Datasheet

WB50NBT

Version 3.0

Revision History

Ver.	Date	Notes	Contributor(s)	Approver
1.0	07 April 2015	Initial Release		Chris Cole
1.1	07 April 2015	Added Current Consumption data		Chris Cole
1.2	02 May 2015	Fixed BT chip data in specs table		Jay White
1.3	08 July 2016	Updated mechanical drawing with pin indicators (pin 1 and pin 120) Changed from HIG to Datasheet		Chris Cole
1.4	01 Sept 2016	Adding Declaration of Conformity Added numbered headings		Sue White
1.5	03 Nov 2016	Updated Tx power numbers to the following: **802.11a (UNII-1, UNII-2A, UNII-2C) or CH 36 – CH140** 6 Mbps 17 dBm (50.1 mW) 54 Mbps 14 dBm (25.1 mW) **802.11a (UNII-3) or CH 148 – CH 165** 6 Mbps 15 dBm (31.6 mW) 54 Mbps 14 dBm (25.1 mW) **802.11n (5 GHz) (UNII-1, UNII-2A, UNII-2C) or CH 36 – CH140** 6.5 Mbps (MCS0; HT20) 17 dBm (50.1 mW) 65 Mbps (MCS7;HT20) 13 dBm (20 mW) (MCS0; HT40) 14 dBm (25.1 mW) (MCS7; HT40) 11 dBm (12.5 mW) **802.11n (5 GHz) (UNII-3) or CH 148 – CH 165** 6.5 Mbps (MCS0; HT20) 15 dBm (31.6 mW) 65 Mbps (MCS7;HT20) 12 dBm (15.8 mW) (MCS0; HT40) 14 dBm (25.1 mW) (MCS7; HT40) 11 dBm (12.5 mW)		Andrew Chen
1.6	09 Dec 2016	Removed *Preliminary* references		Jay White
1.7	27 Feb 2017	Changed pin 28 (PWDN) from an Input to and Output		Mark Calhoun
1.8	10 Mar 2017	Updated 5 GHz frequency bands and operating channels info.		Kris Sidle
1.9	19 Apr 2017	Fixed FCC frequency range.		Miles Chung
1.10	24 May 2017	Updated EU DoC for new RED standards		Maggie Teng
1.11	15 June 2017	Updated EU DoC for latest RED standard (including EN 301 893 v2.1.1)		Maggie Teng
1.12		Removed *SPI slave* references		Chris Cole
1.13	18 Aug 2017	Removed 802.11r references		Jay White
1.14	01 May 2018	Updated product photo; updated Industry Canada statement; updated to new Laird template		Maggie Teng
1.15	06 Mar 2019	Updated logos and URLs		Sue White
1.16	23 July 2019	Added certified antenna to the EN certification section		Maggie Teng
1.17	25 Oct 2019	Updated warranty information – changed three years to one year		Jay White
1.18	9 June 2020	Minor changes		Jay White
1.19	17 Sept 2020	Added note on ECC on NAND Flash		Andy Dobbing
1.20	16 Nov 2020	Updated all regulatory information	Ryan Urness	Jay White
2.0	21 Feb 2021	Transferred detailed regulatory information into a separate document	Sue White	Jonathan Kaye
2.1	31 Jan 2024	Updated Block Diagram and flash/storage parts in Specifications	Miles Chung	Andrew Chen
3.0	15 May 2025	Ezurio rebranding	Sue White	Dave Drogowski

Contents

1 Scope

This document describes key hardware aspects of the Ezurio WB50NBT 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 Ezurio SSD50NBT, QUALCOMM Atheros AR6004, CSR CSR8811.

The information in this document is subject to change. Please refer to the WB50NBT product page on the Ezurio website for the most recent version.

