



# One Box Tester for LTE-Advanced UE Development

Radio Communication Analyzer  
MT8821C

# New Features

Version 30.40 released in October 2016 adds the following key items.

- No limits on DL 3CA 4x4 MIMO test band combinations → See [Slide 5](#) for details
  - Support for 4x4 MIMO 256QAM tests → See [Slide 5](#) for details
  - RF RX Measurements with easier settings closer to actual usage environment
    - Set 4x4 MIMO and 2x2 MIMO for each CC at LTE CA tests → See [Slide 5](#) for details
    - Set any value for DL MCS Index, Number of RB, and Starting RB at each subframe → See [Slide 15](#) for details
  - Supports FDD/TDD joint 4CA → See [Slide 9](#) for details
  - Expanded UE Capability Information function
    - Capture and display UE CA configuration for specified Band → See [Slide 17](#) for details
  - Supports Band 46 used by LAA, and Band 252, 255 used by LTE-U → See [Slide 9](#) for details
  - Added RF TRx tests and revisions in 3GPP TS36.521-1 (July 2016)
    - Key Items
      - 6.2.4\_2 Additional Maximum Power Reduction (A-MPR) for UL 64QAM
      - 6.3.5A.2.1 Power Control Relative power tolerance for CA (intra-band contiguous DL CA and UL CA)
      - 6.6.2.2A.2\_1 Additional Spectrum Emission Mask for CA (inter-band DL CA and UL CA) for UL 64QAM
      - 7.4A.5\_H Maximum input level for CA (3DL CA without UL CA) for 256QAM in DL
- and more

# Radio Communication Analyzer MT8821C

The new MT8821C is an all-in-one tester designed for RF verification and functional tests of LTE-Advanced UE. It supports all systems supported by the MT8820C, plus LTE-Advanced\*.

## ✓ LTE/LTE-Advanced

- DL CA 5CCs SISO
- DL CA 4CCs with 2x2 MIMO
- DL CA 3CCs with 4x4 MIMO
- UL CA 2CCs

## ✓ W-CDMA

- HSPA Evolution
- DB/DC-HSDPA
- 4C-HSDPA
- DC-HSUPA

## ✓ GSM

- GPRS
- EGPRS

## ✓ CDMA 2000

- EV-DO Rev.A

## ✓ TD-SCDMA

- HSPA
- HSPA Evolution

## ✓ Enhanced GUI with large touch panel

## ✓ ParallelPhone measurement

## ✓ Built-in application/IMS server

## ✓ Compatibility with MT8820C

\*: PHS not supported



- ✓ Up to 8Tx RF/2 Rx RF
- ✓ Frequency range:
  - 30 MHz to 3.8 GHz
  - 3.8 GHz to 6.0 GHz (Option)
- ✓ Built-in front end

# All-In One Tester for LTE-Advanced UE Development

The all-in-one MT8821C supports RF parametric tests through to UE functional and performance tests in one box.

It is the perfect solution for development of RF chipsets and UE.



## ◆ RF Verification Tests

- UE TRX Tests
- UE Calibration
- RRM (Inter-RAT Measurements)

## ◆ Functional Tests

- OTA
- SAR
- IP Throughput
- Power Consumption
- VoLTE Voice/Video Echoback Tests

## ◆ Product Overview

- This option supports all-in-one Physical Throughput measurement for DL CA 2CCs 4x4MIMO 256QAM (800 Mbps). Two sets support Physical Throughput measurement for DL CA 3CCs 4x4 MIMO 256QAM (**1.2 Gbps**).

### Specifications:

Antenna Configuration	4x2 MIMO (TM3), 4x4 MIMO (TM3, <b>TM4</b> , TM9)
DL Modulation	QPSK, 16QAM, 64QAM, <b>256QAM</b>

Red means new function in October 2016 release

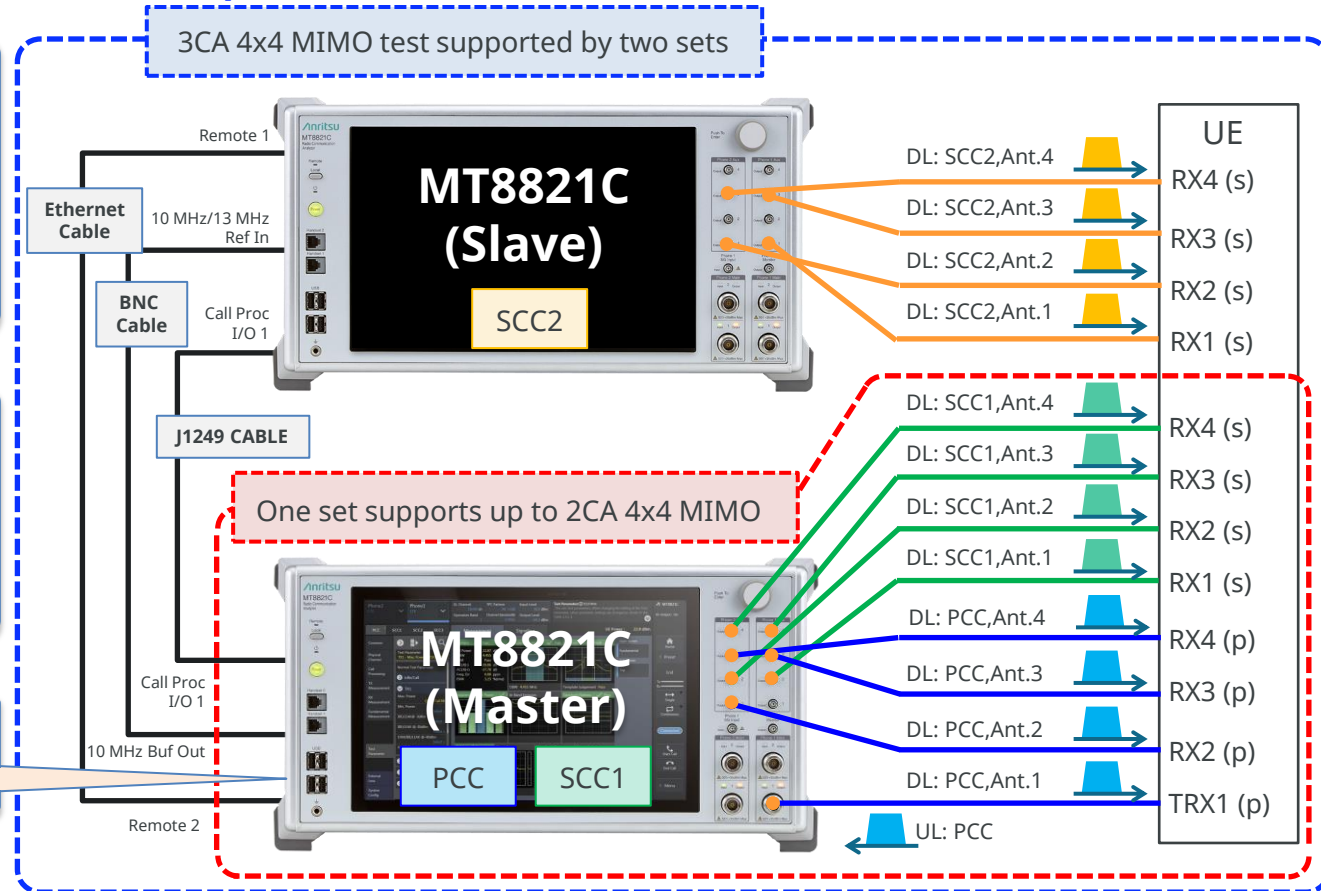
- Supports All Band Combinations
  - Intra-Band contiguous CA
  - Intra-Band Non-contiguous CA
  - Inter Band CA

