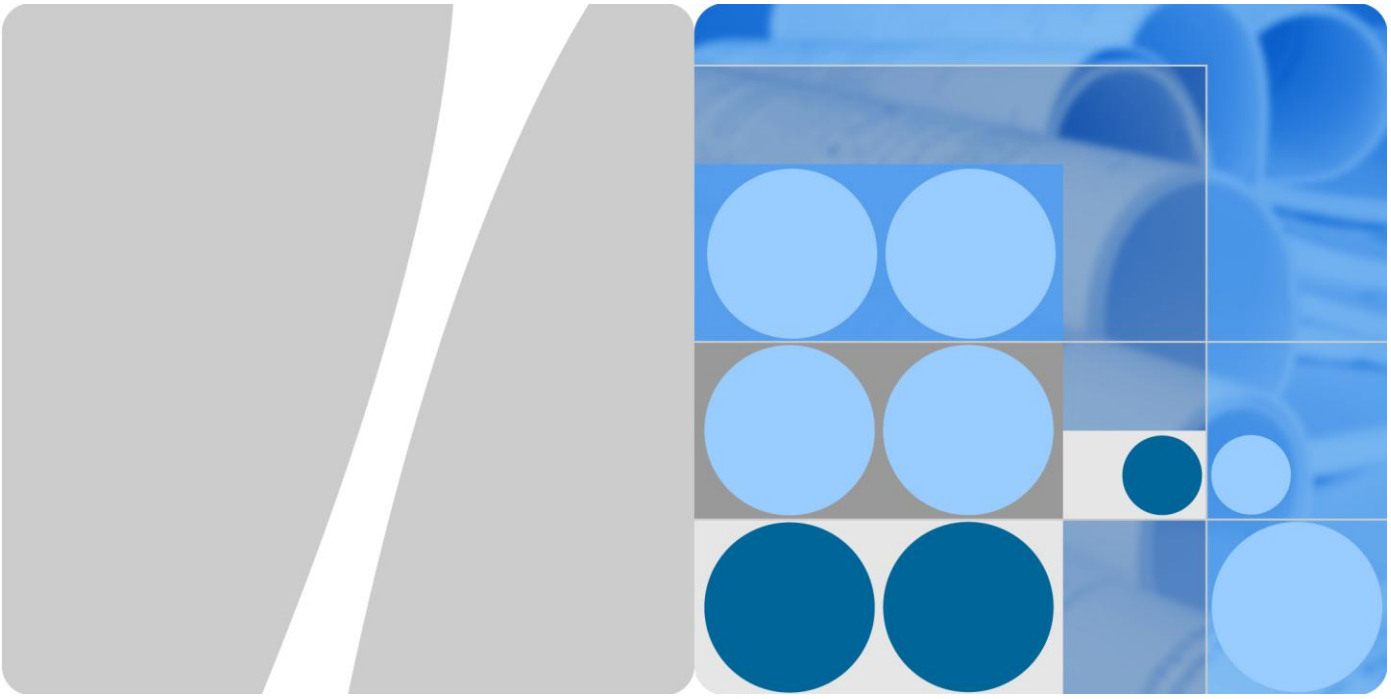
Product Description



HUAWEI E586 Mobile WiFi
V100R001

Issue 02

Date 2011-05-12

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About This Document

Summary

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

The following table lists the contents of this document.

Chapter	Describes
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 Technical Reference	The technical references of the product.
6 Packing List	The items contained in the package of the product.

History

Issue	Details	Date
01	First release.	2011-02-12
02	Update	2011-05-12

Contents

1 Overview

HUAWEI E586 Mobile WiFi (hereinafter referred to as the E586) is a high-speed packet access universal serial bus (USB) modem. It is a multi-mode wireless terminal for SOHO (Small Office and Home Office) and business professionals. To meet requirements from different markets, the E586 has three branch types, E586Bs-1, E586Bs-2, and E586Bs-6, within Huawei. The differences lie in their supported bands:

