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Product Description



HUAWEI E5785Lh-22c Mobile WiFi
V200R001

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About This Document

Summary

This document provides information about the major functions, supported services and system architecture.

The following table lists the contents of this document.

Chapter	Details
1 Overview	The supported network modes, basic services and functions, and the appearance of the product.
2 Features	The supported features and technical specifications of the product.
3 Services and Applications	The services and applications of the product.
4 System Architecture	The architecture of the product.
5 Packing List	The items contained in the package of the product.



History

Issue	Details	Date
01	First release.	2016-06-02

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1 Overview

1.1 Brief Introduction

HUAWEI E5785Lh-22c Mobile WiFi (hereinafter referred to as the E5785Lh-22c) is a high-speed packet access mobile hotspot. It is a multi-mode wireless terminal for SOHO (Small Office and Home Office) and business professionals.

The E5785Lh-22c supports the following standards:

- Long Term Evolution Carrier Aggregation (LTE CA)
- LTE Frequency Division Duplex (FDD)
- LTE Time Division Duplex (TDD)
- Dual Carrier High Speed Packet Access Plus (DC-HSPA+)
- High Speed Packet Access Plus (HSPA+)
- High Speed Uplink Packet Access (HSUPA)
- High Speed Downlink Packet Access (HSDPA)
- Universal Mobile Telecommunications System (UMTS)
- Enhanced Data rates for Global Evolution (EDGE)
- General Packet Radio Service (GPRS)
- Global System for Mobile communications (GSM)

The E5785Lh-22c provides the following services:

- LTE CA packet data service
- LTE FDD packet data service
- LTE TDD packet data service
- DC-HSPA+ packet data service
- HSPA+/HSPA/UMTS packet data service
- Short Message Service (SMS)

You can connect the E5785Lh-22c with the USB interface of a computer, or connect the E5785Lh-22c with the Wi-Fi. In the service area of the LTE CA/LTE FDD/LTE TDD/ DC-HSPA+/HSPA+/HSPA/UMTS network, you can surf the Internet and send/receive messages/emails cordlessly. The E5785Lh-22c is fast, reliable, and easy to operate. Thus, mobile users can experience many new features and services with the E5785Lh-22c. These features and services will enable a large number of

users to use the E5785Lh-22c and the average revenue per user (ARPU) of operators will increase substantially.

Figure 1-1 shows the profile of the E5785Lh-22c.

Figure 1-1 E5785Lh-22c profile



1.2 Optional Features

Optional features refer to features that are not supported by the standard version or are disabled by default. These features can be customized according to operator or customer requirements. The E5785Lh-22c's optional feature is as follows:

- IPv6/IPv4 dual stack (optional)
- SIM lock (optional)

2 Features

2.1 Main Features

The E5785Lh-22c mainly supports the following features:

- LTE FDD CA (DL) data service of up to 300 Mbit/s
- LTE FDD (DL) data service of up to 150 Mbit/s
- LTE FDD (UL) data service of up to 50 Mbit/s
- LTE TDD CA (DL) data service of up to 224 Mbit/s
- LTE TDD (DL) data service of up to 112 Mbit/s
- LTE TDD (UL) data service of up to 20 Mbit/s
- DC-HSPA+ (DL) data service of up to 43.2 Mbit/s
- HSPA+ (DL) data service of up to 21.6 Mbit/s
- HSDPA (DL) data service of up to 14.4 Mbit/s
- HSUPA (UL) data service of up to 5.76 Mbit/s
- UMTS data service of up to 384 kbit/s
- EDGE data service of up to 236.8 kbit/s
- GPRS data service of up to 85.6 kbit/s
- PS domain data service based on LTE/UMTS/GSM
- SMS based on LTE/UMTS/GSM
- Built-in LTE/UMTS and WLAN high gain antenna
- Wi-Fi 2.4 GHz and 5 GHz
- Menu-style LCD UI
- Support for HUAWEI HiLink APP (Mobile WiFi APP)
- Press and Play
- IPv6/IPv4 dual stack (optional)
- Built-in DHCP Server, DNS RELAY and NAT
- Online software upgrade
- Traffic statistic
- WPS
- Standard Micro USB 2.0 interface
- 2D Barcode easy connection

- Windows 7, Windows 8, Windows 8.1, Windows 10 (does not support Windows RT), MAC OS X 10.7, 10.8, 10.9, 10.10 and 10.11 with latest upgrades

2.2 Technical Specifications

2.2.1 Hardware

Table 2-1 lists the hardware specifications.

