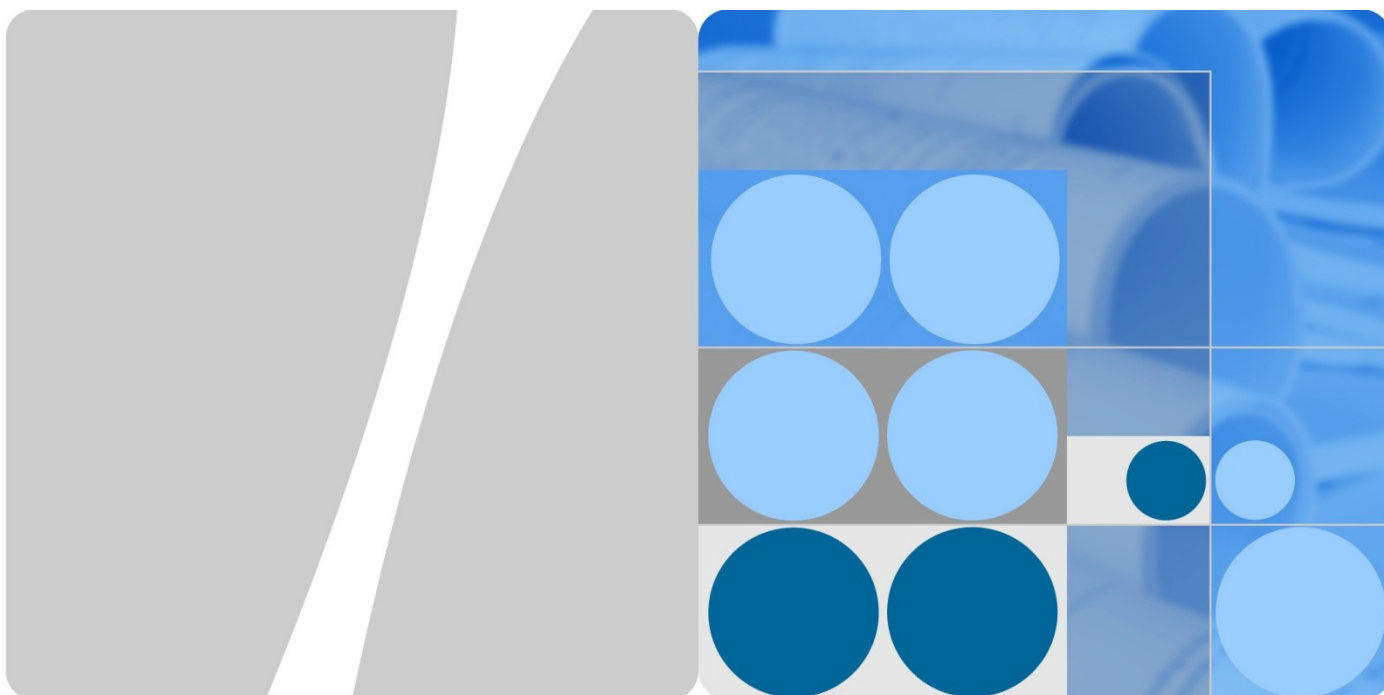


# Product Description



HUAWEI E5221 Mobile WiFi  
V100R001

**Issue** 03  
**Date** 2013-05-06

HUAWEI TECHNOLOGIES CO., LTD.



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## About This Document

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### 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.	2013-02-21
02	<ul style="list-style-type: none"><li>Change the dimensions(H × W × D) from “14.6 mm×90.5 mm×57.0 mm” to “14.6 mm×90.2 mm×57.0 mm”</li><li>Change the weight from “about 58 g” to “about 68 g”</li></ul>	2013-04-19
03	Delete “DC-HSPA+” from the “Operating frequency DC-HSPA+/HSPA+/HSPA/UMTS 2100/900 MHz”	2013-05-06

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# 1 Overview

## 1.1 Brief Introduction

HUAWEI E5221 Mobile WiFi 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 E5221 supports the following standards:

- 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 E5221 provides the following services:

- HSPA+ packet data service of up to 21.6 Mbit/s
- 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)

You can connect the E5221 with the USB interface of a computer, or connect the E5221 with the Wi-Fi. In the service area of the HSPA+/HSPA/UMTS/EDGE/GPRS/GSM network, you can surf the Internet and send/receive messages/emails cordlessly. The E5221 is fast, reliable, and easy to operate. Thus, mobile users can experience many new features and services with the E5221. These features and services will enable a large number of users to use the E5221 and the average revenue per user (ARPU) of operators will increase substantially.

