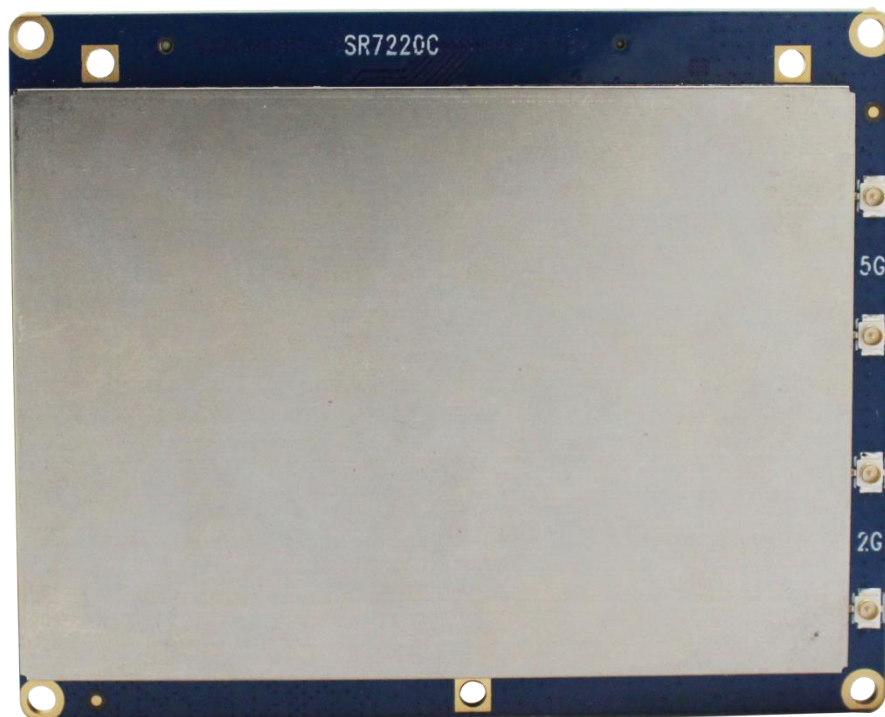


ComIoT 60

High Performance 802.11ax WiFi6 Dual Band

Router Core Module

Product Specifications



- Qualcomm Chipset Solution
- Mesh Solution Support
- 802.11ax WI-Fi Support
- Support Development Resources
- 1800Mbps WIFI Transfer Speed
- Support USB3.0 and Hardware Accelerator

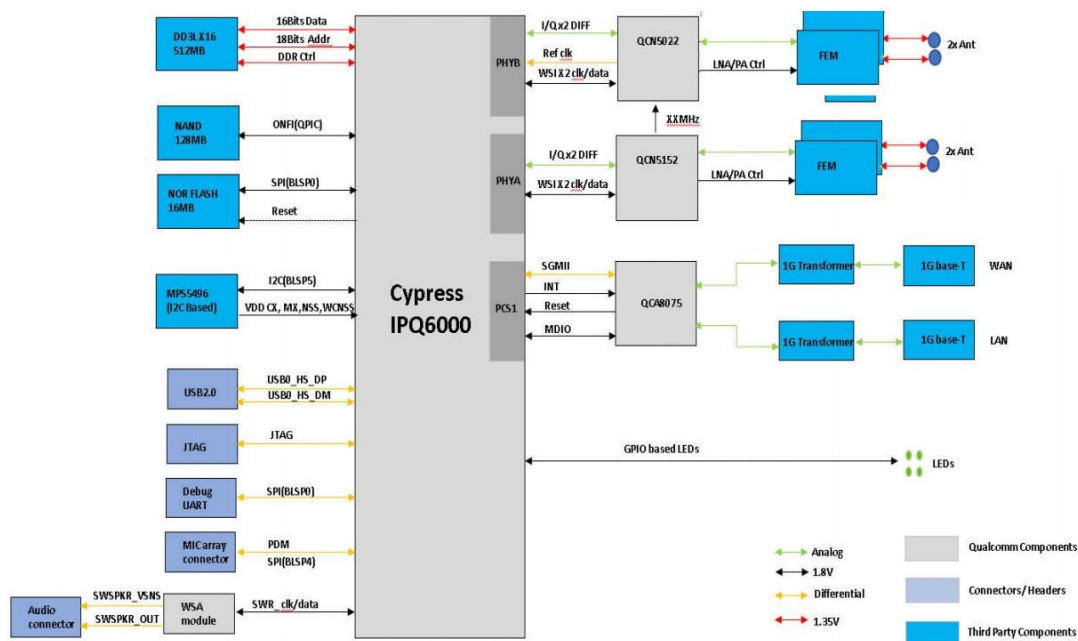
Version 1.0

Document release	Date	Modification	Approved
Version 1.0	2020.11.10	Initial release	
Version 1.1	2021.05.10	Improve RF performance	

