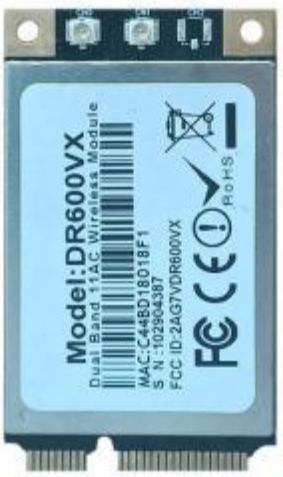
DR600VX

2x2 MIMO 802.11ac Mini PCIe WiFi Module
Dual Band Wireless Access Points

Features



- Qualcomm-Atheros QCA9882 chipset
- 2.4GHz max 24dBm & 5GHz max 23dBm output power
- IEEE 802.11ac compliant & backward compatible with 802.11a/b/g/n
- 2x2 MIMO Technology, up to 867Mbps
- Mini PCI Express edge connector
- Support the Frequency 2412MHz~2462MHz
  Support the Frequency 5180MHz~5825MHz
- RoHS compliance ensure a high level protection of human health and the environment from risks that can be posed by chemicals
- Supports Spatial Multiplexing, Cyclic-Delay Diversity (CDD), Low-Density Parity Check (LDPC) Codes, Maximal Ratio Combining (MRC), Space Time Block Code (STBC)
- Supports IEEE 802.11d, e, h, i, k, r, v time stamp, and w standards
- Cards are individually calibrated for Quality Assurance

Applications

- Security Surveillance
- Commercial radio coverage
- Hotel Wireless application
- Country coverage
- Forest fire protection engineering
- Some special scene application

Product Description

DR600VX based on QCA9882 chipset is an enterprise wireless module integrated with 2x2 5G high power Radio module and 2x2 2.4G high power Radio module designed specifically to provide users with mobile access to high-bandwidth video streaming, voice, and data transmission for office and challenging RF environment in factories, warehouses establishment.

Specifications

Symbol	Parameter
Chipset	QCA9882
Host Interface	Mini PCI Express 1.1 Standard
Antenna Connector	2 x UF.L
Frequency Range	2.4GHz: 2.412GHz to 2.462GHz 5GHz: 5.15GHz to 5.825GHz
Operating Voltage	3.3V DC
Power Consumption	
Modulation Techniques	OFDM: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM
Environmental Temperature	Operating: -40°C to 70°C, Storage: -40°C to 90°C
Environmental Humidity, non-condensing	Operating: 5% to 95%, Storage: Max. 90%
ROHS Compliance	YES
Dimensions (W×H×D)	30.0mm × 50.9mm × 3.2mm

RF Performance Table

Operating Mode	Data Rate	TX Power		Tolerance
		1 Chain	2 Chains	
2.4 GHz 802.11b	1Mbps	20dBm	23dBm	±2dB
	2Mbps	20dBm	23dBm	±2dB
	5.5Mbps	20dBm	23dBm	±2dB
	11Mbps	20dBm	23dBm	±2dB
2.4 GHz 802.11g	6Mbps	21dBm	24dBm	±2dB
	9Mbps	21dBm	24dBm	±2dB
	12Mbps	21dBm	24dBm	±2dB
	18Mbps	21dBm	24dBm	±2dB
	24Mbps	21dBm	24dBm	±2dB
	36Mbps	20dBm	23dBm	±2dB
	48Mbps	19dBm	22dBm	±2dB
	54Mbps	19dBm	22dBm	±2dB
2.4 GHz 802.11n HT20	MCS0	21dBm	24dBm	±2dB
	MCS1	21dBm	24dBm	±2dB
	MCS2	21dBm	24dBm	±2dB
	MCS3	20dBm	23dBm	±2dB
	MCS4	20dBm	23dBm	±2dB
	MCS5	20dBm	23dBm	±2dB
	MCS6	19dBm	22dBm	±2dB
	MCS7	19dBm	22dBm	±2dB
2.4 GHz 802.11n HT40	MCS0	21dBm	24dBm	±2dB
	MCS1	21dBm	24dBm	±2dB
	MCS2	21dBm	24dBm	±2dB
	MCS3	20dBm	23dBm	±2dB
	MCS4	20dBm	23dBm	±2dB
	MCS5	20dBm	23dBm	±2dB
	MCS6	19dBm	22dBm	±2dB
	MCS7	18dBm	21dBm	±2dB

