



# JWX6053

802.11a/b/g/n/ac 3T3R Mini-PCI-Express Module

## Technical Specifications

Standards  
Data Rate  
Operating Frequency  
Interface  
Modulation  
Recommended Operating Conditions  
Output Power & Sensitivity

### STANDARDS

Wireless: IEEE 802.11a/b/g/n/ac (3T3R) / Chipset: Qualcomm Atheros QCA9890

### DATA RATE

802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: 450Mbps / 802.11ac: 1.3Gbps

### OPERATING FREQUENCY

IEEE 802.11 a/b/g/n ISM Band, 2.412GHz ~ 2.472GHz, 49425MHz ~ 5825MHz

### INTERFACE

Mini PCI-e, Antenna Ports : U.FL \* 3 for 3T3R

### MODULATION

802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)

### RECOMMENDED OPERATING CONDITIONS

Operating Voltage: DC 3.3V  $\pm$  5%

Operating Temperature Range: -40°C to 85°C

Storage Temperature Range: -40°C to +90°C

Operating Humidity (non-condensing): 10% ~ 90%

Storage Humidity (non-condensing): 5% to 90%

Current consumption: 4W (Max.)

Dimension (in mm): 30 x 50 mm

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**OUTPUT POWER & SENSITIVITY**

<b>802.11b g</b>		
<b>Data Rate</b>	<b>Tx +/- 2dB (1TX)</b>	<b>Rx Sensitivity +/- 2dB</b>
1~11Mbps	18dBm	-90dBm
6Mbps	18dBm	-90dBm
9Mbps	18dBm	-91dBm
12Mbps	18dBm	-90dBm
18Mbps	18dBm	-86dBm
24Mbps	18dBm	-84dBm
36Mbps	16dBm	-81dBm
48Mbps	15dBm	-77dBm
54Mbps	13dBm	-75dBm

<b>802.11n/2.4GHz</b>				
	<b>Data Rate</b>	<b>Tx +/- 2dB (1TX)</b>	<b>Tx +/- 2dB (3TX)</b>	<b>Rx Sensitivity +/- 2dB</b>
<b>HT20</b>	MCS 0	17dBm	22dBm	-93dBm
	MCS 1	17dBm	22dBm	-93dBm
	MCS 2	17dBm	22dBm	-91dBm
	MCS 3	16dBm	21dBm	-87dBm
	MCS 4	16dBm	21dBm	-84dBm
	MCS 5	16dBm	21dBm	-79dBm
	MCS 6	14dBm	19dBm	-78dBm
	MCS 7	11dBm	16dBm	-77dBm
<b>HT40</b>	MCS 0	17dBm	22dBm	-91dBm
	MCS 1	17dBm	22dBm	-90dBm
	MCS 2	17dBm	22dBm	-88dBm
	MCS 3	16dBm	21dBm	-84dBm
	MCS 4	16dBm	21dBm	-81dBm
	MCS 5	16dBm	21dBm	-77dBm
	MCS 6	14dBm	19dBm	-76dBm
	MCS 7	11dBm	16dBm	-74dBm

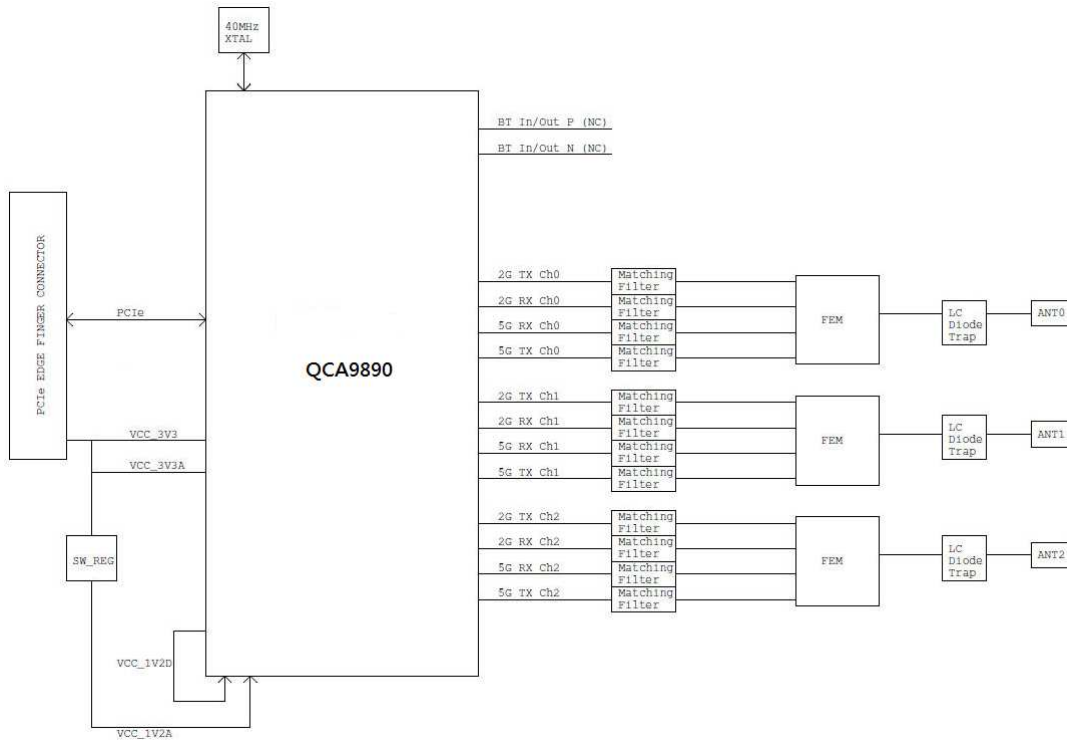
802.11a		
Data Rate	Tx +/- 2dB (1TX)	Rx Sensitivity +/- 2dB
6Mbps	16dBm	-93dBm
9Mbps	16dBm	-92dBm
12Mbps	16dBm	-90dBm
18Mbps	16dBm	-88dBm
24Mbps	16dBm	-84dBm
36Mbps	15dBm	-81dBm
48Mbps	14dBm	-77dBm
54Mbps	13dBm	-76dBm

