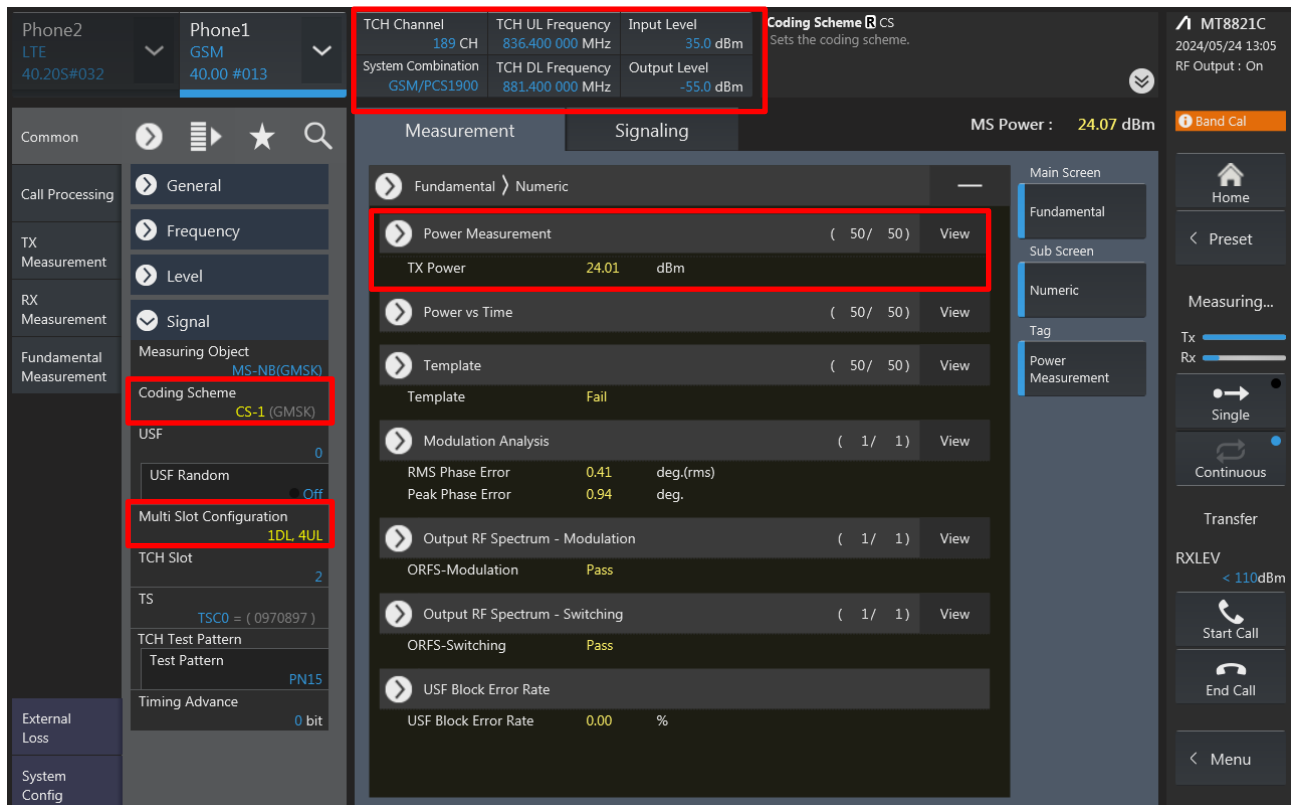


Power measurement connection diagram:

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.

