

MEASUREMENT REPORT

LTE

Applicant Name:

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

Date of Testing:

5/25 - 8/18/2018

Test Site/Location:

PCTEST Lab. Morgan Hill, CA, USA

Test Report Serial No.:

1C1806040009-03-R1.BCG

FCC ID:

BCG-A2007

APPLICANT:

Apple Inc.

Application Type:

Certification

Model:

A2007

EUT Type:

Watch

FCC Classification:

Licensed Non-Broadcast Transmitter Worn on Body (TNT)

FCC Rule Part(s):

22 & 27

Test Procedure(s):

ANSI C63.26-2015, ANSI/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.

This revised Test Report (S/N: 1C1806040009-03-R1.BCG) supersedes and replaces the previously issued test report (S/N: 1C1806040009-03.BCG) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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.



Randy Ortanez
President

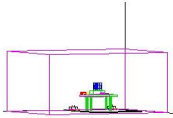


FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 1 of 82

TABLE OF CONTENTS

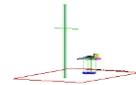
1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION.....	5
2.1	Equipment Description	5
2.2	Device Capabilities.....	5
2.3	Antenna Description	5
2.4	Test Support Equipment.....	6
2.5	Test Configuration	6
2.6	Software and Firmware	6
2.7	EMI Suppression Device(s)/Modifications	6
3.0	DESCRIPTION OF TESTS	7
3.1	Measurement Procedure.....	7
3.2	Cellular - Base Frequency Blocks	7
3.3	Cellular - Mobile Frequency Blocks	7
3.4	BRS/EBS Frequency Block	7
3.5	Radiated Power and Radiated Spurious Emissions	8
4.0	MEASUREMENT UNCERTAINTY	9
5.0	TEST EQUIPMENT CALIBRATION DATA	10
6.0	SAMPLE CALCULATIONS	11
7.0	TEST RESULTS.....	12
7.1	Summary.....	12
7.2	Occupied Bandwidth	14
7.3	Spurious and Harmonic Emissions at Antenna Terminal	27
7.4	Band Edge Emissions at Antenna Terminal.....	47
7.5	Radiated Power (ERP/EIRP).....	61
7.6	Radiated Spurious Emissions Measurements	67
7.7	Frequency Stability / Temperature Variation	75
8.0	CONCLUSION.....	82

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 2 of 82



MEASUREMENT REPORT

FCC Part 22 & 27



Mode	Tx Frequency (MHz)	ERP		EIRP		Emission Designator	Modulation
		Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)		
LTE Band 5	824.7 - 848.3	0.0003	-5.66	0.0004	-3.51	1M11G7W	QPSK
LTE Band 5	824.7 - 848.3	0.0002	-6.58	0.0004	-4.43	1M11D7W	16QAM
LTE Band 5	825.5 - 847.5	0.0003	-5.77	0.0004	-3.62	2M73G7W	QPSK
LTE Band 5	825.5 - 847.5	0.0002	-6.39	0.0004	-4.24	2M72D7W	16QAM
LTE Band 5	826.5 - 846.5	0.0003	-5.79	0.0004	-3.64	4M54G7W	QPSK
LTE Band 5	826.5 - 846.5	0.0002	-6.56	0.0004	-4.41	4M54D7W	16QAM
LTE Band 5	829 - 844	0.0003	-5.80	0.0004	-3.65	9M10G7W	QPSK
LTE Band 5	829 - 844	0.0002	-6.35	0.0004	-4.20	5M34D7W	16QAM
LTE Band 26	824.7 - 848.3	0.0003	-5.77	0.0004	-3.62	1M10G7W	QPSK
LTE Band 26	824.7 - 848.3	0.0002	-6.51	0.0004	-4.36	1M11D7W	16QAM
LTE Band 26	825.5 - 847.5	0.0003	-5.79	0.0004	-3.64	2M73G7W	QPSK
LTE Band 26	825.5 - 847.5	0.0002	-6.48	0.0004	-4.33	2M72D7W	16QAM
LTE Band 26	826.5 - 846.5	0.0003	-5.75	0.0004	-3.60	4M55G7W	QPSK
LTE Band 26	826.5 - 846.5	0.0002	-6.43	0.0004	-4.28	4M55D7W	16QAM
LTE Band 26	829 - 844	0.0003	-5.78	0.0004	-3.63	9M13G7W	QPSK
LTE Band 26	829 - 844	0.0002	-6.33	0.0004	-4.18	5M45D7W	16QAM
LTE Band 7	2502.5 - 2567.5			0.0105	10.20	4M54G7W	QPSK
LTE Band 7	2502.5 - 2567.5			0.0089	9.49	4M53D7W	16QAM
LTE Band 7	2505 - 2565			0.0107	10.30	9M08G7W	QPSK
LTE Band 7	2505 - 2565			0.0091	9.59	5M42D7W	16QAM
LTE Band 7	2507.5 - 2562.5			0.0110	10.40	13M6G7W	QPSK
LTE Band 7	2507.5 - 2562.5			0.0091	9.58	5M35D7W	16QAM
LTE Band 7	2510 - 2560			0.0110	10.40	18M1G7W	QPSK
LTE Band 7	2510 - 2560			0.0102	10.07	5M38D7W	16QAM
LTE Band 41	2498.5 - 2687.5			0.0116	10.64	4M55G7W	QPSK
LTE Band 41	2498.5 - 2687.5			0.0116	10.65	4M54D7W	16QAM
LTE Band 41	2501 - 2685			0.0116	10.65	9M19G7W	QPSK
LTE Band 41	2501 - 2685			0.0106	10.25	5M51D7W	16QAM
LTE Band 41	2503.5 - 2682.5			0.0115	10.62	13M6G7W	QPSK
LTE Band 41	2503.5 - 2682.5			0.0110	10.41	5M41D7W	16QAM
LTE Band 41	2506 - 2680			0.0119	10.75	18M1G7W	QPSK
LTE Band 41	2506 - 2680			0.0102	10.08	5M46D7W	16QAM

EUT Overview

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 3 of 82

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 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. 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 PCTEST Engineering Lab located in Morgan Hill, CA 95037, U.S.A.

- PCTEST is an ISO 17025-2005 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.
- PCTEST 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 ISSED Standards (RSS).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISSED.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 4 of 82

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Watch FCC ID: BCG-A2007**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: C89WP001K477, C89WR00WK478

2.2 Device Capabilities

This device contains the following capabilities:

850 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n WLAN, Bluetooth (1x, EDR, HDR4, HDR8, LE), NFC

LTE Band 26 (814.7 – 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 – 849 MHz). Therefore, test data provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.

2.3 Antenna Description

Following antenna was used for the testing.

Frequency [MHz]	Antenna Gain (dBi)
698-716	-29
777-787	-29.9
814-824	-28.3
824-849	-28.4
1710-1755	-14.4
1850-1915	-14.3
2490-2690	-12.1

Table 2-1. Antenna Peak Gain

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 5 of 82

2.4 Test Support Equipment

1	Apple MacBook	Model:	A1398	S/N:	C2QKP008F6F3
	w/AC/DC Adapter	Model:	A1435	S/N:	
2	Apple USB Cable	Model:	Kanzi	S/N:	316F8A
	w/ Charging Dock	Model:	FAPS73	S/N:	17242000868
	w/ Dock	Model:	X241	S/N:	GW17E01ST28
3	USB Lightning Cable	Model:	N/A	S/N:	N/A
	w/ AC Adapter	Model:	A1265	S/N:	1X0450PGS8QZ
4	Wireless Charging Pad (WCP)	Model:	DVT-2a	S/N:	DLC824400H9J0V64U
	Wireless Charging Pad (WCP)	Model:	DVT-1d	S/N:	DLC824401XHJLW04U
5	Test Pathfinder Mogao Board	Model:	X920	S/N:	920-04087-03
	w/ EVT SiP Cradle	Model:	X920	S/N:	PF 2016
6	DC Power Supply	Model:	KPS3010D	S/N:	N/A

Table 2-2. Test Support Equipment Used

2.5 Test Configuration

The EUT was tested per the guidance of ANSI/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 store display sample was investigated and determined as not the worst case. The EUT was also investigated with and without wireless charger. The worst case configuration found was used for all testing.

The emissions below 1GHz and above 18GHz were tested with the highest transmitting power channel and the worst case configuration.

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.

16-QAM Modulation uplink is only supported for RBs of 27 or less.

2.6 Software and Firmware

The test was conducted with firmware version wOS 5.0 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.

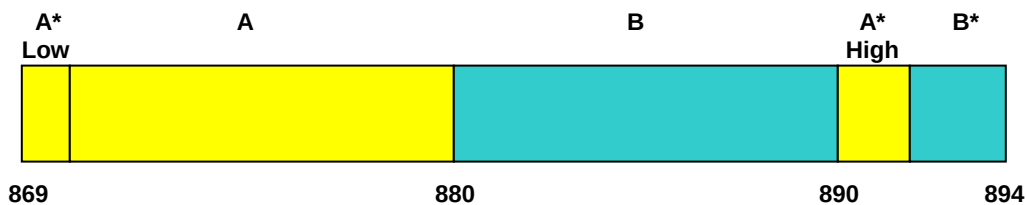
FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 6 of 82

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

3.2 Cellular - Base Frequency Blocks



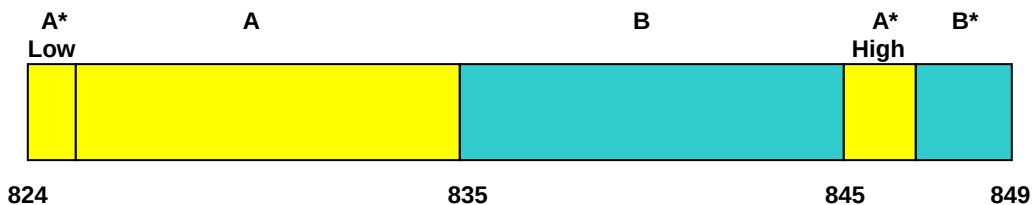
BLOCK 1: 869 – 880 MHz (A* Low + A)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 4: 891.5 – 894 MHz (B*)

3.3 Cellular - Mobile Frequency Blocks



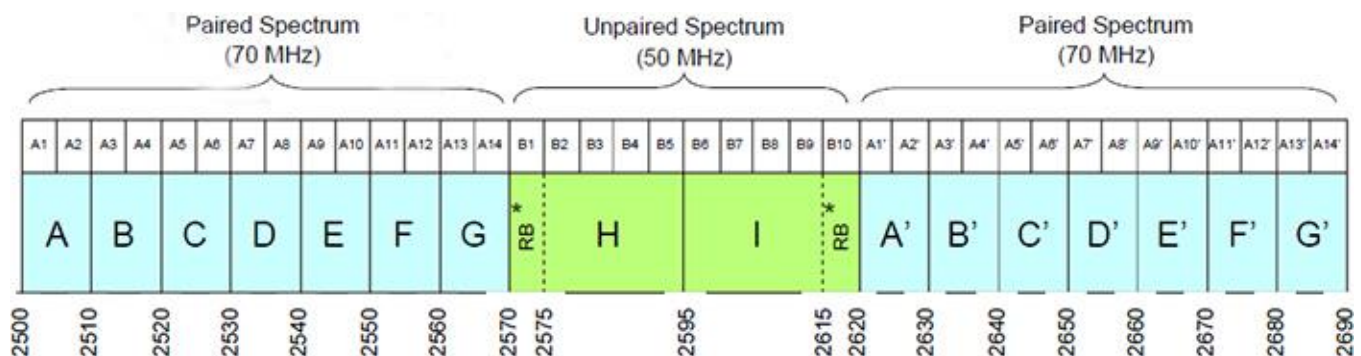
BLOCK 1: 824 – 835 MHz (A* Low + A)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

3.4 BRS/EBS Frequency Block



FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 7 of 82

3.5 Radiated Power and 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.

Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$. For Band 7 and 41, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of $55 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 8 of 82

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. 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_{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 ($\pm$ dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 9 of 82

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
COM-POWER	LIN-120A	LISN	3/7/2018	Annual	3/7/2019	241296
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	2/27/2018	Annual	2/27/2019	MY49430244
Maturo	NCD/264/205616	Mast/TT controller	N/A	N/A	N/A	NCD_264
Rohde & Schwarz	ESW44	EMI Test Receiver	12/20/2017	Annual	12/20/2018	101668
Rohde & Schwarz	ESW44	EMI Test Receiver	11/16/2017	Annual	11/16/2018	101570
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	2/6/2018	Annual	2/6/2019	101619
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	6/11/2018	Annual	6/11/2019	161675
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	4/16/2018	Annual	4/16/2019	161617
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	12/8/2017	Annual	12/8/2018	164175
Rohde & Schwarz	SFUNIT-RX	Shielded Filter Unit	9/11/2017	Annual	9/11/2018	102132
Rohde & Schwarz	SFUNIT-RX	Shielded Filter Unit	12/11/2017	Annual	12/11/2018	102136
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/11/2018	Annual	6/11/2019	100051
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	1/25/2018	Annual	1/25/2019	102333
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	3/13/2018	Annual	3/13/2019	T058601-02
Rohde & Schwarz	HL562E	Ultra Broadband Antenna (30MHz - 6GHz)	6/8/2018	Annual	6/8/2019	100810
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna(400MHz-18GHz)	11/13/2017	Annual	11/13/2018	101057
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna (400MHz-18GHz)	11/29/2017	Annual	11/29/2018	101063
ESPEC	SU-241	Temperature Chamber	8/10/2018	Annual	8/10/2019	92009574

Table 5-1. Test Equipment

Notes:

1. 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.
2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 10 of 82

6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7W

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination of Any

QAM Modulation

Emission Designator = 8M45D7W

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

W = Combination of Any

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average 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 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 11 of 82

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
 FCC ID: BCG-A2007
 FCC Classification: Licensed Non-Broadcast Transmitter Worn on Body (TNT)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
2.1051 2.917(a)	Out of Band Emissions	$> 43 + 10\log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions			Section 7.3, 7.4
27.53(m)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.3, 7.4
2.1046	Transmitter Conducted Output Power	N/A			Section 7.5
2.1055 22.355 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 27)			Section 7.7

Table 7-1. Summary of Conducted Test Results

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 12 of 82

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 26/5)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.5
27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 7, 41)	< 2 Watts max. EIRP			Section 7.5
2.1053 22.917(a)	Undesirable Emissions	> 43 + 10log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.6
27.53(m)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.6

Table 7-2. Summary of Radiated 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 (Sections 7.2, 7.3, 7.4) 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.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "LTE Automation," Version 4.13.
- 5) For operation <1GHz, the EIRP limits in the table above are referenced to the specifications written in the relevant Radio Standards Specifications for Innovation, Science, and Economic Development Canada.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 13 of 82

7.2 Occupied Bandwidth

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 $\geq 3 \times$ 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.

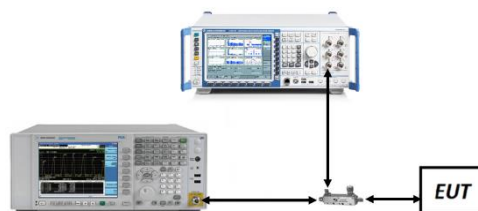


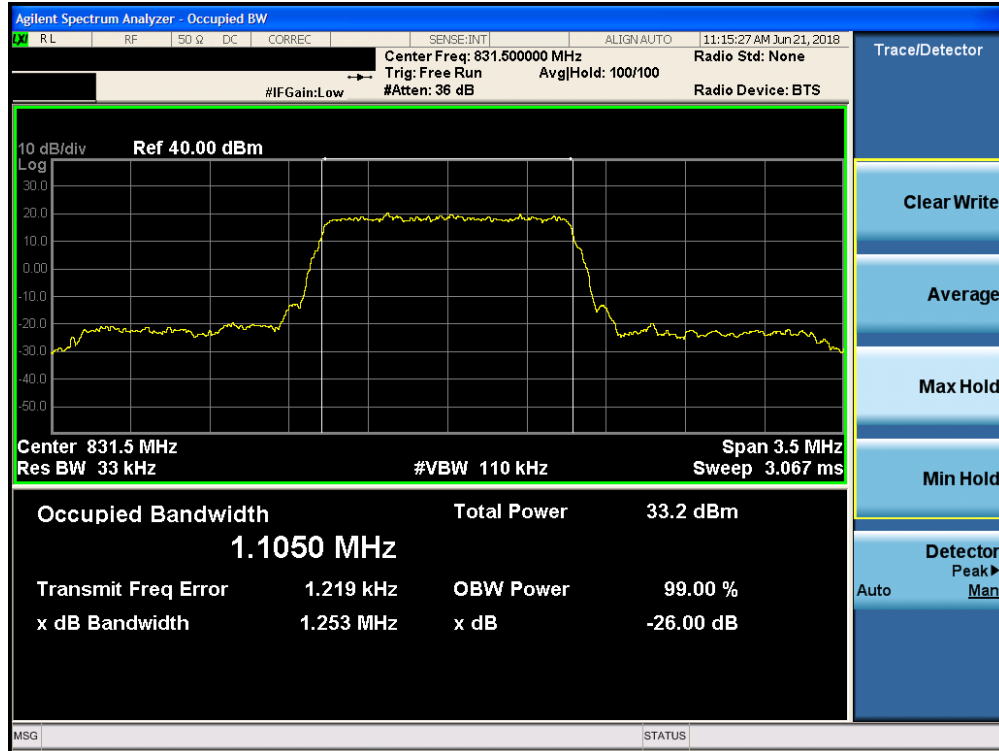
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

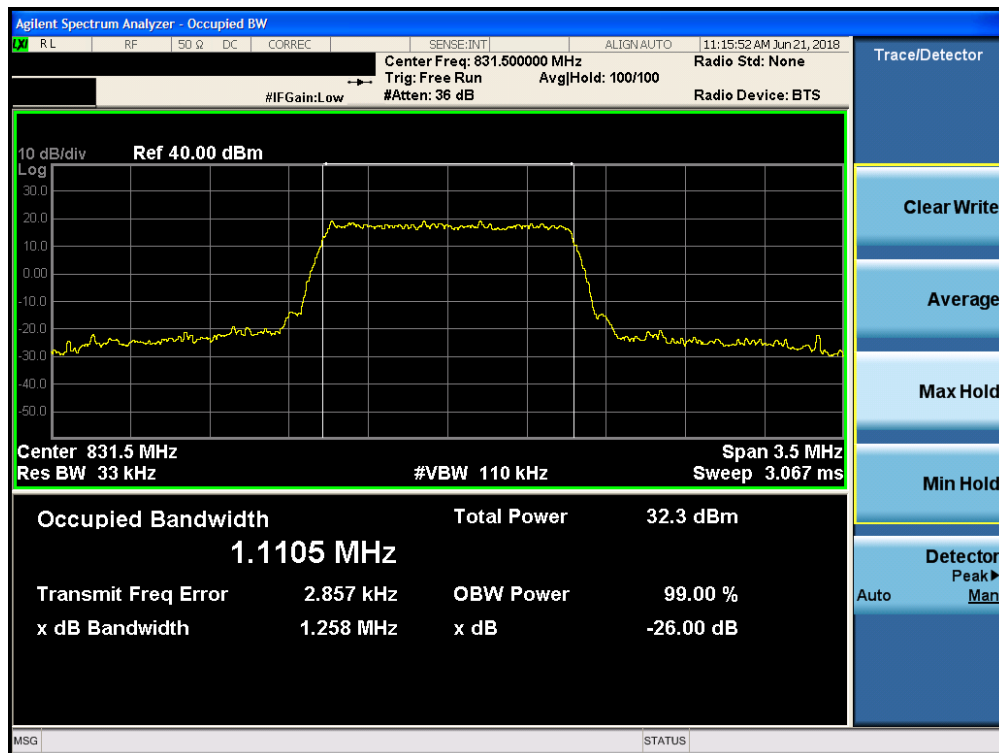
None.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 14 of 82

Band 26/5

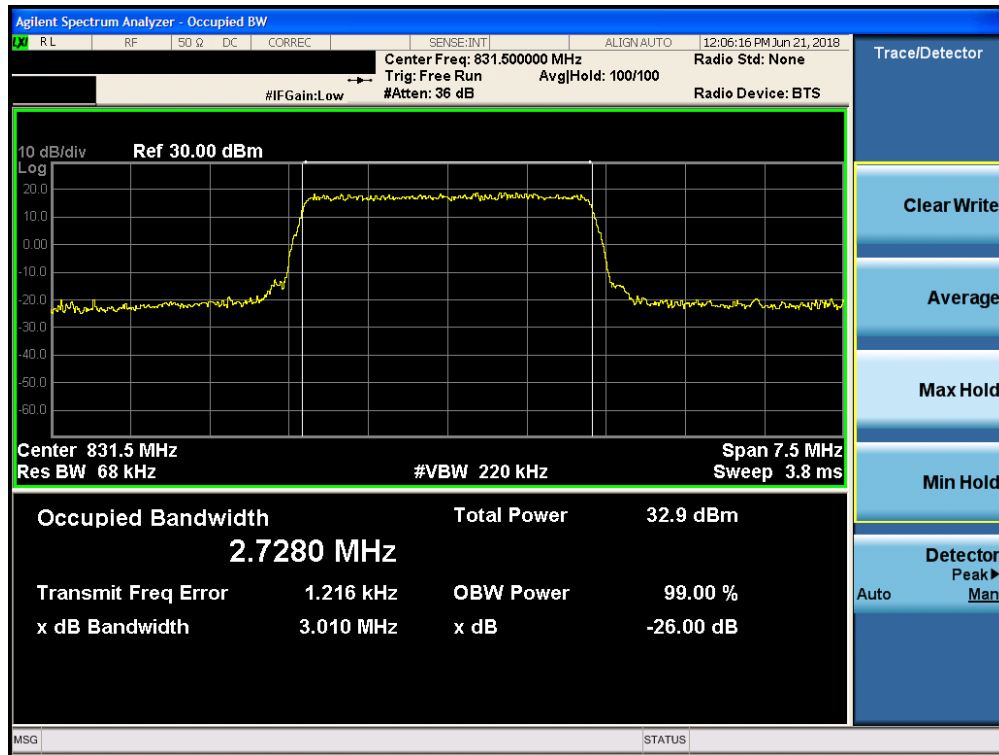


Plot 7-1. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)

