

# 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**

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.

		C	onducted Power (dBr	n)
Mechanism(s)	Mode/Band	Un-triggered	Triggered	Triggered
		(Max Power)	(Reduced Power)	(Reduced Power)
Grip	WCDMA B4	23.16	20.89	
Grip	WCDMA B2	23.54	20.26	
Grip	LTE Band 2	22.91	20.16	
Grip	LTE Band 41	22.67	20.63	
Hotspot On	GSM/GPRS/EDGE 850	31.87	29.56	
Hotspot On	GSM/GPRS/EDGE 1900	29.33	26.95	
Hotspot On	WCDMA B4	23.16	21.23	
Hotspot On	WCDMA B2	23.54	20.19	
Hotspot On	LTE Band 2	22.91	20.16	
Hotspot On	LTE Band 4	22.48	20.69	
Hotspot On	LTE Band 41	22.67	17.79	
Hotspot On, Then Grip	GSM/GPRS/EDGE 850	31.87	29.56	29.56
Hotspot On, Then Grip	GSM/GPRS/EDGE 1900	29.33	26.95	26.95
Hotspot On, Then Grip	WCDMA B4	23.16	21.23	21.23
Hotspot On, Then Grip	WCDMA B2	23.54	20.19	20.19
Hotspot On, Then Grip	LTE Band 2	22.91	20.16	20.16
Hotspot On, Then Grip	LTE Band 4	22.48	20.69	20.69
Hotspot On, Then Grip	LTE Band 41	22.67	17.79	17.79
Grip, then Hotspot On	WCDMA B4	23.16	20.89	21.23
Grip, then Hotspot On	WCDMA B2	23.54	20.26	20.19
Grip, then Hotspot On	LTE Band 2	22.91	20.16	20.16
Grip, then Hotspot On	LTE Band 41	22.67	20.63	17.79

#### Main Antenna Verification Summary

#### **1.1.** Distance Verification Procedure

F-TP22-03 (Rev.00)



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 distance 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 / Left side/ Bottom side)

LEGEND

 $\rightarrow$ 

Direction of DUT travel for determination of power reduction triggering point

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

	Trigger dist	tance – Rear	Trigger dista	nce – Left side	Trigger distance – Bottom		
Tissue simulating liquid	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	Moving toward phantom [mm]	Moving away from phantom [mm]	
1750MHz Tissue	8	9	NA	NA	4	5	
1900MHz Tissue	8	9	NA	NA	4	5	
2600MHz Tissue	11	12	7	8	NA	NA	

Distance Measurement verification for Proximity sensor

F-TP22-03 (Rev.00)



Rear side – EUT Moving toward (trigger) to the Phantom
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Mode				Distance	to DUT O	utput pow	er (dBm)			
Mode	13[mm]	12 [mm]	11[mm]	10[mm]	9[mm]	8[mm]	7[mm]	6[mm]	5[mm]	4[mm]
WCDMA B4	23.06	23.18	23.10	23.22	23.25	20.87	20.81	20.99	20.83	20.83
WCDMA B2	23.45	23.62	23.55	23.57	23.49	20.32	20.25	20.27	20.34	20.26
LTE Band 2	22.94	22.83	22.93	22.90	22.89	20.08	20.07	20.08	20.24	20.17

Mode		Distance to DUT Output power (dBm)											
	Mode 16[mm] 1	15 [mm]	14[mm]	13[mm]	8[mm]	7[mm]							
LTE Band 41	22.69	22.69	22.63	22.76	22.69	20.66	20.68	20.66	20.69	20.72			

## Rear side - EUT Moving away (Release) from the Phantom

Mode		Distance to DUT Output power (dBm)												
WOUG		7[mm]	8[mm]	9[mm]	10[mm]	11mm]	12[mm]	13[mm]	14[mm]					
WCDMA B4	20.82	20.98	20.93	20.95	20.97	23.10	23.16	23.23	23.15	23.12				
WCDMA B2	20.32	20.30	20.27	20.25	20.33	23.47	23.61	23.49	23.56	23.54				
LTE Band 2	20.06	20.09	20.26	20.14	20.13	22.94	22.87	22.82	22.90	22.87				