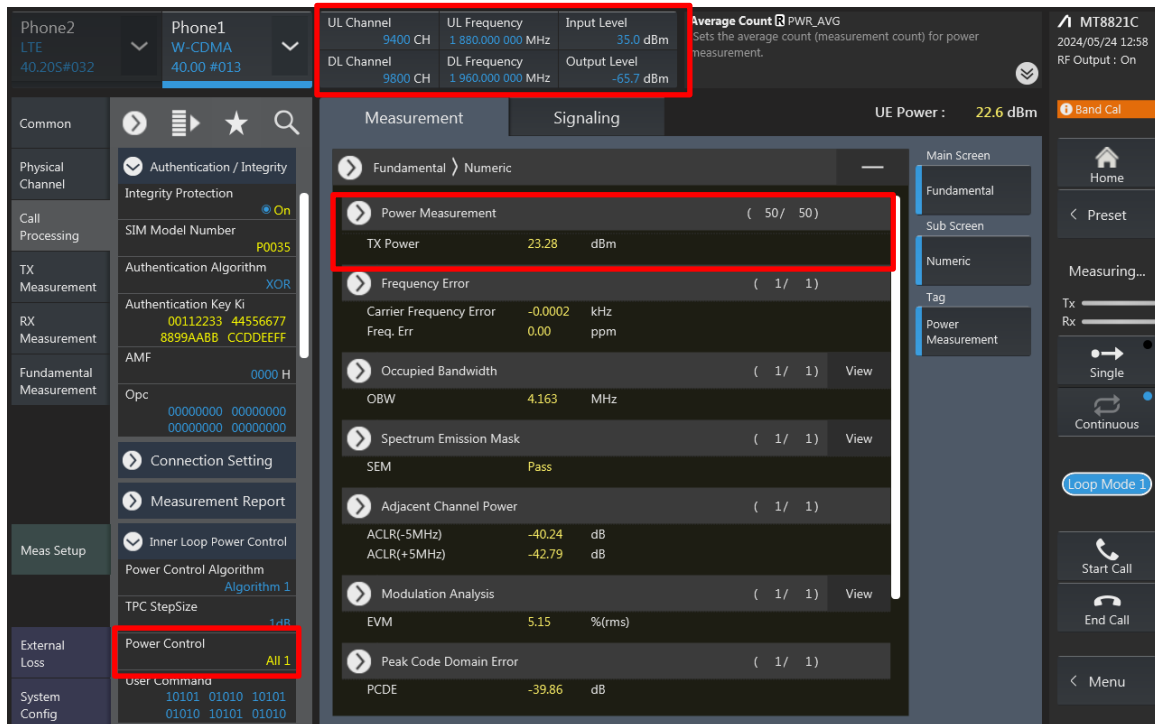
<GSM>



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

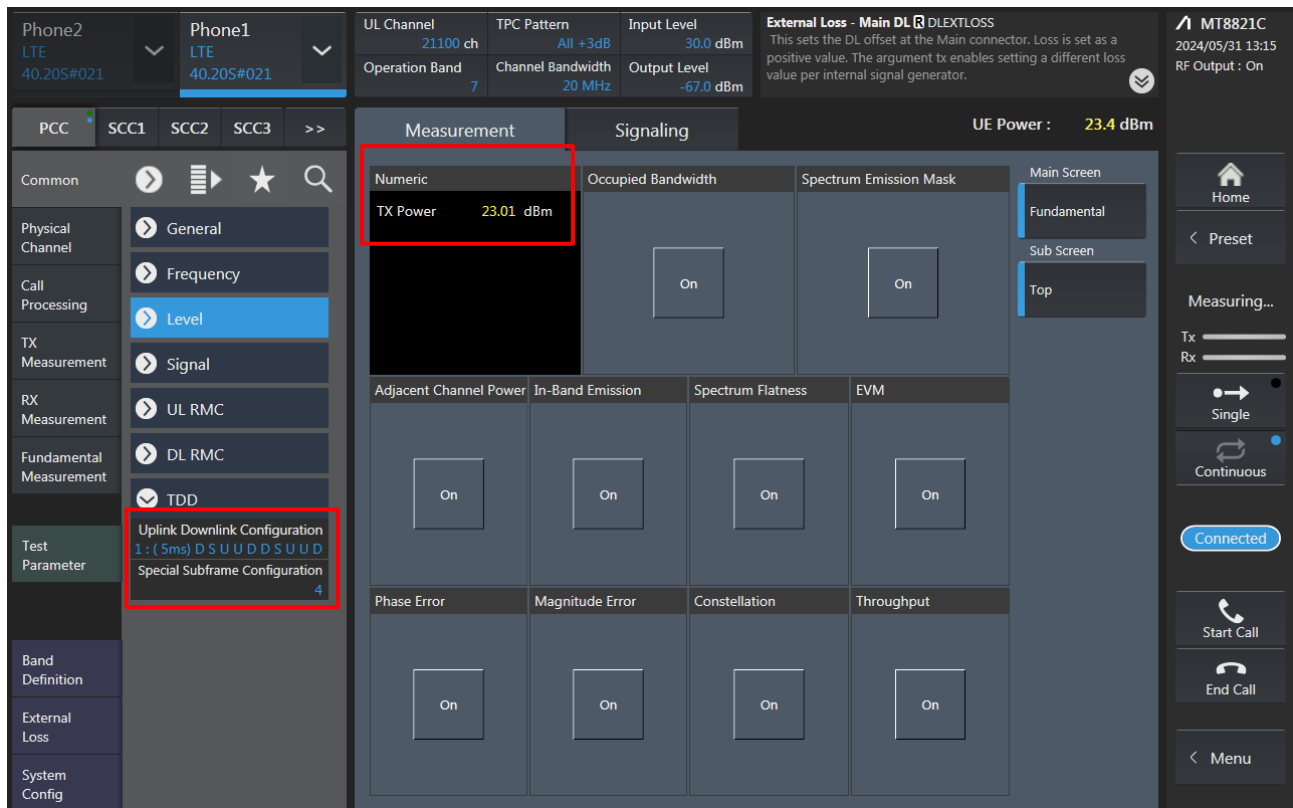
- Top Bar:** Shows Phone2 (LTE, 40.205#032) and Phone1 (GSM, 40.00 #013). It also displays TCH Channel (189 CH), TCH UL Frequency (836.400 000 MHz), Input Level (35.0 dBm), TCH DL Frequency (881.400 000 MHz), and Output Level (-55.0 dBm). The Coding Scheme is set to CS.
- Left Sidebar:** Contains navigation options like Common, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, and External Loss. The 'Fundamental Measurement' section is expanded, showing 'Coding Scheme' (CS-1 (GMSK)) and 'Multi Slot Configuration' (1DL, 4UL).
- Main Area:** Displays 'Measurement' and 'Signaling' tabs. The 'Measurement' tab is active, showing 'Fundamental' and 'Numeric' views. The 'Power Measurement' section is highlighted, showing 'TX Power' (24.01 dBm). Other measurements include 'Power vs Time', 'Template', 'Modulation Analysis', 'Output RF Spectrum - Modulation', 'Output RF Spectrum - Switching', and 'USF Block Error Rate'.
- Right Sidebar:** Shows 'MT8821C' with a timestamp of 2024/05/24 13:05 and 'RF Output : On'. It also includes a 'Band Cal' button and a 'Main Screen' section with 'Fundamental', 'Sub Screen', 'Numeric', and 'Tag' options.

<WCDMA>



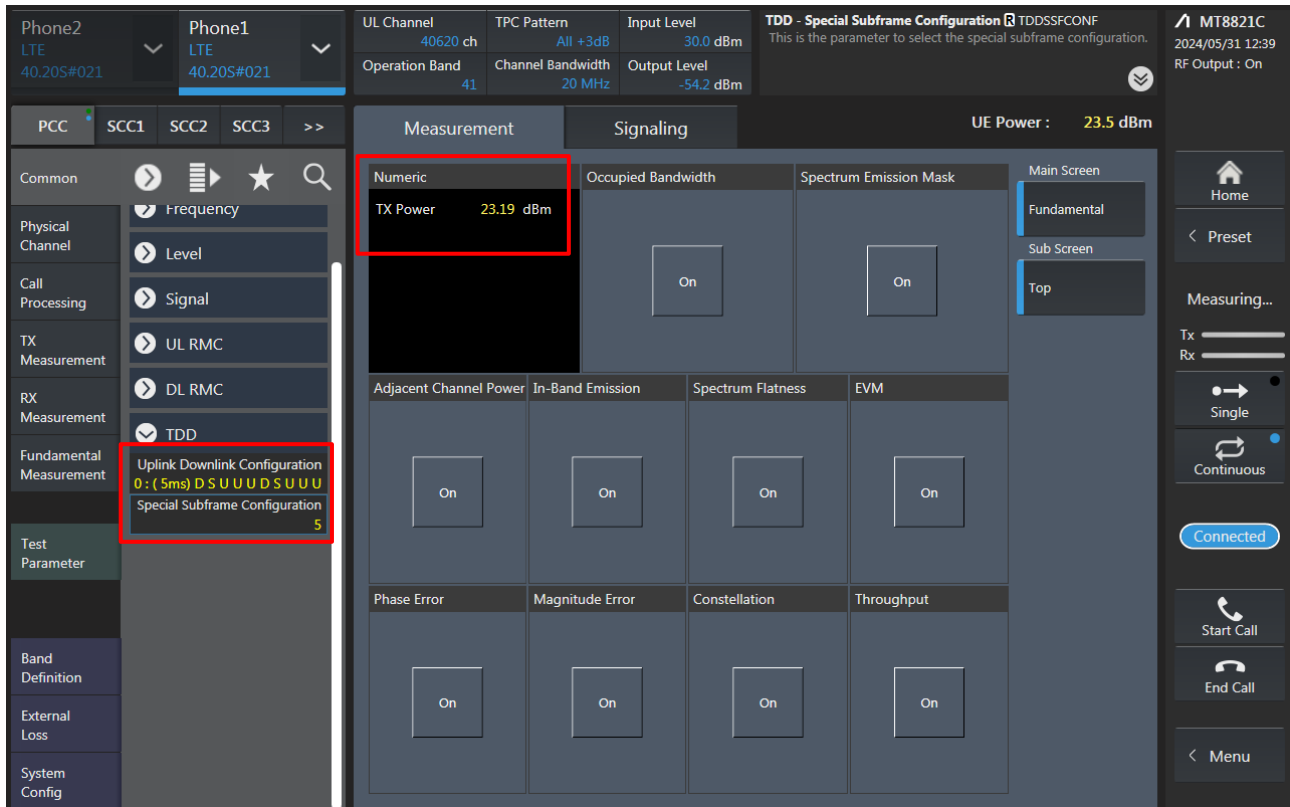
The screenshot shows the WCDMA measurement interface. The top bar displays 'Phone2 LTE 40.20S#032' and 'Phone1 W-CDMA 40.00 #013'. The 'Measurement' tab is active, showing 'Fundamental' and 'Numeric' views. The 'Power Measurement' section is highlighted with a red box, showing 'TX Power' at 23.28 dBm. The 'Occupied Bandwidth' section shows 'OBW' at 4.163 MHz. The 'Adjacent Channel Power' section shows 'ACLR(-5MHz)' at -40.24 dB and 'ACLR(+5MHz)' at -42.79 dB. The 'Modulation Analysis' section shows 'EVM' at 5.15 % (rms). The 'Peak Code Domain Error' section shows 'PCDE' at -39.86 dB. The 'External Loss' section shows 'Power Control' at 'All 1'. The 'System Config' section shows 'User Command' at '10101 01010 10101 01010 10101 01010 01010'.

