

**FCC TEST REPORT for UNII Device (Wi-Fi 5GHz)  
No. 171100706SHA-002**

Applicant : GES Singapore Pte Ltd.  
28 Marsiling Lane, Singapore 739152

Manufacturing site : Same as applicant

Product Name : 802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card

Type/Model : QCNFA364A

**TEST RESULT : PASS**

**SUMMARY**

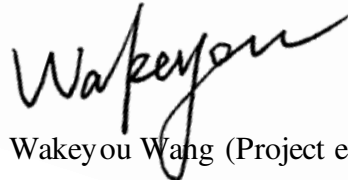
The equipment complies with the requirements according to the following standard(s):

**47CFR Part 15 (2017):** Radio Frequency Devices

**ANSI C63.10 (2013):** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

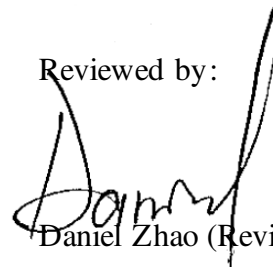
Date of issue: Jan 22, 2018

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## Description of Test Facility

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IC Assigned Code: 2042B-1

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## 1. General Information

### 1.1 Applicant Information

Applicant : GES Singapore Pte Ltd.  
28 Marsiling Lane, Singapore 739152

Manufacturing site : Same as applicant

### 1.2 Identification of the EUT

Product Name : 802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card

Type/model : QCNFA364A

FCC ID : 2AOJ9-7357622

IC : 9871A -7357622

### 1.3 Technical specification

Operation Frequency Band :	FCC	5180-5240MHz, 5260-5320MHz, 5500-5720MHz, 5745-5825MHz
	IC	5180-5240MHz, 5260-5320MHz, 5500-5580MHz, 5660-5725MHz, 5745-5825MHz

Type of Modulation : DSSS  
 EUT Modes of Modulation : BPSK, QPSK, 16QAM, 64QAM, 256QAM

Channel Number :	Protocol	Channel (MHz)	Channel No.	Channel (MHz)	Channel No.
	802.11a/n20	5180 - 5240	4	5260-5320	4
	802.11n40	5190 - 5230	2	5270-5310	2
	802.11ac80	5210	1	5290	1

Protocol	Channel (MHz)	Channel No.	Channel (MHz)	Channel No.
802.11a/n20	5500 - 5720	12	5745-5825	5
802.11n40	5510-5710	6	5755-5795	2
802.11ac80	5530-5690	3	5775	1

Description of EUT : This device is a module supporting 802.11a/b/g/n/ac as well as Bluetooth dual modes.

Among this report, only 802.11a/n/ac was assessed.

Port identification : /

Antenna : PIFA, 5dBi, 2\*2 MIMO

Rating : 3.3Vdc from host equipment

Category of EUT : Class B

EUT type :  Table top  
 Floor standing

Sample received date : Nov 5, 2017

Sample Identification : /

No  
 Date of test : Nov 5, 2017 – Jan 22, 2018

## 2. Test Specification

### 2.1 Standards or specification

47CFR Part 15 (2017)  
ANSI C63.10 (2013)  
789033 D02 General UNII Test Procedures New Rules v01r04  
KDB 662911 D01 Multiple Transmitter Output v02r01  
KDB 644545 D03 Guidance for IEEE 802.11ac New Rules v01

### 2.2 Mode of operation during the test

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

**Test software setting:** default power setting among the software *QCARCT*

The lowest, middle and highest channel were tested as representatives.

Freq. Band (MHz)	Mode	L (MHz)	M (MHz)	H (MHz)
5150-5250	802.11a	5180	5200	5240
	802.11n20	5180	5200	5240
	802.11n40	5190	/	5230
	802.11ac80	/	5210	/

Freq. Band (MHz)	Mode	L (MHz)	M (MHz)	H (MHz)
5250-5350	802.11a	5260	5300	5320
	802.11n20	5260	5300	5320
	802.11n40	5270	/	5310
	802.11ac80	/	5290	/

Freq. Band (MHz)	Mode	L (MHz)	M (MHz)	H (MHz)
5470-5725	802.11a	5500	5600	5720
	802.11n20	5500	5600	5720
	802.11n40	5510	5590	5710
	802.11ac80	5530	5610	5690

Freq. Band (MHz)	Mode	L (MHz)	M (MHz)	H (MHz)
5745-5850	802.11a	5745	5785	5825
	802.11n20	5745	5785	5825
	802.11n40	5755	/	5795
	802.11ac80	/	5775	/

The power is confirmed at all data rates for each mode, and the highest reading is achieved under the data rate below:

Mode	Data Rate (Mbps)
802.11a	6
802.11n20	MCS8
802.11n40	MCS8
802.11ac80	MCS0, NSS=2

All tests are conducted among this data rate.

Duty cycle for each mode is calculated as:

Mode	Duty cycle
802.11a	21.425 ms/21.562 ms = 0.994
802.11n20	19.787 ms/20 ms = 0.989
802.11n40	Duty cycle = 9.54 ms/9.645 ms = 0.989
802.11ac80	Duty cycle = 4.425 ms/4.54 ms = 0.975

For all duty cycle is  $\geq 98\%$ , it could be looked as continuously transmission.

Antenna gain calculation

Mode	Beamforming supported	CDD supported	Directional gain (dBi)	PSD Directional gain (dBi)
802.11a	No	Yes	5	8
802.11n20	No	No	5	5
802.11n40	No	No	5	5
802.11ac80	No	No	5	5



**2.3 Test software list**

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

**2.4 Test peripherals list**

Item No.	Name	Band and Model	Description
1	Laptop computer	HP, EliteBook 2530P	-

## 2.5 Instrument list

Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2018-10-18
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2018-05-30
<input checked="" type="checkbox"/>	Horn antenna	R&S	HF 906	EC 3049	2018-09-22
<input type="checkbox"/>	Horn antenna	ETS	3117	EC 4792-1	2018-08-23
<input checked="" type="checkbox"/>	Pre-amplifier	R&S	Pre-amp 18	EC5881	2018-06-19
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2018-09-08
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2018-09-10
<input checked="" type="checkbox"/>	Power sensor	Agilent	U2021XA	EC 5338-1	2018-03-03
<input type="checkbox"/>	Vector Signal Generator	Agilent	N5182B	EC 5175	2018-03-06
<input type="checkbox"/>	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2018-03-03
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCI 7	EC 4501	2018-02-23
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3323	2018-06-14
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3324	2018-04-09
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3325	2018-03-23
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 3320	2018-06-28
Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2018-10-19
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2018-12-01
<input type="checkbox"/>	I.S.N.	FCC	FCC-TLISN -T8-02	EC 3756	2018-02-08

## 2.6 Test Summary

**This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.**

TEST ITEM	FCC REFERANCE	RESULT
Maximum Conducted Output Power & EIRP	15.407(a)	Pass
Power spectral density	15.407(a)	Pass
Minimum 6dB Bandwidth	15.407(e)	Pass
Radiated emission	15.407(b), 15.209	Pass
Power line conducted emission	15.207	Pass
Occupied bandwidth	/	Pass
Frequency Stability	/	Pass

## 2.7 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT

Item No.	Test Items	Expanded Uncertainty (k=2) (±)
1	Radio frequency	<b>0.84 × 10<sup>-7</sup></b>
2	RF power, conducted	<b>0.74 dB</b>
3	RF power, radiated	<b>5.92 dB</b>
5	Power Spectral Density, conducted	<b>2.99 dB</b>
6	Occupied Channel Bandwidth	<b>0.88 %</b>
7	Conducted emission at mains ports	<b>3.19 dB</b>
8	Radiated Emissions up to 1 GHz	<b>4.90 dB</b>
9	Radiated Emissions 1-6GHz	<b>5.02 dB</b>
19	Radiated Emissions 6-18GHz	<b>5.28 dB</b>

### 3. Maximum Conducted Output Power

**Test result: Pass**

#### 3.1 Test limit

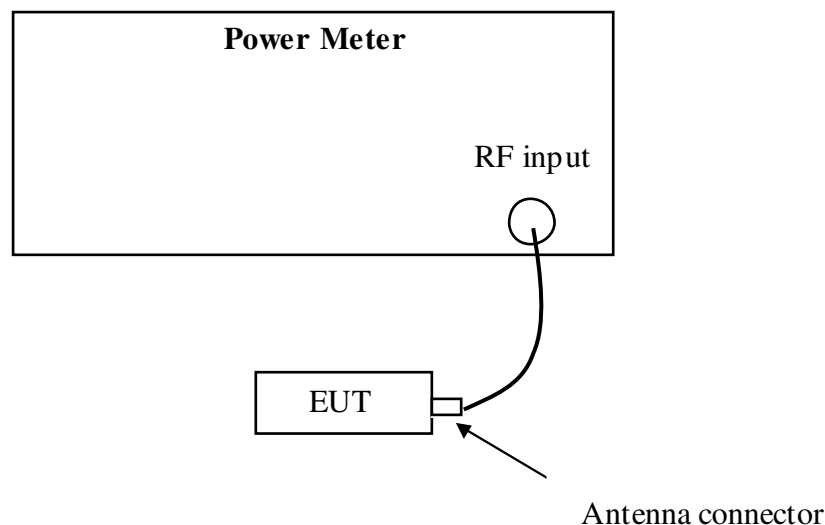
##### FCC limit

- For outdoor access point operating in 5150-5250MHz: 30dBm,  
Maximum EIRP at any elevation angle above 30 degrees  $\leq 21$ dBm;
- For indoor access point operating in 5150-5250MHz: 30dBm;
- For fixed point-to-point access point operating in 5150-5250MHz: 30dBm;
- For mobile and portable client devices operating in 5150-5250MHz: 24dBm;
- For device operating in 5.25-5.35 GHz and 5.47-5.725 GHz: 24dBm or 11dBm + 10logB  
(B is 26dB bandwidth) whichever power is less;
- For device operating in 5.725-5.85 GHz: 30dBm

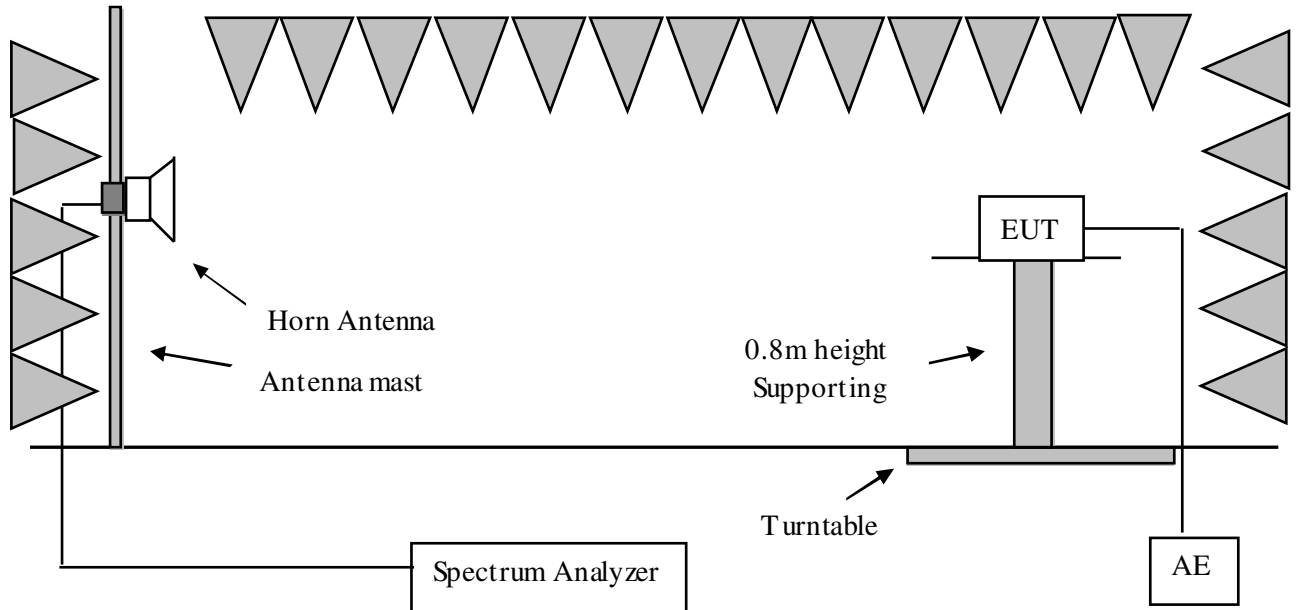
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beamforming type, the limit should be the less of original and original + 6 – antenna gain-beamforming gain.

#### 3.2 Test Configuration

- Maximum Conducted Output Power test



Maximum EIRP test



### 3.3 Test procedure and test setup

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm RF cable connected to spectrum analyzer and the measurement method refer to KDB 789033D02: Method PM.

The EIRP test is conducted at any elevation angle above 30 degrees as measured from the horizon.

### 3.4 Test protocol

Temperature : 24 °C  
Relative Humidity : 44 %

Conducted power limit calculation

*5150-5250MHz:*

Mode	Chosen limit (dBm)	Directional gain (dBi)	Final limit (dBm)
802.11a	24.00	5	24.00
802.11n20	24.00	5	24.00
802.11n40	24.00	5	24.00
802.11ac80	24.00	5	24.00

Note: Final limit is calculated as Chosen limit – Directional gain exceeding 6dBi.

*5250-5350MHz & 5470-5725MHz:*

Mode	Limit calculation		Chosen limit (dBm)	Directional gain (dBi)	Final limit (dBm)
	Min B (99% or 26dB) (MHz)	11dBm + 10logB (dBm)			
802.11a	16.70	23.23	23.23	5	23.23
802.11n20	17.79	23.50	23.50	5	23.50
802.11n40	35.99	26.56	24.00	5	24.00
802.11ac80	75.06	29.75	24.00	5	24.00

Note: 1. Chosen limit is 24dBm or 11dBm + 10logB which is lesser;  
2. Final limit is calculated as Chosen limit – Directional gain exceeding 6dBi.

*5725-5850MHz:*

Mode	Chosen limit (dBm)	Directional gain (dBi)	Final limit (dBm)
802.11a	30.00	5	30.00
802.11n20	30.00	5	30.00
802.11n40	30.00	5	30.00
802.11ac80	30.00	5	30.00

Note: Final limit is calculated as Chosen limit – Directional gain exceeding 6dBi.

Maximum Conducted Output Power test

Mode	Freq (MHz)	Factor (dB)	Reading (dBm)			Total (dBm)	Limit (dBm)	Margin (dB)
			Port 0	Port 1	Port 2			
802.11a	5180	1.5	14.00	14.20	/	17.11	24.00	6.89
	5200	1.5	13.80	14.20	/	17.01	24.00	6.99
	5240	1.5	13.90	14.40	/	17.17	24.00	6.83
	5260	1.5	15.10	15.80	/	18.47	23.23	4.76
	5300	1.5	15.10	15.90	/	18.53	23.23	4.70
	5320	1.5	15.20	16.00	/	18.63	23.23	4.60
	5500	1.5	15.40	16.80	/	19.17	23.23	4.06
	5580	1.5	15.20	16.40	/	18.85	23.23	4.38
	5600	1.5	15.00	16.60	/	18.88	23.23	4.35
	5720	1.5	14.70	16.50	/	18.70	23.23	4.53
	5745	1.5	14.20	16.00	/	18.20	30.00	11.80
	5785	1.5	13.80	15.50	/	17.74	30.00	12.26
	5825	1.5	13.20	15.20	/	17.32	30.00	12.68
802.11n20	5180	1.5	13.80	14.00	/	16.91	24.00	7.09
	5200	1.5	13.90	14.30	/	17.11	24.00	6.89
	5240	1.5	14.10	14.20	/	17.16	24.00	6.84
	5260	1.5	14.60	15.60	/	18.14	23.50	5.36
	5300	1.5	14.50	15.70	/	18.15	23.50	5.35
	5320	1.5	14.60	15.90	/	18.31	23.50	5.19
	5500	1.5	14.70	16.60	/	18.76	23.50	4.74
	5580	1.5	14.90	16.50	/	18.78	23.50	4.72
	5600	1.5	14.90	16.10	/	18.55	23.50	4.95
	5720	1.5	14.50	16.00	/	18.32	23.50	5.18

	5745	1.5	14.00	15.80	/	18.00	30.00	12.00
	5785	1.5	13.60	15.30	/	17.54	30.00	12.46
	5825	1.5	13.00	14.90	/	17.06	30.00	12.94
802.11n40	5190	1.5	14.00	15.30	/	17.71	24.00	6.29
	5230	1.5	14.10	15.20	/	17.70	24.00	6.30
	5270	1.5	14.30	14.80	/	17.57	24.00	6.43
	5310	1.5	14.20	15.30	/	17.80	24.00	6.20
	5510	1.5	14.60	15.10	/	17.87	24.00	6.13
	5550	1.5	14.40	15.50	/	18.00	24.00	6.00
	5590	1.5	14.50	15.70	/	18.15	24.00	5.85
	5710	1.5	14.30	15.90	/	18.18	24.00	5.82
	5755	1.5	13.60	14.90	/	17.31	30.00	12.69
	5795	1.5	13.10	14.50	/	16.87	30.00	13.13
802.11ac80	5210	1.5	12.30	13.80	/	16.12	24.00	7.88
	5290	1.5	12.60	13.30	/	15.97	24.00	8.03
	5530	1.5	12.80	14.50	/	16.74	24.00	7.26
	5610	1.5	12.90	14.40	/	16.72	24.00	7.28
	5690	1.5	12.70	14.40	/	16.64	24.00	7.36
	5775	1.5	11.80	13.40	/	15.68	30.00	14.32

Note: 1. Factor = Cable loss + duty cycle.

2. Total power =  $10 * \lg(10^{\text{port } 0 / 10} + 10^{\text{port } 1 / 10} + 10^{\text{port } 2 / 10})$

3. The straddles channels are assessed with the more conservative power limits.



## 4. Power spectral density

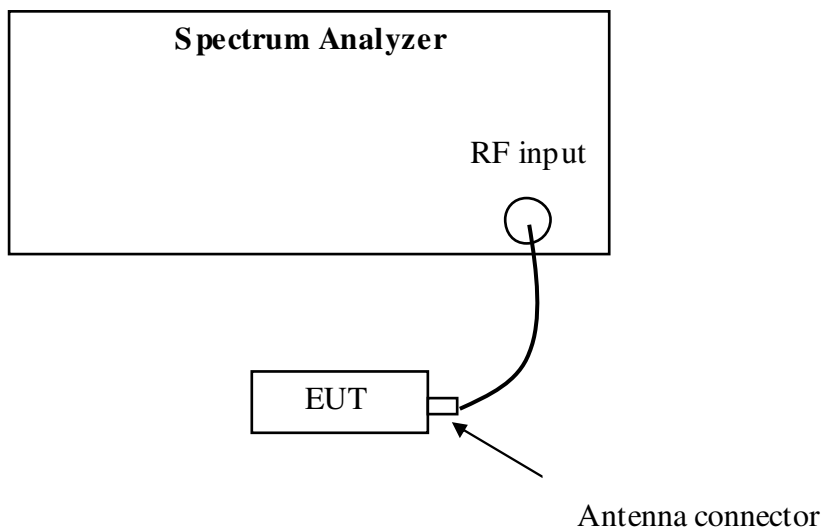
**Test result: Pass**

### 4.1 Test limit

- For outdoor access point operating in 5150-5250MHz: 17dBm/MHz;
- For indoor access point operating in 5150-5250MHz: 17dBm/MHz;
- For fixed point-to-point access point operating in 5150-5250MHz: 17dBm/MHz;
- For client devices operating in 5150-5250MHz: 11dBm/MHz;
- For device operating in 5.25-5.35 GHz and 5.47-5.725 GHz: 11dBm/MHz;
- For device operating in 5.725-5.85 GHz: 30dBm/500kHz;

If the transmitting antenna of directional gain greater than 6dBi is used, the PSD shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.  
If there have a beamforming type, the limit should be the less of original and original + 6 – antenna gain-beamforming gain.

### 4.2 Test Configuration



### 4.3 Test procedure and test setup

The power spectral density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz, the video bandwidth set >RBW (measurement method refer to KDB 789033D02: section F).



802.11n20	5180	1.5	0.33	1.20	3.80	11.00	7.20
	5200	1.5	0.10	1.36	3.79	11.00	7.21
	5240	1.5	-0.03	1.01	3.53	11.00	7.47
	5260	1.5	0.24	0.66	3.47	11.00	7.53
	5300	1.5	0.01	0.22	3.13	11.00	7.87
	5320	1.5	-0.10	0.57	3.26	11.00	7.74
	5500	1.5	0.90	1.55	4.25	11.00	6.75
	5580	1.5	0.54	0.91	3.74	11.00	7.26
	5600	1.5	1.28	1.77	4.54	11.00	6.46
	5720	1.5	1.26	2.16	4.74	11.00	6.26
	5745	1.5	0.92	1.43	4.19	30.00	25.81
	5785	1.5	1.05	0.96	4.02	30.00	25.98
	5825	1.5	0.65	0.84	3.76	30.00	26.24
802.11n40	5190	1.5	-3.00	-1.75	0.68	11.00	10.32
	5230	1.5	-3.06	-1.77	0.64	11.00	10.36
	5270	1.5	-2.72	-2.26	0.53	11.00	10.47
	5310	1.5	-3.26	-2.39	0.21	11.00	10.79
	5510	1.5	-0.82	-1.94	1.67	11.00	9.33
	5550	1.5	-2.82	-1.88	0.69	11.00	10.31
	5590	1.5	-1.98	-0.82	1.65	11.00	9.35
	5710	1.5	-1.94	-0.46	1.87	11.00	9.13
	5755	1.5	-1.96	-1.31	1.39	30.00	28.61
	5795	1.5	-2.04	-1.91	1.04	30.00	28.96
802.11ac80	5210	1.5	-7.70	-6.14	-3.84	11.00	14.84
	5290	1.5	-7.62	-7.09	-4.34	11.00	15.34
	5530	1.5	-6.42	-5.64	-3.00	11.00	14.00

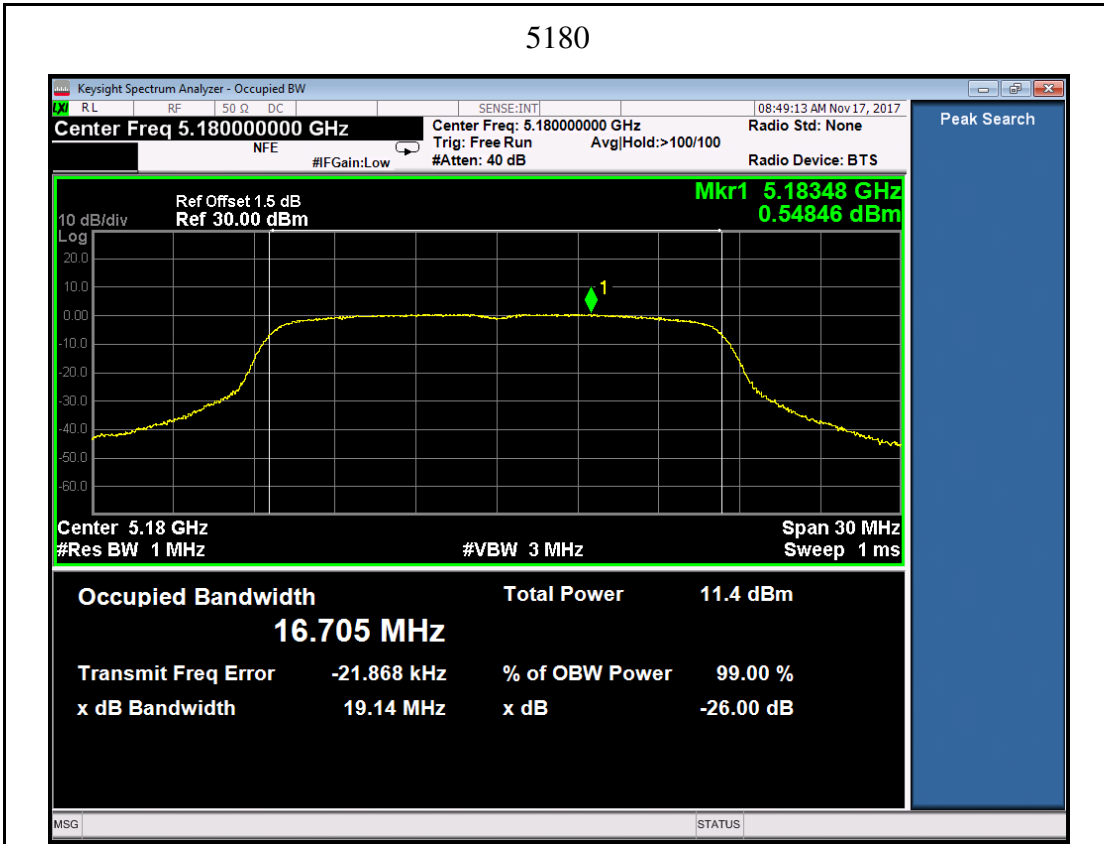
	5610	1.5	-6.15	-5.19	-2.63	11.00	13.63
	5690	1.5	-5.78	-4.97	-2.35	11.00	13.35
	5775	1.5	-6.64	-5.87	-3.23	30.00	33.23

- Note: 1. Factor = Cable loss + duty cycle.  
 2. Total power =  $10 * \lg(10^{\text{port } 0 / 10} + 10^{\text{port } 1 / 10} + 10^{\text{port } 2 / 10})$   
 3. The straddles channels are assessed with the more conservative power limits.

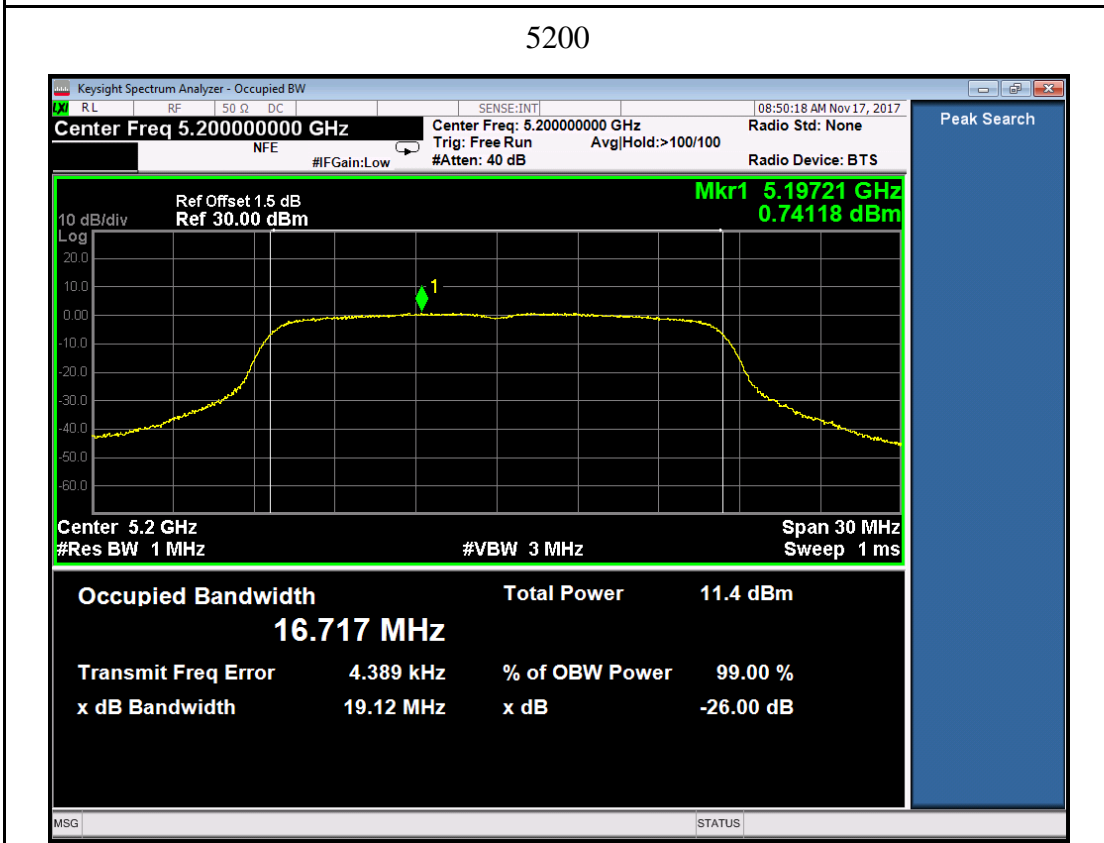
Port 0

802.11a

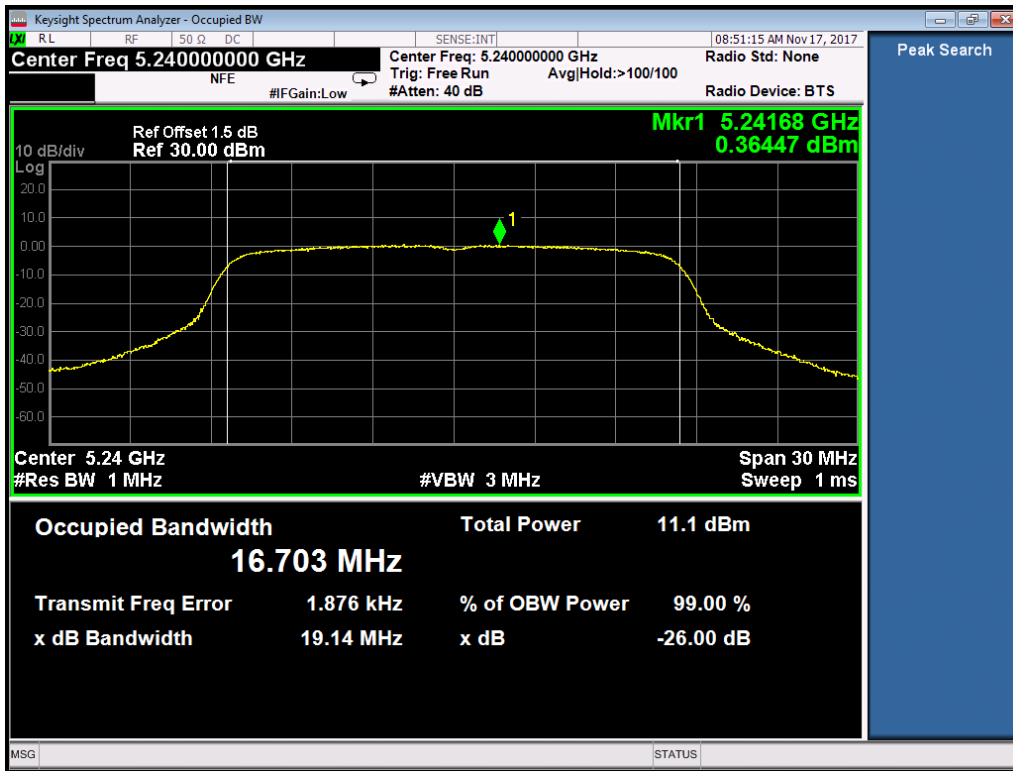
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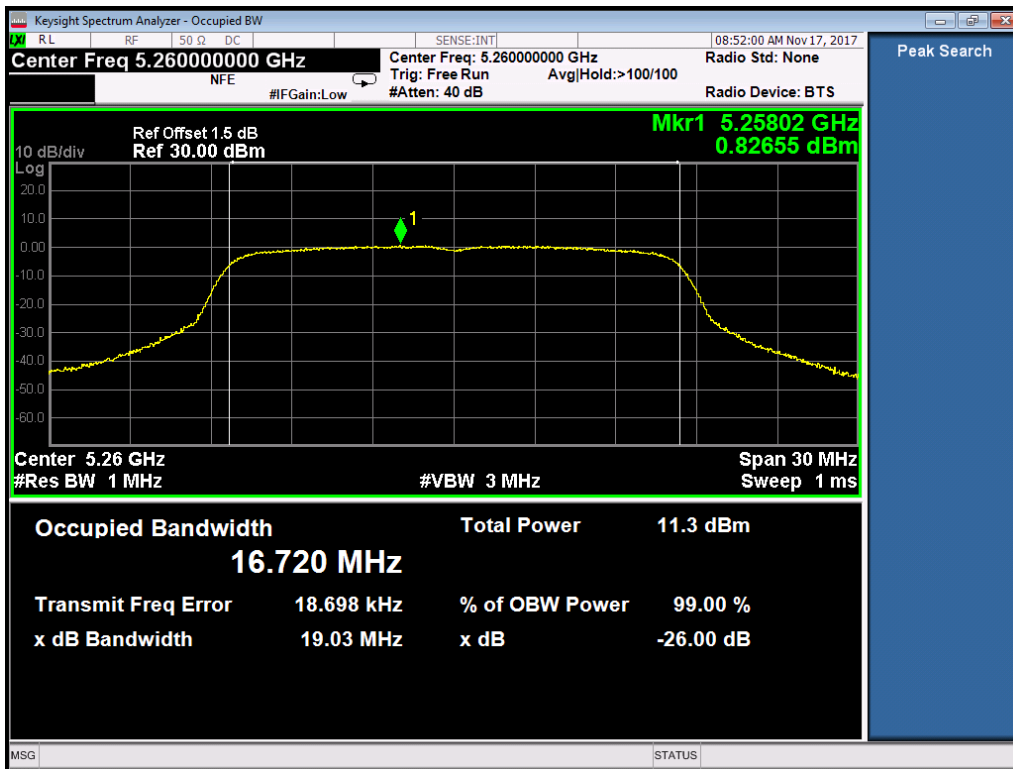
5200



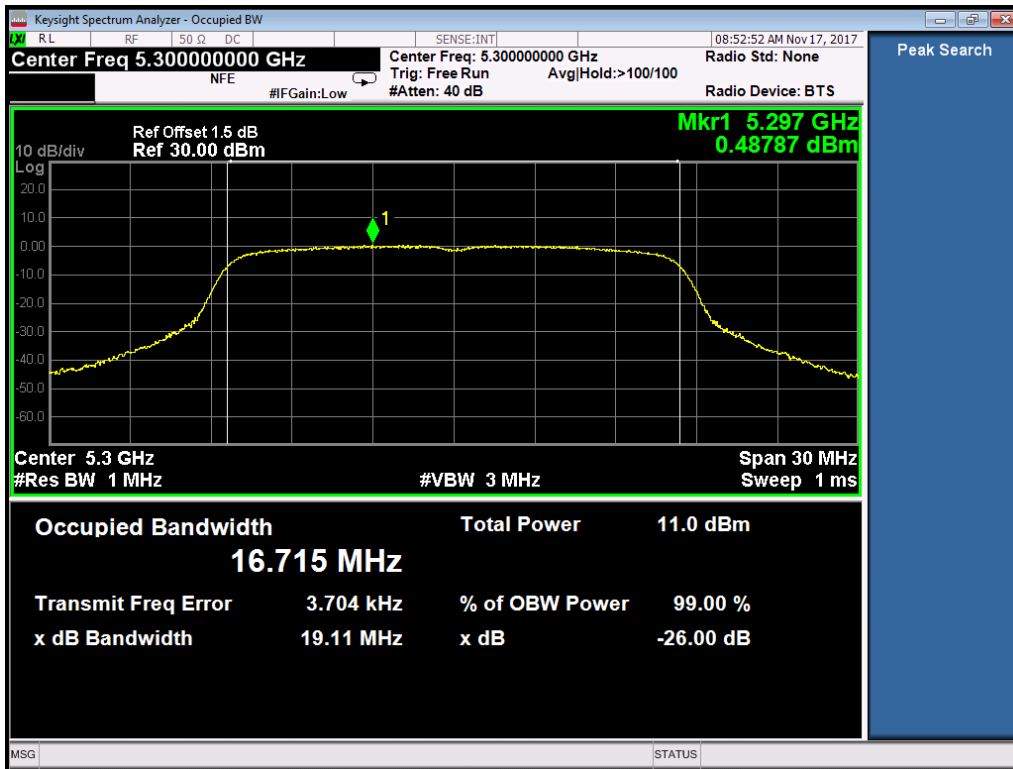
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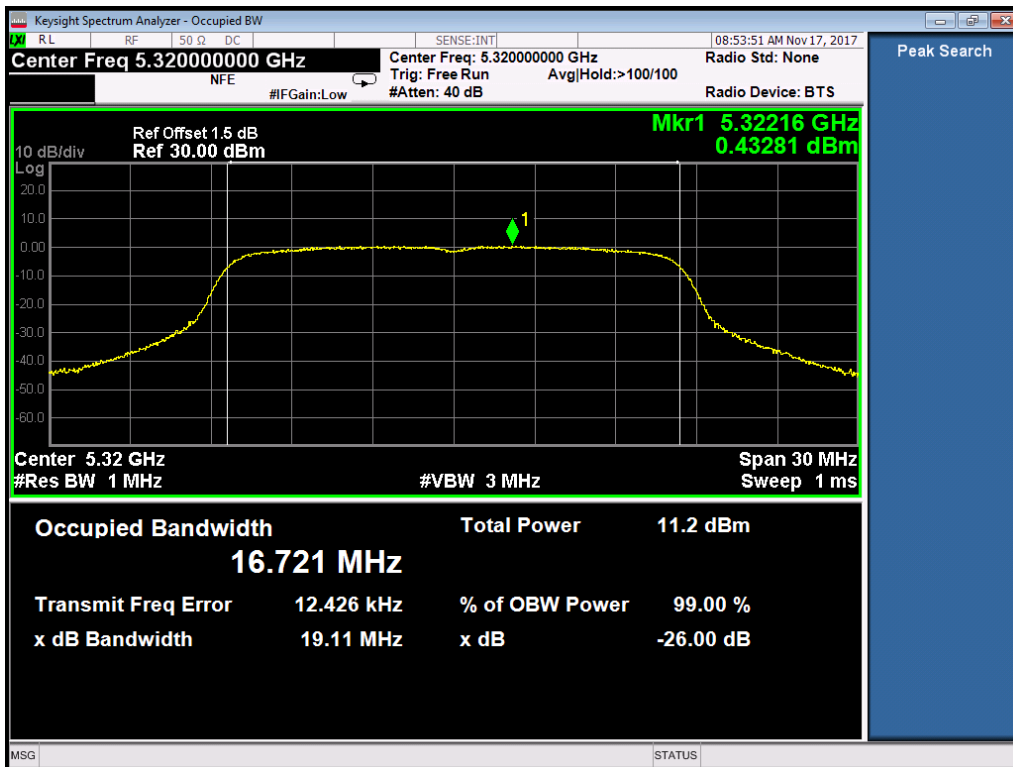
5260



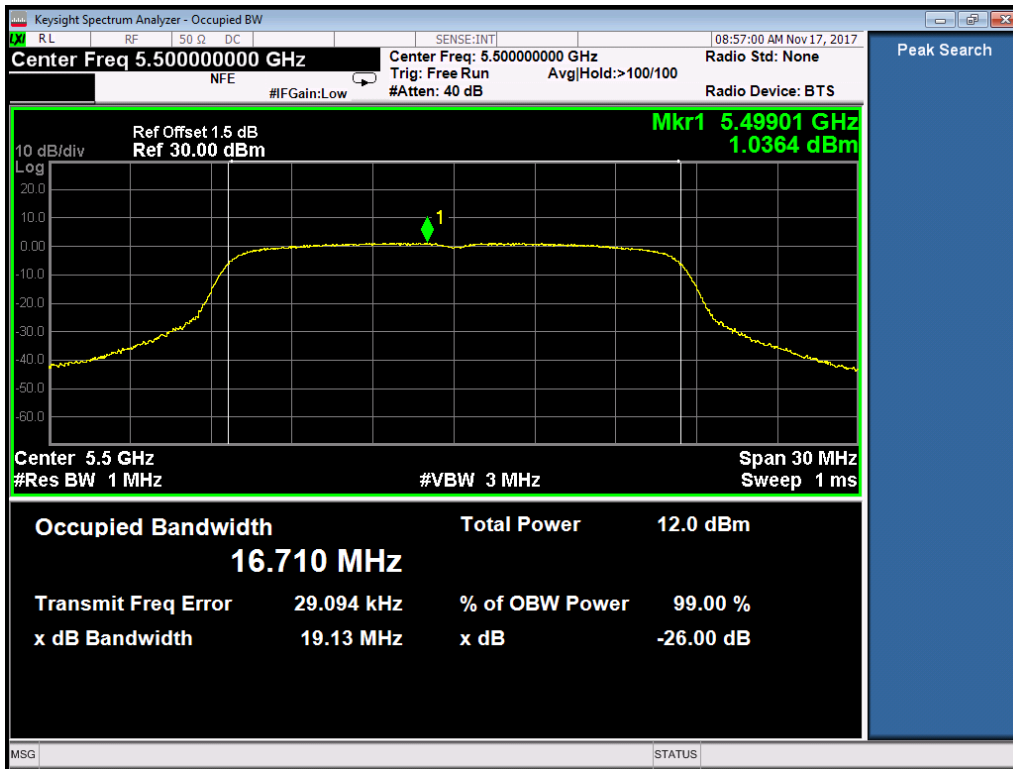
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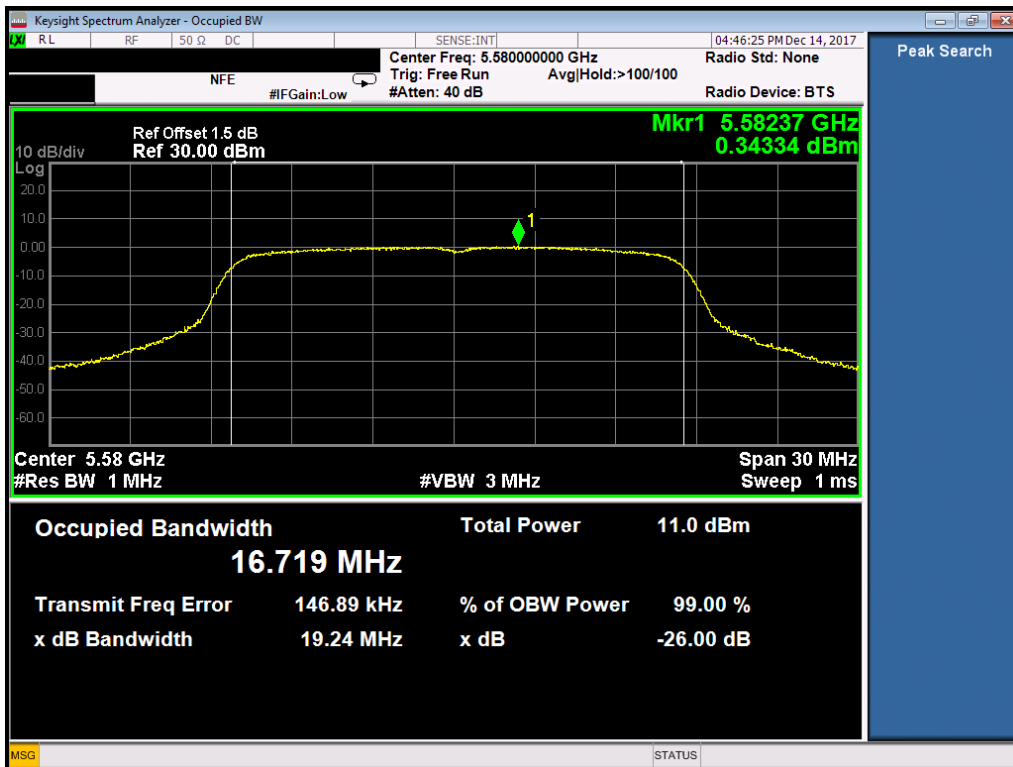
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5500

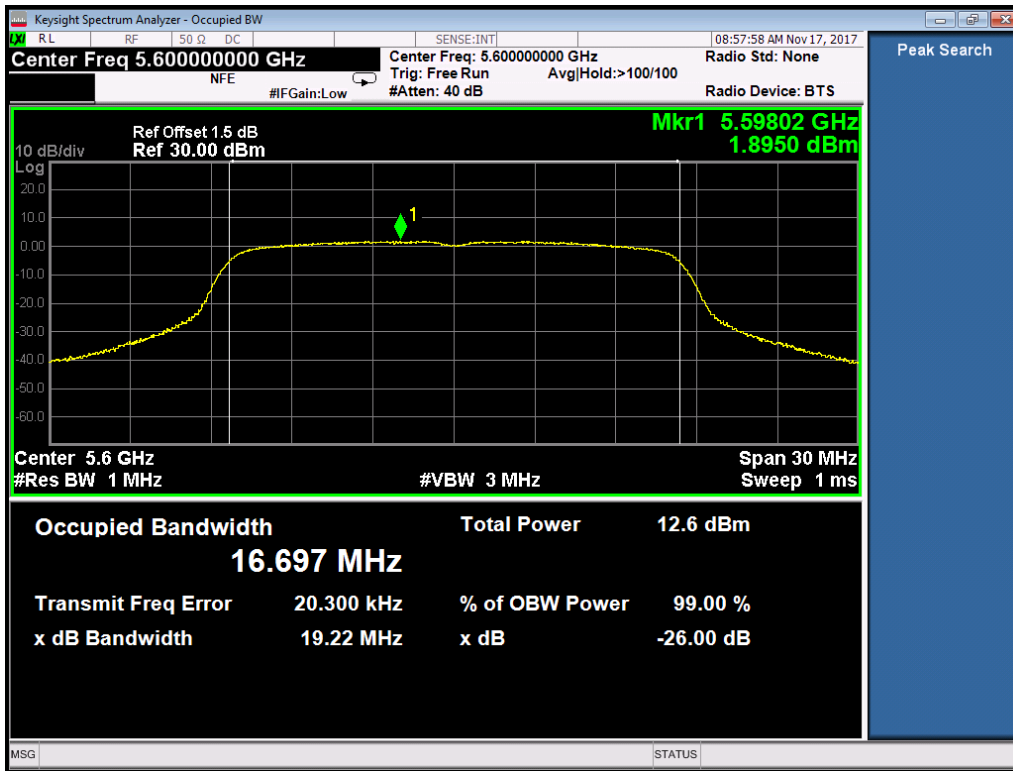


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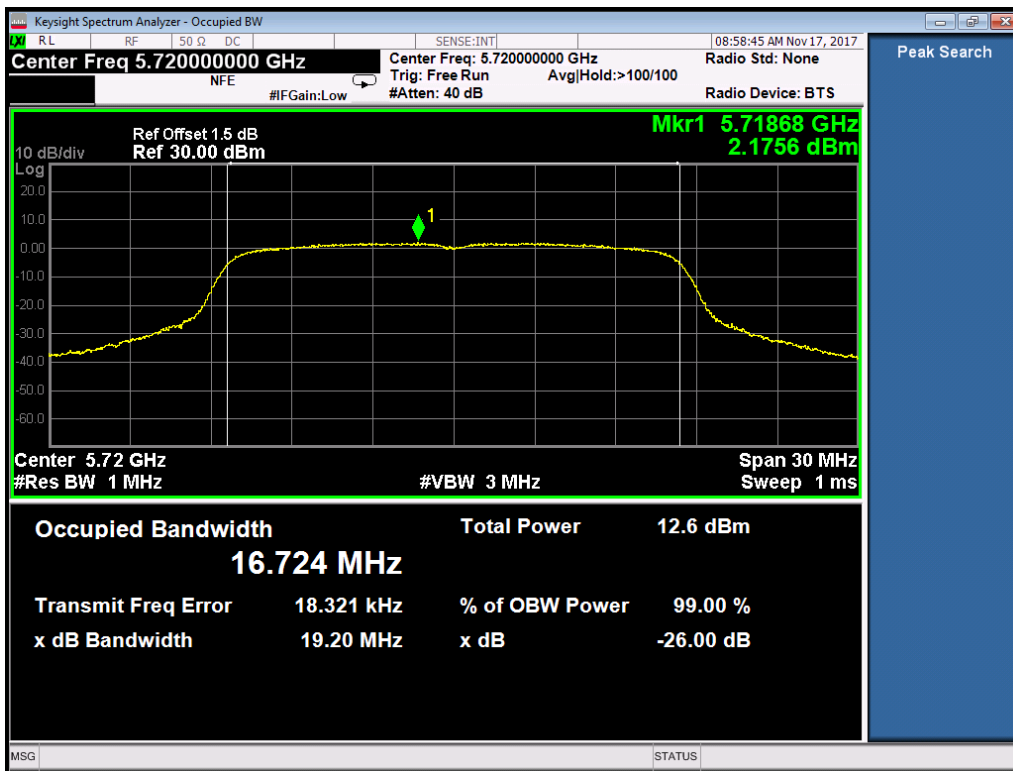




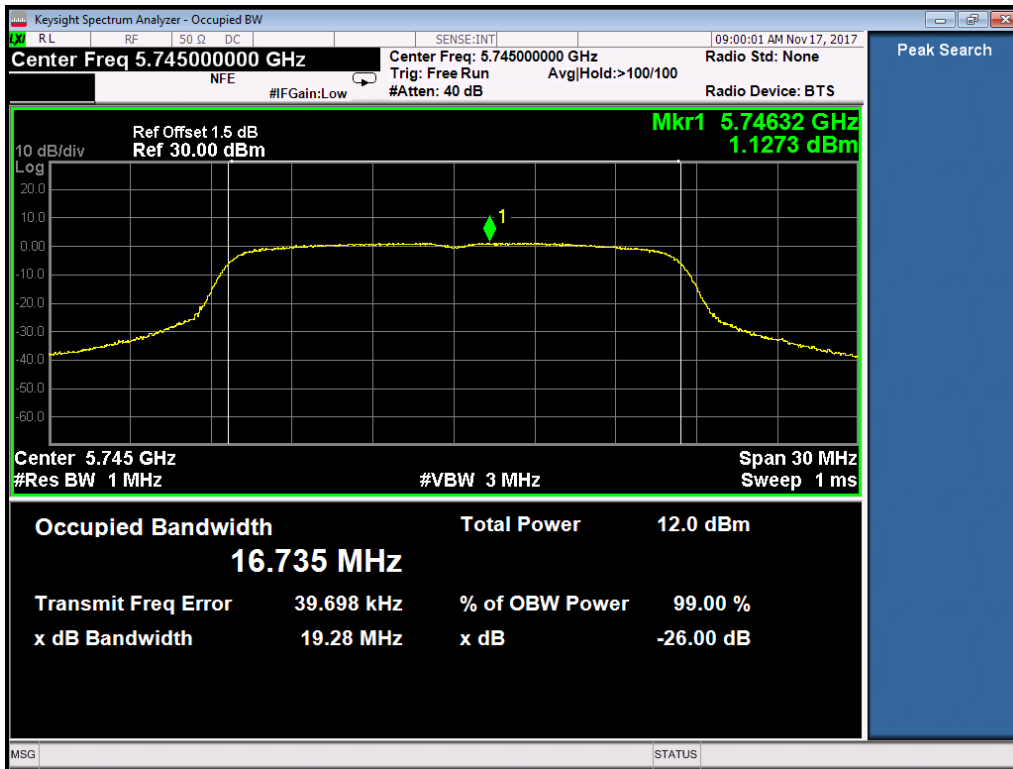
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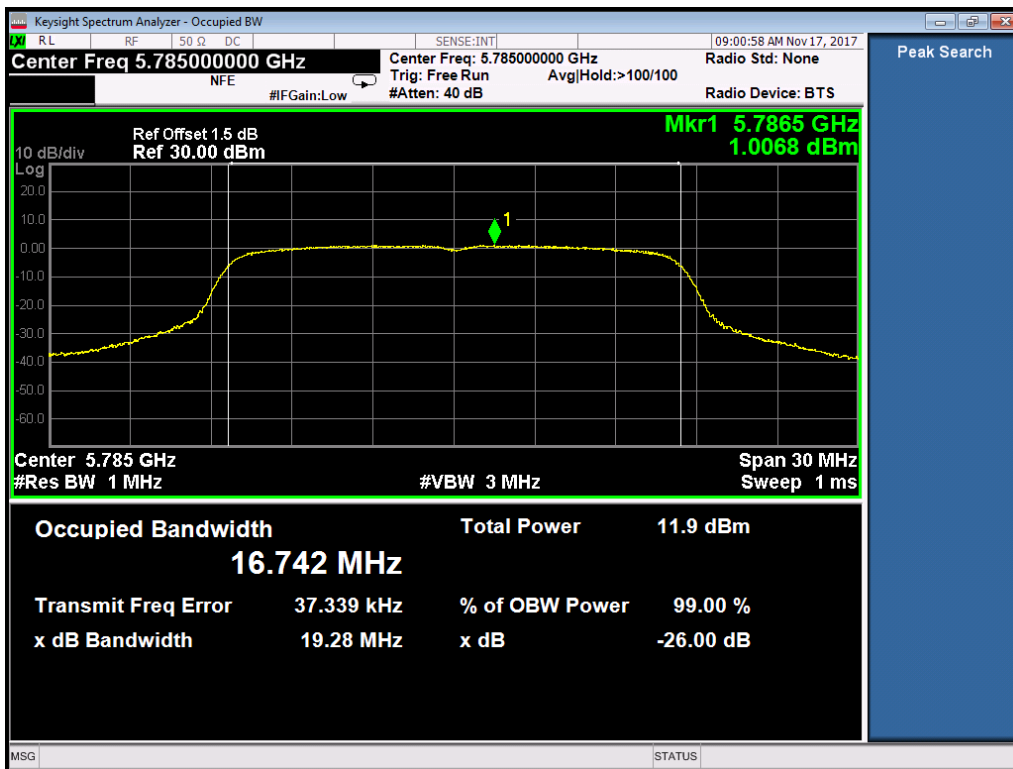
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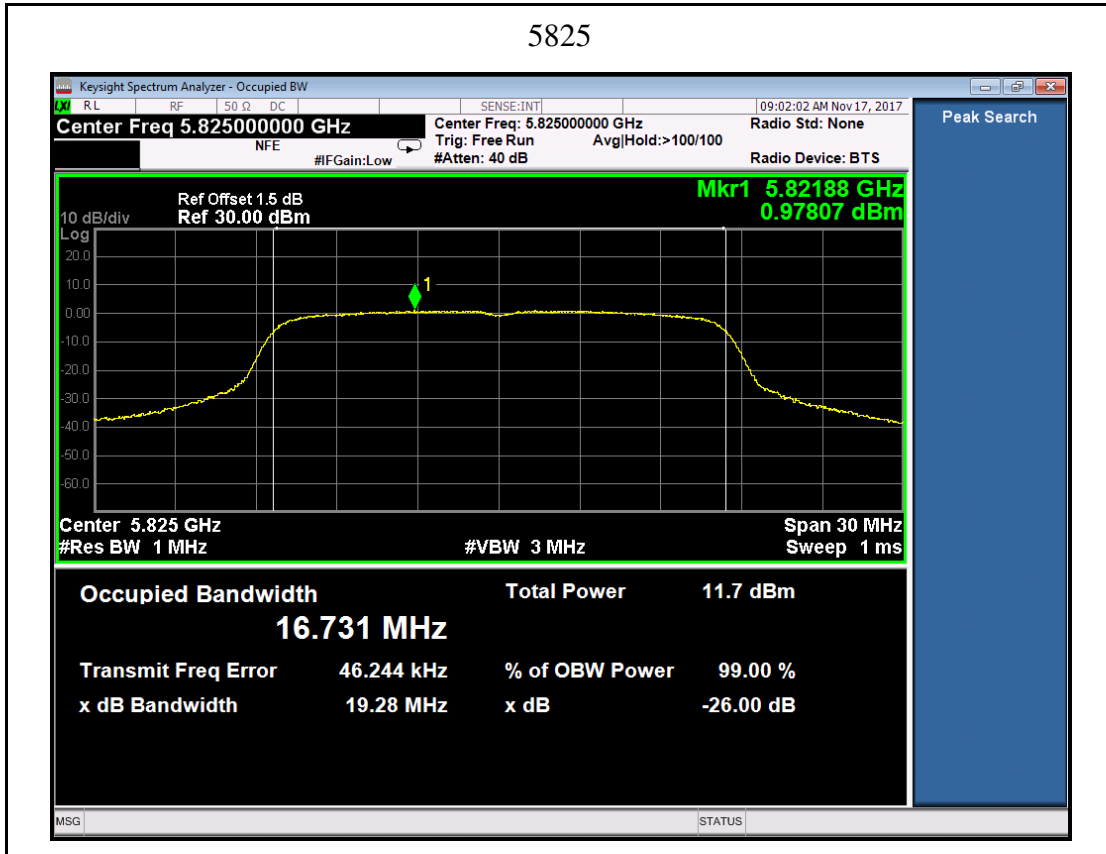
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5785

