Nemko Korea Co., Ltd.

155 & 159, Osan-Ro, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 449-852 KOREA, REPUBLIC OF
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FCC and IC EVALUATION REPORT FOR CERTIFICATION

Applicant :

Samsung Electronics Co., Ltd.
129, Samsung-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, Korea.
(Post code : 443-742)
Attn. : Mr. Jaywoo. Lee

Dates of Issue : January 7, 2013
Test Report No. : NK-12-R-235-1
Test Site : Nemko Korea Co., Ltd.

FCC ID **IC**	**A3LWIDT30Q** **649E-WIDT30Q**
Brand Name	**SAMSUNG**
Contact Person	**Samsung Electronics Co., Ltd.** **129, Samsung-ro, Yeongtong-gu,** **Suwon-si, Gyeonggi-do, Korea, 443-742.** **Mr. Jaywoo. Lee** **Telephone No. : +82-31-277-2569**

Applied Standard: FCC 47 CFR Part 15.247 and IC RSS-210 Issue 8
Classification: Digital modulation Transmitter
EUT Type: WiFi module

The device bearing the brand name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003, ANSI C63.10-2009. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.

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

Jan. 7, 2013
Tested By : Jin-ha Ko
Engineer

Jan. 7. 2013
Reviewed By : Deokha Ryu
Technical Manager

TABLE OF CONTENTS

1. SCOPE

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15 and IC RSS-210.

Responsible Party :	Samsung Electronics Co., Ltd.
Contact Person :	Mr. Jaywoo. Lee
Manufacturer :	Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea 443-742

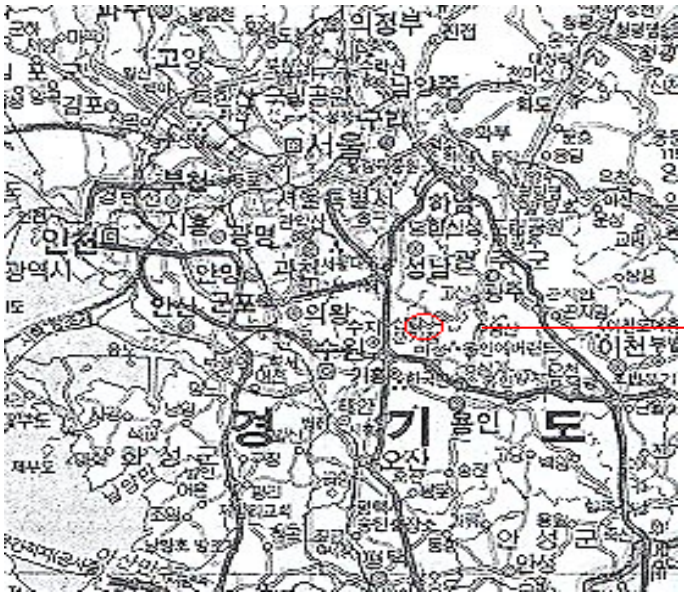
- FCC ID: A3LWIDT30Q
- IC : 649E-WIDT30Q
- Model: WIDT30Q
- Brand Name: SAMSUNG
- EUT Type: WiFi module
- Classification: Digital modulation Transmitter
- Applied Standard: FCC 47 CFR Part 15.247 and IC RSS-210 Issue 8
- Test Procedure(s): ANSI C63.4-2003, ANSI C63.10 and FCC guidance of 558074 D01 DTS Meas. Guidance v02 dated October 4, 2012 entitled “Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) Operating Under §15.247”
- Dates of Test: November 21, 2012 ~ December 27, 2012
- Place of Tests: Nemko Korea Co., Ltd.

2. INTRODUCTION

2.1 Test facility

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003), the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009) was used in determining radiated and conducted emissions emanating from **Samsung Electronics Co., Ltd.**
FCC ID : A3LWIDT30Q and **IC : 649E-WIDT30Q**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory*** .
The site address 155 & 159, Osan-Ro, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 449-852 KOREA, REPULIC OF.
The area of Nemko Korea Corporation Ltd. EMC Test Site is located in a mountain area at 80 km (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 km (18miles) south-southeast from central Seoul.
It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.
The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 2003.



Nemko Korea Co., Ltd.
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Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. EMC Lab. and Incheon Airport.

2.2 Accreditation and listing

Accreditation type		Accreditation number
FC	FCC part 15/18 Filing site	Registration No. 97992
	CAB Accreditation for DOC	Designation No. KR0026
KOLAS	KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)	Registration No. 155
Industry Canada	Canada IC Registered site	Site No. 2040E
VCCI	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
IECEE CB SCHEME	EMC CBTL	-
방송통신위원회	KCC(RRL)Designated Lab.	Registration No. KR0026
	SASO registered Lab and Certification Body	Registration No. 2008-15

3. TEST CONDITIONS & EUT INFORMATION

3.1 Operation During Test

The EUT is the MIMO transceiver which is module supporting the 802.11a/b/g/n mode (802.11a/b/g :1TX/1RX, 802.11n: 2TX/2RX).
During the test, the EUT was connected to laptop PC and then a test program was executed to operate EUT continuously. The operating voltage of EUT was 5 Vdc supplied from a USB port on Laptop PC. The EUT was tested at the lowest channel, middle channel and the highest channel with the maximum output power in accordance with the manufacturer's specifications. The worst data were recorded in the report.

3.1.1 Table of test channels

Frequency band	Mode	Test Channel (CH)	Frequency (MHz)
2.4 GHz	802.11b,g,n(20 MHz)	1	2412
		6	2437
		11	2462
5 GHz	802.11a,n(20 MHz)	149	5745
		157	5785
		165	5825
	802.11n(40 MHz)	151	5755
		159	5795

3.1.2 Table of test modes for 2.4 GHz band:

Test Items	Mode	Data rate (Mbps)	Test Channel (CH)
Conducted Emissions	802.11n(20 MHz)	13.5	6
Radiated Emissions	802.11n(20 MHz)	13.5	6
6 dB Bandwidth	802.11b	1	1/6/11
	802.11g	6	1/6/11
	802.11n(20 MHz)	6.5	1/6/11
Peak Output Power	802.11b	1	1/6/11
	802.11g	6	1/6/11
	802.11n	6.5	1/6/11
Peak Power Spectral Density	802.11b	1	1/6/11
	802.11g	6	1/6/11

	802.11n	6.5	1/6/11
Conducted Spurious Emission, Radiated Spurious Emission, Band edge Emission	802.11b	1	1/6/11
	802.11g	6	1/6/11
	802.11n	6.5	1/6/11

3.1.3 Table of test modes for 5 GHz band:

Test Items	Mode	Data rate (Mbps)	Test Channel (CH)
Conducted Emissions	802.11n(20 MHz)	13.5	157
Radiated Emissions	802.11n(20 MHz)	13.5	157
6 dB Bandwidth	802.11a	6	149/157/165
	802.11n(20 MHz)	6.5	149/157/165
	802.11n(40 MHz)	13.5	1/6/11
Peak Output Power	802.11a	6	149/157/165
	802.11n(20 MHz)	6.5	149/157/165
	802.11n(40 MHz)	13.5	151/159
Peak Power Spectral Density	802.11a	6	149/157/165
	802.11n(20 MHz)	6.5	149/157/165
	802.11n(40 MHz)	13.5	151/159
Conducted Spurious Emission, Radiated Spurious Emission, Band edge Emission	802.11a	6	149/157/165
	802.11n(20 MHz)	6.5	149/157/165
	802.11n(40 MHz)	13.5	151/159

3.1.4 Antenna information:

Frequency band	Mode	Antenna TX mode	Support MIMO
2.4 GHz	802.11b,g	■ 1TX, □ 2TX	□ Yes, ■ No
	802.11n(20 MHz)	□ 1TX, ■ 2TX	■ Yes, □ No
5 GHz	802.11a	■ 1TX, □ 2TX	□ Yes, ■ No
	802.11n(20 MHz) 802.11n(40 MHz)	□ 1TX, ■ 2TX	■ Yes, □ No

Note :

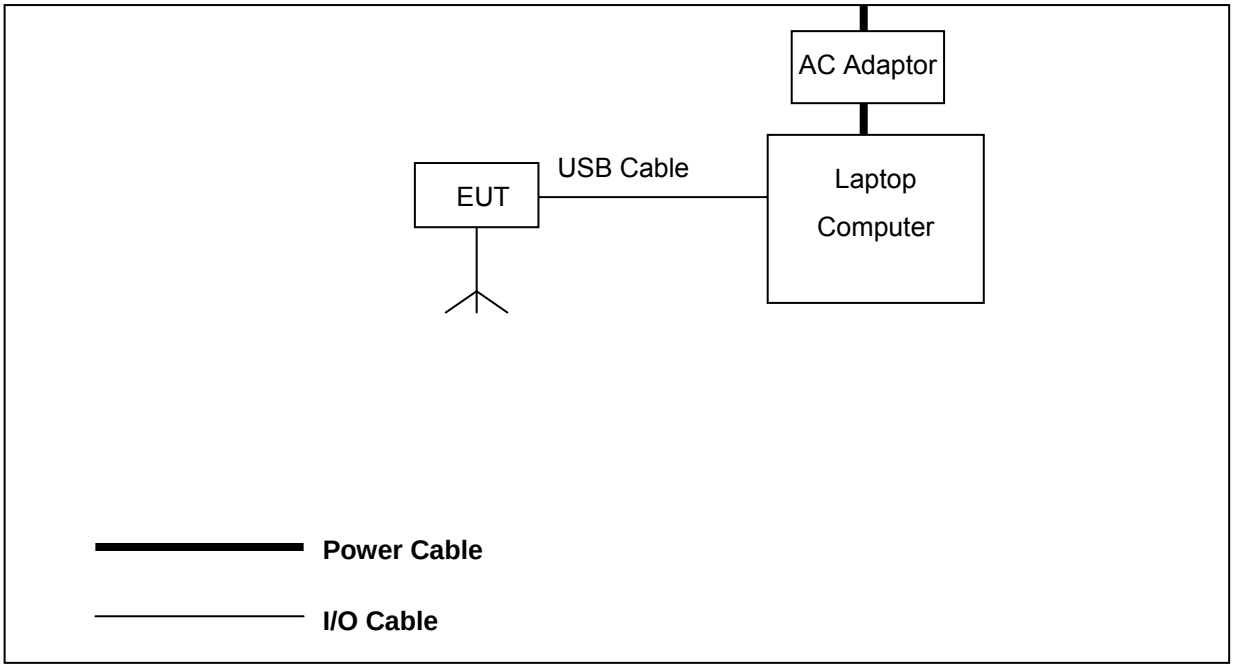
1. The EUT support both chains transmit and receive simultaneously for 802.11n(20 MHz/40 MHz).

2. The EUT support the antenna with TX diversity function for 802.11b/g/a.

3.2 Support Equipment

EUT	Samsung Electronics Co., Ltd. FCC ID: A3LWIDT30Q	S/N: N/A
Laptop Computer	Samsung Electronics Co., Ltd. Model : NT-R55 0.3 m unshielded pin connector cable	FCC DOC S/N : 408L93AP400115W
AC/DC Adapter	Chicony Power Technology Co., Ltd. Model : AD-9019S 1.5 m unshielded power cable	FCC DOC S/N : CNBA4400215ADON81BT01V8

3.3 Setup Drawing



3.4 EUT Information

The EUT is the **Samsung WiFi module FCC ID: A3LWIDT30Q, IC: 649E-WIDT30Q.**

Specifications:

Category	WiFi module
Model Name	WIDT30Q
Brand Name	SAMSUNG
Frequency of Operation	For 2.4 GHz Band 802.11b,g,n(20 MHz): 2412 MHz ~ 2462 MHz For 5 GHz Band 802.11a,n(20 MHz) : 5745 MHz ~ 5825 MHz 802.11n(40 MHz) : 5755 MHz ~ 5795 MHz
Power Output (Conducted)	For 2.4 GHz Band 802.11b : 20.90 dBm 802.11g : 25.91 dBm 802.11n(20 MHz) : 27.88 dBm For 5 GHz Band 802.11a : 23.52 dBm 802.11n(20 MHz) : 24.35 dBm 802.11n(40 MHz) : 20.49 dBm
Channels	For 2.4 GHz Band 802.11b,g,n(20 MHz): 11 CH For 5 GHz Band 802.11a,n(20 MHz) : 5 CH 802.11n(40 MHz) : 2 CH
Antenna Gain (peak)	For 2.4 GHz Band Ant 0 : 3.64 dBi, Ant1 : 2.15 dBi For 5 GHz Band Ant 0 : 1.35 dBi, Ant1 : -0.90 dBi
Antenna Setup	802.11b, 802.11g : 1TX / 1RX 802.11n(20 MHz) : 2TX / 2RX
Modulations	DSSS(BPSK,QPSK,CCK) for 802.11b OFDM(BPSK,QPSK,16QAM,64QAM) for 802.11a,g,n
Temperature Range	-20 ℃ ~ +50 ℃
Voltage	5.0 Vdc
Dimensions (D x W x H)	58.00 mm x 31.45 mm X 8.50 mm
Weight	10.7 g
Remarks	-

4. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specification:

Name of Test	FCC Paragraph No.	IC Paragraph No.	Result	Remark
Conducted Emission	15.207	RSS-GEN 7.2.4	Complies	
Radiated Emission	15.209	RSS-210 Issue 8 A8.5	Complies	
6 dB Bandwidth	15.247(a)(2)	RSS-210 Issue 8 A8.2	Complies	
Peak Power Output	15.247(b)(3)	RSS-210 Issue 8 A8.4	Complies	
Power Spectral Density	15.247(e)	RSS-210 Issue 8 A8.2	Complies	
Conducted Spurious Emission	15.247(d)	RSS-210 Issue 8 A8.5	Complies	
Radiated Spurious Emission	15.247(d)	RSS-210 Issue 8 A8.5	Complies	
Maximum Permissible Exposure	1.1307(b)	RSS-102	Complies	

5. RECOMMENDATION/CONCLUSION

The data collected shows that the **Samsung WiFi module FCC ID: A3LWIDT30Q, IC : 649E-WIDT30Q** is in compliance with Part 15.247 of the FCC Rule and RSS-210 Issue 8 of the IC Specification.

6. ANTENNA REQUIREMENTS

§15.203 of the FCC Rules part 15 Subpart C

: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The antenna of the **Samsung WiFi module FCC ID: A3LWIDT30Q, IC: 649E-WIDT30Q** is **permanently attached** and there are no provisions for connection to an external antenna. It complies with the requirement of §15.203.

According to "**662911 D01 Multiple Transmitter Output v01r02**", if two antennas are unequal antenna gains and transmit signals are correlated, then the **Directional gain = 10 log[($10^{G1/20}$+$10^{G2/20}$)^2/N_{ANT}] dBi**. The directional gain of Samsung WiFi module are **5.94 dBi** for **2.4 GHz band** and **3.31 dBi** for **5 GHz band**.

7. DESCRIPTION OF TESTS

7.1 Conducted Emissions

The Line conducted emission test facility is located inside a 4 x 7 x 2.5 meter shielded enclosure. It is manufactured by EM engineering. The shielding effectiveness of the shielded room is in accordance with MIL-STD-285 or NSA 65-6. A 1 m x 1.5 m wooden table 0.8 m height is placed 0.4 m away from the vertical wall and 1.5 m away from the side of wall of the shielded room Rohde & Schwarz (ESH3-Z5) and (ESH2-Z5) of the 50 ohm/50 μH Line Impedance Stabilization Network (LISN) are bonded to the shielded room. The EUT is powered from the Rohde & Schwarz LISN (ESH3-Z5) and the support equipment is powered from the Rohde & Schwarz LISN (ESH2-Z5). Power to the LISNs are filtered by high-current high insertion loss Power line filters. The purpose of filter is to attenuate ambient signal interference and this filter is also bonded to shielded enclosure. All electrical cables are shielded by tinned copper zipper tubing with inner diameter of 1 / 2 ".

If DC power device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the LISNs, All interconnecting cables more than 1 meter were shortened by non inductive bundling (serpentinefashion) to a 1 meter length.

Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150 kHz to 30 MHz with 200 msec sweep time.

The frequency producing the maximum level was re-examined using the EMI test receiver.

(Rohde & Schwarz ESCS30). The detector functions were set to CISPR quasi-peak mode & average mode. The bandwidth of receiver was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.

Each emission was maximized by; switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; whichever determined the worst case emission.

Each EME reported was calibrated using the R&S signal generator.

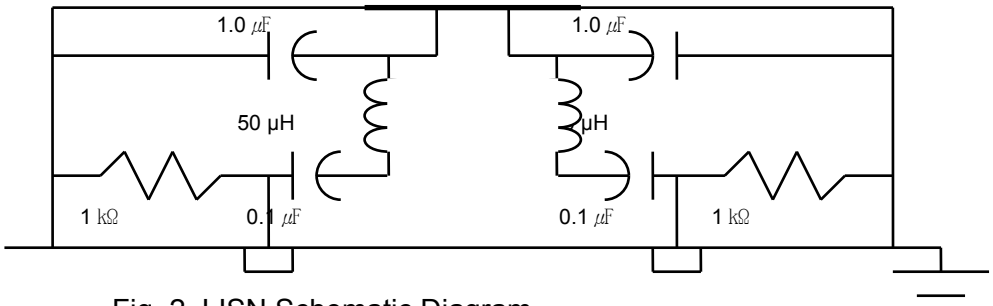


Fig. 2. LISN Schematic Diagram

7.2 Radiated Emissions

The measurement was performed at the test site that is specified in accordance with ANSI C63.4-2003 and ANCI C63.10-2009.
The spurious emission was scanned from 9 kHz to 30 MHz using Loop Antenna(Rohde&Schwarz, HFH2-Z2) and 30 to 1000 MHz using Trilog broadband test antenna(Schwarzbeck, VULB 9163). Above 1 GHz, Horn antenna (Schwarzbeck BBHA 9120D: up to 18 GHz, Q-par Angus QSH20S20 : 18 to 26.5 GHz, QSH22K20: up to 40 GHz) was used.
The test equipment was placed on turntable with 0.8 m above ground. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The EUT, cable, wire arrangement and mode of operation that has the highest amplitude relative to the limit was selected. Then, the turn table was rotated from 0˚ to 360˚ and an antenna mast was moved from 1 m to 4 m height to maximize the suspected highest amplitude signal. The final maximized level was recorded.

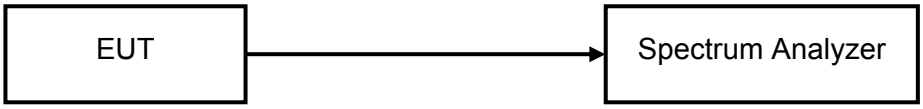
At frequencies below 1000 MHz, measurements performed using the CISPR quasi-peak detection.
At frequencies above 1000 MHz, measurements performed using the peak and average measurement procedures described in KDB “558074D01 DTS Meas Guidance v02” in section 10.2.3.2 and 10.2.3.3. Peak emission levels were measured by setting the analyzer RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Trace mode = max hold. Average emission levels were measured by setting the analyzer RBW = 1 MHz, VBW = 3 MHz, Detector = RMS, Trace averaging in power averaging (RMS) mode over a minimum of 100 traces, when the EUT was configured to transmit with duty cycle ≥ 98 percent.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100	3
88–216	150	3
216–960	200	3
Above 960	500	3

Radiated Emissions Limits per 47 CFR 15.209(a)

7.3 6 dB Bandwidth

Test Setup

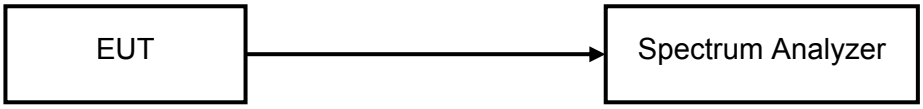


Test Procedure

EUTs 6 dB bandwidth is measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.
The spectrum analyzer setting is as follows.
RBW = approximately 1-5 % of the emission bandwidth
VBW ≥ 3 x RBW
Detector = Peak
Trace mode = max hold
Sweep = auto couple
Allow the trace to stabilize.
The bandwidth measurement function on the spectrum analyzer is used to measure the 6 dB bandwidth.

7.4 Maximum Peak Output Power

Test Setup

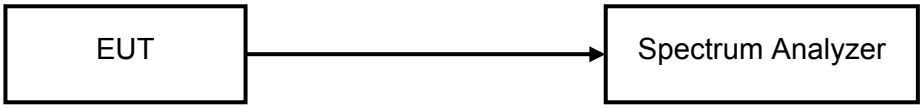


Test Procedure

EUTs Maximum Peak Conducted Output Power is measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.
The spectrum analyzer setting is as follows.
RBW = 1 MHz
VBW = 3 MHz
Span = fully encompass the DTS bandwidth
Detector = peak
Sweep time = auto couple
Allow the trace to stabilize.
The band power measurement function on the spectrum analyzer is used to measure the Maximum peak conducted output power.

7.5 Peak Power Spectral Density

Test Setup



Test Procedure

EUTs Peak Power Spectral Density is measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.

The spectrum analyzer setting is as follows.

Center frequency = DTS channel center frequency

Span = 1.5 times the DTS channel bandwidth

RBW ≥ 3 kHz

VBW ≥ 3 x RBW

Detector = peak

Sweep time = auto couple

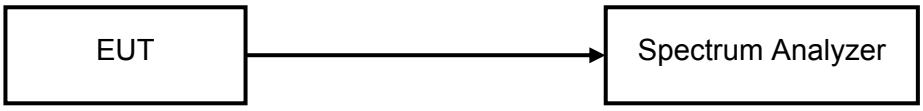
Trace mode = max hold

Allow the trace to stabilize.

The peak search function on the spectrum analyzer is used to determine the maximum amplitude level within the fundamental DTS bandwidth.

7.6 Conducted Spurious Emissions

Test Setup



Test Procedure

EUTs Conducted spurious emissions are measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.
The spectrum analyzer setting is as follows.

1) Reference Level
RBW = 100 kHz
VBW ≥ 300 kHz
Span = 1.5 times the DTS channel bandwidth
Detector = peak
Sweep time = auto couple
Trace mode = max hold
Allow the trace to stabilize.
The peak search function on the spectrum analyzer is used to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

2) Unwanted Emissions
RBW = 100 kHz
VBW ≥ 300 kHz
Span = encompass the spectrum to be examined
Detector = peak
Sweep time = auto couple
Allow the trace to stabilize.
The amplitude of all unwanted emissions outside of the authorized frequency band is confirmed that it is attenuated by at least the minimum requirements specified.

8. TEST DATA

8.1 Conducted Emissions

FCC §15.207, RSS-Gen

2.4 GHz band

Frequency	Level(dBµV)		*)Factor	**) Line	Limit(dBµV)		Margin(dB)	
(MHz)	Q-Peak	Average	(dB)		Q-Peak	Average	Q-Peak	Average
0.17	55.6	38.2	0.2	L	65.0	55.0	9.4	16.8
0.23	50.1	32.5	0.2	L	62.4	52.4	12.3	19.9
0.29	43.7	27.6	0.2	L	60.5	50.5	16.8	22.9
0.36	38.2	22.4	0.2	L	58.7	48.7	20.5	26.3
0.53	36.7	22.6	0.2	N	56.0	46.0	19.3	23.4
0.91	32.6	18.1	0.1	L	56.0	46.0	23.4	27.9

Line Conducted Emissions Tabulated Data

5 GHz band

Frequency	Level(dBµV)		*)Factor	**) Line	Limit(dBµV)		Margin(dB)	
(MHz)	Q-Peak	Average	(dB)		Q-Peak	Average	Q-Peak	Average
0.17	54.3	36.5	0.2	N	65.0	55.0	10.7	18.5
0.23	48.7	32.1	0.2	N	62.4	52.4	13.7	20.3
0.29	42.7	27.1	0.2	N	60.5	50.5	17.8	23.4
0.36	38.1	23.4	0.2	N	58.7	48.7	20.6	25.3
0.52	36.3	23.1	0.2	L	56.0	46.0	19.7	22.9
20.23	32.8	25.1	1.7	L	60.0	50.0	27.2	24.9

Line Conducted Emissions Tabulated Data

Notes:

1. Measurements using CISPR quasi-peak mode & average mode.

2. All modes of operation were investigated and the worst -case emission are reported. See attached Plots.

*3. *) Factor = LISN + Cable Loss*

*4. **) LINE : L = Line , N = Neutral*

5. The limit is on the FCC Part section 15.207(a).

PLOTS OF EMISSIONS

2.4 GHz band

- ***Conducted Emission at the Mains port (Line)***

NEMKO KOREA (NK-12-R-235) 19 Dec 2012 16:05

Conducted Emissions

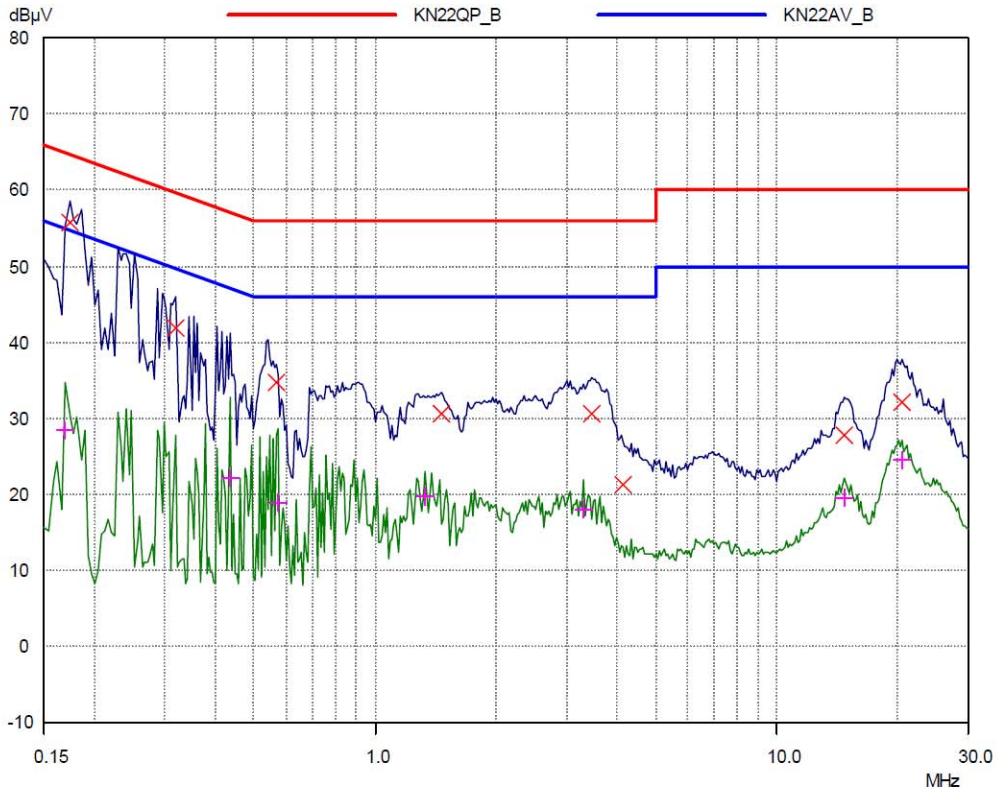
EUT:	Wireless lan module
Manuf:	Samsung Electronics
Op Cond:	a.c. 120 V, 60 Hz (802.11n HT20 Mid channel)
Operator:	Jinha. KO
Test Spec:	FCC Part 15.207
Comment:	MODEL : WIDT30Q
	LINE : L1

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	ESH3_Z5_Line

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	30 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (Neutral)***

NEMKO KOREA (NK-12-R-235) 19 Dec 2012 16:15

Conducted Emissions

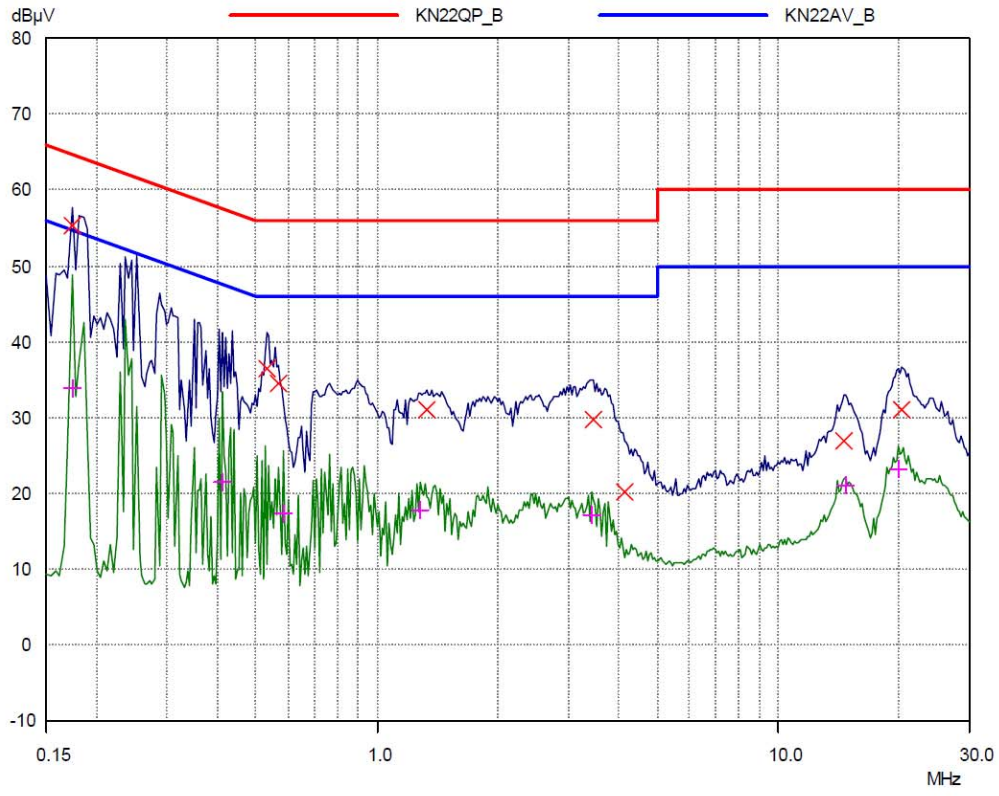
EUT:	Wireless lan module
Manuf:	Samsung Electronics
Op Cond:	a.c. 120 V, 60 Hz (802.11n HT20 Mid channel)
Operator:	Jinha. KO
Test Spec:	FCC Part 15.207
Comment:	MODEL : WIDT30Q
	LINE : Neutral

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	ESH3_Z5_Neutral

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Subranges: 8
Acc Margin: 30 dB



PLOTS OF EMISSIONS

5 GHz band

- ***Conducted Emission at the Mains port (Line)***

NEMKO KOREA (NK-12-R-235) 19 Dec 2012 16:52

Conducted Emissions

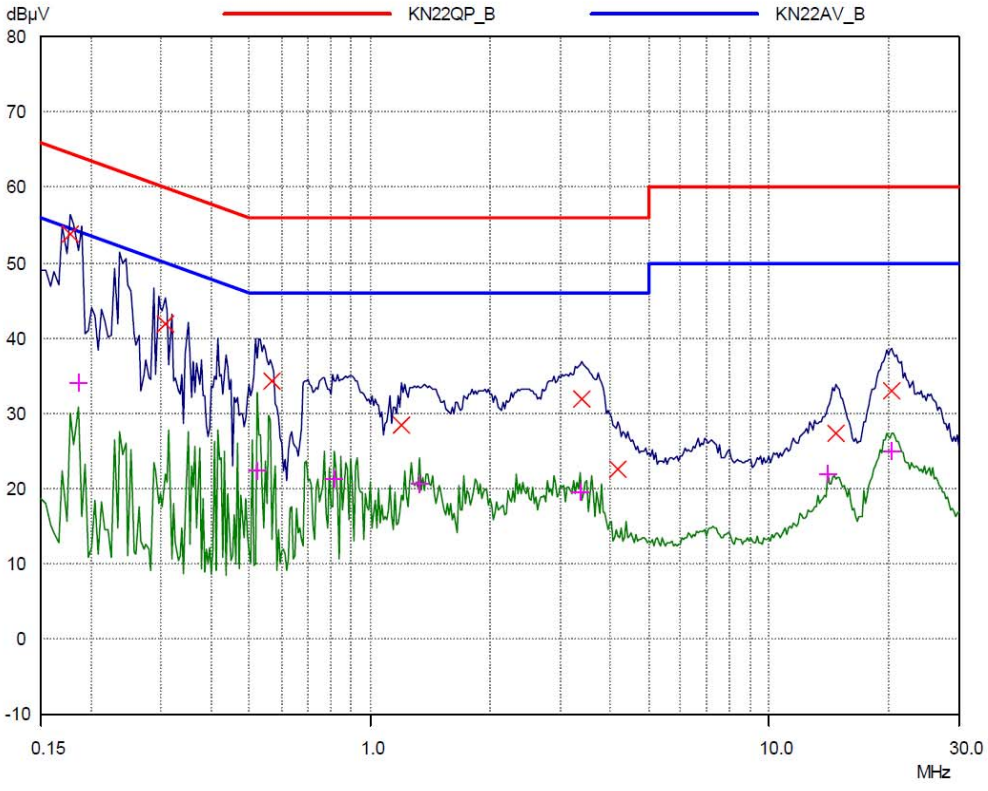
EUT:	Wireless lan module
Manuf:	Samsung Electronics
Op Cond:	a.c. 120 V, 60 Hz (802.11n HT20, Ch157)
Operator:	Jinha. KO
Test Spec:	FCC Part 15.207
Comment:	MODEL : WIDT30Q
	LINE : L1

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	ESH3_Z5_Line

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	30 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (Neutral)***

NEMKO KOREA (NK-12-R-235) 19 Dec 2012 16:42

Conducted Emissions

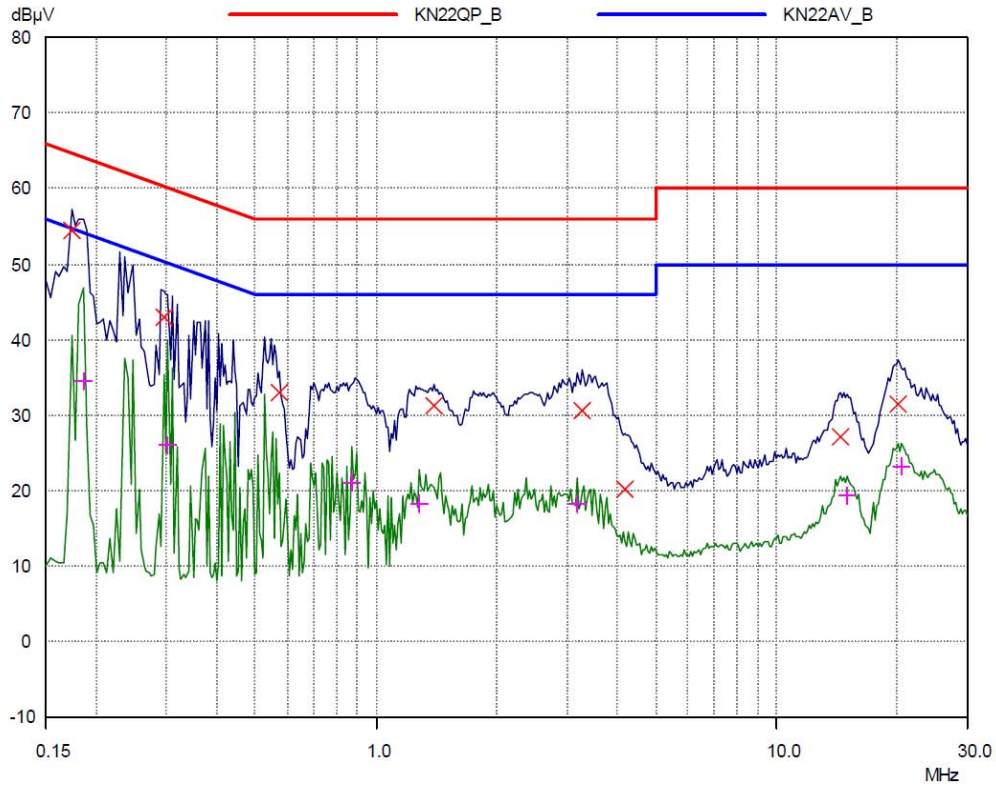
EUT:	Wireless lan module
Manuf:	Samsung Electronics
Op Cond:	a.c. 120 V, 60 Hz (802.11n HT20, Ch157)
Operator:	Jinha. KO
Test Spec:	FCC Part 15.207
Comment:	MODEL : WIDT30Q
	LINE : Neutral

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	ESH3_Z5_Neutral

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	30 dB



8.2 Radiated Emissions

FCC §15.209, RSS-210 Issue 8, A8.5

2.4 GHz band

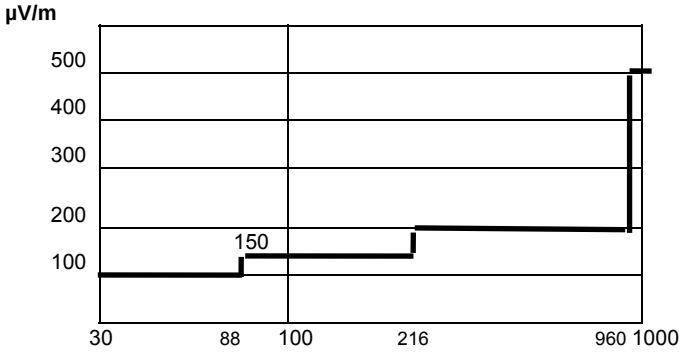
Frequency (MHz)	Reading (dBµV/m)	Pol* (H/V)	Antenna Heights (cm)	Turntable Angles (°)	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.48	45.33	V	107	40	-18.0	27.3	40.0	12.7
223.25	51.11	H	175	163	-19.1	32.0	46.0	14.0
240.00	57.41	H	163	150	-19.1	38.3	46.0	7.7
317.32	53.80	H	160	122	-13.6	40.2	46.0	5.8
320.00	54.50	H	160	122	-13.6	40.9	46.0	5.1
377.91	45.80	H	112	123	-13.6	32.2	46.0	13.8

Radiated Measurements at 3meters

5 GHz band

Frequency (MHz)	Reading (dBµV/m)	Pol* (H/V)	Antenna Heights (cm)	Turntable Angles (°)	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
40.38	45.88	V	101	30	-17.0	28.9	40.0	11.1
118.94	49.71	H	284	6	-19.9	29.8	43.5	13.7
240.00	60.51	H	160	353	-19.1	41.4	46.0	4.6
320.04	54.50	H	159	338	-13.6	40.9	46.0	5.1
379.05	44.00	H	114	110	-13.6	30.4	46.0	15.6
392.27	45.10	H	100	325	-13.6	31.5	46.0	14.5

Radiated Measurements at 3meters



Notes:

1. All modes were measured and the worst-case emission was reported.

2 The radiated limits are shown on Figure 3.

Above 1 GHz the limit is 500 µV/m.

Fig. 3. Limits at 3 meters

*3. *Pol. H = Horizontal, V = Vertical*

*4. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.*

5. Measurements using CISPR quasi-peak mode.

6. The radiated emissions testing were made by rotating through three orthogonal axes. The worst date was recorded.

8.3 6 dB Modulated Bandwidth

8.3.1 6 dB Modulated Bandwidth – 2.4 GHz band

FCC §15.247(a)(2), RSS-210 Issue 8, A8.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11b mode

Channel	Frequency(MHz)	Result(MHz)		Limit (MHz)
		Chain 0	Chain 1	
Low	2412	10.14	10.13	0.5
Middle	2437	10.13	10.14	0.5
High	2462	10.14	10.14	0.5

802.11g mode

Channel	Frequency(MHz)	Result(MHz)		Limit (MHz)
		Chain 0	Chain 1	
Low	2412	16.58	16.59	0.5
Middle	2437	16.60	16.61	0.5
High	2462	16.60	16.58	0.5

802.11n(20 MHz) mode

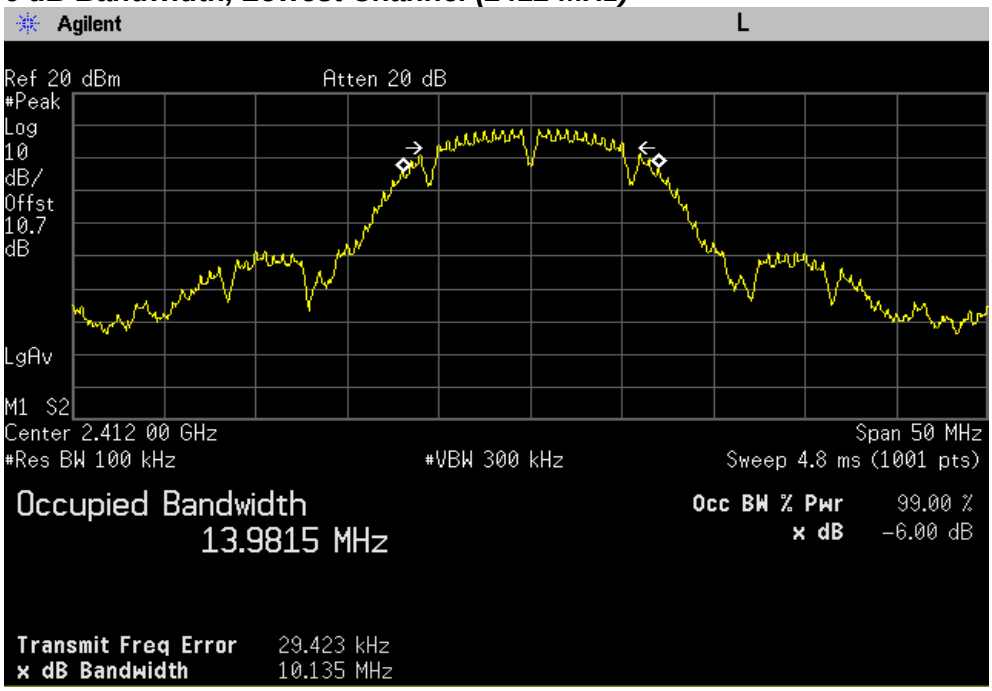
Channel	Frequency(MHz)	Result(MHz)		Limit (MHz)
		Chain 0	Chain 1	
Low	2412	17.81	17.80	0.5
Middle	2437	17.81	17.81	0.5
High	2462	17.78	17.82	0.5

PLOTS OF EMISSIONS

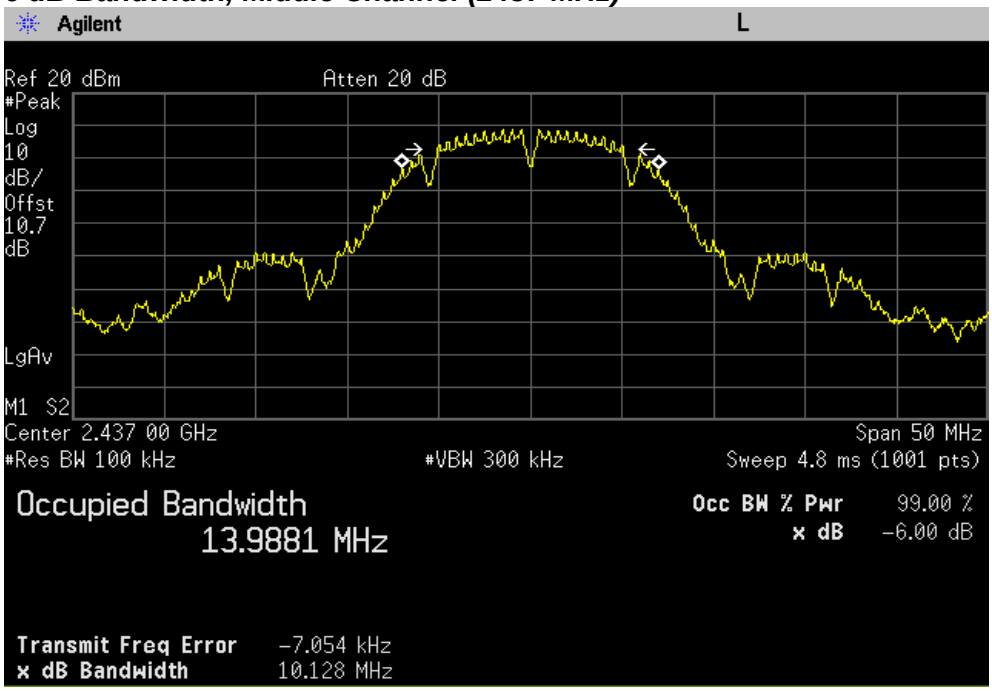
802.11b mode

Chain 0

6 dB Bandwidth, Lowest Channel (2412 MHz)

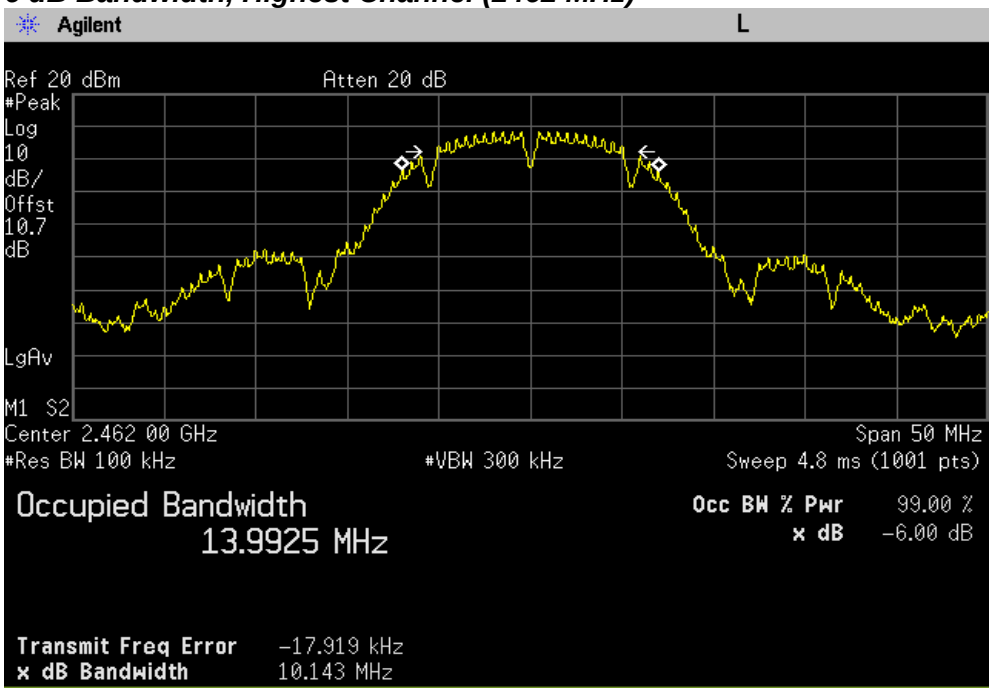


6 dB Bandwidth, Middle Channel (2437 MHz)



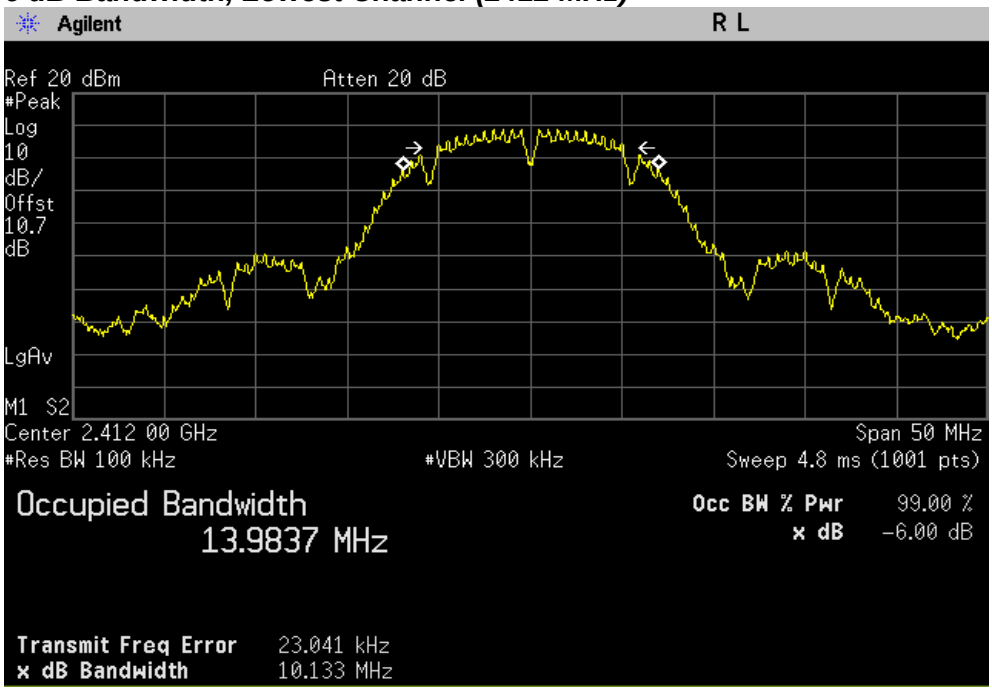
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (2462 MHz)



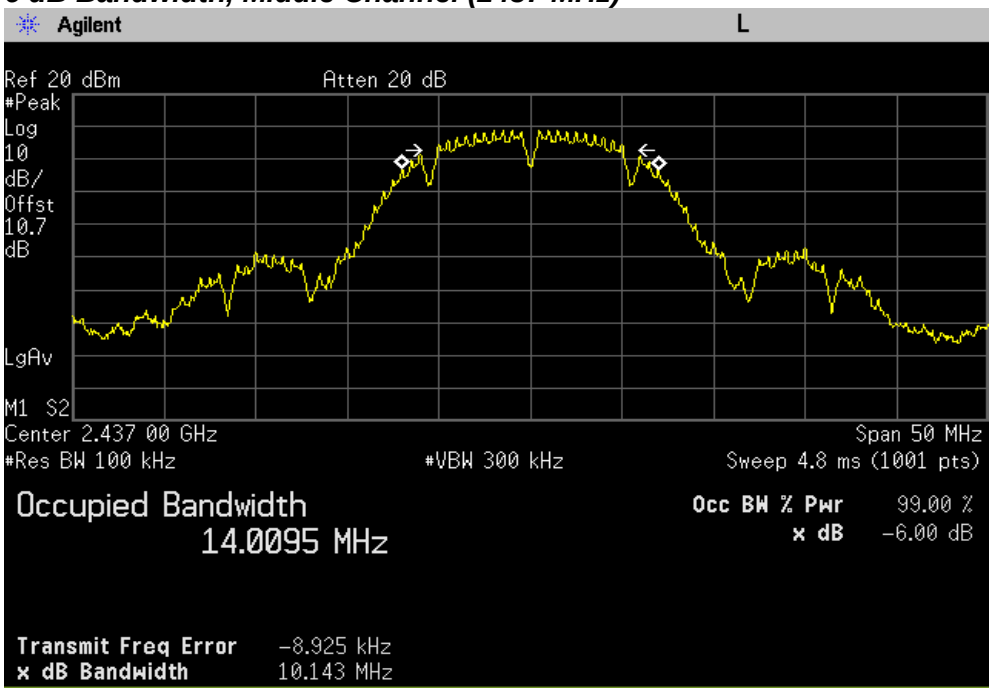
Chain 1

6 dB Bandwidth, Lowest Channel (2412 MHz)

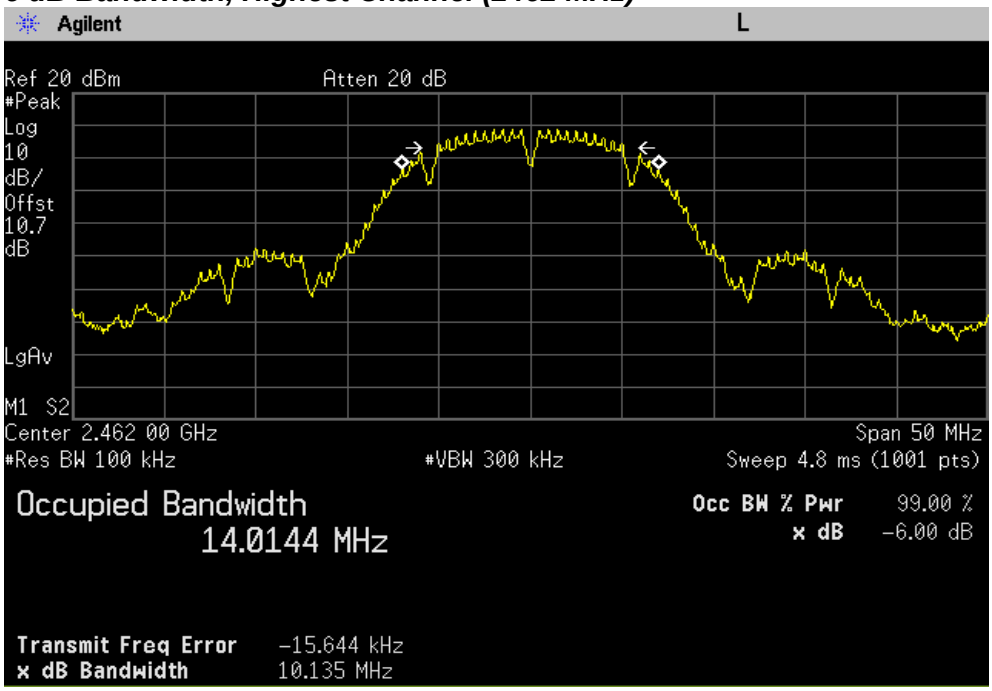


PLOTS OF EMISSIONS

6 dB Bandwidth, Middle Channel (2437 MHz)



6 dB Bandwidth, Highest Channel (2462 MHz)

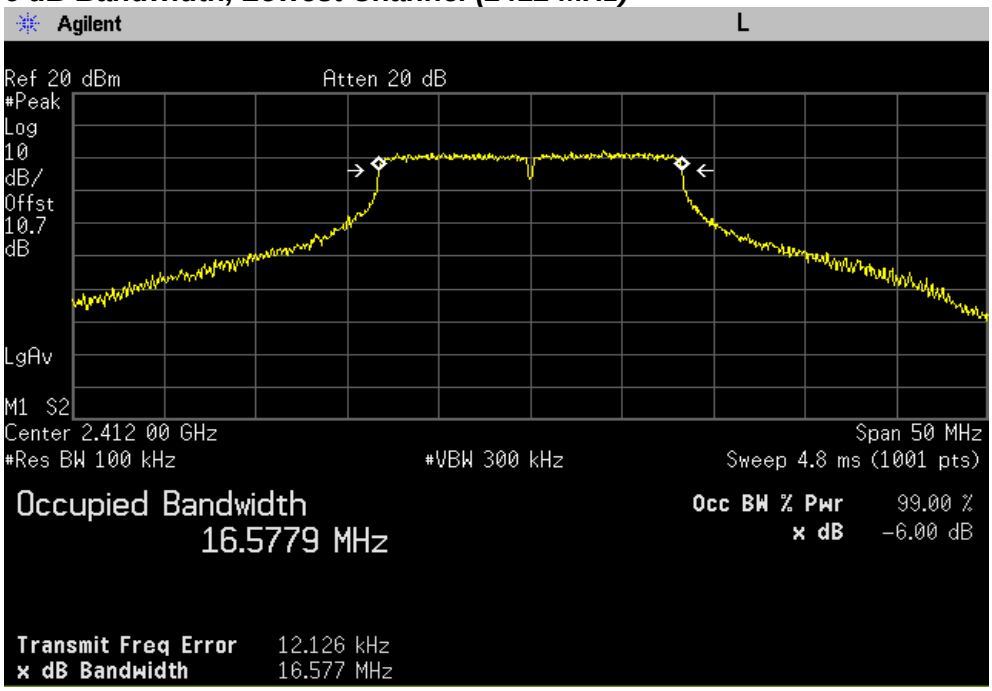


PLOTS OF EMISSIONS

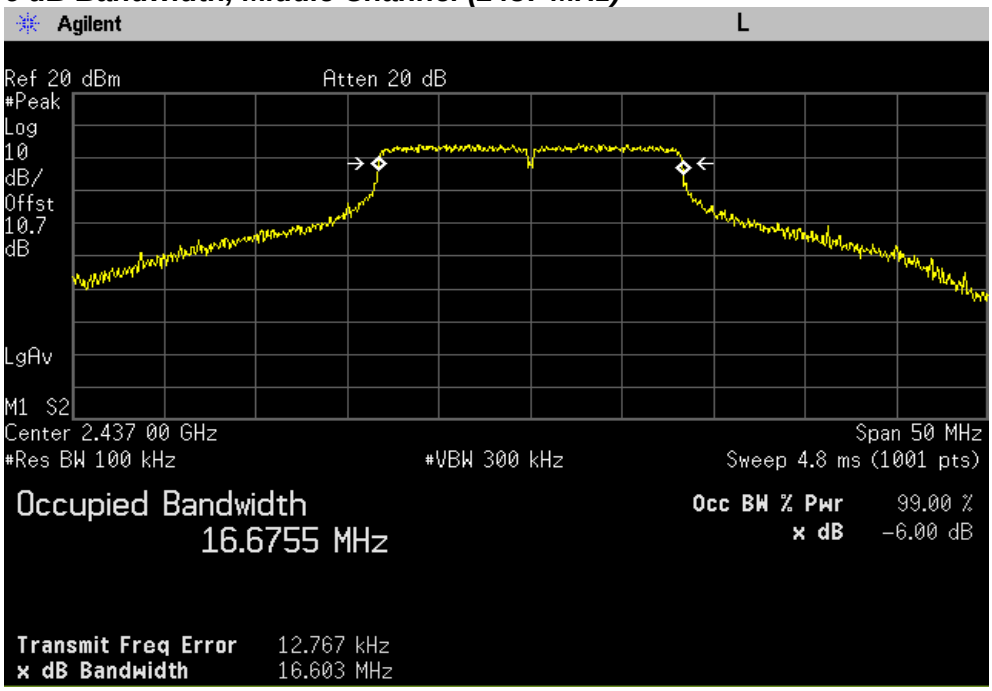
802.11g mode

Chain 0

6 dB Bandwidth, Lowest Channel (2412 MHz)

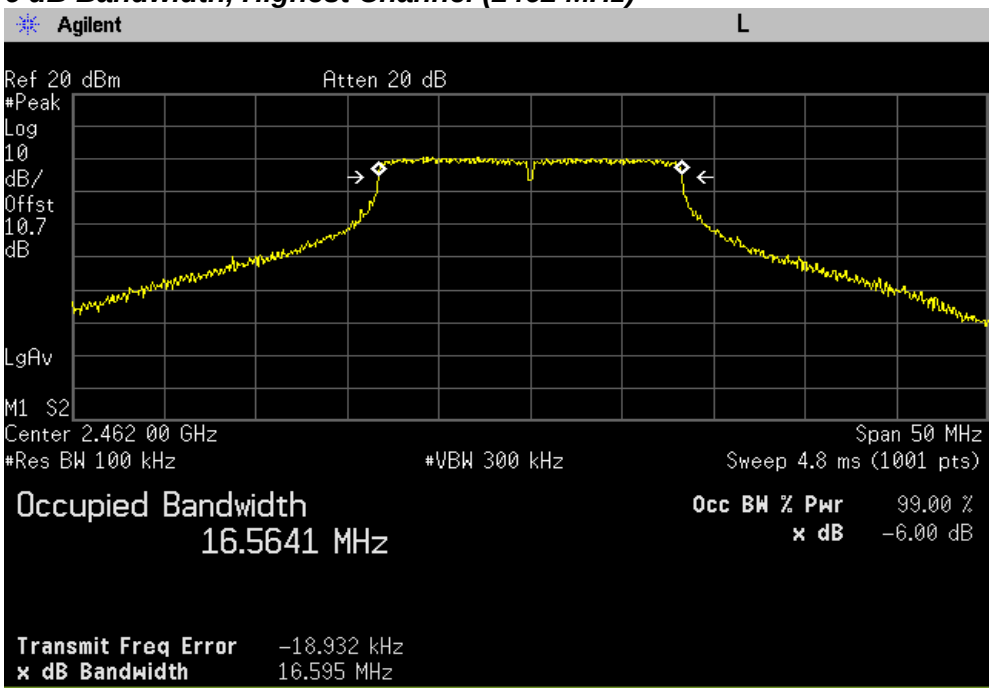


6 dB Bandwidth, Middle Channel (2437 MHz)



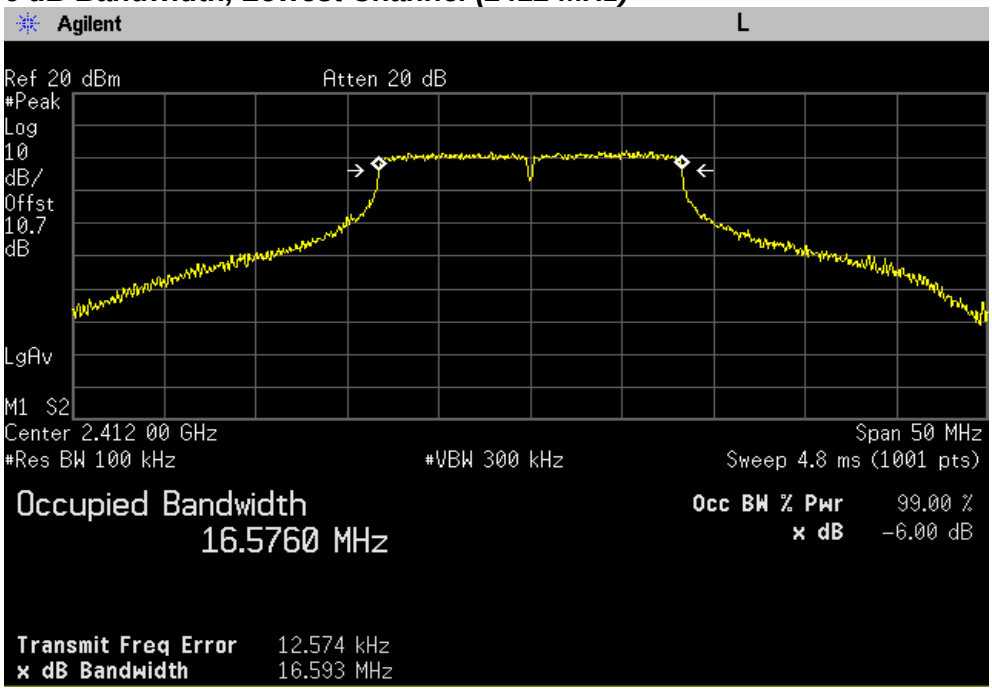
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (2462 MHz)



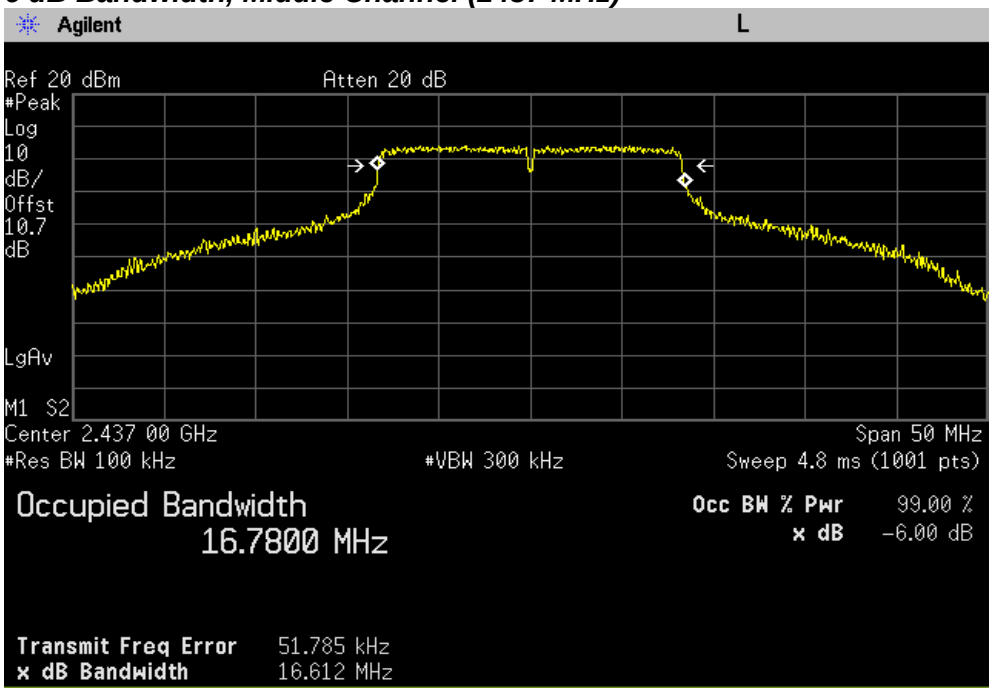
Chain 1

6 dB Bandwidth, Lowest Channel (2412 MHz)

