MD8470A
Signalling Tester
MX847040B TD-SCDMA/GSM Simulation Kit
On-the-Bench Global Mobile Communications Network for Wireless Application Developers

Full-scale deployment of TD-SCDMA is starting in China following the sudden expansion of 2/2.5G communication standards. Moreover, mobile markets in China are increasingly adopting the 3.5G HSDPA mobile communication standard supporting high-speed packet data. This complex mixture of 2/2.5/3/3.5G mobile networks increases the need for assured service quality and call connectivity as mobile terminals move between different cells. Since the HSDPA standard offers much faster data download speeds, the performance of mobile terminals must be verified in environments with high-speed packet data rates.

The MD8470A Signalling Tester offers a personal benchtop environment for flexible simulation of TD-SCDMA network. The new standalone hardware design and software options allow users to easily configure test environment for 2-cell TD-SCDMA/GSM InterRAT handovers and TD-HSDPA capability of all UE categories specified in 3GPP TS25.306. Service quality, call connectivity, stability, data throughput performance, etc., are all easy to verify with high repeatability using this high-performance test platform. The MD8470A helps you rollout TD-SCDMA terminals and services as early as possible.

**MD8470A TD-SCDMA Features**
- Flexible script-based TD-SCDMA/TD-HSDPA network simulation using C programming interface
- Supports TD-SCDMA/TD-HSDPA bearer services including voice call, video call, packet communication and SMS/MMS
- Supports all UE TD-HSDPA categories in 3GPP TS25.306
- Supports 2-cell InterRAT handover between TD-SCDMA/TD-HSDPA and GSM/(E)GPRS in single platform
- Supports multi-communication standards (TD-SCDMA/TD-HSDPA, GSM/GPRS/EGPRS) with wide frequency coverage (400 MHz to 2.7 GHz)

**Key Applications**
- Perform TD-SCDMA/TD-HSDPA protocol sequence tests
- Perform pre-verification of TD-SCDMA terminal before field tests
- Perform comprehensive function tests at integration phase of TD-SCDMA terminal
- Perform packet-based TD-HSDPA and EGPRS application tests with appropriate external servers
- Verify mobile terminal service quality and call connectivity at InterRAT handover (TD-SCDMA ⇔ GSM)
- Verify roaming service between national carriers
- Evaluate TD-HSDPA data throughput performance
Overview

MX847040B TD-SCDMA/GSM Simulation Kit
Flexible TD-SCDMA/GSM Network Simulation

Feature Highlights
- Flexible physical layer configuration
- Message encode/decode tool and programming library to support efficient test scenario creation
- Protocol message and user data logging at each layer
- Protocol message analysis support for various messages including RRC, NAS [RR, CC, MM, GMM, SM], SMS, SS [Supplementary Service] and CONFIG
- Powerful logging data sorting, searching and filtering for effective troubleshooting
- Monitoring function for DL channel power, UL power, timing alignment and CRC errors

Control Software Support Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario Execution</td>
<td>Reads and executes compiled DLL scenarios</td>
</tr>
<tr>
<td>Real-time Trace</td>
<td>Displays signalling messages and user data during simulation in real time</td>
</tr>
<tr>
<td>Trace Log Save/Load</td>
<td>Saves (Binary/Text/Packet/H.245/Throughput) and recalls (Binary only) traced log data</td>
</tr>
<tr>
<td>Trace Display Filtering</td>
<td>Displays trace filtered by channel and primitive classification</td>
</tr>
<tr>
<td>Message Decode and Analysis</td>
<td>Translates and displays traced messages (RRC, NAS*, SMS, SS, Config)</td>
</tr>
<tr>
<td>Scenario Library Function</td>
<td>Provides C library function for scenario creation</td>
</tr>
<tr>
<td>External Control Function</td>
<td>Provides DLL library allows external application to control MX847040B control software</td>
</tr>
</tbody>
</table>

*: Supports RR, CC, MM, GMM, and SM

MX847040B-13 TD-HSPA Software
High Performance Test Platform

Testing TD-SCDMA/TD-HSDPA Applications
The MD8470A Signalling Tester with MX847040B-13 TD-HSPA software and MU847040B TD-SCDMA/HSPA Signalling Unit supports TD-HSDPA communication standards. Testing of protocols and applications using TD-HSDPA packet data are executed by connecting to a server.