2 Operational Description

This device is an Ezurio WB50NBT 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 Ezurio WB50NBT 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 WB50NBT has a wide variety of interfaces including Fast Ethernet, serial UART, Hi-Speed USB, SPI, PCM, 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 WB50NBT incorporates the Ezurio SSD50NBT Wi-Fi SiP module which uses Qualcomm Atheros AR6004 and CSR 8811. The SSD50NBT supports 2X2 MIMO IEEE 802.11a/b/g/n and the Bluetooth standard 4.0 which includes the Bluetooth Low Energy (BLE) and legacy modes. Three-wired Wi-Fi and BT coexistence schemes are implemented inside the SSD50NBT which provides optimized performance between Wi-Fi and Bluetooth. The WB50NBT product features a Cortex A5 processor running at 536 MHz, 64 MB of Lower Power DDR (LPDDR) memory, and 128 MB of SLC NAND flash storage. Several GPIO lines are available for data acquisition and similar applications. The platform runs an embedded Linux operating system based on the 4.1 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 WB50NBT measures 47 mm long by 37 mm wide by 4.9 mm thick. The wireless bridge physically interfaces to the host device via an 120-pin board to board (B2B) Kyocera connector (AVX) (P/N:245046120600829+), which mates to a 4.0 mm stacking height mating part from Kyocera (AVX) (P/N:145046120640829+). With different Kyocera (AVX) mating parts, different stacking heights (3.0 mm, 3.5 mm, 4.0 mm, and 4.5 mm) can be achieved. Detailed information is available in the mounting section of the Specifications table. The WB50NBT may be secured to the host device via four grounded mounting holes. The WB50NBT operates at temperatures between -30° and +85° degrees Celsius.

Contingent on compliance results, the WB50NBT 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 (BB50NBT). The BB50NBT schematic is available as a design reference.

The WB50NBT provides the following two U.FL type antenna connectors that provide two streams MIMO operation to reach the maximum data rate:

- Main/ANT0 antenna – Wi-Fi only
- Auxiliary/ANT1 – Wi-Fi and Bluetooth

Bluetooth signals can only be presented at the auxiliary/ANT1. 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 WB50NBT is installed. The WB50NBT 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.

3 Block Diagram

Figure 1: WB50NBT 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 port; Wi-Fi operates at both the Main and AUX ports.

4 Specifications

Feature	Description
Physical Interface	Pitch: 0.5 mm Kyocera (AVX) – P/N: 245046120600829+ Mating part: Kyocera (AVX) – P/N:145046120640829+ Stacking height = 4.0 mm **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 (3.3 V signal level)	Four-wire UART with hardware handshaking (up to 921,600 baud) Full mode UART with synchronous clock to support USART interface
SPI Interface (3.3 V signal level)	Five Wire and Master modes supported with two-chip select
USB Interfaces	One USB device port with high speed/full speed/low speed data rates Two USB host ports with high speed/full speed/low speed data rates
Two Wire Interface (3.3V signal level)	Two-wire I2C (Inter-IC)
Debug Interface	Two-wire UART (console) for debug purpose
Digital GPIO (3.3 V signal level)	Six digital 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/AUX) and BT (AUX only) separately, 50 ohm
Wi-Fi Interface	Qualcomm Atheros AR6004 2x2 802.11 a/b/g/n on 20/40 MHz bandwidth
Bluetooth Interface	CSR CSR8811 Bluetooth 4.0 dual-mode (EDR+BLE) Class I Bluetooth (60dBm TX Power)
Operating System	Embedded Linux, 4.1 kernel
Memory	64 MB LPDDR (W949D2DBJX5I)
Storage	128 MB SLC NAND flash (MT29F1G08ABAEAH4-IT X:E Or MX30LF1G18AC-XKI (PCN_12B-2022.) **Note**: When using the Ezurio BSP the SAMA5D31 processor hardware is configured to utilize 8 bits of Error Correcting Code (ECC) to correct bit flips in the WB50 NAND flash devices.
Input Voltage Requirements	VDD_BU: +3.3 VDC +/-5% (Backup) VCC3_3: +3.2V (Min) +3.46V (Max)

Feature	Description
	Note: Voltage ripple must be less than 30 mV.

