Laird

Smart Technology. Delivered.™

Datasheet

WB45NBT

Version 2.1

REVISION HISTORY

Version	Date	Notes	Approver
1.0	15 May 2015	Initial Release	Jonathan Kaye
1.01	29 May 2014	Updated FCC and IC identification numbers.	Andrew Chen
1.02	1 July 2014	Added product image Updated recommended DC supply voltage on VCC 1.8V to 1.8 V +/- 2%.	Andrew Chen
1.03	25 July 2014	Updated 1.8 VDC to +/-2% in the Specifications table Updated the Supply Voltage in the Specifications table Added the updated product images	Andrew Chen
1.04	03 Sept 2014	Removed SDC reference from part number. Added new photo	Andrew Chen
1.05	15 Sept 2014	Updated Molex mating connector – changed Molex 55560 Series 80 Pin Connector P/N 55560-**0804** to Molex 55560 Series 80 Pin Connector P/N 55560-**0807** due to unavailability of former part.	Andrew Chen
1.06	16 Sept 2014	Removed CAN interface references.	Andrew Chen
1.07	10 June 2015	Updated the Tx power and Rx sensitivity numbers.	Andrew Chen
1.08	2 Oct 2015	Fixed links in document	Andrew Chen
1.09	12 Oct 2015	Added link to Molex data sheets	John Imboden
1.10	27 April 2016	Updated Frequency Band and Operating Channel information in the Specifications table	Andrew Chen
1.11	12 May 2016	Added certification info & IDs for FCC, IC, ETSI, MIC, and KC	John Imboden
2.0	02 Aug 2016	Changed from *Hardware Integration Guide* to *Datasheet*	Sue White
2.1	24 Aug 2016	Removed *pending* status of WFA and CCX	John Imboden

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

CONTENTS

1 Scope 4
2 Operational Description 4
3 Block Diagram 5
4 Specifications 5
4.1. Absolute Maximum Ratings 10
4.2. Recommended Operating Conditions and DC Power Electrical Characteristics 11
4.3. Power on Sequence 12
5 Pin Definitions 13
6 Mechanical Specification 17
7 Regulatory 18
7.1. Laird WB45NBT Certifications 18
7.2. Certified Antennas 19
7.3. Documentation Requirements 19
7.3.1. FCC 20
7.3.2. Industry Canada 22
7.3.3. European Union 23
8 Ordering Information 25

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

1 SCOPE

This document describes key hardware aspects of the Laird WB45NBT wireless bridge module. This document is intended to assist device manufacturers and related parties with the integration of this module into their host devices. Data in this document are drawn from a number of sources including data sheets for the QUALCOMM Atheros AR6003, CSR CSR8510, and Atmel AT91SAM9G25.

For accuracy, ensure you are using the most recent version of this document. Contact Laird to obtain the most recent version of this document – http://ews-support.lairdtech.com.

2 OPERATIONAL DESCRIPTION

This device is a Laird WB45NBT wireless bridge module, a wireless communications subsystem that may be integrated into a variety of host devices via a number of available electronic and logical interfaces. The Laird WB45NBT provides complete enterprise-class Wi-Fi connectivity with an integrated TCP/IP stack, full support for IEEE 802.11a/b/g/n and Bluetooth 4.0 dual-mode air standards with a fully integrated security supplicant providing 802.11i/WPA2 Enterprise authentication, data encryption, and BT protocol stacks.

The WB45NBT has a wide variety of interfaces including Fast Ethernet, serial UART, Hi-Speed USB, SPI, and I2C. The wireless bridge may be configured, monitored, and managed via a Command Line Interface (CLI) over an available dedicated console port, via a web interface over a wireless or Ethernet interface or via a remote SDK interface over wireless or Ethernet.

The WB45NBT incorporates a Wi-Fi SiP module using Qualcomm Atheros AR6003 which supports IEEE 802.11a/b/g/n. The CSR (CSR8510) Bluetooth chip supports Bluetooth standard 4.0 which includes the Bluetooth Low Energy (BLE) and legacy modes. The product features an ARM9 processor running at 400 MHz, 64 MB of Lower Power DDR (LPDDR) memory, and 128 MB of NAND flash storage running at 1.8 V to minimize power consumption. Several GPIO lines are available for data acquisition and similar applications. The platform runs an embedded Linux operating system based on the 3.x kernel. A Software Developer's Kit (SDK) with Application Programming Interfaces (API) and software tools are available for the development of custom software applications on the device.

The WB45NBT measures 40 mm long by 40 mm wide by 3.8 mm thick. The wireless bridge physically interfaces to the host device via an 80 pin board to board (B2B) connector (Molex SlimStack™ 54722 Series 80 pin connector P/N 54722-0804), which mates to a 1.5 mm stacking height mating part from Molex 55560 Series P/N 55560-0807. The WB45NBT may be secured to the host device via available grounded mounting holes. The WB45NBT operates at temperatures between -20° and + 70° degrees Celsius.

Contingent on compliance results, WB45NBT is a fully integrated module. It has its own RF shielding and does not require shielding provided by the host device into which it is installed in order to maintain compliance with applicable regulatory standards. As such, the device may be tested in a standalone configuration via a breakout board (BB45NBT). The BB45NBT schematic is available as a design reference in the software downloads tab of the WB45NBT product page.

