

FCC RADIO TEST REPORT

FCC ID: NOI-SB1T14

Product : 13.3inch Digital Signage

Trade Mark : NETRONIX, Pioneer

Model Name : SB1T14-B

Family Model : EM133-B, SB1T14-X, EM133-X

Report No. : N26033000305E

Prepared for

NETRONIX, INC.

No. 945, Boai St., Jubei City, Hsinchu, Taiwan, 30265 R.O.C.

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name: NETRONIX, INC.

Address: No. 945, Boai St., Jubei City, Hsinchu, Taiwan, 30265 R.O.C.

Manufacturer's Name.....: NETRONIX, INC.

Address: No. 945, Boai St., Jubei City, Hsinchu, Taiwan, 30265 R.O.C.

Factory(1): NETRONIX, INC.

Address: No. 945, Boai St., Jubei City, Hsinchu, Taiwan, 30265 R.O.C.

Factory(2): NTX Electronics YANGZHOU CO.,LTD.

Address: No.8, Wuzhou West Road, Economic and technological
Development Zone, Yangzhou, Jiangsu Province, PRC, 225009.

Product description

Product name.....: 13.3inch Digital Signage

Model and/or type reference : SB1T14-B

Family Model.....: EM133-B, SB1T14-X, EM133-X

Sample number : S2604010106-1#

Standards: FCC Part15.407

Test procedure ANSI C63.10-2020+Cor 1-2023 and KDB 789033 D02 General
UNII Test Procedures New Rules v02r01

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements/ the Industry Canada requirements.. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests Mar. 30, 2026 ~ May. 30, 2026

Date of Issue..... May. 30, 2026

Test Result..... **Pass**

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Revision History

Report No.	Version	Description	Issued Date
N26033000305E	Rev.01	Initial issue of report	May. 30, 2026

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.207	AC Power Line Conducted Emissions	PASS	
15.209(a), 15.407 (b)(1) 15.407 (b)(3)	Spurious Radiated Emissions	PASS	
15.407 (a)(1) 15.407 (a)(3)	26 dB and 99% Emission Bandwidth	PASS	
15.407(e)	Minimum 6 dB bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
15.407(b)(1) 15.407(b)(3)	Band Edge	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
15.407(g)	Frequency Stability Measurement	PASS	
15.407(h)	Dynamic Frequency Selection(DFS)	PASS	
15.203	Antenna Requirement	PASS	
15.407(c)	Automatically discontinue transmission	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 FACILITIES AND ACCREDITATIONS

FACILITIES

All measurement facilities used to collect the measurement data are located at No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

CNAS-Lab. : The Certificate Registration Number is L5516.

IC-Registration : The Certificate Registration Number is 9270A.
CAB identifier: CN0074

FCC- Accredited : Test Firm Registration Number: 463705.
Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01
This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Name of Firm : Shenzhen NTEK Testing Technology Co., Ltd.

Site Location : No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 2.80\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(30MHz~1GHz)	$\pm 2.64\text{dB}$
5	All emissions, radiated(1GHz~6GHz)	$\pm 2.40\text{dB}$
6	All emissions, radiated(> 6GHz)	$\pm 2.52\text{dB}$
7	Temperature	$\pm 0.5^\circ\text{C}$
8	Humidity	$\pm 2\%$
9	All emissions, radiated(9KHz~30MHz)	$\pm 6\text{dB}$
10	Occupied bandwidth	$\pm 4.7\%$
11	Duty cycle	$\pm 2.5\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	13.3inch Digital Signage	
Trade Mark	NETRONIX, Pioneer	
Model Name	SB1T14-B	
Family Model	EM133-B, SB1T14-X, EM133-X	
Model Difference	All models have the same circuit and RF module, except for model names, having batteries and no batteries (SB1T14-B has a battery, SB1T14-X does not have a battery. SB1T14-B differs from EM133-B in naming. SB1T14-X and EM133-X differ in naming).	
FCC ID	NOI-SB1T14	
Product Description	IEEE 802.11 WLAN Mode Supported	☒ 802.11a/n/ac/ax (20MHz channel bandwidth)
	Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps; 802.11n (20MHz): MCS0-15, up to 144Mbps 802.11ac/ax (20MHz): MCS0-8, up to 173.4Mbps
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac; OFDMA with BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM for 802.11ax
	Operating Frequency Range	☒ U-NII-1: 5150 MHz ~5250MHz ☒ U-NII-2C: 5470MHz~5725MHz
	Function:	☐ Outdoor AP ☐ Indoor AP ☐ Fixed P2P ☒ Client
	DFS type:	☐ master devices ☐ Slave devices with radar detection ☒ Slave devices without radar detection
	Support TPC	☐ YES ☒ NO
	Antenna Type	PCB Antenna
	Antenna Gain	5.56dBi
	Based on the application, features, or specification exhibited in User's Manual, More details of EUT technical specification, please refer to the User's Manual.	
Adapter	Model: FJ-GN127T30U Input: 100-240V~50/60Hz 1.0A Max Output: 5.0V---3.0A 15.0W OR 9.0V---3.0A 27.0W OR 12.0V---2.5A 30.0W OR 15.0V---2.0A 30.0W OR 20.0V---1.5A 30.0W MAX	
Battery	Battery1: DC 3.85V, 4900mAh, 18.8Wh Battery2: DC 3.85V, 5000mAh, 19.25Wh	
Power supply	DC 3.85V from battery or DC 5V/9V/12V/15V/20V from adapter	
Connecting I/O Port(s)	Please refer to the User's Manual	
HW Version	A3	
SW Version	N/A	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Frequency and Channel list:

Band	20MHz	
	Channel	Frequency
U-NII-1	36	5180 MHz
	40	5200 MHz
	44	5220 MHz
	48	5240 MHz
U-NII-2C	100	5500 MHz
	104	5520 MHz
	108	5540 MHz
	112	5560 MHz
	116	5580 MHz
	120	5600 MHz
	124	5620 MHz
	128	5640 MHz
	132	5660 MHz
	136	5680 MHz
	140	5700 MHz

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Normal Link Mode
Mode 2	802.11a/n/ac/ax CH36/ CH40/CH48/CH100/CH120/CH140

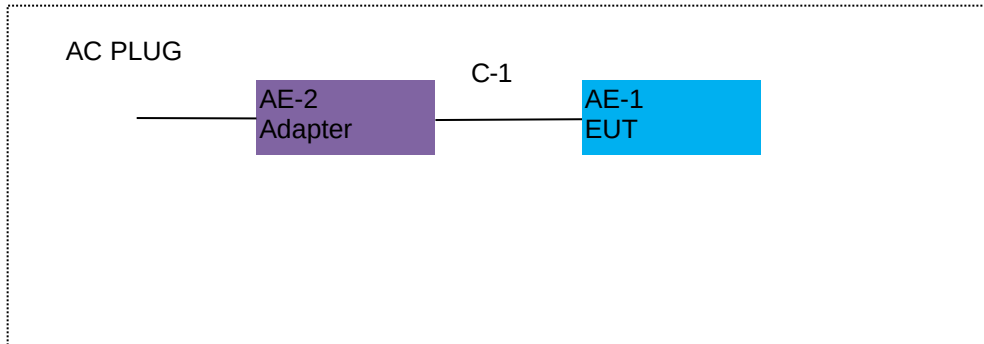
For Radiated Emission	
Final Test Mode	Description
Mode 1	Normal Link Mode
Mode 2	802.11a/n/ac/ax CH36/ CH40/CH48/CH100/CH120/CH140

Note:

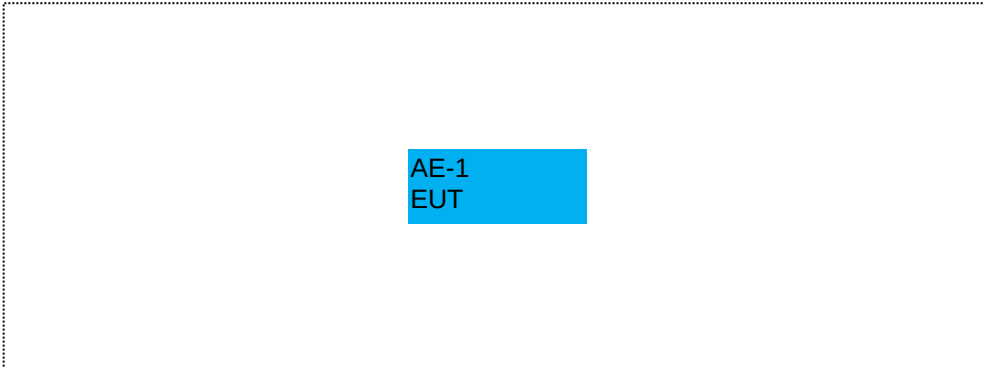
- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

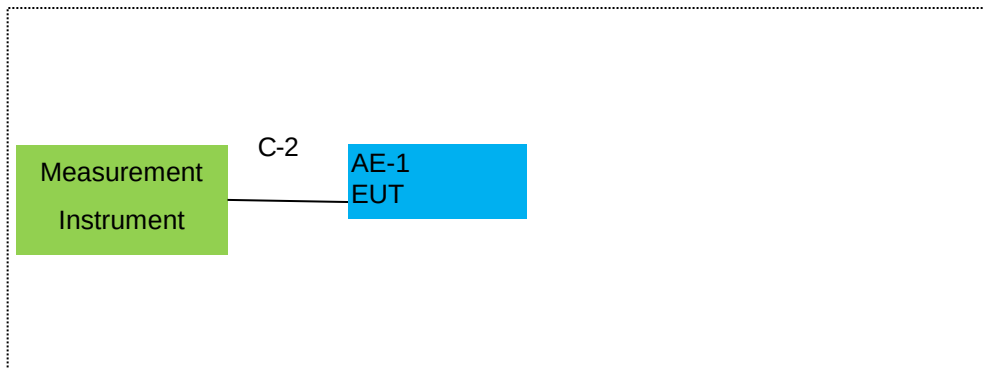
For AC Conducted Emission Mode



For Radiated Test Cases



For Conducted Test Cases



Note: 1. The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.
 2. EUT built-in battery-powered, the battery is fully-charged.

