

## Power measurement connection diagram:

The power measurement for 2G/3G/LTE/5G FR1 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 and DL CA.

## <u><GSM></u>





#### <WCDMA>



## <u> <LTE></u>

Phone2 LTE 40.205#021	~	Phone1 LTE 40.205#021	~	UL Channel 21100 ch Operation Band 7	TPC Pattern A Channel Bar	Input II +3d8 Idwidth Outpu R0 MHz	Level 30.0 dBm It Level -67.0 dBm	External Loss This sets the positive value value per inte	s - Main DL R DLEXTLO DL offset at the Main co b. The argument tx enabl rmal signal generator.	SS nnector. Loss is es setting a diffe	set as a Frent loss	MT8821C 2024/05/31 13:15 RF Output : On
PCC SC	cci s	cc2 scc3	>>	Measuren	nent	Signali	ing		U	E Power :	23.4 dBm	
Common	۲	<b>₽</b> ★	ζ	Numeric		Occupied Ba	ndwidth	Spectru	um Emission Mask	Main So	reen	A
Physical	🔊 Ge	eneral		TX Power	23.01 dBm	_				Fundam	nental	< Preset
Call	🔊 Fr	equency					On		On	Top	een	
Processing	🔊 Le											Measuring
Measurement	🔊 Sig	gnal										Rx
RX Measurement	🔊 υι	. RMC		Adjacent Channel	Power In-Ba	nd Emission	Spectrum	Flatness	EVM			●→ Single
Fundamental Measurement	🔊 DI	RMC				<b></b> _						Continuous
	😔 τα	D		On		On		On	On			
Test Parameter	Uplink I 1 : ( Sm Special	Downlink Configur	ation UD ation									Connected
			<u>_</u>	Phase Error	Magr	iitude Error	Constellat	ion	Throughput			Start Call
Band Definition												C End Call
External Loss				On		On		On	On			
System Config												< Menu



#### <LTE TDD Power class 3>



#### <5GNR FR1>





G NR V08.90	.21#000 *SA-FDD		Power Measurem	ent - Count 🕅 PWR_AVG		😸 – 🗙
PCC :	scc1 scc2 ♦ ≣► ★ Q	DL Center Channel 126900 Al Operation Band 71 DL Channel Ba	Input Level 1 +3dB 26.5 dBm ndwidth Output Level 20MHz -40.0 dBm			MT8000A 2024/05/24 14:12 Ref. Int
Level / Freq Cell	Sell	Measurement	Signaling	U	E Power : 26.0 dBm	
Level / Freq Routing / ARB Physical Channel Call	N_TAoffset DL Subcarrier Spacing(data) 15kHz UL Subcarrier Spacing(data)	Numeric           Tx Power         25.83 dBm           OBW         18.787 MHz           ACLR(-)         -53.70 dB           ACLR(+)         -55.93 dB	Occupied Bandwidth	Spectrum Emission Mask	Main Screen Fundamental Sub Screen	Aome < Preset
Processing Tx Measurement Rx Measurement	15kHz BW Setting Mode Symmetric DL Channel Bandwidth 20MHz		OBW 18.787 MHz		Тор	Measuring Tx
OTA Position Fundamental Measurement	UL Channel Bandwidth 20MHz DL Number of Additional BWP UL Number of Additional BWP 0 BWP1 25 0 25 0 BWP2	Adjacent Channel Power	In-Band Emission	Spectrum Flatness		Single Continuous
Test	25 0 25 0 BWP3 25 0 25 0 BWP4 25 0 25 0	EVM Phase	Error Magnitude Err	or Constellation		Start Call
Parameter External Loss	BWP Switch Delay Type2 Type2 BWP Configuration Option2 Active DL BWP	On	On On	On		End Call
System Config	0 Active UL BWP					< Menu
G NR V08.90	).21#000 *SA-FDD		Power Measurem	ent - Count R PWR_AVG		<mark>⊗</mark> - ×

