

Discover What's Possible™



PRODUCT INTRODUCTION

MU860x20A

Demodulation Unit

MX860x20A

W-CDMA BER/BLER Measurement Software

ANRITSU CORPORATION

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MS860xA Transmitter Tester

MU860x20A Demodulation Unit

MX860x20A W-CDMA BER/BLER Measurement Software

Product Introduction (Ver.2.0)



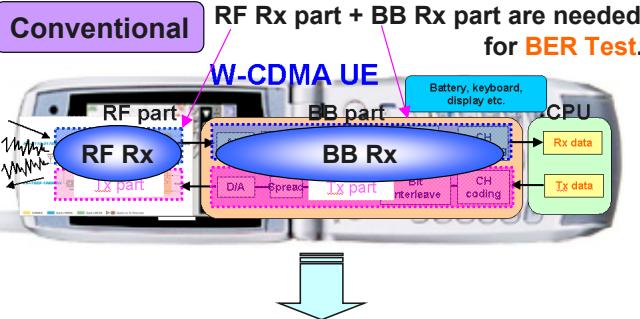
Product Marketing Dept.
Wireless Measurement Div.
Anritsu Corporation

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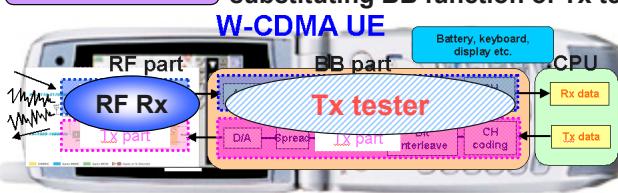
Product concept



BER test item

| TS 34.121 V3.0.1 | Terminal Conformance Specification | Measurement Method |
|------------------------|---|--------------------|
| 6 | Receiver Test | BER |
| 6.2 | Reference Sensitivity Level | BER |
| 6.3 | Maximum Input Level | BER |
| 6.4 | Adjacent Channel Selectivity (ACS) | BER |
| 6.5 | Blocking Characteristics | BER |
| 6.6 | Spurious Response | BER |
| 6.7 | Intermodulation Characteristics | BER |
| 6.8 | Spurious Emissions | Spectrum |
| 7 | Performance Requirement | |
| 7.2 | Demodulation in Static Propagation Conditions | BLER |

New proposal **BER Test** can be performed only in RF Rx part by substituting BB function of Tx tester.



Merits

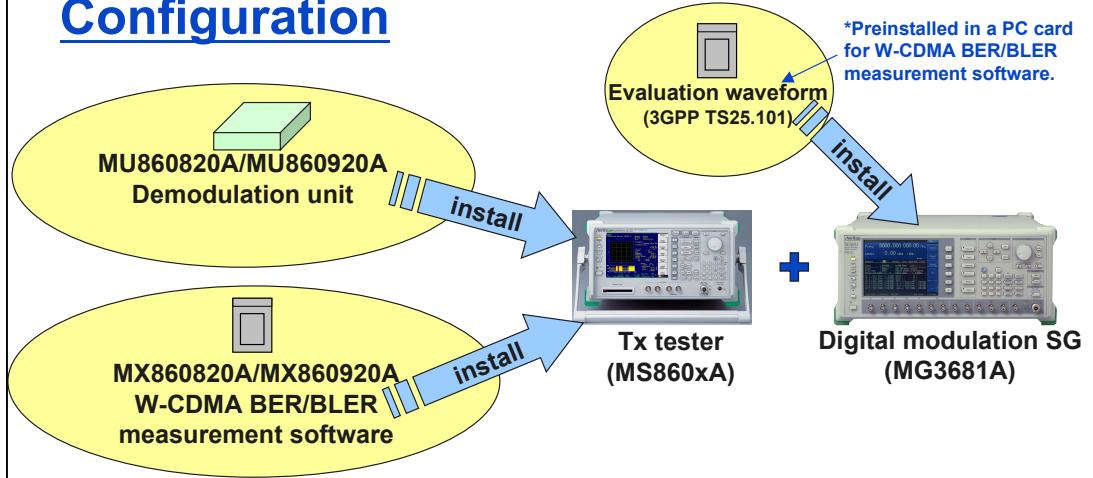
- Able to continue the development of RF part even if the BB part is not available for some reasons.
- Able to use it as a reference receiver of BB Rx part.
- Able to perform fault isolation in RF Rx part and BB Rx portion.