Figure 1-1 shows the appearance of the E5221.

**Figure 1-1 Appearance**



## 1.2 Branch Type

The E5221 has three branch types within Huawei: E5221s-2.

Table 1-1 lists the branch type E5221s-2.

**Table 1-1** Branch type E5221s-2

Item	Specifications
Type	E5221s-2
Operating frequency	HSPA+/HSPA/UMTS 2100/900 MHz
	EDGE/GPRS/GSM 1900/1800/900/850 MHz
	WLAN: 2400–2483.5 MHz

## 1.3 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 E5221's optional features are as follows:

- 3G/Wi-Fi auto offload
- IPv6 /IPv4 dual stack

# 2 Features

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## 2.1 Main Features

The E5221 mainly supports the following features:

- HSPA+ (DL) data service of up to 21.6 Mbit/s
- HSPA+ (UL) data service of up to 5.76 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 UMTS and GSM
- SMS based on CS/PS domain of GSM and UMTS
- Wi-Fi
- Five-second fast boot
- Plug and Play (PnP)
- 3G/Wi-Fi auto offload (optional)
- IPv6 /IPv4 dual stack (optional)
- Built-in DHCP Server, DNS RELAY and NAT
- Online software upgrade
- Traffic statistic
- Standard Micro USB interface
- Micro Secure Digital Memory (microSD) Card
- LED indicators
- Built-in UMTS and WLAN high gain antenna
- Support for HUAWEI Mobile WIFI app
- Windows XP, Windows Vista, Windows 7, Windows 8, MAC OS X 10.5, 10.6, 10.7 and 10.8



## 2.2 Technical Specifications

### 2.2.1 Hardware

Table 2-1 lists the hardware specifications.

**Table 2-1** Hardware specifications

Item	Specifications	
Technical standard	<ul style="list-style-type: none"> <li>• WAN: HSPA+/HSPA/UMTS/EDGE/GPRS/GSM</li> <li>• WLAN: IEEE 802.11b/g/n</li> </ul>	
Internal memory	128 MB Flash, 64 MB Memory	
Maximum transmitter power	UMTS: 24 (+1/-3) dBm	
	WLAN	802.11b: 14 (+/-3) dBm
		802.11g: 11 (+/-3) dBm
		802.11n: 9 (+/-3) dBm
Receiver sensitivity	UMTS: -106 dBm	
	WLAN 802.11b	-76 dBm@11 Mbit/s
		-82 dBm@1 Mbit/s
	WLAN 802.11g: -65 dBm@54 Mbit/s	
	WLAN 802.11n: -64 dBm@65 Mbit/s	
WLAN speed	802.11b: Up to 11 Mbit/s	
	802.11g: Up to 54 Mbit/s	
	802.11n: Support MCS0–MCS7; Up to 72.2 Mbit/s.	
Maximum power consumption	3.5 W	
Power supply	<ul style="list-style-type: none"> <li>• AC: 100–240 V</li> <li>• DC: 5 V, 1 A</li> </ul>	
Battery	<ul style="list-style-type: none"> <li>• Type: Li (Rechargeable)</li> <li>• Capacity: 3.7 V, 1150 mAh</li> <li>• Maximum working time: 4 hours</li> <li>• Maximum standby time: 200 hours while Wi-Fi is off; 23 hours while Wi-Fi is often on.</li> </ul>	
External interfaces	USB interface: Micro USB	
	Standard microSD card interface	

