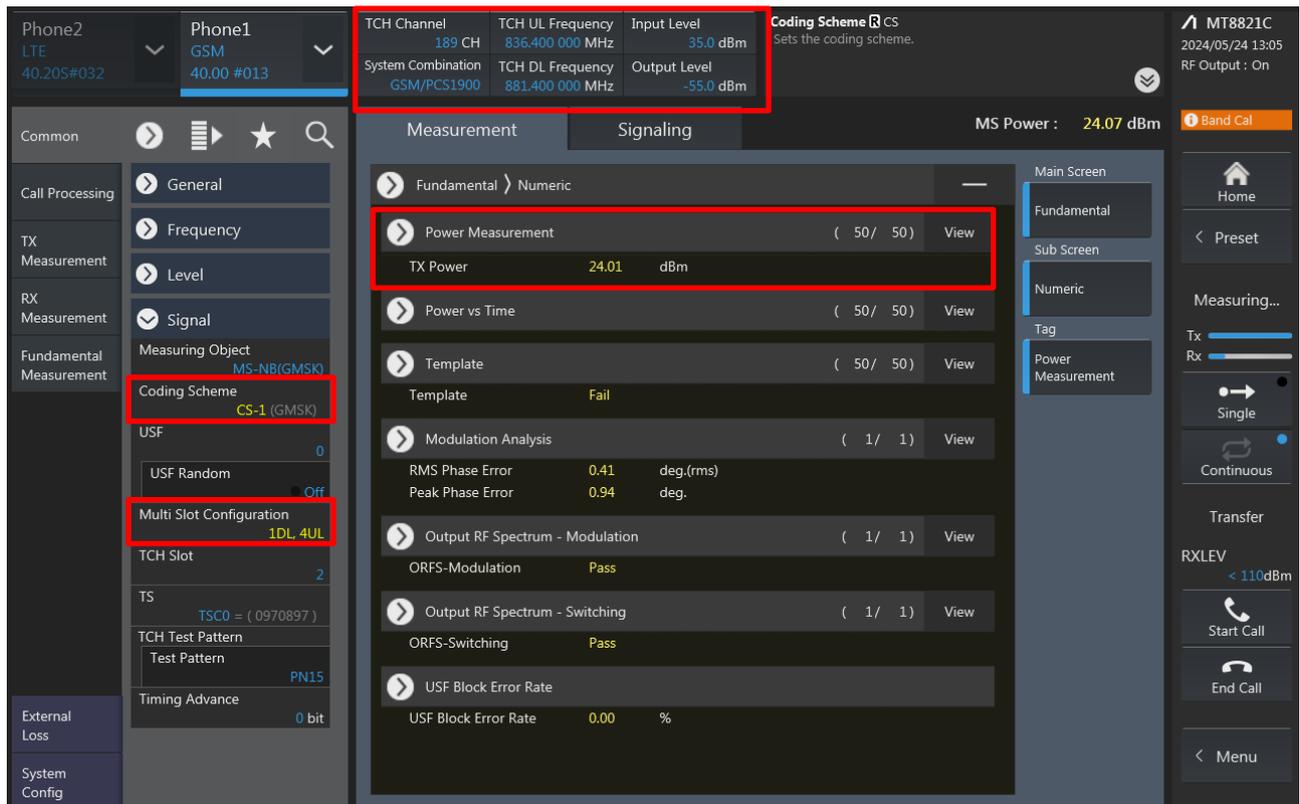


Power measurement connection diagram:

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>



Parameter	Value
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
TX Power	24.01 dBm
Modulation Analysis - RMS Phase Error	0.41 deg.(rms)
Modulation Analysis - Peak Phase Error	0.94 deg.
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
 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: Authentication / Integrity Integrity Protection: On | SIM Model Number: P0035 | Authentication Algorithm: XOR | Authentication Key Ki: 00112233 44556677 8899AABB CCDDEEFF | AMF: 0000 H | Opc: 00000000 00000000 00000000 00000000 | Connection Setting | Measurement Report

