

Woori-Net

Issue Date

2022.09

Document Name

WD-H8X0X

Version

0.1

WD-H8x0x

Hardware Manual

Contents

1.Introduction	4
1.1 Overview	4
1.2 Block Diagram.....	4
1.3 Main Features	5
2.Specifications	6
2.1 Mechanical Dimensions	6
2.1.1. Mechanical Dimensions of the WD-H8x0x.....	6
2.1.2. Top and Side Views of the WD-H8x0x.....	6
2.1.3. Power Connector	7
3.Environmental Requirements	8
4.Frequency Band and CA combinations	8
4.1 Frequency Bands	8
4.2 Carrier Aggregation combinations(TBD)	11
5.Operating mode	12
5.1 Turn On Scenarios	12
5.2 Reset.....	12
6.Label.....	12
6.1 Label	12
6.2 Label Notations	13

➤ Revision History

All revisions made to this document are listed below;

Version	Date	Description
0.1	2022-08	draft

1. Introduction

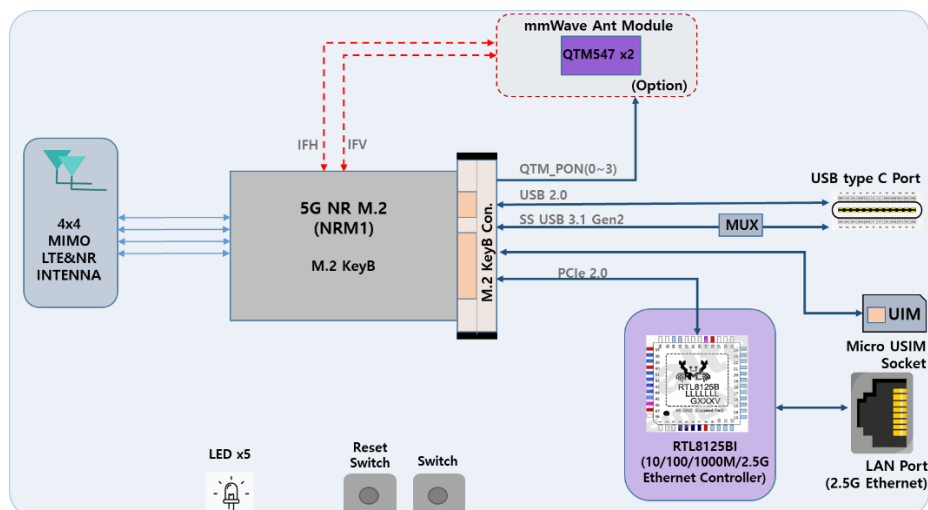
1.1 Overview

WD-H8x0x is 5G Modem. It is applied to 5G M.2 Module(WM-H800x/Woori-net). WD-H8x0x is supporting 5G mmWave and sub-6/4G/3G networks for data communication and connects 10/100/1000M/2.5G Ethernet through RJ45 connector.

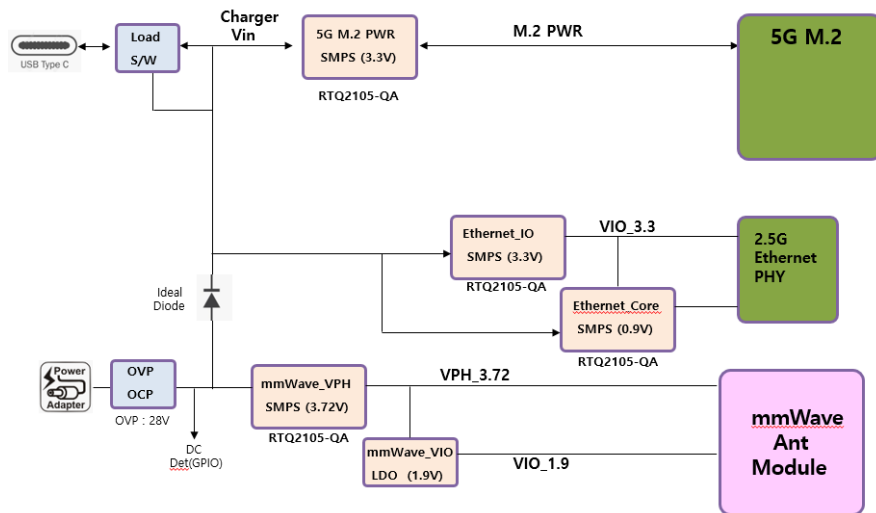
구분	프로젝트명	Qualcomm		사업자	메모리 규격			OS		지원 Tech							보드 Type							Duplexer			모델명		
		Chipset	SW PL		8G/8G	1G/1G	2G/1G	LE	TX	W	Cat 4	Cat 1	Cat M1	Cat NB1	NSA (FR1)	SA (FR1)	mm Wave (FR2)	LGA	B2B	M.2	인테 나	외장 형 안테 나	바우 트 지원	RJ45	코덱 유무	Full		Half	RF Driver
5G NR	NRD1	SDX62	LE1.0	SKT					O		X	O				O						O							WD-H800S
	NRD1	SDX62	LE1.0	KT					O		X	O				O						O							WD-H800K
	NRD1	SDX62	LE1.0	LGU					O		X	O				O						O							WD-H800L
	NRD1	SDX62	LE1.0	SKT					O		X	O			O	O						O							WD-H810S
	NRD1	SDX62	LE1.0	KT					O		X	O			O	O						O							WD-H810K
	NRD1	SDX62	LE1.0	LGU					O		X	O			O	O						O							WD-H810L
	NRD1	SDX62	LE1.0	PRIVATE					O		X	X			X	O						O							WD-H810P

