



# **CERTIFICATION TEST REPORT**

**Report Number. :** 12440720-E4V1

**Applicant :** Samsung Electronics Co., Ltd.  
129 Samsung-Ro, Yeongtong-Gu,  
Suwon-Si, Gyeonggi-Do, 16677, Korea

**Models :** SM-A750G/DS and SM-A750G

**FCC ID :** A3LSMA750G

**EUT Description :** GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, and ANT+

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C

**Date Of Issue:**

August 31, 2018

**Prepared by:**

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NVLAP Lab code: 200065-0

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## REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	8/31/2018	Initial Issue	

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Samsung Electronics Co., Ltd.  
129 Samsung-Ro, Yeongtong-Gu,  
Suwon-Si, Gyeonggi-Do, 16677, Korea

**EUT DESCRIPTION:** GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, and ANT+

**MODELS:** SM-A750G/DS and SM-A750G

**SERIAL NUMBER:** Conducted: R38K70KQF9N; R38K70KQGDH (Original)  
Radiated: R38K70KQFNY (Original)  
Conducted: R38K70MNSEF (Spot Check)  
Radiated: R38K70MNRBF, R38K70MNQ6Z (Spot Check)

**DATE TESTED:** August 10, 2018 – August 21, 2018 (Original)  
August 24-30, 2018 (Spot Check)

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

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## 2. INTRODUCTION OF TEST DATA REUSE

### 2.1. INTRODUCTION

According to the manufacturer, the WLAN, Bluetooth, ANT+ and WWAN hardware of A3LSMA750G are identical to A3LSMA750GN. In addition A3LSMA750G digital circuit is identical to A3LSMA750GN. Therefore the following report/data of A3LSMA750G may be represented from A3LSMA750GN along with the spot check verification data.

- WLAN
- Bluetooth
- ANT+
- WWAN

### 2.2. DEVICES DIFFERENCES

Difference between A3LSMA750G and A3LSMA750GN:

Samsung Electronics Co., Ltd. hereby declares that between A3LSMA750G and A3LSMA750GN:

Hardware:

- AP/CP/TRCV/PMIC are same.
- Deleted NFC circuit and NFC antennas.
- BT/WIFI/FM/GPS parts are exactly same.
- PCB layout is exactly same.
- Mechanic parts are exactly same.

Software:

- SW was updated to reflect the HW changes
- PROTOCOL PART is same.
- All applications of MMS, SATK/USATK, SMS, SS, SUPL, DM, VOLTE feature is same.

In addition, the A3LSMA750G does not support NFC.

Therefore the WLAN, Bluetooth, ANT+, WWAN report and data of A3LSMA750GN may represent for A3LSMA750G.

### 2.3. SPOT CHECK VERIFICATION RESULTS SUMMARY

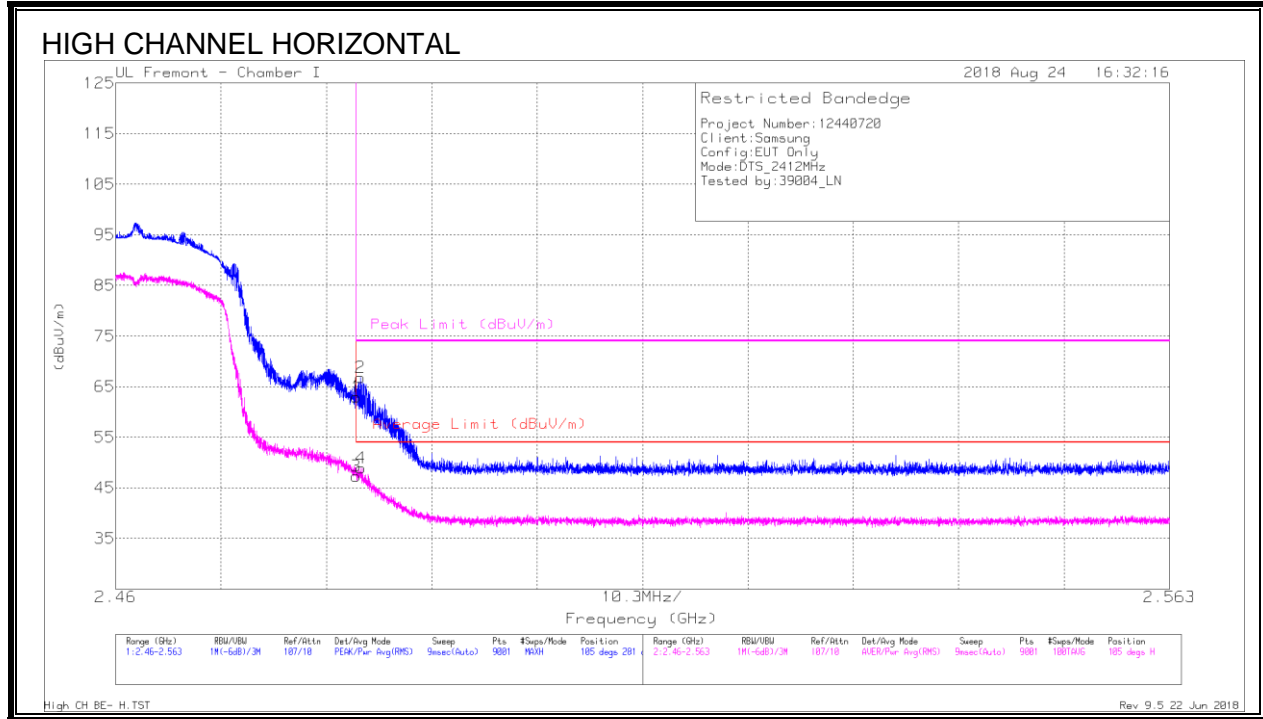
Spot check verification has been done on device A3LSMA750G for radiated harmonic spurious and radiated band-edge. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary below.

SM-A750G/DS SPOT CHECK RESULTS										
Technology	Mode	Test Item	Channel	Measured Frequency	SM-A750GN_DS		SM-A750G_DS		Delta (dB)	
					Peak	Ave	Peak	Ave	Peak	Ave
DTS	11n HT20	RBE	11	2484MHz	70.33	51.99	66.85	49.15	-3.48	-2.84
	11b	RSE	1	4824MHz	52.71	50.82	41.42	31.15	-11.29	-19.67

Comparison of two models, higher deviation is within 3dB range and all test are under FCC Technical Limits.

**2.3.1. SPOT CHECK DATA**

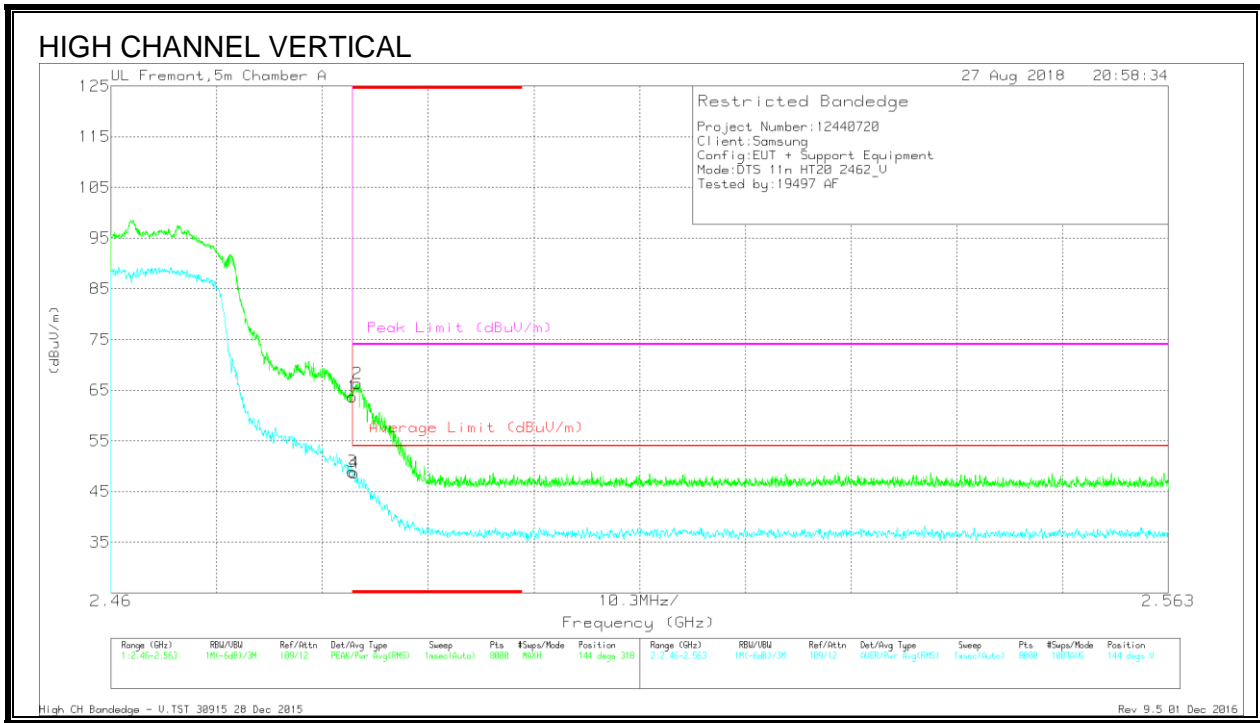
**2.3.2. BANDEDGE (HIGH CHANNEL)**



**Trace Markers**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT862 (dB/m)	Amp/Cb1/Fitr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	52.21	Pk	32.4	-21.7	0	62.91	-	-	74	-11.09	105	281	H
2	* 2.484	56.15	Pk	32.4	-21.7	0	66.85	-	-	74	-7.15	105	281	H
3	* 2.484	36.64	RMS	32.4	-21.7	.24	47.58	54	-6.42	-	-	105	281	H
4	* 2.484	38.21	RMS	32.4	-21.7	.24	49.15	54	-4.85	-	-	105	281	H

\* - indicates frequency in CFR47 Pt 15 Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection



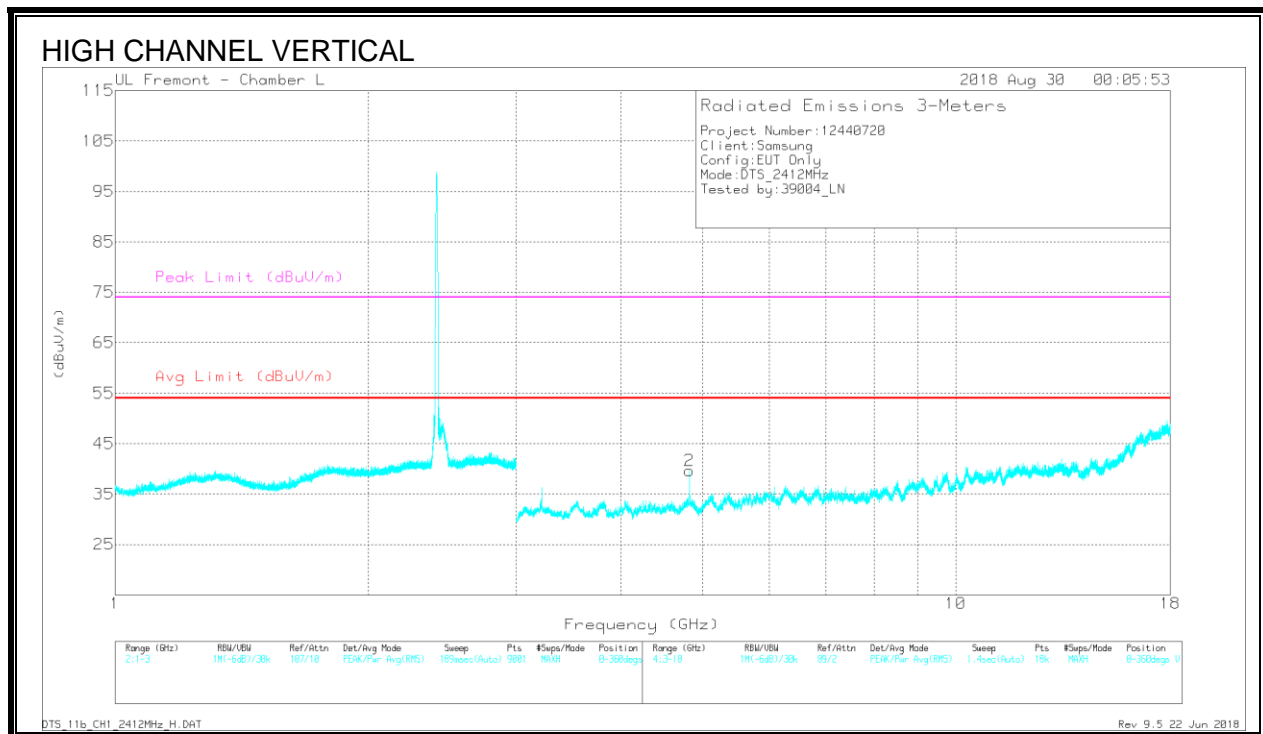
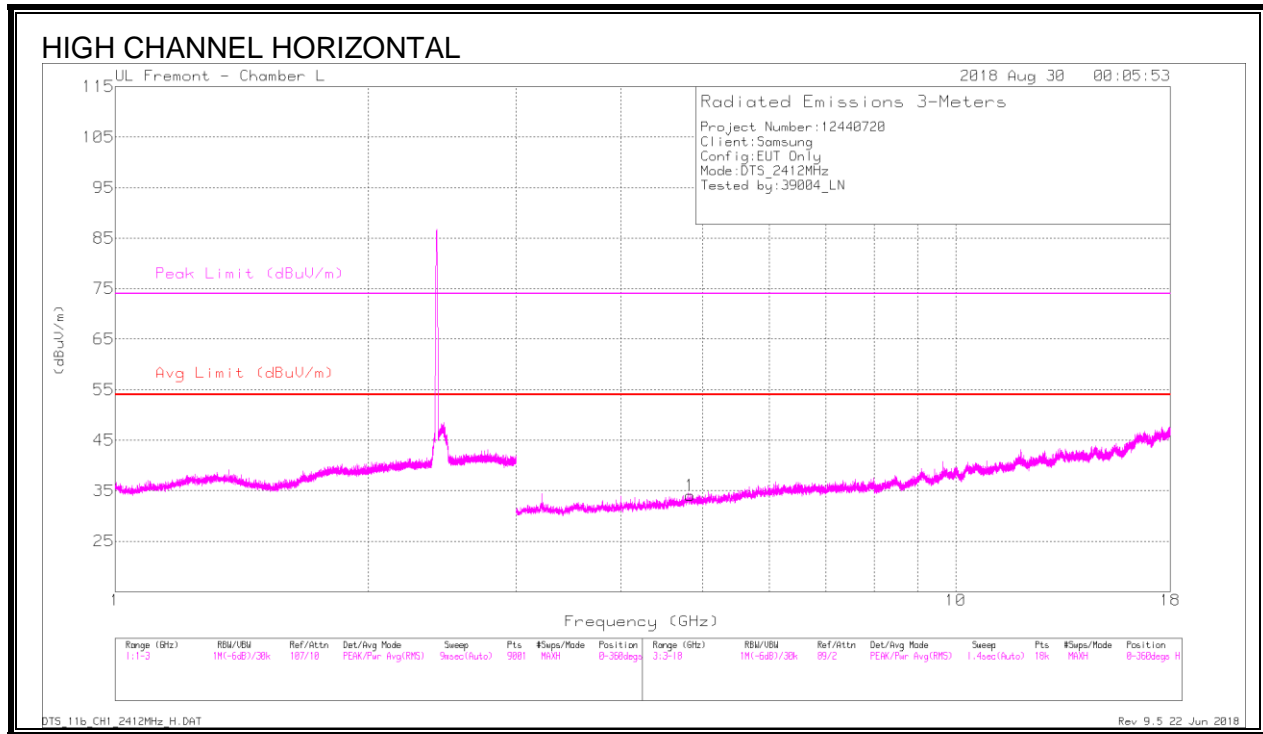
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.3	Pk	32.3	-22.9	0	63.7	-	-	74	-10.3	144	318	V
2	* 2.484	56.89	Pk	32.3	-22.9	0	66.29	-	-	74	-7.71	144	318	V
3	* 2.484	39.3	RMS	32.3	-22.9	.24	48.94	54	-5.06	-	-	144	318	V
4	* 2.484	38.99	RMS	32.3	-22.9	.24	48.63	54	-5.37	-	-	144	318	V

\* - indicates frequency in CFR47 Pt 15 Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection



### 2.3.3. HARMONICS AND SPURIOUS EMISSIONS



**Radiated Emissions**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.83	35.32	PK2	34.2	-28.1	41.42	-	-	74	-32.58	46	325	H
	* 4.831	25.05	MAv1	34.2	-28.1	31.15	54	-22.85	-	-	46	325	H
2	* 4.824	32.01	PK2	34.2	-28.3	37.91	-	-	74	-36.09	185	129	V
	* 4.824	32.66	MAv1	34.2	-28.3	38.56	54	-15.44	-	-	185	129	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

**2.4. REFERENCE DETAIL**

Equipment Class	Reference FCC ID	Report Title/Section
DTS (WLAN)	A3LSMA750GN	12440598-E4V2 FCC Report DTS WLAN

### 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v4, ANSI C63.10-2013.

### 4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
<input checked="" type="checkbox"/> Chamber A (IC:2324B-1)	<input type="checkbox"/> Chamber D (IC:22541-1)	<input checked="" type="checkbox"/> Chamber I (IC: 2324A-5)
<input type="checkbox"/> Chamber B (IC:2324B-2)	<input type="checkbox"/> Chamber E (IC:22541-2)	<input type="checkbox"/> Chamber J (IC: 2324A-6)
<input type="checkbox"/> Chamber C (IC:2324B-3)	<input type="checkbox"/> Chamber F (IC:22541-3)	<input type="checkbox"/> Chamber K (IC: 2324A-1)
	<input type="checkbox"/> Chamber G (IC:22541-4)	<input checked="" type="checkbox"/> Chamber L (IC: 2324A-3)
	<input type="checkbox"/> Chamber H (IC:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

## 5. CALIBRATION AND UNCERTAINTY

### 5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 5.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

### 5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

## 6. EQUIPMENT UNDER TEST

### 6.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE phone with BT, DTS/UNII a/b/g/n/ac, ANT+ and NFC.

### 6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

#### 2.4GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
<b>1Tx</b>			
2412 - 2462	802.11b	18.39	69.02
2412 - 2462	802.11g	16.35	43.15
2412 - 2462	802.11n HT20	16.35	43.15

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal antenna, with a maximum gain of -1.71 dBi.

### 6.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was A750GN.001

### 6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps  
802.11g mode: 6 Mbps  
802.11n HT20mode: MCS0

## 6.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	EP-TA50EWE	DW3J719AS/A-E	N/A
Earphone	Samsung	N/A	N/A	N/A

### I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	RF	Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Un-shielded	1	EUT to AC Mains

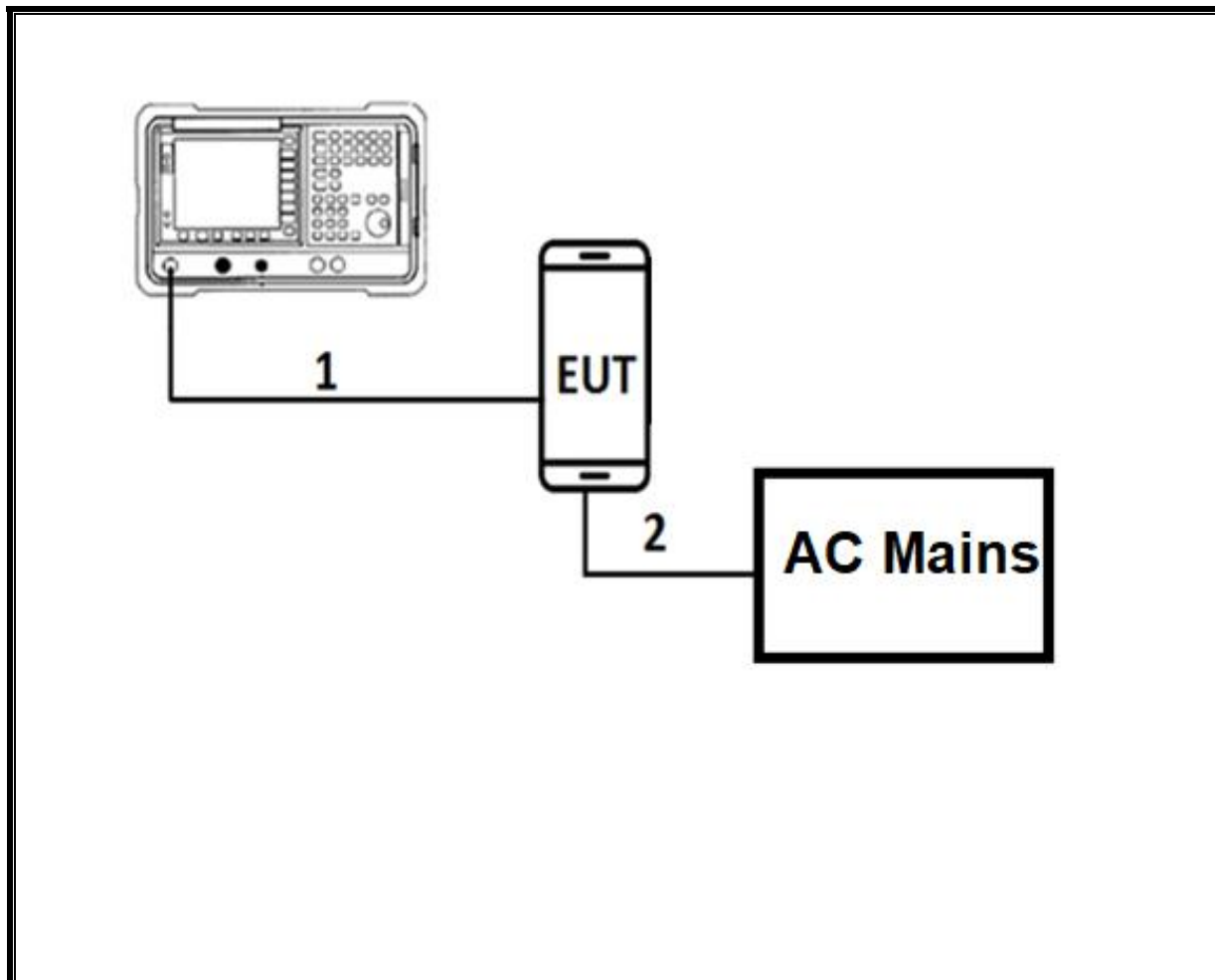
### I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	1	N/A
2	earphone	1	3.5mm	Un-shielded	1	N/A

### TEST SETUP

The EUT is stand alone. Test software exercised the radio card.

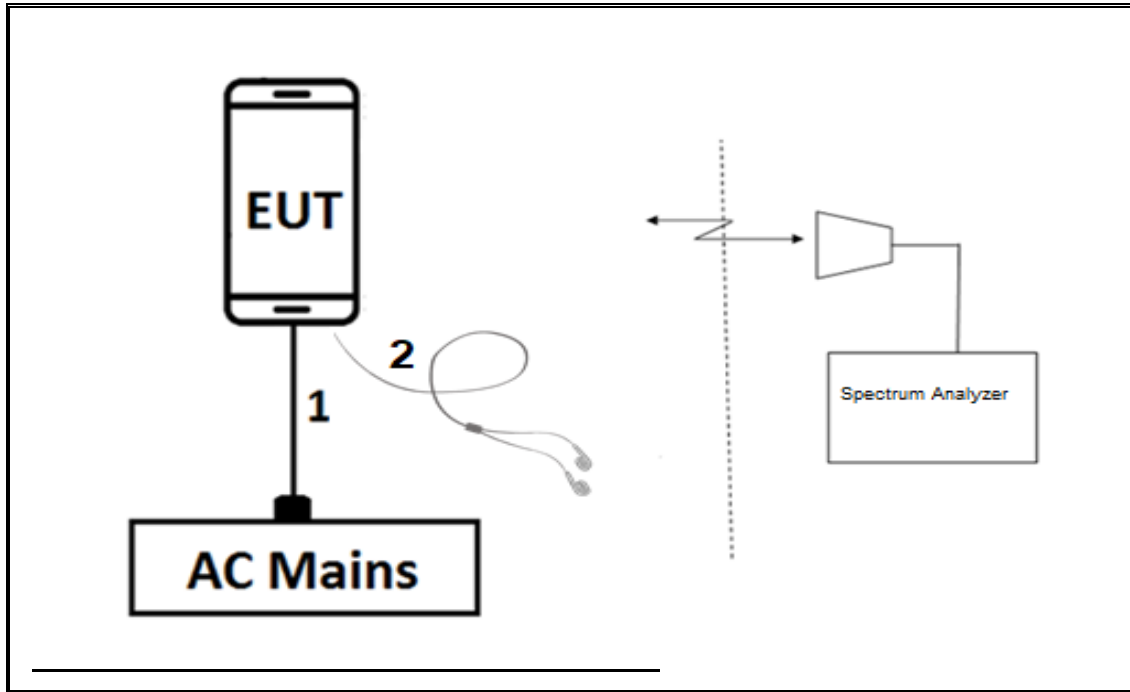
**CONDCUTED TEST SETUP DIAGRAM**



**TEST SETUP**

For conducted tests: the EUT was stand alone. The test software exercises the radio.

**RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM**



**TEST SETUP**

For radiated tests: EUT is Stand alone. The test software exercises the radio.



## 7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 558074 D01 v04, Section 6.

6 dB BW: KDB 558074 D01 v04, Section 8.1.

99% BW: ANSI C63.10-2013, Section 6.9.3.

Output Power: KDB 558074 D01 v04, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v04, Section 10.3.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.1 (b).

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.1.

Band-edge: KDB 558074 D01 v04, Section 12.1.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

## 8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST (ORIGINAL)					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Amplifier, 10KHz to 1GHz, 32dB	Agilent (Keysight) Technologies	8447D	T10	02/14/2019	02/14/2018
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T407	05/10/2019	05/10/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	05/24/2019	05/24/2018
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	17146	08/01/2019	08/01/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T346	04/03/2019	04/03/2018
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T931	02/24/2019	02/24/2018
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1269	04/05/2019	04/05/2018
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T1225	04/10/2019	04/10/2018
EMI Reciever	Rohde & Schwarz	ESR	T1436	02/21/2019	02/21/2018
L.I.S.N.	FCC INC.	FCC LISN 50/250	T1310	06/15/2019	06/15/2018
L.I.S.N.	FCC INC.	FCC LISN 50/250	T24	03/06/2019	03/06/2018
Antenna, Active Loop 9kHz-30MHz	Com-Power Corp.	AL-130R	T1866	10/10/2018	10/10/2017
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179522	05/11/2019	05/11/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T200	11/18/2018	11/18/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/2019	01/08/2018
18 - 26.5 GHz Horn Antenna	Seavey Division	MWH-1826/B	T89	01/18/2019	01/18/2018
Pre-Amp 1-26.5 GHz	Agilent	8449B	T404	03/09/2019	023/09/2018

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Rev 9.5, Jun 22, 2018
Antenna Port Software	UL	UL RF	Ver 8.5, Jul 12, 2018

<b>TEST EQUIPMENT LIST (SPOT CHECK)</b>					
<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>ID Num</b>	<b>Cal Due</b>	<b>Last Cal</b>
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	04/25/2019	04/25/2018
RF Amplifier, 1-18GHz, 35dB	MITEQ Inc	AMF-4D-01000800-30-29P	T1573	06/12/2019	06/12/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	04/16/2019	04/16/2018
Filter, LPF 5.0GHz	MICRO-TRONICS	LPS17541	T481	06/12/2019	06/12/2018
Filter, HPF 6.0HPF	MICRO-TRONICS	HPS17542	T484	06/12/2019	06/12/2018
Filter, HPF 3.0GHz	MICRO-TRONICS	HPM17543	T486	06/12/2019	06/12/2018
Thermometer - Digital	Control Company	14-650-118	PRE0177861	02/26/2019	02/26/2018

<b>Test Software List</b>			
<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Version</b>
Radiated Software	UL	UL EMC	Ver 9.5, June 22, 2018

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

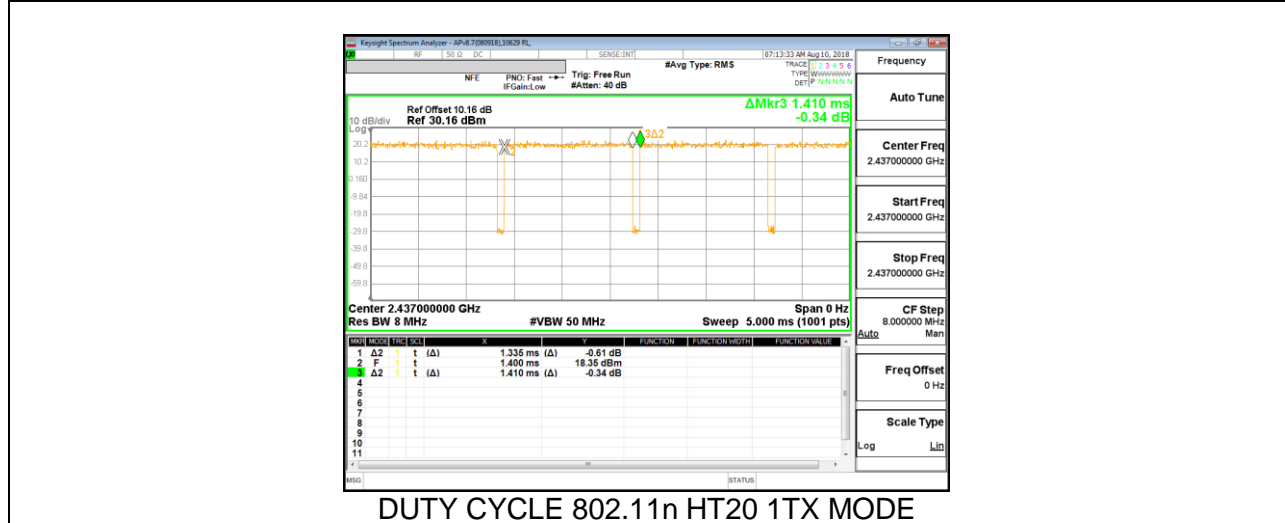
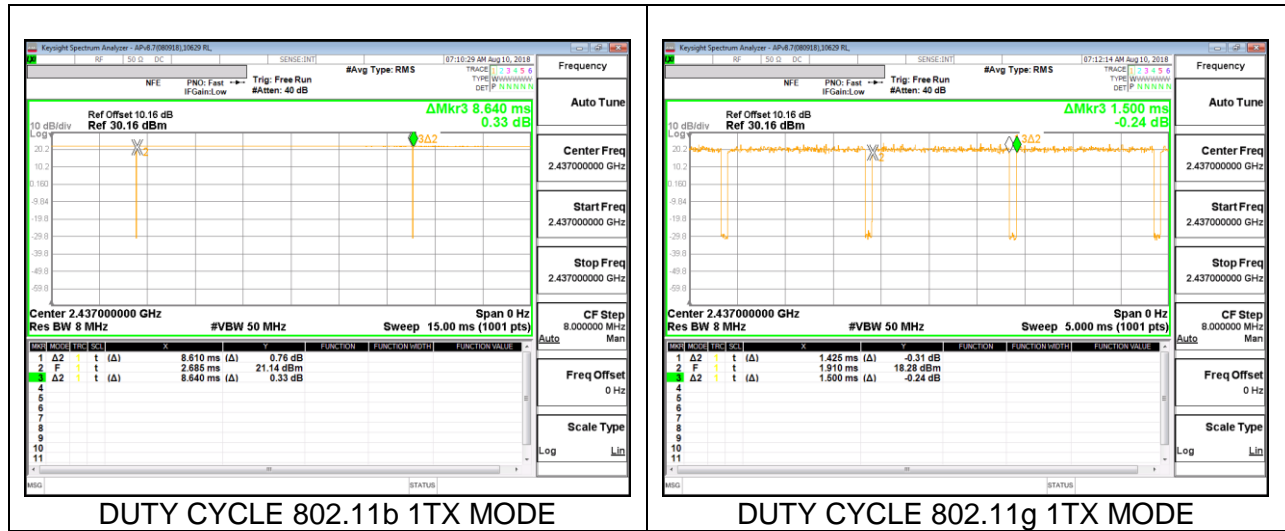
#### PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
<b>2.4GHz Band</b>						
802.11b 1TX	8.610	8.640	0.997	99.65%	0.00	0.010
802.11g 1TX	1.425	1.500	0.950	95.00%	0.22	0.702
802.11n HT20 1TX	1.335	1.410	0.947	94.68%	0.24	0.749

**DUTY CYCLE PLOTS**



## **9.2. 99% BANDWIDTH**

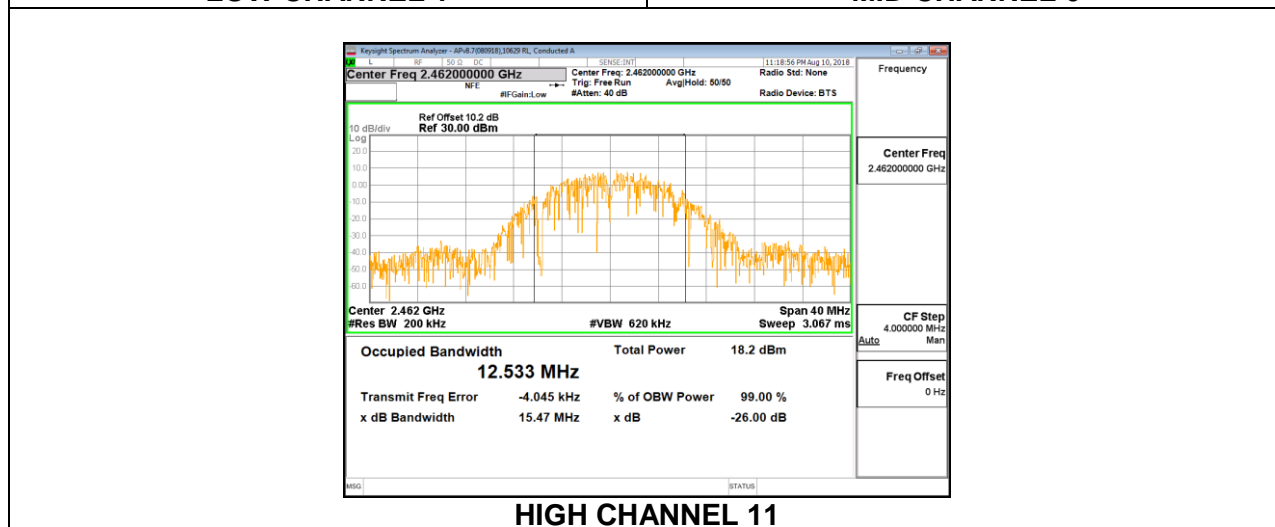
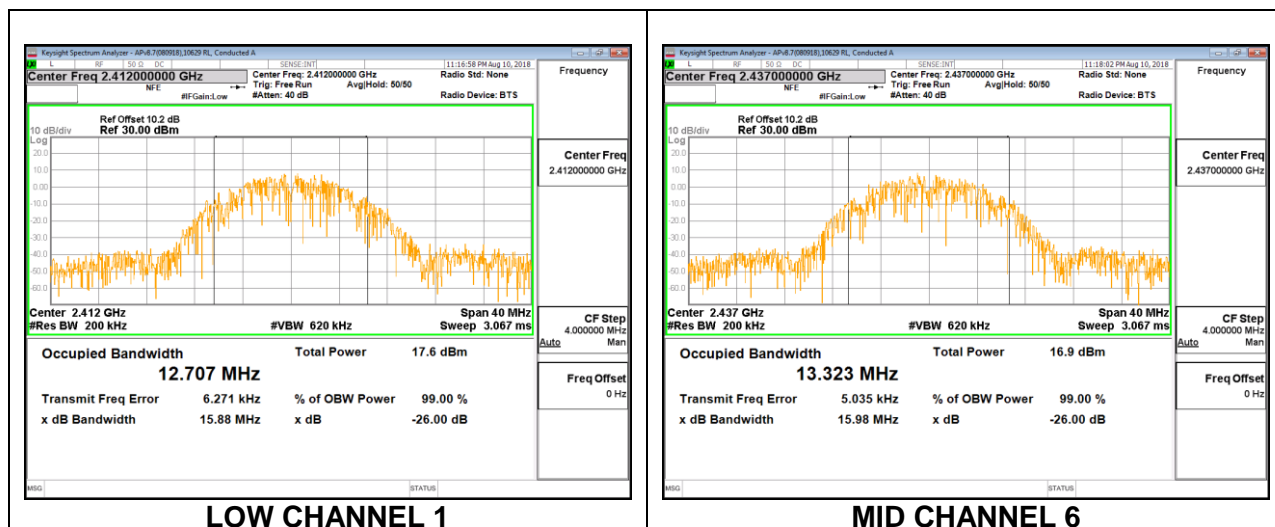
### **LIMITS**

None; for reporting purposes only.

