Product Introduction

Manufacturer Test Suite

MT8820B/MT8815B
Radio Communication Analyzer

Anritsu

MT8820B/MT8815B
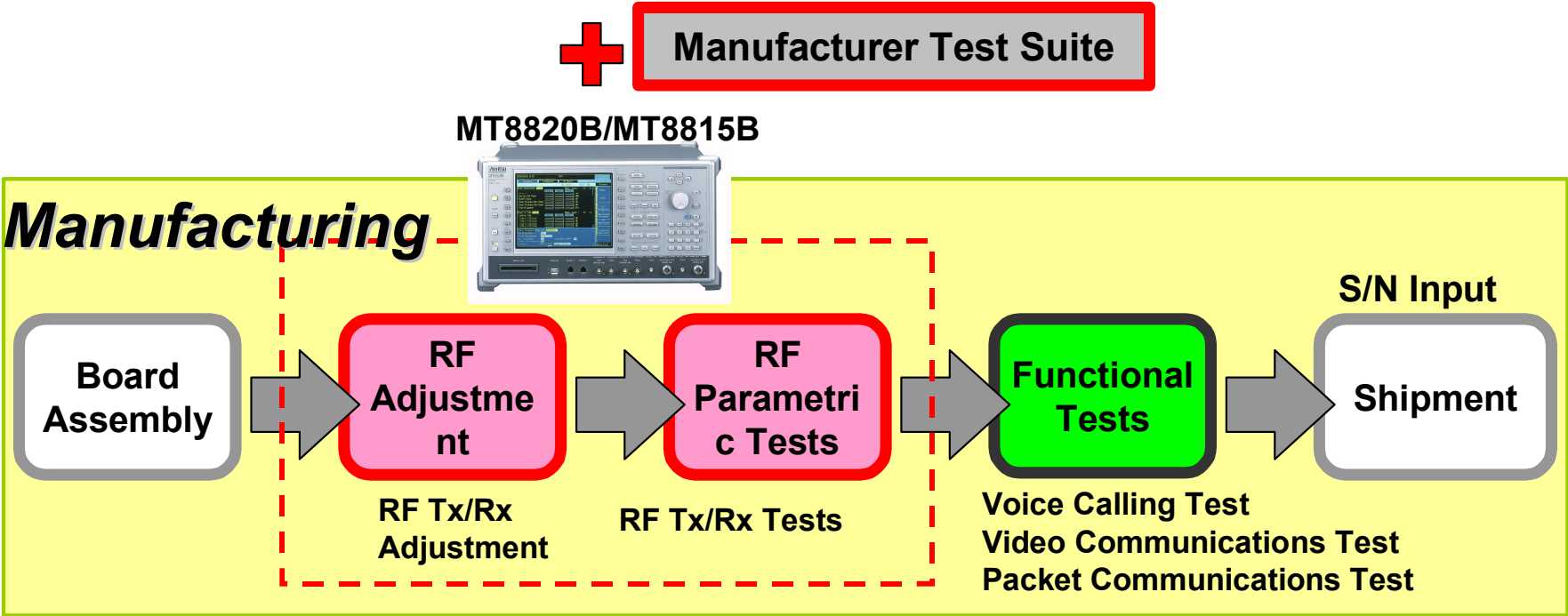# Manufacturer Test Suite
Product Introduction

MT8820B-031/MX882030C/MX882030C-011/-021 for W-CDMA/HSDPA/HSUPA

MT8820B-032/MX882031C/MX882031C-011 for GSM/GPRS/EGPRS

Version 3.0

May 2009
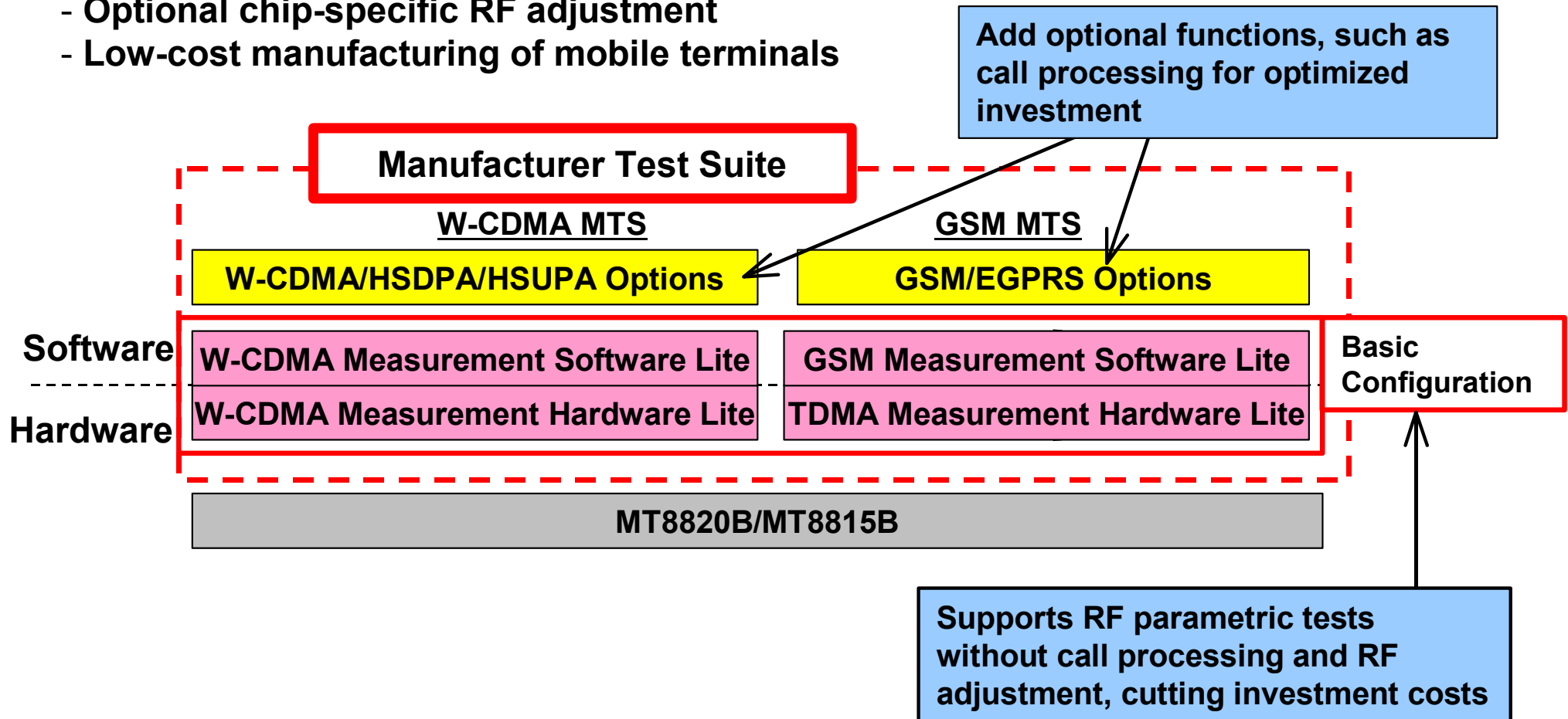
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Manufacturer Test Suite Outline

Manufacturer Test Suite (MTS) runs on the MT8820B/MT8815B platform and is the generic name for the combination of hardware and software focusing on RF adjustments and RF parametric tests for manufacturing mobile terminals. It is a new low-price solution for the MT8820B/MT8815B offering flexible configuration of options. It supports both W-CDMA/HSDPA/HSUPA and GSM/GPRS/EGPRS.

Manufacturer Test Suite

MT8820B/MT8815B

Manufacturing

| Board Assembly | → | RF Adjustment | → | RF Parametric Tests | → | Functional Tests | → | Shipment |

S/N Input

RF Tx/Rx Adjustment

RF Tx/Rx Tests

Voice Calling Test
Video Communications Test
Packet Communications Test

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Manufacturer Test Suite Features

- **Basic configuration focusing on RF adjustment and RF parametric tests in test mode (without call processing)**
- **Optional call processing**
- **Optional chip-specific RF adjustment**
- **Low-cost manufacturing of mobile terminals**

Add optional functions, such as call processing for optimized investment

Manufacturer Test Suite

W-CDMA MTS

GSM MTS

W-CDMA/HSDPA/HSUPA Options	GSM/EGPRS Options

Software

Hardware

W-CDMA Measurement Software Lite	GSM Measurement Software Lite
W-CDMA Measurement Hardware Lite	TDMA Measurement Hardware Lite

Basic Configuration

MT8820B/MT8815B

Supports RF parametric tests without call processing and RF adjustment, cutting investment costs

Manufacturer Test Suite Options (W-CDMA/HSDPA/HSUPA)

