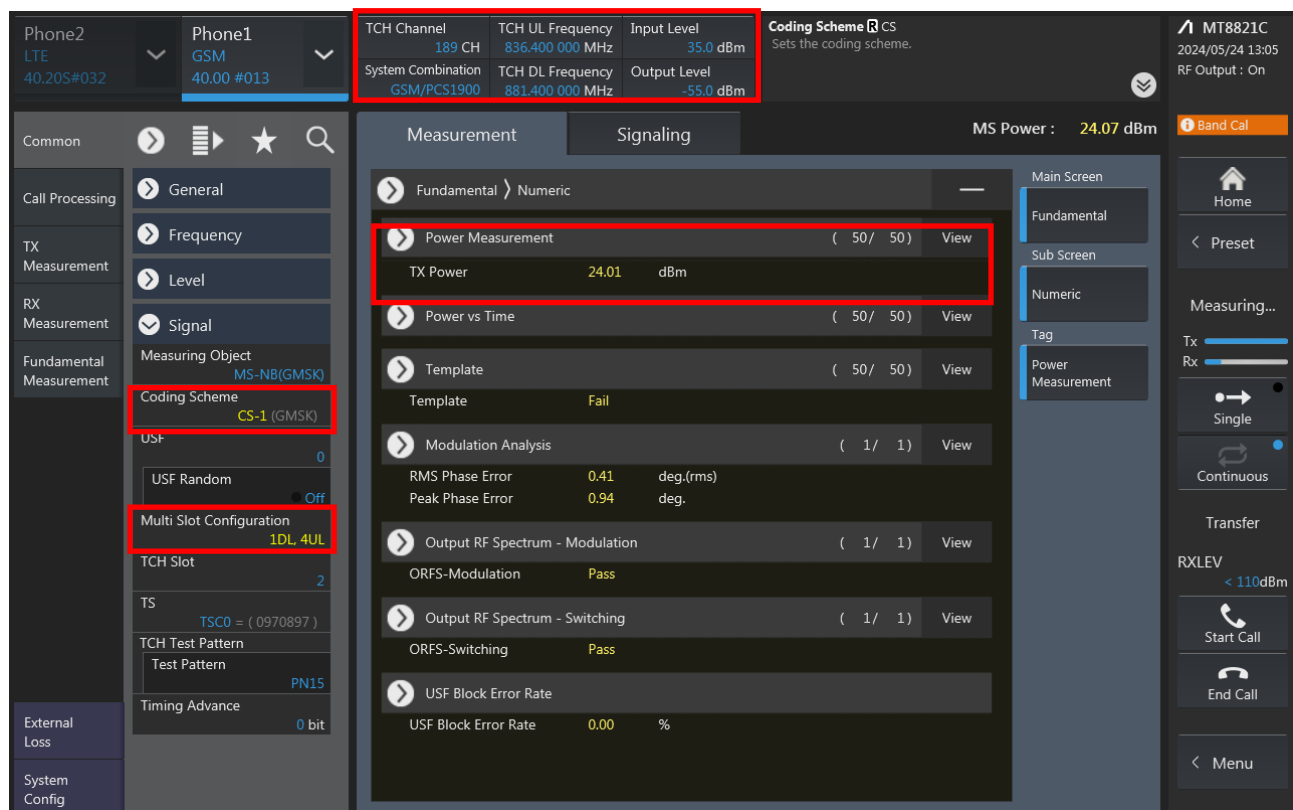


Appendix D-3. 2G/3G/LTE/5G FR1/UL and DL CA connection diagram

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 interface for GSM configuration and measurement. Key elements include:

- Phone Configuration:** Phone2 (LTE 40.205#032) and Phone1 (GSM 40.00 #013).
- Measurement Parameters:**
 - 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 (Sets the coding scheme).
- Measurement Results:**
 - Power Measurement:** TX Power 24.01 dBm.
 - Power vs Time:** (50/ 50) View
 - Template:** (50/ 50) View
 - Modulation Analysis:** (1/ 1) View
 - RMS Phase Error: 0.41 deg.(rms)
 - Peak Phase Error: 0.94 deg.
 - Output RF Spectrum - Modulation:** (1/ 1) View
 - ORFS-Modulation: Pass
 - Output RF Spectrum - Switching:** (1/ 1) View
 - ORFS-Switching: Pass
 - USF Block Error Rate:** USF Block Error Rate 0.00 %
- Configuration Details:**
 - Measuring Object: MS-NB(GMSK)
 - Coding Scheme: CS-1 (GMSK)
 - USF: 0
 - USF Random: Off
 - Multi Slot Configuration: 1DL, 4UL
 - TCH Slot: 2
 - TS: TSC0 = (0970897)
 - TCH Test Pattern: Test Pattern PN15
 - Timing Advance: 0 bit
- MS Power:** 24.07 dBm
- Band Cal:** On
- MT8821C:** 2024/05/24 13:05, RF Output : On

