



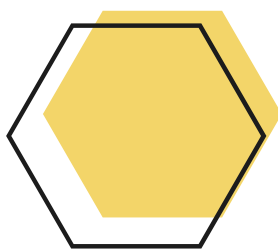
BlackPepper 6 DATASHEET

BKP6-AX2AX2-2450



IEEE 802.11 a/b/g/n/ac/ax

High-Performance, Dual independent Radio operating in ISM 2.4 GHz license-free Band and 4.9/5 GHz Bands, 2x2 MU-MIMO



Optimized SWaP-C

Size, Weight, Power, Cost
Optimized Radio Module



Industrial grade

-40 deg C to +85 deg C
operation temperature



VIZMONET PTE LTD

21 Woodlands Close, #03-01, Primz Biz Hub, Singapore 737 854
+65 6255 0581 | enquiry@vizmonet.com | <https://vizmonet.com>

HW REV# 02.00
Last updated on Apr-19-25

SWaP-C Optimized Design



Industry Standard Connectors for Power, USB and Ethernet Signals



Additional Heatsink Options

TECHNICAL SPECIFICATION

RADIO MODULE – GENERAL INFO	
Radio chipset	Qualcomm IPQ 6028 – Quad Arm Cortex A53 at 1.8 GHz (CPU) QCA 8081 (Ethernet PHY)
NOR Flash	SPI NOR Flash, 32 MB
NAND Flash	NAND Flash, 256 MB
RAM	DDR3L, 1 GB
Operating System	Linux, OPENWRT, supports open source ath11K Linux driver
Security	AES 128, 256, SHA 1-96, 128, 256, 512, CCM and GCM operation FIPS level 2 certification
Operating frequency – 11 b/g/n/ac/ax	2400 MHz to 2483.5 MHz (2S, MU-MIMO)
Operating frequency – 11 a/n/ac/ax	4900 MHz to 5850 MHz (2S, MU-MIMO)
Data rate -11b	1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps
Data rate-11g	6Mbps, 9Mbps, 12Mbps, 18 Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data rate-11n	MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7
Data rate-11ac	MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7, MCS8, MCS9, MCS10, MCS11
Data rate-11ax	MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7, MCS8, MCS9, MCS10, MCS11,
Channel BW – 2.4 GHz, 4.9 GHz	5 MHz/10 MHz/20 MHz /40 MHz
Channel BW – 5 GHz	5 MHz/10 MHz/20 MHz /40 MHz/80 MHz
Compliance	RoHS, MIL-STD-810H Shock & Vibration
MAC ID	74E277 Series
INTERFACE SPECIFICATIONS	
Power , Operating Voltage	DC in, 9V to 30V
Total DC Power Consumption	21W (Excluding USB Add-on)
RF Antenna connector	x4 SMA Female (Jack) connectors
ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature Range	-40 deg C to +85 deg C
PHYSICAL SPECIFICATIONS	
Mechanical Dimension	(L) 90 mm x (W) 50 mm x (D) 11.4 mm (excluding SMA connectors)
Weight	100g
REGULATORY INFORMATION	
Compliance	In Progress
PACKAGING INFORMATION	
No of units	TBD

ORDERING INFORMATION

BKP6-AX2AX2-2450

BlackPepper 6, Dual Independent, 2x2 MU-MIMO,
IEEE 802.11 a/b/g/n/ac/ax, 2.4 GHz, 5 GHz Bands, 30 dBm

RADIO SPECIFICATION

TX/RX Specification (11b/g) – 2412 MHz to 2462 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 2.4 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
1 Mbps	DBPSK	27	11.5	-100
2 Mbps	DQPSK	27	11.5	-96
5.5 Mbps	QPSK	27	11.5	-94
11 Mbps	QPSK	27	11.5	-89
6 Mbps	BPSK	27	11.5	-96
9 Mbps	BPSK	27	11.5	-94
12 Mbps	QPSK	27	11.5	-93
18 Mbps	QPSK	27	11.5	-91
24 Mbps	16-QAM	26	10.5	-86
36 Mbps	16-QAM	26	10.5	-83
48 Mbps	64-QAM	25	10	-80
54 Mbps	64-QAM	24	9.5	-78