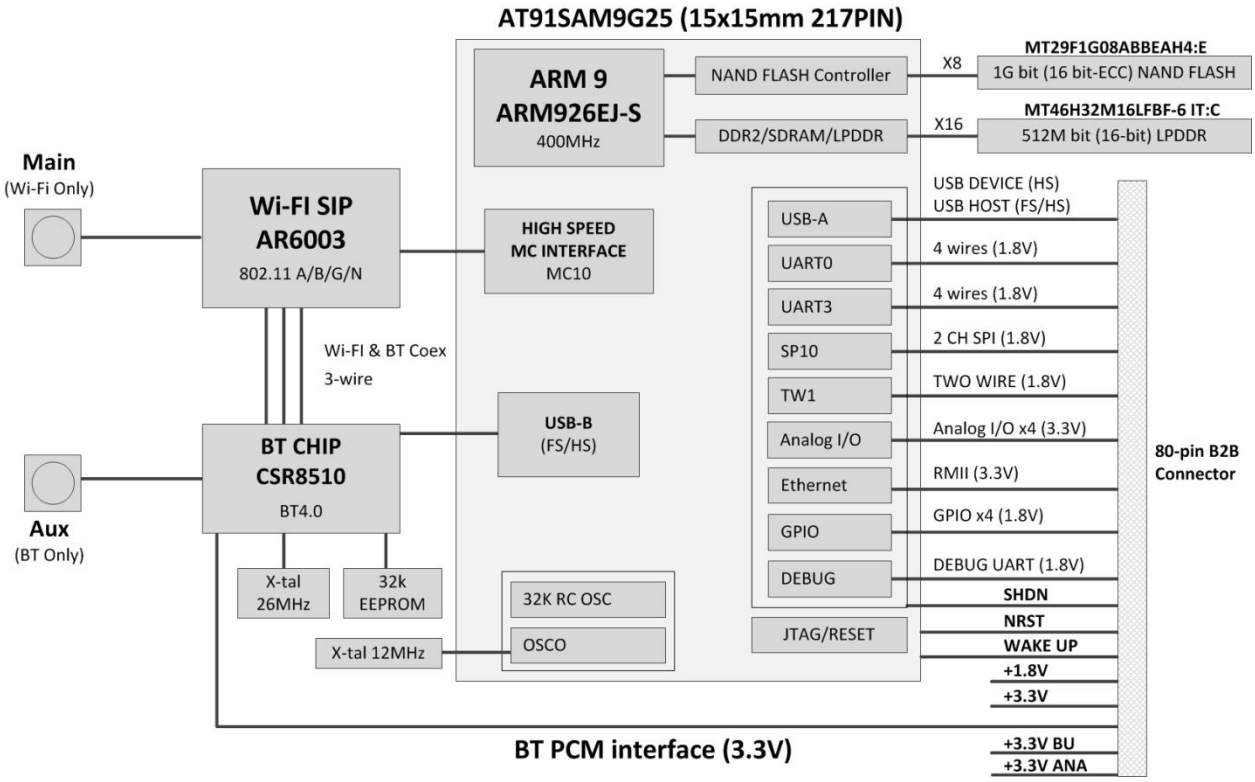
The WB45NBT provides two U.FL type antenna connectors; the main antenna (for Wi-Fi) and the auxiliary (for Bluetooth) work separately to get the best coexistence performance. Supported host device antenna types include dipole and monopole antennas.

Regulatory operational requirements are included in this document and may be incorporated into the operating manual of any device into which the WB45NBT is installed. The WB45NBT is designed for installation into mobile devices which typically operate at distances greater than 20 cm from the human body and portable devices which typically operate at distances less than 20 cm from the human body. See Documentation Requirements for more information.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

3 Block Diagram



Note: Transmitter frequencies for Wi-Fi are 2412-2462 MHz and 5180-5805 MHz. Transmitter frequencies for Bluetooth are 2402-2480 MHz.

Note: Bluetooth functions on the AUX antenna and Wi-Fi operates at the Main antenna only.

4 Specifications

Feature	Description
Physical Interface	Pitch: 0.5 mm Stacking height: 1.50 mm Molex 54722 Series 80 Pin Connector P/N 54722-0804 **Mating part:** Molex 55560 Series 80 Pin Connector P/N 55560-0807 **Note:** See **Mounting** for mating connector options.
Ethernet Interface (3.3 V signal level)	10/100 Mbps RMII (Reduced Media Independent Interface)
Asynchronous Serial Port Interfaces (1.8 V signal level)	Four-wire UART with hardware handshaking (up to 921,600 baud) Two-wire UART (console) for debug purpose
SPI Interface	Five Wire, Master and Slave modes supported with 2 chip select

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Feature	Description
(1.8 V signal level)	
USB Interfaces	Configurable USB Host port/Device port to support USB full speed and high speed data rates
Two Wire Interface (1.8V signal level)	Two-wire I2C (Inter-IC)
Debug Interface	Two-wire UART (console) for debug purpose
Digital GPIO (1.8 V signal level)	4 digital General Purpose I/O (GPIO)
Analog GPIO (3.3 V signal level)	4 analog General Purpose I/O (GPIO)
PCM interface	13-bit or 16-bit linear, 8-bit µ-law or A-law companded sample formats
Antenna Interface	2 Hirose U.FL connectors for Wi-Fi (Main) and BT (Aux) separately, 50 ohm **Note:** Wi-Fi and BT sharing a single antenna is NOT currently supported.
Wi-Fi Interface	Qualcomm Atheros AR6003 1X1 802.11 a/b/g/n on 20 MHz bandwidth
Bluetooth Interface	CSR CSR8510 Bluetooth 4.0 dual-mode (EDR+BLE)
Processor Chip Set	Atmel 400 MHz ARM 9, P/N AT91SAM9G25-CU
Operating System	Embedded Linux, 3.x kernel
Memory	64 MB LPDDR
Storage	128 MB SLC NAND flash
Input Voltage Requirements	3.3 VDC +/-5% (Backup) 3.3 VDC ±5% (system) 1.8 VDC +/-2% (Memory and I/O interface) **Note:** Voltage ripple must be less than 30 mV.

Current Consumption

Note: These current consumption measurements were taken using Linux kernel version 3.8.0.

Note: Standby refers to the radio operating while connected to an AP but not transmitting or receiving.

	Mode	1.8 V	3.3 V
		Average	Average
802.11a	Transmit	78	325
	Receive	95	71
	Standby	13	56
802.11b	Transmit	74	278
	Receive	91	57
	Standby	13	56
802.11g	Transmit	80	265
	Receive	91	57
	Standby	13	56
802.11n (2.4 GHz)	Transmit	80	285
	Receive	91	57
	Standby	13	56
802.11n (5 GHz)	Transmit	78	335
	Receive	95	70
	Standby	13	56

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Feature	Description			
	Sleep	N/A	11	31

Note: Average current was measured with a Fluke 87V DMM. Standby current was measured with a Yokogawa DL9140 oscilloscope and 700937 current probe; the unit was connected to an AP. Tx current reflects constant transmit test mode. During testing, the WB45NBT was set to USB device mode.

