



Product Description

HUAWEI E156G HSDPA USB Stick

V100R001

Issue:- 01

Date:- 2008-09-26

Bit of a techie?

Here's the full spec doc from the manufacturer.
It's got every little detail you could want to know
about this particular product.
The features, services, technical reference and
other bits and bobs.

Enjoy.



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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

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About This Document

Summary

This document provides information about the major functions, supported services, system architecture, and technical references of HUAWEI E156G HSDPA USB Stick (hereinafter referred to as the E156G).

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 E156G. |
| 2 Features | The supported features and technical specifications of the E156G. |
| 3 Services and Applications | The services and applications of the E156G. |
| 4 System Architecture | The architecture of the E156G. |
| 5 Technical Reference | The technical references of the E156G. |
| 6 Packing List | The items contained in the package of the E156G. |
| A Acronyms and Abbreviations | The acronyms and abbreviations mentioned in this document. |



History

| Issue | Details | Date |
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| 01 | Initial draft completed. | 2008-09-26 |
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1 Overview

HUAWEI E156G HSDPA USB Stick (hereinafter referred to as the E156G) is a high-speed downlink packet access (HSDPA) universal serial bus (USB) modem. It is a multi-mode wireless terminal for business professionals.

The E156G supports the following standards:

- 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 E156G provides the following services:

- HSDPA/UMTS packet data service of up to 3.6 Mbps
- EDGE/GPRS packet data service of up to 236.8 kbps
- WCDMA/GSM Short Message Service (SMS)

You can connect the E156G with the USB interface of a computer. In the service area of the HSDPA/UMTS/EDGE/GPRS/GSM network, you can surf the Internet and send/receive messages/emails cordlessly. The E156G is fast, reliable, and easy to operate. Thus, mobile users can experience many new features and services with the E156G. These features and services will enable a large number of users to use the E156G and the average revenue per user (ARPU) of operators will increase substantially.

Figure 1-1 shows the profile of the E156G.

Figure 1-1 E156G profile



2 Features

2.1 Main Features

The E156G mainly supports the following features:

- HSDPA/UMTS 2100 MHz, GSM/GPRS/EDGE 850/900/1800/1900 MHz
- HSDPA Equalizer and receive diversity
- HSDPA data service of up to 3.6 Mbps
- UMTS PS domain data service of up to 384 kbps
- EDGE packet data service of up to 236.8 kbps
- GPRS packet data service of up to 85.6 kbps
- CS domain data service based on UMTS and GSM
- SMS based on CS/PS domain of GSM and WCDMA
- Plug and play (PnP)
- USSD
- EAP-SIM
- Personal computer/Smart card (PC/SC) Driver
- USB Extension Cable, easy to connect
- Standard USB interface (Type A)
- External antenna
- Micro Secure Digital Memory (Micro SD) Card
- Windows 2000/ Windows XP/ Windows Vista/ MAC operating system (OS)

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"> • WCDMA/HSDPA R5 • GSM/GPRS/EDGE R99 |
| Operating frequency | HSDPA/UMTS 2100 MHz: <ul style="list-style-type: none"> • Uplink: 1920–1980 MHz • Downlink: 2110–2170 MHz EDGE/GPRS/GSM 1900 MHz: <ul style="list-style-type: none"> • Uplink: 1850–1910 MHz • Downlink: 1930–1990 MHz EDGE/GPRS/GSM 1800 MHz: <ul style="list-style-type: none"> • Uplink: 1710–1785 MHz • Downlink: 1805–1880 MHz EDGE/GPRS/GSM 900 MHz: <ul style="list-style-type: none"> • Uplink: 880–915 MHz • Downlink: 925–960 MHz EDGE/GPRS/GSM 850 MHz: <ul style="list-style-type: none"> • Uplink: 824–849 MHz • Downlink: 869–894 MHz |
| External interfaces | USB interface: supporting USB 2.0 high speed |
| | External antenna interface |
| | standard micro SD card interface |
| | SIM/USIM card: standard 6-pin SIM card interface |
| Maximum transmitter power | HSDPA/UMTS 2100 MHz: +24dBm (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) |
| Static receiver | HSDPA/UMTS 2100 MHz: compliant with 3GPP TS 25.101 (R5) |

| Item | Specifications |
|--|--|
| sensitivity | EDGE/GPRS/GSM 850/900/1800/1900 MHz: compliant with 3GPP TS 05.05 (R99) |
| Maximum power consumption | ≤ 2.5 W |
| Power supply | 5 V/500 mA |
| LED | indicating the status of the E156G |
| Dimensions (D × W × H) | 70.15 mm × 25.64 mm × 11.60 mm |
| Weight | <40g |
| Temperature | <ul style="list-style-type: none"> • Operating: -10°C to +45°C • Storage: -20°C to +70°C |
| 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 |
| | 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: <ul style="list-style-type: none"> • Duration • Send/Receive flow • Send/Receive rate |
| | Traffic statistics: You can view the traffic information of the day, the month, or the 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 | <ul style="list-style-type: none"> • APN management: create, delete, edit, import, and export. • Set up network connection. |
| Software installation | Automatic installation (PNP) |
| Other | Network connection settings: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 3G preferred • GPRS preferred |
| | PIN management: activate/deactivate PIN, PIN lock, changing PIN, unblocking by using the PUK. |
| System requirement | <ul style="list-style-type: none"> • Windows 2000 SP4, Windows XP SP2, Windows Vista • Mac OS X 10.4 and 10.5 with latest upgrades • 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: PIN = personal identification number PUK = PIN unblocking key | |

