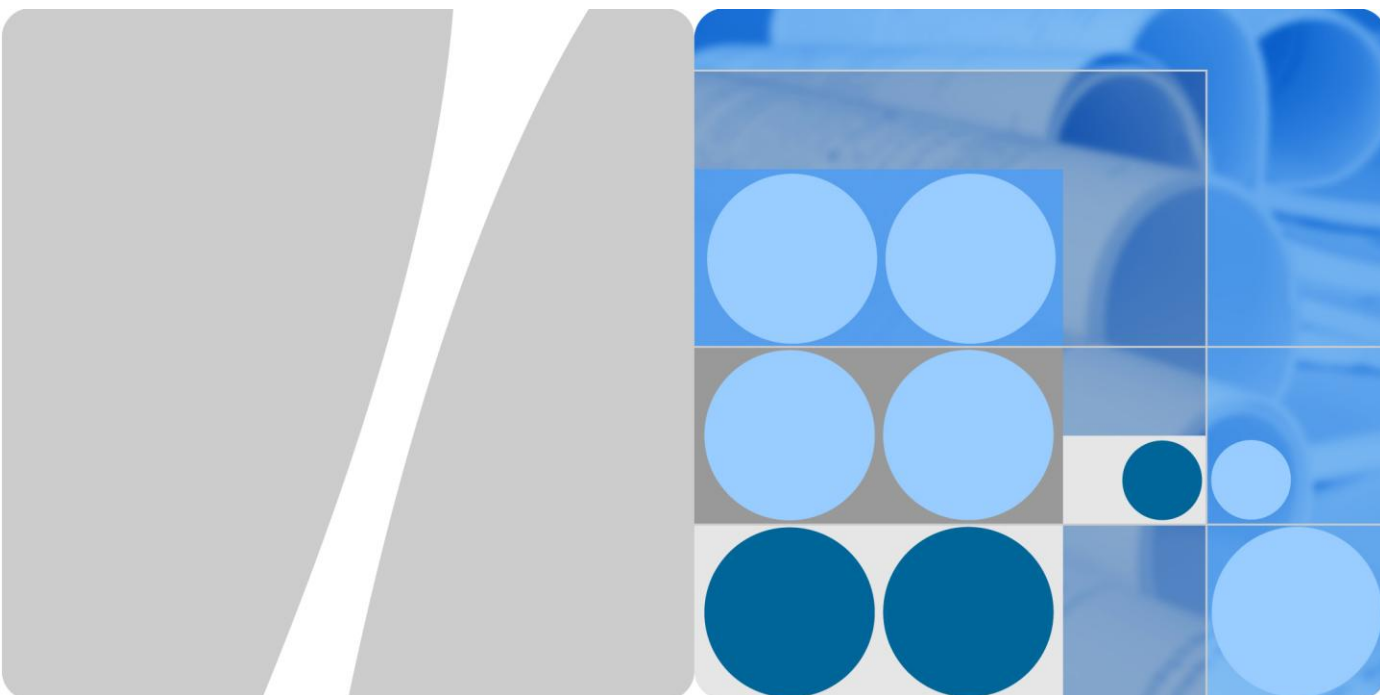


# Product Description



HUAWEI E5180s-22 LTE cube  
V200R001

**Issue**      03  
**Date**        2014-07-26

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# About This Document

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## Purpose

This document describes the main functions, supported services, and system architecture of the HUAWEI E5180s-22 LTE cube V200R001 (E5180s-22 for short).

This document is organized as follows.

Chapter	Description
1 Overview	Supported network modes, basic services and functions, and appearance of the E5180s-22.
2 Product Features	Features and technical specifications of the E5180s-22.
3 Services and Applications	Services provided by the E5180s-22.
4 System Architecture	System architecture of the E5180s-22.
5 Packing List	Items included with the E5180s-22.