Operating Mode	Data Rate	RX Sensitivity	Tolerance
2.4 GHz 802.11b	1Mbps	-95dBm	±2dB
	2Mbps	-94dBm	±2dB
	5.5Mbps	-92dBm	±2dB
	11Mbps	-90dBm	±2dB
2.4 GHz 802.11g	6Mbps	-94dBm	±2dB
	9Mbps	-93dBm	±2dB
	12Mbps	-92dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-88dBm	±2dB
	36Mbps	-85dBm	±2dB
	48Mbps	-81dBm	±2dB
	54Mbps	-80dBm	±2dB
2.4 GHz 802.11n HT20	MCS0	-93dBm	±2dB
	MCS1	-91dBm	±2dB
	MCS2	-89dBm	±2dB
	MCS3	-84dBm	±2dB
	MCS4	-83dBm	±2dB
	MCS5	-78dBm	±2dB
	MCS6	-78dBm	±2dB
	MCS7	-76dBm	±2dB
2.4 GHz 802.11n HT40	MCS0	-92dBm	±2dB
	MCS1	-88dBm	±2dB
	MCS2	-85dBm	±2dB
	MCS3	-82dBm	±2dB
	MCS4	-79dBm	±2dB
	MCS5	-75dBm	±2dB
	MCS6	-75dBm	±2dB
	MCS7	-73dBm	±2dB

Operating Mode	Data Rate	TX Power		Tolerance
		1 Chain	2 Chains	
5 GHz 802.11a	6Mbps	20dBm	23dBm	±2dB
	9Mbps	20dBm	23dBm	±2dB
	12Mbps	20dBm	23dBm	±2dB
	18Mbps	20dBm	23dBm	±2dB
	24Mbps	20dBm	23dBm	±2dB
	36Mbps	18dBm	21dBm	±2dB
	48Mbps	16dBm	19dBm	±2dB
	54Mbps	16dBm	18dBm	±2dB
5 GHz 802.11n/ac HT20	MCS0	19dBm	22dBm	±2dB
	MCS1	19dBm	22dBm	±2dB
	MCS2	19dBm	22dBm	±2dB
	MCS3	18dBm	21dBm	±2dB
	MCS4	18dBm	21dBm	±2dB
	MCS5	17dBm	20dBm	±2dB
	MCS6	16dBm	19dBm	±2dB
	MCS7	15dBm	18dBm	±2dB
	MCS8	14dBm	17dBm	±2dB
5 GHz 802.11n/ac HT40	MCS0	18dBm	21dBm	±2dB
	MCS1	18dBm	21dBm	±2dB
	MCS2	18dBm	21dBm	±2dB
	MCS3	17dBm	20dBm	±2dB
	MCS4	17dBm	20dBm	±2dB
	MCS5	16dBm	19dBm	±2dB
	MCS6	15dBm	18dBm	±2dB
	MCS7	15dBm	18dBm	±2dB
	MCS8	14dBm	17dBm	±2dB
	MCS9	14dBm	17dBm	±2dB
5 GHz 802.11n/ac HT80	MCS0	18dBm	21dBm	±2dB
	MCS1	18dBm	21dBm	±2dB
	MCS2	18dBm	21dBm	±2dB
	MCS3	17dBm	20dBm	±2dB
	MCS4	17dBm	20dBm	±2dB
	MCS5	16dBm	19dBm	±2dB
	MCS6	15dBm	18dBm	±2dB
	MCS7	15dBm	18dBm	±2dB
	MCS8	14dBm	17dBm	±2dB
	MCS9	14dBm	17dBm	±2dB

Operating Mode	Data Rate	RX Sensitivity	Tolerance
5 GHz 802.11a	6Mbps	-94dBm	±2dB
	9Mbps	-94dBm	±2dB
	12Mbps	-92dBm	±2dB
	18Mbps	-90dBm	±2dB
	24Mbps	-86dBm	±2dB
	36Mbps	-84dBm	±2dB
	48Mbps	-81dBm	±2dB
	54Mbps	-80dBm	±2dB
5 GHz 802.11n/ac HT20	MCS0	-93dBm	±2dB
	MCS1	-90dBm	±2dB
	MCS2	-87dBm	±2dB
	MCS3	-83dBm	±2dB
	MCS4	-80dBm	±2dB
	MCS5	-77dBm	±2dB
	MCS6	-74dBm	±2dB
	MCS7	-73dBm	±2dB
	MCS8	-71dBm	±2dB
5 GHz 802.11n/ac HT40	MCS0	-90dBm	±2dB
	MCS1	-88dBm	±2dB
	MCS2	-85dBm	±2dB
	MCS3	-82dBm	±2dB
	MCS4	-79dBm	±2dB
	MCS5	-75dBm	±2dB
	MCS6	-73dBm	±2dB
	MCS7	-73dBm	±2dB
	MCS8	-69dBm	±2dB
	MCS9	-66dBm	±2dB
5 GHz 802.11n/ac HT80	MCS0	-88dBm	±2dB
	MCS1	-86dBm	±2dB
	MCS2	-84dBm	±2dB
	MCS3	-81dBm	±2dB
	MCS4	-77dBm	±2dB
	MCS5	-74dBm	±2dB
	MCS6	-73dBm	±2dB
	MCS7	-70dBm	±2dB
	MCS8	-67dBm	±2dB
	MCS9	-65dBm	±2dB