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	13.3inch Digital Signage	SB1T14-B	N/A	EUT
AE-2	Adapter	FJ-GN127T30U	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	USB Cable	YES	NO	1.0m
C-2	RF Cable	YES	NO	0.1m

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation& Conducted Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4440A	MY41000130	2025.04.24 2026.04.15	2026.04.23 2027.04.14	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2025.04.17 2026.04.08	2026.04.16 2027.04.07	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2025.04.17 2026.04.08	2026.04.16 2027.04.07	1 year
4	Test Receiver	R&S	ESPI7	101318	N/A	N/A	N/A
5	Bilog Antenna	TESEQ	CBL6111D	31216	N/A	N/A	N/A
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2024.05.12	2027.05.11	3 year
9	Amplifier	EMC	EMC051835SE	980246	2025.04.17 2026.04.08	2026.04.16 2027.04.07	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	055	2024.05.17	2027.05.16	3 year
11	Power Meter	DARE	RPR3006W	15I00041SN084	2025.04.17 2026.04.08	2026.04.16 2027.04.07	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2024.05.06	2027.05.05	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2024.05.06	2027.05.05	3 year
14	High Test Cable(1G-40GHz)	N/A	R-03	N/A	2024.05.06	2027.05.05	3 year
15	Filter	TRILTHIC	2400MHz	29	2024.04.26	2027.04.25	3 year
16	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note:

We will use the temporary antenna connector (soldered on the PCB board) When conducted test
And this temporary antenna connector is listed within the instrument list

AC Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2025.04.17 2026.04.08	2026.04.16 2027.04.07	1 year
2	LISN	R&S	ENV216	101313	2025.04.16 2026.04.08	2026.04.15 2027.04.07	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2025.04.16 2026.04.08	2026.04.15 2027.04.07	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2024.04.26	2027.04.25	3 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2024.05.06	2027.05.05	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2024.05.06	2027.05.05	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2024.05.06	2027.05.05	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& Aux Equipment which is scheduled for calibration every 3 years.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTest	MTS 8310 2.4GHz/5GHz	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

3. TEST REQUIREMENTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 APPLICABLE STANDARD

According to FCC Part 15.207(a)

3.1.2 CONFORMANCE LIMIT

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. *Decreases with the logarithm of the frequency
 2. The lower limit shall apply at the transition frequencies
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3.1.3 TEST CONFIGURATION

3.1.4 TEST PROCEDURE

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2020+Cor 1-2023 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.5 TEST RESULTS

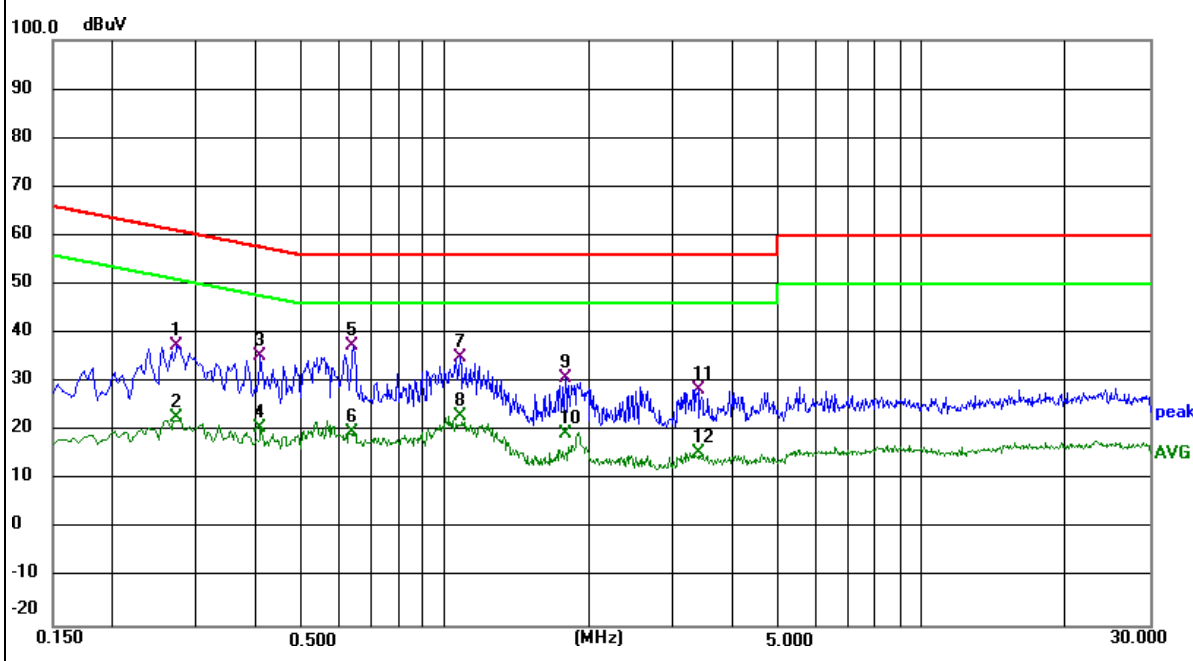
EUT :	13.3inch Digital Signage	Model Name :	SB1T14-B
Temperature :	23.8℃	Relative Humidity :	55.4%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 1 (5.2G)

Both the battery-powered and plug-in versions have completed evaluation; this report presents data solely for the battery-powered version, which represents the worst-case scenario.

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.2740	18.03	19.49	37.52	61.00	-23.48	QP
0.2740	3.21	19.49	22.70	51.00	-28.30	AVG
0.4097	15.87	19.50	35.37	57.65	-22.28	QP
0.4097	1.21	19.50	20.71	47.65	-26.94	AVG
0.6419	17.99	19.51	37.50	56.00	-18.50	QP
0.6419	0.13	19.51	19.64	46.00	-26.36	AVG
1.0740	15.61	19.52	35.13	56.00	-20.87	QP
1.0740	3.62	19.52	23.14	46.00	-22.86	AVG
1.7820	11.36	19.53	30.89	56.00	-25.11	QP
1.7820	-0.15	19.53	19.38	46.00	-26.62	AVG
3.3980	8.86	19.55	28.41	56.00	-27.59	QP
3.3980	-3.96	19.55	15.59	46.00	-30.41	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

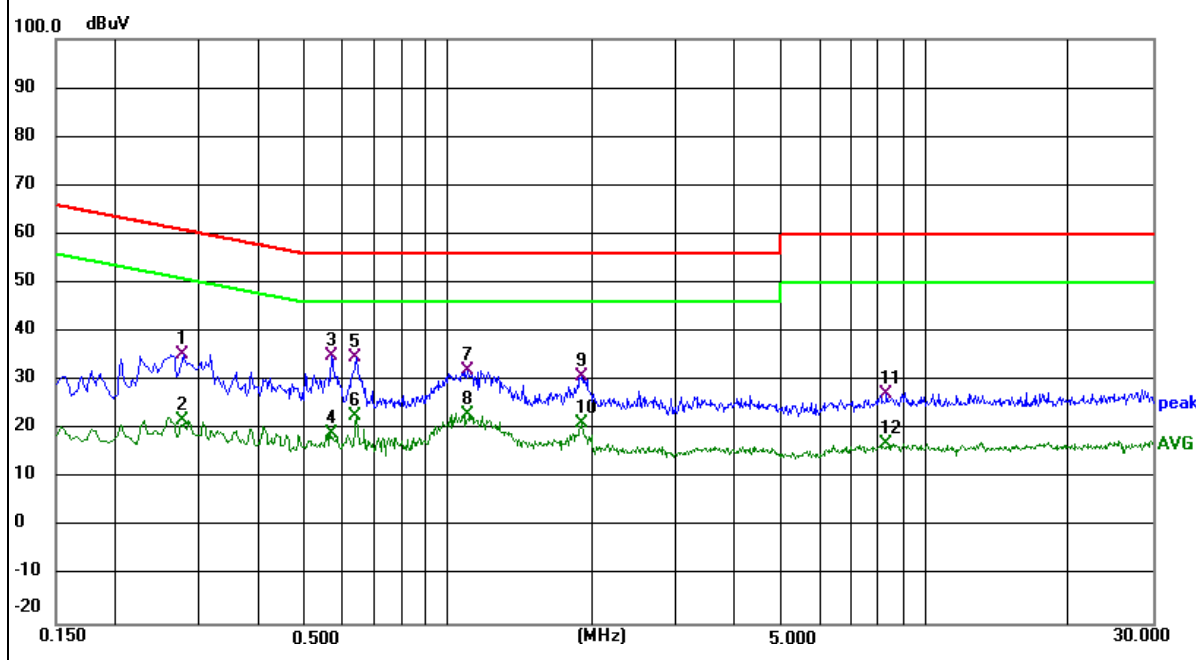


EUT :	13.3inch Digital Signage	Model Name :	SB1T14-B
Temperature :	23.8℃	Relative Humidity :	55.4%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 1 (5.2G)

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.2779	15.85	19.43	35.28	60.88	-25.60	QP
0.2779	2.32	19.43	21.75	50.88	-29.13	AVG
0.5695	15.46	19.53	34.99	56.00	-21.01	QP
0.5695	-0.48	19.53	19.05	46.00	-26.95	AVG
0.6419	15.06	19.56	34.62	56.00	-21.38	QP
0.6419	3.18	19.56	22.74	46.00	-23.26	AVG
1.0940	12.51	19.52	32.03	56.00	-23.97	QP
1.0940	3.46	19.52	22.98	46.00	-23.02	AVG
1.8976	11.45	19.49	30.94	56.00	-25.06	QP
1.8976	1.62	19.49	21.11	46.00	-24.89	AVG
8.2980	7.56	19.62	27.18	60.00	-32.82	QP
8.2980	-2.53	19.62	17.09	50.00	-32.91	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

