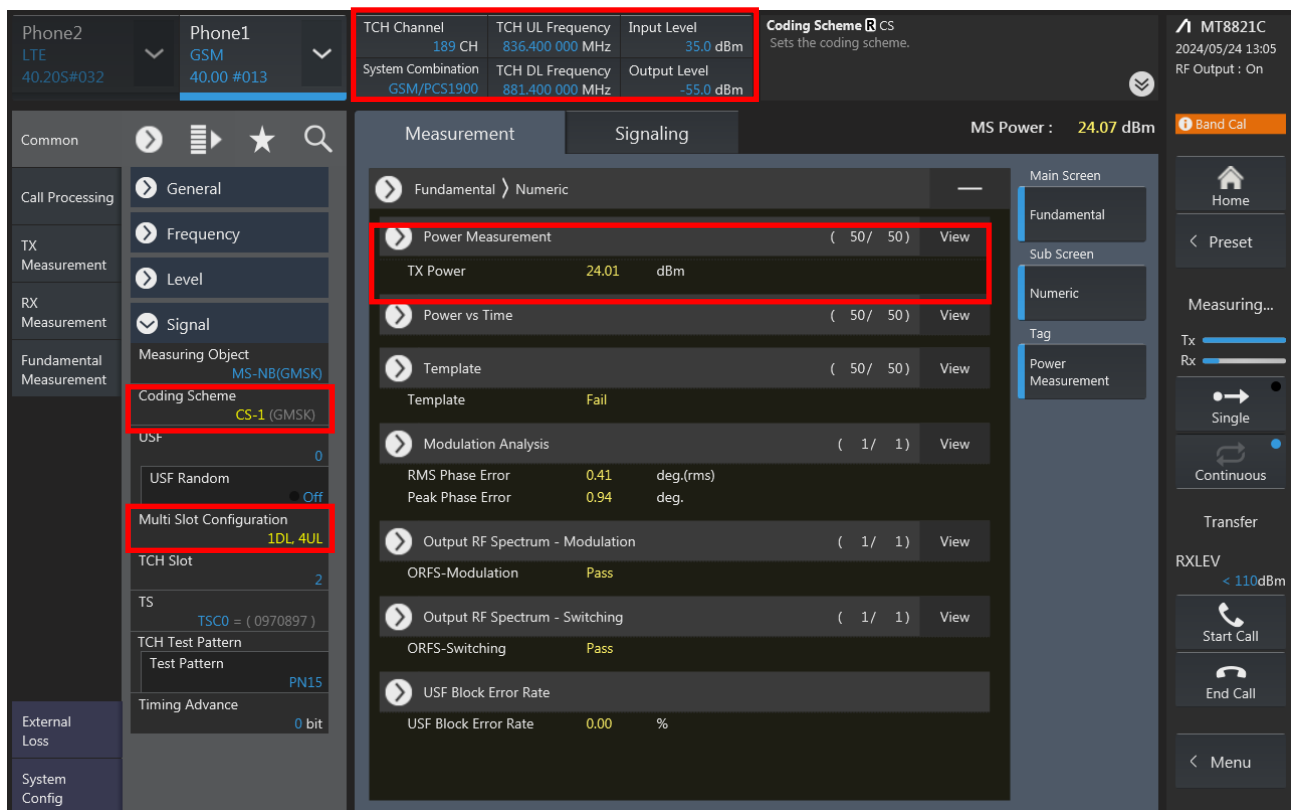


Appendix H. 2G/3G/LTE/5G FR1/LTE CA connection diagram

General Note:

The power measurement for 2G/3G/LTE/5G FR1/LTE CA is to establish a connection between device and call box, and via call box to configure Bands, channel, BWs, RB size, carrier aggregation of CA, frequency channels, SCS and maximum output power. Hereunder is screenshot call box connection information for 2G/3G/LTE/5G FR1/LTE CA.

GSM



The screenshot displays the MT8821C interface for GSM configuration and measurement. The top status bar shows 'Phone2 LTE 40.20S#032' and 'Phone1 GSM 40.00 #013'. The 'TCH Channel' is set to 189 CH, 'TCH UL Frequency' is 836.400 000 MHz, 'Input Level' is 35.0 dBm, 'System Combination' is GSM/PCS1900, 'TCH DL Frequency' is 881.400 000 MHz, and 'Output Level' is -55.0 dBm. The 'Coding Scheme' is CS. The 'MS Power' is 24.07 dBm. The 'Band Cal' is on. The 'Measuring...' section shows 'Tx' and 'Rx' levels, with 'RxLEV' at < 110dBm. The 'Main Screen' shows 'Fundamental' and 'Sub Screen' options. The 'Tag' section shows 'Power Measurement' and 'Power vs Time'. The 'Modulation Analysis' section shows 'RMS Phase Error' at 0.41 deg.(rms) and 'Peak Phase Error' at 0.94 deg. The 'Output RF Spectrum - Modulation' section shows 'ORFS-Modulation' as 'Pass'. The 'Output RF Spectrum - Switching' section shows 'ORFS-Switching' as 'Pass'. The 'USF Block Error Rate' section shows 'USF Block Error Rate' at 0.00 %.

Parameter	Value	Unit
TCH Channel	189 CH	
TCH UL Frequency	836.400 000	MHz
Input Level	35.0	dBm
System Combination	GSM/PCS1900	
TCH DL Frequency	881.400 000	MHz
Output Level	-55.0	dBm
Coding Scheme	CS	
MS Power	24.07	dBm
RxLEV	< 110	dBm
RMS Phase Error	0.41	deg.(rms)
Peak Phase Error	0.94	deg.
ORFS-Modulation	Pass	
ORFS-Switching	Pass	
USF Block Error Rate	0.00	%

WCDMA

Phone2
LTE
40.20S#032

Phone1
W-CDMA
40.00 #013

UL Channel
9400 CH

UL Frequency
1 880.000 000 MHz

Input Level
35.0 dBm

Average Count PWR_AVG
Sets the average count (measurement count) for power measurement.