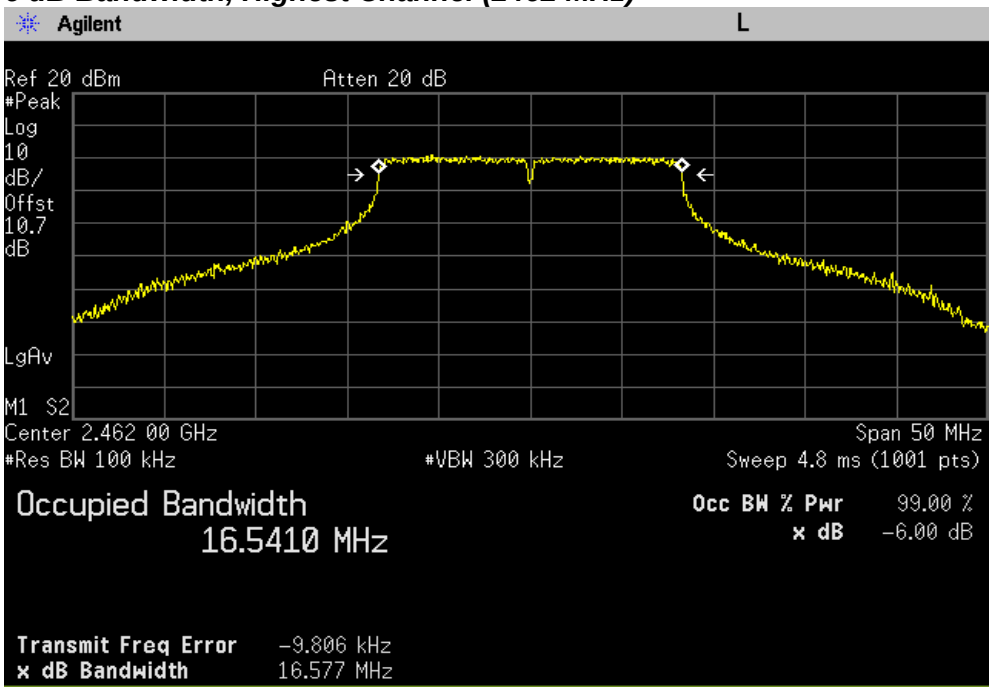


PLOTS OF EMISSIONS

6 dB Bandwidth, Middle Channel (2437 MHz)



6 dB Bandwidth, Highest Channel (2462 MHz)

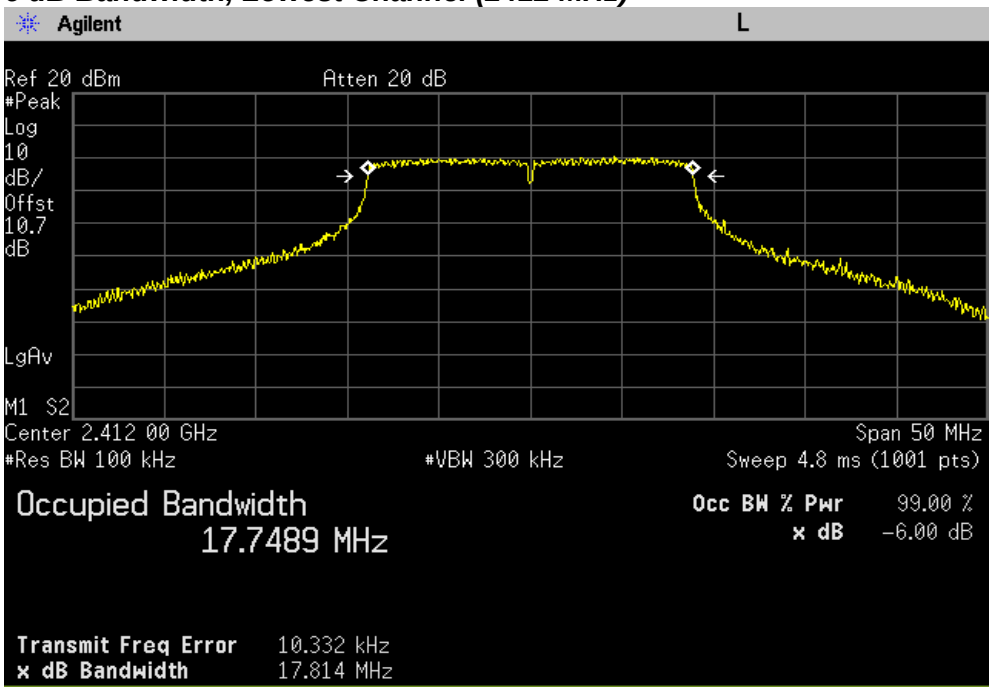


PLOTS OF EMISSIONS

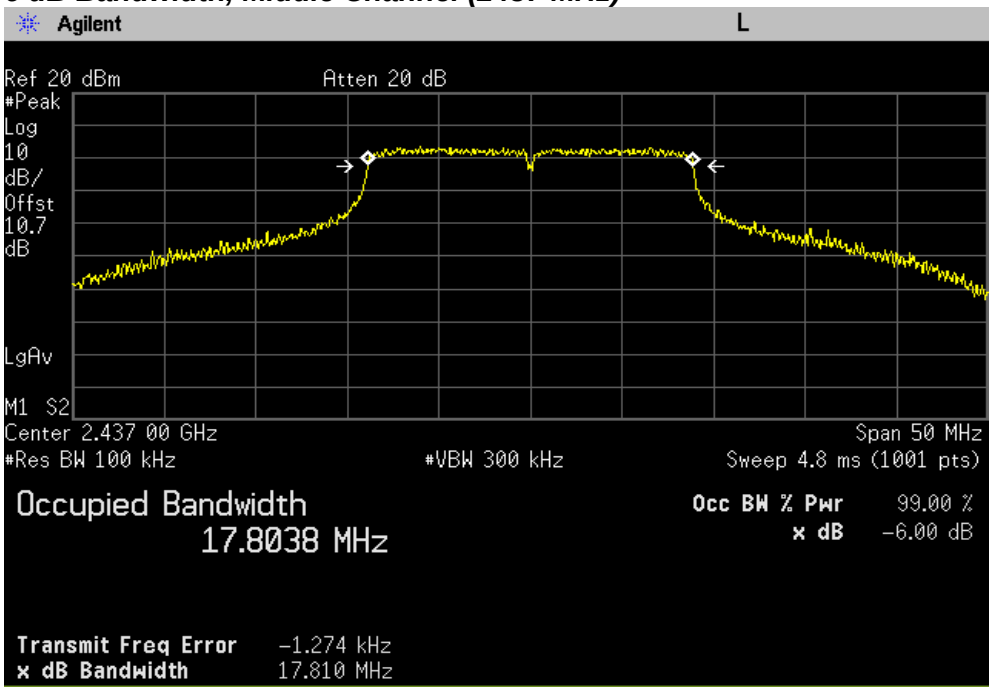
802.11n(20 MHz) mode

Chain 0

6 dB Bandwidth, Lowest Channel (2412 MHz)

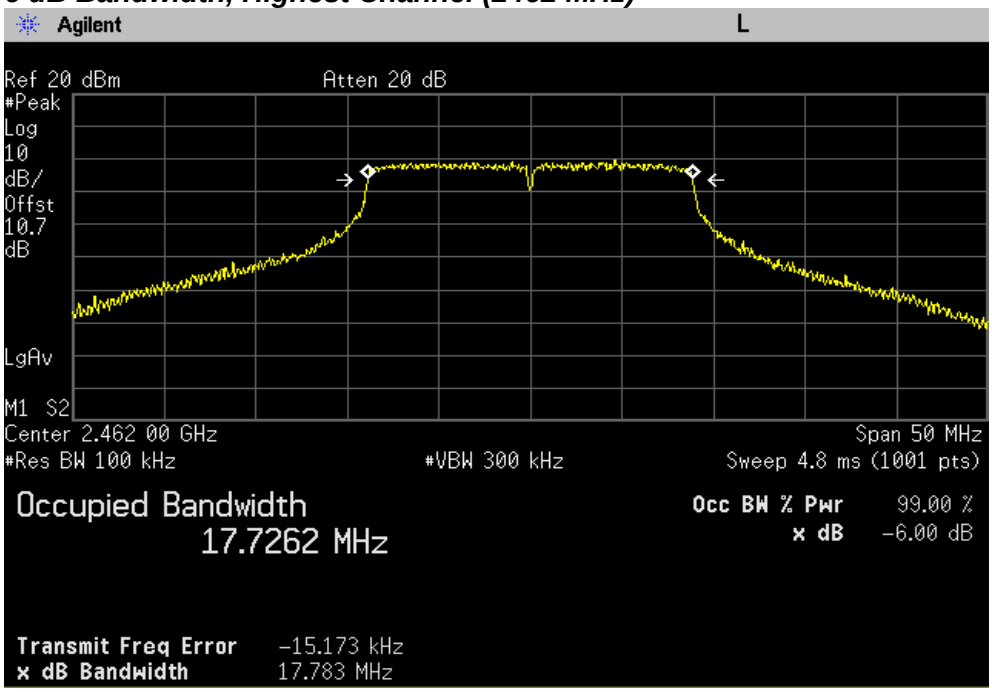


6 dB Bandwidth, Middle Channel (2437 MHz)



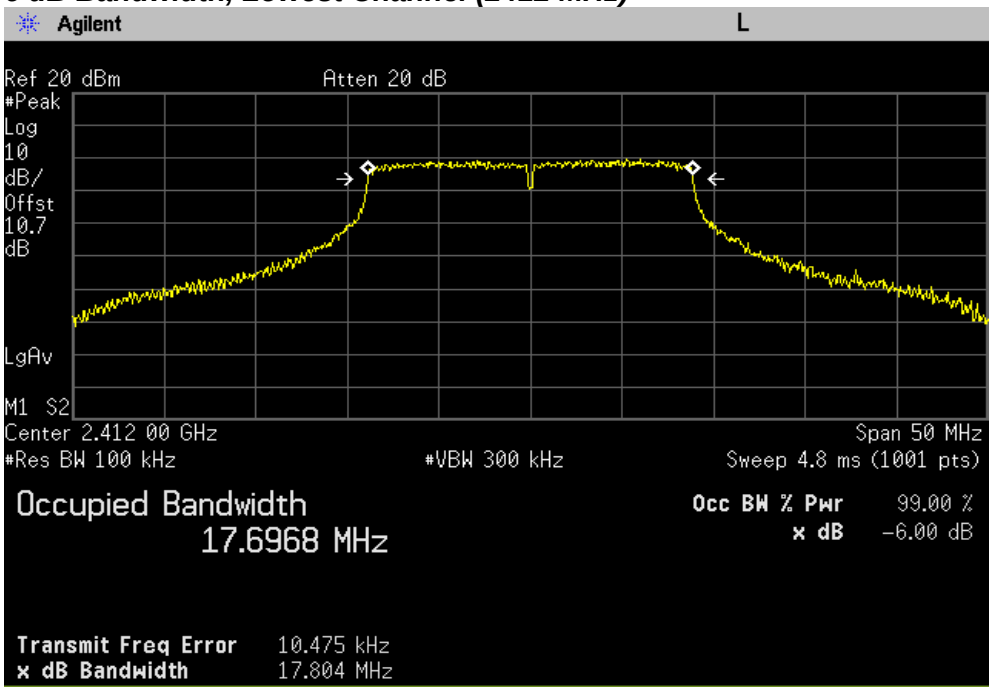
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (2462 MHz)



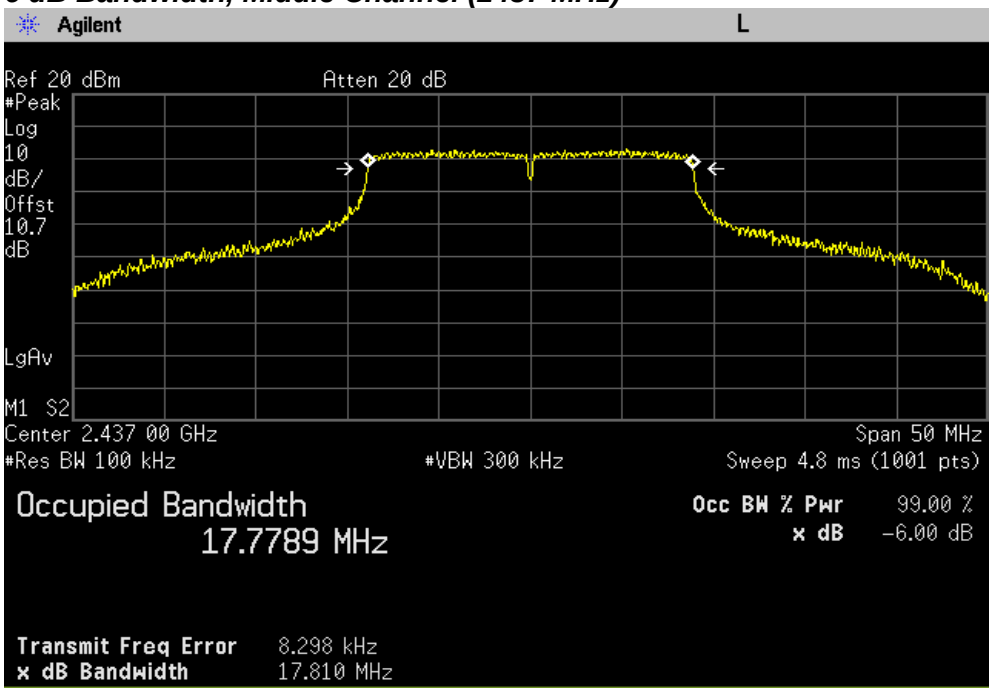
Chain 1

6 dB Bandwidth, Lowest Channel (2412 MHz)

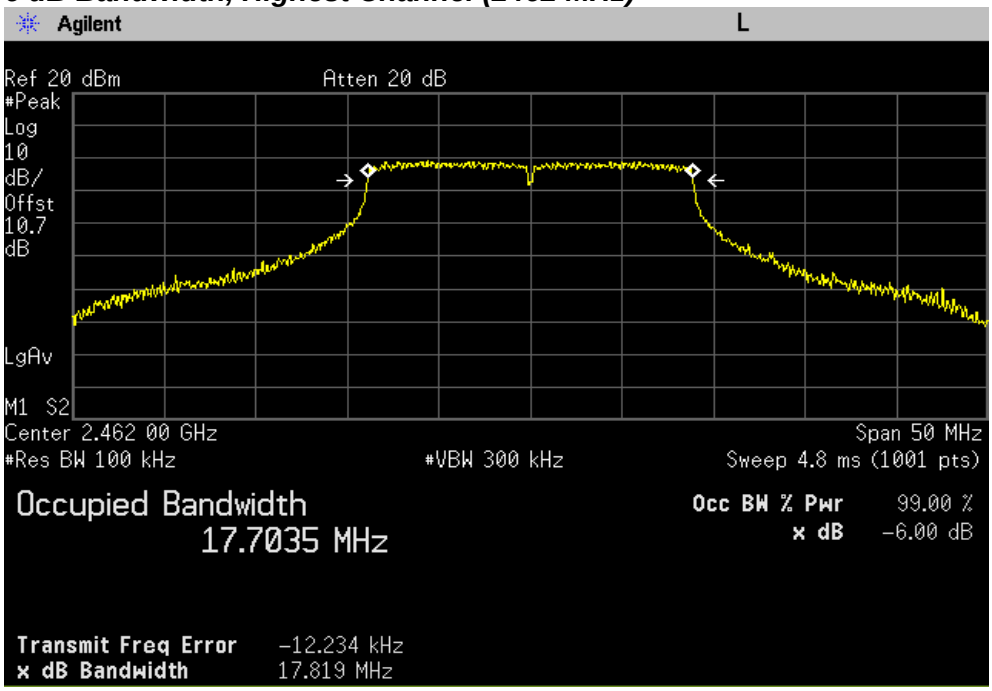


PLOTS OF EMISSIONS

6 dB Bandwidth, Middle Channel (2437 MHz)



6 dB Bandwidth, Highest Channel (2462 MHz)



8.3.2 6 dB Modulated Bandwidth – 5 GHz band

FCC §15.247(a)(2), RSS-210 Issue 8, A8.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency(MHz)	Result(MHz)		Limit (MHz)
		Chain 0	Chain 1	
Low	5745	16.53	16.52	0.5
Middle	5785	16.55	16.55	0.5
High	5825	16.54	16.49	0.5

802.11n(20 MHz) mode

Channel	Frequency(MHz)	Result(MHz)		Limit (MHz)
		Chain 0	Chain 1	
Low	5745	17.72	17.73	0.5
Middle	5785	17.73	17.68	0.5
High	5825	17.72	17.69	0.5

802.11n(40 MHz) mode

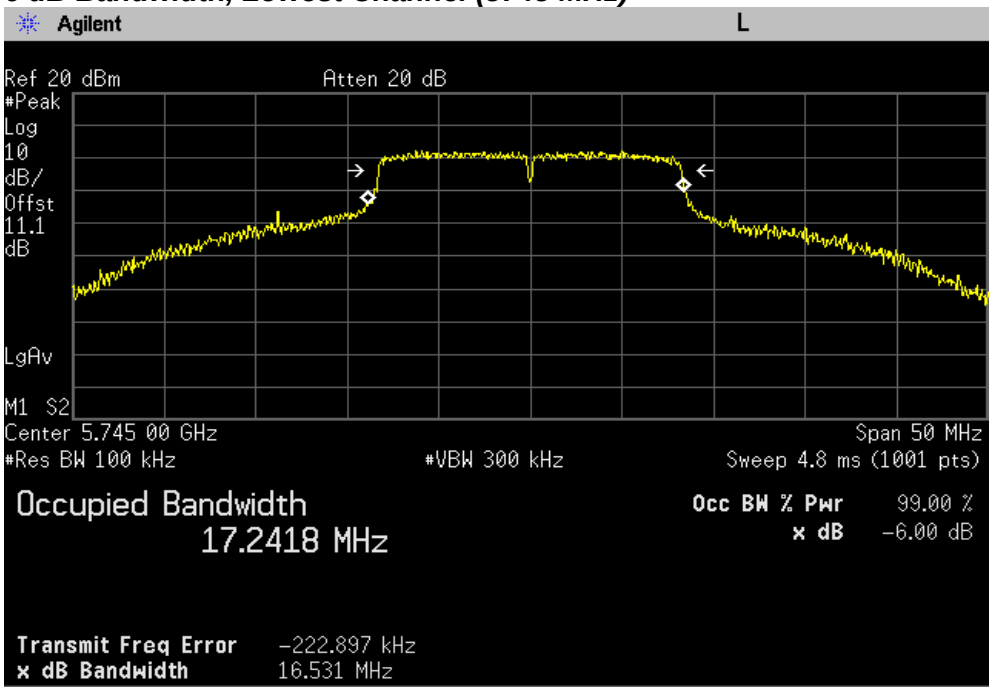
Channel	Frequency(MHz)	Result(MHz)		Limit (MHz)
		Chain 0	Chain 1	
Low	5755	36.50	36.47	0.5
High	5795	36.49	36.50	0.5

PLOTS OF EMISSIONS

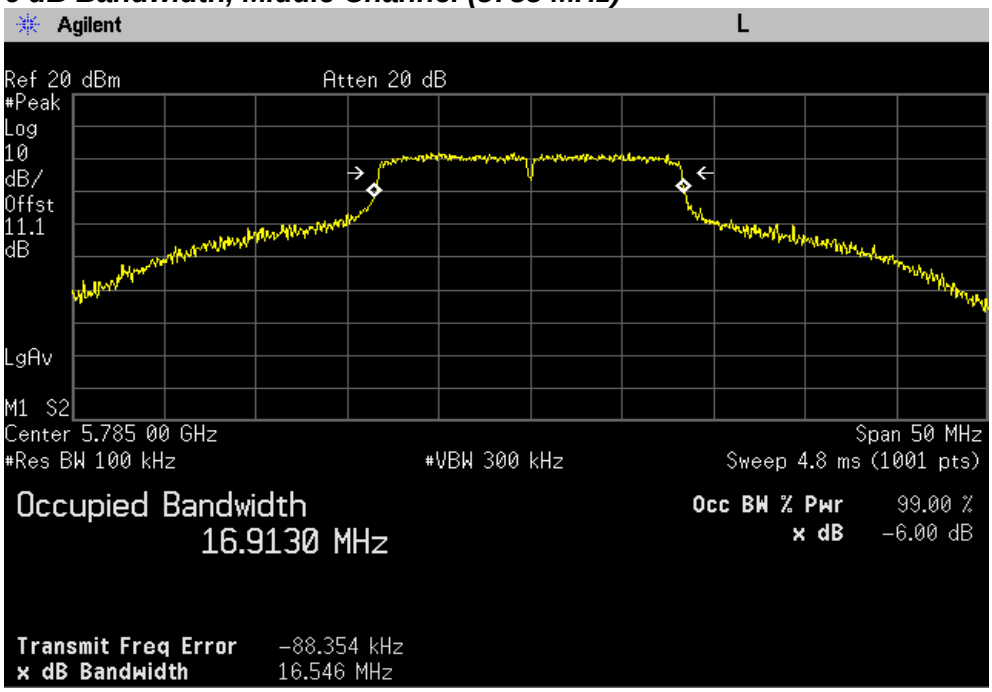
802.11a mode

Chain 0

6 dB Bandwidth, Lowest Channel (5745 MHz)

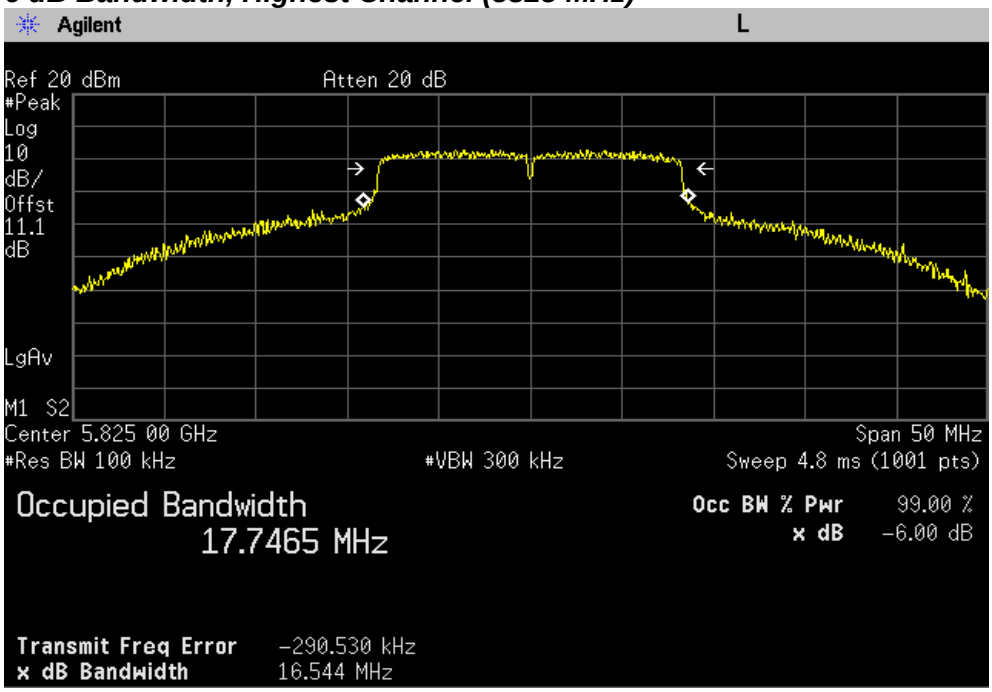


6 dB Bandwidth, Middle Channel (5785 MHz)



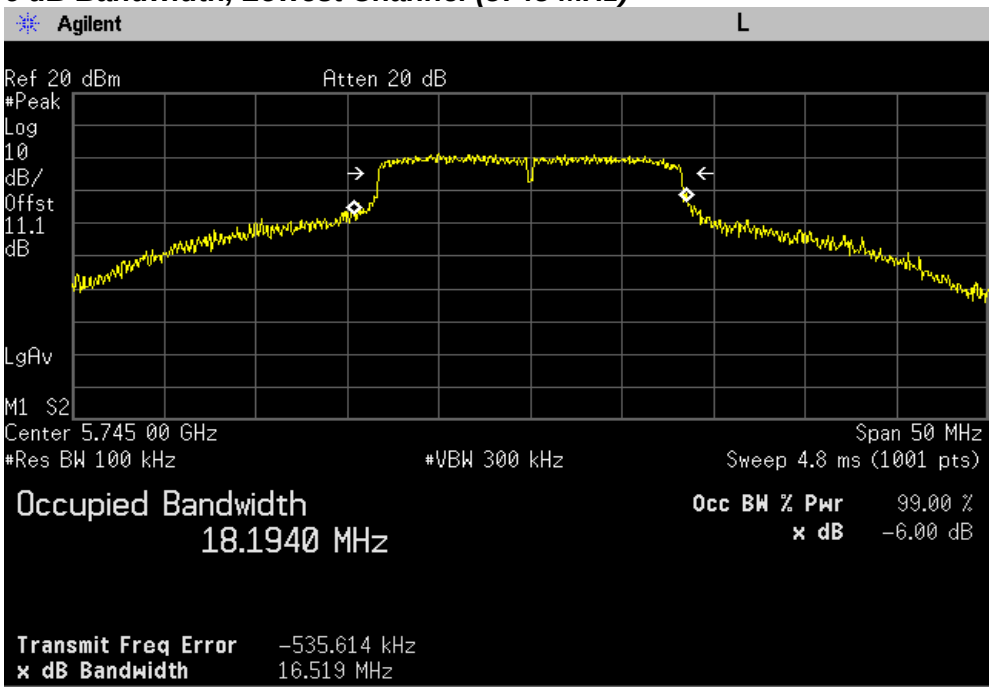
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (5825 MHz)



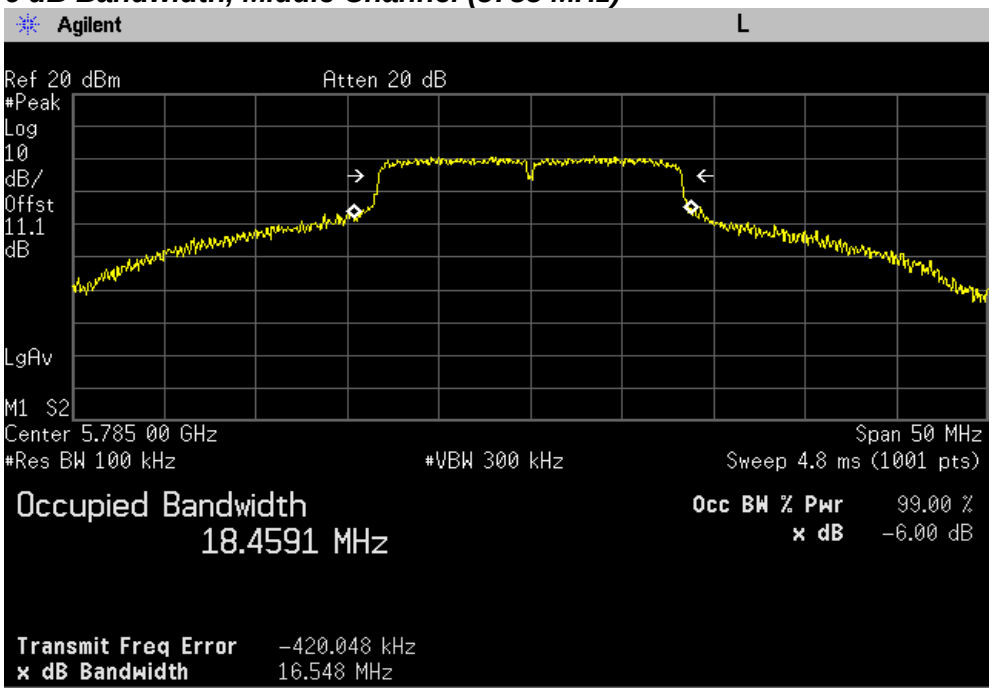
Chain 1

6 dB Bandwidth, Lowest Channel (5745 MHz)

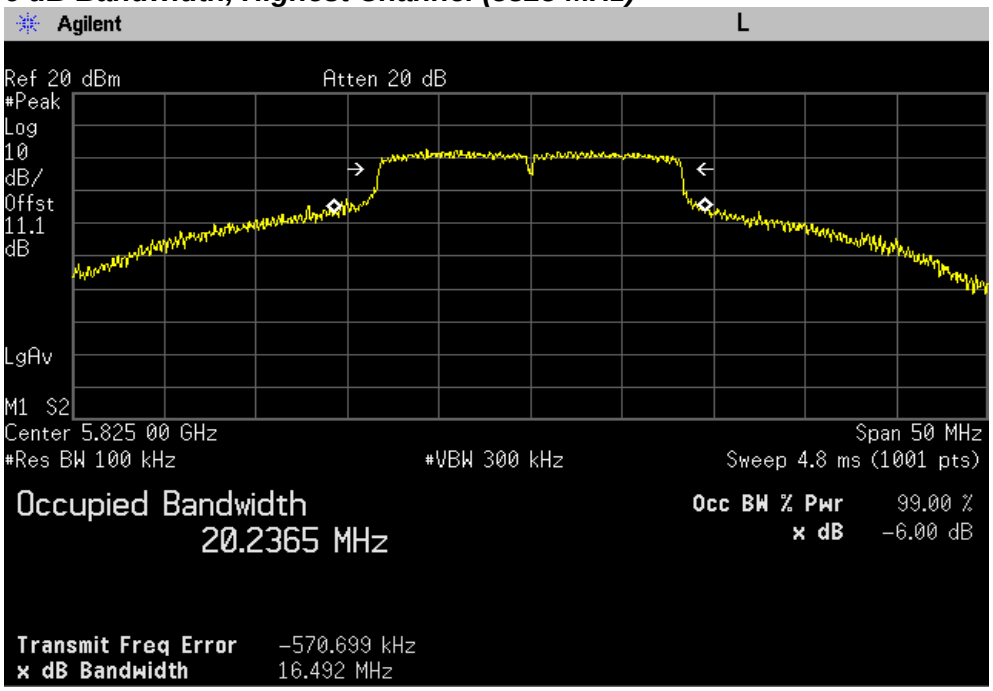


PLOTS OF EMISSIONS

6 dB Bandwidth, Middle Channel (5785 MHz)



6 dB Bandwidth, Highest Channel (5825 MHz)

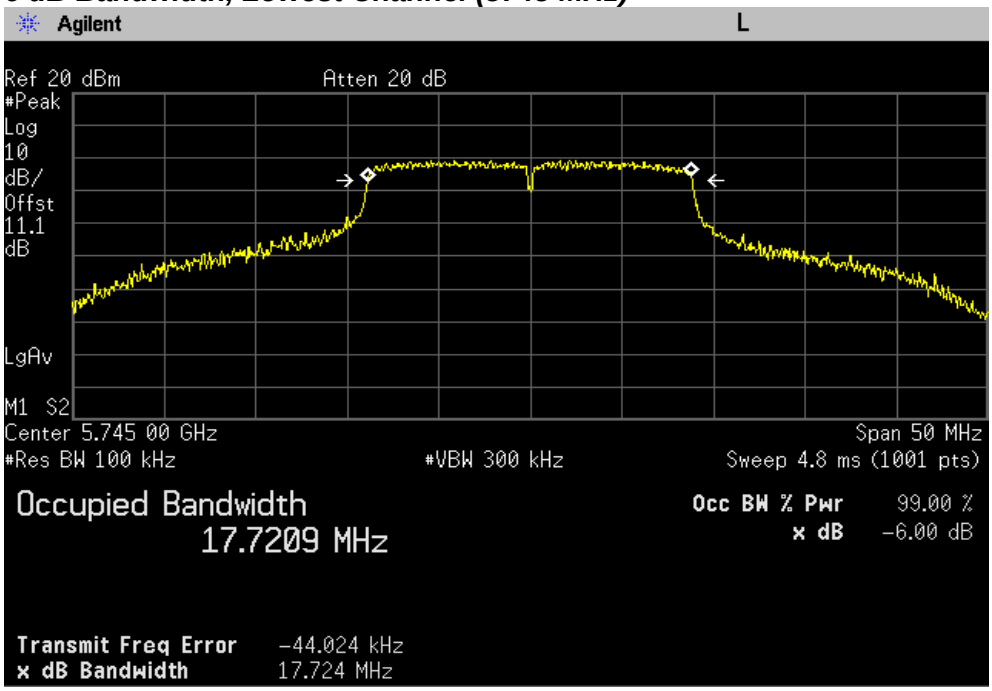


PLOTS OF EMISSIONS

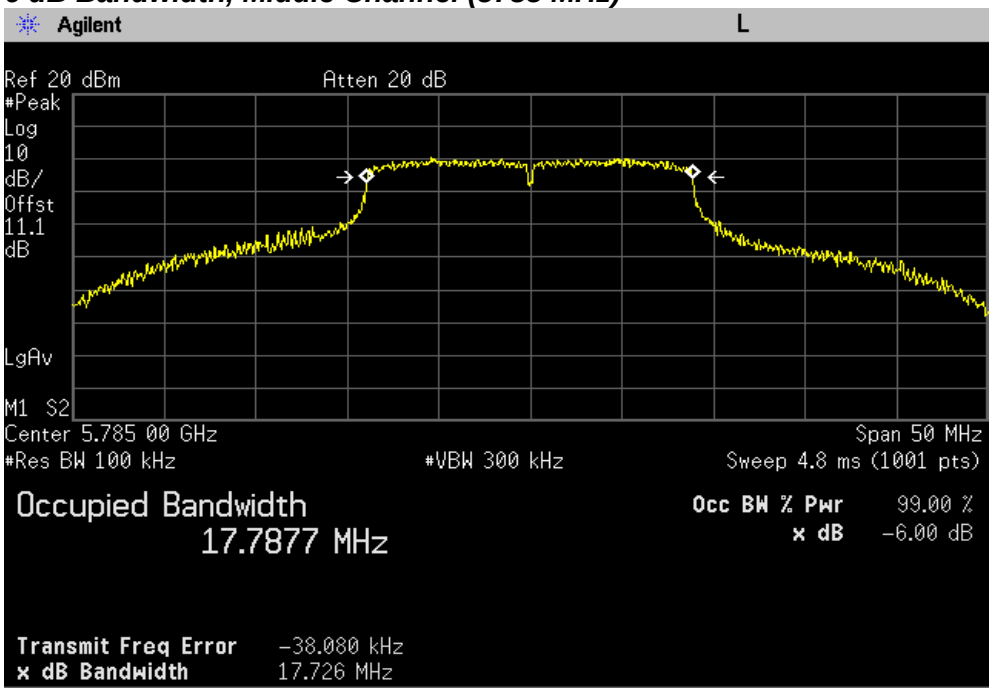
802.11n(20 MHz) mode

Chain 0

6 dB Bandwidth, Lowest Channel (5745 MHz)

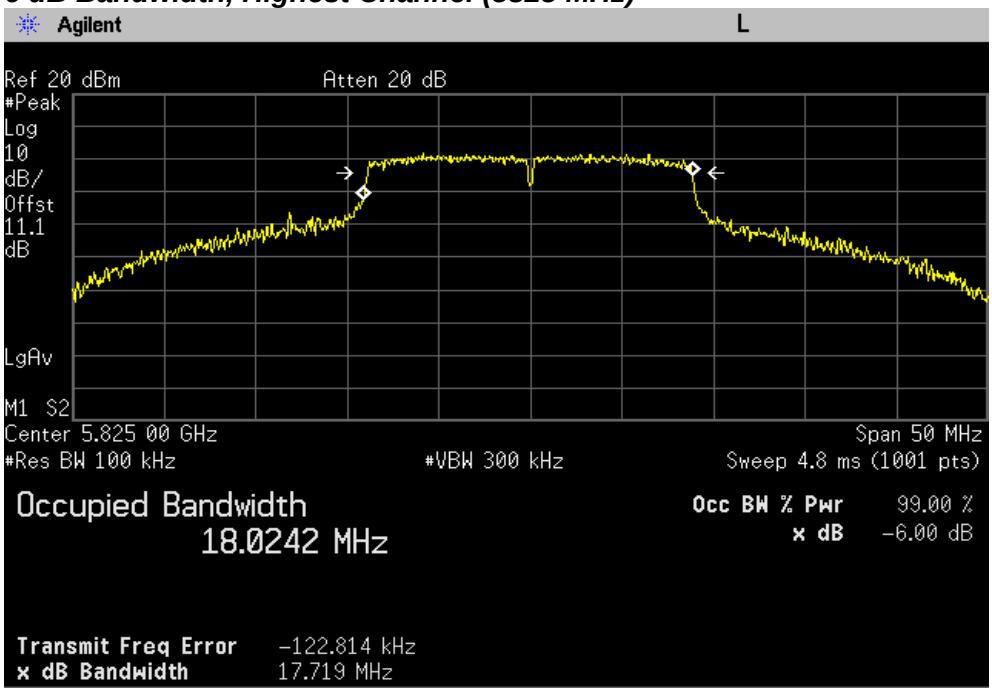


6 dB Bandwidth, Middle Channel (5785 MHz)



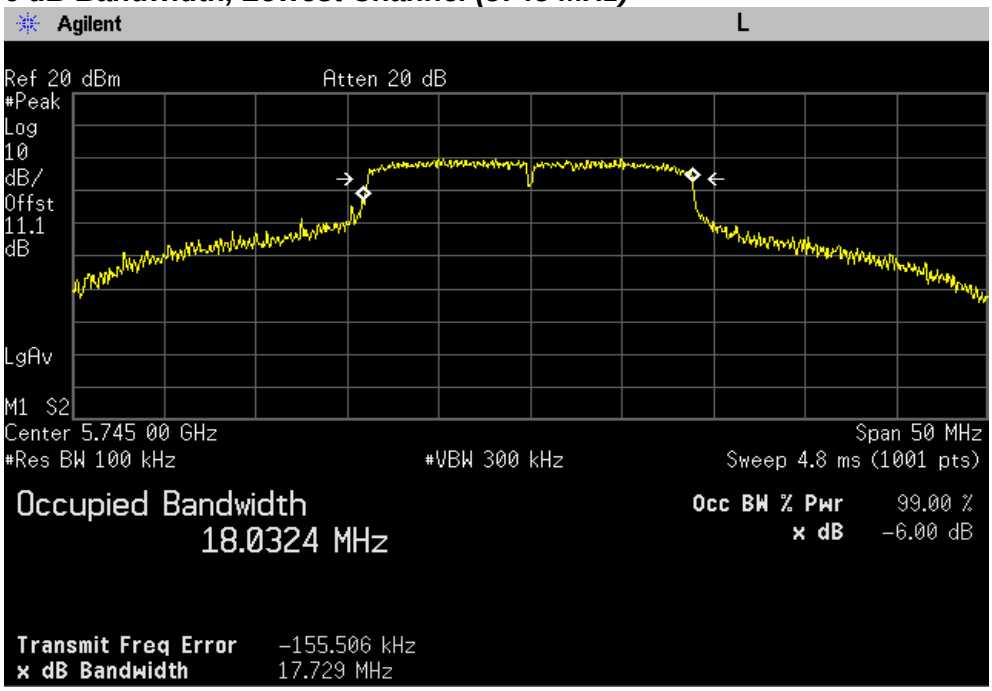
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (5825 MHz)



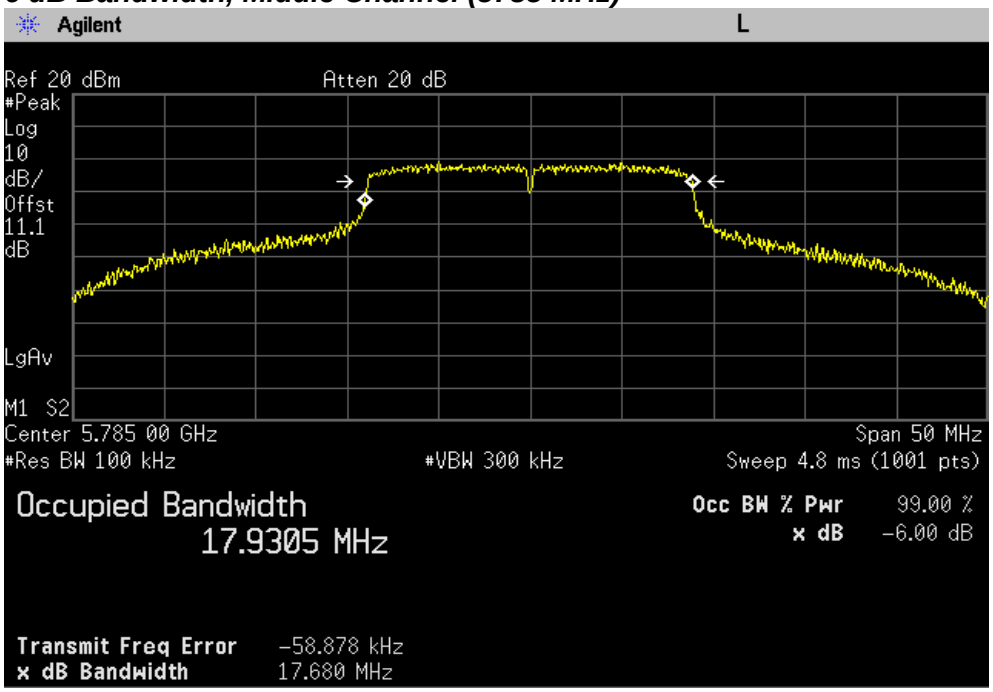
Chain 1

6 dB Bandwidth, Lowest Channel (5745 MHz)

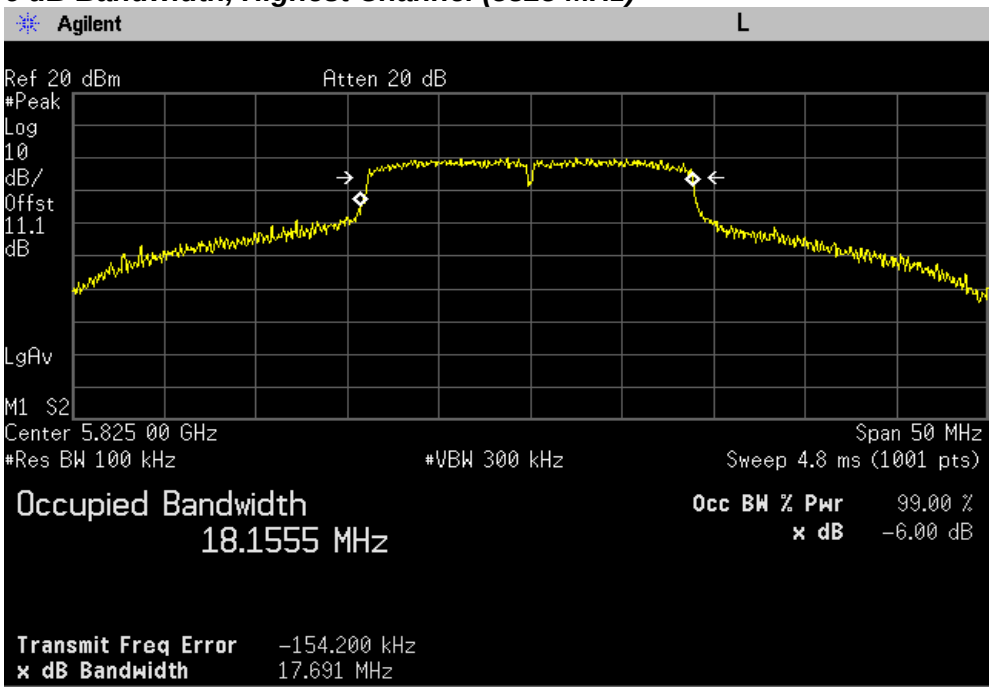


PLOTS OF EMISSIONS

6 dB Bandwidth, Middle Channel (5785 MHz)



6 dB Bandwidth, Highest Channel (5825 MHz)

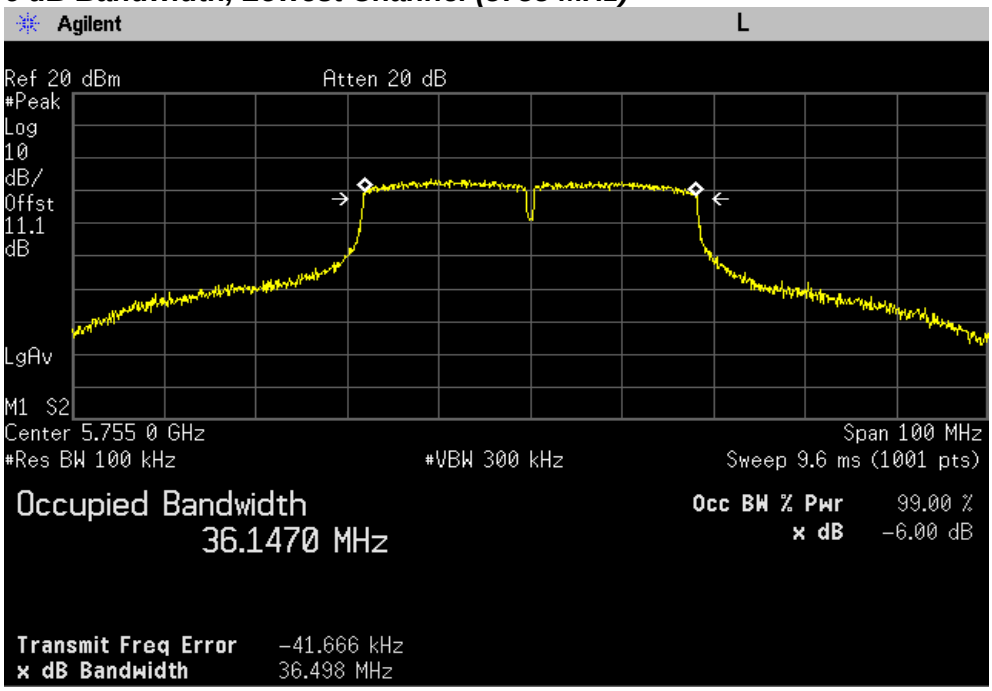


PLOTS OF EMISSIONS

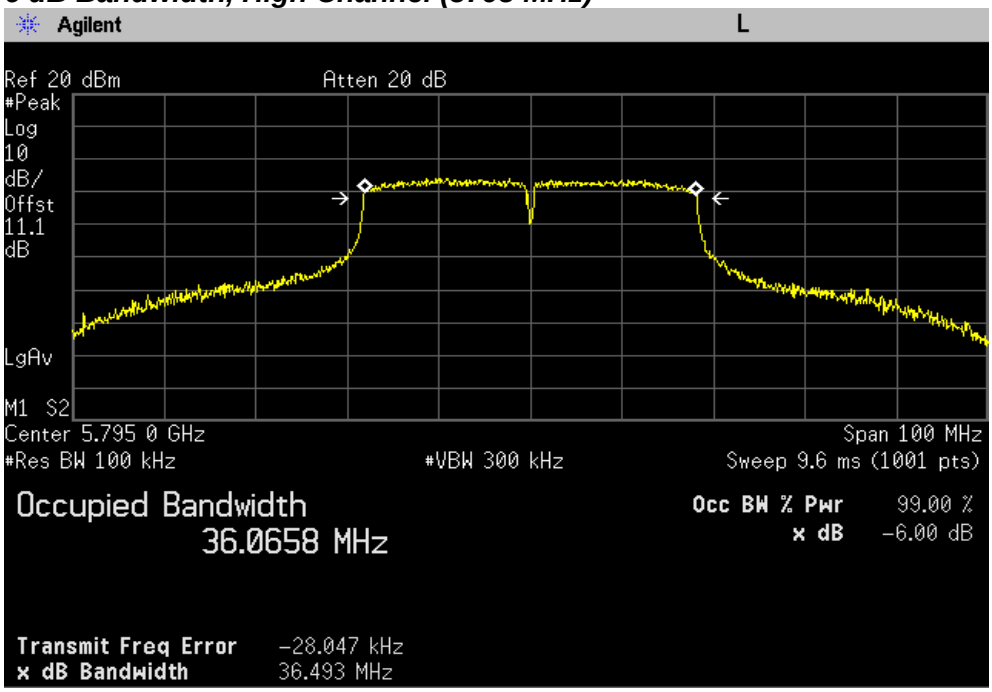
802.11n(40 MHz) mode

Chain 0

6 dB Bandwidth, Lowest Channel (5755 MHz)



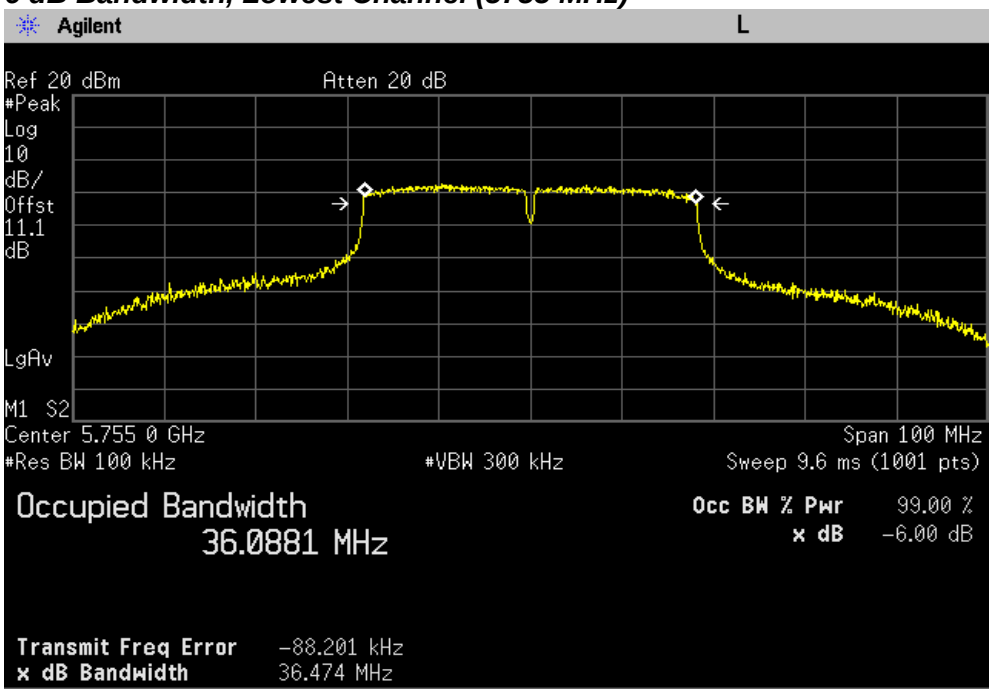
6 dB Bandwidth, High Channel (5795 MHz)



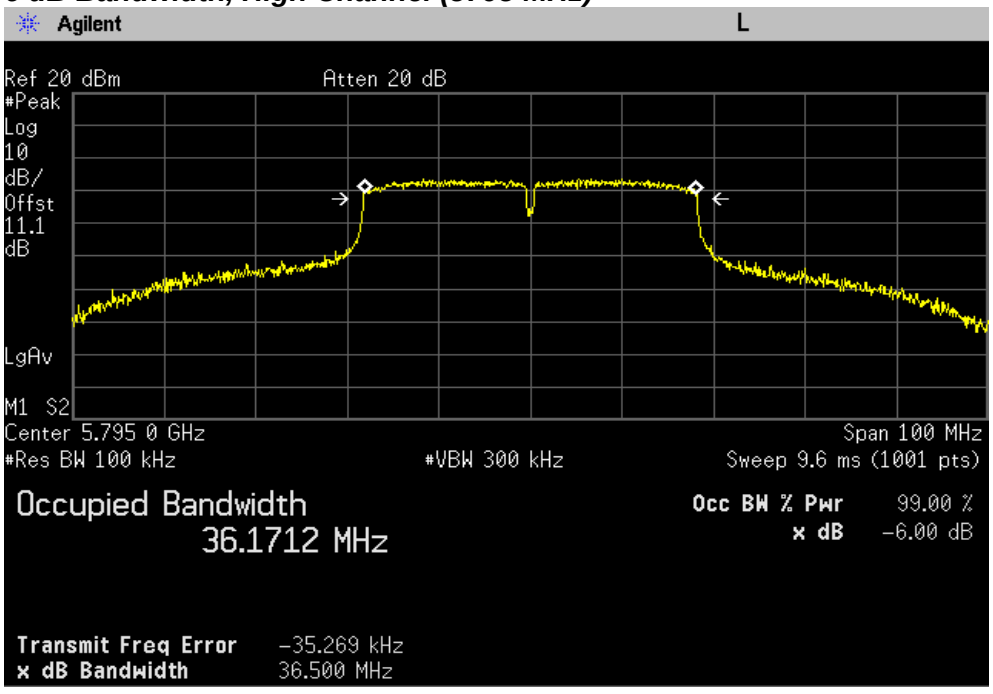
PLOTS OF EMISSIONS

Chain 1

6 dB Bandwidth, Lowest Channel (5755 MHz)



6 dB Bandwidth, High Channel (5795 MHz)



8.4 Maximum Peak Power Output

8.4.1 Maximum Peak Power Output – 2.4 GHz band

FCC §15.247(b)(3), RSS-210 Issue 8, A8.4

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11b

Channel	Frequency(MHz)	Result(dBm)		Limit (dBm)
		Chain 0	Chain 1	
Low	2412	20.84	20.90	30.0
Middle	2437	20.82	20.89	30.0
High	2462	20.81	20.80	30.0

802.11g

Channel	Frequency(MHz)	Result(dBm)		Limit (dBm)
		Chain 0	Chain 1	
Low	2412	23.46	23.48	30.0
Middle	2437	25.91	25.88	30.0
High	2462	22.48	22.52	30.0

802.11n(20 MHz)

Channel	Frequency (MHz)	Result(dBm)		*Total Peak Power (dBm)	Limit (dBm)
		Chain 0	Chain 1		
Low	2412	22.00	21.32	24.68	30.0
Middle	2437	25.02	24.72	27.88	30.0
High	2462	21.40	21.12	24.27	30.0

Note:

The following equation was used for spectrum offset:

Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

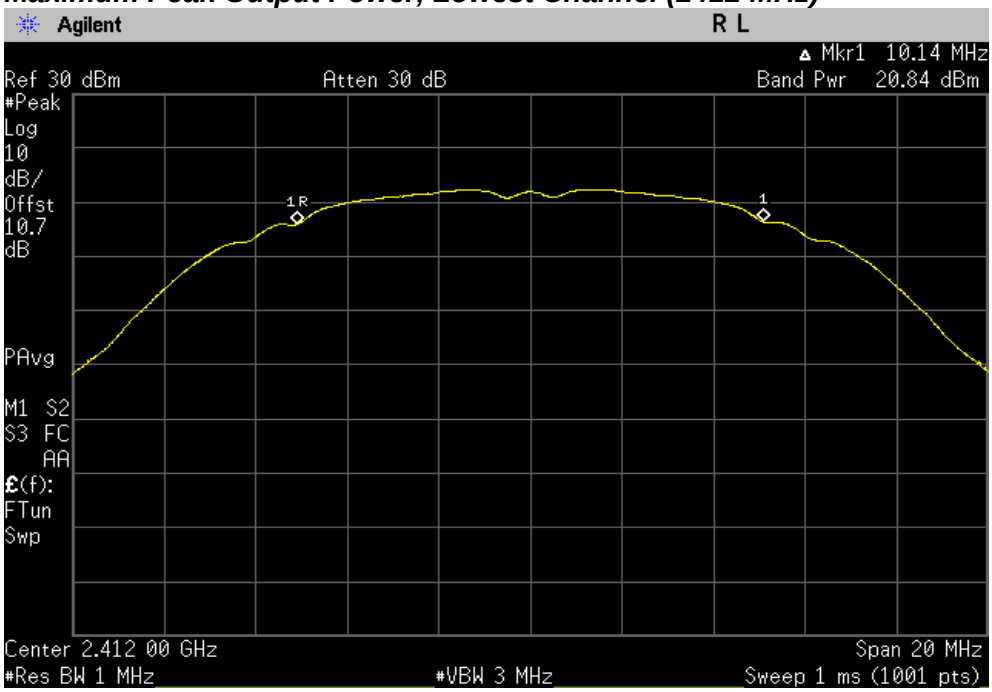
**Total Peak power = 10 log [10^(Chain 0 Power/10) + 10^(Chain 1 Power/10)]*

PLOT OF TEST DATA

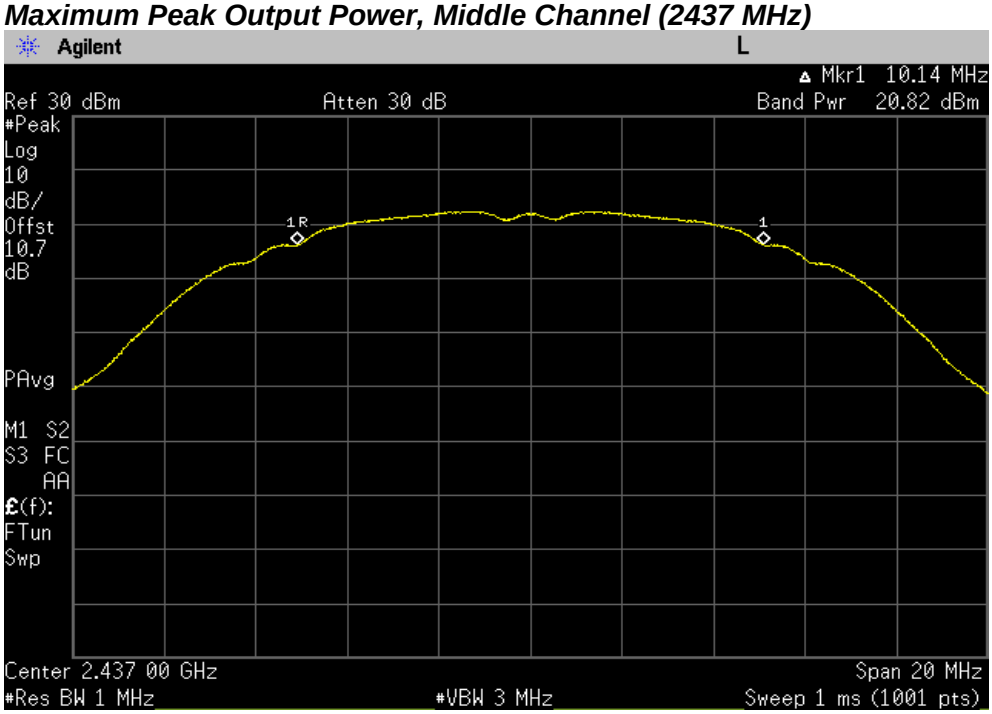
802.11b mode

Chain 0

Maximum Peak Output Power, Lowest Channel (2412 MHz)

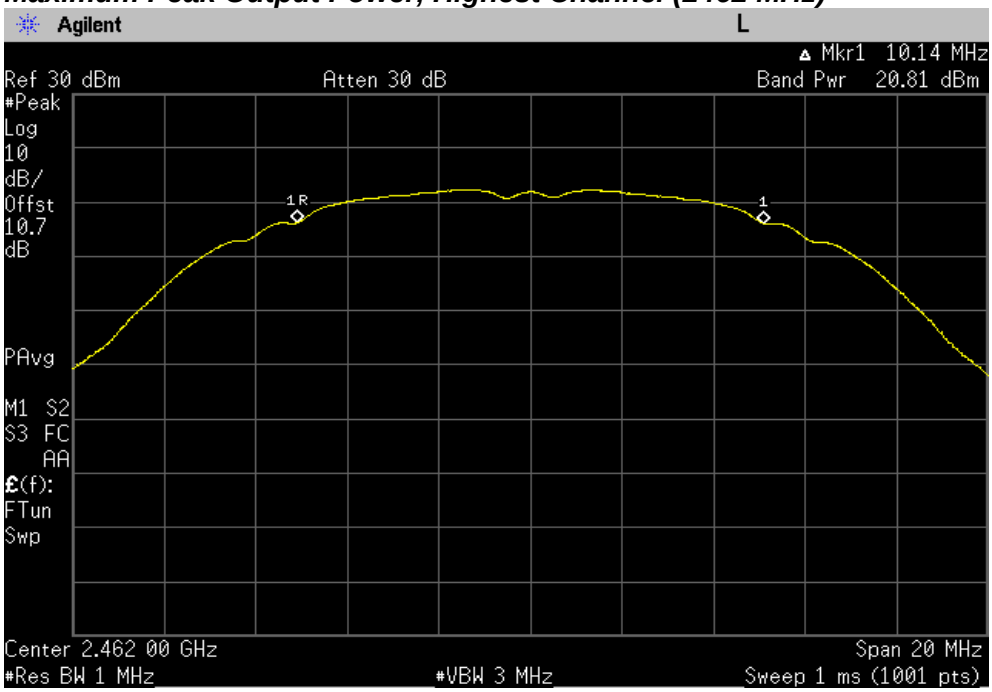


Maximum Peak Output Power, Middle Channel (2437 MHz)



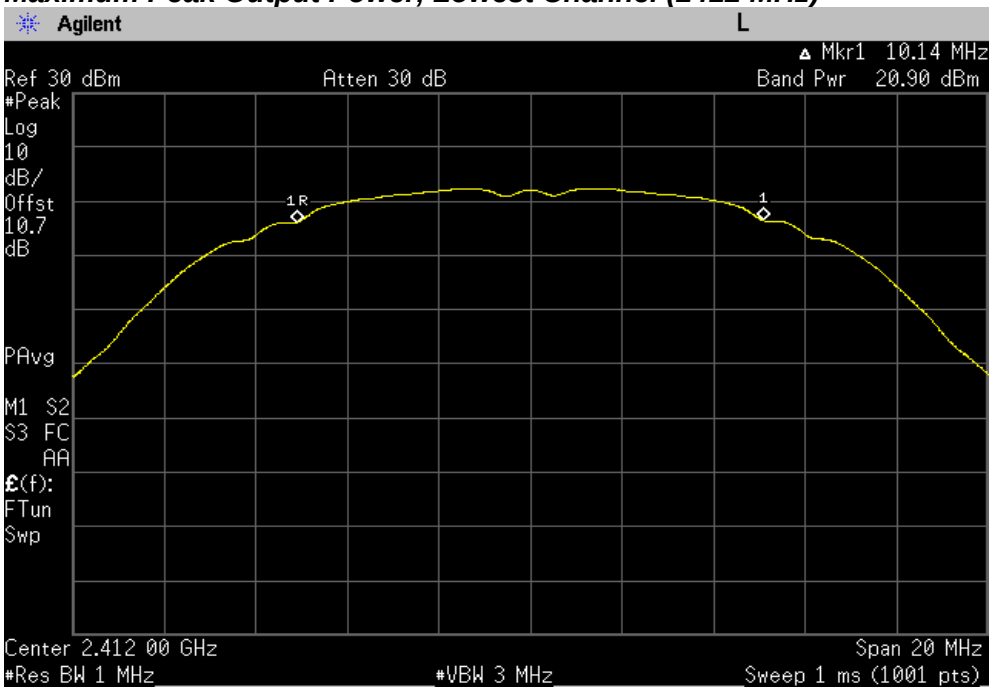
PLOT OF TEST DATA

Maximum Peak Output Power, Highest Channel (2462 MHz)