TX/RX Specification (11n) – 2412 MHz to 2462 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 2.4 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HT20-MCS0	BPSK	27	11.5	-94
HT20-MCS1	QPSK	27	11.5	-90
HT20-MCS2	QPSK	27	11.5	-88
HT20-MCS3	16-QAM	26	10.5	-85
HT20-MCS4	16-QAM	26	10.5	-81
HT20-MCS5	64-QAM	25	10	-77
HT20-MCS6	64-QAM	24	9.75	-76
HT20-MCS7	64-QAM	23	9.5	-74
HT40-MCS0	BPSK	27	11.5	-91
HT40-MCS1	QPSK	27	11.5	-87
HT40-MCS2	QPSK	27	11.5	-85
HT40-MCS3	16-QAM	26	10.5	-82
HT40-MCS4	16-QAM	26	10.5	-78
HT40-MCS5	64-QAM	25	10	-74
HT40-MCS6	64-QAM	24	9.75	-73
HT40-MCS7	64-QAM	23	9.5	-71

TX/RX Specification (11ac) – 2412 MHz to 2462 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 2.4 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT20-MCS0	BPSK	27	11.5	-96
VHT20-MCS1	QPSK	27	11.5	-94
VHT20-MCS2	QPSK	27	11.5	-92
VHT20-MCS3	16-QAM	26	10.5	-89
VHT20-MCS4	16-QAM	26	10.5	-85
VHT20-MCS5	64-QAM	25	10	-81
VHT20-MCS6	64-QAM	24	9.75	-80
VHT20-MCS7	64-QAM	23	9.5	-79
VHT20-MCS8	256-QAM	22	9.25	-74
VHT20-MCS9	256-QAM	21	9	-72
VHT20-MCS10	1024-QAM	21	9	-69
VHT20-MCS11	1024-QAM	21	9	-67
VHT40-MCS0	BPSK	27	11.5	-93
VHT40-MCS1	QPSK	27	11.5	-91
VHT40-MCS2	QPSK	27	11.5	-89
VHT40-MCS3	16-QAM	26	10.5	-86
VHT40-MCS4	16-QAM	26	10.5	-82
VHT40-MCS5	64-QAM	25	10	-78
VHT40-MCS6	64-QAM	24	9.75	-77
VHT40-MCS7	64-QAM	23	9.5	-76
VHT40-MCS8	256-QAM	22	9.25	-71
VHT40-MCS9	256-QAM	21	9	-69
VHT40-MCS10	1024-QAM	21	9	-66
VHT40-MCS11	1024-QAM	21	9	-64

TX/RX Specification (11ax) – 2412 MHz to 2462 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 2.4 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HE20-MCS0	BPSK	27	11.5	-94
HE20-MCS1	QPSK	27	11.5	-93
HE20-MCS2	QPSK	27	11.5	-91
HE20-MCS3	16-QAM	26	10.5	-89
HE20-MCS4	16-QAM	26	10.5	-85
HE20-MCS5	64-QAM	25	10	-81
HE20-MCS6	64-QAM	24	9.75	-80
HE20-MCS7	64-QAM	23	9.5	-78
HE20-MCS8	256-QAM	22	9.25	-75
HE20-MCS9	256-QAM	21	9	-73
HE20-MCS10	1024-QAM	21	9	-70
HE20-MCS11	1024-QAM	21	9	-67
HE40-MCS0	BPSK	27	11.5	-91
HE40-MCS1	QPSK	27	11.5	-90
HE40-MCS2	QPSK	27	11.5	-88
HE40-MCS3	16-QAM	26	10.5	-86
HE40-MCS4	16-QAM	26	10.5	-82
HE40-MCS5	64-QAM	25	10	-78
HE40-MCS6	64-QAM	24	9.75	-77
HE40-MCS7	64-QAM	23	9.5	-75
HE40-MCS8	256-QAM	22	9.25	-72
HE40-MCS9	256-QAM	21	9	-70
HE40-MCS10	1024-QAM	21	9	-67
HE40-MCS11	1024-QAM	21	9	-64

TX Specification - 2412 MHz to 2462 MHz

Parameter	Specification
RF Power control Step	0.5 dBm
Spectral Mask Compliance	Compliant with IEEE 802.11b/g/n/ac/ax Mask, with > 5 dB margin
EVM Compliance	Compliant with IEEE 802.11b/g/n/ac/ax EVM requirement with > 5 dB margin
Second Harmonic Spurious Emission	-30 dBC
Third Harmonic Spurious Emission	-40 dBC
Transmitter Spurious Emission	FCC PART 15C COMPLIANT

