP Client OBEX Push client HSP Headset Profile HFP HandsFree Profile
	Firmware Upgrade	Available over UART
	Connection Modes	Point to point (cable replacement)
Command Interface	AT Instructions set Multipoint Capabilities	Comprehensive control of connection and module operation S Registers for non-volatile storage of parameters
Current Consumption	Data Transfer	Typically 32mA
	Low Power Sniff Mode	Less than 2.5mA
Supply Voltage	Supply	3.0V – 3.3V DC
	I/O	1.7V – 3.3V DC (independent of Supply)
	USB & UART	1.7V – 3.6V DC (independent of Supply)
Coexistence / Compatibility	WLAN (802.11)	2-wire and 3-wire hardware coexistence schemes supported
Connections	Interface	Surface Mount Pads
	External Antenna (BTM430)	Pad for 50 Ohm antenna
Physical	Dimensions	12.5mm x 18.0 x 3.4mm BTM430 12.5mm x 22.0mm x 3.4mm BTM431
	Weight	3 grams
Environmental	Operating Temperature	-30°C to +70°C
	Storage Temperature	-40°C to +85°C
Approvals	Bluetooth	Qualified as an END product
	FCC	Limited Modular Approval (BTM430) Full Modular Approval (BTM431)
	CE & R&TTE	Meets CE and R&TTE requirements
Miscellaneous	Lead free	Lead-free and RoHS compliant
	Warranty	1-Year Warranty
Development Tools	Development Kit	Development board and software tools DVK-BTM430 (Dev Kit with BTM430 module fitted) DVK-BTM431 (Dev Kit with BTM431 module fitted)

2.2 Pin Definitions

Table 2: Pin Definitions

Pin	Signal	Description	Voltage Specification
1	Unused		
2	GND		
3	UART_CTS	Clear to Send I/P	VUSB
4	UART_RXD	Receive data I/P	VUSB
5	UART_RTS	Request to Send O/P	VUSB
6	UART_TXD	Transmit data O/P	VUSB
7	GND		
8	SPI_CSB	SPI bus chip select I/P	VIO
9	SPI_MISO	SPI bus serial O/P	VIO
10	SPI_MOSI	SPI bus serial I/P	VIO
11	SPI_CLK	SPI bus clock I/P	VIO
12	VDD_USB	USB & UART supply voltage	
13	VDD_IO	I/O supply voltage	
14	VDD_IN	Main supply voltage	
15	GND		
16	PCM_IN	PCM data I/P	VIO
17	PCM_SYNC	PCM sync I/P	VIO
18	PCM_CLK	PCM clock I/P	VIO
19	PCM_OUT	PCM Data O/P	VIO
20	RESET	Module reset I/P	See note 2
21	GPIO4	BT_ACTIVE / BT_STATE	VIO
22	GPIO2 / UART_DCD	I/O for host	VIO
23	GND		
24	Unused		
25	Unused		See note 3
26	Unused		See note 3
27	Unused		See note 3
28	GND (BTM430 only)		See note 3
29	ANT (BTM430 only)	Antenna connection (50 ohm matched)	See note 3
30	GND (BTM430 only)		See note 3
31	Unused		See note 3
32	Unused		See note 3
33	Unused		See note 3
34	Unused		See note 3
35	Unused		See note 3
36	Unused		See note 3
37	Unused		See note 3
38	Unused		

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Pin	Signal	Description	Voltage Specification
39	Unused		
40	Unused		
41	GND		
42	GPIO1/ UART_RI	I/O for host	VIO
43	GPIO7	UART_DTR	VIO
44	GPIO8	UART_DSR	VIO
45	GND		
46	D-	Not used for AT module variants	VUSB
47	D+	Not used for AT module variants	VUSB
48	GPIO6	RF_ACTIVE	VIO
49	GPIO5	WLAN_ACTIVE	VIO
50	GPIO3	BT_PRIORITY	VIO

Note: 1. Unused pins may have internal connections and must not be connected.
2. Reset input is active low. Input is pulled up to VDD_IN via 22k. Minimum reset pulse width is 5 ms.
3. Pins 8 – 11 (SPI related) are only for Laird internal production purposes.
4. Pins 25-37 should be left not connected on modules with integrated antenna

2.3 Operating Parameters

Table 3: Operating Parameters

Recommended Operating Conditions		
OPERATING CONDITION	MIN	MAX
VDD_USB (USB compatibility not required)	1.7	3.6
VDD_USB (USB compatibility required)	3.1	3.6
VDD_IO	1.7	3.3
VDD_IN	3.0	3.3

2.4 Voltage Specifications

Table 4: Voltage Specifications - VUSB

Logic Levels (VUSB)			
INPUT VOLTAGE LEVELS	MIN	TYP	MAX
V_{ih}	0.7VDD_USB		
V_{il} 2.7<VDD_USB<3.0	-0.4		+0.8
1.7<VDD_USB<1.9	-0.4		+0.4
OUTPUT VOLTAGE LEVELS (1.7<VDD_USB<1.9)			
V_{oh} (Iout = -4mA)	VDD_USB – 0.4		
V_{ol} (Iout = 4mA)			0.4
OUTPUT VOLTAGE LEVELS (2.7<VDD_USB<3.0)			
V_{oh} (Iout = -4mA)	VDD_USB – 0.2		
V_{ol} (Iout = 4mA)			0.2

Note: VDD_USB must be connected to power the USB and UART interfaces.