Product Description

ComIoT 60 module is a complete small module developed and produced by Shenzhen Movingcomm Technology Co., Ltd. It supports 802.11 a/b/g/n/ac/ax protocols and offers a variety of wifi6 scenario solutions. It is optimized for low-power, low-cost, highly integrated WI-FI6 AP and routing devices for direct use with a simple external interface design.

Designed based on a single-chip IPQ6000, the module is a quad-core ARM Cortex-A7 architecture with a main frequency of up to 710MHz. WiFi supports dual-band 802.11a/b/g/n/ac/ax 2x2 MIMO with a maximum bandwidth of up to 1800Mbps. The module supports both AP and client modes, including a large number of business applications that reduce customer research and design effort. The general hardware architecture is shown in the following image:



Product Features

- Use Qualcomm IPQ6000 solution
- 2.4GHz supports WI-FI6 with a maximum speed of 600Mbps
- 5.8GHz supports WiFi6 with a maximum speed of 1200Mbps
- Support Dynamic Frequency Selection (DFS)
- Memory with DDR3 4GB
- Support 256Mbit SPI NOR Flash
- Support 256MByte NAND Flash
- Ethernet port support 2.5Gbps/1Gbps.
- Support PCIe v3.0
- Support USB 2.0/3.0 & MicroSD support.
- Support for Serial and multiple GPIO

Hardware Specifications

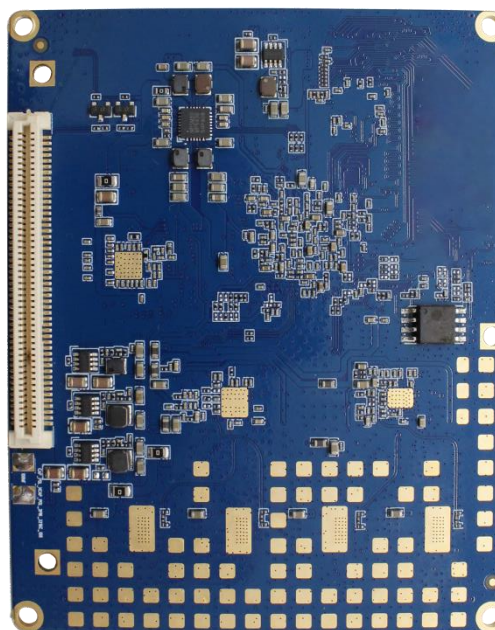
Main Chipset	IPQ6000
RF Frequency	2.40~2.4835GHz & 5.725~5.850GHz
WIFI Standards	802.11a/b/g/n/ac/ax(2X2)
Modulation	11b: DBPSK, DQPSK and CCK and DSSS 11g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: MCS0~15 OFDM 11a:BPSK, QPSK, 16QAM, 64QAM 11ac:BPSK, QPSK, 16QAM, 64QAM, 256QAM,OFDM 11ax:BPSK, QPSK, 16QAM, 64QAM, 256QAM,1024QAM,OFDMA
Theoretical Bandwidth	11b:1, 2, 5.5 and 11Mbps 11g:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~5,MIMO up to 300Mbps 11a:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11ac:wave2,MU-MIMO,up to 867Mbps 11ax:2.4Ghz up to 600Mbps,5.8GHz up to 1200Mbps
Board to Board Connector	100Pin Connector

Main Interfaces	Ethernet*5, UART*1, USB*1, PCIE*1
PCB	4 Layer
Size	86.5mm(W) x 66.5mm(L) x 8.0mm(T)
Antenna	Standard IPEX Connector
Operating Temperature	-20° C to +70° C
Storage Temperature	-40° C to +90° C
Humidity	5% ~ 95%
Static Protection	Human Body Model: -2000V ~ +2000V
Static Protection	Machine Mode: -200V ~ +200V
Operating Voltage	12V +/-10%
Average Power Consumption	4.5W
Cooling Size (Recommend)	80 x 56 x 6 Note: the wifi6 chip operates and has high thermal temperature, the module temperature needed to be in control below $\leq 70^{\circ}\text{C}$
GPIO Output Voltage	1.8 V & 3.3V +/-10%

