

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
Issued Date	Nov. 12, 2019
Report No.	1980460R-RFUSP01V00
Report Version	V1.0



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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Test Report

Issued Date: Nov. 12, 2019

Report No.: 1980460R-RFUSP01V00



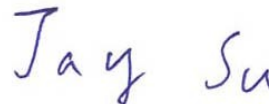
Product Name	23.1 inches Bar type Digital Signage
Applicant	Shuttle Inc.
Address	No.30,Lane76,Rei Kuang Rd.,Nei-Hu Dist.,Taipei, Taiwan R.O.C.
Manufacturer	Shuttle Inc.
Model No.	D230
FCC ID.	S8CD230
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V / 60Hz
Trade Name	Shuttle
Applicable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

Documented By :



(Senior Adm. Specialist / Rita Huang)

Tested By :



(Engineer / Jay Su)

Approved By :



(Director / Vincent Lin)

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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	2402-2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	PCB Antenna
Channel Control	Auto
Antenna Gain	Refer to the table "Antenna List"
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.

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 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 Bluetooth V3.0, V2.1+EDR.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test
4. Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through pre-testing, to produce emissions similar to those for 3Mb/s.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK) Mode 2: Transmit - 2Mbps (4DQPSK) Mode 3: Transmit - 3Mbps (8DPSK)
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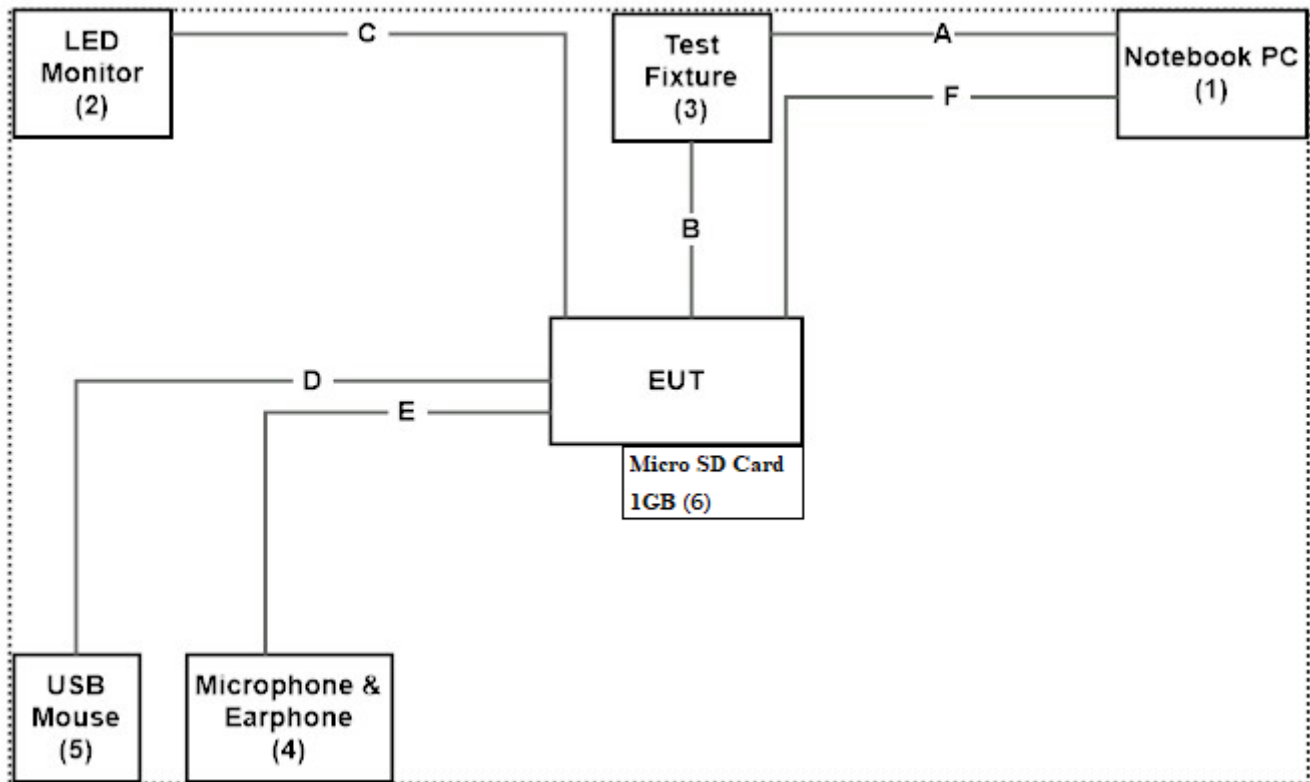
1.3. Tested System Details

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
	Horn Antenna	Com-Power	AH-1840	101043	2019/01/09	2020/01/08
	Amplifier + Cable	EMCI	EMC184045SE	980370	2019/03/21	2020/03/20
	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

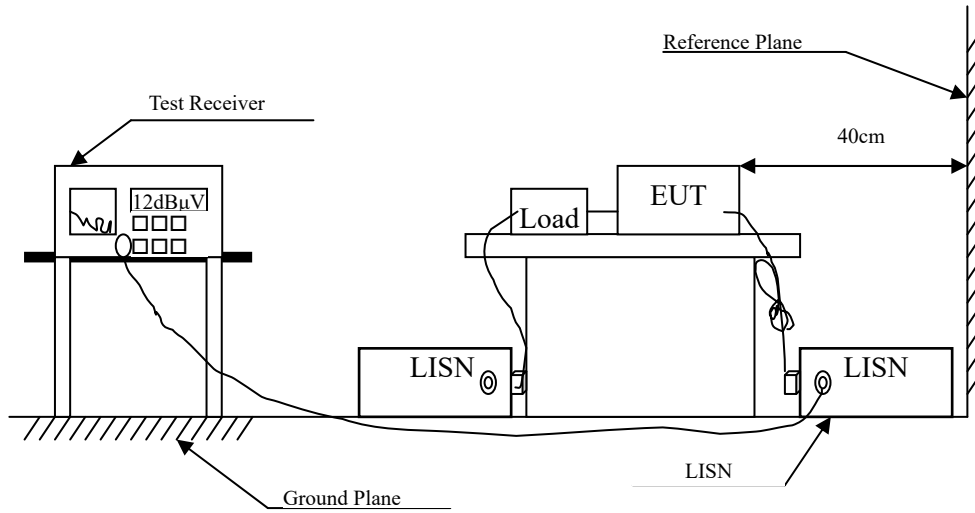
Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

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	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals 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 refer 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 the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

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

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

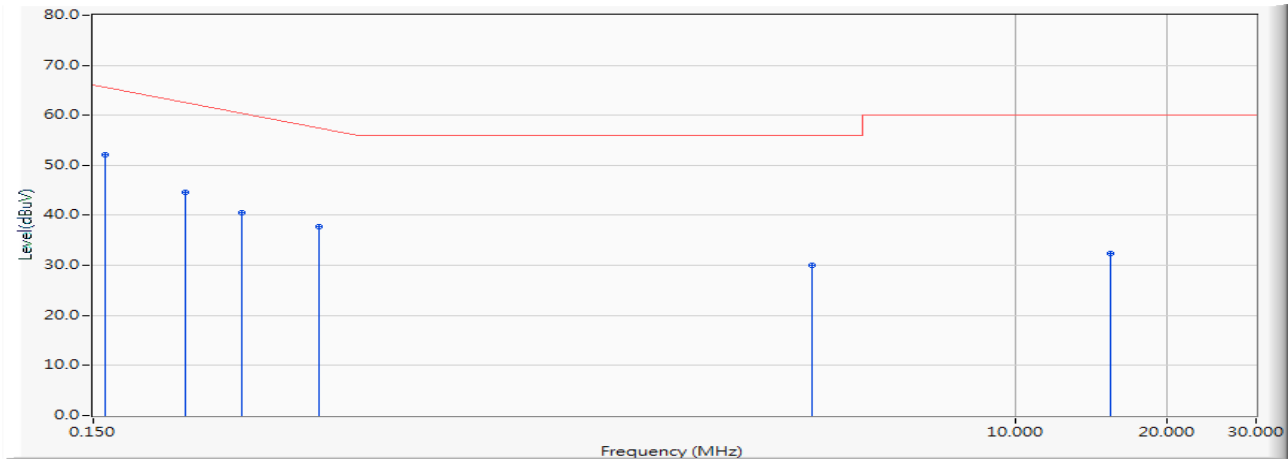
2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : 23.1 inches Bar type Digital Signage
 Test Item : Conducted Emission Test
 Test date : 2019/10/04
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Line 1



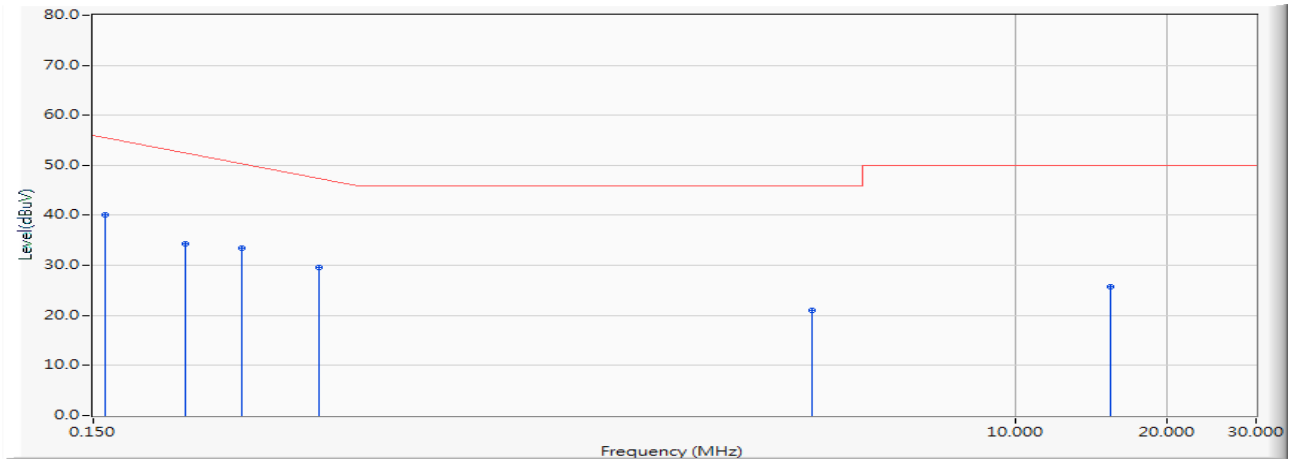
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.158	9.668	42.420	52.088	-13.683	65.771	QUASIPeAK
2		0.228	9.672	34.900	44.572	-19.199	63.771	QUASIPeAK
3		0.295	9.676	30.780	40.456	-21.401	61.857	QUASIPeAK
4		0.420	9.682	28.000	37.682	-20.604	58.286	QUASIPeAK
5		3.978	9.840	20.100	29.940	-26.060	56.000	QUASIPeAK
6		15.494	10.111	22.360	32.471	-27.529	60.000	QUASIPeAK

Note:

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

Product : 23.1 inches Bar type Digital Signage
 Test Item : Conducted Emission Test
 Test date : 2019/10/04
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Line 1



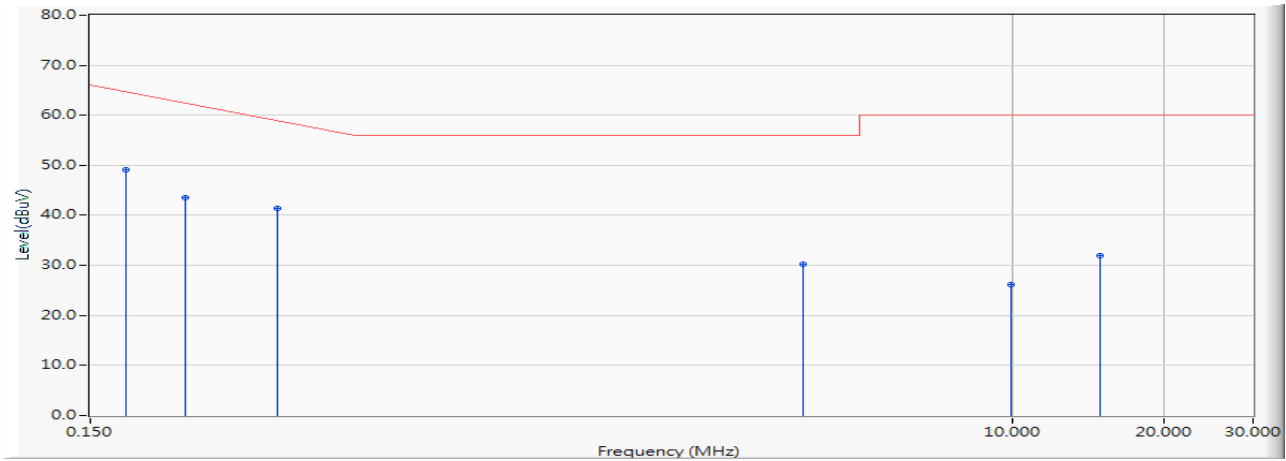
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.158	9.668	30.470	40.138	-15.633	55.771	AVERAGE
2		0.228	9.672	24.540	34.212	-19.559	53.771	AVERAGE
3		0.295	9.676	23.790	33.466	-18.391	51.857	AVERAGE
4		0.420	9.682	19.840	29.522	-18.764	48.286	AVERAGE
5		3.978	9.840	11.130	20.970	-25.030	46.000	AVERAGE
6		15.494	10.111	15.530	25.641	-24.359	50.000	AVERAGE

Note:

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

Product : 23.1 inches Bar type Digital Signage
 Test Item : Conducted Emission Test
 Test date : 2019/10/04
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Line 2



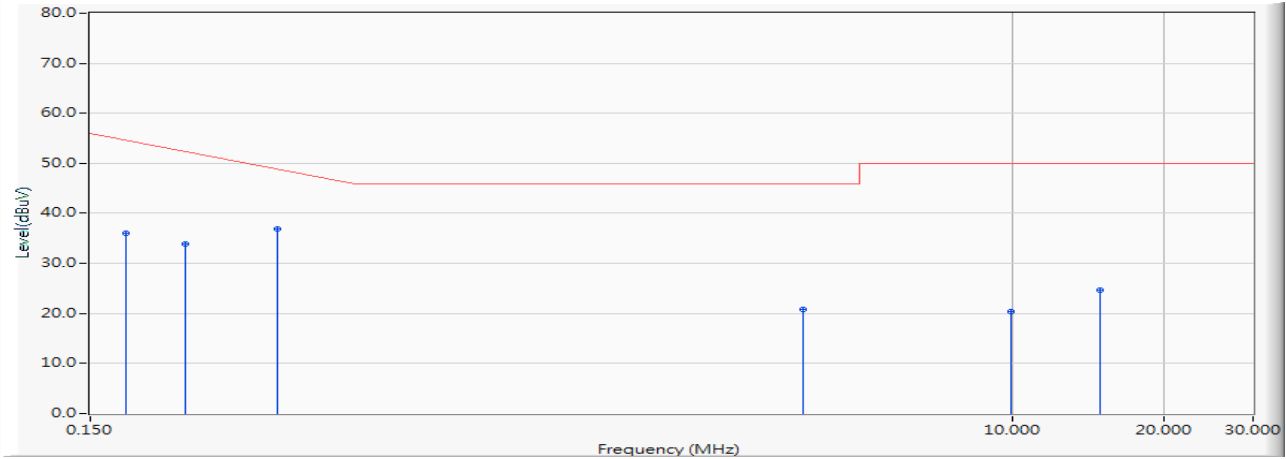
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.177	9.703	39.480	49.183	-16.046	65.229	QUASIPeAK
2		0.232	9.702	33.880	43.582	-20.075	63.657	QUASIPeAK
3		0.353	9.709	31.660	41.369	-18.831	60.200	QUASIPeAK
4		3.849	9.877	20.440	30.317	-25.683	56.000	QUASIPeAK
5		9.966	10.086	16.020	26.106	-33.894	60.000	QUASIPeAK
6		14.951	10.222	21.740	31.962	-28.038	60.000	QUASIPeAK

Note:

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

Product : 23.1 inches Bar type Digital Signage
 Test Item : Conducted Emission Test
 Test date : 2019/10/04
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Line 2



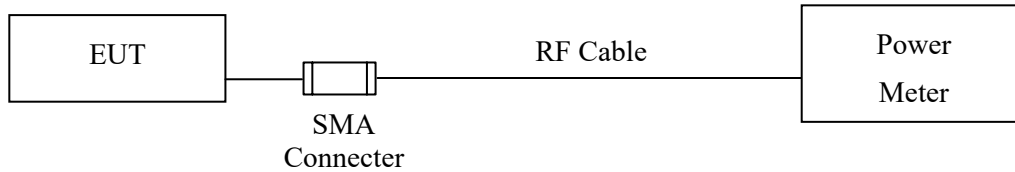
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.177	9.703	26.290	35.993	-19.236	55.229	AVERAGE
2		0.232	9.702	24.190	33.892	-19.765	53.657	AVERAGE
3	*	0.353	9.709	27.260	36.969	-13.231	50.200	AVERAGE
4		3.849	9.877	10.880	20.757	-25.243	46.000	AVERAGE
5		9.966	10.086	10.190	20.276	-29.724	50.000	AVERAGE
6		14.951	10.222	14.520	24.742	-25.258	50.000	AVERAGE

Note:

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

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

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
Test Site : No.3 OATS
Test date : 2019/11/04
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit	Result
Channel 00	2402.00	-1.41	1 Watt= 30 dBm	Pass
Channel 39	2441.00	-1.29	1 Watt= 30 dBm	Pass
Channel 78	2480.00	-1.87	1 Watt= 30 dBm	Pass

Product : 23.1 inches Bar type Digital Signage
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/11/04
Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit	Result
Channel 00	2402.00	-5.89	1 Watt= 30 dBm	Pass
Channel 39	2441.00	-5.94	1 Watt= 30 dBm	Pass
Channel 78	2480.00	-6.37	1 Watt= 30 dBm	Pass

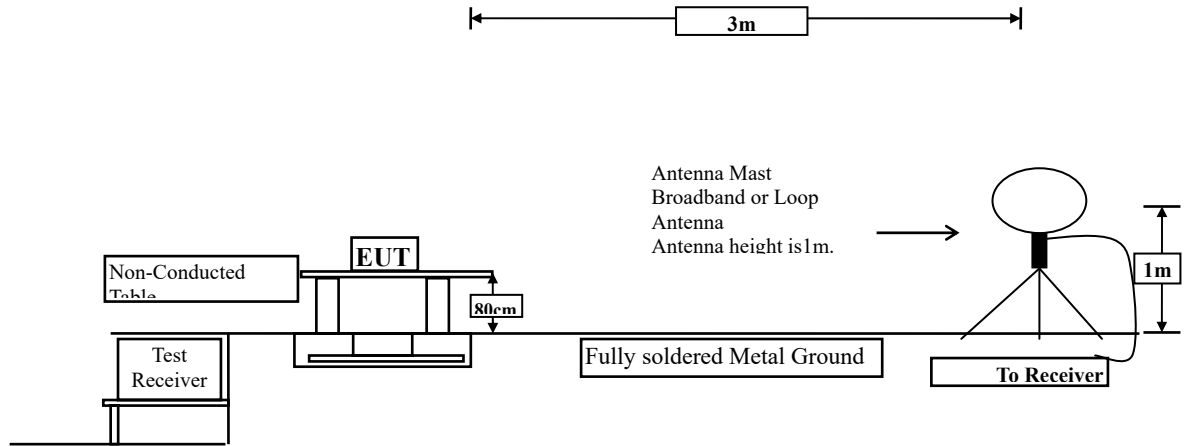
Product : 23.1 inches Bar type Digital Signage
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/11/04
Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency (MHz)	Measurement Level	Required Limit	Result
Channel 00	2402.00	-5.71	1 Watt= 30 dBm	Pass
Channel 39	2441.00	-5.81	1 Watt= 30 dBm	Pass
Channel 78	2480.00	-6.19	1 Watt= 30 dBm	Pass

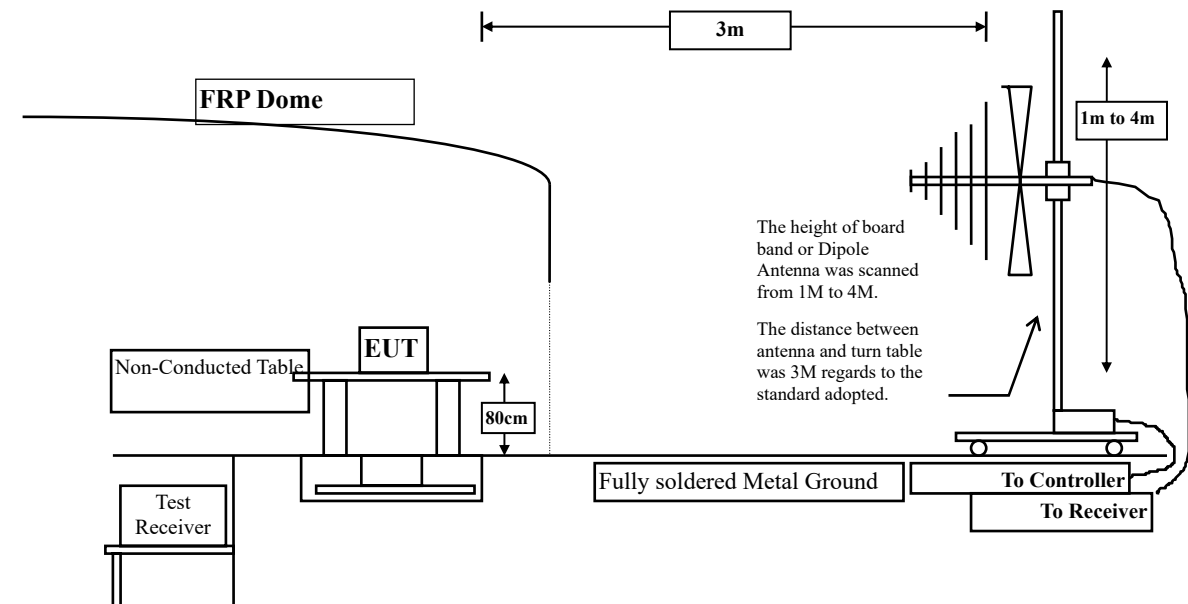
4. Radiated Emission

4.1. Test Setup

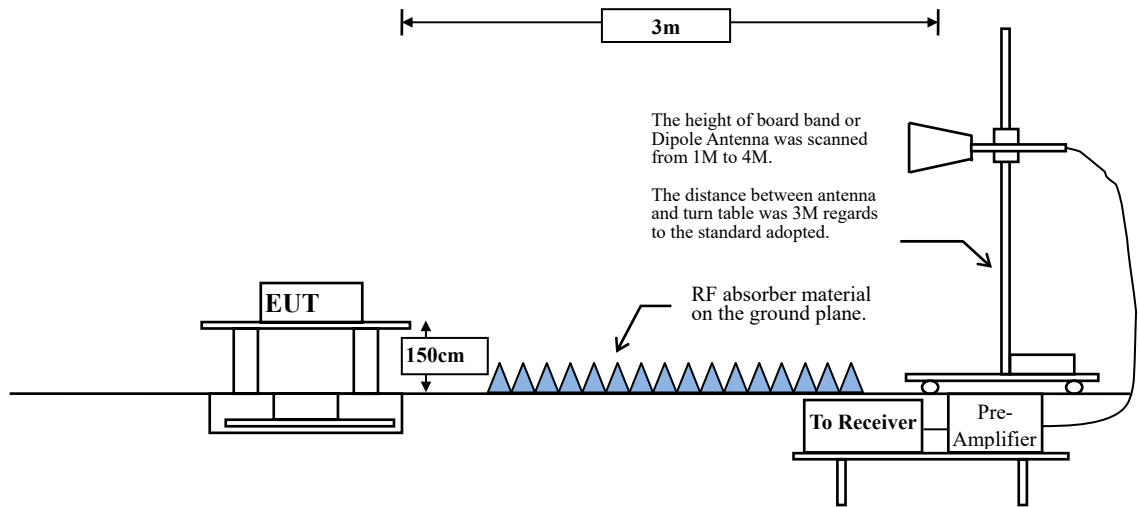
Under 30MHz



Below 1GHz



Above 1GHz



4.2. Limits

➤ General Radiated Emission 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 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:
1. RF Voltage (dBμV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested 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 worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

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

4.4. Uncertainty

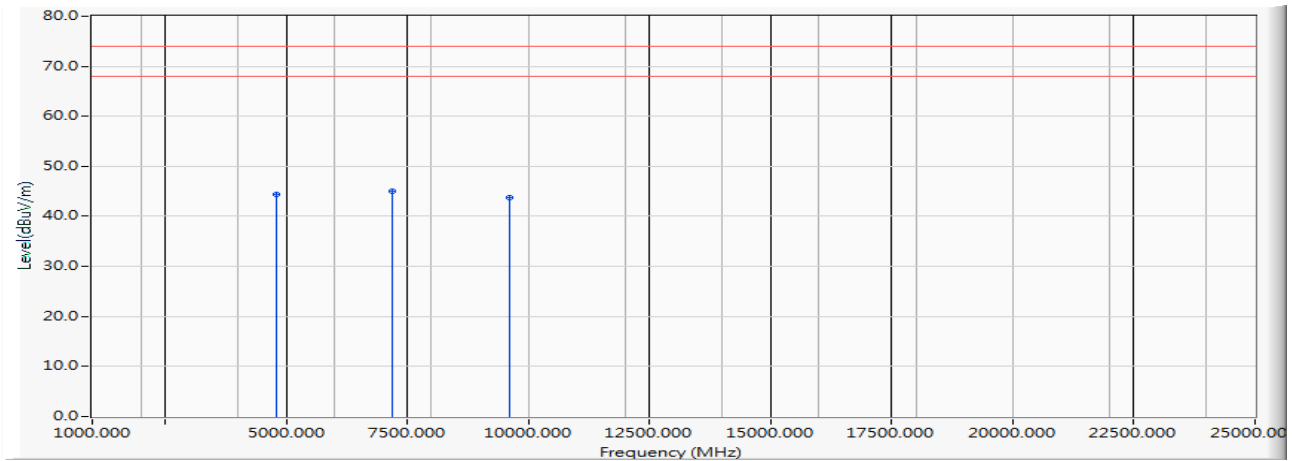
± 4.08 dB above 1GHz

± 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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Horizontal



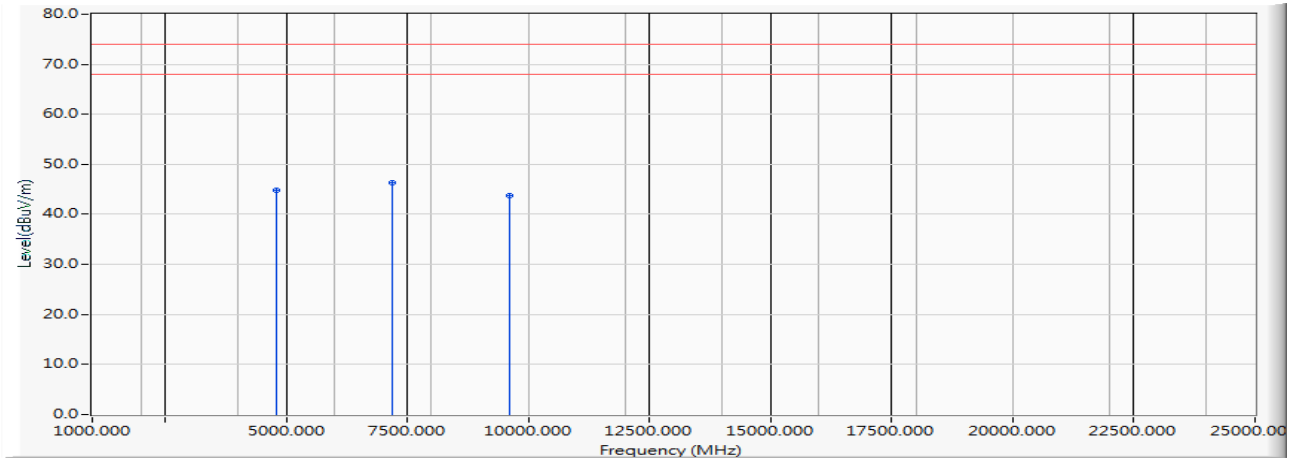
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-12.148	56.650	44.502	-29.498	74.000	PEAK
2	*	7206.000	-13.147	58.130	44.983	-29.017	74.000	PEAK
3		9608.000	-13.430	57.120	43.690	-30.310	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Vertical