Server Connection Example

Supports All UE Categories
New hardware supports high-speed TD-HSDPA BTS functions of the following all UE categories specified in 3GPP TS25.306 for verifying data throughput performance.

3GPP TS25.306
1.28 Mcps TDD HS-DSCH physical layer categories (TD-HSDPA)

<table>
<thead>
<tr>
<th>HS-DSCH category</th>
<th>Maximum number of HSDSCH codes per timeslot</th>
<th>Maximum number of HSDSCH timeslot per TTI</th>
<th>Maximum number of HSDSCH transport channel bits can be received within an HSDSCH TTI</th>
<th>Total number of soft channel bits</th>
<th>Maximum Throughput [bps]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>16</td>
<td>2</td>
<td>2788</td>
<td>11264</td>
<td>557600</td>
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<tr>
<td>Category 2</td>
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<td>2788</td>
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<td>Category 3</td>
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<td>Category 5</td>
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<td>Category 7</td>
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<td>Category 10</td>
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<td>Category 11</td>
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<td>Category 12</td>
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<tr>
<td>Category 13</td>
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<td>14043</td>
<td>112840</td>
<td>2808600</td>
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<tr>
<td>Category 14</td>
<td>16</td>
<td>5</td>
<td>14043</td>
<td>168960</td>
<td>2808600</td>
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<tr>
<td>Category 15</td>
<td>16</td>
<td>5</td>
<td>14043</td>
<td>168960</td>
<td>2808600</td>
</tr>
</tbody>
</table>
Applications

Protocol Tests

Protocol Sequence Tests using C Programming Libraries

TD-SCDMA/GSM protocol sequence tests, such as broadcast information transmission, location registration, UE-originated voice call, UE-terminated voice call, UE-originated packet call, UE-call release, NW-call release and handovers are performed using dedicated C scenarios. Test parameters and sequence can also be defined freely to perform semi-normal and interrupt testing. In addition, data transfer between the mobile terminal and MD8470A can be monitored simultaneously in real time. These functions support troubleshooting as well as efficient protocol sequence tests for chipsets and mobile terminals.

InterRAT Handover Tests

(TD-SCDMA/TD-HSDPA ⇔ GSM/(E)GPRS)

All-in-One Cell Selection, Reselection & Handover Tests

The rapid spread of dual-mode TD-SCDMA/GSM terminals means InterRAT is becoming a key technology in completing network compatibility. The all-in-one MD8470A supports 2-cell InterRAT tests including cell selection, reselection and handovers. In addition to roaming verifications when moving between different carriers, it can verify the quality of high-speed packet-based multimedia services at InterRAT between TD-HSDPA and EGPRS by installing the MX847040B-13 TD-HSPA Software and MX847010A-01 EGPRS Software options. Moreover, various UE protocol sequence tests can also be performed at InterRAT handover. Since one MD8470A with these options closely emulates the real service environment, it greatly improves work efficiency at pre-verification of field tests.

Effective Scenario Creation

Protocol Message Encoder/Decoder Tool (Message Coder)

The Message Coder is a protocol message encoder/decoder tool supporting RRC, NAS (RR, CC, MM, GMM, SM), SMS, and SS (Supplementary Services). It makes creation of protocol messages needed for test scenarios more efficient.

Message Encoder/Decoder Library

A protocol message encoder/decoder library supporting RRC, NAS (RR, CC, MM, GMM, SM), SMS, and SS (Supplementary Service) simplifies changing or extracting message information elements in test scenarios. The information elements are designated using the tree structure shown in the decode results of the Message Coder. This feature can be used for conditional branch processing in the scenario and analysis of received messages.
Application Tests

All-in-One Platform for Testing Various Applications

The MD8470A supports a full range of TD-SCDMA application tests as well as end-to-end simulation of various services when connected to an application server.

TD-SCDMA Voice Call Tests (Handset/Loopback)

Voice call testing is performed between the mobile terminal and handset by connecting a handset to the MD8470A. A sample scenario is provided for voice call testing (AMR 12.2 kbps).