Current Consumption		Mode	3.3 V	
			Average Current (mA)	Maximum Current (mA)
Note: These current consumption measurements were taken using Linux kernel version 4.1.	802.11a	Transmit	755	1385
		Receive	149	268
		Standby	65	207
	802.11b	Transmit	520	972
Note: Standby refers to the radio operating while connected to an AP but not transmitting or receiving.		Receive	134	234
		Standby	65	207
	802.11g	Transmit	495	1092
		Receive	134	234
		Standby	65	207
	802.11n (2.4 GHz)	Transmit	497	1092
		Receive	135	234
		Standby	65	207
	802.11n (5 GHz)	Transmit	731	1507
		Receive	150	268
		Standby	65	207

Feature	Description
Operating Temperature	-30° to +85°C (-22°F to 185°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	Conductive 4KV; Air coupled 8KV follow EN61000-4-2
Length/Width/Thickness	47 mm x 37 mm x 4.9 mm
	Note: Length, width, and thickness measurements include the metal shielding.
Weight	8.6 g (0.30 oz.)
Mounting	Connector and through holes.
	Refer to *Mechanical Specifications* for additional information.
	Recommended:
	Connector:
	• Pitch: 0.5 mm, 120 pin Kyocera (AVX) P/N:245046120600829+
	Mating part:
	• Kyocera (AVX) P/N:145046120630829+, Stacking height: 3.0 mm
	• Kyocera (AVX) P/N:145046120635829+, Stacking height: 3.5 mm
	• Kyocera (AVX) P/N:145046120640829+, Stacking height: 4.0 mm
	• Kyocera (AVX) P/N:145046120645829+, Stacking height: 4.5 mm

Feature	Description
	Stand-off for 4.0 mm stacking height: • EMI STOP P/N:F40M20-401126D4BM http://www.emistop.com; sales08@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 0-15): Full Guard Interval: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 104, 117 Mbps Short Guard Interval: 1.2, 14.4, 21.7, 28.9, 29.9, 43.3, 57.8, 65, 72.2, 86.7, 115.6, 130, 144.4 Mbps
Modulation	BPSK @ 1, 6,9, 6.5, 7.2,13 and 14.4 Mbps QPSK @ 2, 12, 18, 13, 14.4,19.5, 21.7, 26, 28.9, 39,43.3 Mbps CCK @ 5.5 and 11 Mbps 16-QAM @ 24, 36,26, 29.9,39,43.3,52,57.8,78,86.7 Mbps 64-QAM @ 48,54,52, 57.8, 58.5, 65,72.2,104.0,115.6,117.0,130.0,144.4 Mbps
802.11n Spatial Streams	2X2 MIMO (Multiple Input, Multiple Output)
Regulatory Domain Support	FCC EU MIC (Japan) KC (Korea)

2.4 GHz Frequency Bands	**EU:** 2.4 GHz to 2.483 GHz	**MIC:** 2.4 GHz to 2.495 GHz
	FCC: 2.4 GHz to 2.483 GHz	**KC:** 2.4 GHz to 2.483 GHz

2.4 GHz Operating Channels	**EU:** 13 (3 non-overlapping)	**MIC:** 14 (4 non-overlapping)
	FCC: 11 (3 non-overlapping)	**KC:** 13 (3 non-overlapping)

5 GHz Frequency Bands	**EU** 5.15 GHz to 5.35 GHz (Ch 36/40/44/48/52/56/60/64) 5.47 GHz to 5.725 GHz (Ch 100/104/108/112/116/120/124/128/132/136/140) **FCC** 5.15 GHz to 5.35 GHz (Ch 36/40/44/48/52/56/60/64) 5.47 GHz to 5.725 GHz (Ch 100/104/108/112/116/120/124/128/ 132/136/140) 5.725 GHz to 5.85 GHz (Ch 149/153/157/161/165) **MIC** 5.15 GHz to 5.35 GHz (Ch 36/40/44/48/52/56/60/64) 5.47 GHz to 5.725 GHz (Ch 100/104/108/112/116/120/124/128/ 132/136/140) **KC** 5.15 GHz to 5.35 GHz (Ch 36/40/44/48/52/56/60/64) 5.47 GHz to 5.725 GHz (Ch 100/104/108/112/116/120/124) 5.725 GHz to 5.825 GHz (Ch 149/153/157/161)