The Manufacturer Test Suite options for W-CDMA/HSDPA/HSUPA are shown below.
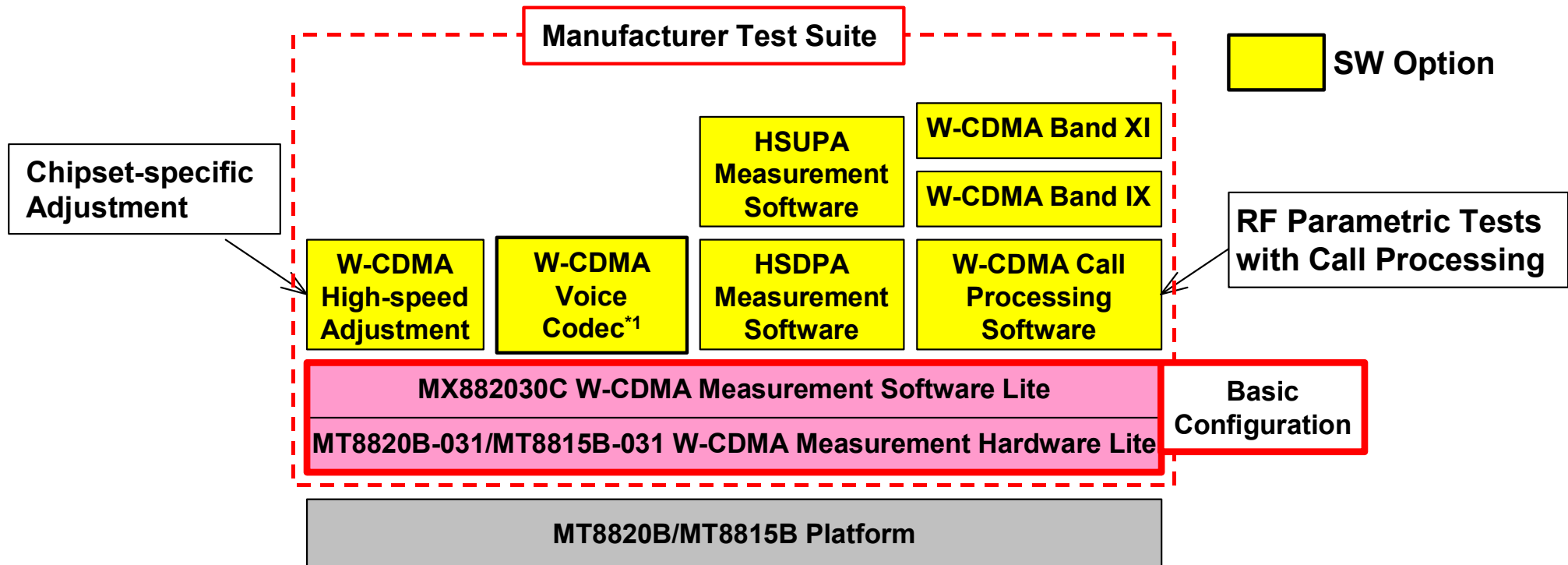
*1: Requires MT8820B/15B-011 Audio Board

W-CDMA Basic Configuration (MT8820B-031/MT8815B-031 + MX882030C)

The Manufacturer Test Suite W-CDMA basic configuration supports W-CDMA RF parametric tests (without call processing) in the test mode. The MT8820B/MT8815B functions as a real-time signal generator and signal analyzer. Only RMC 12.2k is supported.

W-CDMA Measurement Items (Test Mode)

Tx Measurements (Fundamental Measurement)
    TX Power and Filtered Power
    Frequency Error
    Occupied Bandwidth
    Spectrum Emission Mask
    Adjacent Channel Leakage Power Ratio
    Error Vector Magnitude
    Peak Code Domain Error

Tx Measurements (Time Domain)
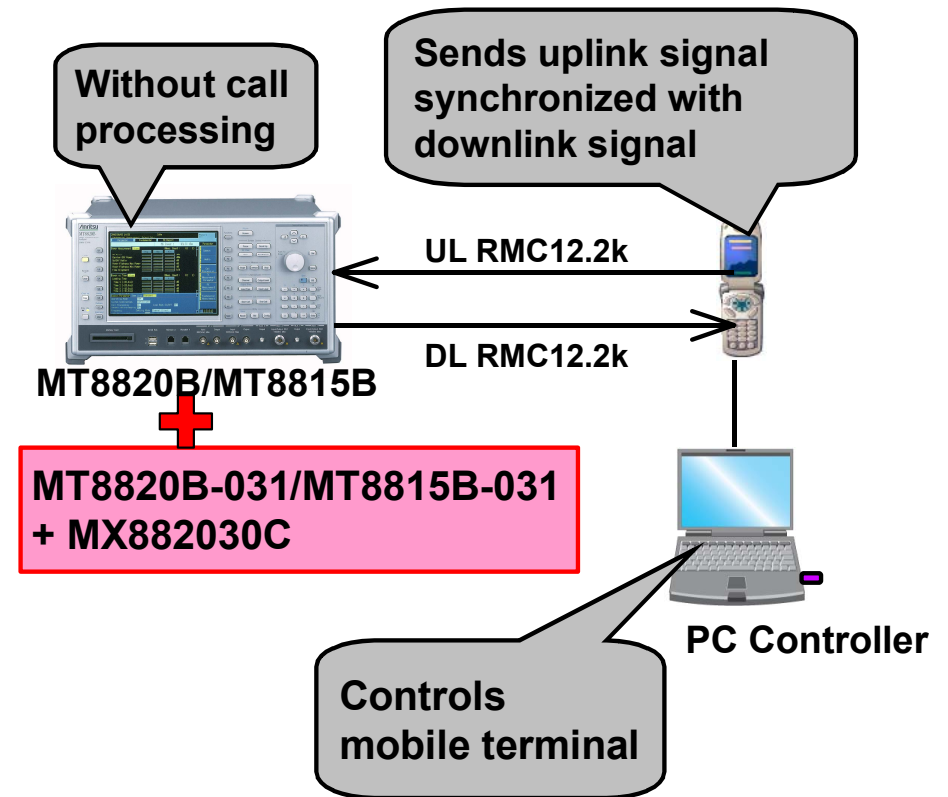   Power Results for Each Timeslot
    Transmit On/Off Power
    Phase Discontinuity
    PRACH Preamble Quality

Rx Measurement (Fundamental Measurement)
    BER (RMC12.2k)

Spectrum Monitor
    Spectrum in 5 and 25 MHz Bandwidth

Without call processing

Sends uplink signal synchronized with downlink signal

UL RMC12.2k

DL RMC12.2k

MT8820B/MT8815B

MT8820B-031/MT8815B-031 + MX882030C

Controls mobile terminal

PC Controller

MX882030C_31C-E-L-1

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W-CDMA Call Processing Software (MX882030C-050)

Adding the W-CDMA call processing software supports W-CDMA RF parametric tests with call processing and voice communication tests. When the HSDPA/HSUPA Measurement Software (MX882030C-011/-021) is installed, HSDPA/HSUPA RF parametric tests can be performed too.

W-CDMA Measurement Items (Call Processing)

TX Measurements (Fundamental Measurement)
TX Power and Filtered Power
Frequency Error
Occupied Bandwidth
Spectrum Emission Mask
Adjacent Channel Leakage Power Ratio
Error Vector Magnitude
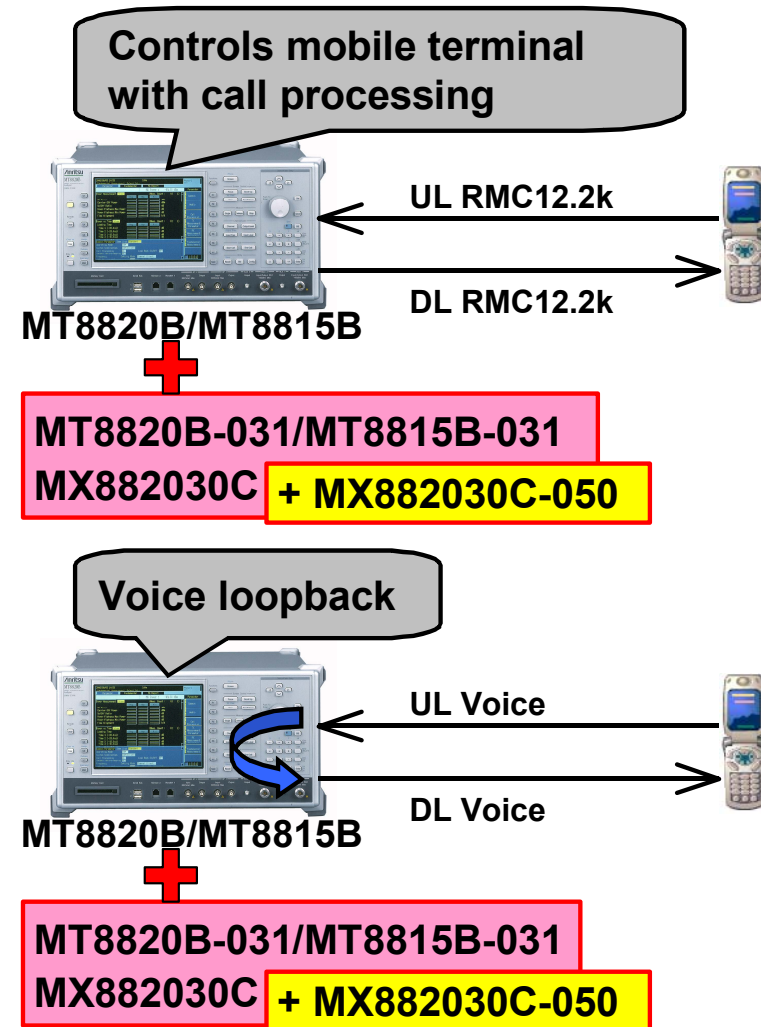Peak Code Domain Error

TX Measurements (Time Domain)
Open Loop Power
Inner Loop Power
Transmit On/Off Power
Phase Discontinuity
PRACH Preamble Quality

RX Measurement (Fundamental Measurement)
BER (RMC12.2k)
BLER (RMC12.2k)

Spectrum Monitor
Spectrum in 5 and 25 MHz Bandwidth

Controls mobile terminal with call processing

UL RMC12.2k
DL RMC12.2k

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-050

Voice loopback

UL Voice
DL Voice

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-050

MX882030C_31C-E-L-1

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HSDPA Measurement Software (MX882030C-011)

Installing the HSDPA Measurement Software supports HSDPA RF parametric tests. When the W-CDMA Call Processing Software is not installed, HSDPA RF parametric tests (without call processing) can be performed in the test mode. When the W-CDMA Call Processing Software is installed, HSDPA RF parametric tests with call processing can be performed too. Only FRC H-Set 1 (QPSK, 16QAM) is supported.