802.11n/5GHz				
	Data Rate	Tx +/- 2dB (1TX)	Tx +/- 2dB (3TX)	Rx Sensitivity +/- 2dB
HT20	MCS 0	16dBm	21dBm	-95dBm
	MCS 1	16dBm	21dBm	-94dBm
	MCS 2	16dBm	21dBm	-92dBm
	MCS 3	15dBm	20dBm	-87dBm
	MCS 4	15dBm	20dBm	-84dBm
	MCS 5	13dBm	18dBm	-80dBm
	MCS 6	11dBm	16dBm	-78dBm
	MCS 7	11dBm	16dBm	-77dBm
HT40	MCS 0	16dBm	21dBm	-92dBm
	MCS 1	16dBm	21dBm	-91dBm
	MCS 2	16dBm	21dBm	-88dBm
	MCS 3	15dBm	20dBm	-84dBm
	MCS 4	15dBm	20dBm	-81dBm
	MCS 5	13dBm	18dBm	-78dBm
	MCS 6	11dBm	16dBm	-76dBm
	MCS 7	11dBm	16dBm	-74dBm

802.11ac				
	Data Rate	Tx +/- 2dB (1TX)	Tx +/- 2dB (3TX)	Rx Sensitivity +/- 2dB
VHT20	MCS 0	16dBm	21dBm	-95dBm
	MCS 1	16dBm	21dBm	-94dBm
	MCS 2	16dBm	21dBm	-92dBm
	MCS 3	15dBm	20dBm	-87dBm
	MCS 4	15dBm	20dBm	-84dBm
	MCS 5	13dBm	18dBm	-80dBm
	MCS 6	11dBm	16dBm	-78dBm
	MCS 7	11dBm	16dBm	-77dBm
	MCS 8	10dBm	15dBm	-72dBm
VHT40	MCS 0	16dBm	21dBm	-92dBm
	MCS 1	16dBm	21dBm	-91dBm
	MCS 2	16dBm	21dBm	-89dBm
	MCS 3	15dBm	20dBm	-85dBm
	MCS 4	15dBm	20dBm	-81dBm
	MCS 5	13dBm	18dBm	-78dBm
	MCS 6	11dBm	16dBm	-76dBm
	MCS 7	11dBm	16dBm	-75dBm
	MCS 8	10dBm	15dBm	-71dBm
	MCS 9	10dBm	15dBm	-69dBm
VHT80	MCS 0	16dBm	21dBm	-89dBm
	MCS 1	16dBm	21dBm	-88dBm
	MCS 2	16dBm	21dBm	-85dBm
	MCS 3	14dBm	19dBm	-81dBm
	MCS 4	14dBm	19dBm	-78dBm
	MCS 5	12dBm	17dBm	-74dBm
	MCS 6	11dBm	16dBm	-73dBm
	MCS 7	11dBm	16dBm	-71dBm
	MCS 8	9dBm	14dBm	-67dBm
	MCS 9	9dBm	14dBm	-65dBm

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## ■ Block Diagram



## ■ Pin Definition

PIN#	Pin Name	Design Status	PIN#	Pin Name	Design Status
1	WAKE_L	Yes (PCIE_WAKE_L)	2	+3.3Vaux	YES
3	COEX1	NC	4	GND	YES
5	COEX2	NC	6	+1.5V	NC
7	CLKREQ_L	YES (PCIE_CLKREQ_L)	8	UIM_PWR	YES (Reserved)
9	GND	YES	10	UIM_DATA	YES (Reserved)
11	REFCLK-	YES (PCIE_REFCLK_N)	12	UIM_CLK	YES (Reserved)
13	REFCLK+	YES (PCIE_REFCLK_P)	14	UIM_RESET	YES (Reserved)
15	GND	YES	16	UIM_VPP	NC
17	UIM_C8	NC	18	GND	YES
19	UIM_C4	NC	20	W_DISABLE_L	YES
21	GND	YES	22	PERST_L	YES (PCIE_RST_L)
23	PERn0	YES (PCIE_TX_N)	24	+3.3Vaux	YES
25	PERp0	YES (PCIE_TX_P)	26	GND	YES
27	GND	YES	28	+1.5V	NC
29	GND	YES	30	SMB_CLK	NC
31	PETn0	YES (PCIE_RX_P)	32	SMB_DATA	NC
33	PETp0	YES (PCIE_RX_N)	34	GND	YES
35	GND	YES	36	USB_D-	NC
37	GND	YES	38	USB_D+	NC
39	+3.3Vaux	YES	40	GND	YES
41	+3.3Vaux	YES	42	LED_WWAN_L	NC
43	GND	YES	44	LED_WLAN_L	YES (GPIO1_WLAN_LED)
45	RESERVED	NC	46	LED_WPAN_L	YES (GPIO17_BT_LED)
47	RESERVED	NC	48	+1.5V	NC
49	RESERVED	YES (VCC_FEM_4V)	50	GND	YES
51	RESERVED	NC	52	+3.3Vaux	YES