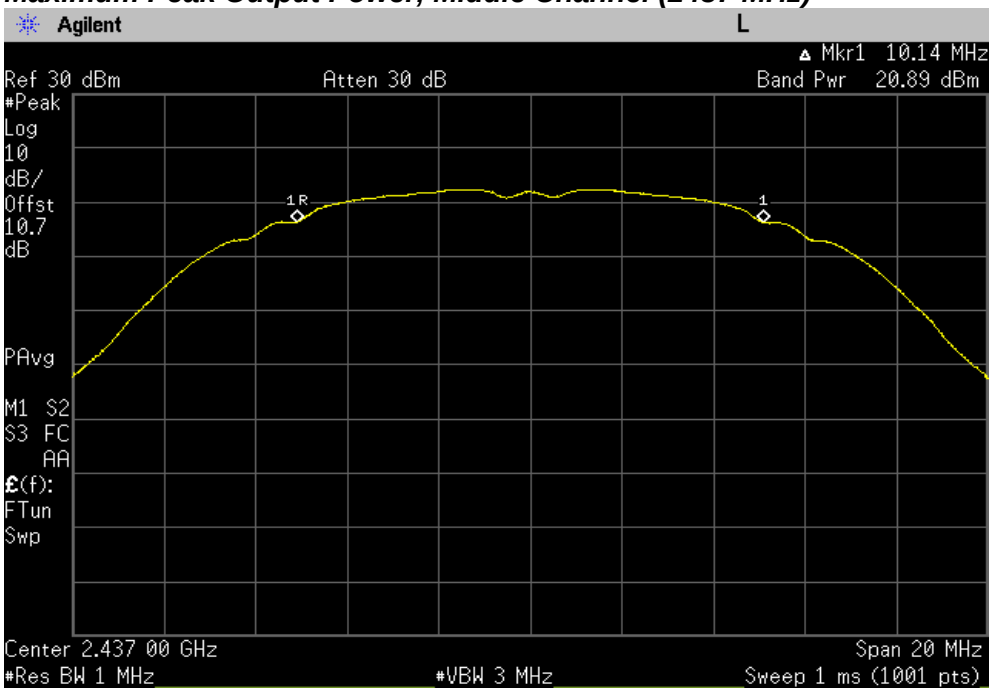
Chain 1

Maximum Peak Output Power, Lowest Channel (2412 MHz)

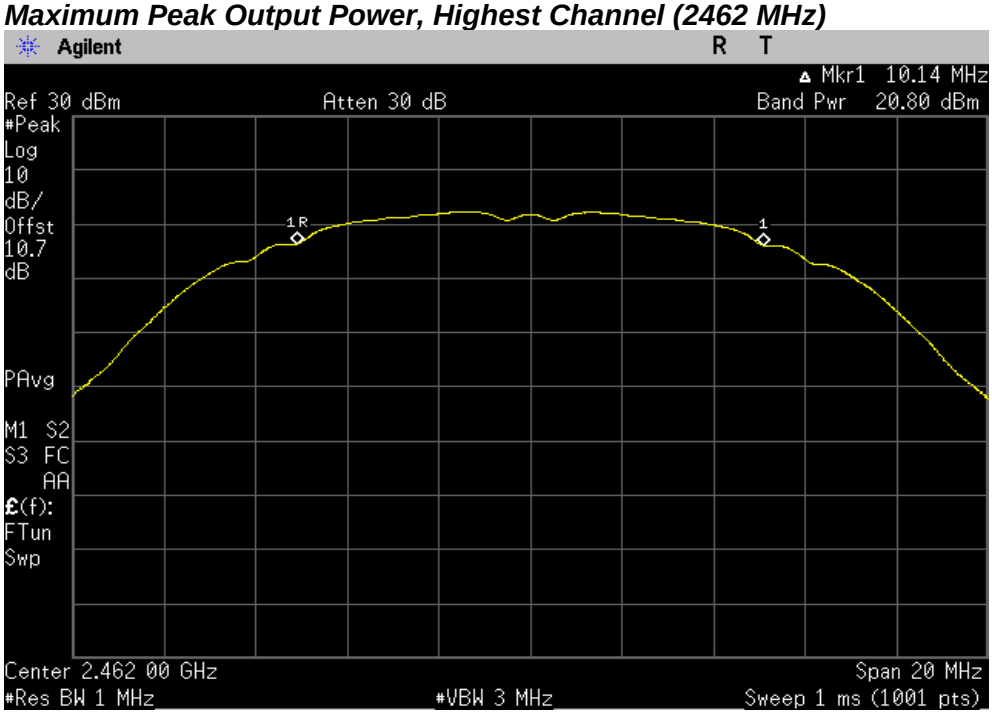


PLOT OF TEST DATA

Maximum Peak Output Power, Middle Channel (2437 MHz)



Maximum Peak Output Power, Highest Channel (2462 MHz)

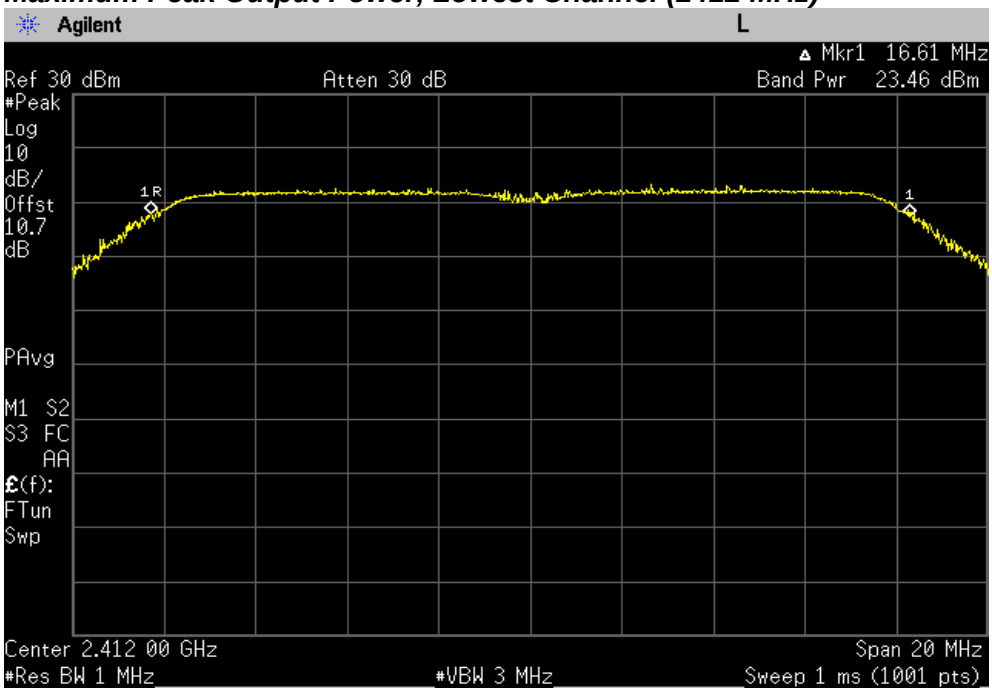


PLOT OF TEST DATA

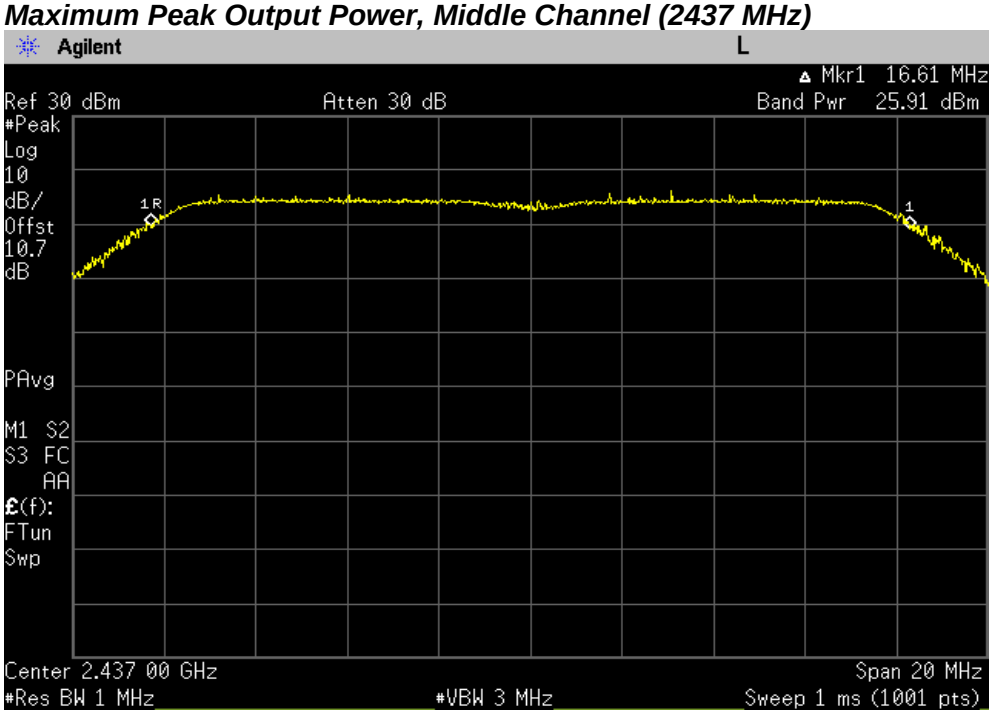
802.11g mode

Chain 0

Maximum Peak Output Power, Lowest Channel (2412 MHz)

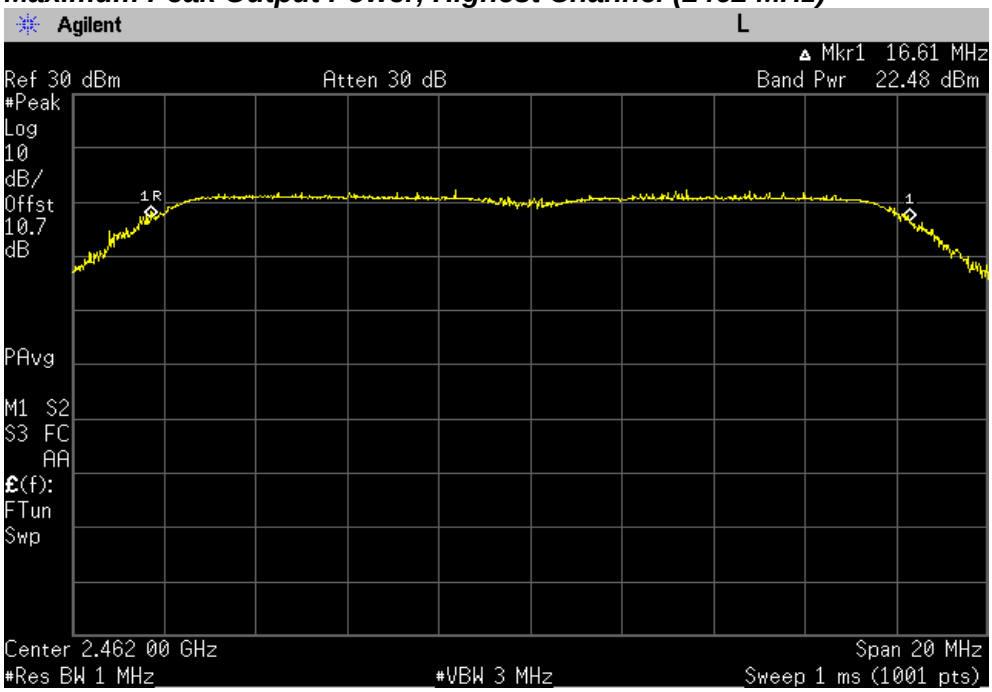


Maximum Peak Output Power, Middle Channel (2437 MHz)



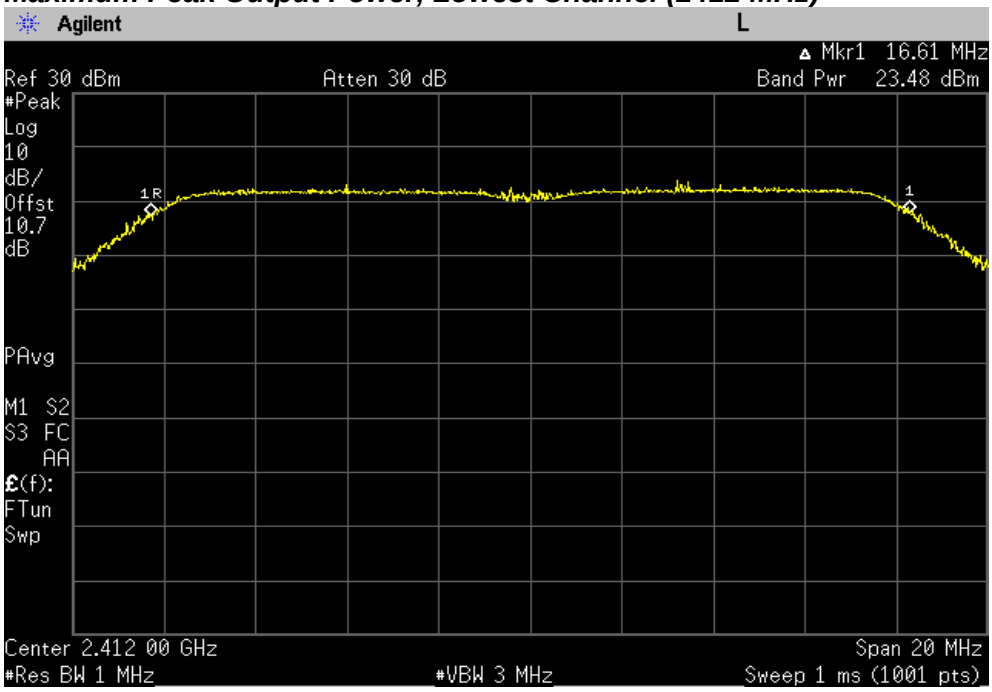
PLOT OF TEST DATA

Maximum Peak Output Power, Highest Channel (2462 MHz)



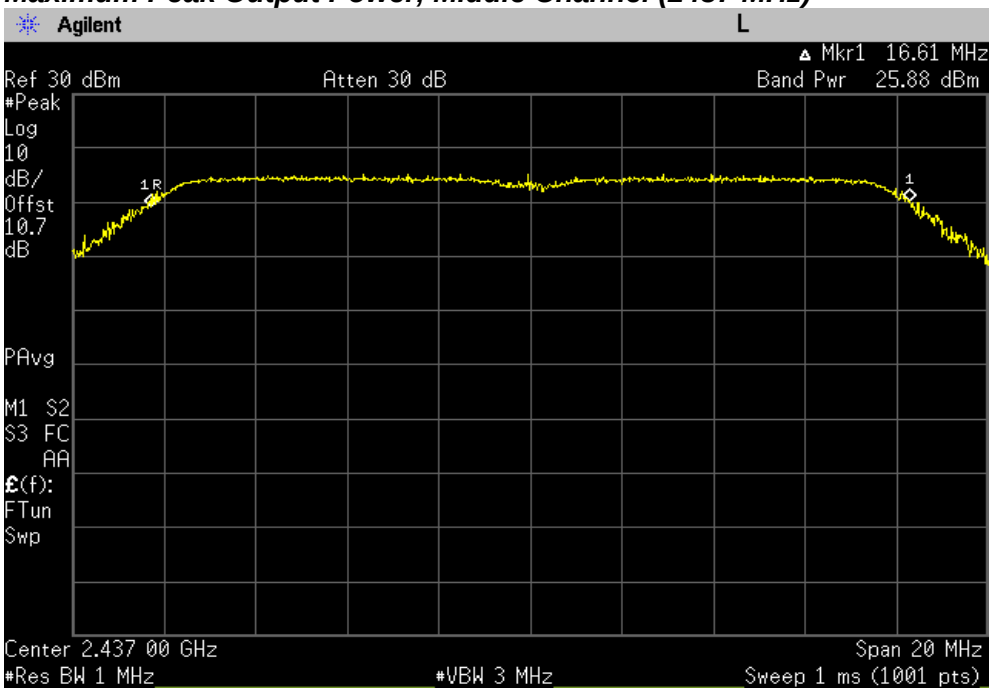
Chain 1

Maximum Peak Output Power, Lowest Channel (2412 MHz)

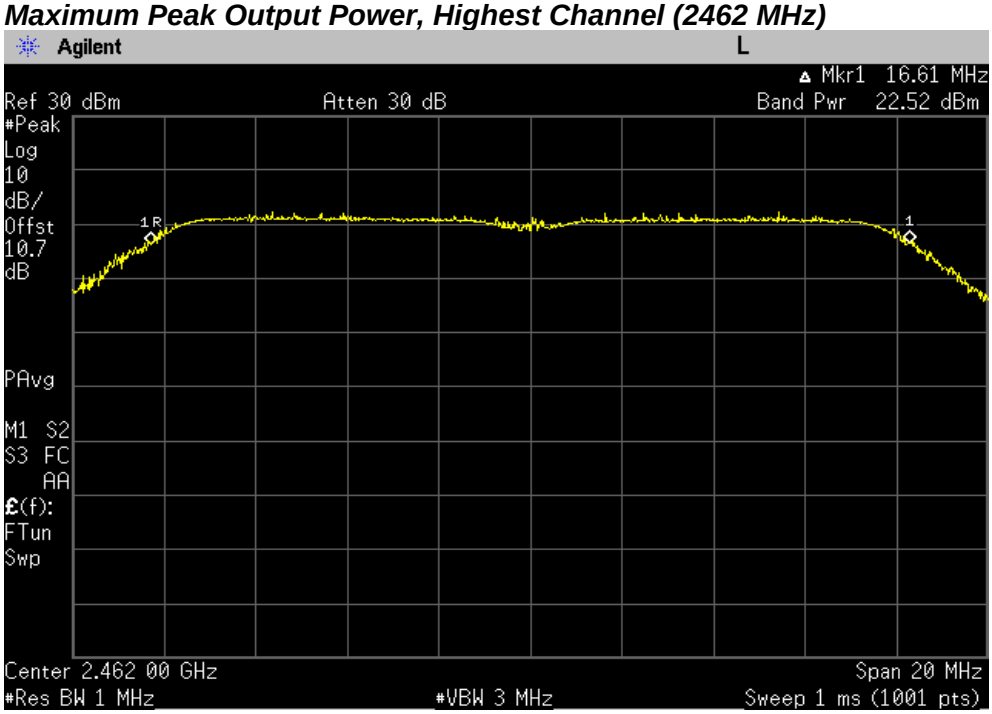


PLOT OF TEST DATA

Maximum Peak Output Power, Middle Channel (2437 MHz)



Maximum Peak Output Power, Highest Channel (2462 MHz)

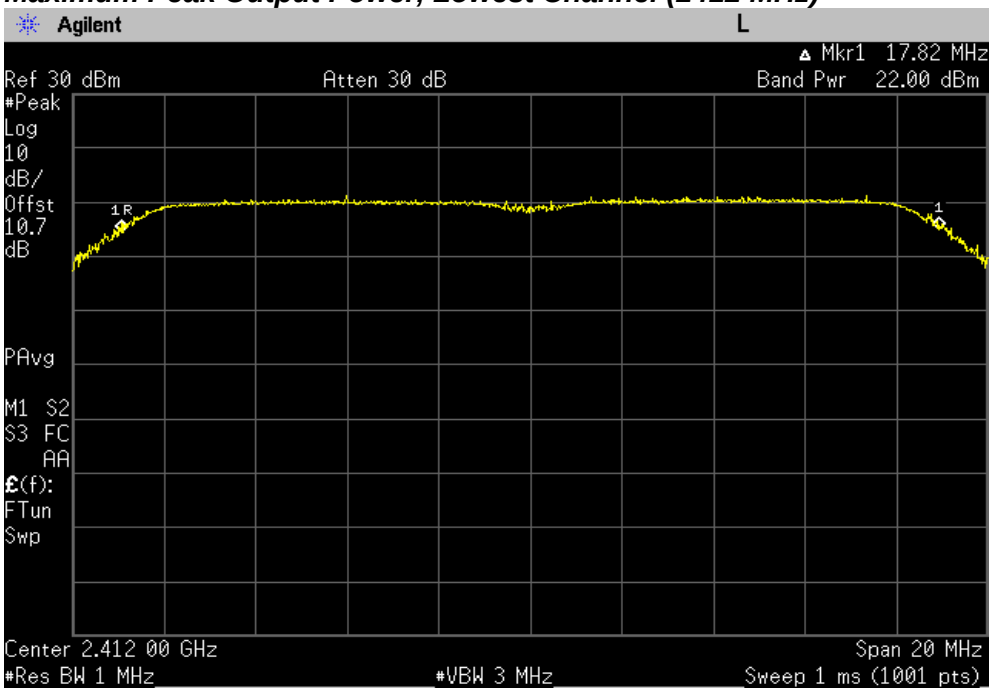


PLOT OF TEST DATA

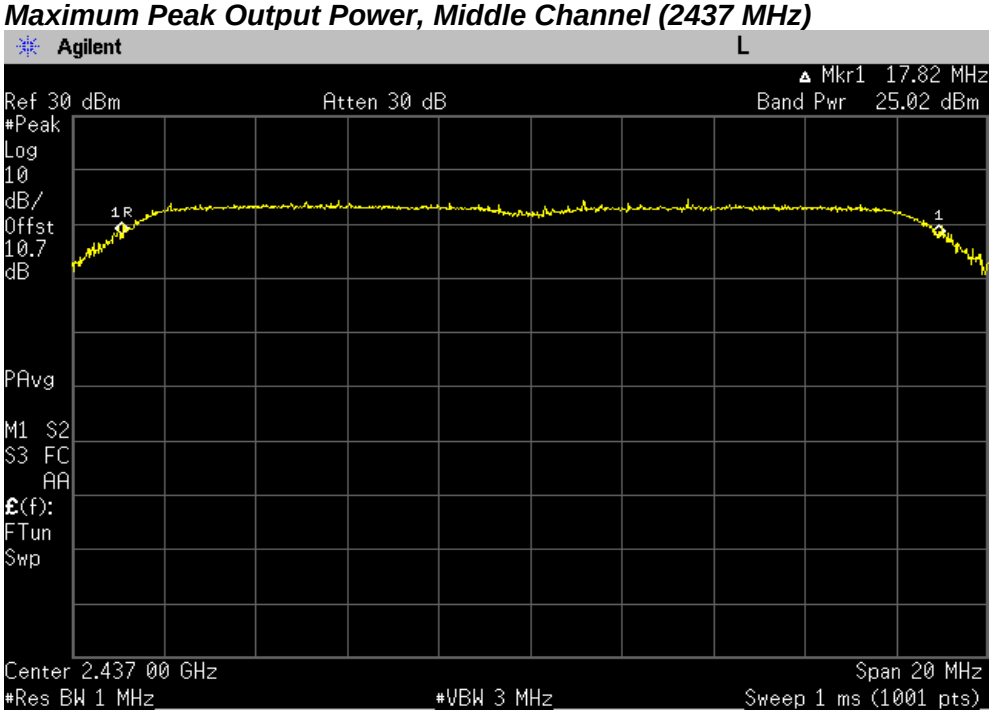
802.11n(20 MHz) mode

Chain 0

Maximum Peak Output Power, Lowest Channel (2412 MHz)

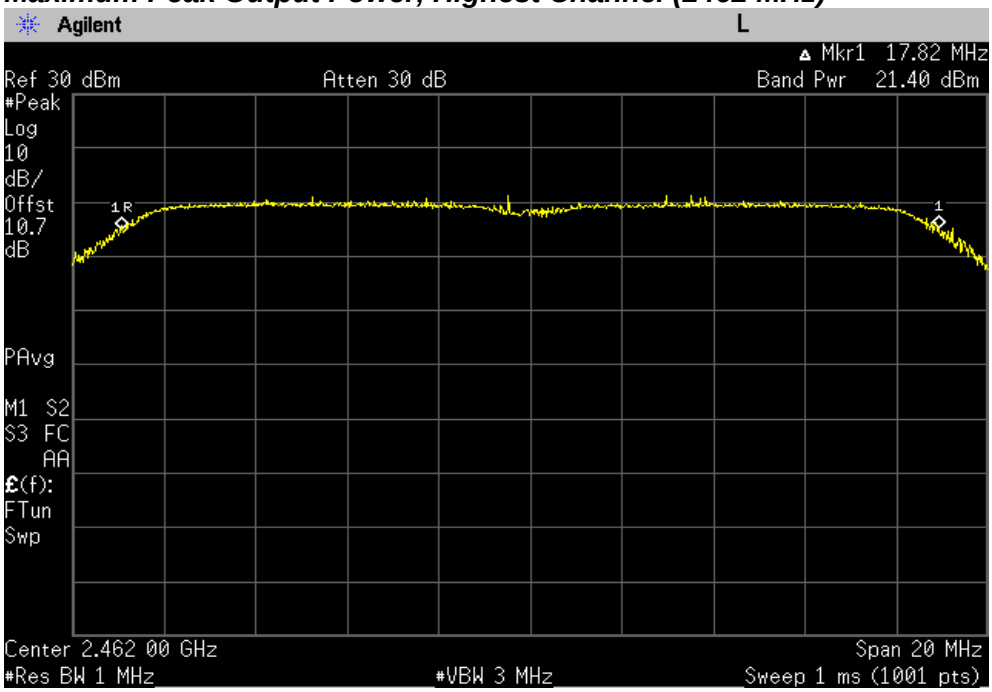


Maximum Peak Output Power, Middle Channel (2437 MHz)



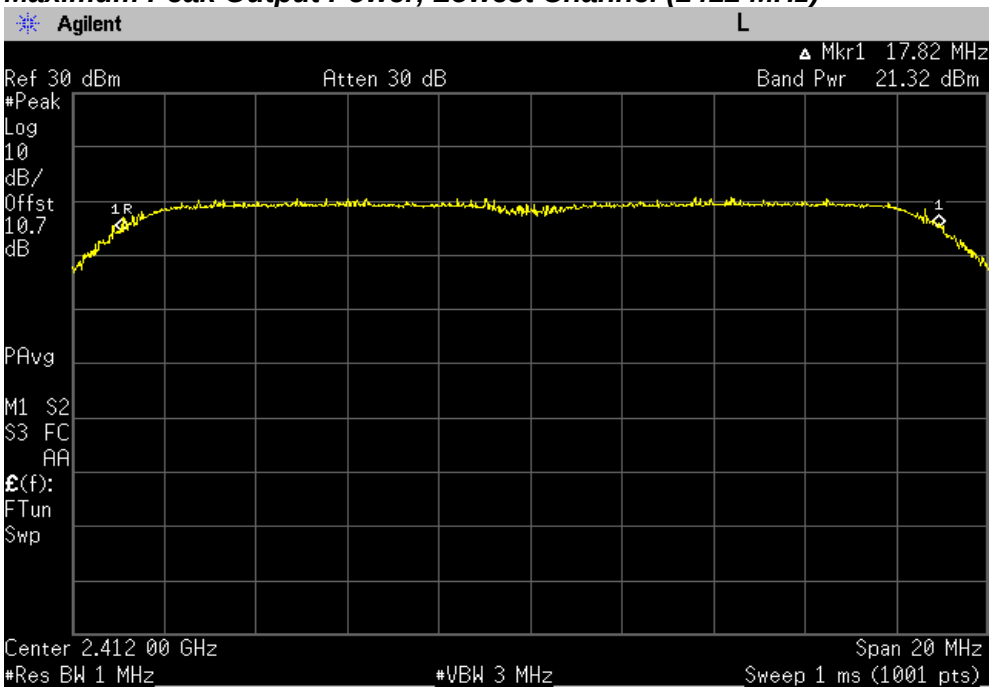
PLOT OF TEST DATA

Maximum Peak Output Power, Highest Channel (2462 MHz)



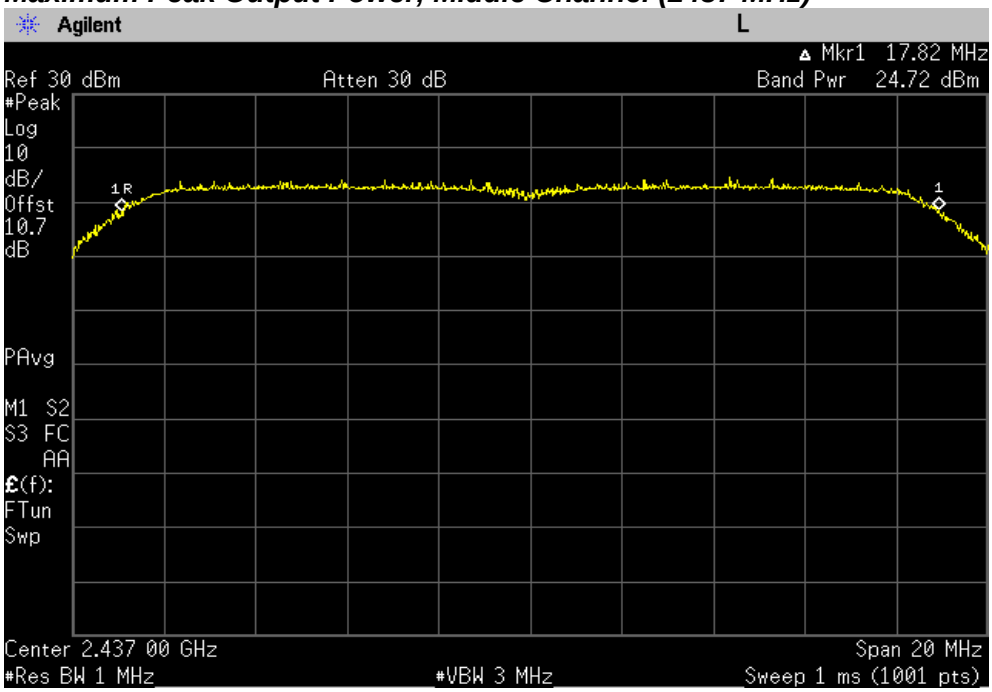
Chain 1

Maximum Peak Output Power, Lowest Channel (2412 MHz)

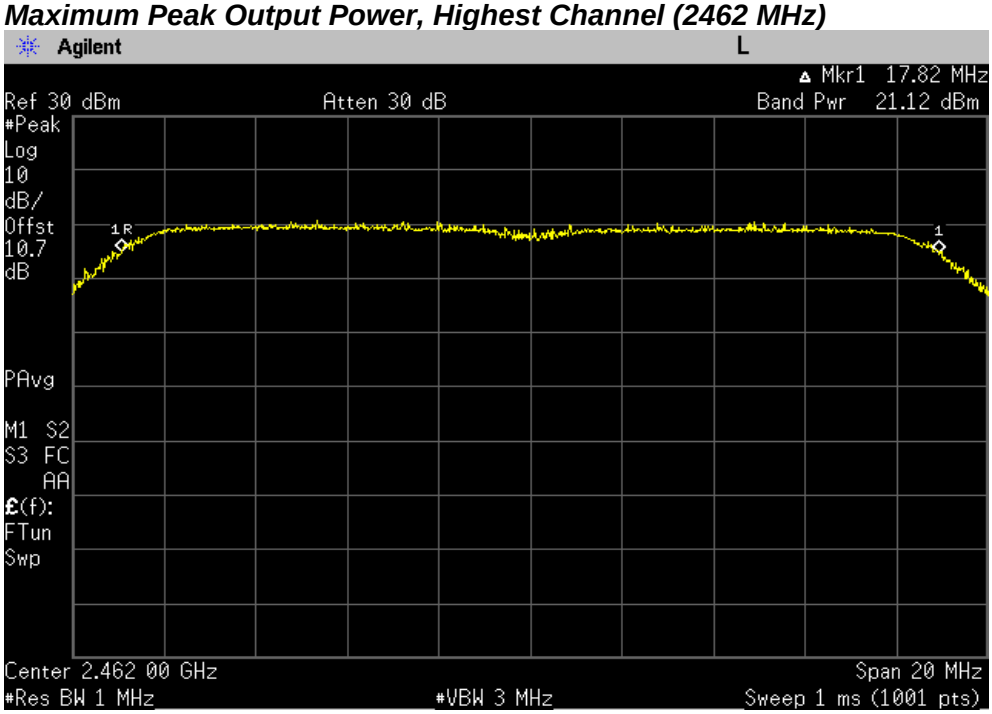


PLOT OF TEST DATA

Maximum Peak Output Power, Middle Channel (2437 MHz)



Maximum Peak Output Power, Highest Channel (2462 MHz)



8.4.2 Maximum Peak Power Output – 5 GHz band

FCC §15.247(b)(3), RSS-210 Issue 8, A8.4

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a

Channel	Frequency(MHz)	Result(dBm)		Limit (dBm)
		Chain 0	Chain 1	
Low	5745	21.54	22.20	30.0
Middle	5785	22.29	22.04	30.0
High	5825	23.52	23.20	30.0

802.11n(20 MHz)

Channel	Frequency (MHz)	Result(dBm)		*Total Peak Power (dBm)	Limit (dBm)
		Chain 0	Chain 1		
Low	5745	19.49	20.27	22.91	30.0
Middle	5785	21.02	20.03	23.56	30.0
High	5825	21.90	20.70	24.35	30.0

802.11n(40 MHz)

Channel	Frequency (MHz)	Result(dBm)		*Total Peak Power (dBm)	Limit (dBm)
		Chain 0	Chain 1		
Low	5755	17.42	17.29	20.37	30.0
High	5795	17.55	17.41	20.49	30.0

Note:

The following equation was used for spectrum offset:

Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

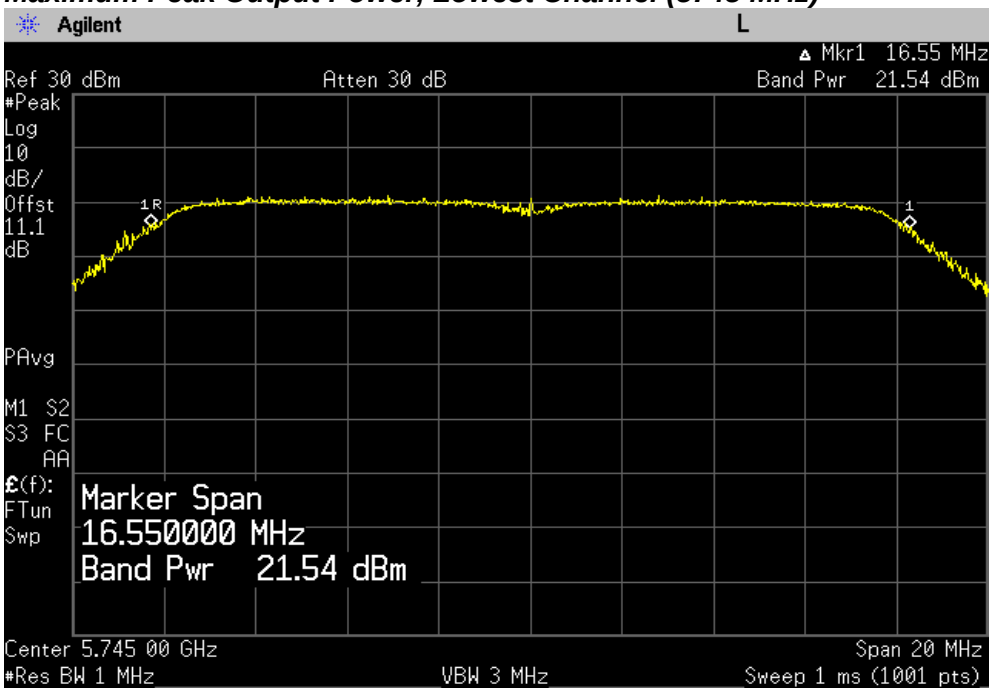
**Total Peak power = 10 log [10^(Chain 0 Power/10) + 10^(Chain 1 Power/10)]*

PLOT OF TEST DATA

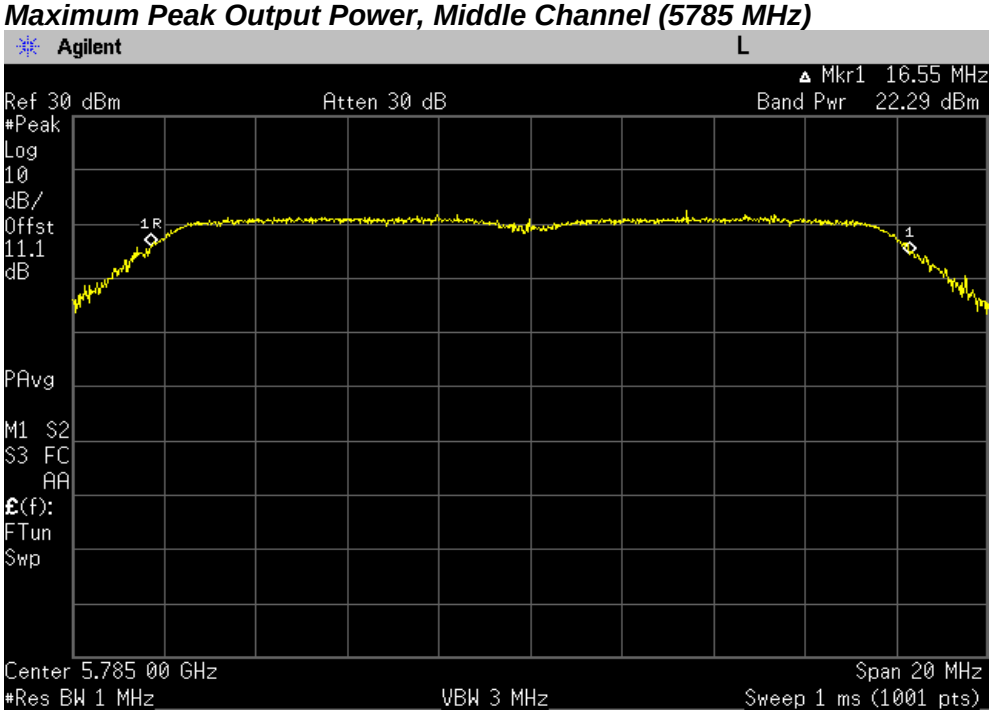
802.11a mode

Chain 0

Maximum Peak Output Power, Lowest Channel (5745 MHz)

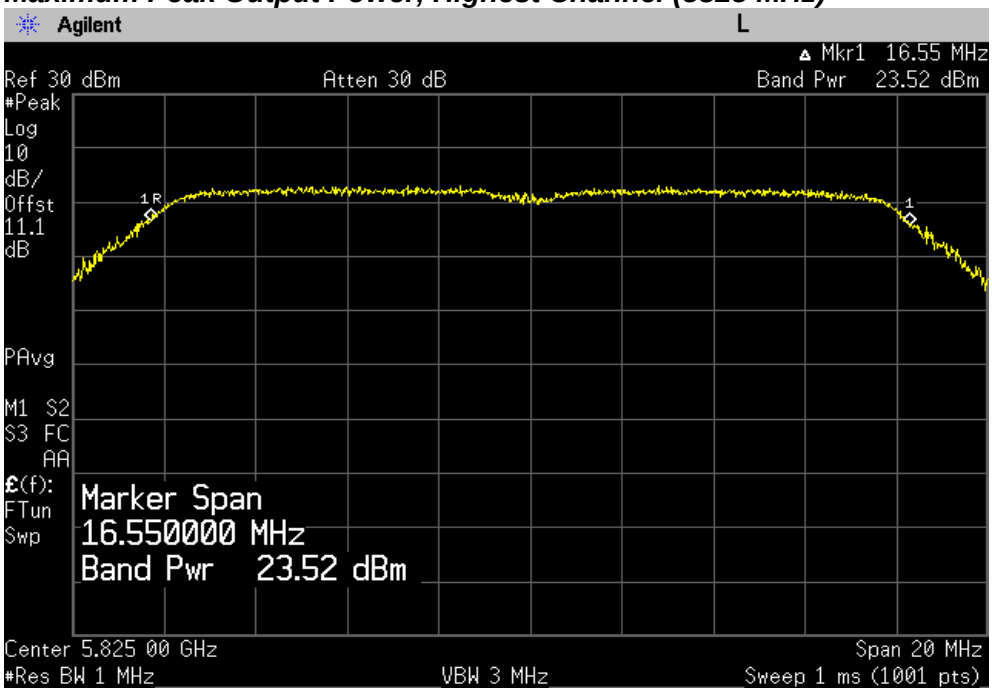


Maximum Peak Output Power, Middle Channel (5785 MHz)



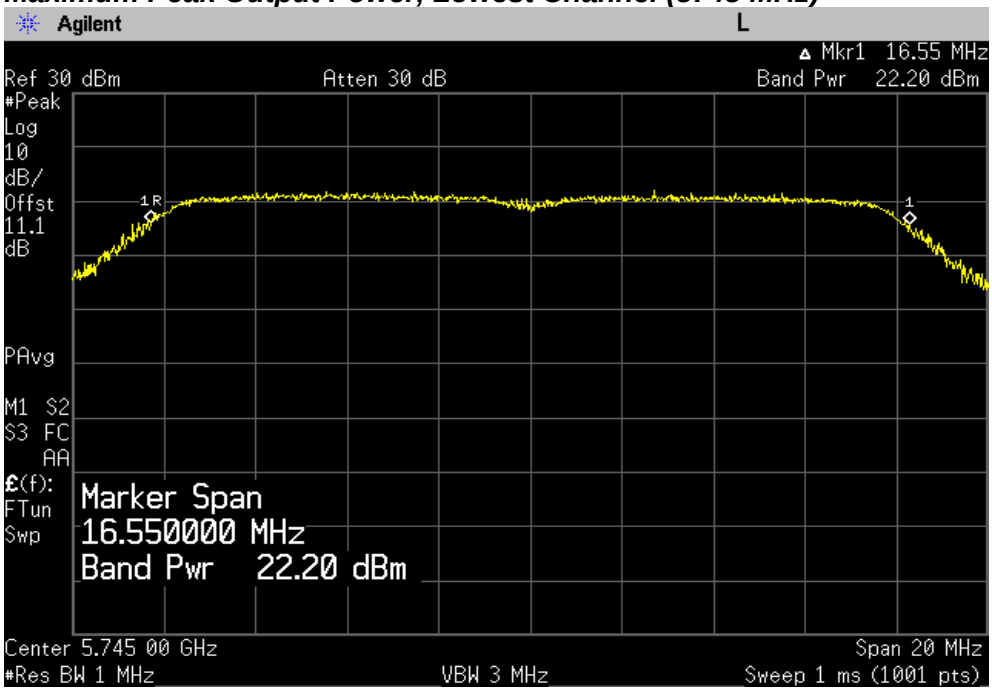
PLOT OF TEST DATA

Maximum Peak Output Power, Highest Channel (5825 MHz)



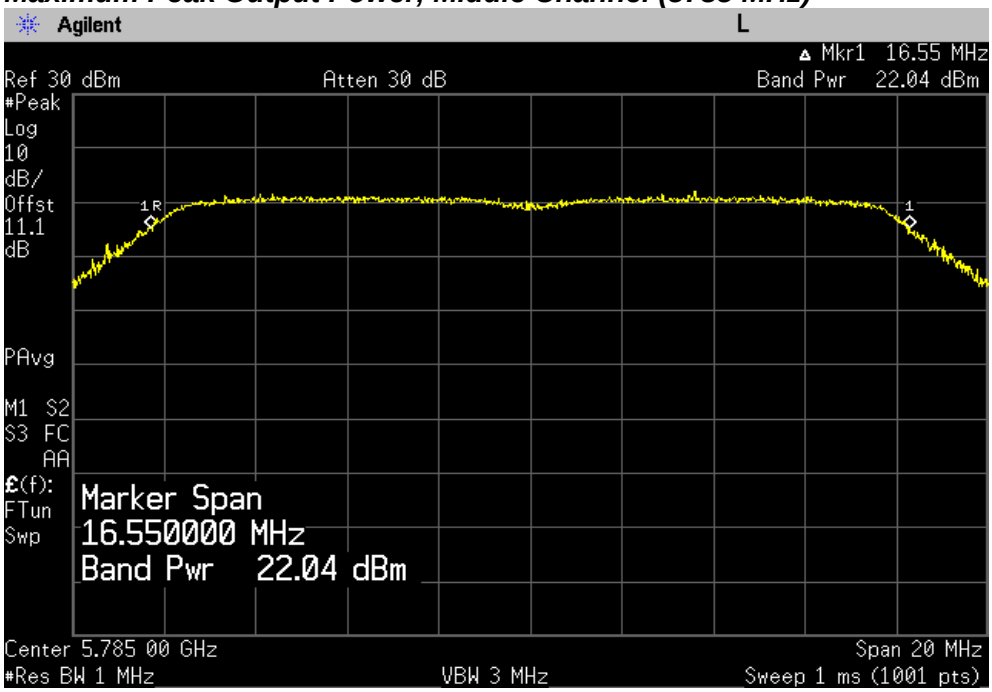
Chain 1

Maximum Peak Output Power, Lowest Channel (5745 MHz)

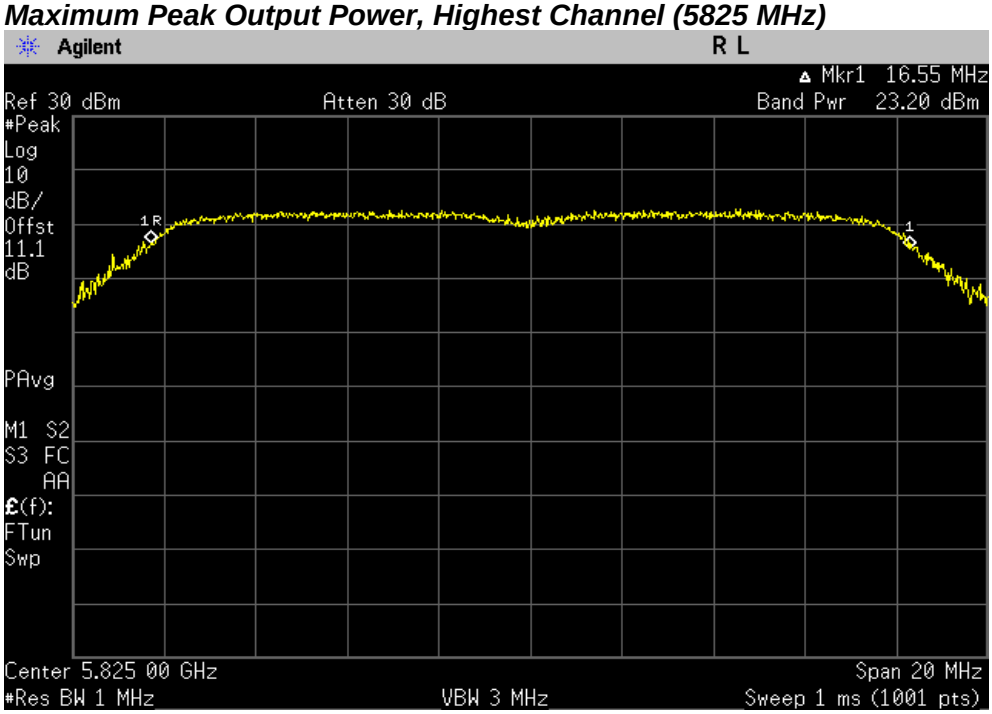


PLOT OF TEST DATA

Maximum Peak Output Power, Middle Channel (5785 MHz)



Maximum Peak Output Power, Highest Channel (5825 MHz)

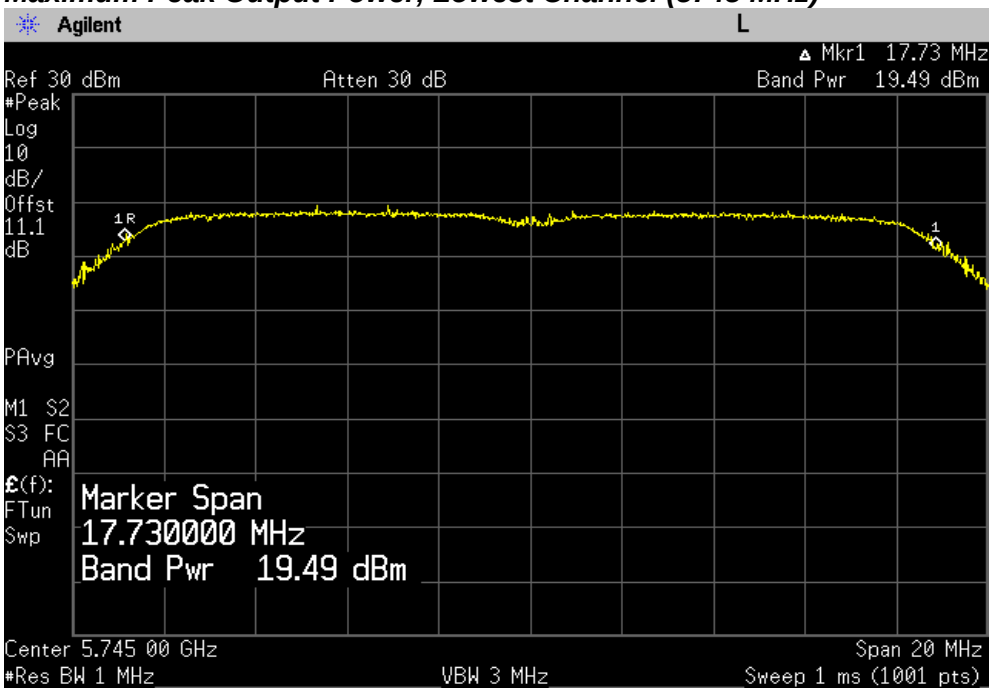


PLOT OF TEST DATA

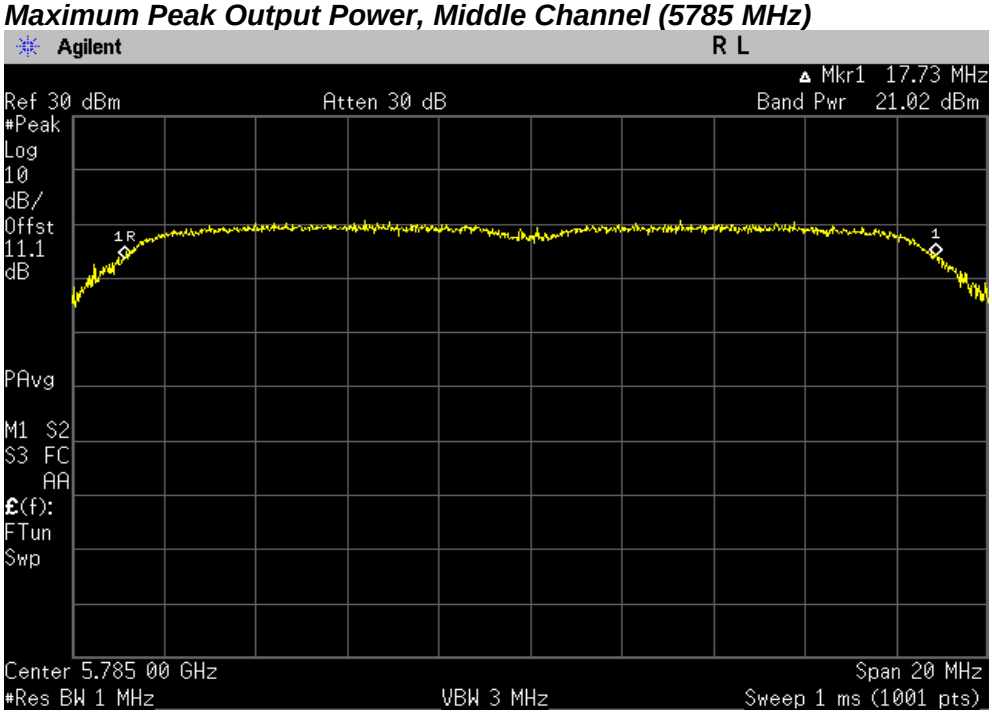
802.11n(20 MHz) mode

Chain 0

Maximum Peak Output Power, Lowest Channel (5745 MHz)

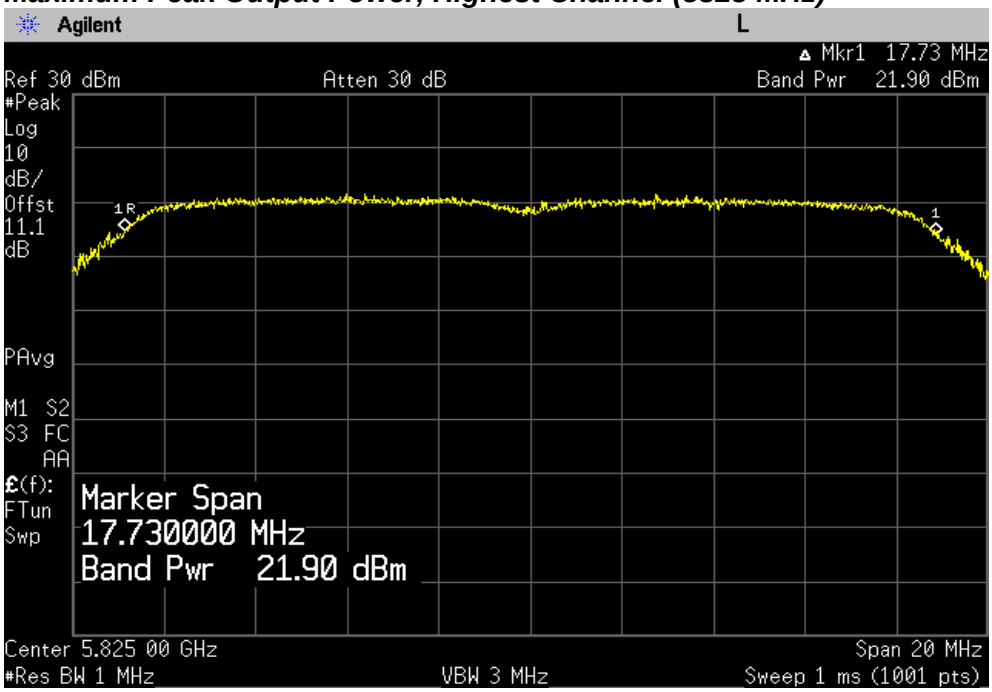


Maximum Peak Output Power, Middle Channel (5785 MHz)



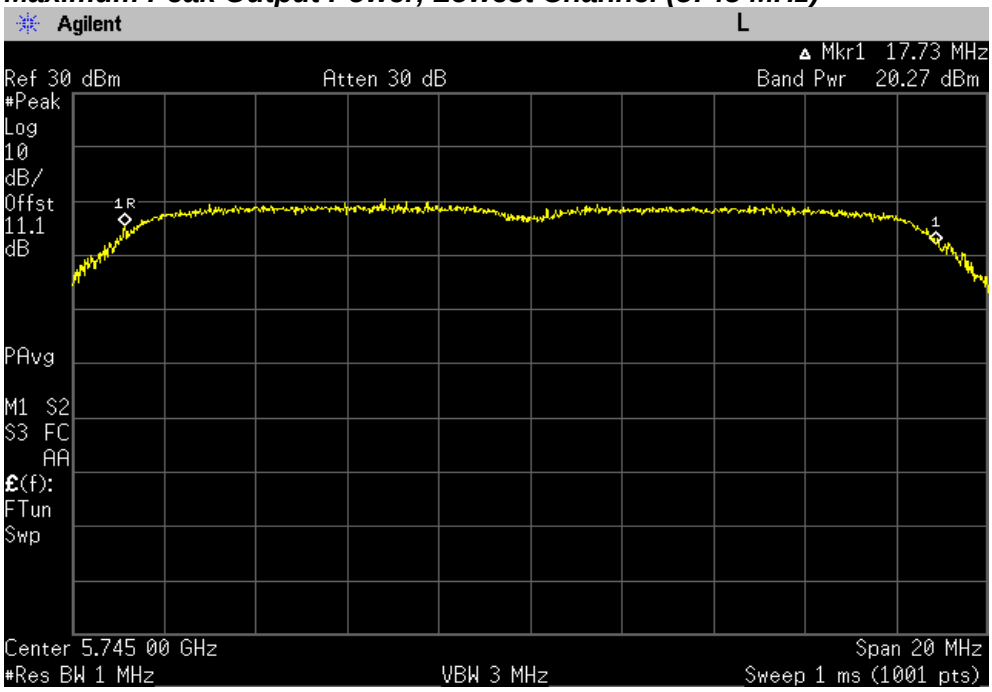
PLOT OF TEST DATA

Maximum Peak Output Power, Highest Channel (5825 MHz)



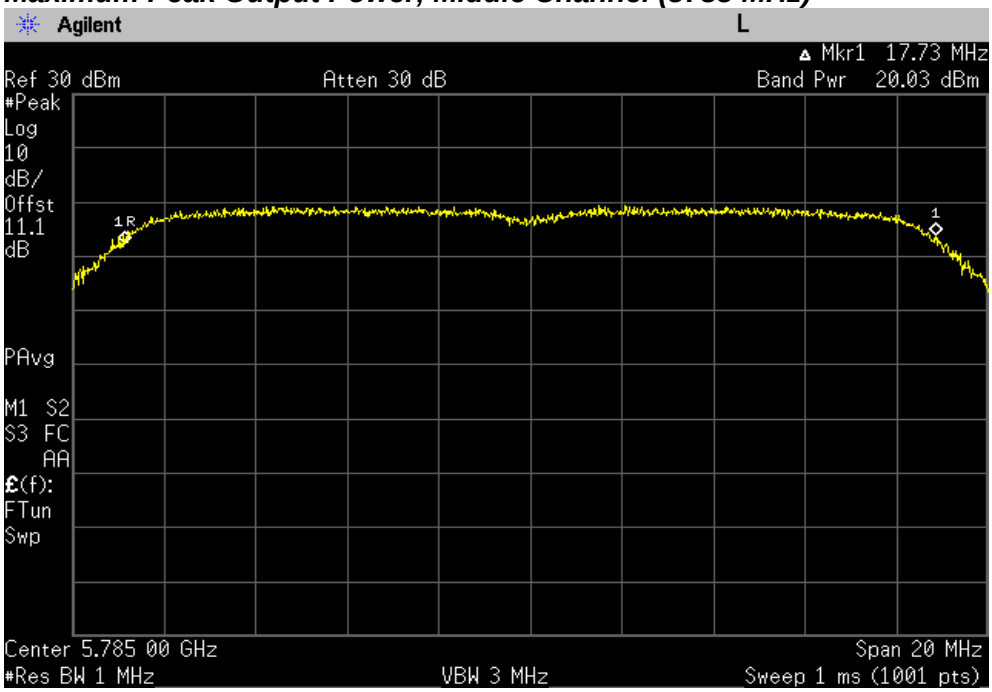
Chain 1

Maximum Peak Output Power, Lowest Channel (5745 MHz)

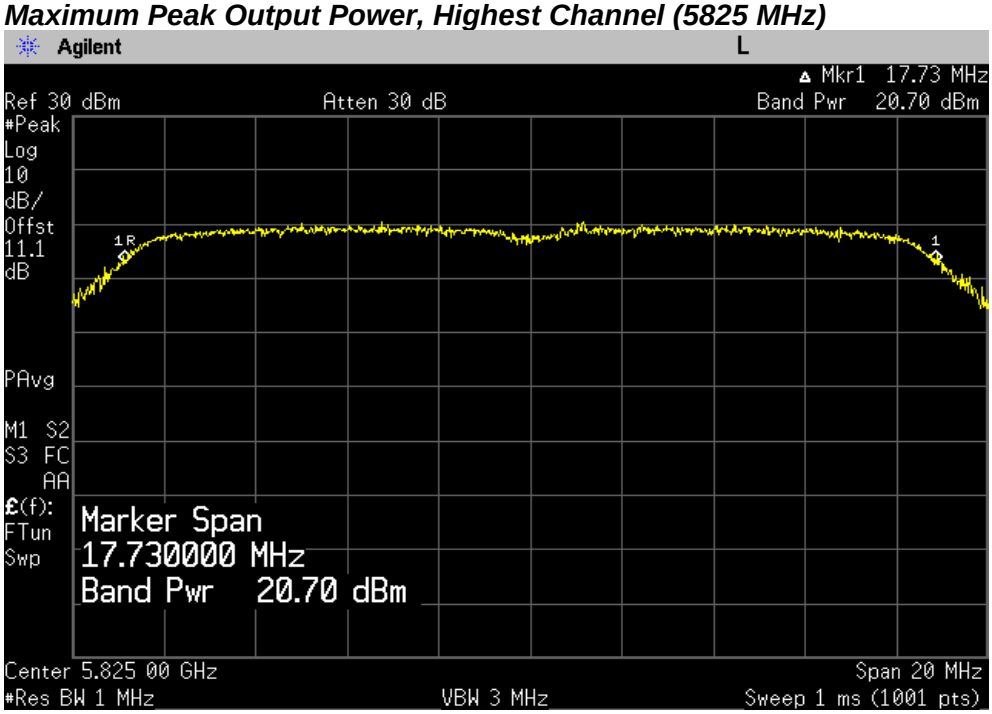


PLOT OF TEST DATA

Maximum Peak Output Power, Middle Channel (5785 MHz)



Maximum Peak Output Power, Highest Channel (5825 MHz)

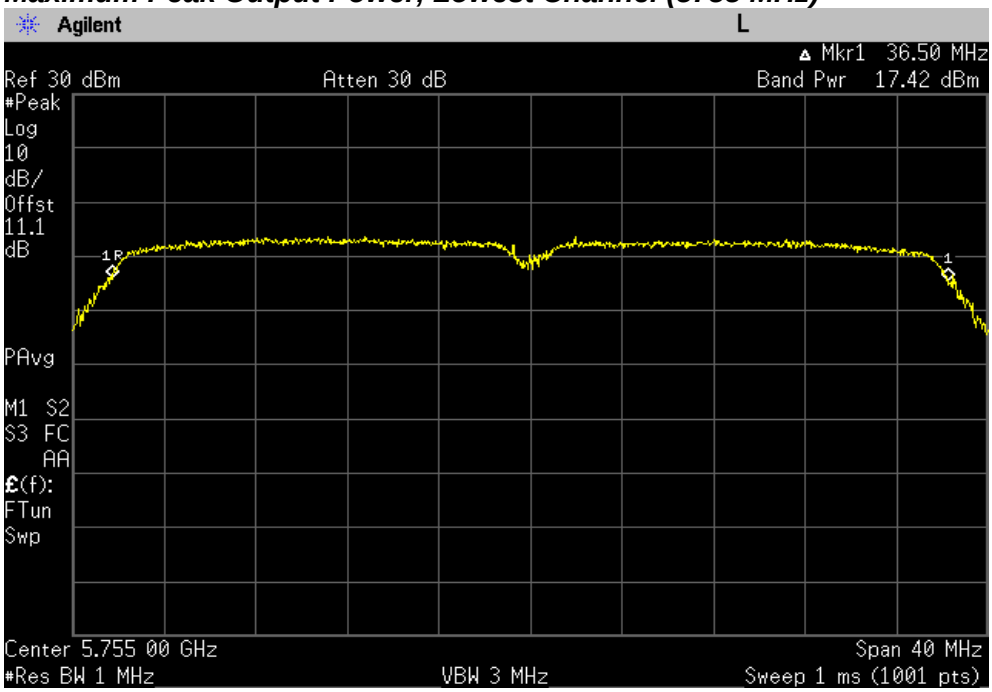


PLOT OF TEST DATA

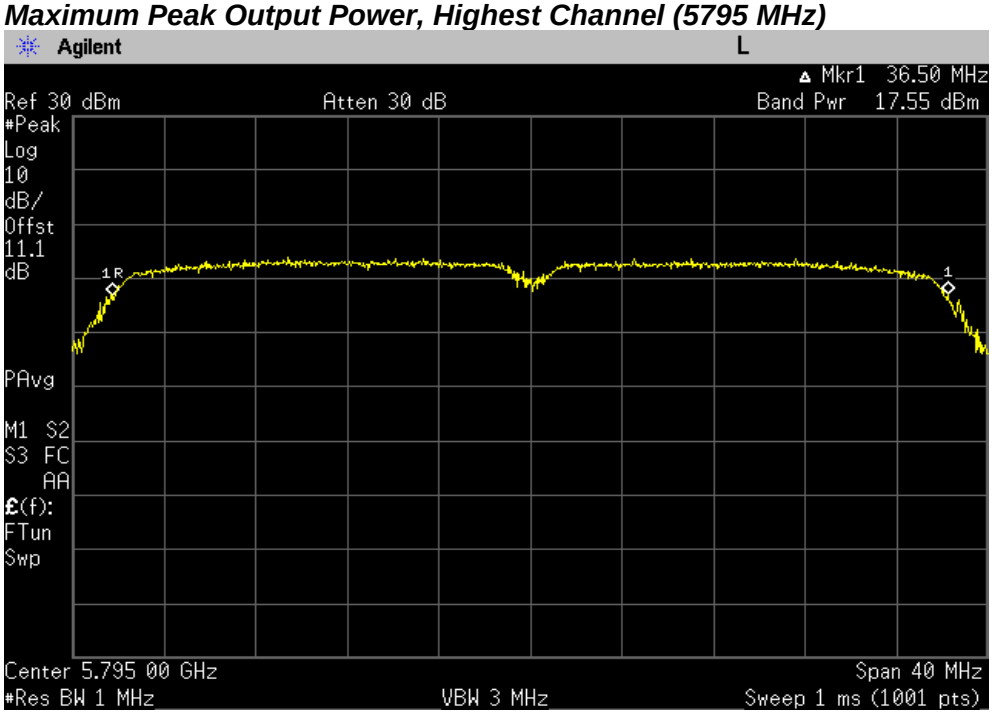
802.11n(40 MHz) mode

Chain 0

Maximum Peak Output Power, Lowest Channel (5755 MHz)