### **RESULTS**

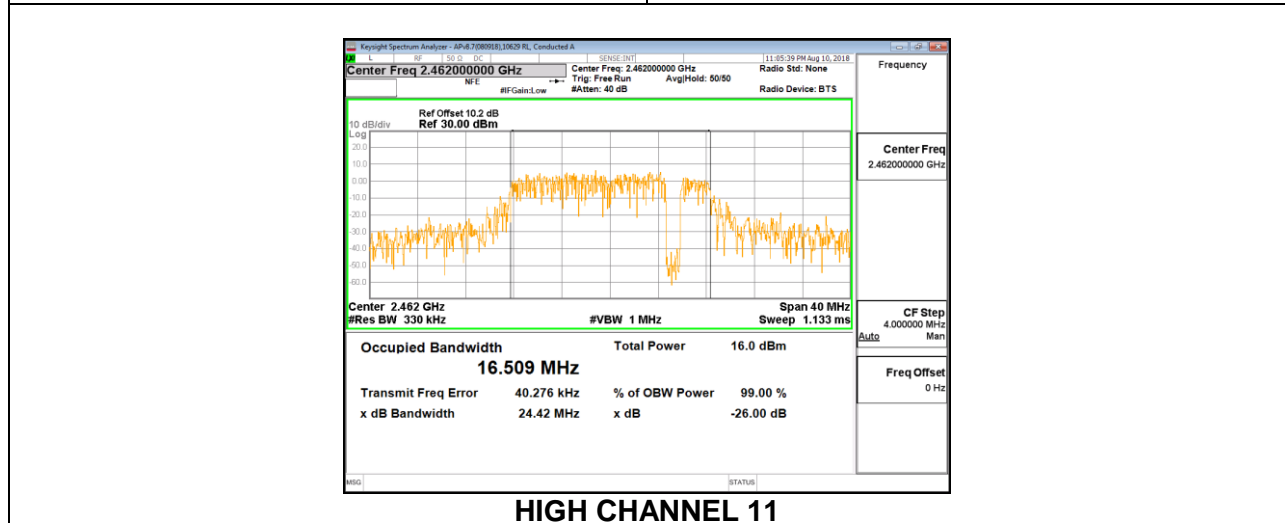
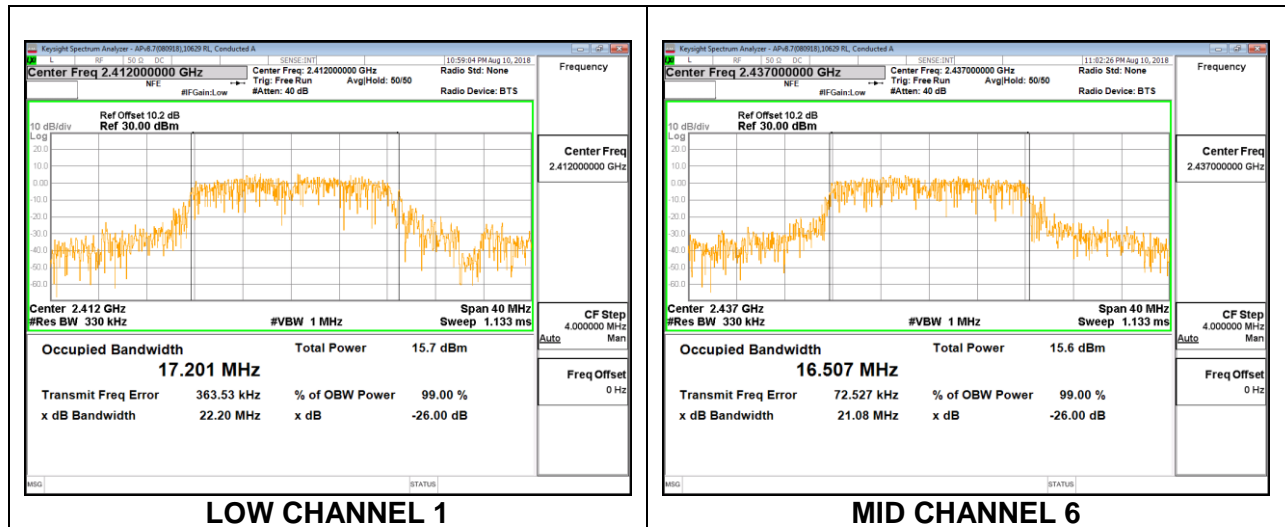
### 9.2.1. 802.11b MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.7070
Mid 6	2437	13.3230
High 11	2462	12.5330



### 9.2.2. 802.11g MODE

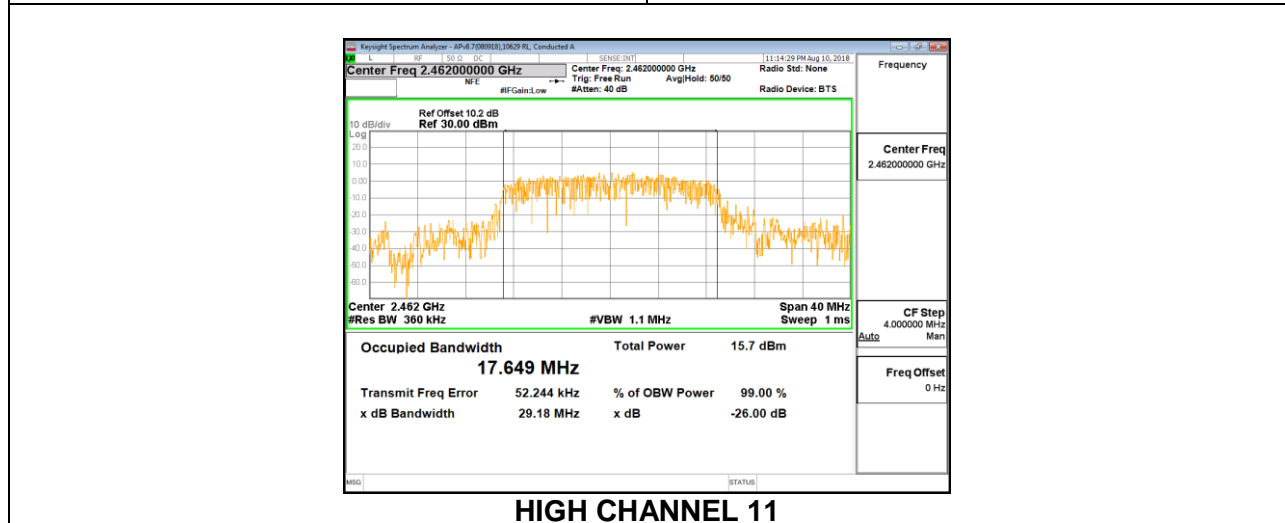
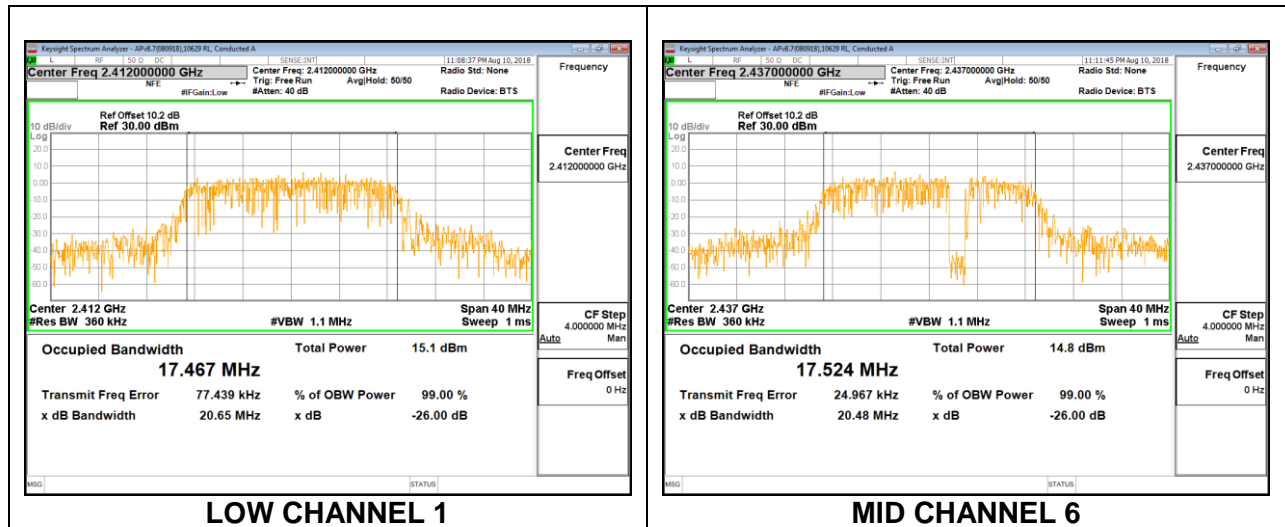
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.2010
Mid 6	2437	16.5070
High 11	2462	16.5090





### 802.11n HT20 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.4670
Mid 6	2437	17.5240
High 11	2462	17.6490



### **9.3. 6 dB BANDWIDTH**

#### **LIMITS**

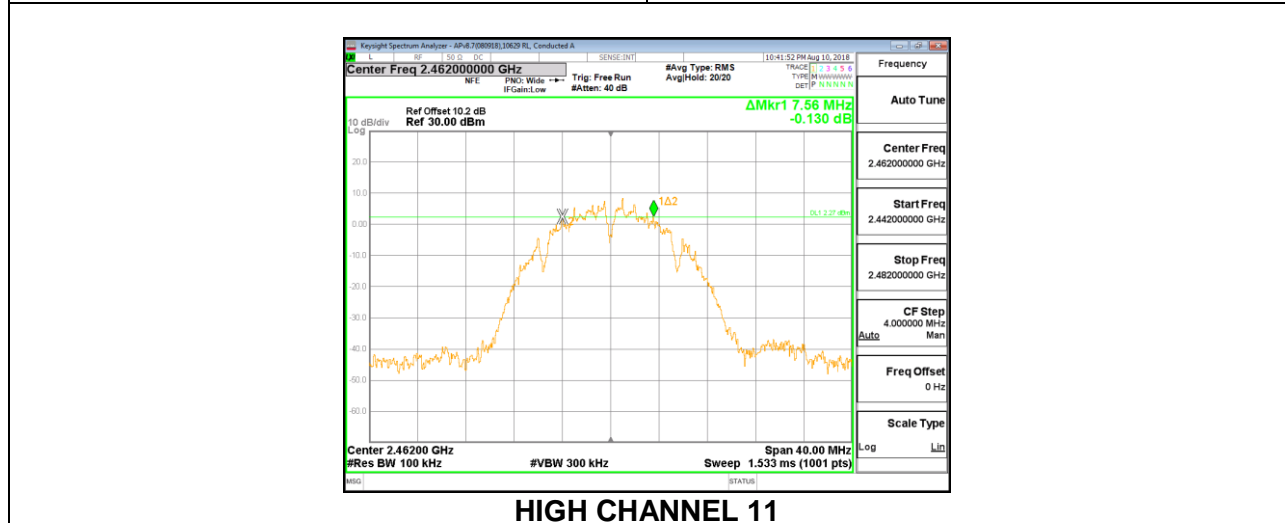
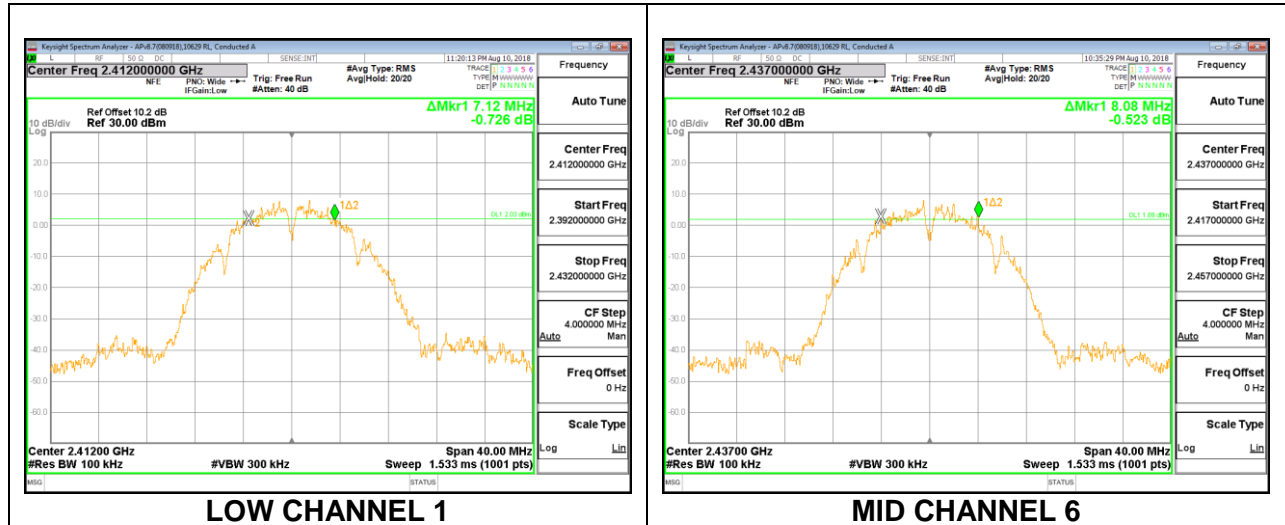
FCC §15.247 (a) (2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