TD-SCDMA Video Call Tests (Loopback)

Video call testing is performed by looping back video data within the MD8470A. The ability to save H.245 control protocol trace data during video calls supports offline analysis of H.245 protocol message logs. A sample scenario is provided for video call testing (AV 64 kbps).

TD-SCDMA Packet Communication Tests

Application functions using packet data are tested on this all-in-one platform by installing an application server in the built-in PC. External application servers can also be connected. A sample scenario is provided for packet communication testing.

TD-SCDMA Messaging Tests (SMS/MMS)

Using the SMSC (SMS Centre) software to simulate Short Message Service supports SMS sending/receiving, and SMS loopback tests. The SMSC has a simple GUI for creating and sending test text (7-bit ASCII, Unicode) and binary SMS messages. Also, combining with a separate MMSC (MMS Center) application server* and SMSC supports MMS (Multimedia Messaging Service) testing.

*: Requires separate MMS application server

Data Throughput Tests

Data Throughput Measurements

The new built-in IP Performance Monitor function supports real-time monitoring of data throughput performance. Actual data throughput can be verified at a fixed rate or at a rate determined by the TD-HSDPA UE category and CQI value.

Examples of TD-HSDPA Test

- Transfer large volumes of data from FTP server
- Verify data throughput performance using the throughput monitor.
- Perform service interruption testing, such as incoming voice call during TD-HSDPA data communication.
- Check the data throughput behavior at InterRAT handover.

Test System Example

Ethernet and handset interfaces support various data communication services and an application server can be installed in the built-in PC. The all-in-one platform provides a development environment including the application server function.
## Specifications

### Supported TD-SCDMA Downlink Channel/Uplink Channel/Bearer Services

#### Supported TD-SCDMA Downlink Channel

<table>
<thead>
<tr>
<th>Channel</th>
<th>Logical Channel</th>
<th>Transport Channel</th>
<th>Physical Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>BCCH</td>
<td>BCH</td>
<td>P-CCPCH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Codes</td>
</tr>
<tr>
<td></td>
<td>PCCH</td>
<td>PCH</td>
<td>S-CCPCH</td>
</tr>
<tr>
<td></td>
<td>CCCH/DCCCH/DTCH</td>
<td>FACH</td>
<td>Max. 16 Codes</td>
</tr>
<tr>
<td>Dedicated</td>
<td>DCCH + DTCH</td>
<td>DCH</td>
<td>DPCH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Max. 16 Codes, 4 Slots</td>
</tr>
</tbody>
</table>

#### Supported TD-SCDMA Uplink Channel

<table>
<thead>
<tr>
<th>Channel</th>
<th>Logical Channel</th>
<th>Transport Channel</th>
<th>Physical Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>CCCH</td>
<td>RACH</td>
<td>PRACH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Max. 2 Codes</td>
</tr>
<tr>
<td>Dedicated</td>
<td>DCCH/DTCH</td>
<td>DCH</td>
<td>DPCH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Max. 2 Codes, 4 Slots</td>
</tr>
</tbody>
</table>

#### Supported Bearer Service

<table>
<thead>
<tr>
<th>Service</th>
<th>Data rate</th>
<th>DL Physical Channel</th>
<th>UL Physical Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol (Standalone DCCH)</td>
<td>12.2 kbps</td>
<td>DPCH (2 Codes)</td>
<td>DPCH (SF8, 1 Code)</td>
</tr>
<tr>
<td>Voice Call (GSM-AMR)</td>
<td>64 kbps</td>
<td>DPCH (8 Codes)</td>
<td>DPCH (SF2, 1 Slot)</td>
</tr>
<tr>
<td>Video Call</td>
<td>64 kbps</td>
<td>DPCH (8 Codes)</td>
<td>DPCH (SF2, 1 Slot)</td>
</tr>
<tr>
<td>Packet Switched Data (HSDPA)</td>
<td>2.8 Mbps</td>
<td>HS-PDSCH (16 Codes, 5 Slots)</td>
<td></td>
</tr>
<tr>
<td>Reference Measurement Channel</td>
<td>12.2 kbps</td>
<td>DPCH (2 Codes)</td>
<td>DPCH (SF8, 1 Code) or DPCH (SF16, 2 Codes)</td>
</tr>
<tr>
<td>Reference measurement channels (HSDPA)</td>
<td>64 kbps</td>
<td>DPCH (8 Codes)</td>
<td>DPCH (SF2, 1 Slot)</td>
</tr>
</tbody>
</table>
## MD8470A Signalling Tester

