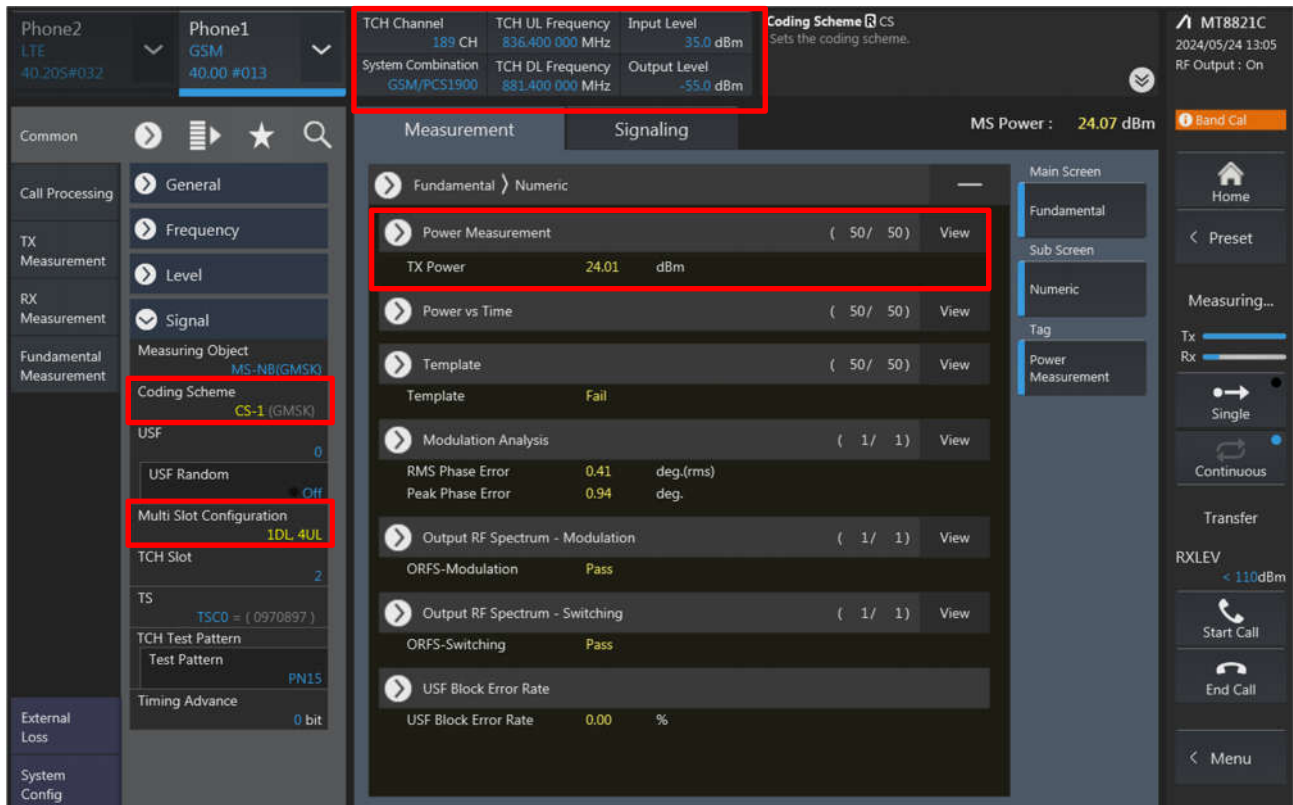


Power measurement connection diagram:

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

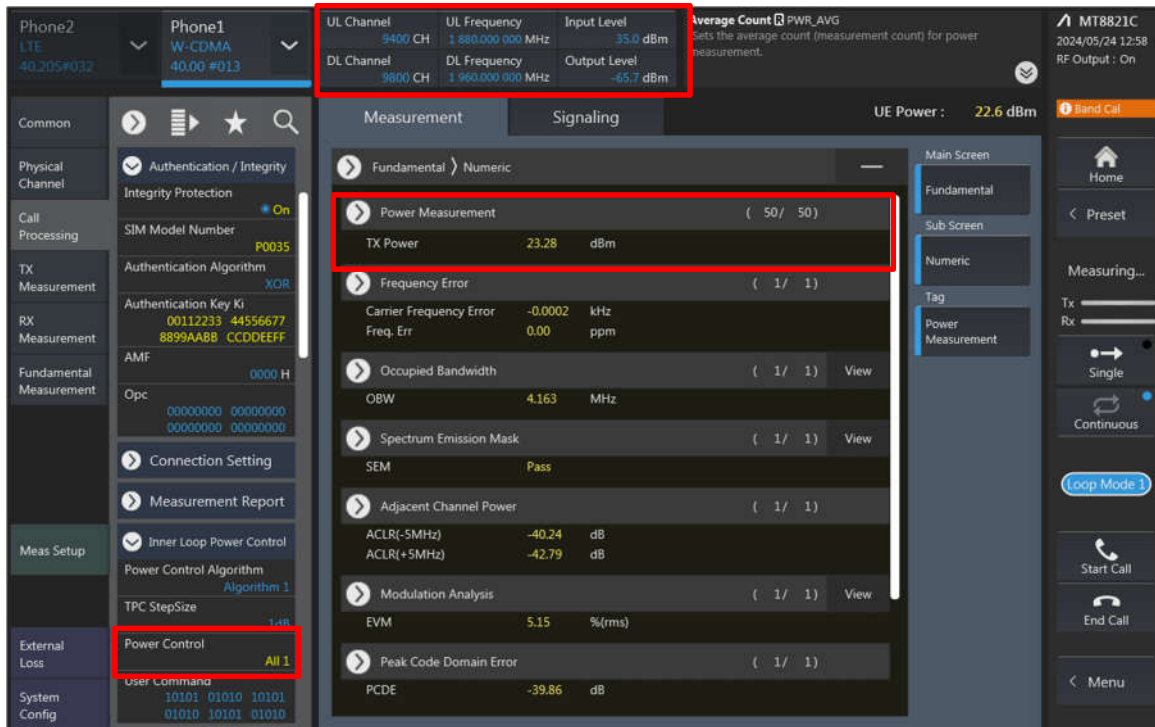
<GSM>



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

- Phone Information:** Phone2 (LTE, 40.205#032) and Phone1 (GSM, 40.00 #013).
- Measurement Configuration:**
 - 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
- Measurement Results:**
 - 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 %
- Side Panel:**
 - Call Processing:** General, Frequency, Level, Signal
 - TX Measurement:** Measuring Object: MS-NB(GMSK)
 - RX Measurement:** Coding Scheme: CS-1 (GMSK)
 - Fundamental Measurement:** 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
 - External Loss:** System Config
- Right Panel:** MT8821C, 2024/05/24 13:05, RF Output: On, MS Power: 24.07 dBm, Band Cal, Home, Preset, Measuring..., Tx/Rx, Single, Continuous, Transfer, RXLEV: < 110dBm, Start Call, End Call, Menu