- Can mix 4x4MIMO and 2x2MIMO connections for each cell

Since Master controls Slave, can test by operating only MT8821C Master

### Limitations

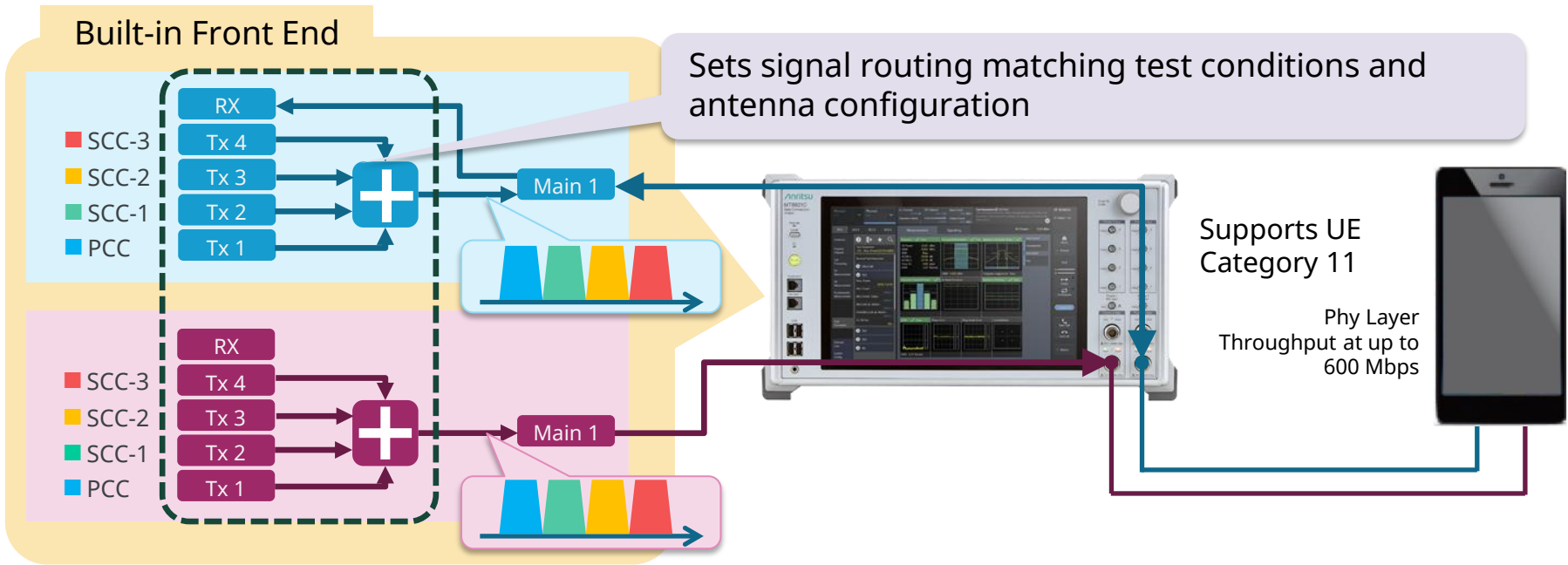
- HARQ re-transmission not supported
- UL/DL Configuration fixed to 1 during FDD/TDD joint CA measurement when PCC set to TDD



\*1: MT8821C neither supports control by UE feedback information, nor UE performance test defined by 3GPP TS 36.521-1 Chapter 8.

## DL CA 4CCs RF Measurements

- ◆ Combining one MT8821C set with the DL CA 4CCs and 2x2 MIMO options supports Throughput measurements of the Phy. layer at up to 800 Mbps.



### Supported 3GPP TS36.521-1 RF Tests\*1

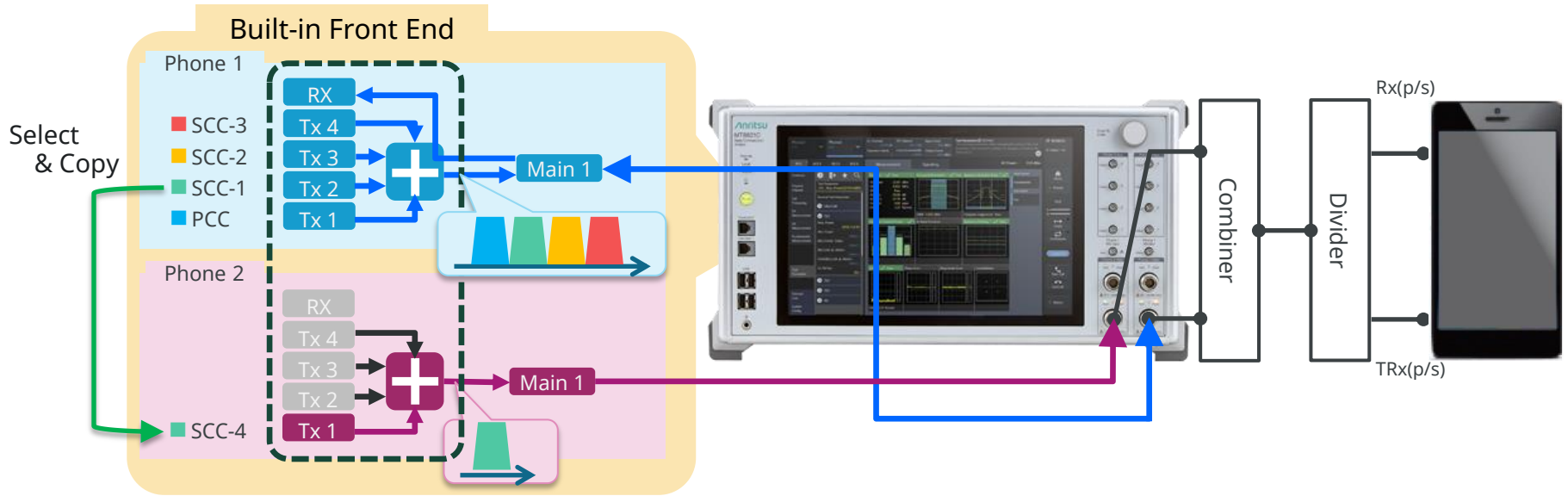
7.3A	Reference sensitivity level for CA	7.7A	Spurious response for CA*2
7.4A	Maximum input level for CA	7.8.1A	Wideband intermodulation for CA*2
7.5A	Adjacent Channel Selectivity (ACS) for CA*2	7.10A	Receiver image for CA*2
7.6.1A	In-band blocking for CA*2		
7.6.2A	Out-of-band blocking for CA*2		
7.6.3A	Narrowband blocking for CA*2		

\*1: Specifications now being defined

\*2: Requires SPA or SG

## ◆ Product Overview

- With this option, one set supports RF measurement of DL CA 5CCs UEs.



### Restrictions:

- SCC4 copies the same configuration as any other CC.

### Supported 3GPP TS36.521-1 RF Tests\*1

7.3A	Reference sensitivity level for CA	7.7A	Spurious response for CA*2
7.4A	Maximum input level for CA	7.8.1A	Wideband intermodulation for CA*2
7.5A	Adjacent Channel Selectivity (ACS) for CA*2	7.10A	Receiver image for CA*2
7.6.1A	In-band blocking for CA*2		
7.6.2A	Out-of-band blocking for CA*2		
7.6.3A	Narrowband blocking for CA*2		