Table 5: Voltage Specifications - VIO

Logic Levels (VIO)			
INPUT VOLTAGE LEVELS	MIN	TYP	MAX
V_{ih}	0.7VDD_IO		
V_{il} 2.7<VDD_IO<3.0	-0.4		+0.8
1.7<VDD_IO<1.9	-0.4		+0.4
OUTPUT VOLTAGE LEVELS (1.7<VDD_USB<1.9)			
V_{oh} (Iout = -4mA)	VDD_IO – 0.4		
V_{ol} (Iout = 4mA)			0.4
OUTPUT VOLTAGE LEVELS (2.7<VDD_USB<3.0)			
V_{oh} (Iout = -4mA)	VDD_IO – 0.2		
V_{ol} (Iout = 4mA)			0.2

3 APPLICATION NOTE FOR SURFACE MOUNT MODULES

3.1 Introduction

Laird Technologies surface mount modules are designed to conform to all major manufacturing guidelines. This application note is intended to provide additional guidance beyond the information that is presented in the User Manual. This Application Note is considered a living document and will be updated as new information is presented.

The modules are designed to meet the needs of a number of commercial and industrial applications. The modules are designed to be easily manufactured and conform to current automated manufacturing processes.

3.2 Shipping

Modules are shipped in ESD (Electrostatic Discharge) safe trays that can be loaded into most manufacturers pick and place machines. Layouts of the trays are provided in Figure 1 and Figure 2.

