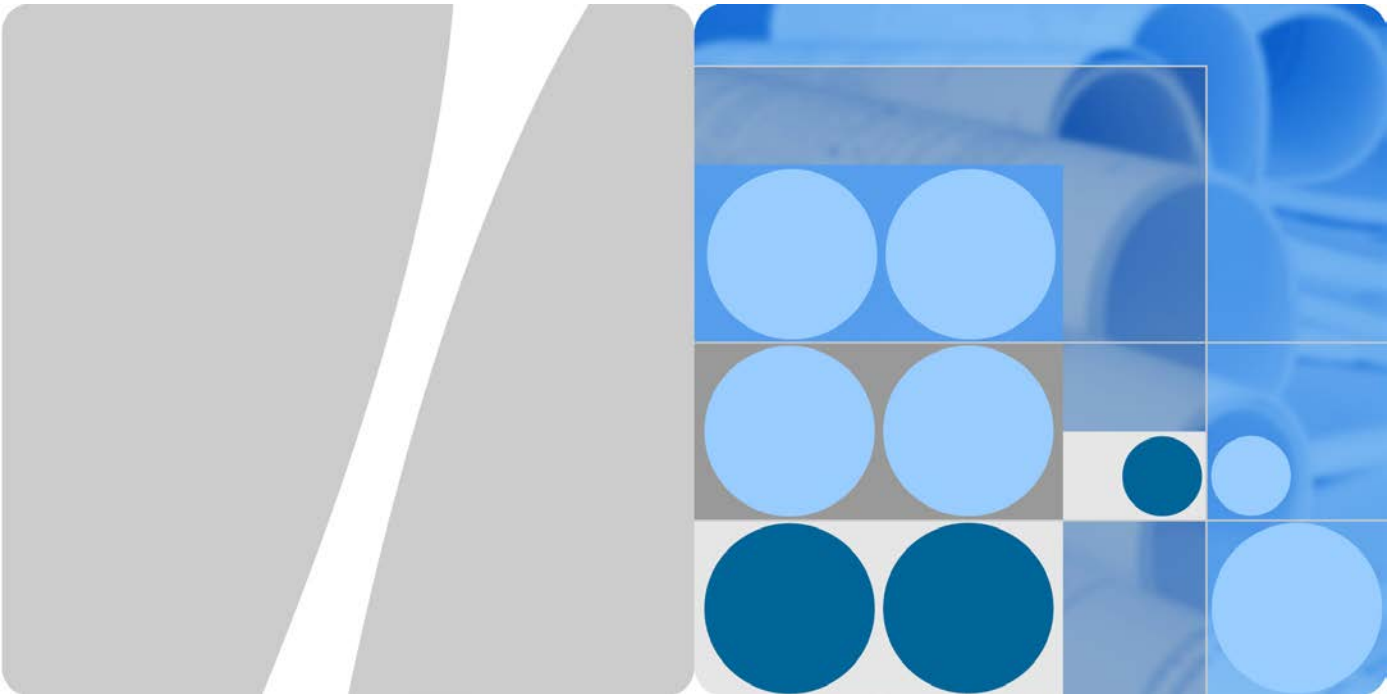
# Product Description



HUAWEI E589u-12 Mobile WiFi
V100R001

**Issue** 03

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**HUAWEI TECHNOLOGIES CO., LTD.**

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# About This Document

## Purpose and Organization

This document describes the major functions, services, and system architecture of HUAWEI E589u-12 Mobile WiFi (E589u-12 for short).

The following table lists the content of each chapter.

| Chapter | Describes |
|---|---|
| 1 Overview | Network modes, major functions and services, and appearance. |
| 2 Features | Features and technical specifications. |
| 3 Services and Applications | Services and applications. |
| 4 System Architecture | System architecture. |
| 5 Packing List | Items contained in the product package. |

# Change History

| Issue | Details | Date |
|---|---|---|
| 01 | Released the first version. | 2012-01-20 |
| 02 | Update. | 2012-05-02 |
| 03 | Update. | 2012-05-18 |

# Contents

# 1 Overview

The E589u-12 is a multimode terminal for high-speed wireless network access. It supports multiple network modes and is specially designed for small office/home office (SOHO) users and business professionals.

