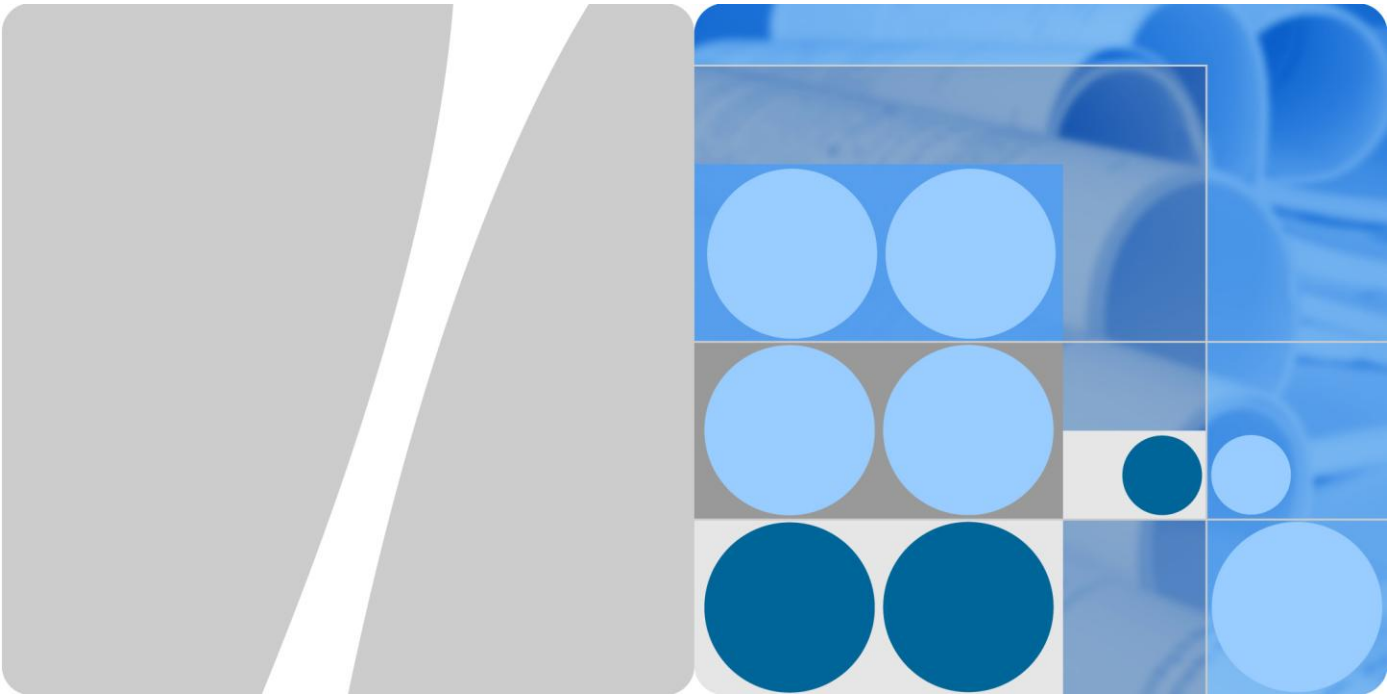
Product Description



HUAWEI E173 HSPA USB Stick
V100R001

Issue 01

Date 2010-03-10

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: support@huawei.com

About This Document

Summary

This document provides information about the major functions, supported services, system architecture, and technical references of HUAWEI E173 HSPA USB Stick (hereinafter referred to as the E173).

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 E173.
2 Features	The supported features and technical specifications of the E173.
3 Services and Applications	The services and applications of the E173.
4 System Architecture	The architecture of the E173.
5 Technical Reference	The technical references of the E173.
6 Packing List	The items contained in the package of the E173.
A Acronyms and Abbreviations	The acronyms and abbreviations mentioned in this document.

History

Issue	Details	Date	Author	Approved by
01	Initial draft completed.	2010-03-10	Wang zhiyong 66144	He jinjun 42931

Contents

1 Overview

HUAWEI E173 HSPA USB Stick (hereinafter referred to as the E173) is a high-speed packet access (HSPA) universal serial bus (USB) stick. It is a multi-mode wireless terminal.

