



DATASHEET

ahSP1



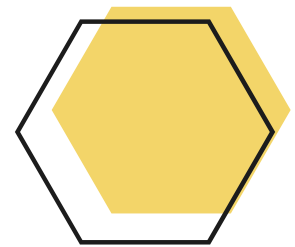
IEEE 802.11 ah

High-Performance,
World's first WiFi-HaLow
module available for
SONY SPRESENSE



Sub GHz ISM Band

902 MHz to 928 MHz
operating Frequency in
license-free Band, 1/2/4
MHz Channel Bandwidths



Industrial grade

-40 deg C to +85 deg C
operation temperature



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HW REV# 04.00

TECHNICAL SPECIFICATION

RADIO MODULE – GENERAL INFO	
Chipset	NRC7292, Cortex-M0,32MHz (11aH) Cortex-M3, 48 MHz (Application), 11aH MAC/PHY
Memory	8Mb, Serial NOR Flash, 752 KB SRAM
Operating frequency	863 MHz to 868 MHz 902 MHz to 928 MHz
300,600,900,1200,1800,2400,2700,300	BPSK(1/2),QPSK(1/2),QPSK(3/4),16QAM(1/2),16QAM(3/4),64QAM(2/3),64QAM(3/4),64QAM(5/6) (1MHz CH BW)
650,1300,1950,2600,3900,5200,5850,6500	BPSK(1/2),BPSK(3/4),QPSK(1/2),QPSK(3/4),16QAM(1/2),16QAM(3/4),64QAM(2/3),64QAM(3/4) (2MHz CH BW)
1350,2700,4050,5400,8100,10800,12150,13500	BPSK(1/2),QPSK(1/2),QPSK(3/4),16QAM(1/2),16QAM(3/4),64QAM(2/3),64QAM(3/4),64QAM(5/6) (4MHz CH BW)
Channel BW	1MHz/2 MHz/4 MHz
RoHS Compliance	Compliant
INTERFACE SPECIFICATIONS	
Operating Voltage	5V +/- 10% (Power feed through USB Micro B connector)
Interface	SPI (1.8V)
RF Antenna connector	x1 SMA
ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature Range	-40 deg C to +85 deg C
PHYSICAL SPECIFICATIONS	
Mechanical Dimension	(L) 68.6 mm x (W) 53.3 mm
Weight	12G
REGULATORY INFORMATION	
Compliance	JAPAN, R020-230040
PACKAGING INFORMATION	
No of units	TBD

ORDERING INFORMATION

ahSP1-JP	Extension Board for SONY SPRESENSE, JAPAN, SISO, IEEE 802.11 ah, 920 MHz, 13 dBm
ahSP1-NA	Extension Board for SONY SPRESENSE, AMERICA, SISO, IEEE 802.11 ah, 902 MHz, 27 dBm
ahSP1-EU	Extension Board for SONY SPRESENSE, EUROPE, SISO, IEEE 802.11 ah, 863 MHz, 12 dBm

RADIO SPECIFICATION

Frequency Channel Mapping, JAPAN (ahSP1-JP)

BW = 1 MHz		BW = 2 MHz		BW = 4 MHz	
Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
40	921	36	923.5	47	924.5
42	923	37	924.5	48	925.5
43	924	38	925.5		
44	925	39	926.5		
45	926				
46	927				

TX Power and RX Sensitivity (ahSP1-JP)

Tolerance for TX Power and Sensitivity = +/- 1 dBm

Parameter	BW (MHz)	Spec (dBm) +/- 1 dBm
Transmit Power	1,2,4	13
RX Sens @ <10% PER, MCS10	1	-110
RX Sens @ <10% PER, MCS0	1	-106
RX Sens @ <10% PER, MCS0	2	-103
RX Sens @ <10% PER, MCS0	4	-100
RX Sens @ <10% PER, MCS0	1	-86
RX Sens @ <10% PER, MCS0	2	-83
RX Sens @ <10% PER, MCS0	4	-80

RADIO SPECIFICATION

Frequency Channel Mapping, EUROPE (ahSP1-EU)

BW = 1 MHz	
Channel number	Frequency (MHz)
36	863.5
37	864.5
38	865.5
39	866.5
40	867.5

TX Power and RX Sensitivity (ahSP1-EU)

Tolerance for TX Power and Sensitivity = +/- 1 dBm

Parameter	BW (MHz)	Spec (dBm) +/- 1 dBm
Transmit Power	1	12
RX Sens @ <10% PER, MCS10	1	-110
RX Sens @ <10% PER, MCS0	1	-106
RX Sens @ <10% PER, MCS0	1	-86

