

RF TEST REPORT



Report No.: FCC_RF_SL18040301-SPC-002-LAA
Supersede Report No.:

| | | |
|---|-----|--|
| Applicant | : | SpiderCloud Wireless, Inc. |
| Product Name | : | SpiderCloud Radio Node |
| Model No. | : | SCRN-320-0246 |
| Test Standard | : | 47 CFR 15.407 |
| Test Method | : | ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v01r02 |
| FCC ID | : | Y47RN320B246 |
| Dates of test | : | 01/18/2017 - 02/10/2017 |
| Issue Date | : | 04/20/2018 |
| Test Result | : | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Equipment complied with the specification | [X] | |
| Equipment did not comply with the specification | [] | |

This Test Report is Issued Under the Authority of:

| | |
|--|------------------------------|
| Gary Chou | |
| Gary Chou Test Engineer | Chen Ge Engineer Reviewer |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | |

Issued By:
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Accreditations for Conformity Assessment

| Country/Region | Accreditation Body | Scope |
|----------------|------------------------|-----------------------------------|
| USA | FCC, A2LA | EMC, RF/Wireless, Telecom |
| Canada | IC, A2LA, NIST | EMC, RF/Wireless, Telecom |
| Taiwan | BSMI, NCC, NIST | EMC, RF, Telecom, Safety |
| Hong Kong | OFTA, NIST | RF/Wireless, Telecom |
| Australia | NATA, NIST | EMC, RF, Telecom, Safety |
| Korea | KCC/RRA, NIST | EMI, EMS, RF, Telecom, Safety |
| Japan | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom |
| Mexico | NOM, COFETEL, Caniety | Safety, EMC, RF/Wireless, Telecom |
| Europe | A2LA, NIST | EMC, RF, Telecom, Safety |
| Israel | MOC, NIST | EMC, RF, Telecom, Safety |

Accreditations for Product Certifications

| Country | Accreditation Body | Scope |
|-----------|--------------------|---------------------------------------|
| USA | FCC TCB, NIST | EMC, RF, Telecom |
| Canada | IC FCB, NIST | EMC, RF, Telecom |
| Singapore | iDA, NIST | EMC, RF, Telecom |
| EU | NB | EMC & Radio Equipment Directive (RED) |
| Japan | MIC (RCB 208) | RF, Telecom |
| Hong Kong | OFTA (US002) | RF, Telecom |

CONTENTS

| | |
|---|-----------|
| 1 REPORT REVISION HISTORY | 4 |
| 2 EXECUTIVE SUMMARY..... | 5 |
| 3 CUSTOMER INFORMATION | 5 |
| 4 TEST SITE INFORMATION | 5 |
| 5 MODIFICATION..... | 5 |
| 6 EUT INFORMATION | 6 |
| 6.1 EUT Description | 6 |
| 6.2 Radio Description | 6 |
| 7 SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION..... | 8 |
| 7.1 Supporting Equipment | 8 |
| 7.2 Cabling Description | 8 |
| 7.3 Test Software Description | 8 |
| 8 TEST SUMMARY..... | 9 |
| 9 MEASUREMENT UNCERTAINTY | 10 |
| 9.1 Conducted Emissions | 10 |
| 9.2 Radiated Emissions (30MHz to 1GHz)..... | 10 |
| 9.3 Radiated Emissions (1GHz to 40GHz)..... | 11 |
| 9.4 RF conducted measurement..... | 11 |
| 10 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS | 12 |
| 10.1 Conducted Emissions | 12 |
| 10.2 26 dB Bandwidth & 6 dB Bandwidth..... | 15 |
| 10.3 Output Power | 23 |
| 10.4 Peak Spectral Density | 37 |
| 10.5 Band Edge and Emission Mask Measurement | 51 |
| 10.6 Radiated Emissions below 1GHz..... | 60 |
| 10.7 Radiated Spurious Emissions above 1GHz..... | 62 |
| ANNEX A. TEST INSTRUMENT | 66 |
| ANNEX B. SIEMIC ACCREDITATION | 67 |

1 Report Revision History

| Report No. | Report Version | Description | Issue Date |
|-------------------------------|----------------|-------------|------------|
| FCC_RF_SI18040301-SPC-002-LAA | None | Original | 04/20/2018 |
| | | | |
| | | | |
| | | | |
| | | | |

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: SpiderCloud Wireless, Inc.
Product: SpiderCloud Radio Node
Model: SCRN-320-0246

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

| | | |
|----------------------|---|--|
| Applicant Name | : | SpiderCloud Wireless |
| Applicant Address | : | 475 Sycamore Dr, Milpitas, CA, 95035, USA |
| Manufacturer Name | : | Sanmina-SCI Systems de Mexico SA de CV |
| Manufacturer Address | : | Carretera Chapala-Guadalajara 45640 Tlajomulco de Zuniga, Jalisco, Mexico |

4 Test site information

| | |
|----------------------|---|
| Lab performing tests | SIEMIC Laboratories |
| Lab Address | 775 Montague Expressway, Milpitas, CA 95035 |
| FCC Test Site No. | 881796 |
| IC Test Site No. | 4842D-2 |
| VCCI Test Site No. | A0133 |

5 Modification

| Index | Item | Description | Note |
|-------|------|-------------|------|
| - | - | - | - |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

6 EUT Information

6.1 EUT Description

| | |
|---------------------------|------------------------|
| Product Name | SpiderCloud Radio Node |
| Model No. | SCRN-320-0246 |
| Trade Name | SpiderCloud |
| Serial No. | 16298X25436 |
| Input Power | 56VDC (PoE) |
| Power Adapter Manu/Model | PHIHONG/POE36U-1AT-R |
| Power Adapter SN | N/A |
| Date of EUT received | 01/13/2017 |
| Equipment Class/ Category | UNII |
| Port/Connectors | PoE, Ethernet |

6.2 Radio Description

| | |
|------------------------|------------------------------|
| Radio Type | LAA/LTE-U |
| Operating Frequency | 5160-5240MHz 5735-5825MHz |
| Modulation | QPSK, 16QAM, 64QAM |
| Channel Spacing | 20MHz |
| Number of Channels | 10 |
| Antenna Type | Internal Omni PCB Antenna |
| Antenna Gain (Peak) | 2dBi |
| Antenna Connector Type | U.FL |
| Note | N/A |

EUT Power level setting

| Mode | Frequency | Power Setting |
|-------|-----------|---------------|
| QPSK | 5160 | 26 |
| | 5200 | 26 |
| | 5240 | 26 |
| 64QAM | 5160 | 26 |
| | 5200 | 26 |
| | 5240 | 26 |
| QPSK | 5735 | 26 |
| | 5785 | 26 |
| | 5825 | 26 |
| 64QAM | 5735 | 26 |
| | 5785 | 26 |
| | 5825 | 26 |

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

| Item | Supporting Equipment Description | Model | Serial Number | Manufacturer | Note |
|------|----------------------------------|--------------|---------------|--------------|------|
| 1 | 10MHz Clock | OX200-SC | 141871594391 | Metric Test | - |
| 2 | POE | POE36U-1AT-R | N/A | PHIHONG | - |
| | | | | | |

7.2 Cabling Description

| Name | Connection Start | | Connection Stop | | Length / shielding Info | | Note |
|------|------------------|----------|-----------------|----------|-------------------------|------------|------|
| | From | I/O Port | To | I/O Port | Length (m) | Shielding | |
| RJ45 | EUT | RJ45 | POE | RJ45 | 2 | Unshielded | - |
| RJ45 | POE | RJ45 | Laptop | RJ45 | 3 | Unshielded | - |

7.3 Test Software Description

| Test Item | Software | Description |
|------------|---------------|---|
| RF testing | TMciDvtClient | Enable EUT continuous TX mode and change to different channel |
| | | |
| | | |

8 Test Summary

| Test Item | Test standard | | Test Method/Procedure | Pass / Fail |
|--------------------------------|---------------|--|---|--|
| Restricted Band of Operation | FCC | | ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01r02 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| AC Conducted Emissions Voltage | FCC | | ANSI C63.4 – 2014 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |

| Test Item | Test standard | | Test Method/Procedure | Pass / Fail |
|---|---|--|----------------------------------|--|
| 26 & 6 dB Emission Bandwidth | FCC | | 15.407 (a) (1) 15.407 (a) (3) | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Maximum conducted Output Power | FCC | | 15.407 (a) (1) 15.407 (a) (3) | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Power reduction (Antenna Gain > 6 dBi) | FCC | | 15.407 (a) (1) 15.407 (a) (3) | <input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A |
| Band Edge and Radiated Spurious Emissions | FCC | | 15.407(b)(1), 15.407(b)(6) | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Emission Mask | FCC | | 15.407(b)(4) 15.407(b)(6) | 789033 D02 General UNII Test Procedures New Rules v01r02 |
| Power Spectral Density | FCC | | 15.407 (a) (1) 15.407 (a) (3) | 789033 D02 General UNII Test Procedures New Rules v01r02 |
| Frequency Stability | FCC | | 15.407 (g) | 789033 D02 General UNII Test Procedures New Rules v01r02 |
| Transmit Power Control (TPC) | FCC | | 15.407 (h)(1) | 789033 D02 General UNII Test Procedures New Rules v01r02 |
| User Manual | FCC | | - | - |
| Remark | 1. All measurement uncertainties are not taken into consideration for all presented test result. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. | | | |

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|-----------------------------------|------------|--------------------------|----------|-------------------------|----------------------|
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.069284 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.125 |
| LISN Insertion Loss | 0.40 | Normal | 2 | 1 | 0.20 |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 |
| Mismatch LISN - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| LISN Impedance | 2.5 | Triangular | 2.449 | 1 | 1.0208248 |
| Combined Standard Uncertainty | | | | | 1.928133 |
| Expanded Uncertainty (K=2) | | | | | 3.856266 |

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|-----------------------------------|------------|--------------------------|----------|-------------------------|----------------------|
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.069284 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.125 |
| Antenna Factor | 0.65 | Normal | 2 | 1 | 0.325 |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 |
| Mismatch Filter - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| NSA Calibration | 4.0 | U-Shape | 1.414 | 1 | 2.8288543 |
| Combined Standard Uncertainty | | | | | 3.0059131 |
| Expanded Uncertainty (K=2) | | | | | 6.0118262 |

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|-----------------------------------|------------|--------------------------|----------|-------------------------|----------------------|
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.0692840 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.1050000 |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.1250000 |
| Antenna Factor | 0.65 | Normal | 2 | 1 | 0.3250000 |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.8660508 |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.8660508 |
| Mismatch Filter - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| VSWR Calibration | 2.0 | U-Shape | 1.414 | 1 | 1.4144272 |
| Combined Standard Uncertainty | | | | | 4.2363 |
| Expanded Uncertainty (K=2) | | | | | 8.4726 |

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|-----------------------------------|------------|--------------------------|----------|-------------------------|----------------------|
| Reference Level | 0.12 | Rectangular | 1.732 | 1 | 0.069284 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 |
| Attenuator | 0.25 | Normal | 2 | 1 | 0.125 |
| Mismatch | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| Combined Standard Uncertainty | | | | | 0.476087 |
| Expanded Uncertainty (K=2) | | | | | 0.952174 |

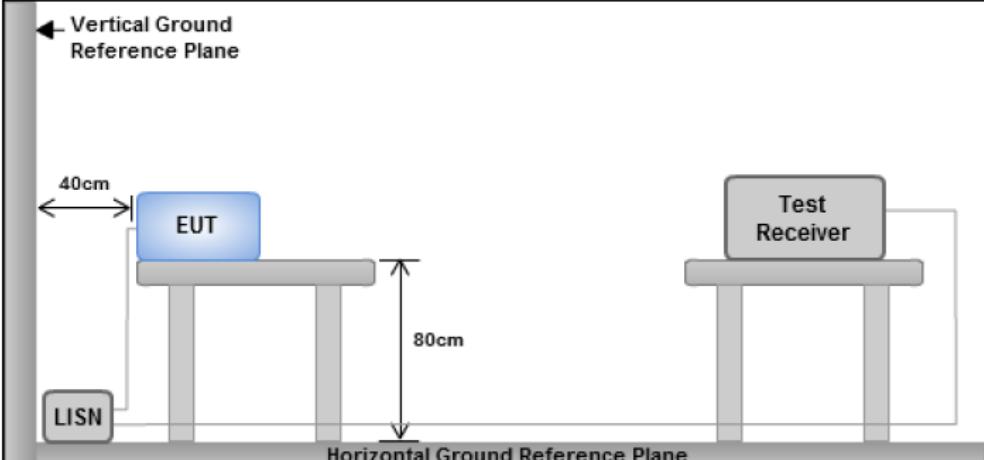
The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 Conducted Emissions

Conducted Emission Limit

| Frequency ranges (MHz) | Limit (dBuV) | |
|---------------------------|--------------|---------|
| | QP | Average |
| 0.15 ~ 0.5 | 66 – 56 | 56 – 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

| Spec | Item | Requirement | Applicable |
|--------------|--|---|---|
| RSS247(A8.1) | a) | For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges. | <input checked="" type="checkbox"/> |
| Test Setup | |  <p>Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</p> | |
| Procedure | | | <ul style="list-style-type: none"> - The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply. |
| Remark | EUT was tested at 120VAC, 60Hz | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

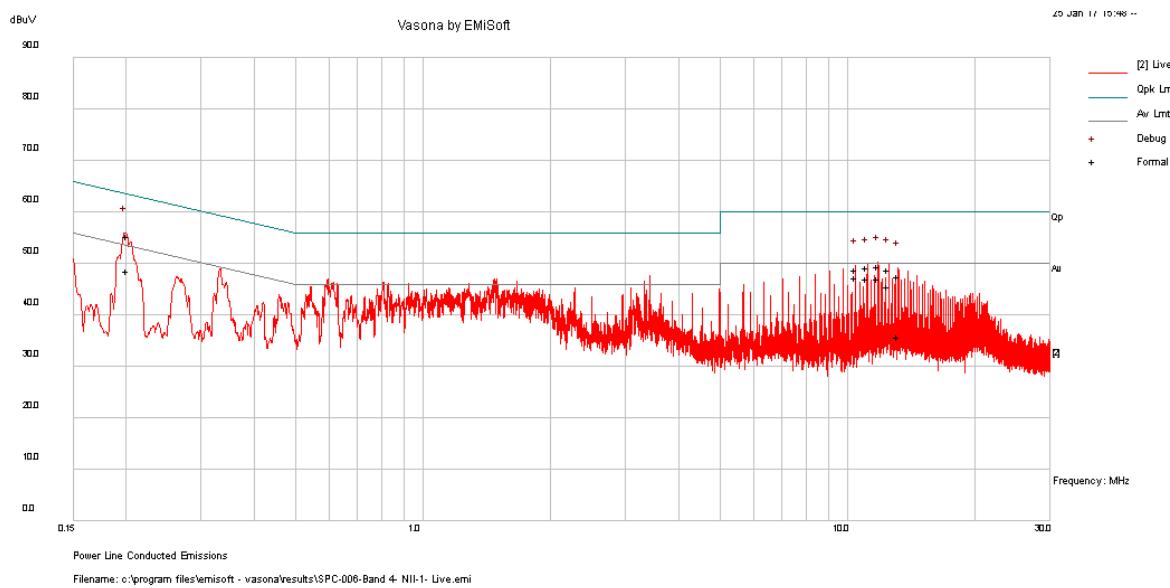
Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Gary Chou at Conducted Emission test site.

Conducted Emission Test Results

| Test specification: | Conducted Emissions | | |
|---------------------------|---------------------|--------------|--|
| Environmental Conditions: | Temp(°C): | 21 | Result: <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| | Humidity (%): | 42 | |
| | Atmospheric(mbar): | 1021 | |
| | Mains Power: | 120Vac, 60Hz | |
| Tested by: | Gary Chou | | |
| Test Date: | 01/25/2017 | | |
| Remarks | POE, Line | | |

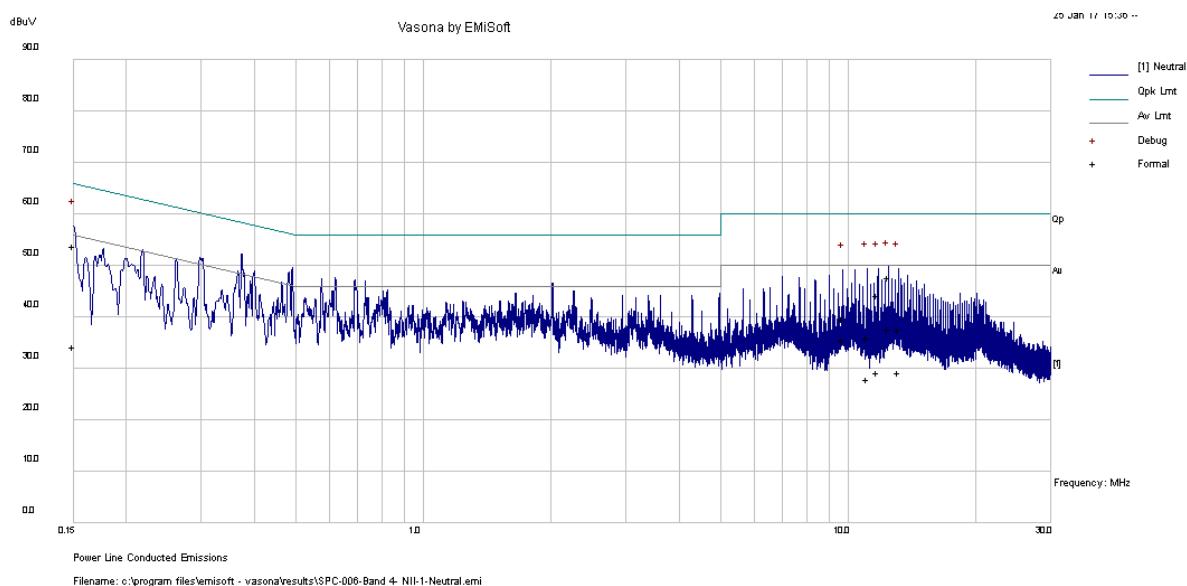


Line Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line / Neutral | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|----------------|--------------|-------------|------------|
| 11.81 | 38.92 | 10.05 | 0.53 | 49.51 | Quasi Peak | Live | 60 | -10.49 | Pass |
| 0.20 | 44.03 | 10 | 1.25 | 55.28 | Quasi Peak | Live | 63.59 | -8.31 | Pass |
| 11.13 | 38.65 | 10.05 | 0.52 | 49.22 | Quasi Peak | Live | 60 | -10.78 | Pass |
| 12.50 | 38.36 | 10.05 | 0.54 | 48.95 | Quasi Peak | Live | 60 | -11.05 | Pass |
| 10.45 | 38.32 | 10.05 | 0.52 | 48.89 | Quasi Peak | Live | 60 | -11.11 | Pass |
| 13.18 | 37.01 | 10.06 | 0.54 | 47.61 | Quasi Peak | Live | 60 | -12.39 | Pass |
| 11.81 | 36.44 | 10.05 | 0.53 | 47.03 | Average | Live | 50 | -2.97 | Pass |
| 0.20 | 37.37 | 10 | 1.25 | 48.62 | Average | Live | 53.59 | -4.97 | Pass |
| 11.13 | 36.56 | 10.05 | 0.52 | 47.13 | Average | Live | 50 | -2.87 | Pass |
| 12.50 | 35.06 | 10.05 | 0.54 | 45.65 | Average | Live | 50 | -4.35 | Pass |
| 10.45 | 36.85 | 10.05 | 0.52 | 47.42 | Average | Live | 50 | -2.58 | Pass |
| 13.18 | 25.19 | 10.06 | 0.54 | 35.79 | Average | Live | 50 | -14.21 | Pass |

Conducted Emission Test Results

| Test specification: | Conducted Emissions | | |
|---------------------------|---------------------|------|--|
| Environmental Conditions: | Temp(°C): | 21 | Result: <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| | Humidity (%): | 42 | |
| | Atmospheric(mbar): | 1021 | |
| Mains Power: | 120Vac, 60Hz | | |
| Tested by: | Gary Chou | | |
| Test Date: | 01/25/2017 | | |
| Remarks | POE, Neutral | | |

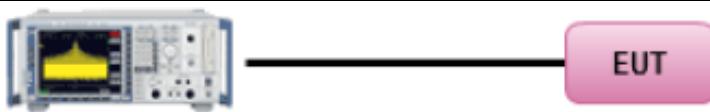


Neutral Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line / Neutral | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|----------------|--------------|-------------|------------|
| 0.15 | 42.18 | 10 | 1.74 | 53.93 | Quasi Peak | Neutral | 66 | -12.07 | Pass |
| 12.44 | 37.17 | 10.05 | 0.54 | 47.76 | Quasi Peak | Neutral | 60 | -12.24 | Pass |
| 11.76 | 33.65 | 10.05 | 0.53 | 44.23 | Quasi Peak | Neutral | 60 | -15.77 | Pass |
| 13.12 | 26.95 | 10.06 | 0.54 | 37.55 | Quasi Peak | Neutral | 60 | -22.45 | Pass |
| 11.07 | 25.39 | 10.05 | 0.52 | 35.96 | Quasi Peak | Neutral | 60 | -24.04 | Pass |
| 9.69 | 29.23 | 10.05 | 0.51 | 39.79 | Quasi Peak | Neutral | 60 | -20.21 | Pass |
| 0.15 | 22.65 | 10 | 1.74 | 34.4 | Average | Neutral | 56 | -21.6 | Pass |
| 12.44 | 27.22 | 10.05 | 0.54 | 37.81 | Average | Neutral | 50 | -12.19 | Pass |
| 11.76 | 18.63 | 10.05 | 0.53 | 29.21 | Average | Neutral | 50 | -20.79 | Pass |
| 13.12 | 18.69 | 10.06 | 0.54 | 29.29 | Average | Neutral | 50 | -20.71 | Pass |
| 11.07 | 17.39 | 10.05 | 0.52 | 27.97 | Average | Neutral | 50 | -22.03 | Pass |
| 9.69 | 25.09 | 10.05 | 0.51 | 35.65 | Average | Neutral | 50 | -14.35 | Pass |

10.2 26 dB Bandwidth & 6 dB Bandwidth

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------|---|--|--|
| § 15.407 | - | 26 dB Emission BW: Report only for reference. | <input checked="" type="checkbox"/> |
| | a) (2) | 26 dB Emission BW: Report only for power limit calculation. | <input type="checkbox"/> |
| | e) | Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz. | <input checked="" type="checkbox"/> |
| Test Setup |  Spectrum Analyzer | | |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01r02</p> <p><u>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. <ul style="list-style-type: none"> o Set RBW = around 1% of emission bandwidth o Set VBW > RBW o Detector = Peak o Trace mode = max hold - Capture the plot. - Repeat above steps for different test channel and other modulation type. <p><u>6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 6dB BW. <ul style="list-style-type: none"> o Set RBW = 100 KHz o Set VBW \geq 3 x RBW o Detector = Peak o Trace mode = max hold o Sweep = auto couple - Capture the plot. - Repeat above steps for different test channel and other modulation type. | | |
| Test Date | 01/18/2017 – 02/10/2017 | Environmental condition | Temperature 22°C Relative Humidity 38% Atmospheric Pressure 1020mbar |
| Remark | N/A | | |
| Result | <input checked="" type="checkbox"/> Pass | <input type="checkbox"/> Fail | |

Test Data Yes N/A

Test Plot Yes N/A

Test was done by Chen Ge at RF test site.