- E586Bs-1: HSPA+/HSPA/UMTS 2100MHz, EDGE/GPRS/GSM 1900/1800/900/850MHz
- E586Bs-2: HSPA+/HSPA/UMTS 2100/900MHz, EDGE/GPRS/GSM 1900/1800/900/850MHz
- E586Bs-6: HSPA+/HSPA/UMTS 2100/1900/850 MHz, EDGE/GPRS/GSM 1900/1800/900/850 MHz

The E586 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 E586 provides the following services:

- HSPA+ packet data service of up to 21 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 E586 with the USB interface of a computer, or connect the E586 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 E586 is fast, reliable, and easy to operate. Thus, mobile users can experience many new features and services with the E586. These features and services will enable a large number of users to use the E586 and the average revenue per user (ARPU) of operators will increase substantially.

Figure 1-1 shows the profile of the E586.

Figure 1-1 E586 profile

2 Features

2.1 Main Features

The E586 mainly supports the following features:

- HSPA+/HSPA/UMTS 2100/1900/900/850 MHz, EDGE/GPRS/GSM 1900/1800/900/850 MHz
- Equalizer
- HSPA+ (DL) data service of up to 21 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 and WPS
- Built-in DHCP Server, DNS RELAY and NAT
- Plug and play (PnP)
- Personal computer/Smart card (PC/SC) Driver
- USB Extension Cable, easy to connect
- OLED screen
- Standard Micro USB interface
- Built-in UMTS and WLAN high gain antenna
- Micro Secure Digital Memory (microSD) Card
- Windows XP, Windows Vista, Windows 7, MAC OS X 10.5, MAC OS X 10.6

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: HSPA+/HSPA/UMTS/EDGE/GPRS/GSM • WLAN: IEEE 802.11b/g/n	
Operating frequency	HSPA+/HSPA/UMTS	E586Bs-1: 2100MHz E586Bs-2: 2100/900MHz E586Bs-6: 2100/1900/850MHz
	EDGE/GPRS/GSM: 1900/1800/900/850MHz	
	WLAN: 2.401GHz–2.495GHz	
Internal memory	128MB Flash, 64MB Memory	
Maximum transmitter power	UMTS: ≥24 (+1/-3) dBm	
	WLAN (Battery mode)	802.11b: 7.5 (+/-3) dBm
		802.11g: 6.5 (+/-3) dBm
		802.11n: 6.5 (+/-3) dBm
	WLAN (Power adapter mode)	802.11b: 14 (+/-3) dBm
		802.11g: 11 (+/-3) dBm
		802.11n: 7 (+/-3) dBm
Receiver sensitivity	UMTS: -106dBm	
	WLAN 802.11b: -76dBm@11Mbps/-82dBm@1Mbps	
	WLAN 802.11g: -65dBm@54Mbps	
	WLAN 802.11n: -64dBm@65Mbps	
WLAN speed	802.11b: Up to 11Mbit/s	
	802.11g: Up to 54Mbit/s	
	802.11n: Support MCS0–MCS7; Up to 72.2Mbit/s.	
Maximum power consumption	3.5 W	
Power supply	• AC: 100V–240V • DC: 5V, 1A	

Item	Specifications
Battery	• Type: Li (Rechargeable) • Capacity: 3.7 V, 1500 mAh • Maximum working time: 5 hours • Maximum standby time: 280 hours while Wi-Fi is off; 40 hours while Wi-Fi is often on.
External interfaces	USB interface: Micro USB
	Standard microSD card interface
	SIM card: standard 6-pin SIM card interface
Display screen	OLED
key-press	Power switch, WPS switch, Reset switch
Antenna	• Built-in GSM/UMTS main diversity antenna • Built-in UMTS diversity antenna • Built-in WLAN antenna
Dimensions (D × W × H)	95.5mm×48.6mm×14.1mm
Weight	about 80g (including the battery)
Temperature	• Operating: –10℃ to +35℃ • Storage: –20℃ to +70℃
Humidity	5% to 95%

2.2.2 Software

Table 2-2 lists the software specifications.