Based on the most conservative measured triggering distance for WCDMA B4/2, and LTE 2 of 8mm, additional Phablet SAR measurements for WCDMA B4/2, and LTE 2 were required at 7mm from rear side for the above modes

Mode		Distance to DUT Output power (dBm)										
wode	8[mm]	9[mm]	10[mm]	11[mm]	12[mm]	13[mm]	11mm]	12[mm]	13[mm]	14[mm]		
LTE Band 41	20.55	20.65	20.54	20.55	20.65	22.77	22.65	22.74	22.71	22.57		

Based on the most conservative measured triggering distance for LTE B41 of 11mm, additional Phablet SAR measurements for LTE B41 were required at 10mm from rear side for the above modes



## Left side - EUT Moving toward (trigger) to the Phantom

Mode		Distance to DUT Output power (dBm)											
Mode	12[mm]	11[mm]	10[mm]	9[mm]	8[mm]	7[mm]	6[mm]	5[mm]	4[mm]	3[mm]			
LTE Band 41	22.75	22.64	22.62	22.74	22.72	20.60	20.70	20.61	20.72	20.62			

## Left side - EUT Moving away (Release) from the Phantom

Mode		Distance to DUT Output power (dBm)										
wode	4[mm] 5[mm] 6[mm] 7[mm] 8[mm] 9[mm] 10[mm] 11[mm] 12[mm]								13[mm]			
LTE Band 41	20.72	20.53	20.58	20.55	20.53	22.70	22.58	22.61	22.63	22.63		

Based on the most conservative measured triggering distance for LTE B41 of 7mm, additional Phablet SAR measurements for LTE B41 were required at 6mm from Left side for the above modes

## Bottom side - EUT Moving toward (trigger) to the Phantom

Mede		Distance to DUT Output power (dBm)													
Mode		8 [mm]	7[mm]	6[mm]	5[mm]	4[mm]	3[mm]	2[mm]	1[mm]	0[mm]					
WCDMA B4	23.18	23.24	23.23	23.21	23.18	20.90	20.84	20.85	20.87	20.88					
WCDMA B2	23.54	23.51	23.45	23.49	23.46	20.34	20.28	20.24	20.33	20.18					
LTE Band 2	22.82	22.96	22.93	22.87	22.97	20.08	20.09	20.14	20.20	20.06					

## Bottom side - EUT Moving away (Release) from the Phantom

Mode		Distance to DUT Output power (dBm)													
Mode	1[mm]	2[mm]	3[mm]	4[mm]	5[mm]	6[mm]	7mm]	8[mm]	9[mm]	10[mm]					
WCDMA B4	20.98	20.82	20.99	20.99	20.85	23.15	23.18	23.23	23.15	23.25					
WCDMA B2	20.32	20.33	20.29	20.35	20.21	23.60	23.50	23.50	23.58	23.53					
LTE Band 2	20.18	20.22	20.17	20.12	20.12	22.85	22.94	22.86	22.81	23.00					

Based on the most conservative measured triggering distance of 4mm, additional Phablet SAR measurements for WCDMA B4/2, and LTE 2 were required at 3mm from Bottom side for the above modes



## 1.2 Proximity Sensor Coverage for SAR measurements

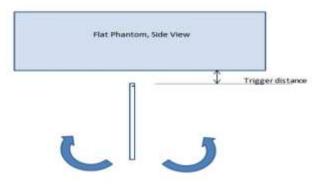
(KDB 616217 D04v01r02§6.3)

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 $\pm 45^{\circ}$ .



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

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

	Minimumdistance					Pow	er reduc	tion stat	us			
Tissue	atwhich power reduction was maintained over-45°		-40°	-30°	<b>-20</b> °	-10°	<b>0</b> °	10°	<b>20</b> °	30°	<b>40</b> °	45°
1750 MHz Tissue	4 mm	On	On	On	On	On	On	On	On	On	On	On
1900 MHz Tissue	4 mm	On	On	On	On	On	On	On	On	On	On	On



Wireless technologies	Position	§6.2 Triggering Distance [mm]	§6.3 Coverage	§6.4 Tilt Angle	Worst case distance for Phablet SAR [mm]
	Rear	8	N/A	N/A	7
(WCDMA B4/ B2 /LTE B2)	Bottom	4	N/A	N/A	3
WWAN	Rear	11	N/A	N/A	10
(LTE B41)	Left side	7	N/A	N/A	6

# 1.5 Resulting test positions for Phablet SAR measurements

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 RCV-On configuration

This device uses a power reduction mechanism for SAR compliance for LTE B41 operations during voice or VoIP held to ear scenarios.