HSDPA Measurement Items
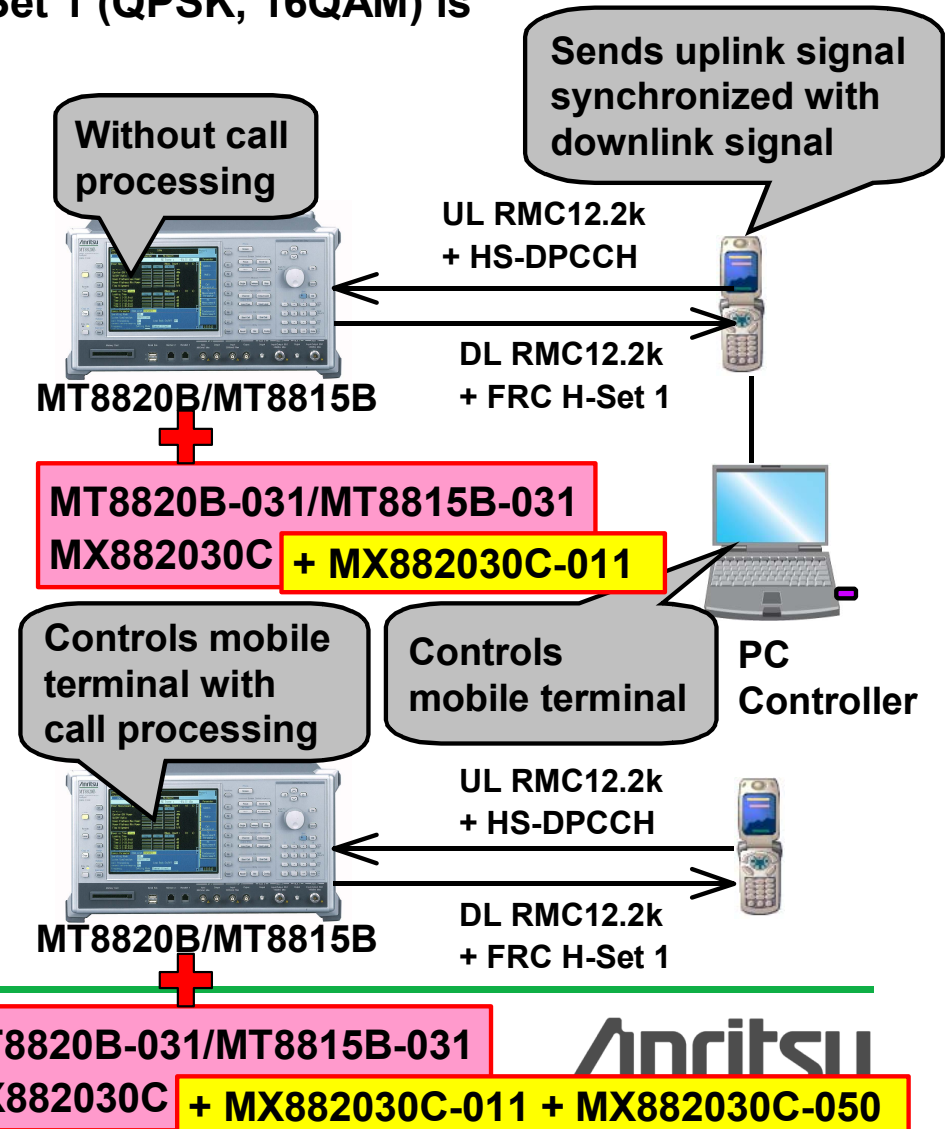
TX Measurements (Fundamental Measurement)
- TX Power and Filtered Power
- Frequency Error
- Occupied Bandwidth
- Spectrum Emission Mask
- Adjacent Channel Leakage Power Ratio
- Error Vector Magnitude

TX Measurement (Time Domain)
- HS-DPCCH Power Control

RX Measurement (Fundamental Measurement)
- Throughput (H-Set 1)

Without call processing

Sends uplink signal synchronized with downlink signal

UL RMC12.2k + HS-DPCCH

DL RMC12.2k + FRC H-Set 1

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-011

Controls mobile terminal with call processing

Controls mobile terminal

PC Controller

UL RMC12.2k + HS-DPCCH

DL RMC12.2k + FRC H-Set 1

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-011 + MX882030C-050

HSUPA Measurement Software (MX882030C-021）

Installing the HSUPA Measurement Software supports HSUPA RF parametric tests.
When the W-CDMA Call Processing Software is not installed, HSUPA RF parametric
tests (without call processing) can be performed in the test mode. When the W-CDMA
Call Processing Software is installed, HSUPA RF parametric tests with call
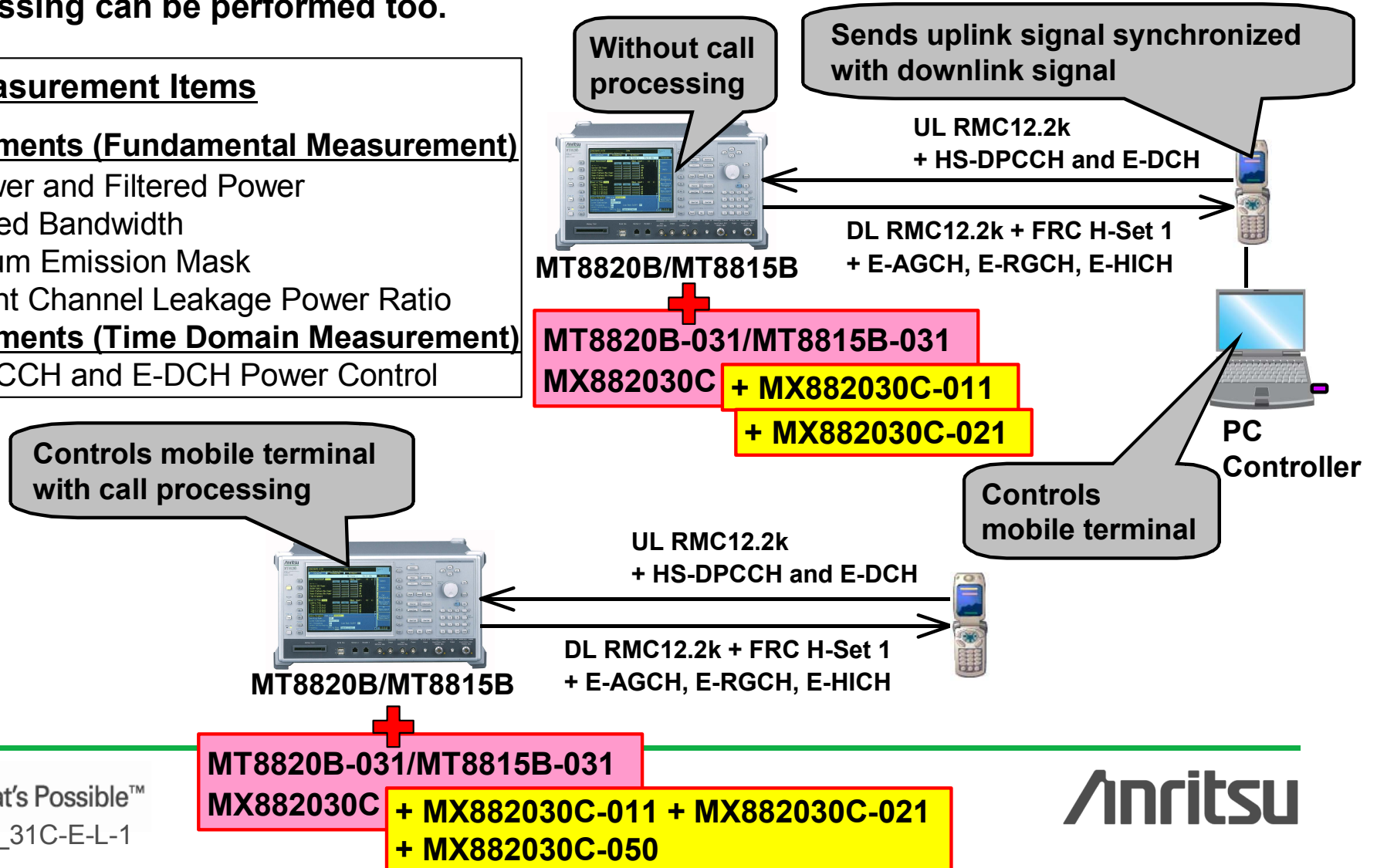processing can be performed too.