## Change History

Version	Change Description	Date
01	First release	2014-03-17
02	<ul style="list-style-type: none"><li>• Modify the appearance of E5180s-22</li><li>• Modify the authentication of WLAN</li><li>• Delete the WAN function of RJ45 port</li></ul>	2014-05-07
03	Change LTE CPE into LTE cube	2014-07-26

# Contents

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<b>About This Document .....</b>	<b>3</b>
<b>1 Overview .....</b>	<b>6</b>
<b>2 Product Features .....</b>	<b>8</b>
2.1 Main Features.....	8
2.2 Technical Specifications .....	9
2.2.1 Hardware Specifications.....	9
2.2.2 Antenna Specifications .....	10
2.2.3 Software Specifications .....	11
<b>3 Services and Applications.....</b>	<b>14</b>
3.1 Data Services .....	14
3.2 Voice Services.....	15
3.3 Security Services .....	16
3.3.1 Firewall.....	16
3.3.2 User Authentication .....	16
3.3.3 PIN Protection.....	16
3.4 Maintenance and Management .....	16
<b>4 System Architecture.....</b>	<b>17</b>
4.1 System Architecture Diagram.....	17
4.2 Functional Modules .....	17
<b>5 Packing List.....</b>	<b>18</b>

# 1 Overview

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As a high-performance LTE cube device, the E5180s-22 enables users to get access to wireless and wired networks. The E5180s-22 supports the following frequency bands:

- LTE
  - Frequency division duplex (FDD): 2600/2100/1800/900/800 MHz
  - Time division duplex (TDD): 2600 MHz
- DC-HSPA+/HSPA+/HSPA/UMTS: 2100/900 MHz
- EDGE/GPRS/GSM: 1900/1800/900/850 MHz

The E5180s-22 can work in any of the following network standards:

- 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 Global Evolution (EDGE)
- General Packet Radio Service (GPRS)
- Global System for Mobile Communications (GSM)

The E5180s-22 provides the following services and functions:

- Data services
- Voice services
- Short message service (SMS)
- Security functions
- Maintenance and management

Figure 1-1 shows the appearance of the E5180s-22.

**Figure 1-1** E5180s-22 appearance



# 2 Product Features

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## 2.1 Main Features

The following lists the main features of the E5180s-22:

- Access to LTE/DC-HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS/GSM wireless networks
- LTE FDD downlink packet data service at a maximum transmission rate of 150 Mbit/s (theoretical value)
- LTE FDD uplink packet data service at a maximum transmission rate of 50 Mbit/s (theoretical value)
- LTE TDD downlink packet data service at a maximum transmission rate of 112 Mbit/s (theoretical value)
- LTE TDD uplink packet data service at a maximum transmission rate of 10 Mbit/s (theoretical value)
- DC-HSPA+ downlink packet data service at a maximum transmission rate of 43.2 Mbit/s (theoretical value)
- HSPA+ downlink packet data service at a maximum transmission rate of 21.6 Mbit/s (theoretical value)
- HSPA downlink packet data service at a maximum transmission rate of 14.4 Mbit/s (theoretical value)
- HSPA uplink packet data service at a maximum transmission rate of 5.76 Mbit/s (theoretical value)
- UMTS packet data service at a maximum transmission rate of 384 kbit/s (theoretical value)
- UMTS circuit-switched data service at a maximum transmission rate of 64 kbit/s (theoretical value)
- EDGE packet data service at a maximum transmission rate of 236.8 kbit/s (theoretical value)
- GPRS packet data service at a maximum transmission rate of 85.6 kbit/s (theoretical value)
- IEEE802.11b/g/n
- Wi-Fi
- RJ45 port for LAN connections
- RJ11 port for telephone connections



- Support for HUAWEI Mobile WiFi App
- Functioning as a Dynamic Host Configuration Protocol (DHCP) server and supporting Network Address Translation (NAT)
- Internet Protocol version 6 (IPv6)/Internet Protocol version 4 (IPv4)dual stack
- Windows XP SP3, Windows Vista SP1/SP2, Windows 7, Windows 8, Windows 8.1, and Mac OS X 10.7, 10.8, and 10.9 with latest upgrades

## 2.2 Technical Specifications

### 2.2.1 Hardware Specifications

Table 2-1 lists the hardware specifications of the E5180s-22.

