LTE Outdoor CPE B2338-168
Product Description

Issue   **Draft A**

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Contents

1 About This Document

1.1 Summary

This document provides information on product features, main functions and services, technical specifications, and technical references.

This document consists of the following chapters.

Chapter	Description
2 Product Overview	Provides an overview of the product.
3 Features	Describes the product features.
4 Technical Specifications	Describes the specifications of product hardware, software, and user interface.
5 Services and Applications	Describes the main functions and applications.
6 System Structure and Scenario Constraints	Describes the product system structure.
7 Technical References	Describes the standards and communication protocols of the products.

◫ NOTE

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

1.2 History

Issue	Description	Date
Draft A	Initial commercial release	2016-01-10

1.3 Acronyms and Abbreviations

Acronym or Abbreviation	Full Spelling
ARP	Address Resolution Protocol
AP	access point
APN	access point name
CPE	customer premises equipment
DHCP	Dynamic Host Configuration Protocol
DNS	domain name server
DL	downlink
IP	Internet Protocol
ICMP	Internet Control Message Protocol
LAN	local area network
LED	light emitting diode
LTE	Long Term Evolution
NAT	Network Address Translation
SOHO	small office home office
SCP	service control point
SDRAM	synchronous dynamic random access memory
UMTS	Universal Mobile Telecommunications System
UL	uplink
WAN	wide area network
Wi-Fi	Wireless Fidelity
WPS	Wi-Fi protected setup

2 Product Overview

The HUAWEI LTE CPE B2338-168 is a Long Term Evolution (LTE) wireless gateway for multiple users in household, factory, and small office environments. It enables users to access the Internet through the wired or wireless network.

The B2338-168 supports 3GPP Release 12 with UE uplink category 13 and downlink category 12.

The B2338-168 also supports wired and wireless network access, and provides data service such as router and switch functionality. The supported service functions are as follows:

- Data service
- VoIP service
- Security service
- L2/L3 VPN service
- IP pass-through
- Multi-APN
- Local management and maintenance
- Firmware over the air (FOTA)

3 Features

The main features of the B2338-168 are as follows:

- LTE connectivity with DL 4x4 MIMO + 2CC CA, DL 3CC CA, and UL 2CC CA + 64QAM (Notes:DL 2CC CA and 3CC CA need different software versions)
  - Supports LTE TDD-only DL 4x4 MIMO and DL 2CC up to 40 MHz contiguous or non-contiguous carrier aggregation.
  - Supports LTE FDD+TDD 2CC up to 40MHz CA,FDD 2*2MIMO,TDD 4*4MIMO(TM9)
  - Supports LTE TDD UL 2CC up to 40 MHz contiguous or non-contiguous(inter-band) carrier aggregation and UL 64QAM.
  - Supports DL 3CC CA (TDD only and FDD + TDD) (Notes: need different software versions)
- High speed experience
  - Supports LTE UE uplink category 13 and downlink category 12.
  - Supports a maximum throughput of 420 Mbit/s in the downlink and 30 Mbit/s in the uplink when TDD subframe configuration 2 is used.(TDD DL 2CC+4*4MIMO/UL 2CC CA+64QAM)
  - Supports a maximum throughput of 300 Mbit/s in the downlink and 150 Mbit/s in the uplink when TDD subframe configuration 2 is used.(FDD DL 2CC+2*2MIMO/UL 2CC CA+64QAM)
- Two-port Gigabit Ethernet (GE) switch

  Supports wired LAN connectivity with rate auto-negotiation and medium dependent interface crossover (MDIX) auto-detection.
- Wireless LAN access point
  - Supports wireless LAN (WLAN) connectivity with an integrated 802.11ac/b/g/n access point.
  - Supports 802.11 security mechanisms, such as WEP, WPA, and WPA2.
- Voice over IP (VoIP)
  - Supports high-quality voice services over the telephony interface in compliance with the Simple Internet Protocol (SIP).
  - Supports two lines of voice and connection to another integrated access device (IAD) to obtain more voice ports.
  - Supports multiple APNs, with one APN for VoIP.
- Flexible networking capabilities

- Provides high-speed routing capability.
- Supports a comprehensive set of networking and IP protocols, such as bridging, routing, domain name server (DNS), dynamic DNS, Dynamic Host Configuration Protocol (DHCP) server, and Network Address Translation (NAT).

- Flexible security services
  - Supports packet filtering firewall.
  - Provides instant protection to block potential security risks and intrusion attempts.

