

# TD-LTE/TD-SCDMA/GSM All-In-One RF Tester

MT8820C

Radio Communication Analyzer

# Anritsu MT8820C TD-LTE/TD-SCDMA/GSM All-In-One RF Tester



**Version 1.0**  
**Oct 2012**

**ANRITSU CORPORATION**

# Key Features

- ✓ All-in-One TD-LTE/TD-SCDMA/GSM RF Tester w/ Signaling
- ✓ Available all R&D RF and Manufacturing process
- ✓ Importance of Signaling mode
- ✓ All 3GPP TRX compliance
- ✓ Easy execution of 3GPP test
- ✓ ALL 3GPP Bands supported
- ✓ Various and Useful features
- ✓ TD-LTE DL 2x2 MIMO Throughput w/ UE Cat.4
- ✓ TD-SCDMA HSPA, Function Test
- ✓ GSM/EGPRS(EDGE) features
- ✓ Technical Support in China

# All-in-One TD-LTE/TD-SCDMA/GSM RF Tester w/ Signaling

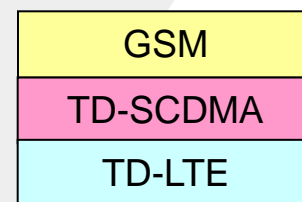
## Anritsu MT8820C is **ONLY** RF Tester with Signaling of TD-LTE/TD-SCDMA/GSM in One Box in the world!

As you know, CMCC which is one of the largest network operator in the world plan to launch TD-LTE in years in addition to current TD-SCDMA/GSM service. Therefore, the TD-LTE/TD-SCDMA/GSM mobile terminals are demanded.

All-in-One MT8820C supporting all test functions, including signaling, is the ideal RF tester for RF R&D and manufacturing of TD-LTE/TD-SCDMA/GSM mobile terminals . It gives you cost-benefit, small footprint, and efficient work over other solutions like two boxes.



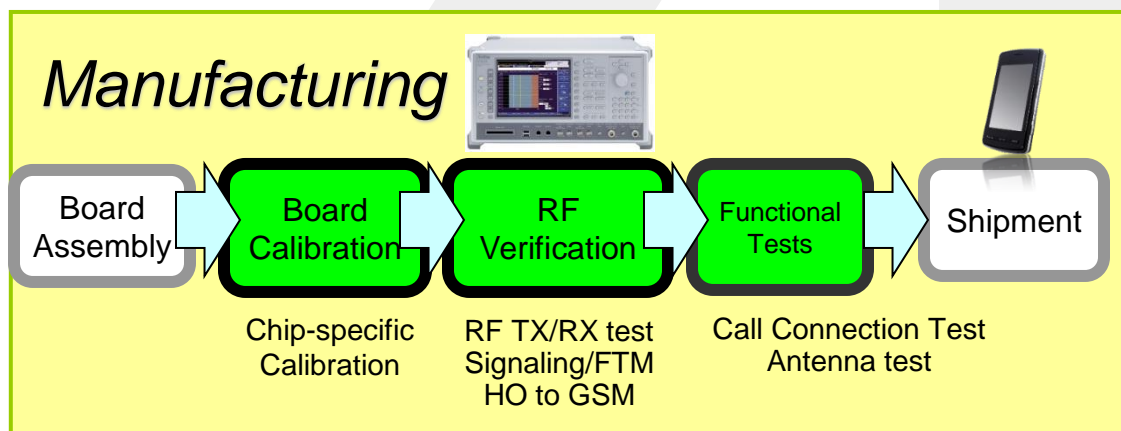
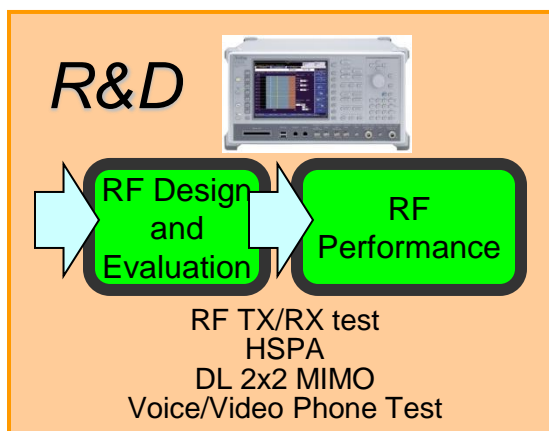
*All-In-One!*



# Available all R&D RF and Manufacturing process





The various MT8820C functions, such as calibration, RF parametric testing, signaling, non-signaling, voice calling, video calling, HSPA, 2x2 MIMO support all RF R&D and Manufacturing process for TD-LTE/TD-SCDMA/GSM terminals shown below.

	Call Connection	FTM (Non-signaling)	Chip-specific Calibration	TX test	RX test	Function Test
GSM/GPRS/EGPRS	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	Audio, Voice call
TD-SCDMA/HSPA	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	Audio, Voice call, video call, HO to GSM
LTE TDD	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>	DL 2x2 MIMO, IP throughput



# Importance of Signaling mode

Some of 3GPP TRX test items to be executed requires “Signaling” function in the RF tester, Since the UE is controlled dynamically by signaling messages during the test. Without signaling function, all 3GPP TRX test item could not be supported. MT8820C support signaling function of all TD-LTE/TD-SCDMA/GSM in one box.