26dB Bandwidth measurement result for 5.2GHz

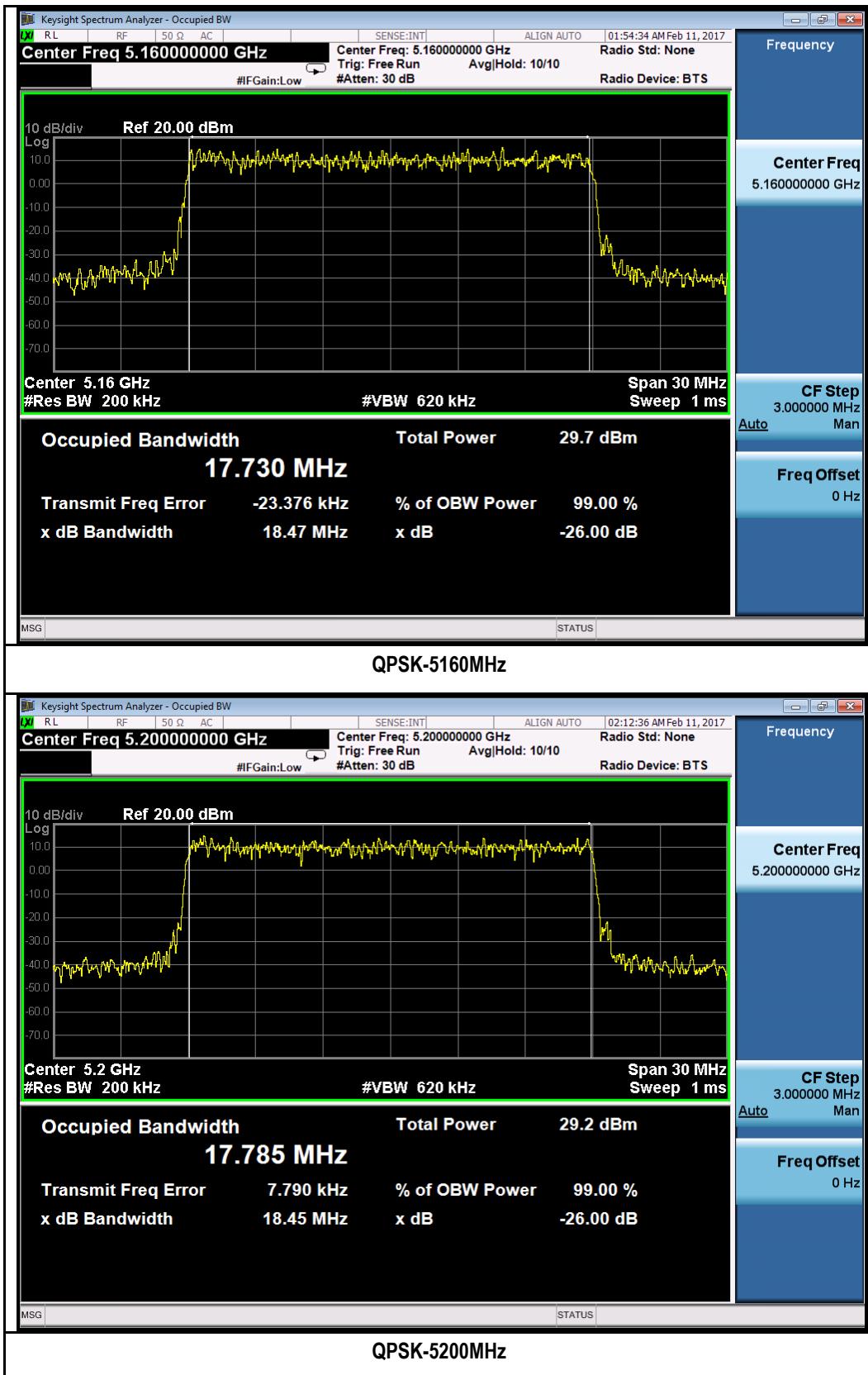
| Type | Test mode | Freq (MHz) | CH | Result (MHz) | Limit (MHz) |
|---------|-----------|------------|------|--------------|-------------|
| 26dB BW | QPSK | 5160 | Low | 18.47 | - |
| | | 5200 | Mid | 18.45 | - |
| | | 5240 | High | 18.43 | - |
| | 64QAM | 5160 | Low | 18.71 | - |
| | | 5200 | Mid | 18.40 | - |
| | | 5240 | High | 18.46 | - |

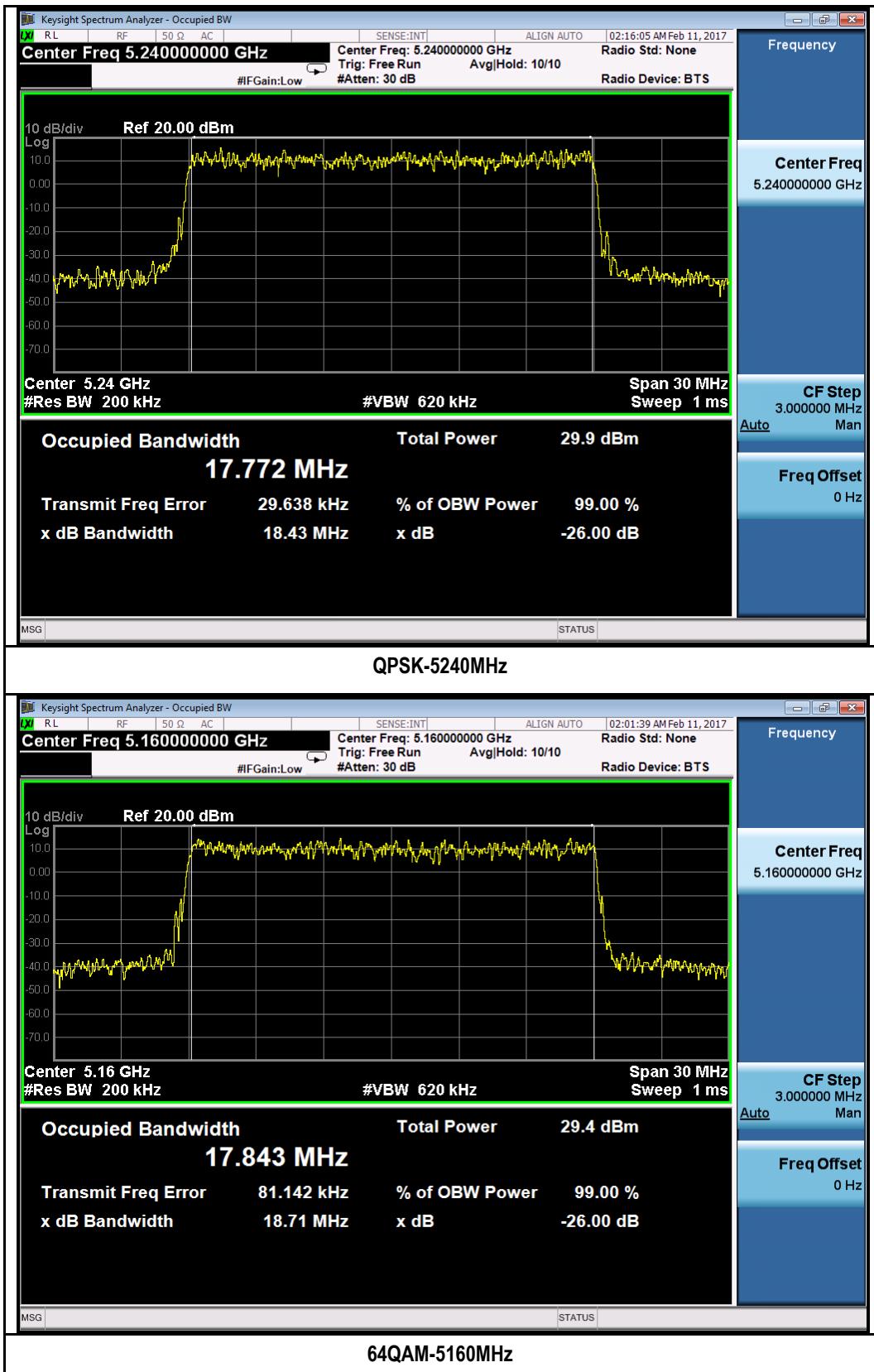
6dB Bandwidth measurement result for 5.8GHz

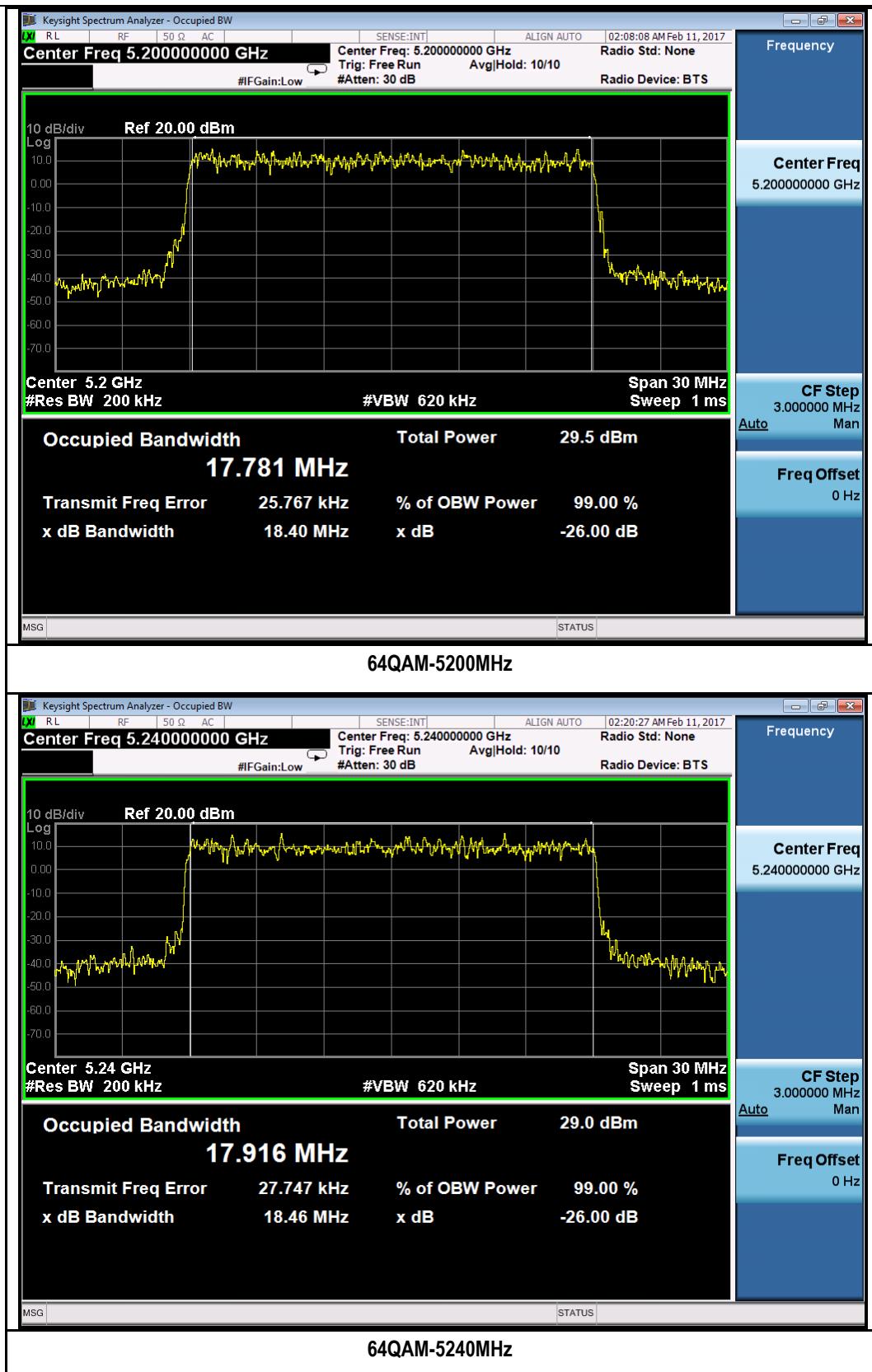
| Type | Test mode | Freq (MHz) | CH | Result (MHz) | Limit (MHz) | Result |
|--------|-----------|------------|------|--------------|-------------|--------|
| 6dB BW | QPSK | 5745 | Low | 17.96 | ≥ 0.5 | Pass |
| | | 5785 | Mid | 17.97 | ≥ 0.5 | Pass |
| | | 5825 | High | 17.99 | ≥ 0.5 | Pass |
| | 64QAM | 5745 | Low | 17.98 | ≥ 0.5 | Pass |
| | | 5785 | Mid | 18.00 | ≥ 0.5 | Pass |
| | | 5825 | High | 17.94 | ≥ 0.5 | Pass |

26dB Bandwidth Test Plots

W52:

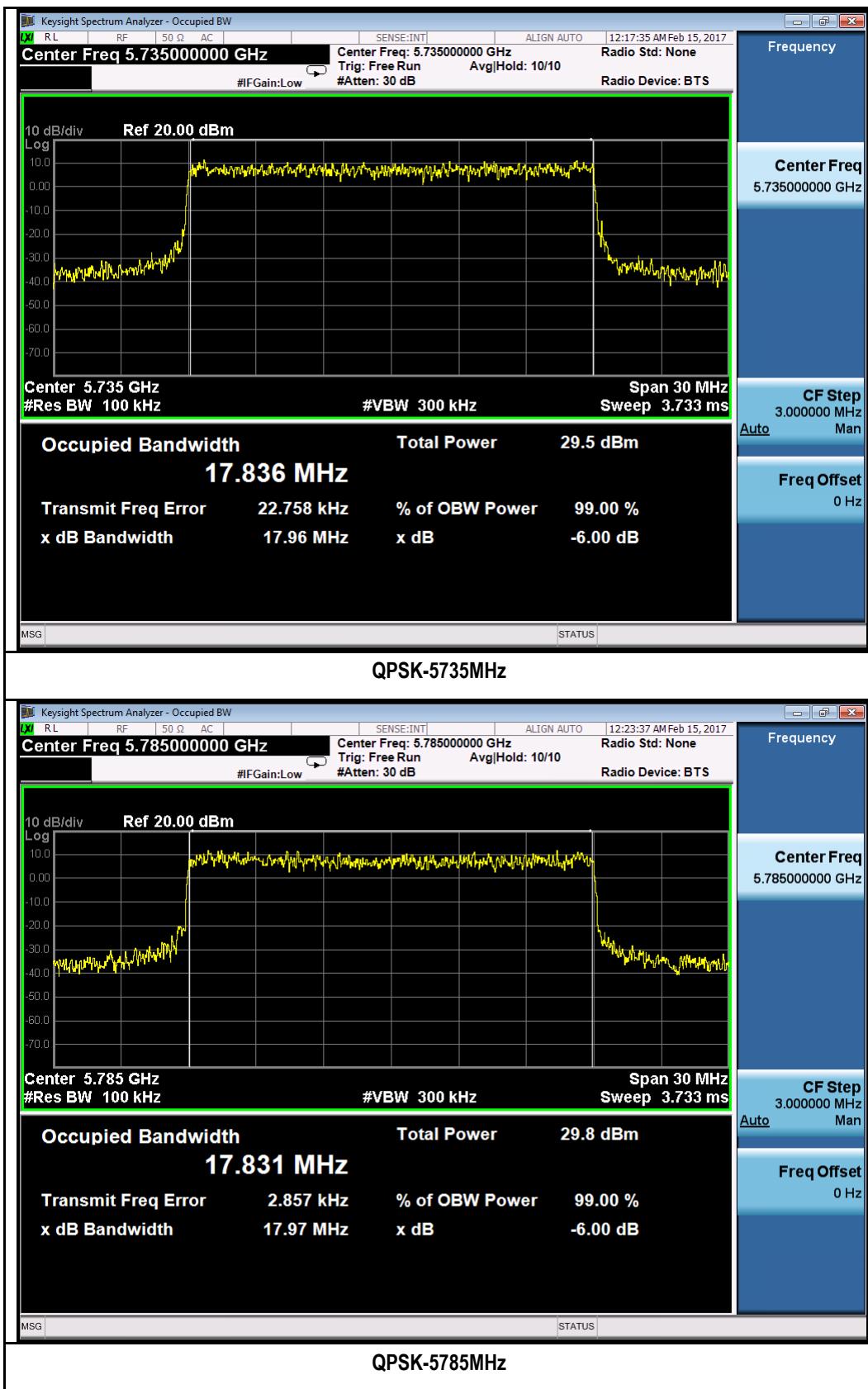


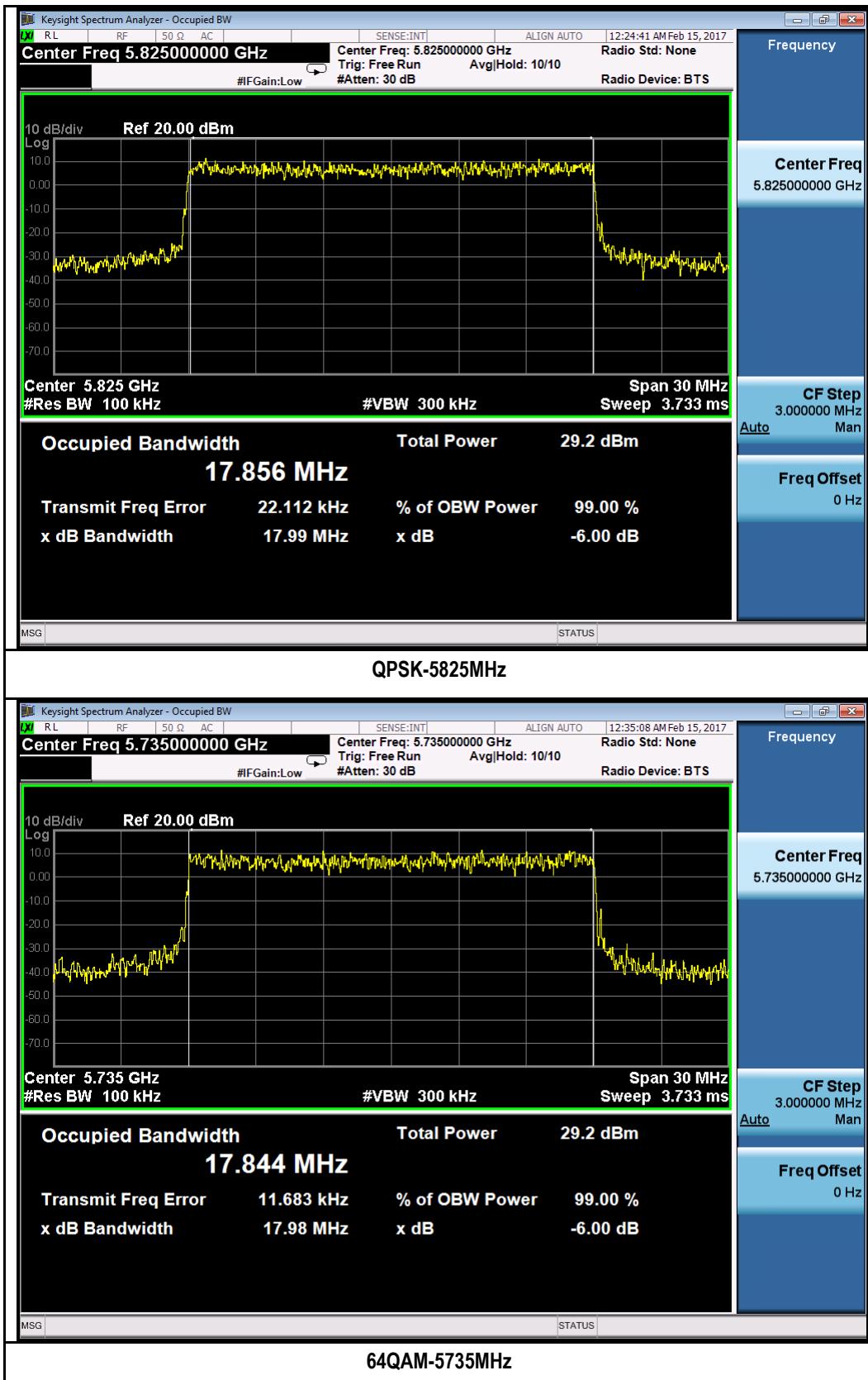


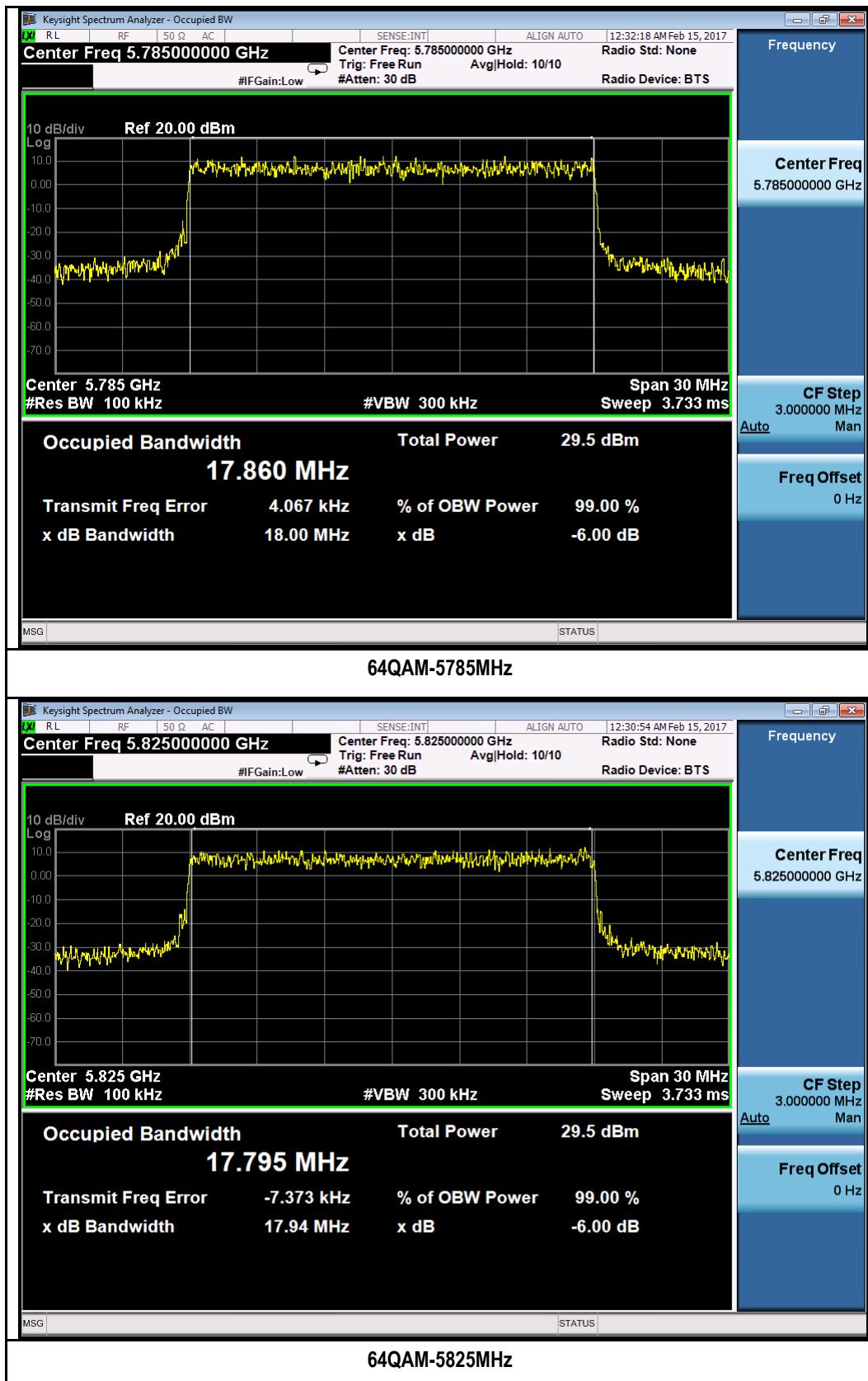


6dB Bandwidth Test Plots

W58:

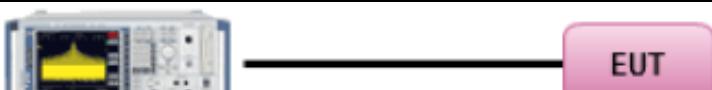






10.3 Output Power

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------|---|---|--|
| § 15.407 | a)(1)(ii) | For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. | <input checked="" type="checkbox"/> |
| | a)(3) | For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. | <input checked="" type="checkbox"/> |
| | a)(1)(i) | The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). | <input checked="" type="checkbox"/> |
| Test Setup |  <p>Spectrum Analyzer</p> | | |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01r02</p> <p><u>Measurement using a Spectrum Analyzer or EMI Receiver (SA)</u></p> <p>Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep):</p> <ul style="list-style-type: none"> (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. (ii) Set RBW = 1 MHz (iii) Set VBW = 3 MHz (iv) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.) (v) Sweep time = auto. (vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode. (vii) If transmit duty cycle $< 98\%$, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run." (viii) Trace average at least 100 traces in power averaging (rms) mode. (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum. | | |
| Test Date | 01/18/2017 – 02/10/2017 | Environmental condition | Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar |
| Remark | Two antennas are used for this band. The highest directional gain of the antenna is 6dBi, no limit adjust is required. | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Chen Ge at RF test site.

