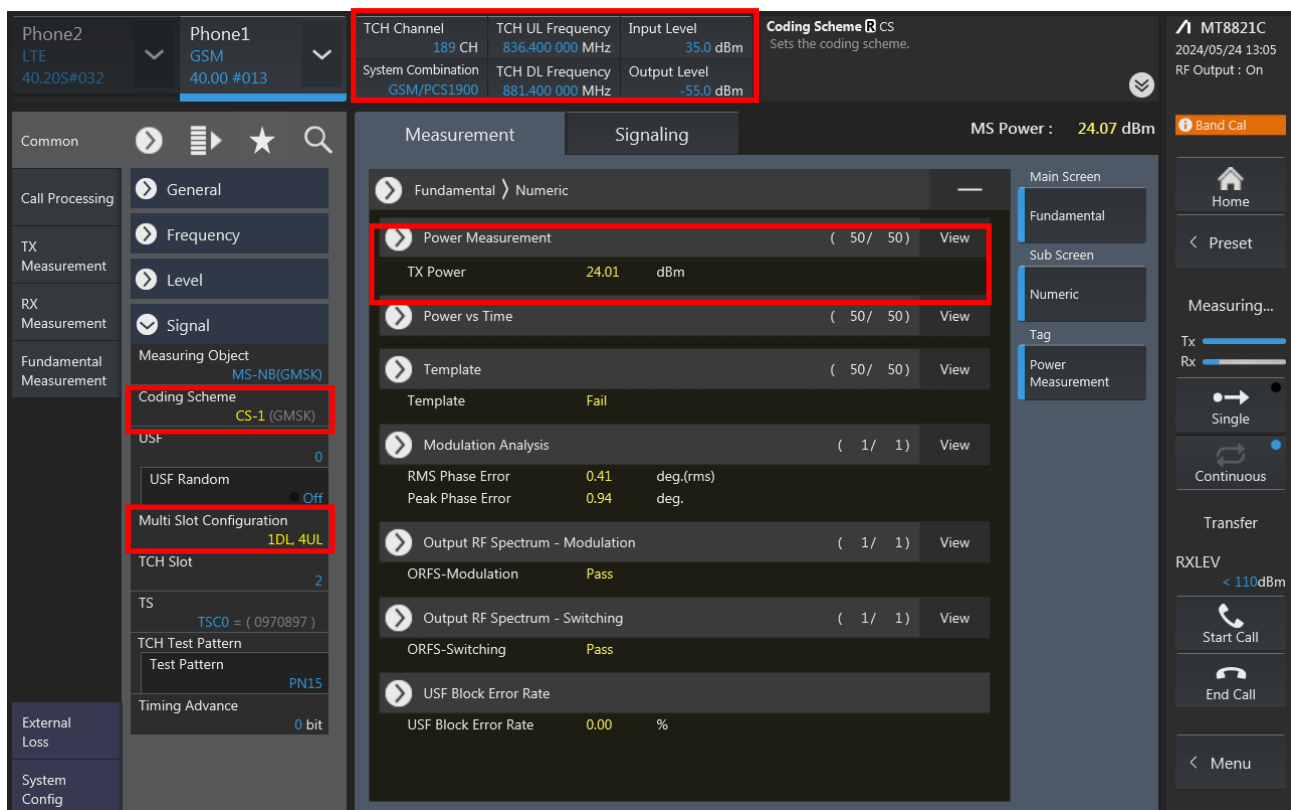


Appendix D-4. 2G/3G/LTE/5G FR1/UL and DL CA connection diagram

General Note:

The power measurement for 2G/3G/LTE/5G FR1/UL and DL 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/UL and DL CA.