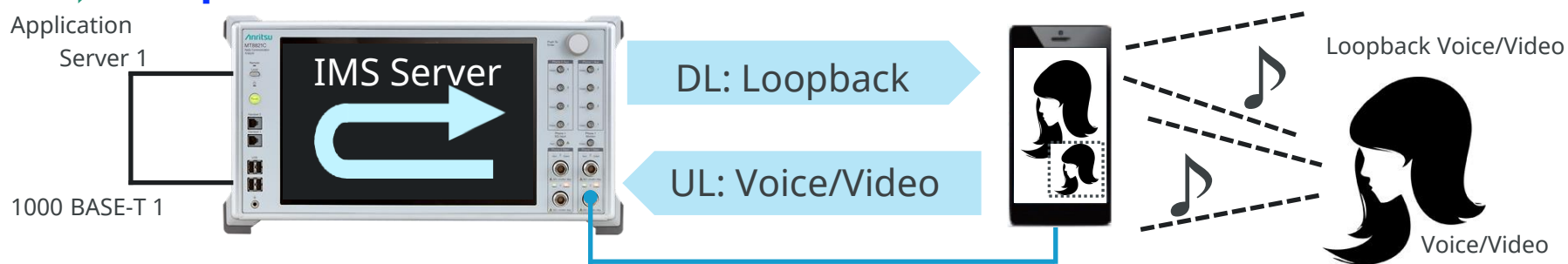
\*1: Specifications now being defined

\*2: Requires SPA or SG

# VoLTE Echoback MX882164C

Built-in IMS Server

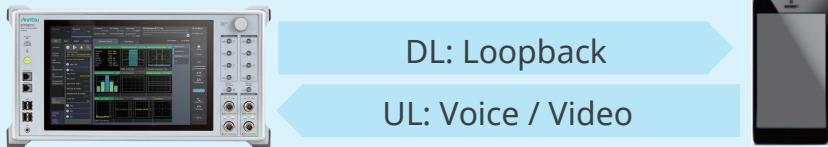
## ➔ Simple Voice and Video Echoback Test



## ◆ Functions

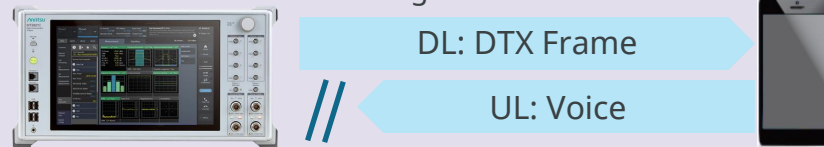
### ■ Voice/Video Echoback

Voice and Video from UE returns to UE



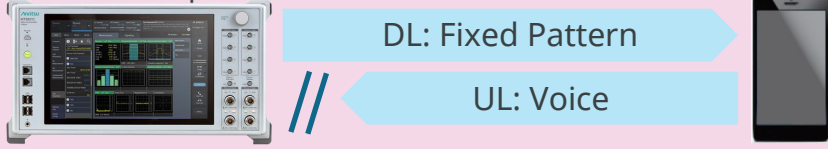
### ■ DTX Frame

Sends DTX Frame to UE at regular interval



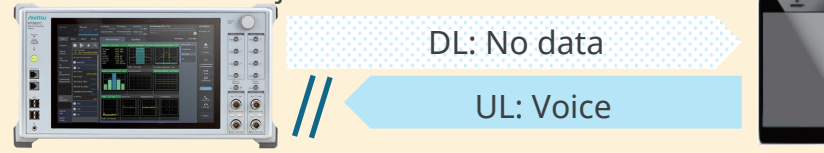
### ■ Fixed Pattern

Sends fixed-pattern data to UE



### ■ No Data

No data sent and just connected to UE



The following codec rates are supported by V30.30.

	Codec Rate
WB-AMR	6.60 kbps, 8.85 kbps, 12.65 kbps, 14.25 kbps, 15.85 kbps, 18.25 kbps, 19.85 kbps, 23.05 kbps, 23.85 kbps
NB-AMR	4.75 kbps, 5.15 kbps, 5.90 kbps, 6.70 kbps, 7.40 kbps, 7.95 kbps, 10.20 kbps, 12.20 kbps

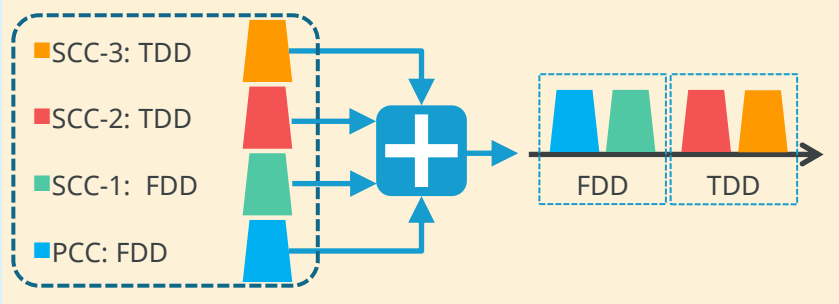


# New LTE-Advanced Features

Includes latest features as follows:

## ■ Supports Joint 4CA

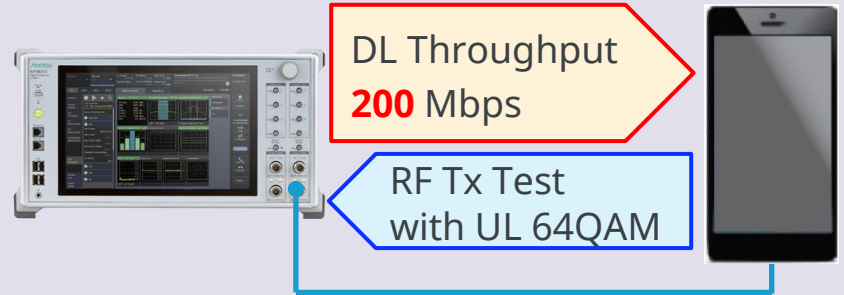
Can connect DL CA CCs with mixed FDD/TDD\*



\*FDD and TDD Joint 4CA measurement requires MX882112C-021, 031, 041, and MX882113C-021, 031, 041 options

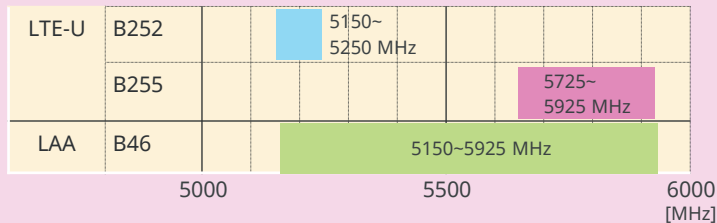
## ■ DL 256QAM/UL 64QAM

Throughput Measurements of 200 Mbps using DL 256QAM and support for UL 64 QAM RF TX measurement.



## ■ Supports LTE-U\*1 and LAA\*2

Supports Band 46\*3 used by LAA, and Band 252\*3, and 255\*3 used by LTE-U



\*1: RF measurement requires MX882112C/13C-021, 031, or 041 option.  
The IP data transfer test requires the MX882112C/13C-026, 036, or 046 option.  
\*2: Frame Structure Type 3 will be supported in the future.  
\*3: The MT8821C-019 option is required to use B46, 252, and 255.

## ■ UE Category 0

RF Tests of UE Category 0 modules

### ■ Key UE Category 0 Specifications

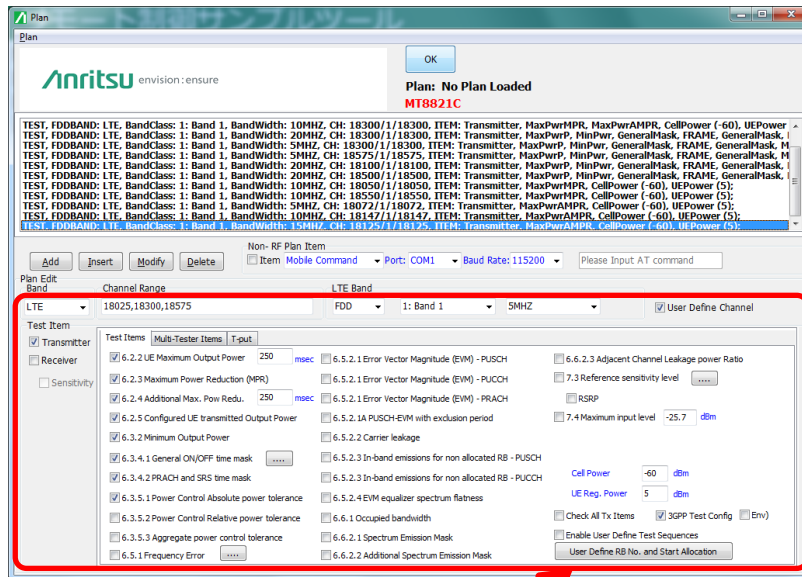
Parameter	Performance
Peak DL Rate	1 Mbps
Peak UL Rate	1 Mbps
MIMO	Not supported
Carrier Aggregation	Not supported
Duplex Mode	Full duplex*

\*Half-duplex mode is TBD.