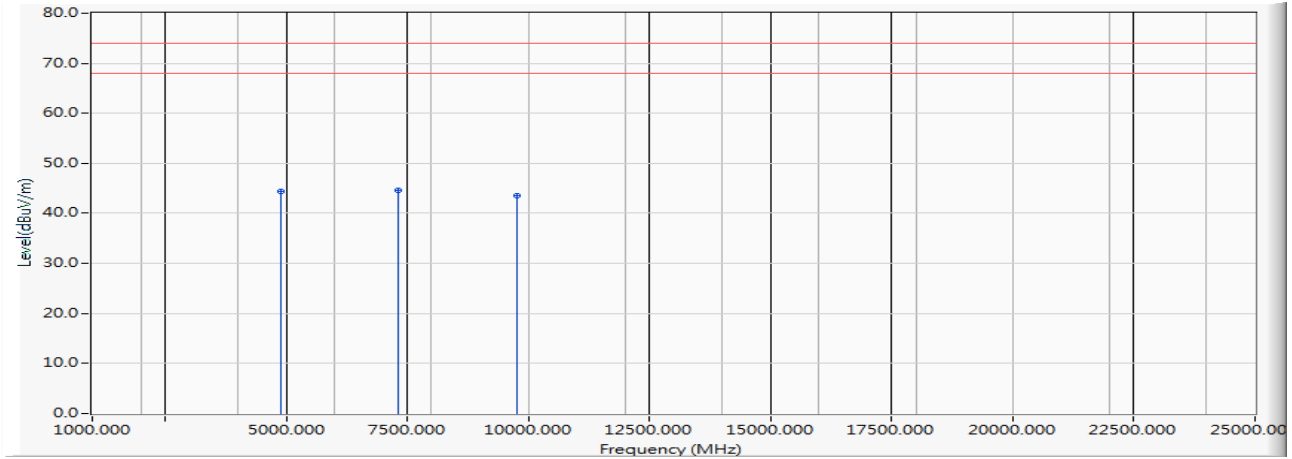
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-12.148	56.920	44.772	-29.228	74.000	PEAK
2	*	7206.000	-13.147	59.440	46.293	-27.707	74.000	PEAK
3		9608.000	-13.430	57.270	43.840	-30.160	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Horizontal



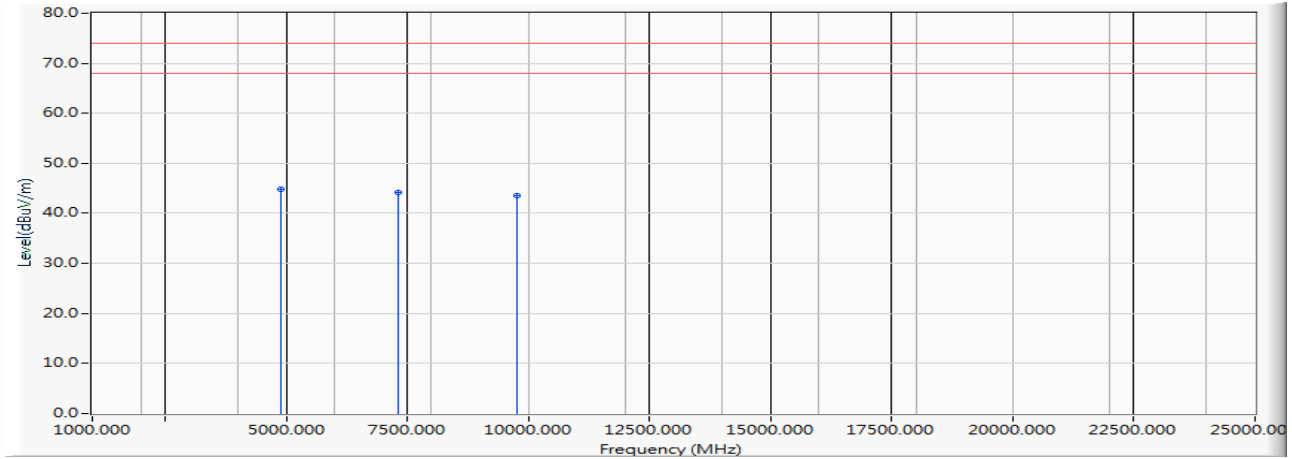
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4882.000	-11.589	56.030	44.441	-29.559	74.000	PEAK
2	*	7323.000	-13.572	58.090	44.518	-29.482	74.000	PEAK
3		9764.000	-12.529	56.020	43.491	-30.509	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Vertical



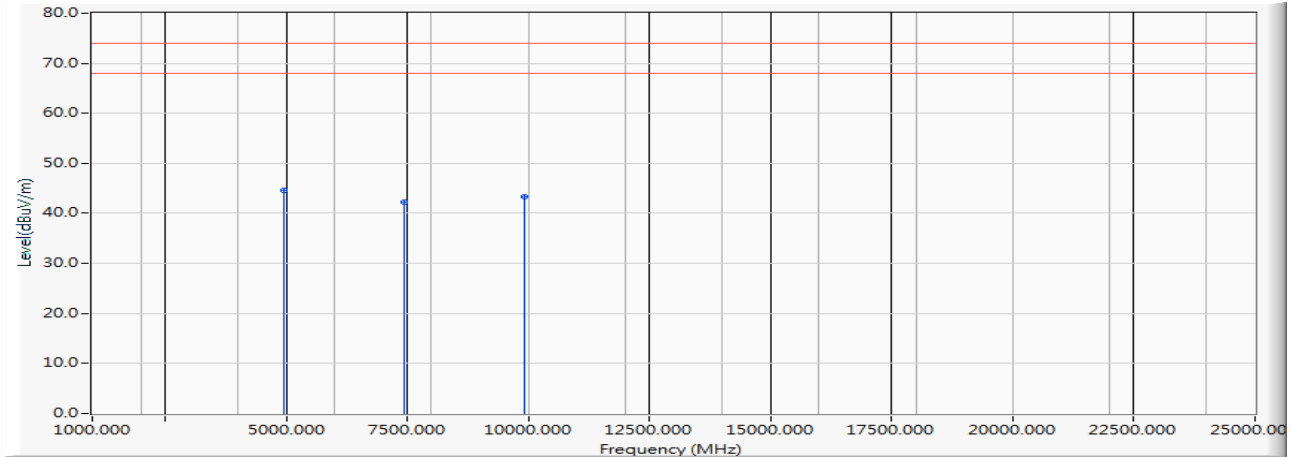
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4882.000	-11.589	56.380	44.791	-29.209	74.000	PEAK
2		7323.000	-13.572	57.660	44.088	-29.912	74.000	PEAK
3		9764.000	-12.529	56.070	43.541	-30.459	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Horizontal



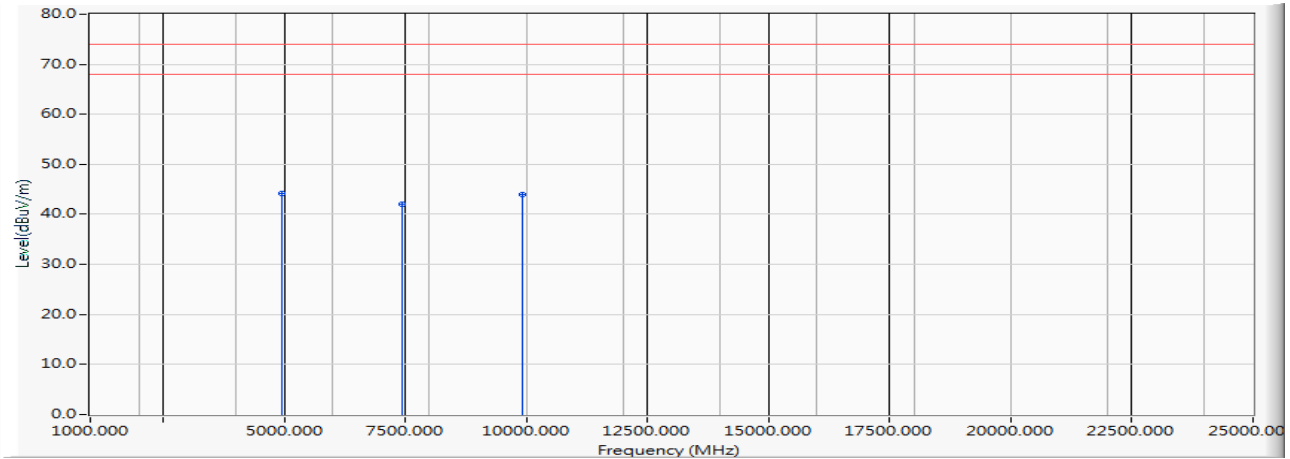
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-10.882	55.430	44.548	-29.452	74.000	PEAK
2		7440.000	-14.622	56.780	42.158	-31.842	74.000	PEAK
3		9920.000	-14.231	57.520	43.289	-30.711	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Vertical



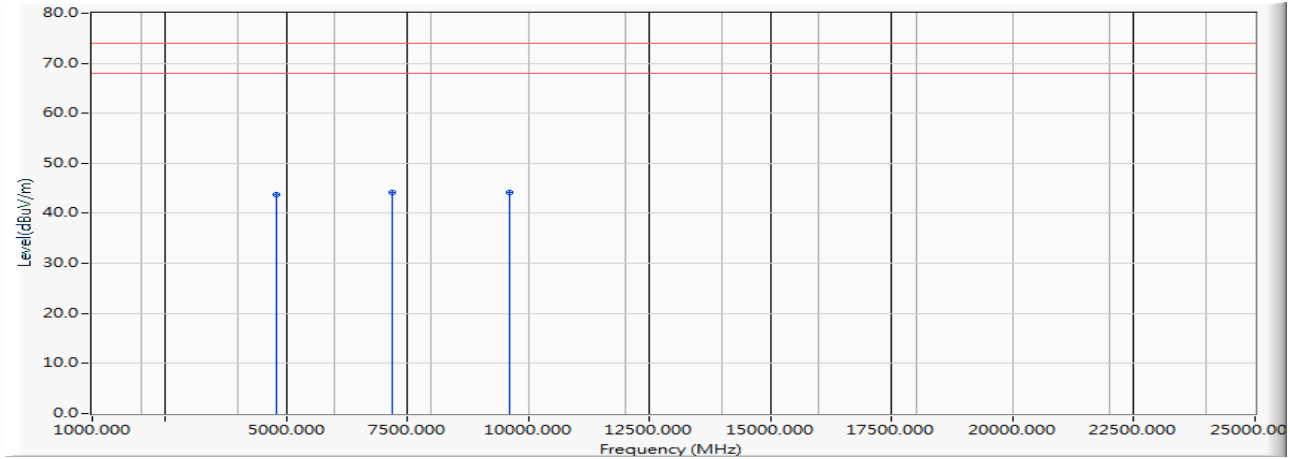
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-10.882	55.110	44.228	-29.772	74.000	PEAK
2		7440.000	-14.622	56.690	42.068	-31.932	74.000	PEAK
3		9920.000	-14.231	58.120	43.889	-30.111	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK)(2402MHz)

Horizontal



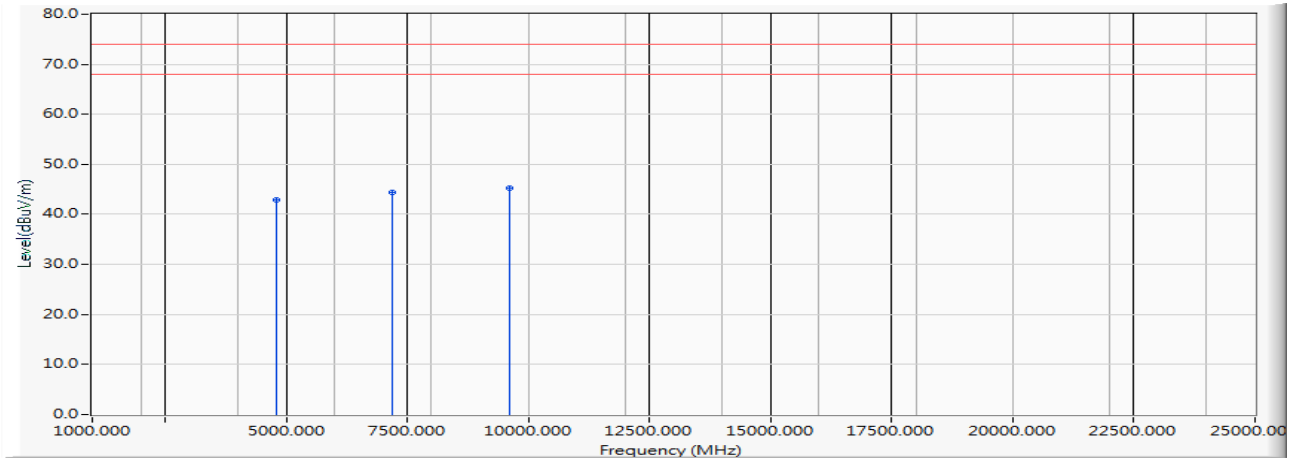
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-12.148	55.900	43.752	-30.248	74.000	PEAK
2	*	7206.000	-13.147	57.400	44.253	-29.747	74.000	PEAK
3		9608.000	-13.430	57.650	44.220	-29.780	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2402MHz)

Vertical



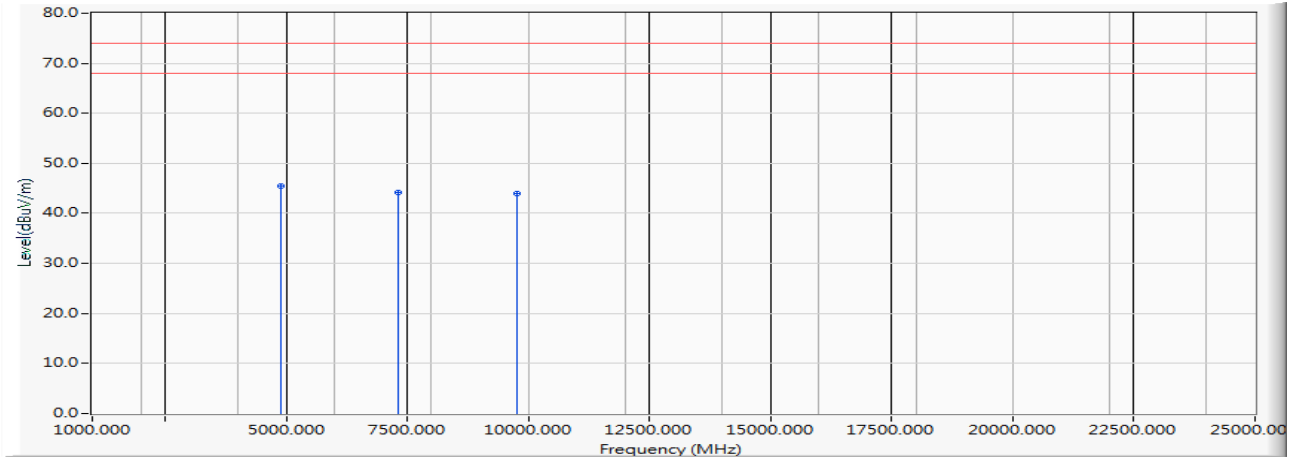
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	4804.000	-12.148	54.980	42.832	-31.168	74.000	PEAK
2	7206.000	-13.147	57.600	44.453	-29.547	74.000	PEAK
3	* 9608.000	-13.430	58.590	45.160	-28.840	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2441MHz)

Horizontal



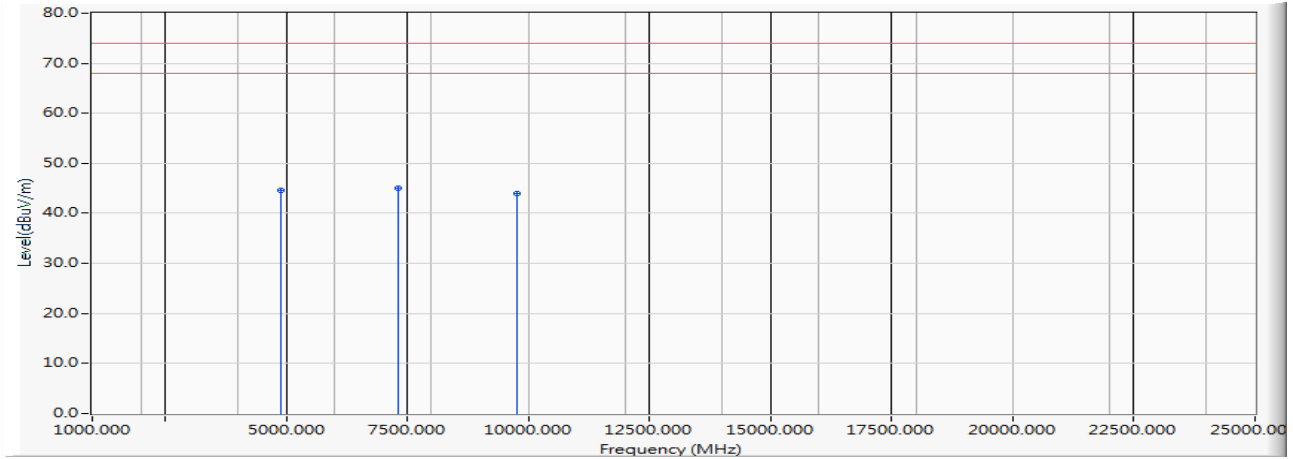
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4882.000	-11.589	56.990	45.401	-28.599	74.000	PEAK
2		7323.000	-13.572	57.650	44.078	-29.922	74.000	PEAK
3		9764.000	-12.529	56.540	44.011	-29.989	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2441MHz)

Vertical



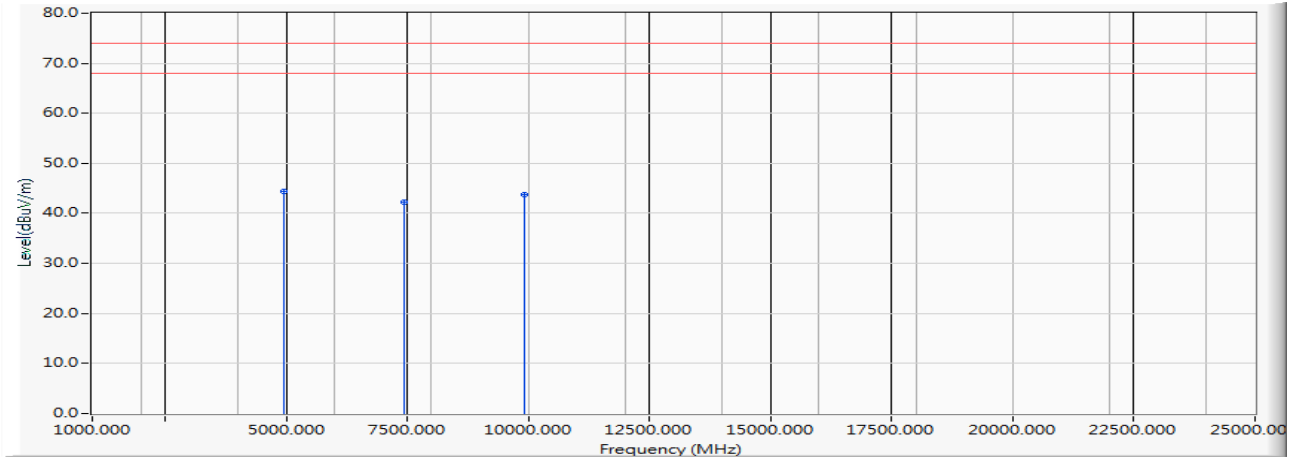
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4882.000	-11.589	56.280	44.691	-29.309	74.000	PEAK
2	*	7323.000	-13.572	58.630	45.058	-28.942	74.000	PEAK
3		9764.000	-12.529	56.400	43.871	-30.129	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2480MHz)

Horizontal



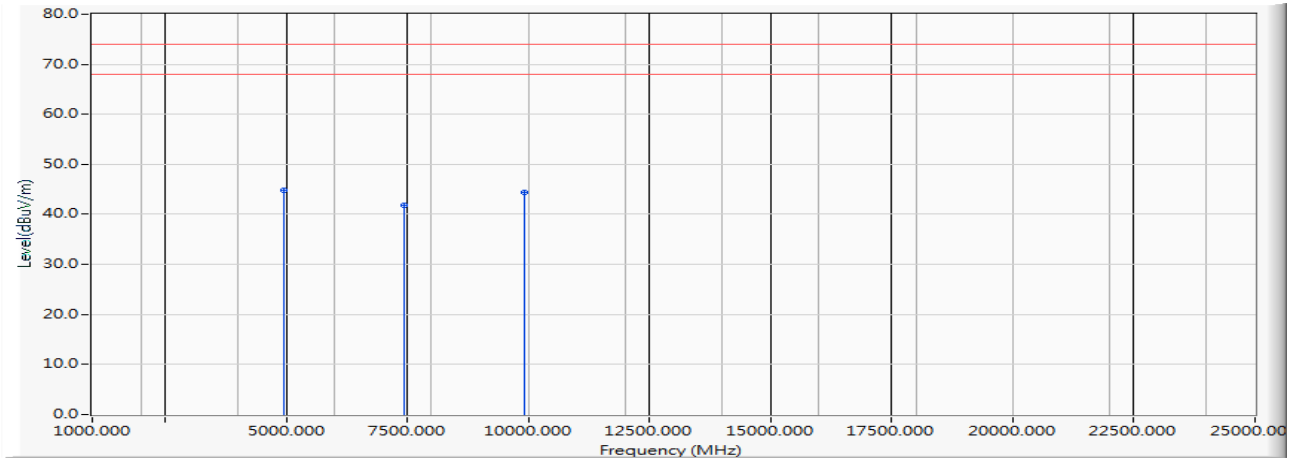
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-10.882	55.370	44.488	-29.512	74.000	PEAK
2		7440.000	-14.622	56.780	42.158	-31.842	74.000	PEAK
3		9920.000	-14.231	58.060	43.829	-30.171	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2480MHz)

Vertical



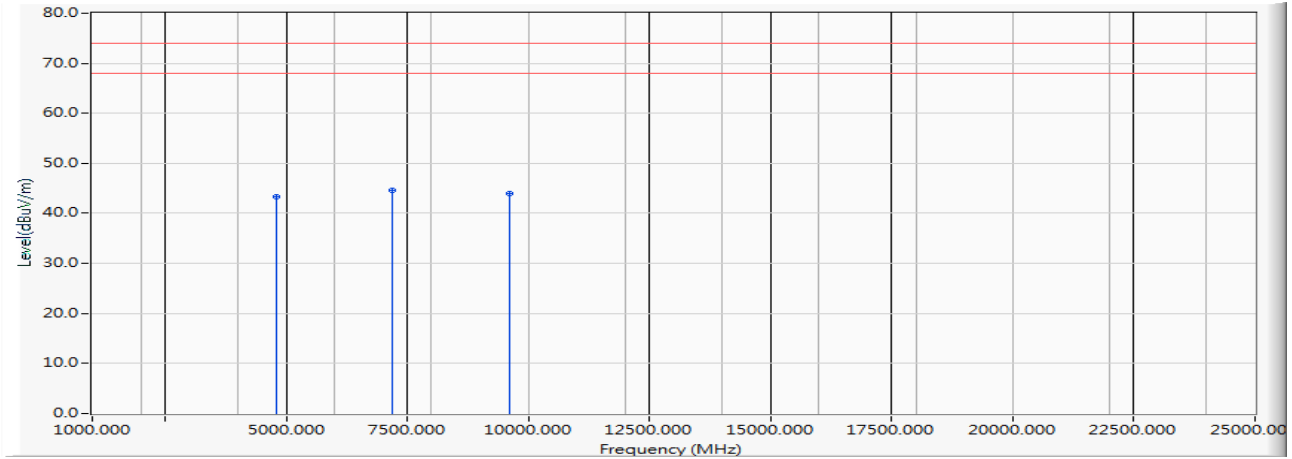
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-10.882	55.650	44.768	-29.232	74.000	PEAK
2		7440.000	-14.622	56.430	41.808	-32.192	74.000	PEAK
3		9920.000	-14.231	58.600	44.369	-29.631	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)(2402MHz)

Horizontal



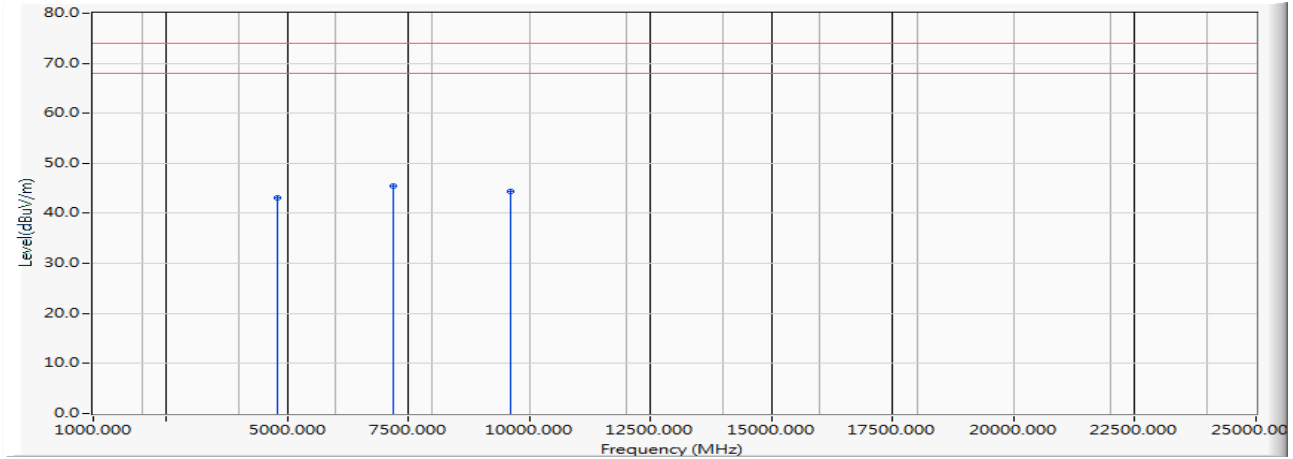
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-12.148	55.380	43.232	-30.768	74.000	PEAK
2	*	7206.000	-13.147	57.690	44.543	-29.457	74.000	PEAK
3		9608.000	-13.430	57.450	44.020	-29.980	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)(2402MHz)

Vertical



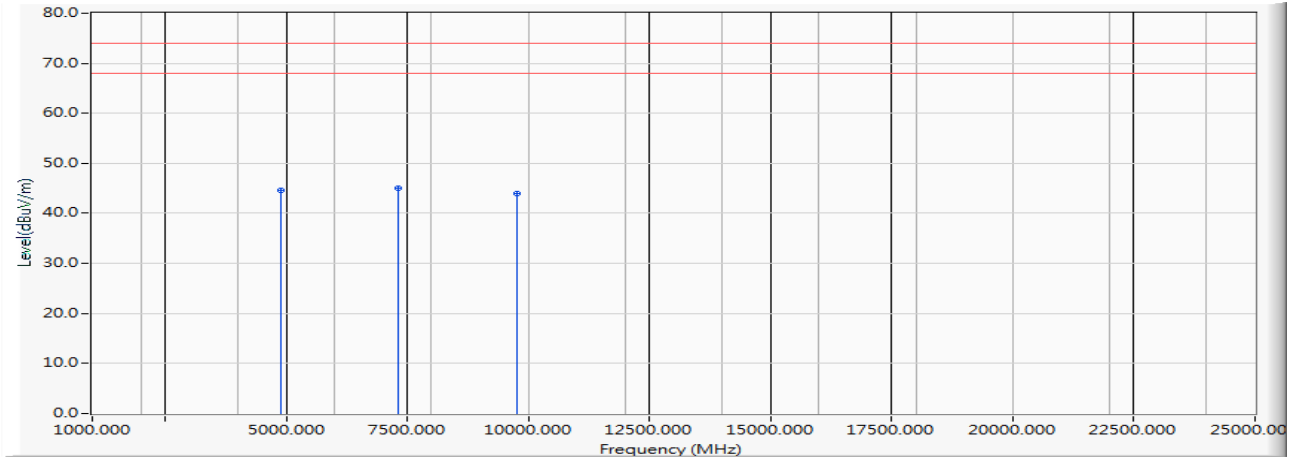
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	-12.148	55.290	43.142	-30.858	74.000	PEAK
2	*	7206.000	-13.147	58.680	45.533	-28.467	74.000	PEAK
3		9608.000	-13.430	57.820	44.390	-29.610	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Horizontal



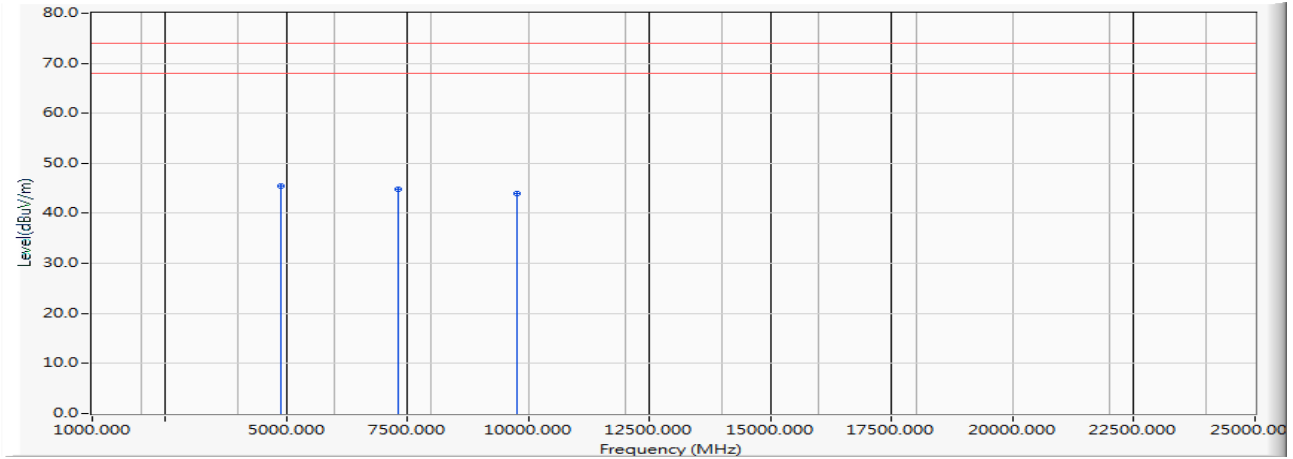
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4882.000	-11.589	56.270	44.681	-29.319	74.000	PEAK
2	*	7323.000	-13.572	58.600	45.028	-28.972	74.000	PEAK
3		9764.000	-12.529	56.480	43.951	-30.049	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Vertical