<LTE>



The screenshot shows the LTE measurement interface. The top bar displays 'Phone2 LTE 40.20S#021' and 'Phone1 LTE 40.20S#021'. The 'Measurement' tab is active, showing 'Numeric' and 'Occupied Bandwidth' views. The 'Power Measurement' section is highlighted with a red box, showing 'TX Power' at 23.01 dBm. The 'Occupied Bandwidth' section shows 'OBW' at 20 MHz. The 'Spectrum Emission Mask' section shows 'SEM' at 'Pass'. The 'Adjacent Channel Power' section shows 'ACLR(-5MHz)' at -40.24 dB and 'ACLR(+5MHz)' at -42.79 dB. The 'Modulation Analysis' section shows 'EVM' at 5.15 % (rms). The 'Peak Code Domain Error' section shows 'PCDE' at -39.86 dB. The 'External Loss' section shows 'Power Control' at 'All 1'. The 'System Config' section shows 'User Command' at '10101 01010 10101 01010 10101 01010 01010'.

<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

Operation Band 41

Channel Bandwidth 20 MHz

Output Level -54.2 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

UE Power : 23.5 dBm

Measurement

Numeric

TX Power 23.19 dBm

Occupied Bandwidth

Spectrum Emission Mask

Main Screen

Fundamental

Sub Screen

Top

Adjacent Channel Power

In-Band Emission

Spectrum Flatness

EVM

Phase Error

Magnitude Error

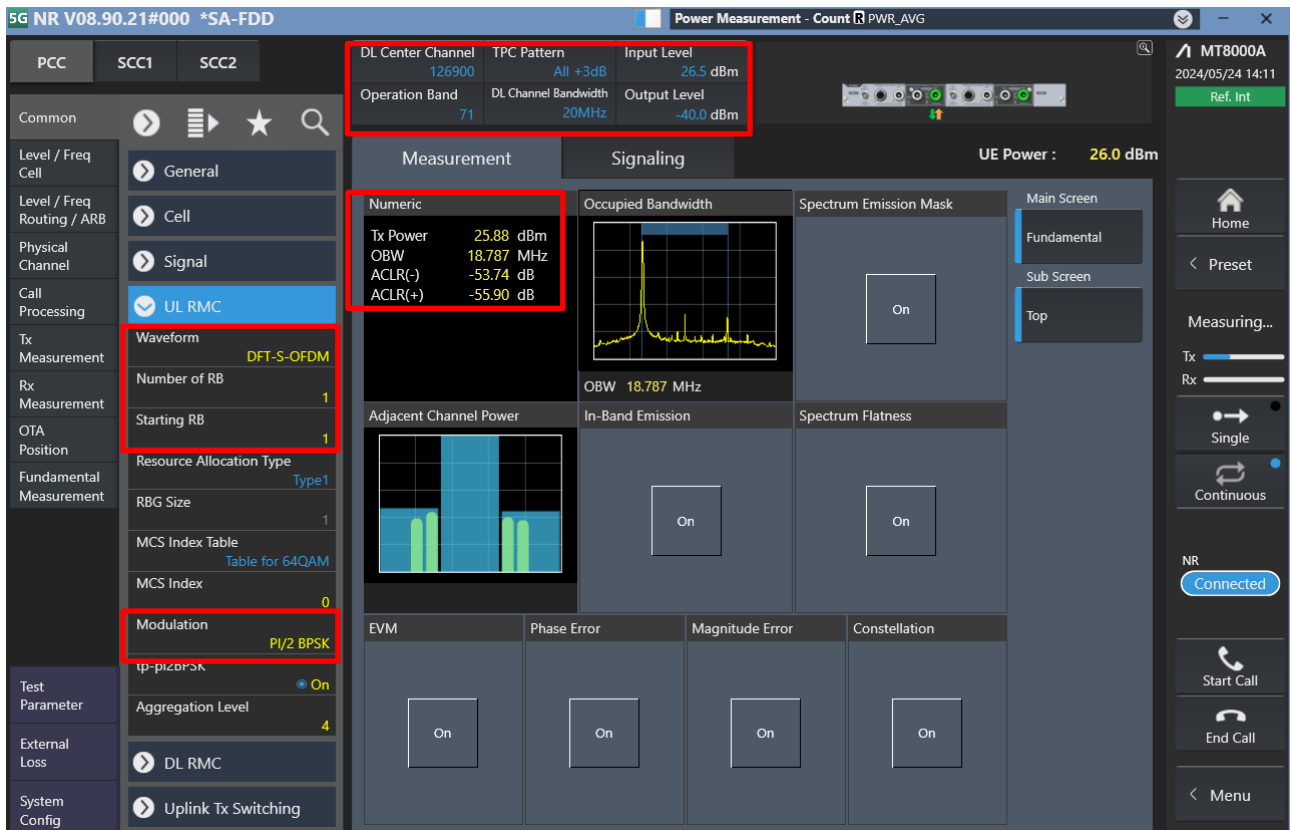
Constellation

Throughput

Uplink Downlink Configuration 0:(5ms)DSUUUSUUU

Special Subframe Configuration 5

<5G NR FR1>



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

Power Measurement - Count PWR_AVG

MT88000A

2024/05/24 14:11

Ref. Int

UE Power : 26.0 dBm

Measurement

Numeric

Tx Power 25.88 dBm

OBW 18.787 MHz

ACLR(-) -53.74 dB

ACLR(+) -55.90 dB

Occupied Bandwidth

Spectrum Emission Mask

Main Screen

Fundamental

Sub Screen

Top

Adjacent Channel Power

In-Band Emission

Spectrum Flatness

EVM

Phase Error

Magnitude Error

Constellation

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

Waveform DFT-S-OFDM

Number of RB 1

Starting RB 1

Resource Allocation Type Type1

RBG Size 1

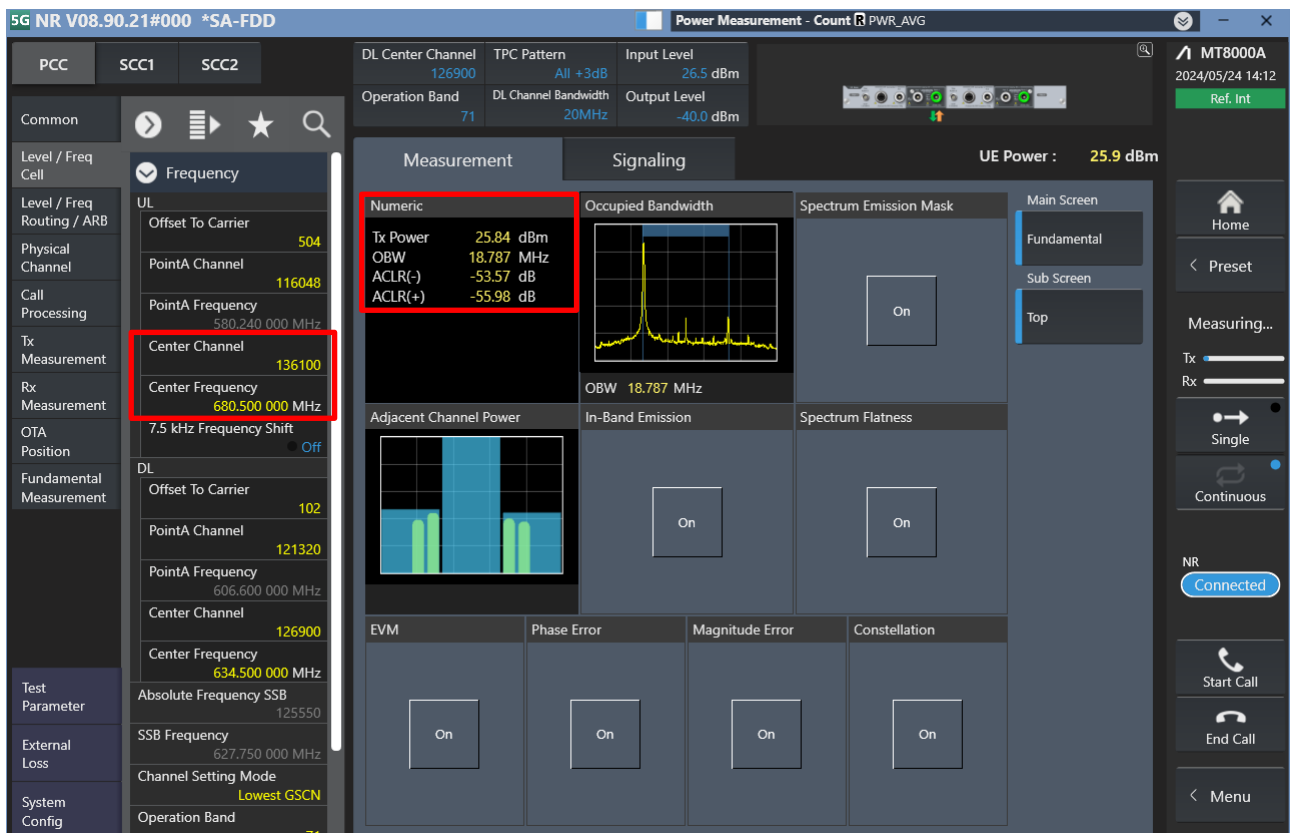
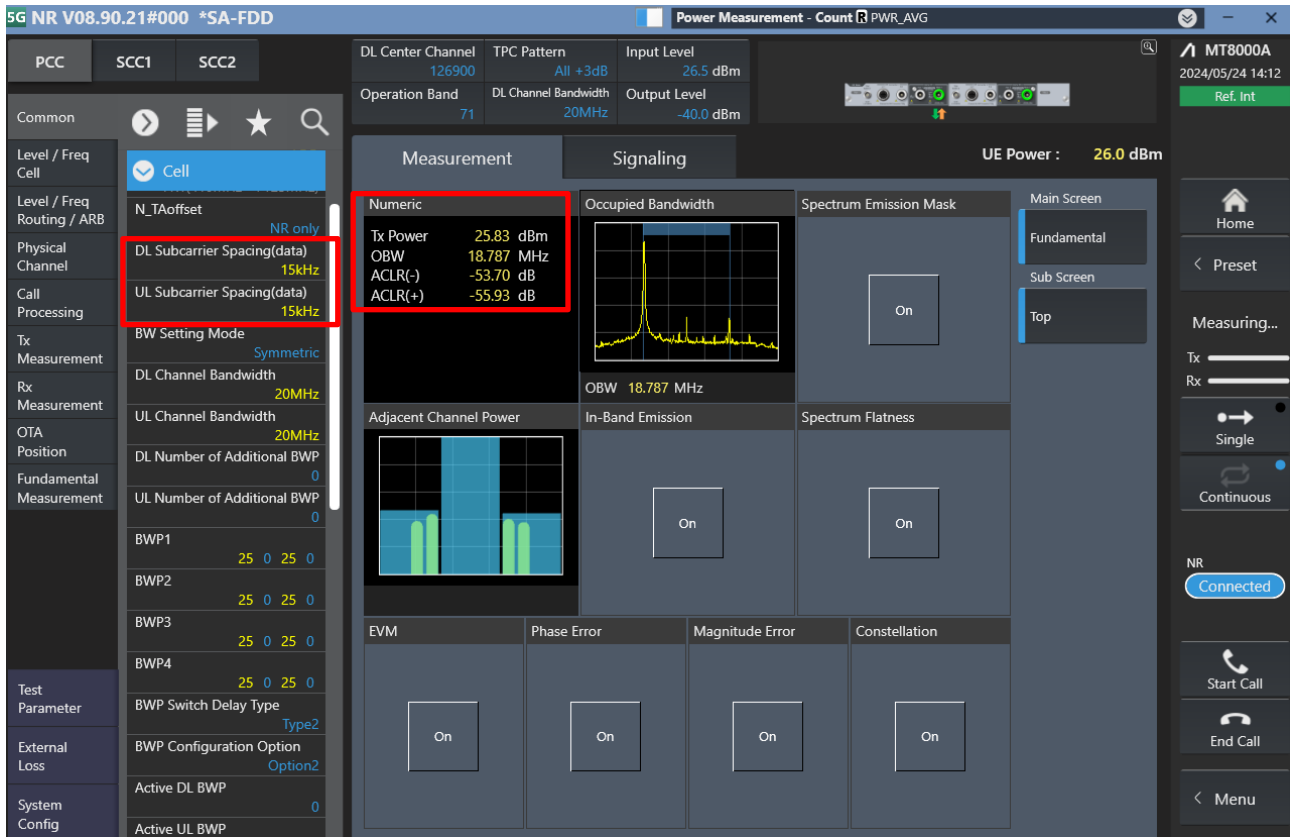
MCS Index Table Table for 64QAM