- Web-based configuration

  Supports local and remote management and maintenance with built-in web-based configuration and user-friendly web interface.

- TR069&SNMP-based device management
  - Supports the CPE WAN Management Protocol (CWMP) as specified in Broadband Forum TR-069&SNMP Amendment II.
  - Supports remote software image installation, with a set of configuration and status parameters.

- VPN

  Supports L2/L3 VPN client.

- Antenna and interface

  Has a built-in LTE and WLAN high-gain, high-performance antenna.

- Others
  - Has a user-friendly design of LED indicators to show the status of equipment.
  - Supports Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10, Linux, and Mac.
  - Be compatible with browsers including Internet Explorer, Firefox, Chrome, and Safari.

4 Technical Specifications

4.1 Hardware Specifications

Table 4-1 describes the technical specifications of the B2338-168.

Table 4-1 Technical specifications of the B2338-168

Item	Description	
Technical standard	WAN: LTE 3GPP Release 12 (uplink category 13 and downlink category 12)	
	LAN: IEEE 802.3	
	WLAN: IEEE 802.11ac/b/g/n	
Working frequency band	LTE TDD	Bands 38, 40, 41, 42 and 43
	LTE FDD	Bands 1,3,7 and 20
	WLAN	2.4 GHz and 5 GHz
Frequency channel bandwidth	5 MHz, 10 MHz, 15 MHz, and 20 MHz	
External interface	Indoor unit: • 2 Ethernet ports (RJ45): 10/100/1000 Mbit/s • 1 Giga PoE WAN port (RJ45) • 2 POTS ports (RJ11) • 1 power button • 1 reset button Outdoor unit: • 1 Giga PoE LAN port (RJ45): 10/100/1000 Mbit/s • 1 USIM card slot	

Item	Description	
LED indicator	Indoor unit: • 1 system power indicator • 1 system indicator for WAN connection • 5 indicators for LTE signal strength display • 2 WLAN indicators (2.4 GHz and 5 GHz each) • 2 phone indicators • 2 LINK/ACTIVE indicators for each Ethernet port Outdoor unit: • 1 system power indicator • 1 system indicator for Ethernet connection • 1 SIM indicator for SIM connection • 5 indicators for LTE signal strength display	
Maximum transmit power	LTE	200 mW (23 dBm ± 2 dB)
	WLAN	802.11ac: • SISO: 10 mW (10 dBm ± 2 dB) • MIMO: 20 mW (13 dBm ± 2 dB) 802.11n: • SISO: 16 mW (12 dBm ± 2 dB) • MIMO: 32 mW (15 dBm ± 2 dB) 802.11g: 16 mW (12 dBm ± 2 dB) 802.11b: 32 mW (15 dBm ± 2 dB)
Receiver sensitivity	LTE	• Band 38 and band 40: • -100 dBm/5 MHz • -97 dBm/10 MHz • -95.2 dBm/15 MHz • -94 dBm/20 MHz • Band 41: • -98 dBm/5 MHz • -95 dBm/10 MHz • -93.2 dBm/15 MHz • -92 dBm/20 MHz • Band 42 and band 43: • -99 dBm/5 MHz • -96 dBm/10 MHz • -94.2 dBm/15 MHz • -93 dBm/20 MHz

Item	Description	
	WLAN	• -48 dBm @ 160 Mbit/s, typical for 802.11ac • -64 dBm @ 65 Mbit/s, typical for 802.11n • -65 dBm @ 54 Mbit/s, typical for 802.11g • -76 dBm @ 11 Mbit/s, typical for 802.11b
Power consumption	Average power consumption at peak hours: < 24 W Average power consumption with Wi-Fi disabled: < 22 W	
AC/DC power supply	AC: 100–270 V, 50/60 Hz DC: 56 V	
Dimensions (W x D x H)	Outdoor unit: 255mm x 251.5mm x 102mm Indoor unit: 173mm x 128.01mm x 60mm	
Dimensions with package (W x D x H)	BOX: 380mm x 355mm x 215mm Carton: 380mm x 355mm x 430mm (2pcs)	
Weight	Outdoor unit: < 1.5 kg Indoor unit: < 285 g	
Weight with package	All packet(BOX) < 3.6kg All packet(Carton) < 7.2kg	
Temperature	Outdoor unit: • Working temperature: –40ºC to +60ºC • Storage temperature: –40ºC to +70ºC Indoor unit: • Working temperature: 0ºC to +40ºC • Storage temperature: –40ºC to +70ºC	
Humidity	5% to 95%	
Installation	Pole-mounting kits for the outdoor unit	
Environmental rating	IP65 for the outdoor unit	
Certification/Compliance	CE certification IEC/EN60950-1 Wireless Safety IEC/EN60950-22 Environmental CE Class B ROHS REACH WEEE	

4.2 Antenna Specifications

4.2.1 Build-in LTE Antenna

Table 4-2 describes LTE antenna specifications.