<WCDMA>

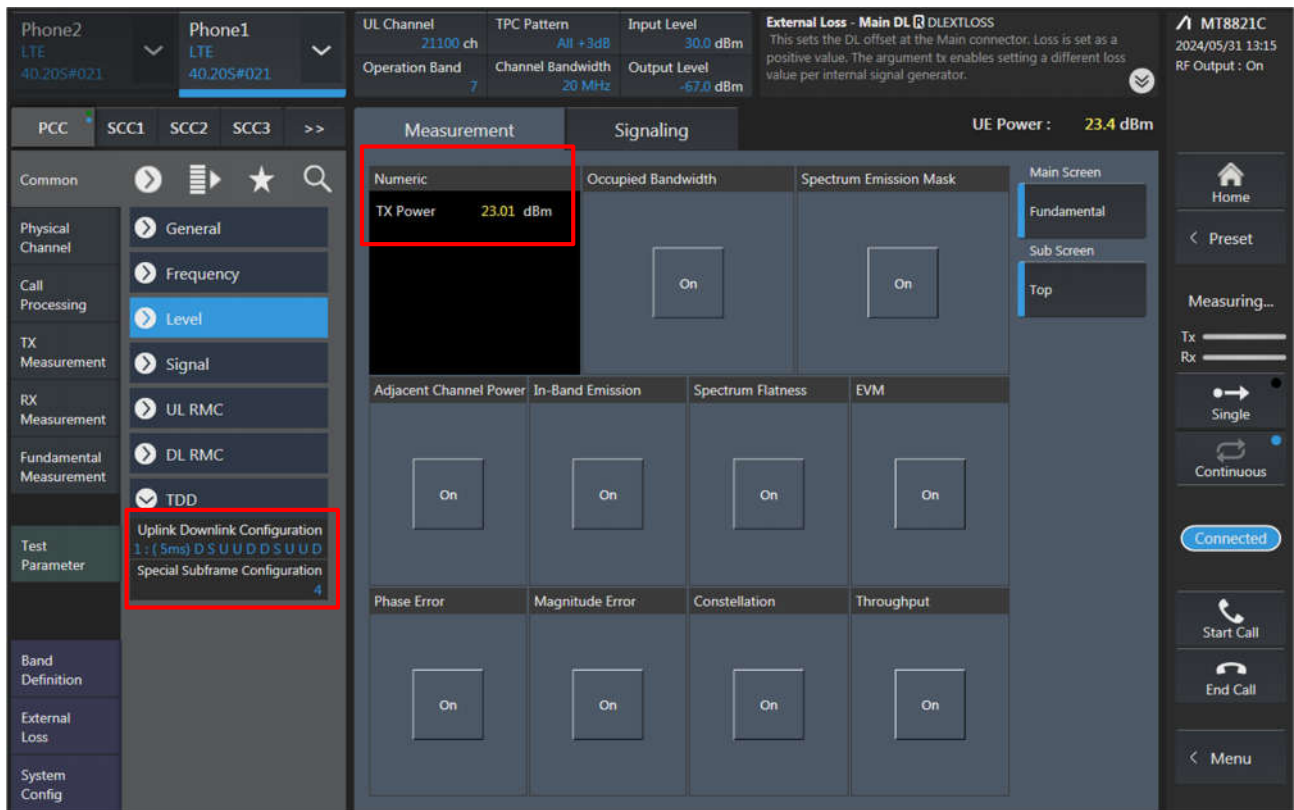


The WCDMA interface shows two phones (Phone2 and Phone1) connected. The main display is divided into sections for Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Meas Setup, External Loss, and System Config. The Measurement section is active, showing a list of metrics including Power Measurement, Frequency Error, Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Power, Modulation Analysis, and Peak Code Domain Error. The Power Measurement section is highlighted with a red box, showing TX Power at 23.28 dBm. The External Loss section is also highlighted with a red box, showing Power Control at All 1.

UL Channel	UL Frequency	Input Level
9400 CH	1 880.000 000 MHz	35.0 dBm
DL Channel	DL Frequency	Output Level
9800 CH	1 960.000 000 MHz	-65.7 dBm

Metric	Value	Unit
TX Power	23.28	dBm
Frequency Error	(50 / 50)	
Carrier Frequency Error	-0.0002	kHz
Freq. Err	0.00	ppm
Occupied Bandwidth	4.163	MHz
Spectrum Emission Mask	Pass	
Adjacent Channel Power	(1 / 1)	
ACLR(-5MHz)	-40.24	dB
ACLR(+5MHz)	-42.79	dB
Modulation Analysis	(1 / 1)	
EVM	5.15	%(rms)
Peak Code Domain Error	(1 / 1)	
PCDE	-39.86	dB

<LTE>



The LTE interface shows two phones (Phone2 and Phone1) connected. The main display is divided into sections for Common, Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config. The Measurement section is active, showing a list of metrics including TX Power, Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Power, In-Band Emission, Spectrum Flatness, EVM, Phase Error, Magnitude Error, Constellation, and Throughput. The TX Power section is highlighted with a red box, showing TX Power at 23.01 dBm. The Test Parameter section is also highlighted with a red box, showing Uplink Downlink Configuration 1: (5ms) DSUUDDDSUU and Special Subframe Configuration 4.