3 Services and Applications

3.1 Packet Data Service

The E156G supports the PS domain data service based on HSDPA/UMTS /EDGE/GPRS

After you connect the E156G to a PC with a USB interface, the E156G driver and the client software are installed on the PC automatically. You can configure APN through the E156G 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

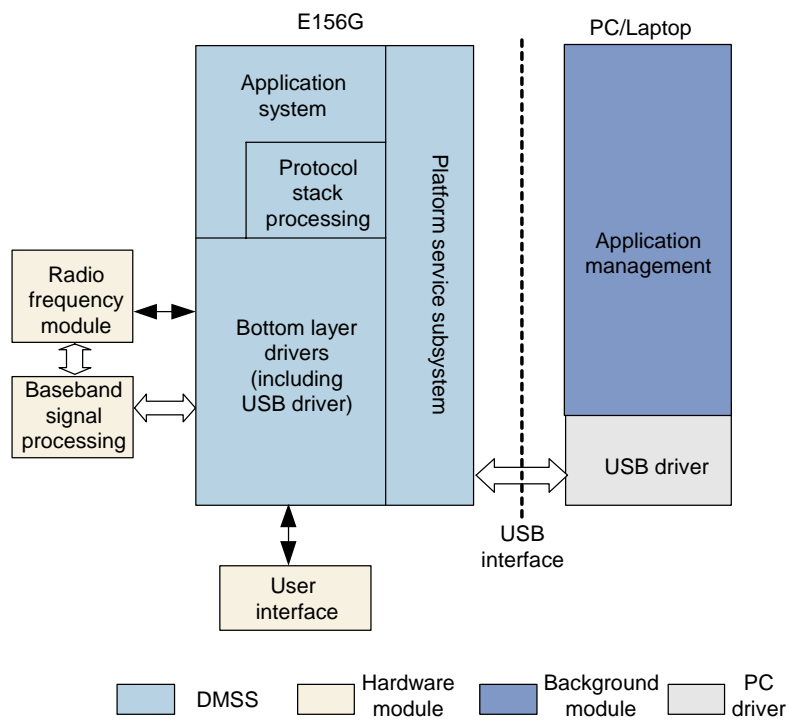
The E156G supports message writing/sending/receiving and group sending (up to 20 contacts at a time). You can manage messages through the dashboard, such as sorting the messages by telephone number or time. You can also import/export messages between the SIM/USIM card and a laptop.

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 processes HSDPA/UMTS/EDGE/GPRS/GSM baseband digital signals, including:

- Modulating/Demodulating HSDPA/UMTS baseband signals
- Modulating/Demodulating EDGE/GPRS/GSM baseband signals
- Encoding/Decoding HSDPA/UMTS channel
- Encoding/Decoding EDGE/GPRS/GSM channel

Bottom Layer Driver

It drives peripherals, including USB, LED, and SIM/USIM.

Platform Service Subsystem

It initializes programs, diagnoses the running of the system, downloads data and serves as a watchdog.

Protocol Stack System

It processes protocols of HSDPA/UMTS/EDGE/GPRS/GSM.

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 LED and SIM/USIM.

Application Management

Through the application window, you can set the parameters of the E156G and operate the E156G.

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 (SNDP) 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

This chapter describes the items contained in the package of the E156G.

Table 6-1 lists the items contained in the package of the E156G.

Table 6-1 Packing list of the E156G

| Item | Quantity | Remarks |
|--|----------|----------|
| HUAWEI E156G HSDPA USB Stick | 1 | Standard |
| USB Extension Cable | 1 | Standard |
| HUAWEI E156G HSDPA USB Stick Quick Start | 1 | Standard |
| Micro SD Card | 1 | Optional |
| External Antenna | 1 | Optional |

Note:

- Only the external antenna dedicated for Huawei devices can be used on the E156G.
- The external antenna is wrapped separately.
- When an external antenna is required, you need to purchase.

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 |
| FDD | Frequency Division Duplex |
| GERAN | GSM/EDGE Radio Access Network |
| GPRS | General Packet Radio Service |
| GSM | Global System for Mobile Communications |
| 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 |
| 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 |
| 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 |
| UTRAN | UMTS Terrestrial Radio Access Network |
| WCDMA | Wideband Code Division Multiple Access |