Output Power measurement result for 5.2GHz

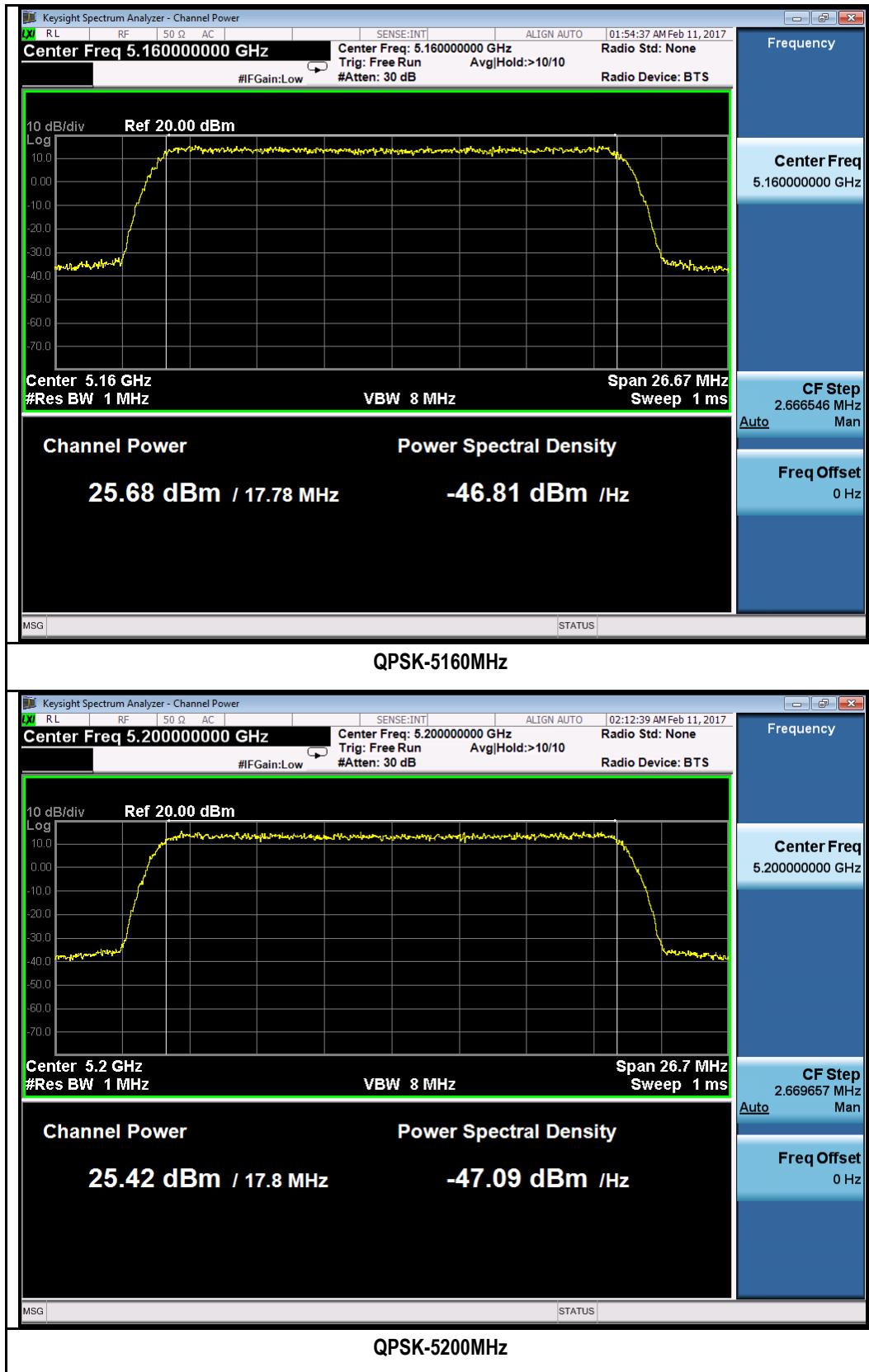
| Type | Test mode | Freq (MHz) | CH | Conducted Power (dBm) | | | Limit (dBm) | Result |
|--------------|-----------|------------|------|-----------------------|---------|----------------|-------------|--------|
| | | | | Chain 1 | Chain 2 | Combined Power | | |
| Output power | QPSK | 5160 | Low | 25.68 | 25.64 | 28.67 | 30 | Pass |
| | | 5200 | Mid | 25.42 | 25.40 | 28.42 | 30 | Pass |
| | | 5240 | High | 25.54 | 25.46 | 28.51 | 30 | Pass |
| | 64QAM | 5160 | Low | 25.74 | 25.81 | 28.79 | 30 | Pass |
| | | 5200 | Mid | 25.38 | 25.36 | 28.38 | 30 | Pass |
| | | 5240 | High | 25.57 | 25.59 | 28.59 | 30 | Pass |

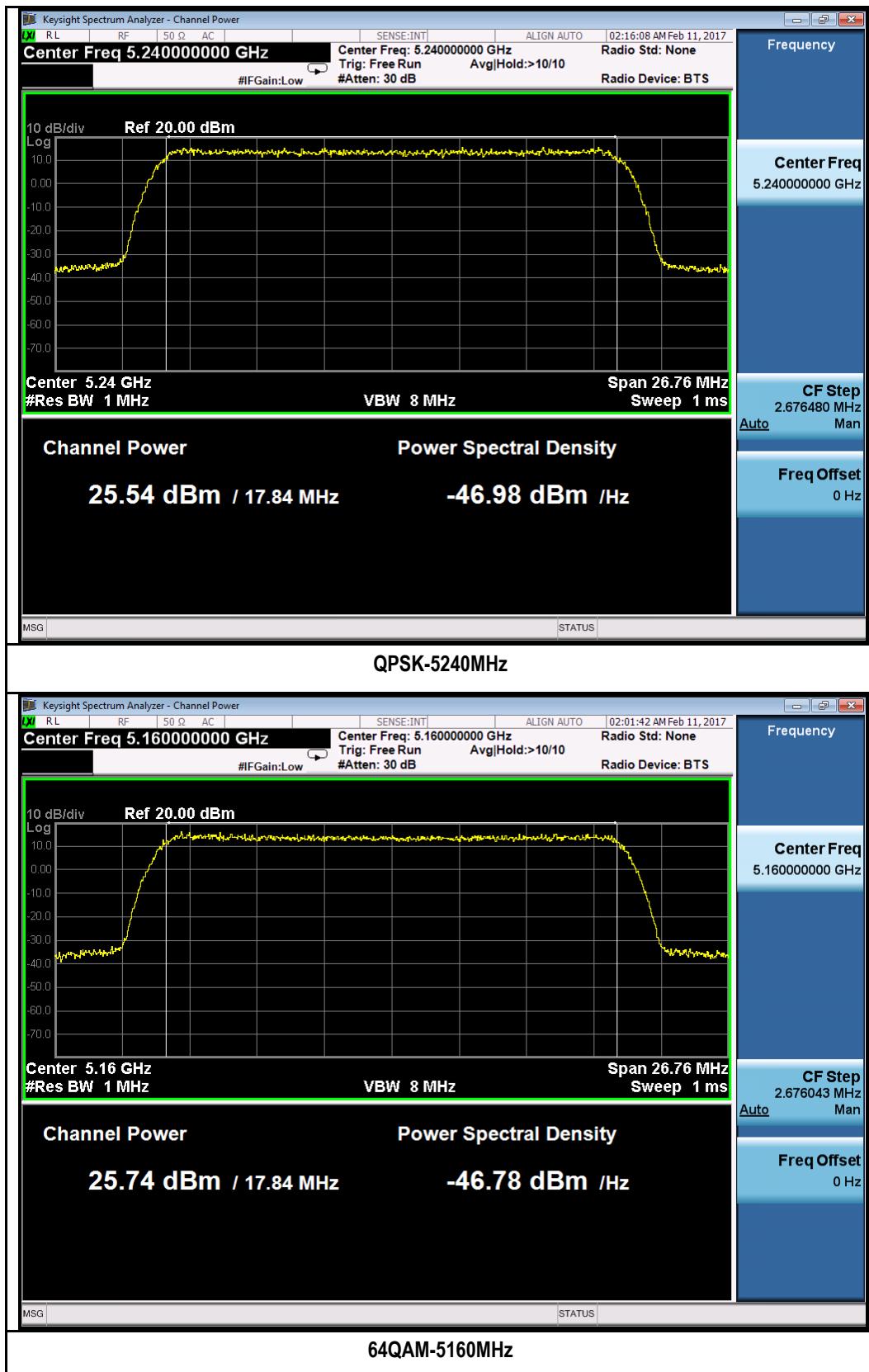
Output Power Measurement Results for 5.8GHz

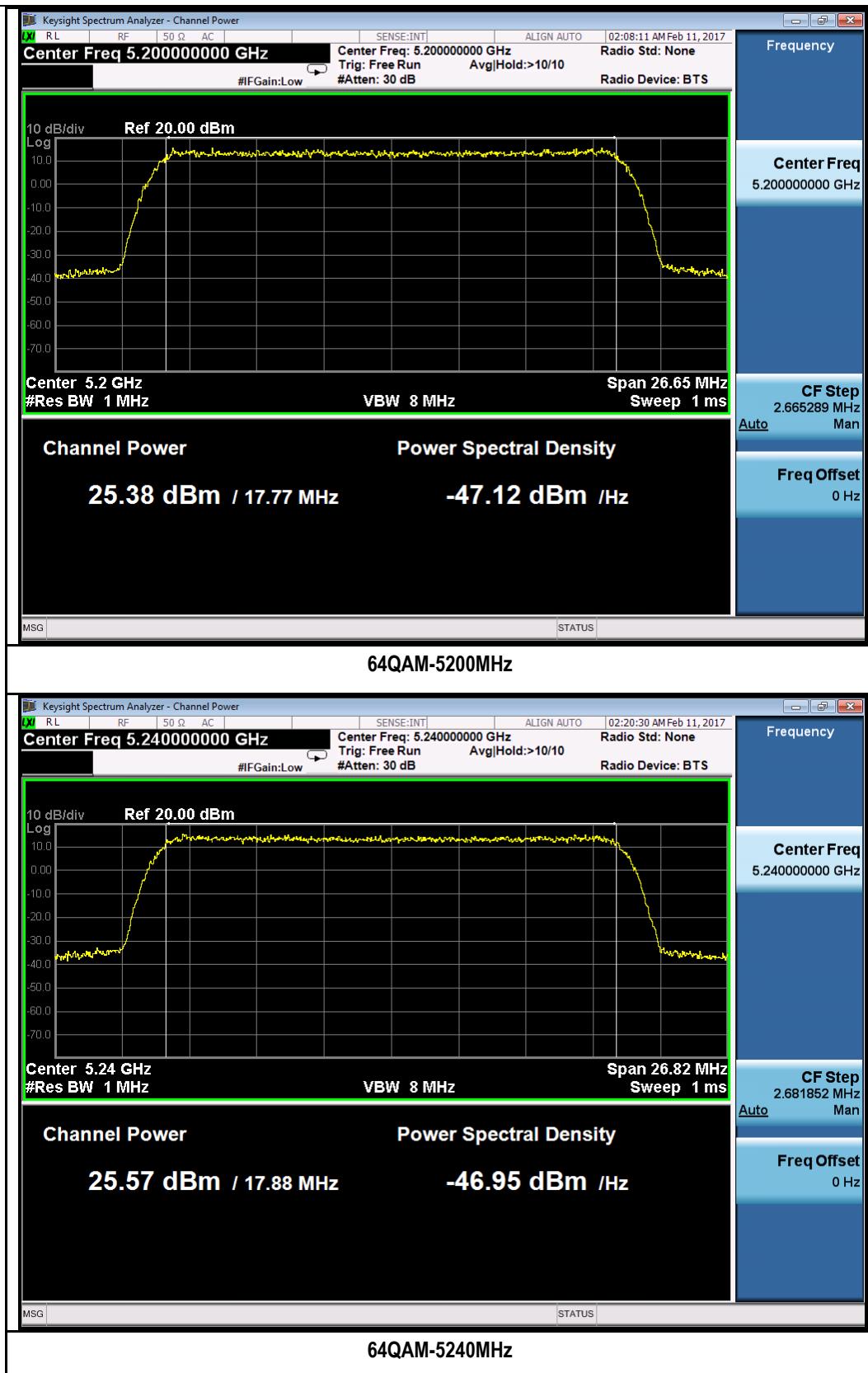
| Type | Test mode | Freq (MHz) | CH | Conducted Power (dBm) | | | Limit (dBm) | Result |
|--------------|-----------|------------|------|-----------------------|---------|----------------|-------------|--------|
| | | | | Chain 1 | Chain 2 | Combined Power | | |
| Output power | QPSK | 5735 | Low | 25.52 | 25.51 | 28.53 | 30 | Pass |
| | | 5785 | Mid | 25.66 | 25.67 | 28.68 | 30 | Pass |
| | | 5825 | High | 25.29 | 25.26 | 28.29 | 30 | Pass |
| | 64QAM | 5735 | Low | 25.74 | 25.68 | 28.72 | 30 | Pass |
| | | 5785 | Mid | 25.74 | 25.71 | 28.74 | 30 | Pass |
| | | 5825 | High | 25.30 | 25.36 | 28.34 | 30 | Pass |

Test Plot for W52:

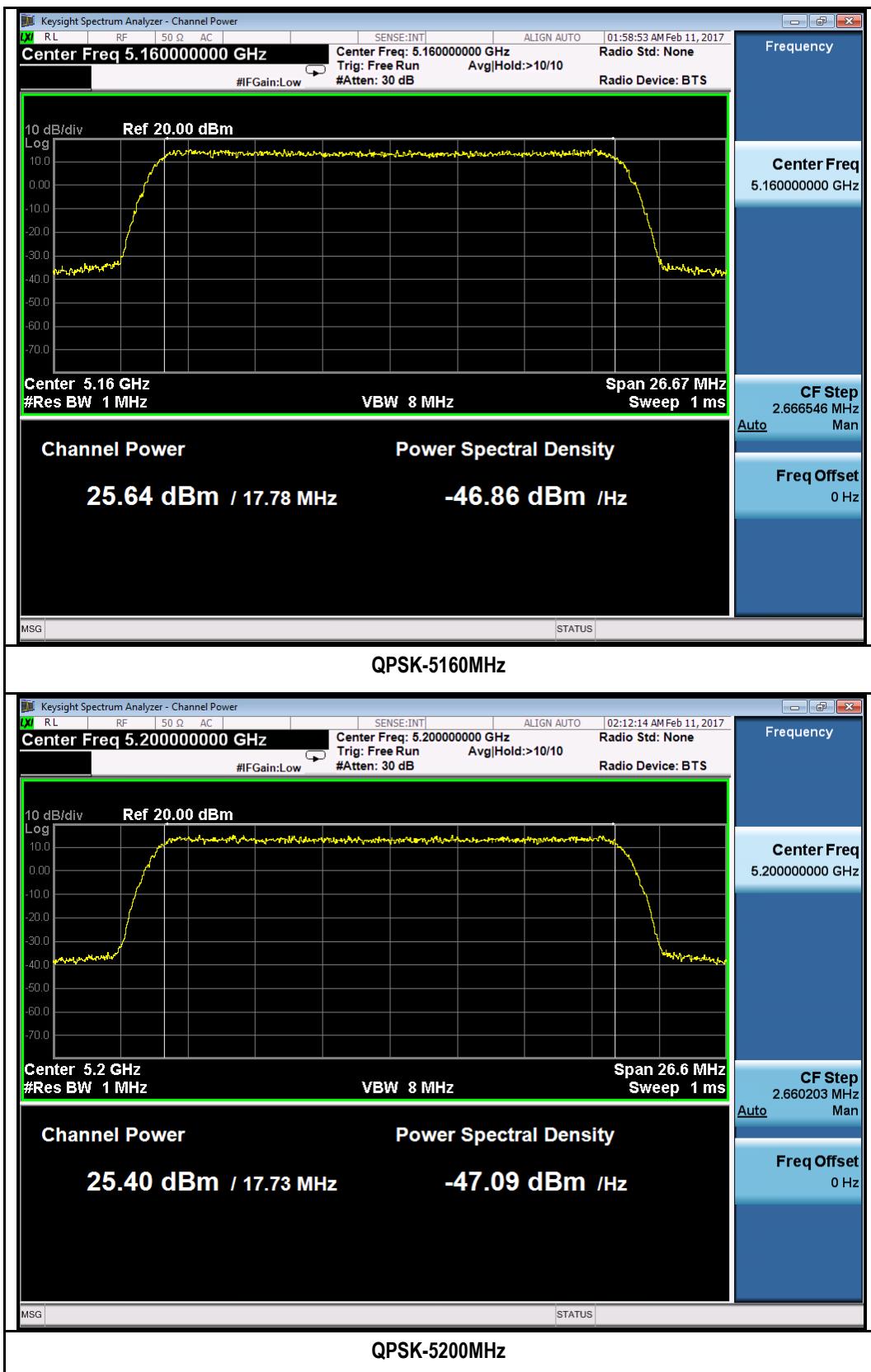
Chain 1:

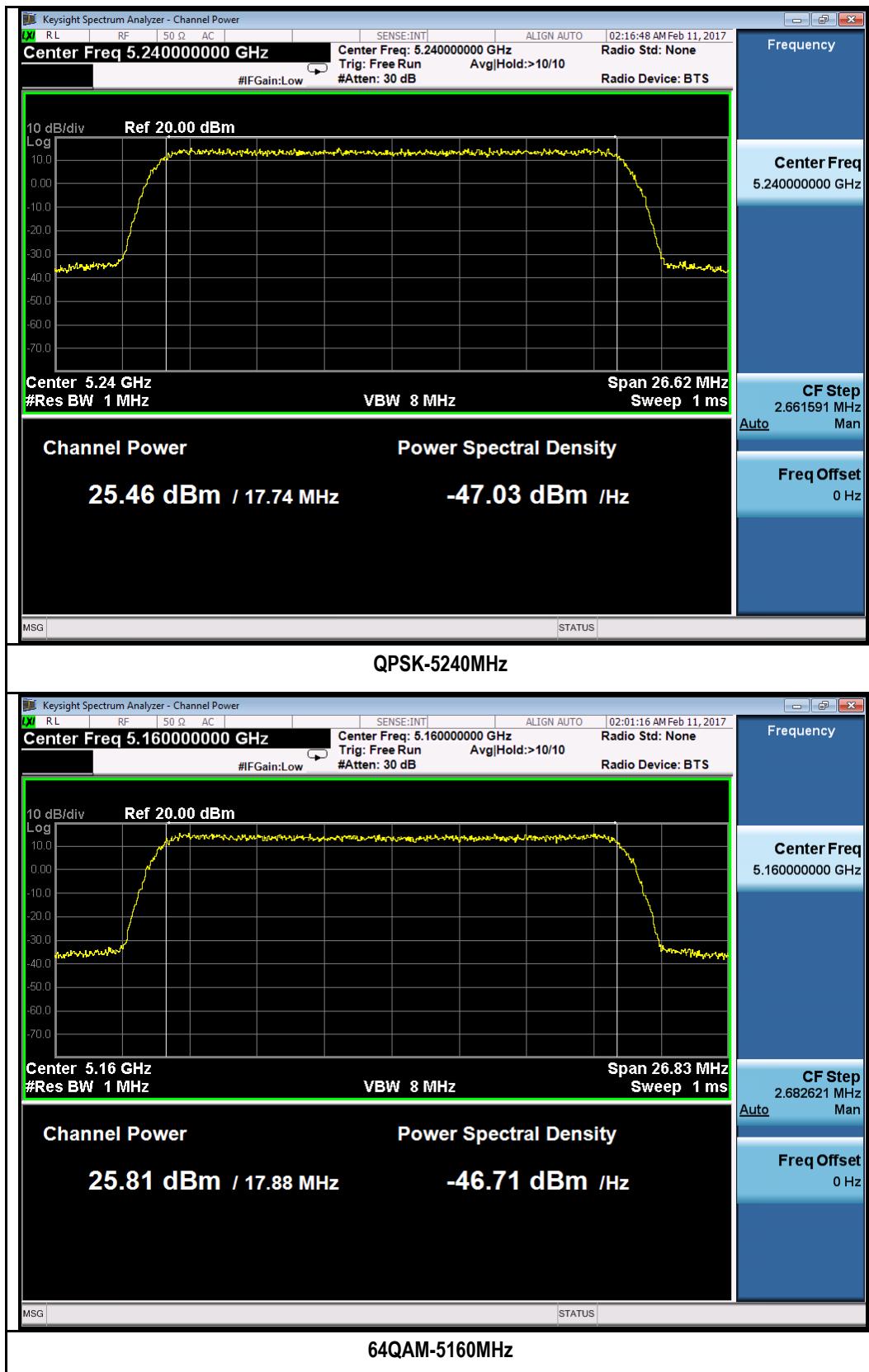


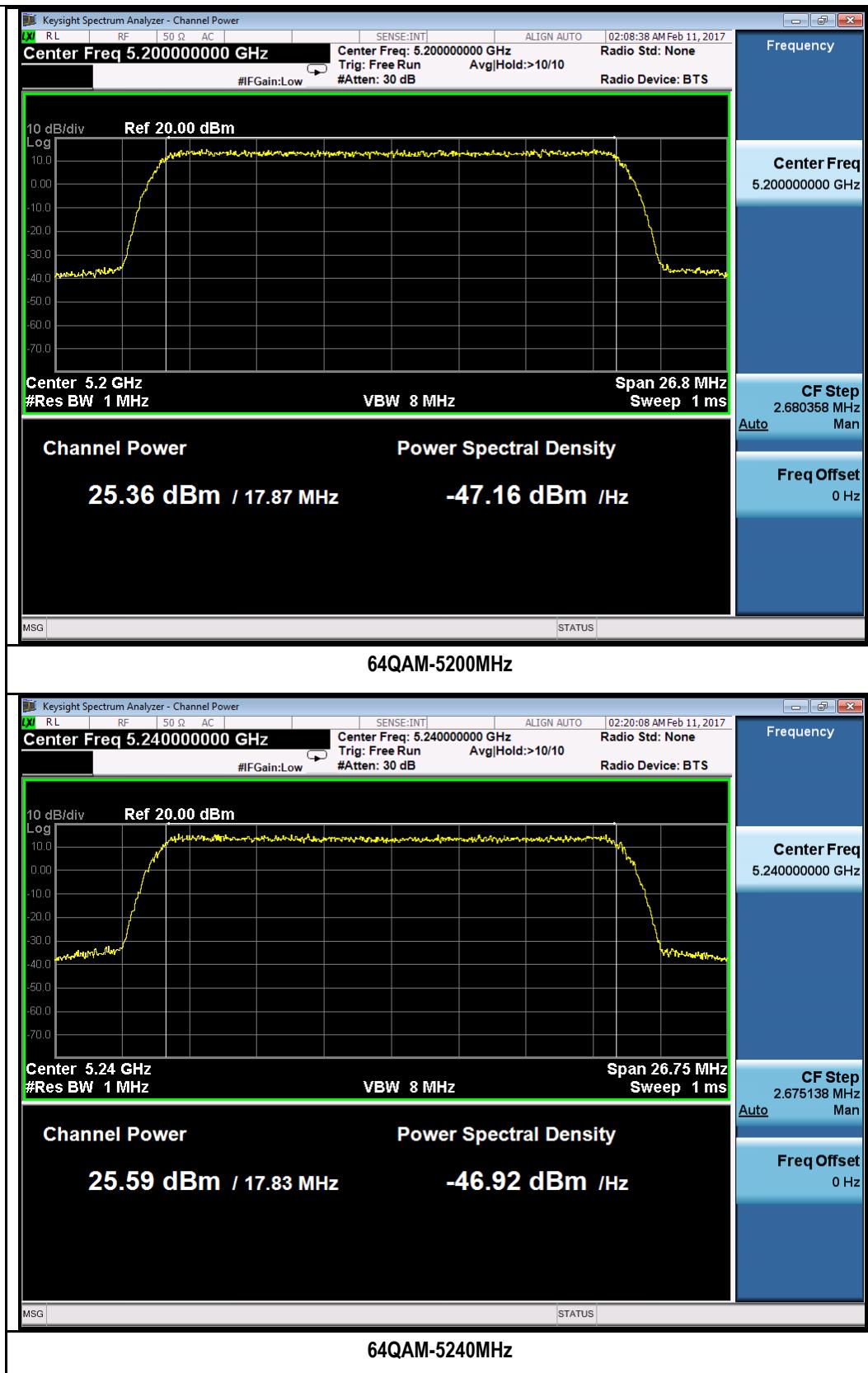




Chain 2:

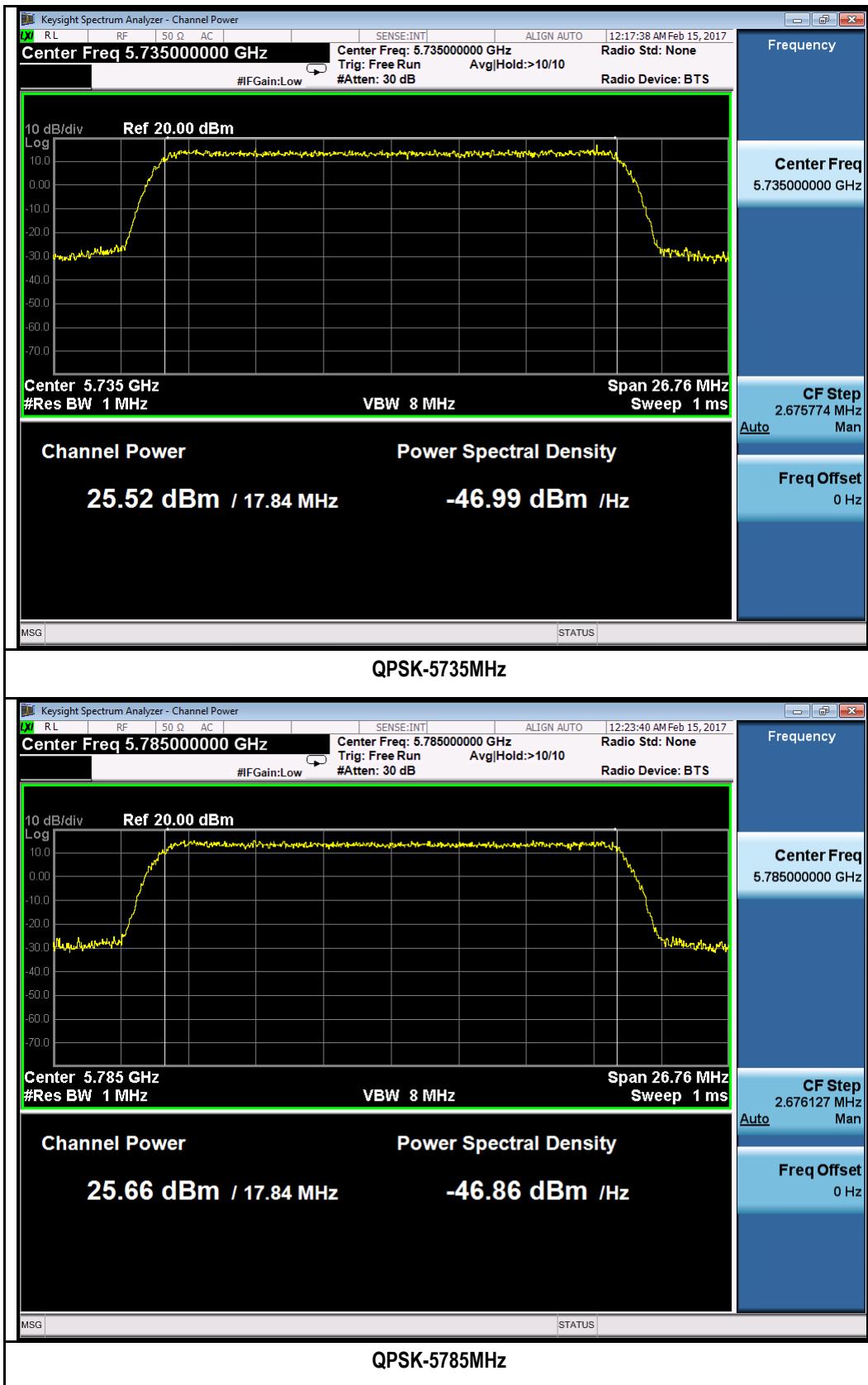


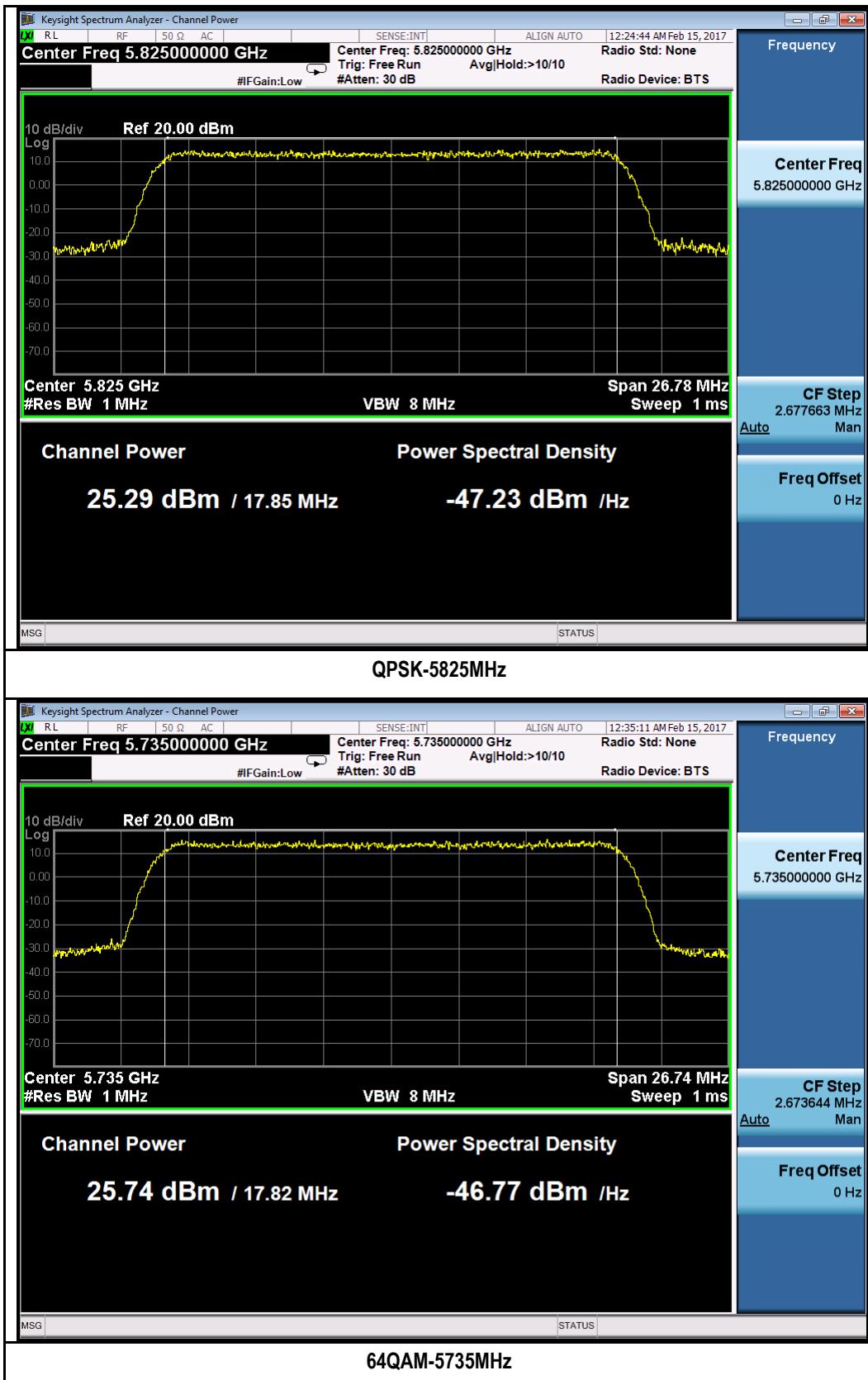


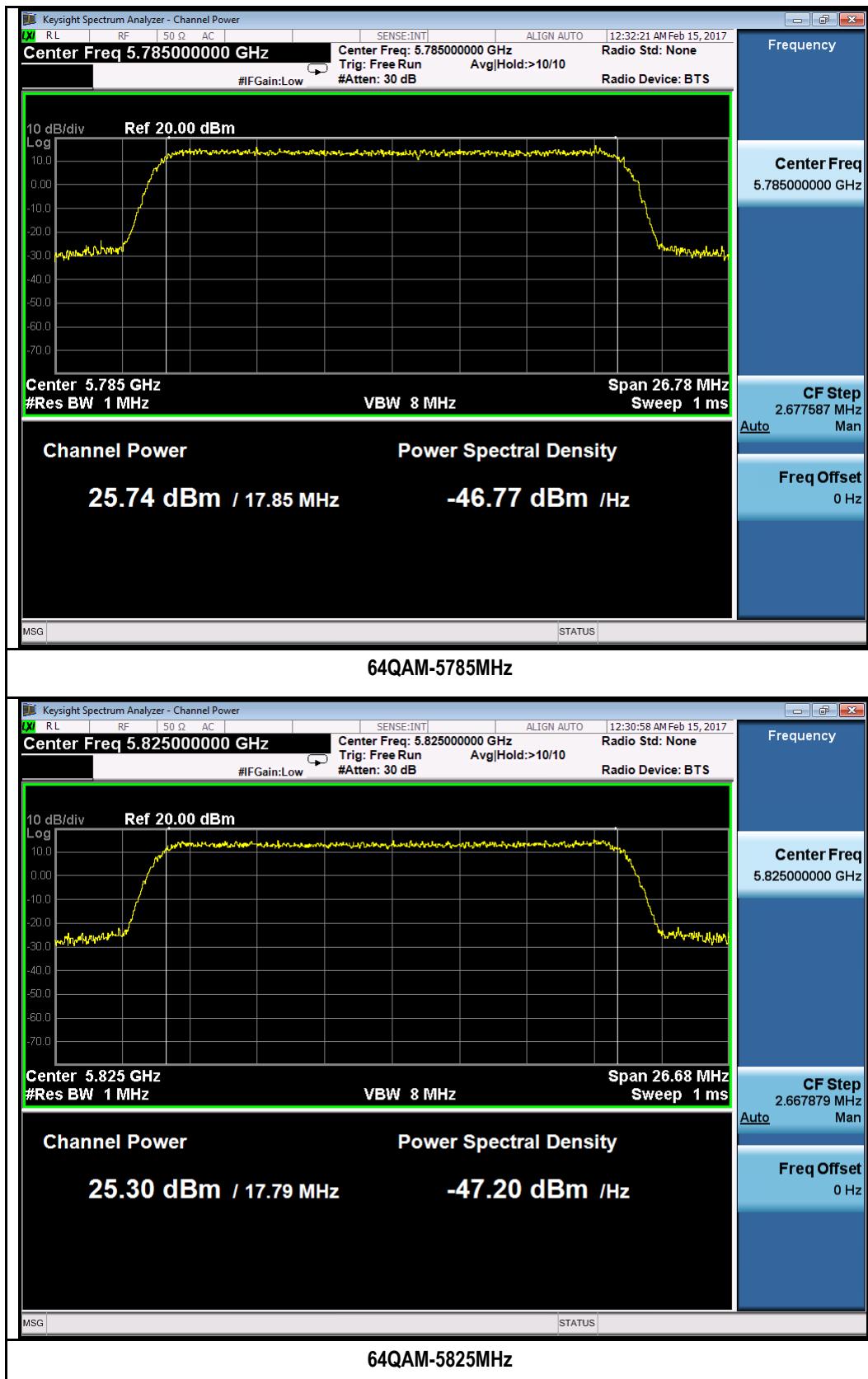


Test Plot for W58:

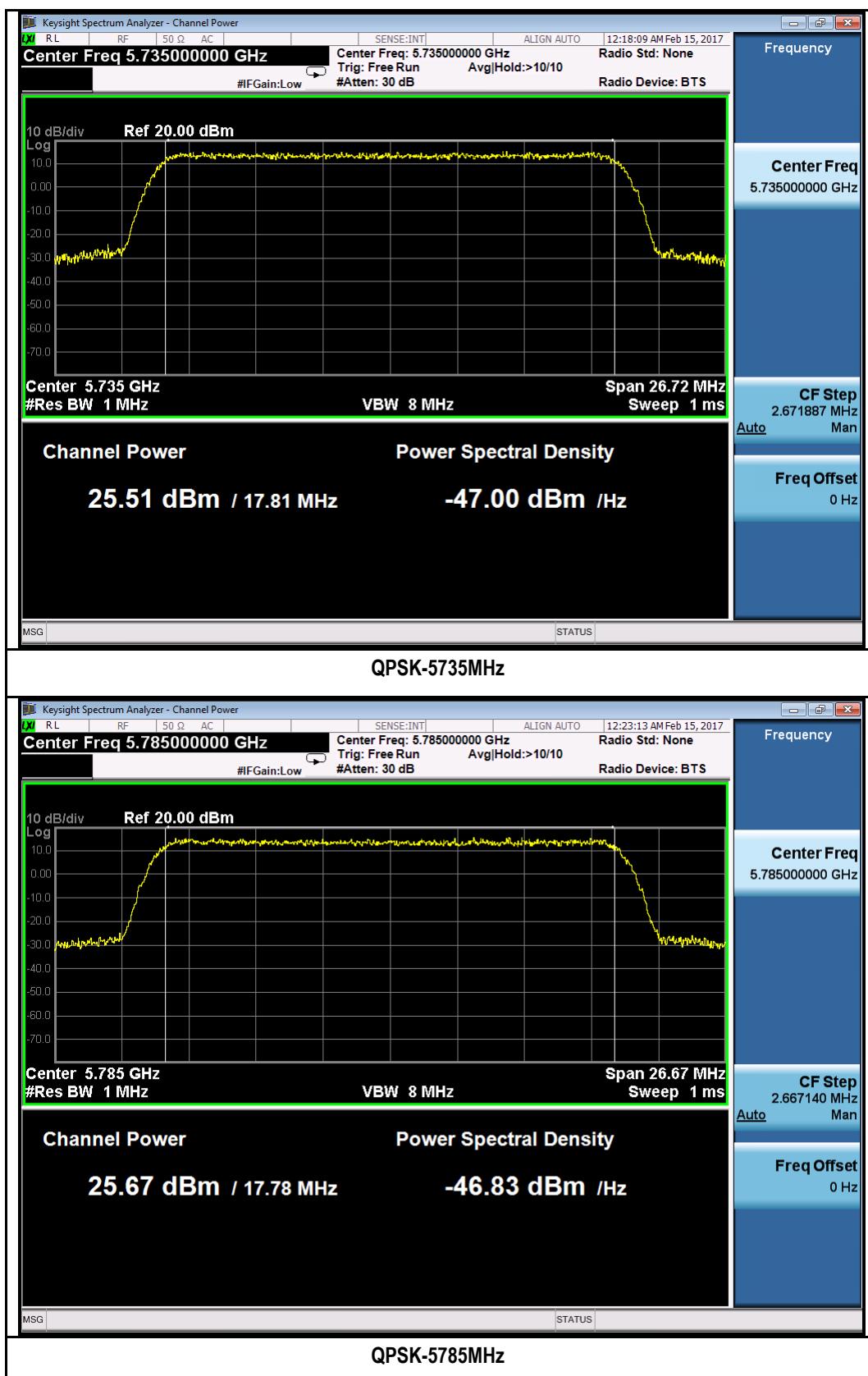
Chain 1:



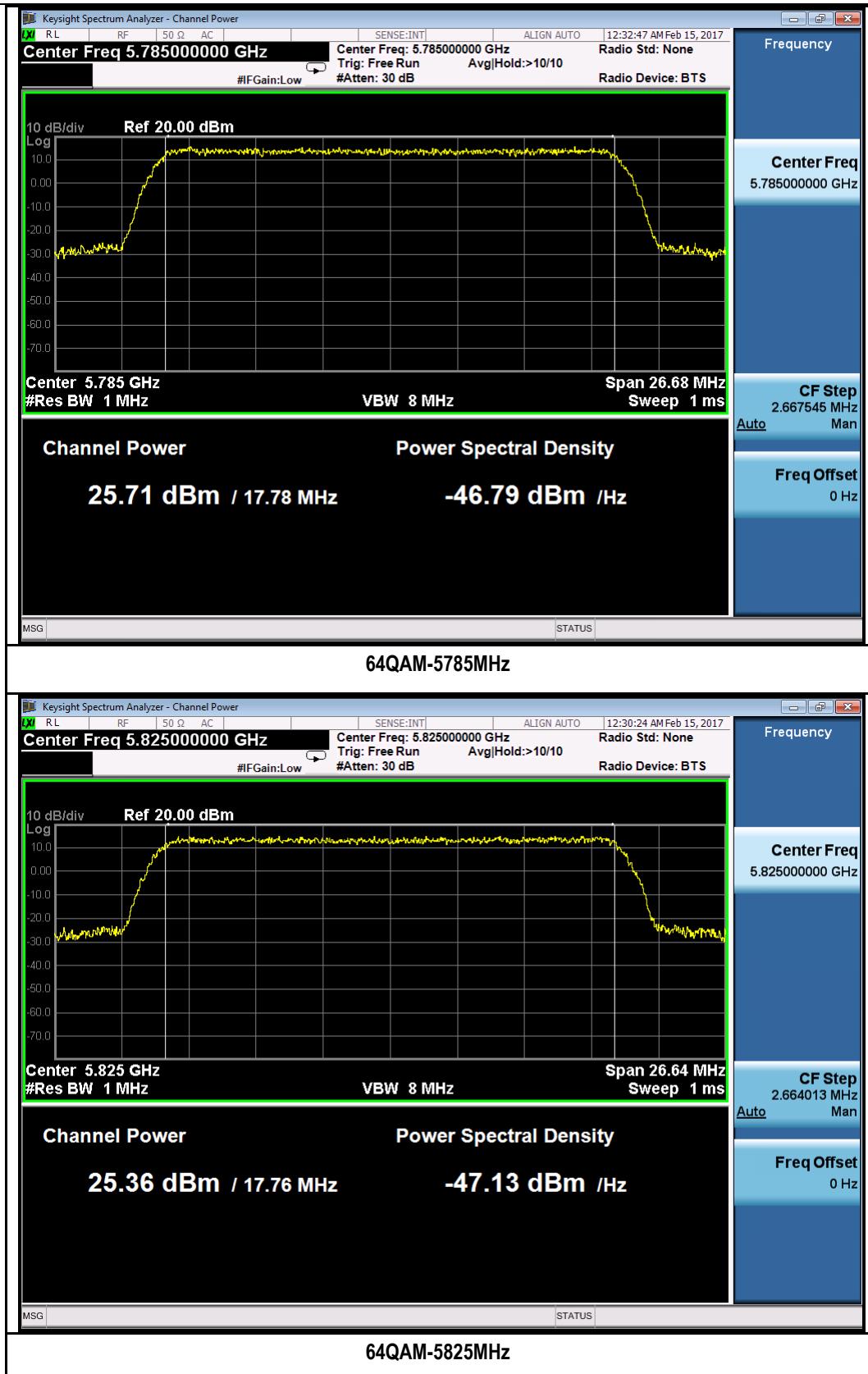




Chain 2:

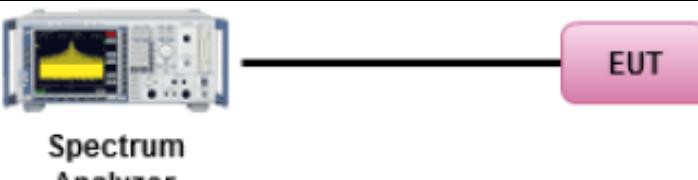






10.4 Peak Spectral Density

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------|--|--|--|
| § 15.407 | a)(1)(i) | For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. | <input checked="" type="checkbox"/> |
| | a)(3) | For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. | <input checked="" type="checkbox"/> |
| Test Setup |  Spectrum Analyzer | | |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1</p> <p><u>Maximum spectral density measurement procedure</u></p> <ul style="list-style-type: none"> - Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. - Set RBW = 1 MHz - Set VBW \geq 3 MHz - Detector = RMS. - Sweep time = auto couple. - Trace mode = max hold. - Trace average at least 100 traces in power averaging - Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used. | | |
| Test Date | 01/18/2017 – 02/10/2017 | Environmental condition | Temperature 22°C Relative Humidity 42% Atmospheric Pressure 1020mbar |
| Remark | Two antennas are used for this band. The highest directional gain of the antenna is 6dBi, no limit adjust is required. | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Chen Ge at RF test site.