### Transmitter characteristics
- Frequency range: 400 MHz to 2700 MHz
- Frequency setting resolution: 100 Hz
- Output level range: –120 to –18 dBm (RF Main)
- Output level accuracy: ±3 dB (Output level: ≥–50 dBm, +18˚ to +28˚C)
- Modulation accuracy: ≤7% rms (when MU847040A/B is mounted)
- Phase error: ≤4˚ rms (when MU847020A/B is mounted)

### Receiver characteristics
- Frequency range: 400 MHz to 2700 MHz
- Frequency setting resolution: 100 Hz
- Maximum input level: +34 dBm (average)
- Reference setting range: –30 to +20 dBm (RF Main)

### External interface
- RF Main/Aux1/Aux2: N-type connector, Impedance: 50 Ω
- Call Proc Serial I/O A to D: D-Sub 9-pin connector, RS-232C, Serial interface for data communications
- Call Proc Ethernet A to D: RJ-45 connector, 10BASE-T, Ethernet interface for data communications
- ISDN 0/1: RJ-45 connector (Option), ISDN interface for data communications (I.430)
- Handset: Modular jack, Handset interface (including dedicated handset)

### Reference oscillator
- 10 MHz Buff Output
  - Frequency: 10 MHz
  - Level: TTL level
  - Connector: BNC type
- Startup characteristics: ≤±5 × 10⁻⁸ (5 minutes after power-on, referenced to 24 hours after power-on)
- Aging rate: ≤±1 × 10⁻⁶/day, ±1 × 10⁻⁷/year (referenced to 24 hours after power-on)
- Temperature characteristics: ≤±2 × 10⁻⁶

### External reference input
- 10 MHz Ref Input
  - Frequency: 10 MHz (±0.5 ppm)
  - Level: ≥0 dBm
  - Impedance: 50 Ω
  - Connector: BNC type

### Built-in personal computer
- OS: Windows XP Professional operating system
- CPU: Mobile Intel Pentium 4 processor 1.7 GHz
- HDD: 40 GB
- Memory: 512 MB

### User interface
- Display: Color TFT LCD, 10.4-inch, XGA
- Headphone: 3.5-mm mini-jack
- Microphone: 3.5-mm mini-jack
- USB: USB1.1 (Front panel), USB2.0/1.1 (Rear panel)
- RS-232C: D-Sub 9-pin connector
- PCMCIA: Type I, II compliant (Front/Rear panel)
- Keyboard: PS/2
- Mouse: PS/2
- VGA: Mini D-Sub 15-pin connector
- Ethernet 0/1: RJ-45 connector (10BASE-T/100BASE-TX)

### Dimensions
- 426 (W) × 221.5 (H) × 281 (D) mm (excluding protrusions)

### Mass
- ≤17 kg (when all options)

### Power supply
- 100 to 120 Vac/200 to 240 Vac (–15%/+10%, Max.: 250 V), 47.5 Hz to 63 Hz, ≤300 VA

### Operating temperature
- +5˚ to +40˚C, Humidity ≤95% (no condensation)

### Storage temperature
- –20˚ to +65˚C, Humidity ≤95% (no condensation)

### EMC
- EN61326-1, EN61000-3-2
- LVD
- EN61010-1

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* Other companies, product names and service names are registered trademarks of their respective companies.
Panel Layout

1. **Power switch**
   Switches mode between power-on (On) and standby (Stby)

2. **[RF Main] Main input/output connector**
   Main N-type input/output connector

3. **[RF Aux1] Aux1 input/output connector**
   Auxiliary N-type input/output connector

4. **[RF Aux2] Aux2 input/output connector**
   Auxiliary N-type input/output connector

5. **Left key**
   Performs same operation as left mouse click

6. **Right key**
   Performs same operation as left mouse click

7. **[Pointer] Pointer**
   Moves screen pointer

8. **Cursor key**
   Performs same operation as keyboard cursor key

9. **Enter key**
   Performs same operation as keyboard Enter key

10. **[Extender] Extender key**
    Changes keyboard key functions to descriptions in blue while key lamp lit