5 GHz Operating Channels	EU:19 non-overlapping)	MIC: 19 non-overlapping
	FCC: 24 non-overlapping	KC: 19 non-overlapping

Maximum Transmit Power	**802.11a (UNII-1, UNII-2A, UNII-2C) or CH 36 – CH140**

Feature	Description	
Note: *Transmit power on each channels varies according to individual country regulations. All values for lowest data rate is nominal, +/-2 dBm.* *Others are +/-2.5dBm* **Note:** *HT40 – 40 Mhz-wide channels* *HT20 – 20 MHz-wide channel*	6 Mbps	17 dBm (50.1 mW)
	54 Mbps	14 dBm (25.1 mW)
	802.11a (UNII-3) or CH 148 – CH 165	
	6 Mbps	15 dBm (31.6 mW)
	54 Mbps	14 dBm (25.1 mW)
	802.11b	
	1 Mbps	17 dBm (50.1 mW)
	11 Mbps	17 dBm (50.1 mW)
	802.11g	
	6 Mbps	17 dBm (50.1 mW)
	54 Mbps	14 dBm (25.1 mW)
	802.11n (2.4 GHz)	
	6.5 Mbps (MCS0)	17 dBm (50.1 mW)
	65 Mbps (MCS7)	13 dBm (20 mW)
	802.11n (5 GHz) (UNII-1, UNII-2A, UNII-2C) or CH 36 – CH140	
	6.5 Mbps (MCS0; HT20)	17 dBm (50.1 mW)
	65 Mbps (MCS7; HT20)	13 dBm (20 mW)
	(MCS0; HT40)	14 dBm (25.1 mW)
	(MCS7; HT40)	11 dBm (12.5 mW)
	802.11n (5 GHz) (UNII-3) or CH 148 – CH 165	
	6.5 Mbps (MCS0; HT20)	15 dBm (31.6 mW)
	65 Mbps (MCS7; HT20)	12 dBm (15.8 mW)
	(MCS0; HT40)	14 dBm (25.1 mW)
	(MCS7; HT40)	11 dBm (12.5 mW)
	Bluetooth	
	1 Mbps	6 dBm (3.98 mW)
	2 Mbps	6 dBm (3.98 mW)
	3 Mbps	3 dBm (1.99 mW)
Typical Receiver Sensitivity **Note:** All values nominal, +/-3 dBm. Variant by channels.	**802.11a:**	
	6 Mbps	-92 dBm
	54 Mbps	-74 dBm (PER <= 10%)
	802.11b:	
	1 Mbps	-94 dBm
	11 Mbps	-87 dBm (PER <= 8%)
	802.11g:	
	6 Mbps	-91 dBm
	54 Mbps	-74 dBm (PER <= 10%)
	802.11n (2.4 GHz)	
	MCS0 Mbps	-91 dBm
	MCS7 Mbps	-71 dBm
	802.11n (5 GHz HT20)	
	MCS0 Mbps	-92 dBm
	MCS7 Mbps	-71 dBm
	Bluetooth:	
	1 Mbps	-83 dBm (1DH1)
	2 Mbps	-75 dBm (3DH5)
	3 Mbps	-86 dBm

Feature	Description
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 • PEAP-MSCHAPv2 • EAP-TLS • PEAP-TLS • EAP-TTLS • LEAP • PEAP-GTC
Compliance	EN 300 328 62311:2008 EN 301 489-1 EN 50665:2017 EN 301 489-17 EN 50385:2017 EN 301 893 EU 2015/863 (RoHS 3) 47 CFR FCC Part 15.247 47 CFR FCC Part 15.407 47 CFR FCC Part 2.1091 AS/NZS 2772.2:2016 Amd 1:2018
Certifications Note: These certifications are pending.	**Wi-Fi Alliance** 802.11a, 802.11b, 802.11g , 802.11n WPA Enterprise WPA2 Enterprise Cisco Compatible Extensions (Version 4)
Warranty	One Year Warranty
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
	I/O pin		-0.3	-	3.8	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.

