

FCC CERTIFICATION TEST REPORT

FOR

Applicant	:	Guangzhou FiiO Electronics Technology Co., Ltd.
Address	:	2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China.
Equipment under Test	:	Portable High Resolution Music Player
Model No.	:	M11 Pro, M15 Pro, M11K, M15K, M11 Plus, M15 Plus, M9 Plus, M7 Plus, M5 Plus, M3 Plus
Trade Mark	:	FiiO
FCC ID	:	R56-FCIDAN
Manufacturer	:	Guangzhou FiiO Electronics Technology Co., Ltd.
Address	:	2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China.

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,
Dongguan City, Guangdong Province, China, 523808

Tel: +86-0769-38826678, **E-mail:** ddt@dgddt.com, <http://www.dgddt.com>

REPORT

TABLE OF CONTENTS

	Test report declares.....	4
1.	Summary of test results	6
2.	General test information.....	7
2.1.	Description of EUT	7
2.2.	Accessories of EUT.....	7
2.3.	Assistant equipment used for test.....	7
2.4.	Block diagram of EUT configuration for test	8
2.5.	Deviations of test standard.....	9
2.6.	Test environment conditions	9
2.7.	Test laboratory	9
2.8.	Measurement uncertainty.....	9
3.	Equipment used during test	10
4.	26/6dB Bandwidth	11
4.1.	Block diagram of test setup.....	11
4.2.	Limits	11
4.3.	Test Procedure.....	11
4.4.	Test Result	12
4.5.	Original test data	13
5.	Maximum Output Power.....	24
5.1.	Block diagram of test setup.....	24
5.2.	Limits	24
5.3.	Test Procedure.....	24
5.4.	Test Result	24
6.	Power Spectral Density.....	37
6.1.	Block diagram of test setup.....	37
6.2.	Limits	37
6.3.	Test Procedure.....	37
6.4.	Test Result	38
6.5.	Original test data	39
7.	Frequency Stability Measurement	51
7.1.	Limit of Frequency Stability	51
7.2.	Measuring Instruments.....	51
7.3.	Test Procedures	51
7.4.	Test Setup	51
7.5.	Test Result	51
8.	Emissions in restricted frequency bands	57
8.1.	Block diagram of test setup.....	57

8.2.	Limit.....	58
8.3.	Test Procedure.....	59
8.4.	Test result.....	61
9.	Band Edge Compliance	69
9.1.	Block diagram of test setup.....	69
9.2.	Limit.....	69
9.3.	Test Procedure.....	69
9.4.	Test result.....	69
10.	Power Line Conducted Emission	92
10.1.	Block diagram of test setup.....	92
10.2.	Power Line Conducted Emission Limits (Class B)	92
10.3.	Test Procedure.....	92
10.4.	Test Result	93
11.	Antenna Requirements	96
11.1.	Limit.....	96
11.2.	Result	96
12.	Dynamic Frequency Selection	97
12.1.	Applicability of DFS requirements.....	97
12.2.	Limit.....	98
12.3.	Parameters of radar test waveforms.....	98
12.4.	Calibration of radar waveform	99
12.5.	Channel closing transmission time, channel move time and non-occupancy period	102
12.6.	Test setup.....	103
12.7.	Test result.....	103
13.	Test setup photograph	106
14.	Photos of the EUT	108

TEST REPORT DECLARE

Applicant	:	Guangzhou FiiO Electronics Technology Co., Ltd.
Address	:	2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China.
Equipment under Test	:	Portable High Resolution Music Player
Model No	:	M11 Pro, M15 Pro, M11K, M15K, M11 Plus, M15 Plus, M9 Plus, M7 Plus, M5 Plus, M3 Plus
Trade Mark	:	FiiO
Manufacturer	:	Guangzhou FiiO Electronics Technology Co., Ltd.
Address	:	2/F, F Building, Hougang Industrial Zone, Shigang Village, Huangshi West Road, Baiyun District, Guangzhou City, China.

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C.

Test procedure used: ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01.

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-R19081209-1E11		
Date of Receipt:	Aug. 16, 2019	Date of Test:	Aug. 16, 2019 ~ Nov. 20, 2019

Prepared By:

Sam Li
Sam Li/Engineer

Approved By:


Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision history

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Nov. 20, 2019	

1. Summary of test results

The EUT have been tested according to the applicable standards as referenced below.

