

**Element Washington DC LLC** 

18855 Adams Court, Morgan Hill, CA 95037 USA Tel. 410.290.6652 / Fax 410.290.6654





# PART 27 MEASUREMENT REPORT

#### **Applicant Name:**

Apple Inc. One Apple Park Way Cupertino, CA 95014 United States

#### Date of Testing: 5/1/2022 - 8/15/2022 Test Site/Location: Element Washington DC LLC Morgan Hill, CA, USA Test Report Serial No.: 1C2205090038-04.BCG

BCG-A2772			
Apple Inc.			
Certification			
A2772			
Watch			
PCS Licensed Transmitter Worn on Body (PCT)			
27			
ANSI C63.26-2015, TIA-603-E-2016, KDB 971168 D01 v03r01			

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez Executive Vice President



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					EIRP		
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	Max. Power [mW]	Max. Power [dBm]	Emission Designator
	5 MHz	QPSK	2502.5 - 2567.5	4.5619	57.544	17.60	4M56G7W
		16QAM	2502.5 - 2567.5	4.5639	49.091	16.91	4M56D7W
	10 MH-	QPSK	2505 - 2565	9.1207	56.624	17.53	9M12G7W
LTE Band 7	10 MHz	16QAM	2505 - 2565	5.4805	48.641	16.87	5M48D7W
LTE Band 7	15 MHz	QPSK	2507.5 - 2562.5	13.6564	57.544	17.60	13M7G7W
		16QAM	2507.5 - 2562.5	6.4083	46.238	16.65	6M41D7W
	20 MHz	QPSK	2510 - 2560	18.1384	57.544	17.60	18M1G7W
		16QAM	2510 - 2560	8.3189	48.195	16.83	8M32D7W
	5 MUT	QPSK	2498.5 - 2687.5	4.5620	50.119	17.00	4M56G7W
	5 MHz	16QAM	2498.5 - 2687.5	4.5469	38.815	15.89	4M55D7W
	10.141	QPSK	2501 - 2685	9.1691	49.431	16.94	9M17G7W
LTE Dand 44	10 MHz	16QAM	2501 - 2685	5.5815	41.305	16.16	5M58D7W
LTE Band 41		QPSK	2503.5 - 2682.5	13.6330	49.545	16.95	13M6G7W
	15 MHz	16QAM	2503.5 - 2682.5	6.6173	38.994	15.91	6M62D7W
	20 MU	QPSK	2506 - 2680	18.1390	49.545	16.95	18M1G7W
	20 MHz	16QAM	2506 - 2680	7.5900	39.355	15.95	7M59D7W

**EUT Overview** 

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# 1.0 INTRODUCTION

# 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

# 1.2 Element Washington DC LLC Test Location

These measurement tests were conducted at the Element Washington DC LLC facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

#### 1.3 Test Facility / Accreditations

Measurements were performed at Element located in Morgan Hill, CA 95037, U.S.A.

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Washington DC LLC facility is a registered (22831) test laboratory with the site description on file with ISED.

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# 2.0 PRODUCT INFORMATION

# 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Watch FCC ID:BCG-A2772**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: MQ6GGJGYXC, N6QT4D147W, DLC215300991T0J31

## 2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n WLAN, 802.11a/n UNII, Bluetooth (1x, EDR, HDR4, HDR8, LE1M, LE2M), NFC, UWB, 60.5GHz Transmitter.

This device supports simultaneous transmission operations, which allows for multiple transmitters to transmit simultaneously on the same antenna. The table below shows all configurations possible.

	Antenna FCM						
Simultaneous	WLAN	Bluetooth	LTE/WCDMA	UNII	UWB		
Tx Config	802.11 b/g/n	BDR, EDR, HDR4/8, LE1/2M	Mid band/ High band	802.11 a/n	Ch.5, Ch.9		
Config 1	$\checkmark$	×	×	×	$\checkmark$		
Config 2	×	$\checkmark$	×	×	$\checkmark$		
Config 3	×	×	✓	×	✓		
Config 4	×	$\checkmark$	✓	×	×		
Config 5	✓	×	✓	×	×		
Config 6	×	×	✓	✓	×		
Config 7	×	×	✓	×	✓		
Config 8	×	$\checkmark$	✓	×	✓		
Config 9	✓	×	✓	×	✓		
Config 10	×	$\checkmark$	✓	$\checkmark$	×		

Table 2-1. Simultaneous Transmission Configurations

✓ = Support; × = Not Support

## 2.3 Antenna Description

Following antenna gains provided by manufacturer were used for testing.

Band	Antenna Gain (dBi)
Danu	Antenna FCM
LTE Band 7	-6.4
LTE Band 41	-7.0

Table 2-2. Highest Antenna Gain

Note: Antenna Specifications has been attached to Appendix A

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# 2.4 Test Support Equipment

1	Apple Macbook	Model:	A1398	S/N:	C2QKP008F6F3		
	w/AC/DC Adapter	Model:	A1435	S/N:	N/A		
	Apple iPhone	Model:	993-89846LL/A	S/N:	QHLHY57CJ9		
2	Apple USB-C cable	Model:	N/A	S/N:	N/A		
	w/ Charging Dock	Model:	N/A	S/N:	DQ812910BBG08V22H		
	w/ Cradle	Model:	LA2-AC-SM-P1	S/N:	FV40423073CMW6M3J		
3	Apple Magnetic Charger	Model:	A2515	S/N:	DLC035200UJMFR0AJ		
4	Pathfinder Falcon	Model:	920-098626-01	S/N:	DLC03770065Q6PM1W		
	SiP Socket	Model:	N/A	S/N:	P1 X2539S PF 101		
5	DC Power Supply	Model:	KPS3010D	S/N:	N/A		
6	Store Sample Wristband	Model:	N/A	S/N:	DLC219400361YDQ2W		

Table 2-3. Test Support Equipment

# 2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.26 2015, TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

The worst case configuration was investigated for all combinations of the two materials, aluminum, and stainless steel, and various types of wristbands, metal and non-metal wristbands. The EUT was also investigated with and without wireless charger. The worst case configuration found was used for all testing.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz and above 18GHz were tested with the highest transmitting power and the worst case channel.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

This device only supports 27RBs or less for 16-QAM uplink.

All possible simultaneous transmission configurations have been investigated and the worst case config has been reported.

Description	Bluetooth	LTE	UNII
Antenna	FCM	FCM	FCM
Channel	78	40620	36
Operating Frequency (MHz)	2480	2593	5180
Mode/Modulation	GFSK ePA	QPSK/1RB/20MHz	11n

 Table 2-4. Worst Case Simultaneous Transmission Configuration

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# 2.6 Software and Firmware

The test was conducted with firmware watchOS 9.0 installed on the EUT.

# 2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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# 3.0 DESCRIPTION OF TESTS

## 3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI C63.26 2015, TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

## 3.2 Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

E[dBµV/m] = Measured amplitude level[dBm] + 107 + Cable Loss[dB] + Antenna Factor[dB/m]

And

 $EIRP_{[dBm]} = E_{[dB\mu V/m]} + 20logD - 104.8$ ; where D is the measurement distance in meters.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014.

Per KDB 414788 D01 v01r01, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

Radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI C63.26-2015 and TIA-603-E-2016.

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# 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.77
Radiated Disturbance (<30MHz)	4.38
Radiated Disturbance (30MHz-1GHz)	4.75
Radiated Disturbance (1-18GHz)	5.20
Radiated Disturbance (>18GHz)	4.72

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# 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	6/10/2022	Annual	6/10/2023	MY49430244
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	8/13/2021	Annual	8/13/2022	T058701-01
ESPEC	SU-241	Tabletop Temperature Chamber	10/26/2021	Annual	10/26/2022	92009574
ETS-Lindgren	3142E	BiConiLog Antenna (30MHz - 6GHz)	10/21/2021	Annual	10/21/2022	208204
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	5/11/2022	Annual	5/11/2023	205956
Keysight Technology	N9040B	UXA Signal Analyzer	2/8/2022	Annual	2/8/2023	MY57212015
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	1/6/2022	Annual	1/6/2023	101639
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	3/4/2022	Annual	3/4/2023	101619
Rohde & Schwarz	ESW26	EMI Test Receiver	5/19/2022	Annual	5/19/2023	101299
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	1/6/2022	Annual	1/6/2023	102327
Rohde & Schwarz	ESW44	EMI Test Receiver	12/2/2021	Annual	12/2/2022	101570
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	10/11/2021	Annual	10/11/2022	161616
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/4/2021	Annual	11/4/2022	151888
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	4/18/2022	Annual	4/18/2023	100050
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna (400MHz-18GHz)	1/25/2022	Annual	1/25/2023	101063
Rohde & Schwarz	HFH2-Z2	Loop Antenna	4/3/2022	Annual	4/3/2023	100546

Table 5-1. Test Equipment

#### Notes:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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# 6.0 SAMPLE CALCULATIONS

#### **Emission Designator**

#### **QPSK Modulation**

Emission Designator = 8M62G7W BW = 8.62 MHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination of Any

#### **QAM Modulation**

Emission Designator = 8M45D7W BW = 8.45 MHz D = Amplitude/Angle Modulated 7 = Quantized/Digital Info W = Combination of Any

#### **Spurious Radiated Emission**

#### Example: Spurious emission at 3700.40 MHz

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm -(-24.80) = 50.3 dBc.

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# 7.0 TEST RESULTS

# 7.1 Summary

Company Name:	Apple Inc.
FCC ID:	BCG-A2772
FCC Classification:	PCS Licensed Transmitter Worn on Body (PCT)
Mode(s):	<u>LTE</u>

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
	Occupied Bandwidth	2.1049	N/A	N/A	Section 7.2
	Conducted Band Edge / Spurious Emissions (LTE Band 7)	2 10E1 27 E2(m)	Undesirable emissions must meet the limits detailed in	PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (LTE Band 41)	2.1031, 21.33(11)	27.53(m)	PASS	Sections 7.3, 7.4
	Transmitter Conducted Output Power	2.1046	N/A	N/A	See RF Exposure Report
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 7)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 41)	27.50(h)(2)	< 2 Watts max. EIRP	PASS	Section 7.6
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block over the temperature and voltage range as tested	PASS	Section 7.8
RADIATED	Radiated Spurious Emissions (LTE Band 7)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in	PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 41)	2.1055, 27.55(m)	27.53(m)	PASS	Section 7.7

Table 7-1. Summary of Test Results

#### Notes:

- 1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2. The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized was Element EMC Software Tool v1.1.

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# 7.2 Occupied Bandwidth §2.1049

#### **Test Overview**

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

#### **Test Procedure Used**

KDB 971168 D01 v03r01 - Section 4.2

#### Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW ≥ 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within

1-5% of the 99% occupied bandwidth observed in Step 7

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

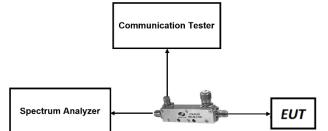


Figure 7-1. Test Instrument & Measurement Setup

#### Test Notes

None.

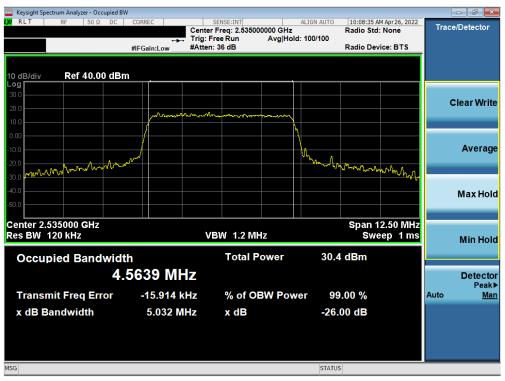
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# LTE Band 7



Plot 7-1. Occupied Bandwidth Plot (LTE Band 7 - 5MHz QPSK - Full RB)

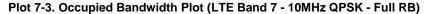


Plot 7-2. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 16-QAM - Full RB)

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LXIRLT F	RF 50 9	Ω DC	CORREC	Contr	SENSE:INT or Freq: 2.5350	00000 GH7	ALIGN AUTO	10:05:18 A Radio Std	M Apr 26, 2022	Trace	e/Detector
					Free Run		d: 100/100	Raulo Stu	None		
			#IFGain:Lo	w #Atte	n: 36 dB			Radio Dev	ice: BTS		
10 dB/div	Ref 40.0	00 dBm	า								
Log											
30.0											Clear Write
20.0			يستر	monanter	-mar -	mount					
10.0											
0.00			_/				<u>ل</u>				
-10.0			_/				<u>}</u>				Average
-10.0 -20.0	n Managado	why have	~JC				Munhan	munhadre	mound		
-30.0	and the second								Last a 20 Andref M		
-40.0											
											Max Hole
-50.0											_
Center 2.535	00 GHz	_						Span 2	5.00 MHz		
Res BW 240	kHz			۱	/BW 2.4 №	lHz			ep 1 ms		Min Hold
Occupie	d Ban	dwidt	h		Total	Power	31.9	dBm			
		9_1	1207	MHz							Detecto
											Peak
Transmit	Freq E	ror	-16.3	13 kHz	% of C	BW Pow	er 99	9.00 %		Auto	<u>Mai</u>
x dB Band	dwidth		10.6	6 MHz	x dB		-26.	00 dB			
150							CTATH	6			
ISG							STATU	5			





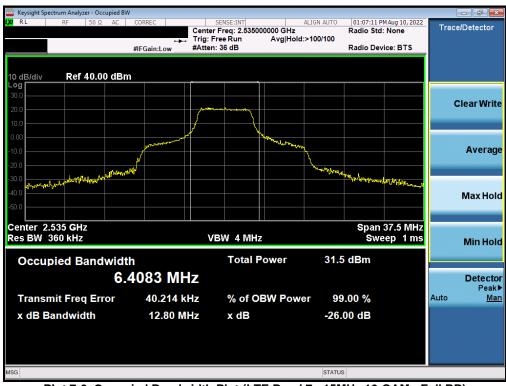
Plot 7-4. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 15 of 67
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,			\/2 2 2/15/2022



Keysight Spectrum Analyzer - Occupie					- 6 💌
<mark>0 RLT</mark> RF 50Ω D	CCORREC	SENSE:INT Center Freg: 2.535000	ALIGN AUTO	10:02:36 AM Apr 26, 2022 Radio Std: None	Trace/Detector
	- <b></b> -	Trig: Free Run	Avg Hold: 100/100		
	#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 d	IBm				
_ <b>og</b>					
20.0					Clear Writ
10.0	Antonio	lo man man and the strange	see warming		
	1		h,		
0.00			7		Avereg
10.0	Aller		mun		Averag
20.0				and and washing the state	
50.0					
40.0					Max Hol
50.0					
Center 2.53500 GHz				Span 37.50 MHz	
Res BW 360 kHz		VBW 4 MHz		Sweep 1 ms	Min Hol
Occupied Bandwi	idth	Total Po	ower 31.9	dBm	
	13.656 MH	z			Detecto
					Peak
Transmit Freq Error	-7.905 k	Hz % of OB	W Power 99	.00 %	Auto <u>Ma</u>
x dB Bandwidth	15.80 M	Hz x dB	-26.	00 dB	
SG			STATU	s	

Plot 7-5. Occupied Bandwidth Plot (LTE Band 7 - 15MHz QPSK - Full RB)



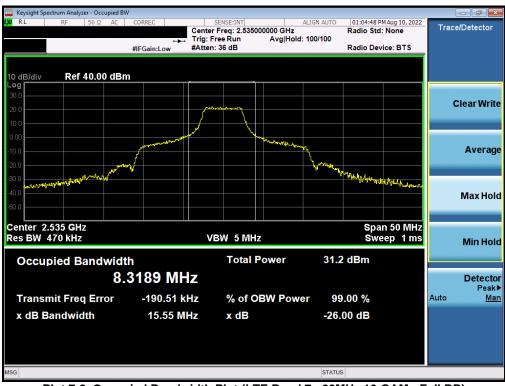
Plot 7-6. Occupied Bandwidth Plot (LTE Band 7 - 15MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 16 of 67
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			V2 2 2/15/2022