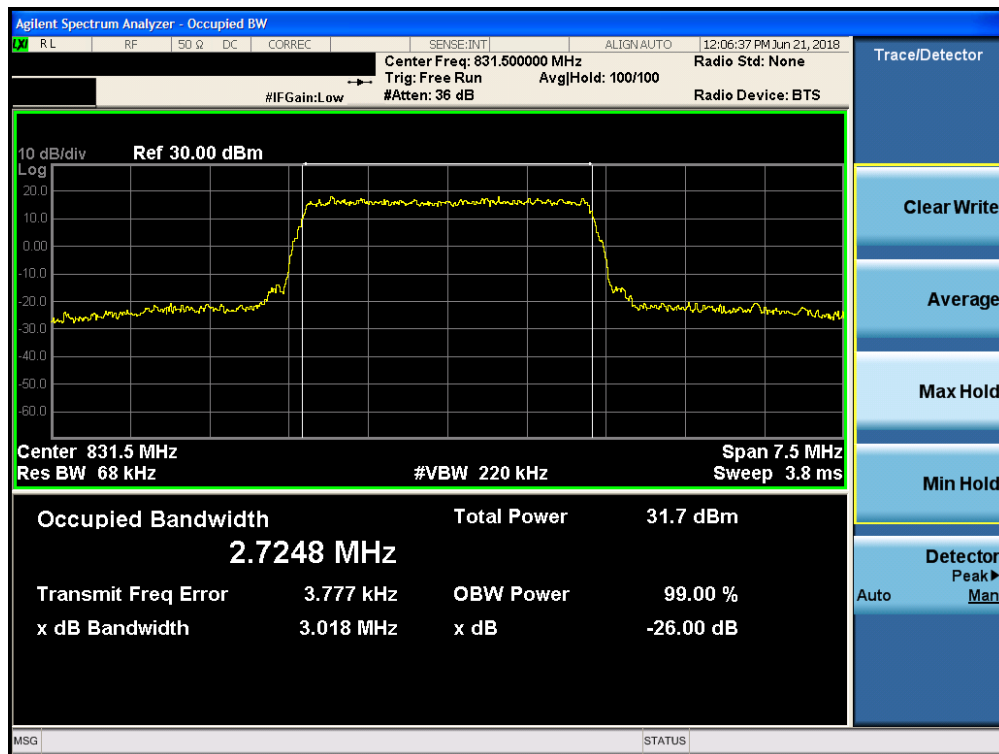


Plot 7-2. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 15 of 82

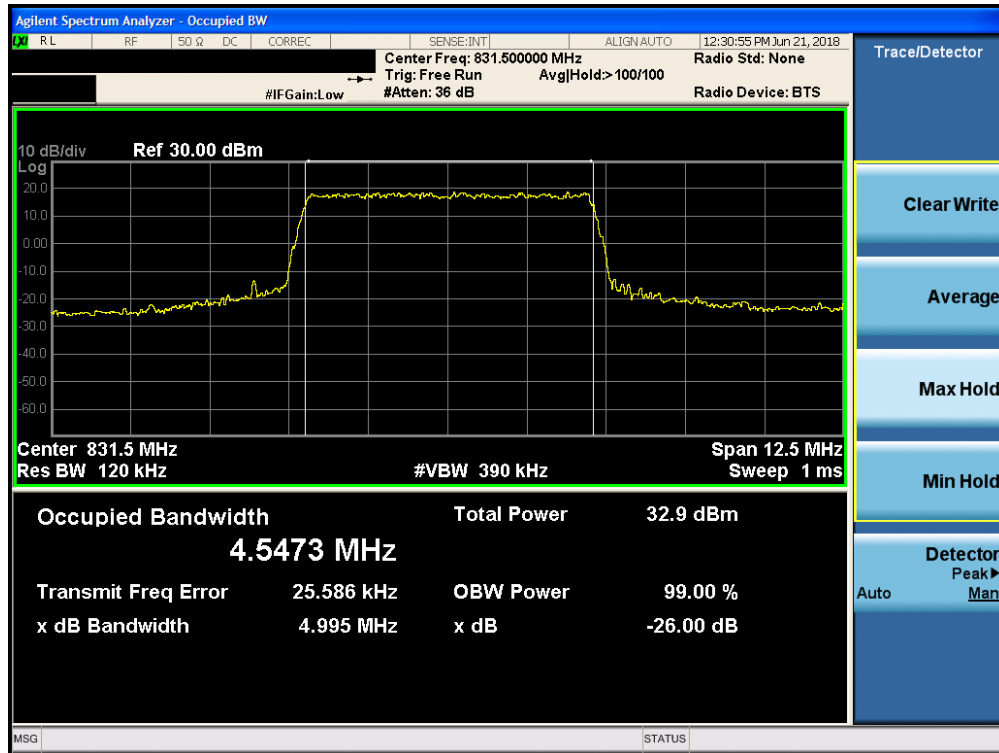


Plot 7-3. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

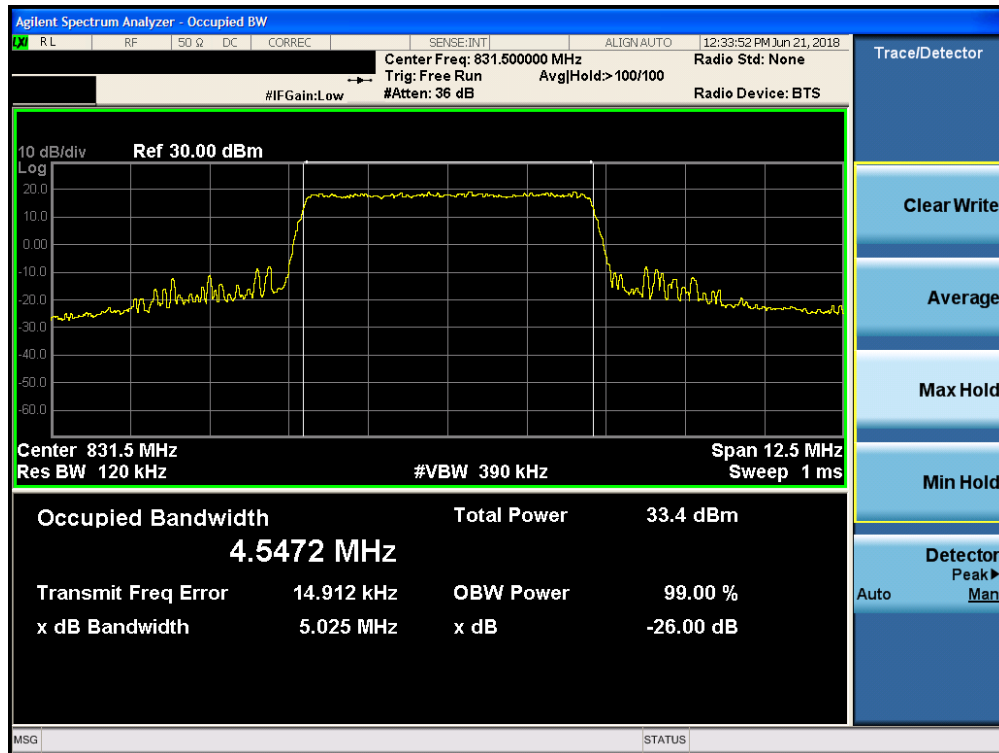


Plot 7-4. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 16 of 82

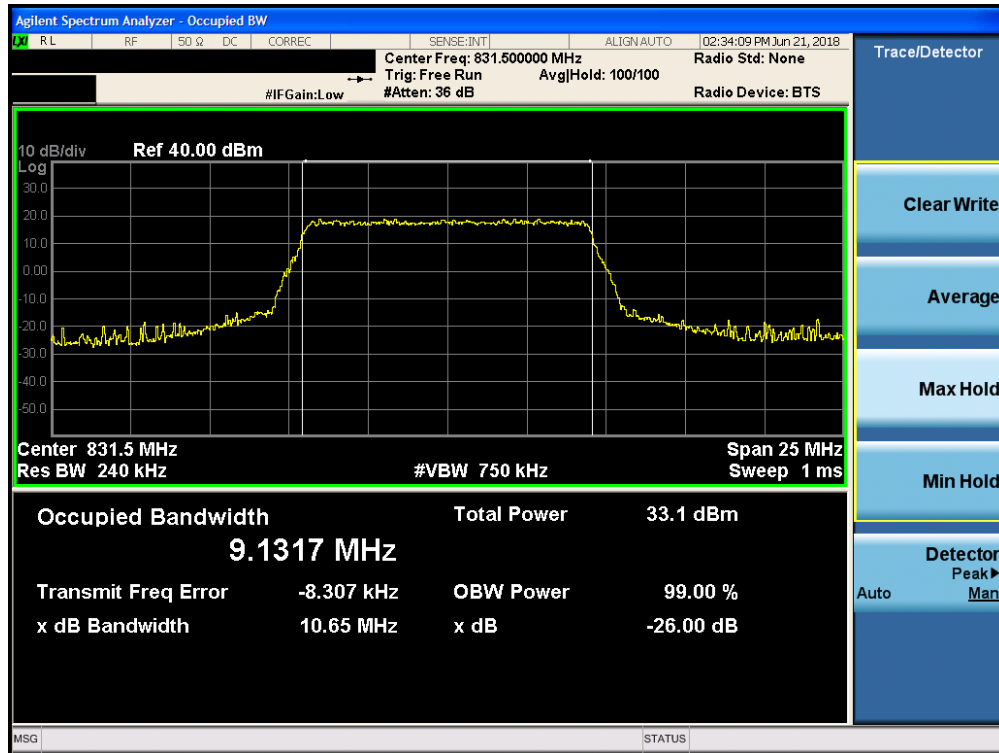


Plot 7-5. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

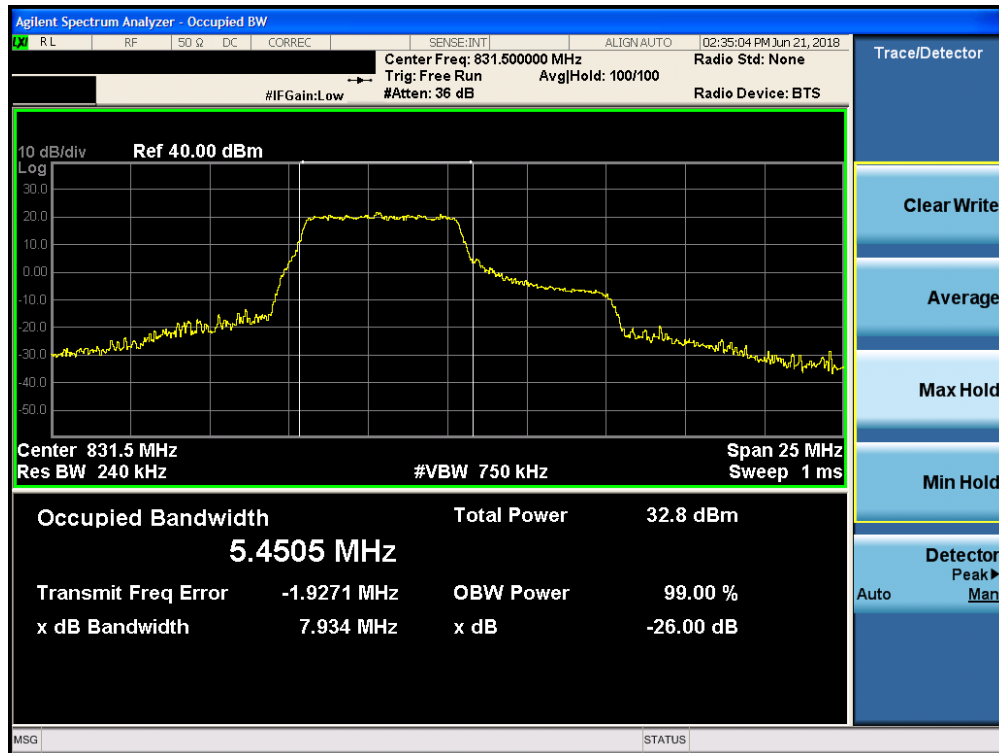


Plot 7-6. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 17 of 82



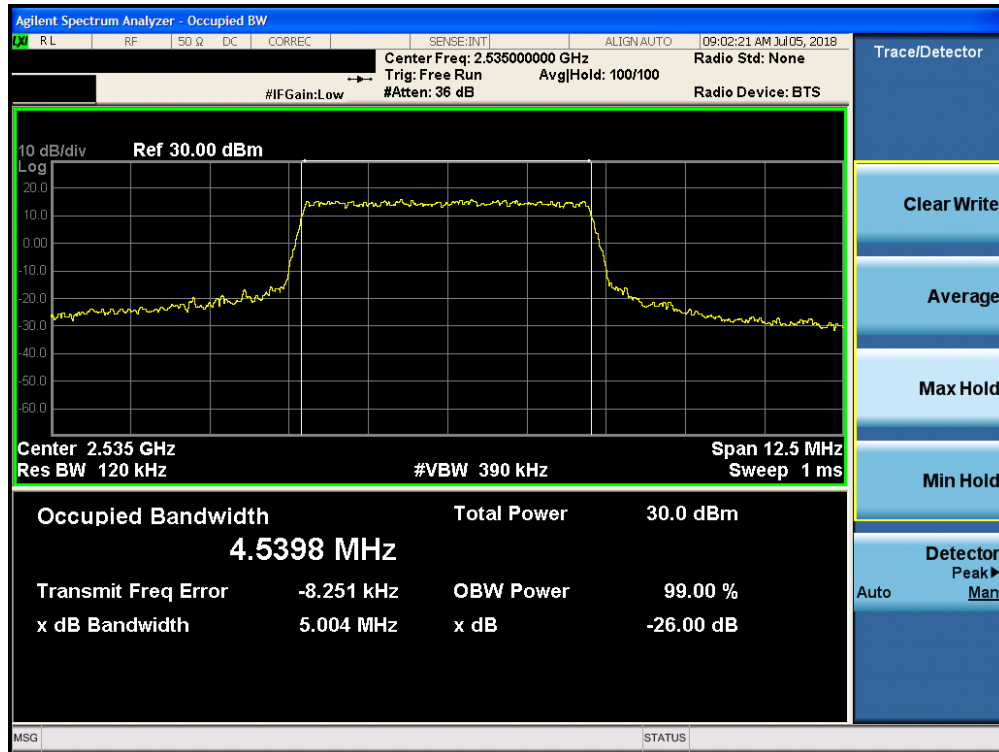
Plot 7-7. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



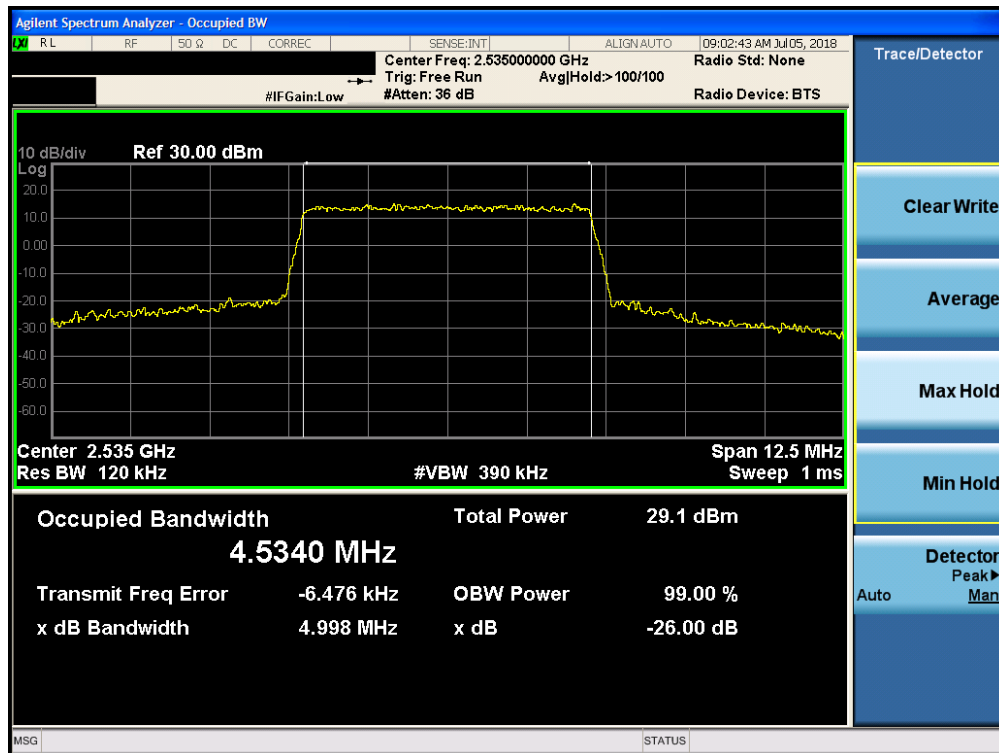
Plot 7-8. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 18 of 82

Band 7

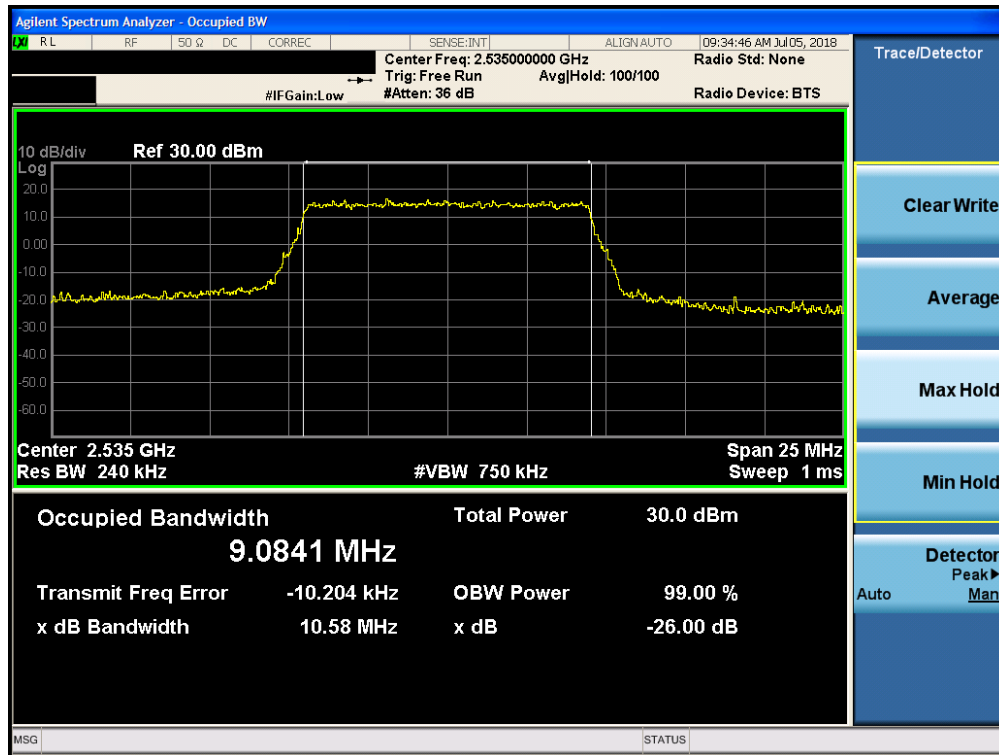


Plot 7-9. Occupied Bandwidth Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)

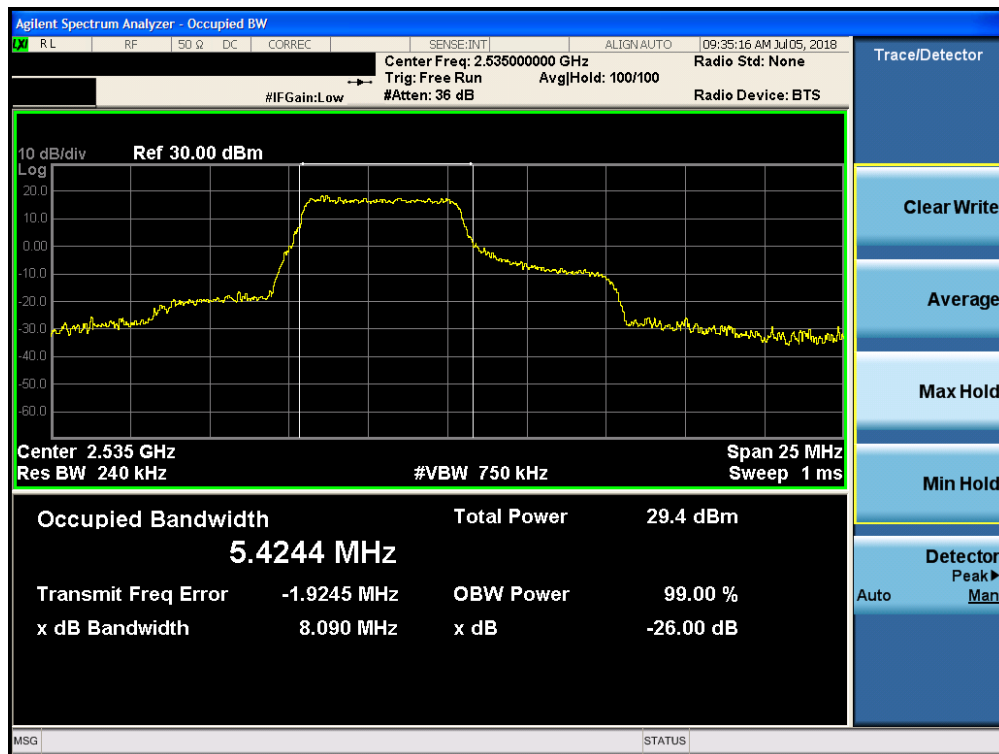


Plot 7-10. Occupied Bandwidth Plot (Band 7 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 19 of 82

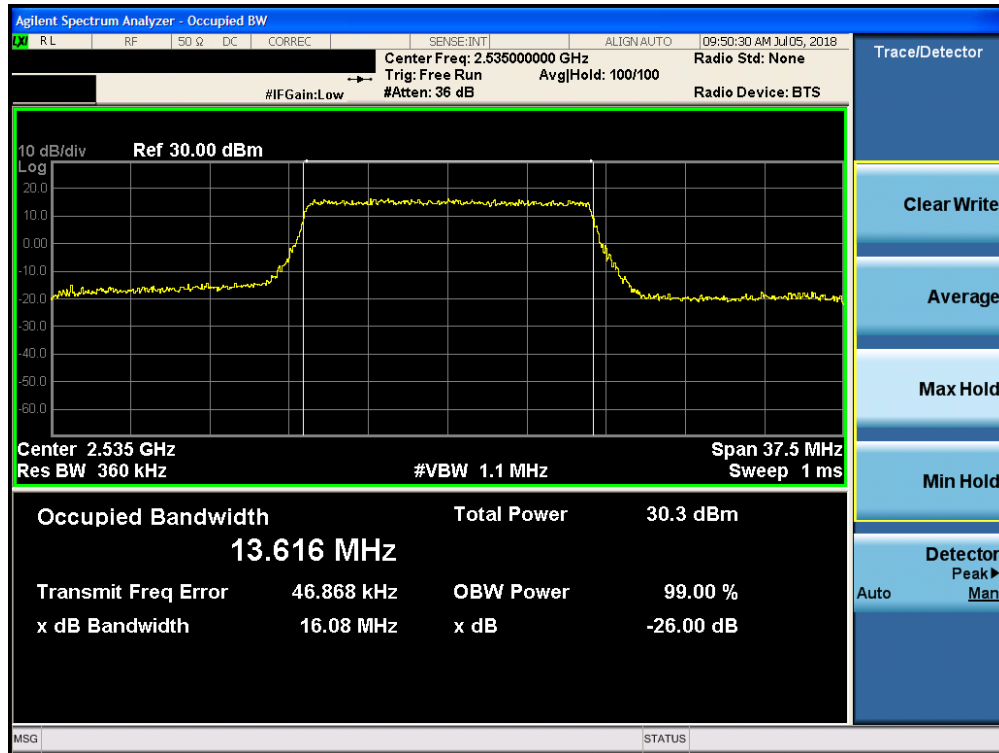


Plot 7-11. Occupied Bandwidth Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

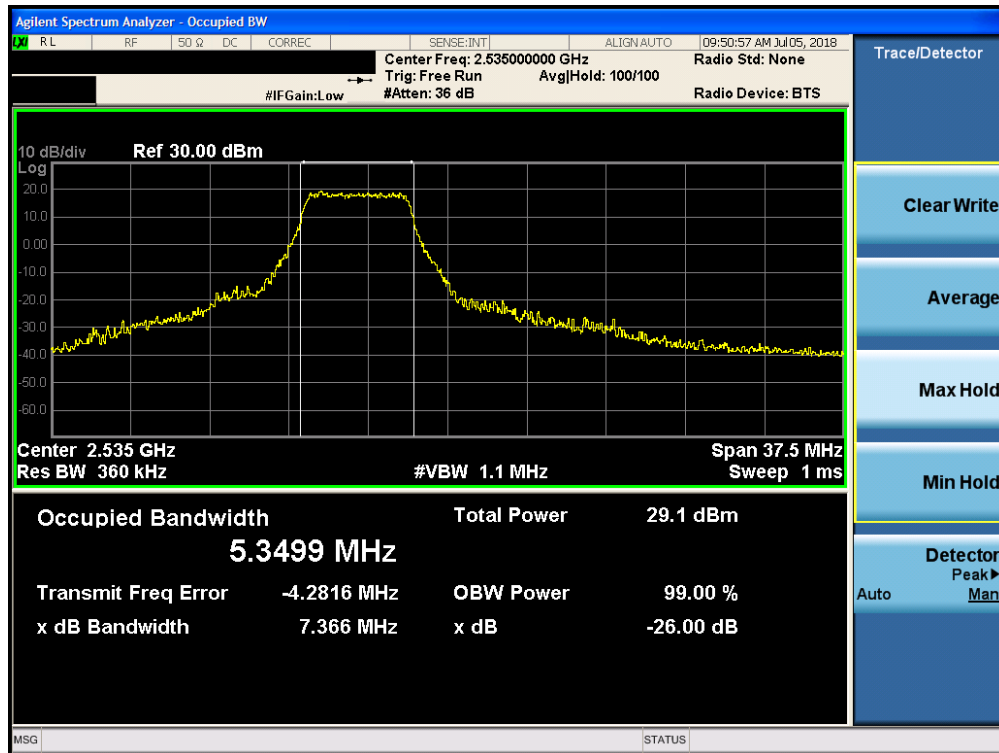


Plot 7-12. Occupied Bandwidth Plot (Band 7 - 10.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 20 of 82

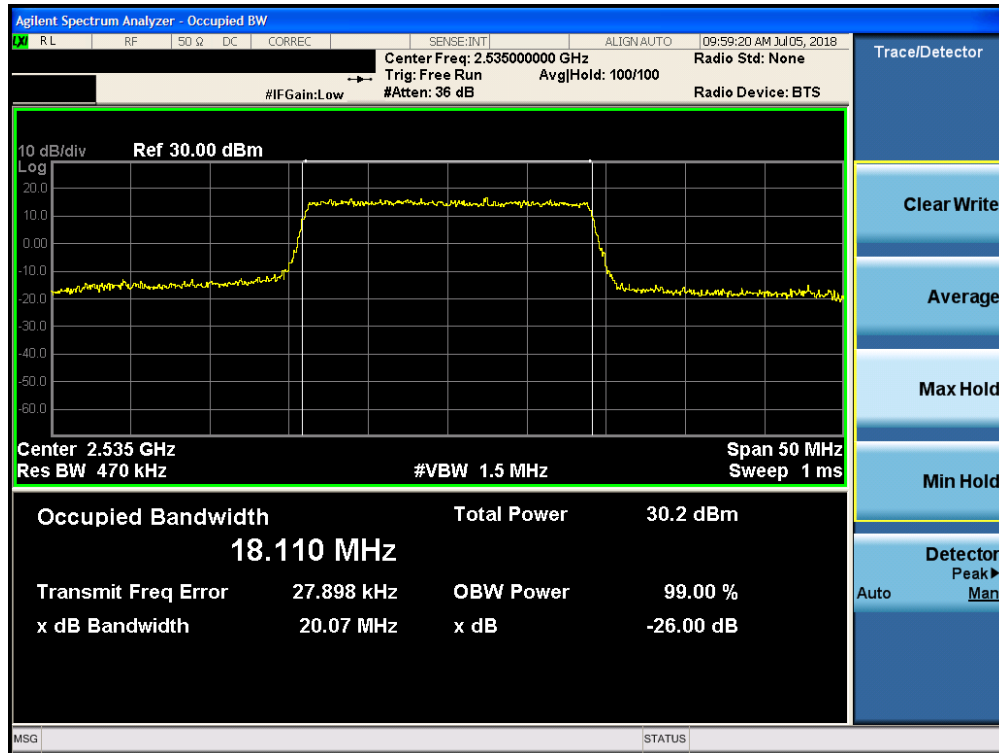


Plot 7-13. Occupied Bandwidth Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

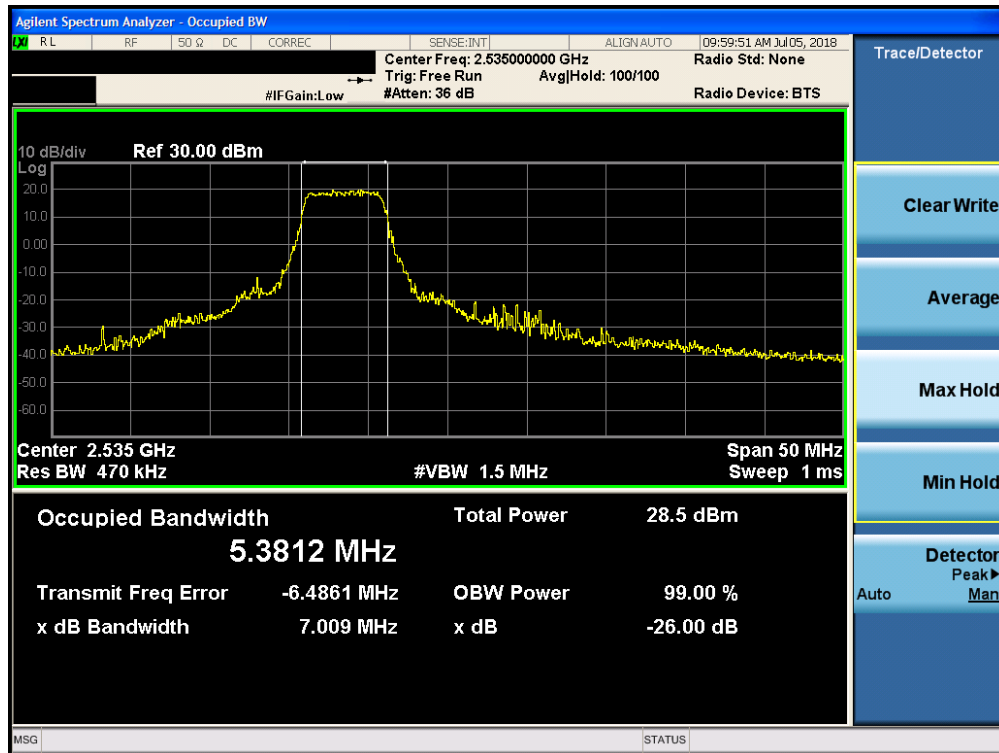


Plot 7-14. Occupied Bandwidth Plot (Band 7 - 15.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 21 of 82



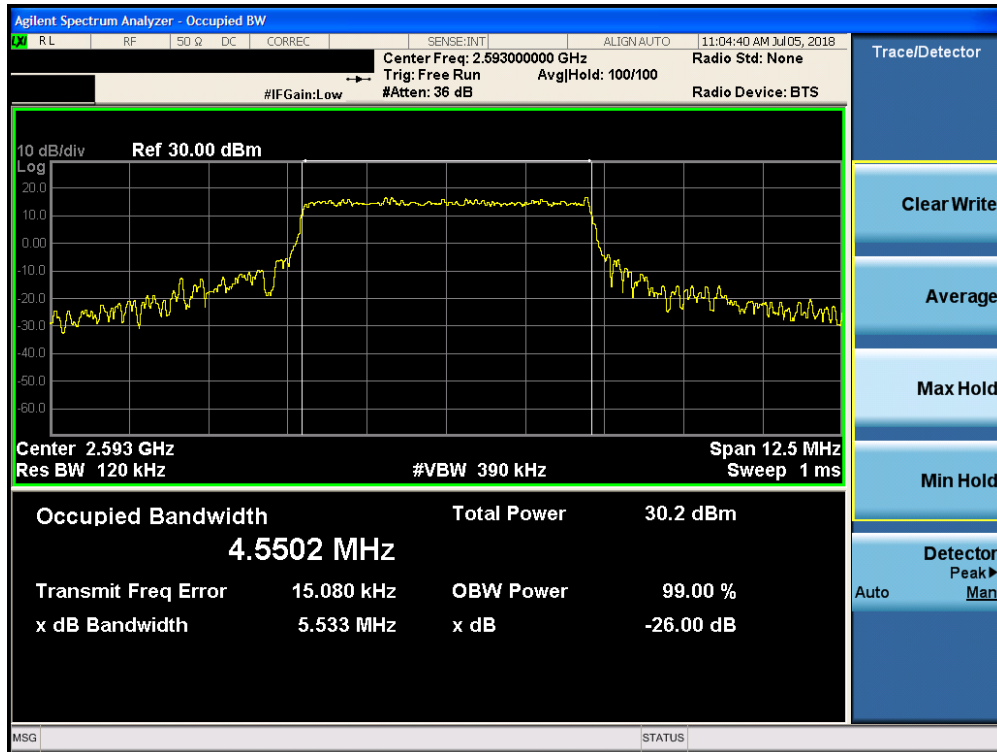
Plot 7-15. Occupied Bandwidth Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)



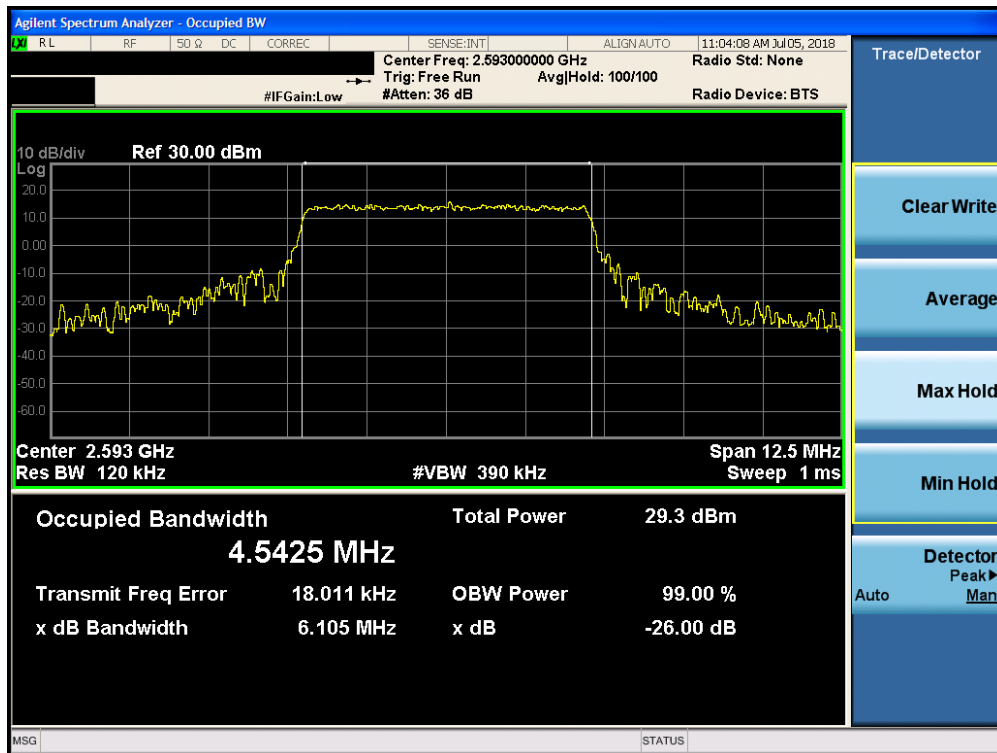
Plot 7-16. Occupied Bandwidth Plot (Band 7 - 20.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 22 of 82

Band 41

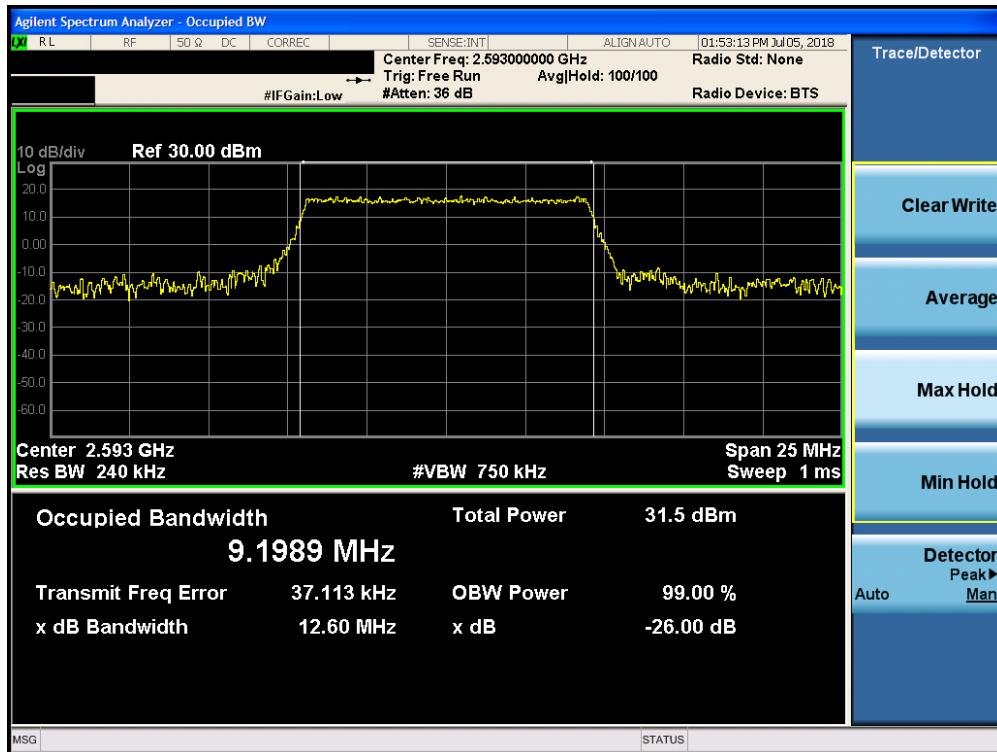


Plot 7-17. Occupied Bandwidth Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)

