FCC Test Report

Product Name	23.1 inches Bar type Digital Signage
Model No	D230
FCC ID.	S8CD230

Applicant	Shuttle Inc.
Address	No.30,Lane76,Rei Kuang Rd.,Nei-Hu Dist.,Taipei, Taiwan R.O.C.

Date of Receipt	Aug. 29, 2019
Issue Date	Nov. 12, 2019
Report No.	1980460R-RFUSP01V00-B
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
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The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

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Issue Date: Nov. 12, 2019
Report No.: 1980460R-RFUSP01V00-B

Product Name	23.1 inches Bar type Digital Signage
Applicant	Shuttle Inc.
Address	No.30,Lane76,Rei Kuang Rd.,Nei-Hu Dist.,Taipei, Taiwan R.O.C.
Manufacturer	Shuttle Inc.
Model No.	D230
FCC ID.	S8CD230
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	Shuttle
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Rita Huang

(Senior Adm. Specialist / Rita Huang)

Tested By : Jay Su

(Engineer / Jay Su)

Approved By :

(Director / Vincent Lin)

TABLE OF CONTENTS

	Description	Page
1.	**GENERAL INFORMATION**	**5**
1.1.	EUT Description	5
1.2.	Operational Description	7
1.3.	Tested System Details	8
1.4.	Configuration of Tested System	8
1.5.	EUT Exercise Software	9
1.6.	Test Facility	10
1.7.	List of Test Equipment	11
2.	**Conducted Emission**	**13**
2.1.	Test Setup	13
2.2.	Limits	14
2.3.	Test Procedure	14
2.4.	Uncertainty	14
2.5.	Test Result of Conducted Emission	15
3.	**Peak Power Output**	**19**
3.1.	Test Setup	19
3.2.	Limits	19
3.3.	Test Procedure	19
3.4.	Uncertainty	19
3.5.	Test Result of Peak Power Output	20
4.	**Radiated Emission**	**23**
4.1.	Test Setup	23
4.2.	Limits	24
4.3.	Test Procedure	25
4.4.	Uncertainty	26
4.5.	Test Result of Radiated Emission	27
5.	**RF antenna conducted test**	**52**
5.1.	Test Setup	52
5.2.	Limits	52
5.3.	Test Procedure	52
5.4.	Uncertainty	52
5.5.	Test Result of RF antenna conducted test	53
6.	**Band Edge**	**56**
6.1.	Test Setup	56
6.2.	Limits	57
6.3.	Test Procedure	57
6.4.	Uncertainty	58
6.5.	Test Result of Band Edge	59
7.	**6dB Bandwidth**	**83**
7.1.	Test Setup	83
7.2.	Limits	83

7.3. Test Procedure 83
7.4. Uncertainty 83
7.5. Test Result of 6dB Bandwidth....84

8. Power Density 90

8.1. Test Setup 90
8.2. Limits 90
8.3. Test Procedure 90
8.4. Uncertainty 90
8.5. Test Result of Power Density 91

9. Duty Cycle 97

9.1. Test Setup 97
9.2. Test Procedure 97
9.3. Uncertainty 97
9.4. Test Result of Duty Cycle....98

10. EMI Reduction Method During Compliance Testing 101

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	23.1 inches Bar type Digital Signage
Trade Name	Shuttle
Model No.	D230
FCC ID.	S8CD230
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW
Number of Channels	802.11b/g/n-20MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 150Mbps
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PCB Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Power Adapter	MFR: APD, M/N: WA-24Q12FU Input: 100-240V, 50-60Hz, 0.7A Output: 12V, 2A Cable out: Non-Shielded, 1.8m, with one ferrite core bonded.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	WGT	43R-D23001-0300	PCB Antenna	3.2dBi for 2.4 GHz

Note:

1. The antenna of EUT conforms to FCC 15.203.

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

Note:

1. The EUT is a 23.1 inches Bar type Digital Signage,Contains functions and so on WLAN (802.11a/b/g/n/ac) with Bluetooth (5.0 and V3.0, V2.1+EDR) combo card module transceiver, this report for 5GHz WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps、802.11g is 6Mbps、802.11n(20M-BW) is 7.2Mbps
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

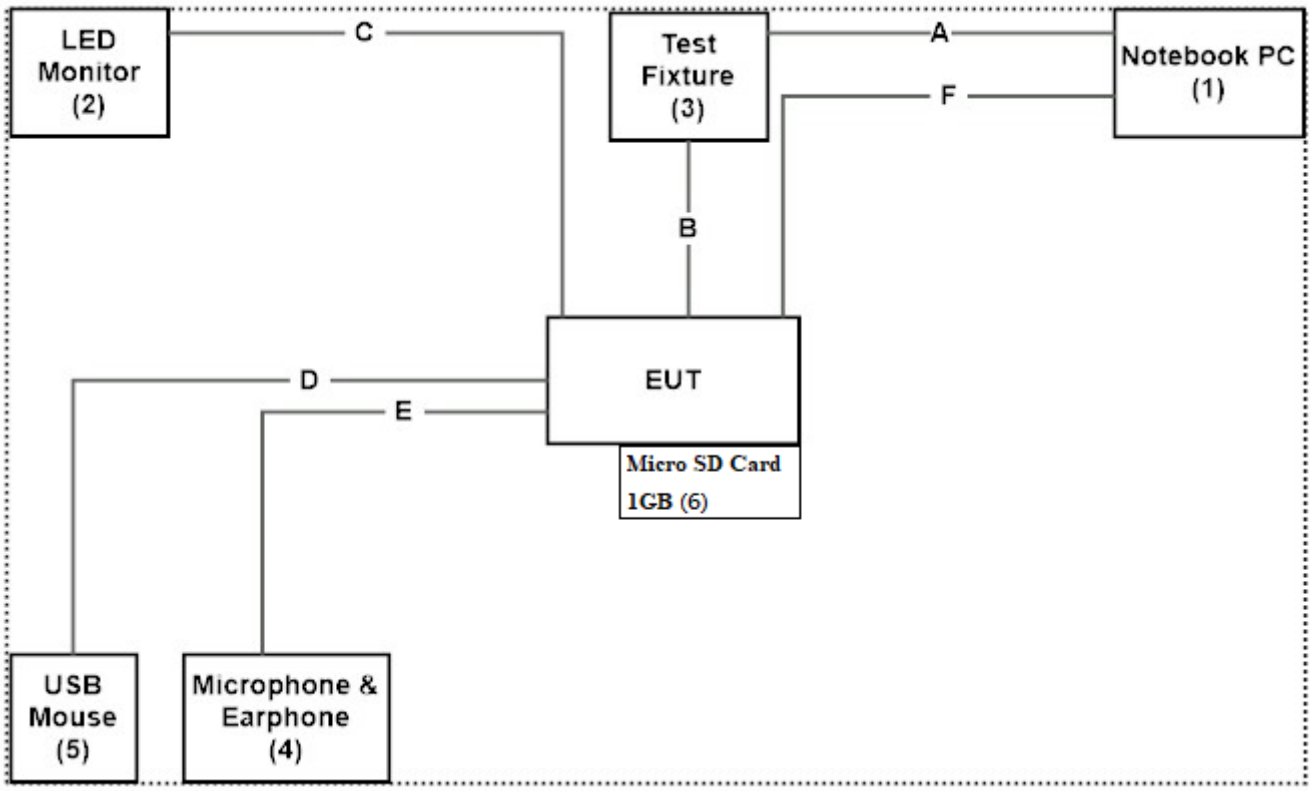
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5491	1PL56S2	Non-Shielded, 0.8m
2	LED Monitor	ViewSonic	VX2257-mhd	UFY163502150	Non-Shielded, 1.8m
3	Test Fixture	N/A	N/A	N/A	N/A
4	Microphone & Earphone	RONEVER	MOE241	N/A	N/A
5	USB Mouse	Logitech	M-U0026	1245HS0684F8	N/A
6	Micro SD Card 1GB	SanDisk	N/A	0801002841D2N	N/A

Signal Cable Type		Signal cable Description
A	Test Fixture Cable	Non-Shielded, 1.2m
B	Test Fixture Cable	Non-Shielded, 0.2m
C	HCMI Cable	Non-Shielded, 1.8m
D	USB Cable	Shielded, 1.8m
E	Microphone & Earphone Cable	Non-Shielded, 1.2m
F	LAN Cable	Non-Shielded, 2.0m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Ampak RF Test Tool (Ver6.1)” on the Notebook PC.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	23°C
	Humidity (%RH)	10~90 %	70%
Radiated Emission	Temperature (°C)	10~40 °C	25°C
	Humidity (%RH)	10~90 %	72%
Conductive	Temperature (°C)	10~40 °C	23°C
	Humidity (%RH)	10~90 %	70%

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: http://www.dekra.com.tw

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/02/12	2020/02/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2019/10/13	2020/10/12
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/08/01	2020/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/25	2020/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/25	2020/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2019/11/07	2020/11/06
X	LISN	R&S	ESH3-Z5	836679/017	2019/02/09	2020/02/08
X	LISN	R&S	ENV216	100097	2019/02/09	2020/02/08
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2019/06/21	2020/06/20

For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2019/03/12	2020/03/11
	Loop Antenna	Teseq	HLA6121	37133	2019/10/13	2021/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2019/06/24	2020/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2019/06/14	2020/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2019/06/14	2020/06/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2019/05/03	2020/05/02
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2019/04/10	2020/04/09
X	Horn Antenna	Com-Power	AH-1840	101043	2019/01/09	2020/01/08
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2019/03/21	2020/03/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/06	2020/08/05
X	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/06	2020/08/05

Note:

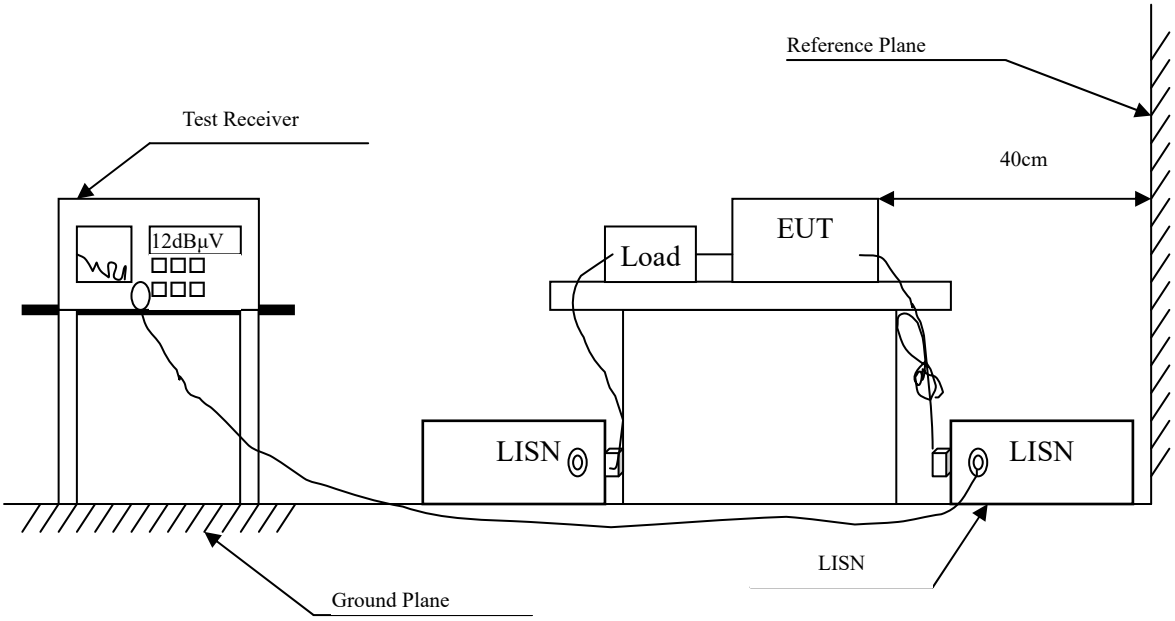
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113.

1.8. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

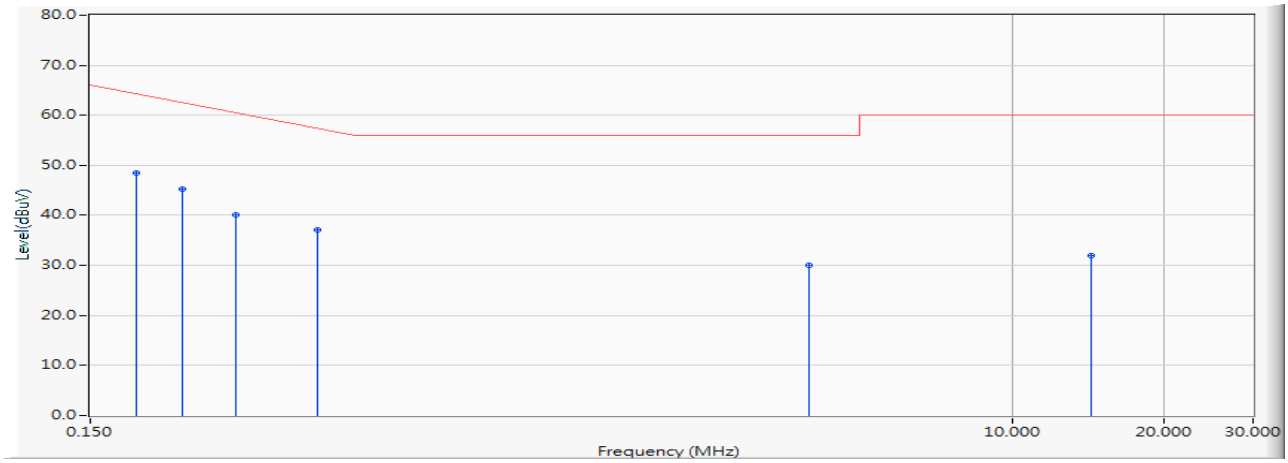
2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : 23.1 inches Bar type Digital Signage
Test Item : Conducted Emission Test
Power Line : Line 1
Test Date : 2019/10/04
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

Line1



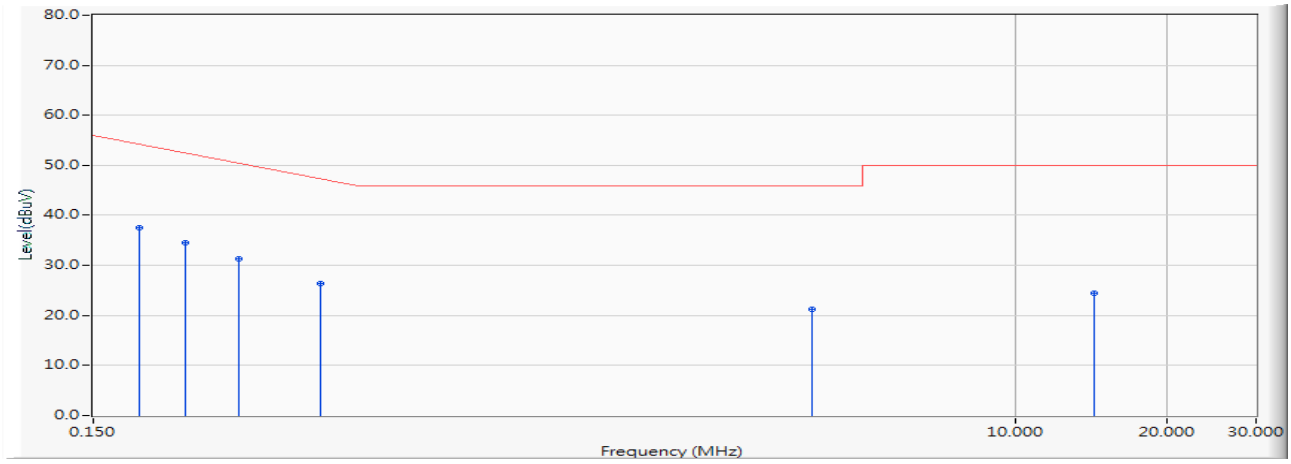
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.185	9.670	38.720	48.390	-16.610	65.000	QUASIPEAK
2		0.228	9.672	35.480	45.152	-18.619	63.771	QUASIPEAK
3		0.291	9.675	30.520	40.195	-21.776	61.971	QUASIPEAK
4		0.423	9.683	27.500	37.183	-21.017	58.200	QUASIPEAK
5		3.974	9.840	20.200	30.040	-25.960	56.000	QUASIPEAK
6		14.330	10.090	21.780	31.870	-28.130	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "*" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Date	:	2019/10/04
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

Line1



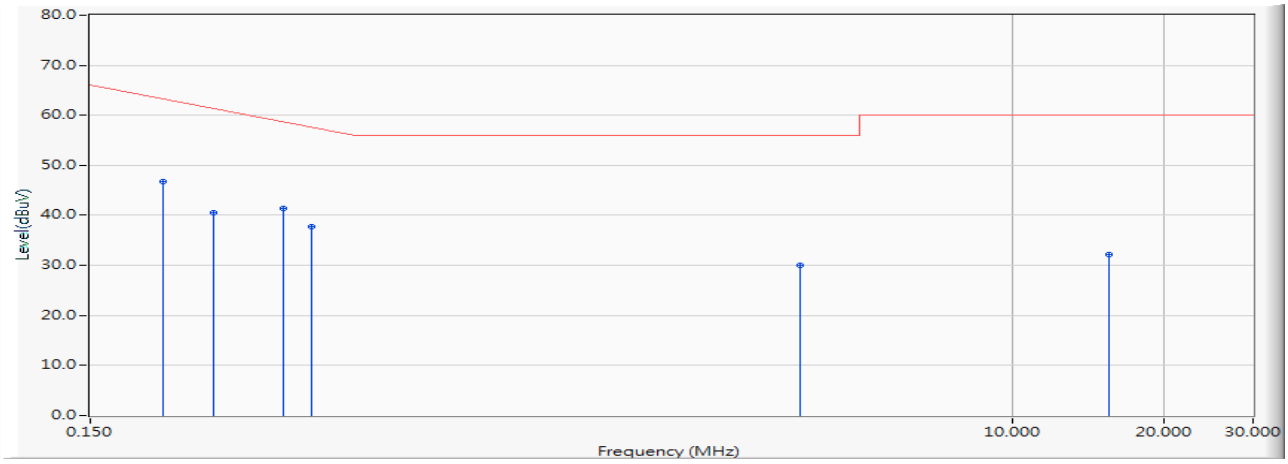
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.185	9.670	27.860	37.530	-17.470	55.000	AVERAGE
2		0.228	9.672	24.790	34.462	-19.309	53.771	AVERAGE
3		0.291	9.675	21.550	31.225	-20.746	51.971	AVERAGE
4		0.423	9.683	16.690	26.373	-21.827	48.200	AVERAGE
5		3.974	9.840	11.420	21.260	-24.740	46.000	AVERAGE
6		14.330	10.090	14.380	24.470	-25.530	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "*" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test Date	:	2019/10/04
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

Line2



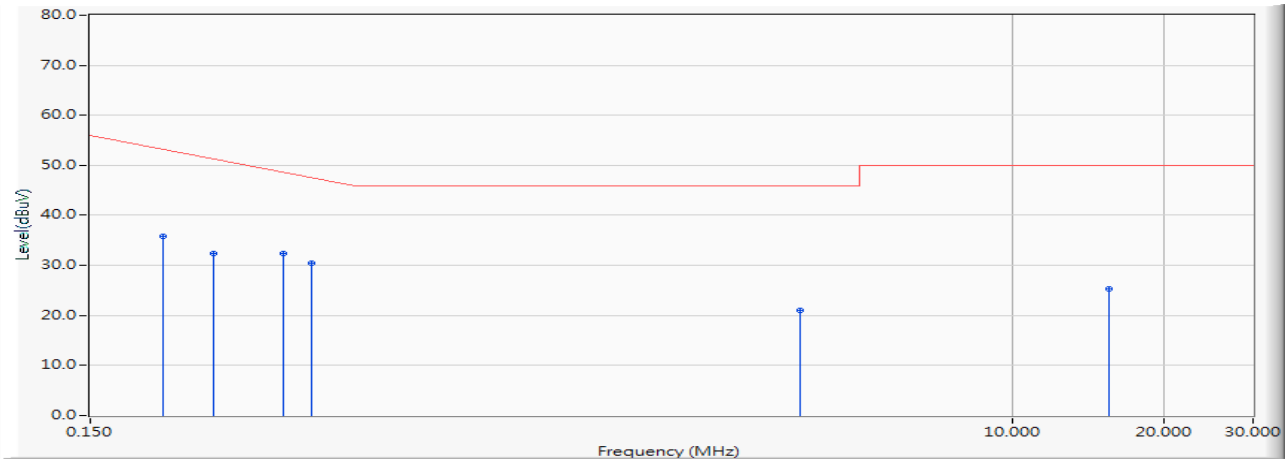
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.209	9.701	37.080	46.781	-17.533	64.314	QUASIPEAK
2		0.263	9.704	30.900	40.604	-22.167	62.771	QUASIPEAK
3		0.361	9.709	31.780	41.489	-18.482	59.971	QUASIPEAK
4		0.412	9.712	28.080	37.792	-20.722	58.514	QUASIPEAK
5		3.802	9.876	20.220	30.096	-25.904	56.000	QUASIPEAK
6		15.537	10.242	21.900	32.142	-27.858	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "*" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test Date	:	2019/10/04
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

Line2



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.209	9.701	26.150	35.851	-18.463	54.314	AVERAGE
2		0.263	9.704	22.710	32.414	-20.357	52.771	AVERAGE
3	*	0.361	9.709	22.710	32.419	-17.552	49.971	AVERAGE
4		0.412	9.712	20.670	30.382	-18.132	48.514	AVERAGE
5		3.802	9.876	11.230	21.106	-24.894	46.000	AVERAGE
6		15.537	10.242	15.100	25.342	-24.658	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "*" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup

3.2. Limits

The maximum peak power shall be less 1 Watt.

3.3. Test Procedure

Tested according to C63.10:2013 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 8.3.1.3 PKPM1 Peak power meter method. The maximum average conducted output power using C63.10:2013 Section 11.9.1.3 PKPM1 Peak power meter method.

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product : 23.1 inches Bar type Digital Signage
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Date : 2019/11/04
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	15.68	--	--	--	18.88	<30dBm	Pass
06	2437	15.79	15.57	15.5	15.42	19.01	<30dBm	Pass
11	2462	15.84	--	--	--	19.07	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : 23.1 inches Bar type Digital Signage
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Date : 2019/11/04
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	12.52	--	--	--	--	--	--	--	22.13	<30dBm	Pass
06	2437	12.64	12.56	12.48	12.39	12.31	12.23	12.16	12.09	22.08	<30dBm	Pass
11	2462	12.95	--	--	--	--	--	--	--	22.36	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : 23.1 inches Bar type Digital Signage
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Date : 2019/11/04
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

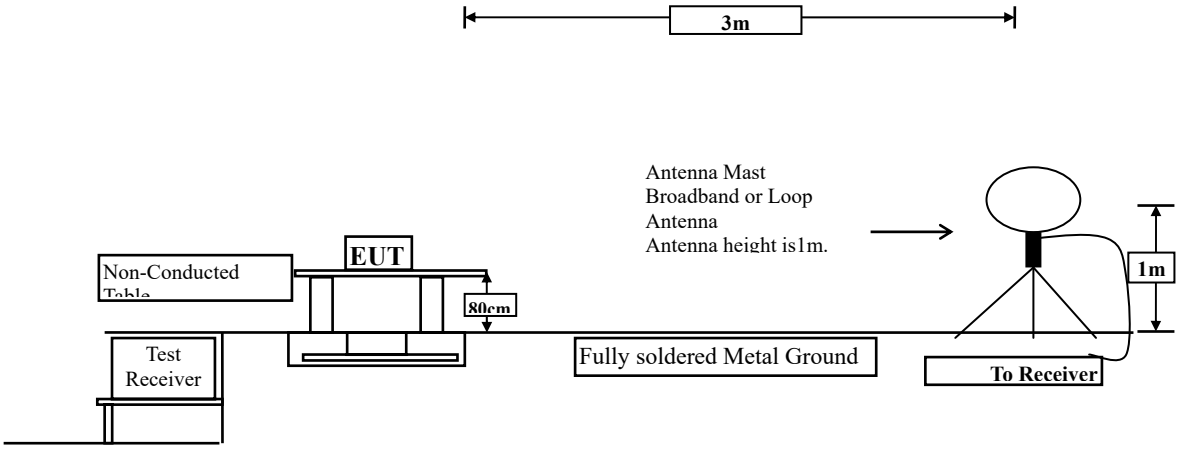
Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		HT0	HT1	HT2	HT3	HT4	HT5	HT6	HT7	HT0		
		Measurement Level (dBm)										
01	2412	12.5	--	--	--	--	--	--	--	22.15	<30dBm	Pass
06	2437	12.76	12.64	12.5	12.4	12.27	12.19	12.05	11.96	22.43	<30dBm	Pass
11	2462	12.82	--	--	--	--	--	--	--	22.59	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

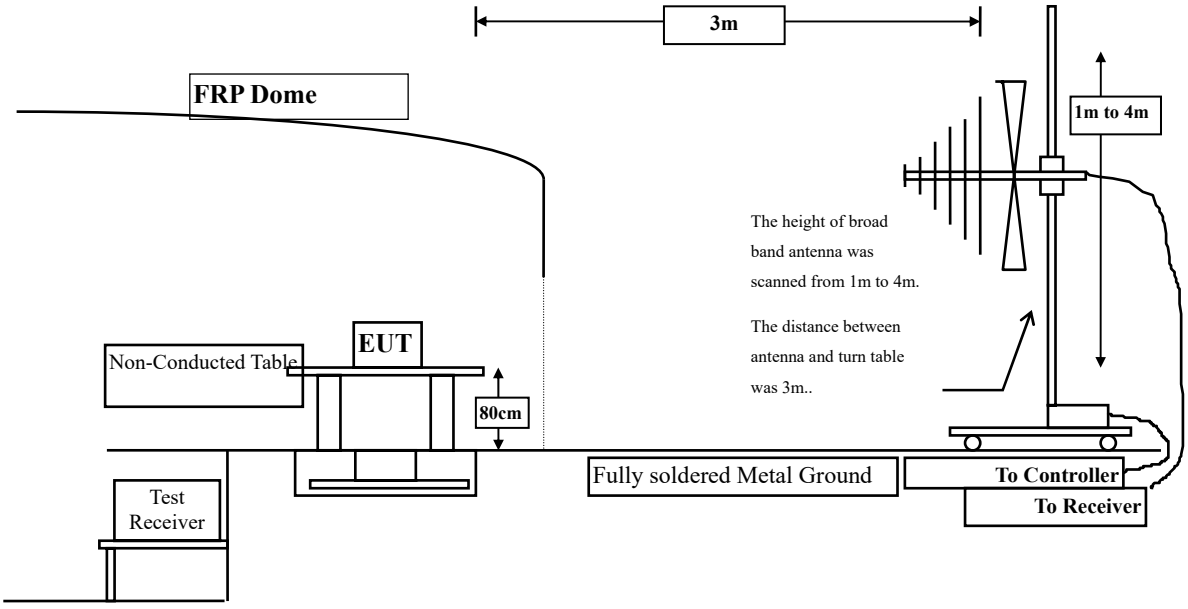
4. Radiated Emission

4.1. Test Setup

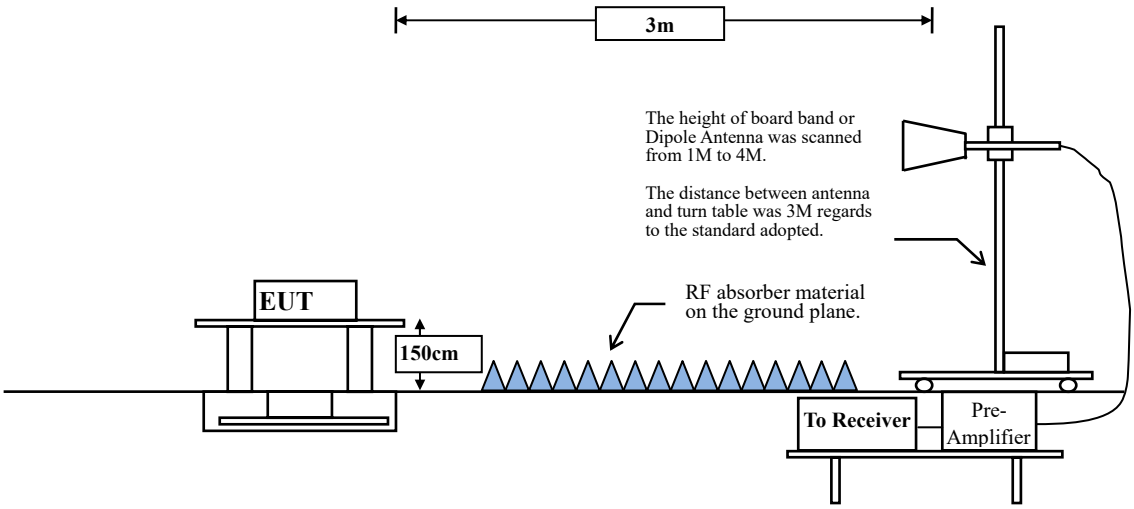
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dBμV/m) = 20 log E field strength (uV/m)

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	99.28	8.4000	119	10
802.11g	96.97	1.3959	716	1000
802.11n20	96.43	1.3023	768	1000

Note: Duty Cycle Refer to Section 9.

