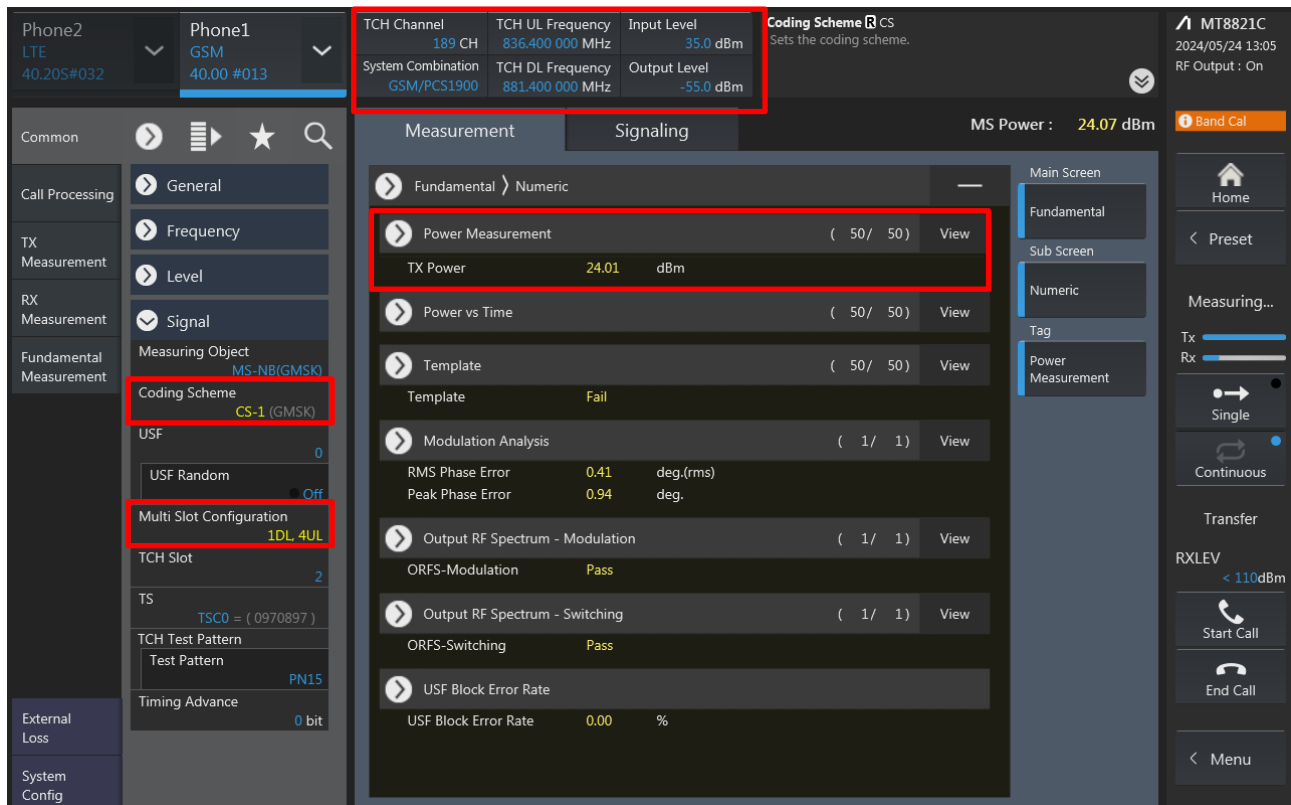


Power measurement connection diagram:

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.