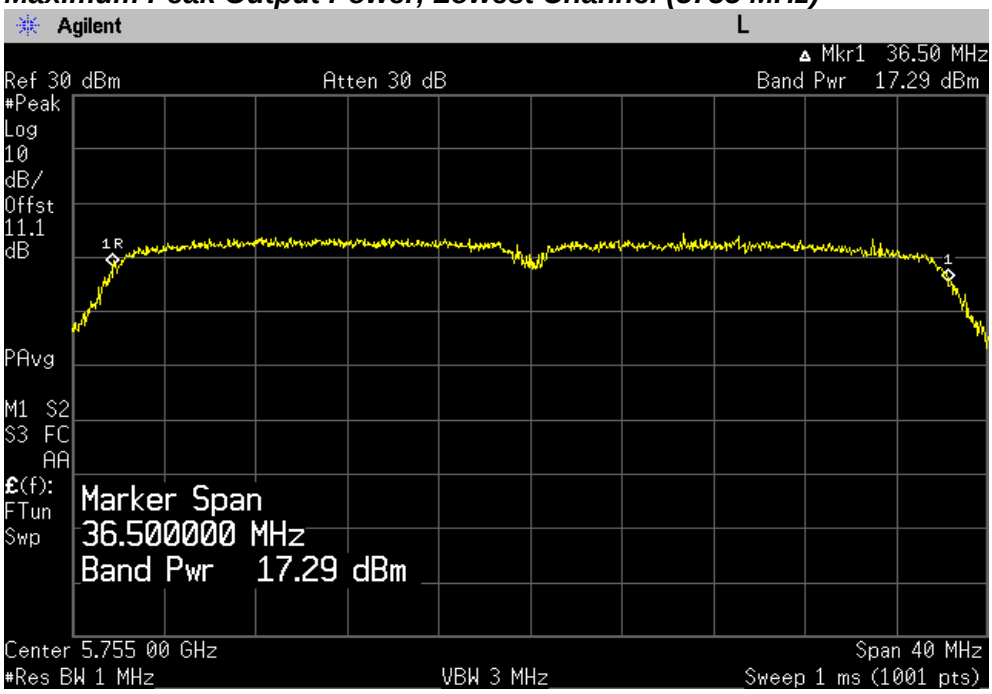
Maximum Peak Output Power, Highest Channel (5795 MHz)



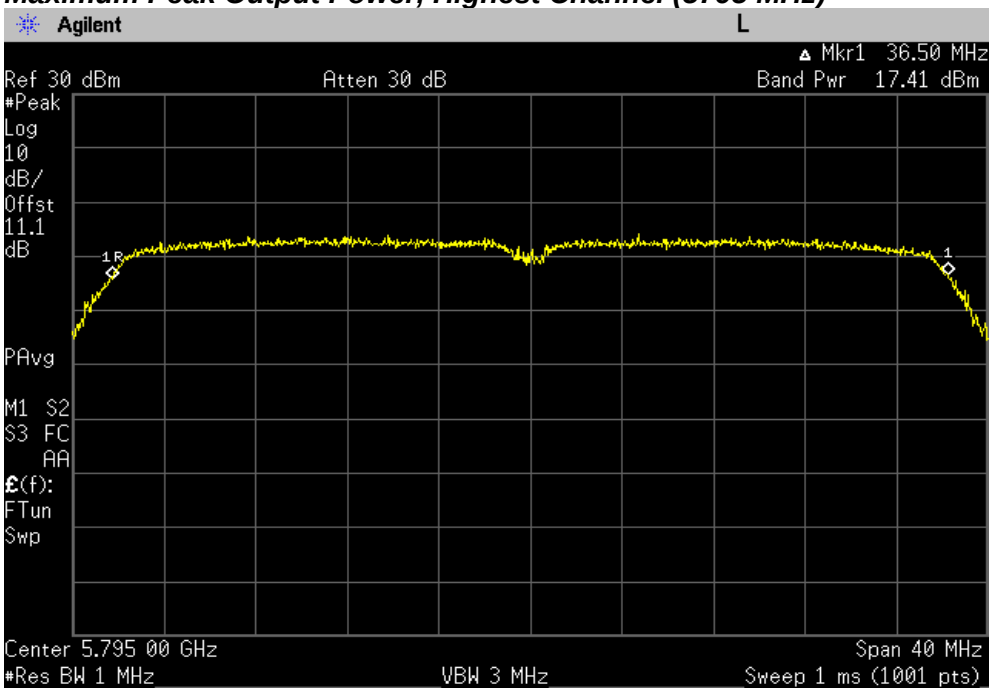
PLOT OF TEST DATA

Chain 1

Maximum Peak Output Power, Lowest Channel (5755 MHz)



Maximum Peak Output Power, Highest Channel (5795 MHz)



8.5 Power Spectral Density

8.5.1 Power Spectral Density – 2.4 GHz band

FCC §15.247(e), RSS-210 Issue 8, A8.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11b

Channel	Frequency(MHz)	Result(dBm)		Limit (dBm)
		Chain 0	Chain 1	
Low	2412	2.21	0.55	8.0
Middle	2437	0.55	0.51	8.0
High	2462	0.49	0.88	8.0

802.11g

Channel	Frequency(MHz)	Result(dBm)		Limit (dBm)
		Chain 0	Chain 1	
Low	2412	-3.66	-2.81	8.0
Middle	2437	-1.38	-1.35	8.0
High	2462	-4.20	-4.16	8.0

802.11n(20 MHz)

Channel	Frequency (MHz)	Result(dBm)		*Total Power Spectral Density (dBm)	Limit (dBm)
		Chain 0	Chain 1		
Low	2412	-6.16	-5.78	-2.96	8.0
Middle	2437	-2.61	-2.65	0.38	8.0
High	2462	-6.33	-5.49	-2.88	8.0

Note:

The following equation was used for spectrum offset:

Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

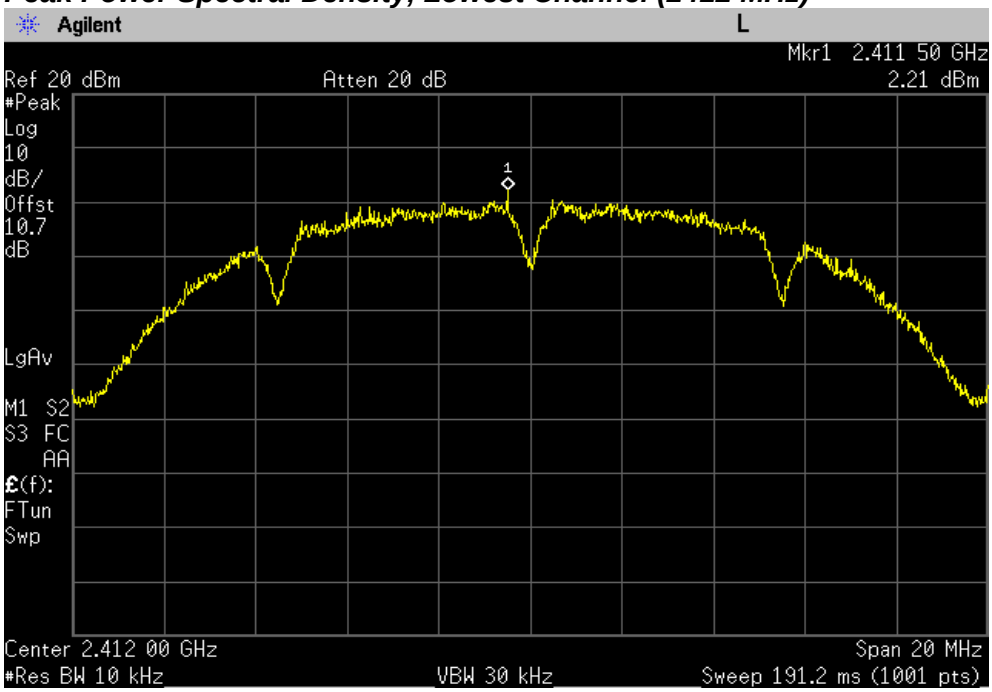
**Total Peak power = 10 log [10^(Chain 0 Power density/10) + 10^(Chain 1 Power density/10)]*

PLOT OF TEST DATA

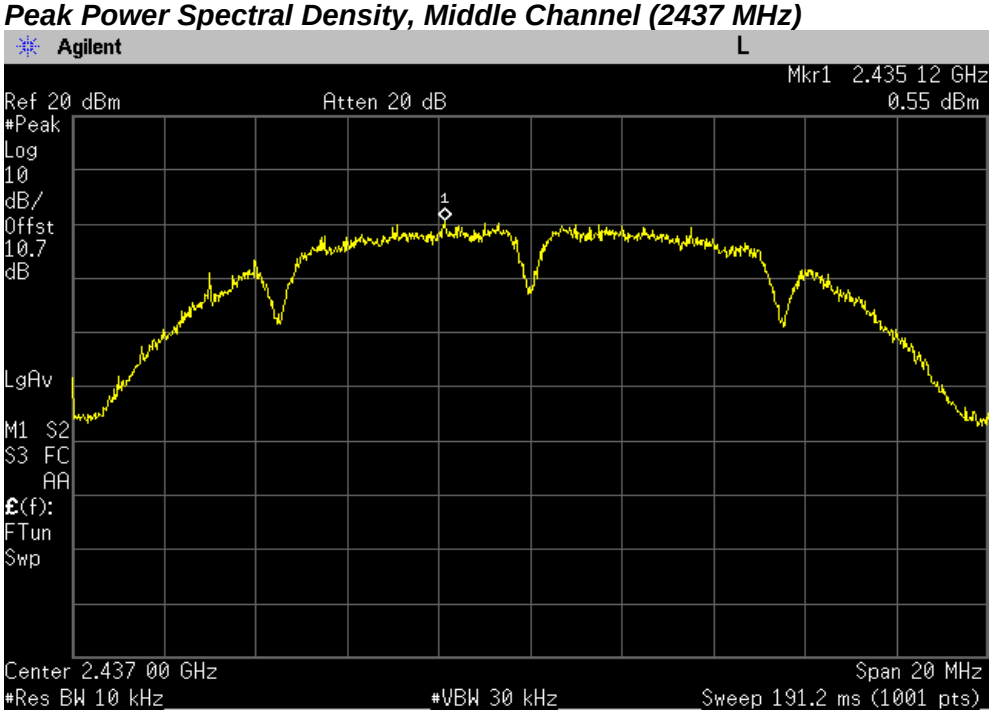
802.11b mode

Chain 0

Peak Power Spectral Density, Lowest Channel (2412 MHz)

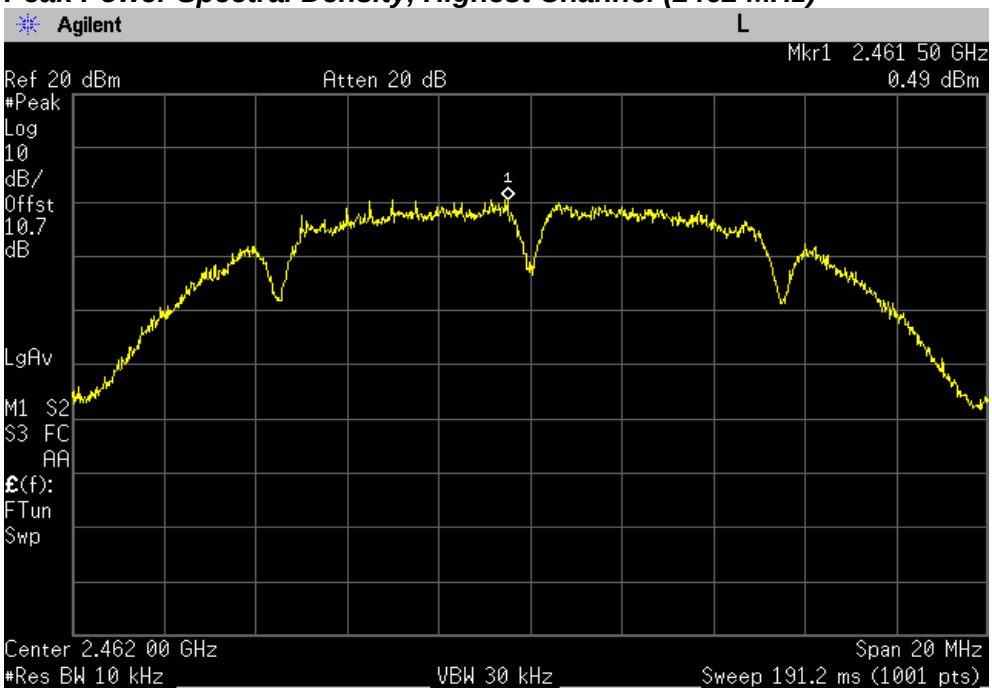


Peak Power Spectral Density, Middle Channel (2437 MHz)



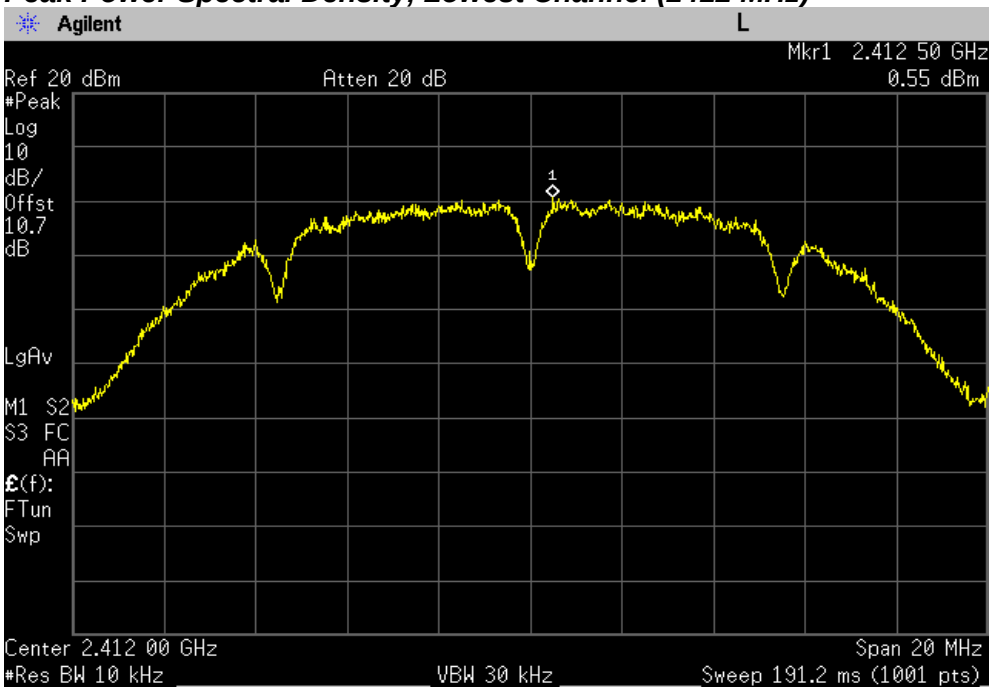
PLOT OF TEST DATA

Peak Power Spectral Density, Highest Channel (2462 MHz)



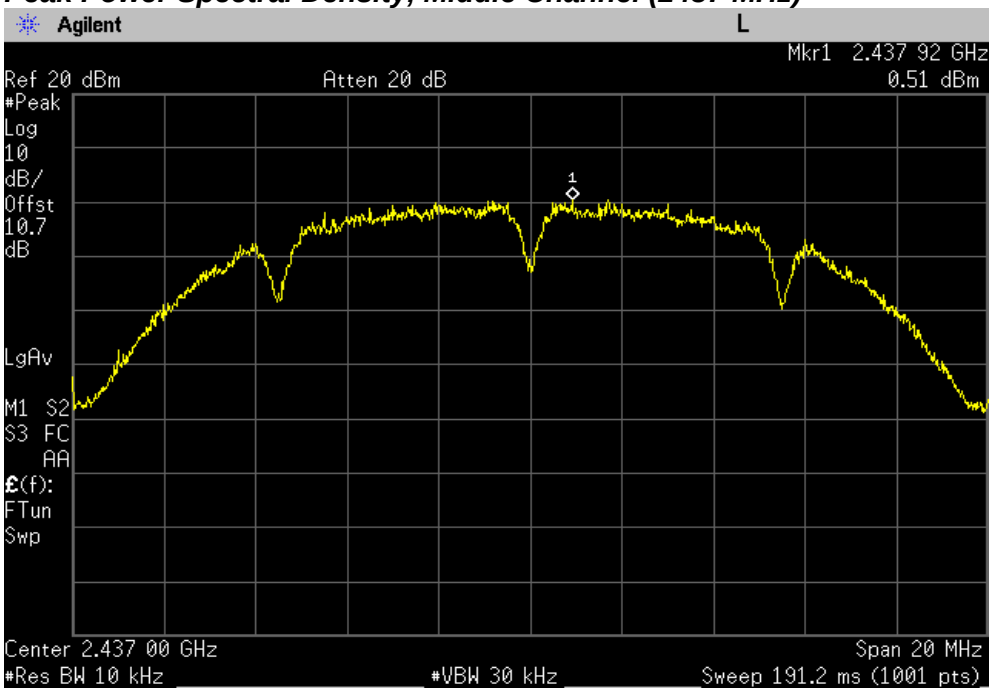
Chain 1

Peak Power Spectral Density, Lowest Channel (2412 MHz)

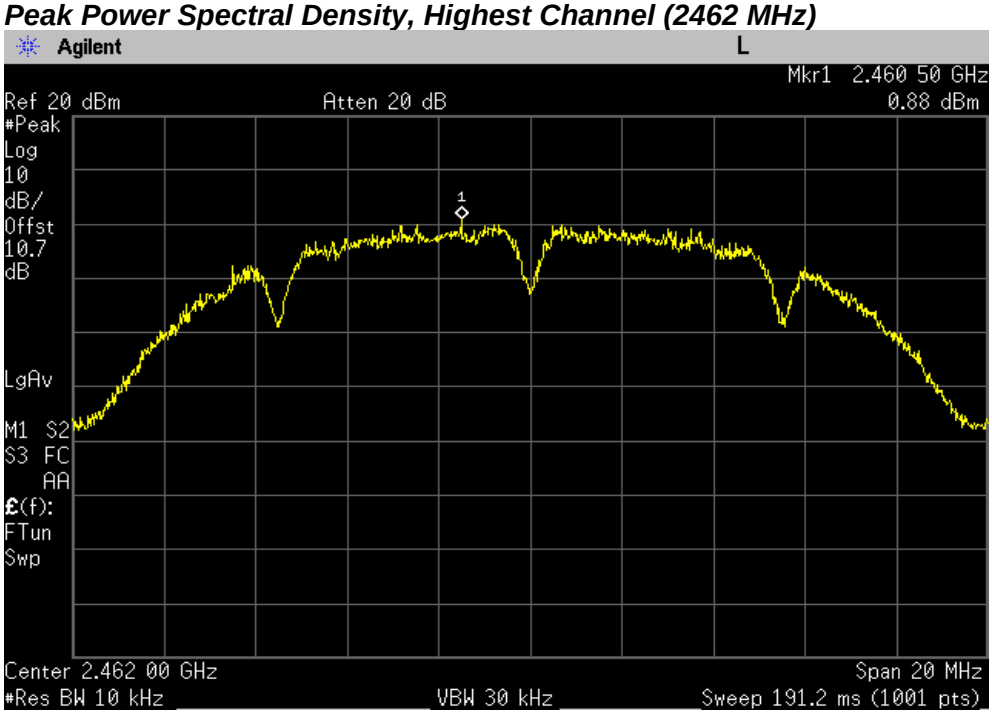


PLOT OF TEST DATA

Peak Power Spectral Density, Middle Channel (2437 MHz)



Peak Power Spectral Density, Highest Channel (2462 MHz)

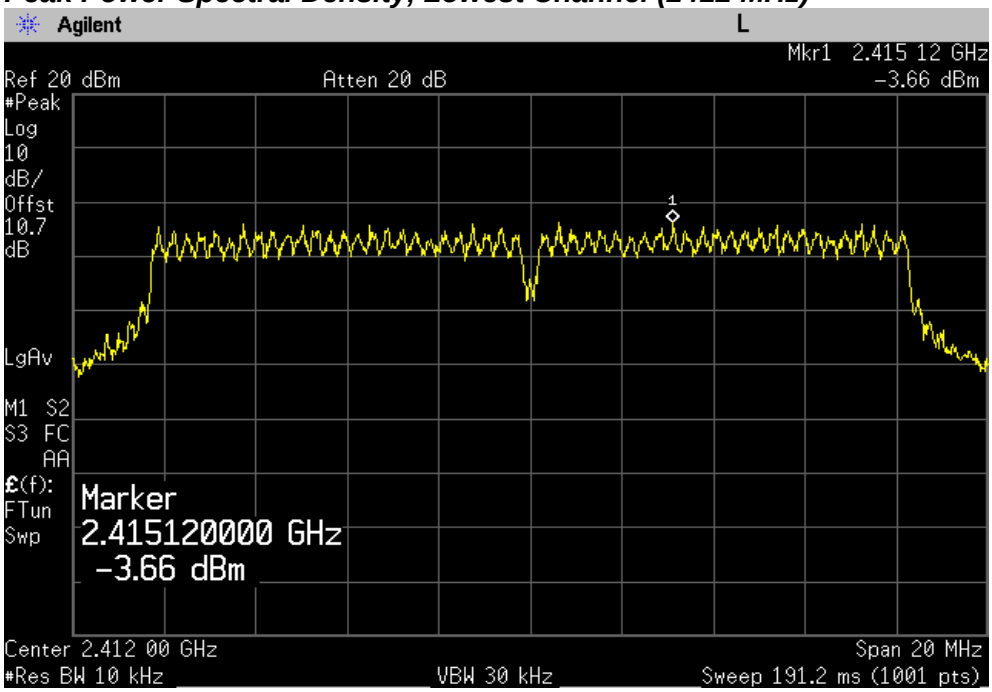


PLOT OF TEST DATA

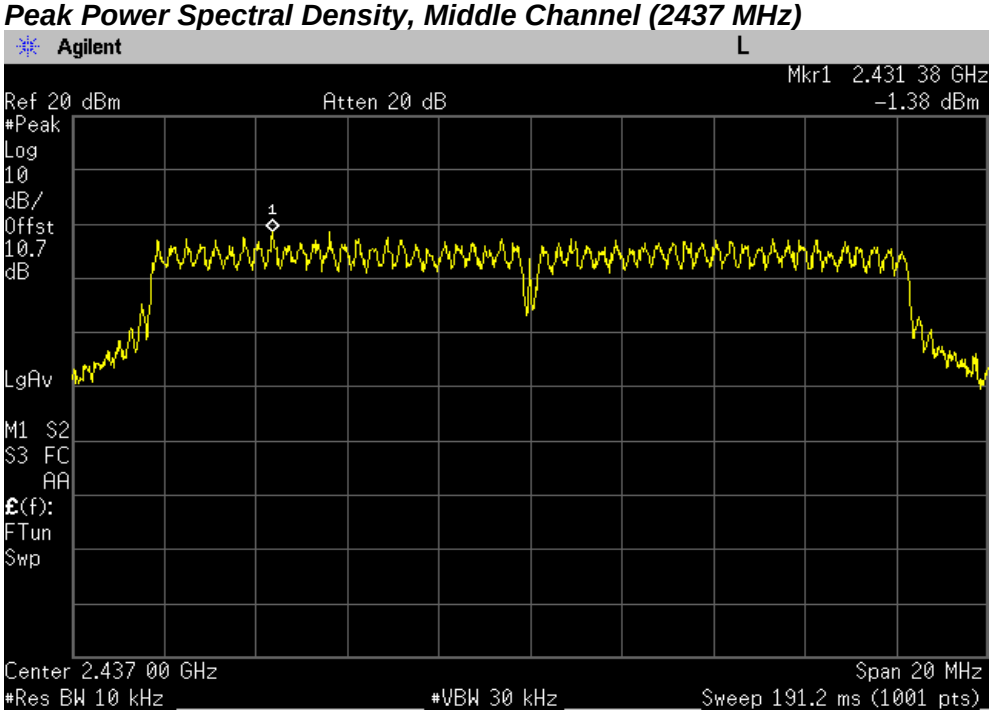
802.11g mode

Chain 0

Peak Power Spectral Density, Lowest Channel (2412 MHz)

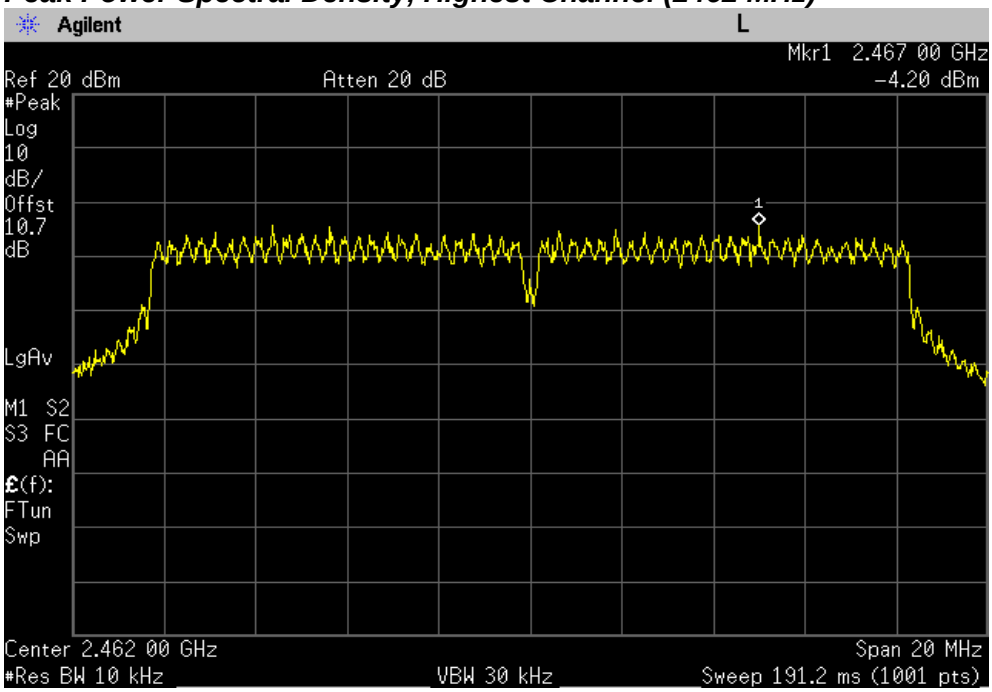


Peak Power Spectral Density, Middle Channel (2437 MHz)



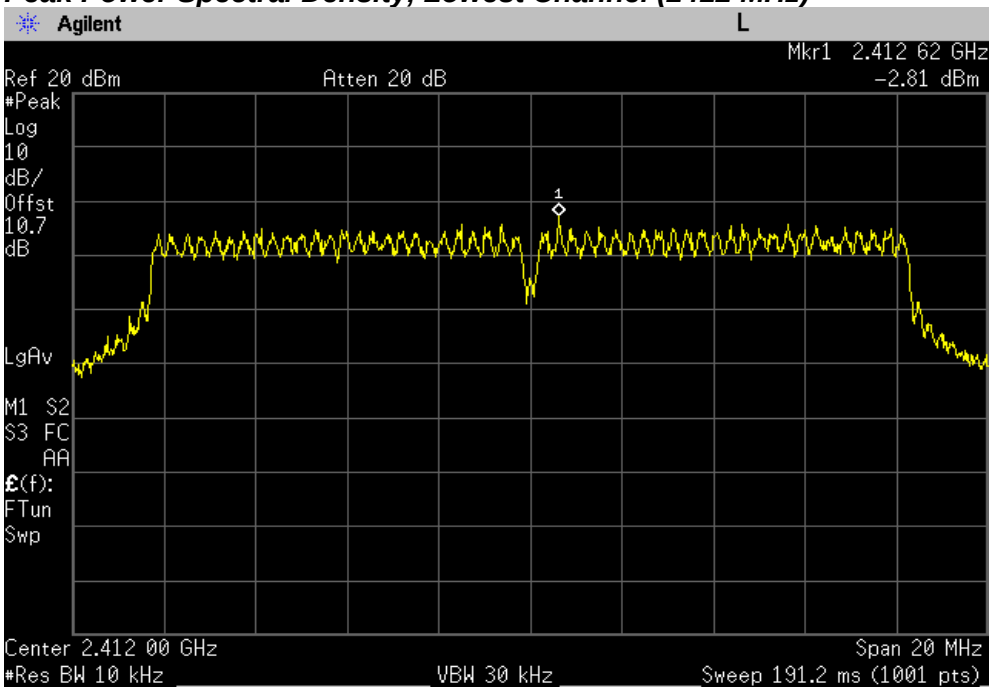
PLOT OF TEST DATA

Peak Power Spectral Density, Highest Channel (2462 MHz)



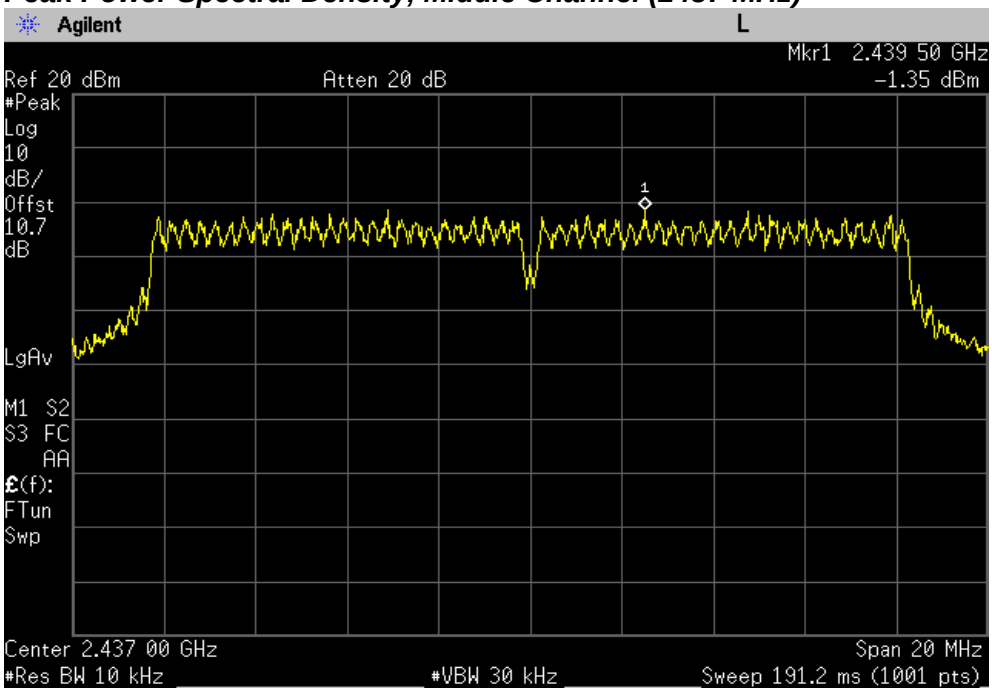
Chain 1

Peak Power Spectral Density, Lowest Channel (2412 MHz)

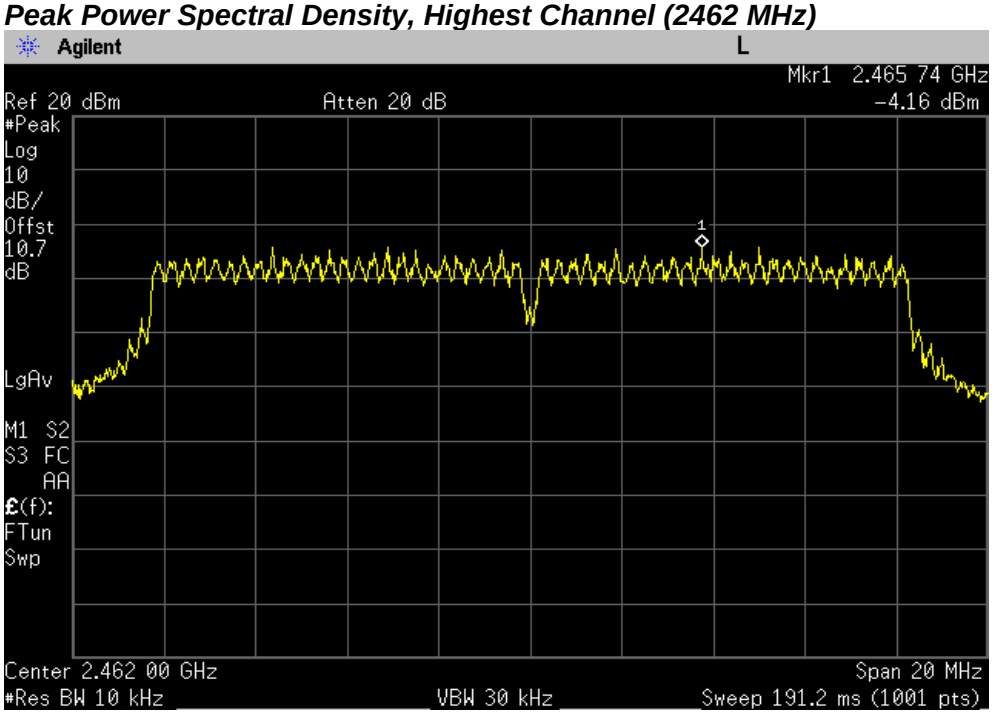


PLOT OF TEST DATA

Peak Power Spectral Density, Middle Channel (2437 MHz)



Peak Power Spectral Density, Highest Channel (2462 MHz)

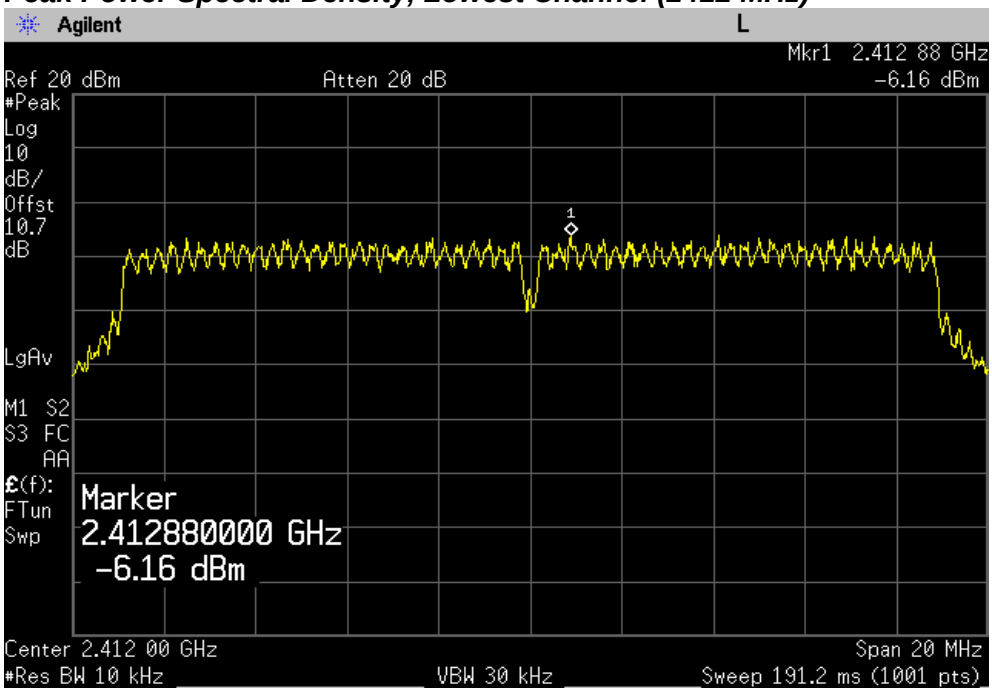


PLOT OF TEST DATA

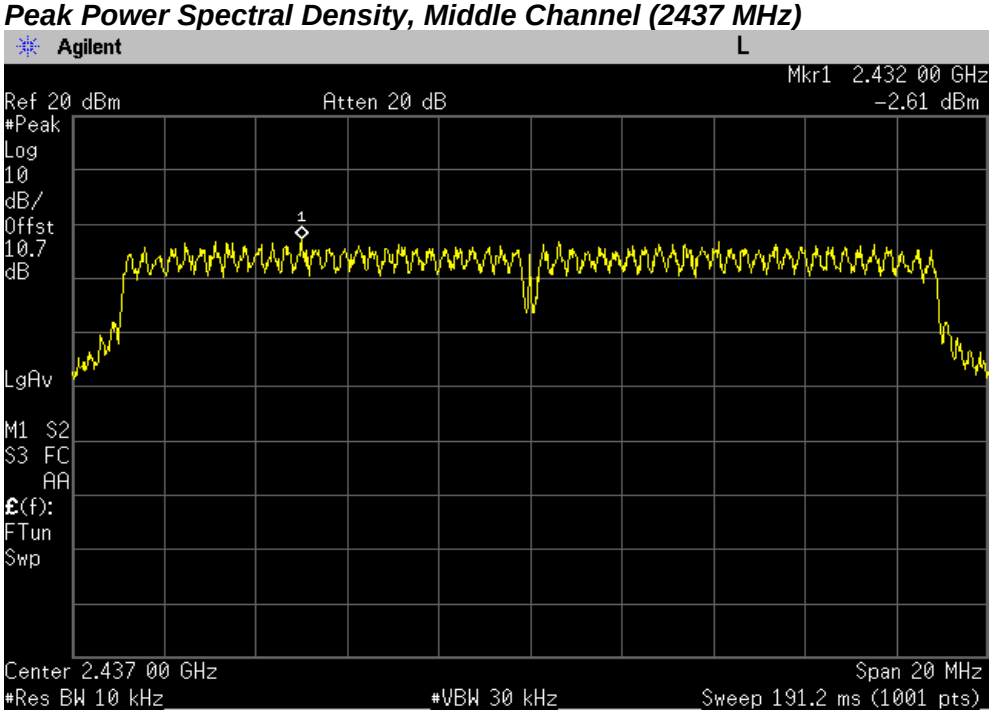
802.11n(20 MHz) mode

Chain 0

Peak Power Spectral Density, Lowest Channel (2412 MHz)

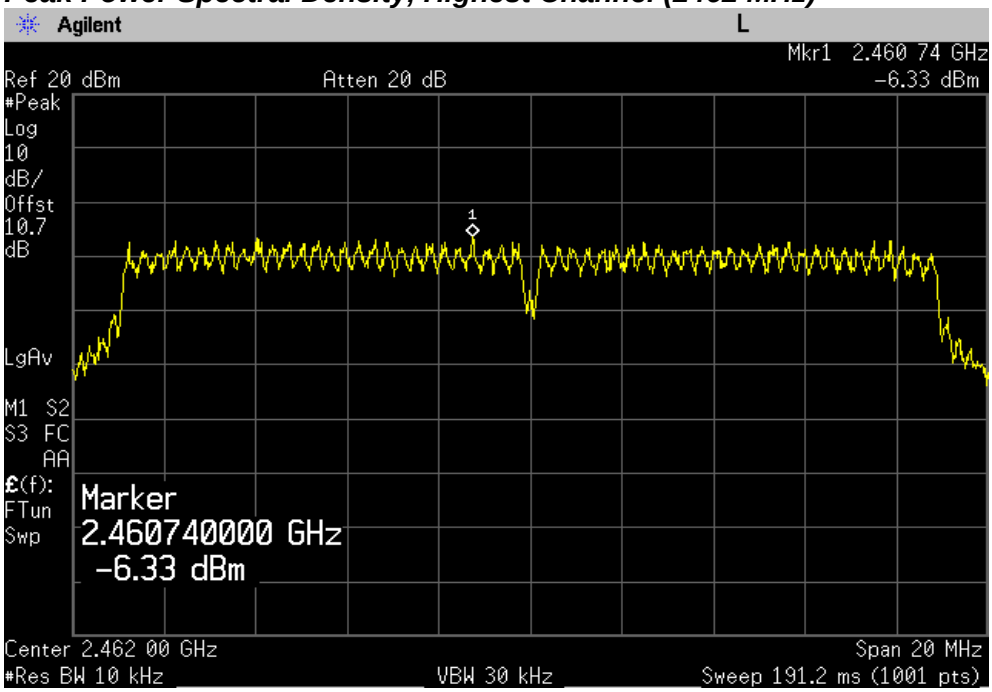


Peak Power Spectral Density, Middle Channel (2437 MHz)



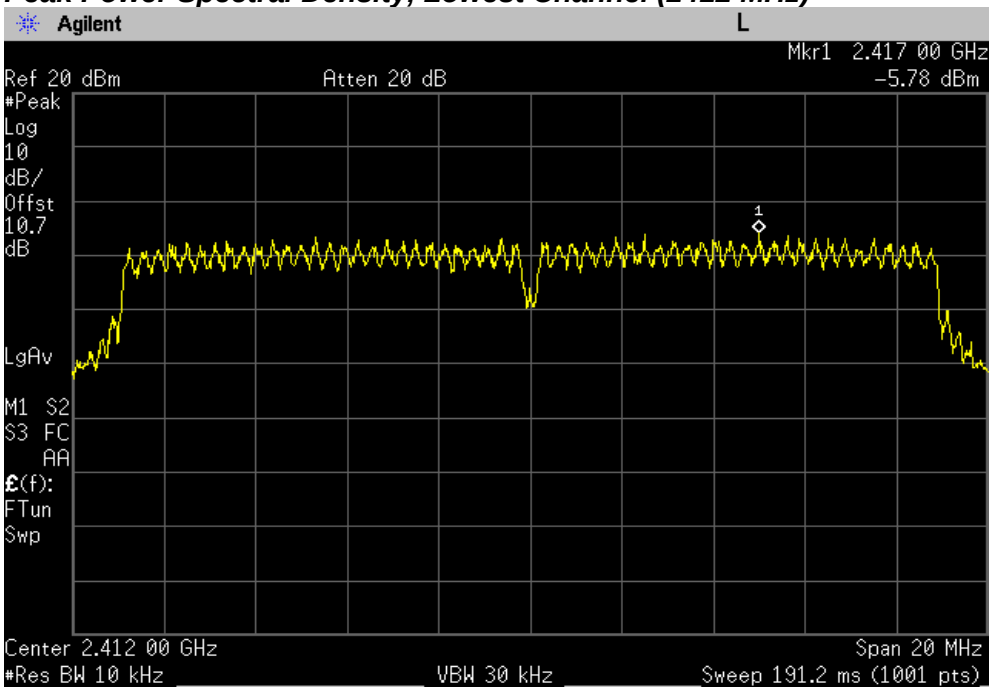
PLOT OF TEST DATA

Peak Power Spectral Density, Highest Channel (2462 MHz)



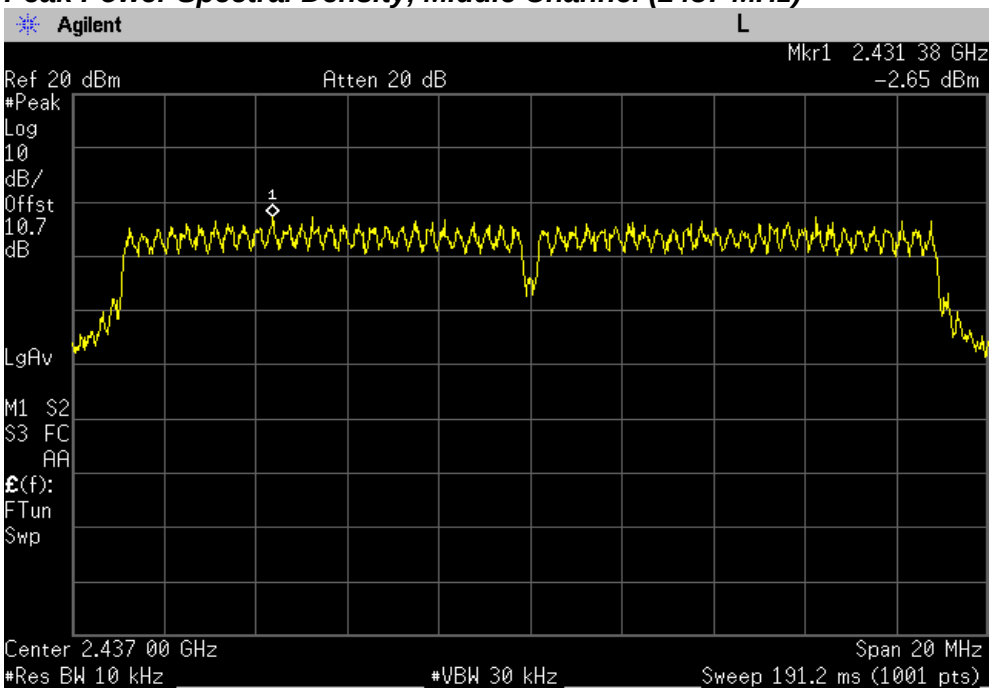
Chain 1

Peak Power Spectral Density, Lowest Channel (2412 MHz)

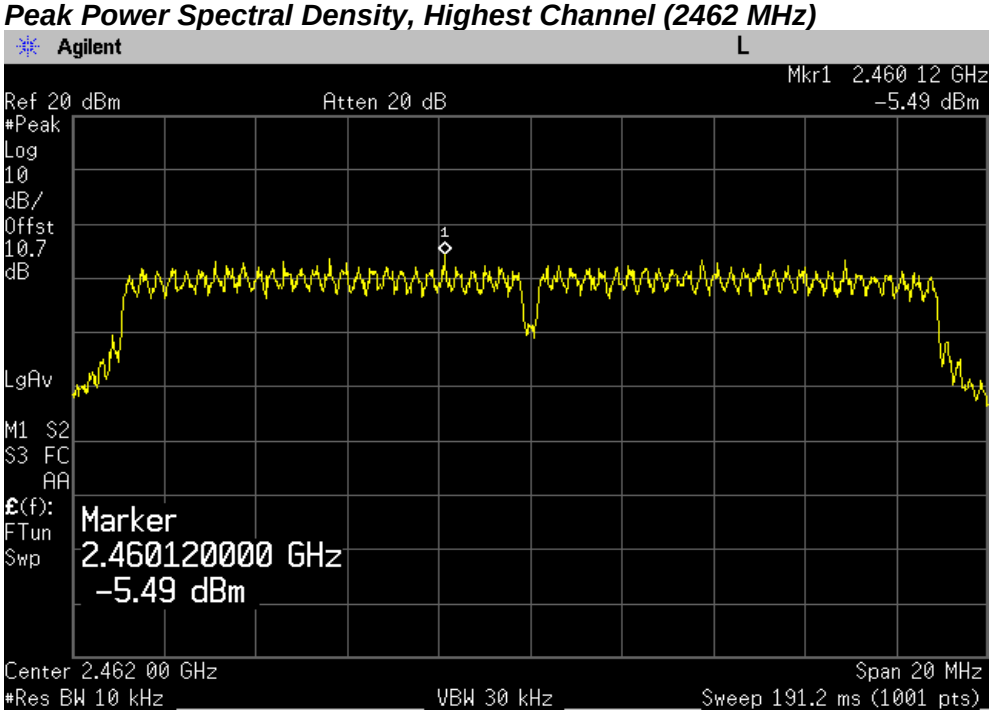


PLOT OF TEST DATA

Peak Power Spectral Density, Middle Channel (2437 MHz)



Peak Power Spectral Density, Highest Channel (2462 MHz)



8.5.2 Power Spectral Density – 5 GHz band

FCC §15.247(e), RSS-210 Issue 8, A8.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a

Channel	Frequency(MHz)	Result(dBm)		Limit (dBm)
		Chain 0	Chain 1	
Low	5745	-4.70	-4.18	8.0
Middle	5785	-3.83	-4.92	8.0
High	5825	-2.79	-3.66	8.0

802.11n(20 MHz)

Channel	Frequency (MHz)	Result(dBm)		*Total Power Spectral Density (dBm)	Limit (dBm)
		Chain 0	Chain 1		
Low	5745	-5.05	-7.40	-3.06	8.0
Middle	5785	-6.50	-7.34	-3.89	8.0
High	5825	-5.79	-6.61	-3.17	8.0

802.11n(40 MHz)

Channel	Frequency (MHz)	Result(dBm)		*Total Power Spectral Density (dBm)	Limit (dBm)
		Chain 0	Chain 1		
Low	5755	-12.70	-14.40	-10.46	8.0
High	5795	-11.92	-13.09	-9.46	8.0

Note:

The following equation was used for spectrum offset:

Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

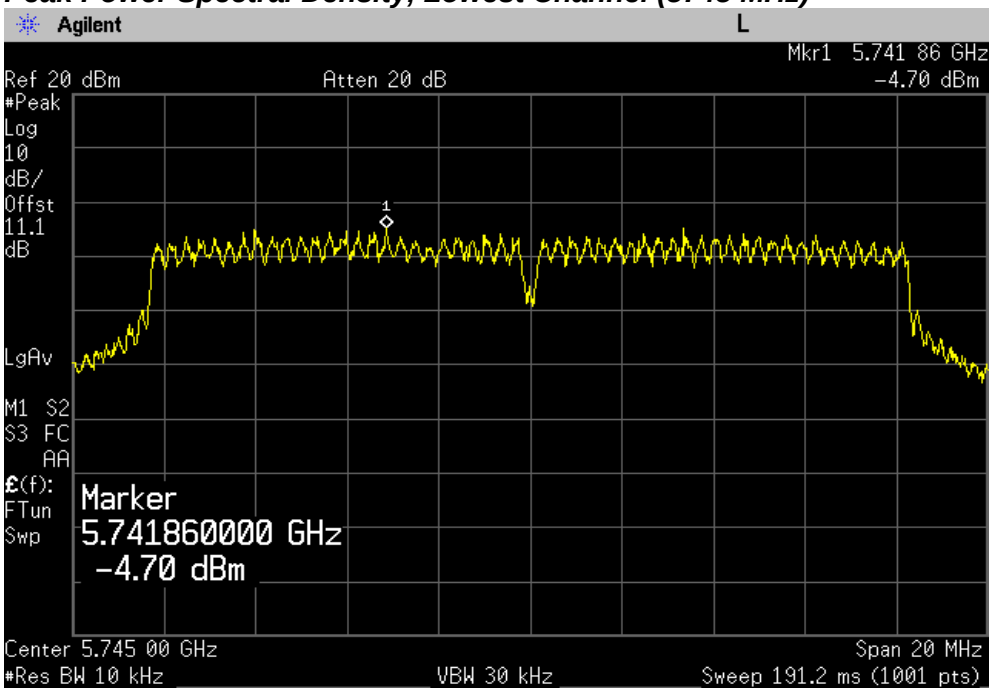
**Total Peak power = 10 log [10^(Chain 0 Power density/10) + 10^(Chain 1 Power density/10)]*

PLOT OF TEST DATA

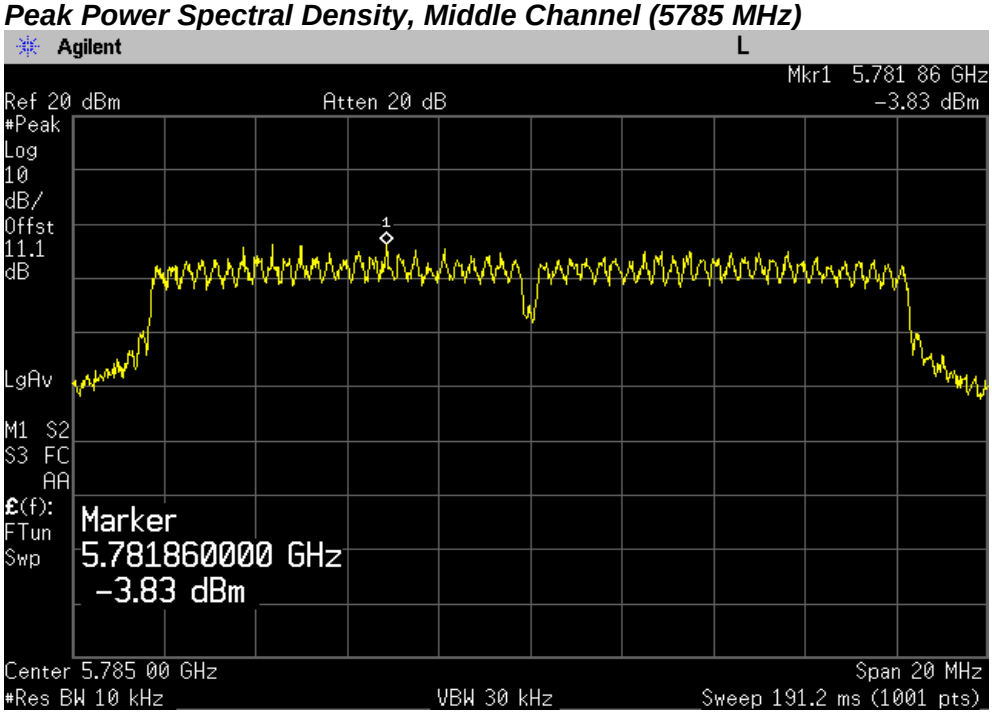
802.11a mode

Chain 0

Peak Power Spectral Density, Lowest Channel (5745 MHz)

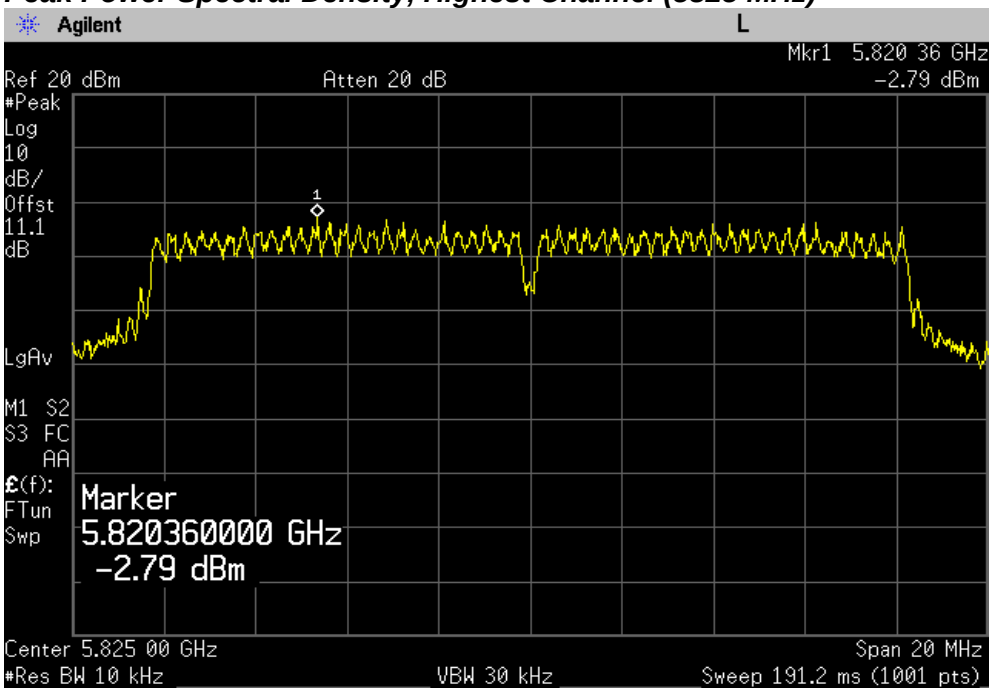


Peak Power Spectral Density, Middle Channel (5785 MHz)



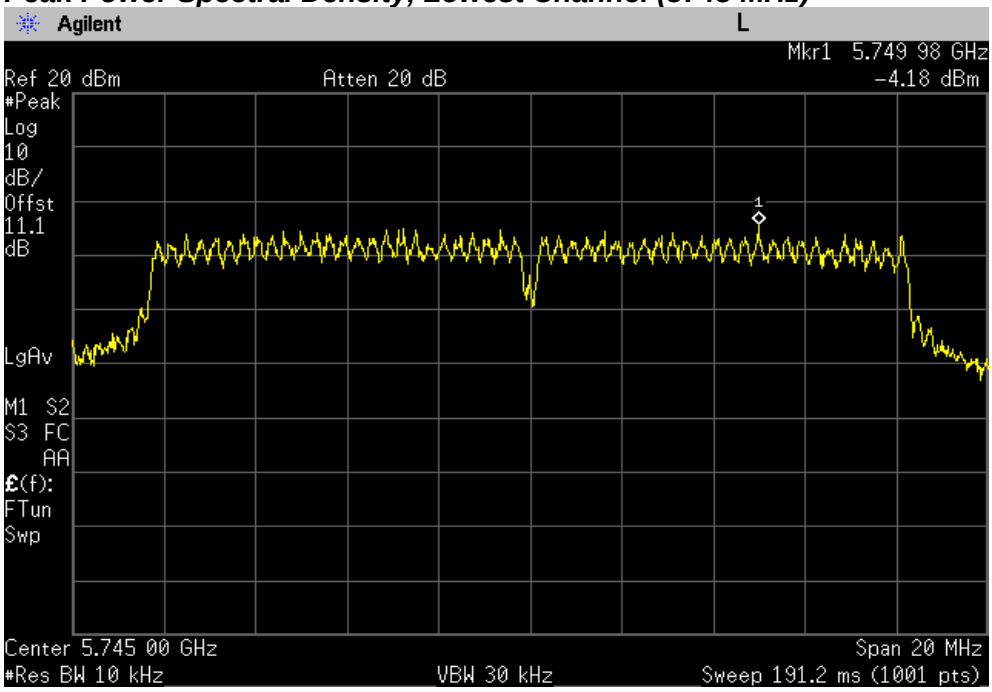
PLOT OF TEST DATA

Peak Power Spectral Density, Highest Channel (5825 MHz)



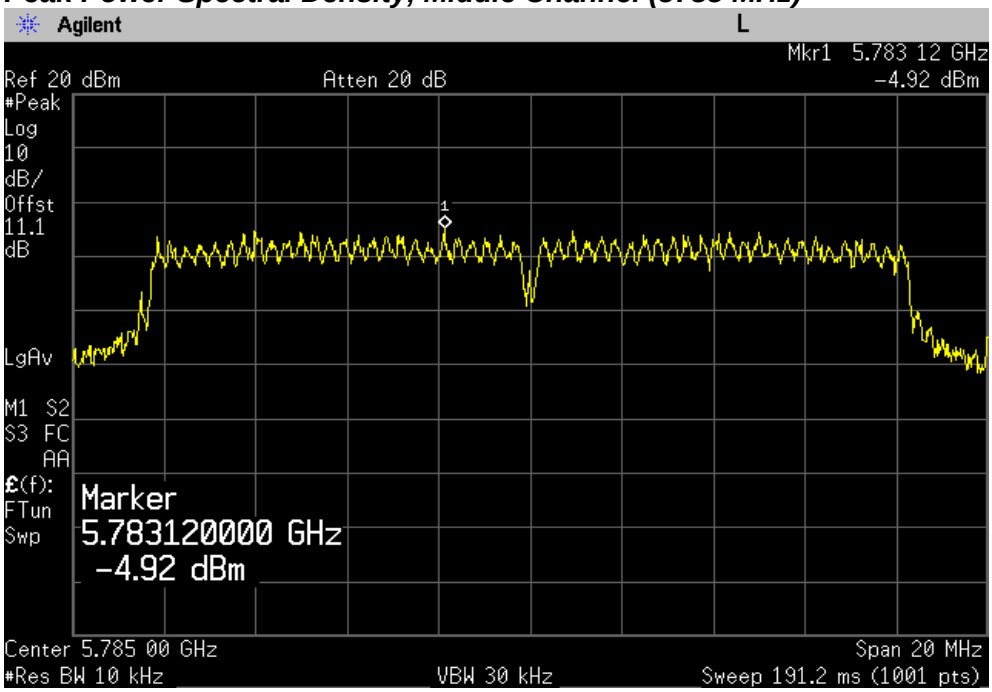
Chain 1

Peak Power Spectral Density, Lowest Channel (5745 MHz)

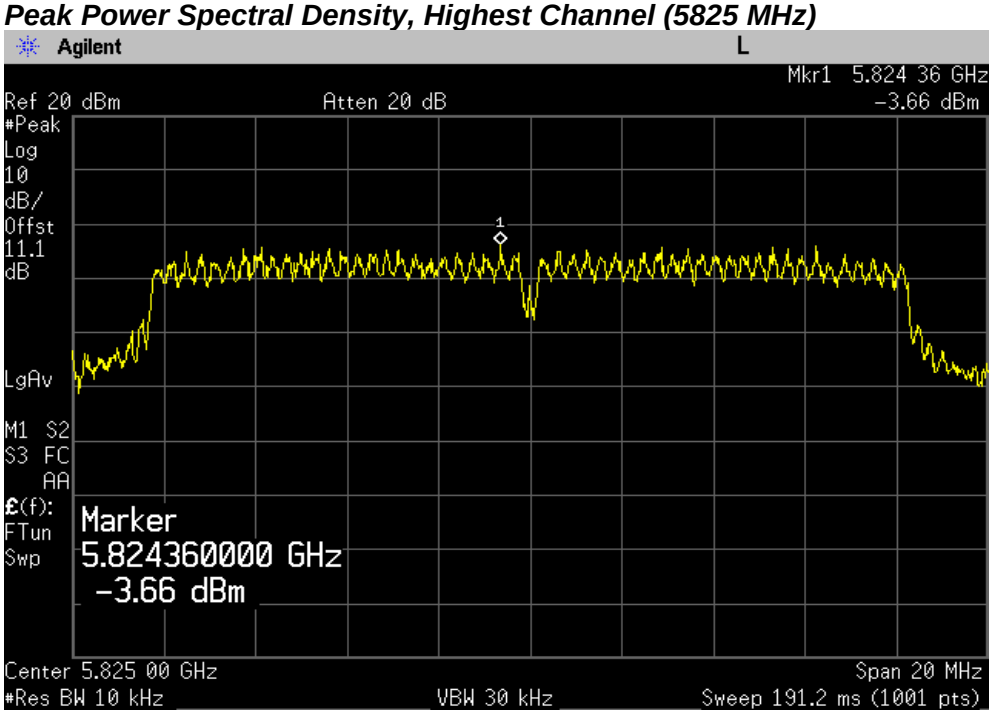


PLOT OF TEST DATA

Peak Power Spectral Density, Middle Channel (5785 MHz)



Peak Power Spectral Density, Highest Channel (5825 MHz)