4.4. Uncertainty

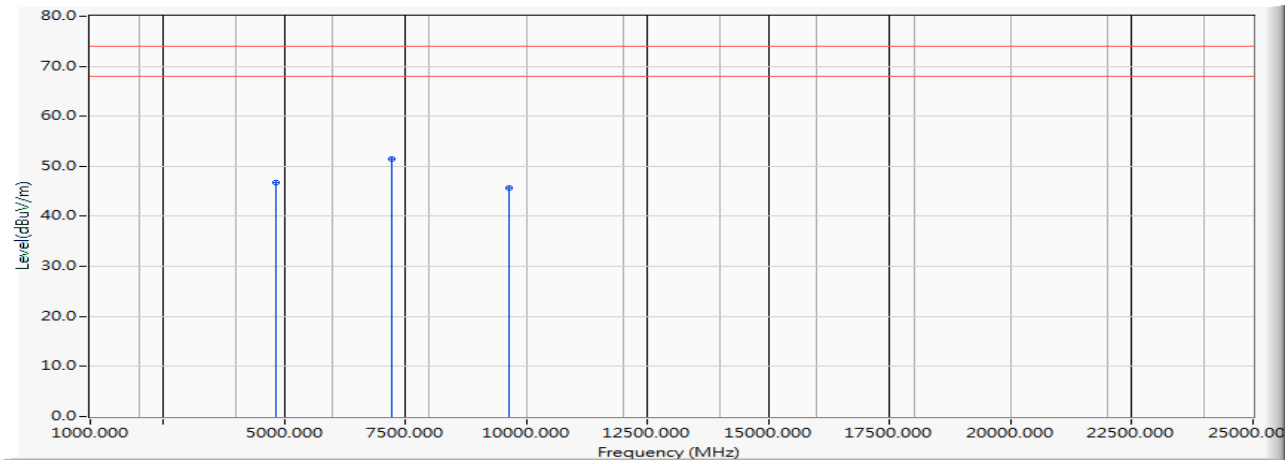
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Radiated Emission

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Horizontal



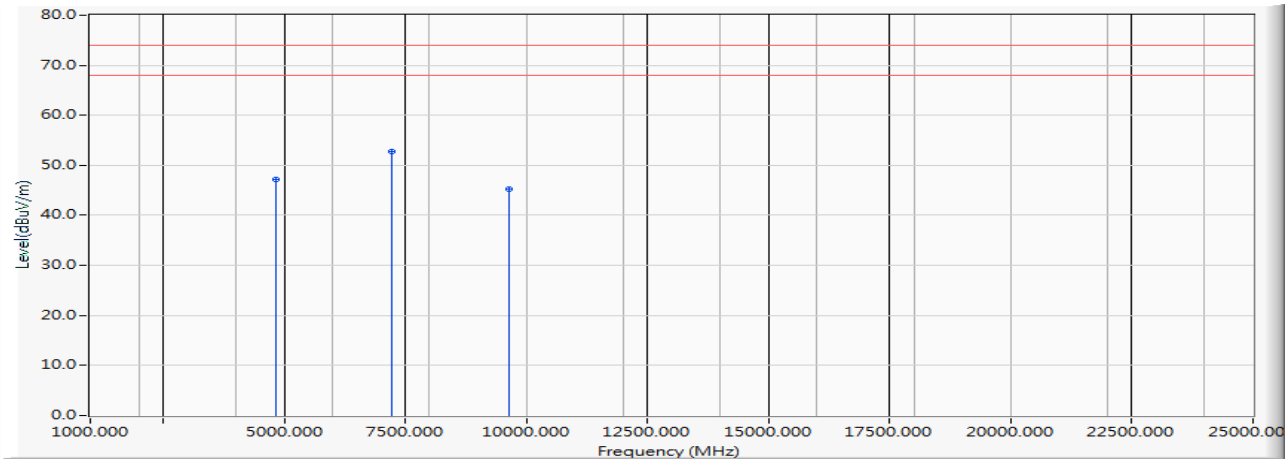
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	58.770	46.781	-27.219	74.000	PEAK
2	*	7236.000	-12.957	64.460	51.503	-22.497	74.000	PEAK
3		9648.000	-13.106	58.760	45.654	-28.346	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Vertical



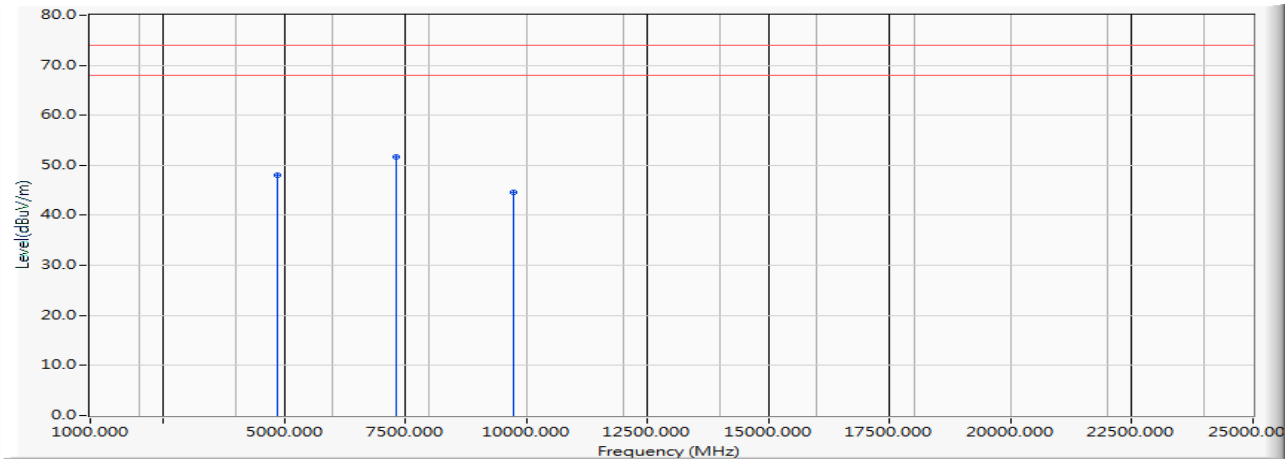
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	59.120	47.131	-26.869	74.000	PEAK
2	*	7236.000	-12.957	65.790	52.833	-21.167	74.000	PEAK
3		9648.000	-13.106	58.410	45.304	-28.696	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Horizontal



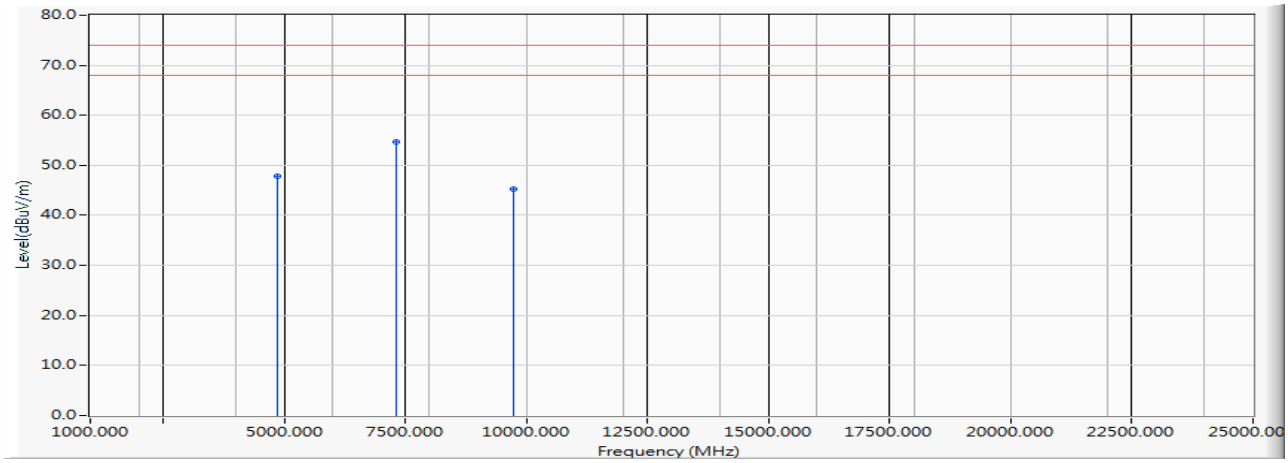
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	59.680	48.043	-25.957	74.000	PEAK
2	*	7311.000	-13.474	65.110	51.636	-22.364	74.000	PEAK
3		9748.000	-12.439	57.020	44.581	-29.419	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : 23.1 inches Bar type Digital Signage
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2019/10/29
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Vertical



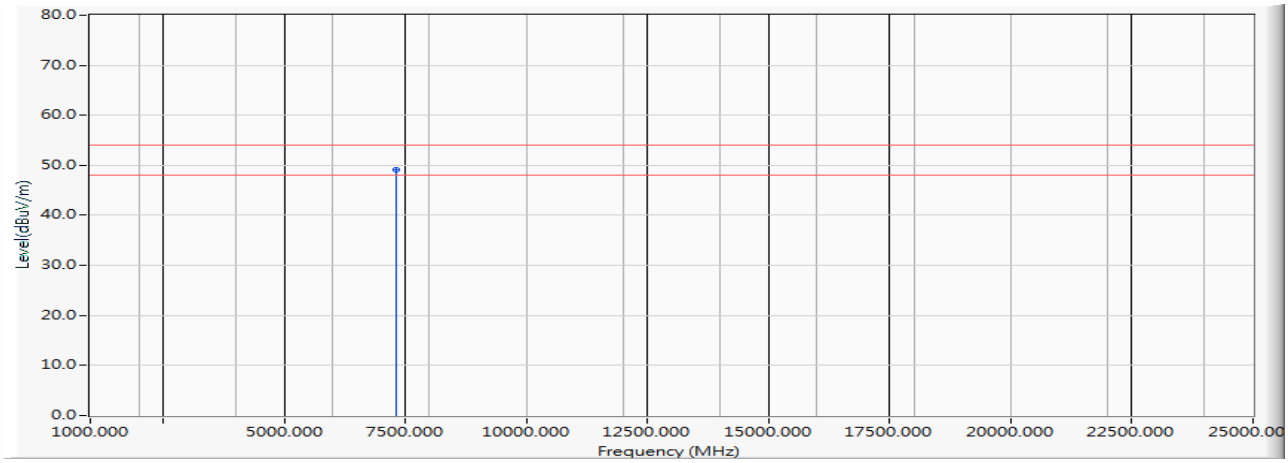
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	59.510	47.873	-26.127	74.000	PEAK
2	*	7311.000	-13.474	68.240	54.766	-19.234	74.000	PEAK
3		9748.000	-12.439	57.720	45.281	-28.719	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Vertical



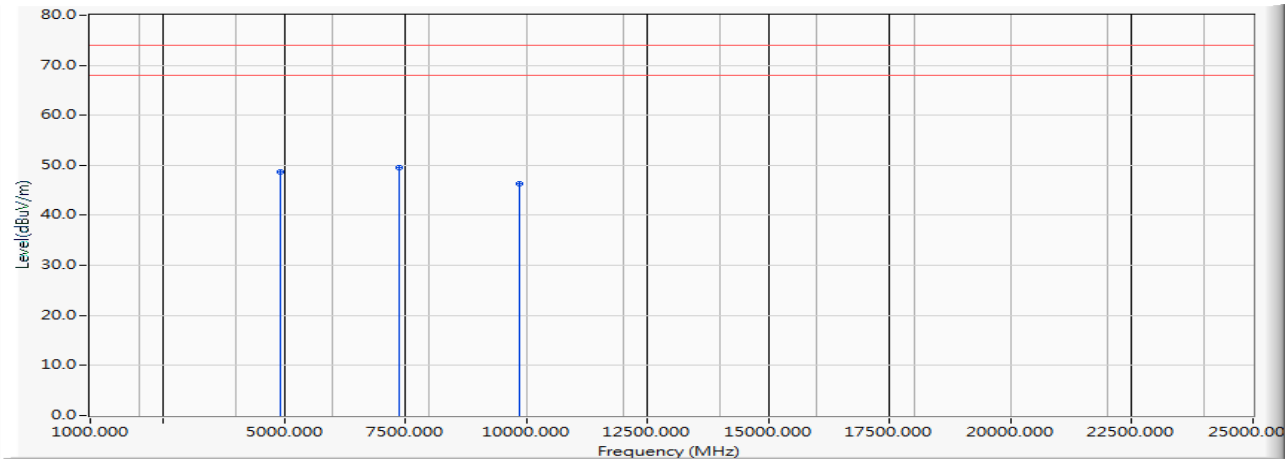
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	7311.000	-13.474	62.590	49.116	-4.884	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Horizontal



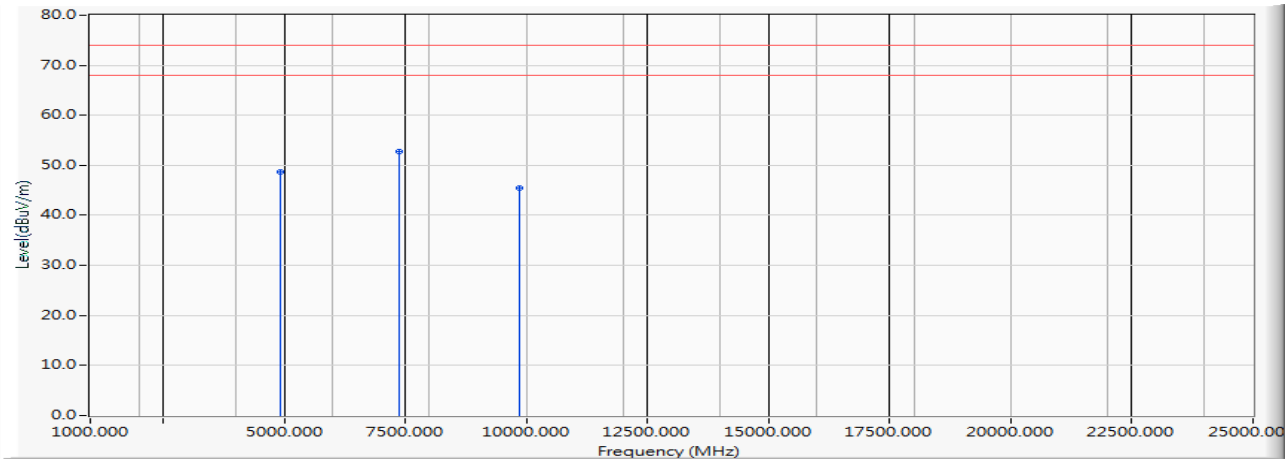
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	59.940	48.699	-25.301	74.000	PEAK
2	*	7386.000	-14.095	63.720	49.625	-24.375	74.000	PEAK
3		9848.000	-13.445	59.850	46.404	-27.596	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Vertical



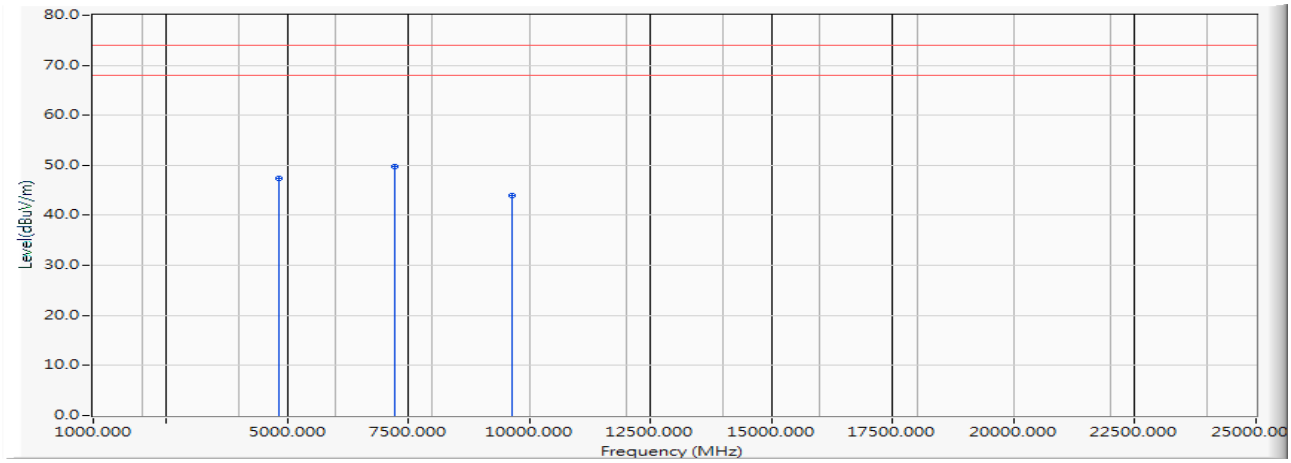
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	60.020	48.779	-25.221	74.000	PEAK
2	*	7386.000	-14.095	66.820	52.725	-21.275	74.000	PEAK
3		9848.000	-13.445	58.970	45.524	-28.476	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Horizontal



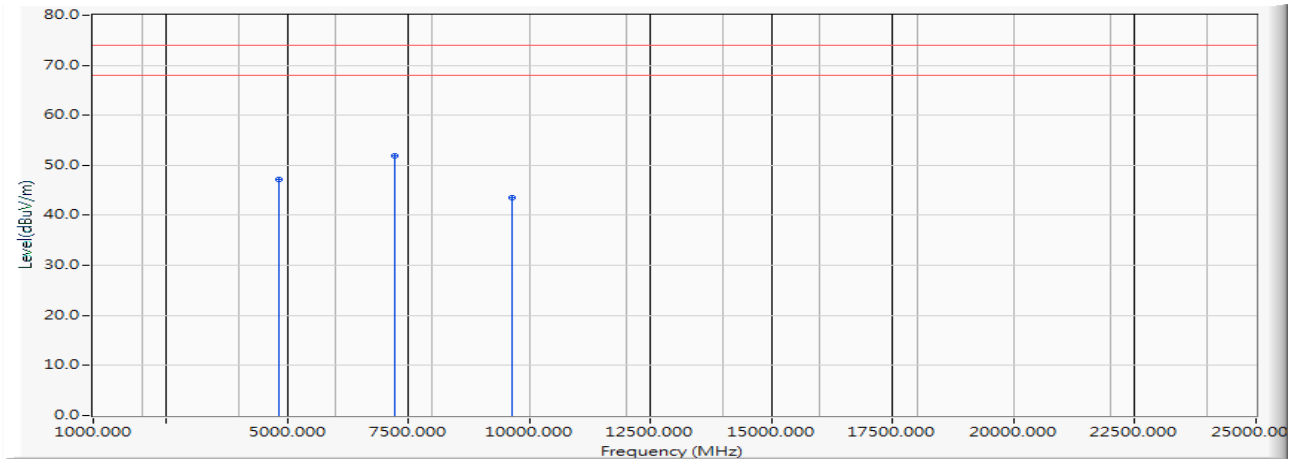
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	59.481	47.492	-26.508	74.000	PEAK
2	*	7236.000	-12.957	62.805	49.848	-24.152	74.000	PEAK
3		9648.000	-13.106	57.157	44.051	-29.949	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Vertical



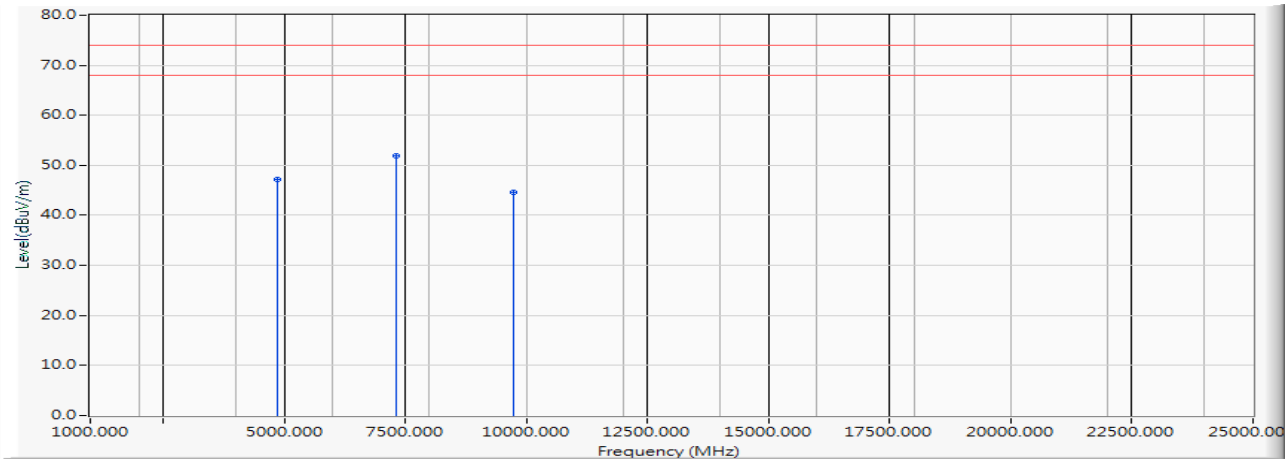
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	59.122	47.133	-26.867	74.000	PEAK
2	*	7236.000	-12.957	64.888	51.931	-22.069	74.000	PEAK
3		9648.000	-13.106	56.672	43.566	-30.434	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Horizontal



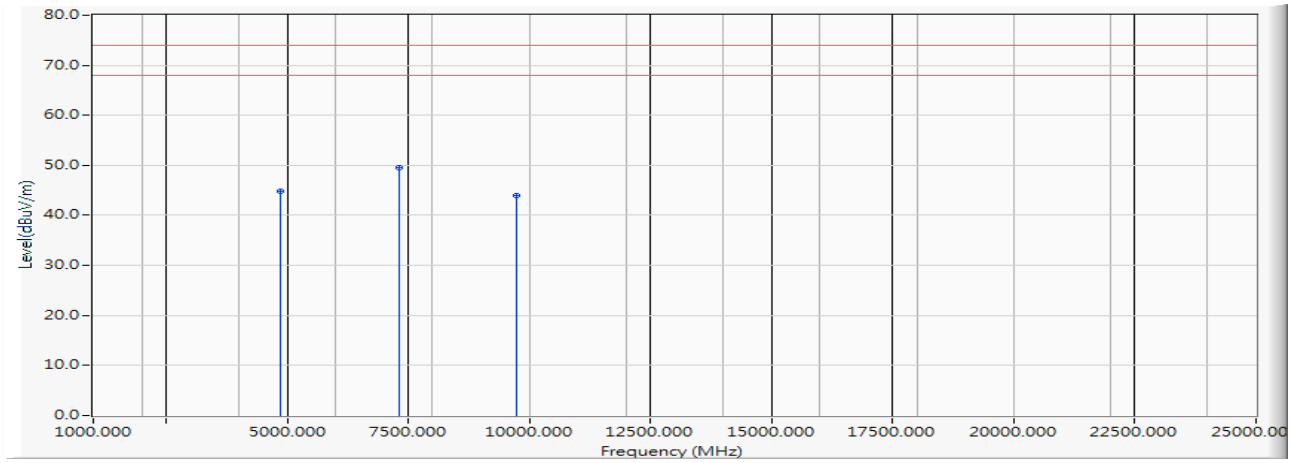
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	58.907	47.270	-26.730	74.000	PEAK
2	*	7311.000	-13.474	65.479	52.005	-21.995	74.000	PEAK
3		9748.000	-12.439	57.139	44.700	-29.300	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Vertical



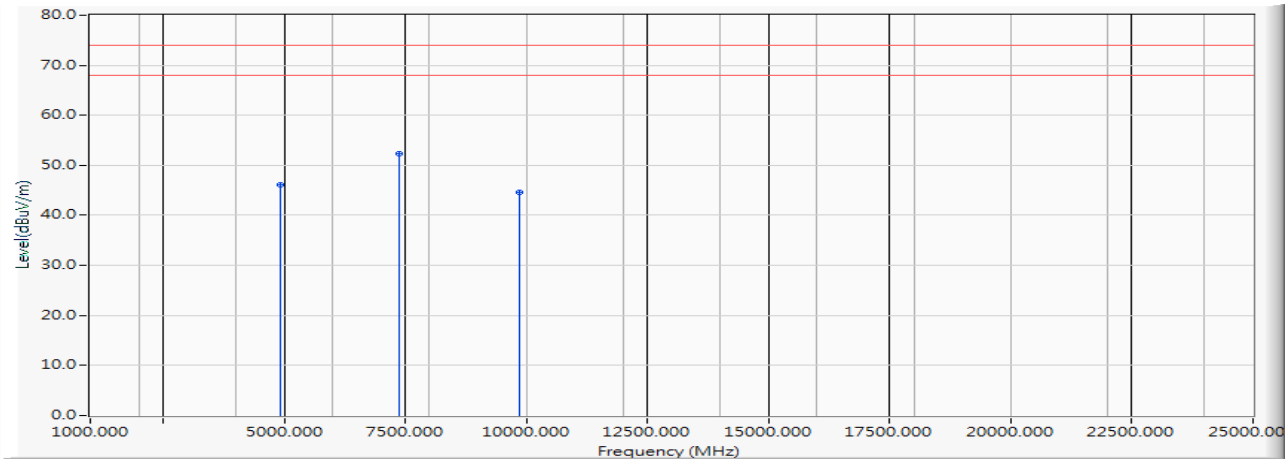
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	56.379	44.742	-29.258	74.000	PEAK
2	*	7311.000	-13.474	63.024	49.550	-24.450	74.000	PEAK
3		9748.000	-12.439	56.383	43.944	-30.056	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Horizontal