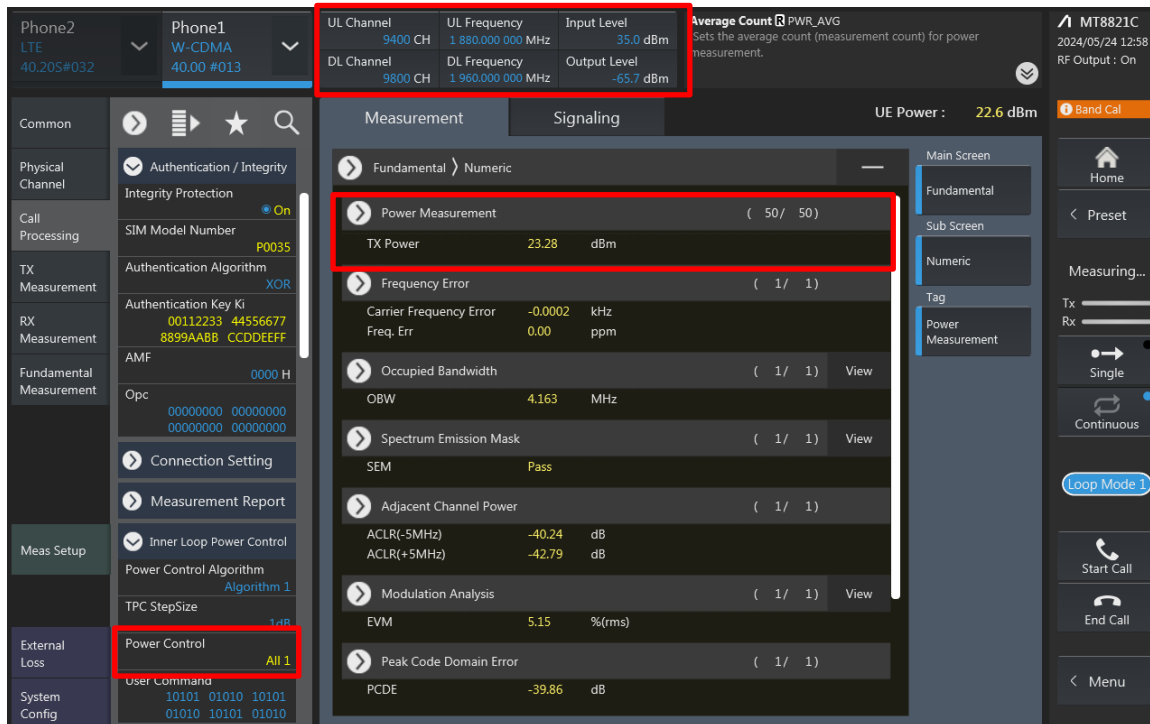
<GSM>



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

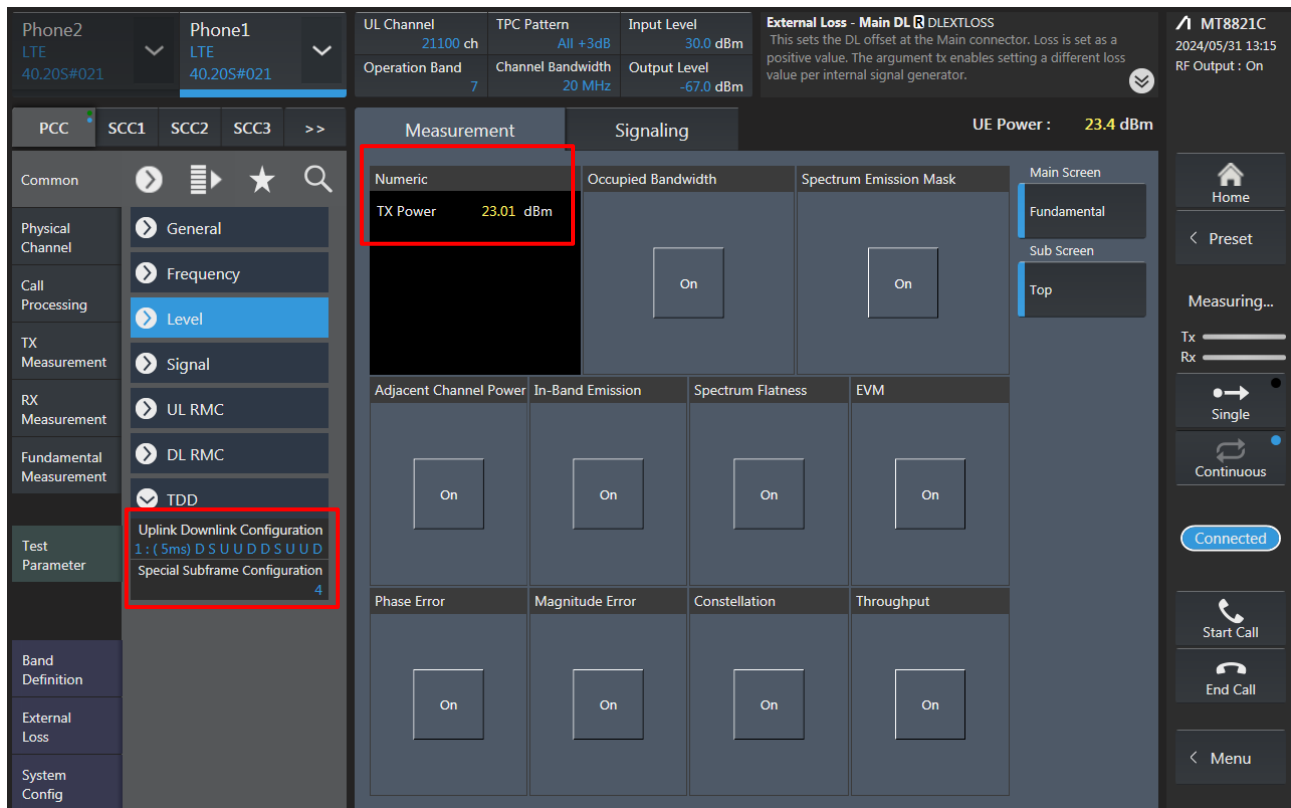
- Top Bar:** Shows Phone2 (LTE, 40.205#032) and Phone1 (GSM, 40.00 #013). The TCH Channel is 189 CH, TCH UL Frequency is 836.400 000 MHz, Input Level is 35.0 dBm, and TCH DL Frequency is 881.400 000 MHz. The Coding Scheme is CS.
- Left Sidebar:** Contains navigation options like Call Processing, TX Measurement, RX Measurement, Fundamental Measurement, and External Loss.
- Main Area:**
 - Measurement Tab:** Shows the Power Measurement section with a red box highlighting the TX Power value of 24.01 dBm. Other sections include Power vs Time, Template, Modulation Analysis, Output RF Spectrum - Modulation, Output RF Spectrum - Switching, and USF Block Error Rate.
 - Signaling Tab:** Shows the Template section with a red box highlighting the Template value of Fail.
- Right Sidebar:** Contains navigation options like Home, Preset, Measuring..., Single, Continuous, Transfer, and End Call.

<WCDMA>



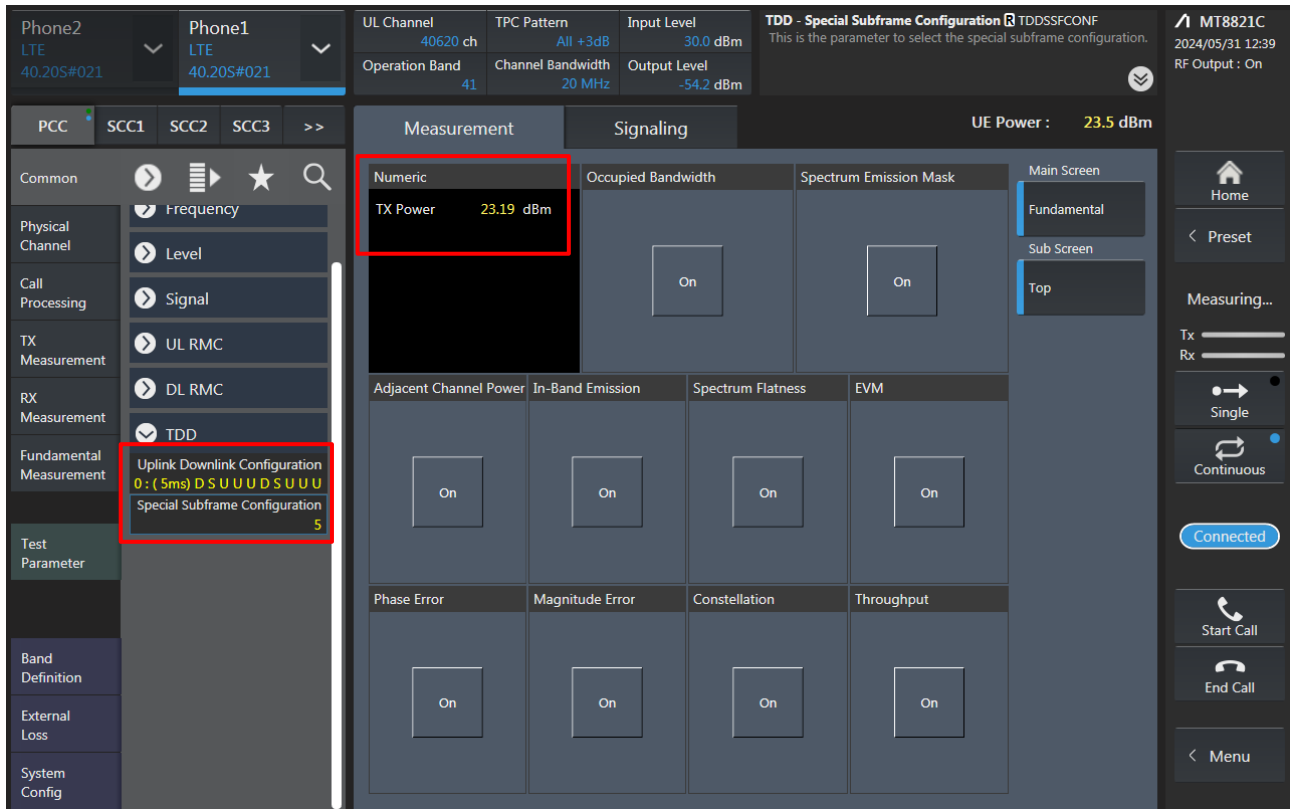
The screenshot shows the WCDMA measurement interface. The top bar displays 'Phone2 LTE 40.20S#032' and 'Phone1 W-CDMA 40.00 #013'. The 'Measurement' tab is active, showing a 'Fundamental' view. The 'Power Measurement' section is highlighted with a red box, showing 'TX Power' at 23.28 dBm. The 'Occupied 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 'UE Power' is 22.6 dBm. The 'Main Screen' shows 'Fundamental' and 'Sub Screen' options. The 'Tag' shows 'Power Measurement'. The 'Loop Mode' is set to 'Loop Mode 1'. The 'Start Call' and 'End Call' buttons are visible on the right side.