Keysight Spectrum Analyzer - Occup					- F ×
<mark>ORLT</mark> RF 50Ω	DC CORREC	SENSE:INT Center Freg: 2.535000	ALIGN AUTO	09:47:51 AM Apr 26, 2022 Radio Std: None	Trace/Detector
	+→- #IFGain:Low		Avg Hold: 100/100	Radio Device: BTS	
10 dB/div Ref 40.00	dBm				
_og					
30.0					Clear Write
20.0	monum	arana and a second and the	enotion		
10.0	Å		N.		
10.00	M		M.		Average
	walm		"hat hat way way	welson domentation	Average
20.0 www.lote.lone.com/without late				and an ordered	
-40.0					Max Hold
-50.0					Max Hold
Center 2.53500 GHz Res BW 470 kHz		VBW 5 MHz		Span 50.00 MHz Sweep 1 ms	
					Min Hold
Occupied Bandw	vidth	Total Po	ower 31.9	dBm	
	18.138 MF	z			Detecto Peak
Transmit Freq Erro	r -23.753 k	Hz % of OB	W Power 99	.00 %	Auto <u>Mar</u>
x dB Bandwidth	21.48 M	Hz xdB	-26.	00 dB	
SG			STATU	5	

Plot 7-7. Occupied Bandwidth Plot (LTE Band 7 - 20MHz QPSK - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 17 of 67
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			V2 2 2/15/2022



# LTE Band 41



Plot 7-9. Occupied Bandwidth Plot (LTE Band 41 - 5MHz QPSK - Full RB)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 41 - 5MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 18 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage to 0107
<u>-</u>		·	V2.2 2/15/2022



🔤 Keysight Spectrum Analyzer - Occ	upied BW				- ē ×
LX/RLT RF 50Ω		SENSE:INT nter Freg: 2.593000000 GHz	ALIGN AUTO 10:59:01 P Radio Std	M May 16, 2022	Trace/Detector
		g: Free Run Avg Hold		None	
		ten: 36 dB	Radio Dev	ice: BTS	
10 dB/div Ref 40.00	) dBm				
Log					
30.0					Clear Write
20.0		An other Description and solar the state			Clear write
10.0					
0.00	<u>J</u>		۹		
	and the second sec				Average
And the share of the Control of the	, Lufter for the		man who had a for all who	NUN MANY WHAT	Average
-20:0					
-30.0					
-40.0					Max Hold
-50.0					
Center 2.59300 GHz				5.00 MHz	
Res BW 240 kHz		#VBW 750 kHz	SWe	ep 1 ms	Min Hold
Occupied Band	width	Total Power	32.0 dBm		
Occupied Barid			52.0 UBIII		
	9.1691 MHz				Detector
Transmit Freq Err	or -4.064 kHz	% of OBW Pow	er 99.00 %		Peak▶ Auto Man
· · · ·					
x dB Bandwidth	11.08 MHz	x dB	-26.00 dB		
MSG			STATUS		
mou			JIATUS		

Plot 7-11. Occupied Bandwidth Plot (LTE Band 41 - 10MHz QPSK - Full RB)



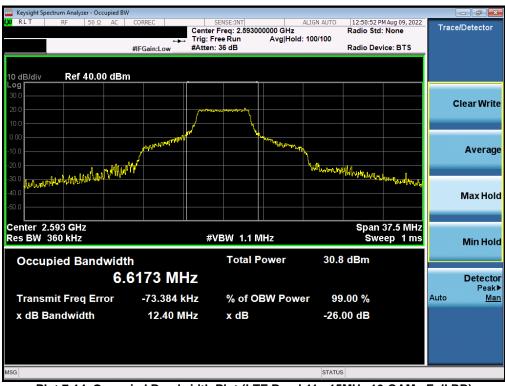
Plot 7-12. Occupied Bandwidth Plot (LTE Band 41 - 10MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 19 of 67
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🔤 Keysight Spectrum Analyzer - Occu	ipied BW				
LX RLT RF 50Ω	DC CORREC	SENSE:INT A ter Freq: 2.593000000 GHz	LIGN AUTO 10:50:36 PN Radio Std:	May 16, 2022	Trace/Detector
		: Free Run Avg Hold:		None	
	#IFGain:Low #Att	ten: 36 dB	Radio Devi	ice: BTS	
10 dB/div Ref 40.00	dBm				
Log					
30.0					Clear Write
20.0	and the second	manne			elour mile
10.0					
0.00					
-10.0			Muller margin and the		Average
-10.0 -20.0			What have a start and a start	the share and have	
-30.0					
-40.0					Max Hold
-50.0					
Center 2.59300 GHz				7.50 MHz	
Res BW 360 kHz		#VBW 1.1 MHz	Swe	ep 1 ms	Min Hold
		Total Power	31.7 dBm		
Occupied Bandy		TOTALLEOME	51.7 UBIII		
	13.633 MHz				Detector
Transmit Freq Erro	or 3.455 kHz	% of OBW Powe	r 99.00 %		Peak▶ Auto Man
x dB Bandwidth	17.00 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-13. Occupied Bandwidth Plot (LTE Band 41 - 15MHz QPSK - Full RB)



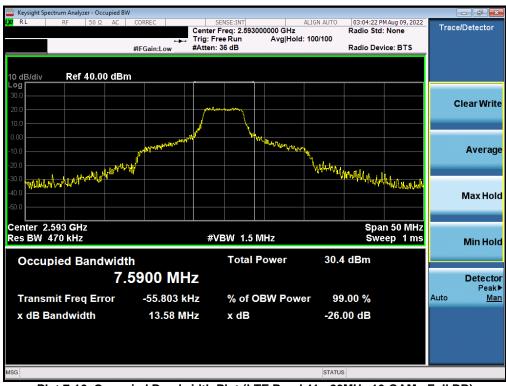
Plot 7-14. Occupied Bandwidth Plot (LTE Band 41 - 15MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 20 of 67
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			V2 2 2/15/2022



Keysight Spectrum Analyzer - Occupied E					- F ×
XIRLT RF 50Ω DC	CORREC	SENSE:INT ter Freg: 2.59300000	ALIGN AUTO	10:46:54 PM May 16, 2022 Radio Std: None	Trace/Detector
	Trig		vg Hold: 100/100	Radio Device: BTS	
10 dB/div Ref 40.00 dB	m				
20.0	manana	man and a star and a star	menter and a second sec		Clear Writ
20.00 20.00 20.0 0 20.0 0	whoth		ly Ny vinalinaly	Mushammarablanshit	Averag
40.0					Max Hol
Center 2.59300 GHz Res BW 470 kHz		#VBW 1.5 MHz		Span 50.00 MHz Sweep 1 ms	Min Hol
Occupied Bandwid	th	Total Pow	ver 31.	ō dBm	
	8.139 MHz				Detecto Peak
Transmit Freq Error	-4.348 kHz	% of OBW	Power 99	0.00 %	Auto <u>Ma</u>
x dB Bandwidth	21.37 MHz	x dB	-26.	00 dB	
SG			STATU	s	

Plot 7-15. Occupied Bandwidth Plot (LTE Band 41 - 20MHz QPSK - Full RB)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 41 - 20MHz 16-QAM - Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 21 of 67
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			V2 2 2/15/2022



#### 7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051, §27.53(m)

#### **Test Overview**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

# For LTE Bands 7 and 41, the minimum permissible attenuation level of any spurious emission is 55 + 10log<sub>10</sub>(*P*[*w*atts]).

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

#### Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

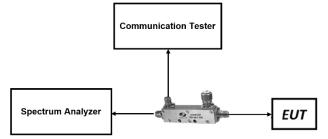


Figure 7-2. Test Instrument & Measurement Setup

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 22 of 67	
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			\/2 2 2/15/2022	



#### Test Notes

1. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

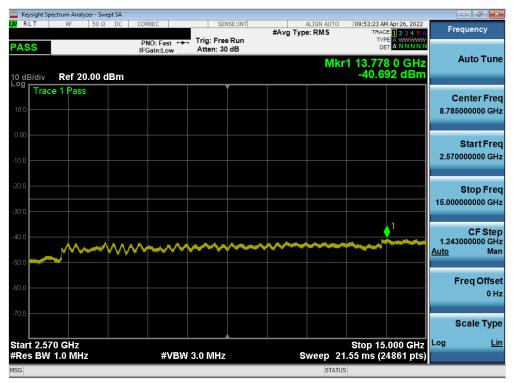
FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 23 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 23 01 07	
			V2 2 2/15/2022	



# LTE Band 7

	ectrum Analyz												
RLT	RF	50 Ω	DC	CORREC		SEI	SE:INT	#Avg -	ALIGN AUTO Type: RMS		M Apr 26, 2022 CE 1 2 3 4 5 6	Fi	equency
PASS				PNO: F IFGain:	ast ↔ ∟ow	Trig: Free Atten: 30		#/1¥9	ype. Kino	T)			
I0 dB/div	Ref 20	.00 dl	Bm						N	lkr1 2.47 -47.4	5 0 GHz 05 dBm		Auto Tune
-og Trac	e 1 Pass												Center Free 2500000 GH
0.00													Otoret Erro
10.0												30	Start Fre 0.000000 MH
20.0												2 47	Stop Fre 5000000 GH
30.0													CF Ste
50.0										and the state of the		244 <u>Auto</u>	1.500000 MH Ma
	اليونية ( المراجعة ( ا المراجعة ( المراجعة ( الم	ويوافق مراجع	nin un nin o		entrino qu	ersen en e	ile le traduie						Freq Offse
70.0													0 H
													Scale Type <u>Li</u>
Start 0.03 Res BW					#VBW	3.0 MHz			Sweep	Stop 2 3.260 ms	2.475 GHz (4891 pts)	Log	
ISG									STAT				

Plot 7-17. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-18. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 24 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 24 01 07	
			V2.2 2/15/2022	



🤐 Keysight Spectrum Analyzer - Swept SA					
LX/RLT RF 50Ω DC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	09:54:12 AM Apr 26, 2022 TRACE 1 2 3 4 5 6	Frequency
PASS	PNO: Fast ↔→	Trig: Free Run Atten: 10 dB		TYPE A WWWWWW DET A NNNNN	
	IFGain:Low	Attent To dB	ML	r1 26.680 0 GHz	Auto Tune
10 dB/div Ref 0.00 dBm				-50.632 dBm	
Log Trace 1 Pass		Ţ			
					Center Freq
-10.0					21.00000000 GHz
-20.0					
-20.0					Start Freq
-30.0					15.00000000 GHz
-40.0					Stop Freq
				_1	27.000000000 GHz
-50.0					
			and the second design of the s		CF Step
-60.0					1.200000000 GHz
-70.0					<u>Auto</u> Man
-80.0					Freq Offset 0 Hz
					0 H2
-90.0					
					Scale Type
Start 15.000 GHz				Stop 27.000 GHz	Log <u>Lin</u>
#Res BW 1.0 MHz	#VBW :	3.0 MHz	Sweep 2	0.80 ms (24001 pts)	
MSG			STATU	S	

Plot 7-19. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

RLT RF	50 Ω DC CO	RREC						
ASS		NO: Fast ↔→		#Avg Typ	ALIGN AUTO e: RMS	09:54:51 AM Apr 26, 2022 TRACE 1 2 3 4 5 0 TYPE A WWWW DET A NNNN	<i>.</i>	requency
0 dB/div Ref 20	.00 dBm	Guineow			Μ	lkr1 2.492 5 GHz -47.019 dBm		Auto Tu
og Trace 1 Pass								Center Fr 5000000 G
0.0							3	Start Fr 0.000000 M
80.0							2.50	Stop Fr 0000000 G
0.0						1	24 <u>Auto</u>	CF St 7.000000 M N
0.0	nya kana kata kata kata kata kata kata kat							Freq Offs 0
0.0 tart 0.030 GHz						Stop 2.500 GHz	Log	Scale Ty
Res BW 1.0 MHz		#VBW	3.0 MHz		Sweep	3.293 ms (4941 pts)		

Plot 7-20. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2772	element 🤤	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 25 of 67
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			\/2 2 2/15/2022



Keysight Spectrum Analyzer - Swept SA					
LX/RLT RF 50Ω DC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	09:55:19 AM Apr 26, 2022 TRACE 1 2 3 4 5 6	Frequency
PASS	PNO: Fast ↔→→ IFGain:Low	Trig: Free Run Atten: 30 dB	" <b>g</b> . , pere	TYPE A WWWWW DET A NNNNN	
10 dB/div Ref 20.00 dBm			Mki	1 13.607 0 GHz -40.711 dBm	Auto Tune
10.0					Center Freq 8.785000000 GHz
-10.0					Start Freq 2.570000000 GHz
-20.0					Stop Freq 15.000000000 GHz
-40.0	~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			CF Step 1.243000000 GHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 2.570 GHz				Stop 15.000 GHz	Scale Type
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 2	1.55 ms (24861 pts)	
MSG			STATU	5	

Plot 7-21. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-22. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 26 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 20 01 07	
	•	·	V2.2 2/15/2022	



	ectrum Analyzer - Sw										
LXU RLT	RF 50 Ω	DC COI	RREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO		Apr 26, 2022	Freq	uency
PASS			NO: Fast ↔	, Trig: Free Atten: 30				TYP			
PA33		IF	Gain:Low	Atten: 30	dB					<u>م</u>	uto Tune
							IVI	kr1 2.500	44 dBm		
10 dB/div Log	Ref 20.00	dBm						-40.1	44 UDIII		
Trace	e 1 Pass									Ce	nter Freg
10.0										1.2650	00000 GHz
0.00											
											start Freq
-10.0										30.00	
-20.0										S	Stop Freq
										2.5000	00000 GHz
-30.0											
-40.0											<b>CF</b> Step
-40.0									K		00000 MHz
-50.0						a ar an an suis blandeise		and the second	Parameter and the second	<u>Auto</u>	Man
CO.C	and the second second second					and the second second second					
-60.0										Fr	eq Offset
											0 Hz
-70.0											
										So	ale Type
Stort 0.03								Stop 3	.500 GHz	Log	Lin
Start 0.03 #Res BW			#VBV	3.0 MHz			Sweep	ے stop 2 ) 3.293 ms	4941 pts)		
MSG							STATU	_			

Plot 7-23. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-24. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 27 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 27 01 07
<u></u>	•	·	V2.2 2/15/2022





Plot 7-25. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

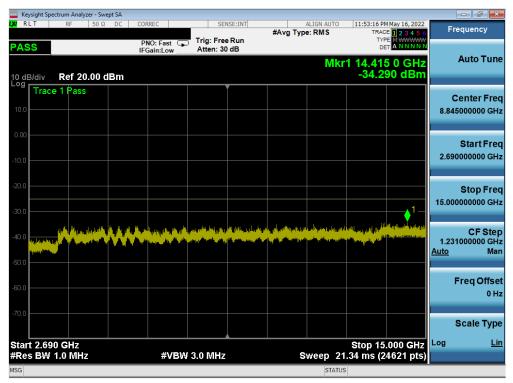
FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 28 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 20 01 07
			V2.2 2/15/2022



# LTE Band 41

	pectrum Analy	zer - Swe	pt SA										
L <mark>XI</mark> RLT	RF	50 Ω	DC	CORREC		SEN	ISE:INT	#Ava	ALIGN AUT Type: RMS		PM May 16, 2022	F	requency
PASS					ast 🖵	Trig: Free		#AV9	rype. Kino	1			
PA35				IFGain:	Low	Atten: 30	dB		_				Auto Tune
	-		_							MKr1 2.4	46 0 GHz 073 dBm		Auto Tune
10 dB/div Log	Ref 20		Bm							-00.			
Tra	ce 1 Pass												Center Free
10.0													52500000 GH
0.00													04
													Start Free
-10.0												3	0.000000 MH
-20.0													Stop Free
												2.4	75000000 GH
-30.0											1		
-40.0													CF Ste
-40.0		الملايد الد		لىقىرولىلار بال	Hunder and	Langer and the second secon	ALL DESCRIPTION OF		lapar data and				4.500000 MH Mai
-50.0			and state	design and the	ang	n a dhall na hgu bha Sulais Mhaire Sulais An taonn a stàiteann an t-ann				التؤذير أججا وبالمرابط		<u>Auto</u>	IVIA
-60.0													Freq Offse
													0 H
-70.0													
													Scale Type
Start 0.0	30 6 47									Stop	2.475 GHz	Log	Lir
	1.0 MH	z			#VBW	3.0 MHz			Sweep	3.260 ms	2.475 GHZ (4891 pts)		
MSG										ATUS			