DL Channel
9800 CH

DL Frequency
1 960.000 000 MHz

Output Level
-65.7 dBm

Common

Physical Channel

Call Processing

TX Measurement

RX Measurement

Fundamental Measurement

Meas Setup

External Loss

System Config

Authentication / Integrity

Integrity Protection

SIM Model Number

P0035

Authentication Algorithm

XOR

Authentication Key Ki

00112233 44556677
8899AABB CCDDDEFF

AMF

0000

H

Opc

00000000 00000000
00000000 00000000

Connection Setting

Measurement Report

Inner Loop Power Control

Power Control Algorithm

Algorithm 1

TPC StepSize

1dB

Power Control

All 1

User Command

10101 01010 10101
01010 10101 01010

Measurement

Signaling

UE Power : 22.6 dBm

Band Cal

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

Loop Mode 1

Start Call

End Call

Menu

Fundamental

Numeric

Power Measurement (50/ 50)

TX Power 23.28 dBm

Frequency Error (1/ 1)

Carrier Frequency Error -0.0002 kHz

Freq. Err 0.00 ppm

Occupied Bandwidth (1/ 1) View

OBW 4.163 MHz

Spectrum Emission Mask (1/ 1) View

SEM Pass

Adjacent Channel Power (1/ 1)

ACLR(-5MHz) -40.24 dB

ACLR(+5MHz) -42.79 dB

Modulation Analysis (1/ 1) View

EVM 5.15 %(rms)

Peak Code Domain Error (1/ 1)

PCDE -39.86 dB

LTE

Phone2
LTE
40.20S#032

Phone1
LTE
40.20S#032

UL Channel
18900 ch

TPC Pattern
All +3dB

Input Level
35.0 dBm

Power Measurement - Meas. Count PWR_AVG
This sets the measurement count of the power measurement.

Operation Band
2

Channel Bandwidth
20 MHz

Output Level
-54.2 dBm

PCC

SCC1

SCC2

SCC3

>>

Common

Physical Channel

Call Processing

TX Measurement

RX Measurement

Fundamental Measurement

Test Parameter

Band Definition

External Loss

System Config

General

Frequency

Level

Signal

UL RMC

UL Allocation Mode

Normal

RB Pos.

Min(#0)

Number of RB

1

Starting RB

0

Max UL Throughput

72 kbps

MCS Index

5 QPSK 5 72 8

256QAM

Disabled

DL RMC

Measurement

Signaling

UE Power : 25.4 dBm

Band Cal

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

Connected

Start Call

End Call

Menu

Fundamental

Numeric

Power Measurement (50/ 50)

