

**H138-380 5G CPE  
V100R001**

# **Product Description**

**Issue**            **01**

**Date**            **2021-08-27**

## **Trademarks and Permissions**

All other trademarks and trade names mentioned in this document are the property of their respective holders.

LTE is a trademark of ETSI.

Wi-Fi®, the Wi-Fi CERTIFIED logo, and the Wi-Fi logo are trademarks of Wi-Fi Alliance.

## **Notice**

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

## **DBG Communications Technology Co., Ltd.**

Address: Building A, No. 5 (DBG Factory), Yongda Road, Xiangshui River, West District of Daya Bay, Huizhou City, Guangdong Province, China.

---

# About This Document

---

## Summary

This document provides information regarding the features, main functions and services, technical specifications, and technical references of the product.

This document includes:

Chapter	Details
1 Product Overview	Provides an overview of the product.
2 Technical Specifications	Describes the specifications of the product hardware, software, and user interface.
3 Services and Applications	Describes the main functions and applications of the product.
4 System Structure and Scenario Constraints	Describes the product system structure.
5 Technical References	Describes the standards and communication protocols of the product.
6 Packing List	Describes the devices and accessories that comprise the product package



### NOTE

The document is an invitation to offer but not an offer. It is intended to describe the general features and functions of a product. The features and functions of certain products may vary with the requirements of customers.

## History

Issue	Date	Details
01	2021-08-16	Initial official release.

## Acronyms and Abbreviations

Acronym or Abbreviation	Full Spelling
3GPP	3rd Generation Partnership Project
ACS	Auto Configuration Server
AES	Advanced Encryption Standard
ALG	Application Layer Gateway
AMR-NB	Adaptive Multi-Rate compression - Narrowband
AMR-WB	Adaptive Multi-Rate compression - Wideband
AP	Access Point
APN	Access Point Name
ARP	Address Resolution Protocol
CLAT	Customer-side Translator
CPE	Customer Premises Equipment
CS	Circuit Switched
CSFB	Circuit Switched Fallback
DBDC	Dual Band Dual Concurrent
DL	Downlink
DMZ	Demilitarized Zone
DNS	Domain Name Server
DTMF	Dual-Tone Multi-Frequency
E-UTRA	Evolved Universal Terrestrial Radio Access Network
FDD	Frequency Division Duplex
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IPSec	Internet Protocol Security
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ICMP	Internet Control Message Protocol
L2TP	Layer Two Tunneling Protocol
LAN	Local Area Network
LED	Light Emitting Diode

Acronym or Abbreviation	Full Spelling
LTE	Long Term Evolution
MAC	Media Access Control
MDI	Medium Dependent Interface
MDIX	Medium Dependent Interface Crossover
MIMO	Multi-input Multi-output
MME	Mobility Management Entity
NAT	Network Address Translation
NAPT	Network Address and Port Translation
PC	Personal Computer
PCC	Primary Component Carrier
PGW	PDN Gateway
PIN	Personal Identification Number
PLAT	Provider-side Translator
PPTP	Point-to-Point Tunneling Protocol
QAM	Quadrature Amplitude Modulation
QR	Quick Response
RFC	Request For Comments
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
SAMBA	System for Advanced Mobile Broadband Applications
SCC	Secondary Component Carrier
SCP	Service Control Point
SDRAM	Synchronous Dynamic Random Access Memory
SDP	Session Description Protocol
SGW	Serving Gateway
SIP	Session Initiation Protocol
SMA	Sub-Miniature-A
SMS	Short Message
SOHO	Small Office Home Office
SSID	Service Set Identifier
TDD	Time Division Duplex

<b>Acronym or Abbreviation</b>	<b>Full Spelling</b>
TKIP	Temporal Key Integrity Protocol
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UPnP	Universal Plug and Play
USB	Universal Serial Bus
USIM	UMTS Subscriber Identity Module
VPN	Virtual Private Network
WAN	Wide Area Network
Wi-Fi®	Wireless Fidelity
WMM	Wi-Fi Multimedia
WPA/WPA2-PSK	Wi-Fi Protected Access/Wi-Fi Protected Access II - Pre-Shared Key
WPA2-PSK	Wi-Fi Protected Access II - Pre-Shared Key
WPS	Wi-Fi Protected Setup

---

# Contents

---

<b>About This Document</b> .....	<b>ii</b>
<b>1 Product Overview</b> .....	<b>1</b>
<b>2 Technical Specifications</b> .....	<b>3</b>
2.1 Hardware Specifications .....	3
2.2 Antenna Specifications .....	6
2.2.1 Build-in 5G/LTE Antenna .....	6
2.2.2 Build-in Wi-Fi Antenna .....	12
2.2.3 LTE CA combination .....	13
2.2.4 EN_DC combination .....	17
2.3 Software Specifications .....	22
<b>3 Services and Applications</b> .....	<b>26</b>
3.1 Data Services .....	26
3.1.1 Accessing the Internet through a Mobile Network (5G/LTE).....	26
3.1.2 Accessing the Internet through an Ethernet Network .....	27
3.2 Voice Services.....	27
3.3 SMS .....	27
3.4 Security Service .....	27
3.4.1 Firewall Service .....	27
3.4.2 MAC Filtering .....	28
3.4.3 Wi-Fi Authentication .....	28
3.5 VPN Function .....	28
3.5.1 VPN Client.....	28
3.5.2 VPN Pass-Through .....	28
3.6 IP Pass-Through (Customization).....	29
3.7 IPv6 Only and IPv4v6 Dual Stack.....	29
3.7.1 IPv4v6 Dual Stack .....	29
3.7.2 IPv6 Only (CLAT) (Customization) .....	29
3.8 Multi-APN (Customization) .....	30
3.9 5GHz Preferred.....	30
3.10 Customer management .....	30
3.10.1 WebUI.....	30
3.10.2 The device management app.....	30

---

3.11 Operator maintenance (Customization) .....	31
3.12 FOTA .....	31
<b>4 System Structure and Scenario Constraints.....</b>	<b>32</b>
4.1 System Architecture.....	32
4.2 Scenario Constraints .....	33
<b>5 Technical References.....</b>	<b>34</b>
5.1 Standards and Communication Protocols .....	34
5.1.1 Standards and Communication Protocols of the Product.....	34
5.1.2 Standards and Communication Protocols of the Wireless Uu Interface.....	34
<b>6 Packing List.....</b>	<b>35</b>



# 1 Product Overview

The 5G CPE H138-380 is a 5G wireless gateway for multiple users in household or small office environments. It enables users to access the Internet.

The H138-380 supports 3GPP Release 15 with UE downlink category 19 and uplink category 18. The supported service functions are as follows:

- Data service:

**SA:**

➤ 5G:

Downlink 1CC (100M), 4x4 MIMO, 256 QAM, peak rate: 1.8Gbps (DL/UL subframe configuration 8:2).

Uplink 1CC (100M) 2x2 MIMO, 256 QAM, peak rate: 250Mbps (DL/UL subframe configuration 8:2)

**NSA:**

➤ 5G:

Downlink 1CC (100M), 4x4 MIMO, 256 QAM, peak rate: 1.8Gbps (DL/UL subframe configuration 8:2)

Uplink 1CC (100M), 1Tx, 256 QAM, peak rate: 125Mbps (DL/UL subframe configuration 8:2)

➤ LTE

Downlink 4CC, 4x4 MIMO (Different frequency bands support different MIMO modes), 256QAM, peak rate: 1.2Gbps (FDD frequency bands, 20+20+20+20MHz, 4x4MIMO, a maximum of 12 streams).

Uplink 1CC, 1Tx, 256 QAM, peak rate: 100Mbps (FDD frequency bands, 20MHz)

 **NOTE**

The actual data rate varies with network configuration.

- Working band:

5G: n1/n3/n5/n7/n8/n20/n28 (UL: 703~733MHz/DL: 758~788MHz)/n38/n40 (2300-2390MHz)/n41/n71/n77/n78/n79,

LTE: B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32/B34/B38/B39/B40 (2300-2390MHz)/B41/B42/B43

- Wi-Fi: 802.11 b/g/n/a/ac/ax. 2.4GHz Wi-Fi 2x2 MIMO up to 574Mbps, 5GHz Wi-Fi 2x2 MIMO up to 1200Mbps. Maximum Users: 64+64
- 1 GE port for LAN/WAN, 1 GE port for LAN.