4.2   Recommended Operating Conditions and DC Power Electrical Characteristics

Parameter	Comments	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	VCC3_3/VDD BU	Referred to GND	3.2	3.3	3.46	V
Voltage Ripple	VCC3_3/VDD BU	Referred to GND	-	-	30	mV
Recommend Voltage Supply Current Rating	VCC3_3 VDD_BU		-	-	2000 10	mA
DC Output Current	I/O pin	3.3 V signal level	-	-	8	mA
Voltage Rise Time	At power on	3.3 V / 3.3 VBU	-	-	0.5	ms
Operating Current	WLAN sub-system	Continuous receive	-	TBD	-	mA
		Continuous transmit	-	TBD	-	
	Bluetooth sub-system	Continuous receive	-	TBD	-	mA
		Continuous transmit	-	TBD	-	
	CPU sub-system	Varies with system load	-	TBD	-	mA
Operating Temperature			-30	-	+85	°C

4.3   Power on Sequence

Notes: Apply the 3.3 V (backup and system) at the same time.

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

4.3.1   DC Electrical Characteristics (3.3 V signal level)

Indicates whether the signal is input or output state.

Indicates whether Pull-Up, Pull-Down, or nothing is enabled.

Indicates if Schmitt Trigger is enabled.

Tri-state

GPIO [1-6]	PIO, I, PU, ST
LED [0-2]	PIO, I, PU, ST
STAT_0; STAT_1	PIO, I, PU, ST
SHDN	O
NRST	I, PU, ST
BINT	I, PU, ST
WKUP	I, PU, ST
DDM; DDP; HDMA; HDPA; HDMB; HDPB	O, PD
E_TXEN; E_TX [0-1]; E_RXER; E_RX [0-1]; E_MDC;	PIO, I, PU, ST
E_MDIO; E_CRSDV; E_REFCK; E_RST_L; E_INT	TBD
BT_PCM_OUT; BT_PCM_IN; BT_PCM_SYNC; BT_PCM_CLK	TBD
XPABIAS50; XPABIAS51; XPABIAS20; XPABIAS21	TBD
AR6004_GPIO38	TBD
LTE_ACTIVE	TBD
LTE_FRAME_SYNC	TBD
WCN_PRIORITY	TBD

Parameter	Conditions	Min.	Typ.	Max.	Unit
VIL	Input Low-Level Voltage	-0.3	-	0.8	V
VIH	Input High-Level Voltage	2.0	-	3.6	V
VOL	Output Low-Level Voltage	-	-	0.4	V
VOH	Output High-Level Voltage	2.9	-	-	V
VHYS	Schmitt trigger Hysteresis	0.34	-	-	V
RPULLUP	Pull-up/Pull-down Resistance	45	100	130	KΩ
IO	Output Current	-	-	8	mA

5 Pin Definitions

Table 1: Pin Definitions

#	Pin Name	Section	I/O	Reference	Description	If Unused
1	GND		-	-	Ground	Must be connected to GND
2	GPIO_1	GPIO	I/O	VCC3_3	General I/O 1	Leave open
3	SPI_NPCS1		O	VCC3_3	SPI Bus Chip Select 1	Leave open
4	GPIO_2	GPIO	I/O	VCC3_3	General I/O 2	Leave open
5	SPI_NPCS0		O	VCC3_3	SPI Bus Chip Select 0	Leave open
6	GPIO_3	GPIO	I/O	VCC3_3	General I/O 3	Leave open
7	GND		-	-	Ground	Must be connected to GND
8	GPIO_4	GPIO	I/O	VCC3_3	General I/O 4	Leave open
9	SPI_MOSI		O	VCC3_3	SPI Master Out	Leave open
10	DRXD	DBGU	I	VCC3_3	Console/Debug Serial Input	Leave open
11	SPI_MISO		I	VCC3_3	SPI Master In	Leave open
12	DTXD	DBGU	O	VCC3_3	Console/Debug Serial Output	Leave open
13	GND		-	-	Ground	Must be connected to GND
14	GPIO_5	GPIO	I/O	VCC3_3	General I/O 5	Leave open
15	SPI_CLK		O	VCC3_3	SPI Programming Clock Master – O	Leave open
16	GPIO_6	GPIO	I/O	VCC3_3	General I/O 6	Leave open
17	GND		-	-	Ground	Must be connected to GND
18	LED_0		O	VCC3_3	LED Indicator (WLAN Act) (IO = 8 Ma maximum)	Leave open
19	E_REFCK		I	VCC3_3	Ethernet Reference Clock (50 MHz maximum)	Leave open
20	LED_1		O	VCC3_3	LED Indicator (TBD) (IO = 8 Ma maximum)	Leave open
21	GND		-	-	Ground	Must be connected to GND
22	LED_2		O	VCC3_3	LED Indicator (TBD) (IO = 8 Ma maximum)	Leave open
23	E_TXD0		O	VCC3_3	Ethernet Data Output 0	Leave open
24	STAT_0		O	VCC3_3	Status High while system in reset, bootloader, or OS boot; Low when OS is up	Leave open
25	E_TXD1		O	VCC3_3	Ethernet Data Output 1	Leave open
26	STAT_1		O	VCC3_3	Status High when system is running; Low when system is in suspend state	Leave open