GPIO Pin Mapping

GPIO Pin	Function		
GPIO0	WLAN DIS		
GPIO1	WLAN LED		
GPIO2	MCI CLK IN		
GPIO3	MCI CLK OUT		
GPIO4	MCI DATA OUT		
GPIO5	MCI DATA IN		
GPIO12	TMS		
13	TCK		
14	TDI		
15	TDO		
16	CPU WARM RESET / JTEG RESET		
17	GPIO17 BT LED		
19	ANT A		
20	ANT B		
21	FEM BS		
22	FEM MODE		

MiniPCIe Slot Pin Assignment

TOP Side		Bottom Side	
1	PCIE WAKE L	2	VCC 3V3
3	NC	4	GND
5	NC	6	NC
7	PCIE CLKREQ L	8	NC
9	GND	10	NC
11	PCIE REFCLK N	12	NC
13	PCIE REFCLK P	14	NC
15	GND	16	NC
Mechanical key			
17	NC	18	GND
19	NC	20	GPIO0 WLAN DIS
21	GND	22	PCIE RST L
23	PCIE TX N	24	VCC 3V3
25	PCIE TX P	26	GND
27	GND	28	NC
29	GND	30	NC

31	PCIE RX P	32	NC
33	PCIE RX N	34	GND
35	GND	36	NC
37	GND	38	NC
39	VCC 3V3 (RESERVED)	40	GND
41	VCC 3V3 (RESERVED)	42	NC
43	GND	44	GPIO1 WLAN LED
45	NC	46	GPIO17 BT LED
47	NC	48	NC
49	NC	50	GND
51	NC	52	VCC 3V3

Version

Version	CPU	Feature
DR600VX	QCA9882	
DR600VX-i	QCA9890	Operation Temp. Up to 85°
DR600VX-4.9	QCA9882	Support 4.9G

FCC Regulatory Compliance

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

Note: 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.

RF Exposure Compliance

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

ISED Regulatory compliance

This device contains licence-exempt transmitters that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).

Operation is subject to the following two conditions:

This device may not cause interference.

This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur 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 :

L'appareil ne doit pas produire de brouillage;

L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d' en compromettre le fonctionnement.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules
FCC Part 15 Subpart C 15.247 & 15.407

2.3 Specific operational use conditions
The module is a Wireless module.
Frequency Range: 802.11b/g/n-HT20: 2412 ~ 2462MHz
802.11n-HT40: 2422 ~ 2452MHz
Channel Number: 802.11b/g/n-HT20: 11
802.11n-HT40:7
Type of Modulation: 802.11b: DSSS
802.11g/n: OFDM
Data Rate: 802.11b: 1/2/5.5/11Mbps
802.11g: 6/9/12/18/24/36/48/54Mbps
802.11n: MCS0~MCS7
Antenna Type: Dual band Dipole Antenna
Antenna Gain: 2dBi

Frequency Range: For 802.11a/n-HT20/ac-VHT20:
5180~5240MHz, 5745~5825MHz
For 802.11n-HT40/ac-VHT40:
5190~5230MHz, 5755~5795MHz
For 802.11ac-VHT80:
5210MHz, 5775MHz
Type of Modulation: 802.11a/n/ac: OFDM
Data Rate: 802.11a: 6/9/12/18/24/36/48/54Mbps
802.11n: up to 150Mbps
802.11ac: up to 433.3Mbps
Antenna Type: Dual band Dipole Antenna
Antenna Gain: 2dBi

The module can be used for mobile or portable applications with a maximum 2 dBi antenna. The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operaition. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

2.4 Limited module procedures
Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

2.5 Trace antenna designs
Not applicable. The module has its own antenna, and doesn’t need a host’s printed board microstrip trace antenna etc.

2.6 RF exposure considerations
The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users’ body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances,

the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

2.7 Antennas

Antenna Specification are as follows:

Type: Dual Band

Dipole Antenna

Gain: 2dBi

This device is intended only for host manufacturers under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna;

The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employa ‘unique’ antenna coupler.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

2.8 Label and compliance information
Host product manufacturers need to provide a physical or e-label stating “Contains FCC ID: 2AG7VDR600VX” with their finished product.

2.9 Information on test modes and additional testing requirements
Host manufacturer must perfom test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.
Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer
The modular transmitter is **only** FCC authorized for FCC Part 15 Subpart C 15.247 & 15.407 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Federal Communication Commission Statement (FCC, U.S.)

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 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.

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.

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.

IMPORTANT NOTES

Co-location warning:
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM integration instructions:
This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:
In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:
The final end product must be labeled in a visible area with the following: “Contains Transmitter Module FCC ID: 2AG7VDR600VX”.

Information that must be placed in the end user manual:
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.