Table 2-1 Hardware specifications

Item	Specifications
Technical standard	WAN: LTE CA/LTE FDD/LTE TDD/ DC-HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS/GSM
	WLAN: IEEE 802.11a/b/g/n/ac
Operating frequency	LTE CA: <ul style="list-style-type: none"> • intra-band continuous CA: <ul style="list-style-type: none"> -CA_3C -40MHz total -CA_7C -40MHz total -CA_38C -40MHz total • intra-band non-contiguous CA: <ul style="list-style-type: none"> CA_3A_3A -40MHz total • Inter-frequency CA: <ul style="list-style-type: none"> -CA_3A-5A -30MHz total -CA_3A-7A -40MHz total -CA_3A-8A -30MHz total -CA_3A-20A -30MHz total -CA_7A-8A -30MHz total -CA_7A-20A -30MHz total -CA_20A-32A -30MHz total
	LTE FDD:B1/B3/B5/B7/B8/B20/B32 LTE TDD:B38
	DC-HSPA+/HSPA+/HSPA/UMTS: B1 (2100MHz)/B2 (1900MHz)/B5 (850MHz)/B8 (900MHz)
	EDGE/GPRS/GSM: B2 (1900MHz)/B3 (1800MHz)/B5 (850MHz)/B8 (900MHz)
	WLAN: 2.4 GHz, 5 GHz
Internal memory	256 MB Flash, 256 MB DDR SDRAM
Maximum	LTE: Conform to Power Class 3 Definition

Item	Specifications		
transmitter power	UMTS: Conform to Power Class 3 Definition		
	WLAN	802.11a: 10 dBm	
		802.11b: 15 dBm	
		802.11g: 12 dBm	
		802.11n (2.4GHz)	11 dBm (20 MHz)
			10 dBm (40 MHz)
		802.11n (5GHz)	10 dBm (20 MHz)
			10 dBm (40 MHz)
		802.11ac	10 dBm (20 MHz)
			9 dBm (40 MHz)
8 dBm (80 MHz)			
Receiver sensitivity	LTE: Conform to 3GPP requirements		
	UMTS: Conform to 3GPP requirements		
	WLAN	802.11a: -65 dBm	
		802.11b: -76 dBm	
		802.11g: -65 dBm	
		802.11n: -64 dBm	
		802.11ac: -64 dBm	
WLAN speed	802.11a: Up to 54 Mbit/s		
	802.11b: Up to 11 Mbit/s		
	802.11g: Up to 54 Mbit/s		
	802.11n	HT20: Support MCS0-MCS7; Up to 72.2 Mbit/s. Support MCS8-MCS15; Up to 144.4 Mbit/s.	
		HT40: Support MCS0-MCS7; Up to 150 Mbit/s. Support MCS8-MCS15; Up to 300 Mbit/s.	
	802.11ac: Up to 867 Mbit/s		
Maximum power consumption	3.5 W		
Power supply	AC: 100-240 V		
	DC: 5 V, 2 A		

Item	Specifications
Battery	Type: Li (rechargeable)
	Capacity: 3.8 V, 3000 mAh
	Maximum working time: 12 hours (depending on the network)
	Maximum standby time: 600 hours (depending on the network)
External interfaces	Micro USB 2.0 interface
	Micro-SIM card interface
Screen	TFT-LCD
Key-press	Power switch, MENU switch, RESET switch
Antenna	Built-in LTE/UMTS/GSM main antenna
	Built-in LTE/UMTS/GSM diversity antenna
	Built-in WLAN 2 x 2 antenna
Dimensions (W x D x H)	108.0 mm x 62.0 mm x 17.3 mm
Weight	About 127g (including the battery)
Temperature	Operating: 0°C to +35°C
	Storage: -20°C to +70°C
Humidity	5% to 95% (non-condensing)

2.2.2 Software

Table 2-2 lists the software specifications.