#	Pin Name	Section	I/O	Reference	Description	If Unused
27	GND		-	-	Ground	Must be connected to GND
28	PWDN (SHDN)		O	VDD_BU	Power down the Module Active low	100K Pull High
29	E_RXD0		I	VCC3_3	Ethernet Data Input 0	Leave open
30	NRST (RESET)		I	VCC3_3	HW System Reset Active low	100K Pull High
31	E_RXD1		I	VCC3_3	Ethernet Data Input 1	Leave open
32	GND		-	-	Ground	Must be connected to GND
33	GND		-	-	Ground	Must be connected to GND
34	TW_D		I/O	VCC3_3	Two-wire Serial Data	Leave open
35	E_TXEN		O	VCC3_3	Ethernet Transmit Enable	Leave open
36	TW_CLK		I/O	VCC3_3	Two-wire Serial Clock	Leave open
37	E_CRSDV		I	VCC3_3	Ethernet Carrier Sense and Valid Data	Leave open
38	GND		-	-	Ground	Must be connected to GND
39	E_RXER		I	VCC3_3	Ethernet Receive Error	Leave open
40	TXD_1		O	VCC3_3	Serial UART1 Transmit Data 1	Leave open
41	E_RST_L		O	VCC3_3	Ethernet Reset	Leave open
42	RXD_1		I	VCC3_3	Serial UART1 Receive Data 1	Leave open
43	E_MDC		O	VCC3_3	Ethernet Management Data Clock	Leave open
44	CTS_1		I	VCC3_3	UART1 Interface, clear-to-send, active low	Leave open
45	E_MDIO		I/O	VCC3_3	Ethernet Management Data I/O	Leave open
46	RTS_1		O	VCC3_3	UART1 Interface, request-to-send, active low	Leave open
47	E_INT		I	VCC3_3	Ethernet Interrupt Request	Leave open
48	GND		-	-	Ground	Must be connected to GND
49	GND		-	-	Ground	Must be connected to GND
50	CTS_0		I	VCC3_3	UART0 Interface, clear-to-send, active low	Leave open
51	MC_DA3		I/O	VCC3_3	SDIO Multimedia Card Data 3	Leave open
52	RTS_0		O	VCC3_3	UART0 Interface, request-to-send, active low	Leave open
53	MC_DA2		I/O	VCC3_3	SDIO Multimedia Card Data 2	Leave open
54	DSR_0		I	VCC3_3	UART0 Interface, Data Set Ready	10K Pull High

