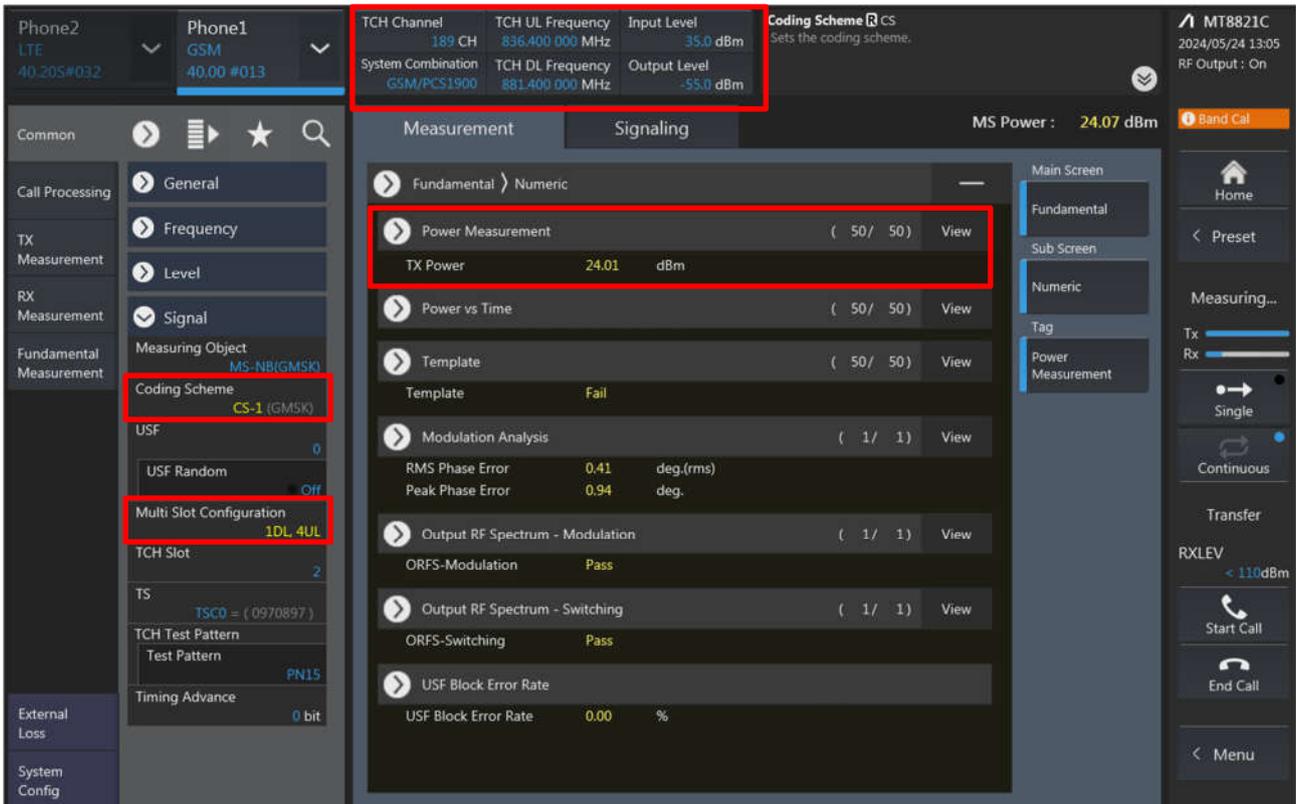


**Power measurement connection diagram:**

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>**





<WCDMA>

The screenshot displays the WCDMA measurement interface. At the top, it shows 'Phone1 W-CDMA 40.00 #013'. A red box highlights the channel parameters: 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. The 'Average Count' is set to PWR\_AVG. The 'Measurement' section shows 'Fundamental' selected, with 'Power Measurement' (50/50) highlighted in a red box, showing a TX Power of 23.28 dBm. Other metrics include Frequency Error (-0.0002 kHz), Occupied Bandwidth (4.163 MHz), and Adjacent Channel Power (ACLR(-5MHz) -40.24 dB, ACLR(+5MHz) -42.79 dB). The 'External Loss' is set to 'All 1'. The UE Power is 22.6 dBm.

