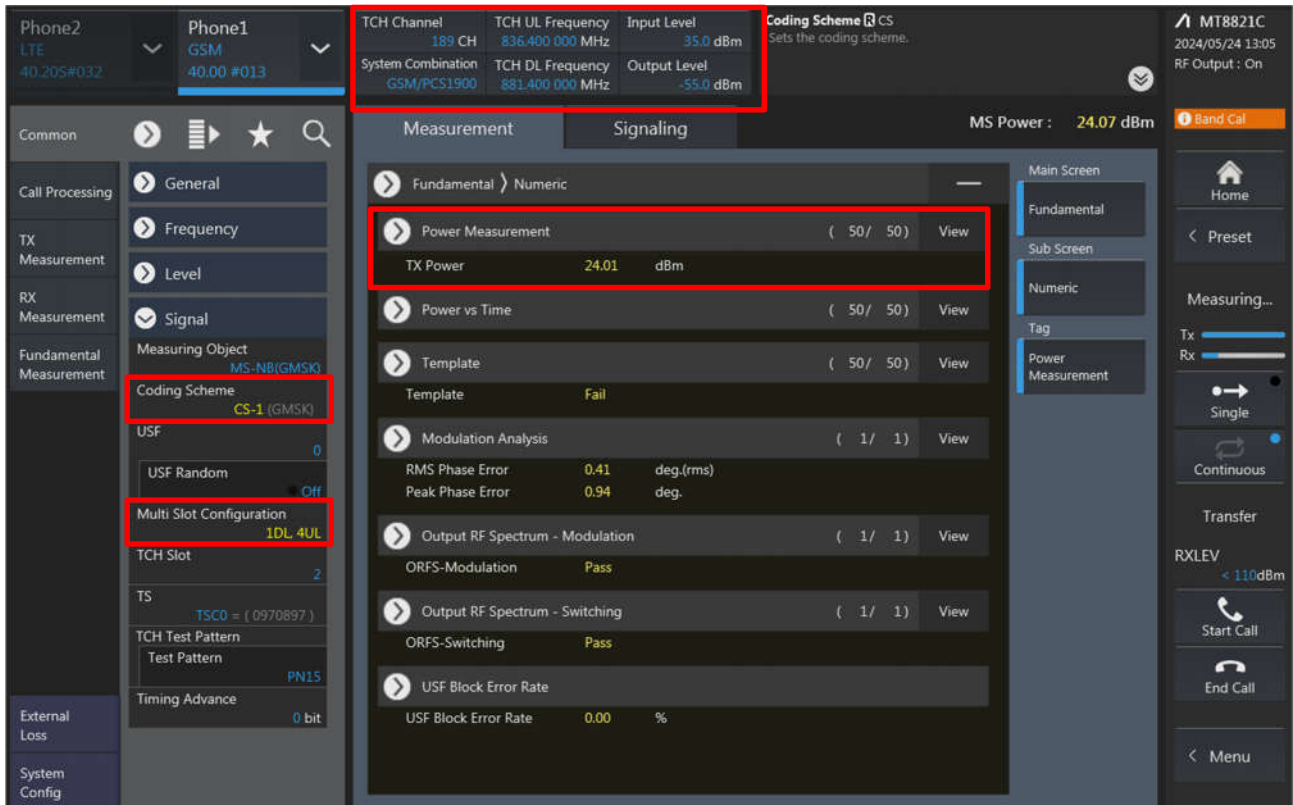


Power measurement connection diagram:

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.

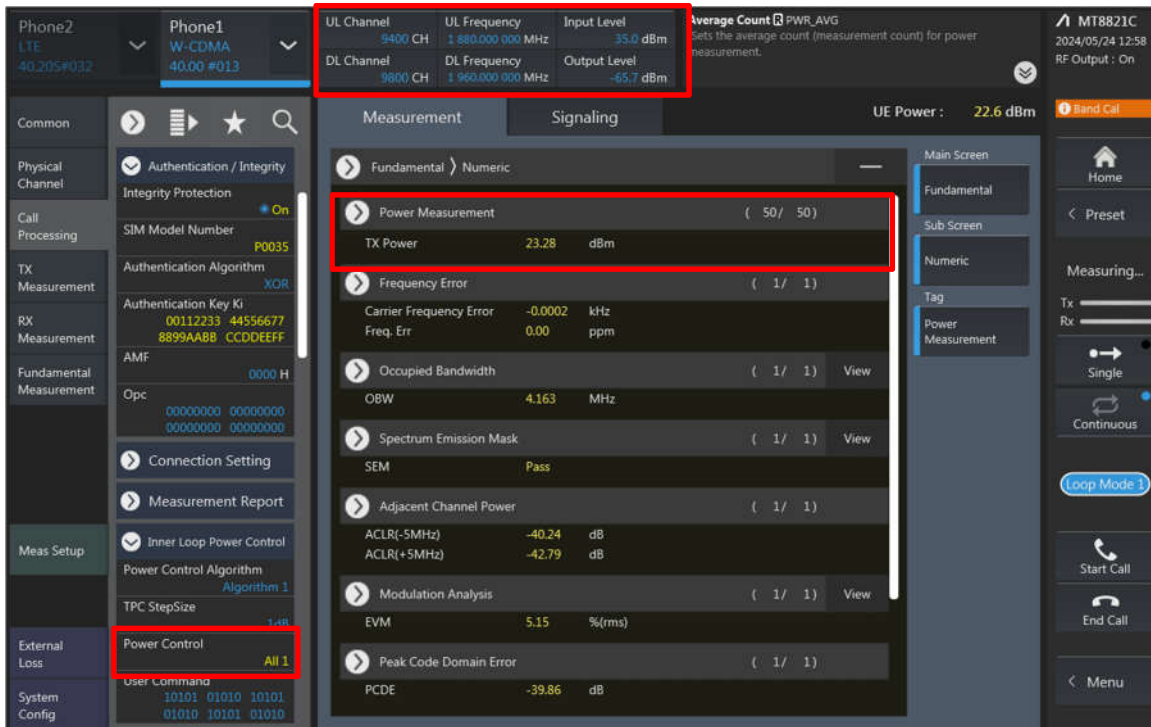
<GSM>



The screenshot displays the configuration and measurement settings for a GSM call. The interface is divided into several sections:

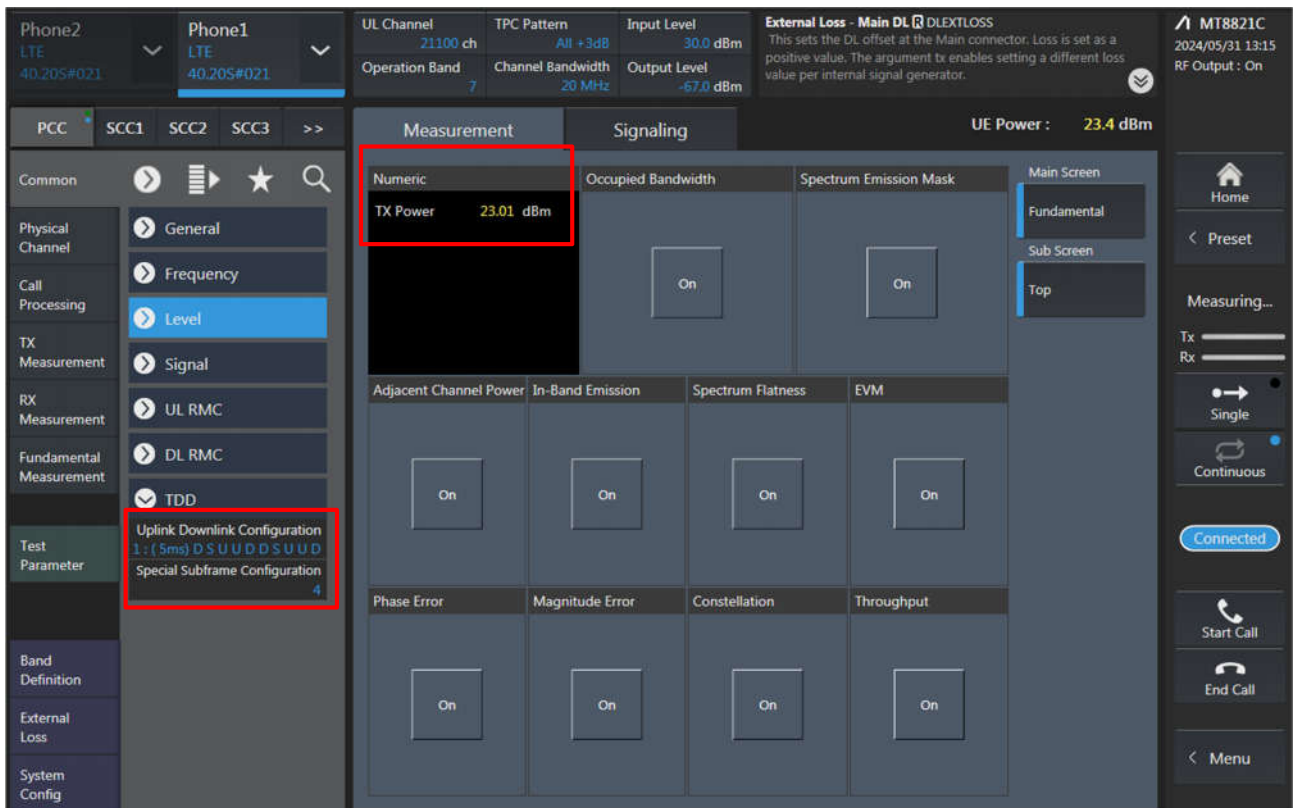
- Phone Configuration:**
 - Phone2: LTE, 40.205#032
 - Phone1: GSM, 40.00 #013
- Measurement Parameters (highlighted in red):**
 - TCH Channel: 189 CH
 - TCH UL Frequency: 838.400 000 MHz
 - Input Level: 35.0 dBm
 - System Combination: GSM/PCS1900
 - TCH DL Frequency: 881.400 000 MHz
 - Output Level: -55.0 dBm
 - Coding Scheme: CS
- Measurement Results (highlighted in red):**
 - TX Power: 24.01 dBm
- Configuration Parameters:**
 - Measuring Object: MS-NB(GMSK)
 - Coding Scheme: CS-1 (GMSK)
 - USF: 0
 - USF Random: Off
 - Multi Slot Configuration: 1DL, 4UL
 - TCH Slot: 2
 - TS: TSC0 = (0970897)
 - TCH Test Pattern: PN15
 - Timing Advance: 0 bit
- Measurement Options:**
 - Power Measurement (50/50)
 - Power vs Time (50/50)
 - Template (50/50)
 - Modulation Analysis (1/1)
 - Output RF Spectrum - Modulation (1/1)
 - Output RF Spectrum - Switching (1/1)
 - USF Block Error Rate
- Modulation Analysis Results:**
 - Template: Fail
 - RMS Phase Error: 0.41 deg.(rms)
 - Peak Phase Error: 0.94 deg.
- Output RF Spectrum Results:**
 - ORFS-Modulation: Pass
 - ORFS-Switching: Pass
- USF Block Error Rate Results:**
 - USF Block Error Rate: 0.00 %
- Other UI Elements:**
 - MS Power: 24.07 dBm
 - Band Cal: On
 - MT8821C
 - 2024/05/24 13:05
 - RF Output: On
 - Home, Preset, Measuring..., Single, Continuous, Transfer, RXLEV < 110dBm, Start Call, End Call, Menu

<WCDMA>



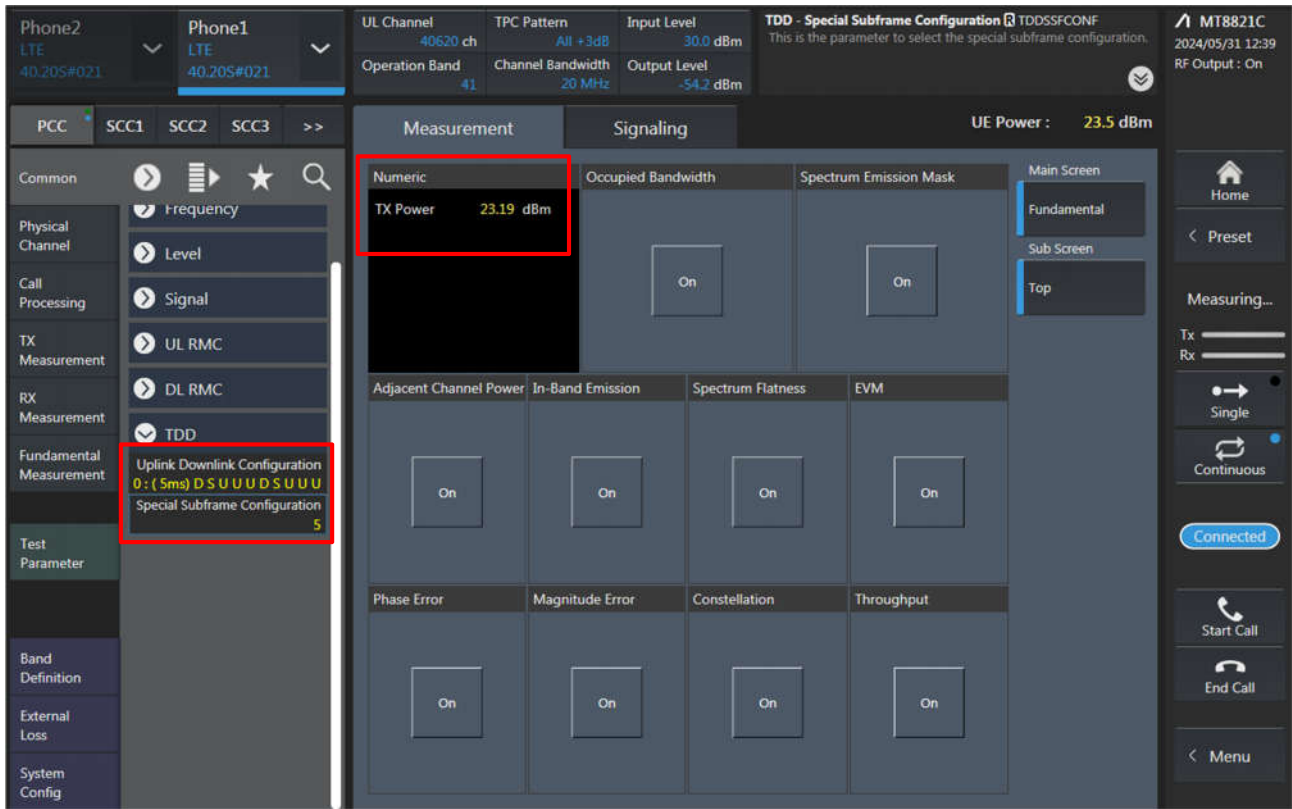
The screenshot shows the WCDMA measurement interface. At the top, it displays 'Phone2 LTE 40.205#032' and 'Phone1 W-CDMA 40.00 #013'. The 'Measurement' section is highlighted with a red box, showing 'Fundamental > Numeric' with 'Power Measurement (50 / 50)' and 'TX Power 23.28 dBm'. Other parameters include '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 'External Loss' is set to 'All 1'. The 'UE Power' is 22.6 dBm. The interface includes various tabs like 'Common', 'Physical Channel', 'Call Processing', 'TX Measurement', 'RX Measurement', 'Fundamental Measurement', 'Meas Setup', 'External Loss', and 'System Config'. The right side has a 'Main Screen' menu with 'Fundamental', 'Sub Screen', 'Numeric', and 'Tag' options, and a 'Measuring...' section with 'Single', 'Continuous', and 'Loop Mode 1' buttons.