The E589u-12 supports the following frequency bands:

- LTE FDD 2100/1800/2600/900/DD800 MHz
- DC-HSPA+/HSPA+/HSPA/UMTS 2100/900 MHz
- EDGE/GPRS/GSM 850/900/1800/1900 MHz

The E589u-12 supports the following network modes:

- Long Term Evolution (LTE)
- 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 GSM Evolution (EDGE)
- General packet radio service (GPRS)
- Global System for Mobile Communications (GSM)

The E589u-12 provides the following services:

- High-speed LTE packet data service of up to 100 Mbit/s
- High-speed DC-HSPA+ packet data service of up to 43.2 Mbit/s
- High-speed HSPA+ packet data service of up to 21.6 Mbit/s
- High-speed HSPA (HSUPA/HSDPA)/UMTS packet data service of up to 14.4 Mbit/s
- EDGE/GPRS packet data service of up to 236.8 kbit/s
- UMTS/GSM Short Message Service (SMS)

The E589u-12 can be connected to multiple wireless devices using the Wireless Fidelity (Wi-Fi), allowing users to access the Internet, and send/receive SMS and email messages when in the coverage areas of LTE, DC-HSPA+, HSPA+, HSPA, UMTS, EDGE, GPRS, or GSM networks. With high-speed network access, reliable performance, and easy-to-operate user interface (UI), the E589u-12 provides users with better wireless network access experience and operators with substantially increased average revenue per user (ARPU).

Figure 1-1 shows the E589u-12.

**Figure 1-1** E589u-12

# 2 Features

## 2.1 Main Features

The E589u-12 supports the following features:

- Downlink LTE packet data service of up to 100 Mbit/s
- Uplink LTE packet data service of up to 50 Mbit/s
- Downlink LTE -> Wi-Fi packet data service of up to 35 Mbit/s
- Downlink DC-HSPA+ packet data service of up to 43.2 Mbit/s
- Downlink HSPA+ packet data service of up to 21.6 Mbit/s
- Downlink HSDPA packet data service of up to 14.4 Mbit/s
- Uplink DC-HSPA+/ HSPA+/HSUPA packet data service of up to 5.76 Mbit/s
- Uplink and downlink UMTS packet data service of up to 384 kbit/s
- Uplink and downlink EDGE packet data service of up to 236.8 kbit/s
- Uplink and downlink GPRS packet data service of up to 85.6 kbit/s
- Packet switched (PS) domain data service based on LTE, UMTS and GSM
- SMS based on UMTS and GSM
- Wi-Fi and Wi-Fi Protected Setup (WPS)
- Concurrent wireless connections from 10 users
- Built-in Dynamic Host Configuration Protocol (DHCP) server, Domain Name System (DNS) relay, and network address translation (NAT)
- 3000 mAh built-in battery (non-removable) that supports up to 10 hours operating time
- Maximum standby time is 360 hours while Wi-Fi is off
- Universal Serial Bus (USB) extension cable for convenient connection in various usage scenarios
- Thin film transistor liquid crystal display (TFT-LCD)
- Standard micro-USB port
- Built-in LTE, UMTS, and wireless local area network (WLAN) antennas
- Micro Secure Digital (microSD) memory card
- Windows XP, Windows Vista, Windows 7, and Mac OS X 10.5, 10.6, and 10.7

# 2.2 Technical Specifications

## 2.2.1 Hardware

Table 2-1 lists the E589u-12's hardware specifications.

**Table 2-1** Hardware specifications

| Item | Specifications | |
|---|---|---|
| Standards compliance | WAN: LTE/DC-HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS/GSM | |
| | WLAN: IEEE 802.11b/g/n | |
| Operating frequency | LTE: FDD 2100/1800/2600/900/DD800 MHz | |
| | DC-HSPA+/HSPA+/HSPA/UMTS: 2100/900 MHz | |
| | EDGE/GPRS/GSM: 1900/1800/900/850 MHz | |
| | WLAN: 2400–2483 MHz | |
| Memory | 128 MB NAND flash and 64 MB SRAM | |
| Maximum transmit power | LTE: 22 dBm | |
| | UMTS: 23 dBm | |
| | WLAN | 802.11b: 13 dBm |
| | | 802.11g: 11 dBm |
| | | 802.11n: 11 dBm |
| Receiver sensitivity | LTE | 2100 MHz: –97 dBm@10 MHz |
| | | 1800 MHz: –94 dBm@10 MHz |
| | | 2600 MHz: –95 dBm@10 MHz |
| | | 900 MHz: –94 dBm@10 MHz |
| | | DD800MHz: –94 dBm@10 MHz |
| | UMTS : –109 dBm@3.8 MHz | |
| | WLAN 802.11b: –76 dBm@11 Mbit/s or –82 dBm@1 Mbit/s | |
| | WLAN 802.11g: –65 dBm@54 Mbit/s | |
| | WLAN 802.11n: –64 dBm@65 Mbit/s | |
| WLAN rate | 802.11b: up to 11 Mbit/s | |
| | 802.11g: up to 54 Mbit/s | |
| | 802.11n: support for MCS0–MCS7; up to 72.2 Mbit/s | |