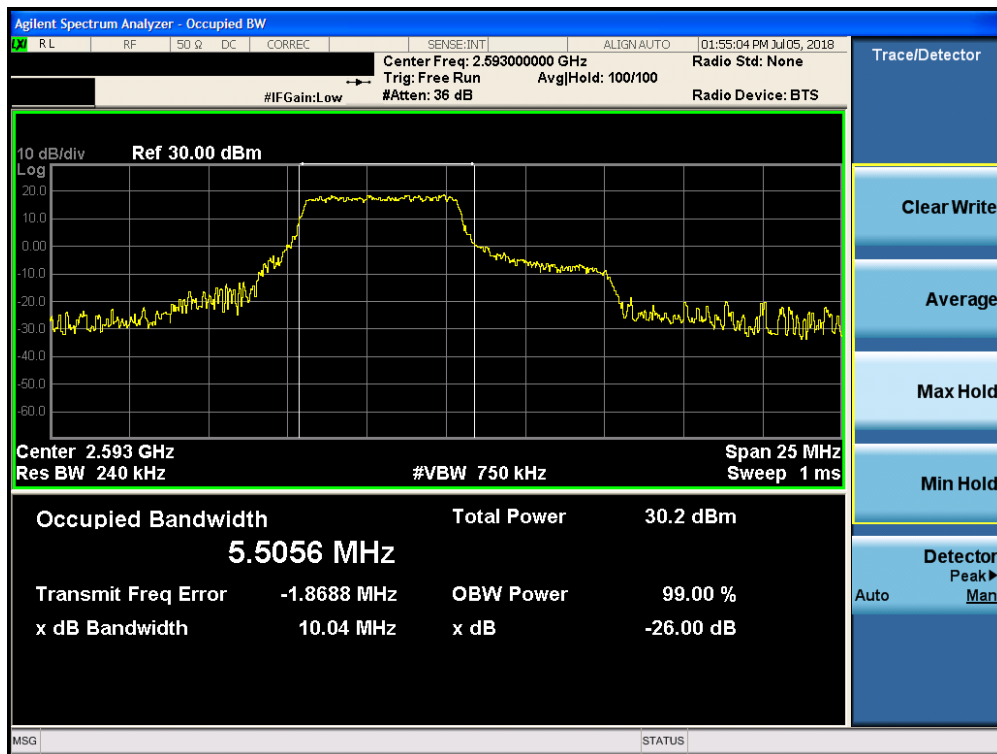


Plot 7-18. Occupied Bandwidth Plot (Band 41 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 23 of 82

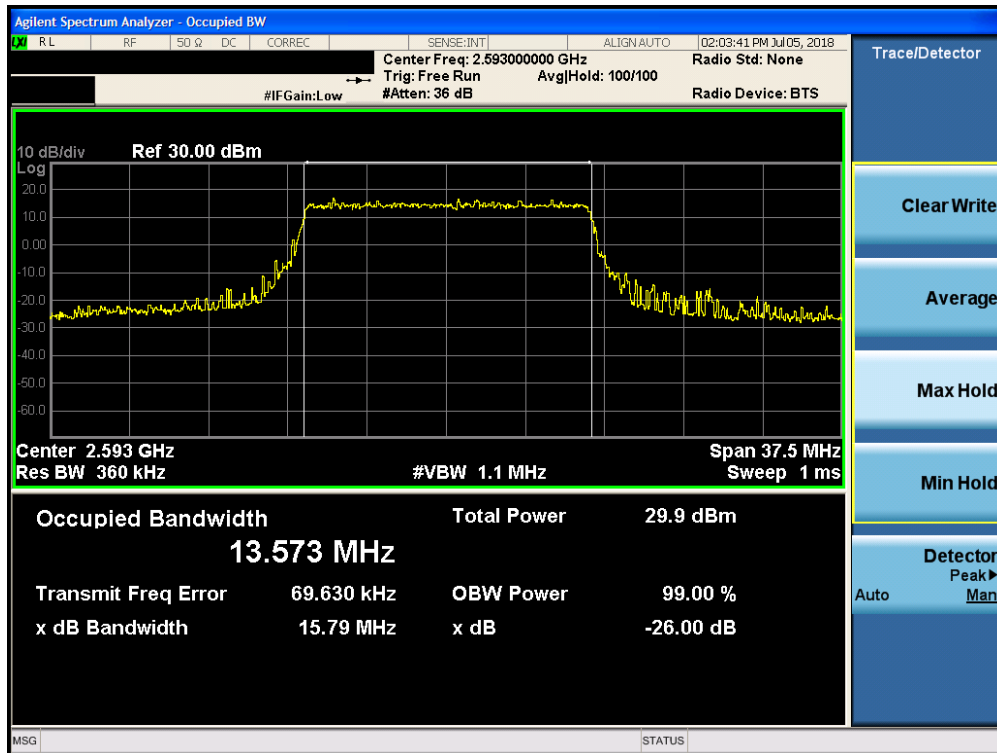


Plot 7-19. Occupied Bandwidth Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

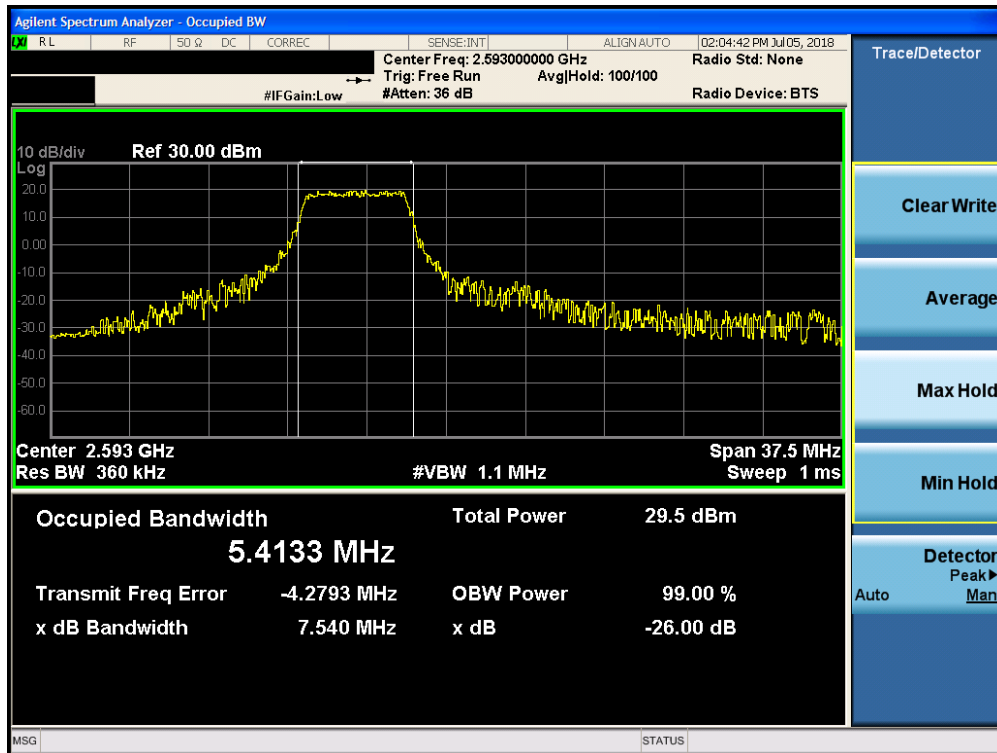


Plot 7-20. Occupied Bandwidth Plot (Band 41 - 10.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 24 of 82

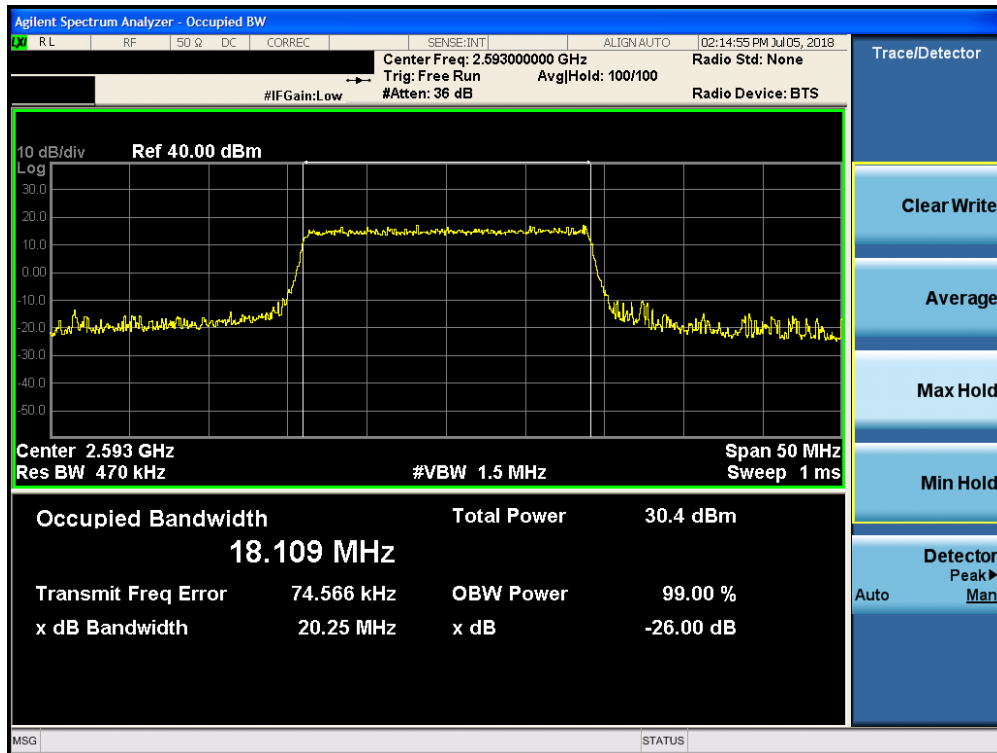


Plot 7-21. Occupied Bandwidth Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)

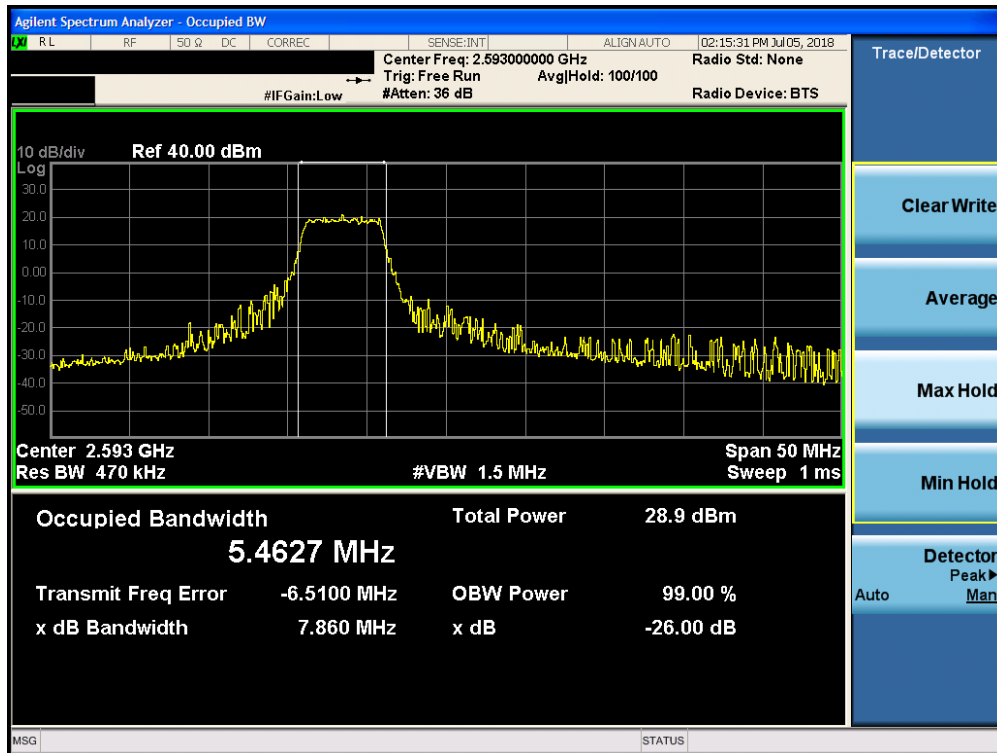


Plot 7-22. Occupied Bandwidth Plot (Band 41 - 15.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 25 of 82



Plot 7-23. Occupied Bandwidth Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-24. Occupied Bandwidth Plot (Band 41 - 20.0MHz 16-QAM - RB Size 27, RB Offset 0 Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 26 of 82

7.3 Spurious and Harmonic Emissions at Antenna Terminal

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 10th 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 its maximum duty cycle, 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.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{\text{Watts}})$, where P is the transmitter power in Watts.

For Band 7 and 41, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P_{\text{Watts}})$.

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 at least 10 * the fundamental frequency (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.

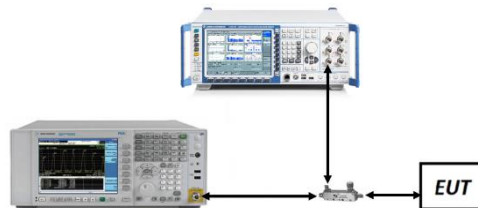


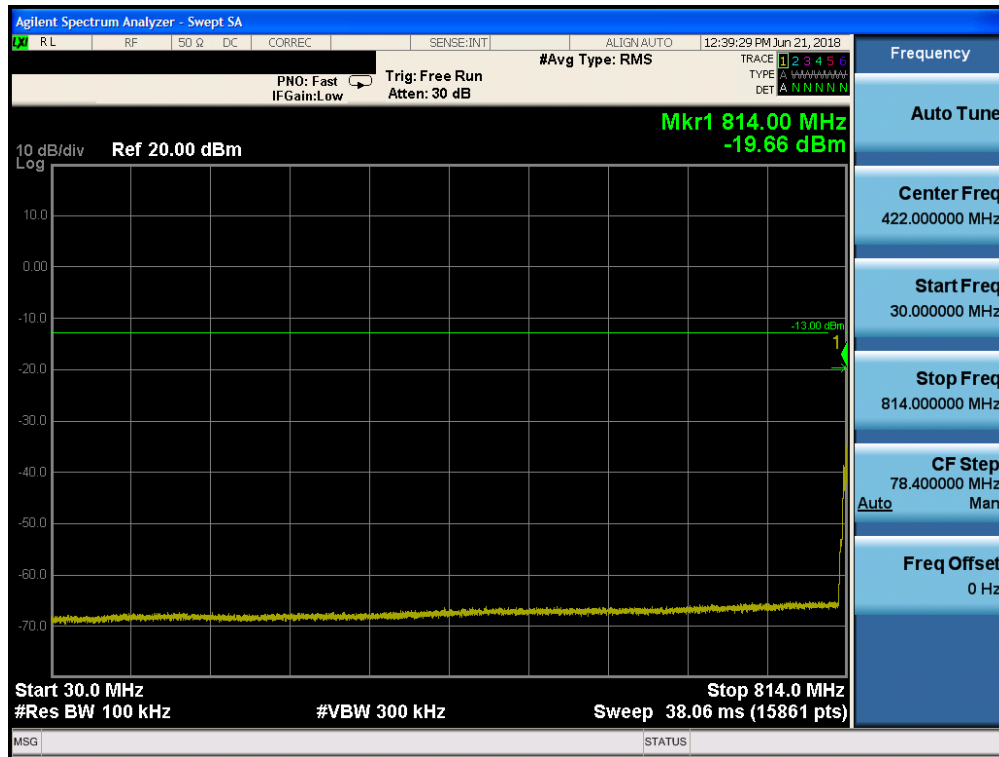
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

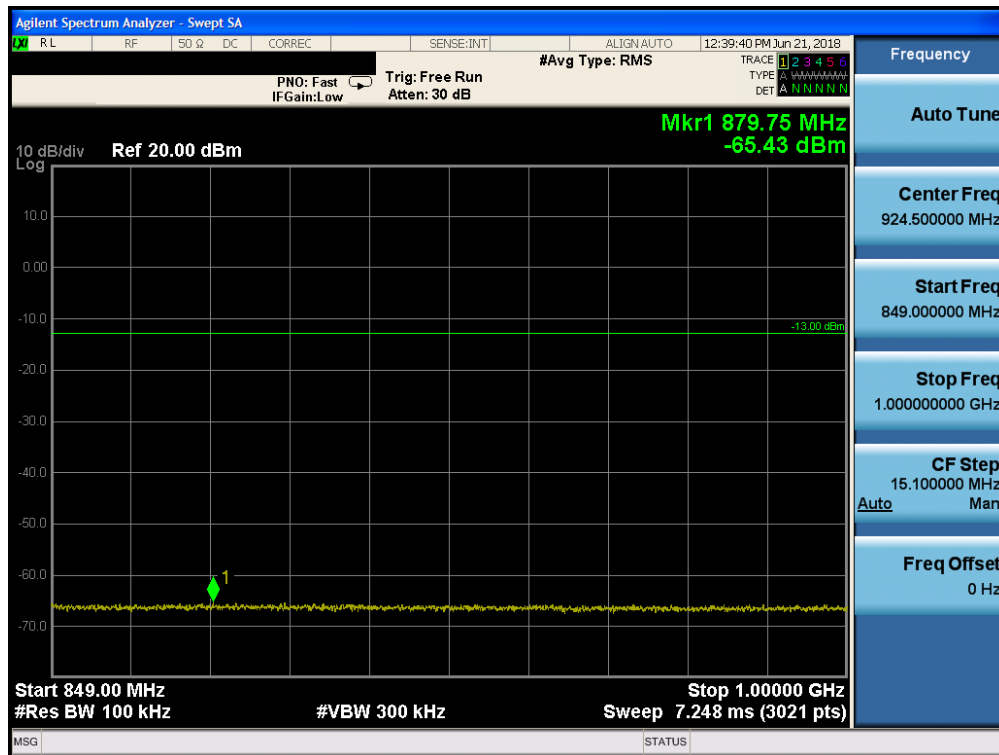
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the 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-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 27 of 82