RX Specification - 2412 MHz to 2462 MHz

Parameter	Specification
Receiver Maximum input level (10% PER)	
11b, 11g < 18 Mbps, 11n/11ac/11ax < MCS5	> 2 dBm
11b, 11g > 18 Mbps, 11n/11ac/11ax > MCS5	> -10 dBm
Frequency Accuracy	Within $\pm$ 10 PPM
Receiver Adjacent Channel Rejection (ACR)	
11g, 6 Mbps	> 25 dBC
11ac, 11ax, HE40-MCS0	> 30 dBC
11ax, HE40-MCS11	> 11 dBC
Interference De-sensitization 11ax, HE20-MCS13	
400 MHz to 2350 MHz	> 50 dBC
4800 MHz to 5825 MHz	> 60 dBC

TX/RX Specification (11a/n) – 4920 MHz to 5500 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 4.9/5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Target Power are defined for 4.9 GHz (4920 MHz-4990 MHz) with channel BW 5/10/20 MHz.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
6 Mbps	BPSK	27	12.5	-94
9 Mbps	BPSK	27	12.5	-92
12 Mbps	QPSK	26	11.5	-91
18 Mbps	QPSK	26	11.5	-90
24 Mbps	16-QAM	25	10.5	-85
36 Mbps	16-QAM	24	10	-82
48 Mbps	64-QAM	23	9.5	-77
54 Mbps	64-QAM	22	9	-76
HT20-MCS0	BPSK	27	12.5	-92
HT20-MCS1	QPSK	26	11.5	-89
HT20-MCS2	QPSK	26	11.5	-87
HT20-MCS3	16-QAM	24	10	-83
HT20-MCS4	16-QAM	24	10	-80
HT20-MCS5	64-QAM	23	9.5	-76
HT20-MCS6	64-QAM	21	8.5	-74
HT20-MCS7	64-QAM	21	8.5	-73
HT40-MCS0	BPSK	27	12.5	-89
HT40-MCS1	QPSK	26	11.5	-86
HT40-MCS2	QPSK	26	11.5	-84
HT40-MCS3	16-QAM	24	10	-80
HT40-MCS4	16-QAM	22	9	-77
HT40-MCS5	64-QAM	22	9	-73
HT40-MCS6	64-QAM	21	8.5	-71
HT40-MCS7	64-QAM	21	8.5	-70

TX/RX Specification (11a/n) – 5500 MHz to 5700 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power per chain (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
6 Mbps	BPSK	27	12.5	-94
9 Mbps	BPSK	27	12.5	-92
12 Mbps	QPSK	27	12.5	-91
18 Mbps	QPSK	27	12.5	-90
24 Mbps	16-QAM	25	10.5	-85
36 Mbps	16-QAM	25	10.5	-82
48 Mbps	64-QAM	24	10	-77
54 Mbps	64-QAM	23	9.5	-76
HT20-MCS0	BPSK	27	12.5	-92
HT20-MCS1	QPSK	27	12.5	-89
HT20-MCS2	QPSK	27	12.5	-87
HT20-MCS3	16-QAM	25	10.5	-83
HT20-MCS4	16-QAM	25	10.5	-80
HT20-MCS5	64-QAM	24	10	-76
HT20-MCS6	64-QAM	23	9.5	-74
HT20-MCS7	64-QAM	22	9	-73
HT40-MCS0	BPSK	27	12.5	-89
HT40-MCS1	QPSK	26	11.5	-86
HT40-MCS2	QPSK	26	11.5	-84
HT40-MCS3	16-QAM	25	10.5	-80
HT40-MCS4	16-QAM	22	9	-77
HT40-MCS5	64-QAM	22	9	-73
HT40-MCS6	64-QAM	21	8.5	-71
HT40-MCS7	64-QAM	21	8.5	-70