HSUPA Measurement Items

TX Measurements (Fundamental Measurement)
TX Power and Filtered Power
Occupied Bandwidth
Spectrum Emission Mask
Adjacent Channel Leakage Power Ratio
TX Measurements (Time Domain Measurement)
HS-DPCCH and E-DCH Power Control

Without call processing

Sends uplink signal synchronized with downlink signal

UL RMC12.2k
+ HS-DPCCH and E-DCH

DL RMC12.2k + FRC H-Set 1
+ E-AGCH, E-RGCH, E-HICH

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-011
+ MX882030C-021

Controls mobile terminal with call processing

UL RMC12.2k
+ HS-DPCCH and E-DCH

DL RMC12.2k + FRC H-Set 1
+ E-AGCH, E-RGCH, E-HICH

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-011 + MX882030C-021
+ MX882030C-050

PC Controller

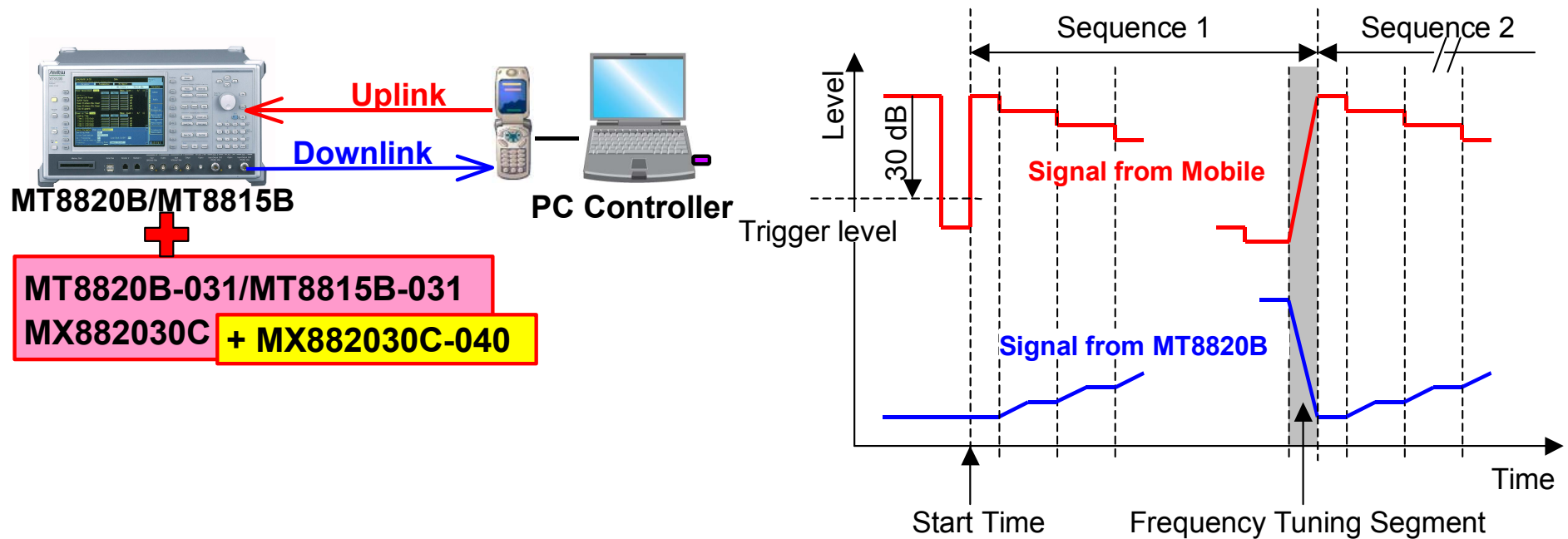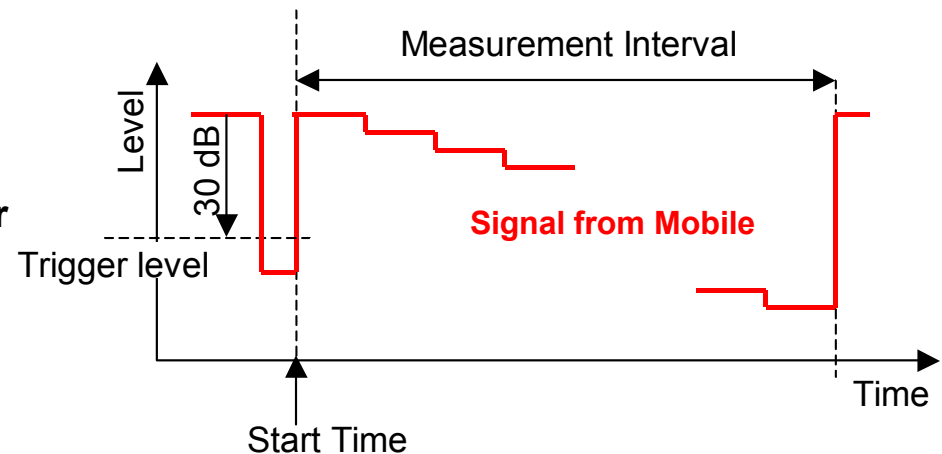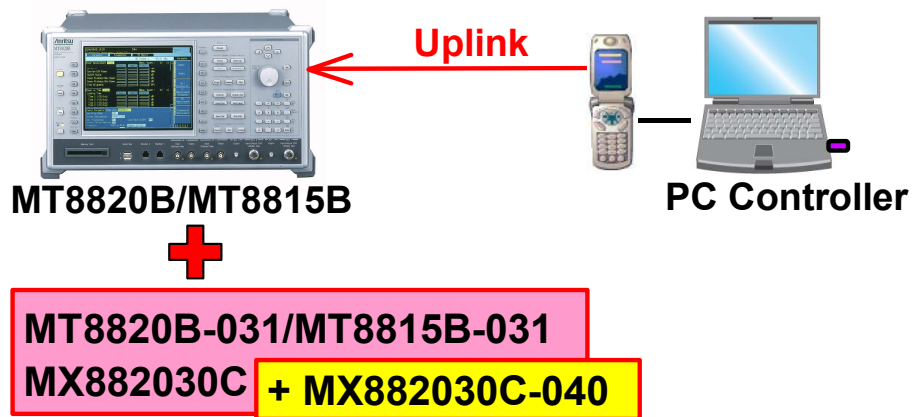**Controls mobile terminal**

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W-CDMA High-speed Adjustment (MX882030C-040)

W-CDMA High-speed Adjustment is a function for fast adjustment of the RF Tx/Rx part of W-CDMA terminals. High-speed adjustment is performed in conjunction with the mobile adjustment function.
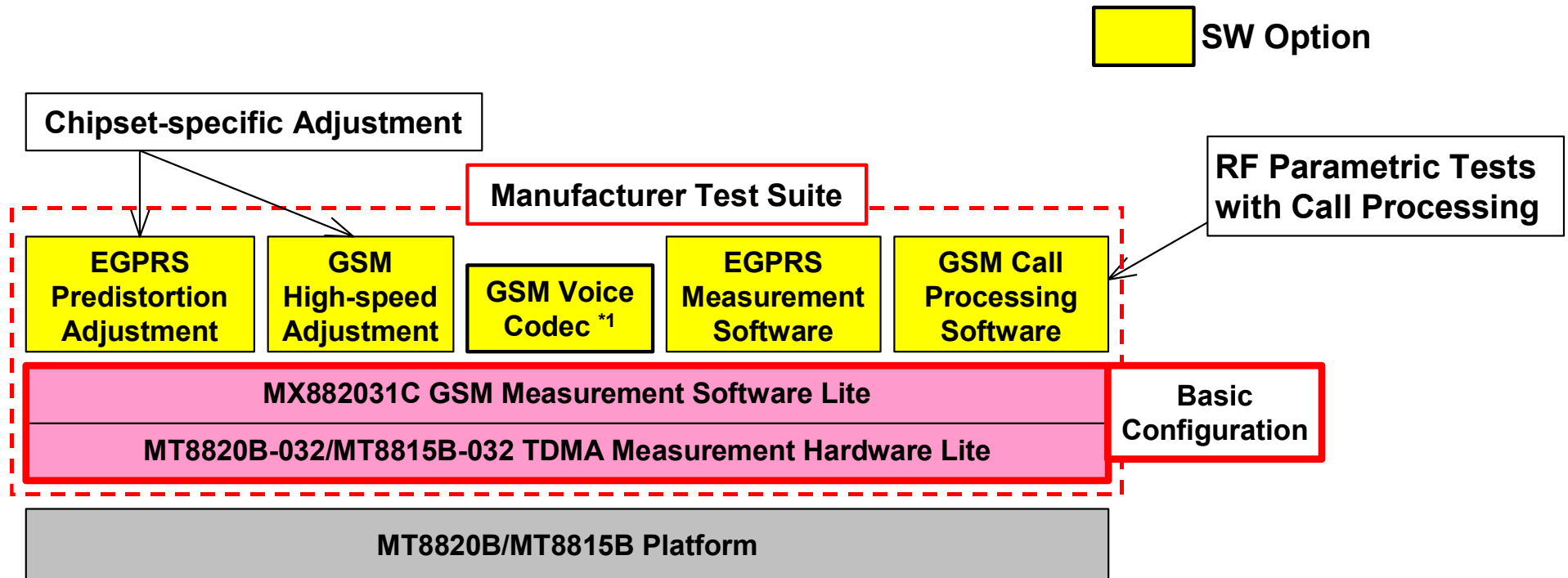
Tx/Rx versus Frequency

Simultaneous adjustment of Tx output power and Rx input level at several frequencies in one sweep

MT8820B/MT8815B

MT8820B-031/MT8815B-031
MX882030C + MX882030C-040

PC Controller

W-CDMA High-speed Adjustment (MX882030C-040)

W-CDMA High-speed Adjustment is a function for fast adjustment of the RF Tx/Rx part of W-CDMA terminals. High-speed adjustment is performed in conjunction with the mobile adjustment function.