| Item | Specifications |
|---|---|
| Maximum power consumption | 4.3 W |
| Power supply | AC: 100–240 V |
| | DC: 5 V, 2 A |
| Battery | Type: Li-ion battery (rechargeable and non-removable) |
| | Capacity: 3.7 V, 3000 mAh |
| | Maximum operating time: 10 hours |
| | Maximum standby time: 360 hours while Wi-Fi is off |
| External interfaces | Micro-USB port |
| | Standard microSD card interface |
| | Standard 6-pin SIM card interface |
| | External main antenna interface |
| Display | TFT-LCD |
| Keys | Wi-Fi/Power multiplexing key, WPS switch, and Reset key |
| Antenna | Built-in LTE/UMTS/GSM main antenna |
| | Built-in LTE/UMTS diversity antenna |
| | Built-in WLAN antenna |
| | External LTE/UMTS/GSM main antenna interface |
| Dimensions (H x W x D) | 13.5 mm x 62 mm x 113 mm |
| Weight | About 140 g |
| Ambient temperature | Operating: 0°C to +35°C |
| | Storage: –20°C to +70°C |
| Humidity | 5% to 95% (non-condensing) |

**Note**

FDD = Frequency Division Duplex

SRAM = static random-access memory

WAN = wide area network

## 2.2.2 Software

Table 2-2 lists the E589u-12's software specifications.

**Table 2-2** Software specifications

| Item | Description |
| --- | --- |
| SMS | • Write, send, and receive messages.<br>• Set SMS center number.<br>• Save up to 300 messages to local storage.<br>• Choose to save messages to local storage (default storage location) or SIM card.<br>• Notify users of new messages. |
| Network connection setup | • Create, delete, and edit APNs.<br>• Set up dial-up connection automatically. |
| WLAN setup | • Set the SSID.<br>• Broadcast and hide the SSID.<br>• Open system and shared key authentication.<br>• ASCII and HEX keys.<br>• 64/128-bit WEP encryption.<br>• 256-bit WPA-PSK and WPA2-PSK encryption.<br>• TKIP and AES encryption algorithm.<br>• Automatic rate adjustment.<br>• Station management.<br>• Turn off Wi-Fi at a specified time. |
| Firewall setup | • Enable/Disable the firewall.<br>• LAN IP filter.<br>• Port forwarding.<br>• Virtual server.<br>• DMZ service. |
| DHCP setup | • Enable/Disable DHCP server.<br>• Set up address pool on the DHCP server.<br>• Set the DHCP lease time. |
| System requirements | • Windows XP, Windows Vista, and Windows 7.<br>• Mac OS X 10.5, 10.6, and 10.7.<br>• The computer's hardware must meet or exceed the recommended configuration for the operating system running on the computer.<br>• Display resolution: 1024 x 768 pixels or higher. |

| Item | Description |
|---|---|
| Others | Network connection:<br>• Automatic network selection and registration<br>• Manual network selection and registration |
| | Network status display: signal strength, operator name, system mode, and others. |
| | Optional network connection types, for example:<br>• LTE preferred<br>• 3G preferred<br>• 2G preferred |
| | PIN management:<br>• Edit<br>• Enable/Disable<br>• Verify |