PSD measurement result

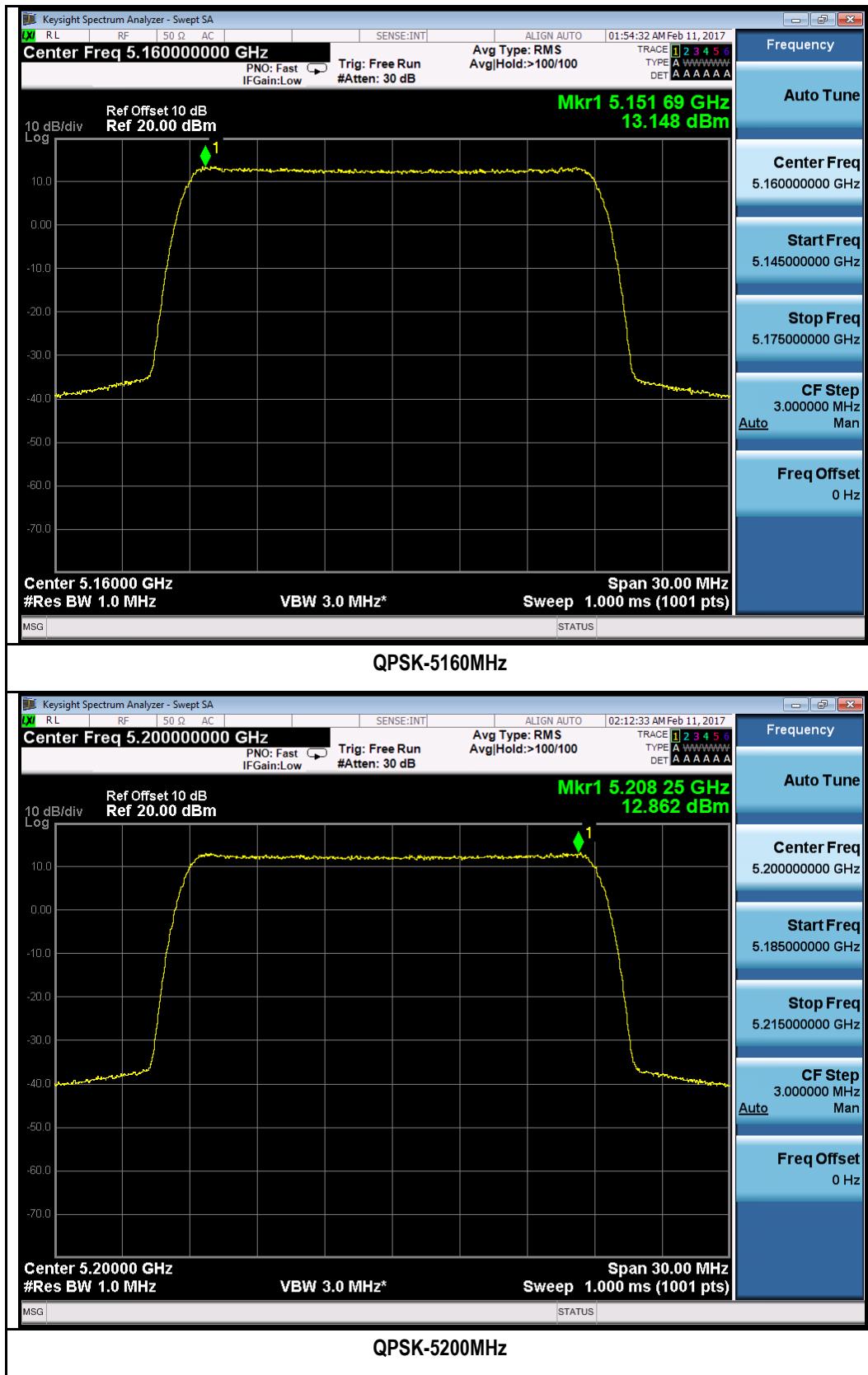
| Type | Test mode | Freq (MHz) | CH | Conducted PSD (dBm/MHz) | | | Limit (dBm/MHz) | Result |
|------|-----------|------------|------|-------------------------|---------|--------------|-----------------|--------|
| | | | | Chain 1 | Chain 2 | Combined PSD | | |
| PSD | QPSK | 5160 | Low | 13.14 | 13.60 | 16.39 | 17 | Pass |
| | | 5200 | Mid | 12.86 | 12.87 | 15.88 | 17 | Pass |
| | | 5240 | High | 12.85 | 12.87 | 15.87 | 17 | Pass |
| | 64QAM | 5160 | Low | 13.11 | 13.32 | 16.23 | 17 | Pass |
| | | 5200 | Mid | 12.85 | 12.93 | 15.90 | 17 | Pass |
| | | 5240 | High | 13.10 | 13.31 | 16.22 | 17 | Pass |

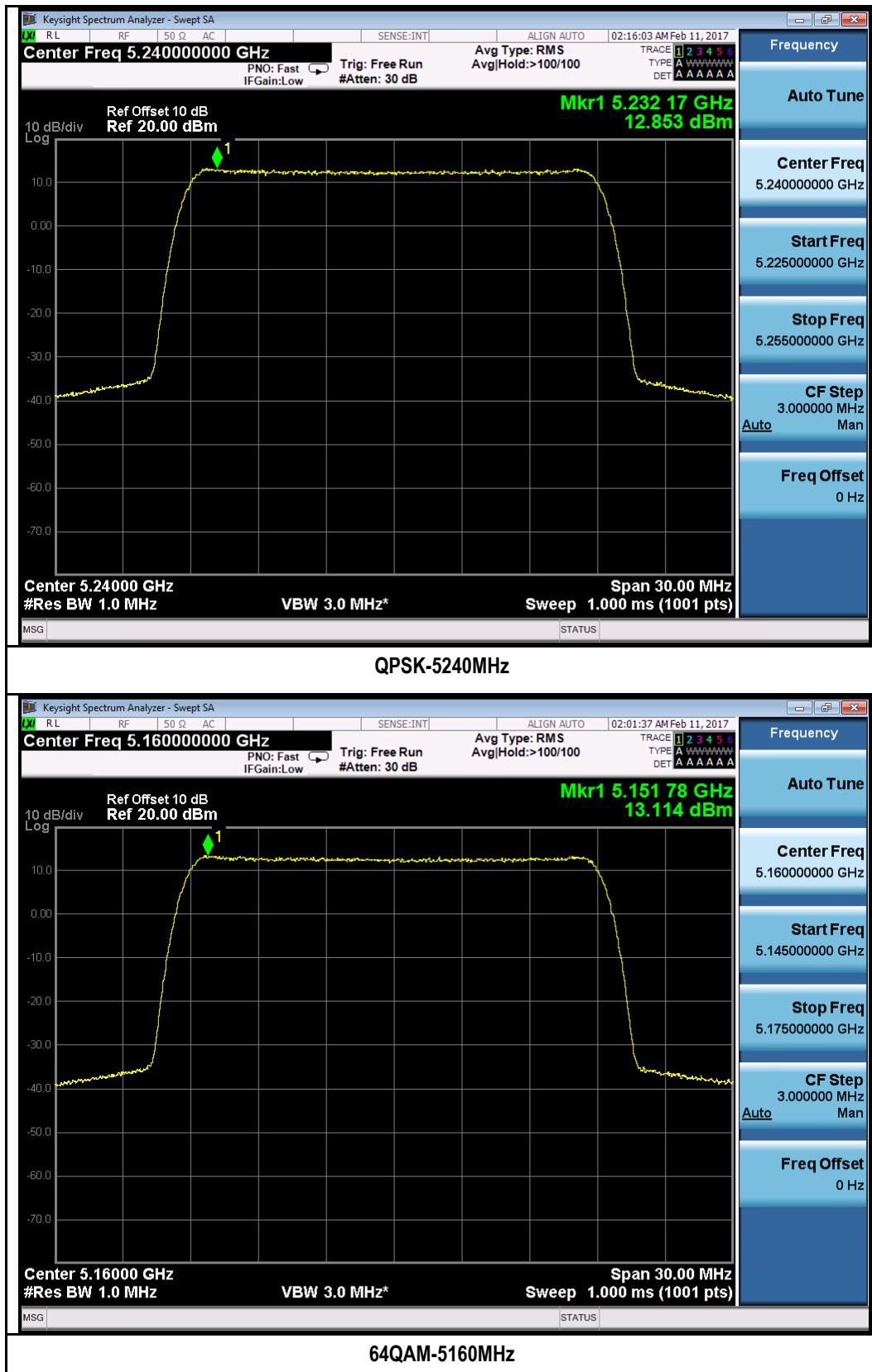
| Type | Test mode | Freq (MHz) | CH | Conducted PSD (dBm/100kHz) | | | Combined PSD(dBm/500kHz) | Limit (dBm/500kHz) | Result |
|------|-----------|------------|------|----------------------------|---------|------------------------|--------------------------|--------------------|--------|
| | | | | Chain 1 | Chain 2 | correction factor (dB) | | | |
| PSD | QPSK | 5735 | Low | 4.38 | 4.83 | 6.99 | 14.61 | 30 | Pass |
| | | 5785 | Mid | 4.64 | 5.09 | 6.99 | 14.87 | 30 | Pass |
| | | 5825 | High | 4.65 | 4.24 | 6.99 | 14.45 | 30 | Pass |
| | 64QAM | 5735 | Low | 4.93 | 4.64 | 6.99 | 14.79 | 30 | Pass |
| | | 5785 | Mid | 4.61 | 5.02 | 6.99 | 14.82 | 30 | Pass |
| | | 5825 | High | 4.40 | 4.73 | 6.99 | 14.57 | 30 | Pass |

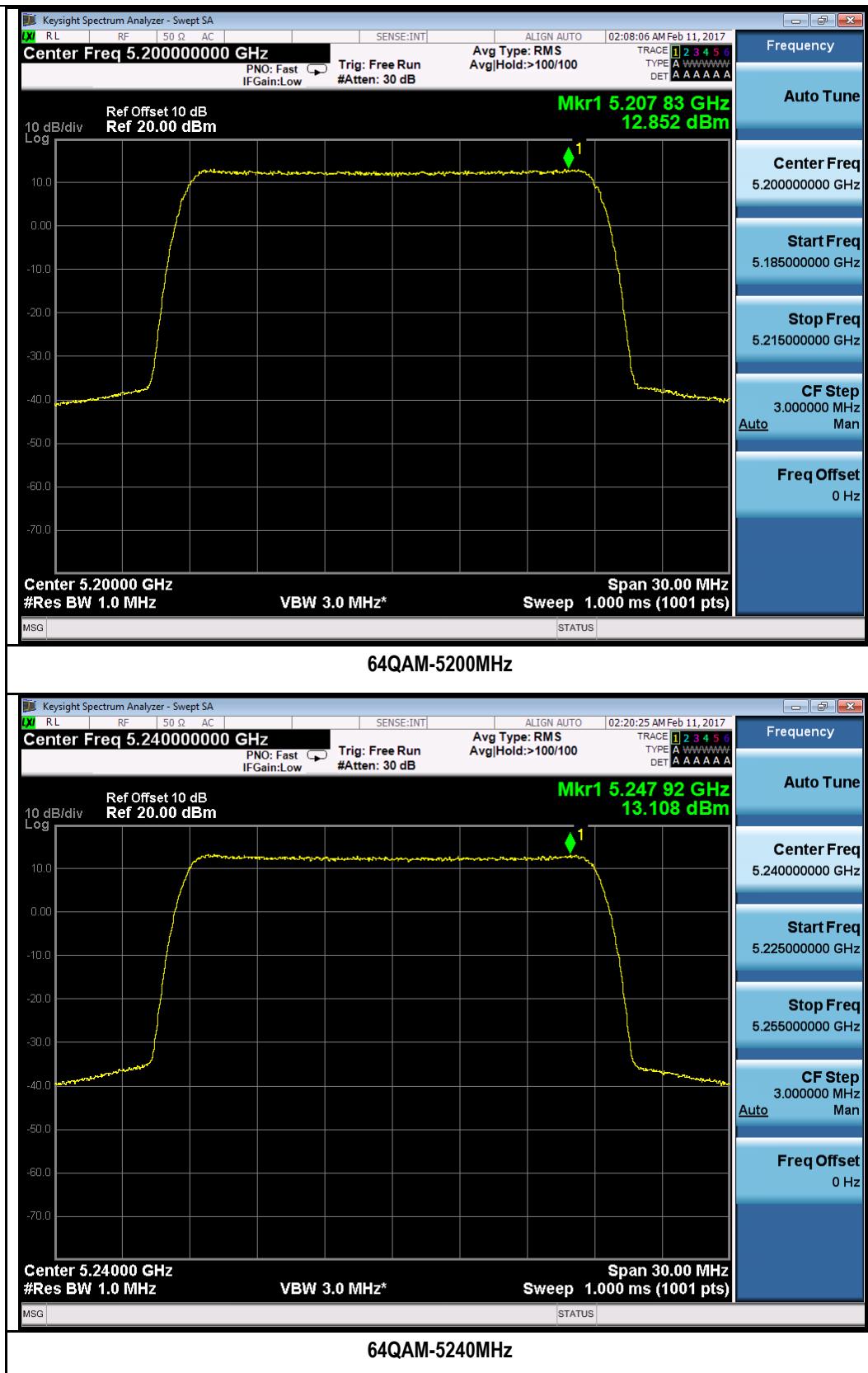
Note BW correction factor = $10\log(500\text{kHz}/\text{RBW})$, RBW was set to 100kHz during test.

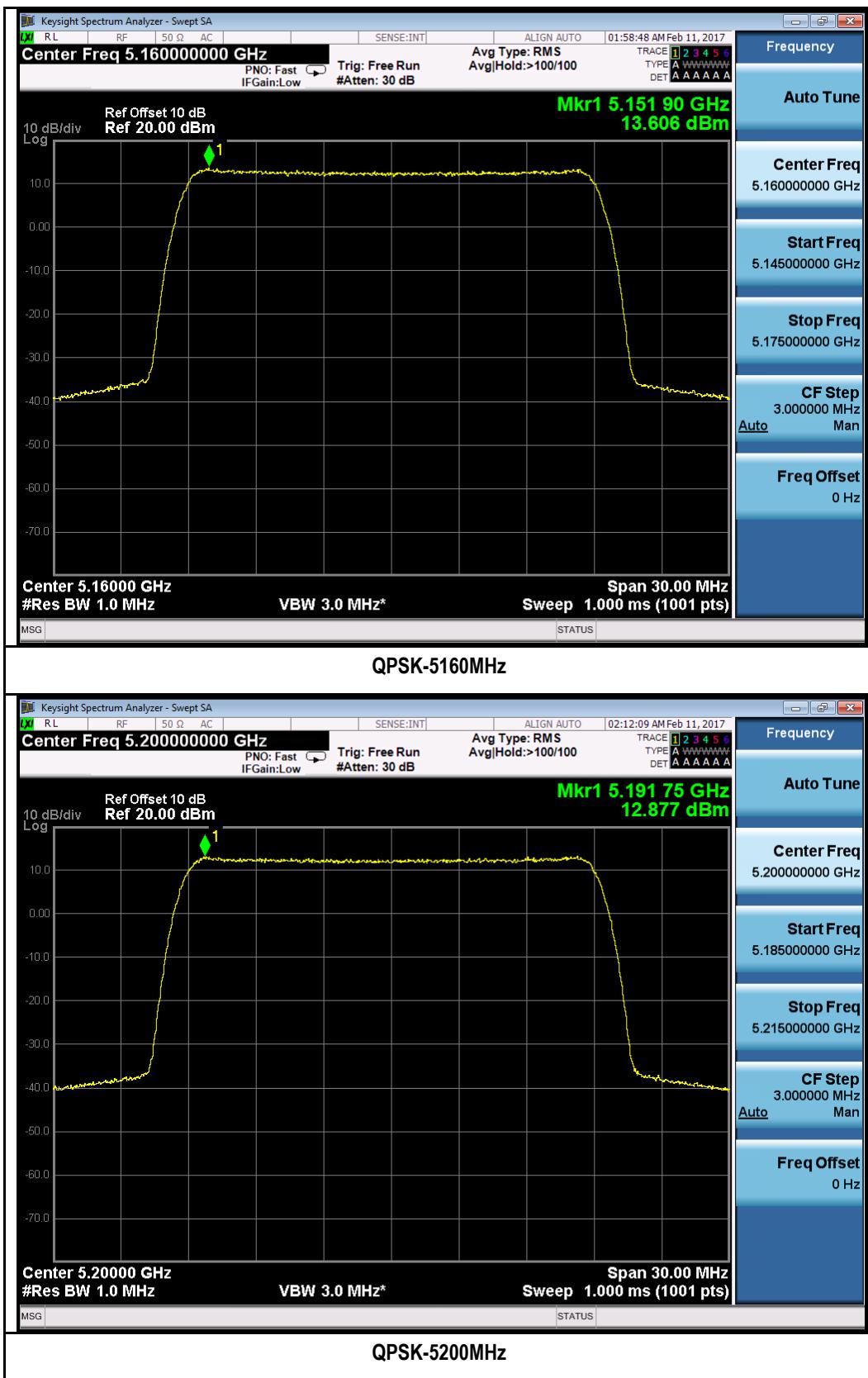
Test Plot for W52:

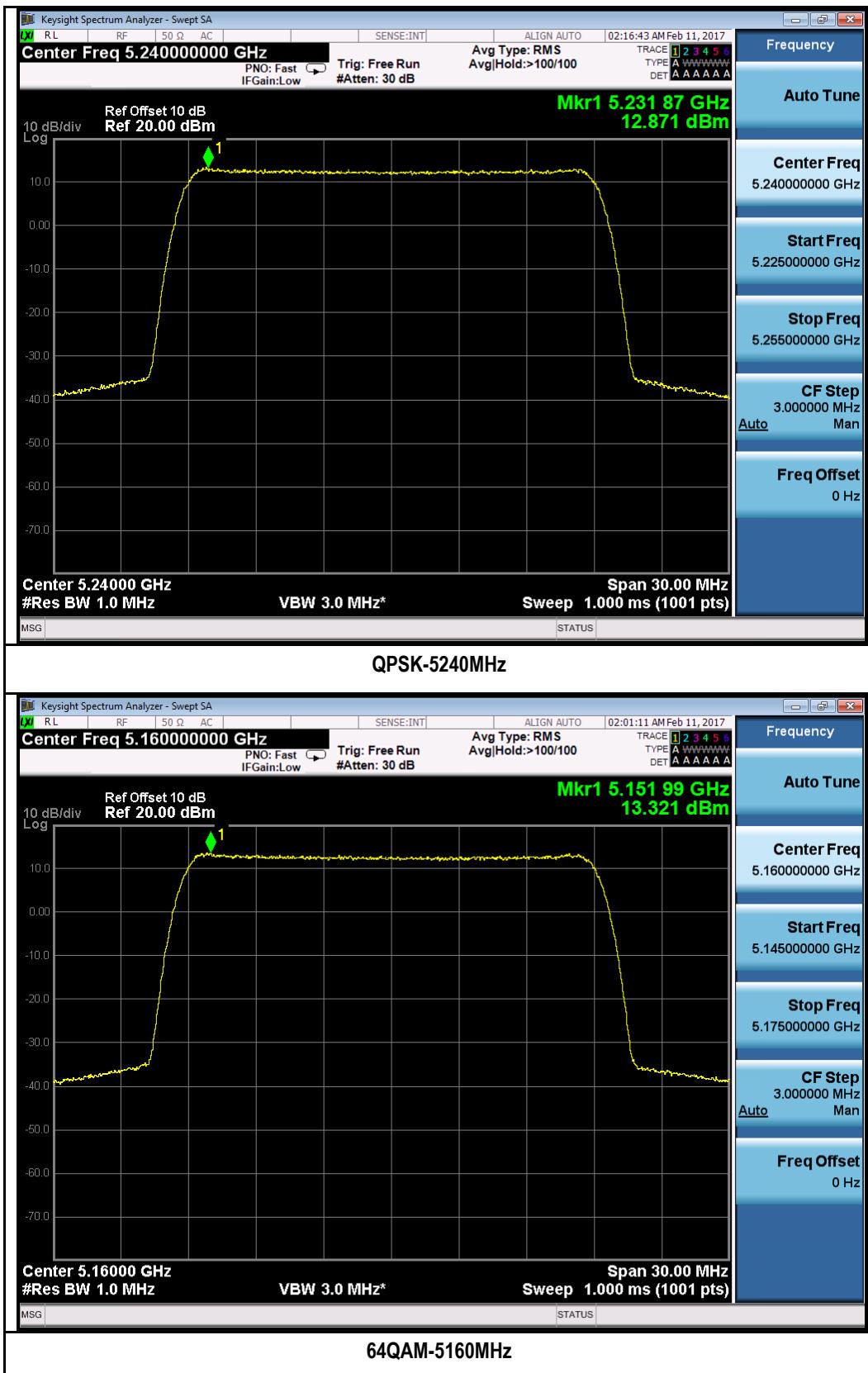
Chain 1:

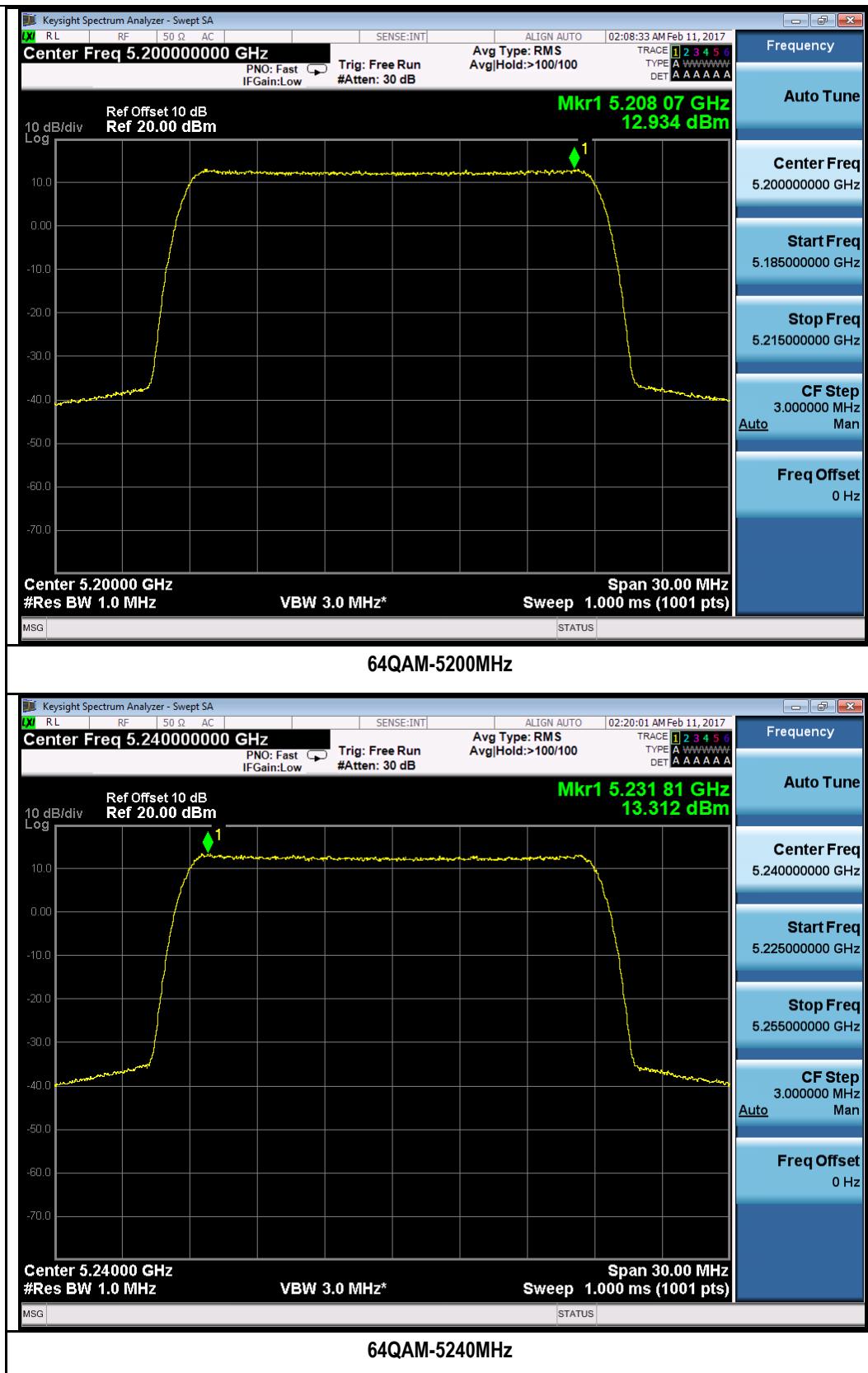






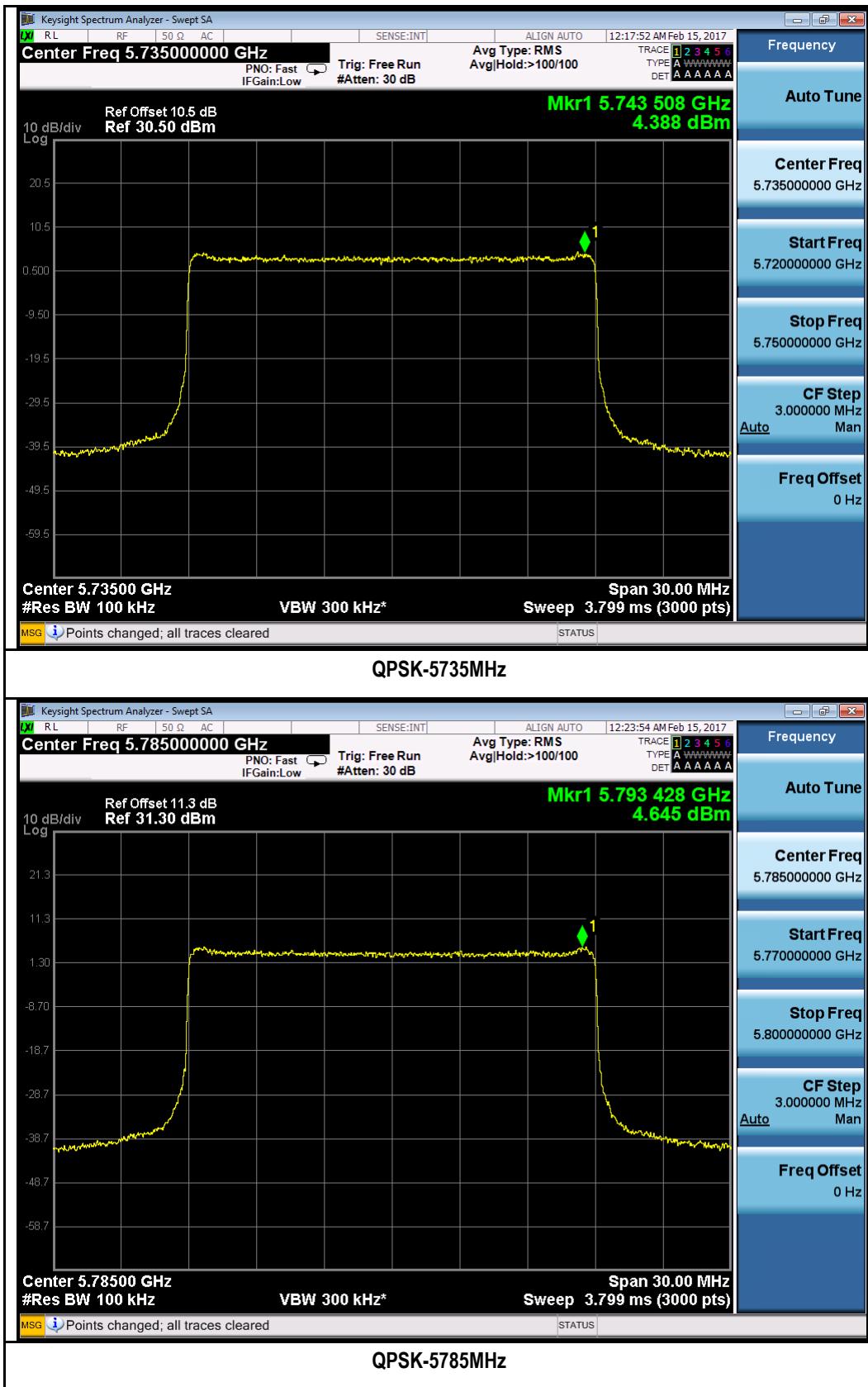
Chain 2:


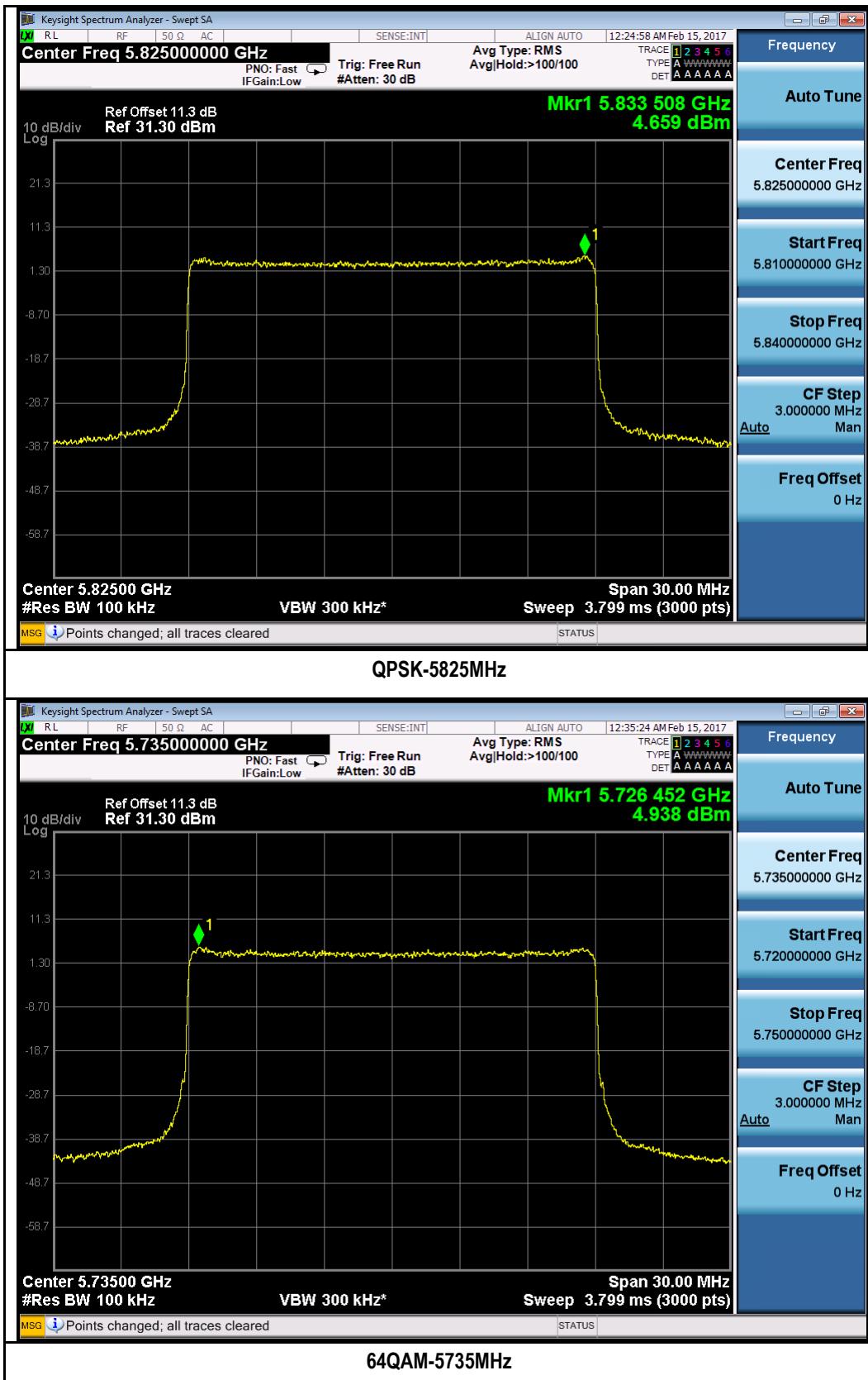


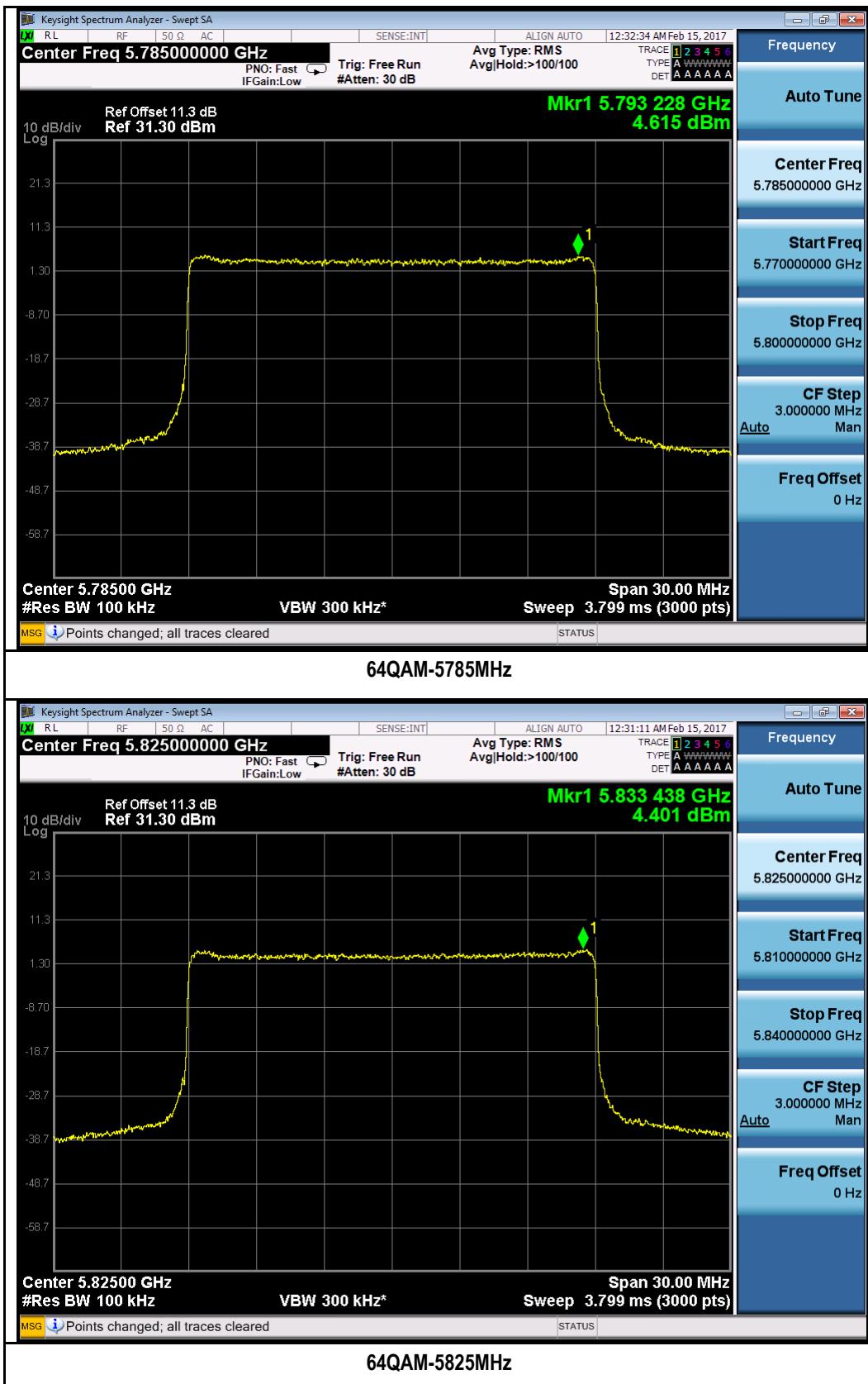


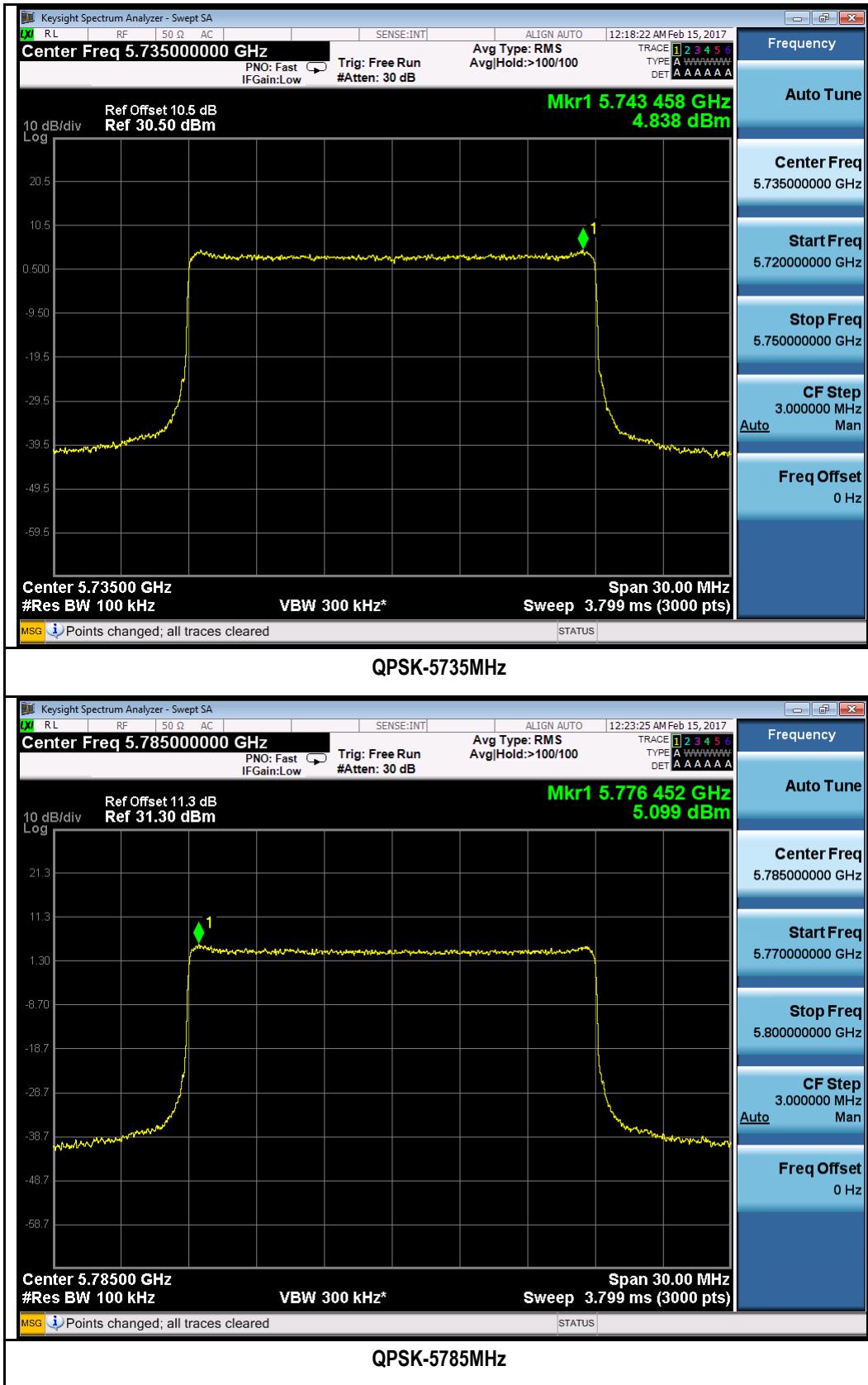
Test Plot for W58:

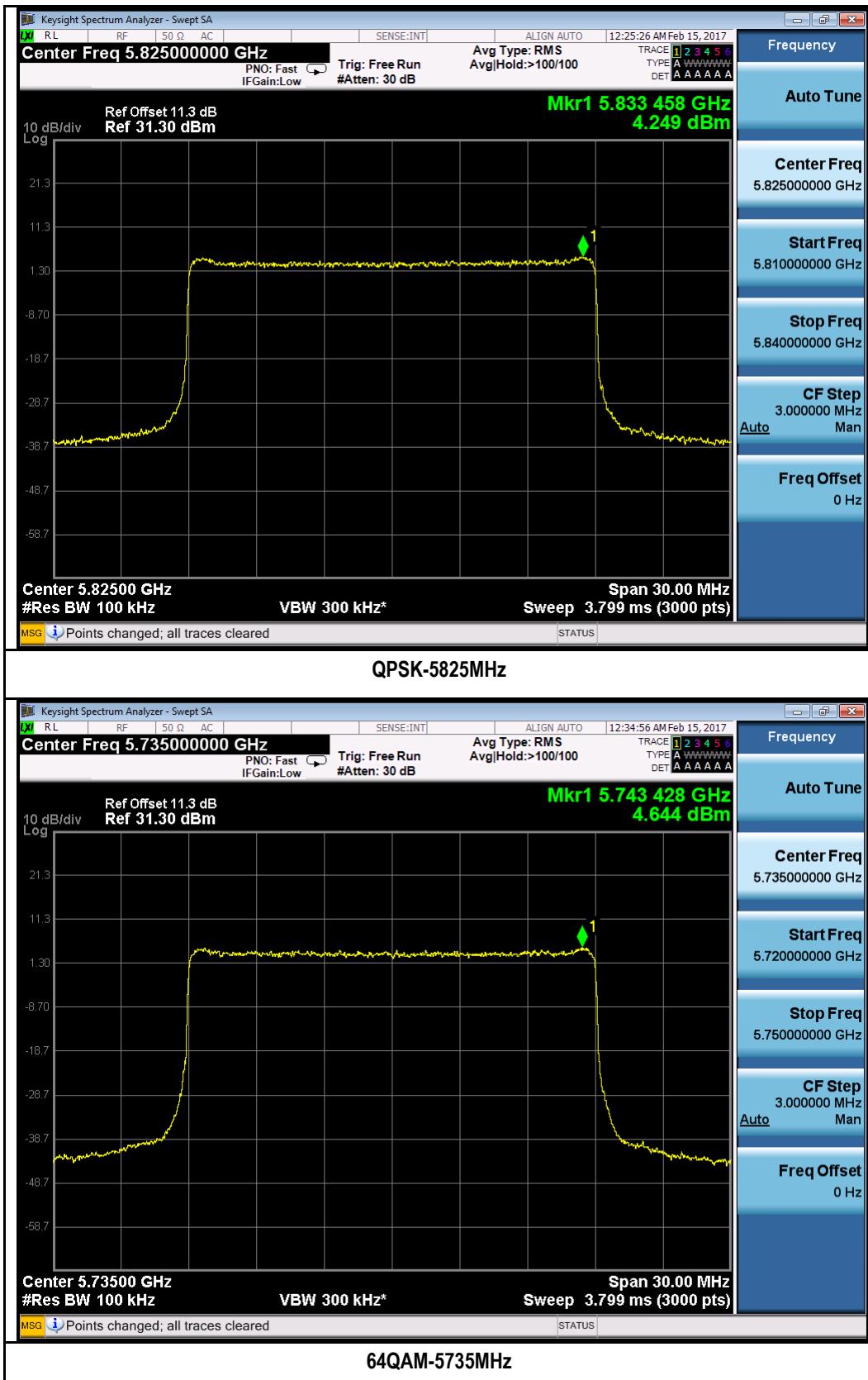
Chain 1:

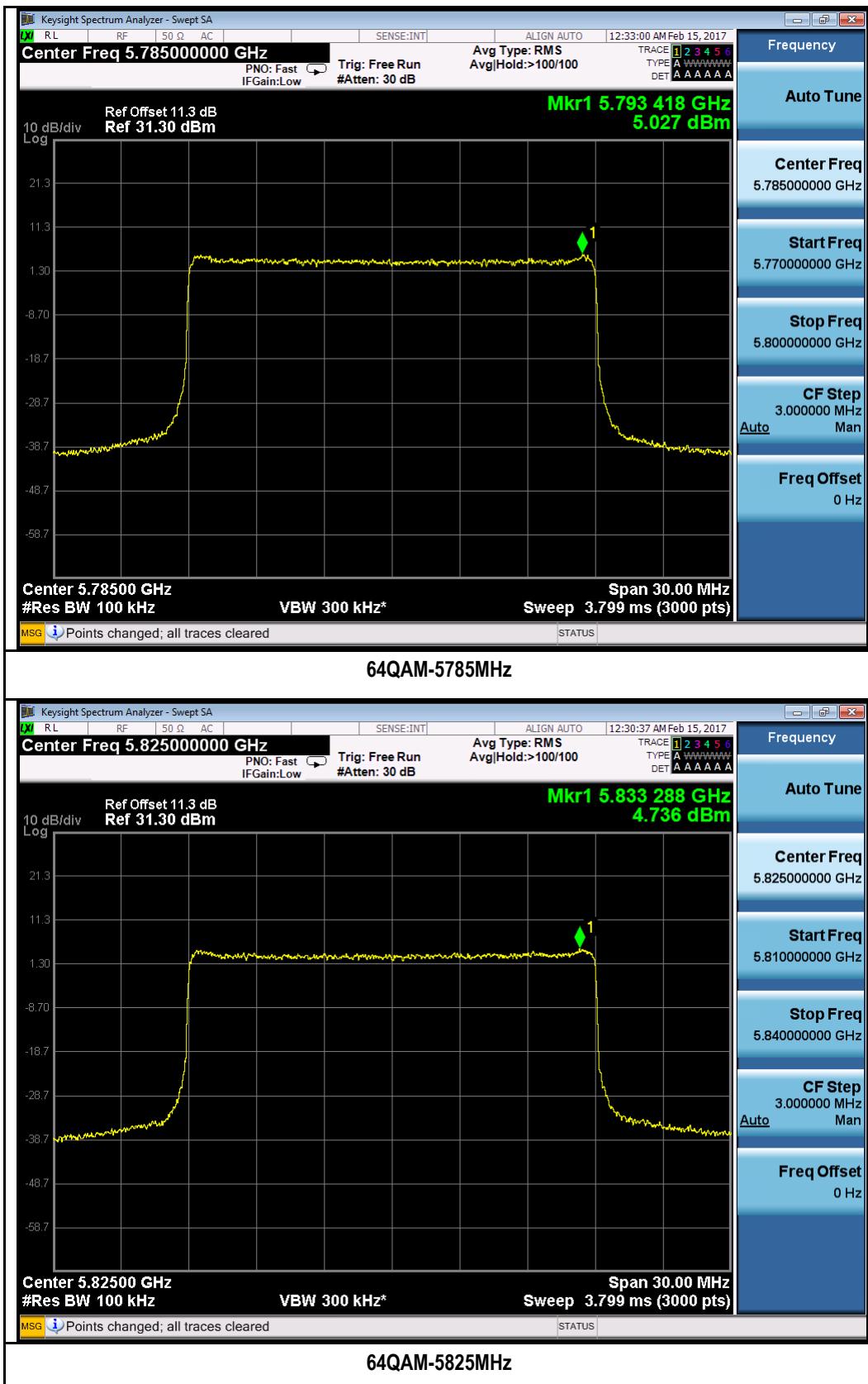






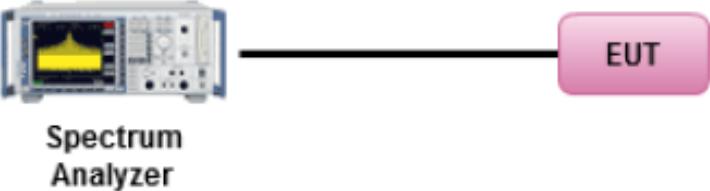
Chain 2:






10.5 Band Edge and Emission Mask Measurement

Requirement(s):

| Spec | Item | Requirement | Applicable |
|---|--|---|-------------------------------------|
| 47CFR§ 15.407(b)(2), 15.407(b)(6) | (1) | For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. | <input checked="" type="checkbox"/> |
| | (4) | For transmitters operating in the 5.725-5.825 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. | <input checked="" type="checkbox"/> |
| Test Setup |  <p>Spectrum Analyzer → EUT</p> | | |
| Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1</p> <p><u>Band Edge measurement:</u></p> <ul style="list-style-type: none"> - For average emissions measurements, follow the procedures described in section II.G.6., "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes: - Set RBW=100kHz - Set VBW=300kHz - Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured. | | |
| Remark | Antenna gain was added to the offset. | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