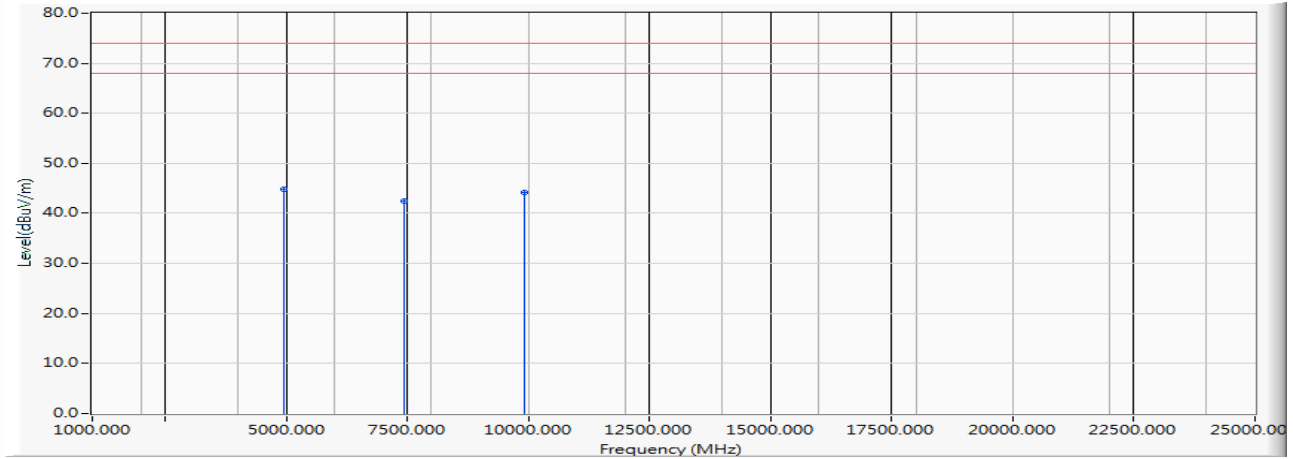
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4882.000	-11.589	57.020	45.431	-28.569	74.000	PEAK
2		7323.000	-13.572	58.320	44.748	-29.252	74.000	PEAK
3		9764.000	-12.529	56.500	43.971	-30.029	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal



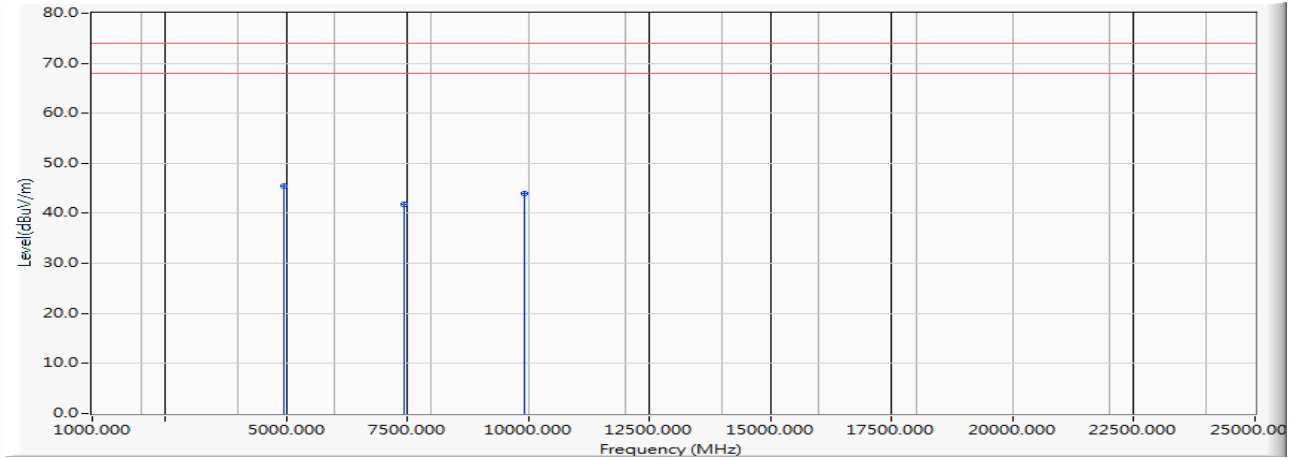
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-10.882	55.810	44.928	-29.072	74.000	PEAK
2		7440.000	-14.622	57.040	42.418	-31.582	74.000	PEAK
3		9920.000	-14.231	58.490	44.259	-29.741	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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 : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Vertical



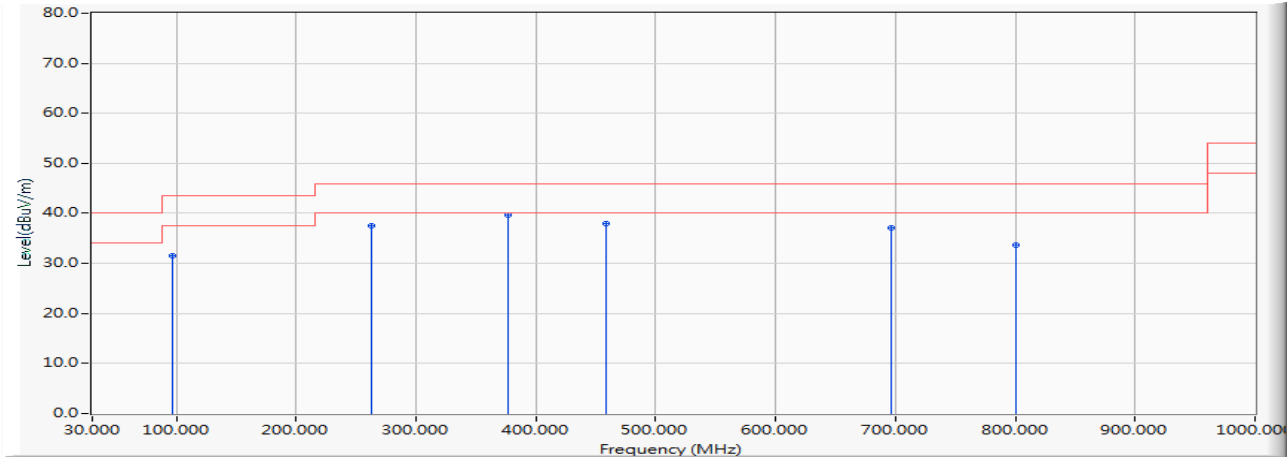
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4960.000	-10.882	56.380	45.498	-28.502	74.000	PEAK
2		7440.000	-14.622	56.480	41.858	-32.142	74.000	PEAK
3		9920.000	-14.231	58.300	44.069	-29.931	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. 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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Horizontal



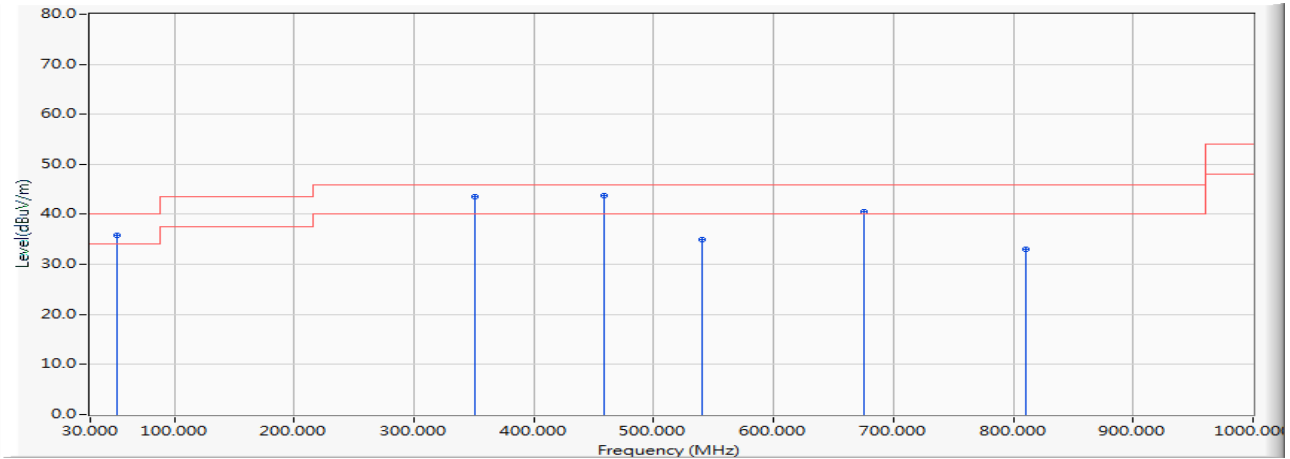
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		97.478	-16.559	48.088	31.529	-11.971	43.500	PEAK
2		263.362	-18.346	55.840	37.493	-8.507	46.000	PEAK
3	*	377.232	-12.123	51.741	39.618	-6.382	46.000	PEAK
4		458.768	-10.460	48.371	37.911	-8.089	46.000	PEAK
5		696.348	-9.206	46.344	37.138	-8.862	46.000	PEAK
6		800.377	-8.930	42.515	33.585	-12.415	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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Vertical



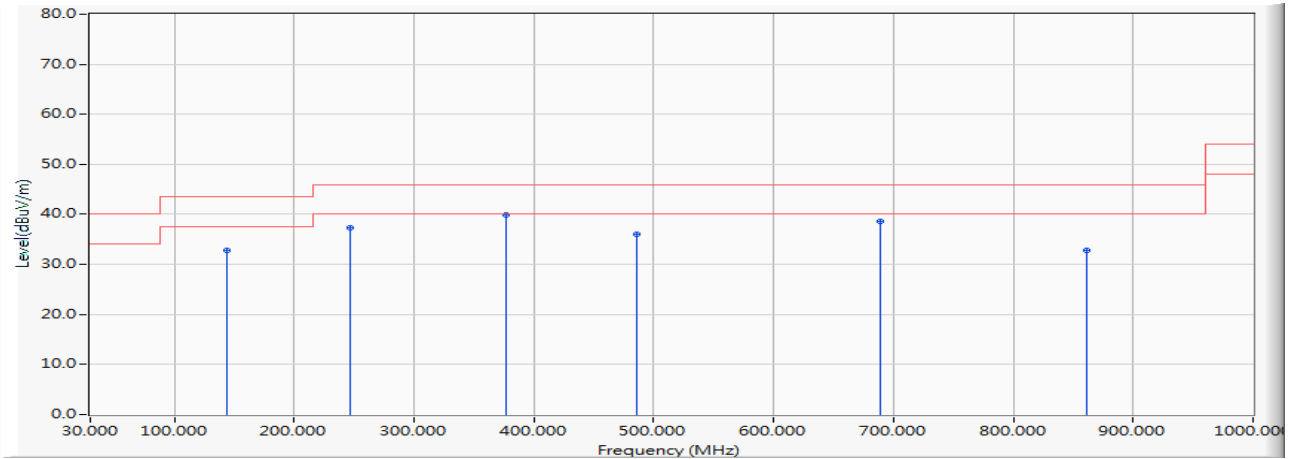
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		52.493	-17.786	53.499	35.713	-4.287	40.000	PEAK
2		350.522	-13.279	56.923	43.643	-2.357	46.000	PEAK
3	*	458.768	-10.460	54.260	43.800	-2.200	46.000	PEAK
4		540.304	-11.395	46.355	34.960	-11.040	46.000	PEAK
5		675.261	-9.469	49.906	40.437	-5.563	46.000	PEAK
6		810.217	-8.944	41.882	32.938	-13.062	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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2441MHz)

Horizontal



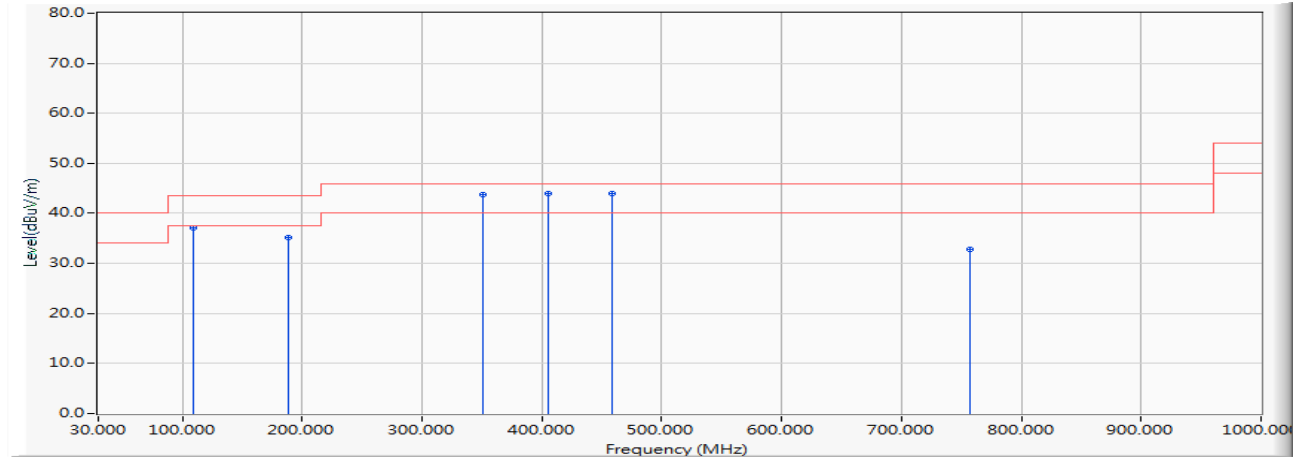
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		143.870	-18.476	51.185	32.709	-10.791	43.500	PEAK
2		246.493	-18.154	55.517	37.363	-8.637	46.000	PEAK
3	*	377.232	-12.123	51.960	39.837	-6.163	46.000	PEAK
4		485.478	-11.794	47.801	36.006	-9.994	46.000	PEAK
5		689.319	-9.230	47.734	38.503	-7.497	46.000	PEAK
6		860.826	-8.415	41.123	32.708	-13.292	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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2441MHz)

Vertical



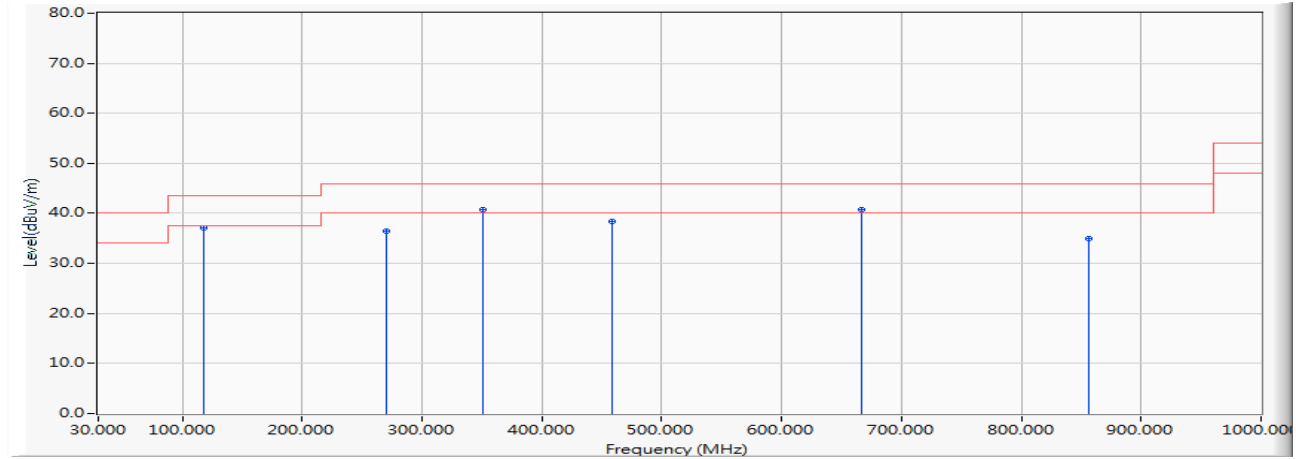
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		108.725	-16.705	53.913	37.209	-6.291	43.500	PEAK
2		188.855	-18.813	53.883	35.070	-8.430	43.500	PEAK
3		350.522	-13.279	56.990	43.710	-2.290	46.000	PEAK
4		405.348	-13.330	57.354	44.024	-1.976	46.000	PEAK
5	*	458.768	-10.460	54.519	44.059	-1.941	46.000	PEAK
6		756.797	-7.372	40.241	32.868	-13.132	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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Horizontal



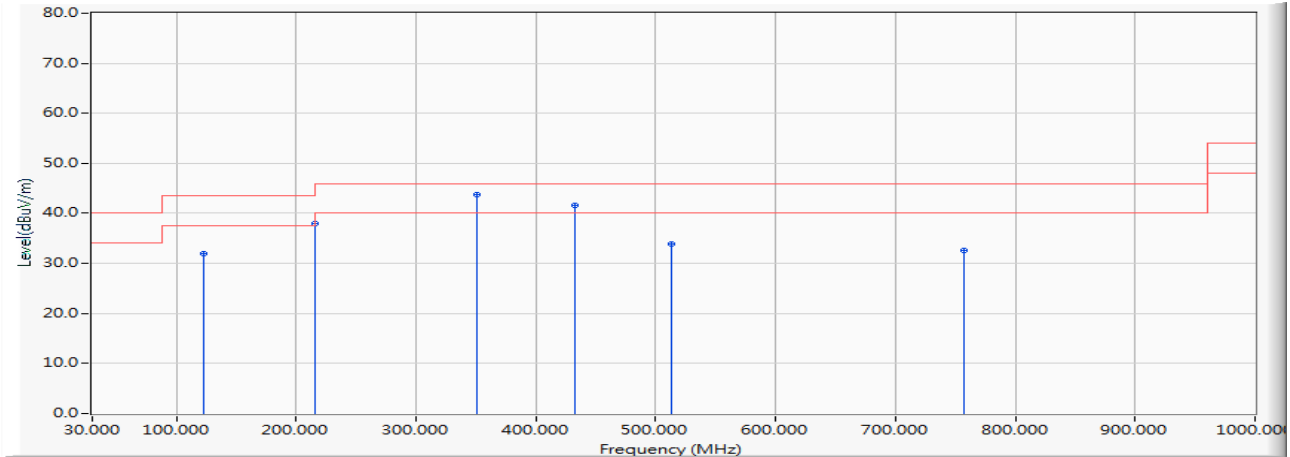
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		118.565	-16.901	54.020	37.118	-6.382	43.500	PEAK
2		270.391	-18.646	55.075	36.428	-9.572	46.000	PEAK
3	*	350.522	-13.279	54.125	40.845	-5.155	46.000	PEAK
4		458.768	-10.460	48.950	38.490	-7.510	46.000	PEAK
5		666.826	-9.799	50.563	40.763	-5.237	46.000	PEAK
6		856.609	-8.385	43.413	35.028	-10.972	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
 Test Site : No.3 OATS
 Test date : 2019/11/01
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Vertical



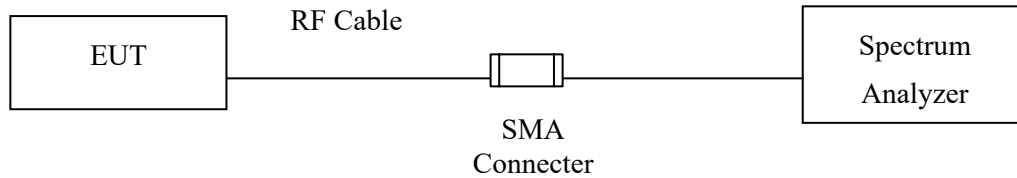
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	122.783	-16.678	48.533	31.855	-11.645	43.500	PEAK
2	215.565	-18.132	56.105	37.973	-5.527	43.500	PEAK
3	* 350.522	-13.279	57.082	43.802	-2.198	46.000	PEAK
4	432.058	-10.761	52.455	41.694	-4.306	46.000	PEAK
5	513.594	-11.113	45.048	33.935	-12.065	46.000	PEAK
6	756.797	-7.372	39.969	32.596	-13.404	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



5.2. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

$\pm 1.20\text{dB}$

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 : 2019/03/13
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 00:

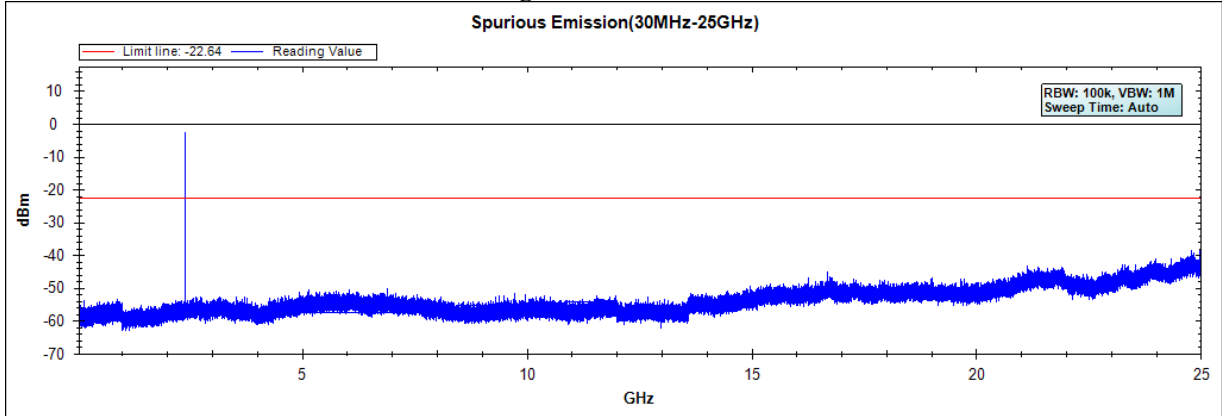


Figure Channel 39:

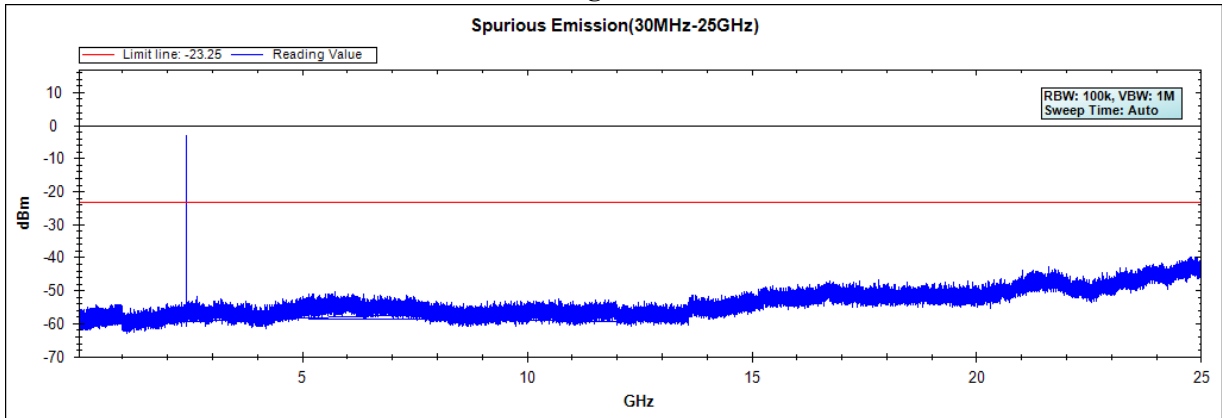
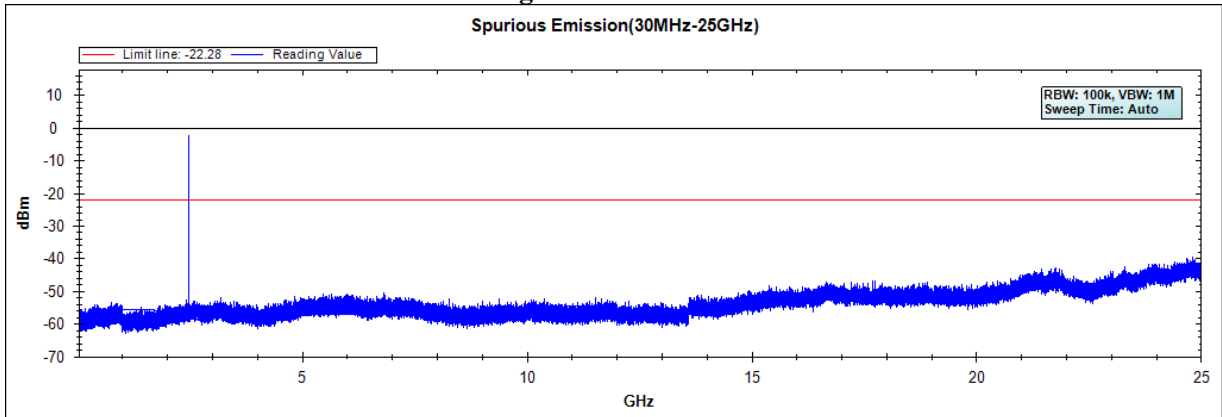


Figure Channel 78:



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 Test
Test Site : No.3 OATS
Test date : 2019/03/13
Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK)

Figure Channel 00:

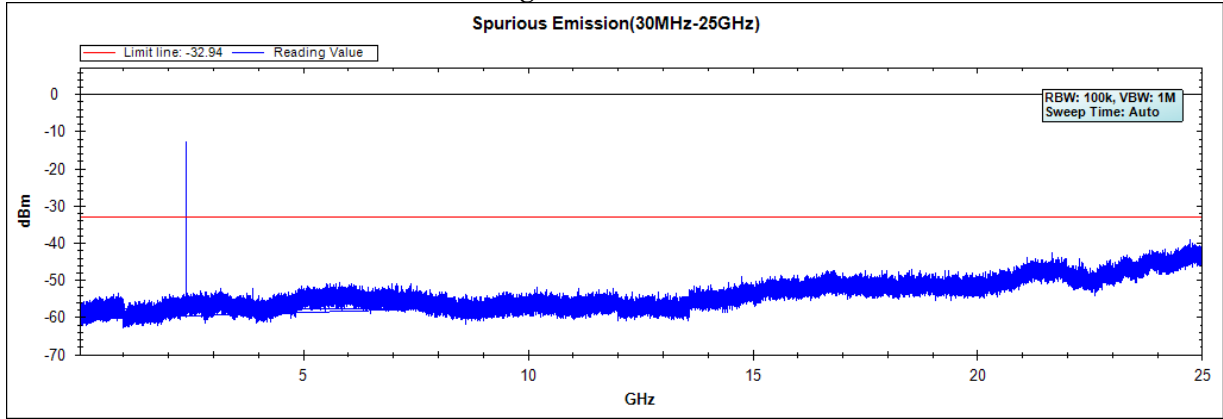


Figure Channel 39:

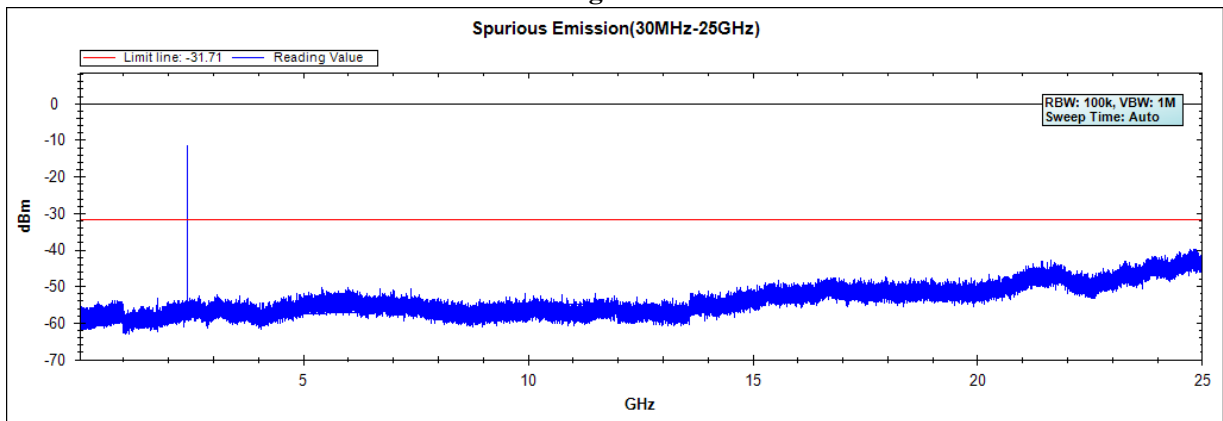
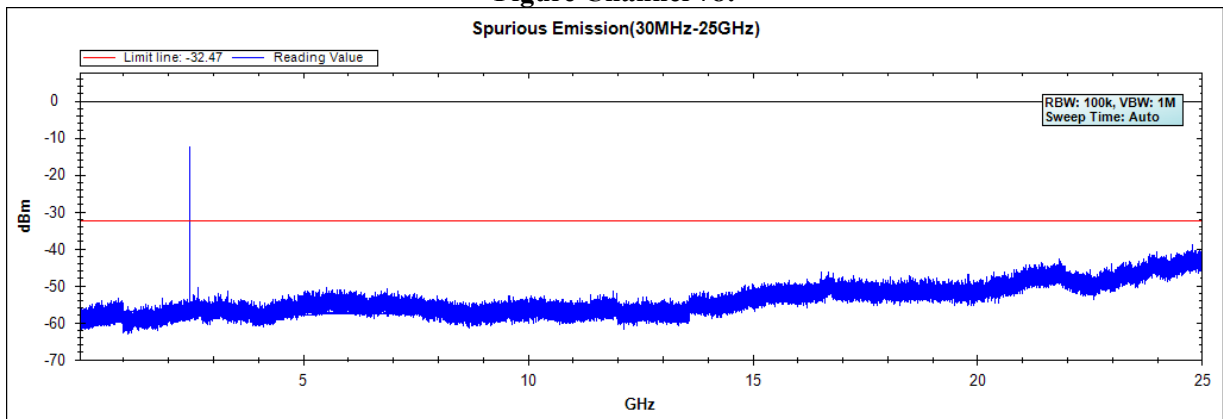


