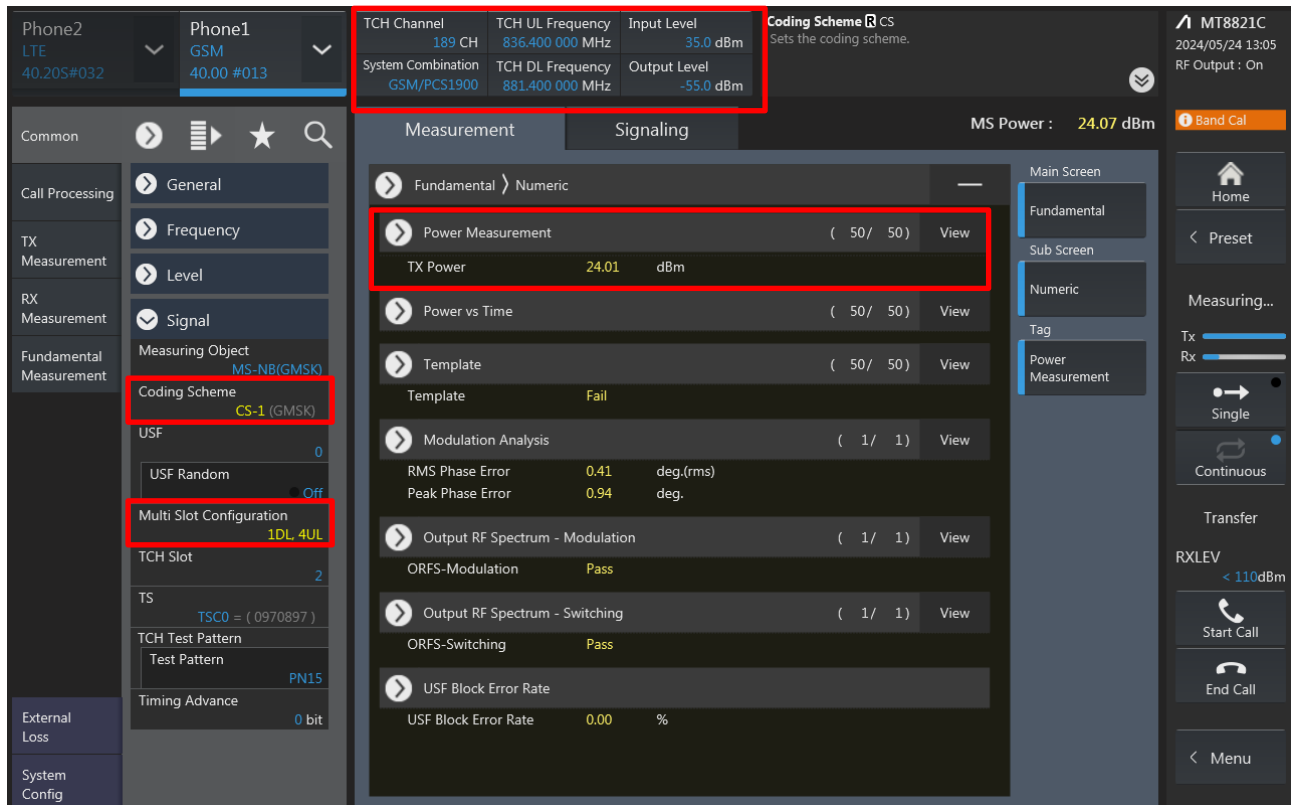


Power measurement connection diagram:

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

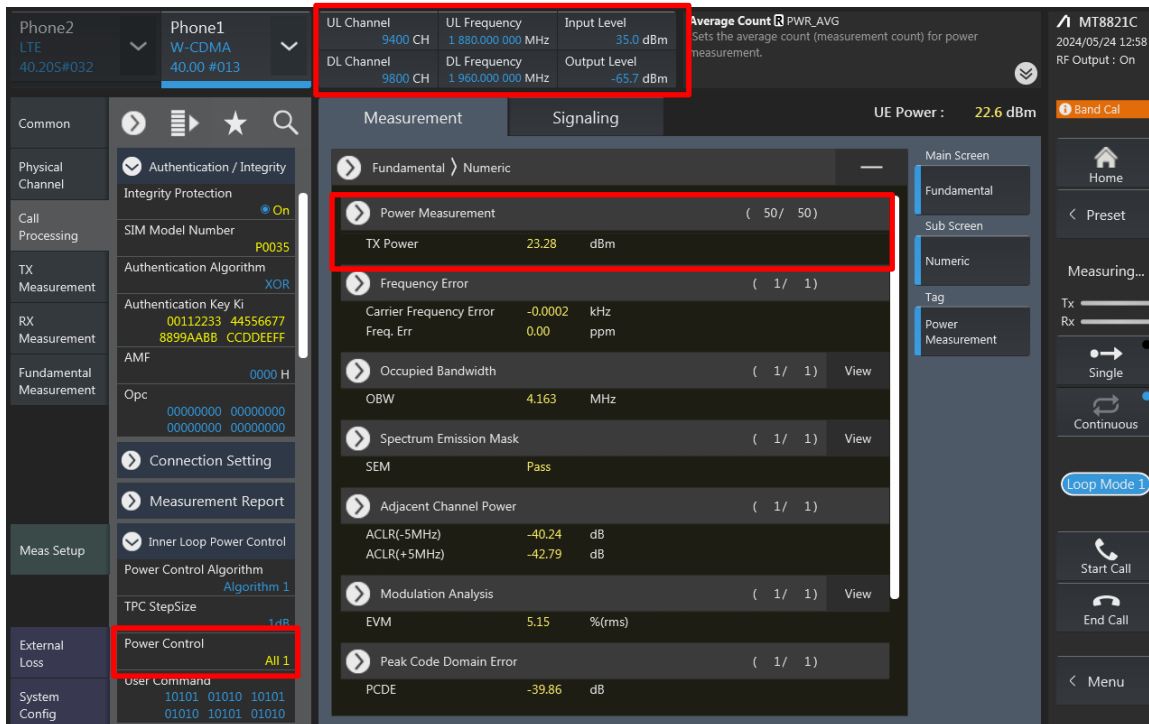
<GSM>



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 options like General, Frequency, Level, Signal, and Measuring Object (MS-NB(GMSK)).
- Main Area:** Displays the 'Measurement' tab with a 'Fundamental' sub-tab. The 'Power Measurement' section shows TX Power at 24.01 dBm. Other sections include 'Power vs Time', 'Template' (Fail), 'Modulation Analysis' (RMS Phase Error: 0.41 deg.(rms), Peak Phase Error: 0.94 deg.), 'Output RF Spectrum - Modulation' (ORFS-Modulation: Pass), 'Output RF Spectrum - Switching' (ORFS-Switching: Pass), and 'USF Block Error Rate' (USF Block Error Rate: 0.00 %).
- Right Sidebar:** Shows the 'Main Screen' with options like Fundamental, Sub Screen, Numeric, and Tag. It also displays the 'Band Cal' button and the 'MT8821C' device information (2024/05/24 13:05, RF Output : On).

<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

UE Power: 22.6 dBm

Measurement: Fundamental > Numeric

Power Measurement (50/50): TX Power 23.28 dBm

Frequency Error (1/1): Carrier Frequency Error -0.0002 kHz, Freq. Err 0.00 ppm

Occupied Bandwidth (1/1): OBW 4.163 MHz

Spectrum Emission Mask (1/1): SEM 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

Connection Setting: Authentication / Integrity, Integrity Protection On, SIM Model Number P0035, Authentication Algorithm XOR, Authentication Key Ki 00112233 44556677 8899AABB CCDDDEFF, AMF 0000 H, Opc 00000000 00000000 00000000 00000000

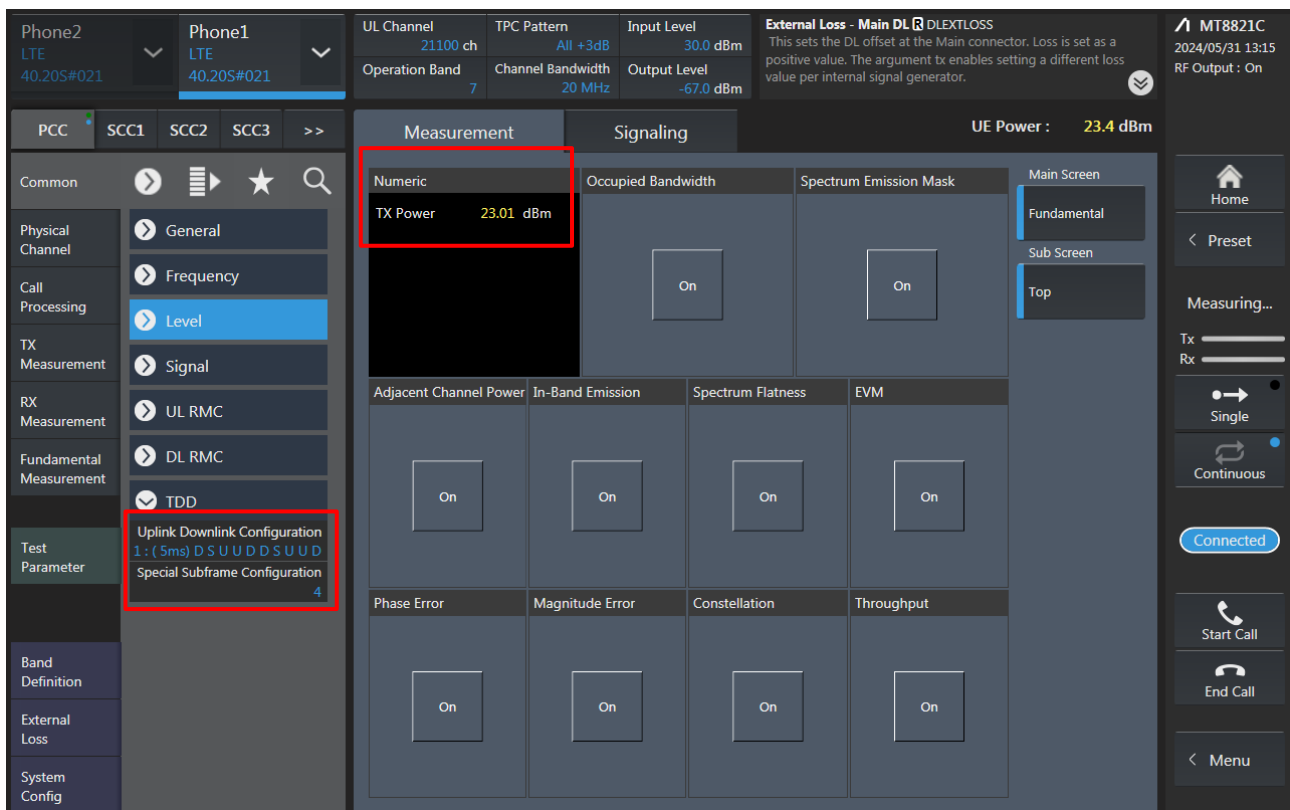
Measurement Report: Connection Setting, Measurement Report

Meas Setup: Inner Loop Power Control, Power Control Algorithm Algorithm 1, TPC StepSize 1

External Loss: Power Control All 1

User Command: 10101 01010 10101 01010 10101 01010

<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

UE Power: 23.4 dBm

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

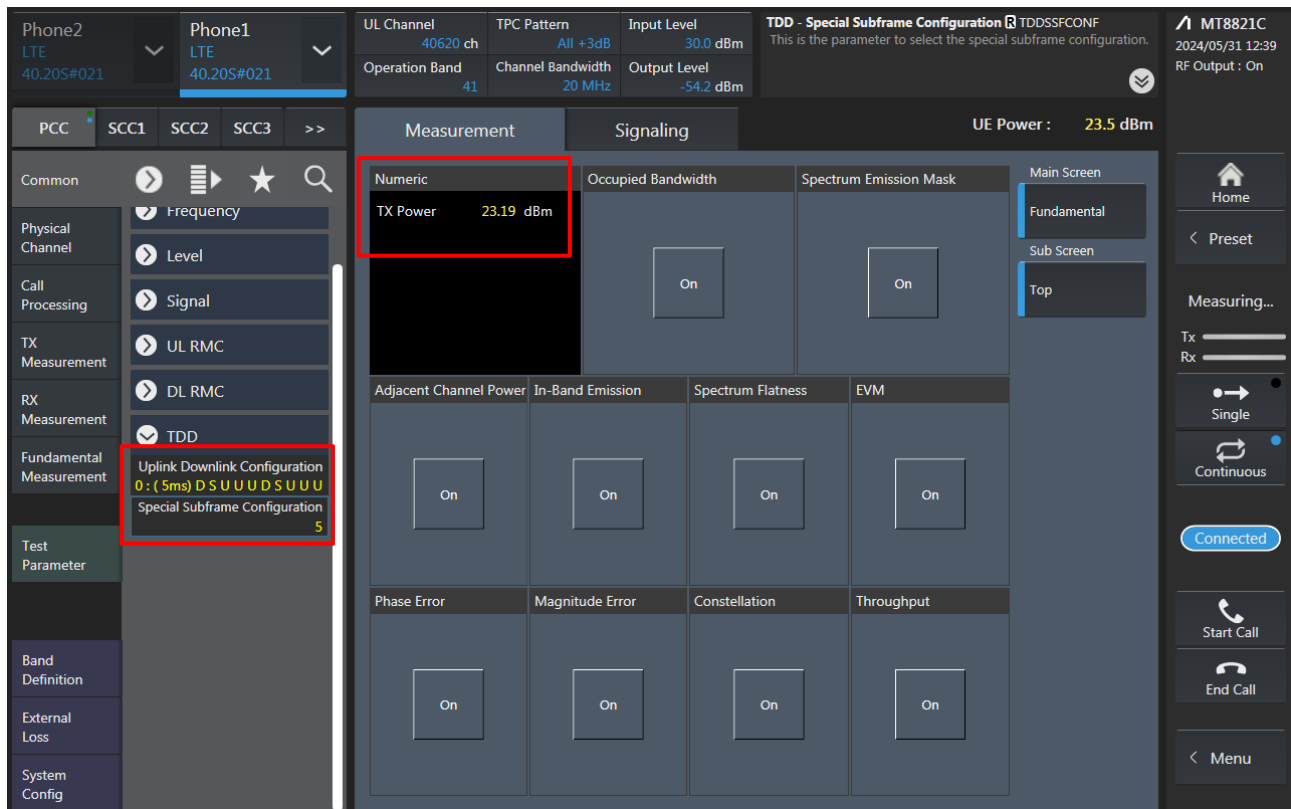
Phase Error: On

Magnitude Error: On

Constellation: On

Throughput: On

Uplink Downlink Configuration 1: (5ms) D S U U D D S U U D, Special Subframe Configuration 4

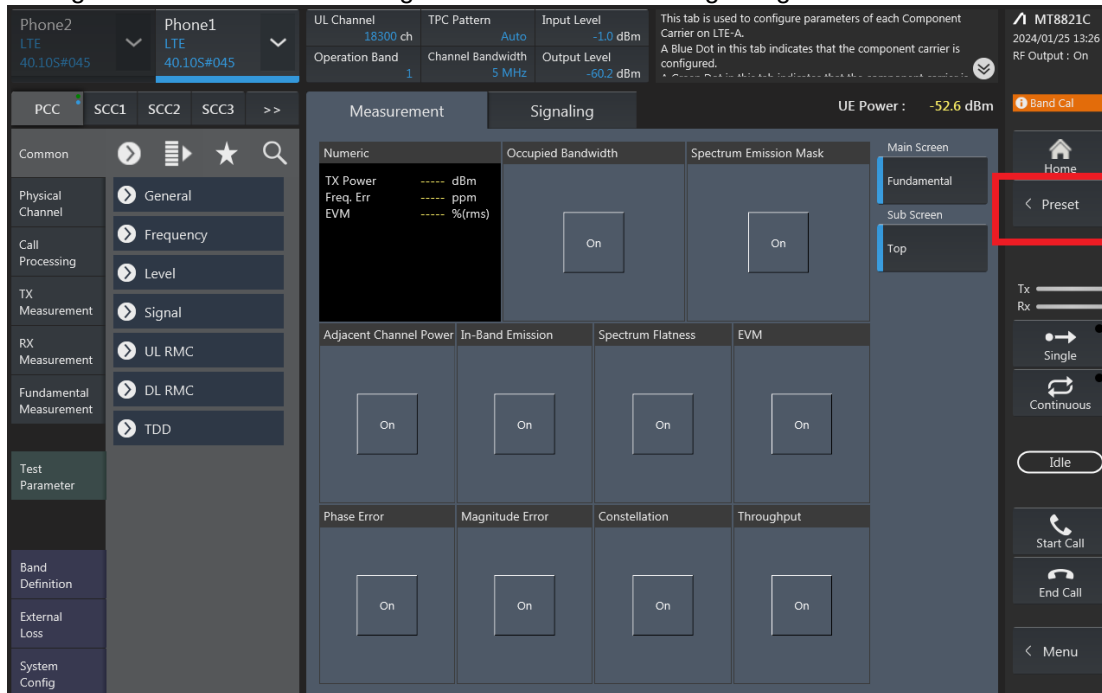
<LTE TDD Power class 3>

The screenshot displays the SPORTON LAB. LTE TDD Power class 3 configuration interface. The interface is divided into several sections:

- Top Bar:** Shows Phone2 (LTE, 40.20S#021) and Phone1 (LTE, 40.20S#021). It also displays 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 TDDSSFCNF, and the MT8821C is shown with a timestamp of 2024/05/31 12:39 and RF Output: On.
- Left Sidebar:** Contains navigation options: PCC, SCC1, SCC2, SCC3, and >>. Below these are sections for Common, Physical Channel, Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, Test Parameter, Band Definition, External Loss, and System Config.
- Measurement Section:** A red box highlights the 'TX Power' value of 23.19 dBm. Other measurement options include Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Power, In-Band Emission, Spectrum Flatness, EVM, Phase Error, Magnitude Error, Constellation, and Throughput.
- Fundamental Measurement Section:** A red box highlights the 'TDD' option. The Uplink Downlink Configuration is set to 0: (5ms) D S U U U D S U U U, and the Special Subframe Configuration is set to 5.
- Right Sidebar:** Includes a 'Main Screen' section with 'Fundamental' and 'Sub Screen' options. Below this are 'Measuring...' controls for Tx and Rx, and a 'Connected' status indicator. At the bottom, there are 'Start Call' and 'End Call' buttons, and a 'Menu' button.

LTE Downlink Carrier Aggregation configurations:

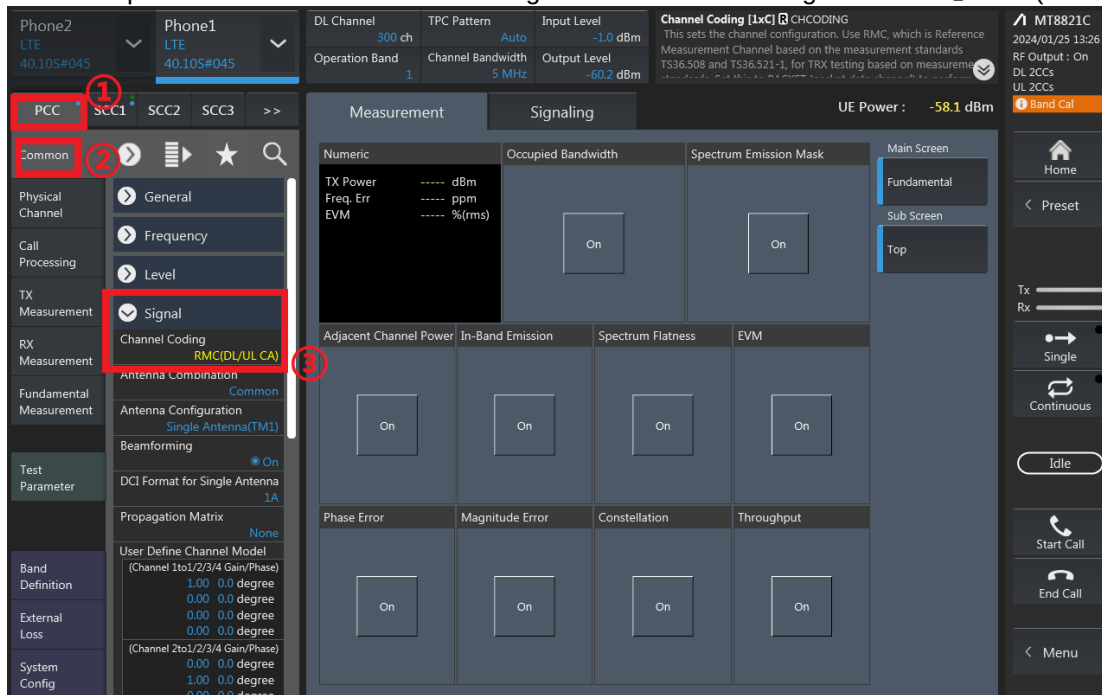
1. Change the Scenario in the Configuration of Phone1 LTE Signaling and Preset.



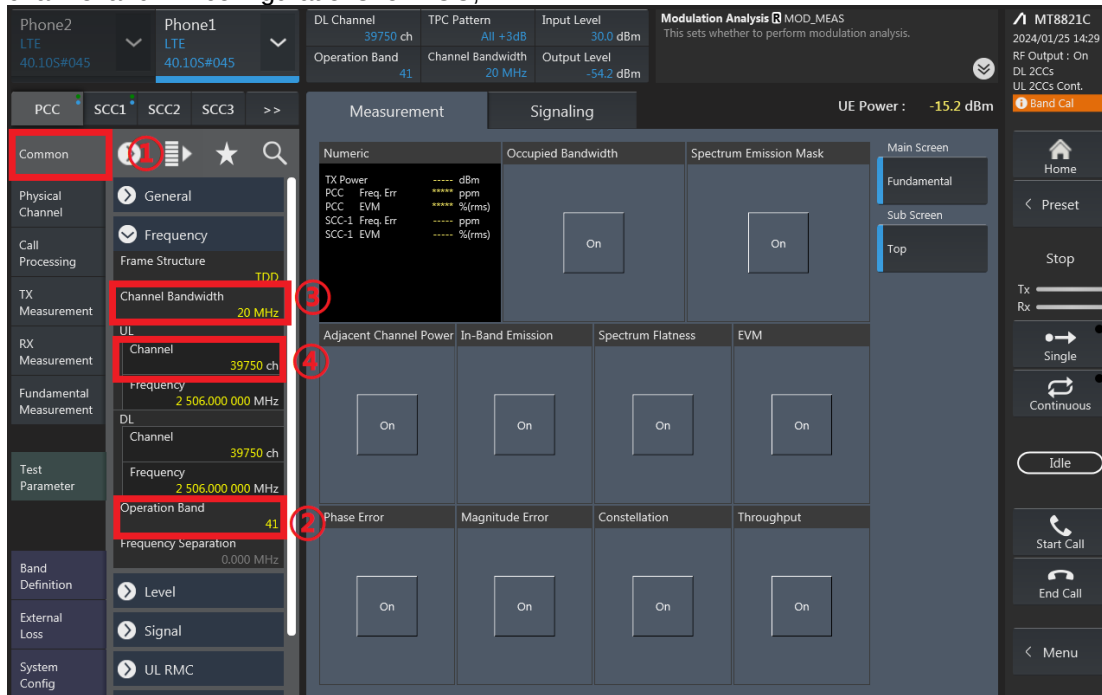
2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation; If Select "RMC (DL CA)" for Downlink Carrier Aggregation.

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 40.10S#045 Phone1 LTE 40.10S#045

DL Channel 39750 ch TPC Pattern All +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

MT8821C 2024/01/25 14:29 RF Output : On DL 2CCs UL 2CCs Cont.

PCC SCC1 SCC2 SCC3 >>

Measurement Signaling UE Power : -15.2 dBm

Common

Physical Channel General

Call Processing Frequency

TX Measurement Channel Bandwidth 20 MHz

RX Measurement Channel 39750 ch

Fundamental Measurement Frequency 2 506.000 000 MHz

Test Parameter Channel 39750 ch Frequency 2 506.000 000 MHz Operation Band 41 Frequency Separation 0.000 MHz

Band Definition Level

External Loss Signal

System Config UL RMC

Numeric Occupied Bandwidth Spectrum Emission Mask

TX Power PCC Freq. Err. dBm PPM PCC EVM dBm PPM SCC-1 Freq. Err. dBm PPM SCC-1 EVM dBm PPM

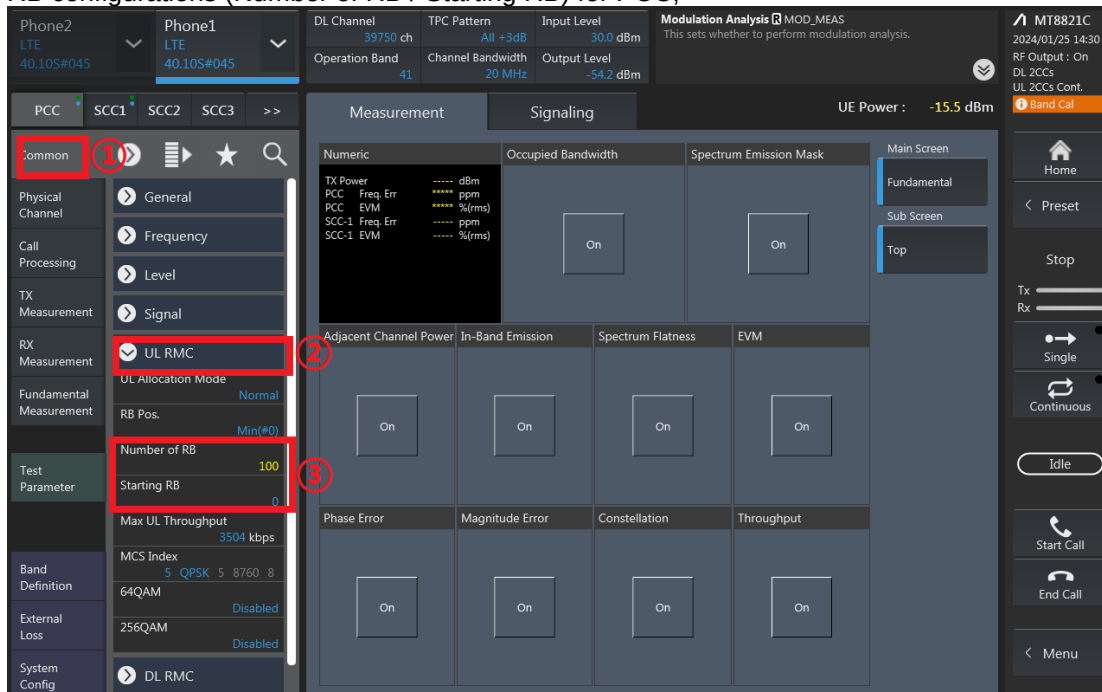
Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

Phase Error Magnitude Error Constellation Throughput

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 40.10S#045 Phone1 LTE 40.10S#045

DL Channel 39750 ch TPC Pattern All +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

MT8821C 2024/01/25 14:30 RF Output : On DL 2CCs UL 2CCs Cont.

PCC SCC1 SCC2 SCC3 >>

Measurement Signaling UE Power : -15.5 dBm

Common

Physical Channel General

Call Processing Frequency

TX Measurement Level

RX Measurement Signal

Fundamental Measurement UL RMC

Test Parameter UL Allocation Mode Normal RB Pos. Min(#0) Number of RB 100 Starting RB 0 Max UL Throughput 3504 kbps MCS Index 5 QPSK 5 8760 8 64QAM 256QAM Disabled Disabled

Band Definition DL RMC

Numeric Occupied Bandwidth Spectrum Emission Mask

TX Power PCC Freq. Err. dBm PPM PCC EVM dBm PPM SCC-1 Freq. Err. dBm PPM SCC-1 EVM dBm PPM

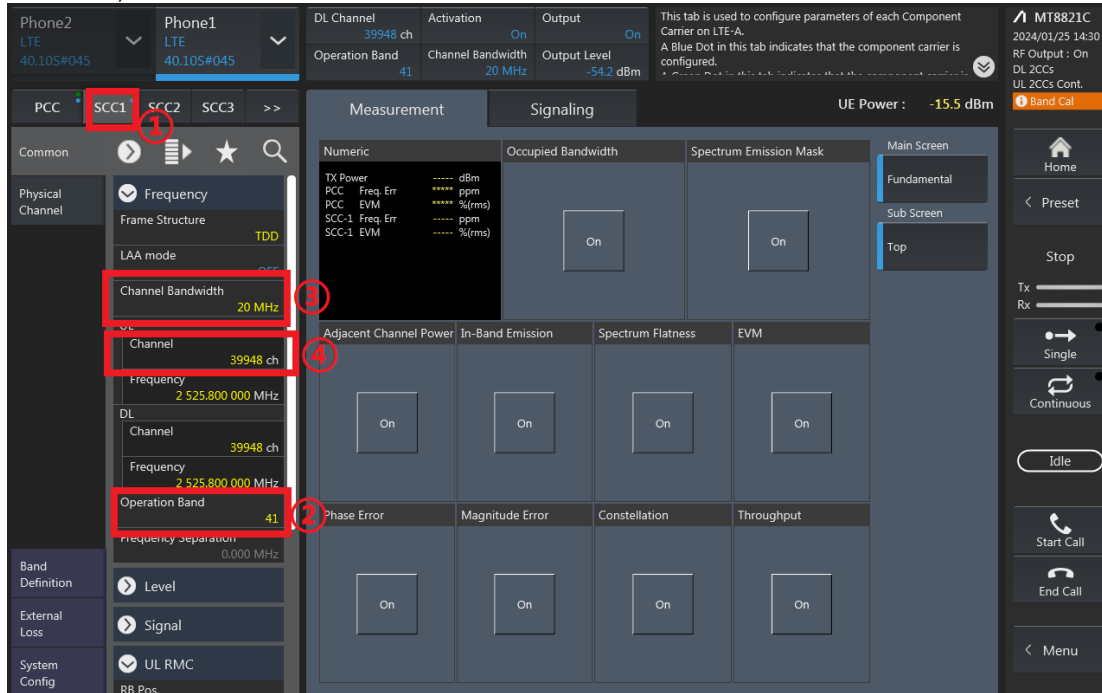
Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

Phase Error Magnitude Error Constellation Throughput

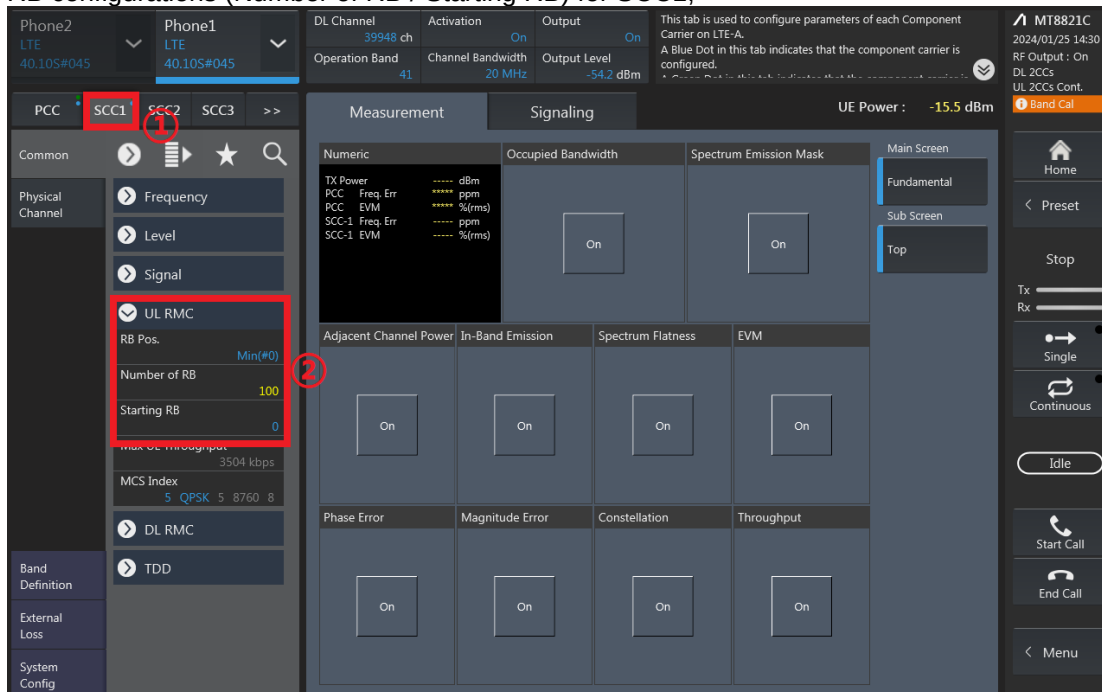
Main Screen Fundamental Sub Screen Top

Home Preset Stop Tx Rx Single Continuous Idle Start Call End Call Menu

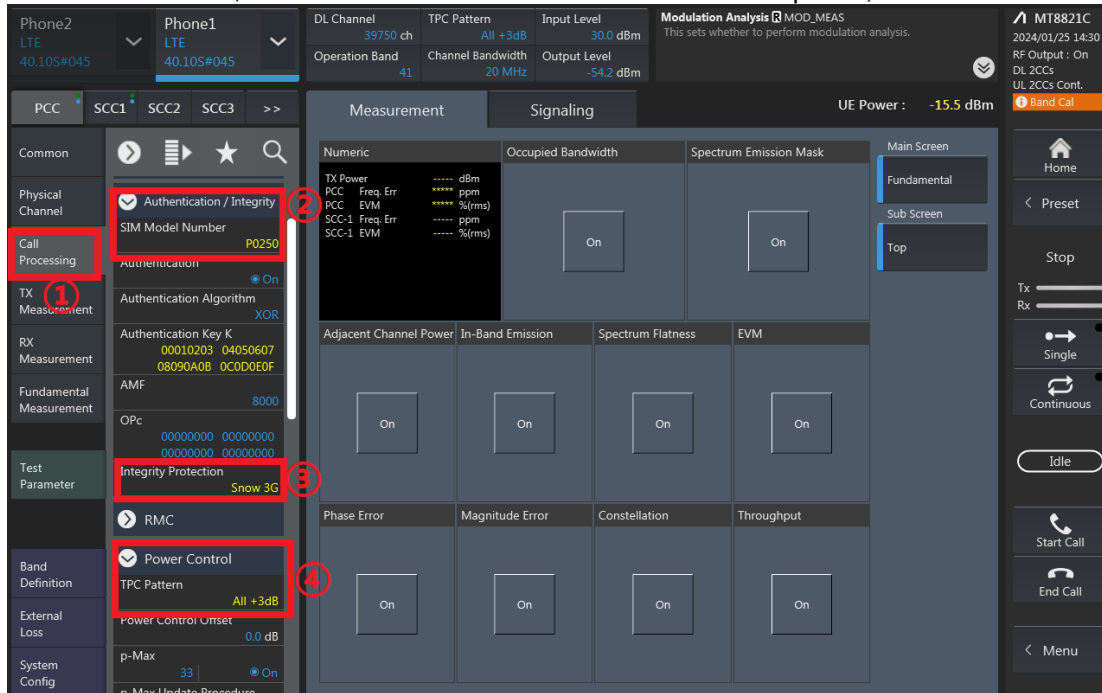
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



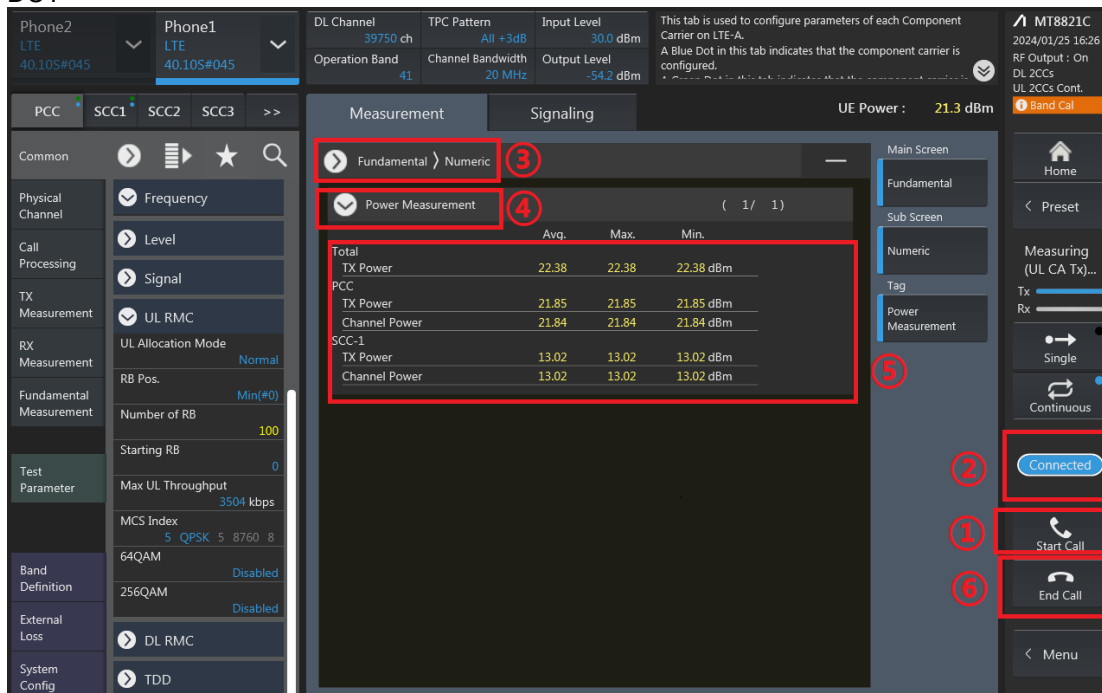
RB configurations (Number of RB / Starting RB) for SCC1;



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



	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

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

Downlink CA Power

Full Power															
2CC															
Configure		CA Configuration (BCS)	PCC							SCC				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Intra-Band	Non-Contiguous	CA_7A-7A	Band 7	20M	2535	21100	QPSK	1	0	Band 7	5M	2687.5	3425	22.87	23.02
		CA_41A-41A	Band 41	20M	2593	40620	QPSK	1	0	Band 41	5M	2687.5	41565	23.58	23.86
	Contiguous	CA_7C	Band 7	20M	2535	21100	QPSK	1	0	Band 7	20M	2674.80	3298	22.93	23.02
		CA_38C	Band 38	20M	2580	37850	QPSK	1	0	Band 38	20M	2599.80	38048	23.23	23.50
		CA_41C	Band 41	20M	2593	40620	QPSK	1	0	Band 41	20M	2612.80	40818	23.55	23.86