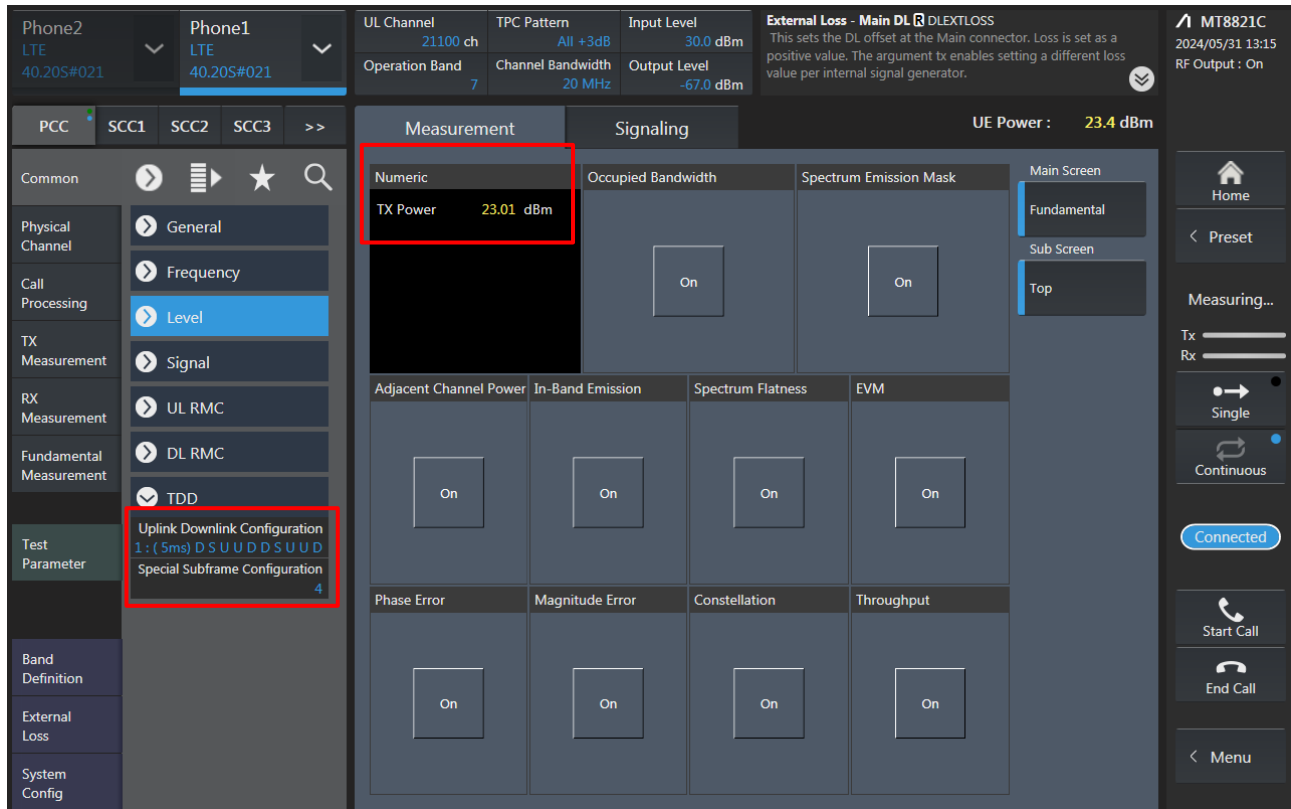


Power measurement connection diagram:

The power measurement for 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.

<LTE>



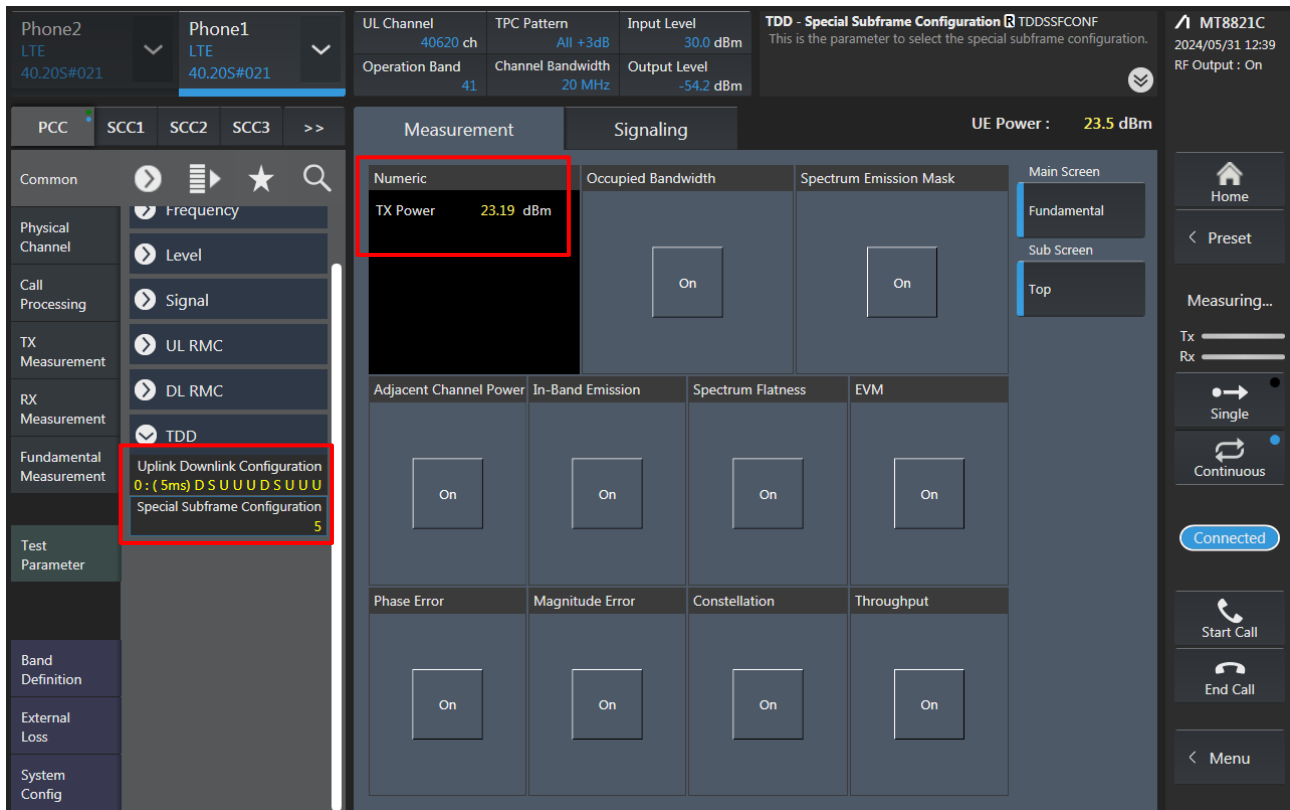
The screenshot displays the MT8821C software interface for LTE power measurement. The top status bar shows 'Phone1 LTE 40.20S#021' and 'UE Power: 23.4 dBm'. The main area is divided into several sections:

- Measurement:** Contains a table with the following data:

Measurement	Value
Numeric	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
- Test Parameter:** Contains a table with the following data:

Test Parameter	Value
Uplink Downlink Configuration	1: (5ms) D S U U D D S U U D
Special Subframe Configuration	4

The right sidebar includes navigation buttons (Home, Preset, Measuring...), a 'Connected' status indicator, and call control buttons (Start Call, End Call, Menu).

<LTE TDD Power class 3>

Phone2
LTE
40.20S#021

Phone1
LTE
40.20S#021

UL Channel 40620 ch
Operation Band 41
TPC Pattern All +3dB
Channel Bandwidth 20 MHz
Input Level 30.0 dBm
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

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
On

Spectrum Emission Mask
On

Adjacent Channel Power
On

In-Band Emission
On

Spectrum Flatness
On

EVM
On

Phase Error
On

Magnitude Error
On

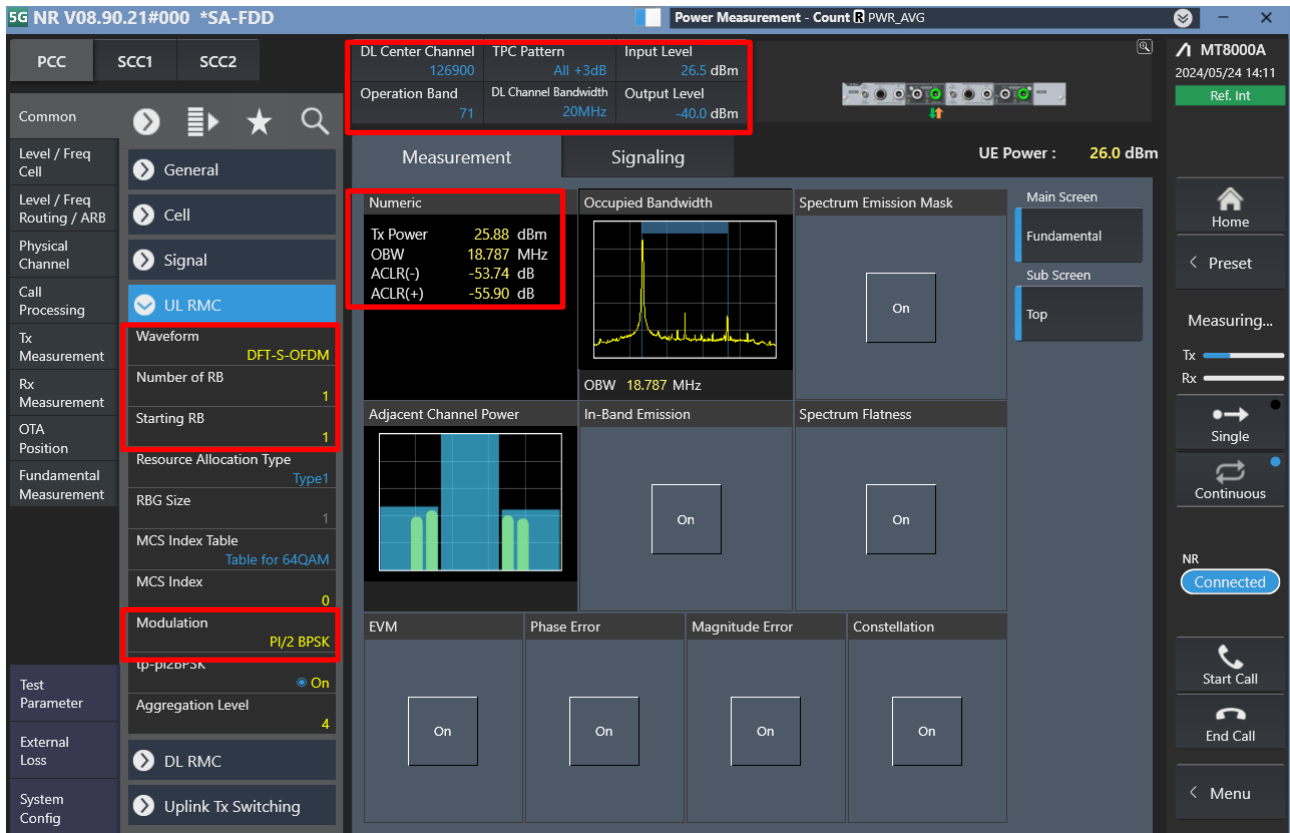
Constellation
On

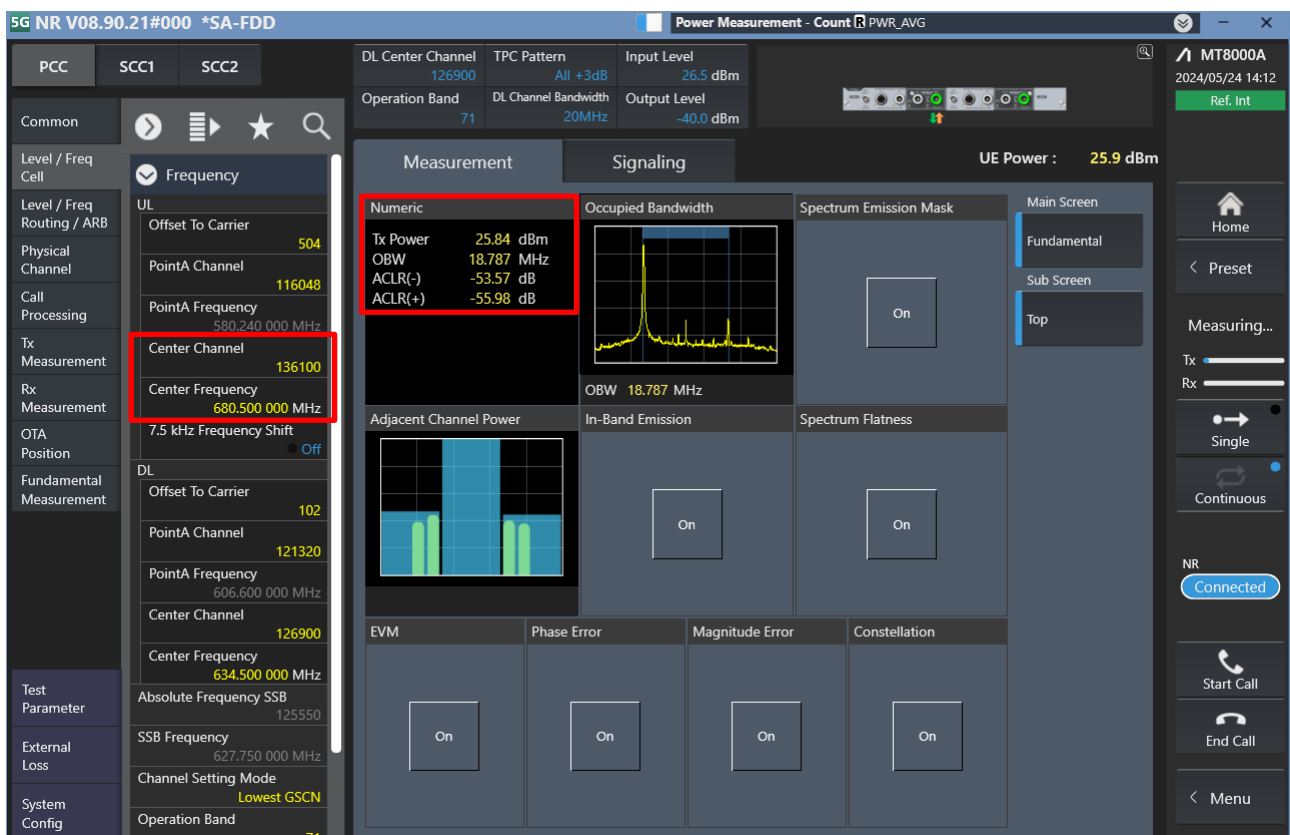
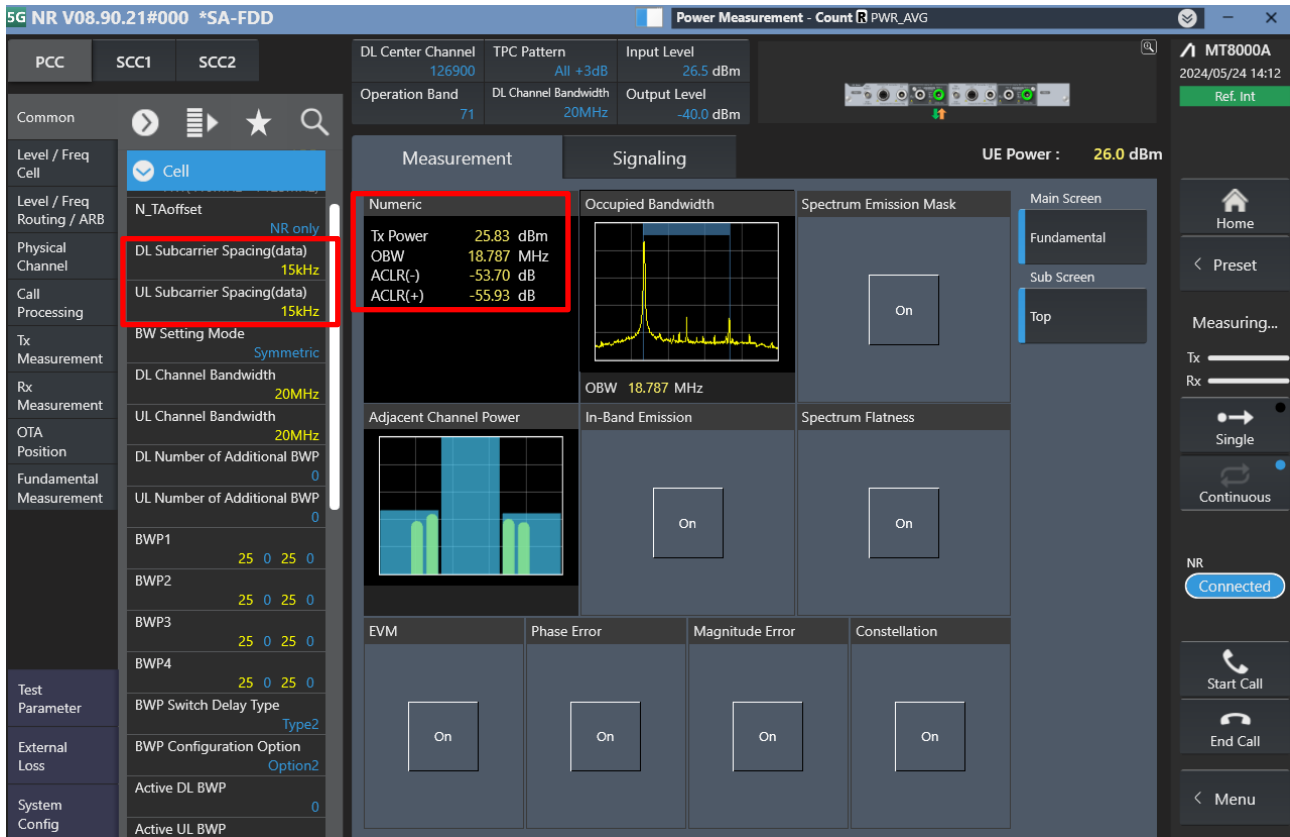
Throughput
On

Main Screen
Fundamental
Sub Screen
Top

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

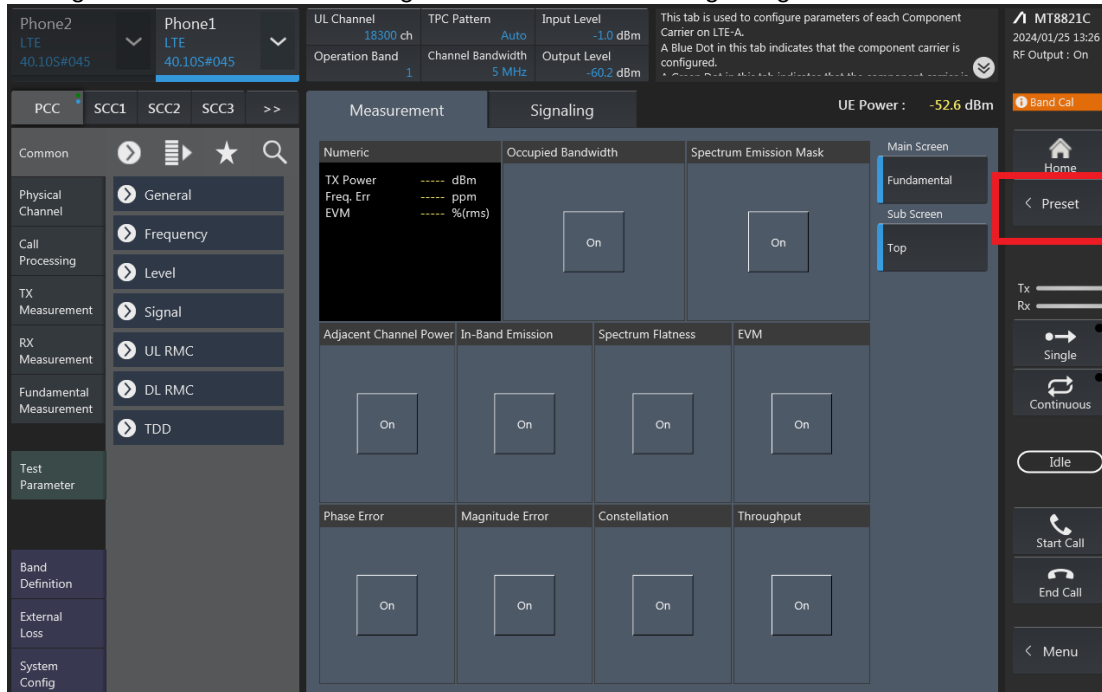
<5G NR FR1>





LTE Uplink and Downlink Carrier Aggregation configurations:

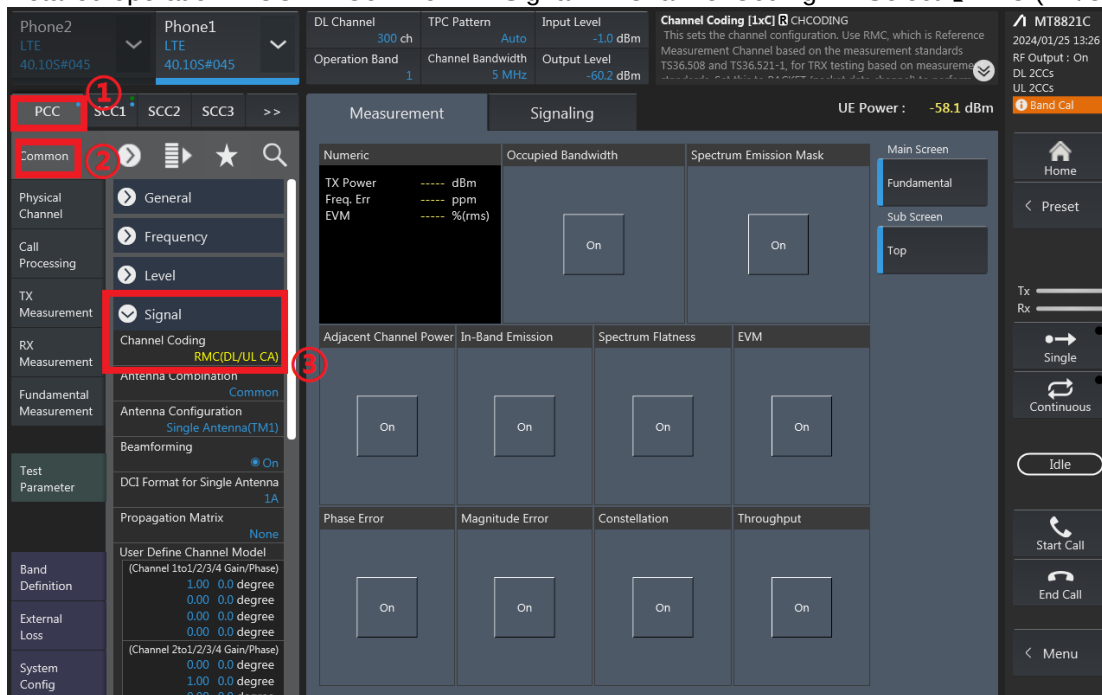
1. Change the Scenario in the Configuration of Phone1 LTE Signaling and Preset.



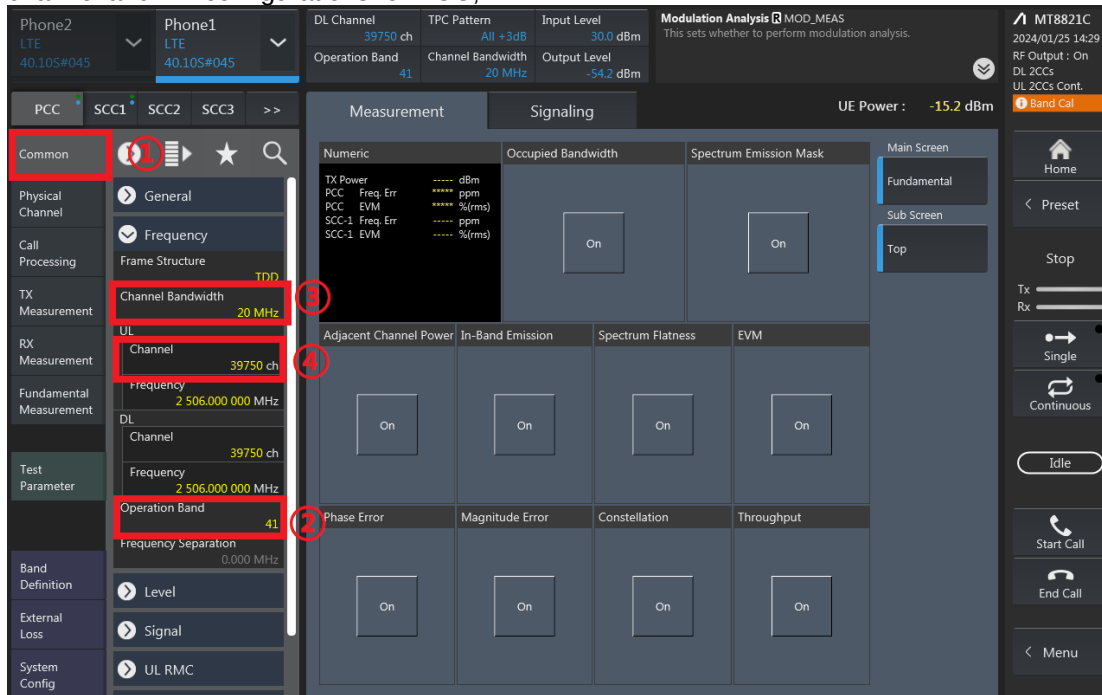
2. If Select "RMC (DL/UL CA)" for Uplink Carrier Aggregation;
If Select "RMC (DL CA)" for Downlink Carrier Aggregation.

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.

UE Power : -15.2 dBm

Measurement Signaling

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

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

Occupied Bandwidth

Spectrum Emission Mask

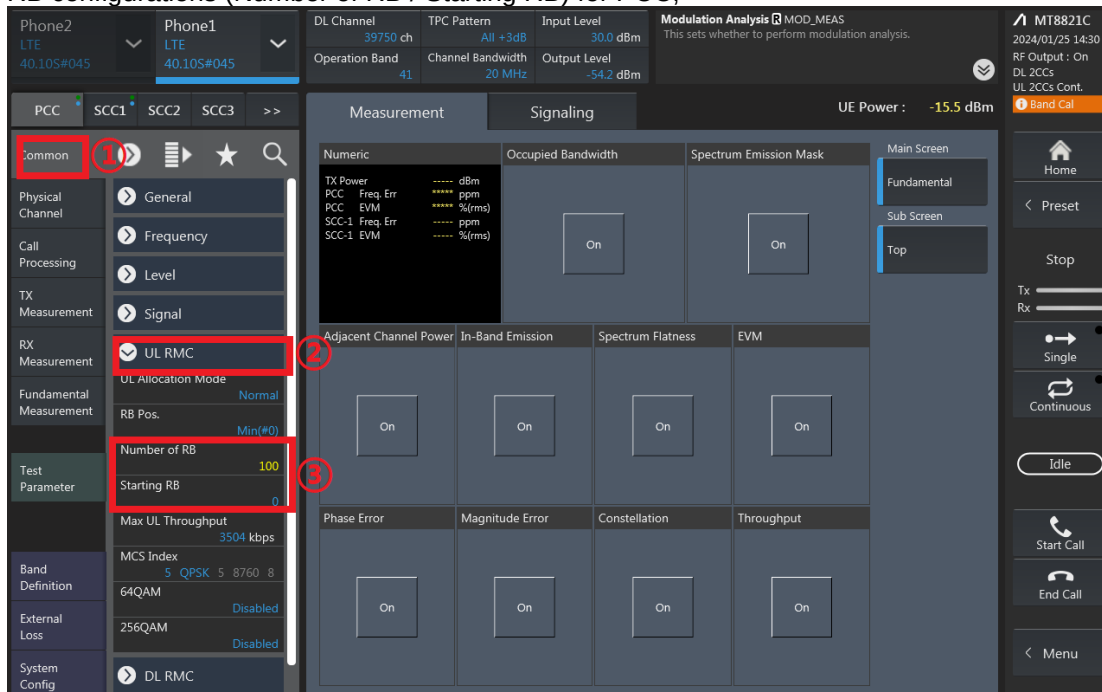
Main Screen Fundamental Sub Screen Top

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

Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

Phase Error Magnitude Error Constellation Throughput

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.

UE Power : -15.5 dBm

Measurement Signaling

Common

Physical Channel General

Call Processing Level

TX Measurement Signal

RX Measurement UL RMC

Fundamental Measurement UL Allocation Mode Normal RB Pos. Min(#0)

Test Parameter Number of RB 100 Starting RB 0 Max UL Throughput 3504 kbps

Band Definition MCS Index 5 QPSK 5 8760 8 64QAM

External Loss 256QAM Disabled

System Config DL RMC

Numeric

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

Occupied Bandwidth

Spectrum Emission Mask

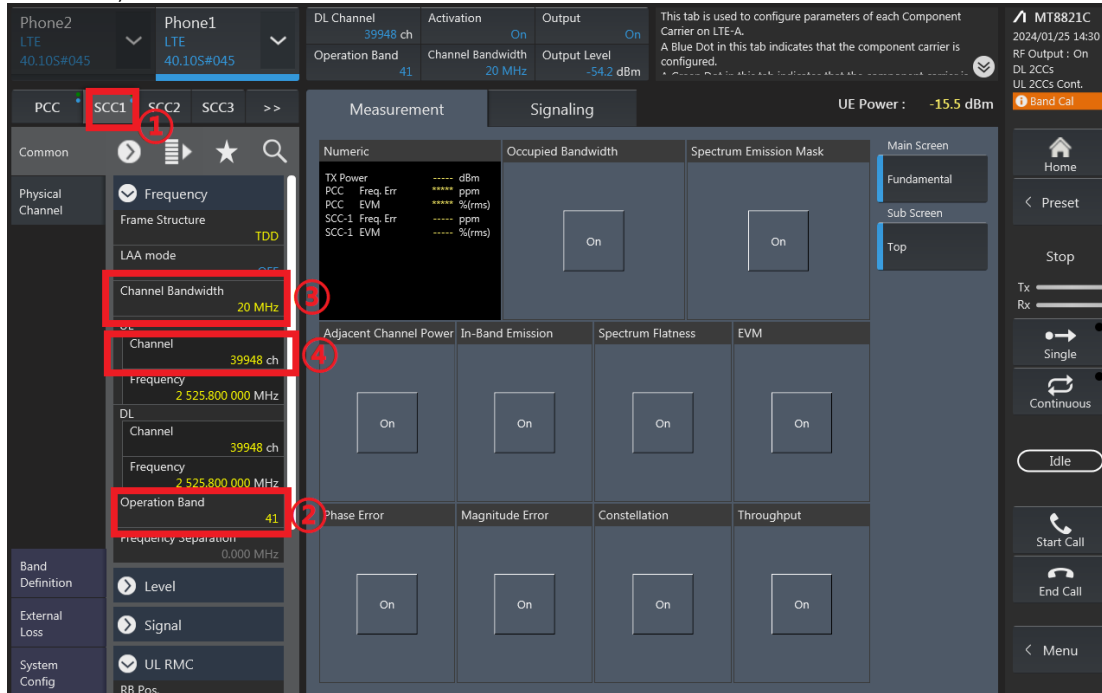
Main Screen Fundamental Sub Screen Top

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

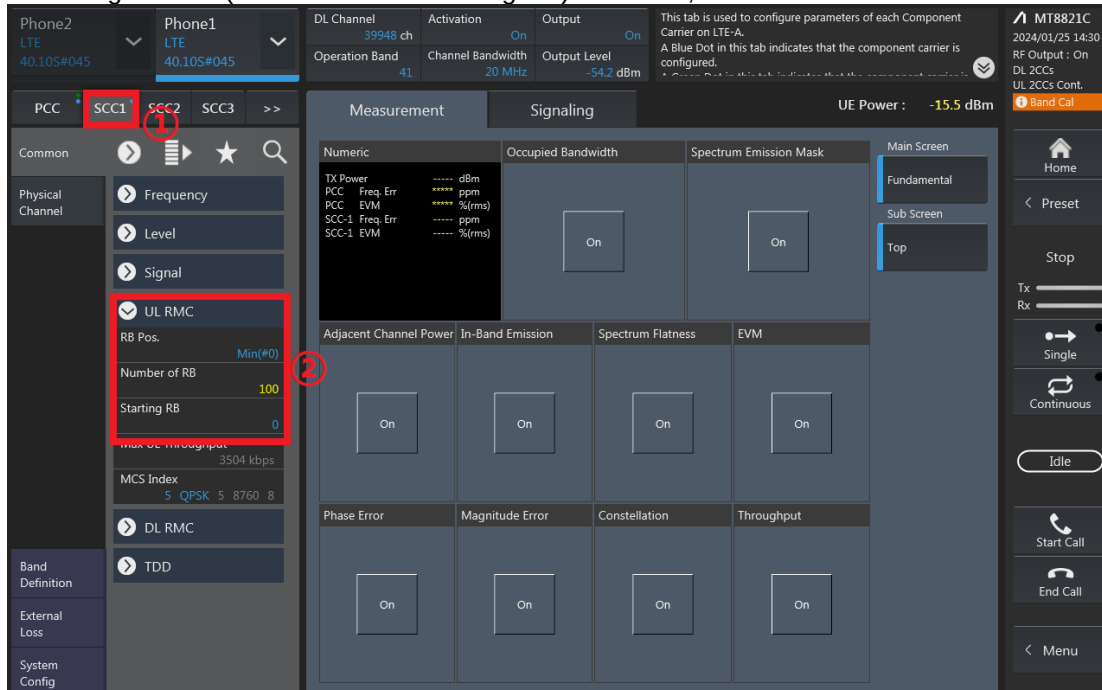
Adjacent Channel Power In-Band Emission Spectrum Flatness EVM

Phase Error Magnitude Error Constellation Throughput

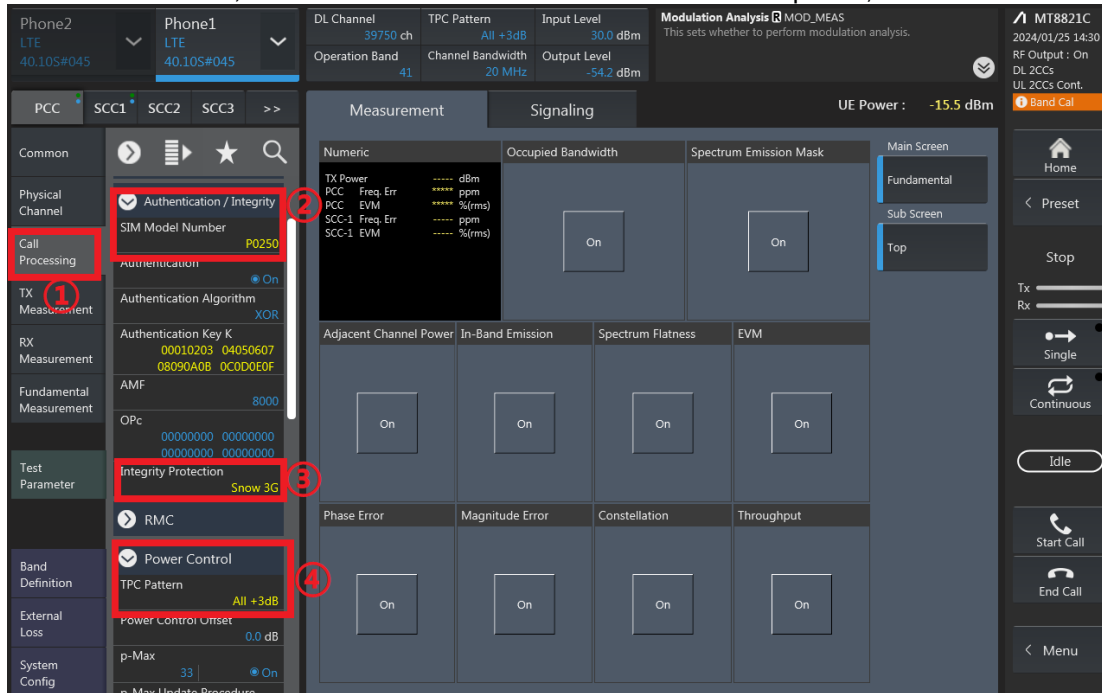
4. SCC parameter Settings: Select the SCC1 tab, Set operating band, BW, channel, and RB configurations for SCC1;



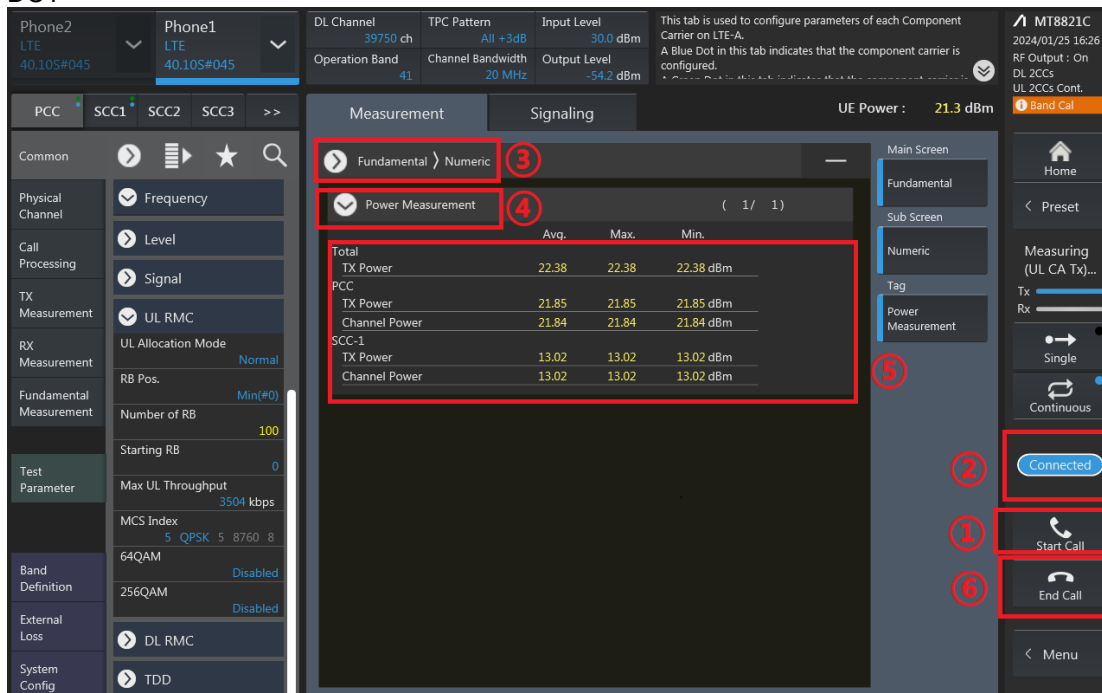
RB configurations (Number of RB / Starting RB) for SCC1;



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.

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)		
CA Band	CA_4A-7A	4	20	1732.5	20175	QPSK	1	0	7	20	2655	3100	22.73	22.78		
	CA_29A-66A	66	20M	1720	132072	QPSK	1	49	Band 29	10M	722.5	9715	22.77	22.85		
	CA_41C	41	20	2549.5	40185	QPSK	1	0	41	20	2569.3	40383	23.03	23.24		

3CC																		
Configure	CA Configuration (BCS)	PCC							SCC1				SCC2				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	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
CA Band	CA_2A-4A-5A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	5	10	881.5	2525	22.33	22.56
	CA_2A-5A-66A	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	66	20	2155	66886	22.41	22.56
	CA_2A-5B	2	20	1880	18900	QPSK	1	0	5	10	884	2550	5	5	891.2	2622	22.36	22.56
	CA_4A-5B	4	20	1732.5	20175	QPSK	1	0	5	10	884	2550	5	5	891.2	2622	22.69	22.78
	CA_4A-48C	4	20	1732.5	20175	QPSK	1	0	48	20	3625	55990	48	20	3644.5	56188	22.69	22.78
	CA_66A-66A-66A	66	20	1745	132322	QPSK	1	0	66	20	2120	66536	66	20	2190	67236	22.71	22.85
	CA_66A-66C	66	20	1745	132322	QPSK	1	0	66	20	2185	67186	66	5	2196.7	67303	22.66	22.85
	CA_4A-4A-71A	4	20	1745	20300	QPSK	1	0	4	5	2112.5	1975	71	20	634.5	68786	22.69	22.78
	CA_5A-7A-66A	5	10	829	20450	QPSK	1	0	7	20	2630	2850	66	20	2155	66886	22.87	22.95
	CA_2A-12A-30A	2	20	1880	18900	QPSK	1	0	12	10	737.5	5095	30	10	2355	9820	22.38	22.56
	CA_2A-5A-30A	2	20	1880	18900	QPSK	1	0	5	10	881.5	2525	30	10	2355	9820	22.33	22.56
	CA_4A-12A-30A	4	20	1745	20300	QPSK	1	0	12	10	737.5	5095	30	10	2355	9820	22.63	22.78
	CA_4A-5A-30A	4	20	1745	20300	QPSK	1	0	5	10	881.5	2525	30	10	2355	9820	22.64	22.78
	CA_5A-30A-66A	5	10	829	20450	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	22.89	22.95
	CA_12A-30A-66A	12	10	707.5	23095	QPSK	1	0	30	10	2355	9820	66	20	2155	66886	22.60	22.85
	CA_7A-66A-66A	7	20	2535	21100	QPSK	1	0	66	20	2120	66536	66	20	2190	67236	22.51	22.64
	CA_2A-29A-30A	2	20M	1880	18900	QPSK	1	49	Band 30	10M	2355	9820	Band 29	10M	722.5	9715	22.61	22.66
	CA_4A-29A-30A	4	20M	1732.5	20175	QPSK	1	49	Band 30	10M	2355	9820	Band 29	10M	722.5	9715	22.70	22.73

4CC																						
Configure	CA Configuration (BCS)	PCC							SCC1				SCC2				SCC3				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	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
CA Band	CA_2A-2A-4A-4A	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	4	20	2132.5	2175	4	5	2152.5	2375	22.31	22.56
	CA_2A-2A-66A-66A	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	66	20	2120	66536	66	20	2190	67236	22.37	22.56
	CA_2A-2A-66C	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	66	20	2185	67186	66	5	2196.7	67303	22.49	22.56
	CA_5A-5A-66A-66A	5	10	829	20450	QPSK	1	0	5	10	889	2600	66	20	2155	66886	66	5	2197.5	67311	22.82	22.95
	CA_2A-2A-66B	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	66	10	2150.1	66837	66	10	2160	66936	22.34	22.56
	CA_2A-2A-4A-12A	2	20	1880	18900	QPSK	1	0	2	5	1932.5	625	4	20	2132.5	2175	12	10	737.5	5095	22.45	22.56
	CA_2A-2A-12A-66A	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	12	10	737.5	5095	66	20	2155	66886	22.51	22.56
	CA_2A-4A-12B	2	20M	1880	18900	QPSK	1	49	4	20M	2132.5	2175	12	5M	733.8	5058	12	10M	741	5130	22.51	22.56
	CA_2A-12A-66A-66A	2	20	1880	18900	QPSK	1	0	12	10	737.5	5095	66	20	2155	66886	66	5	2197.5	67311	22.41	22.56
	CA_2A-66C-71A	2	20	1880	18900	QPSK	1	0	66	20	2155	66886	66	20	2174.8	67084	71	20	637	68786	22.41	22.56
	CA_4A-4A-12B	4	20	1745	20300	QPSK	1	0	4	5	2112.5	1975	12	5M	733.8	5058	12	10M	741	5130	22.55	22.78
	CA_12B-66A-66A	66	20	1745	132322	QPSK	1	0	66	20	2120	66536	12	5M	733.8	5058	12	10M	741	5130	22.75	22.85
	CA_2A-2A-4A-71A	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	4	20	2132.5	2175	71	20	634.5	68786	22.48	22.56
	CA_2A-2A-66A-71A	2	20	1880	18900	QPSK	1	0	2	5	1987.5	1175	66	20	2155	66886	71	20	634.5	68786	22.43	22.56
	CA_2A-66A-66A-71A	2	20	1880	18900	QPSK	1	0	66	20	2155	66886	66	5	2197.5	67311	71	20	634.5	68786	22.47	22.56
	CA_2A-12A-66C	2	20	1880	18900	QPSK	1	0	12	10	737.5	5095	66	20	2185	67186	66	5	2196.7	67303	22.51	22.56
	CA_2A-4A-4A-12A	2	20	1880	18900	QPSK	1	0	4	20	2132.5	2175	4	5	2152.5	2375	12	10	737.5	5095	22.32	22.56
	CA_2C-66A-66A	2	20	1870.1	18801	QPSK	1	0	2	20	1969.9	999	66	20	2120	66536	66	20	2190	67236	22.47	22.56
	CA_7C-66A-66A	7	20	2535	21100	QPSK	1	0	7	20	2674.8	3298	66	20	2120	66536	66	20	2190	67236	22.52	22.64

UL CA Power

CA_2C_Ant 1								
Combination 20MHz+20MHz (100RB+100RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset		Tune up Power (dBm)
18700	18898	QPSK	1	0	0	0	DSI 0	22.48
18900	19098	QPSK	1	0	0	0	DSI 0	22.51
19100	18902	QPSK	1	0	0	0	DSI 0	22.36
18700	18898	QPSK	1	0	0	0	DSI 1	18.52
18900	19098	QPSK	1	0	0	0	DSI 1	18.50
19100	18902	QPSK	1	0	0	0	DSI 1	18.56

CA_5B_Ant 1								
Combination 10MHz+10MHz (50RB+50RB)								
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)
			RB Size	RB offset	RB Size	RB offset		Tune up Power (dBm)
20450	20549	QPSK	1	0	0	0	DSI 0	22.58
20575	20476	QPSK	1	0	0	0	DSI 0	22.67
20600	20501	QPSK	1	0	0	0	DSI 0	22.65
20450	20549	QPSK	1	0	0	0	DSI 1	20.55
20575	20476	QPSK	1	0	0	0	DSI 1	20.72
20600	20501	QPSK	1	0	0	0	DSI 1	20.68

CA_7C_Ant 1									
Combination 20MHz+20MHz (100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset			
20850	21048	QPSK	1	0	0	0	DSI 0	22.16	24
21001	21199	QPSK	1	0	0	0	DSI 0	22.24	24
21152	21350	QPSK	1	0	0	0	DSI 0	22.31	24
20850	21048	QPSK	1	0	0	0	DSI 1	18.37	19.2
21001	21199	QPSK	1	0	0	0	DSI 1	18.28	19.2
21152	21350	QPSK	1	0	0	0	DSI 1	18.25	19.2

CA_12B_Ant 1									
Combination 5MHz+10MHz (100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset			
23038	23110	QPSK	1	0	0	0	DSI 0	22.45	24
23048	23120	QPSK	1	0	0	0	DSI 0	22.46	24
23058	23130	QPSK	1	0	0	0	DSI 0	22.42	24
23038	23110	QPSK	1	0	0	0	DSI 1	20.48	22
23048	23120	QPSK	1	0	0	0	DSI 1	20.49	22
23058	23130	QPSK	1	0	0	0	DSI 1	20.46	22

CA_66B_Ant 1									
Combination 15MHz+5MHz (75RB+25RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset			
132047	132140	QPSK	1	0	0	0	DSI 0	22.47	24
132322	132229	QPSK	1	0	0	0	DSI 0	22.36	24
132597	132504	QPSK	1	0	0	0	DSI 0	22.33	24
132047	132140	QPSK	1	0	0	0	DSI 1	18.55	20
132322	132229	QPSK	1	0	0	0	DSI 1	18.46	20
132597	132504	QPSK	1	0	0	0	DSI 1	18.32	20

CA_66C_Ant 1									
Combination 20MHz+20MHz (100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset			
132072	132270	QPSK	1	0	0	0	DSI 0	22.55	24
132322	132124	QPSK	1	0	0	0	DSI 0	22.57	24
132572	132374	QPSK	1	0	0	0	DSI 0	22.54	24
132072	132270	QPSK	1	0	0	0	DSI 1	18.55	20
132322	132124	QPSK	1	0	0	0	DSI 1	18.63	20
132572	132374	QPSK	1	0	0	0	DSI 1	18.51	20

CA_41C_Ant 2									
Combination 20MHz+20MHz (100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Power Reduction	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset			
39750	39948	QPSK	1	0	0	0	DSI 0	22.64	24
40185	39987	QPSK	1	0	0	0	DSI 0	22.91	24
40620	40422	QPSK	1	0	0	0	DSI 0	23.21	24
41055	40857	QPSK	1	0	0	0	DSI 0	23.15	24
41490	41292	QPSK	1	0	0	0	DSI 0	23.14	24
39750	39948	QPSK	1	0	0	0	DSI 1	19.77	21
40185	39987	QPSK	1	0	0	0	DSI 1	20.08	21
40620	40422	QPSK	1	0	0	0	DSI 1	20.37	21
41055	40857	QPSK	1	0	0	0	DSI 1	20.31	21
41490	41292	QPSK	1	0	0	0	DSI 1	20.38	21