Description of Test Item	Standard	Results
6/26db Bandwidth	FCC 15.407 (e)	PASS
Maximum Conducted Output Power	FCC 15.407 (a)	PASS
Power Spectral Density	FCC 15.407 (a)	PASS
Frequency Stability Measurement	FCC 15.407 (g)	PASS
Emissions in restricted frequency bands	FCC 15.407 (a) FCC 15.209 FCC 15.205	PASS
Band Edge Compliance	FCC 15.407 (a) FCC 15.209 FCC 15.205	PASS
Power Line Conducted Emission	FCC 15.207	PASS
Antenna requirement	FCC 15.203	PASS
Dynamic Frequency Selection	FCC 15.407 (h)	PASS

2. General test information

2.1. Description of EUT

EUT* Name	: Portable High Resolution Music Player
Model Number	: M11 Pro, M15 Pro, M11K, M15K, M11 Plus, M15 Plus, M9 Plus, M7 Plus, M5 Plus, M3 Plus
Difference of model number	: All models are identical except the appearance and model number, therefore the test performed on the model M11 Pro.
EUT function description	: Please reference user manual of this device
Power supply	: DC 5V from external AC Adapter : DC 3.8V built-in battery
Radio Technology	: IEEE 802.11a/n
FCC Operation frequency	: IEEE 802.11a: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz : IEEE 802.11n HT20: 5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz : IEEE 802.11n HT40: 5190MHz-5230MHz, 5270MHz-5310MHz, 5510MHz-5670MHz, 5755MHz-5755MHz
Modulation	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) : IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK)
Transmitter rate	: IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps : IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130.0, 144.4 Mbps : IEEE 802.11n HT40: 30, 60, 90, 120, 180, 240, 270, 300 Mbps
Antenna Type	: Dedicated FPC antenna, maximum PK gain: 2.67 dBi
Sample Type	: Series production

Note: EUT is the ab. of equipment under test.

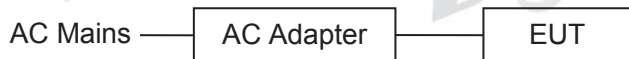
2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
N/A	N/A	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
Notebook	DELL	Latitude D610	FCC DOC	00045-534-136-300
AC Adapter	N/A	N/A	N/A	Input: AC 100-240V 50-60Hz 0.5A Output: DC 5V 2.3A

2.4. Block diagram of EUT configuration for test



Test software: SamsungRFTTestTool.EXE

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode and data rate as below table.

Tested mode, channel, and data rate information				
Mode	Setting Tx Power	data rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11a	/	54	Low: CH36	5180
	/	54	Middle: CH40	5200
	/	54	High: CH48	5240
	/	54	Low: CH52	5260
	/	54	Middle: CH56	5280
	/	54	High: CH64	5320
	/	54	Low: CH100	5500
	/	54	Middle: CH116	5580
	/	54	High: CH140	5700
	/	54	Low: CH149	5745
	/	54	Middle: CH157	5785
	/	54	High: CH165	5825
IEEE 802.11n HT20	/	MCS 7	Low: CH36	5180
	/	MCS 7	Middle: CH40	5200
	/	MCS 7	High: CH48	5240
	/	MCS 7	Low: CH52	5260
	/	MCS 7	Middle: CH56	5280
	/	MCS 7	High: CH64	5320
	/	MCS 7	Low: CH100	5500
	/	MCS 7	Middle: CH116	5580
	/	MCS 7	High: CH140	5700
	/	MCS 7	Low: CH149	5745
	/	MCS 7	Middle: CH157	5785
	/	MCS 7	High: CH165	5825
IEEE 802.11n HT40	/	MCS 7	Low: CH38	5190
	/	MCS 7	Middle: CH46	5230
	/	MCS 7	High: CH54	5270
	/	MCS 7	Low: CH62	5310
	/	MCS 7	Middle: CH102	5510
	/	MCS 7	High: CH110	5550
	/	MCS 7	Low: CH134	5670
	/	MCS 7	Middle: CH151	5755
	/	MCS 7	High: CH159	5795

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.5. Deviations of test standard

No Deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25°C
Humidity range:	40-75%
Pressure range:	86-106 kPa