	TD-LTE w/ Signaling	TD-SCDMA w/ Signaling	GSM w/ Signaling
 Anritsu MT8820C	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>
 Competitor A Product 1 Product 2	<i>Not Supported</i> <i>Supported</i>	<i>Supported</i> <i>Not Supported</i>	<i>Supported</i> <i>Not Supported</i>
 Competitor B Product 3	<i>Supported</i>	<i>Not Supported</i>	<i>Supported</i>
 Competitor C Product 4	<i>Not Supported</i>	<i>Supported</i>	<i>Supported</i>

In addition, MT8820C signaling function is very reliable and stable, because GSM, TD-SCDMA, and TD-LTE has been supported since 2001, 2007, and 2010, respectively.

# All 3GPP TRX Compliance

Anritsu MT8820C supports all 3GPP TRX test items of TD-LTE/TD-SCDMA, and almost of GSM. For more detail, refer to MT8820C Application Notes <http://www.anritsu.com/en-us/products-solutions/products/mt8820c.aspx>

## TD-LTE

1.2. 3GPP Measurement Specification (3GPP TS 36.521-1 V9.7.0(2011-12)) Table

Item	Comment	Non-Call Processing <sup>1)</sup>	Call Processing
6	Transmitter Characteristics		
6.2.1	UE Maximum output power	✓	✓
6.2.2	Maximum Power Reduction (MPR)	✓	✓
6.2.3	Additional Maximum Power Reduction (A-MPR)	✓	✓
6.2.4	Configured maximum transmitted output power	✓	✓
6.3	Output power dynamics	✓	✓
6.3.1	Void	✓	✓
6.3.2	Minimum output power	✓	✓
6.3.3	Transmit OFF power	✓	✓
6.3.4	ON/OFF time mask	✓	✓
6.3.4.1	General ON/OFF time mask	✓	✓
6.3.4.2	PRACH and SRS time mask	✓	✓
6.3.4.2.1	PRACH time mask	✓	✓
6.3.4.2.2	SRS time mask	✓	✓
6.3.5	Power control	✓	✓
6.3.5.1	Power control absolute power tolerance	✓	✓
6.3.5.2	Power control relative power tolerance	✓	✓
6.3.5.3	Aggregate power control tolerance	✓	✓
6.4	Void	✓	✓
6.5	Transmit signal quality	✓	✓
6.5.1	Frequency error	✓	✓
6.5.2	Transmit modulation	✓	✓
6.5.2.1	Error Vector Magnitude (EVM)	✓	✓
6.5.2.1A	PUSCH-EVM with exclusion period	✓	✓
6.5.2.2	Carrier leakage	✓	✓
6.5.2.3	In-band emissions for non allocated RB	✓	✓
6.5.2.4	EVM equalizer spectrum flatness	✓	✓
6.6	Output RF spectrum emissions	✓	✓
6.6.1	Occupied bandwidth	✓	✓
6.6.2	Out-of-band emission	✓	✓
6.6.2.1	Spectrum emission mask	✓	✓
6.6.2.2	Additional spectrum emission mask	✓	✓
6.6.2.3	Adjacent Channel Leakage Power Ratio	✓	✓
6.6.2.4	Additional ACLR requirements	✓	✓
6.6.3	Spurious emissions	✓	✓
6.6.3.1	Transmitter Spurious emissions	Requires external equipment	✓
6.6.3.2	Spurious emission band UE co-existence	Requires external equipment	✓
6.6.3.3	Additional spurious emissions	Requires external equipment	✓
6.7	Transmit intermodulation	Requires external equipment	✓
7	Receiver Characteristics	✓	✓
7.3	Reference sensitivity level	✓	✓
7.4	Maximum input level	✓	✓
7.5	Adjacent Channel Selectivity (ACS)	Requires external equipment	✓
7.6	Blocking characteristics	✓	✓
7.6.1	In-band blocking	Requires external equipment	✓
7.6.2	Out-of-band blocking	Requires external equipment	✓
7.6.3	Narrow band blocking	Requires external equipment	✓
7.7	Spurious response	Requires external equipment	✓
7.8	Intermodulation characteristics	✓	✓
7.8.1	Wide band intermodulation	Requires external equipment	✓
7.8.2	Void	✓	✓
7.9	Spurious emissions	Requires external equipment	✓

✓: Supported | ✓: Requires external equipment (SPA or SG) | △: Future Support | ✗: Not Supported

<sup>1)</sup> Non-Call Processing does not support call processing function. In addition, because Loop Back and UL Power Control of payload data cannot be controlled, UEs must output signals matching test conditions.

<sup>2)</sup> This application note does not explain measurement procedures for appropriate test items.

<sup>3)</sup> Supports measurements only broadcast information is fixed.

<sup>4)</sup> Outputs DL SMC defined from TS 36.521-1 Annex A Table A.3.2-1 to Table A.3.2-4 in fixed pattern (ARF).