Plot 7-26. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



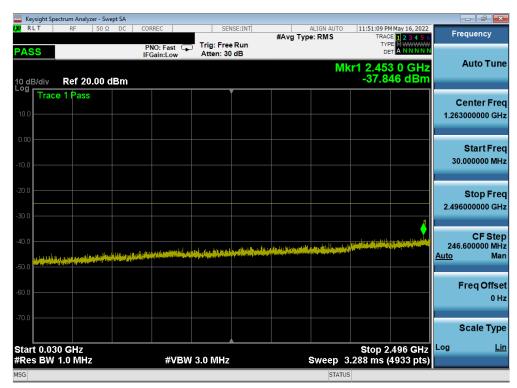
Plot 7-27. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 29 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 29 01 07
			V2.2 2/15/2022



	ectrum Analyzer - Swept S					
LXU RLT	RF 50 Ω D	C CORREC	SENSE:INT	#Avg Type: RMS	11:53:53 PM May 16, 2022 TRACE 1 2 3 4 5 6	Frequency
PASS		PNO: Fast 😱	Trig: Free Run Atten: 10 dB		TYPE M WWWWWW DET A N N N N N	
T AGG		IFGain:Low	Atten: 10 dB			Auto Tune
10.101.1				IVIKI	1 26.815 0 GHz -43.651 dBm	
10 dB/div	Ref 0.00 dBm		•		-40.001 abiii	
Irac	e 1 Pass					Center Freq
-10.0						21.000000000 GHz
-20.0						Start Freq
						5tart Freq 15.000000000 GHz
-30.0						13.000000000000
					1	
-40.0						Stop Freq
-50.0				d tation in a	A DESCRIPTION OF THE OWNER OF THE	27.000000000 GHz
-30.0	فروبا للعارين والطريقينا ورايت	وأحدين فالمورق ويساويكا وملاق المعا	Parameter States and a growth and a state of the states of	a a a a a a a a a a a a a a a a a a a		
-60.0	المللة فالأن ستعداد المتعلد إلاه وحس	And a state of the second s	and the state of the			CF Step
						1.200000000 GHz Auto Man
-70.0						<u>Auto</u> mun
						Energy Office at
-80.0						Freq Offset 0 Hz
						0 H2
-90.0						
						Scale Type
Start 15.0	00 GHz		<u> </u>		Stop 27.000 GHz	Log <u>Lin</u>
#Res BW		#VBW	3.0 MHz	Sweep 20	0.80 ms (24001 pts)	
MSG				STATU		

Plot 7-28. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



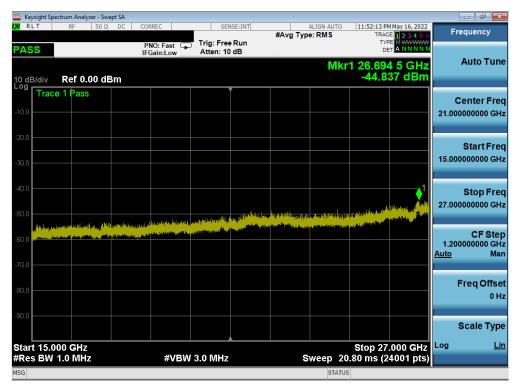
Plot 7-29. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 30 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 30 01 07
			V2.2 2/15/2022



Keysight Spectrum Analyzer - Swept SA									ð 🗙
LX/RLT RF 50Ω DC	CORREC	SEN	SE:INT	#Avg Type	ALIGN AUTO		May 16, 2022	Freque	ncy
PASS	PNO: Fast 🖵	Trig: Free Atten: 30				TYP			
1400	IFGain:Low	Atten: 30	aв					Aut	o Tune
					IVIK	1 14.109	0 GHZ 04 dBm		
10 dB/div Ref 20.00 dBm				1	1	-04.1			
Trace 1 Pass								Cente	er Freq
10.0								8.8450000	000 GHz
0.00								Eta	rt Frea
								2.6900000	
-10.0								2.0000000	
-20.0									
-20.0									p Freq
-30.0							1	15.000000	000 GHz
55.5							a set of set of him		
	Control of the second second second		National property of the second s	A Design of the second s		and the part of the second	Contraction and Contract		F Step
			and the second second		an din od strais.			1.2310000 Auto	000 GHz Man
-50.0								<u>//uto</u>	man
								Erog	Offset
-60.0								гіеч	0 Hz
									0112
-70.0									
								Scal	е Туре
Start 2.690 GHz						Stop 15	.000 GHz	Log	Lin
#Res BW 1.0 MHz	#VBW	3.0 MHz		S	weep 2'	1.34 ms (2	4621 pts)		
MSG					STATU	s			

Plot 7-30. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



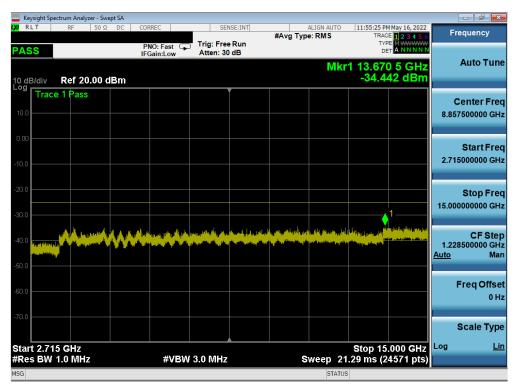
Plot 7-31. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 31 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage ST 01 07
<u></u>	•	·	V2.2 2/15/2022



Keysight Spectrum Analyzer - Swept					
LX/RLT RF 50Ω	DC CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	11:54:51 PM May 16, 2022 TRACE 1 2 3 4 5 6	Frequency
PASS	PNO: Fast 😱	Trig: Free Run	mitig type. time	TYPE MWWWWW DET A N N N N N	
PASS	IFGain:Low	Atten: 30 dB			Auto Tune
			MI	kr1 2.366 0 GHz -37.880 dBm	Auto Tulle
10 dB/div Ref 20.00 dB	sm			-37.860 UBIII	
Trace 1 Pass		ľ			Center Freq
10.0					1.263000000 GHz
0.00					
					Start Freq
-10.0					30.000000 MHz
-20.0					Stop Freq
					2.496000000 GHz
-30.0					
				♦1	05.04.0
-40.0					CF Step 246.600000 MHz
the second state of the second se	and the dependence of the second s		and the second		<u>Auto</u> Man
-50.0					
					Freq Offset
-60.0					0 Hz
-70.0					
					Scale Type
Start 0.030 GHz		A		Stop 2.496 GHz	Log <u>Lin</u>
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 3	3.288 ms (4933 pts)	
MSG			STATU		

Plot 7-32. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-33. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 32 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 32 01 07
			\/2 2 2/15/2022



Keysight Spectrum Analyzer - Swept SA								- ¢ ×
LXI RLT RF 50Ω DC (	CORREC		SE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	May 16, 2022	Frequency
PASS	PNO: Fast 😱	Trig: Free Atten: 10				TYF		
					Mk	r1 26.97		Auto Tune
10 dB/div Ref 0.00 dBm						-44.6	04 dBm	
Trace 1 Pass								Center Freq
-10.0								21.000000000 GHz
-20.0								
-20.0								Start Freq
-30.0								15.00000000 GHz
-40.0							<u> </u>	Stop Freq
-50.0				an this in a surface of	- dadrika radak dat	ألقد والمطلق ويتخر وما	Manual and	27.00000000 GHz
-50.0	(genety)//seconds/iteration	and the system of the system o	And a state of the second	the second s	aller i terret i a	and the short state of		05.04.0
-60.0								CF Step 1.20000000 GHz
-70.0								<u>Auto</u> Man
-70.0								
-80.0								Freq Offset 0 Hz
								0112
-90.0								Scale Type
Start 15.000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz		s	weep 2	27 Stop 20 Stop 27	.000 0112	Log <u>Lin</u>
MSG					STATU			

Plot 7-34. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 33 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 33 01 07	
			\/2 2 2/15/2022	



# 7.4 Band Edge Emissions at Antenna Terminal

§2.1051, §27.53(m)

#### **Test Overview**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section. All ports were tested and only the worst case data was reported.

# For LTE Bands 7 and 41, the minimum permissible attenuation level is noted in the Test Notes on the following page.

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- 4. VBW <u>></u> 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

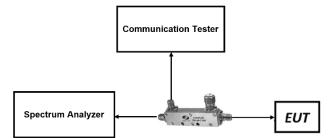


Figure 7-3. Test Instrument & Measurement Setup

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 34 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	
			\/2 2 2/15/2022



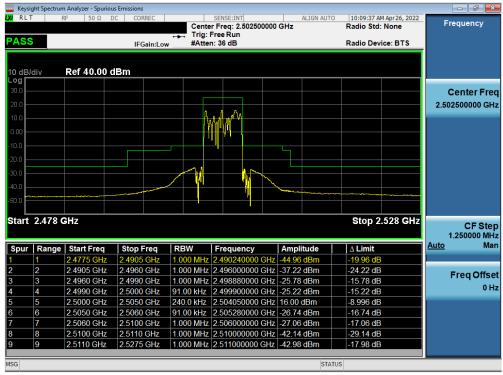
#### Test Notes

- 1. Per 27.53(h), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- 2. Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

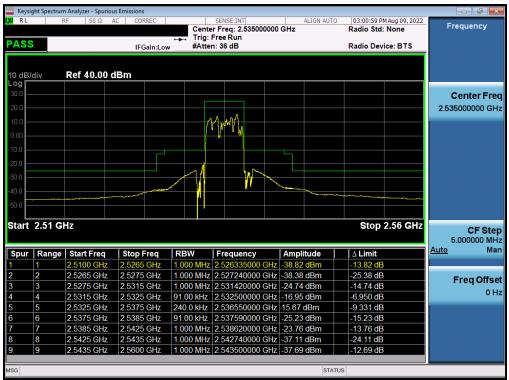
FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 35 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	
			\/2 2 2/15/2022



# LTE Band 7



Plot 7-35. Lower ACP Plot (LTE Band 7 - 5MHz QPSK - Full RB)



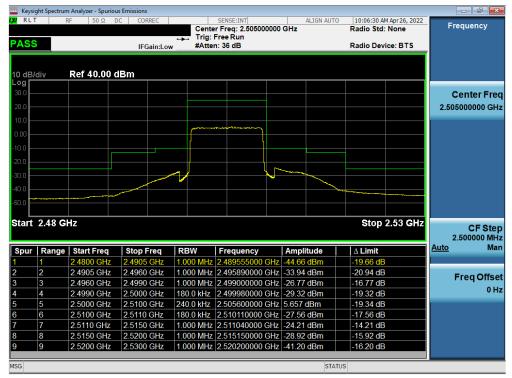
#### Plot 7-36. Middle ACP Plot (LTE Band 7 - 5MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 36 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	
			1/2 2 2/15/2022



	 		is Emissions		SENSE:INT			
RLI	I K	α-   50 Ω2 L	C CORREC	Cente	r Freq: 2.567500000	ALIGN AUTO	2 10:10:02 AM Apr 26, 202 Radio Std: None	Frequency
100				Trig:	Free Run			
ASS	<u> </u>		IFGain:Low	, #Atter	n: 36 dB		Radio Device: BTS	_
0 dB/	/div	Ref 40.00 c	IBm					
.og								
30.0								Center Fre
20.0					л			2.567500000 GH
10.0				A	A da A LA			
					AP4(* V)			
10.0								
20.0					<u> </u>			
30.0								
40.0					10 >	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
50.0						~~~~~	~	
	2.543 0	GHz					Stop 2.593 GH	Z CF Ste 1.250000 MH
itart	2.543 C		Stop Freq	RBW	Frequency	Amplitude	Stop 2.593 GH	1.250000 MH
			Stop Freq 2.5590 GHz		Frequency 2.558835000 GHz	· · · ·		1.250000 MH
tart Spur	Range	Start Freq		1.000 MHz		-40.31 dBm	∆ Limit	1.250000 MF Auto Ma
start Spur	Range	Start Freq 2.5425 GHz	2.5590 GHz	1.000 MHz 1.000 MHz	2.558835000 GHz	-40.31 dBm -38.42 dBm	Δ Limit -15.31 dB	Auto Ma
tart Spur	Range 1 2 3 4	<b>Start Freq</b> 2.5425 GHz 2.5590 GHz 2.5600 GHz 2.5640 GHz	2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz	1.000 MHz 1.000 MHz 1.000 MHz 91.00 kHz	2.558835000 GHz 2.559860000 GHz 2.564000000 GHz 2.564630000 GHz	-40.31 dBm -38.42 dBm -24.89 dBm -23.73 dBm	∆ Limit -15.31 dB -25.42 dB -14.89 dB -13.73 dB	Auto Ma
spur	Range 1 2 3	<b>Start Freq</b> 2.5425 GHz 2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz	2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz	1.000 MHz 1.000 MHz 1.000 MHz 91.00 kHz 240.0 kHz	2.558835000 GHz 2.559860000 GHz 2.564000000 GHz 2.564630000 GHz 2.568800000 GHz	-40.31 dBm -38.42 dBm -24.89 dBm -23.73 dBm 18.09 dBm	Δ Limit -15.31 dB -25.42 dB -14.89 dB -13.73 dB -6.911 dB	Auto Ma
spur	Range 1 2 3 4	<b>Start Freq</b> 2.5425 GHz 2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz	2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz 2.5710 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           91.00 KHz           240.0 KHz           91.00 KHz	2.558835000 GHz 2.559860000 GHz 2.564000000 GHz 2.564630000 GHz 2.568800000 GHz 2.570150000 GHz	-40.31 dBm -38.42 dBm -24.89 dBm -23.73 dBm 18.09 dBm -19.46 dBm	∆ Limit -15.31 dB -25.42 dB -14.89 dB -13.73 dB	Auto Ma
Spur	Range 1 2 3 4 5	<b>Start Freq</b> 2.5425 GHz 2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz 2.5710 GHz	2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz 2.5710 GHz 2.5750 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           91.00 KHz           240.0 KHz           91.00 KHz           1.000 MHz	2.558835000 GHz 2.559860000 GHz 2.564000000 GHz 2.564630000 GHz 2.568800000 GHz 2.568800000 GHz 2.570150000 GHz	-40.31 dBm -38.42 dBm -24.89 dBm -23.73 dBm 18.09 dBm -19.46 dBm -26.58 dBm	Δ Limit -15.31 dB -25.42 dB -14.89 dB -13.73 dB -6.911 dB -9.462 dB -16.58 dB	Auto Ma
Spur	Range           1           2           3           4           5           6           7           8	<b>Start Freq</b> 2.5425 GHz 2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz 2.5710 GHz 2.5750 GHz	2,5590 GHz 2,5600 GHz 2,5640 GHz 2,5650 GHz 2,5700 GHz 2,5710 GHz 2,5750 GHz 2,5760 GHz	1.000 MHz           1.000 MHz           1.000 MHz           91.00 KHz           240.0 KHz           91.00 KHz           1.000 MHz           1.000 MHz	2 558835000 GHz 2 559860000 GHz 2 564000000 GHz 2 564630000 GHz 2 568800000 GHz 2 57150000 GHz 2 571000000 GHz 2 575980000 GHz	-40.31 dBm -38.42 dBm -24.89 dBm -23.73 dBm 18.09 dBm -19.46 dBm -26.58 dBm -37.68 dBm	Δ Limit -15.31 dB -25.42 dB -14.89 dB -13.73 dB -6.911 dB -9.462 dB -16.58 dB -24.68 dB	Auto Ma
itart	Range           1           2           3           4           5           6           7           8	<b>Start Freq</b> 2.5425 GHz 2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz 2.5710 GHz	2.5590 GHz 2.5600 GHz 2.5640 GHz 2.5650 GHz 2.5700 GHz 2.5710 GHz 2.5750 GHz	1.000 MHz           1.000 MHz           1.000 MHz           91.00 KHz           240.0 KHz           91.00 KHz           1.000 MHz           1.000 MHz	2.558835000 GHz 2.559860000 GHz 2.564000000 GHz 2.564630000 GHz 2.568800000 GHz 2.568800000 GHz 2.570150000 GHz	-40.31 dBm -38.42 dBm -24.89 dBm -23.73 dBm 18.09 dBm -19.46 dBm -26.58 dBm -37.68 dBm	Δ Limit -15.31 dB -25.42 dB -14.89 dB -13.73 dB -6.911 dB -9.462 dB -16.58 dB	1.250000 MH