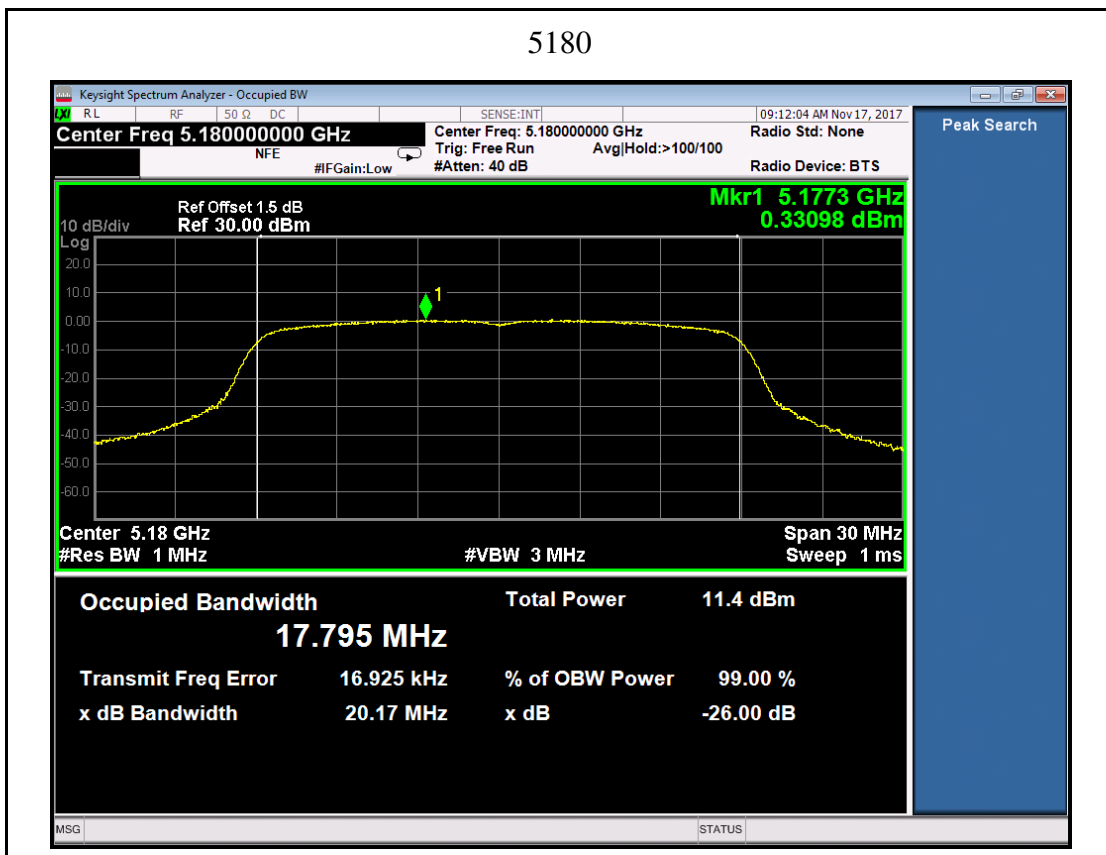


5825

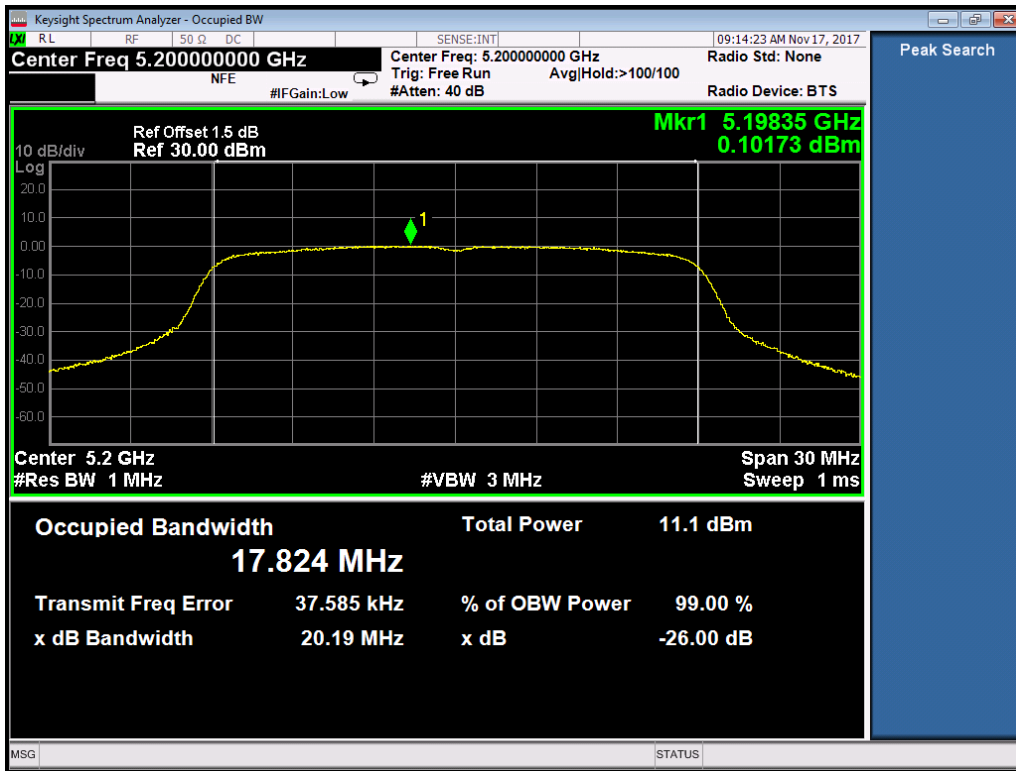


802.11n20

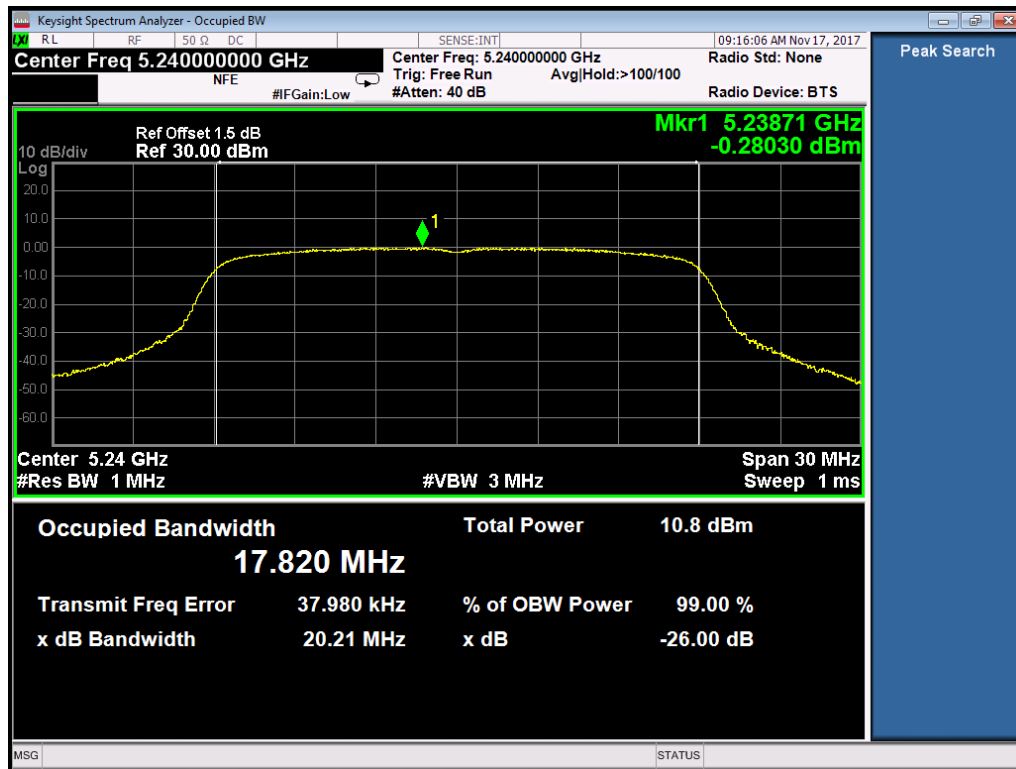
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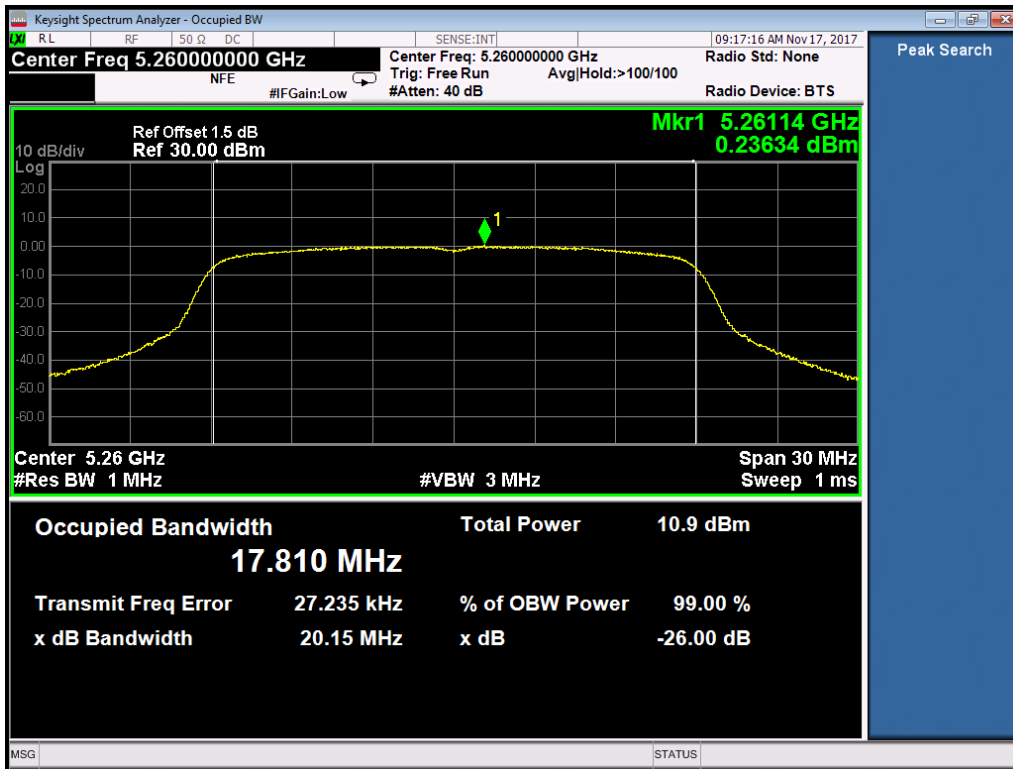
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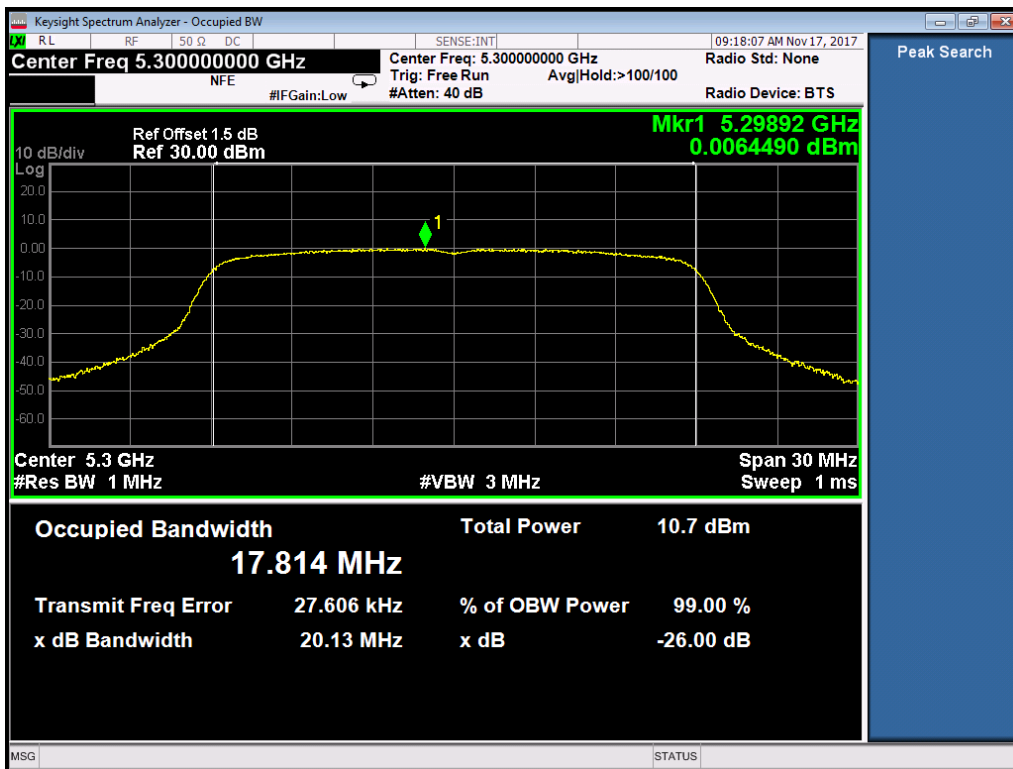
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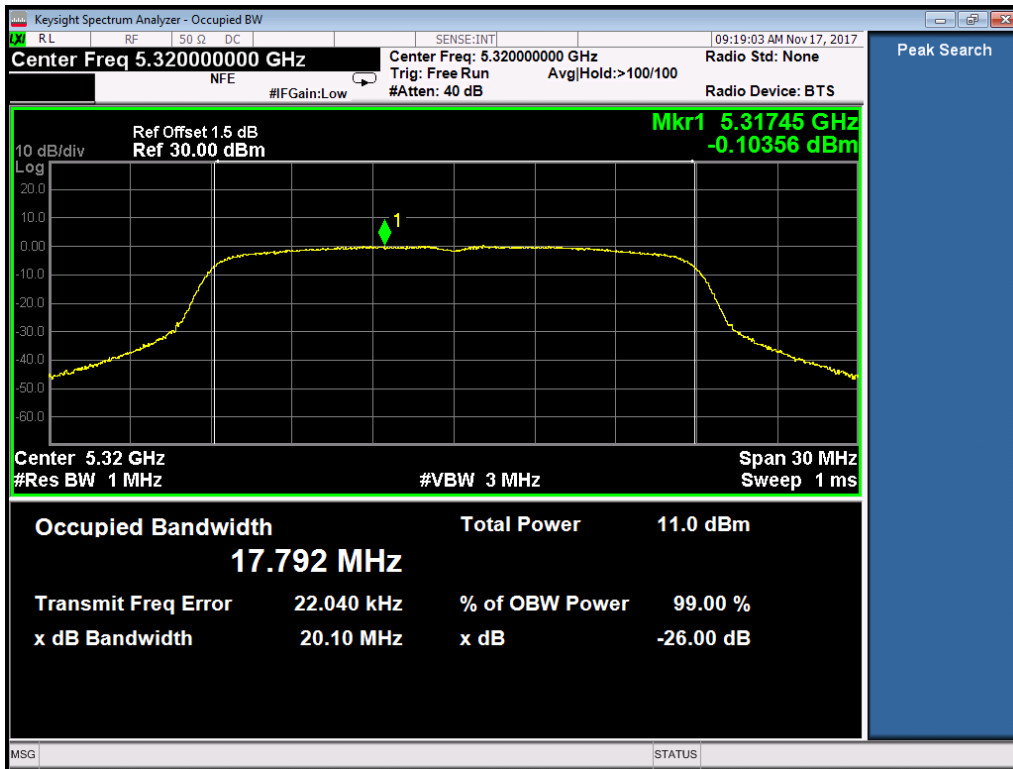
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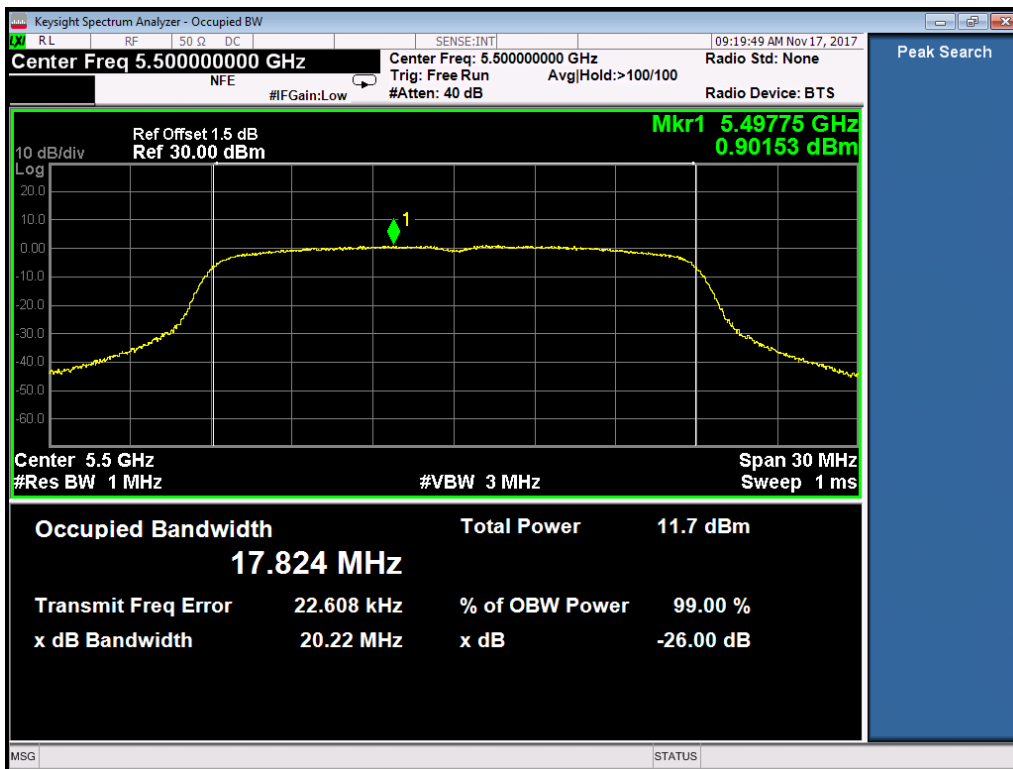
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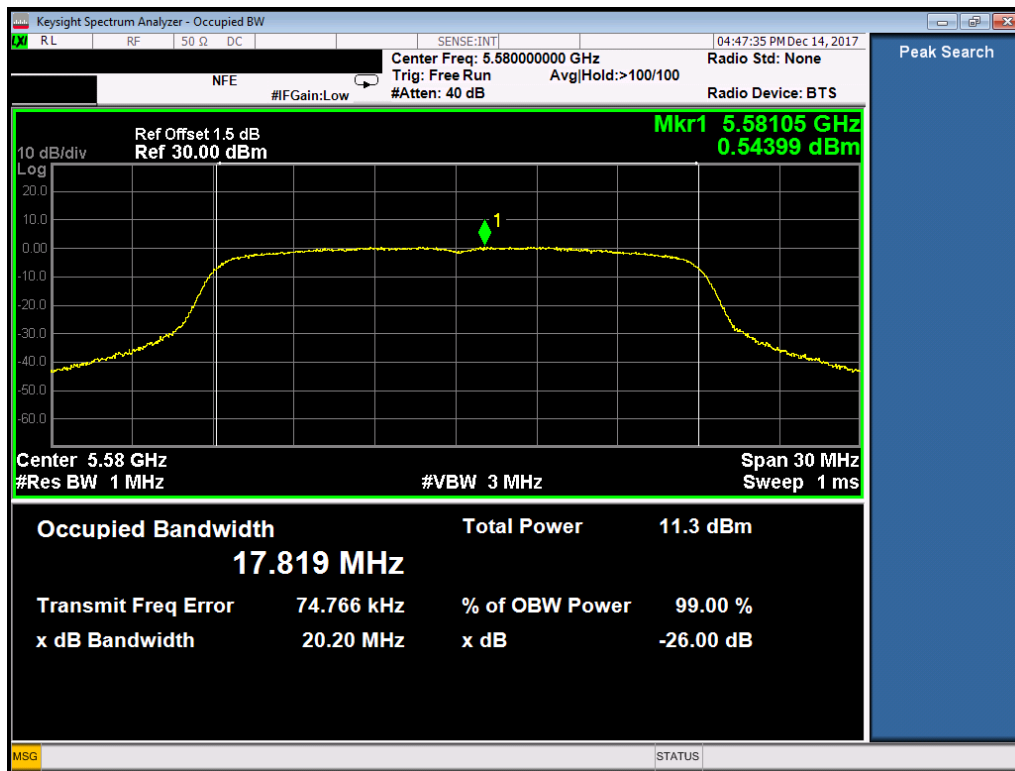
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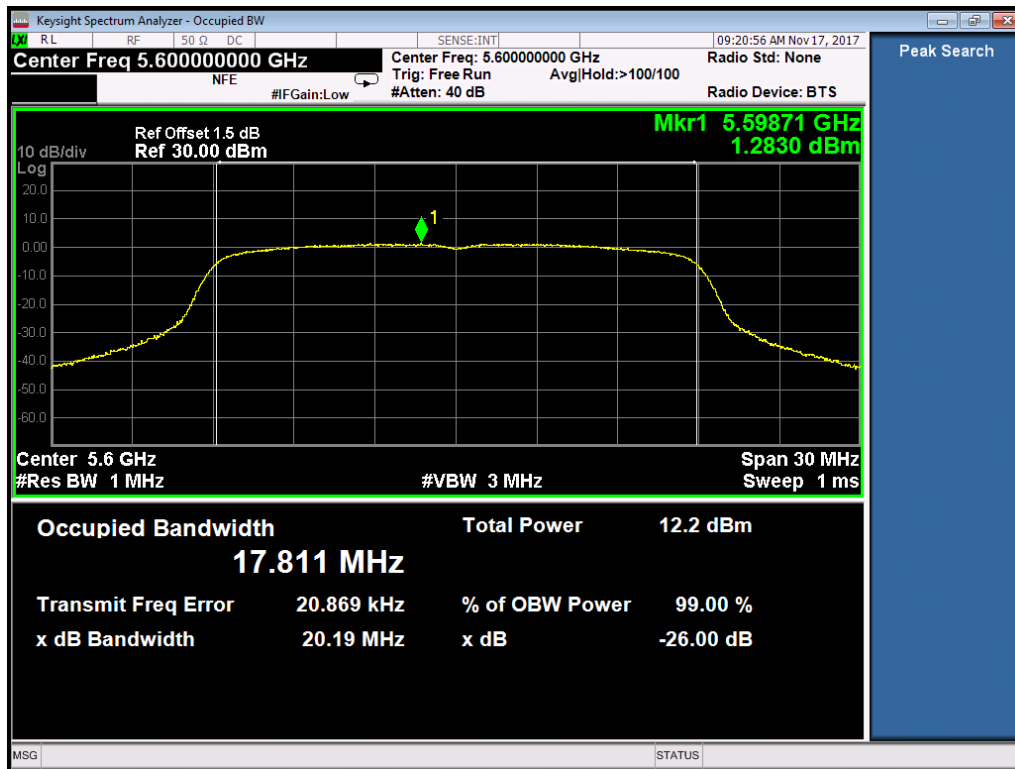
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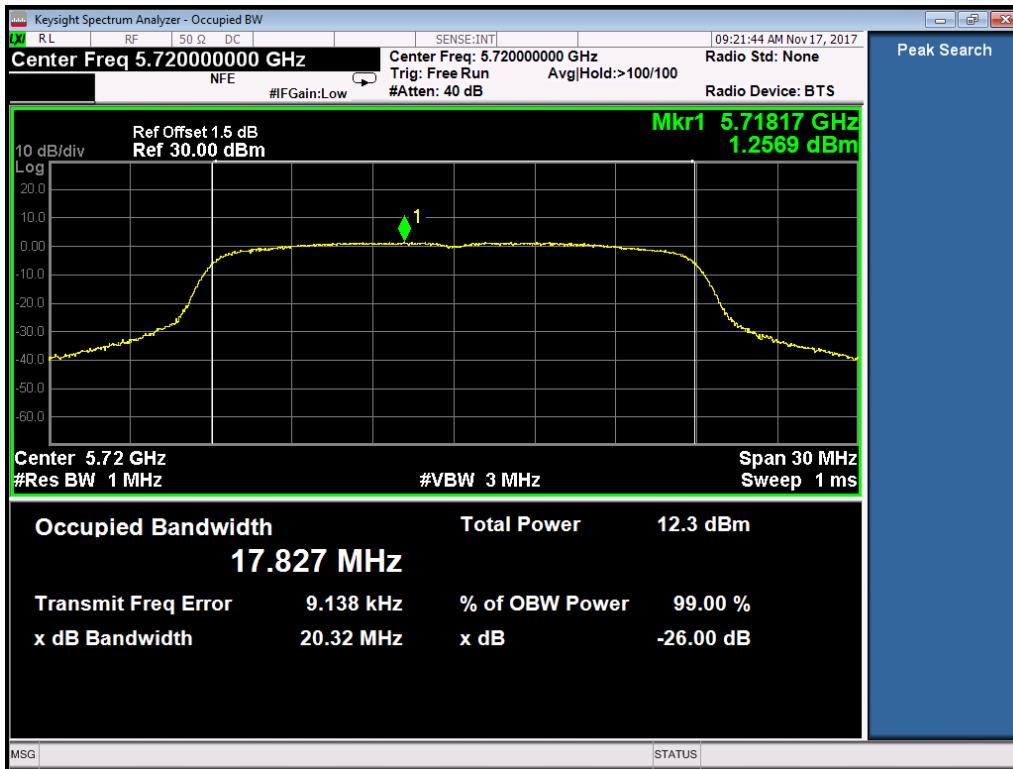
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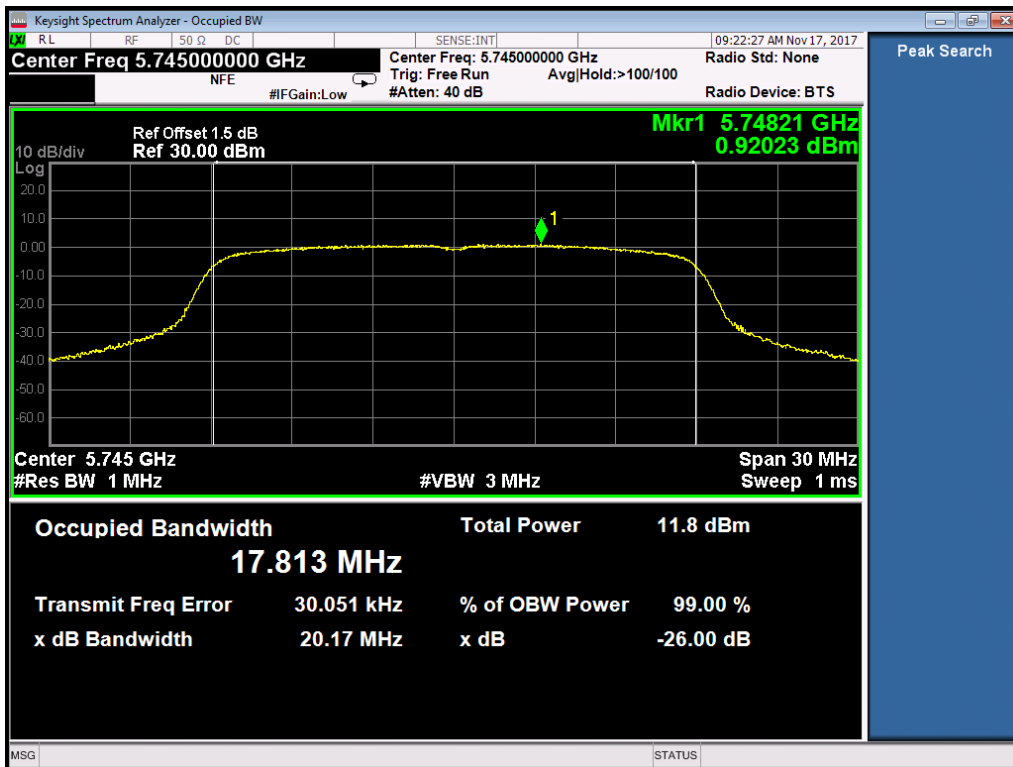
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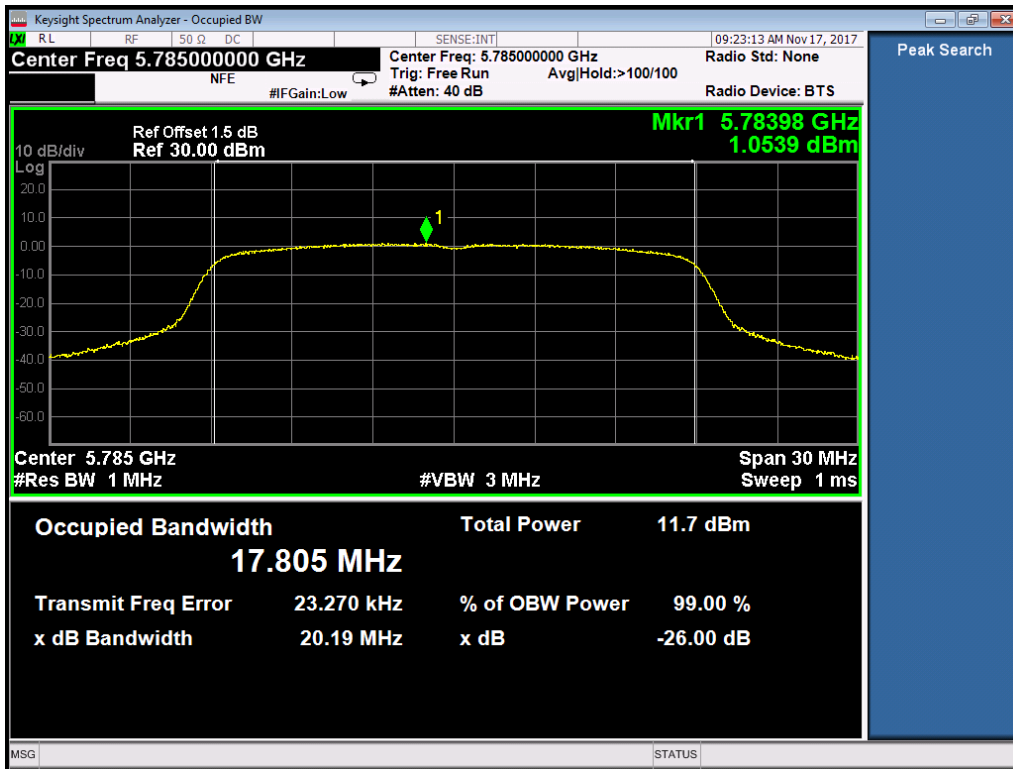


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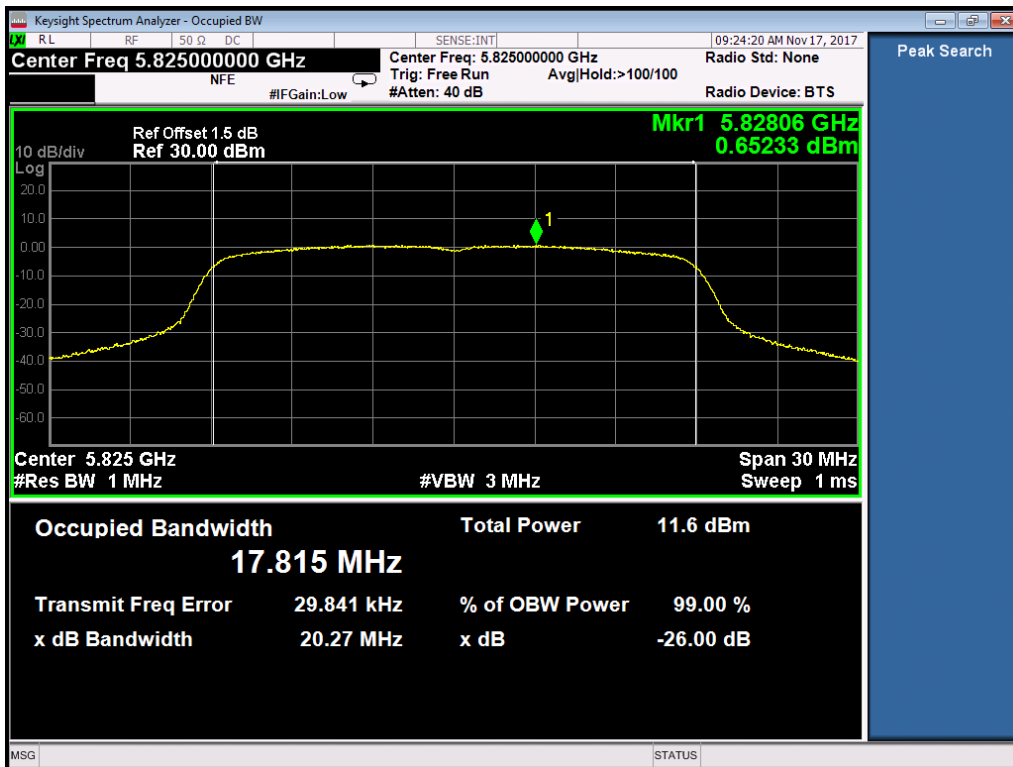




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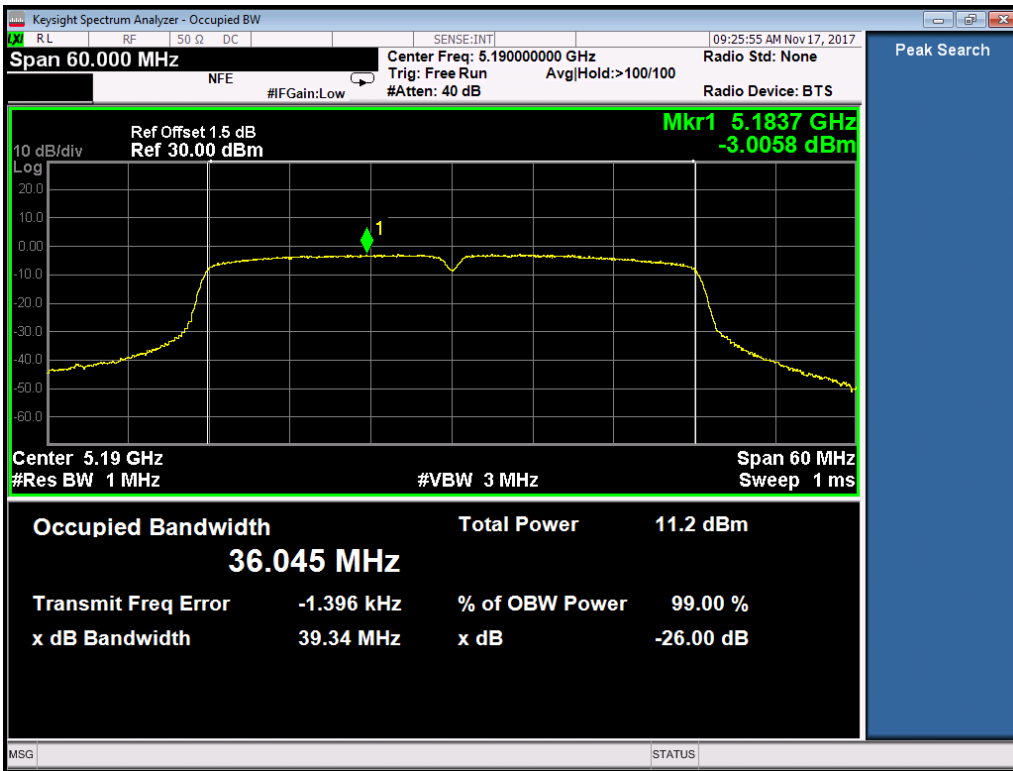


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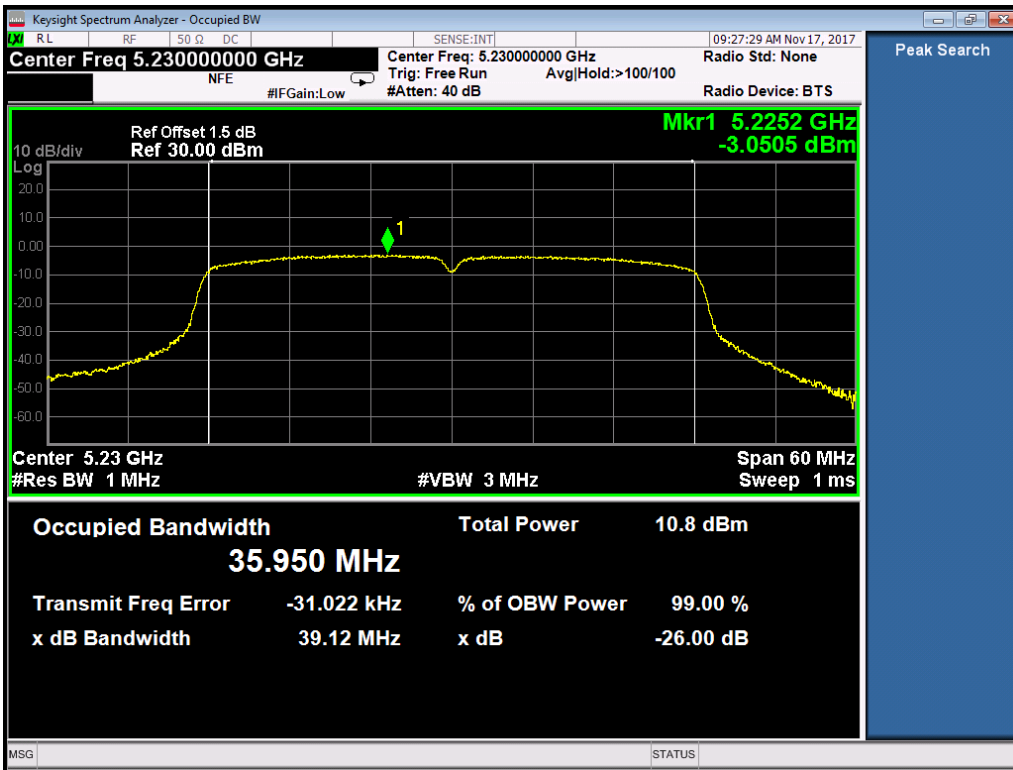


802.11n40

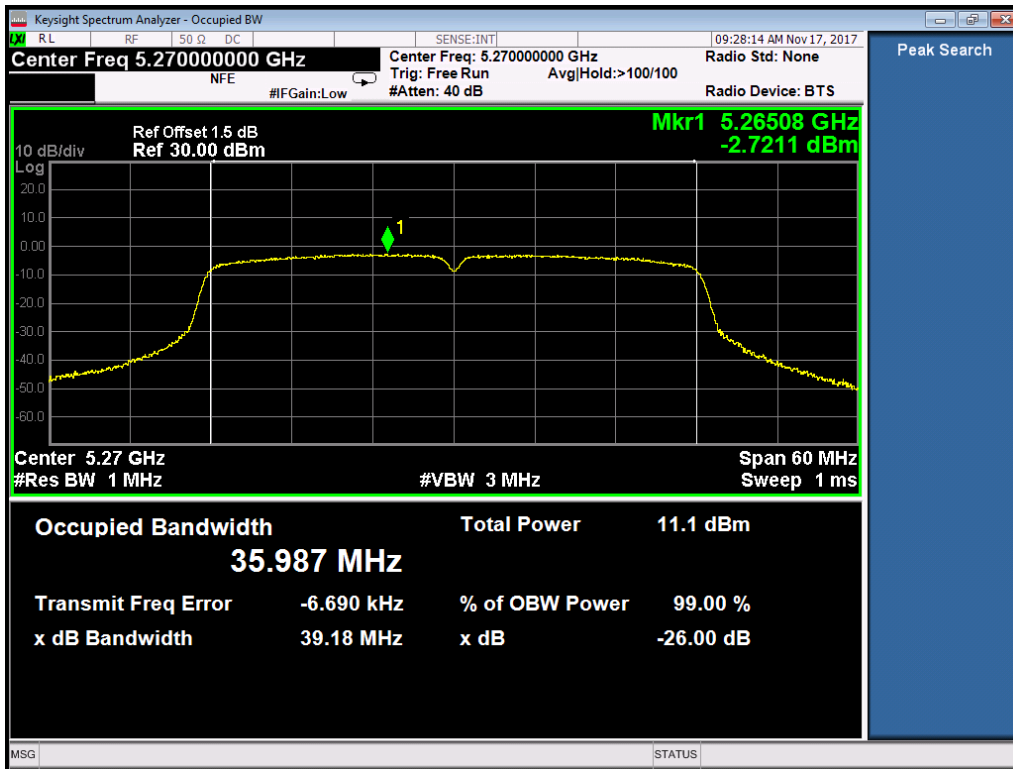
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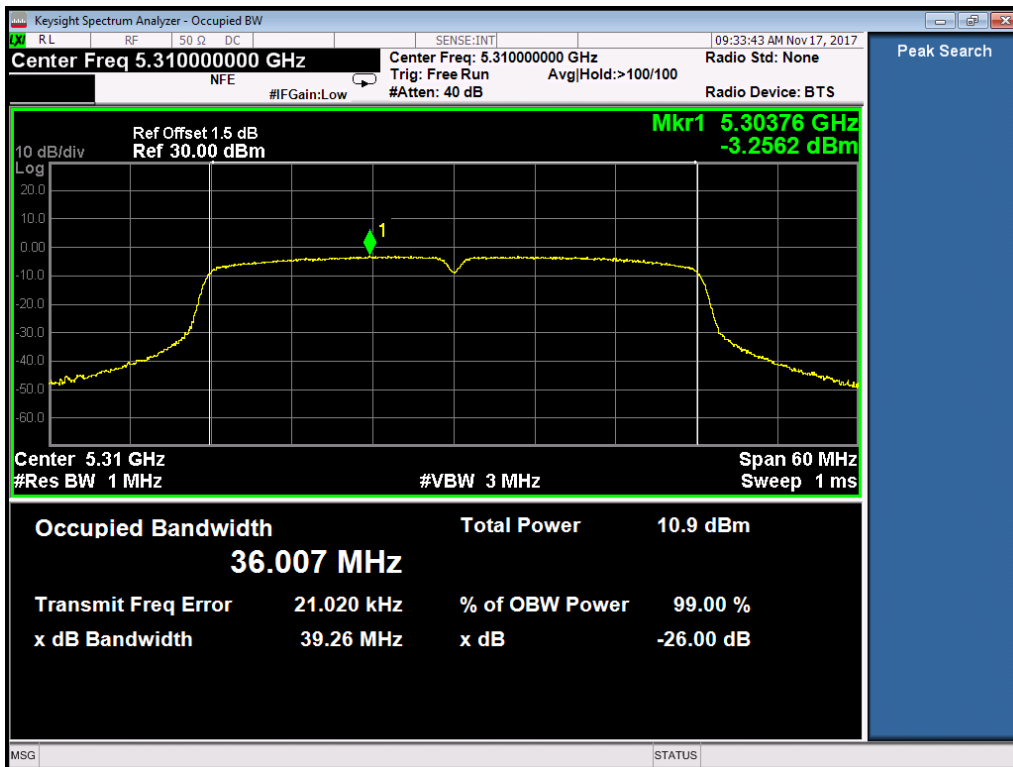
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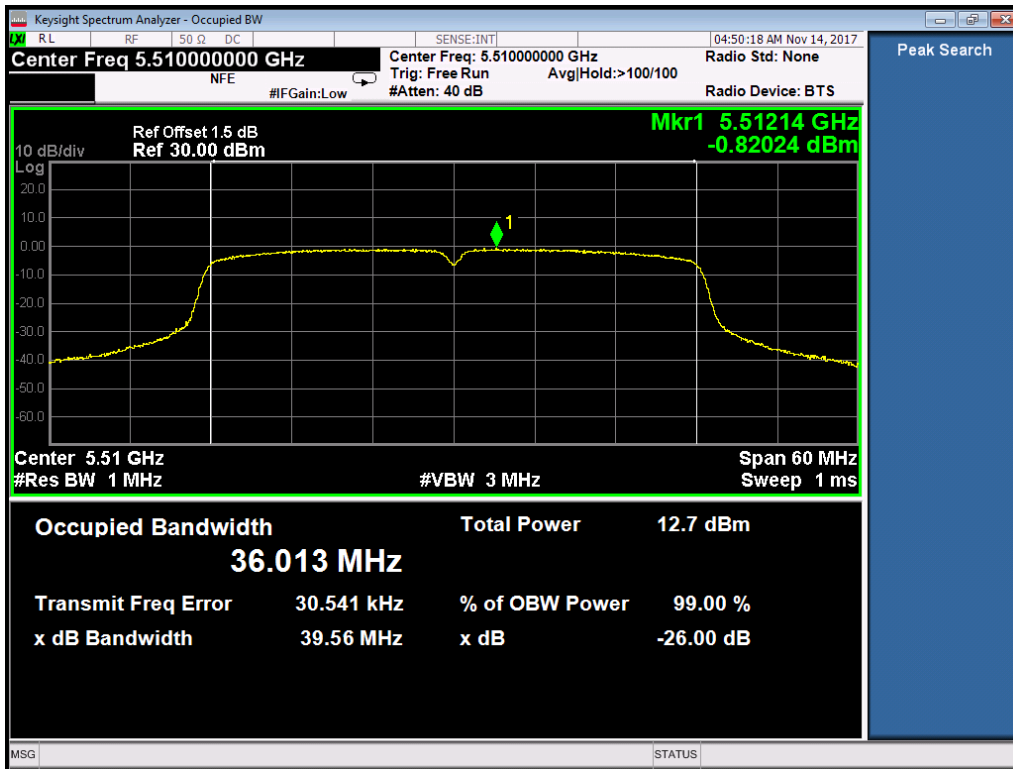
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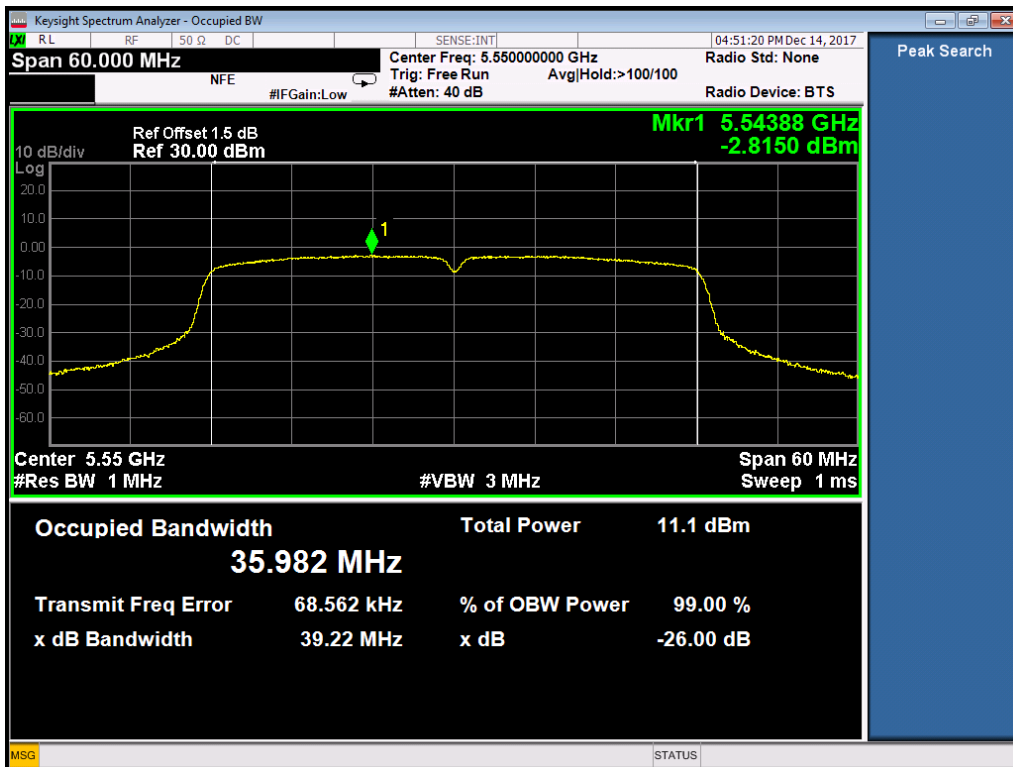
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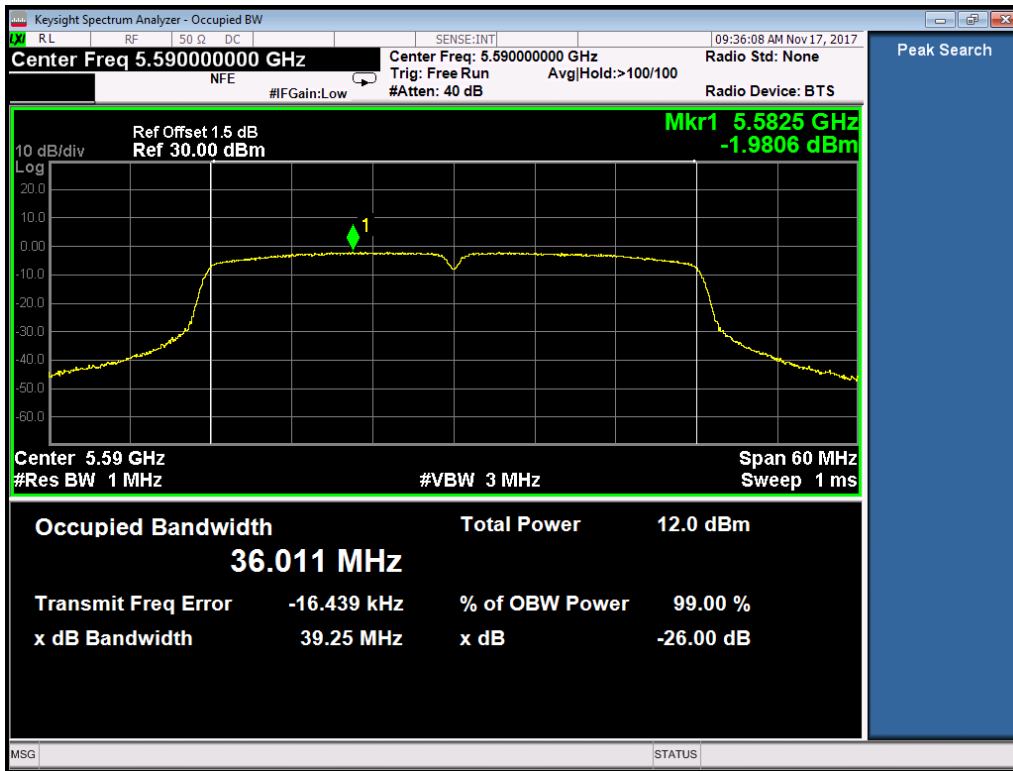
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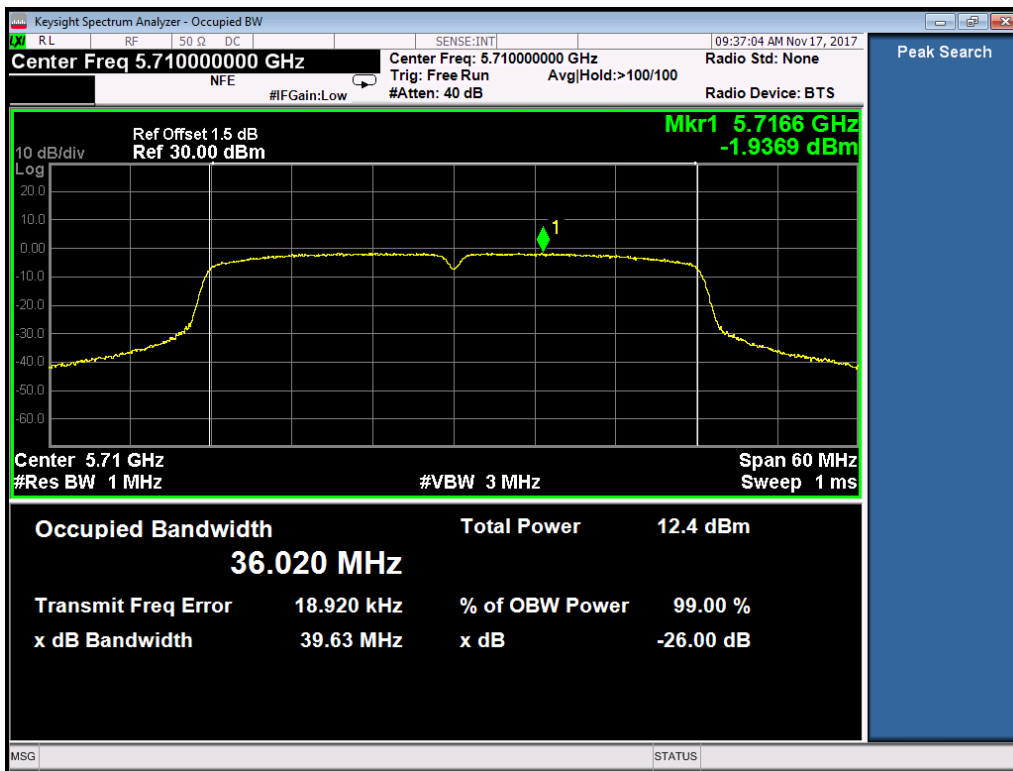
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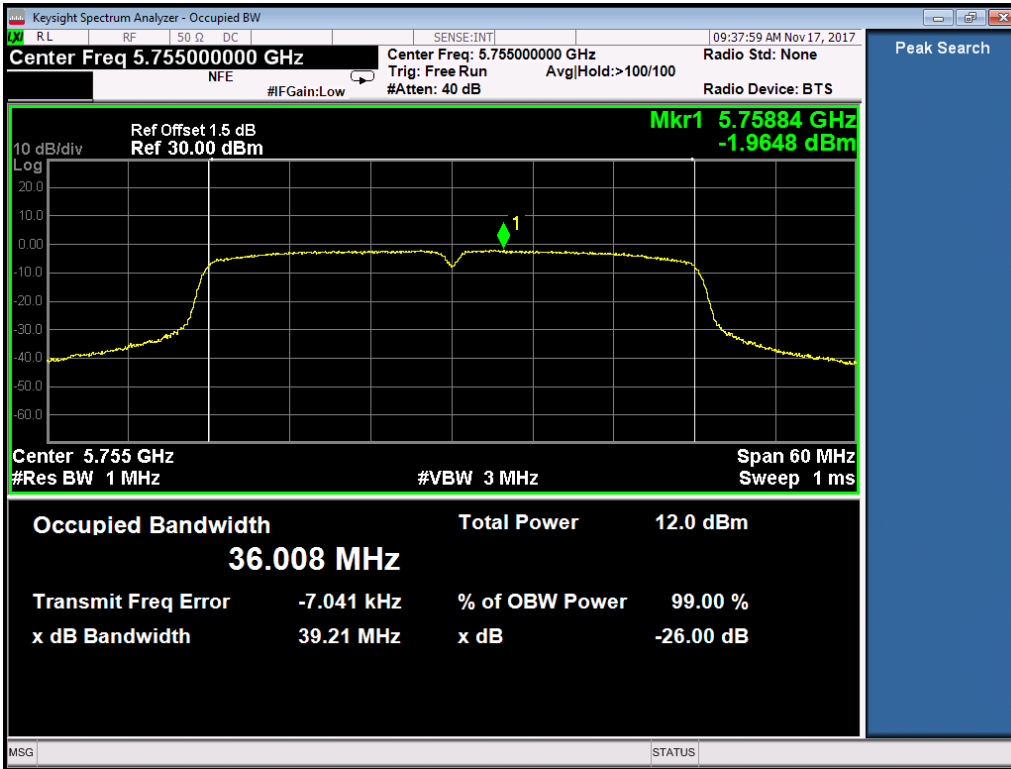
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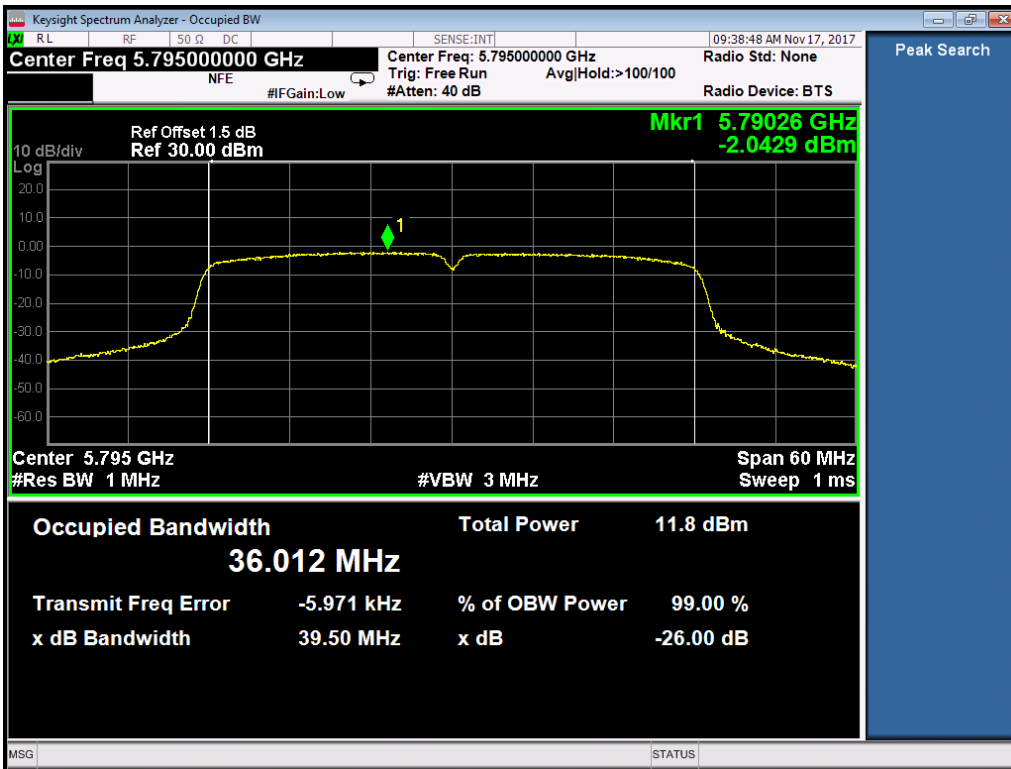
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5755

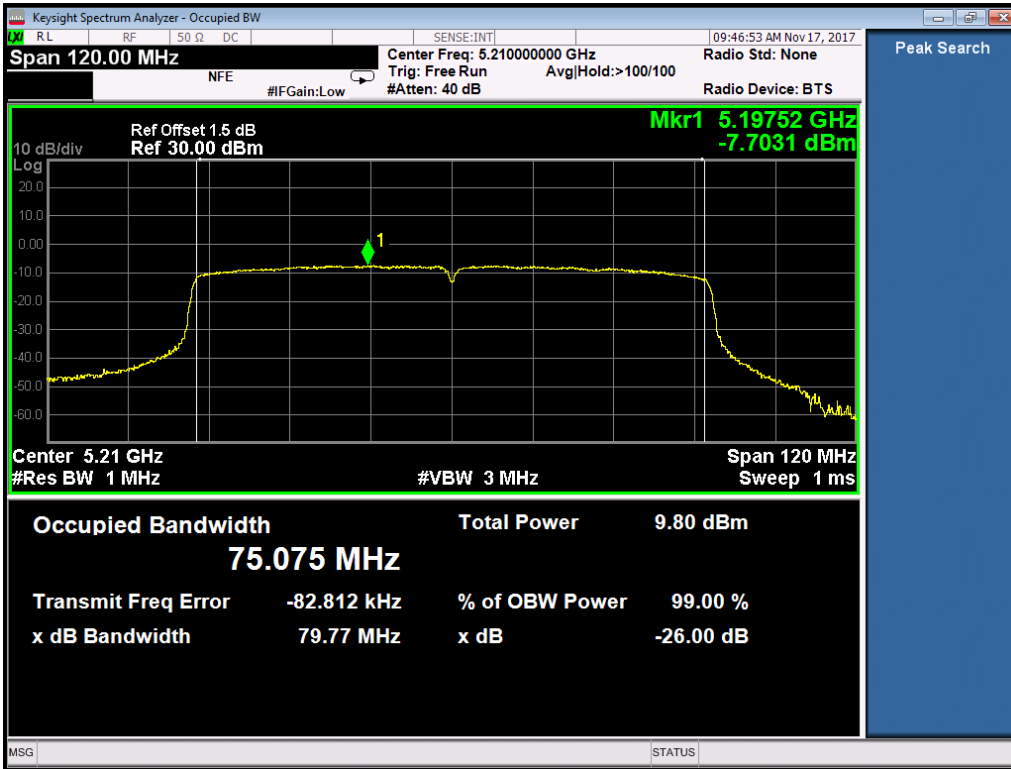


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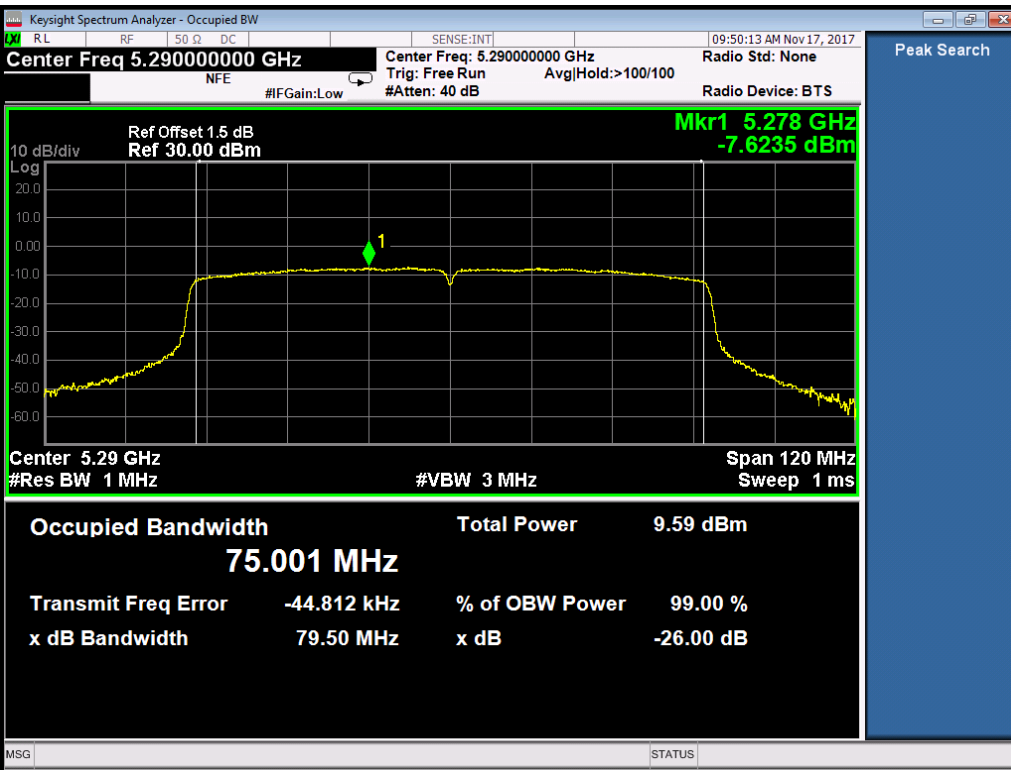


802.11ac80

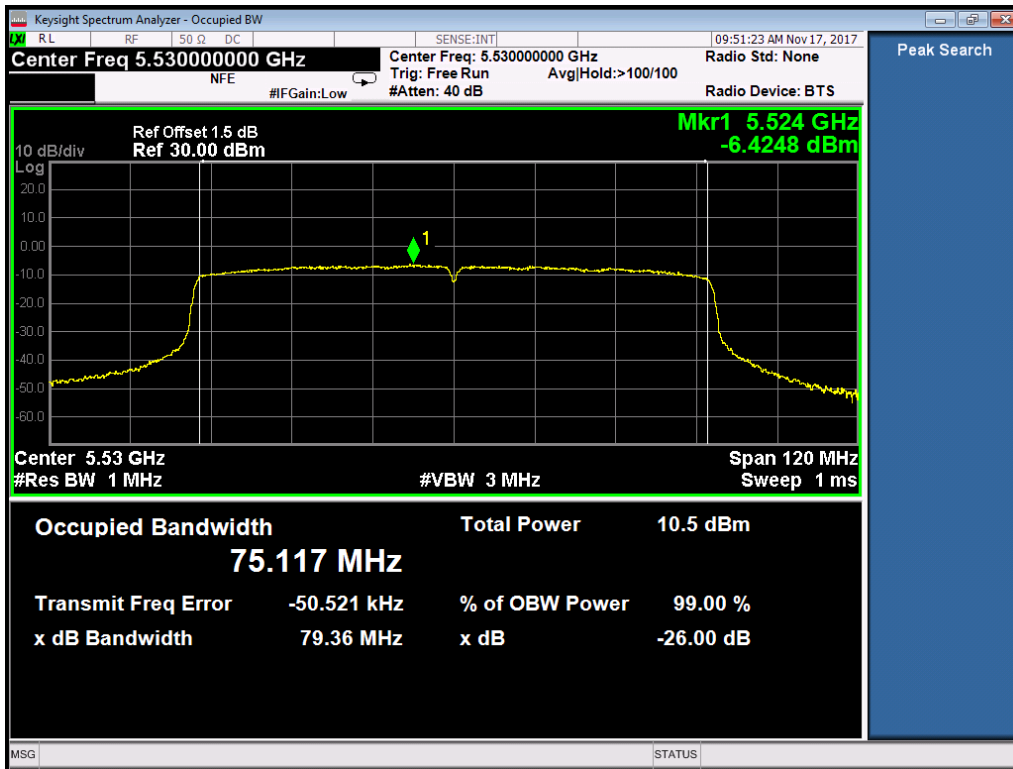
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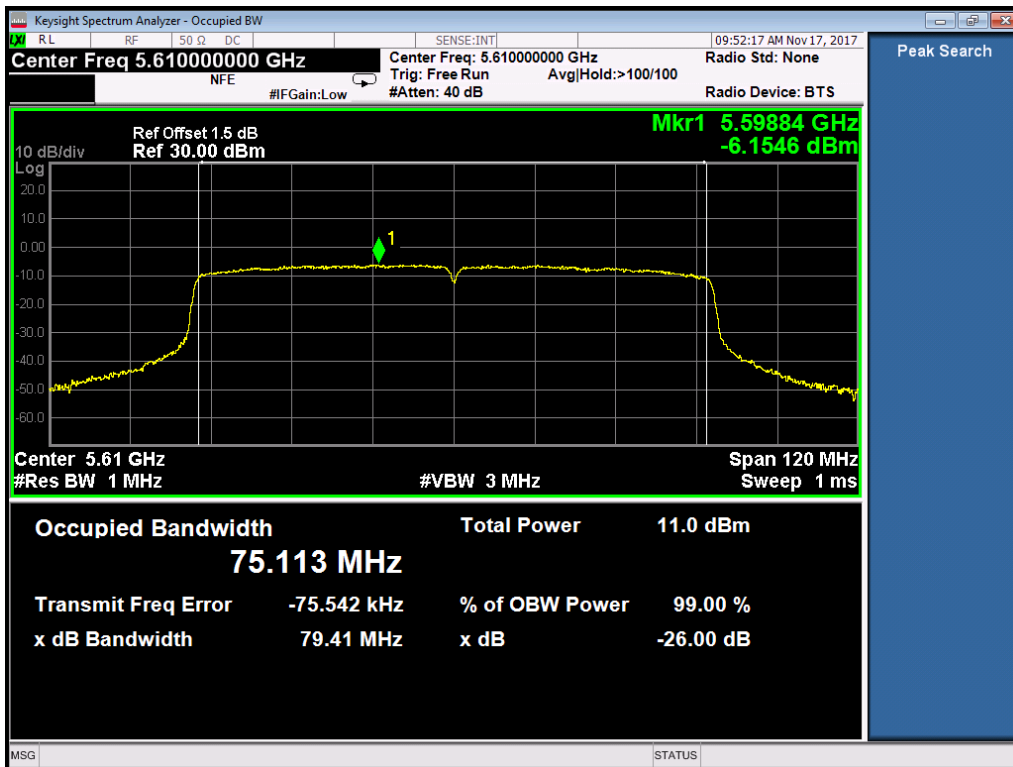
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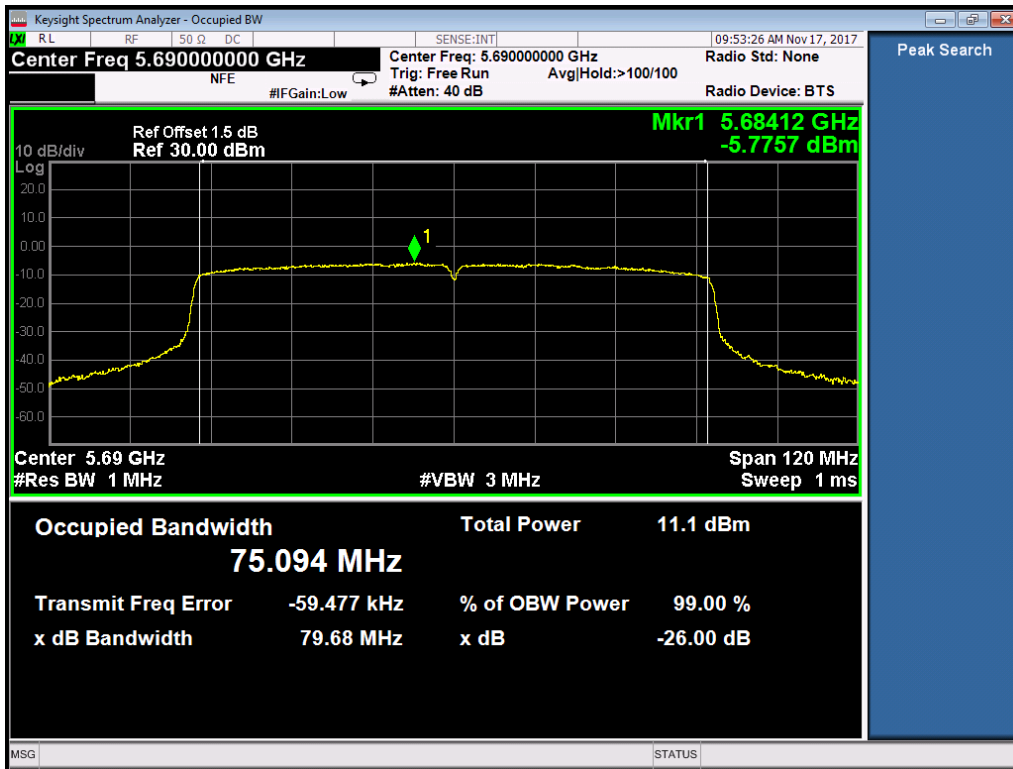