Product model division

1.2 Block Diagram



WD-H8x0x Block Diagram



WD-H8x0x Power Block Diagram

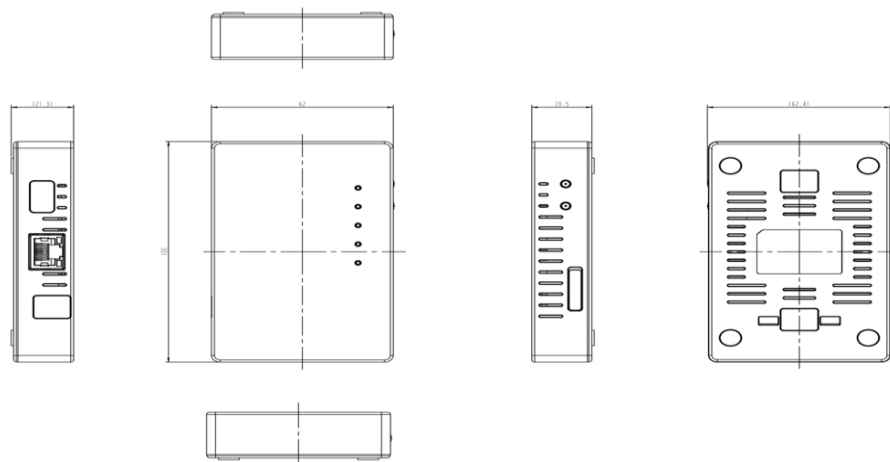
1.3 Main Features

Function	Features
Cellular technology	5G: FR1(Sub 6G), optional FR2(mmWave), Rel 15 4G: CAT. 20 (2Gbps) on DL, CAT. 13 (150Mbps) on UL, Rel 14
4x4 MIMO	5G: n1/2/3/66/7/41/77/78/79 4G: B1/25(2)/3/66(4)/7/30/40/41(38)/42/48
Diversity/2nd Rx	4G: all operating bands
USIM port - dual voltage	Support for SIM Class B and Class C support Clock rates up to 4 MHz
Application processor	Application processor to run customer application code 32 bit ARM Cortex-A7 up to 1.5 GHz running the Linux operating system 4Gbit NAND Flash + 4Gbit LPDDR4 MCP is supported
주요 Port	USB type-C Connector RJ45 Connector

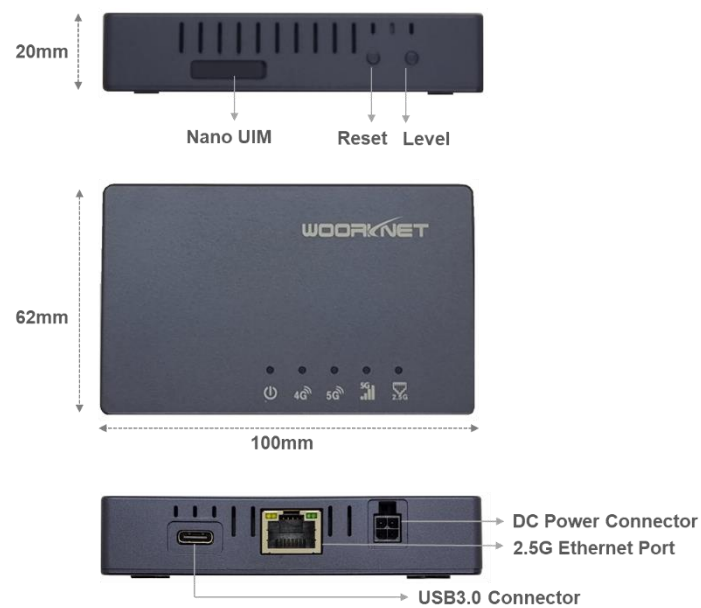
2. Specifications

2.1 Mechanical Dimensions

2.1.1. Mechanical Dimensions of the WD-H8x0x



2.1.2. Top and Side Views of the WD-H8x0x



2.1.3. Power Connector



USB Type-C Connector

DC Power Connector

DC Power Connector

WD-H800X	Cable	Power Pin Map
 <p>Molex Part No.: 430450400</p>	 <p>Molex Part No.: 430250400</p>	 <p>DC 12V GND</p>