Operating Temperature	-20° to +70°C (-4°F to 158°F)
Operating Humidity	10 to 90% (non-condensing)
Storage Temperature	-30° to 85°C (-22° to 185°F)
Storage Humidity	10 to 90% (non-condensing)
Maximum Electrostatic Discharge	Maximum Contact Discharge (CD): 4 kV Maximum Air Discharge (AD): 8 kV
Length/Width/Thickness	40 mm (1.57 in.) x 40 mm (1.57 in.) x 3.8 mm (0.15 in.) **Note:** Length, width, and thickness measurements include the metal shielding.
Weight	6.8 g (0.24 oz.)
Mounting	Connector and through holes. Refer to **Mechanical Specifications** for additional information. Recommended: **Connector:** ▪ Mating part: Molex 55560 Series 80 Pin Connector P/N 55560-0807 ▪ Stand-off: EMI STOP F40M20-151126D4BM http://www.emistop.com
Wi-Fi Media	Direct Sequence-Spread Spectrum (DSSS) Complementary Code Keying (CCK) Orthogonal Frequency Divisional Multiplexing (OFDM)
Wi-Fi Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Network Architecture	Infrastructure and ad hoc
Wi-Fi Standards	IEEE 802.11a, 802.11b, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i, 802.11n
Wi-Fi Data Rates Supported	802.11a (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b (DSSS, CCK): 1, 2, 5.5, 11 Mbps 802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (OFDM, HT20, MCS 0-7): 6.5,13,19.5, 26, 39,52, 58.5, 72.2 Mbps 7.2,14.4, 21.7, 28.9,43.3, 57.8, 65 Mbps
Modulation	BPSK @ 1, 6, 6.5, 7.2 and 9 Mbps QPSK @ 2, 12, 13, 14.4,18, 19.5 and 21.7 Mbps CCK @ 5.5 and 11 Mbps 16-QAM @ 24, 26, 28.9, 36, 39 and 43.3 Mbps 64-QAM @ 48, 52, 54, 57.8, 58.5, 65, and 72.2 Mbps
802.11n Spatial Streams	1X1 SISO (Single Input, Single Output)

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Feature	Description
Regulatory Domain Support	FCC (Americas, Parts of Asia, and Middle East) ETSI (Europe, Middle East, Africa, and Parts of Asia) MIC (Japan) (formerly TELEC) KC (Korea) (formerly KCC)
2.4 GHz Frequency Bands	ETSI: 2.4 GHz to 2.483 GHz FCC: 2.4 GHz to 2.483 GHz MIC: 2.4 GHz to 2.495 GHz KC: 2.4 GHz to 2.483 GHz
2.4 GHz Operating Channels	ETSI: 13 (3 non-overlapping) FCC: 11 (3 non-overlapping) MIC: 14 (4 non-overlapping) KC: 13 (3 non-overlapping)
5 GHz Frequency Bands	ETSI: 5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz FCC: 5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz 5.725 GHz to 5.825 GHz MIC: 5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz KC: 5.15 GHz to 5.25 GHz 5.725 GHz to 5.825 GHz
5 GHz Operating Channels	ETSI: 19 non-overlapping FCC: 24 non-overlapping MIC: 19 non-overlapping KC: 19 non-overlapping
Maximum Transmit Power **Note:** Maximum transmits power varies according to individual country regulations. All values nominal, +/-2 dBm. **Note:** Summit 45 series radios support a single spatial stream and 20 MHz channel bandwidth at 2.4GHz.	**802.11a** 6 Mbps 15 dBm (31.623 mW) 54 Mbps 12 dBm (19.953 mW) **802.11b** 1 Mbps 16 dBm (39.81 mW) 11 Mbps 16 dBm (39.81mW) **802.11g** 6 Mbps 16 dBm (39.81 mW) 54 Mbps 12 dBm (25.12 mW) **802.11n (2.4 GHz)** 6.5 Mbps (MCS0) 16 dBm (39.81 mW) 65 Mbps (MCS7) 12 dBm (15.85 mW) **802.11n (5 GHz HT20)** 6.5 Mbps (MCS0) 15 dBm (31.62mW) 65 Mbps (MCS7) 12 dBm (15.85mW) **Bluetooth** 6 dBm (3.98 mW) (Class 1)

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Feature	Description
Typical Receiver Sensitivity **Note:** All values nominal, +/-3 dBm. Variant by channels.	**802.11a:** 6 Mbps -90 dBm 54 Mbps -73 dBm (PER <= 10%) **802.11b:** 1 Mbps -89 dBm 11 Mbps -82 dBm (PER <= 8%) **802.11g:** 6 Mbps -85 dBm 54 Mbps -68 dBm (PER <= 10%) **802.11n (2.4 GHz)** MCS0 Mbps -86 dBm MCS7 Mbps -65 dBm **802.11n (5 GHz HT20)** MCS0 Mbps -90 dBm MCS7 Mbps -70 dBm **Bluetooth:** 1 Mbps -89 dBm 2 Mbps -91 dBm 3 Mbps -85 dBm
Security	**Standards** ▪ Wireless Equivalent Privacy (WEP) ▪ Wi-Fi Protected Access (WPA) ▪ IEEE 802.11i (WPA2) **Encryption** ▪ Wireless Equivalent Privacy (WEP, RC4 Algorithm) ▪ Temporal Key Integrity Protocol (TKIP, RC4 Algorithm) ▪ Advanced Encryption Standard (AES, Rijndael Algorithm) **Encryption Key Provisioning** ▪ Static (40-bit and 128-bit lengths) ▪ Pre-Shared (PSK) ▪ Dynamic **802.1X Extensible Authentication Protocol Types** ▪ EAP-FAST ▪ EAP-TLS ▪ EAP-TTLS ▪ PEAP-GTC ▪ PEAP-MSCHAPv2 ▪ PEAP-TLS ▪ LEAP