11. **[BackSpace] BackSpace key**
    Deletes previous letter in same operation as BackSpace on keyboard

12. **Ten keys**
    Input numeric values for parameters and A to F in hexadecimal

13. **[HDD] Hard disk access lamp**
    Lights during main-frame HDD access

14. **[Handset] Handset connector**
    Handset (standard accessory) connector

15. **[USB] USB connector**
    USB connector for USB1.1 devices

16. **[PCMCIA] PCMCIA slot**
    Slot for Type I or II PCMCIA memory card
[Trigger I/O Input] Trigger input connector
Reserved

[Trigger I/O Output] Trigger output connector
Reserved

[Call Proc Timing I/O A to D] Timing input/output port for call processing
Reserved

[Call Proc Serial I/O A to D] Serial input/output port for call processing
D-sub 9-pin connector for call processing

[10 MHz Ref Input] Reference signal input connector
BNC connector for external reference signal input

[10 MHz Buff Output] Reference signal output connector
BNC connector for built-in reference signal output

[PCMCIA] PCMCIA slot
Slot for Type I or II PCMCIA memory card

[Call Proc Ethernet A to D] Ethernet input/output port for call processing
RJ-45 connector and Ethernet port for call processing for packet communications

[ISDN 0] ISDN 0 port
RJ-45 connector for ISDN for video call test (BRI) <Option>

[ISDN 1] ISDN 1 port
Reserved

[Keyboard] Keyboard
Keyboard connector (standard accessory)

[Mouse] Mouse
Mouse connector (standard accessory)

[Headphone] Headphone
Headphone connector for 3.5-mm mini-jack

[Microphone] Microphone
Microphone connector for 3.5-mm mini-jack

[VGA] VGA connector
Mini D-sub 15-pin connector for external monitor

[USB] USB connector
USB connector for USB 2.0/1.1 devices

[Ethernet 0] Ethernet 0 port
Ethernet port for built-in PC

[Ethernet 1] Ethernet 1 port
Ethernet port for built-in PC

[RS-232C] RS-232C port
D-sub 9-pin connector for external PC

Main power switch
Switches main power on and off; front-panel Power switch enters Stby mode while main power on
Units/Options/Software

Hardware

- **TD-SCDMA/HSPA Signalling Unit (MU847040B)**
  This hardware unit simulates operation of a TD-SCDMA/HSPA base station.

- **GSM Signalling Unit (MU847020B)**
  This hardware unit simulates operation of a GSM/GPRS base station.

- **Second RF Option (MD8470A-02)**
  This hardware unit supports simulation using two RF signals. It is required when running InterRAT testing with one MD8470A unit.

Software

- **TD-SCDMA/GSM Simulation Kit (MX847040B)**
  This software is required for use with TD-SCDMA and GSM/GPRS. The kit includes libraries for scenario programming, control software for scenario execution and tracing/analysis, sample scenarios for basic call processing, and user manuals. (Microsoft Visual C++.net Standard 2003 or Microsoft Visual Studio 2005 Standard Edition or Microsoft Visual Studio 2008 Standard Edition is required for scenario compiling. Also, if Visual C++.net Standard 2003 or Visual Studio 2005 Standard Edition or Visual Studio 2008 Standard Edition is installed in the built-in PC, a CD or DVD drive with USB interface is required.)
  - Microsoft®, Visual C++®, and Visual Studio® are registered trademarks of Microsoft Corporation in the United States and other countries

- **TD-HSPA Software (MX847040B-13)**
  This software is required for TD-HSDPA simulation.
  TD-HSDPA testing is supported by combining the MX847040B TD-SCDMA/GSM Simulation Kit with MU847040B TD-SCDMA/HSPA Signalling Unit.

- **EGPRS Software (MX847010A-01)**
  This software is required for EGPRS simulation. EGPRS testing is supported by combining the MX847040B TD-SCDMA/GSM Simulation Kit with the MU847020B GSM Signalling Unit.

Software Maintenance Contract

- **MX847040B Support Service (1 year) (MX847040B-SS110)**
  This contract supports user troubleshooting and software maintenance releases. It is the software maintenance contract for the MX847040B.