**Note**

3G = 3rd generation

AES = Advanced Encryption Standard

APN = Access Point Name

ASCII = American Standard Code for Information Interchange

DMZ = demilitarized zone

HEX = hexadecimal

LAN = local area network

PIN = personal identification number

SSID= service set identifier

TKIP = Temporary Key Integrity Protocol

WEP = Wired Equivalent Privacy

WPA-PSK = Wi-Fi Protected Access Pre-Shared Key

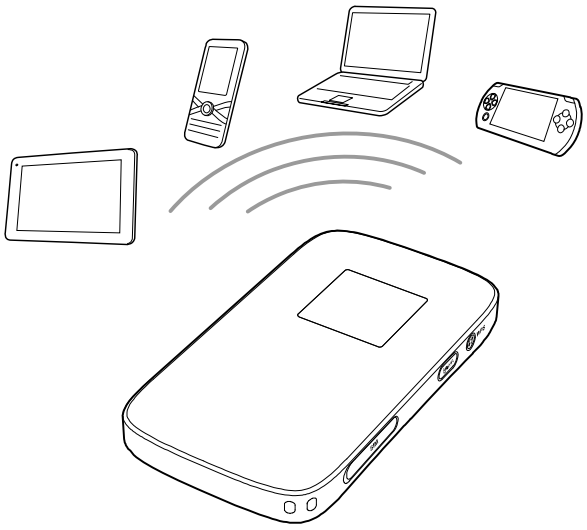
# 3 Services and Applications

## 3.1 Data Service

The E589u-12 can be used as a wireless modem when Wi-Fi is enabled. Users can set up wireless connections between Wi-Fi enabled user equipment and the E589u-12, and then access the Internet.

A maximum of 10 users can use Wi-Fi enabled devices to access the E589u-12 simultaneously, which sets up a WLAN.

**Figure 3-1** Access from multiple devices using Wi-Fi



## 3.2 SMS

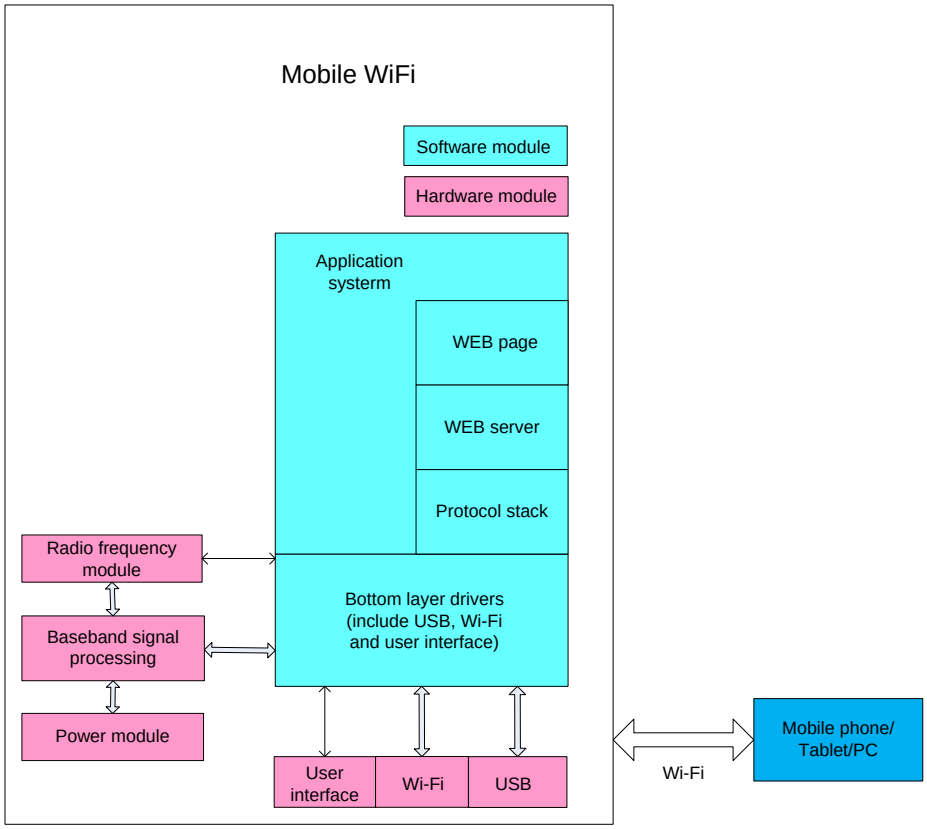
The E589u-12 allows users to write, send, and receive messages. The E589u-12's web interface provides powerful message management functions, such as management of received, sent and draft messages.