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Feature	Description
Compliance **Note:** Pursuing MIC and KC certifications is currently TBD.	**ETSI Regulatory Domain** EN 300 328 EN 300 328 v1.8.1 (BT 2.1) EN 301 489-1 EN 301 489-17 EN 301 893 EN 60950-1 EN 55022:2006 Class B EN 55024:1998 +A1:2001, A2:2003 EN 61000-3-2:2006 EN 61000-3-3:1995 +A1:2001, A2:2005 EU 2002/95/EC (RoHS) **FCC Regulatory Domain** FCC 15.247 DTS – 802.11b/g (Wi-Fi): 2.4 GHz & 5.8 GHz FCC 15.407 UNII – 802.11a (Wi-Fi): 2.4 GHz & 5.4 GHz FCC 15.247 DSS – BT 2.1 FCC Part 15 Class B UL 60950 **Industry Canada** RSS-210 – 802.11a/b/g/n (Wi-Fi) – 2.4 GHz, 5.8 GHz, 5.2 GHz, and 5.4 GHz ICES-003, Class B CSA C22.2, No. 60950 RSS-210 – BT 2.1
Certifications	**Wi-Fi Alliance** 802.11a, 802.11b, 802.11g , 802.11n WPA Enterprise WPA2 Enterprise Cisco Compatible Extensions (Version 4)
Warranty	Limited Lifetime
All specifications are subject to change without notice	

4.1. Absolute Maximum Ratings

Parameter	Comments	Conditions	Min.	Typ.	Max.	Unit
Input Voltage	3.3V VCC pin	With respect to ground	-0.3	-	3.8	V
	1.8V VCC pin		-0.3	-	2.0	V
	Any 3.3V IO pin		-0.3	-	3.8	V
	Any 1.8V IO pin		-0.3		2.0	V
RF input		Maximum RF input from the antenna port (reference to 50 ohm)			+10	dBm

Note: Voltage operated over the maximum limit may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

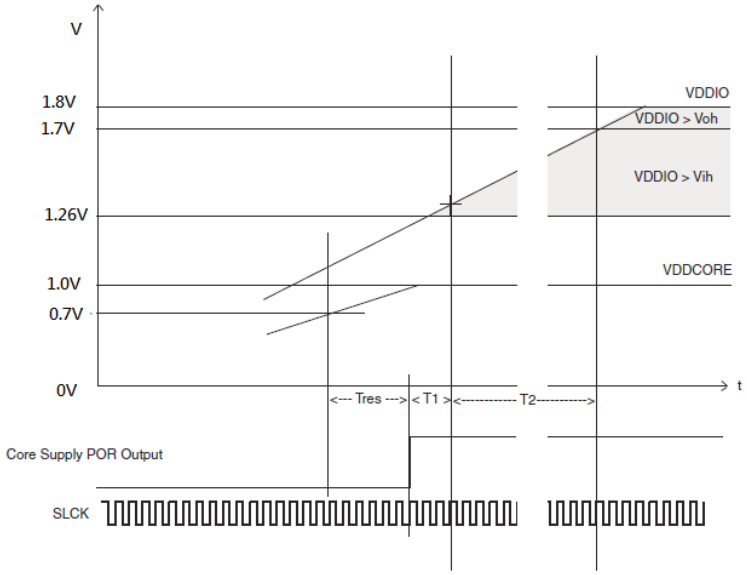
4.2. Recommended Operating Conditions and DC Power Electrical Characteristics

Parameter	Comments	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	3.3 V/3.3 V_BU/3.3 V_ANA (+/-5%) 1.8 V VCC (+/- 2%)		3.14 1.76	3.3 1.8	3.47 1.84	V
Voltage Ripple	3.3 V/3.3 V_BU 3.3 V_ANA/1.8 V		-	-	30	mV
Recommend voltage supply current rating	3.3 V_BU 3.3 V_ANA 3.3 V 1.8 V			-	10 100 1000 500	mA
DC Output Current	Analog IO pin	3.3 V signal level	-	-	8	mA
DC Output Current	Digital IO pin	1.8 V signal level	-	-	2	mA
Voltage Rise Time	At power on	3.3 V / 3.3 VBU / 1.8 V	-	-	5	ms
Operating Current	WLAN sub-system	Continuous receive	-	TBD		mA
		IEEE PSM	TBD	-	-	
		Continuous transmit (3.3 V/ 1.8 V)	-	330/85	400/100	
	Bluetooth sub-system	Continuous receive	-	TBD		mA
		Continuous transmit				
	CPU sub-system	Varies with system load	-	TBD		mA
Operating Temperature			-20	25	+70	°C

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

4.3. Power on Sequence



Notes: Apply the 3.3 V (backup and system) and 1.8 V (memory & interface I/O) at the same time.

The CPU implements the internal POR (Power-On-Reset) and guarantees that the power sources will reach their target values prior to the release of POR.

Tres=30 us, T1=66 us, T2=352 us (minimum)

Establish the VDDIO/CDDIOP (1.8 V for memory and interface I/O) and VCCBU (3.3 V) first, then VDDPLL (1.0 V from LDO), and the VDDCORE (1.0 V from DC-DC regulator) to ensure reliable device operation. This is implemented on the WB45NBT; apply 3.3 V (backup and system) and 1.8 V (memory and interface I/O) at the same time.

