

J F Y H ; D Delivery Specification

(V1.2)



Model Name: J F Y H ; D
Description: IEEE802.11n a/b/g PCIe half mini-card

<i>Edition #</i>	<i>Reason for revision</i>	<i>Issue date</i>
V1.1	Initial Document	2010/11/24
V1.2	Changed Target Power for Yield Rate	2012/09/25

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1. Hardware Block Diagram

HDWF-9B follows the design of Atheros AR9382. The major internal components are illustrated in Figure 1-1.

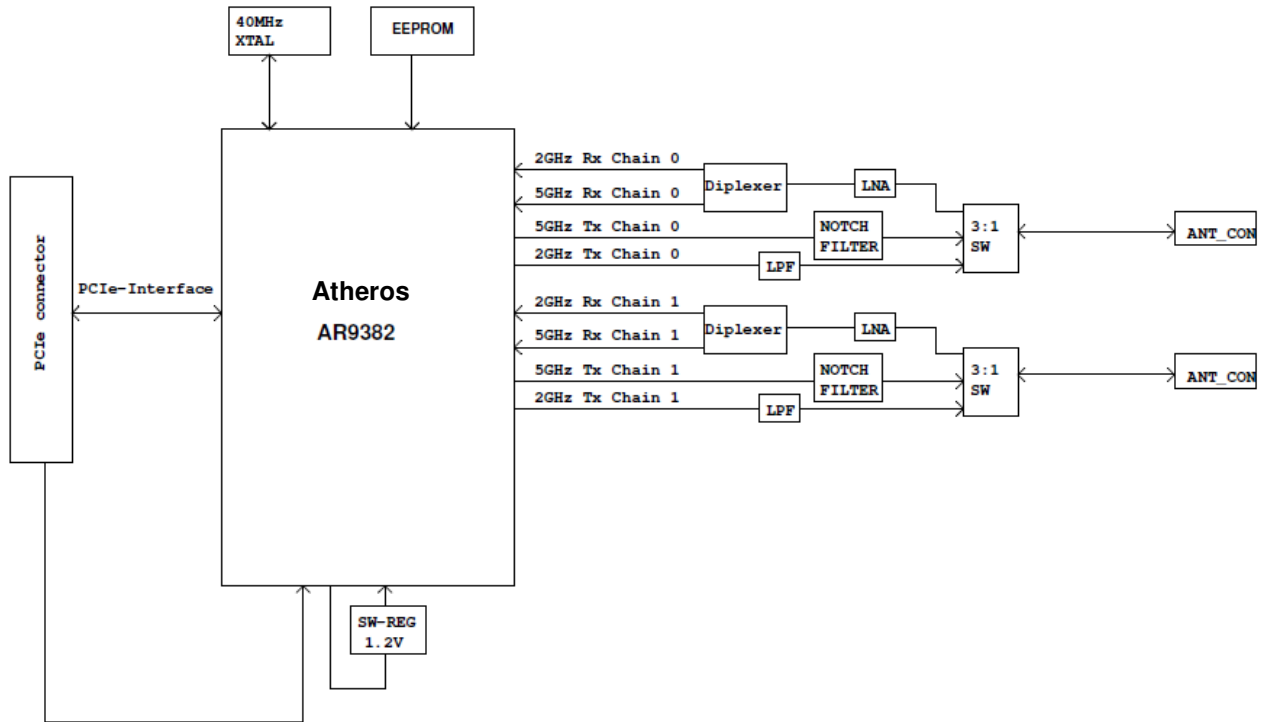


Figure 1-1 HDWF-9B Major Component and System Interface

2. Pin Definition

Pin No.	Name	Direction	Description
4,9,15,18,21,26,27,29,34,35,50	GND	---	Ground.
43	RESERVED	---	Tied to ground.
37,45,47,49,51	RESERVED	---	No connection.
39,41	RESERVED	---	Reserved for 3.3V.
40	GND	---	No connection.
3	RESERVED	I/O	Reserved for GPIO4.
5	RESERVED	I/O	Reserved for GPIO5.
8,10,12,14,16,17,19,	NC	---	No connection.
33	PETp0	Analog input signal	Differential receive
31	PETn0	Analog input signal	Differential receive
25	PERP0	Analog output signal	Differential transmit
23	PERN0	Analog output signal	Differential transmit
13	REFCLK+	Analog input signal	Differential reference clock (100MHz).
11	REFCLK-	Analog input signal	Differential reference clock (100MHz).
20	WLAN_DISABLE_L	I/O	Reserved for GPIO7.
7	CLKREQ_L	A digital output signal with open drain	Reference clock request, open drain
22	PERST_L	Input signals with weak internal pull-down, to prevent signals from floating	PCI Express reset with weak pull down
1	WAKE_L	A digital output signal with open drain	Reserved for 3.3V or WAKE2_L (Request to service a function-initiated wake event, open drain).
32	SMB_DATA	---	No connection.
30	SMB_CLK	---	No connection.
46	LED_WPAN_L	O	No connection.
44	LED_WLAN_L	O	Reserved for GPIO10.
42	LED_WWAN_L	---	No connection.
38	USB_D+	I/O	No connection.
36	USB_D-	I/O	No connection.
6,28,48	1.5V	---	No connection.
2,52	3.3V	---	3.3V
24	3.3VAUX	---	No connection.