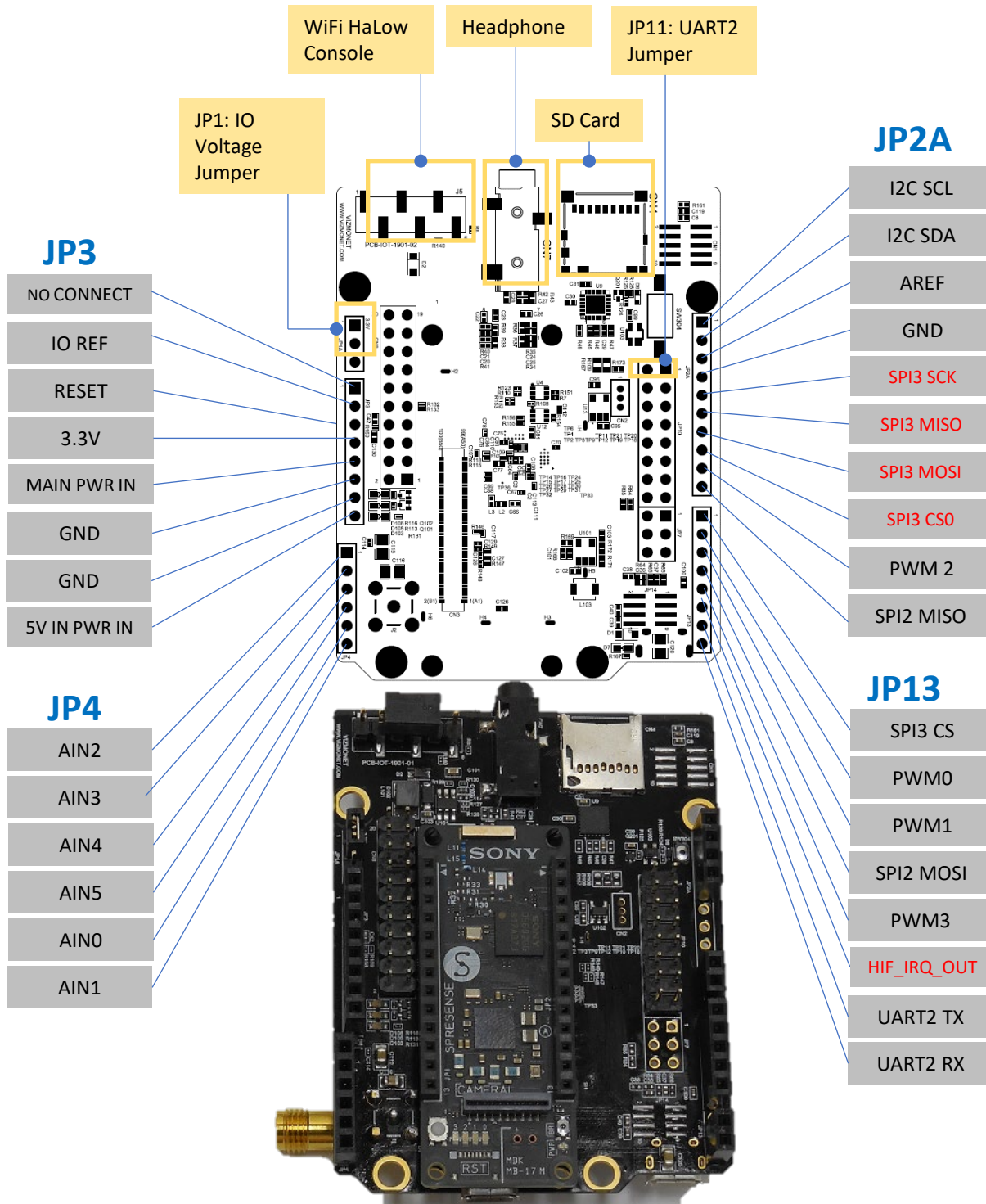
Frequency Channel Mapping, USA, CANADA (ahSP1-NA)

