

# RF TEST REPORT



Report No.: FCC\_RF\_SL18061302-SPC-005-0446  
 Supersede Report No.:

Applicant	:	SpiderCloud Wireless, Inc.
Product Name	:	SpiderCloud Radio Node
Model No.	:	SCRN-320-0446 & SCRN-320-0446-E
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v02
FCC ID	:	Y47RN320B446
Dates of test	:	01/18/2017 - 07/02/2018
Issue Date	:	07/03/2018
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		

This Test Report is Issued Under the Authority of:	
<i>Gary Chou</i>	<i>Chen Ge</i>
Gary Chou	Chen Ge
Test Engineer	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:  
 SIEMIC Laboratories  
 775 Montague Expressway, Milpitas, 95035 CA



775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

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## Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

### 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 & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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## 1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL18061302-SPC-005-0446	None	Original	07/03/2018

## 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-320-0446 & SCRN-320-0446-E

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1<sup>st</sup> 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-320-0446 & SCRN-320-0446-E
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	LAA/LTE-U
Operating Frequency	5160-5240MHz 5735-5825MHz	5190-5230MHz 5755-5795MHz
Modulation	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM
Channel Spacing	20MHz	40MHz
Number of Channels	10	4
Antenna Type	Internal Omni PCB Antenna External Omni PCB Antenna	Internal Omni PCB Antenna External Omni PCB Antenna
Antenna Gain (Peak)	2dBi / 3dBi	2dBi / 3dBi
Antenna Connector Type	U.FL	U.FL
Note	N/A	N/A

EUT Power level setting



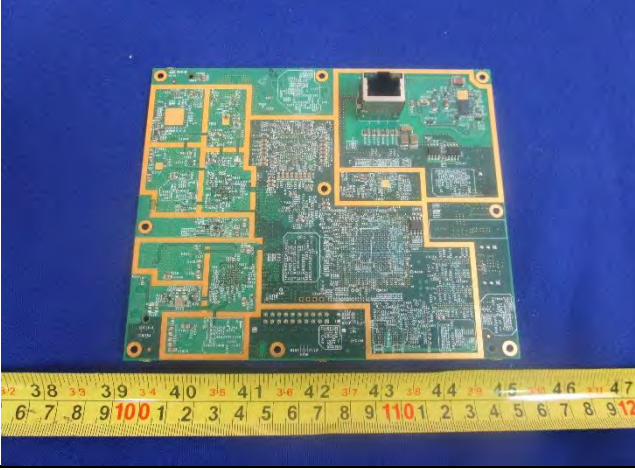
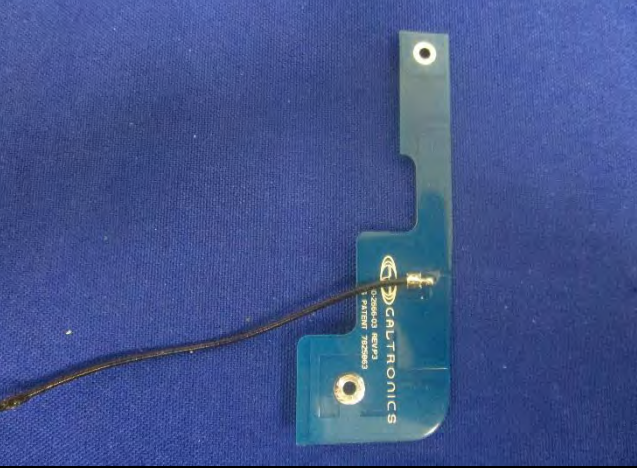
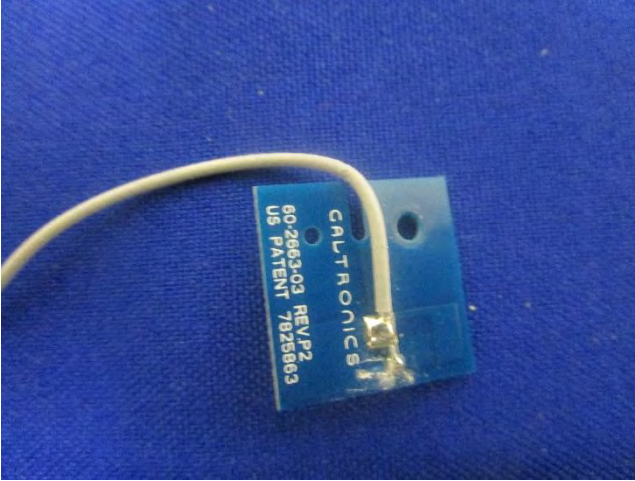
Mode	Frequency	Power Setting
QPSK	5160	26
	5200	26
	5240	26
64QAM	5160	26
	5200	26
	5240	26
QPSK	5735	26
	5785	26
	5825	26
64QAM	5735	26
	5785	26
	5825	26

### 6.3 EUT Photos - External



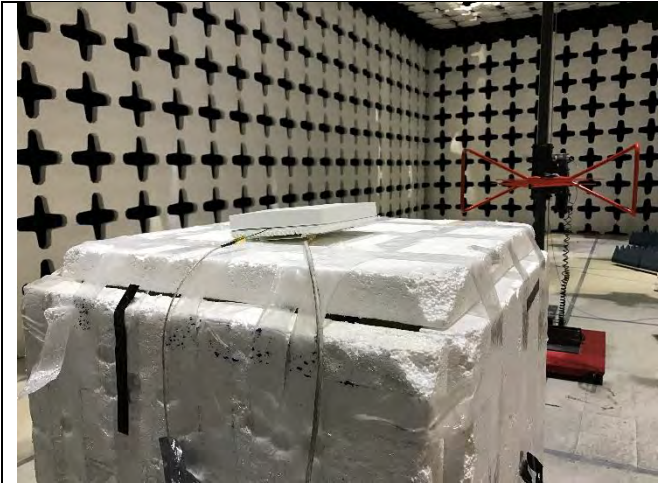


#### 6.4 EUT Photos - Internal

	
<p>EUT - Open Case View</p>	<p>Main PCB - Top View</p>
	
<p>Main PCB - Bottom View</p>	<p>Internal antenna 1</p>
	
<p>Internal antenna 2</p>	

## 6.5 EUT Test Setup Photos

Internal Antenna:



Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



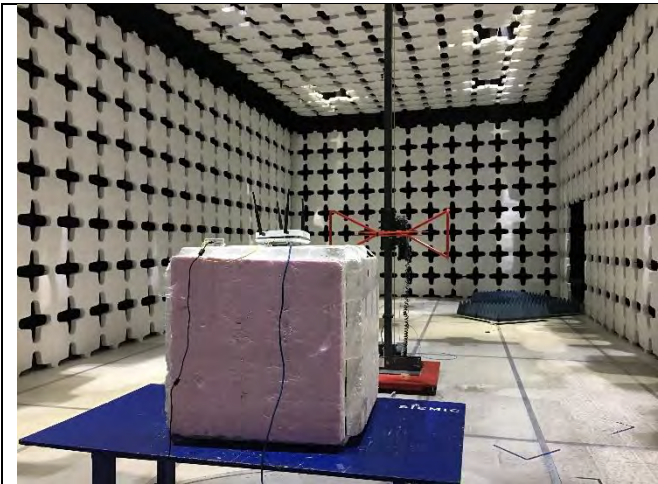
Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

Note: The spurious emission in different EUT orientation was investigated, including the EUT standing up position and the laying down position. The EUT orientation shown in above setup photo is the worst case position.

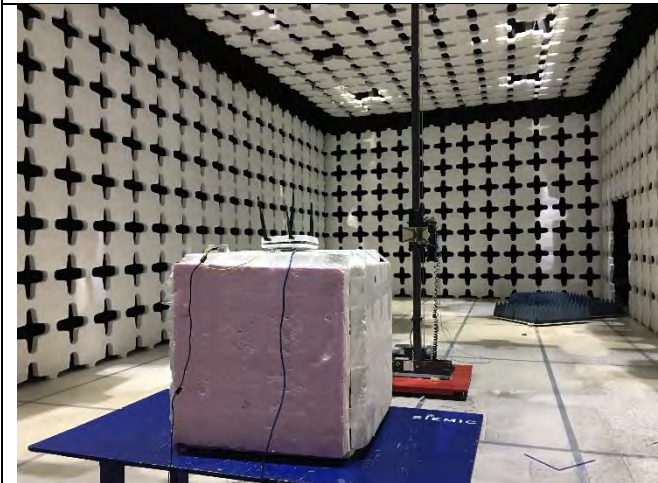
External Antenna:



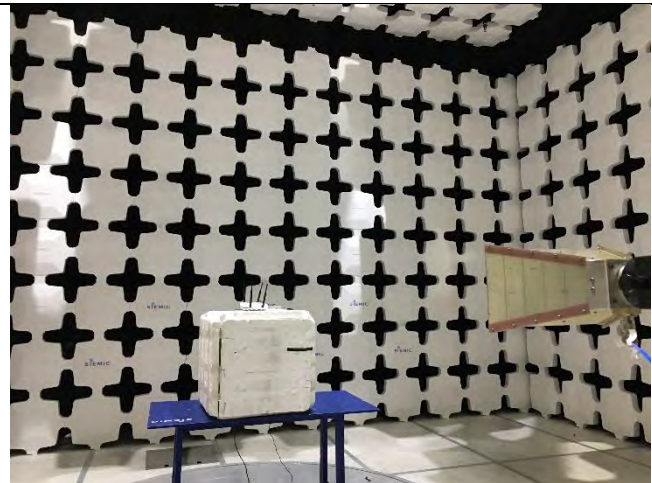
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

Note: The spurious emission in different EUT orientation was investigated, including the EUT standing up position and the laying down position. The EUT orientation shown in above setup photo is the worst case position.

## 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	15.205	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v02	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	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)	789033 D02 General UNII Test Procedures New Rules v02	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Maximum conducted Output Power	FCC	15.407 (a) (1) 15.407 (a) (3)	789033 D02 General UNII Test Procedures New Rules v02	<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)	662911 D01 Multiple Transmitter Output v02r01	<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)	789033 D02 General UNII Test Procedures New Rules v02	<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 v02	
Power Spectral Density	FCC	15.407 (a) (1) 15.407 (a) (3)	789033 D02 General UNII Test Procedures New Rules v02	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Frequency Stability	FCC	15.407 (g)	789033 D02 General UNII Test Procedures New Rules v02	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	789033 D02 General UNII Test Procedures New Rules v02	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
User Manual	FCC	-	-	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A

Remark	<ol style="list-style-type: none"> <li>All measurement uncertainties are not taken into consideration for all presented test result.</li> <li>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.</li> </ol>
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## 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
<b>Expanded Uncertainty (K=2)</b>					<b>3.856266</b>

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
<b>Expanded Uncertainty (K=2)</b>					<b>6.0118262</b>

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
<b>Expanded Uncertainty (K=2)</b>					<b>8.4726</b>

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
<b>Expanded Uncertainty (K=2)</b>					<b>0.952174</b>

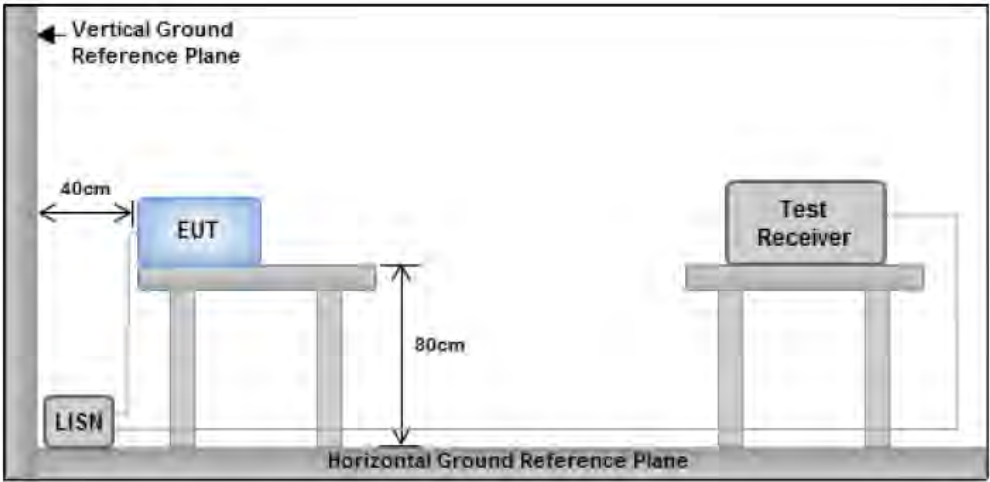
The total derived measurement uncertainty is +/- 0.95 dB.

## 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
15.207 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 $\mu$ 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><b>Note: 1. Support units were connected to second LISN.</b>  <b>2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</b></p>	
Procedure		<ul style="list-style-type: none"> <li>- 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.</li> <li>- The power supply for the EUT was fed through a 50<math>\Omega</math>/50<math>\mu</math>H EUT LISN, connected to filtered mains.</li> <li>- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>- All other supporting equipment was powered separately from another main supply.</li> </ul>	
Remark		EUT was tested at 120VAC, 60Hz	
Result		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Test Data    Yes                       N/A

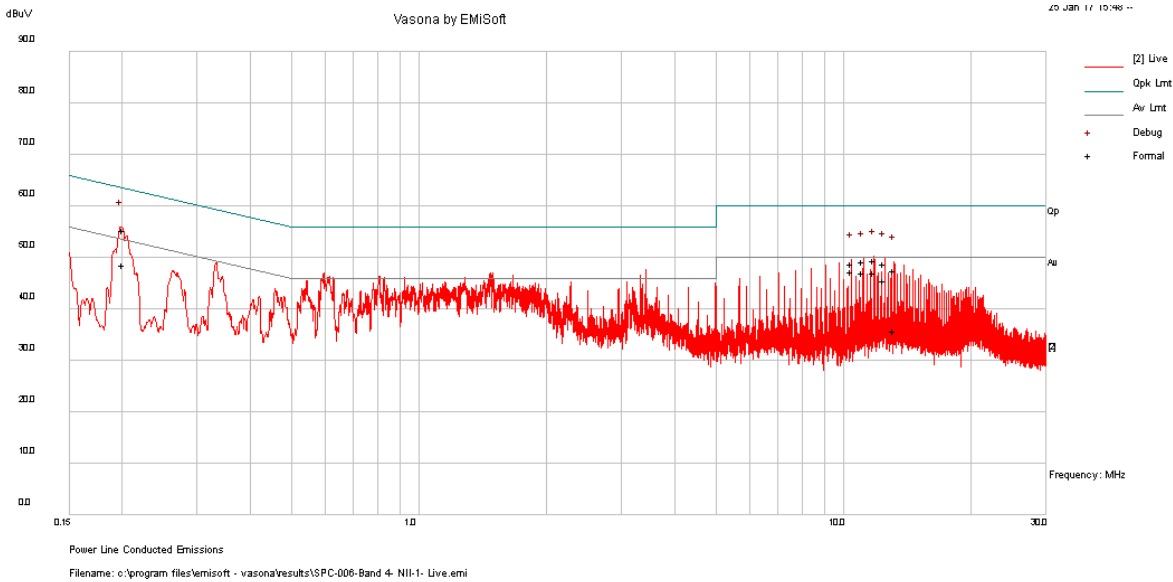
Test Plot    Yes (See below)               N/A

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			

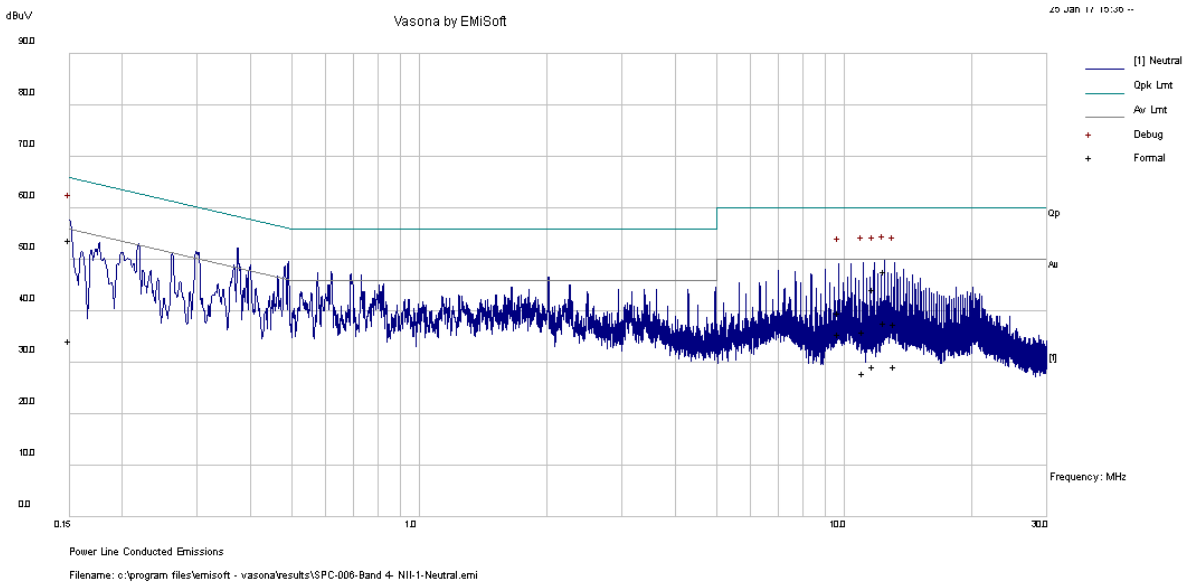


Line Plot at 120Vac, 60Hz

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			

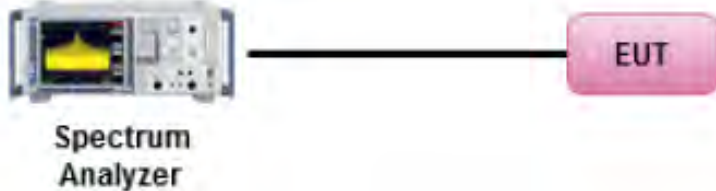


Neutral Plot at 120Vac, 60Hz

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			
Test Procedure	<p>789033 D02 General UNII Test Procedures New Rules v02</p> <p><u>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> <li>- Allow the trace to stabilize.</li> <li>- Use the spectrum analyzer built-in measurement function to determine the 26dB BW. <ul style="list-style-type: none"> <li>o Set RBW = around 1% of emission bandwidth</li> <li>o Set VBW &gt; RBW</li> <li>o Detector = Peak</li> <li>o Trace mode = max hold</li> </ul> </li> <li>- Capture the plot.</li> <li>- Repeat above steps for different test channel and other modulation type.</li> </ul> <p><u>6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> <li>- Allow the trace to stabilize.</li> <li>- Use the spectrum analyzer built-in measurement function to determine the 6dB BW. <ul style="list-style-type: none"> <li>o Set RBW = 100 KHz</li> <li>o <b>Set VBW ≥ 3 x RBW</b></li> <li>o Detector = Peak</li> <li>o Trace mode = max hold</li> <li>o Sweep = auto couple</li> </ul> </li> <li>- Capture the plot.</li> <li>- Repeat above steps for different test channel and other modulation type.</li> </ul>		
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  
20MHz:

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	-

40MHz:

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
26dB BW	64QAM	5190	Low	38.79	-
		5230	Mid	38.73	-

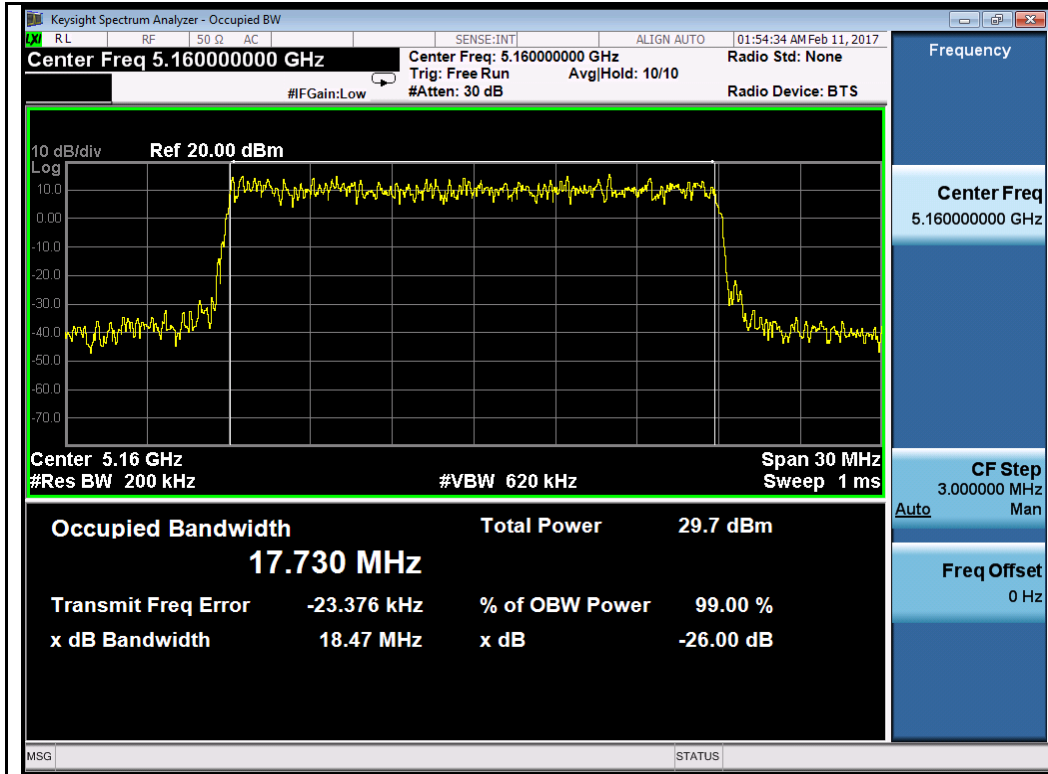
6dB Bandwidth measurement result for 5.8GHz  
20MHz:

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

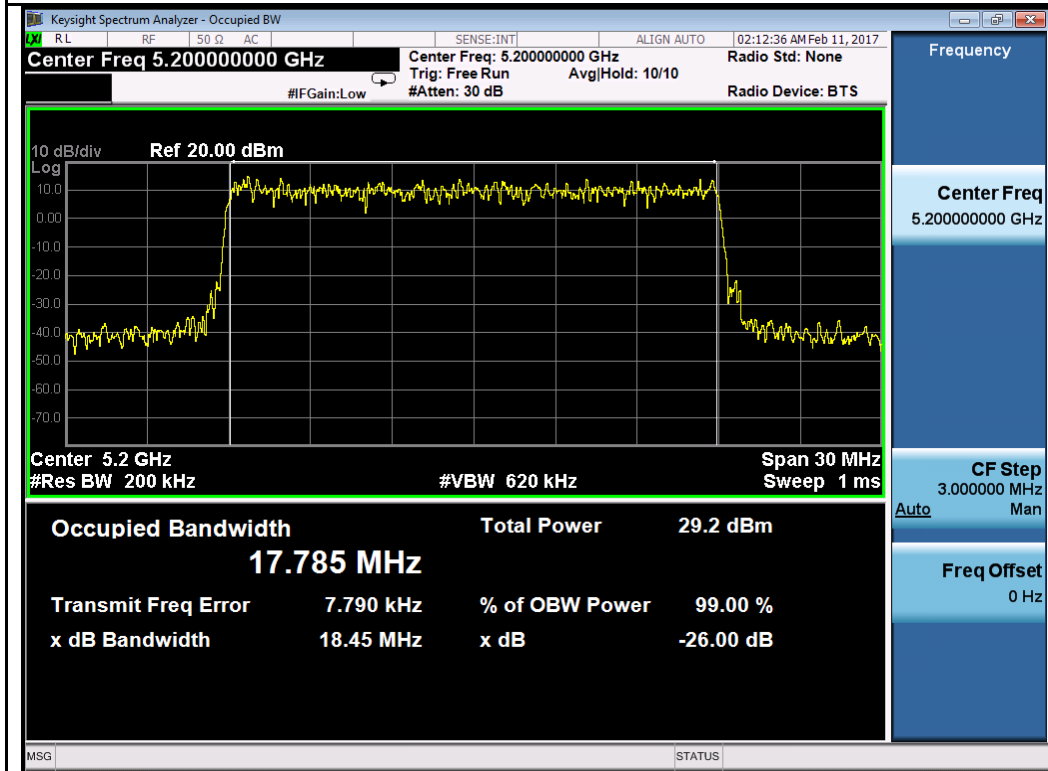
40MHz:

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
6dB BW	64QAM	5755	Low	37.63	-
		5795	High	37.82	-

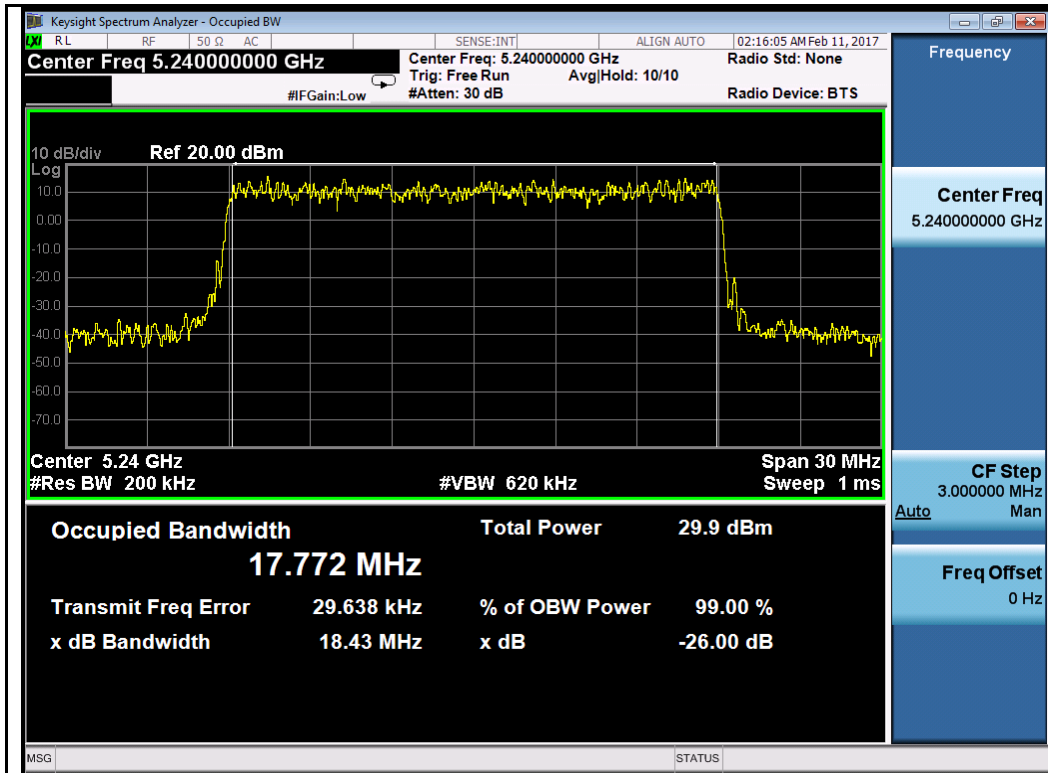
26dB Bandwidth Test Plots  
W52 20MHz:



