



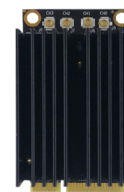
Wireless Module

Catalogue



Revision: 290421

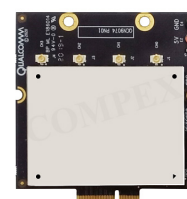
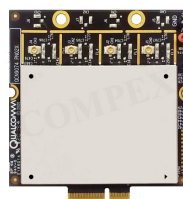
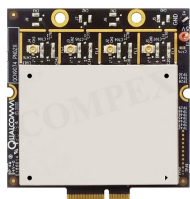
802.11ax (WiFi 6)



HARDWARE SPECIFICATIONS

TYPE OF CARD	2x2 MU-MIMO 802.11ax	2x2 MU-MIMO 802.11ax	4x4 MU-MIMO 802.11ax	4x4 MU-MIMO 802.11ax
MU-MIMO	2x2	2x2	4x4	4x4
MODEL	WLE1500H5	WLE1500H2	WLE3000H5	WLE3000H2
CHIPSET	QCN9022/9072	QCN9022/9072	QCN9024/9074	QCN9024/9074
STANDARD	802.11a/n/ac/ax	802.11b/g/n/ax	802.11a/n/ac/ax	802.11b/g/n/ax
THEORETICAL RATE	2402Mbps	573Mbps	4804Mbps	1201Mbps
FORM FACTOR	Standard size	Standard size	Standard size	Standard size
SPECTRUM	5.150-5.850GHz (QCN9022) 4.920-5.850GHz (QCN9072)	2.412-2.472GHz	5.150-5.850GHz (QCN9024) 4.920-5.850GHz (QCN9074)	2.412-2.472GHz
REFERENCE DESIGN	PN02.1	PN01.1	PN02.1	PN01.1
HOST INTERFACE	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe
OPERATING VOLTAGE	3.3V	3.3V	3.3V	3.3V
POWER (PER CHAIN)	19dBm @ 5GHz	20dBm @ 2.4GHz	19dBm @ 5GHz	20dBm @ 2.4GHz
POWER CONSUMPTION	7.8W (Max)	7.2W (Max)	8.8W (Max)	8W (Max)
CHANNEL SUPPORT	Supports 20/40/80/160MHz at 5GHz	Supports 20/40MHz at 2.4GHz	Supports 20/40/80/160MHz at 5GHz	Supports 20/40MHz at 2.4GHz
ANTENNA CONNECTOR	2x U.FL Connectors	2x U.FL Connectors	4x U.FL Connectors	4x U.FL Connectors
MODULATION TECHNIQUES	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM
OPERATING ENVIRONMENT	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C
CERTIFICATION	REACH & RoHS Compliance	REACH & RoHS Compliance	REACH & RoHS Compliance	REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	TBD	TBD	TBD	TBD

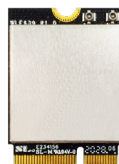
802.11ax (WiFi 6)



HARDWARE SPECIFICATIONS

TYPE OF CARD	4x4 MU-MIMO 802.11ax	4x4 MU-MIMO 802.11ax	4x4 MU-MIMO 802.11ax
MU-MIMO	4x4	4x4	4x4
MODEL	PNO2.7	PNO2.1	PNO1.1
CHIPSET	QCN9024/9074	QCN9024/9074	QCN9024/9074
STANDARD	802.11a/n/ac/ax	802.11a/n/ac/ax	802.11b/g/n/ax
THEORETICAL RATE	4804Mbps	4804Mbps	1376.4Mbps
FORM FACTOR	Key E	Key E	Key E
SPECTRUM	5.925-7.125GHz	5.150-5.950GHz	2.412-2.472GHz
REFERENCE DESIGN	PNO2.7	PNO2.1	PNO1.1
HOST INTERFACE	M.2 E Key	M.2 E Key	M.2 E Key
OPERATING VOLTAGE	5V	5V	5V
POWER (PER CHAIN)	20dBm @ 6GHz	24dBm @ 5GHz	24dBm @ 2.4GHz
POWER CONSUMPTION	16W	16W	15W
CHANNEL SUPPORT	Supports 20/40/80/160MHz at 6GHz	Supports 20/40/80/160MHz at 5GHz	Supports 20/40MHz at 2.4GHz
ANTENNA CONNECTOR	4x U.FL Connectors	4x U.FL Connectors	4x U.FL Connectors
MODULATION TECHNIQUES	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM	OFDMA: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM
OPERATING ENVIRONMENT	-20°C to 70°C	-20°C to 70°C	-20°C to 70°C
CERTIFICATION	REACH & RoHS Compliance	REACH & RoHS Compliance	REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	57 x 60 x 6.3	57 x 60 x 6.3	57 x 60 x 6.3

