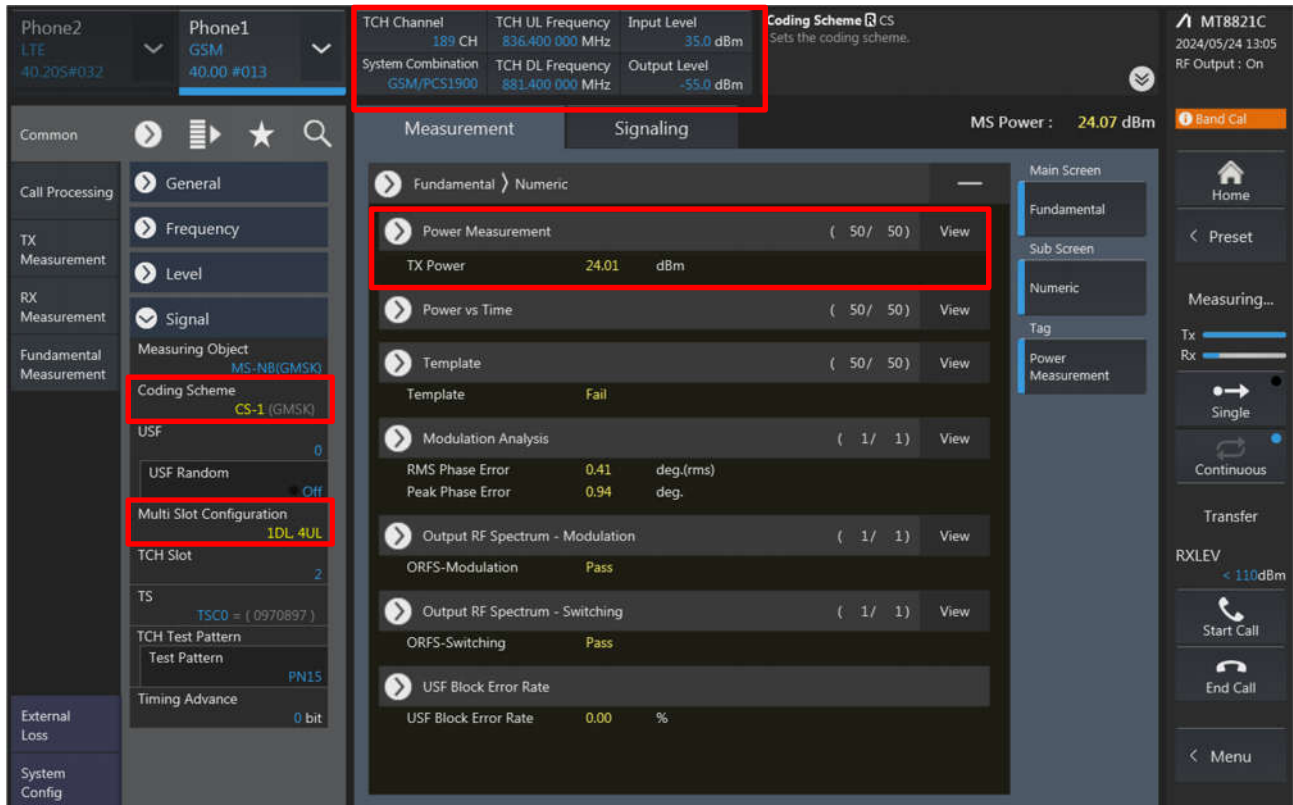


Power measurement connection diagram:

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>



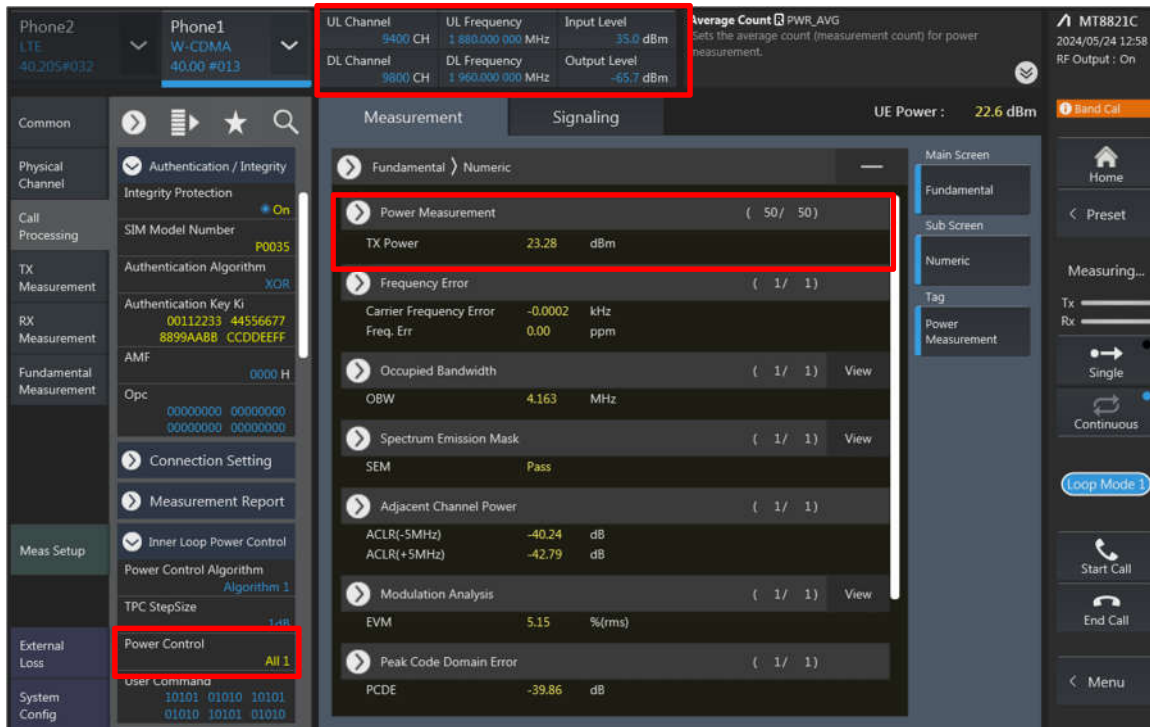
The screenshot displays the SPORTON LAB. software interface for GSM power measurement. The interface is divided into several sections:

- Top Bar:** Shows Phone2 (LTE 40.205#032) and Phone1 (GSM 40.00 #013). The TCH Channel is 189 CH, TCH UL Frequency is 836.400 000 MHz, Input Level is 35.0 dBm, and Coding Scheme is CS. The TCH DL Frequency is 881.400 000 MHz, and Output Level is -55.0 dBm.
- Left Sidebar:** Contains navigation options like Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, and External Loss.
- Main Panel:** Displays measurement results under the 'Measurement' tab. The 'Power Measurement' section shows TX Power as 24.01 dBm. Other sections include Power vs Time, Template, Modulation Analysis, Output RF Spectrum - Modulation, Output RF Spectrum - Switching, and USF Block Error Rate.
- Right Sidebar:** Includes a 'Main Screen' section with 'Fundamental' and 'Sub Screen' options, and a 'Tag' section with 'Power Measurement'.
- Bottom Bar:** Contains a 'Menu' button and a 'Start Call' button.