4.3.1. DC Electrical Characteristics (3.3 V signal level)

I/O Indicates whether the signal is input or output state.
PU/PD Indicates whether Pull-Up, Pull-Down, or nothing is enabled.
ST Indicates if Schmitt Trigger is enabled.
TR Tri-state

Parameter	Conditions	Min.	Typ.	Max.	Unit
AIO [0-3]			I/O;PU;ST		
IRQ (Interrupt Request)			I;PU;ST		
SHDN (Shut-down)			O;PU		
WKUP (Wake-up)			I;ST		
ETXEN;ETX[0-1];ERXER;ERX[0-1];EMDC;EMDIO;ECRSDV;EREF_CLK			**Note**: PU;ST		
V_{IL}	Input Low-Level Voltage	-0.3	-	0.8	V
V_{IH}	Input High-Level Voltage	2.0		3.6	V
V_{OL}	Output Low-Level Voltage			0.4	V
V_{OH}	Output High-Level Voltage	2.9			V

© Copyright 2016 Laird. All Rights Reserved

Parameter	Conditions	Min.	Typ.	Max.	Unit
VT-	Schmitt trigger Negative-going threshold Voltage	0.8	1.1		V
VT+	Schmitt trigger Positive-going threshold Voltage		1.6	2.0	V
VHYS	Schmitt trigger Hysteresis	0.5		0.75	V
RPULLUP	Pull-up/Pull-down Resistance	40	75	190	KΩ
IO	Output Current			8	mA

4.3.2. DC Electrical Characteristics (1.8 V signal level)

I/O	Indicates whether the signal is input or output state.
PU/PD	Indicates whether Pull-Up, Pull-Down or nothing is enabled.
ST	Indicates if Schmitt Trigger is enabled.
TR	Tri-state

Parameter	Conditions	Min.	Typ.	Max.	Unit
GPIO [0-3]				I/O; PU;ST	
TWCK1 (Two-wire Serial Clock);TWD1 (Two-wire Serial Data)				**Note**: PU;ST	
WOW				O	
WIFI_GPIO				I/O	
URTS0;UCTS0;URXD0;UTXD0;URTS3;UCTS3;URXD3;UTXD3				**Notes:** PU;ST	
DTXD;DRXD					PU;ST
PCM_CLK;PCM_SYNC;PCM_OUT;PCM_IN					PD;TR
VIL	Input Low-Level Voltage	-0.3	-	0.54	V
VIH	Input High-Level Voltage	1.26		2.1	V
VOL	Output Low-Level Voltage			0.4	V
VOH	Output High-Level Voltage	1.4			V
VT-	Schmitt trigger Negative-going threshold Voltage			0.54	V
VT+	Schmitt trigger Positive-going threshold Voltage	0.54			V
VHYS	Schmitt trigger Hysteresis	0.28		0.6	V
RPULLUP	Pull-up/Pull-down Resistance	240		1000	KΩ
IO	Output Current			2	mA

Note: We recommend that 1.8 V signal I/O pins should not be used to drive the external circuit directly due to its weak drive capability. A buffer/driver should be used in such applications.

5 PIN DEFINITIONS

Table 1: Pin Definitions

#	Pin Name	Section	I/O	Reference	Description	If unused
1	+3.3V_ANA		-	-	+3.3 V for analog I/O interface	3.3 V must be supplied
2	+3.3V_BU		-	-	+3.3 V for system back up	3.3 V must be supplied
3	GND		-	Ground	Ground	Must be connected to GND

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

#	Pin Name	Section	I/O	Reference	Description	If unused
4	GND		-	Ground	Ground	Must be connected to GND
5	AIO-1 *VBUS_EN	Analog I/O	I/O *O	+3.3 V_ANA	Analog I/O *USB interface in Host mode; used to control (High enable) the USB bus power (5 V).	
6	WKUP		I	+3.3 V_BU	Wake up the processor from deep sleep mode. Low active to wake up the CPU. Internal 100k pull-up	
7	SHDN		O	+3.3 V_BU	Shut down the external power supply for the module to save power consumption. Low active to shut down the power supply. Internal 100K pull-up	
8	AIO-0 *VBUS_SENS	Analog I/O	I/O *I	+3.3 V_ANA	Analog I/O *When USB interfaces in Device mode; It is used to sense the USB bus power (5 V).* **Note:** A voltage divider is needed to implement. Please reference the BB45NBT design.	
9	AIO-3	Analog I/O	I/O	+3.3 V_ANA	Analog I/O	
10	AIO-2 *OVER_CURRENT	Analog I/O	I/O *I	+3.3 V_ANA	Analog I/O *When USB interfaces in Host mode; It is used to sense the USB bus power (5V) running over the current limit.* **Note:** A voltage switch is needed to implement. Please reference the BB45NBT design.	
11	IRQ	Control	I	+3.3 V	External Interrupt Input	
12	GND		-	Ground	Ground	Must be connected to GND
13	GND		-	Ground	Ground	Must be connected to GND
14	EMDC	Ethernet	O	+3.3 V	Ethernet Management Data Clock	
15	ETXEN	Ethernet	O	+3.3 V	Ethernet Transmit Enable	
16	GND		-	Ground	Ground	Must be connected to GND
17	ETX0	Ethernet	O	+3.3 V	Ethernet Transmit Data 0	

