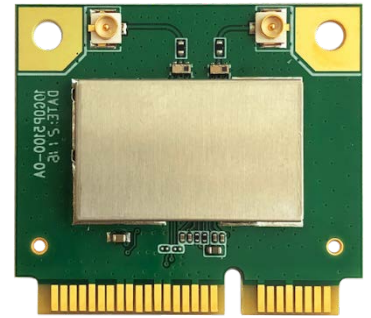


## WPET-239ACN(BT)

802.11ac/a/b/g/n 2T2R

Wi-Fi + Bluetooth 4.2 Half Mini PCIe Module



SparkLAN **WPET-239ACN(BT)** is a highly integrated single-chip Wireless LAN (WLAN), Bluetooth USB module which supports 2 streams 802.11ac solutions with multi-user MIMO (Multiple-Input, Multiple-Output) wireless LAN (WLAN) and integrated Bluetooth 4.2. It is integrated 2Tx2R WLAN MAC, baseband, and dual band RF in a single chip USB module. **WPET-239ACN(BT)** provides a cost effective solution for M2M (machine to machine) connectivity product/device by one USB port.

**WPET-239ACN(BT)** 802.11ac/abgn 2Tx2R PCI-e WLAN/BT module with various USB input format & internal printing or external RF antenna connector for high performance wireless LAN and Bluetooth device. It is designed to provide completely M2M connection & excellent cost performance with low power consumption and enhance the advantages of robust system & applications.

### Embedded Application

Applications include portable handheld devices, thin client computer, medical devices, network security & monitoring, 3D printer, TV, STB, POS, digital signs, gaming machine, robotic machinery, industrial tablets, etc.

### Key Feature

- 802.11ac/a/b/g/n Wi-Fi +Bluetooth 4.2
- Support 802.11ac 2x2, compliant with MU-MIMO. Operates in 2.4GHz and 5GHz frequency bands
- Maximum data rates: 54Mbps in 802.11g, 300Mbps in 802.11n, 866.7Mbps in 802.11ac.
- BT 4.2 features including Low-Energy 2 Mbps
- Support Operation Systems (Android/Linux/Windows)

**Specification**

<b>Standards</b>	IEEE 802.11ac/a/b/g/n (2T2R) Bluetooth V4.2, V4.1, V4.0 LE, V3.0+HS, V2.1+EDR
<b>Chipset</b>	Realtek RTL8822CU
<b>Data Rate</b>	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS0~7 802.11ac: MCS0~9 Bluetooth: 1Mbps, 2Mbps and up to 3Mbps EDR
<b>Operating Frequency</b>	IEEE 802.11 ac/a/b/g/n ISM Band: 2.412GHz~2.484GHz, 5.150GHz~5.850GHz *Subject to local regulations
<b>Interface</b>	WLAN: USB ; Bluetooth: USB
<b>Form Factor</b>	Half Mini PCIe
<b>Antenna</b>	2 x IPEX MHF1 connectors or printed antenna for 2T2R (ANT0 for WIFI only, ANT1 for WIFI+BT)
<b>Modulation</b>	WiFi : 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) BT: Header: GFSK Payload 2M: $\pi/4$ -DQPSK Payload 3M: 8-DPSK
<b>Power Consumption</b>	TX Mode: 600mA (Max.) RX Mode: 350mA (Max.)
<b>Operating Voltage</b>	DC 3.3V
<b>Operating Temperature Range</b>	-20°C ~+70°C
<b>Storage Temperature Range</b>	-40°C ~+85°C
<b>Humidity (Non-Condensing)</b>	5%~95% (Operating) 5%~90% (Storing)
<b>Dimension (in mm)</b>	L x W x H : 29.9mm( $\pm$ 0.3mm) x 26.6mm( $\pm$ 0.3mm) x 3.0mm( $\pm$ 0.3mm)
<b>Weight (g)</b>	2.76g

<b>Driver Support</b>	Windows, Linux, Android
<b>Security</b>	64/128-bits WEP, WPA, WPA2, 802.1x, WPA3