Key settings and results highlighted in red boxes:

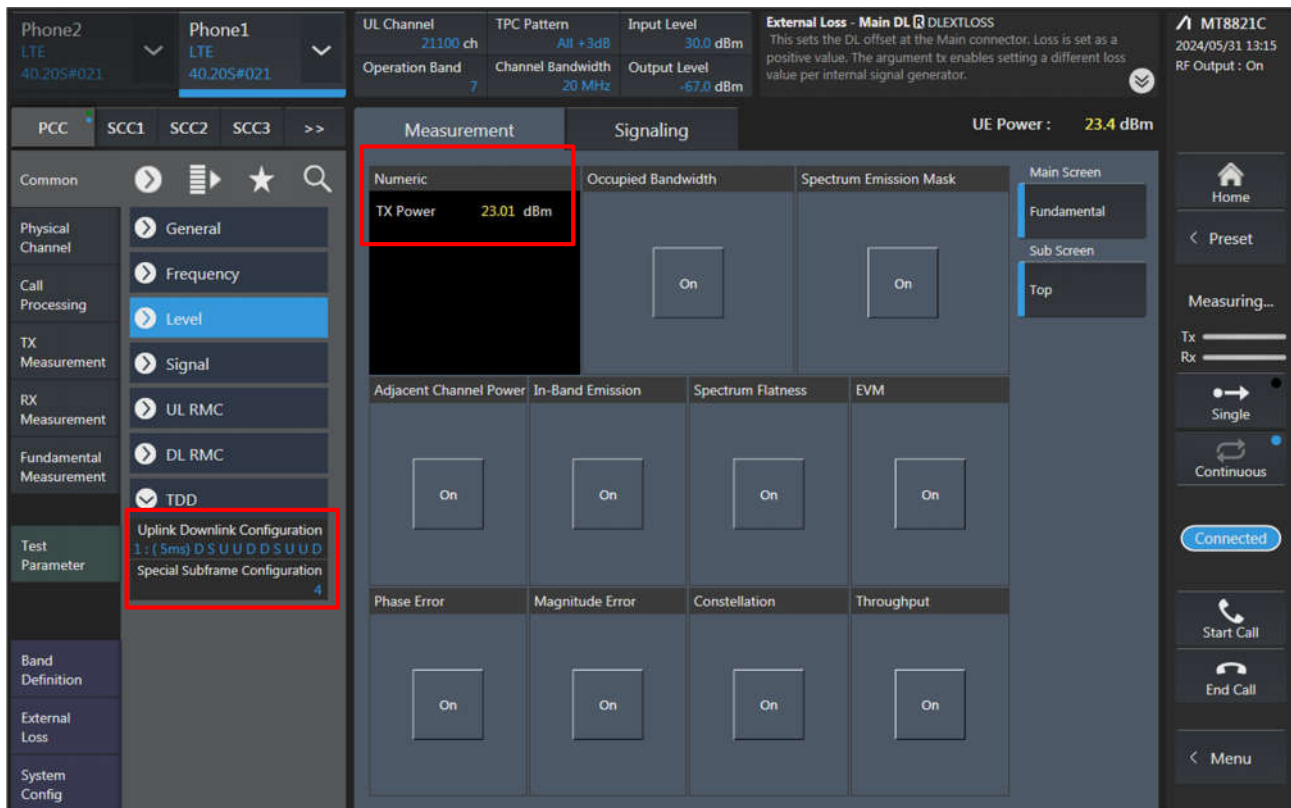
- Coding Scheme:** CS (GMSK)
- Multi Slot Configuration:** 1DL, 4UL
- TX Power:** 24.01 dBm