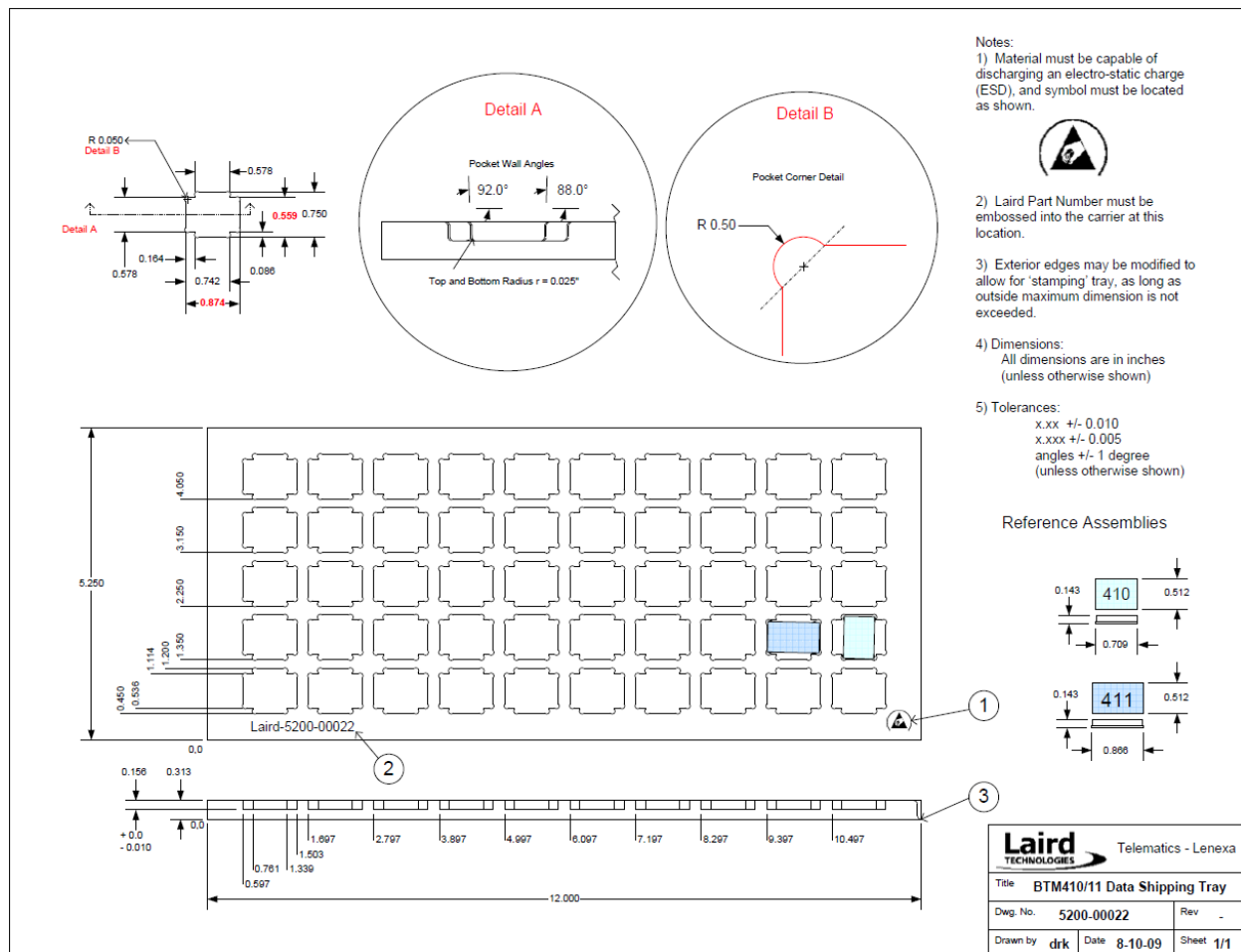


Figure 1: BTM430 and BTM431 Shipping Tray Details

3.3 Reflow Parameters

Laird Technologies surface mount modules are designed to be easily manufactured including reflow soldering to a PCB. Ultimately it is the responsibility of the customer to choose the appropriate solder paste and to ensure oven temperatures during reflow meet the requirements of the solder paste. Laird Technologies' surface mount modules conform to J-STD-020D1 standards for reflow temperatures.

Important: During reflow, modules should not be above 260° and not for more than 30 seconds.

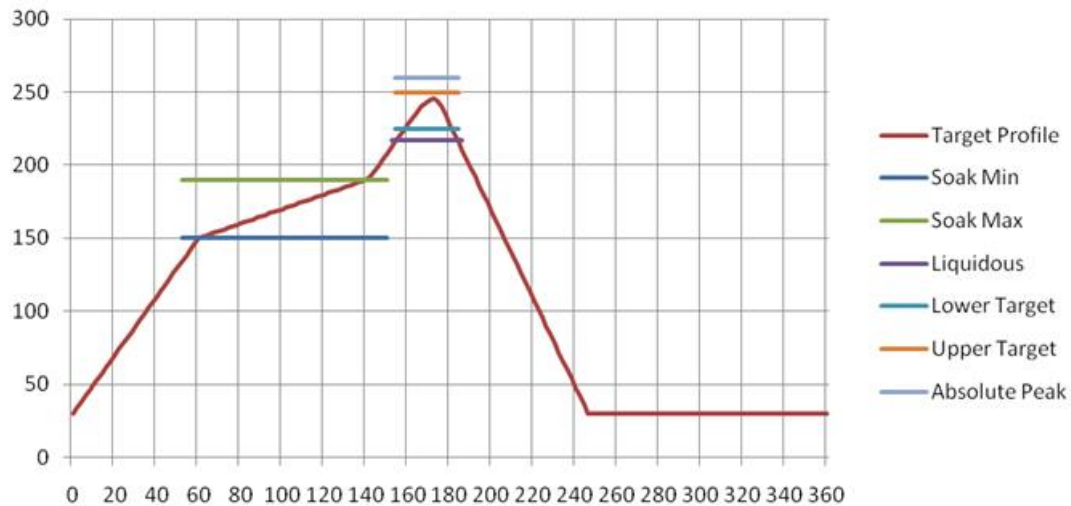


Figure 2: Recommended Reflow Temperature

Temperatures should not exceed the minimums or maximums presented in Table 6.

Table 6: Recommended Maximum and minimum temperatures

Recommended Max & Min's		
SPECIFICATION	VALUE	UNIT
Temperature Inc./Dec. Rate (max)	3	°C / Sec
Temperature Decrease rate (goal)	2-3	°C / Sec
Soak Temp Increase rate (goal)	.5 - 1	°C / Sec
Flux Soak Period (Min)	60	Sec
Flux Soak Period (Max)	90	Sec
Flux Soak Temp (Min)	150	°C
Flux Soak Temp (max)	190	°C
Time Above Liquidous (max)	60	Sec
Time Above Liquidous (min)	20	Sec
Time In Target Reflow Range (goal)	30	Sec
Time At Absolute Peak (max)	30	Sec
Liquidous Temperature (SAC305)	217	°C
Lower Target Reflow Temperature	225	°C
Upper Target Reflow Temperature	250	°C
Absolute Peak Temperature	260	°C

4 FCC REGULATORY STATEMENTS

4.1 BTM430 FCC and Industry Canada Statements

The Final Equipment user manual must show the following statements:

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To comply with the FCC RF exposure compliance requirements, this device and its antenna must not be co-located or operating to conjunction with any other antenna or transmitter.

Considerations for OEM integration:

This module has a limited modular approval. Approval with any other antenna configuration or layout other than that approved will necessitate additional radiated emission testing to be performed.

To inherit the modular approval, the antennas for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This module was approved with the following antenna:

RF Solutions: ANT-24G-WHJ-SMA 0dBi

Operation of this module with any other antenna will require additional testing to be performed.

Co-location with other radio transmitting devices operating concurrently in the same band will require additional testing and certification.