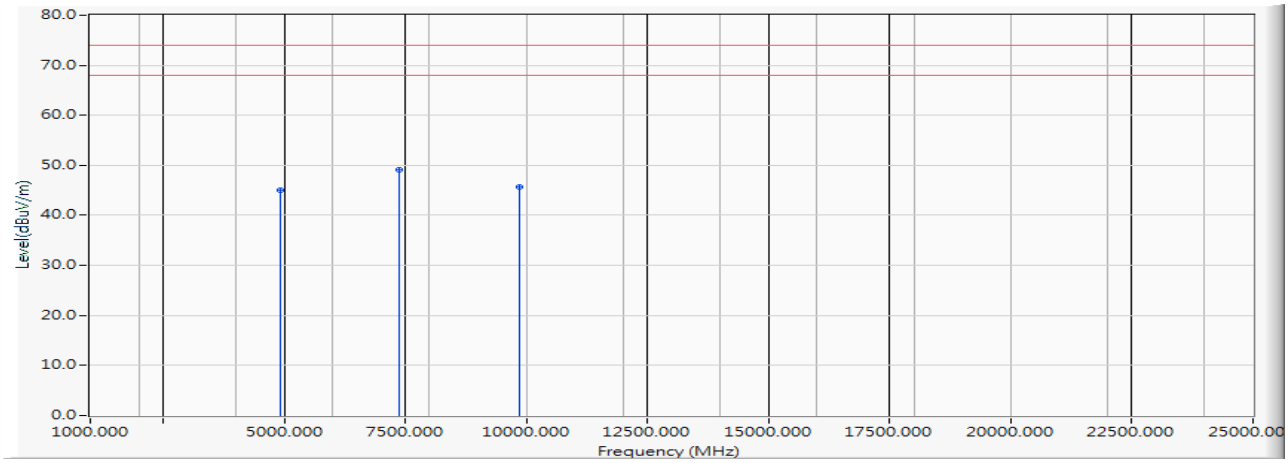
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	57.421	46.180	-27.820	74.000	PEAK
2	*	7386.000	-14.095	66.468	52.373	-21.627	74.000	PEAK
3		9848.000	-13.445	58.020	44.574	-29.426	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Vertical



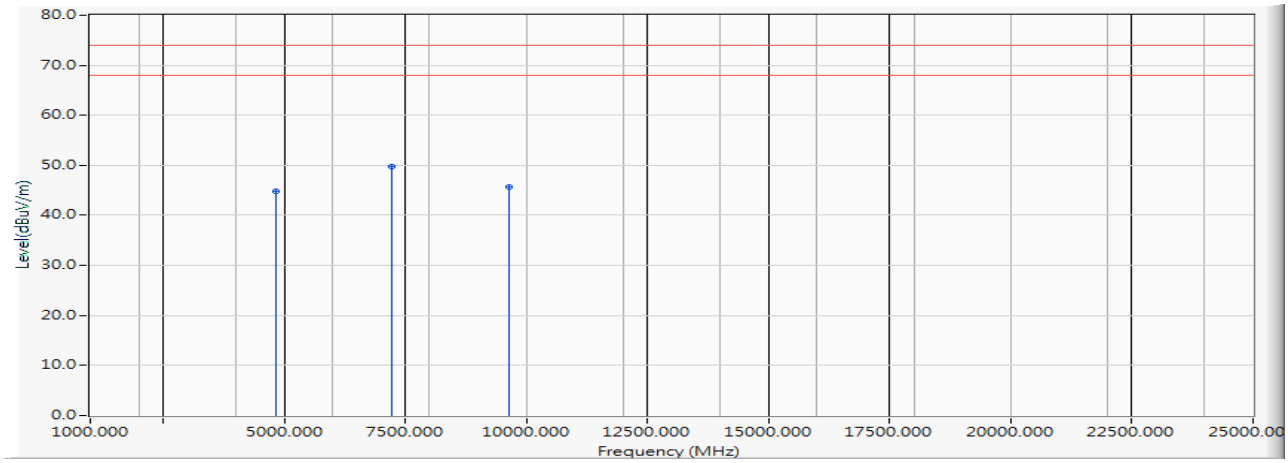
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	56.179	44.938	-29.062	74.000	PEAK
2	*	7386.000	-14.095	63.262	49.167	-24.833	74.000	PEAK
3		9848.000	-13.445	59.101	45.655	-28.345	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)

Horizontal



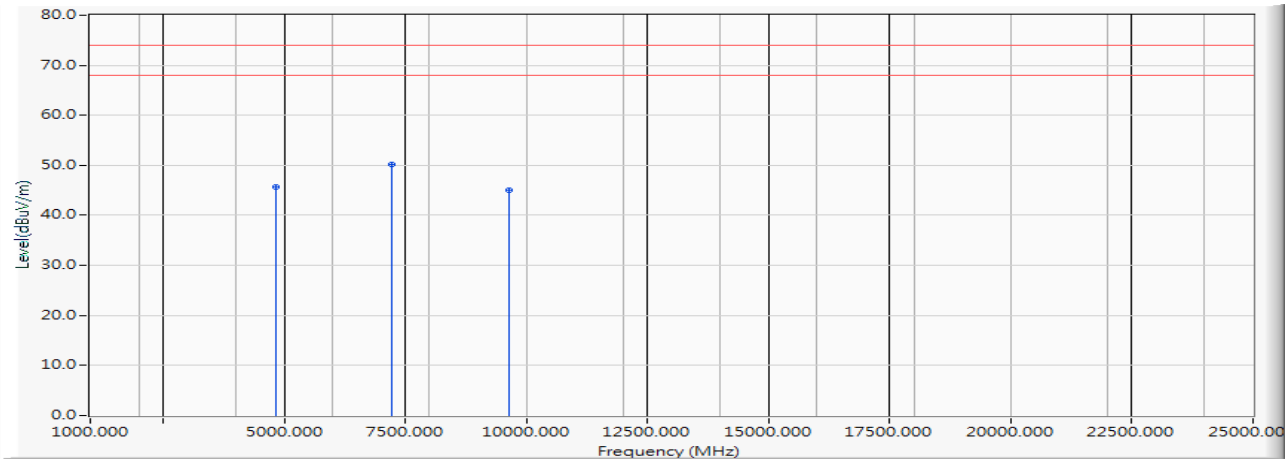
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	56.858	44.869	-29.131	74.000	PEAK
2	*	7236.000	-12.957	62.717	49.760	-24.240	74.000	PEAK
3		9648.000	-13.106	58.816	45.710	-28.290	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)

Vertical



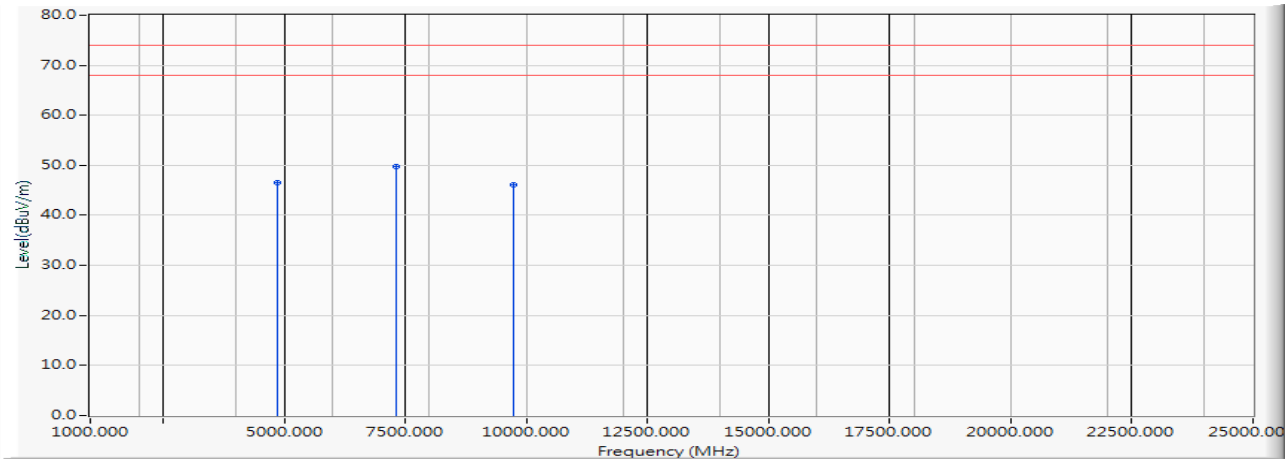
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-11.989	57.634	45.645	-28.355	74.000	PEAK
2	*	7236.000	-12.957	63.158	50.201	-23.799	74.000	PEAK
3		9648.000	-13.106	58.152	45.046	-28.954	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)

Horizontal



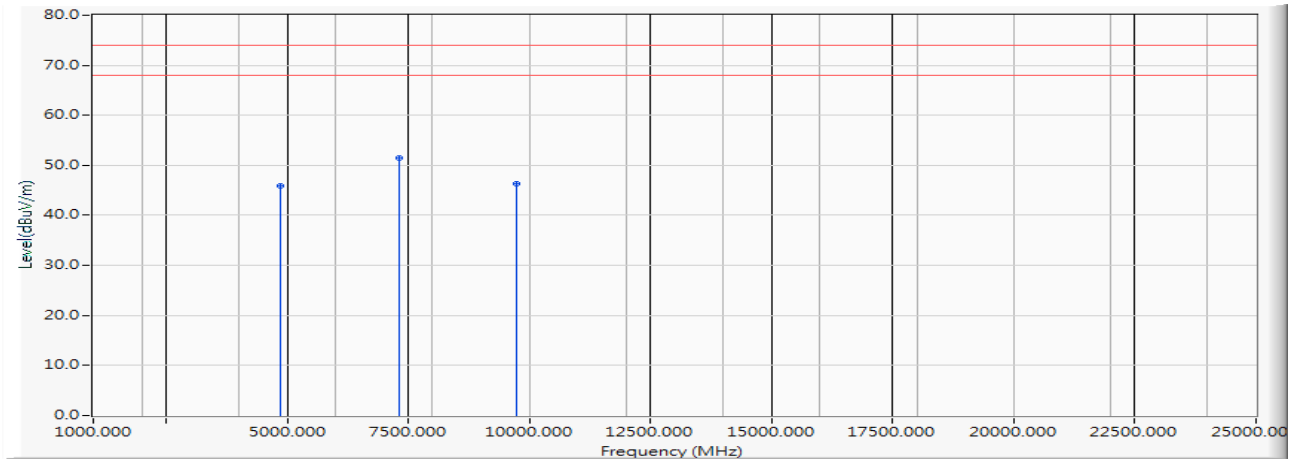
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	58.135	46.498	-27.502	74.000	PEAK
2	*	7311.000	-13.474	63.178	49.704	-24.296	74.000	PEAK
3		9748.000	-12.439	58.476	46.037	-27.963	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)

Vertical



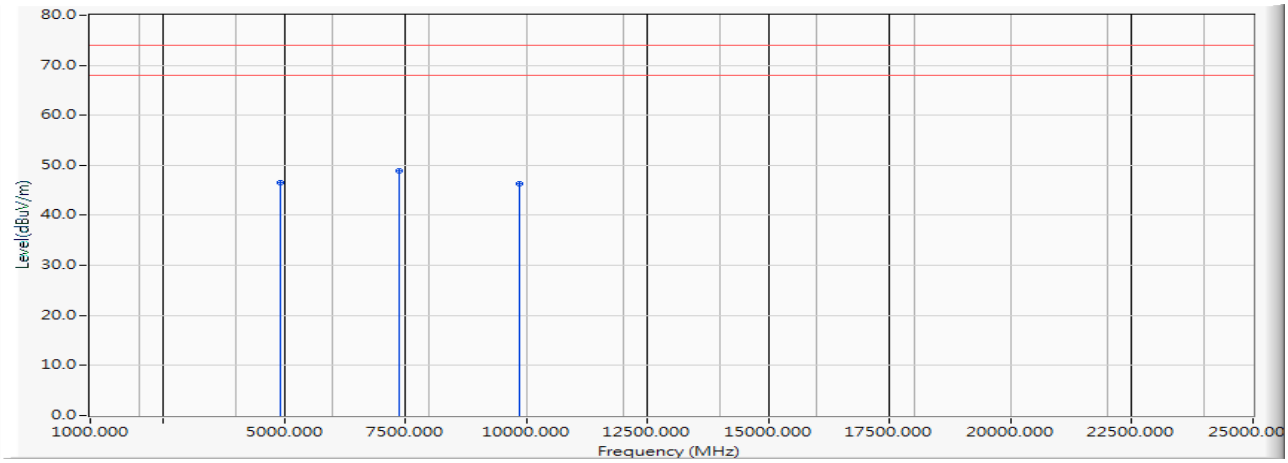
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-11.637	57.499	45.862	-28.138	74.000	PEAK
2	*	7311.000	-13.474	64.884	51.410	-22.590	74.000	PEAK
3		9748.000	-12.439	58.855	46.416	-27.584	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/29
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)

Horizontal



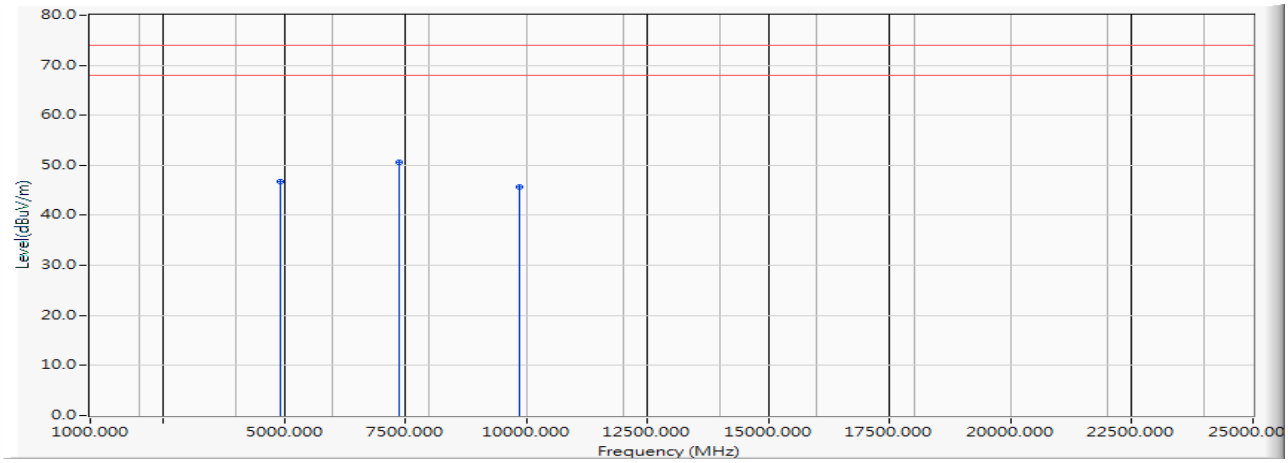
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	57.790	46.549	-27.451	74.000	PEAK
2	*	7386.000	-14.095	63.067	48.972	-25.028	74.000	PEAK
3		9848.000	-13.445	59.859	46.413	-27.587	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : 23.1 inches Bar type Digital Signage
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2019/10/29
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)

Vertical



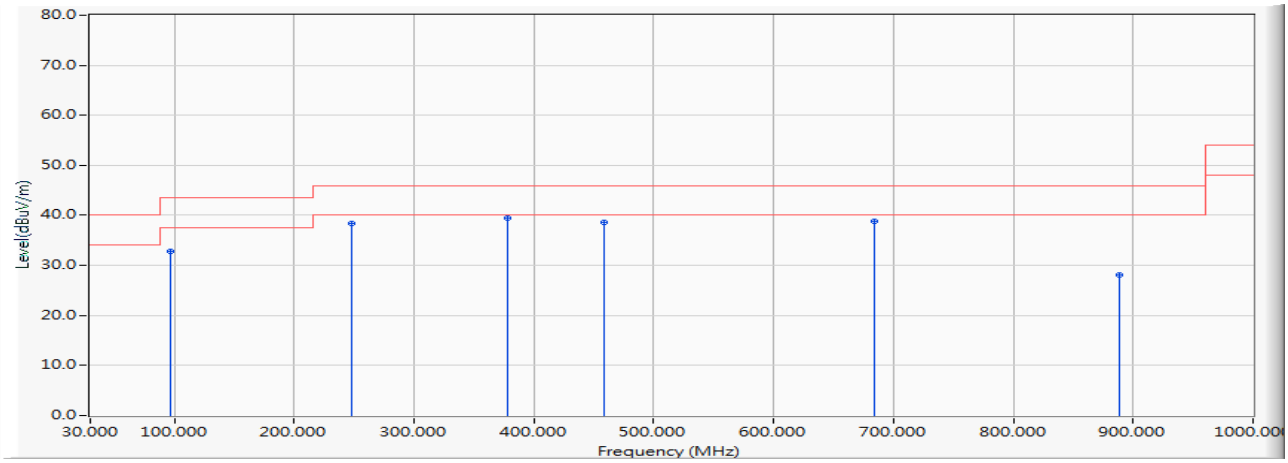
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-11.241	57.964	46.723	-27.277	74.000	PEAK
2	*	7386.000	-14.095	64.656	50.561	-23.439	74.000	PEAK
3		9848.000	-13.445	59.115	45.669	-28.331	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/11/01
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

Horizontal



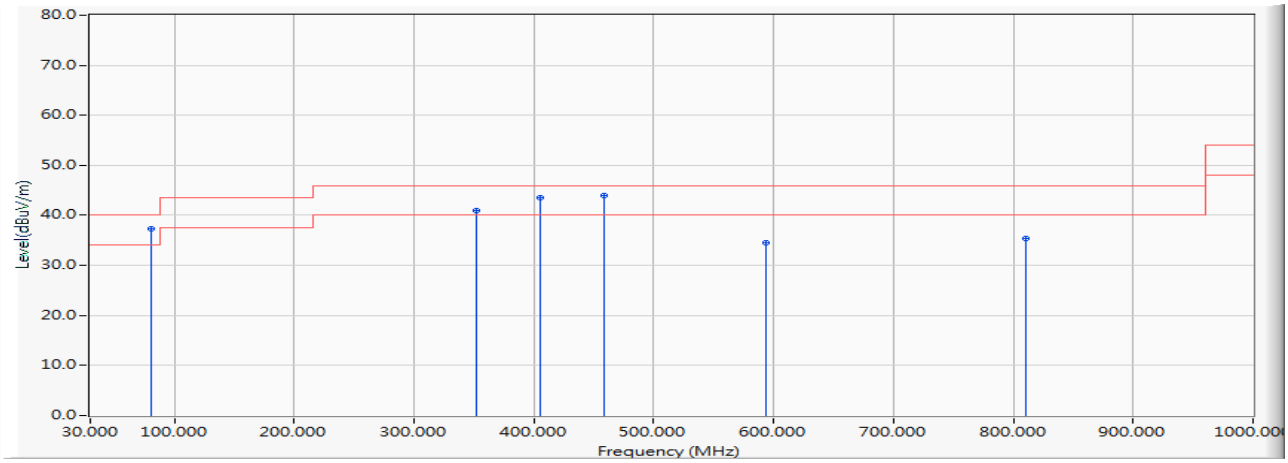
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		97.478	-16.559	49.382	32.823	-10.677	43.500	PEAK
2		247.899	-18.059	56.439	38.379	-7.621	46.000	PEAK
3	*	378.638	-12.074	51.643	39.569	-6.431	46.000	PEAK
4		458.768	-10.460	49.041	38.581	-7.419	46.000	PEAK
5		683.696	-9.263	48.177	38.914	-7.086	46.000	PEAK
6		888.942	-9.028	37.062	28.034	-17.966	46.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/11/01
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

Vertical



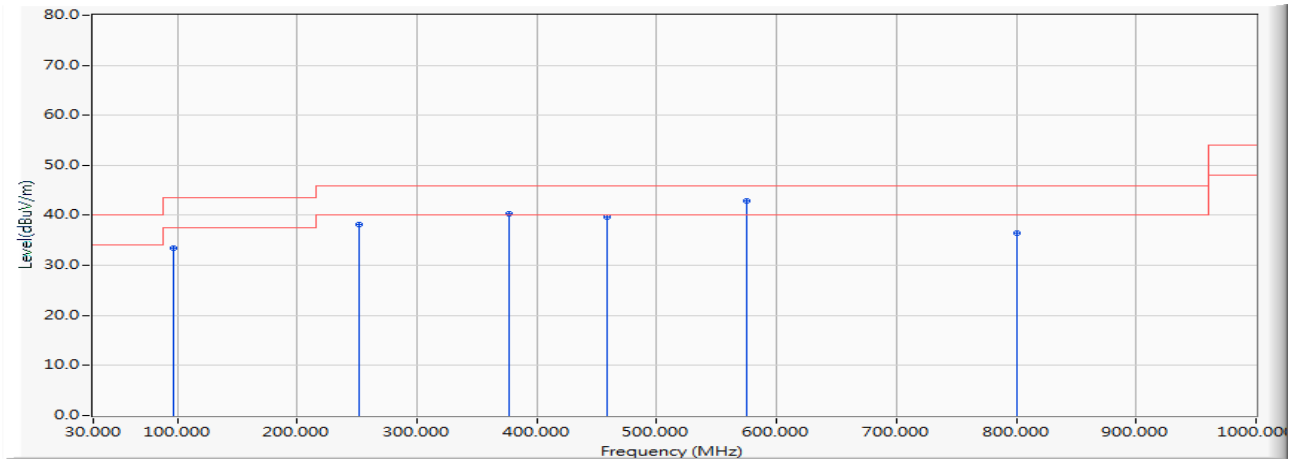
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		80.609	-19.163	56.576	37.413	-2.587	40.000	PEAK
2		351.928	-13.196	54.157	40.961	-5.039	46.000	PEAK
3		405.348	-13.330	56.810	43.480	-2.520	46.000	PEAK
4	*	458.768	-10.460	54.470	44.010	-1.990	46.000	PEAK
5		593.725	-6.884	41.327	34.443	-11.557	46.000	PEAK
6		810.217	-8.944	44.235	35.291	-10.709	46.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/11/01
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

Horizontal



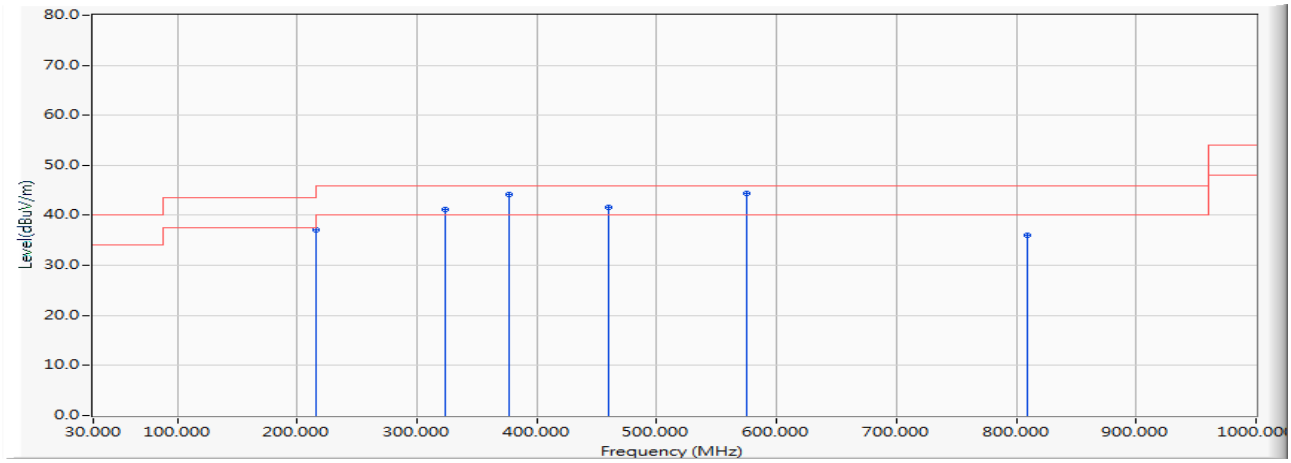
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		97.478	-16.559	50.013	33.454	-10.046	43.500	PEAK
2		252.116	-17.982	56.167	38.185	-7.815	46.000	PEAK
3		377.232	-12.123	52.411	40.288	-5.712	46.000	PEAK
4		458.768	-10.460	50.125	39.665	-6.335	46.000	PEAK
5	*	575.449	-8.191	51.026	42.835	-3.165	46.000	PEAK
6		800.377	-8.930	45.406	36.476	-9.524	46.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/11/01
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

Vertical



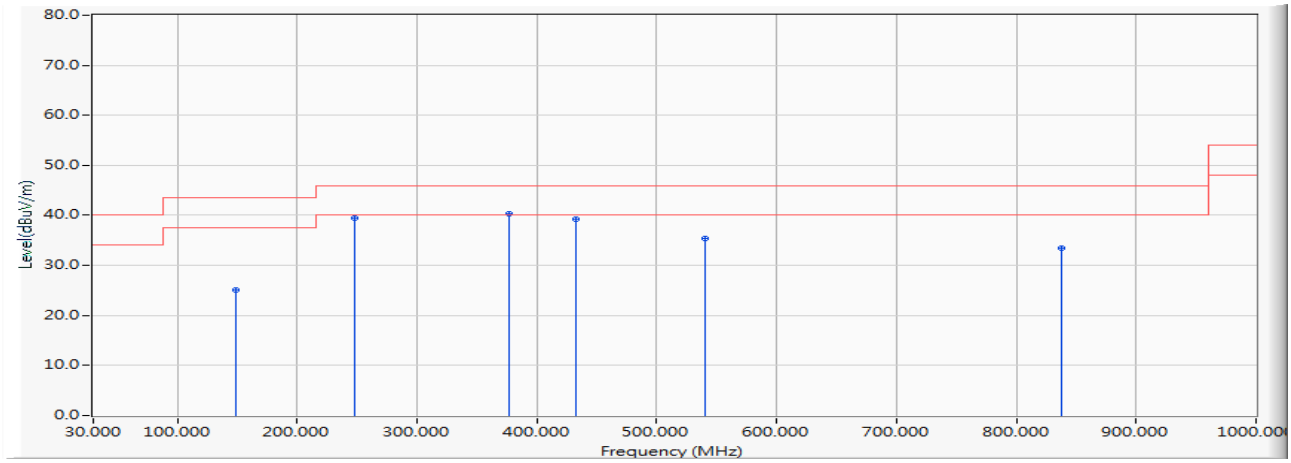
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		215.565	-18.132	55.255	37.123	-6.377	43.500	PEAK
2		323.812	-14.026	55.205	41.179	-4.821	46.000	PEAK
3		377.232	-12.123	56.346	44.223	-1.777	46.000	PEAK
4		460.174	-10.529	52.107	41.579	-4.421	46.000	PEAK
5	*	575.449	-8.191	52.584	44.393	-1.607	46.000	PEAK
6		808.812	-8.946	44.907	35.961	-10.039	46.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/11/01
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)