#### **RESULTS**

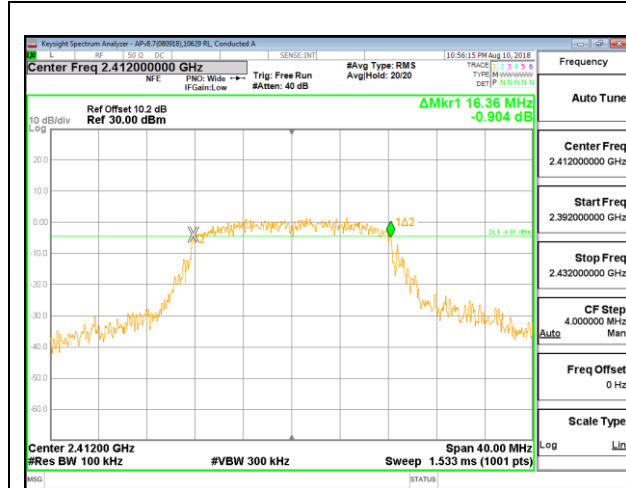
### 9.3.1. 802.11b MODE

Channel	Frequency	6 dB Bandwidth	Minimum Limit
	(MHz)	(MHz)	(MHz)
Low 1	2412	7.1200	0.5
Mid 6	2437	8.0800	0.5
High 11	2462	7.5600	0.5

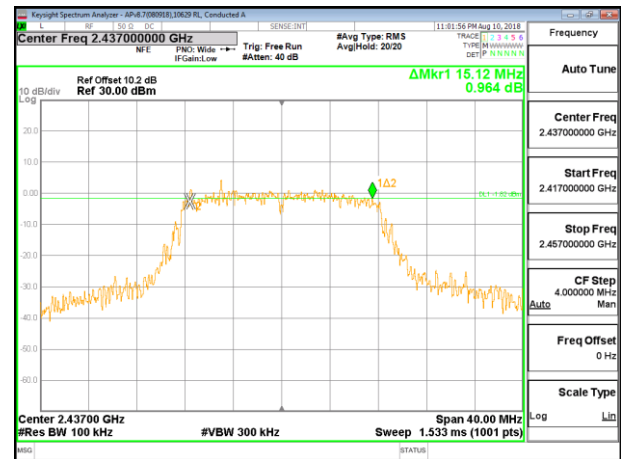


### 9.3.2. 802.11g MODE

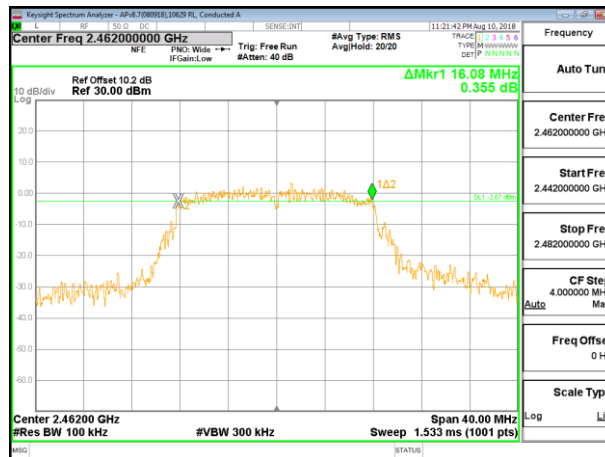
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	16.3600	0.5
Mid 6	2437	15.1200	0.5
High 11	2462	16.0800	0.5



LOW CHANNEL 1



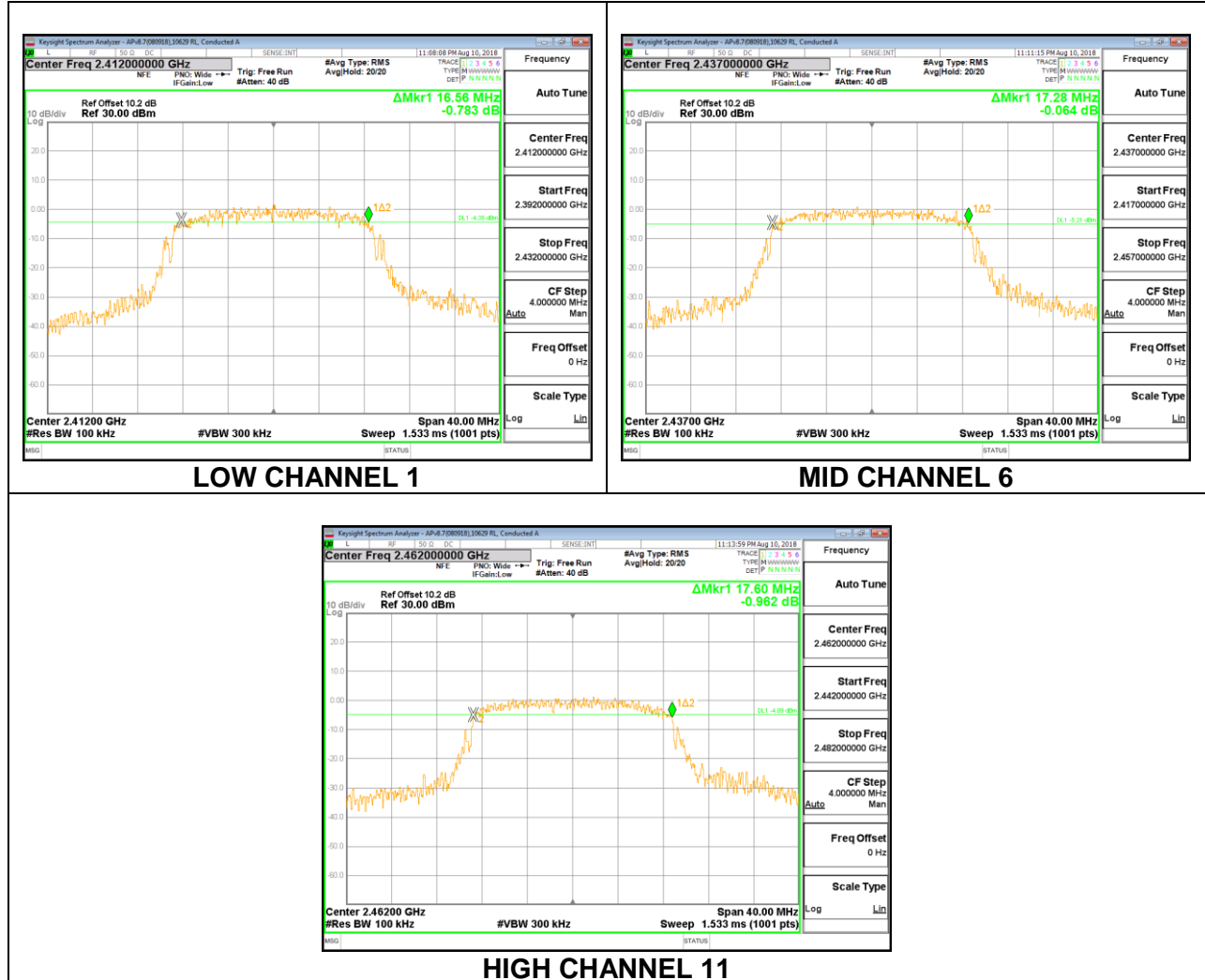
MID CHANNEL 6



HIGH CHANNEL 11

**9.3.3. 802.11n HT20 MODE**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	16.5600	0.5
Mid 6	2437	17.2800	0.5
High 11	2462	17.6000	0.5



## **9.4. OUTPUT POWER**

### **LIMITS**

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **TEST PROCEDURE**

The transmitter output is connected to a power meter. The cable assembly insertion loss was entered as an offset in the power meter to allow for a gated average reading of power.

### **DIRECTIONAL ANTENNA GAIN**

For 1 TX:

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

### **RESULTS**

### 9.4.1. 802.11b MODE

#### Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.71	30.00	30	36	30.00
Mid 6	2437	-1.71	30.00	30	36	30.00
High 11	2462	-1.71	30.00	30	36	30.00

#### Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	14.13	14.13	30.00	-15.87
Mid 6	2437	18.39	18.39	30.00	-11.61
High 11	2462	14.91	14.91	30.00	-15.09

### 9.4.2. 802.11g MODE

**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.71	30.00	30	36	30.00
Mid 6	2437	-1.71	30.00	30	36	30.00
High 11	2462	-1.71	30.00	30	36	30.00

**Results**

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.35	16.35	30.00	-13.65
Mid 6	2437	15.97	15.97	30.00	-14.03
High 11	2462	16.22	16.22	30.00	-13.78



**9.4.3. 802.11n HT20 MODE**

**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.71	30.00	30	36	30.00
Mid 6	2437	-1.71	30.00	30	36	30.00
High 11	2462	-1.71	30.00	30	36	30.00

**Results**

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	15.99	15.99	30.00	-14.01
Mid 6	2437	16.35	16.35	30.00	-13.65
High 11	2462	14.15	14.15	30.00	-15.85