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Configuration



Features

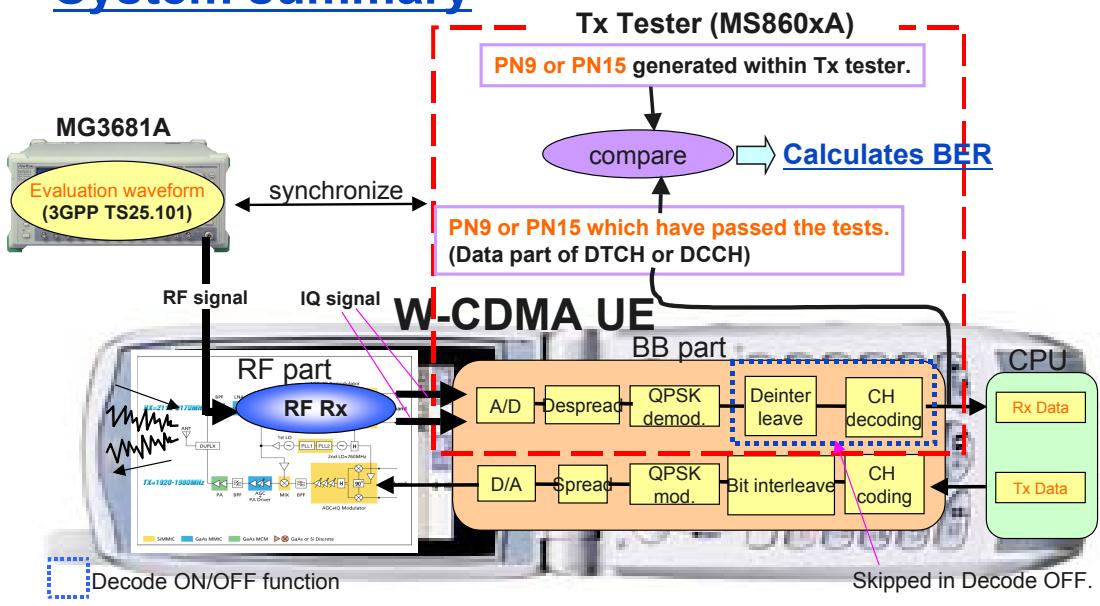
- ◆ RF Rx part of W-CDMA UE can be evaluated by BER/BLER.
- ◆ BER can be measured with/without Error correcting function.
- ◆ Demodulation data(Data,Clock,Enable,Error) is outputted from the rear of MS860xA.
(The development of data logging and analyzing application is being considered.)

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System summary

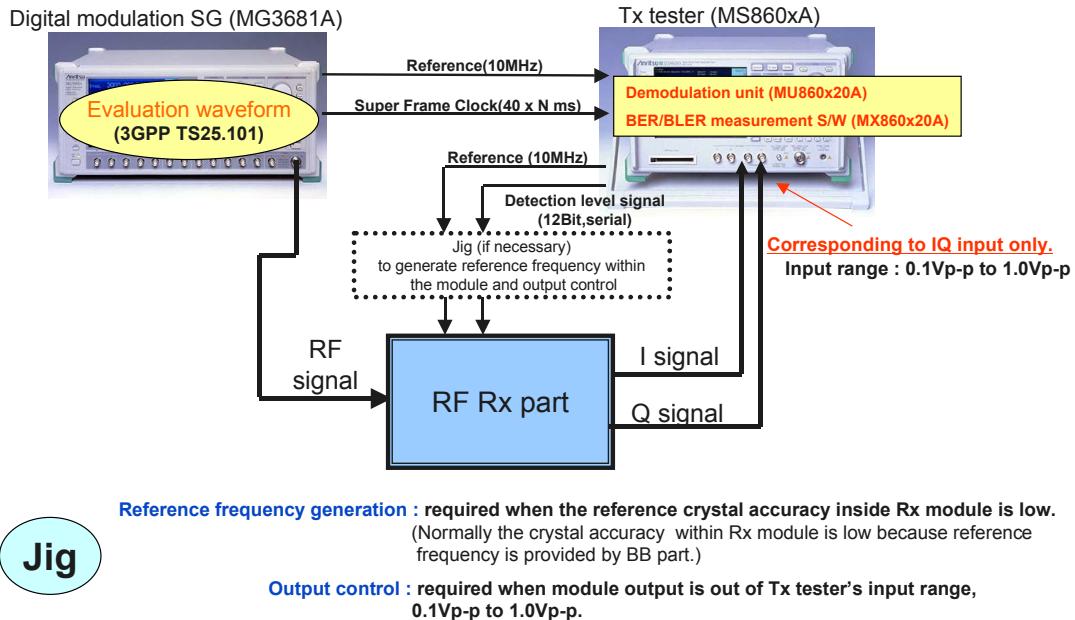


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Connections



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•Evaluation waveform (for MG3681A)