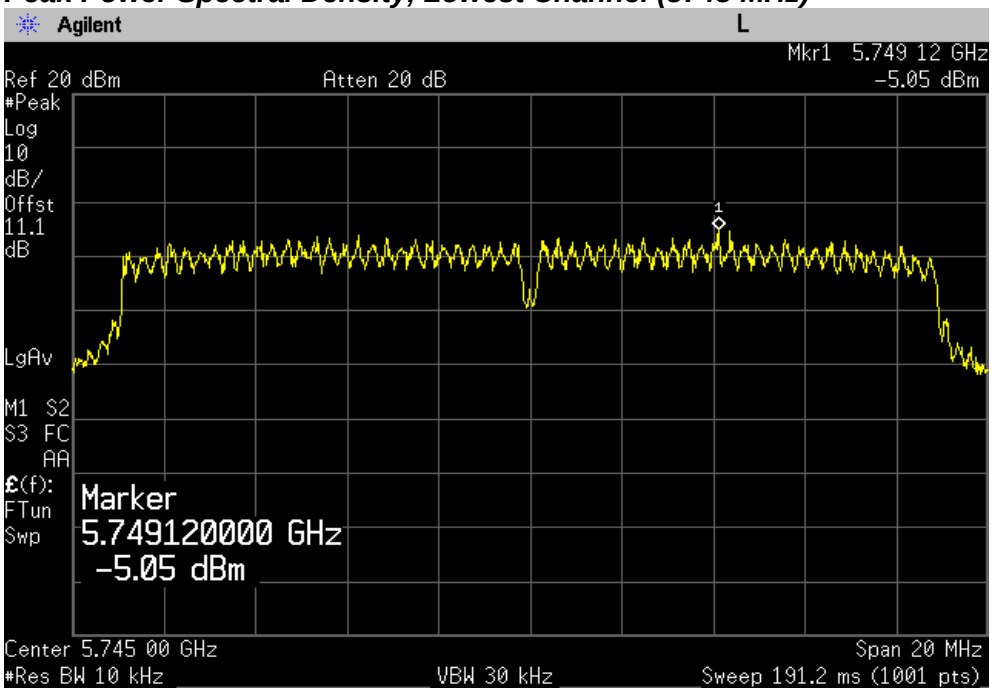


PLOT OF TEST DATA

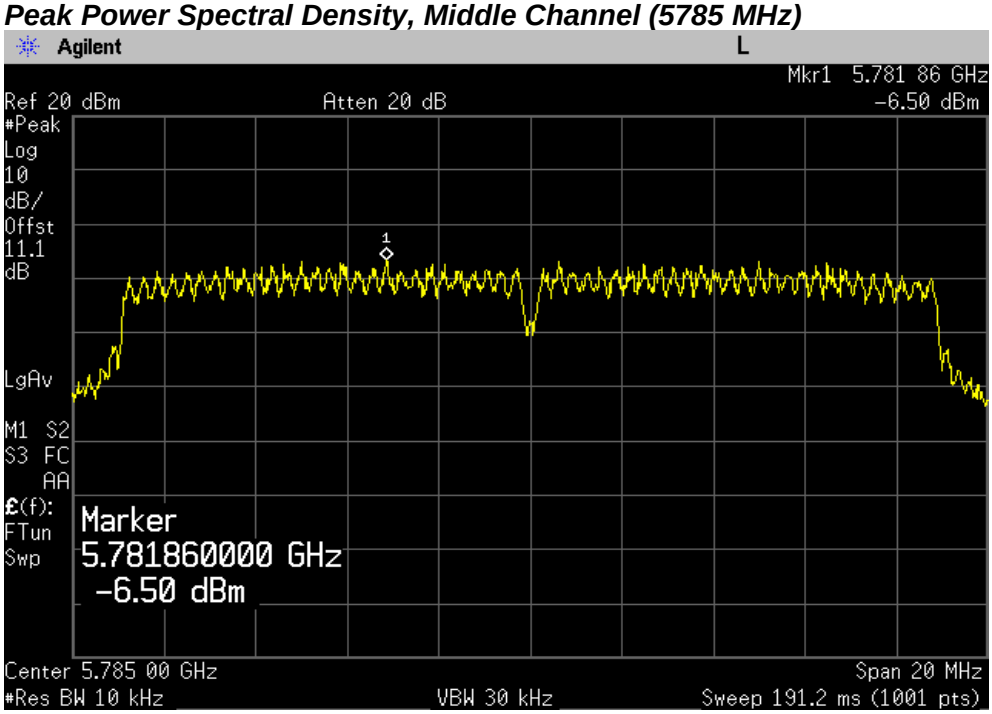
802.11n(20 MHz) mode

Chain 0

Peak Power Spectral Density, Lowest Channel (5745 MHz)

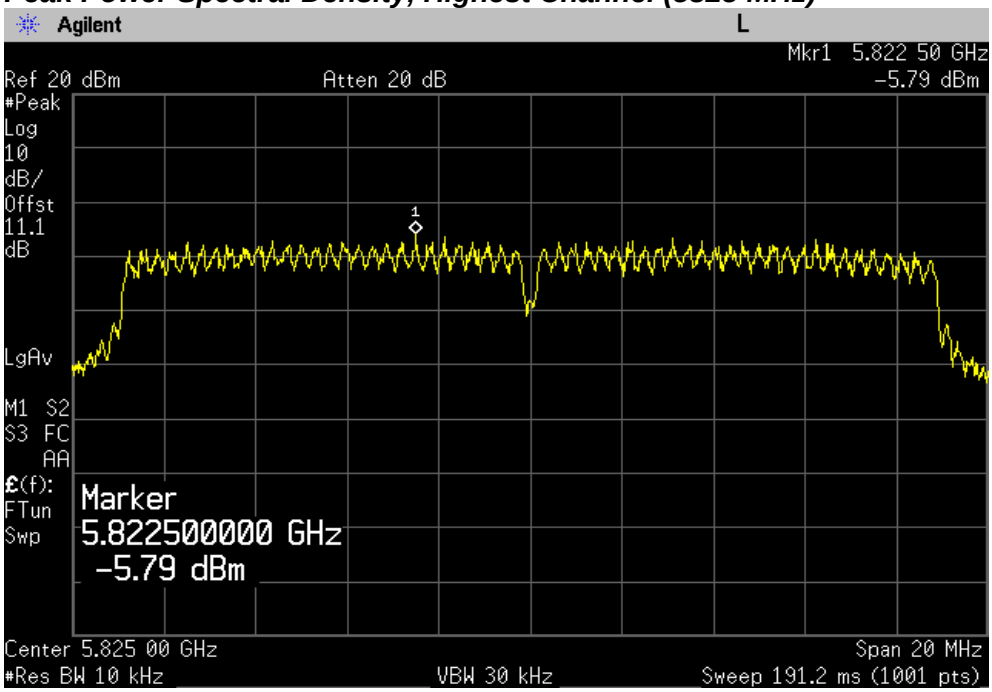


Peak Power Spectral Density, Middle Channel (5785 MHz)



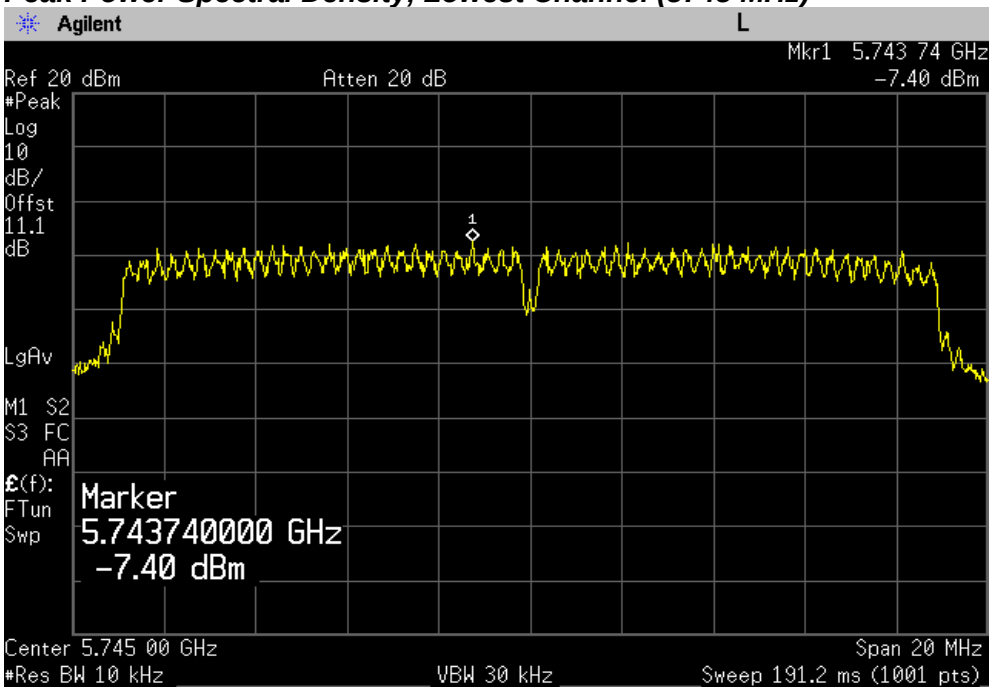
PLOT OF TEST DATA

Peak Power Spectral Density, Highest Channel (5825 MHz)



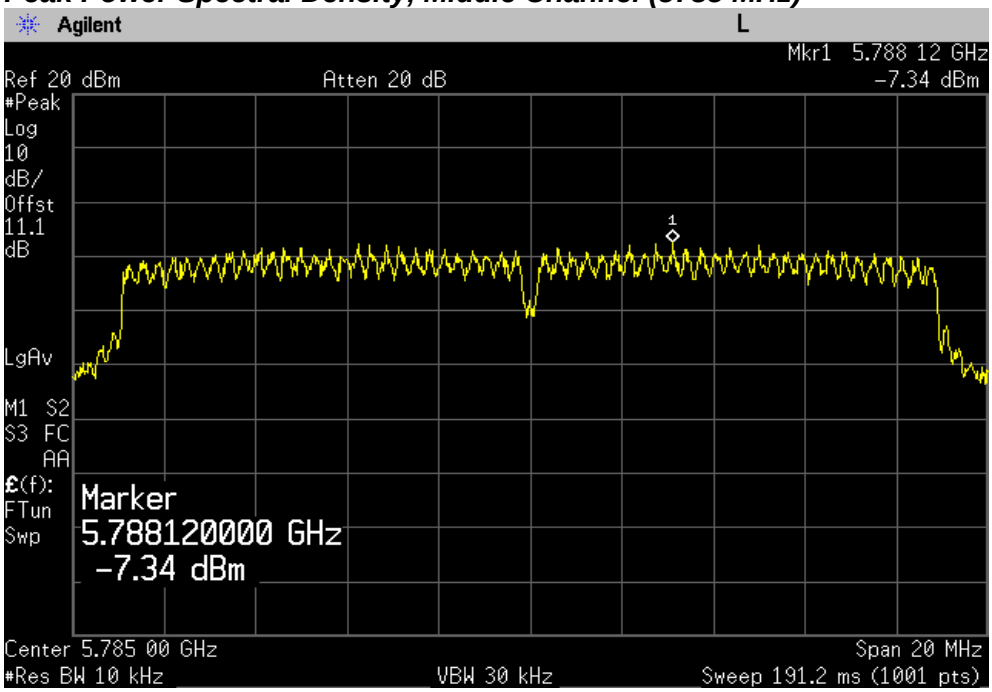
Chain 1

Peak Power Spectral Density, Lowest Channel (5745 MHz)

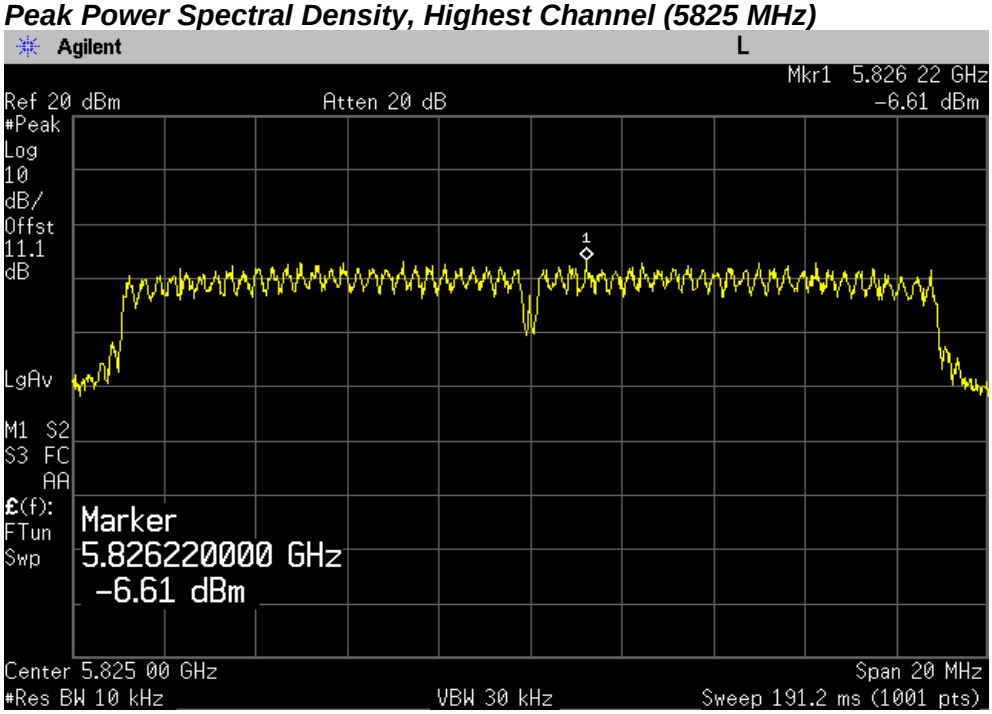


PLOT OF TEST DATA

Peak Power Spectral Density, Middle Channel (5785 MHz)



Peak Power Spectral Density, Highest Channel (5825 MHz)

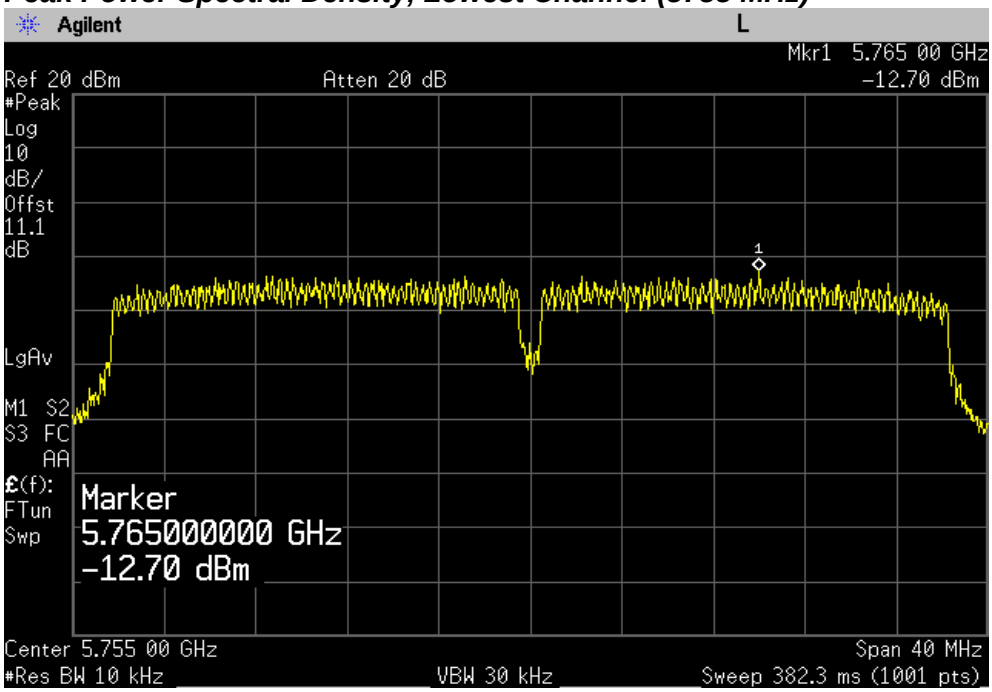


PLOT OF TEST DATA

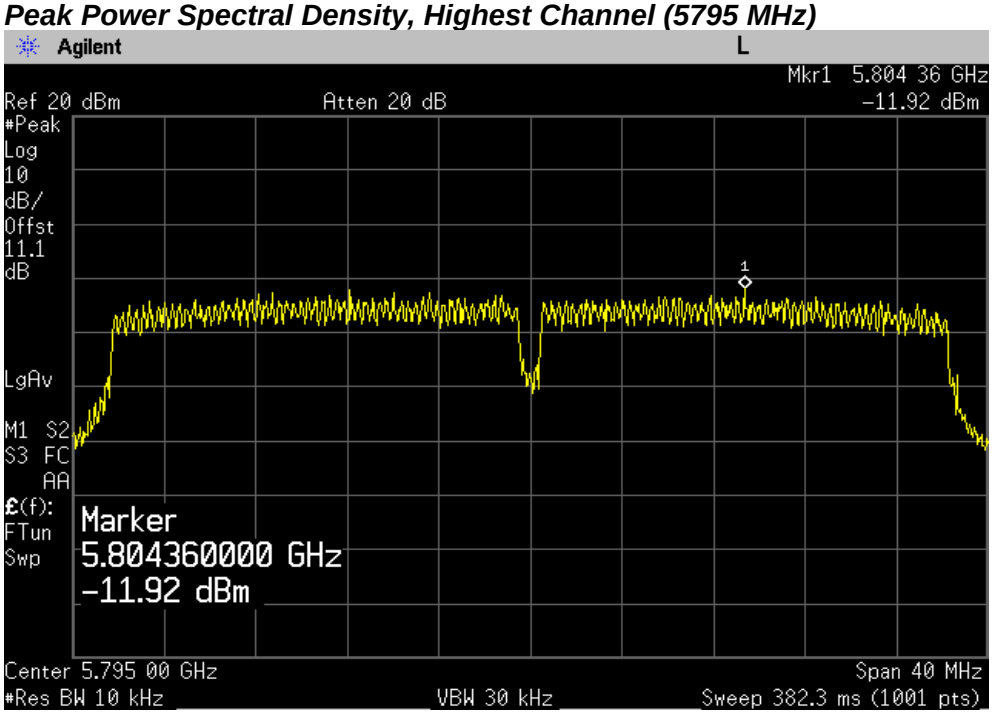
802.11n(40 MHz) mode

Chain 0

Peak Power Spectral Density, Lowest Channel (5755 MHz)



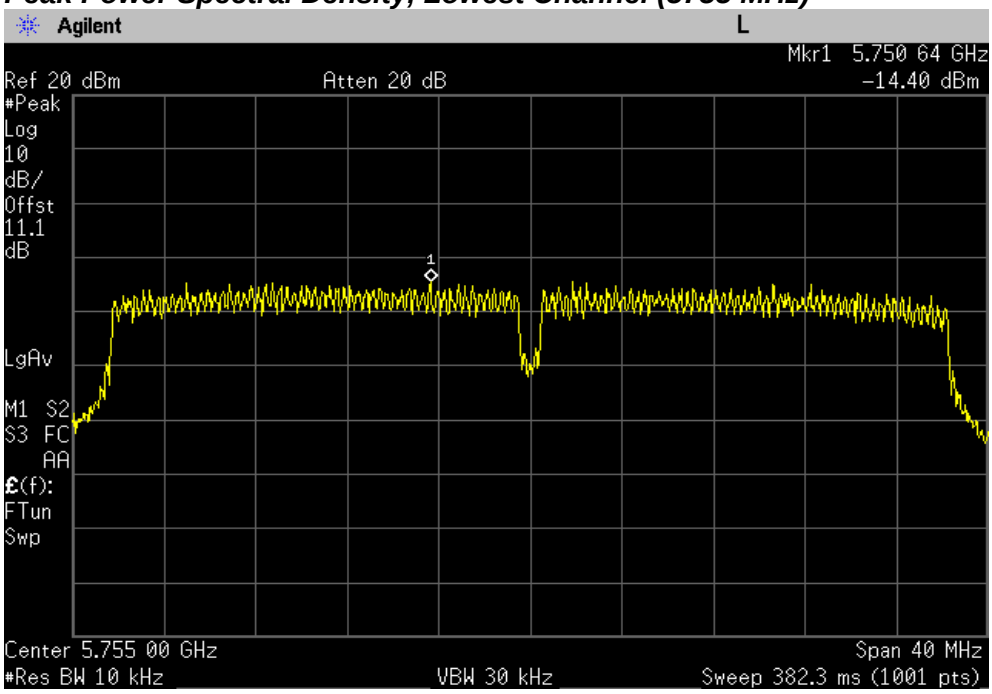
Peak Power Spectral Density, Highest Channel (5795 MHz)



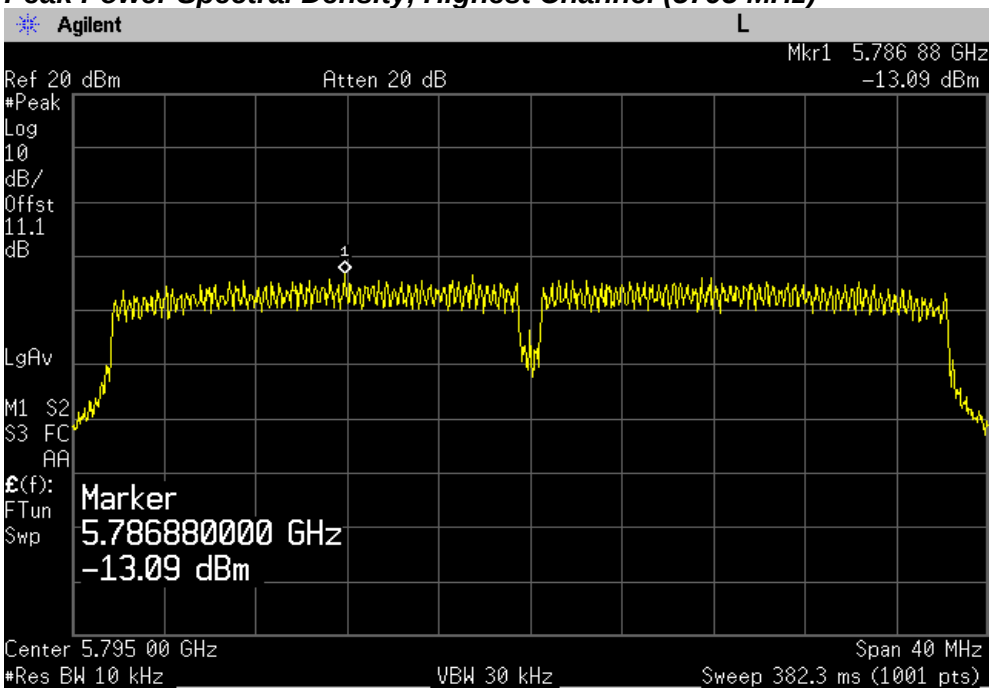
PLOT OF TEST DATA

Chain 1

Peak Power Spectral Density, Lowest Channel (5755 MHz)



Peak Power Spectral Density, Highest Channel (5795 MHz)



8.6 Conducted Spurious Emissions

8.6.1 Conducted Spurious Emissions – 2.4 GHz band

FCC §15.247(d), RSS-210 Issue 8, A8.5

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11b mode

Channel	Frequency (MHz)	Reference Level (dBm)		Conducted Spurious Emissions (dBc)	Limit (dBc)
		Chain 0	Chain 1		
Low	2412	9.12	9.02	More than 20 dBc	20
Middle	2437	9.06	9.07	More than 20 dBc	20
High	2462	8.64	8.81	More than 20 dBc	20

802.11g mode

Channel	Frequency (MHz)	Reference Level (dBm)		Conducted Spurious Emissions (dBc)	Limit (dBc)
		Chain 0	Chain 1		
Low	2412	1.93	2.65	More than 20 dBc	20
Middle	2437	4.26	4.30	More than 20 dBc	20
High	2462	0.94	0.80	More than 20 dBc	20

802.11n(20 MHz) mode

Channel	Frequency (MHz)	Reference Level (dBm)		Conducted Spurious Emissions (dBc)	Limit (dBc)
		Chain 0	Chain 1		
Low	2412	-0.06	-0.21	More than 20 dBc	20
Middle	2437	3.56	3.14	More than 20 dBc	20
High	2462	-0.50	-0.73	More than 20 dBc	20

Note:

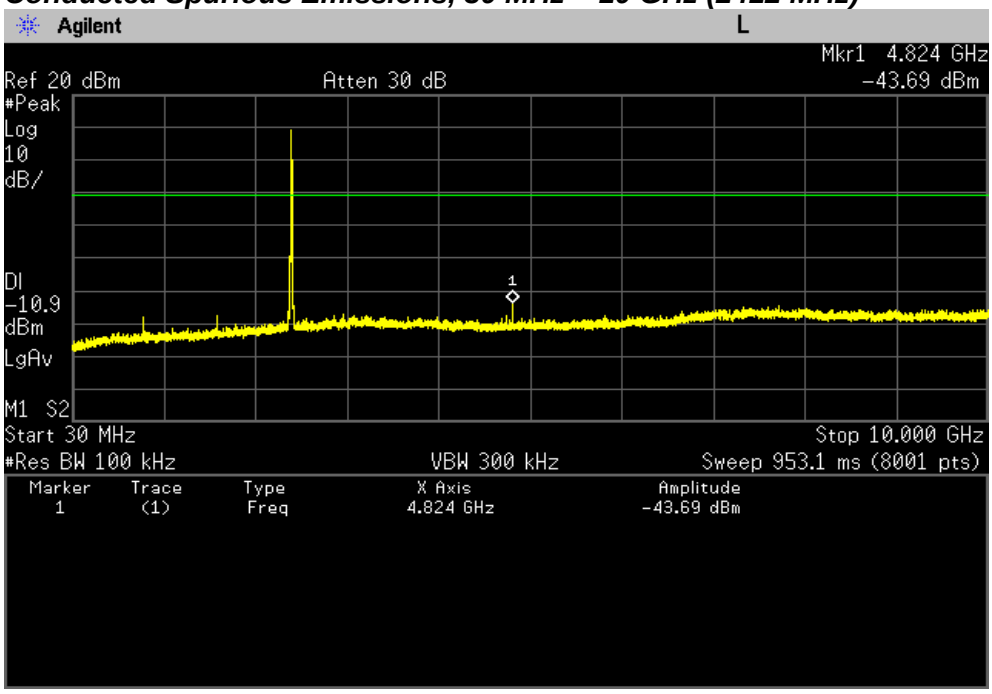
The cable and attenuator loss from 30 MHz to 25 GHz was reflected in spectrum analyzer with correction factor for the spurious emissions test.

PLOT OF TEST DATA

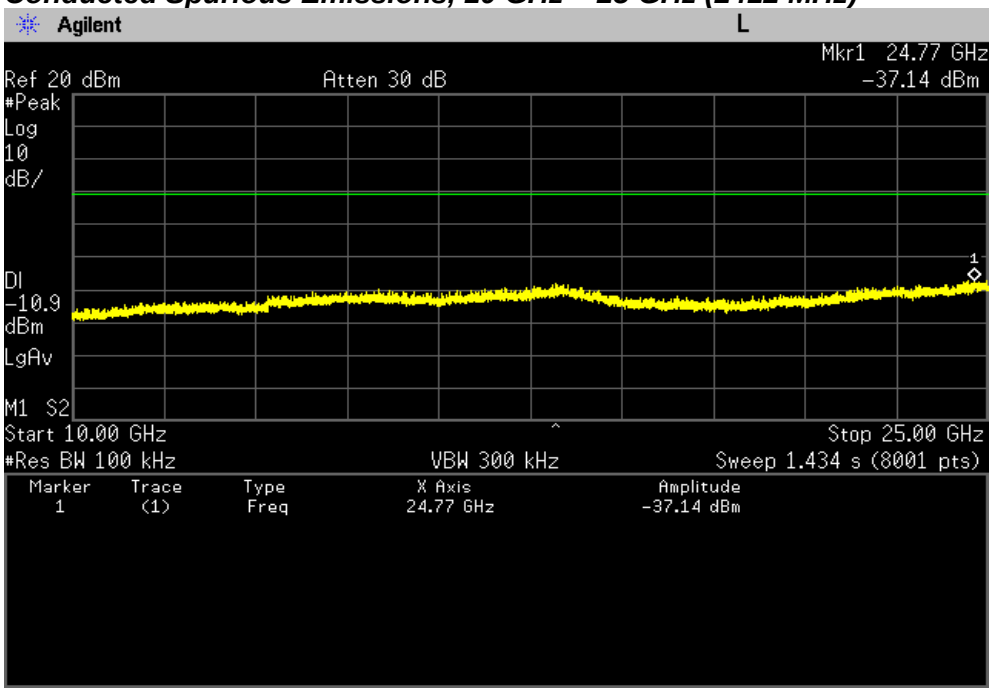
802.11b mode

Chain 0

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2412 MHz)

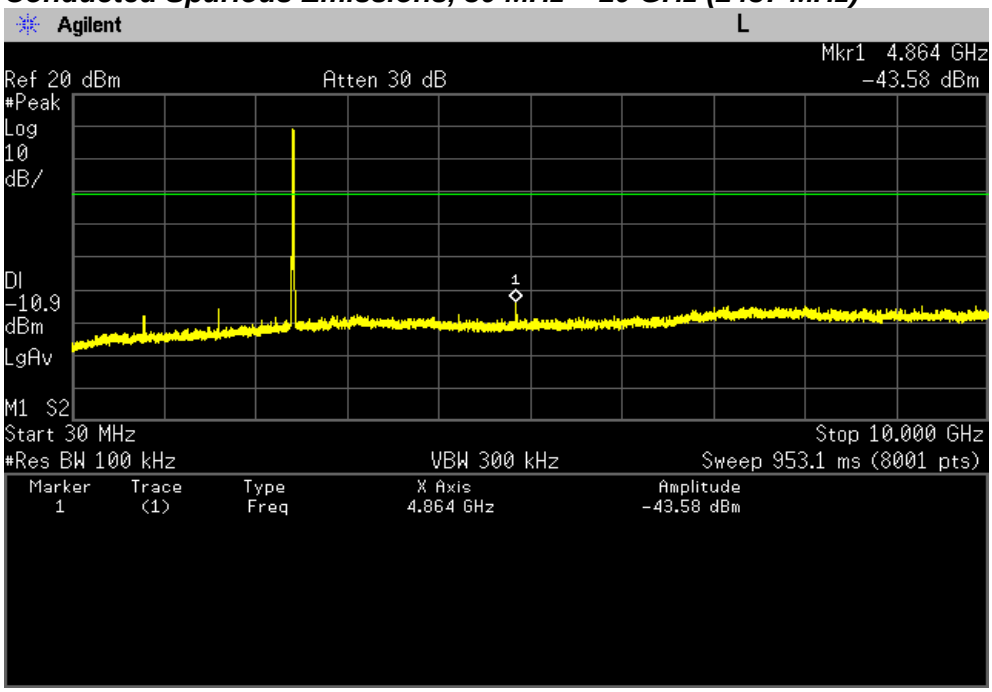


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2412 MHz)

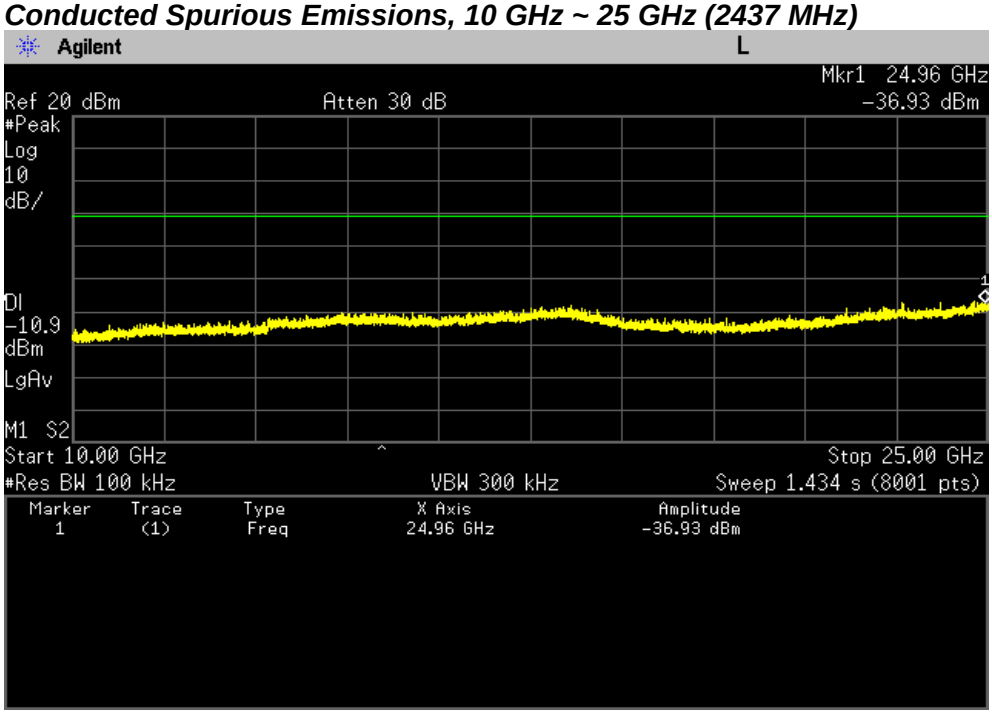


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2437 MHz)

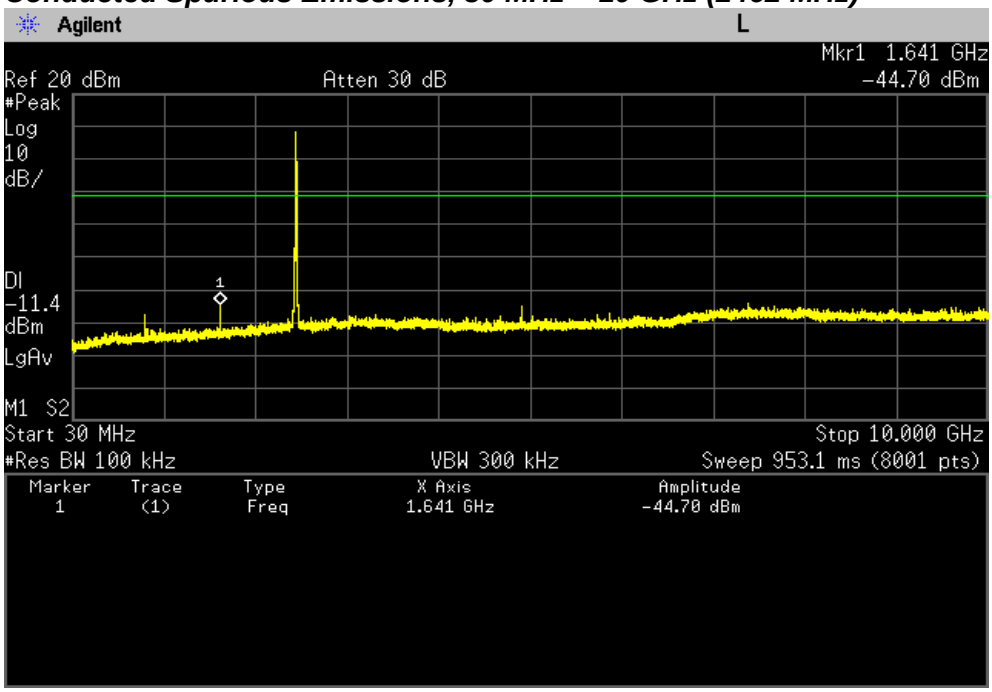


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2437 MHz)

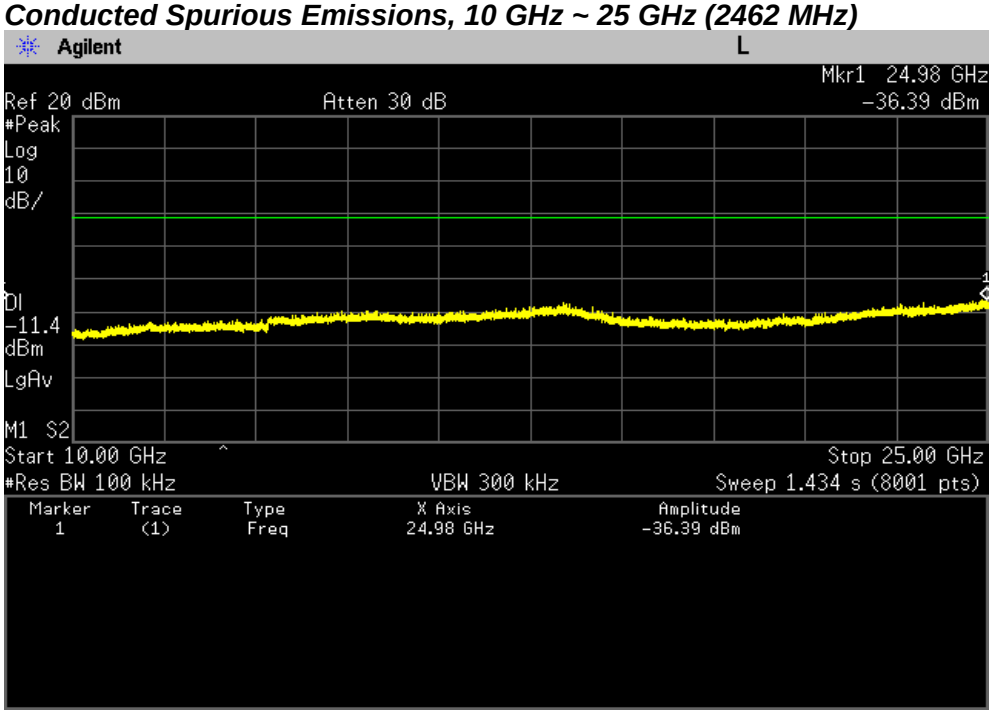


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2462 MHz)



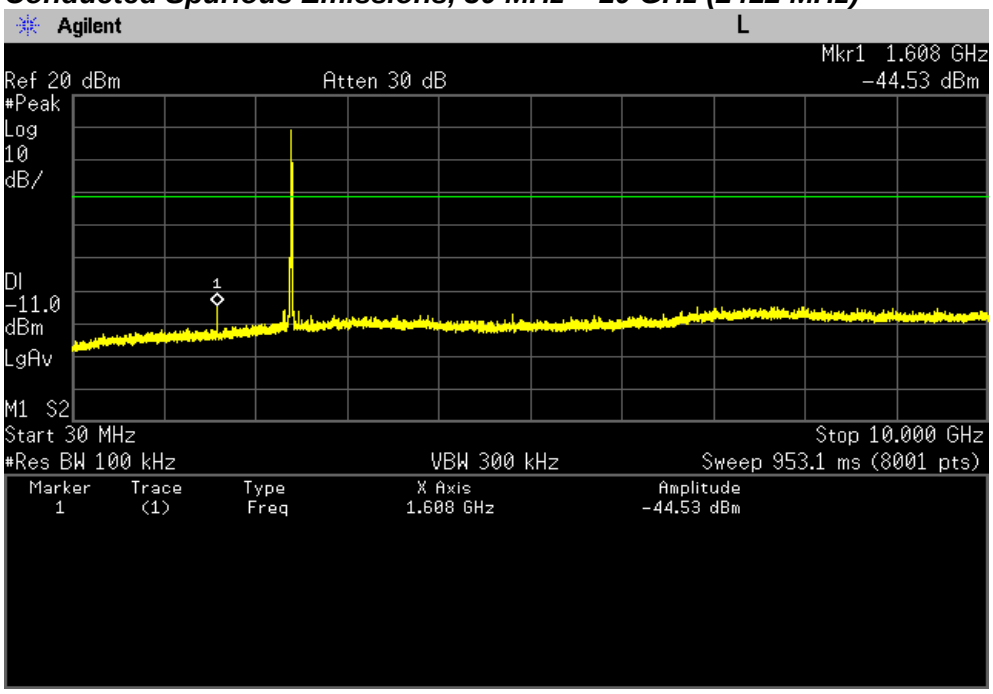
Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2462 MHz)



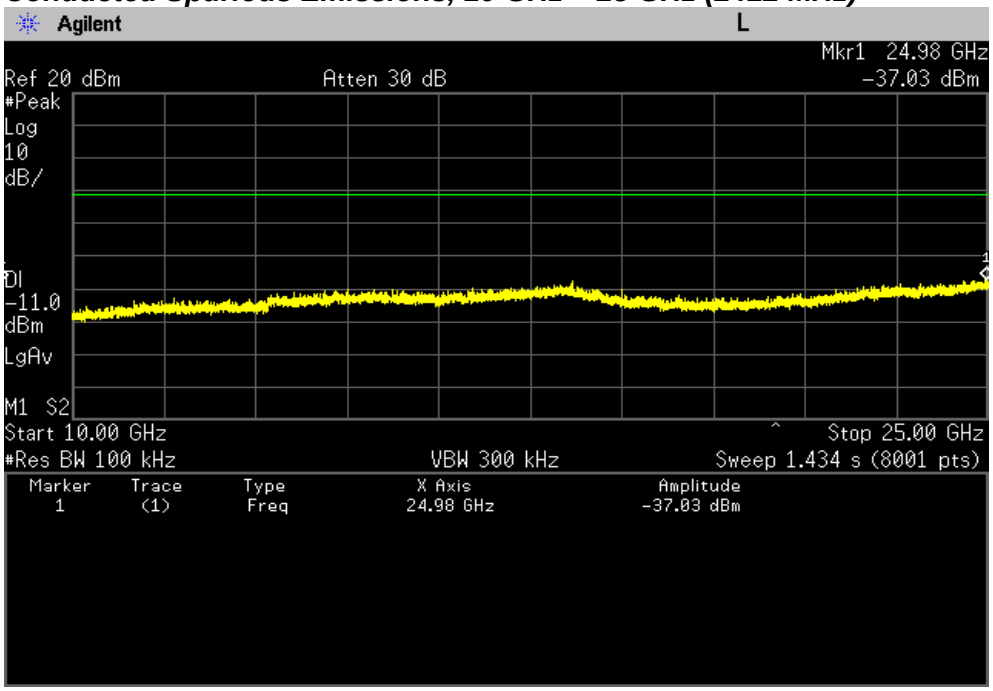
PLOT OF TEST DATA

Chain 1

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2412 MHz)

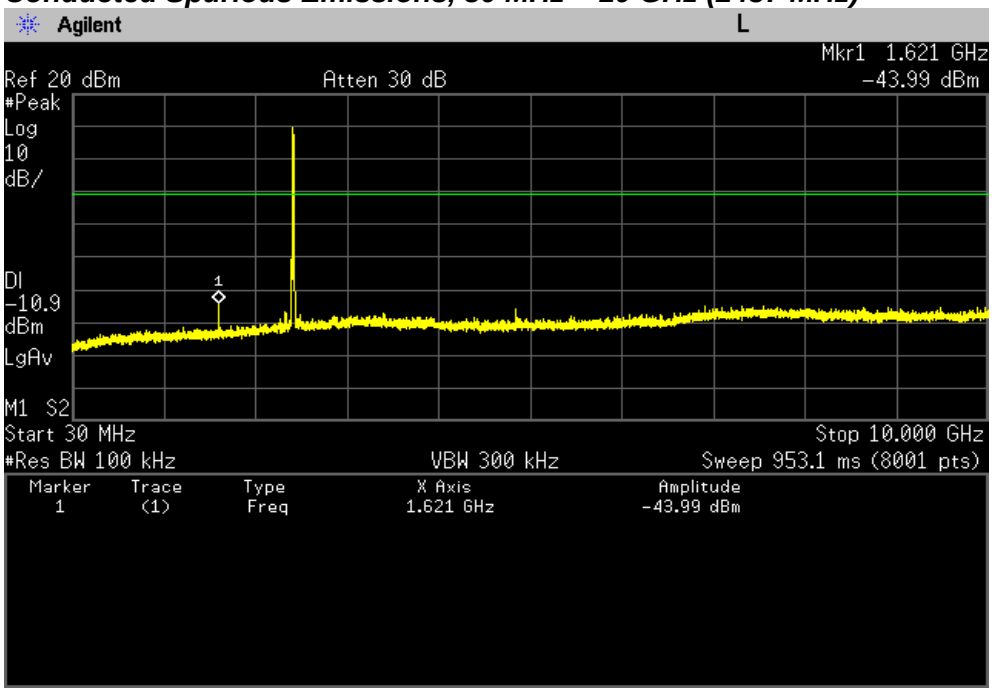


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2412 MHz)

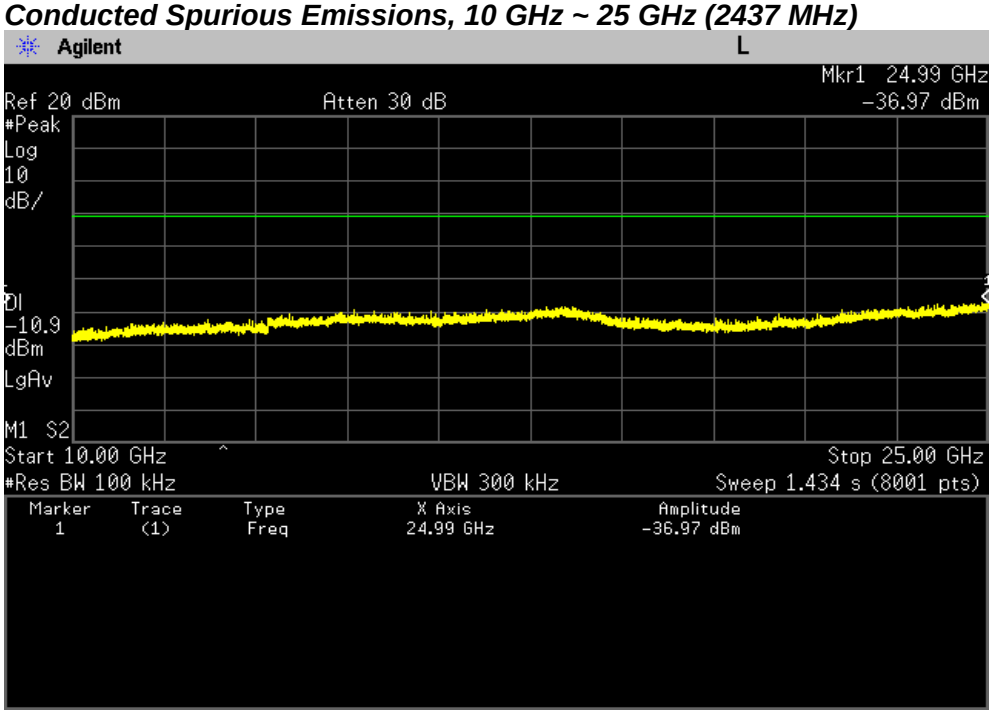


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2437 MHz)

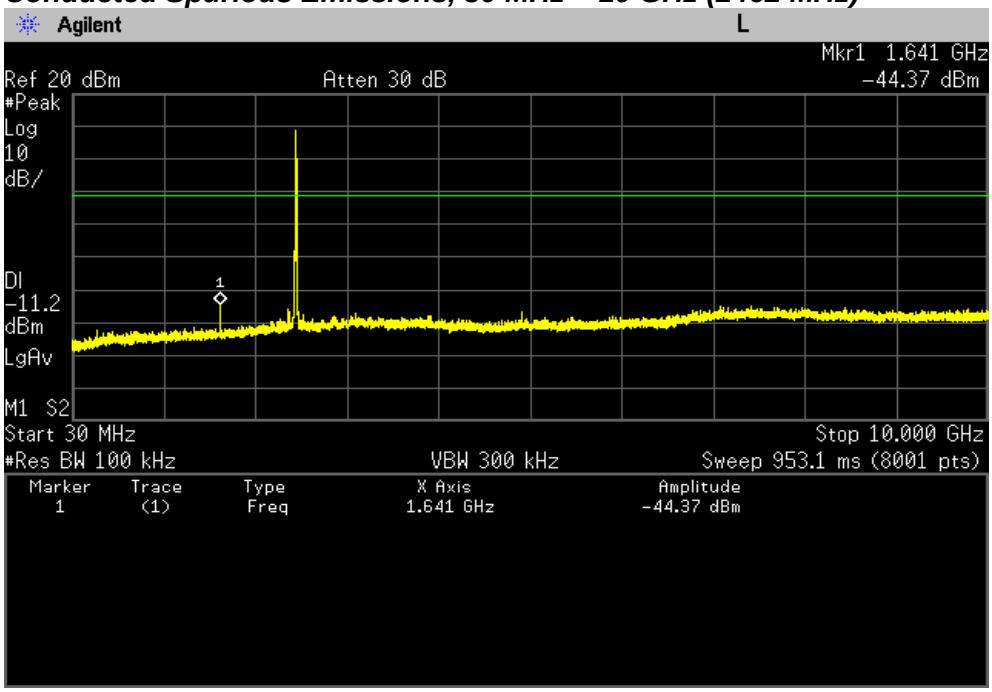


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2437 MHz)

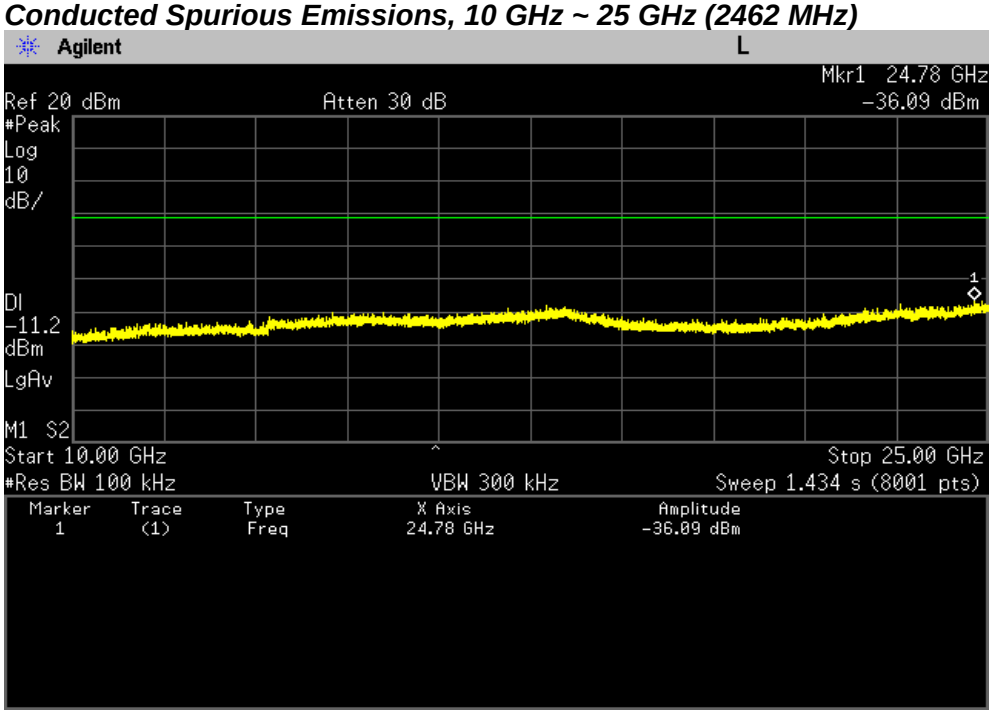


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2462 MHz)



Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2462 MHz)

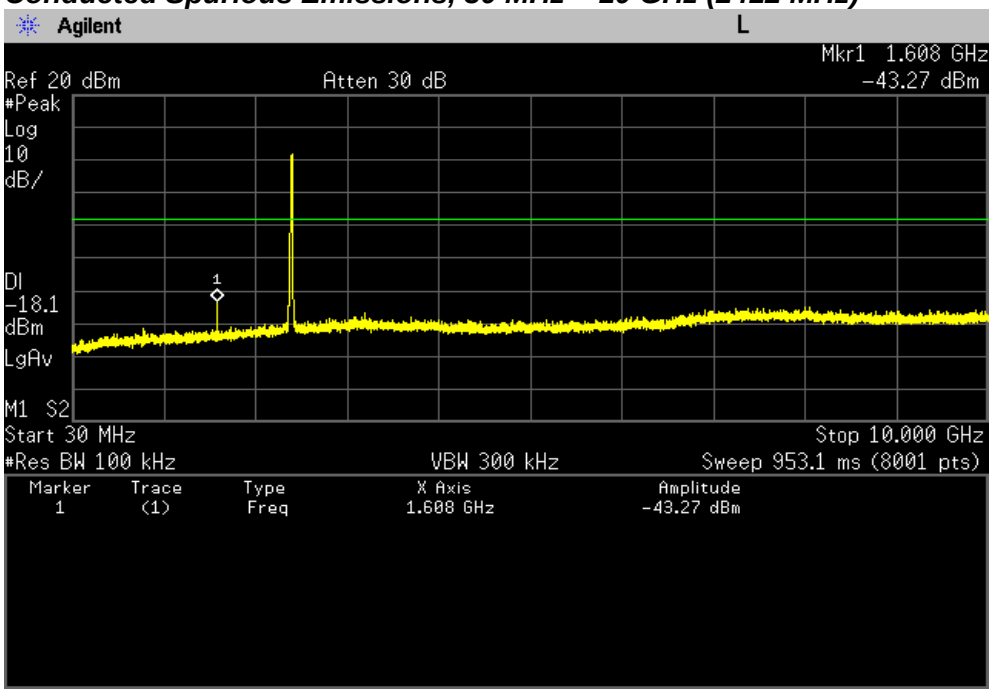


PLOT OF TEST DATA

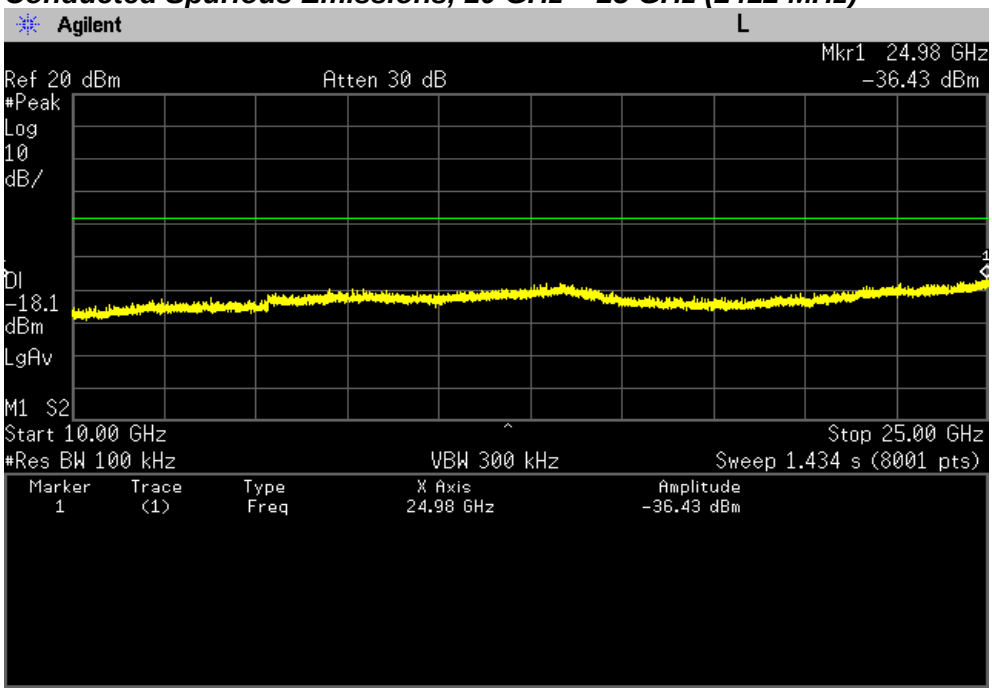
802.11g mode

Chain 0

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2412 MHz)

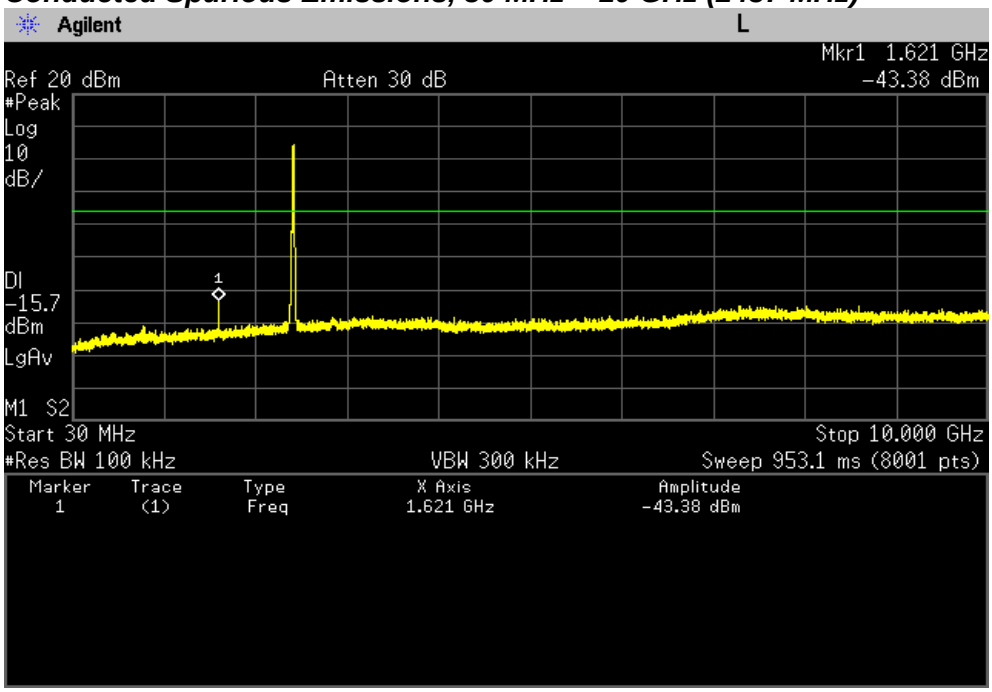


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2412 MHz)

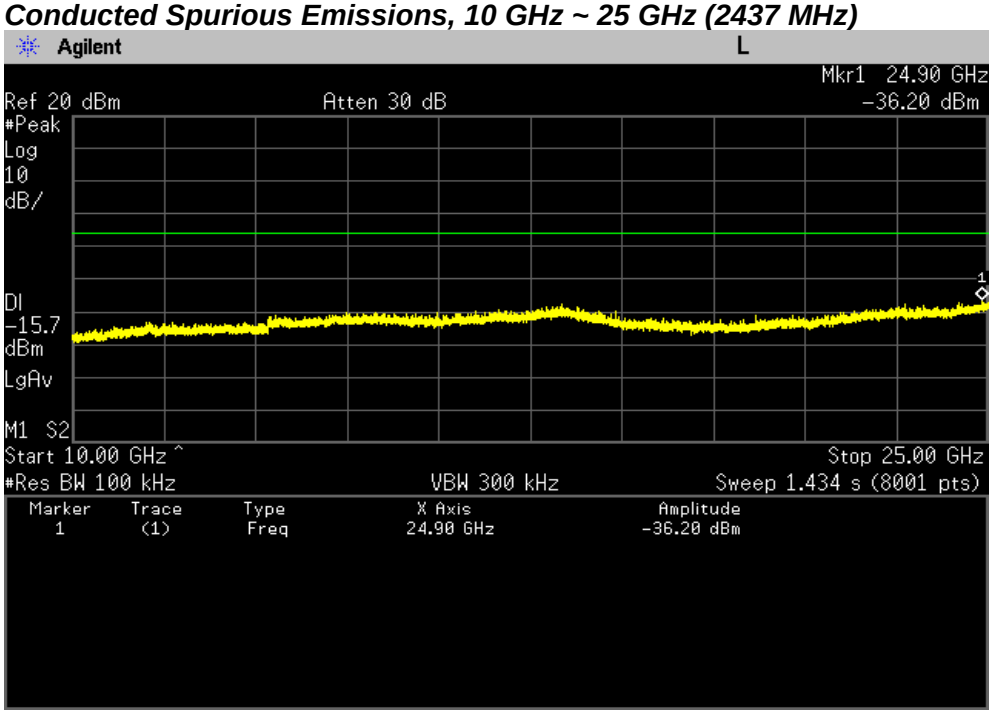


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2437 MHz)

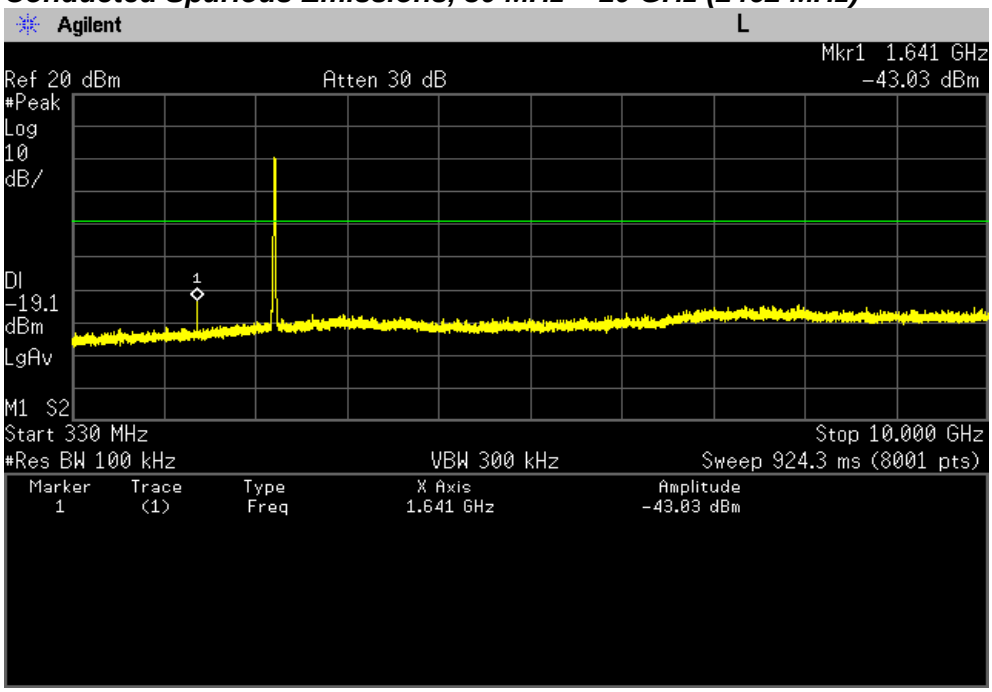


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2437 MHz)

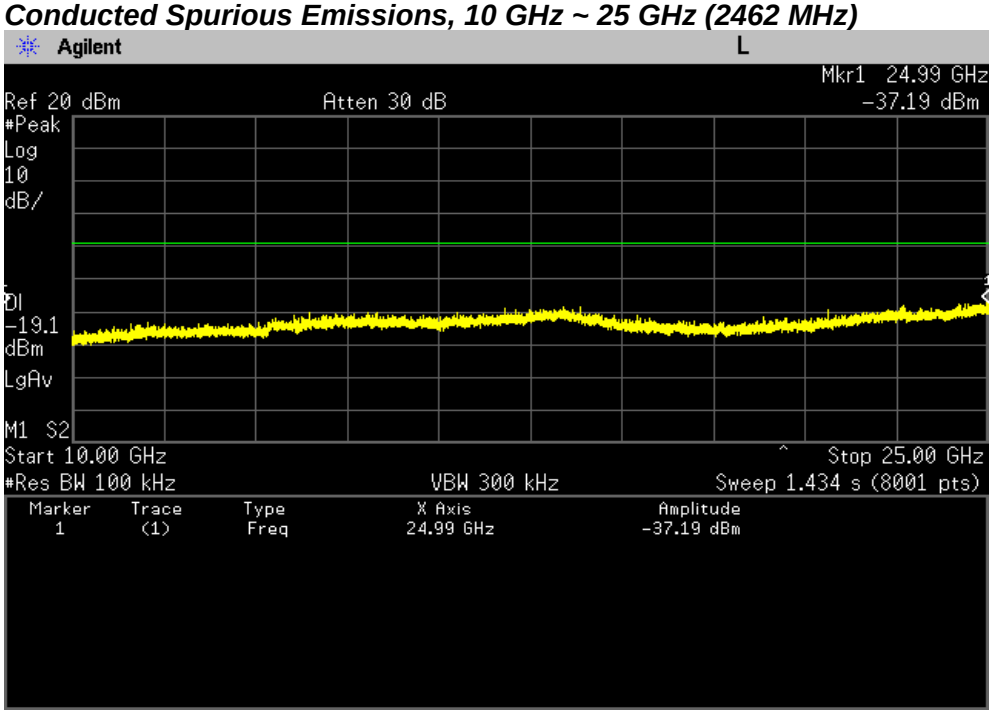


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2462 MHz)