Horizontal



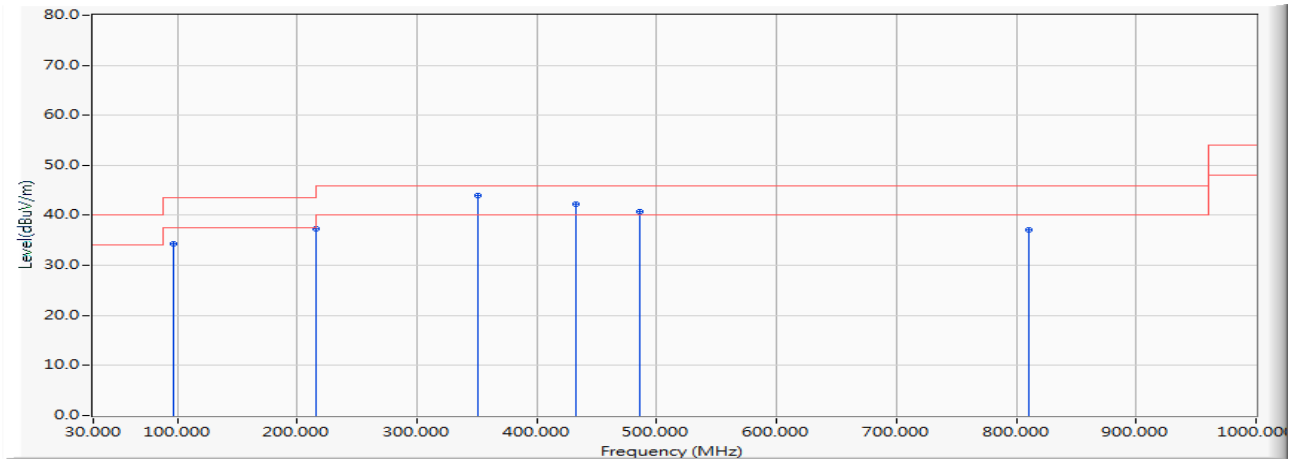
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		149.493	-19.726	44.817	25.091	-18.409	43.500	PEAK
2		247.899	-18.059	57.595	39.535	-6.465	46.000	PEAK
3	*	377.232	-12.123	52.460	40.337	-5.663	46.000	PEAK
4		432.058	-10.761	49.915	39.154	-6.846	46.000	PEAK
5		540.304	-11.395	46.849	35.454	-10.546	46.000	PEAK
6		838.333	-8.439	41.993	33.554	-12.446	46.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2019/11/01
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		97.478	-16.559	50.891	34.332	-9.168	43.500	PEAK
2		215.565	-18.132	55.429	37.297	-6.203	43.500	PEAK
3	*	350.522	-13.279	57.299	44.019	-1.981	46.000	PEAK
4		432.058	-10.761	53.048	42.287	-3.713	46.000	PEAK
5		485.478	-11.794	52.445	40.650	-5.350	46.000	PEAK
6		810.217	-8.944	45.991	37.047	-8.953	46.000	PEAK

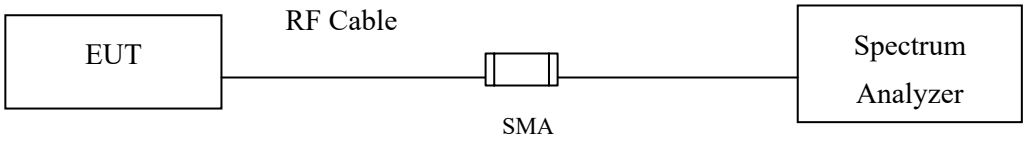
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF antenna conducted test

5.1. Test Setup

RF antenna Conducted Measurement:



5.2. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.3. Test Procedure

The EUT was tested according to C63.10:2013 Section 11.11 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

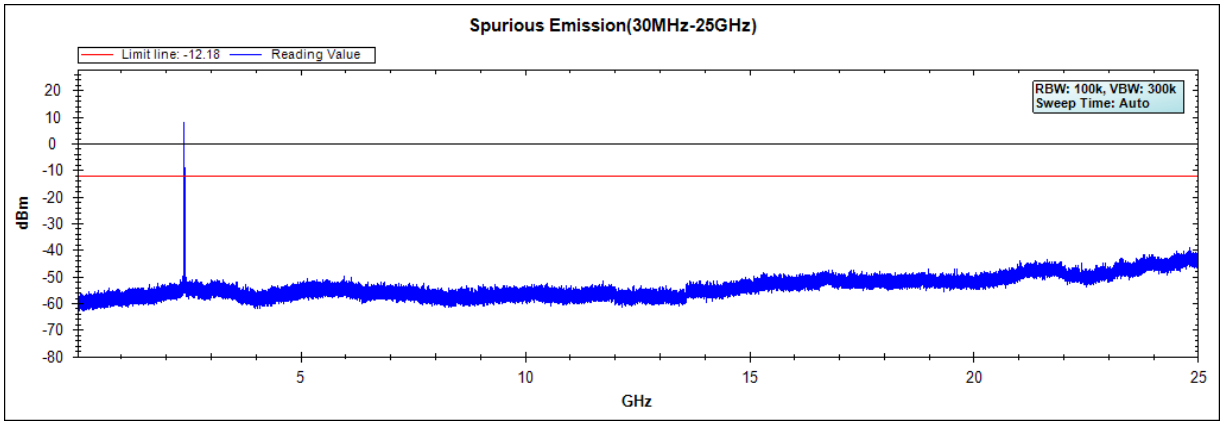
5.4. Uncertainty

The measurement uncertainty
Conducted is defined as ± 1.20dB

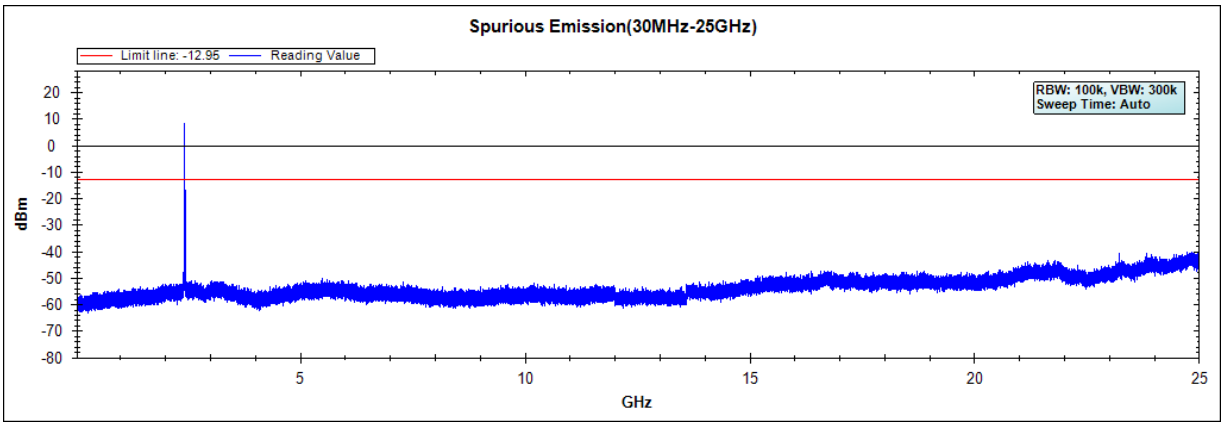
5.5. Test Result of RF antenna conducted test

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	RF antenna conducted test
Test Site	:	No.3 OATS
Test Date	:	2019/11/04
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

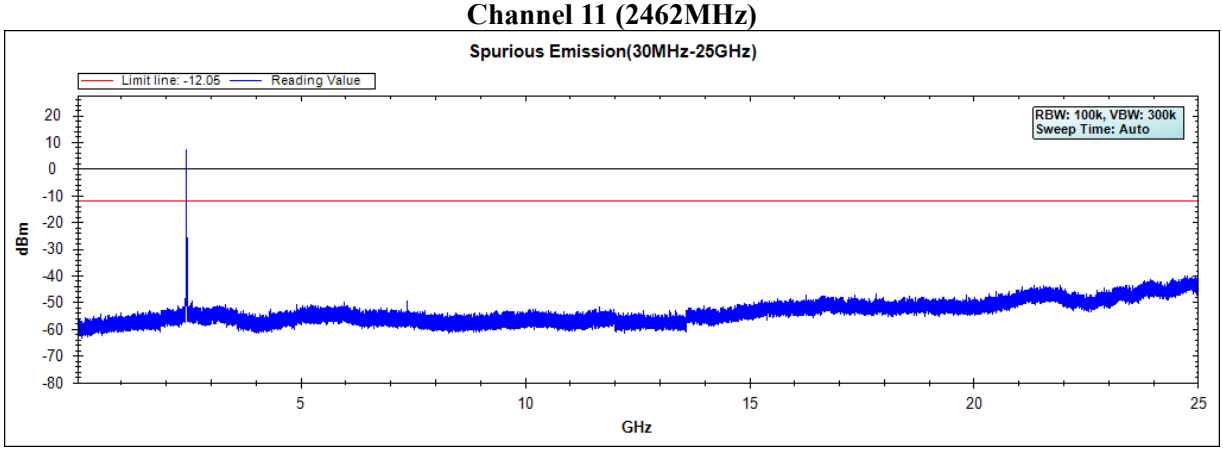
Channel 01 (2412MHz)



Channel 06 (2437MHz)



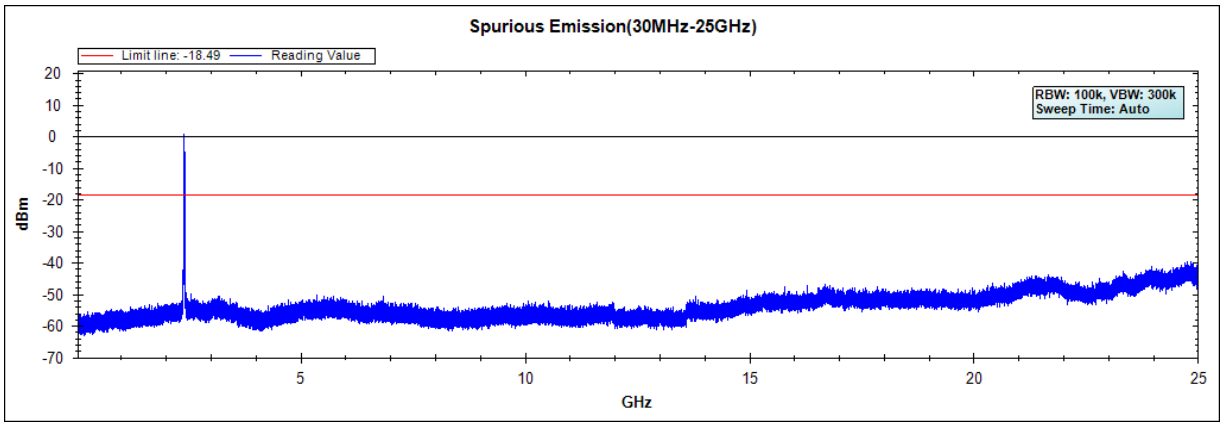
Channel 11 (2462MHz)



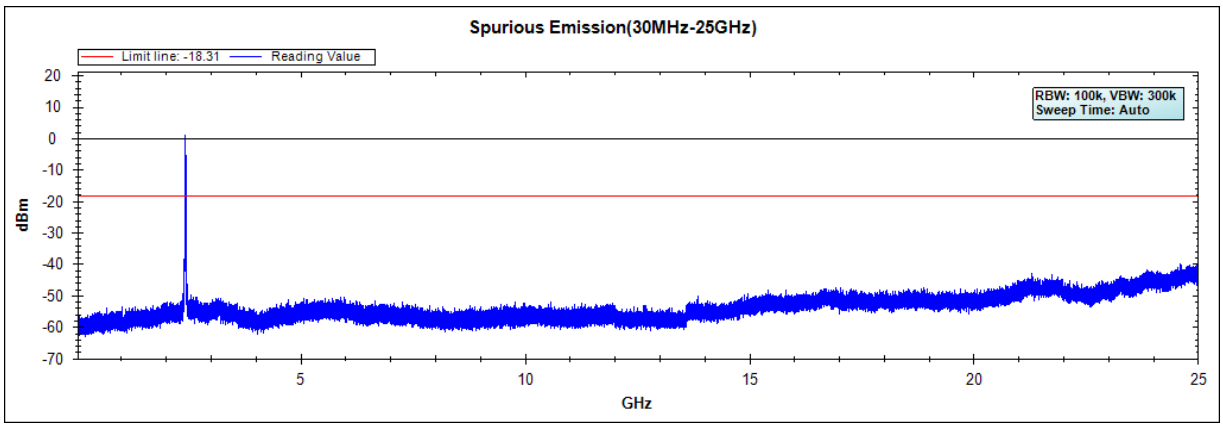
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Date	:	2019/11/04
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

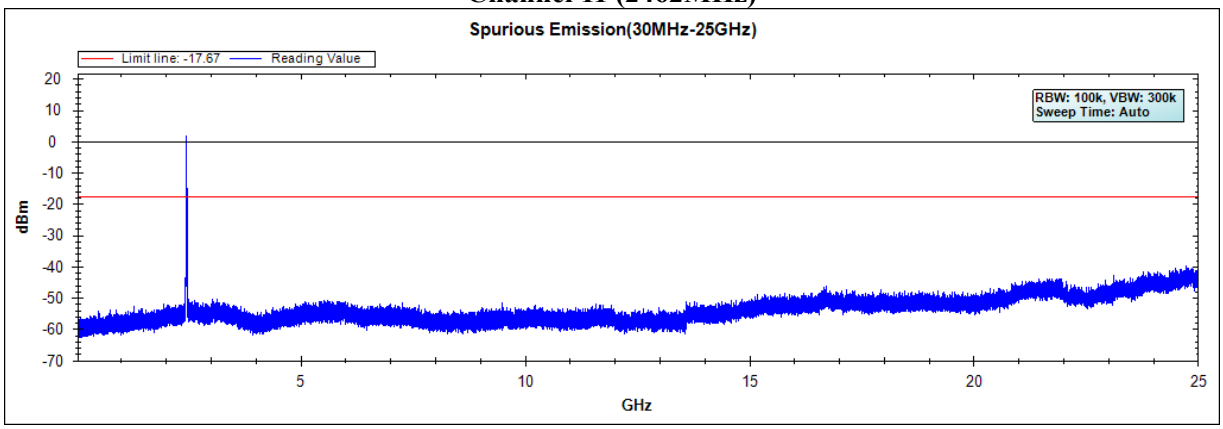
Channel 01 (2412MHz)



Channel 06 (2437MHz)



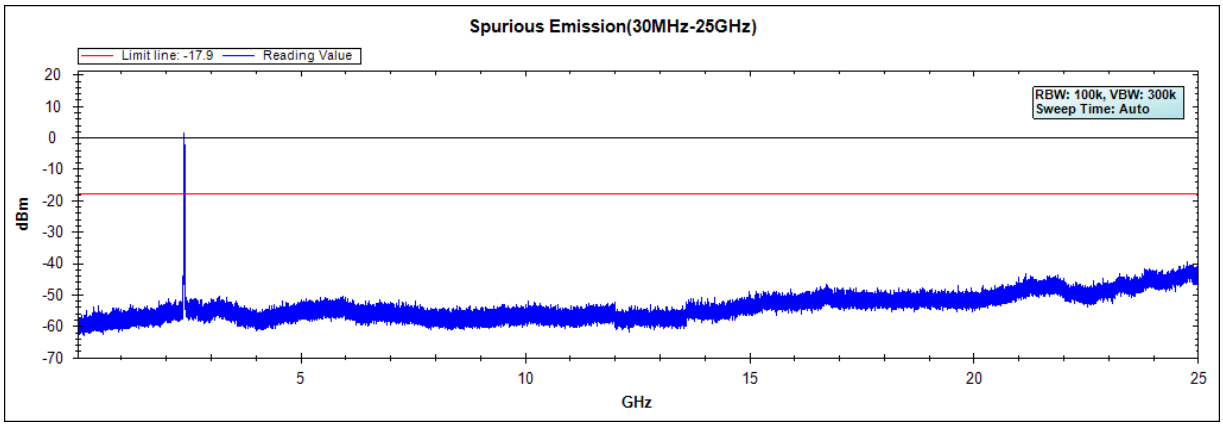
Channel 11 (2462MHz)



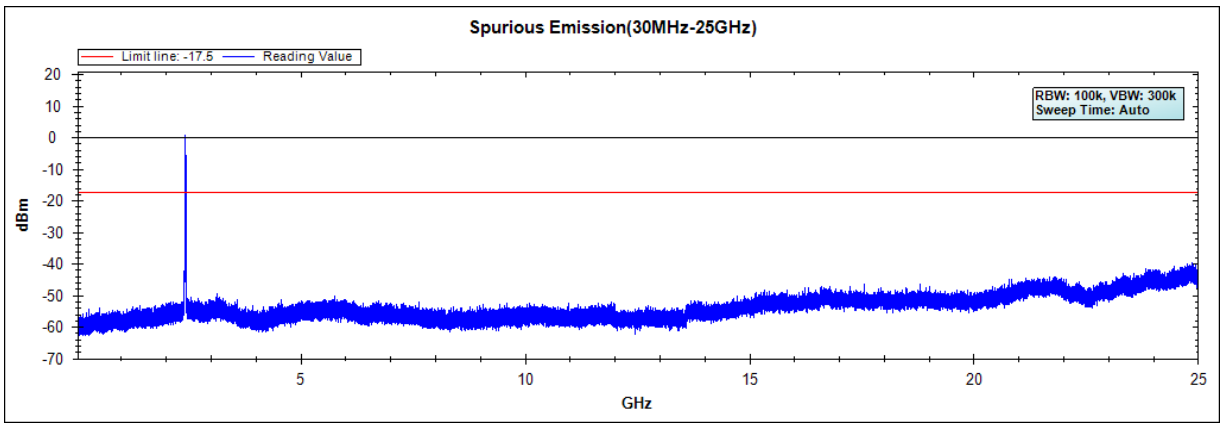
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Date	:	2019/11/04
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

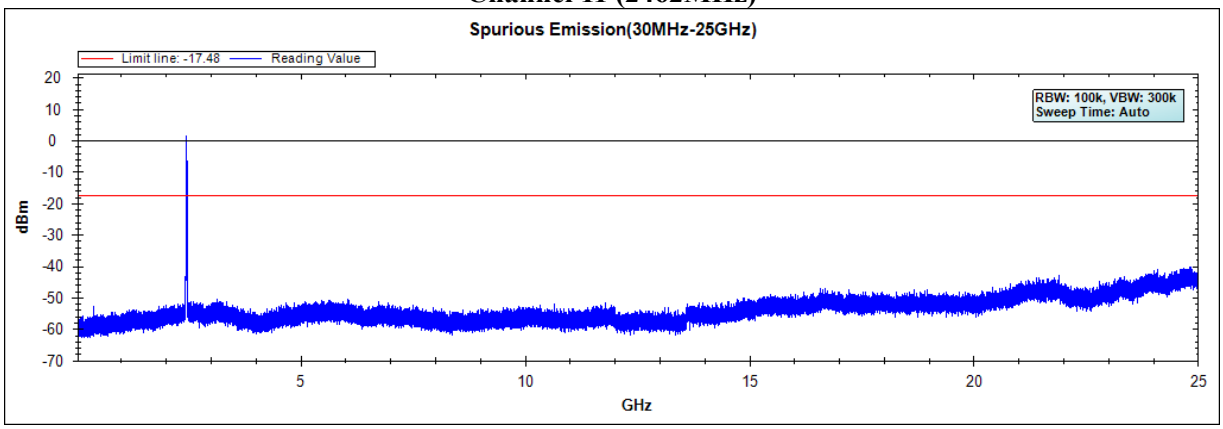
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)

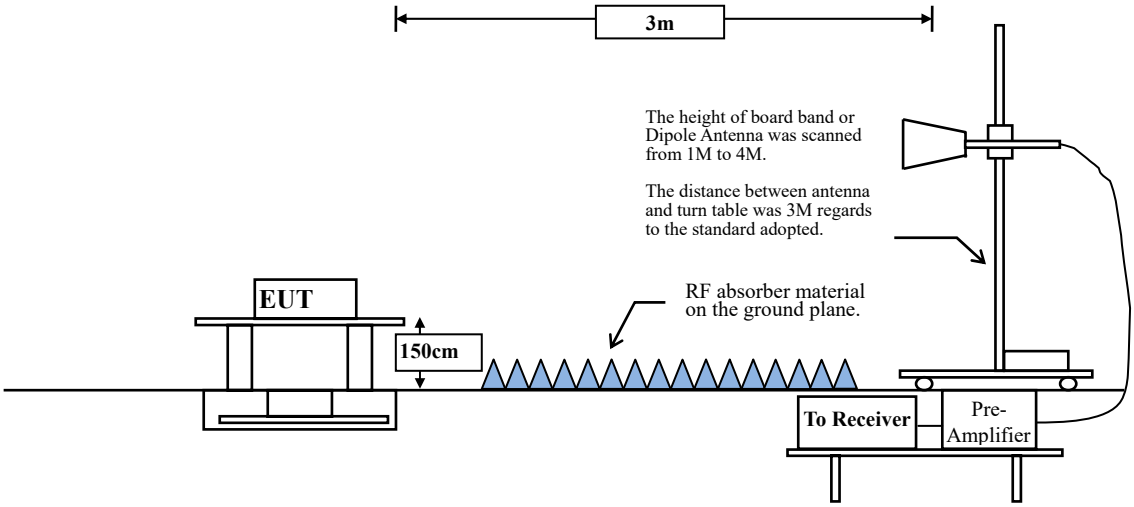


Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

6.1. Test Setup

RF Radiated Measurement:



6.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to ANSI C63.10, 2013 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	99.28	8.4000	119	10
802.11g	96.97	1.3959	716	1000
802.11n20	96.43	1.3023	768	1000

Note: Duty Cycle Refer to Section 9.