TX/RX Specification (11a/n) – 5700 MHz to 5860 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power per chain (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
6 Mbps	BPSK	27	12.5	-94
9 Mbps	BPSK	27	12.5	-92
12 Mbps	QPSK	26	11.5	-91
18 Mbps	QPSK	26	11.5	-90
24 Mbps	16-QAM	25	10.5	-85
36 Mbps	16-QAM	24	10	-82
48 Mbps	64-QAM	23	9.5	-77
54 Mbps	64-QAM	22	9	-76
HT20-MCS0	BPSK	27	12.5	-92
HT20-MCS1	QPSK	26	11.5	-89
HT20-MCS2	QPSK	26	11.5	-87
HT20-MCS3	16-QAM	24	10	-83
HT20-MCS4	16-QAM	23	9.5	-80
HT20-MCS5	64-QAM	23	9.5	-76
HT20-MCS6	64-QAM	22	9	-74
HT20-MCS7	64-QAM	21	8.5	-73
HT40-MCS0	BPSK	27	12.5	-89
HT40-MCS1	QPSK	26	11.5	-86
HT40-MCS2	QPSK	26	11.5	-84
HT40-MCS3	16-QAM	25	10.5	-80
HT40-MCS4	16-QAM	22	9	-77
HT40-MCS5	64-QAM	22	9	-73
HT40-MCS6	64-QAM	21	8.5	-71
HT40-MCS7	64-QAM	21	8.5	-70

TX/RX Specification (11ac) – 4920 MHz to 5500 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 4.9/5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Target Power are defined for 4.9 GHz (4920 MHz-4990 MHz) with channel BW 5/10/20 MHz.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT20-MCS0	BPSK	27	12.5	-95
VHT20-MCS1	QPSK	26	11.5	-93
VHT20-MCS2	QPSK	26	11.5	-91
VHT20-MCS3	16-QAM	24	10	-88
VHT20-MCS4	16-QAM	24	10	-84
VHT20-MCS5	64-QAM	23	9	-80
VHT20-MCS6	64-QAM	22	8.5	-79
VHT20-MCS7	64-QAM	21	8.5	-78
VHT20-MCS8	256-QAM	20	8.5	-73
VHT20-MCS9	256-QAM	20	8.5	-71
VHT20-MCS10	1024-QAM	19	8.5	-68
VHT20-MCS11	1024-QAM	19	8.5	-66
VHT40-MCS0	BPSK	27	12.5	-92
VHT40-MCS1	QPSK	26	11.5	-90
VHT40-MCS2	QPSK	26	11.5	-88
VHT40-MCS3	16-QAM	24	10	-85
VHT40-MCS4	16-QAM	22	9	-81
VHT40-MCS5	64-QAM	22	9	-77
VHT40-MCS6	64-QAM	21	8.5	-76
VHT40-MCS7	64-QAM	21	8.5	-75
VHT40-MCS8	256-QAM	20	8.5	-70
VHT40-MCS9	256-QAM	20	8.5	-68
VHT40-MCS10	1024-QAM	18	8.5	-65
VHT40-MCS11	1024-QAM	18	8.5	-63

TX/RX Specification (11ac) – 4920 MHz to 5500 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 4.9/5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Target Power are defined for 4.9 GHz (4920 MHz-4990 MHz) with channel BW 5/10/20 MHz.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT80-MCS0	BPSK	27	12.5	-89
VHT80-MCS1	QPSK	26	11.5	-87
VHT80-MCS2	QPSK	26	11.5	-85
VHT80-MCS3	16-QAM	24	10	-82
VHT80-MCS4	16-QAM	22	9	-78
VHT80-MCS5	64-QAM	22	9	-74
VHT80-MCS6	64-QAM	21	8.5	-73
VHT80-MCS7	64-QAM	21	8.5	-72
VHT80-MCS8	256-QAM	20	8.5	-67
VHT80-MCS9	256-QAM	20	8.5	-65
VHT80-MCS10	1024-QAM	18	8.5	-62
VHT80-MCS11	1024-QAM	18	8.5	-60

TX/RX Specification (11ac) – 5500 MHz to 5700 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT20-MCS0	BPSK	27	12.5	-95
VHT20-MCS1	QPSK	27	12.5	-93
VHT20-MCS2	QPSK	27	12.5	-91
VHT20-MCS3	16-QAM	25	10.5	-88
VHT20-MCS4	16-QAM	25	10.5	-84
VHT20-MCS5	64-QAM	24	10	-80
VHT20-MCS6	64-QAM	23	9.5	-79
VHT20-MCS7	64-QAM	22	9	-78
VHT20-MCS8	256-QAM	22	9	-73
VHT20-MCS9	256-QAM	21	8.5	-71
VHT20-MCS10	1024-QAM	21	8.5	-68
VHT20-MCS11	1024-QAM	21	8.5	-66
VHT40-MCS0	BPSK	27	12.5	-92
VHT40-MCS1	QPSK	26	11.5	-90
VHT40-MCS2	QPSK	26	11.5	-88
VHT40-MCS3	16-QAM	25	10.5	-85
VHT40-MCS4	16-QAM	23	9.5	-81
VHT40-MCS5	64-QAM	23	9.5	-77
VHT40-MCS6	64-QAM	22	9	-76
VHT40-MCS7	64-QAM	21	8.5	-75
VHT40-MCS8	256-QAM	21	8.5	-70
VHT40-MCS9	256-QAM	21	8.5	-68
VHT40-MCS10	1024-QAM	20	8.5	-65
VHT40-MCS11	1024-QAM	20	8.5	-63