Table 2-2 software specifications

Item	Description
SMS	• Writing/Sending/Receiving • Sending/Receiving extra-long messages • Storage: Up to 1000 messages can be saved in the internal memory of the E586. • Sorting • New message prompt

Item	Description
Network connection setup	• APN management: create, delete, edit, import, and export. • Set up network connection
WLAN setup	• SSID broadcasting and hiding • 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 • TKIP and AES integrated encryption algorithm • Automatic and manual adjustment of ratios • STA management • Wi-Fi enabling and disabling
Firewall setup	• Firewall Switch • LAN IP Filter • Virtual Server • DMZ Service • UPnP Service • WAN Ping block
DHCP setup	• DHCP server enabling and disabling • Address pool of the DHCP server setup • DHCP lease time setup
Software installation	Automatic installation (PNP)
Other	Network connection settings: • Automatic network selection and registration • Manual network selection and registration
	Network status display: signal, operator name, system mode, and so on.
	Selection of network connection types, for example: • 3G preferred • GPRS preferred
	PIN management: activate/deactivate PIN, PIN lock, changing PIN, unblocking by using the PUK.

Item	Description
System requirement	• Windows XP, Windows Vista, Windows 7 • Mac OS X 10.5, Mac OS X 10.6 • Your computer's hardware system should meet or exceed the recommended system requirements for the installed version of OS • Display resolution: 1024*768 or above

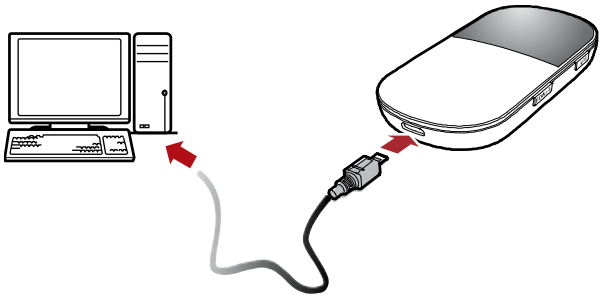
3 Services and Applications

3.1 Data Service

3.1.1 USB Modem

After you connect the E586 and PC with a USB data cable, the E586 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 E586 WEB page (or directly use the default settings) 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 3-1 One-device access via USB



3.1.2 Wireless Modem

The E586 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 E586.

A maximum of five wireless users can access the E586 at the same time. You can set up the WLAN with the access point (AP) function.

Figure 3-2 Multi-device access via Wi-Fi

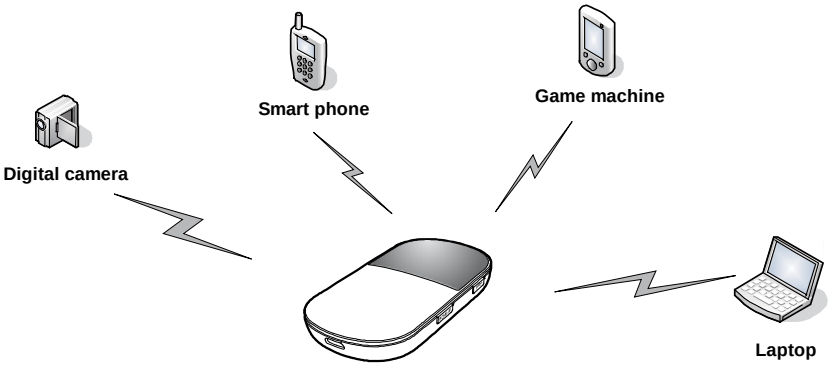
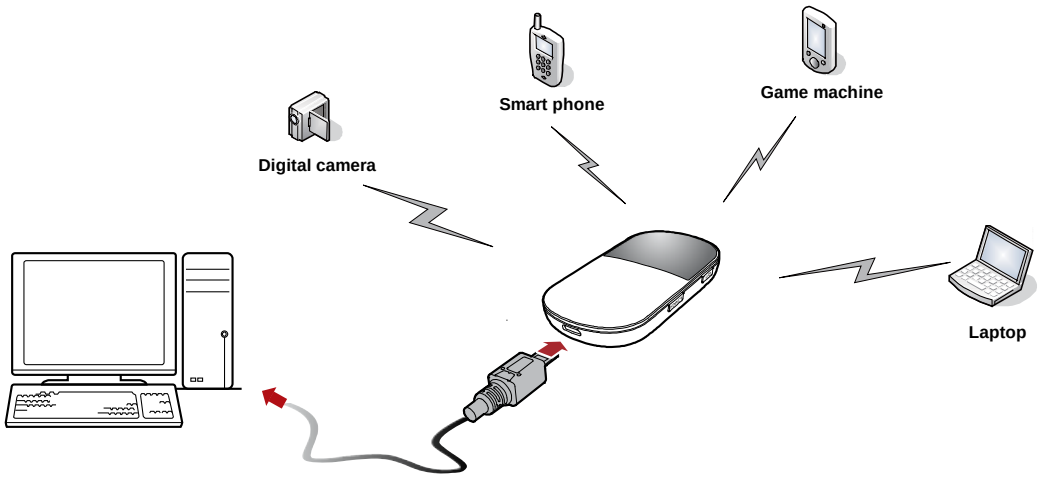