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

#	Pin Name	Section	I/O	Reference	Description	If unused
18	ETX1	Ethernet	O	+3.3 V	Ethernet Transmit Data 1	
19	ERXER	Ethernet	I	+3.3 V	Ethernet Receive Error	
20	ERX0	Ethernet	I	+3.3 V	Ethernet Receive Data 0	
21	GND		-	Ground	Ground	Must be connected to GND
22	ERX1	Ethernet	I	+3.3 V	Ethernet Receive Data 1	
23	REF_CLK	Ethernet	I	+3.3 V	Ethernet 50MHz Clock	Leave open
24	ECRSDV	Ethernet	I	+3.3 V	Ethernet Receive Data Valid	
25	GND		-	Ground	Ground	Must be connected to GND
26	EMDIO	Ethernet	I/O	+3.3 V	Ethernet Management Data Input/Output	
27	TWD1		I/O	+1.8 V	Twist wire bus Data (I2C Data line)	
28	GND		-	Ground	Ground	Must be connected to GND
29	TWCK1		O	+1.8 V	Twist wire bus Clock (I2C Clock line)	
30	+1.8V		-	-	1.8 V for Memory (NAND/LPDDR), bus interface and Wi-Fi/BT bus configuration.	
31	GND		-	Ground	Ground	Must be connected to GND
32	GND		-	Ground	Ground	Must be connected to GND
33	GPIO-0	GPIO	I/O	+1.8 V	General I/O 0	Leave open
34	GPIO-1	GPIO	I/O	+1.8 V	General I/O 1	Leave open
35	GPIO-2	GPIO	I/O	+1.8 V	General I/O 2	Leave open
36	GPIO-3	GPIO	I/O	+1.8 V	General I/O 3	Leave open
37	GND		-	Ground	Ground	Must be connected to GND
38	GND		-	Ground	Ground	Must be connected to GND
39	URXD3	UART3	I	+1.8 V	UART3 Receive Data	Leave open
40	URTS3	UART3	O	+1.8 V	UART3 Ready To Send	Leave open
41	UTXD3	UART3	O	+1.8 V	UART3 Transmit Data	Leave open
42	UCTS3	UART3	I	+1.8 V	UART3 Clear To Send	Leave open
43	GND		-	Ground	Ground	Must be connected to GND
44	GND		-	Ground	Ground	Must be connected to GND
45	URXD0	UART0	I	+1.8 V	UART0 Receive Data	Leave open

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

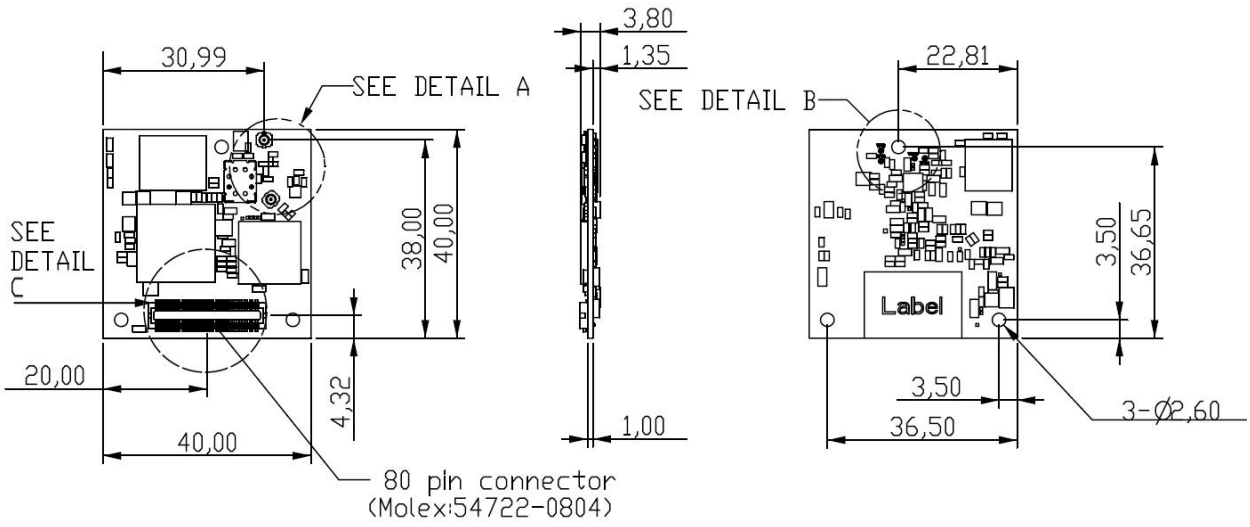
#	Pin Name	Section	I/O	Reference	Description	If unused
46	URTS0	UART0	O	+1.8 V	UART0 Ready To Send	Leave open
47	UTXD0	UART0	O	+1.8 V	UART0 Transmit Data	Leave open
48	UCTS0	UART0	I	+1.8 V	UART0 Clear To Send	Leave open
49	GND		-	Ground	Ground	Must be connected to GND
50	GND		-	Ground	Ground	Must be connected to GND
51	SPI0_CSn1	SPI0	O	+1.8 V	SPI0 Chip Select. Active Low *Only for SPI in Master mode.	Leave open
52	SPI0_MISO	SPI0	I/O	+1.8 V	SPI0 Master In Slave Out	Leave open
53	GND		-	Ground	Ground	Must be connected to GND
54	SPI0_MOSI	SPI0	I/O	+1.8 V	SPI0 Master Out Slave In	Leave open
55	SPI0_CLK	SPI0	I/O	+1.8 V	SPI0 Serial Clock (Master:O Slave:I)	Leave open
56	SPI0_CSn0	SPI0	I/O	+1.8 V	SPI0 Chip Select. (Master:O Slave:I)Active Low	Leave open
57	GND		-	Ground	Ground	Must be connected to GND
58	GND		-	Ground	Ground	Must be connected to GND
59	DRXD	DBGU	I	+1.8 V	Debug UART Receive Data	47K Pull-Up
60	+3.3V		-	-	3.3V for CPU,Wi-Fi and BT	3.3V must be supplied
61	DTXD	DBGU	O	+1.8V	Debug UART Transmit Data	Leave Open
62	+3.3V		-	-	3.3V for CPU,Wi-Fi and BT	3.3V must be supplied
63	GND		-	Ground	Ground	Must be connected to GND
64	GND		-	Ground	Ground	Must be connected to GND
65	HHSDPA	USB Device	I/O		USB (Host/Device) D+	
66	NRST	Control	I	+1.8V	CPU Reset; Low active.	Leave open
67	HHSDMA	USB Device	I/O		USB (Host/Device) D-	
68	WOW		O	+1.8V	Wake On Wireless LAN	
69	GND		-	Ground	Ground	Must be connected to GND
70	Wi-Fi GPIO		I/O	+1.8V	Reserved for Wi-Fi GPIO	Leave open
71	GND		-	Ground	Ground	Must be connected to GND
72	GND		-	Ground	Ground	Must be connected to GND