Meas Setup: Inner Loop Power Control | Power Control Algorithm: Algorithm 1 | TPC StepSize: 1 dB | Power Control: All 1 | User Command

System Config: 10101 01010 10101 | 01010 10101 01010

Measurement: Fundamental > Numeric | TX Power: 23.28 dBm | Frequency Error: -0.0002 kHz, 0.00 ppm | Occupied Bandwidth: 4.163 MHz | Spectrum Emission Mask: Pass | Adjacent Channel Power: ACLR(-5MHz): -40.24 dB, ACLR(+5MHz): -42.79 dB | Modulation Analysis: EVM: 5.15 % (rms) | Peak Code Domain Error: PCDE: -39.86 dB

UE Power: 22.6 dBm

<LTE>

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

UL Channel: 21100 ch | TPC Pattern: All +3dB | Input Level: 30.0 dBm
 Operation Band: 7 | Channel Bandwidth: 20 MHz | Output Level: -67.0 dBm

External Loss - Main DL DLEXTLOSS: This sets the DL offset at the Main connector. Loss is set as a positive value. The argument tx enables setting a different loss value per internal signal generator.

MT8821C 2024/05/31 13:15 | RF Output: On

PCC | SCC1 | SCC2 | SCC3 | >>

Common: General | Frequency | Level | Signal | UL RMC | DL RMC | TDD | Uplink Downlink Configuration 1: (5ms) D S U U D D S U U D | Special Subframe Configuration: 4

Measurement: Numeric | TX Power: 23.01 dBm | Occupied Bandwidth: On | Spectrum Emission Mask: On | Adjacent Channel Power: On | In-Band Emission: On | Spectrum Flatness: On | EVM: On | Phase Error: On | Magnitude Error: On | Constellation: On | Throughput: On

UE Power: 23.4 dBm



<LTE TDD Power class 3>

The screenshot displays the configuration and measurement interface for LTE TDD Power class 3. The interface is divided into several sections:

- Top Bar:** Shows phone information (Phone2, Phone1), UL Channel (40620 ch), TPC Pattern (All +3dB), Input Level (30.0 dBm), and TDD - Special Subframe Configuration (TDDSSFCNF). It also displays the date and time (2024/05/31 12:39) and RF Output status (On).
- Measurement Section:** Contains a table of measurement parameters:

Measurement	Value
Numeric	
TX Power	23.19 dBm
Occupied Bandwidth	On
Spectrum Emission Mask	On
Adjacent Channel Power	On
In-Band Emission	On
Spectrum Flatness	On
EVM	On
Phase Error	On
Magnitude Error	On
Constellation	On
Throughput	On
- Signaling Section:** Contains a table of signaling parameters:

Signaling	Value
Occupied Bandwidth	On
Spectrum Emission Mask	On
Adjacent Channel Power	On
In-Band Emission	On
Spectrum Flatness	On
EVM	On
Phase Error	On
Magnitude Error	On
Constellation	On
Throughput	On
- Left Panel:** A navigation menu with categories like Common, Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config. The 'Fundamental Measurement' section is expanded to show 'Uplink Downlink Configuration 0 : (5ms) DSUUU DSUUU' and 'Special Subframe Configuration 5', both highlighted with a red box.
- Right Panel:** A control panel with buttons for Home, Preset, Measuring..., Tx/Rx level indicators, Single/Continuous measurement modes, Connected status, Start Call, End Call, and Menu.

<5G NR FR1>

DL RMC Configuration:

- 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 Results:

- Tx Power: 25.88 dBm
- OBW: 18.787 MHz
- ACLR(-): -53.74 dB
- ACLR(+): -55.90 dB

Modulation: PI/2 BPSK

Other Parameters:

- 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
- Aggregation Level: 4

UE Power: 26.0 dBm

DL Subcarrier Spacing Configuration:

- DL Subcarrier Spacing(data): 15kHz
- UL Subcarrier Spacing(data): 15kHz

Measurement Results:

- Tx Power: 25.83 dBm
- OBW: 18.787 MHz
- ACLR(-): -53.70 dB
- ACLR(+): -55.93 dB

Other Parameters:

- N_TAoffset: NR only
- BW Setting Mode: Symmetric
- DL Channel Bandwidth: 20MHz
- UL Channel Bandwidth: 20MHz
- DL Number of Additional BWP: 0
- UL Number of Additional BWP: 0
- BWP1: 25 0 25 0
- BWP2: 25 0 25 0
- BWP3: 25 0 25 0
- BWP4: 25 0 25 0
- BWP Switch Delay Type: Type2
- BWP Configuration Option: Option2
- Active DL BWP: 0
- Active UL BWP: 0

UE Power: 26.0 dBm



5G NR V08.90.21#000 *SA-FDD

Power Measurement - Count PWR_AVG

MT8000A
2024/05/24 14:12
Ref. Int

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

Common

Level / Freq Cell

Level / Freq Routing / ARB

Physical Channel

Call Processing

Tx Measurement

Rx Measurement

OTA Position

Fundamental Measurement

Test Parameter

External Loss

System Config

Frequency

UL

Offset To Carrier 504

PointA Channel 116048

PointA Frequency 580.240 000 MHz

Center Channel 136100

Center Frequency 680.500 000 MHz

7.5 kHz Frequency Shift Off

DL

Offset To Carrier 102

PointA Channel 121320

PointA Frequency 606.600 000 MHz

Center Channel 126900

Center Frequency 634.500 000 MHz

Absolute Frequency SSB 125550

SSB Frequency 627.750 000 MHz

Channel Setting Mode Lowest GSCN

Operation Band 71

Measurement

Numeric

Tx Power 25.84 dBm

OBW 18.787 MHz

ACLR(-) -53.57 dB

ACLR(+) -55.98 dB

Occupied Bandwidth

OBW 18.787 MHz

Spectrum Emission Mask

On

Adjacent Channel Power

In-Band Emission

On

Spectrum Flatness

On

EVM

On

Phase Error

On

Magnitude Error

On

Constellation

On

UE Power : 25.9 dBm

Main Screen

Fundamental

Sub Screen

Top

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

NR

Connected

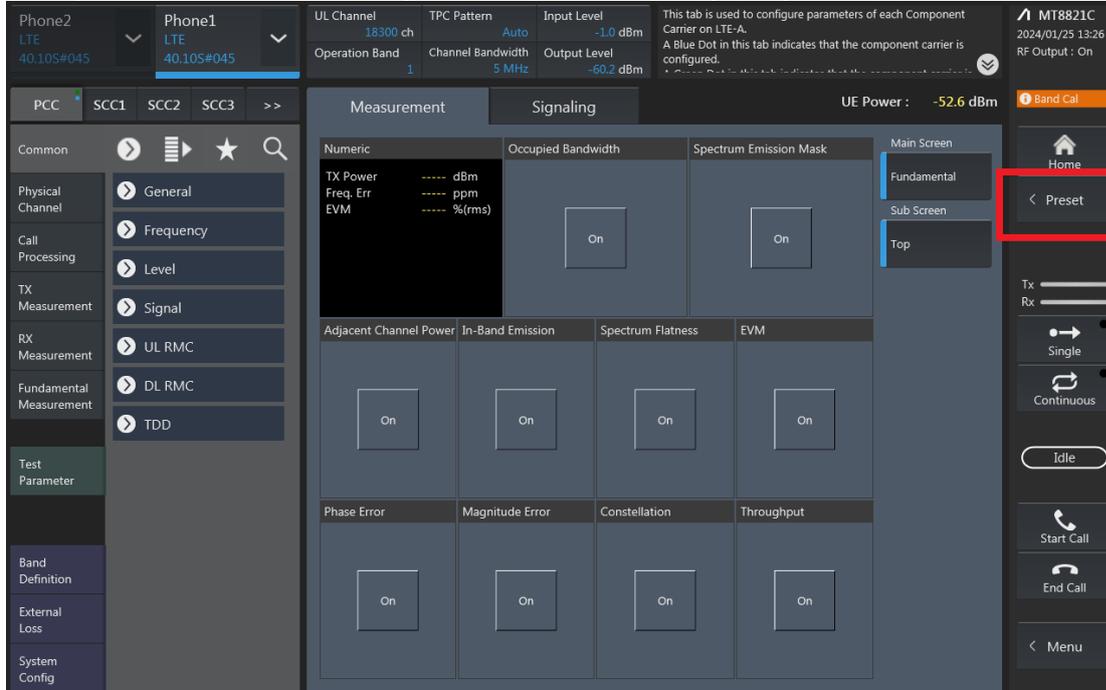
Start Call

End Call

Menu

LTE Uplink and Downlink Carrier Aggregation configurations:

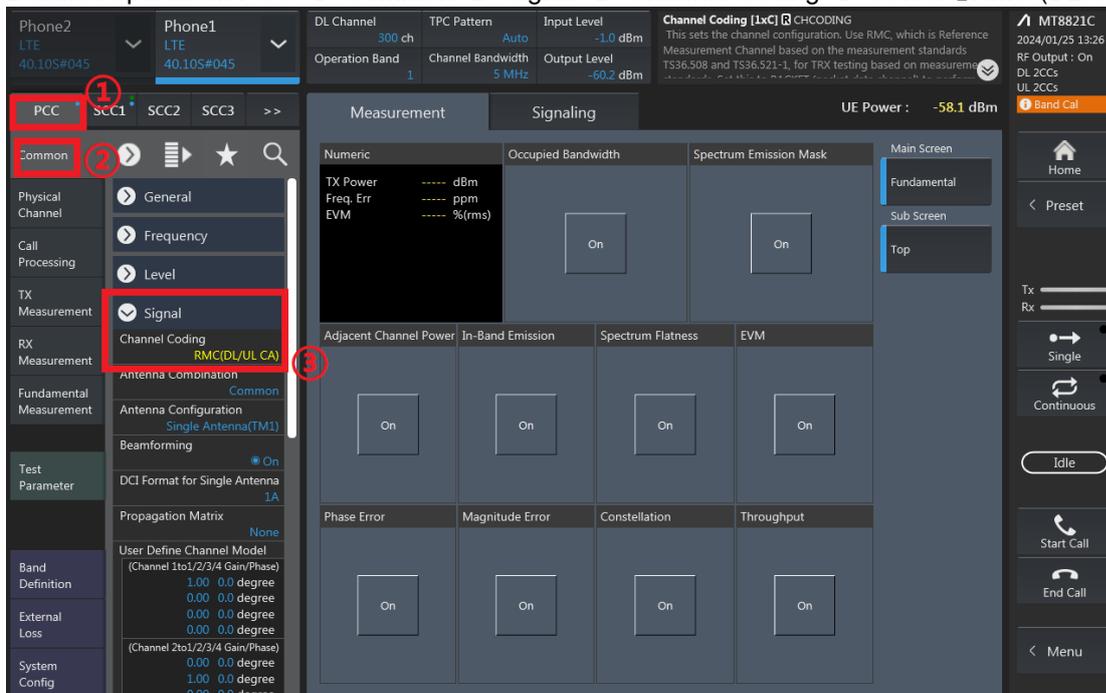
1. Change the Scenario in the Configuration of Phone1 LTE Signaling and Preset.