Figure 3-3 Multi-device access via Wi-Fi and USB at the same time



3.2 SMS

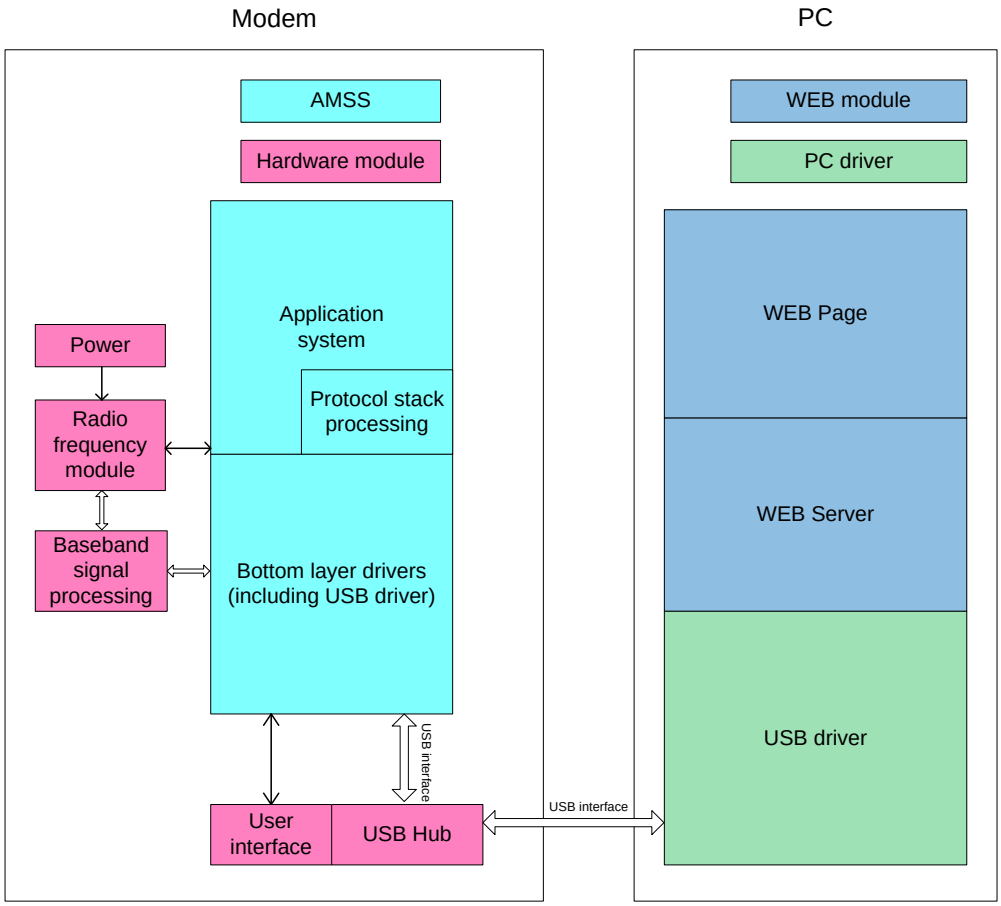
The E586 supports message writing/sending/receiving. You can manage messages through the WEB page, such as inbox, outbox, draft. You can also sort the messages by time.