# Automated 3GPP RF TRx Test Measurement System

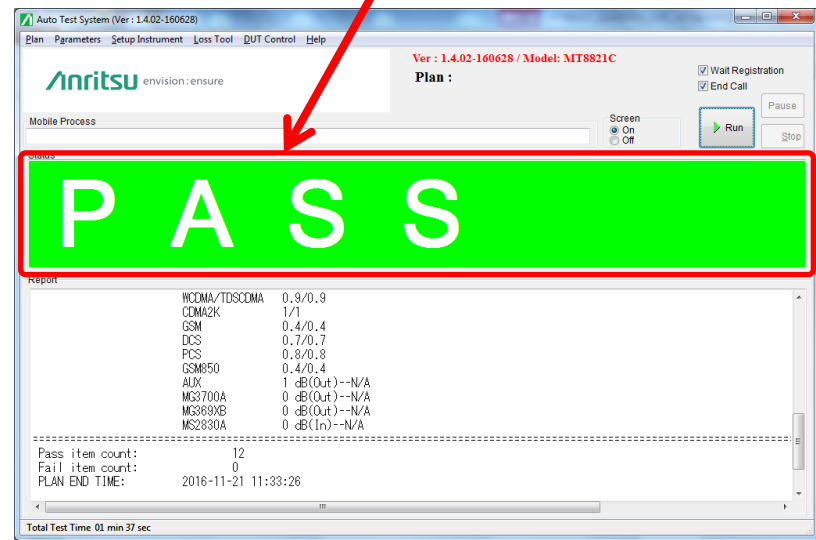
An automated measurement system is easily configured using the ATS tools (remote control sample tools) running on an external PC controller.

Measurement, Pass/Fail evaluation, and report creation are performed simply by selecting test cases from a list, supporting 3GPP RF TRx testing even by inexperienced operators.



Measurement Item Selection Window

Measured Results Pass/Fail Evaluation

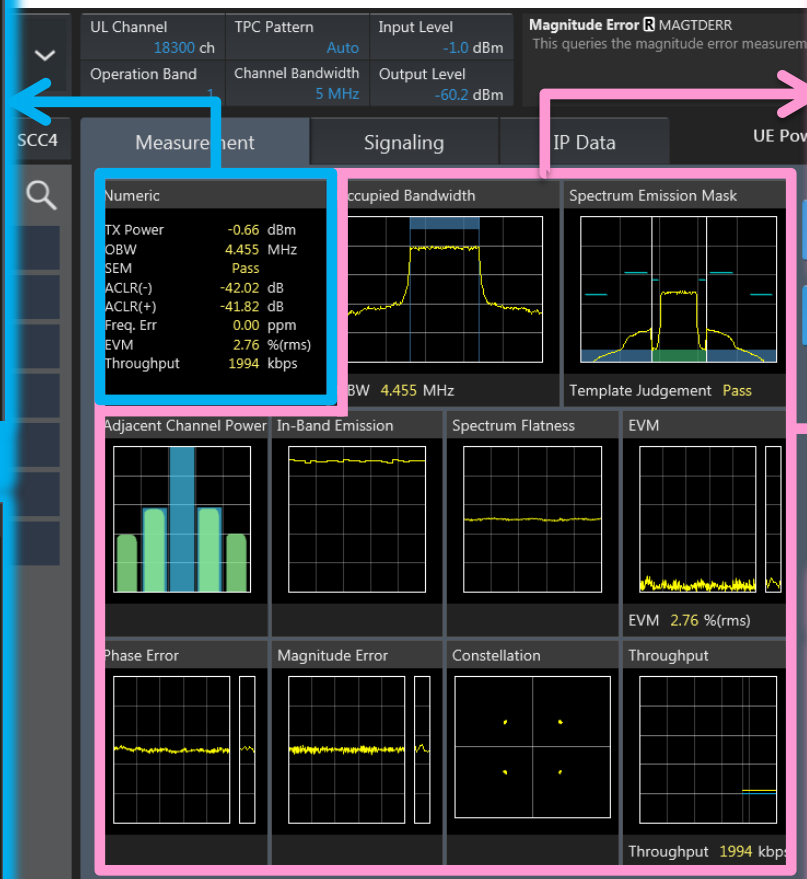
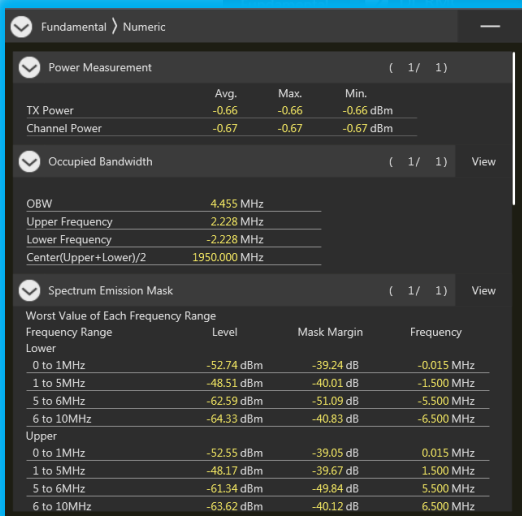


# Enhanced GUI: Measurement (All Results)

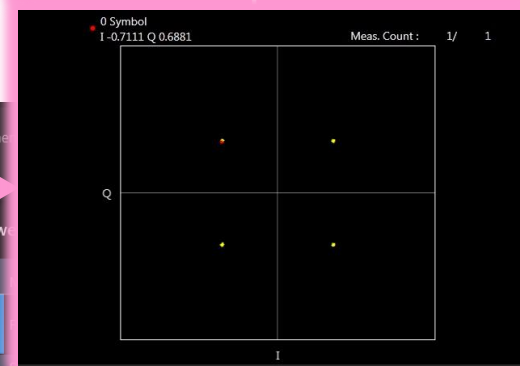
## Overview



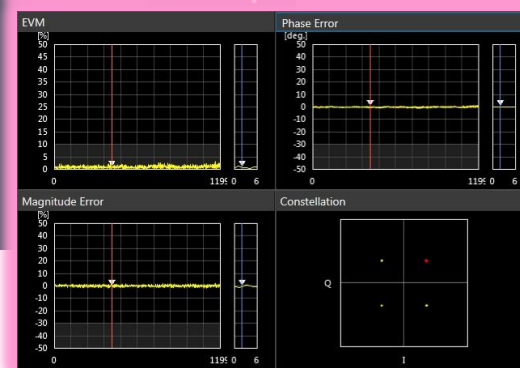
## Detail



## 1-Graph View



## 4-Graph View



# Enhanced GUI: Automatic Help Display

Touching the test parameter/measurement results displays an explanation or remote commands in the Help window.

The screenshot shows the Anritsu test equipment GUI. The top left shows 'Phone2' and 'Phone1 LTE'. The top right shows 'MT8821C' and '2016/08/25 15:46'. The main screen is divided into several sections:

- Configuration:** UL Channel (18300 ch), TPC Pattern (Auto), Input Level (-1.0 dBm), Operation Band (1), Channel Bandwidth (5 MHz), Output Level (-60.2 dBm).
- Measurement:** Numeric values: TX Power (-0.66 dBm), OBW (4.455 MHz), SEM (Pass), ACLR(-) (-42.02 dB), ACLR(+) (-41.82 dB), Freq. Err (0.0 ppm), EVM (2.76 %(rms)), Throughput (1994 kbps). Graphs for Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Power, In-Band Emission, Spectrum Flatness, and EVM.
- Call Processing:** A pink box highlights the 'Call Processing' parameter, which is currently 'On'. A pink arrow points from this box to a help window.
- Help Window:** A pink box highlights the help text for 'Call Processing': 'Call Processing [CALLPROC] This sets the call processing function on/off to switch the call connection mode.'
- Test Parameter:** A list of test parameters including Signal, UL RMC, DL RMC, and TDD.
- System Config:** IP Data Application, External Loss, and System Config.
- Right Panel:** Home, Preset, End, Tx/Rx sliders, Single/Continuous buttons, Connected status, Start Call, End Call, and Menu buttons.