Product Views

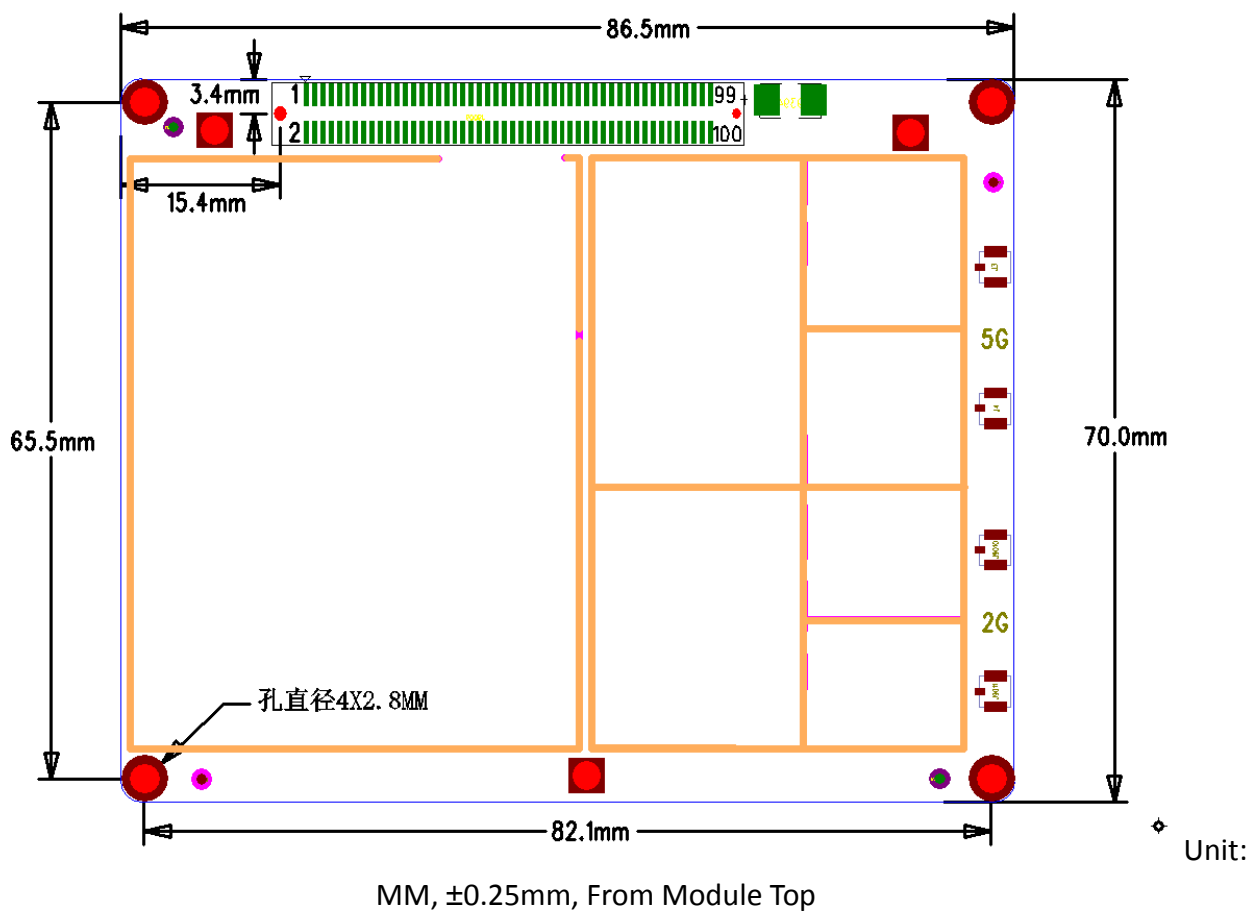


Front

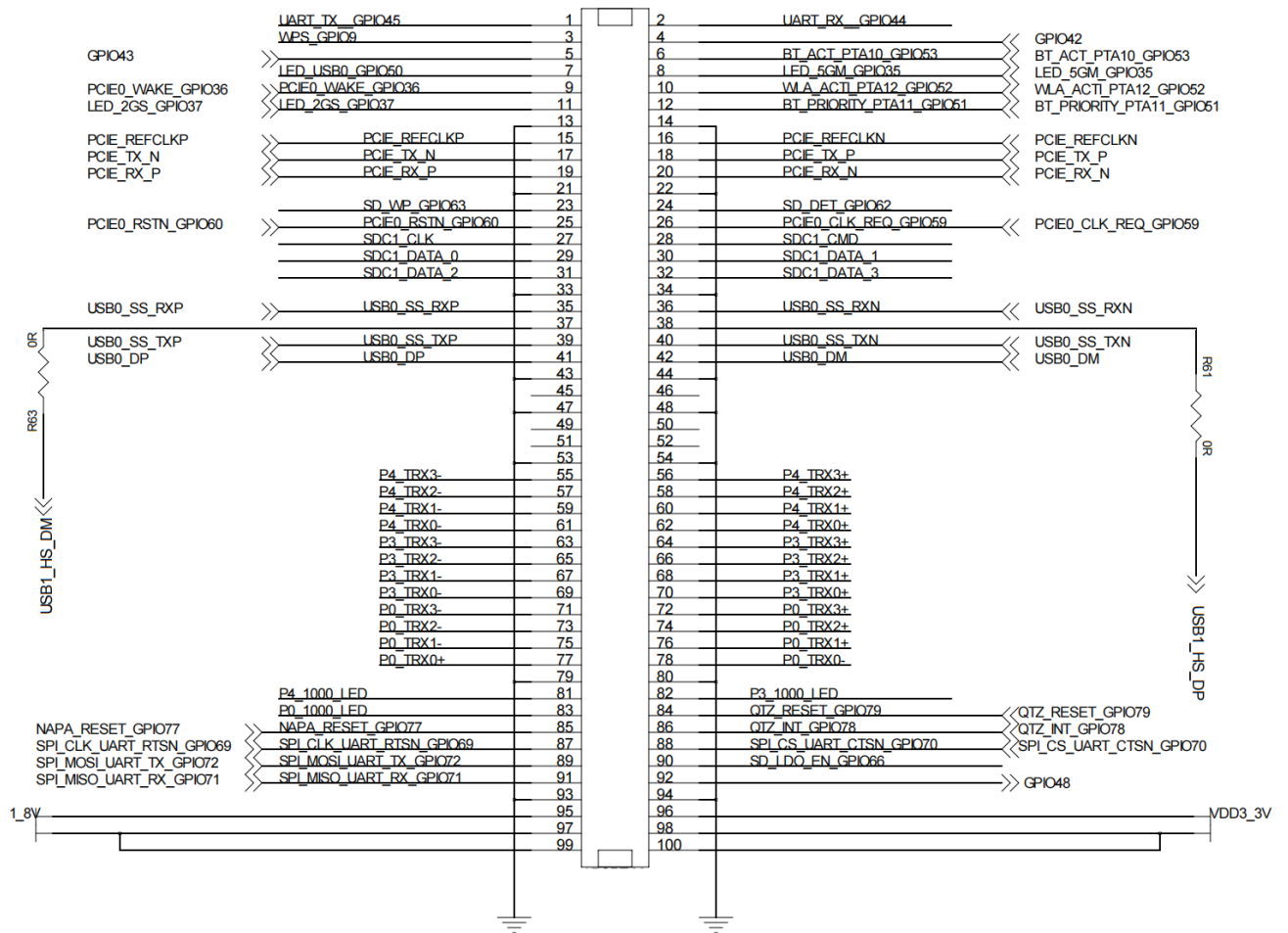


Back

Size and Positioning



Pin Definition



Pin	Name	Description
1	GPIO45-UART-TX	
2	GPIO44-UART-RX	
3	WPS-GPIO9	WPS KEY Pull-down is effective
4	GPIO42	
5	GPIO43	
6	BT_ACT_PTA10_GPIO53	
7	GPIO50	
8	LED_5GM_GPIO35	
9	PCIE0-WAKE-GPIO36	
10	WLA_ACTI_PTA12_GPIO52	
11	GPIO37	
12	BT_PRIORITY_PTA11_GPIO51	
13	GND	GROUND