The E173 supports the following standards:

- 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 E173 provides the following services:

- HSUPA/HSDPA/UMTS packet data service
- EDGE/GPRS packet data service
- WCDMA/GSM Short Message Service (SMS)

You can connect the E173 with the USB interface of a PC.

In the service area of the HSUPA/HSDPA/UMTS/EDGE/GPRS/GSM network, you can browse the Internet, send/receive messages/emails without wire connections. The E173 is fast, reliable, and easy to operate. Thus, mobile users can enjoy many new features and services with the E173. These features and services can enable a large number of users to use the E173 and increase the Average Revenue Per User (ARPU) of operators substantially.

Figure 1-1 shows the profile of the E173.

Figure 1-1 E173 profile

NOTE

This is a sketch for E173. The actual product may differ.

2 Features

2.1 Features

The E173 supports the following features:

- HSUPA/HSDPA/UMTS 2100 MHz or 2100/900MHz or 2100/1900/850MHz and EDGE/GPRS/GSM 1900/1800/900/850 MHz
- HSPA equalizer
- Receive diversity (optional)
- HSUPA data service of up to 2 Mbit/s
- HSDPA data service of up to 7.2 Mbit/s
- UMTS PS domain data service of up to 384 kbit/s
- EDGE packet data service of up to 236.8 kbit/s
- GPRS packet data service of up to 85.6 kbit/s
- SMS based on CS/Packet Switched (PS) domain of GSM and WCDMA
- Plug and Play (PnP)
- Unstructured Supplementary Service Data (USSD)
- Network Driver Interface Specification (NDIS)/Modem driver
- Standard USB interface (Type A)
- Micro Secure Digital Memory (Micro SD) Card
- Windows 7/ Windows 2000/ XP/ Vista, Mac OS and Linux

2.2 Technical Specifications

2.2.1 Hardware

Table 2-1 lists the hardware specifications.

Table 2-1 Hardware specifications

Item	Specifications
Technical standard	• HSUPA R6 • WCDMA/HSDPA R5 • GSM/GPRS/EDGE R99
Operating frequency	HSUPA/HSDPA/UMTS 2100 MHz: • Uplink: 1920–1980 MHz • Downlink: 2110–2170 MHz HSUPA/HSDPA/UMTS 1900 MHz: • Uplink: 1850–1910 MHz • Downlink: 1930–1990 MHz HSUPA/HSDPA/UMTS 900 MHz: Uplink: 880MHz~915MHz Downlink: 925MHz~960MHz HSUPA/HSDPA/UMTS 850 MHz: • Uplink: 824–849 MHz • Downlink: 869–894 MHz EDGE/GPRS/GSM 1900 MHz: • Uplink: 1850–1910 MHz • Downlink: 1930–1990 MHz EDGE/GPRS/GSM 1800 MHz: • Uplink: 1710–1785 MHz • Downlink: 1805–1880 MHz EDGE/GPRS/GSM 900 MHz: • Uplink: 880–915 MHz • Downlink: 925–960 MHz EDGE/GPRS/GSM 850MHz • Uplink: 824–849 MHz • Downlink: 869–894 MHz
External interfaces	USB interface: supporting USB 2.0 high speed
	Standard micro SD card interface
	SIM/USIM card: standard 6-pin SIM card interface
Maximum transmitter power	HSUPA/HSDPA/UMTS 2100 MHz or 2100/900MHZ or 2100/1900/850 MHz: +24 dBm (Power Class 3)
	GSM/GPRS 850/900 MHz: +33 dBm (Power Class 4)
	GSM/GPRS 1800 MHz/1900 MHz: +30 dBm (Power Class 1)
	EDGE 850/900MHz: +27 dBm (Power Class E2)
	EDGE 1800MHz/1900MHz: +26 dBm (Power Class E2)

Item	Specifications
Static receiver sensitivity	HSUPA/HSDPA/UMTS 2100 MHz or 2100/900MHz or 2100/1900/850M: compliant with 3GPP TS 25.101 (R6)
	EDGE/GPRS/GSM 850/900/1800/1900 MHz: compliant with 3GPP TS 05.05 (R99)
Whole-system consumption	≤2.5W
Power supply	5V/500mA
LED	Indicates the status of the E173
Dimensions (D × W × H)	71 mm×26 mm×12.5 mm
Weight	<40g
Temperature	• Operating: –10℃to +45℃ • Storage: –20℃to +70℃
Humidity	5% to 95%
Notes: 3GPP = The 3rd Generation Partnership Project LED = light-emitting diode SIM = subscriber identity module TS = technical specification USIM = UMTS subscriber identity module	

2.2.2 Dashboard

Table 2-2 lists the dashboard specifications.