Item	Specifications
	SIM card: standard 6-pin SIM card interface
Indicators	LED indicators: Signal, Wi-Fi, Battery, SMS
Button	Power switch, Reset switch
Antenna	<ul style="list-style-type: none"><li>• Built-in GSM/UMTS main antenna</li><li>• Built-in UMTS diversity antenna</li><li>• Built-in WLAN antenna</li></ul>
Dimensions (H × W × D)	14.6 mm×90.2 mm×57.0 mm
Weight	about 68 g (including the battery)
Temperature	<ul style="list-style-type: none"><li>• Operating: 0°C to +35°C</li><li>• Storage: -20°C to +60°C</li></ul>
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"><li>• Writing/Sending/Receiving</li><li>• Sending/Receiving extra-long messages</li><li>• Storage: Up to 500 messages can be saved in the internal memory of the E5221.</li><li>• New message prompt</li></ul>
Network connection setup	<ul style="list-style-type: none"><li>• APN management: create, delete and edit.</li><li>• Set up network connection</li></ul>

Item	Description
WLAN setup	<ul style="list-style-type: none"> <li>• SSID broadcasting and hiding</li> <li>• Open system and shared key authentication</li> <li>• ASCII and HEX keys</li> <li>• 64/128-bit WEP encryption</li> <li>• 256-bit WPA-PSK and WPA2-PSK encryption</li> <li>• TKIP and AES encryption algorithm</li> <li>• TKIP and AES integrated encryption algorithm</li> <li>• Automatic adjustment of ratios</li> <li>• STA management</li> <li>• Turn off Wi-Fi automatically</li> <li>• WLAN MAC filter</li> </ul>
Firewall setup	<ul style="list-style-type: none"> <li>• Firewall Switch</li> <li>• LAN IP Filter</li> <li>• Virtual Server</li> <li>• DMZ Service</li> <li>• UPnP Service</li> <li>• WAN Ping block</li> </ul>
NAT setup	<ul style="list-style-type: none"> <li>• CONE NAT</li> <li>• Symmetric NAT</li> <li>• VPN passthrough</li> </ul>
DHCP setup	<ul style="list-style-type: none"> <li>• DHCP server enabling and disabling</li> <li>• Address pool of the DHCP server setup</li> <li>• DHCP lease time setup</li> </ul>
Software installation	Automatic installation (PnP)
3G/Wi-Fi auto offload (optional)	<ul style="list-style-type: none"> <li>• Accessing to WAN via 3G or Wi-Fi</li> <li>• Automatic offload between 3G and Wi-Fi</li> </ul>
IPv6/IPv4 dual stack (optional)	<ul style="list-style-type: none"> <li>• DHCPv6/v4 server and client</li> <li>• DNSv6/v4 server and client</li> <li>• Display IPv6/v4 WAN address</li> </ul>
Other	Network connection settings: <ul style="list-style-type: none"> <li>• Automatic network selection and registration</li> <li>• Manual network selection and registration</li> </ul>
	Network status display: signal, operator name, system mode, and so on.

Item	Description
	Selection of network connection types, for example: <ul style="list-style-type: none"><li>• 3G Only</li><li>• 2G Only</li><li>• Auto</li></ul>
	PIN management: activate/deactivate PIN, PIN lock, changing PIN, unblocking by using the PUK.
System requirement	<ul style="list-style-type: none"><li>• Windows XP, Windows Vista, Windows 7, Windows 8</li><li>• Mac OS X 10.5, 10.6, 10.7 and 10.8</li><li>• Your computer's hardware system should meet or exceed the recommended system requirements for the installed version of OS</li></ul>