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

Metric	Value	Unit
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	

Uplink Downlink Configuration 1: (5ms) DSUUDDDSUU
Special Subframe Configuration 4

<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

PCC SCC1 SCC2 SCC3 >>

Common Frequency Level Signal UL RMC DL RMC TDD Uplink Downlink Configuration 0 : (5ms) D S U U U D S U U U Special Subframe Configuration 5

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

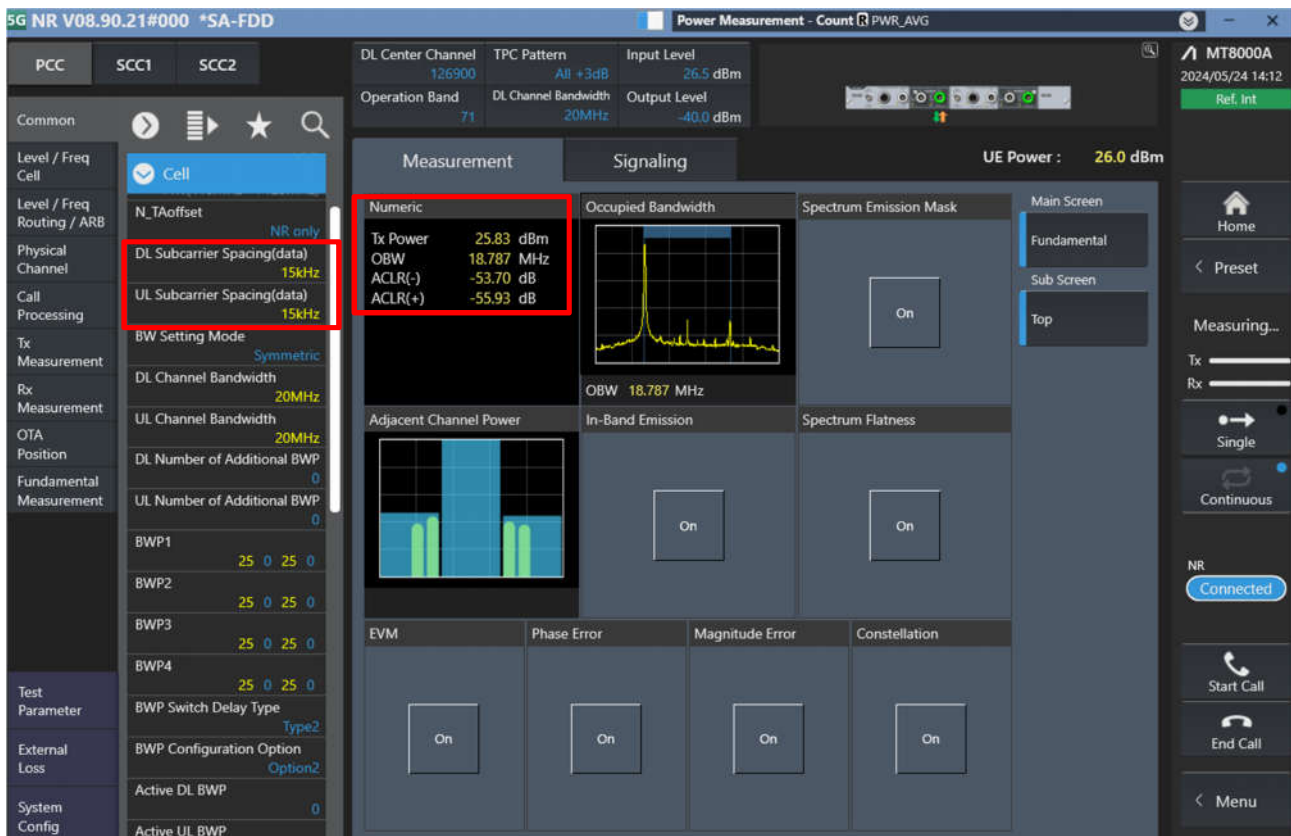
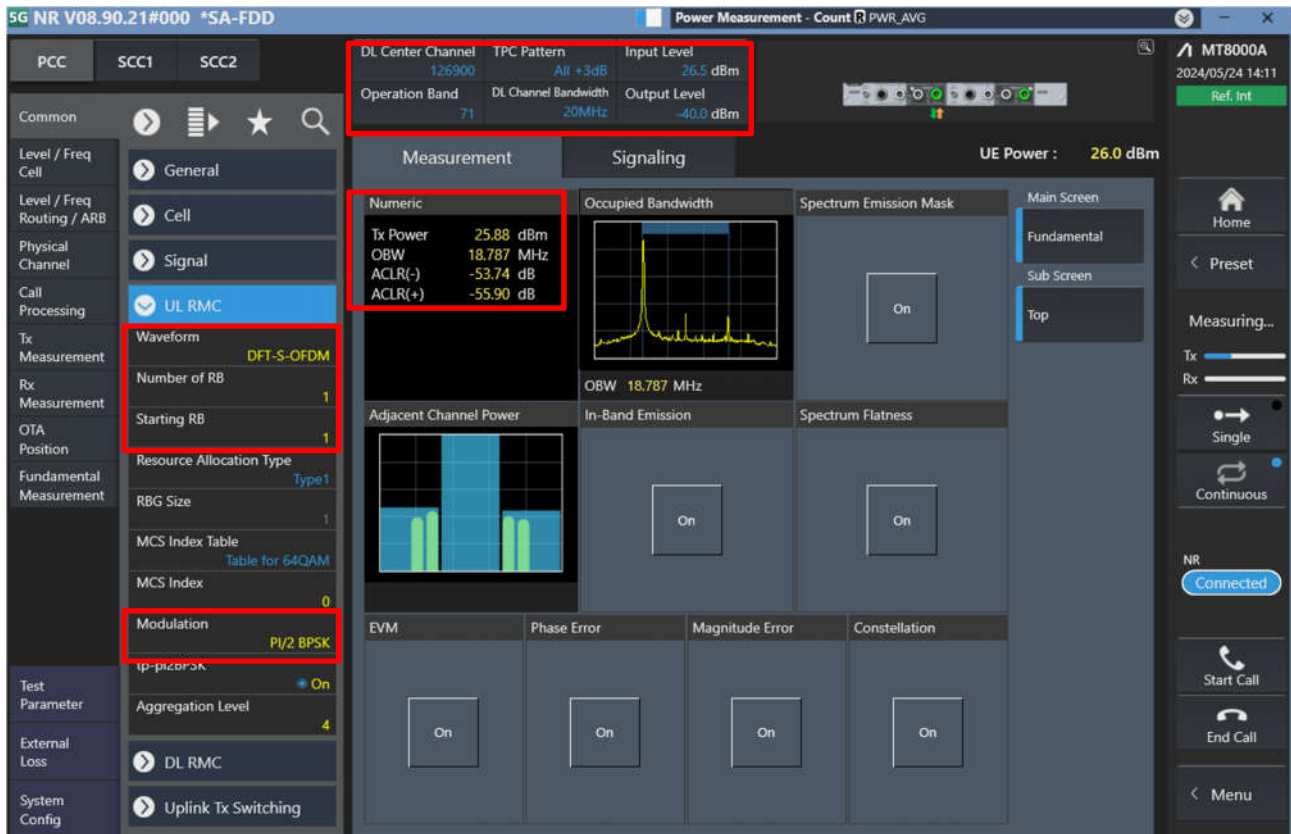
Phase Error Magnitude Error Constellation Throughput