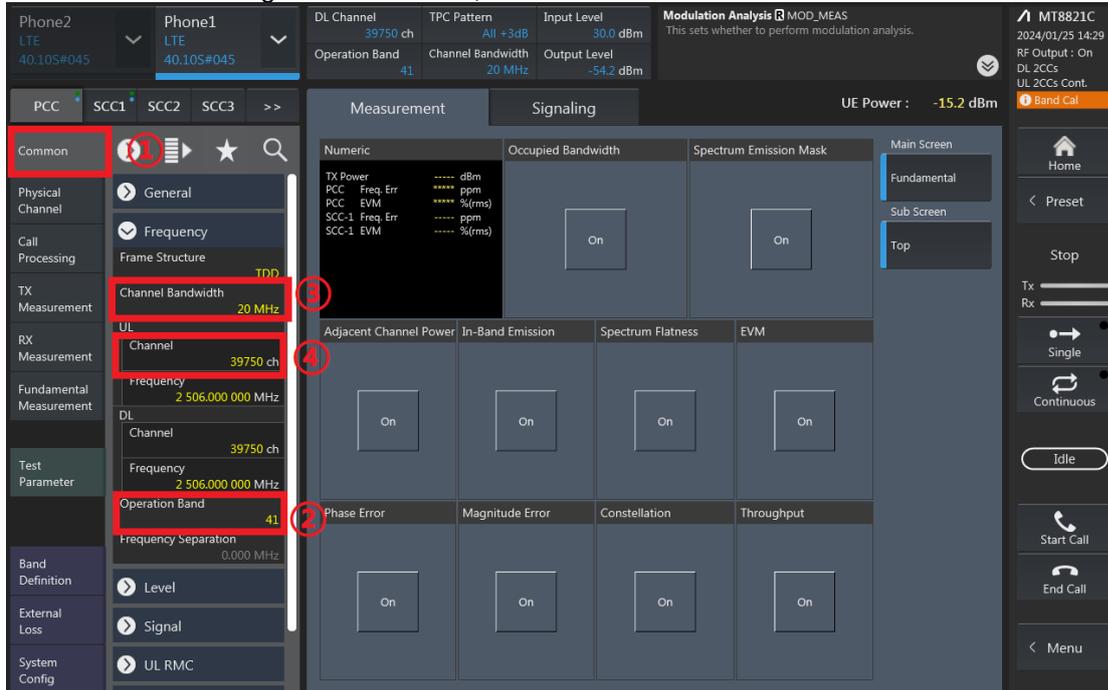
2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation;
If Select "RMC (DL CA)" for Downlink Carrier Aggregation.

For example, Uplink Carrier Aggregation:

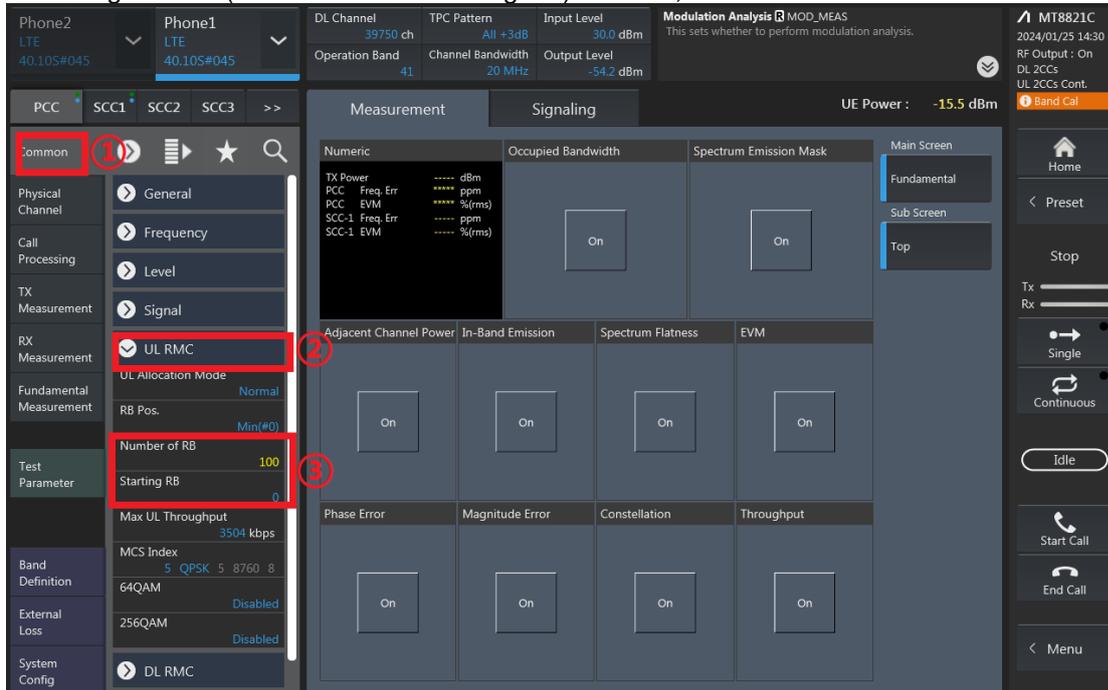
Detailed operation: PCC → Common → Signal → Channel Coding → Select 【RMC (DL/UL CA)】