PCC	scc1 scc2	DL Center Channel TPC Pattern 126900 A Operation Band DL Channel Ba 71	Input Level           II +3d8         26.5 dBm           andwidth         Output Level           20MHz         -40.0 dBm		® 70° <mark></mark>	MT8000A 2024/05/24 14:12 Ref. int
Level / Freq Cell	Ser Frequency	Measurement	Signaling	UER	Power : 25.9 dBm	
Level / Freq Routing / ARB	UL. Offset To Carrier	Numeric	Occupied Bandwidth	Spectrum Emission Mask	Main Screen	Â
Physical Channel	PointA Channel	Tx Power 25.84 dBm OBW 18.787 MHz	کا دهد اک		Fundamental	< Preset
Call Processing	116048 PointA Frequency 580.240 000 MHz	ACLR(+) -55.98 dB		On	Тор	Measuring
Tx Measurement	Center Channel 136100		and Mulherent during		•	Tx
Rx Measurement	Center Frequency 680.500 000 MHz		OBW 18.787 MHz			Rx
OTA Position	7.5 kHz Frequency Shift Off	Adjacent Channel Power	In-Band Emission	Spectrum Hatness		Single
Fundamental Measurement	DL Offset To Carrier 102					Continuous
	PointA Channel 121320		On	On		
	PointA Frequency 606.600 000 MHz					Connected
	Center Channel 126900	EVM Phase	Error Magnitude Erro	or Constellation		
l contra	Center Frequency 634.500 000 MHz					٠.
Test Parameter	Absolute Frequency SSB 125550					
External	SSB Frequency 627,750 000 MHz	On	On On	On		End Call
System Config	Channel Setting Mode Lowest GSCN Operation Band					< Menu



# LTE Uplink and Downlink Carrier Aggregation configurations:

Phone2 LTE 40.105#045	✓ Phone1 LTE 40.105#045	~	UL Channel T 18300 ch Operation Band C 1	PC Pattern Auto hannel Bandwidth 5 MHz	Input Level -1.0 dBm Output Level -60.2 dBm	This tab is used to configure par Carrier on LTE-A. A Blue Dot in this tab indicates t configured.	ameters of each Component hat the component carrier is	MT8821C 2024/01/25 13:26 RF Output : On
PCC S	cc1 scc2 scc3		Measuremer	ıt	Signaling		UE Power: -52.6 dBm	Band Cal
		α	Numeric	Oco	pied Bandwidth	Spectrum Emission Masl	k Main Screen	A
Physical Channel	Seneral		TX Power Freq. Err EVM	dBm ppm %(rms)			Fundamental Sub Screen	< Preset
Call	Frequency						Тор	
Processing	🔊 Level							Tx
Measurement	🕥 Signal			1000				Rx
RX Measurement	📎 UL RMC		Adjacent Channel Po	wer In-Band Emis	sion Spectrum	Flatness EVM		●→ Single
Fundamental	📎 DL RMC							Continuous
measurement	🔊 tod			Or				
Test Parameter							1	ldle
			Phase Error	Magnitude E	rror Constellat	tion Throughput		Start Call
Band Definition							-	End Call
External Loss			On	Or		On On		
System Config								< Menu

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

 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)]

Phone2 175 40.105#045	✓ Phone1 LTE 40.105#045	DL Channel TPC Patte 300 ch Operation Band Channel B	m Input Level Auto -1.0 d8m andwidth Output Level S MHz -60.2 d8m	Channel Coding [1xC] & CHCODING This sets the channel configuration. Us Measurement Channel based on the m TS36.508 and TS36.521-2. for TRX testi	e RMC, which is Reference easurement standards ng based on measureme	MT8821C 2024/01/25 13:26 RF Output : On DL 2CCs UL 2CCs
PCC S	cc1° scc2 scc3 >>	Measurement	Signaling	UE	Power : -58.1 dBm	Band Cal
	D 🗈 🖈 🤇	Numeric	Occupied Bandwidth	Spectrum Emission Mask	Main Screen	A
Physical Channel	🔊 General	TX Power         dBm           Freq. Err         ppm           EVM         %(rm)	s)	,ı	Fundamental Sub Screen	< Preset
Call	> Frequency		On		Тор	
Processing	🔊 Level					T*
1X Measurement	🥪 Signal					Rx
RX. Measurement	Channel Coding RMC(DL/UL CA)	Adjacent Channel Power In-8	land Emission Spectrum F	latness EVM		•→ Single
Fundamental	Antenna Compination	<u>ه</u>				đ
Measurement	Antenna Configuration Single Antenna(1141)			on On		Continuous
	Beamforming					Idla
Test Parameter	DCI Format for Single Antenna 1A					
	Propagation Matrix None	Phase Error Mag	gnitude Error Constellatio	on Throughput		د.
Band	User Define Channel Model (Channel Ito]/2/3/4 (Sain/Phase)					Start Call
Definition	1.00 0.0 degree					End Call
External Loss	0.00 0.0 degree	On	On	On On		
System Config	(Channel 2to1/2/3/4 Gain/Phase) 0.00 0.0 degree 1.00 0.0 degree 0.00 0.0 degree					< Menu