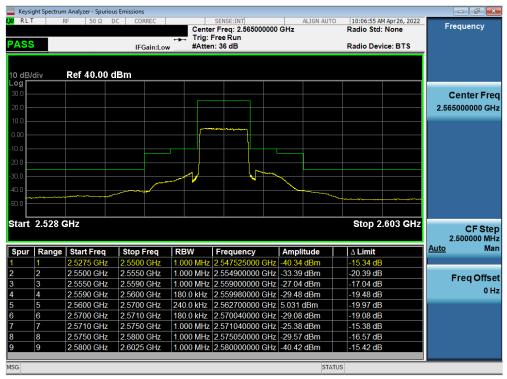
Plot 7-38. Lower ACP Plot (LTE Band 7 - 10MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 37 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 37 01 07
	<u>.</u>	·	V2.2 2/15/2022



ASS		¥F 50 Ω	AC CORREC	+++ Trig:	SENSE:INT r Freq: 2.5350000 Free Run h: 36 dB	ALIGN AUTO	03:00:25 PM Aug 09, 202 Radio Std: None Radio Device: BTS	Frequency
0 dB/ .og <b>[</b>	/div	Ref 40.00						
30.0 — 20.0 —								Center Fre 2.535000000 GH
10.0 - 0.00 - 10.0 -								
20.0 30.0 —								
40.0			and the second s				····	
50.0	~_~~							
so.o Start	2.498 0						Stop 2.573 GH	5.000000 MH
itart	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	∆ Limit	5.000000 Mi
50.0 Start	Range	Start Freq 2.4975 GHz	2.5200 GHz	1.000 MHz	2.518650000 G	Hz -40.24 dBm	Δ Limit -15.24 dB	5.000000 Mi
io.o Start	Range	<b>Start Freq</b> 2.4975 GHz 2.5200 GHz	2.5200 GHz 2.5250 GHz	1.000 MHz 1.000 MHz	2.518650000 G 2.525000000 G	Hz -40.24 dBm Hz -35.10 dBm	Δ Limit -15.24 dB -22.10 dB	5.000000 Mi
itart	<b>Range</b> 1 2 3	<b>Start Freq</b> 2.4975 GHz 2.5200 GHz 2.5250 GHz	2.5200 GHz 2.5250 GHz 2.5290 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2.518650000 G 2.525000000 G 2.528800000 G	Hz -40.24 dBm Hz -35.10 dBm Hz -26.03 dBm	Δ Limit -15.24 dB -22.10 dB -16.03 dB	5.000000 Mi Auto Mi
o.o tart Spur	Range 1 2 3 4	<b>Start Freq</b> 2.4975 GHz 2.5200 GHz 2.5250 GHz 2.5290 GHz	2.5200 GHz 2.5250 GHz 2.5290 GHz 2.5300 GHz	1.000 MHz 1.000 MHz 1.000 MHz 180.0 kHz	2.518650000 G 2.525000000 G 2.528800000 G 2.529860000 G	Hz -40.24 dBm Hz -35.10 dBm Hz -26.03 dBm Hz -28.67 dBm	Δ Limit -15.24 dB -22.10 dB -16.03 dB -18.67 dB	5.000000 Mi Auto M
itart	<b>Range</b> 1 2 3	<b>Start Freq</b> 2.4975 GHz 2.5200 GHz 2.5250 GHz	2.5200 GHz 2.5250 GHz 2.5290 GHz 2.5300 GHz 2.5400 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           180.0 KHz           240.0 KHz	2.518650000 G 2.525000000 G 2.528800000 G	Hz -40.24 dBm Hz -35.10 dBm Hz -26.03 dBm Hz -28.67 dBm Hz 5.148 dBm	Δ Limit -15.24 dB -22.10 dB -16.03 dB	5.000000 Mi Auto Mi
itart	Range 1 2 3 4 5 6	<b>Start Freq</b> 2.4975 GHz 2.5200 GHz 2.5250 GHz 2.5290 GHz 2.5300 GHz	2.5200 GHz 2.5250 GHz 2.5290 GHz 2.5300 GHz 2.5400 GHz 2.5410 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           240.0 KHz           180.0 KHz           180.0 KHz	2.518650000 G 2.525000000 G 2.528800000 G 2.529860000 G 2.529860000 G 2.531800000 G	Hz         -40.24 dBm           Hz         -35.10 dBm           Hz         -26.03 dBm           Hz         -28.67 dBm           Hz         5.148 dBm           Hz         5.76.9 dBm	Δ Limit -15.24 dB -22.10 dB -16.03 dB -18.67 dB -19.85 dB	5.000000 Mi Auto M
0.0 tart	Range           1           2           3           4           5           6           7	<b>Start Freq</b> 2.4975 GHz 2.5200 GHz 2.5250 GHz 2.5290 GHz 2.5300 GHz 2.5400 GHz	2.5200 GHz 2.5250 GHz 2.5290 GHz 2.5300 GHz 2.5400 GHz 2.5410 GHz 2.5450 GHz	1.000 MHz           1.000 MHz           1.000 MHz           180.0 KHz           240.0 KHz           180.0 KHz           180.0 KHz	2.518650000 G 2.525000000 G 2.528800000 G 2.529860000 G 2.529860000 G 2.531800000 G 2.540070000 G	Hz         -40.24 dBm           Hz         -35.10 dBm           Hz         -26.03 dBm           Hz         -28.67 dBm           Hz         5.148 dBm           Hz         -27.69 dBm           Hz         -23.45 dBm	Δ Limit -15.24 dB -22.10 dB -16.03 dB -18.67 dB -19.85 dB -17.69 dB	5.000000 M Auto M

Plot 7-39. Middle ACP Plot (LTE Band 7 - 10MHz QPSK - Full RB)



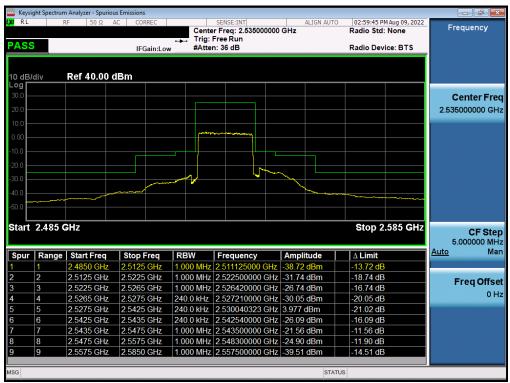
Plot 7-40. Upper ACP Plot (LTE Band 7 - 10MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 38 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 30 01 07
			V/2 2 2/15/2022



RLT		n Analyzer - Spurio F 50 Ω	DC CORREC	Cente	SENSE:INT	ALIGN AUTO	10:03:40 AM Apr 26, 2022 Radio Std: None	Frequency
ASS			IFGain:Lo		Free Run n: 36 dB		Radio Device: BTS	
0 d <u>B/d</u>	liv	Ref 40.00	dBm					
- <b>og</b> 30.0								Center Fred 2.507500000 GH2
10.0				p				
20.0								
50.0								
50.0	2.458 0	Hz					Stop 2.558 GHz	3.750000 MH
		Start Freq	Stop Freq	RBW	Frequency	Amplitude	∆ Limit	CF Stej 3.750000 MH <u>Auto</u> Ma
start 2	Range 1	Start Freq 2.4575 GHz	2.4905 GHz	1.000 MHz	2.490500000 GHz	-38.47 dBm	Δ Limit -13.47 dB	3.750000 MH
Start 2	Range 1 2	<b>Start Freq</b> 2.4575 GHz 2.4905 GHz	2.4905 GHz 2.4960 GHz	1.000 MHz 1.000 MHz	2.490500000 GHz 2.496000000 GHz	-38.47 dBm -31.40 dBm	Δ Limit -13.47 dB -18.40 dB	3.750000 MH Auto Ma
Spur	Range 1 2 3	<b>Start Freq</b> 2.4575 GHz 2.4905 GHz 2.4960 GHz	2.4905 GHz 2.4960 GHz 2.4990 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2.490500000 GHz 2.496000000 GHz 2.498910000 GHz	-38.47 dBm -31.40 dBm -26.21 dBm	Δ Limit -13.47 dB -18.40 dB -16.21 dB	3.750000 MH Auto Ma Freq Offse
spur	<b>Range</b> 1 2 3 4	<b>Start Freq</b> 2.4575 GHz 2.4905 GHz 2.4960 GHz 2.4990 GHz	2.4905 GHz 2.4960 GHz 2.4990 GHz 2.5000 GHz	1.000 MHz 1.000 MHz 1.000 MHz 240.0 kHz	2.490500000 GHz 2.496000000 GHz 2.498910000 GHz 2.499970000 GHz	-38.47 dBm -31.40 dBm -26.21 dBm -29.44 dBm	Δ Limit -13.47 dB -18.40 dB -16.21 dB -19.44 dB	CF Ste 3.750000 MH <u>Auto</u> Ma Freq Offse
Spur	Range 1 2 3 4 5	Start Freq           2.4575 GHz           2.4905 GHz           2.4960 GHz           2.4990 GHz           2.5000 GHz	2.4905 GHz 2.4960 GHz 2.4990 GHz 2.5000 GHz 2.5150 GHz	1.000 MHz 1.000 MHz 1.000 MHz 240.0 kHz 240.0 kHz	2.490500000 GHz 2.496000000 GHz 2.498910000 GHz 2.499970000 GHz 2.510887097 GHz	-38.47 dBm -31.40 dBm -26.21 dBm -29.44 dBm 3.825 dBm	Δ Limit -13.47 dB -18.40 dB -16.21 dB -19.44 dB -21.17 dB	CF Ste 3.750000 MH <u>Auto</u> Ma Freq Offse
Spur	Range 1 2 3 4 5 6	Start Freq           2.4575 GHz           2.4905 GHz           2.4960 GHz           2.4990 GHz           2.5000 GHz           2.5150 GHz	2.4905 GHz 2.4960 GHz 2.4990 GHz 2.5000 GHz 2.5150 GHz 2.5160 GHz	1.000 MHz 1.000 MHz 1.000 MHz 240.0 kHz 240.0 kHz 240.0 kHz	2.490500000 GHz 2.496000000 GHz 2.498910000 GHz 2.499970000 GHz 2.510887097 GHz 2.515040000 GHz	-38.47 dBm -31.40 dBm -26.21 dBm -29.44 dBm 3.825 dBm -27.03 dBm	Δ Limit -13.47 dB -18.40 dB -16.21 dB -19.44 dB -21.17 dB -17.03 dB	3.750000 MH Auto Ma Freq Offse
Spur	Range           1           2           3           4           5           6           7	<b>Start Freq</b> 2.4575 GHz 2.4905 GHz 2.4960 GHz 2.4990 GHz 2.5000 GHz 2.5150 GHz 2.5160 GHz	2.4905 GHz 2.4960 GHz 2.4990 GHz 2.5000 GHz 2.5150 GHz 2.5160 GHz 2.5200 GHz	1.000 MHz 1.000 MHz 1.000 MHz 240.0 kHz 240.0 kHz 240.0 kHz 240.0 kHz 1.000 MHz	2.49050000 GHz 2.49600000 GHz 2.498910000 GHz 2.499970000 GHz 2.510887097 GHz 2.515040000 GHz 2.516080000 GHz	-38.47 dBm -31.40 dBm -26.21 dBm -29.44 dBm 3.825 dBm -27.03 dBm -23.03 dBm	Δ Limit -13.47 dB -18.40 dB -16.21 dB -19.44 dB -21.17 dB -17.03 dB -13.03 dB	3.750000 MH Auto Ma Freq Offse
Start 2	Range 1 2 3 4 5 6	Start Freq           2.4575 GHz           2.4905 GHz           2.4960 GHz           2.4990 GHz           2.5000 GHz           2.5150 GHz	2.4905 GHz 2.4960 GHz 2.4990 GHz 2.5000 GHz 2.5150 GHz 2.5160 GHz	1.000 MHz 1.000 MHz 240.0 KHz 240.0 KHz 240.0 KHz 240.0 KHz 1.000 MHz 1.000 MHz	2.490500000 GHz 2.496000000 GHz 2.498910000 GHz 2.499970000 GHz 2.510887097 GHz 2.515040000 GHz	-38.47 dBm -31.40 dBm -26.21 dBm -29.44 dBm 3.825 dBm -27.03 dBm -23.03 dBm -26.71 dBm	Δ Limit -13.47 dB -18.40 dB -16.21 dB -19.44 dB -21.17 dB -17.03 dB	3.750000 MH Auto Ma

Plot 7-41. Lower ACP Plot (LTE Band 7 - 15MHz QPSK - Full RB)



Plot 7-42. Middle ACP Plot (LTE Band 7 - 15MHz QPSK – Full RB)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 39 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 39 01 07
			\/2 2 2/15/2022