# 3

## Services and Applications

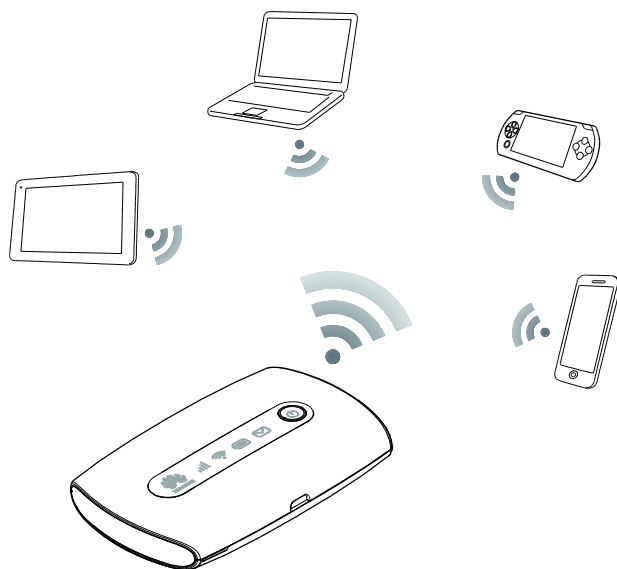
### 3.1 Data Service

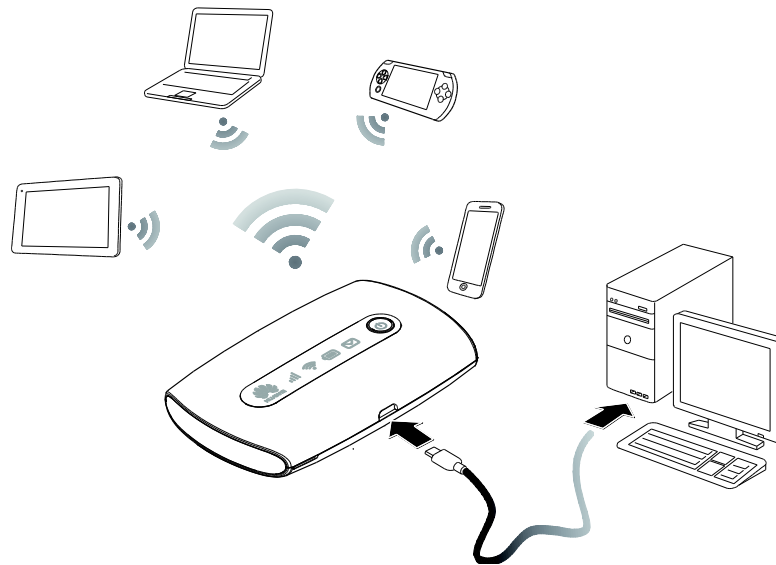
#### 3.1.1 Wireless Modem

The E5221 can be used as a wireless modem when the Wi-Fi is enabled. You can access the Internet service through setting up the wireless network connection with the E5221.

A maximum of ten wireless users can access the E5221 at the same time. You can set up the WLAN with the access point (AP) function.

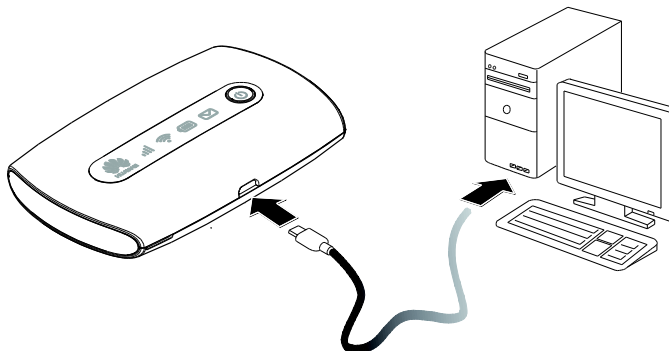
**Figure 3-1** Multi-device access via Wi-Fi