<WCDMA>



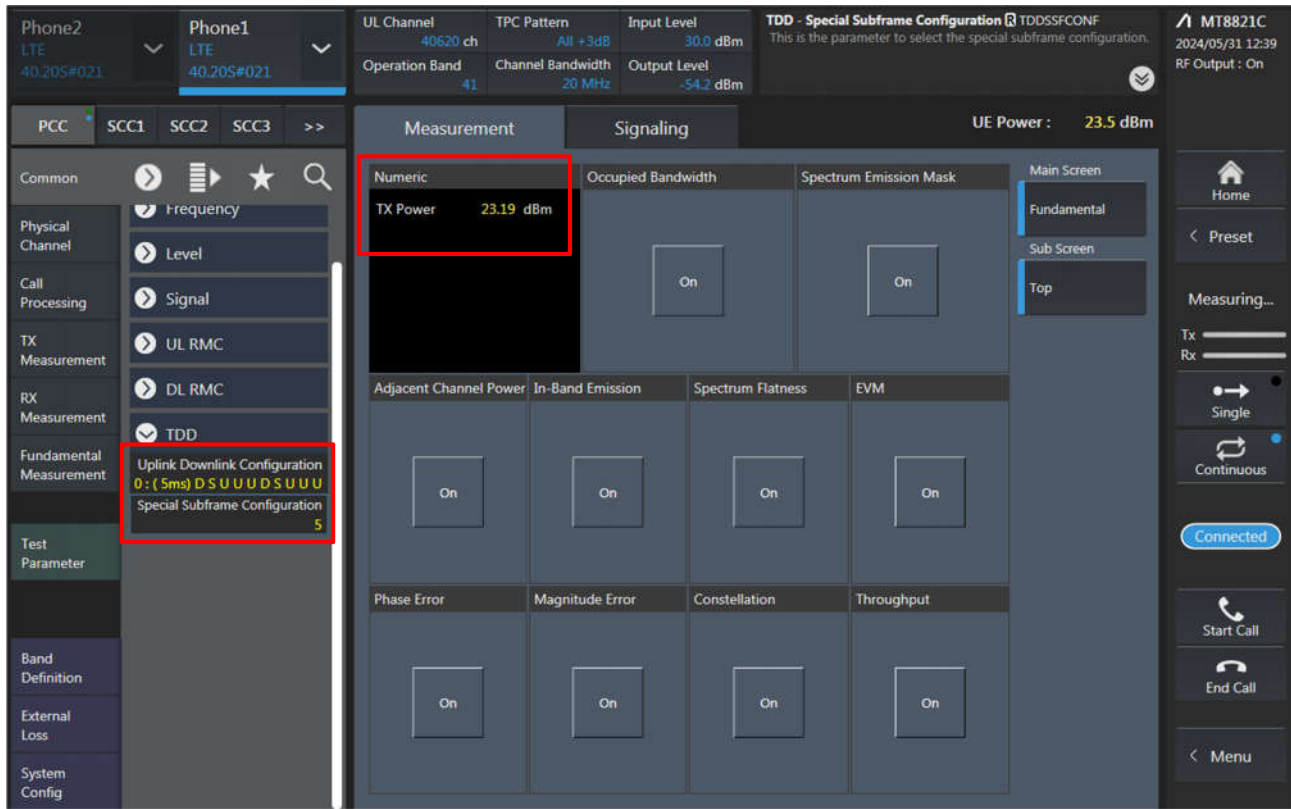
The screenshot shows the WCDMA measurement interface. The top bar displays 'Phone2 LTE 40.205#032' and 'Phone1 W-CDMA 40.00 #013'. The 'Measurement' tab is active, showing various parameters. A red box highlights the 'UL Channel' (9400 CH), 'UL Frequency' (1 880.000 000 MHz), 'Input Level' (35.0 dBm), 'DL Channel' (9800 CH), 'DL Frequency' (1 960.000 000 MHz), and 'Output Level' (-65.7 dBm). Another red box highlights the 'Power Measurement' section, showing 'TX Power' (23.28 dBm). The 'Fundamental' section shows 'Frequency Error' (-0.0002 kHz), 'Carrier Frequency Error' (0.00 ppm), 'Occupied Bandwidth' (4.163 MHz), 'Spectrum Emission Mask' (Pass), 'Adjacent Channel Power' (-40.24 dB), 'Modulation Analysis' (5.15 %/rms), and 'Peak Code Domain Error' (-39.86 dB). The 'Meas Setup' section shows 'Power Control' (All 1) and 'User Command' (10101 01010 10101 01010 10101 01010). The 'UE Power' is 22.6 dBm.

<LTE>



The screenshot shows the LTE measurement interface. The top bar displays 'Phone2 LTE 40.205#021' and 'Phone1 LTE 40.205#021'. The 'Measurement' tab is active, showing various parameters. A red box highlights the 'TX Power' (23.01 dBm). The 'Occupied Bandwidth' and 'Spectrum Emission Mask' sections show 'On' buttons. The 'Adjacent Channel Power', 'In-Band Emission', 'Spectrum Flatness', and 'EVM' sections show 'On' buttons. The 'Phase Error', 'Magnitude Error', 'Constellation', and 'Throughput' sections show 'On' buttons. The 'Test Parameter' section shows 'Uplink Downlink Configuration 1: (5ms) D S U U D D S U U D' and 'Special Subframe Configuration 4'. The 'UE Power' is 23.4 dBm.

<LTE TDD Power class 3>



Phone2 LTE 40.20S#021 Phone1 LTE 40.20S#021

UL Channel 40620 ch TPC Pattern All +3dB Input Level 30.0 dBm TDD - Special Subframe Configuration TDDSSFCNF This is the parameter to select the special subframe configuration. MT8821C 2024/05/31 12:39 RF Output : On