Figure Channel 78:



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 Test
Test Site : No.3 OATS
Test date : 2019/03/13
Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)

Figure Channel 00:

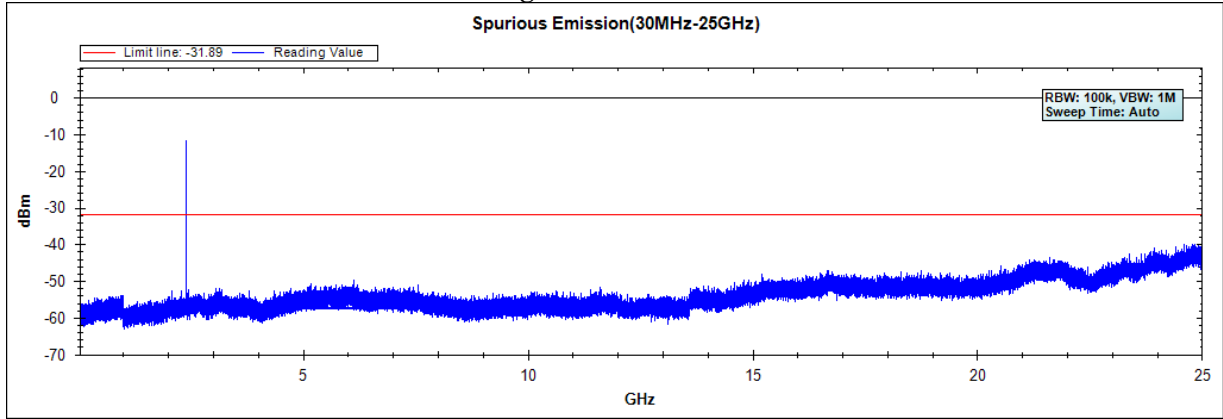


Figure Channel 39:

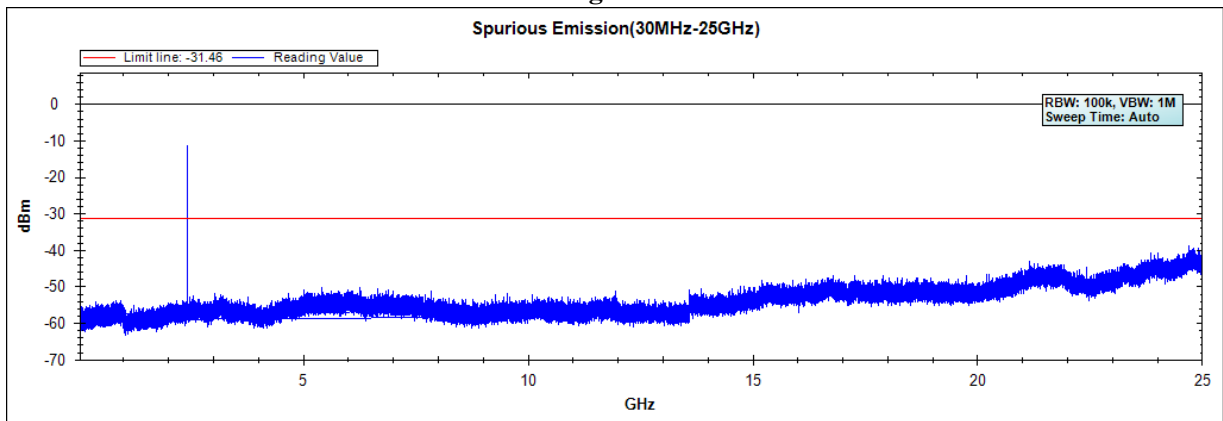
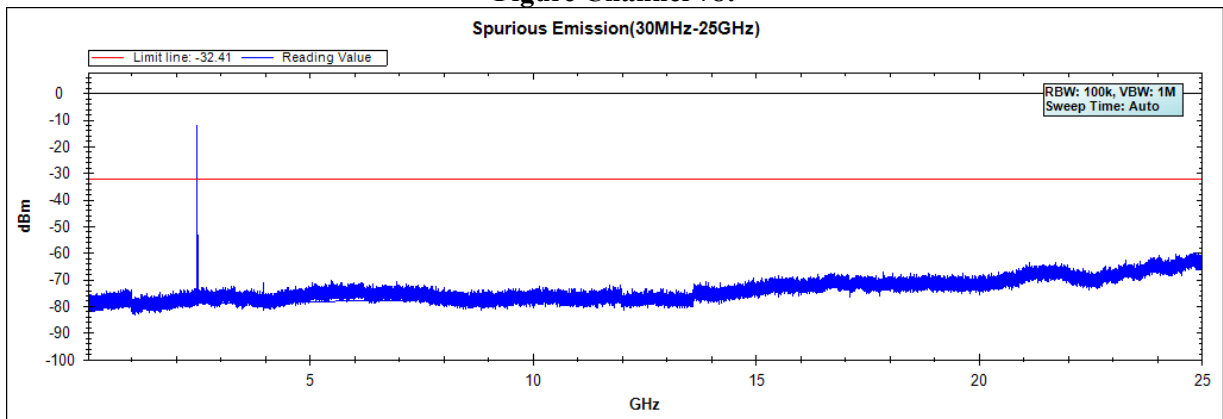


Figure Channel 78:



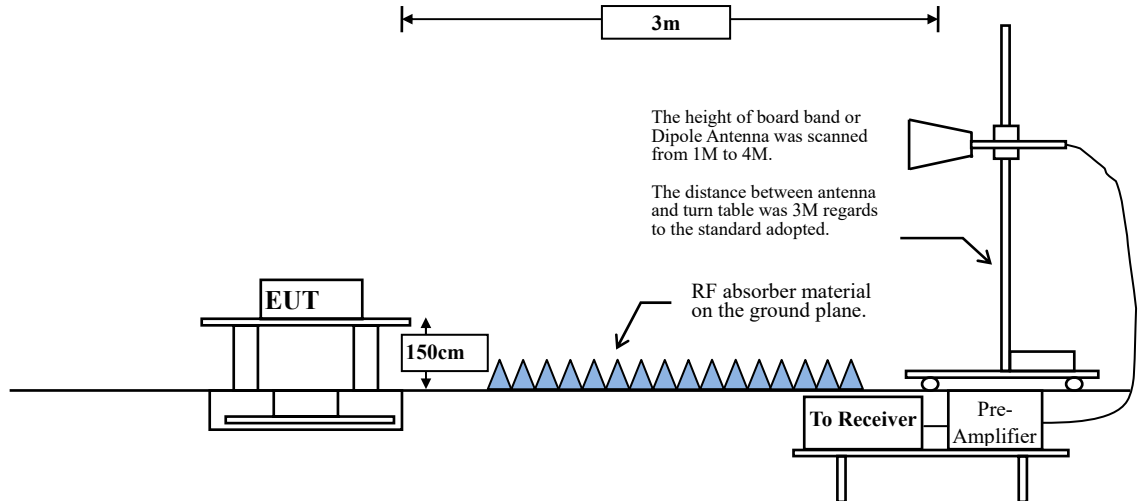
Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

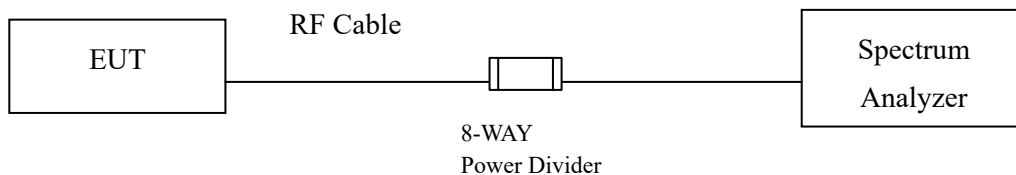
6.1. Test Setup

RF Radiated Measurement:

Above 1GHz



RF Conducted Measurement



6.2. Limit

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)).

6.3. Test Procedure

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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Uncertainty

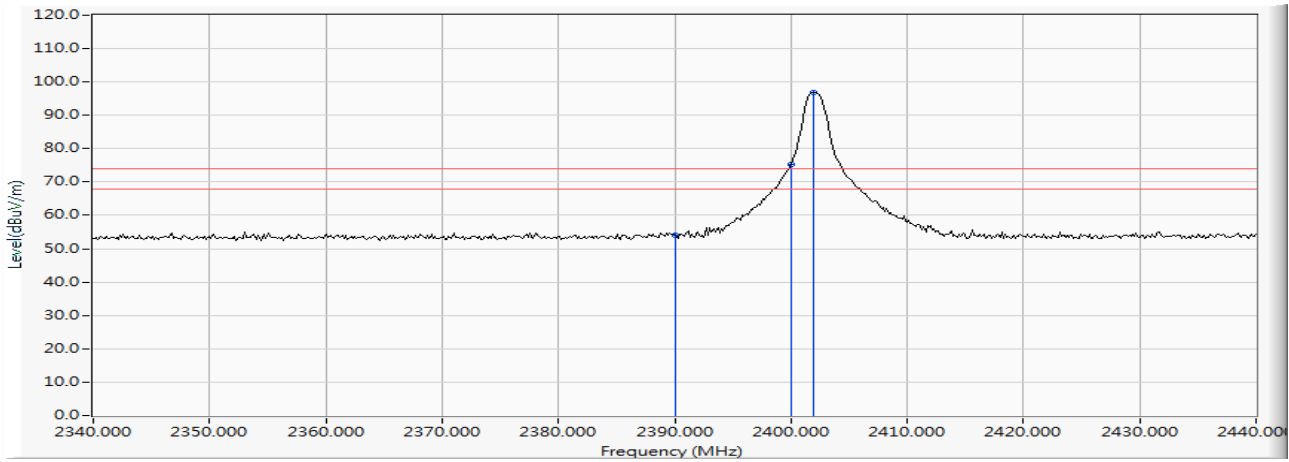
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

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	41.239	54.138	-19.862	74.000	PEAK
2		2400.000	12.961	62.457	75.418	--	--	PEAK
3	*	2401.884	12.974	83.745	96.719	--	--	PEAK

Note:

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

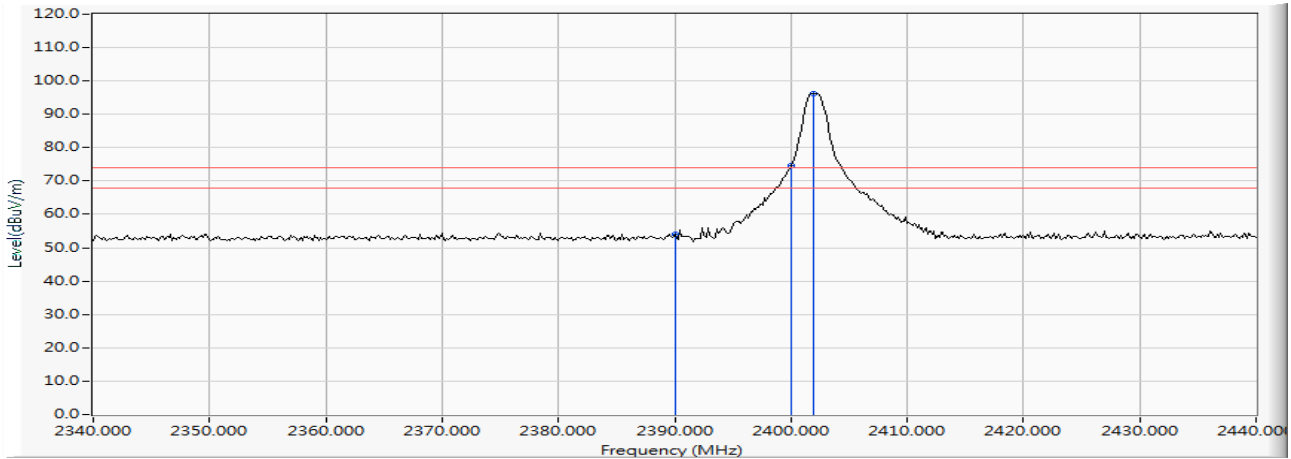
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Average)	2390.000	54.138	-30.755	23.383	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

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	41.172	54.071	-19.929	74.000	PEAK
2	2400.000	12.961	61.625	74.586	--	--	PEAK
3	* 2401.884	12.974	83.259	96.233	--	--	PEAK

Note:

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

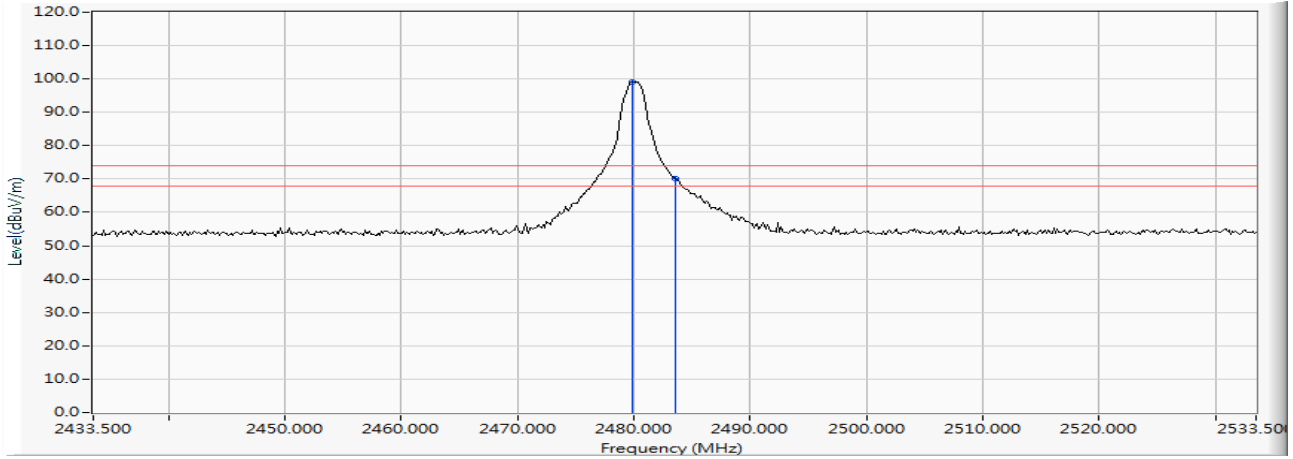
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Average)	2390.000	54.071	-30.755	23.316	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Horizontal



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	13.369	85.706	99.075	--	--	PEAK
2		2483.500	13.375	56.787	70.161	-3.839	74.000	PEAK

Note:

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

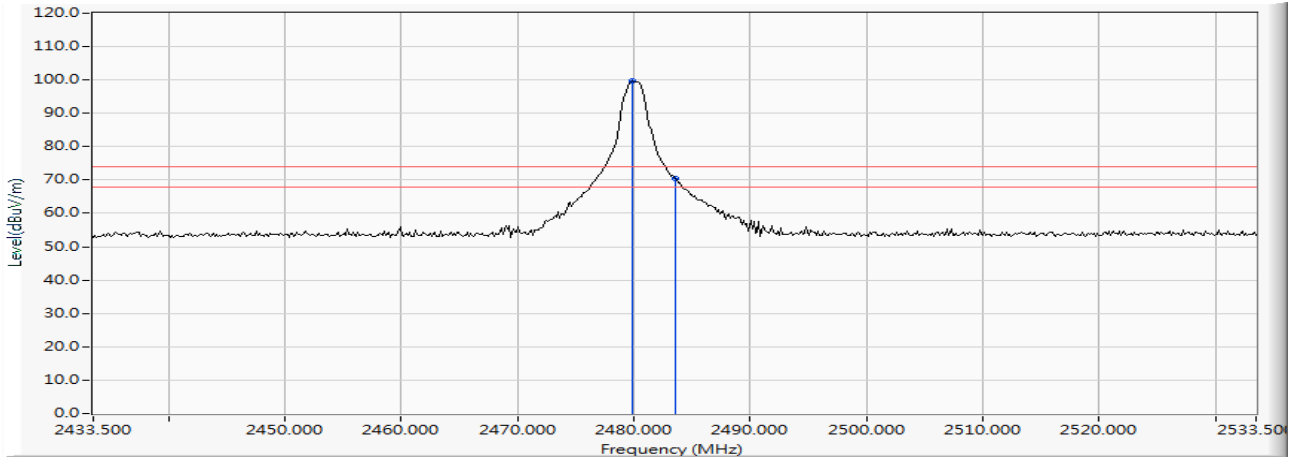
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Average)	2483.500	70.161	-30.755	39.406	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	13.369	86.216	99.585	--	--	PEAK
2		2483.500	13.375	57.090	70.464	-3.536	74.000	PEAK

Note:

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

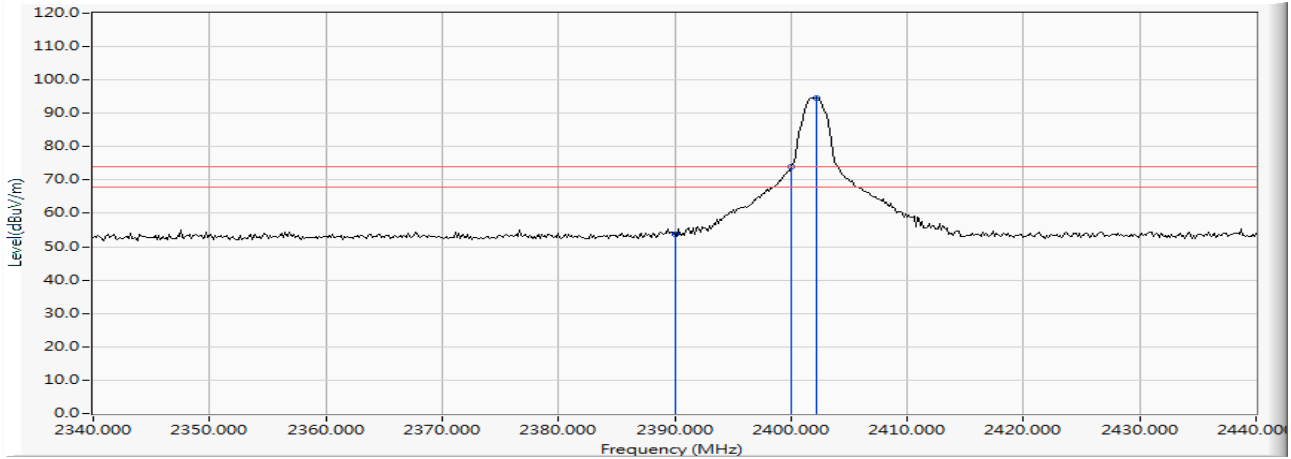
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Average)	2483.500	70.464	-30.755	39.709	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2402MHz)

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	40.936	53.835	-20.165	74.000	PEAK
2		2400.000	12.961	61.024	73.985	--	--	PEAK
3	*	2402.174	12.976	81.768	94.744	--	--	PEAK

Note:

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

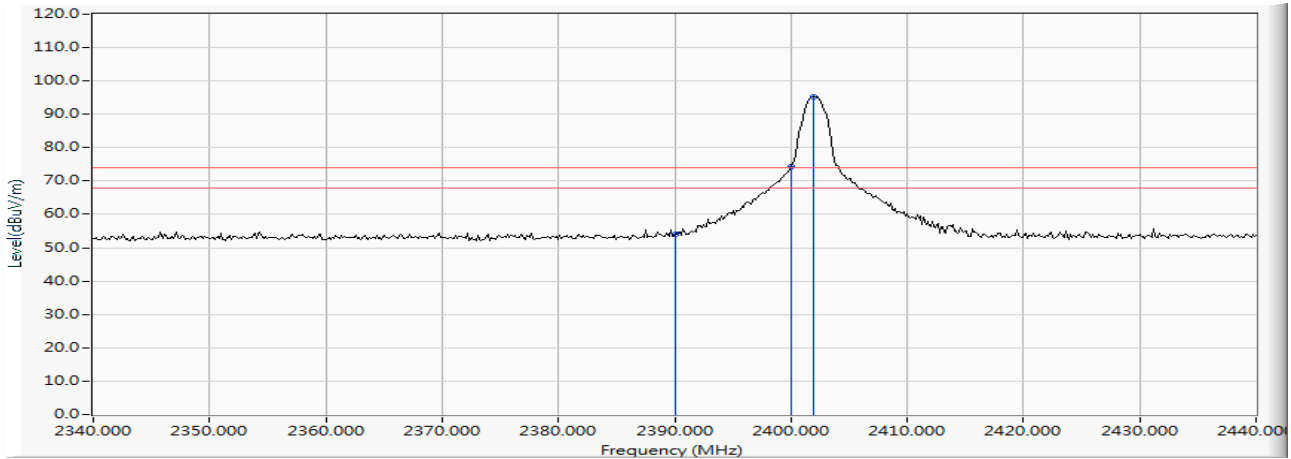
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Average)	2390.000	53.835	-30.755	23.080	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2402MHz)

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	41.004	53.903	-20.097	74.000	PEAK
2	2400.000	12.961	61.409	74.370	--	--	PEAK
3	* 2401.884	12.974	82.198	95.172	--	--	PEAK

Note:

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

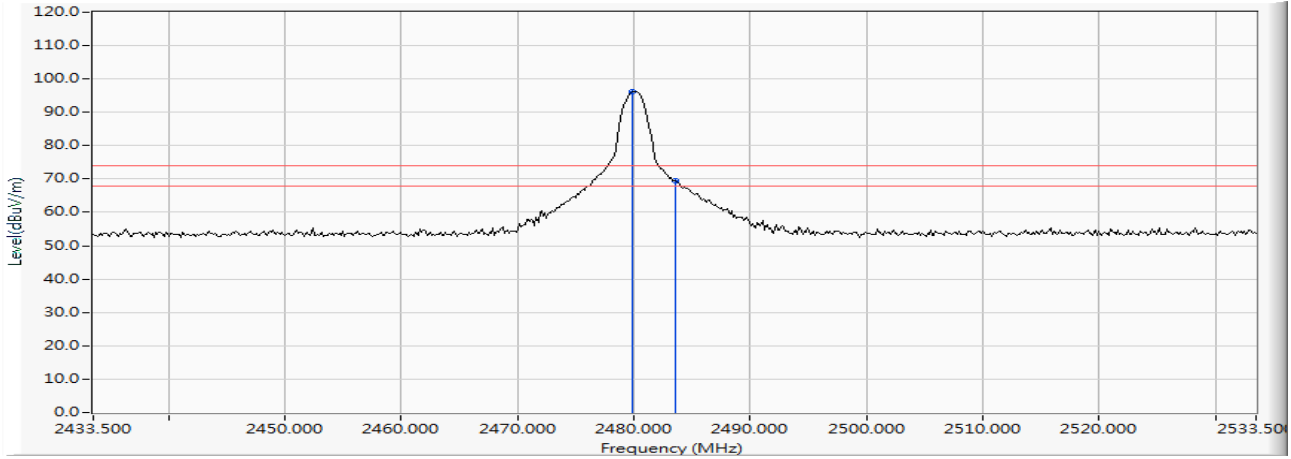
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Average)	2390.000	53.903	-30.755	23.148	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2480MHz)

Horizontal



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	13.369	82.744	96.113	--	--	PEAK
2		2483.500	13.375	55.993	69.367	-4.633	74.000	PEAK

Note:

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

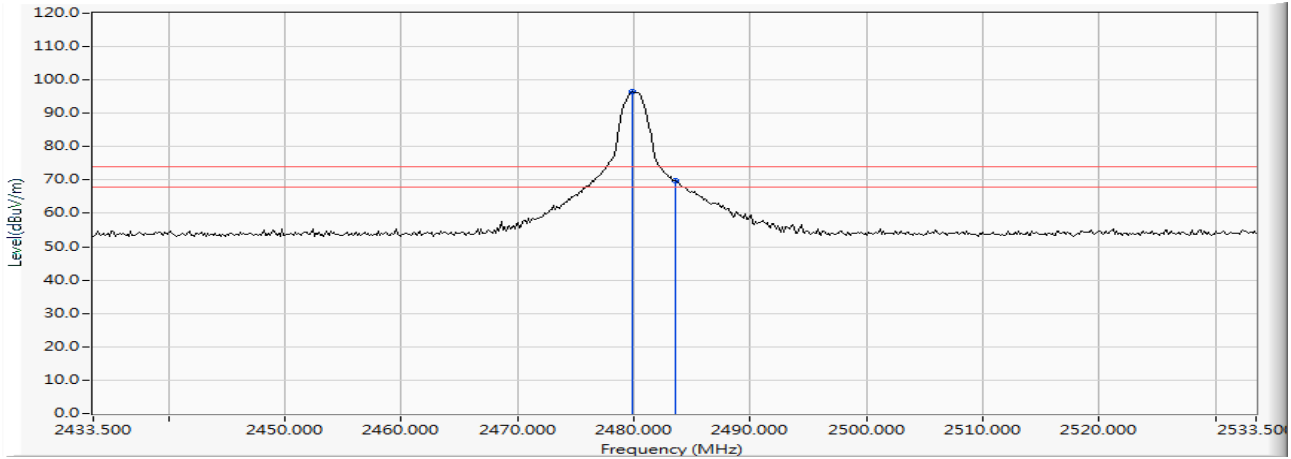
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Average)	2483.500	69.367	-30.755	38.612	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (2480MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	13.369	83.001	96.370	--	--	PEAK
2		2483.500	13.375	56.422	69.796	-4.204	74.000	PEAK

Note:

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

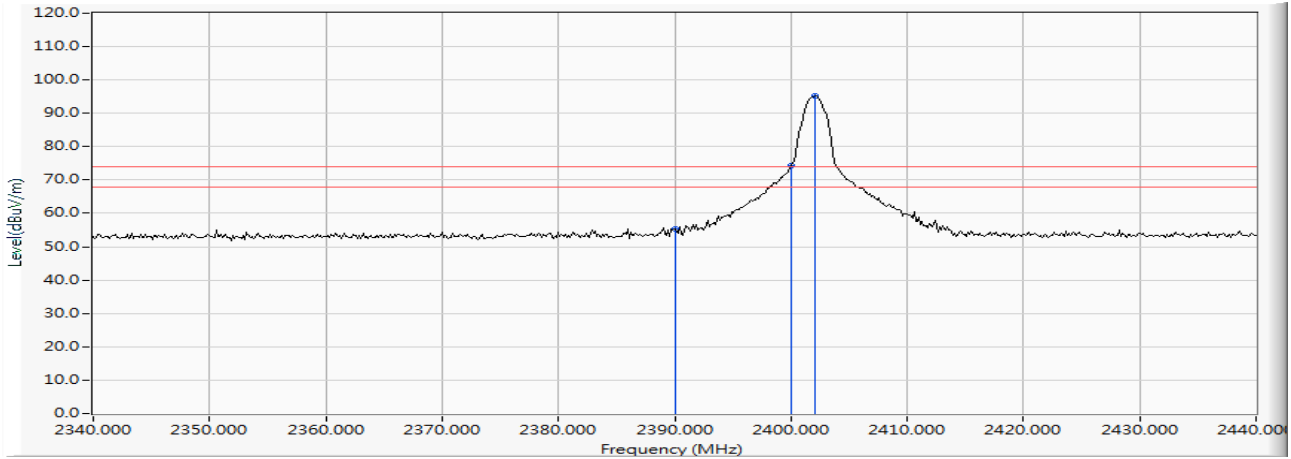
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Average)	2483.500	69.796	-30.755	39.041	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2402MHz)

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	42.444	55.343	-18.657	74.000	PEAK
2		2400.000	12.961	61.221	74.182	--	--	PEAK
3	*	2402.029	12.975	82.165	95.140	--	--	PEAK

Note:

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

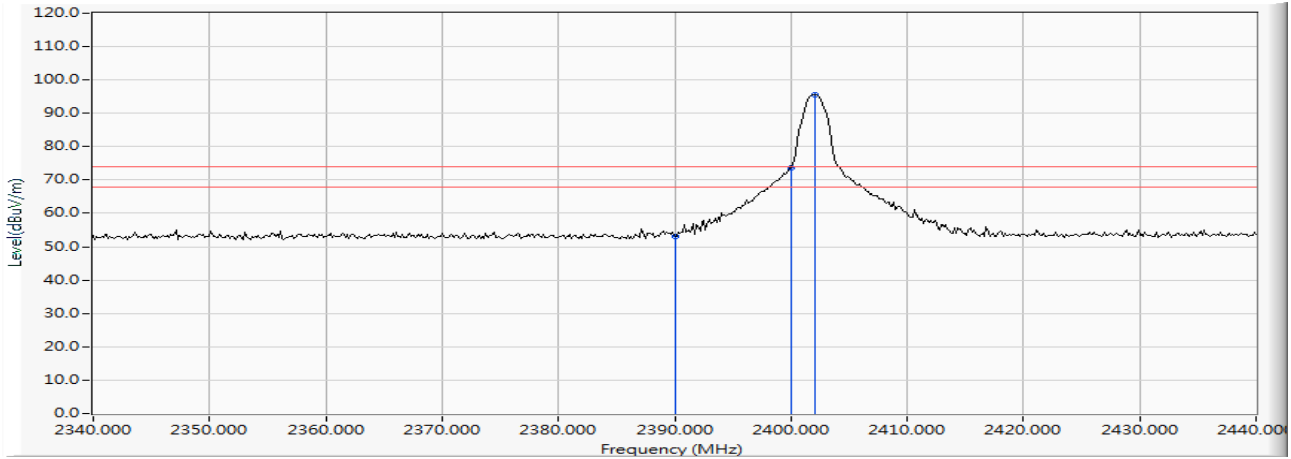
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Average)	2390.000	55.343	-30.755	24.588	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2402MHz)

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	40.169	53.068	-20.932	74.000	PEAK
2		2400.000	12.961	60.750	73.711	--	--	PEAK
3	*	2402.029	12.975	82.662	95.637	--	--	PEAK

Note:

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

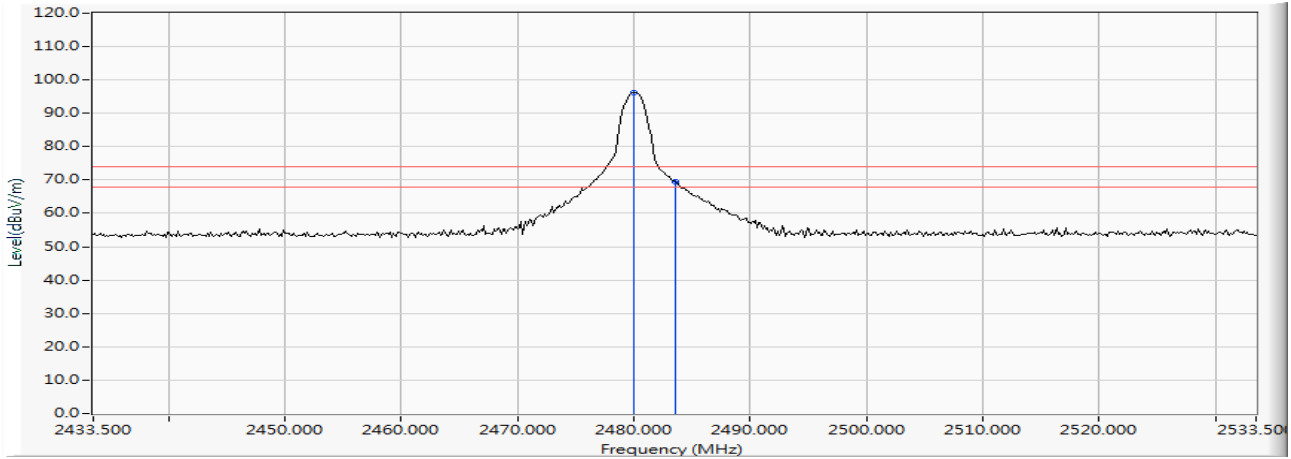
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Average)	2390.000	53.068	-30.755	22.313	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	13.369	82.967	96.336	--	--	PEAK
2		2483.500	13.375	56.092	69.466	-4.534	74.000	PEAK

Note:

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

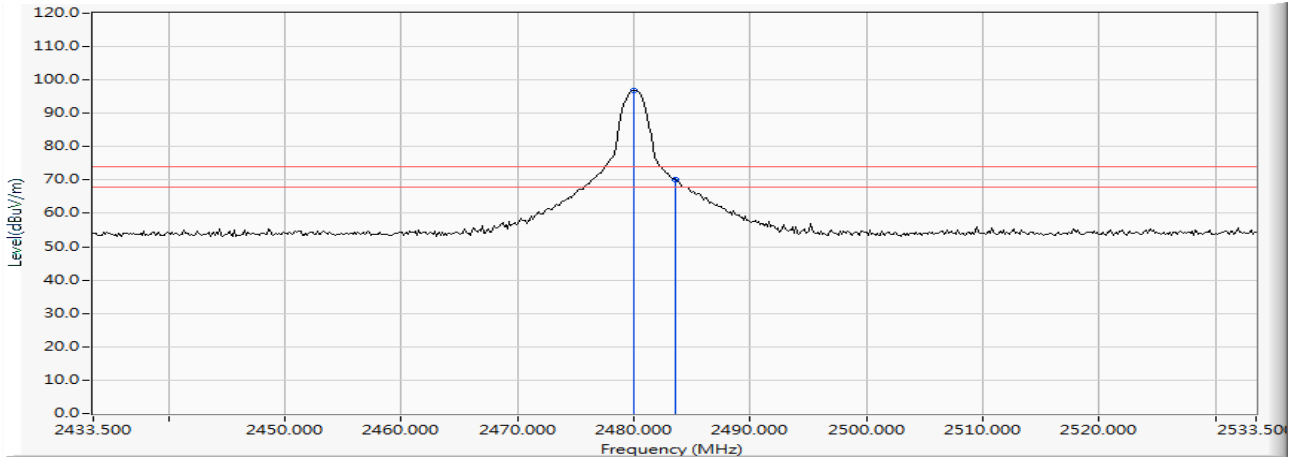
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Average)	2483.500	69.466	-30.755	38.711	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test date : 2019/10/24
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	13.369	83.560	96.929	--	--	PEAK
2		2483.500	13.375	56.665	70.039	-3.961	74.000	PEAK

Note:

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

Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Average)	2483.500	70.039	-30.755	39.284	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

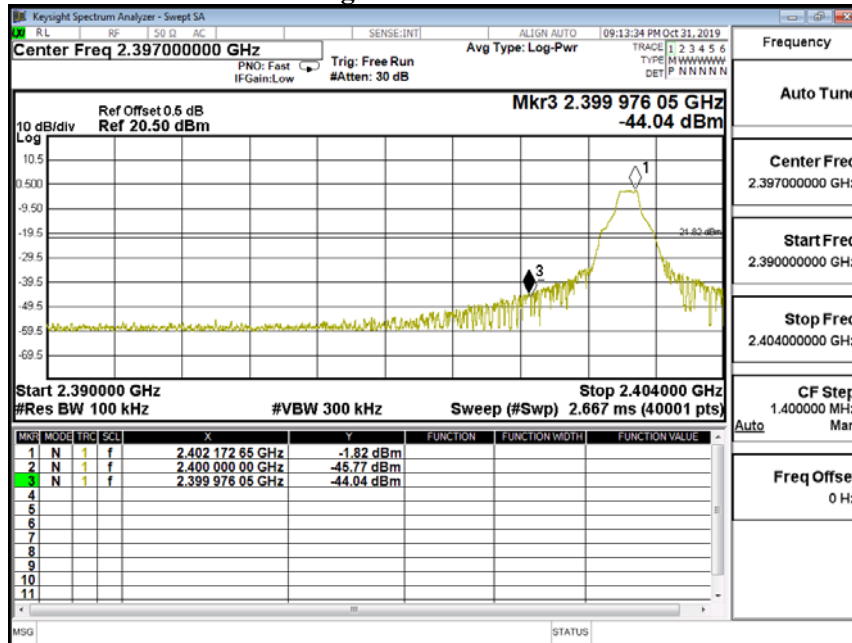
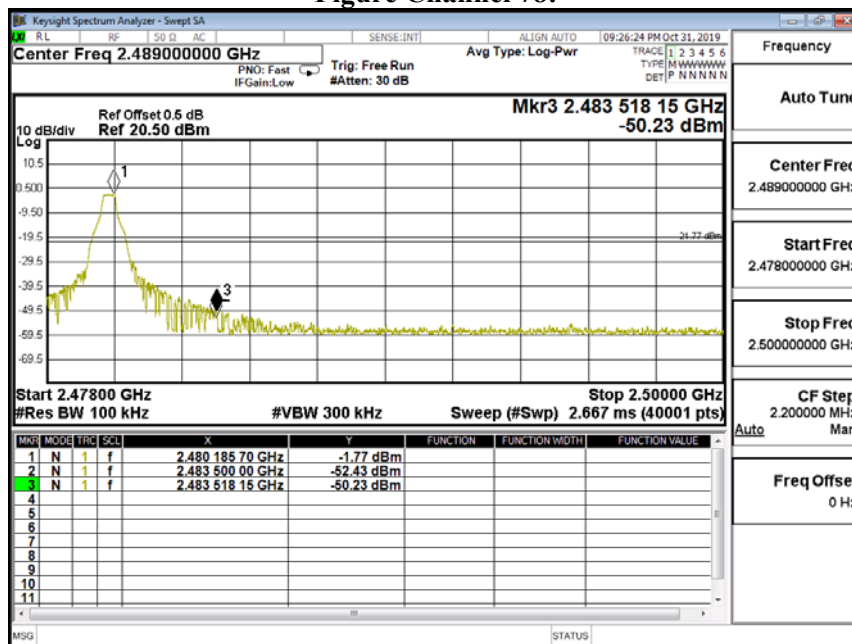


Figure Channel 78:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

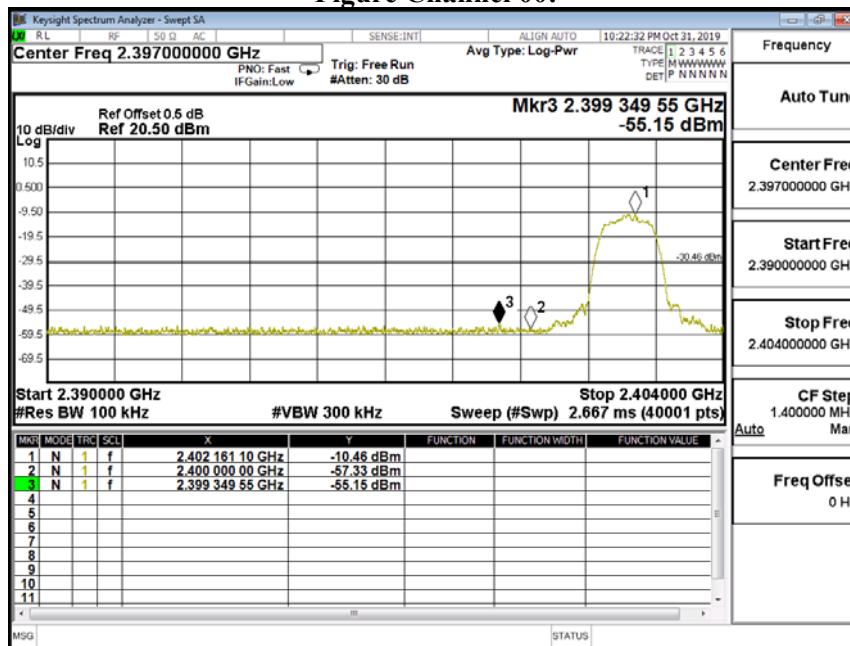
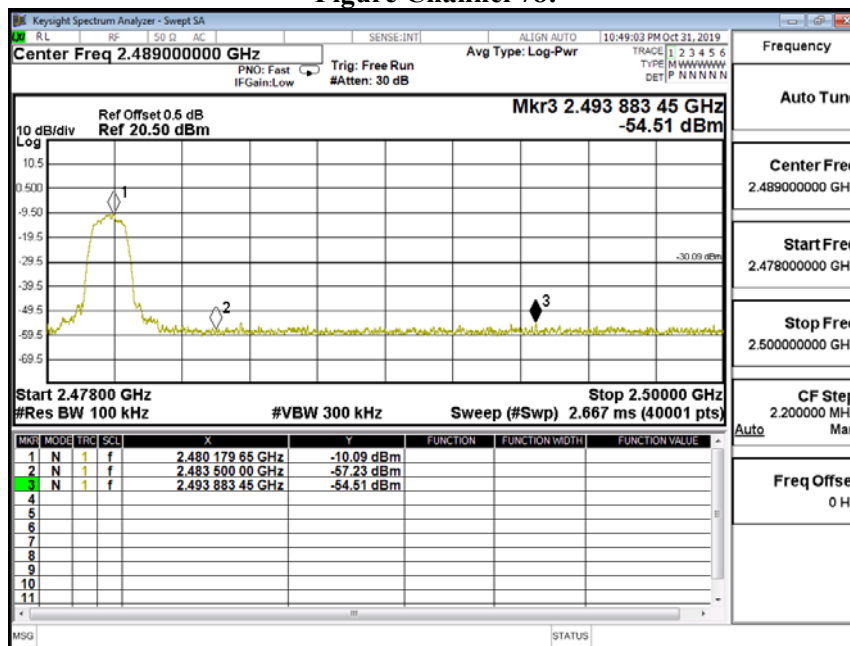


Figure Channel 78:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

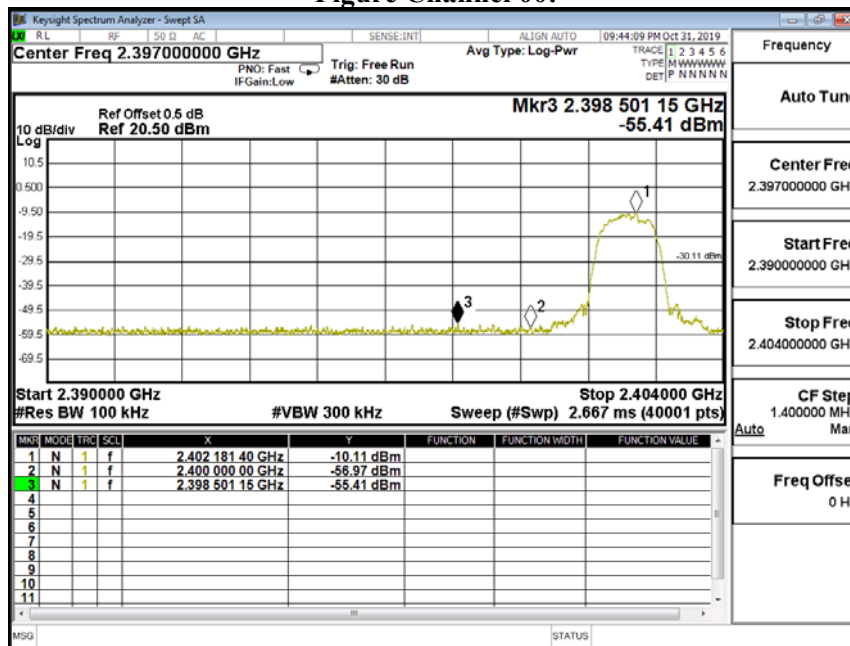
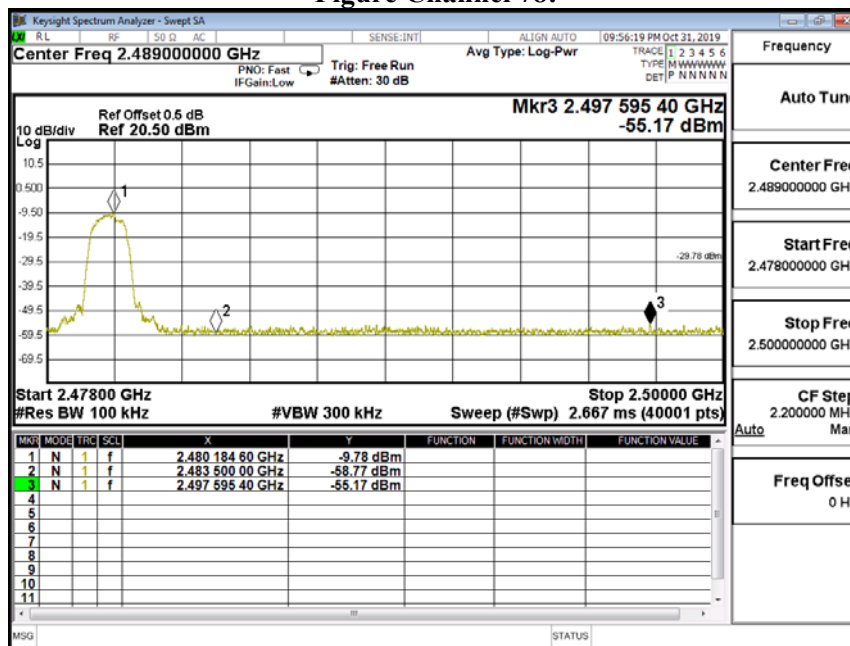


Figure Channel 78:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

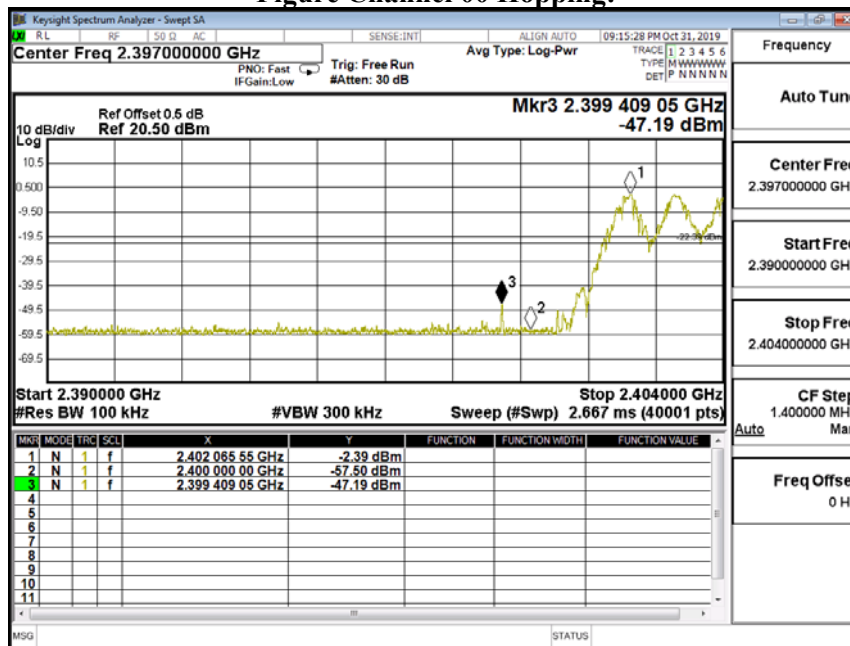
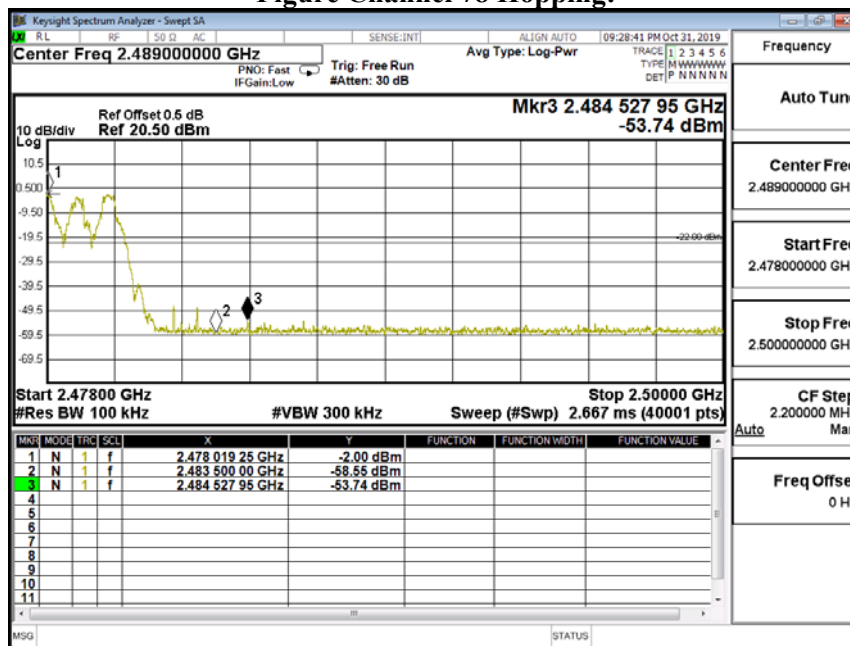


Figure Channel 78 Hopping:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

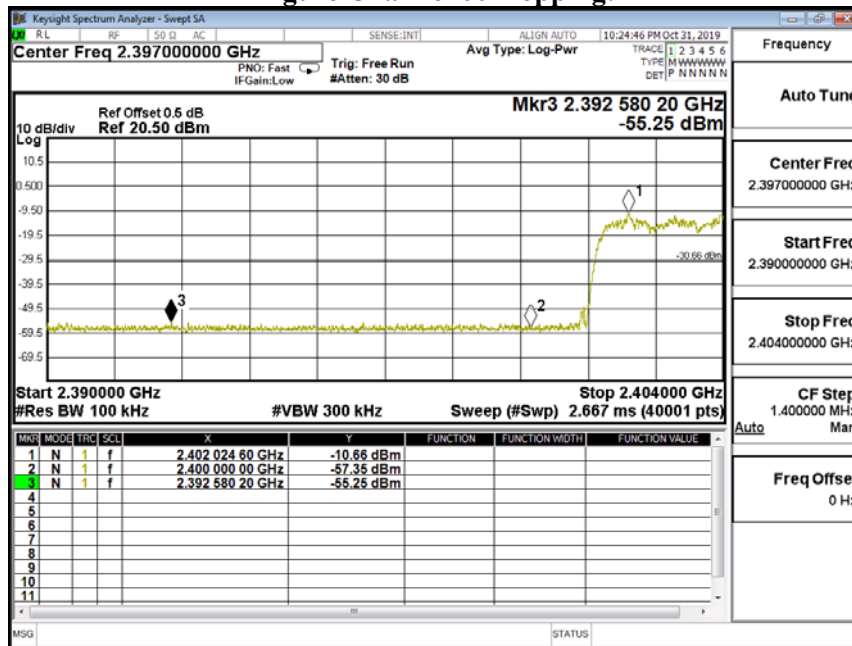
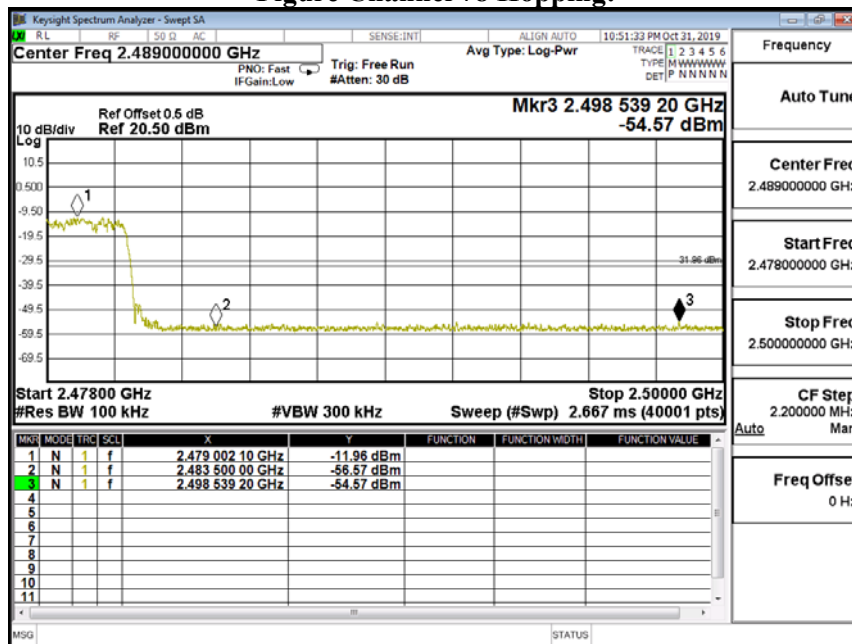


Figure Channel 78 Hopping:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

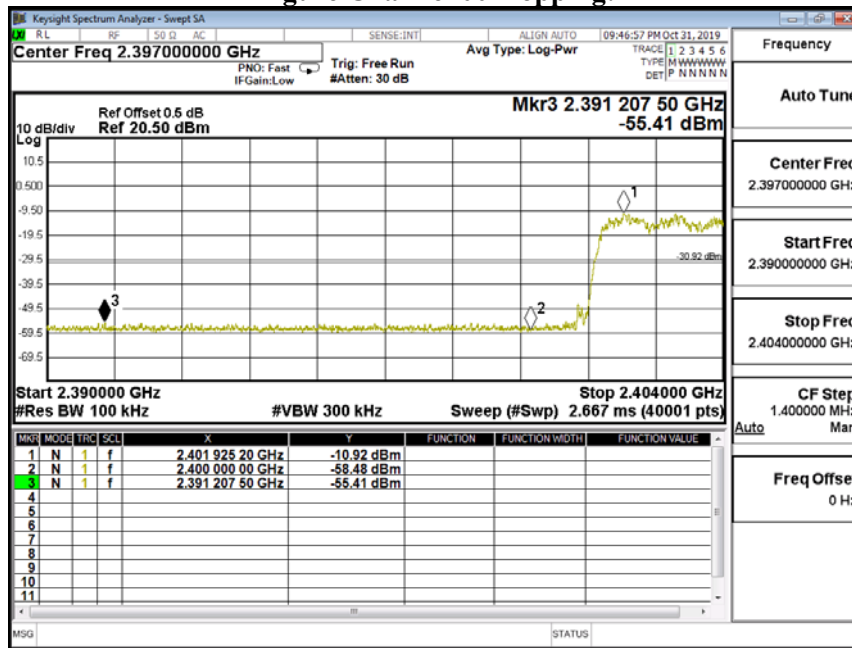
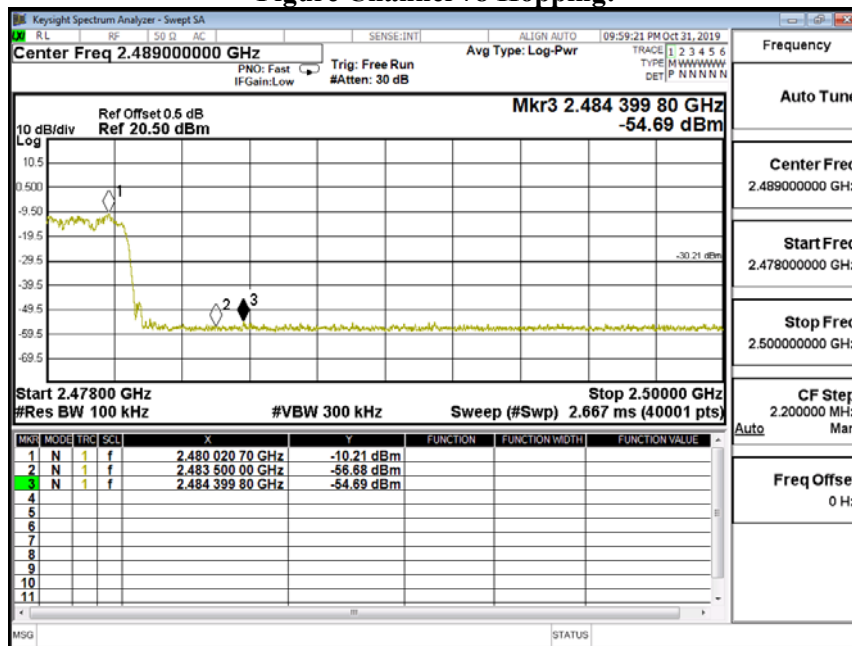
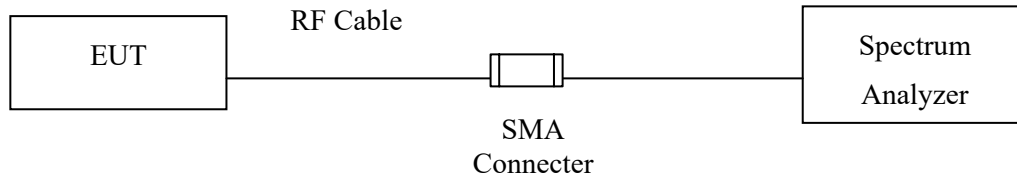


Figure Channel 78 Hopping:



7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

7.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

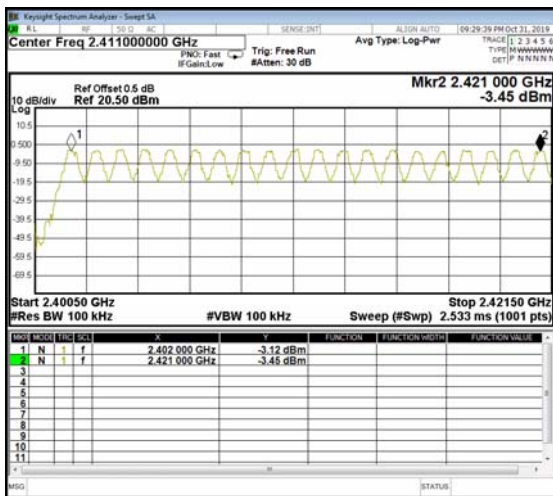
N/A

7.5. Test Result of Channel Number

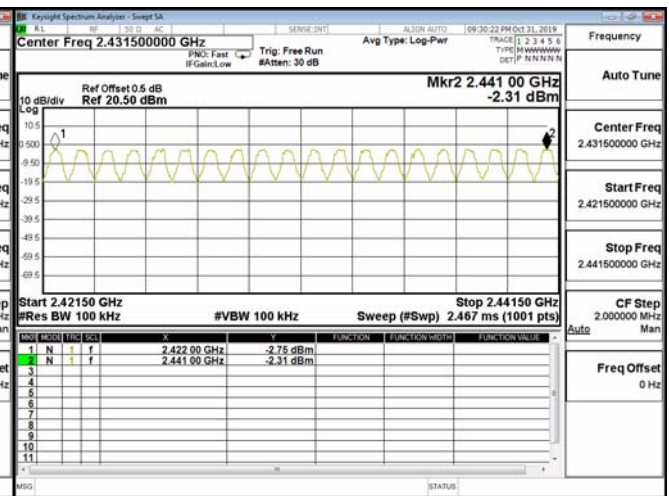
Product : 23.1 inches Bar type Digital Signage
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

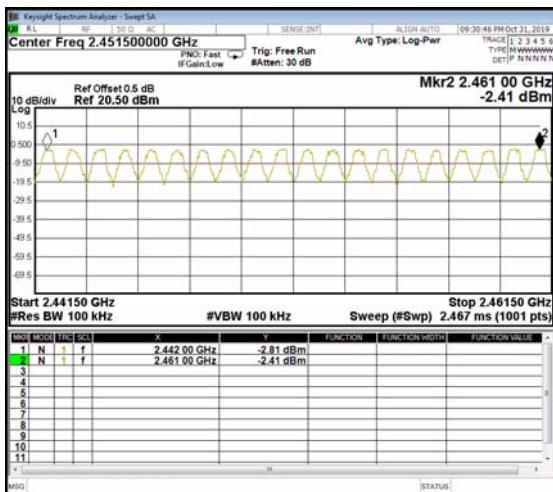
2402-2421MHz



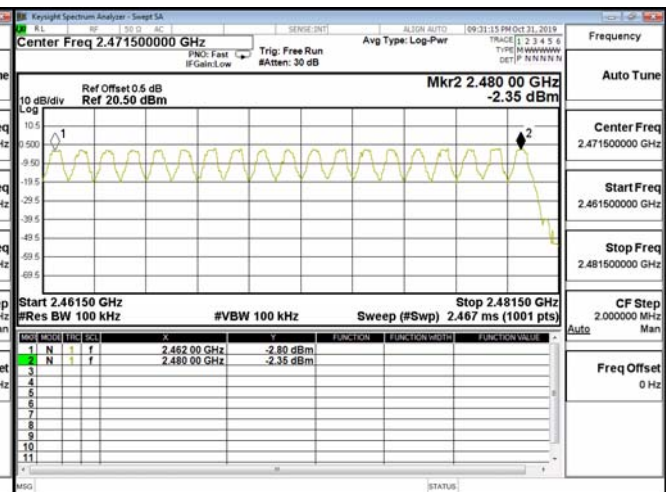
2422-2441MHz



2442-2461MHz



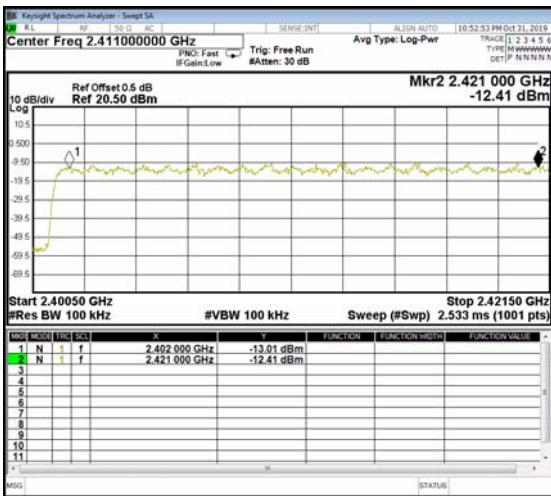
2462-2480MHz



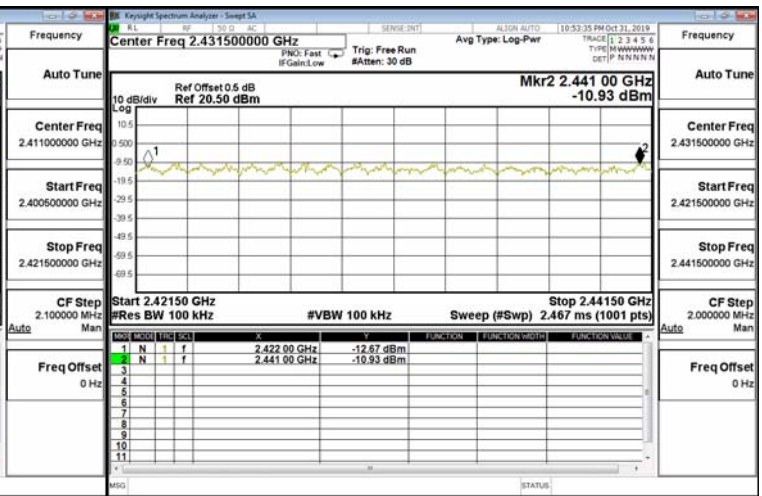
Product : 23.1 inches Bar type Digital Signage
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

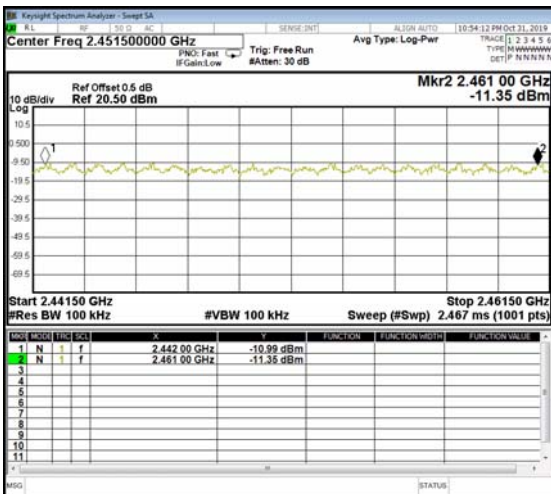
2402-2421MHz



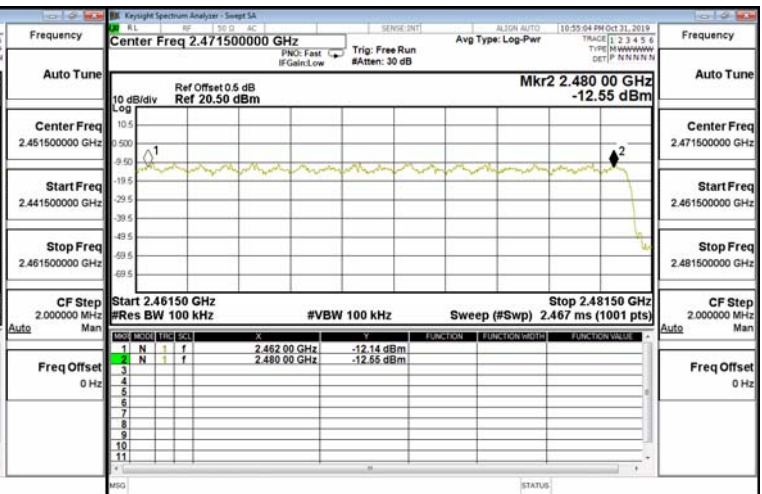
2422-2441MHz



2442-2461MHz



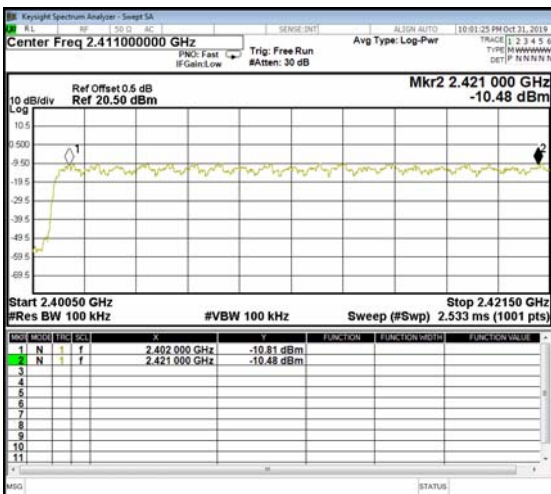
2462-2480MHz



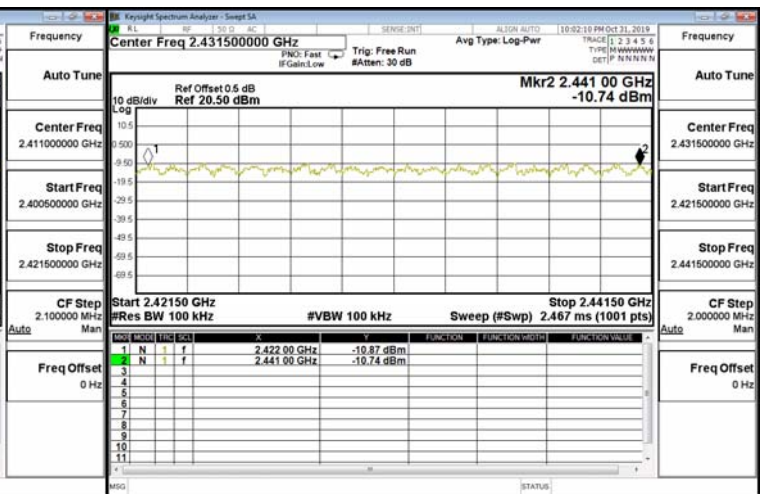
Product : 23.1 inches Bar type Digital Signage
 Test Item : Channel Number
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

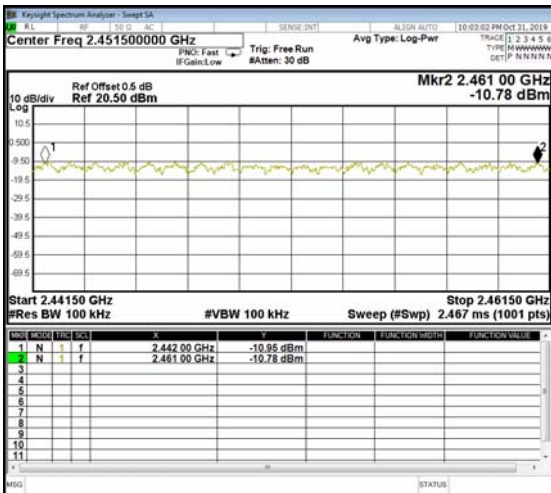
2402-2421MHz



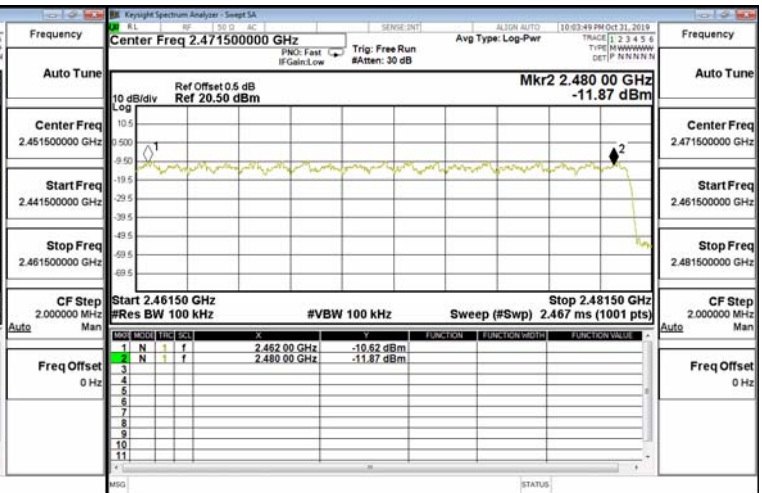
2422-2441MHz



2442-2461MHz

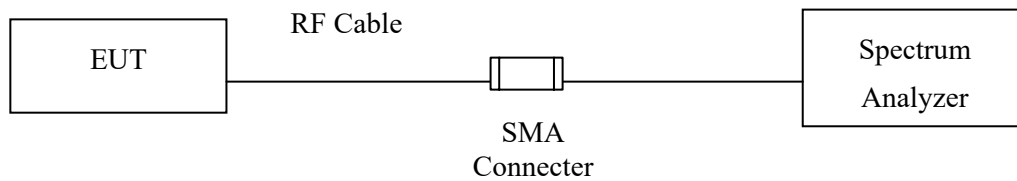


2462-2480MHz



8. Channel Separation

8.1. Test Setup



8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

8.4. Uncertainty

$\pm 283\text{Hz}$

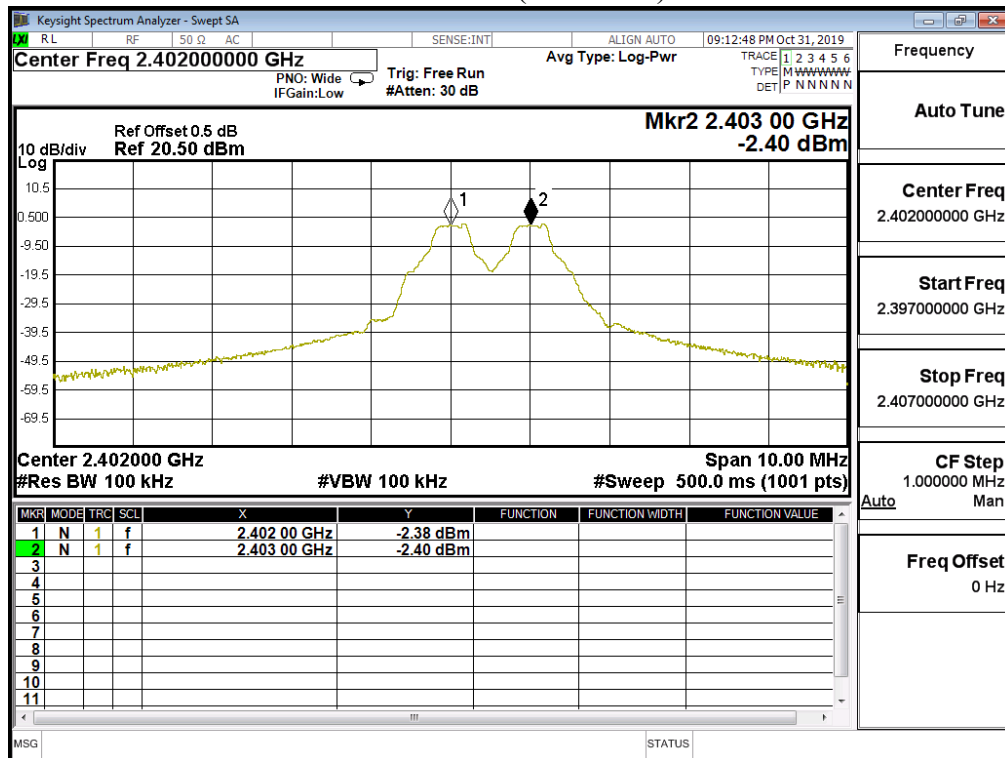
8.5. Test Result of Channel Separation

Product : 23.1 inches Bar type Digital Signage
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

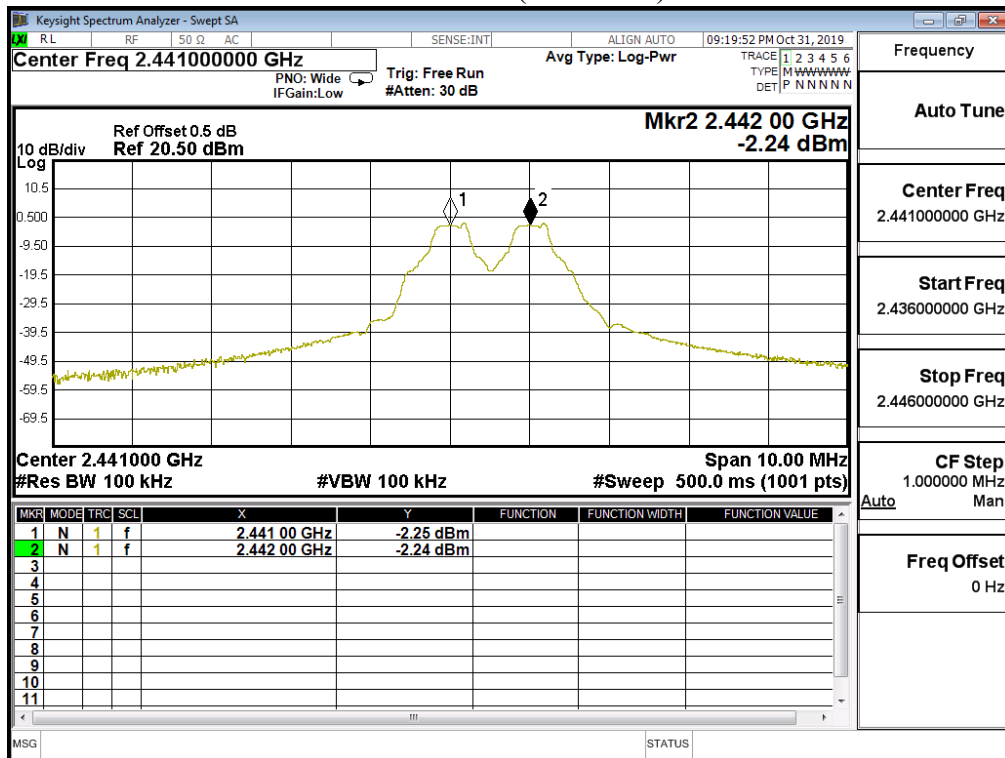
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	634.0	Pass
39	2441	1000	>25 kHz	636.0	Pass
78	2480	1000	>25 kHz	678.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

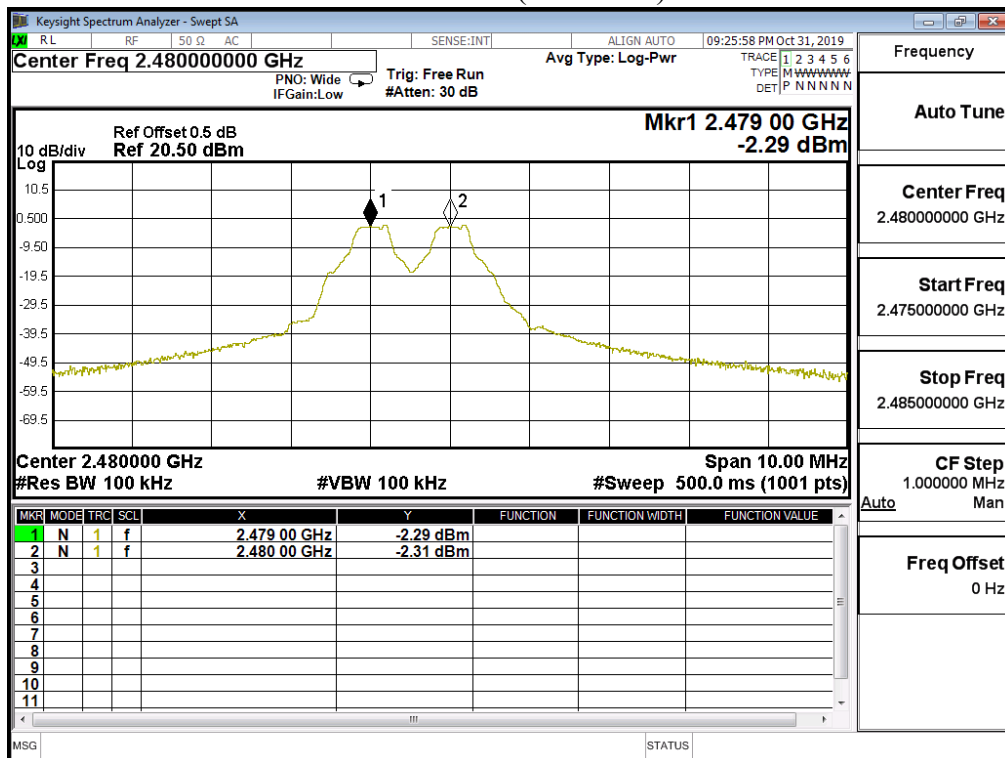
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)

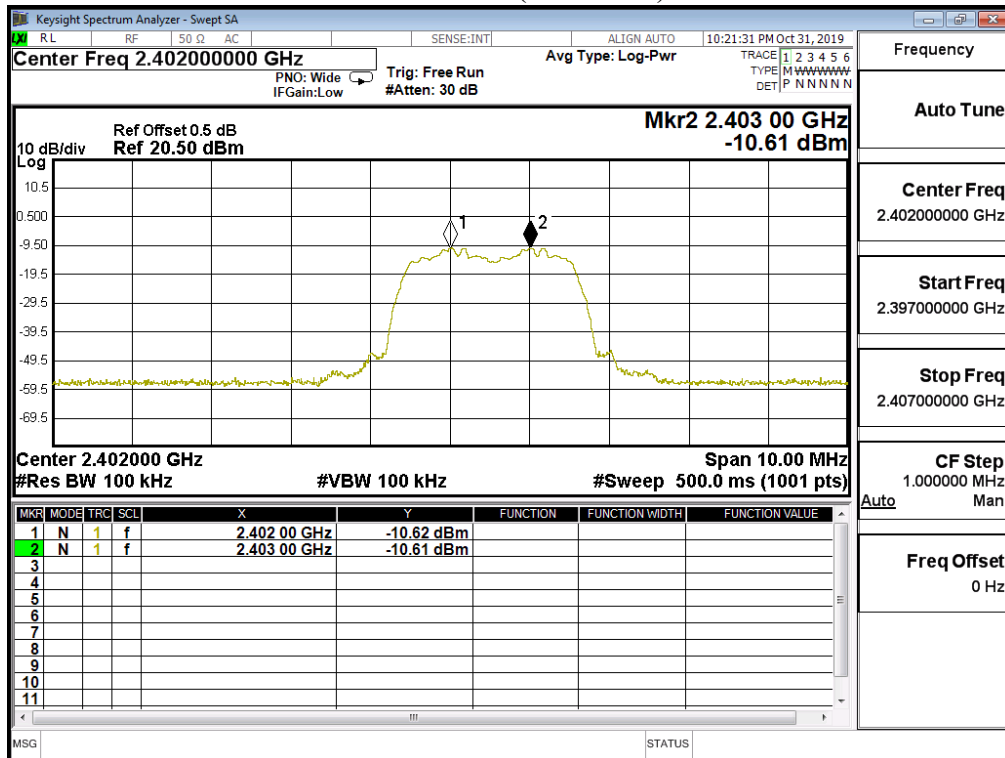


Product : 23.1 inches Bar type Digital Signage
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK)

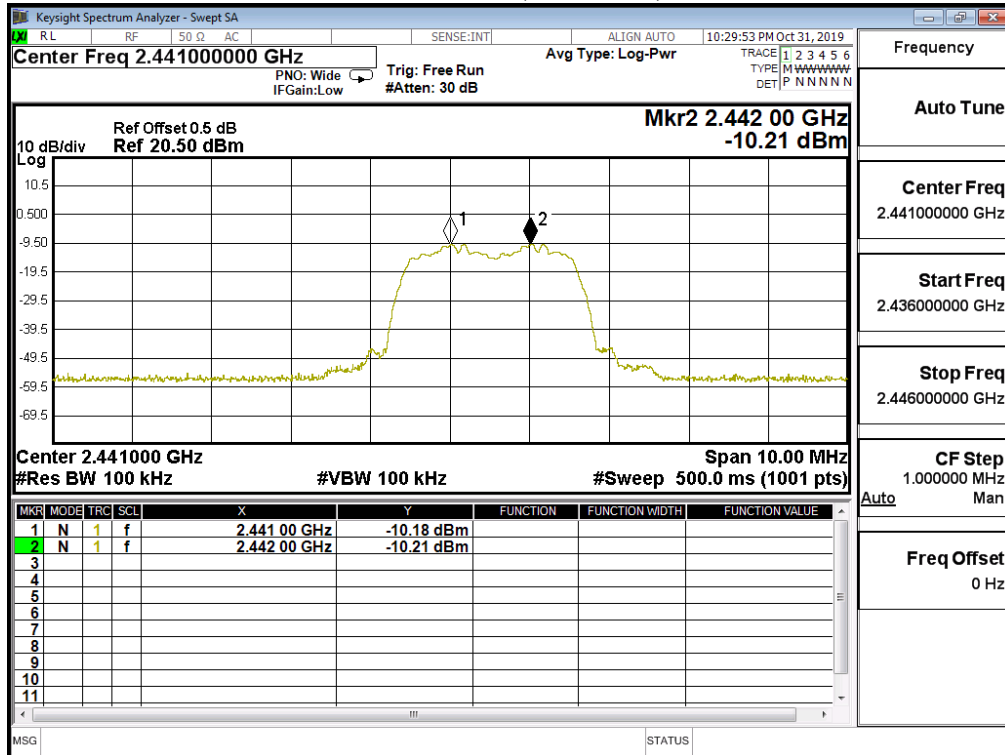
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	908.0	Pass
39	2441	1000	>25 kHz	906.0	Pass
78	2480	1000	>25 kHz	910.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

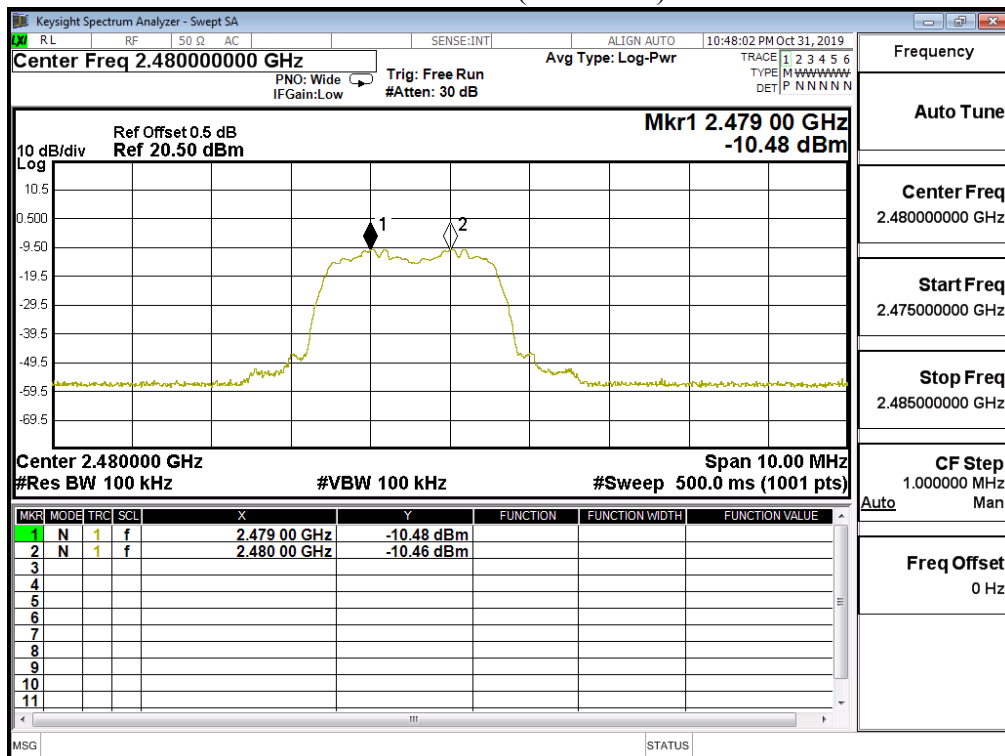
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)

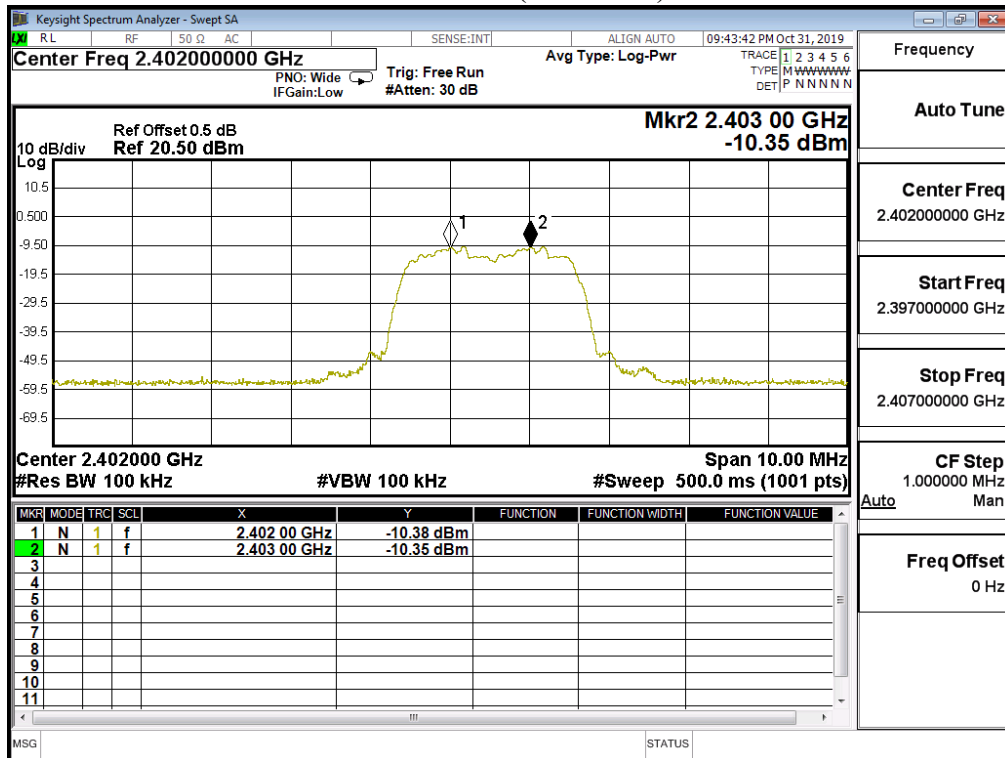


Product : 23.1 inches Bar type Digital Signage
 Test Item : Channel Separation
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)