Table 2-2 Dashboard specifications

Item	Description
SMS	Writing/Sending/Receiving messages
	Sending/Receiving extra-long messages
	Group sending
	Storage: The messages are saved in the hard disk of the PC.
	Sorting
	Importing: You can import messages from the SIM/USIM card to a laptop.
	New message prompt (visual prompt/audio prompt)

Item	Description
Flow display and statistics (data services)	Current connection: • Duration • Send/Receive flow • Send/Receive rate
	Traffic statistics: You can view the traffic information of a current day, month, or year.
Phonebook	Capacity: It depends on the SIM/USIM card capacity or the hard disk space.
	Messages can be sent from the phonebook.
	Importing/Exporting: Import/Export contacts between the SIM/USIM card and a laptop or a file of supported formats.
Network connection setup	• APN management: Create, delete, edit, import, and export APNs. • Setting up network connection.
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, and system mode.
	Selection of network connection types, for example: • 3G preferred • GPRS preferred
	PIN management: Activate/Deactivate PIN, PIN lock, change PIN, and unblock PIN by the PUK.
System requirement	• Windows 7, Windows 2000 SP4, Windows XP SP3, Windows Vista SP2 • Mac OS X 10.4, 10.5 and 10.6 with latest upgrades • Linux 2.6.18 or later • Your computer's hardware system should meet or exceed the recommended system requirements for the installed version of OS • Display resolution: 800 × 600 or above
Notes: APN = Access point name PIN = Personal identification number PUK = PIN unblocking key	

3 Services and Applications

3.1 Packet Data Service

The E173 supports the PS domain data service based on HSUPA/HSDPA/UMTS /EDGE/GPRS.

After you connect the E173 to a PC with a USB interface, the E173 driver and the client software are installed on the PC automatically. You can configure APN through the E173 application (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.

To use the data service, perform the following steps:

1. Enter ***99#** or ***98#** to launch the packet data service.
2. In the **Choose Connection Type** dropdown box, choose a network type, for example: 3G preferred, GPRS preferred.

3.2 SMS

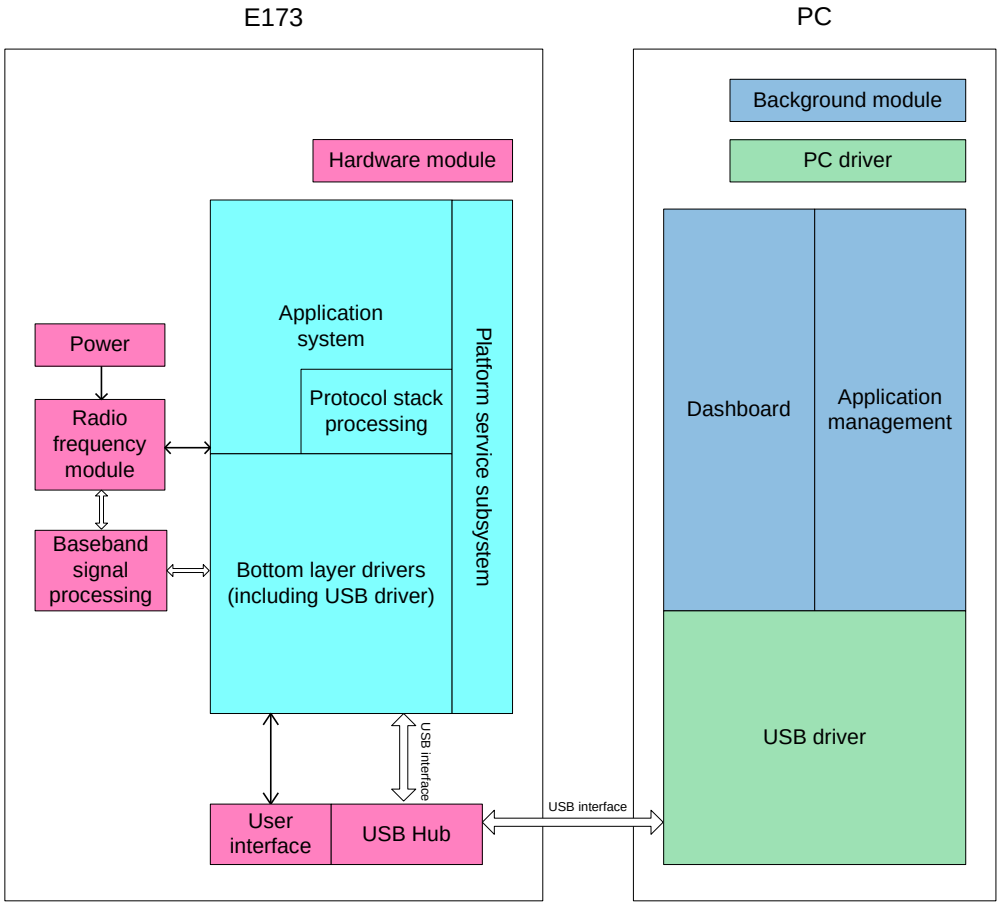
The E173 supports message writing/sending/receiving and group sending (up to 20 contacts at a time). You can manage messages through the dashboard, such as sorting the messages by telephone number or time. You can also import/export messages between the SIM/USIM card and a laptop.