| File name | Contents |
|-------------------|--|
| P12v1 P12Nv1 | 3GPP TS25.101 A.3.1 DL reference measurement channel(12.2 kbps) |
| P64v1 P64Nv1 | 3GPP TS25.101 A.3.2 DL reference measurement channel(64 kbps) |
| P144v1 P144Nv1 | 3GPP TS25.101 A.3.3 DL reference measurement channel(144 kbps) |
| P384v1 P384Nv1 | 3GPP TS25.101 A.3.4 DL reference measurement channel(384 kbps) |
| RSv1 RSNv1 | For testing 6.2 Reception sensitivity (Transmitter Tester measures by setting to 12.2kbps) |
| MAXv1 MAXNv1 | For testing 6.3 Max. input level |

•Evaluation waveforms with N are without decoding.

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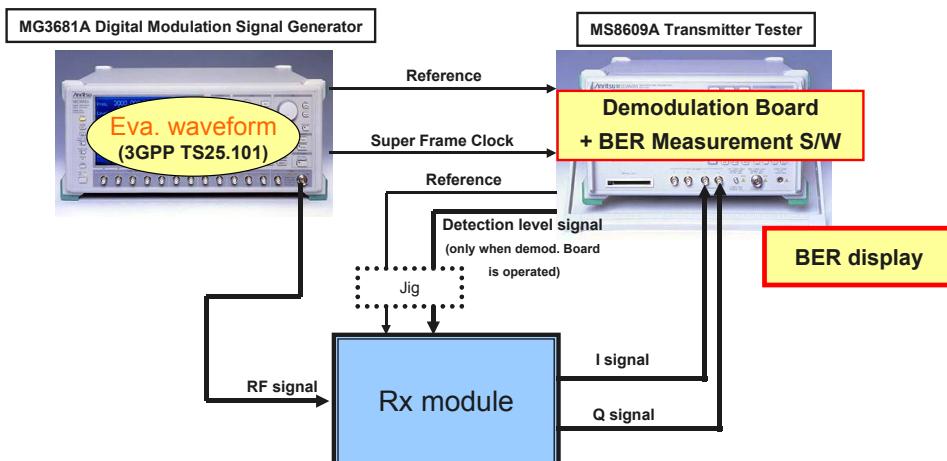
•Terminal test item(Rx)

| TS 34.121 V3.0.1 | Terminal Conformance Specification | Meas. function | Realtime BER supporting item |
|---------------------|---|-------------------|---------------------------------|
| 6 | Receiver Test | | |
| 6.2 | Reference Sensitivity Level | BER | ✓ |
| 6.3 | Maximum Input Level | BER | ✓ |
| 6.4 | Adjacent Channel Selectivity (ACS) | BER | ✓ |
| 6.5 | Blocking Characteristics | BER | ✓ |
| 6.6 | Spurious Response | BER | ✓ |
| 6.7 | Intermodulation Characteristics | BER | ✓ |
| 6.8 | Spurious Emissions | Spectrum | Unnecessary for module |
| 7 | Performance Requirement | | |
| 7.2 | Demodulation in Static Propagation Conditions | BLER | ✓ |
| 7.3 | Demodulation of DCH in Multi-path Fading Propagation Conditions | BLER | ✗ |
| 7.4 | Demodulation of DCH in Moving Propagation Conditions | BLER | ✗ |
| 7.5 | Demodulation of DCH in Birth-death Propagation Conditions | BLER | ✗ |
| 7.6 | Demodulation in of DCH in Base Station Transmit Diversity Mode | | |
| 7.6.1 | Demodulation of DCH in Open-loop Transmit Diversity Mode | BLER | ✗ |
| 7.6.2 | Demodulation of DCH in Closed Loop Transmit Diversity Mode | BLER | ✗ |
| 7.6.3 | Demodulation of DCH in Site Selection Diversity Transmission Mode | BLER | ✗ |
| 7.7 | Demodulation in Handover Conditions | | |
| 7.7.1 | Inter-Cell Soft Handover Performance | BLER | ✗ |
| 7.8 | Inner Loop Power Control in Downlink | BLER | ✗ |
| 7.9 | Outer Loop Power Control in Downlink | | ✗ |
| 7.10 | Downlink Compressed Mode | | ✗ |

Performance tests (7.2~7.10) are not supported because they are performed under multi-path fading environment and BB performance affects the test result.