Band 26/5

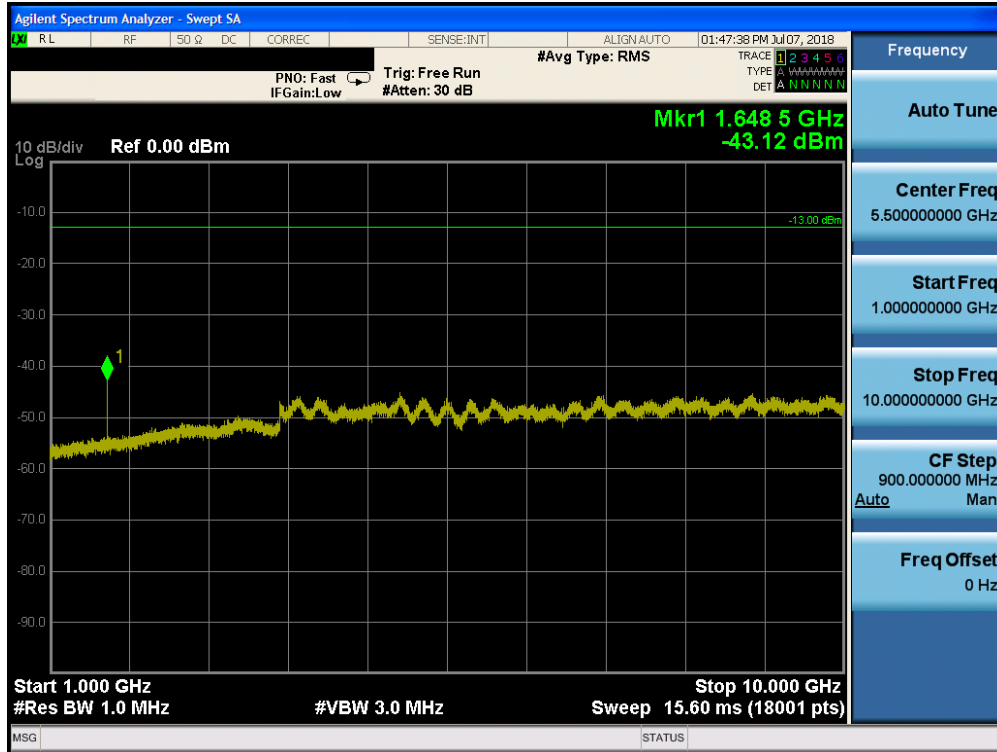


Plot 7-25. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

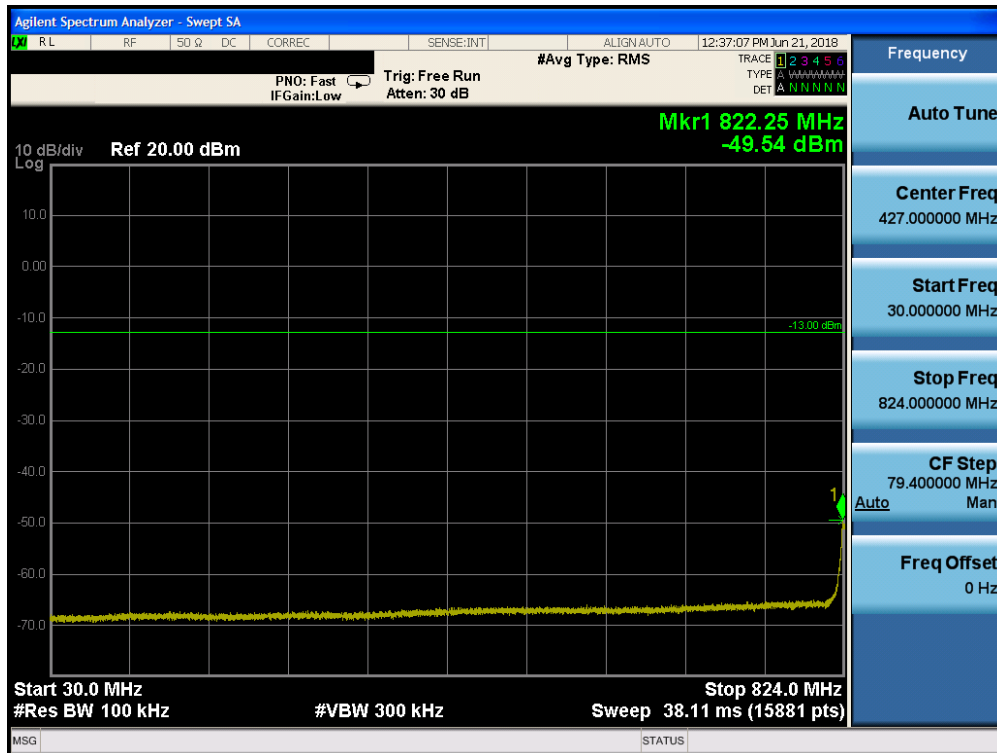


Plot 7-26. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 28 of 82

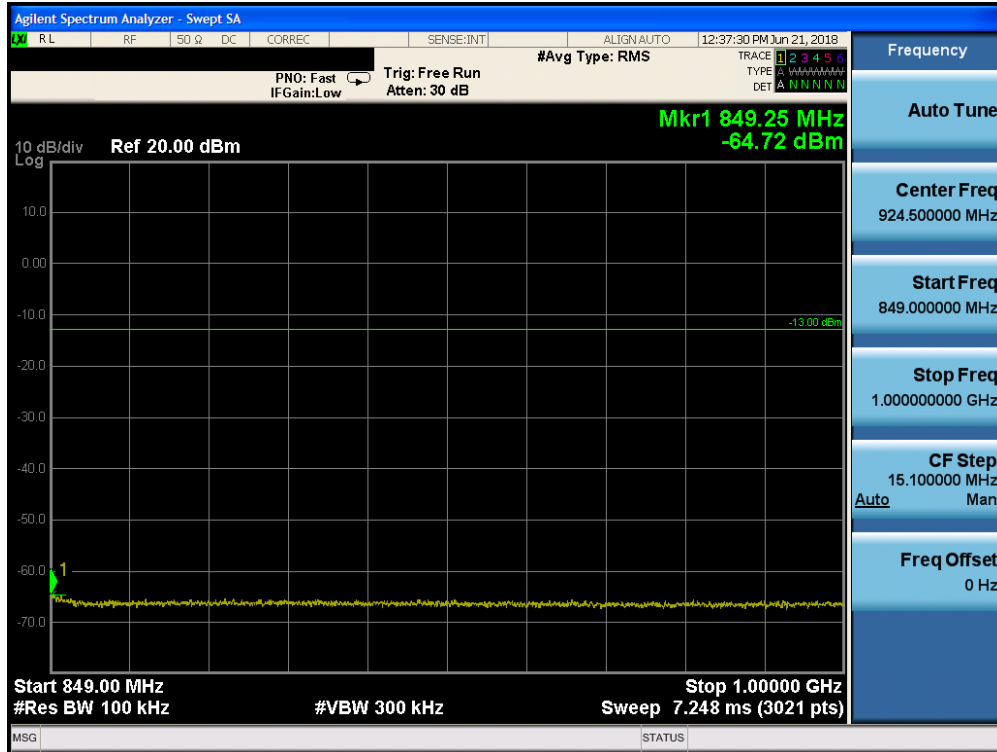


Plot 7-27. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

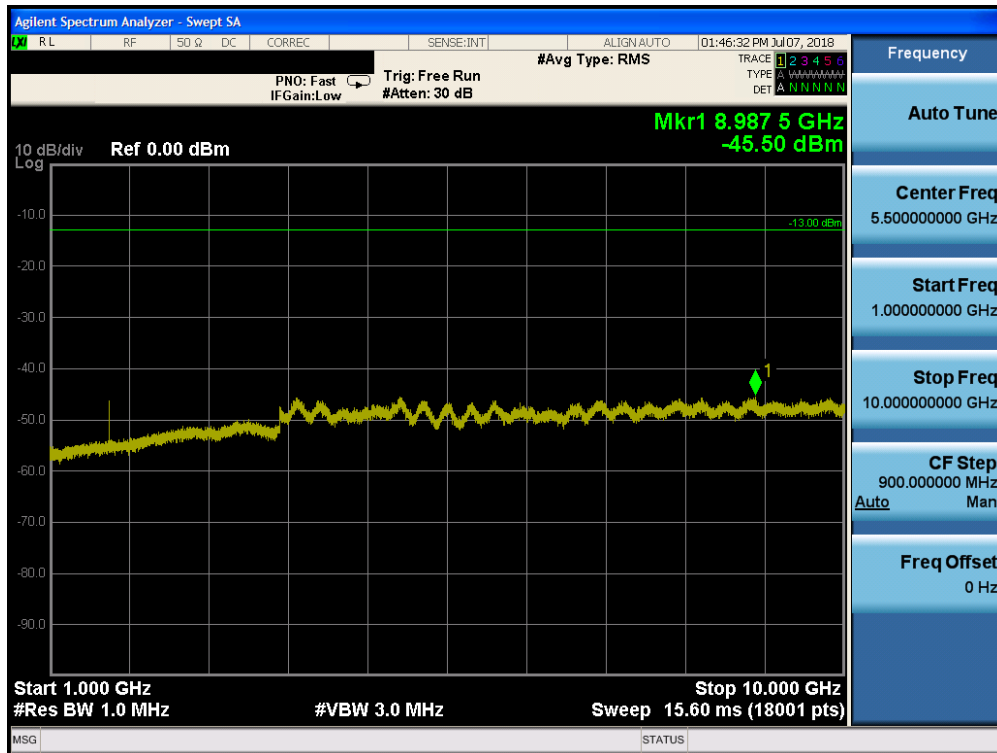


Plot 7-28. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 29 of 82

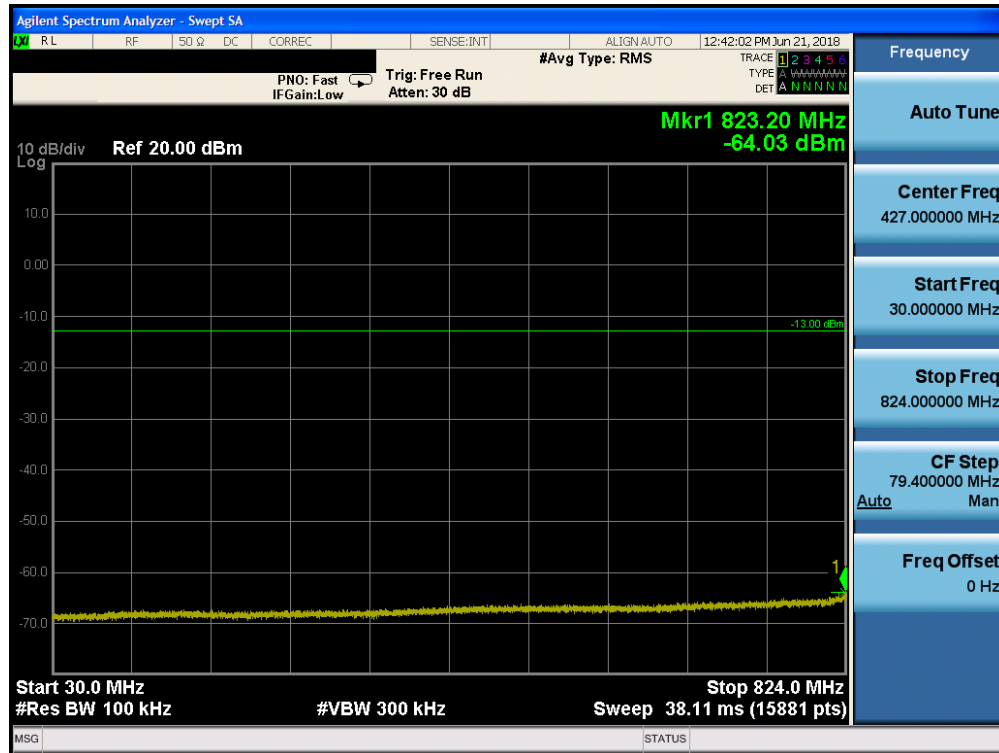


Plot 7-29. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

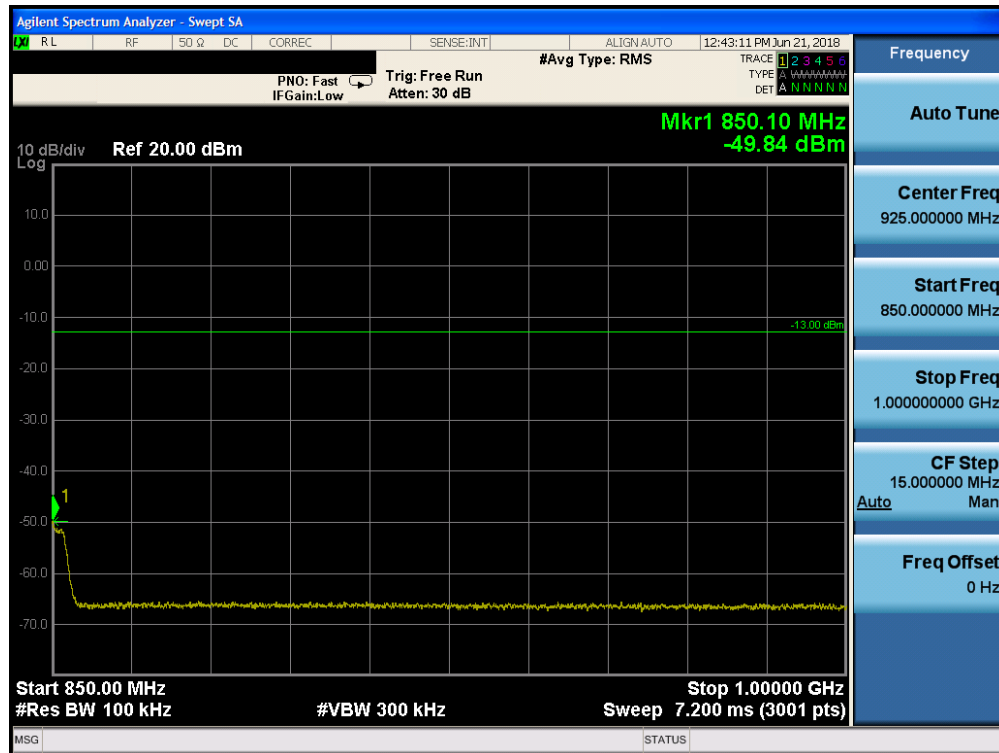


Plot 7-30. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 30 of 82

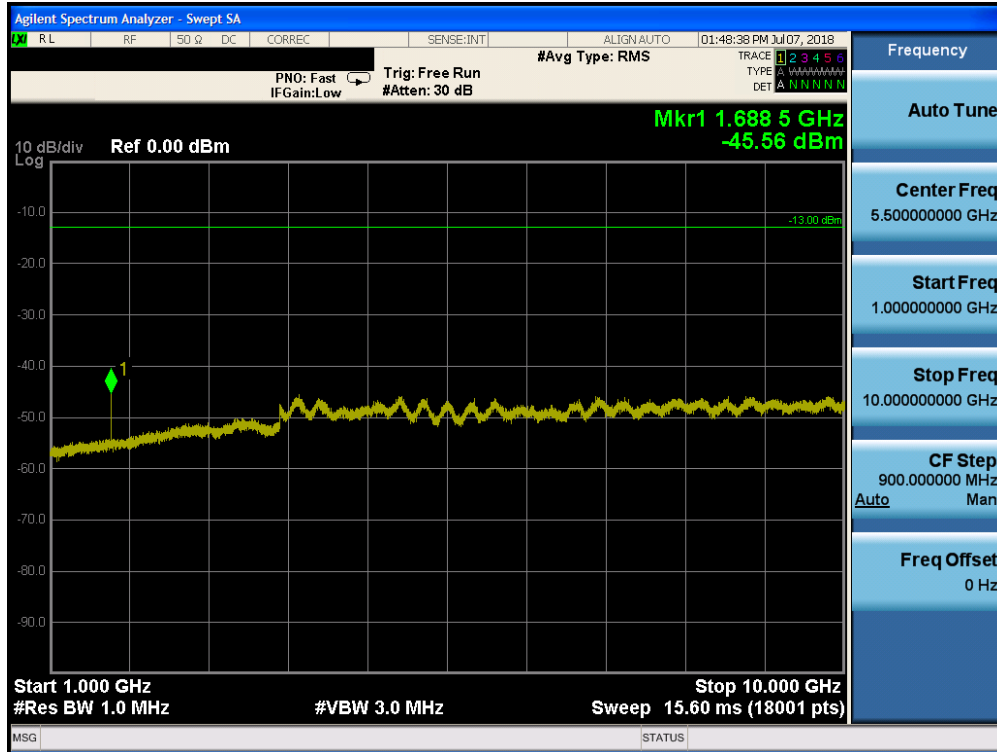


Plot 7-31. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

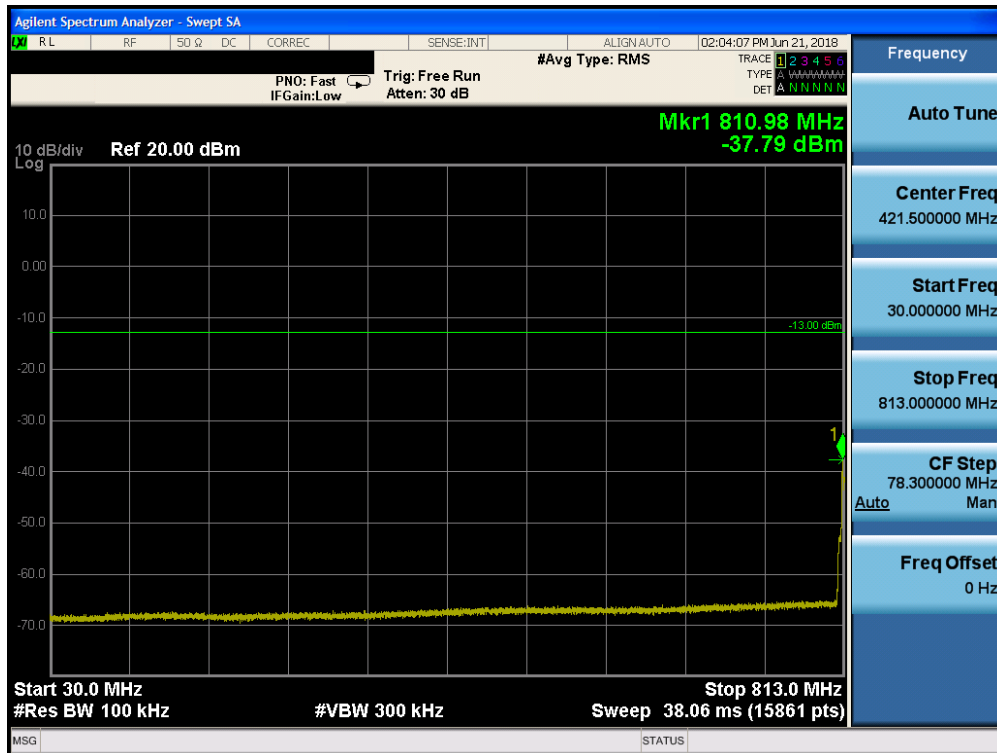


Plot 7-32. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 31 of 82

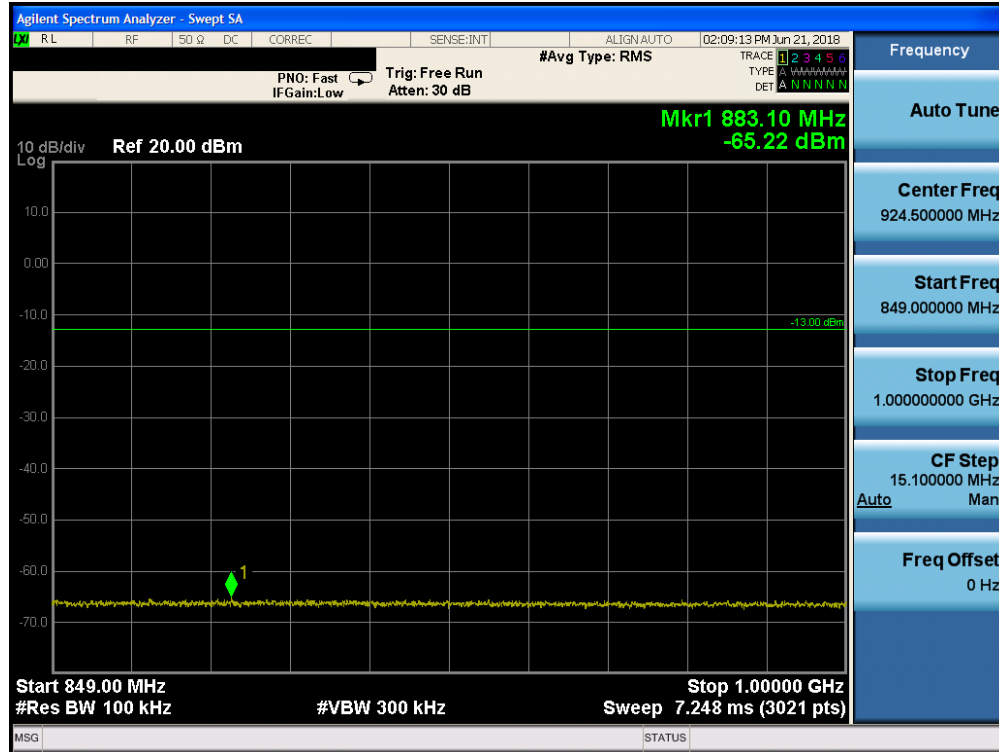


Plot 7-33. Conducted Spurious Plot (Band 26/5 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

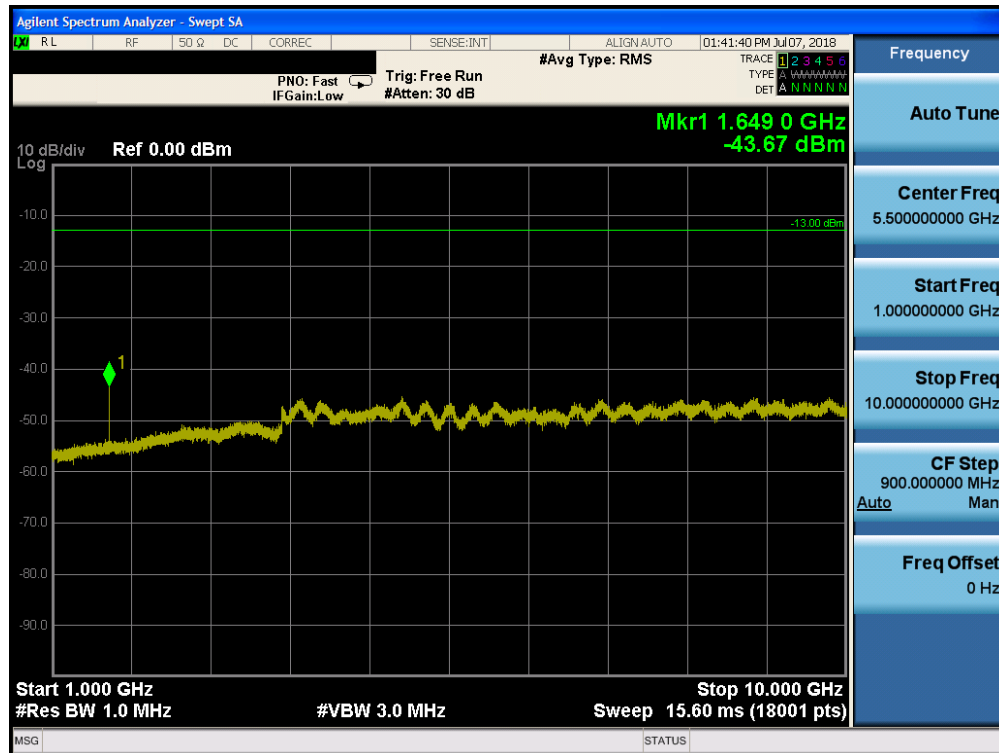


Plot 7-34. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 32 of 82

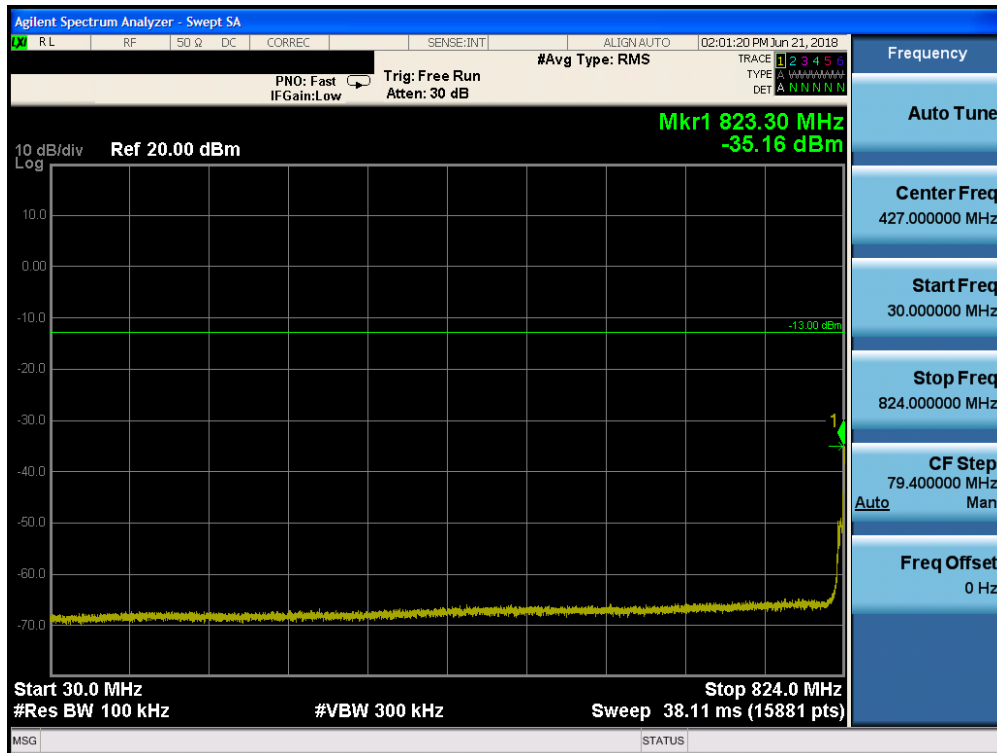


Plot 7-35. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

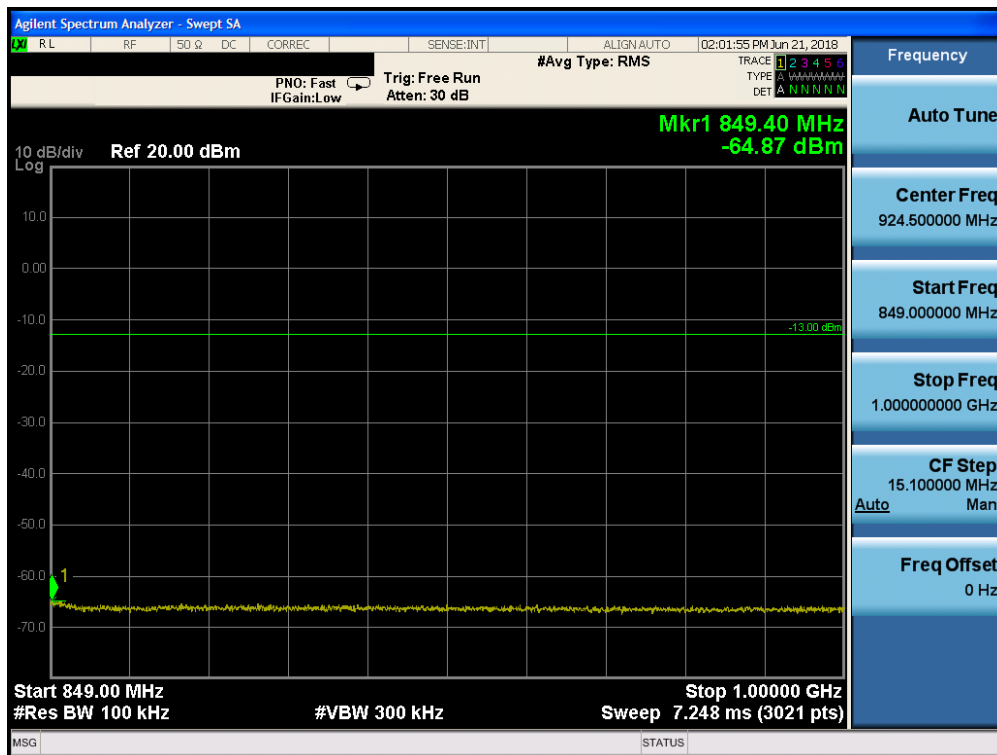


Plot 7-36. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 33 of 82

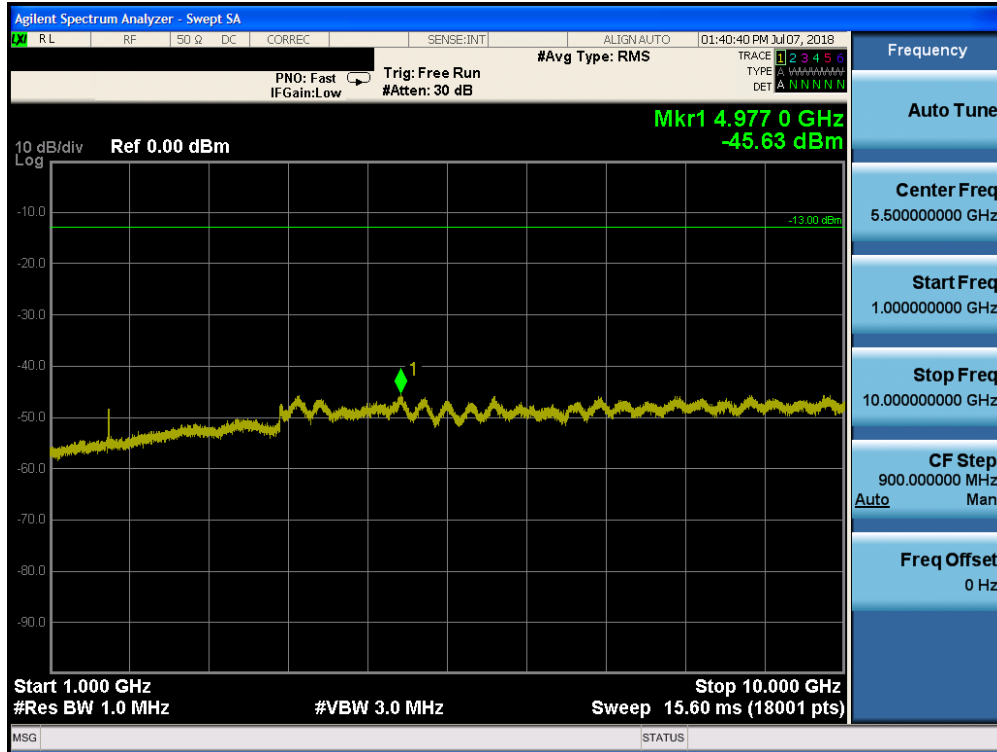


Plot 7-37. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

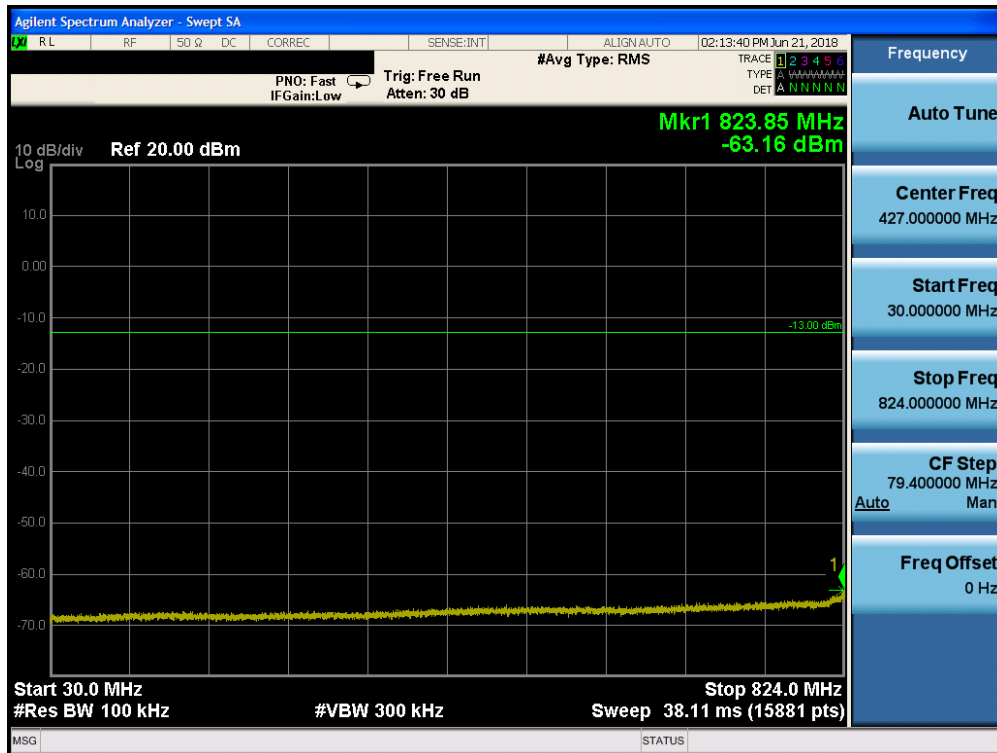


Plot 7-38. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 34 of 82

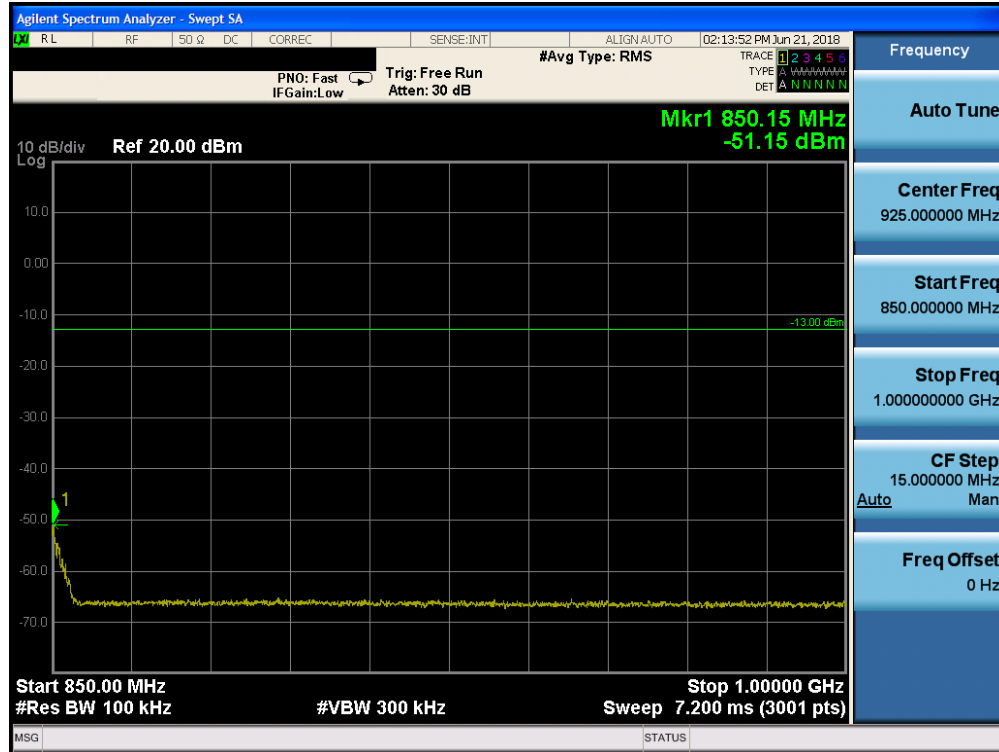


Plot 7-39. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

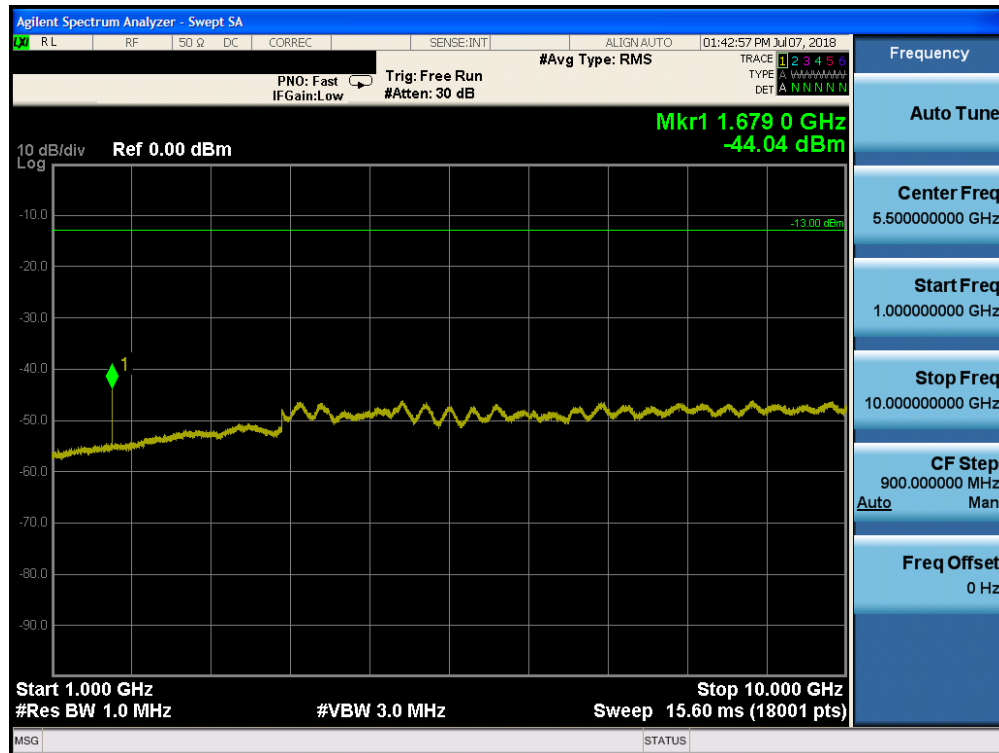


Plot 7-40. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 35 of 82



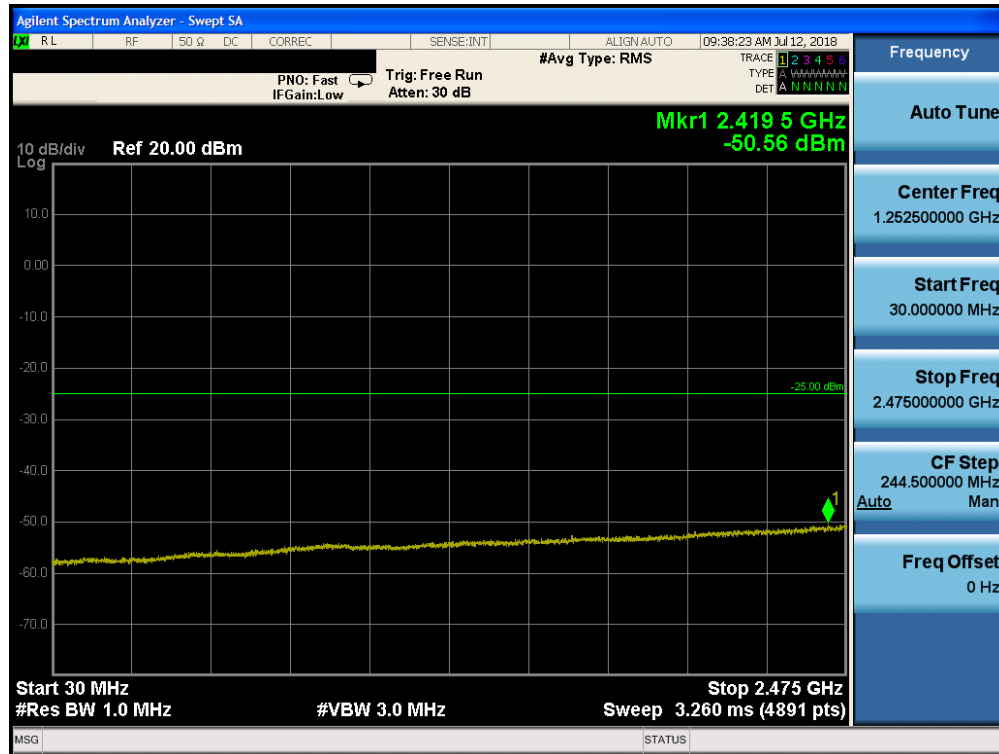
Plot 7-41. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



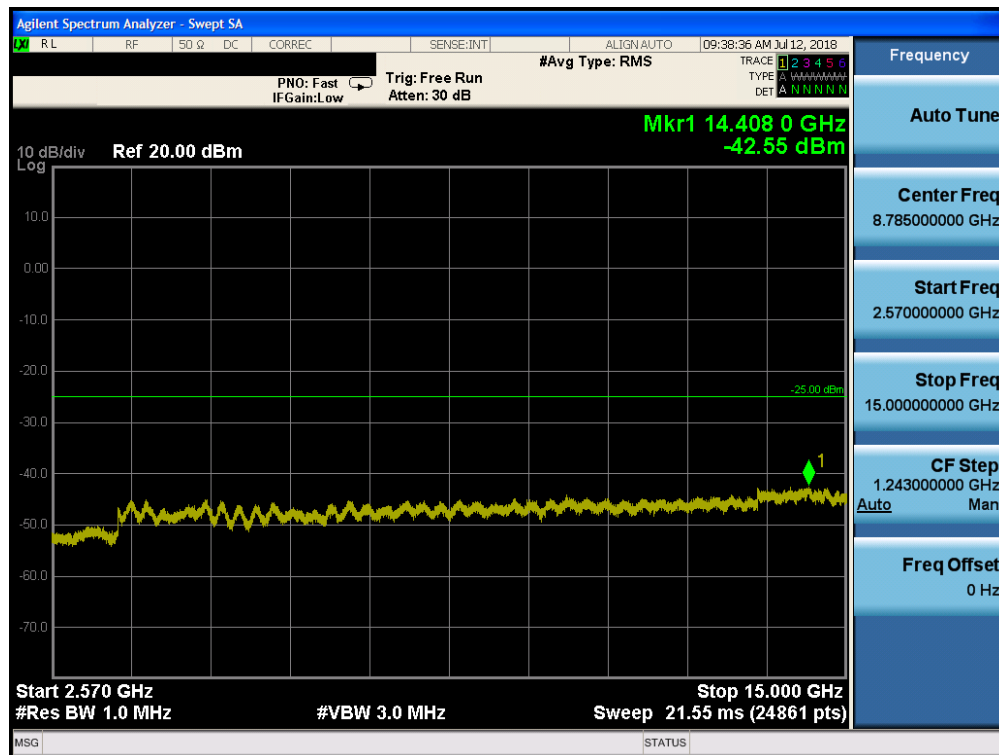
Plot 7-42. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 36 of 82

