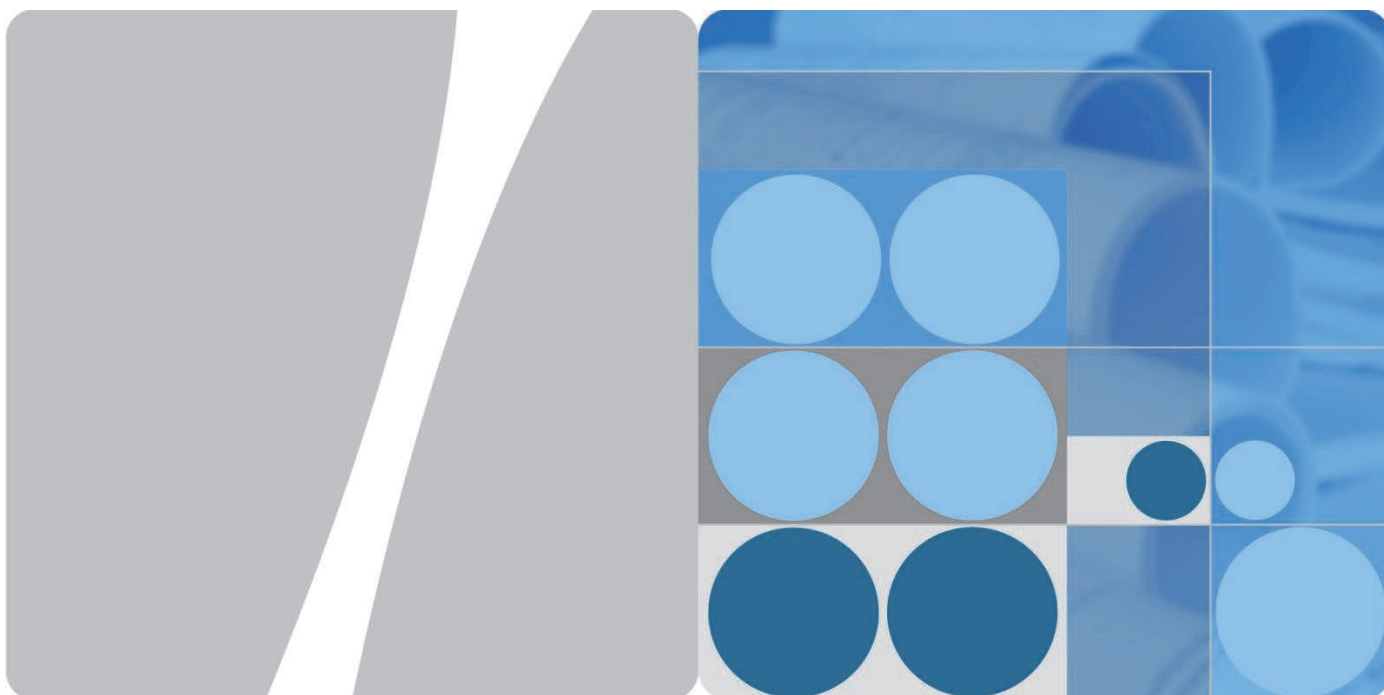


Product Description



MS2372h-158 LTE USB Stick
V100R001

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About This Document

Summary

This document provides information about the major functions, supported services, system architecture, and technical references of MS2372h-158 LTE USB Stick (hereinafter referred to as the MS2372h-158).

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 MS2372h-158.
2 Features	The supported features and technical specifications of the MS2372h-158.
3 Services and Applications	The services and applications of the MS2372h-158.
4 System Architecture	The architecture of the MS2372h-158.
5 Technical Reference	The technical references of the MS2372h-158.
6 Packing List	The items contained in the package of the MS2372h-158.
A Acronyms and Abbreviations	The acronyms and abbreviations mentioned in this document.

History

Issue	Details	Date
01	Initial draft completed.	2020-02-27

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1 Overview

MS2372h-158 LTE USB Stick (hereinafter referred to as the MS2372h-158) is a new generation M2M product . It enables high-speed wireless access various network mode.

The MS2372h-158 supports the following standards:

- Long Term Evolution (LTE) Frequency Division Duplex (FDD)
- Dual Cell 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 MS2372h-158 provides the following services:

- LTE FDD packet data service
- DC-HSPA+ packet data service
- HSPA+ packet data service
- HSDPA packet data service
- HSUPA packet data service
- UMTS packet data service
- EDGE/GPRS packet data service

In the service area of the LTE/DC-HSPA+/HSPA+/UMTS/EDGE/GPRS/GSM network via MS2372h-158, you can perform data transmission, voice and online upgrade.

Figure 1-1 shows the profile of the MS2372h-158.

Figure 1-1 MS2372h-158 profile



2 Features

2.1 Main Features

The MS2372h-158 mainly supports the following features:

- LTE (DL) data service of up to 150 Mbit/s
- DC-HSPA+ (DL) data service of up to 43.2 Mbit/s
- HSPA+ (DL) data service of up to 21.6 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
- Built-in 2G/3G/4G antenna
- Built-in 3G/4G diversity antenna
- Support USSD
- Standard USB interface(Type A)
- Online software upgrade
- LTE 2*2 MIMO

2.2 Technical Specifications

2.2.1 Hardware

Table 2-1 lists the hardware specifications.