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RLT	1   1	F 50Ω E	C CORREC	Cente	SENSE:INT r Freq: 2.562500000	ALIGN AUTO	2 10:03:56 AM Apr 26, 2022 Radio Std: None	Frequency
				Trig:	Free Run			
ASS	<u> </u>		IFGain:Lov	v #Atter	n: 36 dB		Radio Device: BTS	
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0 dB/	Niu	Ref 40.00 d	IBm					
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			Stop Freg	RBW	Frequency	Amplitude		CF Ste 3.750000 MH <u>Auto</u> Ma
start	2.513 C		Stop Freq	<b>RBW</b> 1.000 MHz	Frequency 2.539725000 GHz	Amplitude -39.16 dBm	Stop 2.613 GHz	3.750000 MH
start		Start Freq		1.000 MHz		-39.16 dBm	∆ Limit	3.750000 MH <u>Auto</u> Ma
tart Spur	Range 1	Start Freq 2.5125 GHz	2.5400 GHz	1.000 MHz 1.000 MHz	2.539725000 GHz	-39.16 dBm -28.60 dBm	∆ Limit -14.16 dB	3.750000 MH Auto Ma
start Spur	Range	<b>Start Freq</b> 2.5125 GHz 2.5400 GHz	2.5400 GHz 2.5500 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2.539725000 GHz 2.548800000 GHz	-39.16 dBm -28.60 dBm -25.53 dBm	∆ Limit -14.16 dB -15.60 dB	3.750000 MH <u>Auto</u> Ma
spur	Range           1           2           3	<b>Start Freq</b> 2.5125 GHz 2.5400 GHz 2.5500 GHz	2.5400 GHz 2.5500 GHz 2.5540 GHz	1.000 MHz 1.000 MHz 1.000 MHz 240.0 kHz	2.539725000 GHz 2.548800000 GHz 2.554000000 GHz	-39.16 dBm -28.60 dBm -25.53 dBm -29.65 dBm	Δ Limit -14.16 dB -15.60 dB -15.53 dB	3.750000 MH Auto Ma
spur	Range           1           2           3           4	<b>Start Freq</b> 2.5125 GHz 2.5400 GHz 2.5500 GHz 2.5540 GHz	2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz	1.000 MHz           1.000 MHz           1.000 MHz           240.0 KHz           240.0 KHz	2.539725000 GHz 2.548800000 GHz 2.554000000 GHz 2.554750000 GHz	-39.16 dBm -28.60 dBm -25.53 dBm -29.65 dBm 3.983 dBm	△ Limit -14.16 dB -15.60 dB -15.53 dB -19.65 dB	3.750000 MH Auto Ma
spur	Range           1           2           3           4           5	<b>Start Freq</b> 2.5125 GHz 2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz	2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz 2.5700 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           240.0 KHz           240.0 KHz           240.0 KHz           240.0 KHz	2.539725000 GHz 2.548800000 GHz 2.554000000 GHz 2.554750000 GHz 2.560685484 GHz	-39.16 dBm -28.60 dBm -25.53 dBm -29.65 dBm 3.983 dBm -27.82 dBm	Δ Limit -14.16 dB -15.60 dB -15.53 dB -19.65 dB -21.02 dB	3.750000 MH Auto Ma
tart Spur	Range           1           2           3           4           5           6	<b>Start Freq</b> 2.5125 GHz 2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz 2.5700 GHz	2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz 2.5700 GHz 2.5710 GHz	1.000 MHz           1.000 MHz           1.000 MHz           240.0 KHz           240.0 KHz           240.0 KHz           1.000 MHz	2 539725000 GHz 2 548800000 GHz 2 554000000 GHz 2 554750000 GHz 2 560685484 GHz 2 570000000 GHz	-39,16 dBm -28.60 dBm -25.53 dBm -29.65 dBm 3.983 dBm -27.82 dBm -22.96 dBm	∆ Limit -14.16 dB -15.60 dB -15.53 dB -19.65 dB -21.02 dB -17.82 dB	3.750000 MH Auto Ma
start Spur	Range           1           2           3           4           5           6           7	<b>Start Freq</b> 2.5125 GHz 2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz 2.5700 GHz 2.5710 GHz	2.5400 GHz 2.5500 GHz 2.5540 GHz 2.5550 GHz 2.5700 GHz 2.5710 GHz 2.5750 GHz	1.000 MHz           1.000 MHz           1.000 MHz           240.0 KHz           240.0 KHz           240.0 KHz           1.000 MHz           1.000 MHz           1.000 MHz	2.539725000 GHz 2.548800000 GHz 2.554000000 GHz 2.554750000 GHz 2.560685484 GHz 2.570000000 GHz 2.571040000 GHz	-39.16 dBm -28.60 dBm -25.53 dBm -29.65 dBm 3.983 dBm -27.82 dBm -22.96 dBm -25.78 dBm	Δ Limit -14.16 dB -15.60 dB -15.53 dB -19.65 dB -21.02 dB -17.82 dB -12.96 dB	3.750000 MH Auto Ma

Plot 7-43. Upper ACP Plot (LTE Band 7 - 15MHz QPSK – Full RB)



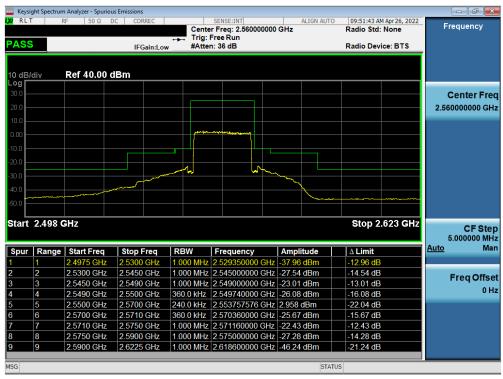
Plot 7-44. Lower ACP Plot (LTE Band 7 - 20MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 40 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	raye 40 01 07
			V/2 2 2/15/2022



ASS		F 50 Ω	AC CORREC	Trig:	SENSE:INT Freq: 2.535000000 Free Run n: 36 dB	ALIGN AUTO	02:58:56 PM Aug 09, 2022 Radio Std: None Radio Device: BTS	Frequency
0 dB/	/div	Ref 40.00	dBm					
30.0 — 20.0 —								Center Fre 2.535000000 GH
10.0 - 0.00 - 10.0 -								
20.0					<b></b>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
40.0			- mandala and a					
50.0 E								
start	2.473 (						Stop 2.598 GHz	5.000000 MF
	2.473 ( Range	Start Freq	Stop Freq		Frequency	Amplitude	∆ Limit	5.000000 Mi
tart	Range	Start Freq 2.4725 GHz	2.5050 GHz	1.000 MHz	2.503050000 GHz	-39.56 dBm	Δ Limit -14.56 dB	5.00000 Mi <u>Auto</u> Mi
tart	Range	<b>Start Freq</b> 2.4725 GHz 2.5050 GHz	2.5050 GHz 2.5200 GHz	1.000 MHz 1.000 MHz	2.503050000 GHz 2.519550000 GHz	-39.56 dBm -29.21 dBm	Δ Limit -14.56 dB -16.21 dB	5.000000 Mi Auto M Freq Offs
tart	<b>Range</b> 1 2 3	<b>Start Freq</b> 2.4725 GHz 2.5050 GHz 2.5200 GHz	2.5050 GHz 2.5200 GHz 2.5240 GHz	2 1.000 MHz 2 1.000 MHz 2 1.000 MHz	2.503050000 GHz 2.519550000 GHz 2.523960000 GHz	-39.56 dBm -29.21 dBm -26.07 dBm	Δ Limit -14.56 dB -16.21 dB -16.07 dB	5.000000 Mi Auto M Freq Offs
tart	Range	<b>Start Freq</b> 2.4725 GHz 2.5050 GHz	2.5050 GHz 2.5200 GHz 2.5240 GHz 2.5250 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           360.0 KHz	2.503050000 GHz 2.519550000 GHz	-39.56 dBm -29.21 dBm -26.07 dBm -28.32 dBm	Δ Limit -14.56 dB -16.21 dB	5.000000 Mi Auto M Freq Offs
spur	Range 1 2 3 4	<b>Start Freq</b> 2.4725 GHz 2.5050 GHz 2.5200 GHz 2.5240 GHz	2.5050 GHz 2.5200 GHz 2.5240 GHz 2.5250 GHz 2.5450 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           360.0 KHz           240.0 KHz	2.503050000 GHz 2.519550000 GHz 2.523960000 GHz 2.524940000 GHz	-39.56 dBm -29.21 dBm -26.07 dBm -28.32 dBm 2.869 dBm	Δ Limit -14.56 dB -16.21 dB -16.07 dB -18.32 dB	5.000000 Mi Auto M Freq Offs
tart	Range 1 2 3 4 5	<b>Start Freq</b> 2.4725 GHz 2.5050 GHz 2.5200 GHz 2.5240 GHz 2.5250 GHz	2.5050 GHz 2.5200 GHz 2.5240 GHz 2.5250 GHz 2.5250 GHz 2.5450 GHz 2.5460 GHz	1.000 MHz           1.000 MHz           1.000 MHz           360.0 kHz           240.0 kHz           360.0 kHz	2.503050000 GHz 2.519550000 GHz 2.523960000 GHz 2.524940000 GHz 2.528030303 GHz	-39.56 dBm -29.21 dBm -26.07 dBm -28.32 dBm 2.869 dBm -25.46 dBm	Δ Limit -14.56 dB -16.21 dB -16.07 dB -18.32 dB -22.13 dB	5.000000 MI
tart	Range 1 2 3 4 5 6	<b>Start Freq</b> 2.4725 GHz 2.5050 GHz 2.5200 GHz 2.5240 GHz 2.5250 GHz 2.5450 GHz	2.5050 GHz 2.5200 GHz 2.5240 GHz 2.5250 GHz 2.5450 GHz 2.5450 GHz 2.5460 GHz 2.5500 GHz	1.000 MHz           1.000 MHz           1.000 MHz           360.0 kHz           240.0 kHz           360.0 kHz           1.000 MHz	2.503050000 GHz 2.519550000 GHz 2.523960000 GHz 2.524940000 GHz 2.528030303 GHz 2.545080000 GHz	-39,56 dBm           -29,21 dBm           -26.07 dBm           -28.32 dBm           2.869 dBm           -25.46 dBm           -22.49 dBm	Δ Limit -14.56 dB -16.21 dB -16.07 dB -18.32 dB -22.13 dB -15.46 dB	5.000000 Mi Auto M Freq Offs

Plot 7-45. Middle ACP Plot (LTE Band 7 - 20MHz QPSK – Full RB)



Plot 7-46. Upper ACP Plot (LTE Band 7 - 20MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 41 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 41 01 07
			\/2 2 2/15/2022



## LTE Band 41



Plot 7-47. Lower ACP Plot (LTE Band 41 - 5MHz QPSK - Full RB)



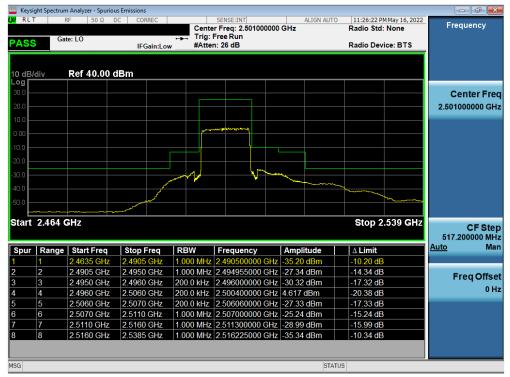
#### Plot 7-48. Middle ACP Plot (LTE Band 41 - 5MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 42 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 42 01 67
	· · · ·		V2.2 2/15/2022