Band 7

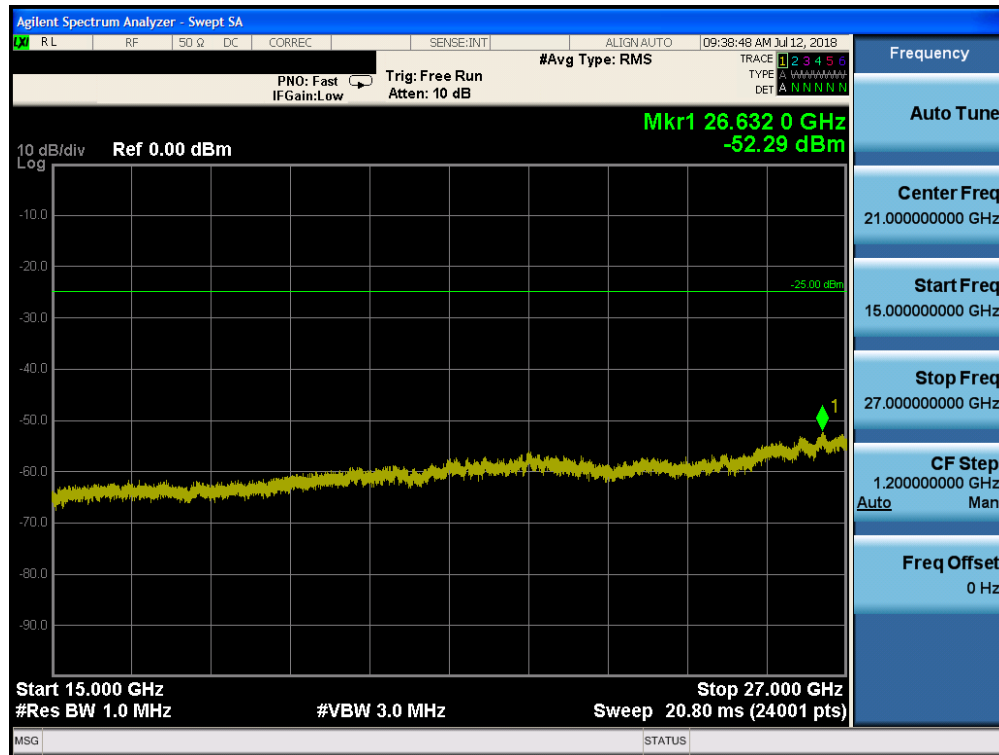


Plot 7-43. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

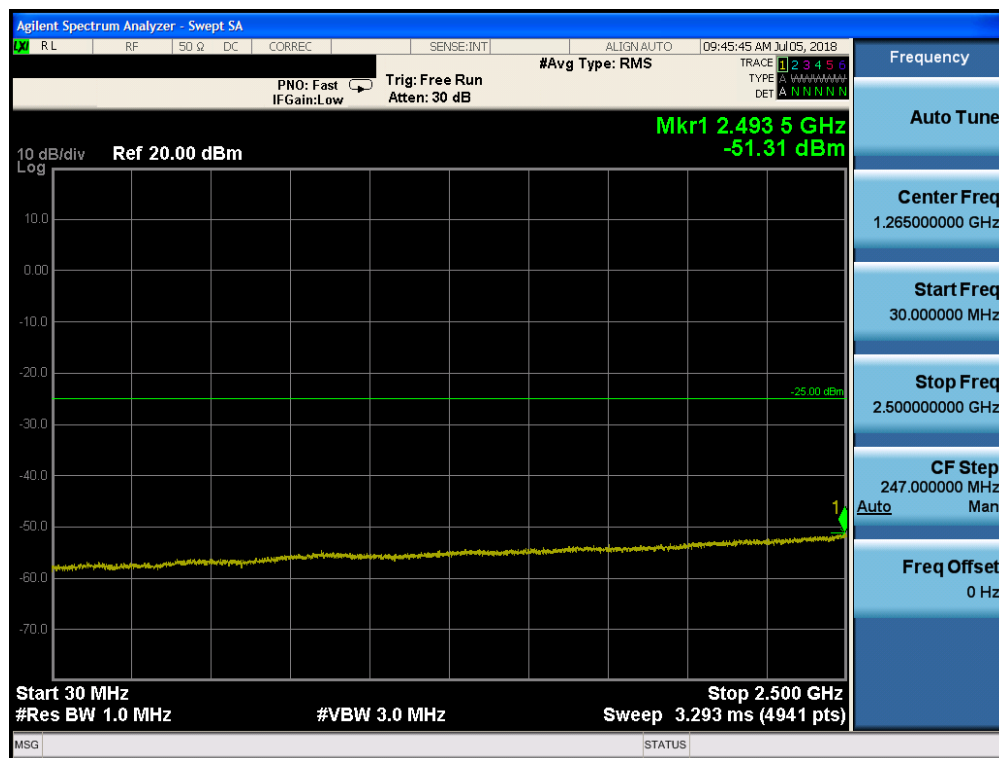


Plot 7-44. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 37 of 82

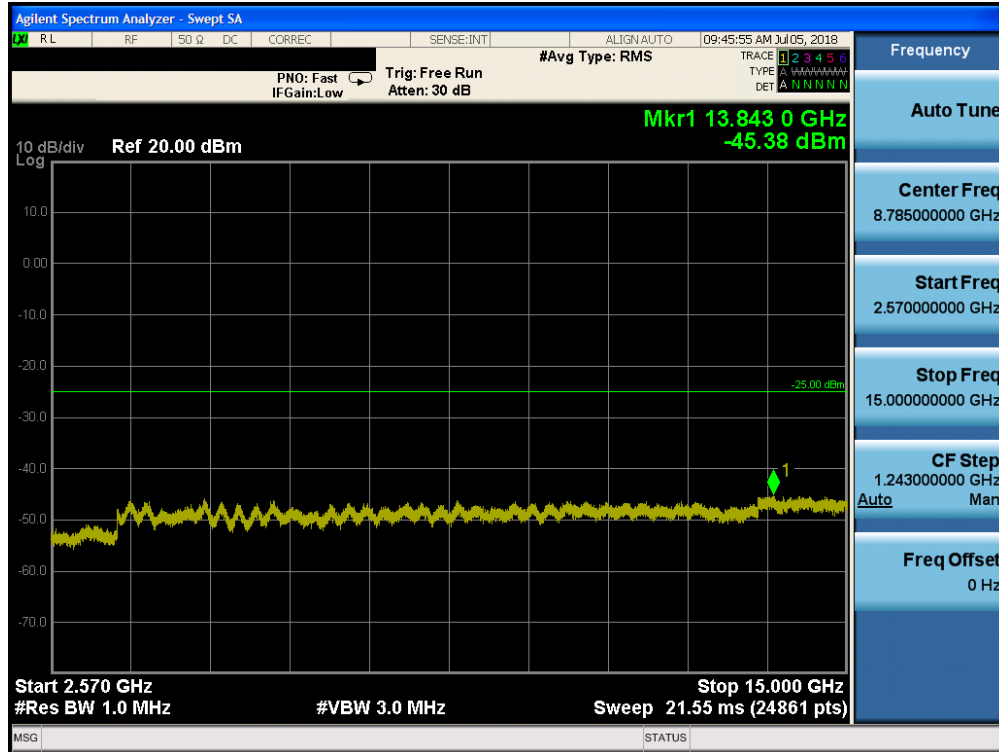


Plot 7-45. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

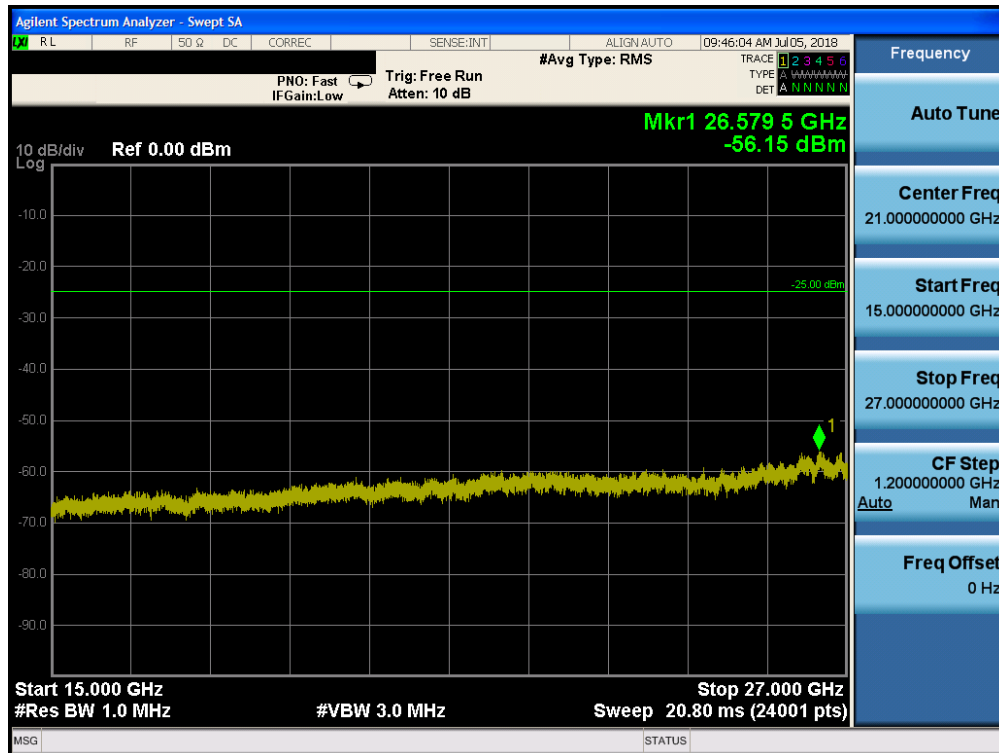


Plot 7-46. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 38 of 82

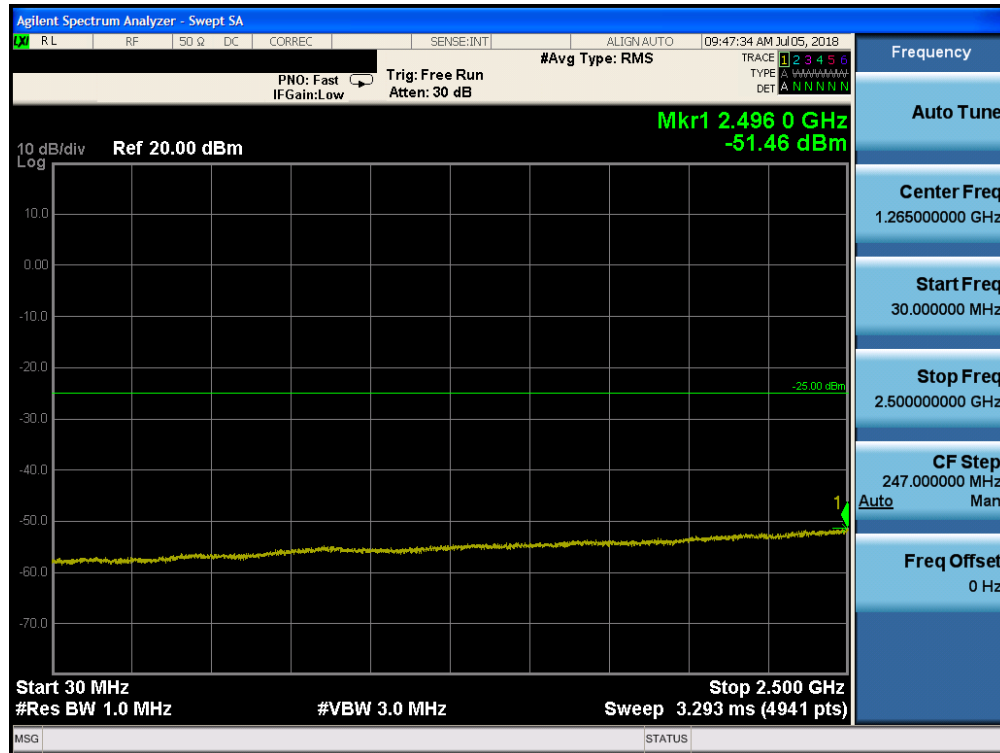


Plot 7-47. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

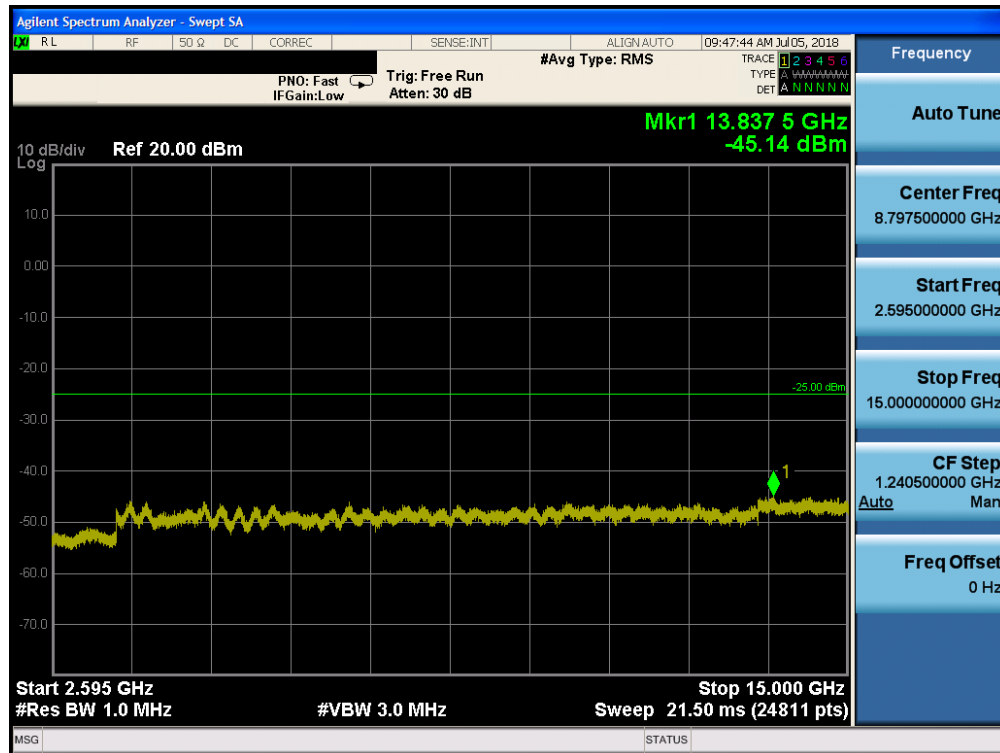


Plot 7-48. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 39 of 82

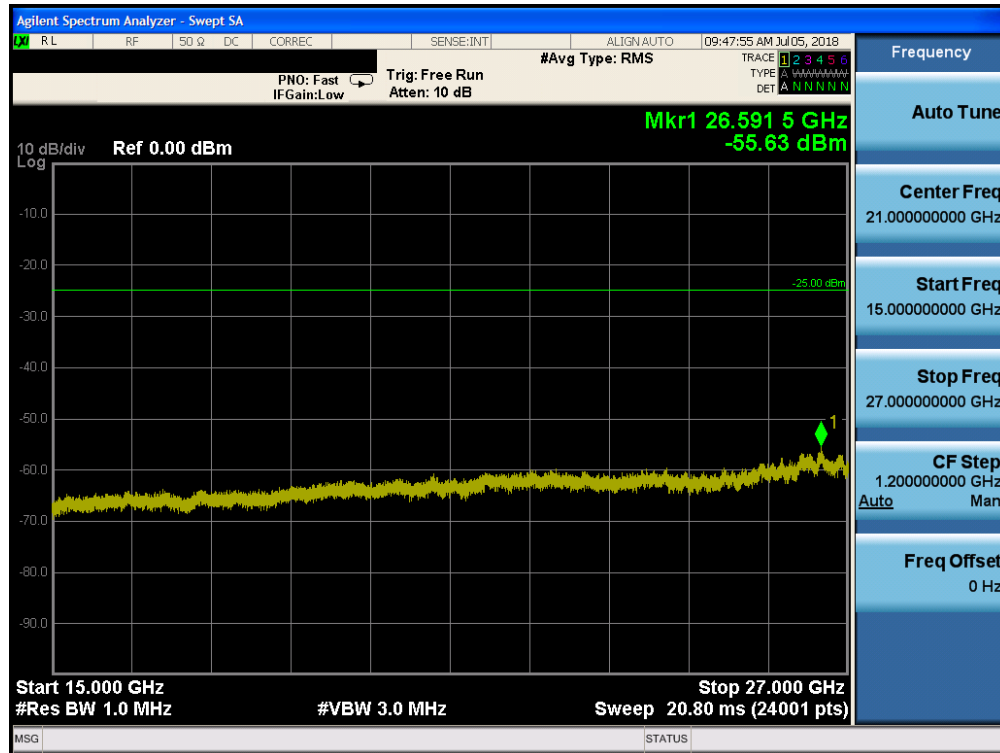


Plot 7-49. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-50. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

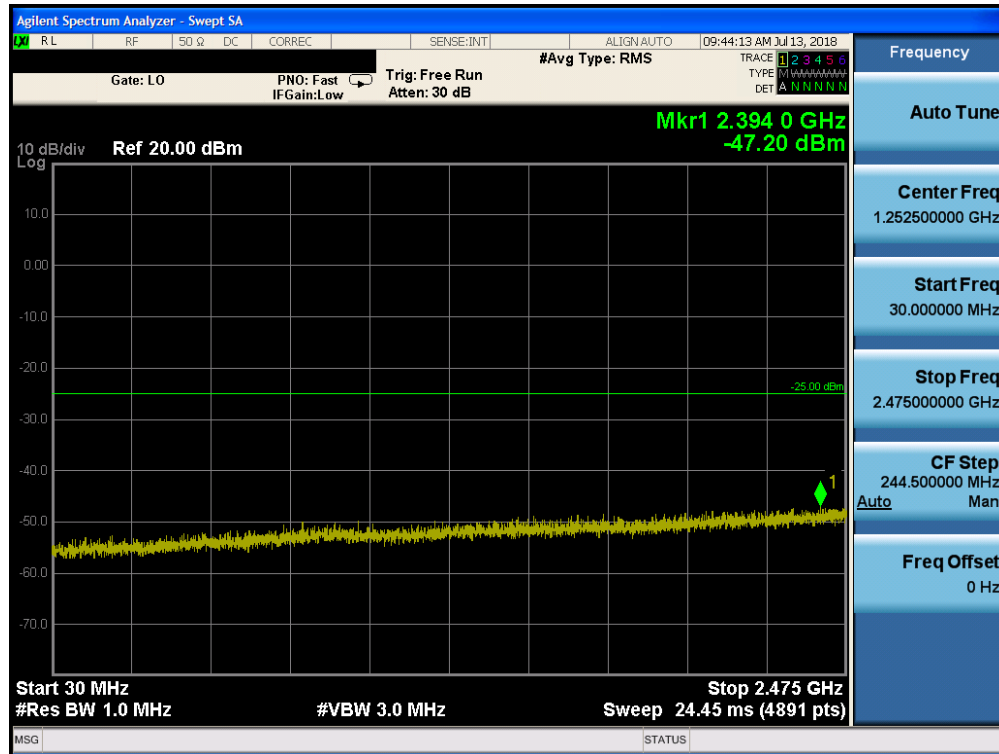
FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 40 of 82



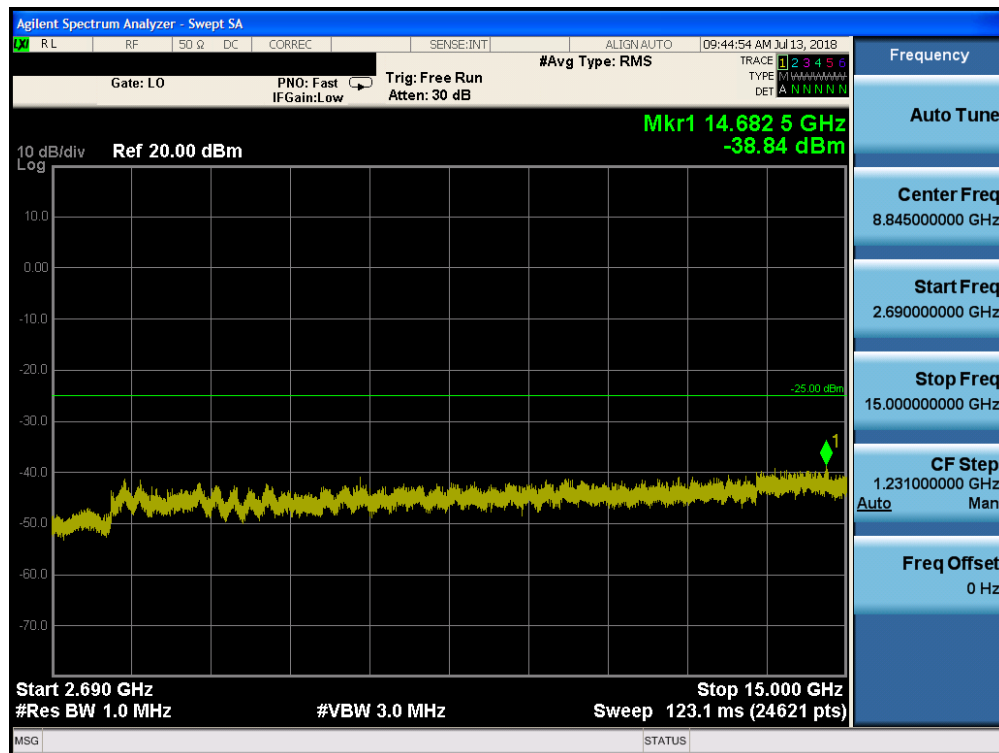
Plot 7-51. Conducted Spurious Plot (Band 7 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 41 of 82