<LTE>

The screenshot displays the LTE measurement interface. At the top, it shows 'Phone1 LTE 40.20S#021'. Channel parameters include UL Channel 21100 ch, TPC Pattern All +3dB, Input Level 30.0 dBm, Operation Band 7, Channel Bandwidth 20 MHz, and Output Level -67.0 dBm. The 'External Loss - Main DL' is set to DLEXTLOSS. The 'Measurement' section shows 'Numeric' selected, with 'TX Power' (23.01 dBm) highlighted in a red box. Other metrics include Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Power, In-Band Emission, Spectrum Flatness, EVM, Phase Error, Magnitude Error, Constellation, and Throughput. 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 TDDSSFCONF | MT8821C 2024/05/31 12:39 RF Output : On

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

Measurement: 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

UE Power : 23.5 dBm

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

<LTE TDD Power class 2>

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 TDDSSFCONF | MT8821C 2024/05/31 12:37 RF Output : On

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

Measurement: TX Power 26.16 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 : 26.6 dBm

Fundamental Measurement: Uplink Downlink Configuration 1: (5ms) D S U U D D S U U U | Special Subframe Configuration 5



**UL Channel Configuration:**

UL Channel	TPC Pattern	Input Level
18900 ch	All +3dB	35.0 dBm
Operation Band	Channel Bandwidth	Output Level
2	20 MHz	-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

UE Power : 25.4 dBm

**Measurement Signaling**

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)

**Test Parameter:**

- Number of RB: 1
- Starting RB: 0
- Max UL Throughput: 72 kbps
- MCS Index: 5 QPSK 5 72 8

<5G NR FR1>

**DL Center Channel Configuration:**

DL Center Channel	TPC Pattern	Input Level
126900	All +3dB	26.5 dBm
Operation Band	DL Channel Bandwidth	Output Level
71	20MHz	-40.0 dBm

**Power Measurement - Count PWR\_AVG**

MT8800A  
2024/05/24 14:11  
Ref. Int

UE Power : 26.0 dBm

**Measurement Signaling**

Numeric

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

**Occupied Bandwidth**

OBW 18.787 MHz

**Waveform: DFT-S-OFDM**

**Modulation: Pi/2 BPSK**

**Test Parameter:**

- 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
- Aggregation Level: 4



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

Power Measurement - Count PWR\_AVG

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

UE Power : 26.0 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

Cell

- N\_TAoffset
- DL Subcarrier Spacing(data) 15kHz
- UL Subcarrier Spacing(data) 15kHz
- 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