GSM



The screenshot displays the MT8821C test equipment interface for GSM configuration and measurement. The interface is divided into several sections:

- Top Bar:** Shows 'Phone2' (LTE 40.205#032) and 'Phone1' (GSM 40.00 #013). It also displays 'TCH Channel' (189 CH), 'TCH UL Frequency' (836.400 000 MHz), 'Input Level' (35.0 dBm), 'Coding Scheme' (CS), 'System Combination' (GSM/PCS1900), 'TCH DL Frequency' (881.400 000 MHz), and 'Output Level' (-55.0 dBm).
- Left Sidebar:** Contains navigation options such as 'Call Processing', 'TX Measurement', 'RX Measurement', 'Fundamental Measurement', 'External Loss', and 'System Config'.
- Main Area:**
 - Measurement Tab:** Displays 'Power Measurement' with 'TX Power' at 24.01 dBm. Other options include 'Power vs Time', 'Template', 'Modulation Analysis', 'Output RF Spectrum - Modulation', 'Output RF Spectrum - Switching', and 'USF Block Error Rate'.
 - Signaling Tab:** Displays 'Modulation Analysis' with 'RMS Phase Error' at 0.41 deg.(rms) and 'Peak Phase Error' at 0.94 deg. Other options include 'Output RF Spectrum - Modulation', 'Output RF Spectrum - Switching', and 'USF Block Error Rate'.
- Right Sidebar:** Shows 'Main Screen' and 'Sub Screen' options, along with 'Tx' and 'Rx' power levels. It also includes a 'Band Cal' button and a 'Menu' button.

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

DL Channel
9800 CH

DL Frequency
1 960.000 000 MHz

Output Level
-65.7 dBm

Average Count PWR_AVG

Sets the average count (measurement count) for power measurement.

MT8821C
2024/05/24 12:58
RF Output : On

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

Operation Band
2

Channel Bandwidth
20 MHz

Output Level
-54.2 dBm

Power Measurement - Meas. Count PWR_AVG

This sets the measurement count of the power measurement.