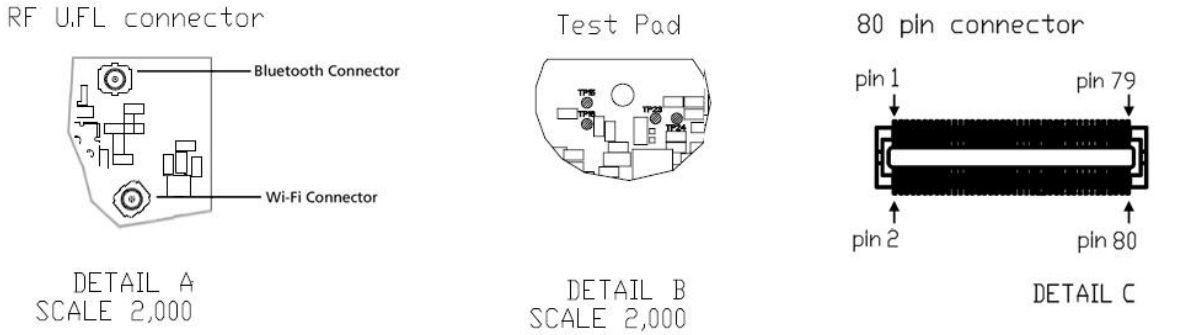
© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

#	Pin Name	Section	I/O	Reference	Description	If unused
73	PCM_CLK		I O	+1.8V +1.8V	PCM CLK input when BT acts as Slave PCM CLK output when BT acts as Master	Leave open
74	PCM_IN		I	+1.8V	PCM signal input.	
75	GND		-	Ground	Ground	Must be connected to GND
76	GND		-	Ground	Ground	Must be connected to GND
77	PCM_SYNC		I/O	+1.8V	PCM signal sync	
78	PCM_OUT		O	+1.8V	PCM signal output	
79	GND		-	Ground	Ground	Must be connected to GND
80	GND		-	Ground	Ground	Must be connected to GND

6 Mechanical Specification

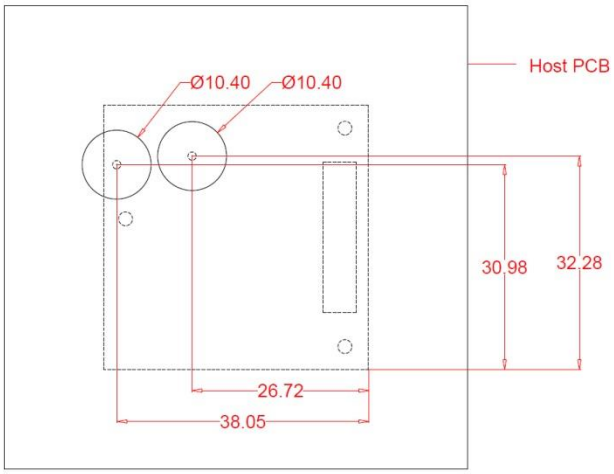




The following diagram shows the recommended clearance holes in the host PCB for U.FL antenna connectors.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610



Note: Laird recommends that you mount the module off the edge of the board or cut out one corner and place the module in the corner to limit the cutout area. This is necessary to meet the low height requirement of the module.

Figure 1: Recommended clearance holes for antenna connectors

Figure 2: WB45NBT (Top)

Figure 3: WB45NBT (Bottom)

Note: The WB45NBT is shipped in trays with the connector facing up.

7 REGULATORY

7.1. Laird WB45NBT Certifications

Regulatory Domain	Certifications	Certification ID
ETSI	EN 300 328 v1.8.1 EN 301 893 v1.7.1 EN 60950-1:2006 +A11:2009+A1:2010+A12:2011 EN 62311:2008 EN 301 489-1 v1.9.2 EN 301 489-17 v2.2.1	N/A

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Regulatory Domain	Certifications	Certification ID
FCC	Modular Approval 15 Subpart B (Class B) 15.247 Subpart C (DTS) 15.407 Subpart E (DFS)	SQG-WB45NBT
Industry Canada (IC)	RSS-210 Issue 8 RSS-Gen Issue 3	3147A-WB45NBT
MIC (Japan)	STD-766 Bluetooth EDR STD-T66 Bluetooth LE STD-T71 Article 2 Item 19, Category WW (2.4GHz Channels 1-13) Article 2 Item 19-2, Category GZ (2.4GHz Channel 14) Article 2 Item 19-3 Category XW (5150-5250 W52 & 5250-5350 W53)	R 201-140137
KC (Korea)		MSIP-CRM-LAI-WB45NBT

7.2. Certified Antennas

The WB45NBT was tested to the regulatory standards defined in the "Certifications" section of the Specifications table above. Summit conducted these tests with the following antennas:

Model	Type	Connector	Maximum Gain
MAG.LAYERS EDA-1513-25GR2-B2-CY	Dipole	SMA Jack Reverse	2 dBi
MAG.LAYERS PCA-4606-2G4C1-A13-CY	PCB Dipole	TNOV	2.2 dBi
Laird NanoBlade-IP04	PCB Dipole	IPEX MHF	2.4-2.5 GHz: 2 dBi 5.15-5.35 GHz: 3.9 dBi 5.6 GHz: 4 dBi
Laird MAF95310 Mini NanoBlade Flex	PCB Dipole	IPEX MHF	2.4 GHz: 2.79 dBi 5 GHz: 3.38 dBi
Laird NanoBlue-IP04	PCB Dipole	IPEX MHF	2.5 GHz only: 2 dBi
Ethertronics WLAN_1000146	Magnetic Dipole	IPEX MHF	2.4-2.5 GHz: 2 dBi 4.9-5.1 GHz: 3.5 dBi 5.15-5.35 GHz: 3.5 dBi 5.7-5.9 GHz: 3.5 dBi

7.3. Documentation Requirements

In order to ensure regulatory compliance, when integrating the WB45NBT into a host device, it is necessary to meet the documentation requirements set forth by the applicable regulatory agencies. The following sections (FCC, Industry Canada, and European Union) outline the information that may be included in the user's guide and external labels for the host devices into which the WB45NBT is integrated.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

7.3.1. FCC

Note: You must place ***Contains FCC ID: SQG-WB45NBT*** on the host product in such a location that it can be seen by an operator at the time of purchase.