•Down link

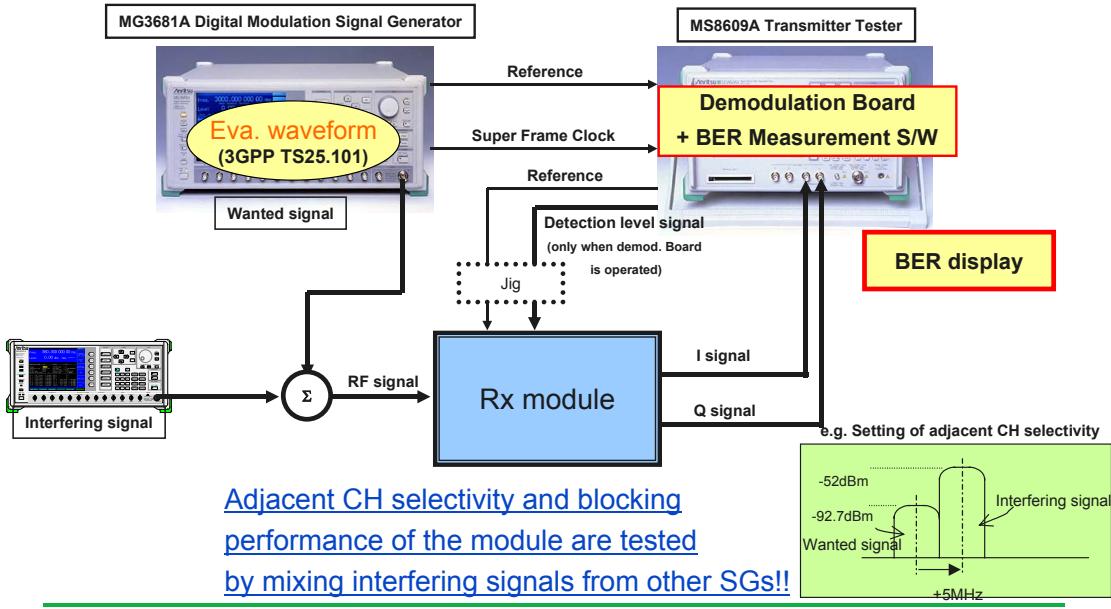
6.2 Reception sensitivity
6.3 Max. input level



Tests are performable at SG output level set to module's reception sensitivity level or max. input level !!

•Down link

- 6.4 Adjacent CH selectivity
- 6.5 Blocking characteristic
- 6.6 Spurious response



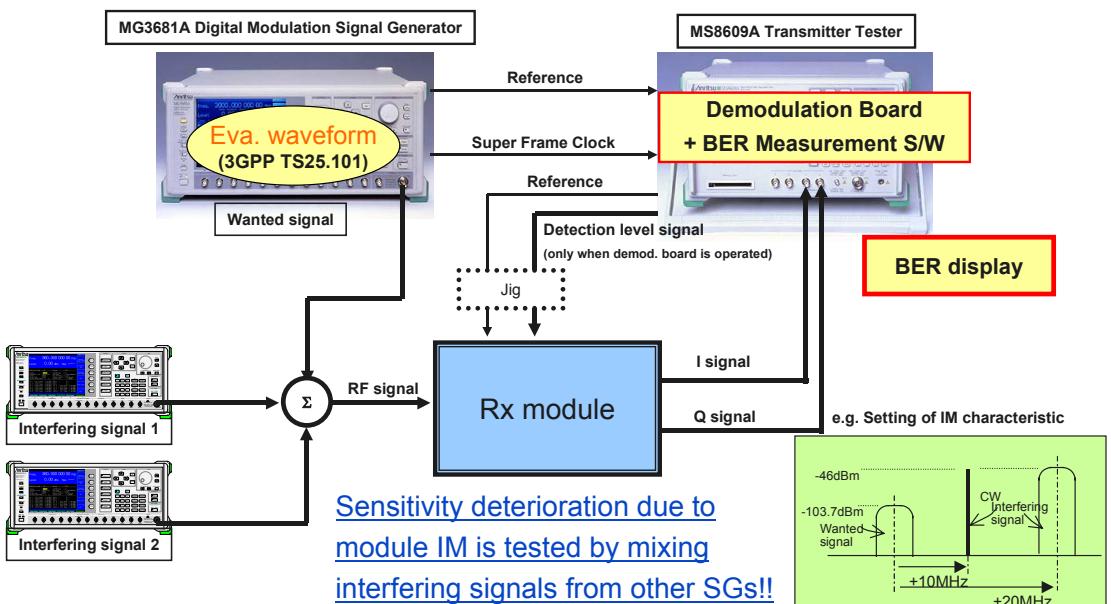
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- 6.7 Inter-modulation characteristic