Multi-power Measurement

Adjustment of transmitter output power in one sweep

Uplink

MT8820B/MT8815B

PC Controller

MT8820B-031/MT8815B-031
MX882030C **+ MX882030C-040**

Level

30 dB

Trigger level

Measurement Interval

Signal from Mobile

Time

Start Time

Manufacturer Test Suite Options (GSM/GPRS/EGPRS)

The Manufacturer Test Suite options for GSM/GPRS/EGPRS are shown below.

| | SW Option |

- Chipset-specific Adjustment
- Manufacturer Test Suite
- RF Parametric Tests with Call Processing

| EGPRS Predistortion Adjustment | GSM High-speed Adjustment | GSM Voice Codec *1 | EGPRS Measurement Software | GSM Call Processing Software |

MX882031C GSM Measurement Software Lite

MT8820B-032/MT8815B-032 TDMA Measurement Hardware Lite

Basic Configuration

MT8820B/MT8815B Platform

*1: Requires MT8820B/15B-011 Audio Board

GSM/GPRS Basic Configuration (MT8820B-032/MT8815B-032 + MX882031C)

The Manufacturer Test Suite GSM/GPRS basic configuration supports GSM/GPRS RF parametric tests (without call processing) in the test mode. The MT8820B/MT8815B functions as a real-time signal generator and signal analyzer. Only enhanced full rate speech and full rate speech are supported.

GSM/GPRS Measurement Items (Test Mode)
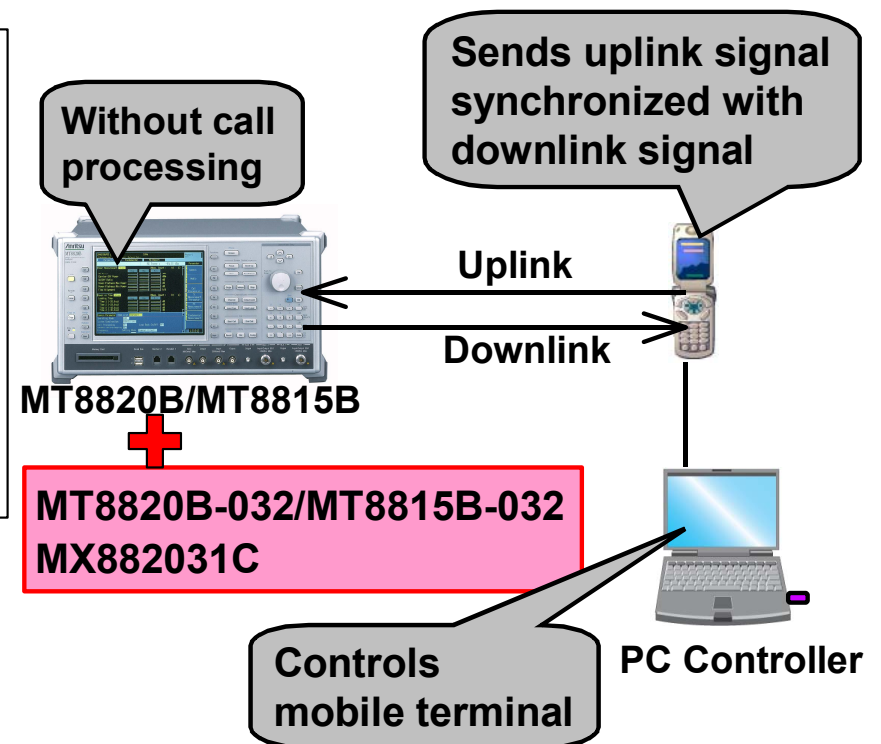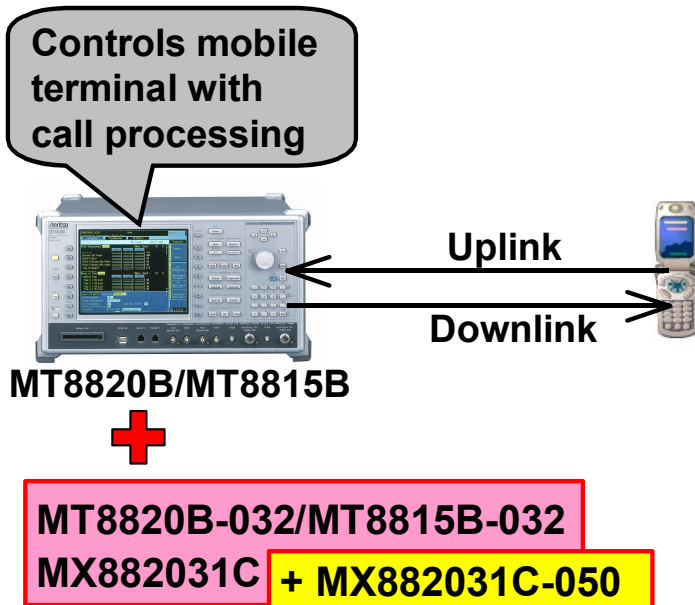
TX Measurements (Fundamental Measurement)
Frequency Error and Phase Error
Transmit Output Power and Burst Timing
Output RF Spectrum (Modulation and Switching)
RX Measurements (Fundamental Measurement)
FER, CRC Error and BER (FS and EFS)(GSM)
Spectrum Monitor
Spectrum in 250k, 1M, 5M to 25 MHz Bandwidth

Sends uplink signal synchronized with downlink signal

Without call processing

Uplink

Downlink

MT8820B/MT8815B

MT8820B-032/MT8815B-032 MX882031C

Controls mobile terminal

PC Controller

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GSM Call Processing Software (MX882031C-050)

Adding the GSM call processing software supports GSM/GPRS RF parametric tests with call processing and voice communication tests. When the EGPRS Measurement Software (MX882031C-011) is installed, EGPRS RF parametric test can be performed too.

GSM/GPRS Measurement Items (Call Processing)

TX Measurements (Fundamental Measurement)
    Frequency Error and Phase Error
    Transmit Output Power and Burst Timing
    Output RF Spectrum (Modulation and Switching)
RX Measurements (Fundamental Measurement)
    FER, CRC Error and BER (FS and EFS) (GSM)
    BLER (GPRS)
Spectrum Monitor
    Spectrum in 250k, 1M, 5M to 25 MHz Bandwidth

Controls mobile terminal with call processing

Uplink

Downlink

MT8820B/MT8815B

+

MT8820B-032/MT8815B-032
MX882031C **+ MX882031C-050**

EGPRS Measurement Software (MX882031C-011)

Installing the EGPRS Measurement Software supports EGPRS RF parametric tests. When the GSM Call Processing Software is not installed, EGPRS RF parametric tests (without call processing) can be performed in the test mode. When the GSM Call Processing Software is installed, EGPRS RF parametric tests with call processing can be performed too.

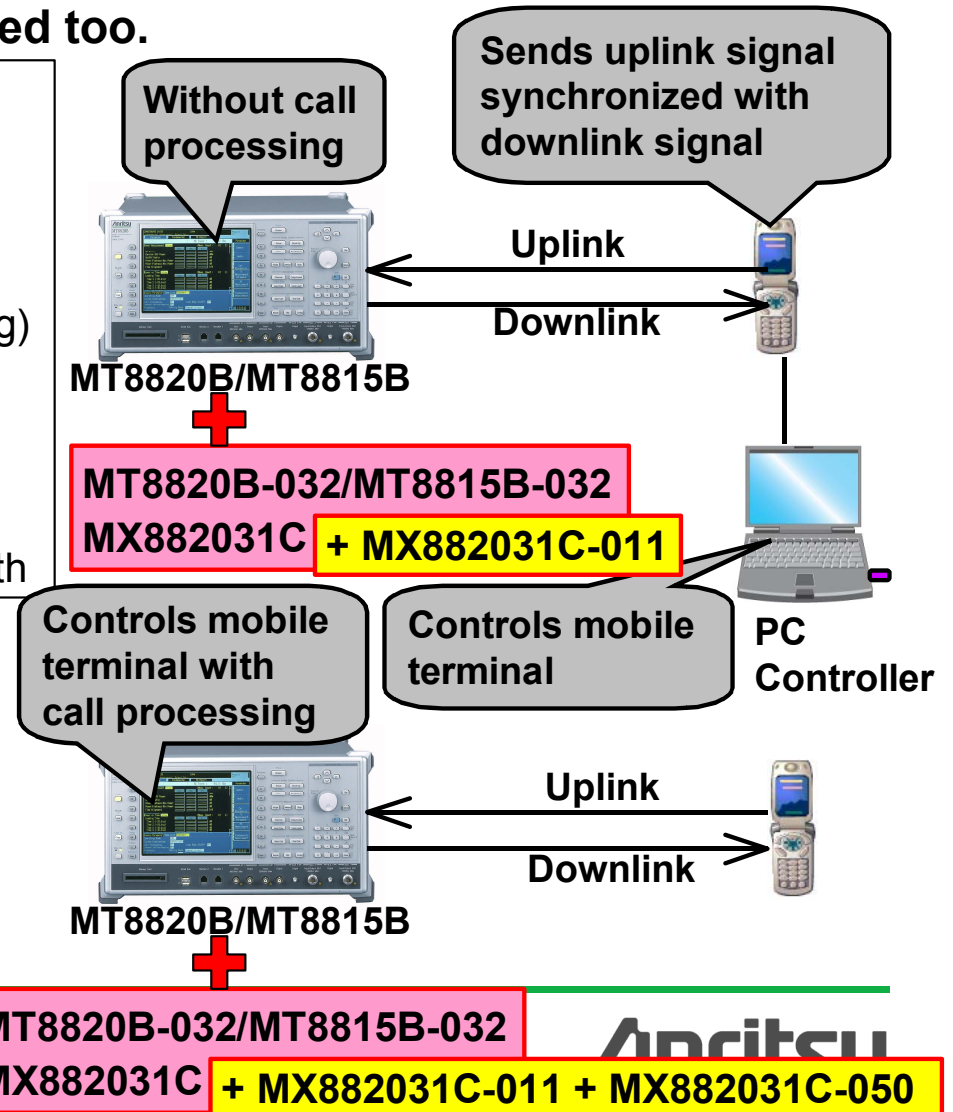## EGPRS Measurement Items

TX Measurements (Fundamental Measurement)