Solution         Center Freq: 2.687500000 GHz         Radio Std: None         Radio Device: BTS           10 dB/div         Ref 40.00 dBm         Radio Device: BTS         Radio Device: BTS         Radio Std: None           10 dB/div         Ref 40.00 dBm         Radio Std: None         Radio Std: None         Radio Device: BTS           10 dB/div         Ref 40.00 dBm         Radio Std: None         Radio Std: None         Radio Device: BTS           10 dB/div         Ref 40.00 dBm         Radio Std: None         Radio Std: None         Radio Std: None           200         Image: Start Freq         Stop Freq         Ref 40.00         Ref 40.00         Ref 40.00           200         Image: Start Freq         Stop Freq         Ref 40.00         Ref 40.00         Ref 40.00           200         Image: Start Freq         Stop Freq         Ref 40.00         Ref 40.00         Ref 40.00           200         Image: Start Freq         Stop Freq         Ref 40.00         Ref 40.00         Ref 40.00           201         Image: Start Freq         Stop Freq         Ref 40.00         Ref 40.00         All the failed fa	Keysight S	Spectrum Ar	nalyzer - Spuriou 50 Ω [				GENG					11.21.4	0.0144	1	22	- F
Gate: L0       Trig: Free Run #Atten: 26 dB       Radio Device: BTS         10 dB/div       Ref 40.00 dBm       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm         20 0       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm         20 0       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm         20 0       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm         20 0       Image: Ref 40.00 dBm       Image: Ref 40.00 dBm	U KLI	RF	50 Ω L		KKEC	Ce			0000 GI		GN AUTO				22	Frequency
Number         Number         Number         Number           10 dB/div         Ref 40.00 dBm         Image: Start Frequency         Ref 40.00 dBm         Image: Start Frequency         Image: Start Frequency         Start 2.663 GHz         Start 1.000 MHz         2.67990 GHz         1.000 MHz         2.67995000 GHz         3.488 dBm         2.188 dB         2.188 dB         3.3         2.6800 GHz         1.000 MHz         2.6800000 GHz         2.27.73 dBm         1.11.77 dB         Freq 0           4         2.6800 GHz         2.6800 GHz         1.000 MHz         2.68800000 GHz         2.27.73 dBm         1.20.30 B         5.5         2.6890 GHz         2.6900 GHz         1.000 MHz         2.699106000 GHz         2.27.73 dBm         1.20.30 B         5.5         2.6800 GHz         2.6910 GHz         1.000 MHz         2.699106000 GHz         2.29.73 dBm         1.12.03 dB         5.5         2.6800 GHz         2.6910 GHz         1.000 HHz         2.699106000 GHz         2.29.73 dBm         1.12.03 dB         1.585 dB         7.7         2.6910 GHz         1.100 KHz	1400	Gate:	LO			🛶 Tri	g: Free l	Run								
-og	A35			IFC	Gain:Lo	w #A	tten: 26	dB				Radio I	Devic	e: BTS	_	
Center       Center         200																
Start         Z.663 GHz         Stop Freq         RBW         Frequency         Amplitude         A Limit         Center           20         <	0 dB/div	R	ef 40.00 d	dBm												
Spur         Range         Start Freq         Stop Freq         RBW         Frequency         Amplitude         Δ Limit         Δ Limit         Δuto           1         2.6625 GHz         2.6790 GHz         1.000 MHz         2.67900000 GHz         -36 17 dBm         -11.17 dB         -4.000<																
Spur         Range         Start Freq         Stop Freq         RBW         Frequency         Amplitude         Δ Limit         Δ Limit         Δuto           1         2.6625 GHz         2.6790 GHz         1.000 MHz         2.679900000 GHz         -34.88 dBm         -21.88 dB         -21.88 dB         -21.73 dB         -4.000 MHz         -4.69900 GHz         -34.88 dBm         -21.88 dB         -21.88 dB         -7         2.6800 GHz         2.6800 GHz         1000 MHz         2.67990000 GHz         -24.93 dBm         -11.77 dB         -4.000         -4.000 MHz         2.679900000 GHz         -22.73 dBm         -12.73 dB         -4.000         -4.000 MHz         2.6800 GHz         -2.6800 GHz         -2.6910 GHz         -10.00 HHz         -2.6800 GHz         -2.285 dBm         -14.93 dB         -14.93 dB         -14.93 dB         -2.6800 GHz         -2.6910 GHZ         -2.85 dBm         -15.85 dB																Center F
Spur         Range         Start Freq         Stop Freq         RBW         Frequency         Amplitude         Δ Limit         Δ Limit         Δuto           1         2.6625 GHz         2.6790 GHz         1.000 MHz         2.679900000 GHz         -34.88 dBm         -21.88 dB         -21.88 dB         -21.73 dB         -40.00	0.0														2	2.687500000
Spur         Range         Start Freq         Stop Freq         RBW         Frequency         Amplitude         Δ Limit         <	0.0						المع وال ا	w.								
Spur         Range         Start Freq         Stop Freq         RBW         Frequency         Amplitude         Δ Limit         <							, ruji	í u								
Stop							<b>P</b> 1	n n								
Stop																
Spur       Range       Start Freq       Stop Freq       RBW       Frequency       Amplitude       Δ Limit       Δ Limit         1       2.6625 GHz       2.6790 GHz       1.000 MHz       2.67900000 GHz       -36.17 dBm       -11.17 dB       -4.100 MHz       -4.68400000 GHz       -2.273 dBm       -12.73 dB       -4.100 MHz       -4.93 dB       -5.2.6850 GHz       2.6900 GHz       110.0 KHz       2.684050000 GHz       -24.93 dBm       -14.93 dB       -4.4.93 dB       -5.2.6850 GHz       2.6900 GHz       10.00 KHz       2.68900 GHz       -2.2.73 dBm       -12.03 dB       -5.2.6850 GHz       2.6900 GHz       -2.6900 GHz       -2.6900 GHz       -2.6910 GHz       -2.6910 GHZ       -4.4.00 dB       -4.4.00 dB       -4.2.6900 GHz       -2.6910 GHZ       -2.6910 GHZ       -2.6910 GHZ       -2.6910 GHZ       -4.4.00 dB       -4	20.0															
Stop       2.663 GHz       Stop Freq       RBW       Frequency       Amplitude       Δ Limit         1       2.6625 GHz       2.6790 GHz       1.000 MHz       2.67900000 GHz       -3617 dBm       -11.17 dB         2       2.6790 GHz       2.6800 GHz       1.000 MHz       2.67900000 GHz       -34.88 dBm       -21.88 dB       -21.88 dB         3       2.6800 GHz       2.6840 GHz       1.000 MHz       2.68400000 GHz       -22.73 dBm       -12.73 dB         4       2.6840 GHz       2.6850 GHz       10.00 HHz       2.68400000 GHz       -24.93 dBm       -14.93 dB         5       2.6850 GHz       2.6900 GHz       110.0 kHz       2.680220000 GHz       12.97 dBm       -12.03 dB         6       2.6900 GHz       2.6910 GHz       10.00 MHz       2.691080000 GHz       -24.90 dBm       -14.93 dB         6       2.6900 GHz       2.6910 GHz       10.00 MHz       2.691080000 GHz       -22.73 dBm       -15.85 dB         7       7       2.6910 GHz       2.691080000 GHz       -22.85 dBm       -15.85 dB       -14.400 dB         8       2.6950 GHz       2.6960 GHz       1.000 MHz       2.691080000 GHz       -24.00 dBm       -14.00 dB	30.0					mar I	[	<u>N</u>							_	
Start 2.663 GHz       Stop Freq       RBW       Frequency       Amplitude       ∆ Limit         1       2.6625 GHz       2.6790 GHz       1.000 MHz       2.67900000 GHz       -36 17 dBm       -11.17 dB         2       2.6790 GHz       2.6840 GHz       1.000 MHz       2.67900000 GHz       -34.88 dBm       -21.88 dB       -21.88 dB         3       2.6800 GHz       2.6840 GHz       1.000 MHz       2.68400000 GHz       -22.73 dBm       -12.73 dB         4       2.6840 GHz       2.6850 GHz       110.0 kHz       2.684870000 GHz       -24.93 dBm       -14.93 dB         5       2.6850 GHz       2.6900 GHz       110.0 kHz       2.6920000 GHz       12.97 dBm       -12.03 dB         6       2.6900 GHz       2.6910 GHz       10.00 MHz       2.691080000 GHz       -22.85 dBm       -15.85 dB         7       7       2.6910 GHz       2.6910 GHZ       -691180000 GHz       -24.90 dBm       -14.00 dB         8       2.6950 GHz       2.6960 GHz       1.000 MHz       2.691180000 GHz       -24.90 dBm       -14.80 dB	\$0.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		·				•••••						
Start 2.663 GHz       Stop Freq       RBW       Frequency       Amplitude       ∆ Limit         1       2.6625 GHz       2.6790 GHz       1.000 MHz       2.67900000 GHz       -36 17 dBm       -11.17 dB         2       2.6790 GHz       2.6840 GHz       1.000 MHz       2.67900000 GHz       -34.88 dBm       -21.88 dB       -21.88 dB         3       3.26800 GHz       2.6840 GHz       1.000 MHz       2.68400000 GHz       -22.73 dBm       -12.73 dB         4       2.6840 GHz       2.6800 GHz       110.0 kHz       2.684870000 GHz       24.93 dBm       -14.93 dB         5       2.6850 GHz       2.6900 GHz       110.0 kHz       2.6902000 GHz       12.97 dBm       -12.03 dB         6       2.6900 GHz       2.6910 GHz       10.00 MHz       2.69100000 GHz       -22.85 dBm       -14.03 dB         5       2.6850 GHz       2.6910 GHz       110.0 kHz       2.69100000 GHz       2.280 dBm       -14.00 dB         6       2.6900 GHz       2.6910 GHz       10.00 MHz       2.69100000 GHz       -22.80 dBm       -14.00 dB         7       7       2.6910 GHz       2.6910 GHz       1.000 MHz       2.69100000 GHz       -24.00 dBm       -14.00 dB         8       2.6950 GHz       2.6960 GHz	50 0 <b>.</b>		and the second s					<u> </u>				Longe and the second				
Spur         Range         Start Freq         Stop Freq         RBW         Frequency         Amplitude         A Limit           1         2.6625 GHz         2.6790 GHz         1.000 MHz         2.6790000 GHz         -36.17 dBm         -11.17 dB           2         2.6790 GHz         2.6800 GHz         1.000 MHz         2.679950000 GHz         -34.88 dBm         -21.88 dB         Frequency         Amplitude         -11.17 dB           3         2.6800 GHz         2.6840 GHz         1.000 MHz         2.679950000 GHz         -22.73 dBm         -12.73 dB           4         2.6840 GHz         2.6800 GHz         1.00 kHz         2.684870000 GHz         -22.97 dBm         -12.03 dB           5         2.6850 GHz         2.6900 GHz         110.0 kHz         2.68920000 GHz         -23.85 dBm         -15.85 dB           6         2.6900 GHz         2.6910 GHz         2.69100 0Hz         2.6900 GHz         -24.00 dBm         -14.00 dB           7         7         2.6910 GHz         2.6950 GHz         1.000 MHz         2.691700000 GHz         -24.00 dBm         -14.00 dB           8         2.6950 GHz         2.6960 GHz         1.000 MHz         2.695170000 GHz         -34.84 dBm         -21.84 dB																
Product         Construction	itart 2.	663 GH	z									Stop	) 2.7	'13 GH		CF S 517.200000 I
2       2.6790 GHz       2.6800 GHz       1.000 MHz       2.679950000 GHz       -34.88 dBm       -21.88 dB         3       2.6800 GHz       2.6840 GHz       1.000 MHz       2.68400000 GHz       -22.73 dBm       -12.73 dB         4       2.6840 GHz       2.6850 GHz       110.0 kHz       2.684870000 GHz       -24.93 dBm       -14.93 dB         5       2.6850 GHz       2.6900 GHz       110.0 kHz       2.688850000 GHz       -27.78 dBm       -12.03 dB         6       2.6900 GHz       2.6910 GHz       110.0 kHz       2.688250000 GHz       -27.88 dBm       -15.85 dB         7       2.6910 GHz       2.6950 GHz       110.0 kHz       2.691020000 GHz       -25.85 dBm       -15.85 dB         7       2.6910 GHz       2.6950 GHz       1.000 MHz       2.691080000 GHz       -24.00 dBm       -14.00 dB         8       2.6950 GHz       2.6960 GHz       1.000 MHz       2.695170000 GHz       -34.84 dBm       -21.84 dB	Spur   R	ange	start Freq	Stop	Freq	RBW	Fre	quency	A	mplitu	de	∆ Lim	it		Au	to I
3       2.6800 GHz       2.6840 GHz       1.000 MHz       2.684000000 GHz       -22.73 dBm       -12.73 dB         4       2.6840 GHz       2.6850 GHz       110.0 kHz       2.684070000 GHz       -24.93 dBm       -14.93 dB         5       2.6850 GHz       2.6900 GHz       110.0 kHz       2.6884870000 GHz       -22.73 dBm       -12.03 dB         6       2.6900 GHz       2.6900 GHz       110.0 kHz       2.68850000 GHz       -22.97 dBm       -12.03 dB         7       2.6910 GHz       2.6910 GHz       2.691020000 GHz       -25.85 dBm       -15.85 dB         7       2.6910 GHz       2.6950 GHz       1.000 MHz       2.691080000 GHz       -24.00 dBm       -14.00 dB         8       2.6950 GHz       2.6960 GHz       1.000 MHz       2.695170000 GHz       -34.84 dBm       -21.84 dB	1	2.	6625 GHz	2.6790	GHz	1.000 M	Hz 2.67	9000000	GHz -3	6.17 dE	3m	-11.17	dB			
3       2.68400 GHz       2.26840 GHz       1.000 MHz       2.684000000 GHz       -2.27.3 dBm       -12.73 dB         4       2.6840 GHz       2.6850 GHz       110.0 kHz       2.684870000 GHz       -22.93 dBm       -14.93 dB         5       2.6850 GHz       2.6900 GHz       110.0 kHz       2.688850000 GHz       12.97 dBm       -12.03 dB         6       2.6900 GHz       2.6910 GHz       110.0 kHz       2.690220000 GHz       -25.85 dBm       -15.85 dB         7       2.6910 GHz       2.6950 GHz       1.000 MHz       2.691080000 GHz       -24.00 dBm       -14.00 dB         8       2.6950 GHz       2.6960 GHz       1.000 MHz       2.695170000 GHz       -34.84 dBm       -21.84 dB				_		_						-21.88	dB			Freq Of
5         2.6850 GHz         2.6900 GHz         110.0 kHz         2.688850000 GHz         12.97 dBm         -12.03 dB           6         2.6900 GHz         2.6910 GHz         110.0 kHz         2.690220000 GHz         -25.85 dBm         -15.85 dB           7         2.6910 GHz         2.6950 GHz         1.000 MHz         2.691080000 GHz         -24.00 dBm         -14.00 dB           8         2.6950 GHz         2.6960 GHz         1.000 MHz         2.695170000 GHz         -34.84 dBm         -21.84 dB				_		_										(
6         2.6900 GHz         2.6910 GHz         110.0 kHz         2.690220000 GHz         -25.85 dBm         -15.85 dB           7         2.6910 GHz         2.6950 GHz         1.000 MHz         2.691080000 GHz         -24.00 dBm         -14.00 dB           8         2.6950 GHz         2.6960 GHz         1.000 MHz         2.695170000 GHz         -34.84 dBm         -21.84 dB	4			_		_						_				
7         2.6910 GHz         2.6950 GHz         1.000 MHz         2.691080000 GHz         24.00 dBm         -14.00 dB           8         2.6950 GHz         2.6960 GHz         1.000 MHz         2.695170000 GHz         -34.84 dBm         -21.84 dB		2		_		_						_				
8         2.6950 GHz         2.6960 GHz         1.000 MHz         2.695170000 GHz         -21.84 dB				2 6010	GHz	110.0 kH										
	6	2		_					CHz 2	4 00 dF	Bm	14 00	dB			
	6 7	2.	6910 GHz	2.6950												
9 2.6960 GHz 2.7125 GHz 1.000 MHz 2.696000000 GHz -35.74 dBm -10.74 dB	6 7 8	2. 2. 2.	6910 GHz 6950 GHz	2.6950 2.6960	GHz	1.000 M	Hz 2.69	5170000	GHz -3	4.84 dE	3m	-21.84	dB			

Plot 7-49. Upper ACP Plot (LTE Band 41 - 5MHz QPSK - Full RB)



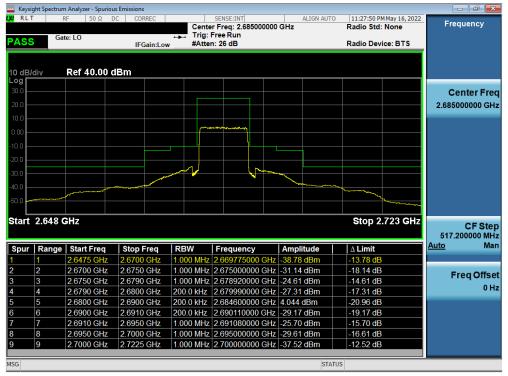
Plot 7-50. Lower ACP Plot (LTE Band 41 - 10MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 43 of 67	
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			\/2 2 2/15/2022	



ASS		RF 50 Ω te: LO	AC CORREC	+++ Trig:	SENSE:INT r Freq: 2.593000000 Free Run h: 26 dB	ALIGN AUTO	05:22:47 PM Aug 09, 2022 Radio Std: None Radio Device: BTS	Frequency
10 dB/ -og <b>Г</b>	/div	Ref 40.00	dBm					
30.0 — 20.0 —								Center Fre 2.593000000 GH
10.0 - 0.00 - 10.0 -					wy			
20.0 - 30.0 -								
40.0								
	2.556						Stop 2.631 GHz	CF Ste 3.750000 MH Auto Ma
Spur	Range	Start Freq 2.5555 GHz	2.5780 GHz	RBW	Frequency 2.577550000 GHz	Amplitude	-11.85 dB	
2	2	2.5555 GHZ	2.5780 GHZ 2.5830 GHz		2.582750000 GHz		-11.85 dB -16.41 dB	
;	3	2.5780 GHz	2.5870 GHz		2.586960000 GHz		-14.25 dB	Freq Offs
, !	4	2.5870 GHz	2.5880 GHz		2.587990000 GHz		-14.23 dB	0 H
	5	2.5880 GHz	2.5980 GHz		2.591500000 GHz		-21.04 dB	
	6	2.5980 GHz	2.5990 GHz	200.0 kHz	2.598080000 GHz	-28.89 dBm	-18.89 dB	
		2.5990 GHz	2.6030 GHz	1.000 MHz	2.599000000 GHz	-26.11 dBm	-16.11 dB	
; ;	7							
;	7 8	2.6030 GHz	2.6080 GHz	1.000 MHz	2.604350000 GHz	-30.94 dBm	-17.94 dB	

Plot 7-51. Middle ACP Plot (LTE Band 41 - 10MHz QPSK – Full RB)



Plot 7-52. Upper ACP Plot (LTE Band 41 - 10MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 44 of 67	
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			V2 2 2/15/2022	



		Analyzer - Spurio			1	-					1			
X RLT	C-4	F 50 Ω e: LO		RREC	- <del></del> - <u>-</u> - <u>-</u>	enter F	ENSE:INT Freq: 2.5035 ee Run 26 dB	500000	GHz	ALIGN AUTO	Radio I	Std: No		Frequency
10 dB/c	div	Ref 40.00	dBm											
20.0														Center Free 2.503500000 GH
0.00						դեղ-∿տղիղ	ng manananing sa kata s							
20.0													_	
-50.0	2.464 0	·		- J							Stor	. 2.5	14 GHz	
Spur	Range		Stop	Frog	RBW		requency		Ampl	itudo	∆ Lim		H4 GHZ	CF Stej 517.200000 MH Auto Ma
opui		2.4635 GHz	2.490				49050000		<u> </u>		-11.25			
2	2	2.4905 GHz	2.495				49500000				-15.87			
		2.4950 GHz	2.496				49595000				-18.92			Freq Offse
		2.4960 GHz	2.5110		_		508900000				-20.09			0 H
1		2.5110 GHz	2.512		_		511030000				-18.30			
		2.5120 GHz	2.516				51204000				-16.20	dB		
					4 000	MHz 2	.516300000	) GHz	-31.91	dBm	-18.91	dB		
	-	2.5160 GHz	2.5260	) GHz	1.000	VII 12 2	010000000				10.01	<u></u>		
5 7 8	-	2.5160 GHz 2.5260 GHz	2.526				.533000000		-35.86		-10.86			

Plot 7-53. Lower ACP Plot (LTE Band 41 - 15MHz QPSK - Full RB)



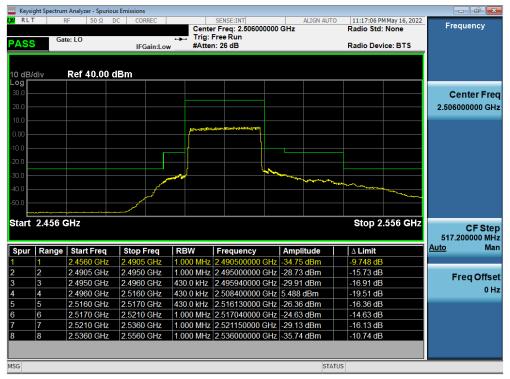
Plot 7-54. Middle ACP Plot (LTE Band 41 - 15MHz QPSK – Full RB)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 45 of 67	
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			V2.2 2/15/2022	



	ectrum Analyzer - Spurio						- 6 💌
A RLT	RF 50 Ω Gate: LO	DC CORREC	🛶 Trig: I	SENSE:INT r Freq: 2.682500000 Free Run n: 26 dB	GHz	Radio Device: BTS	Frequency
10 dB/div Log	Ref 40.00	dBm					
30.0 20.0 10.0							Center Free 2.682500000 GH:
10.00							
20.0							
40.0 50.0		~~~~					
start 2.6	38 GHz					Stop 2.728 GHz	CF Ste 517.200000 MH
Spur Ra	inge Start Freq	Stop Freq	RBW	Frequency	Amplitude	$\Delta$ Limit	<u>Auto</u> Ma
1	2.6375 GHz	2.6600 GHz		2.652575000 GHz		-15.03 dB	
2	2.6600 GHz	2.6700 GHz		2.669300000 GHz		-18.76 dB	Freq Offs
3	2.6700 GHz	2.6740 GHz		2.674000000 GHz		-16.86 dB	0 H
4 5 5	2.6740 GHz	2.6750 GHz		2.674980000 GHz		-19.43 dB	01
	2.6750 GHz	2.6900 GHz		2.677400000 GHz		-20.04 dB	
6	2.6900 GHz 2.6910 GHz	2.6910 GHz 2.6950 GHz		2.69000000 GHz 2.691000000 GHz		-20.06 dB -16.63 dB	
8	2.6950 GHz	2.7050 GHz		2.696200000 GHz		-15.91 dB	
) 9	2.7050 GHz	2.7275 GHz		2.709725000 GHz		-12.19 dB	
ISG					STAT		