Table 4-2 LTE antenna specifications

Item	Description
Frequency	TDD • Band 38: 2570–2620 MHz • Band 40: 2300–2400 MHz • Band 41: 2496–2690 MHz • Band 42: 3400–3600 MHz • Band 43: 3600–3800 MHz FDD • Band 1: 1920–1980 MHz in the uplink and 2110–2170 MHz in the downlink • Band 3: 1710–1788 MHz in the uplink and 1805–1880 MHz in the downlink • Band 7: 2500–2570 MHz in the uplink and 2620–2690 MHz in the downlink • Band 20: 832–862 MHz in the uplink and 791–821 MHz in the downlink
Input impedance	50 Ω
Standing wave ratio	< 3.0 (after all frequencies are matched)
Gain	B7,38,40,41 Up to 7–8dBi B42,43 Up to 8–9dBi B1,3 Up to 6–7dBi B20 Up to >-4dBi
Isolation	> 8 dB
TX/RX	TDD:1T4R FDD:1T2R
Polarization	+/–45-degree dual polarization

4.2.2 Build-in Wi-Fi Antenna

Table 4-3 describes WLAN antenna specifications.

Table 4-3 WLAN antenna specifications

Item	Description
Frequency	2400–2483 MHz and 5170–5835 MHz
Input impedance	50 Ω
Standing wave ratio	< 3
Efficiency	≥ 50%
Gain	2.5 dBi
Isolation	> 8 dB
Polarization	Embedded omni-directional

4.3 Software Specifications

Table 4-4 describes the software specifications.

Table 4-4 Software specifications

Item	Description
LTE features	TDD DL 4x4 MIMO + 2CC CA (contiguous or non-contiguous)
	TDD UL 2CC CA (contiguous or non-contiguous)
	FDD (2x2) + TDD (4x4) 2CC CA
	DL 3CC CA (TDD only/FDD + TDD) 📖 NOTE Only 2R is supported, software version is B2338-168 V100R001C01.
	LTE TDD MIMO: 1) TDD ONLY: Support TM 2,3,7,8,9 (CRS config 2port) or TM 3,4,8 (CRS config 4port) 2) FDD+TDD: TDD support TM 2,3,4,9(CRS config 2port) LTE FDD MIMO: TM2,3,4; DL 2x2 MIMO
	Uplink 64QAM
	LTE Status LED refresh period(ODU): <4s
	Power ON duration: <2min
	Restart duration: <2min
	VPN throughput: <30Mbps(DL+UL)
Mobile network	APN management

Item	Description	
Gateway	Router	• Supports configuration of static routing table entries (more than six entries). • Supports the general route, and disabling of NAT. • Supports manual configuration of LAN IP addresses. • Supports Address Resolution Protocol (ARP).
	DHCP server	• The DHCP server can be enabled or disabled. • The address pool of the DHCP server can be configured. • The lease can be configured. • The DNS relay under the DHCP server can be enabled.
	NAT	Supports NAT and NAPT (compliant with RFC2663, RFC3022, and RFC3027).
	ARP	
	ICMP	
	IPv4, IPv6(data service only),and IPv6/IPv4 dual stack	
	VPN pass-through	
Data service	LTE: UE uplink category 13 and downlink category 12 Maximum throughput: 420 Mbit/s in the downlink and 30 Mbit/s in the uplink	
	WLAN	
	Supports three APNs (one for data, one for voice, and one for management).	
VoIP	Supports G.729a/b, G.711a-law, and G.711u-law Code.	
	Supports SIP (RFC3261).	
	Supports SDP (RFC2327).	
	Supports RTP/RTCP (RFC1889/RFC1890).	
	Supports fax. • G711 fax sending and receiving • T38 fax sending and receiving	
	Supports G.168 (echo cancellation).	