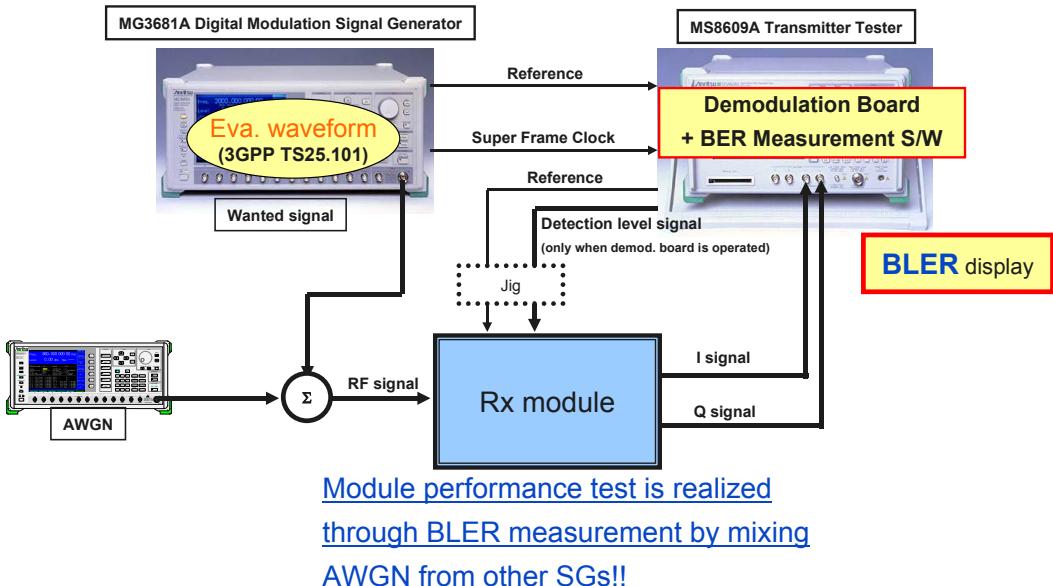
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7.2 Performance test



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•Terminal test items (Tx)

Measured by **MX860x01B W-CDMA Measurement Software.**

*Both W-CDMA BER/BLER software and demodulation unit are not necessary.

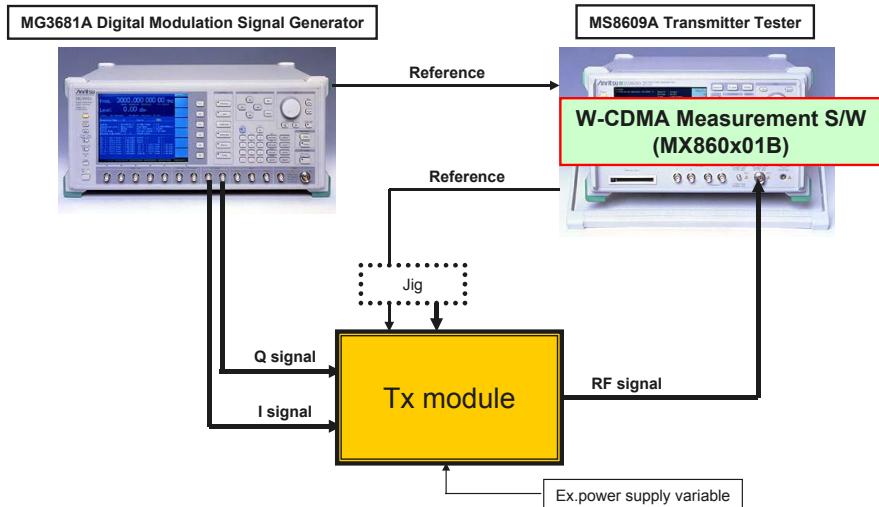
| TS 34.121 V3.0.1 | Terminal Conformance Specification | Meas.function | MX860x01B supporting items |
|---------------------|---|---------------|-------------------------------|
| 5 | Transmitter Test | | |
| 5.2 | Maximum Output Power | Power Level | ✓ |
| 5.3 | Frequency Stability | Frequency | ✓ |
| 5.4 | Output Power Dynamics in the Uplink | | |
| 5.4.1 | Open Loop Power Control in the Uplink | Power Level | Unnecessary for module |
| 5.4.2 | Inner Loop Power Control in the Uplink | Power Level | Unnecessary for module |
| 5.4.3 | Minimum Output Power | Power Level | ✓ |
| 5.5 | Transmit ON/OFF Power | | |
| 5.5.1 | Transmit OFF Power | Power Level | Unnecessary for module |
| 5.5.2 | Transmit ON/OFF Time Mask | Power Level | Unnecessary for module |
| 5.6 | Change of TFC | Power Level | Unnecessary for module |
| 5.7 | Power Setting in Uplink Compressed Mode | Power Level | Unnecessary for module |
| 5.8 | Occupied Bandwidth | Spectrum | ✓ |
| 5.9 | Spectrum Emission Mask | Spectrum | ✓ |
| 5.10 | Adjacent Channel Leakage Power Ratio (ACLR) | Spectrum | ✓ |
| 5.11 | Spurious Emissions | Spectrum | ✓ |
| 5.12 | Transmit Intermodulation | Spectrum | Unnecessary for module |
| 5.13 | Transmit Modulation | | |
| 5.13.1 | Modulation Accuracy | EVM | ✓ |
| 5.13.2 | Peak Code Domain Error | PCDE | ✓ |