Operation Band 41 Channel Bandwidth 20 MHz Output Level -54.2 dBm

Measurement Signaling UE Power : 23.5 dBm

Numeric TX Power 23.19 dBm

Occupied Bandwidth Spectrum Emission Mask

On On

Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

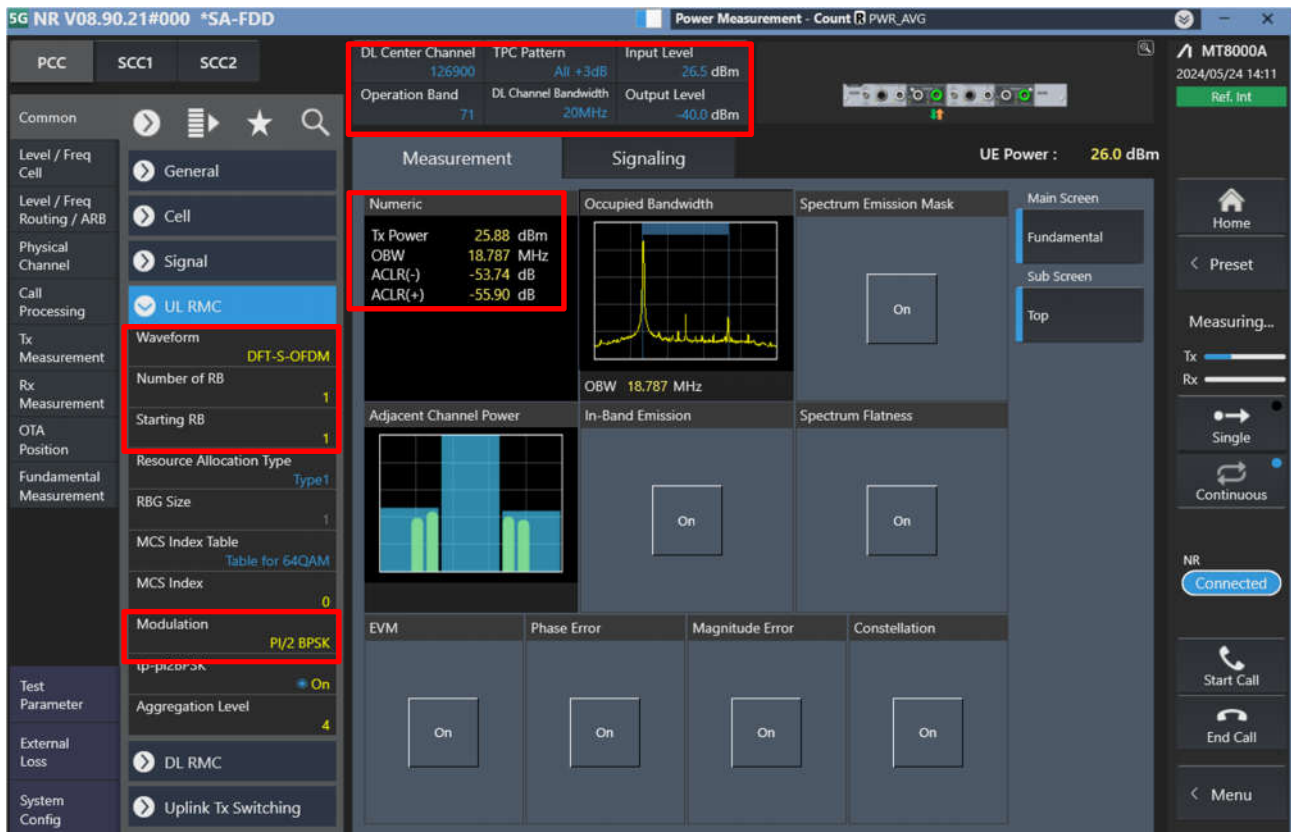
On On On On

Phase Error Magnitude Error Constellation Throughput

On On On On

Uplink Downlink Configuration 0: (5ms) D S U U D S U U Special Subframe Configuration 5

<5G NR FR1>



5G NR V08.90.21#000 *SA-FDD Power Measurement - Count PWR_AVG MT8000A 2024/05/24 14:11 Ref. int

PCC SCC1 SCC2

DL Center Channel 126900 TPC Pattern All +3dB Input Level 26.5 dBm

Operation Band 71 DL Channel Bandwidth 20MHz Output Level -40.0 dBm

Measurement Signaling UE Power : 26.0 dBm

Numeric Tx Power 25.88 dBm OBW 18.787 MHz

Occupied Bandwidth Spectrum Emission Mask

On

Adjacent Channel Power In-Band Emission Spectrum Flatness

On On

EVM Phase Error Magnitude Error Constellation

On On On On

Waveform DFT-S-OFDM

Number of RB 1

Starting RB 1

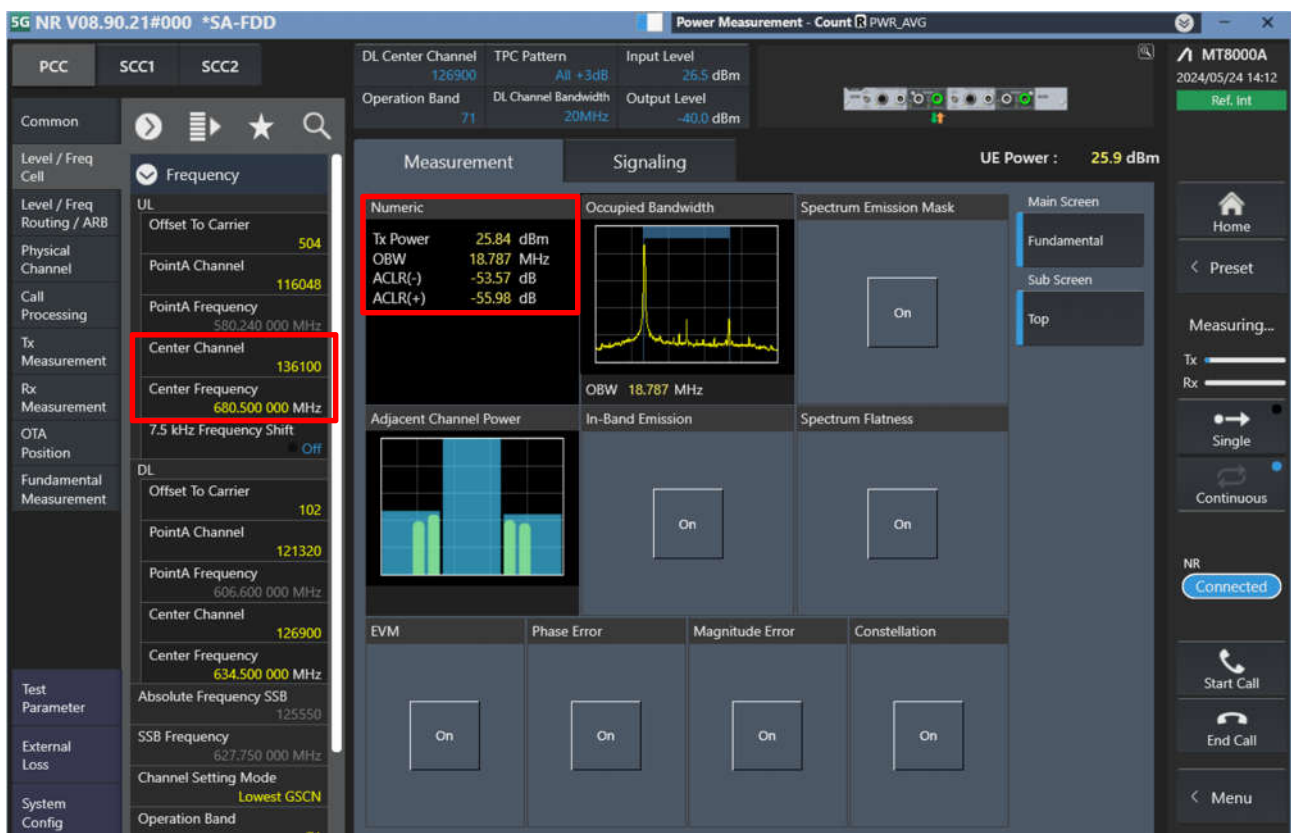
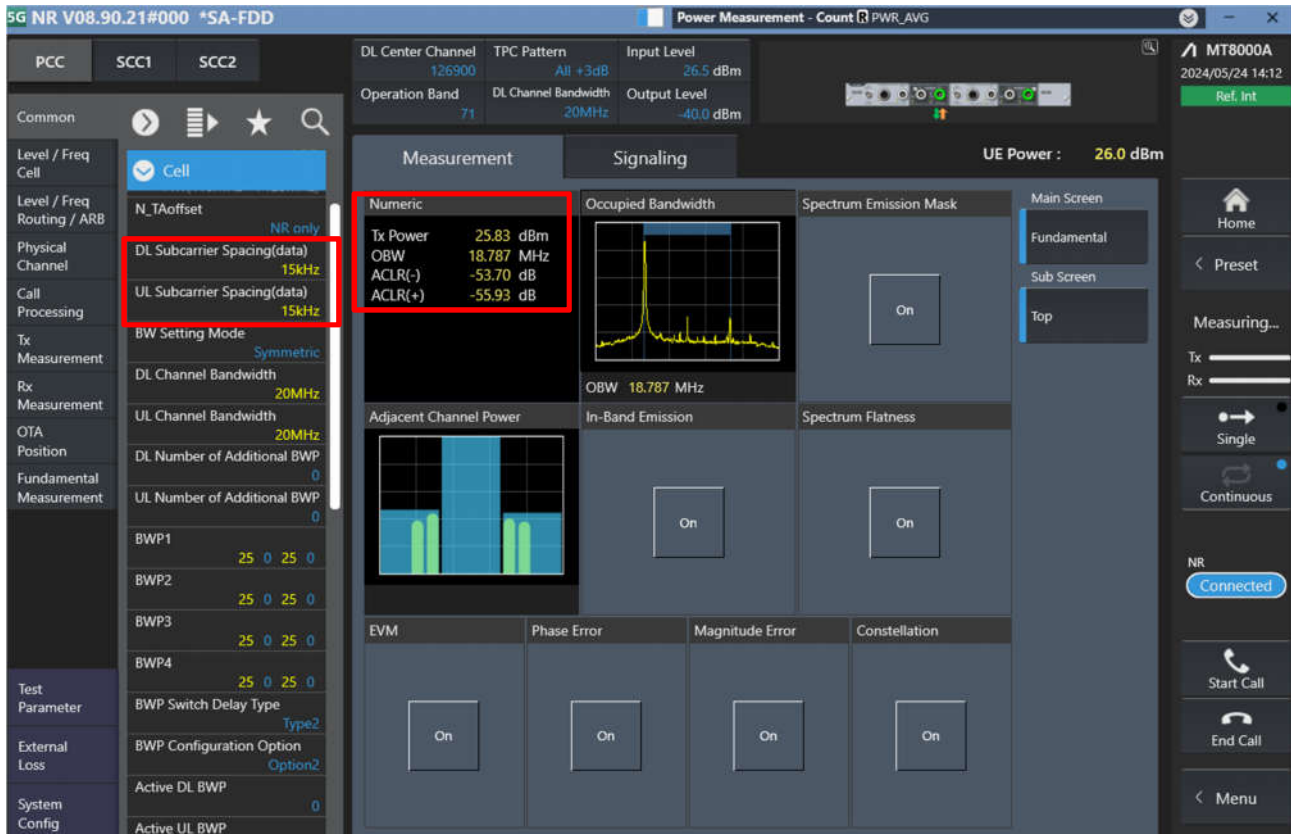
Resource Allocation Type Type1