Designers should note the distinction that the FCC makes regarding portable and mobile devices. Mobile devices are defined as products that are not used closer than 20cm to the human body, whereas portable devices can be used closer than 20cm to the body. A device may be used in portable exposure conditions with no restrictions on host platforms when the averaged output power is less than the low power threshold for an uncontrolled environment $\leq 60/f$ (GHz) i.e. 25 mW for a 2.4 GHz device. The maximum Power Exposure for the BTM430 has been evaluated and found to comply with the low power threshold for an uncontrolled environment.

Refer to FCC document KDB 447498 for more information on RF exposure procedures and equipment authorization policies for mobile and portable devices.

FCC Labeling requirement

If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: PI4410B" or "Contains FCC ID: PI4410B." Any similar wording that expresses the same meaning may be used.

4.2 BTM431 FCC and Industry Canada Statements

The user manual must show the following statements:

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To comply with the FCC RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Considerations for OEM integration:

To inherit the modular approval, the antennas for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Co-location with other radio transmitting devices operating concurrently in the same band will require additional testing and certification.

Designers should note the distinction that the FCC makes regarding portable and mobile devices. Mobile devices are defined as products that are not used closer than 20cm to the human body, whereas portable devices can be used closer than 20cm to the body. A device may be used in portable exposure conditions with no restrictions on host platforms when the averaged output power is less than the low power threshold for an uncontrolled environment $\leq 60/f$ (GHz) i.e. 25 mW for a 2.4 GHz device. The Maximum Power Exposure for the BTM431 has been evaluated and found to comply with the low power threshold for an uncontrolled environment.

Refer to FCC document KDB 447498 for more information on RF exposure procedures and equipment authorization policies for mobile and portable devices.

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If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: PI4411B" or "Contains FCC ID: PI4411B." Any similar wording that expresses the same meaning may be used.

5 EU DECLARATION OF CONFORMITY – BTM430 / BTM431

Manufacturer:	Laird
Product:	BTM410 / BTM411 / BTM420 / BTM421 / BTM430 / BTM431 / BTM441 / BTM443 / BTM461
EU Directive:	RTTE 1995/5/EC
Conformity Assessment:	Annex IV

1.1 Reference Standards used for Presumption of Conformity

Article Number	Requirement	Reference standard(s)
3.1a	Health and Safety	EN 60950-1:2005 (2 nd Ed); +Am1:2009 +Am2:2013 EN 60950-1:2006+A11+a1:2010+A12:2011+A2:2013
3.1a	RF Exposure	EN 62479:2010
3.1b	Protection requirements with respect to electromagnetic compatibility	EN 301 489-1 V1.9.2 (2011-09) EN 301 489-17 V2.2.1 (2012-09) Emissions: EN55022:2010 /AC:2011 (ClassB) Immunity: EN61000-4-2:2009 EN61000-4-3:2006 /A1:2008 /A2:2010
3.2	Means of the efficient use of the radio frequency spectrum	EN 300 328 V1.8.1 (2012-06)

1.2 Declaration:

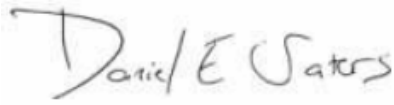
We, Laird, declare under our sole responsibility that the essential radio test suites have been carried out and that the above product to which this declaration relates is in conformity with all the applicable essential requirements of Article 3 of the EU Directive 1995/5/EC, when used for its intended purpose.

Place of Issue:	Laird 11160 Thompson Ave. Lenexa, KS 66219
Date of Issue:	October 2009
Name of Authorized Person:	Daniel Waters / Certifications Specialist