<sup>5)</sup> Throughput measurements supported at UE side.

## TD-SCDMA

1.2. 3GPP Measurement Specification (3GPP TS 34.122 V9.4.0) Table

Item	Comment	
5	Transmitter Characteristics	
5.2	User Equipment maximum output power	✓
5.2A	User Equipment maximum output power with E-DCH	MX882007C-021
5.2B	User Equipment maximum output power with HS-SICH and DPCCH	MX882007C-011
5.3	UE frequency stability	✓
5.4	Output Power Dynamics	✓
5.4.1.3	Open loop power control	✓
5.4.1.4	Closed loop power control	✓
5.4.2	Minimum output power	✓
5.4.3	Transmit OFF power	✓
5.4.4	Transmit ON/OFF Time mask	✓
5.4.5	Out-of-synchronization handling of output power for continuous transmission	✓
5.4.6	Out-of-synchronization handling of output power for discontinuous transmission	✓
5.5	Output RF spectrum emissions	✓
5.5.1	Occupied bandwidth	✓
5.5.2	Out of band emission	✓
5.5.2.1	Spectrum emission mask	✓
5.5.2.1A	Spectrum emission mask	MX882007C-021
5.5.2.1B	Spectrum emission mask	MX882007C-011
5.5.2.2	Adjacent Channel Leakage power Ratio (ACLR)	✓
5.5.2.2A	Adjacent Channel Leakage power Ratio (ACLR) with E-DCH	MX882007C-021
5.5.2.2B	Adjacent Channel Leakage power Ratio (ACLR) with HS-SICH and DPCCH	MX882007C-011
5.5.3	Spurious Emissions	✓
5.6	Transmit Modulation	Requires SPA and SG
5.7	Error Vector Magnitude	✓
5.7.1A	Error Vector Magnitude with E-DCH 16QAM	MX882007C-021
5.7.1B	Error Vector Magnitude with HS-SICH and DPCCH	MX882007C-011
5.7.2	Peak code domain error	✓
6	Receiver Characteristics	✓
6.2	Reference sensitivity level	✓
6.3	Maximum Input Level	✓
6.3A	Minimum Input Level for HS-PDSCH Reception (16QAM)	MX882007C-011
6.4	Adjacent Channel Selectivity (ACS)	Requires SG
6.5	Blocking Characteristics	Requires SG
6.6	Spurious Response	Requires SG
6.7	Intermodulation Characteristics	Requires SPA
6.8	Spurious Emissions	✓
7	Performance Requirements	✓
7.2	Demodulation in static propagation conditions	Requires SG
7.3	Demodulation of DCH in multipath fading conditions	✓
7.3.1	Multipath fading Case 1	Requires Fading Simulator and SG
7.3.2	Multipath fading Case 2	Requires Fading Simulator and SG
7.3.3	Multipath fading Case 3	Requires Fading Simulator and SG
7.5	Power control in downlink	Requires Fading Simulator and SG
8	Performance requirements for HSDPA	✓
8.3	Performance Requirements for 1.28 Mcps TDD option	✓
8.3.1	HS-DSCH throughput for Fixed Reference Channels	✓
8.3.1A	HS-DSCH throughput for Fixed Reference Channels 0.5 Mbps UE class QPSK	MX882007C-011
8.3.1B	HS-DSCH throughput for Fixed Reference Channels 1.1 Mbps UE class 16QAM	MX882007C-011

## GSM

2.2. 3GPP Measurement Specification Table

Item	Comment	
12	Transmitter	
12.1	Conducted spurious emissions	Requires SPA
12.2	Radiated spurious emissions	Requires SPA
12.3	Conducted spurious emissions for MS supporting R-GSM frequency band	✓
12.4	Radiated spurious emissions for MS supporting R-GSM frequency band	Requires SPA
13	Transmitter	
13.1	Frequency error and phase error	✓
13.2	Frequency error under multipath and interference conditions	Requires Fading Simulator
13.3	Transmitter output power and burst timing	✓
13.4	Output RF spectrum	✓
13.5	Frequency error and phase error in HSCSD multi-slot configurations	✓
13.7	Transmitter output power and burst timing in HSCSD configurations	✓
13.8	Output RF spectrum in HSCSD multi-slot configuration	✓
13.9	Output RF spectrum for MS supporting the R-GSM band	✓
13.16	GPRS Transmitter tests	✓
13.16.1	Frequency error and phase error in GPRS multi-slot configuration	✓
13.16.2	Transmitter output power in GPRS multi-slot configuration	up to 2UL
13.16.3	Output RF spectrum in GPRS multi-slot configuration	✓
13.17	EGPRS Transmitter tests	without Call Processing
13.17.1	Frequency error and modulation accuracy in EGPRS configuration	✓
13.17.2	Frequency error under multipath and interference conditions	Requires Fading Simulator
13.17.3	EGPRS Transmitter output power	up to 2UL
13.17.4	Output RF spectrum in EGPRS configuration	UL only

✓: Supported (except Frequency Hopping) | ✓: Requires external equipment (SPA or SG) | F: Future Support | -: Not Supported