- Multi APN function (Customization) for Data, Voice(VoIP), TR-069 services(Customization)
- Routing mode: NAT enable (Default) / IP pass-through (Customization)
- VPN client service (L2TP, PPTP)
- Customer management via WebUI or the device management app
- Operator maintenance via TR-069 (Customization) and TR-143 (Customization)
- Firmware Over the Air (FOTA)
- 5GHz Wi-Fi preferred



# 2 Technical Specifications

## 2.1 Hardware Specifications

**Table 2-1** Technical specifications of the H138-380 main unit

Item	Description	
Technical standard	WAN	3GPP Release 15; LTE DL Cat19/UL Cat18
	LAN	IEEE 802.3/802.3u
	Wi-Fi	IEEE 802.11b/g/n/a/ac/ax
Working band/frequency	5G	n1/n3/n5/n7/n8/n20/n28 (UL: 703~733MHz/DL: 758~788MHz)/n38/n40 (2300-2390MHz)/n41/n71/n77/n78/n79
	LTE	B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32/B34/B38/B39/B40(2300-2390 MHz)/B41/B42/B43
	Wi-Fi	2.4GHz: 2422-2482MHz(5-13ch); 5GHz: 5170-5330MHz, 5490-5170MHz, 5735-5835MHz (W52/W53/W56/W58) Note: The W58 does not perform authentication and needs to be enabled or disabled based on the customization policy.
	DL MIMO	5G 4x4: n1/n3/n7/n38/n40/n41/n77/n78/n79 5G 2x2: n5/n8/n20/n28/n71 LTE 4x4: B1/B3/B7/B38/B39/B40/B41/B42/B43 LTE 2x2: B5/B8/B18/B19/B20/B26/B28/B32/B34
	UL MIMO	5G 2x2: n41/n77/n78/n79 (UL MIMO is supported only in SA mode.)
External port	<ul style="list-style-type: none"> <li>• One power adapter port</li> <li>• One LAN/WAN port (RJ45), One LAN port (RJ45)</li> <li>• One phone port (RJ11)</li> <li>• One SIM card slot (Nano-SIM)</li> </ul>	

Item	Description				
Antennas	<ul style="list-style-type: none"> <li>Built-in 5G/LTE antennas</li> <li>Built-in Wi-Fi 2.4 GHz and 5 GHz antennas</li> </ul>				
LED Indicators	<ul style="list-style-type: none"> <li>One 5G indicator</li> <li>One 4G indicator</li> <li>One Status indicator</li> <li>One ambient light strip</li> </ul>				
Buttons	<ul style="list-style-type: none"> <li>One WPS button (Reuse with the power-off button)</li> <li>One Reset button</li> </ul>				
Maximum transmit power	5G	Conform to 3GPP Definition			
	LTE	Conform to 3GPP Definition			
	Wi-Fi	2.4GHz	Formats and channels	Ant0	Ant1
			802.11b	14	14
			802.11g	16	16
			802.11n20	16	16
			802.11n40	16	16
			802.11ac20	16	16
			802.11ac40	16	16
			802.11ax20	16 low-speed 15 high-speed	16 low-speed 15 high-speed
	802.11ax40	16 low-speed 15 high-speed	16 low-speed 15 high-speed		
	W52/W53	5GHz	Formats and channels	Ant0	Ant1
			11a 6M	16	16
			11a 54M	16	16
			11n 20 MCS0	16	16
11n 20 MCS7			16	16	
11n 40 MCS0			17	17	
11n 40 MCS7			17	17	
11ac 20 MCS0			16	16	
11ac 20 MCS8			16	16	
11ac 40 MCS0			17	17	
11ac 40 MCS9			17	17	
11ac 80 MCS0			17	17	

Item	Description				
			11ax 80 MCS9	17	17
			11ax 20 MCS0	16	16
			11ax 20 MCS11	15.5	15.5
			11ax 40 MCS0	17	17
			11ax 40 MCS11	15.5	15.5
			11ax 80 MCS0	17	17
			11ax 80 MCS11	15.5	15.5
	W56		11a 6M	22	22
			11a 54M	20	20
			11n 20 MCS0	22	22
			11n 20 MCS7	19.5	19.5
			11n 40 MCS0	22	22
			11n 40 MCS7	19.5	19.5
			11ac 20 MCS0	22	22
			11ac 20 MCS8	19	19
			11ac 40 MCS0	22	22
			11ac 40 MCS9	18	18
			11ac 80 MCS0	22	22
			11ac 80 MCS9	18	18
			11ax 20 MCS0	22	22
			11ax 20 MCS11	16	16
			11ax 40 MCS0	21	21
			11ax 40 MCS11	16	16
			11ax 80 MCS0	21	21
			11ax 80 MCS11	16	16
			W58		11a 6M
	11a 54M	16			16
	11n 20 MCS0	16			16
	11n 20 MCS7	16			16
	11n 40 MCS0	17			17
11n 40 MCS7	17	17			
11ac 20 MCS0	16	16			
11ac 20 MCS8	16	16			
11ac 40 MCS0	17	17			

Item	Description		
		11ac 40 MCS9	17
		11ac 80 MCS0	17
		11ac 80 MCS9	17
		11ax 20 MCS0	16
		11ax 20 MCS11	15.5
		11ax 40 MCS0	17
		11ax 40 MCS11	15.5
		11ax 80 MCS0	17
		11ax 80 MCS11	15.5
	Note: 1. Some edge frequency point power will have a fallback 2. The supported frequency bands and power specifications are adjusted according to the regulations of the delivered sites. The current specifications are for reference only		
Receiving sensitivity	5G	Conform to 3GPP Definition	
	LTE	Conform to 3GPP Definition	
	Wi-Fi	Conform to IEEE 802.11 Definition	
Power consumption	< 24 W		
AC/DC power supply	<ul style="list-style-type: none"> <li>AC (input): 100V-240V 50Hz/60Hz</li> <li>DC (output): 12V/2A</li> </ul>		
Dimensions (Maximum)	103 mm (Length) x 103 mm (Width) x 225 mm (Height)		
Weight	About 915 g (excluding the power adapter)		
Temperature	<ul style="list-style-type: none"> <li>Working temperature: 0°C to 40°C</li> <li>Storage temperature: -20°C to +70°C</li> </ul>		
Humidity	5% – 95% (non-condensing)		
Certification/Compliance	CE /RoHS/REACH/WEEE/Wi-Fi/ErP certification		

## 2.2 Antenna Specifications

### 2.2.1 Build-in 5G/LTE Antenna

Table 2-2 LTE antenna specifications

Item	Description
------	-------------

Item	Description				
Frequency	5G				
	<ul style="list-style-type: none"> <li>• n1: UL 1920–1980 MHz DL 2110–2170 MHz</li> <li>• n3: UL 1710–1785 MHz DL 1805–1880 MHz</li> <li>• n5: UL 824–849 MHz DL 869–894 MHz</li> <li>• n7: UL 2500–2570 MHz DL 2620–2690 MHz</li> <li>• n8: UL 880 – 915 MHz DL 925 – 960 MHz</li> <li>• n20: UL 832 – 862 MHz DL 791– 821 MHz</li> <li>• n28: UL 703–733 MHz DL 758–788 MHz</li> <li>• n38: UL 2570–2620MHz DL 2570–2620 MHz</li> <li>• n40: UL 2300–2390 MHz DL 2300–2390 MHz</li> <li>• n41: UL 2496–2690 MHz DL 2496–2690 MHz</li> <li>• n71: UL 663 – 698 MHz DL 617 – 652 MHz</li> <li>• n77: UL 3300–4200 MHz DL 3300–4200 MHz</li> <li>• n78: UL 3300–3800 MHz DL 3300–3800 MHz</li> <li>• n79: UL 4400–5000 MHz DL 4400–5000 MHz</li> </ul>				
	Band	15KHz SCS	15KHz SCS Bandwidths	30KHz SCS	30KHz SCS Bandwidths
	n1	Y	5M 10M 15M 20M 40M	N	/
	n3	Y	5M 10M 15M 20M	N	/
	n5	Y	5M 10M 15M 20M	N	/
	n7	Y	5M 10M 15M 20M	N	/
	n8	Y	5M 10M 15M 20M	N	/
	n20	Y	5M 10M 15M 20M	N	/
	n28	Y	5M 10M 15M 20M 30M	N	/
	n38	N	/	Y	20M
	n40	N	/	Y	20M 30M 40M 50M 60M 80M
	n41	N	/	Y	20M 30M 40M 50M 60M 80M 90M 100M
	n71	Y	10M 15M 20M	N	/
	n77	N	/	Y	20M 40M 50M 60M 80M 90M 100M
	n78	N	/	Y	20M 30M 40M 50M 60M 70M 80M 90M 100M
	n79	N	/	Y	40M 50M 60M 80M 100M

Item	Description
	<p>LTE</p> <ul style="list-style-type: none"> <li>• B1: UL 1920–1980 MHz    DL 2110–2170 MHz</li> <li>• B3: UL 1710–1785 MHz    DL 1805–1880 MHz</li> <li>• B5: UL 824–849 MHz       DL 869–894 MHz</li> <li>• B7: UL 2500–2570 MHz    DL 2620–2690 MHz</li> <li>• B8: UL 880–915 MHz       DL 925–960 MHz</li> <li>• B18: UL 815–830 MHz      DL 860–875 MHz</li> <li>• B19: UL 830–845 MHz      DL 875–890 MHz</li> <li>• B20: UL 832–862 MHz      DL 791–821 MHz</li> <li>• B26: UL 814–849 MHz      DL 859–894 MHz</li> <li>• B28: UL 703–748 MHz      DL 758–803 MHz</li> <li>• B32: /                         DL 1452–1496 MHz</li> <li>• B34: UL 2010–2025 MHz    DL 2010–2025 MHz</li> <li>• B38: UL 2570–2620MHz    DL 2570–2620 MHz</li> <li>• B39: UL 1880–1920 MHz    DL 1880–1920 MHz</li> <li>• B40: UL 2300–2390 MHz    DL 2300–2390 MHz</li> <li>• B41: UL 2496–2690 MHz    DL 2496–2690 MHz</li> <li>• B42: UL 3400–3600 MHz    DL 3400–3600 MHz</li> <li>• B43: UL 3600–3800 MHz    DL 3600–3800 MHz</li> </ul>
Input impedance	50 Ω
Standing wave ratio	< 2.5
Main antenna efficiency	<p>5G</p> <ul style="list-style-type: none"> <li>• n1: -2.1 dB</li> <li>• n3: -1.8 dB</li> <li>• n5: -2.3 dB</li> <li>• n7: -1.9 dB</li> <li>• n8: -2.3 dB</li> <li>• n20: -2.5 dB</li> <li>• n28: -2.5 dB</li> <li>• n38: -2.1 dB</li> <li>• n40: -2.1 dB</li> <li>• n41: -2.1 dB</li> <li>• n71: -4.6 dB</li> <li>• n77: -2.5 dB</li> <li>• n78: -2.7 dB</li> <li>• n79: -2.6 dB</li> </ul> <p>LTE</p>