# Enhanced GUI: Parameter Search

Parameters can be searched by text and settings can be changed.

The screenshot displays the Anritsu test equipment GUI with a parameter search overlay. The search bar contains the text "CH" and a "ChangedParameterList" label. A virtual keyboard is overlaid on the search results. The search results list 35 items, including:

- Channel Bandwidth: 5 MHz
- Channel: 18300 ch
- Channel Coding: RMC
- User Define Channel Model (Channel 1to1/2/3/4 Gain/Phase): 1.00 0.0 degree
- (Channel 2to1/2/3/4 Gain/Phase): 0.00 0.0 degree
- (Channel 3to1/2/3/4 Gain/Phase): 0.00 0.0 degree
- (Channel 4to1/2/3/4 Gain/Phase): 0.00 0.0 degree
- DTCH Data Pattern: MAC Padding Bits

A pink box highlights the search bar and keyboard, and a pink arrow points to the "Channel Coding" parameter in the left sidebar.

# Enhanced GUI: External Loss separate setting for each of the CC/ PCC,SCC Link setting

- (1) Added function linking PCC and SCC parameter settings (only some parameters, such as Output Level)
- (2) Pressing list button at CA connection setting displays PCC and SCC settings simultaneously
- (3) Supports separate External Loss (Main UL/DL) setting for each CC

The screenshot displays the configuration interface for a CA connection. At the top, the 'Output Level (Total)' is set to -70.2 dBm, with a yellow box and arrow (1) pointing to the 'Output Level' field. Below this, a list of channels (PCC, SCC1, SCC2, SCC3) is shown, with a pink box and arrow (2) pointing to the list icon. The main area shows detailed settings for each channel, including 'Level', 'Input Level', 'Output Level', and 'External Loss'. The 'External Loss' section is highlighted with blue boxes and arrow (3), showing separate settings for 'Main UL (Phone1)' and 'Main DL (Phone1)' for each channel, all set to 0.0 dB. The 'Signal' section is also visible at the bottom of each channel's settings.

Channel	Level	Input Level	Output Level	External Loss (Main UL)	External Loss (Main DL)
PCC	190 MHz	-1.0 dBm	-70.2 dBm	0.0 dB	0.0 dB
SCC1	95 MHz	-1.0 dBm	-70.2 dBm	0.0 dB	0.0 dB
SCC2	881.500 000 MHz	-1.0 dBm	-70.2 dBm	0.0 dB	0.0 dB
SCC3	2 110.000 000 MHz	-1.0 dBm	-70.2 dBm	0.0 dB	0.0 dB

# Easy Parameter Setting

## ◆ Easier Downlink : Resource Block, MCS Index Settings

Freely settable parameters for each subframe support easy testing even at near-to-real test environment settings.

When Allocation mode = Detail

RB Allocation				Aggregation Level				
Subframe	Number of RB	Starting RB	MCS Index	Modulation	TBS Index	TBS	SI-RNTI	C-RNTI
0	80	20	28	64QAM	26	59256	-	8
1	100	0	28	64QAM	26	75376	-	8
2	2	98	25	64QAM	23	1128	-	8
3	2	98	8	QPSK	8	256	-	8
4	100	0	25	64QAM	23	57336	-	8
5	96	4	13	16QAM	12	22152	8	-
6	100	0	18	64QAM	16	32856	-	8
7	100	0	18	64QAM	16	32856	-	8
8	50	50	28	64QAM	26	36696	-	8
9	50	50	28	64QAM	26	36696	-	8

When Allocation mode = Normal

MCS Index		Aggregation Level				
Subframe	MCS Index	Modulation	TBS Index	TBS	SI-RNTI	C-RNTI
1-4,6-9	28	64QAM	26	18336	-	4
5	28	64QAM	26	15264	4	-
0	28	64QAM	26	18336	-	4
-	N/A	----	-	-	-	-

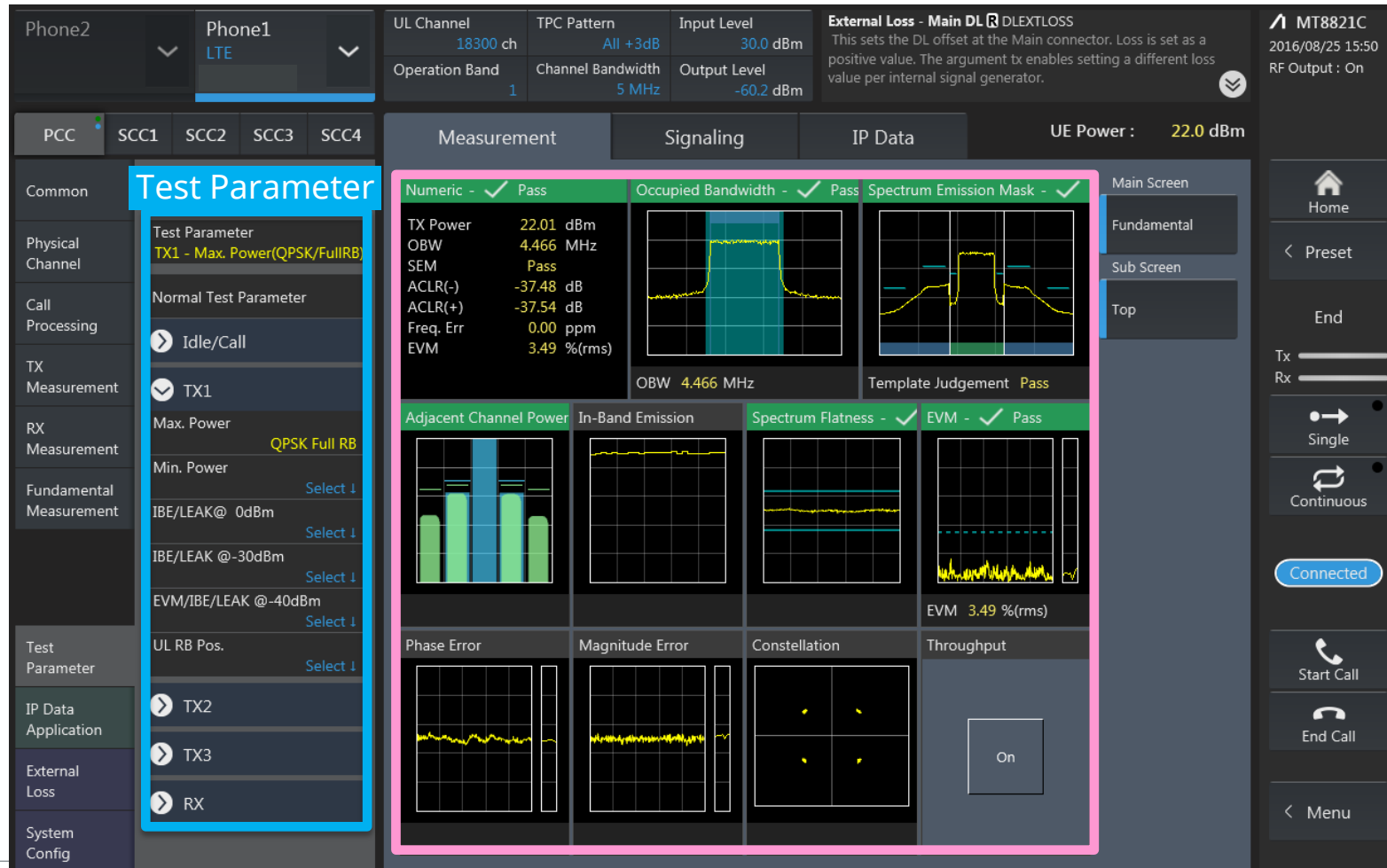
\*Easy legacy setting methods are also supported at measurement based on 3GPP TS 36.521-1.