Item	Comment	
14	Receiver	
14.1	Bad frame indication - TCH/HS	✓
14.1.1	Bad frame indication - TCH/HS	✓
14.1.2	Bad frame indication - TCH/HS	✓
14.1.3	Bad frame indication - TCH/HS - Frequency hopping and downlink DTX - Phase 2 MS in a phase 1 network	✓
14.1.4	Bad frame indication - TCH/HS - Frequency hopping and downlink DTX - Phase 2 MS in a phase 1 network	✓
14.1.5	Bad frame indication - TCH/HS (Speech frame)	✓
14.1.6	Bad frame indication - TCH/HS	✓
14.1.6.1	Bad frame indication - TCH/HS - Random RF input	✓
14.2	Reference sensitivity	✓
14.2.1	Reference sensitivity - TCH/HS	Static conditions
14.2.2	Reference sensitivity - TCH/HS (Speech frames)	Propagation conditions (Requires Fading Simulator)
14.2.3	Reference sensitivity - FACCH	✓
14.2.4	Reference sensitivity - FACCH	✓
14.2.5	Reference sensitivity - full rate data channels	✓
14.2.6	Reference sensitivity - half rate data channels	✓
14.2.7	Reference sensitivity - TCH/HS	Static conditions
14.2.8	Reference sensitivity - full rate data channels in multi-slot configuration	✓
14.2.9	Reference sensitivity - TCH/HS for MS supporting the R-GSM band	Static conditions
14.2.10	Reference sensitivity - TCH/HS	Propagation conditions (Requires Fading Simulator)
14.2.11	Reference sensitivity - TCH/HS	✓
14.2.12	Reference sensitivity - TCH/HS	Static conditions
14.2.13	Reference sensitivity - TCH/HS	✓
14.2.14	Reference sensitivity - TCH/HS	✓
14.3	Usable receiver input level range	Static conditions

✓: Supported (except Frequency Hopping) | ✓: Requires external equipment (SPA or SG) | F: Future Support | -: Not Supported

# Easy execution of 3GPP test – 1/2

“Test Parameter” help user to execute easily 3GPP tests according to 36.521-1 TD-LTE/34.122 TD-SCDMA TRX test conditions, eliminating complex parameter settings and providing easy standard tests. In addition, control is simple and fast using remote commands.

**TD-SCDMA Example**

**OLPC Setting**

**Call Test Setting**

**Out-of-Sync Test Setting**

**Page 3**

# Easy execution of 3GPP test – 2/2

For example, pressing **Call** **Max.Power** automatically sets related parameters controlling the mobile terminal maximum output level, and measurement items.

After measurement, overall evaluation, pass and fail items (displayed in red) can be seen at a glance.

**Setting**

**Measuring**

**Single**

**Result**

**Failed Items (Red)**

**Overall Evaluation**

**Sets Related Parameters and Measurement Items**

# ALL 3GPP Bands supported

Anritsu MT8820C support ALL 3GPP Bands for TD-LTE, TD-SCDMA, and GSM, including new TD-LTE band 42/43 in 3.4 to 3.8GHz frequency range.

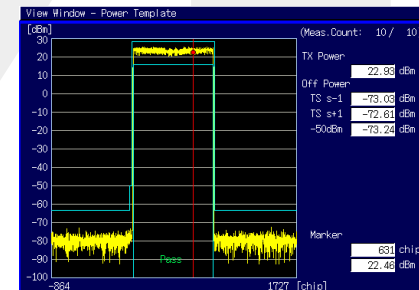
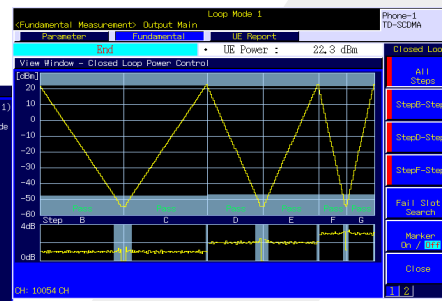
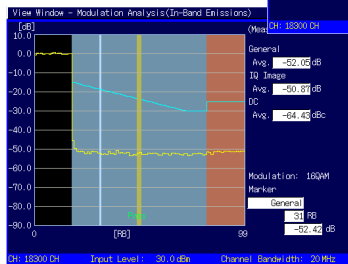
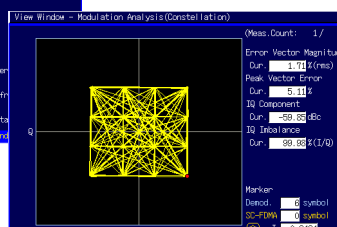
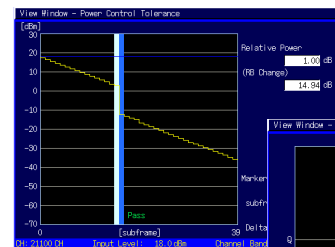
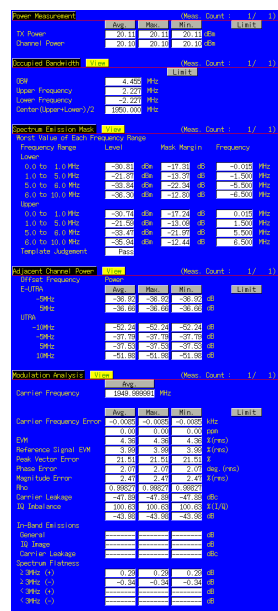
	3GPP Band
TD-LTE	33 to 43
TD-SCDMA	a, b, c, d, e, f
GSM	GSM850, GSM900, DCS1800, PCS1900

Anritsu MT8820C cover wide frequency range 300 to 2700 MHz (standard), 3400 to 3800 MHz (charged opt). Within this range, to add new band is easy and software upgradable if new band comes up in the future.