7.3.1.1 User's Guide Requirements

As outlined in the Operational Description, the WB45NBT complies with FCC Part 15 Rules for a Modular Approval. To leverage Summit's grant, the two conditions below must be met for the host device into which the WB45NBT is integrated:

1. The antenna is installed with 20 cm maintained between the antenna and users.
2. The transmitter module is not co-located with any other transmitter or antenna that is capable of simultaneous operation.

As long as the two conditions above are met, further *transmitter* testing is typically not required. However, the OEM integrator is still responsible for testing its end-product for any additional compliance requirements required with this module installed, such as (but not limited to) digital device emissions and PC peripheral requirements.

IMPORTANT! In the event that the two conditions above ***cannot be met*** (for example certain device configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID ***cannot*** 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.

When using Summit's FCC grant for the WB45NBT, the integrator must include specific information in the user's guide for the device into which the WB45NBT is integrated. The integrator must not provide information to the end user regarding how to install or remove this RF module in the user's manual of the device into which the WB40NBT is integrated. The following FCC statements must be added in their entirety and without modification into a prominent place in the user's guide for the device into which the WB45NBT is integrated:

IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used 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.

Federal Communication Commission Interference Statement

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:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

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.

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 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 restricted to ***indoor*** use when operated in the 5.15 to 5.25 GHz frequency range.

FCC requires this product to be used indoors for the frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.

This device does not permit operations on channels 116-128 (5580 – 5640 MHz) for 11na and 120-128 (5600-5640 MHz) for 11a which overlap the 5600 -5650 MHz band.

IMPORTANT NOTE: FCC 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:

- The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- The transmitter module may not be co-located with any other transmitter or antenna,
- For all products marketed in the United States, the OEM must limit the operation channels from CH1 to CH11 for 2.4 GHz band by the supplied firmware programming tool. The OEM shall not supply any tool or information to the end-user regarding Regulatory Domain change.

As long as the three conditions above are met, further transmitter testing is not 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 cannot 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 cannot be used on the final product. In these circumstances, the OEM integrator is responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

7.3.1.2 End Product Labeling

This transmitter module is authorized only for use in device where the antenna is installed such that 20 cm is maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID: SQG-WB45NBT”.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

7.3.1.3 Manual Information to the End User

The OEM integrator **may NOT** 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/warnings as show in this Hardware Integration Guide.

7.3.2. Industry Canada

Note: You must place ***Contains IC ID: 3147A-WB45NBT*** on the host product in such a location that it can be seen by an operator at the time of purchase.

7.3.2.1 User's Guide Requirements (for Model # WB45NBT)

RF Radiation Hazard Warning

To ensure compliance with FCC and Industry Canada RF exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 20 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

Installez l'appareil en veillant à conserver une distance d'au moins 20 cm entre les éléments rayonnants et les personnes. Cet avertissement de sécurité est conforme aux limites d'exposition définies par la norme CNR-102 at relative aux fréquences radio.

Maximum Antenna Gain – If the integrator configures the device such that the antenna is detectable from the host product.

This radio transmitter (IC ID: 3147A-xxxx) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

"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"

"This device has been designed to operate with an antenna having a maximum gain of [?] dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms."

Cet émetteur radio (IC ID: 3147A-xxxx) a été approuvé par Industrie Canada pour fonctionner avec les types d'antennes énumérées ci-dessus, le gain maximal admissible et nécessaire impédance d'antenne pour chaque type d'antenne indiqué. Types d'antennes ne figurent pas dans cette liste, ayant un gain supérieur au gain maximum indiqué pour ce type, sont strictement interdites pour une utilisation avec cet appareil.

«Pour réduire le risque d'interférence avec d'autres utilisateurs, le type d'antenne et son gain doivent être choisis afin que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas ce qui est nécessaire pour une communication réussie"

«Ce dispositif a été conçu pour fonctionner avec une antenne ayant un gain maximal de [4] dBi. Antenne ayant un gain supérieur sont strictement interdites par la réglementation d'Industrie Canada. L'impédance d'antenne requise est de 50 ohms."This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

7.3.3. European Union

User's Guide Requirements

The integrator must include specific information in the user's guide for the device into which the WB45NBT is integrated. In addition to the required FCC and IC statements outlined above, the following R&TTE statements must be added in their entirety and without modification into a prominent place in the user's guide for the device into which the WB45NBT is integrated:

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:

- **EN60950-1:2001 A11:2004**
  Safety of Information Technology Equipment
- **EN 300 328 V1.8.1: (2006-10)**
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- **EN 301 489-1 V1.6.1: (2005-09)**
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
- **EN 301 489-17 V1.2.1 (2002-08)**
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment
- **EN 301 893 V1.5.1 (2008-12)**
  Electromagnetic compatibility and Radio spectrum Matters (ERM); Broadband Radio Access Networks (BRAN); Specific conditions for 5 GHz high performance RLAN equipment
- **EU 2002/95/EC (RoHS)**
  Declaration of Compliance – EU Directive 2003/95/EC; Reduction of Hazardous Substances (RoHS)

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

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]	Aršo*[name of manufacturer / izgatavotājanosaukums]* deklarē, ka*[type of equipment / iekārtas tips]*atbilstDirektīvas 1999/5/EK būtiskajāmprasībām un citiemar to saistītajiemnoteikumiem.
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 [Slovenian]**	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Menovýrobcu]* týmtovyhlasuje, že *[typzariadenia]* spĺňazákladnépožiadavky a všetkyprís lušnéustanovenia Smernice 1999/5/ES.
fi **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.
sv **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.

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

8 ORDERING INFORMATION

Product Name	Description	Part Number
WB45NBT	802.11a/b/g/n - BT 4.0 Communications Subsystem	WH-WB45NBT
DVK-WB45NBT	Development Breakout board WB45NBT module included	DVK-WB45NBT

© Copyright 2016 Laird. All Rights Reserved

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610