# 4 System Architecture

## 4.1 System Architecture

Figure 4-1 shows the E589u-12's 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/DC-HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS/GSM baseband digital signals, including:
   - Modulating/Demodulating LTE baseband signals.
   - Modulating/Demodulating DC-HSPA+/HSPA+/HSPA/UMTS baseband signals.
   - Modulating/Demodulating EDGE/GPRS/GSM baseband signals
   - Encoding/Decoding the LTE channel.
   - Encoding/Decoding DC-HSPA+/HSPA+/HSPA/UMTS channel.
   - Encoding/Decoding EDGE/GPRS/GSM channel.
3. **Bottom Layer Driver**: It drives peripherals, including USB device, Wi-Fi device, screen, button, SIM card and microSD card.
4. **Protocol Stack System**: It processes protocols of LTE/ DC-HSPA+/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 screen and button.

# 5 Packing List

Table 5-1 lists the items contained in the package of the E589u-12.

**Table 5-1** Packing list of the E589u-12

| Item | Quantity | Remarks |
|---|---|---|
| Mobile WiFi (including non-removable battery) | 1 | Standard |
| USB cable | 1 | Standard |
| Power adapter | 1 | Standard |
| Quick Start | 1 | Standard |
| Safety Information | 1 | Standard |
| Warranty Card | 1 | Optional |

# A Acronyms and Abbreviations

| | |
|---|---|
| **3G** | 3rd generation |
| **3GPP** | 3rd Generation Partnership Project |
| **AES** | Advanced Encryption Standard |
| **APN** | Access Point Name |
| **ARP** | Address Resolution Protocol |
| **ARPU** | average revenue per user |
| **ASCII** | American Standard Code for Information Interchange |
| **BSS** | Base Station System |
| **CS domain** | circuit switched domain |
| **DC-HSPA+** | Dual Carrier High Speed Packet Access Plus |
| **DHCP** | Dynamic Host Configuration Protocol |
| **DL** | Data Link |
| **DMZ** | demilitarized zone |
| **DNS** | Domain Name System |
| **EDGE** | Enhanced Data rates for GSM Evolution |
| **FDD** | Frequency Division Duplex |
| **GERAN** | GSM/EDGE Radio Access Network |
| **GPRS** | General packet radio service |
| **GSM** | Global System for Mobile Communications |
| **HEX** | hexadecimal |
| **HSUPA** | High Speed Uplink Packet Access |
| **HSDPA** | High Speed Downlink Packet Access |
| **HSPA+** | High Speed Packet Access Plus |

| | |
|---|---|
| **HTTP** | Hypertext Transfer Protocol |
| **IC** | Integrated Circuit |
| **ICMP** | Internet Control Message Protocol |
| **IP** | Internet Protocol |
| **LAN** | local area network |
| **LTE** | Long Term Evolution |
| **MAC** | Medium Access Control |
| **MexE** | Mobile Execution Environment |
| **microSD card** | micro Secure Digital card |
| **MS** | Mobile Station |
| **NAS** | Non-Access Stratum |
| **NAT** | network address translation |
| **OS** | Operating System |
| **PDCP** | Packet Data Convergence Protocol |
| **PIN** | personal identification number |
| **PPP** | Point-to-Point Protocol |
| **PS domain** | packet switched domain |
| **RF** | radio frequency |
| **RLC** | Radio Link Control |
| **RRC** | Radio Resource Control |
| **SGSN** | Serving GPRS Support Node |
| **SIM** | Subscriber Identity Module |
| **SMS** | Short Messaging Service |
| **SNDCP** | Subnetwork Dependent Convergence Protocol |
| **SOHO** | small office/home office |
| **SRAM** | static random-access memory |
| **SSID** | service set identifier |
| **TCP** | Transmission Control Protocol |
| **TFT-LCD** | thin film transistor liquid crystal display |
| **TKIP** | Temporary Key Integrity Protocol |
| **TR** | Technical Report |
| **TS** | Technical Specification |
| **UDP** | User Datagram Protocol |

| | |
|---|---|
| **UE** | User Equipment |
| **UMTS** | Universal Mobile Telecommunications System |
| **USAT** | USIM Application Toolkit |
| **USB** | Universal Serial Bus |
| **USIM** | UMTS Subscriber Identity Module |
| **UTRAN** | UMTS Terrestrial Radio Access Network |
| **WAN** | wide area network |
| **WEP** | Wired Equivalent Privacy |
| **Wi-Fi** | Wireless Fidelity |
| **WLAN** | wireless local area network |
| **WPA-PSK** | Wi-Fi Protected Access Pre-Shared Key |
| **WPS** | Wi-Fi Protected Setup |