USB type-C

Precedence	Mode of Operation	Nominal voltage	Maximum Current
<p>Highest</p> <p>↑</p> <p>Lowest</p>	USB PD	Up to 20V	Up to 5A
	USB Type-C current@3A	5V	3A
	USB Type-C current@1.5A	5V	1.5A
	USB BC1.2	5V	Up to 1.5A
	USB 3.1	5V	900mA
	USB 2.0	5V	500mA

When power is supplied by USB type-C Port, it should be used by USB port of supplying over 5V/1.5A mode except for USB PD Mode

3. Environmental Requirements

Condition	Spec
Storage Temperature	-40℃ to + 60℃
Operating Temperature	-20℃ to + 60℃
Humidity (Storaging)	95%(60℃) relative humidity (non-condensing)
Vibration	10 Hz to 100 Hz sinusoidal, 3.0G, 0.5 octave/min, 1 hour
Drop	No damages after 1m drop over concrete floor

4. Frequency Band and CA combinations

4.1 Frequency Bands

The RF performance in 5G, LTE and WCDMA modes conform to the 3GPP specifications

5G NR Sub6 Band supportive

NR Band	Duplex Mode	Uplink Frequency(MHz)	Downlink Frequency(MHz)	Channels	SCS (kHz)
n1 -2100	FDD	1920 – 1980	2110 – 2170	Tx: 384000 – 396000 Rx: 422000 - 434000	15
n2 – 1900 PCS	FDD	1850 – 1910	1930 – 1990	Tx: 370000 – 382000 Rx: 386000 – 398000	15
n3 – 1800	FDD	1710 – 1785	1805 – 1880	Tx: 342000 – 357000 Rx: 361000 – 376000	15
n5 – 850	FDD	824 – 849	869 – 894	Tx: 164800 – 169800 Rx: 173800 – 178800	15

n7 – 2600	FDD	2500 – 2570	2620 - 2690	Tx: 500000 – 514000 Rx: 524000 – 538000	15
n8 – 900	FDD	880 - 915	925 – 960	Tx: 176000 – 183000 Rx: 185000 – 192000	15
N12 – 700a	FDD	699 - 716	729 - 746	Tx: 139800 - 143200 Rx: 145800 - 149200	15
N20 – 800	FDD	832 - 862	791 - 821	Tx: 166400 - 172400 Rx: 158200 - 164200	15
n25 -1900+	FDD	1850 - 1915	1930 - 1995	Tx: 370000 - 383000 Rx: 386000 - 399000	15
n28 - 700 APT	FDD	703 - 748	758 - 803	Tx: 140600 - 149600 Rx: 151600 - 160600	15
n38 - 2600	TDD	2570 - 2620		T/Rx: 514000 - 524000	30
n40 - 2300	TDD	2300 - 2400		T/Rx: 460000 - 480000	30
n41 - 2600+	TDD	2496 - 2690		T/Rx: 499200 - 537996	30
n48 - 3600	TDD	3550 - 3700		T/Rx: 636668 - 646666	30
n66 - AWS-4	FDD	1710 - 1800	2110 - 2200	Tx: 342000 - 356000 Rx: 422000 - 440000	15
n71 - 600	FDD	663 - 698	617 - 652	Tx: 132600 - 139600 Rx: 123400 - 130400	15
n77 - 3700	TDD	3300 - 4200		T/Rx: 620000 - 680000	30
n78 – 3500	TDD	3300 - 3800		T/Rx: 620000 - 653332	30
n79 - 4500	TDD	4400 - 5000		T/Rx: 693334 - 733332	30

5G NR mmWave Band supportive

NR Band	Duplex Mode	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Channels	SCS (kHz)
n257- 28 GHz	TDD	26500 - 29500		T/Rx: 2054167 - 2104168	120
n258 - 26 GHz	TDD	24250 - 27500		T/Rx: 2016667 - 2070831	120
n260 - 39 GHz	TDD	37000 - 40000		T/Rx: 2229167 - 2279165	120
n261- 28 GHz US	TDD	27500 - 28350		T/Rx: 2070833 - 2084999	120