3. PCC parameter Settings: on the screen, and then select the PCC tab and Set operating band, BW, channel and RB configurations for PCC;

Appendix F

Phone2 176 40.105#045	✓ Phone1 LTE 40.105#045	DL Channel TPC Patter 35750 ch Operation Band Channel Ba	n Input Level UI +3dB 30.0 dBm ndwidth Output Level 20 MHz -54.2 dBm	Modulation Analysis (2) MOD_MEAS This sets whether to perform modulation analy	
PCC SC	cc1° scc2 scc3 >>	Measurement	Signaling	UE Powe	r: -15.2 dBm 🚺 Baind Cal
Common	💶 🖈 વ	Numeric	Occupied Bandwidth	Spectrum Emission Mask	Nain Screen
Physical Channel	🔊 General	TX Power dBm PCC Freq. Err ppm PCC EVM %/rms		s	undamental ( Preset
Call Processing	Frequency Frame Structure	SCC-1 EVM %(rms	On	On	op Stop
TX Measurement	Channel Bandwidth 20 MHz				Tx Rx
RX Measurement	UL Channel 39750 ch	Adjacent Channel Power In-B	and Emission Spectrum	Flatness EVM	• Single
Fundamental Measurement	Prequency 2 506:000 000 MHz DL	01		On On	Continuous
Test Parameter	2 506.000 000 MHz				Idle
	Operation Band 41	Phase Error Mag	nitude Error Constella	tion Throughput	Start Call
Band Definition	0.000 MHz			—	End Call
External Loss	Signal	On	On	On On	
System Config	UL RMC				< Menu

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

Phone2 LTE 40:105#045	✓ Phone1 LTE 40.105#045	DL Channel 39750 ch Operation Band 41	TPC Pattern All +3dB Channel Bandwidth 20 MHz	Input Level 30,0 dBm Output Level -54,2 dBm	Modulation Analysis (2) MOD_MEAS This sets whether to perform modulate	in analysis. 🛞	▲ MT8821C 2024/01/25 14:30 RF Output : On DL 2CCs
PCC SC	.c1° scc2 scc3 >>	Measurem	ent :	Signaling	UE	Power : -15.5 dBm	UL 2CCs Cont. Band Cal
tommon	🔊 🗈 \star ९	Numeric	Occu	pied Bandwidth	Spectrum Emission Mask	Main Screen	A Home
Physical Channel	📎 General	TX Power PCC Freq. Err PCC EVM	d8m ppm %(rms)			Fundamental Sub Screen	< Preset
Call	Frequency	SCC-1 Freq.Err SCC-1 EVM	%(rms)			Тор	Stop
TX	🔊 Level						тх ———
Measurement	🔊 Signal	1					Rx
RX Measurement	SUL RMC	2 Adjacent Channel	rower in-band Emis	sion spectrum	Hatness EVM		single
Fundamental	UL Allocation Mode Normal						Continuour
Measurement	RB Pos. Min(#0)	On	On				Commods
Test	Number of R8 100	a '					Idle
Parameter	Starting R8	<b>Y</b>					
	Max UL Throughput 3504 kbps	Phase Error	Magnitude Er	ror Constellat	tion Throughput		Start Call
Band	MCS Index 5 QPSK 5 8760 8						•
External	64QAM Disabled		On				End Call
Loss	256QAM Disabled						< Menu
System Config	DL RMC						



