WPEQ-256ACNRBI

WPEQ-256ACN

Product Introduction

Standard	IEEE802.11ac/a/b/g/n
Chipset solution	QCA9892-BR4B
Radio stream **[Note1]**	2T2R
Antenna type / connector.	External with IPEX connector
Bus Interface	PCI Express
Form Factor	Mini-PCIe
Data Rate	802.11b: 11, 5.5, 2, 1 Mbps; 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 15 for HT20MHz MCS 0 to 15 for HT40MHz 802.11ac: MCS 0 to 8 for HT20MHz MCS 0 to 9 for HT40MHz MCS 0 to 9 for HT80MHz 1. In HT (High Throughput) mode, the data rate depends on the MCS Index. 2. The MCS index for HT (High Throughput) mode is from 0 to 32 as described in the MCS table.
Spreading /Modulation Techniques	802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK,QPSK,16-QAM,64-QAM) 802.11n: OFDM (BPSK,QPSK,16-QAM,64-QAM) 802.11ac: OFDM (BPSK,QPSK,16-QAM,64-QAM, 256-QAM)
Frequency Range **[Note2]**	11b/g/n: 2.412GHz ~ 2.484GHz 11ac/a/n: 5.15GHz ~ 5.85GHz

Transmit Output Power (Tolerance: +/-2dBm)	802.11a: 14dBm@54Mbps 802.11b: 20dBm@11Mbps 802.11g: 16dBm@54Mbps 802.11gn HT20: 15dBm@MCS7 802.11gn HT40: 15dBm@MCS7 802.11an HT20: 13dBm@MCS7 802.11an HT40: 13dBm@MCS7 802.11ac VHT80: 10dBm@MCS9
Receiver Sensitivity	802.11a: ≤-74dBm@54Mbps 802.11b: ≤-87dBm@11Mbps 802.11g: ≤-74dBm@54Mbps 802.11gn HT20: ≤-70dBm@MCS7 802.11gn HT40: ≤-68dBm@MCS7 802.11an HT20: ≤-71dBm@MCS7 802.11an HT40: ≤-68dBm@MCS7 802.11ac VHT80: ≤-59dBm@MCS9
Operating Voltage	DC 3.3V
Power Consumption	TX Mode:1050mA (Max.)
Temperature Range	-40°C~+85°C (Operating), -40°C~+85°C (storing)
Humidity (non-condensing)	10~85 % (Operating), 5~90 % (Storing) **[Note3]**
Security	WEP / WPA / WPA2,802.1X
OS supported	Linux (Linux supports have different versions based on different CPU platforms and O/S. Please contact SPK support group.)

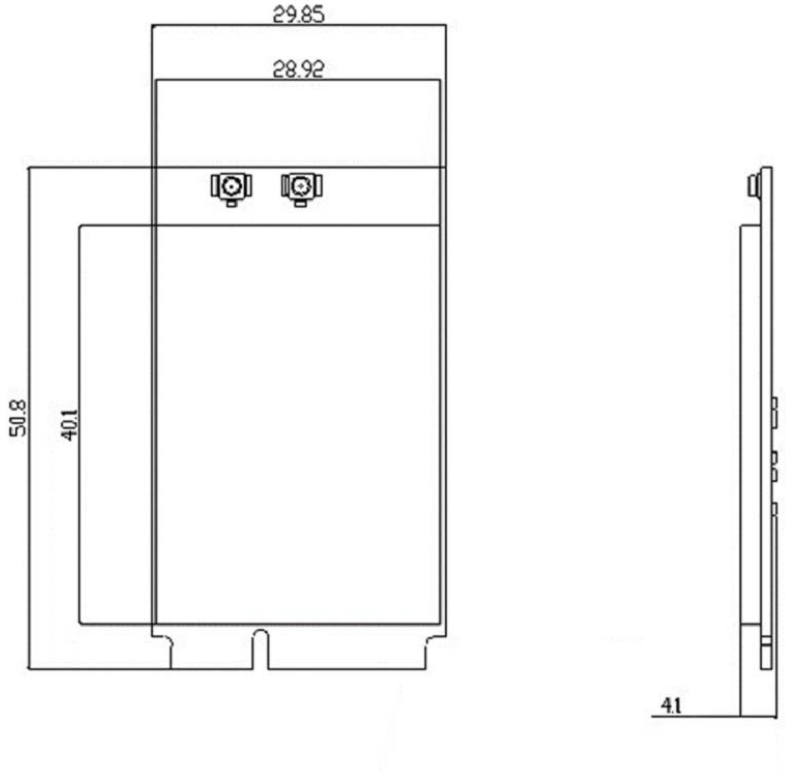
Note:

1. For Radio stream with diversity or MIMO design, all RF connectors on the module must be fitting antennas in order to guarantee the module performance.
2. The frequency range is subject to local regulations.
3. The storing condition is only for product functionality, no included for parts appearance.