When a user makes or receives a LTE B41 voice or Vo LTE call for LTE B41 the audio of the call is sent through the Receiver at the top of the device will trigger the Power reduction for LTE B41 (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	Wireless	Conducted	l Power[dBm]
For Power reduction	Technologies	Un-Triggered (Max Power)	Triggered (Reduced Power)
RCV-on (Voice call)	LTE B41	22.77	20.14



# Appendix I. – DLCA Power Measurement



# 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(CCs) 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:

- 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

Phone2 LTE	~	Phone LTE	e <b>1</b>	~	DL Chanr					30.0 dBm		mber of RB R number of RBs				MT8821C 2019/03/18 13:34
		30.70S	#005		Operatio	n Band 2	Channel Bar 1	ndwidth 10 MHz	Output L	evel 57.2 dBm					8	RF Output : On DL 2CCs
PCC SC	CC1 S	SCC2	SCC3	>>	М	easurem	nent	S	ignaling	)			UE Po	ower :	-21.4 dBm	
Common	۲	≣►	$\star$	Q	Numeri			Occup	ied Band	width	Spectru	um Emission N	lask	Main S	Screen	A Home
Physical Channel	<b>)</b> (	General			TX Pow Freq. Er EVM	rr	***** dBm ***** ppm ***** %(rms)	,					٦	Fundar Sub Sc		< Preset
Call Processing	<b>&gt;</b> F	requency	y							Dn				Тор		Reference
TX	<b>ک</b> ا	evel.										I				Signal not found
Measurement	🔊 s	Signal														
RX Measurement	<b>ک</b> ر	JL RMC			Adjacer	nt Channel	Power In-Ba	and Emissi	on 	Spectrum	Flatness	EVM				•> Single
Fundamental Measurement	٦ 🌖	DL RMC			Г											Continuous
	🔊 т	DD				On										
Test Parameter																
Parameter												EVM ***** 9				
					Phase E	rror	Magr	nitude Erre	or A	Constellat	tion	Throughput				Start Call
Band Definition									ľ							End Call
External Loss												0	n			< Menu
System Config																< Menu

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

Phone2 LTE 30.70S#005	Phone1 LTE 30.70S#005	DL Channel Activation 5790 ch Operation Band Channel Bar 17	Output Output On ndwidth Output Level 10 MHz -57.2 dBm	This tab is used to configure parameters of Carrier on LTE-A. A Blue Dot in this tab indicates that the cor configured.	mponent carrier is	MT8821C 2019/03/18 09:00 RF Output : On DL 2CCs
PCC SC	cc1 scc2 scc3 >>	Measurement	Signaling	UE Pc	ower : 22.1 dBm	
Common		Numeric	Occupied Bandwidth	Spectrum Emission Mask	Main Screen	A Home
Physical Channel	> Frequency	TX Power         22.09 dBm           Freq. Err         0.00 ppm           EVM         3.45 %(rms)			Fundamental Sub Screen	< Preset
	> Level		On	On	Тор	Measuring
	📎 Signal					Тх
	UL RMC	Adjacent Channel Power In-Ba	nd Emission Spectrum	Flatness EVM		
	DL RMC					Single
	DD TDD	On				Continuous
				EVM 3.45 %(rms)		
		Phase Error Magr	nitude Error Constellat	ion Throughput		Start Call
Band Definition				•		End Call
External Loss				On On		< Menu
System Config						( Menu

F-TP22-03 (Rev.00)