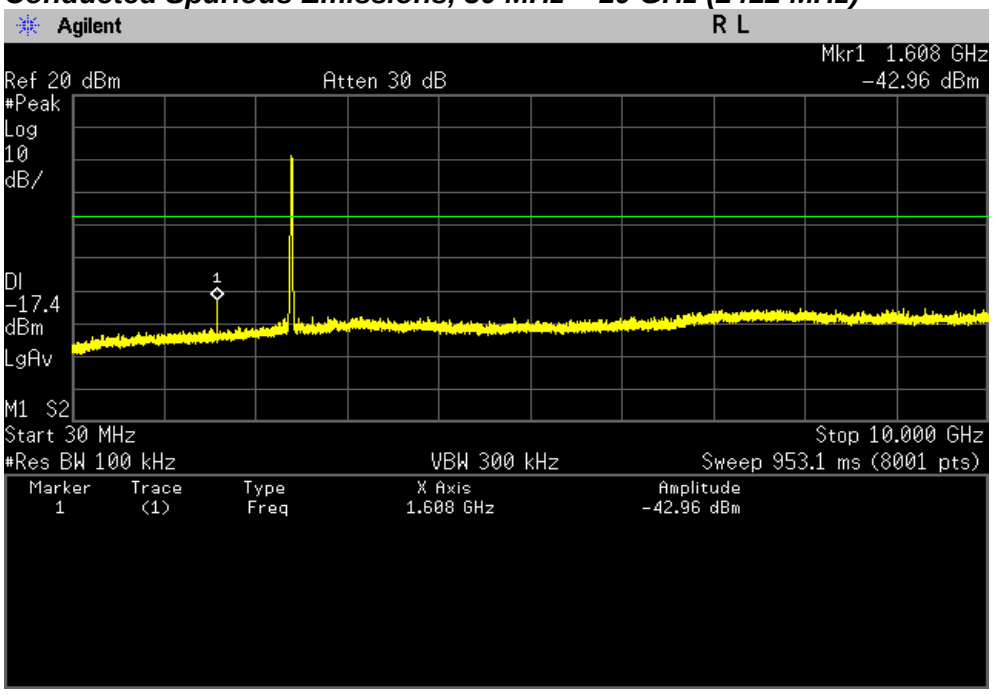
Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2462 MHz)



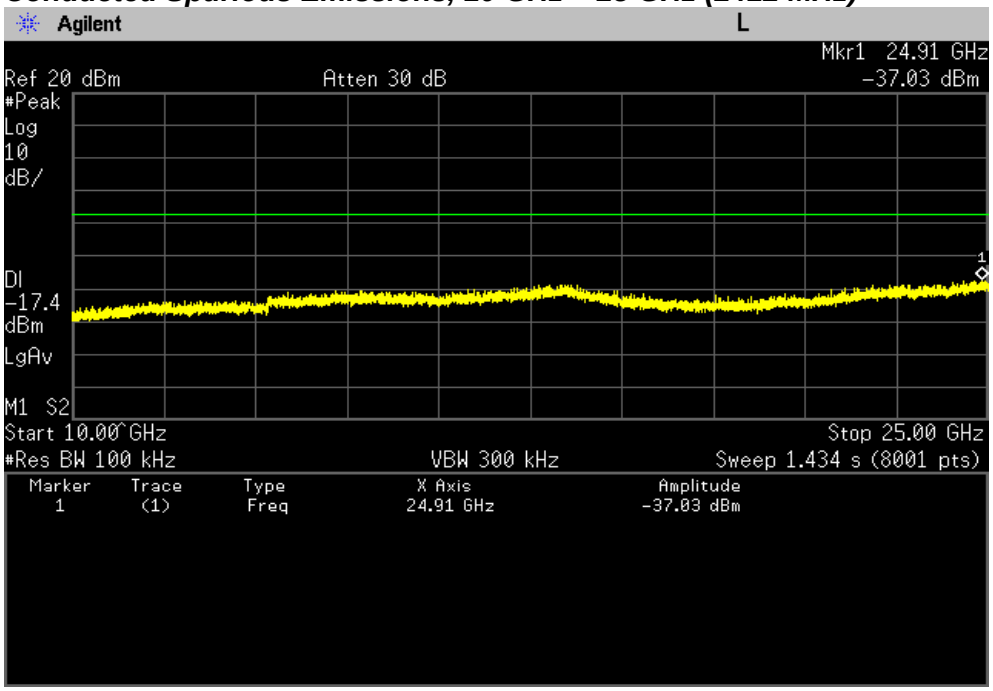
PLOT OF TEST DATA

Chain 1

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2412 MHz)

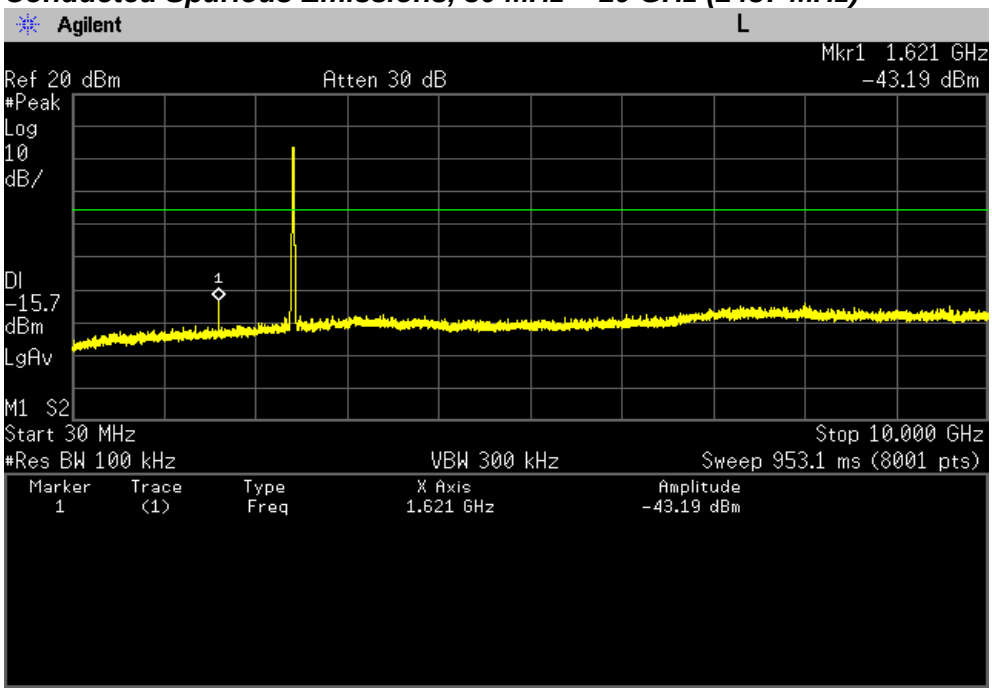


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2412 MHz)

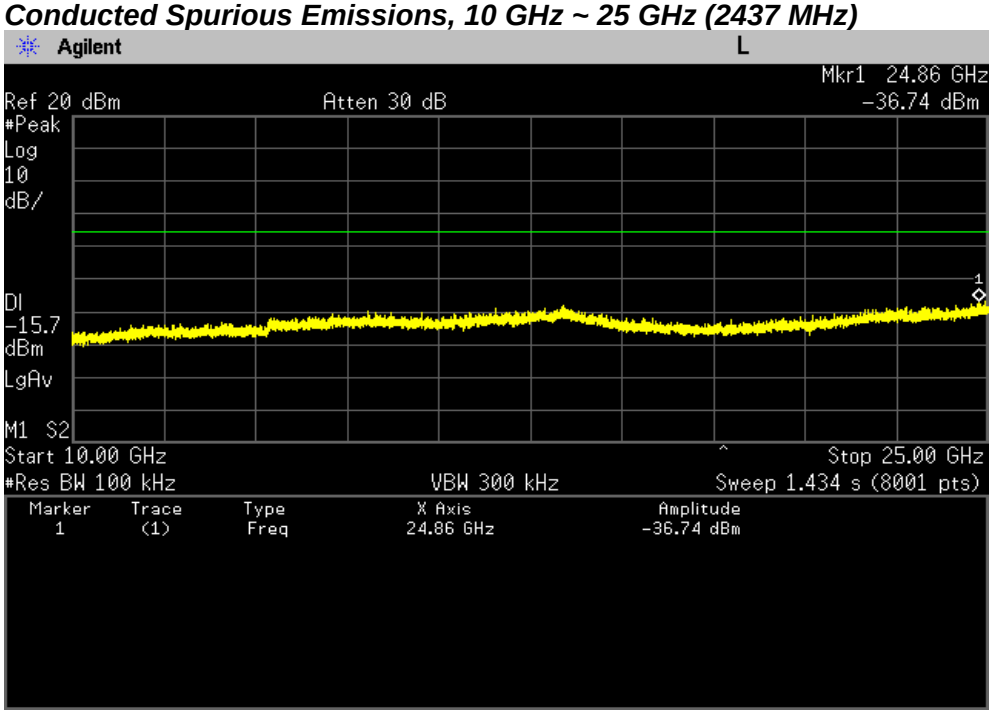


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2437 MHz)

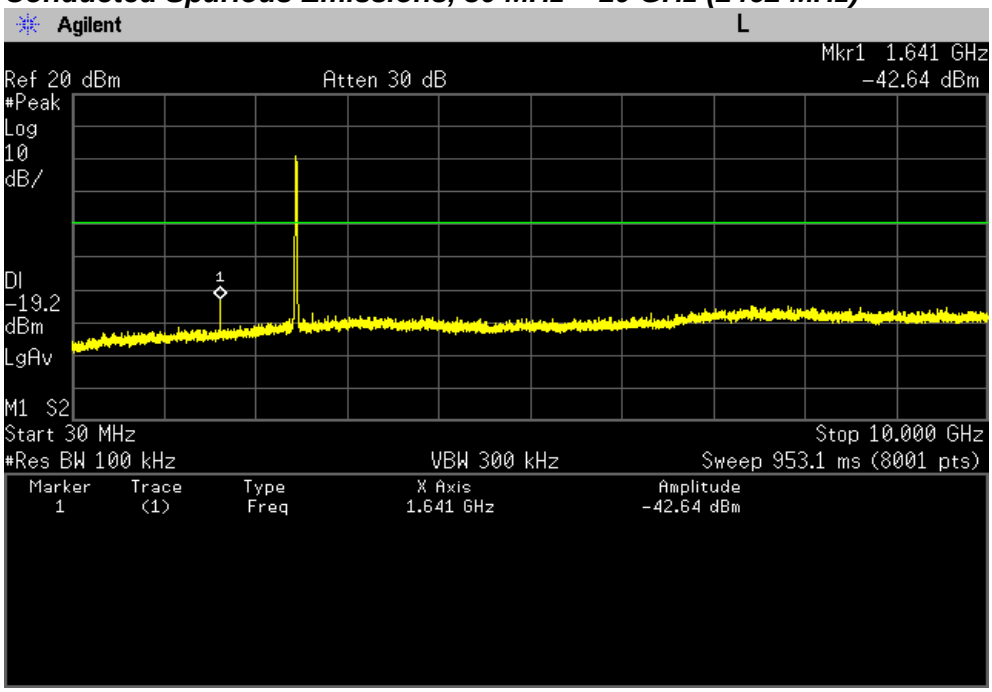


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2437 MHz)

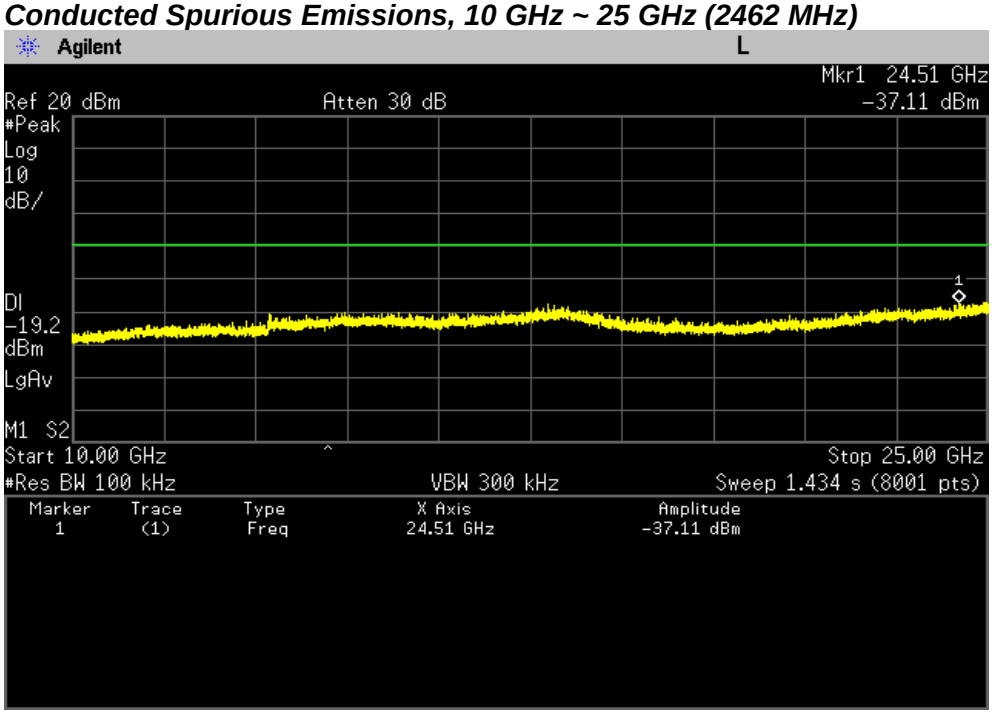


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2462 MHz)



Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2462 MHz)

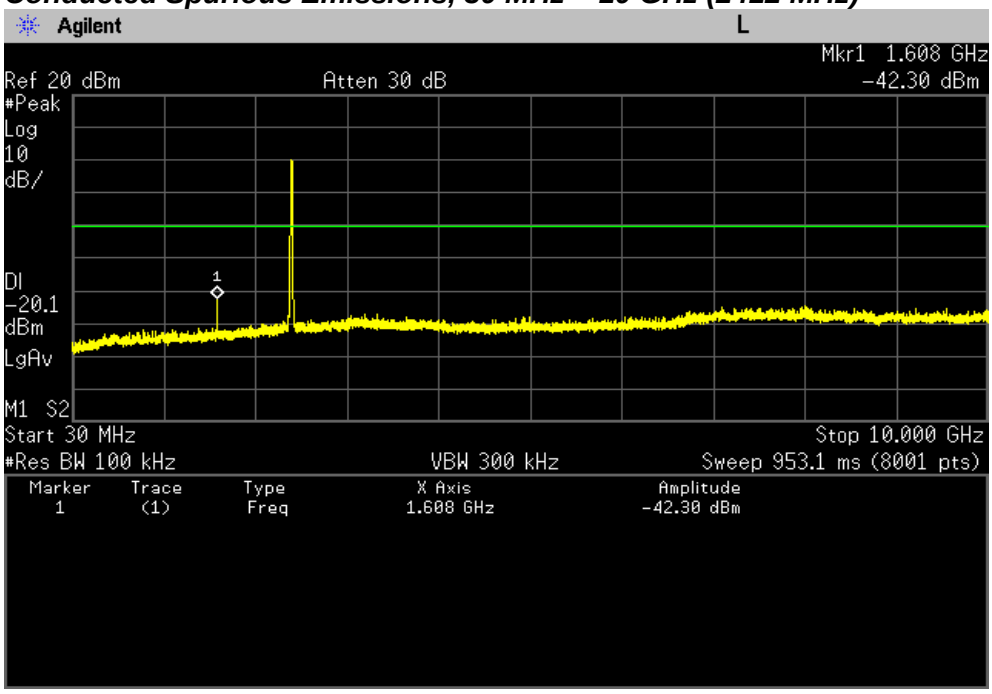


PLOT OF TEST DATA

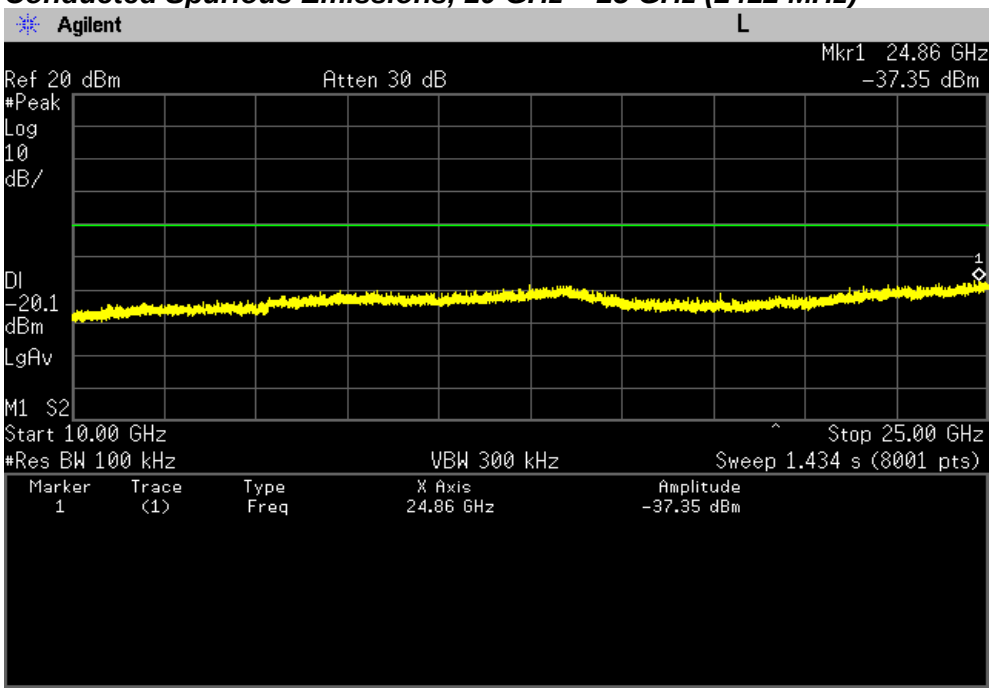
802.11n(20 MHz) mode

Chain 0

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2412 MHz)

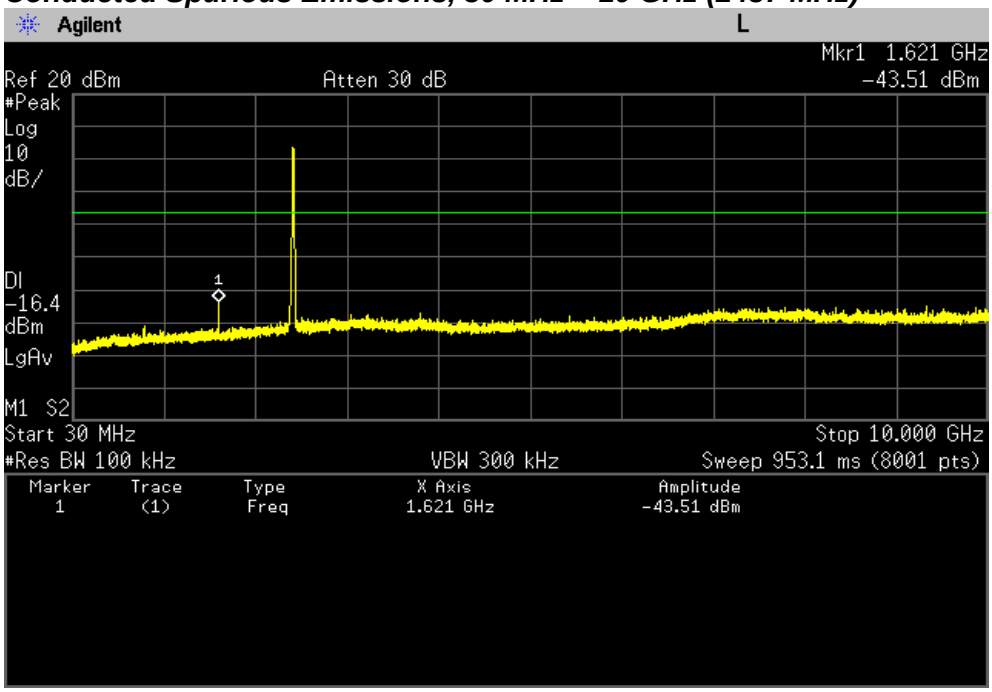


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2412 MHz)

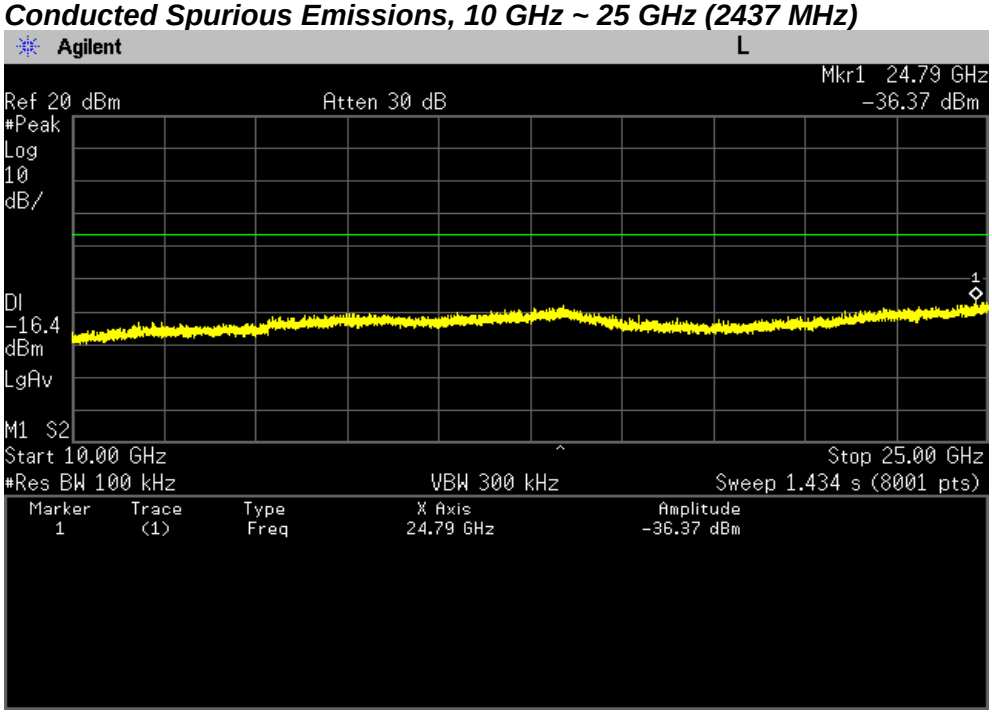


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2437 MHz)

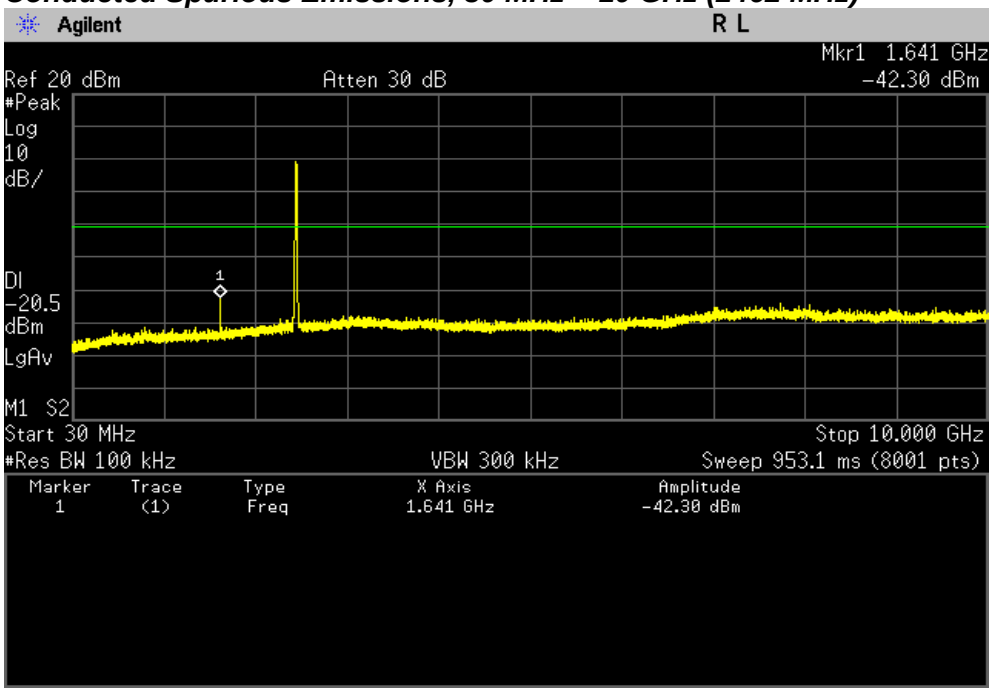


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2437 MHz)

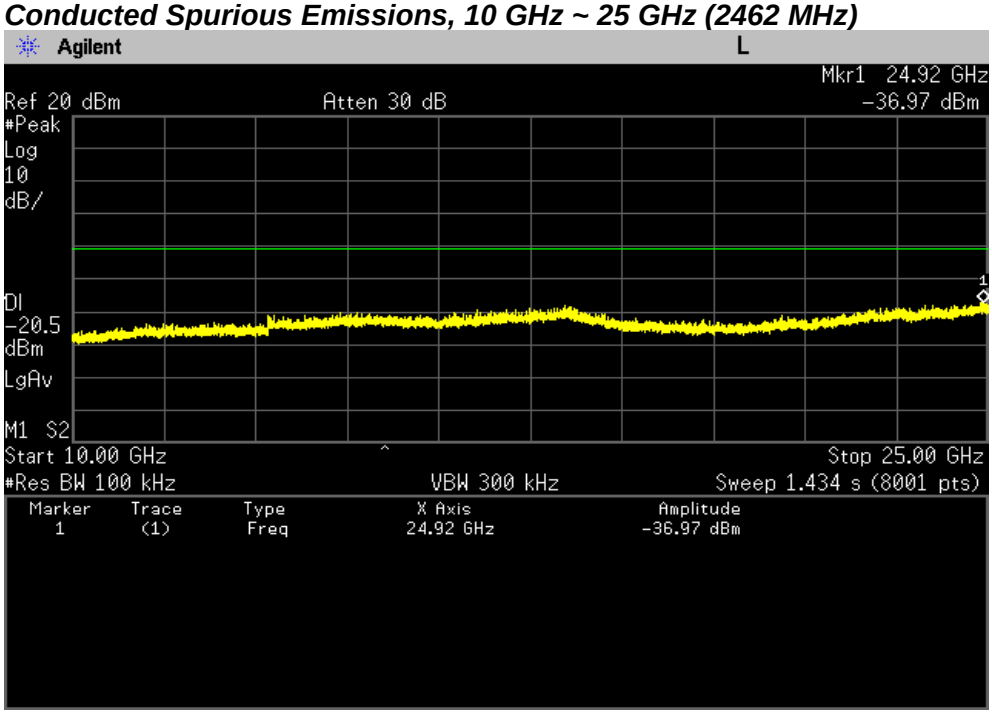


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2462 MHz)



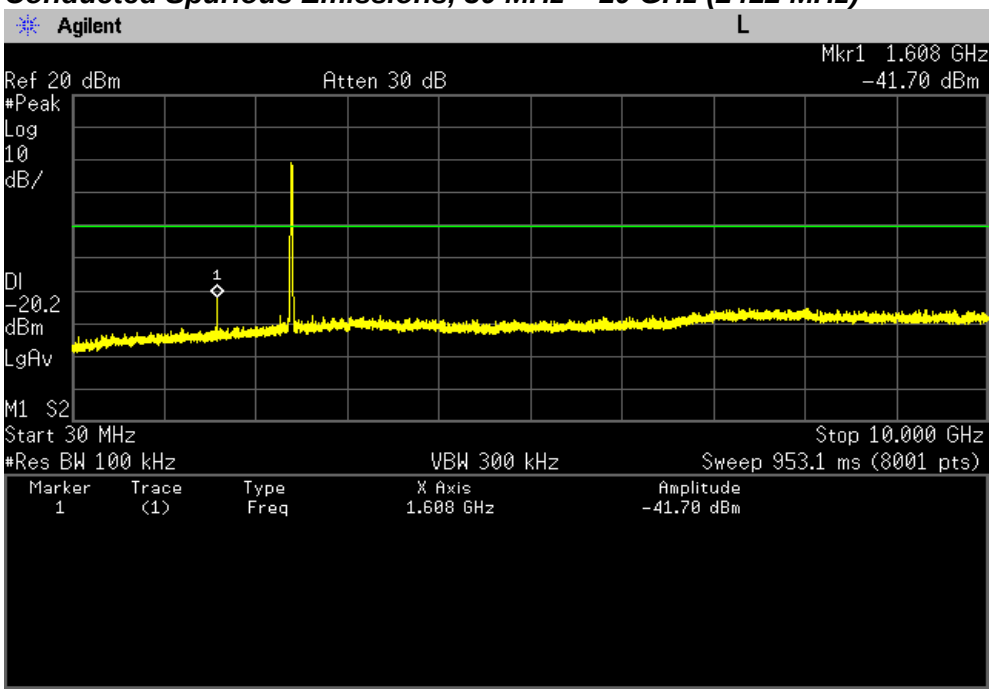
Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2462 MHz)



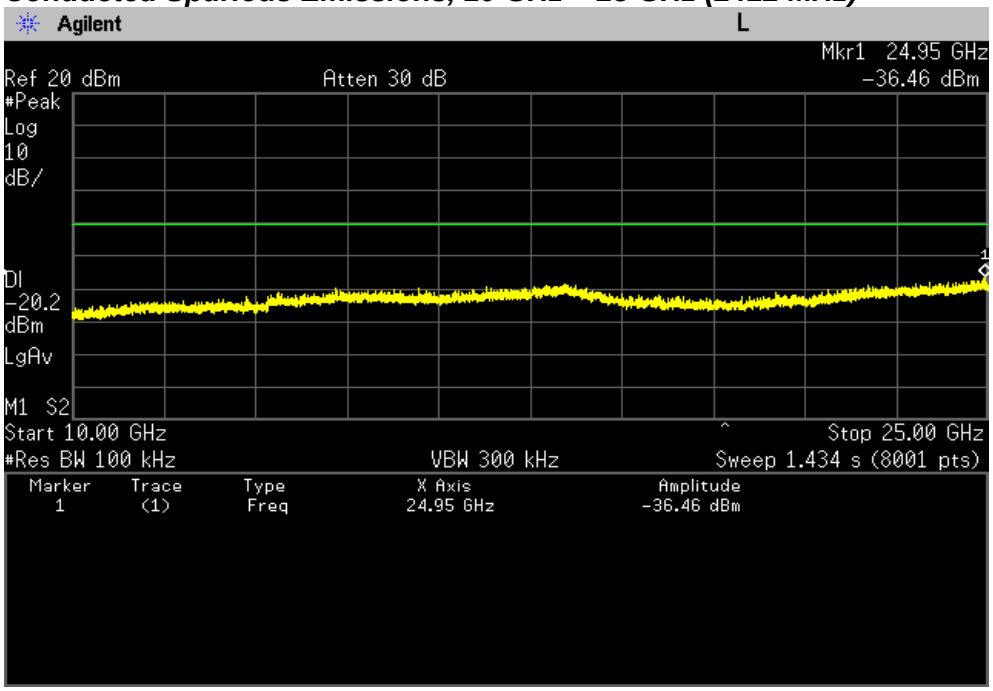
PLOT OF TEST DATA

Chain 1

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2412 MHz)

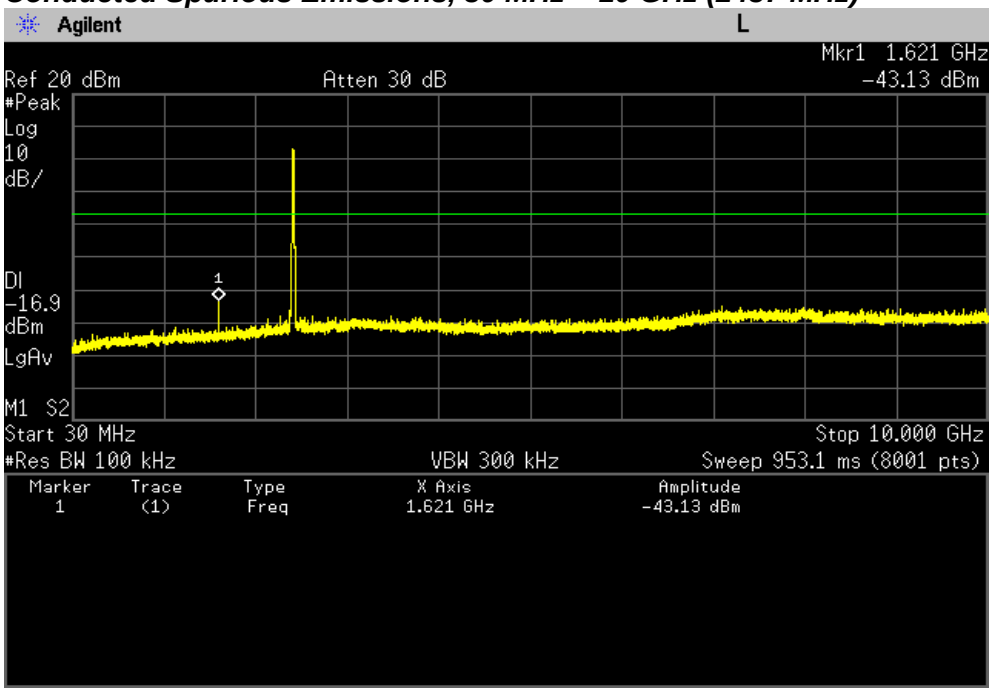


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2412 MHz)

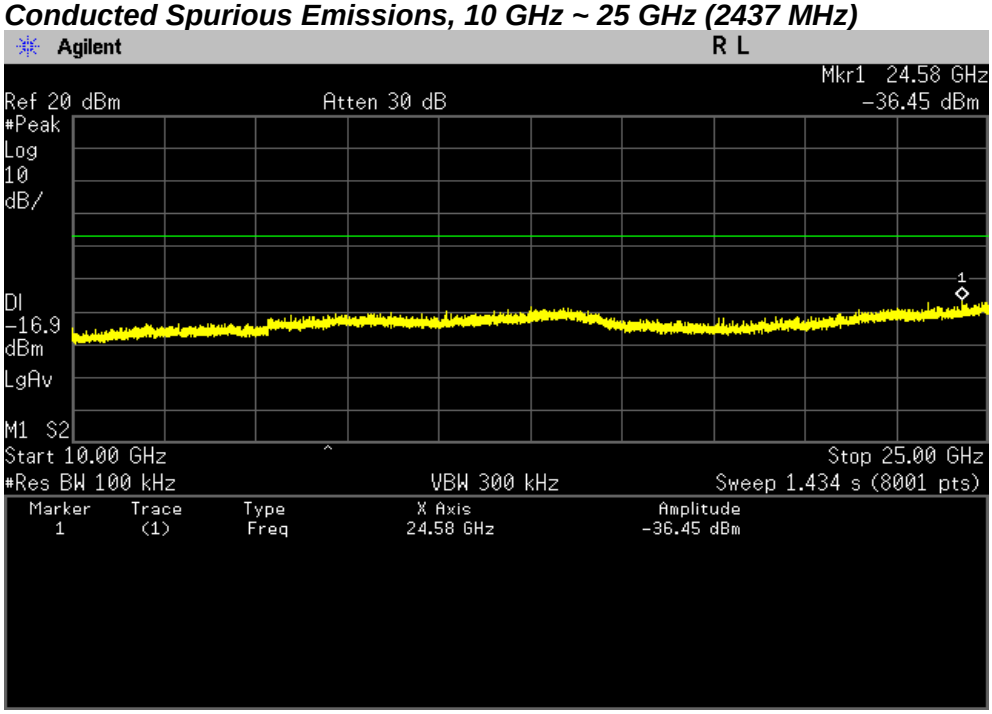


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2437 MHz)

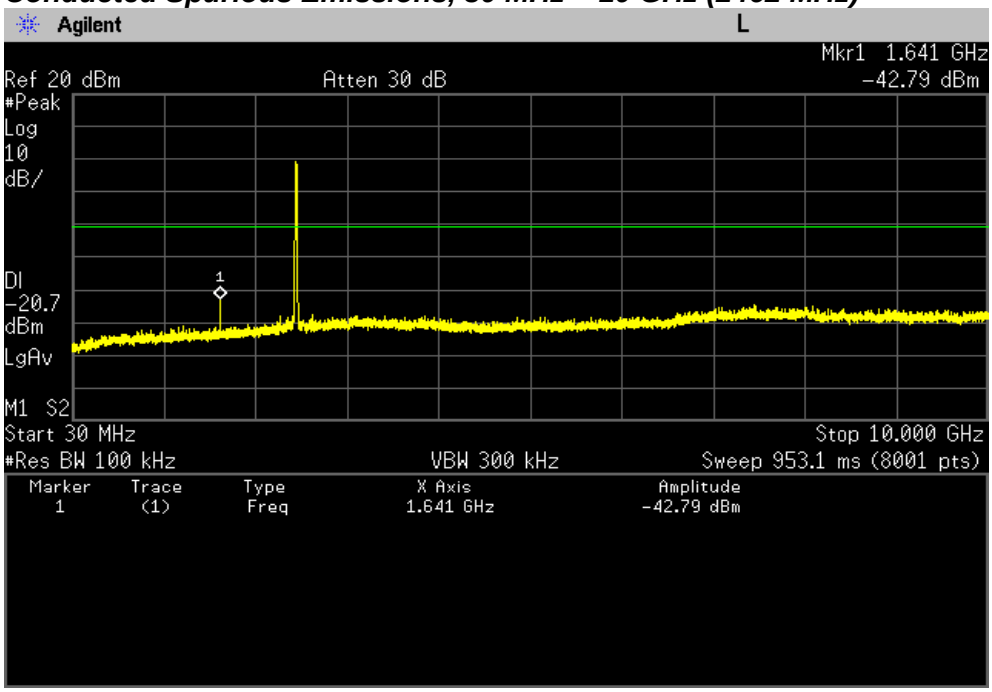


Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2437 MHz)

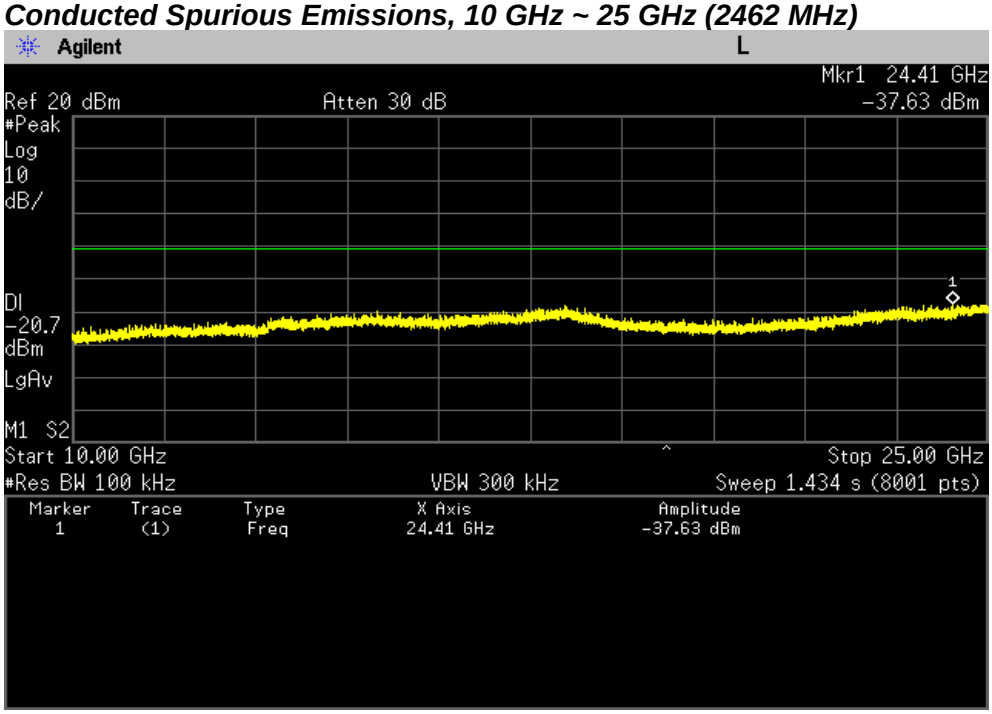


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (2462 MHz)



Conducted Spurious Emissions, 10 GHz ~ 25 GHz (2462 MHz)

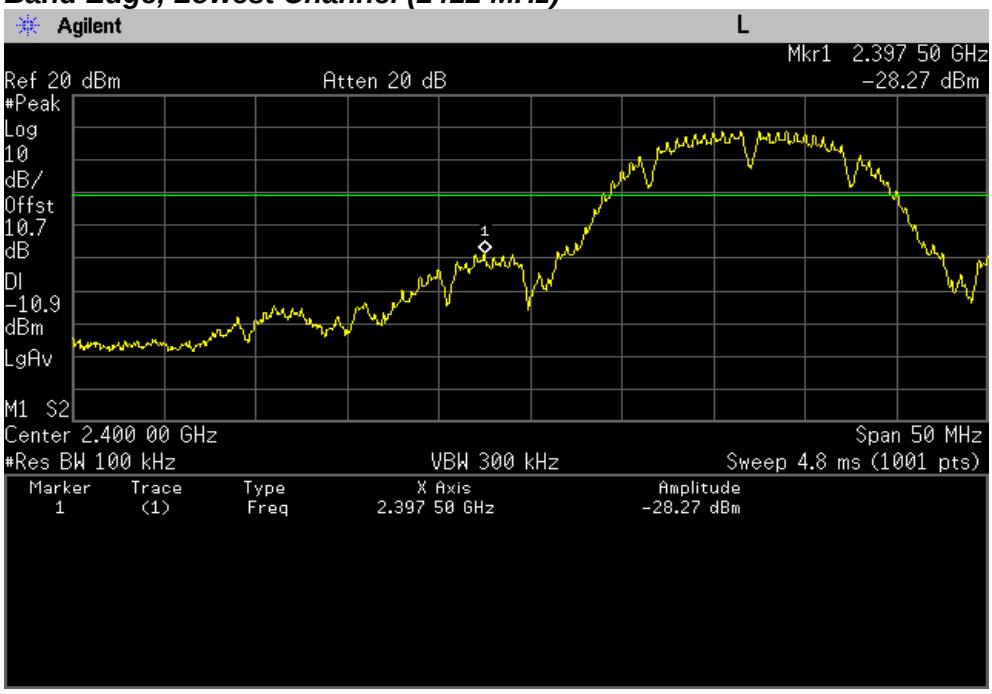


PLOT OF TEST DATA

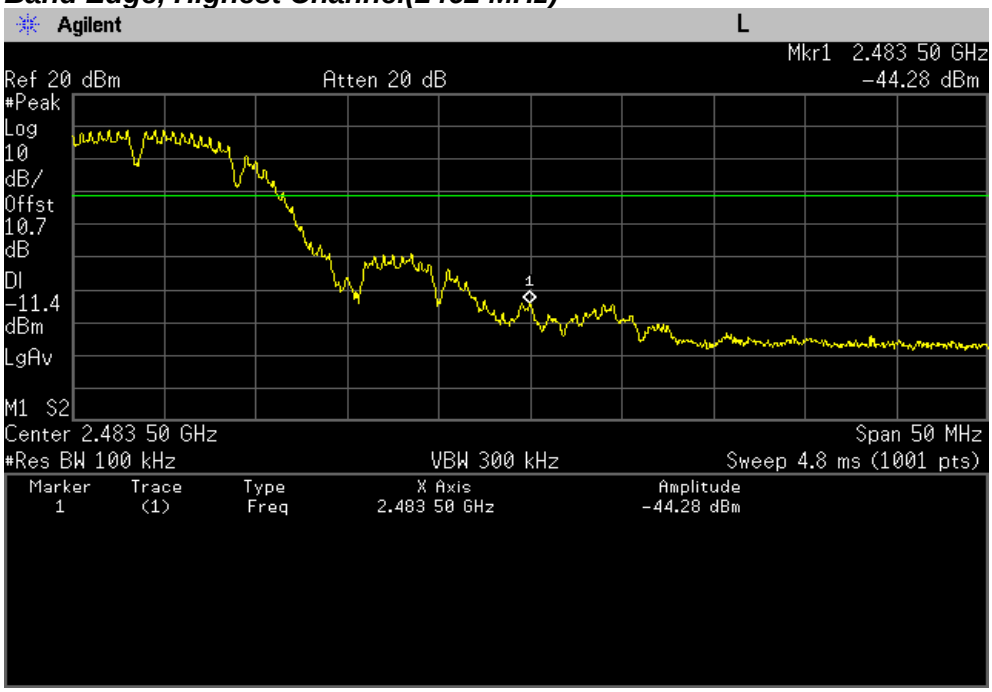
802.11b mode

Chain 0

Band Edge, Lowest Channel (2412 MHz)



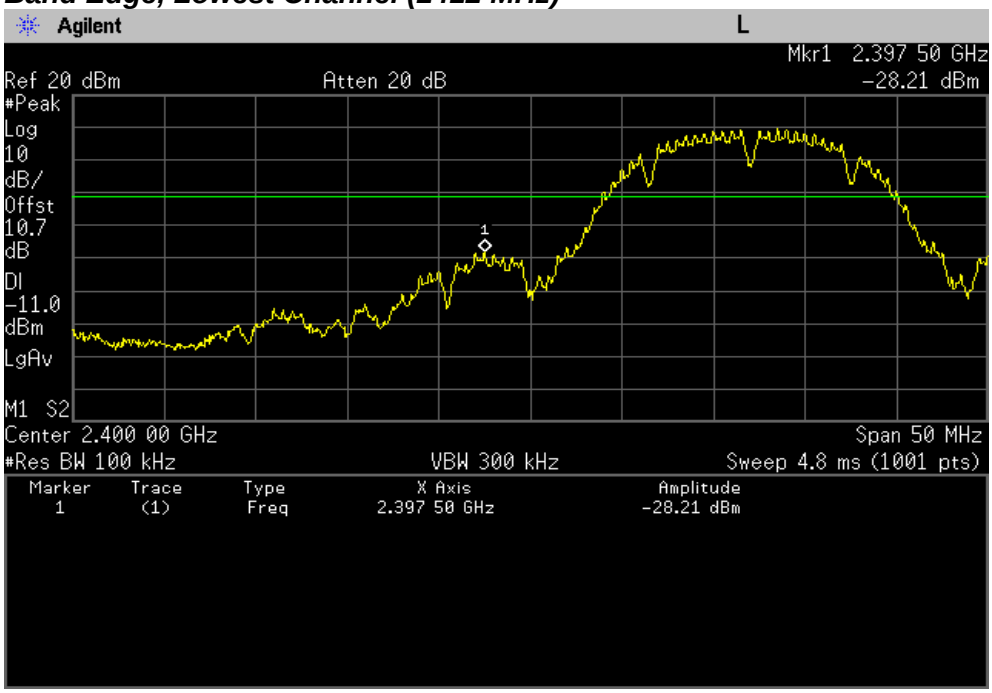
Band Edge, Highest Channel(2462 MHz)



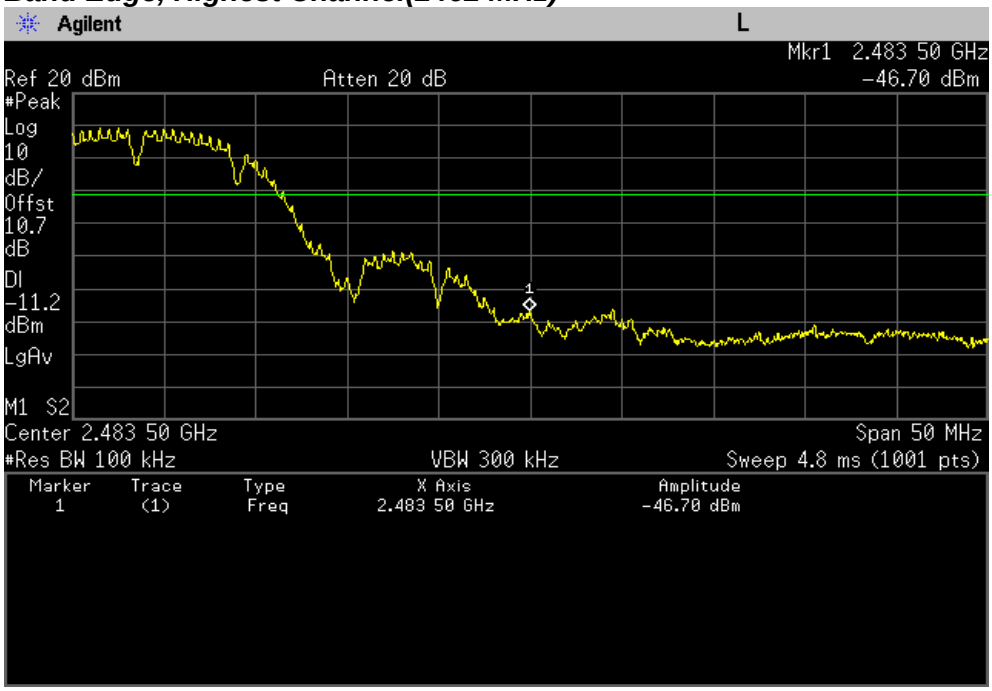
PLOT OF TEST DATA

Chain 1

Band Edge, Lowest Channel (2412 MHz)



Band Edge, Highest Channel(2462 MHz)

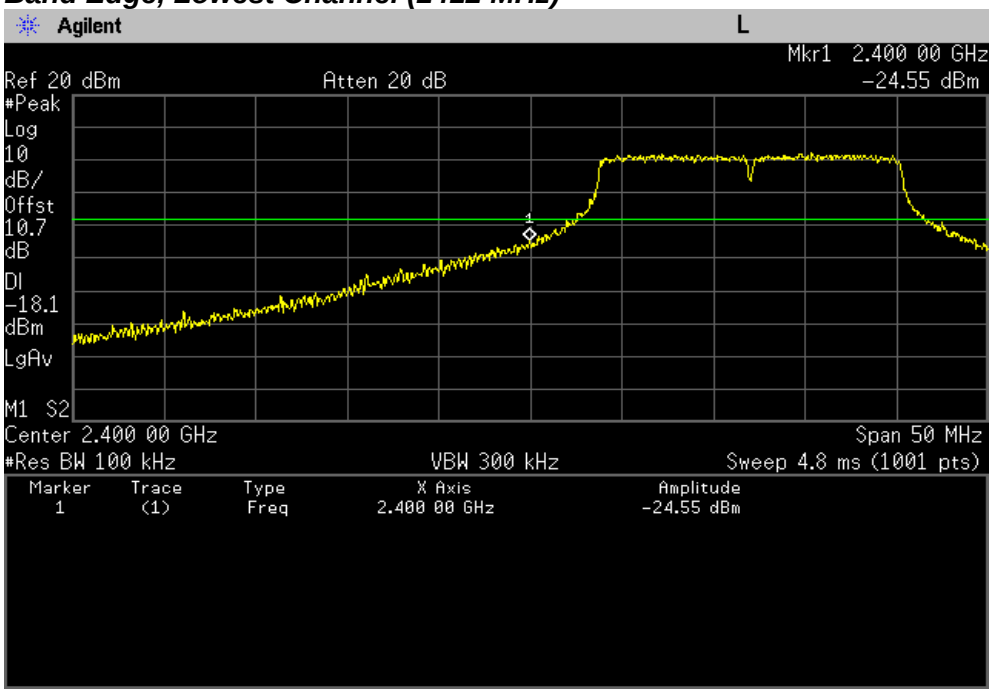


PLOT OF TEST DATA

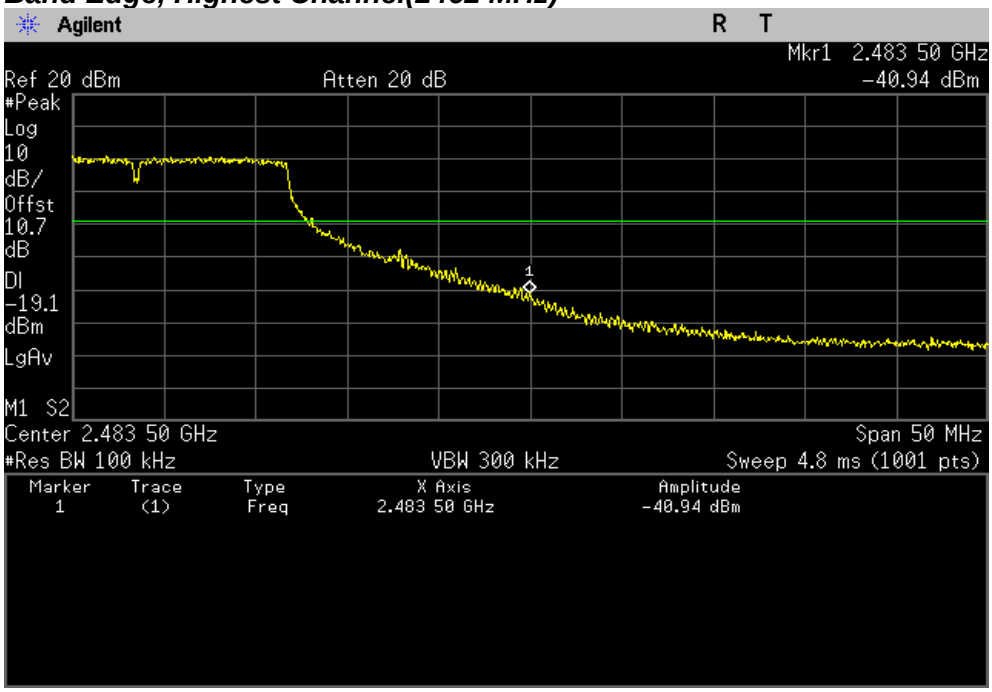
802.11g mode

Chain 0

Band Edge, Lowest Channel (2412 MHz)



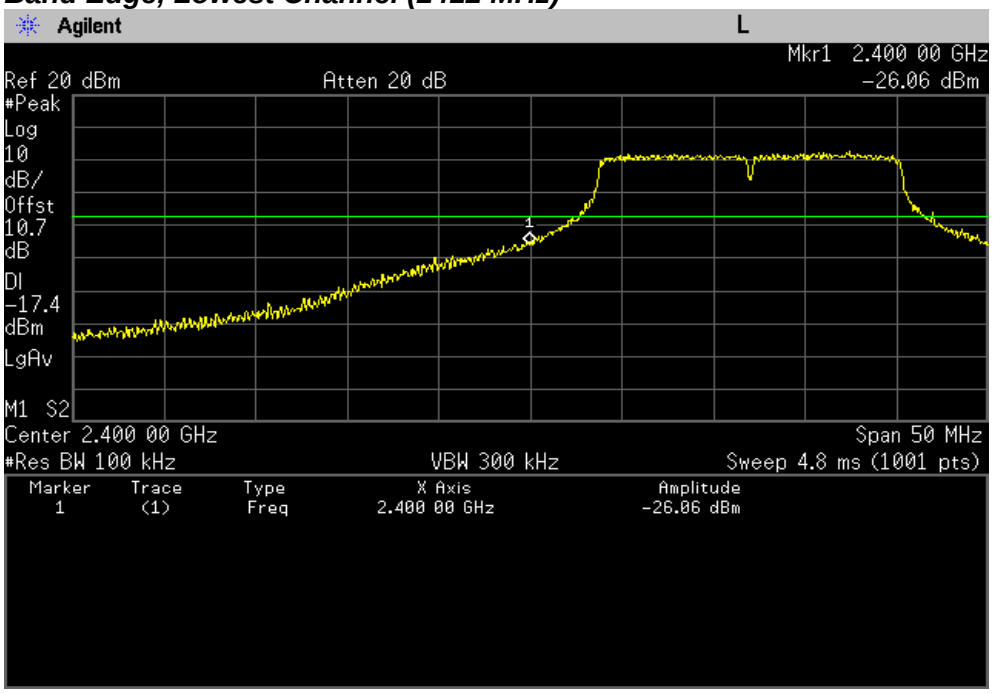
Band Edge, Highest Channel(2462 MHz)



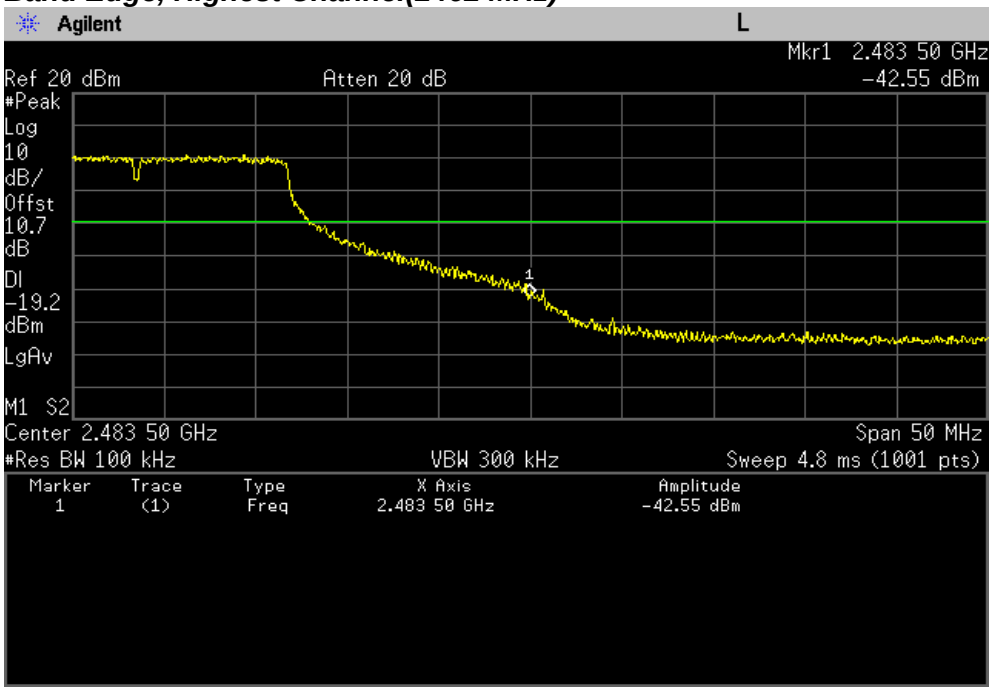
PLOT OF TEST DATA

Chain 1

Band Edge, Lowest Channel (2412 MHz)



Band Edge, Highest Channel(2462 MHz)

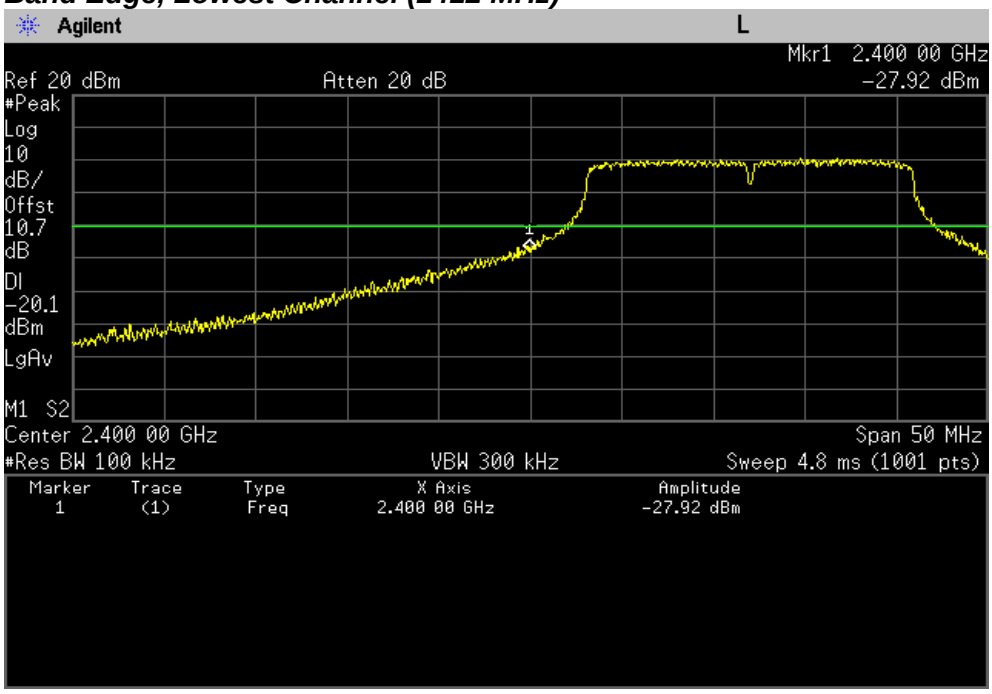


PLOT OF TEST DATA

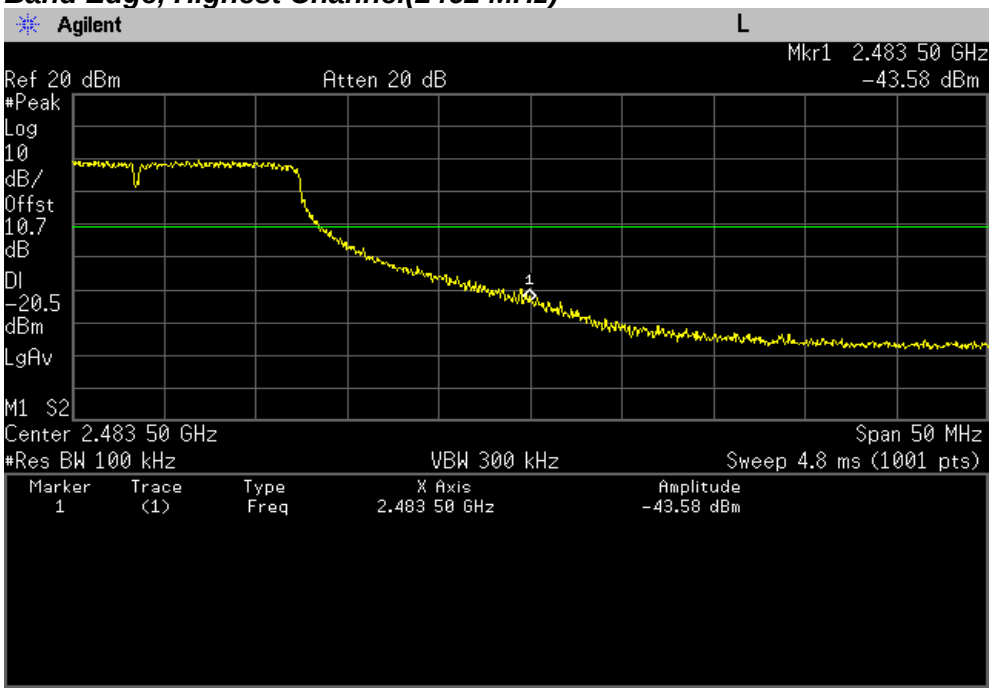
802.11n(20 MHz) mode

Chain 0

Band Edge, Lowest Channel (2412 MHz)



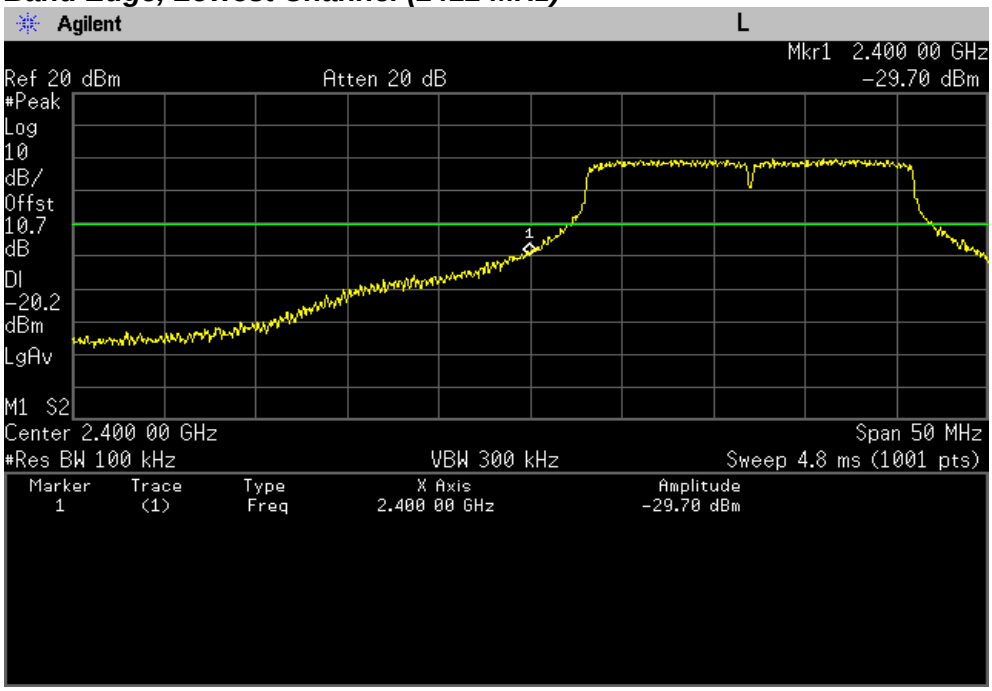
Band Edge, Highest Channel(2462 MHz)



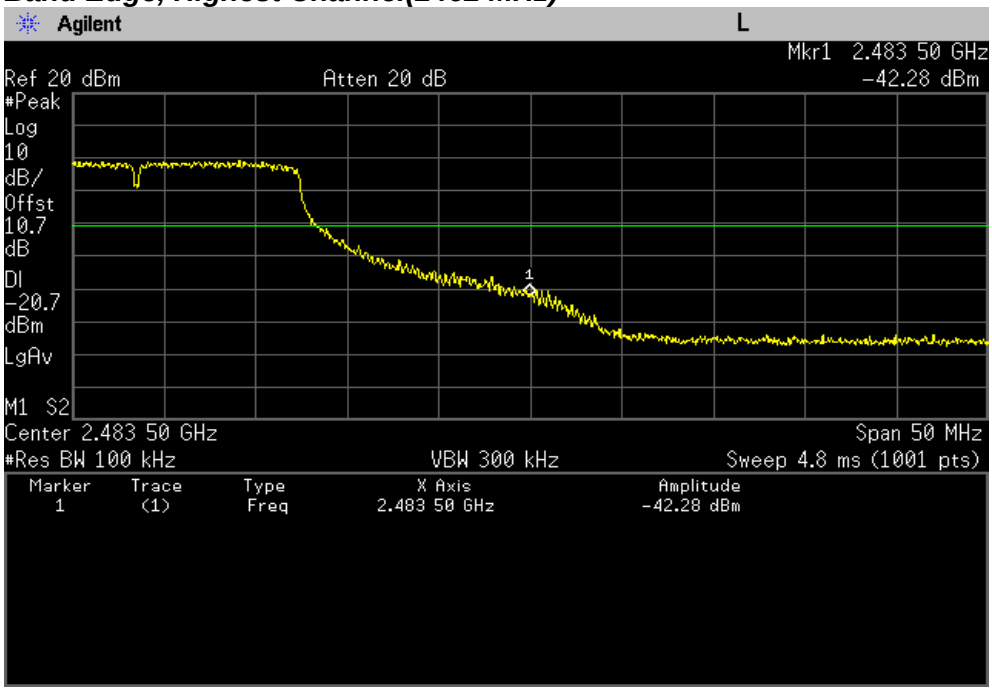
PLOT OF TEST DATA

Chain 1

Band Edge, Lowest Channel (2412 MHz)



Band Edge, Highest Channel(2462 MHz)



8.6.2 Conducted Spurious Emissions – 5 GHz band

FCC §15.247(d), RSS-210 Issue 8, A8.5

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency (MHz)	Reference Level (dBm)		Conducted Spurious Emissions (dBc)	Limit (dBc)
		Chain 0	Chain 1		
Low	5745	1.12	1.85	More than 20 dBc	20
Middle	5785	1.18	0.93	More than 20 dBc	20
High	5825	2.73	2.50	More than 20 dBc	20

802.11n(20 MHz) mode

Channel	Frequency (MHz)	Reference Level (dBm)		Conducted Spurious Emissions (dBc)	Limit (dBc)
		Chain 0	Chain 1		
Low	5745	-1.50	-1.15	More than 20 dBc	20
Middle	5785	-1.18	-1.66	More than 20 dBc	20
High	5825	0.41	-0.01	More than 20 dBc	20

802.11n(40 MHz) mode

Channel	Frequency (MHz)	Reference Level (dBm)		Conducted Spurious Emissions (dBc)	Limit (dBc)
		Chain 0	Chain 1		
Low	5755	-6.26	-7.21	More than 20 dBc	20
High	5795	-5.90	-7.09	More than 20 dBc	20

Note:

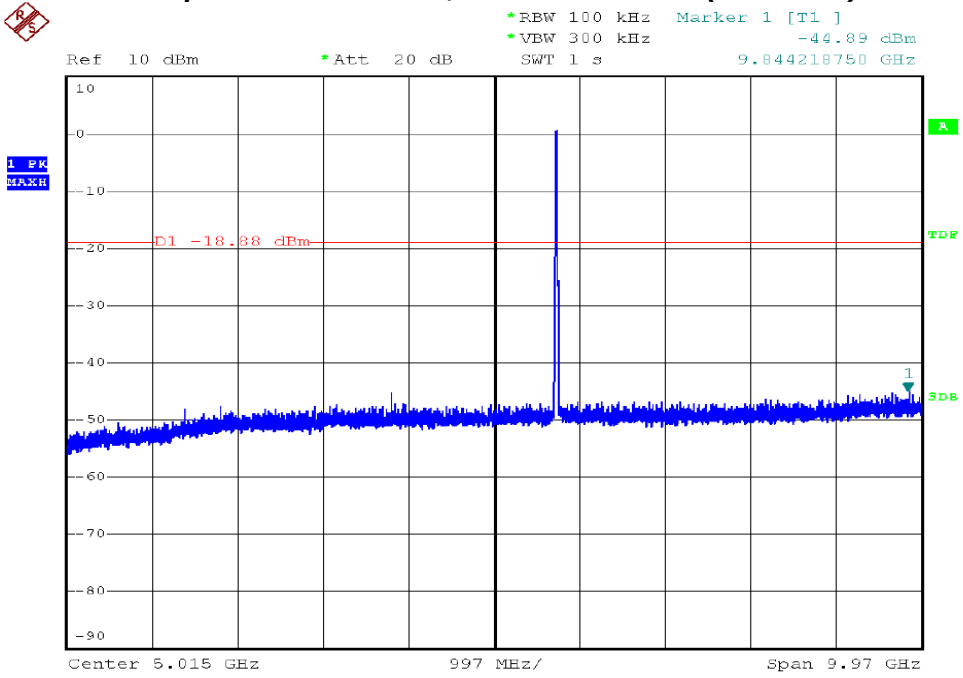
The cable and attenuator loss from 30 MHz to 40 GHz was reflected in spectrum analyzer with correction factor for the spurious emissions test.