2. Hardware Specification

2.1 Hardware Dimension

Dimension: 50.8mm * 29.85mm * 4.1mm(±0.5mm)



2.3 Pin Assignment

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

Pin#	Pin Name	Description	Pin#	Pin Name	Description
1	WAKE_L(NA)	Output and open Drain active Low signal. This signal is used to request that the system return from a sleep/suspended state to service a function initiated wake event.	2	+3.3V	+3.3V
3	No Connection	-	4	GND	GND
5	No Connection	-	6	No Connection	-
7	CLKREQ_L	Output for reference clock request signal	8	No Connection	-
9	GND	GND	10	No Connection	-
11	REFCLK-	Input signal for PCI Express differential reference clock (100 MHz)	12	No Connection	-
13	REFCLK+	Input signal for PCI Express differential reference clock (100 MHz)	14	No Connection	-
15	GND	GND	16	No Connection	-
17	No Connection	-	18	GND	GND
19	No Connection	-	20	W_DISABLE_L (OPT)	Input and active low signal. This signal is used by the system to disable radio operation on add-in cards that implement radio frequency applications. When implemented,

					this signal requires a pull-up resistor on the card
21	GND	GND	22	PERST_L	Input signal for functional reset to the card
23	PERn0	PCI Express x1 data interface: one differential receive pair	24	+3.3V	+3.3V
25	PERp0	PCI Express x1 data interface: one differential receive pair	26	GND	GND
27	GND	GND	28	No Connection	-
29	GND	GND	30	No Connection	-
31	PETn0	PCI Express x1 data interface: one differential transmit pair	32	No Connection	-
33	PETp0	PCI Express x1 data interface: one differential transmit pair	34	GND	GND
35	GND	GND	36	No Connection	-
37	GND	GND	38	No Connection	-
39	No Connection	-	40	GND	GND
41	No Connection	-	42	No Connection	-
43	GND	GND	44	LED_WLAN_L (OPT)	Output and open drain active low signal. This signal is 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
45	No Connection	-	46	No Connection	-
47	No Connection	-	48	No Connection	-
49	No Connection	-	50	GND	GND
51	No Connection	-	52	+3.3V	+3.3V

*** NA: No active**

*** OPT: Optional (**Depends on S/W and H/W design of the module and customer platform main board, functionalities of end devices and drivers.)

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.
This device is restricted to indoor use.

FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

The module is limited to OEM installation ONLY.

This module is intended for OEM integrators under the following conditions:

1. This module is restricted to installation in products for use only in mobile and fixed applications.
2. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.
3. The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.
4. OEM integrator has be limited the operation channels in channel 1-11 for 2.4GHz band.
5. Fixed outdoor applications for point to multipoint operations are subject to the conditions in Part

15.407(a)(1)(i).

The OEM integrator is still responsible for

1. ensuring that the end-user has no manual instructions to remove or install module
2. the FCC compliance requirement of the end product, which integrates this module.
3. Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. Verification, Doc) of the host device to be addressed by the integrator/manufacturer.
4. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

The user manual of the end product should include

1. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
2. the restriction of operating this device in indoor could void the user's authority to operate the equipment.
3. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.
4. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
5. The FCC part 15.19 statement: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Label of the end product:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: **RYK-WPEQ256ACN**".

The end product shall bear the following 15.19 statement: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter [IC: **6158A-WPEQ256ACN**] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

FCC/ISED Antenna List

#	Brand	Model	Connector Type	Type	5GHz				2.4GHz
					Band 1	Band 2	Band 3	Band 4	
1	SparkLAN	AD-103AG	I-Pex	Dipole	2.03				2.02
2	SparkLAN	AD-301N	I-Pex	Dipole	5.2		5.8		4.4
3	SparkLAN	AD-302N	I-Pex	Dipole	2.87				**3.14**
4	SparkLAN	AD-303N	I-Pex	Dipole	3.45				**3.14**
5	SparkLAN	AD-305N	I-Pex	Dipole	5.53				**5**
6	SparkLAN	AD-300N	I-Pex	Dipole	5				3

Le présent émetteur radio [IC: **6158A-WPEQ256ACN**] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