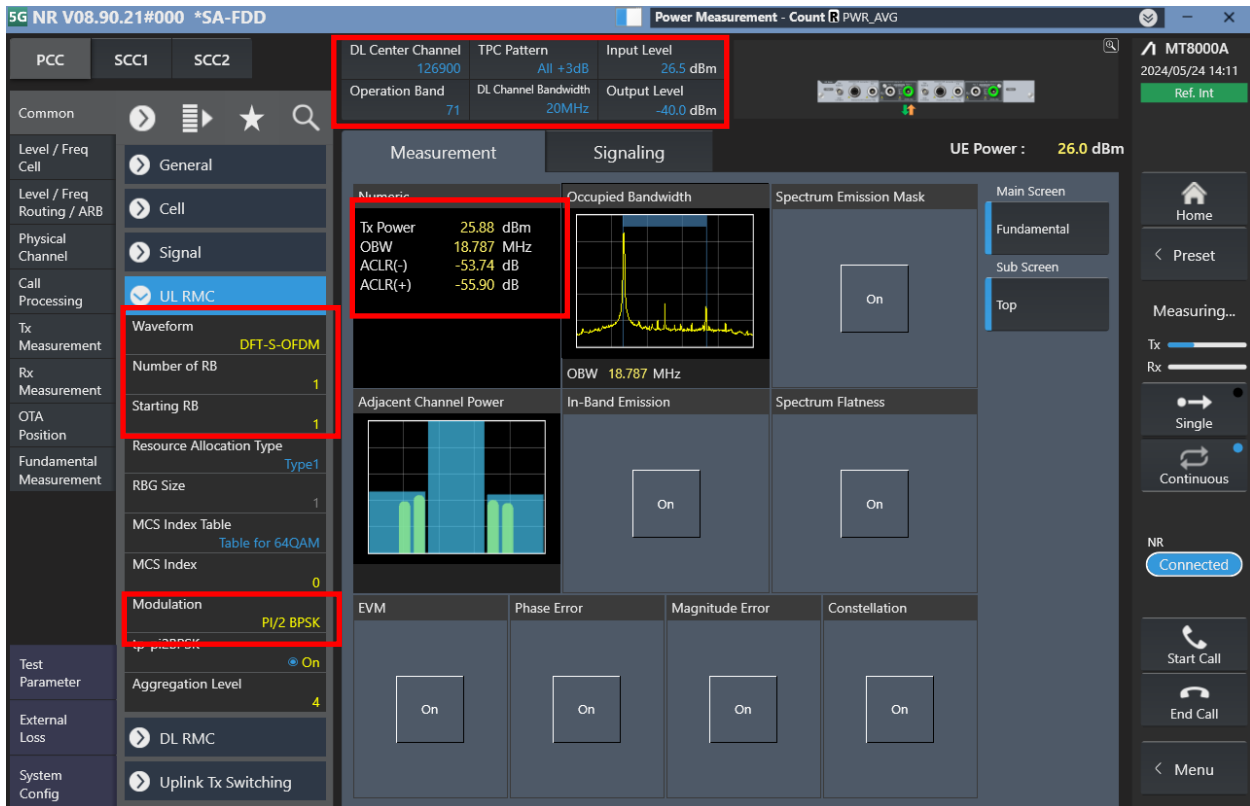
TX Power 25.12 dBm

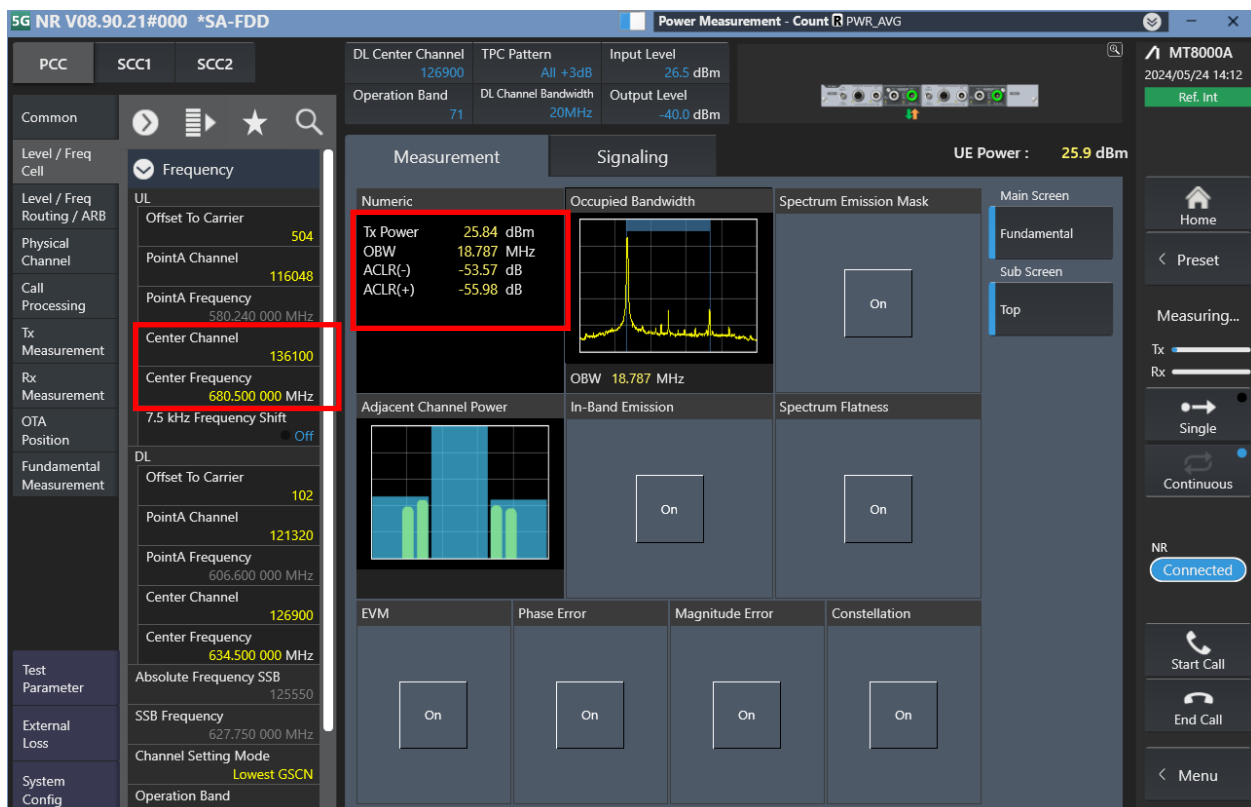
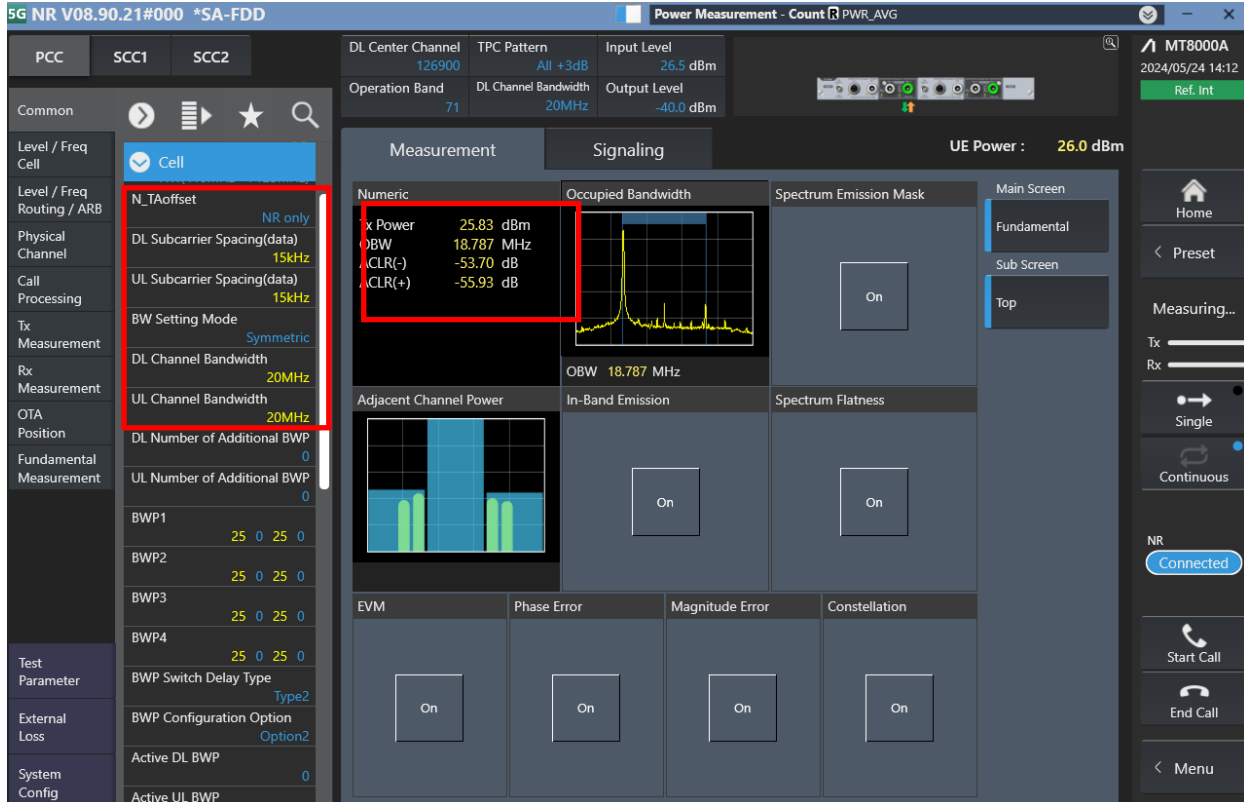
Modulation Analysis (1/ 1) View