---

## 9.5. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

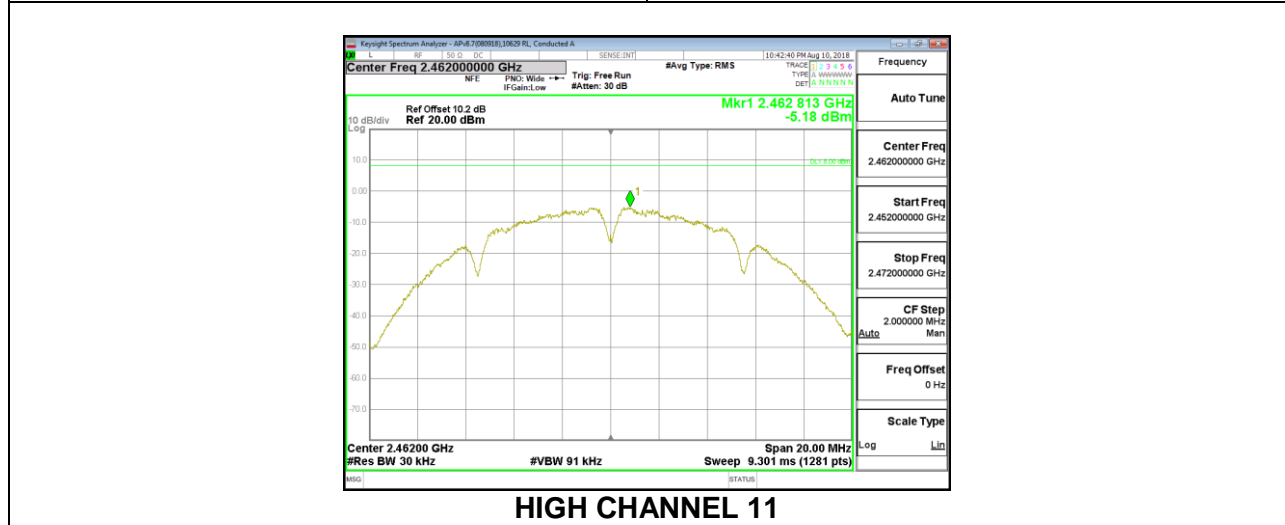
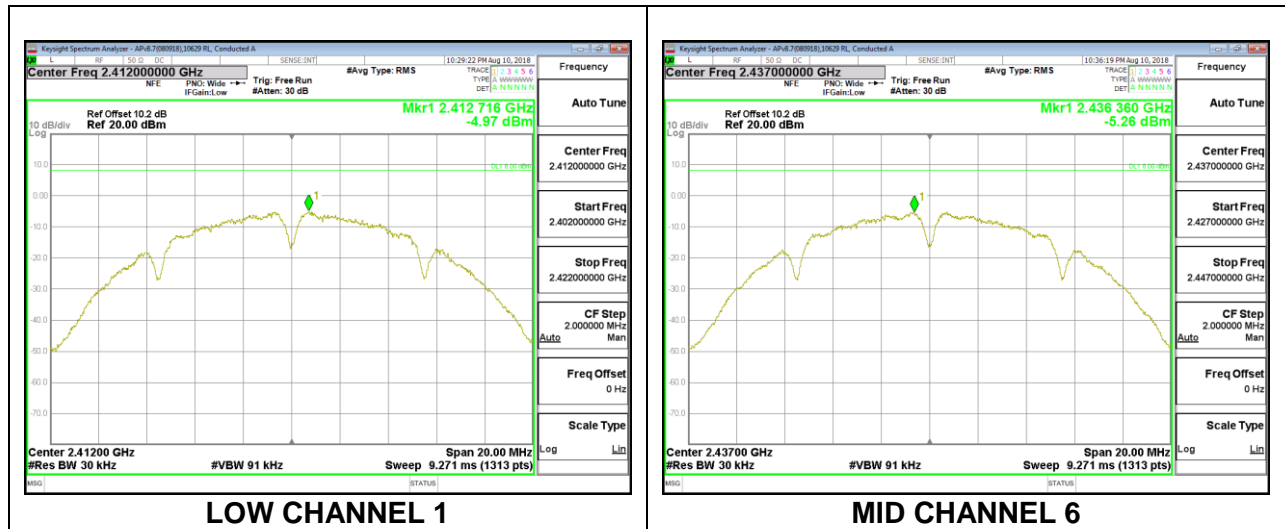
### RESULTS

### 9.5.1. 802.11b MODE

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
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#### PSD Results

Channel	Frequency (MHz)	Meas (dBm/30kHz)	Total Corr'd PSD (dBm/30kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-4.97	-4.97	8.0	-13.0
Mid 6	2437	-5.26	-5.26	8.0	-13.3
High 11	2462	-5.18	-5.18	8.0	-13.2

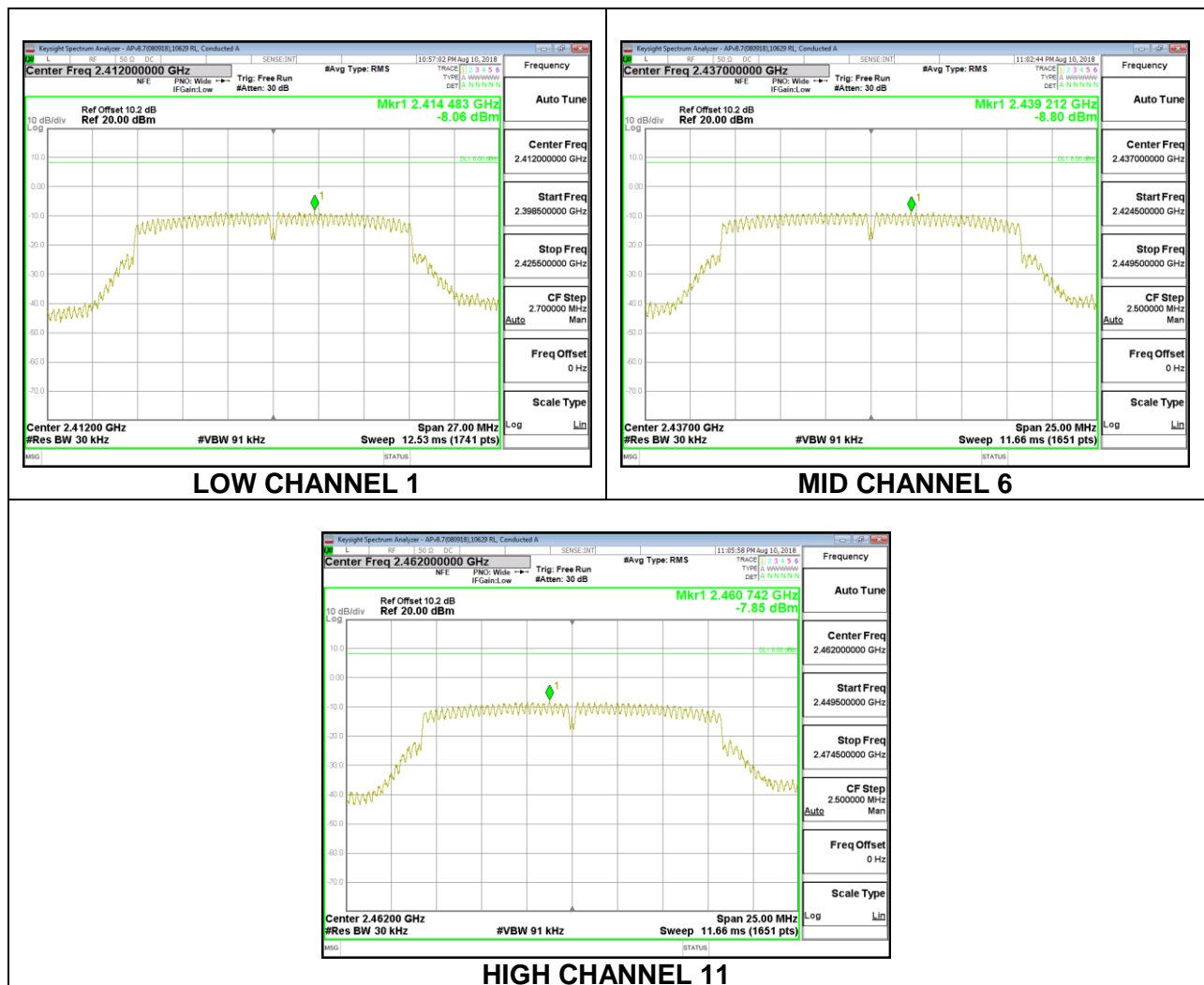


### 9.5.2. 802.11g MODE

<b>Duty Cycle CF (dB)</b>	0.22	<b>Included in Calculations of Corr'd PSD</b>
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#### PSD Results

Channel	Frequency (MHz)	Meas (dBm/30kHz)	Total Corr'd PSD (dBm/30kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-8.06	-7.84	8.0	-15.8
Mid 6	2437	-8.80	-8.58	8.0	-16.6
High 11	2462	-7.85	-7.63	8.0	-15.6

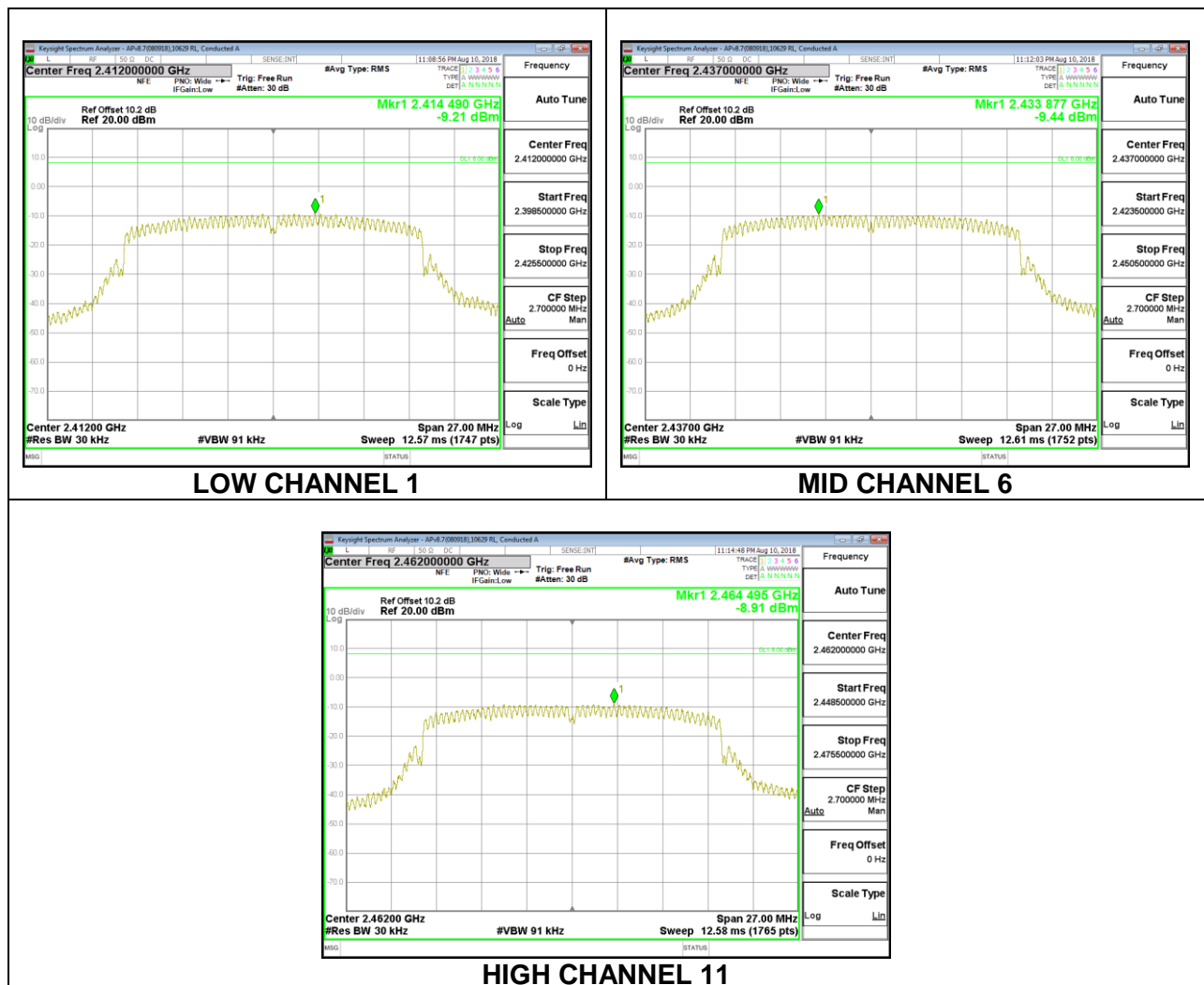


### 9.5.3. 802.11n HT20 MODE

<b>Duty Cycle CF (dB)</b>	0.24	<b>Included in Calculations of Corr'd PSD</b>
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**PSD Results**

Channel	Frequency (MHz)	Meas (dBm/30kHz)	Total Corr'd PSD (dBm/30kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-9.21	-8.97	8.0	-17.0
Mid 6	2437	-9.44	-9.20	8.0	-17.2
High 11	2462	-8.91	-8.67	8.0	-16.7



