PRODUCT INTRODUCTION

MT8820A
Radio Communication Analyzer

ANRITSU CORPORATION
1. IMT-2000 - R&D, Standardization and Anritsu’s Stance

1998-----3GPP was established for the purpose of W-CDMA system integration proposed mainly by Japan and Europe. Anritsu joined in the 3GPP working group as an original member.

(3GPP: 3rd Generation Partnership Project)

Afterwards, 3GPP2 was established as a committee for CDMA2000 standard adopted mainly in the U.S.

1999-----Basic standards were decided for 3GPP (Release 99) and 3GPP2 (Release A) at the end of the year.

Anritsu contributed to the standardization activities by assigning Sub Chairman for T1 and Chairman for T1-Sig in 3GPP UE Test WG.

At the same time, Anritsu started to provide the test solution conforming to the standard specifications.

2000-----Anritsu provided W-CDMA BS/UE Conformance Test System to TELEC.

2001-----3GPP fixed the specifications for Release 99 (corresponding to 3) and starts to discuss Release 4 and 5 for level up as UMTS including GSM.

3GPP2 urged the standardization of intelligent system exclusive for Packet Data communication.

Anritsu developed various W-CDMA measurement solutions for BS/UE production, BS construction and service area status testing as well as starting to support CDMA2000.

2002-----Anritsu collaborates with 7 Layers Corp. in Germany for the business of Conformance Test System.

1. IMT-2000 - R&D, Standardization and Anritsu’s Stance (contd.)

2003-----Anritsu’s ME7873A W-CDMA TRX/Performance Test System has been approved by GCF (GCF: Global Certification Forum) regarding 3GPP TS34.121 RF test (10 items) defined in 3GPP standard for the first time in industry.

Furthermore, the MX785201A W-CDMA Protocol Test System has been approved by GCF regarding 3GPP protocol test in 3GPP TS34.123-3 (13 items).
2. Outline of MT8820A

One-box type radio equipment tester has been developed for the first time in the world by engaging in the 3G communication system, W-CDMA from its trial stage (Japan), following the major communication system for 1G and 2G.

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MT8820A is...

the measuring instrument platform which can perform connection testing and transmission/reception testing of 3G UE with standalone equipment.

The MT8820A hardware platform covers a frequency range of 30 MHz to 2.7 GHz. When dedicated measurement software and hardware are installed, this single platform supports evaluation of all the main transmission/reception characteristics for W-CDMA, GSM/GPRS, CDMA2000 1X and PDC terminals. The built-in GPIB interface enables MT8820A to be integrated into automated production lines as well as to configure an automated test system for after-sales maintenance.
MT8820A is the new platform targeting at 3G, supporting W-CDMA/GSM/GPRS/CDMA2000/PDC measurement.

for UE Development
Efficient and detailed UE evaluation is required in development site, where MT8820A is effectively used for transmission/reception testing and call processing test with standalone equipment.

for Maintenance
UE can be evaluated by simple operation. Also, the waveform of defective UE can be easily checked.

For UE Production
The throughput improved by high-speed measurement contributes to efficient and high-quality UE adjustment/inspection.
3. Features of MT8820A

Single chassis is able to perform transmission/reception characteristic test and call processing test of UE.

Cost & Space: 1/3

Multi System Support

CDMA2000 unit (for CDMA2000 1X), TDMA unit (for GSM, for PDC) and W-CDMA unit can be installed simultaneously, which additionally supports UMTS terminal test.
User friendly MMI (1)

Excellent usability and operability are achieved by minimized screen hierarchies.

As shown on W-CDMA parameter screen (left), items from Common (screen top) through Fundamental Measurement (screen bottom) are configured visually in one screen, enabling smooth screen shift with Encoder/Scroll/Function(Tag) keys.

User friendly MMI (2)

Selected items can be measured in a batch through one touch operation.

Front Panel (Measurement start/stop key)

Continuous Mode
Single Mode
RF Characteristic Test is performable by Call Processing (including Loop-back Mode)

RF transmission/reception characteristic can be measured under call processing state by controlling UE with Call Processing function.