**Table 2-1** Hardware specifications

Item	Description
Technical standards	WAN: LTE/DC-HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS/GSM
	LAN: IEEE 802.3/802.3u
	WLAN: IEEE 802.11b/g/n
Working bands	LTE: <ul style="list-style-type: none"> <li>• FDD 2600/2100/1800/900/800 MHz</li> <li>• TDD 2600 MHz</li> </ul>
	DC-HSPA+/HSPA+/HSPA/UMTS: 2100/900 MHz
	EDGE/GPRS/GSM: 1900/1800/900/850 MHz
	WLAN: 2400–2500 MHz
Memory	512 MB NAND Flash 256 MB Double Data Rate (DDR) Synchronous Dynamic Random Access Memory (SDRAM)
External ports	One power port
	One RJ11 port for telephone connections
	One RJ45 port for LAN connections
	One micro subscriber identity module (SIM) card port
Buttons	One power button
	One RESET button
LED indicators	One signal indicator
	One Wi-Fi indicator
	Decorative light

Item	Description	
Maximum transmit power	LTE: Conform to Power Class 3 Definition	
	UMTS: Conform to Power Class 3 Definition	
	WLAN	802.11b: 16 dBm
		802.11g: 16 dBm
	802.11n: 13 dBm	
Receiving sensitivity	LTE: Confirm to 3GPP Requirements	
	UMTS: Confirm to 3GPP Requirements	
	WLAN	802.11b: -76 dBm at 11 Mbit/s
		802.11g: -65 dBm at 54 Mbit/s
	802.11n: -64 dBm at 65 Mbit/s	
Maximum power consumption	< 6 W	
Power supply	AC: 100–240 V	
	DC: 12 V/1 A	
Dimensions (H x W x D)	70 mm x 70 mm x 110 mm	
Weight	About 250 g	
Temperature	Working temperature: 0°C to +40°C	
	Storage temperature: -20°C to +70°C	
Humidity	5%–95% (non-condensing)	

## 2.2.2 Antenna Specifications

### Built-in Antenna

**Table 2-2** Specifications of the LTE main antenna

Item	Description
Frequency range	790–960 MHz, 1710–2690 MHz
Input impedance	50 Ω
Standing wave ratio (SWR)	< 3
Efficiency	> 45%
Gain	0–3 dBi
Polarization type	Linear polarization

**Table 2-3** Specifications of the WLAN antenna at 2.4 GHz

Item	Description
Frequency range	2400–2500 MHz
Input impedance	50 Ω
SWR	< 3
Efficiency	> 50%
Gain	2 dBi
Polarization type	Linear polarization

## 2.2.3 Software Specifications

Table 2-4 lists the software specifications of the E5180s-22.

**Table 2-4** Software specifications

Item	Description	
Gateway	Supports the default route: 0.0.0.0.	
	Supports the default gateway address: 192.168.8.1.	
	Supports the Address Resolution Protocol (ARP).	
	Supports the Internet Control Message Protocol (ICMP).	
	Supports the domain name service (DNS).	
	NAT	Supports NAT and Network Address and Port Translation (NAPT), which complies with RFC2663, RFC3022, and RFC3027.
		Supports CONE NAT.
		Supports fragmented message identification during common NAT.
	DHCP server	Enables and disables the DHCP server.
		Configures DHCP server address pools.
Sets the lease time.		
Displays the status of the DHCP server address pools, including host names, Media Access Control (MAC) addresses, IP addresses, and remaining lease time.		
SMS	Writing/Sending/Receiving	
	Writing/Sending/Receiving extra-long messages	
	Sets the SMS center number.	

Item	Description	
Voice and fax	VoIP	Supports the Session Initiation Protocol (SIP).
		Supports G.711a/G.711u/G.729a/G.729b/G.726 (-24/-32)/G.722, and G.723.1 for encoding and decoding.
	CS voice	Supports CS voice communication over UMTS and GSM networks.
		Supports the circuit switched fallback (CSFB).
	Fax	T.38 fax
Fax pass through		
Firewall	Enables and disables the firewall.	
	Filters LAN MAC addresses.	
	Filters LAN IP addresses.	
	Filters URLs.	
	Supports demilitarized zone (DMZ).	
	Supports Universal Plug and Play (UPnP).	
	Supports Application Level Gateway (ALG).	
WLAN	Broadcasts and hides service set identifiers (SSIDs).	
	Complies with IEEE 802.11b/g/n.	
	Authentication	Supports OpenSystem authentication.
		Supports encryption using wired equivalent privacy (WEP), Wi-Fi protected access preshared key (WPA-PSK), and WPA-PSK /WPA2-PSK authentication.
		Supports the Advanced Encryption Standard (AES) encryption algorithm.
		Supports the TKIP and AES hybrid encryption algorithm.
	MAC address authentication	Supports the MAC address authentication whitelist.
		Supports the MAC address authentication blacklist.
		Supports a maximum of 16 MAC address entries.
	Supports automatic transmission rate adjustment.	
Station	Supports station status queries.	