<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 a 'Numeric' view. The 'TX Power' is 23.01 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 'UE Power' is 23.4 dBm. The 'Main Screen' shows 'Fundamental' and 'Sub Screen' options. The 'Tag' shows 'Power Measurement'. The 'Loop Mode' is set to 'Loop Mode 1'. The 'Start Call' and 'End Call' buttons are visible on the right side.

<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

PCC SCC1 SCC2 SCC3 >>

Common

Physical Channel

Call Processing

TX Measurement

RX Measurement

Fundamental Measurement

Test Parameter

Band Definition

External Loss

System Config

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

Main Screen

Fundamental

Sub Screen

Top

Adjacent Channel Power

In-Band Emission

Spectrum Flatness

EVM

Phase Error

Magnitude Error

Constellation

Throughput

Home

Preset

Measuring...

Tx

Rx

Single

Continuous

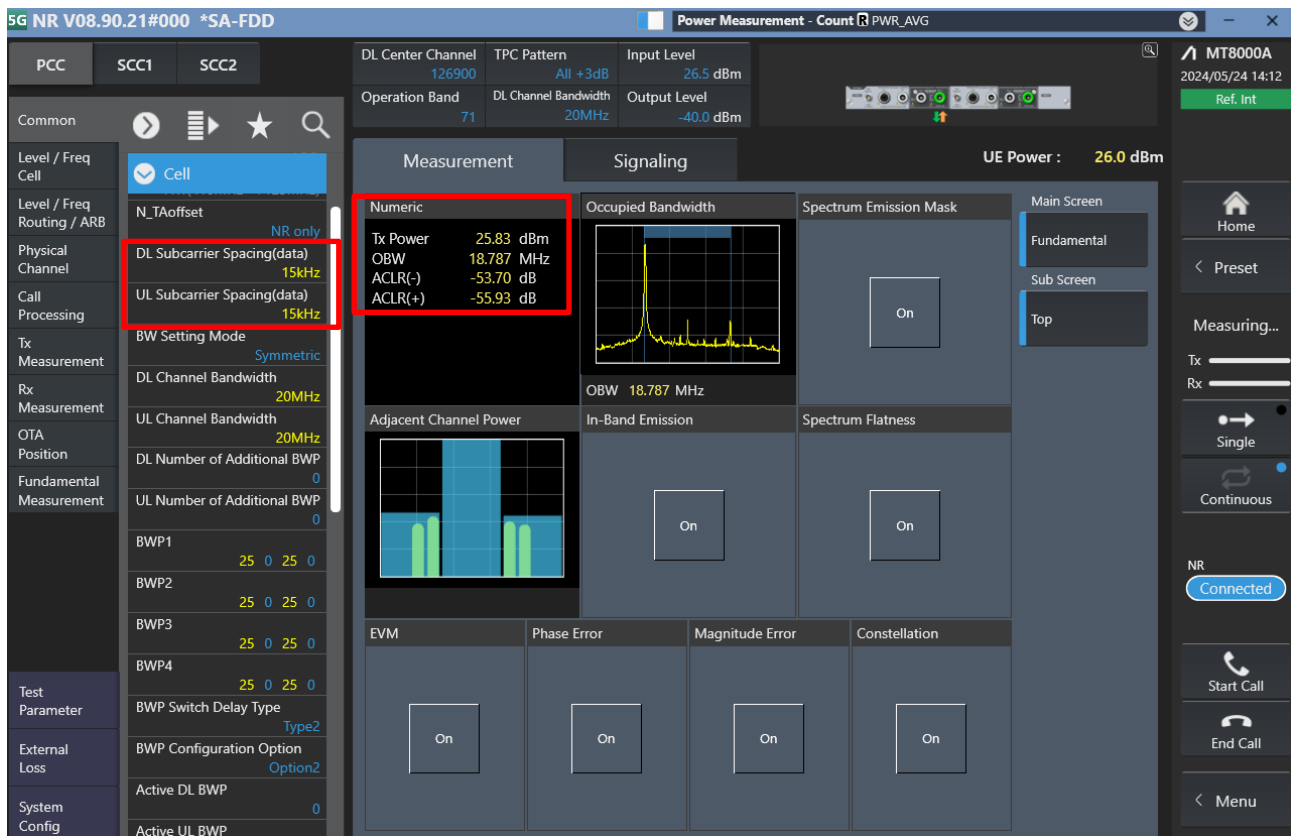
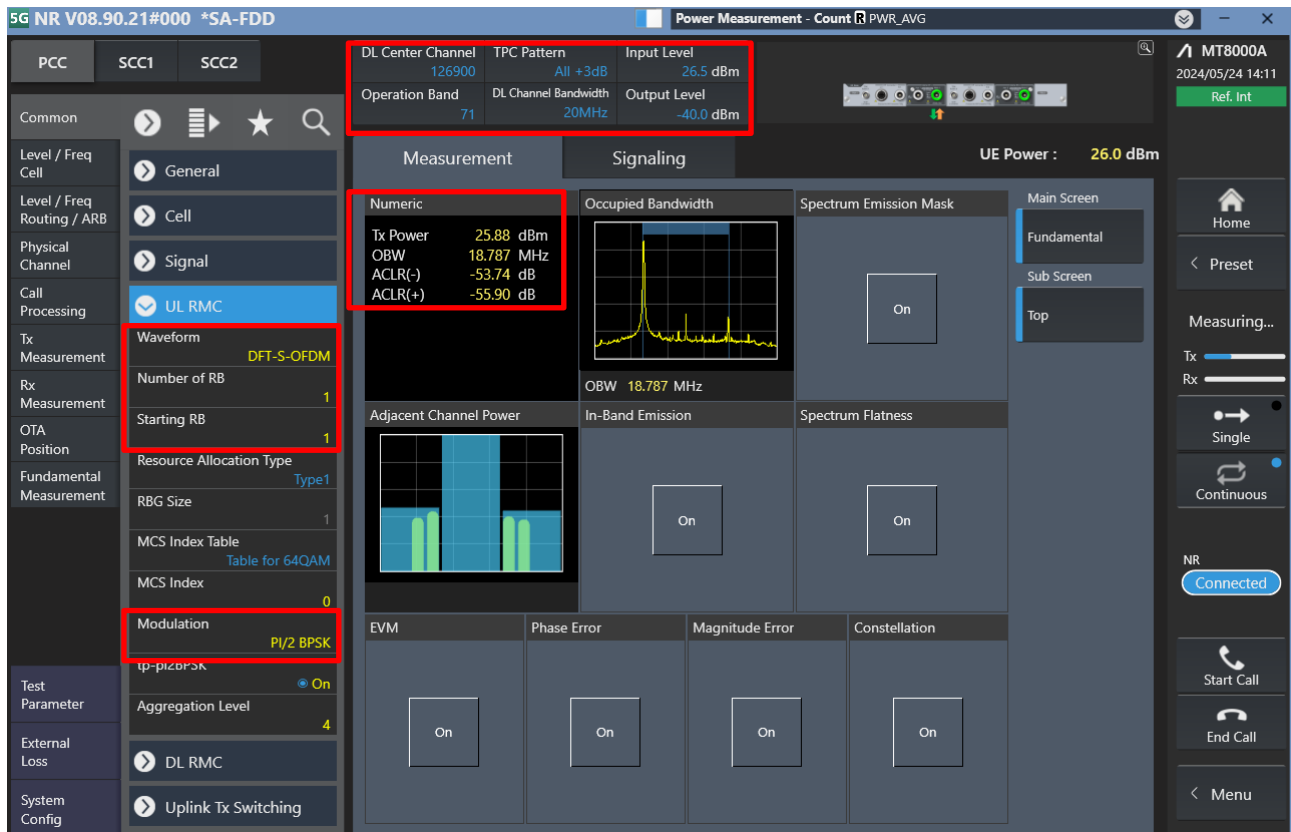
Connected