Item	Description	
	Supports the following phone features: • Caller ID generation • Call waiting • Call transfer • Call forwarding (unconditional, busy, and no answer forwarding) • Call hold • Three-way conference • Do not disturb	
Firewall setup	Firewall switch-on/-off	
	URL filtering	
	LAN IP filtering	
	Virtual server	
	Port forwarding	
	Port triggering	
	DMZ service	
	UPnP service	
	ALG settings	
LAN	10/100/1000 Mbit/s auto-negotiation	
	MDI/MDIX auto-sensing	
	IEEE 802.3/802.3u-compatible	
WLAN	SSID broadcast	
	IEEE 802.11ac/b/g/n	
	WPS	
	WMM	
	Encryption	WEP, AES, and TKIP + AES
	Security mode	• Open • WPA2.0 PSK • WPA1.0/WPA2.0 PSK • WEP Shared Key (four keys at most)
	STA	• Supports inquiry of STA status. • Supports limit of access users (up to 30 users).
Remote management	TR069 or SNMPv3	
USIM	PIN management and USIM card authentication	

Item	Description		
NTP	Supports daylight saving time (DST).		
Maintenance	Supports export of current diagnosis results and operation logs.		
System requirement	Operating system	• Windows 10, Windows 8.1, Windows 8, Windows 7, Windows Vista SP1/SP2, and Windows XP SP3 • Mac OS X 10.9, 10.8, and 10.7 with latest upgrades	
	Web browser	• IE 8.0 (Windows XP) • IE 8.0 and later (Windows 7/Vista) • IE 10.0 and later (Windows 8) • Firefox 24.0 and later • Safari 6.0 and later (Mac) • Opera 12.0 and later • Chrome 27.0 and later	
	Your computer's hardware system should meet or exceed the recommended system requirements for the installed OS version, and if the Web browsers use the IE, it can't set compatible mode, especially for the IE8.		

4.4 CA Combination Sets

The following tables illustrate the CA combinations that the B2338-168 supports. There are 2 software versions which support different CA combination sets. For 4RX version(TDD is 4Rx, FDD is 2Rx,software is B2338-168 V100R001C00), it can support the CA combination sets from Table 4-5 to Table 4-6, and for the FDD+TDD CA, the TDD can only support TM9 4*4MIMO; For 2RX version(2Rx, software is B2338-168 V100R001C01), it can support the CA combination sets from Table 4-7 to Table 4-9.For one specific CPE, it can work only on one version.

4.4.1 4RX version(B2338-168 V100R001C00)

Table 4-5 lists the downlink CA configurations.

Table 4-5 DL 2CC Downlink CA configurations at 4Rx(TDD)/2Rx(FDD)

NO.	Allowed Band Combination Sets		Remark
	PCC	SCC	
1	B1	B1	Up to 40 MHz bandwidth, contiguous
2	B3	B3	Up to 40 MHz bandwidth, contiguous
3	B7	B7	Up to 40 MHz bandwidth, contiguous
4	B20	B20	Up to 30 MHz bandwidth, contiguous
5	B38	B38	Up to 40 MHz bandwidth, contiguous
6	B38	B38	Up to 40 MHz bandwidth, non-contiguous

7	B40	B40	Up to 40 MHz bandwidth, contiguous
8	B40	B40	Up to 40 MHz bandwidth, non-contiguous
9	B41	B41	Up to 40 MHz bandwidth, contiguous
10	B41	B41	Up to 40 MHz bandwidth, non-contiguous
11	B42	B42	Up to 40 MHz bandwidth, contiguous
12	B42	B42	Up to 40 MHz bandwidth, non-contiguous
13	B43	B43	Up to 40 MHz bandwidth, contiguous
14	B38	B40	Up to 40 MHz bandwidth, inter-band
15	B38	B42	Up to 40 MHz bandwidth, inter-band
16	B40	B38	Up to 40 MHz bandwidth, inter-band
17	B40	B41	Up to 40 MHz bandwidth, inter-band
18	B40	B42	Up to 40 MHz bandwidth, inter-band
19	B41	B40	Up to 40 MHz bandwidth, inter-band
20	B41	B42	Up to 40 MHz bandwidth, inter-band
21	B42	B38	Up to 40 MHz bandwidth, inter-band
22	B42	B40	Up to 40 MHz bandwidth, inter-band
23	B42	B41	Up to 40 MHz bandwidth, inter-band
24	B42	B43	Up to 40 MHz bandwidth, inter-band
25	B43	B42	Up to 40 MHz bandwidth, inter-band
26	B1	B38	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
27	B1	B40	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
28	B1	B41	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
29	B1	B42	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
30	B3	B38	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
31	B3	B40	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
32	B3	B41	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
33	B3	B42	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
34	B20	B38	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
35	B20	B40	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
36	B20	B41	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4 MIMO can only support TM9
37	B20	B42	Up to 40 MHz bandwidth, inter-band, TDD 's 4*4

			MIMO can only support TM9	

Table 4-6 lists the uplink CA configurations.