Item	Description	
	management	Supports a maximum of 32 connected stations.
IPv6/IPv4 dual stack	DHCPv6/v4 server and client	
	DNSv6/v4 server and client	
	Display IPv6/v4 WAN address	
HUAWEI Mobile WiFi App	View service provider's name, the roaming status and signal strength.	
	View the data traffic usage and SMS.	
	Manage the connected devices.	
	Change LTE cube's SSID and password.	
System requirements	Operating system: supports Windows XP SP3, Windows Vista SP1/SP2, Windows 7, Windows 8, Windows 8.1, and Mac OS X 10.7, 10.8, and 10.9 with latest upgrades.	
	Hardware configuration: meets the configuration requirements of the operating system.	

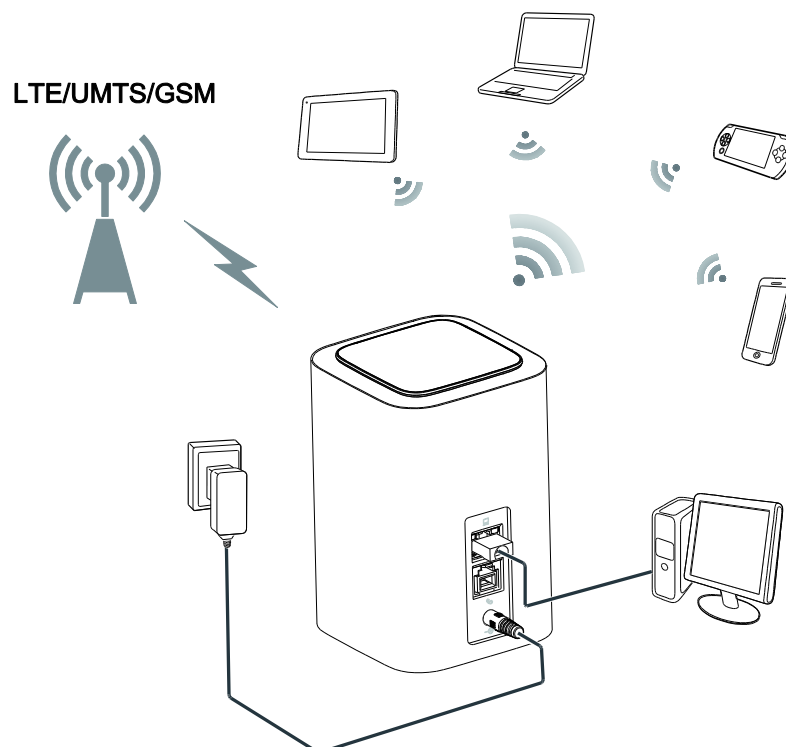
# 3 Services and Applications

## 3.1 Data Services

By connecting to the E5180s-22 over a wireless or wired network, users can get access to high-speed Internet services.

The E5180s-22 can simultaneously set up wireless connections with 32 Wi-Fi devices and establish a local area network (LAN) by connecting to concentrators and switches.