**Figure 3-2** Multi-device access via Wi-Fi and USB at the same time

### 3.1.2 USB Modem

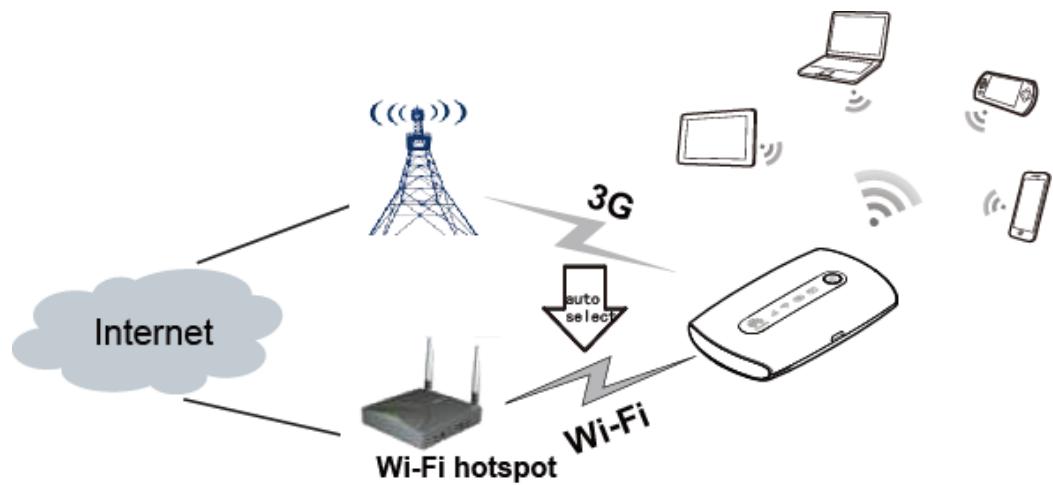
After you connect the E5221 and PC with a USB data cable, the E5221 driver is installed on the PC automatically and the shortcut of the web page is displayed on the PC desktops. You can configure APN on the E5221 WEB page (or directly use the default settings) and set up a network connection. Then you can send or receive E-mail, access the Internet, and download files through wireless data channels.

**Figure 3-3** One-device access via USB

### 3.1.3 3G/Wi-Fi Auto Offload (Optional)

The E5221 allows you to access the Internet via 3G or Wi-Fi. When you are using the E5221 in areas with a Wi-Fi hotspot, for example, an airport, a cafe, a hotel, or your home, the E5221 switches to Wi-Fi connection automatically, saving your 3G network traffic fees.

After the function is enabled, a maximum of five wireless users can access the E5221 at the same time.

**Figure 3-4** 3G/Wi-Fi auto offload

## 3.2 SMS

The E5221 supports message writing/sending/receiving. You can manage messages through the WEB page, such as an inbox, an outbox and a draft.

## 3.3 Sharing Data Stored on the microSD card

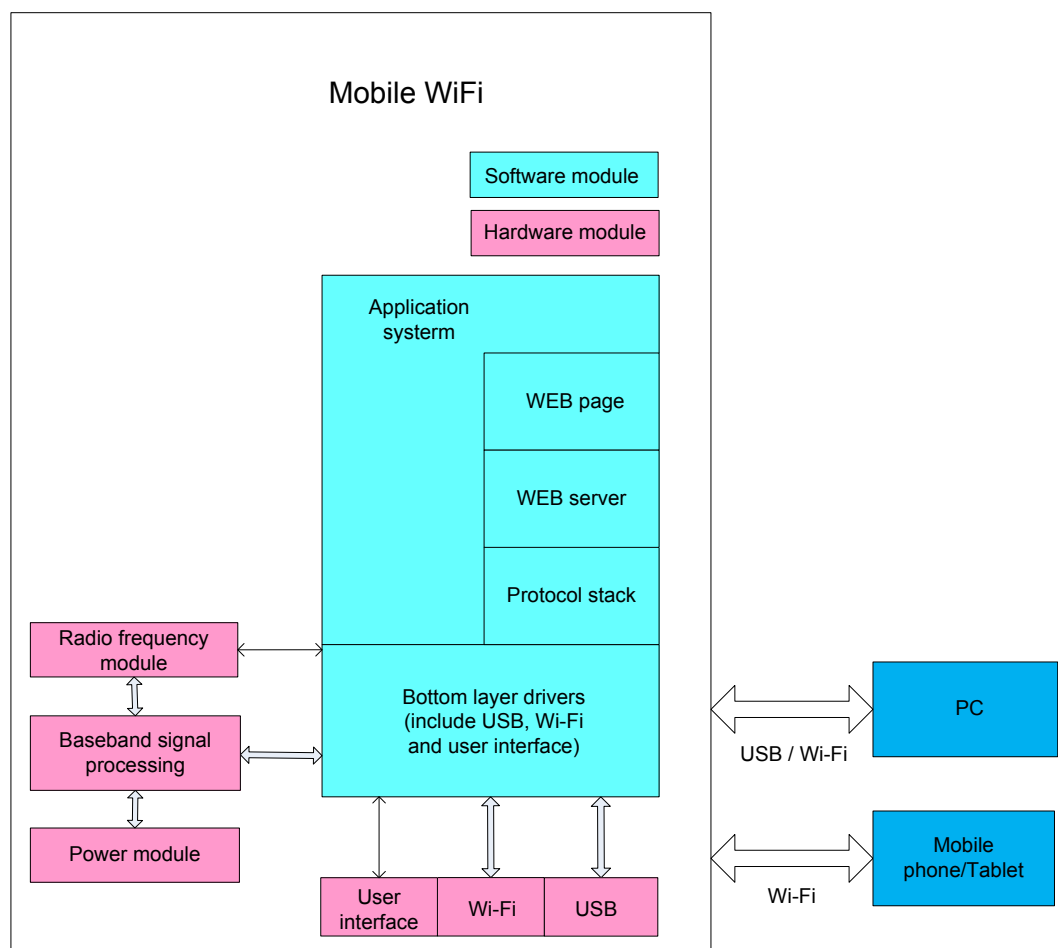
After the microSD card is inserted, you can store data on the card or use the web management page to share data stored on the card.

