AC210MWi-Fi AP Module Datasheet

Introduction

The AC210M is a high-performance 2x2 802.11a/b/g/n/ac Wi-Fi AP module. It supports simultaneous operation of 2.4 GHz and 5 GHz frequency bands. The module provides two MMCX RF connectors for combined 2.4G and 5G radio and one 60-pin board-to-board connector for connection to the host system.

Interface Definition

The module communicates with the host system through an 82-pin connector (the Wi-Fi modules populate 60-pin only).
The connector on the module is Molex 171810-1115.
The connector definition follows Nokia RF and WiFi Card Interface Pinout.xlsx rev 11.

RF Pin	WiFi Pin	Std Use	WiFi Card Usage	RF Card Usage	I/O Voltage	AC Coupling	Pull-up/down	MB Dir
1	–	Gnd	not present	GND				
2	–	DP	not present	SYNCINB0_MB_RF_DN	lvds 1.8v	–	–	O
3	–	DP	not present	SYNCINB0_MB_RF_DP	lvds 1.8v	–	–	O
4	–	Gnd	not present	GND				
5	–	DP	not present	SERDOUT1_RF_MB_DN	cml 1.8v	mb, 0.1uF	–	I
6	–	DP	not present	SERDOUT1_RF_MB_DP	cml 1.8v	mb, 0.1uF	–	I
7	–	Gnd	not present	GND				
8	–	DP	not present	SERDIN0_MB_RF_DN	cml 1.8v	rf, 0.1uF	–	O
9	–	DP	not present	SERDIN0_MB_RF_DP	cml 1.8v	rf, 0.1uF	–	O
10	–	Gnd	not present	GND				
11	–	Extra	not present	GP_INTERRUPT	cmos_[VDD_IF]	–	mb, 4.7K, gnd	I
12	1	Gnd	GND	GND				
13	2	DP	Reserved	SYNCOUTB0_RF_MB_DP	lvds 1.8v	–	–	I
14	3	DP	Reserved	SYNCOUTB0_RF_MB_DN	lvds 1.8v	–	–	I
15	4	Gnd	GND	GND				
16	5	DP	SGMII_1_WIFI_MB_DP	SERDOUT2_RF_MB_DP	sgmii 1.2v/cml 1.8v	mb, 0.1uF	–	I
17	6	DP	SGMII_1_WIFI_MB_DN	SERDOUT2_RF_MB_DN	sgmii 1.2v/cml 1.8v	mb, 0.1uF	–	I
18	7	Gnd	GND	GND				
19	8	DP	SGMII_0_WIFI_MB_DP	SERDOUT3_RF_MB_DP	sgmii 1.2v/cml 1.8v	mb, 0.1uF	–	I
20	9	DP	SGMII_0_WIFI_MB_DN	SERDOUT3_RF_MB_DN	sgmii 1.2v/cml 1.8v	mb, 0.1uF	–	I
21	10	Gnd	GND	GND				
22	11	DP	Reserved	RX_MYK_ENABLE	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
23	12	DP	Reserved	RX_LNA_ENABLE_MAIN	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
24	13	Gnd	Reserved	RX_LNA_ENABLE_DIV	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
25	14	Extra	Reserved	TX_MYK_ENABLE	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
26	15	Extra	Reserved	TX_KEY_MAIN	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