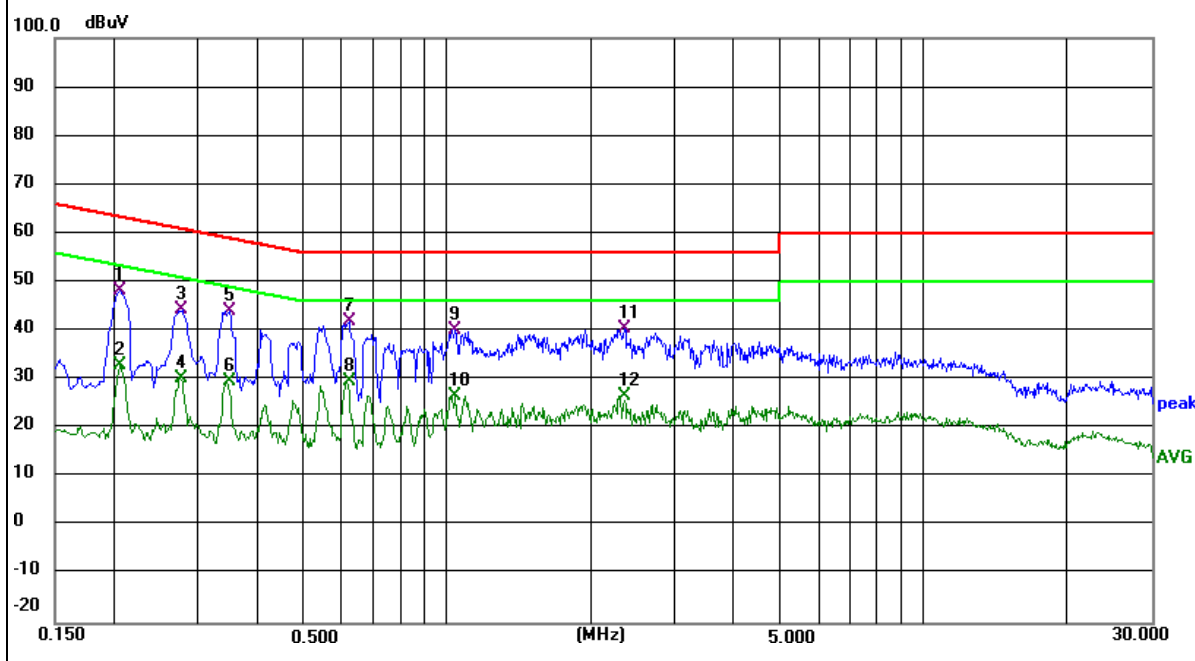


EUT :	13.3inch Digital Signage	Model Name :	SB1T14-B
Temperature :	23.8℃	Relative Humidity :	55.4%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 1 (5.6G)

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.2060	28.78	19.49	48.27	63.37	-15.10	QP
0.2060	13.44	19.49	32.93	53.37	-20.44	AVG
0.2779	24.77	19.49	44.26	60.88	-16.62	QP
0.2779	10.71	19.49	30.20	50.88	-20.68	AVG
0.3500	24.64	19.49	44.13	58.96	-14.83	QP
0.3500	10.15	19.49	29.64	48.96	-19.32	AVG
0.6220	22.43	19.51	41.94	56.00	-14.06	QP
0.6220	10.05	19.51	29.56	46.00	-16.44	AVG
1.0380	20.76	19.52	40.28	56.00	-15.72	QP
1.0380	7.16	19.52	26.68	46.00	-19.32	AVG
2.3540	20.89	19.54	40.43	56.00	-15.57	QP
2.3540	7.03	19.54	26.57	46.00	-19.43	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

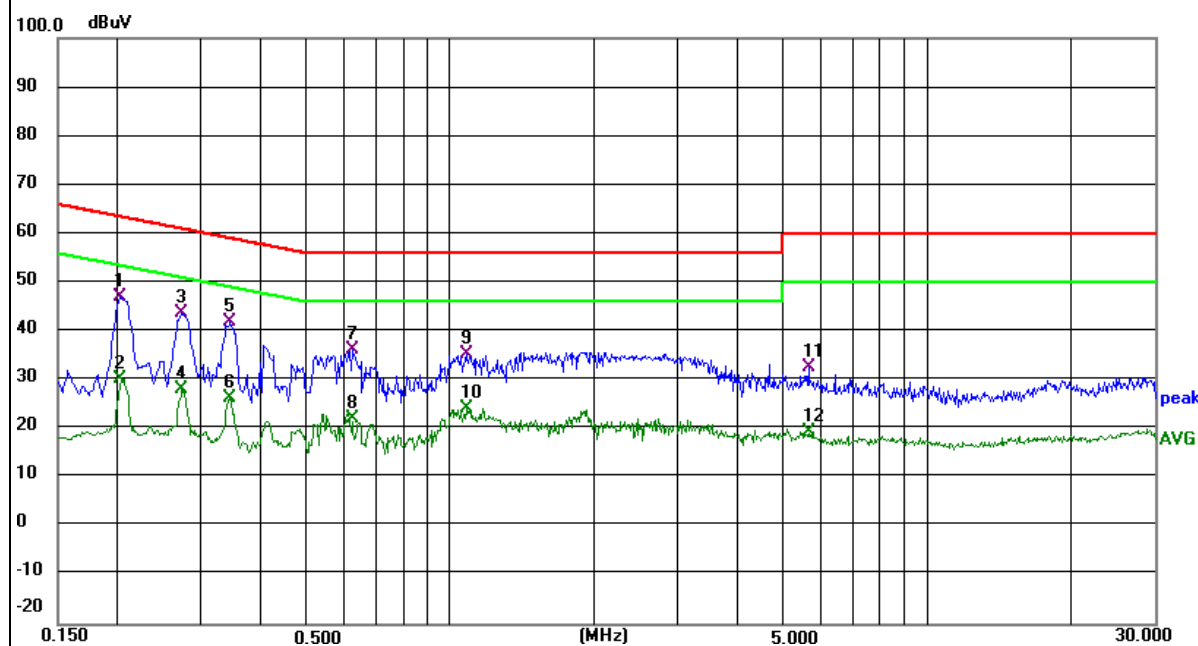


EUT :	13.3inch Digital Signage	Model Name :	SB1T14-B
Temperature :	23.8℃	Relative Humidity :	55.4%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 1 (5.6G)

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.2020	27.75	19.40	47.15	63.53	-16.38	QP
0.2020	10.81	19.40	30.21	53.53	-23.32	AVG
0.2740	24.20	19.43	43.63	61.00	-17.37	QP
0.2740	8.60	19.43	28.03	51.00	-22.97	AVG
0.3460	22.60	19.48	42.08	59.06	-16.98	QP
0.3460	6.95	19.48	26.43	49.06	-22.63	AVG
0.6220	16.80	19.55	36.35	56.00	-19.65	QP
0.6220	2.49	19.55	22.04	46.00	-23.96	AVG
1.0820	15.68	19.52	35.20	56.00	-20.80	QP
1.0820	4.64	19.52	24.16	46.00	-21.84	AVG
5.6460	13.13	19.58	32.71	60.00	-27.29	QP
5.6460	-0.01	19.58	19.57	50.00	-30.43	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(b) and 15.209

3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Remark :1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. For Frequency 9kHz~30MHz:

Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

For Frequency above 30MHz:

Distance extrapolation factor =20log(Specific distance/ test distance)(dB);

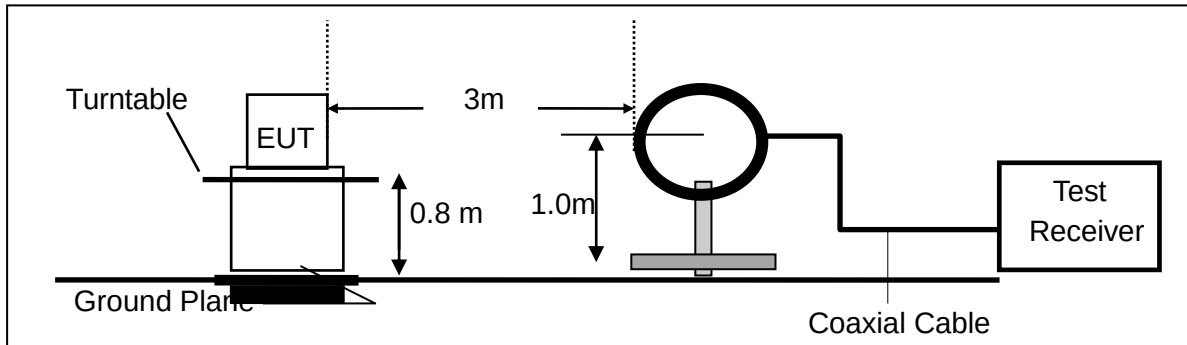
Limit line=Specific limits(dBuV) + distance extrapolation factor.

3.2.3 MEASURING INSTRUMENTS

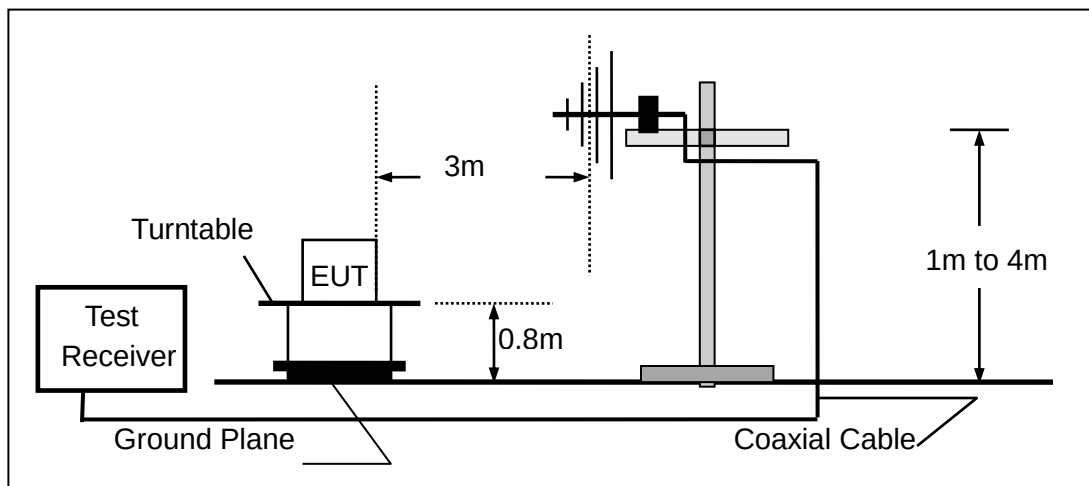
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