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
Authentication / Integrity
Integrity Protection
On

Call Processing
SIM Model Number
P0035

TX Measurement
Authentication Algorithm
XOR

RX Measurement
Authentication Key Ki
00112233 44556677
8899AABB CCDDDEFF

Fundamental Measurement
AMF
0000 H
Opc
00000000 00000000
00000000 00000000

Meas Setup
Connection Setting
Measurement Report

Meas Setup
Inner Loop Power Control
Power Control Algorithm
Algorithm 1
TPC StepSize
1dB

External Loss
Power Control
All 1

System Config
User Command
10101 01010 10101
01010 10101 01010

Measurement

Signaling

UE Power : 22.6 dBm

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

Main Screen
Fundamental

Sub Screen
Numeric

Tag
Power Measurement

Band Cal

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

Loop Mode 1

Start Call

End Call

Menu

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
General

Call Processing
Frequency

TX Measurement
Level

RX Measurement
Signal

Fundamental Measurement
UL RMC
UL Allocation Mode
Normal
RB Pos.
Min(#0)

Test Parameter
Number of RB
1
Starting RB
0

Band Definition
Max UL Throughput
72 kbps
MCS Index
5 QPSK 5 72 8

External Loss
256QAM
Disabled

System Config
DL RMC

Measurement

Signaling

UE Power : 25.4 dBm

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)