MCS Index 0

Modulation PI/2 BPSK

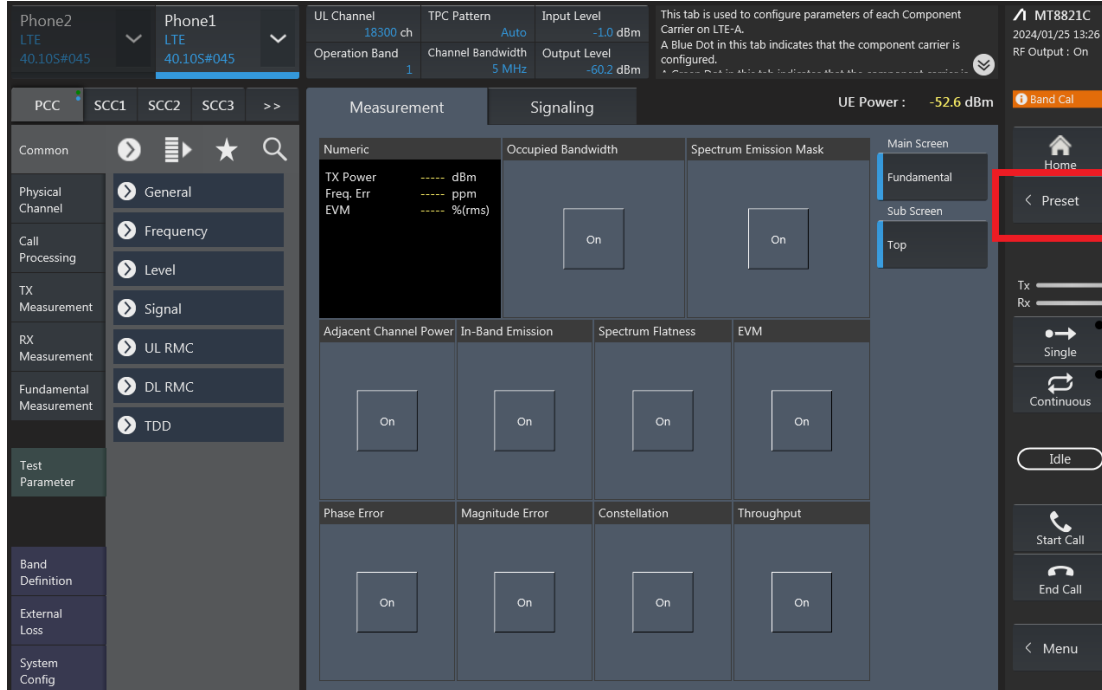
Aggregation Level 4

Uplink Tx Switching



LTE Uplink and Downlink Carrier Aggregation configurations:

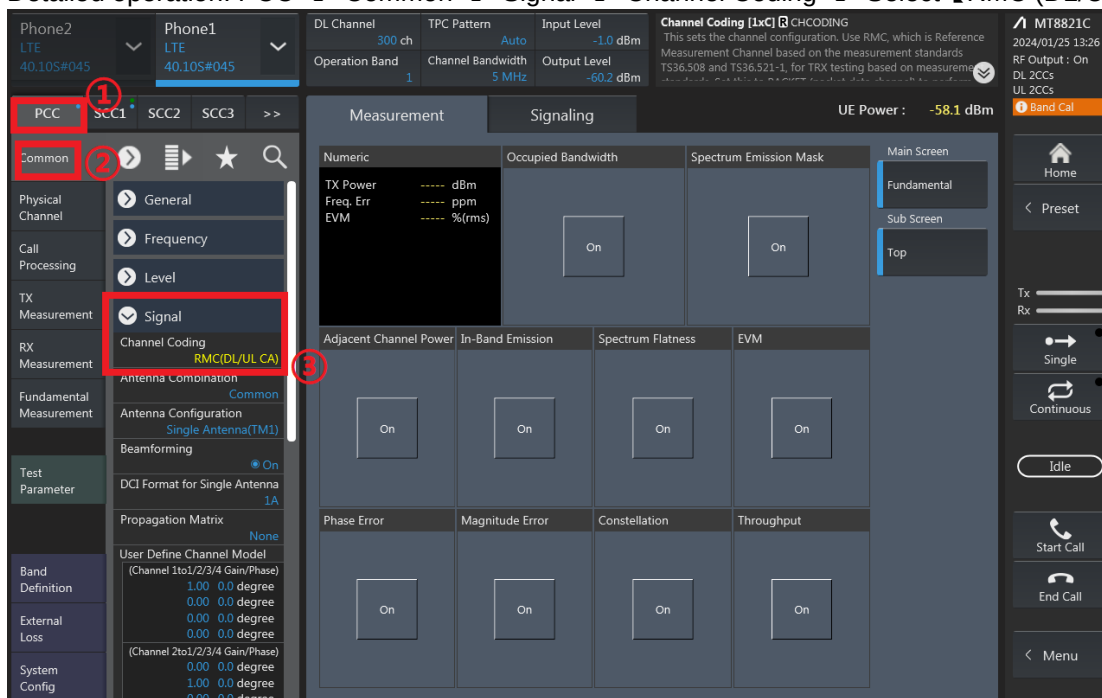
1. Change the Scenario in the Configuration of Phone1 LTE Signaling and Preset.