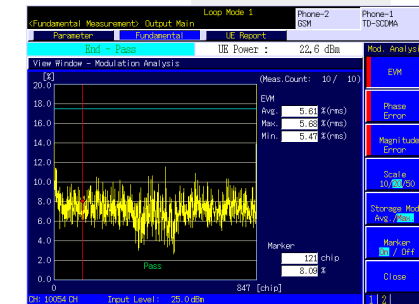
# Various and Useful features

Anritsu MT8820C TD-LTE/TD-SCDMA/GSM can offer not only basic requirements like 3GPP tests w/signaling and all band support, but also various and useful features for RF R&D and production line like Graphical views, UE Report, Throughput, auto CLPC test, etc. The following slides introduce some of these features. For more detail, please refer to MT8820C Brochure, Product Introduction and Application Note.

<http://www.anritsu.com/en-us/products-solutions/products/mt8820c.aspx>

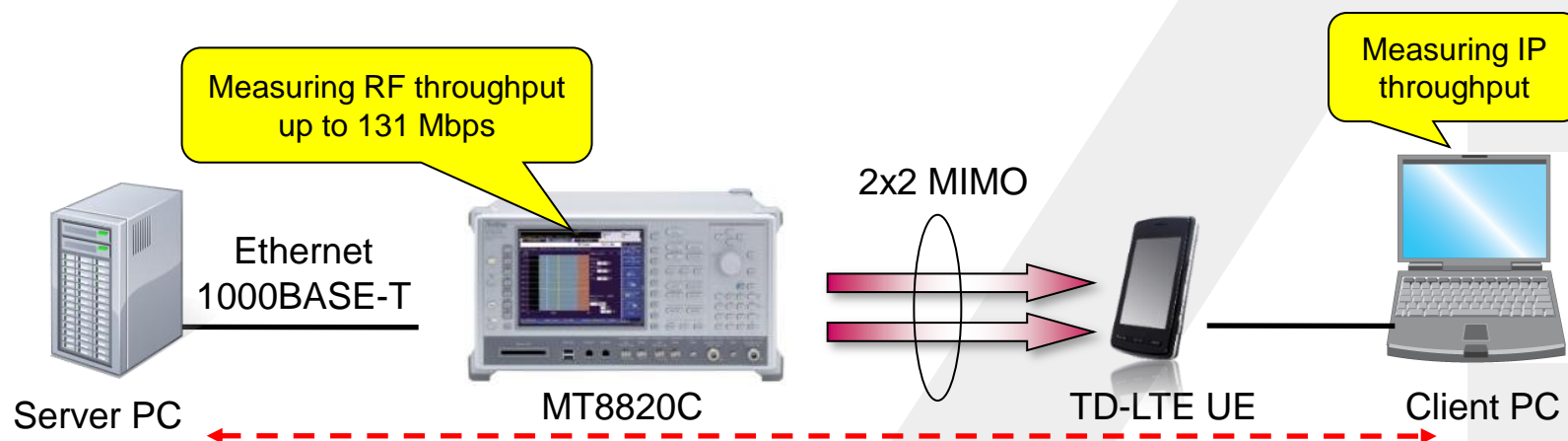


<b>UE Report</b>	
IMSI (DEC)	001010123456789
IMEI	358600030031950
UE Category	3
RSRP	71 ( -70 to -69 dBm )
RSRQ	18 ( -11.0 to -10.5 dB )



# TD-LTE DL 2x2 MIMO Throughput w/ UE Cat.4

Single MT8820C TD-LTE with MIMO configuration have ability to support LTE UE Category 4 DL Throughput (DL 131 Mbps<sup>\*1</sup> in theory) in L1 layer and IP layer<sup>\*2</sup>. We have confirmed it with one chipset.