Frequency Error and Modulation Accuracy
Transmit Output Power and Burst Timing
Output RF Spectrum (Modulation and Switching)

RX Measurements (Fundamental Measurement)

SRB Loopback BER
BLER (call processing)

Spectrum Monitor

Spectrum in 250k, 1M, 5M to 25 MHz Bandwidth

Without call processing

Sends uplink signal synchronized with downlink signal

Uplink

Downlink

MT8820B/MT8815B

MT8820B-032/MT8815B-032
MX882031C + MX882031C-011

Controls mobile terminal with call processing

Controls mobile terminal

PC Controller

Uplink

Downlink

MT8820B/MT8815B

MT8820B-032/MT8815B-032
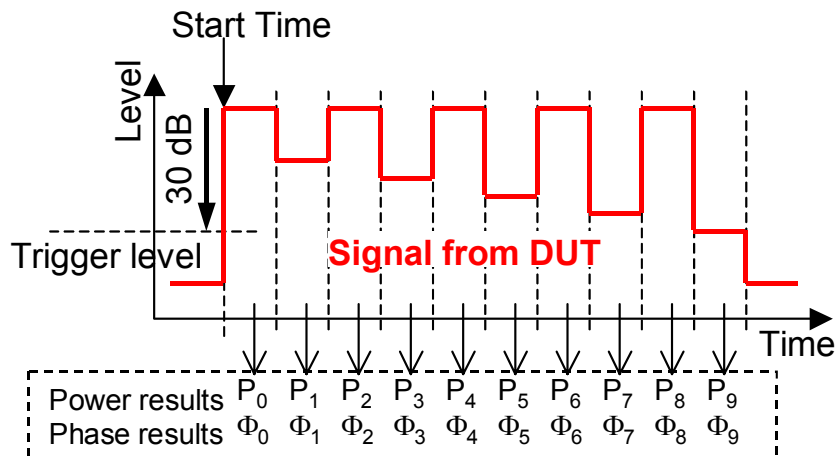MX882031C + MX882031C-011 + MX882031C-050

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EGPRS Predistortion Adjustment (MX882031C-040)*

EGPRS Predistortion Adjustment is a function to adjust the predistortion part of EGPRS terminals. Predistortion adjustment is performed in conjunction with the mobile adjustment function.
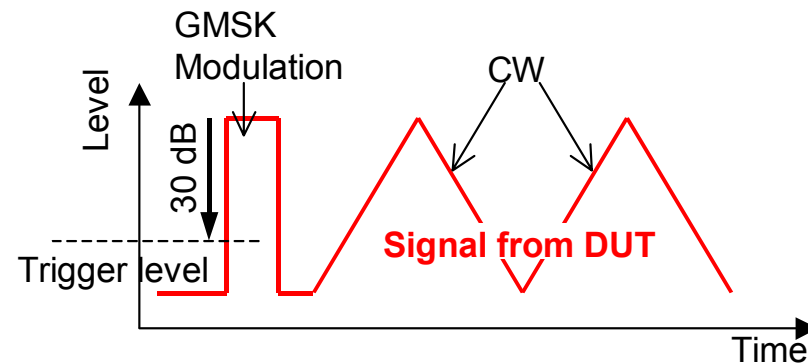
Uplink
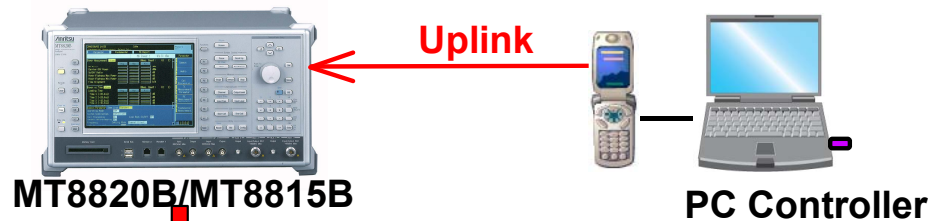
*The measurement runs Fundamental Measurement screen.
The measurement runs with Call Processing Off only.
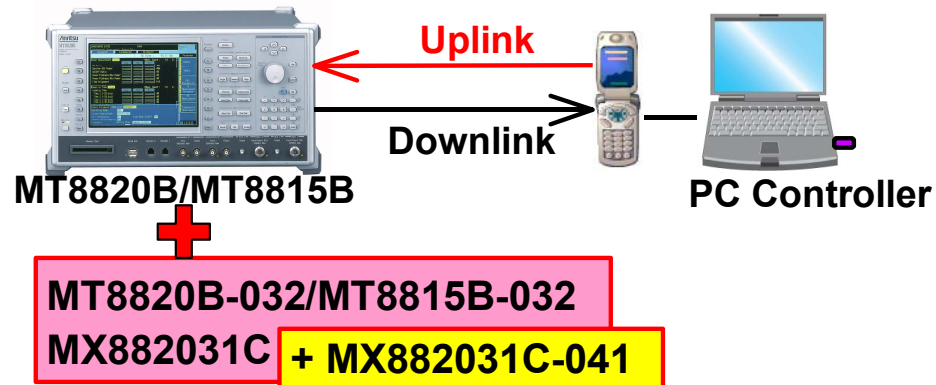The measurement runs with Remote Control only.

MT8820B/MT8815B

PC Controller

MT8820B-032/MT8815B-032

MX882031C **+ MX882031C-040**

Start Time

Level

30 dB

Trigger level

Signal from DUT

Time

Power results P_0 P_1 P_2 P_3 P_4 P_5 P_6 P_7 P_8 P_9
Phase results Φ_0 Φ_1 Φ_2 Φ_3 Φ_4 Φ_5 Φ_6 Φ_7 Φ_8 Φ_9

Measure power and phase of each step

GMSK Modulation

CW

Level

30 dB

Trigger level

Signal from DUT

Time

Measure amplitude and phase at each sample time in CW duration

# GSM High-Speed Adjustment (MX882031C-041)*

GSM High-Speed Adjustment is a function of GSM terminals, running in synchronization with the chipset adjustment function. And it runs IQ Capturing Measurement.


MT8820B/MT8815B

Uplink

Downlink

PC Controller

MT8820B-032/MT8815B-032

MX882031C **+ MX882031C-041**

*The measurement runs Fundamental Measurement screen. The measurement can't run Fundamental Measurement, and IQ Capturing Measurement, or High-Speed Adjustment Measurement when the measurement is effective. The measurement runs with Remote Control only.
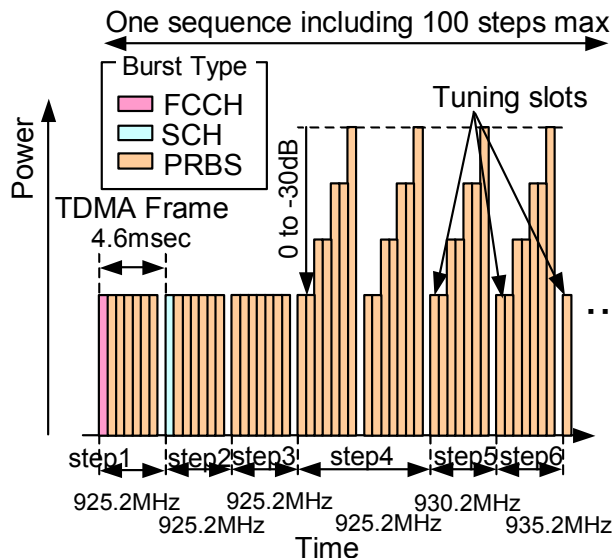
Sequence of Rx Sweep
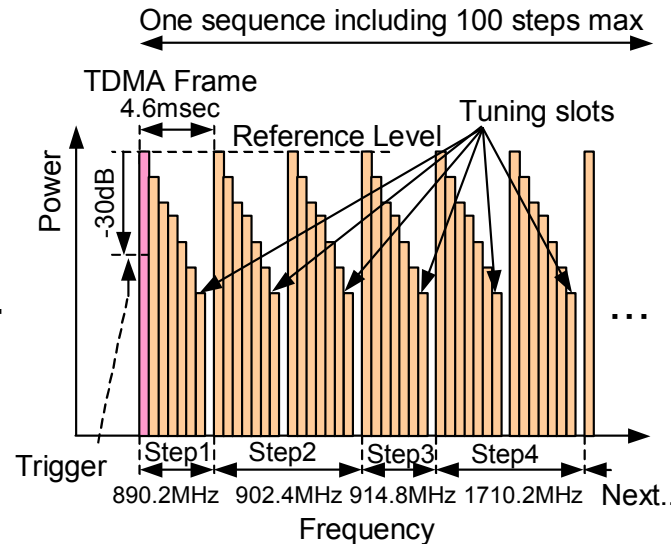
Sequence of Tx Sweep
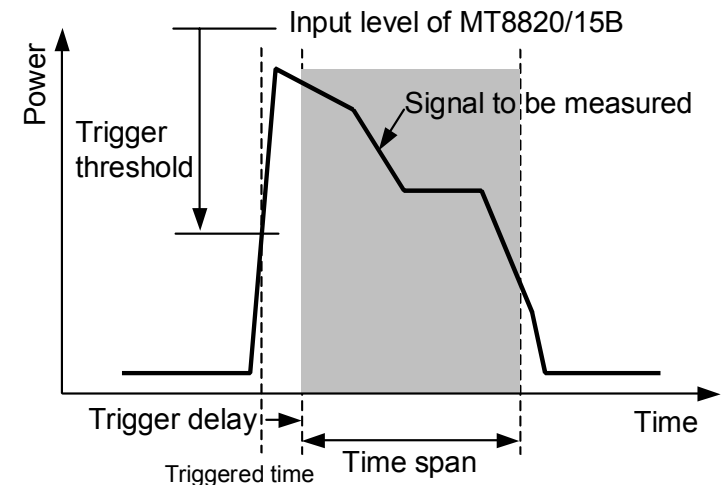
IQ Capturing Measurement

Flexible Configuration

The Manufacturer Test Suite cuts equipment investment by offering optimum configuration to each test method.