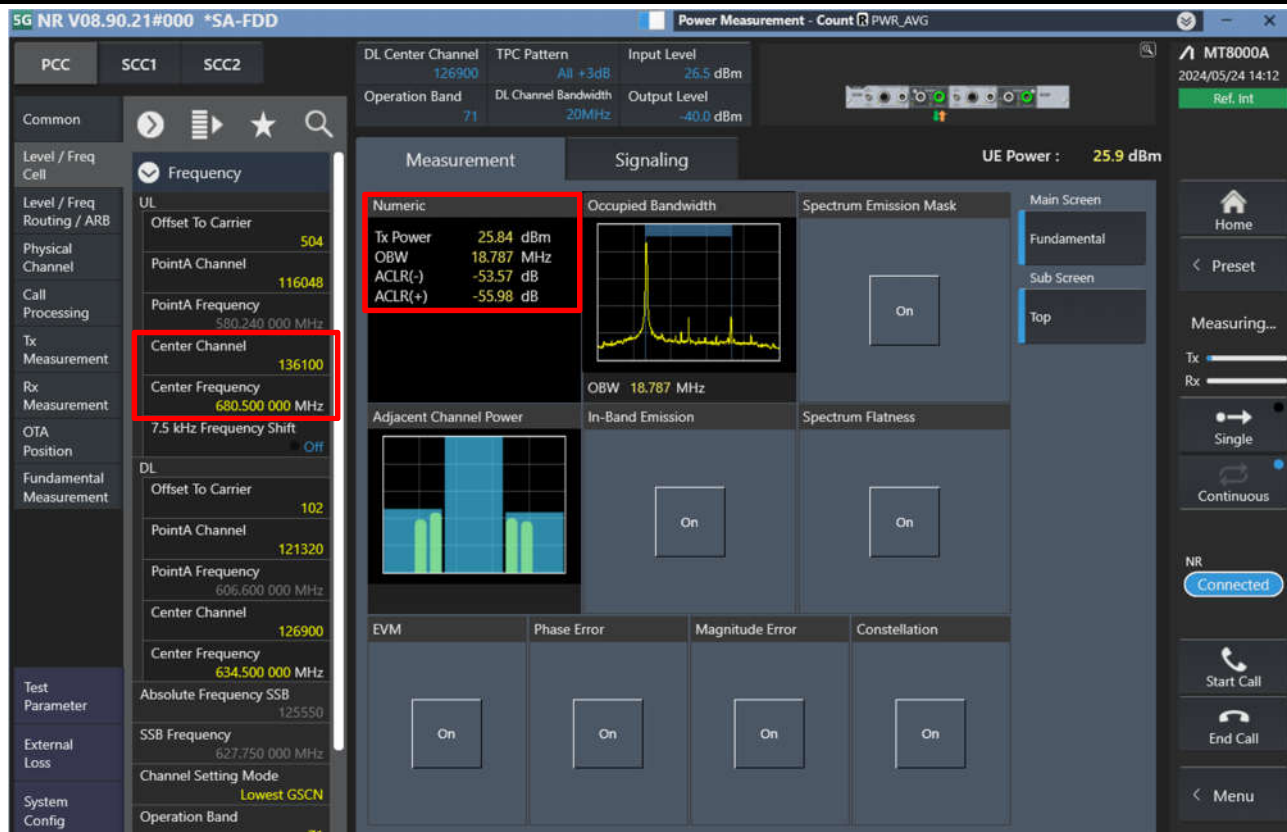
On On On On

Main Screen Fundamental Sub Screen Top

Home Preset Measuring... Tx Rx Single Continuous Connected Start Call End Call Menu