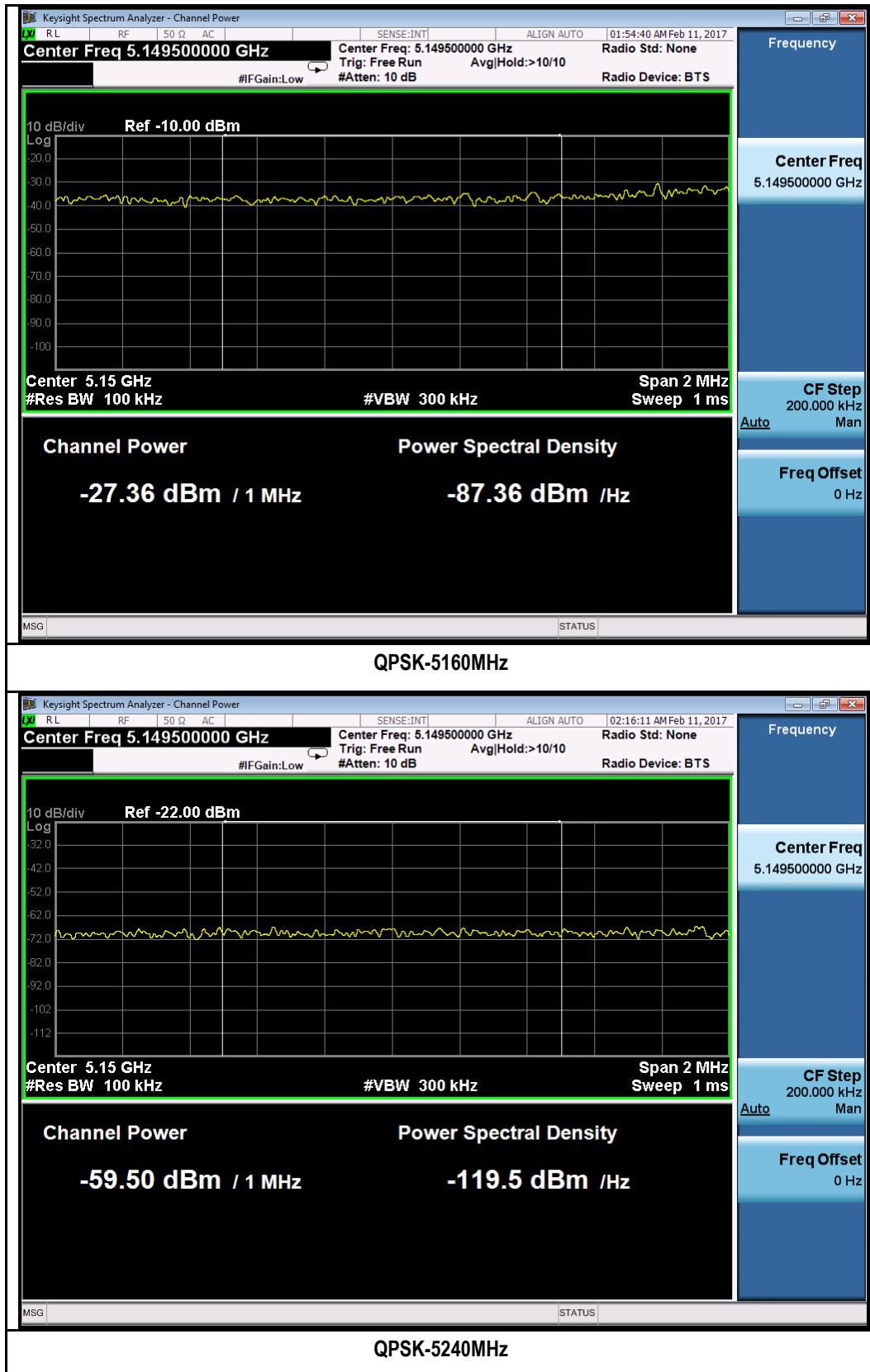
Test Data Yes (See below) N/A

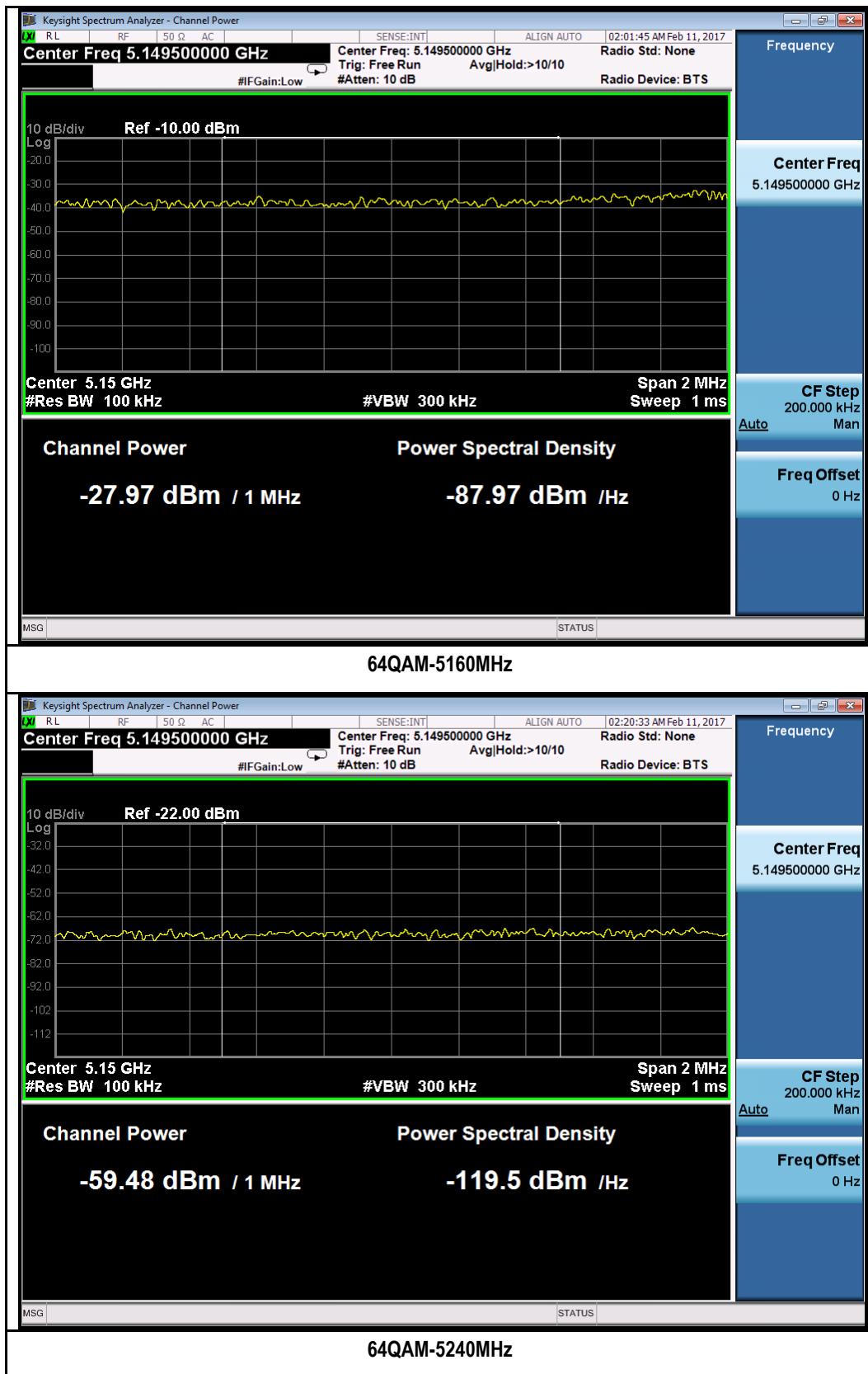
Test Plot Yes (See below) N/A

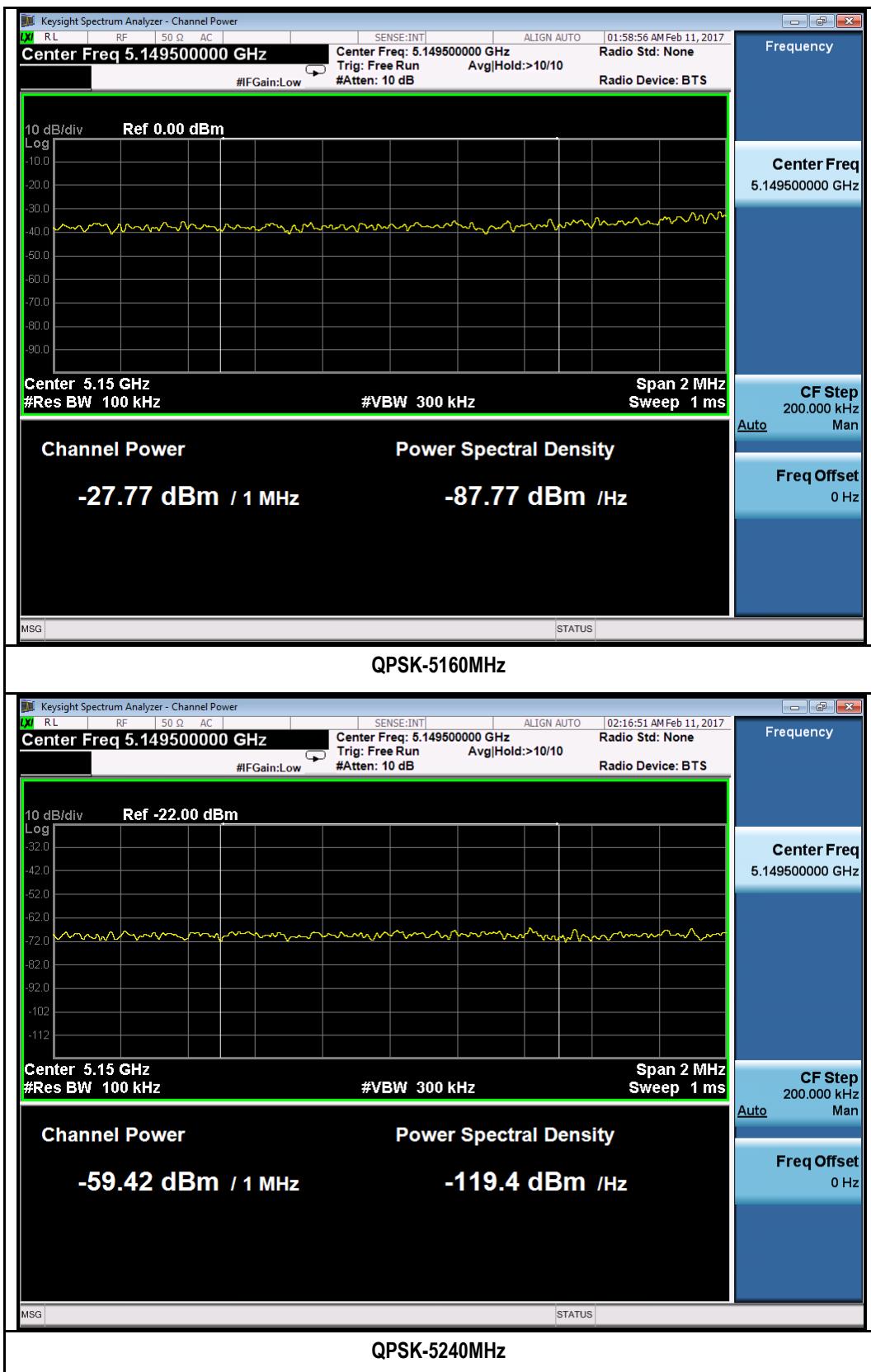
Test was done by Chen Ge at RF test site.

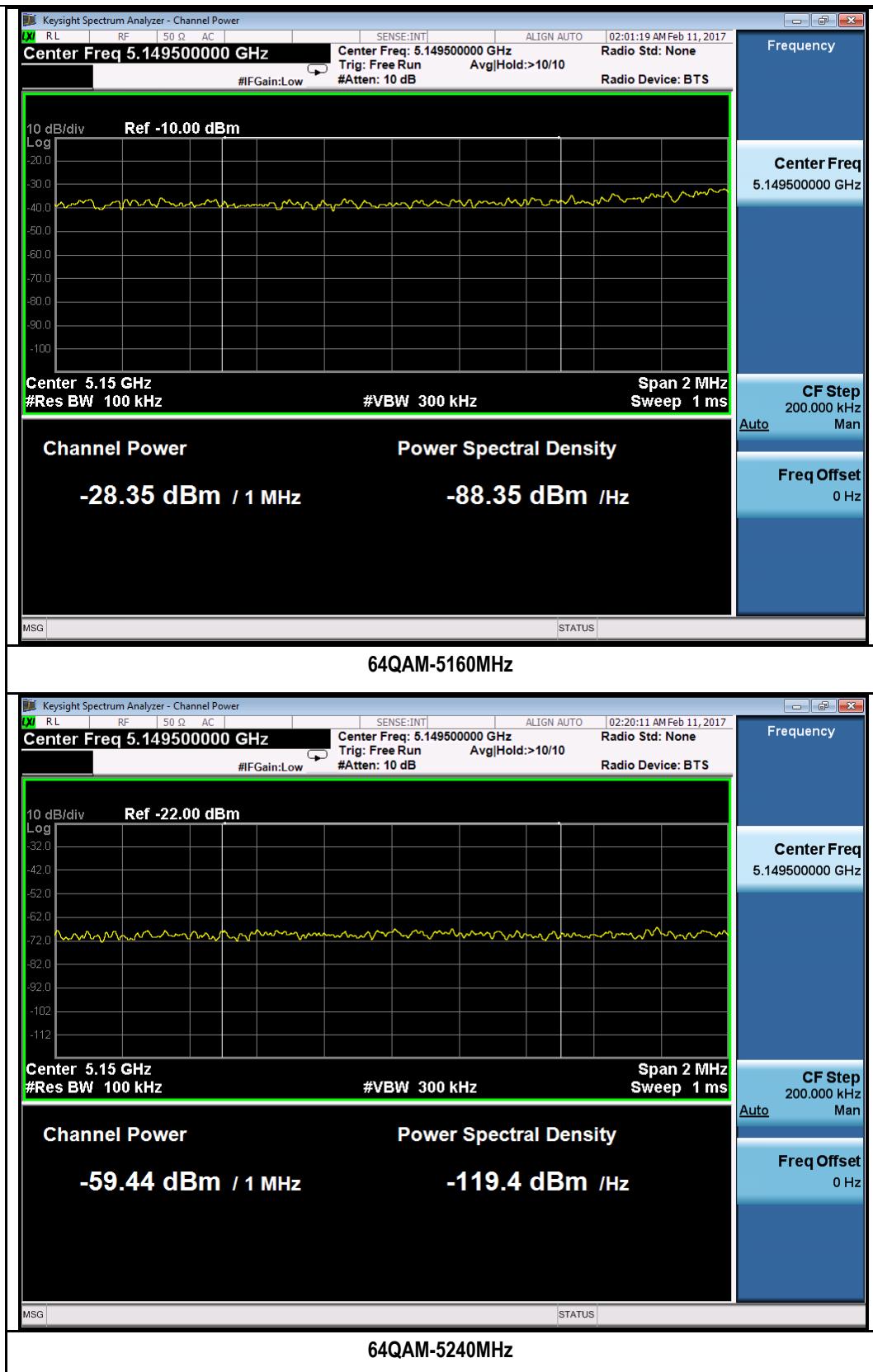
Test Plot for W52:

Chain 1:



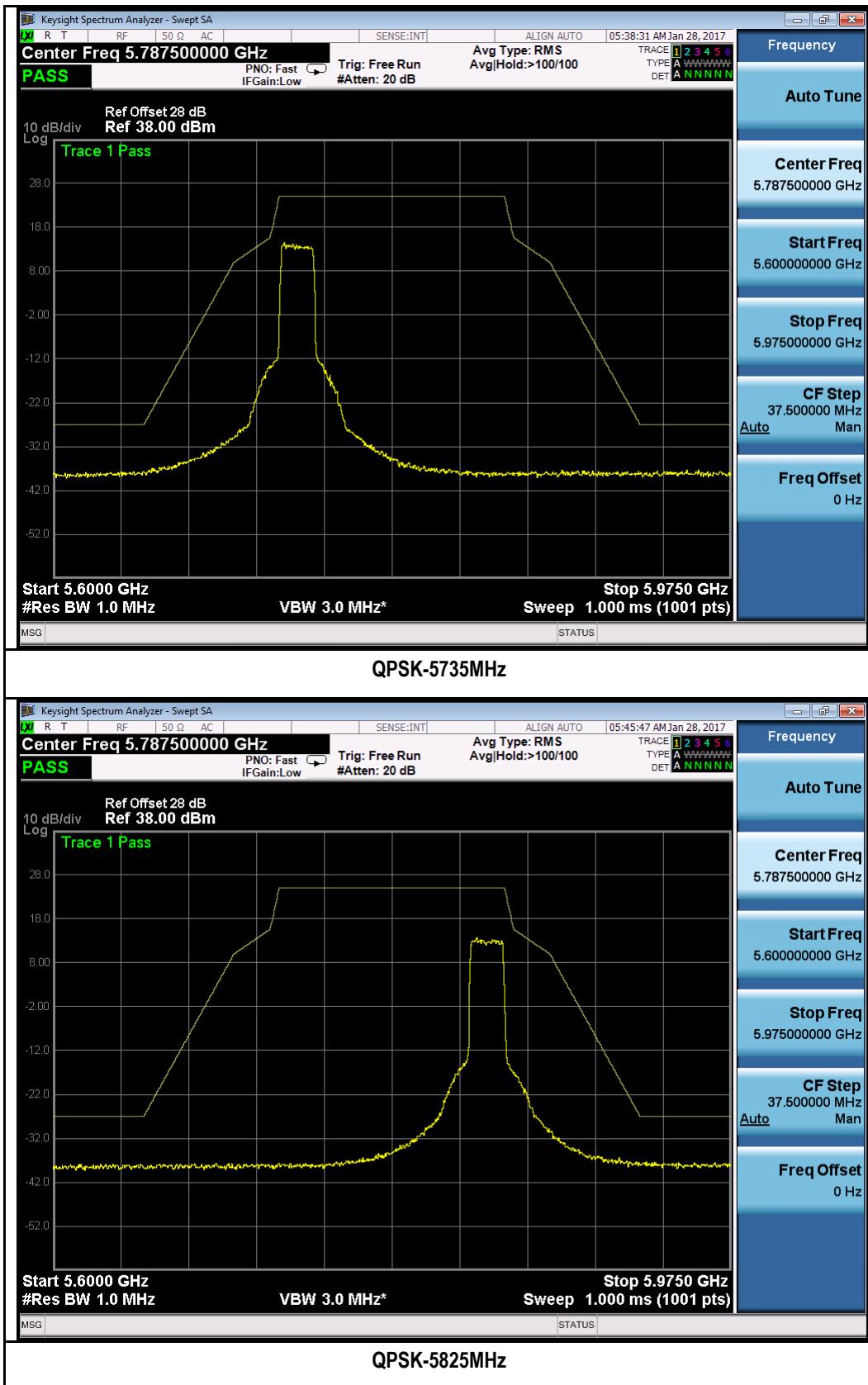


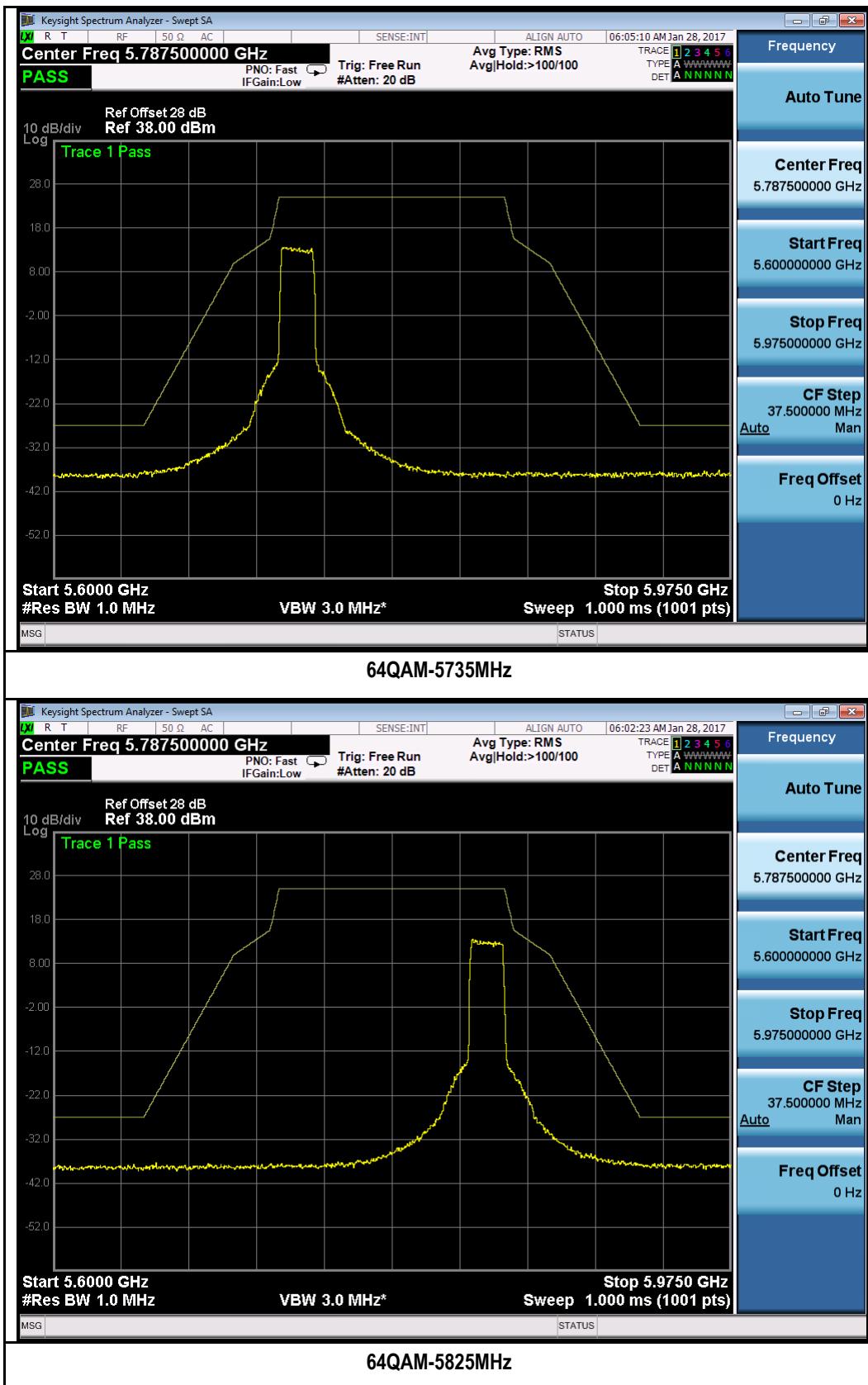
Chain 2:




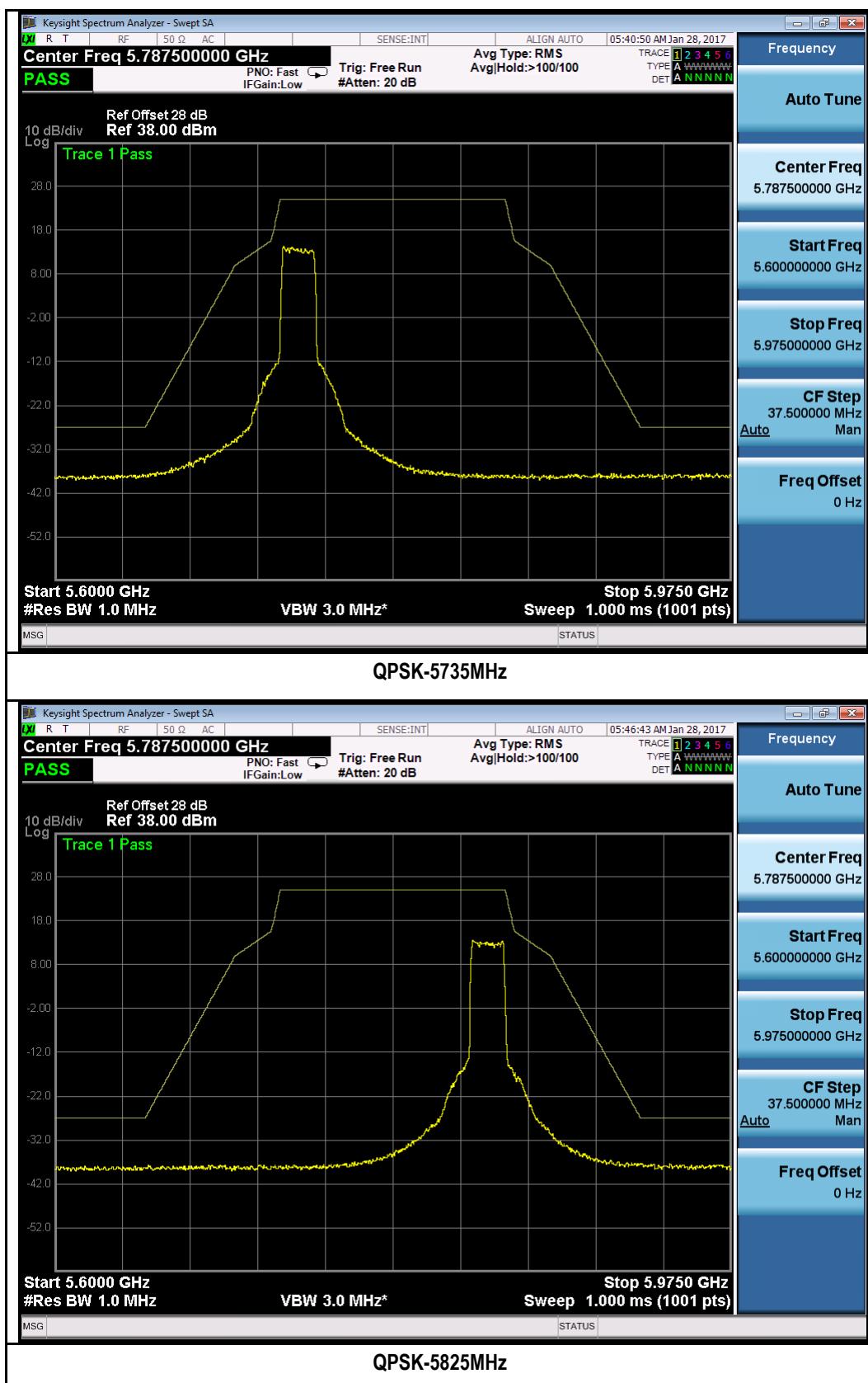
Test Plot for W58:

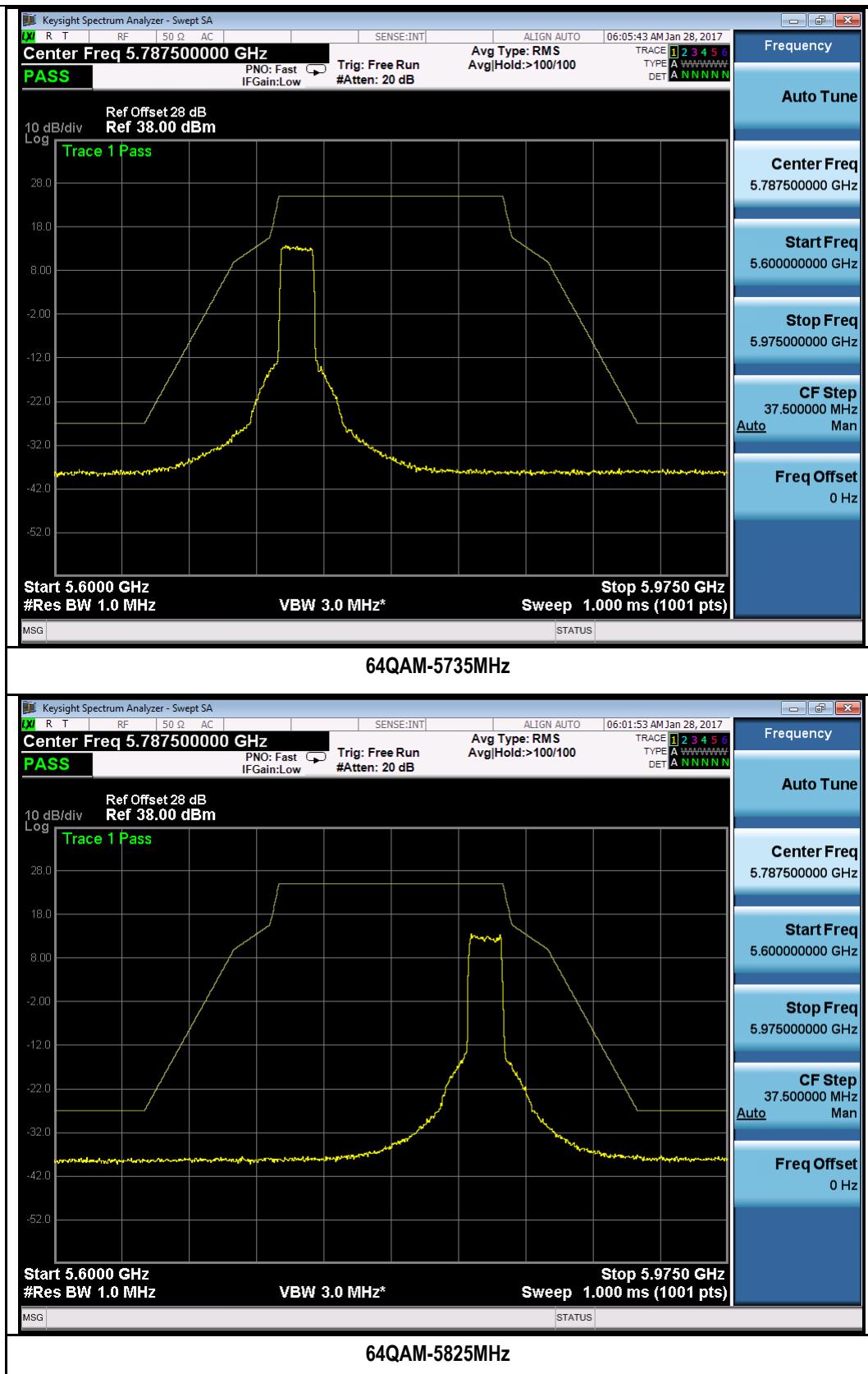
Chain 1:





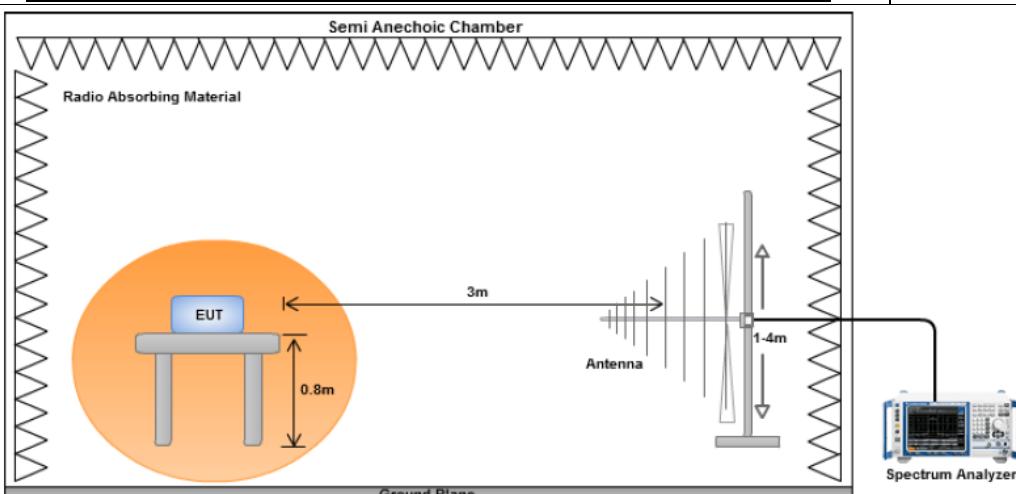
Chain 2:





10.6 Radiated Emissions below 1GHz

Requirement(s):

| Spec | Requirement | Applicable | | | | | | | | | | |
|--------------------------------|---|-----------------------|-----------------------|---------|-----|----------|-----|-----------|-----|-----------|-----|-------------------------------------|
| 47CFR§ 15.407(b) 15.209 (a) | <p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 – 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table> | Frequency range (MHz) | Field Strength (uV/m) | 30 – 88 | 100 | 88 – 216 | 150 | 216 – 960 | 200 | Above 960 | 500 | <input checked="" type="checkbox"/> |
| Frequency range (MHz) | Field Strength (uV/m) | | | | | | | | | | | |
| 30 – 88 | 100 | | | | | | | | | | | |
| 88 – 216 | 150 | | | | | | | | | | | |
| 216 – 960 | 200 | | | | | | | | | | | |
| Above 960 | 500 | | | | | | | | | | | |
| Test Setup |  | | | | | | | | | | | |
| Procedure | <ol style="list-style-type: none"> 1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. A Quasi-peak measurement was then made for that frequency point. 3. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. | | | | | | | | | | | |
| Remark | The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. | | | | | | | | | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | | | | | | | | | | |

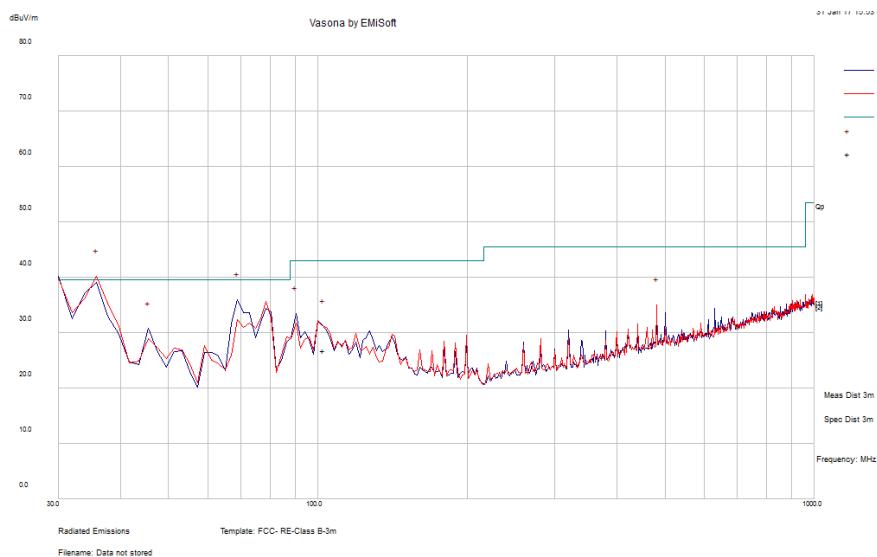
Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by Gary Chou at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

| Test specification | | below 1GHz | |
|---------------------------|---------------------|-------------------|----------------|
| Environmental Conditions: | Temp (°C): | 26 | Result Pass |
| | Humidity (%) | 47 | |
| | Atmospheric (mbar): | 1020 | |
| | Mains Power: | 120VAC, 60Hz | |
| | Tested by: | Gary Chou | |
| | Test Date: | 01/31/2017 | |
| Remarks: | | 20MHz BW, 5200MHz | |

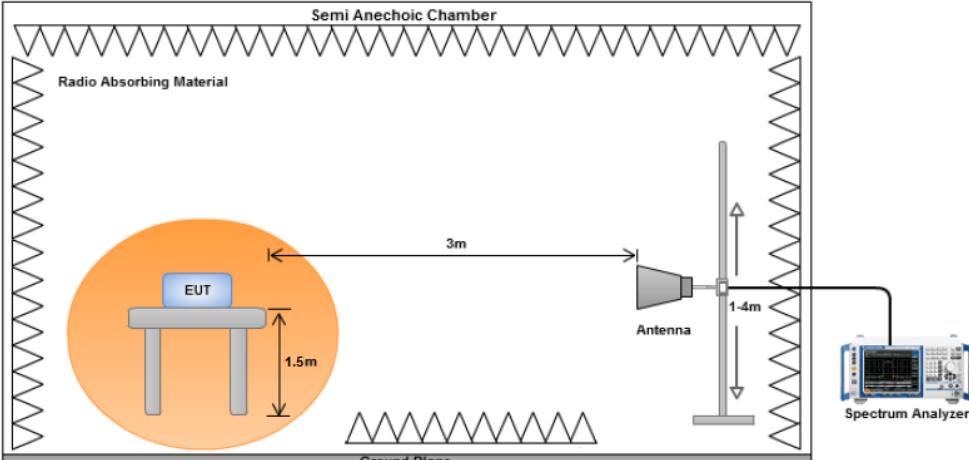


| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 102.40 | 36.46 | 1.68 | -11.35 | 26.78 | Quasi Max | V | 116 | 337 | 43 | -16.22 | Pass |
| 35.67 | 31.99 | 1.1 | -4.56 | 28.53 | Quasi Max | V | 391 | 258 | 39.5 | -10.97 | Pass |
| 69.10 | 39.47 | 1.47 | -14.04 | 26.9 | Quasi Max | H | 99 | 276 | 39.5 | -12.6 | Pass |
| 45.34 | 29.37 | 1.25 | -11.26 | 19.36 | Quasi Max | H | 99 | 118 | 39.5 | -20.14 | Pass |
| 90.01 | 49.39 | 1.59 | -13.99 | 36.98 | Quasi Max | H | 301 | 357 | 43 | -6.02 | Pass |
| 481.14 | 24.37 | 3.54 | -4.49 | 23.41 | Quasi Max | V | 253 | 119 | 45.5 | -22.09 | Pass |

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

10.7 Radiated Spurious Emissions above 1GHz

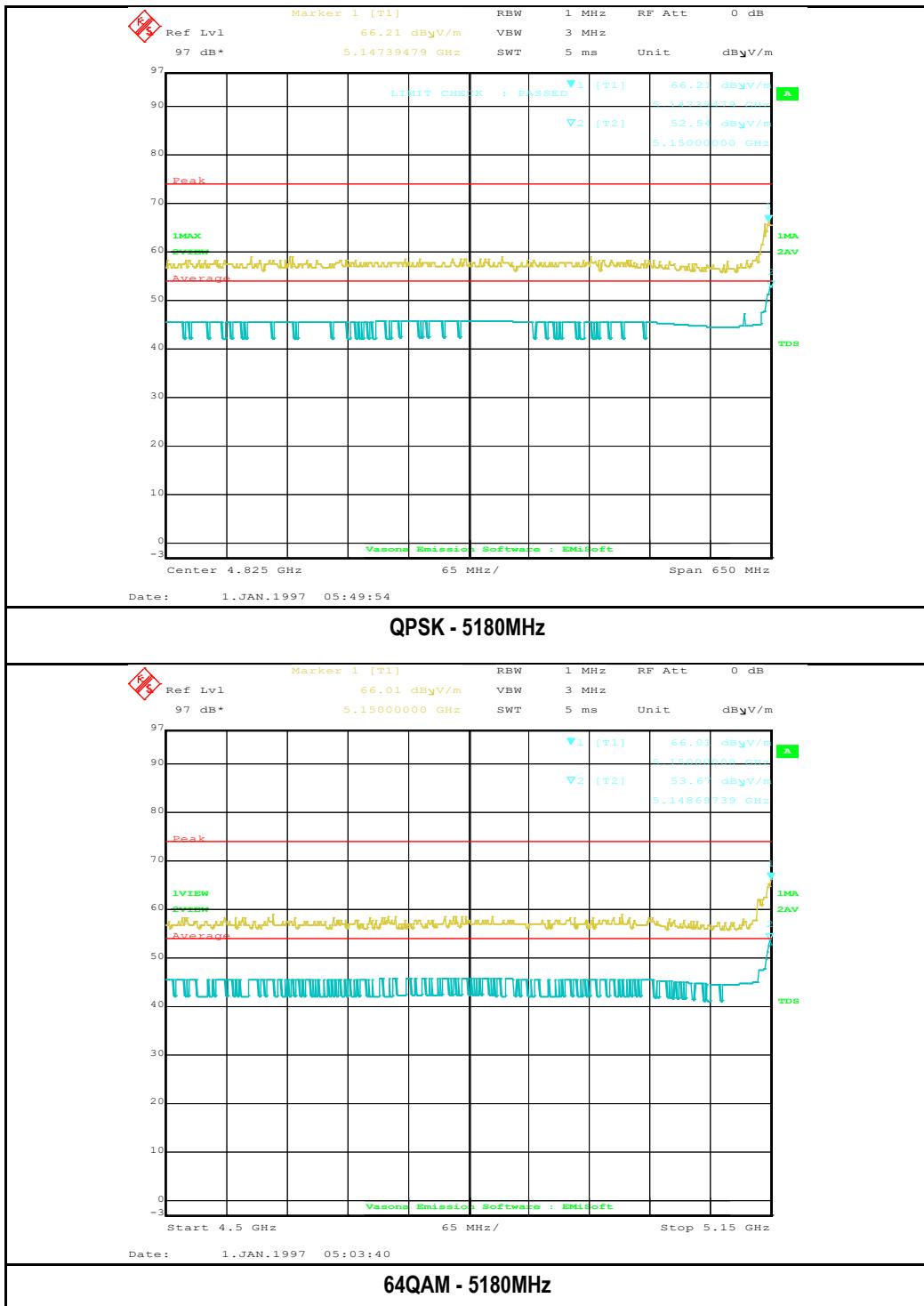
Requirement(s):

| Spec | Item | Requirement | Applicable |
|--------------------------------------|--|---|-------------------------------------|
| 47CFR§ 15.407(b)(2), 15.407(b)(6) | (1) | For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. | <input checked="" type="checkbox"/> |
| | (2) | For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band. | <input type="checkbox"/> |
| | (3) | For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz. | <input type="checkbox"/> |
| | (4) | For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz. | <input checked="" type="checkbox"/> |
| | (5) | Restricted band, emission must also comply with the radiated emission limits specified in 15.209 | <input checked="" type="checkbox"/> |
| Test Setup | |  | |
| Procedure | 1. 2. 3. 4. | <p>The EUT was switched on and allowed to warm up to its normal operating condition.</p> <p>The test was carried out at the selected frequency points obtained from the EUT characterisation.</p> <p>Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:</p> <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. <p>An average measurement was then made for that frequency point.</p> <p>Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p> | |
| Remark | | The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes (See below) N/A
Test Plot Yes (See below) N/A

Test was done by Gary Chou at 3m and 10m chamber.

Restricted Band Measurement Plots:



Radiated Emission Test Results (Above 1GHz)

1GHz-40GHz – 5160MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 1885.25 | 44.99 | 3.15 | -12.38 | 35.75 | Peak Max | V | 164 | 338 | 74 | -38.25 | Pass |
| 3550.57 | 43.35 | 4.31 | -7.2 | 40.47 | Peak Max | V | 180 | 72 | 74 | -33.53 | Pass |
| 10320.20 | 39.84 | 7.88 | 2.1 | 49.83 | Peak Max | V | 120 | 72 | 74 | -24.17 | Pass |
| 1885.25 | 33.48 | 3.15 | -12.38 | 24.24 | Average Max | V | 164 | 338 | 54 | -29.76 | Pass |
| 3550.57 | 31.54 | 4.31 | -7.2 | 28.66 | Average Max | V | 180 | 72 | 54 | -25.35 | Pass |
| 10320.20 | 28.29 | 7.88 | 2.1 | 38.28 | Average Max | V | 120 | 72 | 54 | -15.72 | Pass |

1GHz-40GHz – 5200MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 1884.03 | 45.45 | 3.15 | -12.39 | 36.21 | Peak Max | V | 194 | 283 | 74 | -37.79 | Pass |
| 3552.64 | 43.26 | 4.31 | -7.19 | 40.38 | Peak Max | V | 190 | 42 | 74 | -33.62 | Pass |
| 10400.53 | 40.57 | 7.68 | 2.36 | 50.61 | Peak Max | V | 107 | 19 | 74 | -23.39 | Pass |
| 1884.03 | 33.52 | 3.15 | -12.39 | 24.27 | Average Max | V | 194 | 283 | 54 | -29.73 | Pass |
| 3552.64 | 31.84 | 4.31 | -7.19 | 28.96 | Average Max | V | 190 | 42 | 54 | -25.04 | Pass |
| 10400.53 | 29.03 | 7.68 | 2.36 | 39.07 | Average Max | V | 107 | 19 | 54 | -14.93 | Pass |

1GHz-40GHz – 5240MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 1869.92 | 45.17 | 3.13 | -12.49 | 35.81 | Peak Max | V | 137 | 132 | 74 | -38.19 | Pass |
| 3552.99 | 43.67 | 4.31 | -7.19 | 40.79 | Peak Max | V | 126 | 326 | 74 | -33.21 | Pass |
| 10480.61 | 41.24 | 7.61 | 1.86 | 50.71 | Peak Max | V | 171 | 290 | 74 | -23.29 | Pass |
| 1869.92 | 33.18 | 3.13 | -12.49 | 23.82 | Average Max | V | 137 | 132 | 54 | -30.18 | Pass |
| 3552.99 | 31.62 | 4.31 | -7.19 | 28.74 | Average Max | V | 126 | 326 | 54 | -25.26 | Pass |
| 10480.61 | 28.86 | 7.61 | 1.86 | 38.34 | Average Max | V | 171 | 290 | 54 | -15.67 | Pass |

1GHz-40GHz – 5735MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|------------------|-------------|---------------|----------|-----------------|---------------------|-----|--------|------------|-----------------|--------------|---------------|
| 1869.92 | 45.17 | 3.13 | -12.49 | 35.81 | Peak Max | V | 137 | 132 | 74 | -38.19 | Pass |
| 3550.51 | 43.2 | 4.31 | -7.2 | 40.32 | Peak Max | V | 145 | 187 | 74 | -33.69 | Pass |
| 11470.65 | 40.06 | 7.56 | 1.98 | 49.6 | Peak Max | V | 182 | 276 | 74 | -24.4 | Pass |
| 1869.92 | 33.18 | 3.13 | -12.49 | 23.82 | Average Max | V | 137 | 132 | 54 | -30.18 | Pass |
| 3550.51 | 31.46 | 4.31 | -7.2 | 28.58 | Average Max | V | 145 | 187 | 54 | -25.42 | Pass |
| 11470.65 | 28.44 | 7.56 | 1.98 | 37.98 | Average Max | V | 182 | 276 | 54 | -16.02 | Pass |

1GHz-40GHz – 5785MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|------------------|-------------|---------------|----------|-----------------|---------------------|-----|--------|------------|-----------------|--------------|---------------|
| 1915.66 | 45.09 | 3.18 | -12.2 | 36.07 | Peak Max | V | 175 | 356 | 74 | -37.93 | Pass |
| 3551.22 | 44.08 | 4.31 | -7.2 | 41.19 | Peak Max | V | 198 | 296 | 74 | -32.81 | Pass |
| 11575.66 | 39.22 | 7.52 | 1.88 | 48.62 | Peak Max | V | 110 | 126 | 74 | -25.39 | Pass |
| 1915.66 | 33.17 | 3.18 | -12.2 | 24.15 | Average Max | V | 175 | 356 | 54 | -29.85 | Pass |
| 3551.22 | 31.92 | 4.31 | -7.2 | 29.03 | Average Max | V | 198 | 296 | 54 | -24.97 | Pass |
| 11575.66 | 27.79 | 7.52 | 1.88 | 37.18 | Average Max | V | 110 | 126 | 54 | -16.82 | Pass |

1GHz-40GHz – 5825MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|------------------|-------------|---------------|----------|-----------------|---------------------|-----|--------|------------|-----------------|--------------|---------------|
| 1918.23 | 44.16 | 3.18 | -12.19 | 35.15 | Peak Max | V | 115 | 213 | 74 | -38.85 | Pass |
| 3533.48 | 43.76 | 4.3 | -7.25 | 40.8 | Peak Max | V | 172 | 271 | 74 | -33.2 | Pass |
| 11680.98 | 39.99 | 7.24 | 0.17 | 47.4 | Peak Max | V | 150 | 336 | 74 | -26.6 | Pass |
| 1918.23 | 33 | 3.18 | -12.19 | 24 | Average Max | V | 115 | 213 | 54 | -30.01 | Pass |
| 3533.48 | 31.88 | 4.3 | -7.25 | 28.92 | Average Max | V | 172 | 271 | 54 | -25.08 | Pass |
| 11680.98 | 28.23 | 7.24 | 0.17 | 35.63 | Average Max | V | 150 | 336 | 54 | -18.37 | Pass |

Annex A. TEST INSTRUMENT

| Instrument | Model | Serial # | Cal Date | Cal Cycle | Cal Due | In use |
|---------------------------------|----------|----------|------------|-----------|------------|-------------------------------------|
| Conducted Emissions | | | | | | |
| R & S Receiver | ESIB 40 | 100179 | 06/08/2016 | 1 Year | 06/08/2017 | <input checked="" type="checkbox"/> |
| CHASE LISN | MN2050B | 1018 | 08/07/2016 | 1 Year | 08/07/2017 | <input checked="" type="checkbox"/> |
| Radiated Emissions | | | | | | |
| R & S Receiver | ESIB 40 | 1018 | 08/07/2016 | 1 Year | 08/07/2017 | <input checked="" type="checkbox"/> |
| Bi-Log antenna (30MHz~2GHz) | JB1 | A030702 | 08/12/2016 | 1 Year | 08/12/2017 | <input checked="" type="checkbox"/> |
| Horn Antenna (1GHz~26GHz) | 3115 | 100059 | 08/25/2016 | 1 Year | 08/25/2017 | <input checked="" type="checkbox"/> |
| Horn Antenna (26GHz~40GHz) | AH-840 | 101013 | 08/28/2016 | 1 Year | 08/28/2017 | <input checked="" type="checkbox"/> |
| Pre-Amp (30MHz~40GHz) | LPA-6-30 | 11140711 | 03/10/2016 | 1 Year | 03/10/2017 | <input checked="" type="checkbox"/> |
| 3 Meters SAC | 3M | N/A | 08/08/2016 | 1 Year | 08/08/2017 | <input checked="" type="checkbox"/> |
| 10 Meters SAC | 10M | N/A | 09/05/2016 | 1 Year | 09/05/2017 | <input checked="" type="checkbox"/> |
| RF Conducted Measurement | | | | | | |
| Spectrum Analyzer | N9010A | 10SL0219 | 08/20/2016 | 1 Year | 08/20/2017 | <input checked="" type="checkbox"/> |

Annex B. SIEMIC Accreditation

| Accreditations | Document | Scope / Remark |
|---|---|---|
| ISO 17025 (A2LA) |  | Please see the documents for the detailed scope |
| ISO Guide 65 (A2LA) |  | Please see the documents for the detailed scope |
| TCB Designation | | A1, A2, A3, A4, B1, B2, B3, B4, C |
| FCC DoC Accreditation |  | FCC Declaration of Conformity Accreditation |
| FCC Site Registration |  | 3 meter site |
| FCC Site Registration |  | 10 meter site |
| IC Site Registration |  | 3 meter site |
| IC Site Registration |  | 10 meter site |
| EU NB |  | Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025 |
| |  | Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025 |
| Singapore iDA CB(Certification Body) |   | Phase I, Phase II |
| Vietnam MIC CAB Accreditation |  | Please see the document for the detailed scope |
| Hong Kong OFCA |  | (Phase II) OFCA Foreign Certification Body for Radio and Telecom |
| |  | (Phase I) Conformity Assessment Body for Radio and Telecom |
| Industry Canada CAB |  | Radio: Scope A – All Radio Standard Specification in Category I |
| |  | Telecom: CS-03 Part I, II, V, VI, VII, VIII |

| | | |
|---|---|--|
| Japan Recognized Certification Body Designation |  | Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law |
| Korea CAB Accreditation |  | EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS |
| Taiwan NCC CAB Recognition |  | LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08 |
| Taiwan BSMI CAB Recognition |  | CNS 13438 |
| Japan VCCI |  | R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement |
| Australia CAB Recognition |  | EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1 |
| Australia NATA Recognition |  | AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2 |