Item	Description
	<ul style="list-style-type: none"> <li>• B1: -2.1 dB</li> <li>• B3: -1.8 dB</li> <li>• B5: -2.3 dB</li> <li>• B7: -1.9 dB</li> <li>• B8: -2.3 dB</li> <li>• B18: -2.2 dB</li> <li>• B19: -2.4 dB</li> <li>• B20: -2.5 dB</li> <li>• B26: -2.3 dB</li> <li>• B28: -2.5 dB</li> <li>• B32: -1.6 dB</li> <li>• B34: -1.9 dB</li> <li>• B38: -2.1 dB</li> <li>• B39: -1.8 dB</li> <li>• B40: -2.1 dB</li> <li>• B41: -2.1 dB</li> <li>• B42: -2.7 dB</li> <li>• B43: -2.5 dB</li> </ul>
Diversity antenna efficiency	<p>5G</p> <ul style="list-style-type: none"> <li>• n1: -1.8 dB</li> <li>• n3: -2.8 dB</li> <li>• n5: -2.1 dB</li> <li>• n7: -1.9 dB</li> <li>• n8: -3.5 dB</li> <li>• n20: -2.3 dB</li> <li>• n28: -4.8 dB</li> <li>• n38: -1.8 dB</li> <li>• n40: -1.8 dB</li> <li>• n41: -2 dB</li> <li>• n71: -5.4 dB</li> <li>• n77: -1.7 dB</li> <li>• n78: -2 dB</li> <li>• n79: -2.1 dB</li> </ul> <p>LTE</p> <ul style="list-style-type: none"> <li>• B1: -1.8 dB</li> <li>• B3: -2.8 dB</li> <li>• B5: -2.1 dB</li> <li>• B7: -1.9 dB</li> <li>• B8: -3.5 dB</li> <li>• B18: -2 dB</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>• B19: -2.2 dB</li> <li>• B20: -2.3 dB</li> <li>• B26: -2.1 dB</li> <li>• B28: -4.8 dB</li> <li>• B32: -1.2 dB</li> <li>• B34: -1.6 dB</li> <li>• B38: -1.8 dB</li> <li>• B39: -2 dB</li> <li>• B40: -1.8 dB</li> <li>• B41: -2 dB</li> <li>• B42: -2.2 dB</li> <li>• B43: -1.6 dB</li> </ul>
Main antenna gain	<p>5G</p> <ul style="list-style-type: none"> <li>• n1: 3 dBi</li> <li>• n3: 3.5 dBi</li> <li>• n5: 1 dBi</li> <li>• n7: 4.3 dBi</li> <li>• n8: 1.5 dBi</li> <li>• n20: 1 dBi</li> <li>• n28: 1 dBi</li> <li>• n38: 4.3 dBi</li> <li>• n40: 3.7 dBi</li> <li>• n41: 5.5 dBi</li> <li>• n71: 0 dBi</li> <li>• n77: 4.2 dBi</li> <li>• n78: 4.2 dBi</li> <li>• n79: 4 dBi</li> </ul> <p>LTE</p> <ul style="list-style-type: none"> <li>• B1: 3 dBi</li> <li>• B3: 3.5 dBi</li> <li>• B5: 1 dBi</li> <li>• B7: 4.3 dBi</li> <li>• B8: 1.5 dBi</li> <li>• B18: 1 dBi</li> <li>• B19: 1 dBi</li> <li>• B20: 1.1 dBi</li> <li>• B26: 0.9 dBi</li> <li>• B28: 1 dBi</li> <li>• B32: 2.8 dBi</li> <li>• B34: 3.5 dBi</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>• B38: 4.3 dBi</li> <li>• B39: 2.8 dBi</li> <li>• B40: 3.7 dBi</li> <li>• B41: 5.5 dBi</li> <li>• B42: 4.9 dBi</li> <li>• B43: 4.5 dBi</li> </ul>
Diversity antenna gain	<p>5G</p> <ul style="list-style-type: none"> <li>• n1: 4.1 dBi</li> <li>• n3: 3.5 dBi</li> <li>• n5: -0.6 dBi</li> <li>• n7: 4.8 dBi</li> <li>• n8: 0.6 dBi</li> <li>• n20: 0 dBi</li> <li>• n28: 1.7 dBi</li> <li>• n38: 4.9 dBi</li> <li>• n40: 3.8 dBi</li> <li>• n41: 4.3 dBi</li> <li>• n71: 0 dBi</li> <li>• n77: 5.4 dBi</li> <li>• n78: 4.4 dBi</li> <li>• n79: 4.6 dBi</li> </ul> <p>LTE</p> <ul style="list-style-type: none"> <li>• B1: 4.1 dBi</li> <li>• B3: 3.5 dBi</li> <li>• B5: -0.6 dBi</li> <li>• B7: 4.8 dBi</li> <li>• B8: 0.6 dBi</li> <li>• B18: 0.7 dBi</li> <li>• B19: 0 dBi</li> <li>• B20: 0 dBi</li> <li>• B26: 0.3 dBi</li> <li>• B28: 1.7 dBi</li> <li>• B32: 4 dBi</li> <li>• B34: 3.6 dBi</li> <li>• B38: 4.9 dBi</li> <li>• B39: 3.9 dBi</li> <li>• B40: 3.8 dBi</li> <li>• B41: 4.6 dBi</li> <li>• B42: 4.2 dBi</li> <li>• B43: 4.5 dBi</li> </ul>

Item	Description
5G-MIMO1 antenna efficiency	<ul style="list-style-type: none"> <li>• n77: -1.9 dB</li> <li>• n78: -2 dB</li> <li>• n79: -1.8 dB</li> </ul>
5G-MIMO1 antenna gain	<ul style="list-style-type: none"> <li>• n77: 8.9 dBi</li> <li>• n78: 8.8 dBi</li> <li>• n79: 9.9 dBi</li> </ul>
5G-MIMO2 antenna efficiency	<ul style="list-style-type: none"> <li>• n77: -1.4 dB</li> <li>• n78: -1.6 dB</li> <li>• n79: -1.9 dB</li> </ul>
5G-MIMO2 antenna gain	<ul style="list-style-type: none"> <li>• n77: 9.1 dBi</li> <li>• n78: 8.9 dBi</li> <li>• n79: 10.2 dBi</li> </ul>
TX/RX	2T4R
Polarization	Linear polarization

## 2.2.2 Build-in Wi-Fi Antenna

**Table 2-3** Wi-Fi 2.4 GHz antenna specifications

Item	Description
Frequency	2422-2482MHz(5-13ch)
Input impedance	50 Ω
Standing wave ratio	< 2
Efficiency	-1.5 dB
Gain	1.9 dBi
Polarization	Linear polarization

**Table 2-4** Wi-Fi 5 GHz antenna specifications

Item	Description
Frequency	5170-5330MHz, 5490-5170MHz, 5735-5835MHz
Input impedance	50 Ω
Standing wave ratio	< 2
Efficiency	-2.3 dB
Gain	3.2 dBi
Polarization	Linear polarization

## 2.2.3 LTE CA combination

**Table 2-5** LTE CA combination

Item	Description			
	Band combination	LTE	CA(DL)	MIMO
			CA_1C	4+4
			CA_3C	4+4
			CA_7C	4+4
			CA_38C	4+4
			CA_39C	4+4
			CA_40C	4+4
			CA_40D	4+4
			CA_40E	4+4
			CA_41C	4+4
			CA_41D	4+4
			CA_41E	4+4
			CA_42C	4+4
			CA_42D	2+2
			CA_43C	4+4
			CA_1A-1A	4+4
			CA_3A-3A	4+4
			CA_7A-7A	4+4
			CA_41A-41A	4+4
			CA_42A-42A	4+4
			CA_42A-42C	4+4
			CA_42C-42C	4+4
			CA_1A-3A	4+4
			CA_1A-1A-3A	4+4+4
			CA_1A-3C	4+4
			CA_1A-3A-3A	4+4+4
			CA_1A-5A	4+2
			CA_1A-7A	4+4
			CA_1A-7C	4+4
			CA_1A-7A-7A	4+4+4
			CA_1A-8A	4+2
			CA_1A-20A	4+2
			CA_1A-28A	4+2
			CA_1A-1A-28A	4+4+2
			CA_1A-32A	4+2
			CA_1A-38A	4+4
			CA_1A-40A	4+4
			CA_1A-40C	4+4
			CA_1A-41A	4+4
			CA_1A-41C	4+4
			CA_1A-42A	4+4
			CA_1A-42C	4+4
			CA_1A-42D	4+4
			CA_1A-42E	4+2
			CA_3A-5A	4+2
			CA_3C-5A	4+2