27	16	Extra	Reserved	TX_KEY_DIV	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
28	17	Gnd	Reserved	TR_SWITCH_MAIN	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
29	18	DP	Reserved	TR_SWITCH_DIV	cmos [VDD_IF]	–	rf, 4.7K, gnd	O
30	19	DP	I2C_9550_SCL (for test)	Reserved	n/c on mb	–	–	n/a
31	20	Gnd	I2C_9550_SDA (for test)	GND	n/c on mb wifi slot	–	–	n/a
32	21	DP	TRSTn	GPIO4 (TRSTn)	n/c on mb	–	–	n/a
33	22	DP	TDO	GPIO5 (TDO)	n/c on mb	–	–	n/a
34	23	Gnd	TDI	GPIO6 (TDI)	n/c on mb	–	–	n/a
35	24	DP	TMS	GPIO7 (TMS)	n/c on mb	–	–	n/a
36	25	DP	TCK	GPIO8 (TCK)	n/c on mb	–	–	n/a
37	26	DP	Reserved	TEST	n/c on mb	–	rf, 1K, gnd	n/a
38	27	DP	5V_SENSE	5V_SENSE	ana_5.1v	–	–	I
39	28	DP	VCC_5.1V	VCC_5.1V				
40	29	Gnd	VCC_5.1V	VCC_5.1V				
41	30	Extra	VCC_5.1V	VCC_5.1V				
58	36	DP	SGMII_1_MB_WIFI_DP	SERDIN2_MB_RF_DP	sgmii 1.2v/cml 1.8v	rf/wifi, 0.1u	–	O
59	37	DP	SGMII_1_MB_WIFI_DN	SERDIN2_MB_RF_DN	sgmii 1.2v/cml 1.8v	rf/wifi, 0.1u	–	O
60	38	Gnd	GND	GND				
61	39	DP	SGMII_0_MB_WIFI_DP	SERDIN3_MB_RF_DP	sgmii 1.2v/cml 1.8v	rf/wifi, 0.1u	–	O
62	40	DP	SGMII_0_MB_WIFI_DN	SERDIN3_MB_RF_DN	sgmii 1.2v/cml 1.8v	rf/wifi, 0.1u	–	O
63	41	Gnd	GND	GND				
64	42	DP	I2C_SCL	I2C_SCL	cmos_3.3v	–	1K; rf/wifi 10K, 3.3	I/O
65	43	DP	I2C_SDA	I2C_SDA	cmos_3.3v	–	1K; rf/wifi 10K, 3.3	I/O
66	44	Gnd	GND	GND				
67	45	Extra	Reserved	SPI_SCLK	cmos [VDD_IF]	–	rf, 4.7k, gnd	O
68	46	Extra	UART_WIFI_MB	SPI_MISO	cmos [VDD_IF]	–	mb, 4.7k, VDD_IF	I
69	47	Extra	UART_MB_WIFI	SPI_MOSI	cmos [VDD_IF]	–	rf, 4.7k, VDD_IF	O
70	48	Gnd	Reserved	SPI_CS_n	cmos [VDD_IF]	–	rf, 4.7k, VDD_IF	O
71	49	DP	I2C_WP	I2C_WP	cmos_3.3v	–	rf, 4.7k, 3.3v	O
72	50	DP	RESET_n	RESET_n	cmos [VDD_IF]	–	rf/wifi, 4.7K, VDD_IF	O
73	51	Gnd	GND	GND				
74	52	DP	LED_WLAN_0	GPIO0	cmos [VDD_IF]	–	mb, 10K, VDD_IF	I, I/O
75	53	DP	LED_WLAN_1	GPIO1	cmos [VDD_IF]	–	mb, 10K, VDD_IF	I, I/O
76	54	Gnd	LED_WLAN_2	GPIO2	cmos [VDD_IF]	–	mb, 10K, VDD_IF	I, I/O
77	55	DP	LED_WLAN_3	GPIO3	cmos [VDD_IF]	–	mb, 10K, VDD_IF	I, I/O
78	56	DP	VDD_IF	VDD_IF (1.8v from MB, 2.5v from FPGA Dev Card)				
79	57	Gnd	VCC_5.1V	VCC_5.1V				
80	58	DP	VCC_5.1V	VCC_5.1V				
81	59	DP	VCC_5.1V	VCC_5.1V				
82	60	Gnd	VCC_5.1V	VCC_5.1V				