Main Screen
Fundamental

Sub Screen
Numeric

Tag
Power Measurement

Band Cal

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

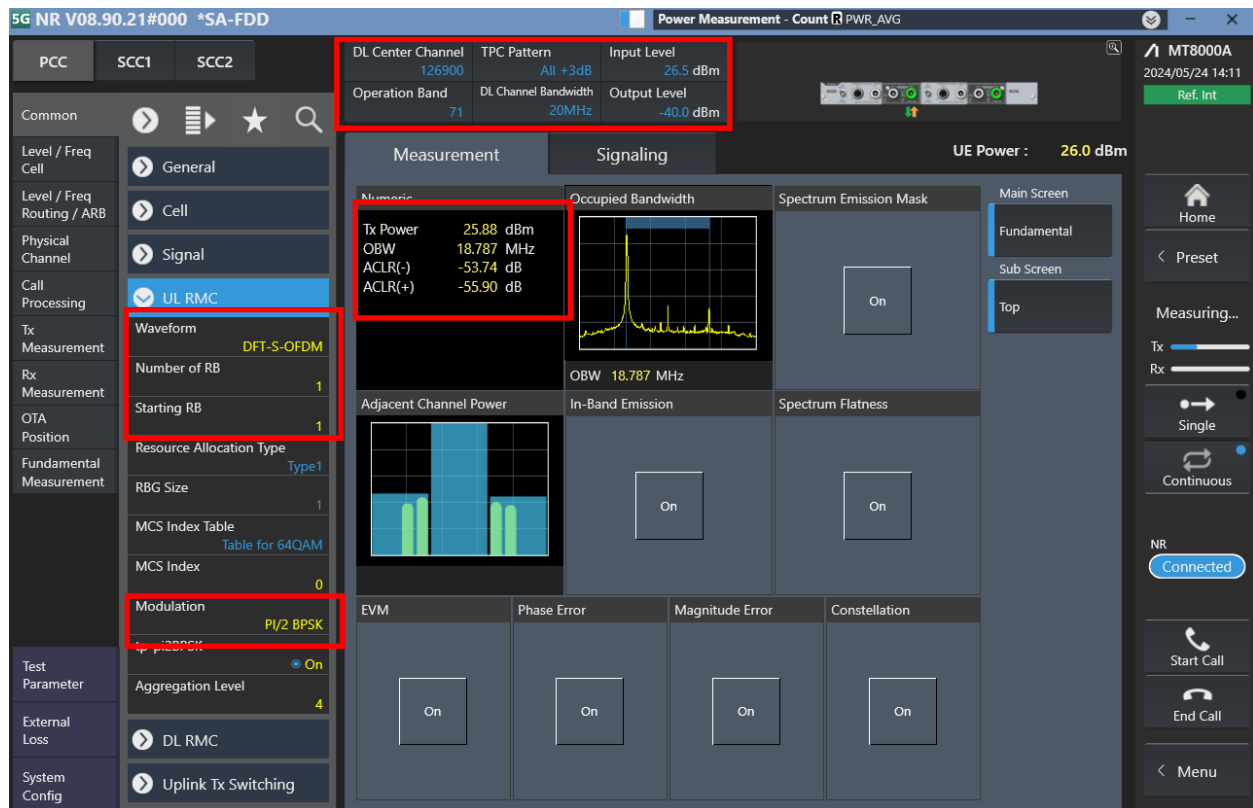
Connected

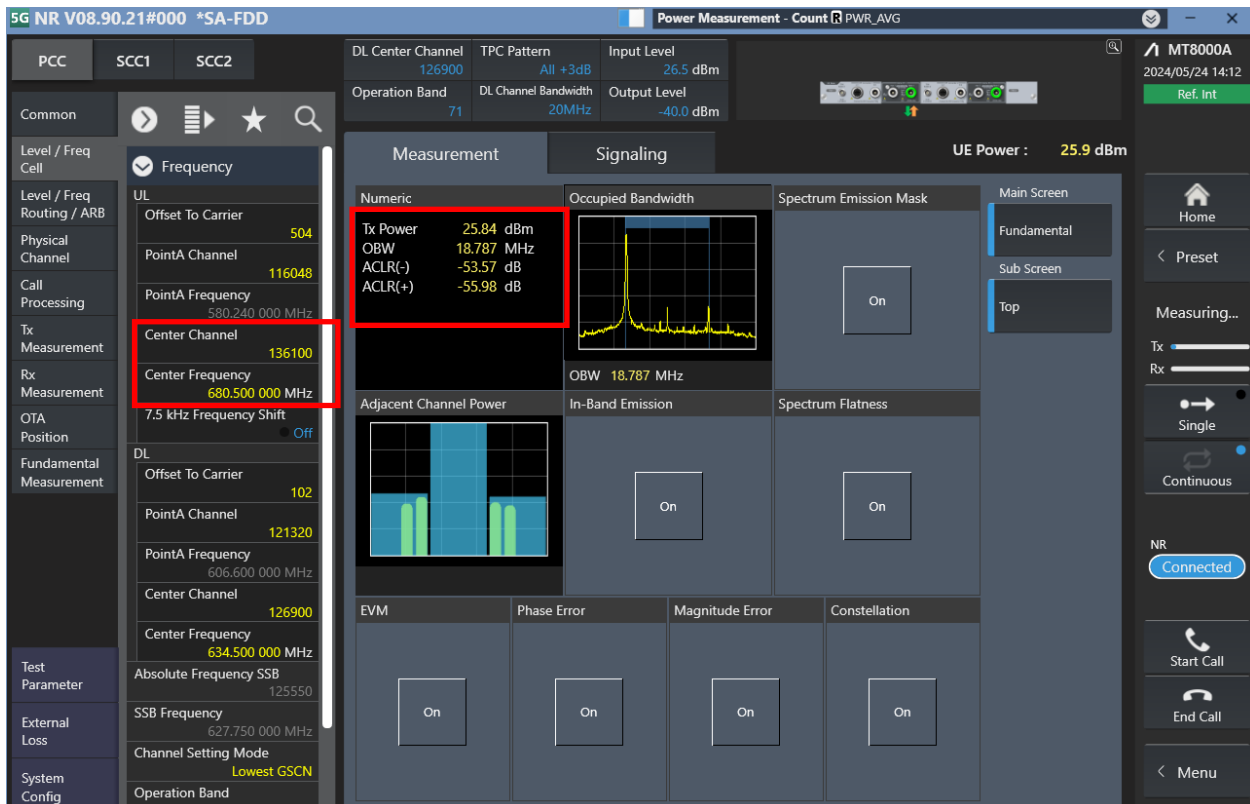
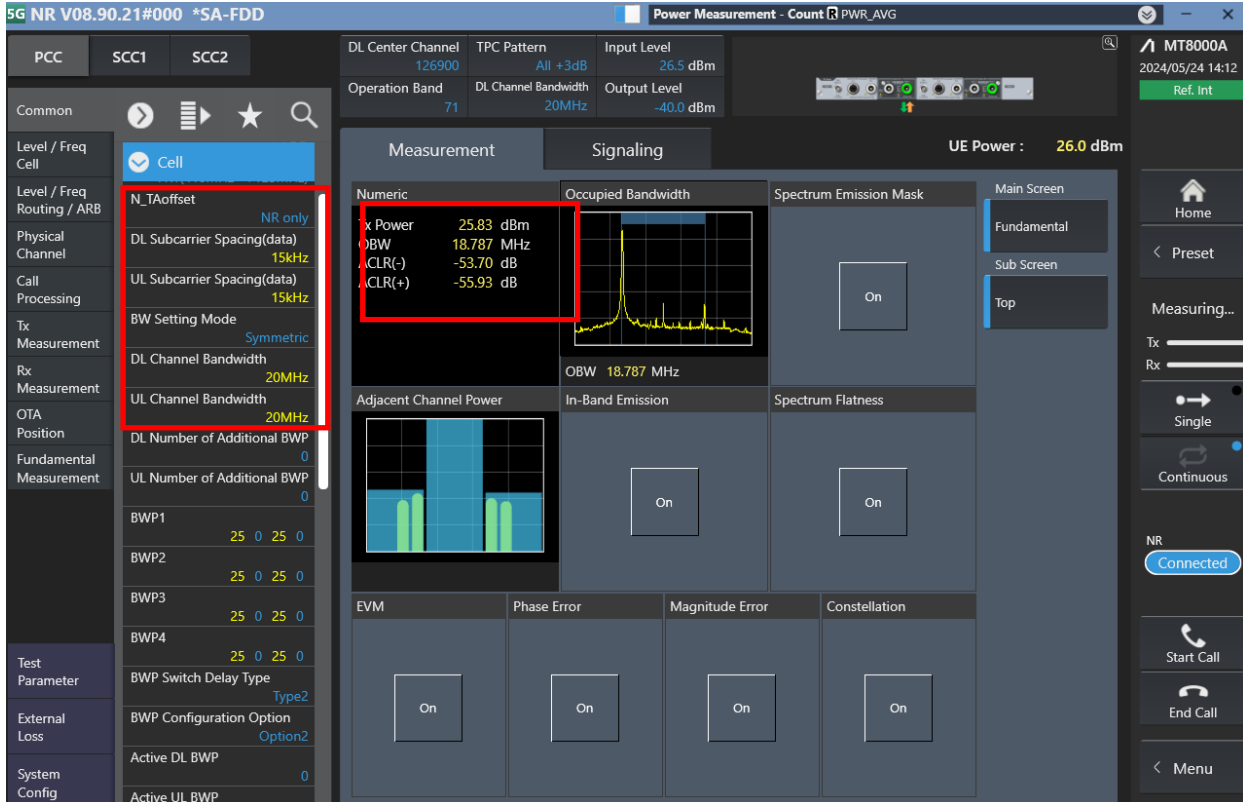
Start Call