	CA_3A-7A	4+4
	CA_3C-7A	4+4
	CA_3A-3A-7A	4+4+4
	CA_3A-7C	4+4
	CA_3A-7A-7A	4+4+4
	CA_3C-7C	4+4
	CA_3A-8A	4+2
	CA_3C-8A	4+2
	CA_3A-3A-8A	4+4+2
	CA_3A-20A	4+2
	CA_3C-20A	4+2
	CA_3A-3A-20A	4+4+2
	CA_3A-28A	4+2
	CA_3C-28A	4+2
	CA_3A-3A-28A	4+4+2
	CA_3A-32A	4+2
	CA_3C-32A	4+2
	CA_3A-38A	4+4
	CA_3C-38A	4+4
	CA_3A-40A	4+4
	CA_3C-40A	4+4
	CA_3A-40C	4+4
	CA_3C-40C	4+4
	CA_3A-40D	4+4
	CA_3A-40E	4+2
	CA_3A-41A	4+4
	CA_3C-41A	4+4
	CA_3A-41C	4+4
	CA_3A-41D	4+4
	CA_3A-42A	4+4
	CA_3A-42C	4+4
	CA_3A-42D	4+4
	CA_3A-42E	4+2
	CA_5A-7A	2+4
	CA_5A-7C	2+4
	CA_5A-40A	2+4
	CA_5A-41A	2+4
	CA_7A-8A	4+2
	CA_7A-20A	4+2
	CA_7C-20A	4+2
	CA_7A-28A	4+2
	CA_7C-28A	4+2
	CA_7A-32A	4+2
	CA_7A-40A	4+2
	CA_7A-40C	4+4
	CA_7A-40D	4+4
	CA_7A-40E	4+2
	CA_8A-32A	2+2
	CA_8A-38A	2+4
	CA_8A-39A	2+4
	CA_8A-40A	2+4
	CA_8A-41A	2+4
	CA_8A-41C	2+4
	CA_20A-32A	2+2

	CA_20A-38A	2+4
	CA_20A-38C	2+4
	CA_28A-40A	2+4
	CA_28A-40C	2+4
	CA_28A-40D	2+4
	CA_28A-41A	2+4
	CA_39A-41A	4+4
	CA_39C-41A	4+4
	CA_39A-41C	4+4
	CA_39C-41C	4+4
	CA_39A-41D	4+4
	CA_40A-42A	4+4
	CA_40A-42C	4+4
	CA_41A-42A	4+4
	CA_41C-42A	4+4
	CA_41A-42C	4+4
	CA_41C-42C	4+4
	CA_41A-42D	4+4
	CA_1A-3A-5A	4+4+2
	CA_1A-3C-5A	4+4+2
	CA_1A-3A-7A	4+4+4
	CA_1A-3C-7A	4+4+4
	CA_1A-3A-7C	4+4+4
	CA_1A-3A-7A-7A	4+4+4+4
	CA_1A-3C-7C	4+4+2
	CA_1A-3A-8A	4+4+2
	CA_1A-3C-8A	4+4+2
	CA_1A-3A-3A-8A	4+4+4+2
	CA_1A-3A-20A	4+4+2
	CA_1A-3C-20A	4+4+2
	CA_1A-3A-28A	4+4+2
	CA_1A-1A-3A-28A	4+4+4+2
	CA_1A-1A-3C-28A	4+4+2+2
	CA_1A-3C-28A	4+4+2
	CA_1A-3A-3A-28A	4+4+4+2
	CA_1A-3A-32A	4+4+2
	CA_1A-3A-38A	4+4+4
	CA_1A-3A-40A	4+4+4
	CA_1A-3A-40C	4+4+4
	CA_1A-3A-41A	4+4+4
	CA_1A-3A-41C	4+4+4
	CA_1A-3A-42A	4+4+4
	CA_1A-3A-42C	4+4+4
	CA_1A-5A-7A	4+2+4
	CA_1A-7A-8A	4+4+2
	CA_1A-7A-20A	4+4+2
	CA_1A-7A-28A	4+4+2
	CA_1A-7C-28A	4+4+2
	CA_1A-7A-32A	4+4+2
	CA_1A-7A-38A	4+4+4
	CA_1A-7A-40A	4+4+2
	CA_1A-7A-40C	4+4+2
	CA_1A-8A-20A	4+2+2
	CA_1A-8A-38A	4+2+4

	CA_1A-20A-32A	4+2+2
	CA_1A-28A-40A	4+2+4
	CA_1A-28A-40C	4+2+4
	CA_1A-41A-42A	4+4+4
	CA_1A-41C-42A	4+4+4
	CA_1A-41A-42C	4+4+4
	CA_1A-41C-42C	4+2+4
	CA_3A-5A-7A	4+2+4
	CA_3A-7A-8A	4+4+2
	CA_3C-7A-8A	4+4+2
	CA_3A-7A-20A	4+4+2
	CA_3C-7A-20A	4+4+2
	CA_3A-7C-20A	4+4+2
	CA_3A-7A-28A	4+4+2
	CA_3C-7A-28A	4+4+2
	CA_3A-7C-28A	4+4+2
	CA_3C-7C-28A	2+4+2
	CA_3A-7A-32A	4+4+2
	CA_3C-7A-32A	4+4+2
	CA_3A-7A-38A	4+4+2
	CA_3A-7A-40A	4+4+2
	CA_3A-7A-40C	4+4+2
	CA_3A-8A-38A	4+2+4
	CA_3C-8A-38A	4+2+4
	CA_3A-20A-32A	4+2+2
	CA_3A-28A-40A	4+2+4
	CA_3A-28A-40C	4+2+4
	CA_3A-28A-40D	2+2+4
	CA_3A-41A-42A	4+4+4
	CA_3A-41C-42A	4+4+4
	CA_3A-41A-42C	4+4+4
	CA_3A-41C-42C	4+2+4
	CA_7A-20A-32A	4+2+2
	CA_7A-20A-38A	4+2+4
	CA_7A-28A-40A	4+2+4
	CA_7A-28A-40C	4+2+4
	CA_1A-3A-5A-7A	4+4+2+4
	CA_1A-3A-7A-8A	4+4+4+2
	CA_1A-3C-7A-8A	4+4+4+2
	CA_1A-3A-7A-20A	4+4+4+2
	CA_1A-3C-7A-20A	2+4+4+2
	CA_1A-3A-7A-28A	4+4+4+2
	CA_1A-3C-7A-28A	2+4+4+2
	CA_1A-3A-7C-28A	2+4+4+2
	CA_1A-3A-7A-32A	4+4+4+2
	CA_1A-3A-7A-40A	4+4+4+2
	CA_1A-3A-7A-40C	4+4+4+2
	CA_1A-3A-8A-38A	4+4+2+4
	CA_1A-3A-20A-32A	4+4+2+2
	CA_1A-3A-28A-40A	4+4+2+4
	CA_1A-3A-28A-40C	4+4+2+2
	CA_1A-7A-20A-32A	4+4+2+2
	CA_3A-7A-20A-32A	4+4+2+2
	CA_3A-7A-28A-40A	4+4+2+2



		CA_3A-7A-28A-40C	4+4+2+2
		CA_1A-3A-7A-20A-32A	4+4+4+2+2
		<b>CA(UL)</b>	<b>MIMO</b>
		CA_1C	/
		CA_3C	/
		CA_7C	/
		CA_38C	/
		CA_39C	/
		CA_40C	/
		CA_41C	/
		CA_42C	/
		CA_43C	/
		CA_1A-3A	/
		CA_1A-5A	/
		CA_1A-7A	/
		CA_1A-8A	/
		CA_1A-20A	/
		CA_3A-5A	/
		CA_3A-7A	/
		CA_3A-8A	/
		CA_3A-28A	/
		CA_3A-20A	/
		CA_5A-7A	/
		CA_7A-28A	/
		CA_7A-20A	/

 **NOTE**

(1)All the preceding LTE CA combinations can only represent product capabilities. For details about the carrier's support, see the product configuration.

(2)B32 supports only SCC. All downlink CA combinations with B32 do not support uplink inter-band CA.

## 2.2.4 EN\_DC combination

**Table 2-6** EN\_DC combination

Item	Description		
		EN_DC	MIMO
Band combination	5G	DC_1A_n5A	4+2
		DC_3A_n1A	4+4
		DC_3C_n1A	4+4
		DC_1A_n3A	4+4
		DC_1C_n3A	4+4
		DC_3A-3A_n1A	4+4+4
		DC_7A_n1A	4+4
		DC_1A_n7A	4+4
		DC_7A-7A_n1A	4+4+4
		DC_8A_n1A	2+4
		DC_1A_n8A	4+2
		DC_20A_n1A	2+4
		DC_1A_n28A	4+2
		DC_1A_n38A	4+4

		DC_40A_n1A	4+4
		DC_1A_n40A	4+4
		DC_1A_n41A	4+4
		DC_1A_n77A	4+4
		DC_1A_n78A	4+4
		DC_1A_n79A	4+4
		DC_3A_n5A	4+2
		DC_3C_n5A	4+2
		DC_3A_n7A	4+4
		DC_3C_n7A	4+4
		DC_7A_n3A	4+4
		DC_3A-3A_n7A	4+4+4
		DC_3A_n8A	4+2
		DC_8A_n3A	2+4
		DC_3A_n20A	4+2
		DC_20A_n3A	2+4
		DC_3A_n28A	4+2
		DC_3C_n28A	4+2
		DC_28A_n3A	2+4
		DC_3A_n38A	4+4
		DC_3C_n38A	4+4
		DC_3A_n40A	4+4
		DC_3A_n41A	4+4
		DC_3A_n77A	4+4
		DC_3A_n78A	4+4
		DC_3C_n78A	4+4
		DC_3A_n79A	4+4
		DC_7A_n5A	4+2
		DC_7C_n5A	4+2
		DC_5A_n78A	2+4
		DC_7A_n8A	4+2
		DC_20A_n7A	2+4
		DC_28A_n7A	2+4
		DC_7A_n28A	4+2
		DC_7C_n28A	4+2
		DC_7A_n77A	4+4
		DC_7A-7A_n77A	4+4+4
		DC_7A_n78A	4+4
		DC_7C_n78A	4+4
		DC_7A-7A_n78A	4+4+4
		DC_8A_n41A	2+4
		DC_8A_n77A	2+4
		DC_8A_n78A	2+4
		DC_8A_n79A	2+4
		DC_20A_n28A	2+2
		DC_20A_n38A	2+4
		DC_20A_n41A	2+4
		DC_20A_n78A	2+4
		DC_28A_n40A	2+4
		DC_28A_n41A	2+4
		DC_28A_n77A	2+4
		DC_28A_n78A	2+4
		DC_38A_n78A	4+4
		DC_39A_n41A	4+4