#	Pin Name	Section	I/O	Reference	Description	If Unused
55	GND		-	-	Ground	Must be connected to GND
56	DTR_0		O	VCC3_3	UART0 Interface, Data Terminal Ready	Leave open
57	MC_DA1		I/O	VCC3_3	SDIO Multimedia Card Data 1	Leave open
58	RI_0		I	VCC3_3	UART0 Ring Indicator 1	10K Pull High
59	MC_DA0		I/O	VCC3_3	SDIO Multimedia Card Data 0	Leave open
60	DCD_0		I	VCC3_3	UART0 Data Carrier Detect	10K Pull High
61	GND		-	-	Ground	Must be connected to GND
62	GND		-	-	Ground	Must be connected to GND
63	MC_CLK		O	VCC3_3	SDIO Multimedia Card Clock	Leave open
64	S_CLK_0		I/O	VCC3_3	UART0 Serial Clock	Leave open
65	GND		-	-	Ground	Must be connected to GND
66	TXD_0		O	VCC3_3	UART0 Serial Output	Leave open
67	MC_CDA		I/O	VCC3_3	SDIO Multimedia Card Command	Leave open
68	RXD_0		I	VCC3_3	UART0 Serial Input	Leave open
69	GND		-	-	Ground	Must be connected to GND
70	GND		-	-	Ground	Must be connected to GND
71	N/C		-	-	No Connection	Leave open
72	B_INT (IRQ)		I	VCC3_3	External Bus Interface Interrupt Request	100K Pull High
73	N/C		-	-	No Connection	Leave open
74	WKUP		I	VDD_BU	Interrupt Signal to wake up module; active low	100K Pull High
75	N/C		-	-	No Connection	Leave open
76	GND		-	-	Ground	Must be connected to GND
77	GND		-	-	Ground	Must be connected to GND
78	XPABIAS50		O	VCC3_3	External 5GHz booster control signal to turn on the PA for Chain 0.	Leave open
79	N/C		-	-	No Connection	Leave open
80	XPABIAS51		O	VCC3_3	External 5GHz booster control signal to turn on the PA for Chain 1	Leave open
81	N/C		-	-	No Connection	Leave open
82	GND		-	-	Ground	Must be connected to GND
83	N/C		-	-	No Connection	Leave open

#	Pin Name	Section	I/O	Reference	Description	If Unused
84	XPABIAS20		O	VCC3_3	External 2.4GHz booster control signal to turn on the PA for Chain 0	Leave open
85	GND		-	-	Ground	Must be connected to GND
86	XPABIAS21		O	VCC3_3	External 2.4GHz booster control signal to turn on the PA for Chain 1	Leave open
87	GPIO_DPU CNTRL		O	VCC3_3	USB device pull-up resistor enable; active high	Leave open
88	BT_PCM_SYN_C		O	VCC3_3	PCM Sync	Leave open
89	DBUSSENSE		I	VCC3_3	USB device bus sense signal from peripheral to host; active low	Leave open
90	BT_PCM_IN		I	VCC3_3	PCM Signal Input	Leave open
91	GND		-	-	Ground	Must be connected to GND
92	BT_PCM_OUT		O	VCC3_3	PCM Signal Output	Leave open
93	DDM		I/O	-	USB Device Data Negative	Leave open
94	GND		-	-	Ground	Must be connected to GND
95	DDP		I/O	-	USB Device Data Positive	Leave open
96	BT_PCM_CLK		I/O	VCC3_3	PCM Clock Signal	Leave open
97	GND		-	-	Ground	Must be connected to GND
98	AR6004_GPIO_38		I/O	VCC3_3	Reserved for feature LTE coexistence ; Reserved for WiFi LED indicator, Active High	Leave open
99	HDMA		I/O	-	USB Host A Data Negative	Leave open
100	GND		-	-	Ground	Must be connected to GND
101	HDPA		I/O	-	USB Host A Data Positive	Leave open
102	LTE_COEX3		I/O	VCC3_3	Reserved for LTE coexistence	Leave open
103	GND		-	-	Ground	Must be connected to GND
104	LTE_ACTIVE		I/O	VCC3_3	Reserved for LTE coexistence	Leave open
105	HDMB		I/O	-	USB Host B Data Negative	Leave open
106	LTE_FRAME_SYNC		I/O	VCC3_3	Reserved for feature usage	Leave open
107	HDPB		I/O	-	USB Host B Data Positive	Leave open
108	WCN_PRIORITY		I/O	VCC3_3	Reserved for LTE coexistence	Leave open
109	GND		-	-	Ground	Must be connected to GND
110	GND		-	-	Ground	Must be connected to GND