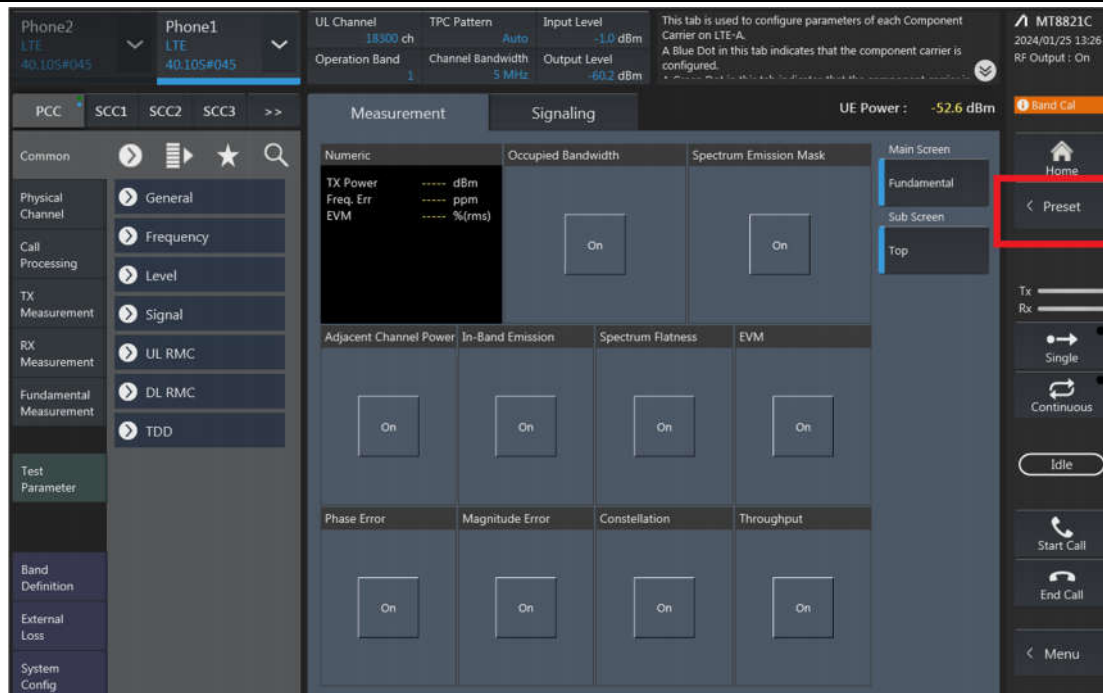
<5G NR FR1>





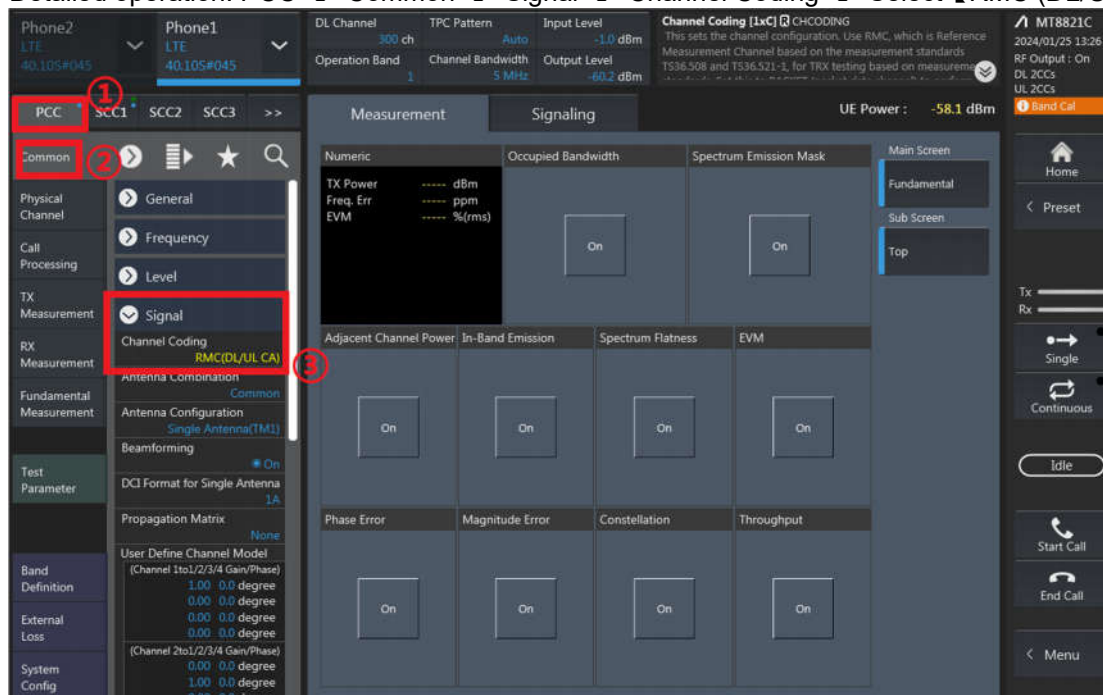
LTE Downlink Carrier Aggregation configurations:

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

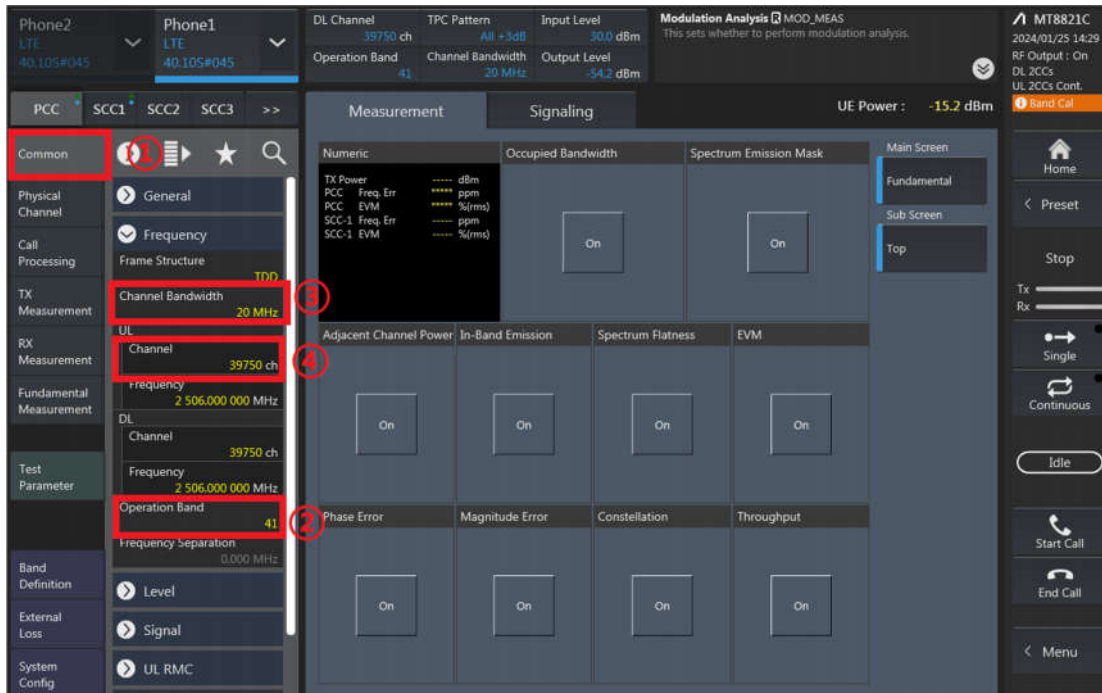


2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation;
If Select "RMC (DL CA)" for Downlink Carrier Aggregation.
For example, Uplink Carrier Aggregation:

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;



Phone2 LTE 40.105#045 Phone1 LTE 40.105#045

DL Channel 39750 ch TPC Pattern Alt +3dB Input Level 30.0 dBm Modulation Analysis MOD-MEAS This sets whether to perform modulation analysis.