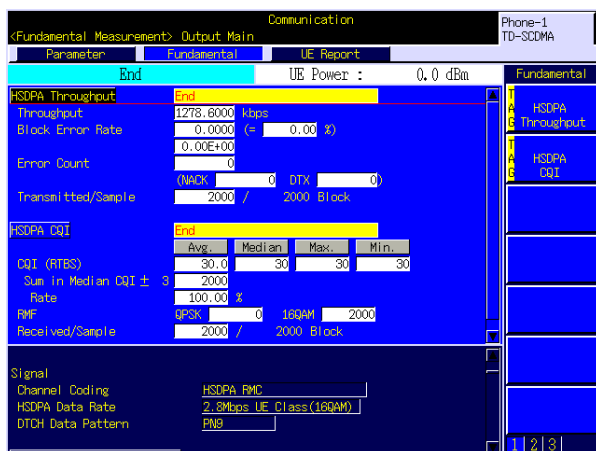
*\*1: Theoretical maximum data rate,*

*\*2: IP data throughput measured by external equipment such as PC.*

*The actual IP throughput may be affected by external PC environment.*

# TD-SCDMA HSPA, Functional Test

Anritsu MT8820C TD-SCDMA HSPA can offer 3GPP TRX HSDPA/HSUPA tests, and HSDPA RF max throughput (Cat.15, 2.8Mbps), CQI, and HSUPA Throughput monitor. In addition, TD-SCDMA Voice Codec opts. offer the end-to-end voice call between a handset and TD-SCDMA UE. TD-SCDMA Video Phone test opt. offer video call test with loopback and end-to-end cases. TD-SCDMA to GSM Blind Handover function is supported to shorten the test time in production line.

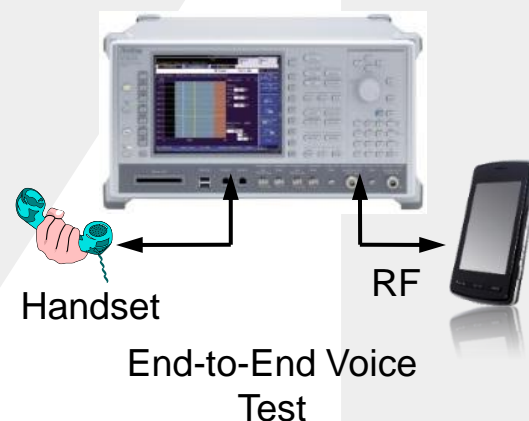


HSDPA Throughput

MT8820C



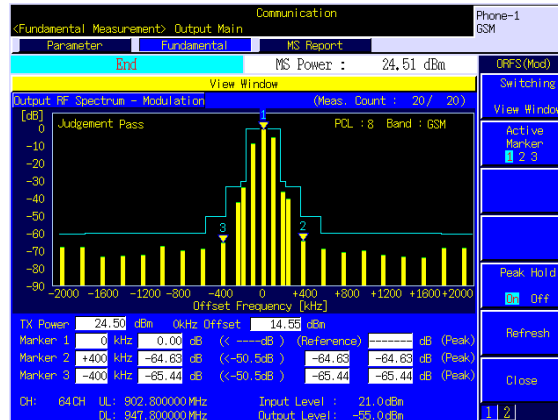
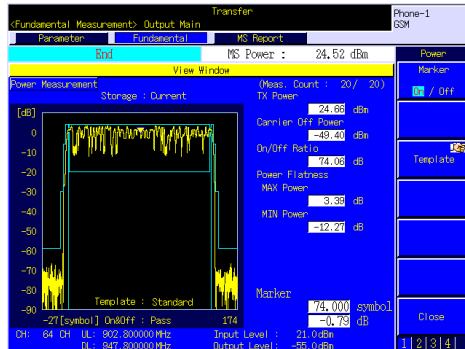
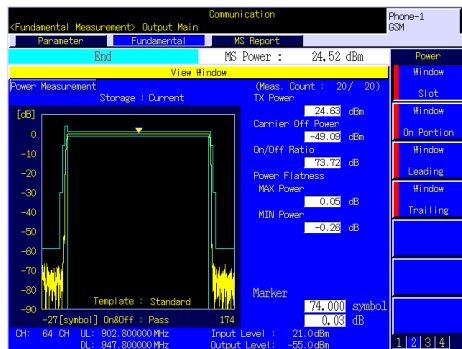
Video call by  
loopback in one  
MT8820C



End-to-End Voice  
Test

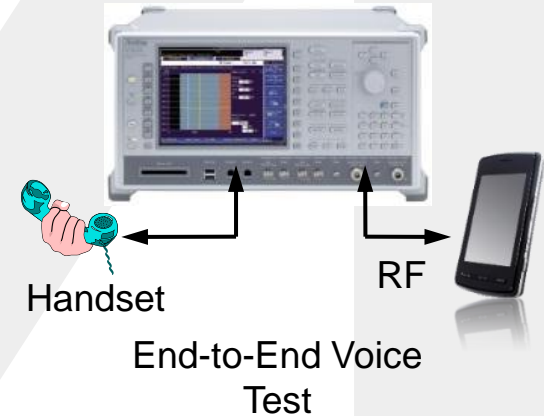
# GSM/EGPRS(EDGE) features

Anritsu MT8820C GSM/EGPRS can offer useful graphical views and support GPRS/EGPRS multi-slot class 1 to 12, 30 to 34. In addition, GSM Voice Codec opts. offer the end-to-end voice call between a handset and GSM UE.