End Call

Menu

5G NR FR1







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)】**

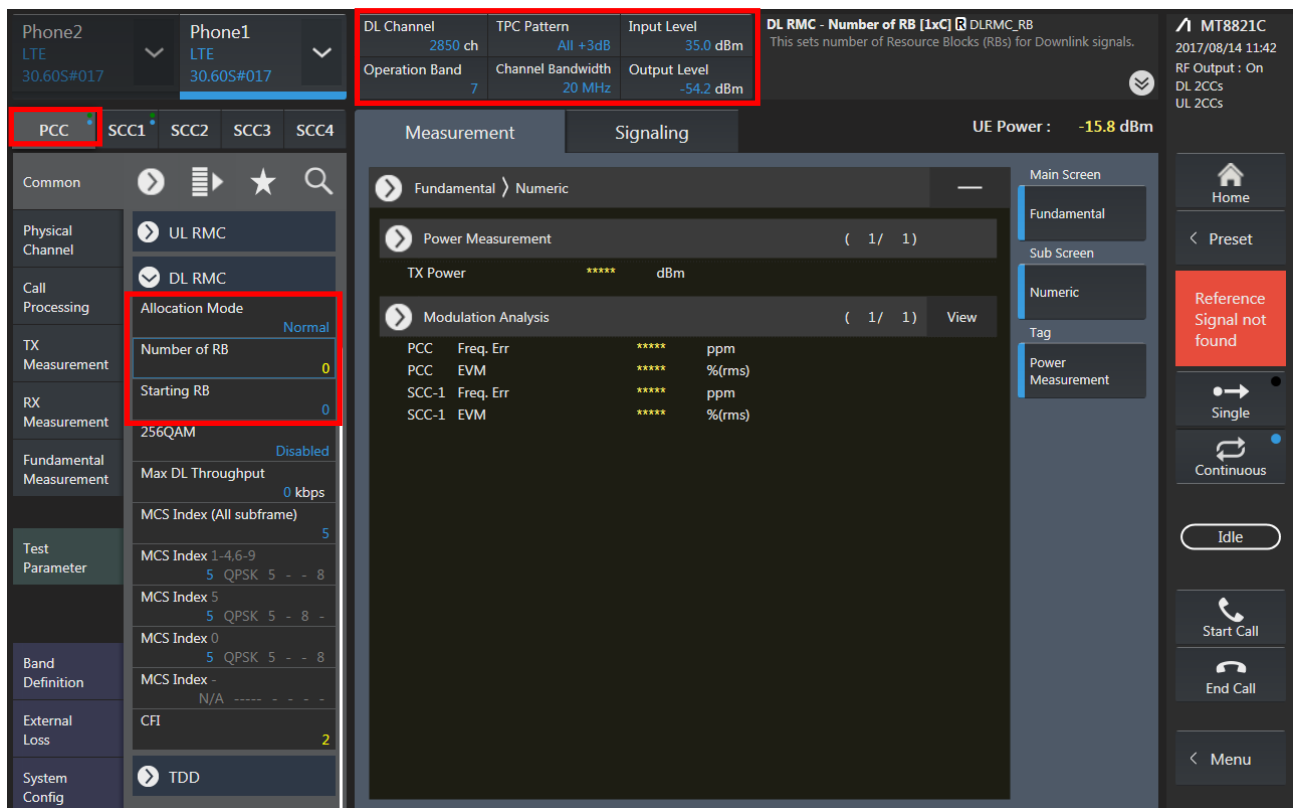
The screenshot displays the MT8821C software interface, which is used for configuring and measuring a mobile communication system. The interface is divided into several sections:

- Top Bar:** Shows the device name "MT8821C" and the date/time "2017/06/13 19:51". It also indicates the RF output status: "RF Output : On", "DL 2CCs", and "UL 2CCs Cont."
- Left Panel:** Contains a list of measurement categories: "Common", "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.
- Top Configuration Bar:** Displays various parameters:
 - Phone2: LTE, 30.60S#017
 - Phone1: LTE, 30.60S#017
 - DL Channel: 2850 ch, All +3dB
 - TPC Pattern: All +3dB
 - Input Level: 35.0 dBm
 - Operation Band: 7
 - Channel Bandwidth: 20 MHz
 - Output Level: -54.2 dBm
 - Channel Coding: 1xTC, CHCODING
- Main Display Area:**
 - Measurement Tab:** Shows "Fundamental" and "Numeric" sub-tabs. The "Fundamental" sub-tab is selected.
 - Power Measurement:** Displays a table of power measurements for PCC and SCC-1 channels.

	Avg.	Max.	Min.
Total TX Power	-27.23	-27.16	-27.27 dBm
PCC TX Power	-30.26	-30.20	-30.36 dBm
Channel Power	-30.73	-30.66	-30.82 dBm
SCC-1 TX Power	-30.17	-30.09	-30.24 dBm
Channel Power	-30.64	-30.54	-30.71 dBm
 - Throughput:** Displays a table of throughput measurements.