<LTE>



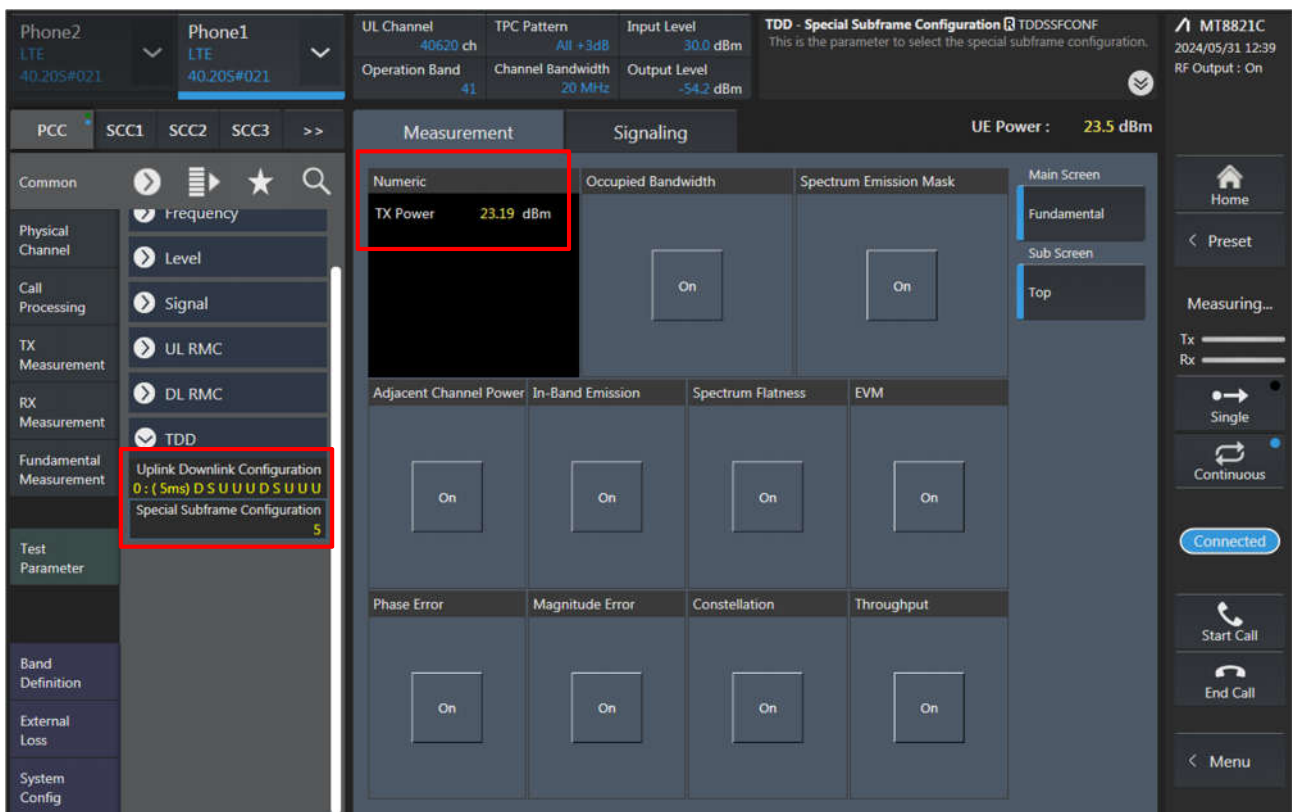
The screenshot shows the LTE measurement interface. At the top, it displays 'Phone2 LTE 40.205#021' and 'Phone1 LTE 40.20S#021'. The 'Measurement' section is highlighted with a red box, showing 'Numeric' with 'TX Power 23.01 dBm'. Other parameters include 'UL Channel 21100 ch', 'TPC Pattern All +3dB', '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 'UE Power' is 23.4 dBm. The interface includes various tabs like 'Common', 'Physical Channel', 'Call Processing', 'TX Measurement', 'RX Measurement', 'Fundamental Measurement', 'Test Parameter', 'Band Definition', 'External Loss', and 'System Config'. The right side has a 'Main Screen' menu with 'Fundamental', 'Sub Screen', and 'Top' options, and a 'Measuring...' section with 'Single', 'Continuous', and 'Connected' buttons.

<LTE TDD Power class 3>



The screenshot shows the LTE TDD Power class 3 measurement interface. The top status bar displays 'Phone2 LTE 40.20S#021' and 'Phone1 LTE 40.20S#021'. The main header includes 'UL Channel 40620 ch', 'TPC Pattern All +3dB', 'Input Level 30.0 dBm', 'Operation Band 41', 'Channel Bandwidth 20 MHz', and 'Output Level -54.2 dBm'. The 'TDD - Special Subframe Configuration' is set to 'TDDSSFCONF'. The 'UE Power' is 23.5 dBm. The 'Measurement' section shows 'TX Power' at 23.19 dBm. The 'Fundamental Measurement' section shows 'Uplink Downlink Configuration 0: (5ms) DSUUU DSUUU' and 'Special Subframe Configuration 5'. The 'Signaling' section shows 'Occupied Bandwidth' and 'Spectrum Emission Mask' both set to 'On'. The 'Adjacent Channel Power', 'In-Band Emission', 'Spectrum Flatness', and 'EVM' sections are also set to 'On'. The 'Phase Error', 'Magnitude Error', 'Constellation', and 'Throughput' sections are also set to 'On'. The interface includes a 'Common' menu with options like 'Frequency', 'Level', 'Signal', 'UL RMC', 'DL RMC', and 'TDD'. The 'Fundamental Measurement' menu is also visible. The 'Test Parameter' section is empty. The 'Band Definition', 'External Loss', and 'System Config' sections are also empty. The 'Connected' status is shown at the bottom right.

<LTE TDD Power class 2>



The screenshot shows the LTE TDD Power class 2 measurement interface. The top status bar displays 'Phone2 LTE 40.20S#021' and 'Phone1 LTE 40.20S#021'. The main header includes 'UL Channel 40620 ch', 'TPC Pattern All +3dB', 'Input Level 30.0 dBm', 'Operation Band 41', 'Channel Bandwidth 20 MHz', and 'Output Level -54.2 dBm'. The 'TDD - Special Subframe Configuration' is set to 'TDDSSFCONF'. The 'UE Power' is 23.5 dBm. The 'Measurement' section shows 'TX Power' at 23.19 dBm. The 'Fundamental Measurement' section shows 'Uplink Downlink Configuration 0: (5ms) DSUUU DSUUU' and 'Special Subframe Configuration 5'. The 'Signaling' section shows 'Occupied Bandwidth' and 'Spectrum Emission Mask' both set to 'On'. The 'Adjacent Channel Power', 'In-Band Emission', 'Spectrum Flatness', and 'EVM' sections are also set to 'On'. The 'Phase Error', 'Magnitude Error', 'Constellation', and 'Throughput' sections are also set to 'On'. The interface includes a 'Common' menu with options like 'Frequency', 'Level', 'Signal', 'UL RMC', 'DL RMC', and 'TDD'. The 'Fundamental Measurement' menu is also visible. The 'Test Parameter' section is empty. The 'Band Definition', 'External Loss', and 'System Config' sections are also empty. The 'Connected' status is shown at the bottom right.