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, OLED, microSD and SIM.
4. **Protocol Stack System**: It processes protocols of HSPA+/HSPA/UMTS/EDGE/GPRS/GSM.
5. **Application System**: It sends laptop commands to the bottom layer protocol for processing and returns the value to the laptop. Existing applications include the following:

- Message management
- CS/PS domain service management

6. **User Interface**: It provides interfaces to connect peripherals. Interfaces are for microSD and SIM.
7. **Application Management**: Through the application window, you can set the parameters of the E586 and operate the E586.

5 Technical Reference

5.1 DATACOM Products

Table 5-1 Standards and Communication Protocols of the DATACOM Products

Item	Description
Physical Layer	RFC894
PPP	RFC1915, RFC1962, RFC1994, RFC2433, RFC2759, RFC1332, RFC1877, RFC1471, RFC1570, RFC2484, RFC1717, RFC1934, RFC1990, RFC1334, RFC1974, RFC1661
ARP	RFC826
IP	RFC791, RFC1122, RFC1071, RFC1141, RFC1624, RFC792, RFC950, RFC1256
ICMP	RFC792, RFC950, RFC1256
TCP	RFC793
UDP	RFC768
DHCP	RFC1531, 1533
NAT	RFC1631

5.2 Wireless Um Interface

The wireless Um interface conforms to the UMTS R99, R4, R5, R6, R7 standards.

Table 5-2 Standards and Communication Protocols of the Wireless Um Interface

Item	Description
Layer1 Specifications (Physical)	Examples of Channel Coding and Multiplexing TR 25.944 (V3.3.0) Physical Layer – General Description TS 25.201 (V3.1.0) Physical Channels and Mapping of Transport Channels onto Physical Channels (FDD) TS 25.211 (V3.5.0) Multiplexing and Channel Coding (FDD) TS 25.212 (V3.5.0) Spreading and Modulation (FDD) TS 25.213 (V3.4.0) Physical Layer – Procedures (FDD) TS 25.214 (V3.5.0) Physical Layer – Measurements (FDD) TS 25.215 (V3.5.0)
Layer 2 Specifications (MAC/RLC)	MAC Protocol Specification TS 25.321 (V3.6.0) RLC Protocol Specification TS 25.322 (V3.5.0)
Layer 3 Specifications (RRC)	UE Interlayer Procedures in Connected Mode TS 25.303 (V3.6.0) UE Procedures in Idle Mode TS 25.304 (V3.5.0) RRC Protocol Specification TS 25.331 (V3.5.0)
Layer 3 NAS/Core Network (MCM)	Architectural Requirements for Release 1999 TS 23.121 (V3.5.1) NAS Functions Related to Mobile Station (MS) in Idle Mode TS 23.122 (V3.5.0) Mobile Radio Interface Signaling Layer 3 – General Aspects TS 24.007 (V3.6.0) Mobile Radio Interface Layer 3 Specification – Core Network TS 24.008 (V3.6.0) PP SMS Support on Mobile Radio Interface TS24.011 (V3.5.0)
GSM Protocol Specifications	Mobile Radio Interface Layer 3 Specification, Radio Resource Control Protocol TS 04.18 (V8.10.0) Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) Layer Specification TS 04.06 (V8.11.0) Digital Cellular Telecommunications System (Phase 2+); Multiplexing and Multiple Access on the Radio Path TS 05.02 (V8.9.0) Technical Specification Group GERAN; Channel coding TS 05.03 (V8.6.1) Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Link Control TS 05.08 (V8.a.0) Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Synchronization TS 05.10 (V8.8.0)