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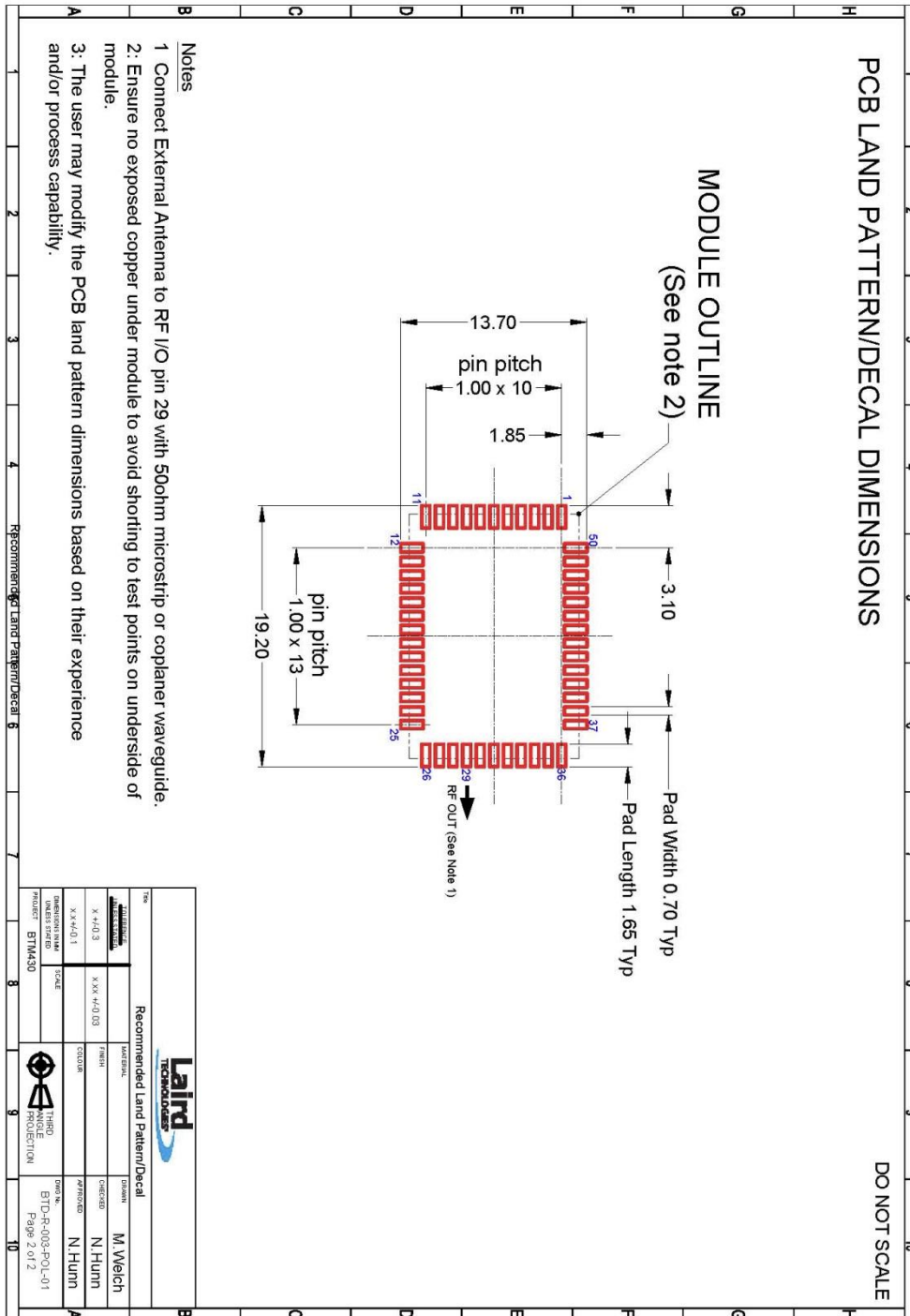
Bluetooth® AT Data Module Datasheet

Signature:



David E Waters

6.2 BTM430 Mechanical Details

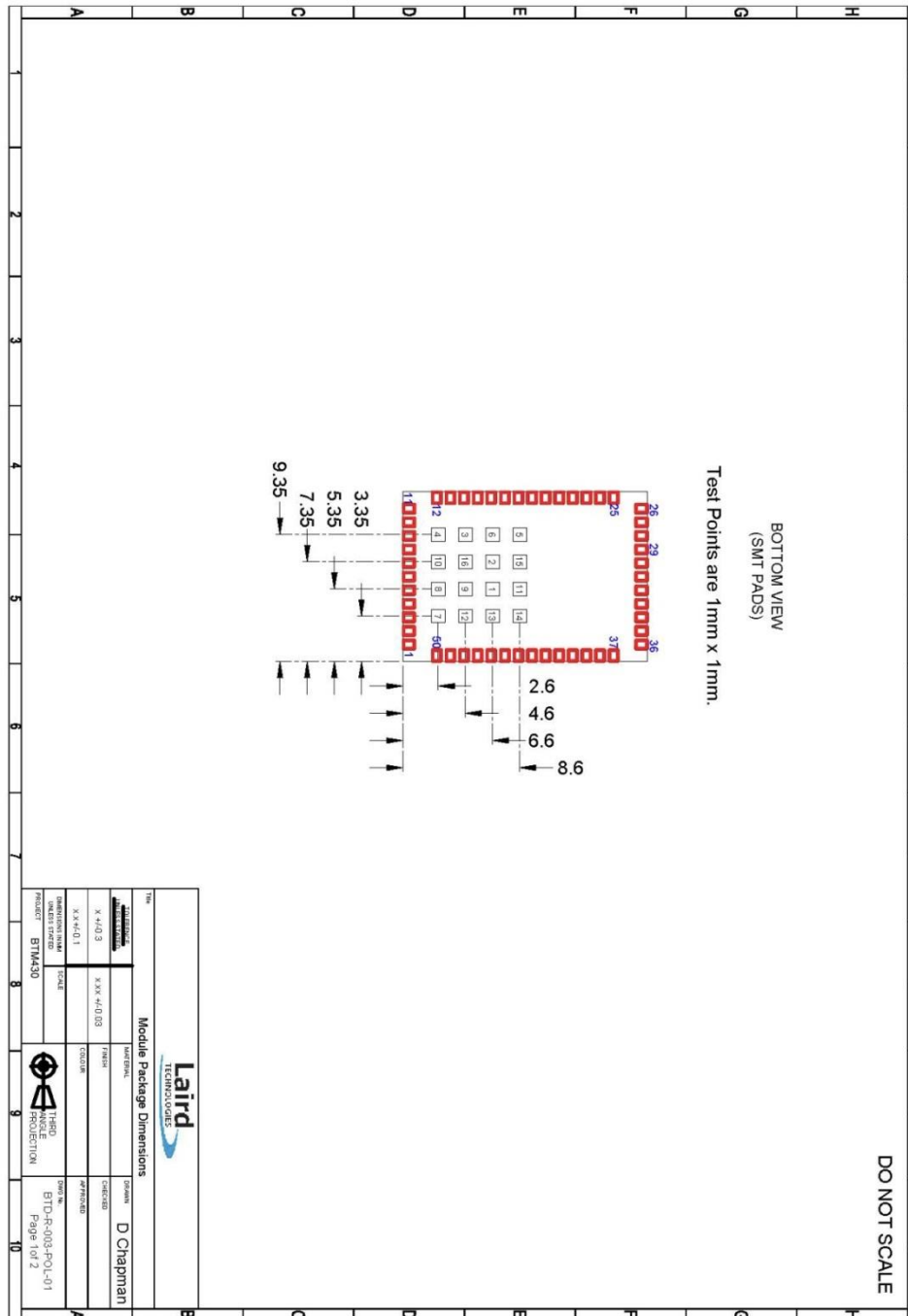


Module Keep-Out Area: An area of 1.5mm around the module should be reserved as a keep-out area. No other components should be placed in this area.

The Development Kit Schematics for this product can be accessed from the following link:

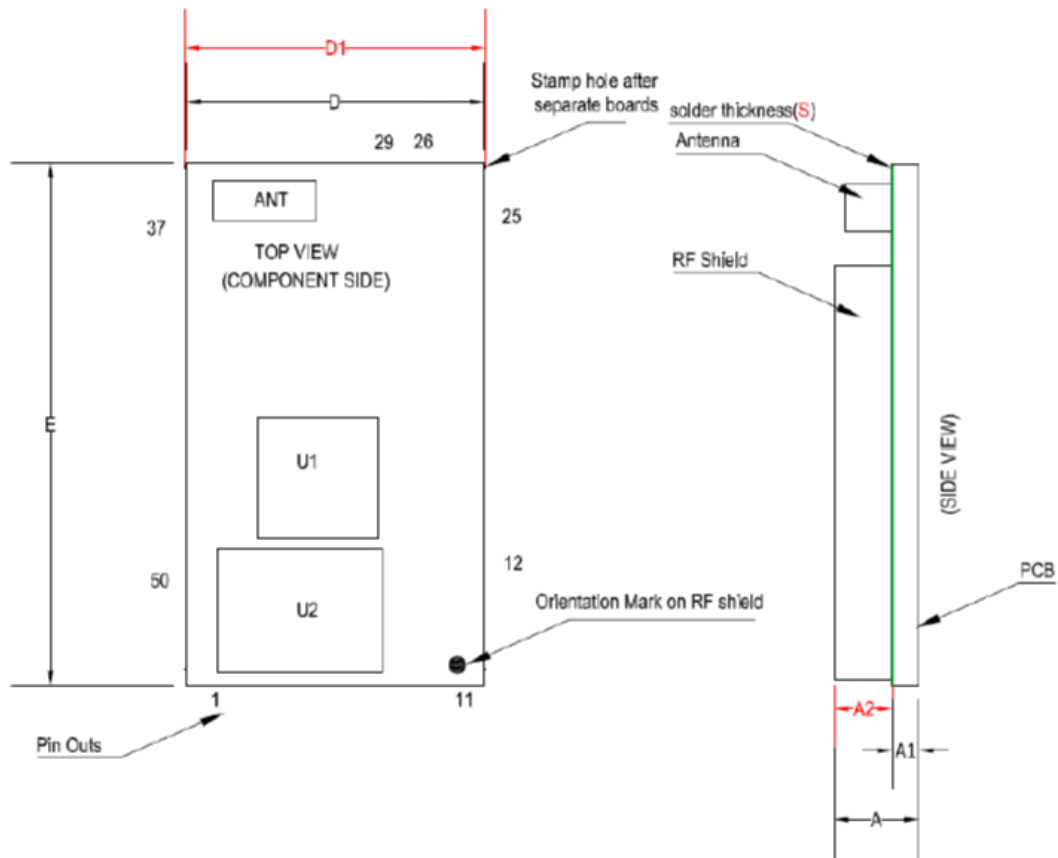
[Development Kit Schematics – BTM430 / BTM431](#)

6.3 BTM430 Mechanical Details



WARNING: Test point dimensions are for reference only. *DO NOT* make electrical connections to these test points, this will void the warranty. Laird does not recommend routing on the top layer underneath the module.