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;



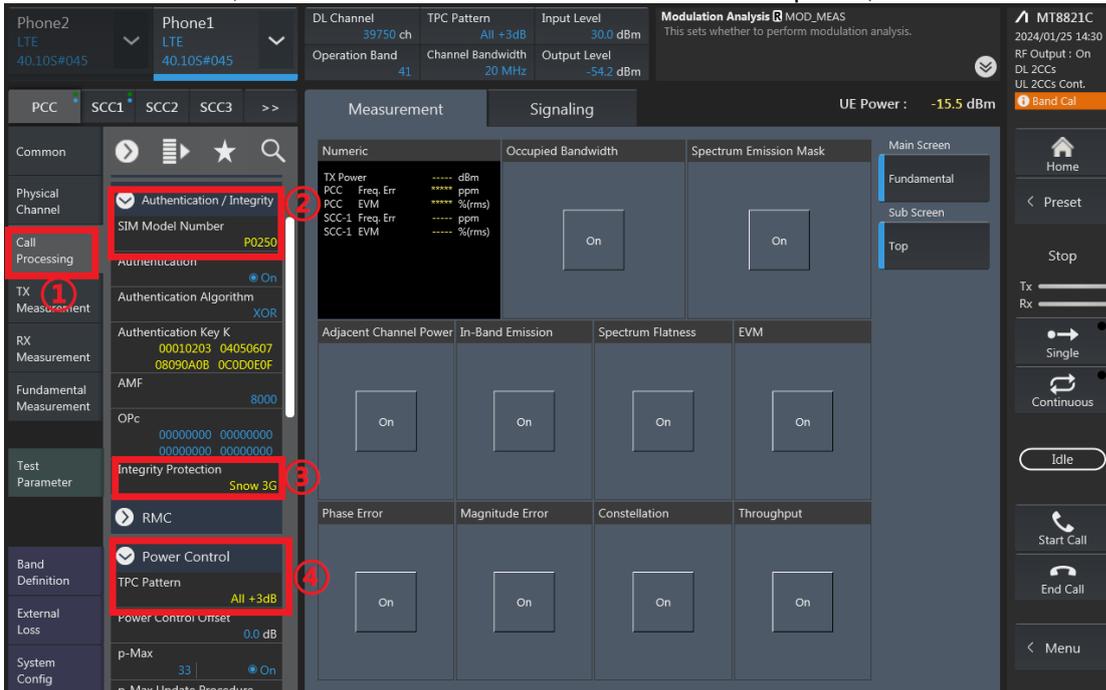
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;

The screenshot shows the SCC1 configuration screen. The 'DL Channel' is set to 39948 ch, 'Operation Band' is 41, 'Channel Bandwidth' is 20 MHz, and 'Channel' is 39948 ch. The 'Activation' and 'Output' status are both 'On'. The 'UE Power' is -15.5 dBm. The interface includes various measurement and signaling options like 'Adjacent Channel Power', 'In-Band Emission', 'Spectrum Flatness', and 'EVM', all currently set to 'On'.