6.4. Uncertainty

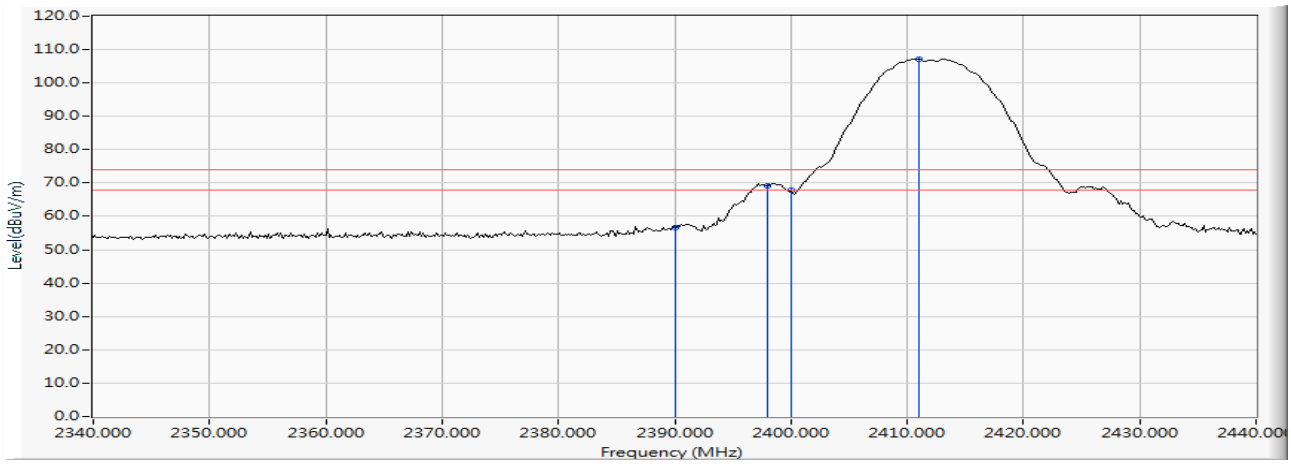
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Horizontal



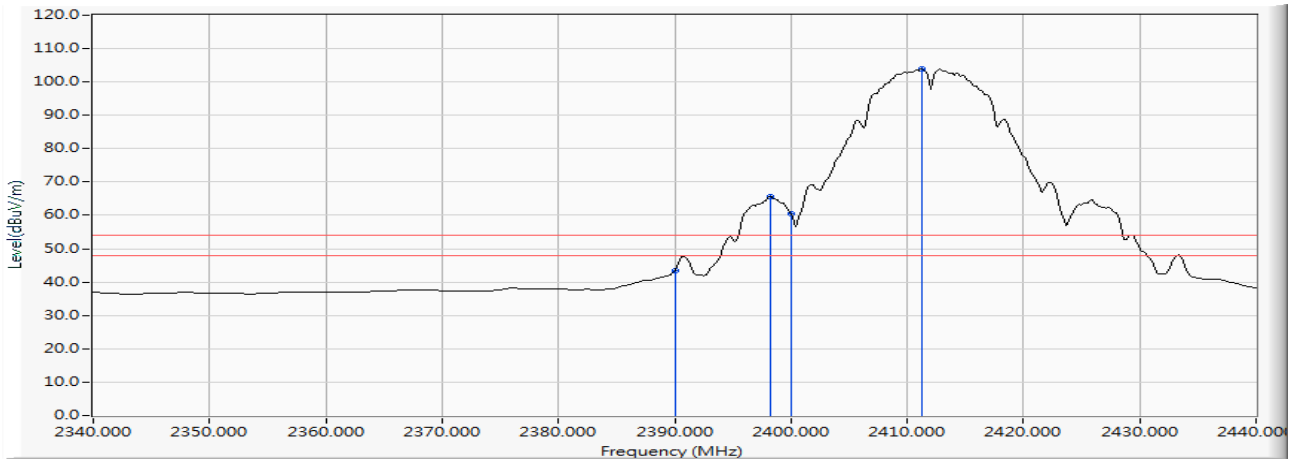
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	43.643	56.542	-17.458	74.000	PEAK
2		2397.971	12.947	56.317	69.264	-4.736	74.000	PEAK
3		2400.000	12.961	54.917	67.878	--	--	PEAK
4	*	2411.014	13.035	94.253	107.288	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Horizontal



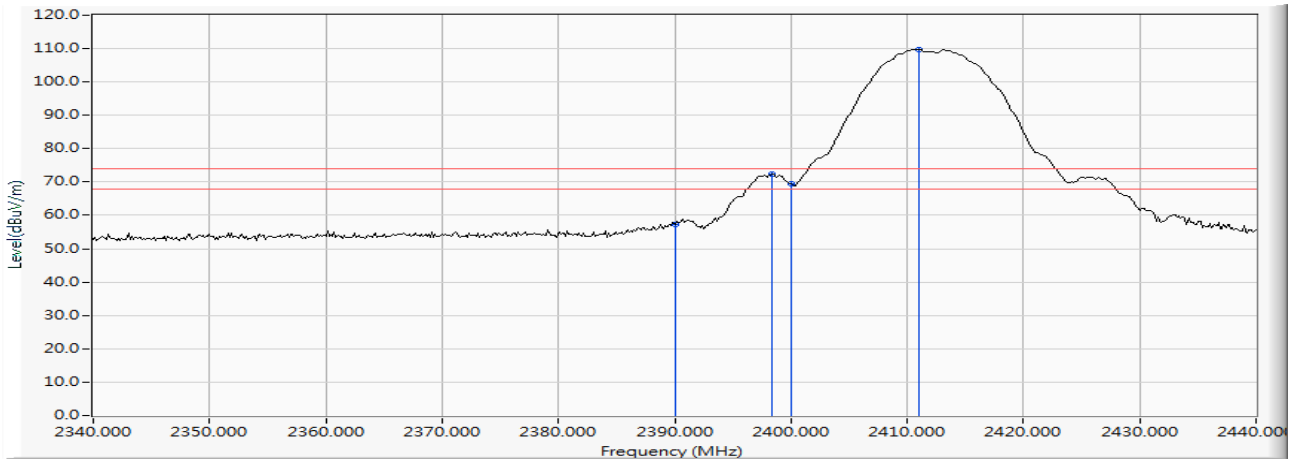
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	30.678	43.577	-10.423	54.000	AVERAGE
2		2398.261	12.950	52.816	65.765	11.765	54.000	AVERAGE
3		2400.000	12.961	47.378	60.339	--	--	AVERAGE
4	*	2411.304	13.038	90.894	103.931	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Vertical



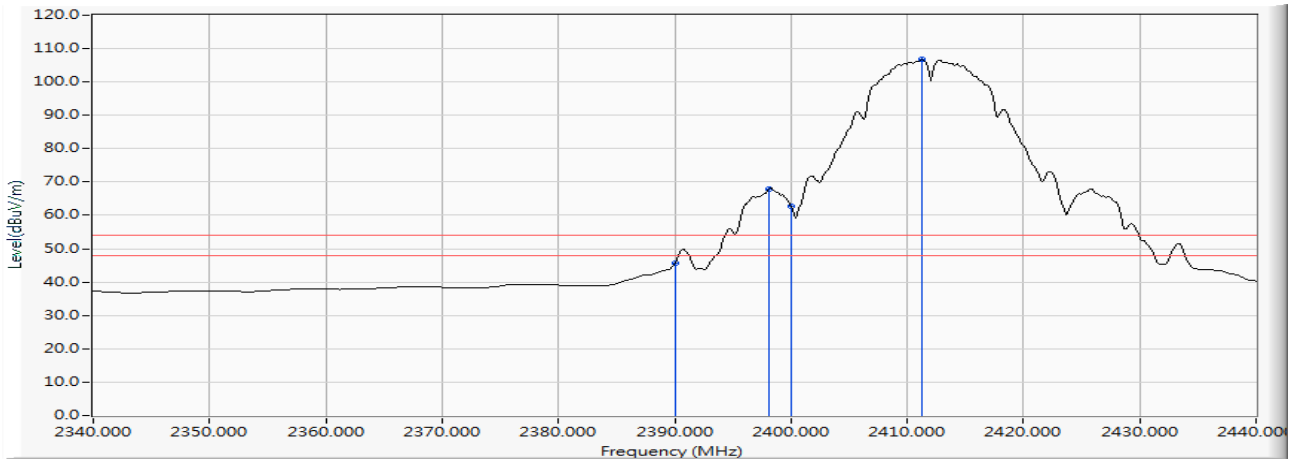
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	44.248	57.147	-16.853	74.000	PEAK
2		2398.406	12.951	59.304	72.254	-1.746	74.000	PEAK
3		2400.000	12.961	56.463	69.424	--	--	PEAK
4	*	2411.014	13.035	96.819	109.854	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Vertical



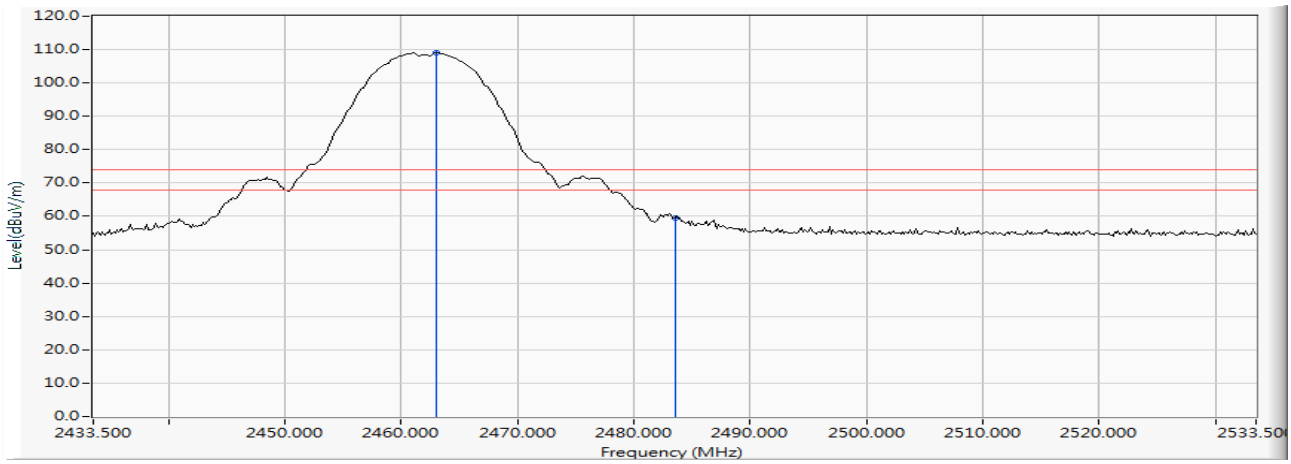
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	32.678	45.577	-8.423	54.000	AVERAGE
2		2398.116	12.947	55.091	68.039	14.039	54.000	AVERAGE
3		2400.000	12.961	49.814	62.775	--	--	AVERAGE
4	*	2411.304	13.038	93.652	106.689	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Horizontal



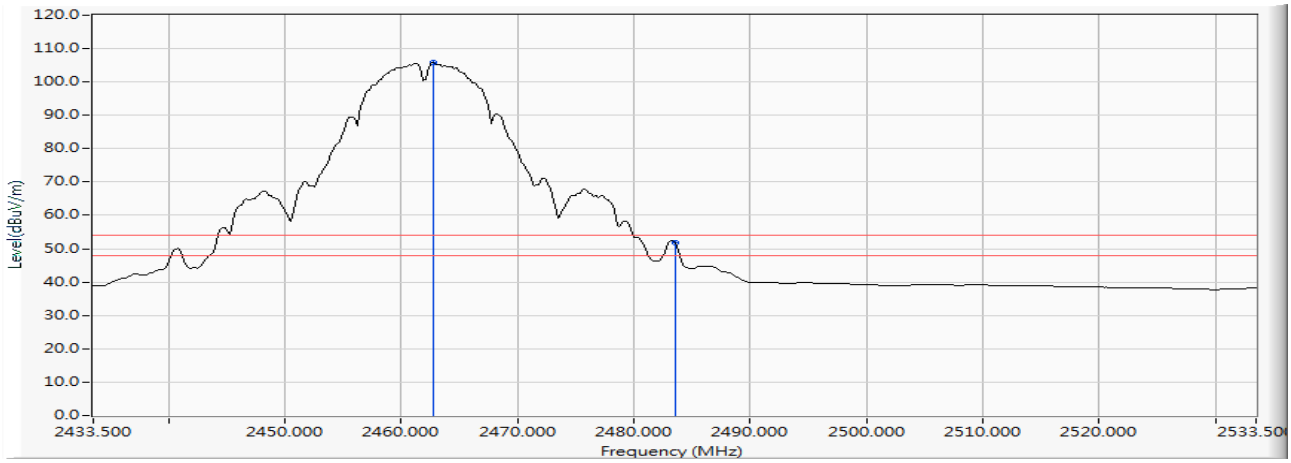
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.065	13.345	95.651	108.995	--	--	PEAK
2		2483.500	13.375	46.091	59.465	-14.535	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Horizontal



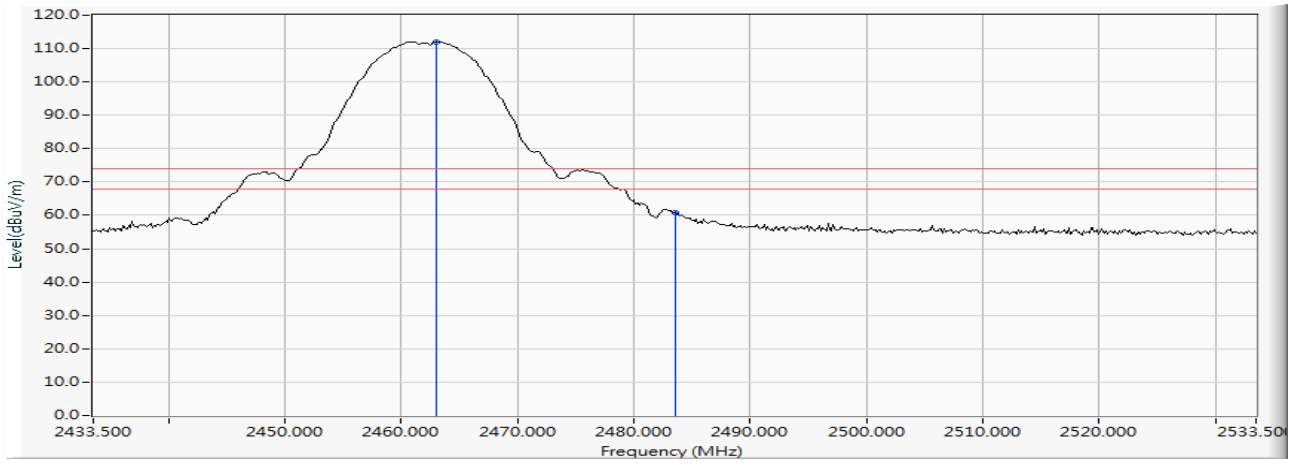
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.775	13.344	92.437	105.781	--	--	AVERAGE
2		2483.500	13.375	38.516	51.890	-2.110	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Vertical



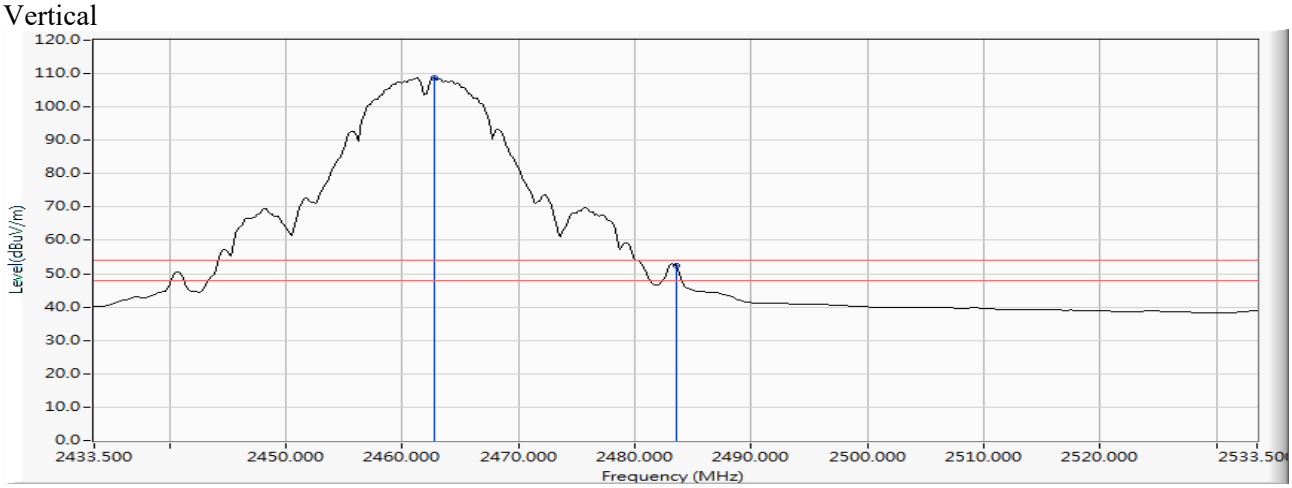
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.065	13.345	98.739	112.083	--	--	PEAK
2		2483.500	13.375	47.541	60.915	-13.085	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Vertical



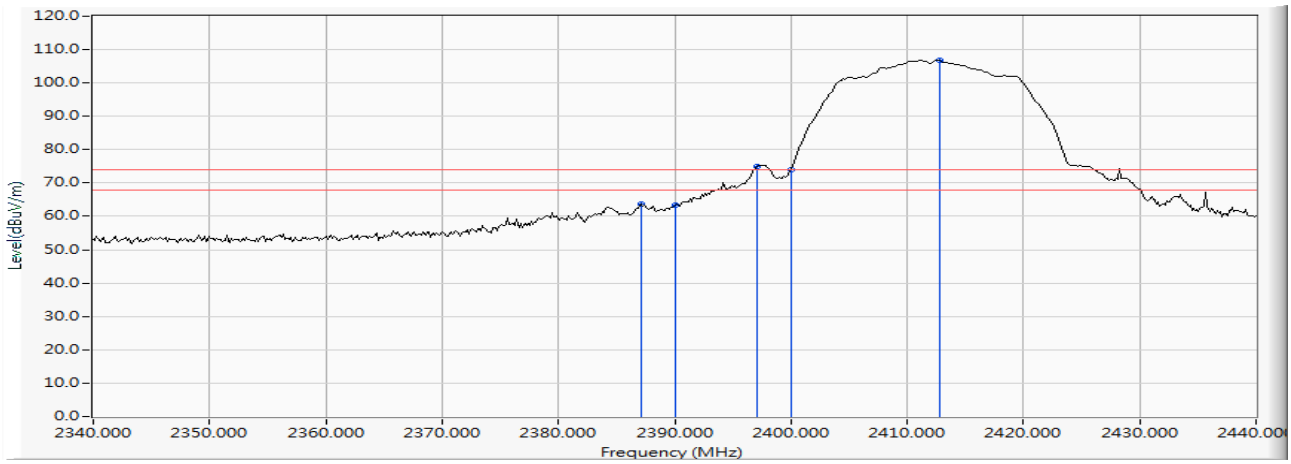
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.775	13.344	95.467	108.811	--	--	AVERAGE
2		2483.500	13.375	38.966	52.340	-1.660	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Horizontal



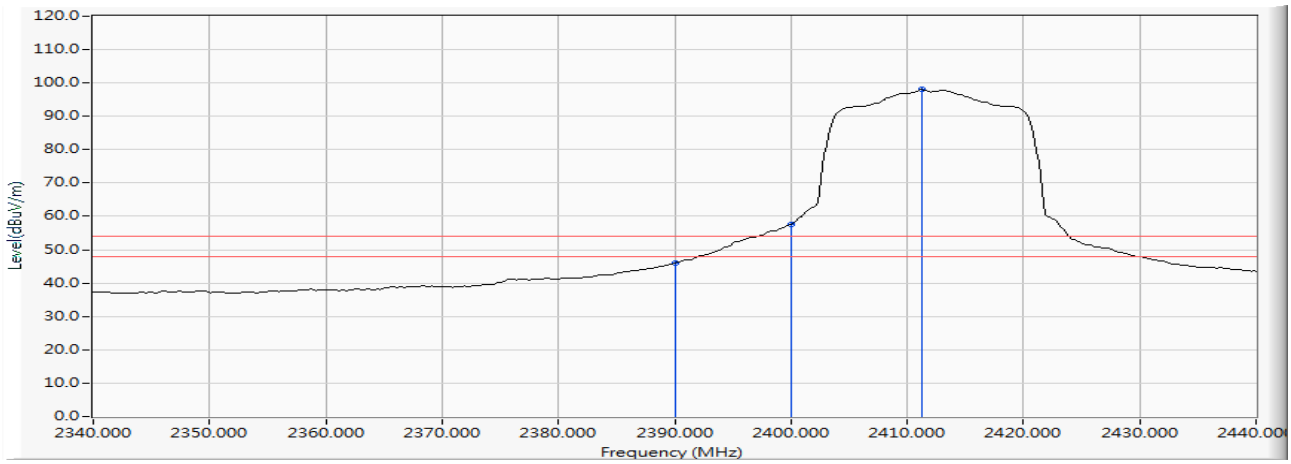
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2387.101	12.883	50.883	63.766	-10.234	74.000	PEAK
2		2390.000	12.899	50.520	63.419	-10.581	74.000	PEAK
3		2397.101	12.941	61.894	74.835	--	--	PEAK
4		2400.000	12.961	61.115	74.076	--	--	PEAK
5	*	2412.754	13.048	93.820	106.868	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Horizontal



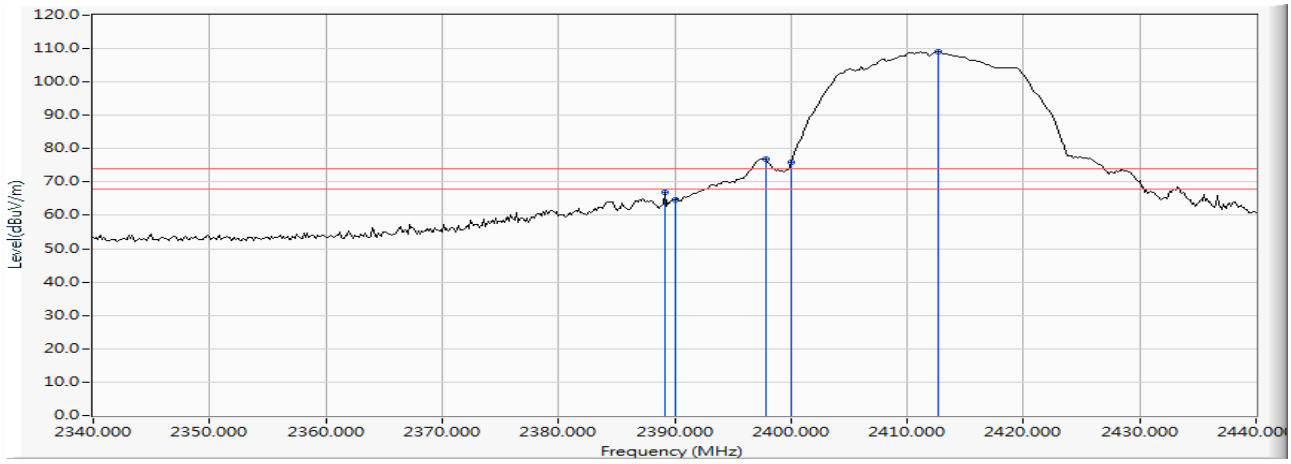
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	33.213	46.112	-7.888	54.000	AVERAGE
2		2400.000	12.961	44.680	57.641	3.641	54.000	AVERAGE
3	*	2411.304	13.038	84.987	98.024	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Vertical



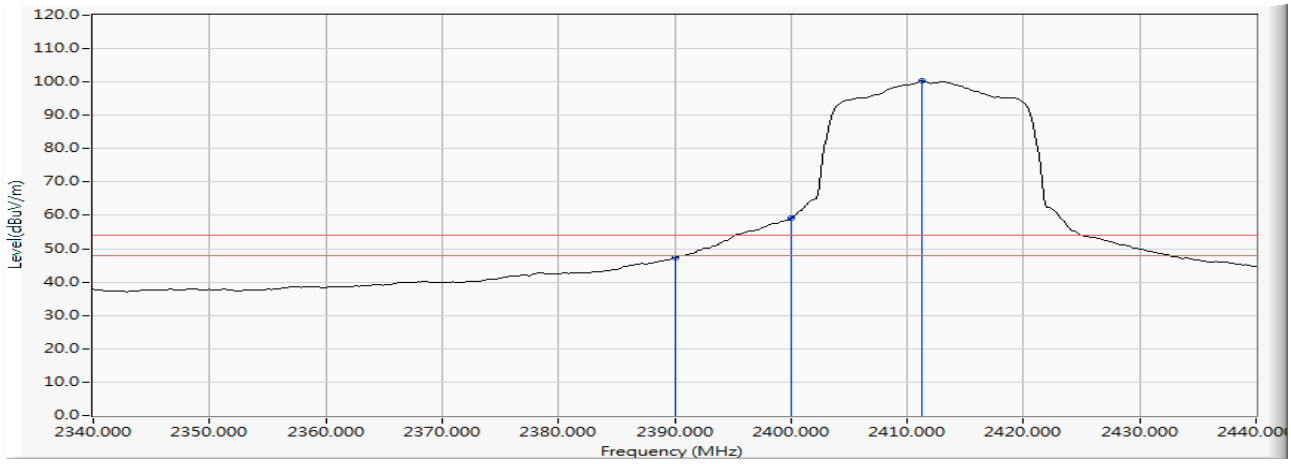
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2389.130	12.894	53.887	66.781	-7.219	74.000	PEAK
2		2390.000	12.899	51.779	64.678	-9.322	74.000	PEAK
3		2397.826	12.946	63.862	76.808	--	--	PEAK
4		2400.000	12.961	63.024	75.985	--	--	PEAK
5	*	2412.609	13.046	96.058	109.104	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Vertical



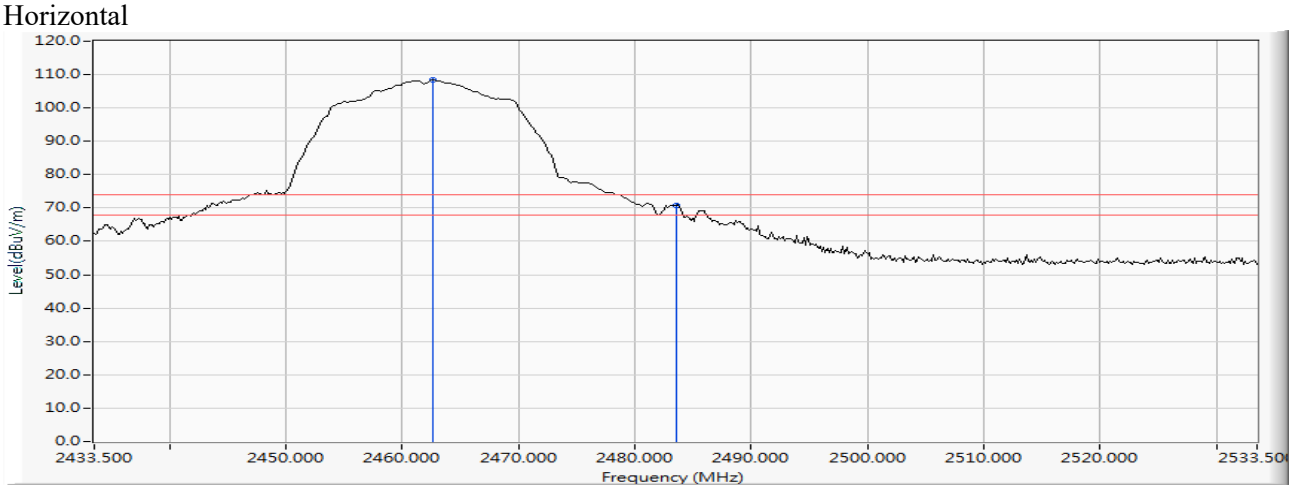
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	34.474	47.373	-6.627	54.000	AVERAGE
2		2400.000	12.961	46.111	59.072	--	--	AVERAGE
3	*	2411.304	13.038	87.199	100.236	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Horizontal



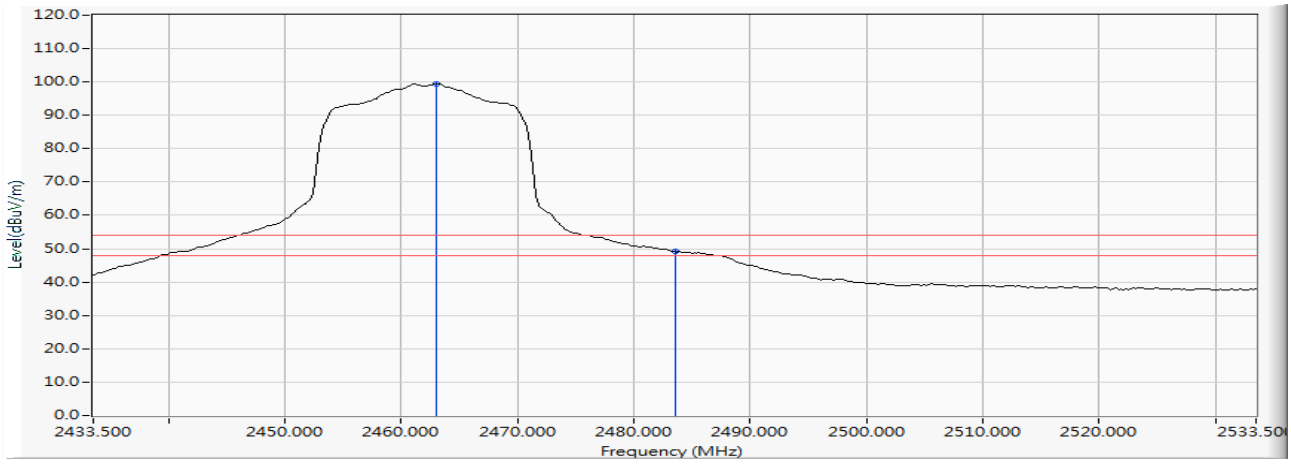
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.630	13.343	95.063	108.407	--	--	PEAK
2		2483.500	13.375	57.343	70.717	-3.283	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Horizontal