Freq. Err 0.00 ppm

EVM 1.35 %(rms)

5G NR FR1



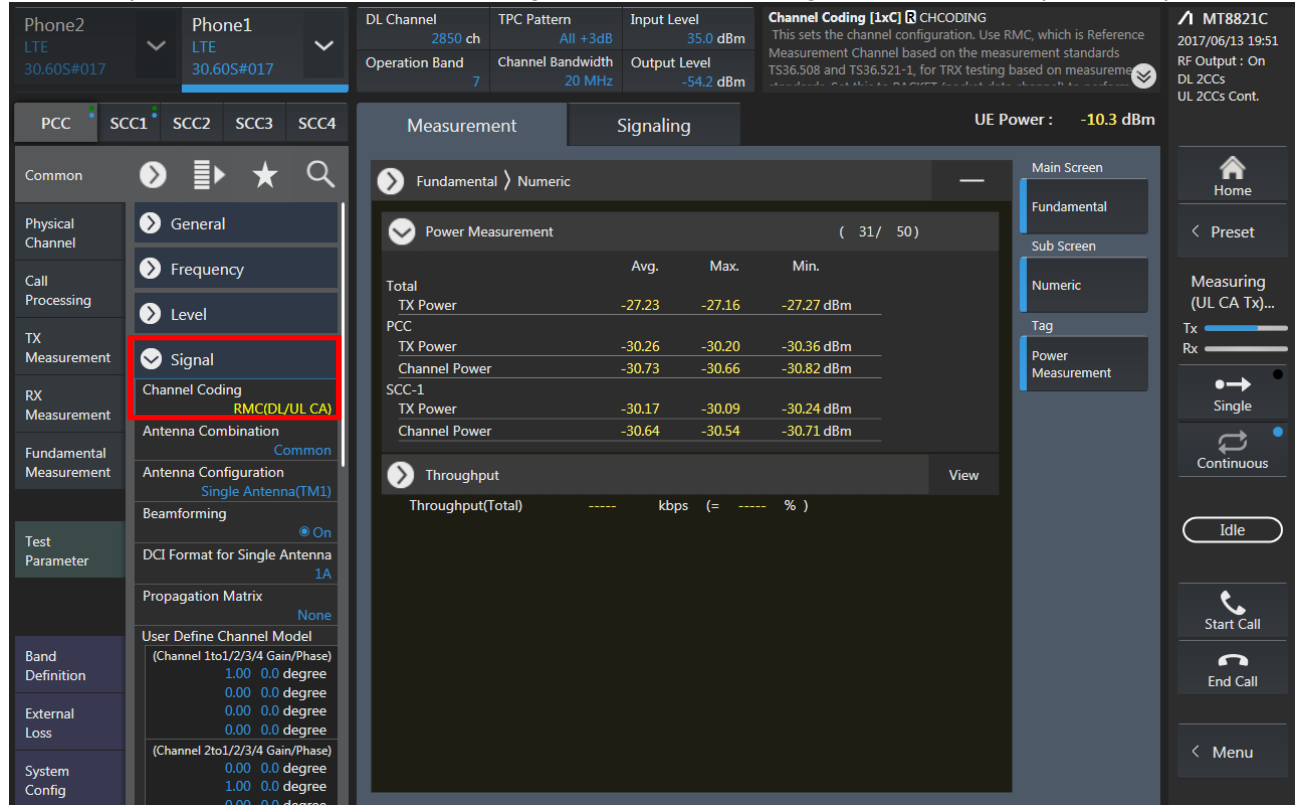


LTE Uplink and Downlink Carrier Aggregation configurations:

1. Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation;
Select "RMC (DL CA)" for Downlink Carrier Aggregation.

For example, Uplink Carrier Aggregation:

Detailed operation: PCC → Common → Signal → Channel Coding → Select **【RMC (DL/UL CA)】**