14	GND	GROUND
15	PCIE_REFCLKP	PCIE 3.0
16	PCIE_REFCLKN	PCIE 3.0
17	PCIE_TX_N	PCIE 3.0
18	PCIE_TX_P	PCIE 3.0
19	PCIE_RX_P	PCIE 3.0
20	PCIE_RX_N	PCIE 3.0
21	GND	GROUND
22	GND	GROUND
23	SD_WP-GPIO63	
24	SD_DET_GPIO62	
25	PCIE0_RSTN_GPIO60	
26	PCIE0_CLK_REQ_GPIO59	
27	SDC1_CLK	
28	SDC1_CMD	
29	SDC1_DATA_0	
30	SDC1_DATA_1	
31	SDC1_DATA_2	
32	SDC1_DATA_3	
33	GND	
34	GND	
35	USB0_SS_RXP	USB 3.0 signal,
36	USB0_SS_RXN	USB 3.0 signal,
37	USB1_HS_DM	USB 2.0 signal,
38	USB1_HS_DP	USB 2.0 signal,
39	USB0_SS_TXP	USB 3.0 signal,
40	USB0_SS_TXN	USB 3.0 signal,
41	USB0_DP	USB 3.0 signal,
42	USB0_DM	USB 3.0 signal,
43	GND	GROUND
44	GND	GROUND
45	CLK_50M_N_NAPA1	
46	CLK_50M_P_NAPA1	
47	GND	GROUND
48	GND	GROUND
49	USXGMII0_RXP	
50	USXGMII0_RXN	
51	USXGMII0_TXN	
52	USXGMII0_TXP	
53	GND	GROUND
54	GND	GROUND

55	P4_TRX3-	Ethernet port
56	P4_TRX3+	Ethernet port
57	P4_TRX2-	Ethernet port
58	P4_TRX2+	Ethernet port
59	P4_TRX1-	Ethernet port
60	P4_TRX1+	Ethernet port
61	P4_TRX0-	Ethernet port
62	P4_TRX0+	Ethernet port
63	P3_TRX3-	Ethernet port
64	P3_TRX3+	Ethernet port
65	P3_TRX2-	Ethernet port
66	P3_TRX2+	Ethernet port
67	P3_TRX1-	Ethernet port
68	P3_TRX1+	Ethernet port
69	P3_TRX0-	Ethernet port
70	P3_TRX0+	Ethernet port
71	P0_TRX3-	Ethernet port
72	P0_TRX3+	Ethernet port
73	P0_TRX2-	Ethernet port
74	P0_TRX2+	Ethernet port
75	P0_TRX1-	Ethernet port
76	P0_TRX1+	Ethernet port
77	P0_TRX0-	Ethernet port
78	P0_TRX0+	Ethernet port
79	GND	
80	GND	
81	P4_1000_LED	Ethernet Port Status Indicator
82	P3_1000_LED	Ethernet Port Status Indicator
83	P0_1000_LED	Ethernet Port Status Indicator
84	QTZ_RESET_GPIO79	
85	NAPA_RESET_GPIO77	
86	QTZ_INT_GPIO78	
87	SPI_CLK_UART_RTSN_GPIO69	
88	SPI_CS_UART_CTSN_GPIO70	
89	SPI_MOSI_UART_TX_GPIO72	
90	SD_LDO_EN_GPIO66	
91	SPI_MISO_UART_RX_GPIO71	
92	GPIO48	
93	GND	GROUND
94	GND	GROUND
95	OUT 1.8V	1.8V Output
96	OUT 3.3V	3.3V Output