Band 41

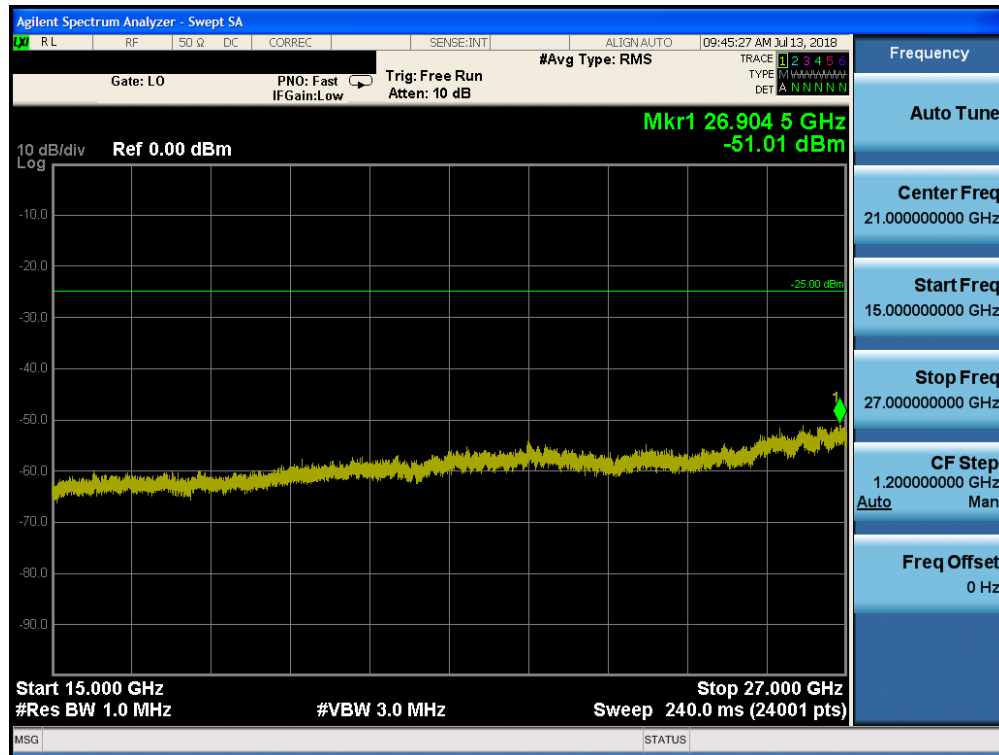


Plot 7-52. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

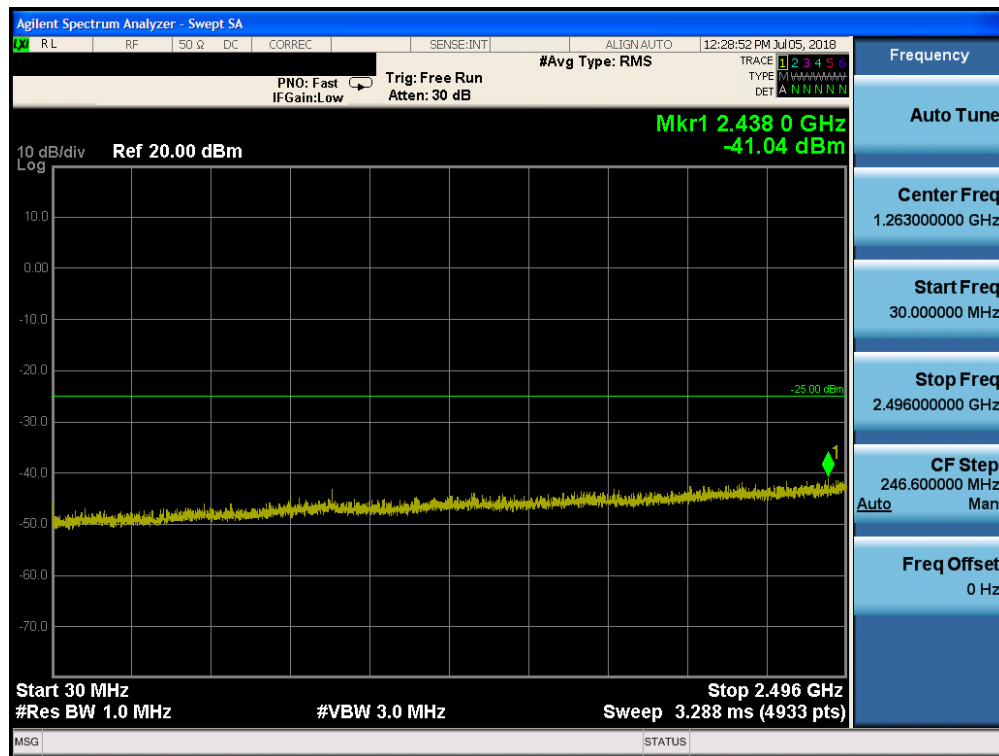


Plot 7-53. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 42 of 82

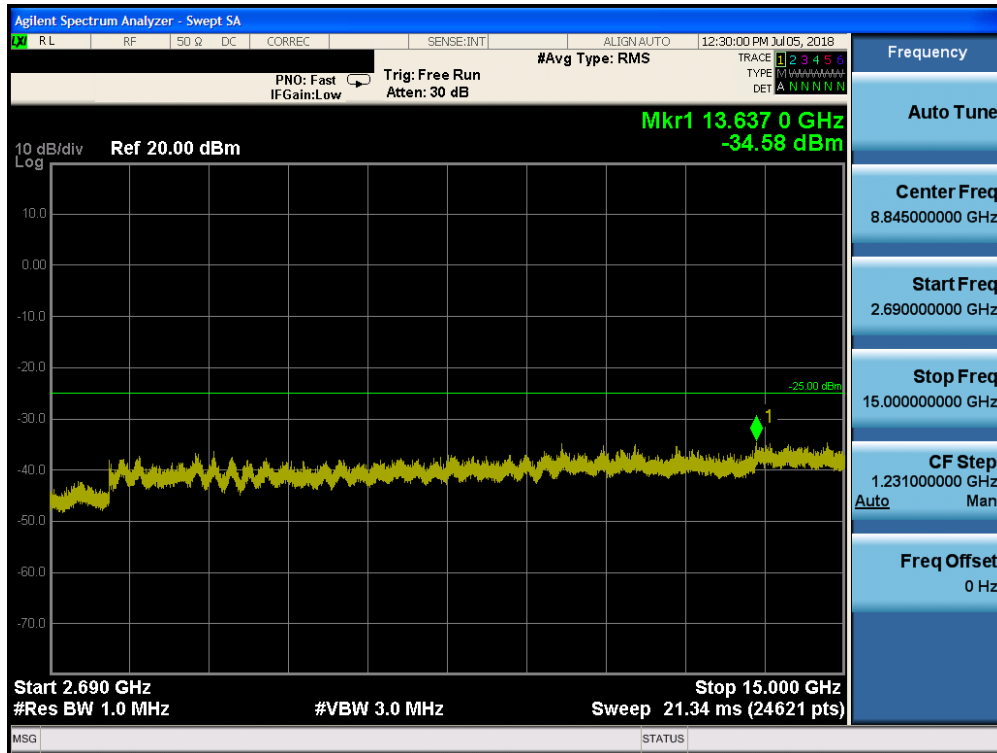


Plot 7-54. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

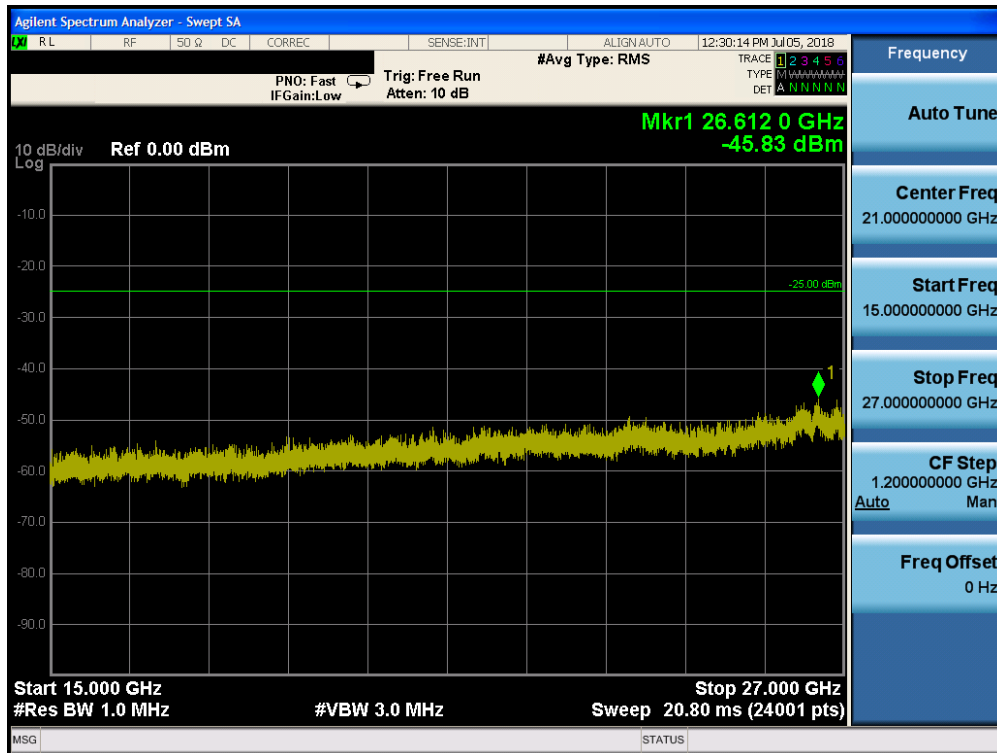


Plot 7-55. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 43 of 82

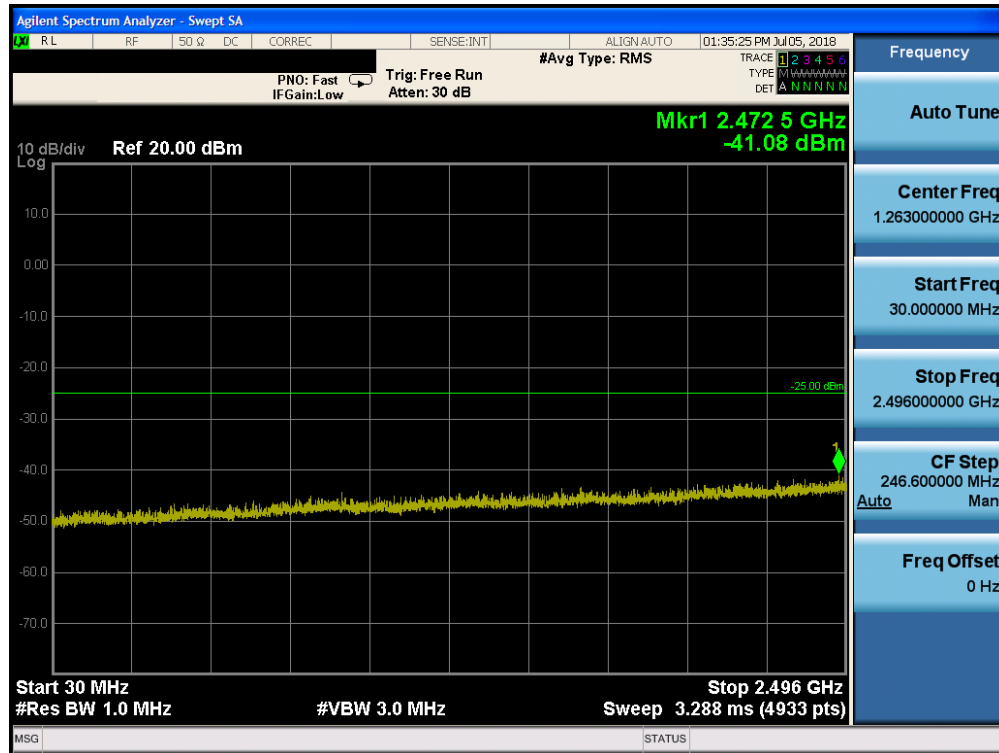


Plot 7-56. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

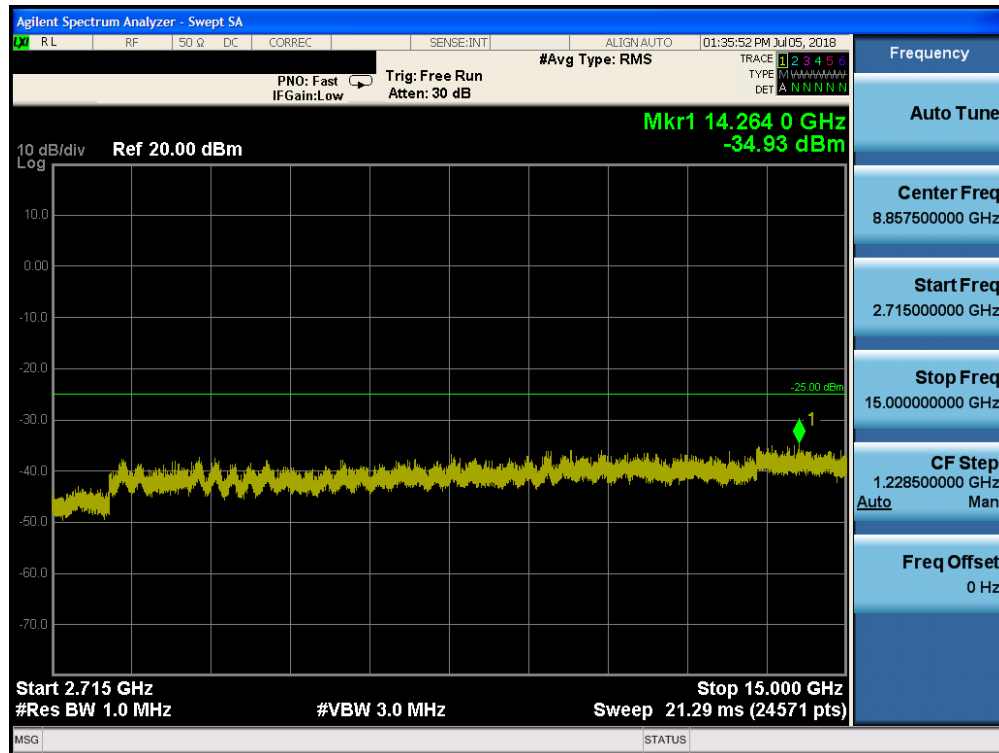


Plot 7-57. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 44 of 82

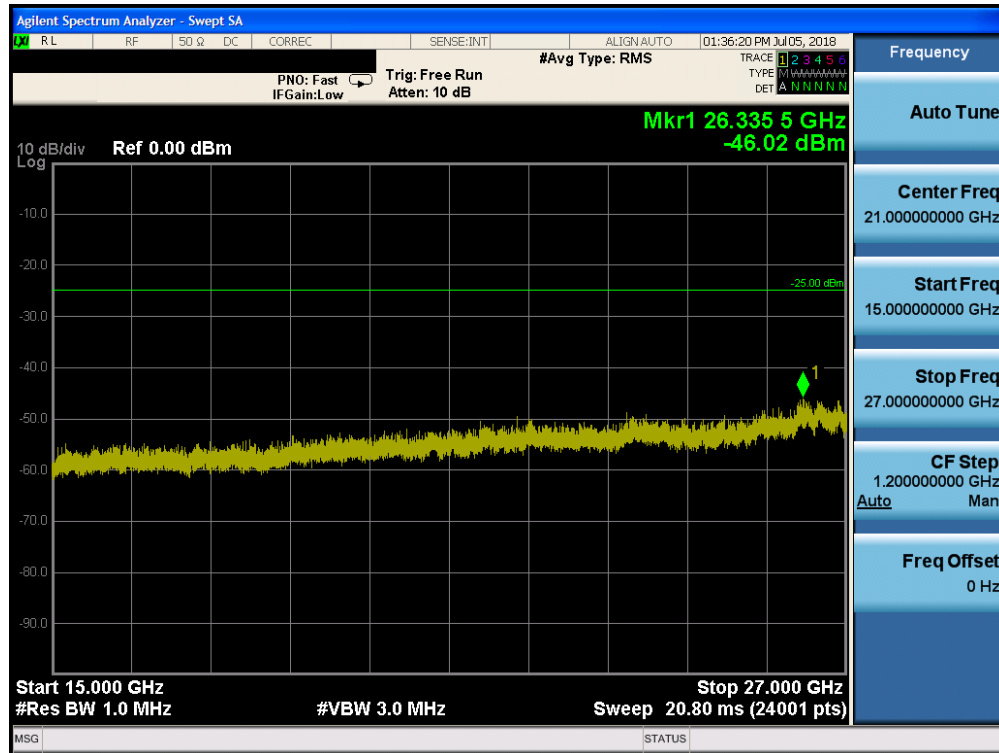


Plot 7-58. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-59. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 45 of 82



Plot 7-60. Conducted Spurious Plot (Band 41 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 46 of 82

7.4 Band Edge Emissions at Antenna Terminal

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 its maximum duty cycle, 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.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 7 and 41 is as 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 $\geq 1\%$ of the emission bandwidth
4. VBW $\geq 3 \times$ RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times$ 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.

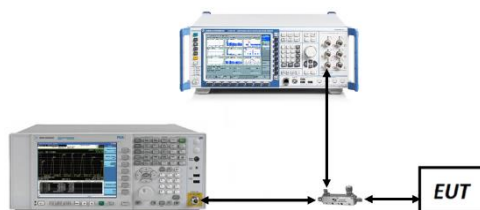


Figure 7-3. Test Instrument & Measurement Setup

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 47 of 82

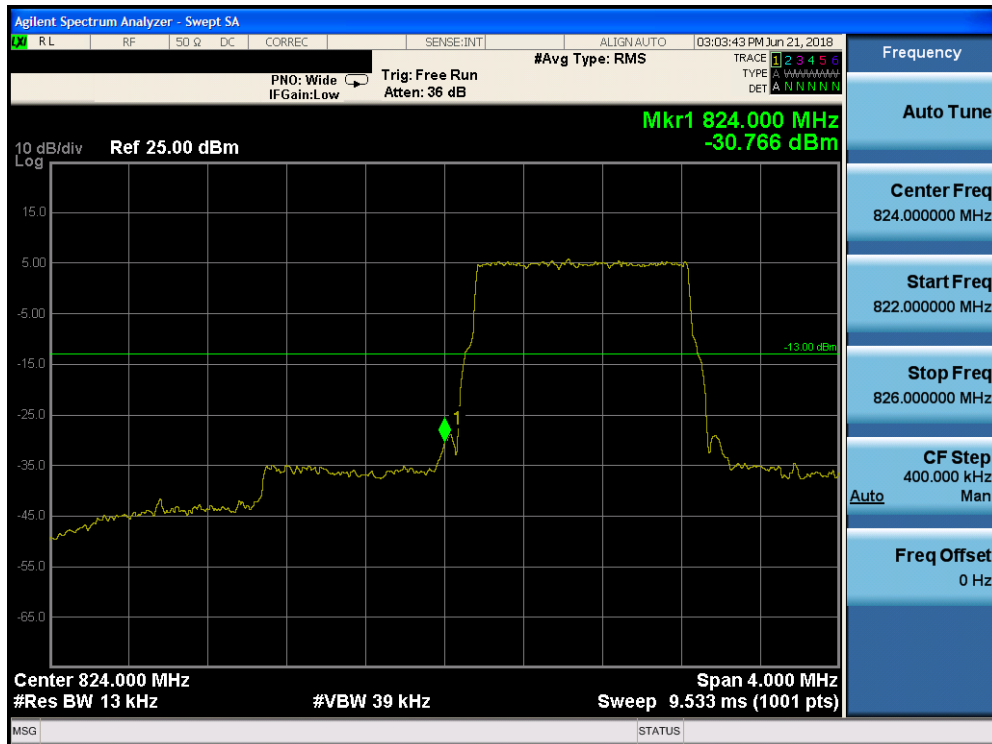
Test Notes

Per 22.917(b) 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.

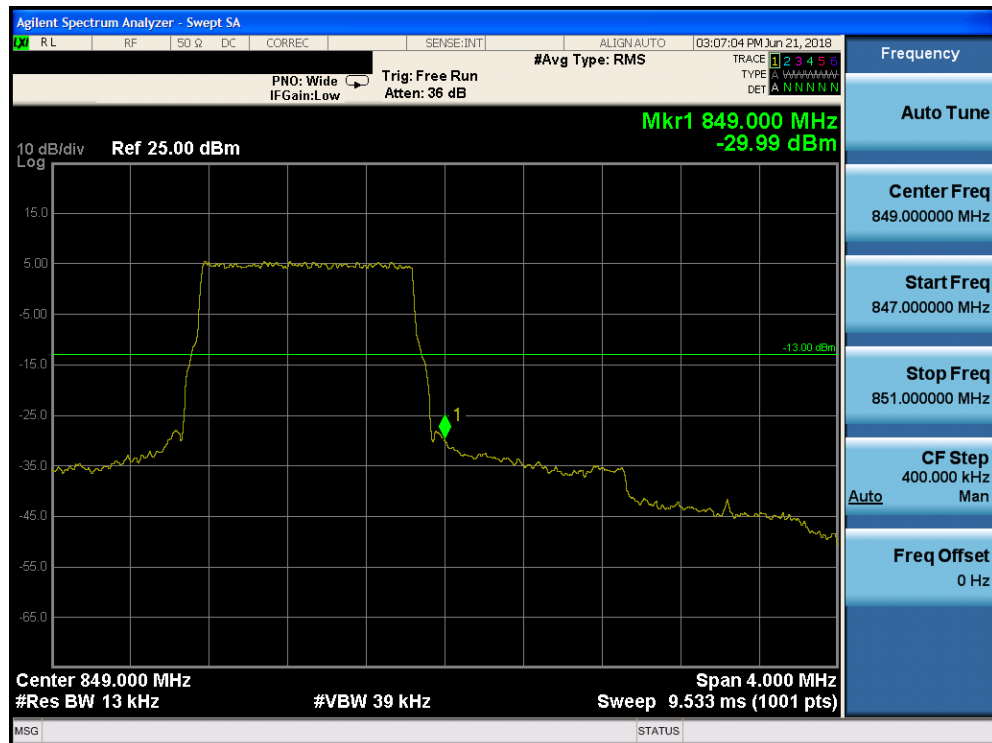
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, 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 than $43 + 10 \log (P)$ 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-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 48 of 82

Band 26/5

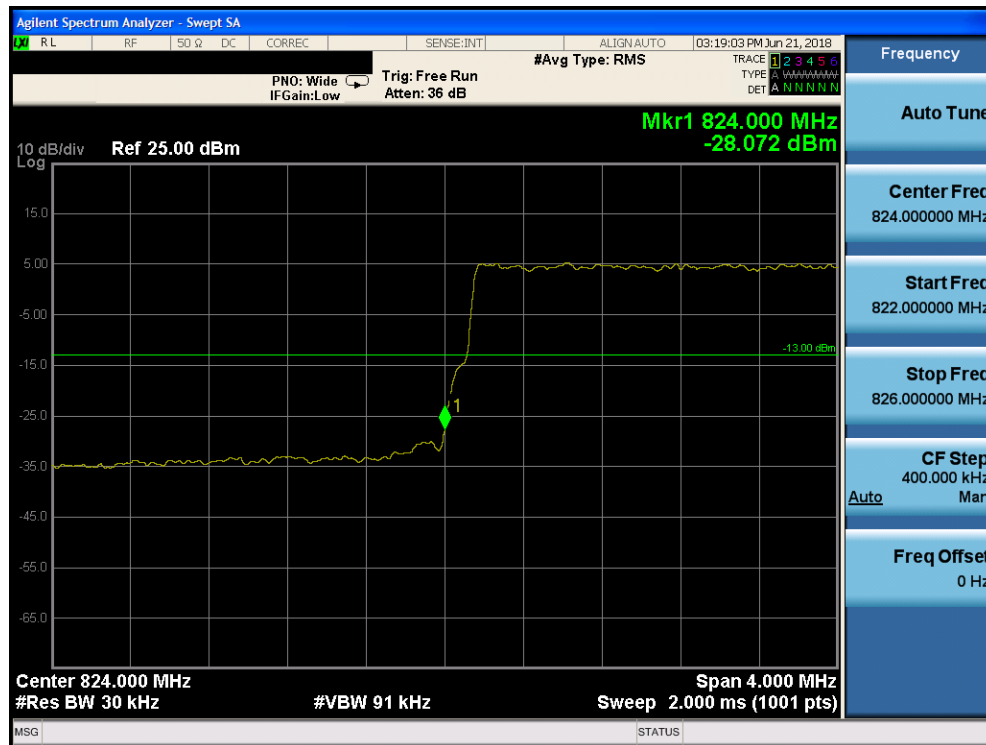


Plot 7-61. Lower Band Edge Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)

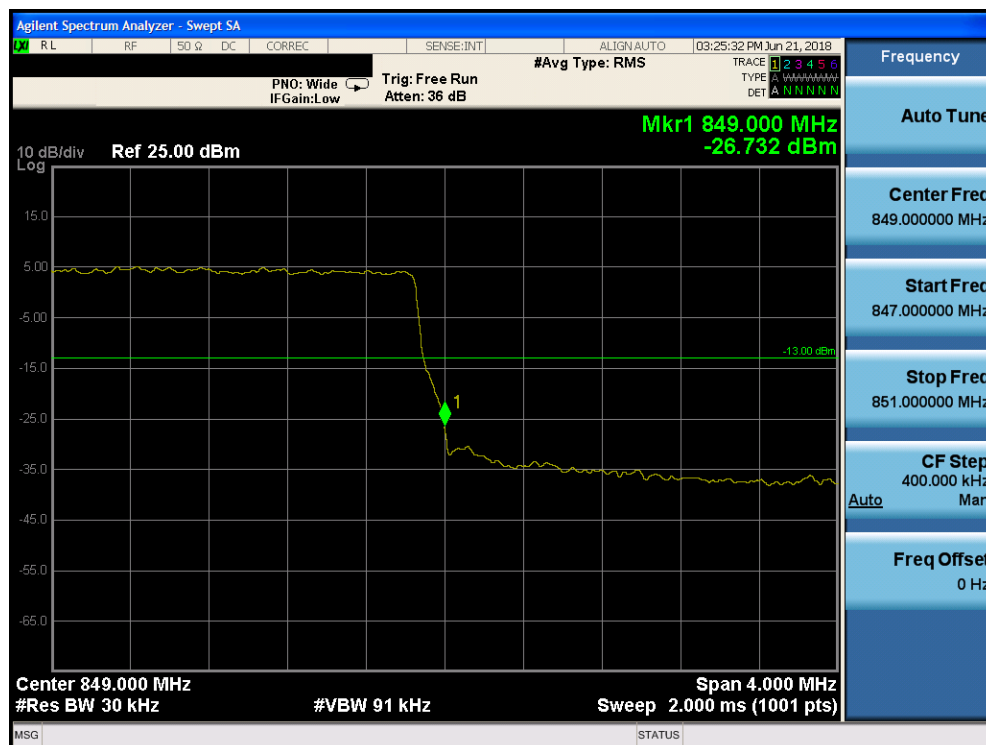


Plot 7-62. Upper Band Edge Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 49 of 82

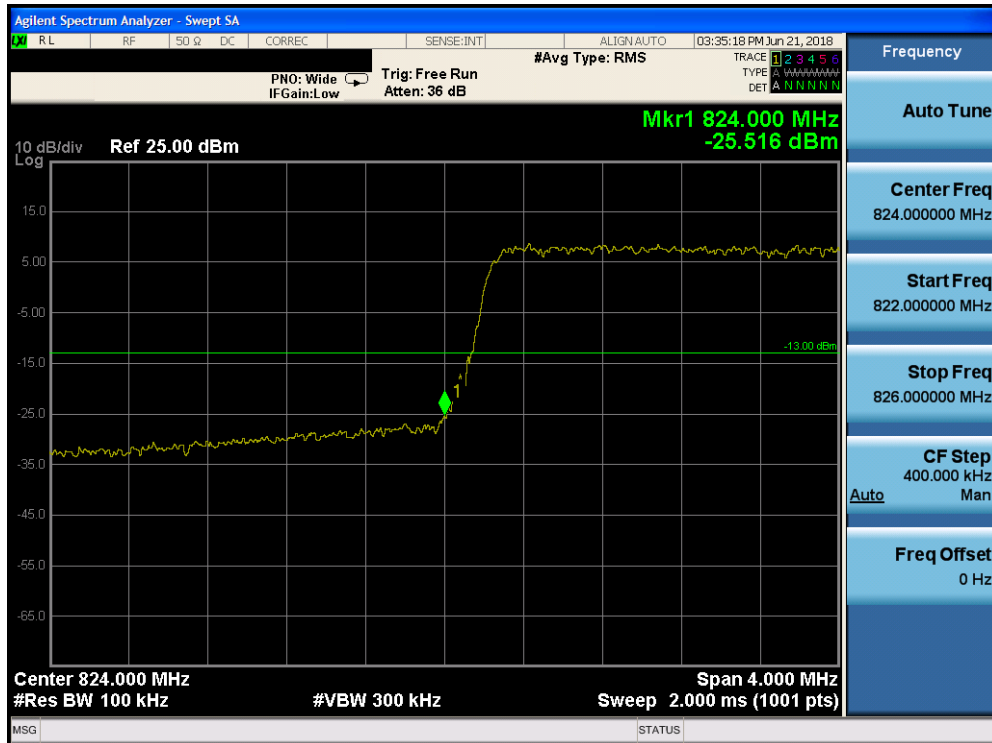


Plot 7-63. Lower Band Edge Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

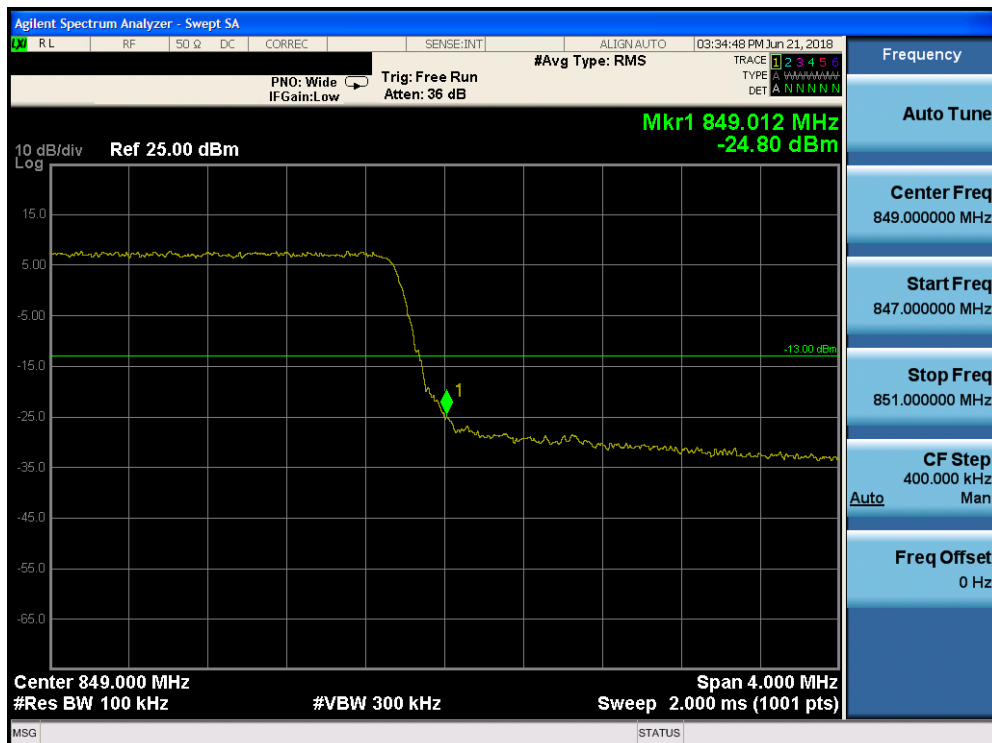


Plot 7-64. Upper Band Edge Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 50 of 82

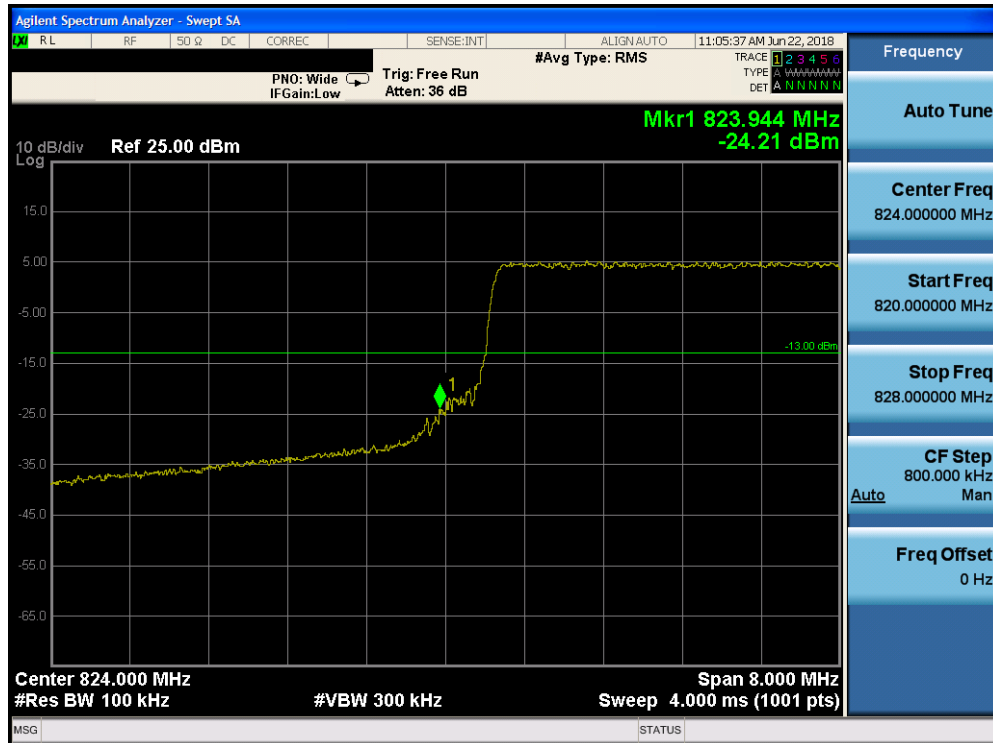


Plot 7-65. Lower Band Edge Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

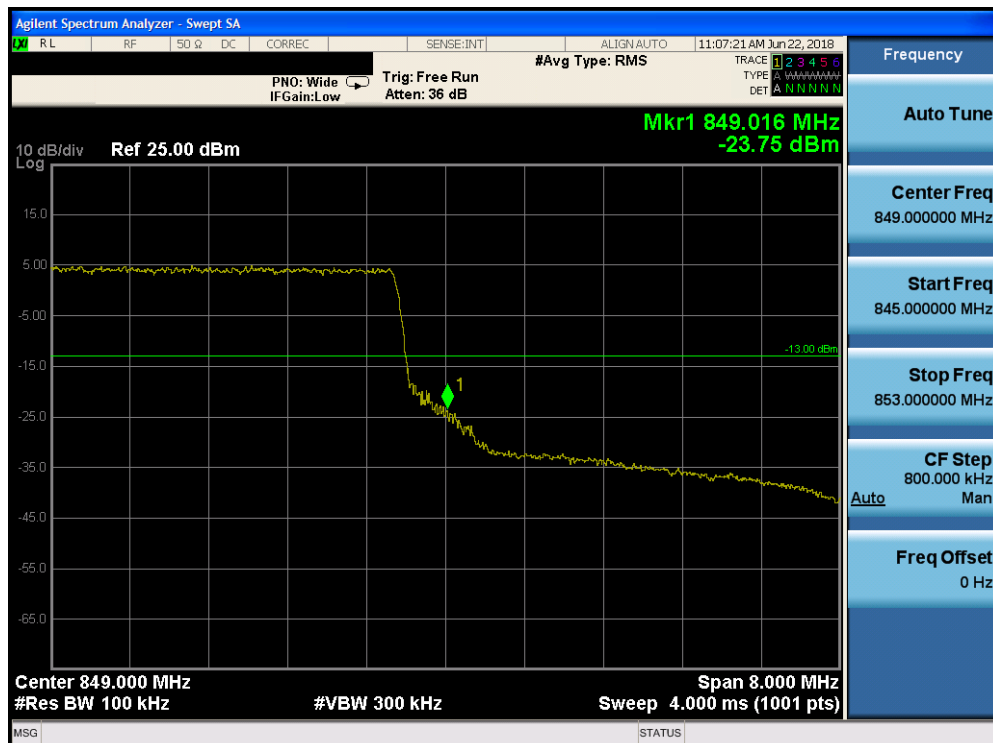


Plot 7-66. Upper Band Edge Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 51 of 82



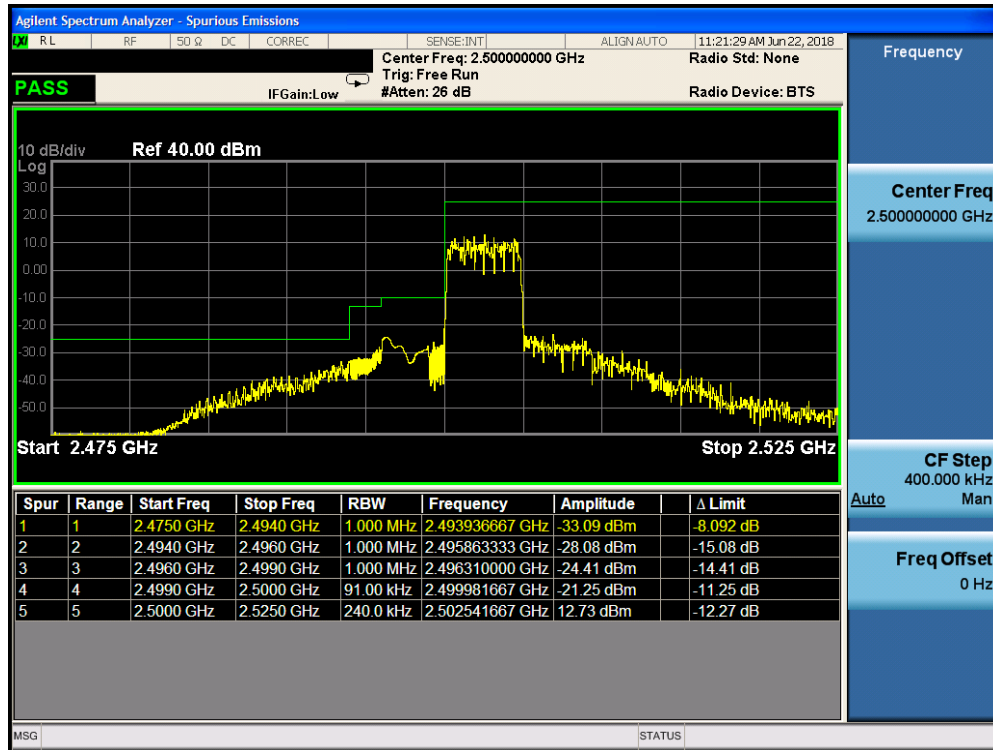
Plot 7-67. Lower Band Edge Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