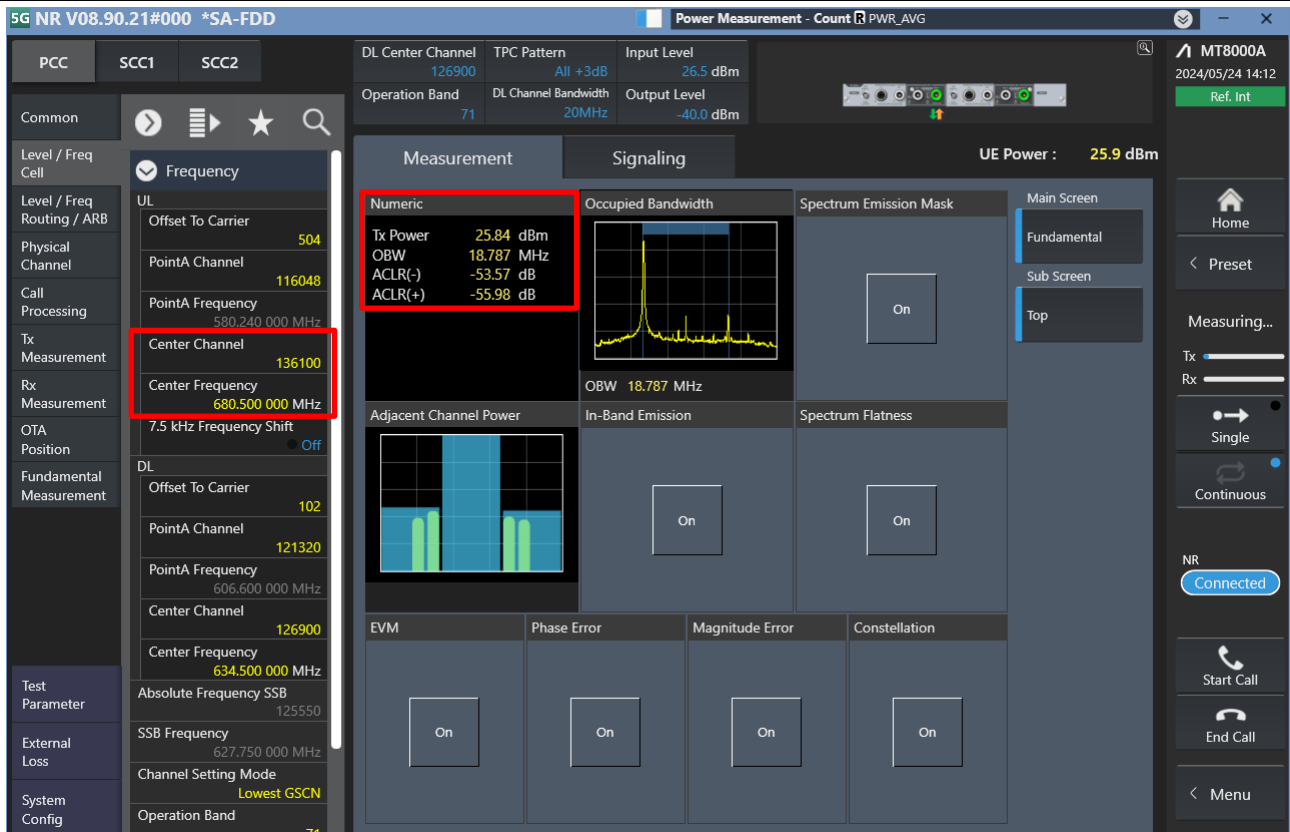
Start Call

End Call

Menu

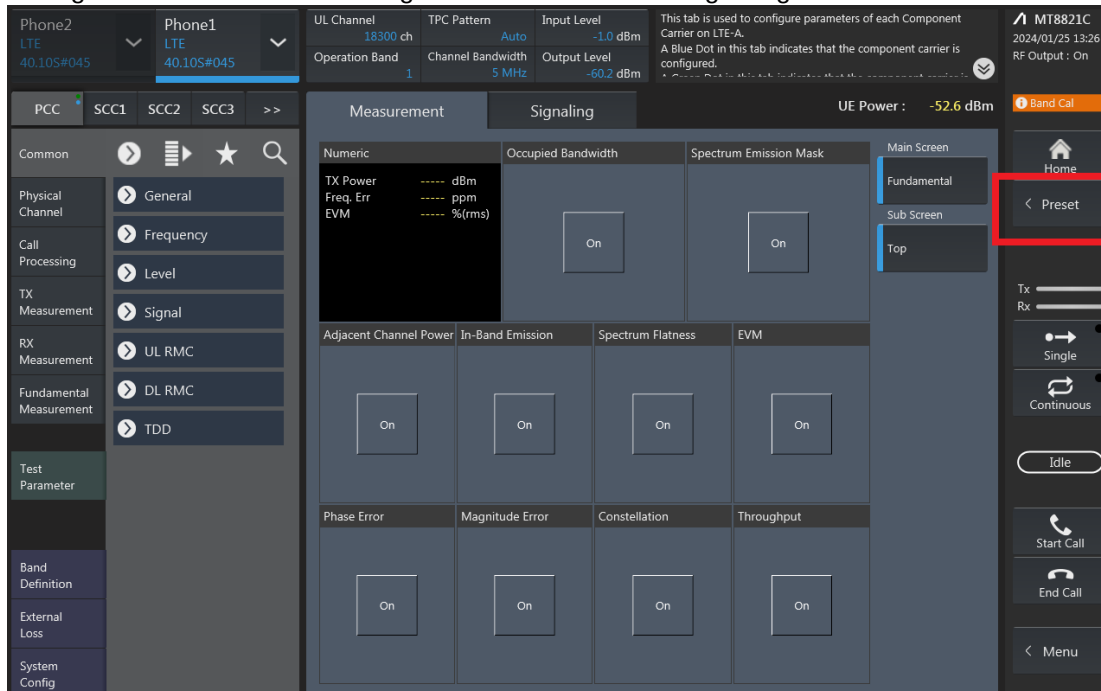
<5G NR FR1>





LTE Uplink and Downlink Carrier Aggregation configurations:

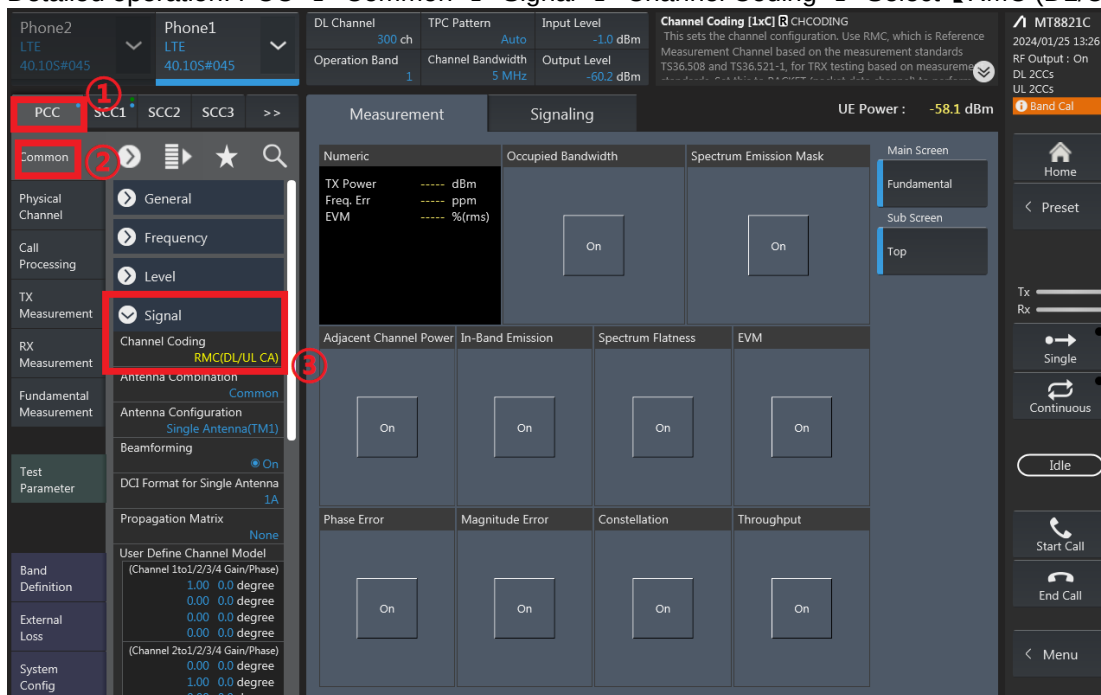
1. Change the Scenario in the Configuration of Phone1 LTE Signaling and Preset.



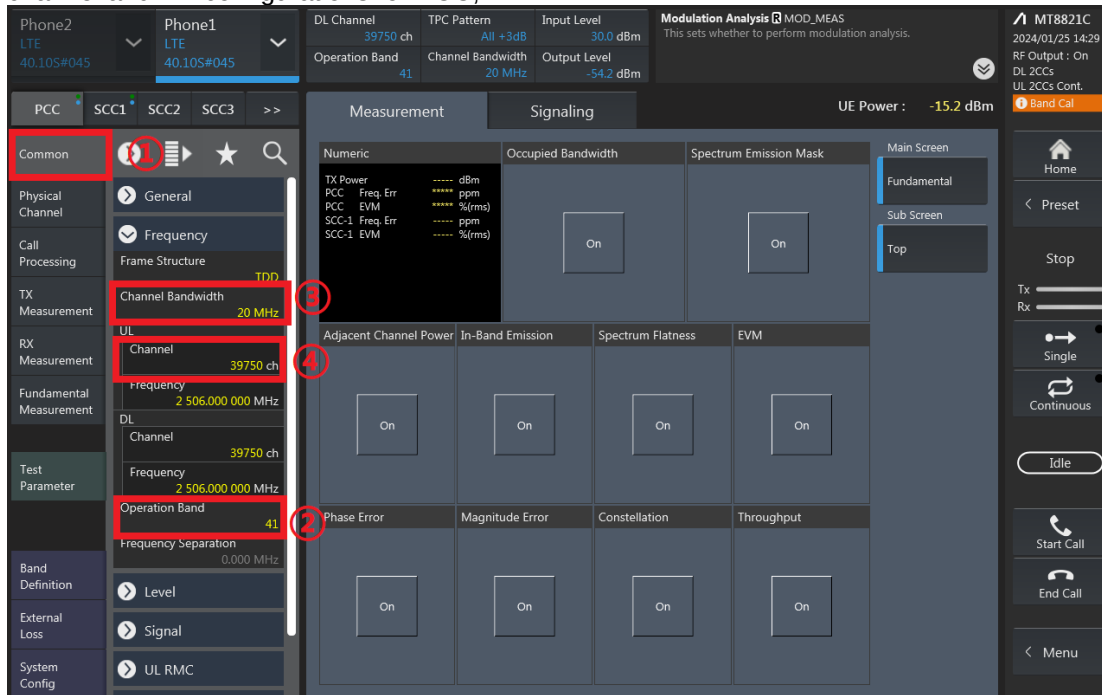
2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation; If Select "RMC (DL CA)" for Downlink Carrier Aggregation.

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;