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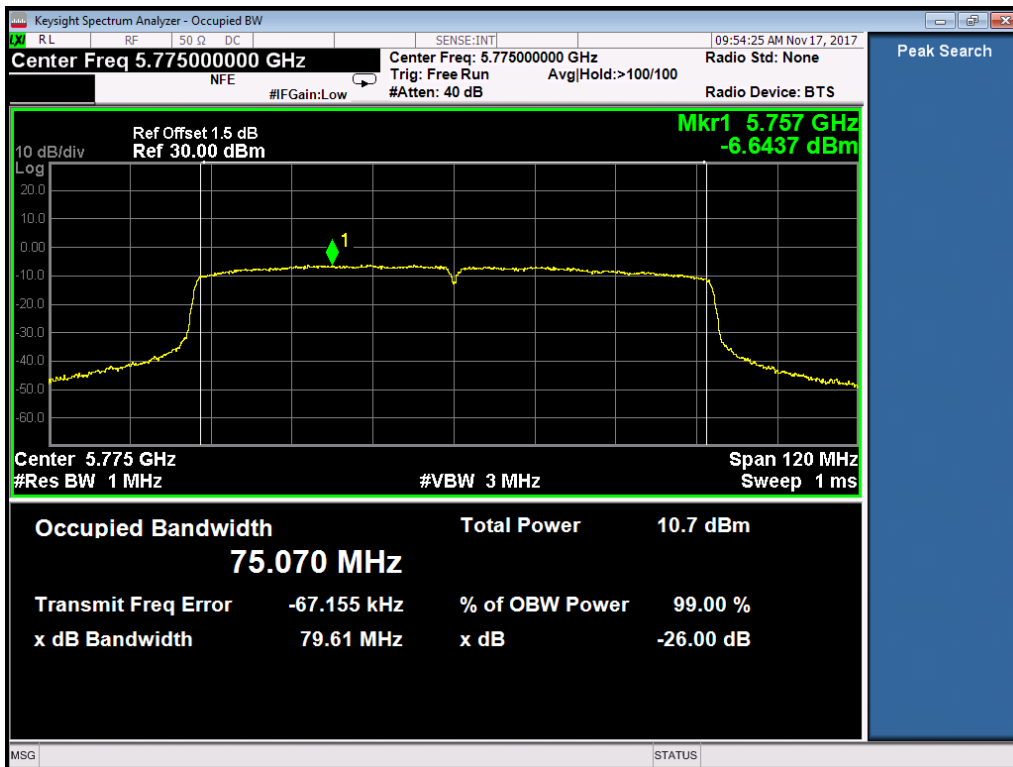




5690



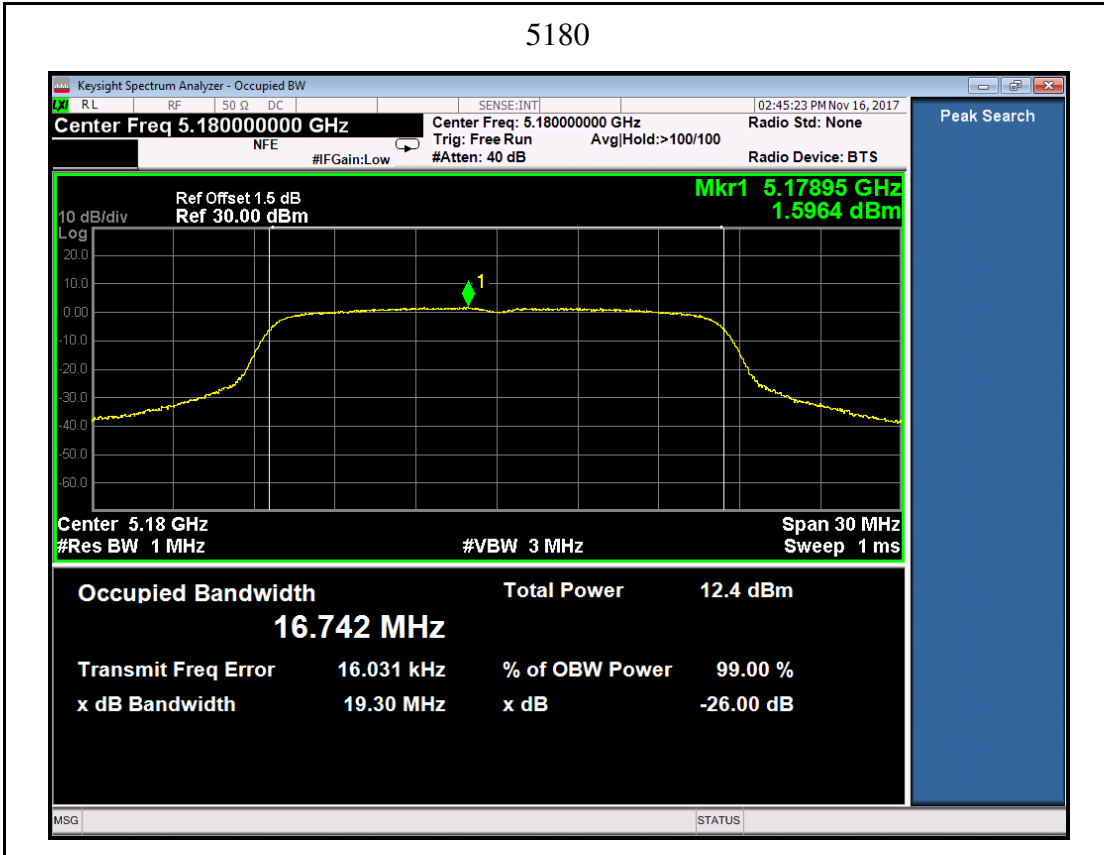
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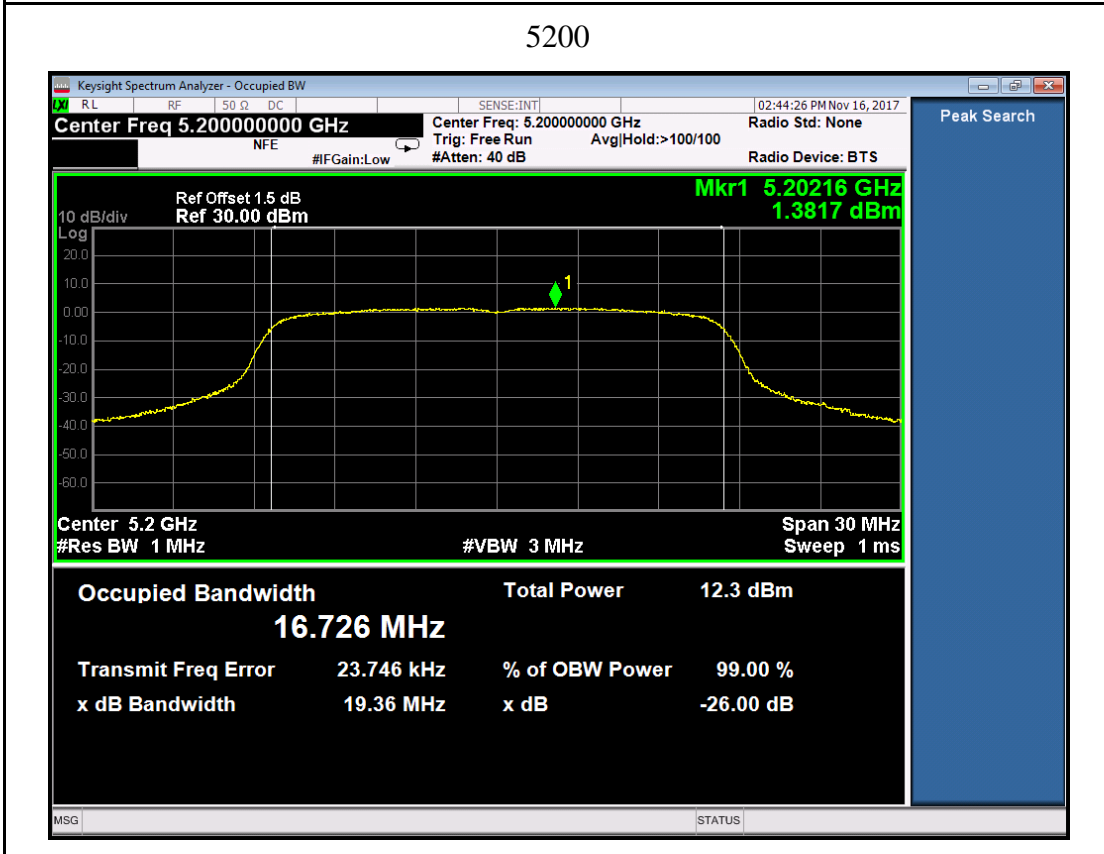
Port 1

802.11a

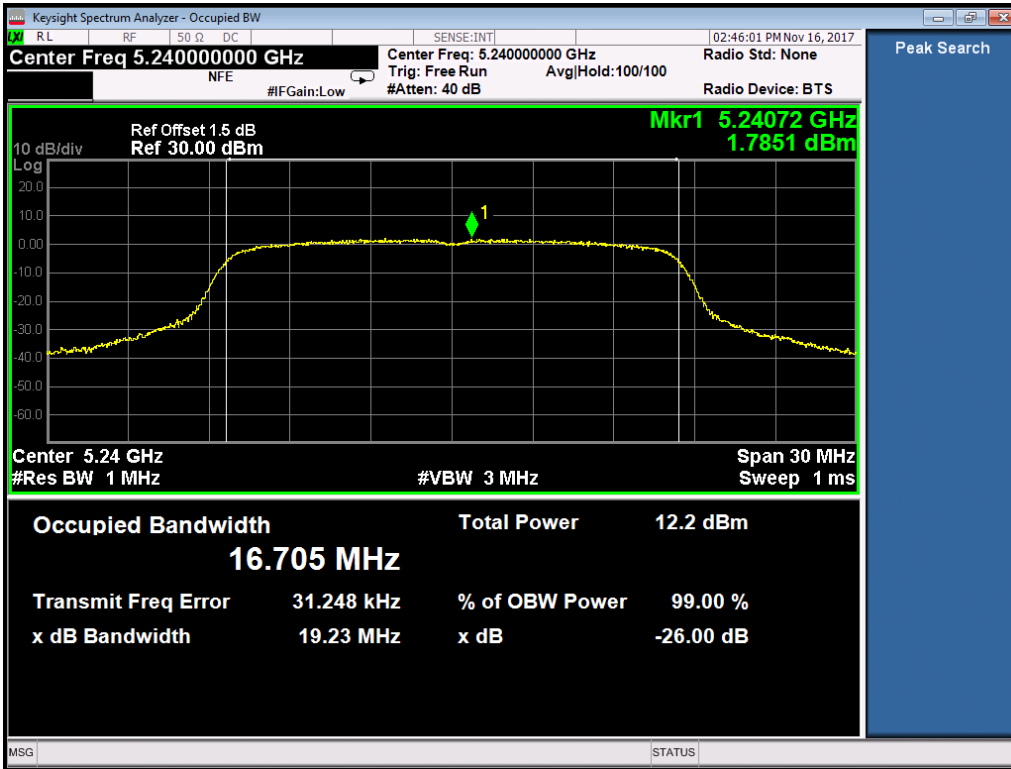
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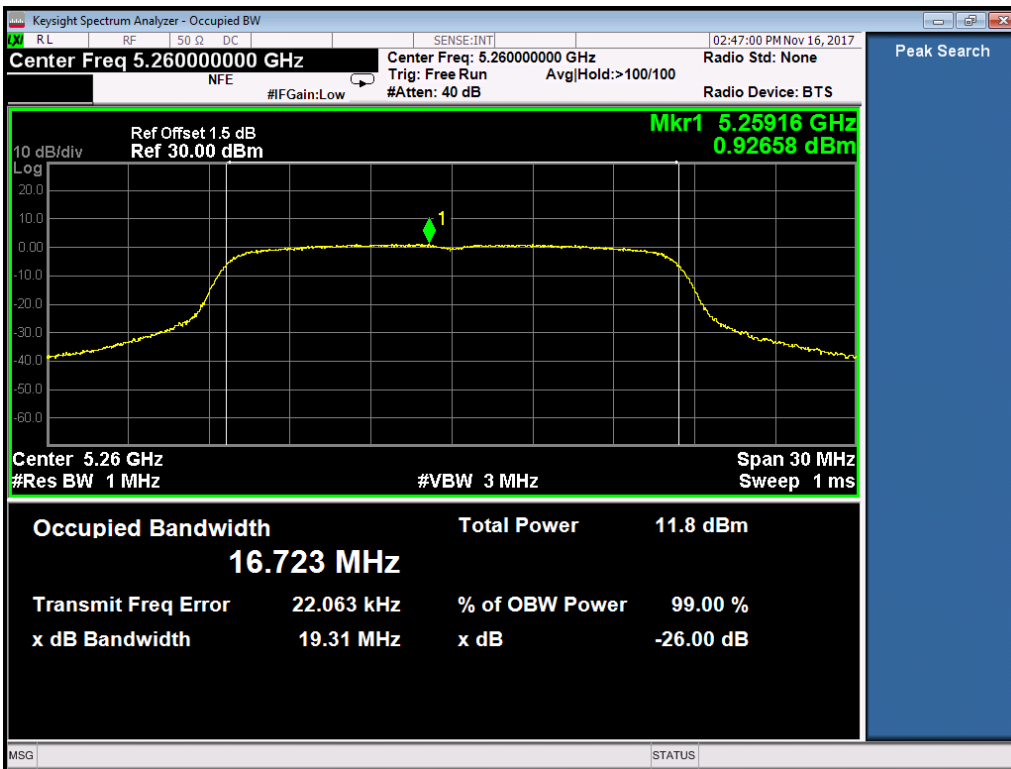
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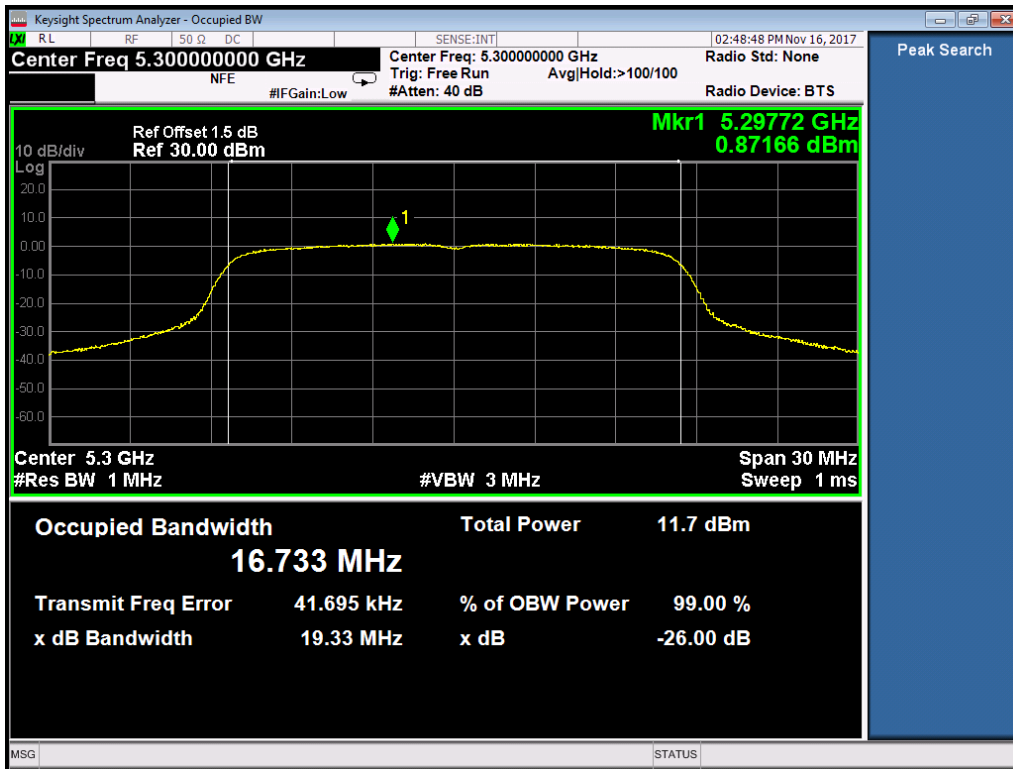
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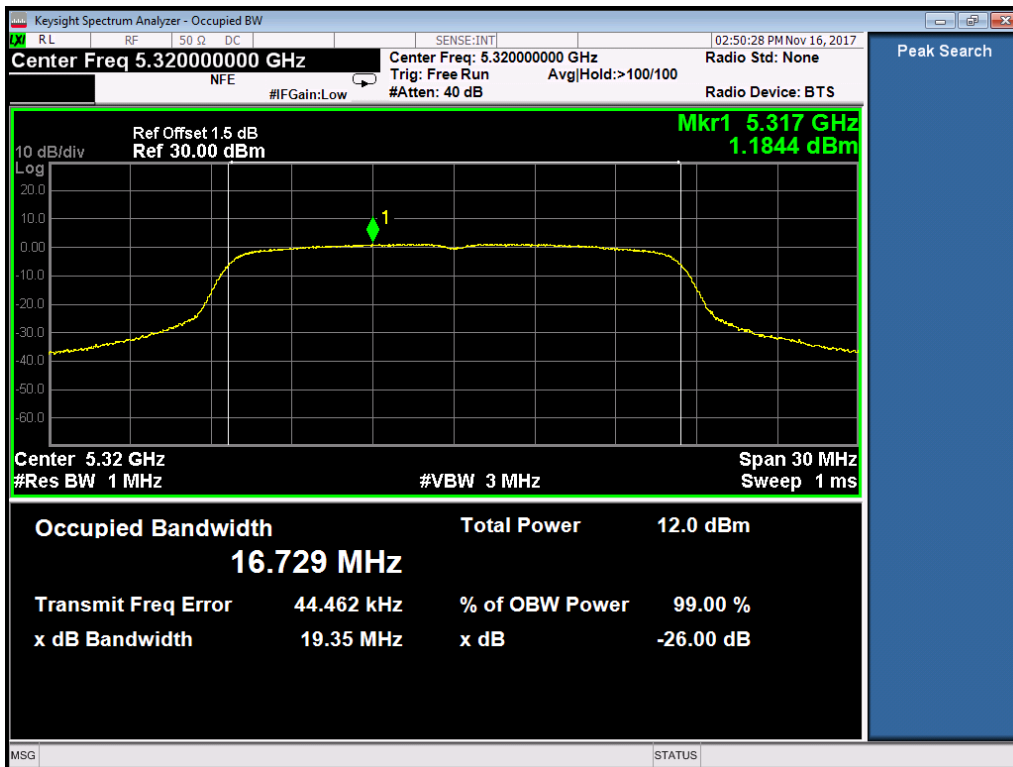
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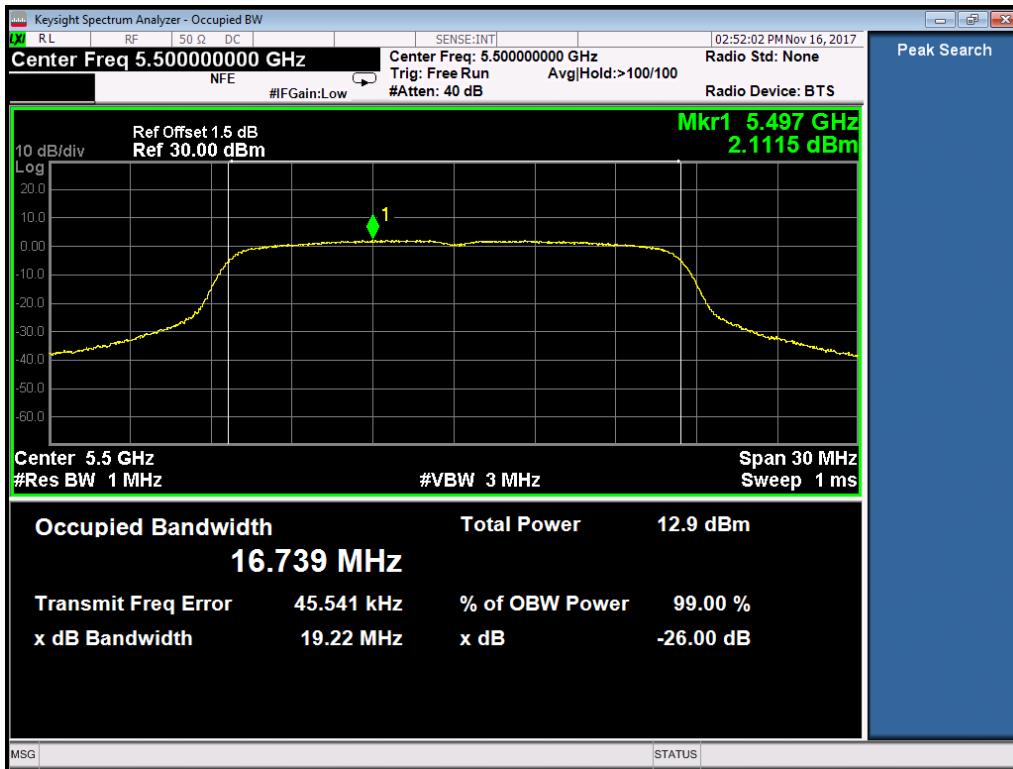
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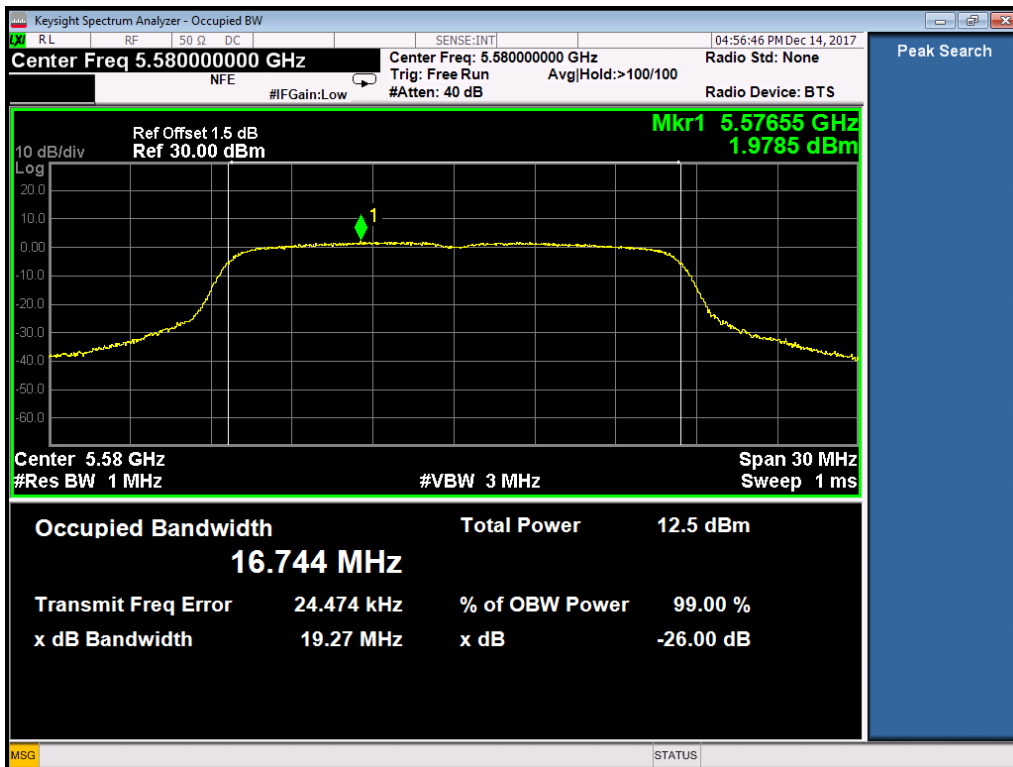
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5500



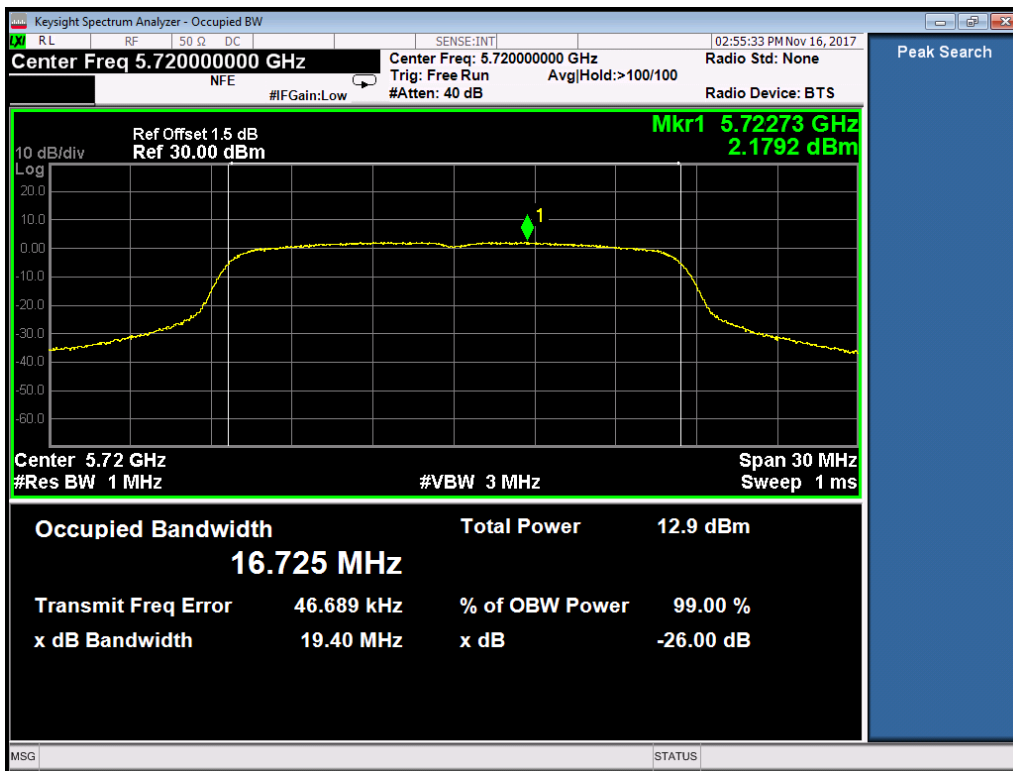
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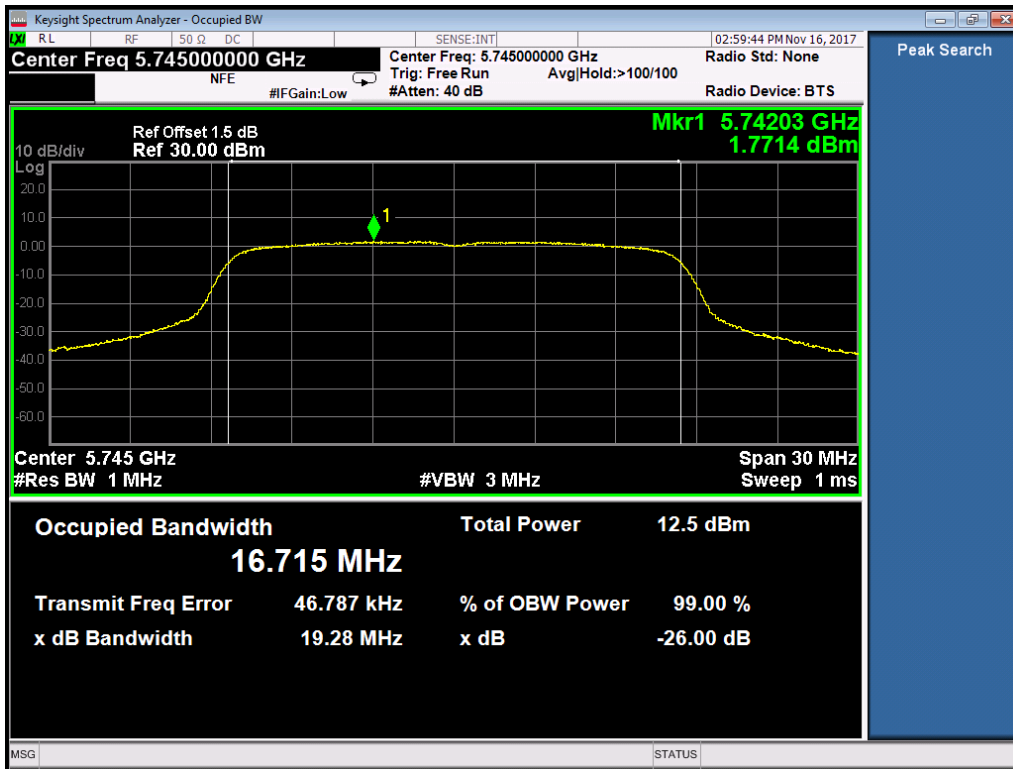
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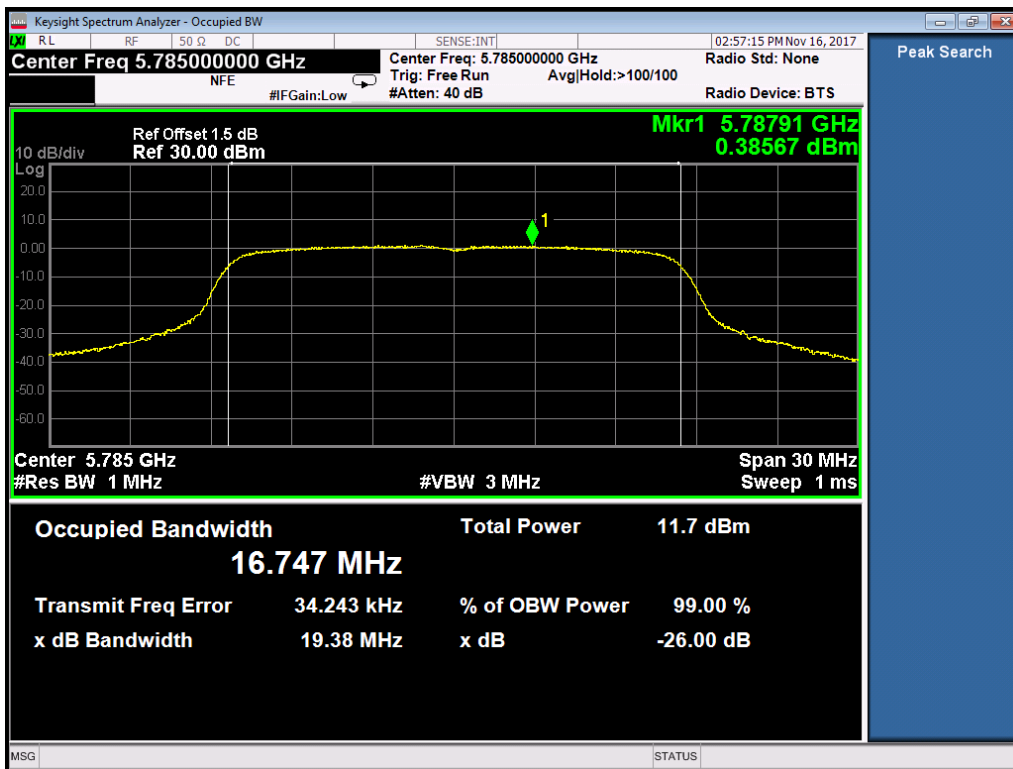
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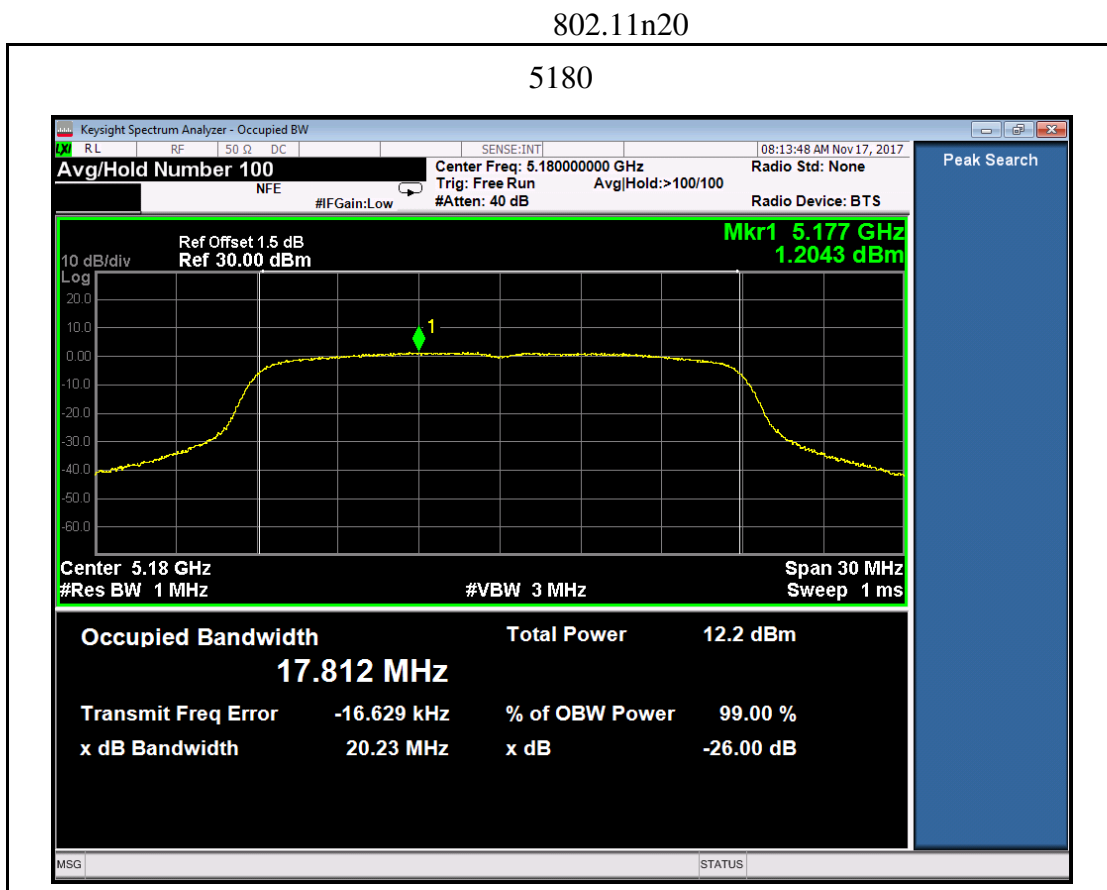
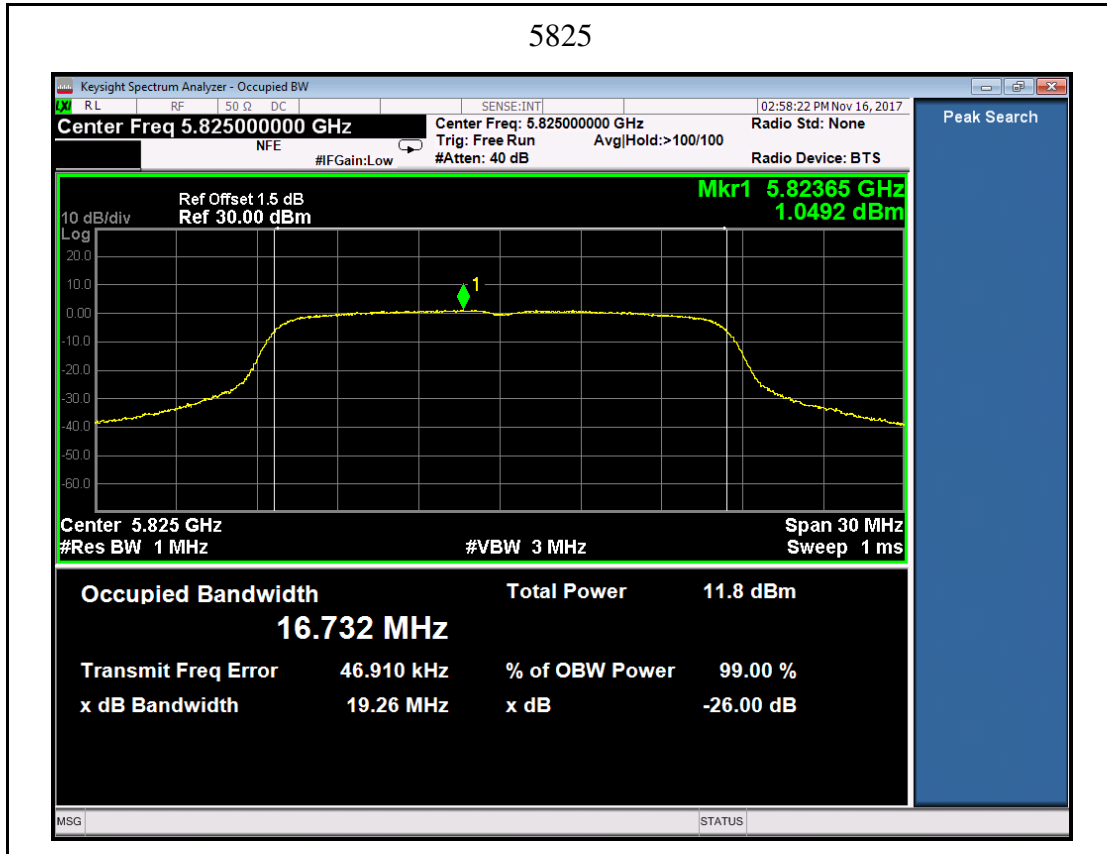


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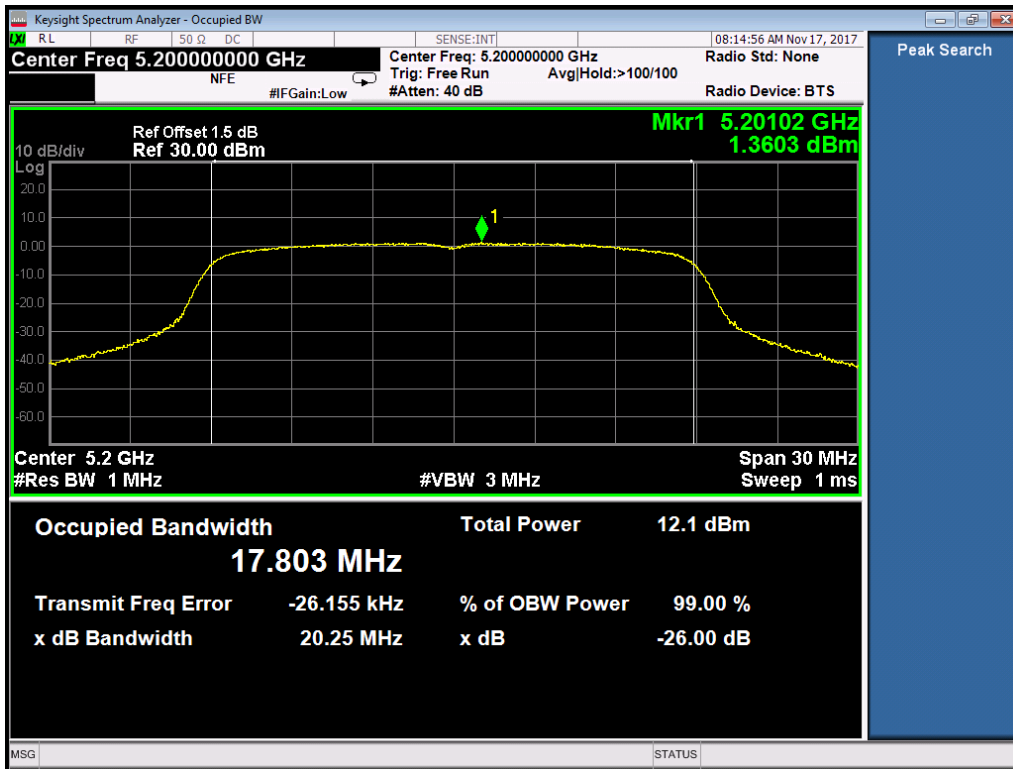
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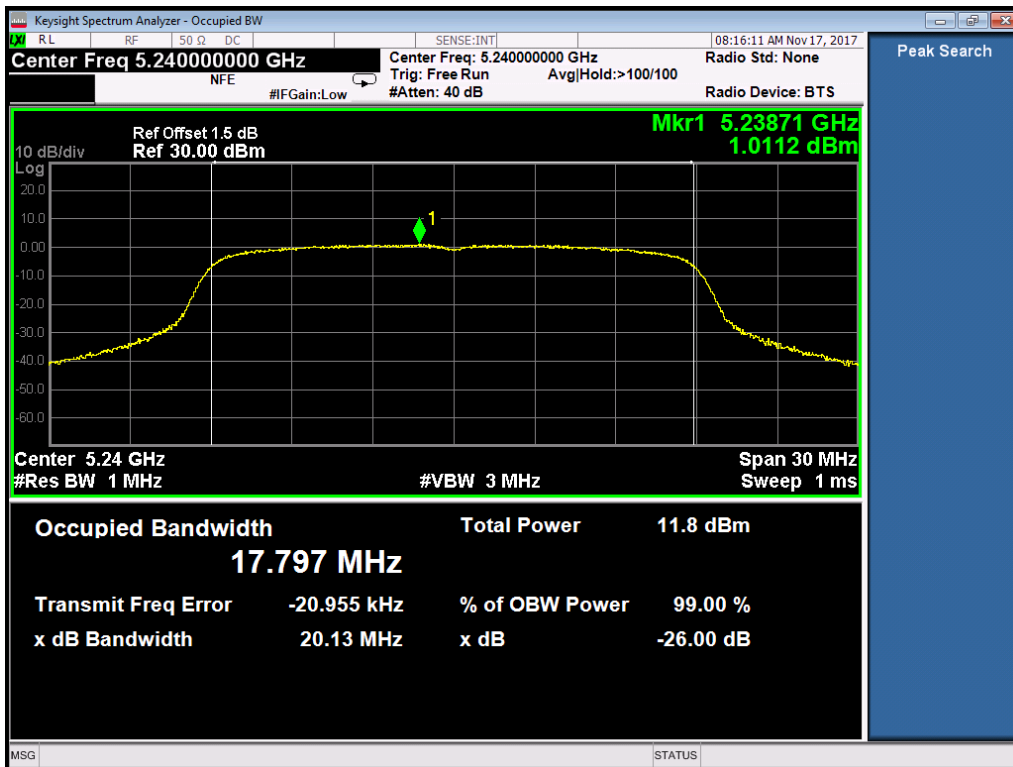




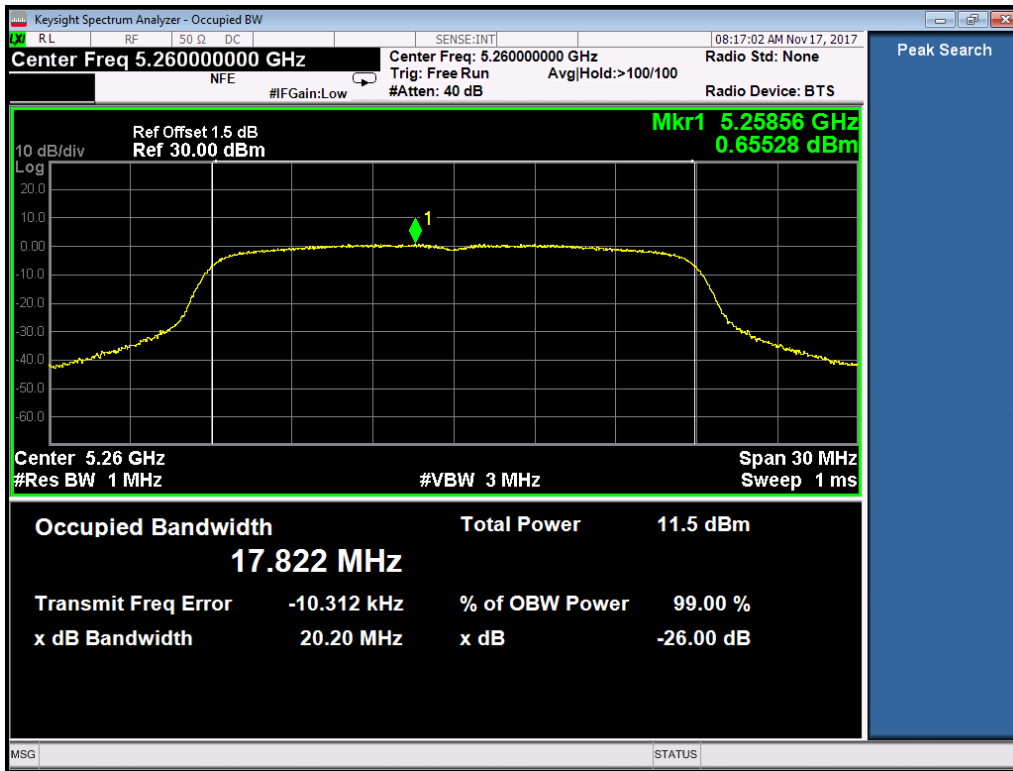
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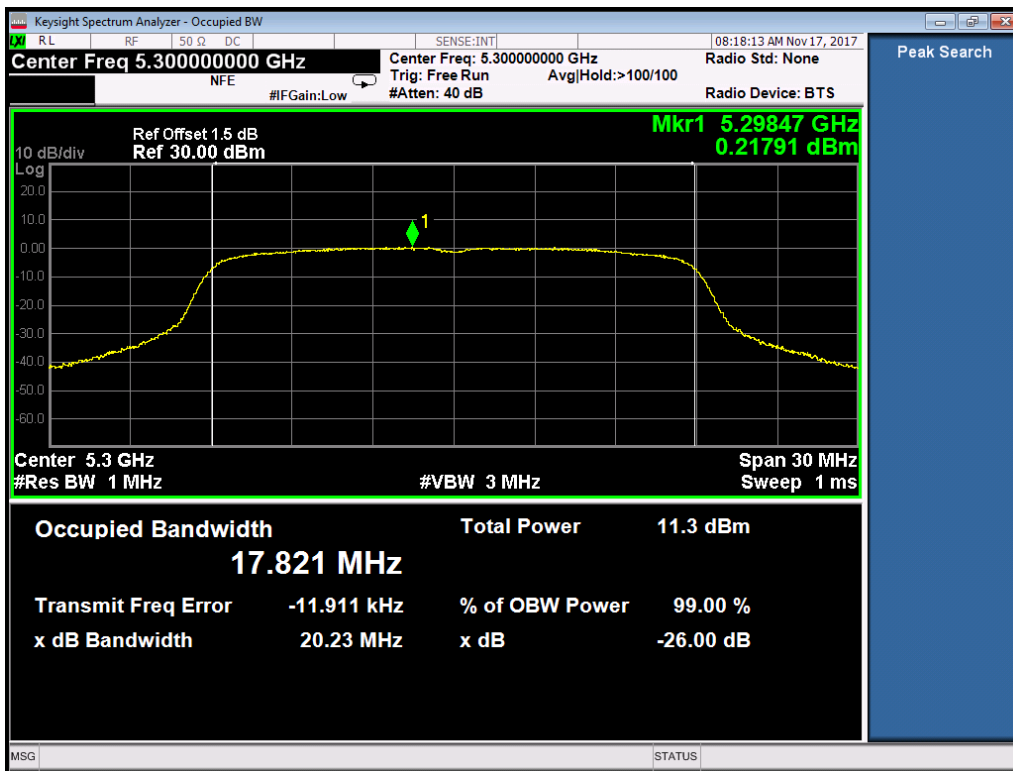
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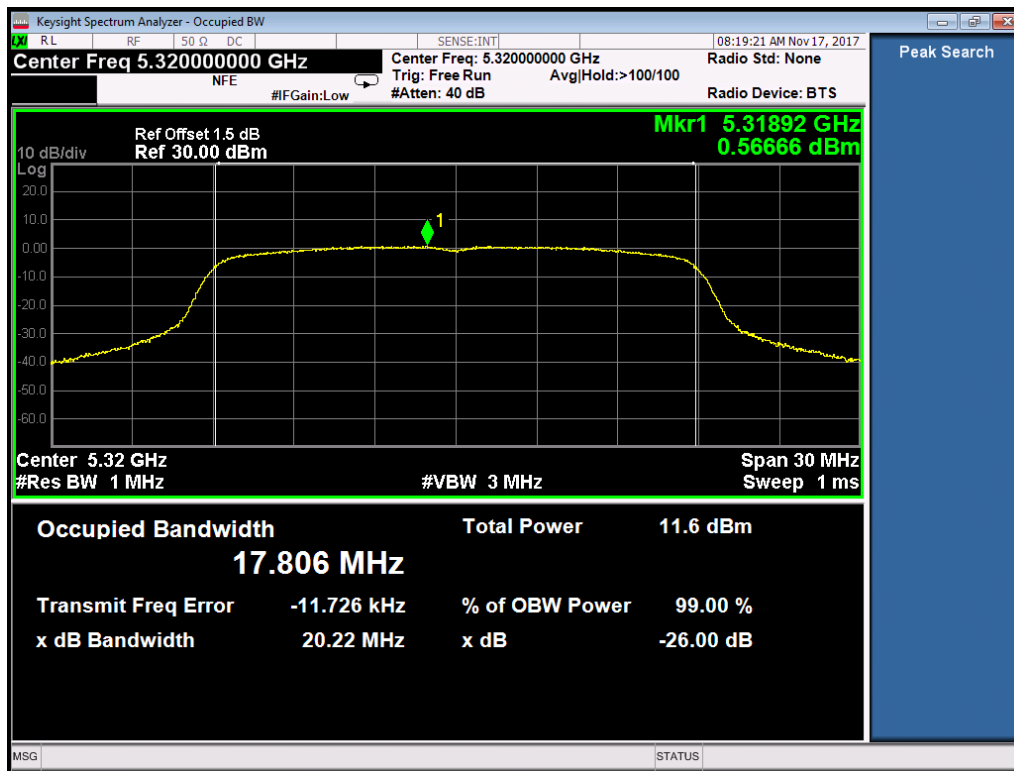
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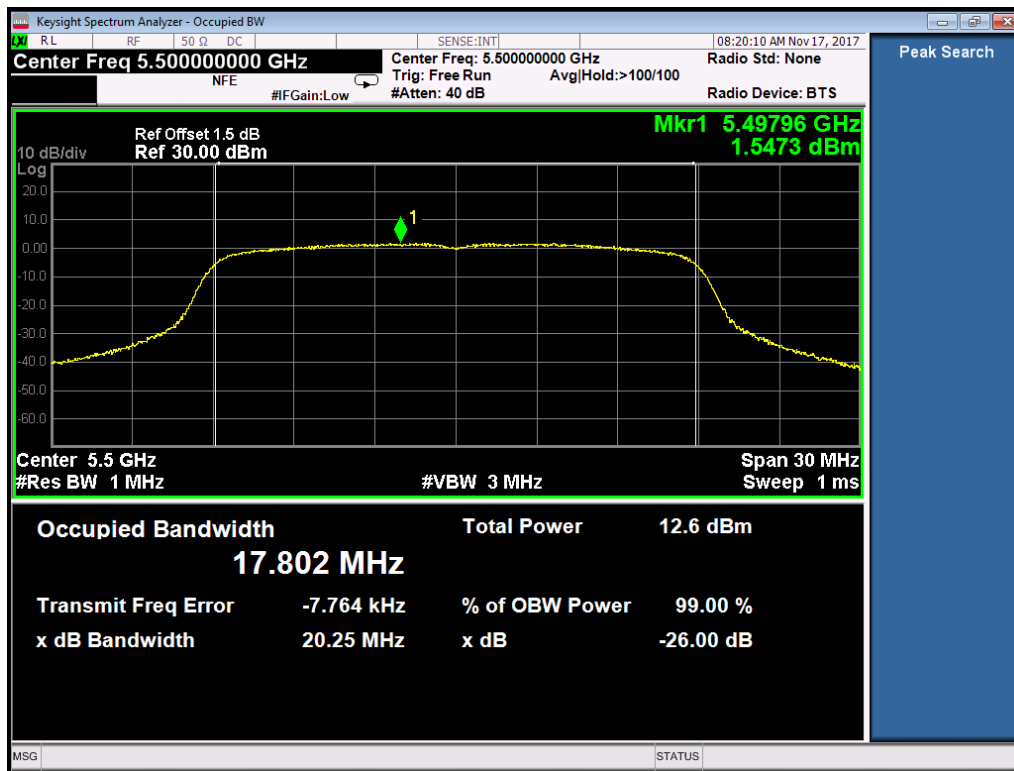
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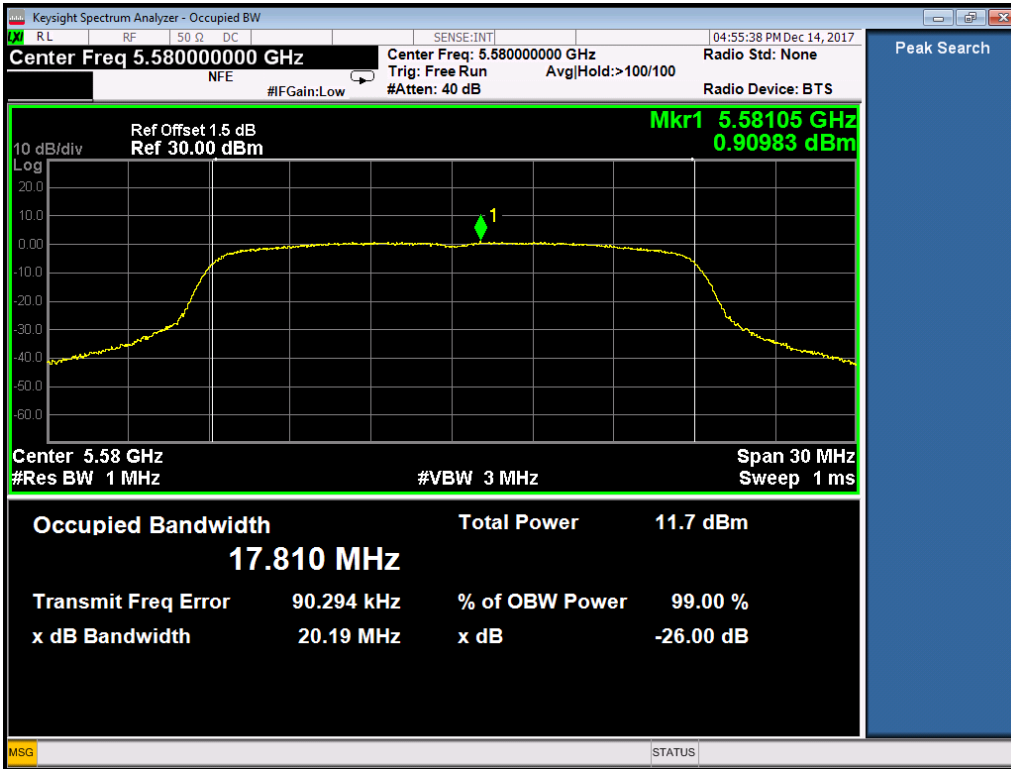
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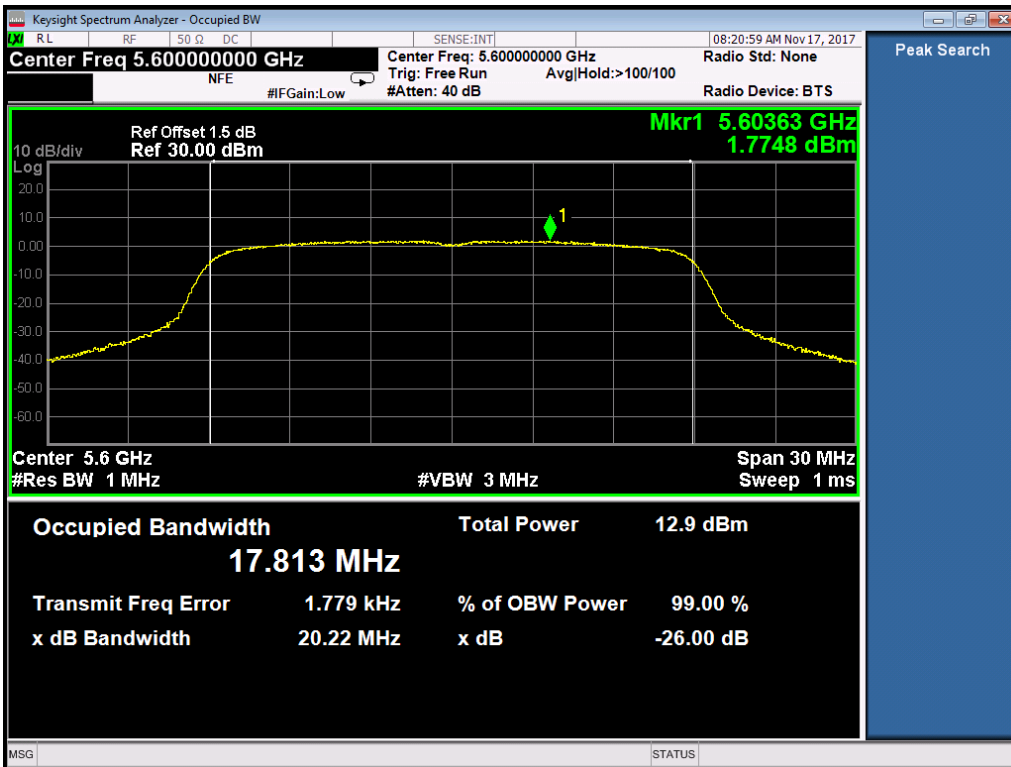
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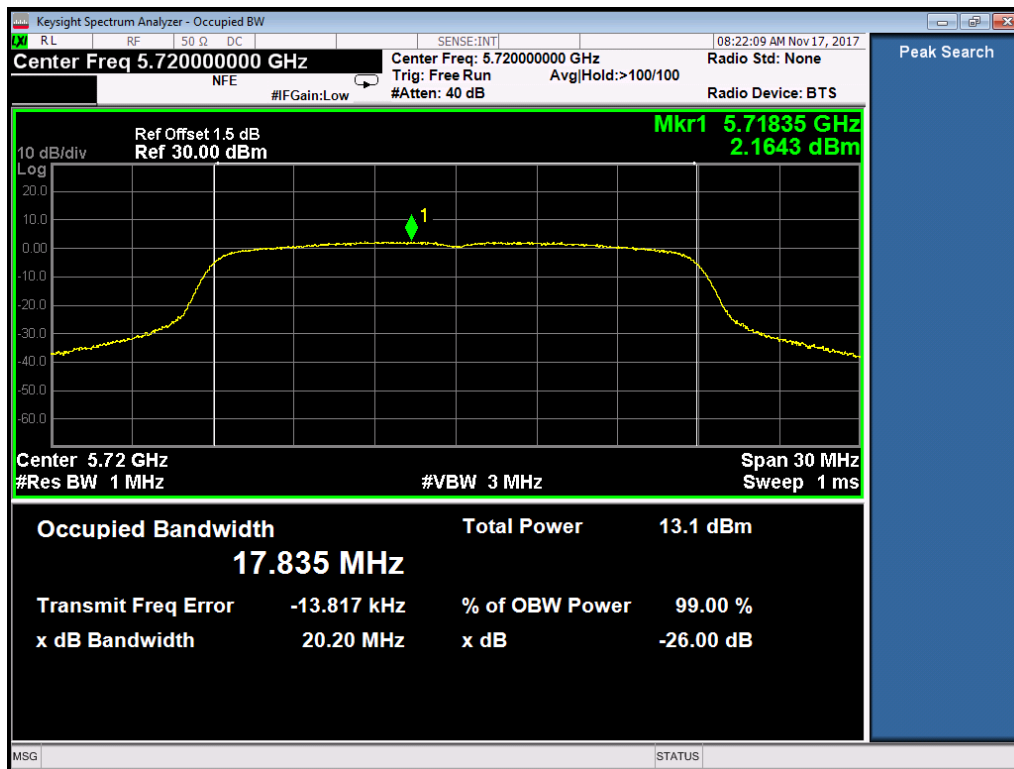
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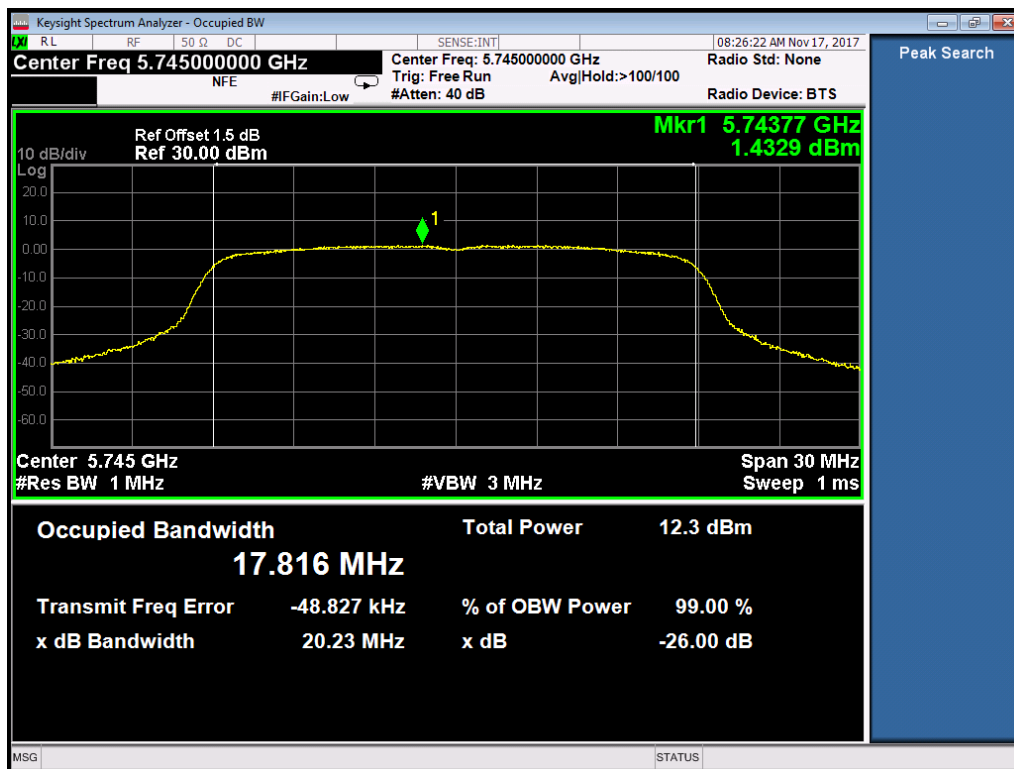
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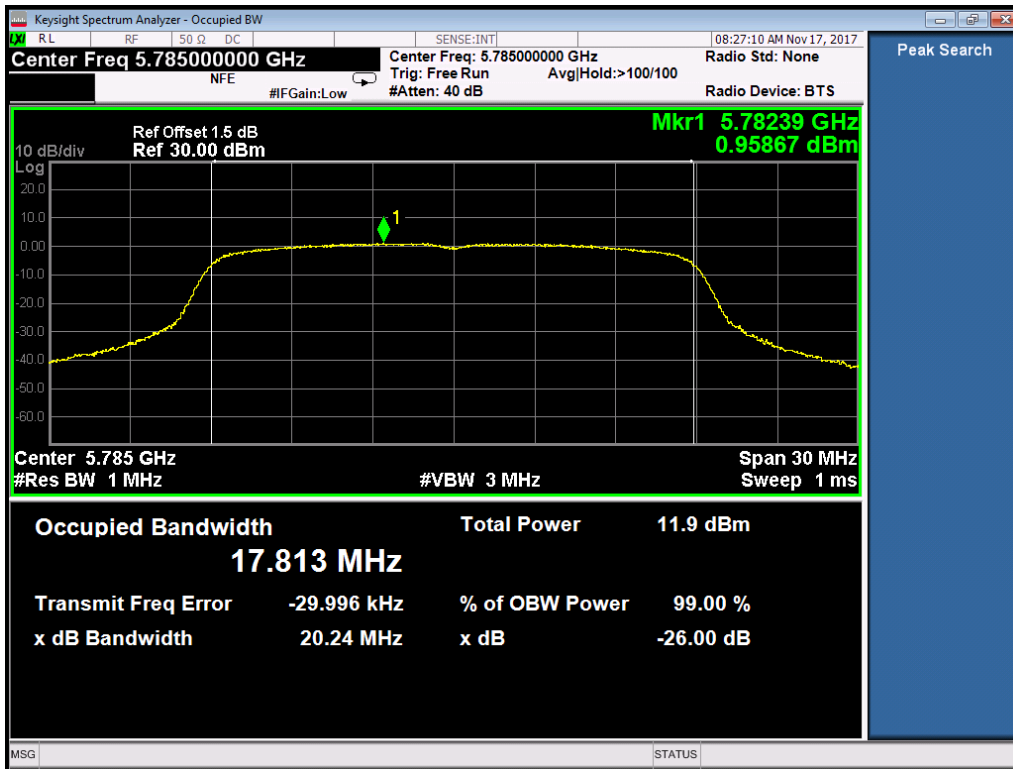
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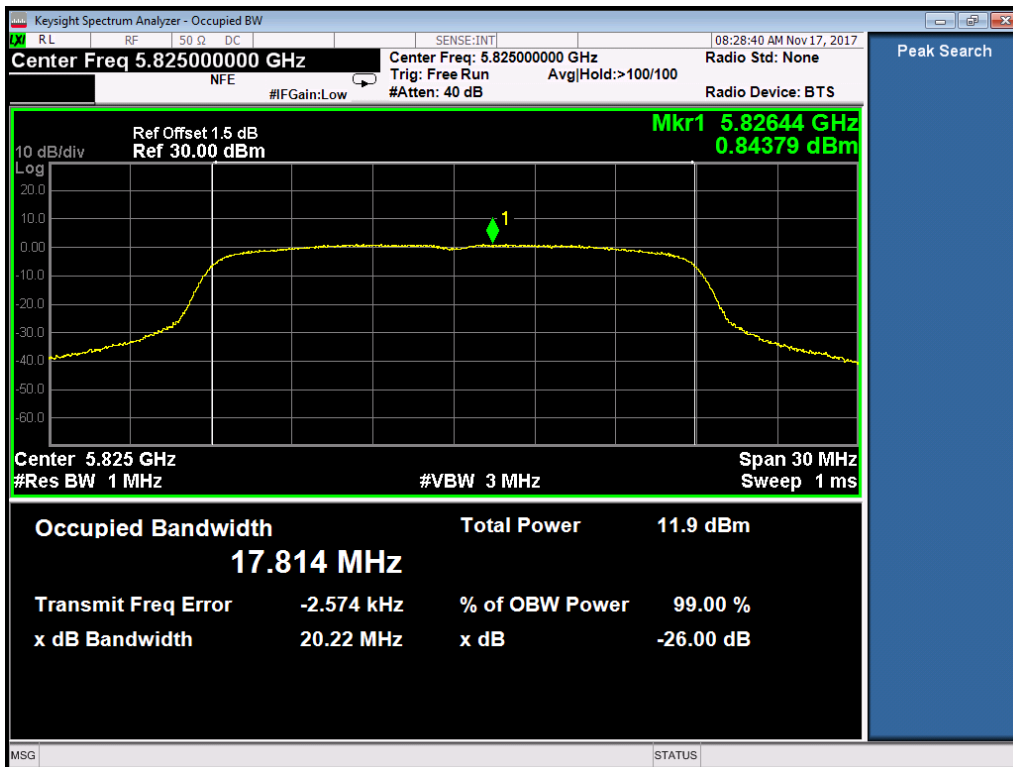
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5785