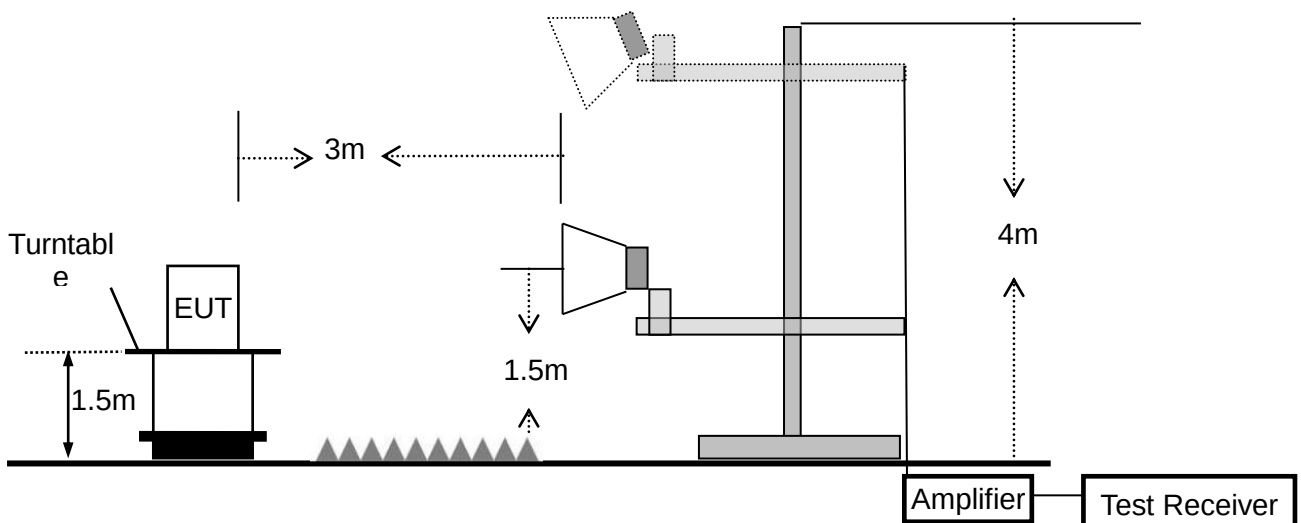
(a) For radiated emissions below 30MHz



(b) For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



3.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2020+Cor 1-2023. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2020+Cor 1-2023 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.

Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 1MHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	1 MHz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW [kHz]})$. , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

3.2.6 TEST RESULTS (9KHz – 30 MHz)

EUT:	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.2.7 TEST RESULTS (30MHz – 1GHz)

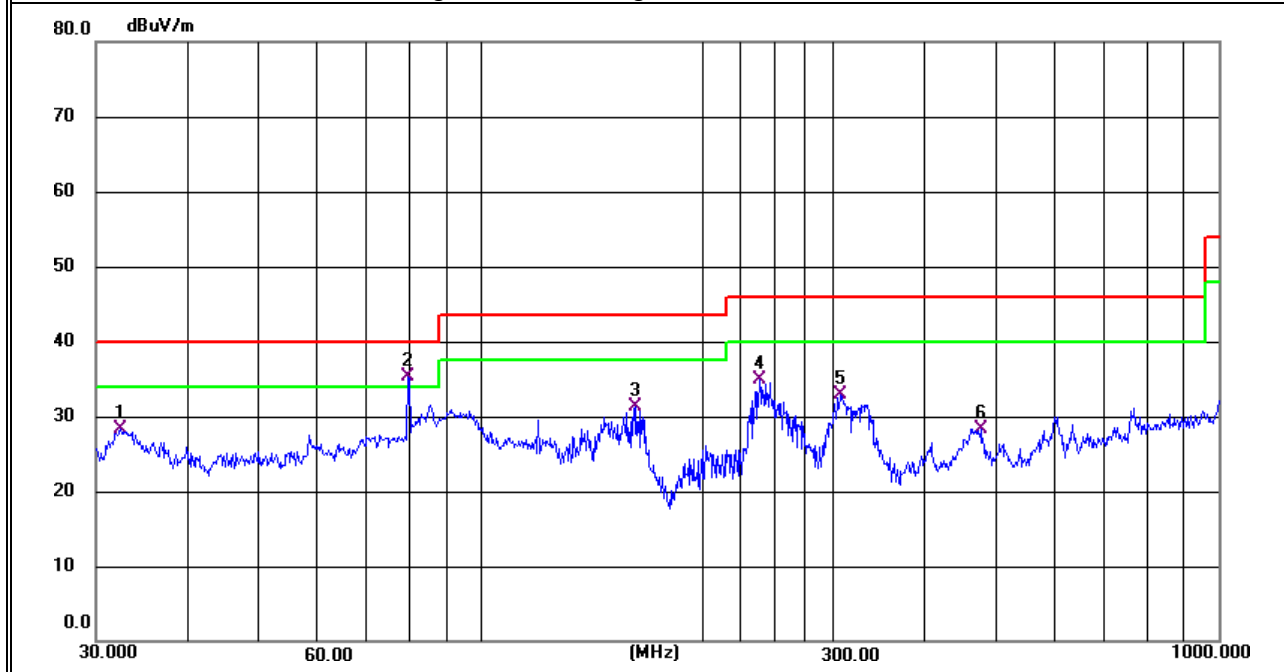
EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	24℃	Relative Humidity :	56.3%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX(5.2G WIFI)		

Both the battery-powered and plug-in versions have completed evaluation; this report presents data solely for the battery-powered version, which represents the worst-case scenario.

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	32.4060	11.69	16.65	28.34	40.00	-11.66	QP
V	79.5210	21.41	13.94	35.35	40.00	-4.65	QP
V	162.0413	16.39	14.97	31.36	43.50	-12.14	QP
V	238.3101	16.26	18.66	34.92	46.00	-11.08	QP
V	306.7536	12.75	20.20	32.95	46.00	-13.05	QP
V	475.4990	4.30	24.04	28.34	46.00	-17.66	QP

Remark:

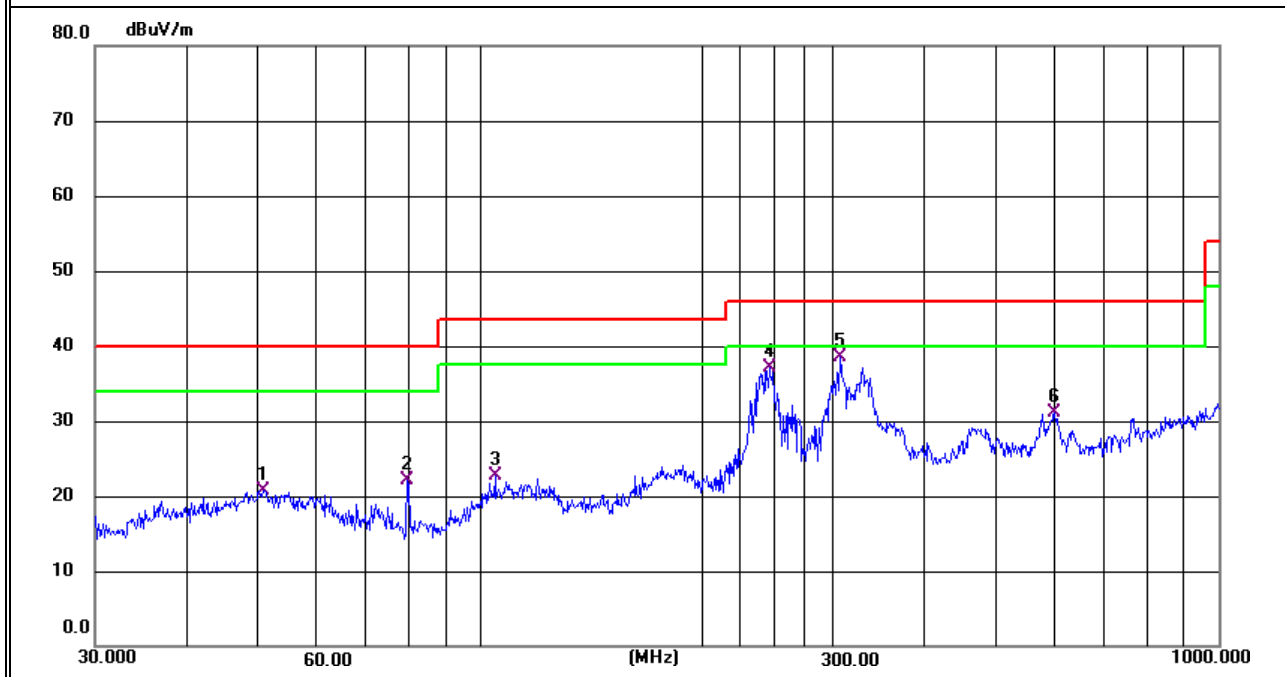
Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	50.7635	0.61	20.13	20.74	40.00	-19.26	QP
H	79.5210	8.20	13.94	22.14	40.00	-17.86	QP
H	104.5360	4.38	18.25	22.63	43.50	-20.87	QP
H	245.9510	18.54	18.63	37.17	46.00	-8.83	QP
H	306.7536	18.32	20.20	38.52	46.00	-7.48	QP
H	599.3211	5.66	25.37	31.03	46.00	-14.97	QP

Remark:

Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



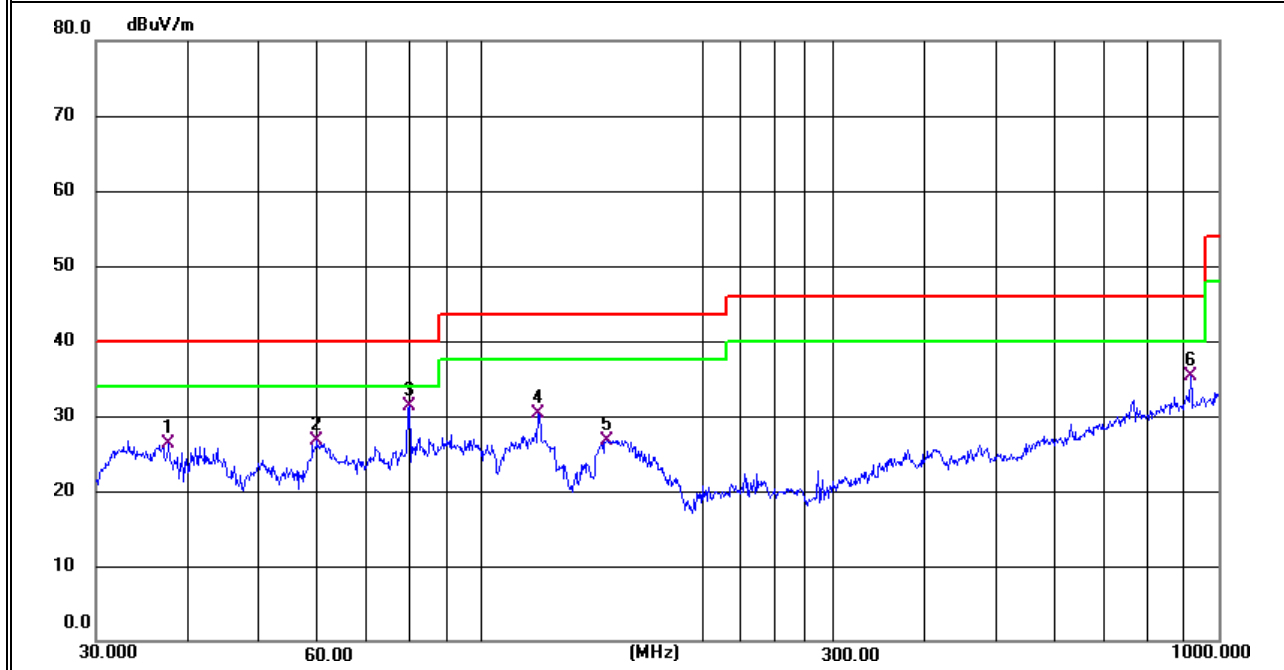
Note (1) All modes have been tested, just the worst mode has been recorded in the report.
 (2) Other emissions are attenuated more than 20dB below the permissible limits, so it does not recorded in the report.

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	24℃	Relative Humidity :	56.3%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX(5.6G WIFI)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	37.6796	7.97	18.41	26.38	40.00	-13.62	QP
V	59.8588	7.55	19.24	26.79	40.00	-13.21	QP
V	79.8002	17.33	13.91	31.24	40.00	-8.76	QP
V	119.4360	14.35	15.89	30.24	43.50	-13.26	QP
V	147.9214	12.73	14.06	26.79	43.50	-16.71	QP
V	916.0684	5.48	29.76	35.24	46.00	-10.76	QP

Remark:

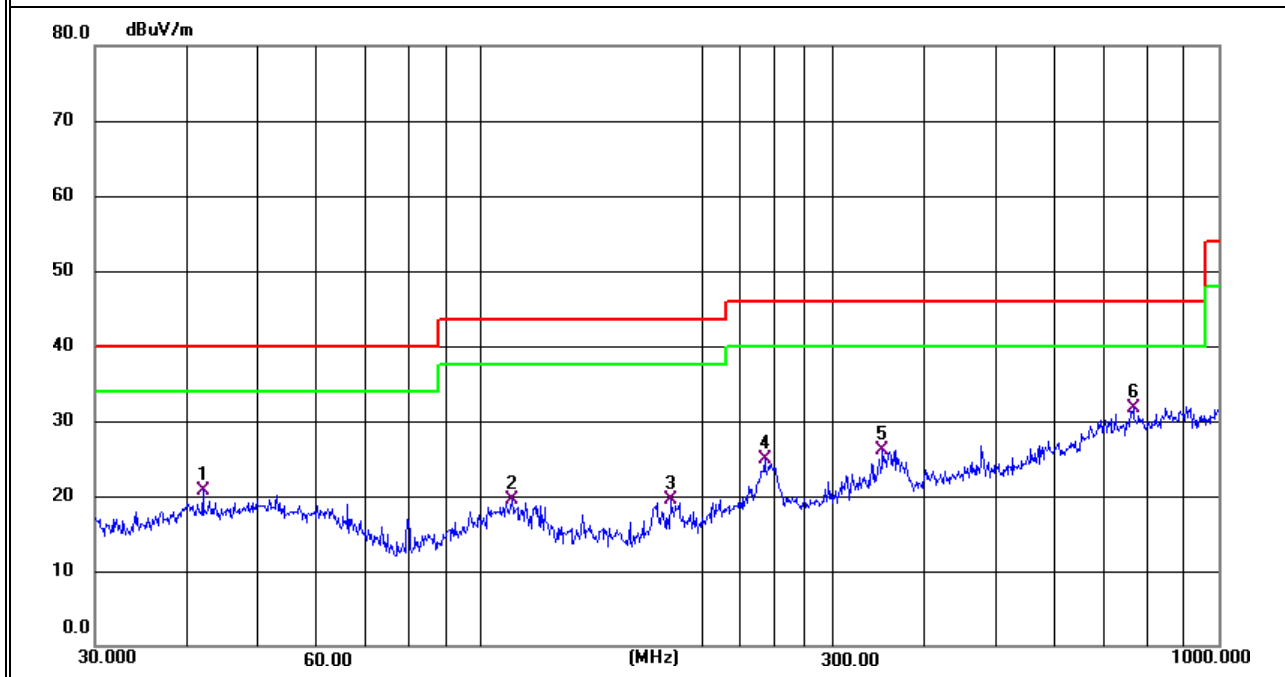
Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	42.0065	1.64	19.16	20.80	40.00	-19.20	QP
H	110.1816	1.44	17.98	19.42	43.50	-24.08	QP
H	180.6486	3.46	16.01	19.47	43.50	-24.03	QP
H	242.5252	6.14	18.67	24.81	46.00	-21.19	QP
H	350.4766	4.72	21.39	26.11	46.00	-19.89	QP
H	766.0570	3.36	28.39	31.75	46.00	-14.25	QP

Remark:

Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit



Note (1) All modes have been tested, just the worst mode has been recorded in the report.

(2) Other emissions are attenuated more than 20dB below the permissible limits, so it does not recorded in the report.

3.2.8 TEST RESULTS (1GHz-18GHz)

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX(5.2G) - 802.11n20_5180~5240MHz		

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G							
Vertical	3694.10	50.45	-9.41	41.04	74.00	-32.96	Pk
Vertical	3694.10	39.94	-9.41	30.53	54.00	-23.47	AV
Vertical	10360.15	50.98	1.27	52.25	68.20	-15.95	Pk
Vertical	15540.22	49.83	5.01	54.84	74.00	-19.16	Pk
Vertical	15540.22	39.52	5.01	44.53	54.00	-9.47	AV
Horizontal	3713.00	49.66	-9.17	40.49	74.00	-33.51	Pk
Horizontal	3713.00	39.65	-9.17	30.48	54.00	-23.52	AV
Horizontal	10360.47	49.13	1.27	50.40	68.20	-17.80	Pk
Horizontal	15540.38	49.84	5.01	54.85	74.00	-19.15	Pk
Horizontal	15540.38	40.36	5.01	45.37	54.00	-8.63	AV
middle Channel (5200 MHz)-Above 1G							
Vertical	3624.13	49.96	-9.60	40.36	74.00	-33.64	Pk
Vertical	3624.13	40.61	-9.60	31.01	54.00	-22.99	AV
Vertical	10400.09	50.33	1.16	51.49	68.20	-16.71	Pk
Vertical	15600.15	49.98	5.21	55.19	74.00	-18.81	Pk
Vertical	15600.15	39.33	5.21	44.54	54.00	-9.46	AV
Horizontal	4202.14	49.02	-7.92	41.10	74.00	-32.90	Pk
Horizontal	4202.14	40.06	-7.92	32.14	54.00	-21.86	AV
Horizontal	10400.14	49.16	1.16	50.32	68.20	-17.88	Pk
Horizontal	15600.51	50.26	5.21	55.47	74.00	-18.53	Pk
Horizontal	15600.51	40.84	5.21	46.05	54.00	-7.95	AV
High Channel (5240 MHz)-Above 1G							
Vertical	4597.70	49.24	-8.05	41.19	74.00	-32.81	Pk
Vertical	4597.70	39.08	-8.05	31.03	54.00	-22.97	AV
Vertical	10480.23	49.91	1.66	51.57	68.20	-16.63	Pk
Vertical	15720.15	50.87	4.47	55.34	74.00	-18.66	Pk
Vertical	15720.15	40.98	4.47	45.45	54.00	-8.55	AV
Horizontal	4589.26	50.95	-7.98	42.97	74.00	-31.03	Pk
Horizontal	4589.26	40.82	-7.98	32.84	54.00	-21.16	AV
Horizontal	10480.59	50.37	1.66	52.03	68.20	-16.17	Pk
Horizontal	15720.18	49.76	4.47	54.23	74.00	-19.77	Pk
Horizontal	15720.18	39.16	4.47	43.63	54.00	-10.37	AV

Note:"802.11n20" mode is the worst mode.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported. Emission level=Read Level+ Factor I.

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX (5.6G) - 802.11a_5500~5700MHz		

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5500 MHz)-Above 1G							
Vertical	5433.02	49.27	-6.26	43.01	74.00	-30.99	Pk
Vertical	5433.02	39.67	-6.26	33.41	54.00	-20.59	AV
Vertical	11000.25	50.25	3.63	53.88	74.00	-20.12	Pk
Vertical	11000.25	40.44	3.63	44.07	54.00	-9.93	AV
Vertical	16500.41	50.32	6.24	56.56	68.20	-11.64	Pk
Horizontal	5126.47	49.51	-6.32	43.19	74.00	-30.81	Pk
Horizontal	5126.47	40.88	-6.32	34.56	54.00	-19.44	AV
Horizontal	11000.32	49.65	3.63	53.28	74.00	-20.72	Pk
Horizontal	11000.32	39.78	3.63	43.41	54.00	-10.59	AV
Horizontal	16500.47	46.25	6.24	52.49	68.20	-15.71	Pk
middle Channel (5600 MHz)-Above 1G							
Vertical	4933.25	50.98	-6.48	44.50	74.00	-29.50	Pk
Vertical	4933.25	40.88	-6.48	34.40	54.00	-19.60	AV
Vertical	11200.58	50.81	2.58	53.39	74.00	-20.61	Pk
Vertical	11200.58	39.90	2.58	42.48	54.00	-11.52	AV
Vertical	16800.45	50.20	6.18	56.38	68.20	-11.82	Pk
Horizontal	4766.32	50.19	-7.30	42.89	74.00	-31.11	Pk
Horizontal	4766.32	40.95	-7.30	33.65	54.00	-20.35	AV
Horizontal	11200.45	49.69	2.58	52.27	74.00	-21.73	Pk
Horizontal	11200.45	39.68	2.58	42.26	54.00	-11.74	AV
Horizontal	16800.33	48.26	6.18	54.44	68.20	-13.76	Pk
High Channel (5825 MHz)-Above 1G							
Vertical	5647.33	50.29	-5.69	44.60	68.20	-23.60	Pk
Vertical	11400.29	49.10	3.53	52.63	74.00	-21.37	Pk
Vertical	11400.29	40.50	3.53	44.03	54.00	-9.97	AV
Vertical	17100.54	50.87	6.27	57.14	68.20	-11.06	Pk
Horizontal	5433.26	50.37	-6.26	44.11	74.00	-29.89	Pk
Horizontal	5433.26	39.51	-6.26	33.25	54.00	-20.75	AV
Horizontal	11400.43	49.05	3.53	52.58	74.00	-21.42	Pk
Horizontal	11400.43	40.39	3.53	43.92	54.00	-10.08	AV
Horizontal	17100.58	50.66	6.27	56.93	68.20	-11.27	Pk