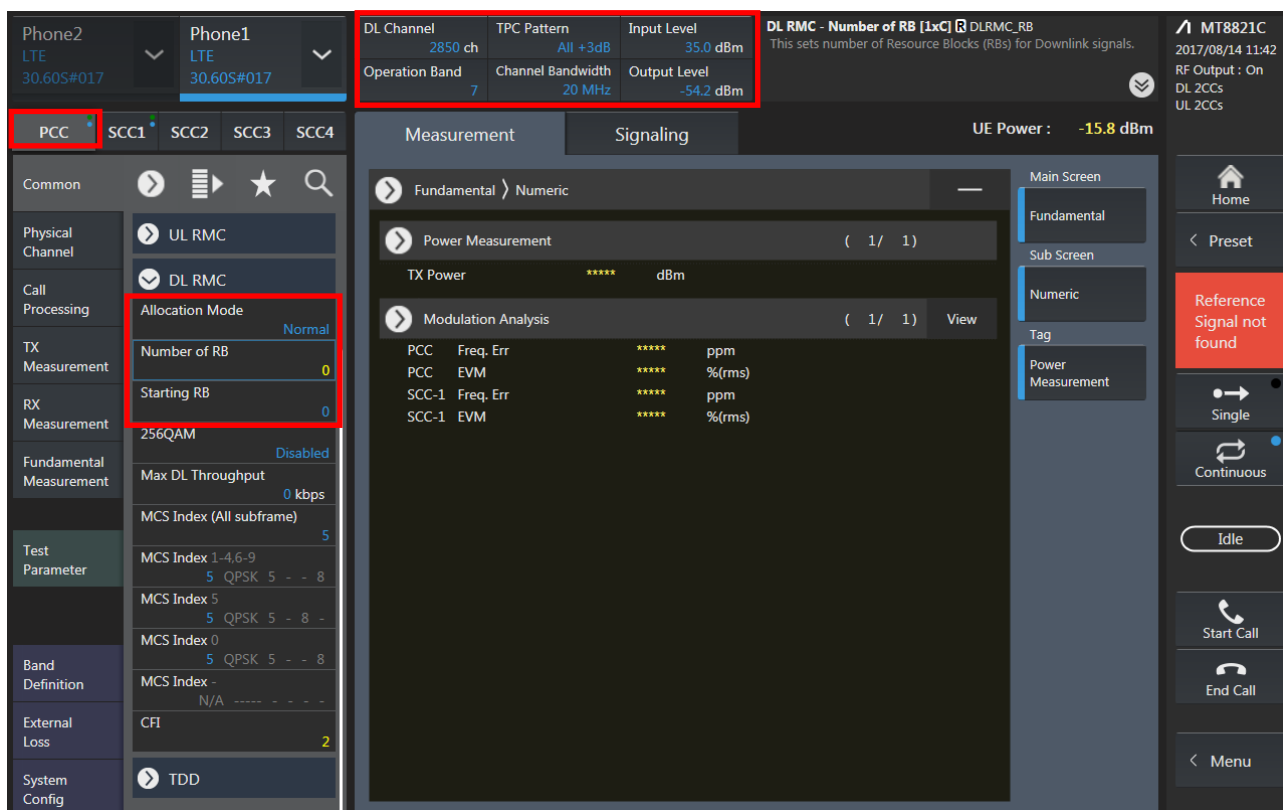


The screenshot displays the SPORTON LAB. software interface for LTE Uplink and Downlink Carrier Aggregation configurations. The interface is divided into several sections:

- Top Status Bar:** Shows Phone2 (LTE 30.60S#017) and Phone1 (LTE 30.60S#017). It also displays DL Channel (2850 ch), TPC Pattern (All +3dB), Input Level (35.0 dBm), and Channel Coding (1xC1) CHCODING. A note indicates that RMC is used for Reference Measurement Channel based on TS36.508 and TS36.521-1.
- Left Sidebar:** Contains various settings including Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config. The 'Signal' option under TX Measurement is highlighted with a red box.
- Main Display Area:** Shows measurement data for Power Measurement and Throughput. The Power Measurement section includes a table with columns for Total, Avg., Max., and Min. values for TX Power, PCC, and SCC-1. The Throughput section shows a table for Throughput(Total) in kbps and %.
- Right Sidebar:** Contains a 'Main Screen' section with 'Fundamental' and 'Sub Screen' options. It also includes a 'Measuring (UL CA Tx)...' section with 'Tx' and 'Rx' indicators and a 'Menu' button.

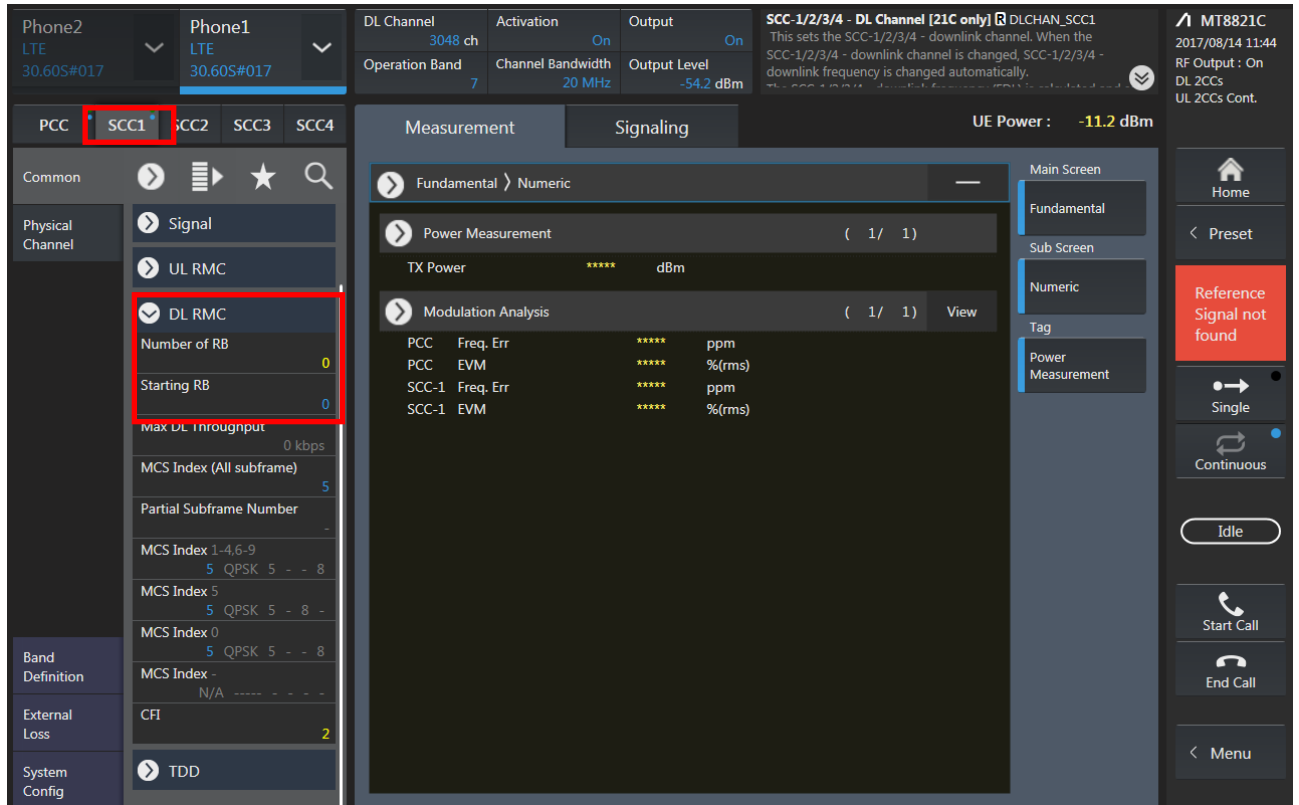
	Total	Avg.	Max.	Min.
TX Power	-27.23	-27.16	-27.27	-27.27 dBm
PCC				
TX Power	-30.26	-30.20	-30.36	-30.36 dBm
Channel Power	-30.73	-30.66	-30.82	-30.82 dBm
SCC-1				
TX Power	-30.17	-30.09	-30.24	-30.24 dBm
Channel Power	-30.64	-30.54	-30.71	-30.71 dBm