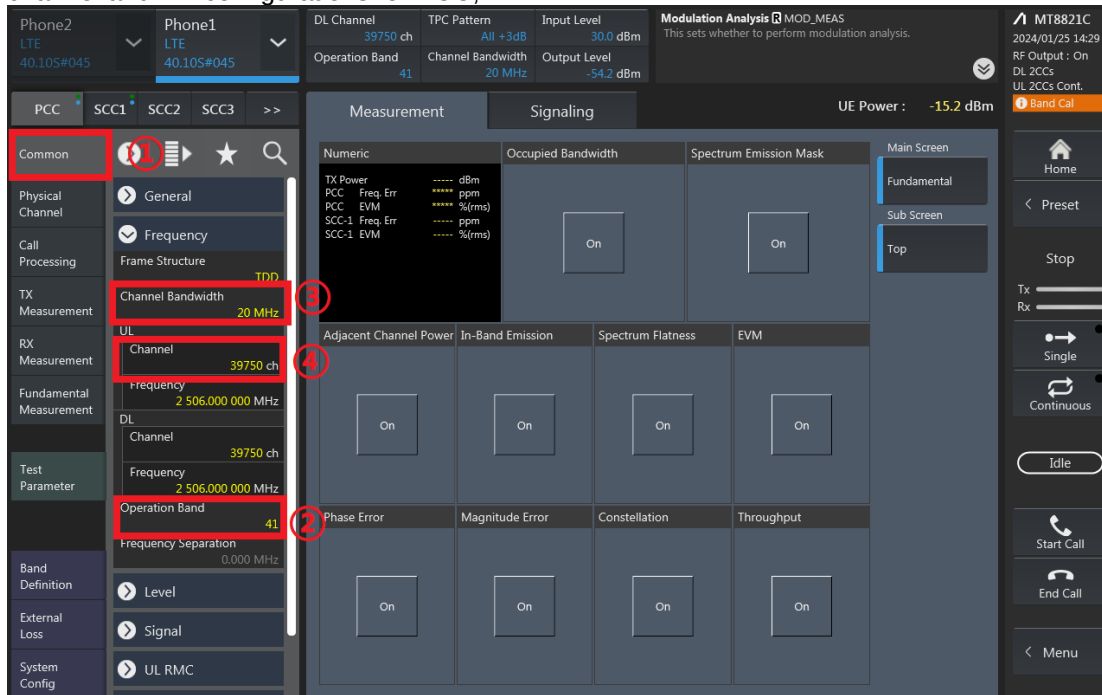
2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation;
If Select "RMC (DL CA)" for Downlink Carrier Aggregation.

For example, Uplink Carrier Aggregation:

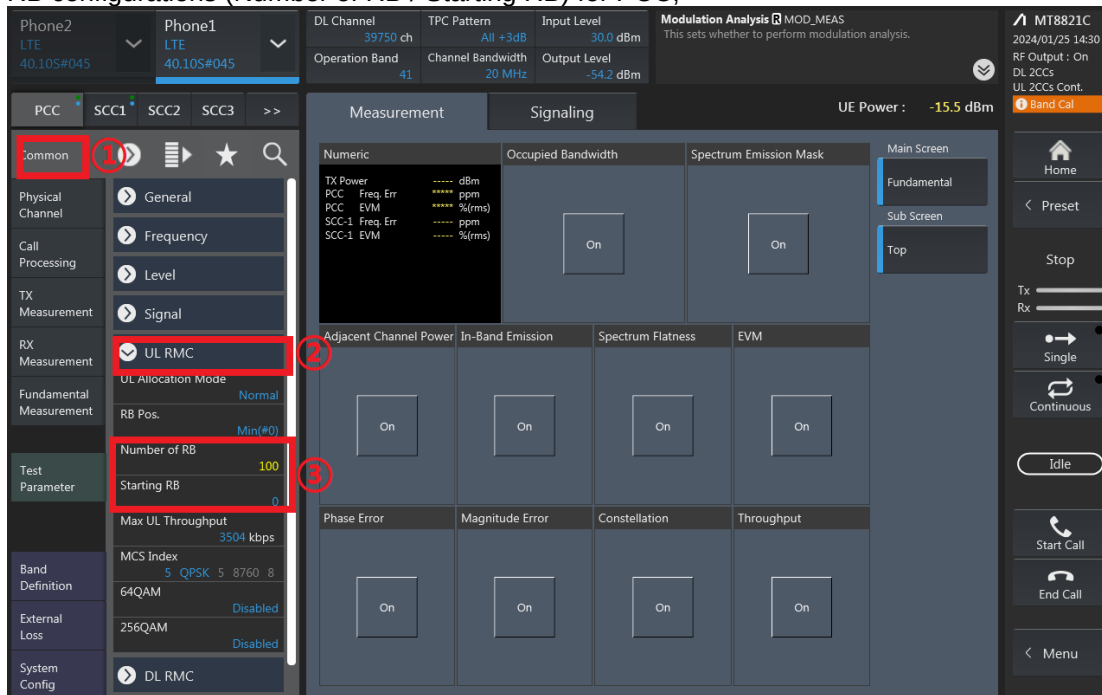
Detailed operation: PCC → Common → Signal → Channel Coding → Select 【RMC (DL/UL CA)】



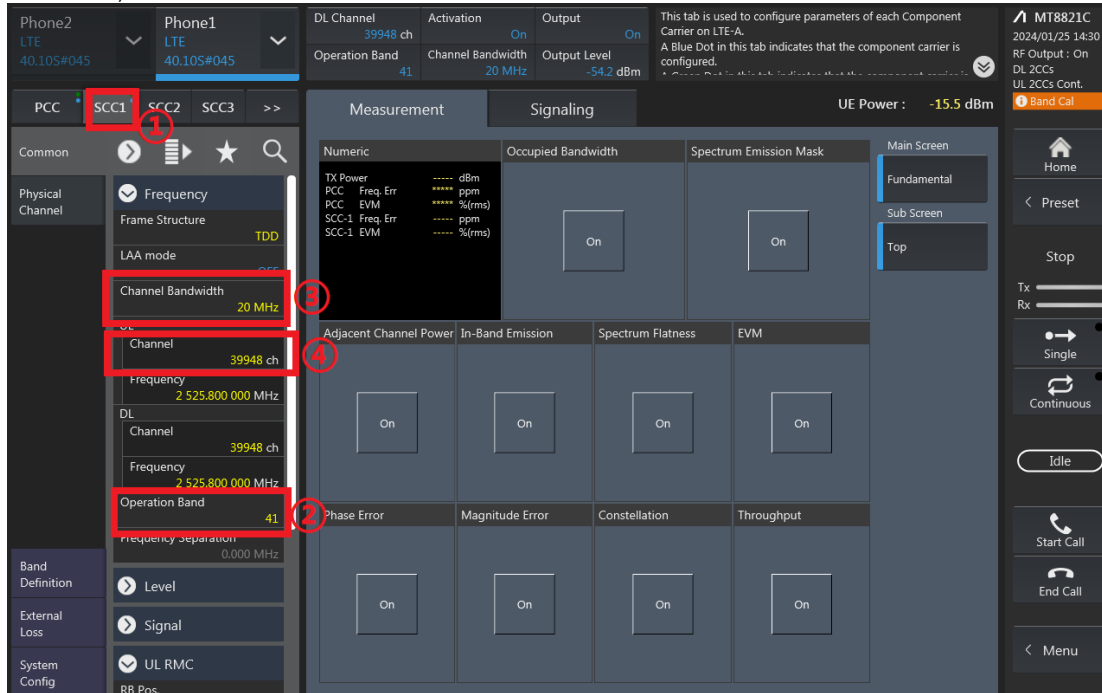
3. PCC parameter Settings: on the screen, and then select the PCC tab and Set operating band, BW, channel and RB configurations for PCC;