# 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 HSPA+/HSPA/UMTS/EDGE/GPRS/GSM baseband digital signals, including:
  - Modulating/Demodulating HSPA+/HSPA/UMTS baseband signals
  - Modulating/Demodulating EDGE/GPRS/GSM baseband signals
  - Encoding/Decoding HSPA+/HSPA/UMTS channel
  - Encoding/Decoding EDGE/GPRS/GSM channel
3. **Bottom layer driver:** It drives peripherals, including USB device, Wi-Fi device, indicator, button, SIM card and microSD card.
4. **Protocol stack system:** It processes protocols of 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 indicator and button.

# 5 Packing List

This chapter describes the items contained in the package of the E5221.

Table 5-1 lists the items contained in the package of the E5221.

**Table 5-1** Packing list of the E5221

Item	Quantity	Remarks
Mobile WiFi	1	Standard
Rechargeable Battery (1150 mAh)	1	Standard
USB Cable (17 cm)	1	Standard
Quick Start	1	Standard
Safety Information	1	Standard
Power Adapter	1	Optional
Warranty Card	1	Optional

# A Acronyms and Abbreviations

<b>2G</b>	The Second Generation
<b>3G</b>	The Third Generation
<b>AES</b>	Advanced Encryption Standard
<b>APN</b>	access point name
<b>ARPU</b>	average revenue per user
<b>ASCII</b>	American Standard Code for Information Interchange
<b>CS</b>	circuit switched
<b>DHCP</b>	Dynamic Host Configuration Protocol
<b>DMZ</b>	demilitarized zone
<b>DNS</b>	Domain Name Server
<b>EDGE</b>	Enhanced Data Rates for GSM Evolution
<b>GPRS</b>	General Packet Radio Service
<b>GSM</b>	Global System for Mobile Communications
<b>HSPA+</b>	High Speed Packet Access Plus
<b>HSUPA</b>	High Speed Uplink Packet Access
<b>HSDPA</b>	High Speed Downlink Packet Access
<b>IEEE</b>	Institute of Electrical and Electronics Engineers
<b>IP</b>	Internet Protocol
<b>LED</b>	light emitting diode
<b>MAC</b>	Medium Access Control
<b>Modem</b>	Modulator Demodulator
<b>NAT</b>	Network Address Translation
<b>OS</b>	Operating System

<b>PC</b>	personal computer
<b>PIN</b>	personal identification number
<b>PS</b>	packet switched
<b>PUK</b>	PIN unblocking key
<b>SIM</b>	subscriber identity module
<b>SMS</b>	short messaging service
<b>SOHO</b>	small office home office
<b>SSID</b>	Service Set Identifier
<b>TKIP</b>	Temporal Key Integrity Protocol
<b>UMTS</b>	Universal Mobile Telecommunications System
<b>UPnP</b>	Universal Plug and Play
<b>USB</b>	Universal Serial Bus
<b>VPN</b>	Virtual Private Network
<b>WAN</b>	wireless area network
<b>WEP</b>	wired equivalent privacy
<b>Wi-Fi</b>	Wireless Fidelity
<b>WLAN</b>	wireless local area network
<b>WPA</b>	Wi-Fi Protected Access