3. Specification

Item	Key specifications					
Main chipset	➤ Atheros® AR9382					
TX/RX	➤ 2T2R (2x2 with MCS 0-15)					
Frequency range	➤ USA: 2.400 ~ 2.483GHz, 5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz, 5.725 ~ 5.85GHz ➤ Europe: 2.400 ~ 2.483GHz, 5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz ➤ Japan: 2.400 ~ 2.497GHz, 5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz ➤ China: 2.400 ~ 2.483GHz, 5.725 ~5.85GHz					
Modulation technique	➤ 802.11 Legacy a/b/g DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16-QAM, 64-QAM) ➤ 802.11n a/g OFDM (BPSK, QPSK, 16-QAM, 64-QAM)					
Host interface	➤ PCI Express® Mini Card Electromechanical Specification Revision 1.1					
Channels support	➤ 802.11n b/g US/Canada: 11 (1 ~ 11) Major European country: 13 (1 ~ 13) France: 4 (10 ~ 13) Japan: 11b: 14 (1~13 or 14th), 11g: 13 (1 ~ 13) China: 13 (1 ~ 13) ➤ 802.11n a 1). US/Canada: 12 non-overlapping channels (36,40,44,48,52,56,60,64; 100,104,108,112,116,120,124,128,132,136,140; 149,153,157,161,165) 2). Europe: 19 non-overlapping channel (36,40,44,48,52,56,60,64; 100,104,108,112,116,120,124,128,132,136,140) 3). Japan: 19 non-overlapping channels (36,40,44,48,52,56,60,64; 100,104,108,112,116,120,124,128,132,136,140) 4). China: 5 non-overlapping channels (149,153,157,161,165)					
Operation voltage	➤ 3.3V +/- 5%					
Power consumption @25° C	(mA)	802.11a Avg	802.11b Avg	802.11g Avg	802.11n(2.4GHz) Avg	802.11n(5GHz) Avg
	➤ 100% TX duty	550	405	436	365	445
***This can be treated as the peak current consumption during operation.						

Output power (only for maximum hardware capability, regardless the regulatory limit)	> Power tolerance 2.4GHz +/-2dB 5.18GHz~5.32GHz +/-2dB 5.5GHz~5.825GHz +/-2.5/-3dB																																				
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➤ 802.11b				
Modulation	Code Rate	Relative constellation error (dB)	IEEE Spec (1Tx dB)	Relative constellation error (dB) Typical/Maximum (2Tx dB)
DBPSK			-10	-30/-15
DQPSK			-10	-30/-15
CCK			-10	-30/-15
➤ 802.11g				
Modulation	Code Rate	Relative constellation error (dB)	IEEE Spec (1Tx dB)	Relative constellation error (dB) Typical/Maximum (2Tx dB)
BPSK	1/2		-5	-25/-15
BPSK	3/4		-8	-25/-15
QPSK	1/2		-10	-25/-15
QPSK	3/4		-13	-25/-15
16-QAM	1/2		-16	-25/-18
16-QAM	3/4		-19	-25/-19
64-QAM	2/3		-22	-26/-22
64-QAM	3/4		-25	-29/-25
➤ 802.11ng				
Modulation	Code Rate	Relative constellation error (dB)	IEEE Spec (1Tx dB)	Relative constellation error (dB) Typical/Maximum (2Tx dB)
✦ HT20				
(MCS0)	BPSK	1/2	-5	-26/-15
(MCS1)	QPSK	1/2	-10	-26/-15
(MCS2)	QPSK	3/4	-13	-26/-15
(MCS3)	16-QAM	1/2	-16	-26/-16
(MCS4)	16-QAM	3/4	-19	-26/-19
(MCS5)	64-QAM	2/3	-22	-26/-22
(MCS6)	64-QAM	3/4	-25	-28/-25
(MCS7)	64-QAM	5/6	-28	-30/-28
(MCS8)	BPSK	1/2	-5	-26/-15
(MCS9)	QPSK	1/2	-10	-26/-15
(MCS10)	QPSK	3/4	-13	-26/-15
(MCS11)	16-QAM	1/2	-16	-26/-15
(MCS12)	16-QAM	3/4	-19	-26/-19
(MCS13)	64-QAM	2/3	-22	-26/-22
(MCS14)	64-QAM	3/4	-25	-28/-25
(MCS15)	64-QAM	5/6	-28	-29/-28
✦ HT40				
(MCS0)	BPSK	1/2	-5	-26/-15
(MCS1)	QPSK	1/2	-10	-26/-15
(MCS2)	QPSK	3/4	-13	-26/-15
(MCS3)	16-QAM	1/2	-16	-26/-16
(MCS4)	16-QAM	3/4	-19	-26/-19
(MCS5)	64-QAM	2/3	-22	-26/-22
(MCS6)	64-QAM	3/4	-25	-28/-25
(MCS7)	64-QAM	5/6	-28	-30/-28
(MCS8)	BPSK	1/2	-5	-26/-15
(MCS9)	QPSK	1/2	-10	-26/-15
(MCS10)	QPSK	3/4	-13	-26/-15
(MCS11)	16-QAM	1/2	-16	-26/-16
(MCS12)	16-QAM	3/4	-19	-26/-19
(MCS13)	64-QAM	2/3	-22	-26/-22
(MCS14)	64-QAM	3/4	-25	-28/-25
(MCS15)	64-QAM	5/6	-28	-29/-28

