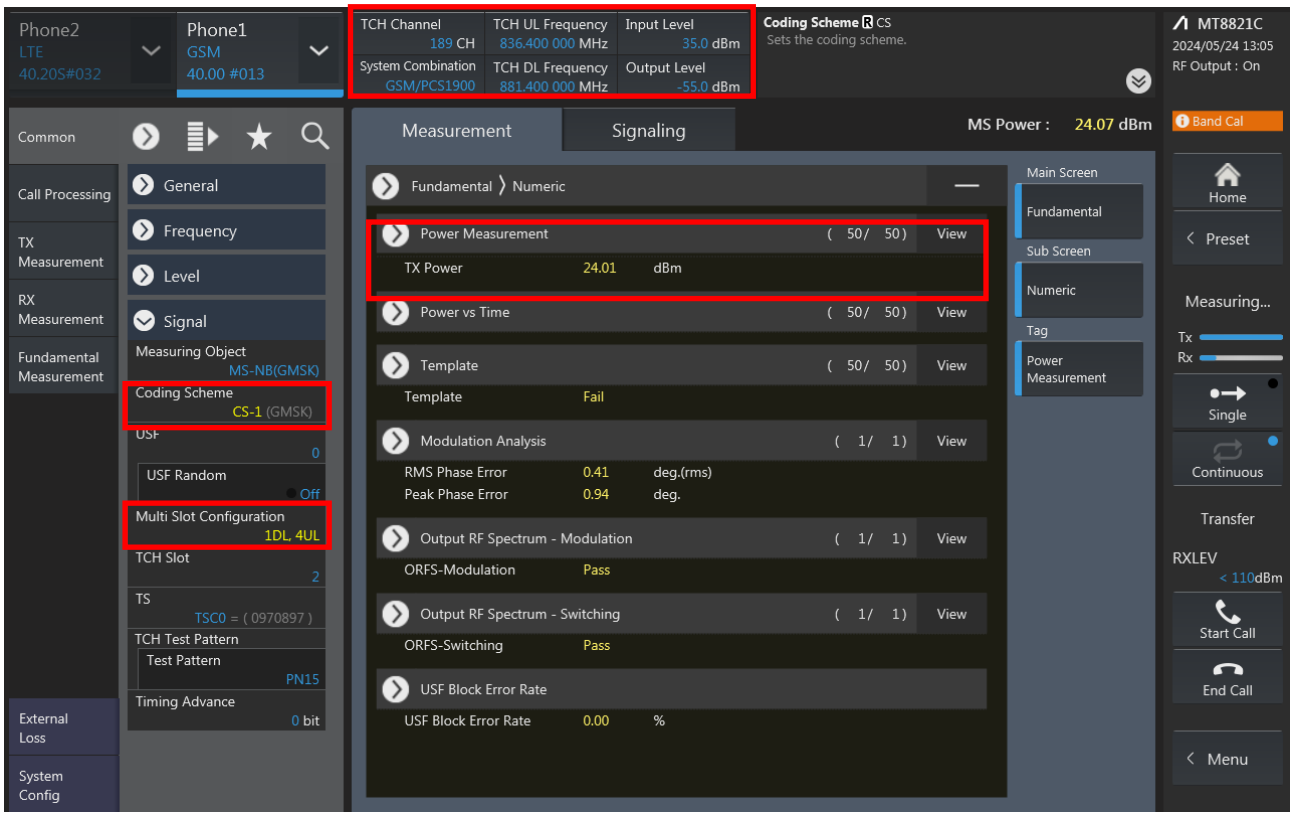
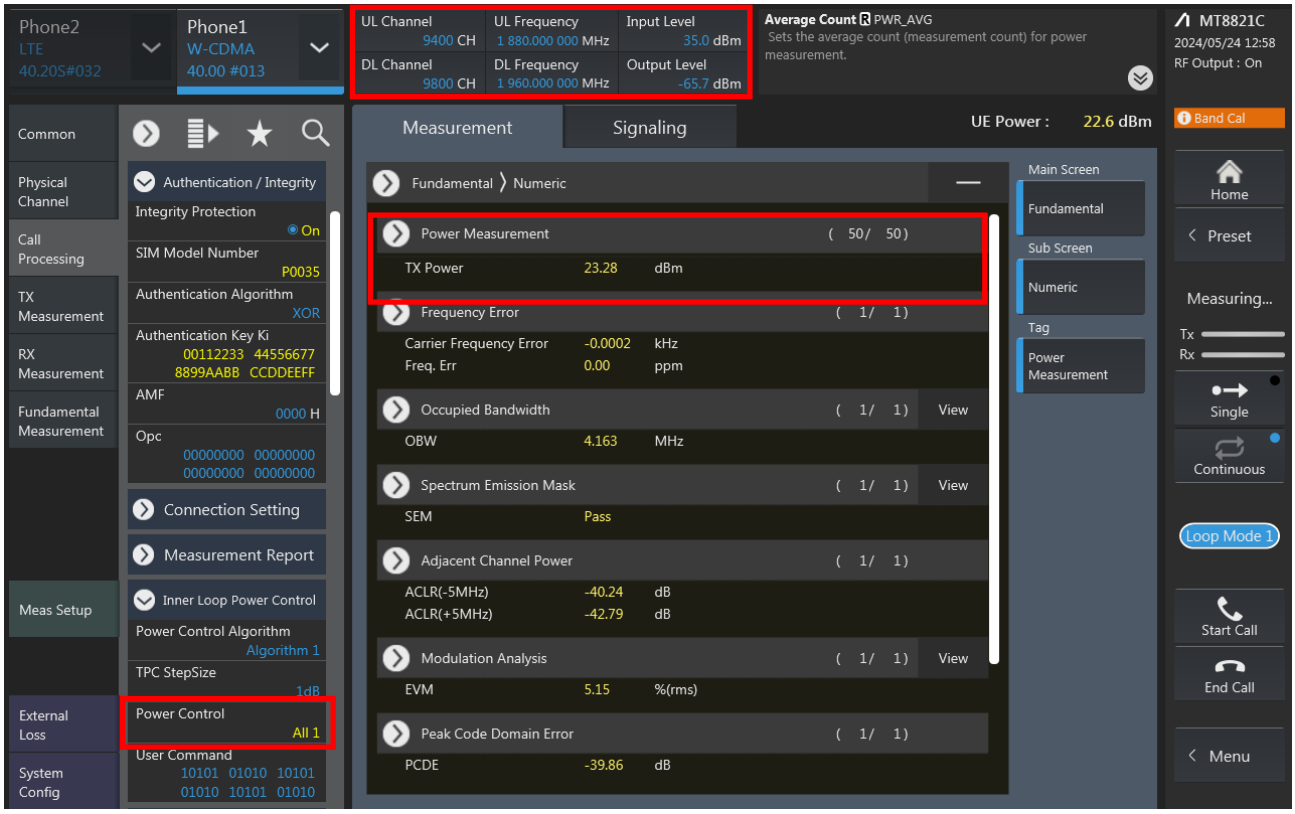
Appendix D-3. 2G/3G/LTE/5G FR1/UL and DL CA connection diagram

General Note:
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.

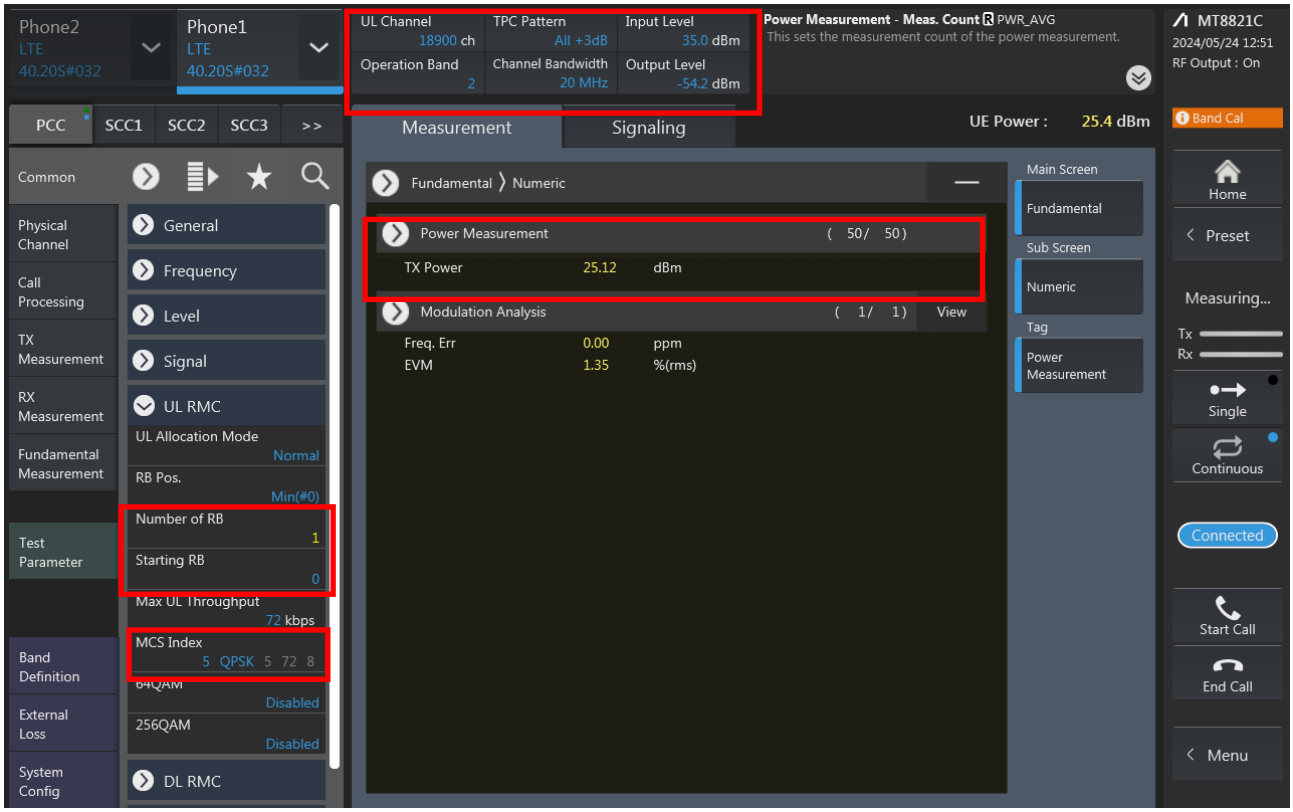
GSM



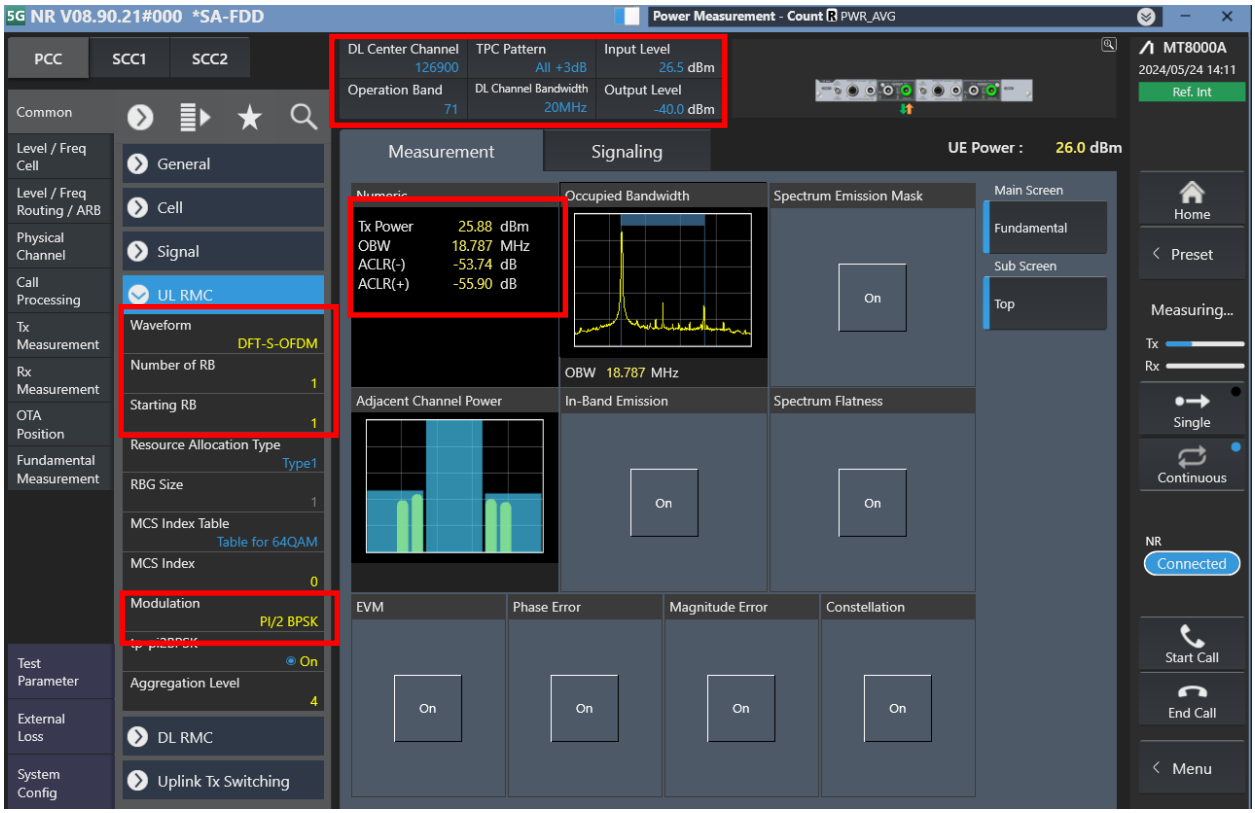
WCDMA

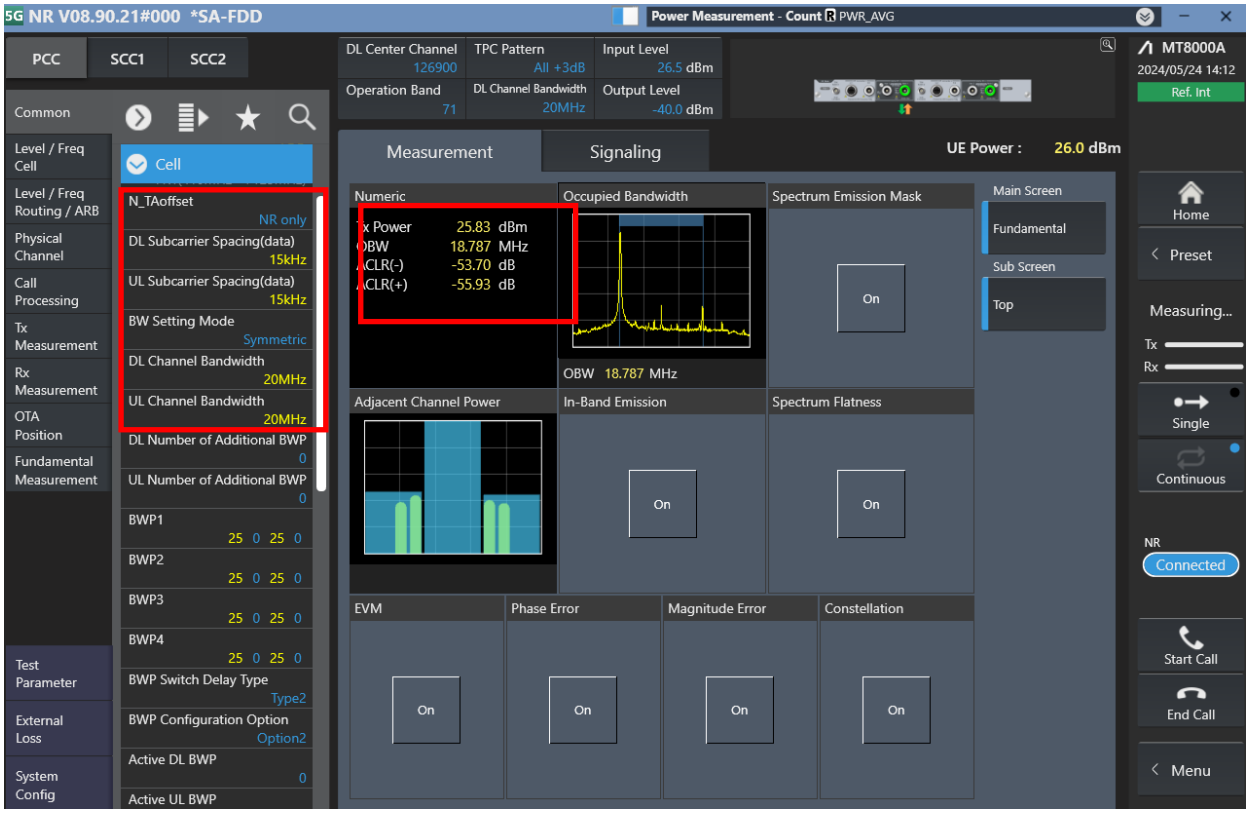

Phone2
LTE
40.20S#032
Phone1
W-CDMA
40.00 #013
UL Channel
9400 CH
UL Frequency
1 880.000 000 MHz
Input Level
35.0 dBm
DL Channel
9800 CH
DL Frequency
1 960.000 000 MHz
Output Level
-65.7 dBm
Average Count R PWR_AVG
Sets the average count (measurement count) for power measurement.
MT8821C
2024/05/24 12:58
RF Output : On
Band Cal
Common
Physical Channel
Call Processing
TX Measurement
RX Measurement
Fundamental Measurement
Meas Setup
External Loss
System Config
Authentication / Integrity
Integrity Protection
On
SIM Model Number
P0035
Authentication Algorithm
XOR
Authentication Key Ki
00112233 44556677
8899AABB CCDDEEFF
AMF
0000 H
Opc
00000000 00000000
00000000 00000000
Connection Setting
Measurement Report
Inner Loop Power Control
Power Control Algorithm
Algorithm 1
TPC StepSize
1dB
Power Control
All 1
User Command
10101 01010 10101
01010 10101 01010
Measurement
Signaling
UE Power : 22.6 dBm
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) View
OBW 4.163 MHz
Spectrum Emission Mask (1/ 1) View
SEM Pass
Adjacent Channel Power (1/ 1)
ACLR(-5MHz) -40.24 dB
ACLR(+5MHz) -42.79 dB
Modulation Analysis (1/ 1) View
EVM 5.15 %(rms)
Peak Code Domain Error (1/ 1)
PCDE -39.86 dB
Main Screen
Fundamental
Sub Screen
Numeric
Tag
Power Measurement
Home
Preset
Measuring...
Tx
Rx
Single
Continuous
Loop Mode 1
Start Call
End Call
Menu

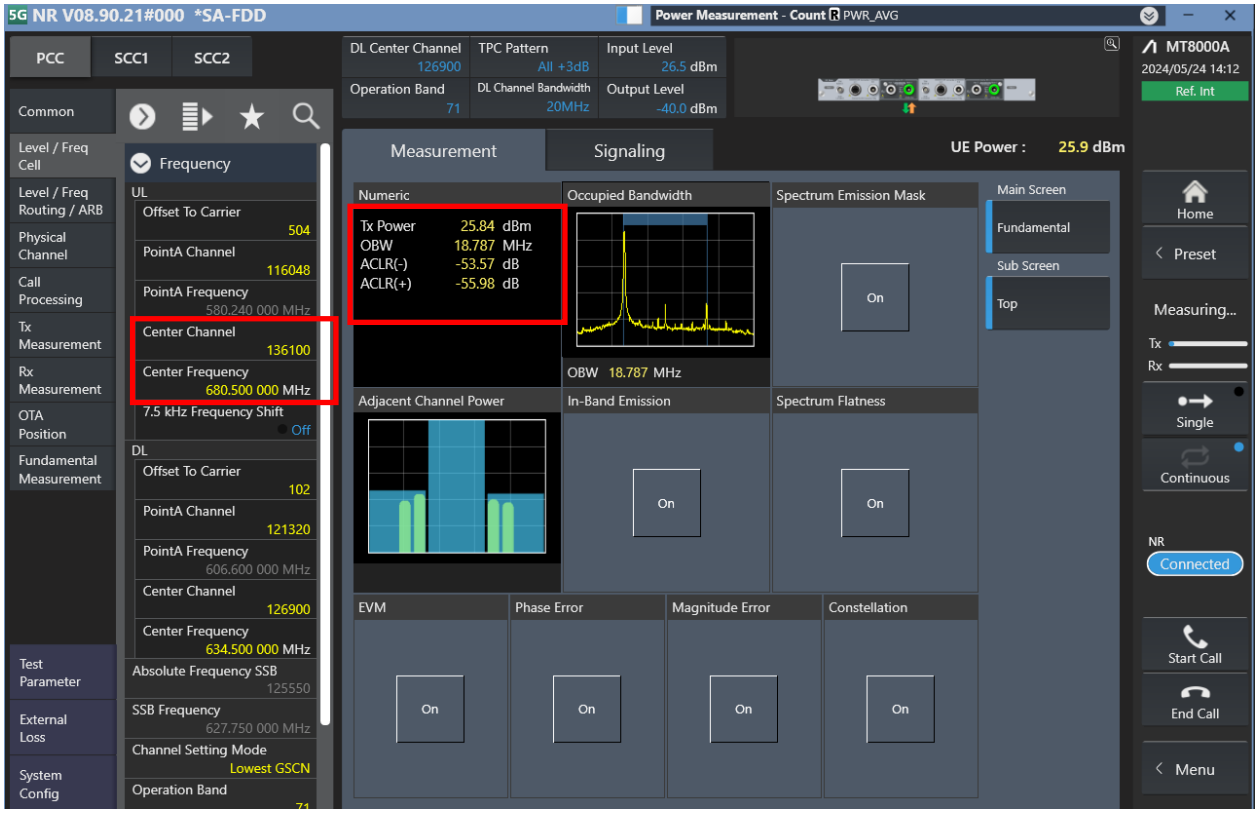
LTE


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 R PWR_AVG
This sets the measurement count of the power measurement.
MT8821C
2024/05/24 12:51
RF Output : On
Band Cal
PCC
SCC1
SCC2
SCC3
>>
Common
Physical Channel
Call Processing
TX Measurement
RX Measurement
Fundamental Measurement
Test Parameter
Band Definition
External Loss
System Config
General
Frequency
Level
Signal
UL RMC
UL Allocation Mode
Normal
RB Pos.
Min(#0)
Number of RB
1
Starting RB
0
Max UL Throughput
72 kbps
MCS Index
5 QPSK 5 72 8
64QAM
Disabled
256QAM
Disabled
DL RMC
Measurement
Signaling
UE Power : 25.4 dBm
Fundamental 〉 Numeric
Power Measurement (50/ 50)
TX Power 25.12 dBm
Modulation Analysis (1/ 1) View
Freq. Err 0.00 ppm
EVM 1.35 %(rms)
Main Screen
Fundamental
Sub Screen
Numeric
Tag
Power Measurement
Home
Preset
Measuring...
Tx
Rx
Single
Continuous
Connected
Start Call
End Call
Menu

5GNR FR1

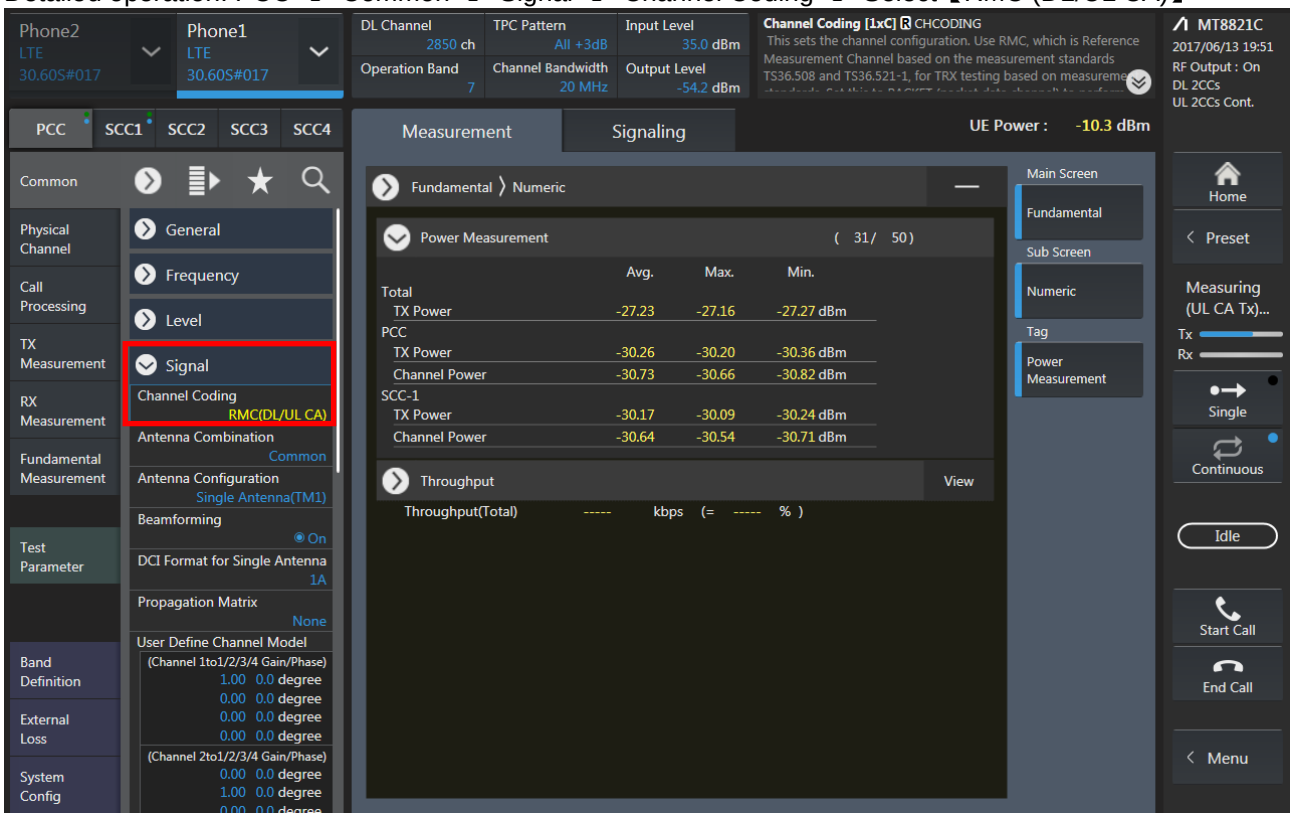

5G NR V08.90.21#000 *SA-FDD
Power Measurement - Count PWR_AVG
PCC
SCC1
SCC2
DL Center Channel
126900
TPC Pattern
All +3dB
Input Level
26.5 dBm
Operation Band
71
DL Channel Bandwidth
20MHz
Output Level
-40.0 dBm
MT8000A
2024/05/24 14:11
Ref. Int
Common
Measurement
Signaling
UE Power : 26.0 dBm
Level / Freq Cell
Level / Freq Routing / ARB
Physical Channel
Call Processing
Tx Measurement
Rx Measurement
OTA Position
Fundamental Measurement
General
Cell
Signal
UL RMC
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
On
Aggregation Level
4
DL RMC
Uplink Tx Switching
Test Parameter
External Loss
System Config
Tx Power 25.88 dBm
OBW 18.787 MHz
ACLR(-) -53.74 dB
ACLR(+) -55.90 dB
Occupied Bandwidth
OBW 18.787 MHz
Spectrum Emission Mask
On
Main Screen
Fundamental
Sub Screen
Top
Adjacent Channel Power
In-Band Emission
On
Spectrum Flatness
On
EVM
Phase Error
Magnitude Error
Constellation
On
On
On
On
Home
Preset
Measuring...
Tx
Rx
Single
Continuous
NR
Connected
Start Call
End Call
Menu


5G NR V08.90.21#000 *SA-FDD
Power Measurement - Count R PWR_AVG
PCC
SCC1
SCC2
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
MT8000A
2024/05/24 14:12
Ref. Int
Common
Level / Freq Cell
Level / Freq Routing / ARB
Physical Channel
Call Processing
Tx Measurement
Rx Measurement
OTA Position
Fundamental Measurement
Test Parameter
External Loss
System Config
Cell
N_TAoffset NR only
DL Subcarrier Spacing(data) 15kHz
UL Subcarrier Spacing(data) 15kHz
BW Setting Mode Symmetric
DL Channel Bandwidth 20MHz
UL Channel Bandwidth 20MHz
DL Number of Additional BWP 0
UL Number of Additional BWP 0
BWP1 25 0 25 0
BWP2 25 0 25 0
BWP3 25 0 25 0
BWP4 25 0 25 0
BWP Switch Delay Type Type2
BWP Configuration Option Option2
Active DL BWP 0
Active UL BWP
Measurement
Signaling
UE Power : 26.0 dBm
Numeric
x Power 25.83 dBm
OBW 18.787 MHz
ACLR(-) -53.70 dB
ACLR(+) -55.93 dB
Occupied Bandwidth
OBW 18.787 MHz
Spectrum Emission Mask
On
Main Screen
Fundamental
Sub Screen
Top
Adjacent Channel Power
In-Band Emission
On
Spectrum Flatness
On
EVM
Phase Error
Magnitude Error
Constellation
On
Home
Preset
Measuring...
Tx
Rx
Single
Continuous
NR
Connected
Start Call
End Call
Menu

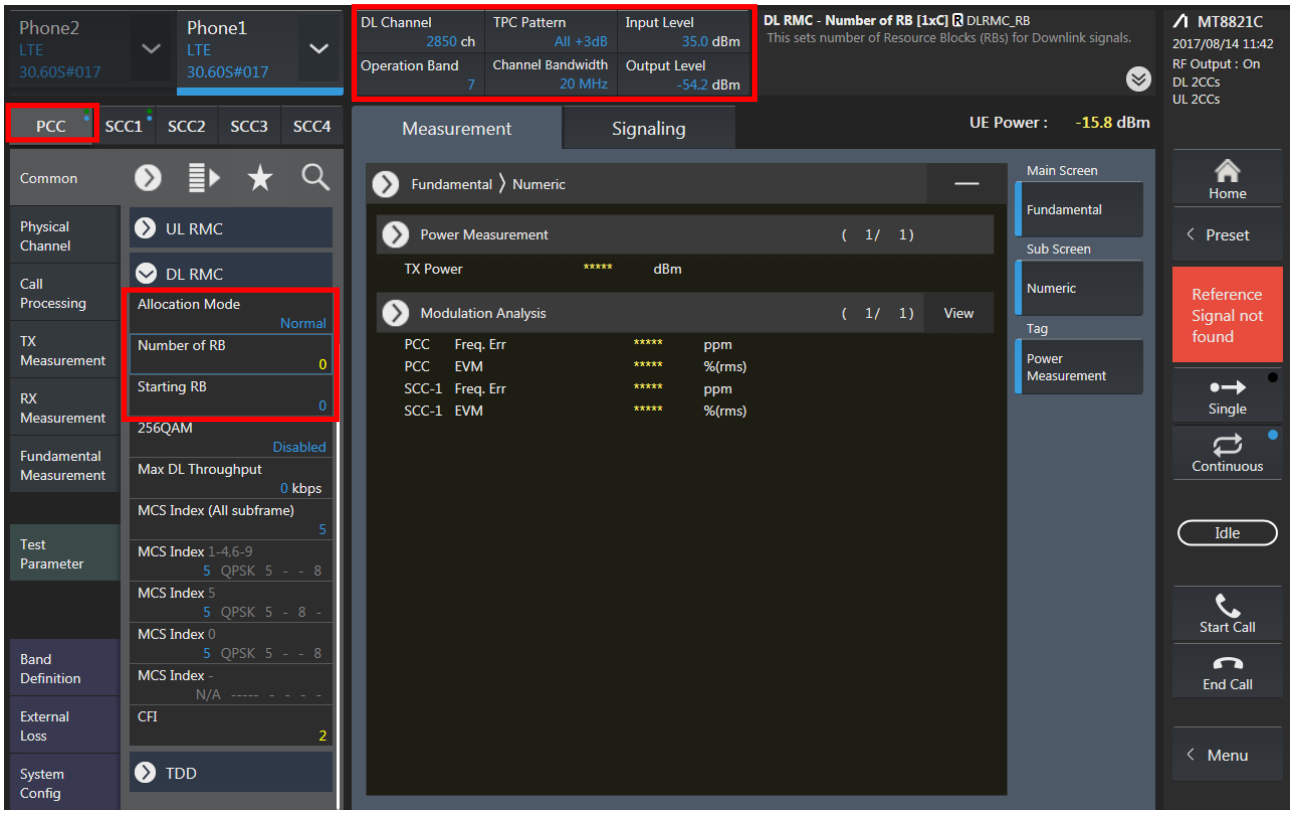

5G NR V08.90.21#000 *SA-FDD
Power Measurement - Count R PWR_AVG
PCC
SCC1
SCC2
DL Center Channel 126900
TPC Pattern All +3dB
Input Level 26.5 dBm
Operation Band 71
DL Channel Bandwidth 20MHz
Output Level -40.0 dBm
MT8000A
2024/05/24 14:12
Ref. Int
Common
Level / Freq Cell
Level / Freq Routing / ARB
Physical Channel
Call Processing
Tx Measurement
Rx Measurement
OTA Position
Fundamental Measurement
Test Parameter
External Loss
System Config
Frequency
UL
Offset To Carrier 504
PointA Channel 116048
PointA Frequency 580.240 000 MHz
Center Channel 136100
Center Frequency 680.500 000 MHz
7.5 kHz Frequency Shift Off
DL
Offset To Carrier 102
PointA Channel 121320
PointA Frequency 606.600 000 MHz
Center Channel 126900
Center Frequency 634.500 000 MHz
Absolute Frequency SSB 125550
SSB Frequency 627.750 000 MHz
Channel Setting Mode Lowest GSCN
Operation Band 71
Measurement
Signaling
UE Power : 25.9 dBm
Numeric
Tx Power 25.84 dBm
OBW 18.787 MHz
ACLR(-) -53.57 dB
ACLR(+) -55.98 dB
Occupied Bandwidth
OBW 18.787 MHz
Spectrum Emission Mask
On
Main Screen
Fundamental
Sub Screen
Top
Adjacent Channel Power
In-Band Emission
On
Spectrum Flatness
On
EVM
Phase Error
Magnitude Error
Constellation
On
Home
Preset
Measuring...
Tx
Rx
Single
Continuous
NR
Connected
Start Call
End Call
Menu

LTE Uplink and Downlink Carrier Aggregation configurations:

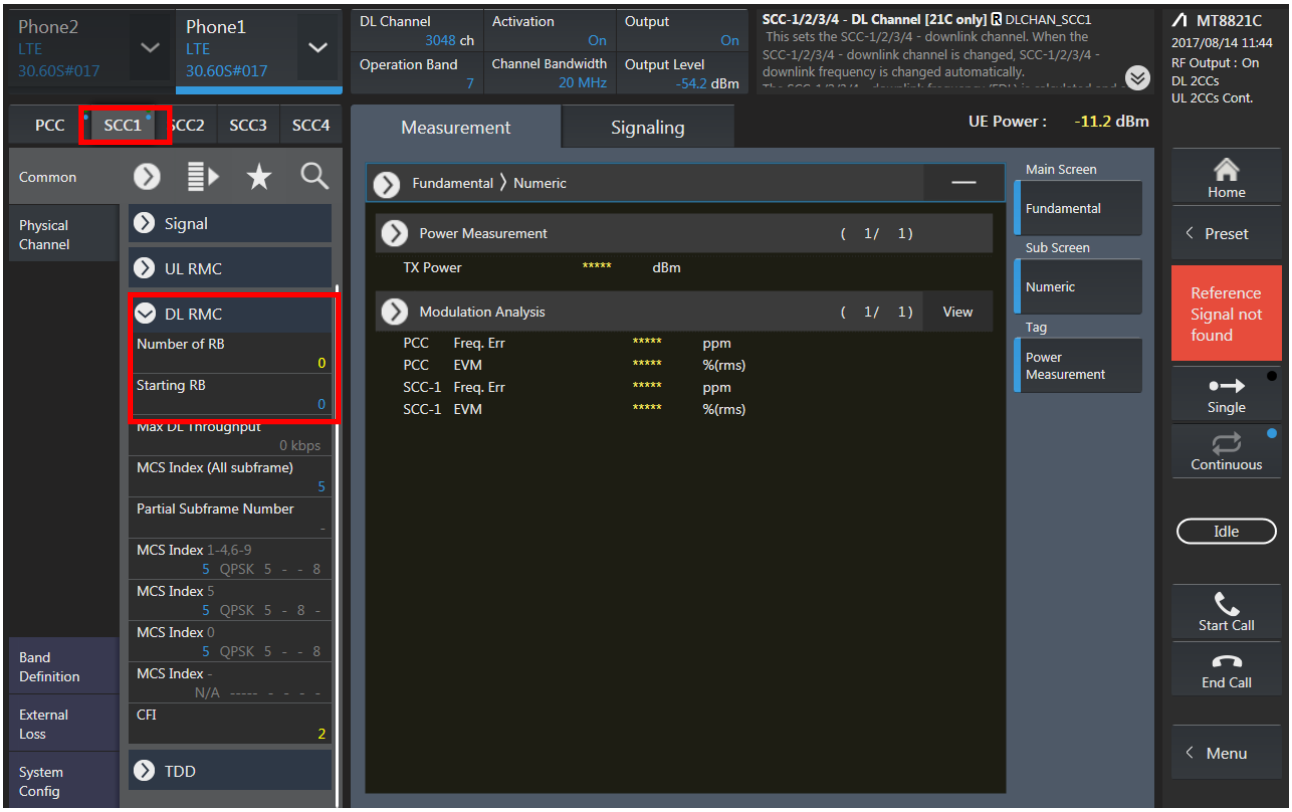
1. Select “RMC (DL/UL CA)” for Uplink Carrier Aggregation;
   Select “RMC (DL CA)” for Downlink Carrier Aggregation.
   For example, Uplink Carrier Aggregation:
   Detailed operation: PCC ➔ Common ➔ Signal ➔ Channel Coding ➔ Select【RMC (DL/UL CA)】



2. PCC parameter Settings: select the PCC tab and Set operating band, BW, channel and RB configurations for PCC.



3. SCC parameter Settings: select the SCC tab and Set operating band, BW, channel and RB configurations for SCC.



4. Select the PCC tab, and select max power;

Click the “Connect” button at the Right of the screen.