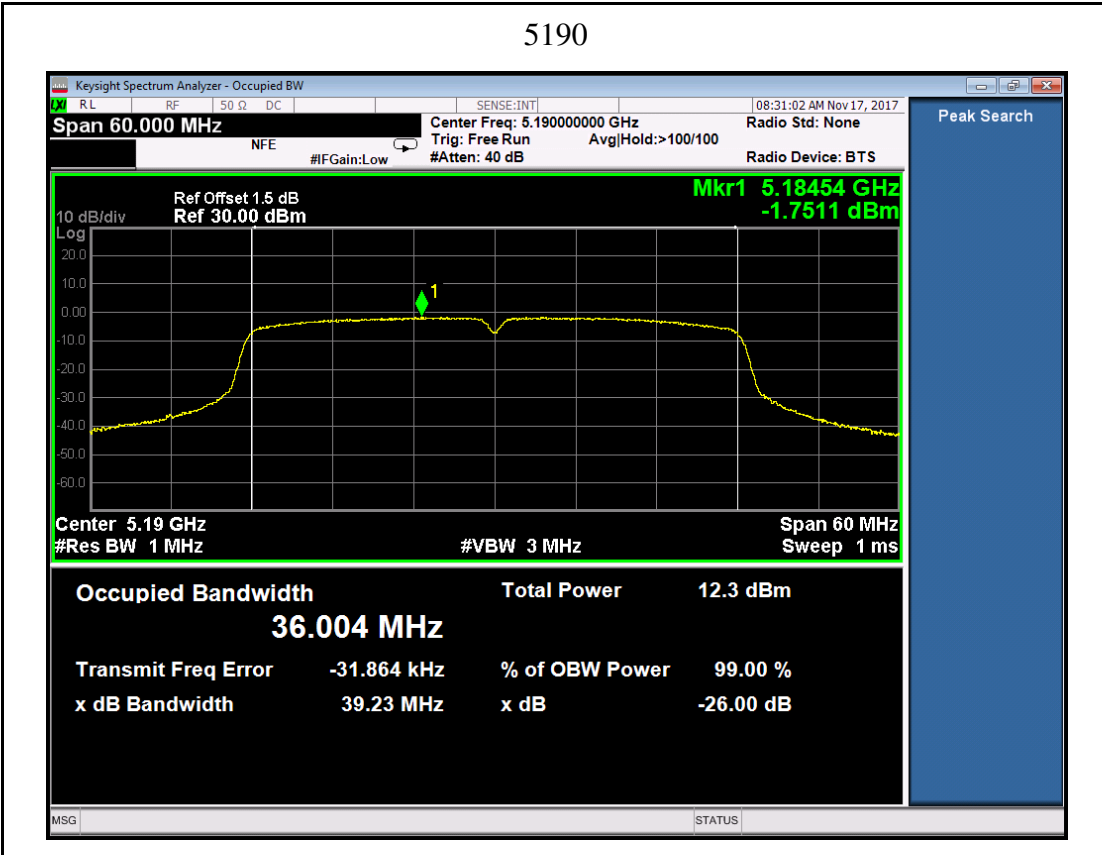


5825

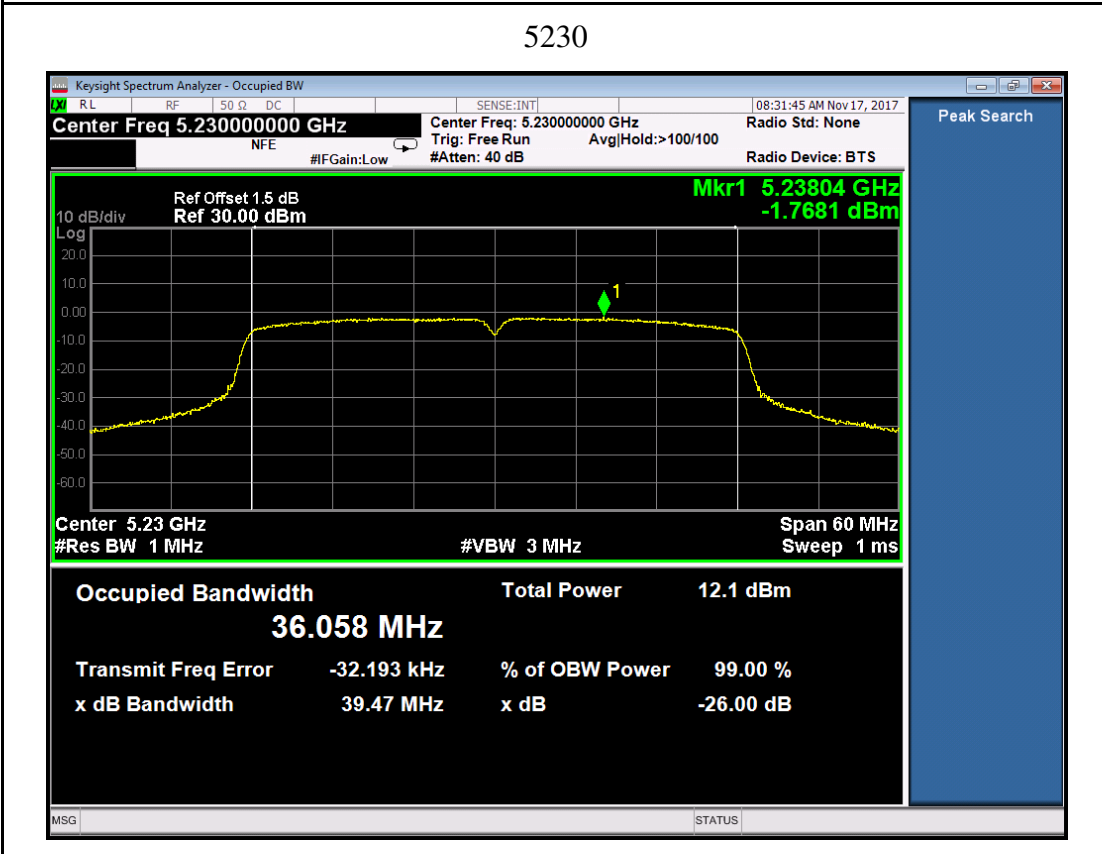


802.11n40

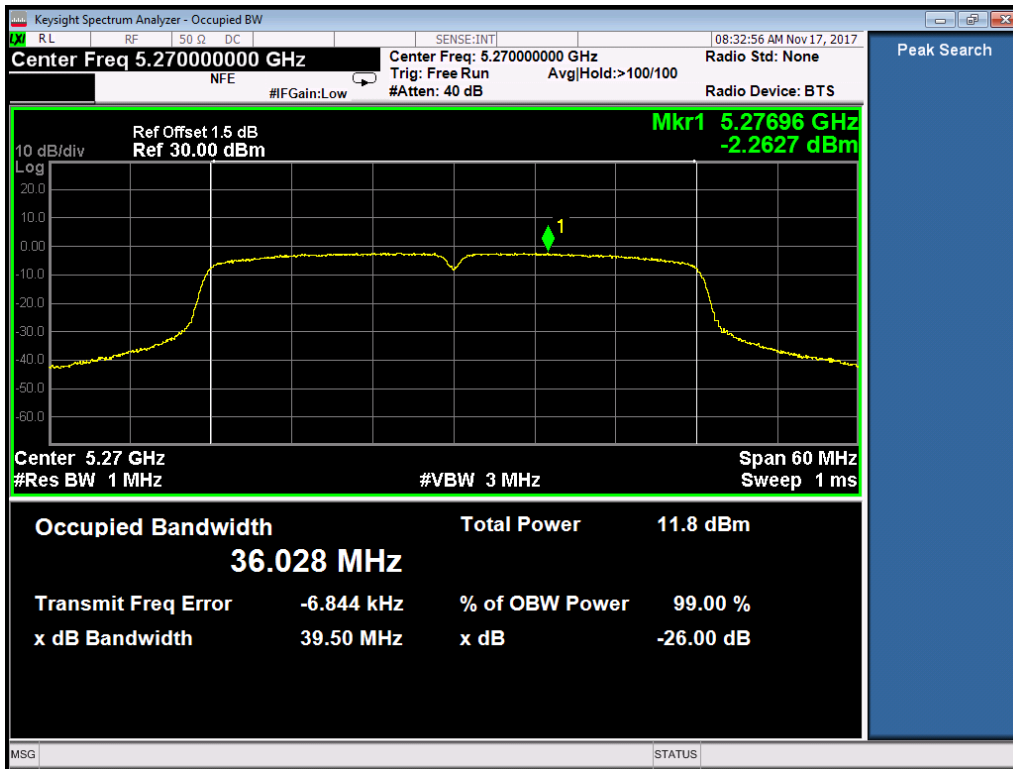
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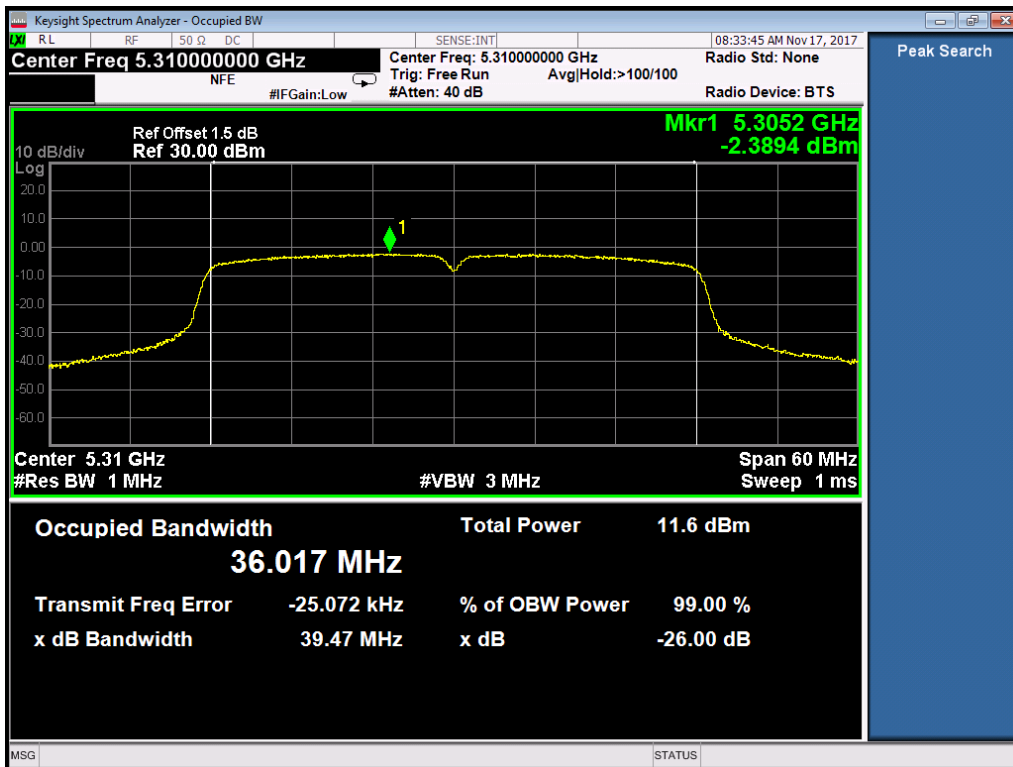
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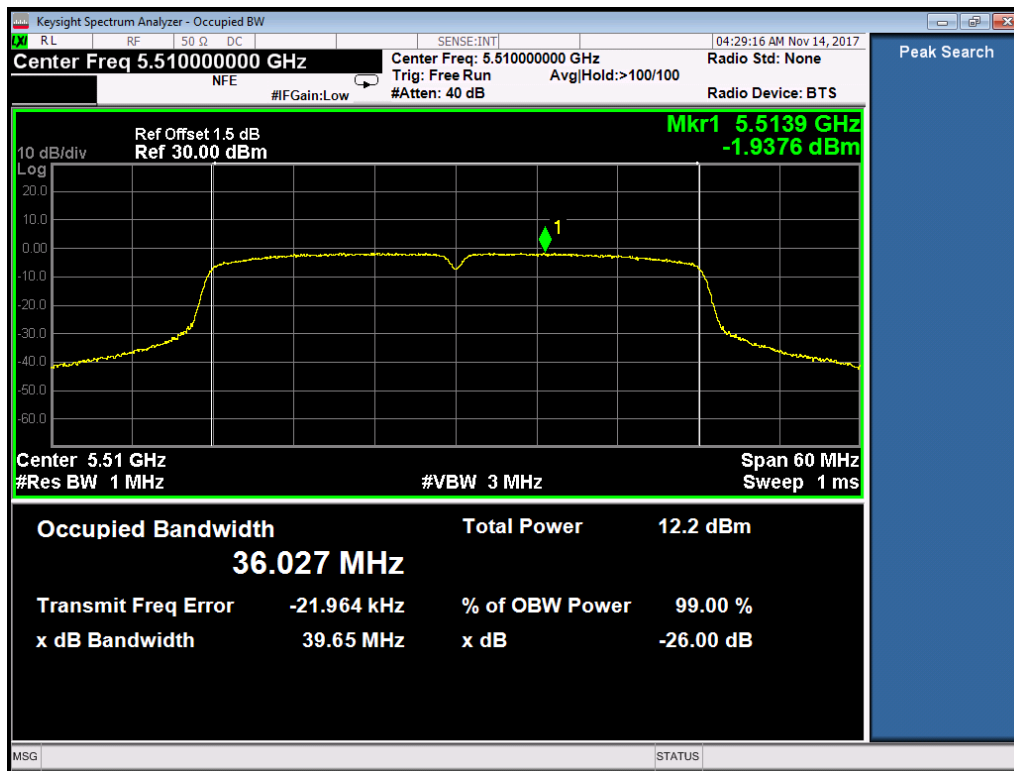


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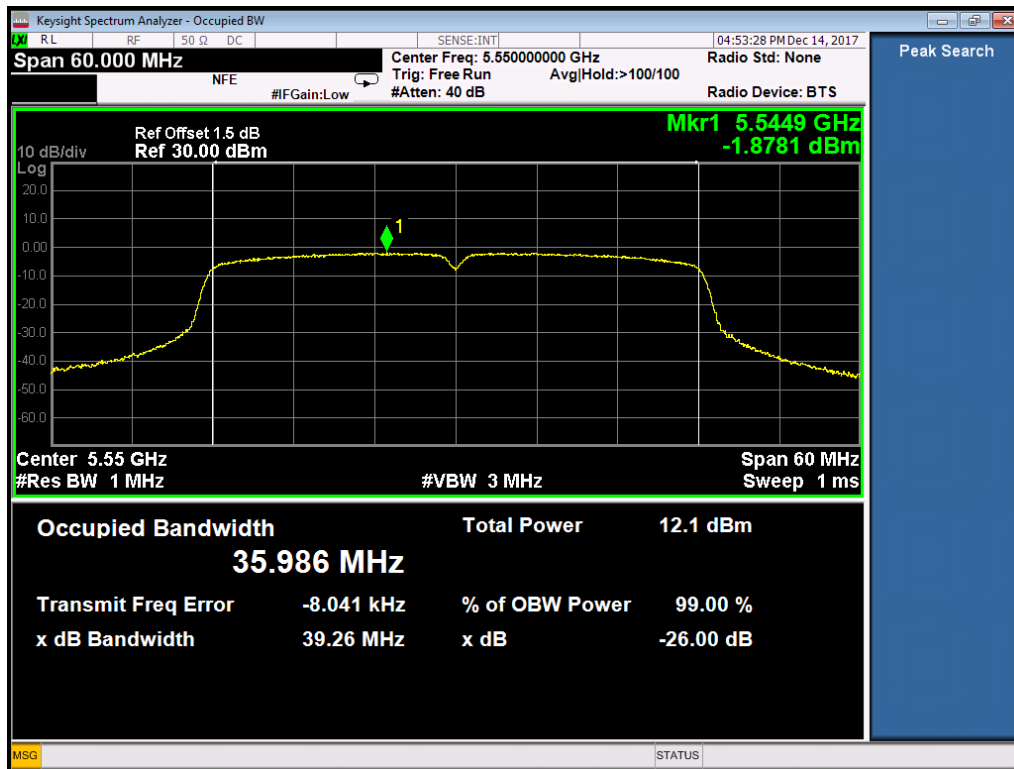




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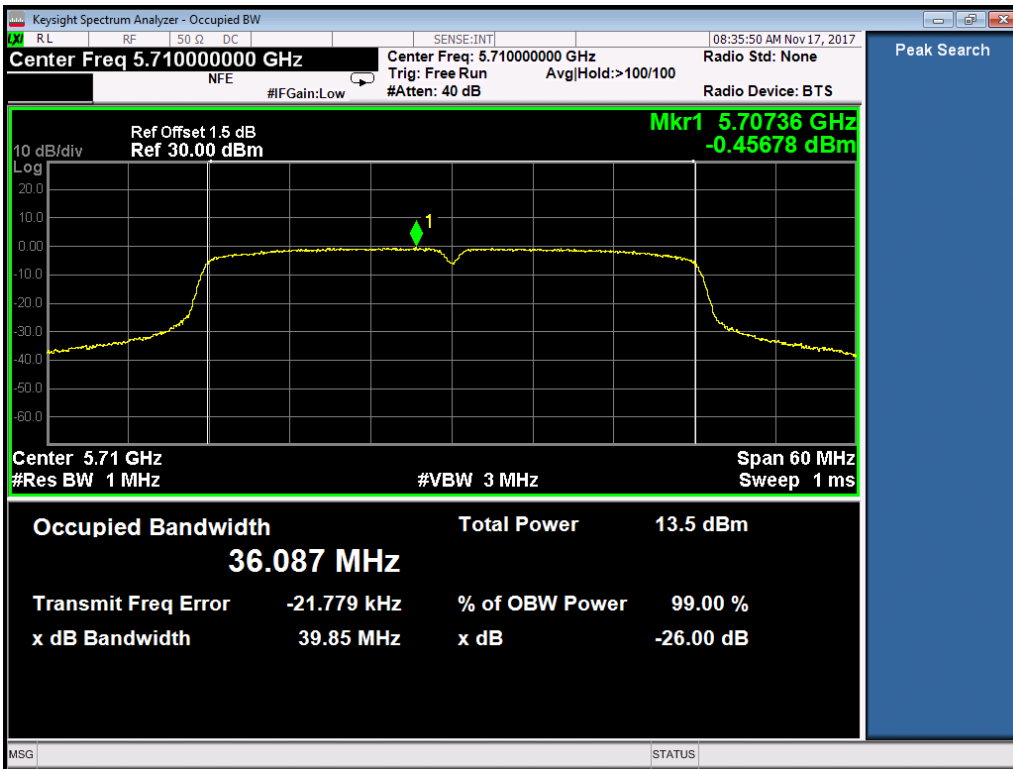
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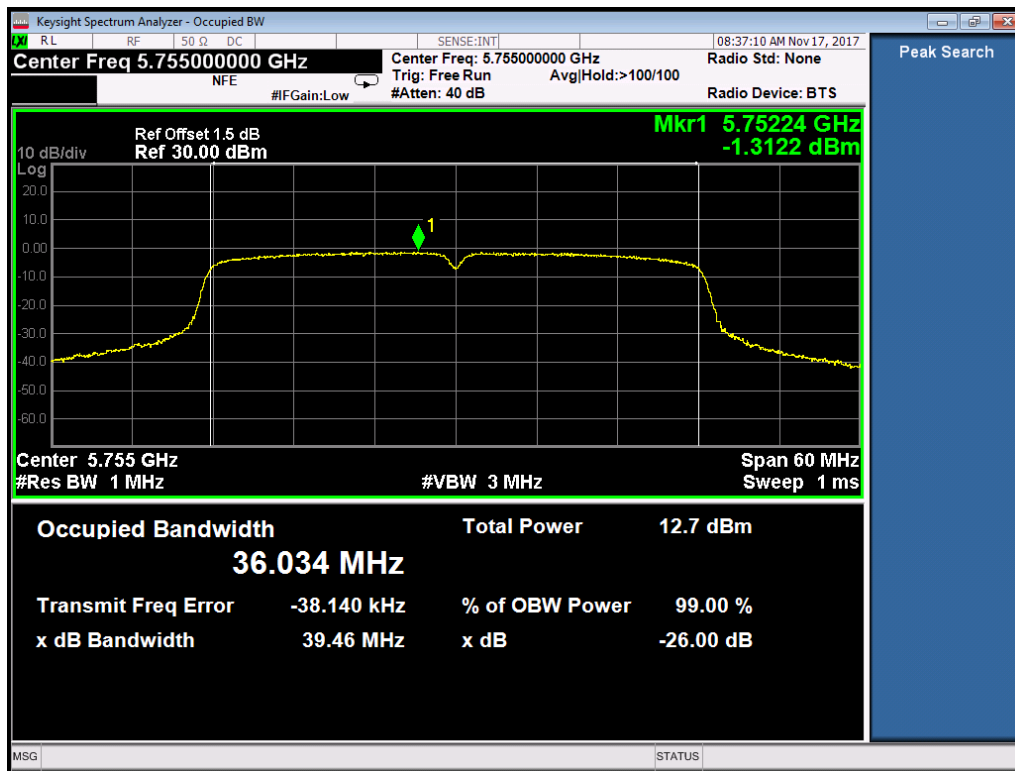
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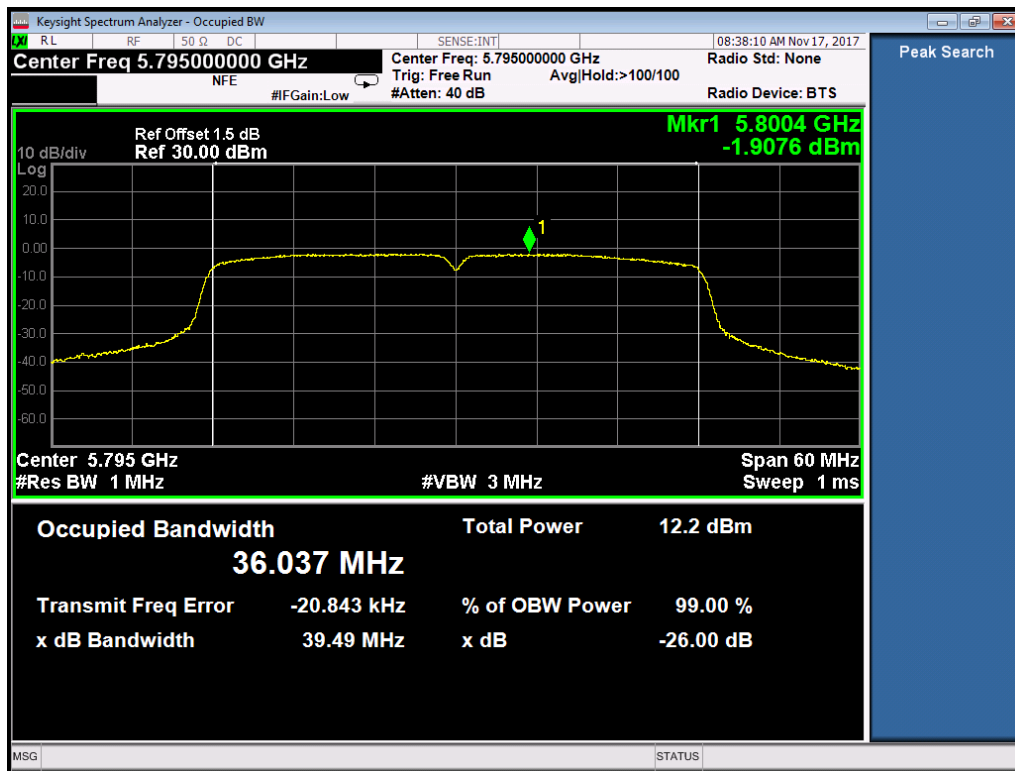
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5755

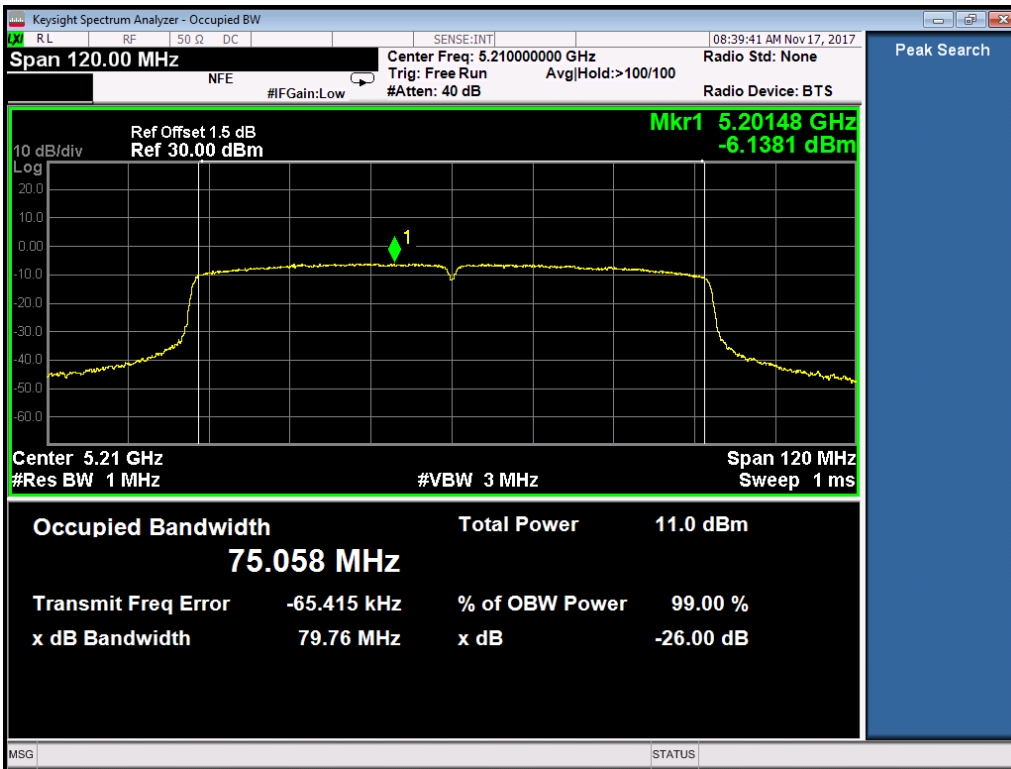


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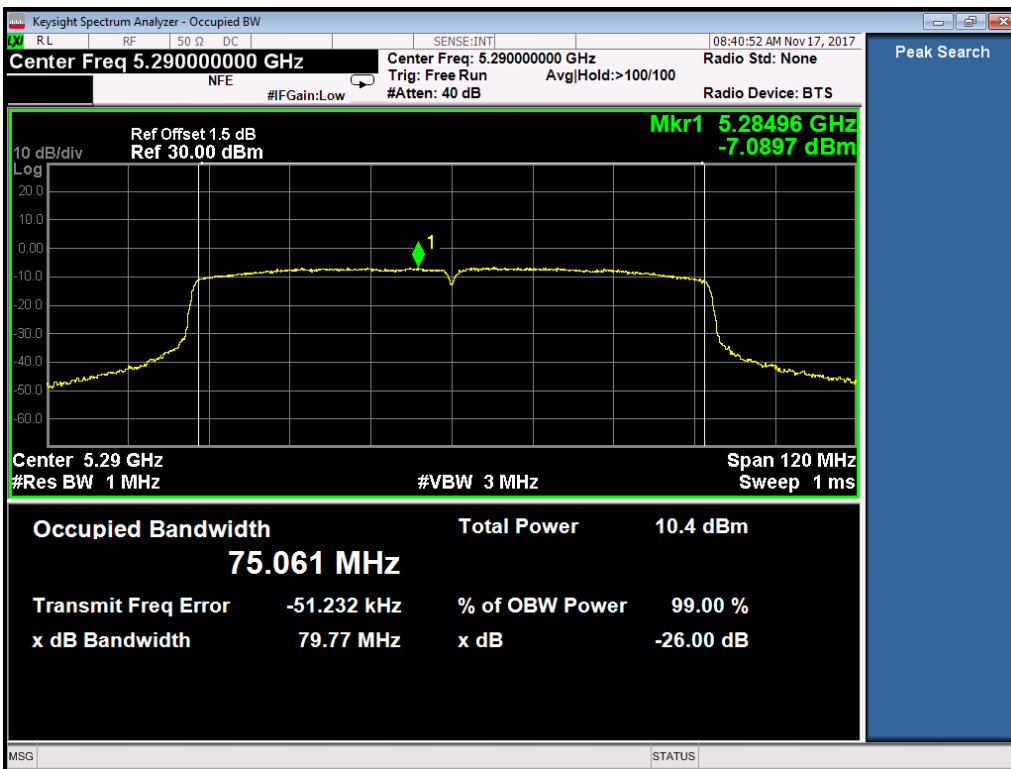


802.11ac80

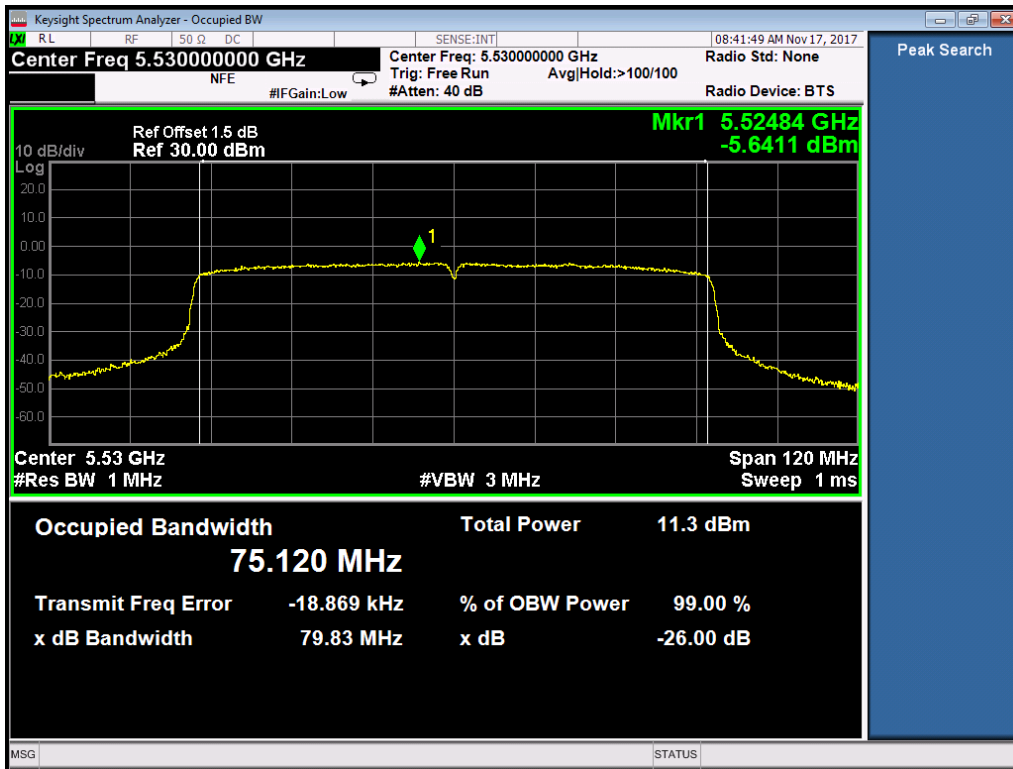
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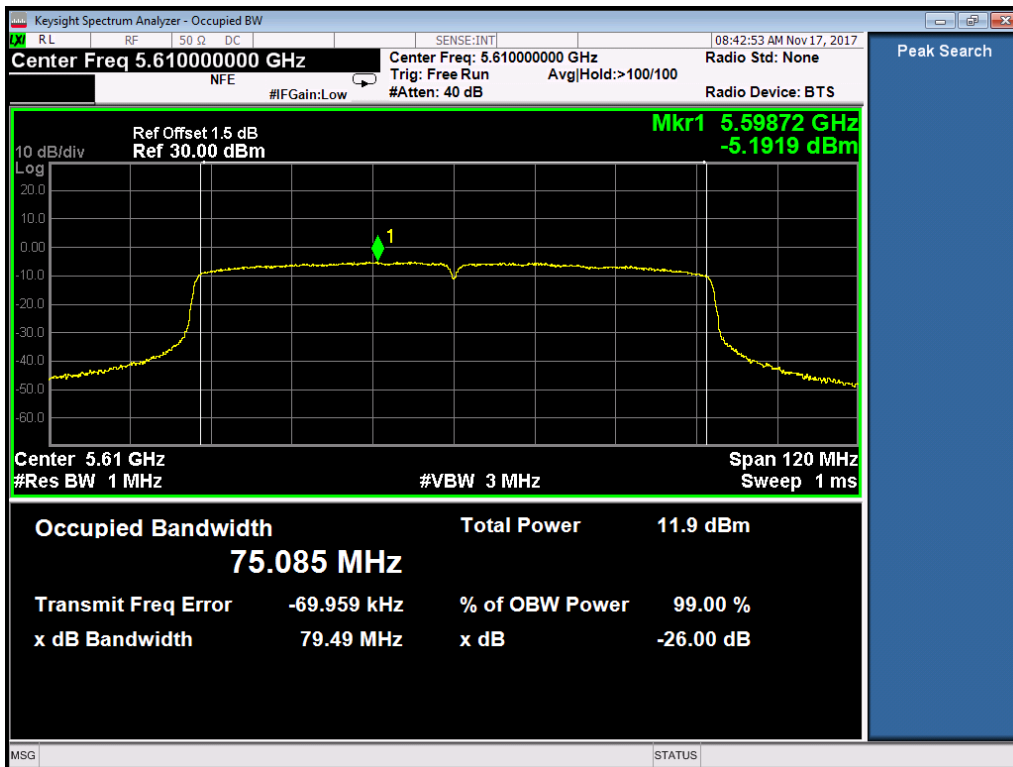
5290



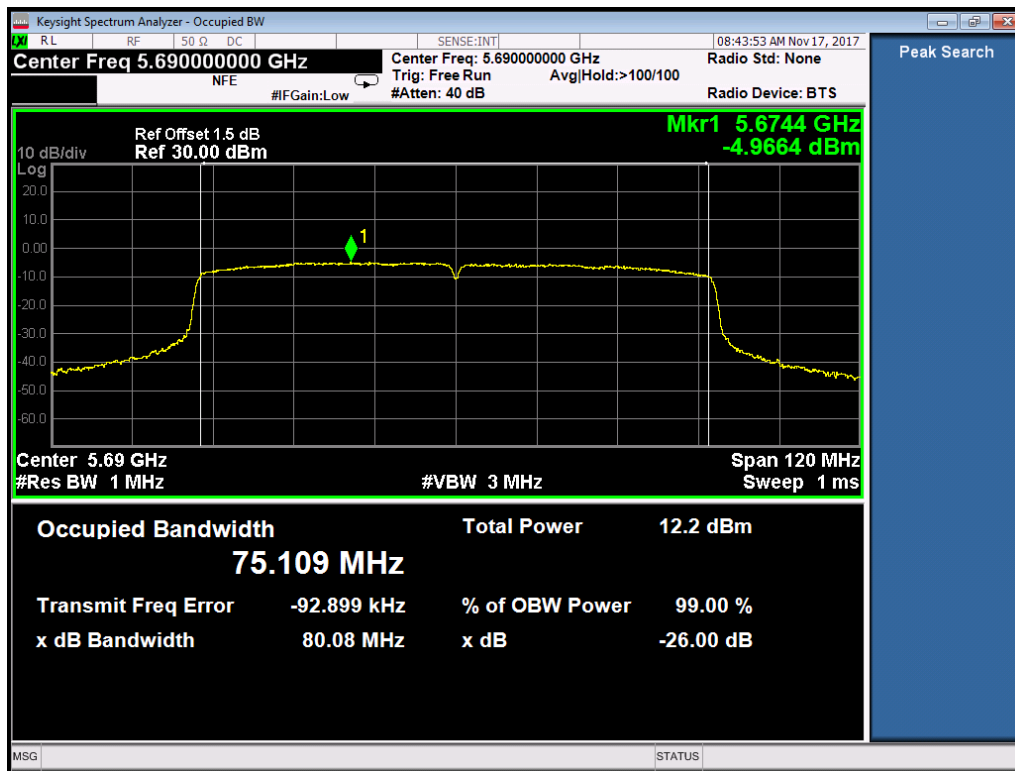
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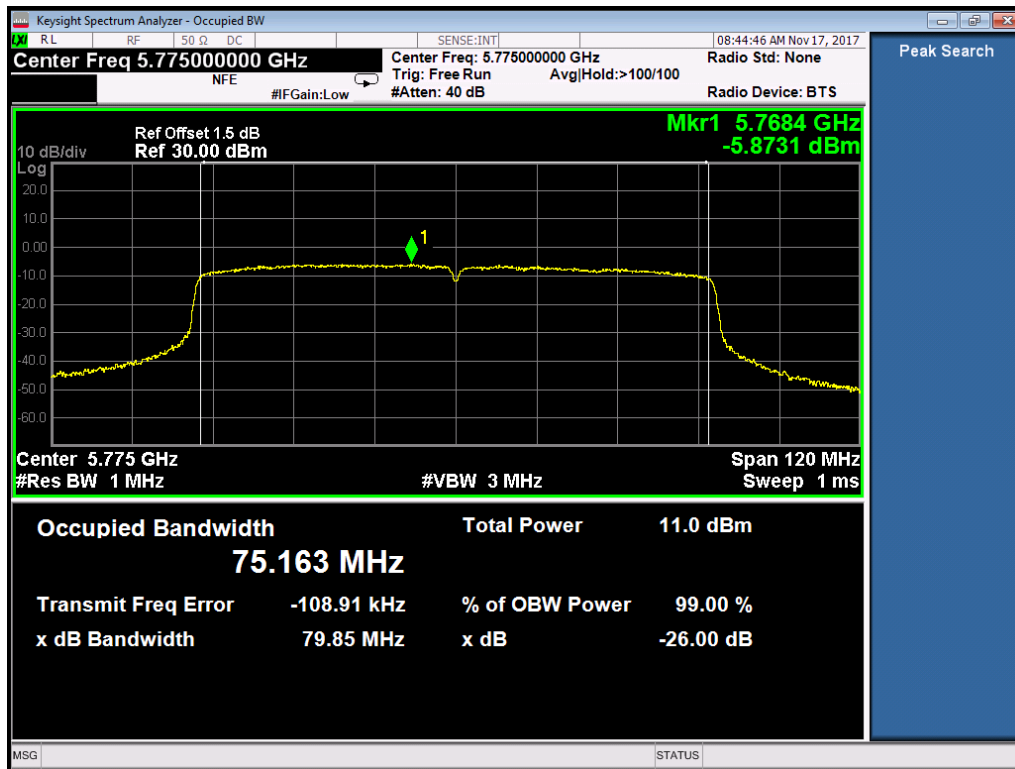
5610



5690



5775



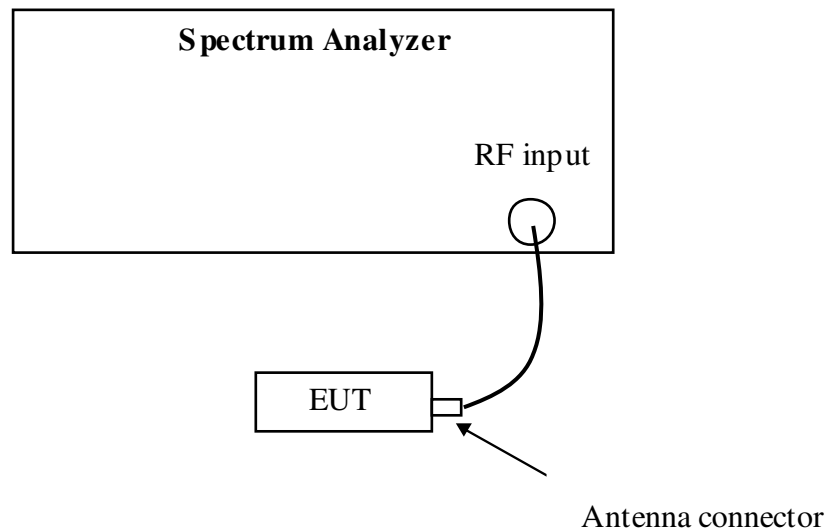
## 5. Minimum 6dB Bandwidth

**Test result: PASS**

### 5.1 Limit

For systems using digital modulation techniques that may operate in the 5725 - 5850 MHz band, the minimum 6 dB bandwidth shall be at least 500 kHz.

### 5.2 Test Configuration



### 5.3 Test Procedure and test setup

The power spectrum density per FCC §15.407(a)(6) was measured from the antenna port of the EUT. Using a 50ohm spectrum analyzer (measurement method refers to KDB 789033D02: Section C).

**5.4 Test Protocol**

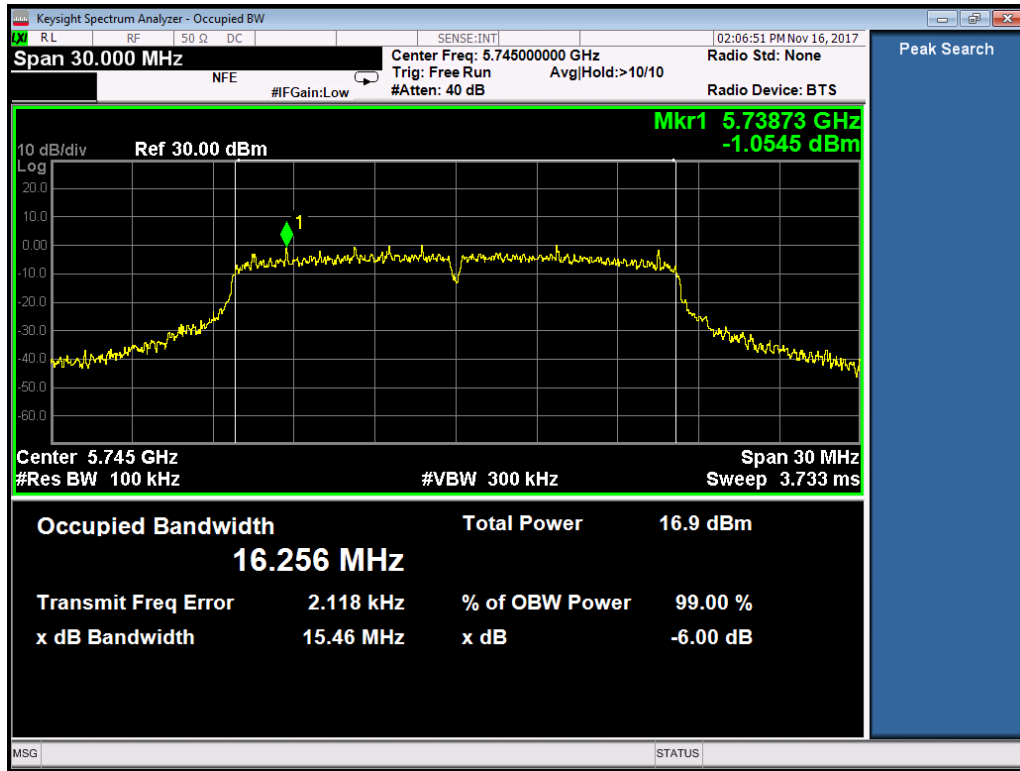
Temperature : 24°C  
Relative Humidity : 44 %

Modulation	Frequency (MHz)	Minimum 6dB Bandwidth (MHz)			Limits (MHz)
		Port0	Port 1	Port 2	
802.11a	5745	15.46	15.33	/	> 0.5
	5785	15.33	15.13	/	> 0.5
	5825	15.04	14.67	/	> 0.5
802.11n20	5745	15.05	15.09	/	> 0.5
	5785	13.85	15.06	/	> 0.5
	5825	14.40	15.41	/	> 0.5
802.11n40	5755	35.05	32.63	/	> 0.5
	5795	35.03	35.02	/	> 0.5
802.11ac80	5775	73.78	73.85	/	> 0.5