**Block Error Rate** End

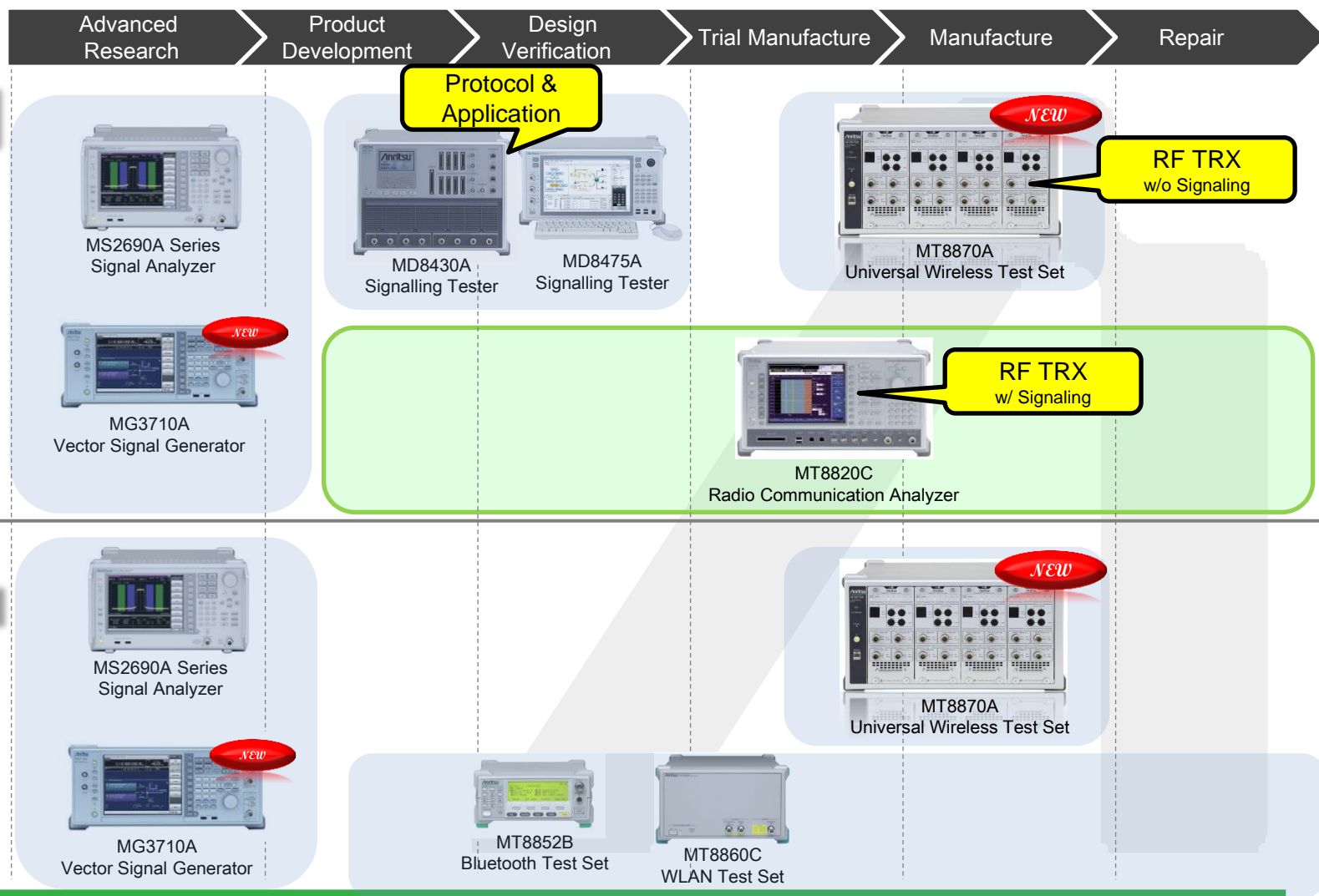
	Ratio	Event	Received	Sample
Block Error Rate	0.00%	0	1000	1000
- 1st Slot	0.00%	0	250	
- 2nd Slot	0.00%	0	250	
- 3rd Slot	0.00%	0	250	
- 4th Slot	0.00%	0	250	



# Appendix

# Appendix

# Product Lineup



# What's MT8820C?

## *All-in-One Test Platform Supporting LTE and Compatibility with Existing 3G/2G*

The MT8820C is Anritsu's new all-in-one test platform for R&D and manufacturing of LTE/2G/3G UE (User Equipment); it is based on the popular MT8820B for the 2G/3G market.

The MT8820C supports manufacturing of LTE mobiles, including RF calibration, RF parametric testing, and functional tests. It is backwards compatible with the MT8820B/15B.

With MT8820C TD-LTE/TD-SCDMA/GSM configuration, To add LTE FDD and WCDMA is just software upgrade.



### Key Features

- **Supports 2G/3G to LTE with Signaling**  
 LTE FDD/TDD  
 W-CDMA/HSPA/HSPA Evolution  
 GSM/GPRS/EGPRS  
 CDMA2000<sup>\*1</sup> 1X/1xEV-DO Rev. A  
 TD-SCDMA/HSPA  
 PHS/ADVANCED PHS
- **Backwards compatibility with MT8820A/B**
- **Supports all manufacturing process.**
- **Parallelphone Measurement<sup>\*2</sup>**

<sup>\*1</sup>: CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA).