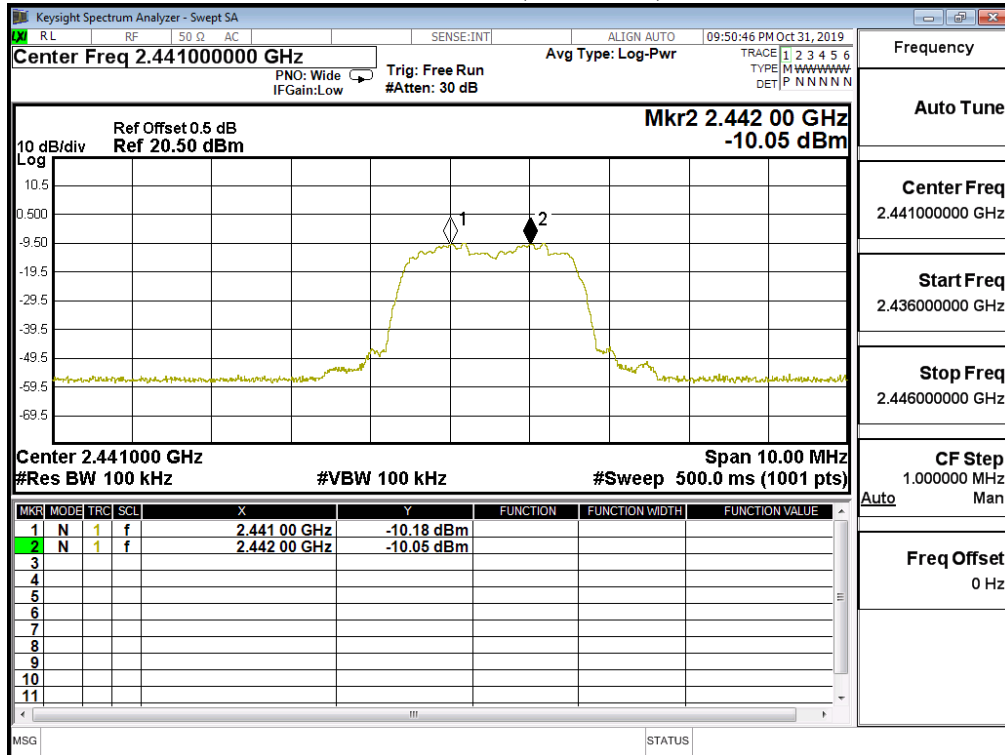
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	882.0	Pass
39	2441	1000	>25 kHz	880.0	Pass
78	2480	1000	>25 kHz	882.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

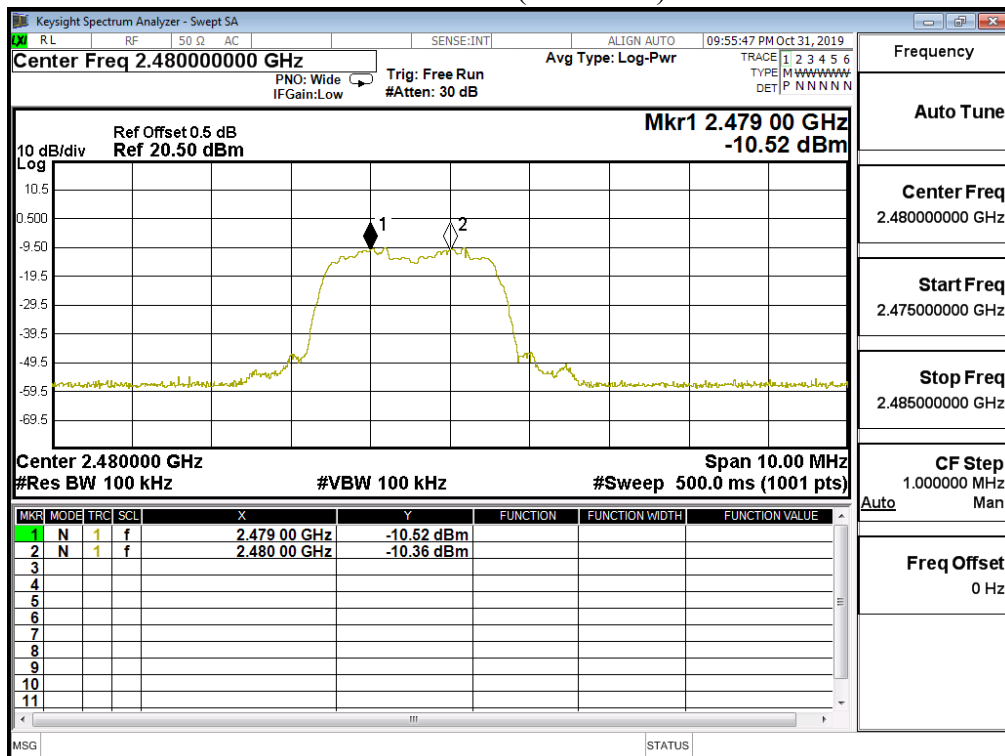
Channel 00 (2402MHz)



Channel 39 (2441MHz)

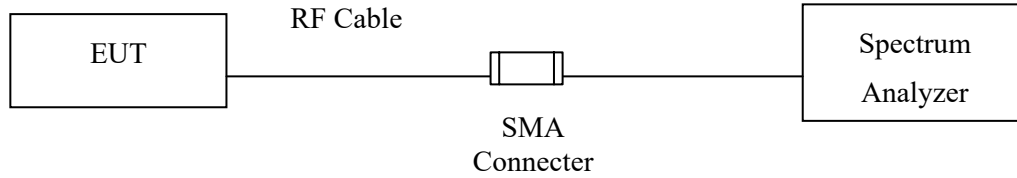


Channel 78 (2480MHz)



9. Dwell Time

9.1. Test Setup



9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

9.4. Uncertainty

$\pm 25\text{msec}$

9.5. Test Result of Dwell Time

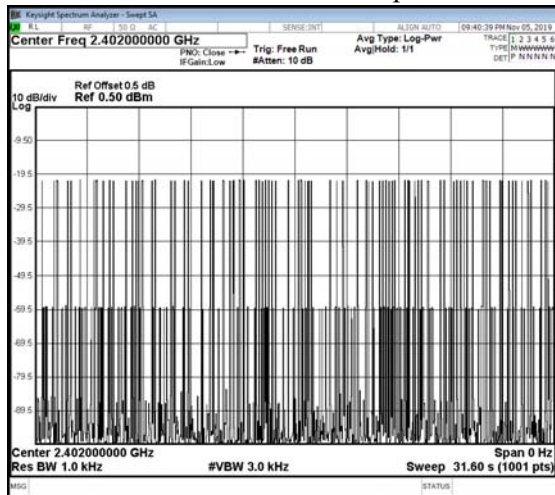
Product : 23.1 inches Bar type Digital Signage
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.880	99	31600	285.120	400	Pass
2441	2.880	106	31600	305.280	400	Pass
2480	2.890	91	31600	262.990	400	Pass

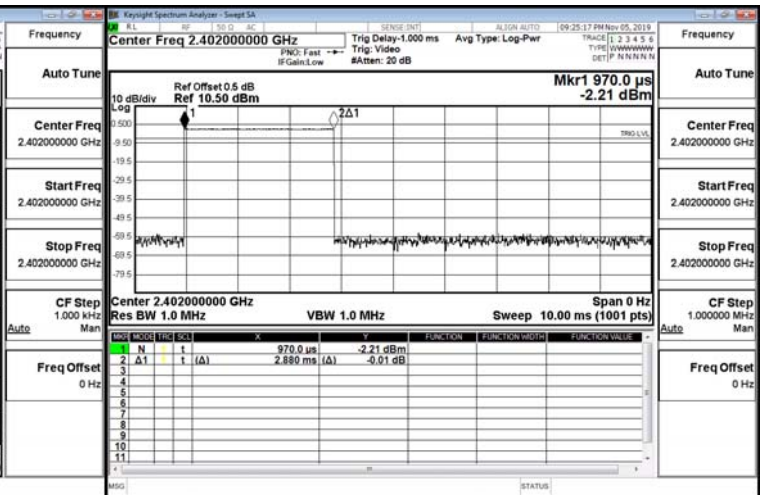
Dwell time = Time slot length*Hopping of number

Sweep time= 79 CHannel * 0.4

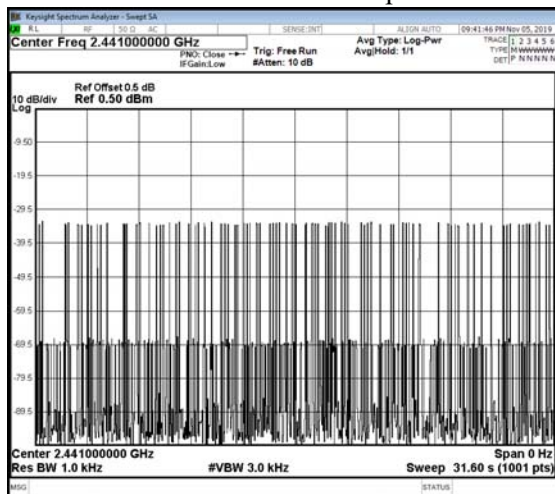
CH 00 Time Interval between hops



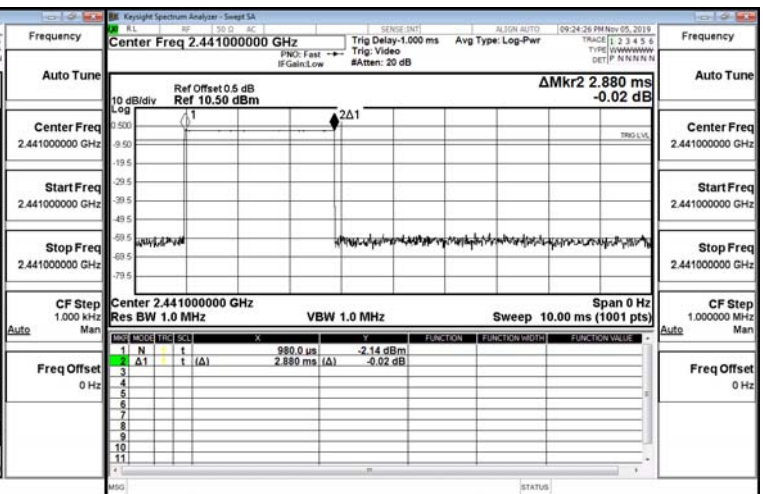
CH 00 Transmission Time



CH39 Time Interval between hops

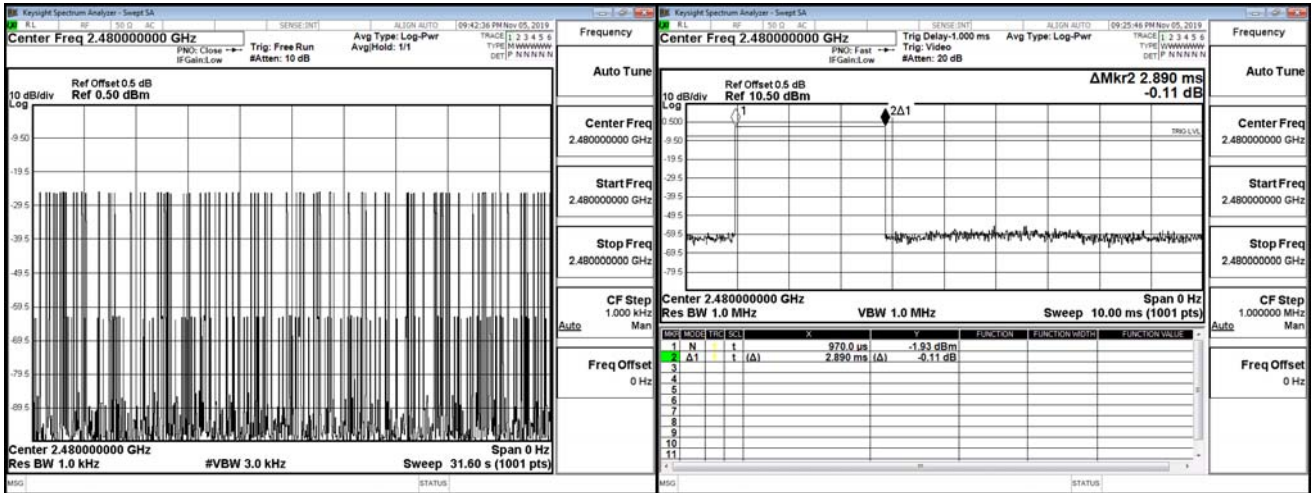


CH 39Transmission Time



CH 78 Time Interval between hops

CH 78 Transmission Time



Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK) (Channel 00,39,78 –DH5)

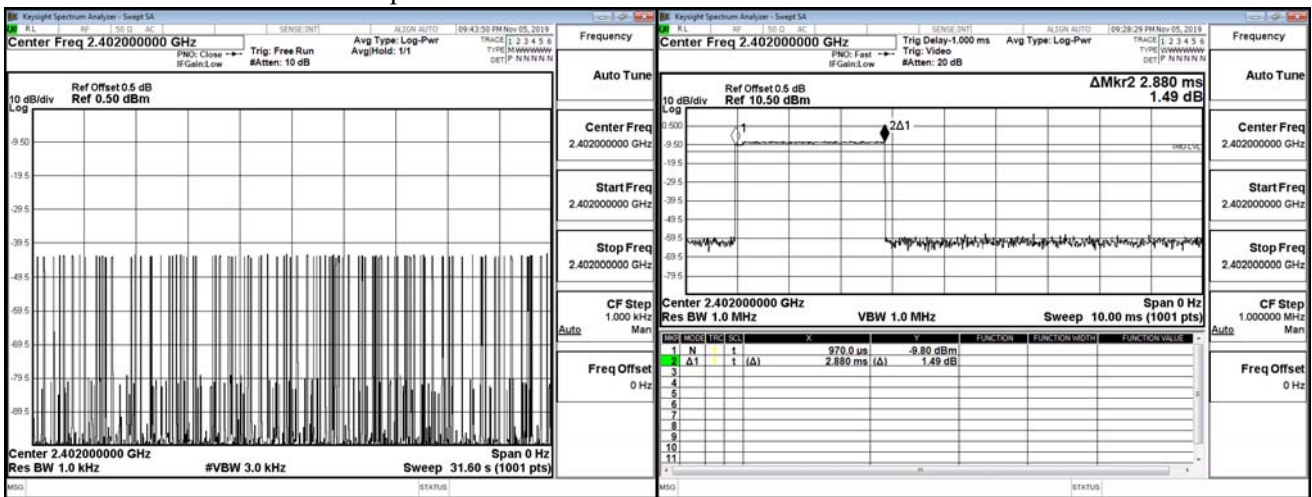
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.880	102	31600	293.760	400	Pass
2441	2.890	94	31600	271.660	400	Pass
2480	2.890	105	31600	303.450	400	Pass

Dwell time = Time slot length*Hopping of number

Sweep time= 79 CHannel * 0.4

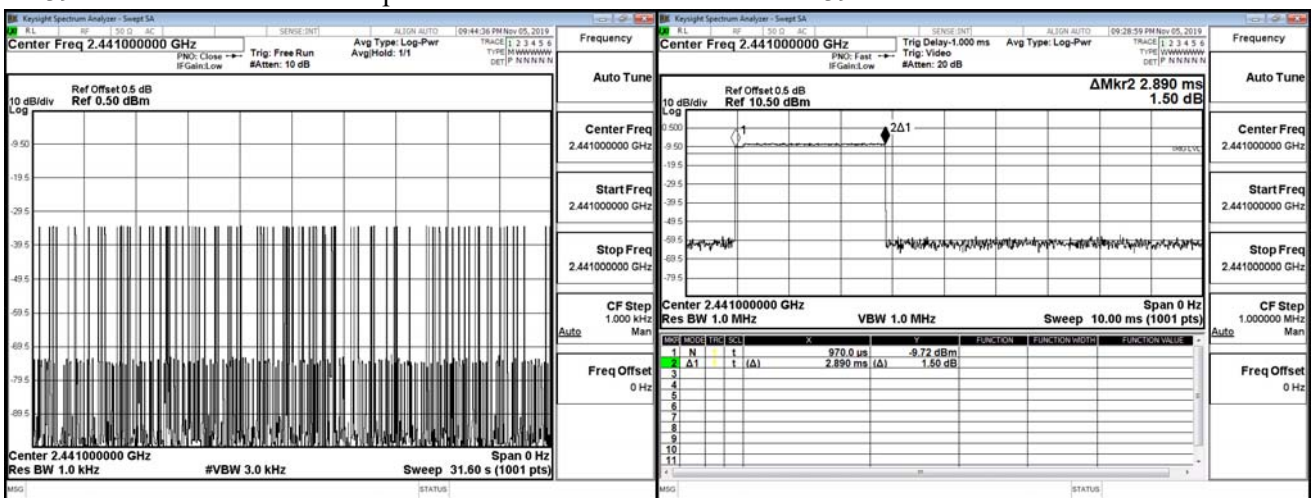
CH 00 Time Interval between hops

CH 00 Transmission Time



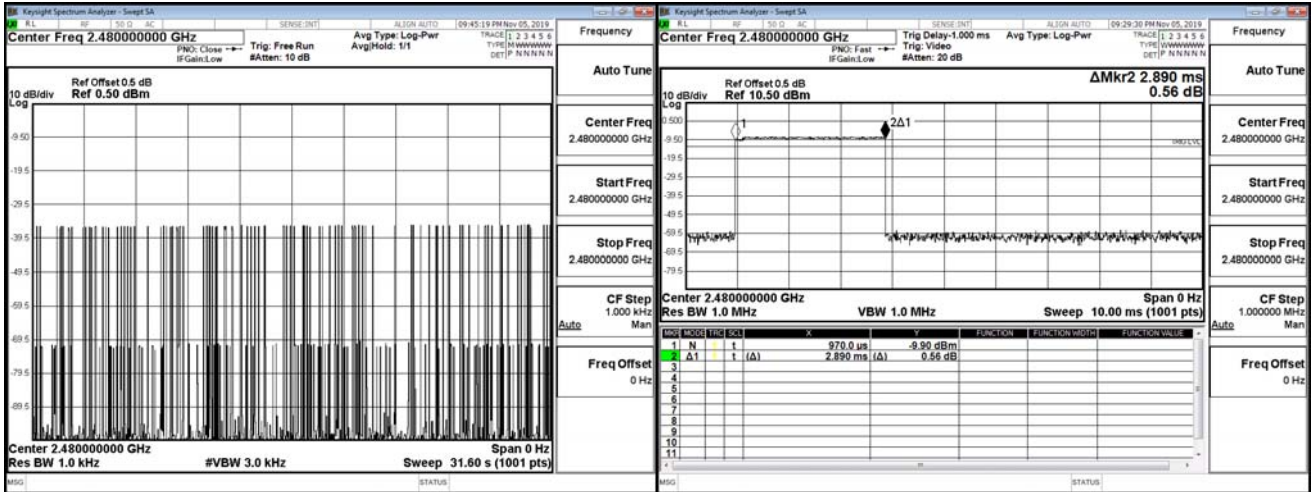
CH39 Time Interval between hops

CH 39Transmission Time



CH 78 Time Interval between hops

CH 78 Transmission Time



Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product : 23.1 inches Bar type Digital Signage
 Test Item : Dwell Time
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

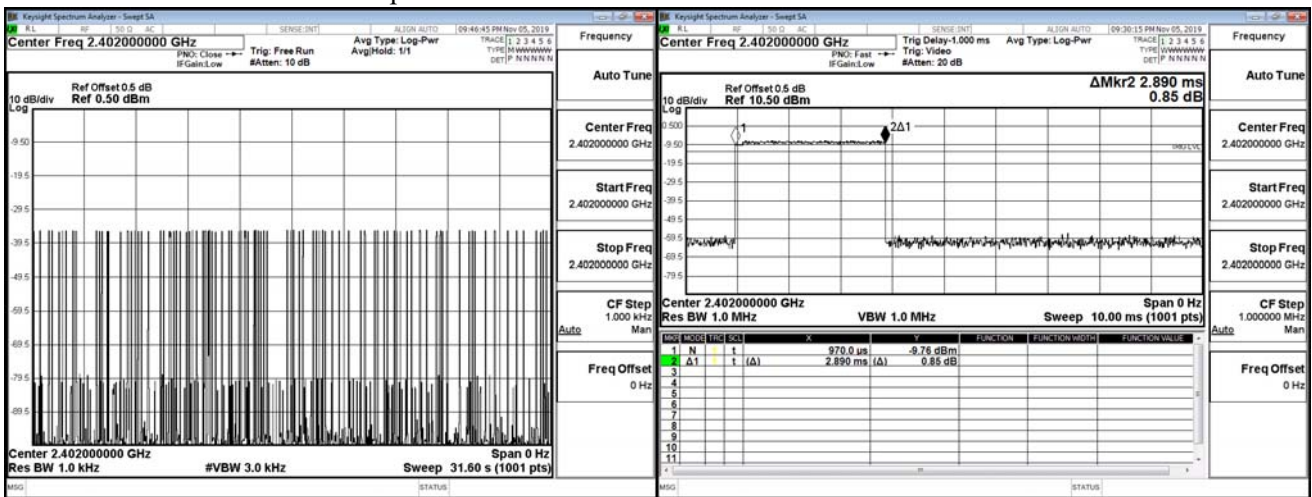
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.890	103	31600	297.670	400	Pass
2441	2.890	99	31600	286.110	400	Pass
2480	2.890	103	31600	297.670	400	Pass

Dwell time = Time slot length*Hopping of number

Sweep time= 79 Channel * 0.4

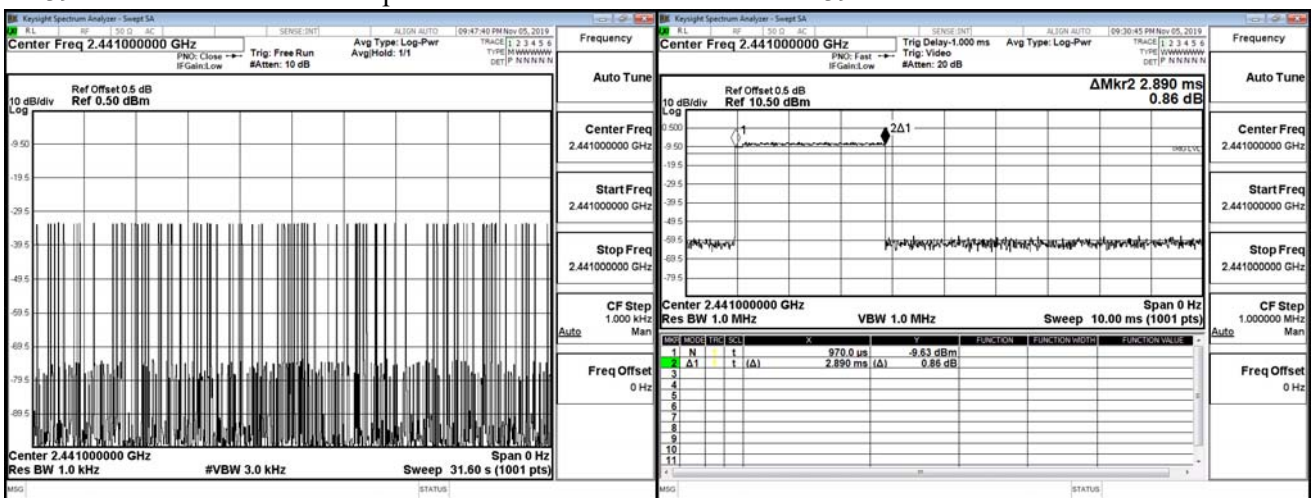
CH 00 Time Interval between hops

CH 00 Transmission Time



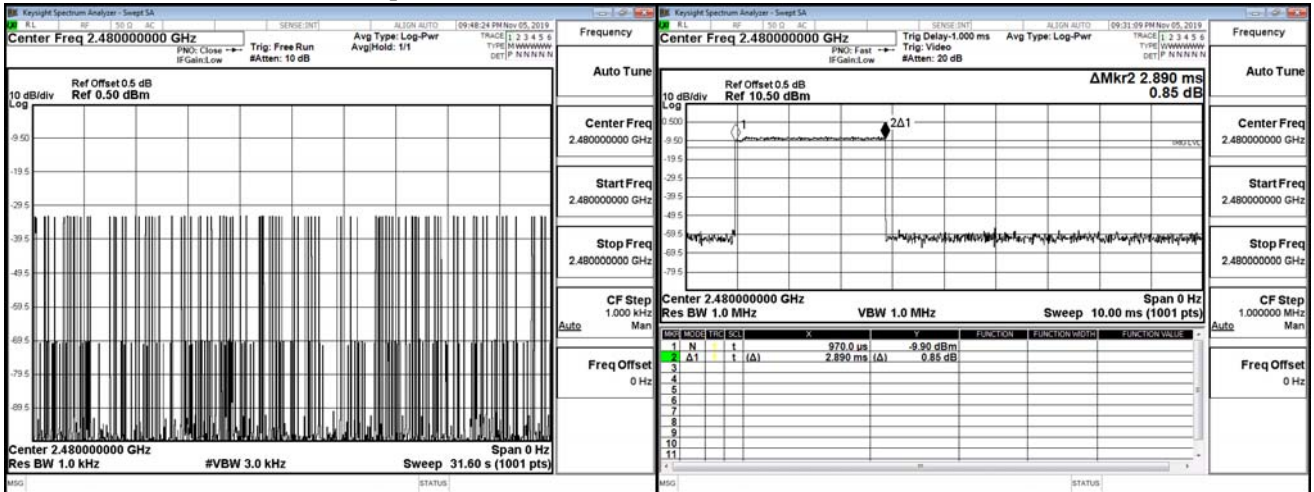
CH39 Time Interval between hops

CH 39Transmission Time



CH 78 Time Interval between hops

CH 78 Transmission Time

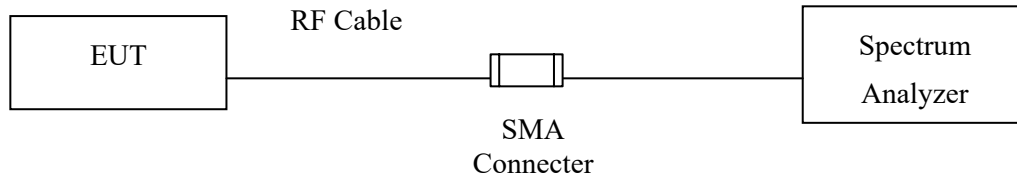


Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

10.4. Uncertainty

$\pm 283\text{Hz}$

10.5. Test Result of Occupied Bandwidth

Product : 23.1 inches Bar type Digital Signage
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	951	--	NA
39	2441	954	--	NA
78	2480	1017	--	NA

Figure Channel 00:

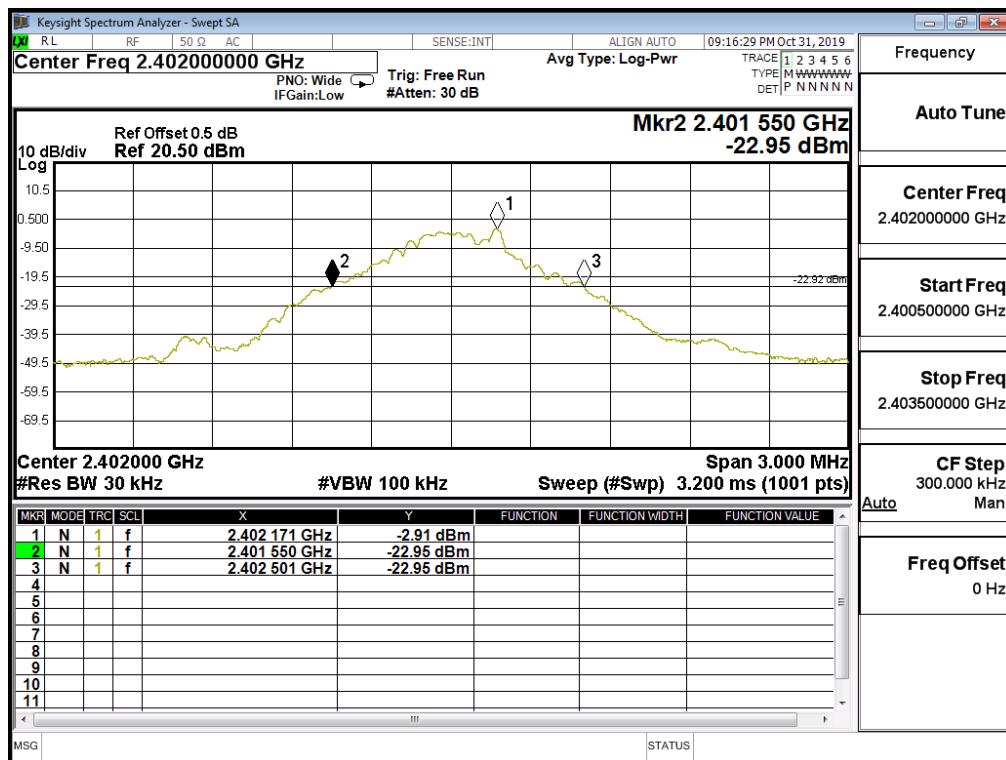


Figure Channel 39:

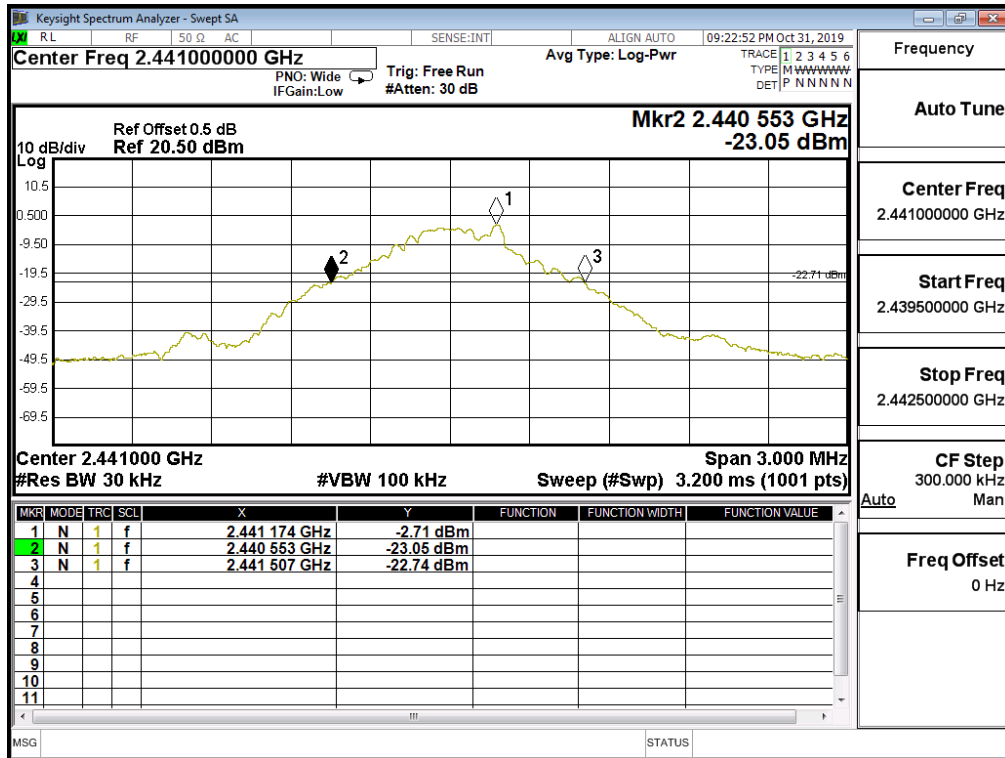
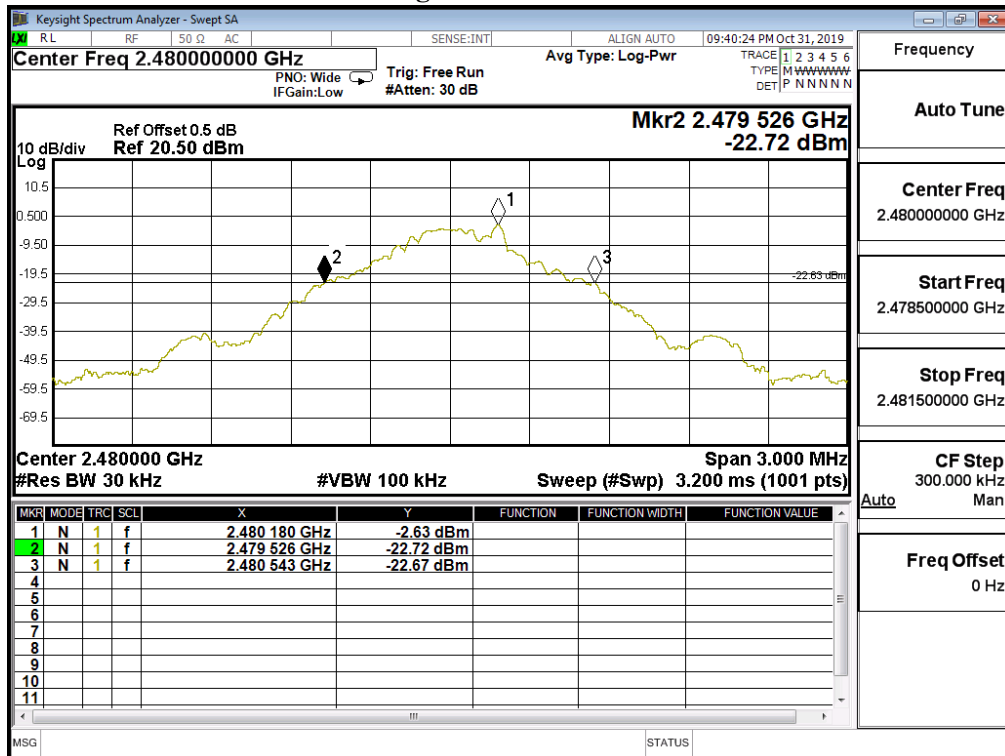


Figure Channel 78:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 2Mbps (4DQPSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1362	--	NA
39	2441	1359	--	NA
78	2480	1365	--	NA

Figure Channel 00:

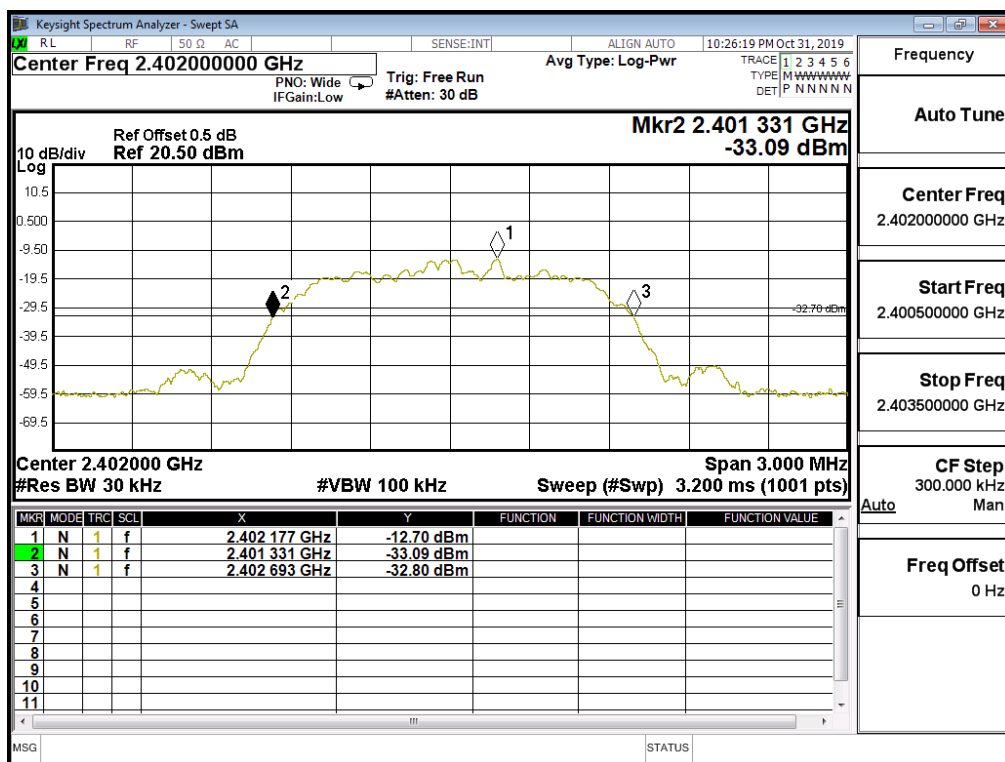


Figure Channel 39:

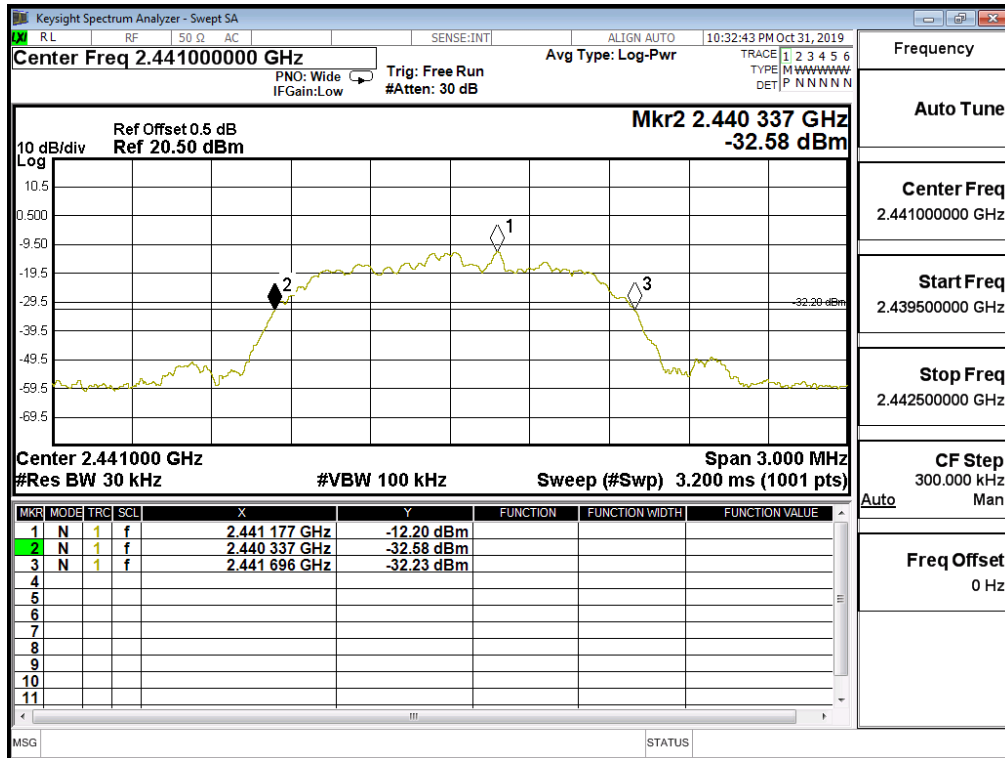
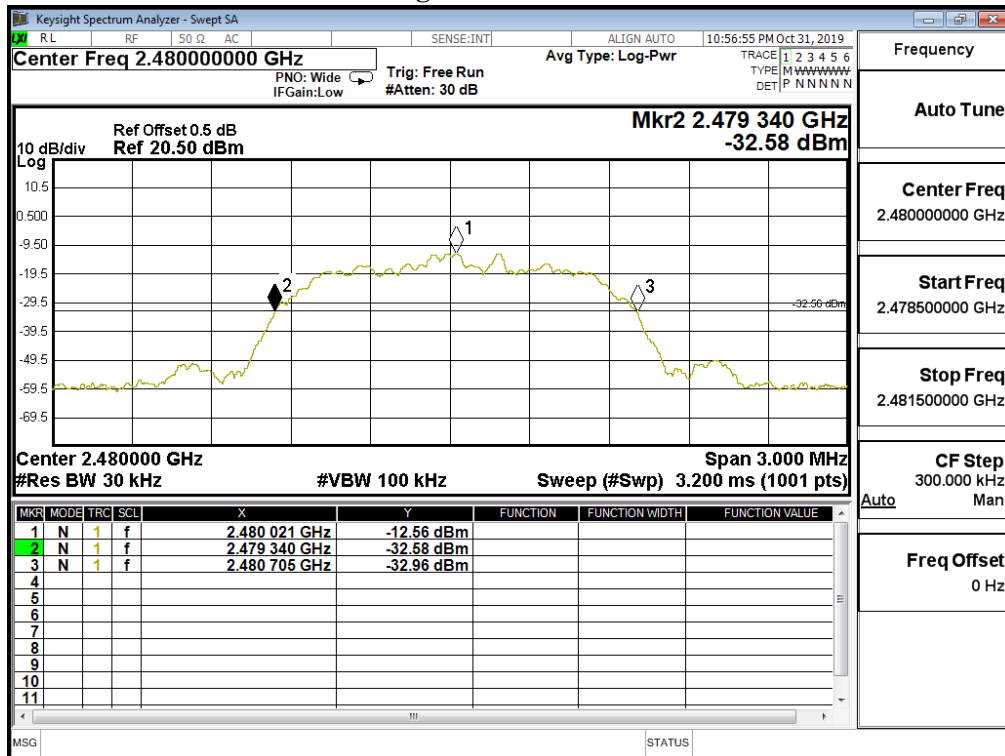


Figure Channel 78:



Product : 23.1 inches Bar type Digital Signage
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1323	--	NA
39	2441	1320	--	NA
78	2480	1323	--	NA

Figure Channel 00:

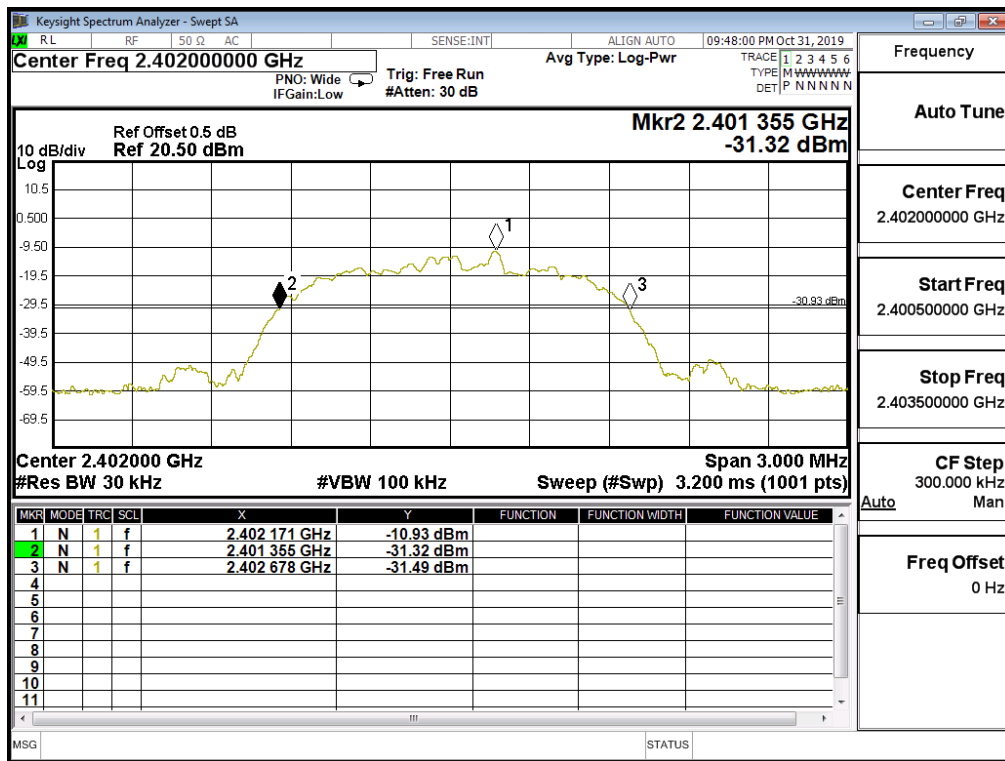


Figure Channel 39:

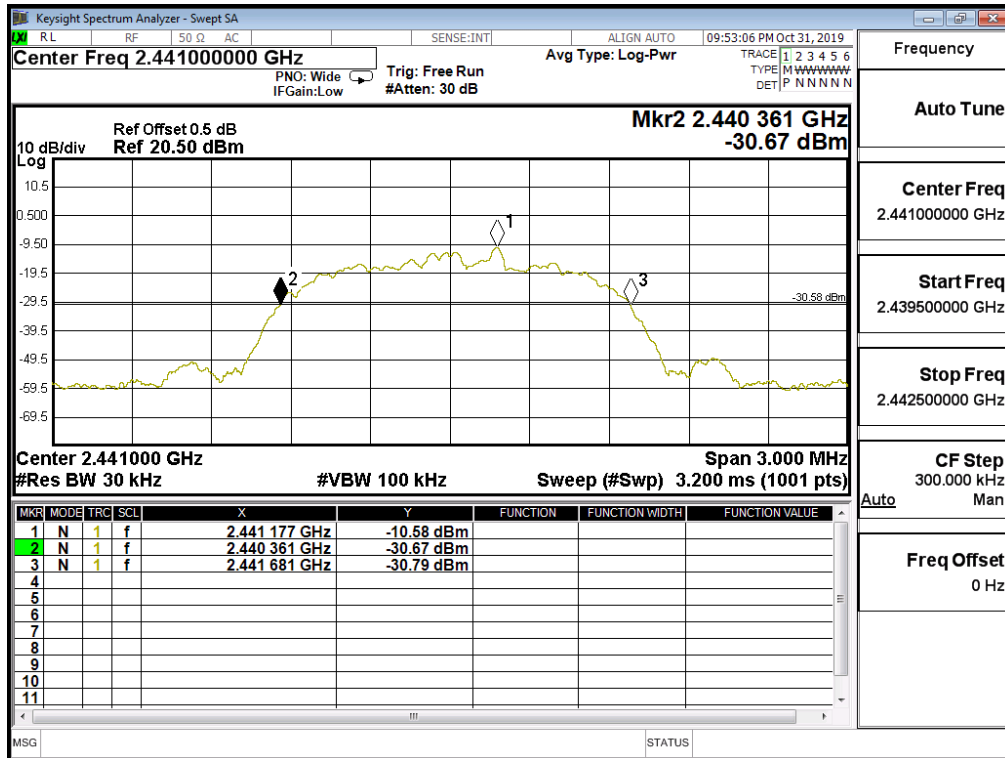
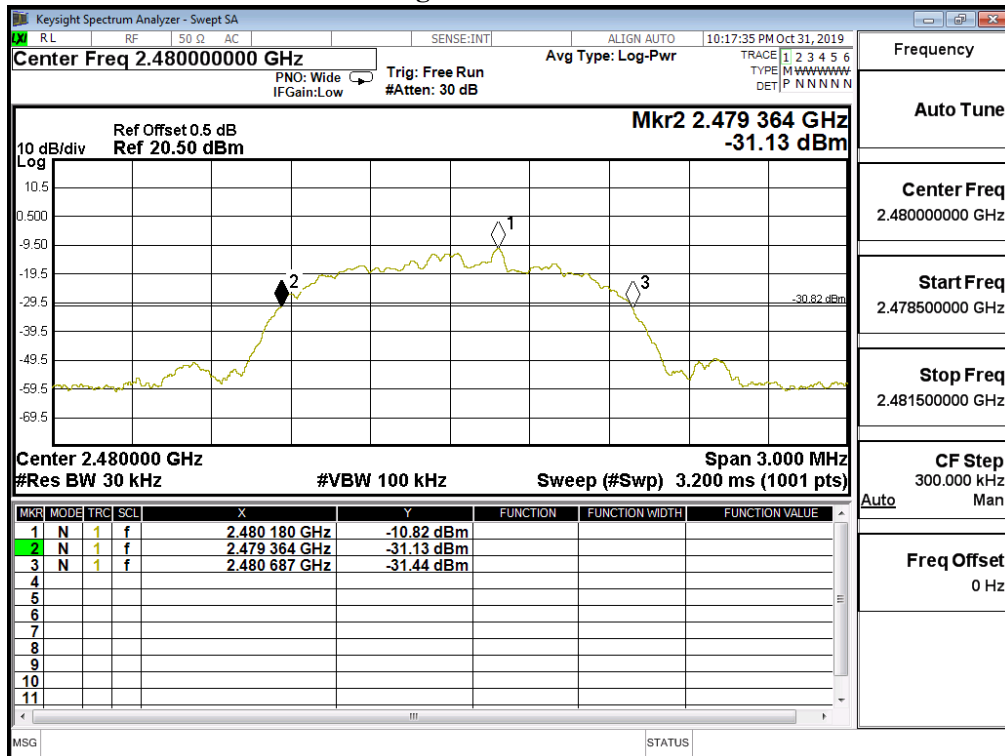
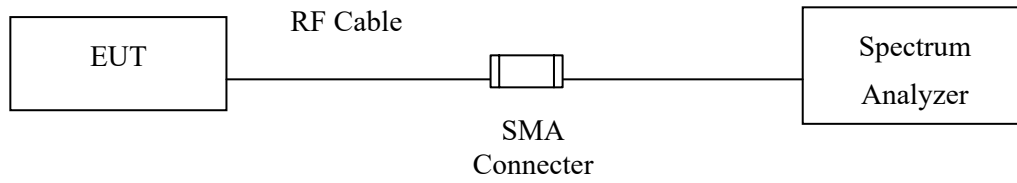


Figure Channel 78:



11. Duty Cycle

11.1. Test Setup

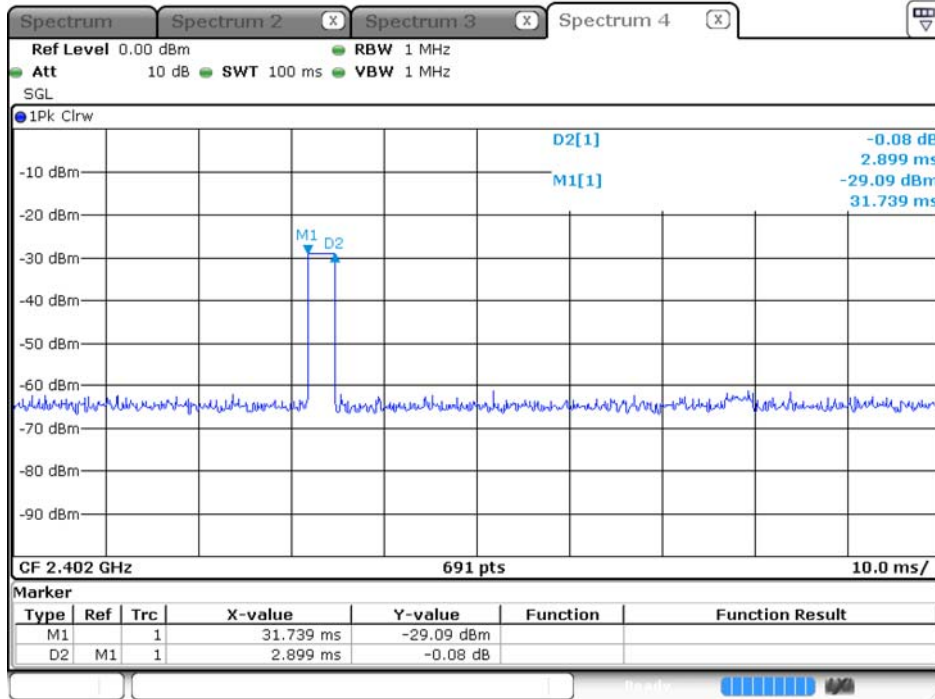


11.2. Uncertainty

$\pm 25\text{msec}$

11.3. Test Result of Duty Cycle

Product : 23.1 inches Bar type Digital Signage
 Test Item : Duty Cycle
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)



Date: 9.JAN.2007 03:28:48

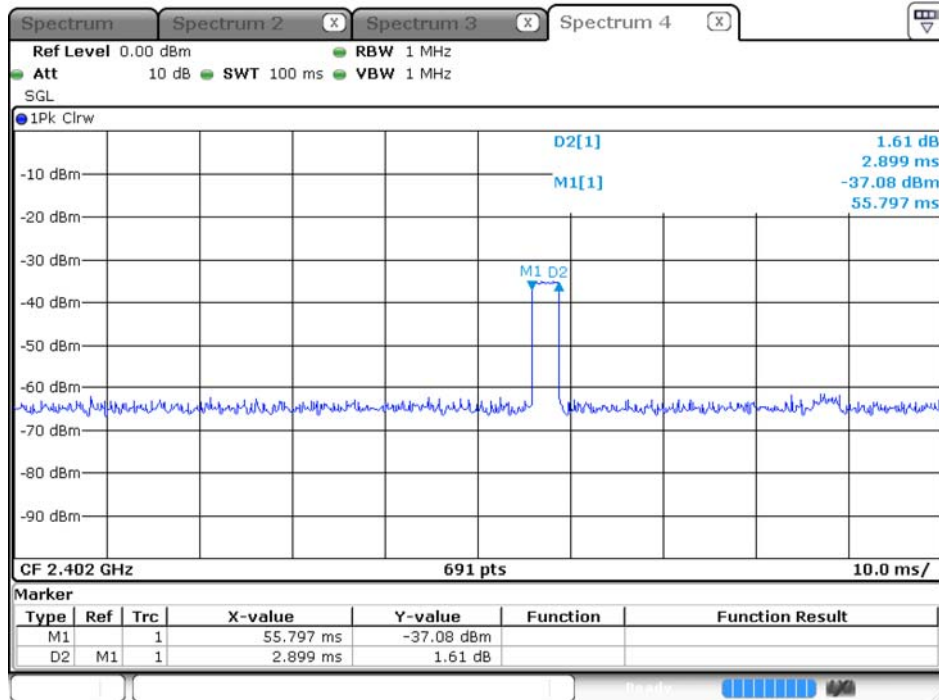
Time on of 100ms= 2.899ms

Duty Cycle= $\frac{2.899\text{ms}}{100\text{ms}} = 0.02899$

Duty Cycle correction factor= $20 \text{ LOG } 0.02899 = -30.755 \text{ dB}$

Duty Cycle correction factor	-30.755	dB
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Product : 23.1 inches Bar type Digital Signage
 Test Item : Duty Cycle
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)



Date: 9.JAN.2007 03:30:23

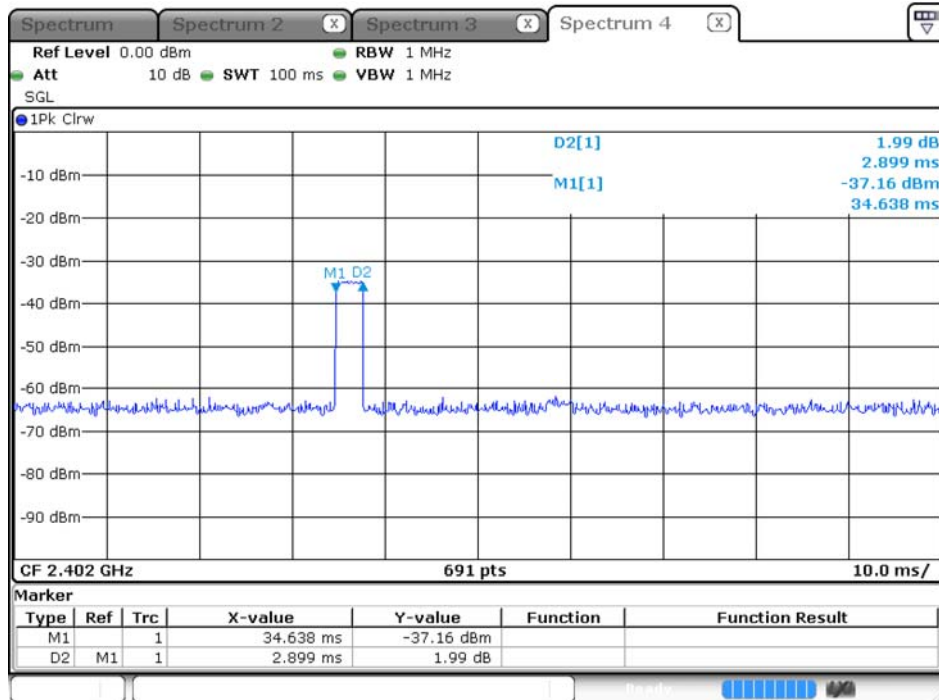
Time on of 100ms= 2.899ms

Duty Cycle= $2.899\text{ms} / 100\text{ms} = 0.02899$

Duty Cycle correction factor= $20 \text{ LOG } 0.02899 = -30.755 \text{ dB}$

Duty Cycle correction factor	-30.755	dB
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Product : 23.1 inches Bar type Digital Signage
 Test Item : Duty Cycle
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)



Date: 9.JAN.2007 03:27:34

Time on of 100ms= 2.899ms

Duty Cycle= $2.899\text{ms} / 100\text{ms} = 0.02899$

Duty Cycle correction factor= $20 \text{ LOG } 0.02899 = -30.755 \text{ dB}$

Duty Cycle correction factor	-30.755	dB
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12. EMI Reduction Method During Compliance Testing

No modification was made during testing.