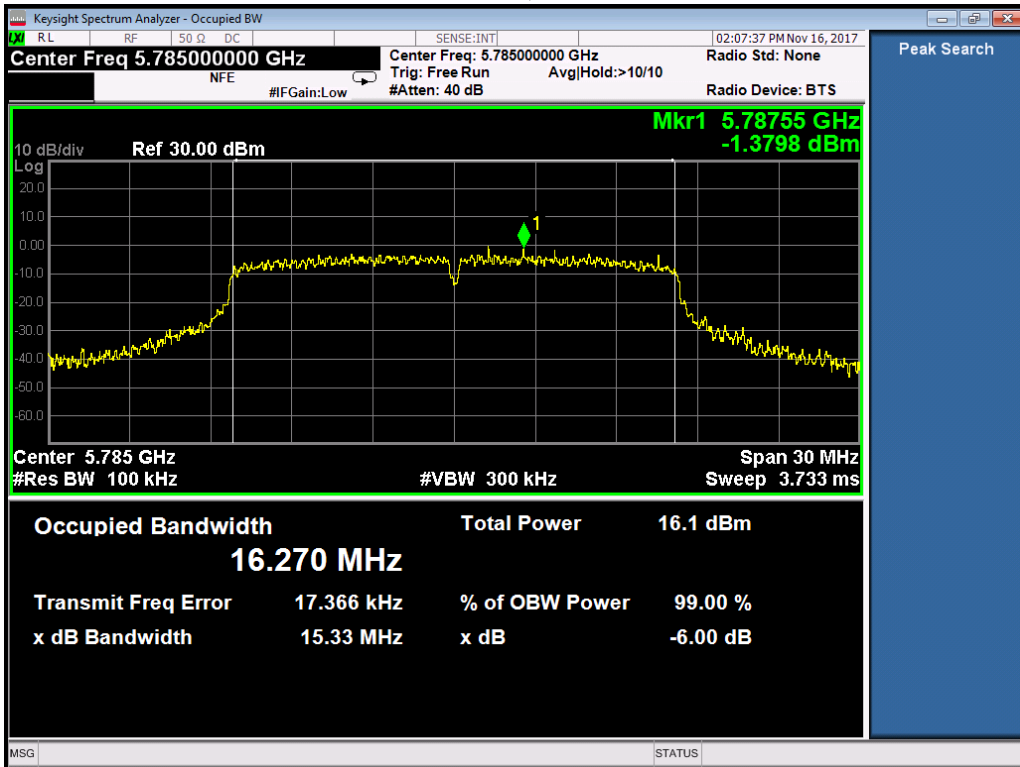


Port 0

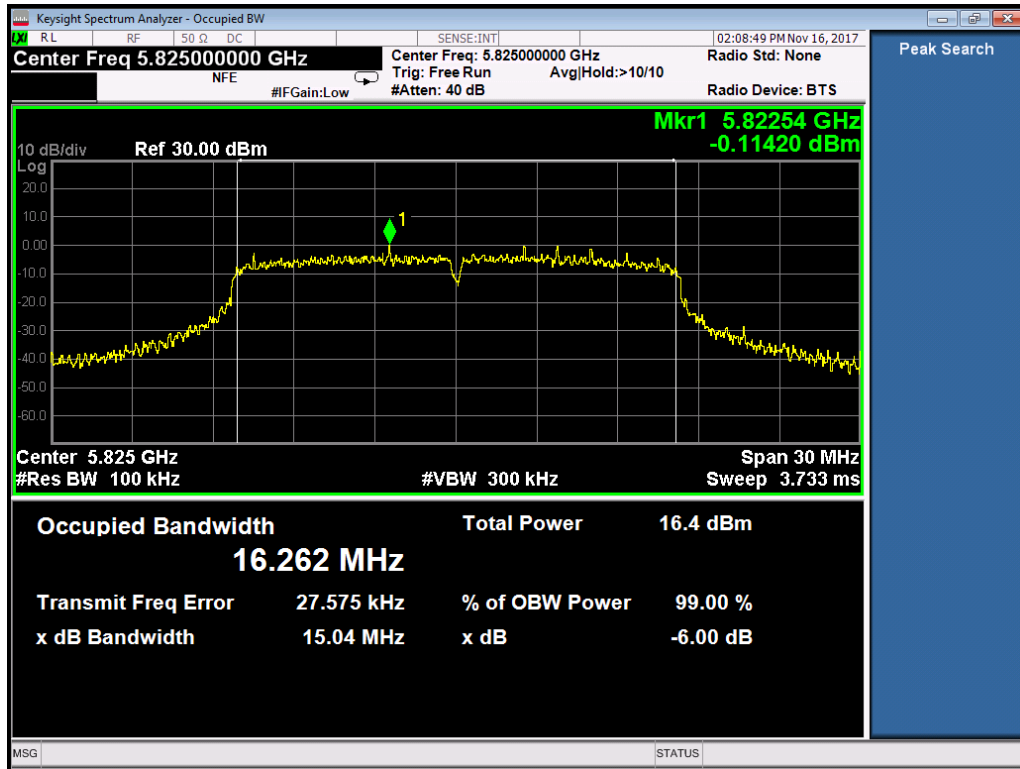
802.11a, 5745



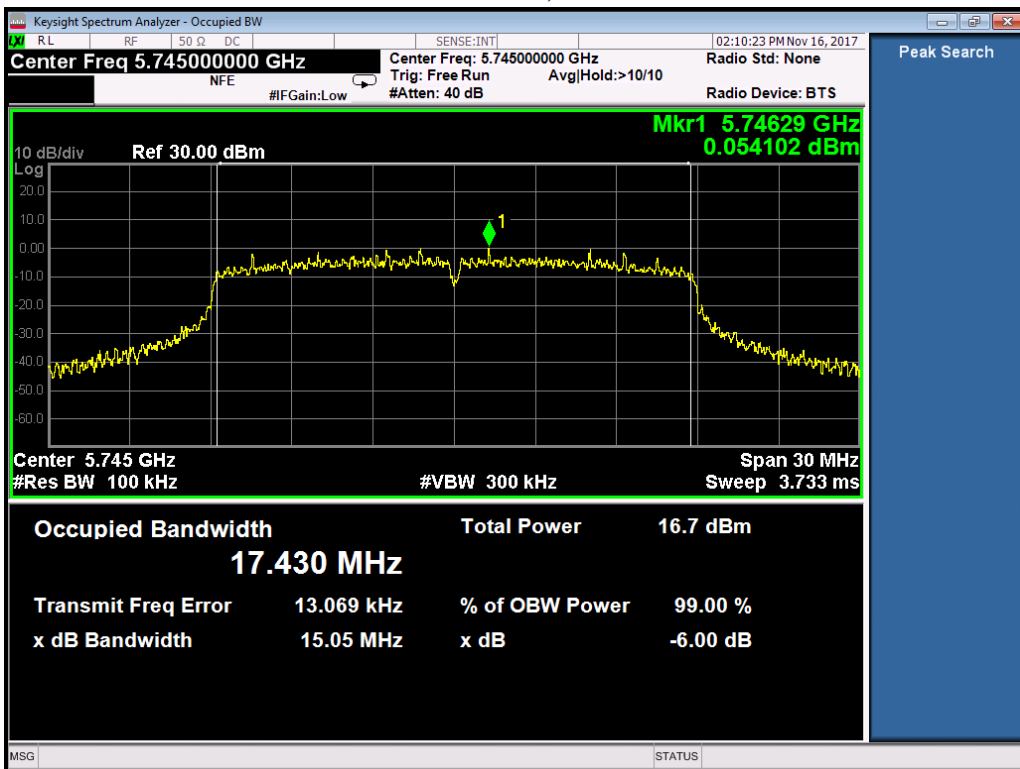
802.11a, 5785



802.11a, 5825



802.11n20, 5745



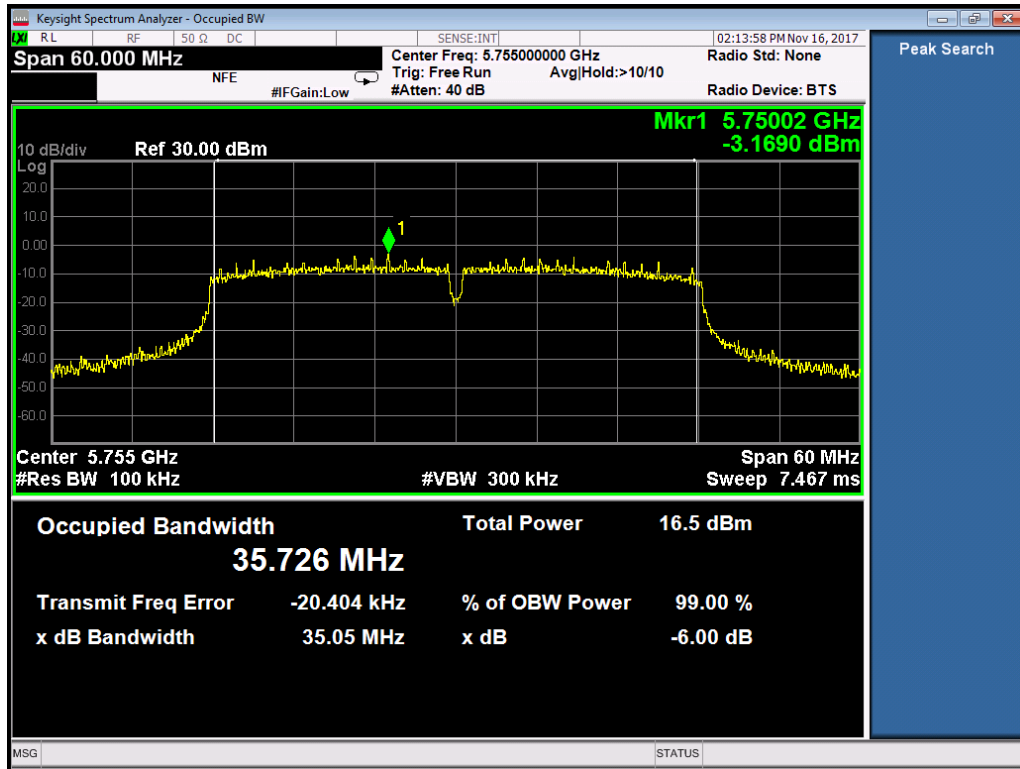
802.11n20, 5785



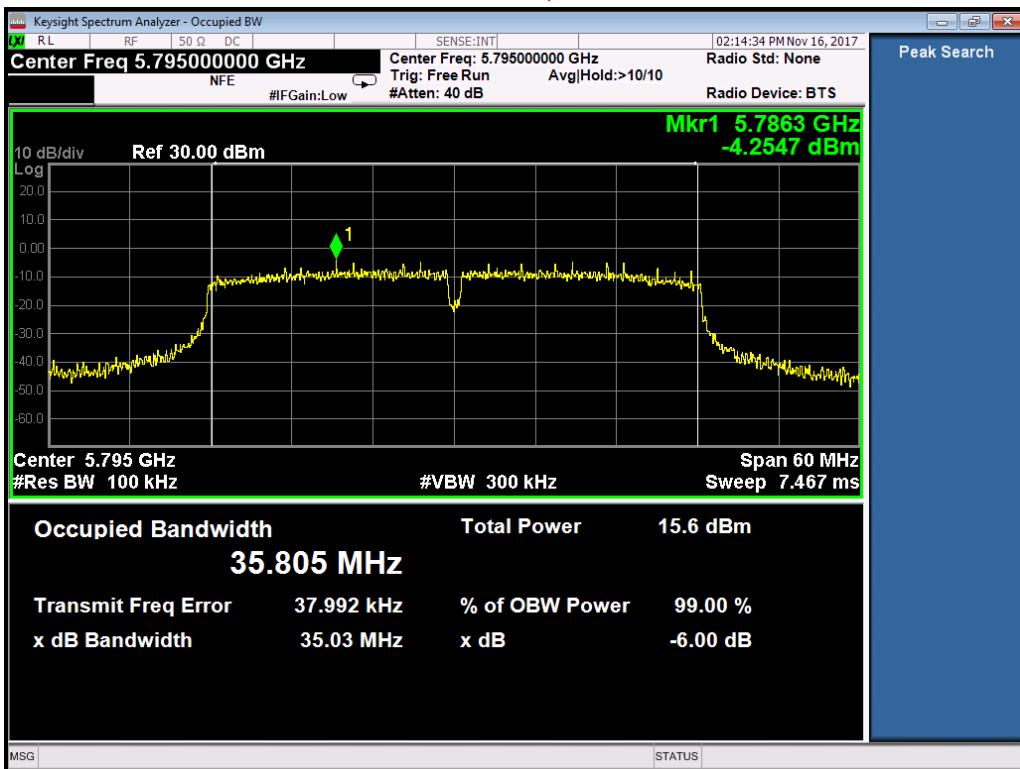
802.11n20, 5825



802.11n40, 5755



802.11n40, 5795

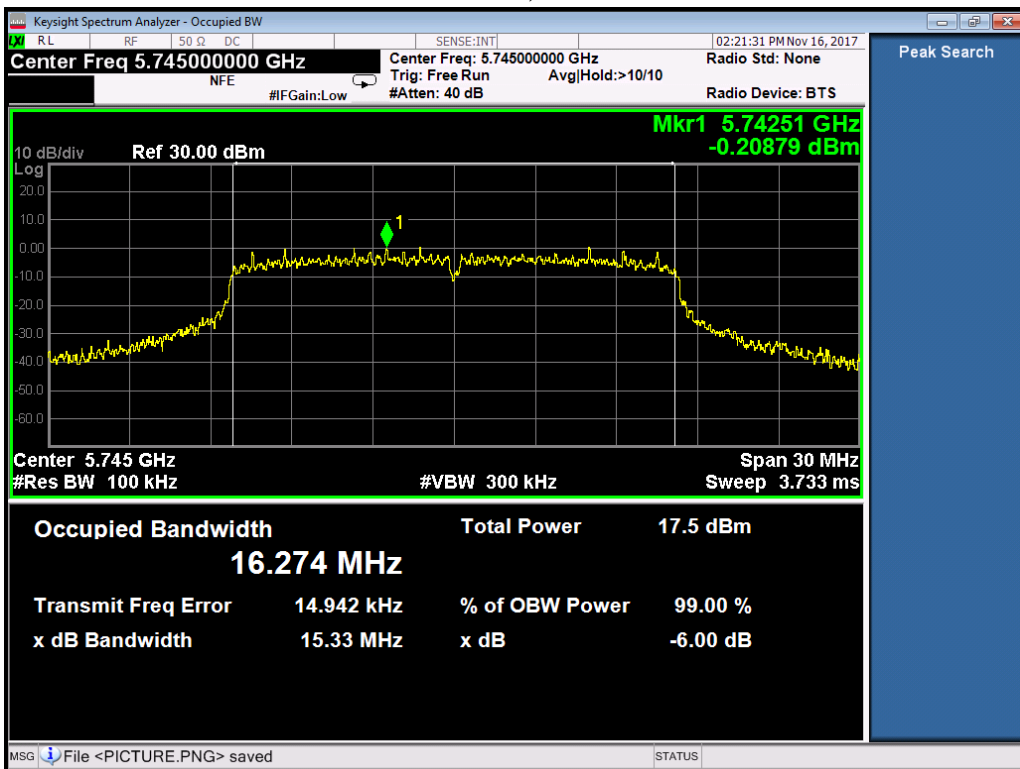


802.11ac80, 5775



Port 1

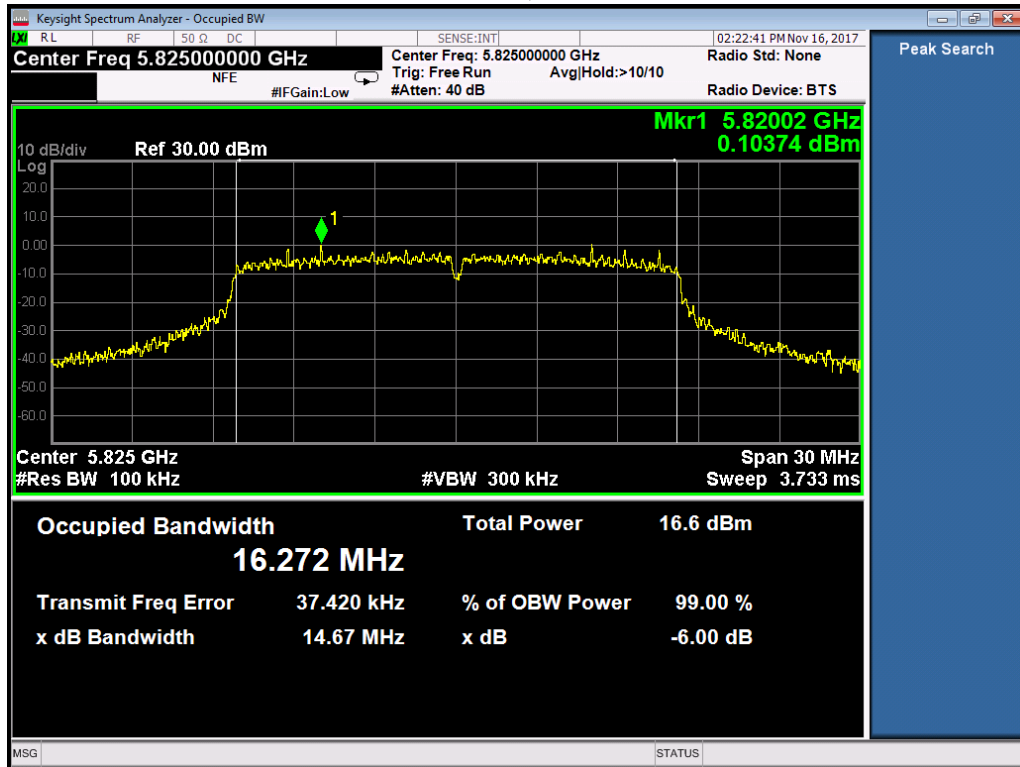
802.11a, 5745



802.11a, 5785



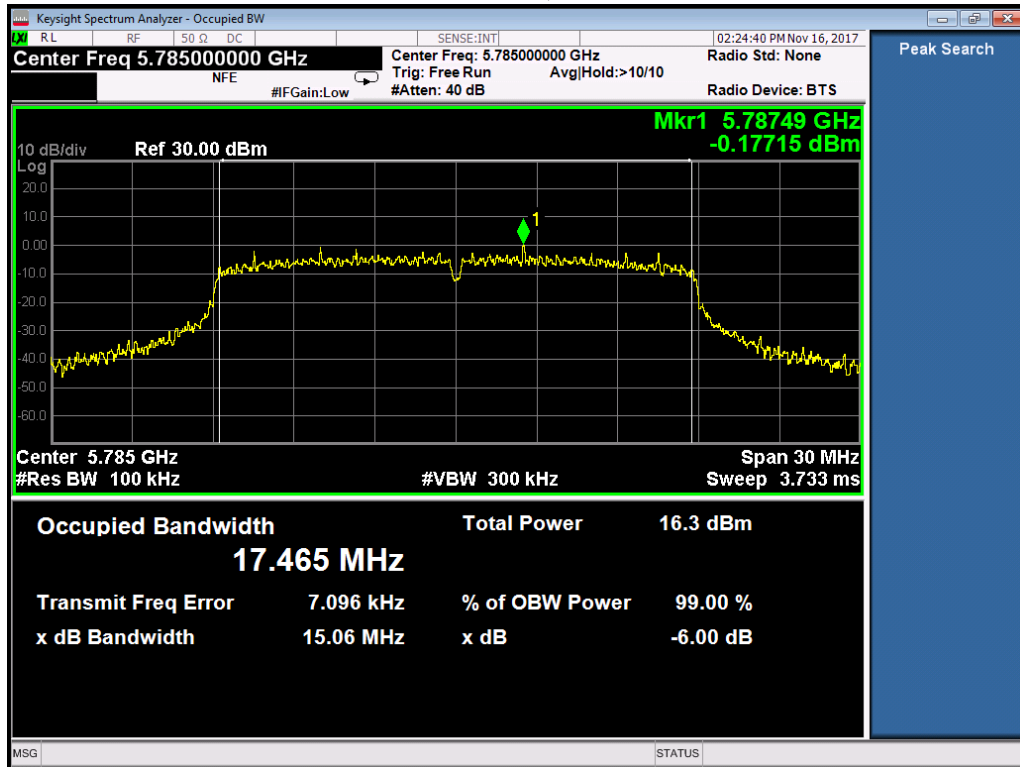
802.11a, 5825



802.11n20, 5745



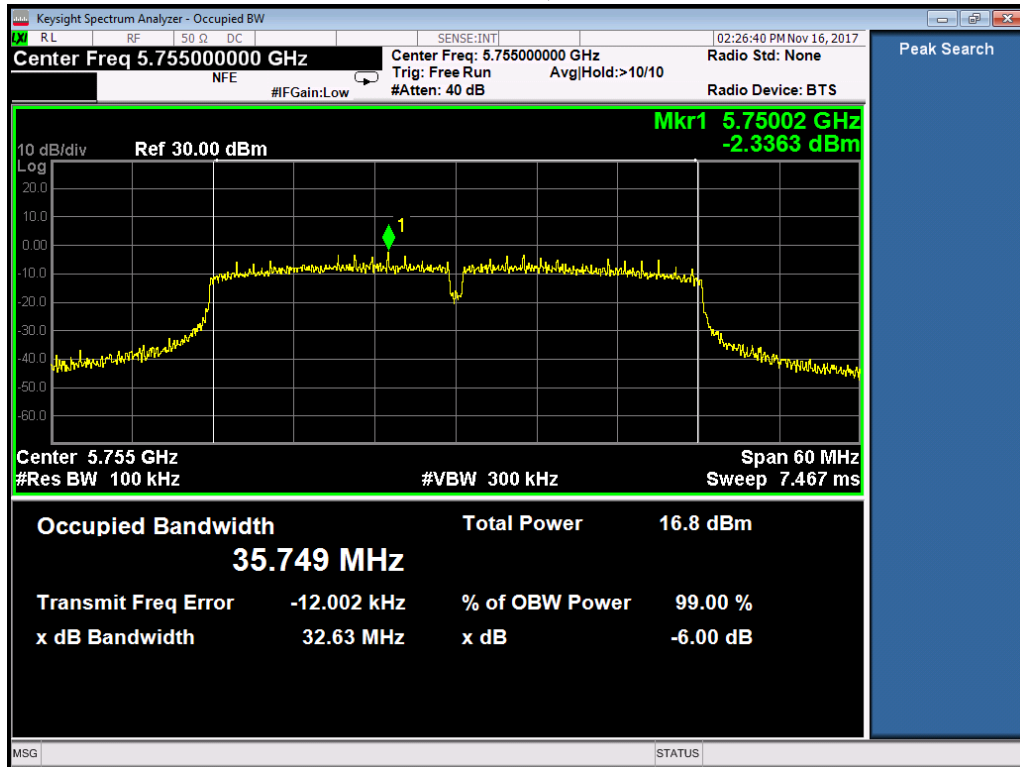
802.11n20, 5785



802.11n20, 5825

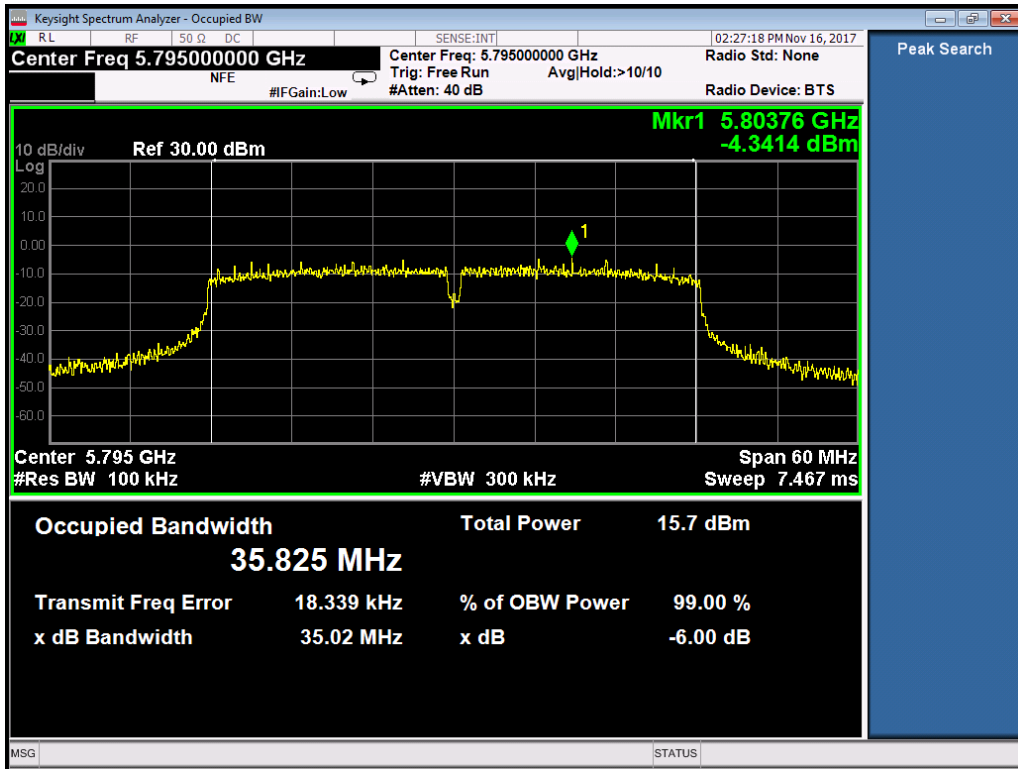


802.11n40, 5755

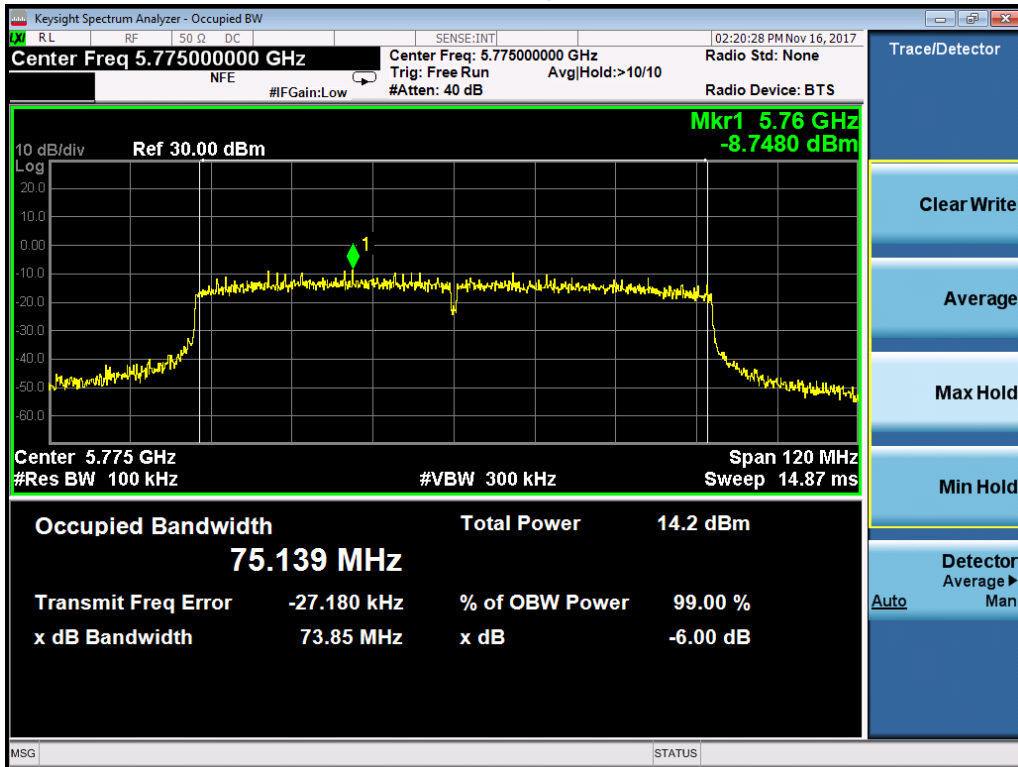




802.11n40, 5795



802.11ac80, 5775



## 6. Radiated emission

**Test result: PASS**

### 6.1 Test limit

6.1.1 The radiated emissions which are lower than 1GHz or fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

6.1.2 The emission which is outside the restrict bands, should comply with the EIRP limit as below:

For transmitters operating in the 5.15–5.25 / 5.25 – 5.35 / 5.47 – 5.725 GHz band: all emissions outside of the 5.15 – 5.35 / 5.47 – 5.725 GHz band shall not exceed an EIRP of -27dBm/MHz.

EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
-27	68.20

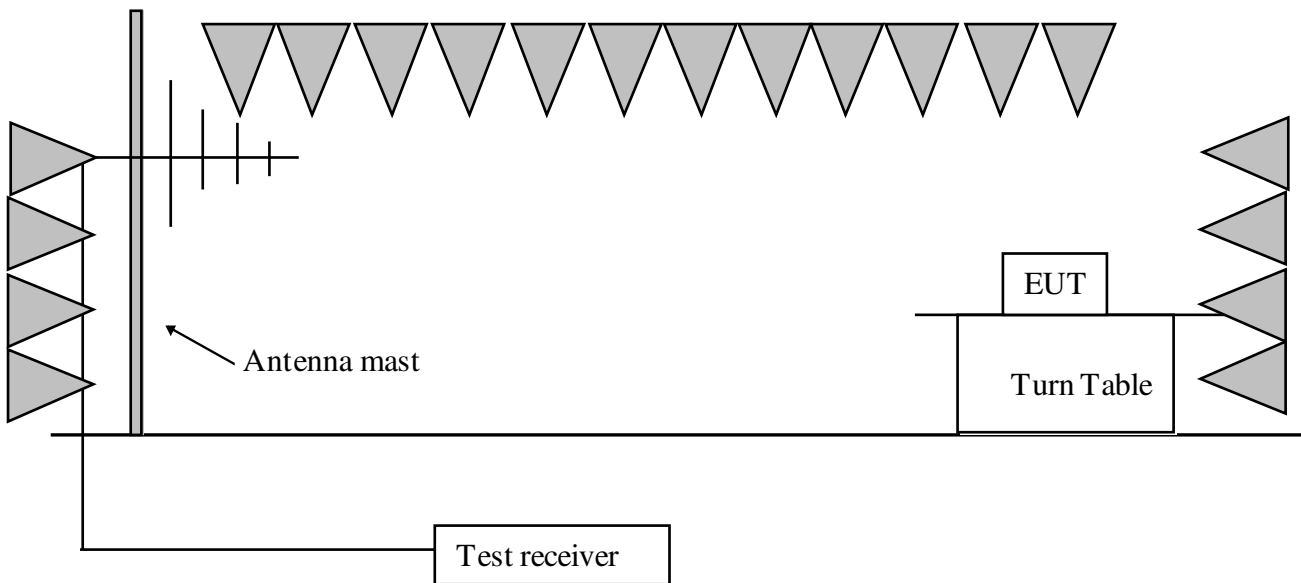
For transmitters operating in the 5.725 – 5.85GHz band:

- 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
  - 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
  - 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
  - 27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.
- (Here the restricted limit -27 dBm/MHz, namely 68.20 dBμV/m is applied for assessment.)

For transmitters operating in the 5.150 – 5.25GHz & 5470-5725MHz bands: Assessed with 15.209(a):

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

## 6.2 Test Configuration



## 6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to KDB 789033D02: Section G.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

- RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);
- RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);
- RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)
- RBW = 1MHz, VBW = 3MHz (>1GHz for PK);
- RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

Remark:

1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Measured level= Original Receiver Reading + Factor
3. Margin = Limit – Measured level
4. If the PK measured level is lower than AV limit, the AV test can be elided.

Example:

FCC ID: 2AOJ9-7357622

Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,  
Gain of Pre-amplifier = 32.00dB, Original Receiver Reading = 10dBuV.  
Then Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;  
Measured level = 10dBuV + 0.20dB/m = 10.20dBuV/m  
Assuming limit = 54dBuV/m,  
Measured level = 10.20dBuV/m, then Margin = 54 - 10.20 = 43.80dBuV/m.

**6.4 Test protocol**

Temperature: 25 °C  
Relative Humidity: 55 %

Emission lower than 1GHz

Frequency (MHz)	Measured level (dBμV/m)	Factor (dB)	Limits (dBμV/m)	Margin (dB)	Detector	Polarization
344.90	41.80	15.90	46.00	4.20	PK	H
502.36	40.40	19.30	46.00	5.60	PK	H
698.69	41.10	20.90	46.00	4.90	PK	V

Emission higher than 1GHz

802.11a

Channel	Frequency (MHz)	Measured level (dBμV/m)	Factor (dB)	Limits (dBμV/m)	Margin (dB)	Detector	Polarization
5180	5150.00	65.40	-1.30	74.00	8.60	PK	V
	5150.00	51.20	-1.30	54.00	2.80	AV	V
	10360.00	58.60	12.50	74.00	15.40	PK	V
	10360.00	44.80	12.50	54.00	9.20	AV	V
	15540.00	62.10	15.80	74.00	11.90	PK	H
	15540.00	47.30	15.80	54.00	6.70	AV	H
5200	10400.00	59.40	12.50	74.00	14.60	PK	V
	10400.00	45.00	12.50	54.00	9.00	AV	V
	15600.00	62.30	15.80	74.00	11.70	PK	V
	15600.00	49.10	15.80	54.00	4.90	AV	V

5240	10480.00	58.40	12.50	74.00	15.60	PK	V
	10480.00	44.60	12.50	54.00	9.40	AV	V
	15720.00	62.70	15.80	74.00	11.30	PK	H
	15720.00	49.80	15.80	54.00	4.20	AV	H
5260	10520.00	58.00	12.50	74.00	16.00	PK	V
	10520.00	44.10	12.50	54.00	9.90	AV	V
	15780.00	62.30	15.80	74.00	11.70	PK	H
	15780.00	49.40	15.80	54.00	4.60	AV	H
5300	10600.00	58.30	12.50	74.00	15.70	PK	V
	10600.00	44.30	12.50	54.00	9.70	AV	V
	15900.00	63.20	15.90	74.00	10.80	PK	H
	15900.00	50.40	15.90	54.00	3.60	AV	H
5320	5350.00	63.20	-1.10	74.00	10.80	PK	V
	5350.00	52.30	-1.10	54.00	1.70	AV	V
	10640.00	58.90	12.50	74.00	15.10	PK	V
	10640.00	44.20	12.50	54.00	9.80	AV	V
	15960.00	62.50	15.90	74.00	11.50	PK	H
	15960.00	49.90	15.90	54.00	4.10	AV	H
5500	5470.00	64.10	-1.10	74.00	9.90	PK	V
	5470.00	51.70	-1.10	54.00	2.30	AV	V
	11000.00	58.00	12.50	74.00	16.00	PK	V
	11000.00	44.30	12.50	54.00	9.70	AV	V
	16500.00	62.20	15.90	74.00	11.80	PK	H
	16500.00	49.70	15.90	54.00	4.30	AV	H
5580	11160.00	59.20	12.50	74.00	14.80	PK	V
	11160.00	44.40	12.50	54.00	9.60	AV	V
	16740.00	63.20	15.90	74.00	10.80	PK	H
	16740.00	50.30	15.90	54.00	3.70	AV	H
5600	11200.00	59.40	12.50	74.00	14.60	PK	V
	11200.00	44.80	12.50	54.00	9.20	AV	V

	16800.00	62.90	15.90	74.00	11.10	PK	H
	16800.00	50.20	15.90	54.00	3.80	AV	H
5720	11400.00	58.80	12.50	74.00	15.20	PK	V
	11400.00	44.80	12.50	54.00	9.20	AV	V
	17100.00	56.80	15.90	74.00	17.20	PK	H
	17100.00	42.00	15.90	54.00	12.00	AV	H
5745	5725.00	65.20	-0.80	68.00	2.80	PK	V
	11490.00	56.50	12.50	74.00	17.50	PK	V
	11490.00	45.40	12.50	54.00	8.60	AV	V
5785	11570.00	56.40	12.50	74.00	17.60	PK	V
	11570.00	45.10	12.50	54.00	8.90	AV	V
5825	5850.00	67.20	-0.70	68.00	0.80	PK	V
	11650.00	56.60	12.50	74.00	17.40	PK	V
	11650.00	45.70	12.50	54.00	8.30	AV	V

Note: the band edge of 5725-5850MHz is assessed with limit of -27dBm.

Mode 802.11n20

Channel	Frequency (MHz)	Measured level (dB $\mu$ V/m)	Factor (dB)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
5180	5150.00	64.10	-1.30	74.00	9.90	PK	V
	5150.00	50.30	-1.30	54.00	3.70	AV	V
	10360.00	56.20	12.50	74.00	17.80	PK	V
	10360.00	43.30	12.50	54.00	10.70	AV	V
	15540.00	60.30	15.80	74.00	13.70	PK	H
	15540.00	45.50	15.80	54.00	8.50	AV	H
5200	10400.00	58.10	12.50	74.00	15.90	PK	V
	10400.00	44.20	12.50	54.00	9.80	AV	V
	15600.00	60.00	15.80	74.00	14.00	PK	V
	15600.00	47.40	15.80	54.00	6.60	AV	V
5240	10480.00	56.50	12.50	74.00	17.50	PK	V

	10480.00	42.90	12.50	54.00	11.10	AV	V
	15720.00	60.30	15.80	74.00	13.70	PK	H
	15720.00	47.60	15.80	54.00	6.40	AV	H
5260	10520.00	57.10	12.50	74.00	16.90	PK	V
	10520.00	43.70	12.50	54.00	10.30	AV	V
	15780.00	60.40	15.80	74.00	13.60	PK	H
	15780.00	47.70	15.80	54.00	6.30	AV	H
5300	10600.00	56.70	12.50	74.00	17.30	PK	V
	10600.00	42.60	12.50	54.00	11.40	AV	V
	15900.00	60.10	15.90	74.00	13.90	PK	H
	15900.00	47.10	15.90	54.00	6.90	AV	H
5320	5350.00	62.10	-1.10	74.00	11.90	PK	V
	5350.00	51.50	-1.10	54.00	2.50	AV	V
	10640.00	56.10	12.50	74.00	17.90	PK	V
	10640.00	42.80	12.50	54.00	11.20	AV	V
	15960.00	59.10	15.90	74.00	14.90	PK	H
	15960.00	47.20	15.90	54.00	6.80	AV	H
5500	5470.00	62.70	-1.10	74.00	11.30	PK	V
	5470.00	49.20	-1.10	54.00	4.80	AV	V
	11000.00	57.60	12.50	74.00	16.40	PK	V
	11000.00	43.40	12.50	54.00	10.60	AV	V
	16500.00	59.50	15.90	74.00	14.50	PK	H
	16500.00	47.20	15.90	54.00	6.80	AV	H
5580	11160.00	59.10	12.50	74.00	14.90	PK	V
	11160.00	44.20	12.50	54.00	9.80	AV	V
	16740.00	63.00	15.90	74.00	11.00	PK	H
	16740.00	50.20	15.90	54.00	3.60	AV	H
5600	11200.00	57.10	12.50	74.00	16.90	PK	V
	11200.00	42.40	12.50	54.00	11.60	AV	V
	16800.00	60.10	15.90	74.00	13.90	PK	H

	16800.00	48.50	15.90	54.00	5.50	AV	H
5720	11400.00	55.60	12.50	74.00	18.40	PK	V
	11400.00	42.90	12.50	54.00	11.10	AV	V
	17100.00	53.70	15.90	74.00	20.30	PK	H
	17100.00	40.10	15.90	54.00	13.90	AV	H
5745	5725.00	64.60	-0.80	68.00	3.40	PK	V
	11490.00	54.80	12.50	74.00	19.20	PK	V
	11490.00	44.00	12.50	54.00	10.00	AV	V
5785	11570.00	54.20	12.50	74.00	19.80	PK	V
	11570.00	43.70	12.50	54.00	10.30	AV	V
5825	5850.00	66.10	-0.70	68.00	1.90	PK	V
	11650.00	54.20	12.50	74.00	19.80	PK	V
	11650.00	43.50	12.50	54.00	10.50	AV	V

Note: the band edge of 5725-5850MHz is assessed with limit of -27dBm.

Mode 802.11n40

Channel	Frequency (MHz)	Measured level (dBμV/m)	Factor (dB)	Limits (dBμV/m)	Margin (dB)	Detector	Polarization
5190	5150.00	63.90	-1.30	74.00	10.10	PK	V
	5150.00	50.10	-1.30	54.00	3.90	AV	V
	10380.00	56.10	12.50	74.00	17.90	PK	V
	10380.00	43.00	12.50	54.00	11.00	AV	V
	15570.00	60.20	15.80	74.00	13.80	PK	H
	15570.00	45.70	15.80	54.00	8.30	AV	H
5230	10460.00	56.40	12.50	74.00	17.60	PK	V
	10460.00	42.70	12.50	54.00	11.30	AV	V
	15690.00	60.20	15.80	74.00	13.80	PK	H
	15690.00	47.30	15.80	54.00	6.70	AV	H
5270	10540.00	57.30	12.50	74.00	16.70	PK	V
	10540.00	43.80	12.50	54.00	10.20	AV	V



	15810.00	60.20	15.80	74.00	13.80	PK	H
	15810.00	47.50	15.80	54.00	6.50	AV	H
5310	5350.00	61.90	-1.10	74.00	12.10	PK	V
	5350.00	51.30	-1.10	54.00	2.70	AV	V
	10620.00	56.00	12.50	74.00	18.00	PK	V
	10620.00	42.40	12.50	54.00	11.60	AV	V
	15930.00	59.30	15.90	74.00	14.70	PK	H
	15930.00	47.40	15.90	54.00	6.60	AV	H
5510	5470.00	62.20	-1.10	74.00	11.80	PK	V
	5470.00	49.00	-1.10	54.00	5.00	AV	V
	11020.00	57.30	12.50	74.00	16.70	PK	V
	11020.00	43.10	12.50	54.00	10.90	AV	V
	16530.00	59.20	15.90	74.00	14.80	PK	H
	16530.00	47.10	15.90	54.00	6.90	AV	H
5550	11000.00	56.50	12.50	74.00	17.50	PK	V
	11000.00	42.30	12.50	54.00	11.70	AV	V
	16650.00	59.50	15.90	74.00	14.50	PK	H
	16650.00	48.10	15.90	54.00	5.90	AV	H
5590	11180.00	56.40	12.50	74.00	17.60	PK	V
	11180.00	42.10	12.50	54.00	11.90	AV	V
	16770.00	59.70	15.90	74.00	14.30	PK	H
	16770.00	48.20	15.90	54.00	5.80	AV	H
5710	11420.00	55.30	12.50	74.00	18.70	PK	V
	11420.00	42.60	12.50	54.00	11.40	AV	V
	17130.00	53.30	15.90	74.00	20.70	PK	H
	17130.00	40.20	15.90	54.00	13.80	AV	H
5755	5725.00	64.40	-0.80	68.00	3.60	PK	V
	11510.00	54.60	12.50	74.00	19.40	PK	V
	11510.00	44.10	12.50	54.00	9.90	AV	V
5795	5850.00	66.20	-0.70	68.00	1.80	PK	V

	11590.00	54.10	12.50	74.00	19.90	PK	V
	11590.00	43.30	12.50	54.00	10.70	AV	V

Note: the band edge of 5725-5850MHz is assessed with limit of -27dBm.

802.11ac80

Channel	Frequency (MHz)	Measured level (dBμV/m)	Factor (dB)	Limits (dBμV/m)	Margin (dB)	Detector	Polarization
5210	5150.00	65.20	-1.30	74.00	8.80	PK	V
	5150.00	51.10	-1.30	54.00	2.90	AV	V
	10420.00	58.20	12.50	74.00	15.80	PK	V
	10420.00	44.10	12.50	54.00	9.90	AV	V
	15630.00	61.50	15.80	74.00	12.50	PK	V
	15630.00	48.40	15.80	54.00	5.60	AV	V
5290	5350.00	63.20	-1.10	74.00	10.80	PK	V
	5350.00	52.30	-1.10	54.00	1.70	AV	V
	10580.00	58.10	12.50	74.00	15.90	PK	V
	10580.00	44.00	12.50	54.00	10.00	AV	V
	15870.00	61.60	15.90	74.00	12.40	PK	H
	15870.00	48.80	15.90	54.00	5.20	AV	H
5530	5470.00	63.80	-1.10	74.00	10.20	PK	V
	5470.00	51.50	-1.10	54.00	2.50	AV	V
	11060.00	59.10	12.50	74.00	14.90	PK	V
	11060.00	45.20	12.50	54.00	8.80	AV	V
	16590.00	60.90	15.90	74.00	13.10	PK	H
	16590.00	48.40	15.90	54.00	5.60	AV	H
5610	11220.00	57.50	12.50	74.00	16.50	PK	V
	11220.00	42.90	12.50	54.00	11.10	AV	V
	16830.00	61.20	15.90	74.00	12.80	PK	H
	16830.00	48.80	15.90	54.00	5.20	AV	H
5690	11380.00	58.40	12.50	74.00	15.60	PK	V
	11380.00	44.50	12.50	54.00	9.50	AV	V

	17070.00	55.60	15.90	74.00	18.40	PK	H
	17070.00	41.30	15.90	54.00	12.70	AV	H
5775	5725.00	65.40	-0.80	68.00	2.60	PK	V
	5850.00	64.00	-0.70	68.00	4.00	PK	V
	11550.00	57.10	12.50	74.00	16.90	PK	V
	11550.00	45.50	12.50	54.00	8.50	AV	V

Note: the band edge of 5725-5850MHz is assessed with limit of -27dBm.

## 7. Power line conducted emission

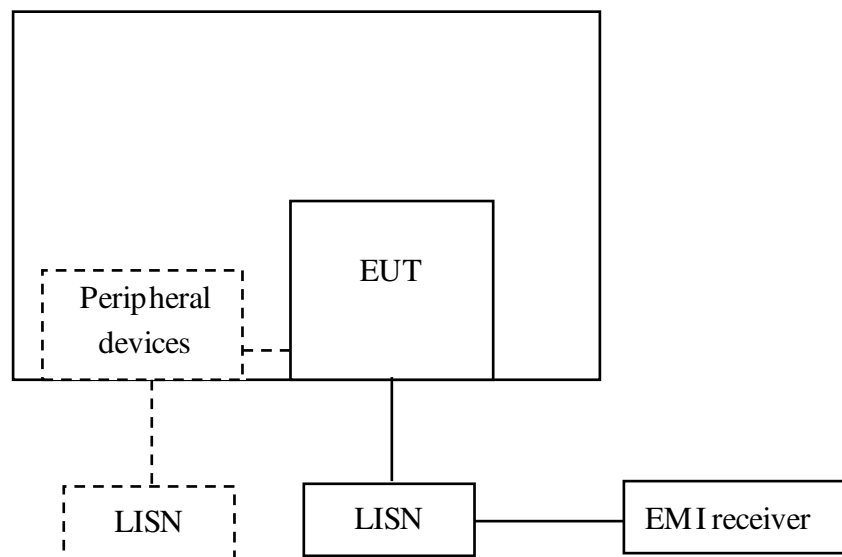
**Test result: Pass**

### 7.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### 7.2 Test configuration



- For table top equipment, wooden support is 0.8m height table
- For floor standing equipment, wooden support is 0.1m height rack.

### **7.3 Test procedure and test set up**

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a  $50\Omega/50\mu\text{H}$  coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a  $50\Omega/50\mu\text{H}$  coupling impedance with  $50\Omega$  termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

### 7.4 Test protocol

Temperature: 24 °C  
Relative Humidity: 44 %



Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.17 (L)	3.00	45.11	28.70	65.10	55.10	19.99	26.40
0.20 (L)	3.00	40.84	26.39	63.58	53.58	22.74	27.19
0.46 (N)	3.00	35.48	22.60	56.78	46.78	21.30	24.18
2.63 (N)	3.00	29.51	17.91	56.00	46.00	26.49	28.09
3.21 (N)	3.00	31.02	18.23	56.00	46.00	24.98	27.77
9.88 (N)	3.00	29.85	23.21	60.00	50.00	30.15	26.79

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).  
2. Margin (dB) = Limit - Corrected Reading.

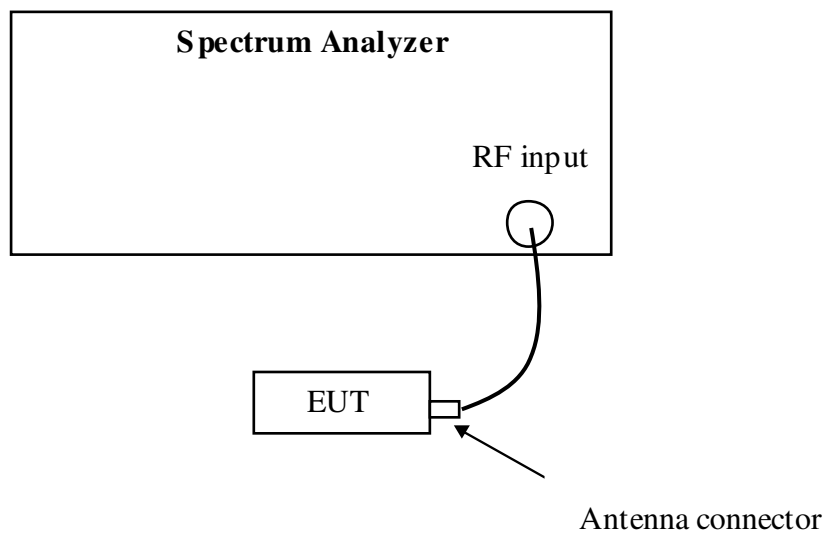
## 8. Occupied Bandwidth

Test Status: Tested

### 8.1 Test limit

None

### 8.2 Test Configuration



### 8.3 Test procedure and test setup

The bandwidth was measured from the antenna port of the EUT.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot$  RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



**8.4 Test protocol**

Temperature : 25 °C  
Relative Humidity : 55 %

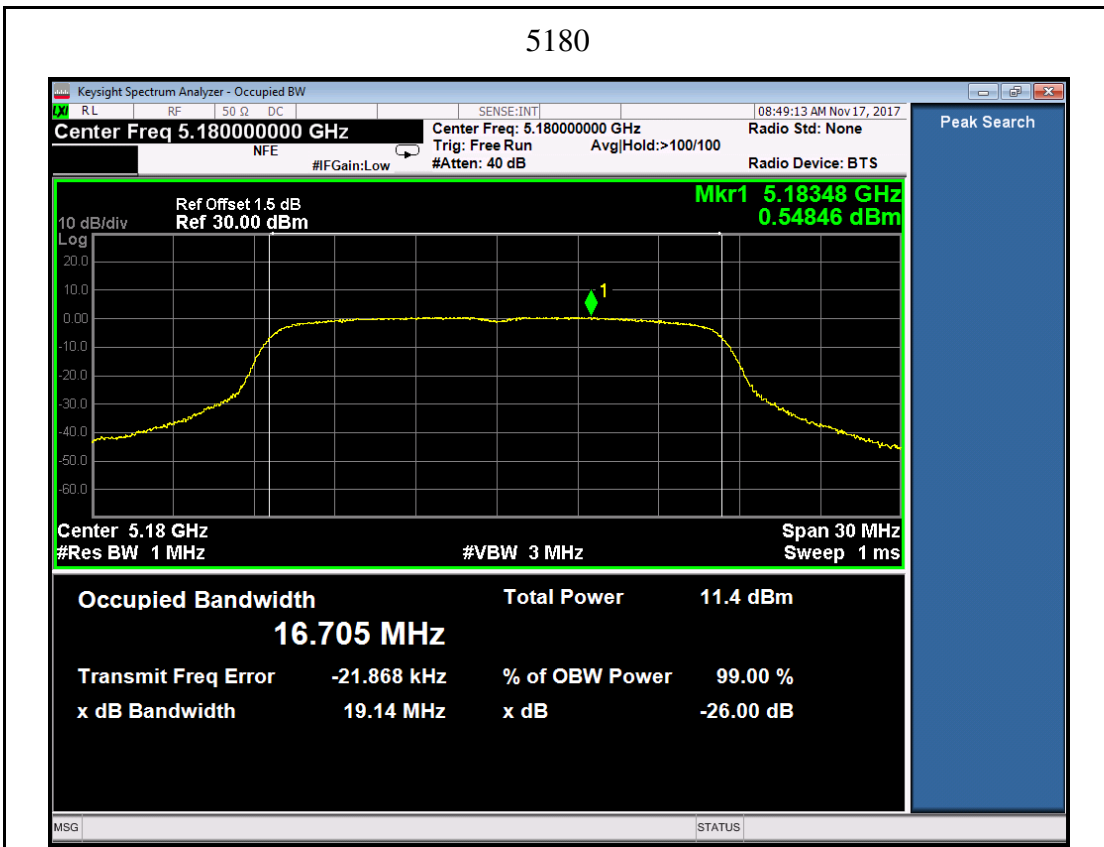
Mode	Freq (MHz)	Port 0		Port 1	
		99% Bandwidth (MHz)	26dB down (MHz)	99% Bandwidth (MHz)	26dB down (MHz)
802.11a	5180	16.71	19.14	16.74	19.30
	5200	16.72	19.12	16.73	19.36
	5240	16.70	19.14	16.71	19.23
	5260	16.72	19.03	16.72	19.31
	5300	16.72	19.11	16.73	19.33
	5320	16.72	19.11	16.73	19.35
	5500	16.71	19.13	16.74	19.22
	5580	16.72	19.24	16.74	19.27
	5600	16.70	19.22	16.73	19.26
	5720	16.72	19.20	16.73	19.40
	5745	16.74	19.28	16.72	19.28
	5785	16.74	19.28	16.75	19.38
	5825	16.73	19.28	16.73	19.26
802.11n20	5180	17.80	20.17	17.81	20.23
	5200	17.82	20.19	17.80	20.25
	5240	17.82	20.21	17.80	20.13
	5260	17.81	20.15	17.82	20.20
	5300	17.81	20.13	17.82	20.23
	5320	17.79	20.10	17.81	20.22
	5500	17.82	20.22	17.80	20.25

	5580	17.82	20.20	17.81	20.19
	5600	17.81	20.19	17.81	20.22
	5720	17.83	20.32	17.83	20.20
	5745	17.81	20.17	17.82	20.23
	5785	17.81	20.10	17.81	20.24
	5825	17.82	20.27	17.81	20.22
802.11n40	5190	36.05	39.34	36.00	39.23
	5230	35.95	39.12	36.06	39.47
	5270	35.99	39.18	36.03	39.50
	5310	36.01	39.26	36.02	39.47
	5510	36.01	39.56	36.03	39.65
	5550	35.98	39.22	35.99	39.26
	5590	36.01	39.25	36.01	39.51
	5710	36.02	39.63	36.09	39.85
	5755	36.01	39.29	36.03	39.46
	5795	36.01	39.50	36.04	39.49
802.11ac80	5210	75.08	79.77	75.06	79.76
	5290	75.01	79.50	75.06	79.77
	5530	75.12	79.36	75.12	79.83
	5610	75.11	79.41	75.09	79.49
	5690	75.09	79.68	75.11	80.08
	5775	75.07	79.61	75.16	79.85

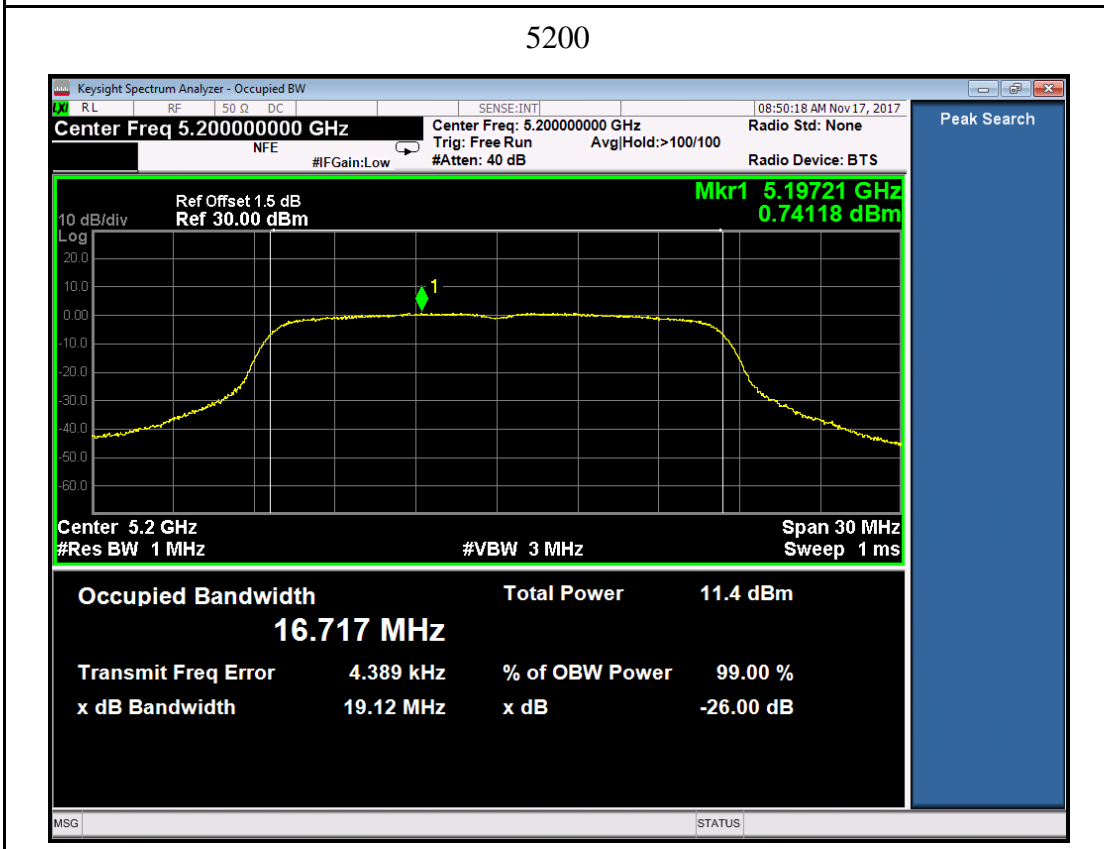
Port 0

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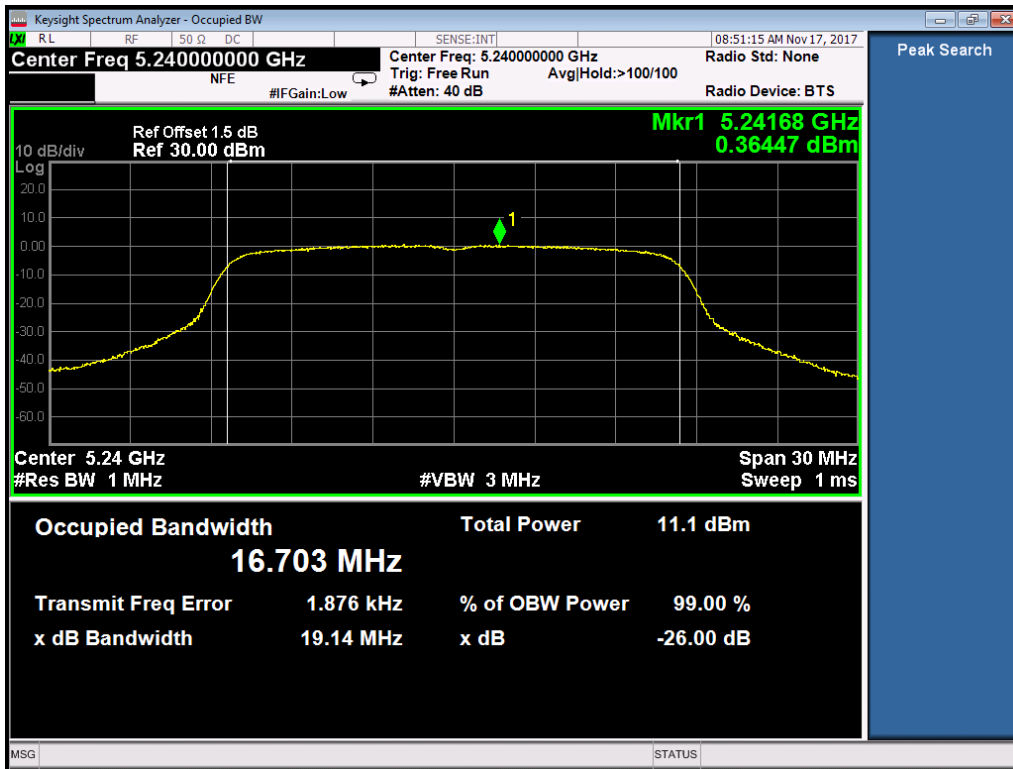
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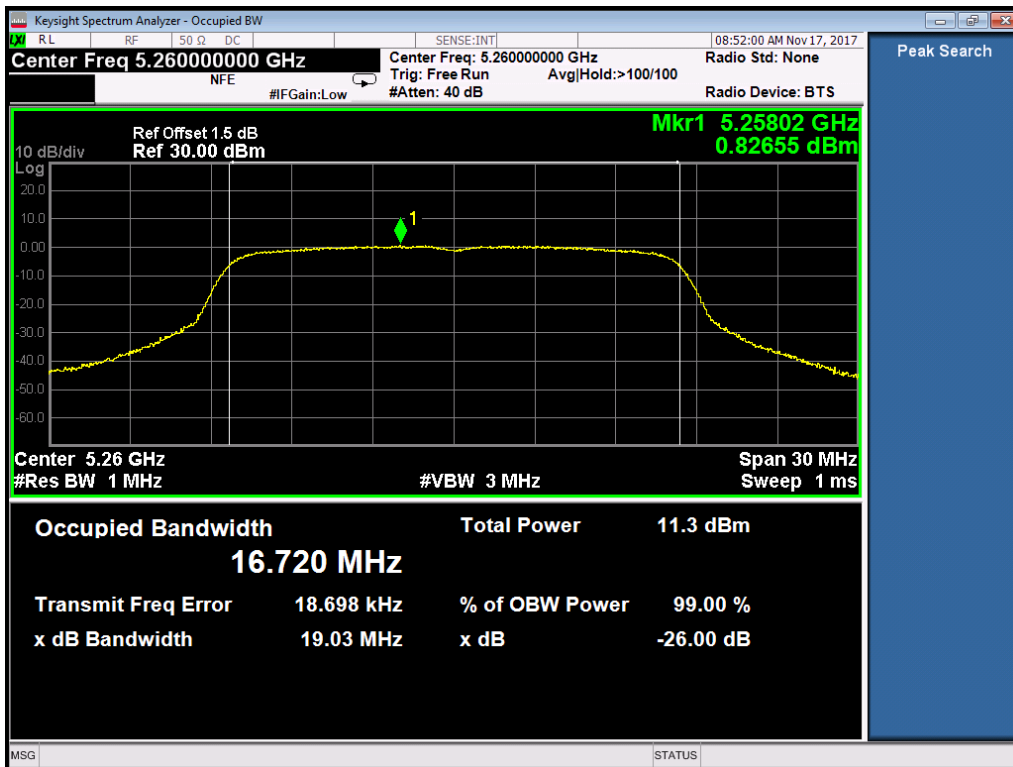
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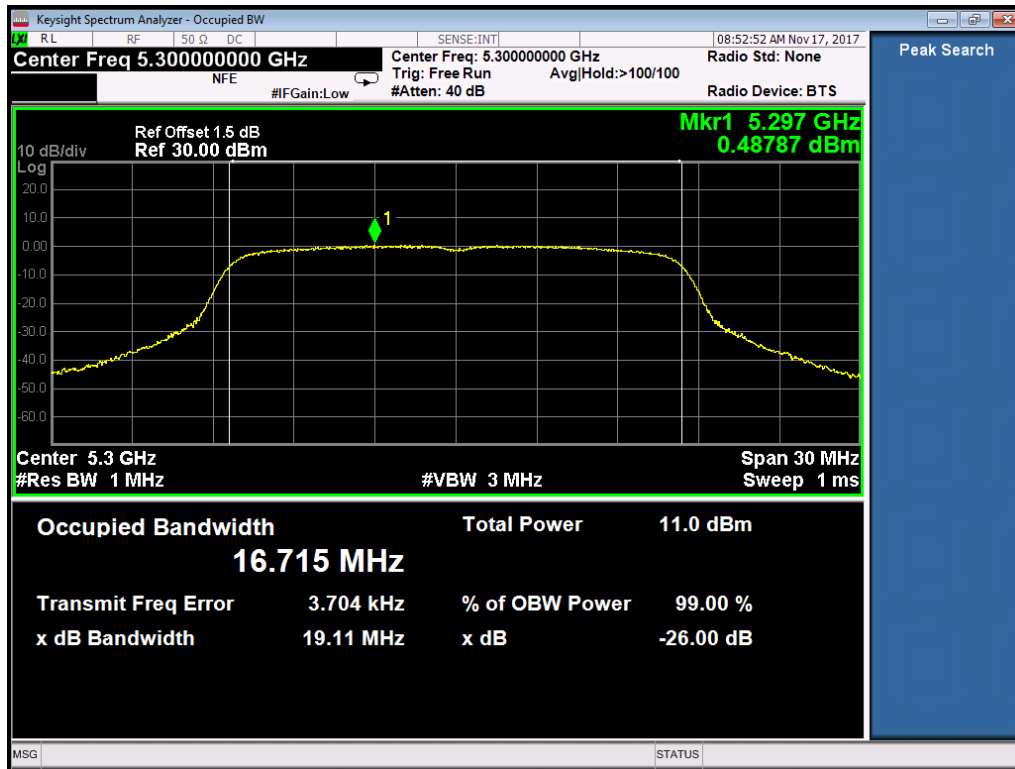
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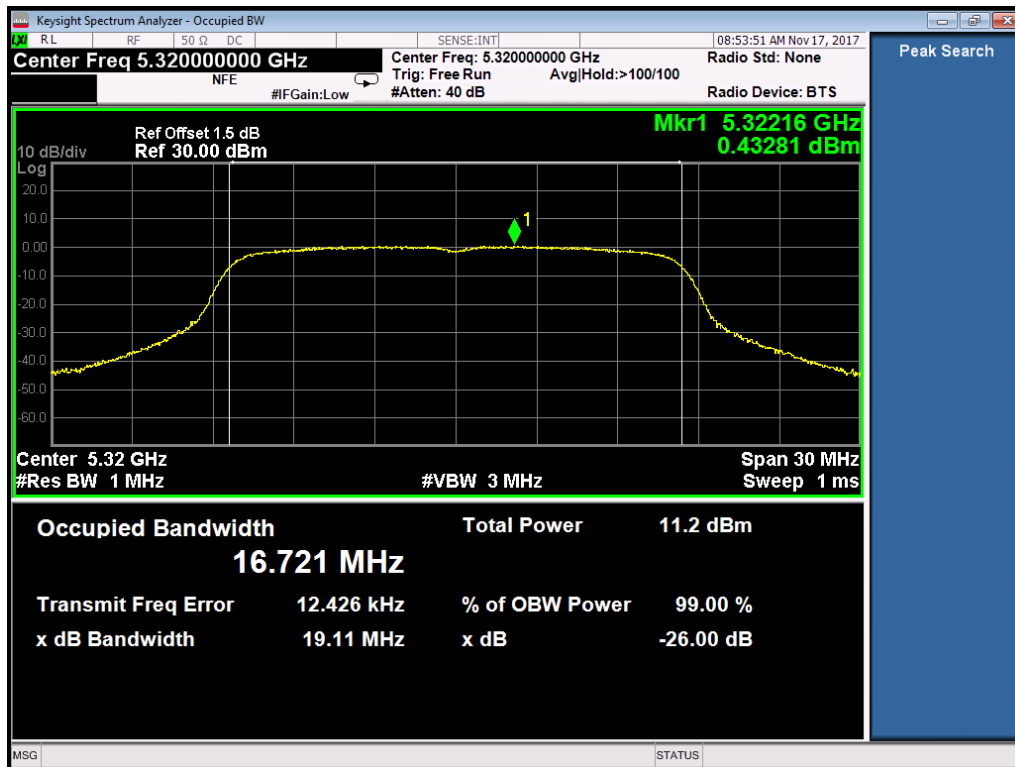
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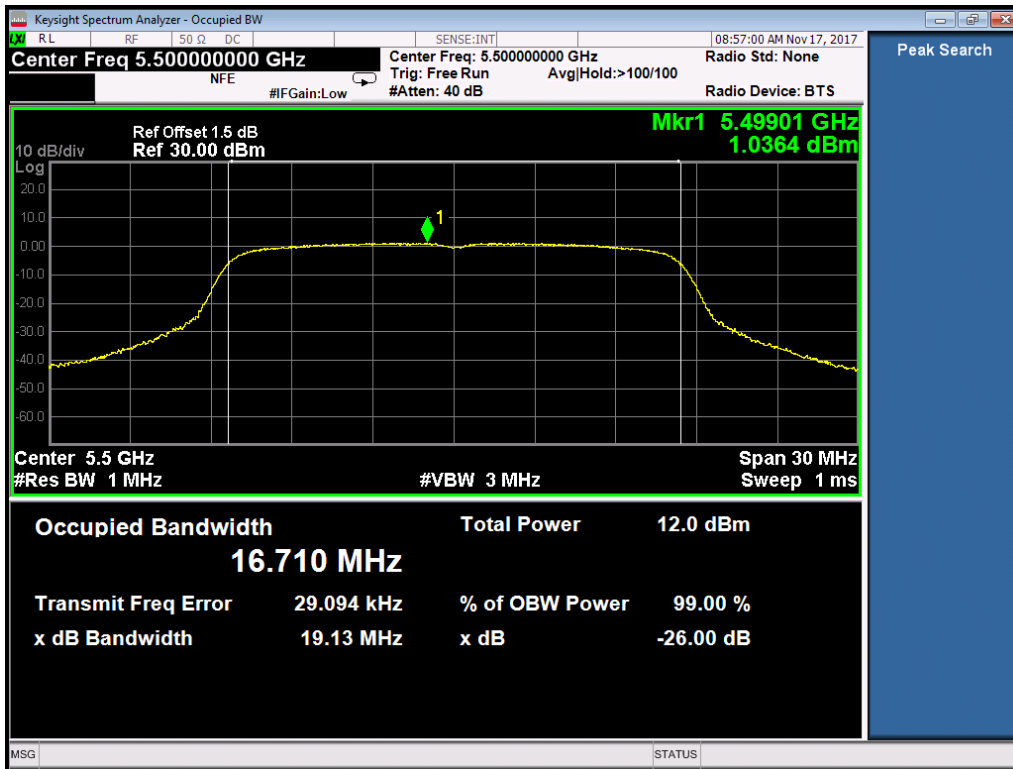
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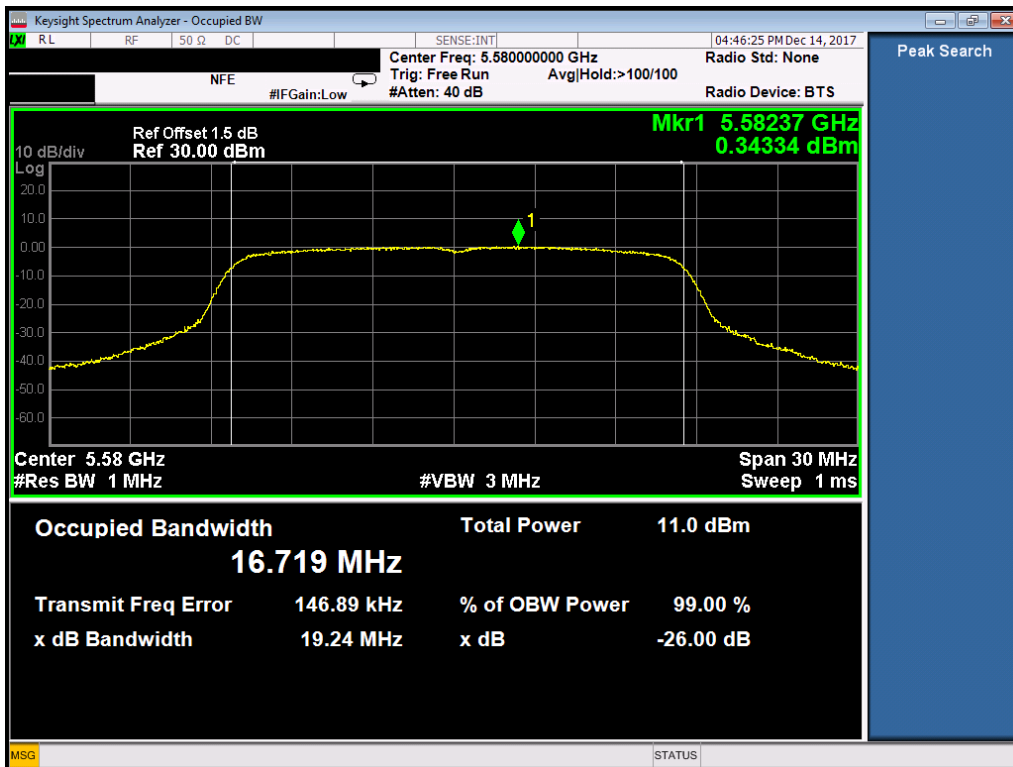
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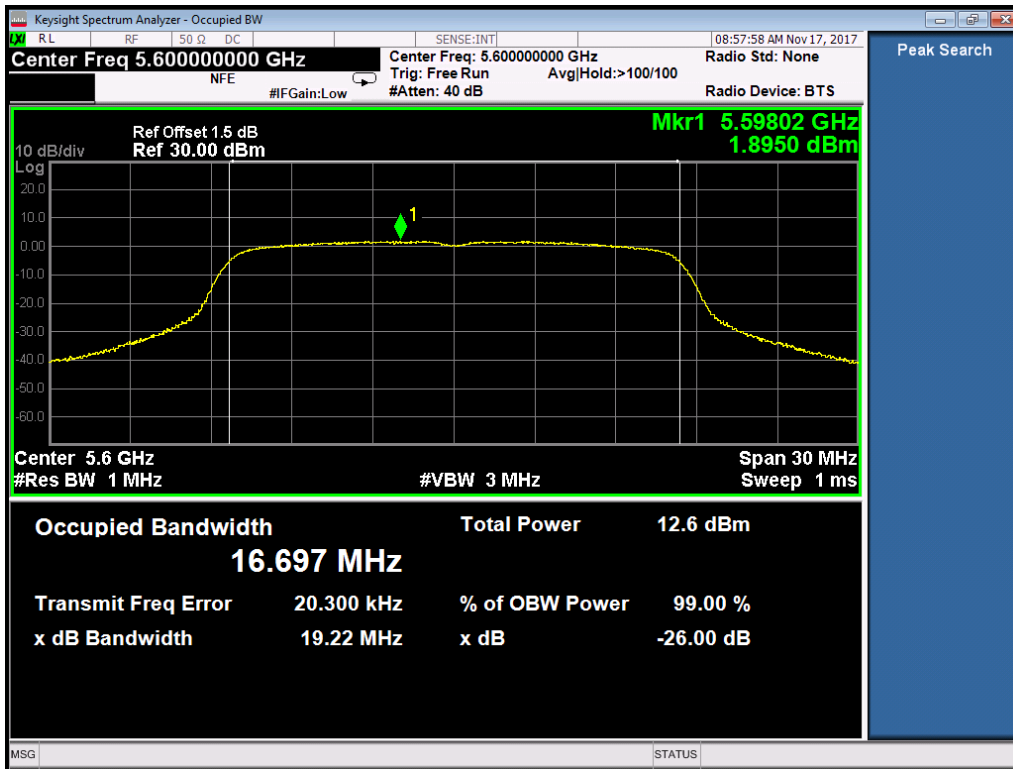
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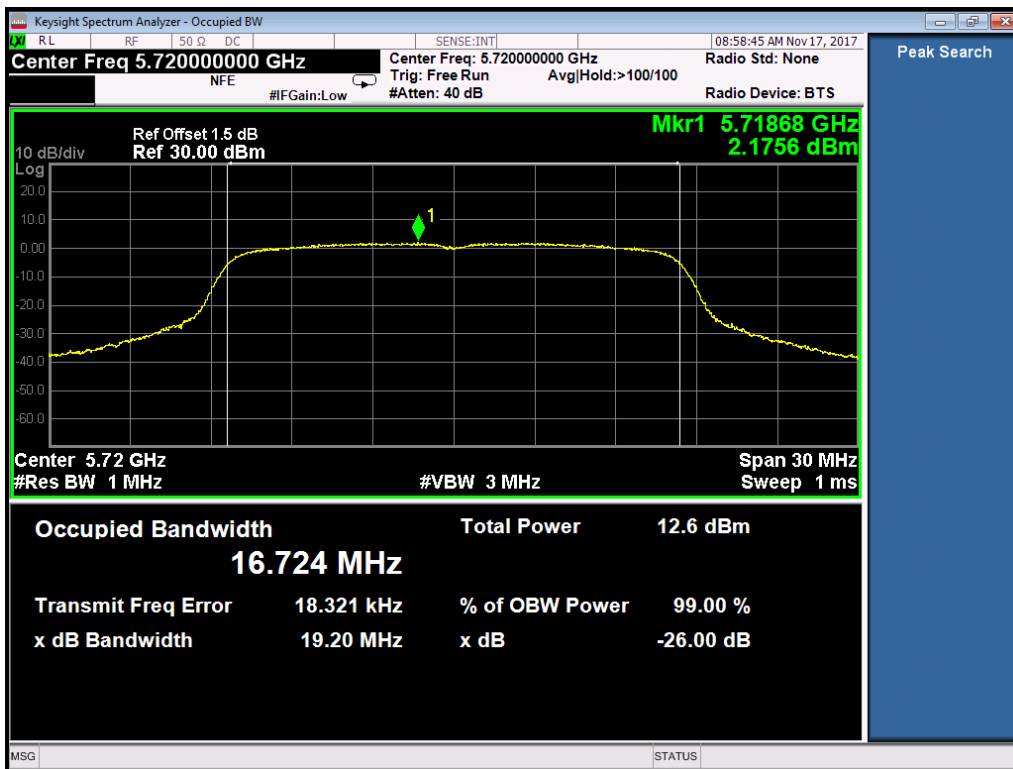
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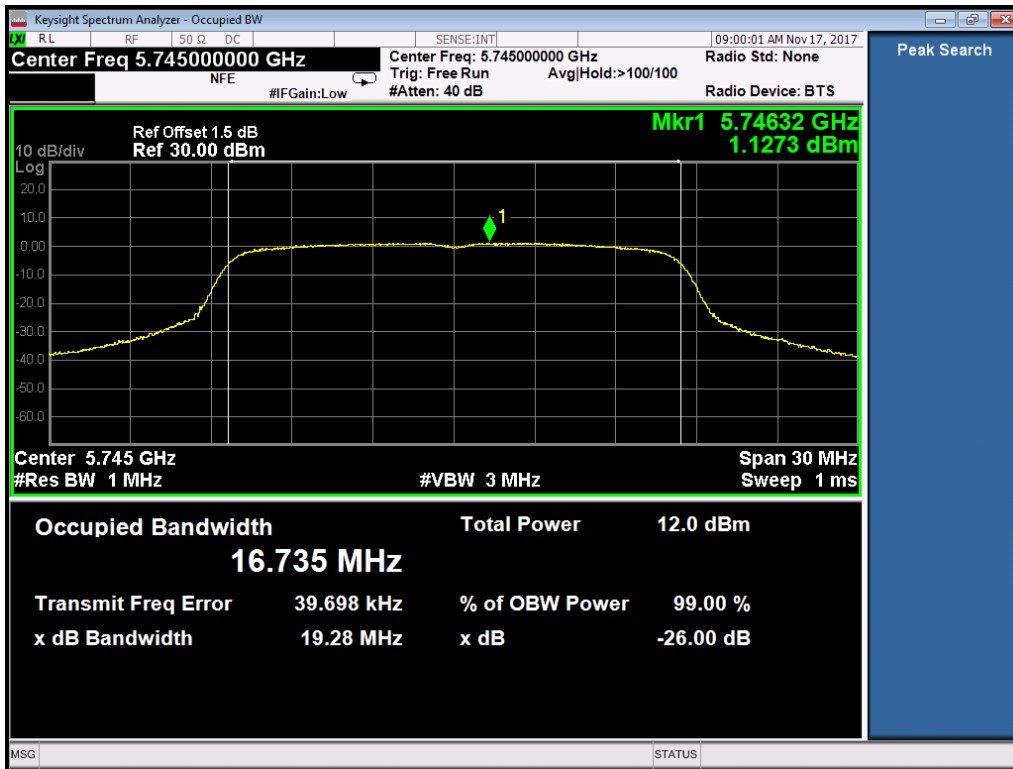
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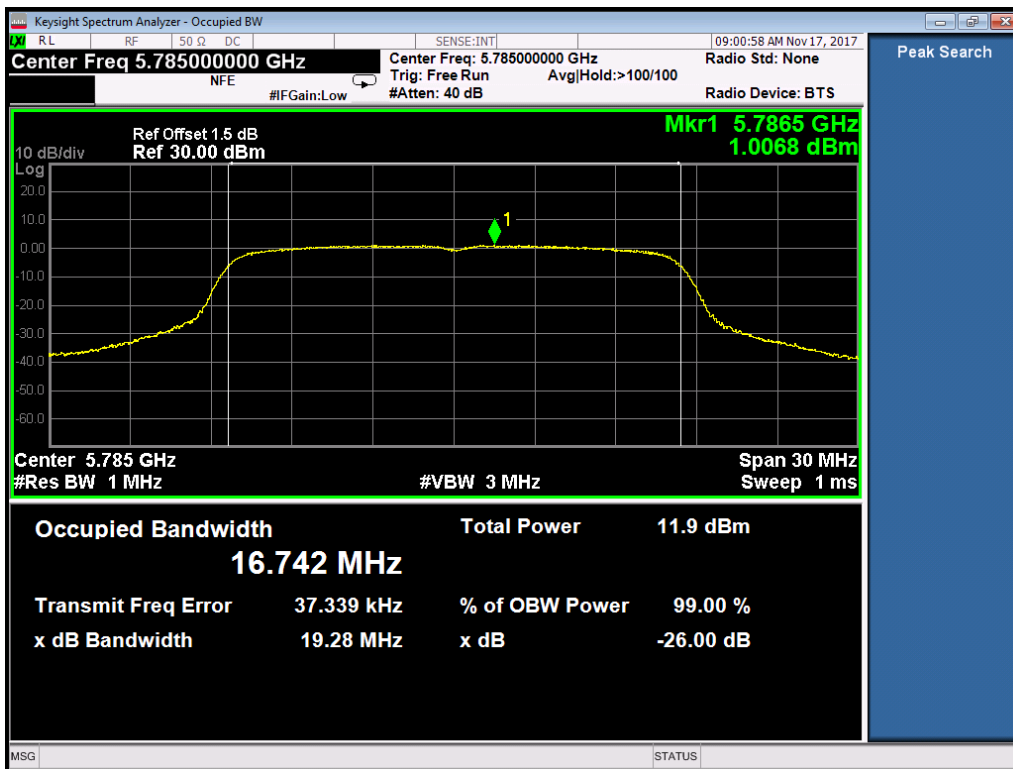
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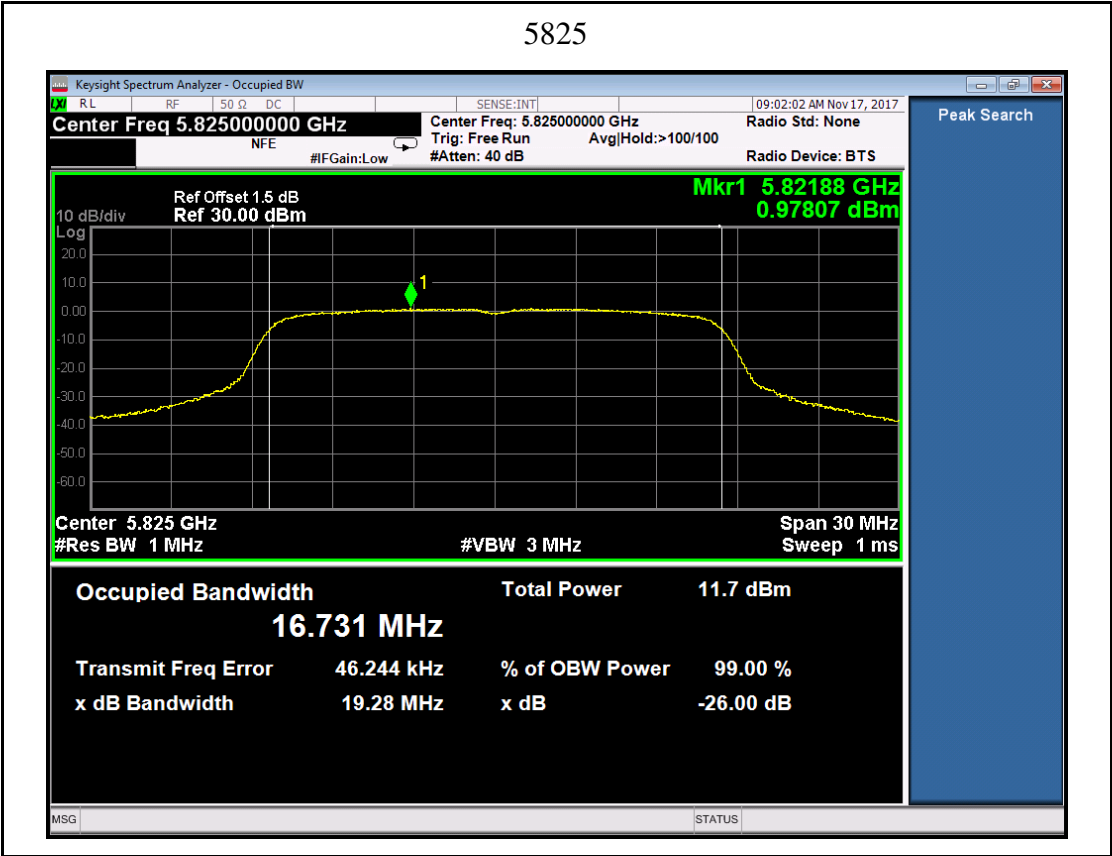