 Option

RF Adjustment	No Call Processing Traditional Adjustment Function as SG + SA	MT8820B/MT8815B	Basic Configuration
	No Call Processing Chip-specific Adjustment	MT8820B/MT8815B	Chip-specific Adjustment / Basic Configuration
RF Parametric Tests	RF Parametric Tests in Test Mode (Without Call Processing)	MT8820B/MT8815B	Basic Configuration
	RF Parametric Tests with Call Processing	MT8820B/MT8815B	Call Processing / Basic Configuration

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Two Test Solutions on One Platform

Manufacturer Test Suite is a manufacturing solution focused on RF adjustment and RF parametric tests of mobile terminals. Developer Test Suite launched in October 2006 is a solution targeted at RF design, RF performance tests, and all of stages for manufacturing. Both solutions are supported by the MT8820B/MT8815B platform.

R&D

- RF Design and Evaluation
- RF Performance

Manufacturing

- Board Assembly
- RF Tx/Rx Adjustment — RF Adjustment
- RF Tx/Rx Tests — RF Parametric Tests
- Voice Calling Test / Video Communications Test / Packet Communications Test — Functional Tests
- Shipment — S/N Input

MT8820B/MT8815B
MT8820B/MT8815B

Developer Test Suite

Supports packet data transfer, video function tests and RF performance tests

Manufacturer Test Suite

Does not support real-time processing functions, such as packet data transfer and video function tests

Discover Wh

Two Test Solutions on One Platform

Because two solutions runs on the MT8820B/MT8815B platform, the GPIB commands, measurement speed, and measurement results of Developer Test Suite (DTS) and Manufacturer Test Suite are the same. The lower internal temperature and fan noise when MTS is installed is also achieved as same level as when DTS is installed.

MT8820B/MT8815B Platform
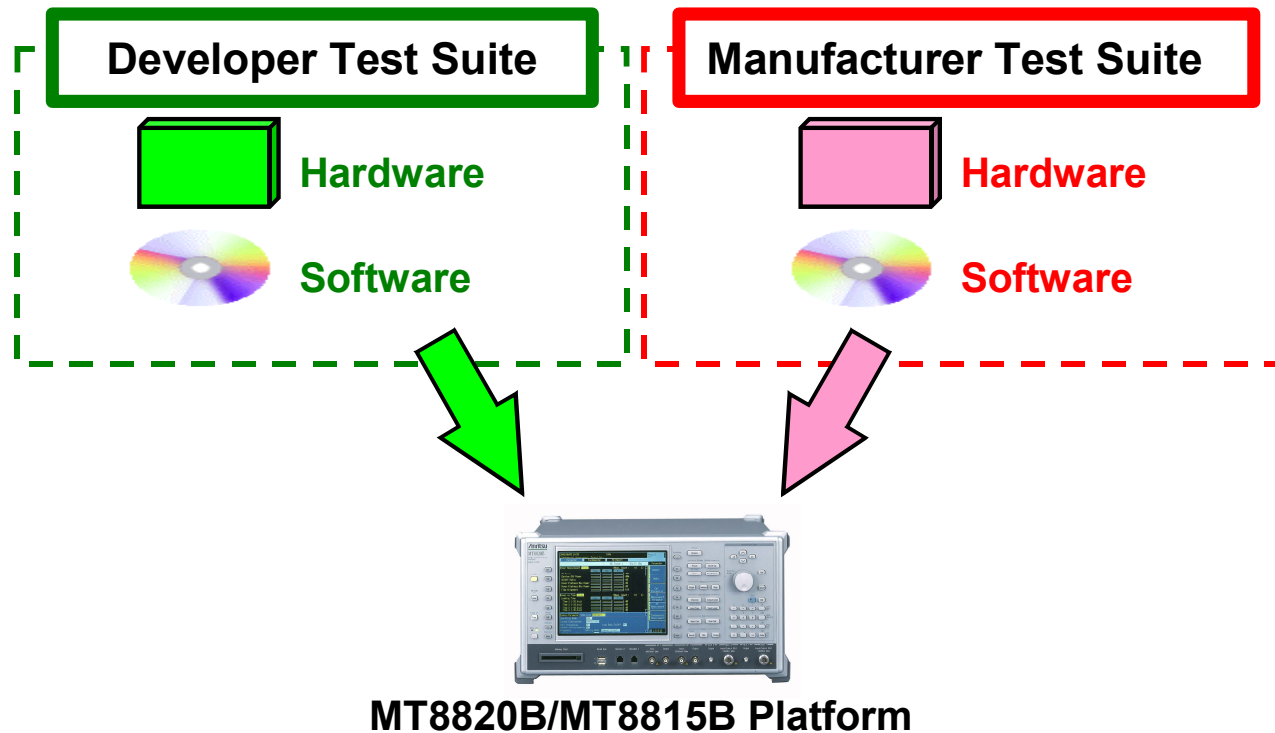
Comparison of Manufacturer Test Suite and Developer Test Suite Functions (W-CDMA)

The required functions are installed as options for Manufacturer Test Suite. Meanwhile, Developer Test Suite includes call processing and chip-specific adjustment as basic functions.

Developer Test Suite

MT8820B/MT8815B

+

Basic Configuration
MT8820B-001/MT8815B-001
MX882000C + MX882050C

RF Adjustment, W-CDMA high-speed adjustment

RF Parametric tests in test mode and with call processing

Manufacturer Test Suite

MT8820B/MT8815B

+

Basic Configuration
MT8820B-031/MT8815B-031
MX882030C

Options + MX882030C-050 + MX882030C-040

Call Processing Software

W-CDMA High-speed Adjustment

RF Adjustment, RF parametric tests in test mode

W-CDMA high-speed adjustment, RF parametric tests with call processing
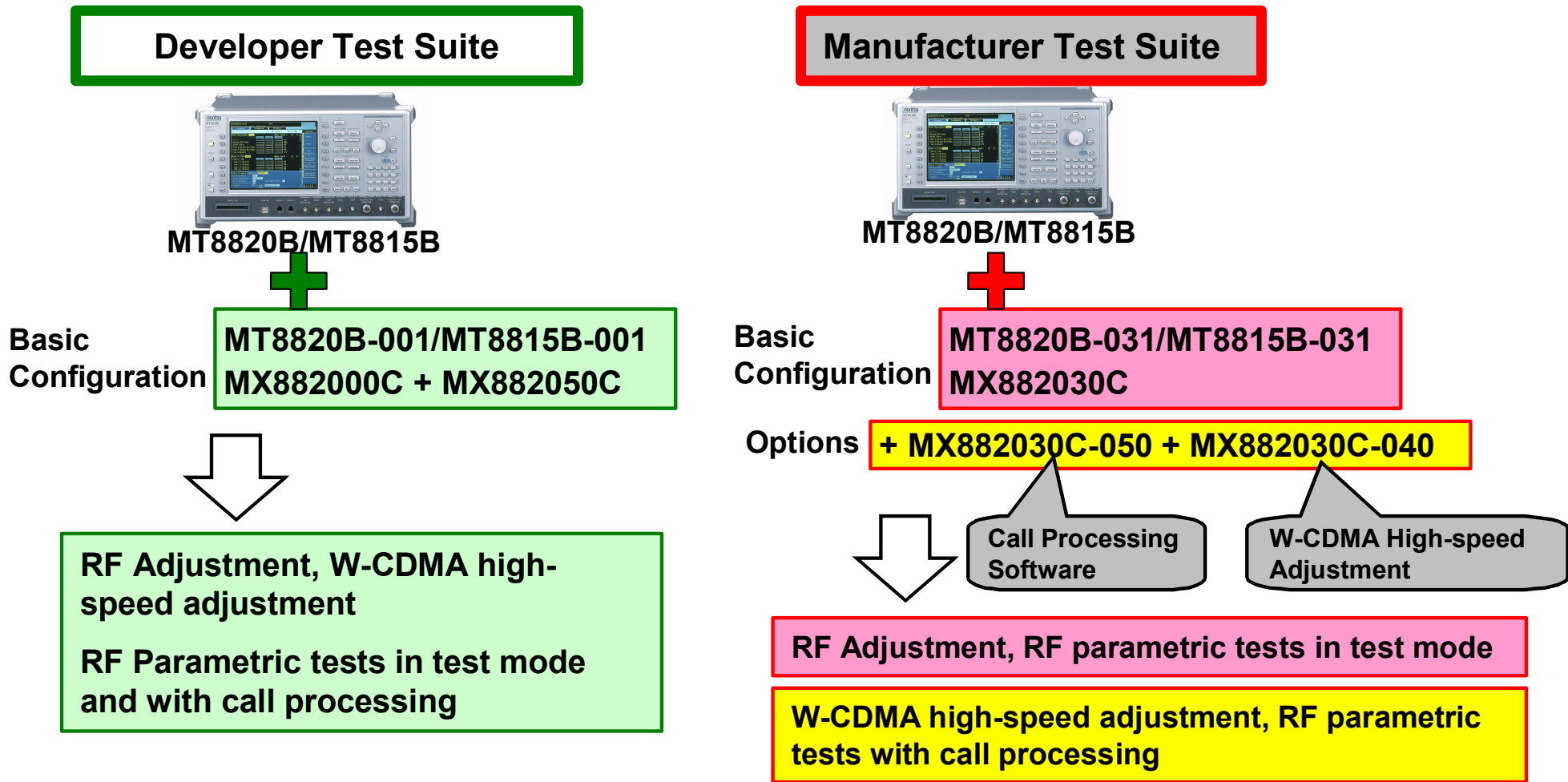
Comparison of Manufacturer Test Suite and Developer Test Suite Functions (W-CDMA)