Table 2-2 software specifications

Item	Description
SMS	<ul style="list-style-type: none"> • Writing/Sending/Receiving • Sending/Receiving extra-long messages • Storage: Up to 500 messages can be saved in the internal memory of the E5785Lh-22c.
Network connection setup	<ul style="list-style-type: none"> • APN management: create, delete and edit. • Set up network connection
WLAN setup	<ul style="list-style-type: none"> • SSID broadcasting and hiding • None (Open), WEP, WPA2-PSK, and WPA/WPA2-PSK encryption Automatic adjustment of ratios • Display STA status • Turn off Wi-Fi automatically • WLAN MAC filter • Dual SSID
Firewall setup	<ul style="list-style-type: none"> • Firewall Switch • LAN IP Filter • Virtual Server • DMZ Service • UPnP Service
NAT setup	<ul style="list-style-type: none"> • CONE NAT • Symmetric NAT • ALG
DHCP setup	<ul style="list-style-type: none"> • DHCP server enabling and disabling • Address pool of the DHCP server setup • DHCP lease time setup
Software installation	Automatic installation
IPv6/IPv4 dual stack (optional)	<ul style="list-style-type: none"> • DHCPv6/v4 server and client • DNSv6/v4 server and client • Display IPv6/v4 WAN address
Other	Network connection settings: <ul style="list-style-type: none"> • Automatic network selection and registration • Manual network selection and registration

Item	Description
	Network status display: signal, operator name, system mode, and so on. LTE network switch: turn on/off LTE network PIN management: activate/deactivate PIN, PIN lock, changing PIN, unblocking by using the PUK.
System requirement	<ul style="list-style-type: none">• Windows 7, Windows 8, Windows 8.1, Windows 10 (does not support Windows RT)• Mac OS X 10.7, 10.8, 10.9, 10.10 and 10.11 with latest upgrades• Your computer's hardware system should meet or exceed the recommended system requirements for the installed version of OS

3 Services and Applications

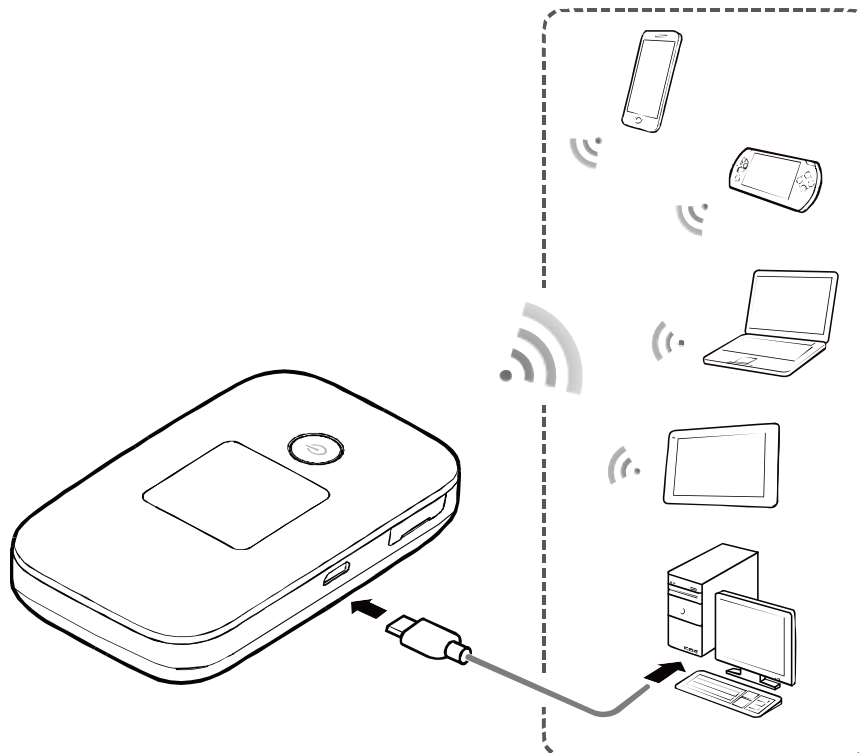
3.1 Data Service

3.1.1 Wireless Modem

The E5785Lh-22c can be used as a wireless modem when the Wi-Fi is enabled. You can directly use the default settings (or configure APN on the E5785Lh-22c Web page) and set up a wireless network connection. Then you can access the Internet.