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Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical/Maximum (2Rx dBm)																																																																																																																																																																																										
◆ HT20																																																																																																																																																																																													
(MCS0) BPSK	1/2	-82	-95/-85																																																																																																																																																																																										
(MCS1) QPSK	1/2	-79	-94/-82																																																																																																																																																																																										
(MCS2) QPSK	3/4	-77	-92/-80																																																																																																																																																																																										
(MCS3) 16-QAM	1/2	-74	-89/-77																																																																																																																																																																																										
(MCS4) 16-QAM	3/4	-70	-86/-73																																																																																																																																																																																										
(MCS5) 64-QAM	2/3	-66	-82/-69																																																																																																																																																																																										
(MCS6) 64-QAM	3/4	-65	-80/-68																																																																																																																																																																																										
(MCS7) 64-QAM	5/6	-64	-78/-67																																																																																																																																																																																										
◆ HT40																																																																																																																																																																																													
(MCS0) BPSK	1/2	-79	-92/-82																																																																																																																																																																																										
(MCS1) QPSK	1/2	-76	-92/-79																																																																																																																																																																																										
(MCS2) QPSK	3/4	-74	-89/-77																																																																																																																																																																																										
(MCS3) 16-QAM	1/2	-71	-86/-74																																																																																																																																																																																										
(MCS4) 16-QAM	3/4	-67	-83/-70																																																																																																																																																																																										
(MCS5) 64-QAM	2/3	-63	-77/-66																																																																																																																																																																																										
(MCS6) 64-QAM	3/4	-62	-76/-65																																																																																																																																																																																										
(MCS7) 64-QAM	5/6	-61	-75/-64																																																																																																																																																																																										
Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical/Maximum (2Rx dBm)																																																																																																																																																																																										
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(MCS0) BPSK	1/2	-82	-94/-85																																																																																																																																																																																										
(MCS1) QPSK	1/2	-79	-92/-82																																																																																																																																																																																										
(MCS2) QPSK	3/4	-77	-90/-80																																																																																																																																																																																										
(MCS3) 16-QAM	1/2	-74	-87/-77																																																																																																																																																																																										
(MCS4) 16-QAM	3/4	-70	-84/-73																																																																																																																																																																																										
(MCS5) 64-QAM	2/3	-66	-79/-69																																																																																																																																																																																										
(MCS6) 64-QAM	3/4	-65	-78/-68																																																																																																																																																																																										
(MCS7) 64-QAM	5/6	-64	-76/-67																																																																																																																																																																																										
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(MCS0) BPSK	1/2	-79	-92/-82																																																																																																																																																																																										
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(MCS4) 16-QAM	3/4	-67	-80/-70																																																																																																																																																																																										
(MCS5) 64-QAM	2/3	-63	-76/-66																																																																																																																																																																																										
(MCS6) 64-QAM	3/4	-62	-74/-65																																																																																																																																																																																										
(MCS7) 64-QAM	5/6	-61	-72/-64																																																																																																																																																																																										
Transmit spectrum mask	<ul style="list-style-type: none"> ➤ Frequency mask is marginal to comply with IEEE 802.11spec. WNC can't guarantee this compliance due to the limitation of chipset. 																																																																																																																																																																																												

Transmit center frequency tolerance	➤ The transmitted center frequency tolerance shall be ± 20 ppm maximum.
PCB dimension	➤ (26.8 \pm 0.1mm)x (29.85 \pm 0.1mm) x (1.05 \pm 0.1mm) with 4 PCB layer
Transfer data rate	<ul style="list-style-type: none"> ➤ 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps ➤ 802.11b: 1, 2, 5.5, 11Mbps ➤ 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps ➤ 802.11n: @800GI(400GI) <ul style="list-style-type: none"> ● 20MHz BW <ul style="list-style-type: none"> ▪ 1 Nss: 65(72.2) Mbps maximal ▪ 2 Nss: 130(144.444) Mbps maximal ● 40MHz BW <ul style="list-style-type: none"> ▪ 1 Nss: 135(150) Mbps maximal ▪ 2 Nss: 270(300) Mbps maximal
Operation temperature	➤ 0° ~ 50° C
Storage temperature	➤ -20° ~ 80° C
RF connector	➤ 2 x SMT Ultra-miniature coaxial connectors

4. Outline