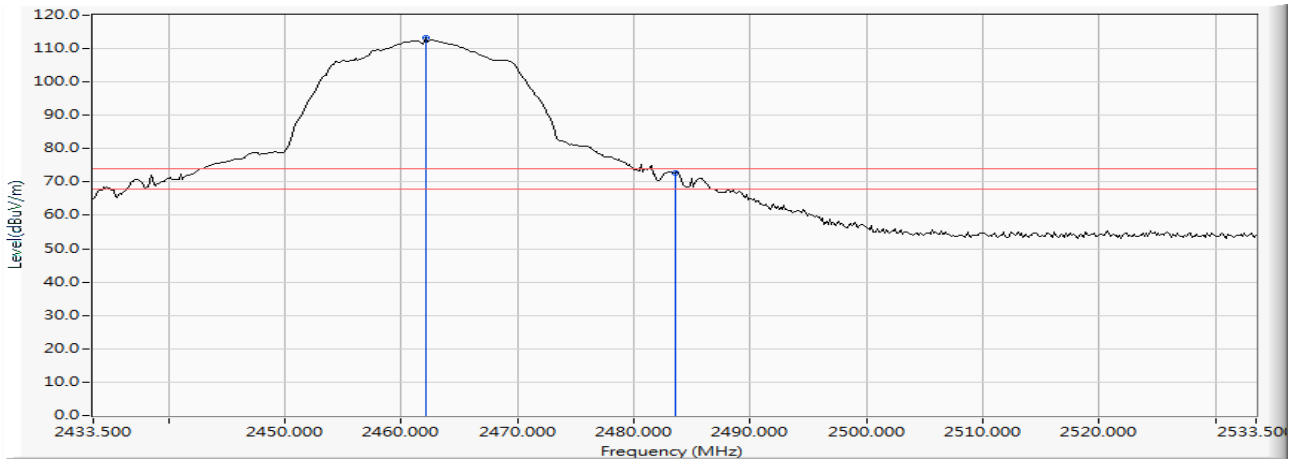
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.065	13.345	86.130	99.474	--	--	AVERAGE
2		2483.500	13.375	35.712	49.086	-4.914	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Vertical



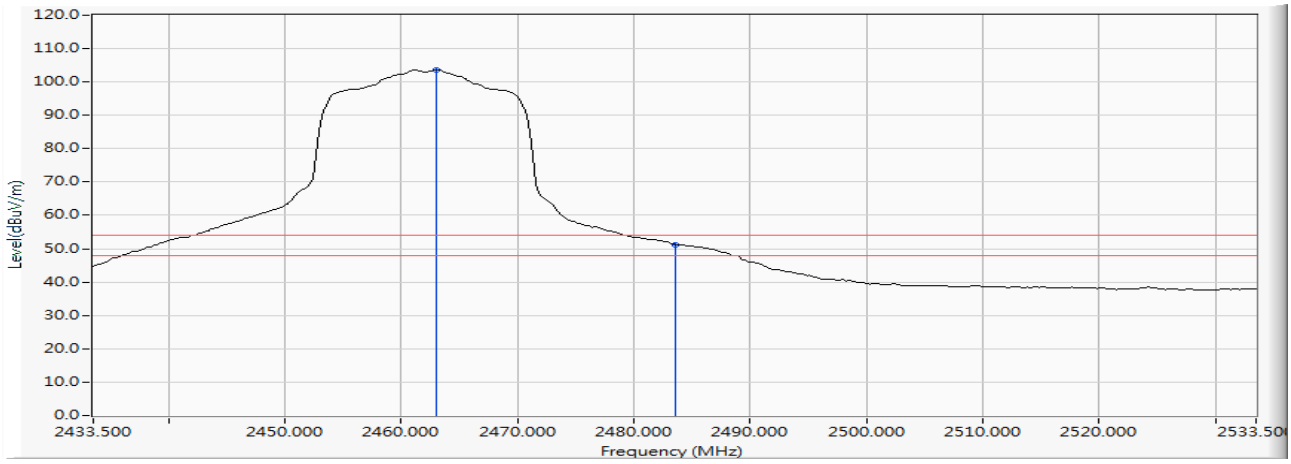
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2462.051	13.343	99.772	113.115	--	--	PEAK
2		2483.500	13.375	59.479	72.853	-1.147	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Vertical



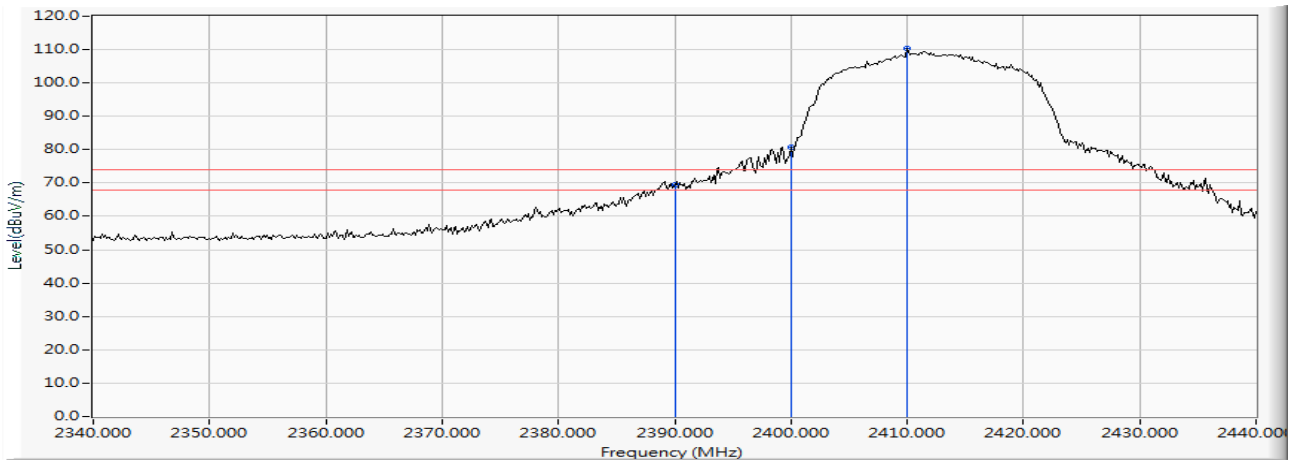
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2463.065	13.345	90.280	103.624	--	--	AVERAGE
2		2483.500	13.375	37.892	51.266	-2.734	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

Horizontal



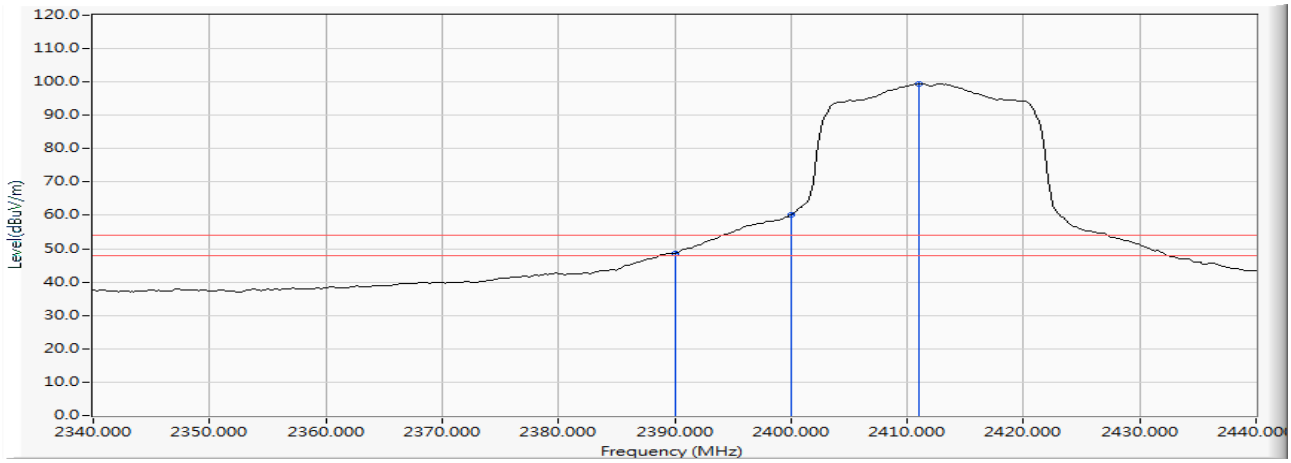
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	56.681	69.580	-4.420	74.000	PEAK
2		2400.000	12.961	67.679	80.640	--	--	PEAK
3	*	2410.000	13.028	97.352	110.380	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

Horizontal



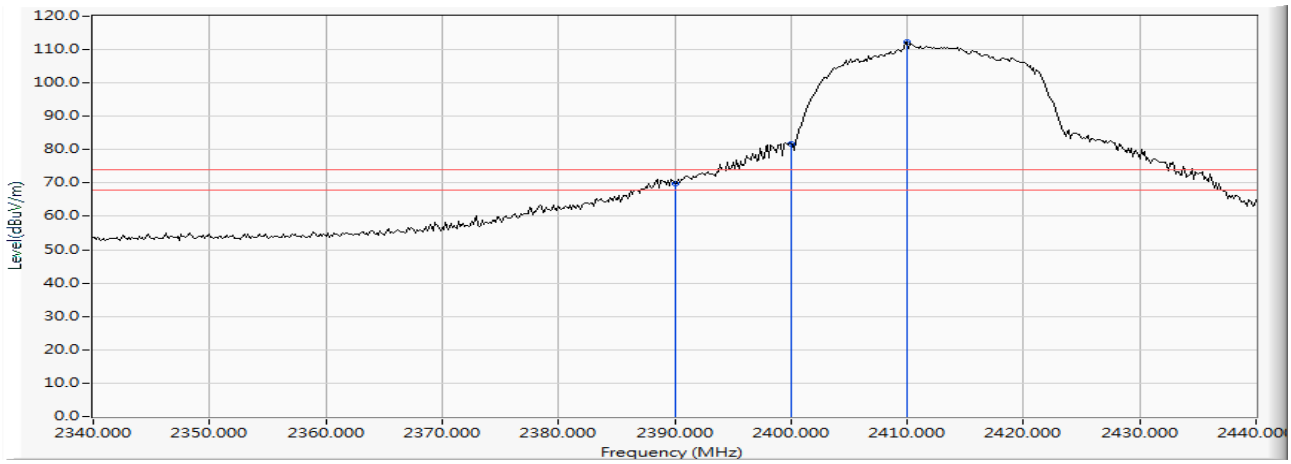
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	35.819	48.718	-5.282	54.000	AVERAGE
2		2400.000	12.961	47.256	60.217	--	--	AVERAGE
3	*	2411.014	13.035	86.414	99.449	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

Vertical



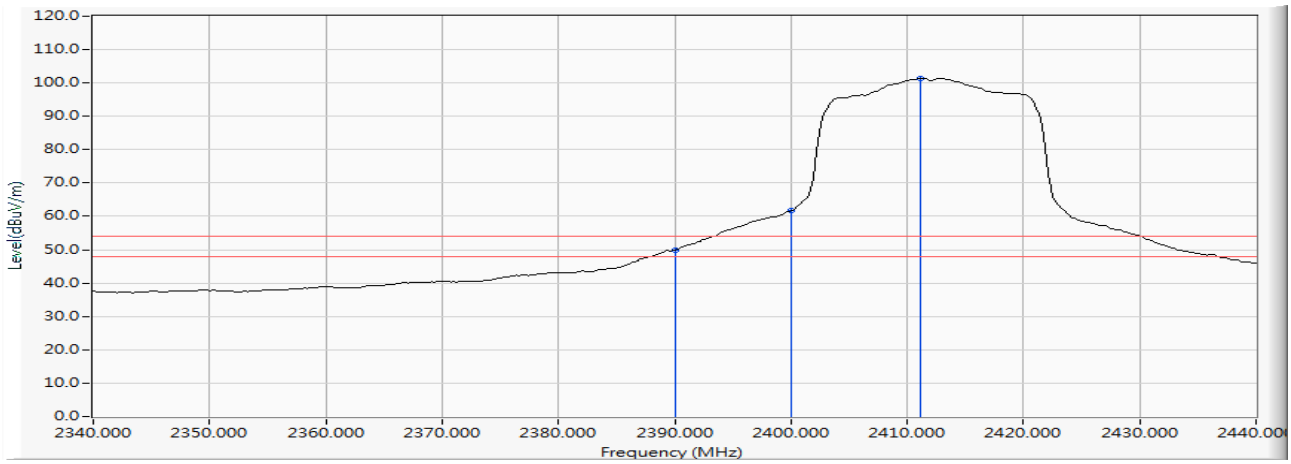
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	56.940	69.839	-4.161	74.000	PEAK
2		2400.000	12.961	68.813	81.774	--	--	PEAK
3	*	2410.000	13.028	99.157	112.185	--	--	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

Vertical



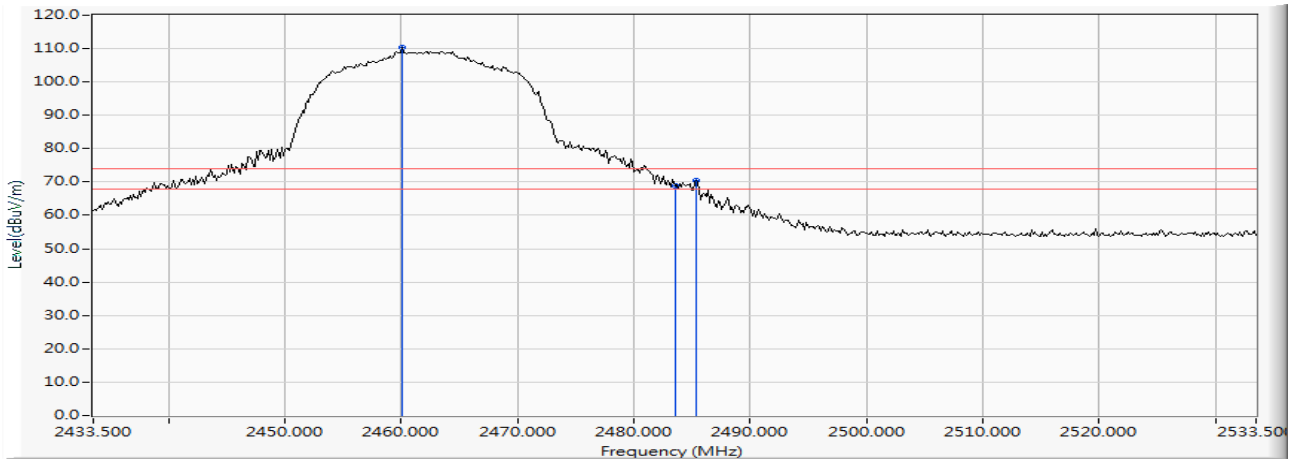
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	12.899	36.998	49.897	-4.103	54.000	AVERAGE
2		2400.000	12.961	48.789	61.750	--	--	AVERAGE
3	*	2411.159	13.036	88.400	101.436	--	--	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 23.1 inches Bar type Digital Signage
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2019/10/23
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

Horizontal



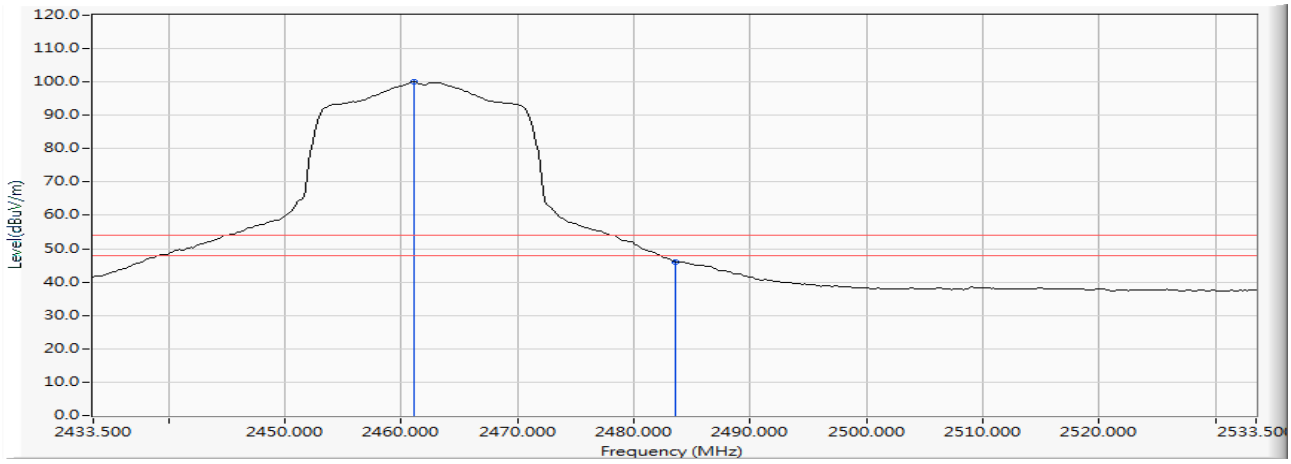
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2460.022	13.336	96.975	110.311	--	--	PEAK
2		2483.500	13.375	55.599	68.973	-5.027	74.000	PEAK
3		2485.384	13.376	57.086	70.463	-3.537	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

Horizontal



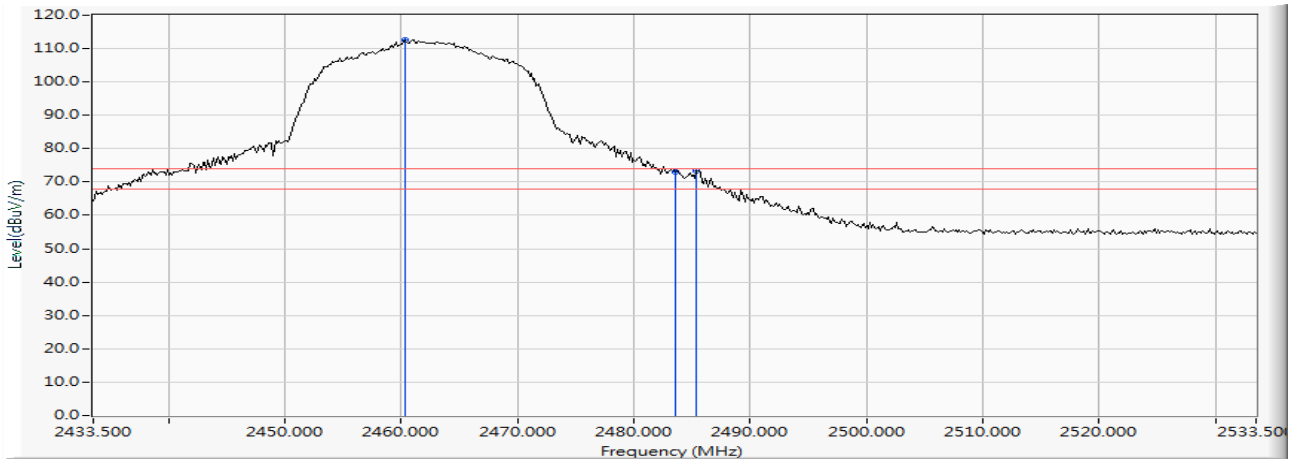
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2461.036	13.339	86.633	99.973	--	--	AVERAGE
2		2483.500	13.375	32.782	46.156	-7.844	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

Vertical



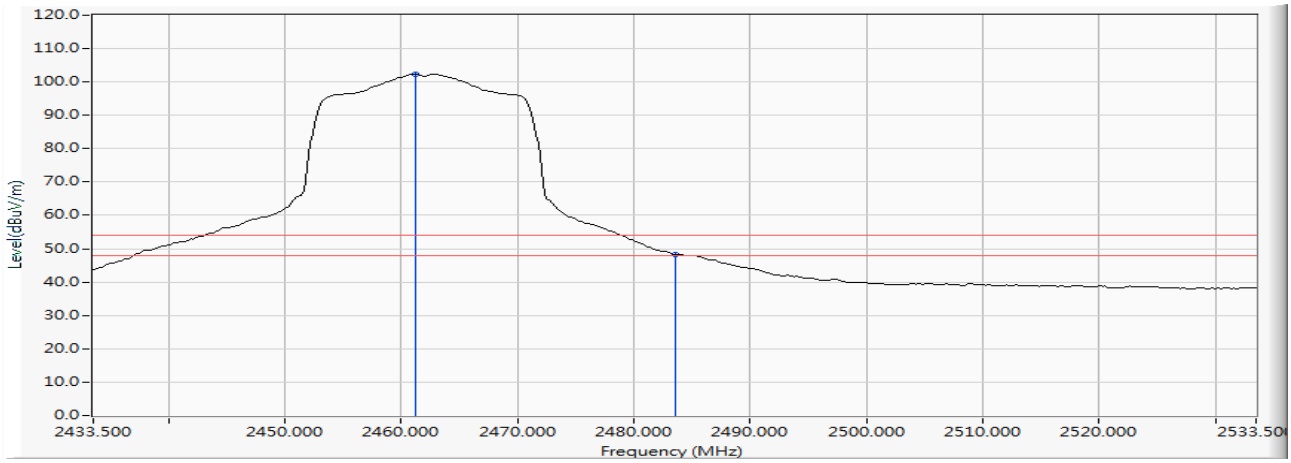
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2460.312	13.337	99.274	112.611	--	--	PEAK
2		2483.500	13.375	59.576	72.950	-1.050	74.000	PEAK
3		2485.384	13.376	59.932	73.309	-0.691	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	23.1 inches Bar type Digital Signage
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2019/10/23
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

Vertical



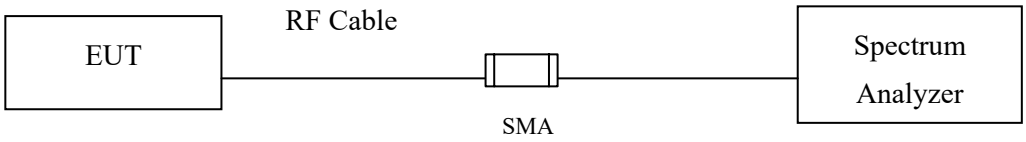
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2461.181	13.340	89.120	102.460	--	--	AVERAGE
2		2483.500	13.375	34.894	48.268	-5.732	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to ANSI C63.10 Section 11.8 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 1-5% of the emission bandwidth, VBW≥3*RBW

7.4. Uncertainty

± 283Hz

7.5. Test Result of 6dB Bandwidth

Product : 23.1 inches Bar type Digital Signage
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	8100	>500	Pass
06	2437	8100	>500	Pass
11	2462	8100	>500	Pass

Figure Channel 01:

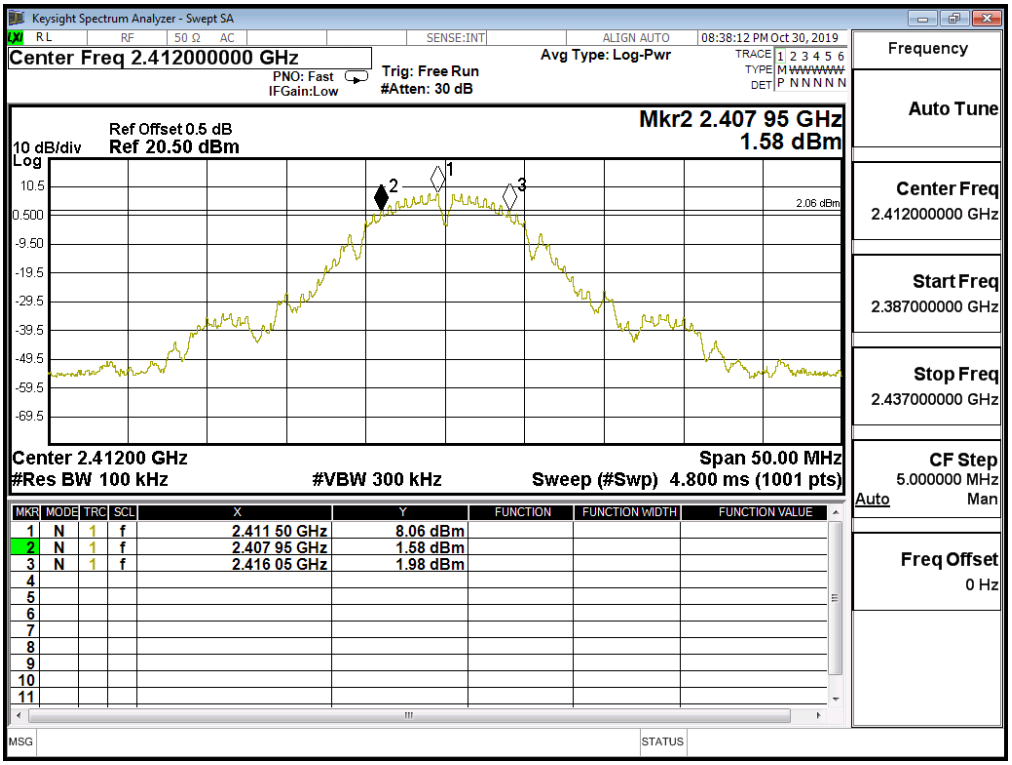


Figure Channel 06:

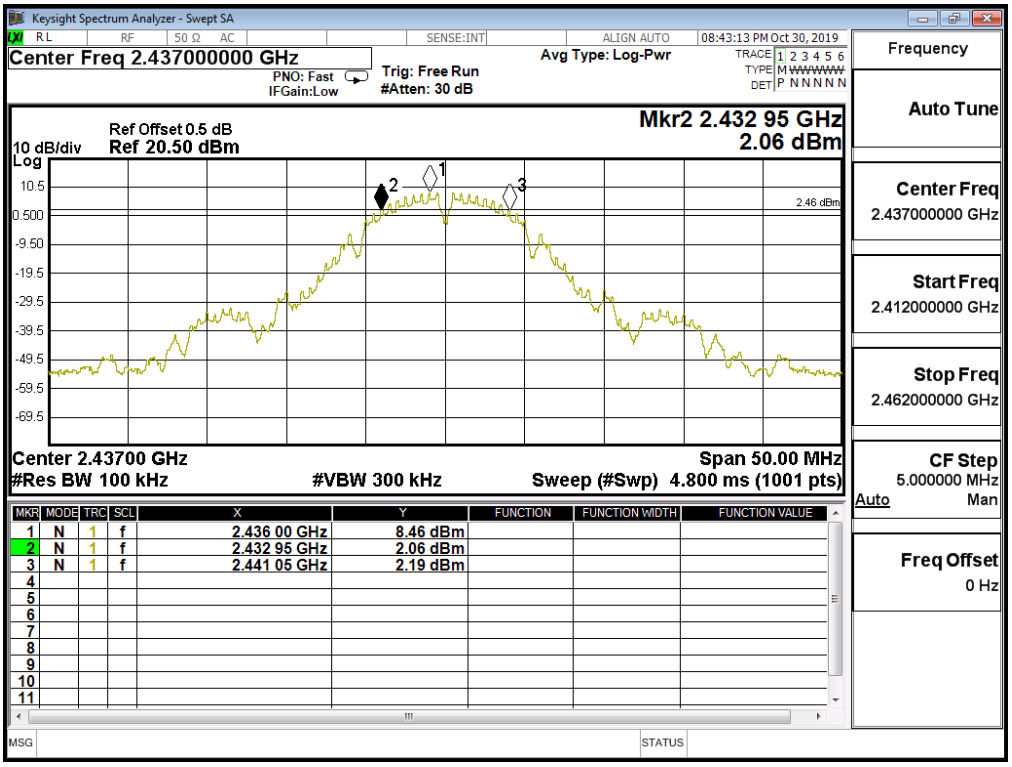
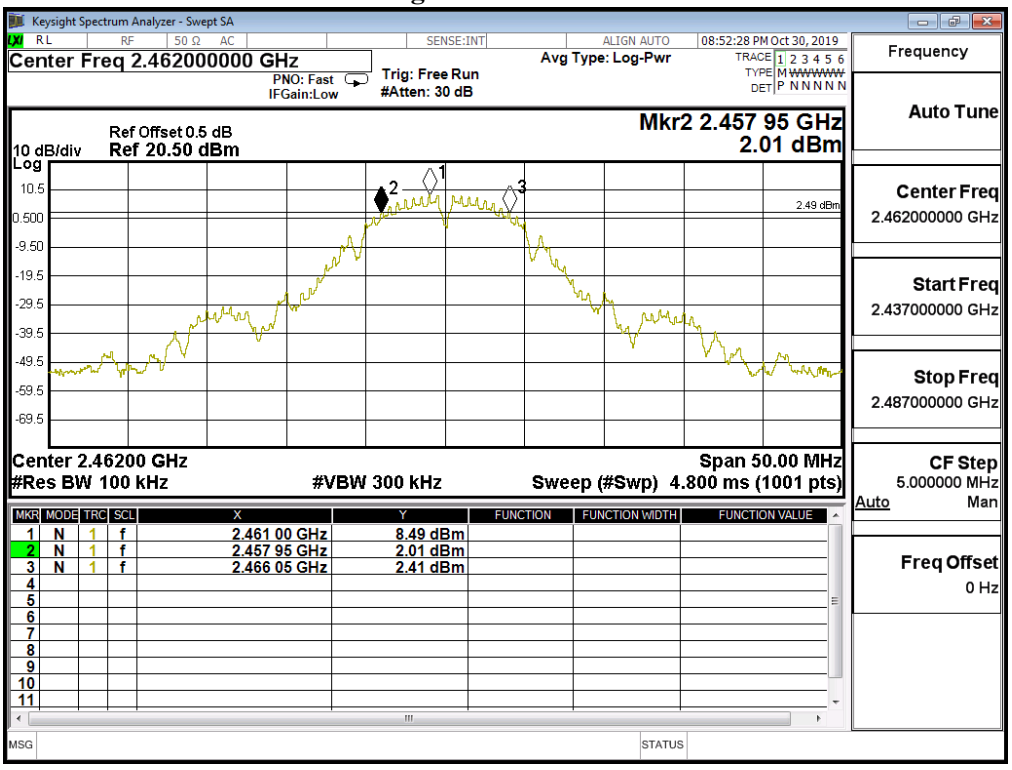


Figure Channel 11:



Product : 23.1 inches Bar type Digital Signage
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	15550	>500	Pass
06	2437	15300	>500	Pass
11	2462	15300	>500	Pass

Figure Channel 01:

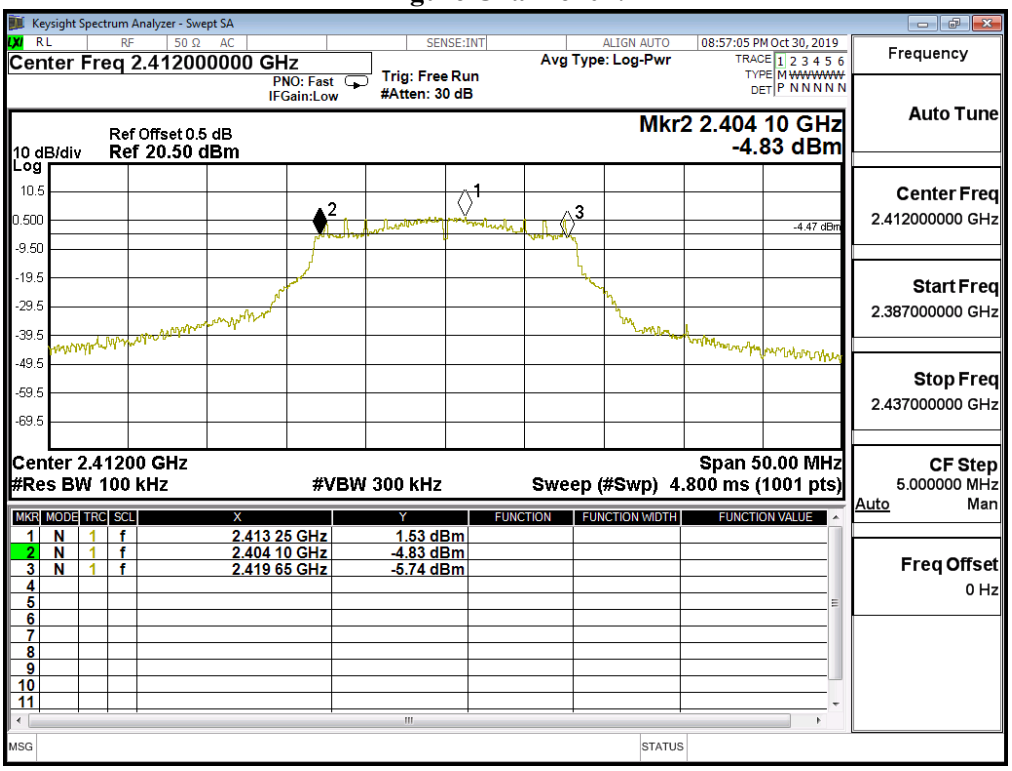


Figure Channel 06:

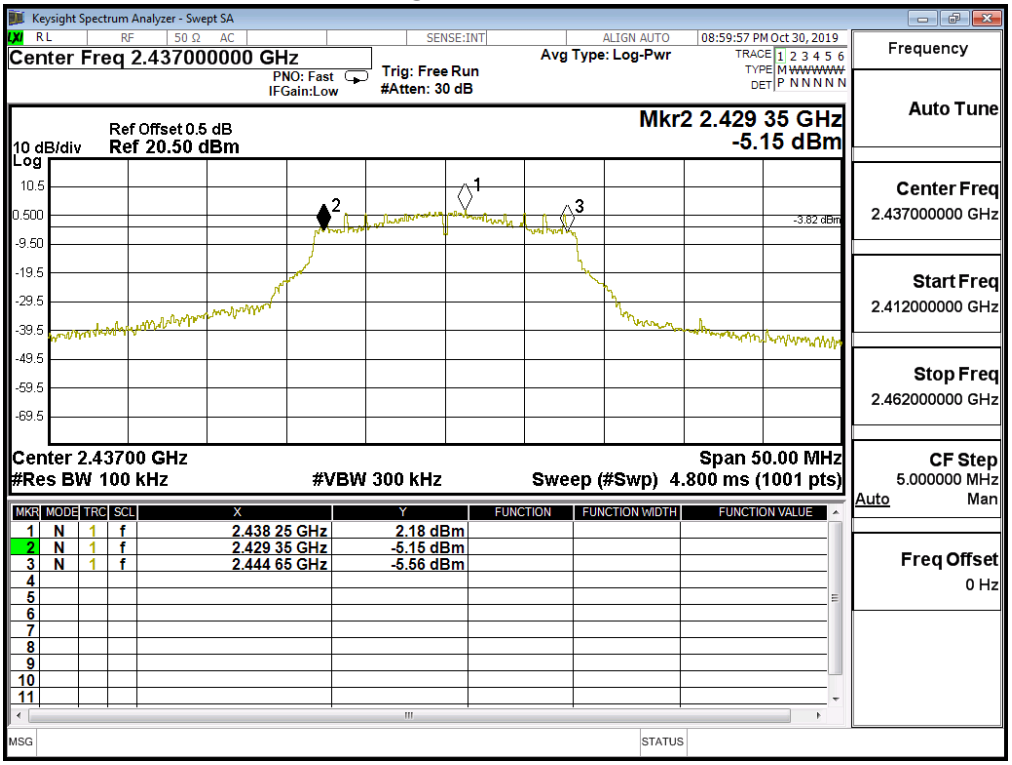
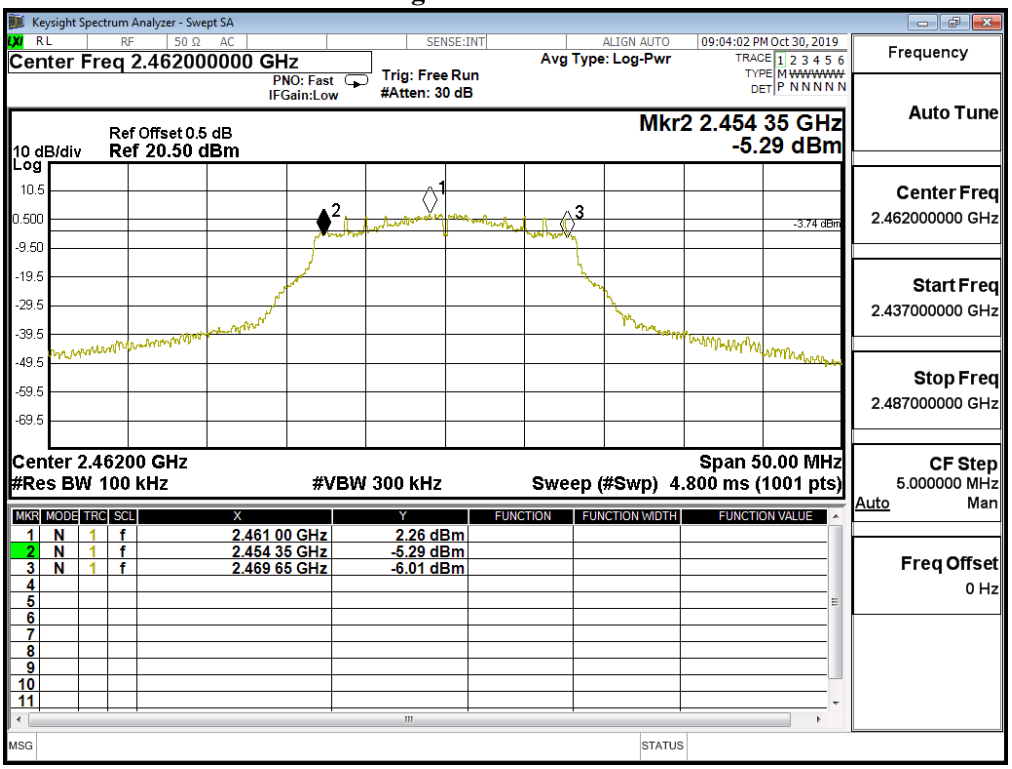


Figure Channel 11:



Product : 23.1 inches Bar type Digital Signage
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	15300	>500	Pass
06	2437	15300	>500	Pass
11	2462	15300	>500	Pass

Figure Channel 01:

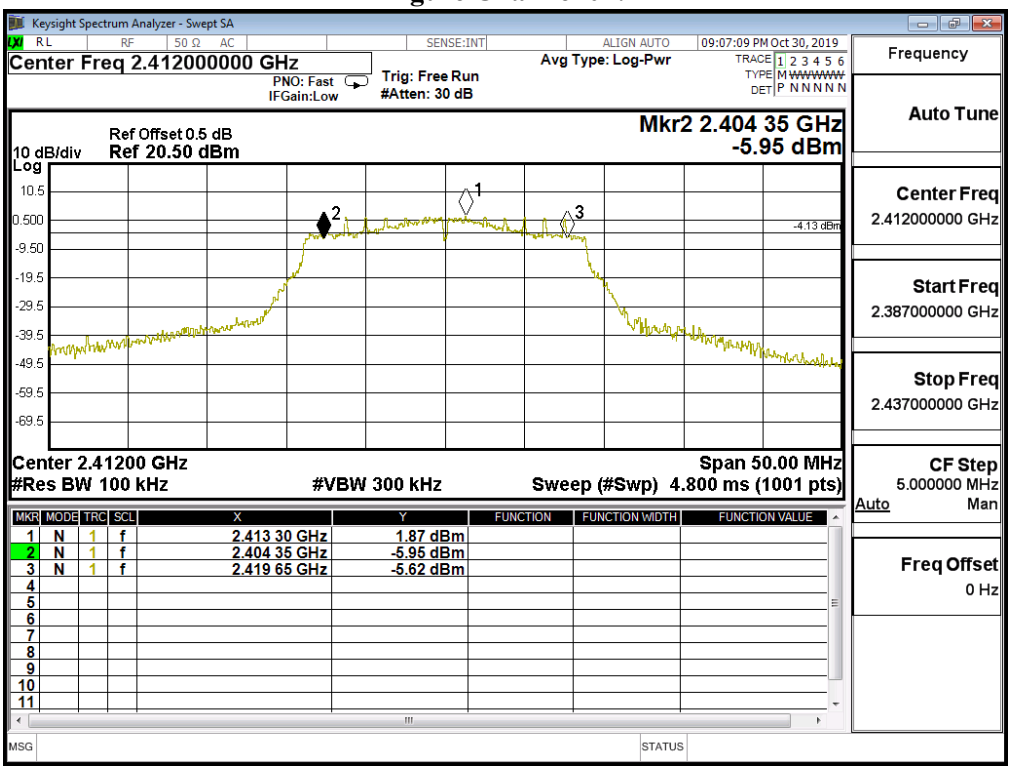


Figure Channel 06:

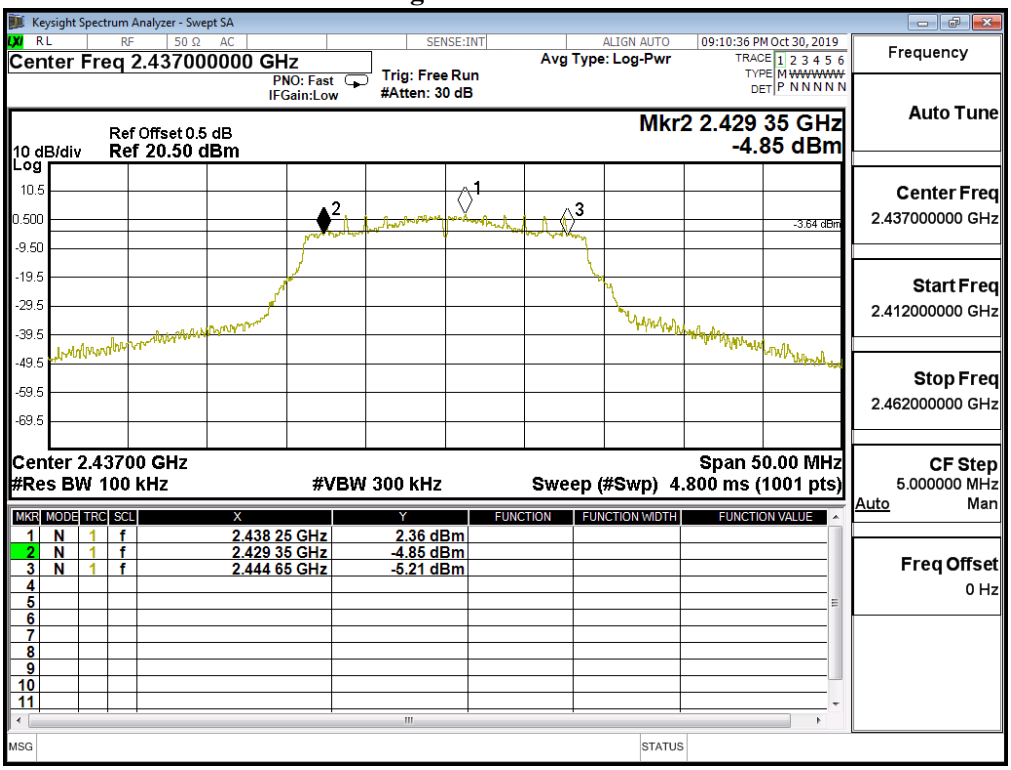
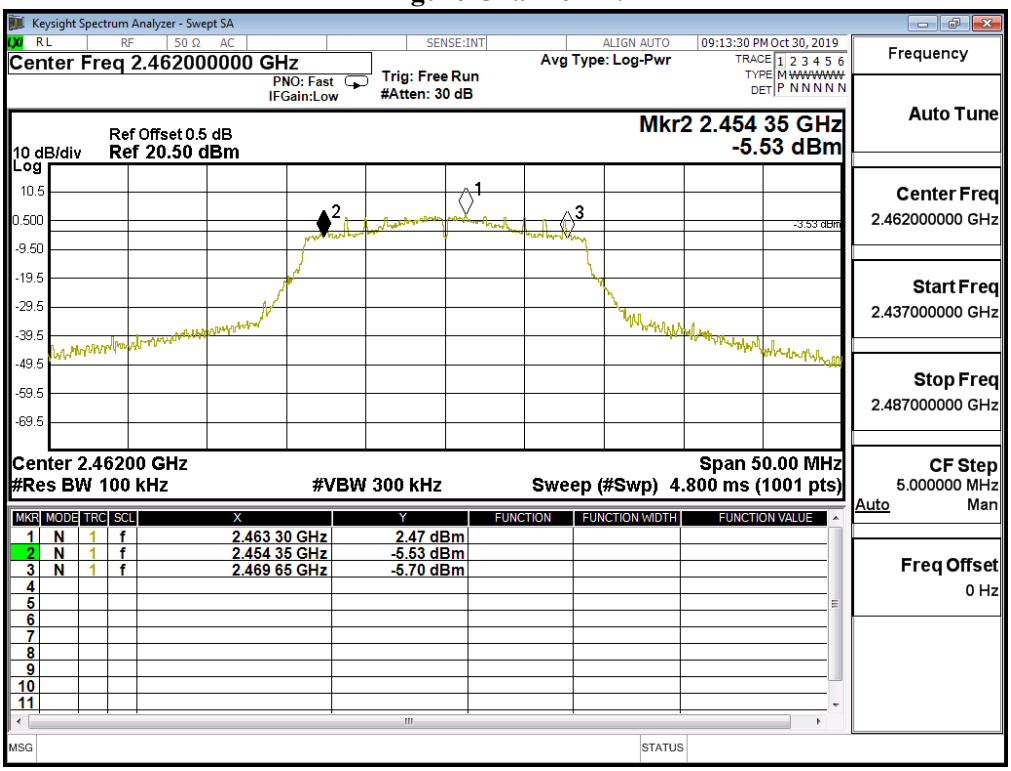
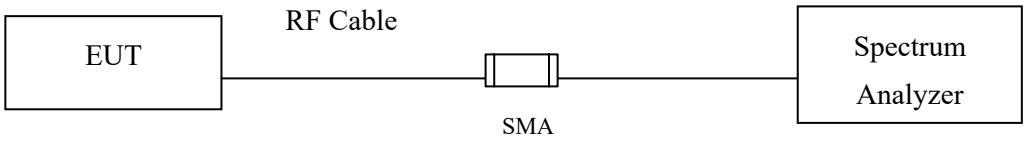


Figure Channel 11:



8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of C63.10 Section 11.10.2 for compliance to FCC 47CFR 15.247 requirements.
The maximum power spectral density using C63.10 Section 11.10.2 Method PKPSD (peak PSD).

8.4. Uncertainty

± 1.20 dB

8.5. Test Result of Power Density

Product : 23.1 inches Bar type Digital Signage
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	7.82	≦8dBm	Pass
06	2437	7.05	≦8dBm	Pass
11	2462	7.95	≦8dBm	Pass

Figure Channel 01:

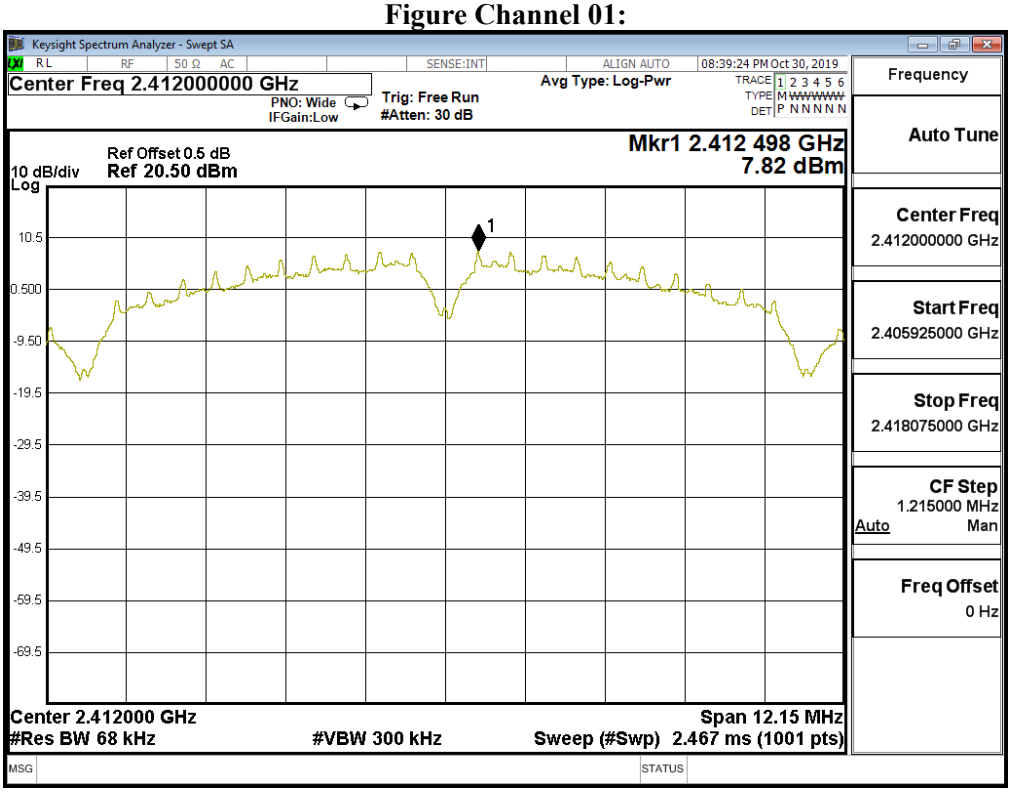


Figure Channel 06:

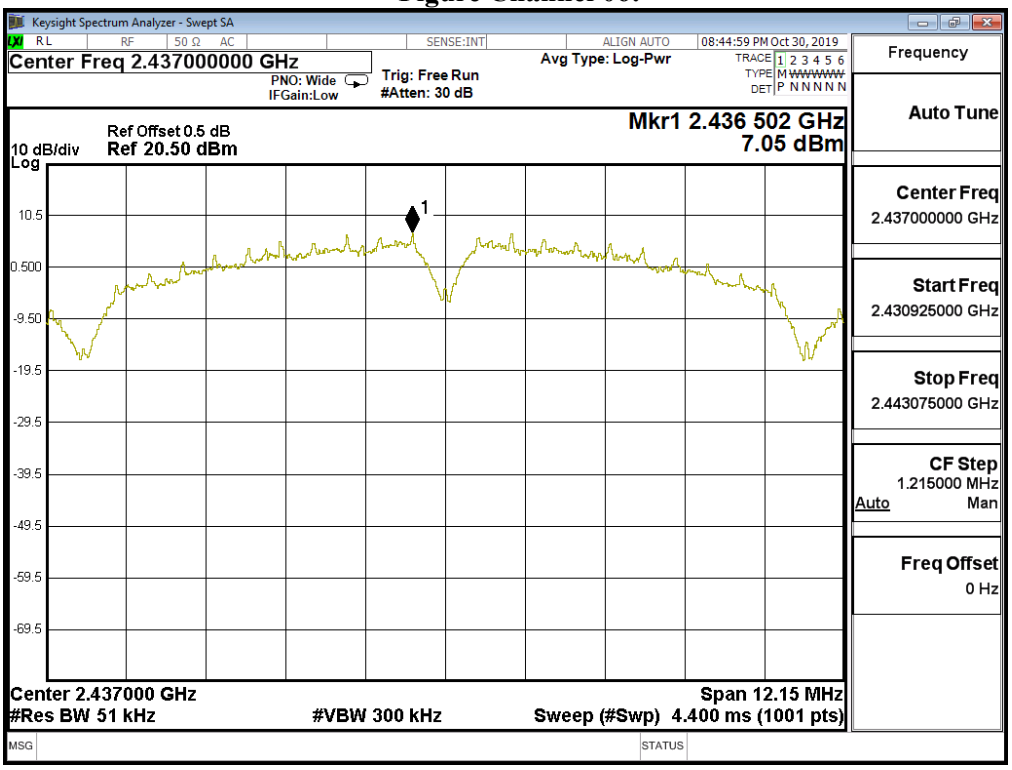
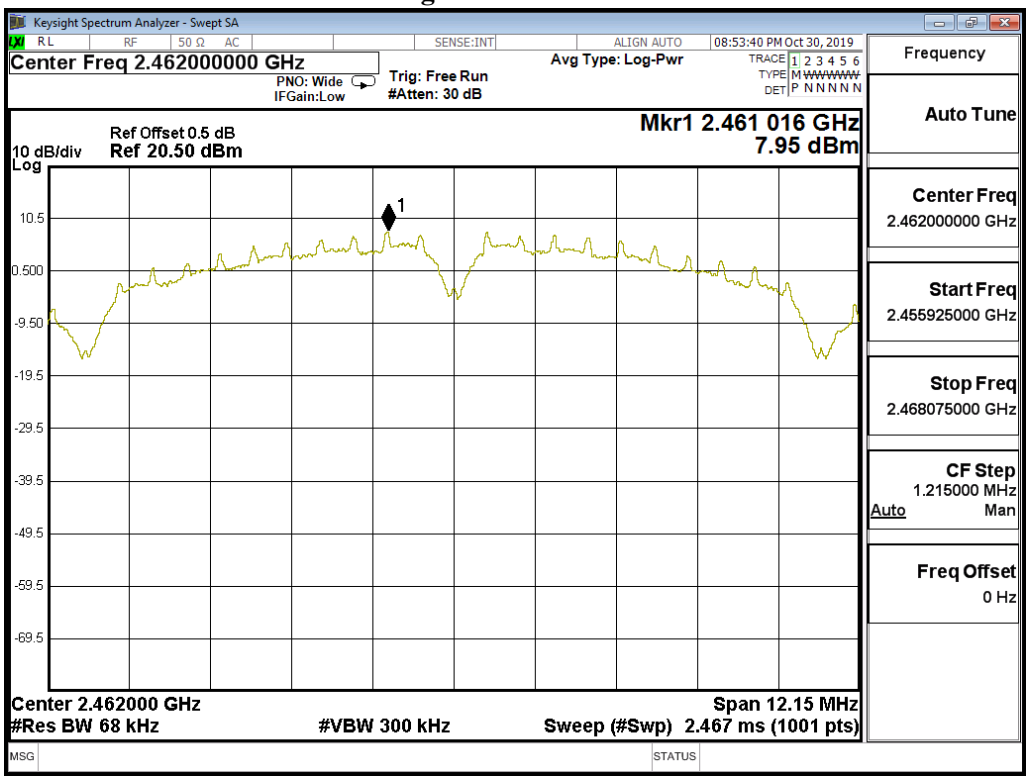