Table 4-6 Uplink CA configurations at 4Rx(TDD)/2Rx(FDD)

NO.	Allowed Band Combination Sets		Remark
	PCC	SCC	
1	B1	B1	Up to 40 MHz bandwidth, contiguous only
2	B3	B3	Up to 40 MHz bandwidth, contiguous only
3	B7	B7	Up to 40 MHz bandwidth, contiguous only
4	B20	B20	Up to 30 MHz bandwidth, contiguous only
5	B38	B38	Up to 40 MHz bandwidth, contiguous only
6	B40	B40	Up to 40 MHz bandwidth, contiguous only
7	B41	B41	Up to 40 MHz bandwidth, contiguous only
8	B42	B42	Up to 40 MHz bandwidth, contiguous only
9	B43	B43	Up to 40 MHz bandwidth, contiguous only
10	B38	B40	Up to 40 MHz bandwidth, inter-band
11	B38	B42	Up to 40 MHz bandwidth, inter-band
12	B40	B38	Up to 40 MHz bandwidth, inter-band
13	B40	B41	Up to 40 MHz bandwidth, inter-band
14	B40	B42	Up to 40 MHz bandwidth, inter-band
15	B41	B40	Up to 40 MHz bandwidth, inter-band
16	B41	B42	Up to 40 MHz bandwidth, inter-band
17	B42	B38	Up to 40 MHz bandwidth, inter-band
18	B42	B40	Up to 40 MHz bandwidth, inter-band
19	B42	B41	Up to 40 MHz bandwidth, inter-band
20	B42	B43	Up to 40 MHz bandwidth, inter-band
21	B43	B42	Up to 40 MHz bandwidth, inter-band

4.4.2 2RX version(B2338-168 V100R001C01)

Table 4-7 lists the downlink CA configurations.

Table 4-7 DL 2CC Downlink CA configurations at 2Rx

No.	Allowed Band Combination Sets		Remark
	PCC	SCC	
1	B1	B1	Up to 40 MHz bandwidth, contiguous
2	B3	B3	Up to 40 MHz bandwidth, contiguous

3	B7	B7	Up to 40 MHz bandwidth, contiguous
4	B20	B20	Up to 30 MHz bandwidth, contiguous
5	B38	B38	Up to 40 MHz bandwidth, contiguous
6	B38	B38	Up to 40 MHz bandwidth, non-contiguous
7	B40	B40	Up to 40 MHz bandwidth, contiguous
8	B40	B40	Up to 40 MHz bandwidth, non-contiguous
9	B41	B41	Up to 40 MHz bandwidth, contiguous
10	B41	B41	Up to 40 MHz bandwidth, non-contiguous
11	B42	B42	Up to 40 MHz bandwidth, contiguous
12	B42	B42	Up to 40 MHz bandwidth, non-contiguous
13	B43	B43	Up to 40 MHz bandwidth, contiguous
14	B38	B40	Up to 40 MHz bandwidth, inter-band
15	B38	B42	Up to 40 MHz bandwidth, inter-band
16	B40	B38	Up to 40 MHz bandwidth, inter-band
17	B40	B41	Up to 40 MHz bandwidth, inter-band
18	B40	B42	Up to 40 MHz bandwidth, inter-band
19	B41	B40	Up to 40 MHz bandwidth, inter-band
20	B41	B42	Up to 40 MHz bandwidth, inter-band
21	B42	B38	Up to 40 MHz bandwidth, inter-band
22	B42	B40	Up to 40 MHz bandwidth, inter-band
23	B42	B41	Up to 40 MHz bandwidth, inter-band
24	B42	B43	Up to 40 MHz bandwidth, inter-band
25	B43	B42	Up to 40 MHz bandwidth, inter-band
26	B1	B38	Up to 40 MHz bandwidth, inter-band
27	B1	B40	Up to 40 MHz bandwidth, inter-band
28	B1	B41	Up to 40 MHz bandwidth, inter-band
29	B1	B42	Up to 40 MHz bandwidth, inter-band
30	B3	B38	Up to 40 MHz bandwidth, inter-band
31	B3	B40	Up to 40 MHz bandwidth, inter-band
32	B3	B41	Up to 40 MHz bandwidth, inter-band
33	B3	B42	Up to 40 MHz bandwidth, inter-band
34	B20	B38	Up to 40 MHz bandwidth, inter-band
35	B20	B40	Up to 40 MHz bandwidth, inter-band
36	B20	B41	Up to 40 MHz bandwidth, inter-band
37	B20	B42	Up to 40 MHz bandwidth, inter-band

Table 4-8 lists the downlink CA configurations.