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

UE Power: -15.2 dBm

Common 1

Physical Channel General

Call Processing Frequency

TX Measurement Frame Structure TDD

RX Measurement Channel Bandwidth 20 MHz 2

Fundamental Measurement Channel 39750 ch 3

Test Parameter Frequency 2 506.000 000 MHz 4

Band Definition DL Channel 39750 ch

External Loss Frequency 2 506.000 000 MHz

System Config Frequency Separation 0.000 MHz

Level

Signal

UL RMC

Measurement

Signaling

Occupied Bandwidth

Spectrum Emission Mask

Main Screen

Fundamental

Sub Screen

Top

Home

Preset

Stop

Tx

Rx

Single

Continuous

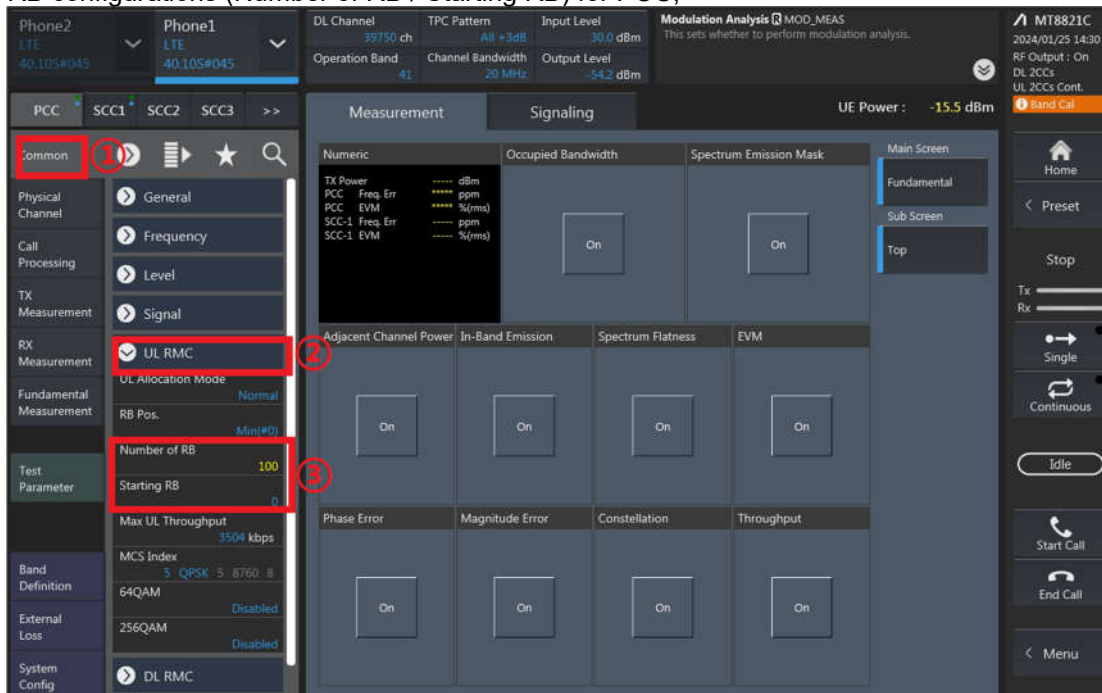
Idle

Start Call

End Call

Menu

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



Phone2 LTE 40.105#045 Phone1 LTE 40.105#045

DL Channel 39750 ch TPC Pattern Alt +3dB Input Level 30.0 dBm Modulation Analysis MOD-MEAS This sets whether to perform modulation analysis.

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

UE Power: -15.5 dBm

Common 1

Physical Channel General

Call Processing Frequency

TX Measurement Level

RX Measurement Signal

Fundamental Measurement UL RMC 2

Test Parameter UL Allocation Mode Normal

Band Definition RB Pos. Min(#0)