		DC_39A_n79A	4+4
		DC_40A_n41A	4+4
		DC_40A_n78A	4+4
		DC_40C_n78A	4+4
		DC_40A_n79A	4+4
		DC_41A_n78A	4+4
		DC_41C_n78A	4+4
		DC_1A-7A_n7A	4+4+4
		DC_3A-7A_n7A	4+4+4
		DC_3C-7A_n7A	4+4+4
		DC_3A-3A_n77A	4+4+4
		DC_7A-28A_n7A	4+2+4
		DC_3A-3A_n78A	4+2+4
		DC_1A-3A_n5A	4+4+2
		DC_1A-3C_n5A	4+4+2
		DC_3A-7A_n1A	4+4+4
		DC_3C-7A_n1A	4+4+4
		DC_3A-7C_n1A	4+4+4
		DC_3C-7C_n1A	4+2+4
		DC_1A-7A_n3A	4+4+4
		DC_1A-3A_n7A	4+4+4
		DC_1A-3C_n7A	4+4+4
		DC_1A-3A-7A_n7A	2+4+4+4
		DC_3A-3A-7A_n1A	4+4+4+4
		DC_1A-3A-3A_n7A	2+4+4+4
		DC_3A-7A-7A_n1A	4+4+4+4
		DC_1A-8A_n3A	4+2+4
		DC_3A-8A_n1A	4+2+4
		DC_3C-8A_n1A	4+2+4
		DC_3A-3A-8A_n1A	4+4+2+4
		DC_3A-20A_n1A	4+2+4
		DC_3C-20A_n1A	4+2+4
		DC_1A-20A_n3A	4+2+4
		DC_1A-28A_n3A	4+2+4
		DC_1A-3A_n28A	4+4+2
		DC_1A-3C_n28A	4+4+2
		DC_1A-3A_n38A	4+4+4
		DC_1A-3A_n40A	4+4+4
		DC_3A-40A_n1A	4+4+4
		DC_1A-3A_n41A	4+4+4
		DC_1A-3A_n77A	4+4+4
		DC_1A-3A_n78A	4+4+4
		DC_1A-3C_n78A	4+4+4
		DC_1A-3A_n79A	4+4+4
		DC_1A-7A_n5A	4+4+2
		DC_1A-7C_n5A	4+4+2
		DC_1A-5A_n78A	4+2+4
		DC_7A-8A_n1A	4+2+4
		DC_7A-20A_n1A	4+2+4
		DC_1A-28A_n7A	4+2+4
		DC_1A-7A_n28A	4+4+2
		DC_1A-1A-28A_n7A	4+4+2+4
		DC_1A-7C_n28A	4+4+2
		DC_1A-7A_n78A	4+4+4

	DC_1A-7C_n78A	4+4+4
	DC_1A-7A-7A_n78A	4+4+4+4
	DC_1A-8A_n77A	4+2+4
	DC_1A-8A_n78A	4+2+4
	DC_1A-8A_n79A	4+2+4
	DC_1A-20A_n28A	4+2+2
	DC_1A-20A_n38A	4+2+4
	DC_1A-20A_n78A	4+2+4
	DC_1A-28A_n40A	4+2+4
	DC_1A-28A_n77A	4+2+4
	DC_1A-28A_n78A	4+2+4
	DC_1A-41A_n78A	4+4+4
	DC_1A-41C_n78A	4+4+4
	DC_1A-42A_n78A	4+4+4
	DC_1A-42C_n78A	4+4+4
	DC_3A-7A_n5A	4+4+2
	DC_3C-7A_n5A	4+4+2
	DC_3A-7C_n5A	4+4+2
	DC_3C-7C_n5A	4+2+2
	DC_3A-5A_n78A	4+2+4
	DC_7A-8A_n3A	4+2+4
	DC_7A-20A_n3A	4+2+4
	DC_3A-20A_n7A	4+2+4
	DC_3A-28A_n7A	4+2+4
	DC_3C-28A_n7A	4+2+4
	DC_7A-28A_n3A	4+2+4
	DC_3A-7A_n28A	4+4+2
	DC_3C-7A_n28A	4+4+2
	DC_3A-3A-28A_n7A	4+4+2+4
	DC_3A-7C_n28A	4+4+2
	DC_3C-7C_n28A	4+2+2
	DC_3A-7A_n77A	4+4+4
	DC_3A-7A_n78A	4+4+4
	DC_3C-7A_n78A	4+4+4
	DC_3A-7A-7A_n78A	4+4+4+4
	DC_3A-3A-7A_n78A	4+4+4+4
	DC_3A-7C_n78A	4+4+4
	DC_3C-7C_n78A	4+2+4
	DC_3A-8A_n77A	4+2+4
	DC_3A-8A_n78A	4+2+4
	DC_3C-8A_n78A	4+2+4
	DC_3A-3A-8A_n78A	4+4+2+4
	DC_3A-8A_n79A	4+2+4
	DC_3A-20A_n28A	4+2+2
	DC_3C-20A_n28A	4+2+2
	DC_3A-20A_n38A	4+2+4
	DC_3A-20A_n78A	4+2+4
	DC_3C-20A_n78A	4+2+4
	DC_3A-28A_n40A	4+2+4
	DC_3A-28A_n41A	4+2+4
	DC_3A-28A_n77A	4+2+4
	DC_3A-28A_n78A	4+2+4
	DC_3C-28A_n78A	4+2+4
	DC_3A-3A-28A_n78A	4+4+2+4

		DC_3A-38A_n78A	4+4+4
		DC_3A-40A_n78A	4+4+4
		DC_3A-41A_n78A	4+4+4
		DC_3A-41C_n78A	4+4+4
		DC_5A-7A_n78A	2+4+4
		DC_7A-8A_n77A	4+2+4
		DC_7A-8A_n78A	4+2+4
		DC_7A-20A_n28A	4+2+2
		DC_7A-20A_n78A	4+2+4
		DC_7A-28A_n78A	4+2+4
		DC_7C-28A_n78A	4+2+4
		DC_20A-38A_n78A	2+4+4
		DC_28A-41A_n78A	2+4+4
		DC_1A-3C-7A_n7A	4+4+4+4
		DC_1A-7A-28A_n7A	4+4+2+4
		DC_3A-7A-28A_n7A	4+4+2+4
		DC_3C-7A-28A_n7A	4+4+2+4
		DC_1A-3A-7A_n5A	4+4+4+2
		DC_1A-3C-7A_n5A	4+4+4+2
		DC_1A-3A-7C_n5A	4+4+4+2
		DC_1A-3C-7C_n5A	4+2+2+2
		DC_1A-3A-5A_n78A	4+4+2+4
		DC_1A-7A-8A_n3A	4+4+2+4
		DC_3A-7A-8A_n1A	4+4+2+4
		DC_3A-7A-20A_n1A	4+4+2+4
		DC_3C-7A-20A_n1A	4+4+2+4
		DC_3A-7C-20A_n1A	4+4+2+4
		DC_1A-7A-20A_n3A	4+4+2+4
		DC_1A-3A-28A_n7A	4+4+2+4
		DC_1A-3C-28A_n7A	4+4+2+4
		DC_1A-3A-7A_n28A	4+4+4+2
		DC_1A-3C-7A_n28A	4+4+4+2
		DC_1A-1A-3A-28A_n7A	2+2+4+2+4
		DC_1A-3A-3A-28A_n7A	4+2+2+2+4
		DC_1A-3A-7C_n28A	2+4+4+2
		DC_1A-1A-3C-28A_n7A	2+2+2+2+4
		DC_1A-3C-7C_n28A	4+2+2+2
		DC_1A-3A-7A_n78A	4+4+4+4
		DC_1A-3C-7A_n78A	4+4+4+4
		DC_1A-3A-7C_n78A	4+4+4+4
		DC_1A-3C-7C_n78A	4+2+2+4
		DC_1A-3A-8A_n77A	4+4+2+4
		DC_1A-3A-8A_n78A	4+4+2+4
		DC_1A-3C-8A_n78A	4+4+2+4
		DC_1A-3A-8A_n79A	4+4+2+4
		DC_1A-3A-20A_n28A	4+4+2+2
		DC_1A-3A-20A_n38A	4+4+2+4
		DC_1A-3A-20A_n78A	4+4+2+4
		DC_1A-3A-28A_n40A	4+4+2+4
		DC_1A-3A-28A_n77A	4+4+2+4
		DC_1A-3A-28A_n78A	4+4+2+4
		DC_1A-3C-28A_n78A	4+4+2+4
		DC_1A-3A-41A_n78A	4+4+4+4
		DC_1A-3A-41C_n78A	4+4+4+4