Table 4-8 DL 3CC Downlink CA configurations at 2Rx

No.	Allowed Band Combination Sets	Remark

	PCC	SCC1	SCC2	
1	B40	B40	B40	Up to 60 MHz bandwidth, 3CC must be contiguous
2	B41	B41	B41	Up to 60 MHz bandwidth, 3CC must be contiguous
3	B42	B42	B42	Up to 60 MHz bandwidth, 3CC must be contiguous
4	B43	B43	B43	Up to 60 MHz bandwidth, 3CC must be contiguous
5	B41	B41	B42	Up to 60 MHz bandwidth, B41 must be contiguous
6	B41	B42	B42	Up to 60 MHz bandwidth, B42 2CC must be contiguous
7	B42	B42	B43	Up to 60 MHz bandwidth, B42 2CC must be contiguous
8	B3	B3	B41	Up to 60 MHz bandwidth, B3 2CC must be contiguous
9	B3	B40	B40	Up to 60 MHz bandwidth, B40 2CC must be contiguous
10	B3	B41	B42	Up to 60 MHz bandwidth
11	B20	B38	B38	Up to 60 MHz bandwidth, B38 2CC must be contiguous
12	B20	B42	B42	Up to 60 MHz bandwidth, B42 2CC must be contiguous

Table 4-9 lists the uplink CA configurations.

Table 4-9 Uplink CA configurations at 2Rx

No.	Allowed Band Combination Sets		Remark
	PCC	SCC	
1	B1	B1	Up to 40 MHz bandwidth, contiguous only
2	B3	B3	Up to 40 MHz bandwidth, contiguous only
3	B7	B7	Up to 40 MHz bandwidth, contiguous only
4	B20	B20	Up to 30 MHz bandwidth, contiguous only
5	B38	B38	Up to 40 MHz bandwidth, contiguous only
6	B40	B40	Up to 40 MHz bandwidth, contiguous only
7	B41	B41	Up to 40 MHz bandwidth, contiguous only
8	B42	B42	Up to 40 MHz bandwidth, contiguous only
9	B43	B43	Up to 40 MHz bandwidth, contiguous only

10	B38	B40	Up to 40 MHz bandwidth, inter-band
11	B38	B42	Up to 40 MHz bandwidth, inter-band
12	B40	B38	Up to 40 MHz bandwidth, inter-band
13	B40	B41	Up to 40 MHz bandwidth, inter-band
14	B40	B42	Up to 40 MHz bandwidth, inter-band
15	B41	B40	Up to 40 MHz bandwidth, inter-band
16	B41	B42	Up to 40 MHz bandwidth, inter-band
17	B42	B38	Up to 40 MHz bandwidth, inter-band
18	B42	B40	Up to 40 MHz bandwidth, inter-band
19	B42	B41	Up to 40 MHz bandwidth, inter-band
20	B42	B43	Up to 40 MHz bandwidth, inter-band
21	B43	B42	Up to 40 MHz bandwidth, inter-band

Note: 3GPP-supported combination sets are defined in 3GPP TS 36.101.

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5 Services and Applications

5.1 Data Services

The B2338-168 supports high-speed data services through LTE networks. By connecting to the B2338-168 using Wi-Fi or an Ethernet cable, you can gain access to high-speed Internet services and establish a local area network (LAN).

5.1.1 Ethernet LAN

You can connect the B2338-168 to a terminal device through an Ethernet cable in small office home office (SOHO) environments to provide data services.

To form a LAN with multiple PCs, you can extend the Ethernet ports through the concentrator or Ethernet switch.

5.1.2 Wi-Fi Service

You can connect the B2338-168 to a terminal device through the WLAN in SOHO environments to provide data services. The B2338-168 supports both 2.4 GHz and 5 GHz frequencies.

5.2 Voice Service

The B2338-168 supports high-quality voice services through the built-in telephony interface in compliance with the SIP protocol. Once the SIP profile is registered and correctly configured, the B2338-168 sends the calls to the VoIP service provider's SIP server, which forwards the calls to either VoIP or PSTN phones.