WLAN + BLE (WiFi 6)



HARDWARE SPECIFICATIONS

TYPE OF CARD	2x2 MU-MIMO 802.11ax
MU-MIMO	2x2
MODEL	WLT639
CHIPSET	QCA6391
STANDARD	802.11a/b/g/n/ac/ax
THEORETICAL RATE	573.6Mbps @ 2.4GHz, 1201Mbps @ 5GHz
FORM FACTOR	Key E
SPECTRUM	2.412-2.483GHz, 5.150-5.850GHz
REFERENCE DESIGN	HST04
HOST INTERFACE	M.2 E Key
OPERATING VOLTAGE	3.3V
POWER (PER CHAIN)	16dBm @ 2.4GHz, 15dBm @ 5GHz
POWER CONSUMPTION	TX: 798.12mA; RX: 196.8mA
CHANNEL SUPPORT	Supports 20/40MHz at 2.4GHz, Supports 20/40/80 at 5GHz
ANTENNA CONNECTOR	2x MHF4 Connectors
MODULATION TECHNIQUES	OFDMA (DPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM)
OPERATING ENVIRONMENT	-20°C to 70°C
CERTIFICATION	REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	22 x 30 x 2.8

WLAN + BLE (WiFi 5)



HARDWARE SPECIFICATIONS

TYPE OF CARD	System-on-chip (SoC) 1x1 WLAN and Bluetooth	M.2 2230 2x2 MU-MIMO 802.11ac
MIMO	1x1	2x2
MODEL	WSD377	WLT674
CHIPSET	QCA9377-3	QCA6174A-5
STANDARD	802.11a/b/g/n/ac	802.11a/b/g/n/ac
THEORETICAL RATE	433Mbps	867Mbps
FORM FACTOR	Single-die	M.2 2230, Key A+E
SPECTRUM	2.412-2.472GHz, 5.180-5.825GHz	2.412-2.472GHz, 5.150-5.850GHz
REFERENCE DESIGN	WB396	NFA364
HOST INTERFACE	SDIO	M.2 E KEY
OPERATING VOLTAGE	3.3V DC	3.3V DC
POWER (PER CHAIN)	16dBm @ 2.4GHz, 11dBm @ 5GHz	18dBm @ 2.4GHz, 10.5dBm @ 5GHz
POWER CONSUMPTION	3.83W (Max)	TX: 610mA, RX: 280mA
CHANNEL SUPPORT	20/40MHz @ 2.4GHz, 20/40/80MHz @ 5GHz	20/40MHz @ 2.4GHz, 20/40/80MHz @ 5GHz
ANTENNA CONNECTOR	SDIO	2x U.FL connectors
MODULATION TECHNIQUES	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
OPERATING ENVIRONMENT	-20°C to 70°C	-20°C to 70°C
CERTIFICATION	CE RED, REACH & RoHS Compliance	CE, FCC, IC, REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	12 x 12 x 2.5	22 x 30 x 3

802.11ac Wave 2 (WiFi 5)



HARDWARE SPECIFICATIONS

TYPE OF CARD	Standard size 4x4 MU-MIMO 802.11ac Wave 2	Standard size 4x4 MU-MIMO 802.11ac Wave 2	Standard size 4x4 MU-MIMO 802.11ac Wave 2	Standard size 4x4 MU-MIMO 802.11ac Wave 2	Wide Size 4x4 MU-MIMO 802.11ac Wave 2
MIMO	4x4	4x4	4x4	4x4	4x4
MODEL	WLEI216VX-1	WLEI216VX	WLEI216V5-20	WLEI216V5-20-1	WLEI216V5-23
CHIPSET	QCA9994	QCA9984	QCA9984	QCA9994	QCA9984
STANDARD	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/n/ac	802.11a/n/ac	802.11a/n/ac
THEORETICAL RATE	800Mbps @ 2.4GHz 1733Mbps @ 5GHz	800Mbps @ 2.4GHz 1733Mbps @ 5GHz	1733Mbps	1733Mbps	1733Mbps
FORM FACTOR	Standard size	Standard size	Standard size	Standard size	Wide size
SPECTRUM	2.412-2.472GHz, 5.180-5.825GHz	2.412-2.472GHz, 5.180-5.825GHz	5.180-5.825GHz	5.180-5.825GHz	5.180-5.825GHz
REFERENCE DESIGN	CAS03	CAS03	CUS239	CUS239	CUS239
HOST INTERFACE	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe
OPERATING VOLTAGE	3.3V DC	3.3V DC	3.3V DC	3.3V DC	5V DC
POWER (PER CHAIN)	20dBm @ 2.4GHz 19dBm @ 5GHz	20dBm @ 2.4GHz 19dBm @ 5GHz	20dBm @ 5GHz	20dBm @ 5GHz	23dBm @ 5GHz
POWER CONSUMPTION	9W (Max)	9W (Max)	8.5W (Max)	8.5W (Max)	13W (Max)
CHANNEL SUPPORT	20/40/80/80+80MHz	20/40/80/80+80MHz	20/40/80/80+80MHz	20/40/80/80+80MHz	20/40/80/80+80MHz
ANTENNA CONNECTOR	4x U.FL	4x U.FL	4x U.FL	4x U.FL	4x U.FL
MODULATION TECHNIQUES	CCCK, OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	CCCK, OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
OPERATING ENVIRONMENT	-40°C to 85°C	-20°C to 70°C	-20°C to 70°C	-40°C to 85°C	-20°C to 70°C
CERTIFICATION	REACH & RoHS Compliance	REACH & RoHS Compliance	FCC, CE, REACH & RoHS Compliance	FCC, CE, REACH & RoHS Compliance	REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	29.9 x 50.8 x 12.9	29.9 x 50.8 x 12.9	29.9 x 50.8 x 12.9	29.9 x 50.8 x 12.9	73.7 x 51.0 x 5.5