	DC_1A-5A-7A_n78A	4+2+4+4
	DC_1A-7A-8A_n78A	4+4+2+4
	DC_1A-7A-20A_n28A	4+4+2+2
	DC_1A-7A-20A_n78A	4+4+2+4
	DC_1A-7A-28A_n78A	4+4+2+4
	DC_1A-7C-28A_n78A	4+4+2+4
	DC_1A-8A-20A_n78A	2+2+2+2
	DC_3A-5A-7A_n78A	4+2+2+4
	DC_3A-7A-8A_n78A	4+4+2+4
	DC_3A-7A-20A_n28A	4+4+2+2
	DC_3A-7A-20A_n78A	4+4+2+4
	DC_3C-7A-20A_n78A	4+4+2+4
	DC_3A-7A-28A_n78A	4+4+2+4
	DC_3C-7A-28A_n78A	4+4+2+4
	DC_3A-7C-28A_n78A	4+4+2+4
	DC_3C-7C-28A_n78A	2+2+2+4
	DC_1A-3A-7A-28A_n7A	4+4+4+2+4
	DC_1A-3C-7A-28A_n7A	4+2+4+2+4
	DC_1A-3A-5A-7A_n78A	4+4+2+4+4
	DC_1A-3A-7A-8A_n78A	4+4+2+4+4
	DC_1A-3A-7A-20A_n28A	4+4+4+2+2
	DC_1A-3A-7A-20A_n78A	4+4+4+2+4
	DC_1A-3A-7A-28A_n78A	4+4+4+2+4
	DC_1A-3C-7A-28A_n78A	4+2+4+2+4
	DC_1A-3A-7C-28A_n78A	4+4+2+2+4

 **NOTE**


(1)All the preceding EN\_DC combinations can only represent product capabilities. For details about the carrier's support, see the product configuration.

(2)B32 supports only SCC. All downlink EN\_DC combinations with B32 do not support uplink inter-band CA.

## 2.3 Software Specifications

**Table 2-7** Software specifications

Item	Description	
5G features	DL 256 QAM, UL 256QAM	
LTE features	DL 4x4 MIMO/5CC (The number of MIMO is related to the specific combination.)	
	DL 256 QAM, UL 256 QAM	
Mobile network	APN management APN auto adapter	
Gateway	Router	<ul style="list-style-type: none"> <li>• Supports the default route</li> <li>• Supports manual configuration of LAN IP addresses</li> <li>• Supports Address Resolution Protocol (ARP)</li> </ul>

Item	Description	
	DHCP server	<ul style="list-style-type: none"> <li>• The DHCP server can be enabled or disabled</li> <li>• The address pool of the DHCP server can be configured</li> <li>• The lease can be configured</li> </ul>
	NAT	<ul style="list-style-type: none"> <li>• Supports NAT and NAPT (compliant with RFC2663, RFC3022, and RFC3027)</li> <li>• Supports cone NAT</li> </ul>
	ARP	
	ICMP	
	IPv4v6 dual stack IPv4 only IPv6 only (Customization , CLAT for LAN side IPv4 device access Internet)  <b>NOTE</b> When the CLAT function is enabled, the IPv4 device Internet access service cannot reach the maximum throughput. Under IPv6 only, NAT-base service (such as port forwarding and port triggering) is not available	
	VPN pass-through	
VPN client	<ul style="list-style-type: none"> <li>• Supports L2TP VPN client</li> <li>• Supports PPTP VPN client</li> </ul>	
SMS	<ul style="list-style-type: none"> <li>• Writing/sending/receiving</li> <li>• Writing/sending/receiving extra-long messages</li> </ul>	
Data service	<ul style="list-style-type: none"> <li>• Supports the SA and NSA networks</li> <li>• The SA network supports a maximum of DL 1CC and 100 MHz bandwidth</li> <li>• In the NSA network, the NR downlink supports 1CC and 100 MHz bandwidth</li> <li>• Maximum number of downlink is 12 flows in the LTE network(The number of flows is related to the EN-DC combination)</li> </ul> Wi-Fi 802.11b/g/n/a/ac/ax Supports multi APNs (Customization, one for data, one for voice, one for voice and one for TR-069)	
Voice	VoIP	Supports G.711a/G.711u/G.726 (-24/-32)/G.722/G.729 codec
		Supports SIP (RFC3261)
		Supports SDP (RFC2327)

Item	Description	
		Supports RTP/RTCP (RFC1889/RFC1890/RFC3550)
		Supports in-band/SIP info/RFC2833 DTMF
		Supports the following phone features: <ul style="list-style-type: none"> <li>• Caller ID generation</li> <li>• Call waiting</li> <li>• Call forwarding (unconditional, busy, and no answer forwarding)</li> <li>• Call hold</li> <li>• Three-way conference</li> </ul>
	VoLTE (Customization)	<ul style="list-style-type: none"> <li>• Supports AMR-NB codec</li> <li>• Supports AMR-WB codec</li> </ul>
		Supports in-band/out-band (RFC2833) DTMF
		Supports the following phone features: <ul style="list-style-type: none"> <li>• Caller ID generation</li> <li>• Call waiting</li> <li>• Call forwarding (unconditional, busy, and no answer forwarding)</li> <li>• Call hold</li> <li>• Three-way conference</li> <li>• Originating Identification Presentation/Restriction</li> <li>• Outgoing Communication Barring</li> </ul>
Firewall setup	<ul style="list-style-type: none"> <li>• Firewall enable/disable</li> <li>• MAC Address Filter</li> <li>• IP Filter</li> <li>• Virtual server</li> <li>• Special Applications</li> <li>• DMZ settings</li> <li>• SIP ALG settings</li> <li>• UPnP settings</li> <li>• NAT settings</li> <li>• Domain Filter</li> </ul>	
LAN	<ul style="list-style-type: none"> <li>• 10/100/1000 Mbps auto-negotiation</li> <li>• MDI/MDIX auto-sensing</li> <li>• IEEE 802.3/802.3u-compatible</li> </ul>	
Wi-Fi	Broadcasts and hides service set identifiers (SSIDs)	
	Complies with IEEE 802.11b/g/n/a/ac/ax	



Item	Description	
	WPS	
	WMM	
	Encryption	AES, and TKIP + AES
	Security mode	<ul style="list-style-type: none"> <li>• Open</li> <li>• WPA2-PSK</li> <li>• WPA3-SAE</li> <li>• WPA/WPA2-PSK</li> <li>• WPA2-PSK/WPA3-SAE</li> </ul>
	MAC address authentication	<ul style="list-style-type: none"> <li>• Supports the MAC address authentication whitelist</li> <li>• Supports the MAC address authentication blacklist</li> <li>• Supports a maximum of 32 MAC address entries</li> </ul>
	STA	<ul style="list-style-type: none"> <li>• Supports inquiry of STA status</li> <li>• Supports a maximum of 128 connected stations</li> </ul>
Operator maintenance (Customization)	<ul style="list-style-type: none"> <li>• Supports TR-069 Amendment III</li> <li>• Supports TR-098 Amendment II</li> <li>• Supports TR-143 Amendment I</li> </ul>	
USIM	PIN management and USIM card authentication	
NTP	Supports daylight saving time (DST) (Customization)	
The device management app	<ul style="list-style-type: none"> <li>• View data traffic usage and SMS</li> <li>• Manage connected devices</li> <li>• Change CPE's SSID and password</li> </ul>	
System requirements	Operating system	Windows 8, Windows 8.1, Windows 10 (Not support Windows RT), MAC OS X 10.12, 10.13, 10.14 and 10.15.
	Web browser	<ul style="list-style-type: none"> <li>• Microsoft Internet Explorer 9.0 and Microsoft Edge 14.0 with latest updates.</li> <li>• Firefox 60.0 with latest updates.</li> <li>• Chrome 60.0 with latest updates.</li> <li>• Safari 10.0 with latest updates.</li> <li>• Opera 51.2 with latest upgrades.</li> </ul>
	Your computer's hardware system should meet or exceed the recommended system requirements for the installed OS version	