### OUTPUT POWER & SENSITIVITY

#### 802.11b

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
11Mbps	17dBm	$\leq$ -76dBm

#### 802.11g

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	16dBm	$\leq$ -65dBm

#### 802.11n / 2.4GHz

	Data Rate	Tx $\pm$ 2dBm(1TX)	Tx +/- 2dB (2TX)	Rx Sensitivity
HT20	MCS7	15dBm	16dBm	$\leq$ -64dBm
	MCS7	15dBm	16dBm	$\leq$ -61dBm

#### 802.11a

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	15dBm	$\leq$ -70dBm

#### 802.11n / 5GHz

	Data Rate	Tx $\pm$ 2dBm(1TX)	Tx +/- 2dB (2TX)	Rx Sensitivity
HT20	MCS7	14dBm	15dBm	$\leq$ -60dBm
	MCS7	14dBm	15dBm	$\leq$ -60dBm

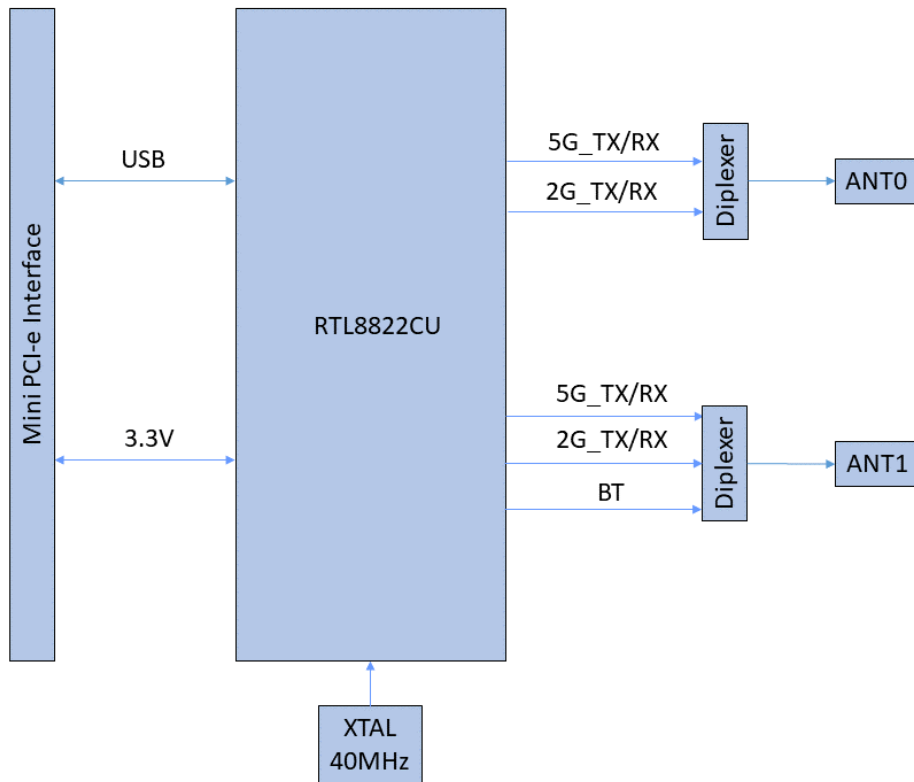
#### 802.11ac

	Data Rate	Tx $\pm$ 2dBm(1TX)	Tx +/- 2dB (2TX)	Rx Sensitivity
VHT80	MCS9	11dBm	12dBm	$\leq$ -51dBm