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

Appendix F

Phone2 LTE 40.105#045	✓ Phone1 LTE 40.105#045	DL Channel Activation 39948 ch Operation Band Channel 8	andwidth Output Level	This tab is used to configure parameters Carrier on LTE-A. A Blue Dot in this tab indicates that the configured.	of each Component	▲ MT8821C 2024/01/25 14:30 RF Output : On DL 2CCs
PCC S	seci secz secz >>	Measurement	Signaling	UE	Power : -15.5 dBm	UL 2CCs Cont.
Common	<ul> <li>● ● ★ Q</li> </ul>	Numeric	Occupied Bandwidth	Spectrum Emission Mask	Main Screen	A Home
Physical Channel	S Frequency Frame Structure	TX Power dBm PCC Freq. Err ppm PCC EVM %(m SCC-1 EVM %(m			Fundamental Sub Screen	< Preset
	LAA mode Channel Bandwidth 20 MHz	3)			Тор	Stop Tx
	Channel 39948 ch	Adjacent Channel Power In-8	and Emission Spectrum	Flatness EVM		●> Single
	DL Channel 39948 ch	On		On On		Continuous
	Frequency 2 525,800 000 MHz Operation Band	There Free Ma	anituda Error Constalla	tion Throughout		
	HI CODO MH2			ion modgipat		Start Call
Band Definition	> Level					End Call
External Loss	Signal	On				
System Config	UL RMC					Menu

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

Phone2 17E 40.105#045	✓ Phone1 LTE 40.105#045	DL Channel Activation 39948 ch Operation Band Channel Ban 41	On Output On On On On On Output Level 20 MHz -54.2 dBm	This tab is used to configure parameters of Carrier on LTE-A. A Blue Dot in this tab indicates that the or configured.	f each Component mponent carrier is Soutput : C UL 2CCS UL 2CCS cont	LC 4:30 Dn
PCC S	cc1 <sup>*</sup> sec2 scc3 >>	Measurement	Signaling	UE P	ower: -15.5 dBm 🚺 Band Cal	
Common		Numeric	Occupied Bandwidth	Spectrum Emission Mask	Main Screen 🏫	
Physical Channel	S Frequency	TX Power dBm PCC Freq. Err ppm PCC EVM %(ms SCC-1 Freq. Err ppm	,		Fundamental   Fundamental   Preset	
	Level	SCC-1 EVM %(rms	) On		Top	
	📎 Signal				Tx	
	SUL RMC				Rx	_
	RB Pos. Min(PD)	Adjacent Channel Power In-Ba	and Emission Spectrum	Flatness EVM	•> Single	
	Number of RB	2			đ	•
	Starting RB	On	on	On On	Continuo	us
	3504 kbpa				Idle	
	MCS Index 5 QPSK 5 8760 8					
	DL RMC	Phase Error Mag	nitude Error Constellati	ion Throughput	Start Cal	<b>8</b> 10
Band Definition	TDD				End Cal	
External Loss		On	On	On On		
System Config					K Menu	



5. Select the PCC tab, then set "SIM Model Number" and select max power;

Phone2 17E 40.105#045	V Phone1 LTE V 40.105#045	DL Channel TPC Patt 39750 ch Operation Band Channel	ern Input Level All +5d8 3000 dBm Bandwidth Output Level 20 MHz -54.2 dBm	Modulation Analysis (2) MOD_MEAS This sets whether to perform modulation analysis	MT8821C     2024/01/25 14:30     RF Output : On     DL 2CCS     UL 2CCS Fort
PCC SC	cc1 scc2 scc3 >>	Measurement	Signaling	UE Power :	-15.5 dBm Band Cal
Common Physical Channel Call Processing TX Measurement RX Measurement	Authentication / Integrity     SiM Model Number     P0250     Authentication Algorithm     XOI     Authentication Algorithm     XOI     Authentication Key K     0010203 04050607     08090A08 0C0D0606     AMF	Numeric TX Power and B POC Free, Err pp POC EVM SC:1 SCC:1 Free, Err Pp SCC:1 Free, Err Skip SCC:1 EVM Skip	Band Emission	Spectrum Emission Mask Mai Fun Sub On Top	n Screen damental Screen Screen Tx Rx Single t
Measurement Test Parameter	0Pc 00000000 0000000 0000000 0000000 000000	on			
	RMC     Power Control	Phase Error M	agnitude Error Constella	tion Throughput	Start Call
band Definition	TPC Pattern	9			End Call
External Loss System	Power Control Unset	On		On On	< Menu
Config	p-Max Update Procedure				