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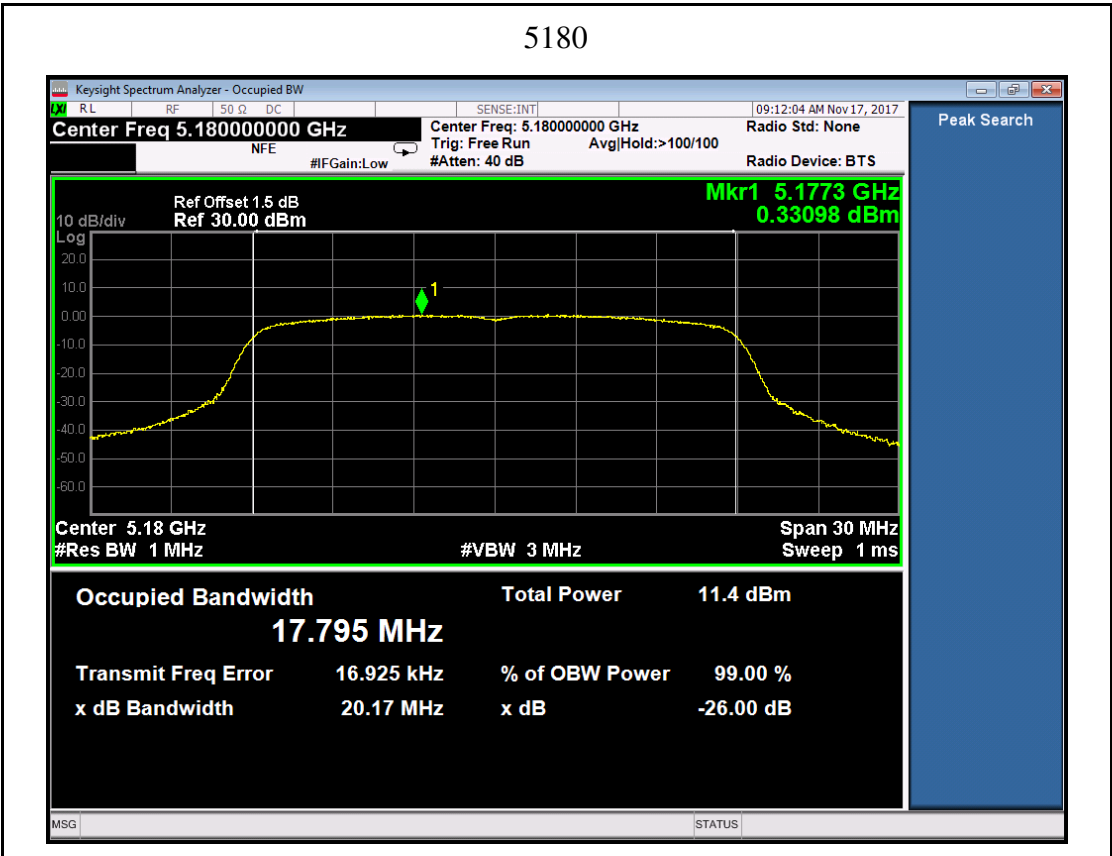


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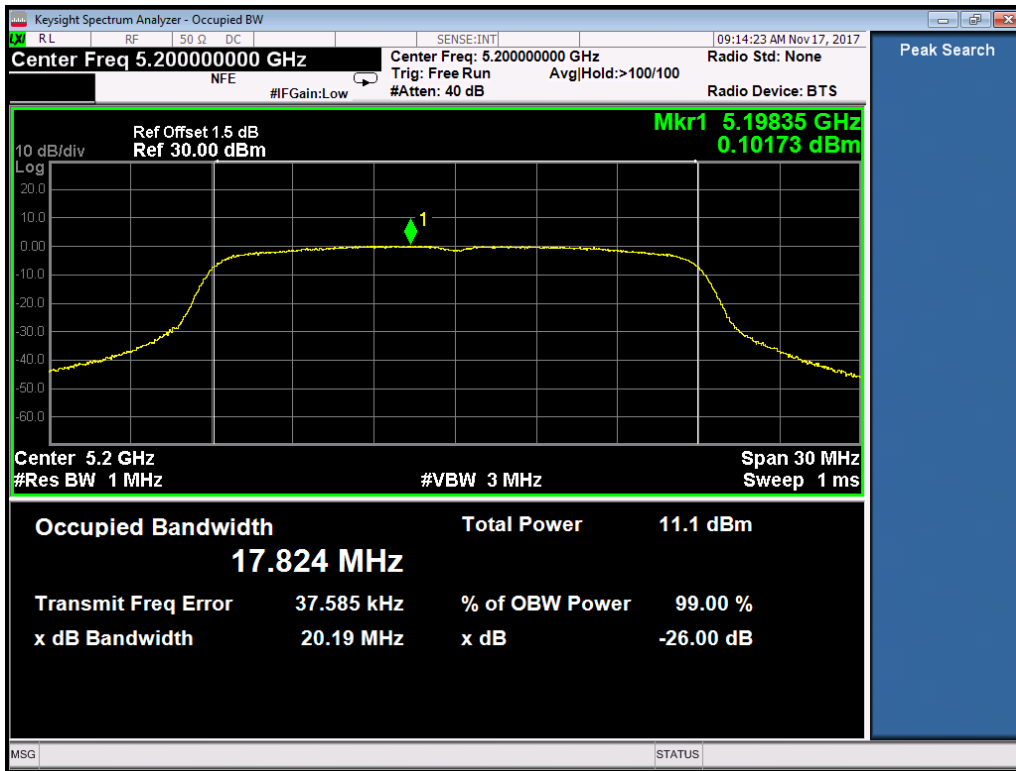


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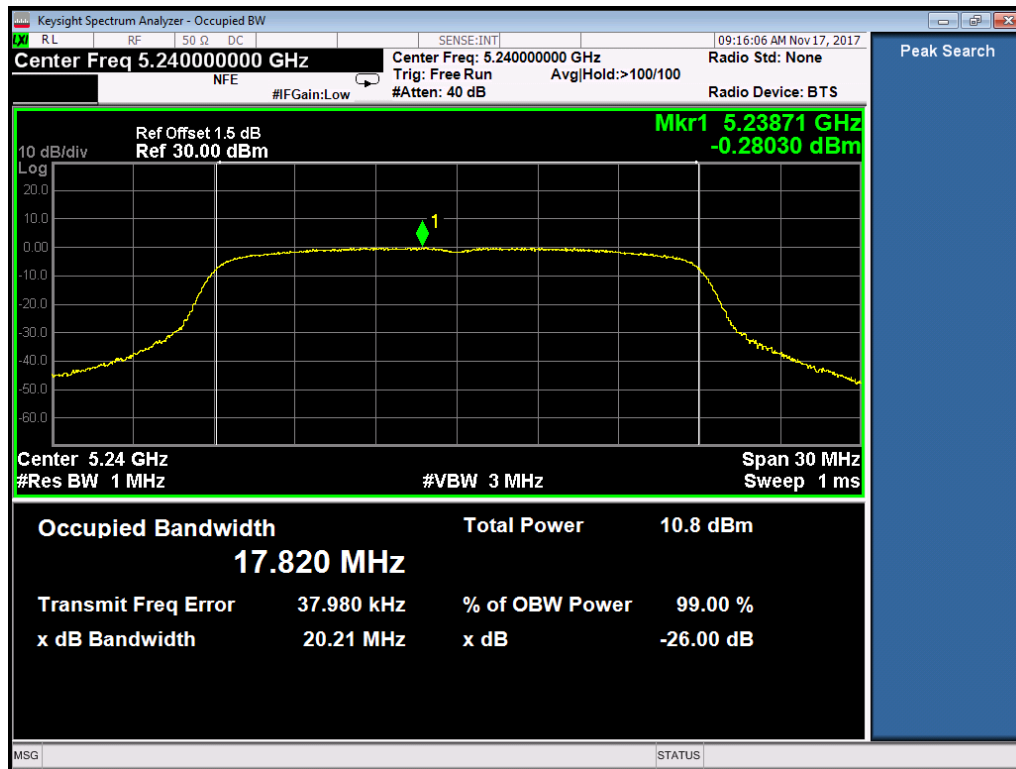
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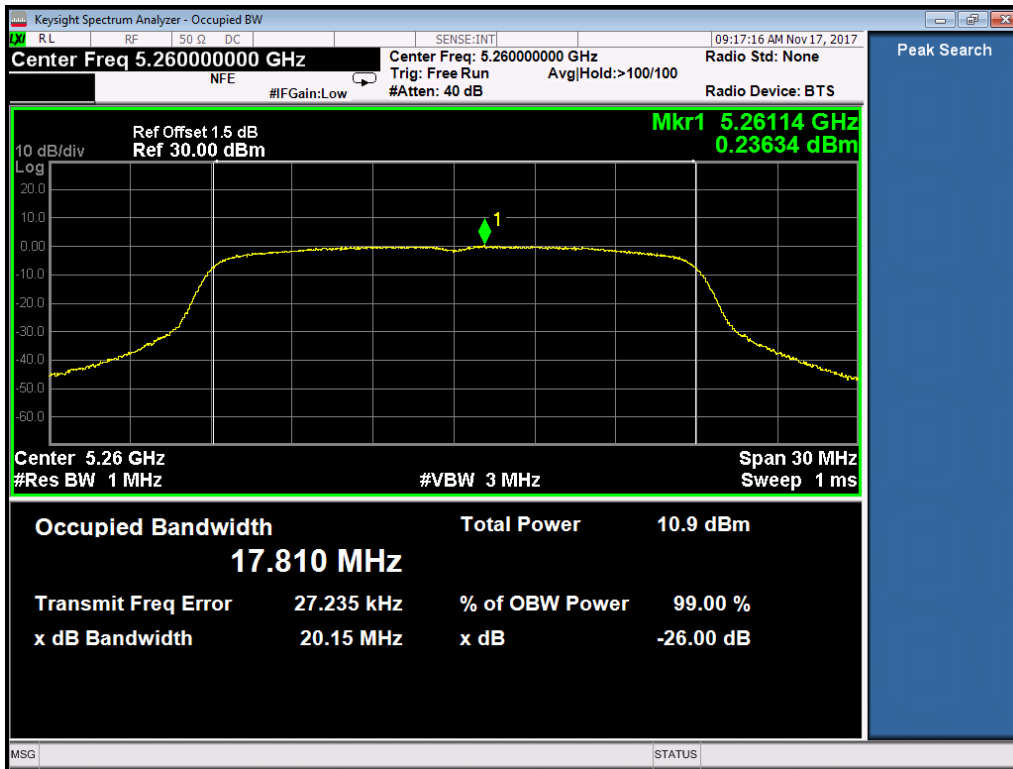
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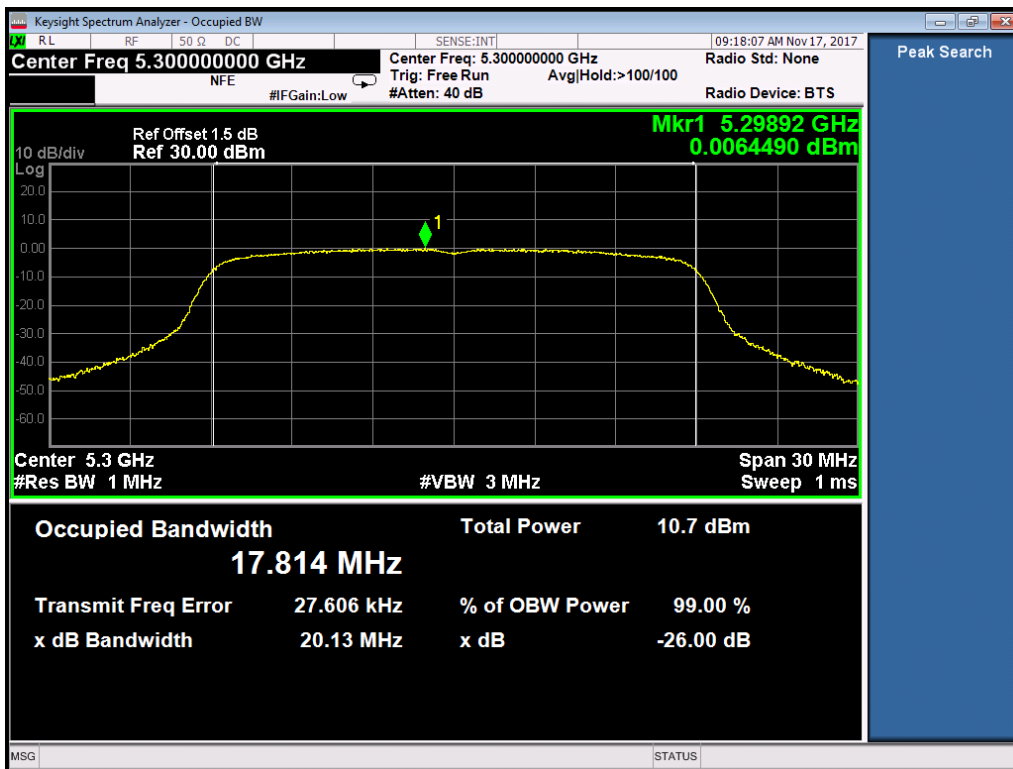
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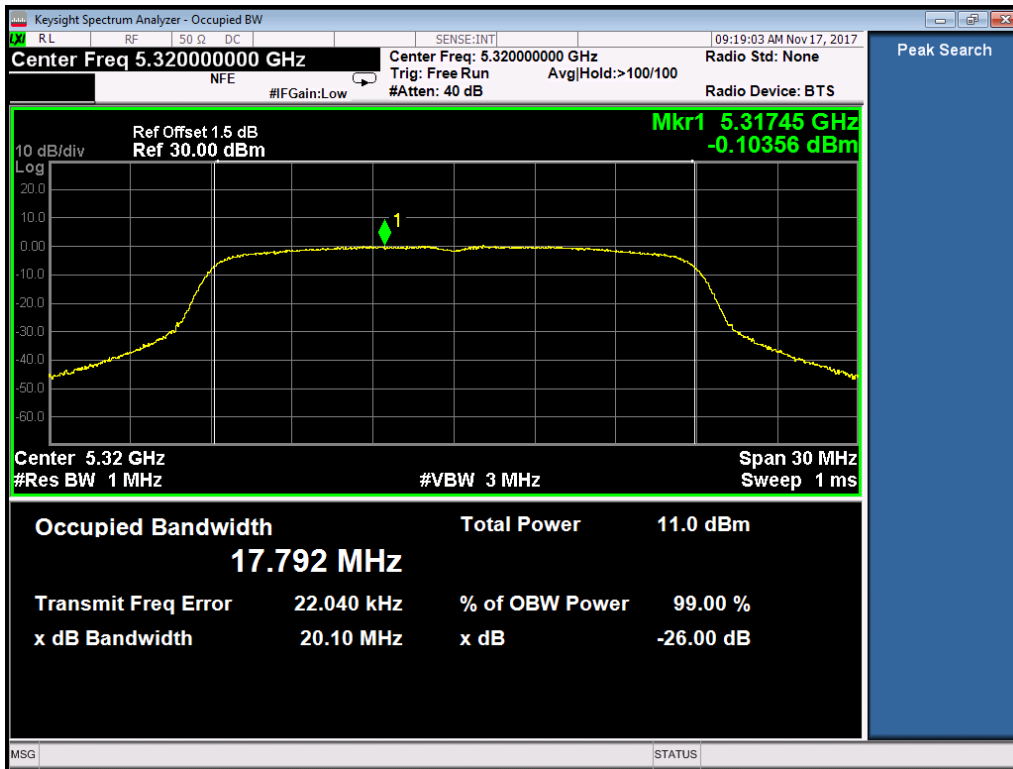
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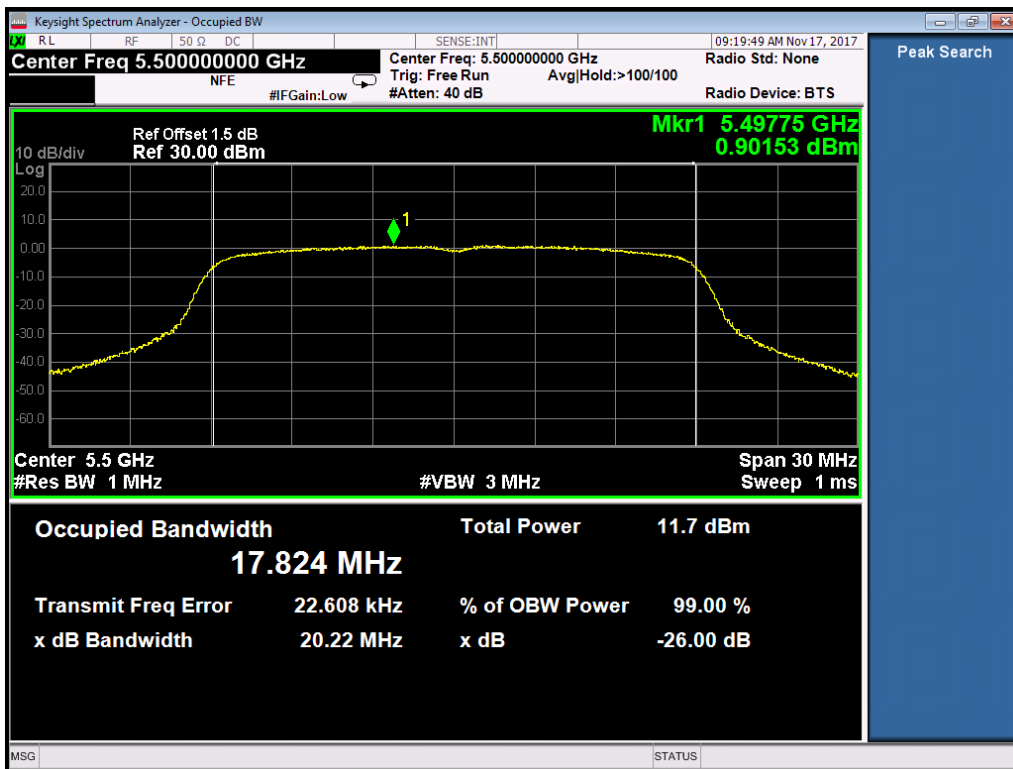
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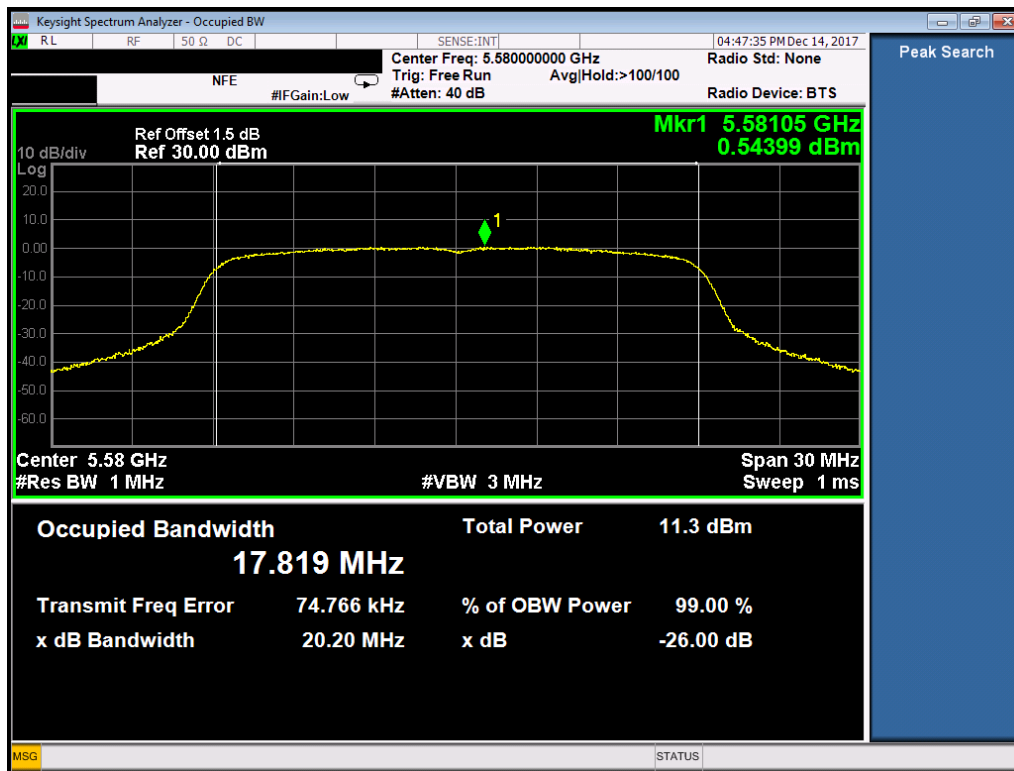
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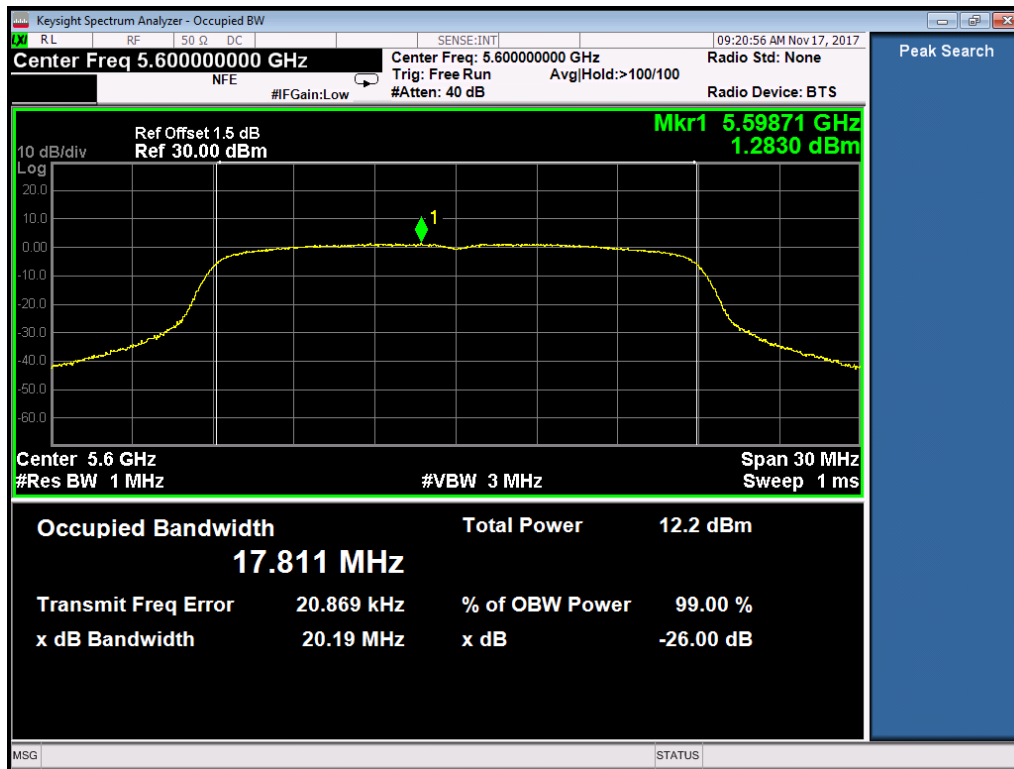
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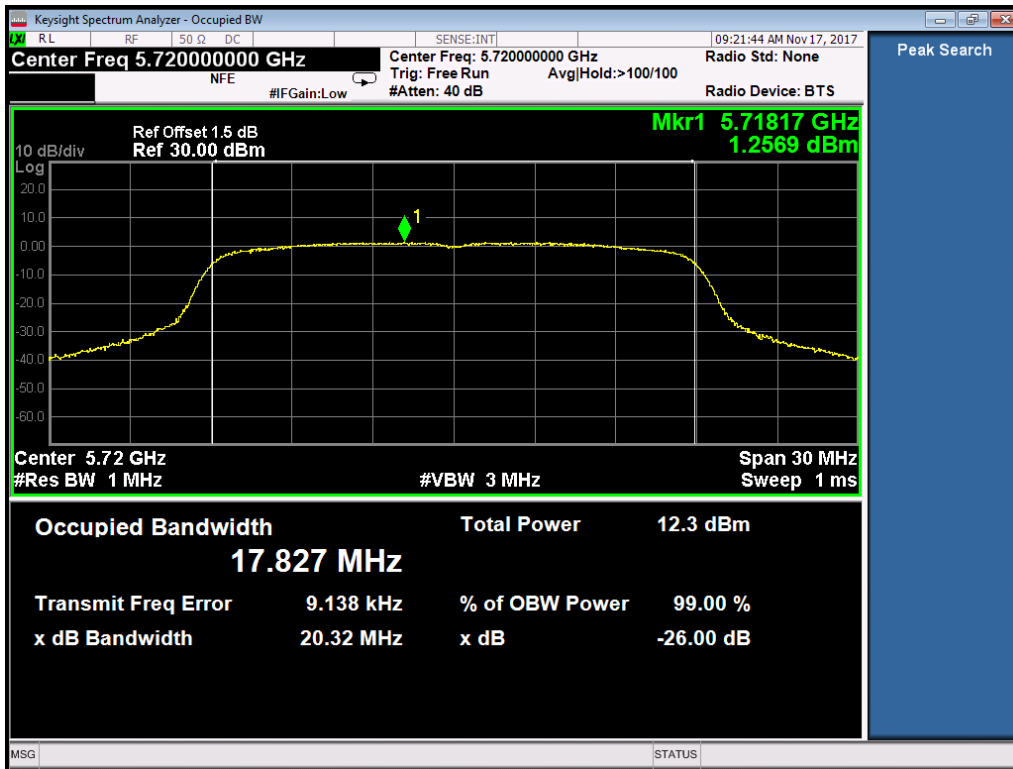
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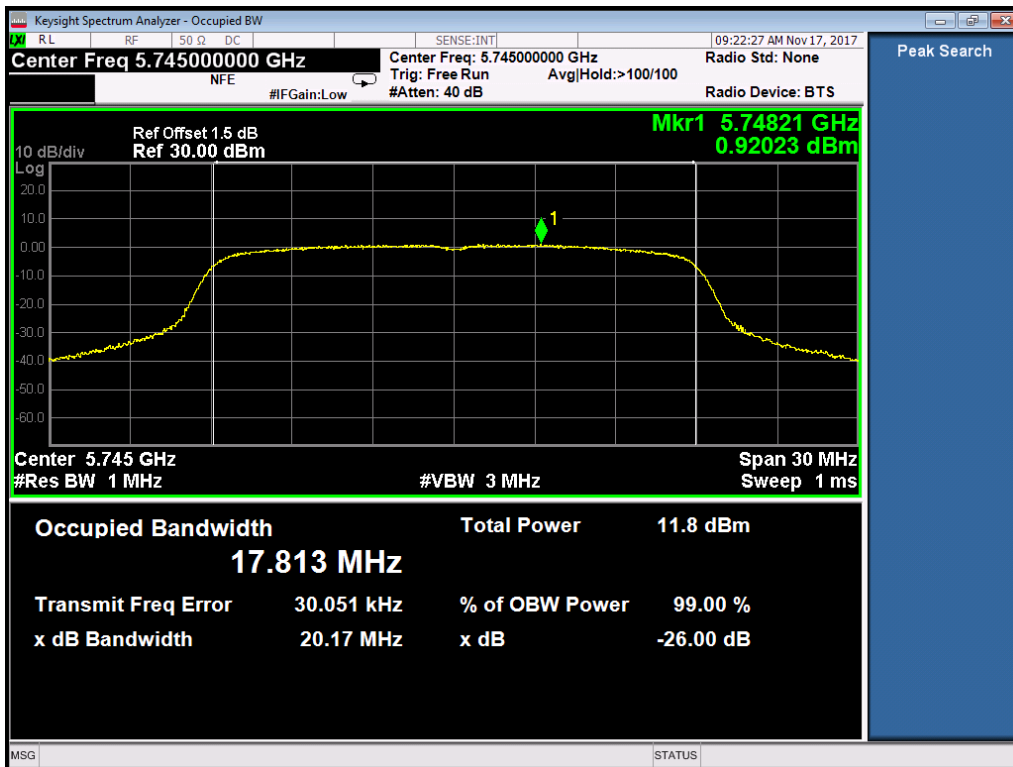
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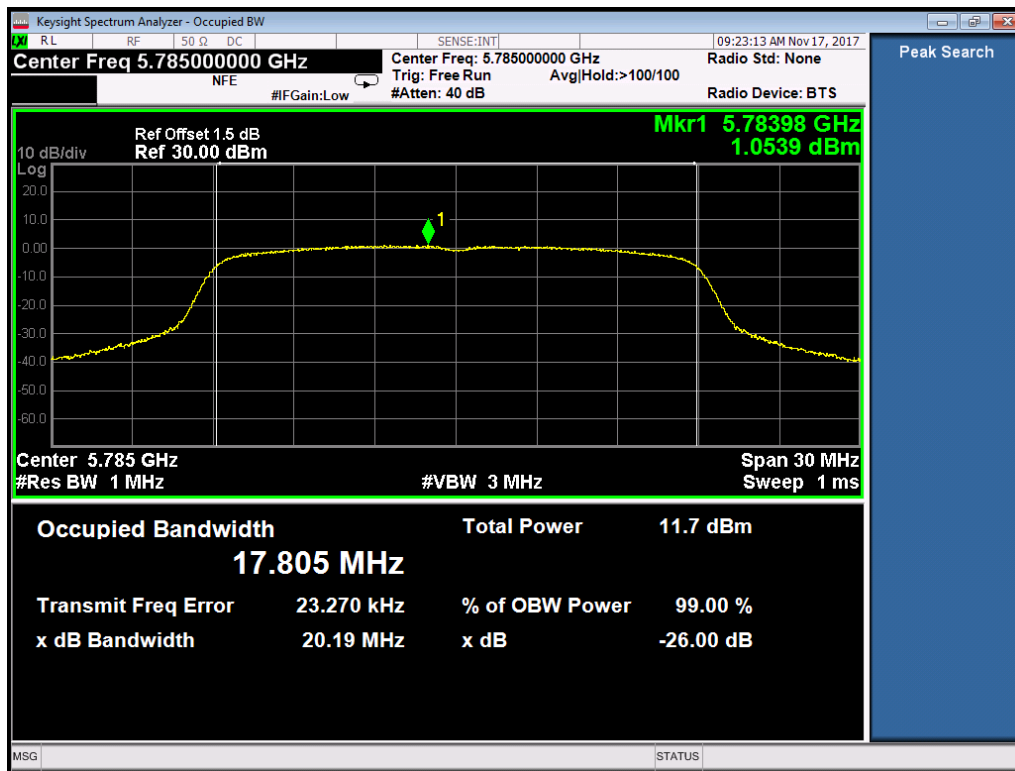
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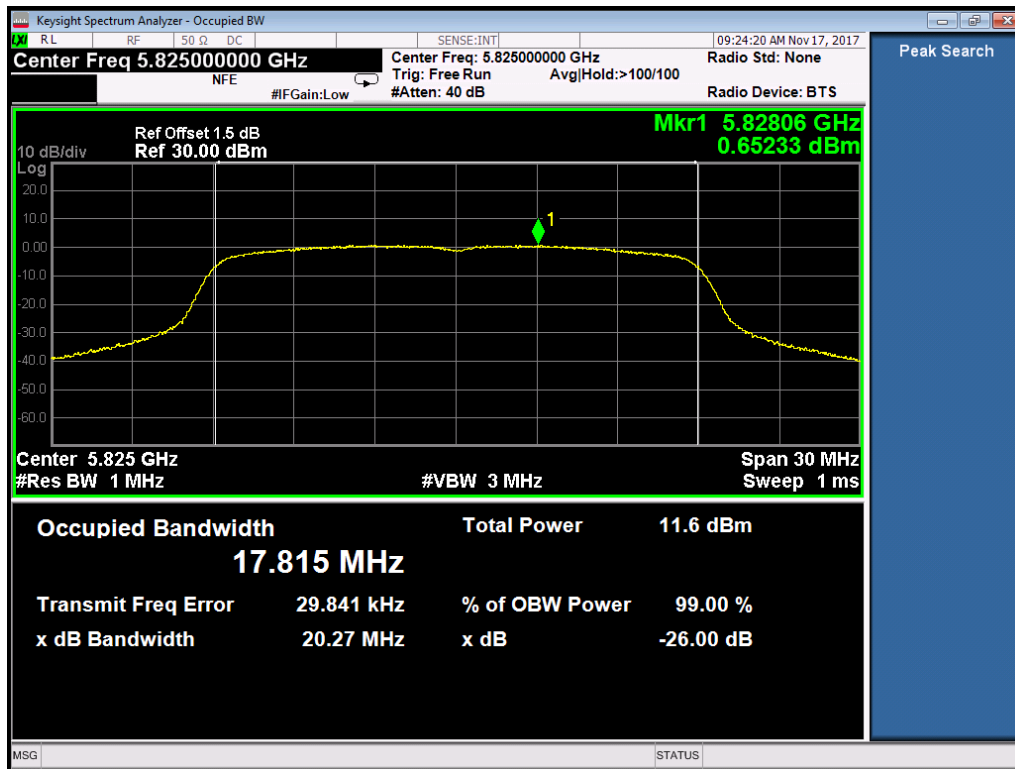
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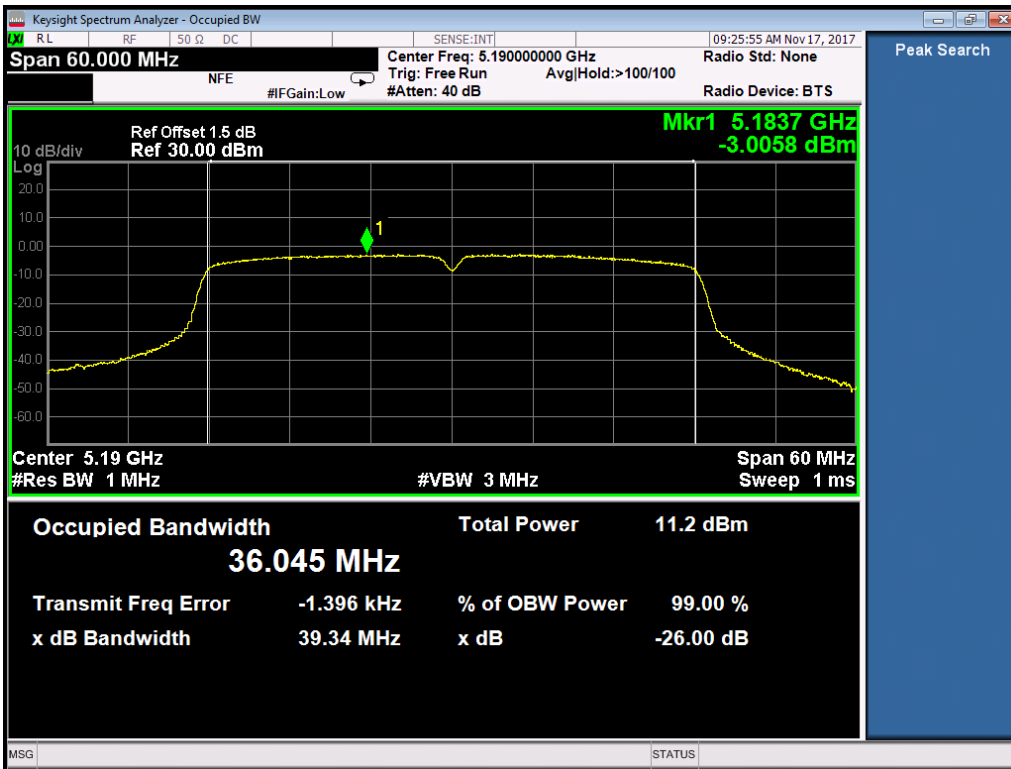


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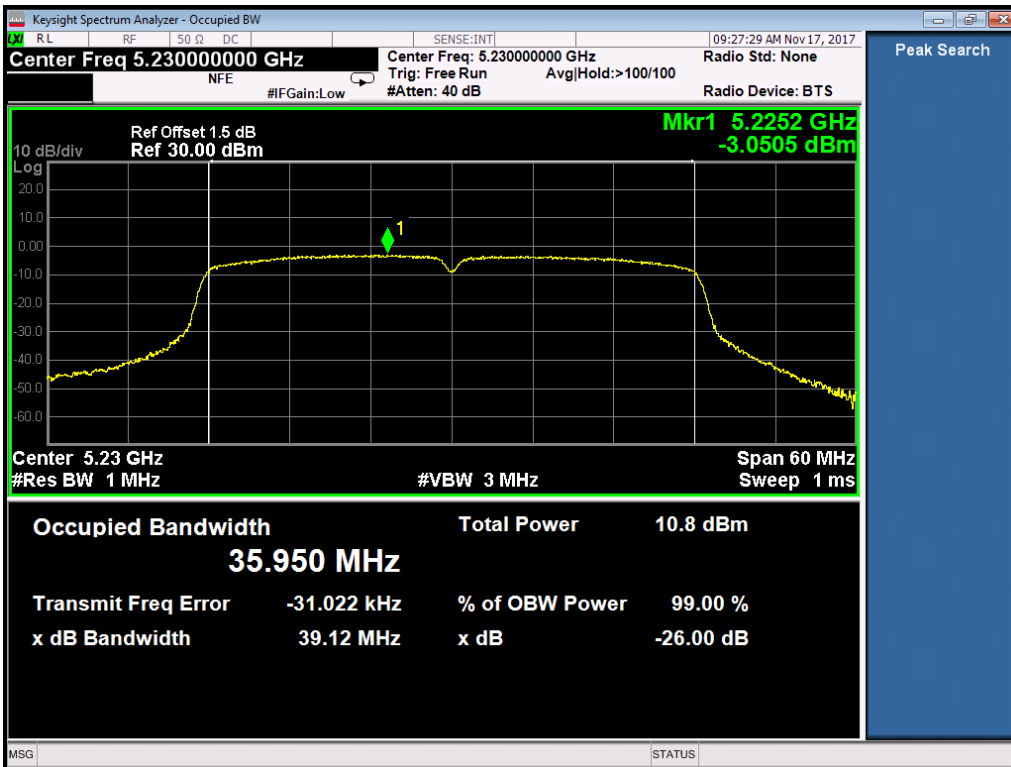


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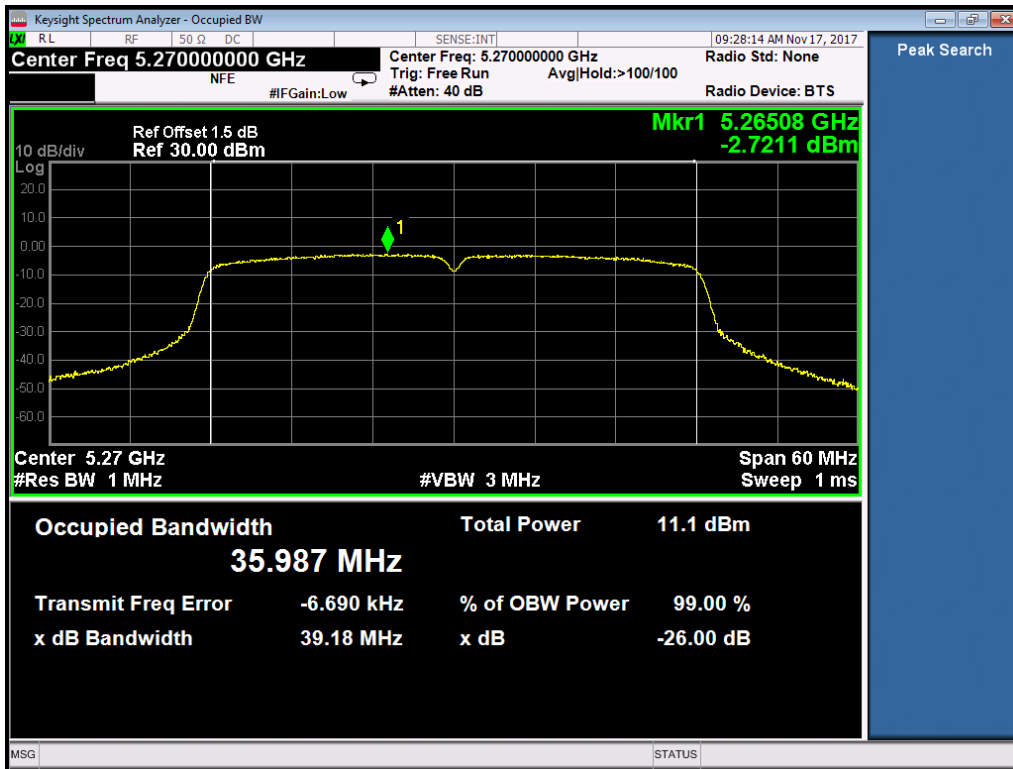


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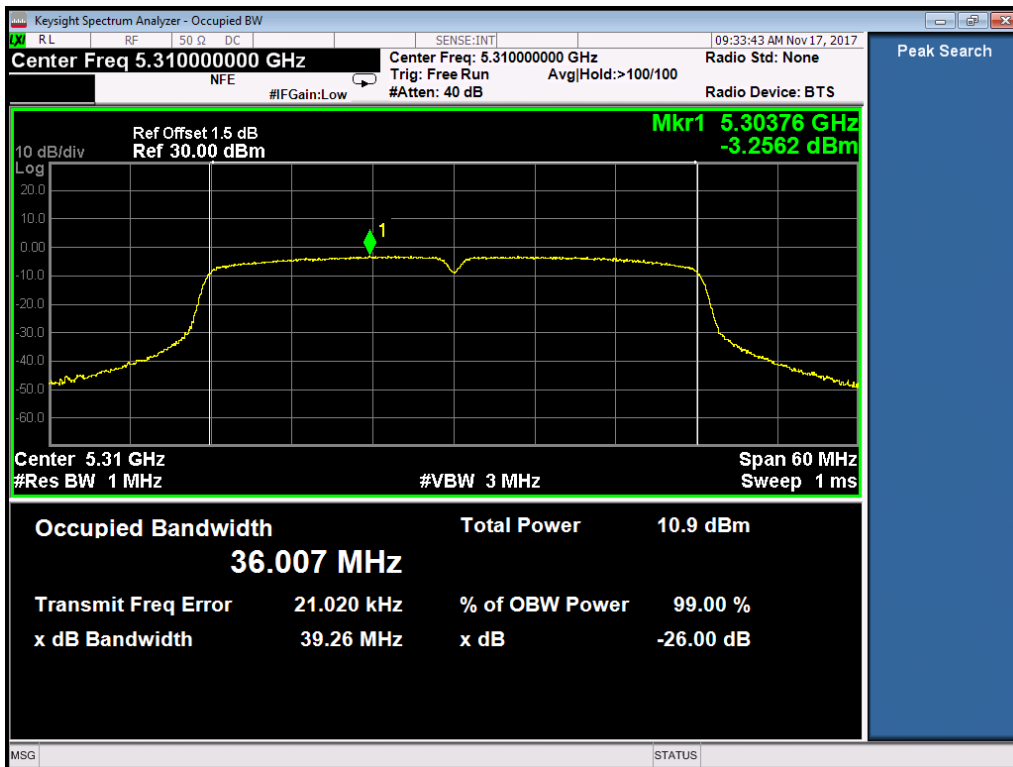




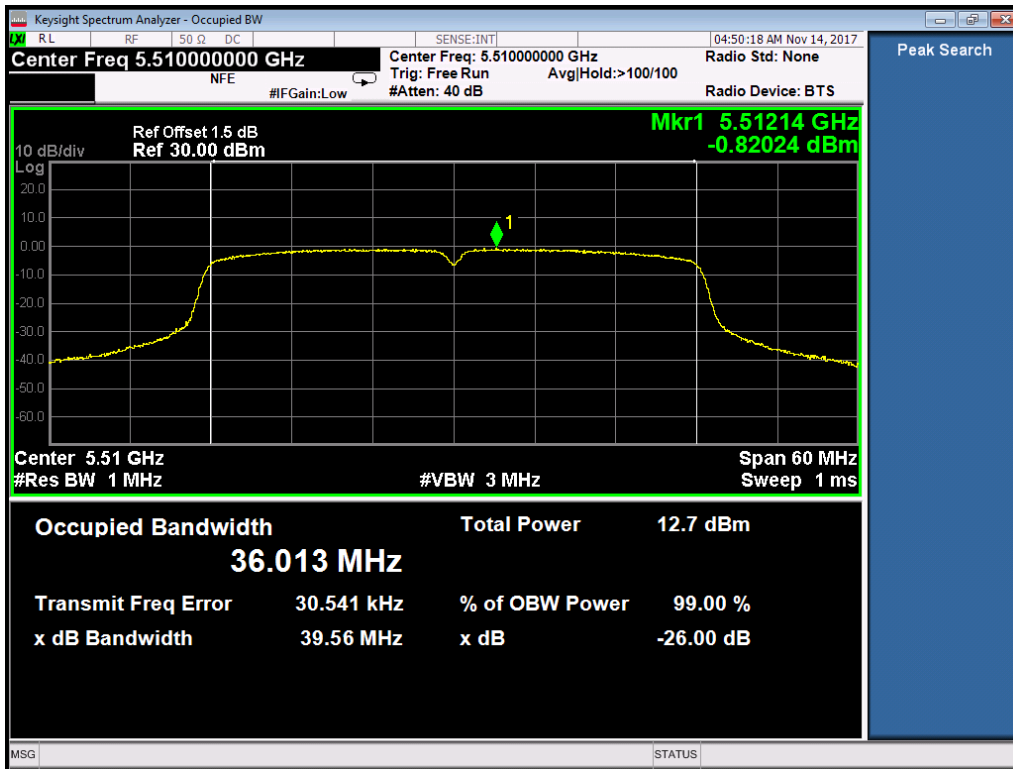
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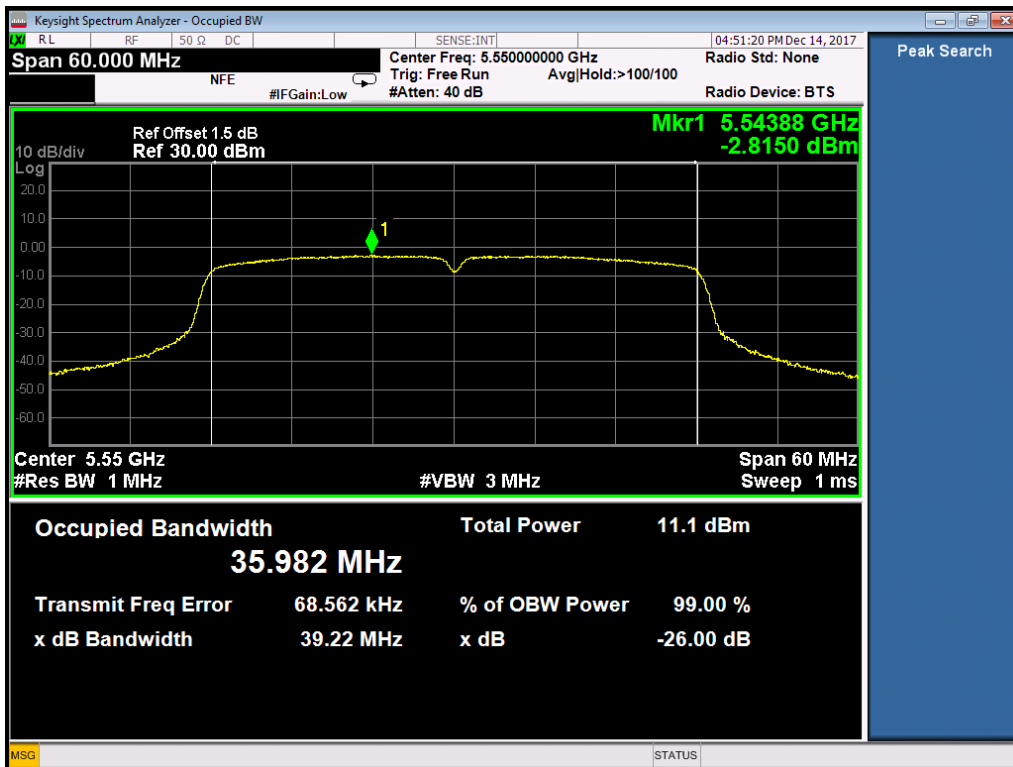
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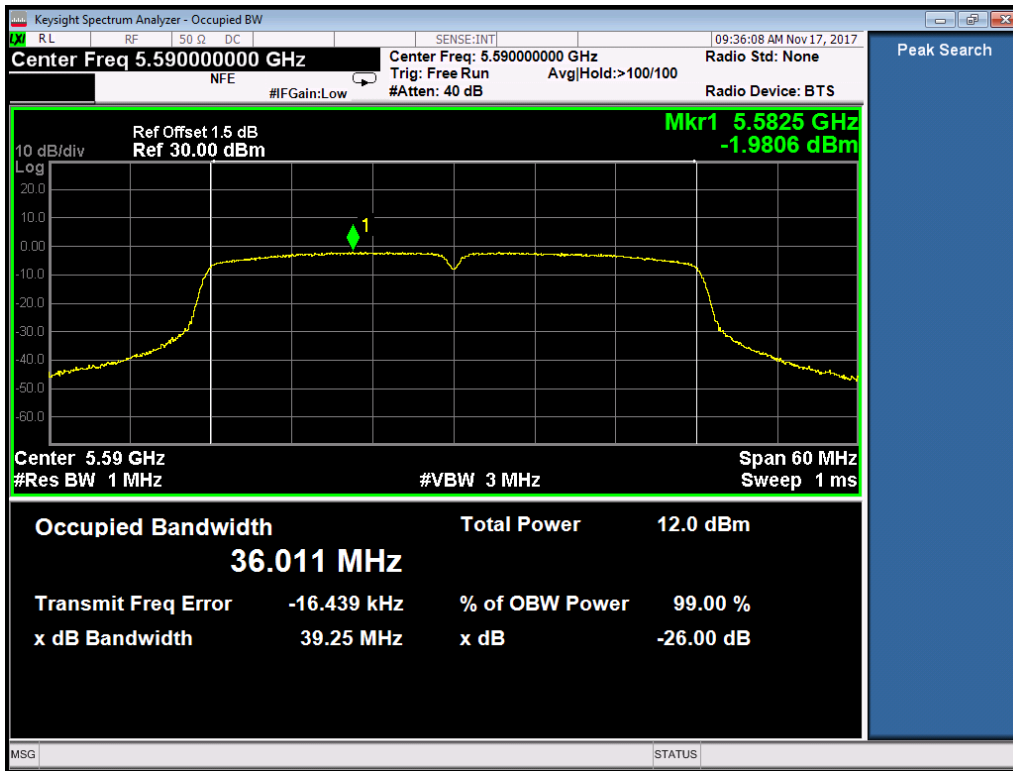
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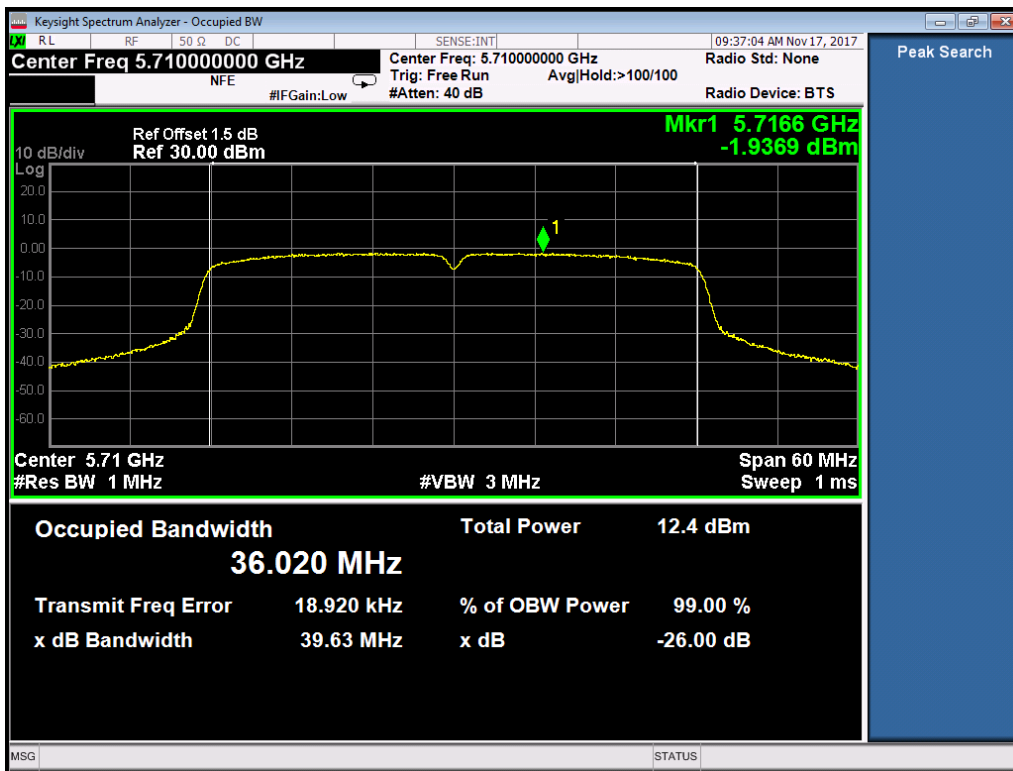
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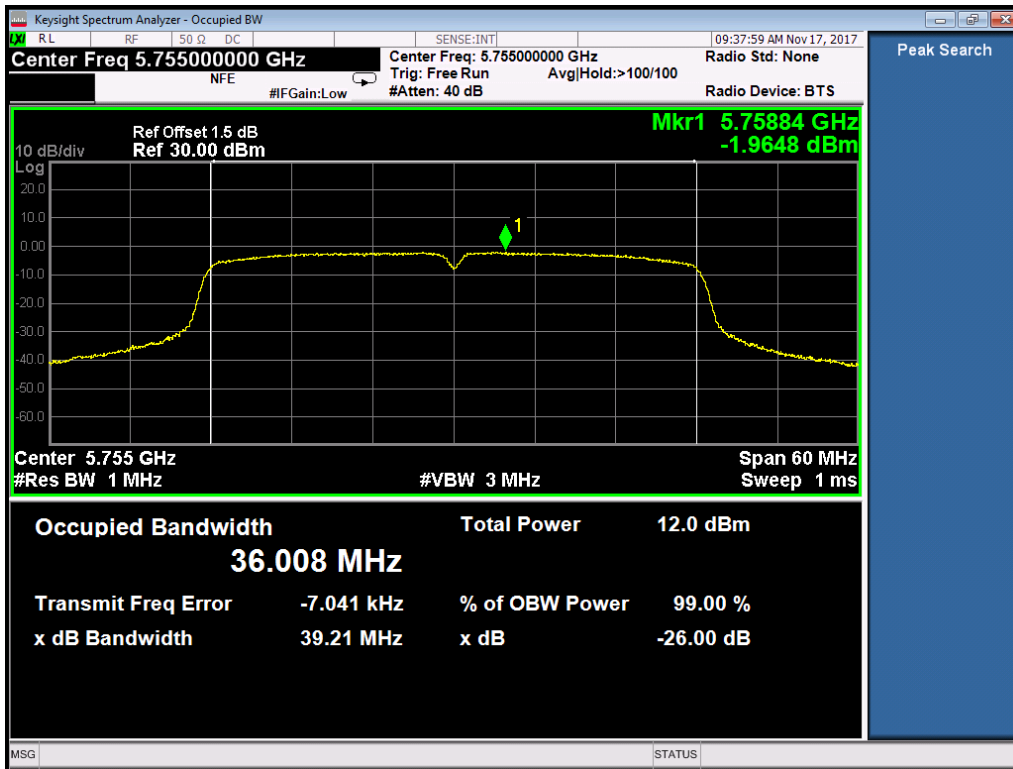
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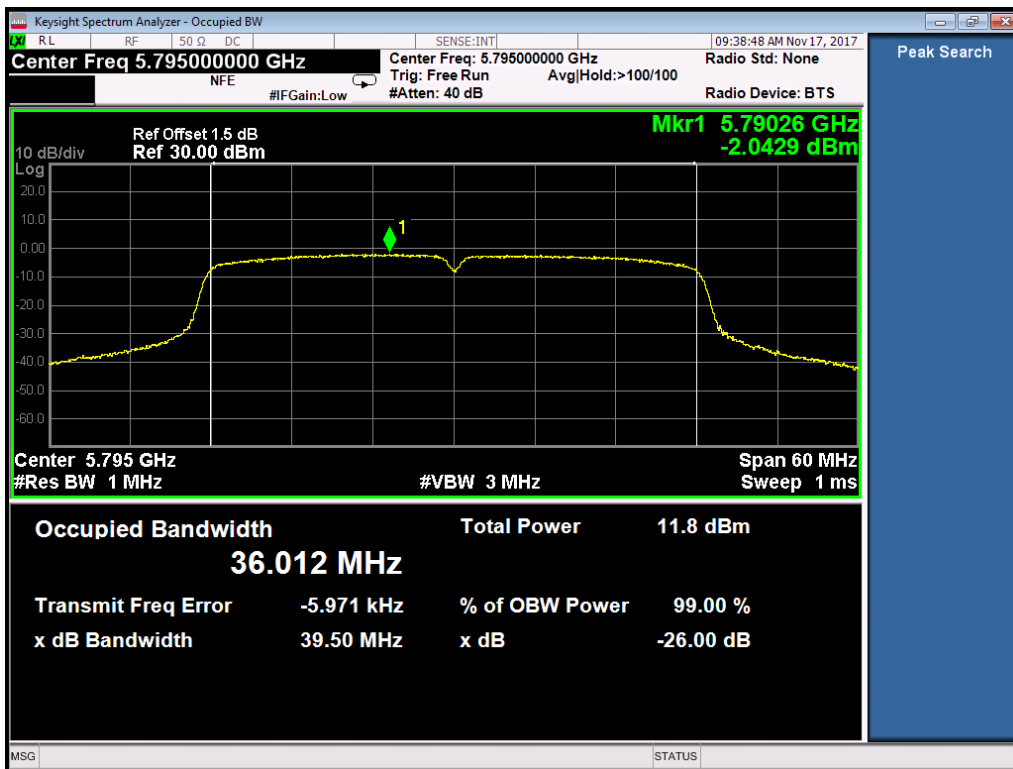
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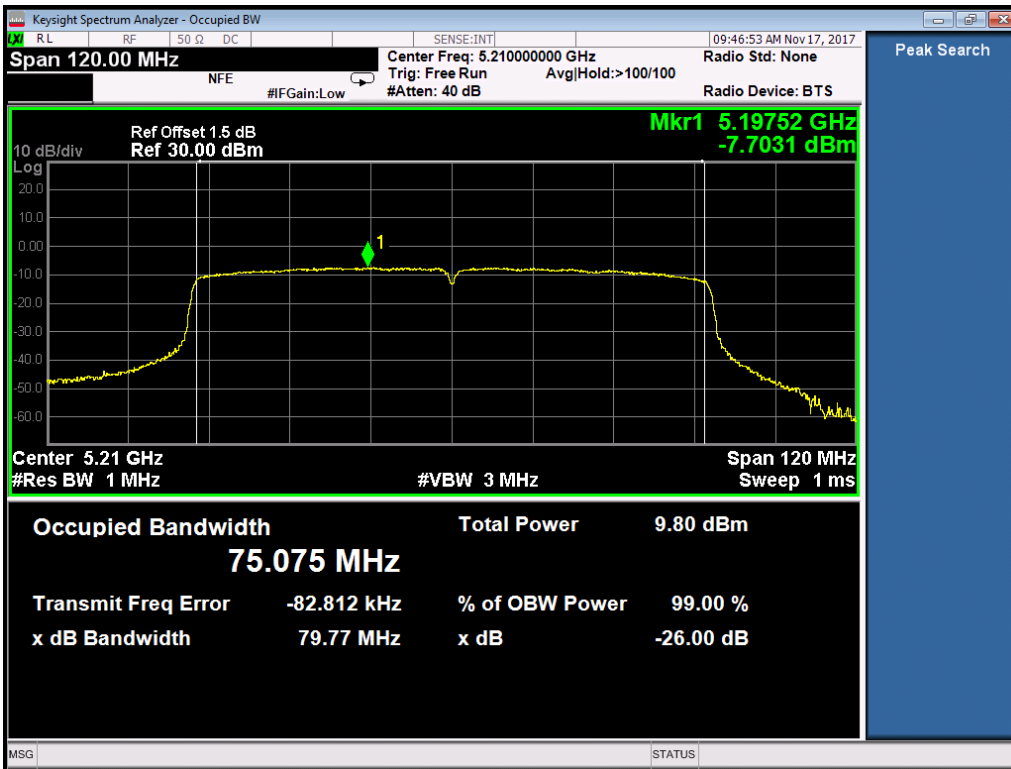