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

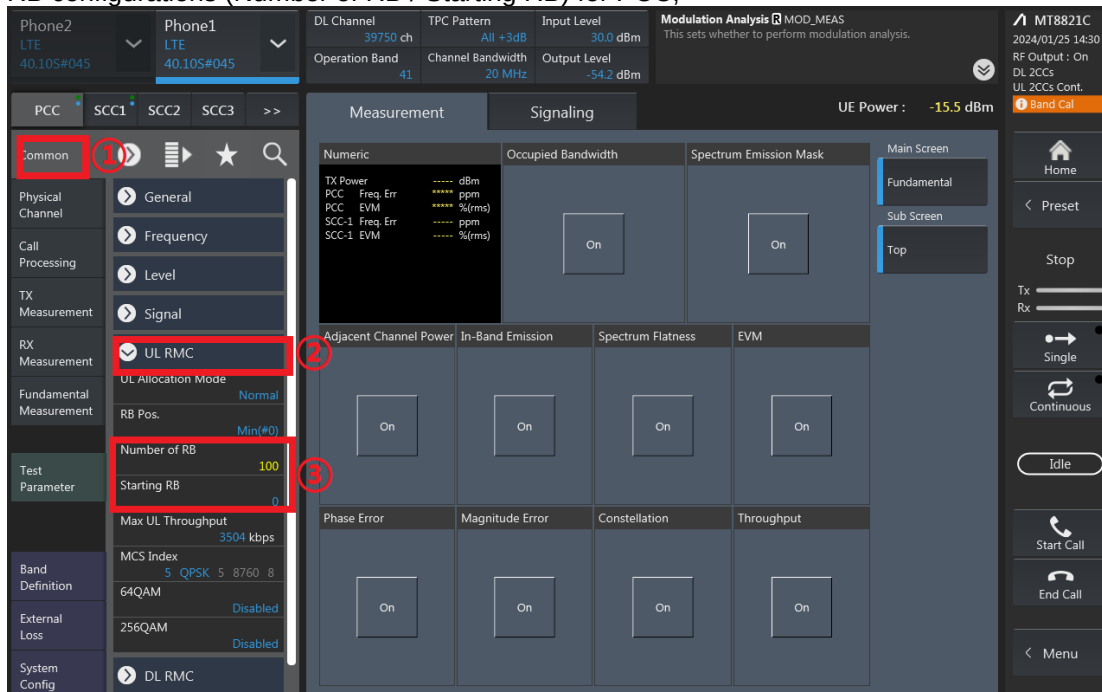
Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

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

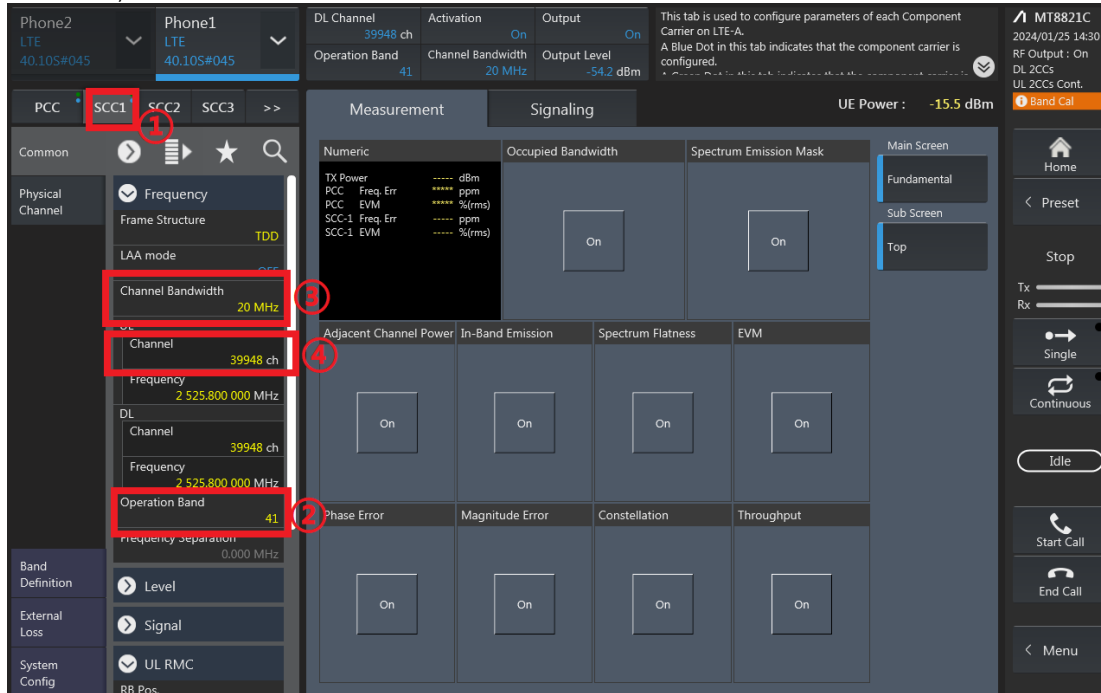
Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