# RF TRX Measurement (Test Parameters)

The MT8821C has a "Test Parameter" function for 3GPP RF tests.

It supports following features.

- One-button parameter setting for 3GPP RF TRX tests
- PASS/FAIL judgment

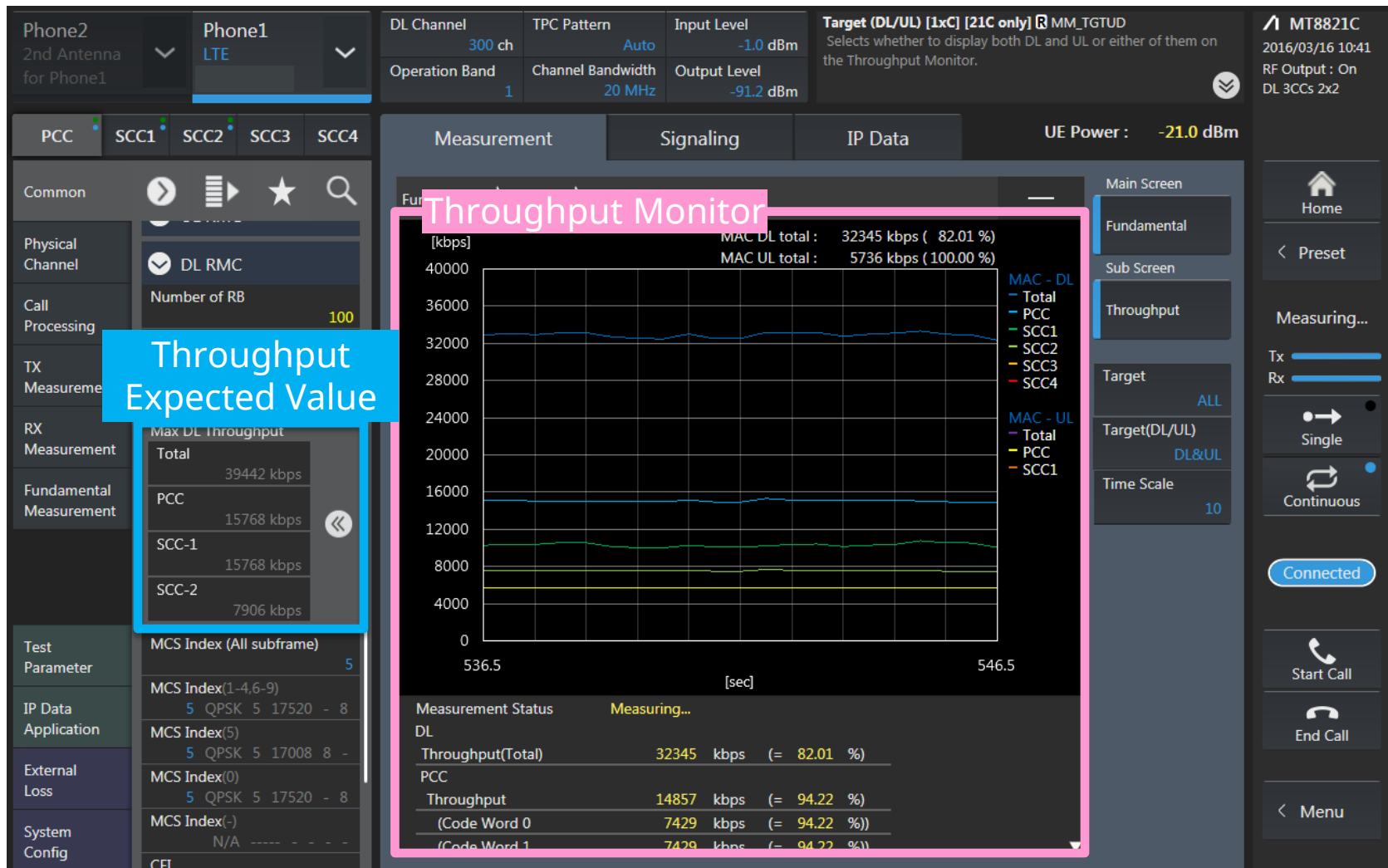






# Throughput Monitor/Display Expected Throughput

The MAC layer Throughput measurement results can be displayed as a graph.  
In addition, a function has been added for displaying expected Throughput values.



# IP Data Application

Data Application (PING/Iperf) operations can be performed from the MT8821C GUI using the Result – IP Data tab. Settings are made at the Parameter – IP Data Application tab.

The screenshot displays the MT8821C GUI interface. At the top, it shows 'Phone2' and 'Phone1' (LTE) settings. Below this are tabs for 'PCC', 'SCC1', 'SCC2', 'SCC3', and 'SCC4'. The main area is divided into 'Measurement', 'Signaling', and 'IP Data' tabs, with 'IP Data' selected. The 'IP Data' tab shows two server configurations: 'Server 1' and 'Server 2'. 'Server 1' is configured for PING and Iperf tests. The results for 'Server 1' show ping statistics: 4 packets sent, 4 received, 0% loss, and round trip times ranging from 12ms to 16ms. 'Server 2' is configured for PING and Iperf tests. The results for 'Server 2' show a client connecting to 192.168.20.11, UDP port 5001, and sending 1470 byte datagrams. A table shows the transfer and bandwidth for 'Server 2' over 8 intervals, with transfer rates around 610 KBytes and bandwidth around 5.00 Mb/Sec. The 'IP Data Application' tab is highlighted in blue, and the 'IP Data' tab is highlighted in pink. The 'PING (Server1)' and 'Iperf (Server1)' options are highlighted in blue. The 'PING (Server2)' and 'Iperf (Server2)' options are highlighted in blue. The 'Connected' status is shown at the bottom right.

Phone2  
2nd Antenna  
for Phone1

Phone1  
LTE

DL Channel 300 ch  
TPC Pattern Auto  
Input Level -1.0 dBm  
Operation Band 1  
Channel Bandwidth 20 MHz  
Output Level -70.2 dBm

Iperf Mode [1xC] [21C only] IPFMODE  
This sets the packet transfer/receive direction of Client/Server of iperf.

MT8821C  
2016/03/16 12:50  
RF Output : On  
DL 3CCs 2x2

PCC SCC1 SCC2 SCC3 SCC4

Measurement Signaling IP Data

UE Power : -21.1 dBm

Common

Physical Channel

Call Processing

TX Measurement

RX Measurement

Fundamental Measurement

Test Parameter

IP Data Application

External Loss

System Config

PING(Server1)

Destination IPv4 Address 192 168 20 11

Destination IPv6 Address 2001 0000 0000 0000 0000 0000 0000 0001

IP Type IPv4

Interval 1000

Buffer Size 32

Iperf(Server1)

Iperf Mode Client

IP Type IPv4

IP Protocol UDP

Destination IPv4 Address 192 168 20 11

Destination IPv6 Address 2001 0000 0000 0000 0000 0000 0000 0001

Bandwidth 5

Bandwidth Unit

Server 1

ping 192.168.20.11 -w 1000 -l 32 -S 192.168.20.10

Pinging 192.168.20.11 from 192.168.20.10 with 32 bytes of data:  
Reply from 192.168.20.11: bytes=32 time=16ms TTL=64  
Reply from 192.168.20.11: bytes=32 time=12ms TTL=64  
Reply from 192.168.20.11: bytes=32 time=12ms TTL=64  
Reply from 192.168.20.11: bytes=32 time=13ms TTL=64

Ping statistics for 192.168.20.11:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 12ms, Maximum = 16ms, Average = 13ms

Server 2

-----  
Client connecting to 192.168.20.11, UDP port 5001  
Binding to local address 192.168.20.10  
Sending 1470 byte datagrams  
UDP buffer size: 1.00 MByte  
-----