External Loss Number of RB 100 3

System Config Starting RB 0 4

Max UL Throughput 3504 kbps

MCS Index 5 QPSK 5 8760.8

64QAM

256QAM Disabled

DL RMC

Measurement

Signaling

Occupied Bandwidth

Spectrum Emission Mask

Main Screen

Fundamental

Sub Screen

Top

Home

Preset

Stop

Tx

Rx

Single

Continuous

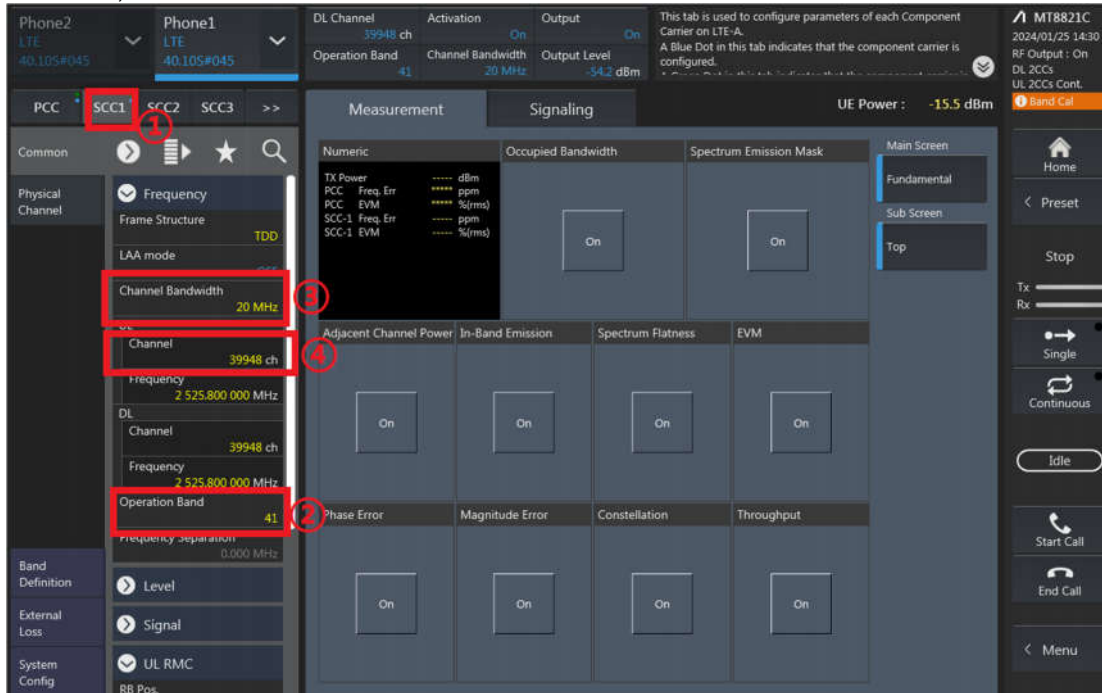
Idle

Start Call

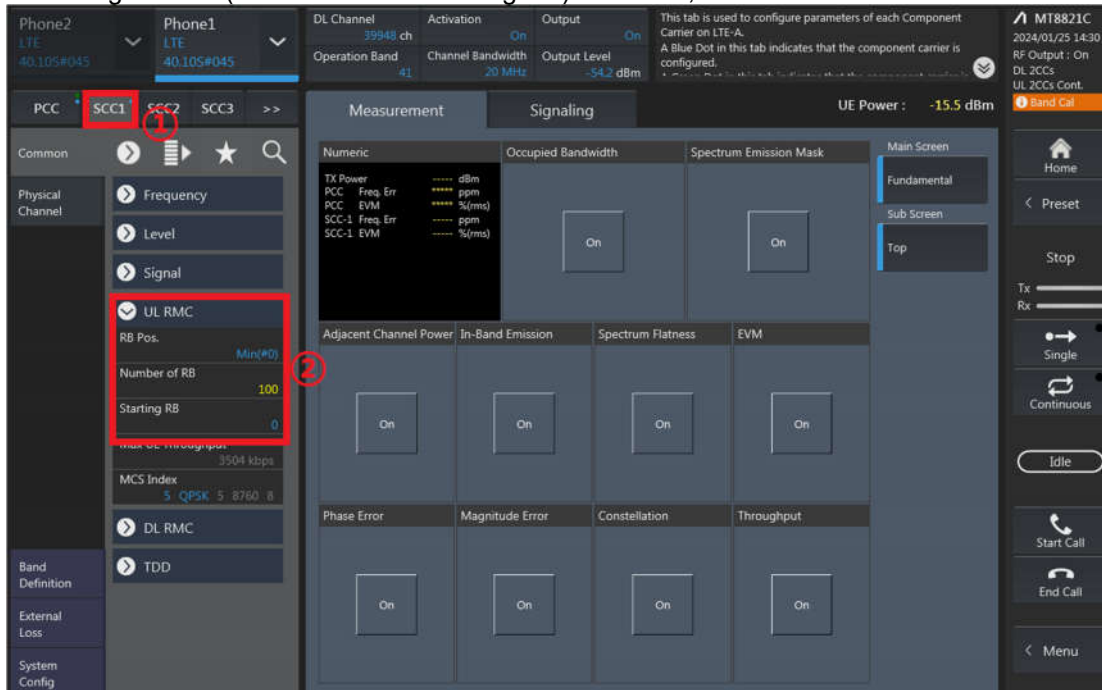
End Call

Menu

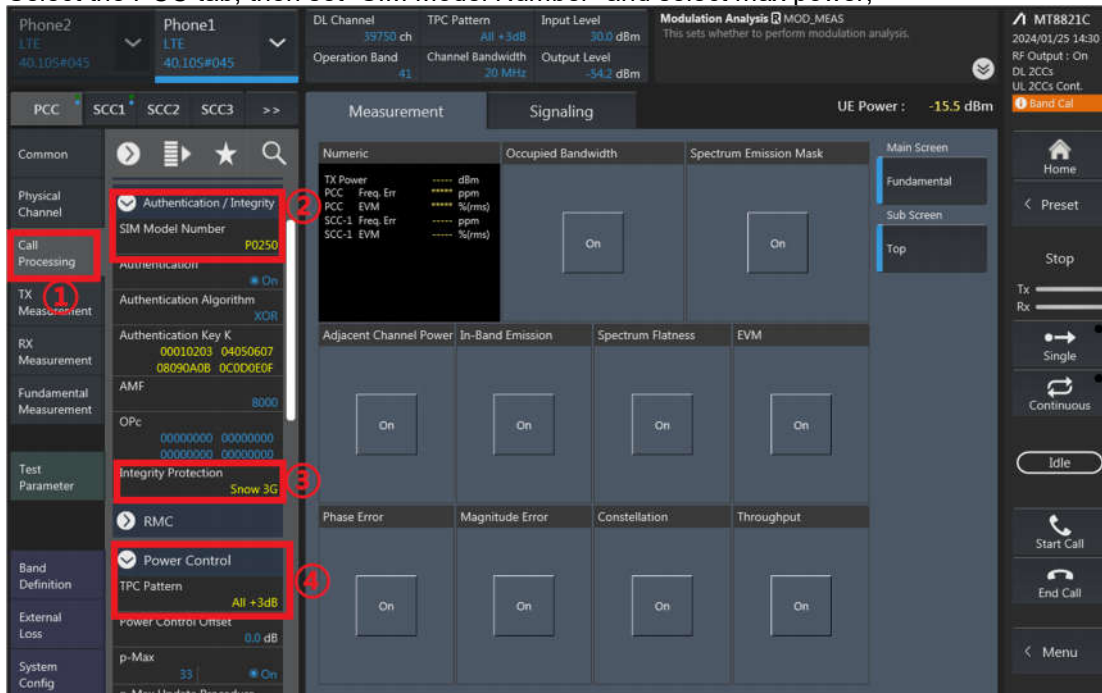
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