6.4 BTM431 Mechanical Details



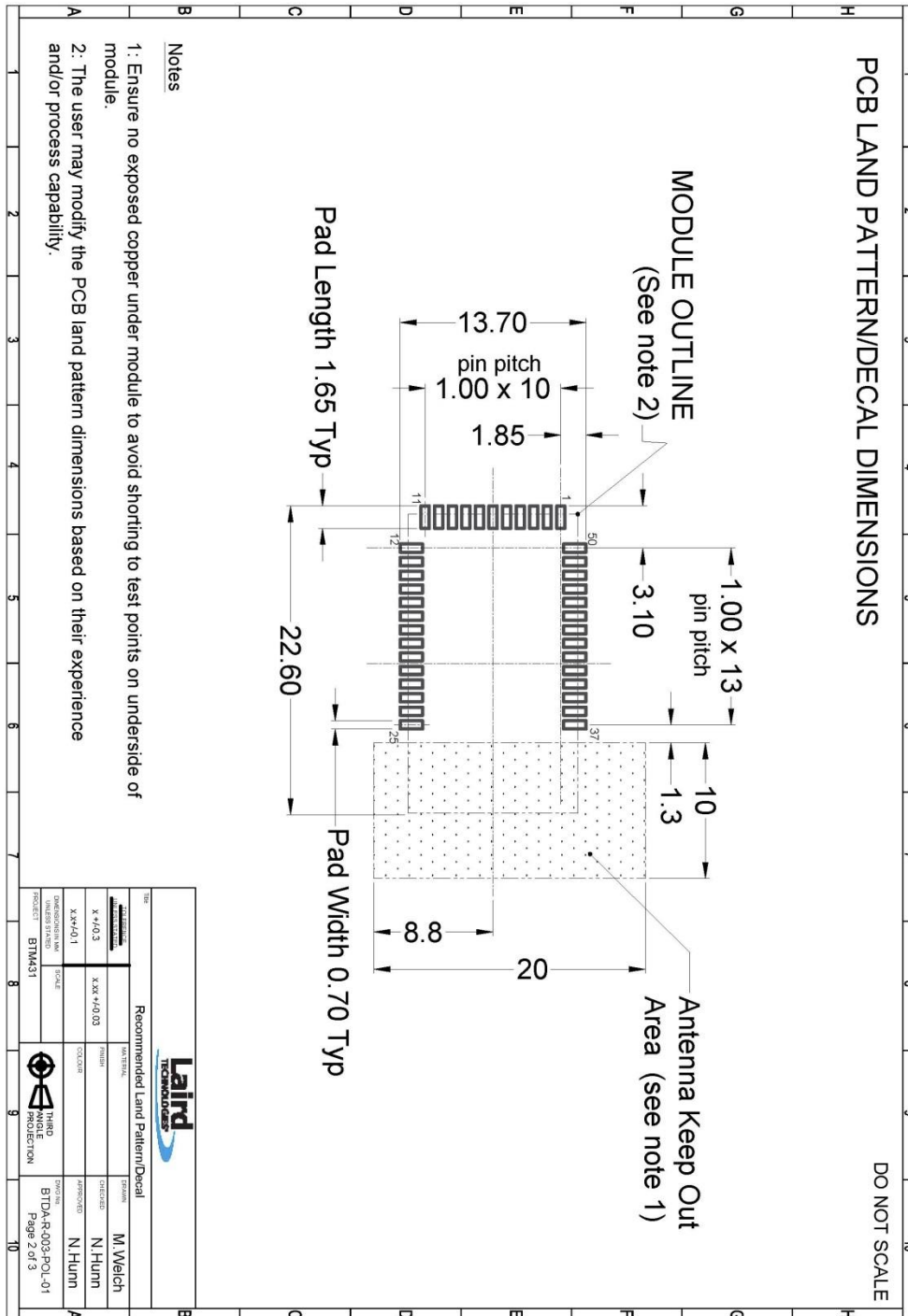
Description	BTM4X1			
Size	22.0x12.5x3.0495mm			
Pitch	1mm			
Dimension	Minimum	Typical	Maximum	Notes
A	2.822mm	3.0495mm	3.277mm	1)A is consist of A1 and A2
A1	0.8mm	0.9mm	1.0mm	2)A2 include solder and shield
A2	2.022mm	2.1495mm	2.277mm	3)D1 measured on stamp hole location after depanelization
D	12.37mm	12.5mm	12.63mm	
D1	12.37mm	12.5mm	13.03mm	
E	21.87mm	22.0mm	22.13mm	

Module Keep-Out Area: An area of 1.5mm around the module should be reserved as a keep-out area. No other components should be placed in this area.

The Development Kit Schematics for this product can be accessed from the following link:

[Development Kit Schematics – BTM430 / BTM431](#)

6.5 BTM431 Mechanical Details




Module Keep-Out Area: An area of 1.5mm around the module should be reserved as a keep-out area. No other components should be placed in this area.