[ID]	Interval	Transfer	Bandwidth
0]	0.0- 1.0 sec	610 KBytes	5.00 Mb/Sec
0]	1.0- 2.0 sec	609 KBytes	4.99 Mb/Sec
0]	2.0- 3.0 sec	610 KBytes	5.00 Mb/Sec
0]	3.0- 4.0 sec	609 KBytes	4.99 Mb/Sec
0]	4.0- 5.0 sec	610 KBytes	5.00 Mb/Sec
0]	5.0- 6.0 sec	609 KBytes	4.99 Mb/Sec
0]	6.0- 7.0 sec	610 KBytes	5.00 Mb/Sec
0]	7.0- 8.0 sec	609 KBytes	4.99 Mb/Sec

PING (Server1)

Iperf (Server1)

PING (Server2)

Iperf (Server2)

Home

Preset

Stop

Tx

Rx

Single

Continuous

Connected

Start Call

End Call

Menu

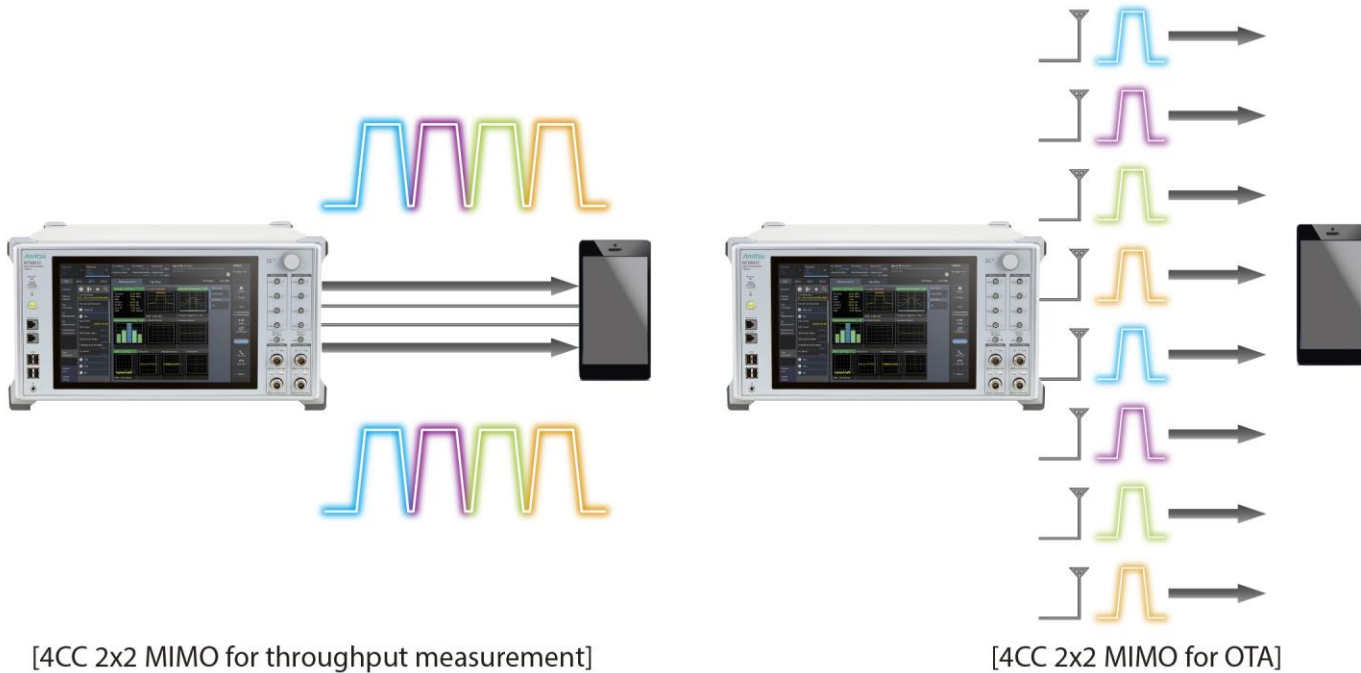
# Internal RF Frontend

The MT8821C supports up to 8 TX RF (when AUX ports used).

It can also combine RF signals using the built-in RF frontend for LTE CA.

## ◆ Combining RF signals

The following combination can be selected according to the customer's purpose.



# Multi-RAT Measurement

One MT8821C can perform two measurements simultaneously. Anritsu calls this function Parallelphone Measurement or PPM.

It supports simultaneous and independent testing of two UEs.

**The MT8821C supports the following tests.**

- SGLTE/SVLTE
- DSDA
- RRM (Inter-RAT measurement)



# Compatibility with MT8820C

The MT8821C is compatible with MT8820C functions, performance, remote commands, etc. Previously developed control software and test sequences can be used with the MT8821C.

- ◆ Reduces costs for test equipment and test environment configuration
- ◆ No risks rebuilding existing LTE and 3G/2G test environment

## Compatibility

- Functions and performance
- Remote commands

MT8820C



Control software and test environment can be reused.



MT8821C



# MT8821C Options

Hardware No.	Hardware Name
<b>MT8821C</b>	<b>Radio Communication Analyzer</b>
MT8821C-001	W-CDMA Measurement Hardware
MT8821C-002	TDMA Measurement Hardware
MT8821C-003	CDMA2000 Measurement Hardware
MT8821C-005	1xEV-DO Measurement Hardware
MT8821C-007	TD-SCDMA Measurement Hardware
MT8821C-008	LTE Measurement Hardware
MT8821C-011	Audio Board
<b>MT8821C-012</b>	<b>Parallel Phone Measurement Hardware</b>
<b>MT8821C-019</b>	<b>Extended RF 3.8GHz - 6GHz</b>
<b>MT8821C-025</b>	<b>2nd RF for Phone1</b>
<b>MT8821C-026</b>	<b>3rd RF for Phone1</b>
<b>MT8821C-027</b>	<b>4th RF for Phone1</b>
<b>MT8821C-028</b>	<b>2nd RF for Phone2</b>
<b>MT8821C-029</b>	<b>3rd RF for Phone2</b>
<b>MT8821C-030</b>	<b>4th RF for Phone2</b>
MT8821C-043	CDMA2000 Time Offset CAL for GPS SG

Software No.	Software Name
<b>MX882100C</b>	<b>W-CDMA Measurement Software</b>
MX882100C-001	W-CDMA Voice Codec
MX882100C-002	W-CDMA External Packet Data
MX882100C-003	W-CDMA Video Phone Test
MX882100C-005	W-CDMA A-GPS
<b>MX882100C-019</b>	<b>WCDMA HSPA Measurement Software</b>
MX882100C-032	DC-HSDPA Measurement Software
MX882100C-033	DC-HSUPA Measurement Software
MX882100C-034	4C-HSDPA Measurement Software
<b>MX882170C</b>	<b>W-CDMA Ciphering Software</b>
<b>MX882101C</b>	<b>GSM Measurement Software</b>
MX882101C-001	GSM Voice Codec
MX882101C-002	GSM External Packet Data
MX882101C-005	GSM A-GPS
MX882101C-011	EGPRS Measurement Software
MX882102C	CDMA2000 Measurement Software
MX882102C-001	CDMA2000 Voice Codec
<b>MX882102C-002</b>	<b>CDMA2000 External Packet Data</b>
<b>MX882106C</b>	<b>1xEV-DO Measurement Software</b>
MX882106C-002	1xEV-DO External Packet Data
MX882107C	TD-SCDMA Measurement Software
MX882107C-001	TD-SCDMA Voice Codec
MX882107C-002	TD-SCDMA External Packet Data
MX882107C-003	TD-SCDMA Video Phone Test
MX882107C-011	TD-SCDMA HSDPA Measurement Software
MX882107C-012	TD-SCDMA HSDPA Evolution Measurement Software
MX882107C-021	TD-SCDMA HSUPA Measurement Software