TX/RX Specification (11ac) – 5500 MHz to 5700 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT80-MCS0	BPSK	27	12.5	-89
VHT80-MCS1	QPSK	27	12.5	-87
VHT80-MCS2	QPSK	25	10.5	-85
VHT80-MCS3	16-QAM	24	10	-82
VHT80-MCS4	16-QAM	23	9.5	-78
VHT80-MCS5	64-QAM	23	9.5	-74
VHT80-MCS6	64-QAM	22	9	-73
VHT80-MCS7	64-QAM	22	9	-72
VHT80-MCS8	256-QAM	21	8.5	-67
VHT80-MCS9	256-QAM	20	8.5	-65
VHT80-MCS10	1024-QAM	19	8.5	-62
VHT80-MCS11	1024-QAM	19	8.5	-60

TX/RX Specification (11ac) – 5700 MHz to 5860 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT20-MCS0	BPSK	27	12.5	-95
VHT20-MCS1	QPSK	26	11.5	-93
VHT20-MCS2	QPSK	26	11.5	-91
VHT20-MCS3	16-QAM	24	10	-88
VHT20-MCS4	16-QAM	23	9.5	-84
VHT20-MCS5	64-QAM	23	9.5	-80
VHT20-MCS6	64-QAM	21	8.5	-79
VHT20-MCS7	64-QAM	21	8.5	-78
VHT20-MCS8	256-QAM	21	8.5	-73
VHT20-MCS9	256-QAM	20	8.5	-71
VHT20-MCS10	1024-QAM	18	8.5	-68
VHT20-MCS11	1024-QAM	17	8.5	-66
VHT40-MCS0	BPSK	27	12.5	-92
VHT40-MCS1	QPSK	26	11.5	-90
VHT40-MCS2	QPSK	26	11.5	-88
VHT40-MCS3	16-QAM	25	10.5	-85
VHT40-MCS4	16-QAM	22	9	-81
VHT40-MCS5	64-QAM	22	9	-77
VHT40-MCS6	64-QAM	21	8.5	-76
VHT40-MCS7	64-QAM	21	8.5	-75
VHT40-MCS8	256-QAM	20	8.5	-70
VHT40-MCS9	256-QAM	20	8.5	-68
VHT40-MCS10	1024-QAM	17	8.5	-65
VHT40-MCS11	1024-QAM	17	8.5	-63

TX/RX Specification (11ac) – 5700 MHz to 5860 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
VHT80-MCS0	BPSK	27	12.5	-89
VHT80-MCS1	QPSK	27	12.5	-87
VHT80-MCS2	QPSK	26	11.5	-85
VHT80-MCS3	16-QAM	25	10.5	-82
VHT80-MCS4	16-QAM	24	10	-78
VHT80-MCS5	64-QAM	23	9.5	-74
VHT80-MCS6	64-QAM	22	9	-73
VHT80-MCS7	64-QAM	22	9	-72
VHT80-MCS8	256-QAM	21	8.5	-67
VHT80-MCS9	256-QAM	20	8.5	-65
VHT80-MCS10	1024-QAM	19	8.5	-62
VHT80-MCS11	1024-QAM	19	8.5	-60