**Figure 3-1** E5180s-22 connected to multiple devices

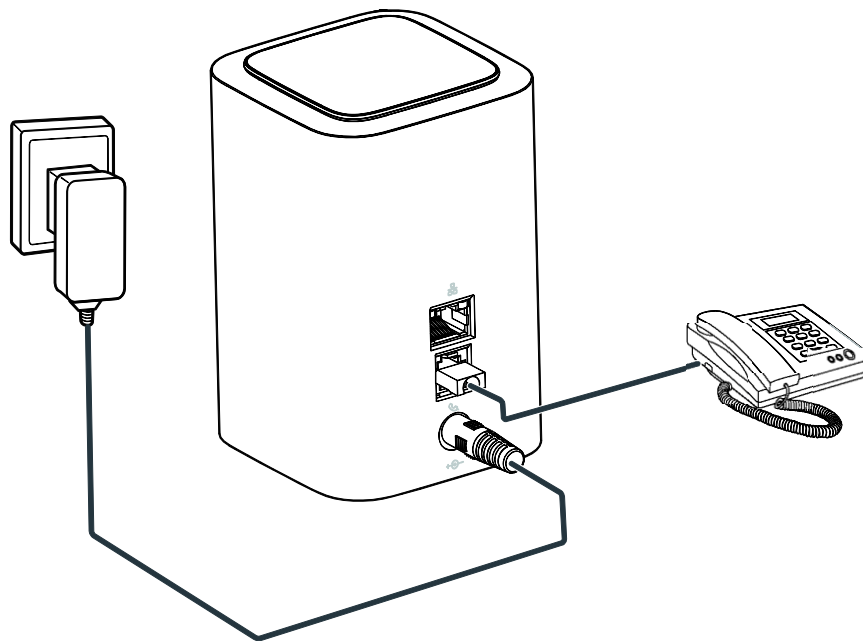


## 3.2 Voice Services

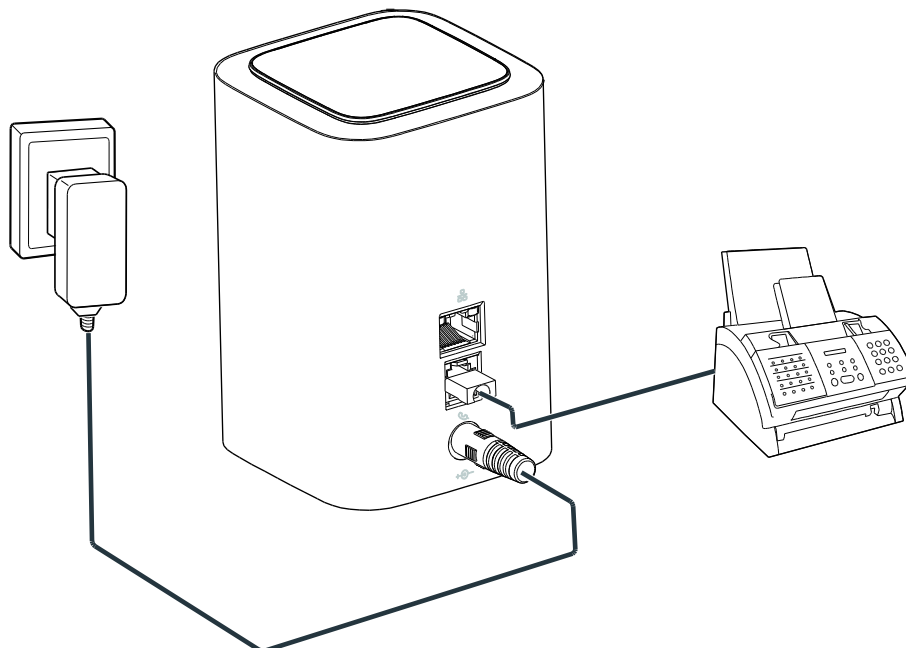
The E5180s-22 provides one telephone port to which users can connect a telephone to implement basic voice functions or connect a fax machine to use fax services.

When connected to a 2G network, the E5180s-22 supports circuit switched (CS) calls but not VoIP.

**Figure 3-2** E5180s-22 connected to a telephone



**Figure 3-3** E5180s-22 connected to a fax machine



## 3.3 Security Services

The E5180s-22 offers security features, such as network firewalls, user authentication, and personal identification number (PIN) protection, to protect users from network security threats.

### 3.3.1 Firewall

The E5180s-22 has the following firewall functions:

- Firewall switch: Enable and disable the firewall.
- LAN MAC address filtering: Prevent specified MAC addresses on a LAN from accessing the network.
- LAN IP address filtering: Prevent specified IP addresses on a LAN from accessing the network.
- URL filtering: Prevent computers on a LAN from visiting specified URLs.

### 3.3.2 User Authentication

The E5180s-22 complies with the following user authentication protocols:

- WEP
- WPA-PSK
- WPA-PSK/WPA2-PSK

### 3.3.3 PIN Protection

If PIN protection is enabled, after the E5180s-22 restarts, users must enter the correct PIN each time they log in to the web management page.

## 3.4 Maintenance and Management

The E5180s-22 allows users to locally manage connected devices, complete network settings, and check the device status to ensure consistent performance.