MT8821C
2024/05/24 12:51
RF Output : On

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

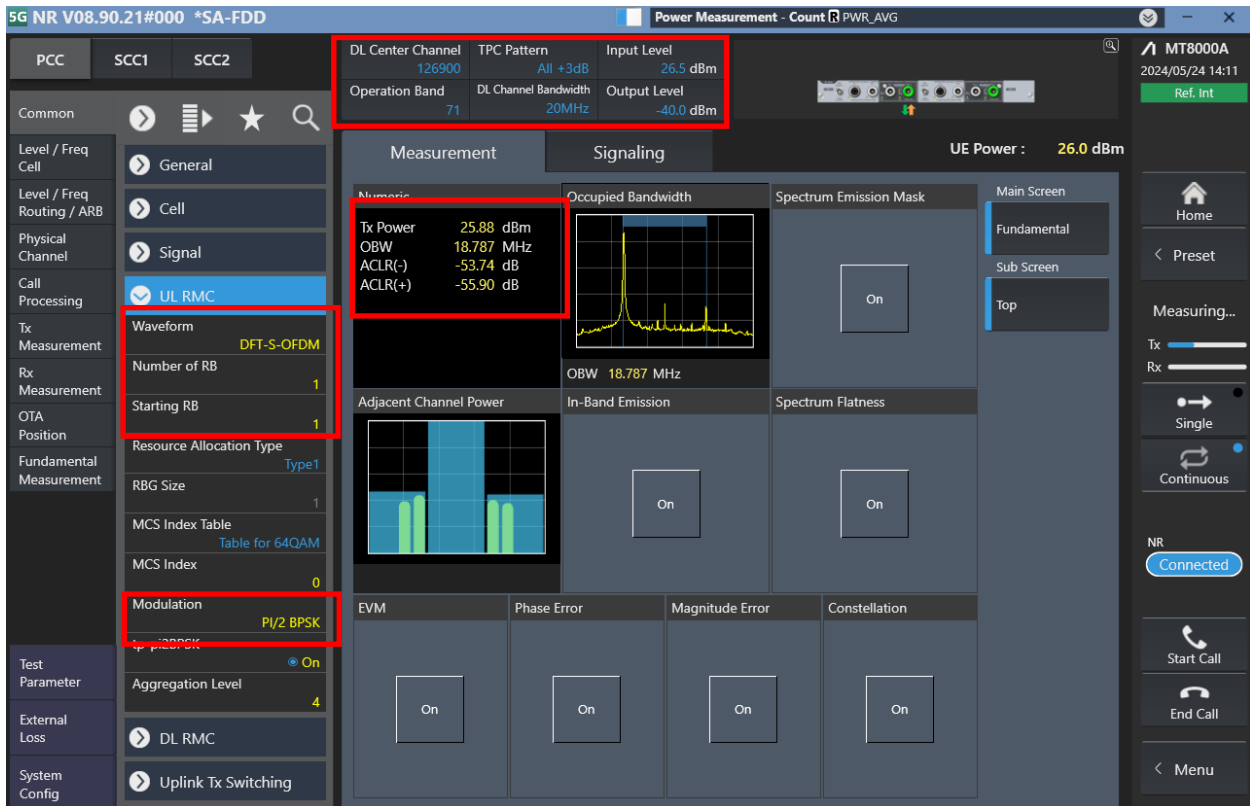
ppm

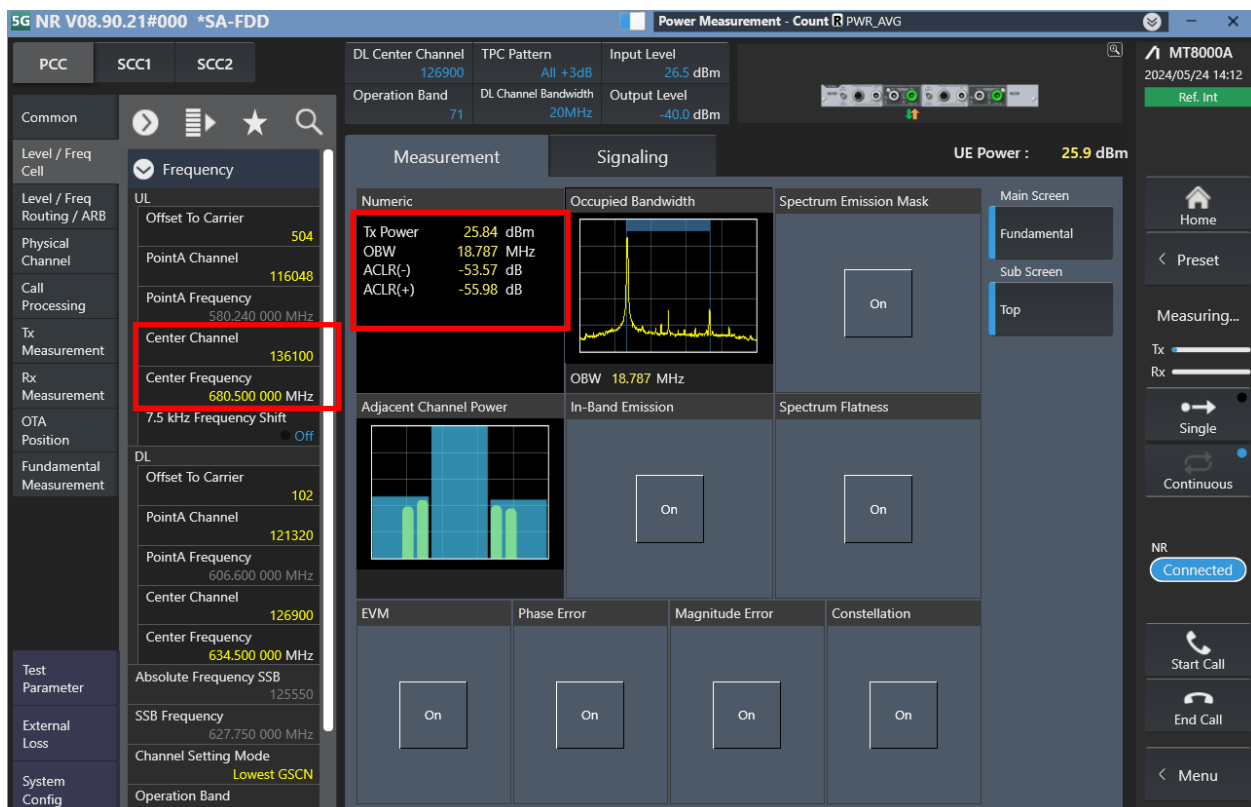
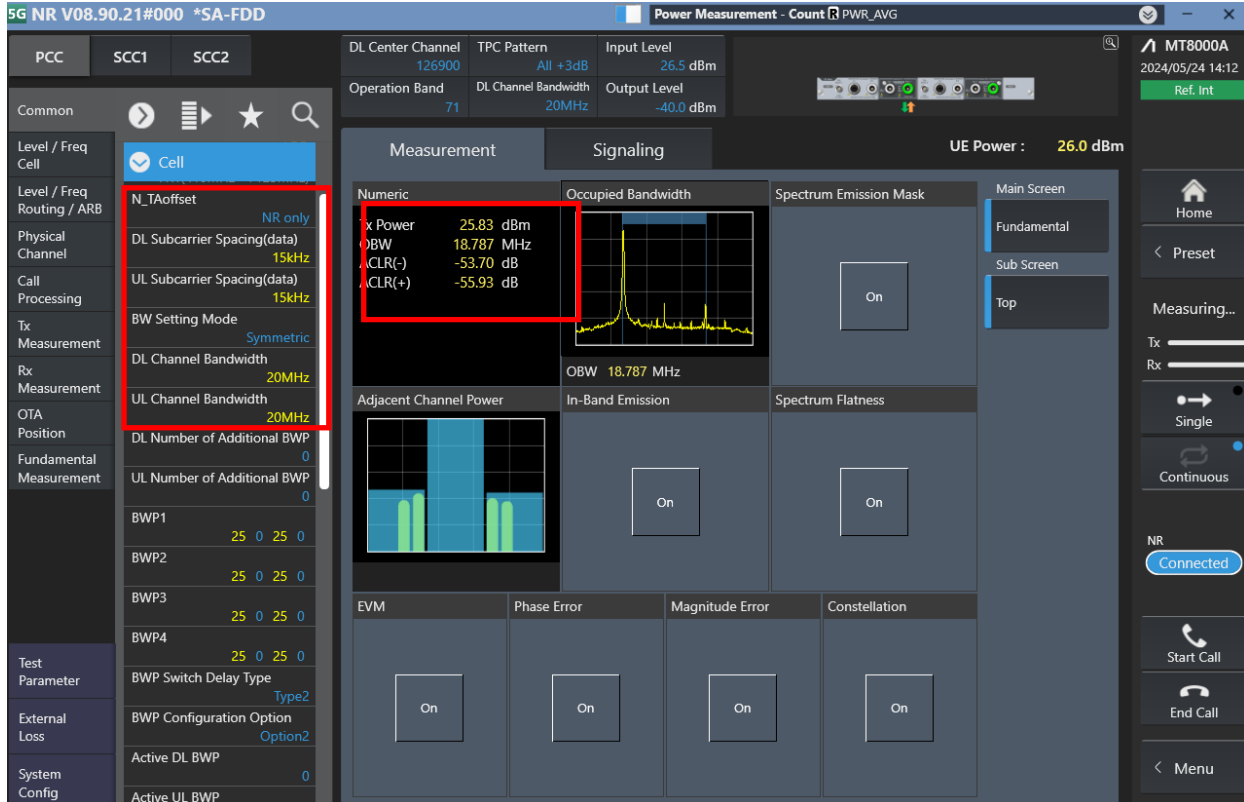
EVM