Table 2-1 Hardware specifications

Item	Specifications
Technical standard	LTE/DC-HSPA+/ HSPA+/HSDPA/HSUPA/WCDMA/ GSM/GPRS/EGRPS
Operating frequency	LTE FDD: B1/B3/B7/B8/B20 UMTS: Band1(2100MHz)/Band8(900MHz) GSM/GPRS/EGRPS: 850/900/1800/1900Mhz
External interfaces	USB interface: supporting USB 2.0 high speed
	SIM/USIM card: standard 6-pin SIM card interface
	TS-5 External antenna interface:2
Internal memory	1Gbits DDRROM: 1Gbits NAND Flash
Maximum transmitter power	LTE:P +23dBm (Power Class 3)
	WCDMA/HSPA+: +24dBm (Power Class 3)
	GSM/GPRS 850M/900MHZ: +33dBm (Power Class 4)
	GSM/GPRS 1800MHZ/1900MHZ: +30dBm (Power Class 1)
	EDGE 850M/900MHZ: +27dBm (Power Class E2)
	EDGE 1800MHZ/1900MHZ: +26dBm (Power Class E2)
Static receiver sensitivity	LTE: Compliant with 3GPP TS 36.101(R10)
	WCDMA/HSPA/HSPA+: Compliant with 3GPP TS 25.101(R8)
	GSM/GPRS/EDGE: Compliant with 3GPP TS 34.121
Maximum power consumption	5V/750mA
LED	indicating the status of the MS2372h-158
Antenna	Built-in 2G/3G/4G antenna
	Built-in 3G/4G diversity antenna
Dimensions (D × W × H)	88mm x 28mm x 11.5mm
Weight	About 35g

Item	Specifications
Temperature	<ul style="list-style-type: none">• Normal Operating temperature: -10~+40°C• Extended Operating temperature: -20~+55°C <p>(When ambient temperature is below -10°C, some RF parameters can't meet 3GPP requirements; When ambient temperature is above 40°C, the MS2372h-158 only use in a well ventilated and signal space.)</p> <ul style="list-style-type: none">• Storage: - 20°C~+70°C
Humidity	<ul style="list-style-type: none">• Operating: 5% to 95%• Storage: 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	

3 Services and Applications

3.1 Packet Data Service

The MS2372h-158 supports the PS domain data service based on LTE/DC-HSPA+/HSPA+/HSDPA/HSUPA/WCDMA/

GSM/GPRS/EGRPS.

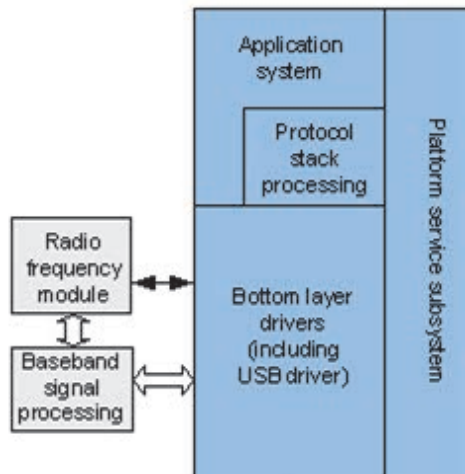
MS2372h-158 can be integrated with medical equipment to achieve data transmission, voice and online upgrades and other functions.

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 LTE/ DC-HSPA+/HSPA+/UMTS/EDGE/GPRS/GSM baseband digital signals, including:

- Modulating/Demodulating LTE baseband signals
- Modulating/Demodulating HSPA+/UMTS baseband signals
- Modulating/Demodulating EDGE/GPRS/GSM baseband signals
- Encoding/Decoding HSPA+/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 LTE/ DC-HSPA+/HSPA+/UMTS/EDGE/GPRS/GSM.

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
- LTE Physical Layer - General Description 36.201
- E-UTRAN Physical Channels and Modulation 36.211
- E-UTRAN Multiplexing and channel coding 36.212
- E-UTRAN Physical layer procedures 36.213
- E-UTRAN Physical layer – Measurements 36.214
- E-UTRAN Services provided by the physical layer 36.302

5.2 Layer 2 Specifications (MAC/RLC)

- MAC Protocol Specification TS 25.321
- RLC Protocol Specification TS 25.322
- E-UTRAN Layer 2 – Measurements 36.314
- E-UTRAN Medium Access Control (MAC) protocol specification 36.321
- E-UTRAN Radio Link Control (RLC) protocol specification 36.322
- E-UTRAN Packet Data Convergence Protocol (PDCP) specification 36.323

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
- E-UTRAN Radio Resource Control (RRC) Protocol specification 36.331
- E-UTRAN User Equipment (UE) procedures in idle mode 36.304

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
- Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS) 24.301

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 (SNDCCP) 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

- User Equipment (UE) Conformance Specification; Radio transmission and reception TS 36.521
- User Equipment (UE) conformance specification; Part 1: Protocol conformance specification TS 36.523-1
- 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.

3rd Generation Partnership Project .Technical Specification Group Core Network and Terminals ;Characteristics of the Universal Subscriber Identity Module (USIM) application TS 31.102

5.10 Safety & Health Specifications

- Safety Standards: EN 60950-1:2006+A11:2009
- Health Standards: EN 62311:2008 / EN 62209-2:2010
- RF spectrum Standards: EN 301 511,v9.0.2 / EN 301 908-1,v4.2.1 / EN 301 908-2,v4.2.1 / EN 301 908-13,v4.2.1

6 Packing List

This chapter describes the items contained in the package of the MS2372h-158.

Table 6-1 lists the items contained in the package of the MS2372h-158.

Table 6-1 Packing list of the MS2372h-158

Item	Quantity	Remarks
MS2372h-158 LTE USB Stick	1	Standard
Quick Start (merge into Safety Information)	1	Standard

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
HSDPA	High Speed Downlink Packet Access
IC	Integrated Circuit
IP	Internet Protocol
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
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