TX/RX Specification (11ax) – 4920 MHz to 5500 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 4.9/5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Target Power are defined for 4.9 GHz (4920 MHz-4990 MHz) with channel BW 5/10/20 MHz.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HE20-MCS0	BPSK	27	12.5	-93
HE20-MCS1	QPSK	27	12.5	-92
HE20-MCS2	QPSK	26	11.5	-90
HE20-MCS3	16-QAM	24	10	-88
HE20-MCS4	16-QAM	24	10	-84
HE20-MCS5	64-QAM	23	9.5	-80
HE20-MCS6	64-QAM	22	9	-78
HE20-MCS7	64-QAM	21	8.5	-76
HE20-MCS8	256-QAM	20	8.5	-73
HE20-MCS9	256-QAM	20	8.5	-71
HE20-MCS10	1024-QAM	18	8.5	-68
HE20-MCS11	1024-QAM	18	8.5	-65
HE40-MCS0	BPSK	27	12.5	-90
HE40-MCS1	QPSK	26	11.5	-89
HE40-MCS2	QPSK	26	11.5	-87
HE40-MCS3	16-QAM	24	10	-85
HE40-MCS4	16-QAM	24	10	-81
HE40-MCS5	64-QAM	23	9.5	-77
HE40-MCS6	64-QAM	22	9	-75
HE40-MCS7	64-QAM	21	8.5	-73
HE40-MCS8	256-QAM	20	8.5	-70
HE40-MCS9	256-QAM	19	8.5	-68
HE40-MCS10	1024-QAM	18	8.5	-65
HE40-MCS11	1024-QAM	18	8.5	-62

TX/RX Specification (11ax) – 4920 MHz to 5500 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 4.9/5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Target Power are defined for 4.9 GHz (4920 MHz-4990 MHz) with channel BW 5/10/20 MHz.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HE80-MCS0	BPSK	27	12.5	-87
HE80-MCS1	QPSK	26	11.5	-86
HE80-MCS2	QPSK	26	11.5	-84
HE80-MCS3	16-QAM	24	10	-82
HE80-MCS4	16-QAM	24	10	-78
HE80-MCS5	64-QAM	23	9.5	-74
HE80-MCS6	64-QAM	22	9	-72
HE80-MCS7	64-QAM	21	8.5	-70
HE80-MCS8	256-QAM	20	8.5	-67
HE80-MCS9	256-QAM	19	8.5	-65
HE80-MCS10	1024-QAM	18	8.5	-62
HE80-MCS11	1024-QAM	18	8.5	-59

TX/RX Specification (11ax) – 5500 MHz to 5700 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HE20-MCS0	BPSK	27	12.5	-93
HE20-MCS1	QPSK	27	12.5	-92
HE20-MCS2	QPSK	27	12.5	-90
HE20-MCS3	16-QAM	25	10.5	-88
HE20-MCS4	16-QAM	25	10.5	-84
HE20-MCS5	64-QAM	23	9.5	-80
HE20-MCS6	64-QAM	22	9	-78
HE20-MCS7	64-QAM	22	9	-76
HE20-MCS8	256-QAM	21	8.5	-73
HE20-MCS9	256-QAM	21	8.5	-71
HE20-MCS10	1024-QAM	20	8.5	-68
HE20-MCS11	1024-QAM	20	8.5	-65
HE40-MCS0	BPSK	27	12.5	-90
HE40-MCS1	QPSK	26	11.5	-89
HE40-MCS2	QPSK	26	11.5	-87
HE40-MCS3	16-QAM	25	10.5	-85
HE40-MCS4	16-QAM	24	10	-81
HE40-MCS5	64-QAM	23	9.5	-77
HE40-MCS6	64-QAM	22	9	-75
HE40-MCS7	64-QAM	21	8.5	-73
HE40-MCS8	256-QAM	21	8.5	-70
HE40-MCS9	256-QAM	21	8.5	-68
HE40-MCS10	1024-QAM	20	8.5	-65
HE40-MCS11	1024-QAM	20	8.5	-62

TX/RX Specification (11ax) – 5500 MHz to 5700 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HE80-MCS0	BPSK	27	12.5	-87
HE80-MCS1	QPSK	27	12.5	-86
HE80-MCS2	QPSK	26	11.5	-84
HE80-MCS3	16-QAM	24	10	-82
HE80-MCS4	16-QAM	24	10	-78
HE80-MCS5	64-QAM	23	9.5	-74
HE80-MCS6	64-QAM	22	9	-72
HE80-MCS7	64-QAM	22	9	-70
HE80-MCS8	256-QAM	21	8.5	-67
HE80-MCS9	256-QAM	20	8.5	-65
HE80-MCS10	1024-QAM	19	8.5	-62
HE80-MCS11	1024-QAM	19	8.5	-59

TX/RX Specification (11ax) – 5700 MHz to 5860 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