Measurement

Numeric

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

Occupied Bandwidth

OBW 18.787 MHz

Adjacent Channel Power

In-Band Emission

Spectrum Flatness

Spectrum Emission Mask

On

Main Screen

- Fundamental
- Sub Screen
- Top

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

NR

Connected

Start Call

End Call

Menu

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

Power Measurement - Count PWR\_AVG

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

UE Power : 25.9 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

- 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

Adjacent Channel Power

In-Band Emission

Spectrum Flatness

Spectrum Emission Mask

On

Main Screen

- Fundamental
- Sub Screen
- Top

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

NR

Connected

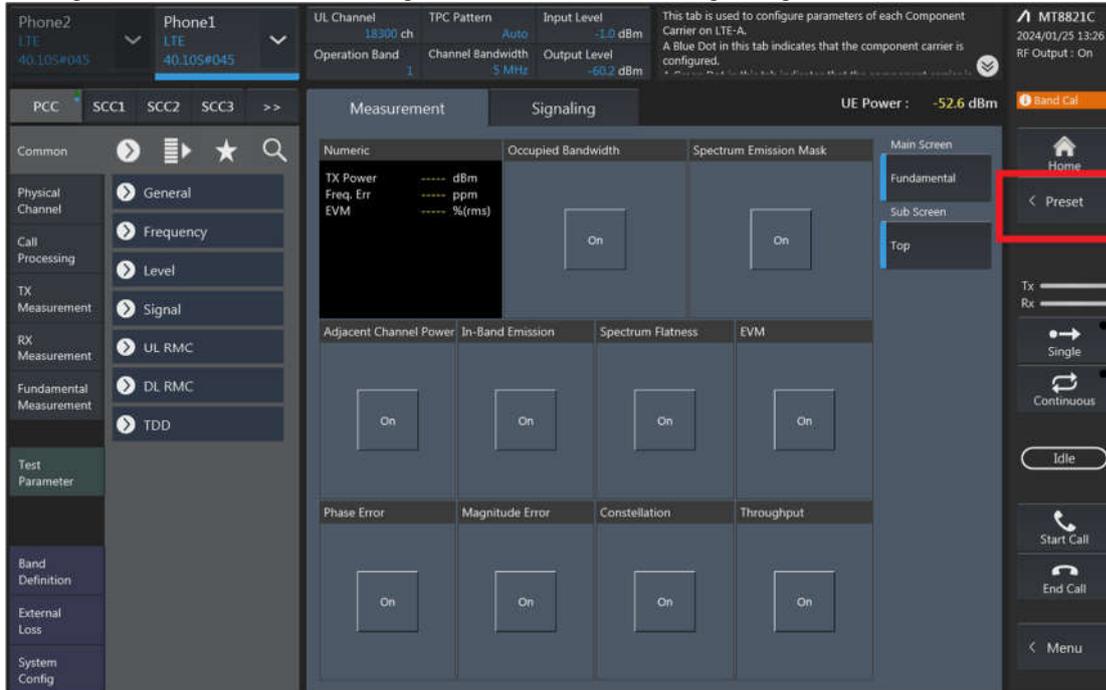
Start Call

End Call

Menu

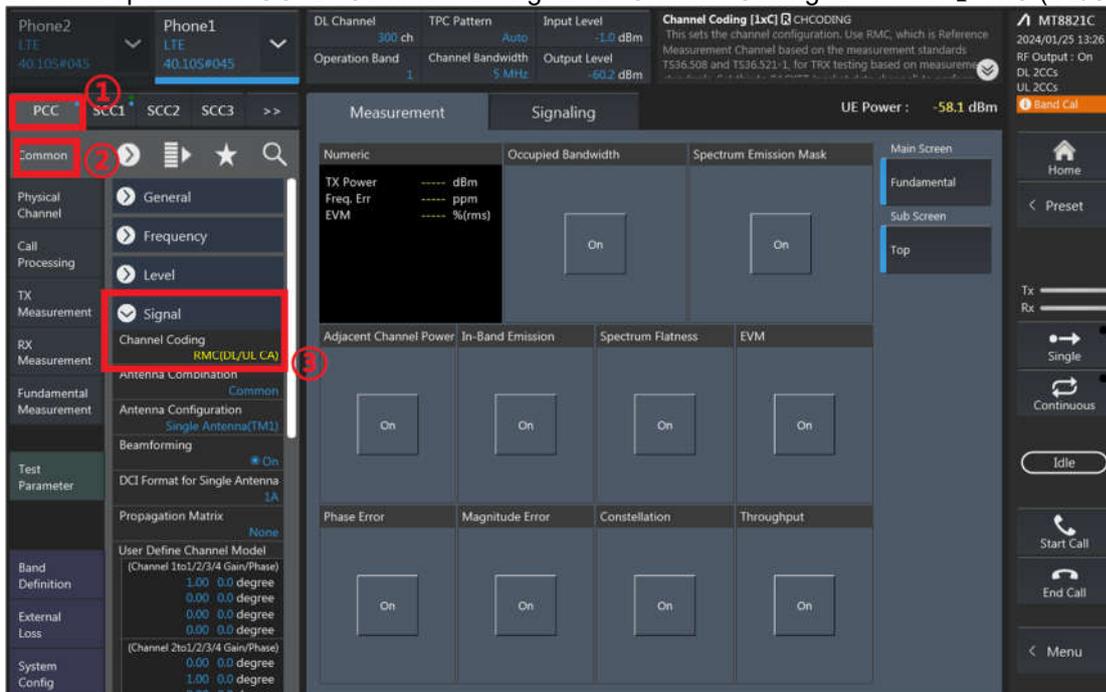
**LTE Uplink and Downlink Carrier Aggregation configurations:**

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)】





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

The screenshot shows the PCC parameter settings interface. The 'Common' tab is active, and the following parameters are highlighted with red circles and numbers:

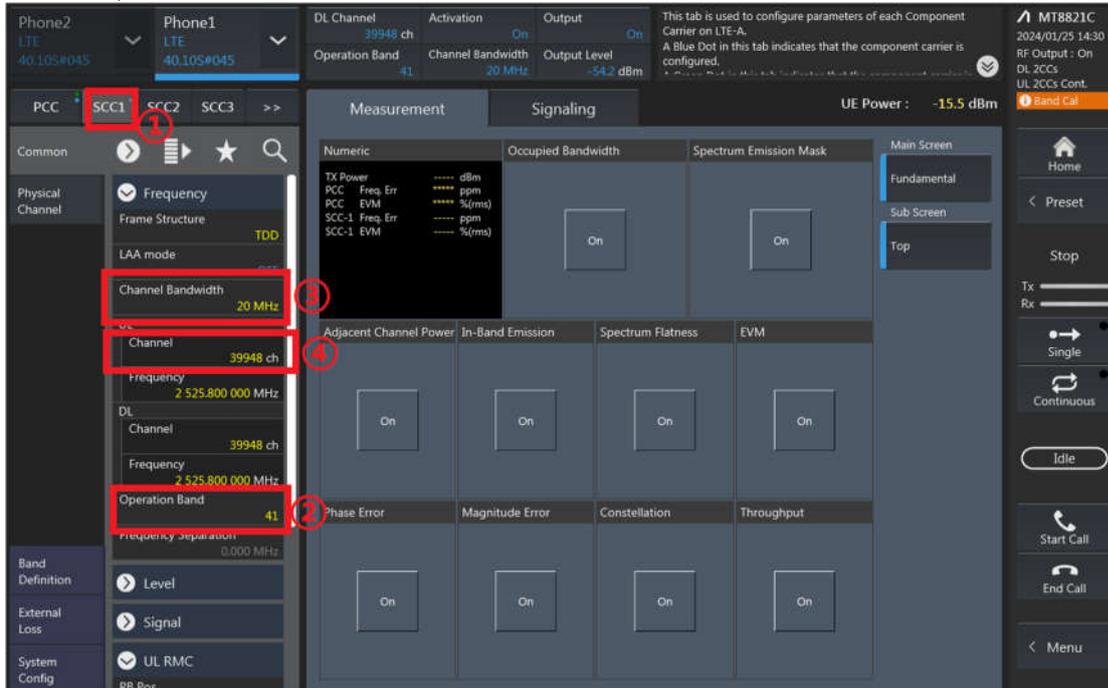
- 1: Common tab
- 2: Operation Band (41)
- 3: Channel Bandwidth (20 MHz)
- 4: Channel (39750 ch)

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

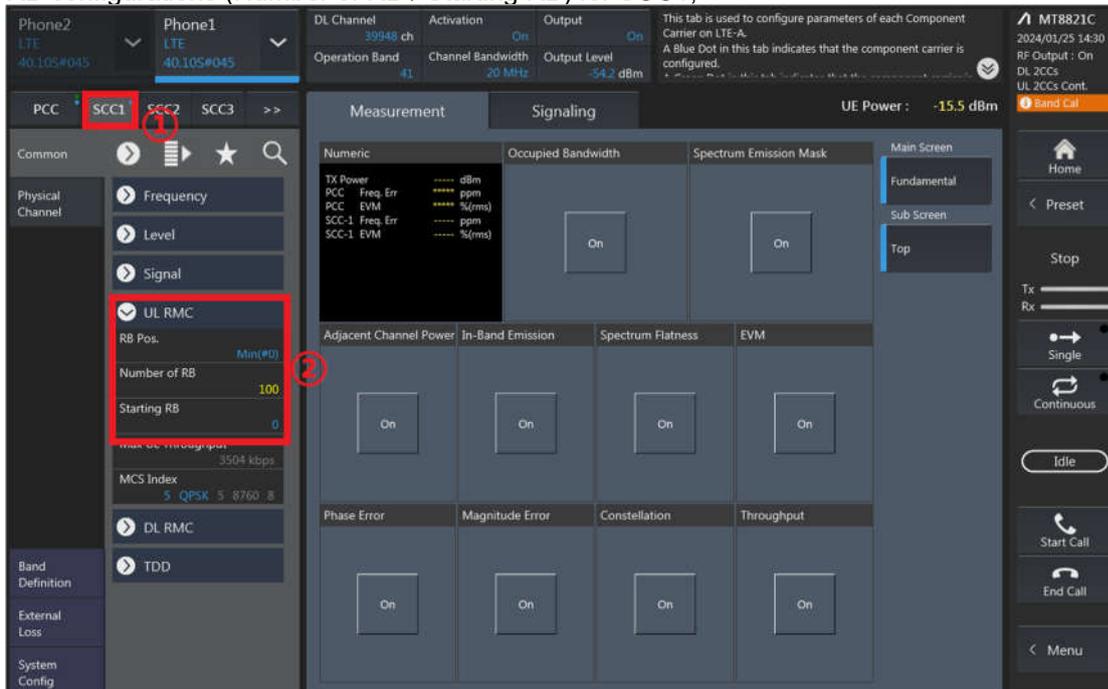
The screenshot shows the RB configurations for PCC. The 'UL RMC' section is expanded, and the following parameters are highlighted with red circles and numbers:

- 1: UL RMC section
- 2: UL Allocation Mode (Normal)
- 3: Number of RB (100)
- 4: Starting RB (0)

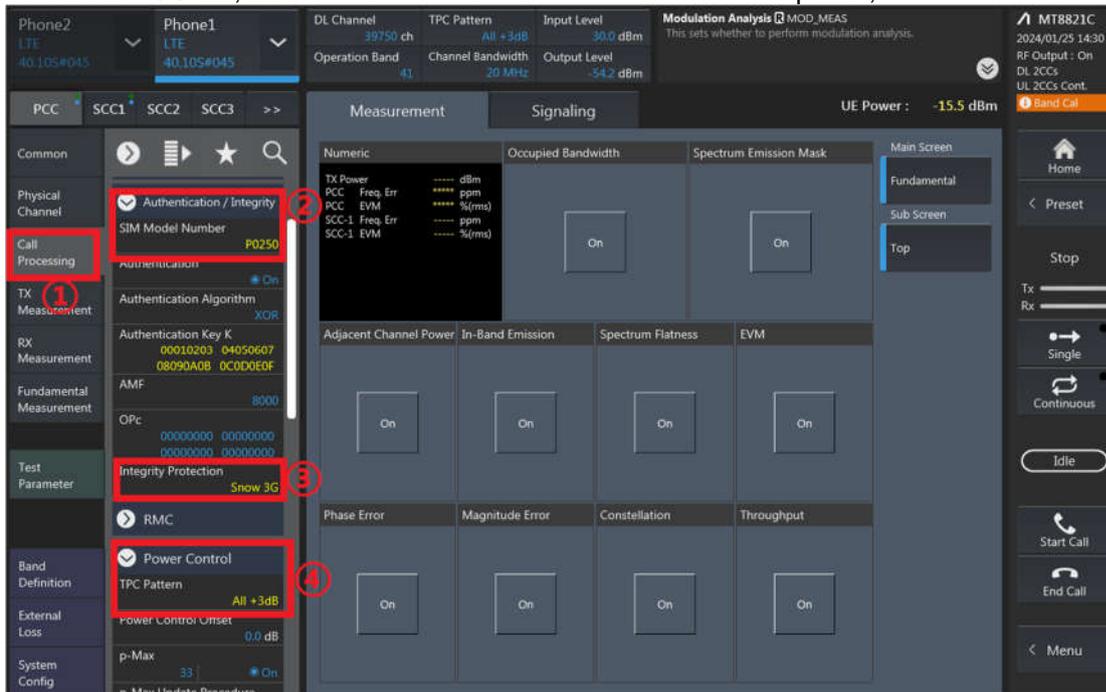
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



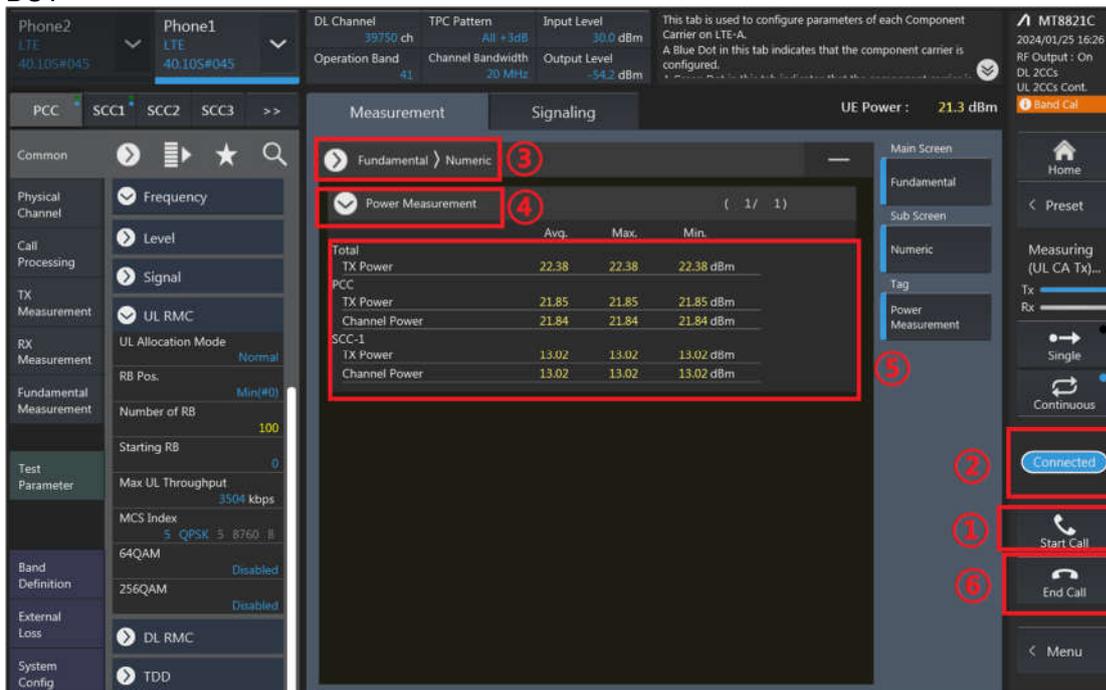
RB configurations (Number of RB / Starting RB) for SCC1;