# 3 Services and Applications

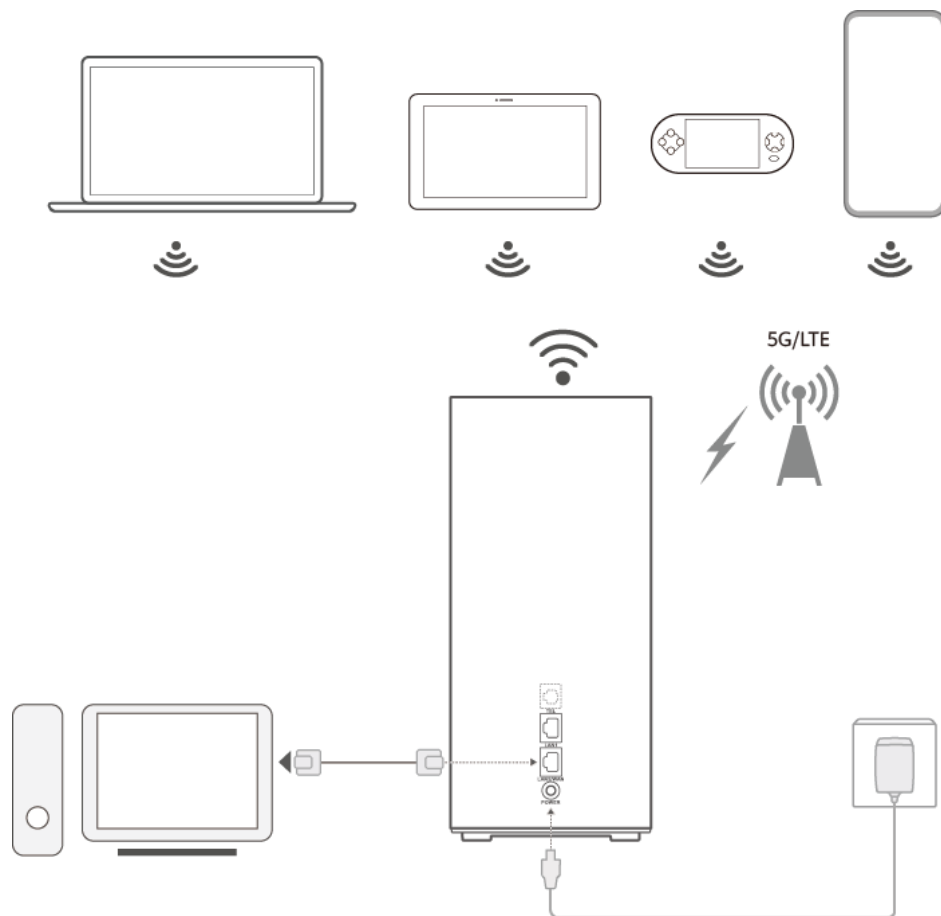
## 3.1 Data Services

The H138-380 can access the Internet through mobile networks and Ethernet networks. By connecting to the H138-380 using Wi-Fi or a network cable, users can obtain access to high-speed Internet services and establish a local area network (LAN).

### 3.1.1 Accessing the Internet through a Mobile Network (5G/LTE)

The H138-380 can access the Internet through mobile networks.

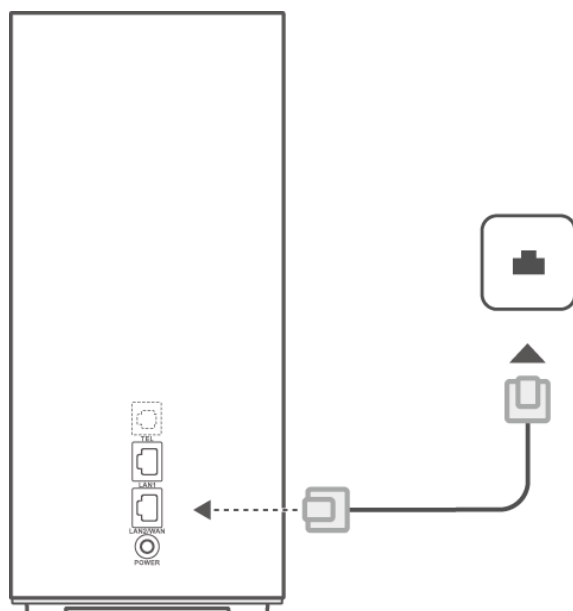
**Figure 3-1** Accessing the Internet through a mobile network



## 3.1.2 Accessing the Internet through an Ethernet Network

The H138-380's LAN/WAN port can be connected to a wall-mounted Ethernet port using a network cable.

**Figure 3-2** Accessing the Internet through an Ethernet network



## 3.2 Voice Services

The H138-380 provides one telephone port that can be connected to telephones for calling.

## 3.3 SMS

The H138-380 supports message writing/sending/receiving and group sending (up to 50 -contacts at a time).

## 3.4 Security Service

The H138-380 supports comprehensive and robust security services. It provides a firewall function and PIN protection mechanisms. These features allow users to connect their computers to the Internet and simultaneously protect their computers against security threats from the Internet.

### 3.4.1 Firewall Service

The H138-380 supports the enabling or disabling of a firewall on the network connection, which protects the device and network from attacks by hackers on the Internet and controls access to the Internet.

### 3.4.2 MAC Filtering

The H138-380 supports configuration of the Media Access Control (MAC) address filtering to restrict network access.

### 3.4.3 Wi-Fi Authentication

The gateway supports the following user authentication protocols for Wi-Fi:

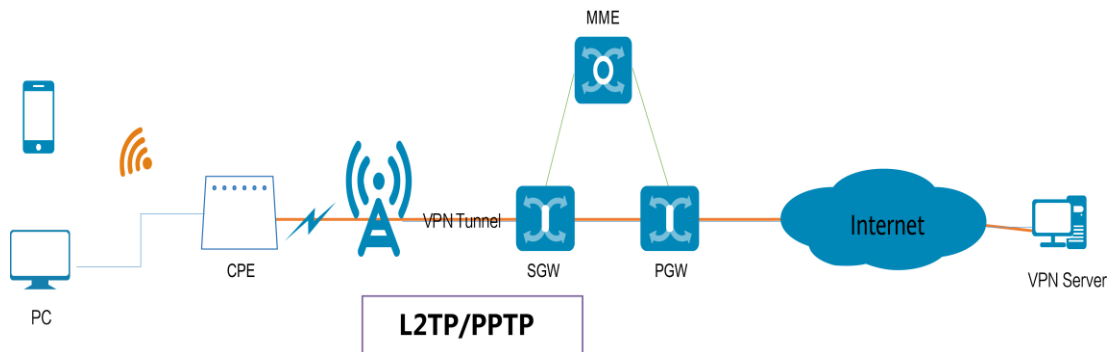
- No encryption
- WPA2-PSK, WPA3-SAE, WPA/WPA2-PSK, WPA2-PSK /WPA3-SAE.

## 3.5 VPN Function

### 3.5.1 VPN Client

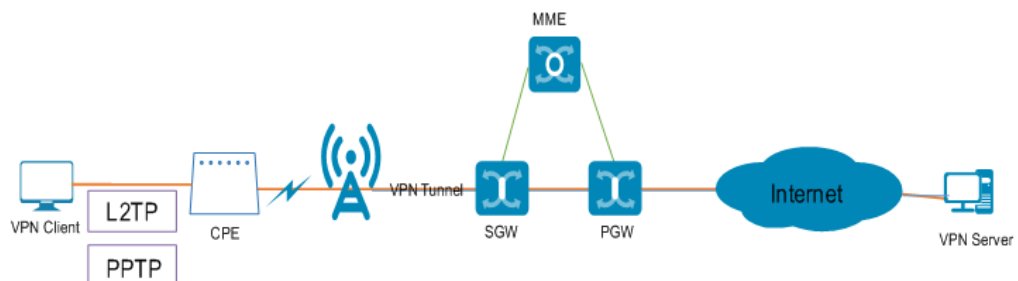
VPN tunneling involves establishing and maintaining a logical network connection (that may contain intermediate hops). On this connection, packets constructed in a specific VPN protocol format are first encapsulated within some other base or carrier protocol, then transmitted between the VPN client and server, and finally decapsulated on the receiving side.

The H138-380 supports L2TP and PPTP tunneling protocols.



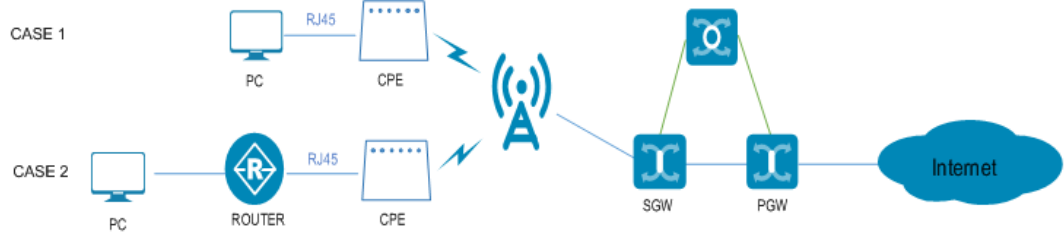
### 3.5.2 VPN Pass-Through

The H138-380 supports L2TP/PPTP VPN pass-through for the LAN side device. The LAN side device can create a VPN tunnel to the VPN server.



### 3.6 IP Pass-Through (Customization)

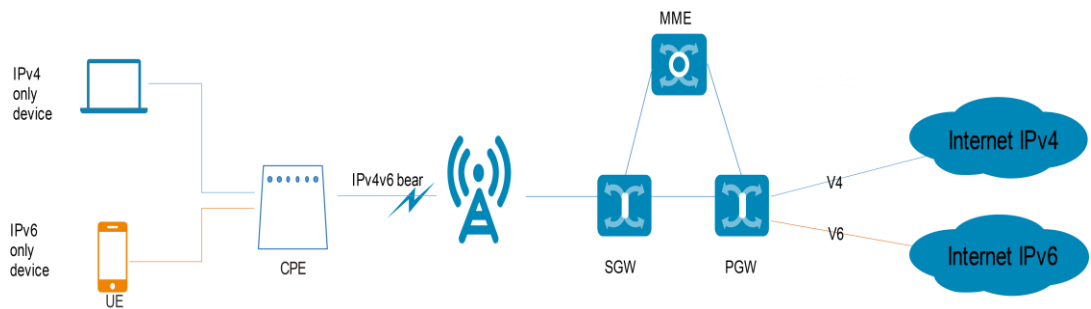
The H138-380 obtains the WAN IP address and passes it through to the PC (Case 1) or Router (Case 2), and then the PC (Case 1) or Router (Case 2) can directly use the WAN IP address.



