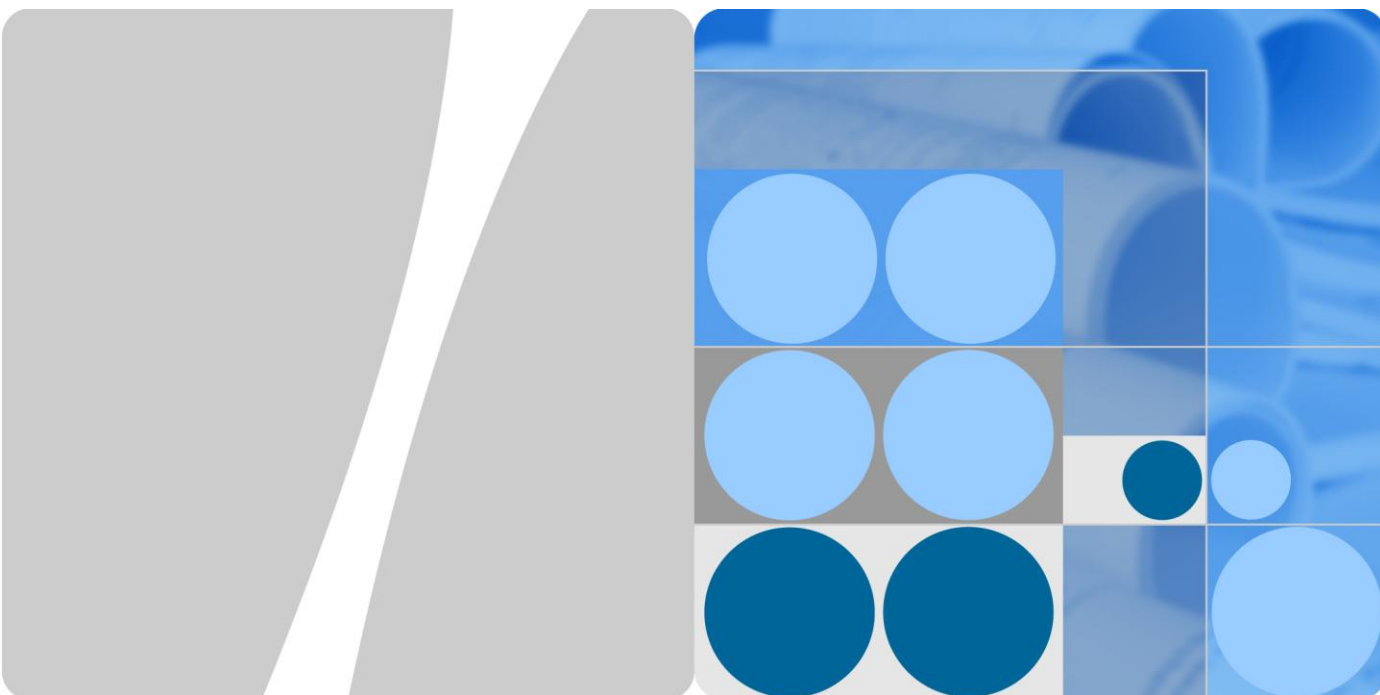# Product Description

HUAWEI E589u-512 Mobile WiFi
V100R001

HUAWEI TECHNOLOGIES CO., LTD.

Huawei Technologies Co., Ltd. provides customers with comprehensive technical support and service. Please feel free to contact our local office or company headquarters.

Huawei Technologies Co., Ltd.

Address:	Huawei Industrial Base
	Bantian, Longgang
	Shenzhen 518129
	People's Republic of China
Website:	http://www.huawei.com
Email:	mobile@huawei.com

About This Document

Purpose and Organization

This document describes the major functions, services, and system architecture of HUAWEI E589u-512 Mobile WiFi (E589u-512 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.	2012-05-18

Contents

1 Overview

The E589u-512 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-512 supports the following frequency bands:

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

The E589u-512 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-512 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-512 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-512 provides users

with better wireless network access experience and operators with substantially increased average revenue per user (ARPU).

Figure 1-1 shows the E589u-512.

Figure 1-1 E589u-512

2 Features

2.1 Main Features

The E589u-512 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-512'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：2600/AWS/1900 MHz	
	DC-HSPA+/HSPA+/HSPA/UMTS：1900/850 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
  SRAM = static random-access memory
  WAN = wide area network

2.2.2 Software

Table 2-2 lists the E589u-512's software specifications.