1.35

%(rms)

5G NR FR1



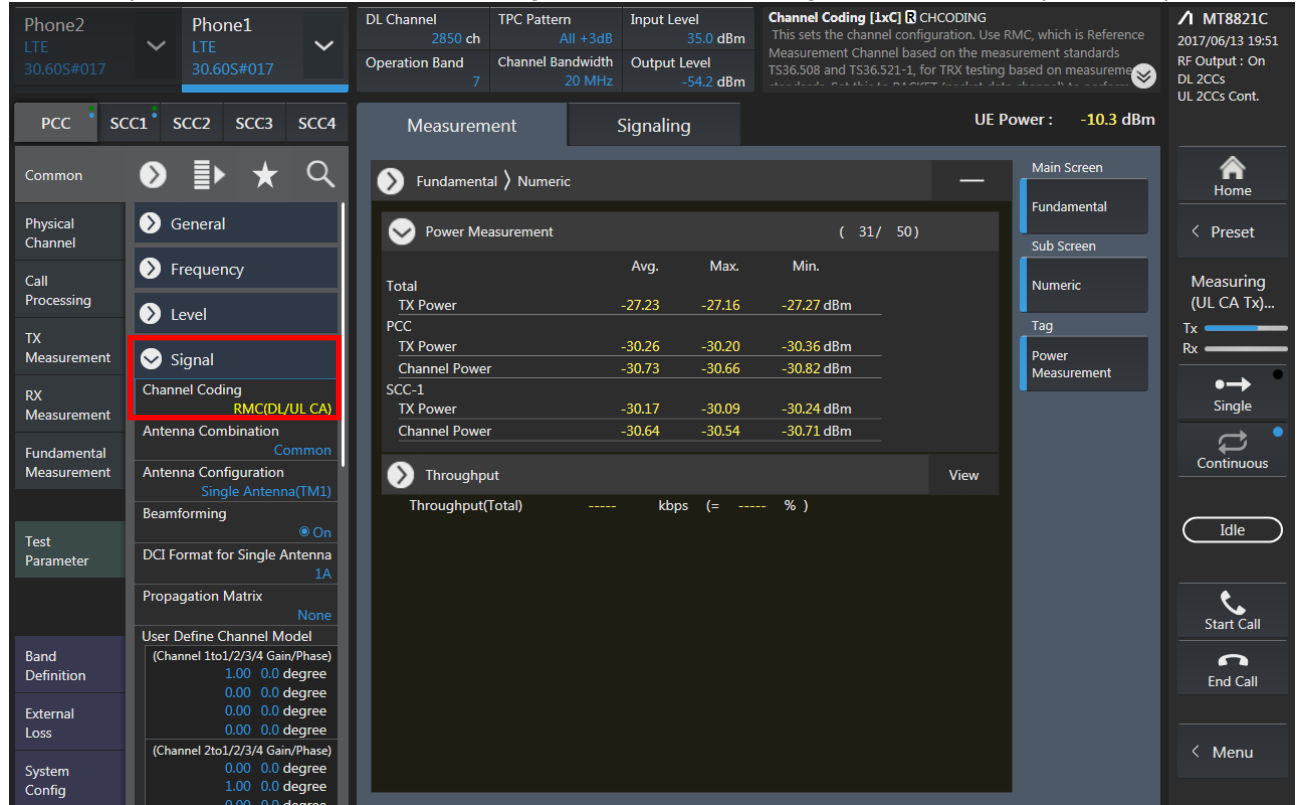


LTE Uplink and Downlink Carrier Aggregation configurations:

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)】**



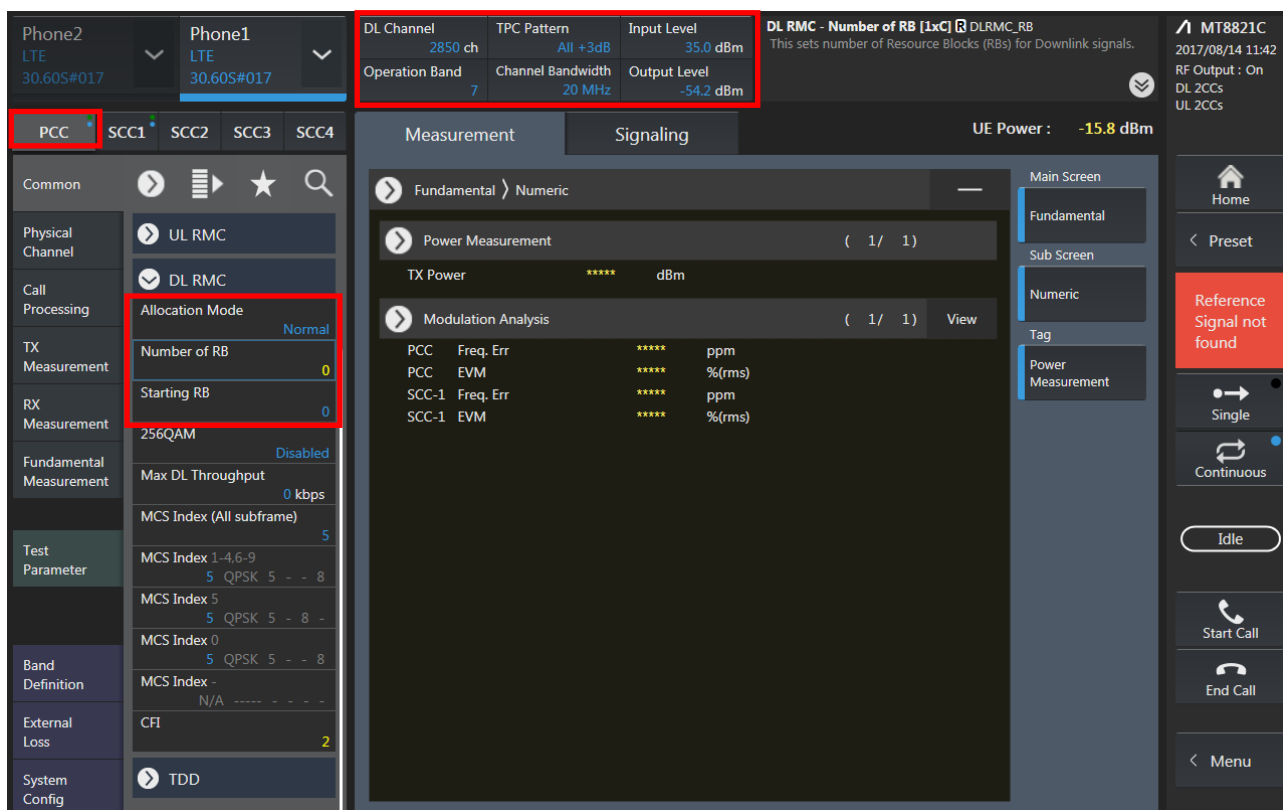
The screenshot displays the SPORTON LAB. software interface for LTE Uplink and Downlink Carrier Aggregation configurations. The interface is divided into several sections:

- 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 [1xC] CHCODING. A note states: "This sets the channel configuration. Use RMC, which is Reference Measurement Channel based on the measurement standards TS36.508 and TS36.521-1, for TRX testing based on measurement." The UE Power is shown as -10.3 dBm.
- Left Sidebar:** Contains various settings categories: 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 the 'Fundamental' screen with 'Power Measurement' and 'Throughput' tabs. The 'Power Measurement' tab is active, displaying a table of power levels for PCC and SCC-1.

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

The 'Throughput' tab shows a throughput of 0 kbps (0 %).