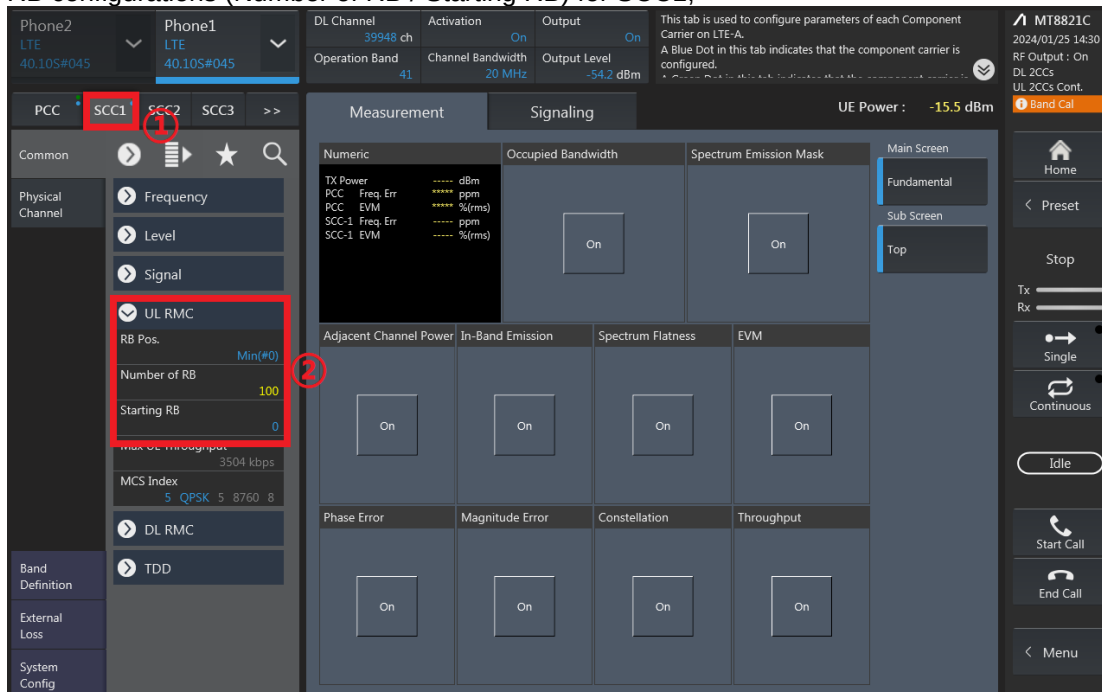
RB configurations (Number of RB / Starting RB) for PCC;



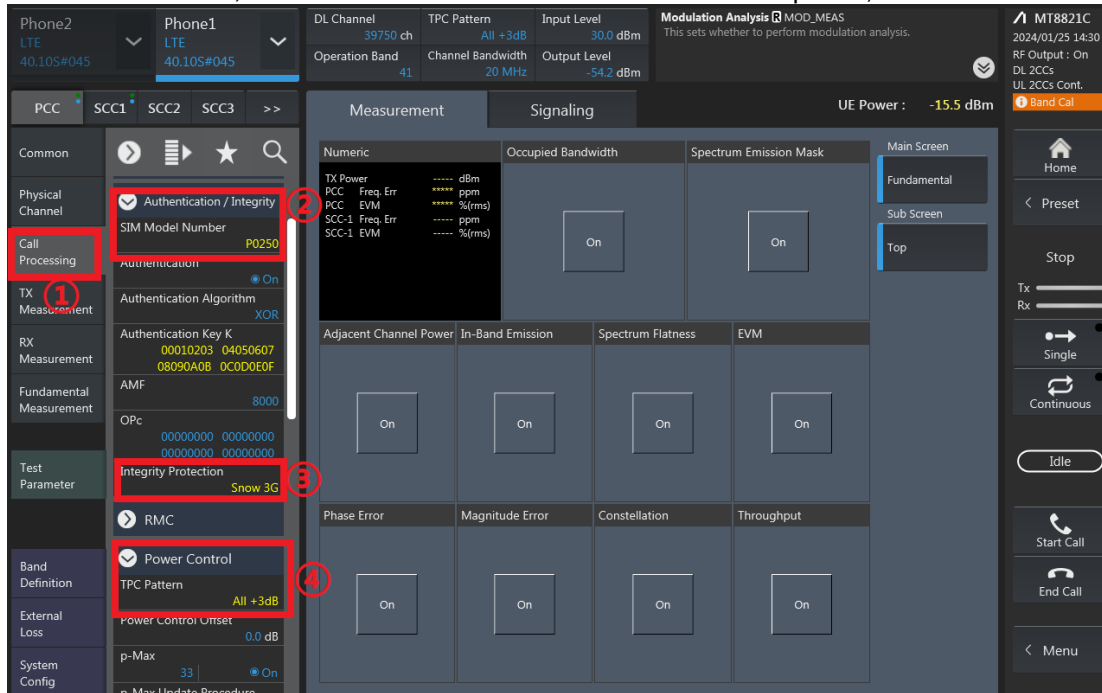
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



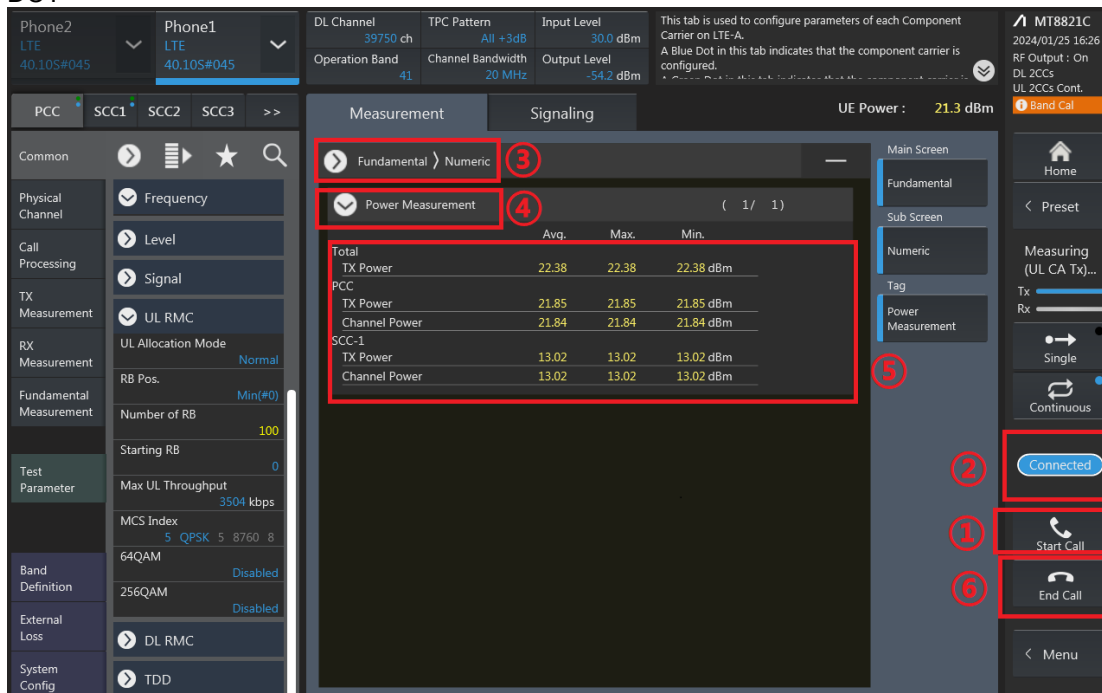
RB configurations (Number of RB / Starting RB) for SCC1;



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



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.