Phase Error Magnitude Error Constellation Throughput

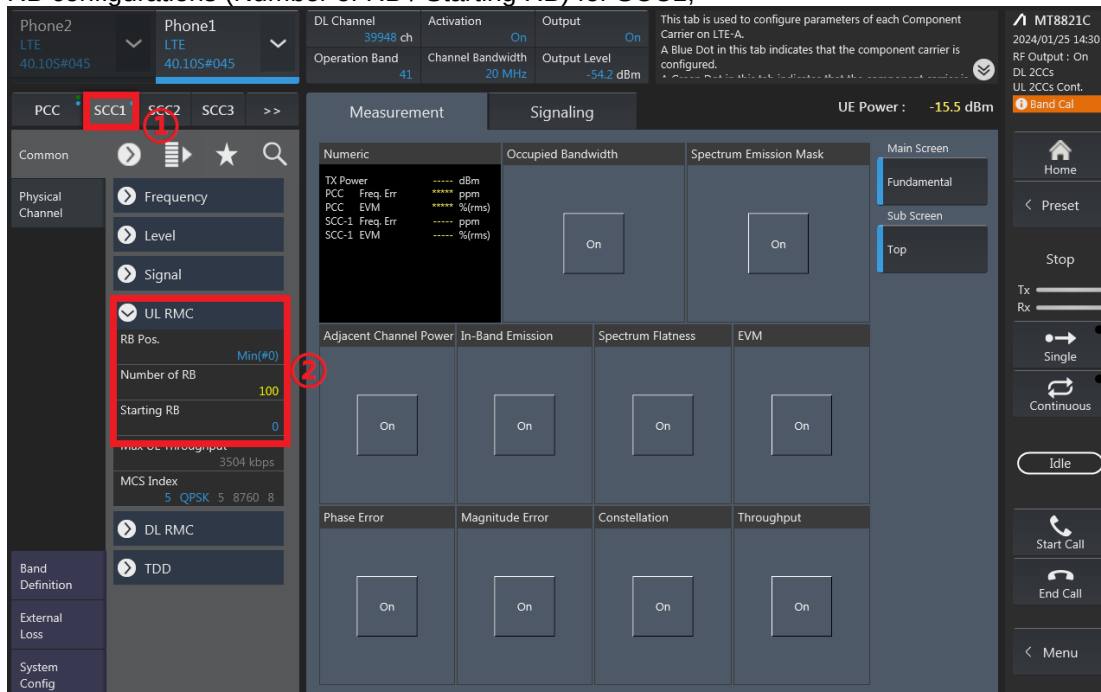
Main Screen Fundamental Sub Screen Top

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

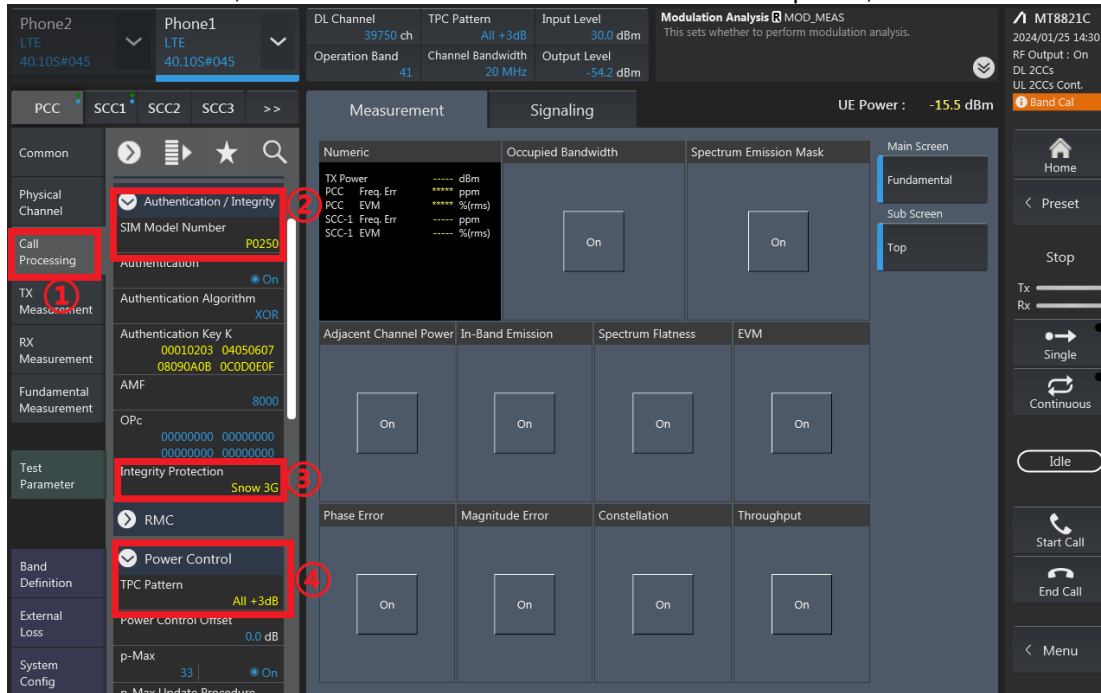
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



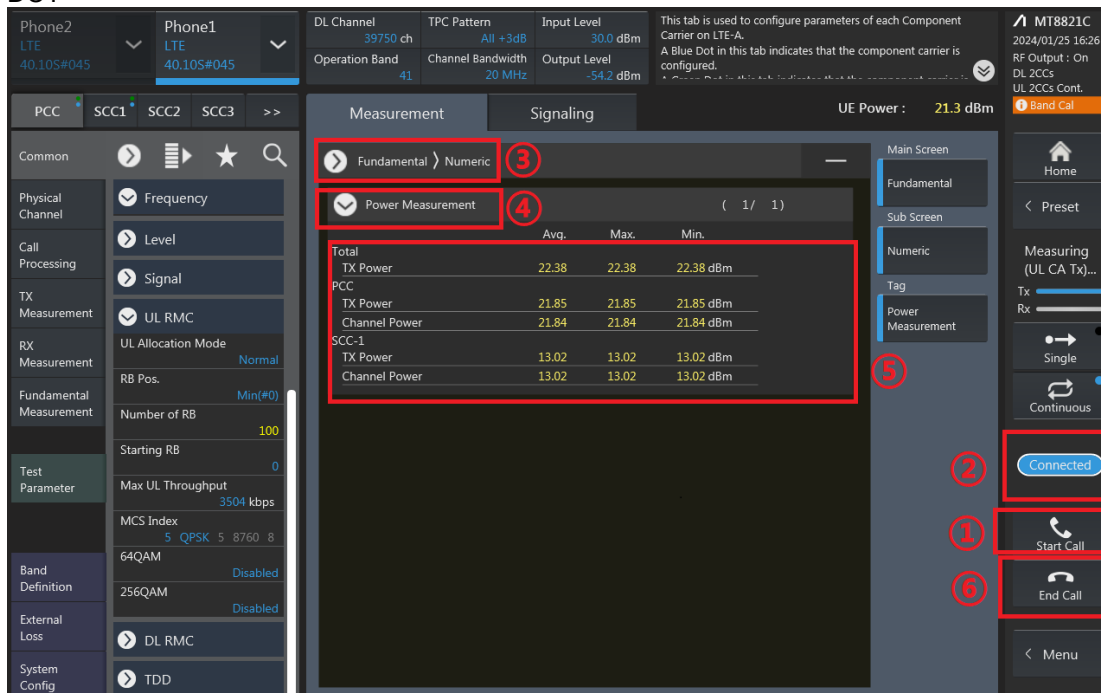
RB configurations (Number of RB / Starting RB) for SCC1;



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



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

UL CA_Power
UL CA_Full & Default Power

CA_7C Ant 1								
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	23.22	24.50
21100	21298	QPSK	1	99	1	0	23.24	24.50
21350	21152	QPSK	1	0	1	99	23.13	24.50

CA_38C Ant 1								
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	23.31	24.50
37901	38099	QPSK	1	99	1	0	23.35	24.50
38150	37952	QPSK	1	0	1	99	23.27	24.50

CA_7C Ant 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	22.31	24.00
21100	21298	QPSK	1	99	1	0	22.37	24.00
21350	21152	QPSK	1	0	1	99	22.27	24.00

CA_38C Ant 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		
37850	38048	QPSK	1	99	1	0	22.44	24.00
37901	38099	QPSK	1	99	1	0	22.55	24.00
38150	37952	QPSK	1	0	1	99	22.49	24.00

UL CA_DSI1

CA_7C Ant 1								
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	23.22	24.50
21100	21298	QPSK	1	99	1	0	23.24	24.50
21350	21152	QPSK	1	0	1	99	23.13	24.50

CA_38C Ant 1								
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	23.31	24.50
37901	38099	QPSK	1	99	1	0	23.35	24.50
38150	37952	QPSK	1	0	1	99	23.27	24.50

CA_7C Ant 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	16.24	18.00
21100	21298	QPSK	1	99	1	0	16.31	18.00
21350	21152	QPSK	1	0	1	99	16.21	18.00

CA_38C Ant 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		
37850	38048	QPSK	1	99	1	0	18.40	20.00
37901	38099	QPSK	1	99	1	0	18.46	20.00
38150	37952	QPSK	1	0	1	99	18.41	20.00

UL CA_DS12

CA_7C Ant 1								
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	23.22	24.50
21100	21298	QPSK	1	99	1	0	23.24	24.50
21350	21152	QPSK	1	0	1	99	23.13	24.50

CA_38C Ant 1								
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	23.31	24.50
37901	38099	QPSK	1	99	1	0	23.35	24.50
38150	37952	QPSK	1	0	1	99	23.27	24.50

CA_7C Ant 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	22.31	24.00
21100	21298	QPSK	1	99	1	0	22.37	24.00
21350	21152	QPSK	1	0	1	99	22.27	24.00

CA_38C Ant 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		
37850	38048	QPSK	1	99	1	0	22.44	24.00
37901	38099	QPSK	1	99	1	0	22.55	24.00
38150	37952	QPSK	1	0	1	99	22.49	24.00

UL CA_DSI3

CA_7C Ant 1								
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	18.61	20.00
21100	21298	QPSK	1	99	1	0	18.67	20.00
21350	21152	QPSK	1	0	1	99	18.63	20.00

CA_38C Ant 1								
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	19.30	20.50
37901	38099	QPSK	1	99	1	0	19.46	20.50
38150	37952	QPSK	1	0	1	99	19.35	20.50

CA_7C Ant 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	22.31	24.00
21100	21298	QPSK	1	99	1	0	22.37	24.00
21350	21152	QPSK	1	0	1	99	22.27	24.00

CA_38C Ant 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		
37850	38048	QPSK	1	99	1	0	22.44	24.00
37901	38099	QPSK	1	99	1	0	22.55	24.00
38150	37952	QPSK	1	0	1	99	22.49	24.00

UL CA_DSI4

CA_7C Ant 1								
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	18.61	20.00
21100	21298	QPSK	1	99	1	0	18.67	20.00
21350	21152	QPSK	1	0	1	99	18.63	20.00

CA_38C Ant 1								
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	19.30	20.50
37901	38099	QPSK	1	99	1	0	19.46	20.50
38150	37952	QPSK	1	0	1	99	19.35	20.50

CA_7C Ant 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	16.24	18.00
21100	21298	QPSK	1	99	1	0	16.31	18.00
21350	21152	QPSK	1	0	1	99	16.21	18.00

CA_38C Ant 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		
37850	38048	QPSK	1	99	1	0	18.40	20.00
37901	38099	QPSK	1	99	1	0	18.46	20.00
38150	37952	QPSK	1	0	1	99	18.41	20.00

Downlink CA Power

2CA DL																
CA List	PCC										SCC				Power	
	LTE	BW	BW	UL	UL	Mod.	UL#	UL	DL Antenna Configuration	LTE	BW	DL	DL	DL Antenna Configuration	With CA	Without CA
	Band	Ant	(MHz)	Freq	Channel		RB	RB Offset		Band	(MHz)	Freq (MHz)	Channel		Tx Power (dBm)	Tx Power (dBm)
																(dBm)
CA_2A-2A	Band 2	1	20M	1880	18900	QPSK	1	0		Band 2	5M	1987.5	1175		22.61	22.67
CA_2A-4A	Band 2	1	20M	1880	18900	QPSK	1	0		Band 4	20M	2132.5	2175	4x4MMMO	22.61	22.67
	Band 4	1	20M	1732.5	20175	QPSK	1	0	4x4MMMO	Band 2	20M	1980	900		23.72	23.86
CA_2C	Band 2	2	20M	1880	18900	QPSK	1	0		Band 2	20M	1979.8	1098		22.85	22.92
CA_4A-5A	Band 4	1	20M	1732.5	20175	QPSK	1	0	4x4MMMO	Band 5	10M	881.5	2525		23.72	23.80
	Band 5	4	10M	836.5	25225	QPSK	1	0		Band 4	20M	2132.5	2175	4x4MMMO	24.34	24.46
CA_38C	Band 38	1	20M	2580	37850	QPSK	1	0	4x4MMMO	Band 38	20M	2599.8	38048	4x4MMMO	23.35	23.43
CA_41C	Band 41	1	20M	2593	40620	QPSK	1	0	4x4MMMO	Band 41	20M	2512.8	40818	4x4MMMO	23.36	23.48
CA_66A-66A	Band 66	1	20M	1745	132322	QPSK	1	0	4x4MMMO	Band 66	5M	2197.5	67311	4x4MMMO	23.66	23.73
CA_66B	Band 66	1	15M	1745	132322	QPSK	1	0	4x4MMMO	Band 66	5M	2164.3	66979	4x4MMMO	23.66	23.73
CA_66C	Band 66	1	20M	1745	132322	QPSK	1	0	4x4MMMO	Band 66	20M	2164.8	66984	4x4MMMO	23.66	23.73

3CA DL																			
3CA List	POC								SOC1					SOC2				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
	Band	Ant	(MHz)	Freq. (MHz)	Channel		RB	RB Offset		Band	(MHz)	Freq. (MHz)	Channel		Band	(MHz)	Freq. (MHz)	Channel	
CA_2A-7A-7A	Band 2	2	20M	1880	18900	QPSK	1	0	4x4MIMO	Band 7	20M	2655	3100	4x4MIMO	Band 7	5M	2687.5	3425	4x4MIMO
	Band 7	3	20M	2535	21100	QPSK	1	0	4x4MIMO	Band 7	5M	2687.5	3425	4x4MIMO	Band 2	20M	1880	900	4x4MIMO
CA_2A-7C	Band 2	2	20M	1880	18900	QPSK	1	0	4x4MIMO	Band 7	20M	2655	3100	4x4MIMO	Band 7	20M	2554.8	3298	4x4MIMO
	Band 7	3	20M	2535	21100	QPSK	1	0	4x4MIMO	Band 7	20M	2554.8	3298	4x4MIMO	Band 2	20M	1880	900	4x4MIMO
CA_4A-7C	Band 4	1	20M	1732.5	30175	QPSK	1	0	4x4MIMO	Band 7	20M	2655	3100	4x4MIMO	Band 7	20M	2554.8	3298	4x4MIMO
	Band 7	3	20M	2535	21100	QPSK	1	0	4x4MIMO	Band 7	20M	2554.8	3298	4x4MIMO	Band 4	20M	2132.5	2175	4x4MIMO
CA_5A-7C	Band 5	4	10M	836.5	20525	QPSK	1	0	4x4MIMO	Band 7	20M	2655	3100	4x4MIMO	Band 7	20M	2554.8	3298	4x4MIMO
	Band 7	1	20M	2535	21100	QPSK	1	0	4x4MIMO	Band 7	20M	2554.8	3298	4x4MIMO	Band 5	10M	881.5	2525	4x4MIMO
CA_41A-41A-41A	Band 41	1	20M	2593	40620	QPSK	1	0	4x4MIMO	Band 41	9M	2687.5	41565	4x4MIMO	Band 41	20M	2306	39750	4x4MIMO
	Band 41	1	20M	2593	40620	QPSK	1	0	4x4MIMO	Band 41	20M	2612.8	40818	4x4MIMO	Band 41	20M	2632.6	41016	4x4MIMO
CA_41D	Band 2	2	20M	1880	18900	QPSK	1	0	4x4MIMO	Band 2	9M	1987.5	1175	4x4MIMO	Band 5	10M	881.5	2525	4x4MIMO
	Band 5	1	10M	836.5	20525	QPSK	1	0	4x4MIMO	Band 2	20M	1880	900	4x4MIMO	Band 2	5M	1987.5	1175	4x4MIMO
CA_2A-2A-5A	Band 2	2	20M	1880	18900	QPSK	1	0	4x4MIMO	Band 2	20M	1880	900	4x4MIMO	Band 2	5M	1987.5	1175	4x4MIMO
	Band 5	1	10M	836.5	20525	QPSK	1	0	4x4MIMO	Band 2	20M	1880	900	4x4MIMO	Band 2	5M	1987.5	1175	4x4MIMO