Figure Channel 11:



Product : 23.1 inches Bar type Digital Signage
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	1.51	≦8dBm	Pass
06	2437	1.69	≦8dBm	Pass
11	2462	2.33	≦8dBm	Pass

Figure Channel 01:

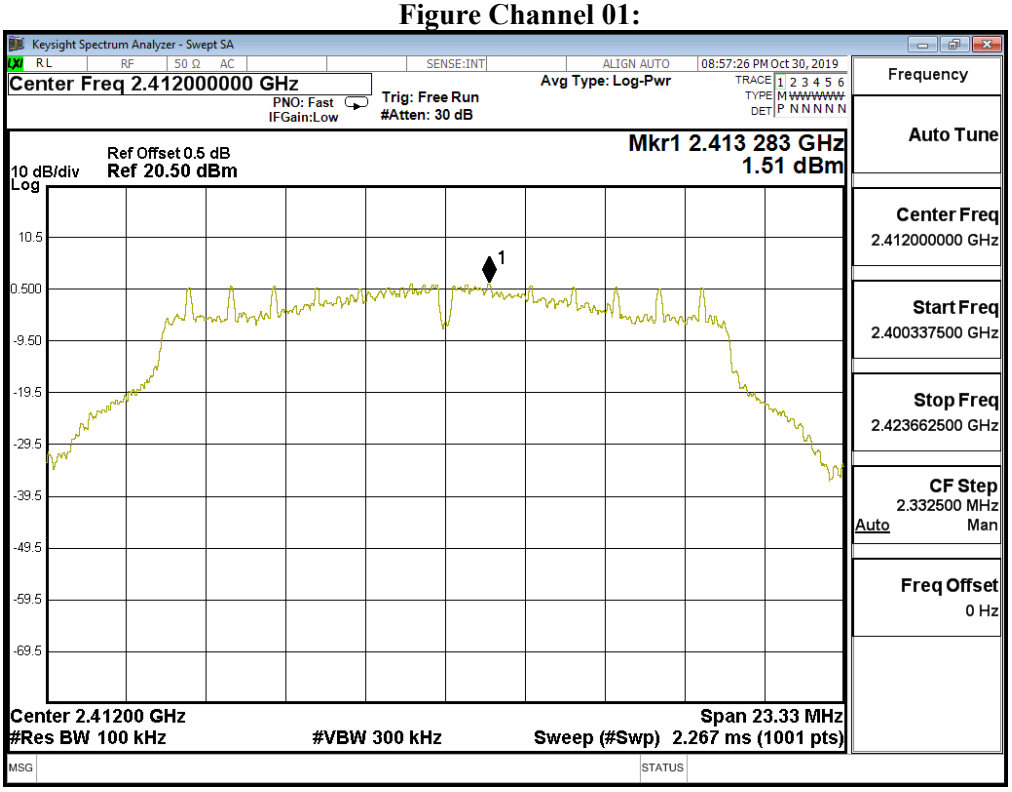


Figure Channel 06:

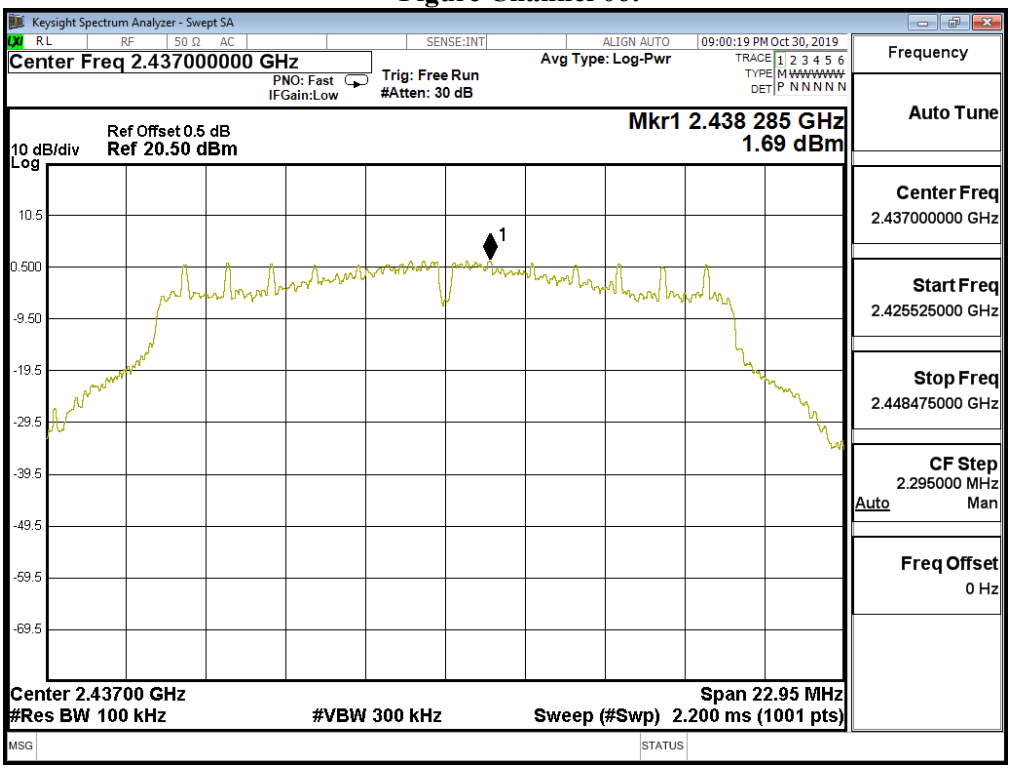
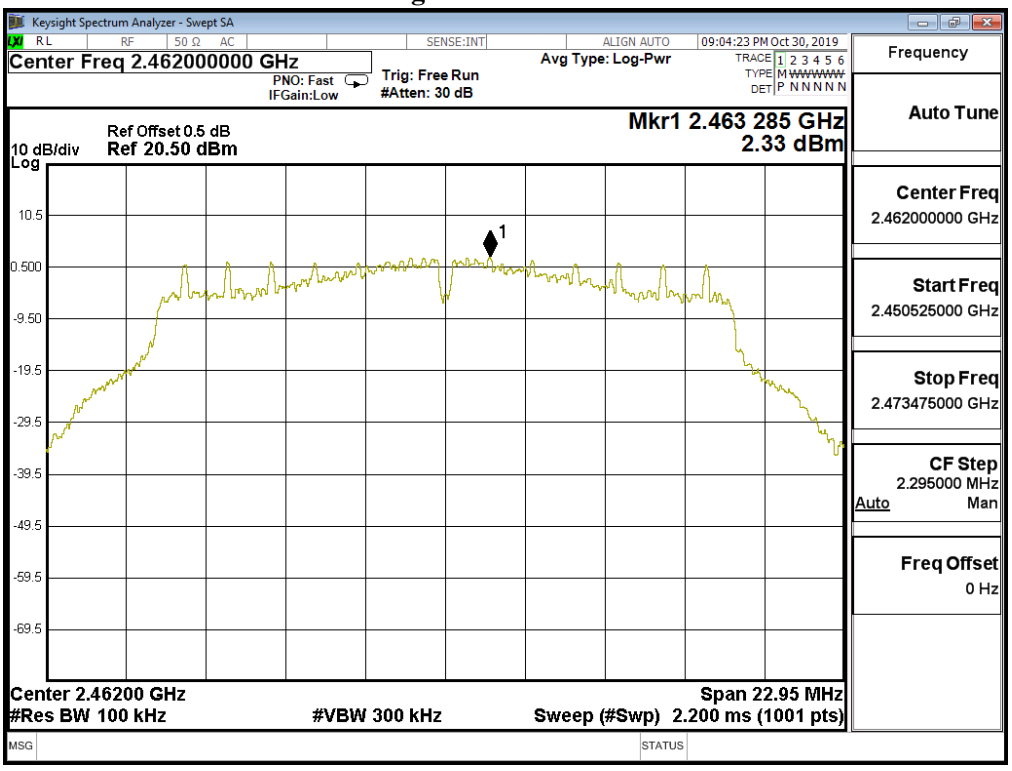


Figure Channel 11:



Product : 23.1 inches Bar type Digital Signage
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	2.10	≦8dBm	Pass
06	2437	2.50	≦8dBm	Pass
11	2462	2.52	≦8dBm	Pass

Figure Channel 01:

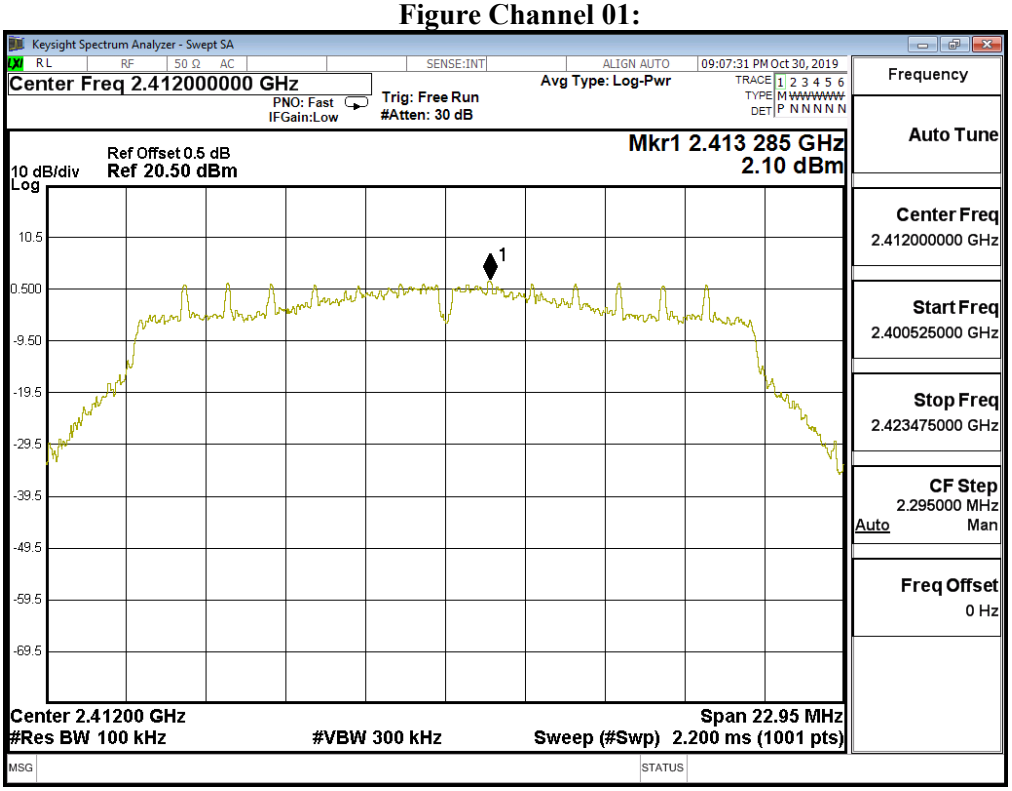


Figure Channel 06:

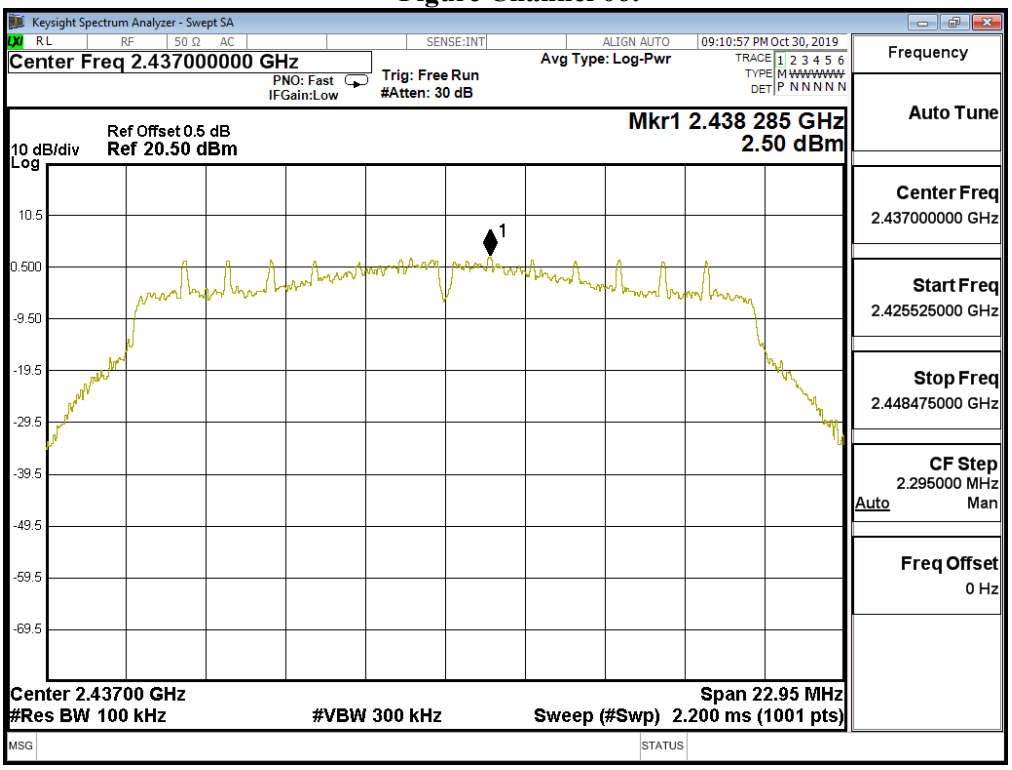
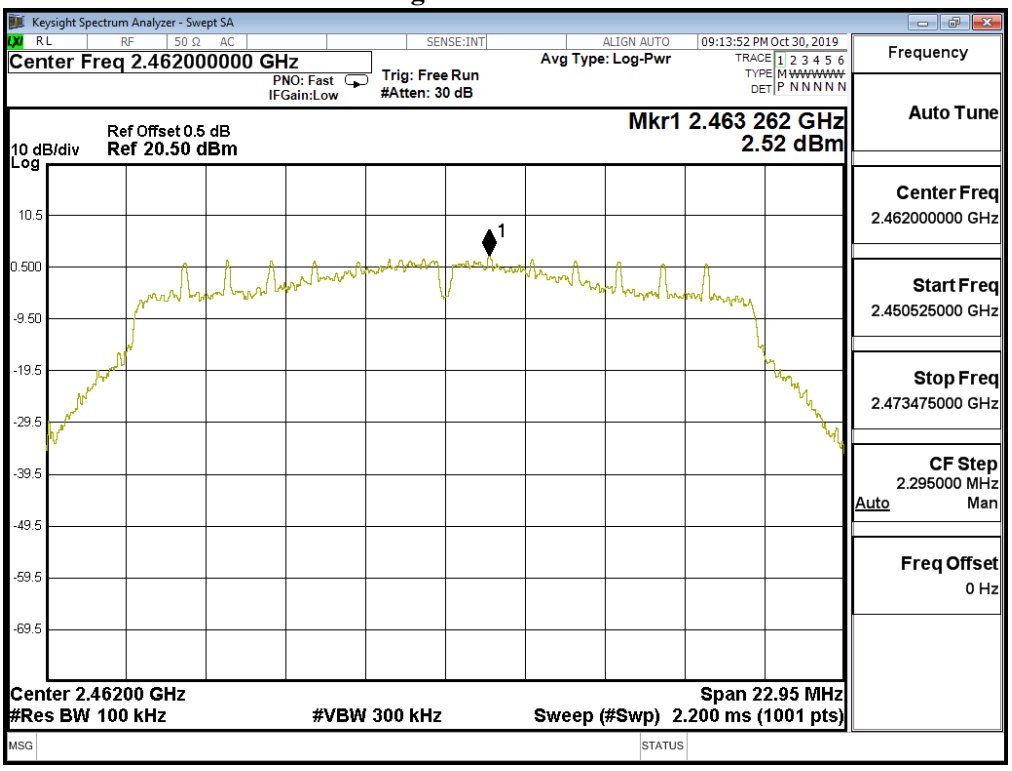
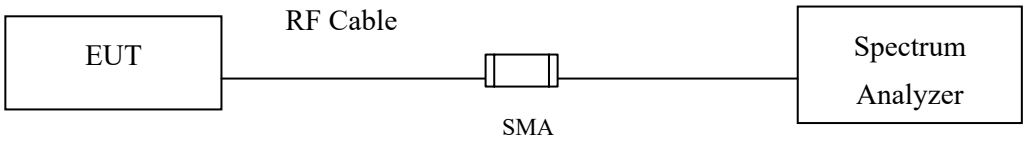


Figure Channel 11:



9. Duty Cycle

9.1. Test Setup



9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to ANSI C63.10 2013 for compliance to FCC 47CFR 15.247 requirements.

9.3. Uncertainty

± 2.31msec

9.4. Test Result of Duty Cycle

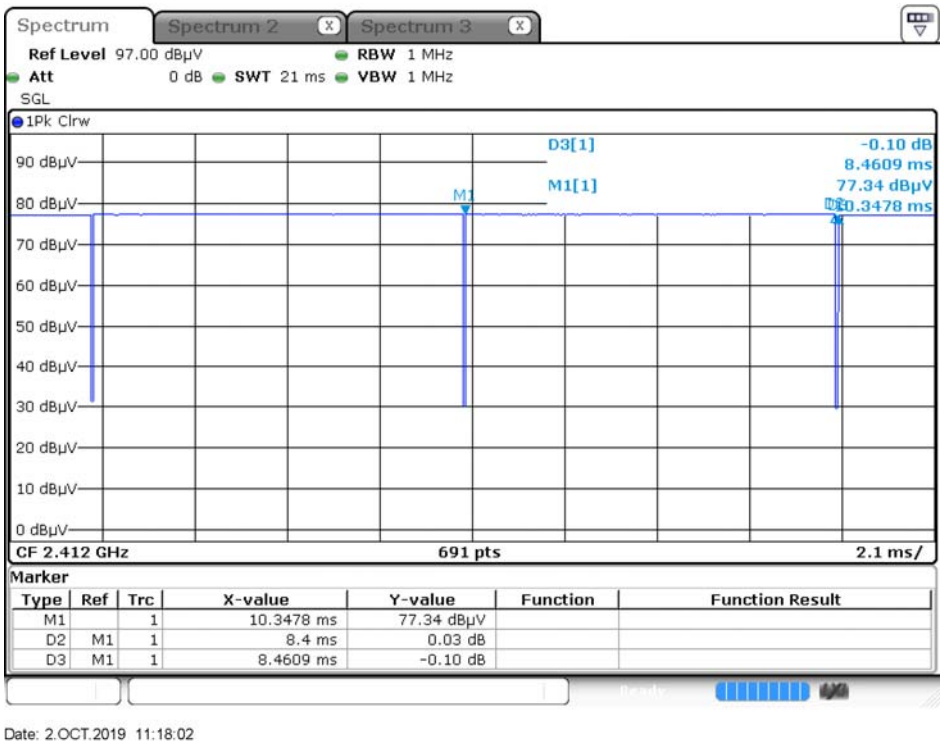
Product : 23.1 inches Bar type Digital Signage
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

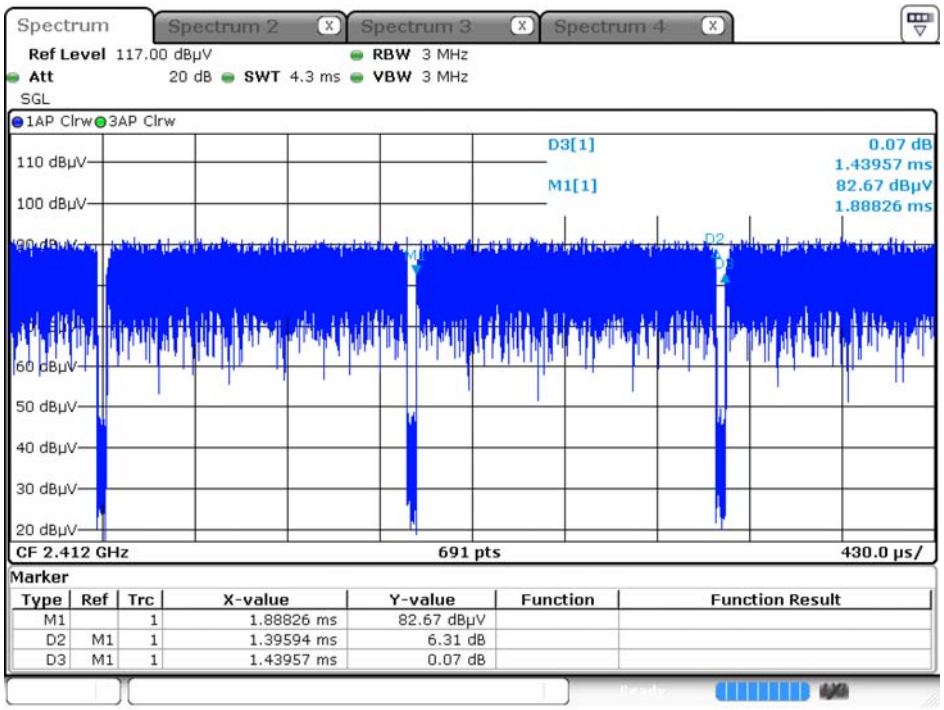
Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	8.4000	8.4609	99.28	0.03
802.11g	1.3959	1.4396	96.97	0.13
802.11n20	1.3023	1.3506	96.43	0.16

802.11b

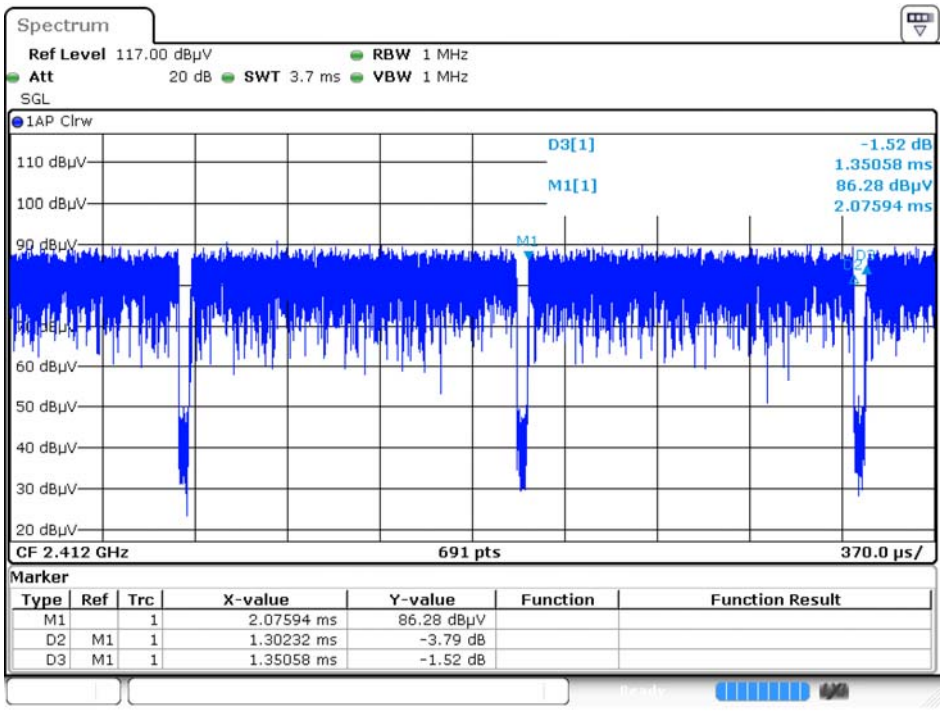


802.11g



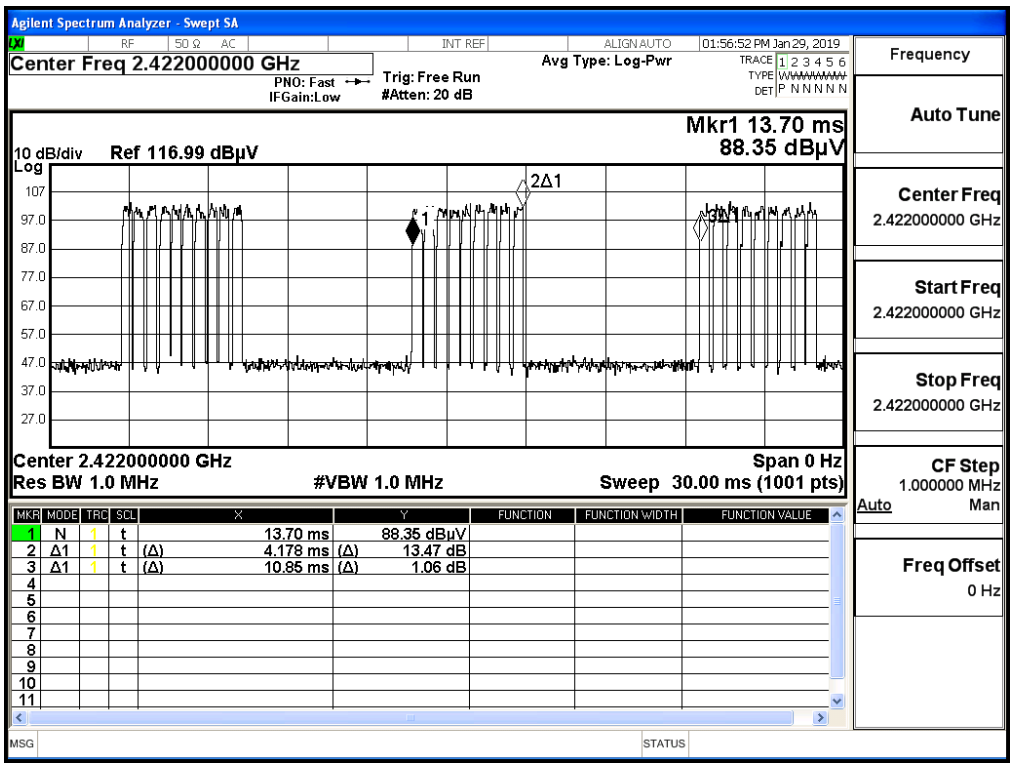
Date: 3.OCT.2019 11:46:31

802.11n20



Date: 3.OCT.2019 13:14:58

802.11n40


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω
AC
INT REF
ALIGN AUTO
01:56:52 PM Jan 29, 2019
Center Freq 2.422000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE WWWWWW
DET P N N N N N
Mkr1 13.70 ms
88.35 dBµV
10 dB/div
Log
Ref 116.99 dBµV
107
97.0
87.0
77.0
67.0
57.0
47.0
37.0
27.0
2Δ1
1
3Δ1
Center 2.422000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 30.00 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 t 13.70 ms 88.35 dBµV
2 Δ1 1 t (Δ) 4.178 ms (Δ) 13.47 dB
3 Δ1 1 t (Δ) 10.85 ms (Δ) 1.06 dB
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.422000000 GHz
Start Freq
2.422000000 GHz
Stop Freq
2.422000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

10. EMI Reduction Method During Compliance Testing

No modification was made during testing.