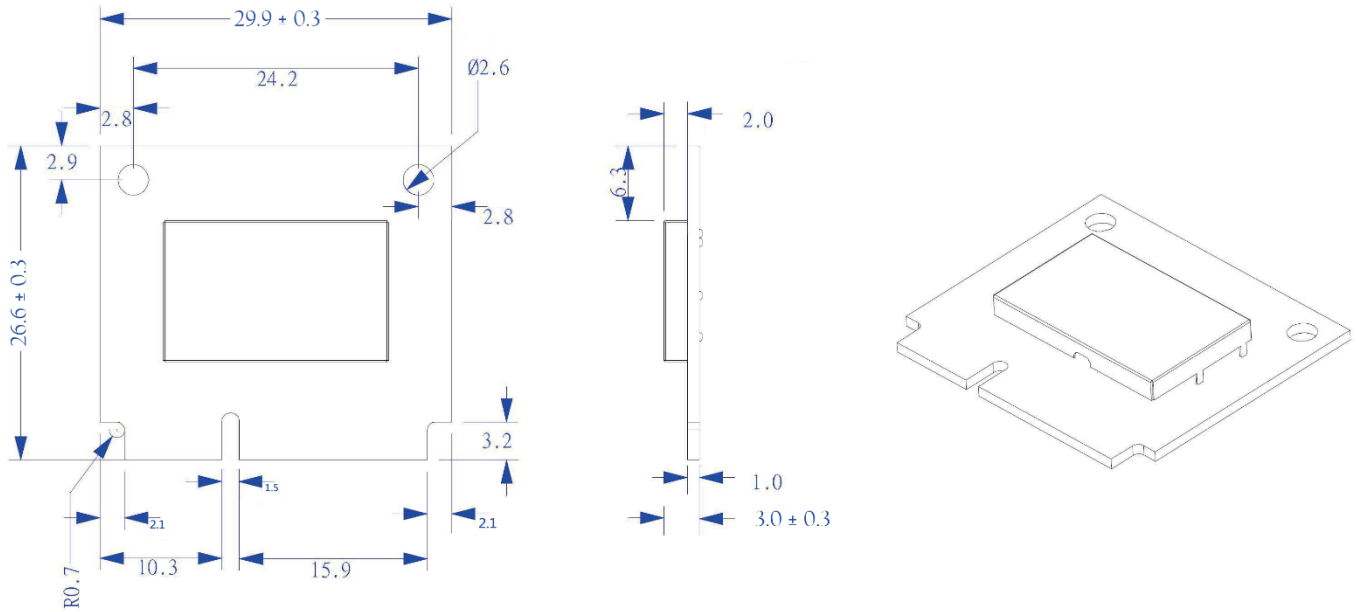
#### Bluetooth

Data Rate	Tx +/- 2dB	Rx Sensitivity
2, 3Mbps	$0 \leq$ Output Power $\leq$ +3.5 dBm	<0.1% BER at -80dBm

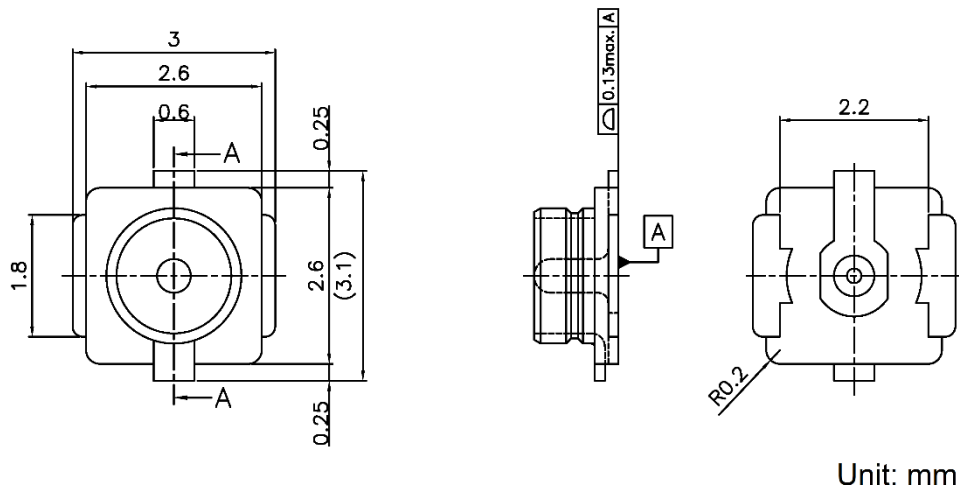
## Block Diagram



### Mechanical Dimension (mm)



### MHF1 connector spec.



## Pin Assignment

The following section illustrate signal pin-outs for the module connector.