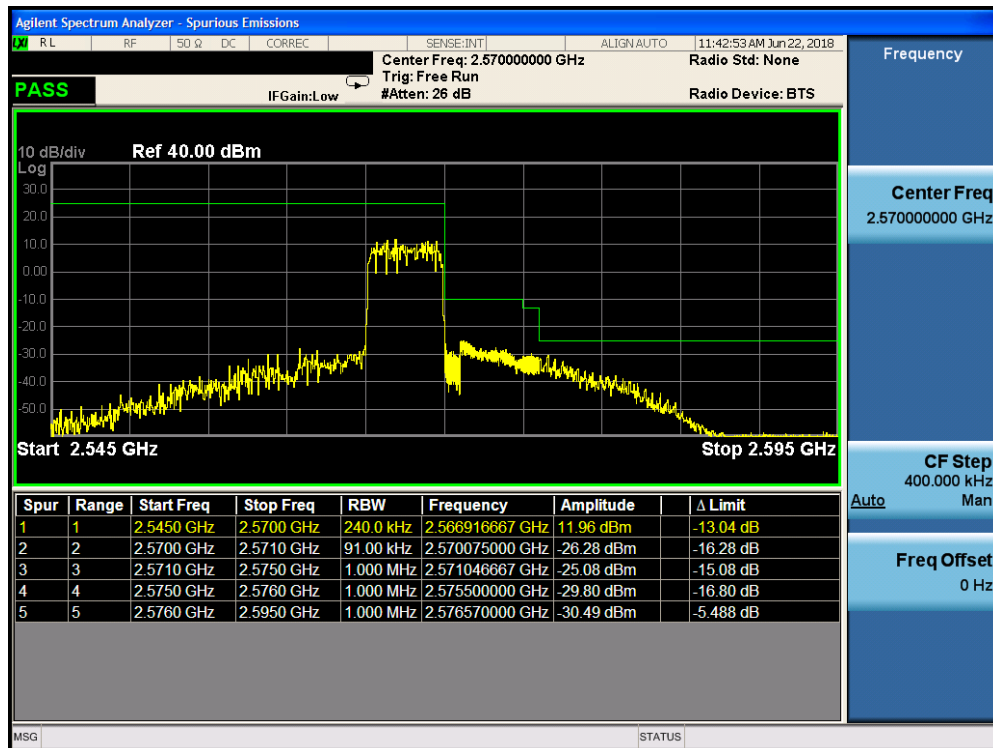
Plot 7-68. Upper Band Edge Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 52 of 82

Band 7

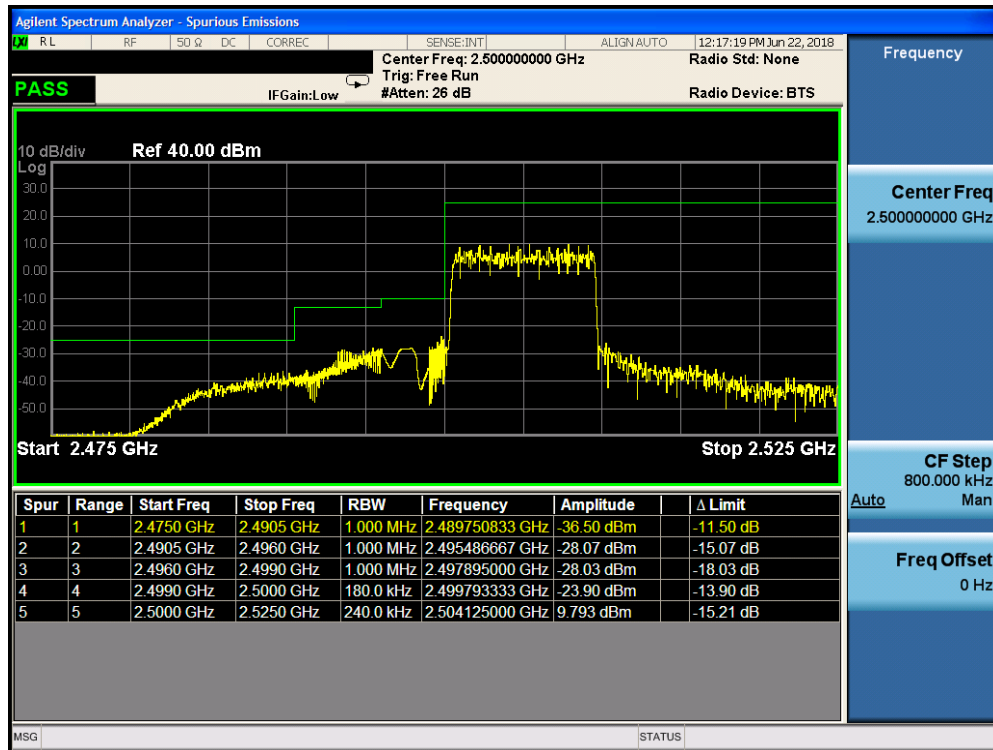


Plot 7-69. Lower ACP Plot (Band 7 - 5.0MHz QPSK - RB Size 25)

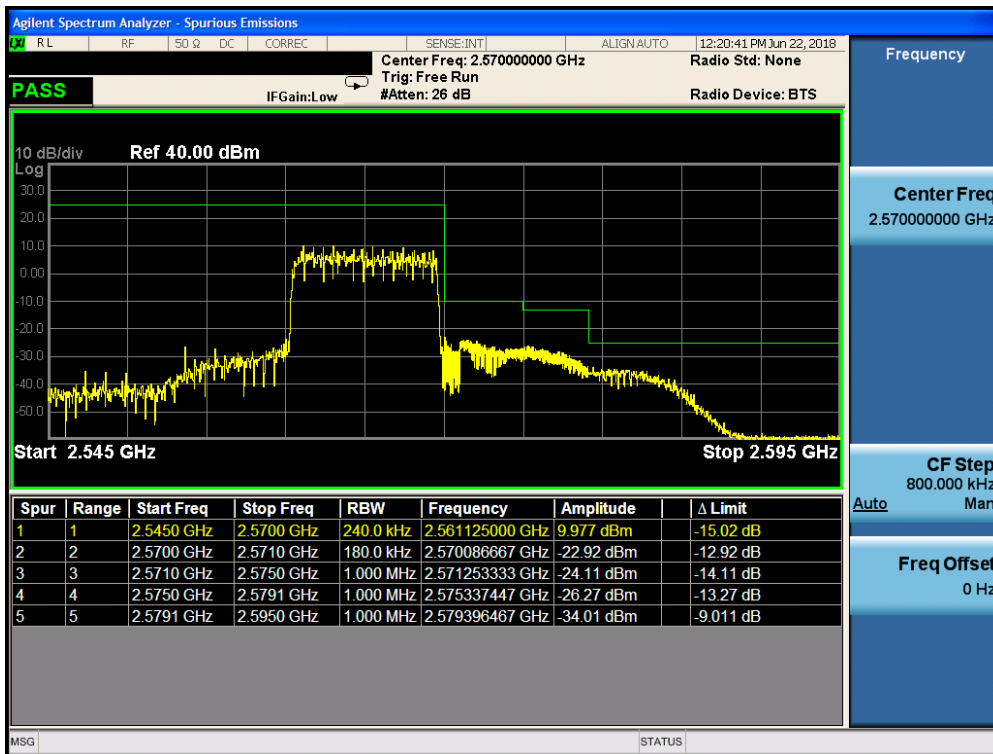


Plot 7-70. Upper ACP Plot (Band 7 - 5.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 53 of 82

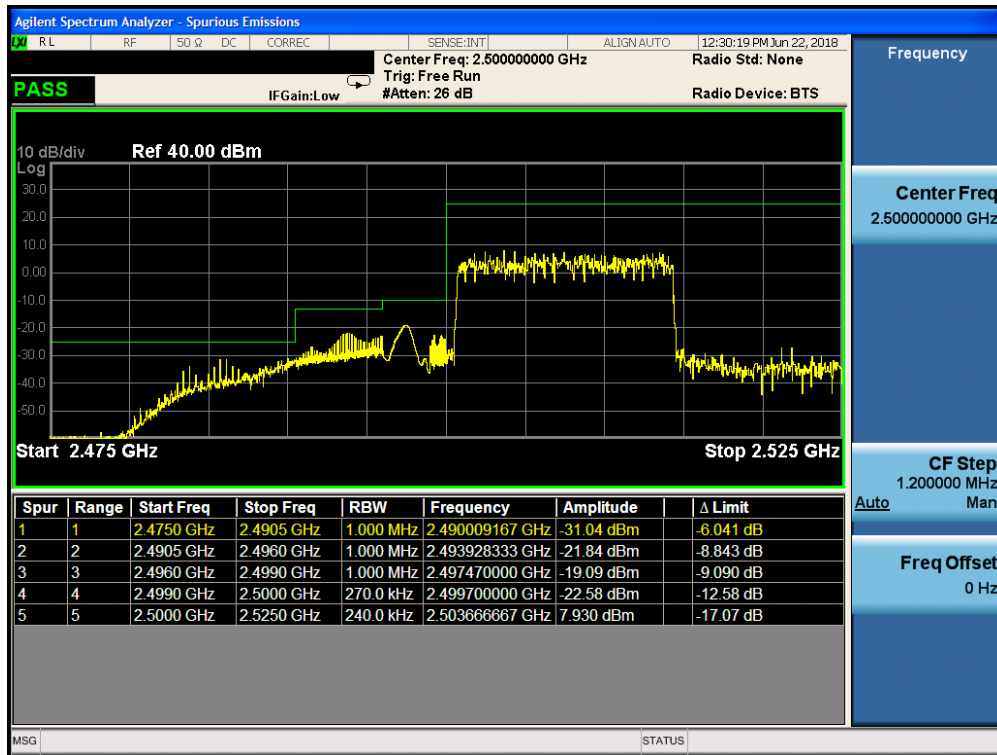


Plot 7-71. Lower ACP Plot (Band 7 - 10.0MHz QPSK - RB Size 25)

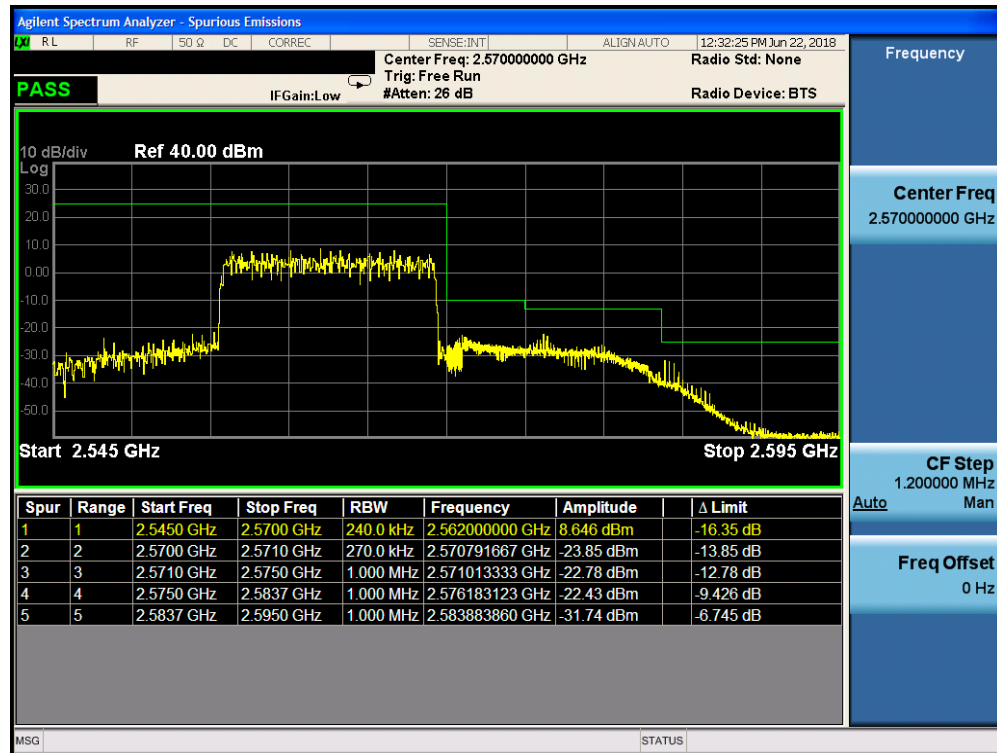


Plot 7-72. Upper ACP Plot (Band 7 - 10.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 54 of 82

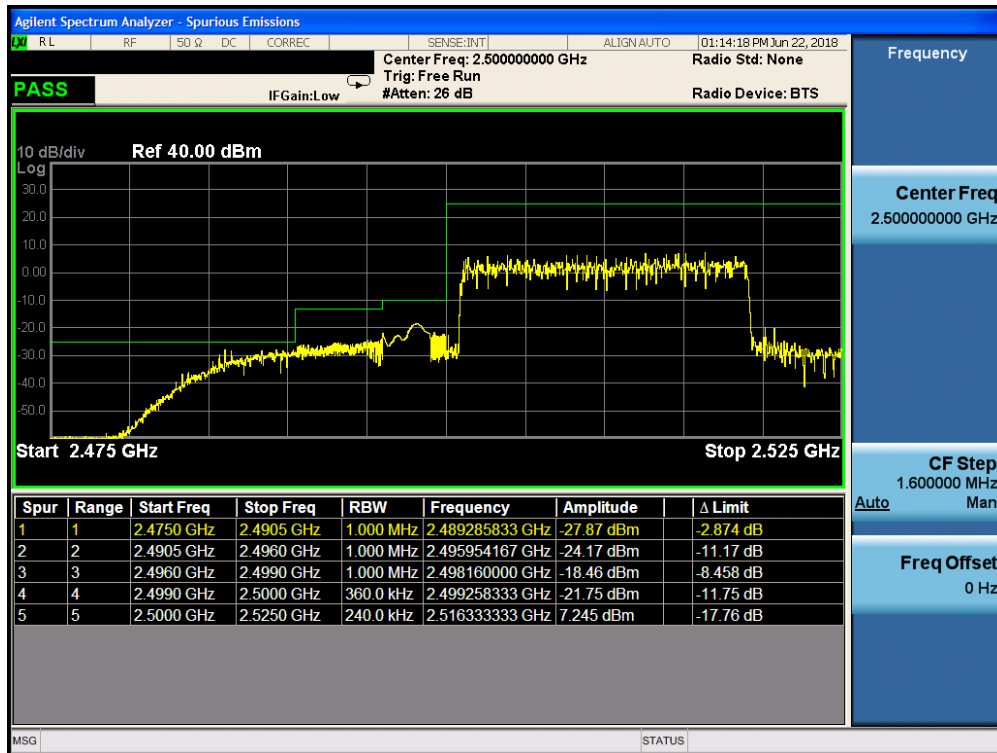


Plot 7-73. Lower ACP Plot (Band 7 - 15.0MHz QPSK - RB Size 25)

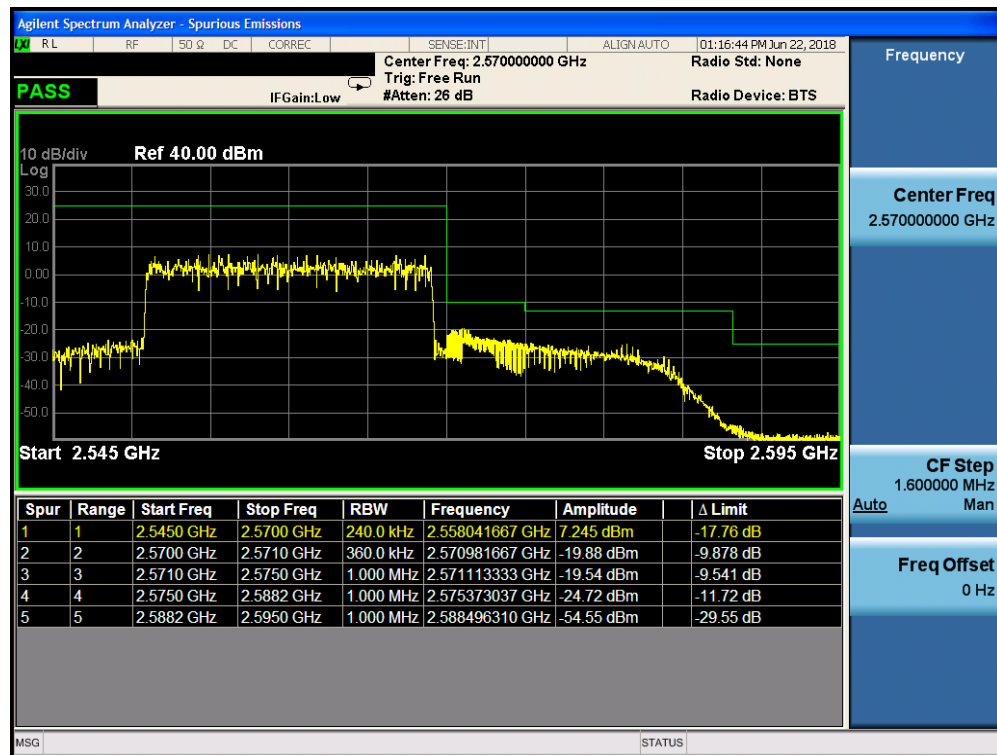


Plot 7-74. Upper ACP Plot (Band 7 - 15.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 55 of 82



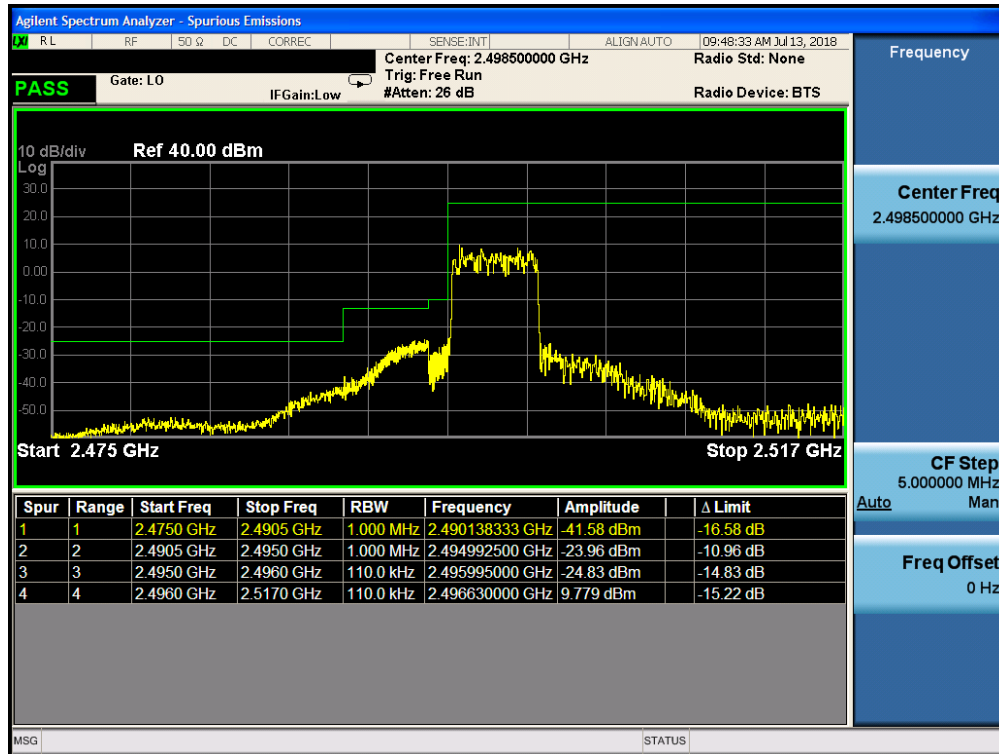
Plot 7-75. Lower ACP Plot (Band 7 - 20.0MHz QPSK - RB Size 25)



Plot 7-76. Upper ACP Plot (Band 7 - 20.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 56 of 82

Band 41

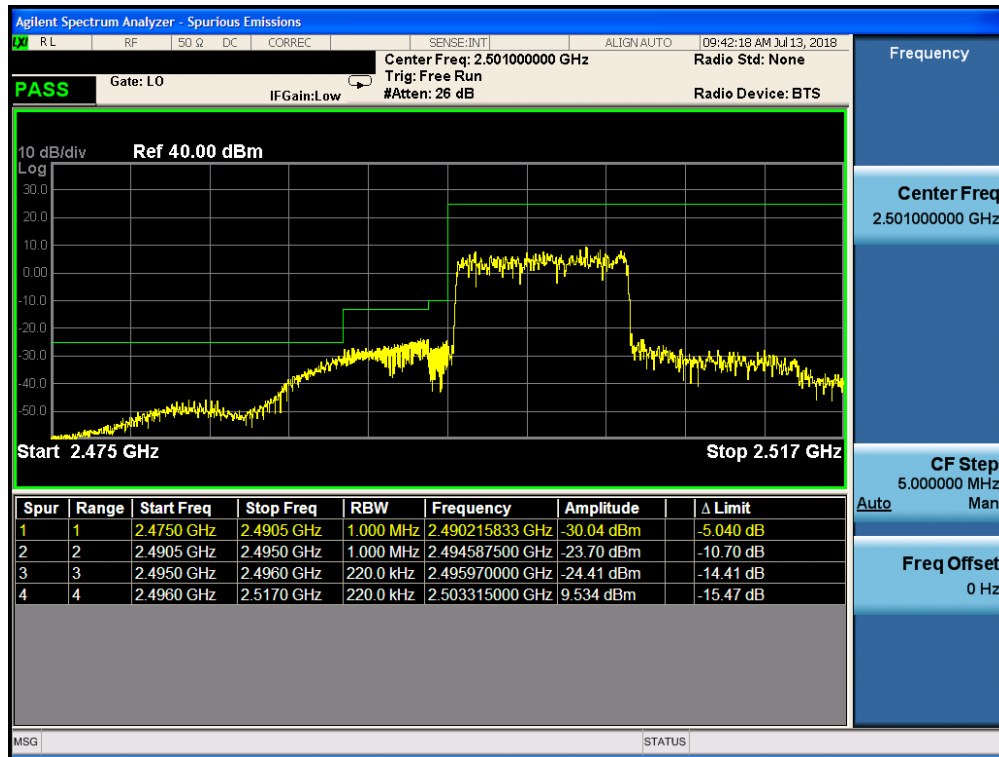


Plot 7-77. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - RB Size 25)

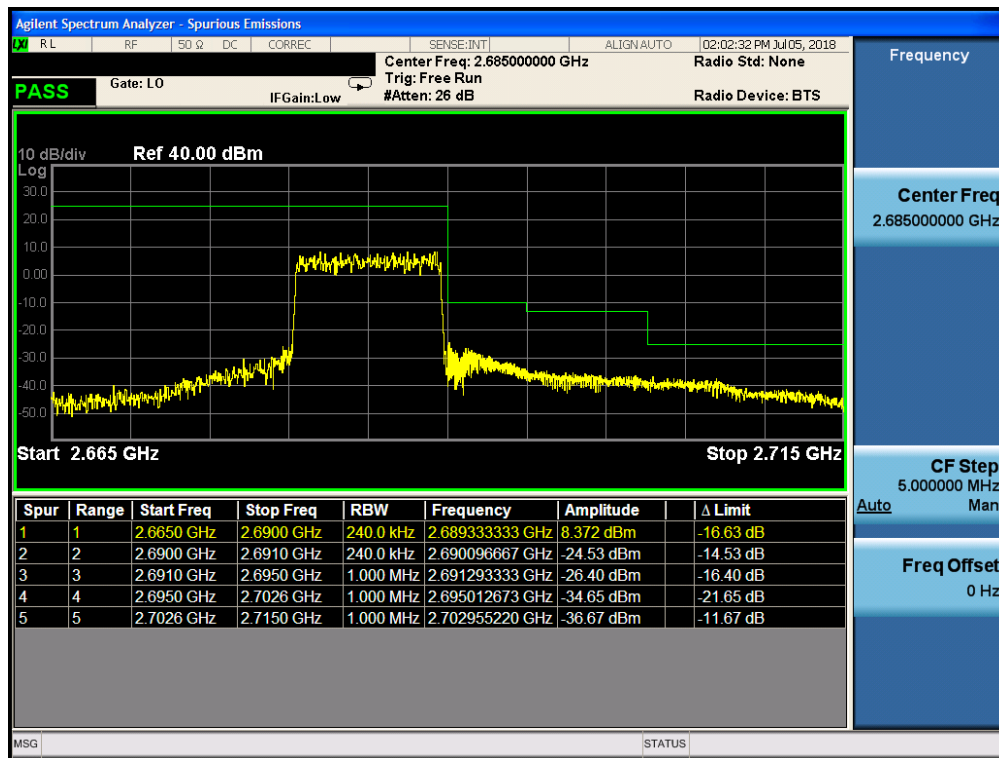


Plot 7-78. Upper ACP Plot (Band 41 - 5.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 57 of 82

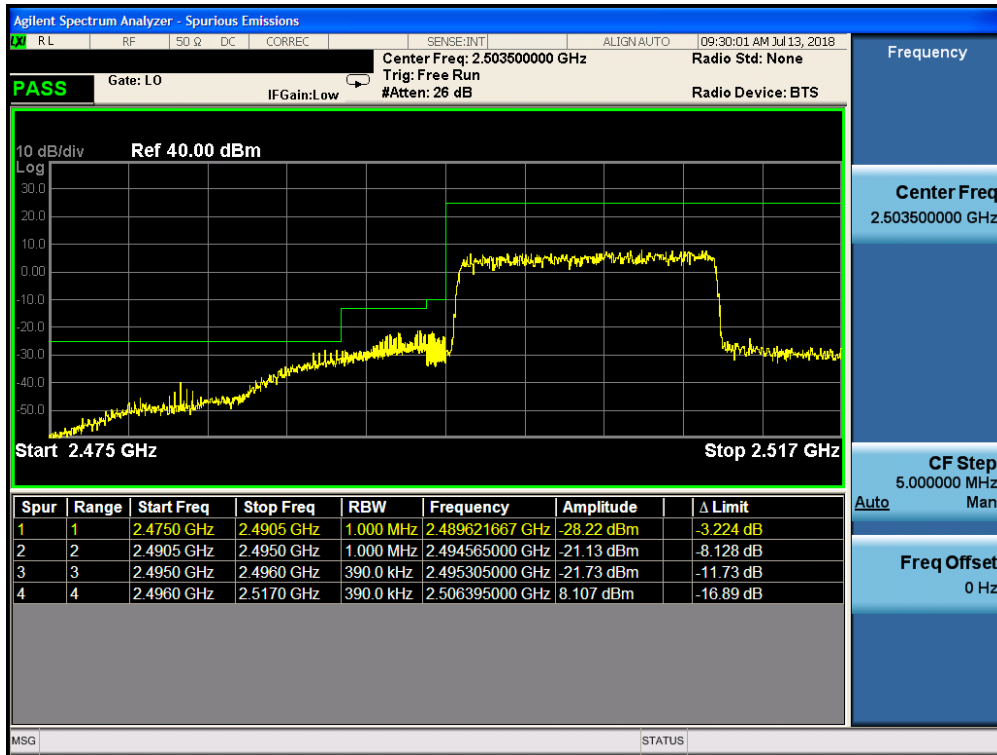


Plot 7-79. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - RB Size 25)

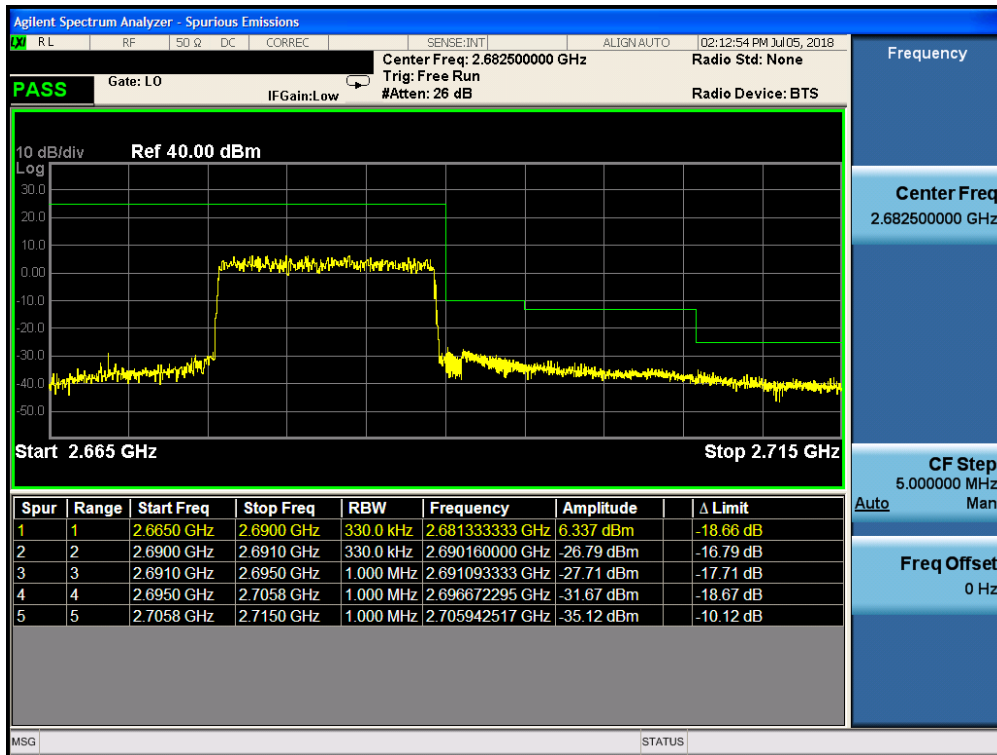


Plot 7-80. Upper ACP Plot (Band 41 - 10.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 58 of 82