#	Pin Name	Section	I/O	Reference	Description	If Unused
111	GND	-	-	-	Ground	Must be connected to GND
112	DEBUG_UART_TXD		O	VCC3_3	WLAN debug UART TXD output.	Leave open
113	GND	-	-	-	Ground	Must be connected to GND
114	GND	-	-	-	Ground	Must be connected to GND
115	VDD_BU	-	-	-	Module Back-up Power 3.3V	
116	GND	-	-	-	Ground	Must be connected to GND
117	VCC3_3	-	-	-	3.3V Module Power	
118	VCC3_3	-	-	-	3.3V Module Power	
119	VCC3_3	-	-	-	3.3V Module Power	
120	VCC3_3	-	-	-	3.3V Module Power	

6 Mechanical Specification
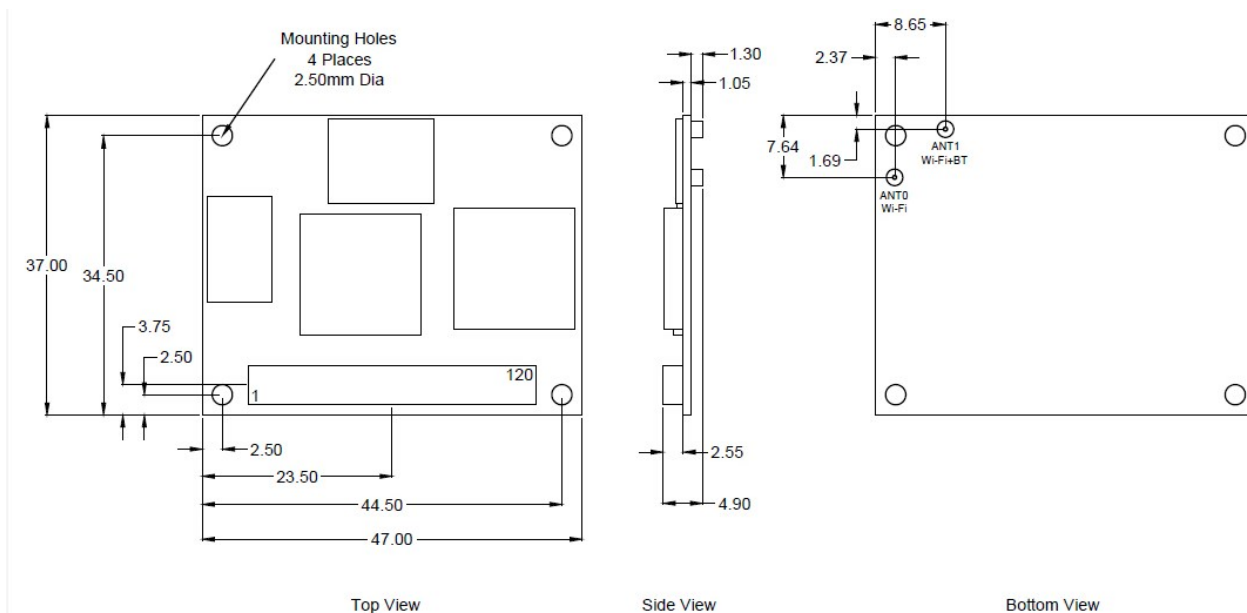
Figure 2: WB50NBT mechanical drawing

7 Regulatory

Note: For complete regulatory information, refer to the WB50NBT Regulatory Information document which is also available from the WB50NBT product page.

The WB50NBT holds current certifications in the following countries:

Country/Region	Regulatory ID
USA (FCC)	SQG-WB50NBT
EU	N/A
Canada (ISED)	3147A-WB50NBT
Australia	N/A
New Zealand	N/A

8 Ordering Information

Product Name	Description	Part Number
WB50NBT	802.11a/b/g/n - BT 4.0 Communications Subsystem	WH-WB50NBT
DVK-WB50NBT	Development Breakout board WB50NBT module included	DVK-WB50NBT

9   Additional Information

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

Headquarters	Ezurio 50 S. Main St. Suite 1100 Akron, OH 44308 USA
Website	http://www.ezurio.com
Technical Support	http://www.ezurio.com/resources/support
Sales Contact	http://www.ezurio.com/contact

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