# 2CA Downlink Carrier aggregation conducted Powers

					PCC					SCC	Tx Power				
Combination (MAX)	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	LTE Single Carrier Tx Power (dBm)	LTE Tx Power with DL CA Enabled(dBm)
2A-2A	2	5	18625	1852.5	625	1932.5	QPSK	1	12	2	20	1100	1980	23.3	23.19
2A-12A(0,1,2)	2	5	18625	1852.5	625	1932.5	QPSK	1	12	12	10	5095	737.5	23.3	23.18
2A-12A(0,1)	12	10	23095	707.5	5095	737.5	QPSK	1	0	2	20	900	1960	23.27	23.2
2A-12A(2)	12	10	23095	707.5	5095	737.5	QPSK	1	0	2	10	900	1960	23.27	23.29
4A-4A(0)	4	10	20000	1715	2000	2115	QPSK	1	24	4	20	2300	2145	23.15	23.06
4A-4A(1)	4	10	20000	1715	2000	2115	QPSK	1	24	4	10	2350	2150	23.15	23.12
4A-5A(0,1)	4	10	20000	1715	2000	2115	QPSK	1	24	5	10	2525	881.5	23.15	23.13
4A-5A(0)	5	5	20425	826.5	2425	871.5	QPSK	1	12	4	10	2175	2132.5	24.31	24.04
4A-5A(1)	5	5	20425	826.5	2425	871.5	QPSK	1	12	4	20	2175	2132.5	24.31	24.02
4A-17A	4	10	20000	1715	2000	2115	QPSK	1	12	17	10	5790	740	23.15	23.22
41C(1) PC3	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	40503	2581.3	23.16	23.04
41C(0,2,3) PC3	41	20	40620	2593	40620	2593	QPSK	1	49	41	20	40818	2612.8	23.08	23.06
41A-41A(0,1) PC3	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	23.16	23.01

## LTE Downlink 2CA Maximum Conducted Power



## LTE Down Link 3CA Call Setup

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

Phone2 SCC for Phone1	Phone1 LTE 30.70S#005	DL Channel TPC Pat 2175 ch Operation Band Channel 4	ttern Input Level <u>All +3dB</u> 30.0 dBn I Bandwidth Output Level <u>5 MHz</u> -60.2 dBn	When changing the setting values of the setting ranges of the UL RMC RB and D	L RMC RB are changed 💎	MT8821C 2019/03/18 13:36 RF Output : On DL 3CCs
PCC SC	cc1 scc2 scc3 >>	Measurement	Signaling	UE	Power: -21.5 dBm	
Common		Numeric	Occupied Bandwidth	Spectrum Emission Mask	Main Screen	A Home
Physical Channel	📎 General	TX Power ***** dBr Freq. Err -7.48 pp EVM 111.69 %(r	m		Fundamental Sub Screen	< Preset
Call Processing	> Frequency		On	On	Тор	Reference
TX	> Level					Signal not found
Measurement	📎 Signal	Adjacent Channel Power Ir	Rand Emission Sports	um Flatness EVM		•
RX Measurement	📎 UL RMC	Aujacent channel Power II				Single
Fundamental Measurement	🔊 DL RMC					Continuous
	> TDD	On				Idle
Test Parameter				EVM 111.69 %(rms)		
		Phase Error N	Agnitude Error Conste	Ilation Throughput		Start Call
Band Definition						End Call
External Loss				On		
System Config						< Menu

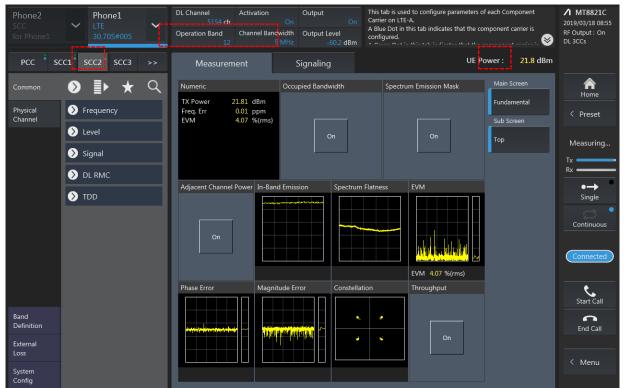
## 2) SCC1 Setting : Channel /RB/BW/Modulation