RBG Size 1

MCS Index Table Table for 64QAM

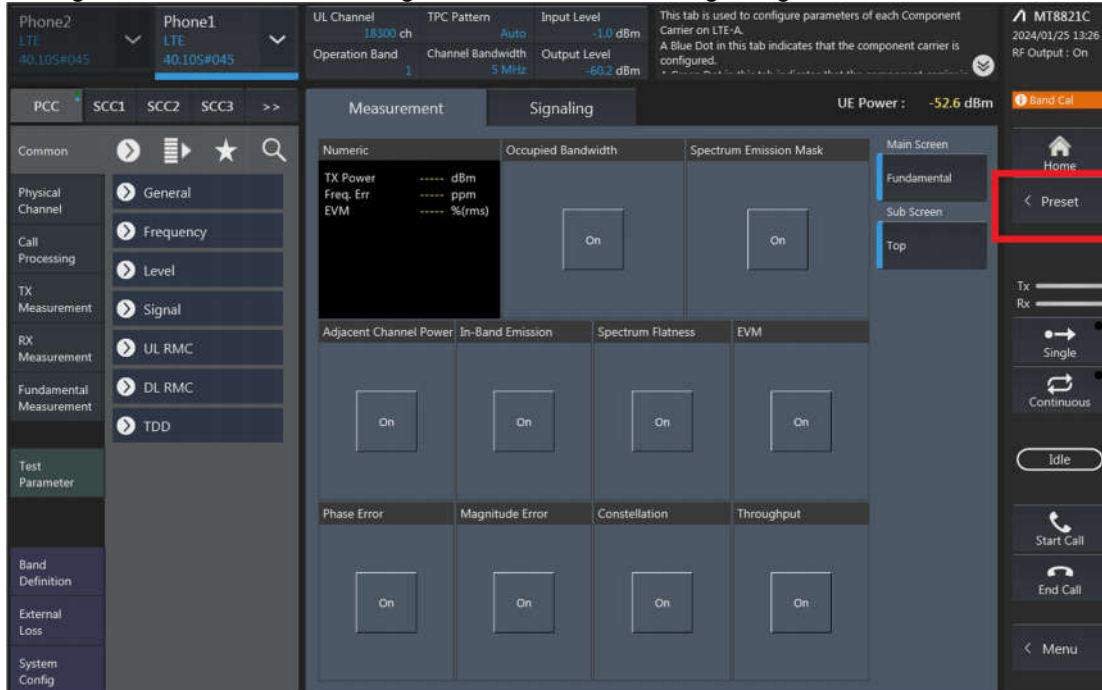
MCS Index 0

Modulation PI/2 BPSK



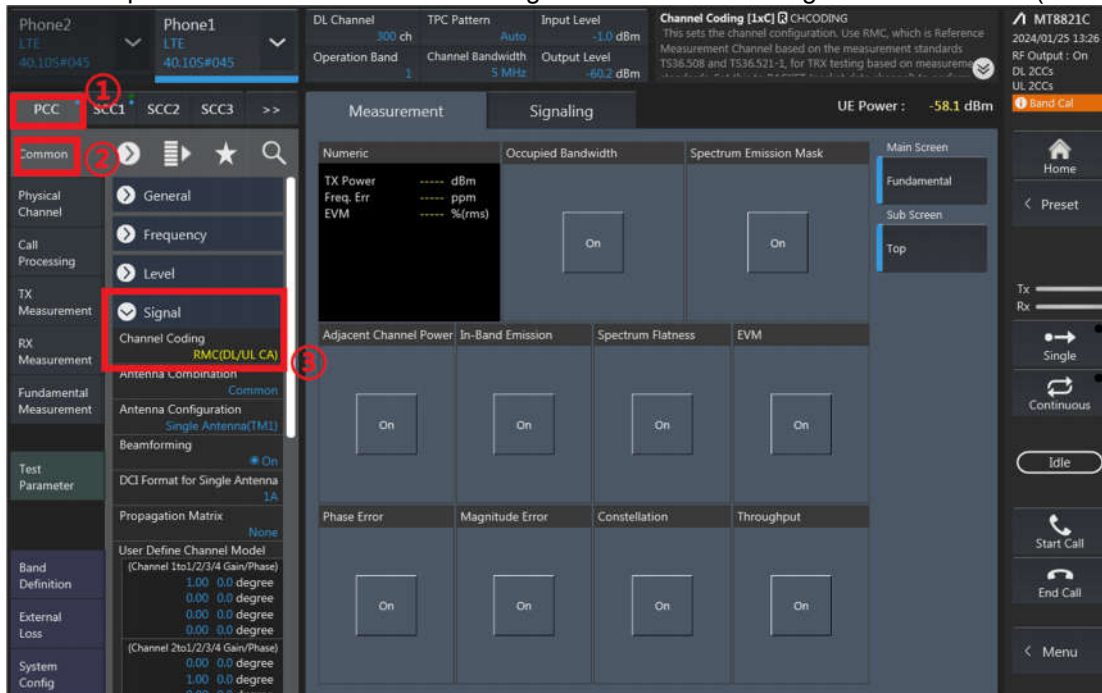
LTE Uplink and Downlink Carrier Aggregation configurations:

1. Change the Scenario in the Configuration of Phone1 LTE Signaling and Preset.

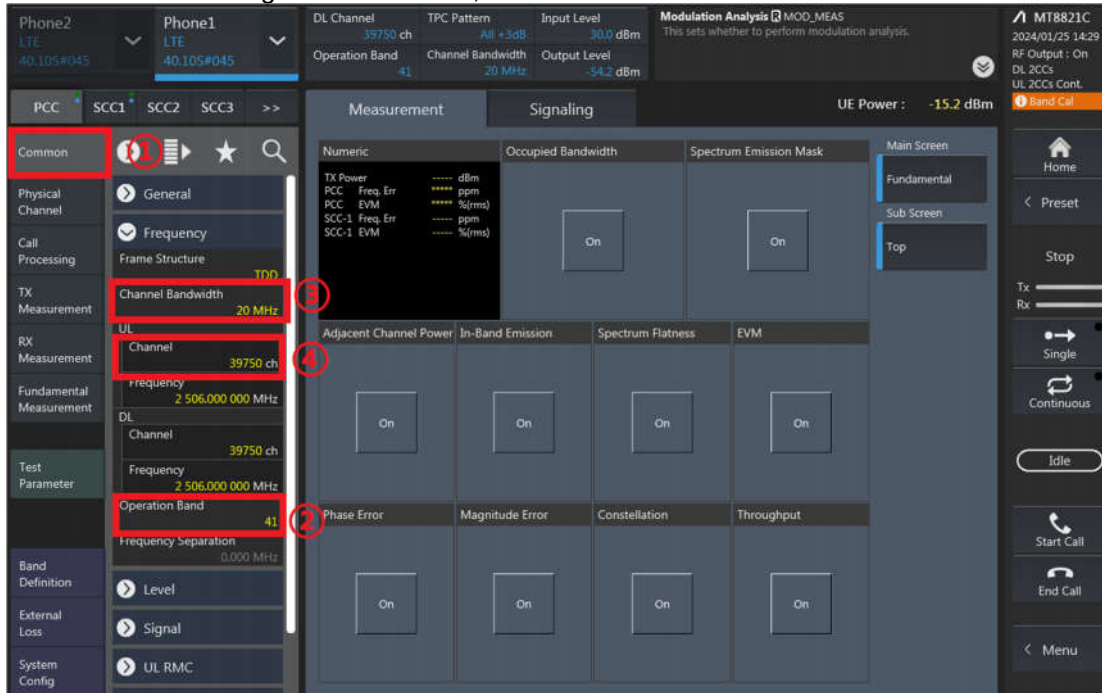


2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation;
If Select "RMC (DL CA)" for Downlink Carrier Aggregation.
For example, Uplink Carrier Aggregation:

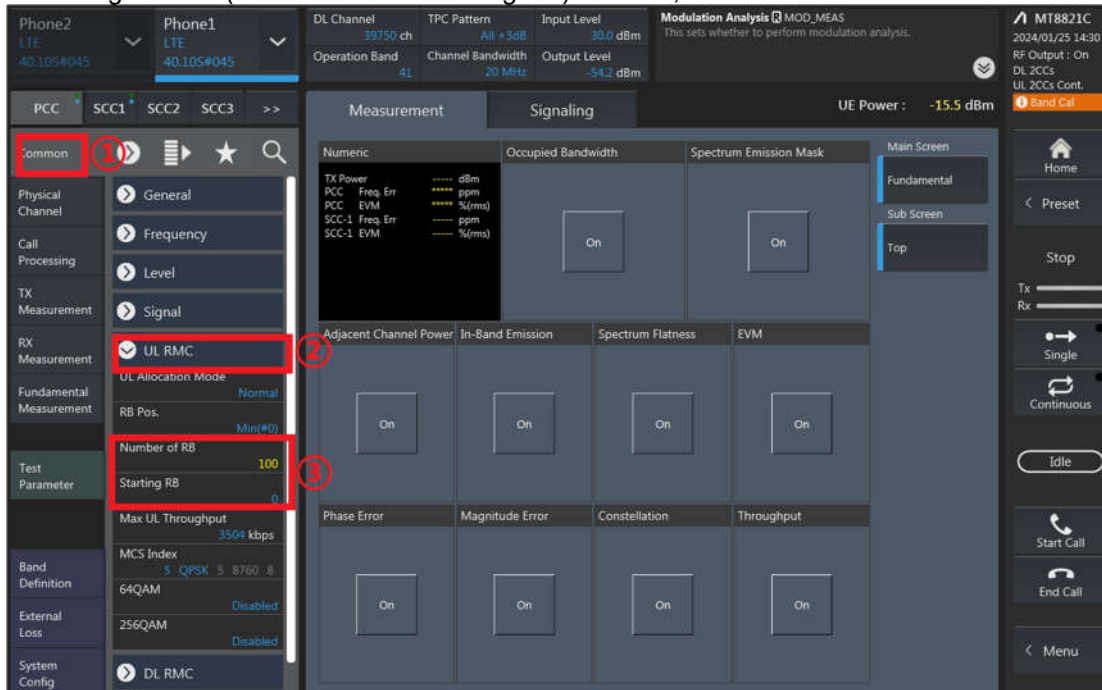
Detailed operation: PCC → Common → Signal → Channel Coding → Select 【RMC (DL/UL CA)】