- PCC parameter Settings: select the PCC tab and Set operating band, BW, channel and RB configurations for PCC.



The screenshot displays the SPORTON LAB. FCC SAR TEST REPORT interface. The left sidebar contains various configuration tabs, with 'PCC' selected. The main area shows the 'PCC' configuration settings, including 'DL Channel' (2850 ch), 'TPC Pattern' (All +3dB), 'Input Level' (35.0 dBm), 'Operation Band' (7), 'Channel Bandwidth' (20 MHz), and 'Output Level' (-54.2 dBm). The 'DL RMC - Number of RB [1x] [3] DLRMC_RB' is also visible. The 'PCC' tab is highlighted in red. The 'PCC' configuration is further detailed in the 'PCC' section, showing 'Allocation Mode' (Normal), 'Number of RB' (0), 'Starting RB' (0), and '256QAM' (Disabled). The 'PCC' section is also highlighted in red. The 'PCC' section is further detailed in the 'PCC' section, showing 'Allocation Mode' (Normal), 'Number of RB' (0), 'Starting RB' (0), and '256QAM' (Disabled). The 'PCC' section is also highlighted in red.

3. SCC parameter Settings: select the SCC tab and Set operating band, BW, channel and RB configurations for SCC.



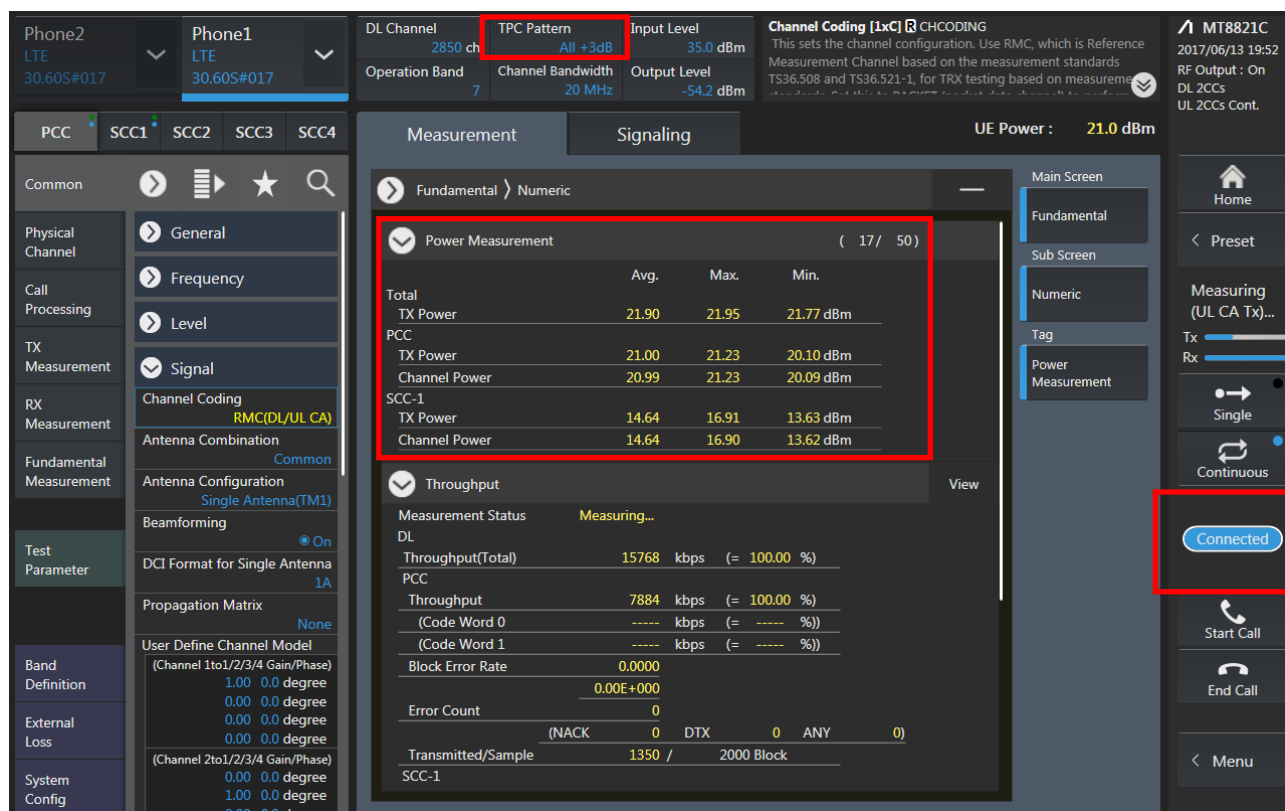
The screenshot displays the SPORTON LAB. FCC SAR TEST REPORT interface. The top section shows the 'Phone1' configuration with 'LTE' and '30.60S#017'. The 'DL Channel' is set to '3048 ch', 'Operation Band' is '7', 'Channel Bandwidth' is '20 MHz', and 'Output Level' is '-54.2 dBm'. The 'Activation' and 'Output' status are both 'On'. The 'SCC-1/2/3/4 - DL Channel [21C only]' is selected, and the 'DLCHAN_SCC1' is set to 'DLCHAN_SCC1'. The 'UE Power' is '-11.2 dBm'. The 'Physical Channel' section is expanded, showing 'Signal', 'UL RMC', and 'DL RMC' (selected). The 'DL RMC' settings are: 'Number of RB' is '0', 'Starting RB' is '0', 'Max DL Throughput' is '0 kbps', 'MCS Index (All subframe)' is '5', 'Partial Subframe Number' is '-', 'MCS Index 1-4,6-9' is '5 QPSK 5 - - 8', 'MCS Index 5' is '5 QPSK 5 - - 8', 'MCS Index 0' is '5 QPSK 5 - - 8', 'MCS Index -' is 'N/A - - - - -', and 'CFI' is '2'. The 'System Config' section shows 'TDD'. The 'Measurement' section is expanded, showing 'Fundamental' and 'Modulation Analysis'. The 'Modulation Analysis' table shows the following data:

Measurement	Value	Unit
TX Power	*****	dBm
PCC Freq. Err	*****	ppm
PCC EVM	*****	%(rms)
SCC-1 Freq. Err	*****	ppm
SCC-1 EVM	*****	%(rms)

The 'Main Screen' section shows 'Fundamental' and 'Sub Screen' (selected). The 'Tag' section shows 'Power Measurement'. The 'Reference Signal not found' message is displayed. The 'Home' button is visible at the bottom right.

4. Select the PCC tab, and select max power;

Click the “Connect” button at the Right of the screen.



The screenshot displays the FCC SAR Test Report software interface. The top bar shows the phone configuration: Phone2 (LTE, 30.60S#017) and Phone1 (LTE, 30.60S#017). The DL Channel is 2850 ch, and the TPC Pattern is All +3dB. The Input Level is 35.0 dBm, and the Output Level is -54.2 dBm. The Channel Coding is 1xC, and the CHCODING is RMC(DL/UL CA). The UE Power is 21.0 dBm.

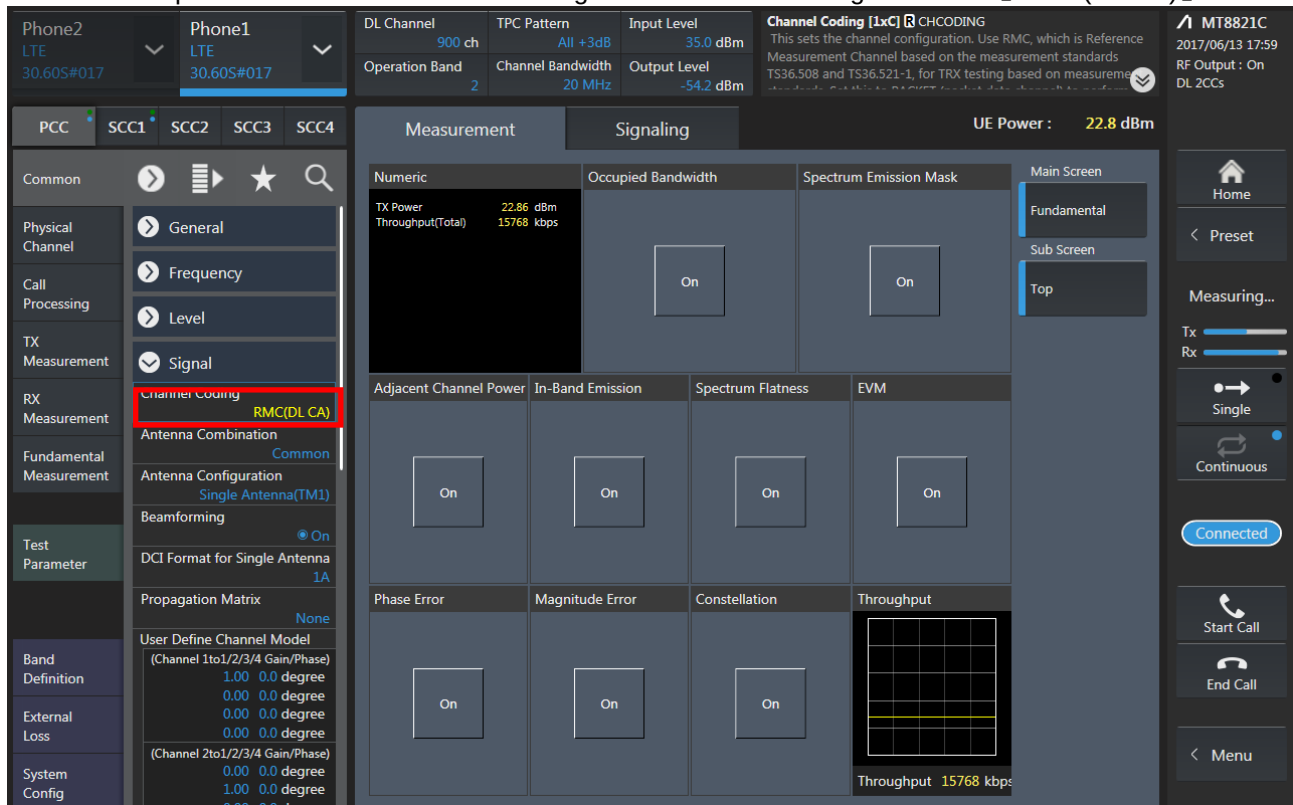
The left sidebar contains various tabs: Common, Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config. The main area is divided into Measurement and Signaling sections. The Measurement section is currently selected, showing a table of power measurements for PCC and SCC-1.