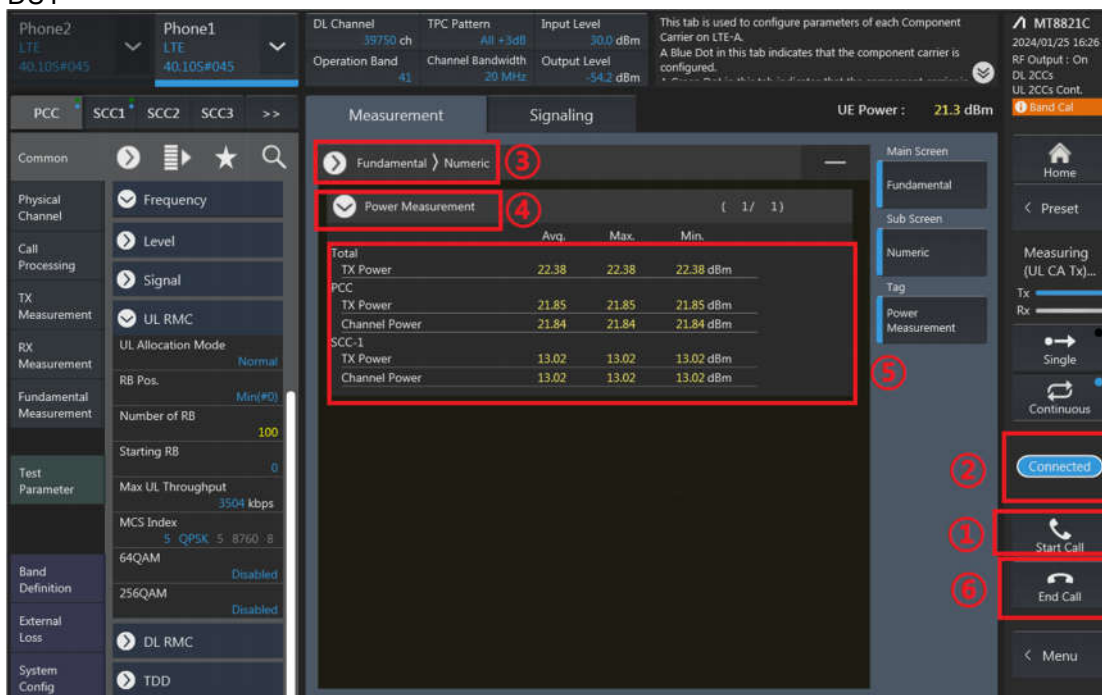
RB configurations (Number of RB / Starting RB) for SCC1;



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



2CA DL																	
CA List	PCC								SCC					Power			
	LTE	BW	BW	UL	UL	UL#	UL	DL Antenna Configuration	LTE	BW	DL	DL	DL Antenna Configuration	With CA	Without CA		
	Band	Ant	(MHz)	Freq (MHz)	Channel	Mod	RB	Offset	Band	(MHz)	Freq (MHz)	Channel		Tx. Power (dBm)	Tx. Power (dBm)		
	CA 41A-42A	Band 41	Ant 0	20M	2593	40620	QPSK	1	0	4X4MIMO	Band 42	20M	3500	42590	4X4MIMO	15.01	15.09
	Band 42	Ant 0	20M <td>3500<td>42590<th>QPSK</th><th>1</th><th>0</th><th>4X4MIMO</th><th>Band 41</th><th>20M</th><th>2593</th><th>40620</th><th>4X4MIMO</th><th>14.66</th><th>14.72</th><th></th></td></td>	3500 <td>42590<th>QPSK</th><th>1</th><th>0</th><th>4X4MIMO</th><th>Band 41</th><th>20M</th><th>2593</th><th>40620</th><th>4X4MIMO</th><th>14.66</th><th>14.72</th><th></th></td>	42590 <th>QPSK</th> <th>1</th> <th>0</th> <th>4X4MIMO</th> <th>Band 41</th> <th>20M</th> <th>2593</th> <th>40620</th> <th>4X4MIMO</th> <th>14.66</th> <th>14.72</th> <th></th>	QPSK	1	0	4X4MIMO	Band 41	20M	2593	40620	4X4MIMO	14.66	14.72	



3CA DL

3CA List	PCC									SCC1					SCC2				Power		
	LTE	BW	BW	UL	UL	UL#	UL	DL Antenna	Configuration	LTE	BW	DL	DL	DL Antenna	LTE	BW	DL	DL	DL Antenna	With CA	Without CA
	Band	Ant	(MHz)	Freq.	Channel	Mod.	RB	RB		Band	(MHz)	Freq.	Channel	Configuration	Band	(MHz)	Freq.	Channel	Configuration	Tx Power	Tx Power
				(MHz)			Offset					(MHz)					(dBm)	(dBm)			
CA_41A-42C	Band 41	Ant 0	20M	2593	40620	QPSK	1	0	4X4MMMO	Band 42	20M	3500	42590	4X4MMMO	Band 42	20M	3519.8	42788	4X4MMMO	15.02	15.09
	Band 42	Ant 0	20M	3500	42590	QPSK	1	0	4X4MMMO	Band 42	20M	3519.8	42788	4X4MMMO	Band 41	20M	2593	40620	4X4MMMO	14.66	14.72
CA_41C-42A	Band 41	Ant 0	20M	2593	40620	QPSK	1	0	4X4MMMO	Band 41	20M	2612.8	40818	4X4MMMO	Band 42	20M	3500	42590	4X4MMMO	15.05	15.09
	Band 42	Ant 0	20M	3500	42590	QPSK	1	0	4X4MMMO	Band 41	20M	2593	40620	4X4MMMO	Band 41	20M	2612.8	40818	4X4MMMO	14.69	14.72