## 9.6. CONDUCTED SPURIOUS EMISSIONS

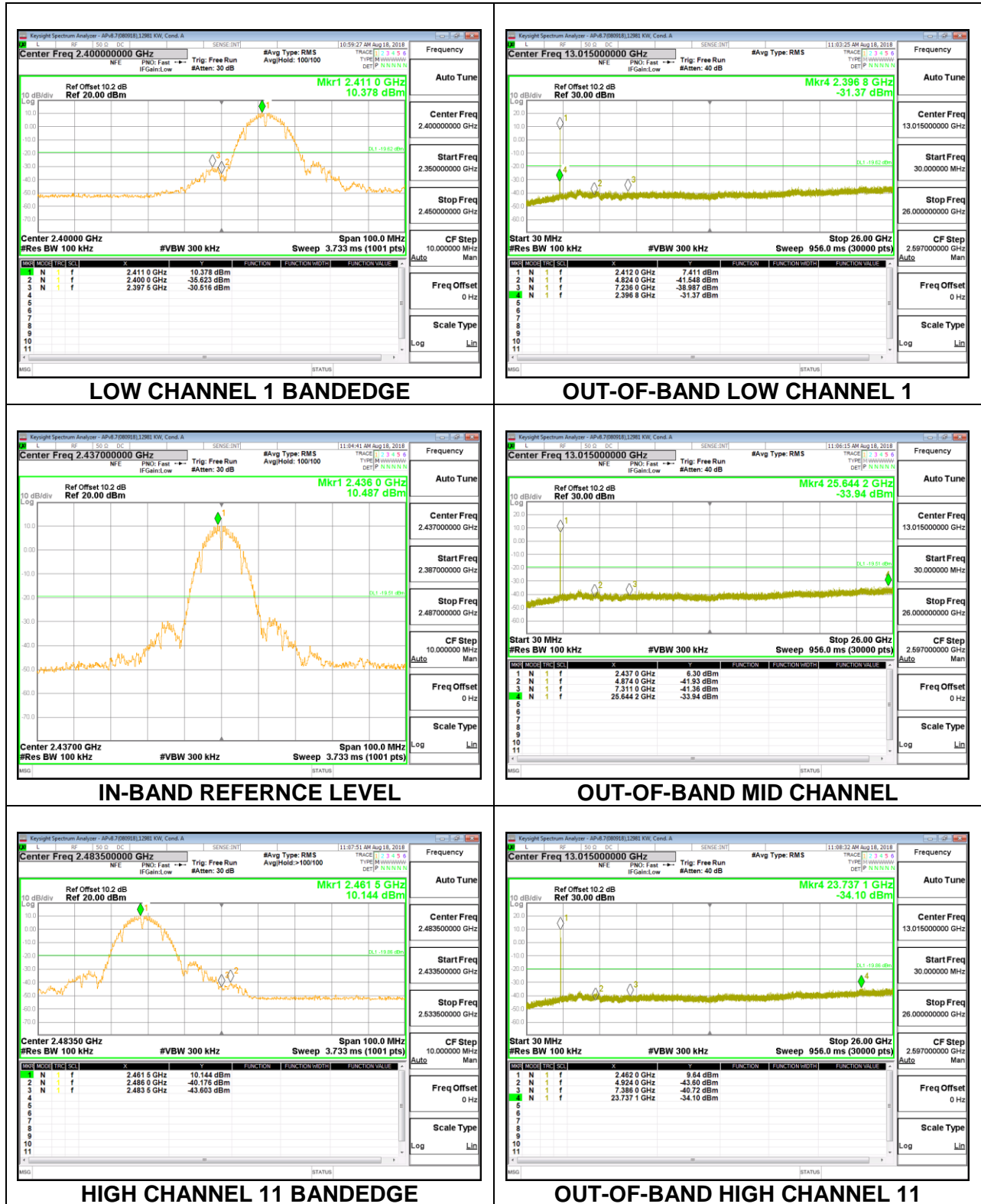
### LIMITS

FCC §15.247 (d)

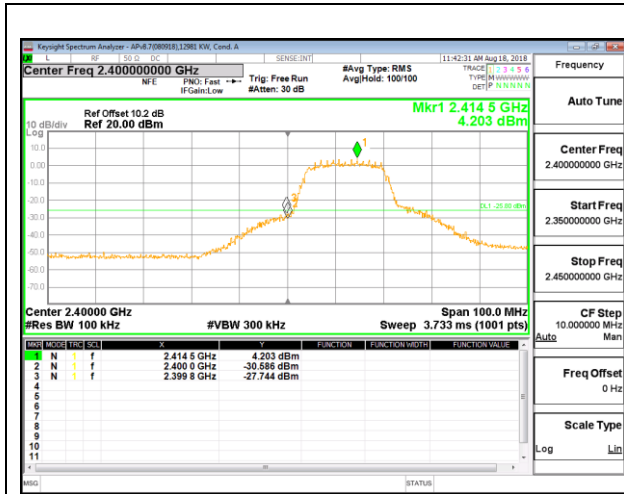
Output power was measured based on the use of average measurement, therefore the required attenuation is 30 dB.

### RESULTS

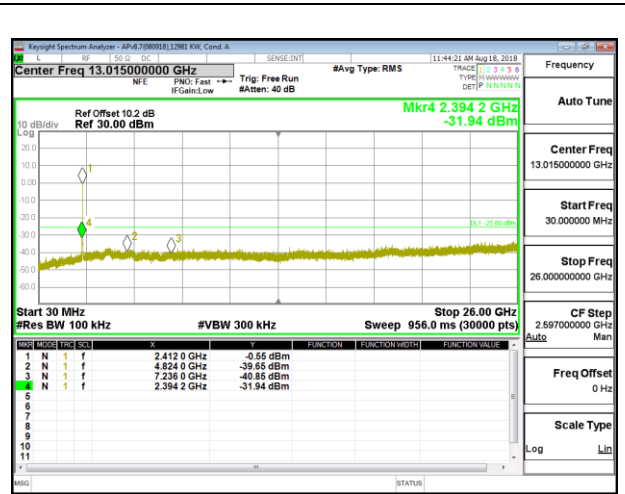
### 9.6.1. 802.11b MODE



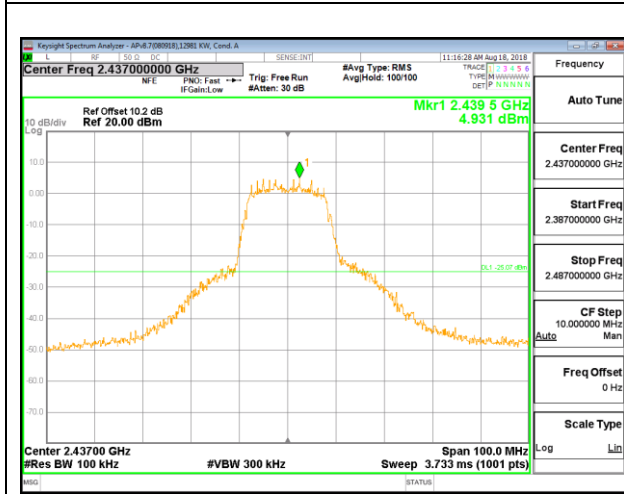
### 9.6.2. 802.11g MODE



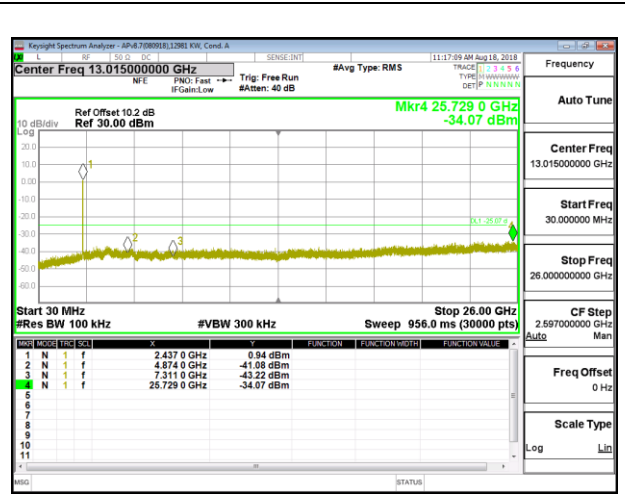
**LOW CHANNEL 1 BANDEDGE**



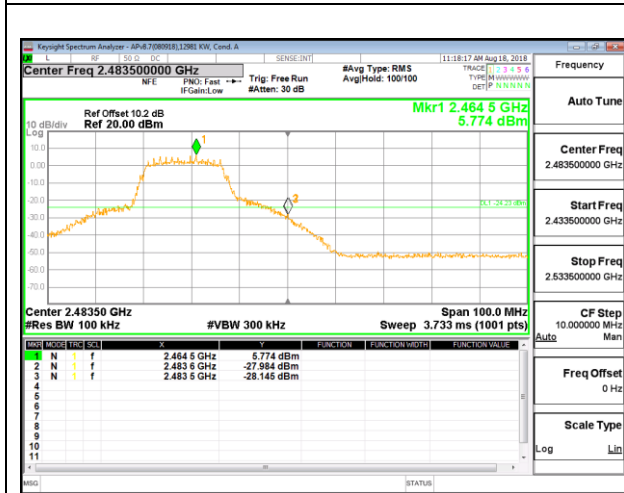
**OUT-OF-BAND LOW CHANNEL 1**



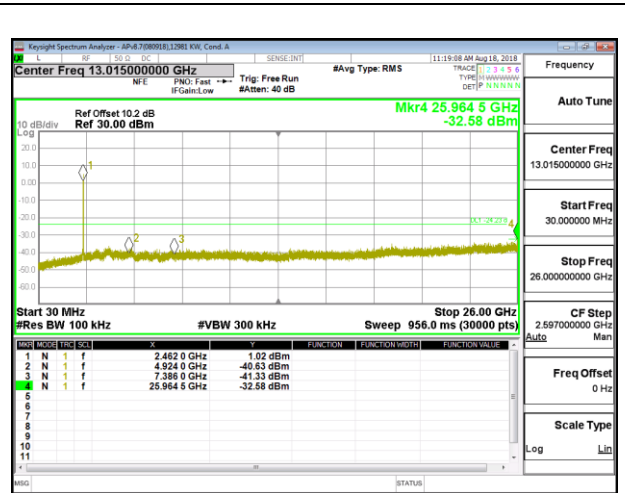
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



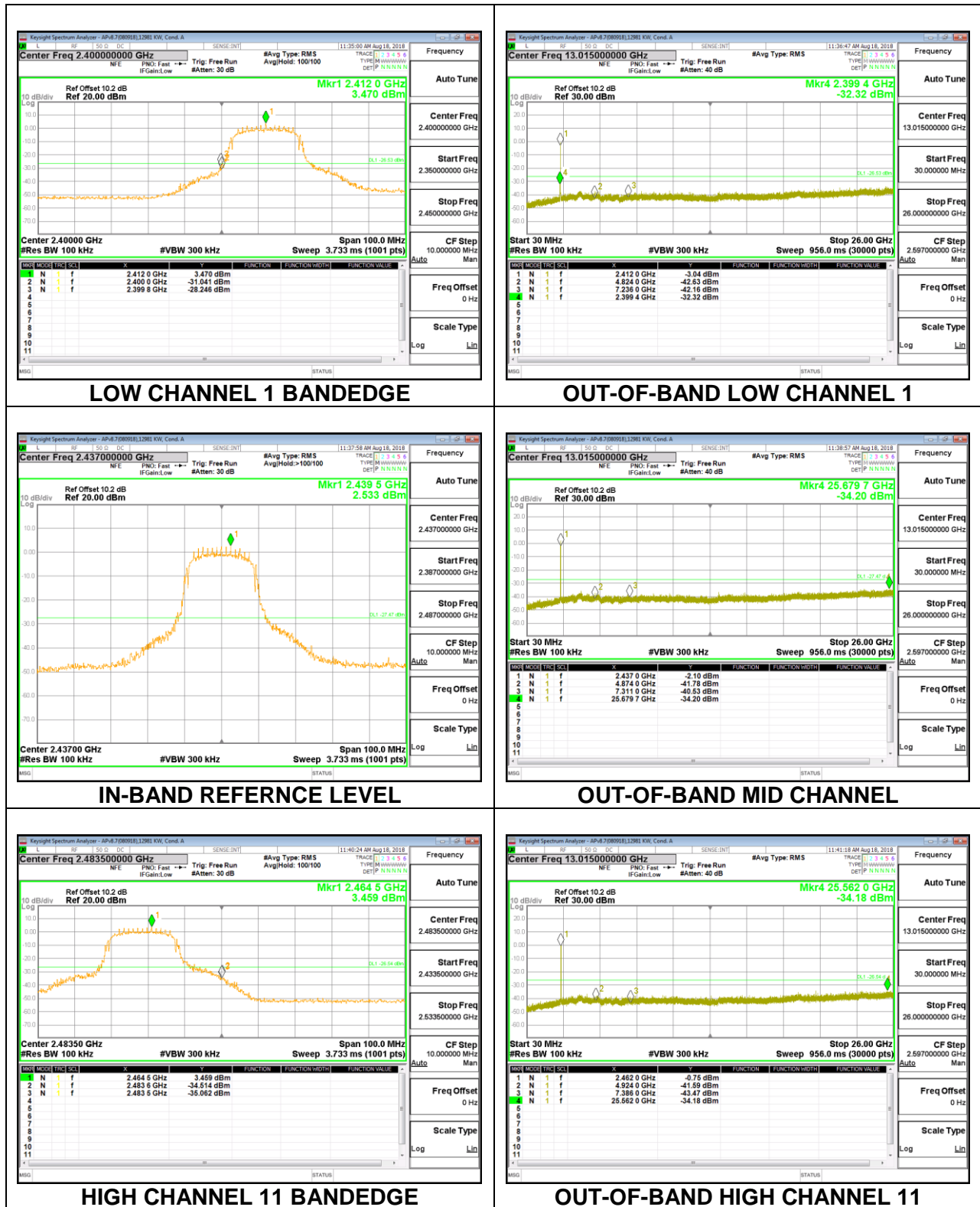
**HIGH CHANNEL 11 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 11**