A maximum of 16(Wi-Fi 2.4 GHz)/10(Wi-Fi 5 GHz) wireless users can access the E5785Lh-22c at the same time. You can set up the WLAN with the access point (AP) function.

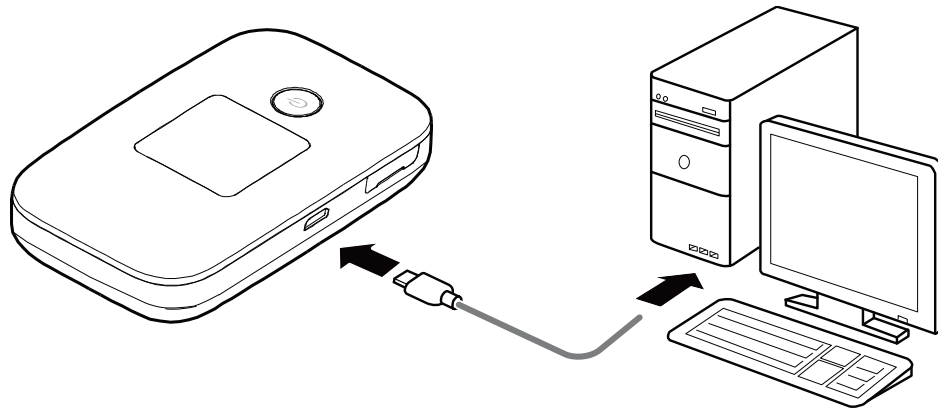
Figure 3-1 Multi-device access via Wi-Fi and USB at the same time



3.1.2 USB Modem

After you connect the E5785Lh-22c and PC with a USB data cable, enter <http://192.168.8.1> in the browser address box. You can directly use the default settings (or configure APN on the E5785Lh-22c Web page) and set up a network connection. Then you can send or receive E-mail, access the network through wireless connection, and download files through wireless data channels.

Figure 3-2 One-device access via USB

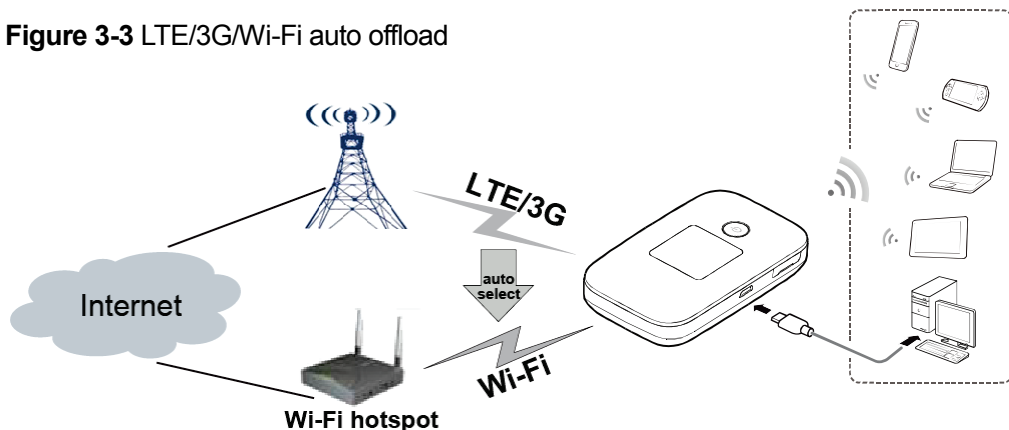


3.1.3 LTE/3G/Wi-Fi Auto Offload

The E5785Lh-22c allows you to access the Internet via LTE, 3G or Wi-Fi. When you are using the E5785Lh-22c in areas with a Wi-Fi hotspot, for example, an airport, a cafe, a hotel, or your home, the E5785Lh-22c switches to Wi-Fi connection automatically, saving your LTE/3G network traffic fees.

Enabling LTE/3G/Wi-Fi auto offload will decrease the number of concurrent users allowed to connect to the E5785Lh-22c by 1.