Plot 7-55. Upper ACP Plot (LTE Band 41 - 15MHz QPSK - Full RB)



Plot 7-56. Lower ACP Plot (LTE Band 41 - 20MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 46 of 67	
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ASS		RF 50 Ω te: LO	AC CORREC	+++ Trig:	SENSE:INT r Freq: 2.593000 Free Run h: 26 dB		LIGN AUTO	05:21:01 P Radio Std: Radio Dev		Frequency
0 dB/ .og <b>Г</b>	'div	Ref 40.00	dBm							
30.0 — 20.0 —										<b>Center Fre</b> 2.593000000 GH
10.0 - 0.00 - 10.0 -					·					
20.0 30.0				~			-			
40.0 -										
start	2.543 0								.643 GHz	3.750000 MH
	2.543 C	Start Freq	Stop Freq	RBW	Frequency	Amplit		∆ Limit		CF Ste 3.750000 M⊦ <u>Auto</u> Ma
Start Spur	Range	Start Freq 2.5430 GHz	2.5630 GHz	1.000 MHz	2.563000000	GHz -40.72 (	dBm	Δ Limit -15.72 dB		3.750000 MH
Spur	Range	<b>Start Freq</b> 2.5430 GHz 2.5630 GHz	2.5630 GHz 2.5780 GHz	1.000 MHz 1.000 MHz	2.563000000 ( 2.578000000 (	GHz -40.72 ( GHz -29.88 (	dBm dBm	∆ Limit -15.72 dB -16.88 dB		3.750000 MH
Start Spur	<b>Range</b> 1 2 3	<b>Start Freq</b> 2.5430 GHz 2.5630 GHz 2.5780 GHz	2.5630 GHz 2.5780 GHz 2.5820 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2.563000000 ( 2.578000000 ( 2.581960000 (	GHz -40.72 ( GHz -29.88 ( GHz -26.54 (	dBm dBm dBm	∆ Limit -15.72 dB -16.88 dB -16.54 dB		3.750000 Mł <u>Auto</u> Ma Freq Offs
itart Spur	Range 1 2 3 4	<b>Start Freq</b> 2.5430 GHz 2.5630 GHz 2.5780 GHz 2.5820 GHz	2.5630 GHz 2.5780 GHz 2.5820 GHz 2.5830 GHz	1.000 MHz 1.000 MHz 1.000 MHz 430.0 kHz	2.563000000 ( 2.578000000 ( 2.581960000 ( 2.582870000 (	GHz -40.72 ( GHz -29.88 ( GHz -26.54 ( GHz -27.29 (	dBm dBm dBm dBm	Δ Limit -15.72 dB -16.88 dB -16.54 dB -17.29 dB		3.750000 Mi <u>Auto</u> Mi Freq Offs
Spur	Range 1 2 3 4 5	<b>Start Freq</b> 2.5430 GHz 2.5630 GHz 2.5780 GHz 2.5820 GHz 2.5830 GHz	2.5630 GHz 2.5780 GHz 2.5820 GHz 2.5830 GHz 2.6030 GHz	1.000 MHz           1.000 MHz           1.000 MHz           430.0 KHz           430.0 KHz	2.563000000 ( 2.578000000 ( 2.581960000 ( 2.582870000 ( 2.585600000 (	GHz -40.72 ( GHz -29.88 ( GHz -26.54 ( GHz -27.29 ( GHz 5.155 d	dBm dBm dBm dBm dBm	Δ Limit -15.72 dB -16.88 dB -16.54 dB -17.29 dB -19.85 dB		3.750000 Mł <u>Auto</u> Ma
start	Range 1 2 3 4 5 6	<b>Start Freq</b> 2.5430 GHz 2.5630 GHz 2.5780 GHz 2.5820 GHz	2.5630 GHz 2.5780 GHz 2.5820 GHz 2.5830 GHz	1.000 MHz           1.000 MHz           1.000 MHz           1.000 MHz           430.0 KHz           430.0 KHz           430.0 KHz	2.563000000 ( 2.578000000 ( 2.581960000 ( 2.582870000 ( 2.585600000 ( 2.603470000 (	GHz         -40.72 (           GHz         -29.88 (           GHz         -26.54 (           GHz         -27.29 (           GHz         5.155 d           GHz         -28.82 (	dBm dBm dBm dBm dBm dBm dBm	Δ Limit -15.72 dB -16.88 dB -16.54 dB -17.29 dB		3.750000 Mł <u>Auto</u> Ma Freq Offs
start Spur	Range           1           2           3           4           5           6           7	<b>Start Freq</b> 2.5430 GHz 2.5630 GHz 2.5780 GHz 2.5820 GHz 2.5830 GHz 2.6030 GHz	2.5630 GHz 2.5780 GHz 2.5820 GHz 2.5830 GHz 2.6030 GHz 2.6040 GHz	1.000 MHz           1.000 MHz           1.000 MHz           430.0 KHz           430.0 KHz           430.0 KHz           1.000 MHz	2.563000000 ( 2.578000000 ( 2.581960000 ( 2.582870000 ( 2.585600000 (	GHz         -40.72 (           GHz         -29.88 (           GHz         -26.54 (           GHz         -27.29 (           GHz         5.155 d           GHz         -28.82 (           GHz         -28.62 (	dBm dBm dBm dBm dBm dBm dBm dBm	Δ Limit -15.72 dB -16.88 dB -16.54 dB -17.29 dB -19.85 dB -18.82 dB		3.750000 Mi <u>Auto</u> Mi Freq Offs

Plot 7-57. Middle ACP Plot (LTE Band 41 - 20MHz QPSK - Full RB)



Plot 7-58. Upper ACP Plot (LTE Band 41 - 20MHz QPSK – Full RB)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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			V2 2 2/15/2022



### 7.5 Radiated Power (EIRP)

#### §27.50(a)(3), §27.50(h)(2)

#### **Test Overview**

Equivalent Isotropic Radiated Power (EIRP) measurements are calculated by adding highest antenna gain to maximum measured conducted output power. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

#### **Test Procedures Used**

KDB 971168 D01 v03r01 - Section 5.2.1

ANSI C63.26-2015 - Section 5.2.5.5

#### **Test Settings**

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured is:

EIRP = PMeas - LC + GT

Where:

EIRP = Equivalent Isotropic Radiated Power (expressed in the same units as PMeas, typically dBW or dBm)

PMeas = measured transmitter output power or PSD, in dBW or dBm

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

GT = gain of the transmitting antenna, in dBi (EIRP)

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

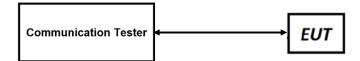


Figure 7-4. EIRP Measurement Setup

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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	·		V2.2 2/15/2022	



#### Test Notes

- 1. The EUT was tested in all possible test configurations. The worst case emissions are reported with the EUT modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2. This unit was tested with its standard battery.
- 3. The Level (dBm) readings in the table were taken with a correction table loaded into the base station simulator. The correction table was used to account for the signal attenuation in the connecting cable between the transmitter and antenna.

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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## LTE Band 7

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	EIRP [dBm]	EIRP [mW]	EIRP Limit [dBm]	Margin [dB]
		2502.5	-6.40	1 / 12	24.00	17.60	57.544	33.01	-15.41
5 MHz	QPSK	2535.0	-6.40	1 / 12	23.62	17.22	52.723	33.01	-15.79
		2567.5	-6.40	1 / 24	23.42	17.02	50.350	33.01	-15.99
	16-QAM	2502.5	-6.40	1 / 12	23.31	16.91	49.091	33.01	-16.10
		2505.0	-6.40	1 / 25	23.93	17.53	56.624	33.01	-15.48
10 MHz	QPSK	2535.0	-6.40	1 / 25	23.64	17.24	52.966	33.01	-15.77
		2565.0	-6.40	1 / 25	23.45	17.05	50.699	33.01	-15.96
	16-QAM	2505.0	-6.40	1 / 25	23.27	16.87	48.641	33.01	-16.14
		2507.5	-6.40	1 / 37	24.00	17.60	57.544	33.01	-15.41
15 MHz	QPSK	2535.0	-6.40	1 / 37	23.72	17.32	53.951	33.01	-15.69
		2562.5	-6.40	1 / 37	23.42	17.02	50.350	33.01	-15.99
	16-QAM	2507.5	-6.40	1 / 37	23.05	16.65	46.238	33.01	-16.36
		2510.0	-6.40	1 / 50	24.00	17.60	57.544	33.01	-15.41
20 MHz	QPSK	2535.0	-6.40	1 / 50	23.64	17.24	52.966	33.01	-15.77
		2560.0	-6.40	1 / 99	23.61	17.21	52.602	33.01	-15.80
	16-QAM	2510.0	-6.40	1 / 50	23.23	16.83	48.195	33.01	-16.18

Table 7-2. Antenna FCM EIRP Data (LTE Band 7)

## LTE Band 41

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	EIRP [dBm]	EIRP [mW]	EIRP Limit [dBm]	Margin [dB]
		2498.5	-7.00	1 / 24	24.00	17.00	50.119	33.01	-16.01
5 MHz	QPSK	2593.0	-7.00	1 / 12	23.49	16.49	44.566	33.01	-16.52
JIMITZ		2687.5	-7.00	1 / 12	23.68	16.68	46.559	33.01	-16.33
	16-QAM	2498.5	-7.00	1 / 0	22.89	15.89	38.815	33.01	-17.12
		2501.0	-7.00	1 / 25	23.94	16.94	49.431	33.01	-16.07
10 MHz	IHz QPSK	2593.0	-7.00	1 / 49	23.47	16.47	44.361	33.01	-16.54
		2685.0	-7.00	1 / 25	23.89	16.89	48.865	33.01	-16.12
	16-QAM	2501.0	-7.00	1 / 0	23.16	16.16	41.305	33.01	-16.85
		2503.5	-7.00	1 / 0	23.95	16.95	49.545	33.01	-16.06
15 MHz	QPSK	2593.0	-7.00	1 / 74	23.46	16.46	44.259	33.01	-16.55
		2682.5	-7.00	1 / 74	23.87	16.87	48.641	33.01	-16.14
	16-QAM	2682.5	-7.00	1 / 0	22.91	15.91	38.994	33.01	-17.10
		2506.0	-7.00	1 / 50	23.95	16.95	49.545	33.01	-16.06
20 MHz	QPSK	2593.0	-7.00	1 / 0	23.50	16.50	44.668	33.01	-16.51
		2680.0	-7.00	1 / 0	23.85	16.85	48.417	33.01	-16.16
	16-QAM	2506.0	-7.00	1 / 0	22.95	15.95	39.355	33.01	-17.06

Table 7-3. Antenna FCM EIRP Data (LTE Band 41)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Daga 50 of 67				
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Page 50 of 67				
V2.2.2/1							



# 7.6 Radiated Spurious Emissions

§2.1053, 27.53(m)

#### **Test Overview**

Radiated spurious emissions measurements are performed using the field strength conversion method described in KDB 971168 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized broadband hybrid antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband hybrid antennas. All measurements are performed while the EUT is operating at maximum power and at the appropriate frequencies.

#### **Test Procedures Used**

KDB 971168 D01 v03r01 - Section 5.8

#### **Test Settings**

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW  $\ge$  3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Page 51 of 67			
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 51 01 07			
V2.2.2/15/202						



#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

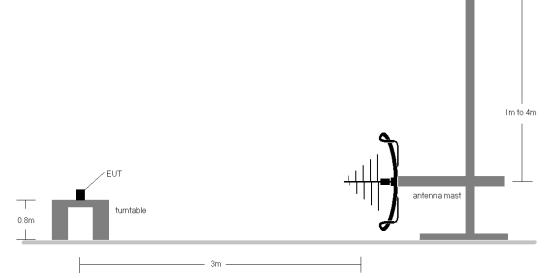


Figure 7-5. Test Instrument & Measurement Setup < 1GHz

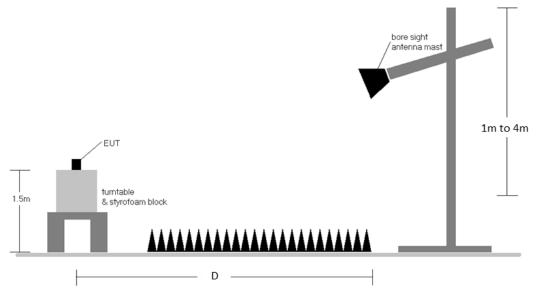


Figure 7-6. Test Instrument & Measurement Setup >1 GHz

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 52 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Page 52 of 67	
			V2.2 2/15/2022	



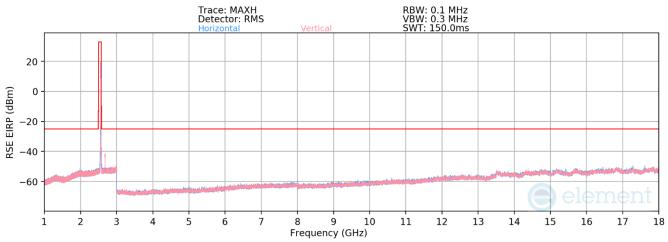
#### Test Notes

- 1. Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
  - a. E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
  - b. EIRP (dBm) =  $E(dB\mu V/m)$  + 20logD 104.8; where D is the measurement distance in meters.
- 2. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 3. This unit was tested with its standard battery.
- 4. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5. D is the measurement test distance and emissions 1-18GHz were measured at a 3 meters test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 6. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 53 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch		
			V2.2 2/15/2022	



# 7.6.1 Antenna FCM – Radiated Spurious Emission Measurements



## LTE Band 7



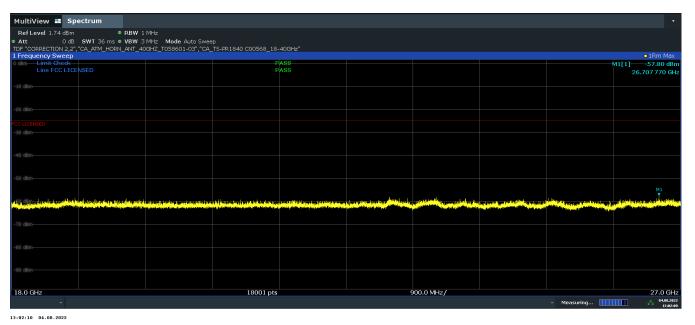
ef Level 1.74 dBm • RBW 1 MHz							
t 0 dB SWT 36 ms • VBW 3 MHz	Mode Auto Sweep						
"CORRECTION 2,2", "CA_ATM_HORN_ANT_40GHZ_"		3-40GHz"					
equency Sweep							•1Rm N
m Limit Check Line FCC LICENSED		PASS PASS					M1[1] -58.09
LINE FCC LICENSED		PASS					18.745710
M1							
Second Second result with the boundary of March Second American Second		and the state of the	In the second statement of the second second	Al addition and a product of the		and a state of the second state of the	and the late of the second
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GHz	18001 pts	S		900.0 MHz/			27.