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•Up link

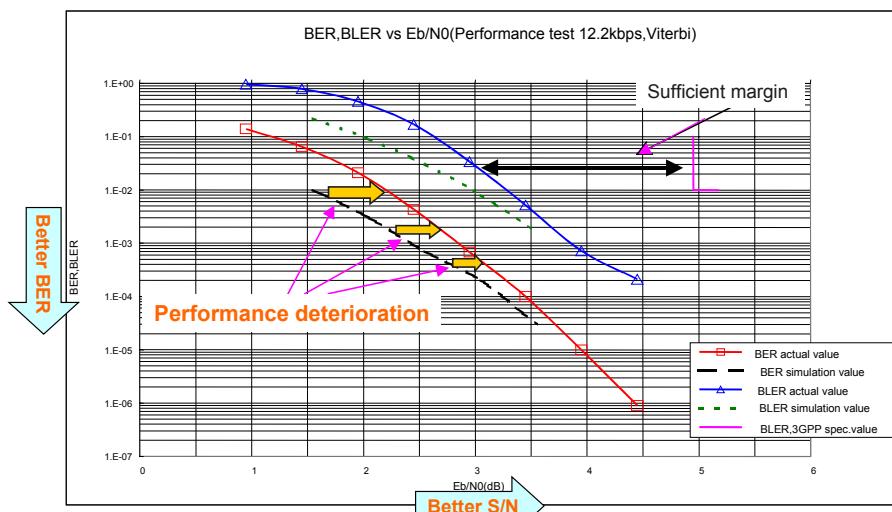


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Example of measurement result (12.2kbps)



*BER performance deteriorates 0.3dB(12.2kbps) to 1dB(384kbps) in comparison with simulation value.

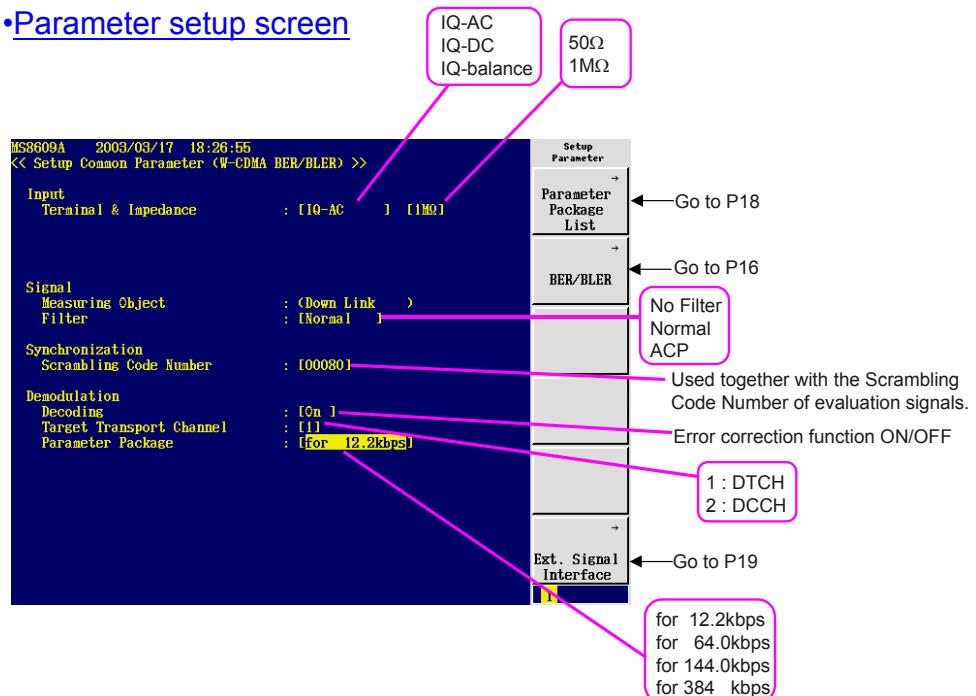
Normally, however, BB part of mobile equipment has deterioration of approx. 1dB in its BER performance. Therefore, **satisfactory performance is maintained**.