Note:"802.11a" mode is the worst mode.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

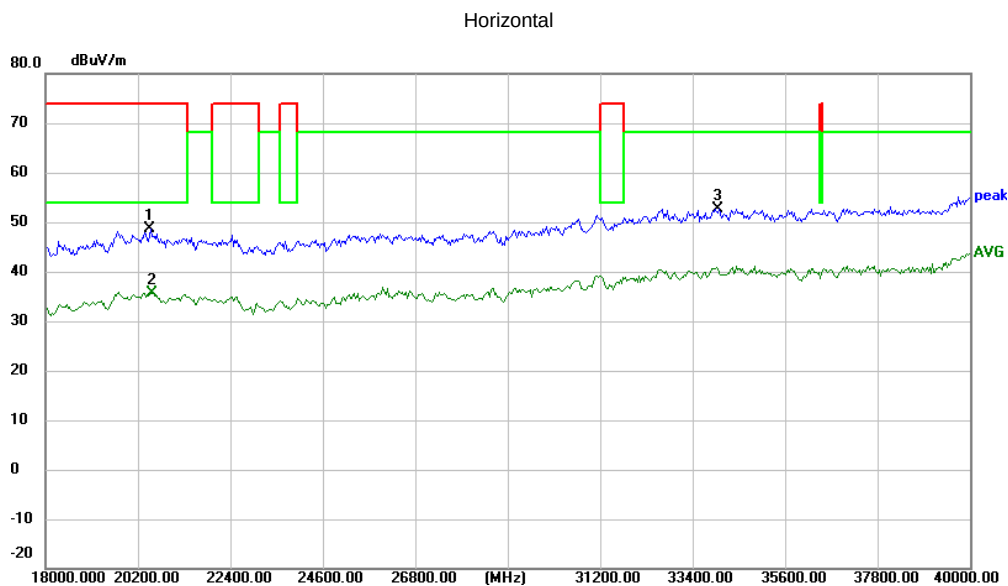
Emission level=Read Level+ Factor

3.2.9 TEST RESULTS (18GHz-40GHz)

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	24.3 °C	Relative Humidity :	57%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX (5.2G)-802.11n20 5180MHz~5240MHz, TX (5.6G)-802.11a 5500MHz~5700MHz		

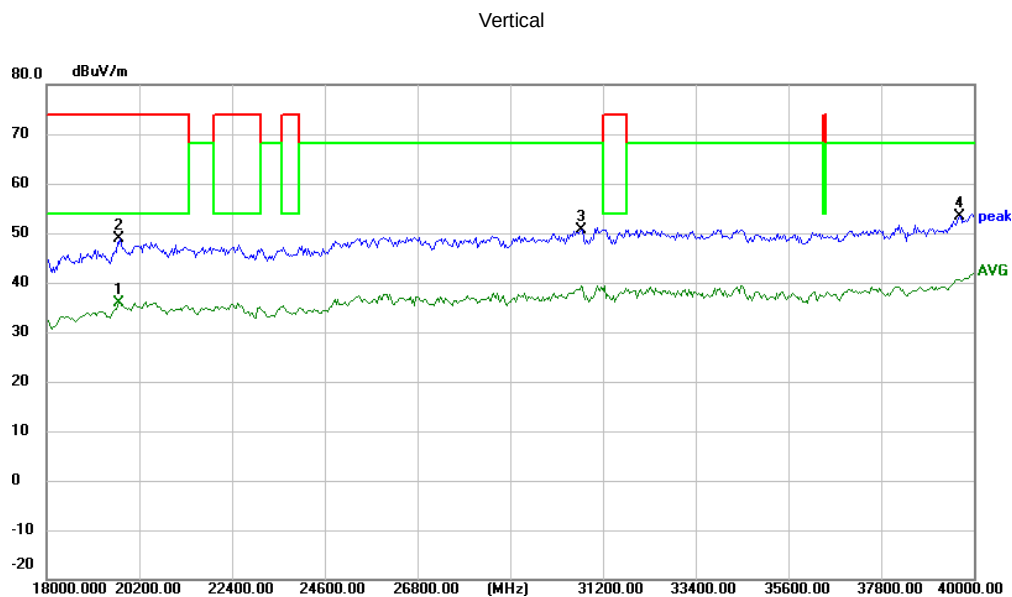
All the modulation modes have been tested, and the worst result was report as below:

Low Channel (5180 MHz)-Above 1G



Measurement Result:

	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	20518.840	60.76	-12.15	48.61	74.00	-25.39	peak
2	20582.608	47.87	-12.14	35.73	54.00	-18.27	AVG
3	34037.681	57.46	-4.92	52.54	68.20	-15.66	peak

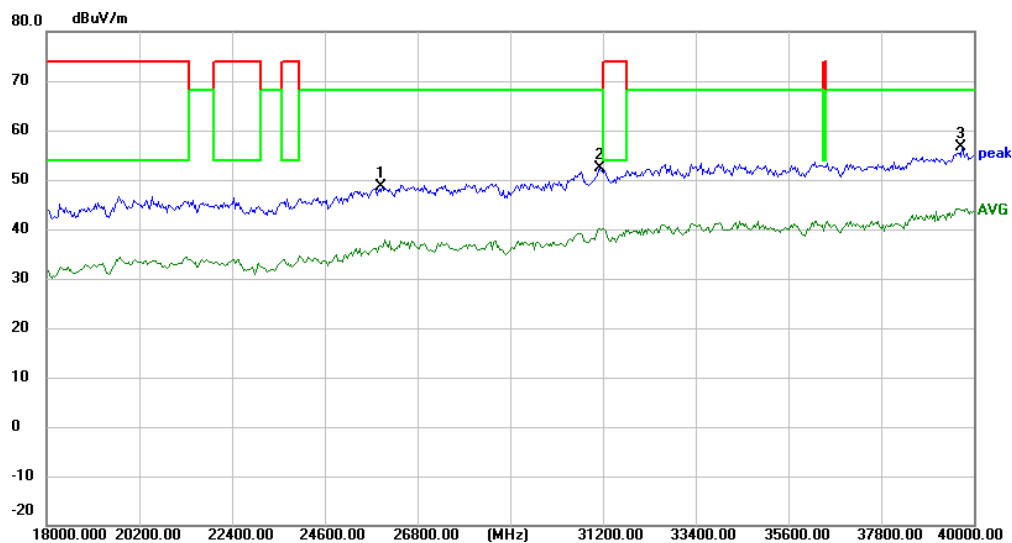


Measurement Result:

	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	19721.739	48.95	-12.96	35.99	54.00	-18.01	AVG
2	19753.623	61.72	-12.89	48.83	74.00	-25.17	peak
3	30689.855	58.63	-7.90	50.73	68.20	-17.47	peak
4	39681.159	57.01	-3.67	53.34	68.20	-14.86	peak

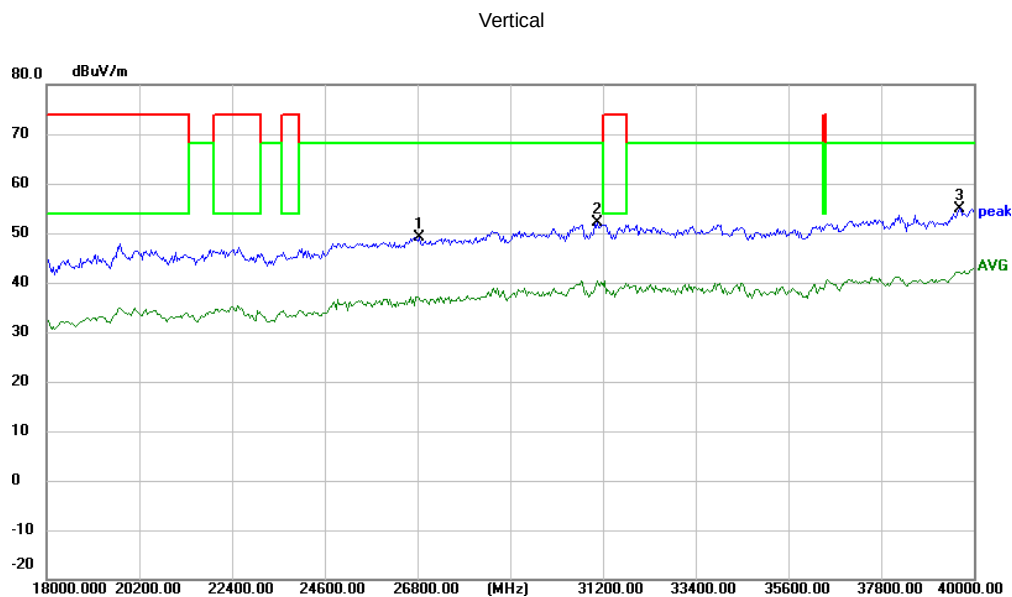
High Channel (5500 MHz)-Above 1G

Horizontal



Measurement Result:

	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	25971.014	57.89	-9.35	48.54	68.20	-19.66	peak
2	31136.232	59.80	-7.30	52.50	68.20	-15.70	peak
3	39713.043	60.26	-3.65	56.61	68.20	-11.59	peak



Measurement Result:

	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	26831.884	58.13	-9.02	49.11	68.20	-19.09	peak
2	31072.464	59.55	-7.50	52.05	68.20	-16.15	peak
3	39681.159	58.51	-3.67	54.84	68.20	-13.36	peak

3.2.10 Spurious Emission in Restricted Band 4.5GHz~5.150 GHz& 5.350GHz~5460GHz

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX (5.2G)-802.11n20 5150MHz~5250MHz,		

All the modulation modes have been tested, The report just record the worst data mode.