### 3.7 IPv6 Only and IPv4v6 Dual Stack

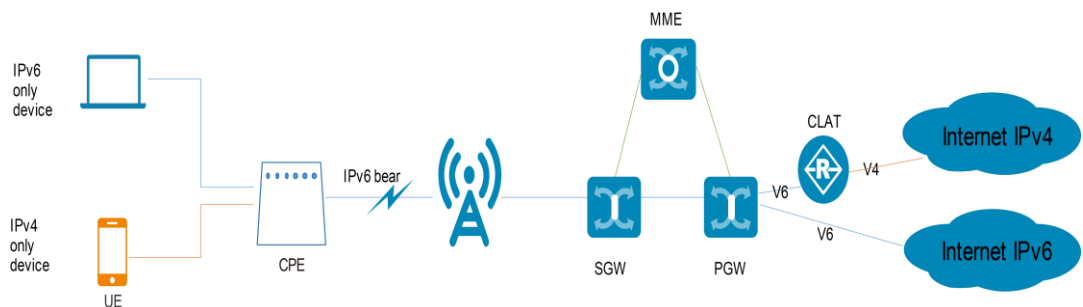
#### 3.7.1 IPv4v6 Dual Stack

The H138-380 provides dual stack function.



#### 3.7.2 IPv6 Only (CLAT) (Customization)

The H138-380 supports IPv6 only with the transition solution CLAT for IPv4 device.



#### NOTE

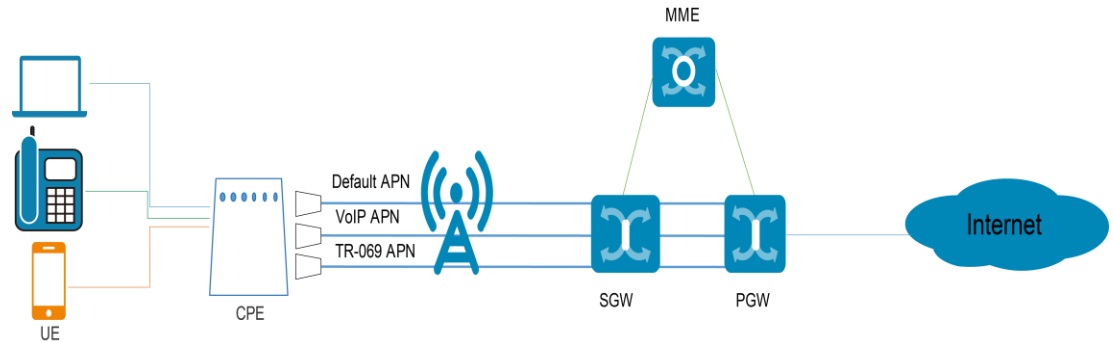
When the IPv6 only (CLAT) function is enabled, NAT-based functions (like DMZ/Port Forwarding/Port tigger) cannot be used.

When an IPv4 device accesses the Internet, the performance is degraded because packets need to be packetized and unpacked. However, IPv6 devices are not affected.

## 3.8 Multi-APN (Customization)

The H138-380 supports the establishment and maintenance of three APNs. These three APN connections isolate data, voice, and remote management services on an operator's network.

The H138-380 supports an independent APN for CPE internet/VoIP/TR-069.



## 3.9 5GHz Preferred

Priority usage of 5 GHz Wi-Fi band over 2.4 GHz band when signal strength is equal to increase connection speeds.

The product will support two SSIDs when 5 GHz preferred is enabled. The first SSID includes 2.4 GHz Wi-Fi and 5GHz Wi-Fi, which provides 5 GHz preferred capabilities. The second SSID ending with '\_5G' is an independent 5 GHz Wi-Fi. Customers can choose according to their needs.

The product also supports two SSIDs when 5 GHz preferred is disabled. The first SSID is only 2.4 GHz Wi-Fi, the second SSID is 5 GHz Wi-Fi ending with '\_5G'. Customers can choose according to their needs.

## 3.10 Customer management

### 3.10.1 WebUI

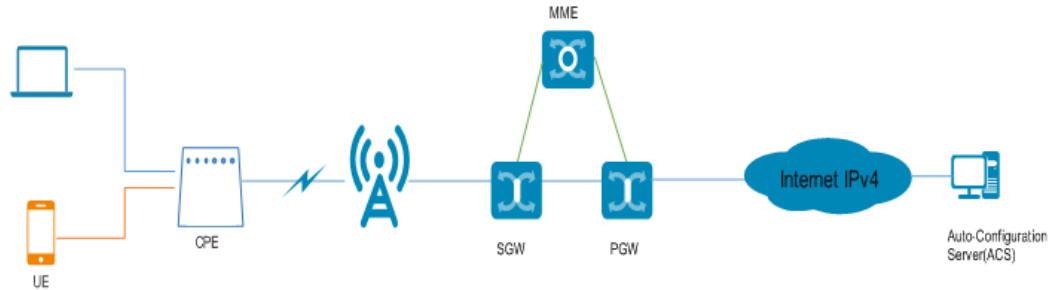
The H138-380 supports local configuration through the Web UI. You can perform device management and network configuration to ensure normal and stable performance.

### 3.10.2 The device management app

Scan the QR code (can be found in the Quick Start Guide and Web UI) to download the device management app and configure the router from your phone.

## 3.11 Operator maintenance (Customization)

The H138-380 supports Operator maintenance through the TR-069. Operator remote manages the CPE software update/parameters configuration via TR-069.



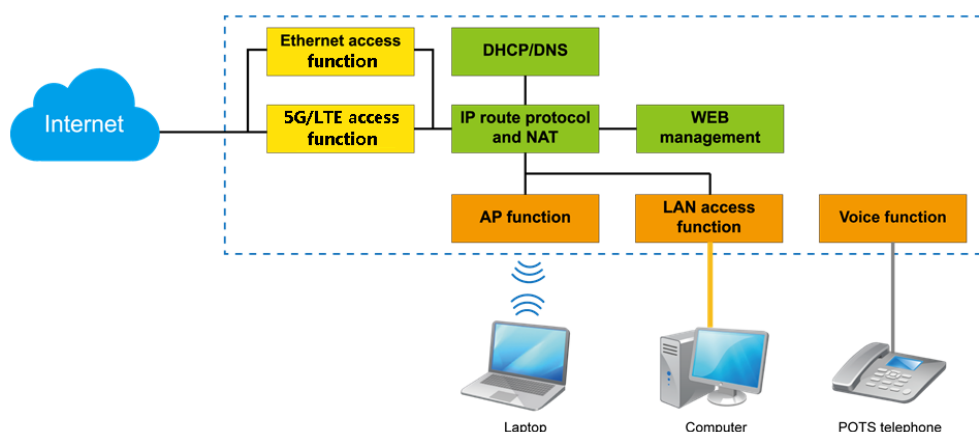
## 3.12 FOTA

The H138-380 supports the FOTA feature, which allows users to remotely update the device firmware through the FOTA server.

# 4 System Structure and Scenario Constraints

## 4.1 System Architecture

Figure 4-1 System structure



The following describes the modules shown in Figure 4-1.

- Ethernet access function: The H138-380 adopts the Ethernet access technology at the WAN side.
- 5G/LTE access function: The H138-380 adopts the 5G/LTE access technology at the WAN side.
- LAN access function: One 10/100/1000 Mbps high-speed Ethernet ports are provided at the LAN side. The H138-380 provides the switching function for local networking and sharing of the broadband network when it is connected to terminal devices.
- AP function: An 802.11b/g/n/a/ac/ax-compliant Wi-Fi AP interface is provided for wireless networking at home. The interface is compliant with the IEEE 802.11b/g/n/a/ac/ax standard and the WPA2-PSK, WPA3-SAE, WPA/WPA2-PSK, WPA2-PSK /WPA3-SAE security authentication mechanisms.
- DHCP/DNS: The DHCP server dynamically allocates IP addresses to PCs.
- Web-based management: You can configure the H138-380 and modify and view the configuration of the H138-380.



- IP routing protocol and NAT: The H138-380 has high-speed routing capability. With the built-in NAT, the H138-380, together with LTE terminals, can provide flexible broadband access solutions and networking schemes.
- Voice function: The H138-380 supports voice services.

## 4.2 Scenario Constraints

The H138-380 is a household wireless broadband access product designed for use in scenarios with relatively few network access devices and relatively low network reliability requirements, such as homes or small office and home offices (SOHOs).

The H138-380 is not an enterprise-grade product. It cannot be used by medium- or large-sized enterprises or in scenarios with high network reliability requirements, such as banks, securities agencies, traffic control, and communications device backhaul.

The H138-380 has the following constraints:

- When the IP Pass-Through mode is enabled, the FOTA function cannot be used.
- When the L2TP/PPTP VPN client function is enabled, the throughput performance will slow down.
- A maximum of 128 devices can be connected to the Wi-Fi in theory; the actual number of devices that can be connected and served depends on actual conditions.

# 5 Technical References

## 5.1 Standards and Communication Protocols

### 5.1.1 Standards and Communication Protocols of the Product

**Table 5-1** Standards and communication protocols of the product

Item	Description
Physical layer	RFC894
ARP	RFC826
IP	RFC791, RFC1122, RFC1071, RFC1141, RFC1624, RFC792, RFC950, RFC1256
ICMP	RFC792, RFC950, RFC1256
TCP	RFC793
UDP	RFC768
NAT	RFC1631, RFC2663, RFC3022, RFC3027
DHCP	RFC1531, RFC1533

### 5.1.2 Standards and Communication Protocols of the Wireless Uu Interface

This device supports 3GPP Release 15.

# 6 Packing List

**Table 6-1** Packing list

Description	Quantity	Remarks
Wireless Gateway	1	Standard
Power supply adapter	1	Standard
Quick Start	1	Standard
Ethernet cable	1	Standard
Phone cable	1	Optional
Warranty card	1	Optional