PLOT OF TEST DATA

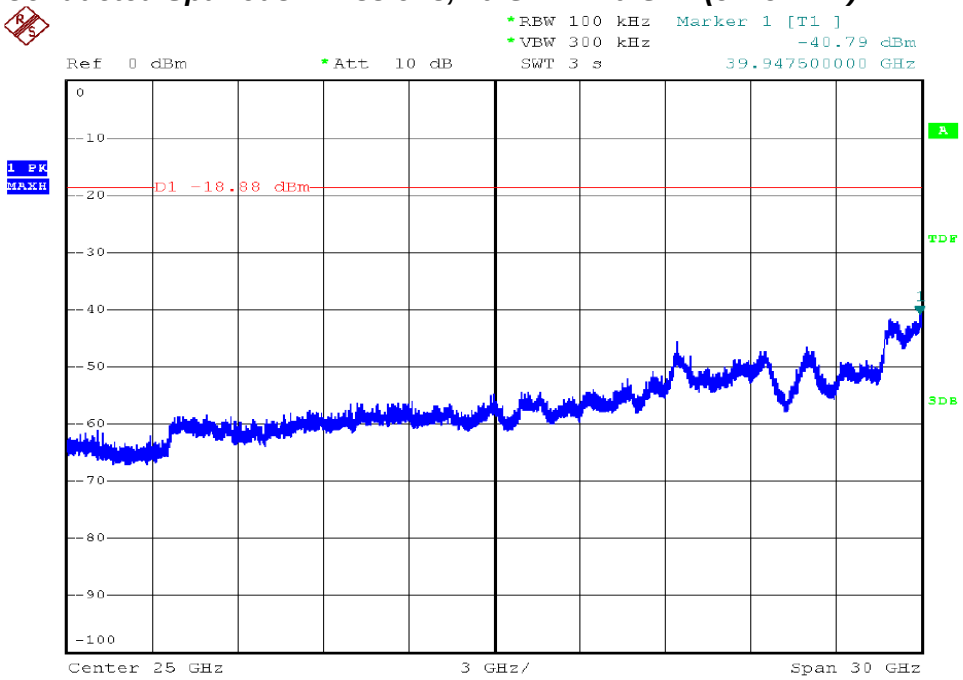
802.11a mode

Chain 0

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5745 MHz)

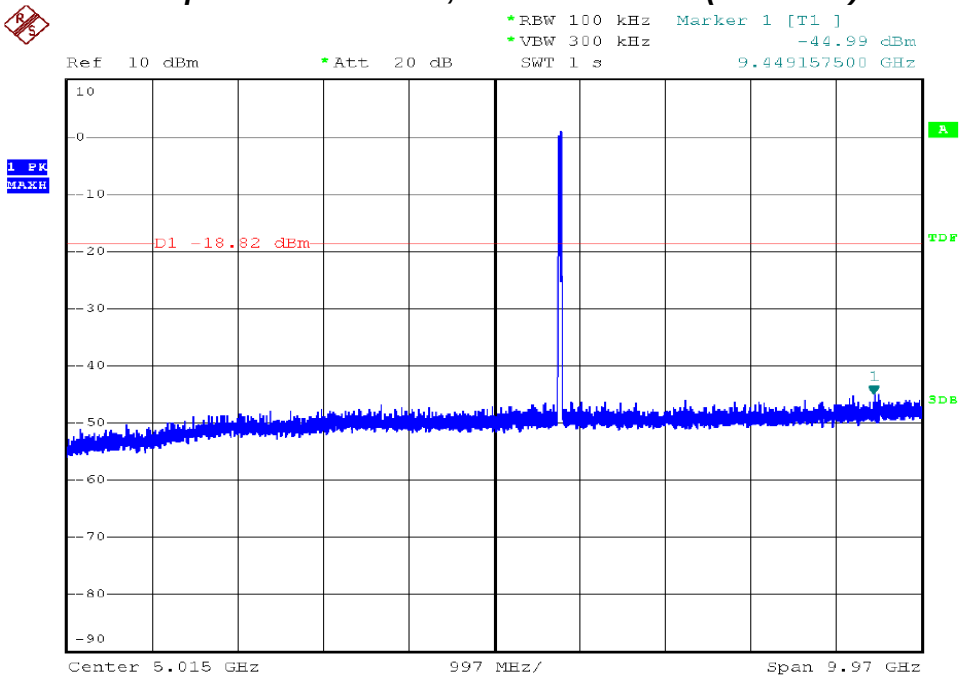


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5745 MHz)

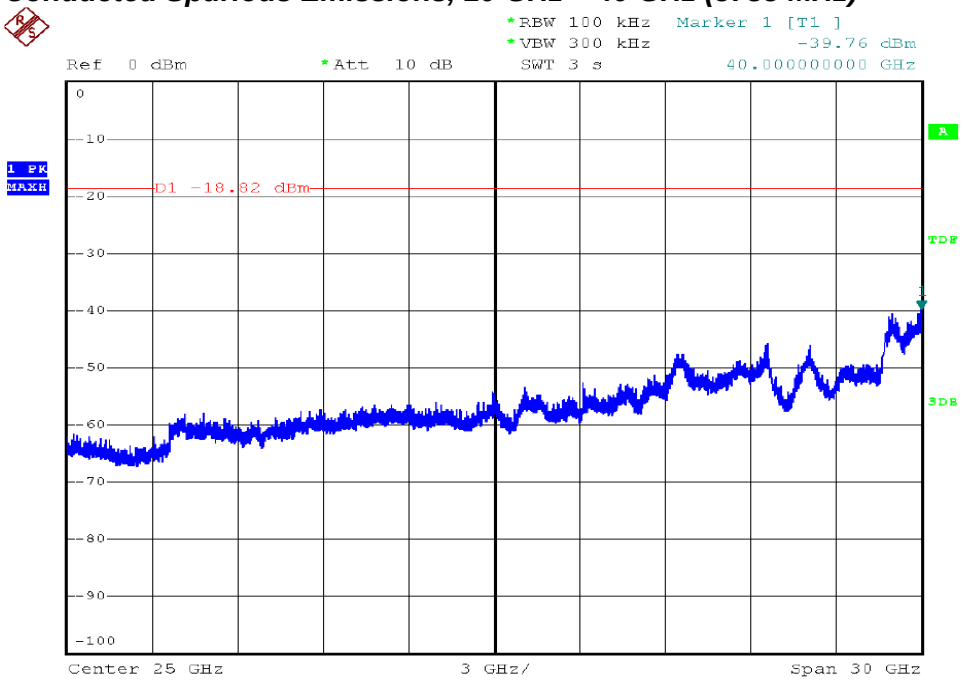


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5785 MHz)

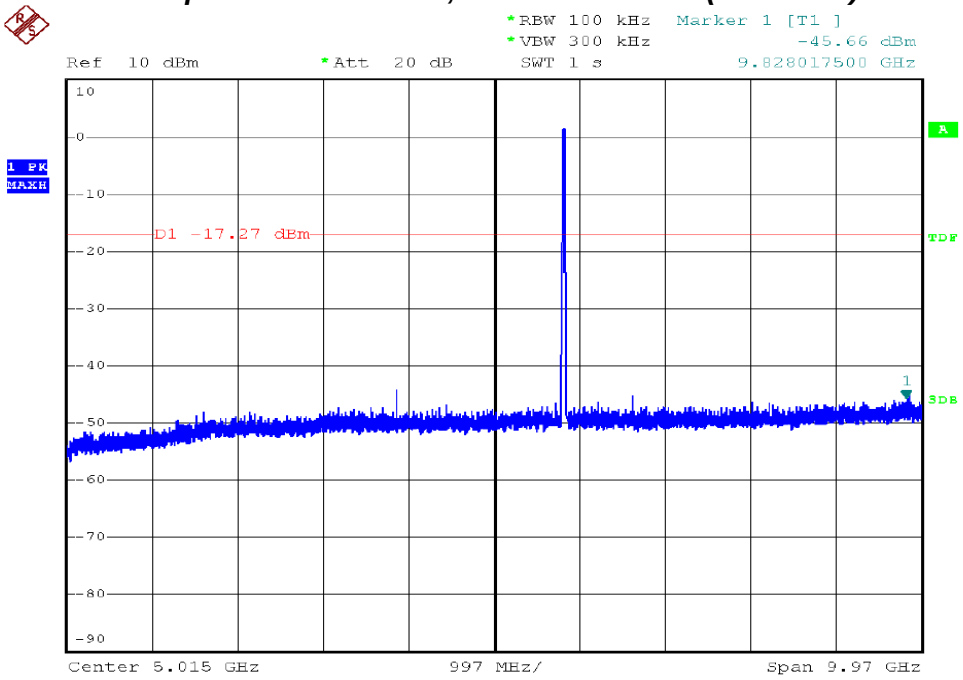


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5785 MHz)

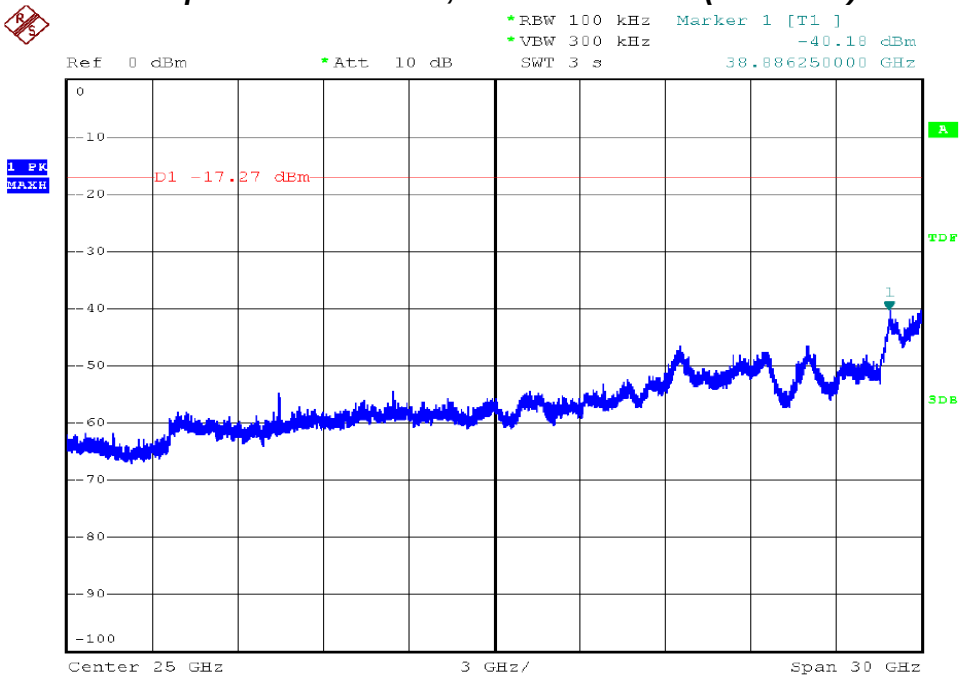


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5825 MHz)



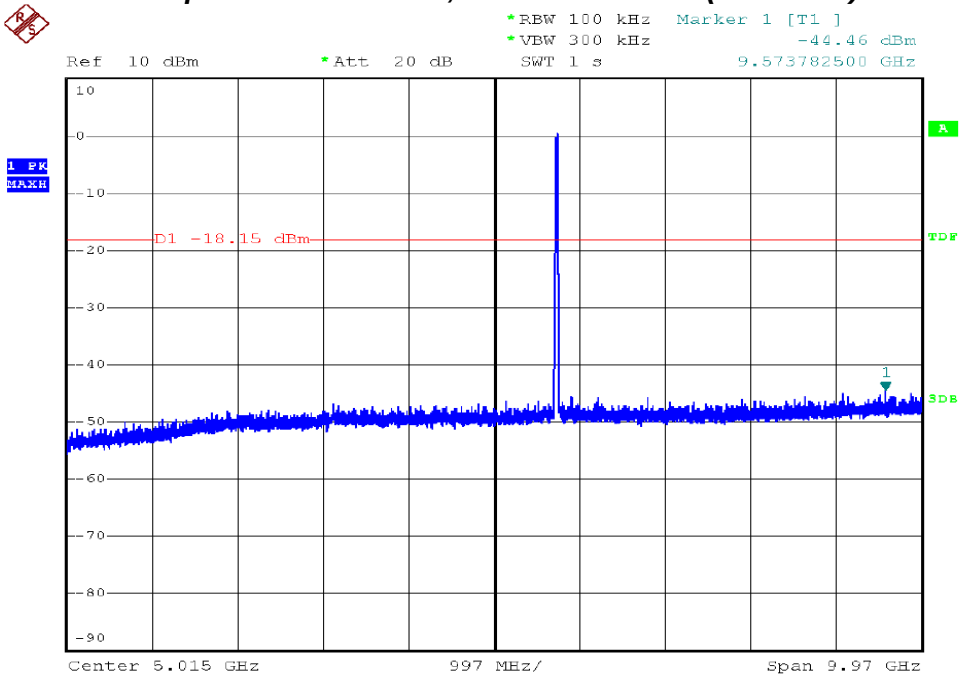
Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5825 MHz)



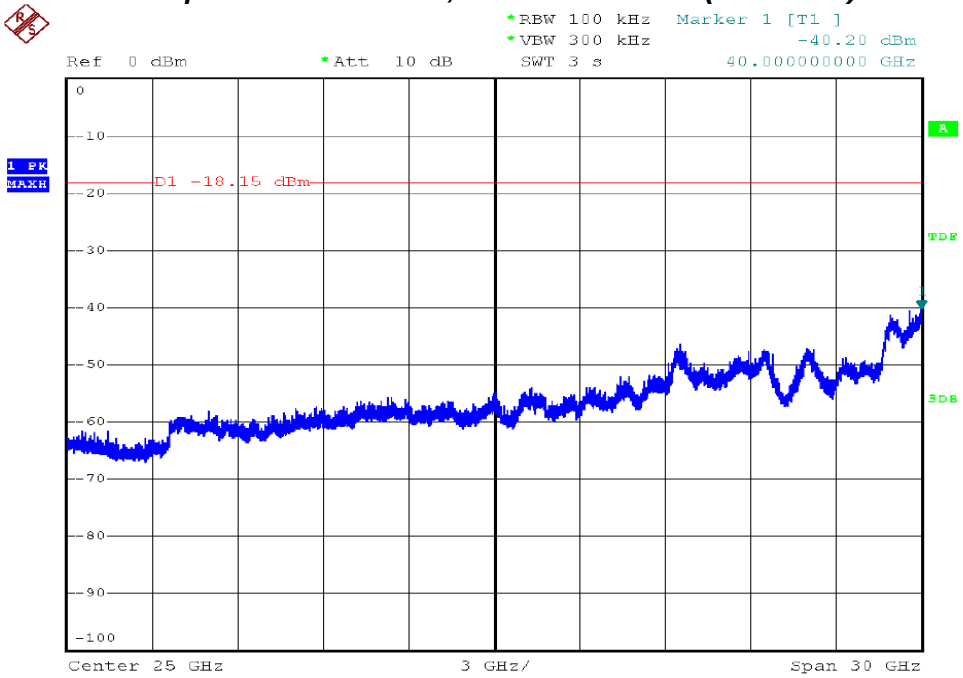
PLOT OF TEST DATA

Chain 1

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5745 MHz)

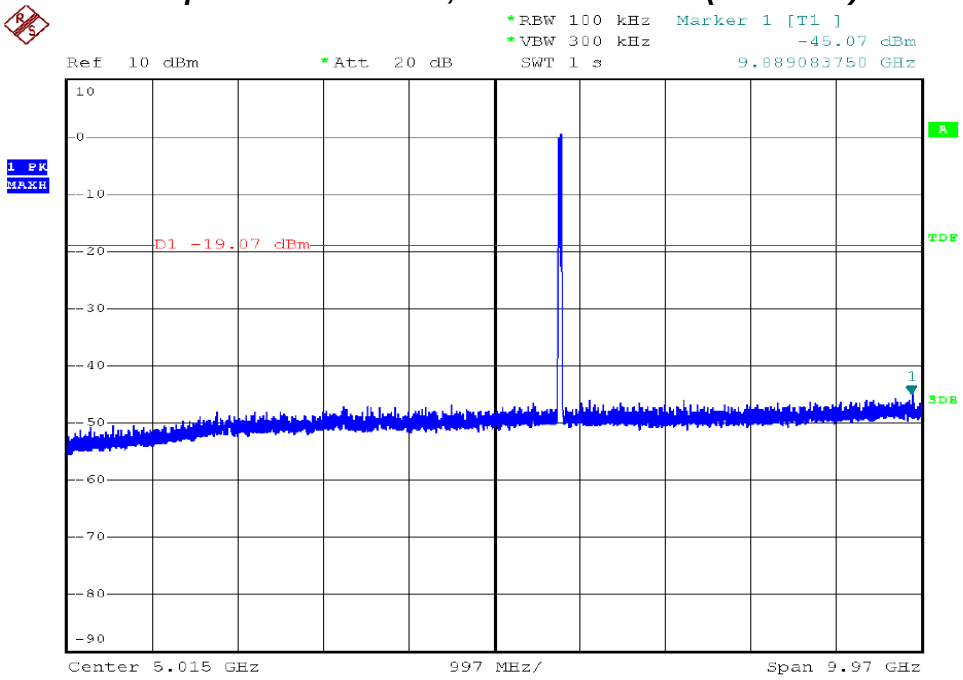


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5745 MHz)

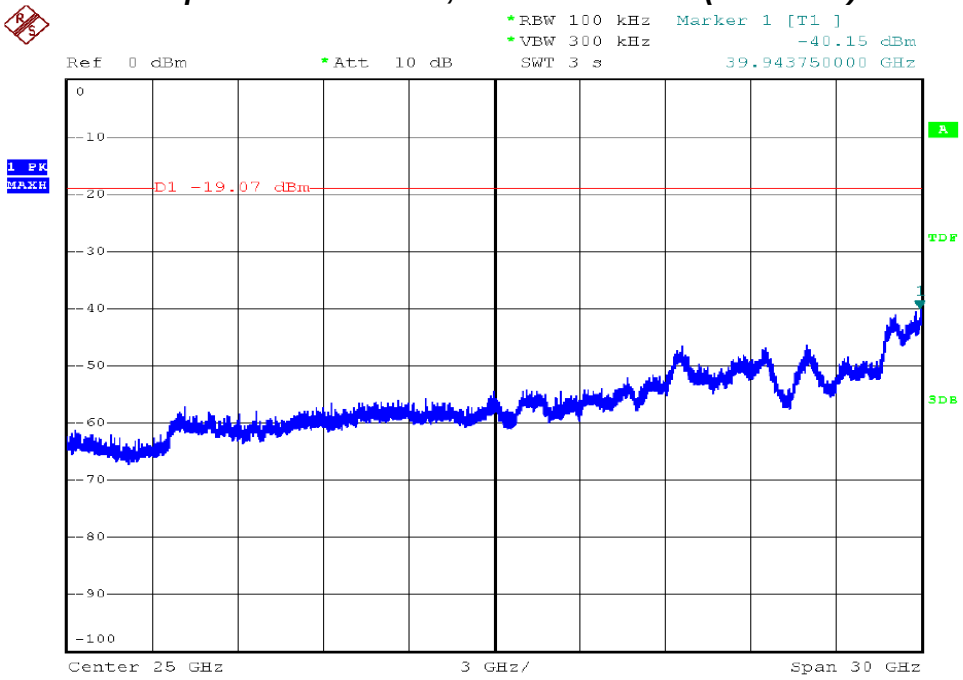


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5785 MHz)

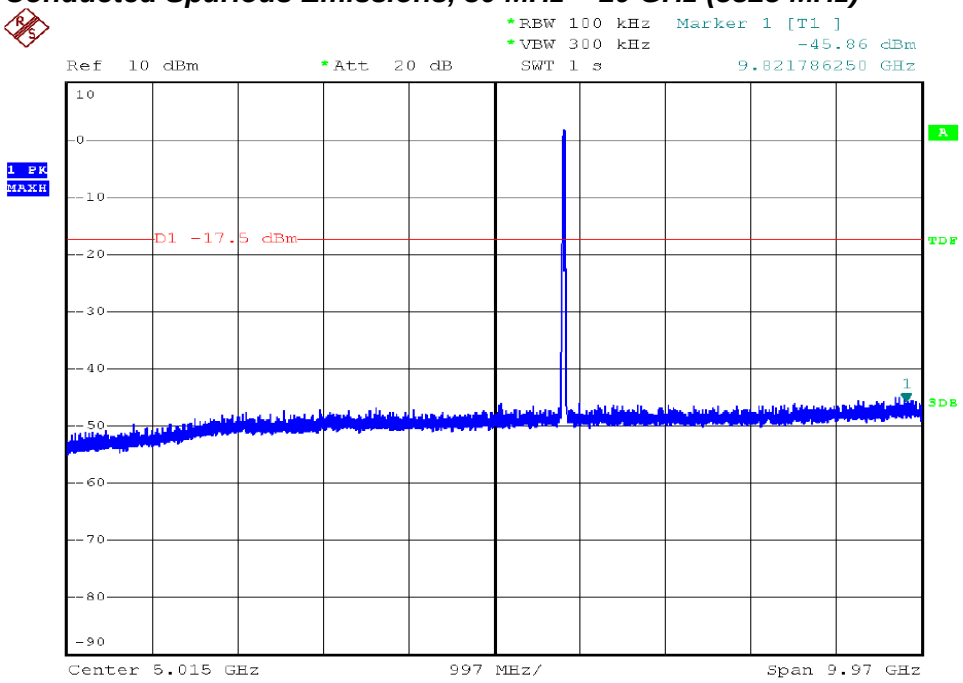


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5785 MHz)

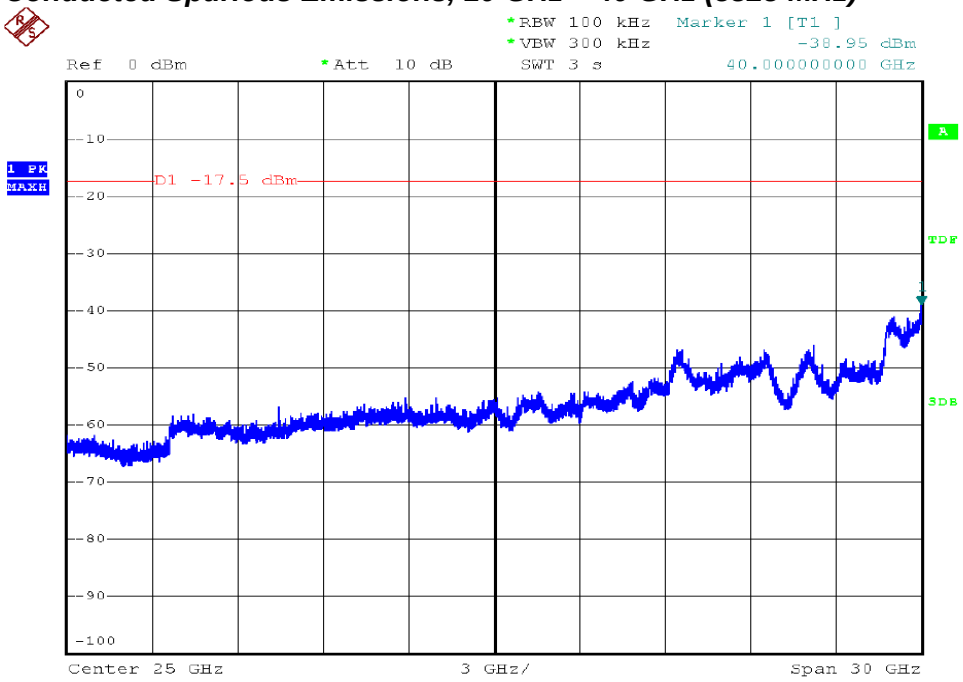


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5825 MHz)



Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5825 MHz)

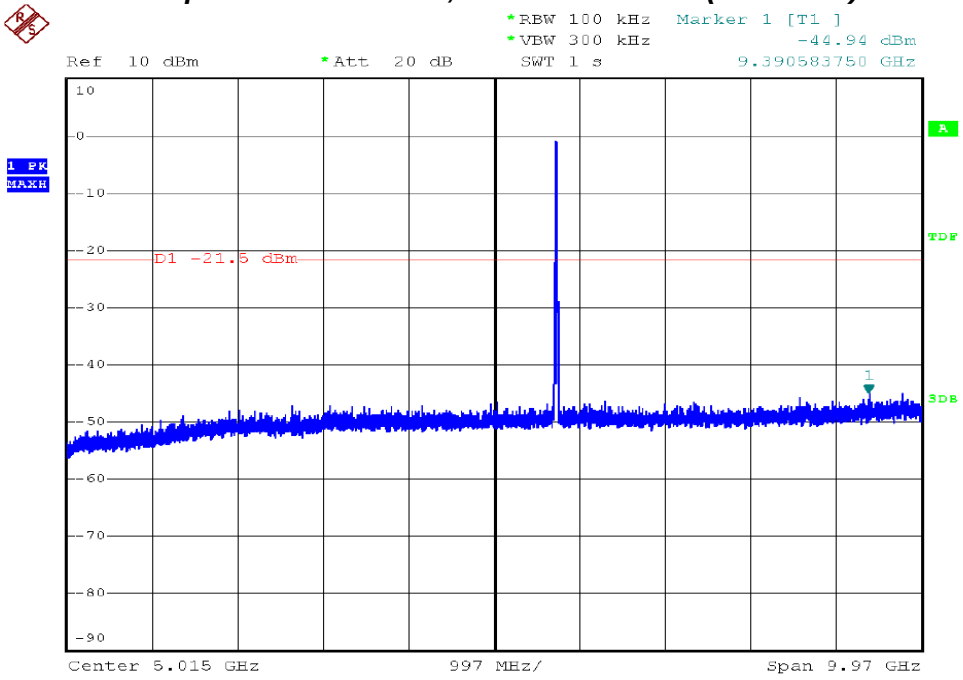


PLOT OF TEST DATA

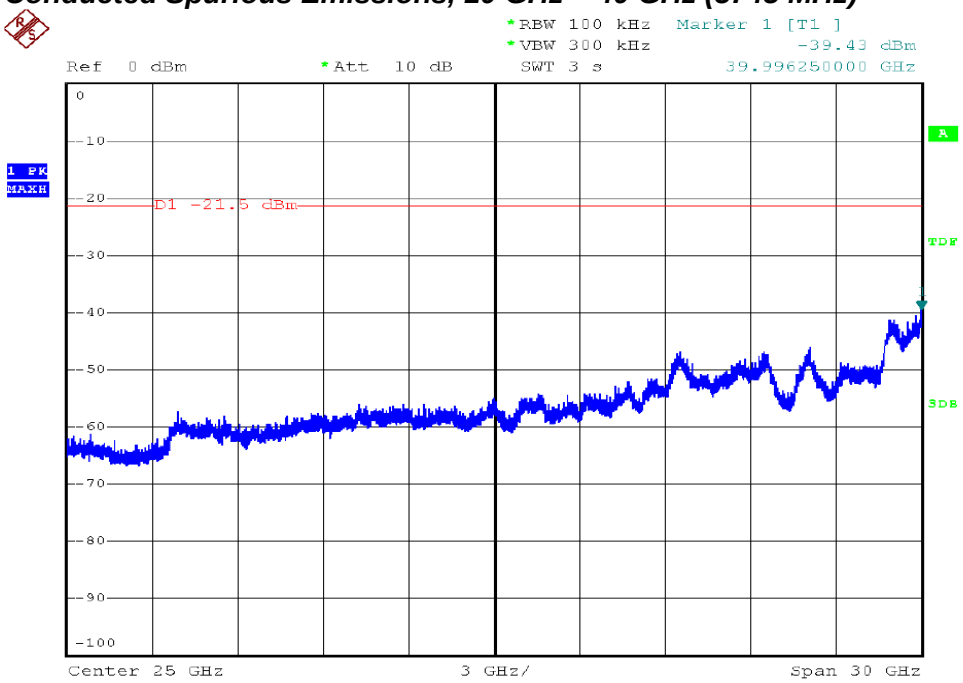
802.11n(20 MHz) mode

Chain 0

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5745 MHz)

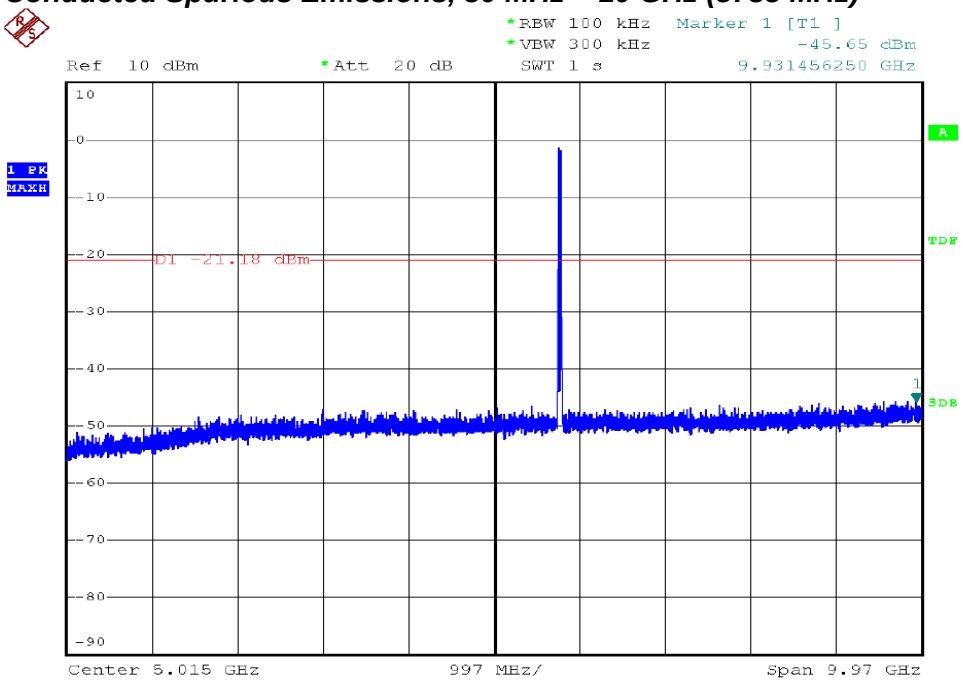


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5745 MHz)

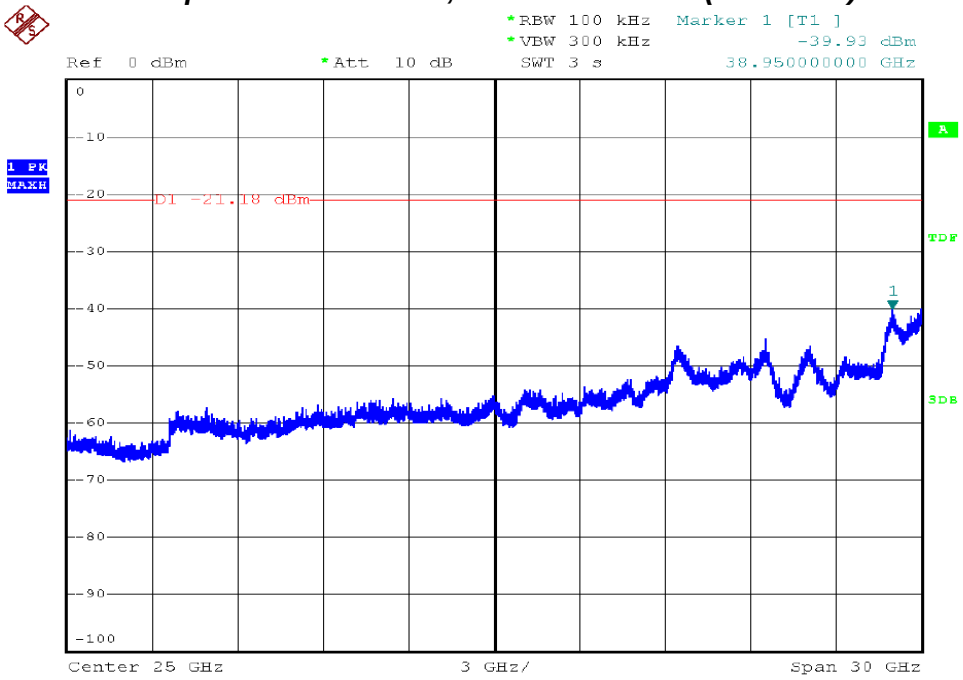


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5785 MHz)

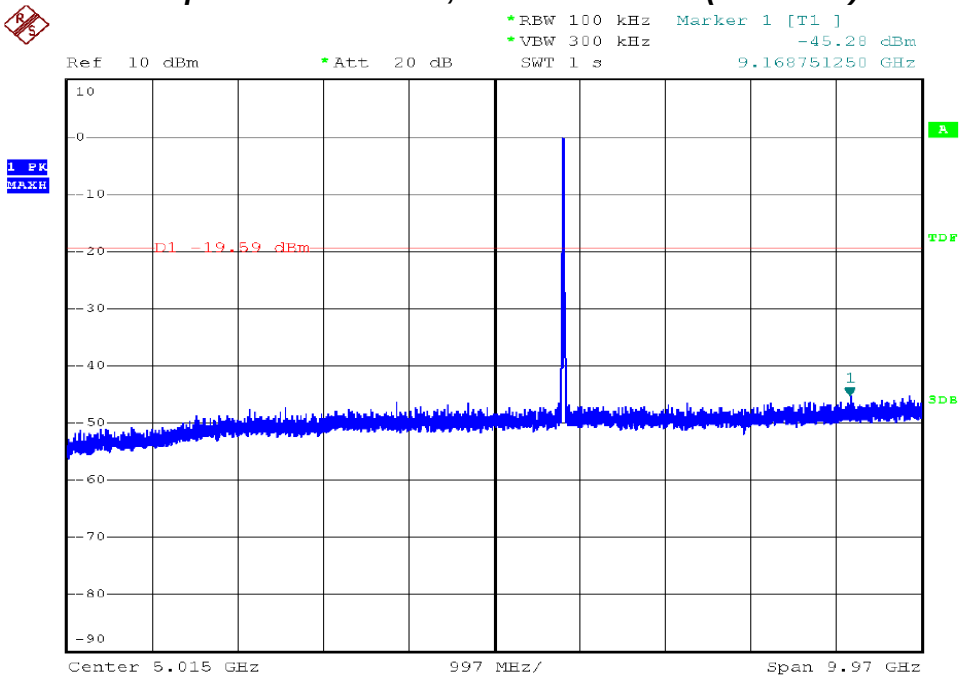


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5785 MHz)

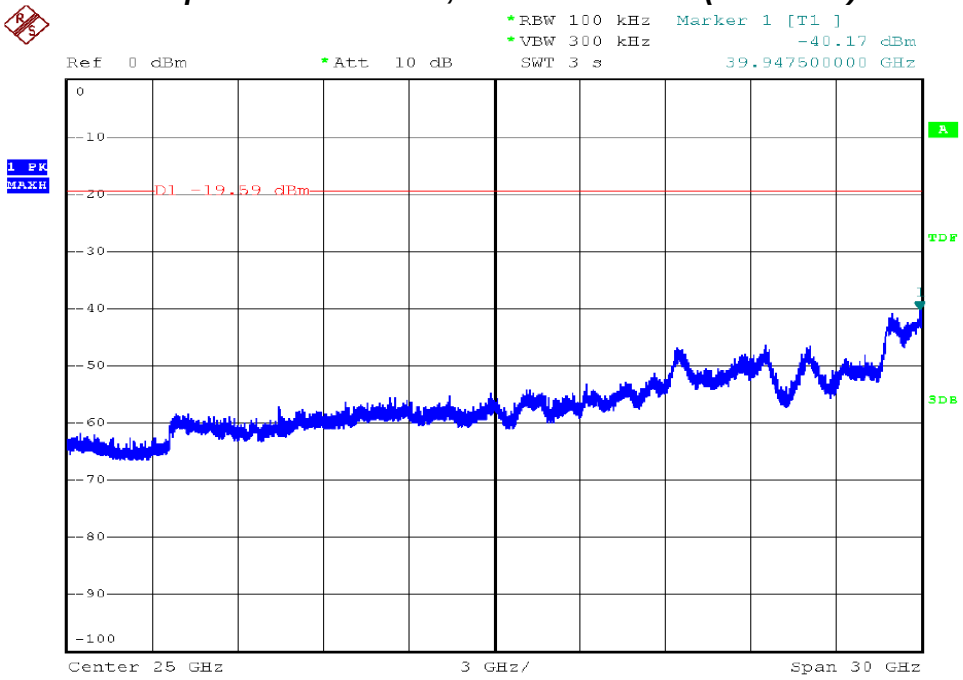


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5825 MHz)



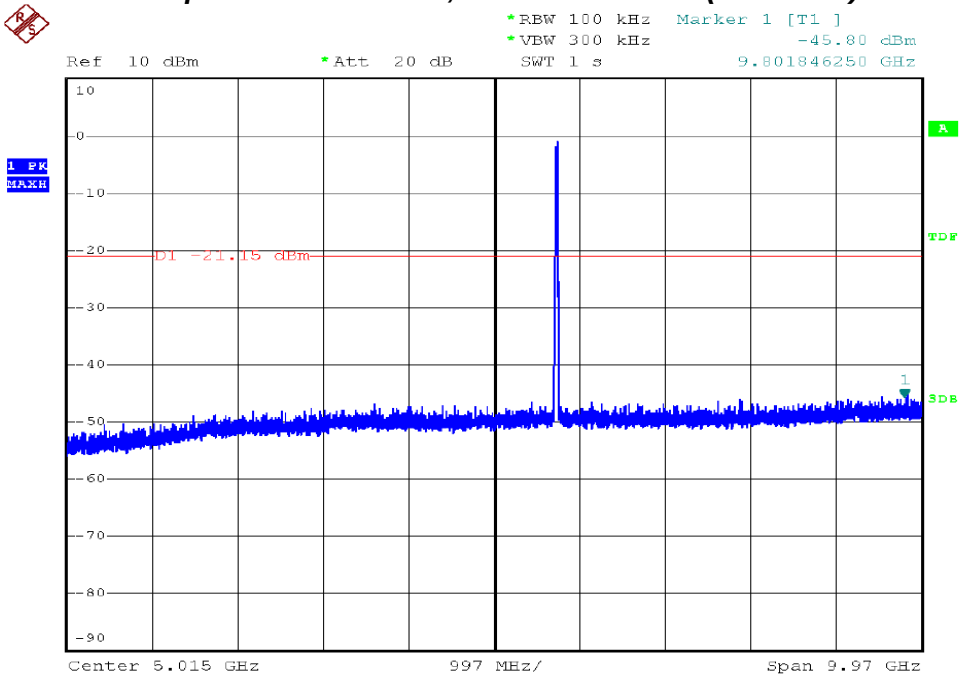
Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5825 MHz)



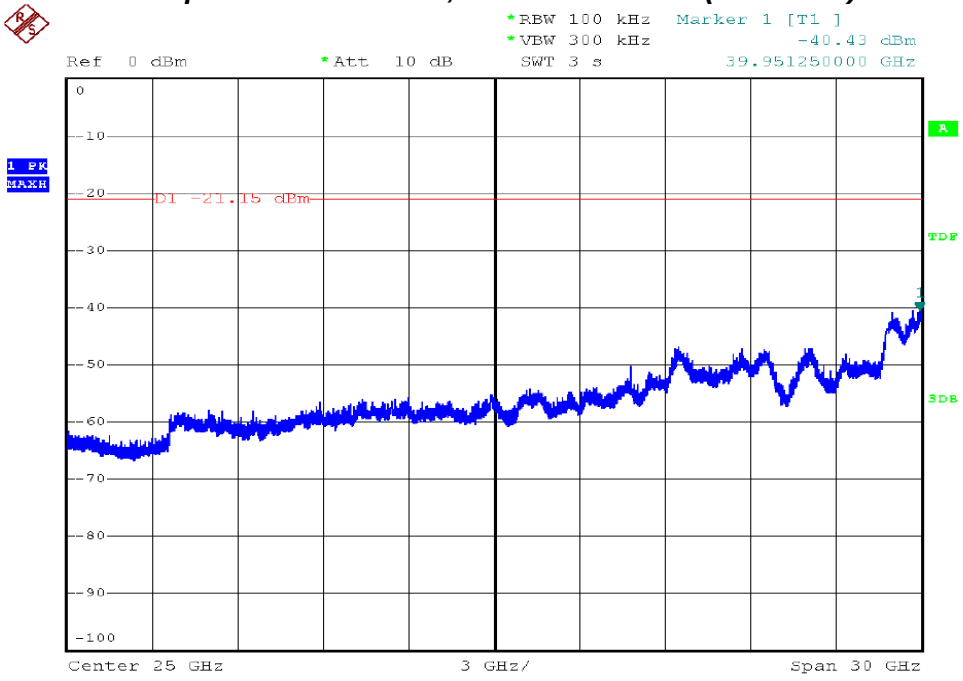
PLOT OF TEST DATA

Chain 1

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5745 MHz)

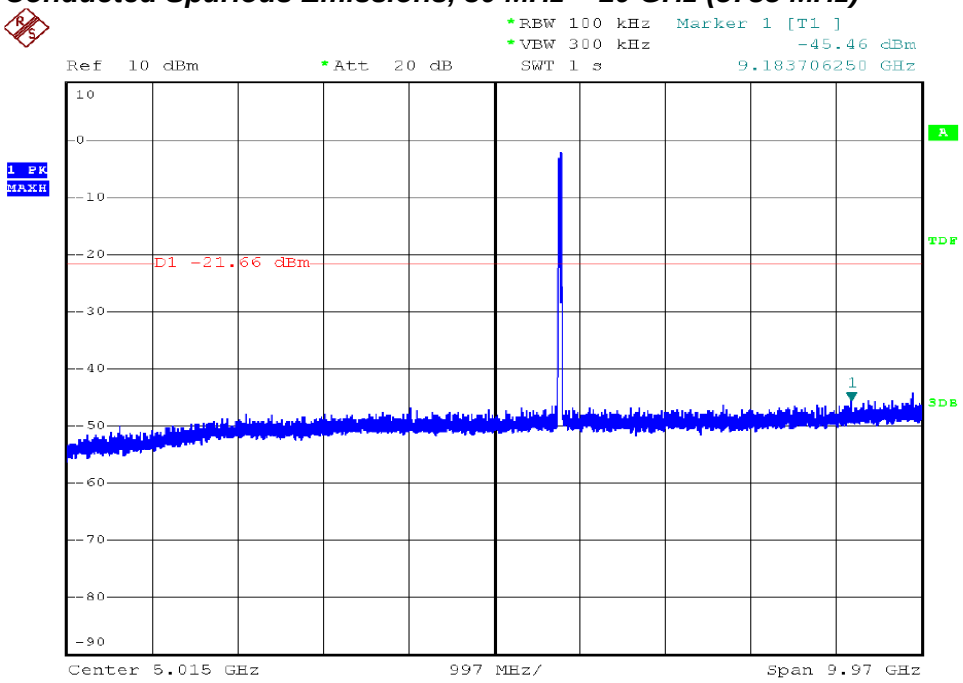


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5745 MHz)

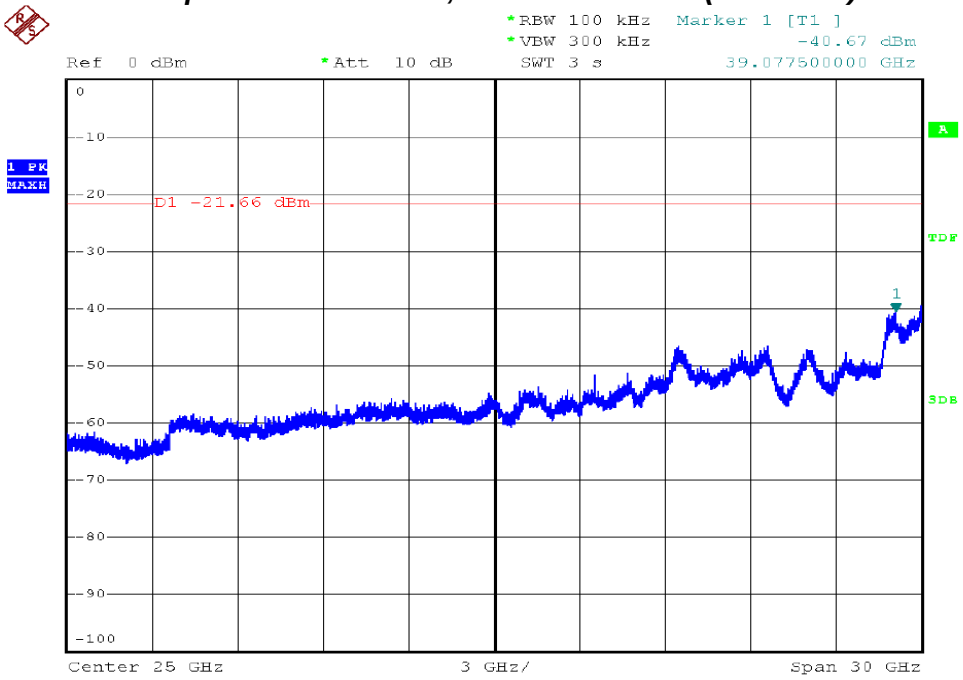


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5785 MHz)

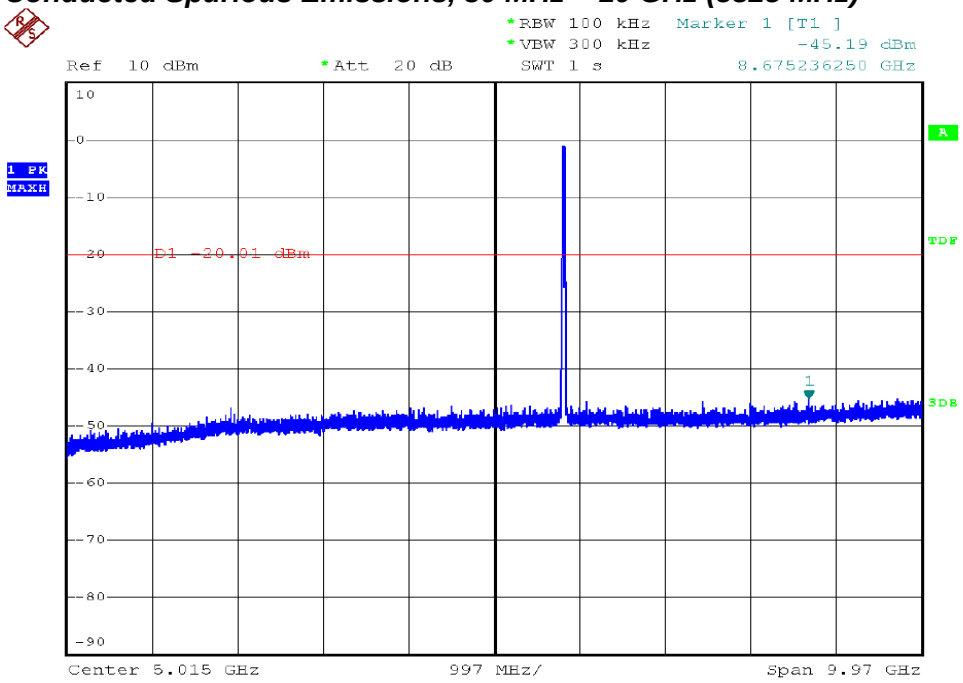


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5785 MHz)

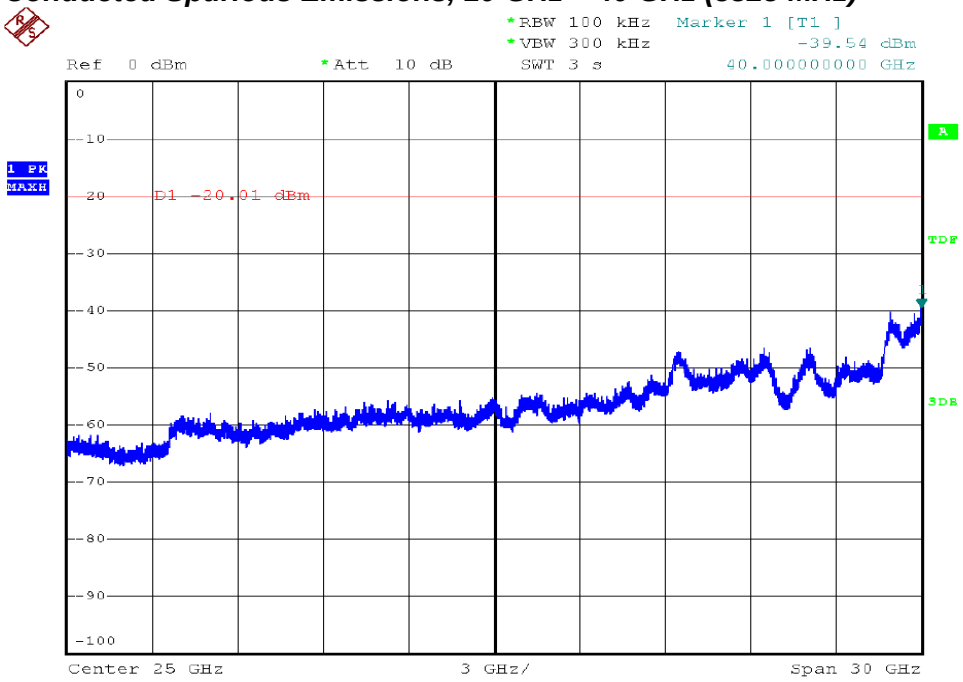


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5825 MHz)



Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5825 MHz)

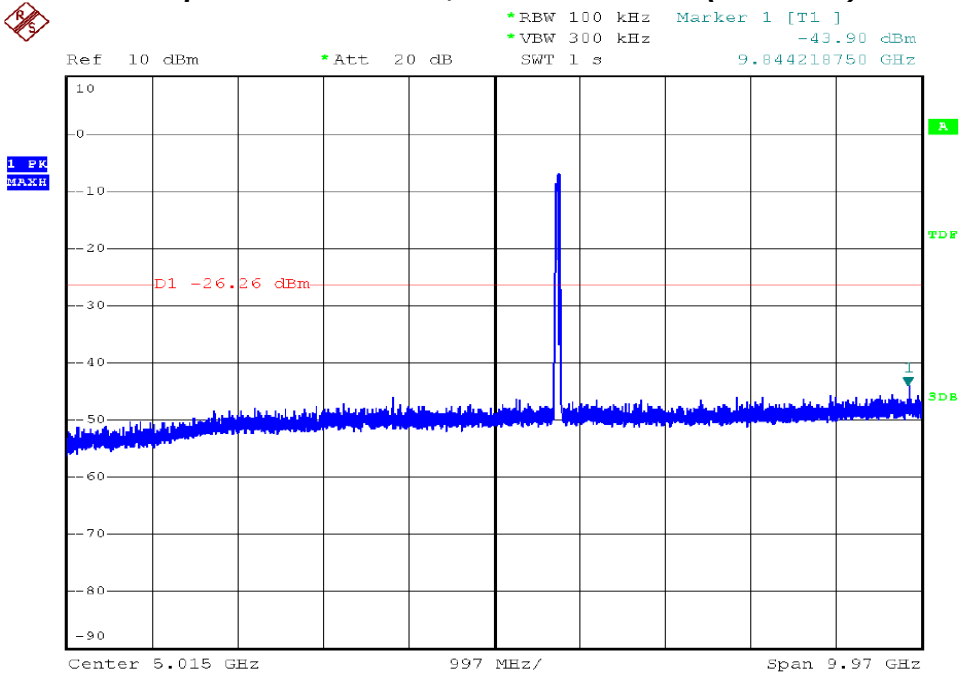


PLOT OF TEST DATA

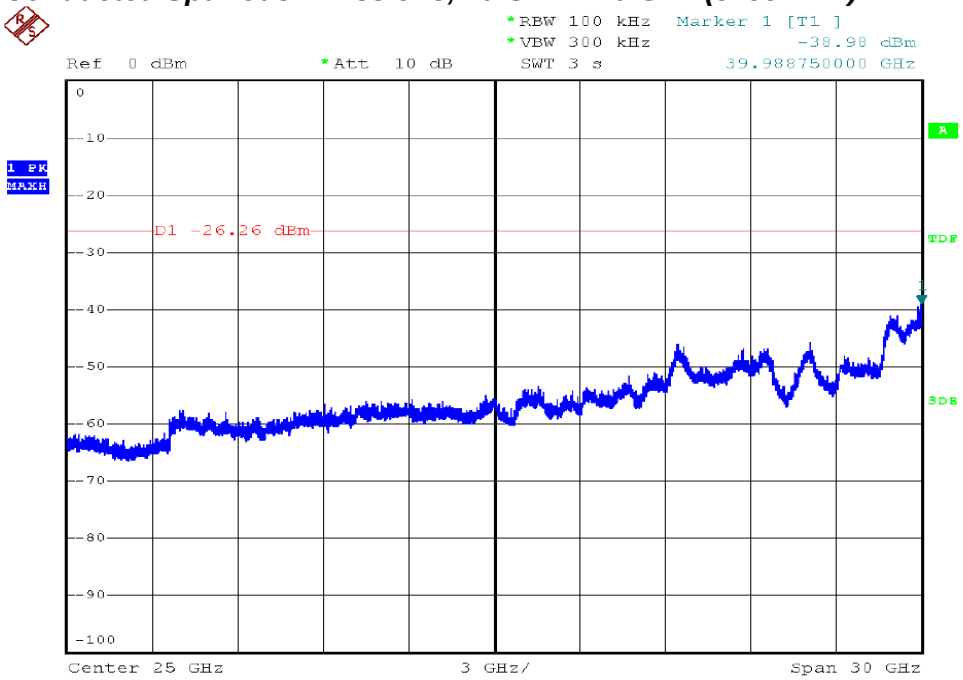
802.11n(40 MHz) mode

Chain 0

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5755 MHz)

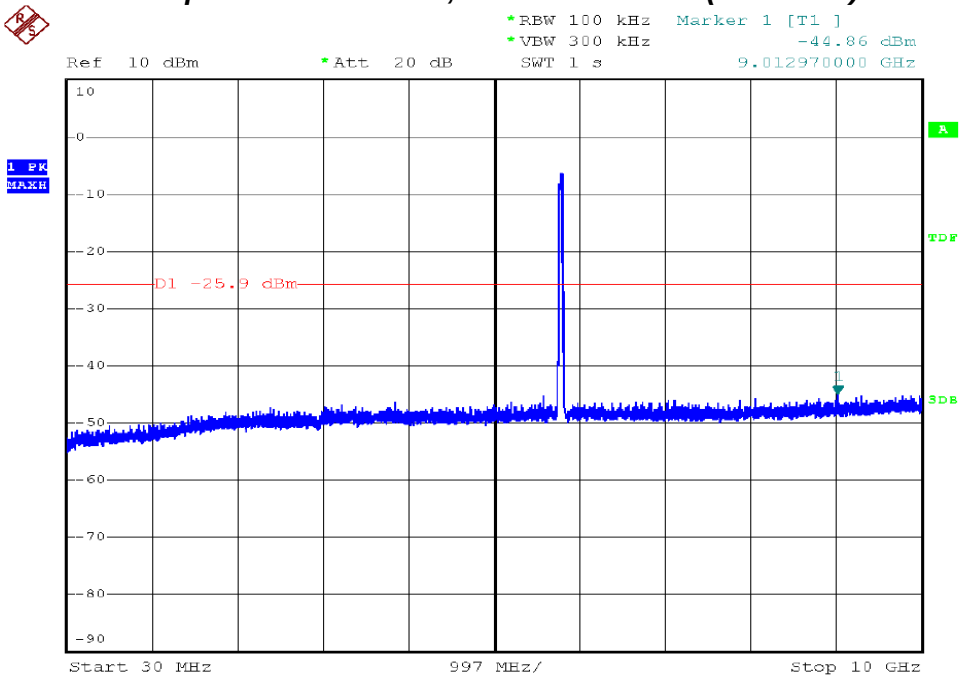


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5755 MHz)

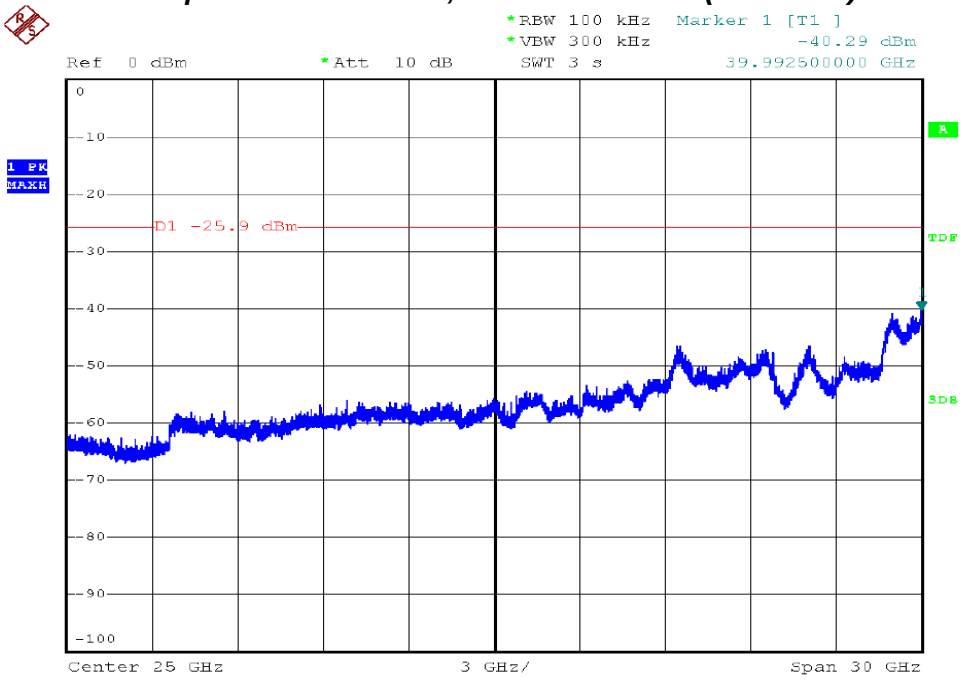


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5795 MHz)