Phone2 LTE 40.20S#032 | **Phone1** LTE 40.20S#032

UL Channel 18900 ch | **TPC Pattern** All +3dB | **Input Level** 35.0 dBm
Operation Band 2 | **Channel Bandwidth** 20 MHz | **Output Level** -54.2 dBm

Power Measurement - Meas. Count PWR_AVG (This sets the measurement count of the power measurement.)

Measurement | **Signaling** | **UE Power** : 25.4 dBm

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>

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

Measurement | **Signaling** | **UE Power** : 26.0 dBm

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

Occupied Bandwidth
OBW 18.787 MHz

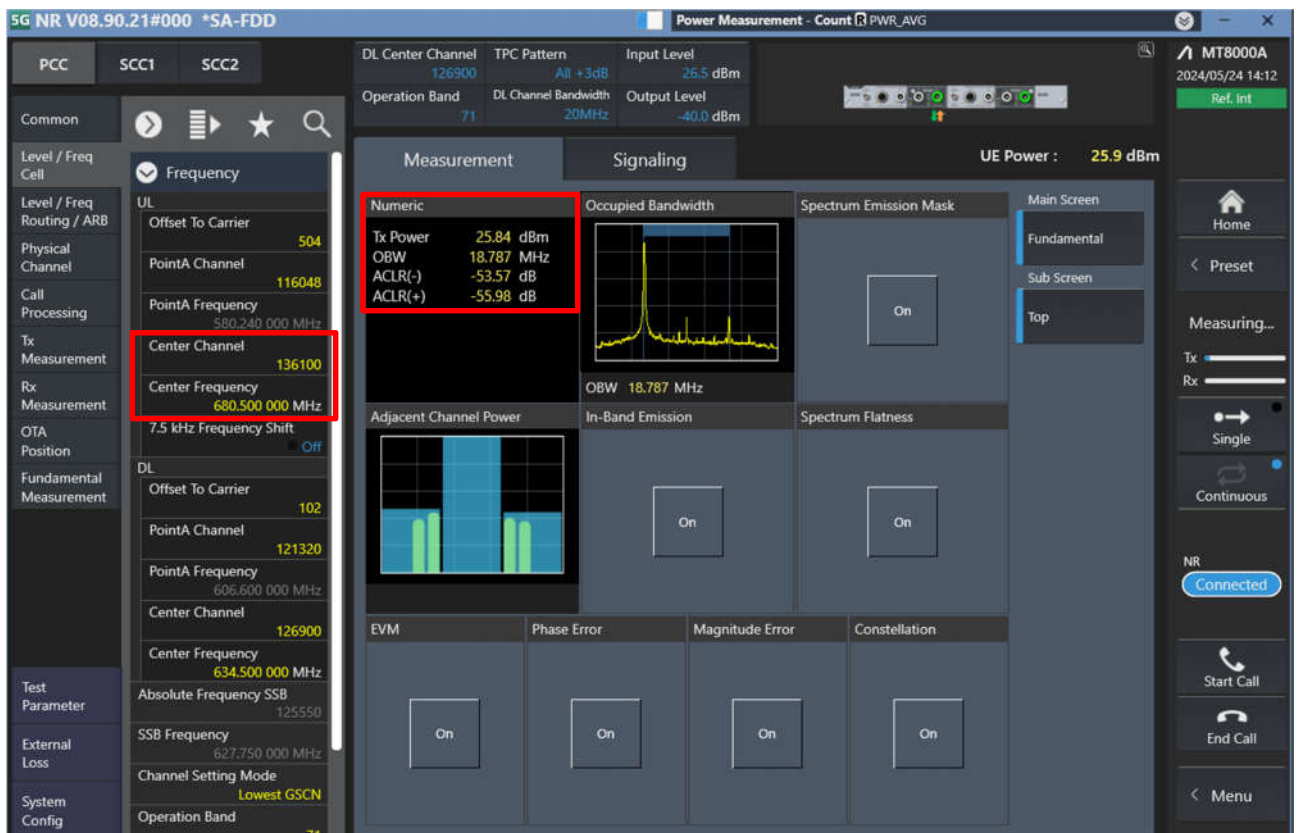
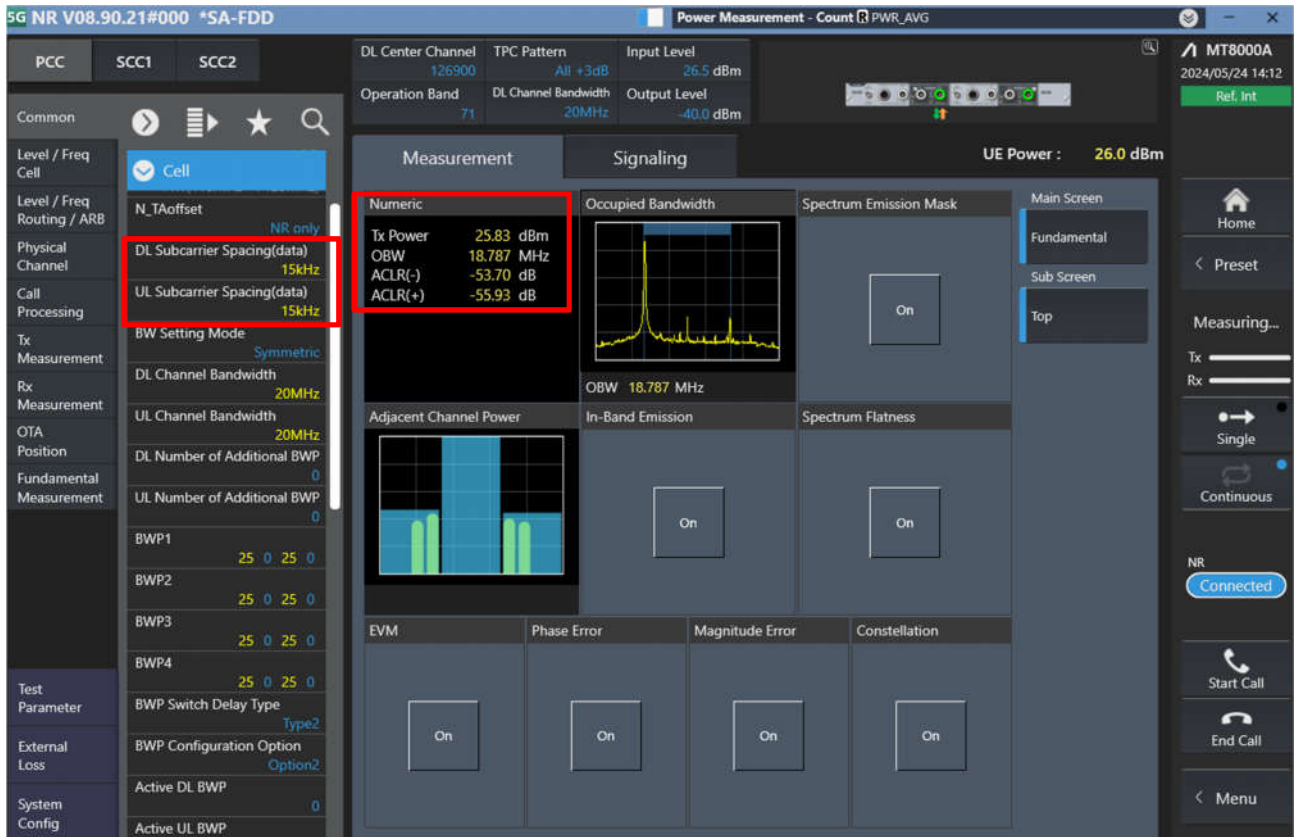
Waveform DFT-S-OFDM