Phone2	Phone1	DL Channel Activa 5035 ch	ation Output	On BANDWIDTH_	SCC-1/2/3/4/5 - Channel Bandwidth [21C only] R BANDWIDTH_SCC1 This sets the SCC-1/2/3/4/5 channel bandwidth. When changing						
for Phone1	30.70S#005	Operation Band Chann 12	nel Bandwidth Output Le 5 MHz -	evel the setting val	lues of the SCC-1/2/3/4/5 - c	width. when changing hannel bandwidth, the	RF Output : On DL 3CCs				
PCC S	cc1 scc2 scc3 >>	Measurement	Signaling		UE Pe	ower: -21.5 dBm					
Common	● 🕪 ★ 🔍	Numeric	Occupied Bandy	vidth Spectru	ım Emission Mask	Main Screen	A Home				
Physical Channel	Frequency 701.500 000 MHz	TX Power ***** d Freq. Err ***** p EVM ***** 9	pm			Fundamental Sub Screen	< Preset				
	DL Channel 5035 ch		c	'n	On	Тор	Measuring				
	Frequency 731.500 000 MHz						Tx				
	Operation Band	Adjacent Channel Power	In-Band Emission	Spectrum Flatness	EVM		●→ Single				
	Frequency Separation 30.000 MHz			a dha ba an dala							
	> Level	On		aan waan ah			Continuous				
	🔊 Signal						Idle				
	📎 UL RMC				EVM ***** %(rms)						
	📎 DL RMC	Phase Error	Magnitude Error	Constellation	Throughput		Start Call				
Band Definition	🔊 TDD						End Call				
External Loss					On						
System Config							< Menu				

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



# 3CA Downlink Carrier aggregation conducted Powers

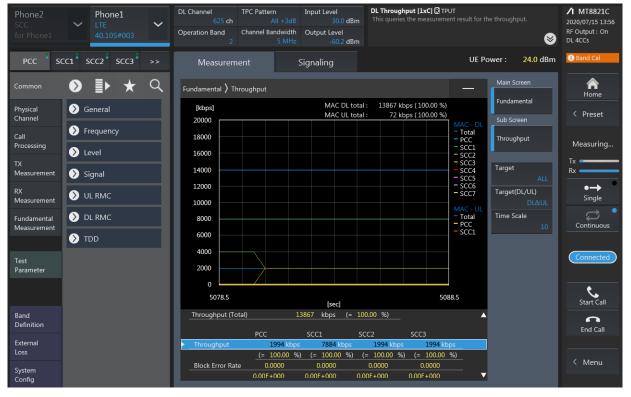
# LTE Downlink 3CA Maximum Conducted Power

					PCC			SCC						SCC	Tx Power				
Combination	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	Carrier Tx	
41A-41C PC3		5	40620		40620		QPSK	1	12	41	20	41490	2680	41	20	41292	2660.2	23.16	23.03
41D PC3	41	20	40620	2593	40620	2593	QPSK	1	12	41	20	40818	2612.8	41	20	41016	2632.6	23.08	23.02



## LTE Down Link 4CA Call Setup

#### PCC Setting: Channel /RB/BW/Modulation



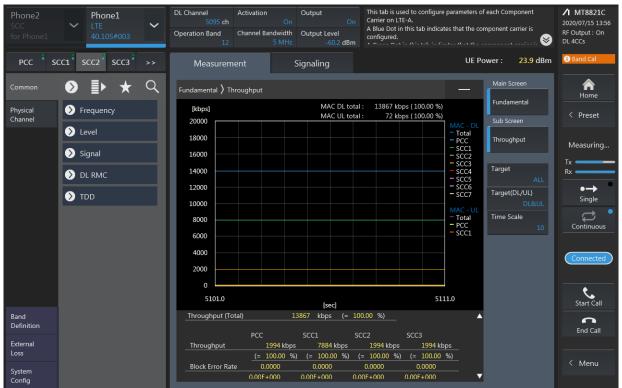
## SCC1 Setting (Channel /RB/BW/Modulation )and call Connection