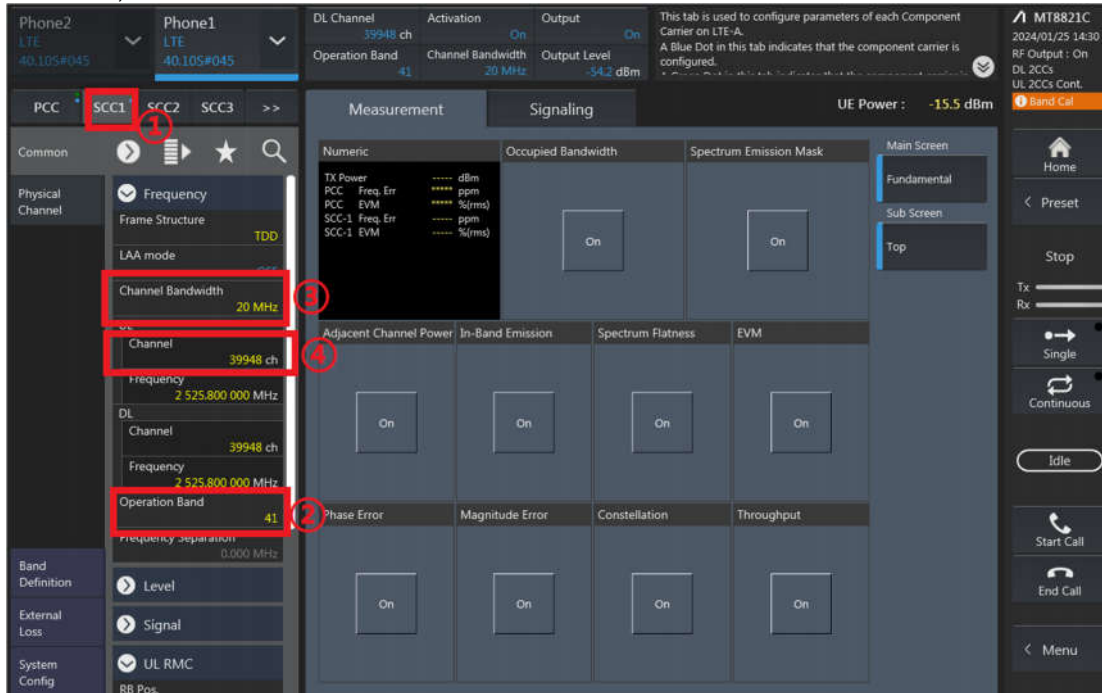
3. PCC parameter Settings: on the screen, and then select the PCC tab and Set operating band, BW, channel and RB configurations for PCC;



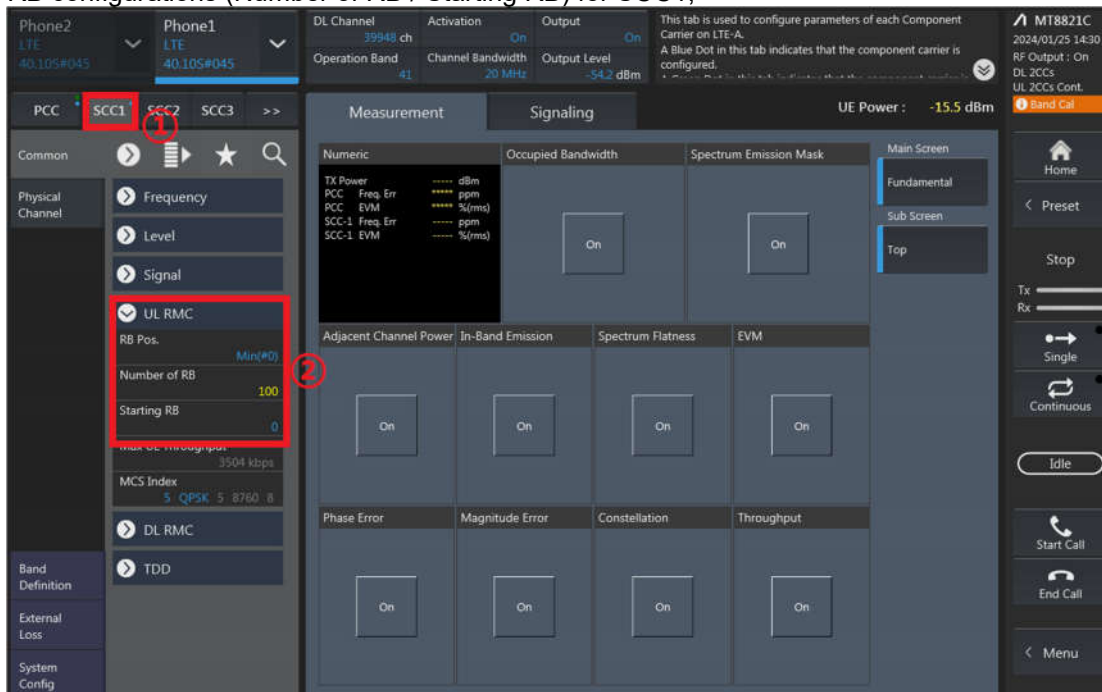
RB configurations (Number of RB / Starting RB) for PCC;