Country: USA, Canada
Tolerance for TX Power and Sensitivity = +/- 1 dBm

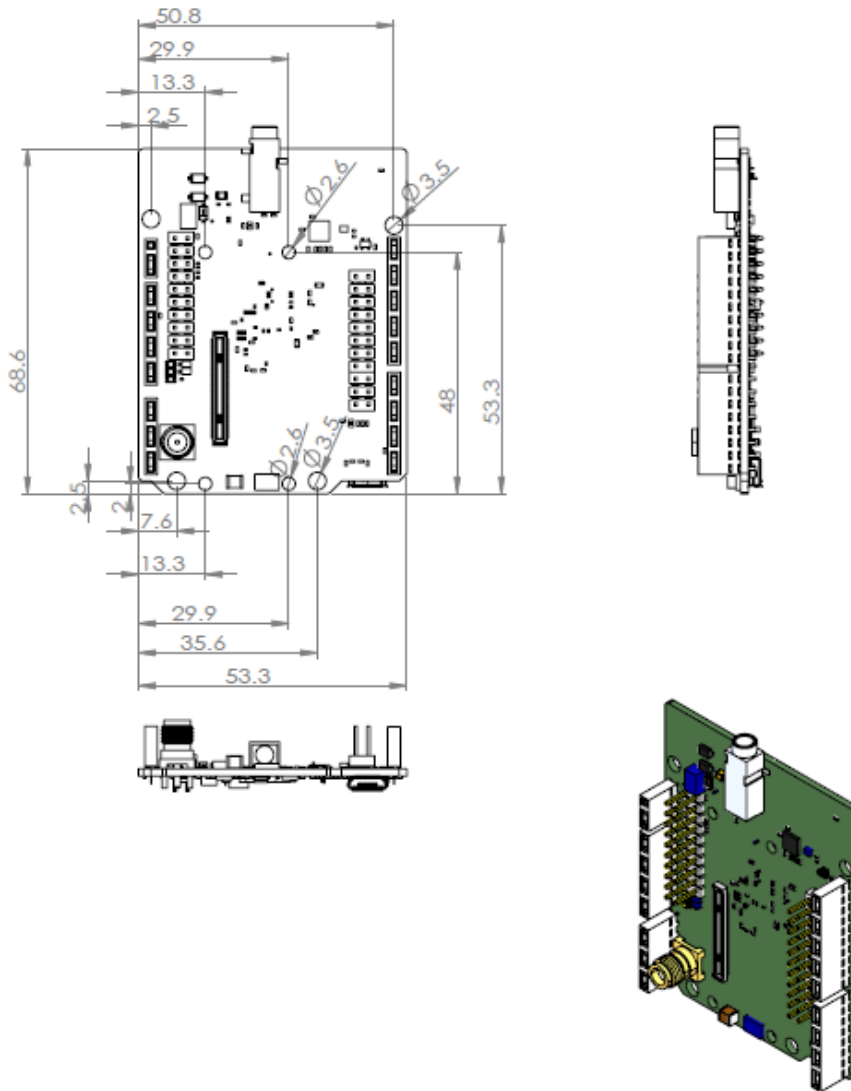
BW = 1 MHz		BW = 2 MHz		BW = 4 MHz	
Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
30	902.5	150	903	TBD	904
31	903.5	151	905	TBD	908
32	904.5	152	907	TBD	912
33	905.5	153(Default)	909	TBD	916
34	906.5	154	911	TBD	920
35	907.5	155	913	TBD	924
36	908.5	156	915		
37	909.5	157	917		
38	910.5	158	919		
39	911.5	159	921		
40	912.5	160	923		
41	913.5	161	925		
42	914.5	162	927		
43	915.5				
44	916.5				
45	917.5				
46	918.5				
47	919.5				
48	920.5				
49	921.5				
50	922.5				
51	923.5				
52	924.5				
53	925.5				
54	926.5				
55	927.5				

TX Power & RX Sensitivity (ahSP1-NA)				
Parameter	Data Rate	Spec (BW=1 MHz)	Spec (BW=2 MHz)	Spec (BW=4 MHz)
Tx Power (dBm)	MCS10	27	--	--
Tx Power (dBm)	MCS0	27	27	27
Tx Power (dBm)	MCS1	27	27	27
Tx Power (dBm)	MCS2	23	24	25
Tx Power (dBm)	MCS3	22	23	23
Tx Power (dBm)	MCS4	21	22	22
Tx Power (dBm)	MCS5	21	21	21
Tx Power (dBm)	MCS6	19	19	20
Tx Power (dBm)	MCS7	19	19	20
RX Sens (dBm)	MCS10	-110	---	---
RX Sens (dBm)	MCS0	-106	-103	-100
RX Sens (dBm)	MCS7	-86	-83	-80

PIN OUT



MECHANICAL DIMENSIONS



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