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



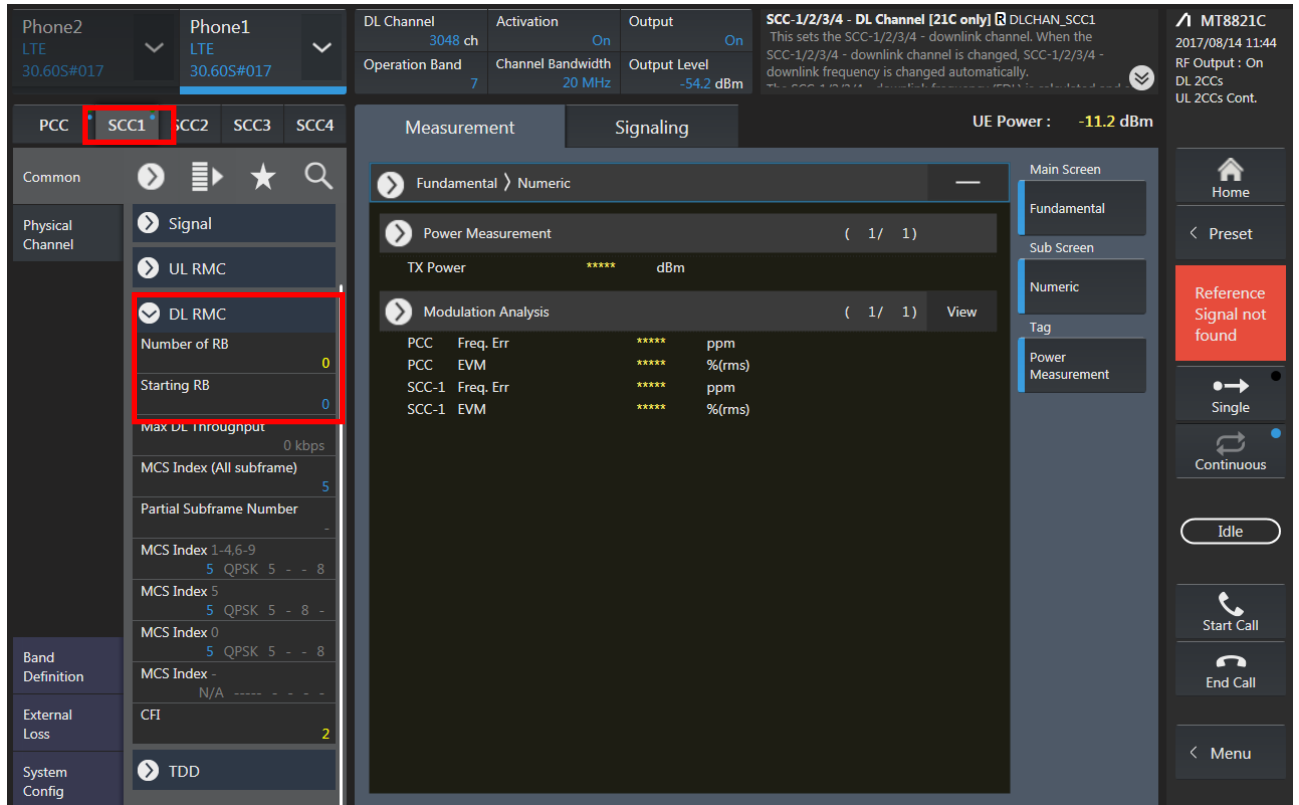
The screenshot displays the SPORTON LAB. FCC SAR TEST REPORT interface. The top section shows the test setup for Phone1 (LTE, 30.60S#017) and Phone2 (LTE, 30.60S#017). The PCC tab is selected, and the DL Channel is set to 2850 ch, Operation Band to 7, TPC Pattern to All +3dB, Input Level to 35.0 dBm, Channel Bandwidth to 20 MHz, and Output Level to -54.2 dBm. The DL RMC - Number of RB is set to 1x1, and the DL RMC - Number of RB is set to 1x1. The UE Power is -15.8 dBm.

The left sidebar shows the test configuration options, including Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config. The PCC tab is selected, and the Allocation Mode is set to Normal. The Number of RB is 0, and the Starting RB is 0. The MCS Index (All subframe) is 5, and the MCS Index 1-4,6-9 is 5. The MCS Index 5 is 5, and the MCS Index 0 is 5. The MCS Index - is N/A. The CFI is 2, and the TDD is selected.

The main display area shows the Measurement and Signaling tabs. The Measurement tab is selected, and the Fundamental and Numeric views are shown. The Power Measurement section shows TX Power as ***** dBm. The Modulation Analysis section shows PCC Freq. Err as ***** ppm, PCC EVM as ***** %(rms), SCC-1 Freq. Err as ***** ppm, and SCC-1 EVM as ***** %(rms).

The right sidebar shows the test status, including the Home button, Preset button, Reference Signal not found message, Single button, Continuous button, Idle button, Start Call button, End Call button, and Menu button.