TOP			
Pin#	Pin Name	Type	Description
1	WAKE#	NC	No Connection
3	COEX1	NC	No Connection
5	COEX2	NC	No Connection
7	CLKREQ#	NC	No Connection
9	GND	G	Ground connections
11	REFCLK-	NC	No Connection
13	REFCLK+	NC	No Connection
15	GND	G	Ground connections
17	UIM_IC_DM	NC	No Connection
19	UIM_IC_DP	NC	No Connection
21	GND	G	Ground connections
23	PETn0	NC	No Connection
25	PETp0	NC	No Connection
27	GND	G	Ground connections
29	GND	G	Ground connections
31	PERn0	NC	No Connection
33	PERp0	NC	No Connection
35	GND	G	Ground connections
37	GND	G	Ground connections
39	+3.3Vaux	NC	No Connection
41	+3.3Vaux	NC	No Connection
43	GND	G	Ground connections
45	ANTCTRL2	NC	No Connection
47	ANTCTRL3	NC	No Connection
49	Reserved	NC	No Connection
51	W_DISABLE2#	NC	No Connection

Note: Power (P), Ground (G), Open-Drain (OD), Input (I), Output (O), Do Not Connect (DNC), No Connection (NC)

## Pin Assignment

The following section illustrate signal pin-outs for the module connector.

BOTTOM			
Pin#	Pin Name	Type	Description
2	+3.3Vaux	P	VDD system power supply input
4	GND	G	Ground connections
6	1.5V/COEX3	NC	No Connection
8	UIM_PWR	NC	No Connection
10	UIM_DATA	NC	No Connection
12	UIM_CLK	NC	No Connection
14	UIM_RESET	NC	No Connection
16	UIM_SPU	NC	No Connection
18	GND	G	Ground connections
20	W_DISABLE1#	NC	No Connection
22	PERST#	NC	No Connection
24	+3.3Vaux	NC	No Connection
26	GND	G	Ground connections
28	+1.5V/ ANTCTRL0	NC	No Connection
30	SMB_CLK	NC	No Connection
32	SMB_DATA	NC	No Connection
34	GND	G	Ground connections
36	USB_D-	I/O	USB serial differential data Negative
38	USB_D+	I/O	USB serial differential data Positive
40	GND	NC	No Connection
42	LED_WWAN#	NC	No Connection
44	LED_WLAN#	O	Open drain, active low signals. These signals are used to allow the PCI Express Mini Card add-in card to provide status indicators via LED devices that will be provided by the system.
46	LED_WPAN#	NC	No Connection
48	+1.5V/ ANTCTRL1	NC	No Connection
50	GND	G	Ground connections
52	+3.3Vaux	P	VDD system power supply input

Note: Power (P), Ground (G), Open-Drain (OD), Input (I), Output (O), Do Not Connect (DNC), No Connection (NC)

## Certification

### Dipole Ant.

 FCC

 IC

 NCC

 CE (RED EN 300 328 V2.2.2 / EN 301 893 V2.1.1)

 MIC

 ASNZS

## Ordering Information

Product Name	Part Number	Description
WPET-239ACN(BT)	R9701890031	802.11ac/a/b/g/n 2T2R Wi-Fi + BT 4.2 Half Mini PCIe Module

## Optional Accessory

Product Name	Part Number	Description
AD-103AG	R3410110203	Dipole Antenna, 2dBi 2.4GHz/5GHz, RP-SMA(M) connector
AD-302N	R3410110221	Dipole Antenna, 3dBi/2dBi 2.4G/5GHz, RP-SMA(M) connector
AD-303N	R3410110222	Dipole Antenna, 3dBi/3dBi 2.4G/5GHz, RP-SMA(M) connector
AD-305N	R3410110223	Dipole Antenna, 5dBi/5dBi 2.4G/5GHz, RP-SMA(M) connector
AD-315N	R3410110233	Dipole Antenna, 3dBi/5dBi 2.4G/5GHz, I-PEX / MHF1 connector
CBIRF-ME150	R3470300023	I-PEX/MHF1 to RP-SMA Female; L:150mm; Coaxial 1.37 Black
CBIRF-ME250	R3470300024	I-PEX/MHF1 to RP-SMA Female; L:250mm; Coaxial 1.37 Black
CBPP-C200	R3200700010	4-pin WTB to 4 pin WTB_L200mm
CBPW-C200	R3200700011	4-pin WTB to flying leads