RF Characteristic Test is performable in Call Processing OFF

RF transmission/reception test is performable by outputting UL synchronized with DL. Also, BER can be measured by inputting the data and clock directly from UE.
## 4. Application Support Table

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>W-CDMA (Terminal testing)</th>
<th>GSM (Terminal testing)</th>
<th>W-CDMA / GSM (Dual-mode Terminal testing (with audio))</th>
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<th>GSM (Terminal testing)</th>
<th>W-CDMA / GSM (Dual-mode Terminal testing (with audio))</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT8820A Main Frame</td>
<td>✓</td>
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<tr>
<td>MT8820A-01 W-CDMA Measurement Hardware</td>
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<td>MT8820A-02 TDMA Measurement Hardware</td>
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<td>MT8820A-11 Audio Board</td>
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<tr>
<td>MX882000A W-CDMA Measurement Software (requires MT8820A-01)</td>
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✓ Option required

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## 4. Application Support Table (contd.)

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>PDC Terminal testing</th>
<th>CDMA2000 Terminal testing</th>
<th>CDMA2000 Terminal testing</th>
<th>CDMA2000 External Packet Data</th>
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## 5. Measurement Items for W-CDMA

<table>
<thead>
<tr>
<th>Measurement Items for W-CDMA</th>
<th>TS 34.121</th>
<th>Terminal Conformance Specification</th>
<th>Function</th>
<th>MT8820A</th>
<th>Reference</th>
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<tbody>
<tr>
<td>5.1 Transmitter Test</td>
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<td>5.2 Maximum Output Power</td>
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<td>Power Level</td>
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<td>5.3 Frequency Stability</td>
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<td>5.4 Output Power Dynamics in the Uplink</td>
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<td>5.5 Transmit ON/OFF Power</td>
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<td>5.8 Occupied Bandwidth</td>
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<td>5.9 Spectrum Emission Mask</td>
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<td>5.10 Adjacent Channel Leakage Power Ratio</td>
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<td>5.13 Transmit Modulation</td>
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<td>5.13.1 Modulation Accuracy</td>
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<td>5.13.2 Peak Code Domain Error</td>
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<td>6.1 Receiver Test</td>
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<td>6.2 Reference Sensitivity Level</td>
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<td>7 Performance requirements</td>
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<td>7.2.1 Demodulation of Dedicated Channel(DCH)</td>
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<td>BLER</td>
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</table>

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## 6. Measurement Items for GSM

### 6.1 Measurement items for GSM

#### Transmission Measurements
- Transmission power
- Power vs Time (template/mask evaluation)
- Frequency error
- Phase error (rms and peak)
- Output spectrum

#### Reception Measurements
- FER/BER/CRC error rate

#### Call Processing
- Location registration, origination, termination, communication, hand over, disconnection from UE, disconnection from network
- UE report monitor (RxLev, RxQual and others)
6.2 Measurement items for GPRS

**Transmission Measurements**
- Carrier frequency and frequency error
- Phase error (rms and peak)
- Burst power
- Power vs time *1
- Output RF spectrum due to modulation
- Output RF spectrum due to switching *1

**Reception Measurements**
- Block error rate (BLER)

*1) Measuring object is single slot which user assigns.

**Call Processing**
- Coding schemes: CS-1, CS-2, CS-3, CS-4
- Multi-slot configurations: 1+1, 2+1, 3+1, 4+1, 2+2, 3+2 (downlink+uplink)
- Multi-slot classes supported: 1 through 6, 8 through 10
- Test mode A
- GSM400/GSM850/GSM900/DCS1800/PCS1900

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**Transmission Measurements**
- Transmission Power
- Modulation Analysis
- Code Domain power
- Occupied Bandwidth
- Spurious Emission

**Reception Measurements**
- Frame Error Rate (FER)

**Call Processing**
- Band Class 0 to 10
- SO 1, 2, 3, 9, 32 (TDSO), 33, 55, 32768
- Location registration, origination, termination, communication, disconnection from CDMA2000 terminal, disconnection from network
- MS report monitor (MS ID)
- Universal Handoff (Band Class, Channel, P_REV, RC, SO)
8. Measurement items for PDC