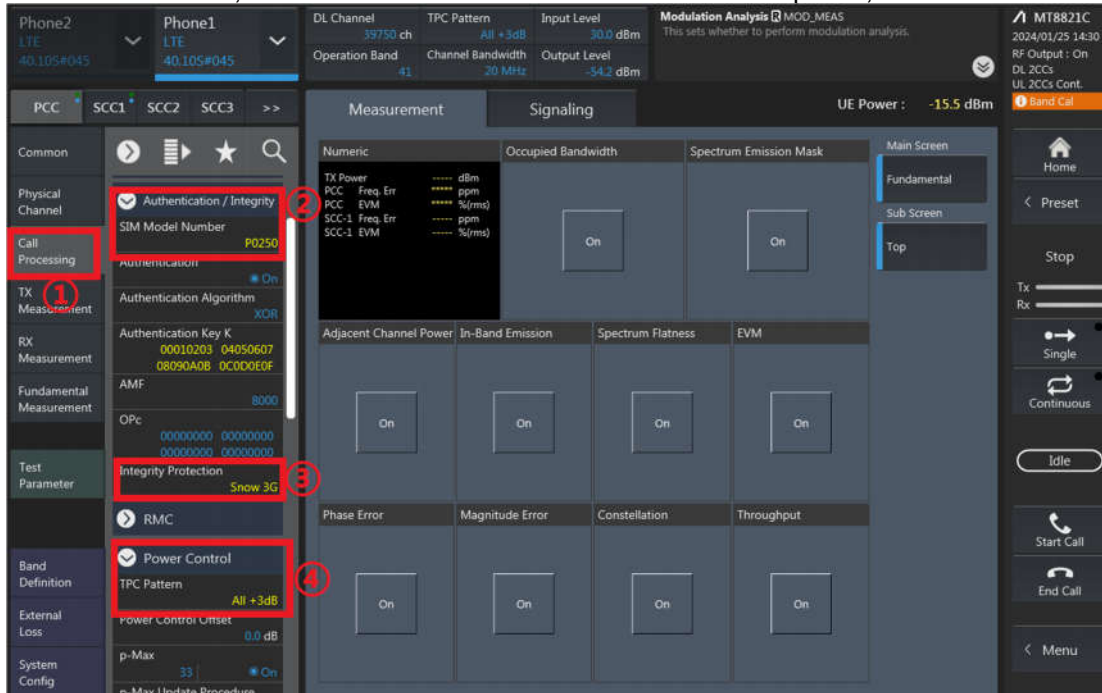
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



RB configurations (Number of RB / Starting RB) for SCC1;



5. Select the PCC tab, then set “SIM Model Number” and select max power;



DL Channel: 39750 ch, Operation Band: 41, TPC Pattern: All +3dB, Input Level: 30.0 dBm, Output Level: -54.2 dBm, Modulation Analysis: MOD_MEAS, UE Power: -15.5 dBm

Common: PCC, SCC1, SCC2, SCC3, >>

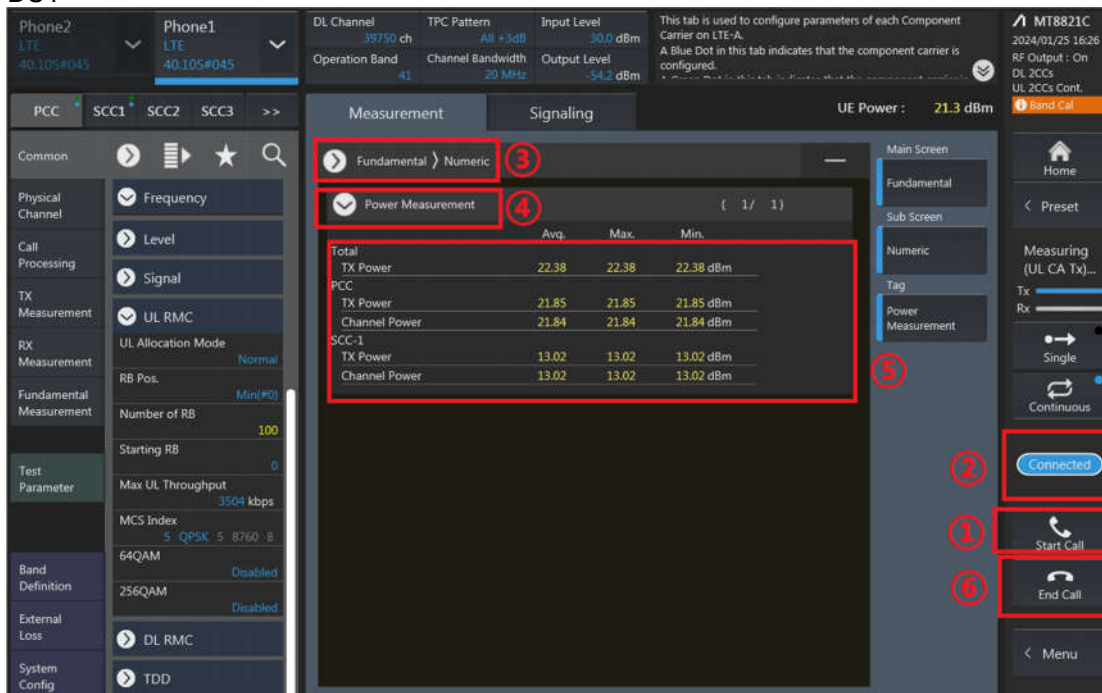
Physical Channel: Authentication / Integrity (SIM Model Number: P0250), Authentication Algorithm: XOR, Authentication Key K: 00010203 04050607 08090A0B 0C0D0E0F, AMF: 8000, OPc: 00000000 00000000 00000000 00000000, Integrity Protection: Snow 3G, RMC: On, Power Control: All +3dB, Power Control Offset: 0.0 dB, p-Max: 33, p-Max Update Procedure: On

Measurement: Numeric, Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Power, In-Band Emission, Spectrum Flatness, EVM, Phase Error, Magnitude Error, Constellation, Throughput

Main Screen: Fundamental, Sub Screen, Top

Home, Preset, Stop, Tx, Rx, Single, Continuous, Idle, Start Call, End Call, Menu

6. Click the “Connect” button at the Right of the screen, if necessary, turn the Airplane mode on/off in the DUT



DL Channel: 39750 ch, Operation Band: 41, TPC Pattern: All +3dB, Input Level: 30.0 dBm, Output Level: -54.2 dBm, This tab is used to configure parameters of each Component Carrier on LTE-A. A Blue Dot in this tab indicates that the component carrier is configured.

Common: PCC, SCC1, SCC2, SCC3, >>

Physical Channel: Frequency, Level, Signal, UL RMC, UL Allocation Mode: Normal, RB Pos: Min(#0), Number of RB: 100, Starting RB: 0, Max UL Throughput: 3504 kbps, MCS Index: 5 QPSK 5 8760 B, 64QAM, 256QAM, Disabled, DL RMC, TDD

Measurement: Fundamental > Numeric, Power Measurement (1 / 1)

	Avg.	Max.	Min.
Total TX Power	22.38	22.38	22.38 dBm
PCC TX Power	21.85	21.85	21.85 dBm
PCC Channel Power	21.84	21.84	21.84 dBm
SCC-1 TX Power	13.02	13.02	13.02 dBm
SCC-1 Channel Power	13.02	13.02	13.02 dBm

Main Screen: Fundamental, Sub Screen, Numeric, Tag, Power Measurement

Home, Preset, Measuring (UL CA Tx)..., Tx, Rx, Single, Continuous, Connected, Start Call, End Call, Menu