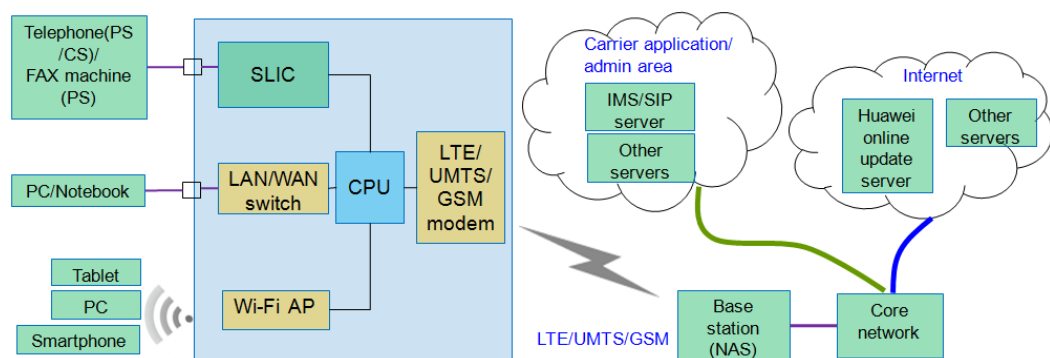


# 4 System Architecture

## 4.1 System Architecture Diagram

Figure 4-1 shows the E5180s-22 system architecture.

**Figure 4-1** E5180s-22 system architecture



## 4.2 Functional Modules

- LTE/UMTS/GSM modem  
Processes the access, management, and data transmission of LTE/DC-HSPA+/HSPA+/HSPA/UMTS/EDGE/GPRS/GSM.
- CPU  
Transmits data and voices from the wireless metropolitan area network (WMAN) to the LAN.
- Subscriber Line Interface Circuit (SLIC)  
Connects telephones or a fax to the E5180s-22.
- LAN switch  
Transmits data over Ethernet ports.
- Wi-Fi access point (AP)  
Enables wireless devices to connect to a LTE/UMTS/GSM network using Wi-Fi or related standards.

# 5 Packing List

Table 5-1 lists the items included with the E5180s-22.

**Table 5-1** Items in the E5180s-22 package

Item	Quantity	Remarks
LTE cube	1	Mandatory
Power adapter	1	Mandatory
Ethernet cable	1	Mandatory
Quick Start	1	Mandatory
Safety Information	1	Mandatory
Warranty Card	1	Optional

# A Acronyms and Abbreviations

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## Numerics

3G The Third Generation

## A

AC Alternating Current

AES Advanced Encryption Standard

ALG Application Level Gateway

ARP Address Resolution Protocol

AP Access Point

APN Access Point Name

## C

CA carrier aggregation

CSFB circuit switched fallback

## D

DC Direct Current

DC-HSPA+ Dual Carrier High Speed Packet Access Plus

DDR Double Data Rate

DHCP Dynamic Host Configuration Protocol

DL Down Link

DMZ demilitarized zone

DNS domain name service

## E

EDGE Enhanced Data Rates for GSM Evolution

## F

FDD frequency division duplex

**G**

GPRS General Packet Radio Service

GSM Global System for Mobile Communications

**H**

HSPA+ High Speed Packet Access Plus

HSPA High Speed Packet Access

HSDPA High Speed Downlink Packet Access

HSUPA High Speed Uplink Packet Access

**I**

ICMP Internet Control Message Protocol

IP Internet Protocol

**L**

LAN Local Area Network

LED Light Emitting Diode

LTE Long Term Evolution

**M**

MAC Media Access Control

MDI Medium Dependent Interface

MDIX Medium Dependent Interface Crossover

**N**

NAPT Network Address and Port Translation

NAT Network Address Translation

**P**

PIN Personal Identification Number

**S**

SDRAM Synchronous Dynamic Random Access Memory

SIM subscriber identity module

SIP Session Initiation Protocol

SMS Short Message Service

SOHO Small Office Home Office

SSID service set identifier

**T**

TDD	time division duplex
TKIP	Temporal Key Integrity Protocol
<b>U</b>	
UL	Up Link
UMTS	Universal Mobile Telecommunications System
UPnP	Universal Plug and Play
URL	Uniform Resource Locator
<b>W</b>	
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network
WPA-PSK	Wi-Fi Protected Access Pre-shared Key
WPS	Wi-Fi Protected Setup