9.6.3. 802.11n HT20 MODE



## 10. RADIATED TEST RESULTS

### LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

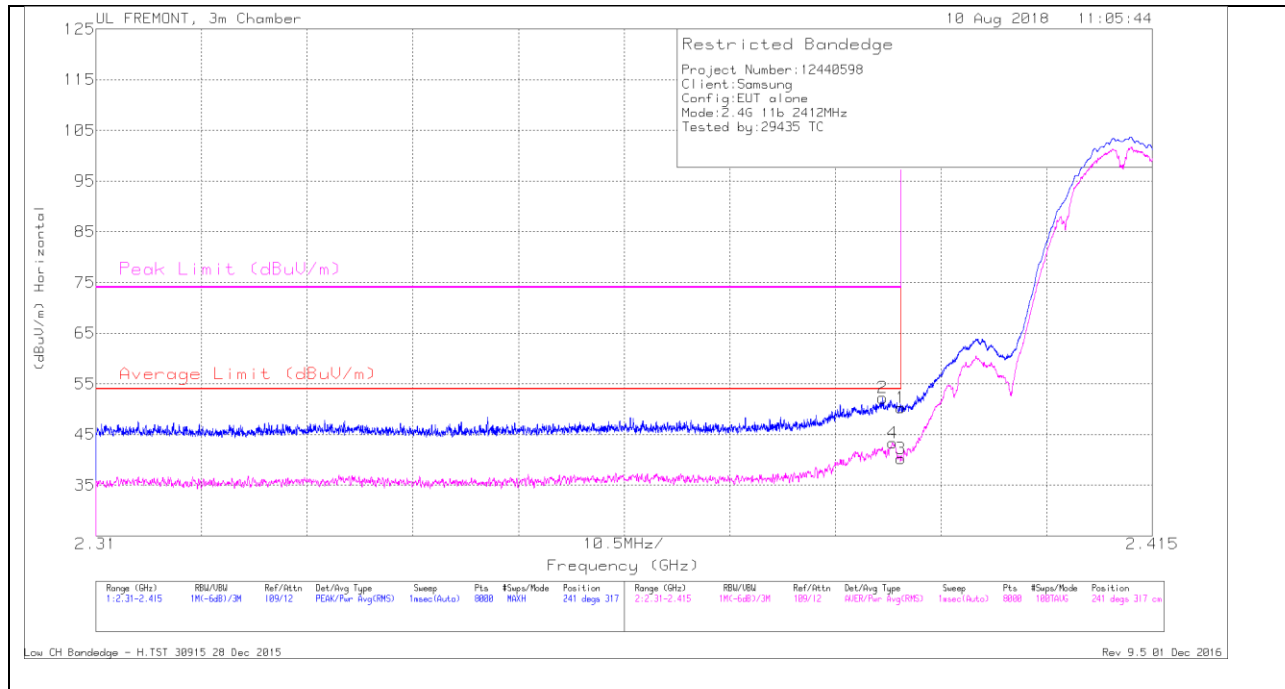
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

## 10.1. TRANSMITTER ABOVE 1 GHz

### 10.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

#### BANDEDGE (LOW CHANNEL, CH 1)

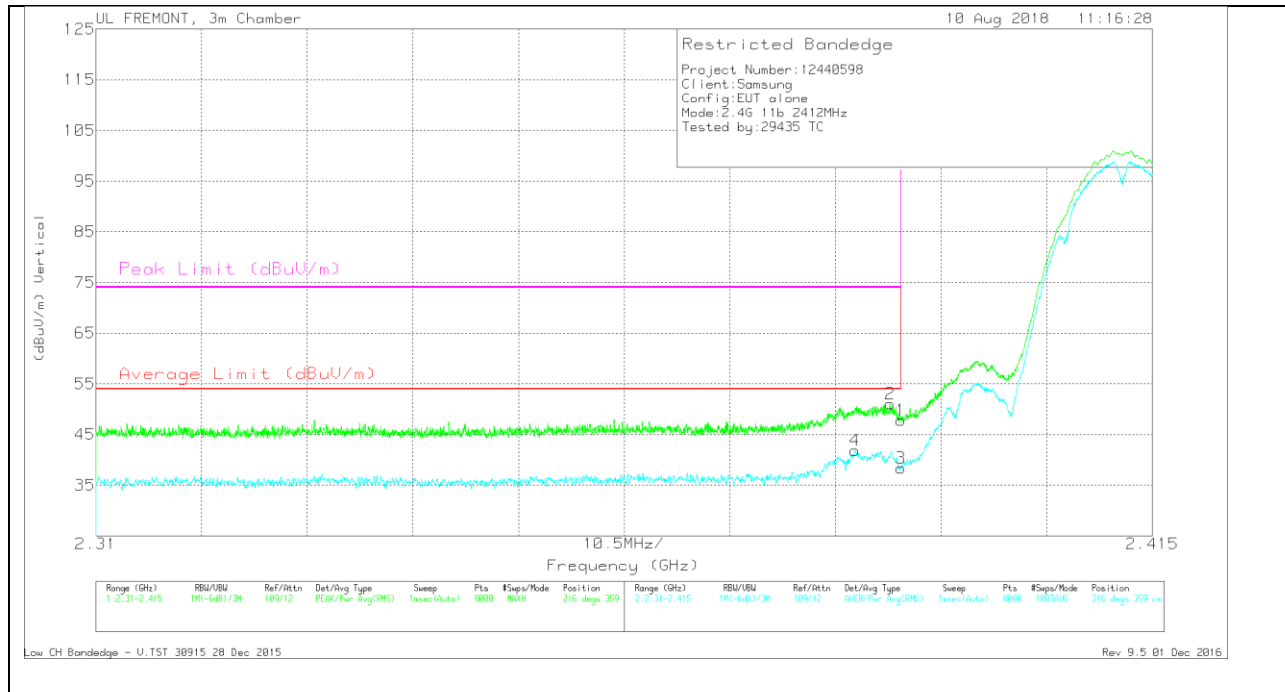
#### HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFT346 (dB/m)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.388	41.52	Pk	32	-21.3	52.22	-	-	74	-21.78	241	317	H
4	2.389	32.7	RMS	32	-21.4	43.3	54	-10.7	-	-	241	317	H
1	2.39	39.72	Pk	32	-21.4	50.32	-	-	74	-23.68	241	317	H
3	2.39	29.68	RMS	32	-21.4	40.28	54	-13.72	-	-	241	317	H

Pk - Peak detector  
 RMS - RMS detection

### VERTICAL RESULT

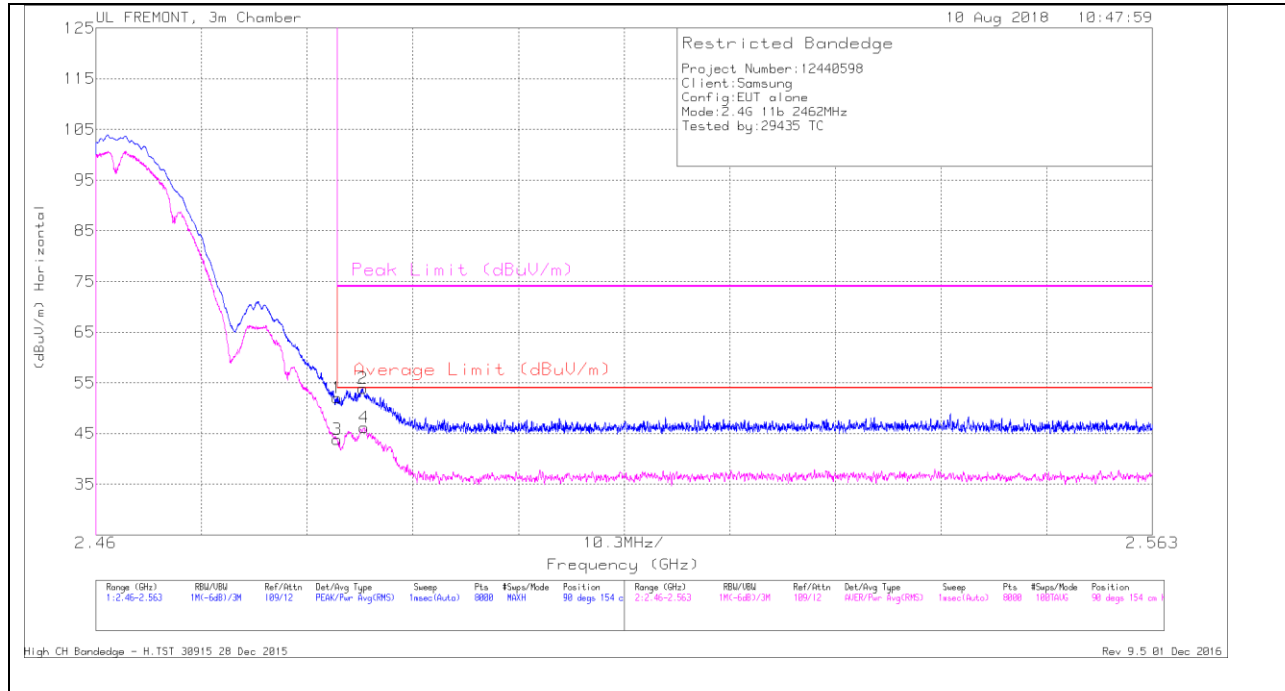


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.385	30.97	RMS	32.1	-21.2	41.87	54	-12.13	-	-	216	359	V
2	2.389	40.39	Pk	32	-21.4	50.99	-	-	74	-23.01	216	359	V
1	2.39	37.23	Pk	32	-21.4	47.83	-	-	74	-26.17	216	359	V
3	2.39	27.74	RMS	32	-21.4	38.34	54	-15.66	-	-	216	359	V

Pk - Peak detector  
 RMS - RMS detection

**BANDEDGE (HIGH CHANNEL, CH 11)**

**HORIZONTAL RESULT**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Ftr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	41.5	Pk	32.3	-21.8	52	-	-	74	-22	90	154	H
3	2.484	33.37	RMS	32.3	-21.8	43.87	54	-10.13	-	-	90	154	H
2	2.486	43.42	Pk	32.3	-21.8	53.92	-	-	74	-20.08	90	154	H
4	2.486	35.68	RMS	32.3	-21.8	46.18	54	-7.82	-	-	90	154	H

Pk - Peak detector  
 RMS - RMS detection