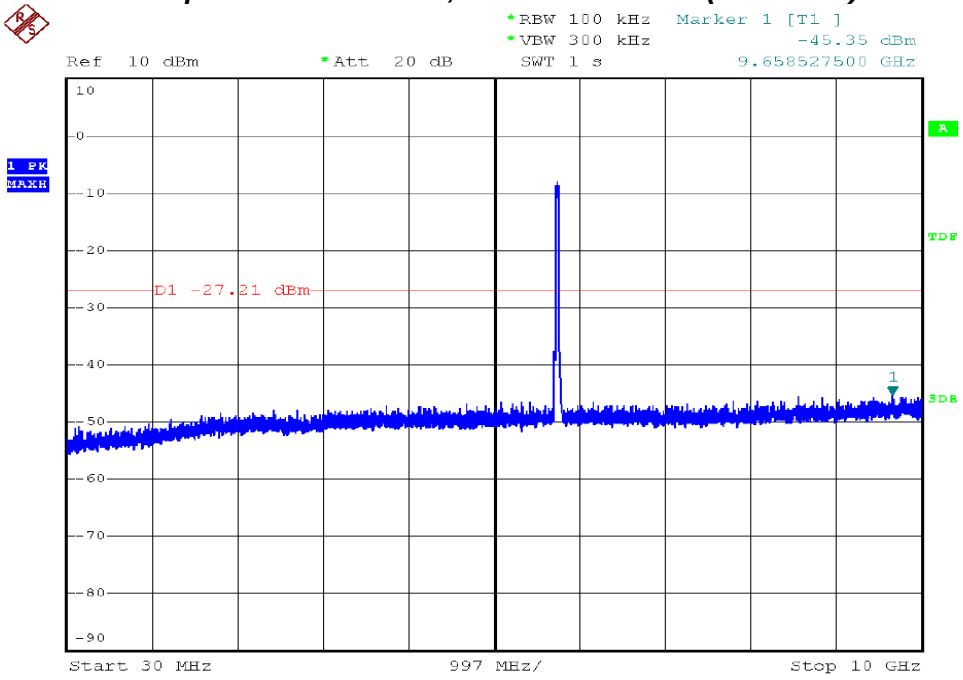
Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5795 MHz)



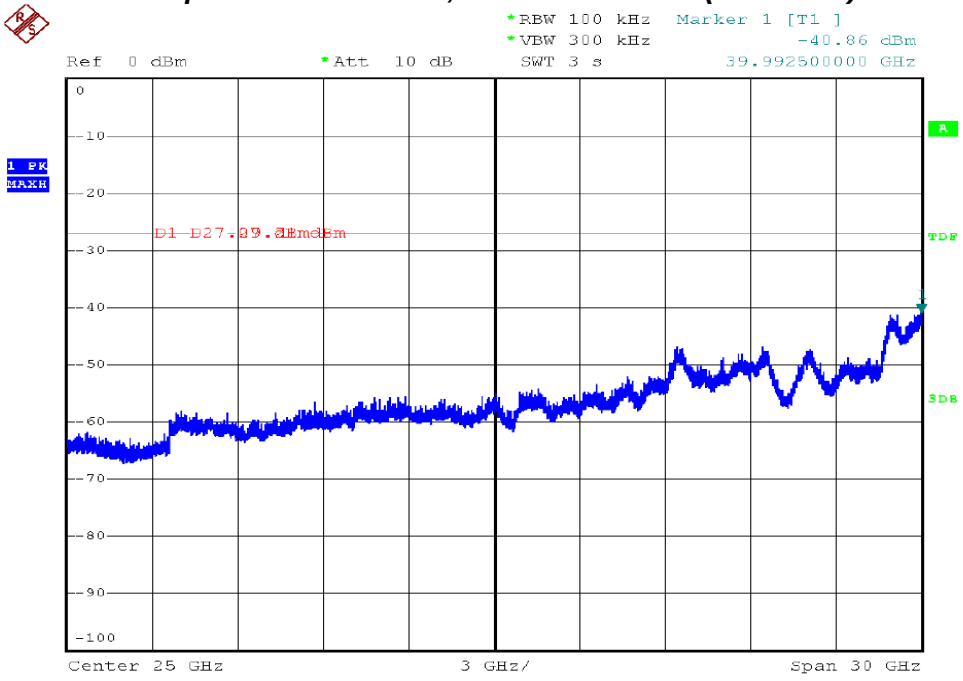
PLOT OF TEST DATA

Chain 1

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5755 MHz)

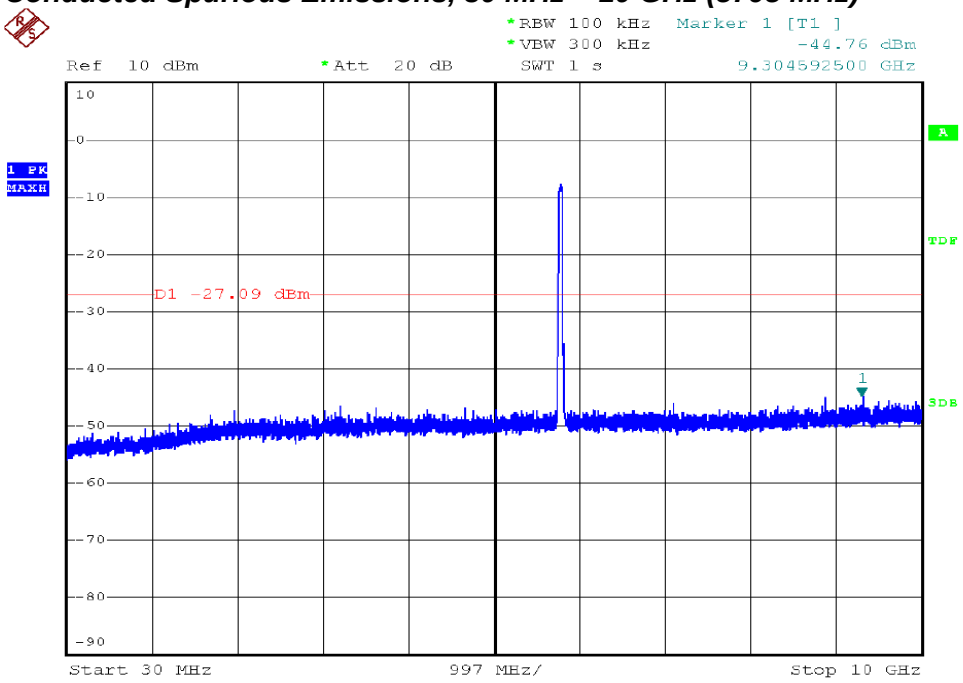


Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5755 MHz)

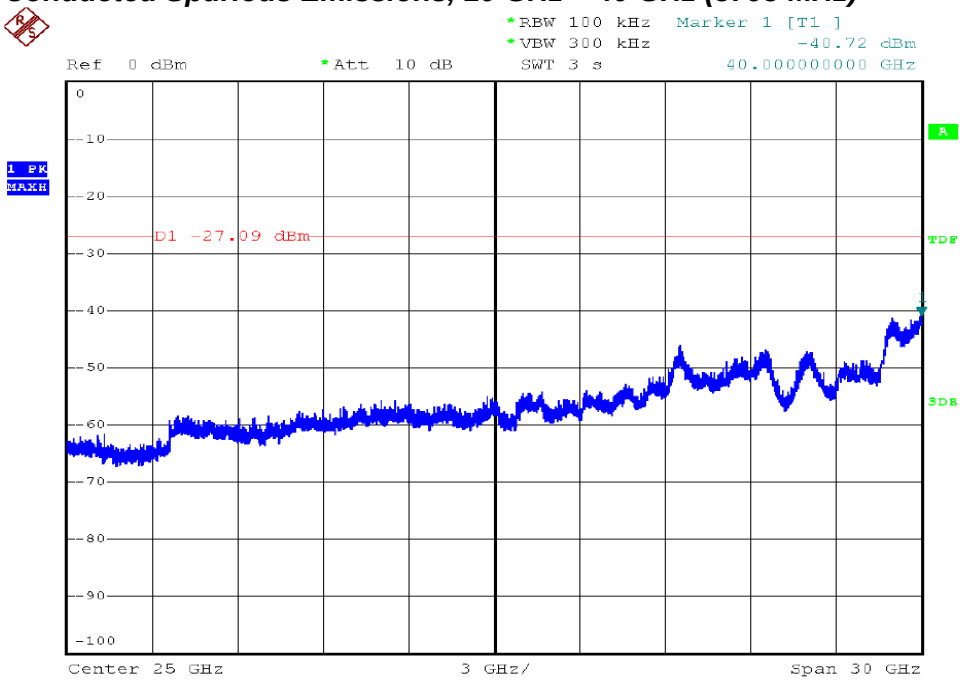


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz (5795 MHz)



Conducted Spurious Emissions, 10 GHz ~ 40 GHz (5795 MHz)

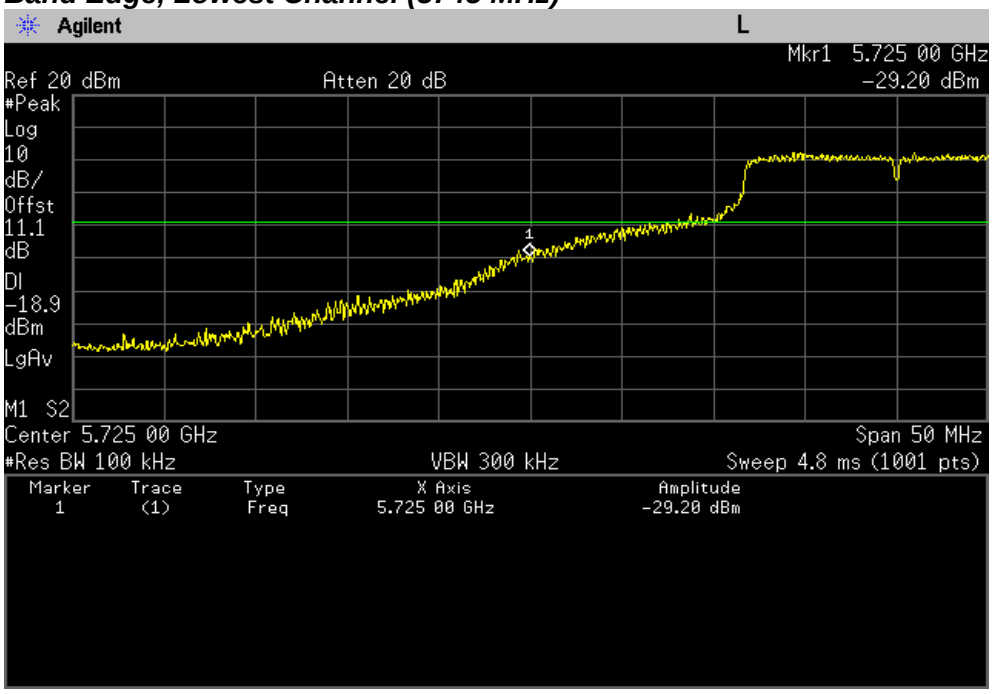


PLOT OF TEST DATA

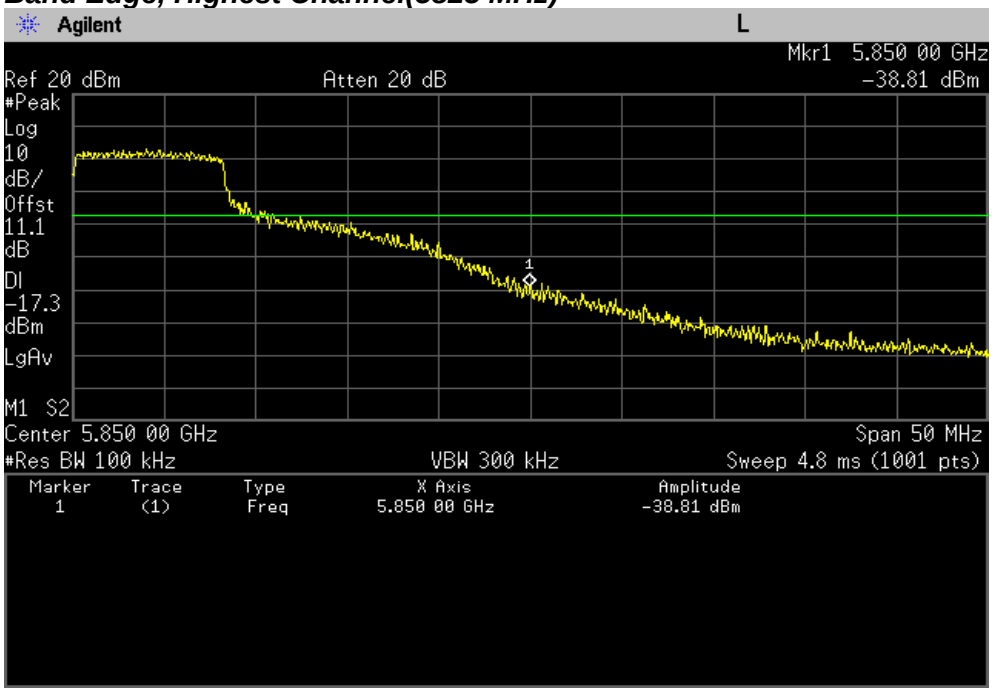
802.11a mode

Chain 0

Band Edge, Lowest Channel (5745 MHz)



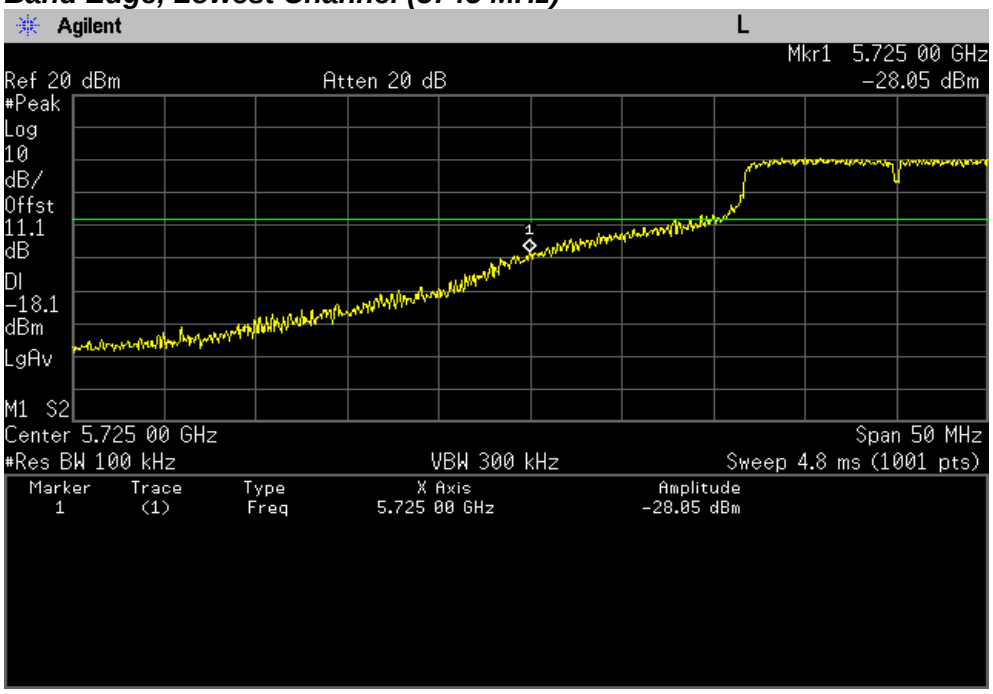
Band Edge, Highest Channel(5825 MHz)



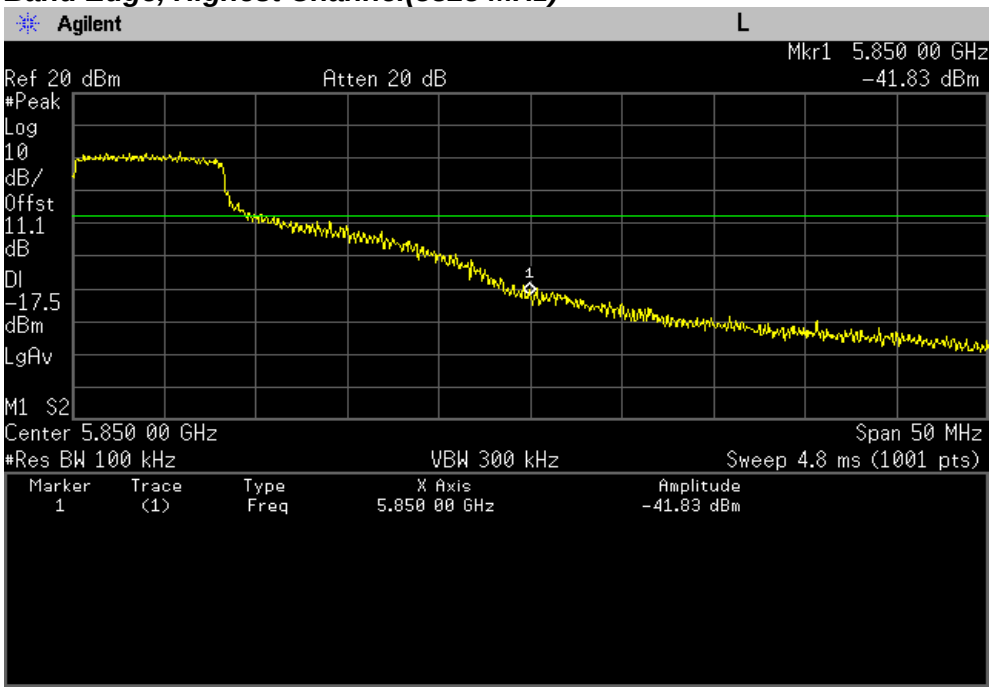
PLOT OF TEST DATA

Chain 1

Band Edge, Lowest Channel (5745 MHz)



Band Edge, Highest Channel(5825 MHz)

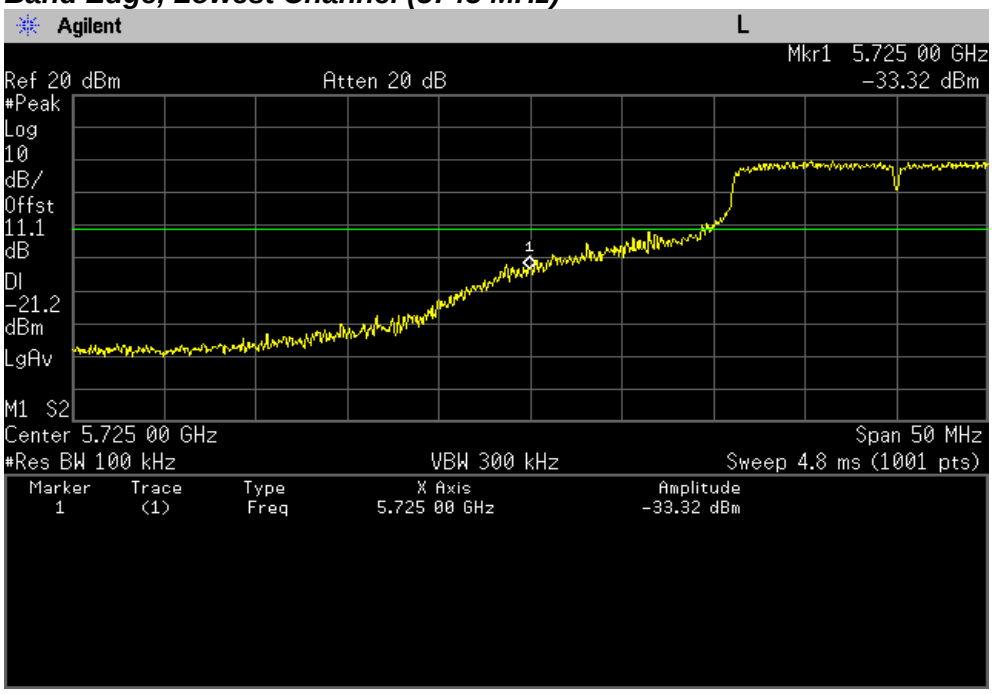


PLOT OF TEST DATA

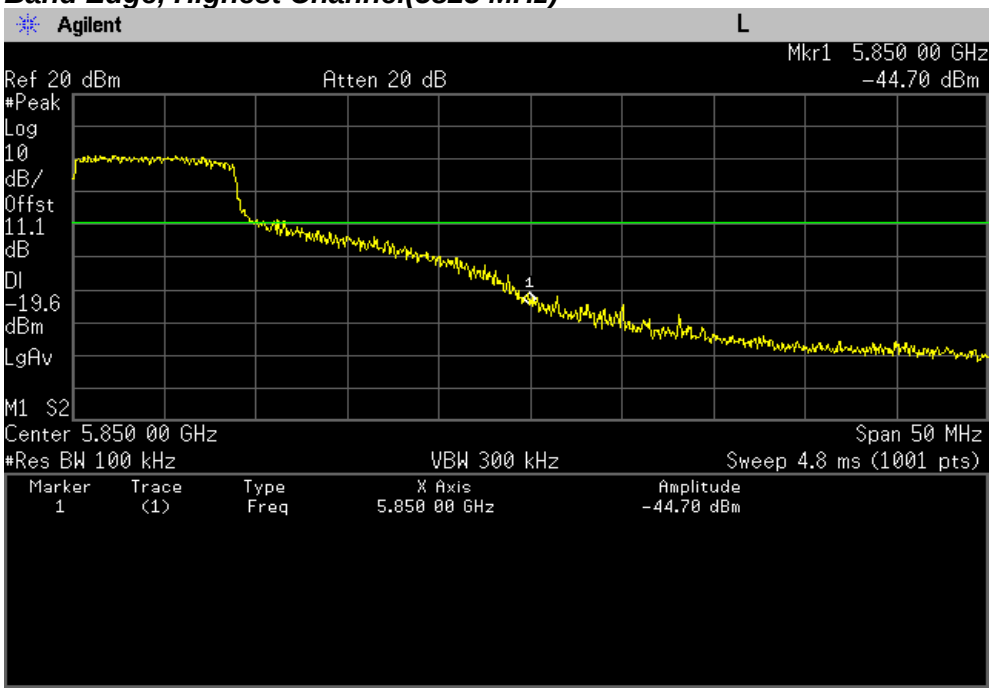
802.11n(20 MHz) mode

Chain 0

Band Edge, Lowest Channel (5745 MHz)



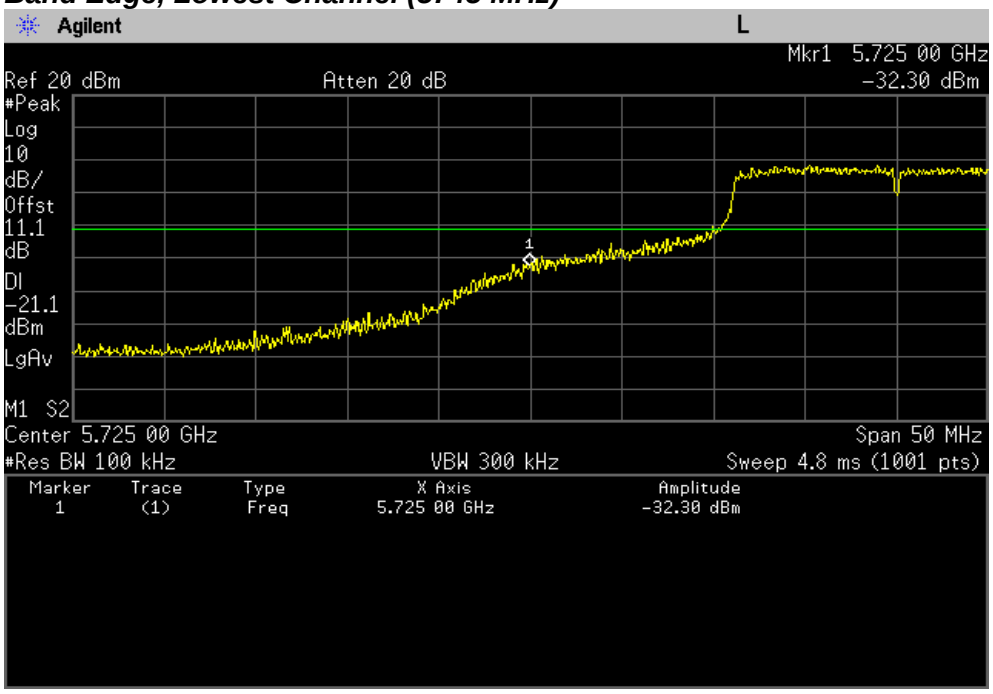
Band Edge, Highest Channel(5825 MHz)



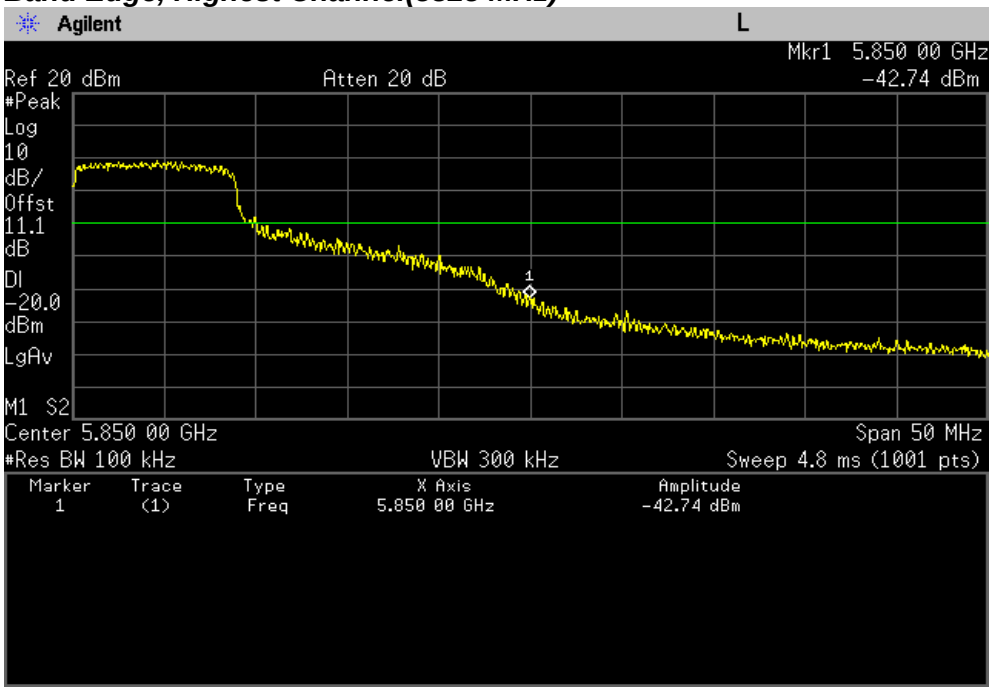
PLOT OF TEST DATA

Chain 1

Band Edge, Lowest Channel (5745 MHz)



Band Edge, Highest Channel(5825 MHz)

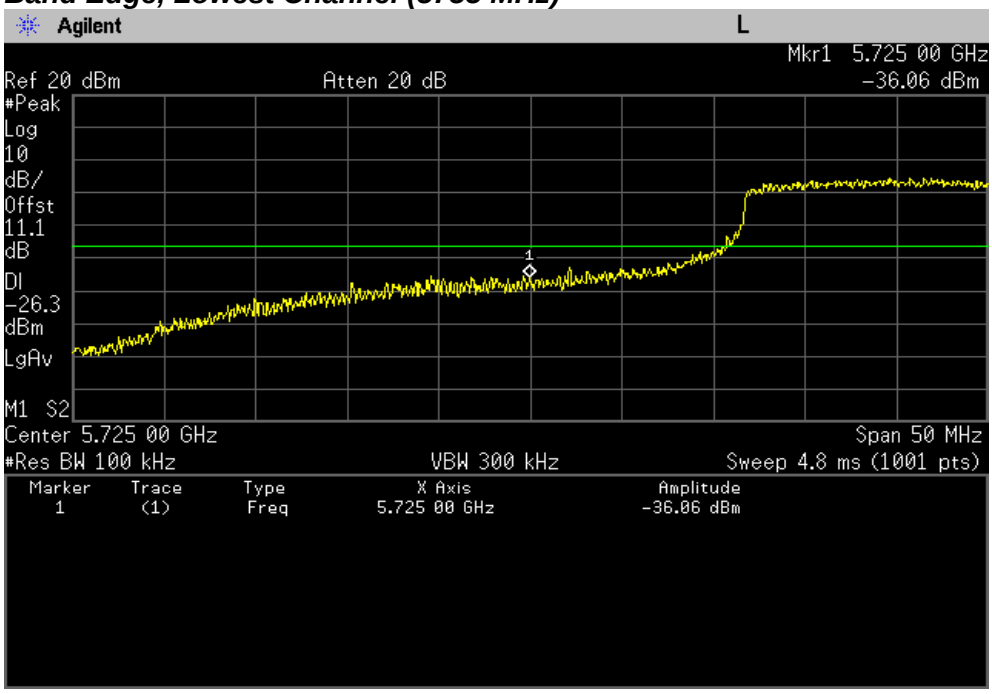


PLOT OF TEST DATA

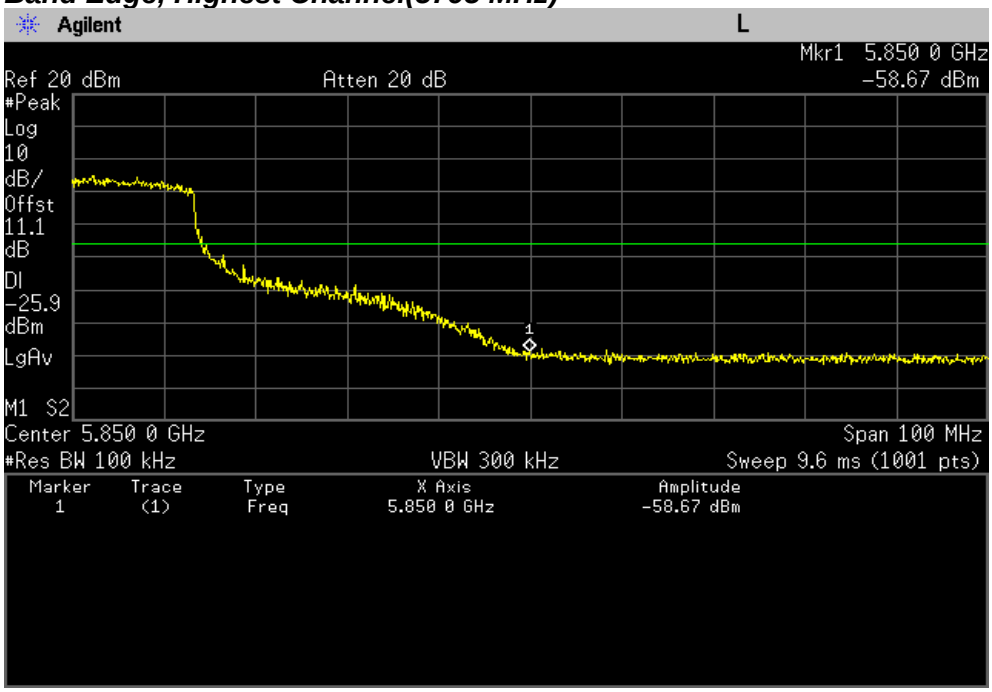
802.11n(40 MHz) mode

Chain 0

Band Edge, Lowest Channel (5755 MHz)



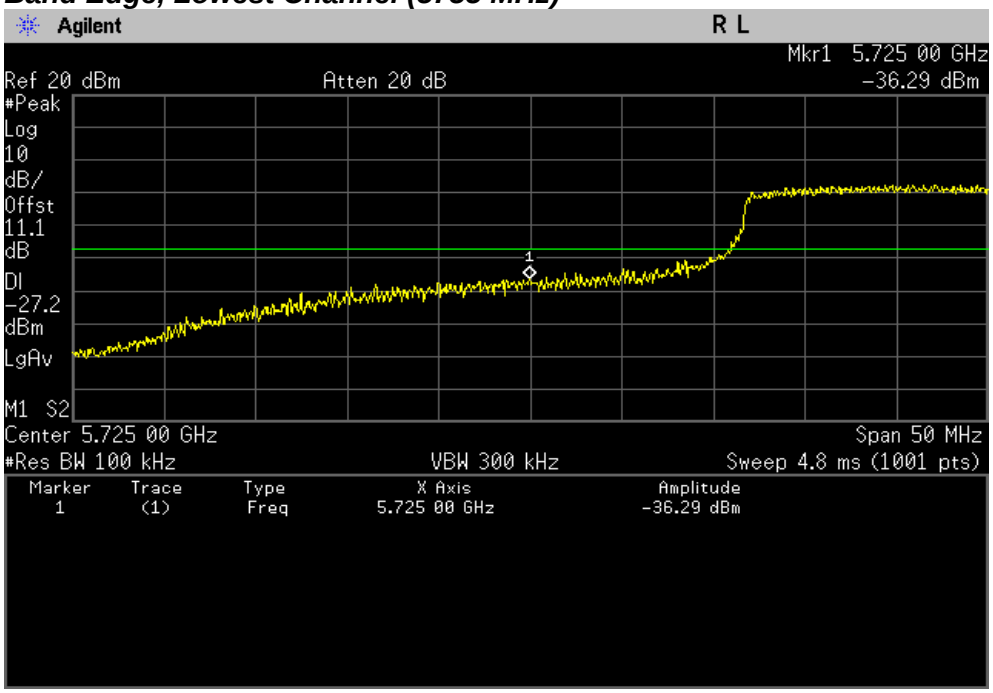
Band Edge, Highest Channel(5795 MHz)



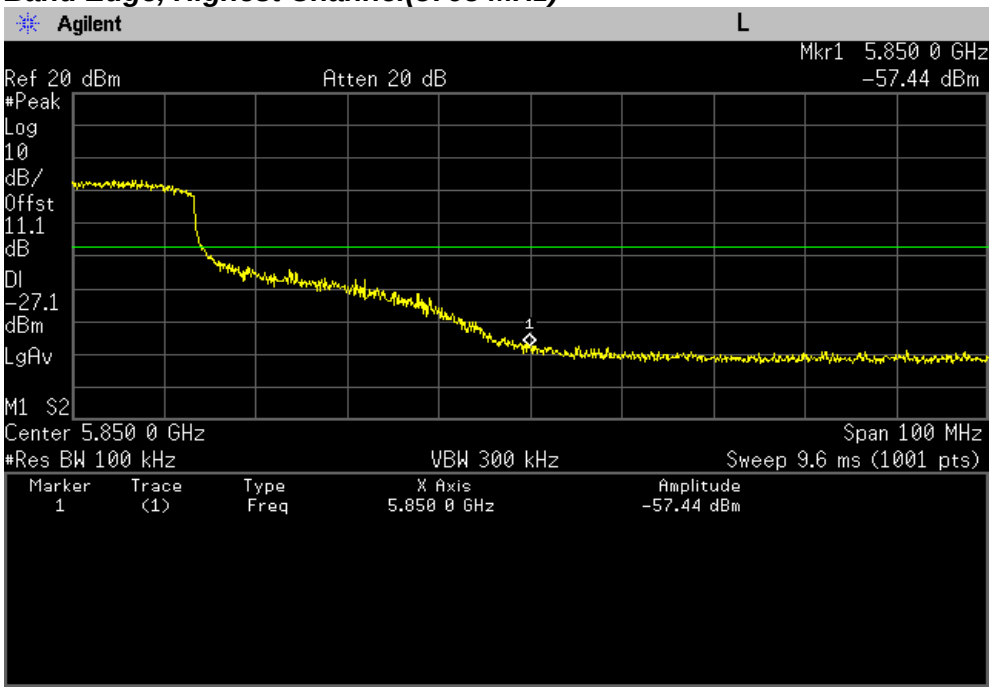
PLOT OF TEST DATA

Chain 1

Band Edge, Lowest Channel (5755 MHz)



Band Edge, Highest Channel(5795 MHz)



8.7 Radiated Spurious Emissions

8.7.1 Radiated Spurious Emissions – 2.4 GHz band

FCC §15.247(d), RSS-210 Issue 8, A8.5

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11 b mode

Chain 0

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1024.75	48.6	V	peak	-4.8	43.8	74.0	30.2
1024.75	40.3	V	average	-4.8	35.5	54.0	18.5
1608.00	47.7	H	peak	-3.2	44.5	74.0	29.5
1608.00	39.1	H	average	-3.2	35.9	54.0	18.1
1667.75	45.6	V	peak	-2.9	42.7	74.0	31.3
1667.75	37.1	V	average	-2.9	34.2	54.0	19.8
1712.00	48.6	H	peak	-2.9	45.7	74.0	28.3
1712.00	37.0	H	average	-2.9	34.1	54.0	19.9
2334.75	47.2	V	peak	-0.9	46.3	74.0	27.7
2334.75	39.7	V	average	-0.9	38.8	54.0	15.2
4824.00	44.5	V	peak	9.0	53.5	74.0	20.5
4824.00	41.5	V	average	9.0	50.5	54.0	3.5

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Middle Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1026.25	48.7	V	peak	-4.8	43.9	74.0	30.1
1026.25	41.5	V	average	-4.8	36.7	54.0	17.3
1593.50	50.9	H	peak	-3.2	47.7	74.0	26.3
1593.50	40.5	H	average	-3.2	37.3	54.0	16.7
1624.75	47.2	H	peak	-3.1	44.1	74.0	29.9
1624.75	40.1	H	average	-3.1	37.0	54.0	17.0
1707.25	46.6	V	peak	-2.9	43.7	74.0	30.3
1707.25	37.6	V	average	-2.9	34.7	54.0	19.3
2358.00	48.4	V	peak	-0.8	47.6	74.0	26.4
2358.00	40.9	V	average	-0.8	40.1	54.0	13.9
4874.25	44.2	V	peak	9.2	53.4	74.0	20.6
4874.25	39.9	V	average	9.2	49.1	54.0	4.9

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1044.50	46.9	V	peak	-4.7	42.2	74.0	31.8
1044.50	40.3	V	average	-4.7	35.6	54.0	18.4
1326.75	45.9	V	peak	-3.8	42.1	74.0	31.9
1326.75	37.8	V	average	-3.8	34.0	54.0	20.0
1600.25	46.6	H	peak	-3.2	43.4	74.0	30.6
1600.25	36.9	H	average	-3.2	33.7	54.0	20.3
1672.75	45.4	V	peak	-2.9	42.5	74.0	31.5
1672.75	36.9	V	average	-2.9	34.0	54.0	20.0
2381.25	48.7	V	peak	-0.8	47.9	74.0	26.1
2381.25	41.2	V	average	-0.8	40.4	54.0	13.6
4924.13	41.3	V	peak	9.3	50.6	74.0	23.4
4924.13	37.1	V	average	9.3	46.4	54.0	7.6

Chain 1

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1022.50	46.3	V	peak	-4.9	41.4	74.0	32.6
1022.50	39.1	V	average	-4.9	34.2	54.0	19.8
1066.50	46.1	V	peak	-4.7	41.4	74.0	32.6
1066.50	38.0	V	average	-4.7	33.3	54.0	20.7
1220.75	45.6	V	peak	-4.3	41.3	74.0	32.7
1220.75	37.5	V	average	-4.3	33.2	54.0	20.8
1337.00	46.5	V	peak	-3.8	42.7	74.0	31.3
1337.00	37.0	V	average	-3.8	33.2	54.0	20.8
1608.00	46.9	V	peak	-3.2	43.7	74.0	30.3
1608.00	42.5	V	average	-3.2	39.3	54.0	14.7
4824.00	42.6	H	peak	9.2	51.8	74.0	22.2
4824.00	37.5	H	average	9.2	46.7	54.0	7.3

Middle Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1023.25	47.4	V	peak	-4.9	42.5	74.0	31.5
1023.25	38.8	V	average	-4.9	33.9	54.0	20.1
1337.00	46.4	V	peak	-3.8	42.6	74.0	31.4
1337.00	37.6	V	average	-3.8	33.8	54.0	20.2
1420.75	45.8	H	peak	-3.7	42.1	74.0	31.9
1420.75	37.9	H	average	-3.7	34.2	54.0	19.8
1624.75	48.2	V	peak	-3.1	45.1	74.0	28.9
1624.75	43.0	V	average	-3.1	39.9	54.0	14.1
2355.50	49.6	V	peak	-0.8	48.8	74.0	25.2
2355.50	43.5	V	average	-0.8	42.7	54.0	11.3
4873.87	40.0	V	peak	9.2	49.2	74.0	24.8
4873.87	36.3	V	average	9.2	45.5	54.0	8.5

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1018.75	48.2	V	peak	-4.9	43.3	74.0	30.7
1018.75	39.5	V	average	-4.9	34.6	54.0	19.4
1600.25	46.7	V	peak	-3.2	43.5	74.0	30.5
1600.25	38.4	V	average	-3.2	35.2	54.0	18.8
1660.00	46.1	V	peak	-2.9	43.2	74.0	30.8
1660.00	38.1	V	average	-2.9	35.2	54.0	18.8
2231.00	46.8	V	peak	-1.3	45.5	74.0	28.5
2231.00	38.9	V	average	-1.3	37.6	54.0	16.4
2381.25	51.5	V	peak	-0.8	50.7	74.0	23.3
2381.25	45.7	V	average	-0.8	44.9	54.0	9.1
4924.13	41.8	V	peak	9.3	51.1	74.0	22.9
4924.13	37.8	V	average	9.3	47.1	54.0	6.9

802.11g mode

Chain 0

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1025.25	48.3	V	peak	-4.8	43.5	74.0	30.5
1025.25	40.9	V	average	-4.8	36.1	54.0	17.9
1106.25	48.2	V	peak	-4.6	43.6	74.0	30.4
1106.25	39.1	V	average	-4.6	34.5	54.0	19.5
1385.50	45.8	V	peak	-3.8	42.0	74.0	32.0
1385.50	38.5	V	average	-3.8	34.7	54.0	19.3
1608.00	47.9	H	peak	-3.2	44.7	74.0	29.3
1608.00	40.8	H	average	-3.2	37.6	54.0	16.4
2208.00	46.9	V	peak	-1.4	45.5	74.0	28.5
2208.00	37.7	V	average	-1.4	36.3	54.0	17.7
4825.13	43.8	V	peak	9.0	52.8	74.0	21.2
4825.13	35.0	V	average	9.0	44.0	54.0	10.0

Middle Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1015.50	47.8	V	peak	-4.9	42.9	74.0	31.1
1015.50	39.3	V	average	-4.9	34.4	54.0	19.6
1176.00	47.0	H	peak	-4.4	42.6	74.0	31.4
1176.00	37.6	H	average	-4.4	33.2	54.0	20.8
1499.00	45.9	H	peak	-3.5	42.4	74.0	31.6
1499.00	37.6	H	average	-3.5	34.1	54.0	19.9
1624.50	46.9	V	peak	-3.1	43.8	74.0	30.2
1624.50	40.5	V	average	-3.1	37.4	54.0	16.6
2223.50	46.0	V	peak	-1.4	44.6	74.0	29.4
2223.50	37.6	V	average	-1.4	36.2	54.0	17.8
4876.87	41.3	V	peak	9.2	50.5	74.0	23.5
4876.87	31.8	V	average	9.2	41.0	54.0	13.0

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1020.75	48.4	V	peak	-4.9	43.5	74.0	30.5
1020.75	41.2	V	average	-4.9	36.3	54.0	17.7
1095.00	47.0	H	peak	-4.6	42.4	74.0	31.6
1095.00	38.5	H	average	-4.6	33.9	54.0	20.1
1335.25	47.3	V	peak	-3.8	43.5	74.0	30.5
1335.25	37.7	V	average	-3.8	33.9	54.0	20.1
1560.25	45.6	V	peak	-3.3	42.3	74.0	31.7
1560.25	37.8	V	average	-3.3	34.5	54.0	19.5
2380.00	49.1	V	peak	-0.8	48.3	74.0	25.7
2380.00	40.5	V	average	-0.8	39.7	54.0	14.3
4926.75	41.1	V	peak	9.3	50.4	74.0	23.6
4926.75	31.5	V	average	9.3	40.8	54.0	13.2

Chain 1

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1021.00	48.9	H	peak	-4.9	44.0	74.0	30.0
1021.00	39.4	H	average	-4.9	34.5	54.0	19.5
1462.75	45.9	V	peak	-3.6	42.3	74.0	31.7
1462.75	37.2	V	average	-3.6	33.6	54.0	20.4
1532.75	46.3	H	peak	-3.4	42.9	74.0	31.1
1532.75	37.0	H	average	-3.4	33.6	54.0	20.4
1608.00	48.5	V	peak	-3.2	45.3	74.0	28.7
1608.00	43.5	V	average	-3.2	40.3	54.0	13.7
2326.75	51.3	V	peak	-1.0	50.3	74.0	23.7
2326.75	43.6	V	average	-1.0	42.6	54.0	11.4
4821.00	40.5	V	peak	9.0	49.5	74.0	24.5
4821.00	32.1	V	average	9.0	41.1	54.0	12.9

Middle Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1023.50	48.1	H	peak	-4.9	43.2	74.0	30.8
1023.50	39.5	H	average	-4.9	34.6	54.0	19.4
1314.50	46.6	V	peak	-3.9	42.7	74.0	31.3
1314.50	37.9	V	average	-3.9	34.0	54.0	20.0
1624.75	47.6	V	peak	-3.1	44.5	74.0	29.5
1624.75	42.9	V	average	-3.1	39.8	54.0	14.2
1676.50	47.1	V	peak	-2.9	44.2	74.0	29.8
1676.50	37.1	V	average	-2.9	34.2	54.0	19.8
2360.25	54.3	V	peak	-0.8	53.5	74.0	20.5
2360.25	42.8	V	average	-0.8	42.0	54.0	12.0
4872.38	40.8	V	peak	9.2	50.0	74.0	24.0
4872.38	31.3	V	average	9.2	40.5	54.0	13.5

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1023.75	47.2	H	peak	-4.9	42.3	74.0	31.7
1023.75	39.5	H	average	-4.9	34.6	54.0	19.4
1104.50	47.4	V	peak	-4.6	42.8	74.0	31.2
1104.50	38.9	V	average	-4.6	34.3	54.0	19.7
1641.25	47.7	V	peak	-3.0	44.7	74.0	29.3
1641.25	42.5	V	average	-3.0	39.5	54.0	14.5
1662.25	46.6	V	peak	-2.9	43.7	74.0	30.3
1662.25	37.0	V	average	-2.9	34.1	54.0	19.9
2385.50	51.9	H	peak	-0.8	51.1	74.0	22.9
2385.50	44.2	H	average	-0.8	43.4	54.0	10.6
4930.13	40.0	V	peak	9.3	49.3	74.0	24.7
4930.13	31.4	V	average	9.3	40.7	54.0	13.3

802.11n(20 MHz) mode

Chain 0 + Chain 1

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1023.75	46.5	H	peak	-4.9	41.6	74.0	32.4
1023.75	38.9	H	average	-4.9	34.0	54.0	20.0
1488.25	45.9	V	peak	-3.6	42.3	74.0	31.7
1488.25	37.4	V	average	-3.6	33.8	54.0	20.2
1608.00	47.4	V	peak	-3.2	44.2	74.0	29.8
1608.00	41.8	V	average	-3.2	38.6	54.0	15.4
1710.00	47.5	V	peak	-2.9	44.6	74.0	29.4
1710.00	37.5	V	average	-2.9	34.6	54.0	19.4
2326.75	49.4	V	peak	-1.0	48.4	74.0	25.6
2326.75	41.0	V	average	-1.0	40.0	54.0	14.0
4823.62	44.4	V	peak	9.0	53.4	74.0	20.6
4823.62	36.5	V	average	9.0	45.5	54.0	8.5

Middle Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1107.75	47.4	V	peak	-4.6	42.8	74.0	31.2
1107.75	38.9	V	average	-4.6	34.3	54.0	19.7
1363.50	46.8	V	peak	-3.8	43.0	74.0	31.0
1363.50	37.7	V	average	-3.8	33.9	54.0	20.1
1624.75	48.1	V	peak	-3.1	45.0	74.0	29.0
1624.75	43.2	V	average	-3.1	40.1	54.0	13.9
2288.00	47.1	H	peak	-1.2	45.9	74.0	28.1
2288.00	40.3	H	average	-1.2	39.1	54.0	14.9
2360.25	49.3	V	peak	-0.8	48.5	74.0	25.5
2360.25	41.4	V	average	-0.8	40.6	54.0	13.4
4872.00	41.5	V	peak	9.1	50.6	74.0	23.4
4872.00	32.5	V	average	9.1	41.6	54.0	12.4

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1103.25	47.7	H	peak	-4.6	43.1	74.0	30.9
1103.25	39.0	H	average	-4.6	34.4	54.0	19.6
1324.75	47.0	V	peak	-3.8	43.2	74.0	30.8
1324.75	37.7	V	average	-3.8	33.9	54.0	20.1
1555.75	45.8	V	peak	-3.4	42.4	74.0	31.6
1555.75	37.4	V	average	-3.4	34.0	54.0	20.0
1625.50	45.6	H	peak	-3.1	42.5	74.0	31.5
1625.50	37.4	H	average	-3.1	34.3	54.0	19.7
2383.50	51.1	V	peak	-0.8	50.3	74.0	23.7
2383.50	43.1	V	average	-0.8	42.3	54.0	11.7
4929.00	40.8	V	peak	9.3	50.1	74.0	23.9
4929.00	32.4	V	average	9.3	41.7	54.0	12.3

Note:

*1. *Pol. H = Horizontal V = Vertical*

*2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.*

*3. ***Distance factor = 20 log (test distance/specific distance) = 20 log (1 / 3)*

4. Other spurious were under 20 dB below Fundamental.

5. The radiated emissions testing were made by rotating through three orthogonal axes. The worst data were recorded.

6. For peak measurements, the resolution bandwidth was set to 1 MHz and the video bandwidth was set to 3 MHz.

7. For average measurements, "10.2.3.3 Average Power Measurement Procedures" at "558074 D01 DTS Meas Guidance v02" was used.

8. The spectrum was measured from 9 kHz to 10th harmonic and the worst-case emissions were reported. No significant emissions were found beyond the fifth harmonic for this device.

8.7.2 Radiated Spurious Emissions – 5 GHz band

FCC §15.247(d), RSS-210 Issue 8, A8.5

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Chain 0

Lowest Channel (5745 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.490	63.81	H	peak	2.81	-9.54	57.08	74.0	16.92
11.490	52.55	H	average	2.81	-9.54	45.82	54.0	8.18
11.490	66.37	V	peak	2.81	-9.54	59.64	74.0	14.36
11.490	52.07	V	average	2.81	-9.54	45.34	54.0	8.66

Middle Channel (5785 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.570	64.25	H	peak	3.60	-9.54	58.31	74.0	15.69
11.570	51.09	H	average	3.60	-9.54	45.15	54.0	8.85
11.570	68.28	V	peak	3.60	-9.54	62.34	74.0	11.66
11.570	54.14	V	average	3.60	-9.54	48.20	54.0	5.80

Highest Channel (5825 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.650	64.58	H	peak	2.92	-9.54	57.96	74.0	16.04
11.650	51.65	H	average	2.92	-9.54	45.03	54.0	8.97
11.650	69.40	V	peak	2.92	-9.54	62.78	74.0	11.22
11.650	54.58	V	average	2.92	-9.54	47.96	54.0	6.04

Chain 1

Lowest Channel (5745 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.490	57.86	H	peak	2.81	-9.54	51.13	74.0	22.87
11.490	44.01	H	average	2.81	-9.54	37.28	54.0	16.72
11.490	60.30	V	peak	2.81	-9.54	53.57	74.0	20.43
11.490	45.44	V	average	2.81	-9.54	38.71	54.0	15.29

Middle Channel (5785 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.570	61.41	H	peak	3.60	-9.54	55.47	74.0	18.53
11.570	47.98	H	average	3.60	-9.54	42.04	54.0	11.96
11.570	62.13	V	peak	3.60	-9.54	56.19	74.0	17.81
11.570	48.73	V	average	3.60	-9.54	42.79	54.0	11.21

Highest Channel (5785 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.650	63.12	H	peak	2.92	-9.54	56.50	74.0	17.50
11.650	50.36	H	average	2.92	-9.54	43.74	54.0	10.26
11.650	65.66	V	peak	2.92	-9.54	59.04	74.0	14.96
11.650	51.95	V	average	2.92	-9.54	45.33	54.0	8.67

802.11n(20 MHz) mode

Chain 0 + Chain 1

Lowest Channel (5745 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.490	55.35	H	peak	2.81	-9.54	48.62	74.0	25.38
11.490	42.13	H	average	2.81	-9.54	35.40	54.0	18.60
11.490	58.37	V	peak	2.81	-9.54	51.64	74.0	22.36
11.490	45.13	V	average	2.81	-9.54	38.40	54.0	15.60

Middle Channel (5785 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.570	57.69	H	peak	3.60	-9.54	51.75	74.0	22.25
11.570	46.23	H	average	3.60	-9.54	40.29	54.0	13.71
11.570	59.75	V	peak	3.60	-9.54	53.81	74.0	20.19
11.570	50.01	V	average	3.60	-9.54	44.07	54.0	9.93

Highest Channel (5825 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.650	57.29	H	peak	2.92	-9.54	50.67	74.0	23.33
11.650	44.76	H	average	2.92	-9.54	38.14	54.0	15.86
11.650	60.20	V	peak	2.92	-9.54	53.58	74.0	20.42
11.650	47.15	V	average	2.92	-9.54	40.53	54.0	13.47

802.11n(40 MHz) mode

Chain 0 + Chain 1

Lowest Channel (5755 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.510	53.19	H	peak	3.15	-9.54	46.80	74.0	27.20
11.510	43.57	H	average	3.15	-9.54	37.18	54.0	16.82
11.510	55.25	V	peak	3.15	-9.54	48.86	74.0	25.14
11.510	42.92	V	average	3.15	-9.54	36.53	54.0	17.47

Highest Channel (5795 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Distance (dB)***	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.590	55.59	H	peak	3.62	-9.54	49.67	74.0	24.33
11.590	43.80	H	average	3.62	-9.54	37.88	54.0	16.12
11.590	57.85	V	peak	3.62	-9.54	51.93	74.0	22.07
11.590	45.97	V	average	3.62	-9.54	40.05	54.0	13.95

Note:

*1. *Pol. H = Horizontal V = Vertical*

*2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.*

*3. ***Distance factor = 20 log (test distance/specific distance) = 20 log (1 / 3)*

4. Other spurious were under 20 dB below Fundamental.

5. The radiated emissions testing were made by rotating through three orthogonal axes. The worst data were recorded.

6. For peak measurements, the resolution bandwidth was set to 1 MHz and the video bandwidth was set to 3 MHz.

7. For average measurements, "10.2.3.3 Average Power Measurement Procedures" at "558074 D01 DTS Meas Guidance v02" was used.

8. The spectrum was measured from 9 kHz to 10th harmonic and the worst-case emissions were reported. No significant emissions were found beyond the fifth harmonic for this device.

8.7.3 Radiated Band Edge

FCC §15.247(d), RSS-210 Issue 8, A8.5

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11b mode

Chain 0

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2389.84	55.10	H	peak	-0.80	54.30	74.0	19.70
2389.84	45.80	H	average	-0.80	45.00	54.0	9.00

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2483.51	50.41	V	peak	-0.20	50.21	74.0	23.79
2483.51	41.20	V	average	-0.20	41.00	54.0	13.00
2487.60	51.71	V	peak	-0.30	51.41	74.0	22.59
2487.60	42.20	V	average	-0.30	41.90	54.0	12.10

Chain 1

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2389.69	54.80	H	peak	-0.80	54.00	74.0	20.00
2389.69	46.80	H	average	-0.80	46.00	54.0	8.00

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2483.61	50.85	V	peak	-0.30	50.55	74.0	23.45
2483.61	44.30	V	average	-0.30	44.00	54.0	10.00
2487.95	51.89	V	peak	-0.30	51.59	74.0	22.41
2487.95	44.80	V	average	-0.30	44.50	54.0	9.50

802.11g mode

Chain 0

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2389.98	70.30	H	peak	-0.80	69.50	74.0	4.50
2389.98	53.60	H	average	-0.80	52.80	54.0	1.20

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2483.53	70.50	V	peak	-0.20	70.30	74.0	3.70
2483.53	45.60	V	average	-0.20	45.40	54.0	8.60

Chain 1

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2389.98	68.70	V	peak	-0.80	67.90	74.0	6.10
2389.98	52.00	V	average	-0.80	51.20	54.0	2.80

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2483.51	72.20	V	peak	-0.20	72.00	74.0	2.00
2483.51	48.33	V	average	-0.20	48.13	54.0	5.87

802.11n(20 MHz) mode

Chain 0 + Chain 1

Lowest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2389.75	71.50	H	peak	-0.80	70.70	74.0	3.30
389.75	51.30	H	average	-0.80	50.50	54.0	3.50

Highest Channel

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2483.50	67.70	V	peak	-0.20	67.50	74.0	6.50
2483.50	45.70	V	average	-0.20	45.50	54.0	8.50

Note:

*1. *Pol. H = Horizontal V = Vertical*

*2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.*

3. The radiated emissions testing were made by rotating through three orthogonal axes. The worst data were recorded.

4. For peak measurements, the resolution bandwidth was set to 1 MHz and the video bandwidth was set to 3 MHz.

5. For average measurements, "10.2.3.3 Average Power Measurement Procedures" at "558074 D01 DTS Meas Guidance v02" was used.

9. TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	*Test Receiver	R & S	ESCS 30	833364/020	Jan. 12 2012	1 year
2	*Test Receiver	R & S	ESCS 30	100302	Oct. 08 2012	1 year
3	*Amplifier	HP	8447F	2805A03427	Jul. 17 2012	1 year
4	*Amplifier	Sonoma Instrument	310N	291916	Jul. 16 2012	1 year
5	*Amplifier	R & S	SCU18	10065	Apr. 05 2012	1 year
6	*Amplifier	R & S	SCU26	10011	Jun. 01 2012	1 year
7	*Amplifier	R & S	SCU40	10008	Jun. 01 2012	1 year
8	*Pre Amplifier	HP	8449B	3008A00107	Jan. 13 2012	1 year
9	*Pre Amplifier	HP	8447F	2805A03351	Jul. 17 2012	1 year
10	*Spectrum Analyzer	Agilent	E4440A	MY44303257	Jul. 16 2012	1 year
11	*Spectrum Analyzer	Agilent	E4440A	MY44022567	Apr. 05 2012	1 year
12	*Spectrum Analyzer	R & S	FSP40	100361	Jul. 17 2012	1 year
13	*Loop Antenna	R & S	HFH2-Z2	100279	Feb. 21 2012	2 year
14	Wideband Power Sensor	R & S	NRP-Z81	100634	Apr. 05 2012	1 year
15	*Biconical Log Antenna	ARA	LPB-2520/A	1180	Apr. 26 2012	2 year
16	*Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-474	Aug. 13 2012	2 year
17	*Horn Antenna	Q-par Angus	QSH20S20	8179	Mar. 28 2011	2 year
18	*Horn Antenna	Q-par Angus	QSH22K20	8180	Mar. 28 2011	2 year
19	*Trilog-Broadband Antenna	SCHWARZBECK	VULB 9163	9163-454	Feb. 24 2012	2 year
20	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-257	Apr. 26 2012	2 year
21	*LISN	R & S	ESH3-Z5	833874/006	Oct. 08 2012	1 year
22	*LISN	R & S	ESH2-Z5	100227	Apr. 04 2012	1 year
23	*Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
24	*Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
25	*Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
26	*Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
27	*Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
28	*Position Controller	Seo-Young EMC	N/A	N/A	N/A	N/A
29	*Turn Table	Seo-Young EMC	N/A	N/A	N/A	N/A
30	*Antenna Mast	Seo-Young EMC	N/A	N/A	N/A	N/A
31	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
32	*Shielded Room	Seo-Young EMC	N/A	N/A	N/A	N/A

*) Test equipment used during the test

10. ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of measurement uncertainty contained in CISPR 16-4-2 with the confidence level of 95%

1. Conducted Uncertainty Calculation

Source of Uncertainty	Xi	Uncertainty of Xi		Coverage factor k	u(Xi) (dB)	Ci	Ci u(Xi) (dB)
		Value (dB)	Probability Distribution				
Receiver reading	***RI***	± 0.1	normal 1	1.000	0.1	1	0.1
Attenuation AMN-Receiver	***LC***	± 0.08	normal 2	2.000	0.04	1	0.04
AMN Voltage division factor	***LAMN***	± 0.8	normal 2	2.000	0.4	1	0.4
Sine wave voltage	***dVSW***	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	***dVPA***	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	***dVPR***	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	***dVNF***	± 0.00	-	-	0.00	1	0.00
AMN Impedance	***dZ***	± 1.80	triangular	2.449	0.73	1	0.73
ⓐ Mismatch	***M***	+ 0.70	U-Shaped	1.414	0.49	1	0.49
ⓑ Mismatch	***M***	- 0.80	U-Shaped	1.414	- 0.56	1	- 0.56
Measurement System Repeatability	***RS***	0.05	normal 1	1.000	0.05	1	0.05
Remark	ⓐ: AMN-Receiver Mismatch : + ⓑ: AMN-Receiver Mismatch : -						
Combined Standard Uncertainty	Normal			± 1.88			
Expended Uncertainty U	Normal (k = 2)			± 3.76			

2. Radiation Uncertainty Calculation

Source of Uncertainty	*Xi*	Uncertainty of *Xi*		Coverage factor *k*	*u(Xi)* (dB)	*Ci*	*Ci u(Xi)* (dB)
		Value (dB)	Probability Distribution				
Receiver reading	***RI***	± 0.10	normal 1	1.000	0.10	1	0.10
Sine wave voltage	***dVsw***	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	***dVpa***	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	***dVpr***	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	***dVnf***	± 0.50	normal 2	2.000	0.25	1	0.25
Antenna Factor Calibration	***AF***	± 1.50	normal 2	2.000	0.75	1	0.75
Attenuation Antenna-receiver	***CL***	± 0.52	normal 2	2.000	0.26	1	0.26
Antenna Directivity	***AD***	± 1.00	rectangular	1.732	0.58	1	0.58
Antenna Factor Height Dependence	***AH***	± 0.50	rectangular	1.732	0.29	1	0.29
Antenna Phase Centre Variation	***AP***	± 0.30	rectangular	1.732	0.17	1	0.17
Antenna Factor Frequency Interpolation	***AI***	± 0.30	rectangular	1.732	0.17	1	0.17
Site Imperfections	***SI***	± 4.00	triangular	2.449	1.63	1	1.63
Measurement Distance Variation	***DV***	± 0.10	rectangular	1.732	0.06	1	0.06
Antenna Balance	***Dbal***	± 0.90	rectangular	1.732	0.52	1	0.52
Cross Polarisation	***DCross***	± 0.90	rectangular	1.732	0.52	1	0.52
ⓐ Mismatch	***M***	+ 0.25	U-Shaped	1.414	0.18	1	0.18
ⓑ Mismatch	***M***	- 0.26	U-Shaped	1.414	- 0.18	1	- 0.18
ⓒ Mismatch	***M***	+ 0.98	U-Shaped	1.414	0.69	1	0.69
ⓓ Mismatch	***M***	- 1.11	U-Shaped	1.414	- 0.79	1	- 0.79
Measurement System Repeatability	***RS***	0.09	normal 1	1.000	0.09	1	0.09
Remark	ⓐ: Biconical Antenna-receiver Mismatch : + (< 200 MHz) ⓑ: Biconical Antenna-receiver Mismatch : - (< 200 MHz) ⓒ: Log Periodic Antenna-receiver Mismatch : + (≧ 200 MHz) ⓓ: Log Periodic Antenna-receiver Mismatch : - (≧ 200 MHz)						
Combined Standard Uncertainty	Normal			± 2.63 (< 200 MHz) ± 2.74 (≧200 MHz)			
Expended Uncertainty U	Normal (*k* = 2)			± 5.26 (< 200 MHz) ± 5.48 (≧200 MHz)			