97	IN-DC12V	Power Input
98	IN-DC12V	Power Input
99	IN-DC12V	Power Input
100	IN-DC12V	Power Input

1. WiFi RF Specifications (5V PA)

RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11a	6Mbps	20dBm	23dBm	±2dB
	9Mbps	20dBm	23dBm	±2dB
	12Mbps	20dBm	23dBm	±2dB
	18Mbps	20dBm	23dBm	±2dB
	24Mbps	20dBm	23dBm	±2dB
	36Mbps	20dBm	23dBm	±2dB
	48Mbps	20dBm	23dBm	±2dB
	54Mbps	20dBm	23dBm	±2dB
5GHz 802.11n/ac VHT20	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
5GHz 802.11n/ac VHT40	MCS 8	18dBm	21dBm	±2dB
	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
5GHz 802.11ac VHT80	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
2.4GHz 802.11ax HE40	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11a	6Mbps	-94	±2dB
	9Mbps	-92	±2dB
	12Mbps	-89	±2dB
	18Mbps	-87	±2dB
	24Mbps	-85	±2dB
	36Mbps	-83	±2dB
	48Mbps	-80	±2dB
	54Mbps	-78	±2dB
5GHz 802.11n/ac VHT20	MCS 0	-94	±2dB
	MCS 1	-92	±2dB
	MCS 2	-89	±2dB
	MCS 3	-87	±2dB
	MCS 4	-85	±2dB
	MCS 5	-83	±2dB
	MCS 6	-80	±2dB
	MCS 7	-77	±2dB
5GHz 802.11n/ac VHT40	MCS 8	-75	±2dB
	MCS 0	-92	±2dB
	MCS 1	-90	±2dB
	MCS 2	-88	±2dB
	MCS 3	-85	±2dB
	MCS 4	-82	±2dB
	MCS 5	-79	±2dB
	MCS 6	-76	±2dB
5GHz 802.11ac VHT80	MCS 7	-73	±2dB
	MCS 8	-70	±2dB
	MCS 9	-67	±2dB
	MCS 0	-87	±2dB
	MCS 1	-85	±2dB
	MCS 2	-83	±2dB
	MCS 3	-80	±2dB
	MCS 4	-78	±2dB
2.4GHz 802.11ax HE40	MCS 5	-75	±2dB
	MCS 6	-73	±2dB
	MCS 7	-70	±2dB
	MCS 8	-67	±2dB
	MCS 9	-64	±2dB
	MCS 9	-72	±2dB
	MCS 10	-69	±2dB
	MCS 11	-66	±2dB

RF Performance Table for 5GHz

	Data Rate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 802.11ax HE20	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB
5GHz 802.11ax HE40	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB
5GHz 802.11ax HE80	MCS 0	20dBm	23dBm	±2dB
	MCS 1	20dBm	23dBm	±2dB
	MCS 2	20dBm	23dBm	±2dB
	MCS 3	20dBm	23dBm	±2dB
	MCS 4	20dBm	23dBm	±2dB
	MCS 5	20dBm	23dBm	±2dB
	MCS 6	20dBm	23dBm	±2dB
	MCS 7	19dBm	22dBm	±2dB
	MCS 8	18dBm	21dBm	±2dB
	MCS 9	18dBm	21dBm	±2dB
	MCS 10	16dBm	19dBm	±2dB
	MCS 11	15dBm	18dBm	±2dB

	Data Rate	RX Specifications Sensitivity	Tolerance
5GHz 802.11ax HE20	MCS 0	-94	±2dB
	MCS 1	-92	±2dB
	MCS 2	-89	±2dB
	MCS 3	-86	±2dB
	MCS 4	-83	±2dB
	MCS 5	-80	±2dB
	MCS 6	-77	±2dB
	MCS 7	-74	±2dB
	MCS 8	-71	±2dB
	MCS 9	-68	±2dB
	MCS 10	-65	±2dB
	MCS 11	-62	±2dB
5GHz 802.11ax HE40	MCS 0	-89	±2dB
	MCS 1	-87	±2dB
	MCS 2	-85	±2dB
	MCS 3	-83	±2dB
	MCS 4	-81	±2dB
	MCS 5	-78	±2dB
	MCS 6	-75	±2dB
	MCS 7	-72	±2dB
	MCS 8	-69	±2dB
	MCS 9	-66	±2dB
	MCS 10	-63	±2dB
	MCS 11	-60	±2dB
5GHz 802.11ax HE80	MCS 0	-86	±2dB
	MCS 1	-84	±2dB
	MCS 2	-81	±2dB
	MCS 3	-79	±2dB
	MCS 4	-76	±2dB
	MCS 5	-74	±2dB
	MCS 6	-71	±2dB
	MCS 7	-68	±2dB
	MCS 8	-65	±2dB
	MCS 9	-62	±2dB
	MCS 10	-59	±2dB
	MCS 11	-56	±2dB

Order Information

Model	Nor Flash Size	Nand Flash Size	DDR3 Size
ComIoT 60-3200A	256Mb	N/A	4Gb
ComIoT 60-161GA	128Mb	1Gb	4Gb