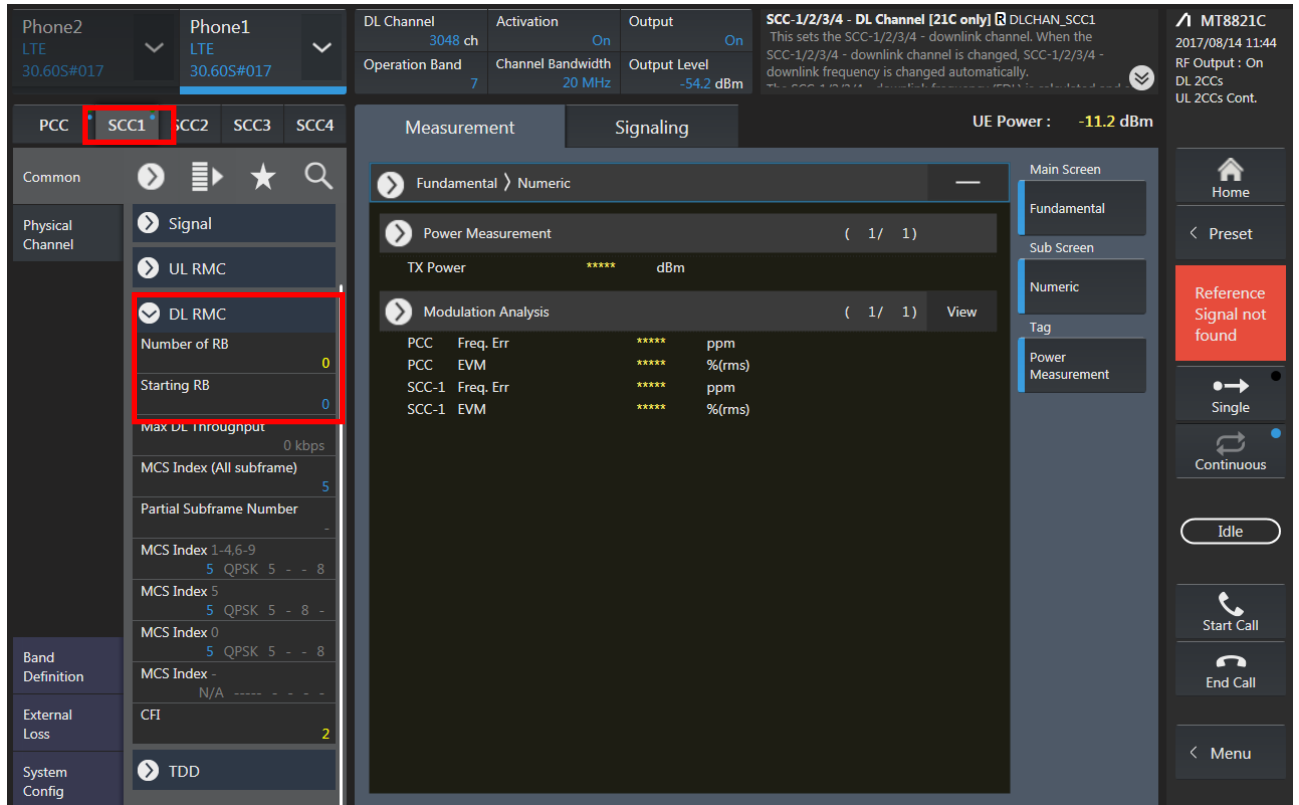
	Throughput(Total)	kbps	(= %)
- Right Panel:** Contains a "Main Screen" section with "Fundamental", "Sub Screen", "Numeric", and "Tag" options. The "Fundamental" option is selected. Below this is a "Power Measurement" section with a "View" button.
- Bottom Bar:** Includes a "Home" button, a "Preset" button, a "Measuring (UL CA Tx)..." button, a "Single" button, a "Continuous" button, an "Idle" button, a "Start Call" button, an "End Call" button, and a "Menu" button.

- 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). 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. The UE Power is -15.8 dBm. The left sidebar shows the test configuration menu with options like Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config. The main area shows the Measurement and Signaling tabs, with the Fundamental tab selected. 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 as MT8821C, 2017/08/14 11:42, RF Output: On, DL 2CCs, UL 2CCs, and a red warning message: Reference Signal not found.