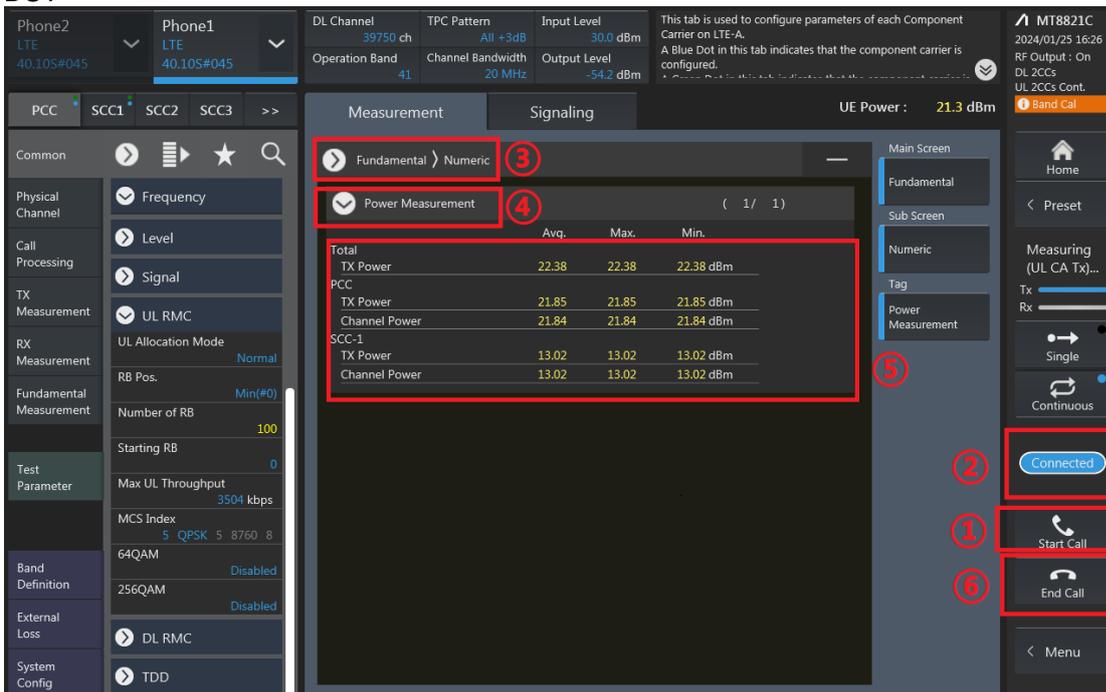
RB configurations (Number of RB / Starting RB) for SCC1;

This screenshot shows the 'UL RMC' configuration section. The 'Number of RB' is set to 100 and the 'Starting RB' is set to 0. The 'DL RMC' and 'TDD' options are also visible. The rest of the interface, including the 'Measurement' and 'Signaling' tabs, remains the same as in the previous screenshot.

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



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



7. The inter-band ULCA test method is similar to intra-band ULCA, and DLCA test method is similar to intra-band ULCA too.

Uplink CA Power

CA_7C Ant0 Default								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	22.91	24.00
21100	21298	QPSK	1	99	1	0	22.98	24.00
21350	21152	QPSK	1	0	1	99	22.95	24.00

CA_38C Ant0 Default								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
37850	38048	QPSK	1	99	1	0	23.15	24.00
38000	38198	QPSK	1	99	1	0	23.18	24.00
38150	37952	QPSK	1	0	1	99	23.13	24.00

CA_41C Ant0 Default								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
39750	39948	QPSK	1	99	1	0	23.09	24.00
40185	40383	QPSK	1	99	1	0	23.11	24.00
40620	40818	QPSK	1	99	1	0	23.21	24.00
41055	41253	QPSK	1	99	1	0	23.14	24.00
41490	41292	QPSK	1	0	1	99	23.05	24.00

Uplink CA Sensor on Power

CA_7C Ant0 Default								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
20850	21048	QPSK	1	99	1	0	9.09	10.00
21100	21298	QPSK	1	99	1	0	9.13	10.00
21350	21152	QPSK	1	0	1	99	9.04	10.00

CA_38C Ant0 Default								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
37850	38048	QPSK	1	99	1	0	10.23	11.00
38000	38198	QPSK	1	99	1	0	10.30	11.00
38150	37952	QPSK	1	0	1	99	10.18	11.00

CA_41C Ant0 Default								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
39750	39948	QPSK	1	99	1	0	10.21	11.00
40185	40383	QPSK	1	99	1	0	10.17	11.00
40620	40818	QPSK	1	99	1	0	10.33	11.00
41055	41253	QPSK	1	99	1	0	10.20	11.00
41490	41292	QPSK	1	0	1	99	10.19	11.00