FCC/ISED Antenna List

#	Brand	Model	Connector Type	Type	5GHz				2.4GHz
					Band 1	Band 2	Band 3	Band 4	
1	SparkLAN	AD-103AG	I-Pex	Dipole	2.03				2.02
2	SparkLAN	AD-301N	I-Pex	Dipole	5.2		5.8		4.4
3	SparkLAN	AD-302N	I-Pex	Dipole	2.87				**3.14**
4	SparkLAN	AD-303N	I-Pex	Dipole	3.45				**3.14**
5	SparkLAN	AD-305N	I-Pex	Dipole	5.53				**5**
6	SparkLAN	AD-300N	I-Pex	Dipole	5				3

the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

IC Radiation Exposure Statement:
This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance **20cm** between the radiator & your body.
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps

Modular OEM Integrator Notice
This device is intended only for OEM integrators under the following conditions:
1) The antenna must be installed such that 20cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)
1) L'antenne doit être installée de telle sorte qu'une distance de 20cm est respectée entre l'antenne et les utilisateurs, et
2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

The OEM integrator is still responsible for
1. ensuring that the end-user has no manual instructions to remove or install module
2. the ISED compliance requirement of the end product, which integrates this module.
3. Appropriate measurements and if applicable additional equipment authorizations of the host device to be addressed by the integrator/manufacturer.
4. The separate approval is required for all other operating configurations, including portable configurations and different antenna configurations

End Product Labeling
The final end product must be labeled in a visible area with the following: "Contains transmitter module IC: **6158A-WPEQ256ACN**".
Contient le module d'émission IC: IC: **6158A-WPEQ256ACN**

The Host Model Number (HMN) must be indicated at any location on the exterior of the end product or product packaging or product literature which shall be available with the end product or online.

Japan Antenna List

#	Brand	Model	Connector Type	Type	5GHz			2.4GHz
					Band 1	Band 2	Band 3	
1	Walsin	RFDPA131000SBLB808	I-Pex	Dipole	**4.4**			**2.93**
2	Cortec	AN2450-5511BRS	I-Pex	Dipole	3.14		3.58	2.89
3	SANSEI	ANTDP-027A0	I-Pex	Dipole	1.3	1.3	1.2	1.5
4	Taoglas	MA231.LBC.002	I-Pex	Flat Bar	2.84	2.84	2.84	2.41
5	WIESON	GPOT113-020A	I-Pex	Dipole	-5.96	-5.96	-5.96	-0.79
6	Cortec	AN2450-16HM01BRS	I-Pex	Dipole	6.27		6.67	2.15
7	ARISTOTLE	RFA-25-AP252-70-500	I-Pex	PCB	2.6		3.62	2.47
8	ARISTOTLE	RFA-25-AP287-4B-350F	I-Pex	PCB	3.5	3.5	3.5	2.8
9	LYNwave	ALX17P-221XX9-00	I-Pex	PCB	3.6	3.6	3.6	3.7
10	LYNwave	ALX17P-221XXG-00	I-Pex	PCB	3.6	3.6	3.6	3.7
11	ARISTOTLE	RFA-25-C17M5-1	I-Pex	Dipole	3			1.5
12	vso	GRF1351	I-Pex	Dipole	4.8		4.9	2.9
13	exceltek	C0255-ANG0027	I-Pex	PCB	2	2	2	2
14	exceltek	C0255-ANG0029	I-Pex	PCB	2	2	2	2
15	exceltek	C0255-ANG0018	I-Pex	Dipole	2.8	2.6	2.9	2.4
16	Anjie	EX06-2458-B1-SMA-MR	I-Pex	Dipole	1.9			1.5
17	ARISTOTLE	RFA-25-C2M2-U-M70	I-Pex	Dipole	2.34	2.34	2.34	2.9
18	ARISTOTLE	RFA-25-C2M2-M32-N	I-Pex	Dipole	1.81			2.56
19	SparkLAN	AD-103AG	I-Pex	Dipole	2.03			2.02
20	SparkLAN	AD-301N	I-Pex	Dipole	5.2		5.8	4.4
21	SparkLAN	AD-302N	I-Pex	Dipole	2.87			**3.14**
22	SparkLAN	AD-303N	I-Pex	Dipole	3.45			**3.14**
23	SparkLAN	AD-305N	I-Pex	Dipole	5.53			**5**
24	SparkLAN	AD-300N	I-Pex	Dipole	5			3
25	SparkLAN	AD-300PF	I-Pex	Pifa	5			3