6. Click the "Connect" button at the Right of the screen, if necessary, turn the Airplane mode on/off in the DUT

Phone2 LTE 40.105#045	✓ Phone1 LTE 40.105≠045	DL Channel TPC Pattern 39750 ch All +1 Operation Band 41 20 M	Input Leve Sdll 3 dth Output Leve IHz -5	10 d8m el 12 d8m	This tab is used to configure po Carrier on LTE-A. A Blue Dot in this tab indicates configured.	arameters of each Component that the component carrier is	▲ MT8821C 2024/01/25 16:26 RF Output : On DL 2CCs UII 2CCS Cont
PCC S	cc1 scc2 scc3 >>	Measurement	Signaling			UE Power : 21.3 dBm	Band Cal
	<ul> <li>▶ ★ </li> <li></li> </ul>	Fundamental > Numeric					A
Physical Channel		Source Power Measurement	3			Fundamental Sub Screen	< Preset
Call Processing	> Level	Total TX Power	Avq.	Max.	Min, 22.38 dBm	Numeric	Measuring
TX Measurement	Signal	PCC TX Power	21.85	21.85	21.85 dBm	Tag Power	Tx Rx
RX Measurement	UL Allocation Mode	SCC-1 TX Power	13.02	13.02	21.84 dBm 13.02 dBm	Measurement	●→ Single
Fundamental	RB Pos. Min(#2)	Channel Power	13.02	13.02	13.02 dBm	<u> </u>	Continuous
measurement	Starting RB					_	
Test Parameter	0 Max UL Throughput 1504 kbps					(2)	Connected
	MCS Index 5 QPSK 5 8760 8					1	Start Call
Band Definition	64QAM Disabled 256QAM					6	End Call
External Loss	Disabled DL RMC					Ŭ	
System Config	TDD						< Menu

7. The inter-band DLCA test method is similar to intra-band DLCA.

2CA DL

		PCC										SCO		Power		
04.114	LTE	BW	BW	UL	UL		UL#	UL		LTE	BW	DL	DL		With CA	Without CA
CALIST	Road	Ant	(MHa)	Freq.	Channel	Mod.		RB	DL Antenna Configuration	Road	Read (Mila)	Freq.	Channel	DL Antenna Configuration	Tx. Power	Tx. Power
	Daliu	741	(MP12)	(MHz)	Chainer		ND	Offset		Danu	(MI12)	(MHz)	Chainer		(dBm)	(dBm)
	Band 41	1	20M	2593	40620	QPSK	1	0	4X4 MIMO	Band 42	20M	3500	42590	4X4 MIMO	22.88	22.95
CA_41A-42A	Band 42	5	20M	3500	42590	QPSK	1	0	4X4 MIMO	Band 41	20M	2593	40620	4X4 MIMO	22.76	22.89



3CA DL

3CA List	PCC								SCC1					SCC2					Power		
	LTE	BW	BW	UL	UL		UL#	UL		LTE	BW	DL	DL		LTE	BW	DL	DL		With CA	Without CA
	Band	Ant	(MHz)	Freq.	Chonnel	Mod.	DD	RB	Configuration	Band	(MHz)	Freq.	Channel	nel Configuration	Band	(MHz)	Freq.	Channel	DL Antenna Configuration	Tx. Power	Tx. Power
				(MHz)	Channel	'	ND	Offset				(MHz)	Citatine			(m/12)	(MHz)			(dBm)	(dBm)
CA_41C-42A	Band 41	1	20M	2593	40620	QPSK	1	0	4X4 MIMO	Band 41	20M	2612.8	40818	4X4 MIMO	Band 42	20M	3500	42590	4X4 MIMO	22.88	22.95
	Band 42	5	20M	3500	42590	QPSK	1	0	4X4 MIMO	Band 41	20M	2593	40620	4X4 MIMO	Band 41	20M	2612.8	40818	4X4 MIMO	22.76	22.89
CA_41A-42C	Band 41	1	20M	2593	40620	QPSK	1	0	4X4 MIMO	Band 42	20M	3500	42590	4X4 MIMO	Band 42	20M	3519.8	42788	4X4 MIMO	22.88	22.95
	Band 42	5	20M	3500	42590	QPSK	1	0	4X4 MIMO	Band 42	20M	3519.8	42788	4X4 MIMO	Band 41	20M	2593	40620	4X4 MIMO	22.76	22.89