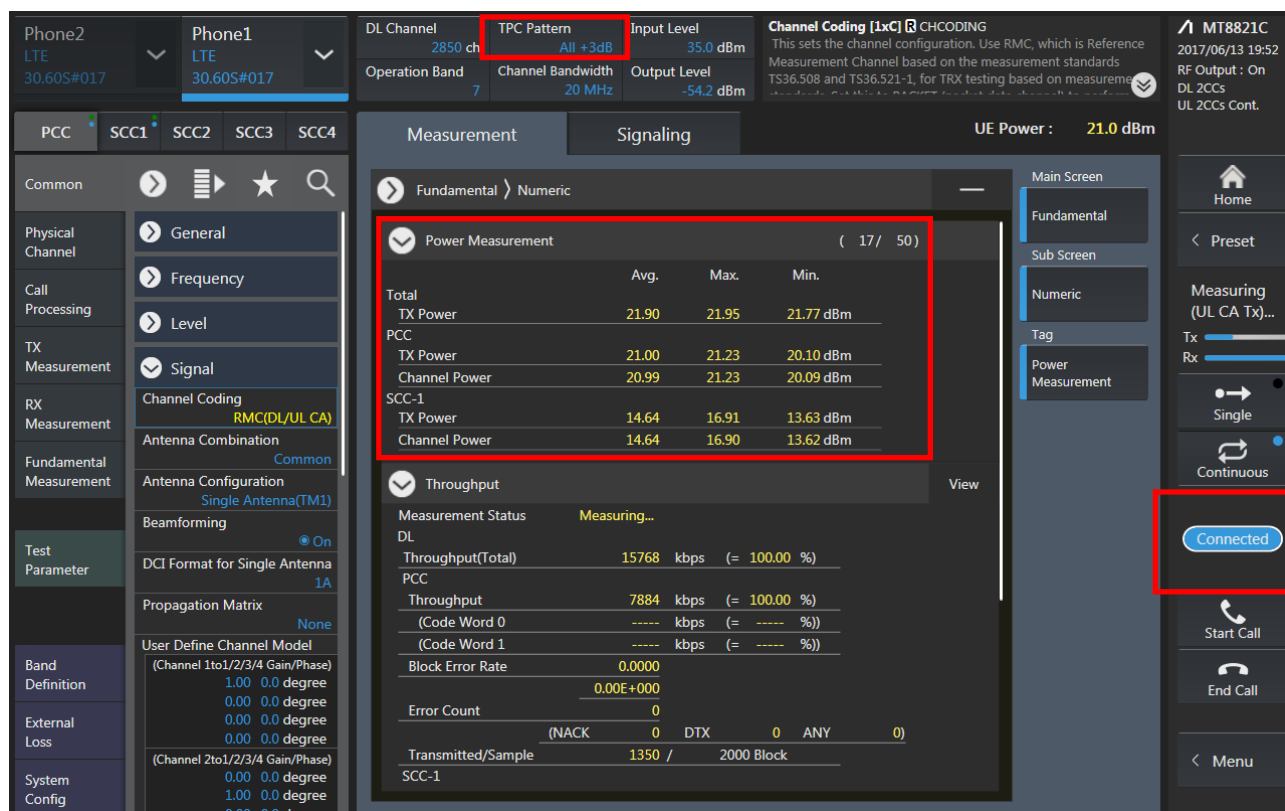
3. SCC parameter Settings: select the SCC tab and Set operating band, BW, channel and RB configurations for SCC.



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' section shows 'PCC Freq. Err' as '***** ppm', 'PCC EVM' as '***** %(rms)', 'SCC-1 Freq. Err' as '***** ppm', and 'SCC-1 EVM' as '***** %(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 section shows configuration parameters for Phone1 and Phone2, including DL Channel (2850 ch), TPC Pattern (All +3dB), Input Level (35.0 dBm), Channel Coding (1xC), and Channel Bandwidth (20 MHz). The left sidebar contains various tabs like PCC, SCC1, SCC2, SCC3, and SCC4. The main area is divided into 'Measurement' and 'Signaling' sections. The 'Measurement' section is currently active, showing 'Power Measurement' and 'Throughput' data. The 'Power Measurement' table is highlighted with a red box, showing values for Total TX Power, PCC TX Power, Channel Power, and SCC-1 TX Power. The 'Throughput' section shows measurement status and throughput data. On the right side, there is a 'Main Screen' panel with buttons for 'Fundamental', 'Sub Screen', 'Tag', and 'Power Measurement'. At the bottom right, there is a 'Connected' button, which is highlighted with a red box, indicating the device is connected to the network.

	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

Throughput		
Throughput(Total)	15768 kbps	(= 100.00 %)
Throughput (Code Word 0)	7884 kbps	(= 100.00 %)
Throughput (Code Word 1)	7884 kbps	(= 100.00 %)
Block Error Rate	0.0000	
Error Count	0	
Transmitted/Sample	1350 / 2000 Block	