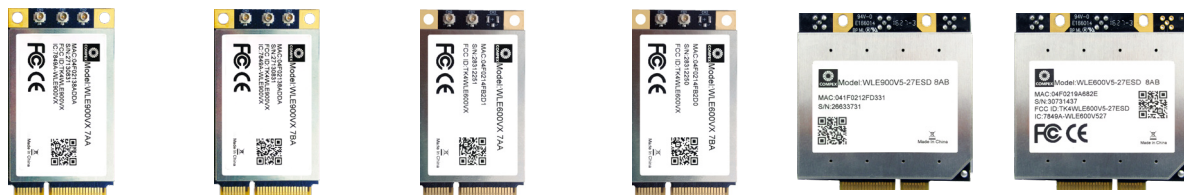
802.11ac Wave 2 (WiFi 5)



HARDWARE SPECIFICATIONS

TYPE OF CARD	Standard size 4x4 MU-MIMO 802.11n	Standard size 4x4 MU-MIMO 802.11ac Wave 2	Standard size 2x2 MU-MIMO 802.11ac Wave 2	Standard size 2x2 MU-MIMO 802.11ac Wave 2
MIMO	4x4	4x4	2x2	2x2
MODEL	WLEI216V2-20	WLEI216V2-20-1	WLE650V5-25A	WLE650V5-18A
CHIPSET	QCA9984	QCA9994	QCA9888	QCA9888
STANDARD	802.11b/g/n/ac	802.11b/g/n/ac	802.11a/n/ac	802.11a/n/ac
THEORETICAL RATE	800Mbps	800Mbps	867Mbps	867Mbps
FORM FACTOR	Standard size	Standard size	Standard size	Standard size
SPECTRUM	2.412-2.472GHz	2.412-2.472GHz	5.180-5.825GHz	5.180-5.825GHz
REFERENCE DESIGN	CUS260	CUS260	BSR02	BSR02
HOST INTERFACE	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe
OPERATING VOLTAGE	3.3V DC	3.3V DC	3.3V and 5V DC	3.3V DC
POWER (PER CHAIN)	20dBm @ 2.4GHz	20dBm @ 2.4GHz	25dBm @ 5GHz	18dBm @ 5GHz
POWER CONSUMPTION	6.68W (Max)	6.68W (Max)	9.49W (Max)	5.6W (Max)
CHANNEL SUPPORT	20/40MHz	20/40MHz	20/40/80/80+80MHz	20/40/80/80+80MHz
ANTENNA CONNECTOR	4x U.FL	4x U.FL	2x MMCX	2x U.FL
MODULATION TECHNIQUES	CCIK, OFDM: BPSK, QPSK, 16-QAM, 64-QAM	CCIK, OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM	BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM
OPERATING ENVIRONMENT	-20°C to 70°C	-40°C to 85°C	-20°C to 70°C	-20°C to 70°C
CERTIFICATION	FCC, CE, REACH & RoHS Compliance	FCC, CE, REACH & RoHS Compliance	REACH & RoHS Compliance	REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	29.9 x 50.8 x 12.9	29.9 x 50.8 x 12.9	29.9 x 50.8 x 12.2	29.9 x 50.8 x 10.4

802.11ac Wave 1 (WiFi 5)