Table 2-2 Software specifications

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

Item	Description
Others	Network connection: • Automatic network selection and registration • Manual network selection and registration
	Network status display: signal strength, operator name, system mode, and others.
	Optional network connection types, for example: • LTE preferred • 3G preferred • 2G preferred
	PIN management: • Edit • Enable/Disable • 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-512 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-512, and then access the Internet.

A maximum of 10 users can use Wi-Fi enabled devices to access the E589u-512 simultaneously, which sets up a WLAN.

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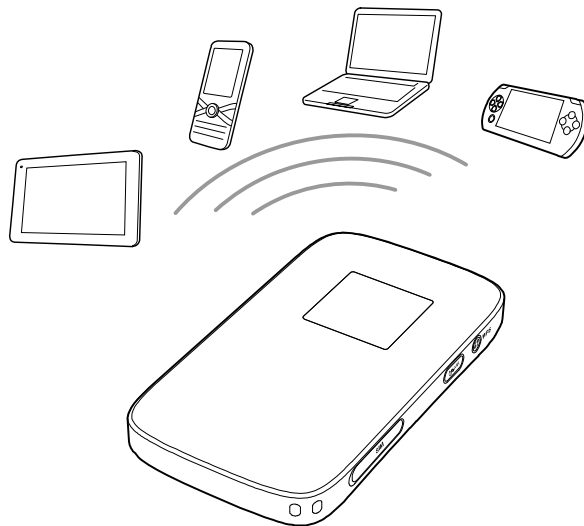
3.2 SMS

The E589u-512 allows users to write, send, and receive messages. The E589u-512'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-512's system architecture.

Figure 4-1 System architecture
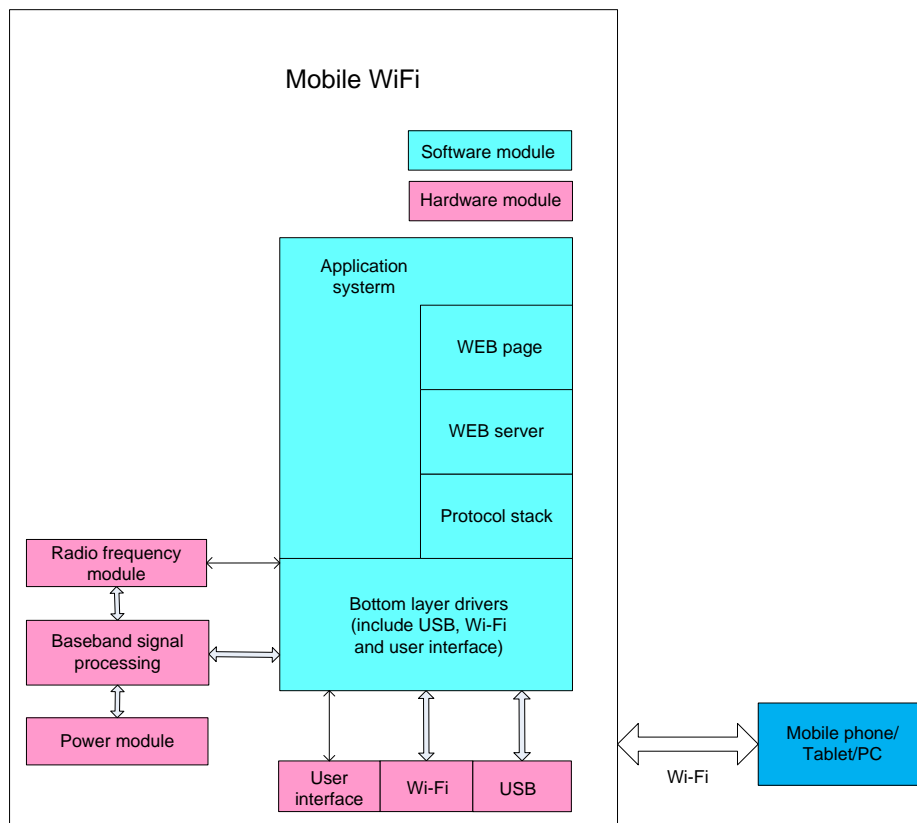
4.2 Functional Modules

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-512.

Table 5-1 Packing list of the E589u-512

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
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