### Configuration

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Option/Unit/Software</th>
</tr>
</thead>
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<td>Single Configuration (1BTS)</td>
<td>TD-SCDMA Test Configuration</td>
</tr>
<tr>
<td></td>
<td>TD-SCDMA/TD-HSDPA Test Configuration</td>
</tr>
<tr>
<td></td>
<td>TD-SCDMA, GSM/GPRS Test Configuration</td>
</tr>
<tr>
<td></td>
<td>TD-SCDMA/TD-HSDPA, GSM/GPRS/EGPRS Test Configuration</td>
</tr>
<tr>
<td>InterRAT Handover Test Configuration</td>
<td>TD-SCDMA ⇔ GSM/GPRS InterRAT Test Configuration</td>
</tr>
<tr>
<td>(2BTS)</td>
<td>TD-SCDMA/TD-HSDPA ⇔ GSM/GPRS/EGPRS InterRAT Test Configuration</td>
</tr>
</tbody>
</table>

TD-SCDMA/TD-HSDPA Test Configuration: Runs simulation corresponding TD-SCDMA/HSDPA 1BTS
TD-SCDMA/TD-HSDPA, GSM/GPRS/EGPRS Test Configuration: Includes functions for test configurations for both TD-SCDMA/TD-HSDPA and GSM/GPRS/EGPRS
Please specify the model/order number, name and quantity when ordering. The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>MD8470A</td>
<td>Main frame</td>
</tr>
<tr>
<td></td>
<td>Signalling Tester</td>
</tr>
<tr>
<td>Z0741</td>
<td>Standard accessories</td>
</tr>
<tr>
<td></td>
<td>Power Cord, 2.6 m</td>
</tr>
<tr>
<td></td>
<td>MD8470A Operation Manual (CD-ROM)</td>
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<tr>
<td></td>
<td>Keyboard (Japanese or English)*1</td>
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<td>G0134</td>
<td>Mouse</td>
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<tr>
<td>A0013</td>
<td>Handset</td>
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<tr>
<td>MX847000A</td>
<td>Platform Software</td>
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<tr>
<td>MD8470A-02</td>
<td>Units/Options</td>
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<tr>
<td>MU847040B</td>
<td>Second RF Option</td>
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<tr>
<td>MU847020B</td>
<td>TD-SCDMA/HSPA Signalling Unit</td>
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<td>Z0714</td>
<td>English OS Option</td>
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<tr>
<td>Z0715</td>
<td>Japanese OS Option</td>
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<td>Z0716A/B</td>
<td>Retrofit Option</td>
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<td>MX847040B</td>
<td>Software</td>
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<tr>
<td>MX847040B-13</td>
<td>TD-SCDMA/GSM Simulation Kit*2</td>
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<td>MX847010A-01</td>
<td>EGPRS Software</td>
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<td>MX847040B Support Service (One year)</td>
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<td>MD8470A-90</td>
<td>Warranty service</td>
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<tr>
<td>MD8470A-91</td>
<td>Extended Three Year Warranty Service</td>
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<td>Extended Five Year Warranty Service</td>
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*1: Selected by Z0714 or Z0715 OS option.
*2: P0035B W-CDMA/GSM TEST USIM is supplied by this option.

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<tr>
<th>Model/Order No.</th>
<th>Application parts</th>
<th>Name</th>
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<tr>
<td>J1261A</td>
<td></td>
<td>Ethernet Cable (Shielded, Straight), 1 m</td>
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<td>J1261B</td>
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<td>Ethernet Cable (Shielded, Straight), 3 m</td>
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<td>J1261C</td>
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<td>Ethernet Cable (Shielded, Crossover), 1 m</td>
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<td>J1262A</td>
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<td>RS-232C Cable (Straight), 2 m</td>
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<td>RS-232C Cable (Crossover), 2 m</td>
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<td>J0576B</td>
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<td>Coaxial Cord (N-P · 5D-2W · N-P), 1 m</td>
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<td>Coaxial Cord (BNC-P · RG58A/U · BNC-P), 1 m</td>
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<td>J1263</td>
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<td>HDD-SUB15P Cable (Mill-Inch)</td>
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