Number of RB 1
Starting RB 1

Modulation Pi/2 BPSK

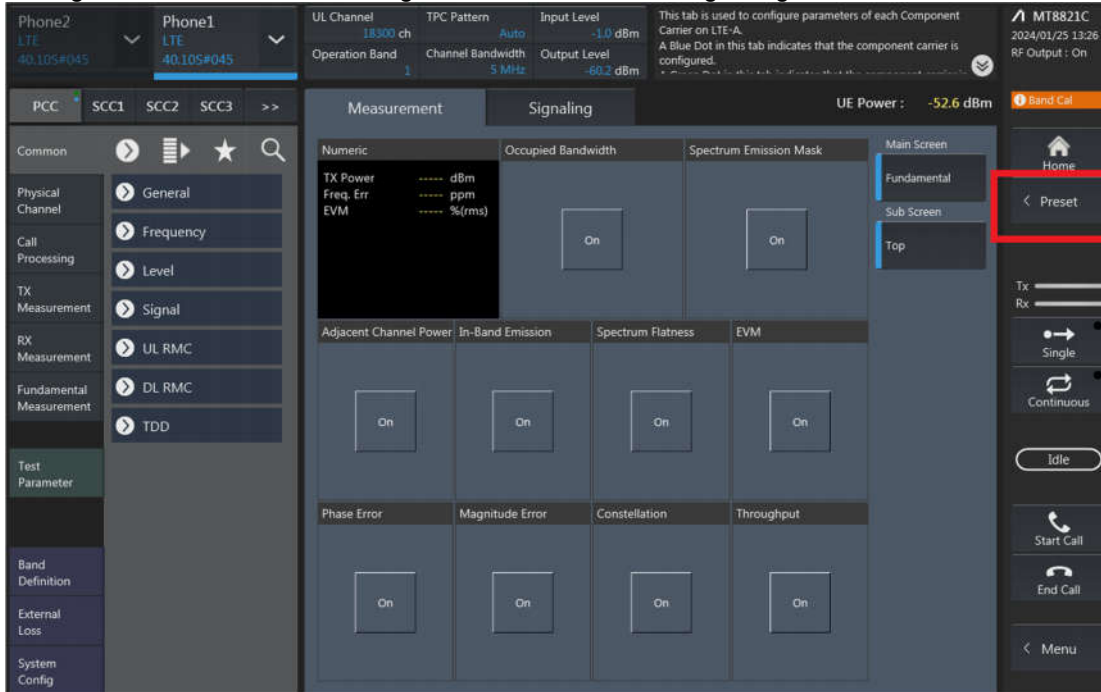
Adjacent Channel Power

EVM | **Phase Error** | **Magnitude Error** | **Constellation**



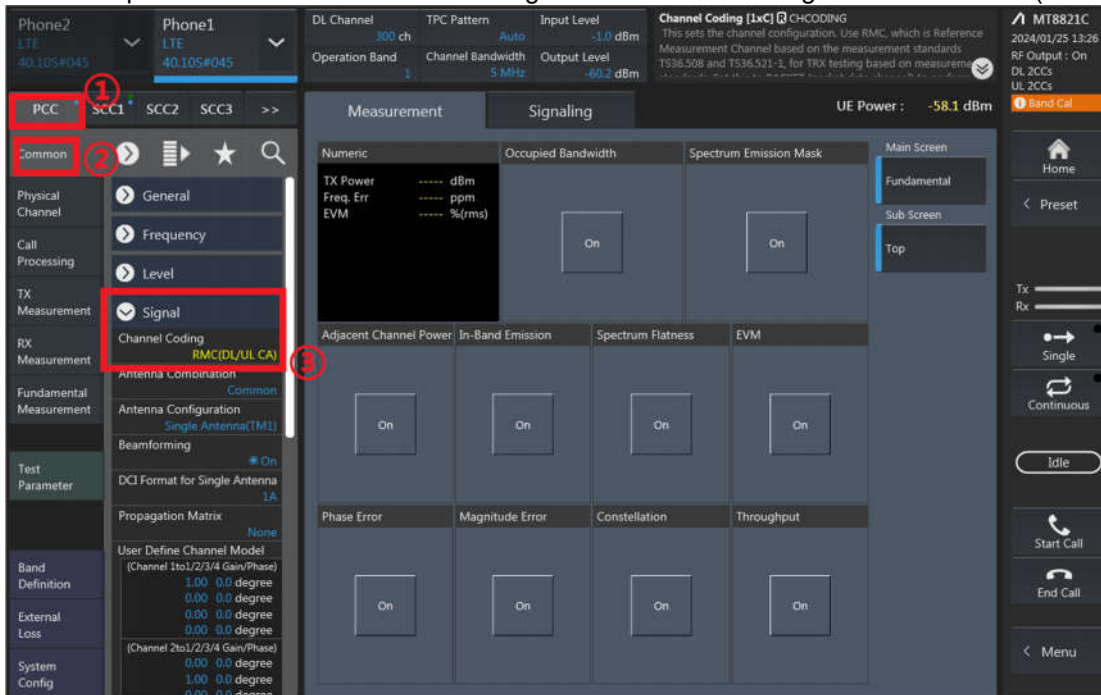
LTE Uplink and Downlink Carrier Aggregation configurations:

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

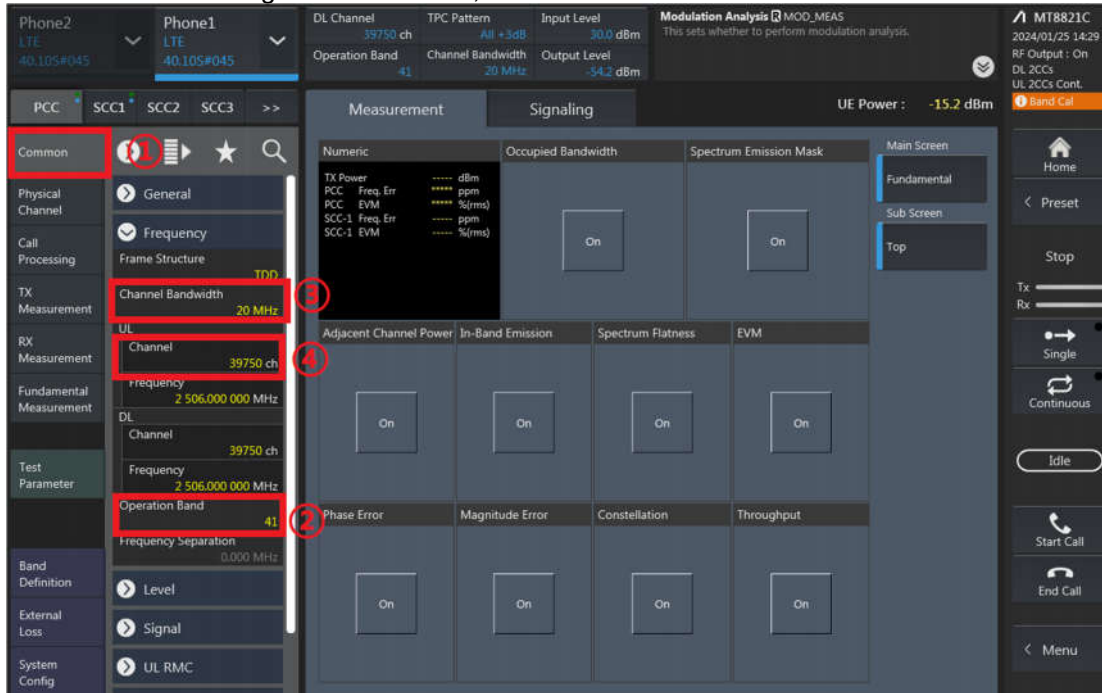


2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation; If Select "RMC (DL CA)" for Downlink Carrier Aggregation. For example, Uplink Carrier Aggregation:

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



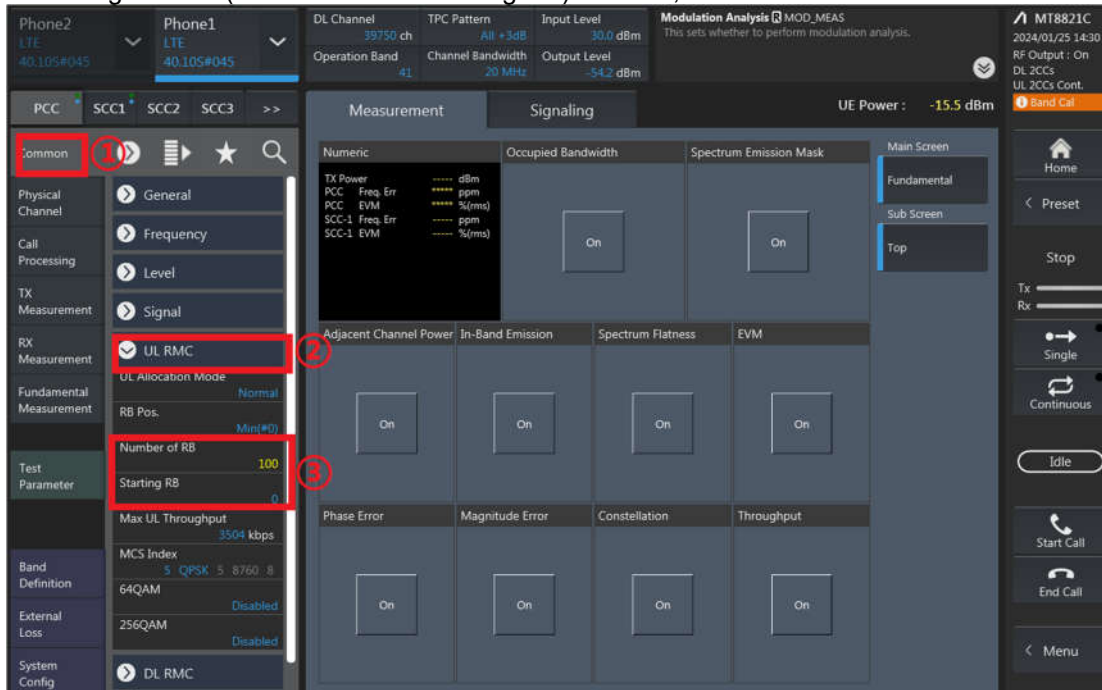
- PCC parameter Settings: on the screen, and then select the PCC tab and Set operating band, BW, channel and RB configurations for PCC;



The screenshot shows the PCC parameter settings interface. The left sidebar is expanded to the 'Common' tab. The main area displays various measurement and signaling parameters. Red boxes and circled numbers highlight specific settings:

- 1. 'Common' tab selected in the sidebar.
- 2. 'Operation Band' set to 41.
- 3. 'Channel Bandwidth' set to 20 MHz.
- 4. 'UL Channel' set to 39750 ch.
- 5. 'Frequency' set to 2 506.000 000 MHz.

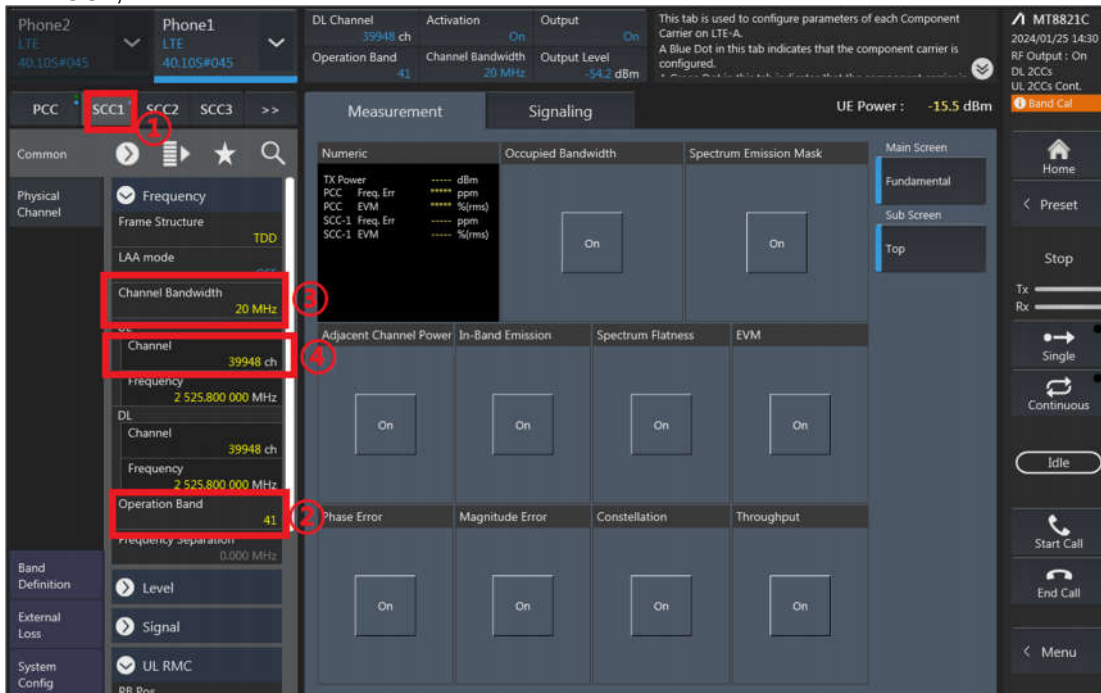
RB configurations (Number of RB / Starting RB) for PCC;



The screenshot shows the RB configurations interface. The left sidebar is expanded to the 'UL RMC' tab. The main area displays various measurement and signaling parameters. Red boxes and circled numbers highlight specific settings:

- 1. 'UL RMC' tab selected in the sidebar.
- 2. 'UL RMC' checked in the 'UL RMC' section.
- 3. 'Number of RB' set to 100.
- 4. 'Starting RB' set to 0.

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

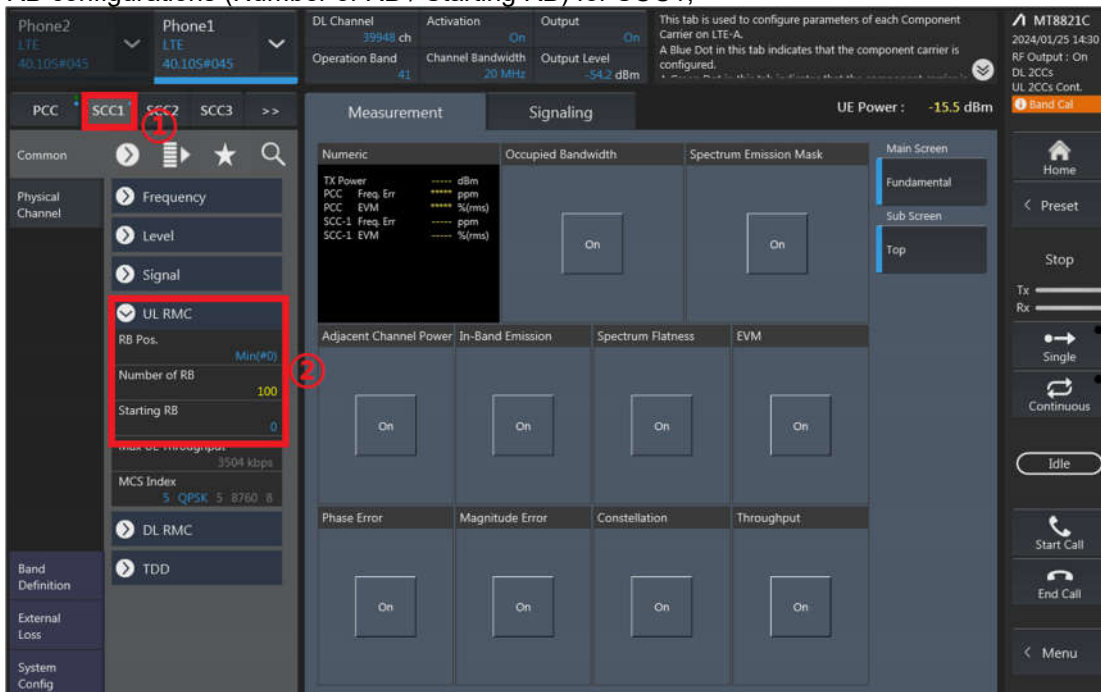


The screenshot shows the SCC1 configuration screen. The 'Physical Channel' section is highlighted with a red box. The following parameters are circled in red:

- Channel Bandwidth: 20 MHz
- Channel: 39948 ch
- Operation Band: 41
- Frequency: 2 525.800 000 MHz

The 'Measurement' and 'Signaling' tabs are visible at the top of the screen.

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



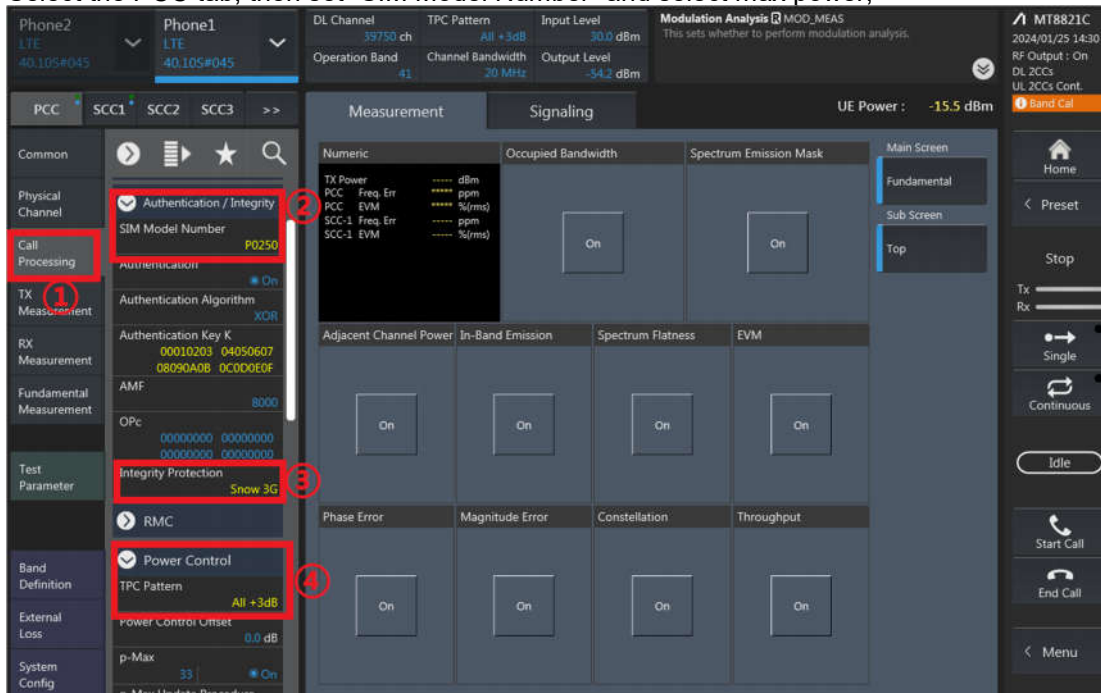
The screenshot shows the SCC1 configuration screen, focusing on the 'UL RMC' section. The 'UL RMC' section is highlighted with a red box, and the 'Number of RB' field is circled in red.

The 'Number of RB' field is set to 100.

The 'Starting RB' field is set to 0.

The 'Measurement' and 'Signaling' tabs are visible at the top of the screen.

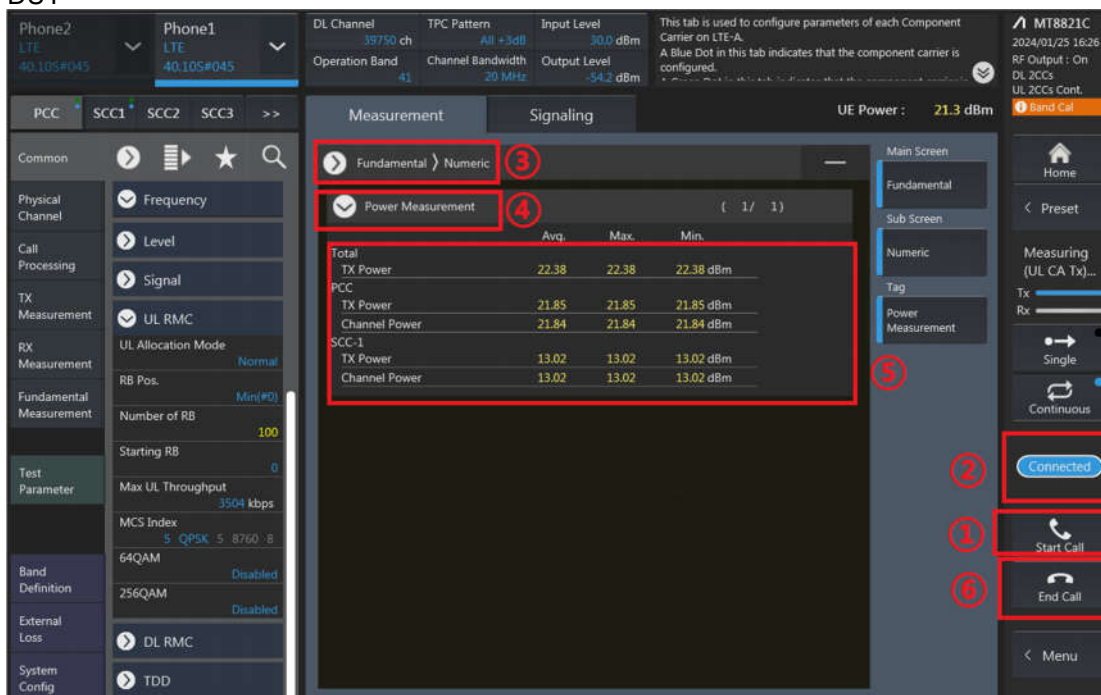
- Select the PCC tab, then set “SIM Model Number” and select max power;



DL Channel: 39750 ch, Operation Band: 41, TPC Pattern: All +3dB, Input Level: 30.0 dBm, Output Level: -34.2 dBm, Modulation Analysis: MOD_MEAS, UE Power: -15.5 dBm

Common: Authentication / Integrity (checked), SIM Model Number: P0250, Integrity Protection: Snow 3G (checked), Power Control (checked), TPC Pattern: All +3dB

- 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: -34.2 dBm, UE Power: 21.3 dBm

	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

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

Uplink CA Power

CA_7C Ant1 Default&ECI2								
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	22.71	24.00
21100	21298	QPSK	1	99	1	0	22.76	24.00
21350	21152	QPSK	1	0	1	99	22.55	24.00

CA_66C Ant0 Default&ECI2								
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	22.51	24.00
132322	132520	QPSK	1	99	1	0	22.65	24.00
132572	132374	QPSK	1	0	1	99	22.46	24.00

CA_66B Ant0 Default&ECI2								
Combination 15MHz+5MHz (75RB+25RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
132047	132140	QPSK	1	74	1	0	22.45	24.00
132322	132415	QPSK	1	74	1	0	22.55	24.00
132597	132504	QPSK	1	0	1	24	22.42	24.00

CA_38C Ant4 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	22.44	24.00
37901	38099	QPSK	1	99	1	0	22.59	24.00
38150	37952	QPSK	1	0	1	99	22.51	24.00



Uplink CA Power

CA_7C Ant1 EC13								
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	17.82	19.00
21100	21298	QPSK	1	99	1	0	17.99	19.00
21350	21152	QPSK	1	0	1	99	17.72	19.00

CA_66C Ant0 EC13								
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	17.05	18.50
132322	132520	QPSK	1	99	1	0	17.12	18.50
132572	132374	QPSK	1	0	1	99	17.06	18.50

CA_66B Ant0 EC13								
Combination 15MHz+5MHz (75RB+25RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
132047	132140	QPSK	1	74	1	0	17.01	18.50
132322	132415	QPSK	1	74	1	0	17.09	18.50
132597	132504	QPSK	1	0	1	24	16.99	18.50

CA_38C Ant4 EC12								
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	14.72	16.00
37901	38099	QPSK	1	99	1	0	14.86	16.00
38150	37952	QPSK	1	0	1	99	14.65	16.00

CA_7C Ant1 EC16								
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	18.55	20.00
21100	21298	QPSK	1	99	1	0	18.74	20.00
21350	21152	QPSK	1	0	1	99	18.65	20.00

CA_66C Ant0 EC16								
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	20.05	21.50
132322	132520	QPSK	1	99	1	0	20.08	21.50
132572	132374	QPSK	1	0	1	99	20.02	21.50

CA_66B Ant0 EC16								
Combination 15MHz+5MHz (75RB+25RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
132047	132140	QPSK	1	74	1	0	20.01	21.50
132322	132415	QPSK	1	74	1	0	20.06	21.50
132597	132504	QPSK	1	0	1	24	19.95	21.50

CA_38C Ant4 EC13								
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	15.55	17.00
37901	38099	QPSK	1	99	1	0	15.71	17.00
38150	37952	QPSK	1	0	1	99	15.52	17.00



CA_7C Ant1 EC17								
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	17.82	19.00
21100	21298	QPSK	1	99	1	0	17.89	19.00
21350	21152	QPSK	1	0	1	99	17.72	19.00

CA_66C Ant0 EC17								
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	16.08	17.50
132322	132520	QPSK	1	99	1	0	16.18	17.50
132572	132374	QPSK	1	0	1	99	16.12	17.50

CA_66B Ant0 EC17								
Combination 15MHz+5MHz (75RB+25RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset		
132047	132140	QPSK	1	74	1	0	16.05	17.50
132322	132415	QPSK	1	74	1	0	16.14	17.50
132597	132504	QPSK	1	0	1	24	16.07	17.50

CA_38C Ant4 EC16								
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	20.31	21.50
37901	38099	QPSK	1	99	1	0	20.35	21.50
38150	37952	QPSK	1	0	1	99	20.25	21.50

CA_38C Ant4 EC17								
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	11.58	13.00
37901	38099	QPSK	1	99	1	0	11.73	13.00
38150	37952	QPSK	1	0	1	99	11.52	13.00

Conducted Power for DL CA

2CA DL

CA List	PCC									SCC					Power	
	LTE	BW	BW	UL	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	RB	Offset	Band	(MHz)	Freq. (MHz)	Channel		Tx Power (dBm)	Tx Power (dBm)
CA_5A-7A	Band 5	Ant0	10M	836.5	20525	QPSK	1	0		Band 7	20M	2655	3100	4X4MIMO	22.82	22.88
	Band 7	Ant1	20M	2535	21100	QPSK	1	0	4X4MIMO	Band 5	10M	861.5	2525		22.95	23.02
CA_7A-7A	Band 7	Ant1	20M	2535	21100	QPSK	1	0	4X4MIMO	Band 7	5M	2687.5	3425	4X4MIMO	22.91	23.02
CA_7B	Band 7	Ant1	15M	2535	21100	QPSK	1	0	4X4MIMO	Band 7	5M	2544.3	3193	4X4MIMO	22.92	23.02
CA_7C	Band 7	Ant1	20M	2535	21100	QPSK	1	0	4X4MIMO	Band 7	20M	2554.8	3298	4X4MIMO	22.97	23.02
CA_38C	Band 38	Ant0	20M	2580	37850	QPSK	1	0	4X4MIMO	Band 38	20M	2599.8	38048	4X4MIMO	22.71	22.79
CA_66A-66A	Band 66	Ant0	20M	1745	132322	QPSK	1	0		Band 66	5M	2197.5	67311		22.66	22.74
	Band 66	Ant4	20M	1745	132322	QPSK	1	0		Band 66	5M	2197.5	67311		20.45	20.50
CA_66B	Band 66	Ant0	15M	1745	132322	QPSK	1	0		Band 66	5M	2164.3	66979		22.61	22.74
	Band 66	Ant4	15M	1745	132322	QPSK	1	0		Band 66	5M	2164.3	66979		20.42	20.50
CA_66C	Band 66	Ant0	20M	1745	132322	QPSK	1	0		Band 66	20M	2164.8	66984		22.65	22.74
	Band 66	Ant4	20M	1745	132322	QPSK	1	0		Band 66	20M	2164.8	66984		20.47	20.50



3CA DL

3CA List	PCC								SCC1				SCC2				Power				
	LTE	BW	BW	UL	UL	Mod.	UL#	UL	DL Antenna Configuration	LTE	BW	DL	DL	DL Antenna Configuration	LTE	BW	DL	DL	DL Antenna Configuration	With CA	Without CA
	Band	Ant	(MHz)	Freq. (MHz)	Channel		RB	Offset		Band	(MHz)	Freq. (MHz)	Channel		Band	(MHz)	Freq. (MHz)	Channel		Tx. Power (dBm)	Tx. Power (dBm)
CA_41A-41A-41A	Band 41	Ant4	20M	2593	40620	QPSK	1	0	4X4MIMO	Band 41	5M	2687.5	41565	4X4MIMO	Band 41	20M	2506	39750	4X4MIMO	22.95	23.11
CA_41A-41C	Band 41	Ant4	20M	2675.8	39750	QPSK	1	0	4X4MIMO	Band 41	20M	2660.2	41292	4X4MIMO	Band 41	20M	2680	41490	4X4MIMO	22.99	23.11
CA_41D	Band 41	Ant4	20M	2593	40620	QPSK	1	0	4X4MIMO	Band 41	20M	2612.8	40618	4X4MIMO	Band 41	20M	2632.6	41016	4X4MIMO	22.94	23.11