4 System Architecture

4.1 System Architecture

Figure 4-1 shows the system architecture.

Figure 4-1 System architecture



4.2 Functional Modules

Radio Frequency Module

It sends/receives radio signals and modulates/demodulates the radio frequency (RF) signals and baseband signals.

Baseband Signal Processing

It implements the digital processing of HSUPA/HSDPA/WCDMA/EDGE/GPRS/GSM baseband signals, including:

- Modulating/Demodulating WCDMA/HSDPA/HSUPA baseband signals
- Modulating/Demodulating GSM/GPRS/EDGE baseband signals
- Encoding/Decoding WCDMA/HSDPA/HSUPA channels
- Encoding/Decoding GSM/GPRS/EDGE channels

Bottom Layer Driver

The bottom layer drivers include drivers of the radio frequency (RF) module, FLASH, and all the peripherals such as the SIM card, USB device, NDIS device. The USB device driver is the bottom layer software at the PC side. It is used to implement functions such as the interaction between the background software and the SIM card, auto-setup, and NDIS driving.

Platform Service Subsystem

It initializes programs, diagnoses, downloads data and serves as a watchdog.

Protocol Stack System

It processes the HSUPA /HSDPA/UMTS/EDGE/GPRS/GSM Layer 2 and Layer 3 protocols.

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:

- Call management
- Message management
- CS/PS domain service management

User Interface

It provides interfaces to connect peripherals. Interfaces are for Micro SD, USB interface, LED and SIM/USIM.

Application Management

It includes management of the following dashboards:

- Testing dashboard

- Maintaining dashboard
- Assembling/manufacturing dashboard

Dashboard

It enables the PC side to display initiating or answering a call and send/receive messages. It provides the interface for CS/PS domain network accessing and periodically refreshes the interface of the current USB stick status. The interface is provided to the end users.

5 Technical Reference

5.1 Layer 1 Specifications (Physical)

- Examples of Channel Coding and Multiplexing TR 25.944
- Physical Layer–General Description TS 25.201
- Physical Channels and Mapping of Transport Channels onto Physical Channels (FDD) TS 25.211
- Multiplexing and Channel Coding (FDD) TS 25.212
- Spreading and Modulation (FDD) TS 25.213
- Physical Layer–Procedures (FDD) TS 25.214
- Physical Layer–Measurements (FDD) TS 25.215
- 3GPP HSDPA overall description 25.308
- 3GPP UE radio access capabilities 25.306

5.2 Layer 2 Specifications (MAC/RLC)

- MAC Protocol Specification TS 25.321
- RLC Protocol Specification TS 25.322

5.3 Layer 3 Specifications (RRC)

- UE Interlayer Procedures in Connected Mode TS 25.303
- UE Procedures in Idle Mode TS 25.304
- RRC Protocol Specification TS 25.331