Data Rate	Modulation	TX Power (dBm)	DC Power Consumption (Watts)	RX Sensitivity (dBm)
HE20-MCS0	BPSK	27	12.5	-93
HE20-MCS1	QPSK	27	12.5	-92
HE20-MCS2	QPSK	26	11.5	-90
HE20-MCS3	16-QAM	24	10	-88
HE20-MCS4	16-QAM	24	10	-84
HE20-MCS5	64-QAM	23	9.5	-80
HE20-MCS6	64-QAM	22	9	-78
HE20-MCS7	64-QAM	21	8.5	-76
HE20-MCS8	256-QAM	20	8.5	-73
HE20-MCS9	256-QAM	20	8.5	-71
HE20-MCS10	1024-QAM	17	8.5	-68
HE20-MCS11	1024-QAM	17	8.5	-65
HE40-MCS0	BPSK	27	12.5	-90
HE40-MCS1	QPSK	26	11.5	-89
HE40-MCS2	QPSK	26	11.5	-87
HE40-MCS3	16-QAM	25	10.5	-85
HE40-MCS4	16-QAM	24	10	-81
HE40-MCS5	64-QAM	23	9.5	-77
HE40-MCS6	64-QAM	22	9	-75
HE40-MCS7	64-QAM	21	8.5	-73
HE40-MCS8	256-QAM	20	8.5	-70
HE40-MCS9	256-QAM	19	8.5	-68
HE40-MCS10	1024-QAM	17	8.5	-65
HE40-MCS11	1024-QAM	17	8.5	-62

TX/RX Specification (11ax) – 5700 MHz to 5860 MHz

TX Power per chain (SISO mode), ± 2 dBm.

DC power consumption refers to the total DC power drawn by the module when operating in 2x2 MU-MIMO mode at 5 GHz and it includes the ideal mode power consumption.

RX Sensitivity per chain (SISO mode), ± 2 dBm.

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HE80-MCS2	QPSK	26	11.5	-84
HE80-MCS3	16-QAM	25	10.5	-82
HE80-MCS4	16-QAM	24	10	-78
HE80-MCS5	64-QAM	23	9.5	-74
HE80-MCS6	64-QAM	22	9	-72
HE80-MCS7	64-QAM	22	9	-70
HE80-MCS8	256-QAM	21	8.5	-67
HE80-MCS9	256-QAM	20	8.5	-65
HE80-MCS10	1024-QAM	18	8.5	-62
HE80-MCS11	1024-QAM	18	8.5	-59

TX Specification - 4900 MHz to 5900 MHz

Parameter	Specification
RF Power control Step	0.5 dBm
Spectral Mask Compliance	Compliant with IEEE 802.11an/ac/ax Mask, with > 5 dB margin
EVM Compliance	Compliant with IEEE 802.11a/n/ac/ax EVM requirement with > 5 dB margin
Second Harmonic Spurious Emission	-60 dBC
Third Harmonic Spurious Emission	-70 dBC
Transmitter Spurious Emission	FCC PART 15E COMPLIANT

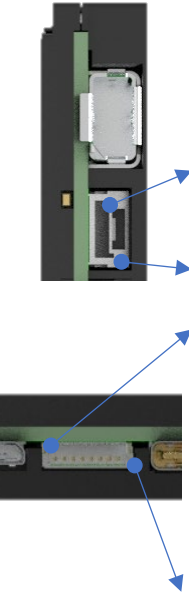
RX Specification - 4900 MHz to 5900 MHz

Parameter	Specification
Receiver Maximum input level (10% PER)	
11a < 18 Mbps, 11n/11ac/11ax < MCS5	> 2 dBm
11a > 18 Mbps, 11n/11ac/11ax > MCS5	> -10 dBm
Frequency Accuracy	Within ± 10 PPM
Receiver Adjacent Channel Rejection (ACR)	
11n, 6 Mbps	> 25 dBC
11ac VHT40, 11ax HE80-MCS0	> 30 dBC
11ax, HE160-MCS11	> 11 dBC
Interference De-sensitization 11ax, HE20-MCS13	
400 MHz to 2350 MHz	> 70 dBC
2400 MHz to 3600 MHz	> 40 dBC
In Band Interference	> 30 dBC