The B2338-168 also supports supplementary services, such as call hold, call waiting, and call transfer, which are generally available from VoIP service providers.

5.3 Security Service

The B2338-168 supports comprehensive and robust security services. It provides the firewall function and PIN protection mechanisms. These features allow users to connect their computers to the Internet and simultaneously protect their computers from the security threats of the Internet.

5.3.1 Firewall Service

The B2338-168 supports enabling or disabling of the firewall on the network connection, which protects the device and network from attacks by hackers on the Internet and controls access to the Internet.

5.3.2 MAC Filtering

The B2338-168 supports configuration of the Media Access Control (MAC) address to restrict network access.

5.3.3 Wi-Fi Authentication

The gateway supports the following user authentication protocols for WLAN:

- No encryption
- WEP-OPEN, WEP-SHARED, WPA-PSK (TKIP), WPA-PSK (AES), WPA2-PSK (TKIP), and WPA2-PSK (AES)

5.4 VPN Tunneling

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 encapsulated within some other base or carrier protocol, then transmitted between the VPN client and server, and finally decapsulated on the receiving side.

The B2338-168 supports L2 and L3 VPN tunneling comprised with tunneling protocols of L2TP and GRE.

Figure 5-1 and Figure 5-2 show the VPN tunneling scenarios.
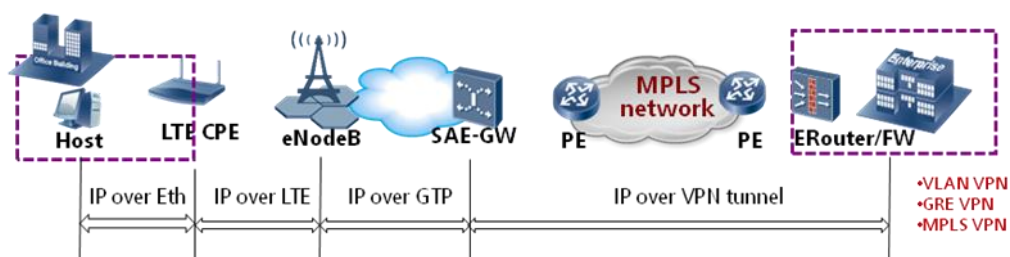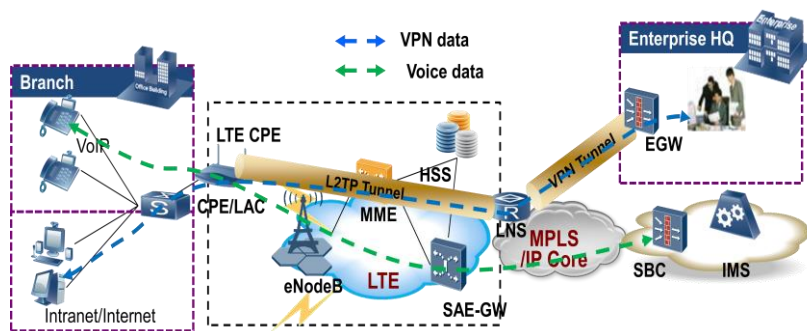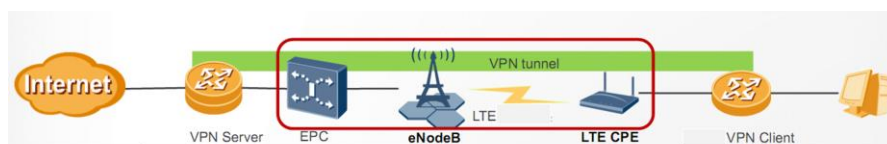
Figure 5-1 Enterprise routing

Figure 5-2 Enterprise VPN protocol stack

5.5 IP Pass-Through

The LTE CPE obtains the WAN IP address and passes it through to the PC, and then the PC can directly use the WAP IP address.

5.6 Multi-APN

The B2338-168 supports establishment and maintenance of three APNs. These three APN connections isolate data, voice, and remote management services on an operator's network.