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•Parameter setup screen

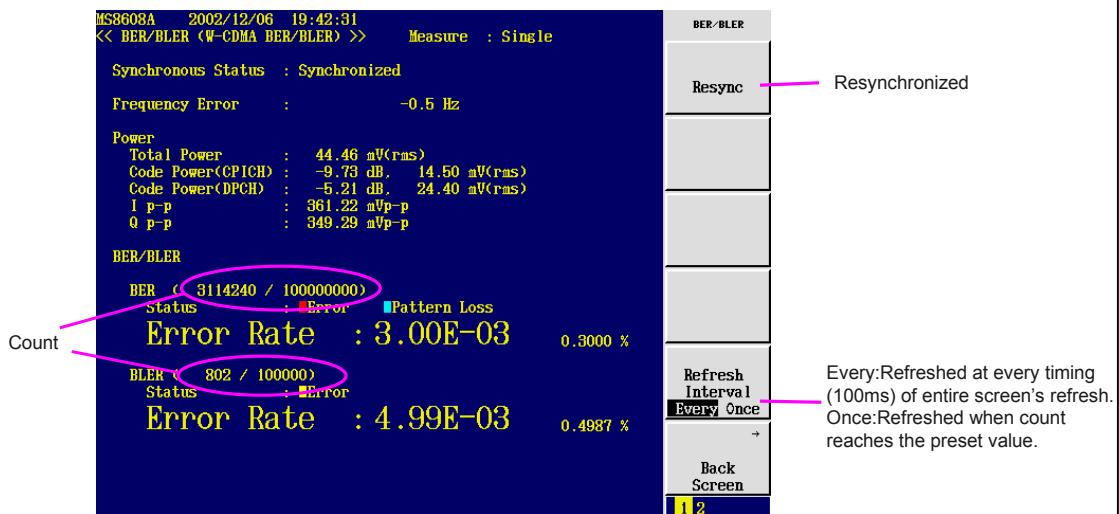


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•BER/BLER measurement screen (1)

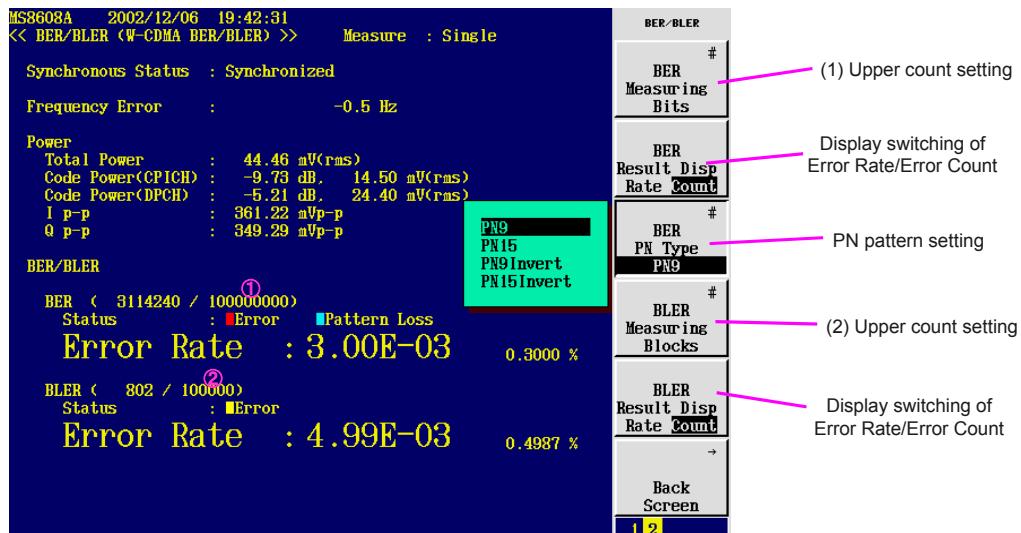


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•BER/BLER measurement screen (2)