The Development Kit Schematics for this product can be accessed from the following link:

[Development Kit Schematics – BTM430 / BTM431](#)

6.6 BTM431 Mechanical Details

APPLICATION NOTES																																																			
DO NOT SCALE																																																			
<ol style="list-style-type: none"> 1.) Ensure there is no copper in the antenna keep out area on any layers of the host p.c. board. Also keep all mounting hardware or any metal clear of this area to prevent affecting proper antenna radiation. 2.) For best antenna performance the module should be placed on the edge of the host p.c. board and preferably in the corner with the antenna facing the corner. 3.) Antenna keep out area definition comes from the module's Developer Kit board which was used for module development and antenna performance evaluation. 4.) Ensure no exposed copper under module on host p.c. board to avoid shorting to test points on underside of module. 5.) The user may modify the PCB land pattern dimensions based on their experience and/or process capability. 																																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Title</th> <th colspan="2">Application Notes</th> <th colspan="2">Revision</th> </tr> </thead> <tbody> <tr> <td>DATE</td> <td>DESCRIPTION</td> <td>DATE</td> <td>DESCRIPTION</td> <td>DATE</td> <td>DESCRIPTION</td> </tr> <tr> <td>X-4-0-3</td> <td></td> <td>X-XX-4-0-03</td> <td>FINISH</td> <td></td> <td>M. Welch</td> </tr> <tr> <td>X-X-4-0-1</td> <td></td> <td></td> <td>COLOR</td> <td></td> <td>N. Hunn</td> </tr> <tr> <td>DATE</td> <td>DESCRIPTION</td> <td>DATE</td> <td>DESCRIPTION</td> <td>DATE</td> <td>DESCRIPTION</td> </tr> <tr> <td></td> <td>UNLESS STATED</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PROJECT</td> <td>BTM431</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Title		Application Notes		Revision		DATE	DESCRIPTION	DATE	DESCRIPTION	DATE	DESCRIPTION	X-4-0-3		X-XX-4-0-03	FINISH		M. Welch	X-X-4-0-1			COLOR		N. Hunn	DATE	DESCRIPTION	DATE	DESCRIPTION	DATE	DESCRIPTION		UNLESS STATED					PROJECT	BTM431				
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7 ORDERING INFORMATION

Part Number	Description
BTM430	Bluetooth AT Data Module (external antenna)
BTM431	Bluetooth AT Data Module (with integrated antenna)
DVK – BTM430	Development board with BTM430 module soldered in place
DVK – BTM431	Development board with BTM431 module soldered in place

7.1 General Comments

This is a preliminary datasheet. Please check with Laird Technologies for the latest information before commencing a design. If in doubt, ask.

Refer to the schematic BTM430-R-001.pdf for the Development Kit on the following two pages for examples of typical pin connections. A pdf of the schematic can be downloaded from the product web page.

8 BLUETOOTH SIG QUALIFICATION

The BTM430 and BTM431 modules are listed on the Bluetooth SIG website as qualified End Products.

Design Name	Owner	Declaration ID	Link to listing on the SIG website
BTM430, BTM431	Laird Technologies	B016510	https://www.bluetooth.org/tpg/QLI_viewQDL.cfm?qid=16510

It is a mandatory requirement of the Bluetooth Special Interest Group (SIG) that every product implementing Bluetooth technology has a Declaration ID. Every Bluetooth design is required to go through the qualification process, even when referencing a Bluetooth Design that already has its own Declaration ID. The Qualification Process requires each company to be registered as a member of the Bluetooth SIG – www.bluetooth.org

The following link provides a link to the Bluetooth Registration page:
<https://www.bluetooth.org/login/register/>

For each Bluetooth Design it is necessary to purchase a Declaration ID. This can be done before starting the new qualification, either through invoicing or credit card payment. The fees for the Declaration ID will depend on your membership status, please refer to the following webpage:
<https://www.bluetooth.org/en-us/test-qualification/qualification-overview/fees>

For a detailed procedure of how to obtain a new Declaration ID for your design, please refer to the following SIG document:
https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=283698&vld=317486

To start the listing, go to: https://www.bluetooth.org/tpg/QLI_SDoc.cfm

In step 1, select the option, Reference a Qualified Design and enter 16510 in the End Product table entry. You can then select your pre-paid Declaration ID from the drop down menu or go to the Purchase Declaration ID page, (please note that unless the Declaration ID is pre-paid or purchased with a credit card, it will not be possible to proceed until the SIG invoice is paid.

BTM430/431

Bluetooth® AT Data Module Datasheet

Once all the relevant sections of step 1 are complete, complete steps 2, 3 and 4 as described in the help document. Your new Design will be listed on the SIG website and you can print your Certificate and DoC.

For further information please refer to the following training material;

<https://www.bluetooth.org/en-us/test-qualification/qualification-overview/listing-process-updates>

8.1 Additional Assistance

Please contact your local sales representative or our support team for further assistance:

Laird Technologies Connectivity Products Business Unit

Support Centre: <http://ews-support.lairdtech.com>

Email: wireless.support@lairdtech.com

Phone: Americas: +1-800-492-2320 Option 2

Europe: +44-1628-858-940

Hong Kong: +852 2923 0610

Web: <http://www.lairdtech.com/bluetooth>

9 RELATED DOCUMENTS

The following additional BTM430/431 technical documents are also available from the [Laird BTM430/431 product page](#) under the Documentation tab:

- Product Brief
- User Guide
- Firmware Release Notes – Version 11.28.1.0
- Development Kit Schematics



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CONN-HIG-BTM430-431

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