Phone2 SCC for Phone1	✓ Phone1 LTE 40.105#003	DL Channel Activation 2175 ch Operation Band Channel Ba 4		DL Throughput [1xC] (2 TPUT This queries the measurement result for the	e throughput.	MT8821C 2020/07/15 13:56 RF Output : On DL 4CCs
PCC S	cc1 <sup>•</sup> scc2 <sup>•</sup> scc3 <sup>•</sup> >>	Measurement	Signaling	UE Po	wer : 23.9 dBm	i Band Cal
Common		Fundamental 👌 Throughput		—	Main Screen	A Home
Physical Channel	> Frequency	[kbps]	MAC DL total MAC UL total		Fundamental	< Preset
Channer	> Level	20000		MAC - DL - Total - PCC	Sub Screen Throughput	
	📎 Signal	16000		- SCC1 - SCC2	moughput	Measuring Tx <b></b>
	➢ UL RMC	14000		- SCC3 - SCC4 - SCC5	Target ALL	Rx
	> DL RMC	12000		- SCC6 - SCC7	Target(DL/UL)	• <del></del> > Single
	DDT S	8000		MAC - UL - Total - PCC	Time Scale	្ដ្
		6000		- SCC1	10	Continuous
		4000				Connected
		2000				
		5091.0	[sec]	5101.0		Start Call
Band Definition		Throughput (Total)	13867 kbps (= 100	<u>).00 %)</u> ▲		•
External		PCC Throughput	SCC1 SC L994 kbps 7884 kbps	C2 SCC3 1994 kbps 1994 kbps		End Call
Loss			100.00 %) (= 100.00 %) (: 0000	= 100.00 %) (= 100.00 %) 0.0000 0.0000		< Menu
System Config		0.00F+		0.0000 0.0000 T		

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

## SCC3 Setting (Channel /RB/BW/Modulation )and call Connection

Phone2 SCC for Phone1	Phone1 LTE 40.105#003		vation On nnel Bandwidth 5 MHz	Output On Output Level -60.2 dBm	DL Throughput [1xC] (3 TF This queries the measurement	PUT ent result for the throughput.	MT8821C 2020/07/15 13:56 RF Output : On DL 4CCs
PCC SC	cc1 scc2 scc3 >>	Measurement	5	Signaling		UE Power : 23.9 dBm	🚯 Band Cal
Common		Fundamental  Through	nput			Main Screen	A Home
Physical Channel	> Frequency	[kbps] 20000		MAC DL total MAC UL total		Sub Scroop	< Preset
	📎 Level	18000				MAC - DL Total - PCC Throughput	Measuring
	📎 Signal	16000				- SCC1 - SCC2 - SCC3 - SCC4 Target	Тх
	DL RMC	14000				SCC4         Target           - SCC5         ALL           - SCC6         Target(DL/UL)	
	S TDD	10000				MAC - UL Total Time Scale	Single
		6000				- PCC - SCC1	Continuous
		4000				-	Connected
		2000					
		5112.5	4	[sec]		22.5	Start Call
Band Definition		Throughput (Total)	PCC	3867 kbps (= 10 SCC1 SC	0.00 %) CC2 SCC3		End Call
External Loss		Throughput	1994 kbps (= 100.00 %)	7884 kbps	1994 kbps 1994 kb = 100.00 %) (= 100.00		
System Config		Block Error Rate(	0.0000 0.00F+000	0.0000 0.00F+000 0.0	0.0000 0.0000 0F+000 0.00F+000	<b>—</b>	< Menu



## 4CA Downlink Carrier aggregation conducted Powers

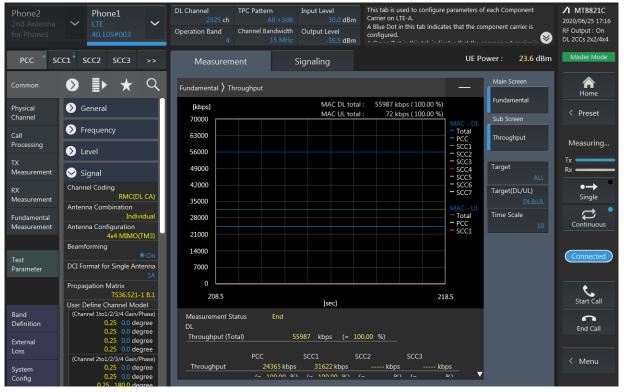
LTE Downlink 4CA Maximum Conducted Power