Item	Description
GPRS Protocol Specifications	Overall Description of the GPRS Radio Interface; stage 2 TS 3.64 (V8.8.0) Mobile Radio Interface Layer 3 Specification TS 04.08 (V8.0.0) Mobile Radio Interface Layer 3 Specification: Radio Resource Control Protocol TS 04.18 (V8.10.0) General Packet Radio Service (GPRS): Mobile Station (MS) – Base Station System (BSS) interface; Radio Link Control / Medium Access Control (RLC/MAC) protocol TS 04.60 (V8.10.0) Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification TS 04.64 (V8.6.0) Mobile Station - Serving GPRS Support Node (MS-SGSN); Subnetwork Dependent Convergence Protocol (SNDCP) TS 04.65 (V8.1.0) Multiplexing and Multiple Access on the Radio Path TS 05.02 (V8.9.0) Channel Coding TS 05.03 (V8.6.1) Modulation TS 05.04 (V8.3.0) Radio Transmission and Reception TS 05.05 (V8.10.0) General Packet Radio Service (GPRS); Stage 1 TS 22.060 (V3.5.0) Mobile Execution Environment (MexE) TS 23.057 (V3.4.0) General Packet Radio Service (GPRS) Service description; stage 2 TS 23.060 (V8.8.0)
General Specifications	UE Capability Requirements TR 21.904 (V3.3.0) UE Radio Access Capabilities TR 25.926 (V3.2.0) Vocabulary TR 25.990 (V3.0.0) Radio Interface Protocol Architecture TS 25.301 (V3.6.0) Services Provided by the Physical Layer TS 25.302 (V3.7.0) Synchronization in UTRAN Stage 2 TS 25.402 (V3.4.0
Performance/Test Specifications	UE Radio Transmission and Reception (FDD) TS 25.101 (V3.5.0) Common Test Environments for User Equipment (UE) TS 34.108 (V3.2.0) Special Conformance Testing Functions TS 34.109 (V3.2.0) Terminal Conformance Specification TS 34.121 (V3.3.0) User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance TS 34.123-1 (V3.2.0) User Equipment (UE) Conformance Specification; Part 2: Protocol Conformance TS 34.123-2 (V3.2.0)

Item	Description
Performance/Test Specifications	Terminal Conformance Specification, Radio Transmission and Reception (FDD) TS 34.121 (V3.3.0) User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance TS 34.123-1 (V3.2.0) S48 User Equipment (UE) Conformance Specification; Part 2: Implementation Conformance Statement (ICS) Specification TS 34.123-2 (V3.2.0)
USIM Specifications	SIM and IC Card Requirements TS 21.111 (V3.3.0) 3rd Gen. Partnership Proj Tech. Spec. Group Terminals; SIM App. Toolkit (USAT) TS 31.111 (V3.3.0)

6 Packing List

This chapter describes the items contained in the package of the E586.

Table 6-1 lists the items contained in the package of the E586.

Table 6-1 Packing list of the E586

Item	Quantity	Remarks
Mobile WiFi	1	Standard
Rechargeable battery (1500mAh)	1	Standard
USB cable	1	Standard
Power adapter	1	Standard
Quick Start	1	Standard
Safety Information	1	Standard
Warranty card	1	Optional
Rechargeable battery (2600mAh)	1	Optional
Cradle	1	Optional

A Acronyms and Abbreviations

3G	The Third Generation
3GPP	3rd Generation Partnership Project
APN	Access Point Name
ARPU	Average Revenue Per User
BSS	Base Station Subsystem
CM	Connection Management
CS domain	Circuit Switched domain
EDGE	Enhanced Data Rates for GSM Evolution
EGPRS	Enhanced GPRS
FDD	Frequency Division Duplex
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HSUPA	High Speed Uplink Packet Access
HSDPA	High Speed Downlink Packet Access
IC	Integrated Circuit
LED	Light Emitting Diode
MAC	Medium Access Control
MexE	Mobile Execution Environment
MM	Mobility Management
Modem	Modulator Demodulator
MS	Mobile Station
MSC	Mobile Switching Center

NAS	Non-Access Stratum
OS	Operating System
PC/SC	Personal Computer/Smart Card
PIN	Personal Identification Number
PnP	Plug and Play
PP	Point-to-Point
PS domain	Packet Switched domain
PUK	PIN Unblocking Key
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
SOSH	Small Office and Home Office
TR	Technical Report
TS	Technical Specification
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
USAT	USIM Application Toolkit
USB	Universal Serial Bus
USIM	UMTS Subscriber Identity Module
USSD	Unstructured Supplementary Service Data
UTRAN	UMTS Terrestrial Radio Access Network
WCDMA	Wideband Code Division Multiple Access