Signal Definition

Signal	Type	Description	Parameters		
SGMII_0_MB_WIFI_DN SGMII_0_MB_WIFI_DP	I	SGMII Differential Input	The signal is AC coupled. Proper biasing is provided on the module receiver.		
			Vih	Input Single Voltage High	-/-/1480 (mV, min/typ/max)
			Vil	Input Single Voltage Low	520/-/- (mV, min/typ/max)
			Vidth	Input Differential Threshold	-50/-/50 (mV, min/typ/max)
			Vio	Internal Offset Voltage	800/900/1000 (mV,min/typ/max)
			Rin	Receiver Differential Input Impedance	100ohm
SGMII_0_WIFI_MB_DN SGMII_0_WIFI_MB_DP	O	SGMII Differential Output			
			Voh	High Level Output Voltage	-/1050/1195 (mV, min/typ/max)
			Vol	Low Level Output Voltage	200/750/-(mV, min/typ/max)
			VoD	Output Differential Voltage	300mV
			VoS	Output Offset Voltage	500/900/1070(mV, min/typ/max)
SGMII_1_MB_WIFI_DN SGMII_1_MB_WIFI_DP SGMII_1_WIFI_MB_DN SGMII_1_WIFI_MB_DP	NC	Reserved	The signals are not connected on the module.		
WIFI_PRESENCE_n	O	Board Present Indication	On module the signal is pulled to GND with a 0 ohm resistor.		
RESET_n	I	Reset	External reset to the module. It is internally pulled down GND by 10k ohm resistor. This reset signal is connected to module CPU through GPIO.. The signal must be driven by 1.8V logic.		
IIC_SDA	IO	I2C Data			
IIC_SCL	I	I2C Clock			
			Vih	Input Voltage High	2/-/3.5 (V, min/typ/max)
			Vil	Input Voltage Low	-0.5/-/0.8 (V, min/typ/max)
			Voh	High Level Output Voltage	2.2/-/3.3 (V, min/typ/max)
			Vol	Low Level Output Voltage	-0.2/-/0.6 (V, min/typ/max)
LED_WLAN_0	OC	2.4G LED	Open collector driven, sink maxim 20mA current when LED lit		
LED_WLAN_1	OC	5G LED	Open collector driven, sink maxim 20mA current when LED lit		
LED_WLAN_2	OC	LED_Reserved	(Reserved) Open collector driven, sink maxim 20mA current when LED lit		
LED_WLAN_3	OC	LED_Reserved	(Reserved) Open collector driven, sink maxim 20mA current when LED lit		
VCC_5.1V	POWER	5V Power Input	5.1V+/-0.15V. 0~3A		
5V_SENSE	POWER	5V Power Sense	The 5V sense is directly wired on the Wi-Fi module from VCC_5.1V		
UART_WIFI_MB	O	UART signal from MB to Module	The signal must be driven by 1.8V logic		
UART_MB_WIFI	I	UART signal from	The signal must be driven by 1.8V logic		
I2C_WP	I	I2C write protect signal	On module this signal is connected to EEPROM write protection, driving high to enable EEPROM write protection. The signal must be driven by 3.3V logic		
VDD_IF	I	1.8V voltage	On module this is 1.8V voltage level reference		
I2C_9550_SCL (for test)	O	I2C clk signal from 9550	On module this is connected to CPU GPIO16 for manufacturing test only		
I2C_9550_SDA (for test)	I/O	I2C data signal between 9550 and slave units	On module this is connected to CPU GPIO 21 for manufacturing test only		
Reserved	NC	Reserved pins	The reserved pins are NOT connected on the Wi-Fi module		
GND	GND	GND	GND		
JTAG	I/O	JTAG debug pins	Connected to CPU EJTAG port for device debug. This interface shall not be daisy chained on MB. This interface must be driven by 2.5V logic		

Power Supply

Power consumption	Average power consumption of the module under typical operation mode shall be less than 10W. Peak power supply current is less than 3A at 5.1V.
Capacitive load	The module shall not present a capacitive load to the mainboard larger than 1500uF
Power up ramping	The module is not designed for hot swapping. The power supply ramping speed is not controlled by the module itself.

Operation Environment

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Operating temperature	The module shall support a low operating temperature limit of -40C. The upper operating temperature limit will be determined by empirically measuring the case temperature of the critical components and ensuring that none of the individual component limits are violated while the module is operating within the Nokia host platform. Once data is available, this entry shall be updated with the upper operating temperature limit. The module is expected to withstand heatsink body temperature of 80C when proper heatsinking is in place.
Operating humidity	5% to 95% non-condensing
Storage temperature	-40°C to +85°C
Elevations	86kPa～106kPa
Environment	Shall be RoHS 2011/65/EU compliant (RoHS 6 compliant, no Pb); WEEE 2002/96/EC recyclable materials requirements Telcordia GR-63-CORE
Surge	The module does not provide onboard surge protection.

Safety and EMC

Safety	This WiFi module design shall not prevent the host product from obtaining NRTL Listing 60950 (US &CA), CB with IEC/EN 60950-1 (Basic safety certificate for worldwide marketing)
EMC/EMI	GB 9254 -2008(Class B of Product) , EN55022, CISPR 22:2006 , EN55024, CISPR 24:2010
Unwanted Emission	The noisy circuits such as crystal, CPU, DDR, etc. are well shielded to avoid generating unwanted emission impacting the LTE/3G band receiver.
ESD	HBM 1.5KV

Package information

1. PCBA Label 1

PCBA Label：

2D data Matrix, no printed label.
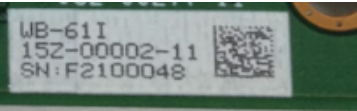
2. PCBA Label 2

Label on PCBA board---Nokia SN

Label size :   30 x 7mm
Material : heat resisting PET
Colors: White material, printing in black
Font Arial size is 3pt
Barcode: code 128B

Label on PCBA board---Certification information
Label size :   15 x 5mm
Material : heat resisting PET
Colors: White material, printing in black
Font Arial size is 3pt

Model: WM2A-AC210m
FCC ID: 2AD8UFZCWM2A1
IC: 109D-FZCWM2A01