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



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



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



Uplink CA Default Power

Ant4		CA_41C							
		Combination 20MHz+20MHz (100RB+100RB)						Measured Power (dBm)	Tune up Power (dBm)
PCC Channel	SCC Channel	Modulation	PCC		SCC				
			RB Size	RB offset	RB Size	RB offset			
39750	39948	QPSK	1	99	1	0	22.79	24.50	
40185	40383	QPSK	1	99	1	0	22.94	24.50	
40620	40818	QPSK	1	99	1	0	23.08	24.50	
41055	41253	QPSK	1	99	1	0	23.06	24.50	
41490	41292	QPSK	1	0	1	99	22.99	24.50	

Ant4		CA_41C-HPUE							
		Combination 20MHz+20MHz (100RB+100RB)						Measured Power (dBm)	Tune up Power (dBm)
PCC Channel	SCC Channel	Modulation	PCC		SCC				
			RB Size	RB offset	RB Size	RB offset			
39750	39948	QPSK	1	99	1	0	25.77	27.50	
40185	40383	QPSK	1	99	1	0	25.84	27.50	
40620	40818	QPSK	1	99	1	0	26.03	27.50	
41055	41253	QPSK	1	99	1	0	25.91	27.50	
41490	41292	QPSK	1	0	1	99	25.88	27.50	

Ant3		CA_42C							
		Combination 20MHz+20MHz (100RB+100RB)						Measured Power (dBm)	Tune up Power (dBm)
PCC Channel	SCC Channel	Modulation	PCC		SCC				
			RB Size	RB offset	RB Size	RB offset			
42190	42388	QPSK	1	99	1	0	22.91	24.50	
42590	42788	QPSK	1	99	1	0	23.04	24.50	
42990	43188	QPSK	1	99	1	0	22.89	24.50	



Uplink CA Sensor on Power

Ant4		CA_41C							
		Combination 20MHz+20MHz (100RB+100RB)						Measured Power (dBm)	Tune up Power (dBm)
PCC Channel	SCC Channel	Modulation	PCC		SCC				
			RB Size	RB offset	RB Size	RB offset			
39750	39948	QPSK	1	99	1	0	14.12	15.50	
40185	40383	QPSK	1	99	1	0	14.18	15.50	
40620	40818	QPSK	1	99	1	0	14.37	15.50	
41055	41253	QPSK	1	99	1	0	14.1	15.50	
41490	41292	QPSK	1	0	1	99	14.09	15.50	

Ant4		CA_41C-HPUE							
		Combination 20MHz+20MHz (100RB+100RB)						Measured Power (dBm)	Tune up Power (dBm)
PCC Channel	SCC Channel	Modulation	PCC		SCC				
			RB Size	RB offset	RB Size	RB offset			
39750	39948	QPSK	1	99	1	0	15.77	17.10	
40185	40383	QPSK	1	99	1	0	15.63	17.10	
40620	40818	QPSK	1	99	1	0	15.89	17.10	
41055	41253	QPSK	1	99	1	0	15.81	17.10	
41490	41292	QPSK	1	0	1	99	15.75	17.10	

Ant3		CA_42C							
		Combination 20MHz+20MHz (100RB+100RB)						Measured Power (dBm)	Tune up Power (dBm)
PCC Channel	SCC Channel	Modulation	PCC		SCC				
			RB Size	RB offset	RB Size	RB offset			
42190	42388	QPSK	1	99	1	0	22.91	24.50	
42590	42788	QPSK	1	99	1	0	23.04	24.50	
42990	43188	QPSK	1	99	1	0	22.89	24.50	