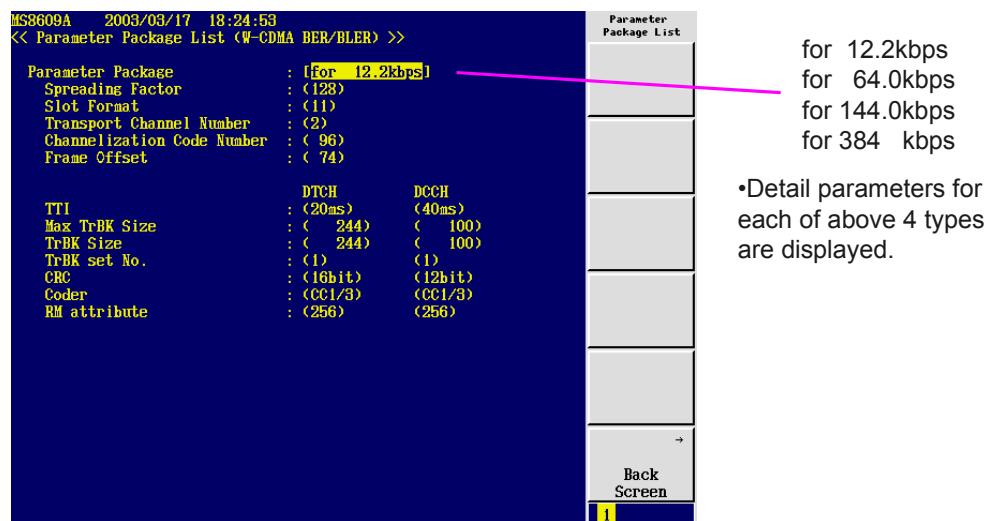


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•Parameter package list screen



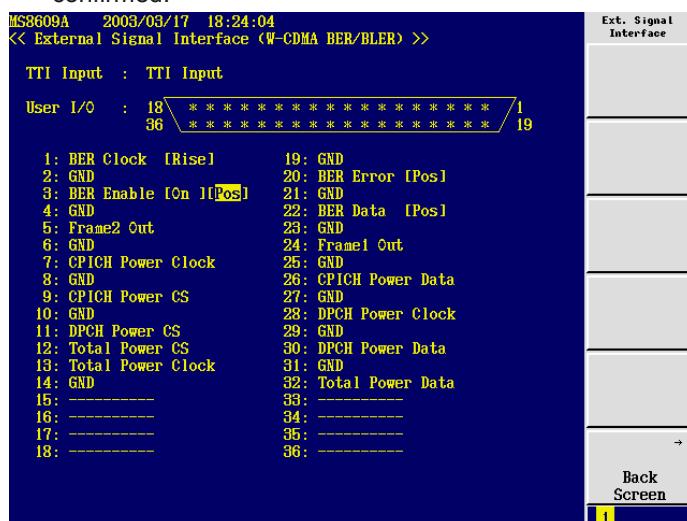
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- Confirmation screen of rear connector's pin assignment

- Pin assignment for signals outputted from the rear can be confirmed.



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Merits of Real-time BER

- Estimation of BER by NF and EVM, etc. → Real-time BER

Merit Accuracy in meas. result allows for deteriorating the performance to the threshold of required level. As a result, cheaper components can be adopted .

 Cost reduced

- Measurement of BER

- Measured by the BB Rx part of conventional model. → Real-time BER

Merit Error correct OFF function enables to observe minute errors less than $1.0 \times E-3$, thus, more reliable quality assurance is achieved. → **More reliable quality assurance**

◆ Measured by the BB Rx part of newly-developed model. → Real-time BER

Merit Not affected by the development status of BB Rx part.

Merit Able to identify in which bugs are caused, RF Rx part or BB Rx part. **Easy to perform fault isolation**

◆ Measured by simulation with a PC. → Real-time BER

Merit BER measurement is performed in real time, which has ever taken extremely long time due to simulation.  **Dev. efficiency is improved.**

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Specifications are subject to change without notice.

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