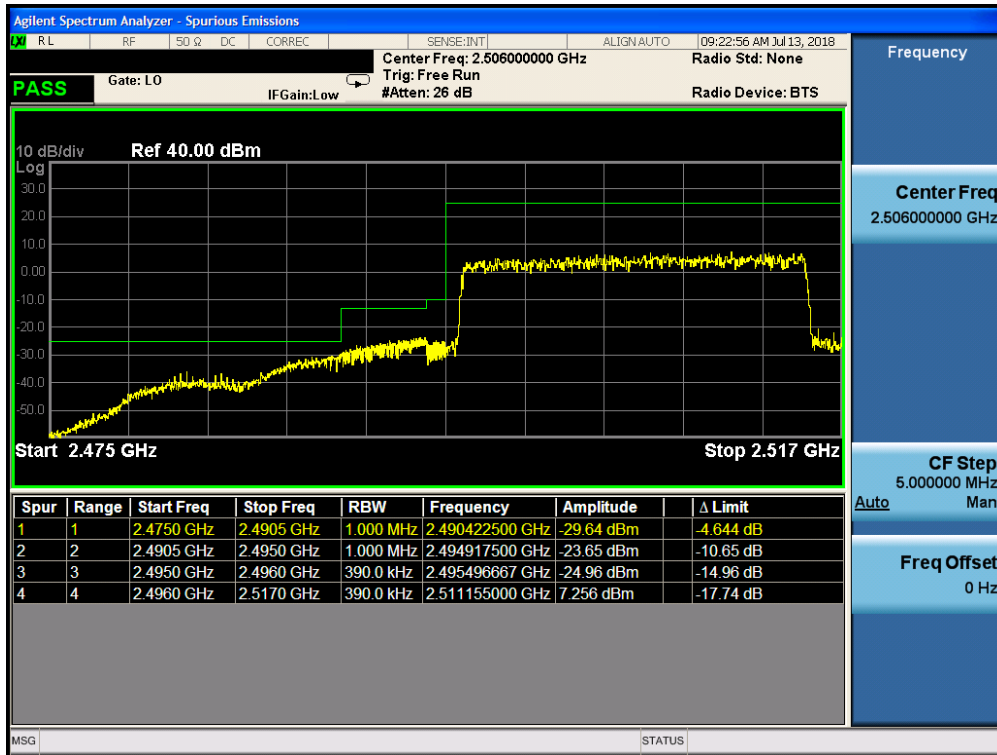


Plot 7-81. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - RB Size 25)

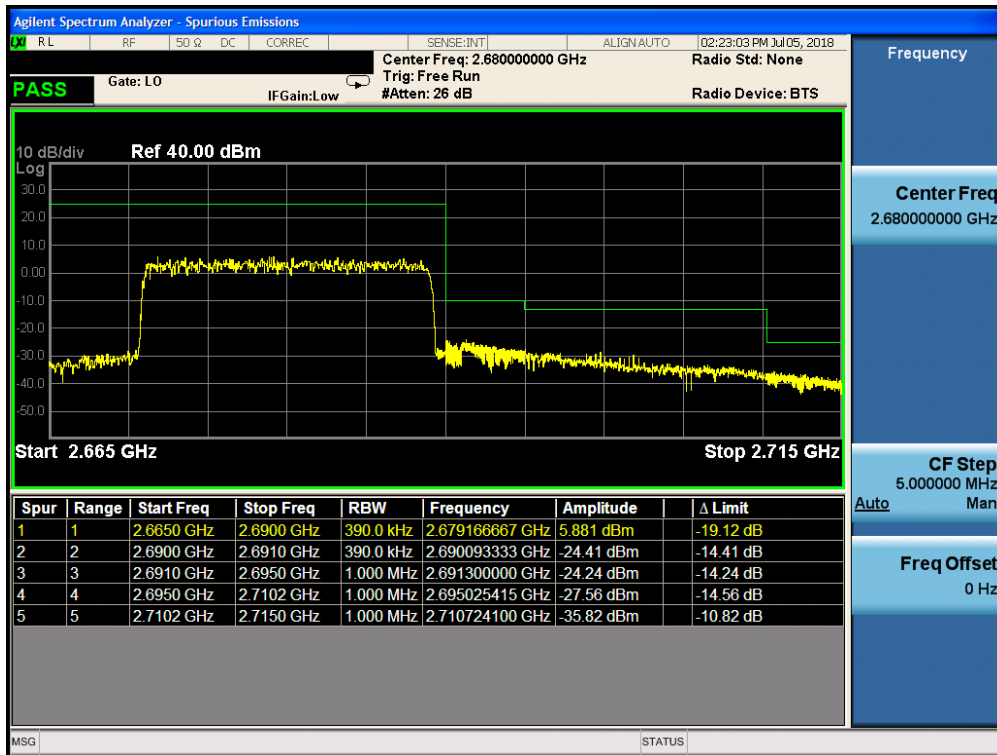


Plot 7-82. Upper ACP Plot (Band 41 - 15.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 59 of 82



Plot 7-83. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - RB Size 25)



Plot 7-84. Upper ACP Plot (Band 41 - 20.0MHz QPSK - RB Size 25)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 60 of 82

7.5 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) is specified when the operating frequency is less than or equal to 1 GHz and Equivalent Isotropic Radiated Power (EIRP) is specified when the operating frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

Test Settings

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

$$\text{ERP/EIRP} = \text{PMeas} - \text{LC} + \text{GT}$$

Where:

ERP/EIRP = effective or equivalent radiated power, respectively (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 dBd (ERP) or dBi (EIRP)

Test Setup

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



Figure 7-4. ERP/EIRP Measurement Setup

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 61 of 82

Test Notes

- 1) 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.
- 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.
- 4) The Ant. Gains (GT) are listed in dBi.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 62 of 82

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	RB Size/Offset	Conducted Power [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	6 / 0	23.75	-28.40	-6.80	0.000	38.45	-45.25
836.50	1.4	QPSK	1 / 0	24.89	-28.40	-5.66	0.000	38.45	-44.11
848.30	1.4	QPSK	1 / 5	24.61	-28.40	-5.94	0.000	38.45	-44.39
824.70	1.4	16-QAM	1 / 5	23.97	-28.40	-6.58	0.000	38.45	-45.03
825.50	3	QPSK	15 / 0	23.75	-28.40	-6.80	0.000	38.45	-45.25
836.50	3	QPSK	1 / 0	24.78	-28.40	-5.77	0.000	38.45	-44.22
847.50	3	QPSK	1 / 7	24.55	-28.40	-6.00	0.000	38.45	-44.45
825.50	3	16-QAM	1 / 7	24.16	-28.40	-6.39	0.000	38.45	-44.84
826.50	5	QPSK	25 / 0	23.74	-28.40	-6.81	0.000	38.45	-45.26
836.50	5	QPSK	1 / 0	24.76	-28.40	-5.79	0.000	38.45	-44.24
846.50	5	QPSK	1 / 0	24.67	-28.40	-5.88	0.000	38.45	-44.33
826.50	5	16-QAM	1 / 24	23.99	-28.40	-6.56	0.000	38.45	-45.01
829.00	10	QPSK	1 / 0	24.61	-28.40	-5.94	0.000	38.45	-44.39
836.50	10	QPSK	1 / 0	24.75	-28.40	-5.80	0.000	38.45	-44.25
844.00	10	QPSK	1 / 0	24.26	-28.40	-6.29	0.000	38.45	-44.74
836.50	10	16-QAM	1 / 27	24.20	-28.40	-6.35	0.000	38.45	-44.80

Table 7-3. ERP Data (Band 5)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 63 of 82

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	RB Size/Offset	Conducted Power [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	1 / 0	24.63	-28.40	-5.92	0.000	38.45	-44.37
836.50	1.4	QPSK	1 / 0	24.78	-28.40	-5.77	0.000	38.45	-44.22
848.30	1.4	QPSK	1 / 0	24.54	-28.40	-6.01	0.000	38.45	-44.46
824.70	1.4	16-QAM	1 / 2	24.04	-28.40	-6.51	0.000	38.45	-44.96
825.50	3	QPSK	1 / 0	24.76	-28.40	-5.79	0.000	38.45	-44.24
836.50	3	QPSK	15 / 0	23.70	-28.40	-6.85	0.000	38.45	-45.30
847.50	3	QPSK	1 / 0	24.67	-28.40	-5.88	0.000	38.45	-44.33
836.50	3	16-QAM	1 / 14	24.07	-28.40	-6.48	0.000	38.45	-44.93
826.50	5	QPSK	1 / 0	24.80	-28.40	-5.75	0.000	38.45	-44.20
836.50	5	QPSK	1 / 0	24.44	-28.40	-6.11	0.000	38.45	-44.56
846.50	5	QPSK	1 / 0	24.55	-28.40	-6.00	0.000	38.45	-44.45
826.50	5	16-QAM	1 / 0	24.12	-28.40	-6.43	0.000	38.45	-44.88
829.00	10	QPSK	1 / 49	24.64	-28.40	-5.91	0.000	38.45	-44.36
836.50	10	QPSK	1 / 49	24.75	-28.40	-5.80	0.000	38.45	-44.25
844.00	10	QPSK	1 / 0	24.77	-28.40	-5.78	0.000	38.45	-44.23
836.50	10	16-QAM	1 / 24	24.22	-28.40	-6.33	0.000	38.45	-44.78

Table 7-4. ERP Data (Band 26)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 64 of 82

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	RB Size/Offset	Conducted Power [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	1 / 0	22.25	-12.10	10.15	0.010	33.01	-22.86
2535.00	5	QPSK	1 / 0	22.30	-12.10	10.20	0.010	33.01	-22.81
2567.50	5	QPSK	1 / 12	22.25	-12.10	10.15	0.010	33.01	-22.86
2502.50	5	16-QAM	1 / 12	21.59	-12.10	9.49	0.009	33.01	-23.52
2505.00	10	QPSK	1 / 0	22.40	-12.10	10.30	0.011	33.01	-22.71
2535.00	10	QPSK	1 / 0	22.35	-12.10	10.25	0.011	33.01	-22.76
2565.00	10	QPSK	1 / 0	22.20	-12.10	10.10	0.010	33.01	-22.91
2505.00	10	16-QAM	1 / 15	21.69	-12.10	9.59	0.009	33.01	-23.42
2507.50	15	QPSK	1 / 0	22.50	-12.10	10.40	0.011	33.01	-22.61
2535.00	15	QPSK	1 / 0	22.40	-12.10	10.30	0.011	33.01	-22.71
2562.50	15	QPSK	1 / 0	22.30	-12.10	10.20	0.010	33.01	-22.81
2562.50	15	16-QAM	1 / 0	21.68	-12.10	9.58	0.009	33.01	-23.43
2510.00	20	QPSK	1 / 0	22.42	-12.10	10.32	0.011	33.01	-22.69
2535.00	20	QPSK	1 / 0	22.50	-12.10	10.40	0.011	33.01	-22.61
2560.00	20	QPSK	1 / 0	22.50	-12.10	10.40	0.011	33.01	-22.61
2510.00	20	16-QAM	1 / 0	22.17	-12.10	10.07	0.010	33.01	-22.94

Table 7-5. EIRP Data (Band 7)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 65 of 82

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	RB Size/Offset	Conducted Power [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	1 / 24	22.10	-12.10	10.00	0.010	33.01	-23.01
2593.00	5	QPSK	1 / 24	22.74	-12.10	10.64	0.012	33.01	-22.37
2687.50	5	QPSK	1 / 24	22.74	-12.10	10.64	0.012	33.01	-22.37
2593.00	5	16-QAM	1 / 12	22.75	-12.10	10.65	0.012	33.01	-22.36
2501.00	10	QPSK	1 / 49	22.10	-12.10	10.00	0.010	33.01	-23.01
2593.00	10	QPSK	1 / 0	22.75	-12.10	10.65	0.012	33.01	-22.36
2685.00	10	QPSK	1 / 0	22.75	-12.10	10.65	0.012	33.01	-22.36
2593.00	10	16-QAM	1 / 0	22.35	-12.10	10.25	0.011	33.01	-22.76
2503.50	15	QPSK	1 / 0	22.07	-12.10	9.97	0.010	33.01	-23.04
2593.00	15	QPSK	1 / 0	22.70	-12.10	10.60	0.011	33.01	-22.41
2682.50	15	QPSK	1 / 0	22.72	-12.10	10.62	0.012	33.01	-22.39
2682.50	15	16-QAM	1 / 0	22.51	-12.10	10.41	0.011	33.01	-22.60
2506.00	20	QPSK	1 / 99	22.10	-12.10	10.00	0.010	33.01	-23.01
2593.00	20	QPSK	1 / 0	22.70	-12.10	10.60	0.011	33.01	-22.41
2680.00	20	QPSK	1 / 0	22.75	-12.10	10.65	0.012	33.01	-22.36
2680.00	20	16-QAM	1 / 0	22.18	-12.10	10.08	0.010	33.01	-22.93

Table 7-6. EIRP Data (Band 41)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 66 of 82

7.6 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 67 of 82

Test Setup

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

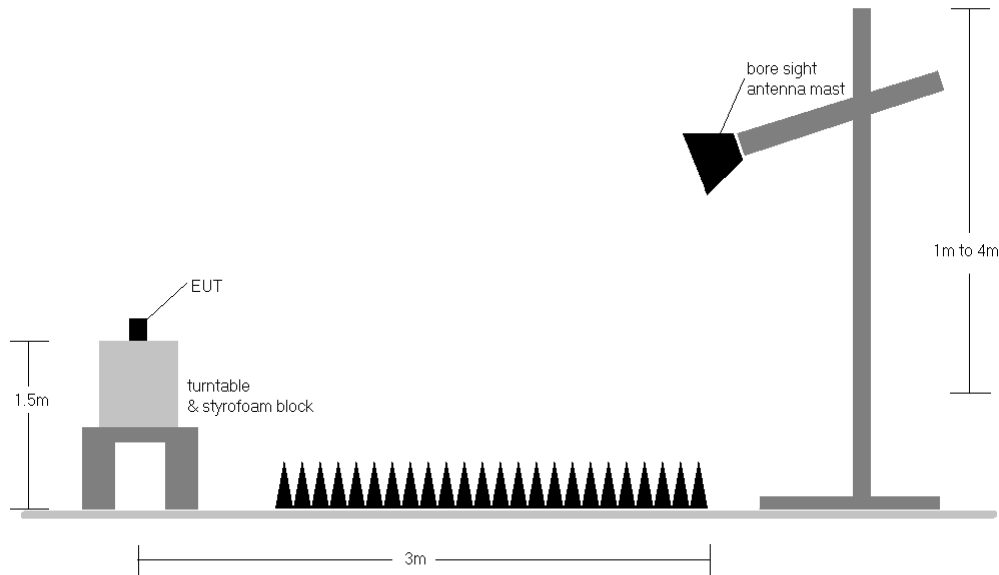


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

- 1) 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.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 68 of 82

Band 26/5

OPERATING FREQUENCY: 829.00 MHz
CHANNEL: 20450
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	121	273	-68.38	5.27	-63.11	-50.1
2487.00	H	-	-	-68.99	5.42	-63.56	-50.6
3316.00	H	-	-	-70.29	7.21	-63.08	-50.1
4145.00	H	-	-	-70.76	8.41	-62.35	-49.4

Table 7-7. Radiated Spurious Data (Band 26/5 – Low Channel)

OPERATING FREQUENCY: 836.50 MHz
CHANNEL: 20525
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	110	255	-71.04	5.16	-65.88	-52.9
2509.50	H	-	-	-68.39	5.39	-63.00	-50.0
3346.00	H	-	-	-69.67	7.31	-62.36	-49.4
4182.50	H	-	-	-69.93	8.40	-61.53	-48.5

Table 7-8. Radiated Spurious Data (Band 26/5 – Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 69 of 82

OPERATING FREQUENCY: 841.50 MHz
 CHANNEL: 26965
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1683.00	V	105	255	-69.29	5.09	-64.20	-51.2
2524.50	V	-	-	-65.91	5.37	-60.54	-47.5
3366.00	V	-	-	-67.70	7.37	-60.34	-47.3
4207.50	V	-	-	-68.20	8.40	-59.81	-46.8

Table 7-9. Radiated Spurious Data (Band 26/5 – High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 70 of 82

Band 7

OPERATING FREQUENCY: 2510.00 MHz
CHANNEL: 20850
MODULATION SIGNAL: QPSK
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	134	287	-58.69	9.79	-48.90	-23.9
7530.00	H	106	366	-49.80	11.68	-38.12	-13.1
10040.00	H	321	343	-55.25	12.21	-43.04	-18.0
12550.00	V	-	-	-62.62	12.62	-50.00	-25.0
15060.00	H	-	-	-58.46	12.40	-46.06	-21.1
17570.00	V	-	-	-55.62	11.89	-43.73	-18.7

Table 7-10. Radiated Spurious Data (Band 7 – Low Channel)

OPERATING FREQUENCY: 2535.00 MHz
CHANNEL: 21100
MODULATION SIGNAL: QPSK
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	V	113	142	-59.54	9.82	-49.72	-24.7
7605.00	H	102	8	-42.22	0.00	-42.22	-17.2
10140.00	V	102	212	-56.30	12.21	-44.09	-19.1
12675.00	H	-	-	-60.91	12.65	-48.27	-23.3
15210.00	H	-	-	-57.59	12.25	-45.34	-20.3
17745.00	H	-	-	-53.29	11.84	-41.45	-16.5

Table 7-11. Radiated Spurious Data (Band 7 – Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 71 of 82

OPERATING FREQUENCY: 2560.00 MHz
 CHANNEL: 21350
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5120.00	H	130	285	-60.44	9.81	-50.63	-25.6
7680.00	H	106	357	-52.09	11.78	-40.31	-15.3
10240.00	H	-	-	-64.04	12.21	-51.82	-26.8
12800.00	H	-	-	-61.97	12.72	-49.25	-24.2
15360.00	H	-	-	-58.18	12.36	-45.82	-20.8
17920.00	H	-	-	-55.07	11.96	-43.11	-18.1

Table 7-12. Radiated Spurious Data (Band 7 – High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 72 of 82

Band 41

OPERATING FREQUENCY: 2506.00 MHz
 CHANNEL: 39790
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Duty Cycle Correction Factor [dB]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5012.00	H	110	300	4.02	-56.12	9.78	-46.34	-21.3
7522.00	H	106	360	4.02	-50.66	11.68	-38.98	-14.0
10032.00	H	264	9	4.02	-54.38	12.21	-42.17	-17.2
12542.00	H	-	-	4.02	-63.24	12.62	-50.62	-25.7
15052.00	H	-	-	4.02	-61.12	12.41	-48.71	-23.7
17562.00	H	-	-	4.02	-57.49	11.89	-45.59	-20.5

Table 7-13. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Duty Cycle Correction Factor [dB]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	150	351	4.02	-60.92	9.76	-51.16	-26.2
7779.00	H	114	351	4.02	-49.34	11.87	-37.47	-12.5
10372.00	H	309	243	4.02	-52.05	12.23	-39.82	-14.8
12965.00	H	215	130	4.02	-59.42	12.89	-46.53	-21.5
15558.00	H	244	329	4.02	-52.30	12.58	-39.72	-14.7

Table 7-14. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 73 of 82

OPERATING FREQUENCY: 2680.00 MHz
 CHANNEL: 41490
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Duty Cycle Correction Factor [dB]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	H	-	-	4.02	-70.16	9.86	-60.30	-35.3
8040.00	H	118	9	4.02	-54.77	12.09	-42.68	-17.7
10720.00	V	301	175	4.02	-54.80	12.29	-42.51	-17.5
13400.00	H	-	-	4.02	-63.30	13.34	-49.96	-25.0
16080.00	H	-	-	4.02	-59.73	12.44	-47.29	-22.3

Table 7-15. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 74 of 82

7.7 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/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 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/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

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 75 of 82

Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY: 831,500,000 Hz
 CHANNEL: 26865
 REFERENCE VOLTAGE: 3.80 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20	831,499,995	-5	-0.0000006
100 %		- 30	831,500,004	4	0.0000005
100 %		- 20	831,499,996	-4	-0.0000005
100 %		- 10	831,499,997	-3	-0.0000004
100 %		0	831,500,003	3	0.0000004
100 %		+ 10	831,500,004	4	0.0000004
100 %		+ 20	831,500,004	4	0.0000005
100 %		+ 30	831,500,004	4	0.0000005
100 %		+ 40	831,500,004	4	0.0000005
100 %		+ 50	831,500,004	4	0.0000005
BATT. ENDPOINT	3.40	+ 20	831,499,995	-5	-0.0000006

Table 7-16. Frequency Stability Data (Band 26/5)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 76 of 82

Band 26/5 Frequency Stability Measurements

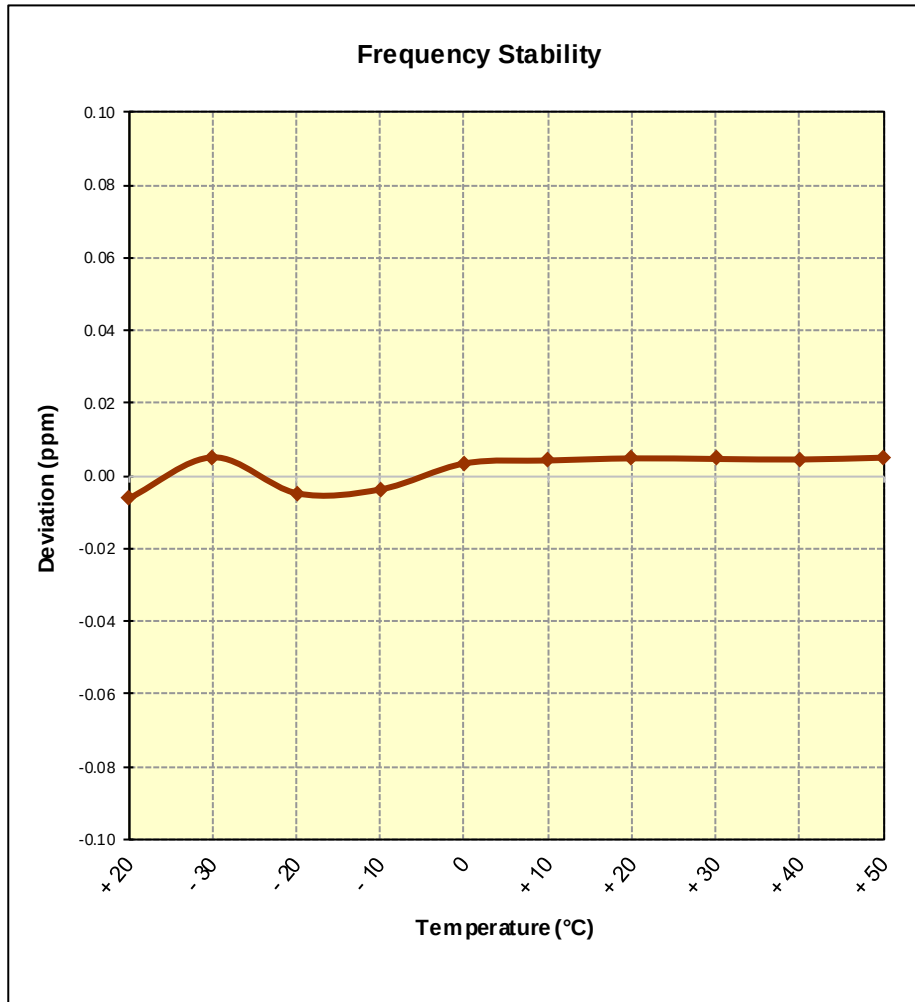


Figure 7-6. Frequency Stability Graph (Band 26/5)

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 77 of 82

Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz
 CHANNEL: 21100
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20	2,535,000,013	13	0.0000005
100 %		- 30	2,535,000,015	15	0.0000006
100 %		- 20	2,535,000,010	10	0.0000004
100 %		- 10	2,535,000,019	19	0.0000007
100 %		0	2,535,000,017	17	0.0000007
100 %		+ 10	2,535,000,018	18	0.0000007
100 %		+ 20	2,535,000,018	18	0.0000007
100 %		+ 30	2,535,000,018	18	0.0000007
100 %		+ 40	2,535,000,021	21	0.0000008
100 %		+ 50	2,535,000,012	12	0.0000005
BATT. ENDPOINT	3.40	+ 20	2,535,000,012	12	0.0000005

Table 7-17. Frequency Stability Data (Band 7)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 78 of 82

Band 7 Frequency Stability Measurements

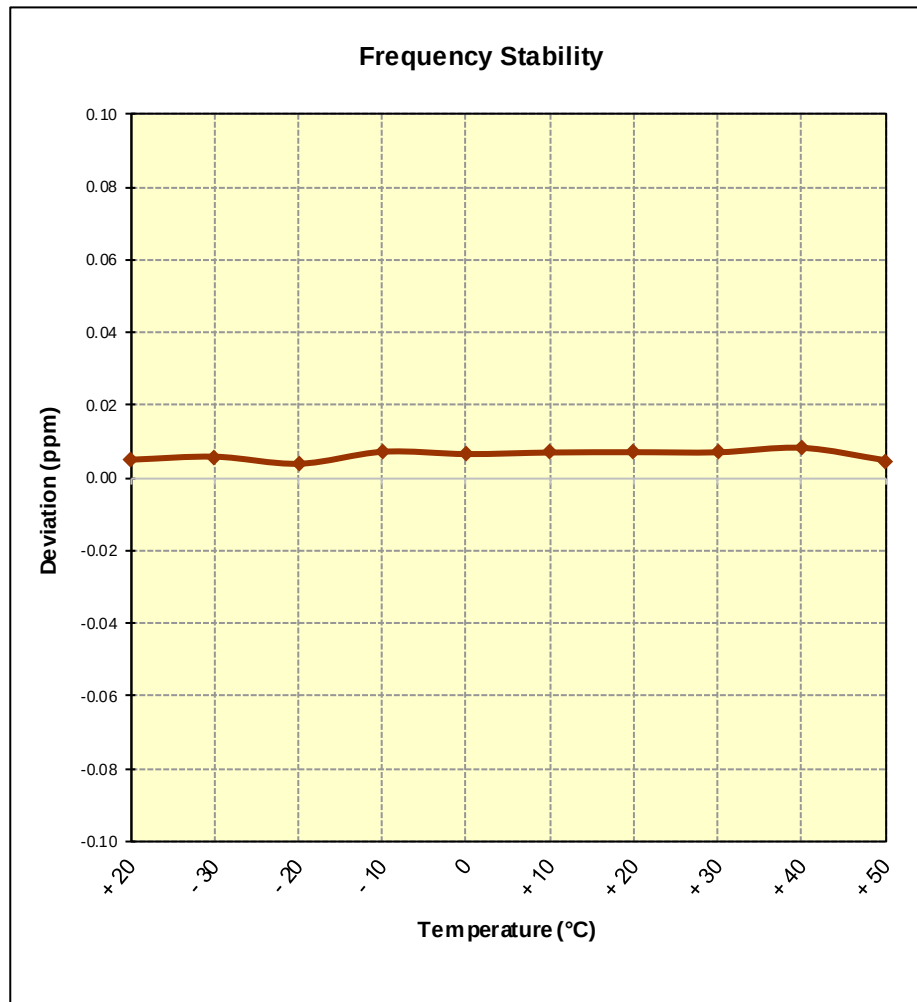


Figure 7-7. Frequency Stability Graph (Band 7)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 79 of 82

Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz
 CHANNEL: 40620
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20	2,593,000,026	26	0.0000010
100 %		- 30	2,593,000,020	20	0.0000008
100 %		- 20	2,593,000,026	26	0.0000010
100 %		- 10	2,593,000,025	25	0.0000010
100 %		0	2,593,000,028	28	0.0000011
100 %		+ 10	2,593,000,026	26	0.0000010
100 %		+ 20	2,593,000,031	31	0.0000012
100 %		+ 30	2,593,000,030	30	0.0000012
100 %		+ 40	2,593,000,028	28	0.0000011
100 %		+ 50	2,593,000,022	22	0.0000008
BATT. ENDPOINT	3.40	+ 20	2,593,000,027	27	0.0000011

Table 7-18. Frequency Stability Data (Band 41)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 80 of 82

Band 41 Frequency Stability Measurements

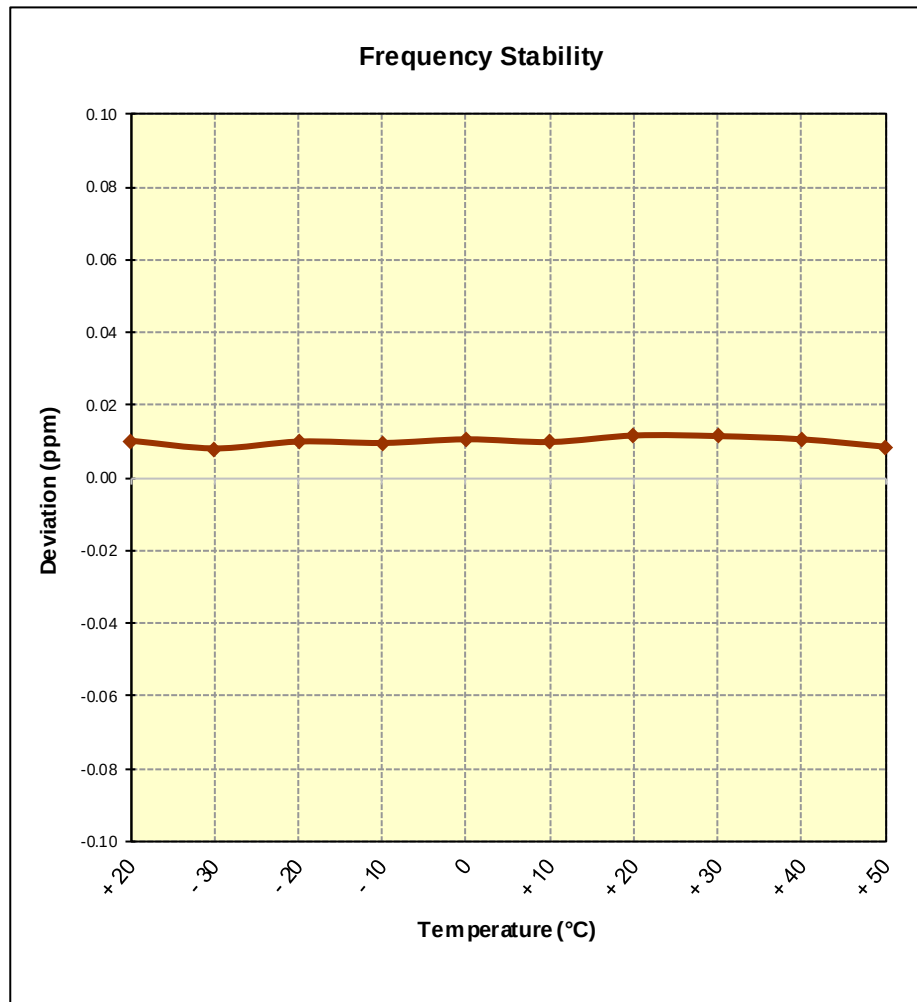


Figure 7-8. Frequency Stability Graph (Band 41)

FCC ID: BCG-A2007	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 81 of 82

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Apple Watch** **FCC ID: BCG-A2007** complies with all the requirements of Part 22 & 27 of the FCC Rules for LTE operation only.

FCC ID: BCG-A2007	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806040009-03-R1.BCG	Test Dates: 5/25 - 8/18/2018	EUT Type: Watch	Page 82 of 82