Frequency	Meter Reading	Preamp Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
Low Channel (5180 MHz)							
4500	50.37	-7.74	42.63	74	-31.37	Pk	Horizontal
4500	36.27	-7.74	28.53	54	-25.47	AV	Horizontal
4500	48.22	-7.74	40.48	74	-33.52	Pk	Vertical
4500	33.93	-7.74	26.19	54	-27.81	AV	Vertical
5150	57.77	0.1	57.87	74	-16.13	Pk	Horizontal
5150	44.25	0.1	44.35	54	-9.65	AV	Horizontal
5150	57.15	0.1	57.25	74	-16.75	Pk	Vertical
5150	44.41	0.1	44.51	54	-9.49	AV	Vertical
High Channel (5240 MHz)							
5350	53.65	-0.79	52.86	74	-21.14	Pk	Vertical
5350	42.41	-0.79	41.62	54	-12.38	AV	Vertical
5350	52.44	-0.79	51.65	74	-22.35	Pk	Horizontal
5350	42.69	-0.79	41.90	54	-12.10	AV	Horizontal

Note: (1) Emission Level= Read Level+ Factor

(2) "802.11n20 " mode is the worst mode. When PK value is lower than the Average value limit, average don't record.

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX (5.6G)-802.11a 5500MHz~5700MHz,		

All the modulation modes have been tested, The report just record the worst data mode.

Frequency	Meter Reading	Preamp Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
Low Channel (5500 MHz)							
5460	53.63	0.06	53.69	74	-20.31	Pk	Vertical
5460	42.18	0.06	42.24	54	-11.76	AV	Vertical
5460	53.47	0.06	53.53	74	-20.47	Pk	Horizontal
5460	42.09	0.06	42.15	54	-11.85	AV	Horizontal

Note: (1) Emission Level= Read Level+ Factor

(2) "802.11a " mode is the worst mode. When PK value is lower than the Average value limit, average don't record.

3.3 POWER SPECTRAL DENSITY TEST

3.3.1 Applied procedures / limit

According to FCC §15.407(a)(3)

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

(3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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3.3.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

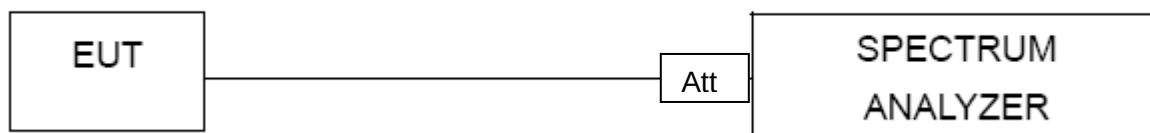
- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ KHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHz}$ is available on nearly all spectrum analyzers.

3.3.3 DEVIATION FROM STANDARD

No deviation.

3.3.4 TEST SETUP



3.3.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.6 TEST RESULTS

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX Frequency Band I (5150-5250MHz), Band 2C, (5470-5725MHz)		

Test data reference attachment.

3.4 26DB & 99% EMISSION BANDWIDTH

3.4.1 Applied procedures / limit

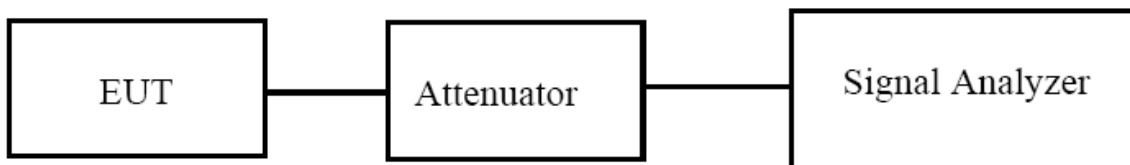
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

3.4.2 TEST PROCEDURE

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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

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



3.4.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.4 TEST RESULTS

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX Frequency Band I (5150-5250MHz), Band 2C, (5470-5725MHz)		

Test data reference attachment.

3.5 MINIMUM 6 DB BANDWIDTH

3.5.1 Applied procedures / limit

According to FCC §15.407(e)

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.5.2 TEST PROCEDURE

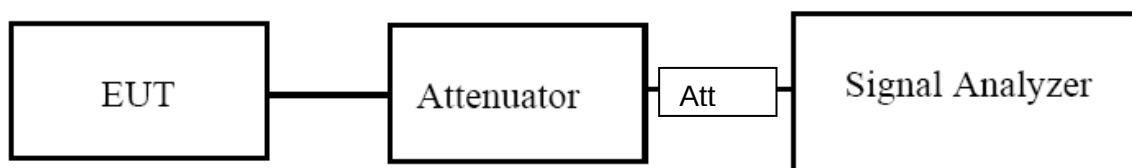
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.5.3 DEVIATION FROM STANDARD

No deviation.

3.5.4 TEST SETUP



3.5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.5.6 TEST RESULTS

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	N/A
Test Mode :	N/A		

Note: Not Applicable.

3.6 MAXIMUM CONDUCTED OUTPUT POWER

3.6.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5470~5725	250 mW or 11 dBm + 10 log B Note: The limit is the smaller of the two, "B" represents -26dB bandwidth.

3.6.2 TEST PROCEDURE

- Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.¹ However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

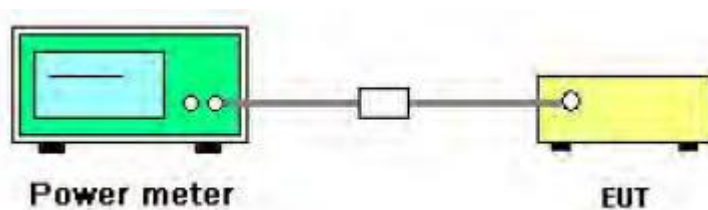
(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

3.6.3 DEVIATION FROM STANDARD

No deviation.

3.6.4 TEST SETUP



3.6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.6.6 TEST RESULTS

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX (5G) Mode Frequency Band I (5150-5250MHz), Band 2C (5470-5725MHz)		

Test data reference attachment.

3.7 OUT OF BAND EMISSIONS

3.7.1 Applicable Standard

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

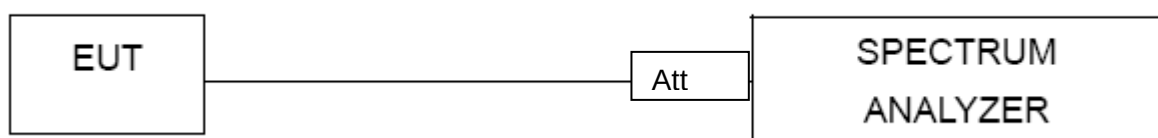
3.7.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

3.7.3 DEVIATION FROM STANDARD

No deviation.

3.7.4 TEST SETUP



3.7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.7.6 TEST RESULTS

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX (5G) Mode Frequency Band I (5150-5250MHz), Band 2C (5470-5725MHz)		

Test data reference attachment.

3.8 SPURIOUS RF CONDUCTED EMISSIONS

3.8.1 Conformance Limit

According to FCC §15.407(b)(1) (2) (3) (4)

3.8.2 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

3.8.3 Test Setup

Please refer to Section 6.1 of this test report.

3.8.4 Test Procedure

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2020+Cor 1-2023 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBW= 300KHz to measure the peak field strength , and measure frequency range from 30MHz to 40GHz.

3.8.5 Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

Test data reference attachment.

3.9 FREQUENCY STABILITY MEASUREMENT

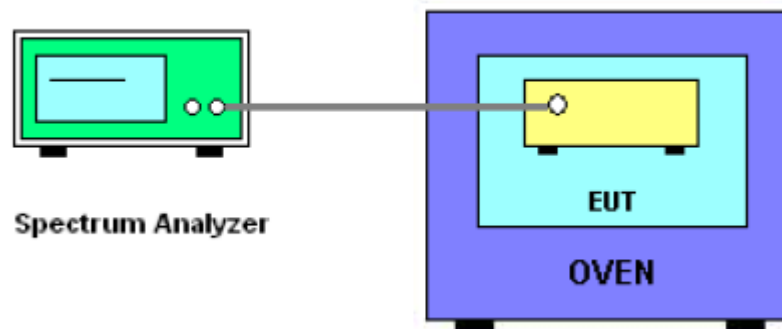
3.9.1 LIMIT

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.9.2 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6 \text{ ppm}$.
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^\circ\text{C} \sim 70^\circ\text{C}$.