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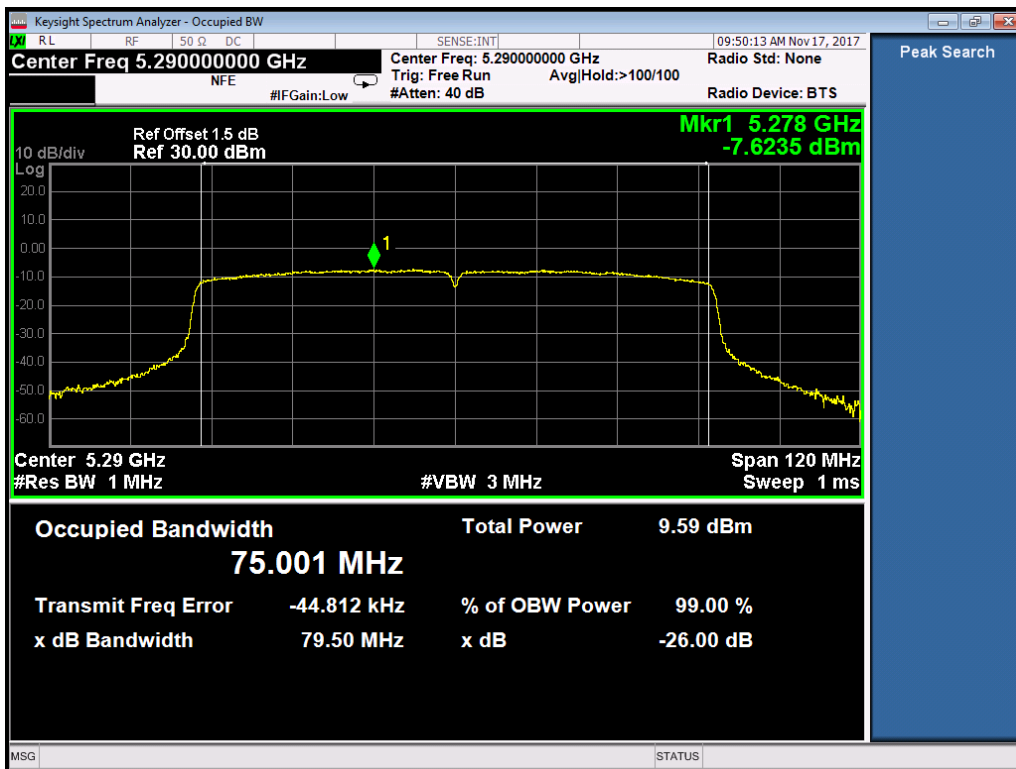


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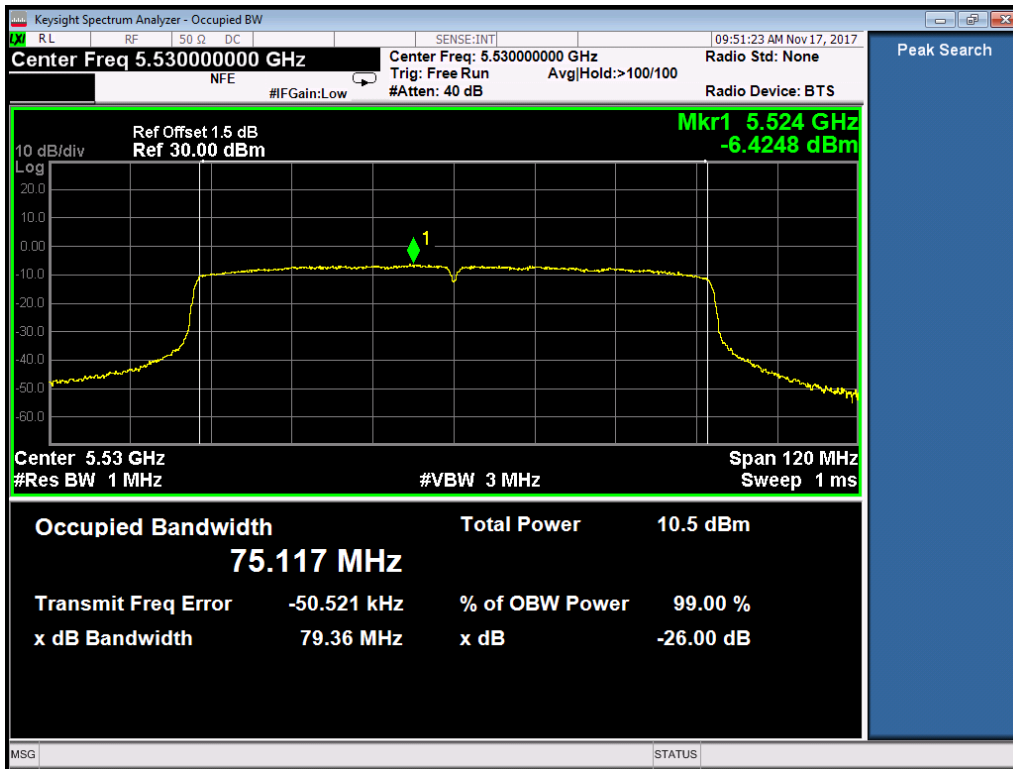
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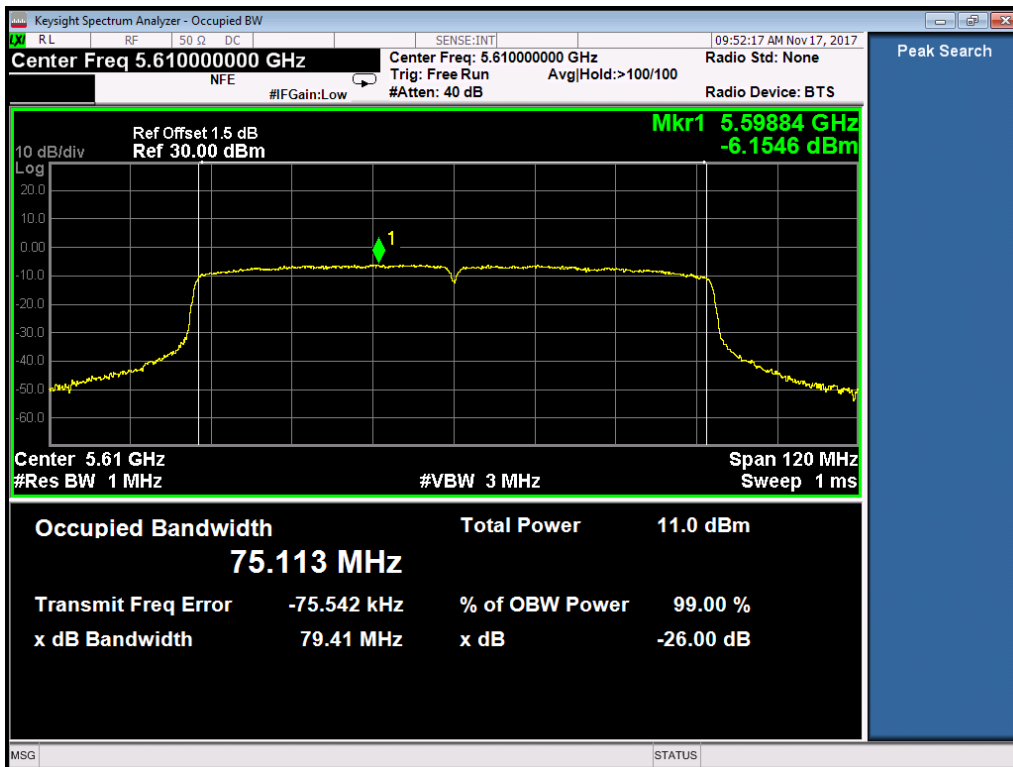
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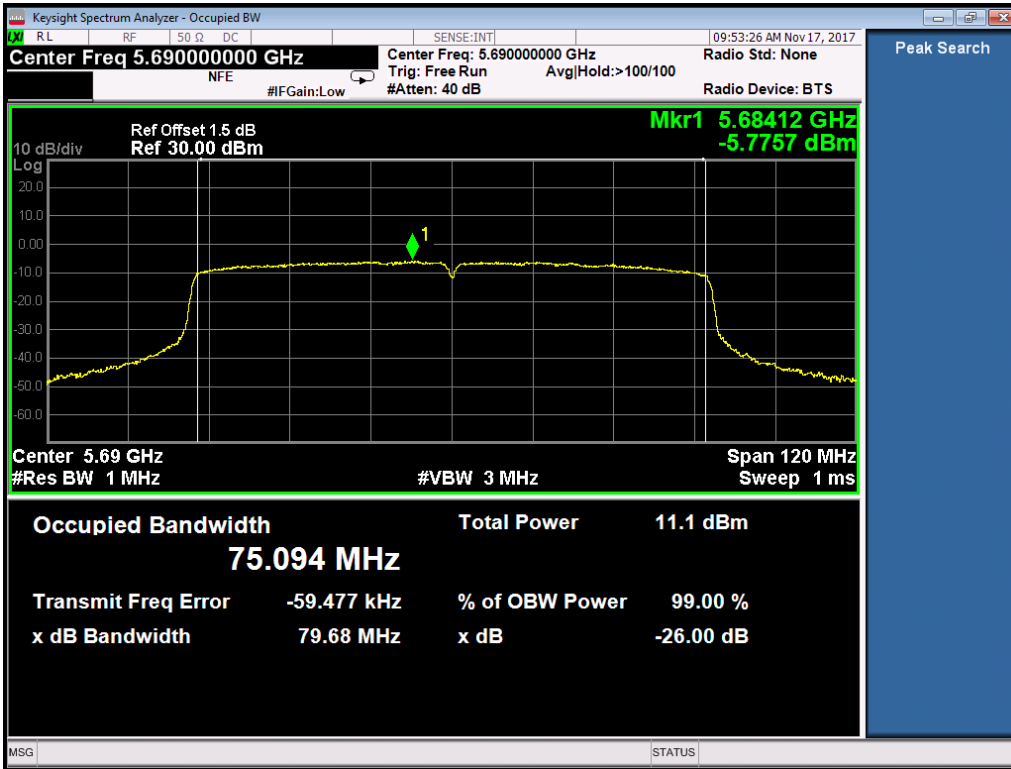
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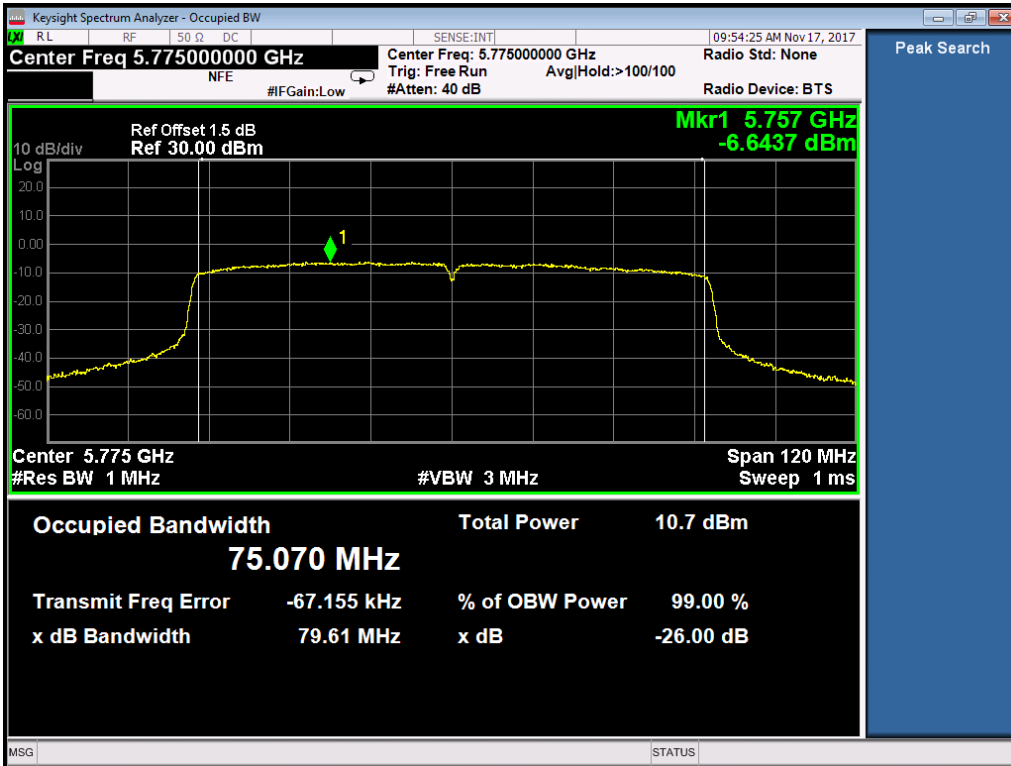
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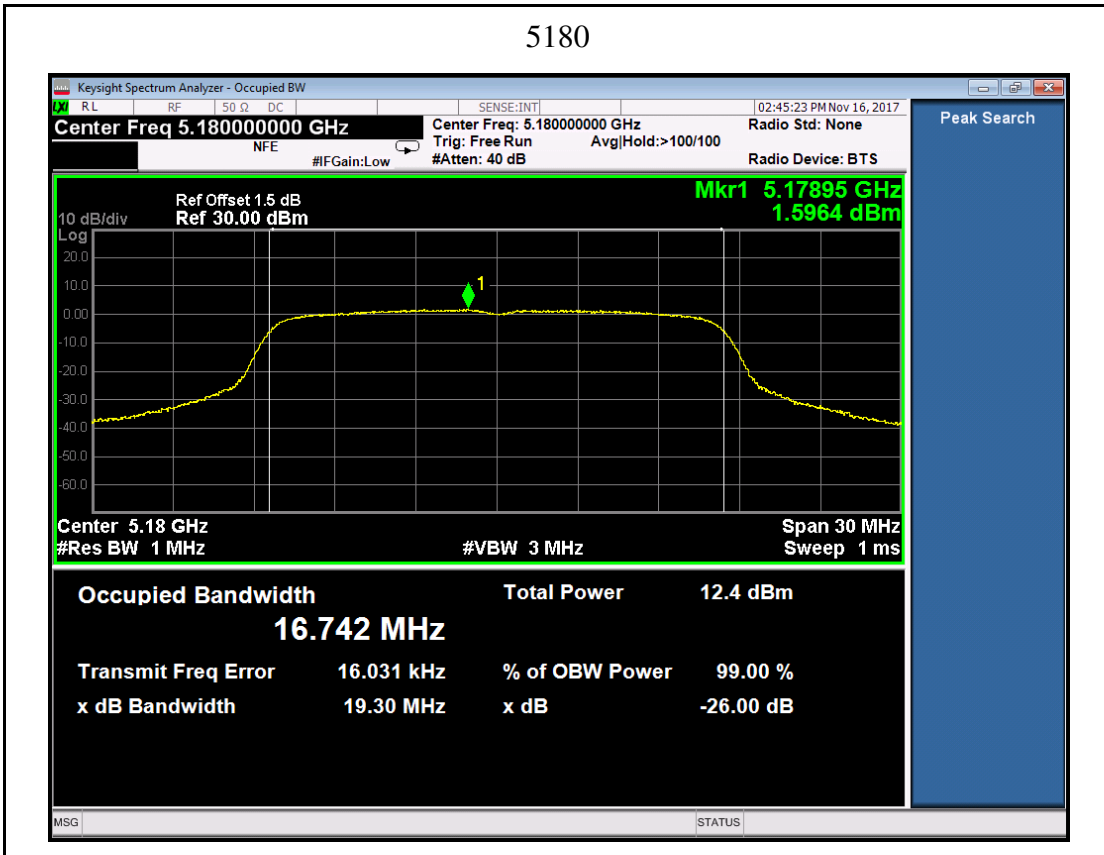
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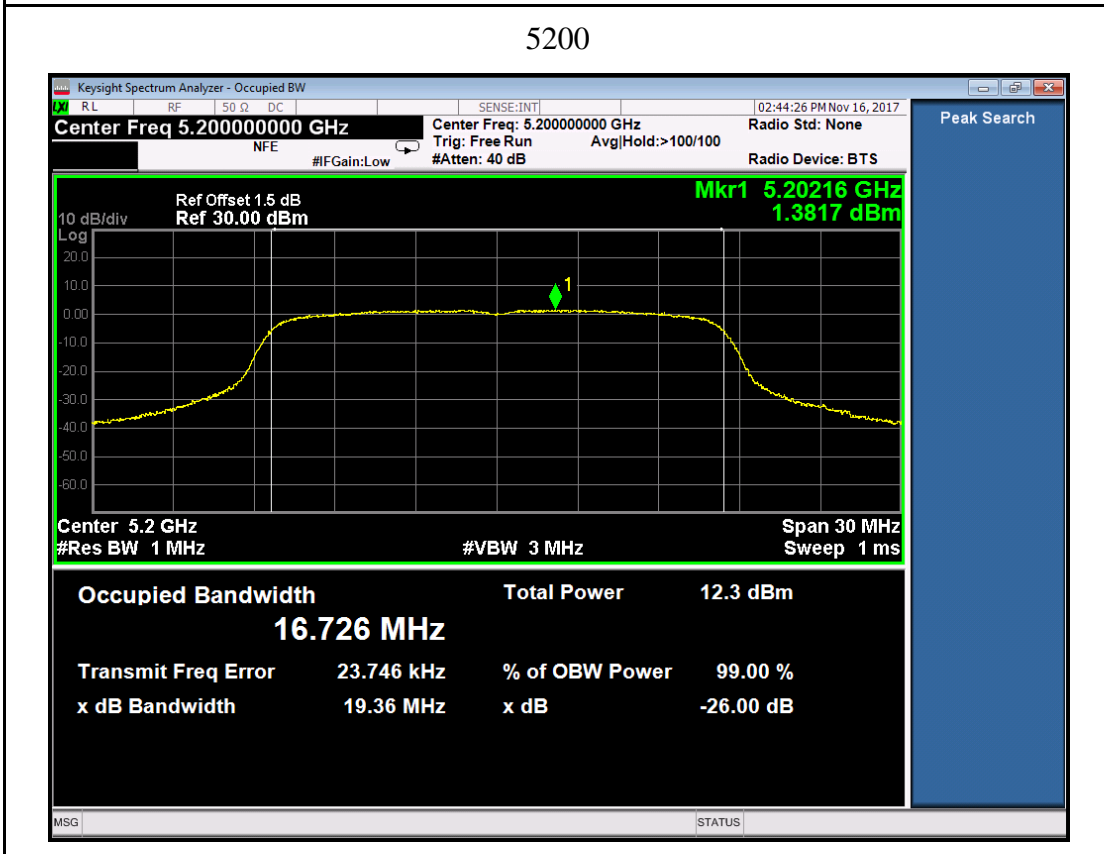
Port 1

802.11a

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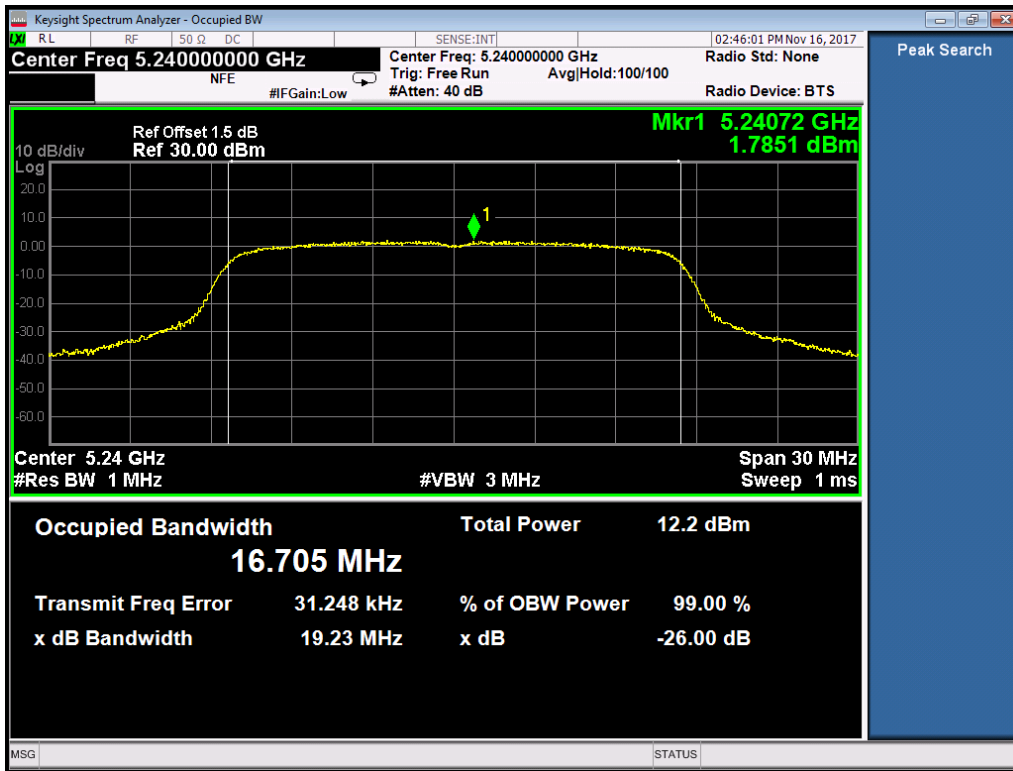


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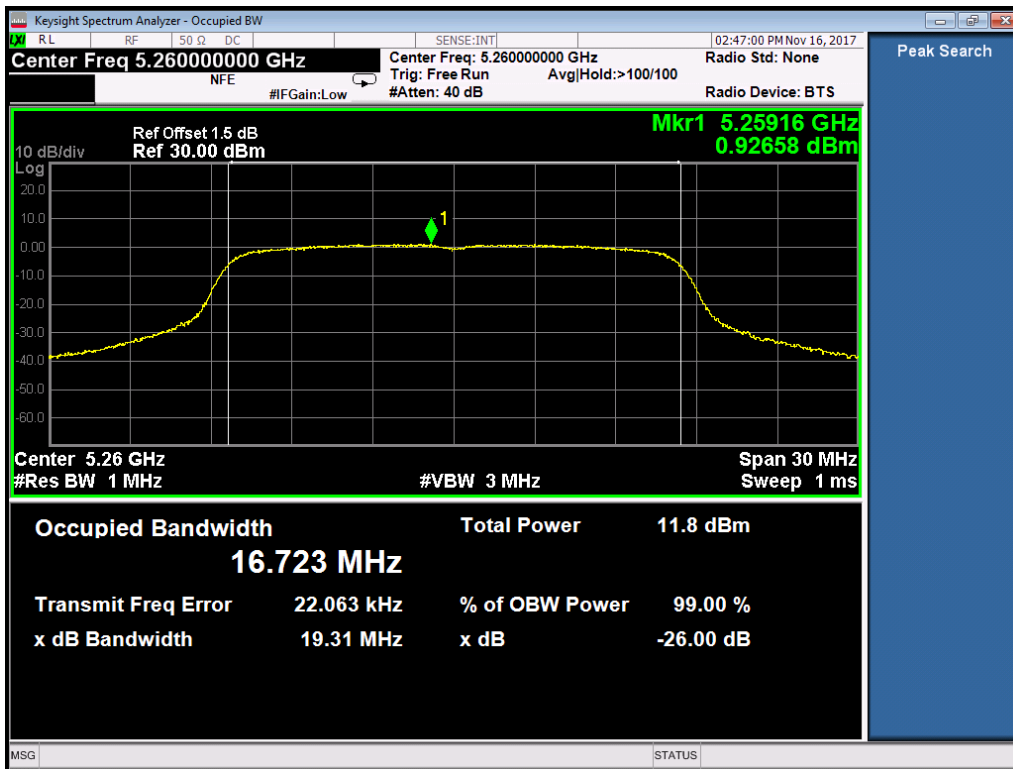




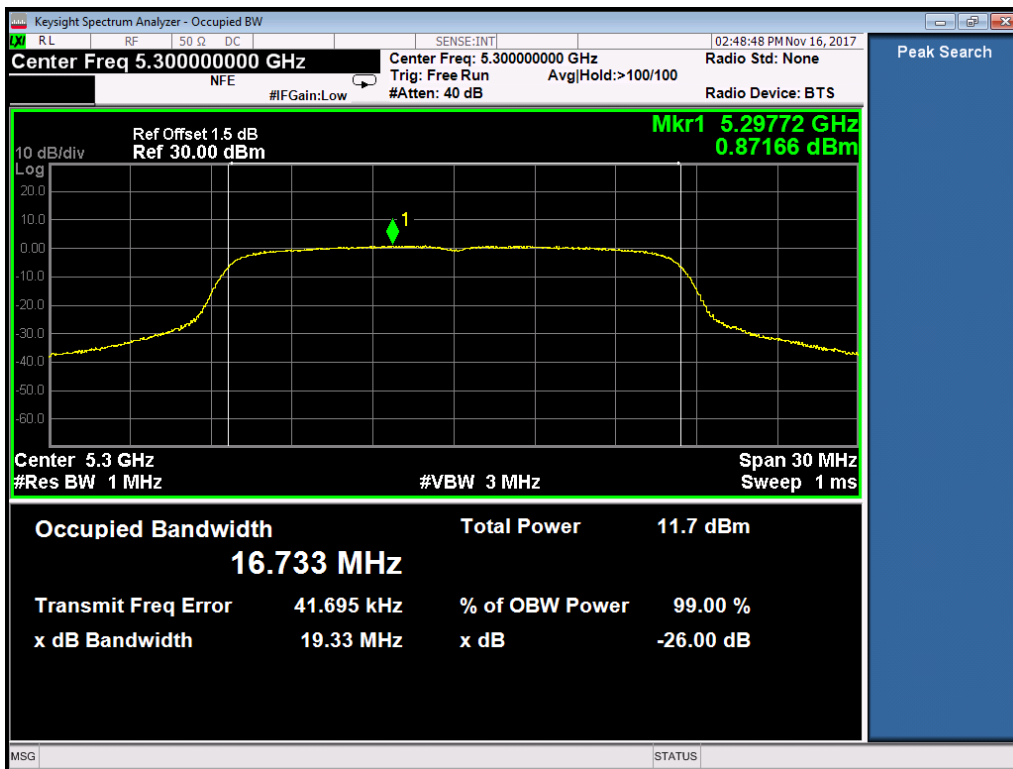
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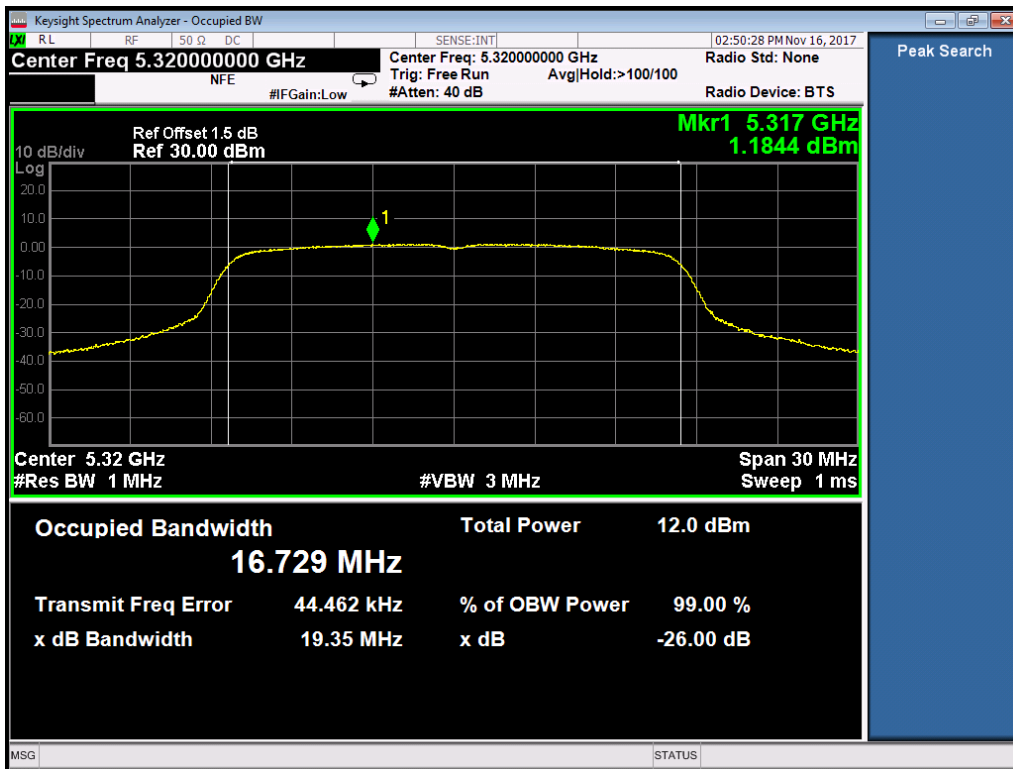
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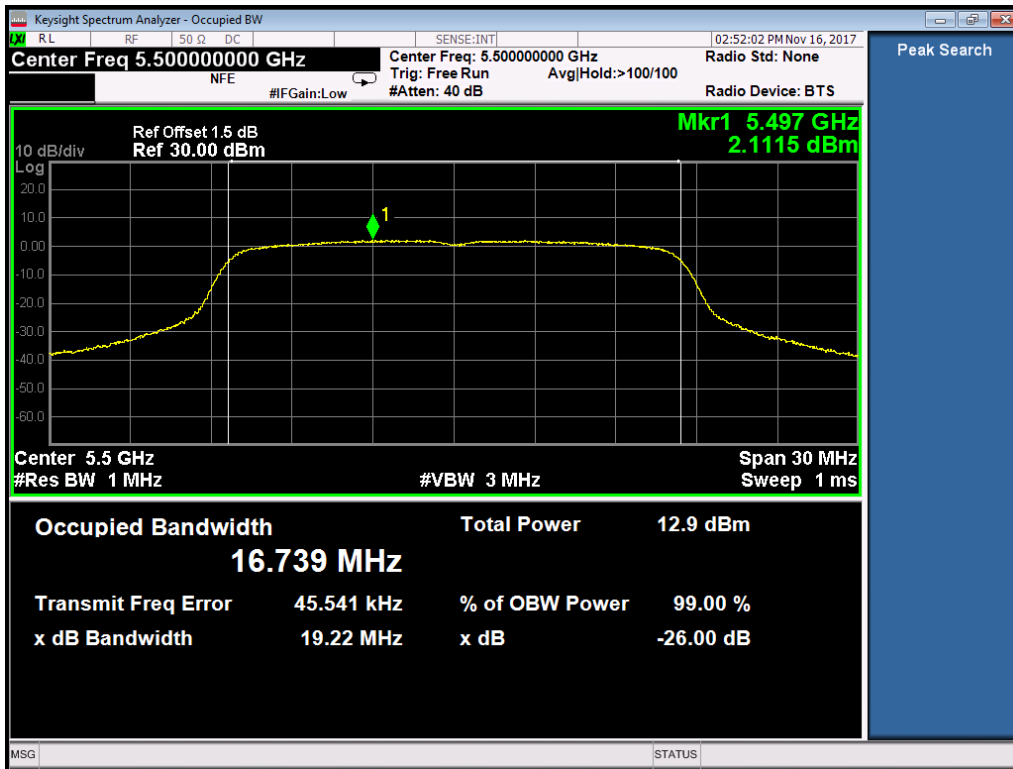
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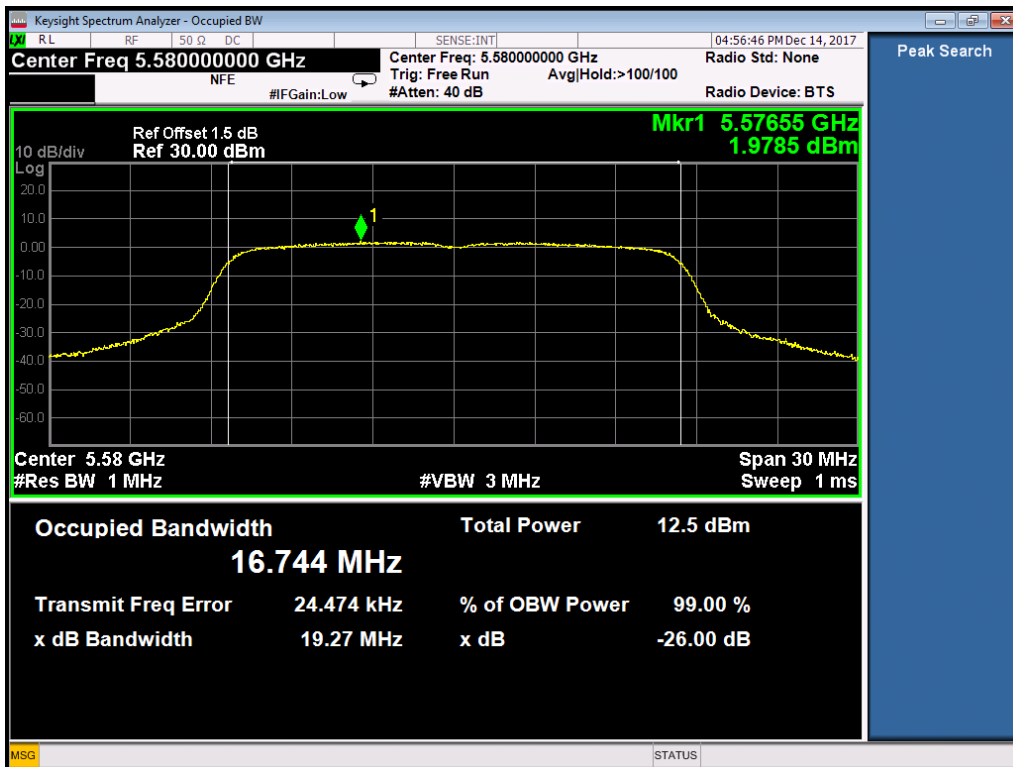
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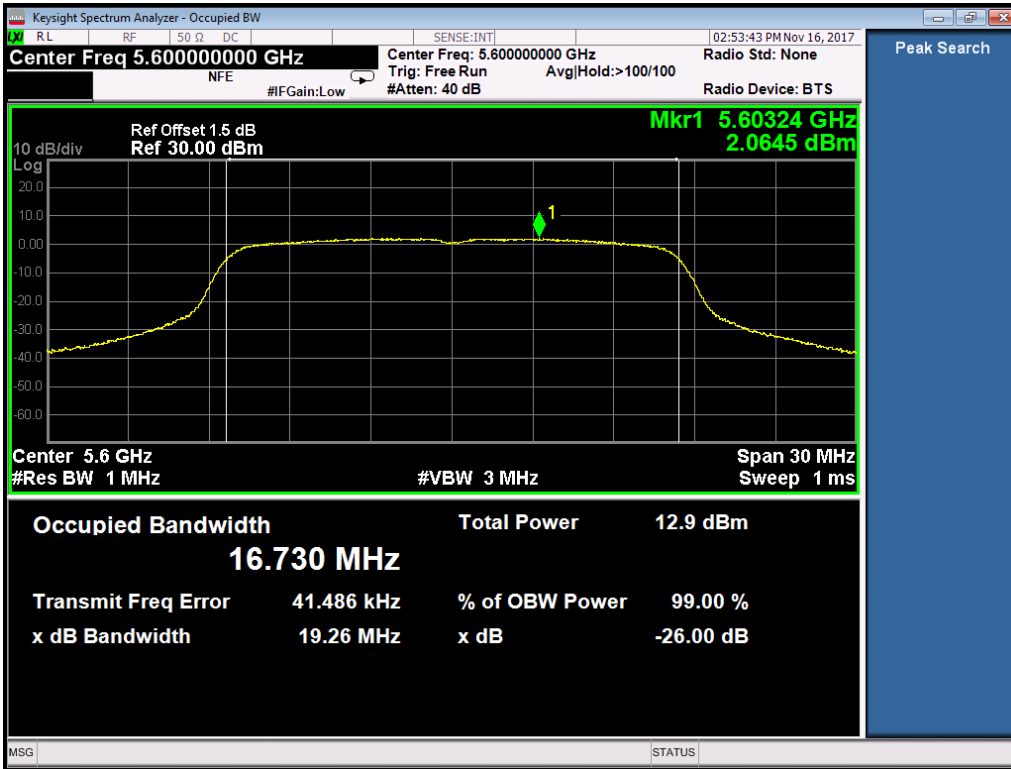
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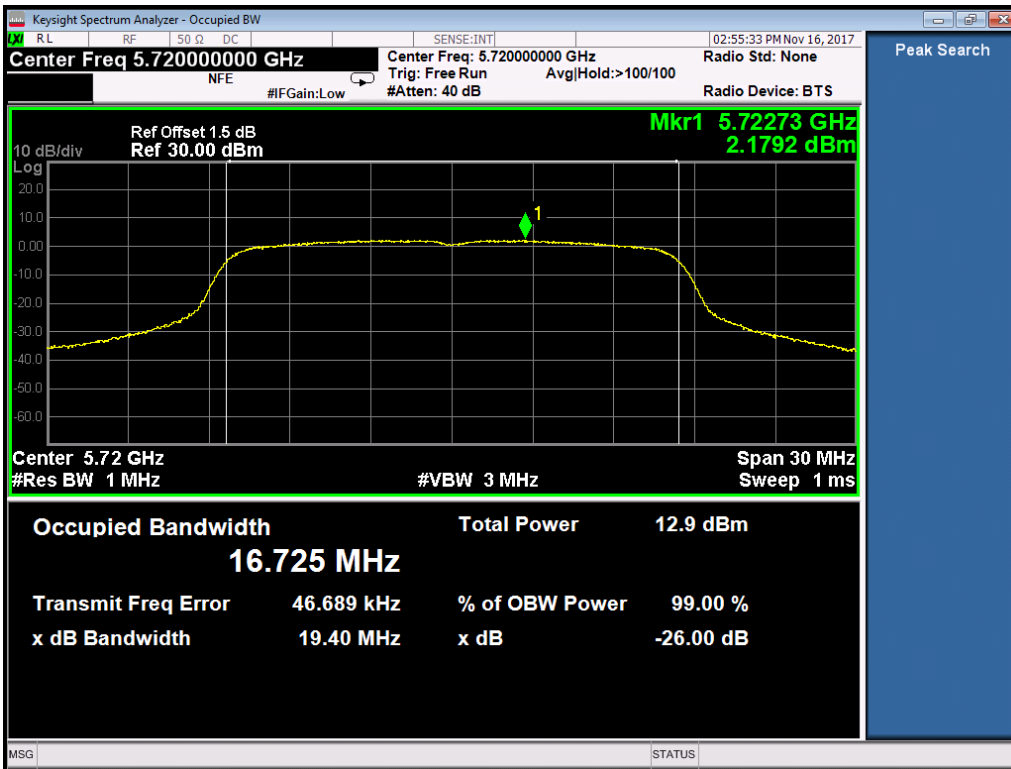
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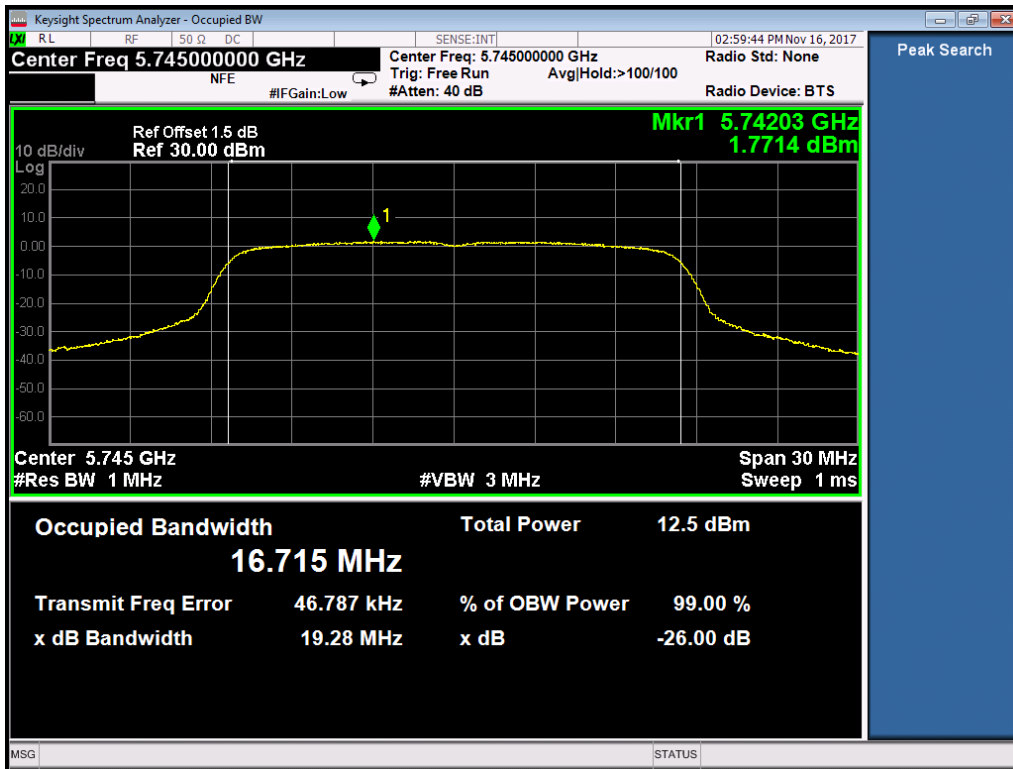
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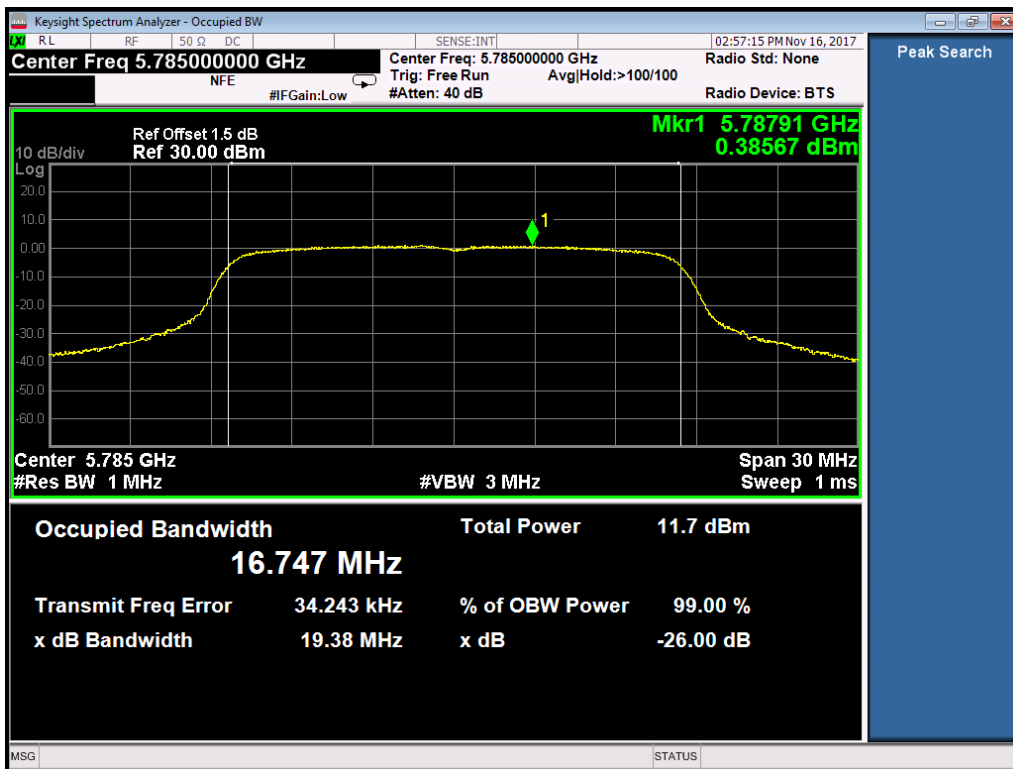
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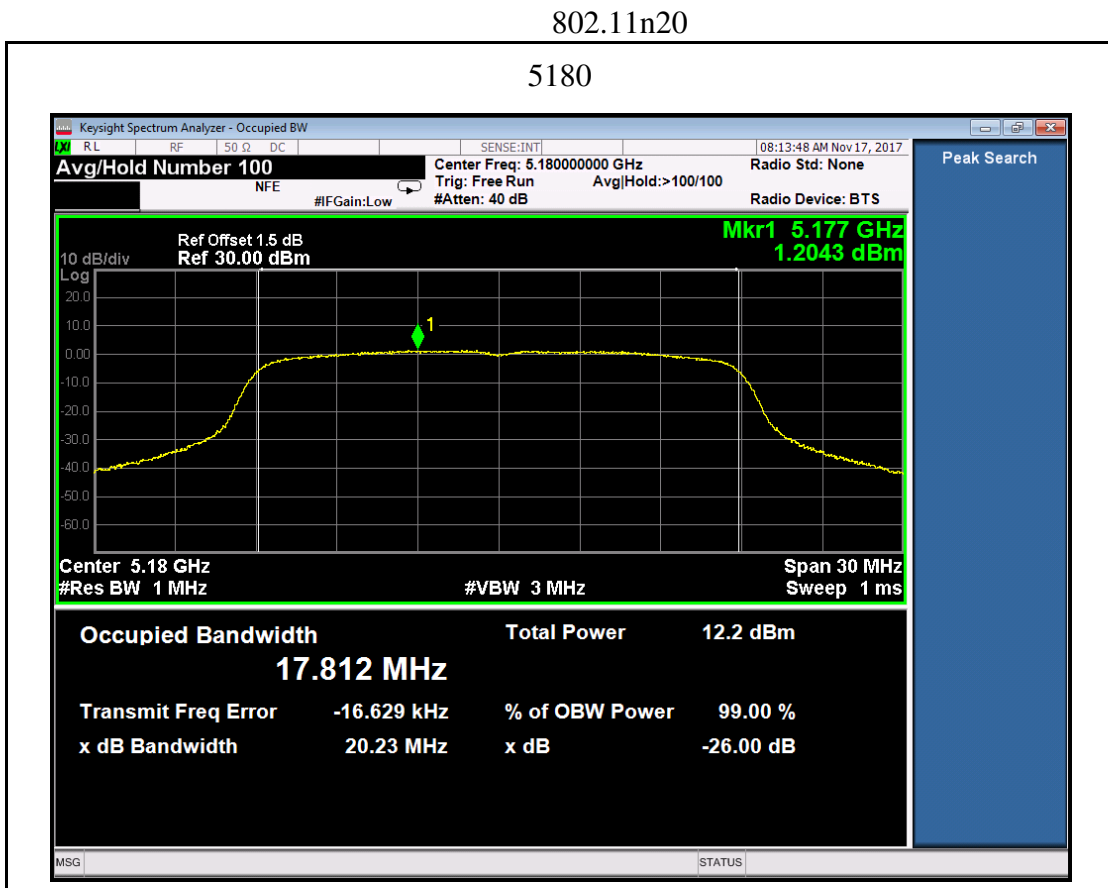
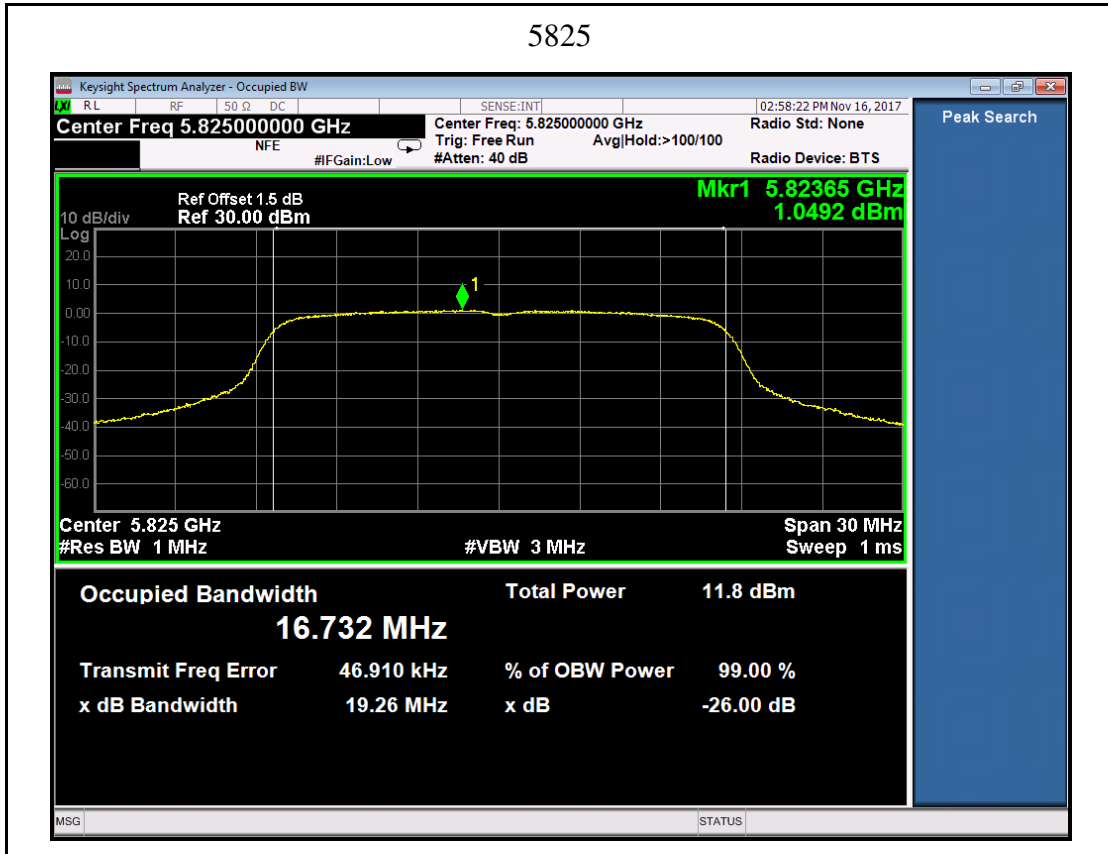


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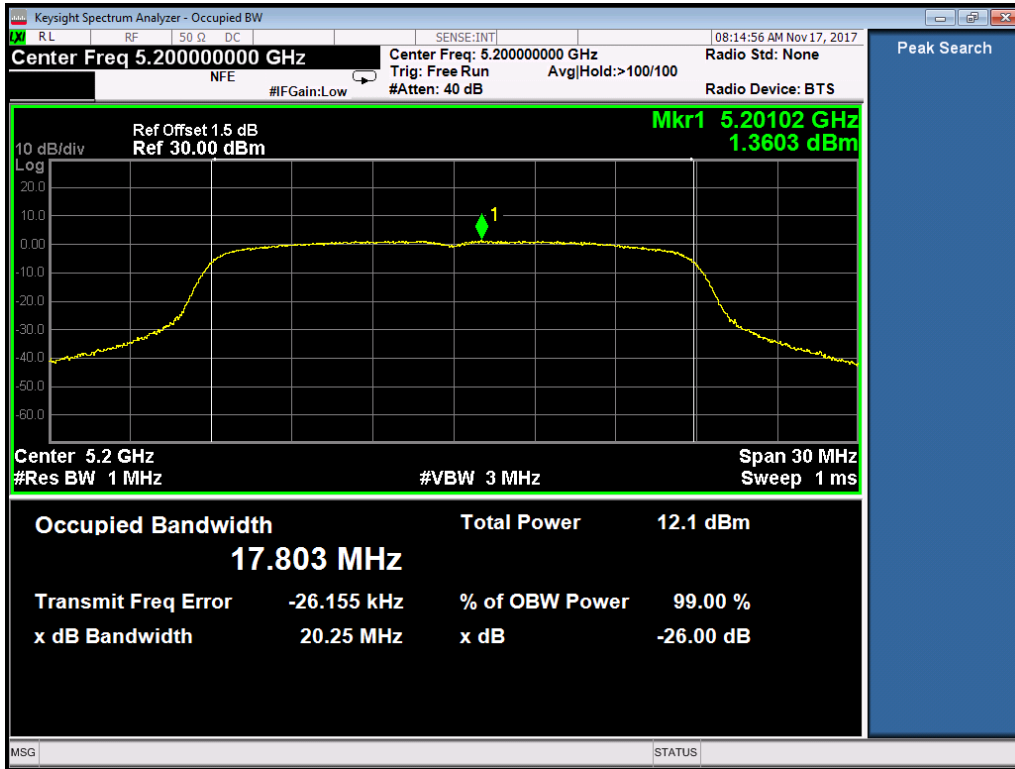


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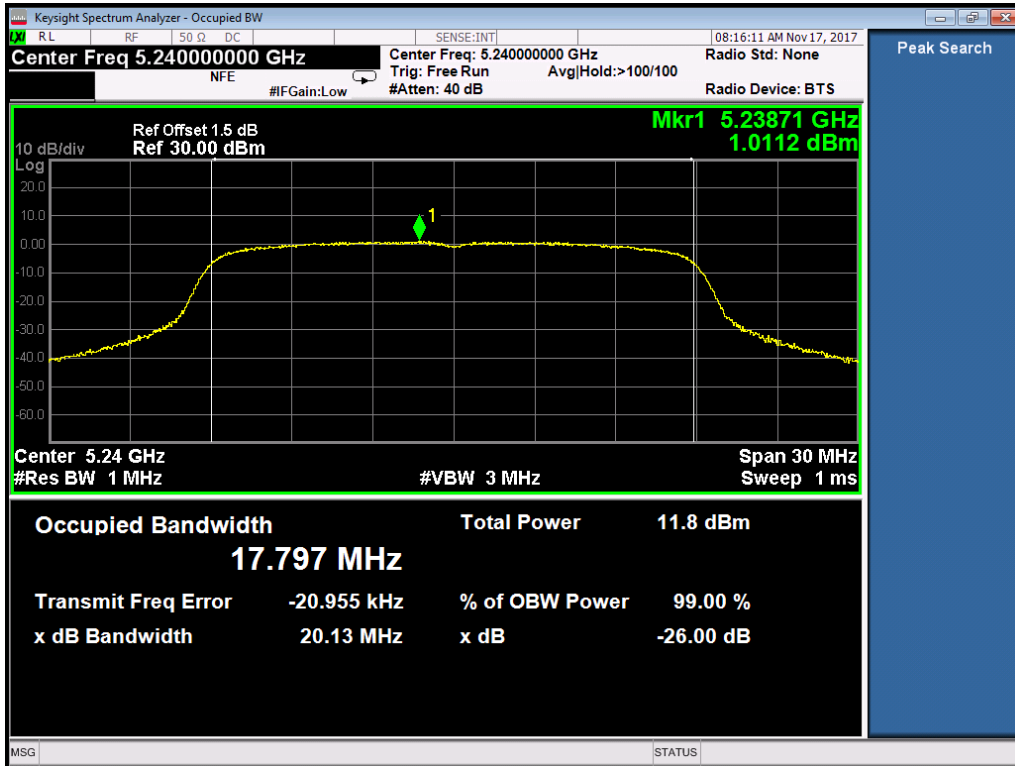