		PCC							SCC				SCC				SCC				Tx Power		
Combination	Band	BW		PCC UL Frequency		PCC DL Frequency	Modulation	RB	offset	Band	BW		SCC DL Frequency	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW		SUCUL	Corrier Ty	LTE Tx Power with DL CA Enabled(dBm)
41E PC3	41	20	40620	2593	40620	2593	QPSK	1	49	41	20	40818	2612.8	41	20	41016	2632.6	41	20	41214	2652.4	23.08	23.03
41C-41C PC3	41	20	40620	2593	40620	2593	QPSK	1	49	41	20	40818	2612.8	41	20	41490	2680	41	20	41292	2660.2	23.08	23.03
41A-41D	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	41	20	41292	2660.2	41	20	41094	2640.4	23.16	23.11

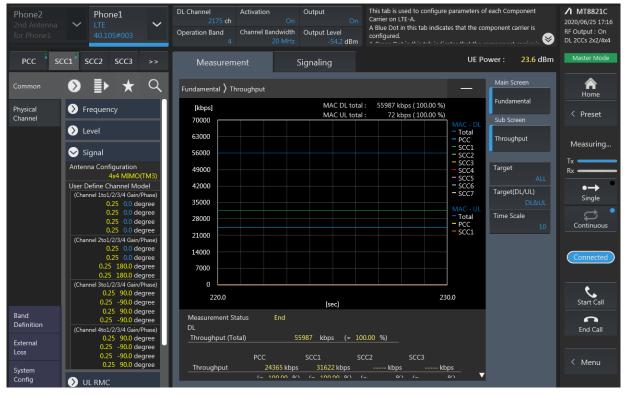


## LTE Down Link 2CA 4x4 MIMO Call Setup

#### PCC Setting : Channel/ RB/ BW/ Modulation



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





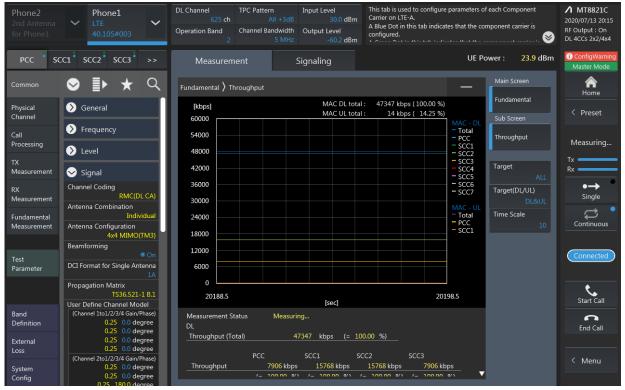
LTE Downlink 2CA 4X4 MIMO Max	ximum Conducted Power
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Combination (MAX)					PCC				SCC	Tx Power					
	Band	BW	PCC UL	PCC UL	PCC DL	PCC DL	Modulation	RB	offset	Band	DIA	SCC DL	SCC DL		LTE Tx Power
			Channel	Frequency	Channel	Frequency					BW	Channel	Frequency	Carrier Tx Power (dBm)	with DL CA Enabled(dBm)
[41C(1)] PC3	41	5	40620		40620		QPSK	1	12	41	20	40503	2581.3	23.16	23.17
[41C(0,2,3)] PC3	41	20	40620	2593	40620	2593	QPSK	1	49	41	20	40818	2612.8	23.08	23.06
[41A]-[41A(0,1)] PC3	41	5	40620	2593	40620	2593	QPSK	1	12	41	20	41490	2680	23.16	23.04