Figure 3-3 LTE/3G/Wi-Fi auto offload



3.2 SMS

The E5785Lh-22c supports message writing/sending/receiving. You can manage messages through the Web page, such as an inbox, an outbox and a draft.

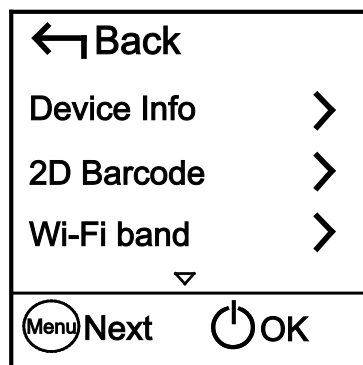
3.3 Menu-Style LCD UI

The E5785Lh-22c provides a menu-style LCD UI with support for multiple languages. Press the menu button to display the menus, and then use the menu and power buttons to select or confirm an option. You can browse the information on the LCD or configure settings. For example, you can:

- Scan a 2D barcode on the E5785Lh-22c's LCD to download the HiLink App (Mobile WiFi App).
- Scan a 2D barcode on the E5785Lh-22c's LCD use the HiLink App (Mobile WiFi App) to connect your device to the Internet.
- Turn on or off the automatic switchover between LTE/3G and Wi-Fi Internet access modes.
- Turn on or off the WPS function.

Figure 3-5 shows the menu-style LCD UI. This figure is for your reference only. The actual UI may vary.

Figure 3-4 Menu-style LCD UI



3.3.1 Scanning a 2D Barcode to Download the HiLink App(Mobile WiFi App)

You can scan a 2D barcode on the E5785Lh-22c's LCD to download the HiLink App (Mobile WiFi App) to your Android devices.

3.3.2 Scanning a 2D Barcode to Connect to the Internet

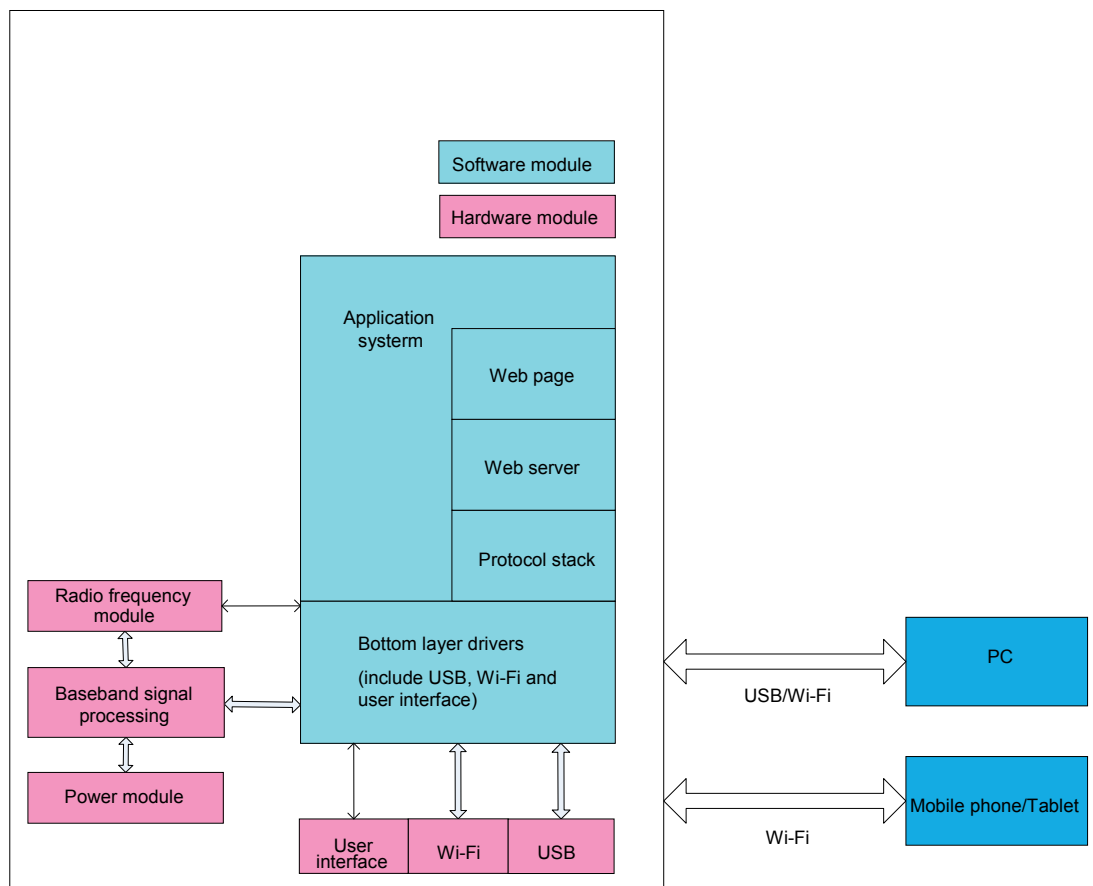
If you are using an Android device that has the HiLink App (Mobile WiFi App) installed, you can quickly connect your device to the E5785Lh-22c to access the Internet by scanning a 2D barcode on the E5785Lh-22c's LCD.