<sup>\*2</sup>: Parallelphone™ is a registered trademark of Anritsu Corporation.

• **United States**

**Anritsu Company**

1155 East Collins Blvd., Suite 100, Richardson,  
TX 75081, U.S.A.  
Toll Free: 1-800-267-4878  
Phone: +1-972-644-1777  
Fax: +1-972-671-1877

• **Canada**

**Anritsu Electronics Ltd.**

700 Silver Seven Road, Suite 120, Kanata,  
Ontario K2V 1C3, Canada  
Phone: +1-613-591-2003  
Fax: +1-613-591-1006

• **Brazil**

**Anritsu Eletrônica Ltda.**

Praça Amadeu Amaral, 27 - 1 Andar  
01327-010 - Bela Vista - São Paulo - SP - Brazil  
Phone: +55-11-3283-2511  
Fax: +55-11-3288-6940

• **Mexico**

**Anritsu Company, S.A. de C.V.**

Av. Ejército Nacional No. 579 Piso 9, Col. Granada  
11520 México, D.F., México  
Phone: +52-55-1101-2370  
Fax: +52-55-5254-3147

• **United Kingdom**

**Anritsu EMEA Ltd.**

200 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K.  
Phone: +44-1582-433200  
Fax: +44-1582-731303

• **France**

**Anritsu S.A.**

12 avenue du Québec, Bâtiment Iris 1- Silic 612,  
91140 VILLEBON SUR YVETTE, France  
Phone: +33-1-60-92-15-50  
Fax: +33-1-64-46-10-65

• **Germany**

**Anritsu GmbH**

Nemetschek Haus, Konrad-Zuse-Platz 1  
81829 München, Germany  
Phone: +49-89-442308-0  
Fax: +49-89-442308-55

• **Italy**

**Anritsu S.r.l.**

Via Elio Vittorini 129, 00144 Roma, Italy  
Phone: +39-6-509-9711  
Fax: +39-6-502-2425

• **Sweden**

**Anritsu AB**

Borgarfjordsgatan 13A, 164 40 KISTA, Sweden  
Phone: +46-8-534-707-00  
Fax: +46-8-534-707-30

• **Finland**

**Anritsu AB**

Teknobulevardi 3-5, FI-01530 VANTAA, Finland  
Phone: +358-20-741-8100  
Fax: +358-20-741-8111

• **Denmark**

**Anritsu A/S (Service Assurance)**

**Anritsu AB (Test & Measurement)**  
Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark  
Phone: +45-7211-2200  
Fax: +45-7211-2210

• **Russia**

**Anritsu EMEA Ltd.**

**Representation Office in Russia**

Tverskaya str. 16/2, bld. 1, 7th floor.  
Russia, 125009, Moscow  
Phone: +7-495-363-1694  
Fax: +7-495-935-8962

• **United Arab Emirates**

**Anritsu EMEA Ltd.**

**Dubai Liaison Office**

P O Box 500413 - Dubai Internet City  
Al Thuraya Building, Tower 1, Suit 701, 7th Floor  
Dubai, United Arab Emirates  
Phone: +971-4-3670352  
Fax: +971-4-3688460

• **India**

**Anritsu India Private Limited**

2nd & 3rd Floor, #837/1, Binnamangla 1st Stage,  
Indiranagar, 100ft Road, Bangalore - 560038, India  
Phone: +91-80-4058-1300  
Fax: +91-80-4058-1301

• **Singapore**

**Anritsu Pte. Ltd.**

60 Alexandra Terrace, #02-08, The Comtech (Lobby A)  
Singapore 118502  
Phone: +65-6282-2400  
Fax: +65-6282-2533

• **P.R. China (Shanghai)**

**Anritsu (China) Co., Ltd.**

Room 1715, Tower A CITY CENTER of Shanghai,  
No.100 Zunyi Road, Chang Ning District,  
Shanghai 200051, P.R. China  
Phone: +86-21-6237-0898  
Fax: +86-21-6237-0899

• **P.R. China (Hong Kong)**

**Anritsu Company Ltd.**

Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza,  
No. 1 Science Museum Road, Tsim Sha Tsui East,  
Kowloon, Hong Kong, P.R. China  
Phone: +852-2301-4980  
Fax: +852-2301-3545

• **Japan**

**Anritsu Corporation**

8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan  
Phone: +81-46-296-1221  
Fax: +81-46-296-1238

• **Korea**

**Anritsu Corporation, Ltd.**

502, 5FL H-Square N B/D, 681  
Sampyeong-dong, Bundang-gu, Seongnam-si,  
Gyeonggi-do, 463-400 Korea  
Phone: +82-31-696-7750  
Fax: +82-31-696-7751

• **Australia**

**Anritsu Pty. Ltd.**

Unit 21/270 Ferntree Gully Road, Notting Hill,  
Victoria 3168, Australia  
Phone: +61-3-9558-8177  
Fax: +61-3-9558-8255

• **Taiwan**

**Anritsu Company Inc.**

7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan  
Phone: +886-2-8751-1816  
Fax: +886-2-8751-1817

Please Contact: