

Appendix H. – Power reduction verification

Per the May 2017 TCBC Workshop notes, demonstration of proper functioning of the power reduction mechanism is required to support the corresponding SAR Configurations.

The verification process was divided into two parts:

- 1) Evaluation of output power levels for individual triggering mechanism.
- 2) Evaluation of the triggering distances for proximity-based sensors.

1. Power Reduction Verification for Main Bands

The Hotspot power reduction applied to this product has a higher priority than the proximity sensor, so these two conditions do not work simultaneously. And in both cases, powers were reduced to the same Power level.

All Hotspot SAR evaluations for this device was performed at the maximum allowed output Power when Hotspot is activated. FCC KDB Publication 616217D04v01r02 section 6 was used as a guideline for selection SAR test distances for this device when being used in phablet use conditions.

For detailed measurement conducted power results, please refer to the Section .11

The Power verification was performed according to the following procedure:

1. A base station simulator was used to establish a conducted RF connection and output power was monitored. The Power measurements were conformed to be within expected tolerances for all states before and after a power reduction mechanism was triggered.
2. Step 1 was repeated for all relevant modes and frequency bands for the mechanism being investigated.
3. Step 1 and 2 were repeated for all individual power reduction mechanism and combinations thereof. For the combination cases, one mechanism was switched to a “Triggered” state at a time; powers were conformed to be within tolerance after each additional mechanism was activated.

| Mechanism(s) | Mode/Band | Conducted Power (dBm) | | |
|-----------------------|-------------------|--------------------------|---------------------------|---------------------------|
| | | Un-triggered (Max Power) | Triggered (Reduced Power) | Triggered (Reduced Power) |
| Grip | GSM/GPRS 1900 1Tx | 30.44 | 29.54 | |
| Grip | GSM/GPRS 1900 2Tx | 28.76 | 28.00 | |
| Grip | GSM/GPRS 1900 3Tx | 26.70 | 25.92 | |
| Grip | GSM/GPRS 1900 4Tx | 25.14 | 24.07 | |
| Grip | WCDMA B2 | 23.41 | 21.16 | |
| Grip | WCDMA B4 | 24.02 | 21.06 | |
| Grip | LTE Band 2 | 23.63 | 21.27 | |
| Grip | LTE Band 4 | 23.47 | 20.60 | |
| Grip | LTE Band 41 | 24.45 | 20.10 | |
| Grip | LTE Band 66 | 23.76 | 20.05 | |
| Grip | Sub 6 Band n66 | 24.61 | 20.65 | |
| Hotspot On | GSM/GPRS 1900 1Tx | 30.44 | 29.53 | |
| Hotspot On | GSM/GPRS 1900 2Tx | 28.76 | 28.01 | |
| Hotspot On | GSM/GPRS 1900 3Tx | 26.70 | 25.93 | |
| Hotspot On | GSM/GPRS 1900 3Tx | 25.14 | 24.08 | |
| Hotspot On | WCDMA B2 | 23.41 | 21.16 | |
| Hotspot On | WCDMA B4 | 24.02 | 21.09 | |
| Hotspot On | LTE Band 2 | 23.63 | 21.28 | |
| Hotspot On | LTE Band 4 | 23.47 | 20.64 | |
| Hotspot On | LTE Band 41 | 24.45 | 20.06 | |
| Hotspot On | LTE Band 66 | 23.76 | 20.05 | |
| Hotspot On | Sub 6 Band n66 | 24.61 | 20.64 | |
| Hotspot On, Then Grip | GSM/GPRS 1900 1Tx | 30.44 | 29.53 | 29.53 |
| Hotspot On, Then Grip | GSM/GPRS 1900 2Tx | 28.76 | 28.01 | 28.01 |
| Hotspot On, Then Grip | GSM/GPRS 1900 3Tx | 26.70 | 25.93 | 25.93 |
| Hotspot On, Then Grip | GSM/GPRS 1900 3Tx | 25.14 | 24.08 | 24.08 |
| Hotspot On, Then Grip | WCDMA B2 | 23.41 | 21.16 | 21.16 |
| Hotspot On, Then Grip | WCDMA B4 | 24.02 | 21.09 | 21.09 |
| Hotspot On, Then Grip | LTE Band 2 | 23.63 | 21.28 | 21.28 |
| Hotspot On, Then Grip | LTE Band 4 | 23.47 | 20.64 | 20.64 |
| Hotspot On, Then Grip | LTE Band 41 | 24.45 | 20.06 | 20.06 |
| Hotspot On, Then Grip | LTE Band 66 | 23.76 | 20.05 | 20.05 |
| Hotspot On, Then Grip | Sub 6 Band n66 | 24.61 | 20.64 | 20.64 |
| Grip, then Hotspot On | GSM/GPRS 1900 1Tx | 30.44 | 29.54 | 29.53 |
| Grip, then Hotspot On | GSM/GPRS 1900 2Tx | 28.76 | 28.00 | 28.01 |
| Grip, then Hotspot On | GSM/GPRS 1900 3Tx | 26.70 | 25.92 | 25.93 |
| Grip, then Hotspot On | GSM/GPRS 1900 3Tx | 25.14 | 24.07 | 24.08 |
| Grip, then Hotspot On | WCDMA B2 | 23.41 | 21.16 | 21.16 |
| Grip, then Hotspot On | WCDMA B4 | 24.02 | 21.06 | 21.09 |
| Grip, then Hotspot On | LTE Band 2 | 23.63 | 21.27 | 21.28 |
| Grip, then Hotspot On | LTE Band 4 | 23.47 | 20.60 | 20.64 |
| Grip, then Hotspot On | LTE Band 41 | 24.45 | 20.10 | 20.06 |
| Grip, then Hotspot On | LTE Band 66 | 23.76 | 20.05 | 20.05 |
| Grip, then Hotspot On | Sub 6 Band n66 | 24.61 | 20.65 | 20.64 |

1.1. Distance Verification Procedure for Main 1 Antenna

Procedures for determining proximity sensor triggering distances(KDB 616217D04v01r02\$6.2)
The distance verification procedure was performed according to the following procedure:

1. A base station simulator was used to establish an RF connection and to monitor the power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom.
2. The device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced,per KDB Publication 616217 D04v01r02.Each applicable test position was evaluated. The distances were conformed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Step 1 and 2 were repeated for the relevant modes, as appropriate
4. Steps1 through 3 were repeated for all distance-based power reduction mechanisms.

For detailed measurement conducted power results, please refer to the Section .11



Proximity Sensor Trigger Distance Assessment KDB 616217 D04\$6.2 (Rear /Bottom side)

LEGEND

- Direction of DUT travel for determination of power reduction triggering point
- Direction of DUT travel for determination of full power resumption triggering point

| Tissue simulating liquid | Trigger distance - Rear | | Trigger distance - Bottom | |
|--------------------------|----------------------------|-------------------------------|----------------------------|-------------------------------|
| | Moving toward phantom [mm] | Moving away from phantom [mm] | Moving toward phantom [mm] | Moving away from phantom [mm] |
| 1800MHz Tissue | 11 | 12 | 9 | 10 |
| 1900MHz Tissue | 11 | 12 | 9 | 10 |

Distance Measurement verification for Proximity sensor

Rear side – EUT Moving toward (trigger) to the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------------|------------------------------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|
| | 16[mm] | 15[mm] | 14[mm] | 13[mm] | 12[mm] | 11[mm] | 10[mm] | 9[mm] | 8[mm] | 7[mm] |
| GSM1900 /Voice | 30.41 | 30.45 | 30.44 | 30.42 | 30.42 | 29.47 | 29.48 | 29.48 | 29.47 | 29.46 |
| GSM1900 /GPRS 1Tx | 30.42 | 30.44 | 30.44 | 30.41 | 30.42 | 29.47 | 29.49 | 29.47 | 29.47 | 29.48 |
| GSM1900 /GPRS 2Tx | 28.74 | 28.72 | 28.74 | 28.72 | 28.73 | 28.00 | 27.99 | 28.01 | 27.98 | 28.01 |
| GSM1900 /GPRS 3Tx | 26.71 | 26.69 | 26.71 | 26.71 | 26.70 | 25.89 | 25.88 | 25.89 | 25.88 | 25.91 |
| GSM1900 /GPRS 4Tx | 25.12 | 25.14 | 25.12 | 25.12 | 25.13 | 24.05 | 24.08 | 24.06 | 24.05 | 24.06 |
| WCDMA B2 | 23.40 | 23.40 | 23.40 | 23.40 | 23.40 | 21.08 | 21.08 | 21.08 | 21.10 | 21.07 |
| WCDMA B4 | 23.78 | 23.78 | 23.80 | 23.80 | 23.80 | 20.82 | 20.83 | 20.82 | 20.81 | 20.83 |
| LTE Band 2 | 23.64 | 23.63 | 23.63 | 23.63 | 23.64 | 21.26 | 21.25 | 21.25 | 21.27 | 21.25 |
| LTE Band 4 | 23.46 | 23.46 | 23.46 | 23.45 | 23.45 | 20.58 | 20.57 | 20.57 | 20.57 | 20.58 |
| LTE Band 66 | 23.76 | 23.76 | 23.77 | 23.75 | 23.76 | 20.05 | 20.03 | 20.05 | 20.03 | 20.05 |
| Sub 6 Band n66 | 24.60 | 24.58 | 24.59 | 24.60 | 24.59 | 20.60 | 20.62 | 20.59 | 20.59 | 20.61 |

Rear side – EUT Moving away (Release) from the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------------|------------------------------------|-------|--------|--------|--------|--------|--------|--------|-------|--------|
| | 8[mm] | 9[mm] | 10[mm] | 11[mm] | 12[mm] | 13[mm] | 14[mm] | 15[mm] | 16mm] | 17[mm] |
| GSM1900 /Voice | 29.46 | 29.48 | 29.47 | 29.47 | 29.45 | 30.39 | 30.43 | 30.43 | 30.40 | 30.40 |
| GSM1900 /GPRS 1Tx | 29.45 | 29.48 | 29.46 | 29.46 | 29.47 | 30.40 | 30.44 | 30.43 | 30.41 | 30.40 |
| GSM1900 /GPRS 2Tx | 27.99 | 27.97 | 28.01 | 27.98 | 28.00 | 28.73 | 28.71 | 28.74 | 28.71 | 28.72 |
| GSM1900 /GPRS 3Tx | 25.88 | 25.87 | 25.88 | 25.88 | 25.90 | 26.70 | 26.67 | 26.70 | 26.69 | 26.69 |
| GSM1900 /GPRS 4Tx | 24.04 | 24.08 | 24.06 | 24.05 | 24.05 | 25.11 | 25.13 | 25.11 | 25.11 | 25.13 |
| WCDMA B2 | 21.07 | 21.08 | 21.06 | 21.09 | 21.06 | 23.38 | 23.40 | 23.38 | 23.38 | 23.39 |
| WCDMA B4 | 20.81 | 20.82 | 20.81 | 20.81 | 20.82 | 23.76 | 23.77 | 23.80 | 23.79 | 23.80 |
| LTE Band 2 | 21.25 | 21.24 | 21.24 | 21.27 | 21.24 | 23.62 | 23.62 | 23.63 | 23.62 | 23.62 |
| LTE Band 4 | 20.57 | 20.57 | 20.57 | 20.57 | 20.58 | 23.44 | 23.46 | 23.46 | 23.44 | 23.43 |
| LTE Band 66 | 20.04 | 20.01 | 20.04 | 20.02 | 20.03 | 23.74 | 23.76 | 23.76 | 23.75 | 23.74 |
| Sub 6 Band n66 | 20.58 | 20.62 | 20.58 | 20.57 | 20.60 | 24.58 | 24.57 | 24.58 | 24.58 | 24.57 |

Based on the most conservative measured triggering distance of 11mm, additional Phablet SAR measurements were required at 10mm from rear side for the above modes.

Bottom side – EUT Moving toward (trigger) to the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------------|------------------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
| | 14[mm] | 13[mm] | 12[mm] | 11[mm] | 10[mm] | 9[mm] | 8[mm] | 7[mm] | 6[mm] | 5[mm] |
| GSM1900 /Voice | 30.40 | 30.43 | 30.43 | 30.41 | 30.40 | 29.45 | 29.46 | 29.45 | 29.45 | 29.46 |
| GSM1900 /GPRS 1Tx | 30.40 | 30.42 | 30.43 | 30.40 | 30.42 | 29.46 | 29.46 | 29.47 | 29.44 | 29.46 |
| GSM1900 /GPRS 2Tx | 28.71 | 28.71 | 28.73 | 28.69 | 28.71 | 27.98 | 27.99 | 28.00 | 27.96 | 27.98 |
| GSM1900 /GPRS 3Tx | 26.69 | 26.67 | 26.69 | 26.70 | 26.70 | 25.86 | 25.87 | 25.88 | 25.87 | 25.88 |
| GSM1900 /GPRS 4Tx | 25.10 | 25.12 | 25.11 | 25.11 | 25.12 | 24.03 | 24.07 | 24.04 | 24.04 | 24.04 |
| WCDMA B2 | 23.37 | 23.39 | 23.39 | 23.37 | 23.39 | 21.06 | 21.06 | 21.07 | 21.09 | 21.04 |
| WCDMA B4 | 23.77 | 23.76 | 23.78 | 23.78 | 23.78 | 20.81 | 20.82 | 20.79 | 20.80 | 20.82 |
| LTE Band 2 | 23.63 | 23.61 | 23.62 | 23.62 | 23.62 | 21.23 | 21.23 | 21.23 | 21.26 | 21.24 |
| LTE Band 4 | 23.46 | 23.43 | 23.44 | 23.43 | 23.43 | 20.58 | 20.55 | 20.55 | 20.55 | 20.58 |
| LTE Band 66 | 23.75 | 23.75 | 23.76 | 23.73 | 23.74 | 20.03 | 20.02 | 20.03 | 20.02 | 20.04 |
| Sub 6 Band n66 | 24.59 | 24.57 | 24.58 | 24.58 | 24.58 | 20.59 | 20.62 | 20.57 | 20.57 | 20.60 |

Bottom– EUT Moving away (Release) from the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------------|------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| | 6[mm] | 7[mm] | 8[mm] | 9[mm] | 10[mm] | 11[mm] | 12[mm] | 13[mm] | 14[mm] | 15[mm] |
| GSM1900 /Voice | 29.45 | 29.46 | 29.46 | 29.46 | 29.44 | 30.40 | 30.43 | 30.42 | 30.40 | 30.40 |
| GSM1900 /GPRS 1Tx | 29.47 | 29.48 | 29.45 | 29.47 | 29.48 | 30.41 | 30.44 | 30.44 | 30.40 | 30.41 |
| GSM1900 /GPRS 2Tx | 27.98 | 27.98 | 28.01 | 27.98 | 27.99 | 28.72 | 28.71 | 28.72 | 28.71 | 28.71 |
| GSM1900 /GPRS 3Tx | 25.88 | 25.86 | 25.87 | 25.88 | 25.89 | 26.69 | 26.67 | 26.69 | 26.71 | 26.68 |
| GSM1900 /GPRS 4Tx | 24.03 | 24.07 | 24.05 | 24.03 | 24.04 | 25.10 | 25.13 | 25.12 | 25.11 | 25.11 |
| WCDMA B2 | 21.06 | 21.06 | 21.07 | 21.10 | 21.05 | 23.40 | 23.39 | 23.38 | 23.39 | 23.39 |
| WCDMA B4 | 20.82 | 20.83 | 20.80 | 20.80 | 20.82 | 23.77 | 23.76 | 23.80 | 23.80 | 23.78 |
| LTE Band 2 | 21.26 | 21.23 | 21.23 | 21.26 | 21.23 | 23.62 | 23.61 | 23.61 | 23.63 | 23.63 |
| LTE Band 4 | 20.57 | 20.55 | 20.55 | 20.55 | 20.56 | 23.46 | 23.44 | 23.45 | 23.43 | 23.44 |
| LTE Band 66 | 20.05 | 20.02 | 20.03 | 20.03 | 20.03 | 23.74 | 23.74 | 23.75 | 23.73 | 23.75 |
| Sub 6 Band n66 | 20.60 | 20.61 | 20.59 | 20.57 | 20.61 | 24.58 | 24.57 | 24.58 | 24.59 | 24.58 |

Based on the most conservative measured triggering distance of 9mm, additional Phablet SAR measurements were required at 8mm from Bottom side for the above modes.

1.2 Proximity Sensor Coverage for SAR measurements

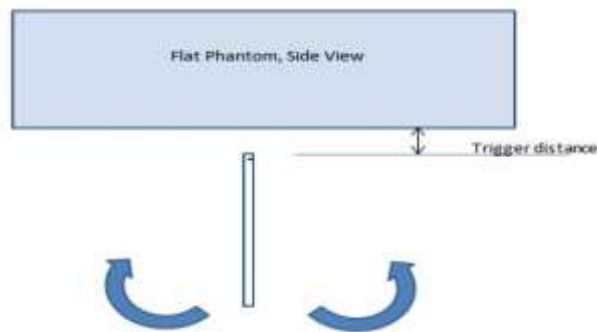
(KDB 616217 D04v01r02§6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

1.3 Proximity Sensor Tilt Angle Assessment

(KDB 616217 D04v01r02 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Bottom side parallel to the base of the flat phantom for each band. The EUT was rotated about Bottom side for angles up to $\pm 45^\circ$. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to $\pm 45^\circ$.



Proximity sensor tilt angle assessment (Bottom side) KDB 616217 §6.4

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (Bottom side)

| Tissue | Minimum distance At which power reduction was maintained over- 45° | Power reduction status | | | | | | | | | | | |
|-----------------|--|------------------------|------|------|------|------|----|-----|-----|-----|-----|-----|----|
| | | -45° | -40° | -30° | -20° | -10° | 0° | 10° | 20° | 30° | 40° | 45° | |
| 1800 MHz Tissue | 9 mm | On | On | On | On | On | On | On | On | On | On | On | On |
| 1900 MHz Tissue | 9 mm | On | On | On | On | On | On | On | On | On | On | On | On |

1.5 Resulting test positions for Phablet SAR measurements

| Wireless technologies | Position | §6.2 Triggering Distance [mm] | §6.3 Coverage | §6.4 Tilt Angle | Worst case distance for Phablet SAR [mm] |
|--|----------|-------------------------------------|------------------|--------------------|--|
| WWAN (GSM1900 /WCDMA B2/B4 /LTEB2/B4/B66 /SUB6 n66) | Rear | 11 | N/A | N/A | 10 |
| | Bottom | 9 | N/A | N/A | 8 |

Note:FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions.

2. Power reduction Verification for Main 2 Antenna

2.1. Distance Verification Procedure for Main 2 Antenna

Procedures for determining proximity sensor triggering distances(KDB 616217D04v01r02§6.2)
The distance verification procedure was performed according to the following procedure:

1. A base station simulator was used to establish an RF connection and to monitor the power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom.
2. The device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced,per KDB Publication 616217 D04v01r02.Each applicable test position was evaluated. The distances were conformed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Step 1 and 2 were repeated for the relevant modes, as appropriate
4. Steps1 through 3 were repeated for all distance-based power reduction mechanisms.

For detailed measurement conducted power results, please refer to the Section .11



Proximity Sensor Trigger Distance Assessment KDB 616217 D04§6.2 (Rear / Leftside)

LEGEND

- Direction of DUT travel for determination of power reduction triggering point
- Direction of DUT travel for determination of full power resumption triggering point

| Tissue simulating liquid | Trigger distance - Rear | | Trigger distance -Left | |
|--------------------------|----------------------------|-------------------------------|----------------------------|-------------------------------|
| | Moving toward phantom [mm] | Moving away from phantom [mm] | Moving toward phantom [mm] | Moving away from phantom [mm] |
| 2600 MHz Tissue | 12 | 13 | 9 | 10 |

Distance Measurement verification for Proximity sensor

Rear side – EUT Moving toward (trigger) to the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| | 17[mm] | 16[mm] | 15[mm] | 14[mm] | 13[mm] | 12[mm] | 11[mm] | 10[mm] | 9[mm] | 8[mm] |
| LTE Band 41 | 24.45 | 24.44 | 24.45 | 24.45 | 24.45 | 20.08 | 20.08 | 20.08 | 20.07 | 20.07 |

Rear side – EUT Moving away (Release) from the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 9[mm] | 10[mm] | 11[mm] | 12[mm] | 13[mm] | 14[mm] | 15[mm] | 16[mm] | 17[mm] | 18[mm] |
| LTE Band 41 | 20.07 | 20.07 | 20.07 | 20.06 | 20.05 | 24.44 | 24.43 | 24.43 | 24.44 | 24.45 |

Based on the most conservative measured triggering distance of 12mm, additional Phablet SAR measurements were required at 11mm from rear side for the above modes.

Left side – EUT Moving toward (trigger) to the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|----------------------|------------------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
| | 14[mm] | 13[mm] | 12[mm] | 11[mm] | 10[mm] | 9[mm] | 8[mm] | 7[mm] | 6[mm] | 5[mm] |
| LTE Band 41(Class 3) | 24.43 | 24.43 | 24.45 | 24.43 | 24.43 | 20.07 | 20.07 | 20.05 | 20.06 | 20.05 |

Left side– EUT Moving away (Release) from the Phantom

| Mode | Distance to DUT Output power (dBm) | | | | | | | | | |
|-------------|------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| | 6[mm] | 7[mm] | 8[mm] | 9[mm] | 10[mm] | 11[mm] | 12[mm] | 13[mm] | 14[mm] | 15[mm] |
| LTE Band 41 | 20.07 | 20.08 | 20.06 | 20.06 | 20.06 | 24.43 | 24.42 | 24.43 | 24.44 | 24.43 |

Based on the most conservative measured triggering distance of 9mm, additional Phablet SAR measurements were required at 8mm from Left side for the above modes.

2.2 Proximity Sensor Coverage for SAR measurements

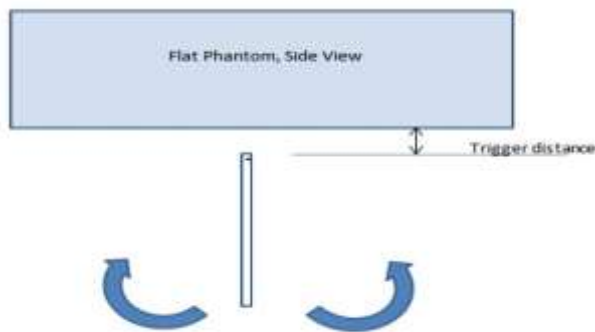
(KDB 616217 D04v01r02§6.3)

As there is no spatial offset between the antenna and the proximity sensor element, proximity sensor coverage did not need to be assessed.

2.3 Proximity Sensor Tilt Angle Assessment

(KDB 616217 D04v01r02 §6.4)

The DUT was positioned directly below the flat phantom at the minimum measured trigger distance with Left side parallel to the base of the flat phantom for each band. The EUT was rotated about Left side for angles up to $\pm 45^\circ$. If the output power increased during the rotation the DUT was moved 1mm toward the phantom and the rotation repeated. This procedure was repeated until the power remained reduced for all angles up to $\pm 45^\circ$.



Proximity sensor tilt angle assessment (Left side) KDB 616217 §6.4

Summary of Tablet Tilt Angle influence to Proximity Sensor Triggering (Left side)

| Tissue | Minimum distance At which power reduction was maintained over- 45° | Power reduction status | | | | | | | | | | | |
|-----------------|--|------------------------|------|------|------|------|----|-----|-----|-----|-----|-----|----|
| | | -45° | -40° | -30° | -20° | -10° | 0° | 10° | 20° | 30° | 40° | 45° | |
| 2600 MHz Tissue | 9 mm | On | On | On | On | On | On | On | On | On | On | On | On |

1.5 Resulting test positions for Phablet SAR measurements

| Wireless technologies | Position | §6.2 Triggering Distance [mm] | §6.3 Coverage | §6.4 Tilt Angle | Worst case distance for Phablet SAR [mm] |
|-----------------------|----------|-------------------------------------|------------------|--------------------|--|
| WWAN (LTE Band 41) | Rear | 12 | N/A | N/A | 11 |
| | Left | 9 | N/A | N/A | 8 |

Note:FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions.

3. Power reduction Verification for Main2 Antenna

This device uses a power reduction mechanism for SAR compliance for operations during voice or VoIP held to ear scenarios.

When a user makes or receives a voice call or VOIP call for Antenna 2 the audio of the call is sent through the Receiver at the top of the device, will trigger the Power reduction for Antenna 2

(i.e. Reducing output power for Head SAR compliance)

Detailed descriptions of the power reduction mechanism are included in the Main operational description document.

| Condition For Power reduction | Wireless Technologies | Conducted Power[dBm] | |
|-------------------------------|-----------------------|--------------------------|---------------------------|
| | | Un-Triggered (Max Power) | Triggered (Reduced Power) |
| RCV-on | LTE 41 | 24.35 | 20.26 |

4. Power reduction Verification for WLAN Antenna

This device uses a power reduction mechanism for SAR compliance for WLAN operations during voice or VoIP held to ear scenarios.

When a user makes or receives a WLAN voice or WLAN VOIP call for WLAN Ant the audio of the call is sent through the Receiver at the top of the device will trigger the Power reduction for WLAN Ant.

(i.e. Reducing output power for Head SAR compliance)

Detailed descriptions of the power reduction mechanism are included in the Main operational description document.

Power Measurement Verification for WLAN

| Condition For Power reduction | Wireless Technologies | Conducted Power[dBm] | |
|-------------------------------|-----------------------------------|--------------------------|---------------------------|
| | | Un-Triggered (Max Power) | Triggered (Reduced Power) |
| RCV-on | 2.4GHz 802.11b (Exclude 12/13ch) | 18.90 | 11.57 |
| RCV-on | 2.4GHz 802.11g (Exclude 12/13ch)) | 17.32 | 11.64 |
| RCV-on | 2.4GHz 802.11n (Exclude 12/13ch) | 17.24 | 11.41 |
| RCV-on | 5GHz 802.11a (Exclude 100~144ch) | 14.34 | 10.97 |
| RCV-on | 5GHz 802.11n 20MHz | 14.37 | 11.01 |
| RCV-on | 5GHz 802.11n 40MHz | 14.23 | 11.13 |
| RCV-on | 5GHz 802.11ac 20MHz | 14.35 | 11.06 |
| RCV-on | 5GHz 802.11ac 40MHz | 14.22 | 11.12 |
| RCV-on | 5GHz 802.11ac 80MHz | 13.13 | 11.13 |

Appendix I. – Down-link CA Power Measurement

5G NR Call Box Setup

1. LTE Down-link Carrier Aggregation Conducted Powers

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number component carriers(CC)s supported by test product implementation. For those configurations required by April 2018 TCBC Workshop notes, conducted power measurements with LTE Carrier Aggregation(CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s)(SCC) on the downlink only.

Downlink Carrier aggregation:

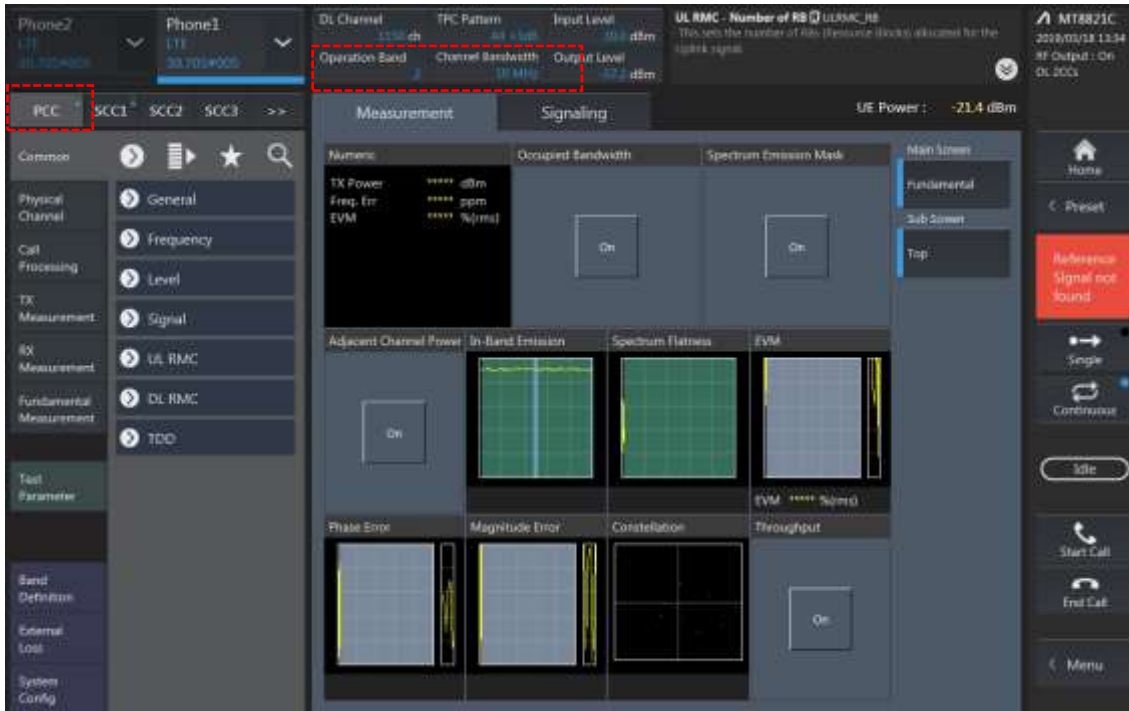
1. This device only supports downlink carrier aggregation. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
3. Per FCC KDB publication 941225 D05A v01r02, Section C)3)b)ii), PCC uplink channel was selected at downlink carrier aggregation combinations. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
4. For continuous intra-band carrier aggregation, the downlink channel spacing between the component carriers was set to multiple of 300kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521.
5. For non-continuous intra-band carrier aggregation, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
6. All selected downlink channels remained fully within the downlink transmission band of the respective component carrier.



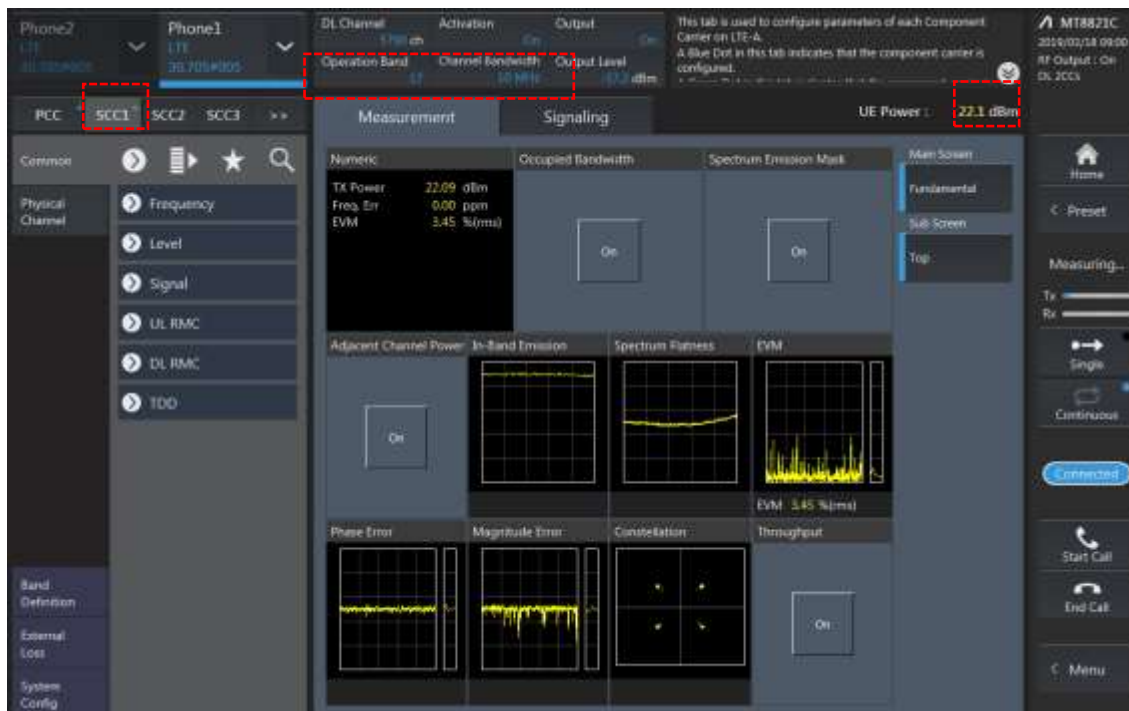
Power Measurement setup

LTE Down Link 2CA Call Setup

PCC Setting : Channel/ RB/ BW/ Modulation



SCC Setting : Channel/ RB/ BW/ Modulation and call Connection

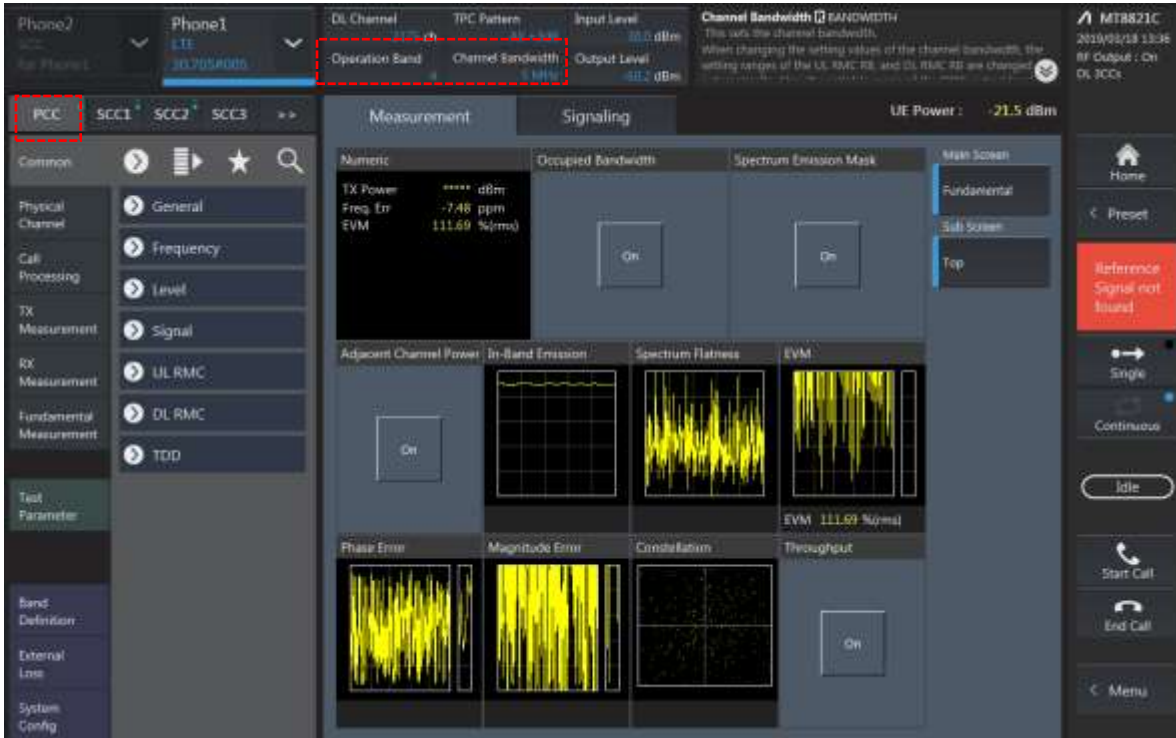


2CA Downlink Carrier aggregation Maximum conducted Powers

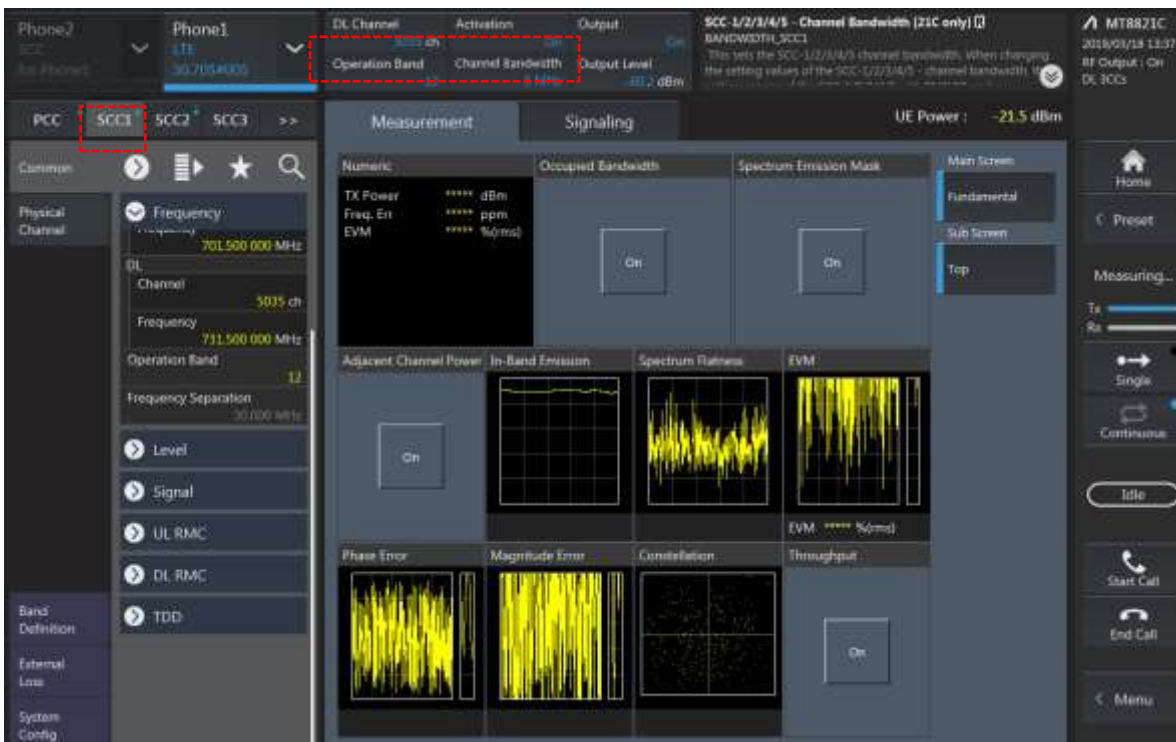
| Combination | PCC | | | | | | | | | SCC | | | | Tx Power | | Delta (2)-(1) |
|-------------|------|----|------------|--------------|------------|--------------|------------|----|-----------|------|----|------------|--------------|---------------------------------------|---|---------------|
| | Band | BW | PCC UL Ch. | PCC UL Freq. | PCC DL Ch. | PCC DL Freq. | Modulation | RB | RB offset | Band | BW | SCC DL Ch. | SCC DL Freq. | LTE Single Carrier Tx Power (dBm) (1) | LTE Tx Power with DL CA Enabled (dBm) (2) | |
| 2C | 2 | 5 | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 2 | 20 | 742 | 1944.2 | 23.78 | 23.53 | -0.25 |
| 2A-2A | 2 | 5 | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 2 | 20 | 1100 | 1980 | 23.78 | 23.61 | -0.17 |
| 2A-2A | 2 | 10 | 19150 | 1905 | 1150 | 1985 | QPSK | 1 | 0 | 2 | 20 | 700 | 1940 | 23.73 | 23.59 | -0.14 |
| 2A-12A | 2 | 5 | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 12 | 10 | 5095 | 737.5 | 23.78 | 23.54 | -0.24 |
| 2A-12A | 12 | 3 | 23165 | 714.5 | 5165 | 744.5 | QPSK | 1 | 7 | 2 | 20 | 700 | 1940 | 25.33 | 25.31 | -0.02 |
| 2A-17A | 2 | 5 | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 17 | 10 | 5790 | 740 | 23.78 | 23.49 | -0.29 |
| 2A-17A | 17 | 10 | 23790 | 710 | 5790 | 740 | QPSK | 1 | 24 | 2 | 10 | 650 | 1960 | 25.05 | 25.02 | -0.03 |
| 2A-66A | 2 | 5 | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 66 | 20 | 66536 | 2120 | 23.78 | 23.52 | -0.26 |
| 2A-66A | 66 | 5 | 131997 | 1712.5 | 66461 | 2112.5 | QPSK | 1 | 12 | 2 | 20 | 700 | 1940 | 24.02 | 23.62 | -0.40 |
| 4A-17A | 4 | 5 | 19975 | 1712.5 | 1975 | 2112.5 | QPSK | 1 | 12 | 17 | 10 | 5790 | 740 | 23.97 | 23.50 | -0.47 |
| 4A-17A | 17 | 10 | 23790 | 710 | 5790 | 740 | QPSK | 1 | 24 | 4 | 10 | 2000 | 2115 | 25.05 | 25.21 | 0.16 |
| 5A-41A | 5 | 5 | 20625 | 846.5 | 2526 | 891.5 | QPSK | 1 | 12 | 41 | 20 | 41490 | 2680 | 24.33 | 24.37 | 0.04 |
| 26A-41A | 26 | 5 | 26715 | 816.5 | 8715 | 861.5 | QPSK | 1 | 12 | 41 | 20 | 41490 | 2680 | 24.05 | 23.76 | -0.29 |
| 26A-41A | 41 | 5 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 12 | 26 | 15 | 8865 | 876.5 | 24.59 | 24.33 | -0.26 |
| 41A-41A | 41 | 5 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 12 | 41 | 20 | 39750 | 2506 | 24.59 | 24.34 | -0.25 |
| 41A-41A | 41 | 5 | 39750 | 2506 | 39750 | 2506 | QPSK | 1 | 0 | 41 | 20 | 41490 | 2680 | 24.02 | 24.24 | 0.22 |
| 66B | 66 | 5 | 131997 | 1712.5 | 66461 | 2112.5 | QPSK | 1 | 12 | 66 | 15 | 66554 | 2121.8 | 24.02 | 23.65 | -0.37 |
| 66C | 66 | 15 | 132047 | 1717.5 | 66511 | 2117.5 | QPSK | 1 | 36 | 66 | 20 | 66682 | 2134.6 | 23.90 | 23.53 | -0.37 |

LTE Down Link 3CA Call Setup

1) PCC Setting: Channel /RB/BW/Modulation



2) SCC1 Setting : Channel /RB/BW/Modulation



3) SCC2 Setting (Channel /RB/BW/Modulation)and call Connection

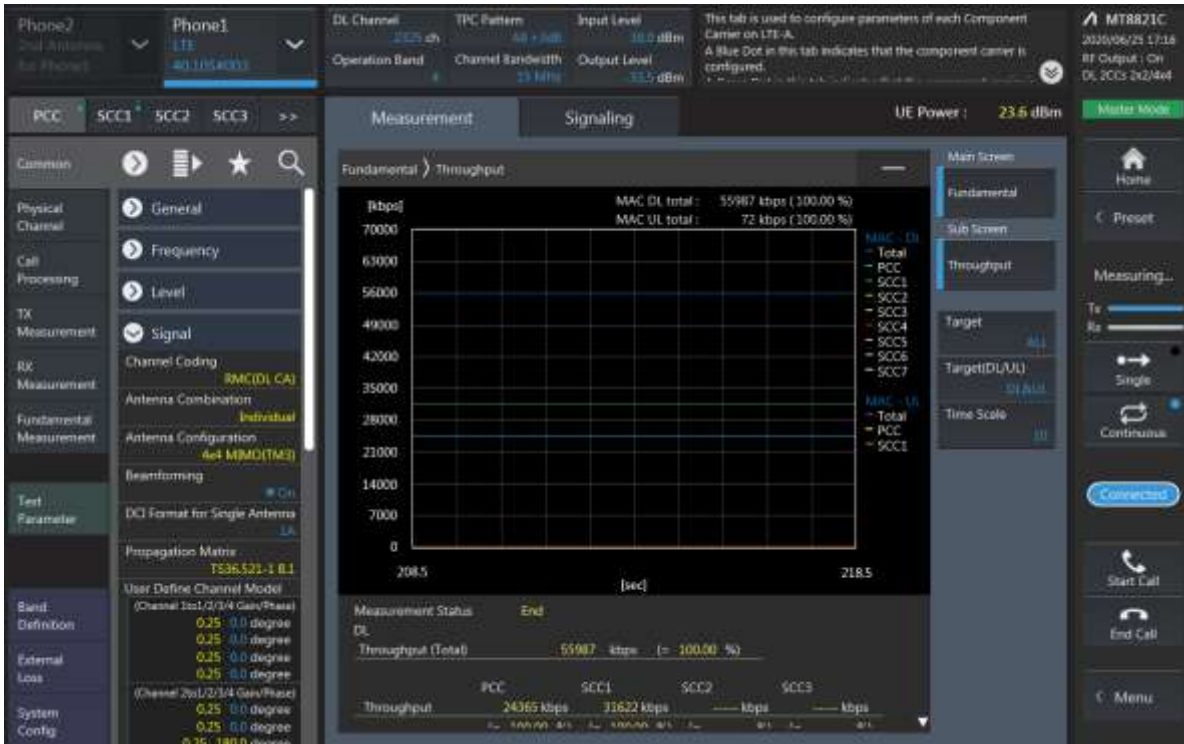


3CA Downlink Carrier aggregation Maximum conducted Powers

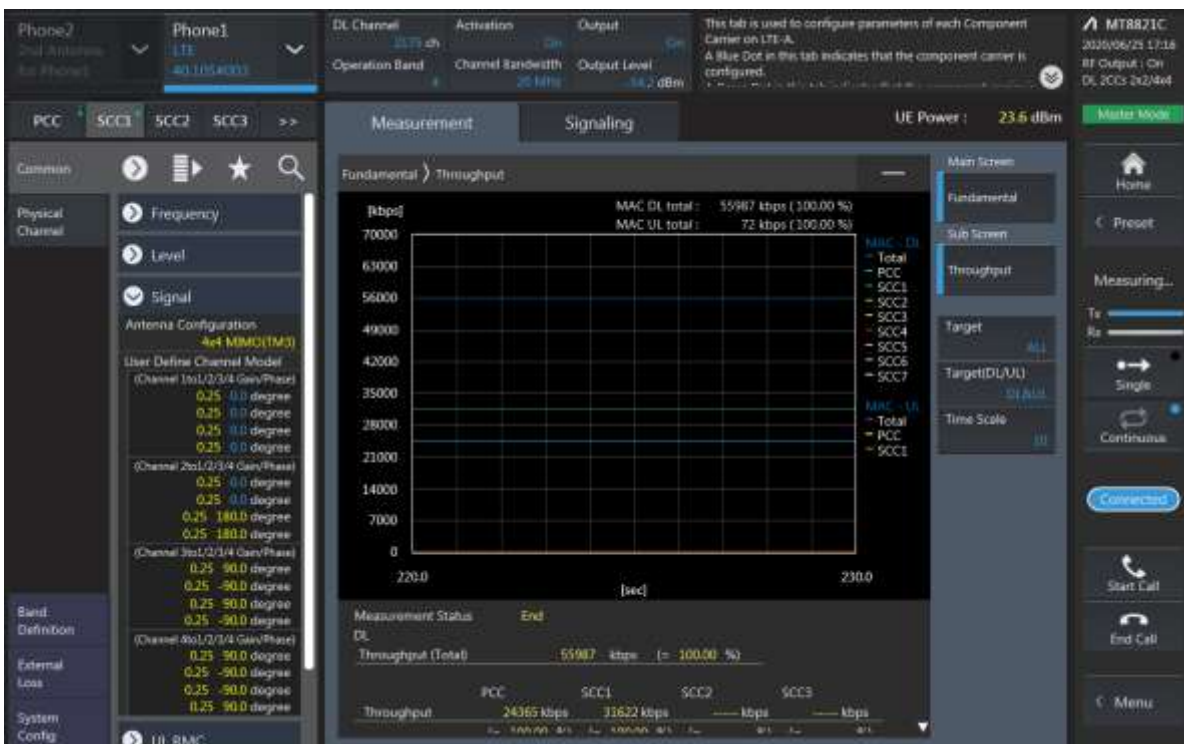
| Combination | PCC | | | | | | | | | SCC | | | | SCC | | | | Tx Power | | Delta (2)-(1) |
|-------------|------|----|------------|--------------|------------|--------------|------------|----|-----------|------|----|------------|--------------|------|----|------------|--------------|---------------------------------------|---|---------------|
| | Band | BW | PCC UL Ch. | PCC UL Freq. | PCC DL Ch. | PCC DL Freq. | Modulation | RB | RB offset | Band | BW | SCC DL Ch. | SCC DL Freq. | Band | BW | SCC DL Ch. | SCC DL Freq. | LTE Single Carrier Tx Power (dBm) (1) | LTE Tx Power with DL CA Enabled (dBm) (2) | |
| 2A-4A-5A | 2 | 5 | 18625 | 1852.5 | 625 | 1932.5 | QPSK | 1 | 0 | 4 | 20 | 2175 | 2132.5 | 5 | 10 | 2525 | 881.5 | 23.78 | 23.57 | -0.21 |
| 2A-4A-5A | 4 | 5 | 19975 | 1712.5 | 1975 | 2112.5 | QPSK | 1 | 12 | 2 | 20 | 900 | 1960 | 5 | 10 | 2525 | 881.5 | 23.97 | 23.79 | -0.18 |
| 2A-4A-5A | 5 | 5 | 20625 | 846.5 | 2526 | 891.5 | QPSK | 1 | 12 | 2 | 20 | 900 | 1960 | 4 | 20 | 2175 | 2132.5 | 24.33 | 24.14 | -0.19 |
| 4A-4A-12A | 4 | 5 | 19975 | 1712.5 | 1975 | 2112.5 | QPSK | 1 | 12 | 4 | 20 | 2275 | 2142.5 | 12 | 10 | 5095 | 737.5 | 23.97 | 23.63 | -0.34 |
| 4A-4A-12A | 12 | 5 | 23155 | 713.5 | 5155 | 743.5 | QPSK | 1 | 12 | 4 | 20 | 2050 | 2120 | 4 | 20 | 2300 | 2145 | 25.33 | 25.43 | 0.10 |
| 5A-66A-66A | 5 | 5 | 20625 | 846.5 | 2526 | 891.5 | QPSK | 1 | 12 | 66 | 20 | 66536 | 2120 | 66 | 20 | 67036 | 2170 | 24.33 | 24.22 | -0.11 |
| 5A-66A-66A | 66 | 5 | 131997 | 1712.5 | 66461 | 2112.5 | QPSK | 1 | 12 | 66 | 20 | 67236 | 2190 | 5 | 10 | 2525 | 881.5 | 24.02 | 23.63 | -0.39 |
| 12A-66A-66A | 12 | 5 | 23155 | 713.5 | 5155 | 743.5 | QPSK | 1 | 12 | 66 | 20 | 66536 | 2120 | 66 | 20 | 67036 | 2170 | 25.33 | 25.53 | 0.20 |
| 12A-66A-66A | 66 | 5 | 131997 | 1712.5 | 66461 | 2112.5 | QPSK | 1 | 12 | 66 | 20 | 67236 | 2190 | 12 | 10 | 5095 | 737.5 | 24.02 | 23.78 | -0.24 |
| 26A-41C | 26 | 5 | 26715 | 816.5 | 8715 | 861.5 | QPSK | 1 | 12 | 41 | 20 | 41292 | 2660.2 | 41 | 20 | 41490 | 2680 | 24.05 | 23.72 | -0.33 |
| 41A-41C | 41 | 10 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 0 | 41 | 20 | 41346 | 2665.6 | 41 | 20 | 39750 | 2506 | 24.53 | 24.28 | -0.25 |
| 41A-41C | 41 | 10 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 0 | 41 | 20 | 39750 | 2506 | 41 | 20 | 39948 | 2525.8 | 24.53 | 24.29 | -0.24 |
| 41D | 41 | 10 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 0 | 41 | 20 | 41346 | 2665.6 | 41 | 20 | 41148 | 2645.8 | 24.53 | 24.24 | -0.29 |

LTE Down Link 2CA 4x4 MIMO Call Setup

PCC Setting : Channel/ RB/ BW/ Modulation



SCC Setting : Channel/ RB/ BW/ Modulation and call Connection

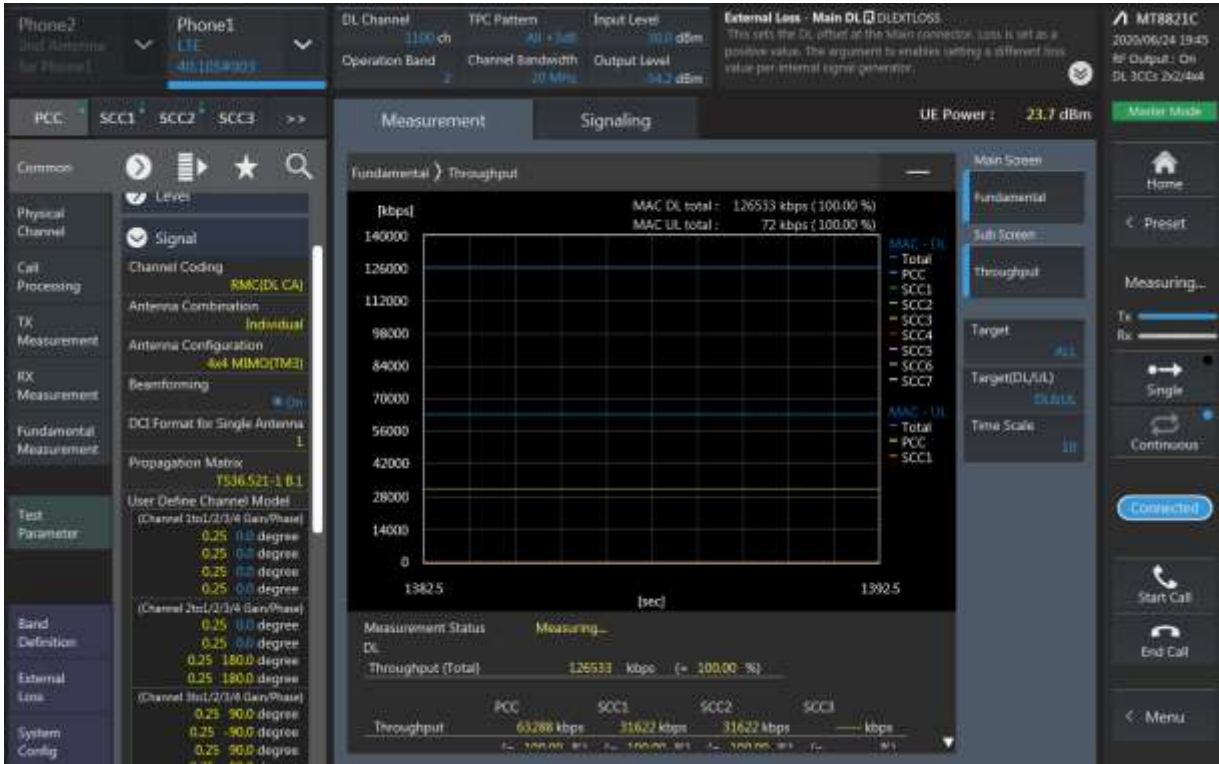


LTE Downlink 2CA 4X4 MIMO Maximum Conducted Power

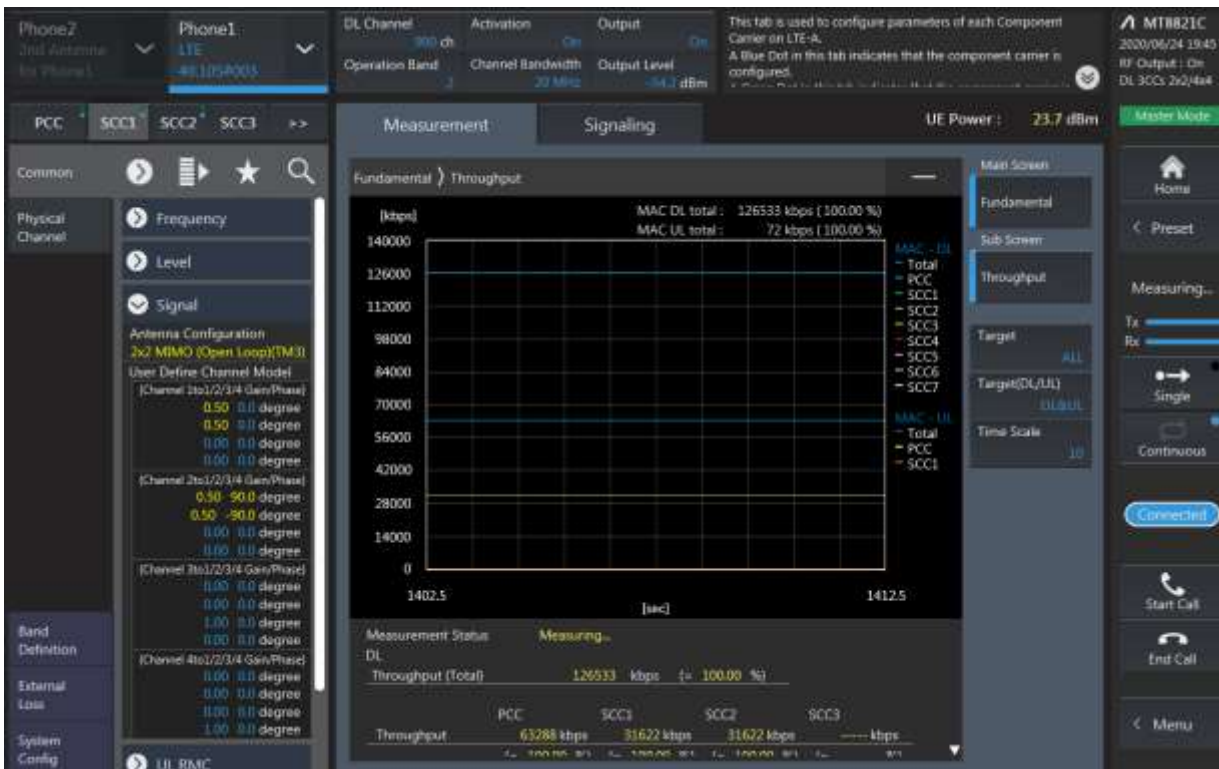
| Combination | PCC | | | | | | | | | SCC | | | | Tx Power | | Delta (2)-(1) |
|-------------|------|----|------------|--------------|------------|--------------|------------|----|-----------|------|----|------------|--------------|---------------------------------------|---|---------------|
| | Band | BW | PCC UL Ch. | PCC UL Freq. | PCC DL Ch. | PCC DL Freq. | Modulation | RB | RB offset | Band | BW | SCC DL Ch. | SCC DL Freq. | LTE Single Carrier Tx Power (dBm) (1) | LTE Tx Power with DL CA Enabled (dBm) (2) | |
| 5A-41A | 5 | 5 | 20625 | 846.5 | 2526 | 891.5 | QPSK | 1 | 12 | 41 | 20 | 41490 | 2680 | 24.33 | 24.36 | 0.03 |
| 26A-41A | 26 | 5 | 26715 | 816.5 | 8715 | 861.5 | QPSK | 1 | 12 | 41 | 20 | 41490 | 2680 | 24.05 | 23.75 | -0.30 |
| 26A-41A | 41 | 5 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 12 | 26 | 15 | 8865 | 876.5 | 24.59 | 24.34 | -0.25 |
| 41A-41A | 41 | 5 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 12 | 41 | 20 | 39750 | 2506 | 24.59 | 24.37 | -0.22 |
| 41A-41A | 41 | 5 | 39750 | 2506 | 39750 | 2506 | QPSK | 1 | 0 | 41 | 20 | 41490 | 2680 | 24.02 | 24.15 | 0.13 |

LTE Down Link 3CA 4x4 MIMO Call Setup

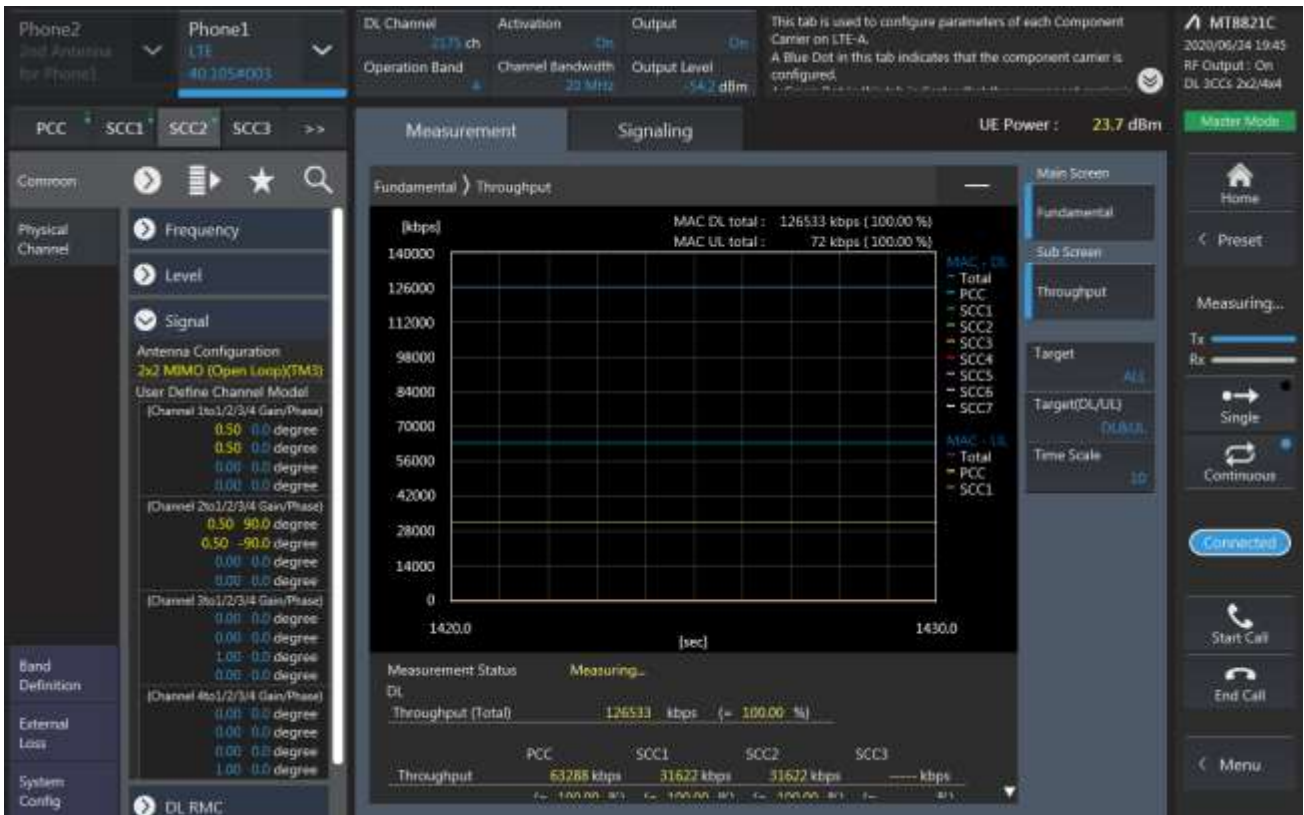
PCC Setting: Channel /RB/BW/Modulation



CC1 Setting : Channel /RB/BW/Modulation



SCC2 Setting (Channel /RB/BW/Modulation)and call Connection



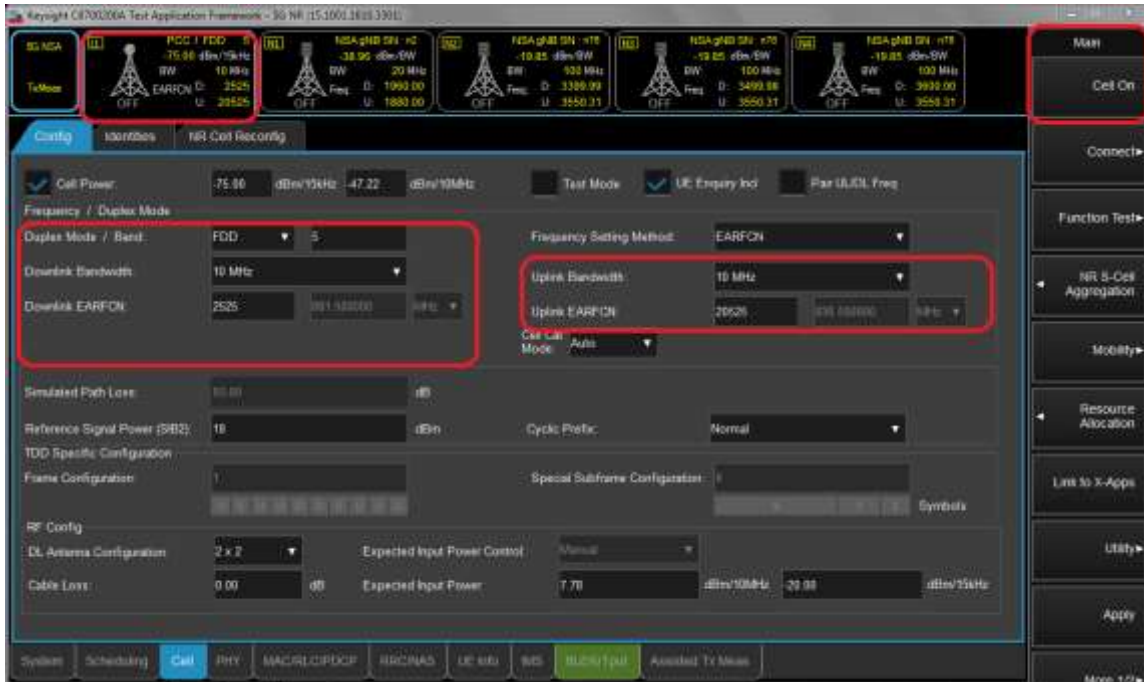
LTE Downlink 3CA 4X4 MIMO Maximum Conducted Power

| Combination | PCC | | | | | | | | | SCC | | | | SCC | | | | Tx Power | | Delta (2)-(1) |
|-------------|------|----|------------|--------------|------------|--------------|------------|----|-----------|------|----|------------|--------------|------|----|------------|--------------|---------------------------------------|---|---------------|
| | Band | BW | PCC UL Ch. | PCC UL Freq. | PCC DL Ch. | PCC DL Freq. | Modulation | RB | RB offset | Band | BW | SCC DL Ch. | SCC DL Freq. | Band | BW | SCC DL Ch. | SCC DL Freq. | LTE Single Carrier Tx Power (dBm) (1) | LTE Tx Power with DL CA Enabled (dBm) (2) | |
| 26A-41C | 26 | 5 | 26715 | 816.5 | 8715 | 861.5 | QPSK | 1 | 12 | 41 | 20 | 41292 | 2660.2 | 41 | 20 | 41490 | 2680 | 24.05 | 23.75 | -0.30 |
| 41A-41C | 41 | 10 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 0 | 41 | 20 | 41346 | 2665.6 | 41 | 20 | 39750 | 2506 | 24.53 | 24.27 | -0.26 |
| 41A-41C | 41 | 10 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 0 | 41 | 20 | 39750 | 2506 | 41 | 20 | 39948 | 2525.8 | 24.53 | 24.31 | -0.22 |
| 41D | 41 | 10 | 41490 | 2680 | 41490 | 2680 | QPSK | 1 | 0 | 41 | 20 | 41346 | 2665.6 | 41 | 20 | 41148 | 2645.8 | 24.53 | 24.32 | -0.21 |

2. 5G NR Call Box Setup

Procedure used to establish output Power measurement for NR Bands
 Select operating band, BW and Channel.

- Click Cell on button in the right of Test application screen.
- Turn the LTE Cell On using "ON/OFF" Key.



- Turn the Airplane Mode On and then turn the Airplane mode off.
- Select All down bits for UL Power control Mode in LTE.



Setup for NR Band

- Select waveform for Setting NR Band (PHY->PUSCH->Enable Transform Precoder)
 - Enable : DFT-s-OFDM, Disable : CP-OFDM

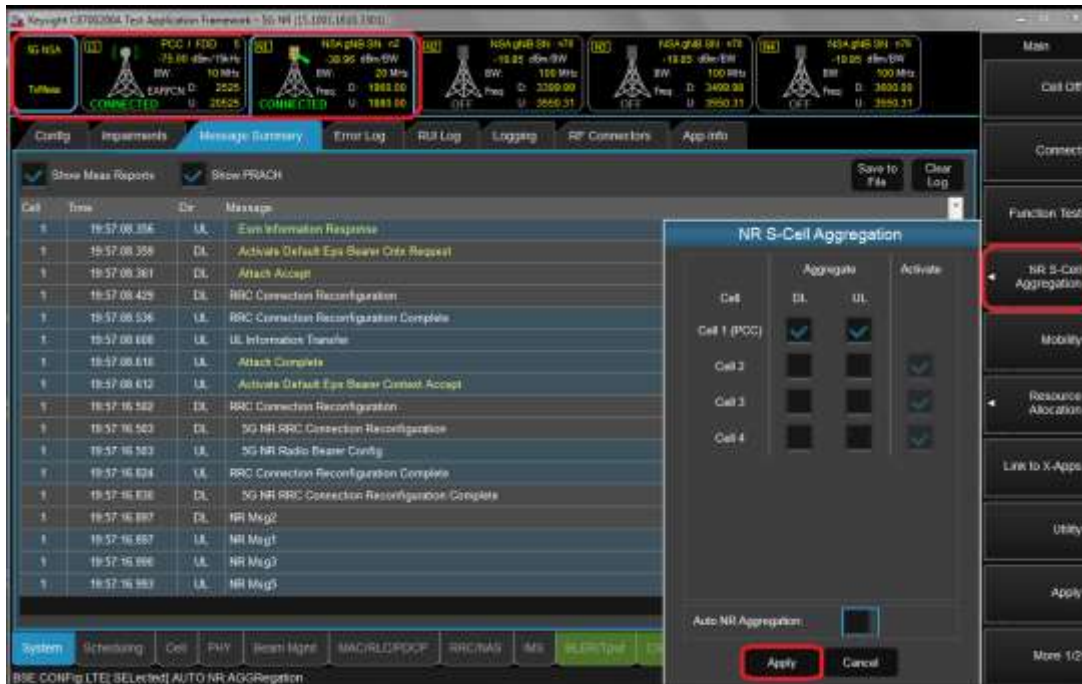


- Select operating band, BW, SCS and Channel.
- Turn the NR Cell On using “ON/OFF” Key.



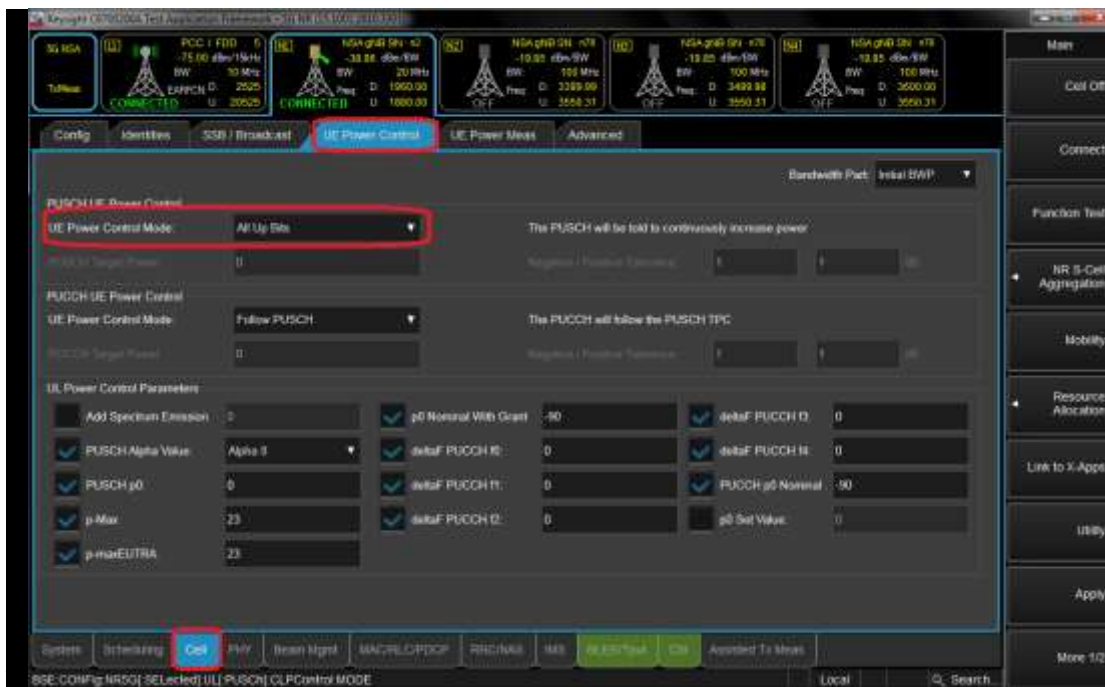
Connect NR S-Cell Aggregation

- Click NR S-Cell Aggregation
- Check the Cell 1's DL and UL box(PCC) and than Click Apply.
- Check the message summary If message shows NR Msg 5, It is connected.



Max Power setting

- Click "Cell in the bottom of screen.
- Click "UE Power control" than change UE Power control mode to All Up bits.



Selecting Start RB/Count/MCS

- Select the each test configuring (Start RB, Count, MCS).



View Tx Power

- Click “Link to X-Apps.”(Please refer to Figure-7)
- Select “Channel Power”.