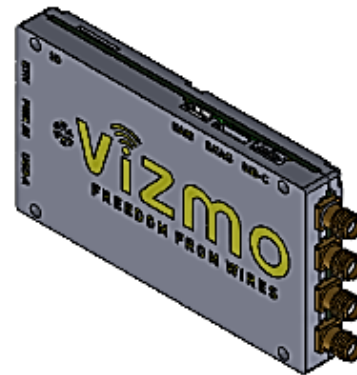
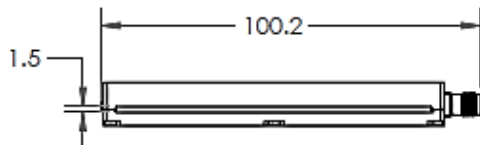
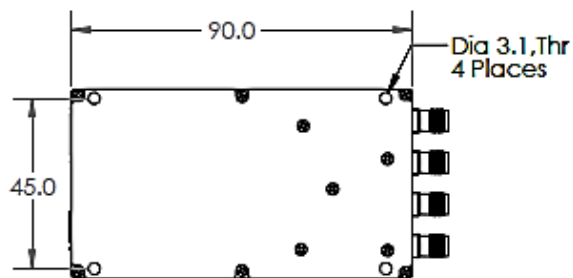
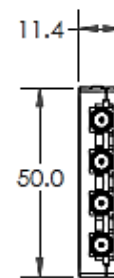
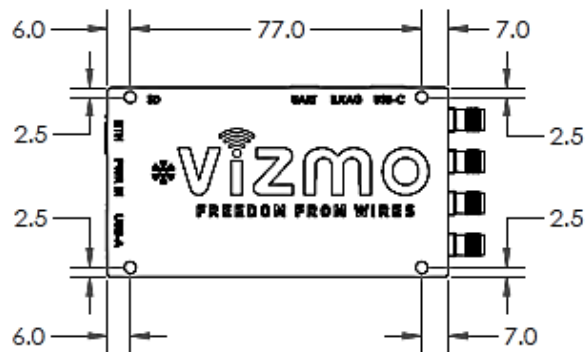
CONNECTION DETAILS

REF	PART
1,2	SMA Connector, 4.9/5 GHz (Ant1,Ant2)
3,4	SMA Connector, 2.4 GHz (Ant1,Ant2)
5	Power Connector, JST SM04B-GHS-TB
6	Ethernet Connector, HIROSE IX60G-A-10P
7	USB Type-A Connector for USB 2.0
8	RGB LED
9	USB Micro-B Connector for UART
10	JST SM08B-GHS-TB for EJTAG (On bottom side)
11	USB, Type-C Connector for USB 3.0
12	SD Card Connector

CONNECTION PIN-OUT



CONNECTOR	PIN#	PIN DESCRIPTION
ANTENNA	1	5 GHz Ant1
	2	5 GHz Ant2
	3	2.4 GHz Ant1
	4	2.4 GHZ Ant2
POWER	JST SM04B-GHS-TB – Pin-1 (from left-to-down on Top side)	GND
	JST SM04B-GHS-TB – Pin-2 (from left-to-down on Top side)	GND
	JST SM04B-GHS-TB – Pin-3 (from left-to-down on Top side)	9V to 30V DC POWER
	JST SM04B-GHS-TB – Pin-4 (from left-to-down on Top side)	9V to 30V DC POWER
E-JTAG	JST SM08B-GHS-TB – Pin-1 (from left-to-right on Top side)	EJTAG-SRST
	JST SM08B-GHS-TB – Pin-2 (from left-to-right on Top side)	EJTAG-TDO
	JST SM08B-GHS-TB – Pin-3 (from left-to-right on Top side)	GND
	JST SM08B-GHS-TB – Pin-4 (from left-to-right on Top side)	EJTAG-TCK
	JST SM08B-GHS-TB – Pin-5 (from left-to-right on Top side)	EJTAG-TMS
	JST SM08B-GHS-TB – Pin-6 (from left-to-right on Top side)	EJTAG-TDI
	JST SM08B-GHS-TB – Pin-7 (from left-to-right on Top side)	EJTAG-TRST
	JST SM08B-GHS-TB – Pin-8 (from left-to-right on Top side)	1.8V DC

MECHANICAL DIMENSIONS

vizmo
FREEDOM FROM WIRES

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Contact

Web: <https://vizmonet.com>
Email: enquiry@vizmonet.com

Headquarters

Vizmonet Pte Ltd
21, Woodlands Close
#03-01, Primz Biz Hub
Singapore 737 854

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