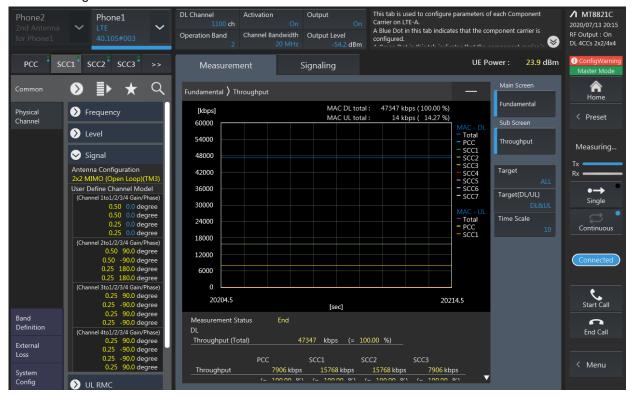


## LTE Down Link 4CA 4x4 MIMO Call Setup

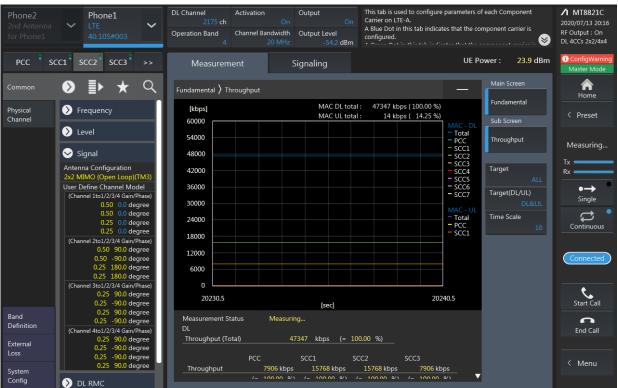
## PCC Setting: Channel /RB/BW/Modulation



SCC1 Setting : Channel /RB/BW/Modulation







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

## SCC3 Setting (Channel /RB/BW/Modulation ) and call Connection

Phone2 2nd Antenna for Phone1 V 40.10S#003	DL Channel Activation 2350 ch Operation Band Channel Bandw 4 10 f	On On On vidth Output Level MHz -57.2 dBm	This tab is used to configure Carrier on LTE-A. A Blue Dot in this tab indicat configured.	tes that the compo	onent carrier is	MT8821C 2020/07/13 20:16 RF Output : On DL 4CCs 2x2/4x4
PCC SCC1 SCC2 SCC3 >>	Measurement	Signaling		UE Powe	er : 23.9 dBm	ConfigWarning Master Mode
Common 🔊 🗈 🛨 🔍	Fundamental 👌 Throughput				Main Screen	A Home
Physical Second	[kbps] 60000	MAC DL total MAC UL total			Fundamental Sub Screen	< Preset
♦ Level ♦ Signal	54000			- Total - PCC T - SCC1	Throughput	Measuring
Antenna Configuration 2x2 MIMO (Open Loop)(TM3)	42000			- SCC5	arget ALL	Tx
User Define Channel Model (Channel 1to1/2/3/4 Gain/Phase) 0.50 0.0 degree	36000 30000			- SCC6 - SCC7 T	arget(DL/UL) DL&UL	•> Single
0.50 0.0 degree 0.25 0.0 degree 0.25 0.0 degree	24000			- Total Ti - PCC - SCC1	ime Scale 10	
(Channel 2to1/2/3/4 Gain/Phase) 0.50 90.0 degree 0.50 -90.0 degree 0.25 180.0 degree	12000					Connected
0.25 180.0 degree (Channel 3to1/2/3/4 Gain/Phase) 0.25 90.0 degree	6000					<b>.</b>
0.25 -90.0 degree	20251.5	[sec]	202	61.5		Start Call
Band 0.25 90.0 degree 0.25 -90.0 degree 0.25 -90	DL	easuring				End Call
External         0.25         90.0 degree           Loss         0.25         -90.0 degree	Throughput (Total) PCC		0.00 %) :C2 SCC3			
System Config DL RMC	Throughput 7906	kbps 15768 kbps	15768 kbps 7906 kb - 100 00 %) (- 100 00	<u> </u>		< Menu



		PCC									SCC				SCC					SCC	Tx Power		
Combination	Band	BW	PCC UL Channel	PCC UL Frequency	PCC DL Channel	PCC DL Frequency	Modulation	RB	offset	Band	BW	SCC DL Channel	SCC DL Frequency	Band	BW		SCC DL Frequency	- Ballo	BW	SCC DL Channel	SCC DL Frequency	Carrier Tx	LTE Tx Power with DL CA Enabled(dBm)
41C-[41C] PC3	41	20	40620	2593	40620	2593	QPSK	1	49	41	20	40818	2613	41	20	41490	2680	41	20	41292	2660.2	23.08	22.92
[41C]-41C PC3	41	20	40620	2593	40620	2593	QPSK	1	49	41	20	40818	2613	41	20	41490	2680	41	20	41292	2660.2	23.08	22.93

LTE Downlink 4CA 4X4 MIMO Maximum Conducted Power