3.9.3 TEST SETUP LAYOUT



3.9.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.9.5 TEST RESULTS

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX Frequency Band I (5150-5250MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.85	5180.0035	5180	0.0035	0.6797
		V max (V)	4.43	5180.0006	5180	0.0006	0.1062
		V min (V)	3.27	5180.0005	5180	0.0005	0.0963
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.85	T (°C)	-20	5180.0041	5180	0.0041	0.7884
		T (°C)	-10	5180.0021	5180	0.0021	0.4072
		T (°C)	0	5180.0034	5180	0.0034	0.6586
		T (°C)	10	5180.0071	5180	0.0071	1.3729
		T (°C)	20	5180.0017	5180	0.0017	0.3293
		T (°C)	30	5180.0057	5180	0.0057	1.1070
		T (°C)	40	5180.0022	5180	0.0022	0.4241
		T (°C)	50	5180.0068	5180	0.0068	1.3036
		T (°C)	60	5180.0089	5180	0.0089	1.7115
		T (°C)	70	5180.0089	5180	0.0089	1.7228
Limits				Within 5150-5250MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.85	5200.0040	5200	0.0040	0.7696
		V max (V)	4.43	5200.0007	5200	0.0007	0.1268
		V min (V)	3.27	5200.0093	5200	0.0093	1.7889
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.85	T (°C)	-20	5200.0008	5200	0.0008	0.1455
		T (°C)	-10	5200.0048	5200	0.0048	0.9267
		T (°C)	0	5200.0039	5200	0.0039	0.7460
		T (°C)	10	5200.0016	5200	0.0016	0.3146
		T (°C)	20	5200.0023	5200	0.0023	0.4486
		T (°C)	30	5200.0022	5200	0.0022	0.4325
		T (°C)	40	5200.0035	5200	0.0035	0.6783
		T (°C)	50	5200.0068	5200	0.0068	1.3099
		T (°C)	60	5200.0031	5200	0.0031	0.5930
		T (°C)	70	5200.0097	5200	0.0097	1.8611
Limits				Within 5150-5250MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.85	5240.0006	5240	0.0006	0.1055
		V max (V)	4.43	5240.0092	5240	0.0092	1.7509
		V min (V)	3.27	5240.0032	5240	0.0032	0.6103
Limits				Within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.85	T (°C)	-20	5240.0014	5240	0.0014	0.2621
		T (°C)	-10	5240.0094	5240	0.0094	1.8018
		T (°C)	0	5240.0009	5240	0.0009	0.1647
		T (°C)	10	5240.0060	5240	0.0060	1.1425
		T (°C)	20	5240.0018	5240	0.0018	0.3501
		T (°C)	30	5240.0006	5240	0.0006	0.1197
		T (°C)	40	5240.0078	5240	0.0078	1.4936
		T (°C)	50	5240.0061	5240	0.0061	1.1717
		T (°C)	60	5240.0053	5240	0.0053	1.0155
		T (°C)	70	5240.0066	5240	0.0066	1.2532
Limits				Within 5150-5250MHz			
Result				Complies			

EUT :	13.3inch Digital Signage	Model Name. :	SB1T14-B
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.85V
Test Mode :	TX Frequency Band 2C (5470-5725MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5500MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.85	5500.0023	5500	0.00226	0.4106
		V max (V)	4.43	5500.0099	5500	0.00987	1.7952
		V min (V)	3.27	5500.0011	5500	0.00115	0.2090
Limits				Within 5470-5725MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5500MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.85	T (°C)	-20	5500.0080	5500	0.00798	1.4510
		T (°C)	-10	5500.0066	5500	0.00655	1.1918
		T (°C)	0	5500.0099	5500	0.00993	1.8047
		T (°C)	10	5500.0022	5500	0.00218	0.3961
		T (°C)	20	5500.0077	5500	0.00773	1.4046
		T (°C)	30	5500.0018	5500	0.00180	0.3281
		T (°C)	40	5500.0024	5500	0.00243	0.4414
		T (°C)	50	5500.0028	5500	0.00282	0.5124
		T (°C)	60	5500.0078	5500	0.00777	1.4136
		T (°C)	70	5500.0005	5500	0.00047	0.0847
Limits				Within 5470-5725MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5600MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.85	5600.0012	5600	0.00119	0.2131
		V max (V)	4.43	5600.0072	5600	0.00723	1.2910
		V min (V)	3.27	5600.0068	5600	0.00682	1.2184
Limits				Within 5470-5725MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5600MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.85	T (°C)	-20	5600.0088	5600	0.00877	1.5663
		T (°C)	-10	5600.0088	5600	0.00884	1.5785
		T (°C)	0	5600.0032	5600	0.00325	0.5799
		T (°C)	10	5600.0076	5600	0.00762	1.3603
		T (°C)	20	5600.0093	5600	0.00934	1.6684
		T (°C)	30	5600.0085	5600	0.00847	1.5132
		T (°C)	40	5600.0007	5600	0.00067	0.1193
		T (°C)	50	5600.0051	5600	0.00510	0.9100
		T (°C)	60	5600.0031	5600	0.00315	0.5619
		T (°C)	70	5600.0075	5600	0.00751	1.3407
Limits				Within 5470-5725MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5700MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.85	5700.0050	5700	0.00501	0.8793
		V max (V)	4.43	5700.0089	5700	0.00889	1.5594
		V min (V)	3.27	5700.0027	5700	0.00273	0.4785
Limits				Within 5470-5725MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5700MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.85	T (°C)	-20	5700.0093	5700	0.00926	1.6242
		T (°C)	-10	5700.0020	5700	0.00204	0.3584
		T (°C)	0	5700.0020	5700	0.00199	0.3497
		T (°C)	10	5700.0066	5700	0.00658	1.1552
		T (°C)	20	5700.0014	5700	0.00140	0.2459
		T (°C)	30	5700.0052	5700	0.00524	0.9199
		T (°C)	40	5700.0017	5700	0.00174	0.3044
		T (°C)	50	5700.0094	5700	0.00943	1.6549
		T (°C)	60	5700.0089	5700	0.00890	1.5620
		T (°C)	70	5700.0021	5700	0.00213	0.3744
Limits				Within 5470-5725MHz			
Result				Complies			

4. DYNAMIC FREQUENCY SELECTION(DFS)

4.1 APPLICABILITY OF DFS REQUIREMENTS

EUT is client and operates as client without radar detection function.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes
Client Beacon Test	N/A	Yes	Yes

Additional requirements for devices with multiple bandwidth modes	Operational Mode	
	Master or Client With Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

4.3 INTERFERENCE THRESHOLD VALUES, MASTER OR CLIENT INCORPORATING IN-SERVICE MONITORING

Maximum Transmit Power	Value (see notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note 3: EIRP is based on the highest antenna gain.	

4.4 DFS RESPONSE REQUIREMENT VALUES

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the 99% power bandwidth See Note 3.

Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the Burst.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate Channel changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

4.5 SHORT PULSE RADAR TEST WAVEFORMS

As the EUT is a Client Device with no Radar Detection, only one type radar pulse is required for the testing. Radar Pulse type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	60%	30
1	1	Test A Test B	$\text{Roundup}\left(\frac{\left(\frac{1}{360}\right) \cdot \left(19 \cdot 10^6\right)}{\text{PRI}_{\text{pri}}}\right)$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a

Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.

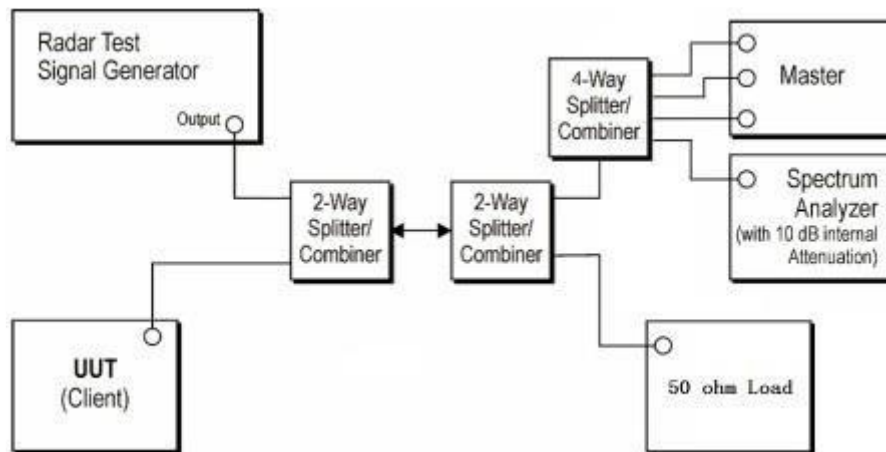
If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

4.6 CALIBRATION SETUP AND DFS TEST RESULTS

Radar Waveform Calibration Procedure

- 1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master
- 2) The interference Radar Detection Threshold Level is $-62\text{dBm} - 2\text{dBi} + 1\text{dB} = -63\text{dBm}$ that had been taken into account the output power range and antenna gain.
- 3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB .
- 4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was $-62\text{dBm} - 2\text{dBi} + 1\text{dB} = -63\text{dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

4.7 CONDUCTED CALIBRATION SETUP



Wireless AP	Manufacturer	ASUSTek Computer Inc
	Model NO.	AX5400
	FCC ID	MSQ-RTAXJ300

Note:1. The Slave device associated with the EUT during these tests does not have radar detection capability.

2. WLAN traffic is generated by using the iperf software to send packets from the Master IP address to the Slave IP address.

3. The time required for the master and slave devices to fully start up is 120s.

4. EUT does not support TPC.

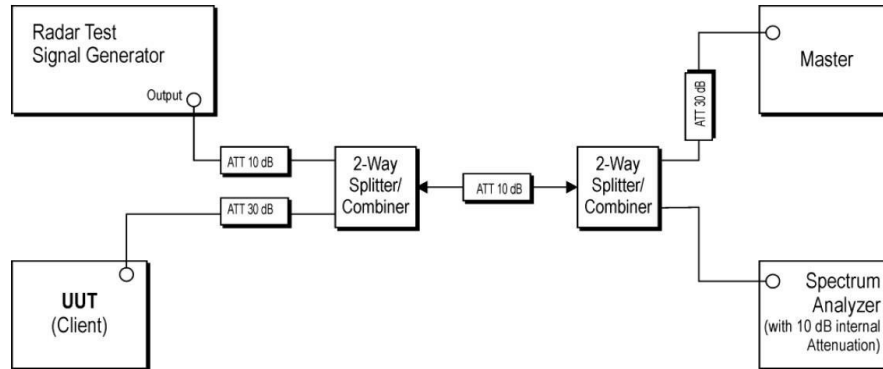
4.8 RADAR WAVEFORM CALIBRATION RESULT

Test data reference attachment.

4.9 IN-SERVICE MONITORING: CHANNEL MOVE TIME, CHANNEL CLOSING TRANSMISSION TIME AND NON-OCCUPANCY PERIOD

TEST CONFIGURATION:

Setup for Client with injection at the Master



TEST PROCEDURE:

1. The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. EUT will associate with the master at channel. The file "iperf.exe" specified by the FCC is Streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom In 600ms plot of the Short Pulse Radar Type
7. Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $Dwell (0.3ms) = S (12000ms) / B (4000)$; where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: $C (ms) = N \times Dwell (0.3ms)$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

TEST MODE:

Mode	Frequency (MHz)
a/n/ac/ax	5500

4.10 RESULT OF CHANNEL MOVE TIME, CHANNEL CLOSING TRANSMISSION TIME AND NON-OCCUPANCY PERIOD FOR CLIENT BEACON TEST

Test data reference attachment.

5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.2 EUT ANTENNA

The EUT antenna is permanent attached PCB antenna (antenna gain:5.56dBi). It comply with the standard requirement.

END OF REPORT