13:01:09 04.08.2022

Plot 7-60. Antenna FCM Radiated Spurious Emission above 18GHz (LTE Band 7, Pol. H)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dogo 54 of 67				
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Page 54 of 67				
V2 2 2/15/							





Plot 7-61. Antenna FCM Radiated Spurious Emission above 18GHz (LTE Band 7, Pol. V)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 55 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Page 55 of 67	
	•	·	V2.2 2/15/2022	



Bandwidth (MHz):	20
Frequency (MHz):	2510.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5020.0	Н	-	-	-78.09	6.97	35.88	-59.38	-25.00	-34.38
7530.0	V	290	299	-78.90	10.42	38.52	-56.74	-25.00	-31.74
10040.0	Н	115	78	-79.13	13.18	41.05	-54.21	-25.00	-29.21
12550.0	Н	-	-	-83.89	16.09	39.20	-56.05	-25.00	-31.05
15060.0	Н	-	-	-84.09	17.85	40.76	-54.50	-25.00	-29.50

#### Table 7-4. Radiated Spurious Data (LTE Band 7 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	2535.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5070.0	V	262	290	-78.98	6.40	34.42	-60.84	-25.00	-35.84
7605.0	Н	-	-	-82.77	10.87	35.10	-60.16	-25.00	-35.16
10140.0	Н	331	207	-78.79	13.59	41.80	-53.46	-25.00	-28.46
12675.0	Н	-	-	-83.61	16.26	39.65	-55.61	-25.00	-30.61
15210.0	Н	-	-	-84.38	17.72	40.34	-54.92	-25.00	-29.92

#### Table 7-5. Radiated Spurious Data (LTE Band 7 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	2560.0
RB / Offset:	1 / 50

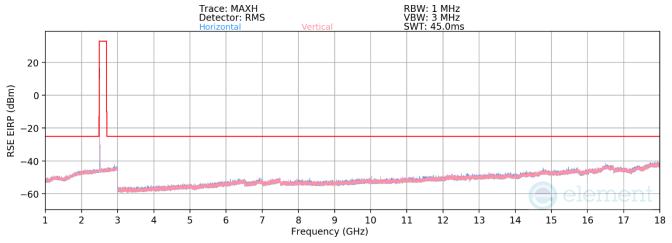
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5120.00	Н	334	4	-78.49	6.30	34.81	-60.45	-25.00	-35.45
7680.00	Н	-	-	-80.23	10.07	36.84	-58.42	-25.00	-33.42
10240.00	Н	245	352	-77.85	13.60	42.75	-52.51	-25.00	-27.51
12800.00	Н	-	-	-84.10	16.84	39.74	-55.51	-25.00	-30.51
15360.00	Н	-	-	-84.05	17.89	40.84	-54.41	-25.00	-29.41

Table 7-6. Radiated Spurious Data (LTE Band 7 – High Channel)

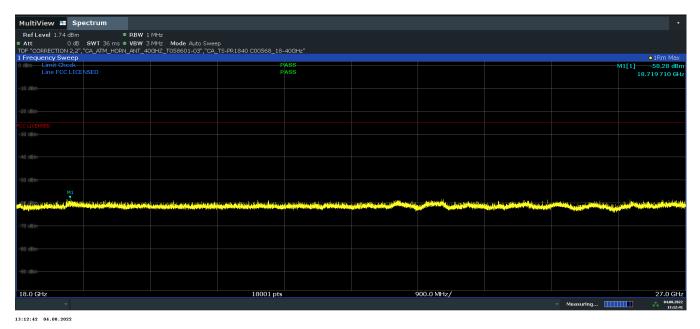
FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 56 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 50 01 67	
			V/2 2 2/15/2022	



## LTE Band 41







Plot 7-63. Antenna FCM Radiated Spurious Emission above 18GHz (LTE Band 41, Pol. H)

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 57 of 67	
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Page 57 of 67	
			V2.2 2/15/2022	



	VBW 3 MHz Mode Auto S						
"CORRECTION 2,2","CA_ATM_HORN equency Sweep	_ANT_40GHZ_T058601-03","	'CA_TS-PR1840 C00568_18-	40GHz"				•1Rm №
m Limit Check Line FCC LICENSED			ASS ASS				M1[1] -58.41 23.082 470
ICENSED							
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Bm						and a second	
) GHz		18001 pts			900.0 MHz/		27.0

Plot 7-64. Antenna FCM Radiated Spurious Emission above 18GHz (LTE Band 41, Pol. V)

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 58 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 56 01 07
			1/2 2 2/15/2022



Bandwidth (MHz):	20
Frequency (MHz):	2506.0
RB / Offset:	1/ 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5012.0	Н	-	-	-78.88	4.59	32.71	-62.54	-25.00	-37.54
7518.0	V	263	141	-77.01	8.75	38.74	-56.52	-25.00	-31.52
10024.0	Н	391	217	-77.95	9.76	38.81	-56.45	-25.00	-31.45
12530.0	Н	-	-	-81.90	12.69	37.79	-57.46	-25.00	-32.46
15036.0	Н	-	-	-82.40	14.58	39.18	-56.08	-25.00	-31.08
17542.0	Н	-	-	-85.18	20.29	42.11	-53.15	-25.00	-28.15

Table 7-7. Antenna FCM Radiated Spurious Data (LTE Band 41 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	2593.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5186.0	V	-	-	-79.27	4.57	32.30	-62.95	-25.00	-37.95
7779.0	Н	-	-	-81.88	8.93	34.05	-61.20	-25.00	-36.20
10372.0	Н	243	343	-78.33	9.90	38.57	-56.69	-25.00	-31.69
12965.0	Н	-	-	-81.96	13.09	38.13	-57.13	-25.00	-32.13
15558.0	Н	-	-	-83.03	15.71	39.68	-55.57	-25.00	-30.57

#### Table 7-8. Antenna FCM Radiated Spurious Data (LTE Band 41 – Mid Channel)

20
2680.0
1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5360.0	V	-	-	-79.38	5.33	32.95	-62.31	-25.00	-37.31
8040.0	Н	-	-	-82.16	9.40	34.24	-61.02	-25.00	-36.02
10720.0	V	-	-	-81.48	10.26	35.78	-59.47	-25.00	-34.47

Table 7-9. Antenna FCM Radiated Spurious Data (LTE Band 41 – High Channel)

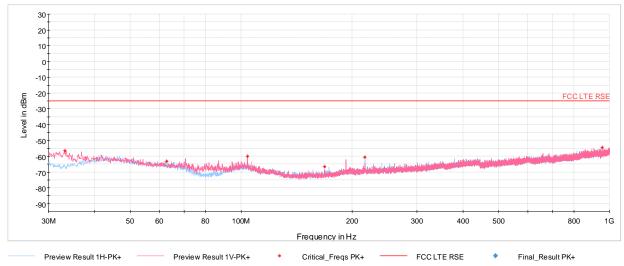
FCC ID: BCG-A2772	element 🤁	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 59 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	- 8/15/2022 Watch	
			V/2 2 2/15/2022



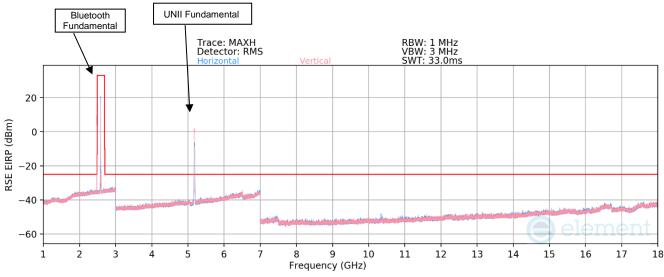
## 7.6.2 Simultaneous Tx Radiated Spurious Emissions Measurements

Description	Bluetooth	LTE	UNII
Antenna	FCM	FCM	FCM
Channel	78	40620	36
Operating Frequency (MHz)	2480	2593	5180
Mode/Modulation	GFSK ePA	QPSK/1RB/20MHz	11n

Table 7-10. Worst Case Simultaneous Transmission Configuration



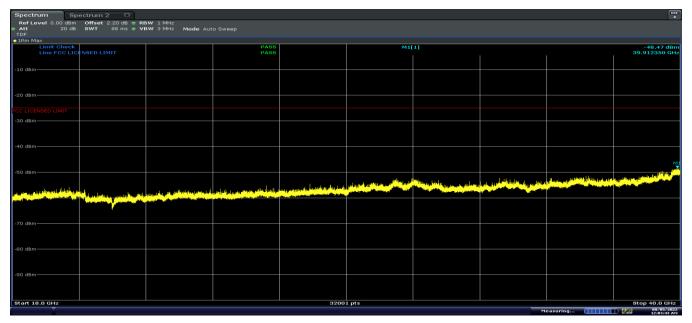
Plot 7-65. Antenna FCM Radiated Spurious Emissions -Simultaneous Transmission 30MHz – 1GHz



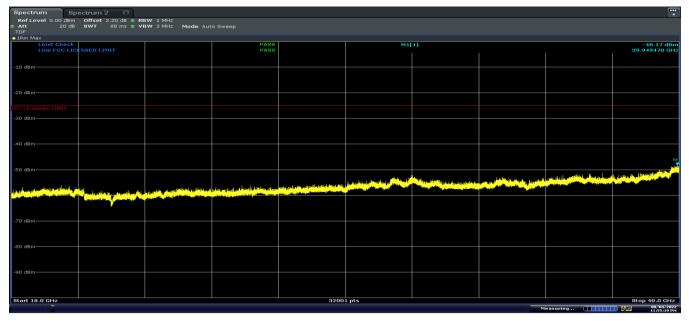
Plot 7-66. Antenna FCM Radiated Spurious Emissions -Simultaneous Transmission 1GHz – 18GHz

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 60 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 00 01 07
			1/2 2 2/15/2022





Plot 7-67. Antenna FCM Radiated Spurious Emissions -Simultaneous Transmission 18GHz-40GHz Pol. H



Plot 7-68. Antenna FCM Radiated Spurious Emissions -Simultaneous Transmission 18GHz-40GHz Pol. V

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 61 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022 Watch		Fage of 01 01 07
			V2 2 2/15/2022



Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	Peak	-	-	-	-68.37	16.14	54.77	73.98	-19.21
7440.00	Peak	Н	109	170	-64.41	10.08	52.67	73.98	-21.31
12400.00	Peak	Н	-	-	-72.72	16.30	50.58	73.98	-23.40
10360.00	Peak	Н	261	106	-65.31	13.87	55.56	68.20	-12.64
15540.00	Avg	Н	-	-	-84.73	19.14	41.41	53.98	-12.57
15540.00	Peak	Н	-	-	-73.26	19.14	52.88	73.98	-21.10

 Table 7-11. Antenna FCM BT and UNII Harmonics Emissions Measurement in Simultaneous Transmission

 Mode

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dBm]	Level at Antenna Terminals [dBm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7752.00	MAXH_RMS	Н	-	-	-81.09	10.17	-34.15	-59.15	-25.00	-34.2
10336.00	MAXH_RMS	Н	319	252	-79.88	13.52	-29.59	-54.59	-25.00	-29.6
12920.00	MAXH_RMS	Н	-	-	-83.85	17.42	-29.66	-54.66	-25.00	-29.7
15504.00	MAXH_RMS	Н	-	-	-83.92	19.12	-28.03	-53.03	-25.00	-28.0
2376.00	MAXH_RMS	-	-	-	-77.23	17.50	-22.95	-47.95	-25.00	-23.0
2688.00	MAXH_RMS	Н	221	299	-77.38	18.22	-22.39	-47.39	-25.00	-22.4

 Table 7-12. Antenna FCM LTE Harmonics and Intermodulations Emissions Measurement in

 Simultaneous Transmission Mode

FCC ID: BCG-A2772	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 62 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	Watch	Fage 62 01 67
	•	·	V2.2 2/15/2022



# 7.7 Frequency Stability / Temperature Variation §2.1055, §27.54

#### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015 and TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

# For Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### Test Procedure Used

ANSI C63.26-2015

TIA-603-E-2016

#### **Test Settings**

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

#### Test Setup

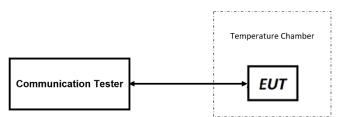


Figure 7-7. Test Instrument & Measurement Setup

#### **Test Notes**

#### None

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 63 of 67
1C2205090038-04.BCG	5/1/2022 - 8/15/2022	2 - 8/15/2022 Watch	
			1/2 2 2/15/2022



# LTE Band 7

LTE Band 7									
	Low Ch	nannel Frequenc	cy (Hz):		2,510,000,000				
	High Cl	hannel Frequen	cy (Hz):		2,560,000,000				
	Re	ef. Voltage (VD	C):		3.8				
Voltage (%)	Power (VDC)	Temp (°C)	Low Freq. (Hz)	High Freq. (Hz)	Low Freq. Dev. (Hz)	High Freq. Dev. (Hz)	Deviation (%)		
		- 30	2,510,000,003	2,560,000,004	1.44	1.72	0.00000007		
		- 20	2,510,000,003	2,560,000,004	1.92	2.09	0.0000008		
		- 10	2,510,000,003	2,560,000,004	1.37	1.75	0.0000007		
		0	2,510,000,003	2,560,000,004	1.79	1.99	0.00000008		
100 %	3.80	+ 10	2,510,000,003	2,560,000,003	1.32	0.75	0.0000005		
		+ 20 (Ref)	2,510,000,002	2,560,000,002	0.00	0.00	0.00000000		
		+ 30	2,510,000,005	2,560,000,004	3.25	1.98	0.0000013		
		+ 40	2,510,000,004	2,560,000,003	2.90	1.55	0.00000012		
		+ 50	2,510,000,004	2,560,000,004	2.45	1.70	0.00000010		
Battery Endpoint	3.40	+ 20	2,510,000,002	2,560,000,002	0.86	0.51	0.0000003		

Table 7-13. LTE Band 7 Frequency Stability Data

FCC ID: BCG-A2772	element 🤤	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 64 of 67
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			\/2 2 2/15/2022



# LTE Band 41

LTE Band	1 41						
	Low Ch	annel Frequeno	cy (Hz):		2,506,000,000		]
	High Cl	nannel Frequen	cy (Hz):		2,580,000,000		1
	Re	ef. Voltage (VD	C):		3.8		
Voltage (%)	Power (VDC)	Temp (°C)	Low Freq. (Hz)	High Freq. (Hz)	Low Freq. Dev. (Hz)	High Freq. Dev. (Hz)	Deviation (%)
		- 30	2,506,000,011	2,580,000,013	5.89	6.51	0.0000003
		- 20	2,506,000,012	2,580,000,015	7.04	7.92	0.0000003
		- 10	2,506,000,012	2,580,000,015	6.92	7.65	0.000003
		0	2,506,000,014	2,580,000,014	8.78	7.25	0.0000004
100 %	3.80	+ 10	2,506,000,013	2,580,000,013	7.45	6.59	0.0000003
		+ 20 (Ref)	2,506,000,005	2,580,000,007	0.00	0.00	0.0000000
		+ 30	2,506,000,014	2,580,000,013	8.75	6.05	0.0000003
		+ 40	2,506,000,014	2,580,000,013	8.68	6.28	0.0000003
		+ 50	2,506,000,011	2,580,000,014	5.95	6.94	0.0000003
Battery Endpoint	3.40	+ 20	2,506,000,012	2,580,000,014	6.23	6.71	0.000003

Table 7-14. LTE Band 41 Frequency Stability Data

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# 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the Apple **Watch FCC ID: BCG-A2772** complies with all the requirements of Part 27 of the FCC rules.

FCC ID: BCG-A2772	element)	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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# 9.0 APPENDIX A

#### Antenna gains provided by manufacturer:

Cellular Antenna Gain (FCM), Type: IFA					
Band	Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)		
1	1921.6	-13.7	-13.4		
1	1950.0	-12.4	-12.8		
1	1978.4	-12.5	-12.8		
3	1711.6	-12.9	-7.9		
3	1747.5	-13.4	-9.1		
3	1783.4	-13.7	-9.6		
7	2502.6	-8.6	-7.4		
7	2535.0	-8.0	-6.8		
7	2567.4	-7.4	-6.4		
25	1851.0	-14.3	-10.8		
25	1882.4	-14.5	-11.7		
25	1914.0	-14.3	-12.1		
39	1882.6	-14.5	-11.8		
39	1900.0	-14.2	-12.3		
39	1917.4	-14.3	-12.5		
40	2302.6	-9.1	-8.3		
40	2350.0	-7.9	-7.4		
41	2498.6	-8.6	-7.5		
41	2593.0	-8.2	-7.0		
41	2687.4	-8.7	-8.1		

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