LTE Bands supportive

E-UTRA Band	Duplex Mode	Uplink Frequency(MHz)	Downlink Frequency(MHz)	Channels
B1 - 2100	FDD	1920 - 1980	2110 - 2170	Tx: 18000 - 18599 Rx: 0 - 599
B2 - 1900 PCS	FDD	1850 - 1910	1930 - 1990	Tx: 18600 - 19199 Rx: 600 - 1199
B3 - 1800+	FDD	1710 - 1785	1805 - 1880	Tx: 19200 - 19949 Rx: 1200 - 1949
B4 - AWS-1	FDD	1710 - 1755	2110 - 2155	Tx: 19950 - 20399 Rx: 1950 - 2399
B5 - 850	FDD	824 - 849	869 - 894	Tx: 20400 - 20649 Rx: 2400 - 2649
B7 - 2600	FDD	2500 - 2570	2620 - 2690	Tx: 20750 - 21449 Rx: 2750 - 3449
B8 - 900 GSM	FDD	880 - 915	925 - 960	Tx: 21450 - 21799 Rx: 3450 - 3799
B12 - 700 a	FDD	699 - 716	729 - 746	Tx : 23010 - 23179 Rx : 5010 - 5179
B13 - 700 c	FDD	777 - 787	746 - 756	Tx : 27210 - 27659 Rx : 9210 - 9659
B14 - 700 PS	FDD	788 - 798	758 - 768	Tx : 23280 - 23379 Rx : 5280 - 5379
B17 - 700 b	FDD	704 - 716	734 - 746	Tx: 23730 - 23849 Rx: 5730 - 5849
B18 - 800 Lower	FDD	815 - 830	860 - 875	Tx: 23850 - 23999 Rx: 5850 - 5999
B19 - 800 Upper	FDD	830 - 845	875 - 890	Tx: 24000 - 24149 Rx: 6000 - 6149
B20 - 800 DD	FDD	832 - 862	791 - 821	Tx: 24150 - 24449 Rx: 6150 - 6449
B25 - 1900+	FDD	1850 - 1915	1930 - 1995	Tx: 8040 - 8689 Rx: 26040 - 26689
B26 - 850+	FDD	814 - 849	859 - 894	Tx: 8690 - 9039

				Rx: 26690 - 27039
B28 - 700 APT	FDD	703 - 748	758 - 803	Tx: 9210 - 9659 Rx: 27210 - 27659
B29 - 700 d	FDD	N/A	717 - 728	Rx: 9660 - 9769
B30 - 2300 WCS	FDD	2305 - 2315	2350 - 2360	Tx: 9770 - 9869 Rx: 27660 - 27759
B32 - 1500 L	FDD	N/A	1452 - 1496	Rx: 9920 - 10359
B34 - 2000	TDD	2010 – 2025		T/Rx: 36200 - 36349
B38 - 2600	TDD	2570 - 2620		T/Rx: 37750 - 38250
B39 - 1900+	TDD	1880 - 1920		T/Rx: 38250 - 38649
B40 - 2300	TDD	2300 - 2400		T/Rx: 38650 - 39650
B41 - 2600+	TDD	2496 - 2690		T/Rx: 39650 - 41589
B42 - 3500	TDD	3400 - 3600		T/Rx: 41590 - 43589
B46 - 5200	TDD	5150 – 5925 (DL only)		Rx: 46790 - 54539
B48 - 3600	TDD	3550 - 3700		T/Rx: 55240 - 56739
B66 - AWS-3	FDD	1710 - 1780	2110 - 2200	Tx: 66436 - 67335 Rx: 131972 - 132671
B71 - 600	FDD	663 - 698	617 - 652	Tx: 133122 - 133471 Rx: 68586 - 68935

4.2 Carrier Aggregation combinations(TBD)

There are 2CC, 3CC, 4CC and 5CC configurations shown in inter-band, and intra-band CA types in single duplex (FDD only) and in hybrid duplex (FDD+TDD) modes

5. Operating mode

5.1 Turn On Scenarios

Auto Power ON

To turn on the device, apply power through DC Jack or USB type-C Connector

5.2 Reset

Press the Reset Key to Hardware reset.

6. Label

6.1 Label



6.2 Label Notations

- 기기의 명칭:LTE 이동통신용 무선설비의 모뎀
- 모델명 : WD-H800x
- 인증번호 : X※XXX-XX-XXXX
- 인증받은자의 상호: (주)우리넷
- 제조년월일: YYYY.MM.DD
- 제조자/제조국가: (주)우리넷/ 한국
- 일련번호: 0000000