4 System Architecture

4.1 System Architecture

Figure 4-1 shows the system architecture.

Figure 4-1 System architecture



4.2 Functional Modules

1. **Radio frequency module:** It sends/receives radio signals and modulates/demodulates the radio frequency (RF) signals and baseband signals
2. **Baseband signal processing:** It processes LTE CA/LTE FDD/LTE TDD/DC-HSPA+/HSPA+/UMTS baseband digital signals, including:
 - Modulating/Demodulating LTE CA/LTE FDD/LTE TDD/DC-HSPA+/HSPA+/UMTS/EDGE/GPRS/GSM baseband signals
 - Encoding/Decoding LTE CA/LTE FDD/LTE TDD/LTE TDD/DC-HSPA+/HSPA+/UMTS/EDGE/GPRS/GSM channel
3. **Bottom layer driver:** It drives peripherals, including a USB device, Wi-Fi devices, a screen, buttons and a SIM card.
4. **Protocol stack system:** It processes protocols of LTE CA/LTE FDD/LTE TDD/DC-HSPA+/HSPA+/UMTS/EDGE/GPRS/GSM and TCP/IP.
5. **Application system:** It provides management system, including SMS, PS domain service, Wi-Fi configuration, network service, Web service and Web page. The user can set management parameters by Web page.
6. **User interface:** It provides human-computer interaction, including a screen and buttons.

5 Packing List

This chapter describes the items contained in the package of the E5785Lh-22c.

Table 5-1 lists the items contained in the package of the E5785Lh-22c.

Table 5-1 Packing list of the E5785Lh-22c

Item	Quantity	Remarks
Mobile WiFi	1	Standard
Rechargeable Battery (3000 mAh)	1	Standard
USB Cable	1	Standard
Quick Start	1	Standard
Safety Information	1	Standard
Charger	1	Optional
Warranty Card	1	Optional

A Acronyms and Abbreviations

3G	The Third Generation
AES	Advanced Encryption Standard
ALG	application level gateway
APN	access point name
ARPU	average revenue per user
ASCII	American Standard Code for Information Interchange
DHCP	Dynamic Host Configuration Protocol
DMZ	demilitarized zone
DNS	Domain Name Server
FDD	frequency division duplex
HSPA+	High Speed Packet Access Plus
HSUPA	High Speed Uplink Packet Access
HSDPA	High Speed Downlink Packet Access
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
LCD	Liquid Crystal Display
LTE	Long Term Evolution
MAC	Medium Access Control
Modem	Modulator Demodulator
NAT	Network Address Translation
OS	Operating System
PC	personal computer
PIN	personal identification number

PnP	Plug and Play
PS	packet switched
PUK	PIN unblocking key
SIM	subscriber identity module
SMS	short messaging service
SOHO	small office home office
SSID	Service Set Identifier
TFT	Thin Film Transistor
TKIP	Temporal Key Integrity Protocol
UMTS	Universal Mobile Telecommunications System
UPnP	Universal Plug and Play
USB	Universal Serial Bus
WAN	wireless area network
WEP	wired equivalent privacy
Wi-Fi	Wireless Fidelity
WLAN	wireless local area network
WPA	Wi-Fi Protected Access