5.4 Layer 3 NAS/Core Network (MM/CM)

- Architectural Requirements for Release 1999 TS 23.121
- NAS Functions Related to Mobile Station (MS) in Idle Mode TS 23.122
- Mobile Radio Interface Signaling Layer 3–General Aspects TS 24.007

- Mobile Radio Interface Layer 3 Specification–Core Network TS 24.008
- PP SMS Support on Mobile Radio Interface TS24.011

5.5 GSM Protocol Specifications

- Mobile Radio Interface Layer 3 Specification, Radio Resource Control Protocol TS 04.18
- Mobile Station–Base Station System (MS–BSS) interface; Data Link (DL) Layer Specification TS 04.06
- Digital Cellular Telecommunications System (Phase 2+); Multiplexing and Multiple Access on the Radio Path TS 05.02
- Technical Specification Group GERAN; Channel coding TS 05.03
- Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Link Control TS 05.08
- Digital Cellular Telecommunications System (Phase 2+); Radio Subsystem Synchronization TS 05.10

5.6 GPRS Protocol Specifications

- Overall Description of the GPRS Radio Interface; stage 2 TS 3.64
- Mobile Radio Interface Layer 3 Specification TS 04.08
- Mobile Radio Interface Layer 3 Specification: Radio Resource Control Protocol TS 04.18
- 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
- Mobile Station–Serving GPRS Support Node (MS–SGSN) Logical Link Control (LLC) Layer Specification TS 04.64
- Mobile Station–Serving GPRS Support Node (MS–SGSN); Subnetwork Dependent Convergence Protocol (SNDCP) TS 04.65
- Multiplexing and Multiple Access on the Radio Path TS 05.02
- Channel Coding TS 05.03
- Modulation TS 05.04
- Radio Transmission and Reception TS 05.05
- General Packet Radio Service (GPRS); Stage 1 TS 22.060
- Mobile Execution Environment (MexE) TS 23.057
- General Packet Radio Service (GPRS) Service description; stage 2 TS 23.060

5.7 General Specifications

- UE Capability Requirements TR 21.904
- UE Radio Access Capabilities TR 25.926
- Vocabulary TR 25.990

- Radio Interface Protocol Architecture TS 25.301
- Services Provided by the Physical Layer TS 25.302
- Synchronization in UTRAN Stage 2 TS 25.402

5.8 Performance/Test Specifications

- UE Radio Transmission and Reception (FDD) TS 25.101
- Common Test Environments for User Equipment (UE) TS 34.108
- Special Conformance Testing Functions TS 34.109
- Terminal Conformance Specification TS 34.121
- User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance TS 34.123-1
- User Equipment (UE) Conformance Specification; Part 2: Protocol Conformance TS 34.123-2

5.9 SIM Specifications

- SIM and IC Card Requirements TS 21.111
- 3rd Gen. Partnership Proj Tech. Spec. Group Terminals; SIM App. Toolkit (USAT) TS 31.111

6 Packing List

Table 6-1 lists the items contained in the package of the E173.

Table 6-1 Packing list of the E173

Item	Quantity	Remarks
HUAWEI E173 HSPA USB Stick	1	Standard
HUAWEI E173 HSPA USB Stick Quick Start	1	Standard
USB Extension Cable	1	Optional
MicroSD card	1	Optional

A Acronyms and Abbreviations

Numerics	
3G	The Third Generation
3GPP	3rd Generation Partnership Project
A	
AMR	Adaptive Multirate Codec
ARPU	Average Revenue Per User
C	
CS	Circuit Switched Domain
D	
DL	Down Link
E	
EDGE	Enhanced Data Rates for GSM Evolution
EGPRS	Enhanced GPRS
G	
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
H	
HSDPA	High Speed Downlink Packet Access
L	
LED	Light-emitting Diode
P	
PC/SC	Personal computer/Smart card
PIN	Personal Identification Number

PS	Packet Switched Domain
PUK	PIN Unblocking Key
S	
SMS	Short Message Service
U	
USB	Universal Serial Bus
USIM	UMTS Subscriber Identity Module
UL	Up Link
USB	Universal Serial Bus
W	
WCDMA	Wideband Code Division Multiple Access