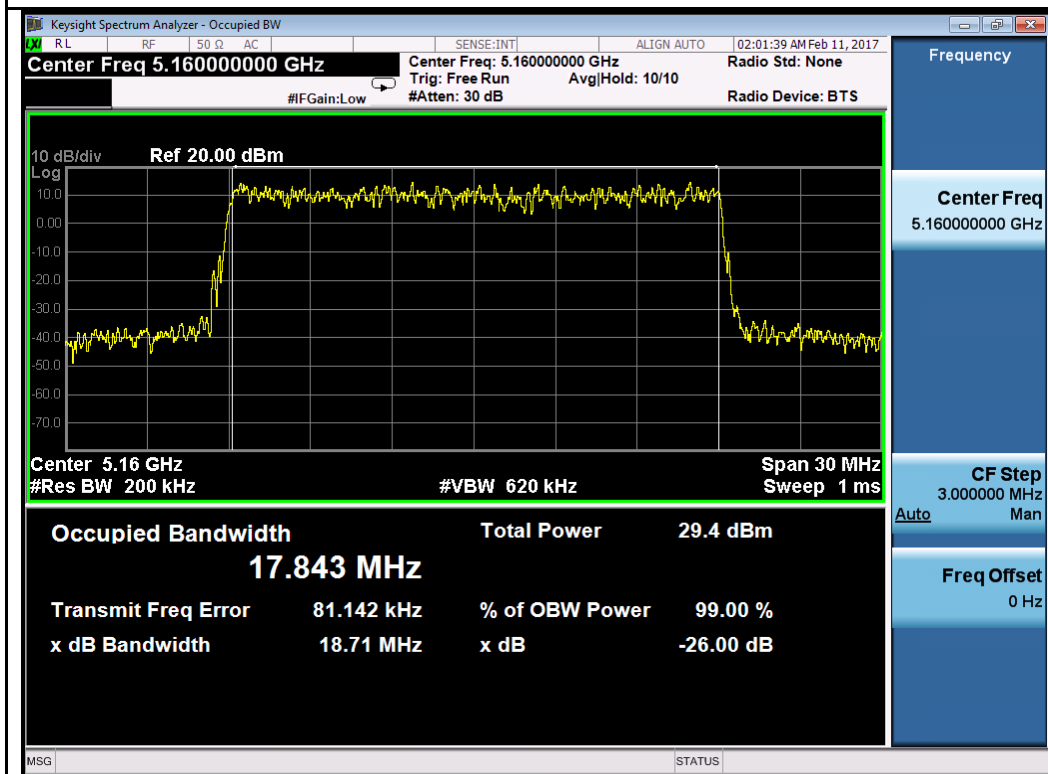
QPSK-5160MHz



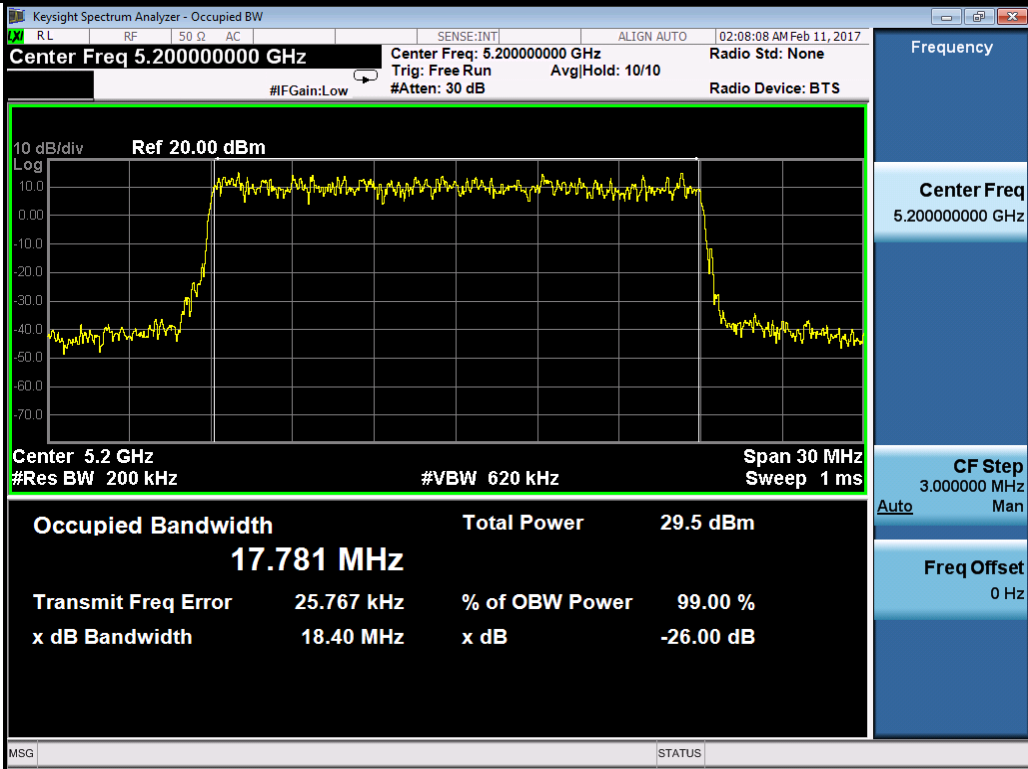
QPSK-5200MHz



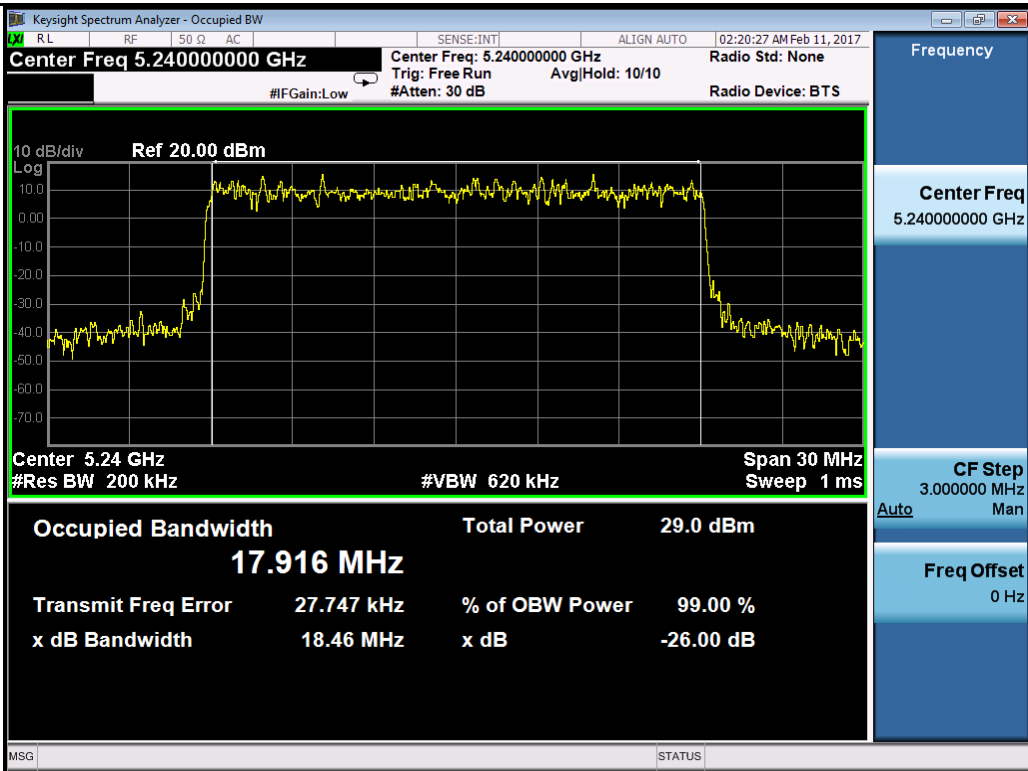
QPSK-5240MHz



64QAM-5160MHz

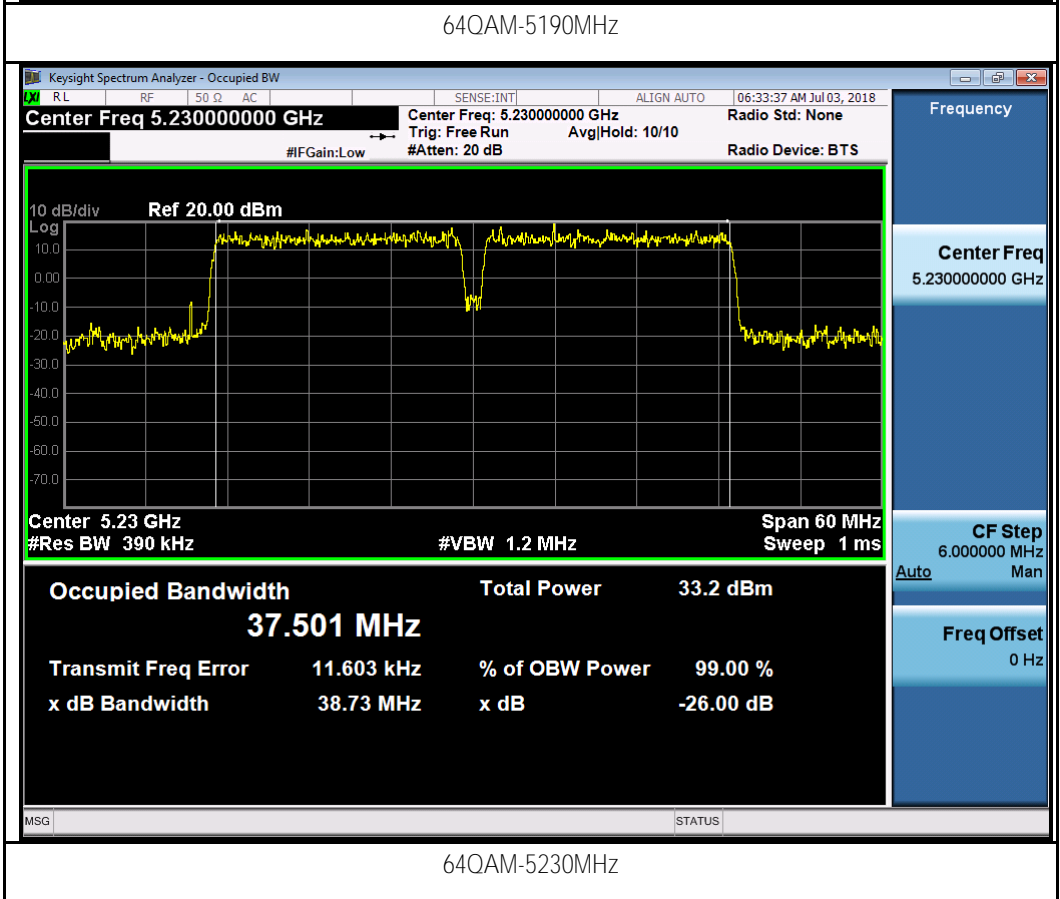
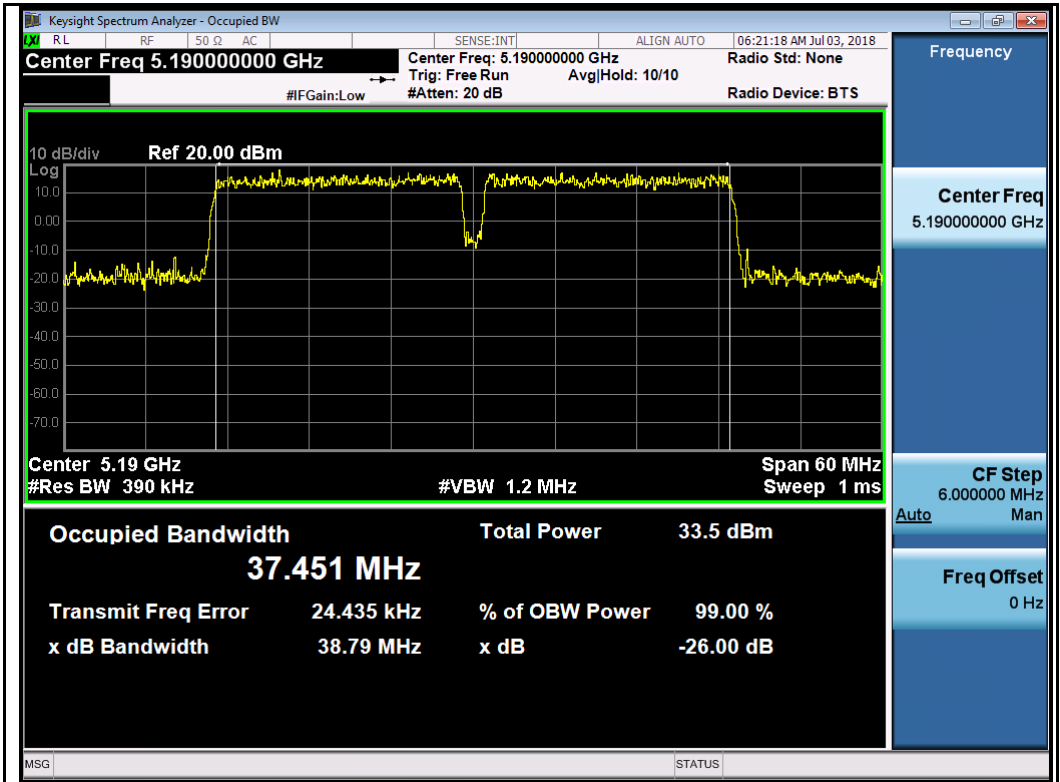


64QAM-5200MHz



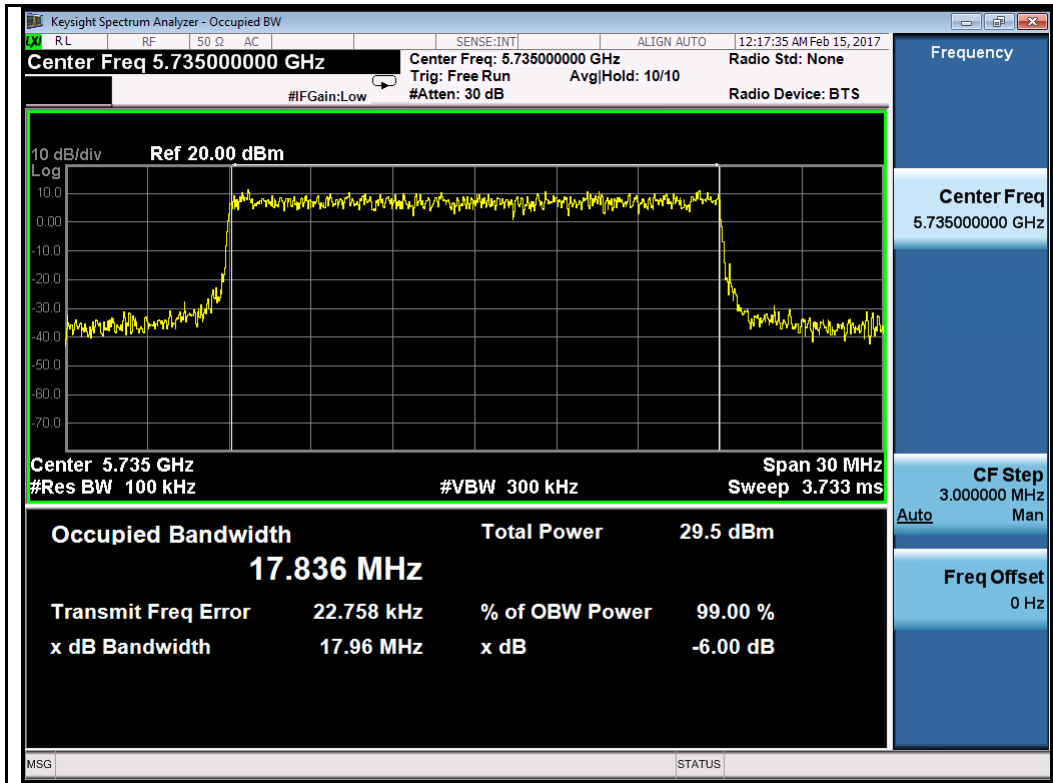
64QAM-5240MHz

W52 40MHz:

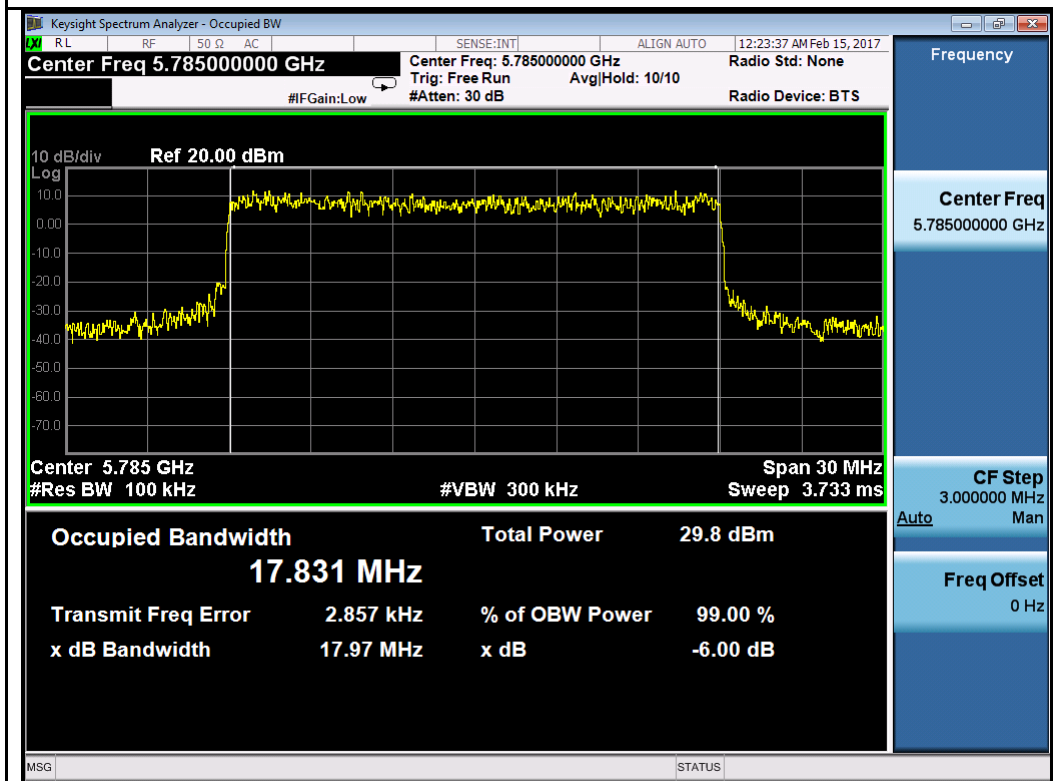




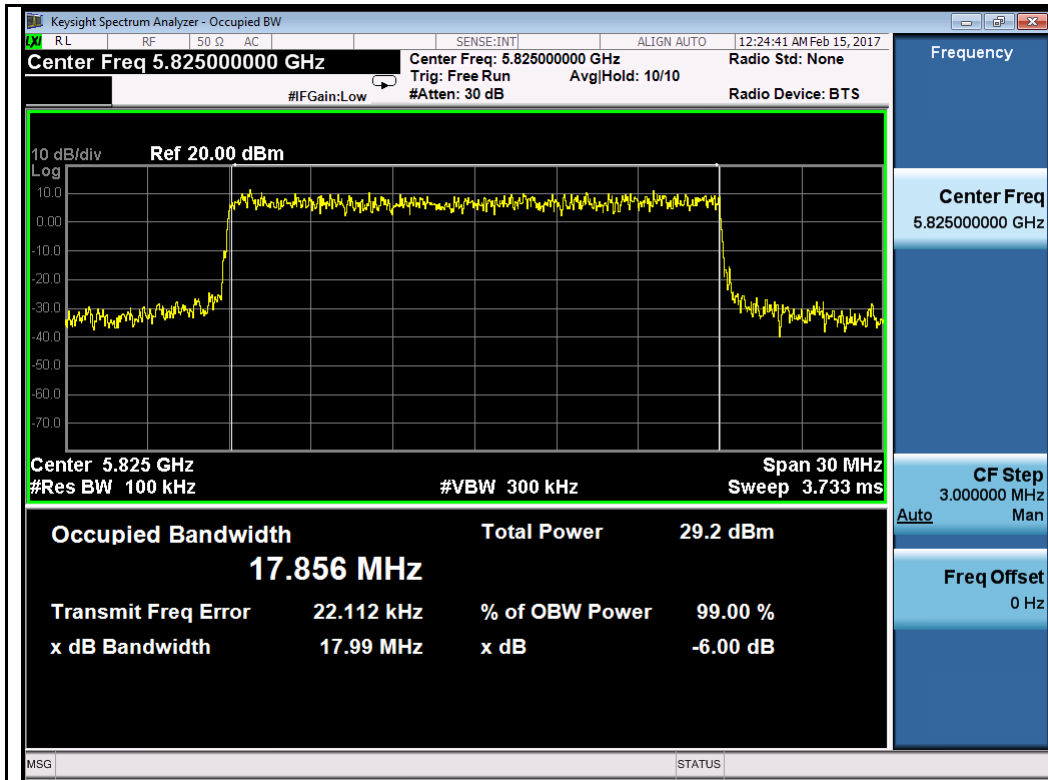
6dB Bandwidth Test Plots  
W58 20MHz:



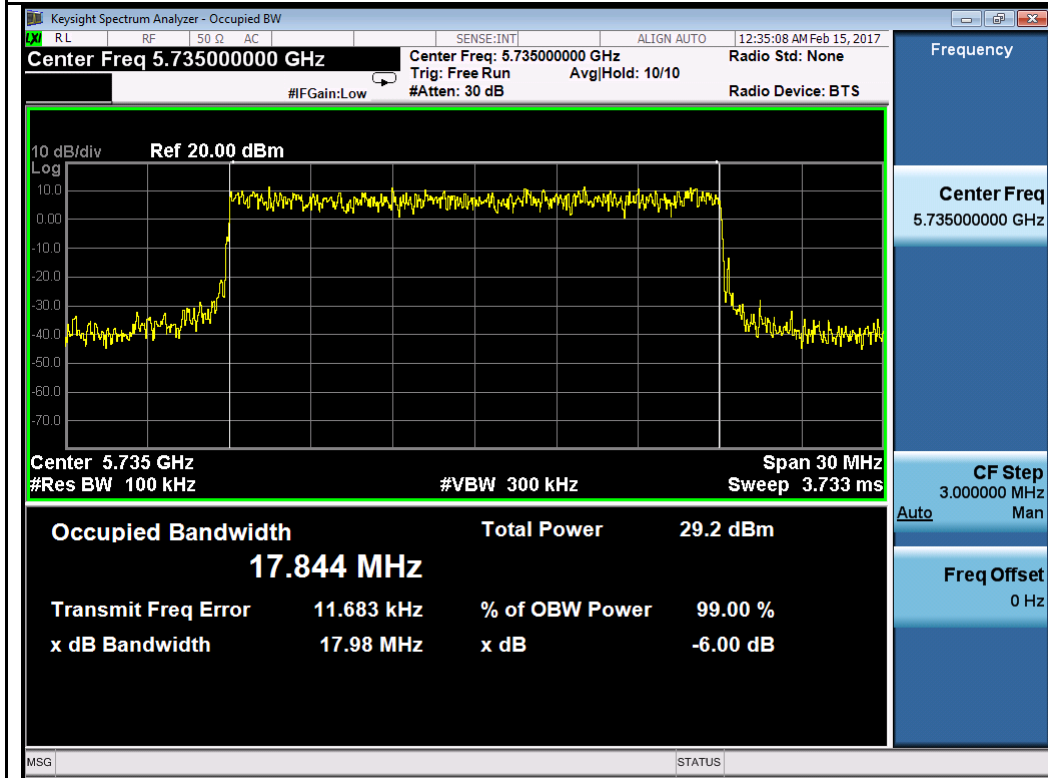
QPSK-5735MHz



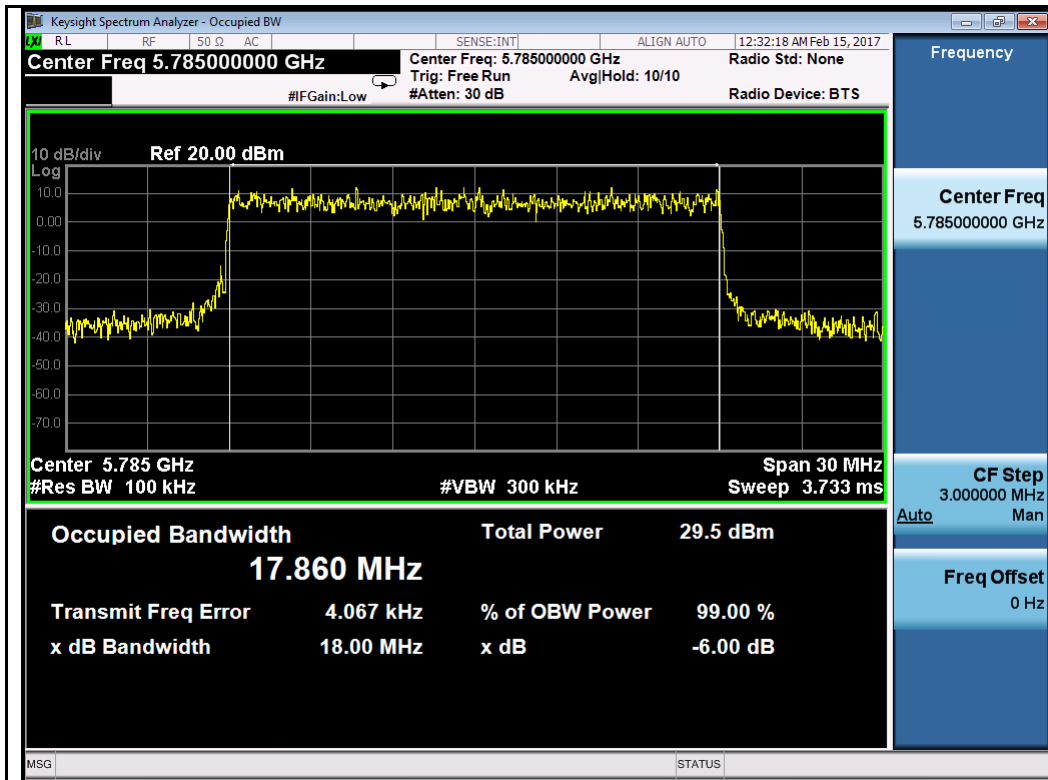
QPSK-5785MHz



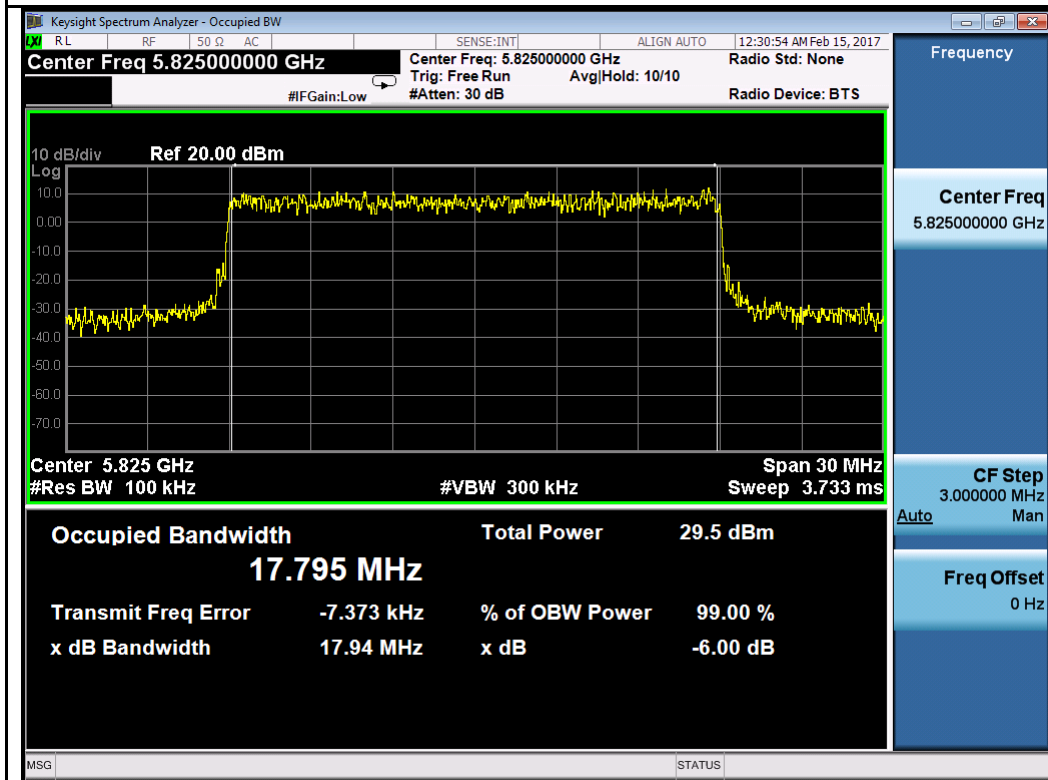
QPSK-5825MHz



64QAM-5735MHz

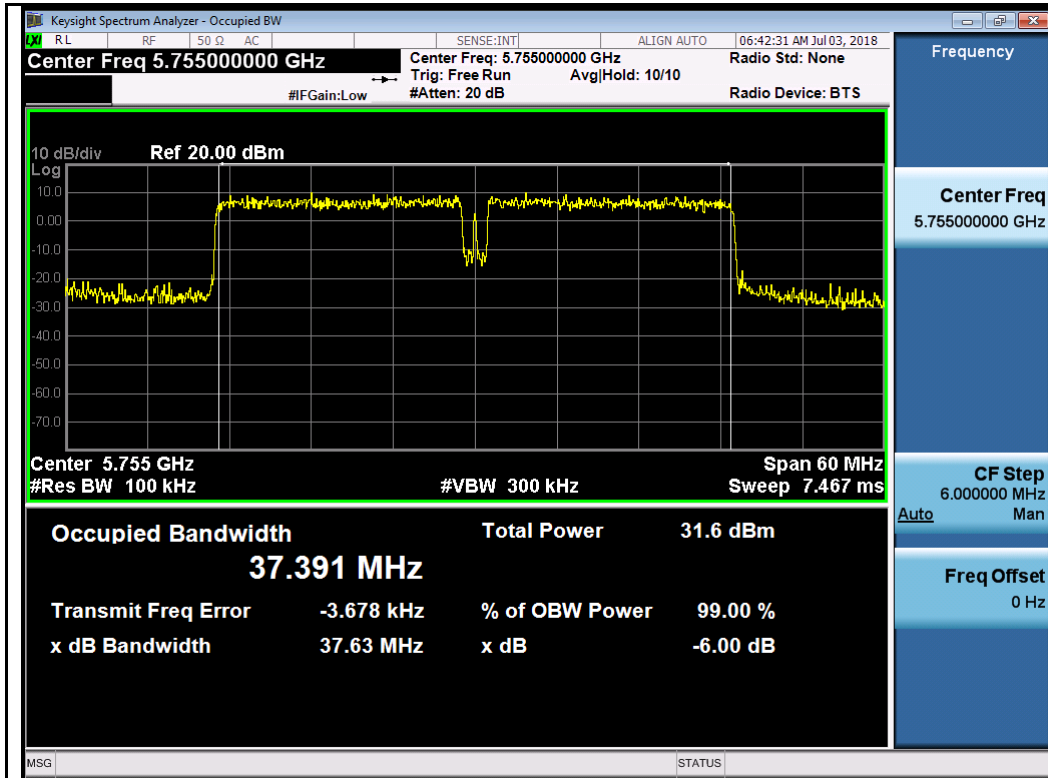


64QAM-5785MHz

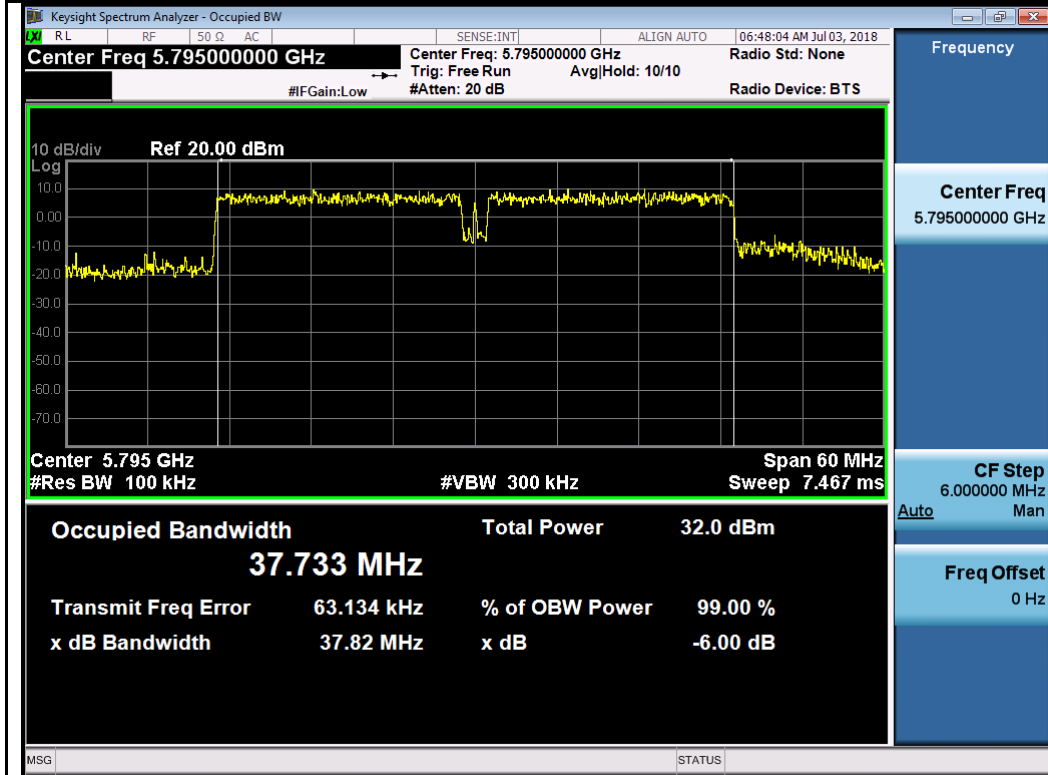


64QAM-5825MHz

W58 40MHz:



64QAM-5755MHz

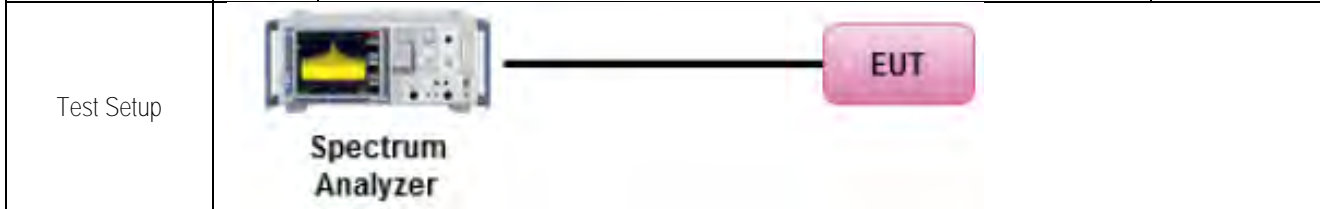


64QAM-5795MHz

### 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 Procedure	<p>789033 D02 General UNII Test Procedures New Rules v02</p> <p><u>Measurement using a Spectrum Analyzer or EMI Receiver (SA)</u> Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep):</p> <ul style="list-style-type: none"> <li>(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.</li> <li>(ii) Set RBW = 1 MHz</li> <li>(iii) Set VBW = 3 MHz</li> <li>(iv) <b>Number of points in sweep <math>\geq 2 \times \text{span} / \text{RBW}</math>. (This ensures that bin-to-bin spacing is <math>\leq \text{RBW}/2</math>, so that narrowband signals are not lost between frequency bins.)</b></li> <li>(v) Sweep time = auto.</li> <li>(vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.</li> <li>(vii) If transmit duty cycle &lt; 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 <math>\geq 98\%</math>, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."</li> <li>(viii) Trace average at least 100 traces in power averaging (rms) mode.</li> <li>(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.</li> </ul>		
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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  
20MHz:

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

40MHz:

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain 1	Chain 2	Combined Power		
Output power	64QAM	5190	Mid	23.57	23.79	26.69	30	Pass
		5230	High	23.59	23.90	26.76	30	Pass

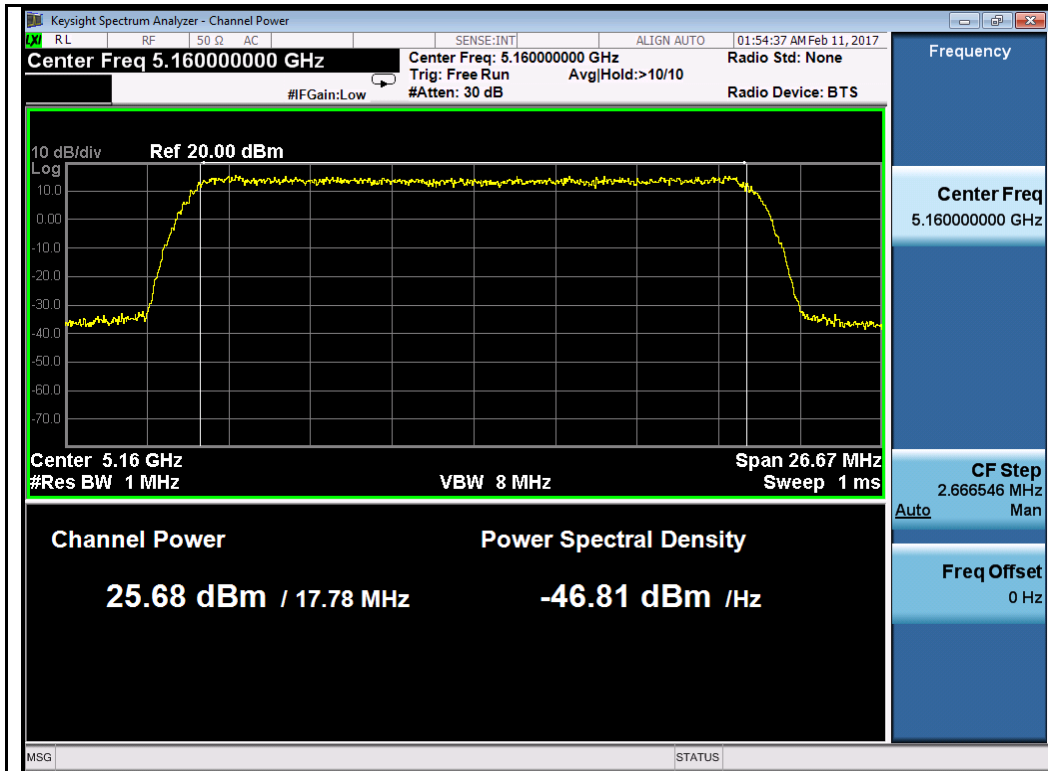
Output Power Measurement Results for 5.8GHz  
20MHz:

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

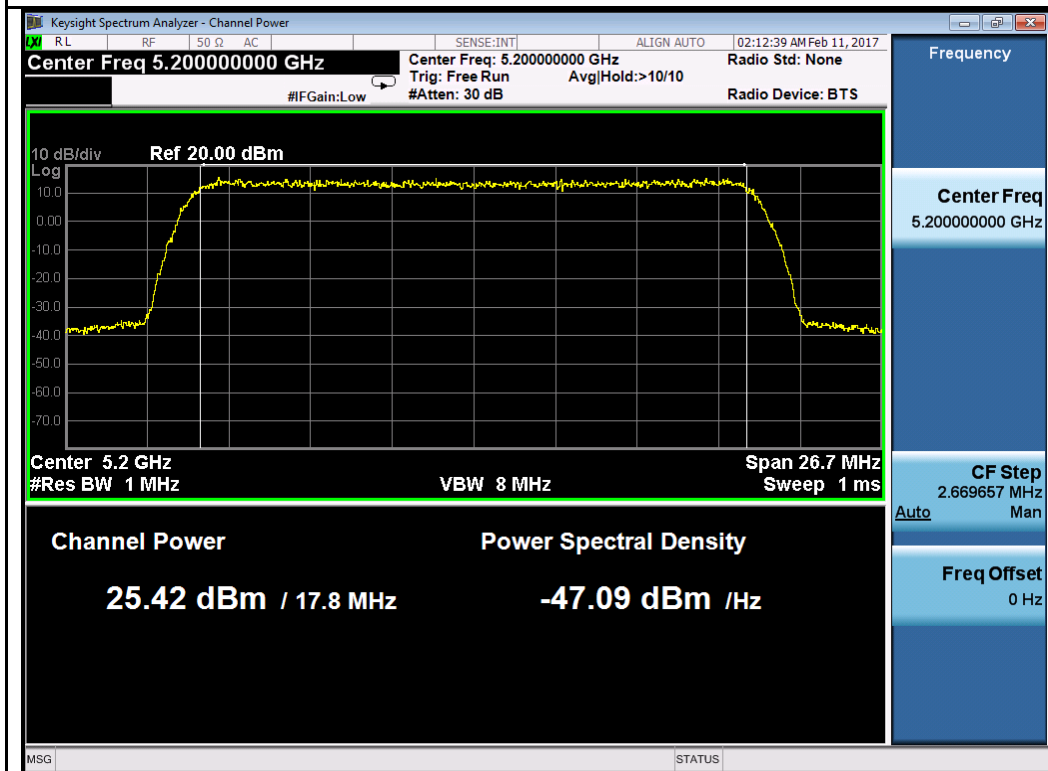
40MHz:

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain 1	Chain 2	Combined Power		
Output power	64QAM	5755	Mid	23.04	23.14	26.10	30	Pass
		5795	High	23.72	23.93	26.84	30	Pass

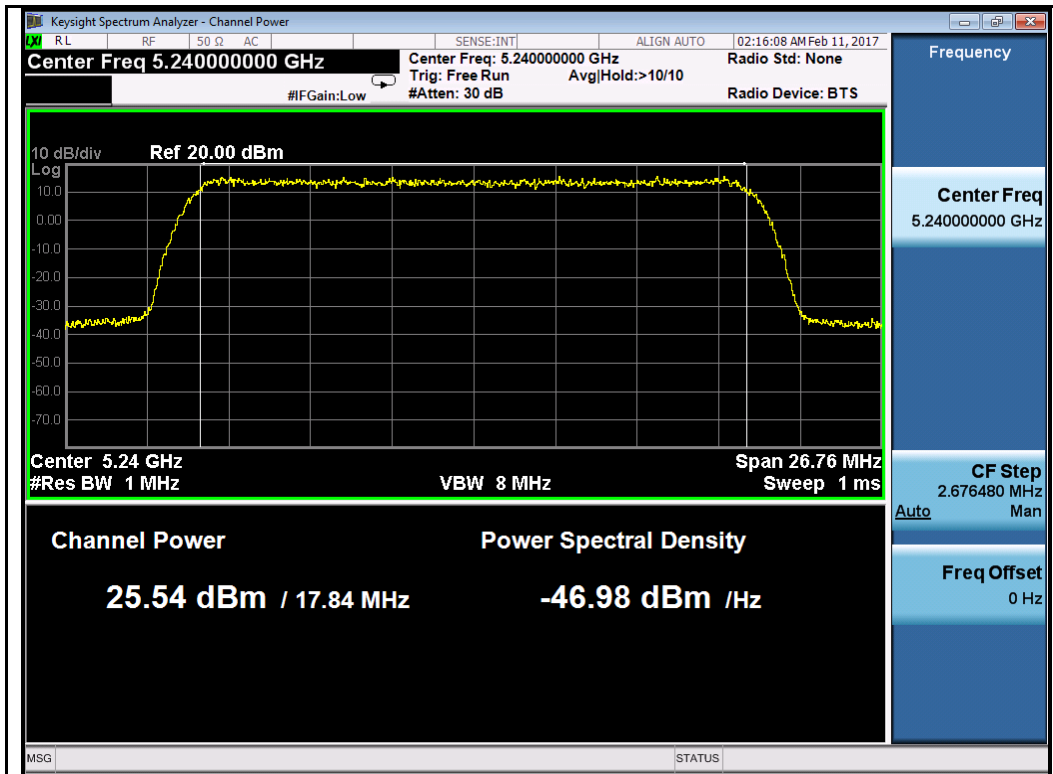
Test Plot for W52 20MHz:  
Chain 1:



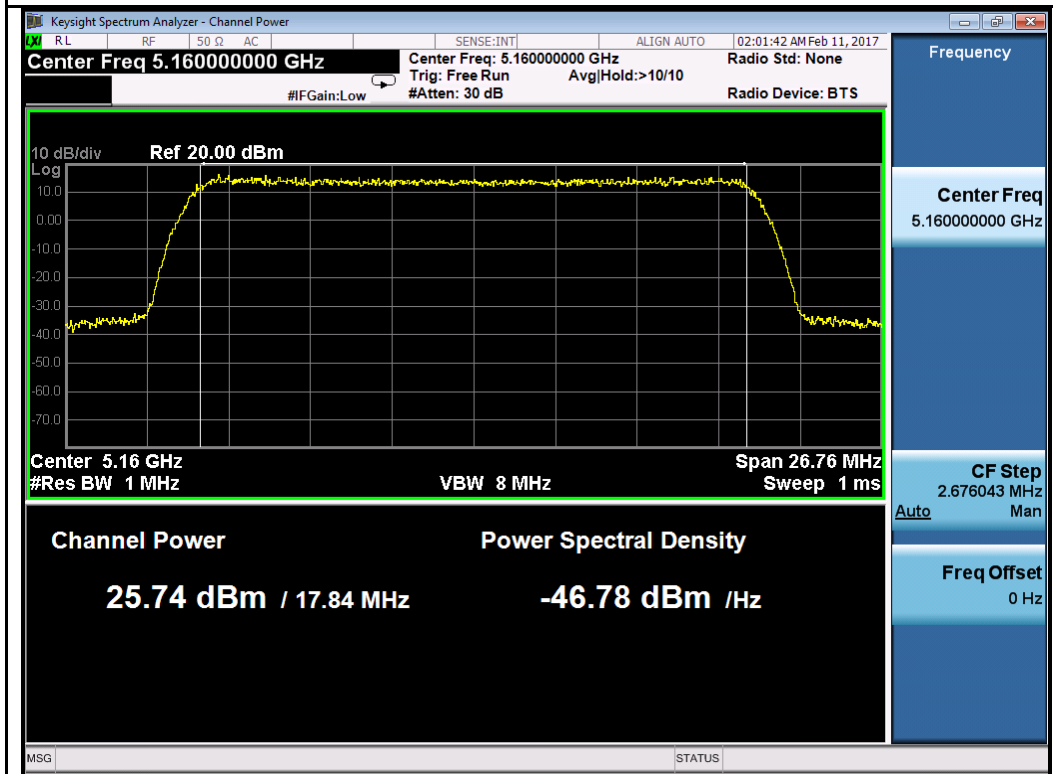
QPSK-5160MHz



QPSK-5200MHz

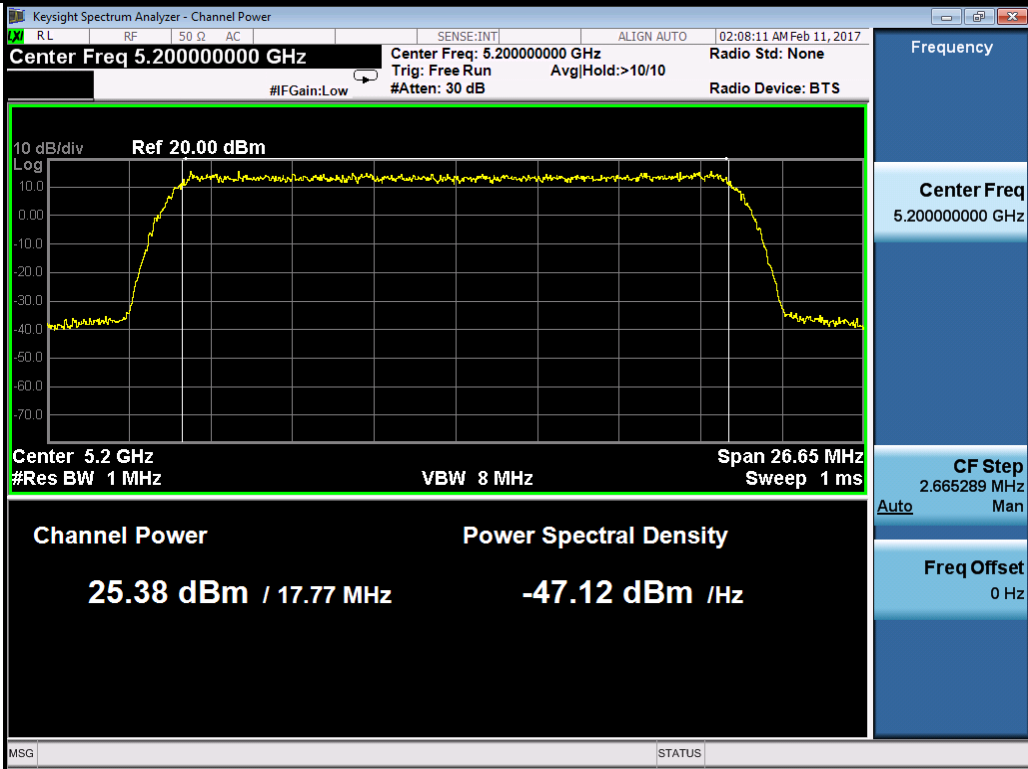


OPK-5240MHz

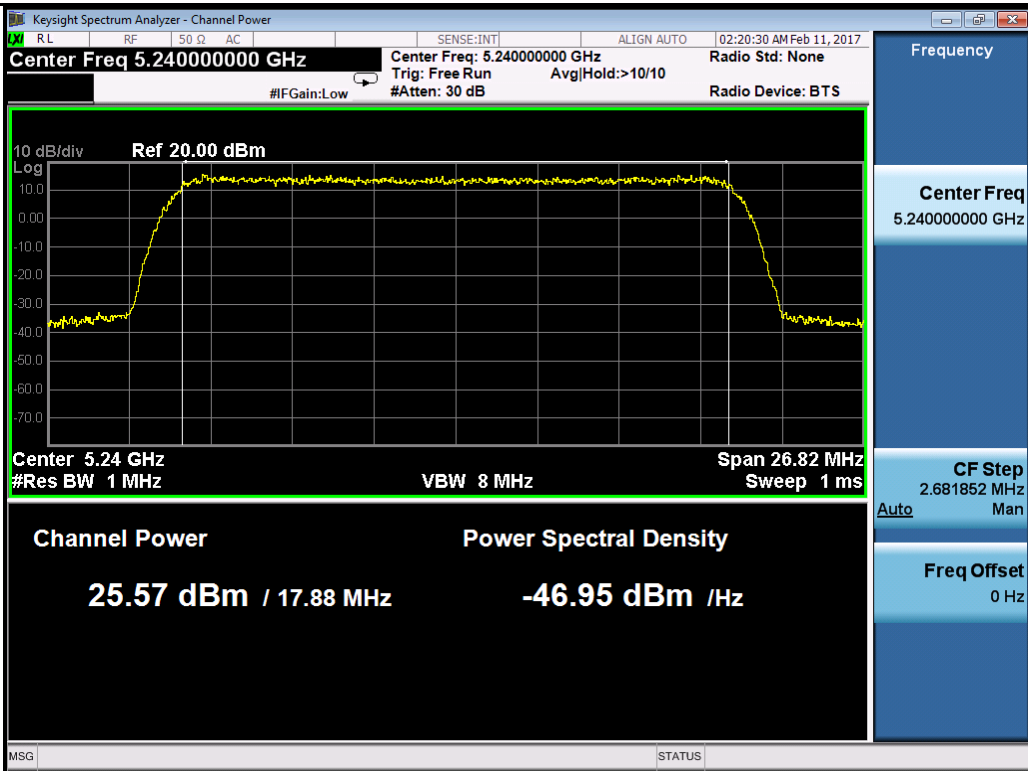


64QAM-5160MHz



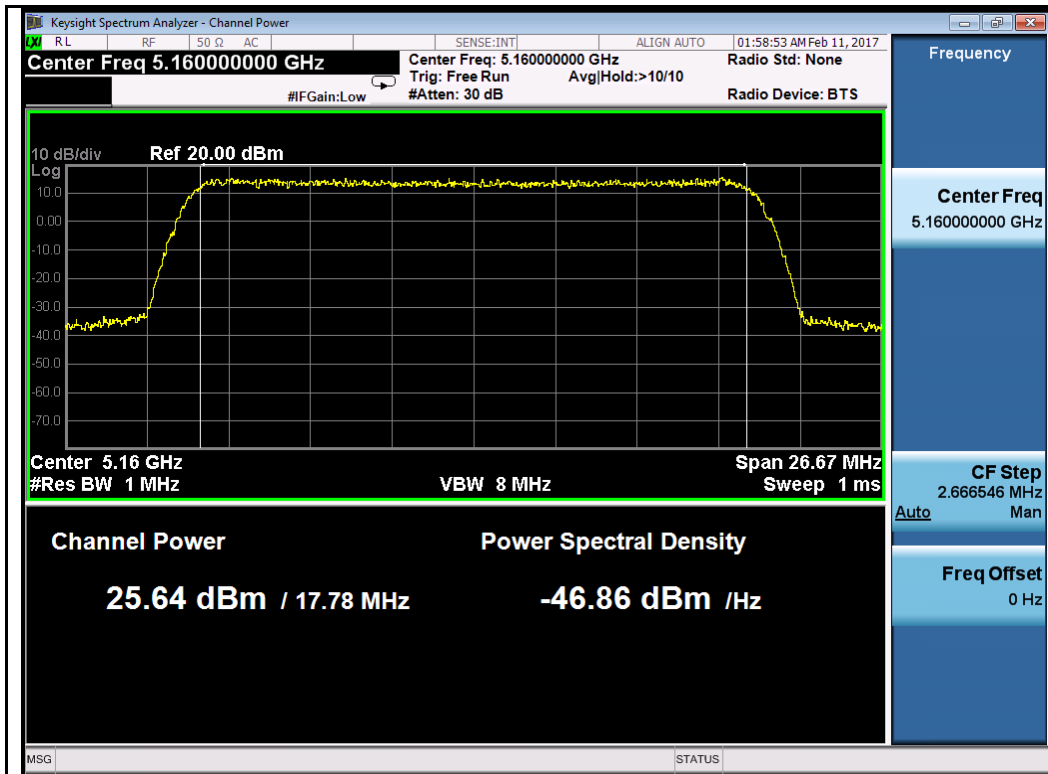


64QAM-5200MHz

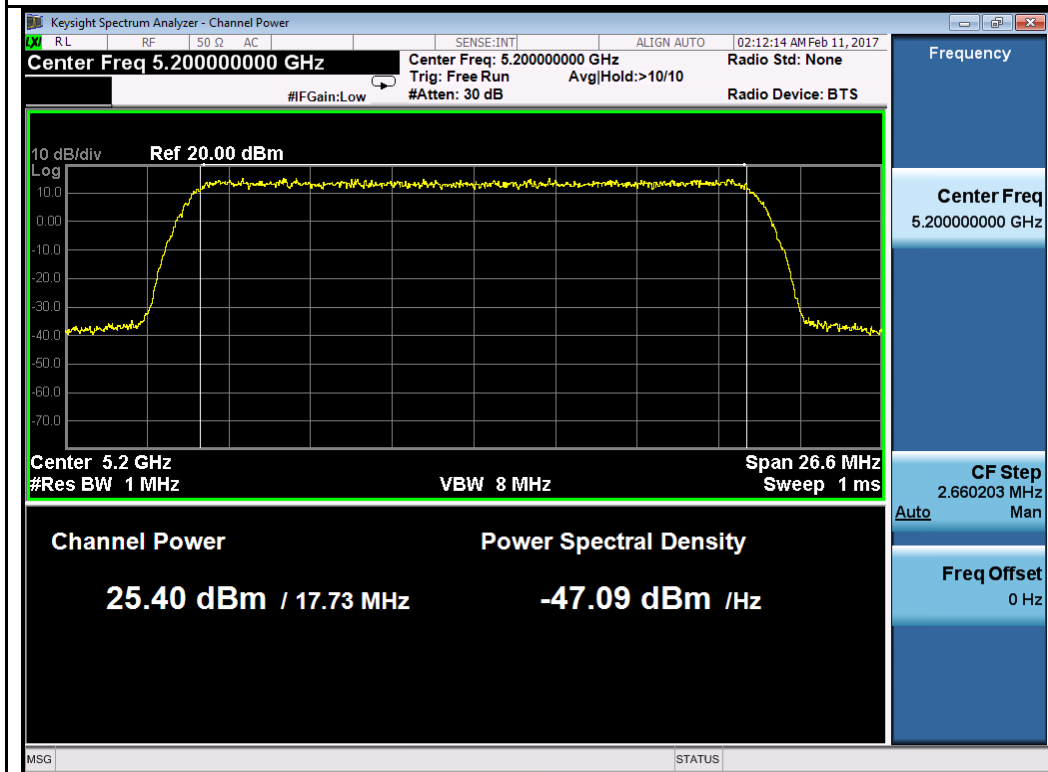


64QAM-5240MHz

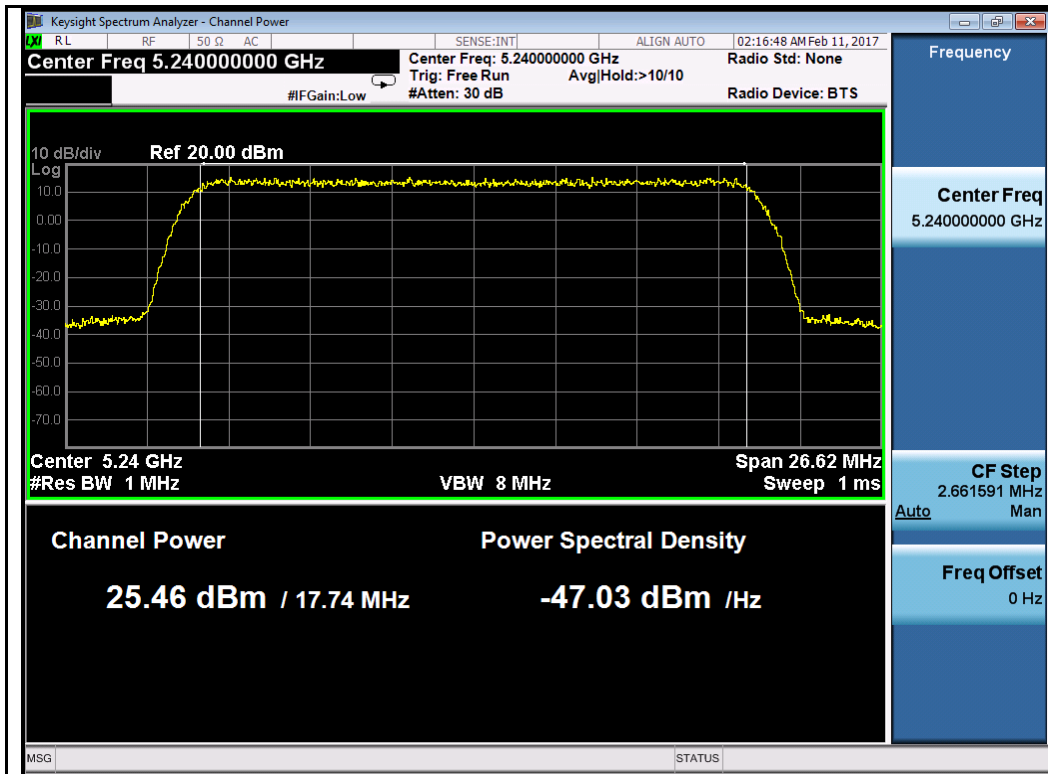
Chain 2:



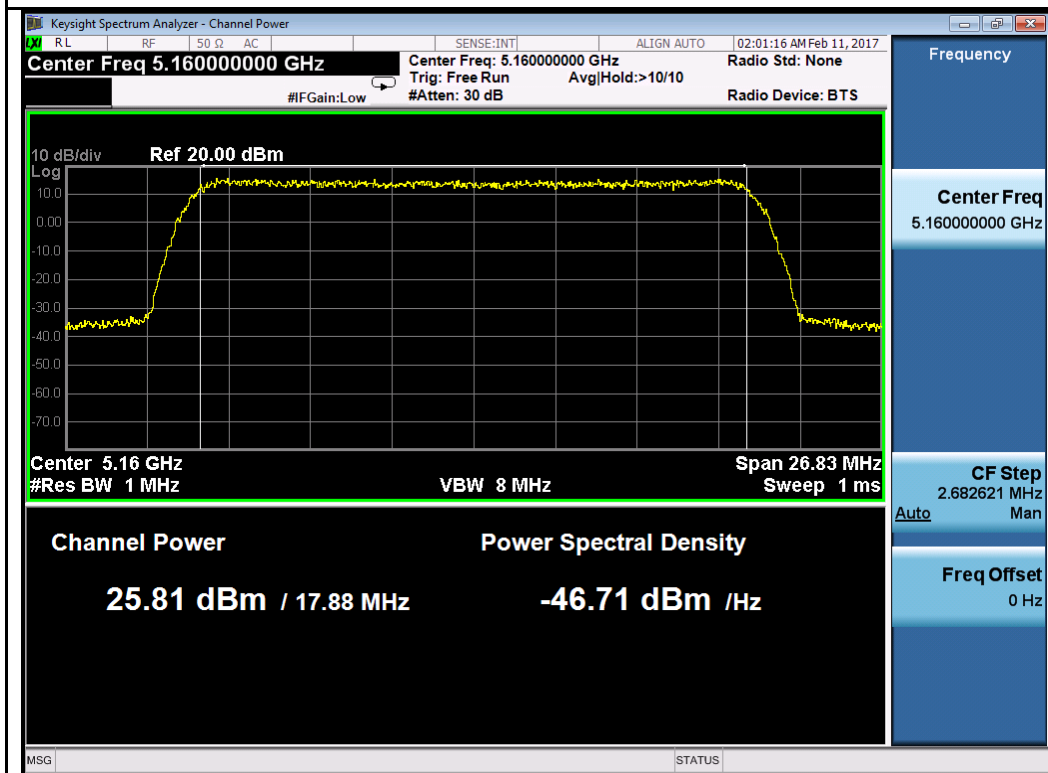
QPSK-5160MHz



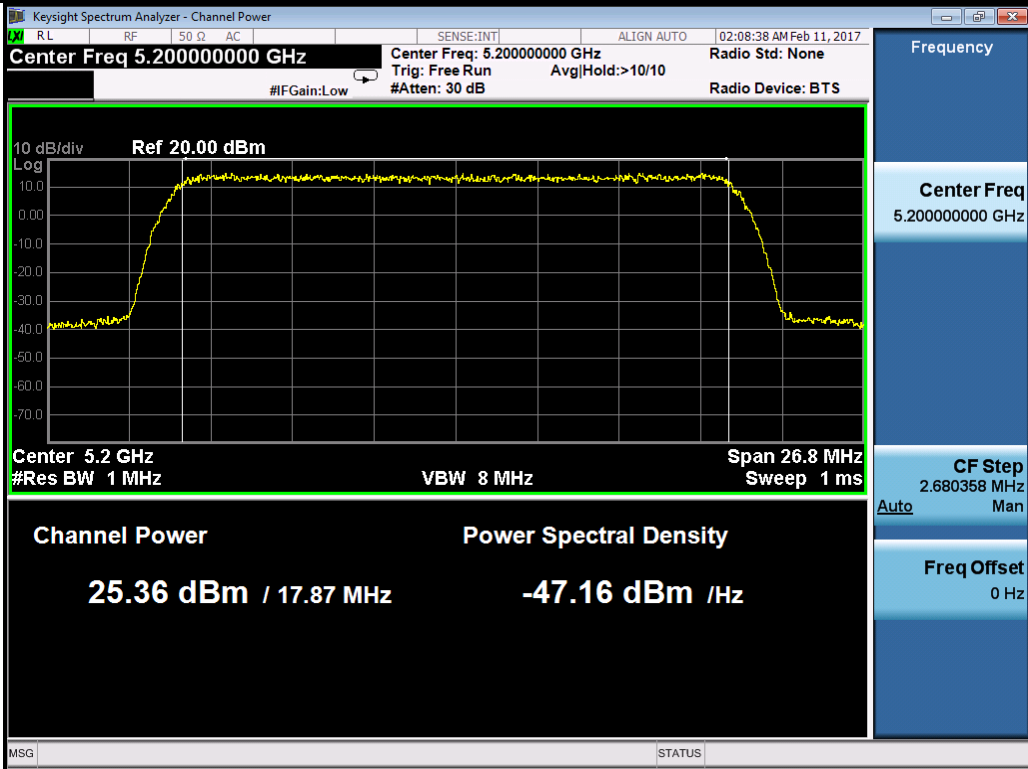
QPSK-5200MHz



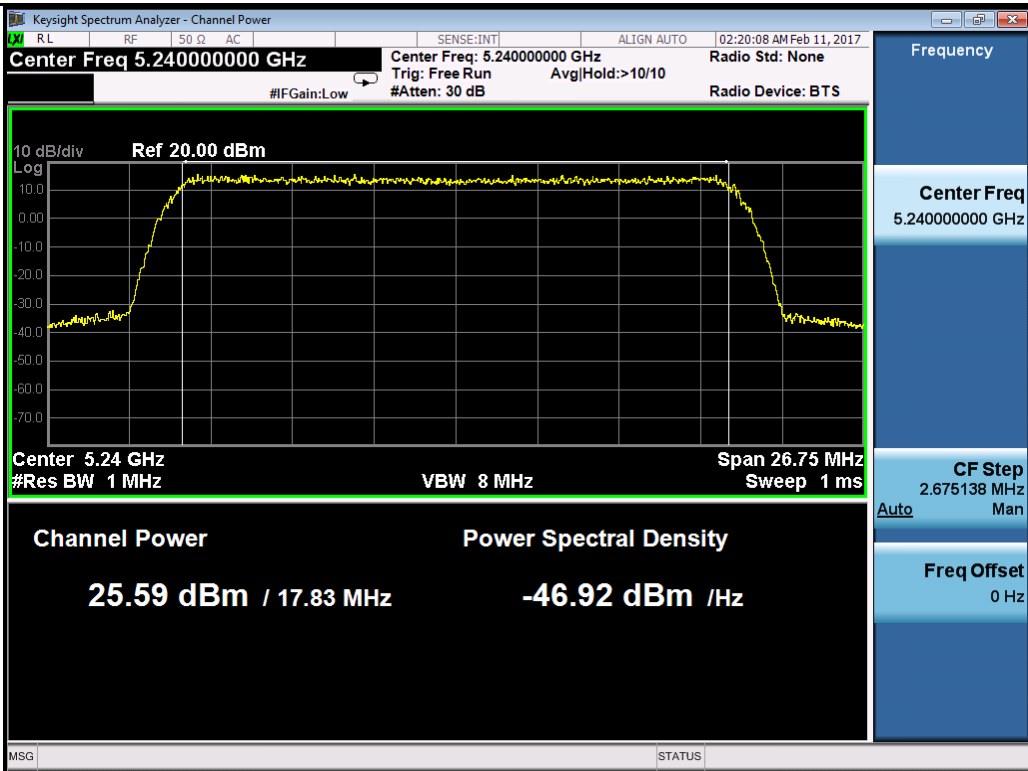
OPK-5240MHz



64QAM-5160MHz

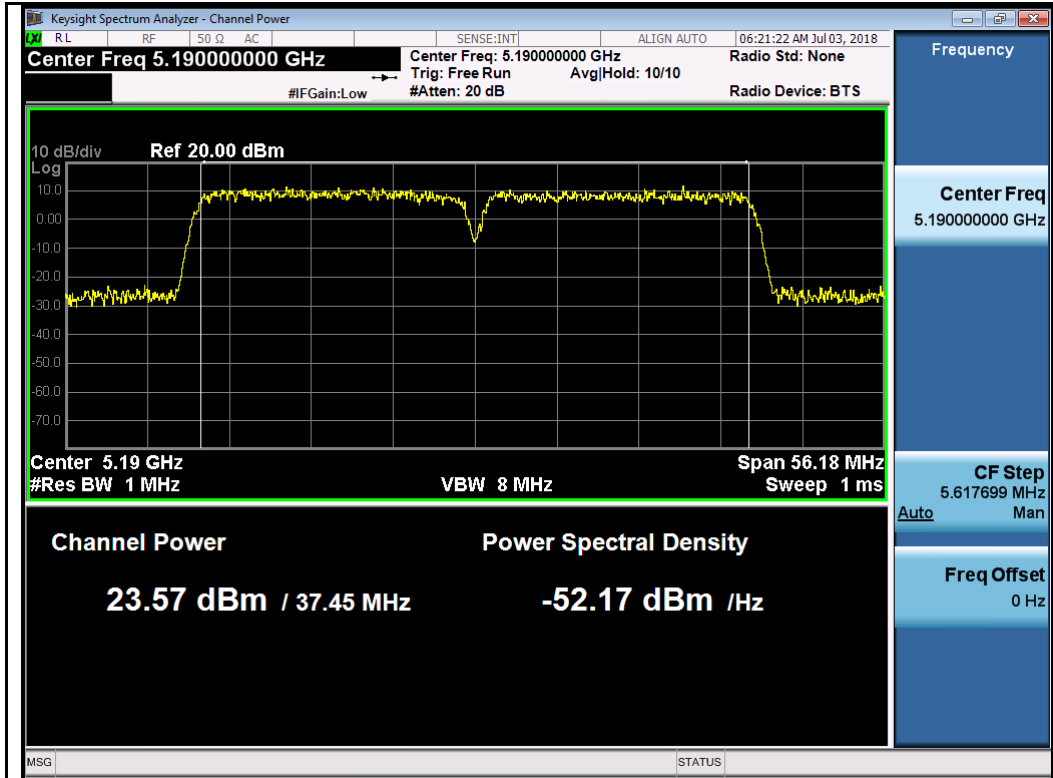


64QAM-5200MHz

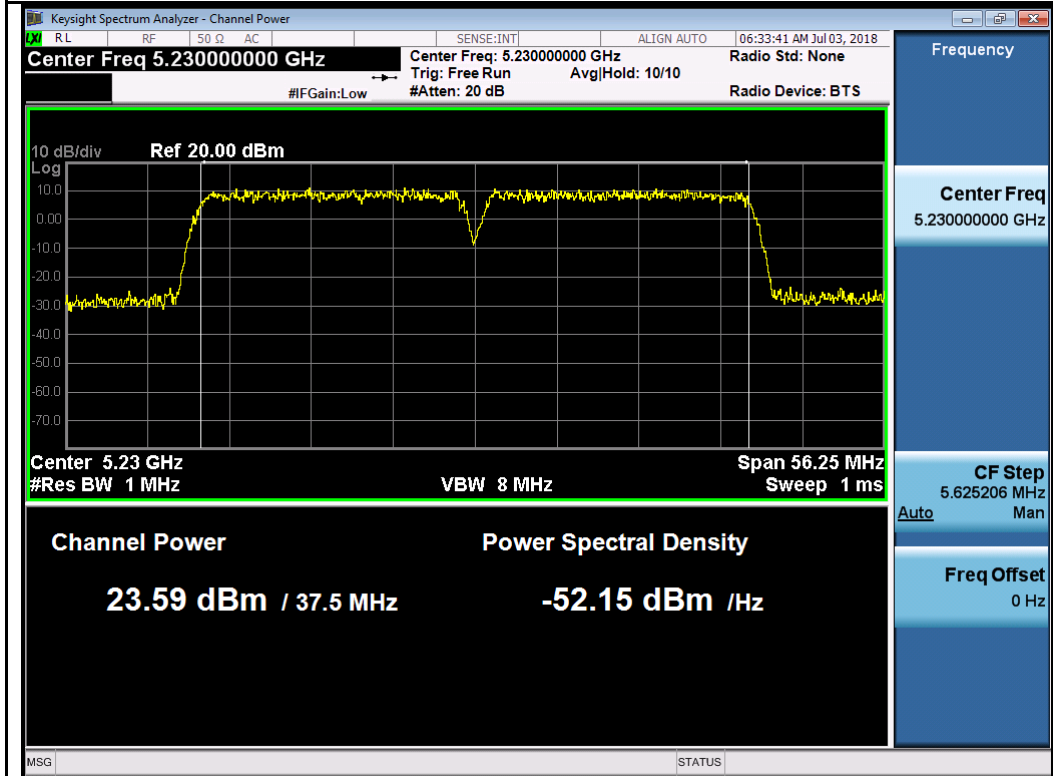


64QAM-5240MHz

40MHz  
Chain 1:

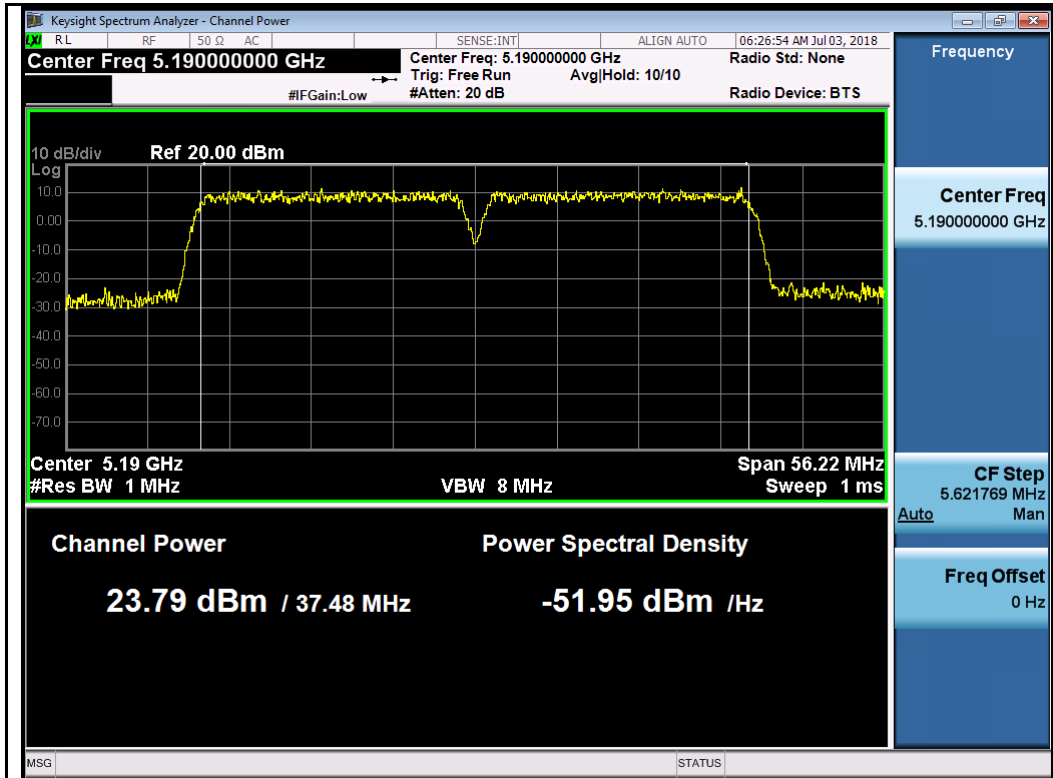


64QAM-5190MHz

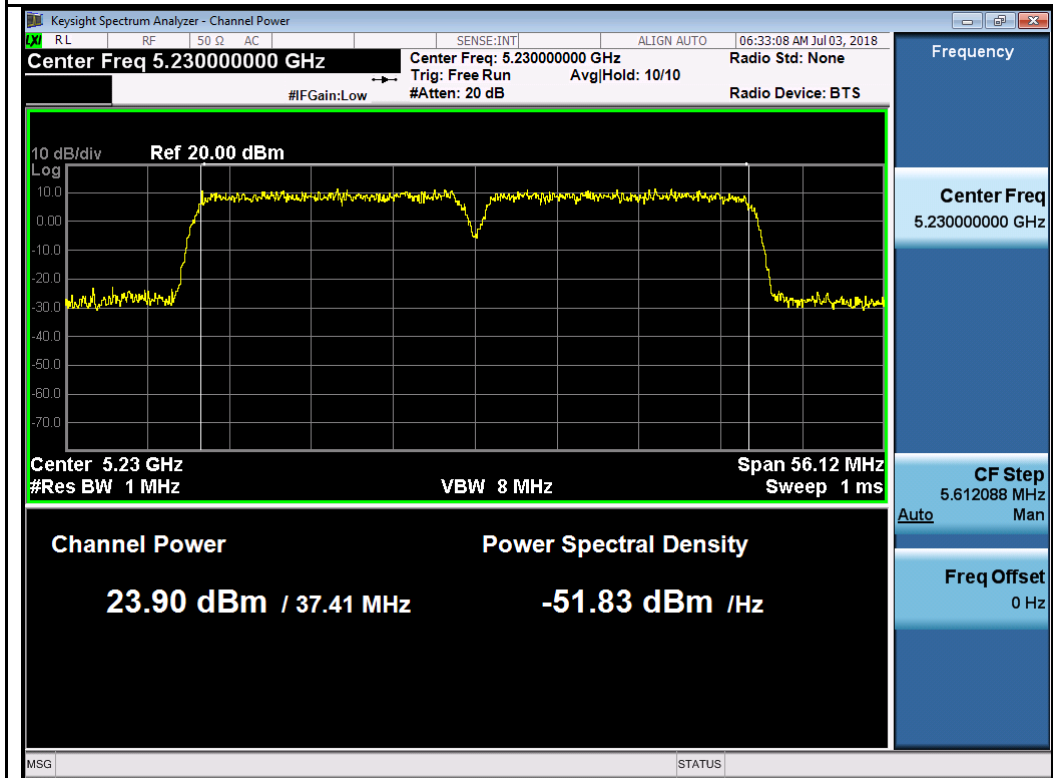


64QAM-5230MHz

Chain 2:



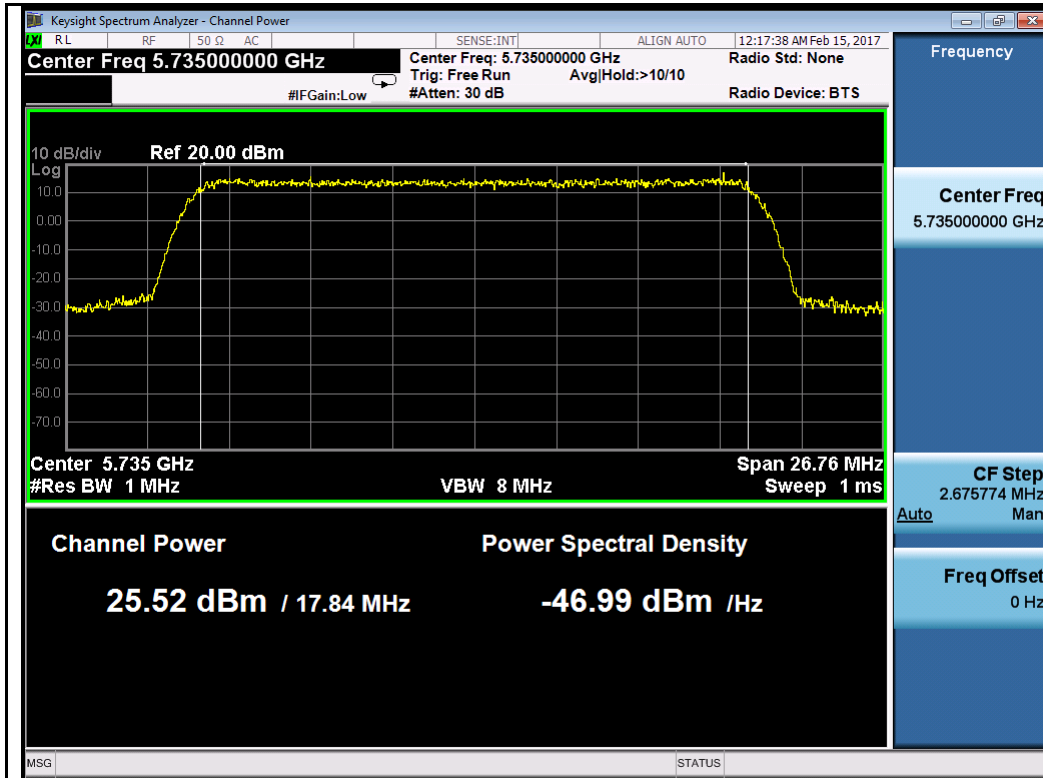
64QAM-5190MHz



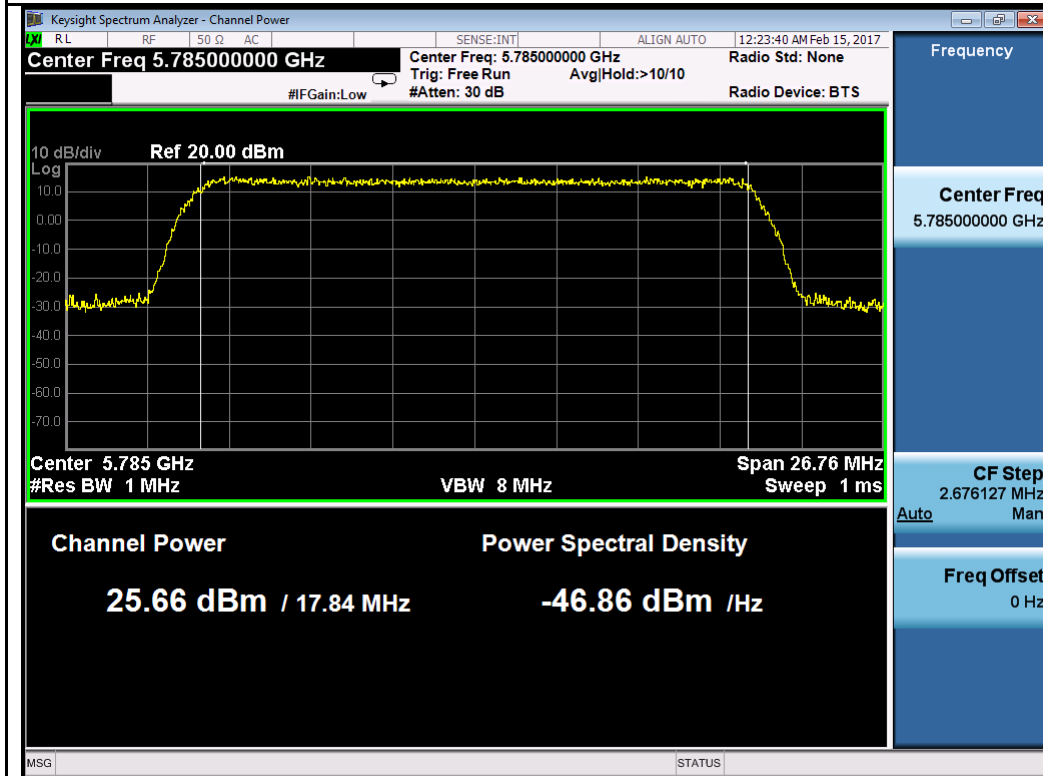
64QAM-5230MHz

Test Plot for W58 20MHz:

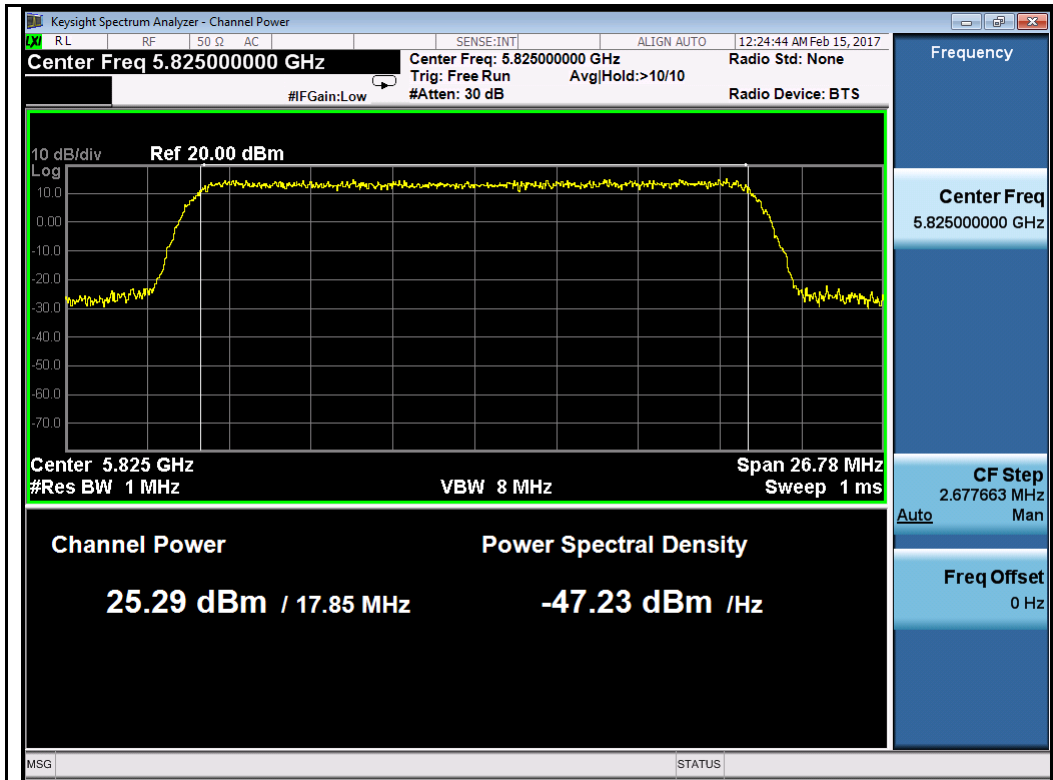
Chain 1:



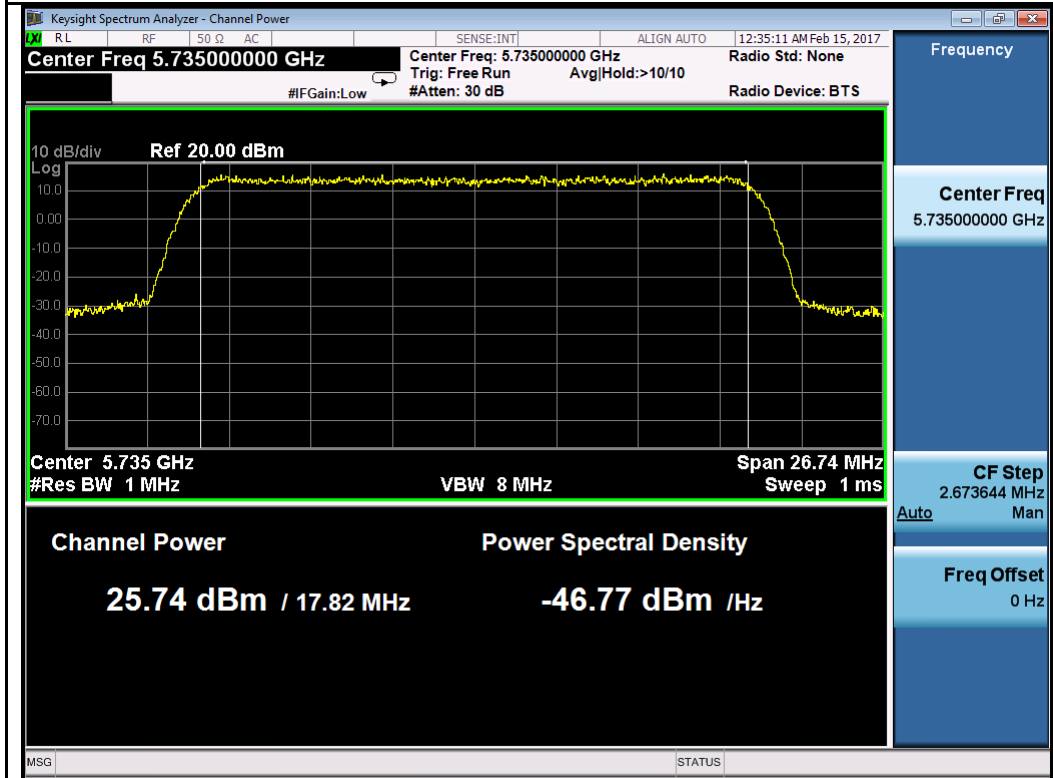
QPSK-5735MHz



QPSK-5785MHz

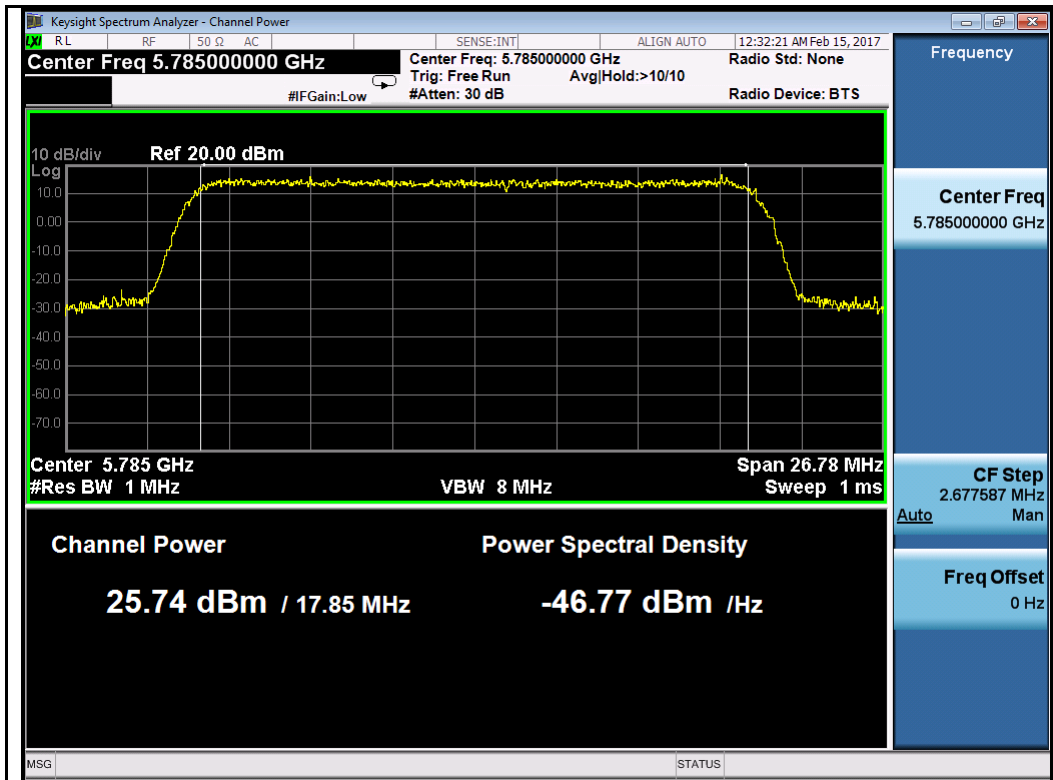


QPSK-5825MHz

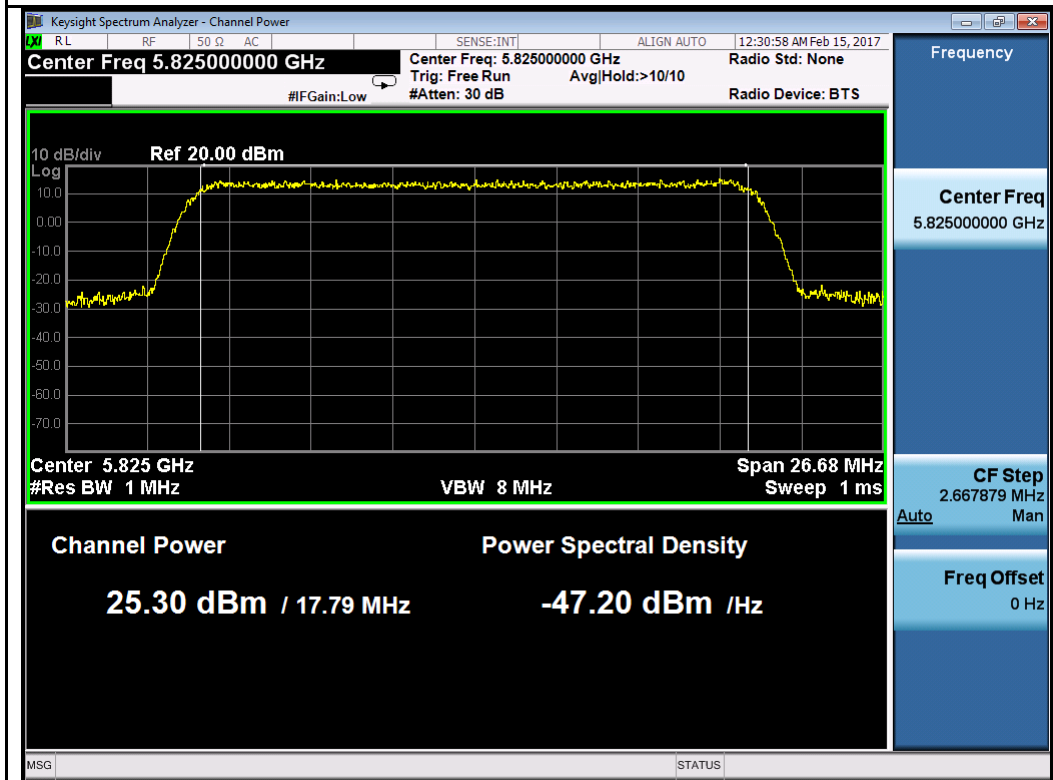


64QAM-5735MHz



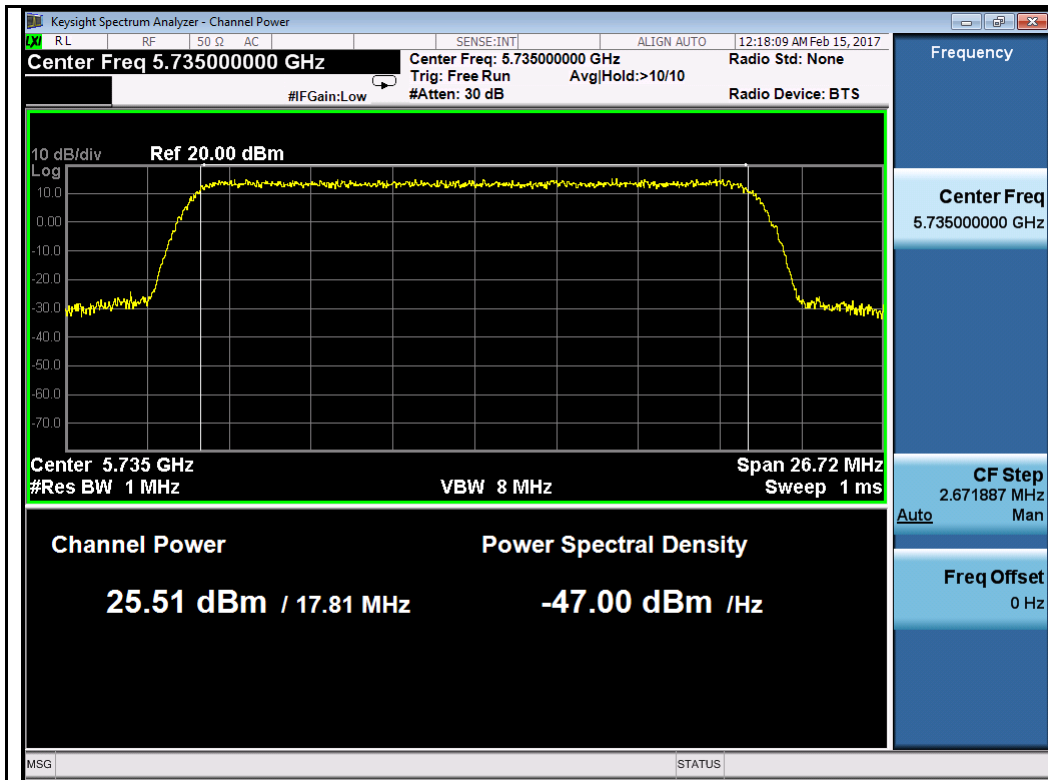


64QAM-5785MHz

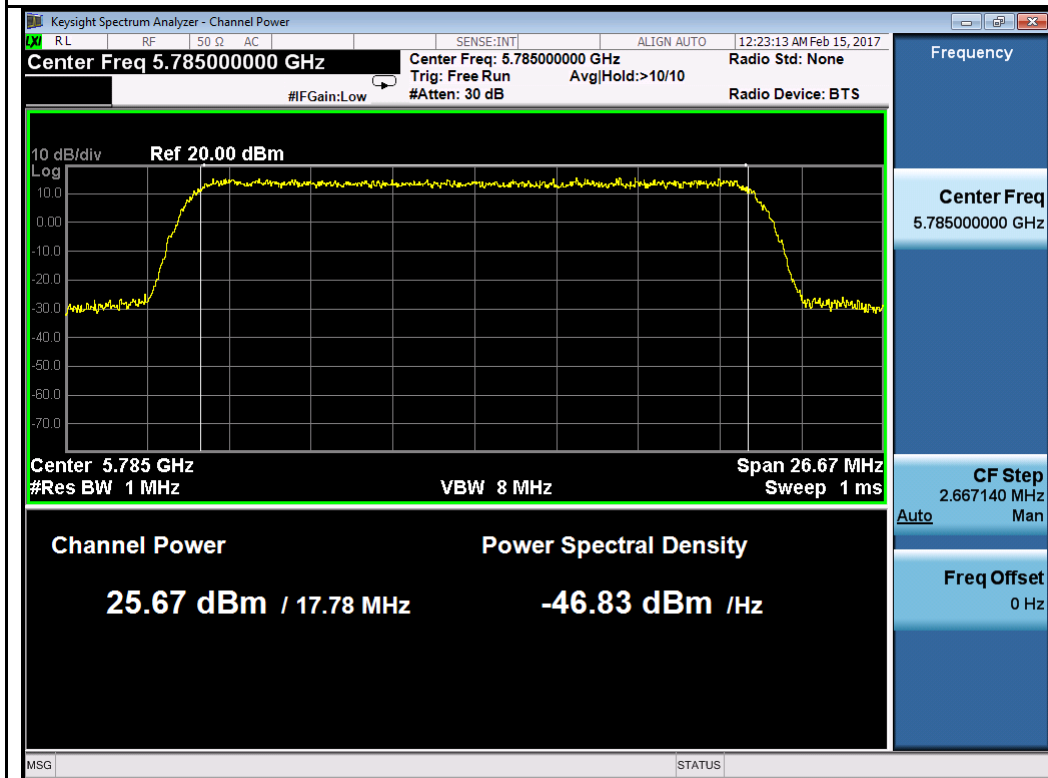


64QAM-5825MHz

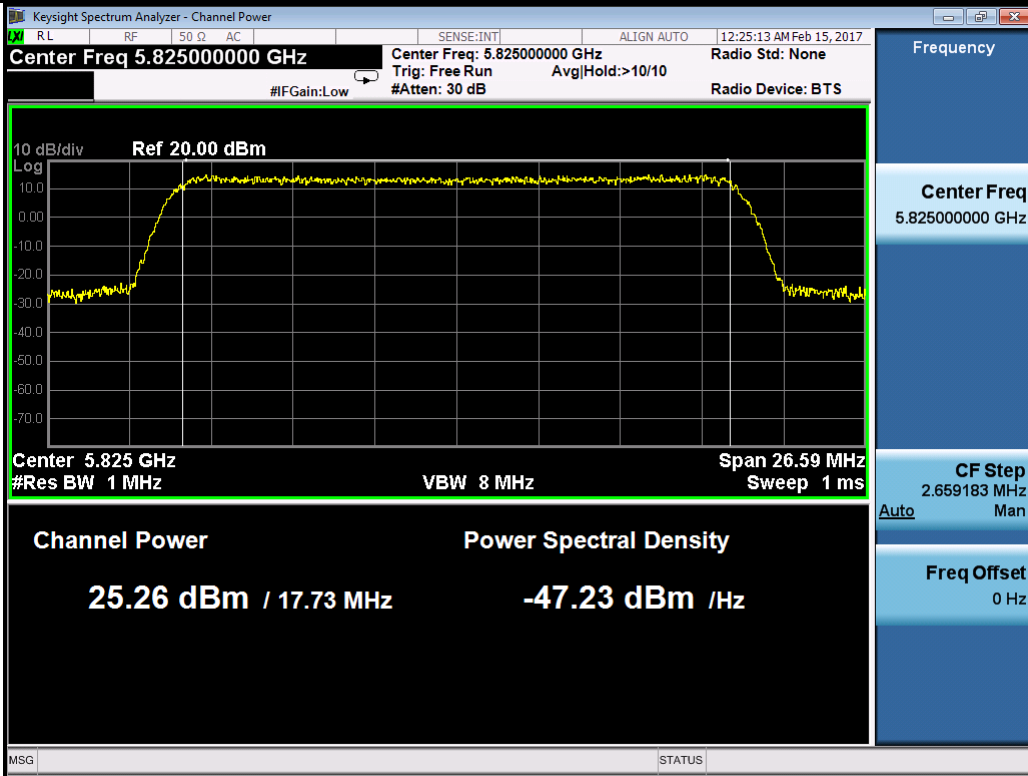
Chain 2:



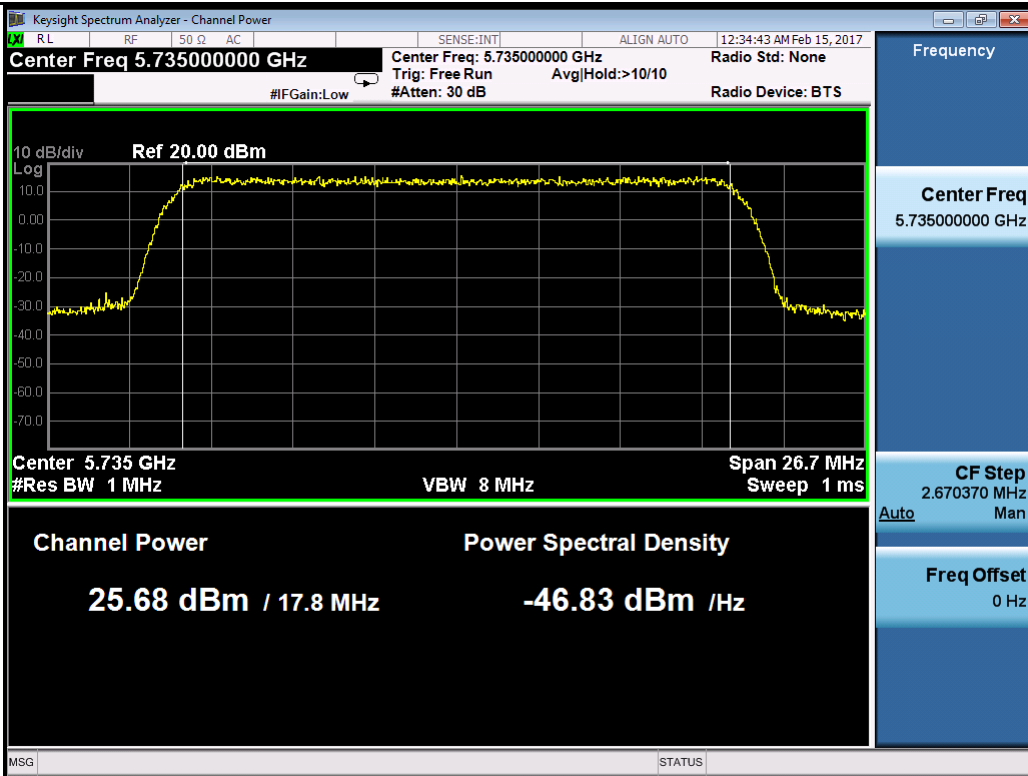
QPSK-5735MHz



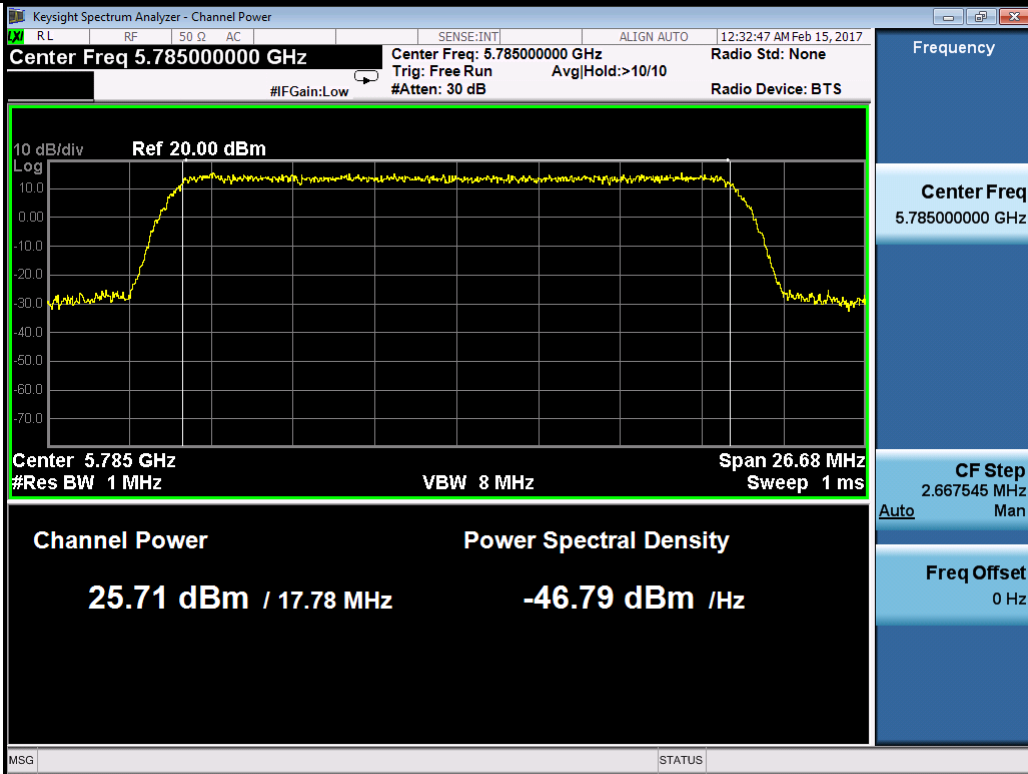
QPSK-5785MHz



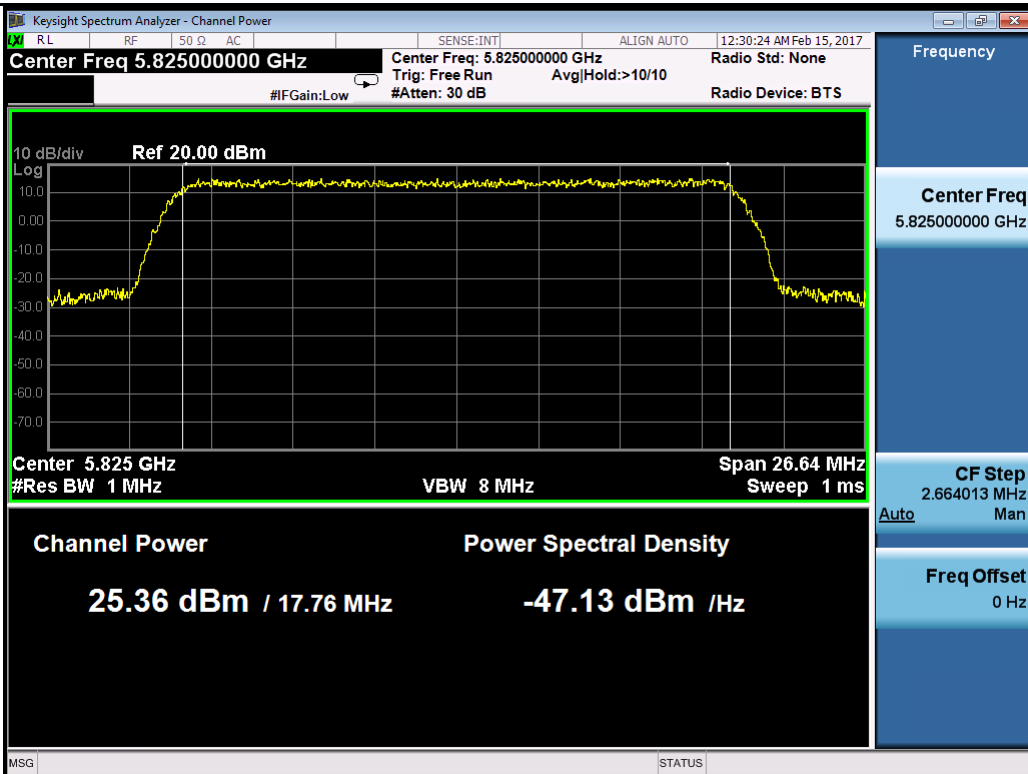
QPSK-5825MHz



64QAM-5735MHz



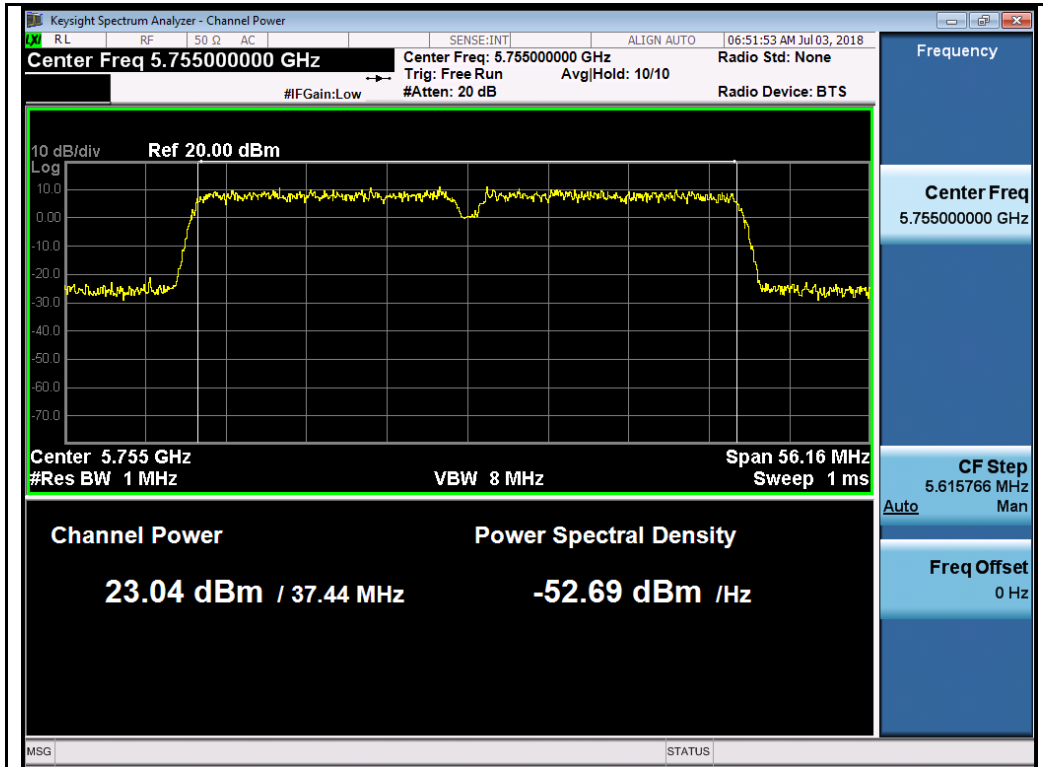
64QAM-5785MHz



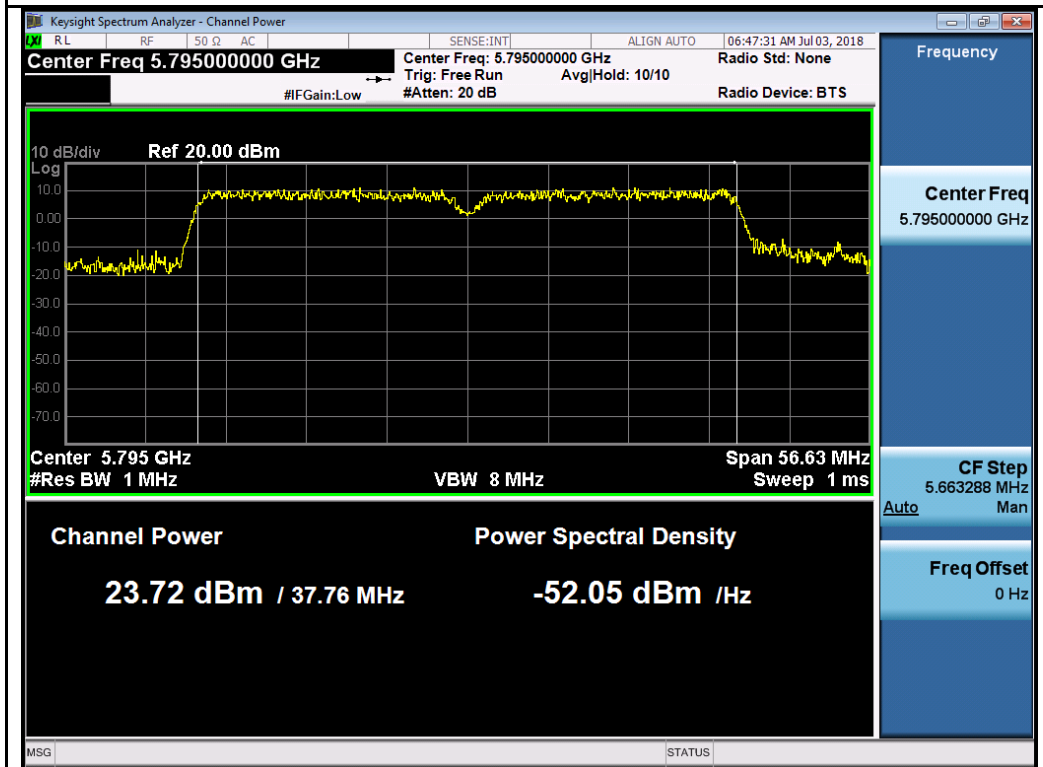
64QAM-5825MHz

Test Plot for W58 40MHz:

Chain 1:



64QAM-5755MHz



64QAM-5795MHz