**Transmission Measurements**
- Transmission Power
- Occupied Bandwidth
- Modulation Accuracy
- Adjacent Channel Power
- Transmission Speed

**Reception Measurements**
- BER

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9. Merits of Introducing MT8820A

No need of equipment replacement even for the manufacture of W-CDMA/GSM, W-CDMA/CDMA2000 and CDMA2000/GSM DUAL mode phones in future

- MT8820A is the first to support W-CDMA measurement in the world.
- Well-developed functions support various phases ranging from R&D to manufacturing and maintenance.
- More efficient production cost is achieved than aging equipment supporting 3G.

**Advanced measurement technology has increased UE throughput to 1.4 times and more of competitors. (W-CDMA measurement)**

- Contributes to the cost reduction for UE production.

**Satisfactory support by 3-year/5-year warranty service (optional)**

- Quick and accurate calibration and repair services are provided.
10. Conclusion

With our Signalling & RF technologies, Anritsu provides complete support for customers’ 3G business ranging from R&D through manufacturing and maintenance.
ANRITSU CORPORATION
1800 Ohna, Atsugi-shi, Kanagawa, 243-8555 Japan
Phone: +81-046-223-1111
Fax: +81-46-296-1264

U.S.A.
ANRITSU COMPANY
North American Region Headquarters
1155 East Collins Blvd., Richardson, TX 75081, U.S.A.
Toll Free: 1-800-ANRITSU (267-4878)
Phone: +1-972-644-1777
Fax: +1-972-671-1877

Canada
ANRITSU ELECTRONICS LTD.
700 Silver Seven Road, Suite 120, Kanata,
ON K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

Brasil
ANRITSU ELETRÔNICA LTDA.
Praca Amadeu Amaral, 27 - 1 andar
01327-010 - Paraíso, Sao Paulo, Brazil
Phone: +55-11-2283-2511
Fax: +55-21-2866540

U.K.
ANRITSU LTD.
200 Capability Green, Luton, Bedfordshire LU1 3LU, U.K.
Phone: +44-1582-433280
Fax: +44-1582-731303

Germany
ANRITSU GmbH
Grafenberger Allee 64-56, 40237 Düsseldorf, Germany
Phone: +49-211-96855-0
Fax: +49-211-96855-55

France
ANRITSU S.A.
9, Avenue du Québec Z.A. de Courtabœuf 91951 Les Ulis Cedex, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

Italy
ANRITSU S.p.A.
Via Elio Vittorini, 129, 00144 Roma EUR, Italy
Phone: +39-06-509-9711
Fax: +39-06-502-24-25

Sweden
ANRITSU AB
Botvid Centr, Fittja Backe 1-3 145 84 Stockholm, Sweden
Phone: +46-853470700
Fax: +46-853470739

Singapore
ANRITSU PTE LTD.
10, Hoe Chiang Road #07-01/02, Keppel Towers,
Singapore 089315
Phone: +65-6282-2400
Fax: +65-6282-2533

Hong Kong
ANRITSU COMPANY LTD.
Suite 923, 9 F., Chinachem Golden Plaza, 77 Mody Road, Tsimshatsui East, Kowloon, Hong Kong, China
Phone: +852-2301-4980
Fax: +852-2301-3945

P. R. China
ANRITSU COMPANY LTD.
Beijing Representative Office
Room 1515, Beijing Fortune Building, No. 5 North Road, the East 3rd Ring Road, Chao-Yang District
Beijing 100004, P.R. China
Phone: +86-10-6590-9230

Korea
ANRITSU CORPORATION
8F Hyeon Juk Bldg, 832-41, Yoosam-dong,
Kangnam-ku, Seoul, 135-080, Korea
Phone: +82-2-553-6603
Fax: +82-2-553-6604-5

Australia
ANRITSU PTY LTD.
Unit 3/170 Forster Road Mt. Waverley, Victoria, 3149, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

Taiwan
ANRITSU COMPANY INC.
7F, No. 316, Sec. 1, NeiHu Rd., Taipei, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817

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