<Intra-Band Power Measurement>

【CA_2C_Ant 1_Full Power】

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		
18700	18898	QPSK	1	99	1	0	22.61	24.00
18900	19098	QPSK	1	99	1	0	22.96	24.00
19100	18902	QPSK	1	0	1	99	22.63	24.00

【CA_2C_Ant 1_ECI 2】

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		
18700	18898	QPSK	1	99	1	0	22.61	24.00
18900	19098	QPSK	1	99	1	0	22.96	24.00
19100	18902	QPSK	1	0	1	99	22.63	24.00

【CA_2C_Ant 1_ECI 3】

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		
18700	18898	QPSK	1	99	1	0	20.51	21.90
18900	19098	QPSK	1	99	1	0	20.73	21.90
19100	18902	QPSK	1	0	1	99	20.62	21.90

【CA_2C_Ant 1_ECI 6】

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		
18700	18898	QPSK	1	99	1	0	22.61	24.00
18900	19098	QPSK	1	99	1	0	22.96	24.00
19100	18902	QPSK	1	0	1	99	22.63	24.00

【CA_2C_Ant 1_ECI 7】

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		
18700	18898	QPSK	1	99	1	0	19.60	20.60
18900	19098	QPSK	1	99	1	0	19.76	20.60
19100	18902	QPSK	1	0	1	99	19.62	20.60

【CA_2C_Ant 1_ECI 4】

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		
18700	18898	QPSK	1	99	1	0	22.61	24.00
18900	19098	QPSK	1	99	1	0	22.96	24.00
19100	18902	QPSK	1	0	1	99	22.63	24.00

【CA_7C_Ant 1_Full Power】

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	23.15	24.00

21100	21298	QPSK	1	99	1	0	23.13	24.00
21350	21152	QPSK	1	0	1	99	23.10	24.00

【CA_7C_Ant 1_ECI 2】

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	23.15	24.00
21100	21298	QPSK	1	99	1	0	23.13	24.00
21350	21152	QPSK	1	0	1	99	23.10	24.00

【CA_7C_Ant 1_ECI 3】

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	23.15	24.00
21100	21298	QPSK	1	99	1	0	23.13	24.00
21350	21152	QPSK	1	0	1	99	23.10	24.00

【CA_7C_Ant 1_ECI 6】

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	23.15	24.00
21100	21298	QPSK	1	99	1	0	23.13	24.00
21350	21152	QPSK	1	0	1	99	23.10	24.00

【CA_7C_Ant 1_ECI 7】

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	20.61	21.60
21100	21298	QPSK	1	99	1	0	20.69	21.60
21350	21152	QPSK	1	0	1	99	20.47	21.60

【CA_7C_Ant 1_ECI 4】

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	23.15	24.00
21100	21298	QPSK	1	99	1	0	23.10	24.00
21350	21152	QPSK	1	0	1	99	23.11	24.00

【CA_42C_Ant 8_Full Power】

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		
42190	42388	QPSK	1	99	1	0	23.14	24.00
42590	42788	QPSK	1	99	1	0	23.09	24.00
42990	42792	QPSK	1	0	1	99	23.10	24.00

【CA_42C_Ant 8_ECI 2】

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		
42190	42388	QPSK	1	99	1	0	23.14	24.00
42590	42788	QPSK	1	99	1	0	23.09	24.00
42990	42792	QPSK	1	0	1	99	23.10	24.00

【CA_42C_Ant 8_ECI 3】

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		
42190	42388	QPSK	1	99	1	0	15.18	16.30
42590	42788	QPSK	1	99	1	0	15.21	16.30
42990	42792	QPSK	1	0	1	99	15.17	16.30

【CA_42C_Ant 8_ECI 6】

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		
42190	42388	QPSK	1	99	1	0	22.69	23.50
42590	42788	QPSK	1	99	1	0	22.71	23.50
42990	42792	QPSK	1	0	1	99	22.62	23.50

【CA_42C_Ant 8_ECI 7】

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		
42190	42388	QPSK	1	99	1	0	13.60	14.80
42590	42788	QPSK	1	99	1	0	13.73	14.80
42990	42792	QPSK	1	0	1	99	13.55	14.80

【CA_42C_Ant 8_ECI 4】

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		
42190	42388	QPSK	1	99	1	0	23.14	24.00
42590	42788	QPSK	1	99	1	0	23.09	24.00
42990	42792	QPSK	1	0	1	99	23.10	24.00

【CA_66C_Ant 1_Full Power】

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		
132072	132270	QPSK	1	99	1	0	23.11	24.00
132322	132520	QPSK	1	99	1	0	23.03	24.00
132572	132374	QPSK	1	0	1	99	23.08	24.00

【CA_66C_Ant 1_ECI 2】

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		
132072	132270	QPSK	1	99	1	0	23.11	24.00
132322	132520	QPSK	1	99	1	0	23.03	24.00
132572	132374	QPSK	1	0	1	99	23.08	24.00

【CA_66C_Ant 1_ECI 3】

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		
132072	132270	QPSK	1	99	1	0	20.02	21.30
132322	132520	QPSK	1	99	1	0	20.09	21.30
132572	132374	QPSK	1	0	1	99	20.03	21.30

【CA_66C_Ant 1_ECI 6】

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		
132072	132270	QPSK	1	99	1	0	21.90	23.20
132322	132520	QPSK	1	99	1	0	21.96	23.20
132572	132374	QPSK	1	0	1	99	21.92	23.20

【CA_66C_Ant 1_ECI 7】

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		
132072	132270	QPSK	1	99	1	0	19.49	20.60
132322	132520	QPSK	1	99	1	0	19.61	20.60
132572	132374	QPSK	1	0	1	99	19.57	20.60

【CA_66C_Ant 1_ECI 4】

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		
132072	132270	QPSK	1	99	1	0	23.11	24.00
132322	132520	QPSK	1	99	1	0	23.03	24.00
132572	132374	QPSK	1	0	1	99	23.08	24.00