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



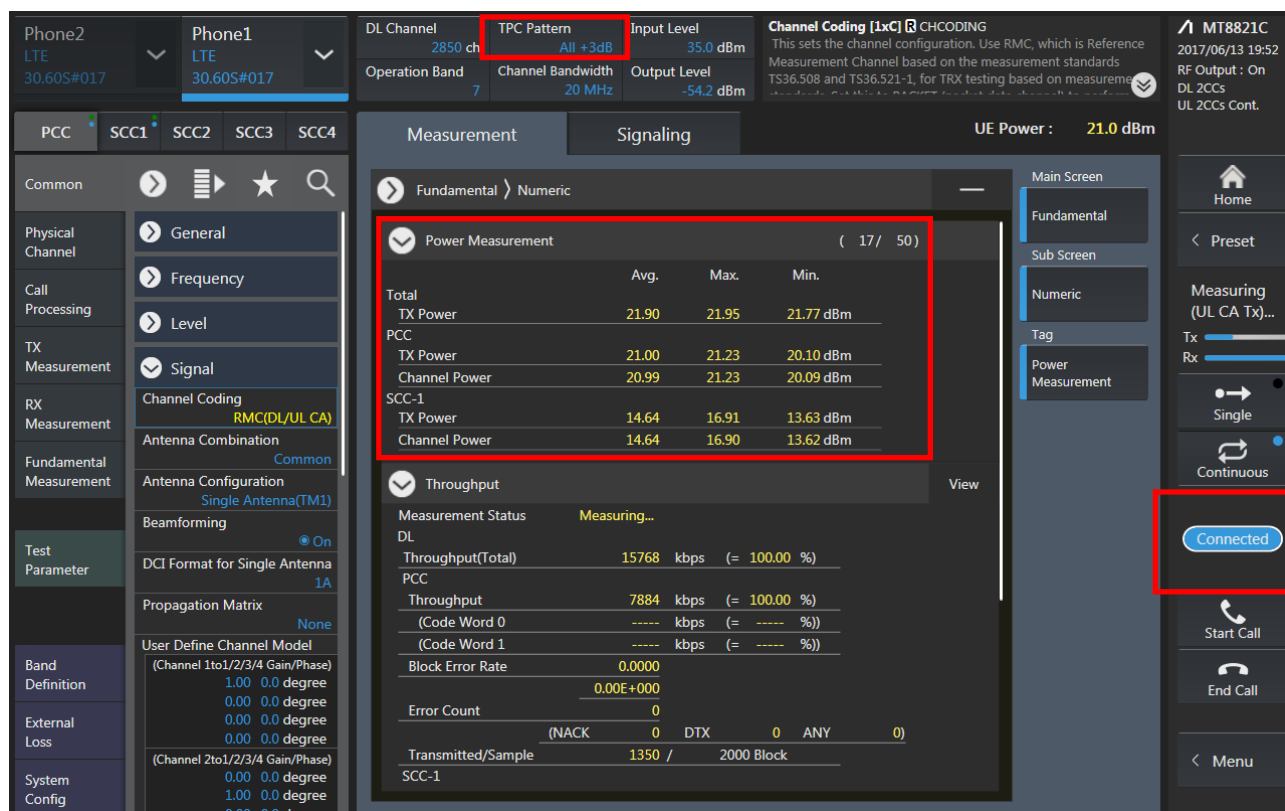
The screenshot displays the SPORTON LAB. FCC SAR TEST REPORT interface. The top section shows the 'Phone1' configuration with 'LTE' and '30.60S#017'. The 'DL Channel' is set to '3048 ch', 'Operation Band' is '7', 'Channel Bandwidth' is '20 MHz', and 'Output Level' is '-54.2 dBm'. The 'Activation' and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

Measurement	Value	Unit
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' (Numeric). The 'Tag' section shows 'Power Measurement'. The 'Reference Signal not found' message is displayed. The 'Home', 'Preset', 'Single', 'Continuous', 'Idle', 'Start Call', 'End Call', and 'Menu' buttons are visible on the right side.

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 'PCC' tab is selected.

The main display area shows the 'Measurement' and 'Signaling' tabs. The 'Measurement' tab is active, and the 'Fundamental' sub-tab is selected. The 'Power Measurement' section is highlighted with a red box, showing the following data:

	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 'Throughput' section is also visible, showing the measurement status as 'Measuring...'. The 'Connected' button is highlighted with a red box on the right side of the screen.