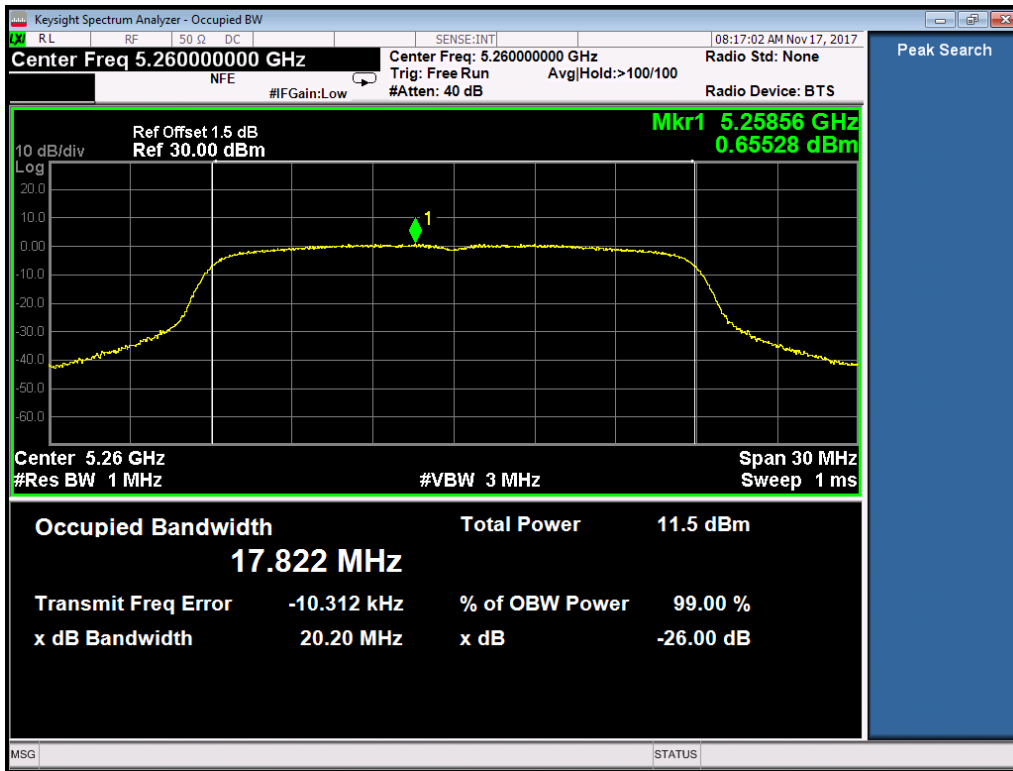
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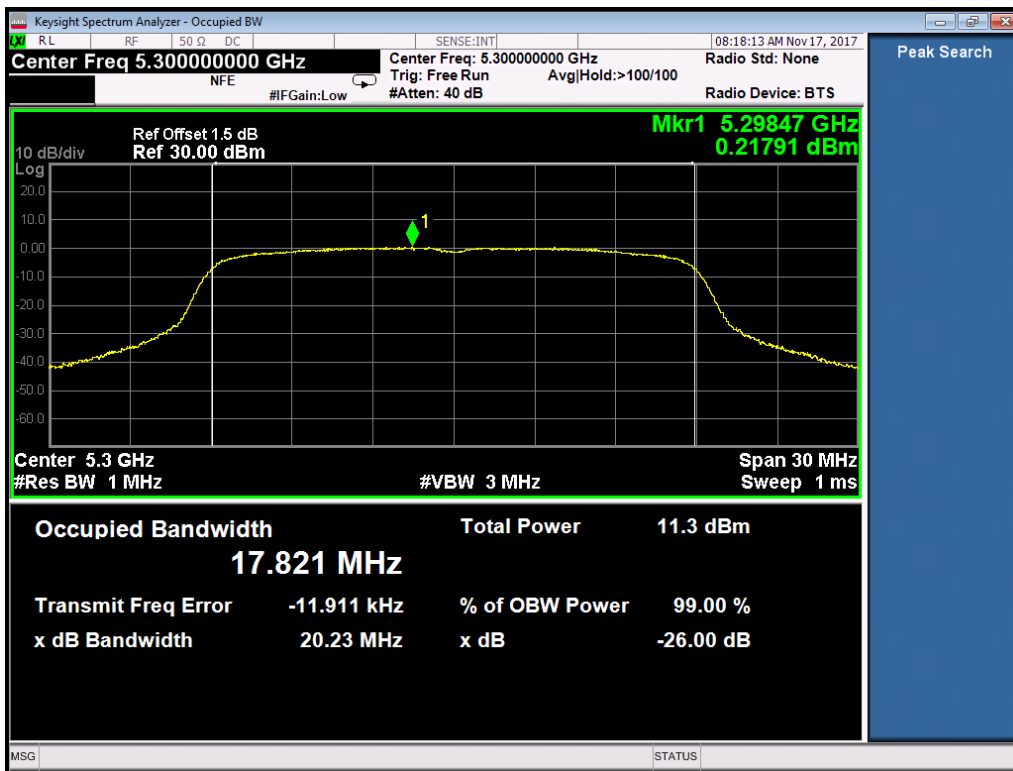
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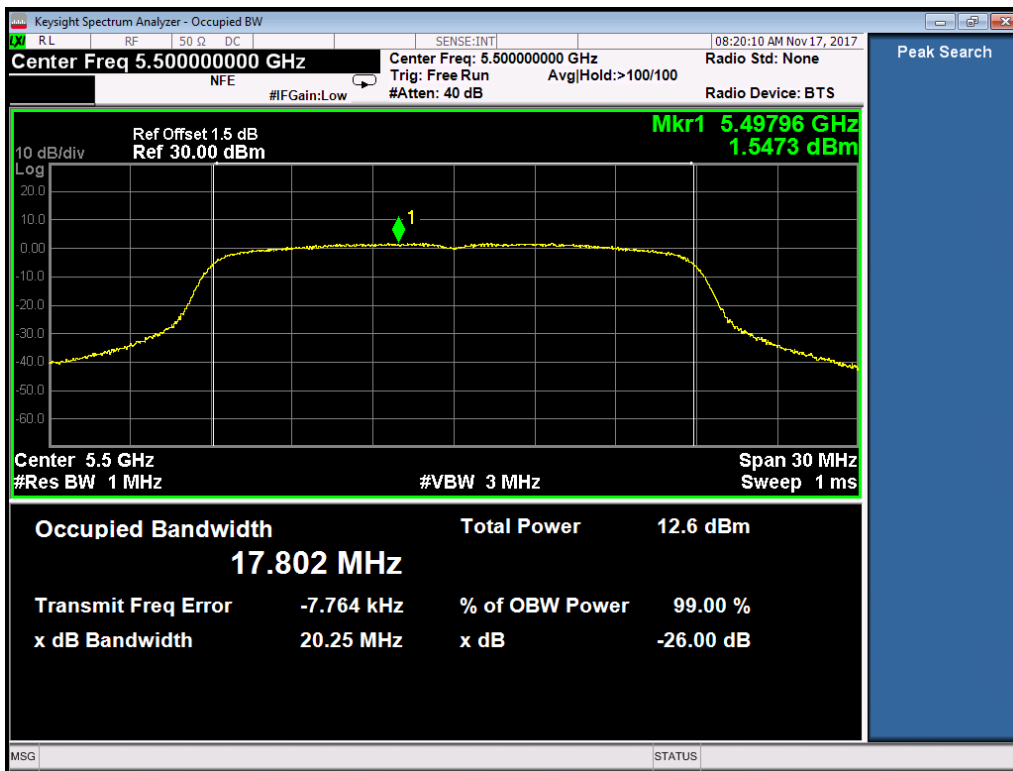




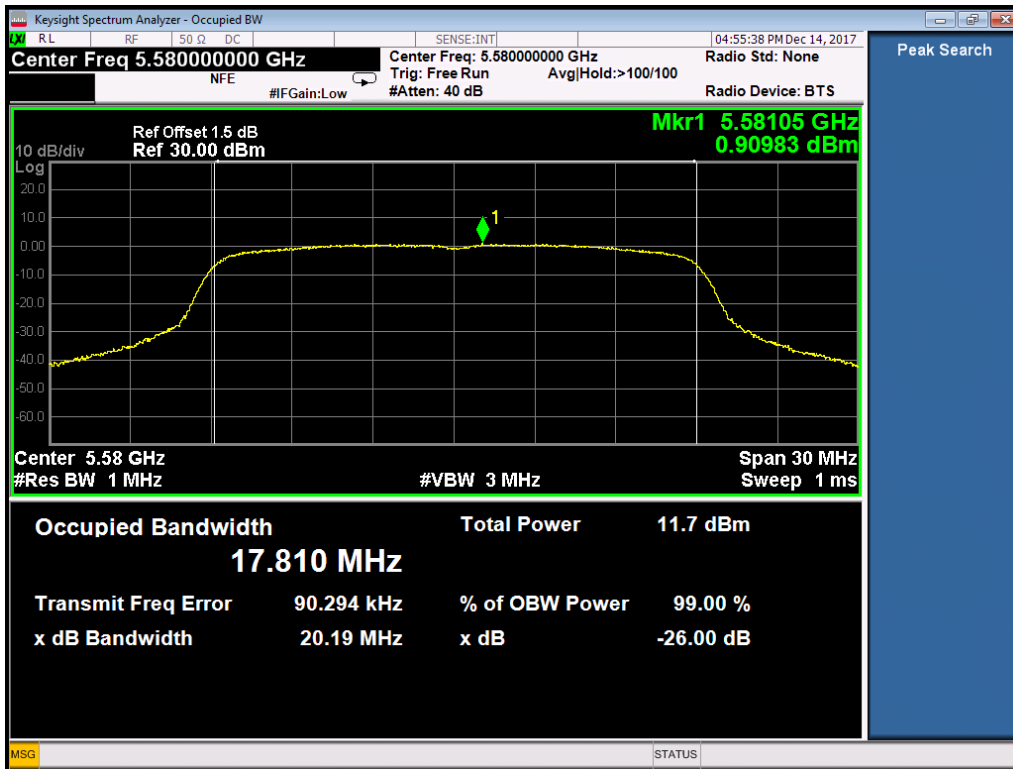
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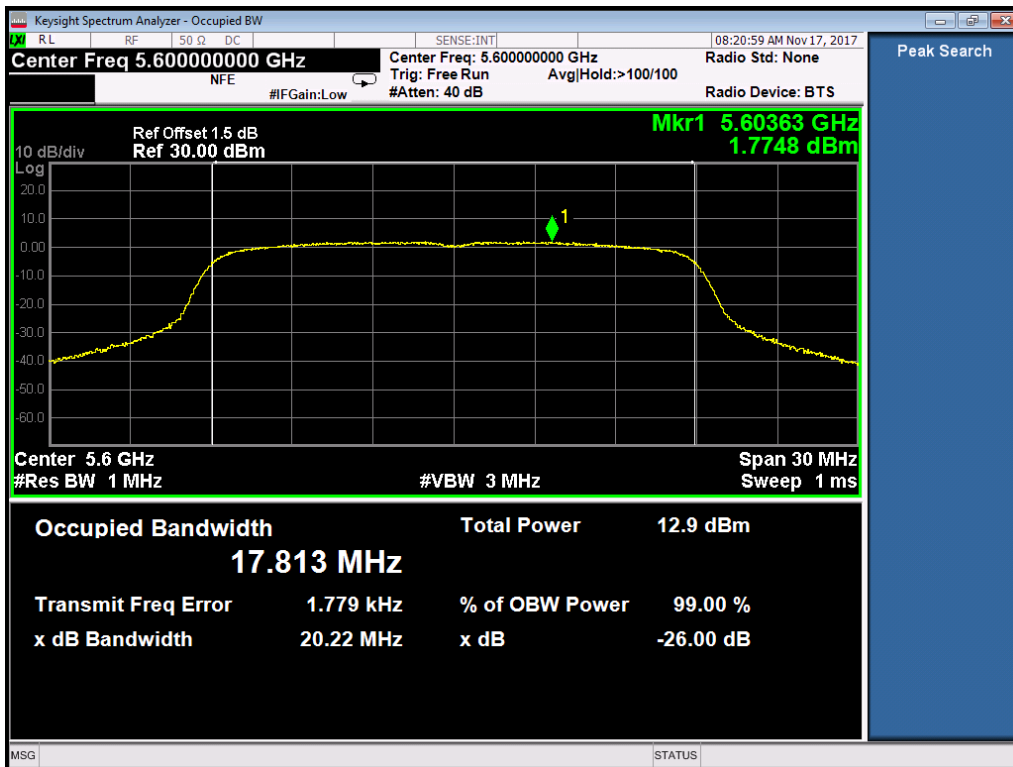
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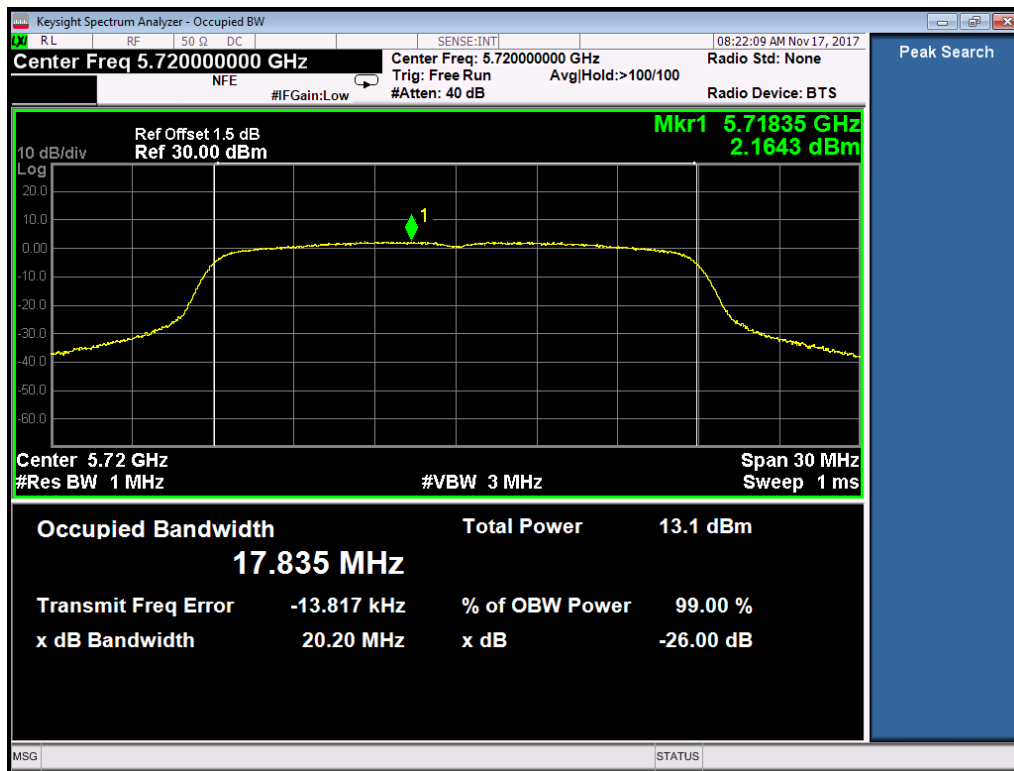
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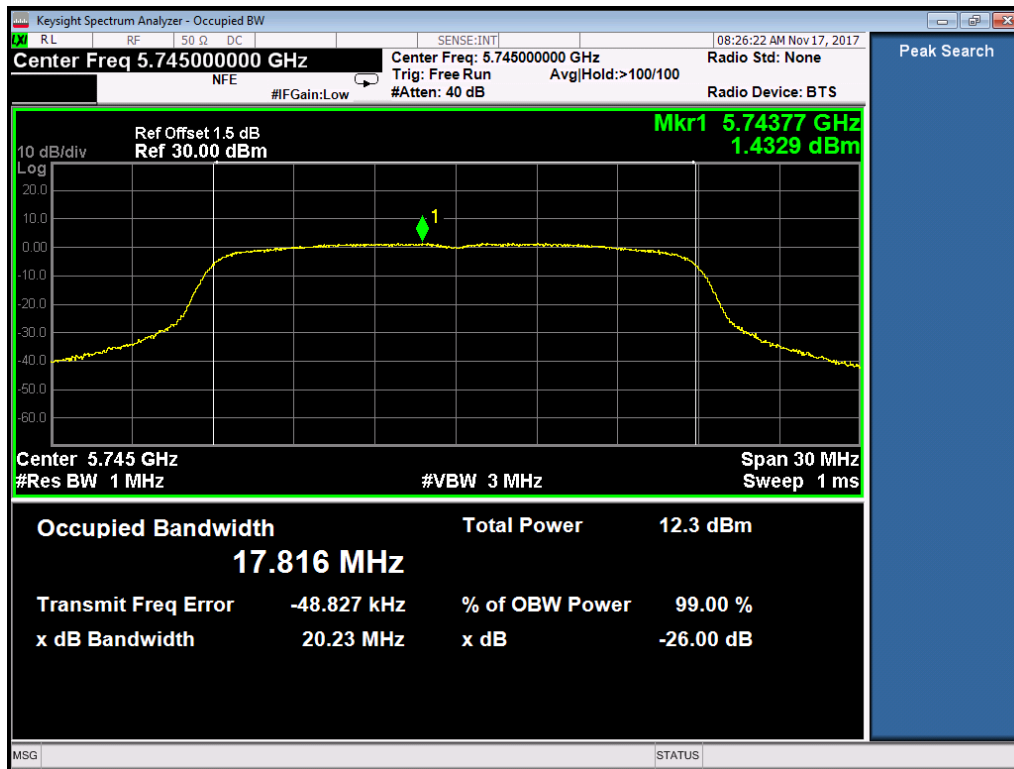
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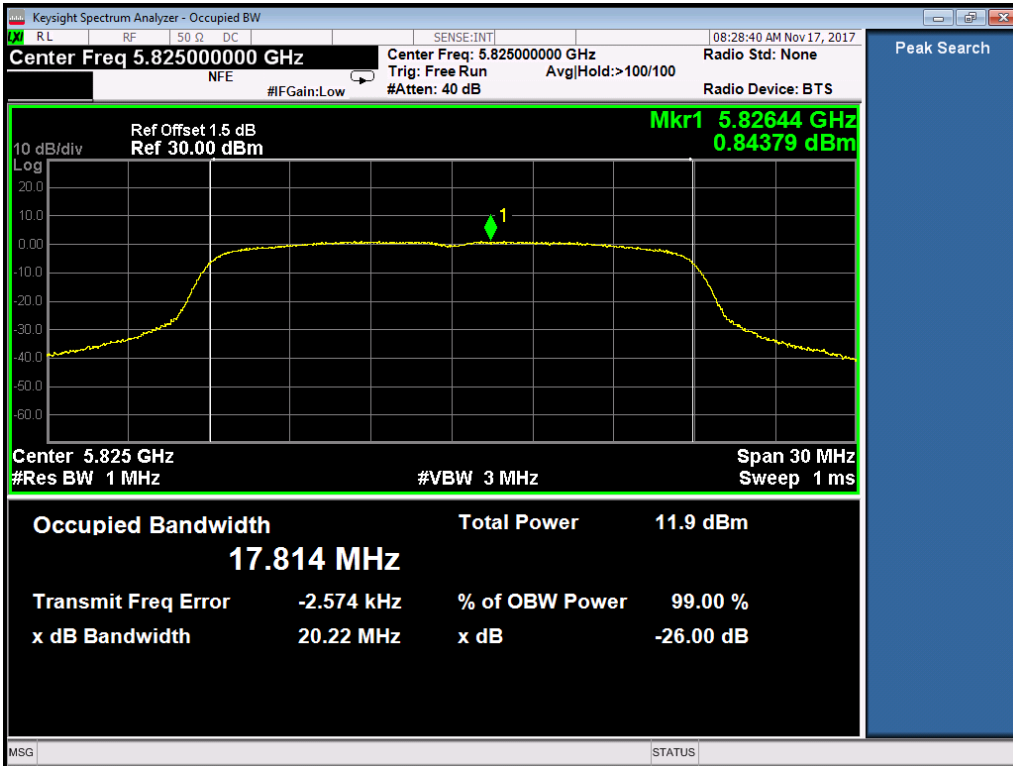
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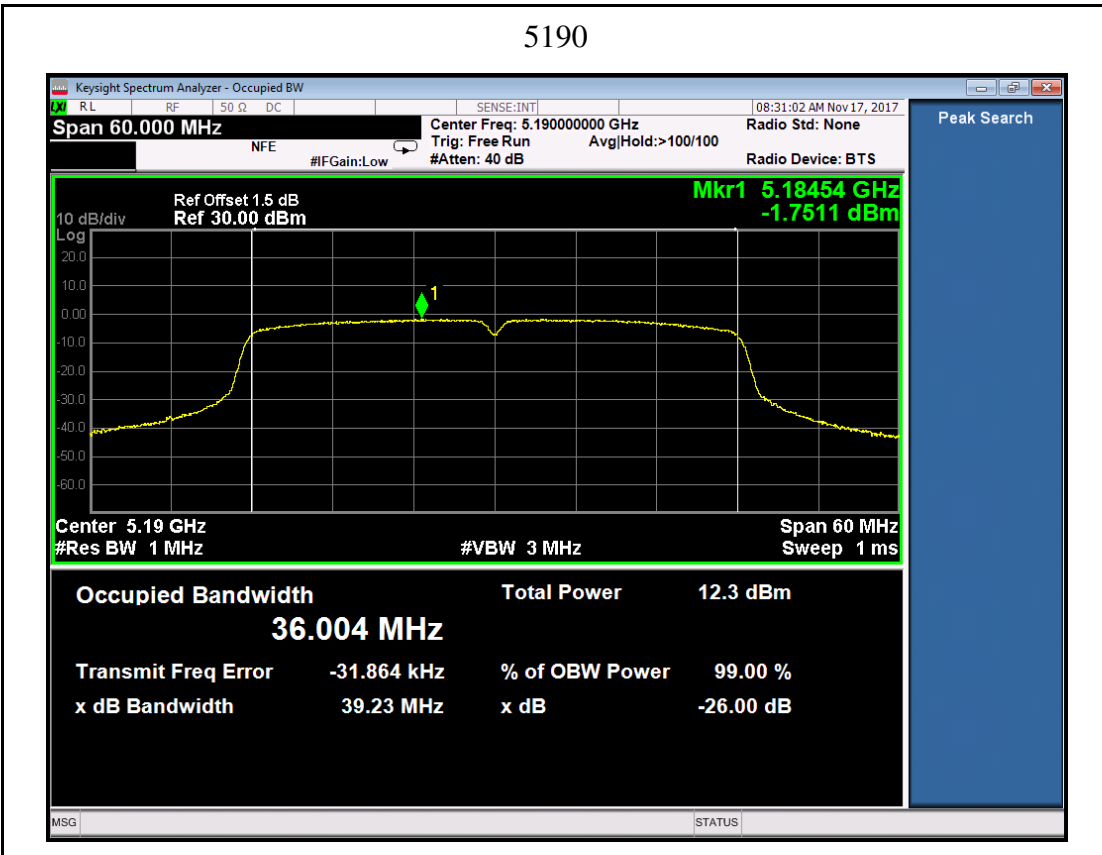


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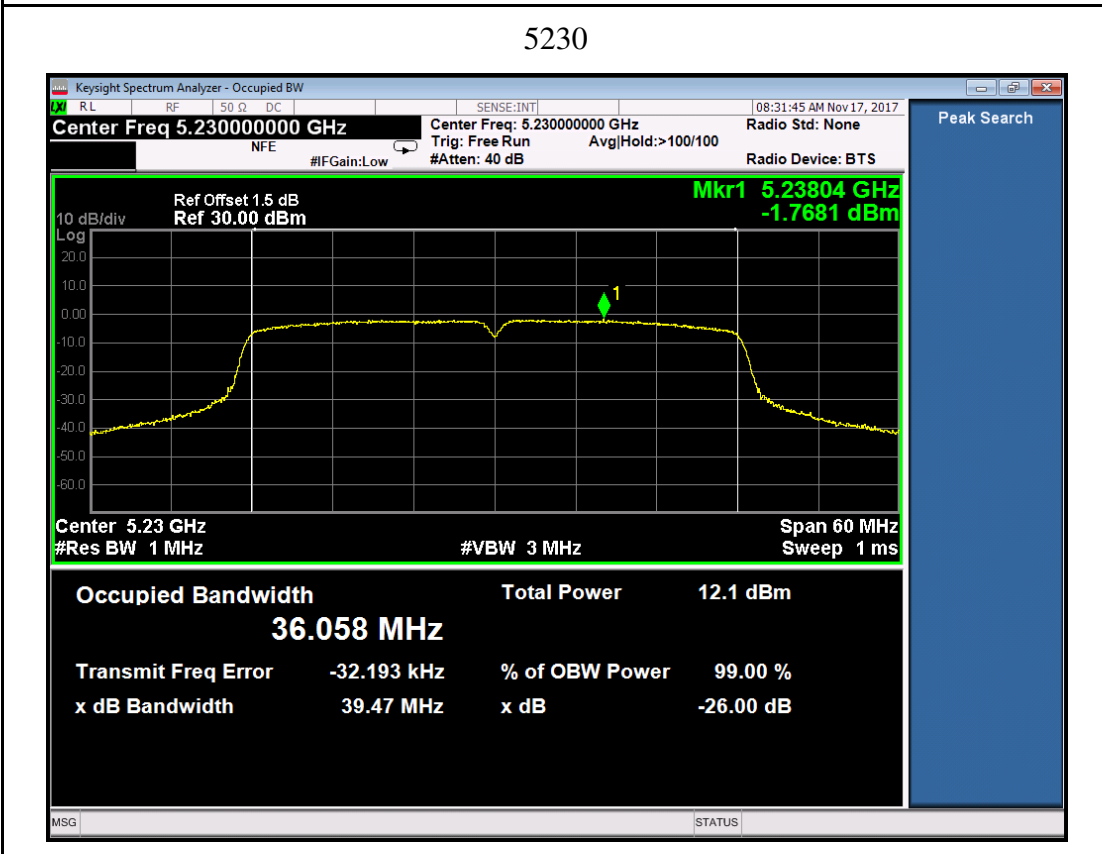


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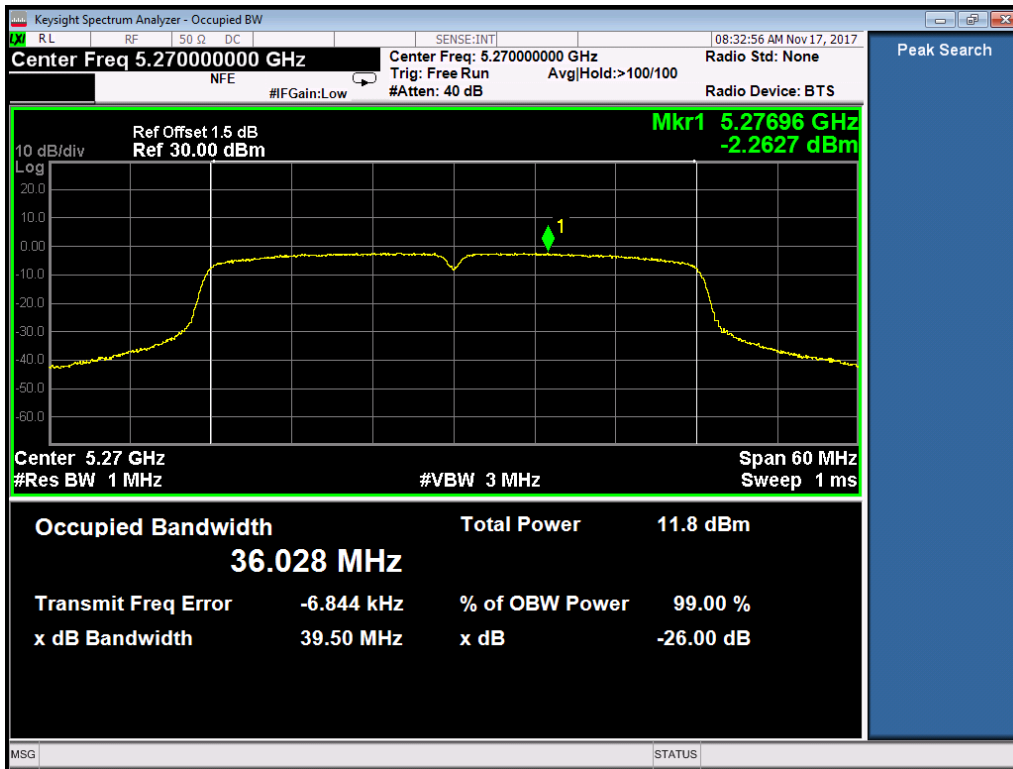
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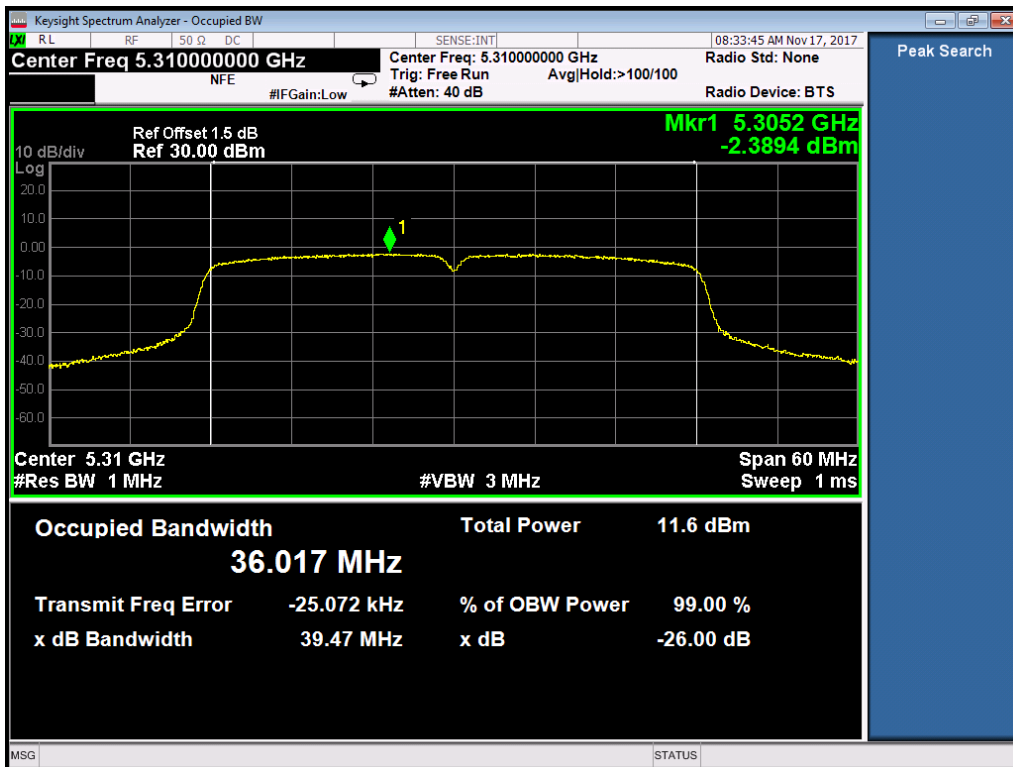
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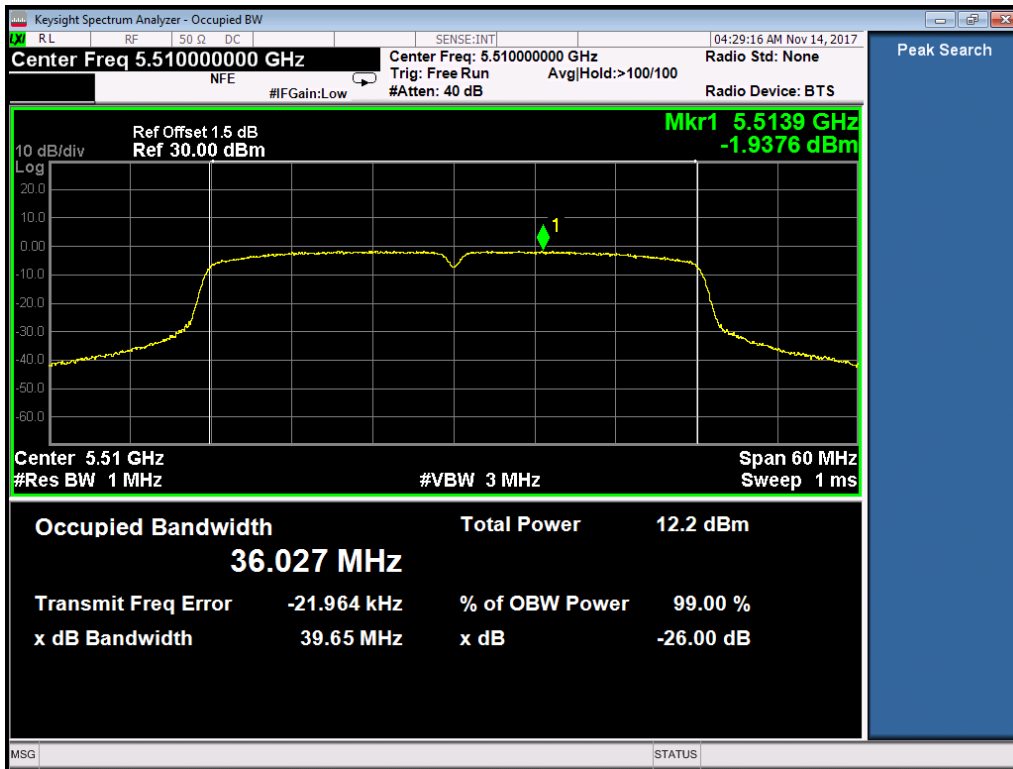
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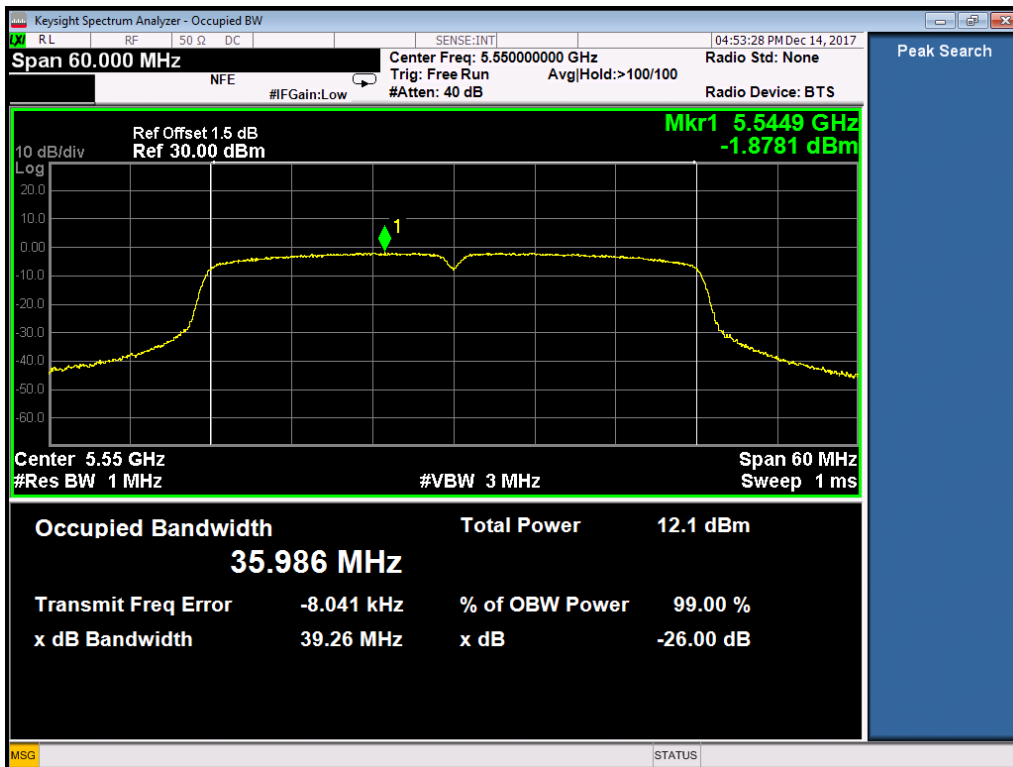
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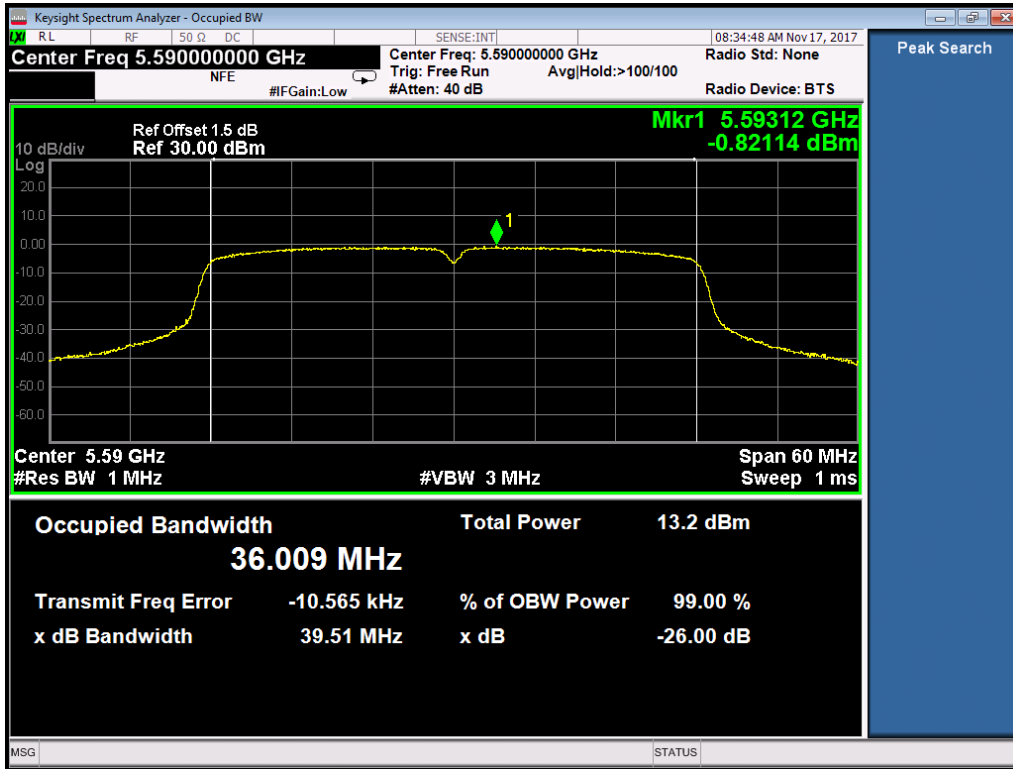
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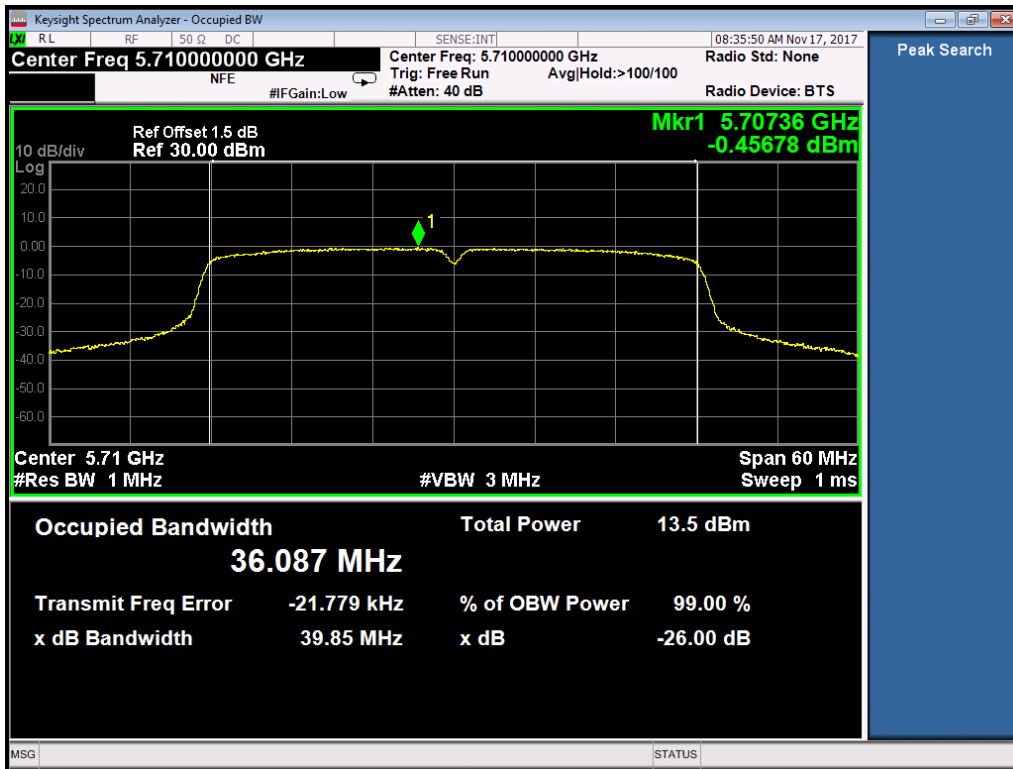
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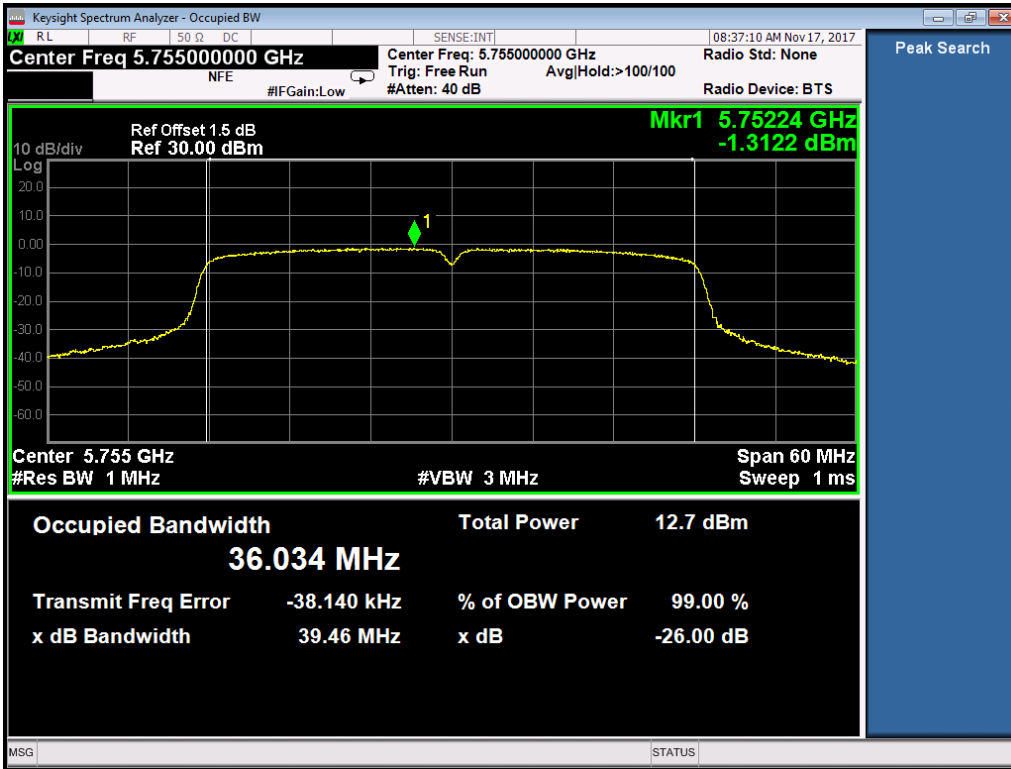


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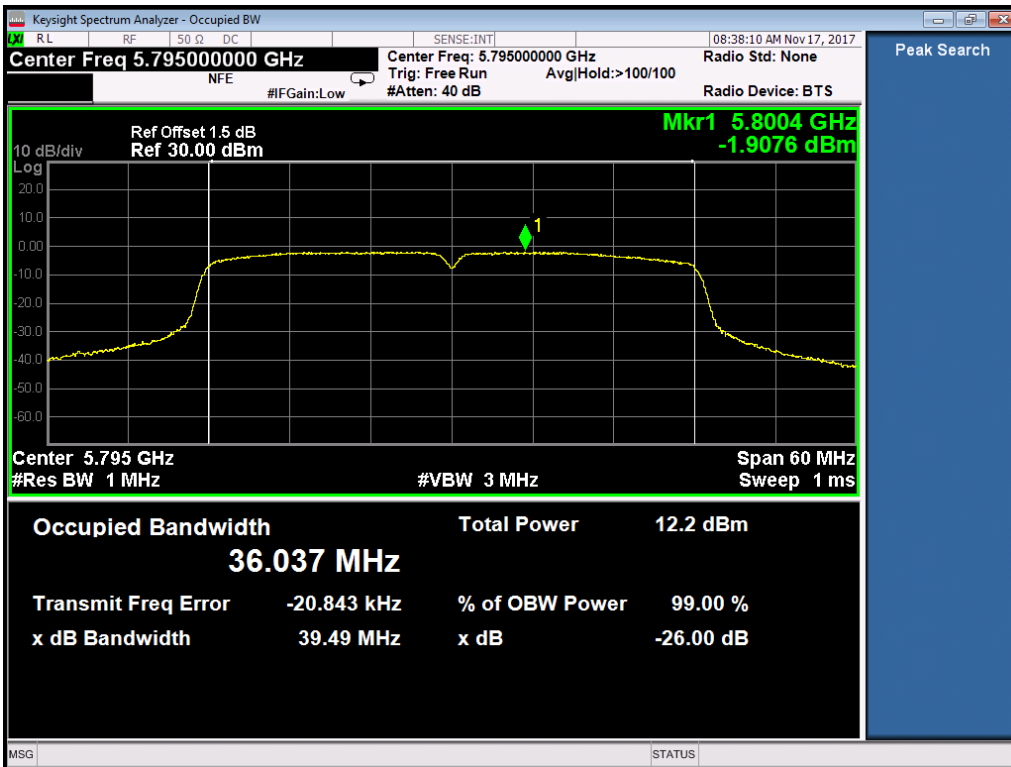




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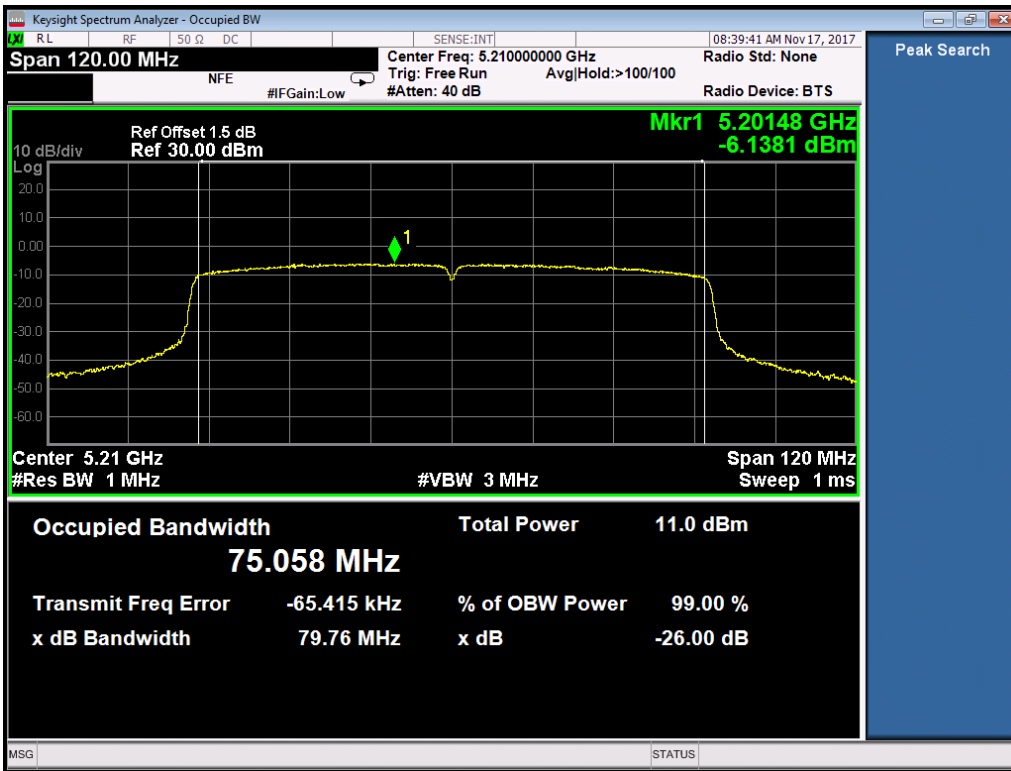


5795

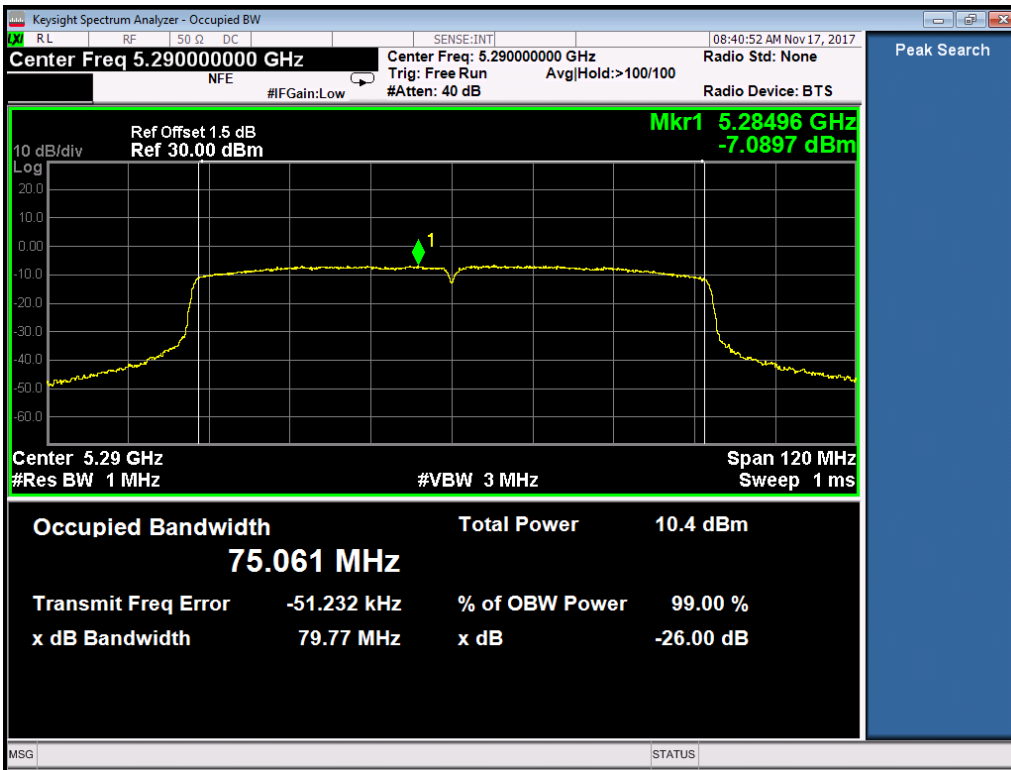


802.11ac80

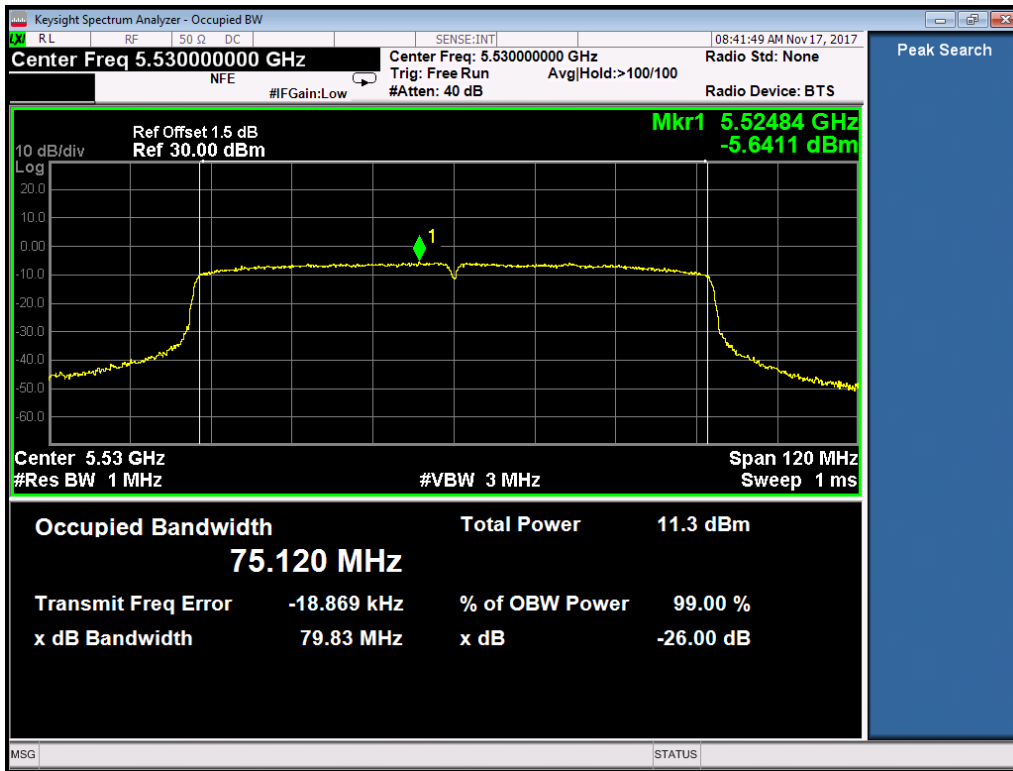
5210



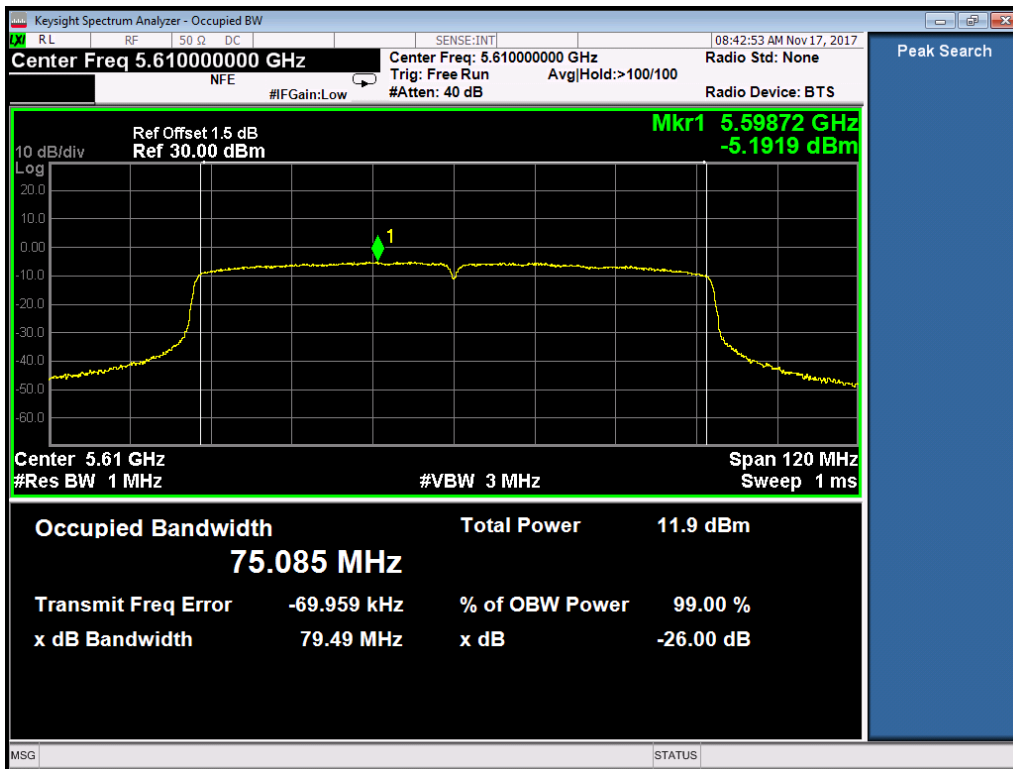
5290



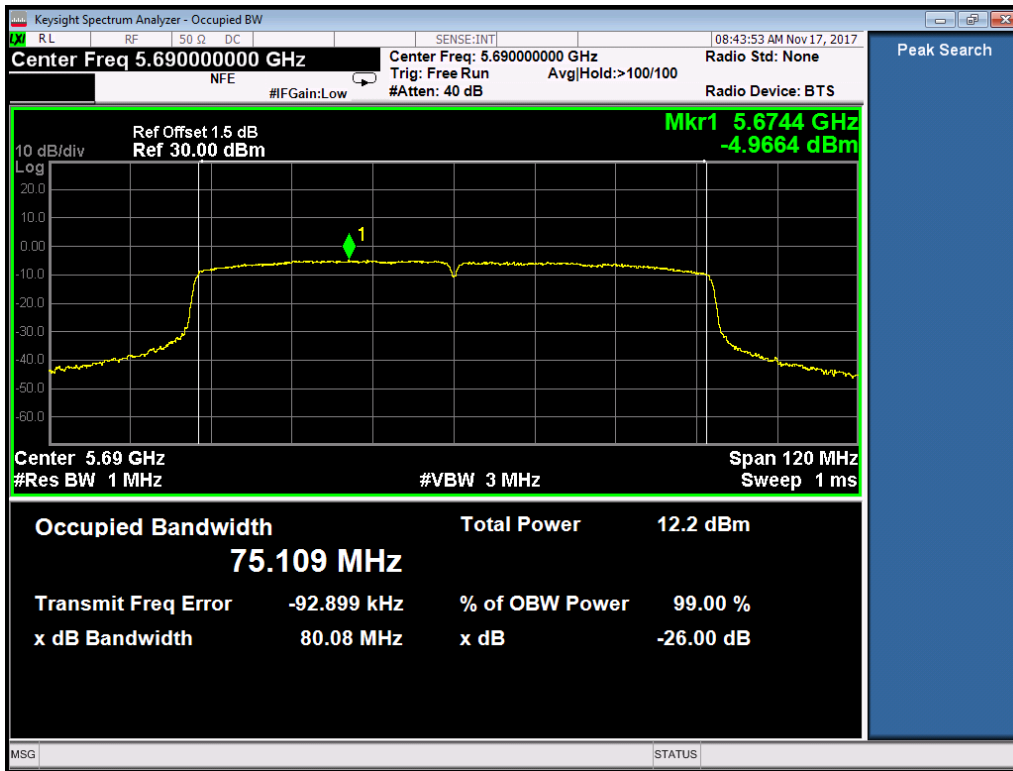
5530



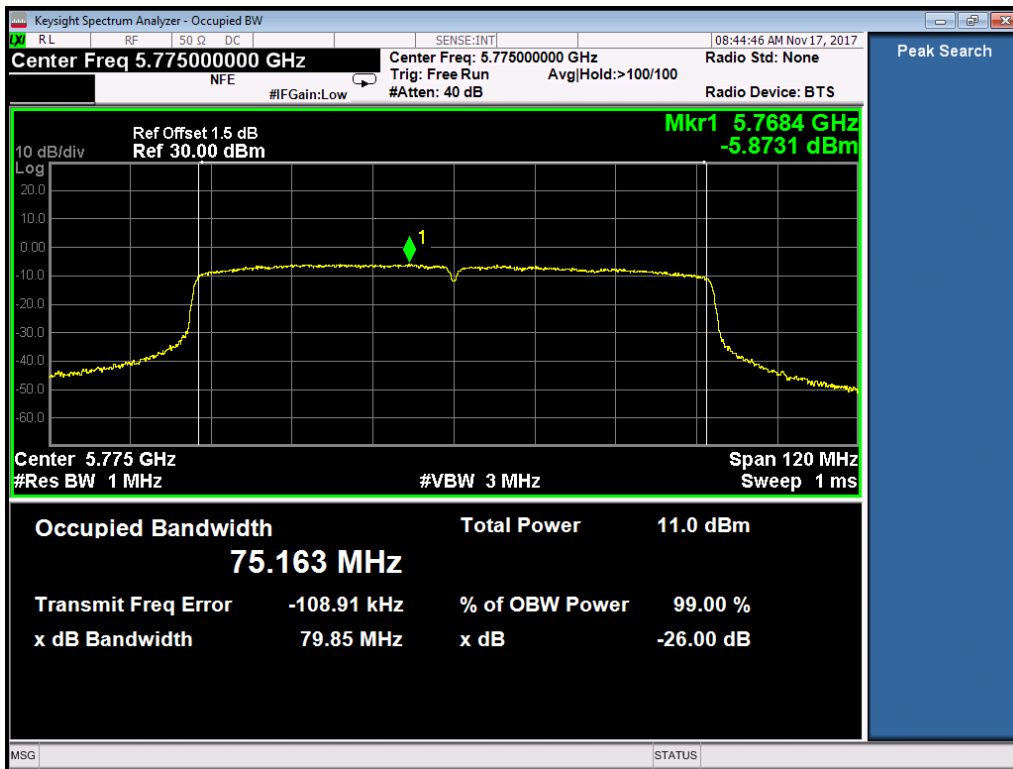
5610



5690



5775



## 9. Frequency Stability

**Test result: Pass**

### 9.1 Limit

The frequency stability shall be sufficient to ensure that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

### 9.2 Test Result

#### Frequency Error - Temperature Variation

Supply Voltage DC (V)	Temperature (°C)	Frequency Stability (Hz)
		Channel (5500MHz)
3.3	-30	-21
	-20	-19
	-10	-17
	0	5
	10	-15
	20	-15
	30	-22
	40	-31
	50	-46

Note: one of all channels was chosen to perform test as representative.

#### Frequency Error - Voltage Variation

Supply Voltage DC (V)	Temperature (°C)	Frequency Stability (Hz)
		Channel (5500MHz)
2.805	20	-15
3.3		-17
3.795		-17

Note: one of all channels was chosen to perform test as representative.

Conclusion: according to test data above, it could be confirmed that any emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.