Software No.	Software Name
MX882112C	LTE FDD Measurement Software
MX882112C-006	LTE FDD IP Data Transfer
MX882112C-011	LTE FDD 2x2 MIMO DL
<b>MX882112C-012</b>	<b>LTE FDD 4x4 MIMO DL</b>
MX882112C-016	LTE FDD CS Fallback to W-CDMA/GSM
MX882112C-017	LTE FDD CS Fallback to CDMA2000
MX882112C-021	LTE-Advanced FDD DL CA Measurement Software
<b>MX882112C-022</b>	<b>LTE-Advanced FDD UL CA Measurement Software</b>
MX882112C-026	LTE-Advanced FDD DL CA IP Data Transfer
MX882112C-031	LTE-Advanced FDD DL CA 3CCs Measurement Software
<b>MX882112C-036</b>	<b>LTE-Advanced FDD DL CA 3CCs IP Data Transfer</b>
<b>MX882112C-041</b>	<b>LTE-Advanced FDD DL CA 4CCs Measurement Software</b>
<b>MX882112C-046</b>	<b>LTE-Advanced FDD DL CA 4CCs IP Data Transfer</b>
<b>MX882112C-051</b>	<b>LTE-Advanced FDD DL CA 5CCs Measurement Software</b>
MX882113C	LTE TDD Measurement Software
MX882113C-006	LTE TDD IP Data Transfer
MX882113C-011	LTE TDD 2x2 MIMO DL
<b>MX882113C-012</b>	<b>LTE TDD 4x4 MIMO DL</b>
MX882113C-016	LTE TDD CS Fallback to W-CDMA/GSM
MX882113C-017	LTE TDD CS Fallback to CDMA2000
MX882113C-018	LTE TDD CS Fallback to TD-SCDMA/GSM
MX882113C-021	LTE-Advanced TDD DL CA Measurement Software
<b>MX882113C-022</b>	<b>LTE-Advanced TDD UL CA Measurement Software</b>
MX882113C-026	LTE-Advanced TDD DL CA IP Data Transfer
MX882113C-031	LTE-Advanced TDD DL CA 3CCs Measurement Software
<b>MX882113C-036</b>	<b>LTE-Advanced TDD DL CA 3CCs IP Data Transfer</b>
<b>MX882113C-041</b>	<b>LTE-Advanced TDD DL CA 4CCs Measurement Software</b>
<b>MX882113C-046</b>	<b>LTE-Advanced TDD DL CA 4CCs IP Data Transfer</b>
<b>MX882113C-051</b>	<b>LTE-Advanced TDD DL CA 5CCs Measurement Software</b>
MX882115C	W-CDMA HSPA IP Data Transfer
MX882115C-001	W-CDMA DC-HSPA IP Data Transfer
MX882120C	SEQ Measurement Software
MX882120C-001	W-CDMA Measurement Software
MX882120C-002	GSM Measurement Software
MX882120C-003	CDMA2000 Measurement Software
MX882120C-004	LTE Measurement Software
MX882120C-005	TD-SCDMA Measurement Software
MX882132C	CDMA2000 Measurement Software Lite
<b>MX882136C</b>	<b>1xEV-DO Measurement Software Lite</b>
MX882142C	LTE FDD Measurement Software Lite
MX882143C	LTE TDD Measurement Software Lite
<b>MX882164C</b>	<b>LTE VoLTE Echoback</b>

\* Red are MT8821C new options.

\* Blue consolidate some MT8820C options.

# MT8820C to MT8821C Upgrade

The MT8821C is upgradeable from the MT8820C. The existing MT8820C hardware and all measurement software can be re-used to make the most efficient use of your investment.



MT8820C



MT8821C



# MT8821C Specifications

Parameter	Specification
Frequency Range	30 MHz to 3.8 GHz (3.8 GHz to 6.0 GHz Option)
Interface	Main: RF In/Out (Max. 4 ports) Aux: RF Out (Max. 8 ports)
Output Level (CW)	-140 to -10 dBm (Main) -125 to +5 dBm (Aux)
Output Level (LTE)	-140 to -12 dBm (Main, LTE 1CC case) -140 to -18 dBm (Main, each CC in 4CCs case) -125 to +3 dBm (Aux)
VSWR	<1.4 (30 MHz to 300 MHz), <1.3 (300 MHz to 3.8 GHz), <1.6 (3.8 GHz to 6 GHz)
Bandwidth	Generator bandwidth: 160 MHz Analyzer bandwidth: 160 MHz
System	<ul style="list-style-type: none"> <li>- LTE FDD/TDD</li> <li>  LTE CA (DL CA 5CCs (with SISO)/ DL CA 4CCs (with 2x2 MIMO)/ DL CA 3CCs (with 4x4 MIMO) by 2units/ UL CA 2CCs, LTE in unlicensed spectrum : 5 GHz)</li> <li>- W-CDMA/HSPA/HSPA Evolution/(DB-)DC-HSDPA/4C-HSDPA/DC-HSUPA</li> <li>- GSM/GPRS/EGPRS</li> <li>- CDMA2000/EV-DO</li> <li>- TD-SCDMA/HSPA/HSDPA Evolution</li> </ul>
Remote Control	Ethernet, GPIB
GUI	Windows 7 OS, touch panel, USB interface
Dimensions	426 (W) × 221.5 (H) × 578 (D) mm (excluding protrusions)

Blue indicates improvements over the MT8820C

# APPENDIX

# MT8821C vs. MT8820C

	MT8821C	MT8820C
Frequency Range	30 MHz to <b>6.0 GHz</b> ( <b>3.8 GHz to 6.0 GHz</b> Option)	30 MHz to 2.7 GHz, 3.4 GHz to 3.8 GHz (3.4 GHz to 3.8 GHz Option)
Interface	Main: RF In/Out ( <b>Max. 4 ports</b> ) Aux: RF Out ( <b>Max. 8 ports</b> )	Main: RF In/Out (Max. 2 ports) Aux: RF Out (Max. 2 ports)
Output Level	-140 to <b>-10 dBm</b> (Main) -125 to <b>+5 dBm</b> (Aux)	-140 to - 10 dBm (Main) -130 to 0 dBm (Aux)
Bandwidth	Generator bandwidth: <b>160 MHz</b> Analyzer bandwidth: <b>160 MHz</b>	Generator bandwidth: 25 MHz Analyzer bandwidth: 25 MHz
System	<ul style="list-style-type: none"> <li>- LTE FDD/TDD</li> <li>  <b>LTE CA (DL CA 5CCs (with SISO)/</b></li> <li>  <b>DL CA 4CCs (with 2x2 MIMO)/</b></li> <li>  <b>DL CA 2CCs (with 4x4 MIMO)/</b></li> <li>  <b>DL CA 3CCs (with 4x4 MIMO) by 2 units/</b></li> <li>  <b>UL CA 2CCs/</b></li> <li>  <b>LTE in unlicensed spectrum : 5 GHz )</b></li> <li>- WCDMA/HSPA/HSPA Evolution/ (DB-)DC-HSDPA/4C-HSDPA/DC-HSUPA</li> <li>- GSM/GPRS/EGPRS</li> <li>- CDMA2000/EVDO</li> <li>- TD-SCDMA/HSPA/HSDPA Evolution</li> </ul>	<ul style="list-style-type: none"> <li>- LTE FDD/TDD (up to 2x2 MIMO)</li> <li>- LTE CA (DL 3CC + 2x2 MIMO by 3units/ UL 2CC)</li> <li>- WCDMA/HSPA/HSPA Evolution/ (DB-)DC-HSDPA/4C-HSDPA/DC-HSUPA</li> <li>- GSM/GPRS/EGPRS</li> <li>- CDMA2000/EVDO</li> <li>- TD-SCDMA/HSPA/HSDPA Evolution</li> </ul>
GUI	<b>Windows 7 OS, touch panel, USB interface</b>	Unix OS, key panel, CF interface
Dimensions	426 (W) × 221.5 (H) × 578 (D) mm (excluding protrusions)	426 (W) × 221.5 (H) × <b>498</b> (D) mm (excluding protrusions)