HARDWARE SPECIFICATIONS

TYPE OF CARD	Standard size 3x3 MIMO 802.11ac	Standard size Industrial Grade 3x3 MIMO 802.11ac	Standard size 2x2 MIMO 802.11ac	Standard size Industrial Grade 2x2 MIMO 802.11ac	Wide card High Power 2x2 MIMO 802.11ac	Wide card High Power 2x2 MIMO 802.11ac
MIMO	3x3	3x3	2x2	2x2	3x3	2x2
MODEL	WLE900VX	WLE900VX-I	WLE600VX	WLE600VX-I	WLE900V5-27ESD	WLE600V5-27ESD
CHIPSET	QCA9880	QCA9890	QCA9882	QCA9892	QCA9880	QCA9882
STANDARD	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/n/ac	802.11a/n/ac
THEORETICAL RATE	1300Mbps	1300Mbps	867Mbps	867Mbps	1300Mbps	867Mbps
FORM FACTOR	Standard size	Standard size	Standard size	Standard size	Wide size	Wide size
SPECTRUM	2.412-2.472GHz 5.180-5.825GHz	2.412-2.472GHz 4.920-5.825GHz	2.412-2.472GHz 5.180-5.825GHz	2.412-2.472GHz 4.920-5.825GHz	5.180-5.825GHz	5.180-5.825GHz
REFERENCE DESIGN	XB140	XB140	XB140	XB140	CUS223	CUS223
HOST INTERFACE	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe	MiniPCIe
OPERATING VOLTAGE	3.3V DC	3.3V DC	3.3V DC	3.3V DC	3.3V and 5V DC	3.3V and 5V DC
POWER (PER CHAIN)	21dBm @ 2.4GHz 20dBm @ 5GHz	21dBm @ 2.4GHz 20dBm @ 5GHz	21dBm @ 2.4GHz 20dBm @ 5GHz	21dBm @ 2.4GHz 20dBm @ 5GHz	27dBm @ 5GHz	27dBm @ 5GHz
POWER CONSUMPTION	5W (Max)	5W (Max)	3.5W (Max)	3.5W (Max)	10W (Max)	7.5W (Max)
CHANNEL SUPPORT	20/40/80MHz	20/40/80MHz	20/40/80MHz	20/40/80MHz	20/40/80MHz	20/40/80MHz
ANTENNA CONNECTOR	3x U.FL	3x U.FL	2x U.FL	2x U.FL	3x MMCX	2x MMCX
MODULATION TECHNIQUES	OFDM: BPSK, QPSK, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM	OFDM: BPSK, QPSK, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM, 256-QAM	BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM	BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM
OPERATING ENVIRONMENT	-20°C to 70°C	-40°C to 70°C*	-20°C to 70°C	-40°C to 70°C*	-20°C to 70°C with normal heatsink, -40°C to 80°C with large heatsink	-20°C to 70°C with normal heatsink, -40°C to 85°C with large heatsink
CERTIFICATION	FCC, CE, REACH & RoHS	FCC, CE, REACH & RoHS Compliance	FCC, CE, REACH & RoHS Compliance	FCC, CE, REACH & RoHS Compliance	REACH & RoHS Compliance	FCC, CE, IC, REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	29.85 x 50.8 x 3.2	29.85 x 50.8 x 3.2	29.85 x 50.8 x 3.2	29.85 x 50.8 x 3.2	50 x 51 x 12.5 with normal heatsink, 95 x 51 x 13 with large heatsink	50 x 51 x 12.5 with normal heatsink, 95 x 51 x 13 with large heatsink

*The wireless module can operate up to 90°C. For long term reliability, it is recommended that a 20°C safety margin be maintained.

802.11n (WiFi 4)



HARDWARE SPECIFICATIONS

TYPE OF CARD	Half size 2x2 MIMO 802.11n
MIMO	2x2
MODEL	WLE200N2
CHIPSET	AR9287
STANDARD	802.11b/g/n
THEORETICAL RATE	300Mbps
FORM FACTOR	Half size
SPECTRUM	2.412-2.484GHz
REFERENCE DESIGN	HB97
HOST INTERFACE	MiniPCIe
OPERATING VOLTAGE	3.3V DC
POWER (PER CHAIN)	16dBm @ 2.4GHz
POWER CONSUMPTION	1.9W
CHANNEL SUPPORT	20/40MHz
ANTENNA CONNECTOR	2x U.FL
MODULATION TECHNIQUES	OFDM: BPSK, QPSK, 16-QAM, 64-QAM DSSS: DBPSK, DQPSK, CCK
OPERATING ENVIRONMENT	-20°C to 70°C
CERTIFICATION	IC, CE, FCC, REACH & RoHS Compliance
DIMENSIONS (W x H x D) in mm	30 x 26.8 x 3.2