The B2338-168 supports an independent APN for both CPE internal VoIP and external IAD under the IMS/NGN/SBC condition.
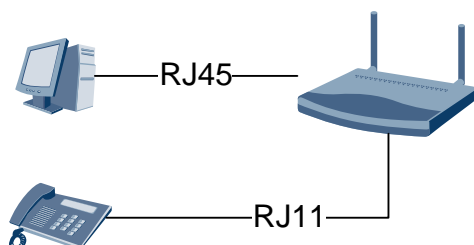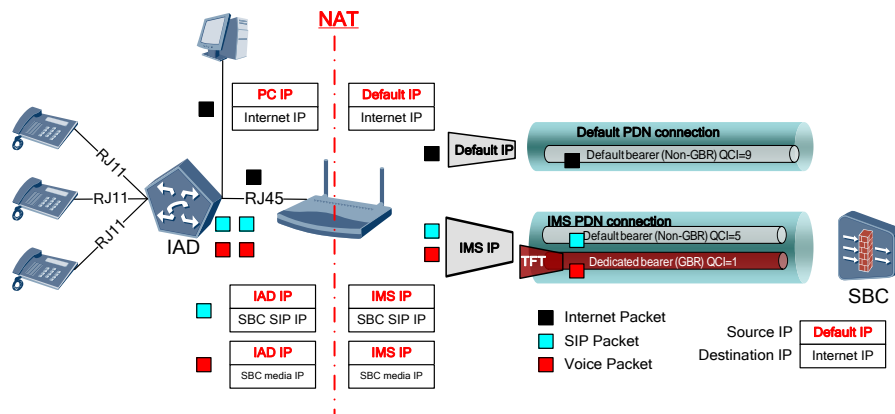
Figure 5-3 CPE with RJ11

Figure 5-4 CPE connected to the IAD/SIP phone/soft SIP phone

5.7 Local Management and Maintenance

The B2338-168 supports local configuration to accomplish device management and network configuration and ensure normal and stable performance.

5.8 FOTA

The B2338-168 supports the FOTA feature, which allows operators to remotely upgrade device firmware for both the outdoor unit and indoor unit simultaneously through the FOTA server.

6 System Structure and Scenario Constraints

6.1 System Architecture

Figure 6-1 shows the interfaces for the B2338-168.

Figure 6-1 System structure

The following describes modules shown in Figure 6-1.

- LTE access function: The B2338-168 adopts the LTE access technology at the WAN side.

- LAN access function: Two 10/100/1000 Mbit/s high-speed Ethernet ports are provided at the LAN side. The B2338-168 provides the switching function for local networking and sharing of the broadband network when it is connected to terminal devices.

- AP function: An 802.11ac/b/g/n-compliant WLAN AP interface is provided, used for wireless networking at home. The interface is compliant with the IEEE 802.11ac/b/g/n standard and the WEP-OPEN, WEP-SHARED, WPA-PSK (TKIP), WPA-PSK (AES), WPA2-PSK (TKIP), and WPA2-PSK (AES) security authentication mechanisms.

- DHCP/DNS: The DHCP server dynamically allocates IP addresses to PCs.

- Web-based management: You can configure the B2338-168, and modify and query the configuration of the B2338-168.

- IP routing protocol and NAT: The B2338-168 has high-speed routing capability. With the built-in NAT, the B2338-168, together with LTE terminals, can provide flexible broadband access solutions and networking schemes.

- VoIP function: The B2338-168 supports VoIP services.

6.2 Scenario Constraints

The B2338-168 is a household wireless broadband access product used in scenarios with a few network access devices and low requirements on network reliability, such as homes or small office and home offices (SOHOs).

The B2338-168 is not an enterprise-level product. It cannot be used by medium- or large-size enterprises or in scenarios with high requirements on network reliability or more than 32 devices connected to the LAN and WLAN port, such as banks, securities agencies, traffic control, and communications device backhaul.

The B2338-168 has the following constraints:

- A maximum of 32 devices can be connected to the LAN and WLAN port.

- Each CPE can serve a maximum of 16 users in Wi-Fi mode, and supports simultaneous data transmission for a maximum of 16 users.

7 Technical References

7.1 Standards and Communication Protocols

7.1.1 Standards and Communication Protocols of the Products

Table 7-1 Standards and communication protocols of the products

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

7.1.2 Standards and Communication Protocols of the Wireless Uu Interface

The B2338-168 supports 3GPP Release 10/11/12, and UE category 6/7/9/10/12/13.

8 Packing List

Table 8-1 lists the devices and accessories of the B2338-168.

Table 8-1 Packing list

Description	Quantity	Unit	Remarks
LTE outdoor unit	1	PCS	Standard
LTE indoor unit	1	PCS	Standard
Power adapter	1	PCS	Standard
Mounting kit	1	SET	Standard
Quick start guide	1	PCS	Standard
Ground cable(1M)	1	PCS	Standard
RJ-45 cable(1.5M)	1	PCS	Standard