	Avg.	Max.	Min.
Total TX Power	21.90	21.95	21.77 dBm
PCC TX Power	21.00	21.23	20.10 dBm
Channel Power	20.99	21.23	20.09 dBm
SCC-1 TX Power	14.64	16.91	13.63 dBm
Channel Power	14.64	16.90	13.62 dBm

The right sidebar contains a 'Main Screen' section with buttons for Fundamental, Sub Screen, Numeric, Tag, and Power Measurement. Below this is a 'Connected' button, which is highlighted with a red box. The bottom right corner contains buttons for Home, Preset, Measuring (UL CA Tx...), Tx, Rx, Single, Continuous, Start Call, End Call, and Menu.

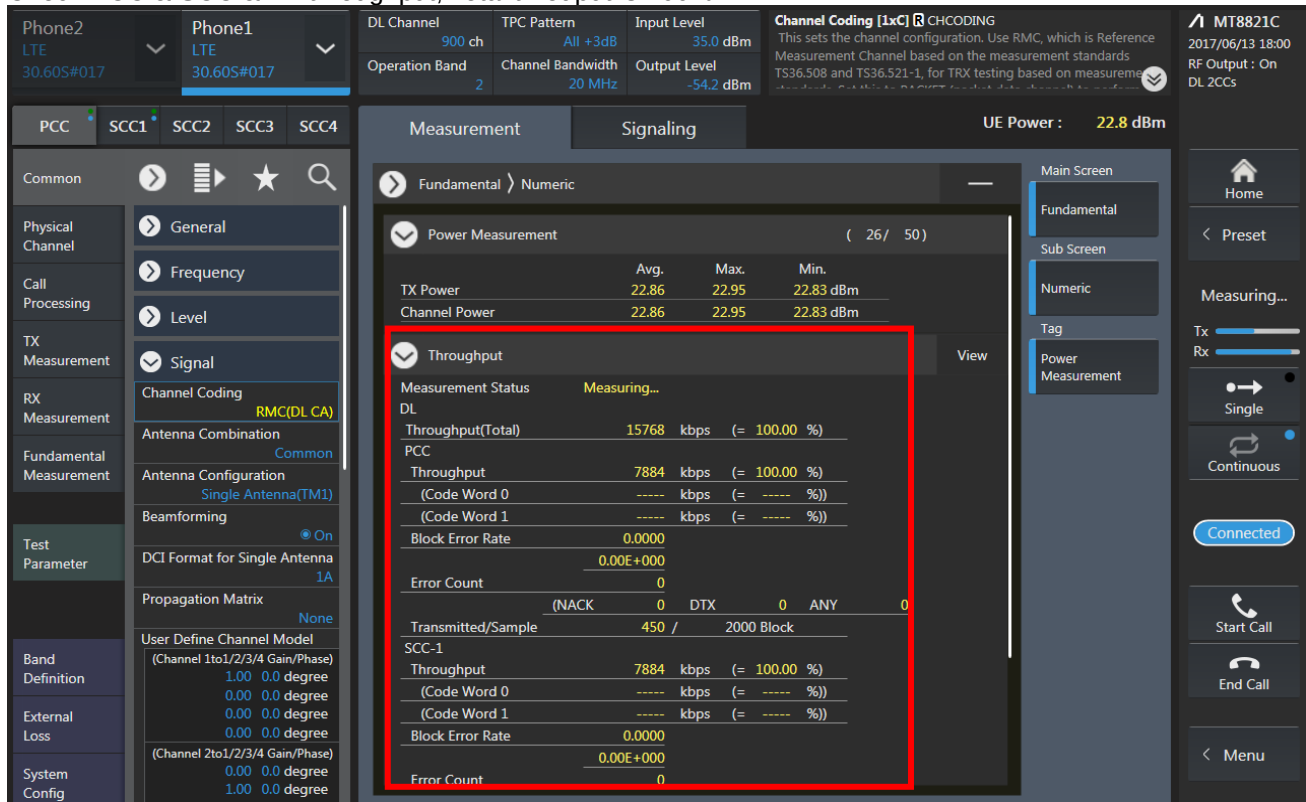
For example, Downlink Carrier Aggregation:

Detailed operation: PCC → Common → Signal → Channel Coding → Select 【RMC (DL CA)】



The screenshot shows the 'Channel Coding' menu with 'RMC(DL CA)' selected. The interface includes a left sidebar with various measurement options, a top status bar with phone information, and a main display area showing measurement results for TX Power, Throughput, and other parameters. The 'UE Power' is indicated as 22.8 dBm.

Check PCC & SCC & DL throughput, Total thruout is 100%



The screenshot shows the 'Throughput' measurement results. The 'DL' section shows a throughput of 15768 kbps (100.00%). The 'PCC' section shows a throughput of 7884 kbps (100.00%). The 'SCC-1' section shows a throughput of 7884 kbps (100.00%). The total throughput is 100.00%.

Measurement Status	Throughput (kbps)	Percentage (%)
DL	15768	100.00
PCC	7884	100.00
SCC-1	7884	100.00