The Manufacturer Test Suite and Developer Test Suite functions are compared below.

W-CDMA	Manufacturer Test Suite	Developer Test Suite
Packet data transfer	No	Option
Video function test	No	Option
Ciphering	No	Option
Call processing	Option	Yes
RMC	12.2k	12.2k/64k/144k/384k
Sequence monitor	No	Yes
High-speed adjustment	Option	Yes

TS34.121 chapters 5 and 6 specify RMC 12.2k for the RF parametric tests.

TS34.121 chapter 7 specifies RMC 12.2k, 64k, 144k and 384k for the RF performance tests.

Comparison of Manufacturer Test Suite and Developer Test Suite Functions (HSDPA)

The Manufacturer Test Suite and Developer Test Suite functions are compared below. Because DTS supports FRC H-Set 1 to 5, it supports throughput tests (demodulation of HS-DSCH – Single Link Performance) in addition to RF parametric tests.

HSDPA	Manufacturer Test Suite	Developer Test Suite
Packet data transfer	No	Option
FRC	H-Set 1	H-Set 1 to 5

TS34.121 chapters 5 and 6 specify FRC H-Set 1 for the RF parametric tests.
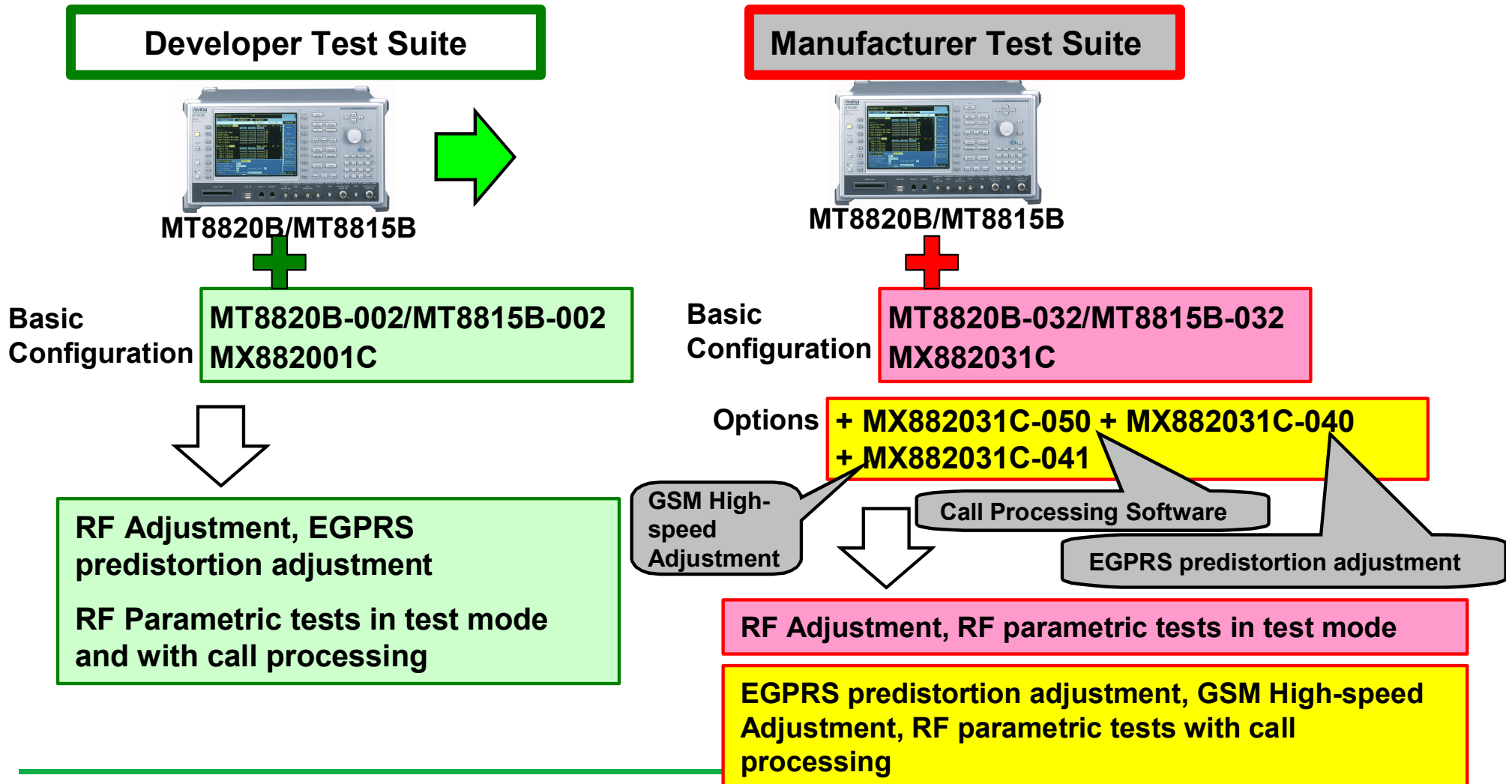TS34.121 chapter 9 specifies FRC H-Set 1 to 5 for the RF performance tests (throughput).

Comparison of Manufacturer Test Suite and Developer Test Suite Functions (HSUPA)

There are no functional differences in the MTS and DTS for HSUPA Software.

Comparison of Manufacturer Test Suite and Developer Test Suite Functions (GSM/GPRS)

The required functions are installed as options for Manufacturer Test Suite. Meanwhile, Developer Test Suite includes call processing and chip-specific adjustment as basic functions.

Developer Test Suite

MT8820B/MT8815B

Manufacturer Test Suite

MT8820B/MT8815B

Basic Configuration

MT8820B-002/MT8815B-002
MX882001C

Basic Configuration

MT8820B-032/MT8815B-032
MX882031C

RF Adjustment, EGPRS predistortion adjustment

RF Parametric tests in test mode and with call processing

Options
+ MX882031C-050 + MX882031C-040
+ MX882031C-041

GSM High-speed Adjustment

Call Processing Software

EGPRS predistortion adjustment

RF Adjustment, RF parametric tests in test mode

EGPRS predistortion adjustment, GSM High-speed Adjustment, RF parametric tests with call processing

MX882030C_31C-E-L-1

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Comparison of Manufacturer Test Suite and Developer Test Suite Functions (GSM/GPRS)

The Manufacturer Test Suite and Developer Test Suite functions are compared below. DTS supports half rate speech and AMR as channel coding in addition to full rate speech and enhanced full rate speech.

GSM/GPRS/EGPRS	Manufacturer Test Suite	Developer Test Suite
Packet data transfer	No	Option
Voice Codec	Option (EFS)	Option (EFS/AMR)
SMS	No	Yes
Predistortion adjustment	Option	Yes
GSM High-speed Adjustment	Option	Option
Channel coding	FS/EFS	FS/EFS/HS0/HS1/ AFS/AHS0/AHS1

Ordering Information

Manufacturer Test Suite

Model	Name
MT8815B-031	W-CDMA Measurement Hardware Lite
MT8820B-031	W-CDMA Measurement Hardware Lite
MX882030C	W-CDMA Measurement Software Lite
MX882030C-050	W-CDMA Call Processing Software
MX882030C-040	W-CDMA High-speed Adjustment
MX882030C-011	HSDPA Measurement Software
MX882030C-021	HSUPA Measurement Software
MX882030C-008	W-CDMA Band XI
MX882030C-009	W-CDMA Band IX
MX882030C-001	W-CDMA Voice Codec
MT8815B-032	TDMA Measurement Hardware Lite
MT8820B-032	TDMA Measurement Hardware Lite
MX882031C	GSM Measurement Software Lite
MX882031C-050	GSM Call Processing Software
MX882031C-040	EGPRS Predistortion Adjustment
MX882031C-041	GSM High-speed Adjustment
MX882031C-011	EGPRS Measurement Software
MX882031C-001	GSM Voice Codec

Note

MX882030C_31C-E-L-1

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Specifications are subject to change without notice.

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Fax: +55-11-3288-6940

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