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com

CNAS Accreditation No. L6451; A2LA Accreditation No. 3870.01

Designation Number: CN1182; Test Firm Registration Number: 540522

Industry Canada site registration number: 10288A-1

2.8. Measurement uncertainty

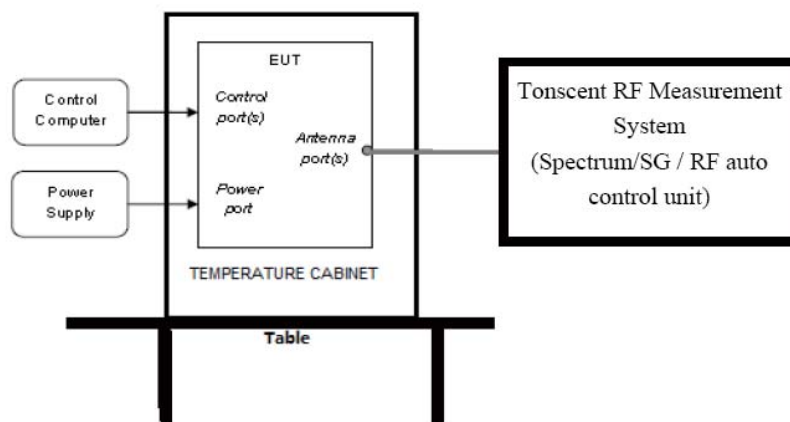
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method) 5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$); 1.66 dB ($8 \text{ GHz} \leq f < 22 \text{ GHz}$)
Uncertainty for radio frequency (RBW<20kHz)	3×10^{-8}
Temperature	0.4°C
Humidity	2%
Uncertainty for Radiation Emission test (30MHz-1GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz-40GHz)	4.10 dB (1-6 GHz) 4.40 dB (6 GHz-18 GHz) 3.54 dB (18 GHz-26 GHz) 4.30 dB (26 GHz-40 GHz)
Uncertainty for Power line conduction emission test	3.32 dB (150 kHz-30 MHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment used during test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (Tonscend RF Measurement System)					
Spectrum analyzer	R&S	FSU26	200071	Sep. 29, 2019	1 Year
Spectrum analyzer	R&S	FSU26	201124	Sep. 29, 2019	1 Year
Wideband Radio Communication tester	R&S	CMW500	117491	Jun. 25, 2019	1 Year
Vector Signal Generator	Agilent	E8267D	US49060192	Sep. 29, 2019	1 Year
Vector Signal Generator	Agilent	N5182A	MY48180737	Jun. 25, 2019	1 Year
Power Sensor	Agilent	U2021XA	MY55150010	Jun. 28, 2019	1 Year
Power Sensor	Agilent	U2021XA	MY55150011	Jun. 28, 2019	1 Year
Temp & Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Sep. 29, 2019	1 Year
Test Software	JS Tonscent	JS1120-3	Ver.2.7	N/A	N/A
USB Data acquisition	Agilent	U2531A	TW55043503	N/A	N/A
Radiation 1#chamber					
EMI Test Receiver	R&S	ESU8	100316	Sep. 29, 2019	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Jun. 25, 2019	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	Nov. 15, 2019	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Sep. 29, 2019	1 Year
Double Ridged Horn Antenna	R&S	HF907	100276	Nov. 15, 2019	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Sep. 29, 2019	1 Year
Pre-amplifier	TERA-MW	TRLA-0040 G35	101303	Sep. 29, 2019	1 Year
RF Cable	HUBSER	CP-X2+ CP-X1	W11.03+ W12.02	Sep. 29, 2019	1 Year
RF Cable	N/A	SMAJ-SMAJ -1M+11M	17070133+17070131	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
EMI Test Receiver	R&S	ESU8	100316	Sep. 29, 2019	1 Year
LISN 1	R&S	ENV216	101109	Sep. 29, 2019	1 Year
LISN 2	R&S	ESH2-Z5	100309	Sep. 29, 2019	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Sep. 29, 2019	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Sep. 29, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A

4. 26/6dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	26 dB Bandwidth	5150-5250
	26 dB Bandwidth	5250-5350
	26 dB Bandwidth	5470-5725
	Minimum 500kHz 6dB Bandwidth	5725-5850

4.3. Test Procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth: RBW=100 kHz For 26 dB Bandwidth: approximately 1% of the emission bandwidth.
VBW	For 6 dB Bandwidth: VBW=300 kHz For 26 dB Bandwidth: >3 RBW
Trace	Max hold
Sweep	Auto couple

(2) Allow the trace to stabilize, 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 26 dB and 6 dB relative to the maximum level measured in the fundamental emission.

4.4. Test Result

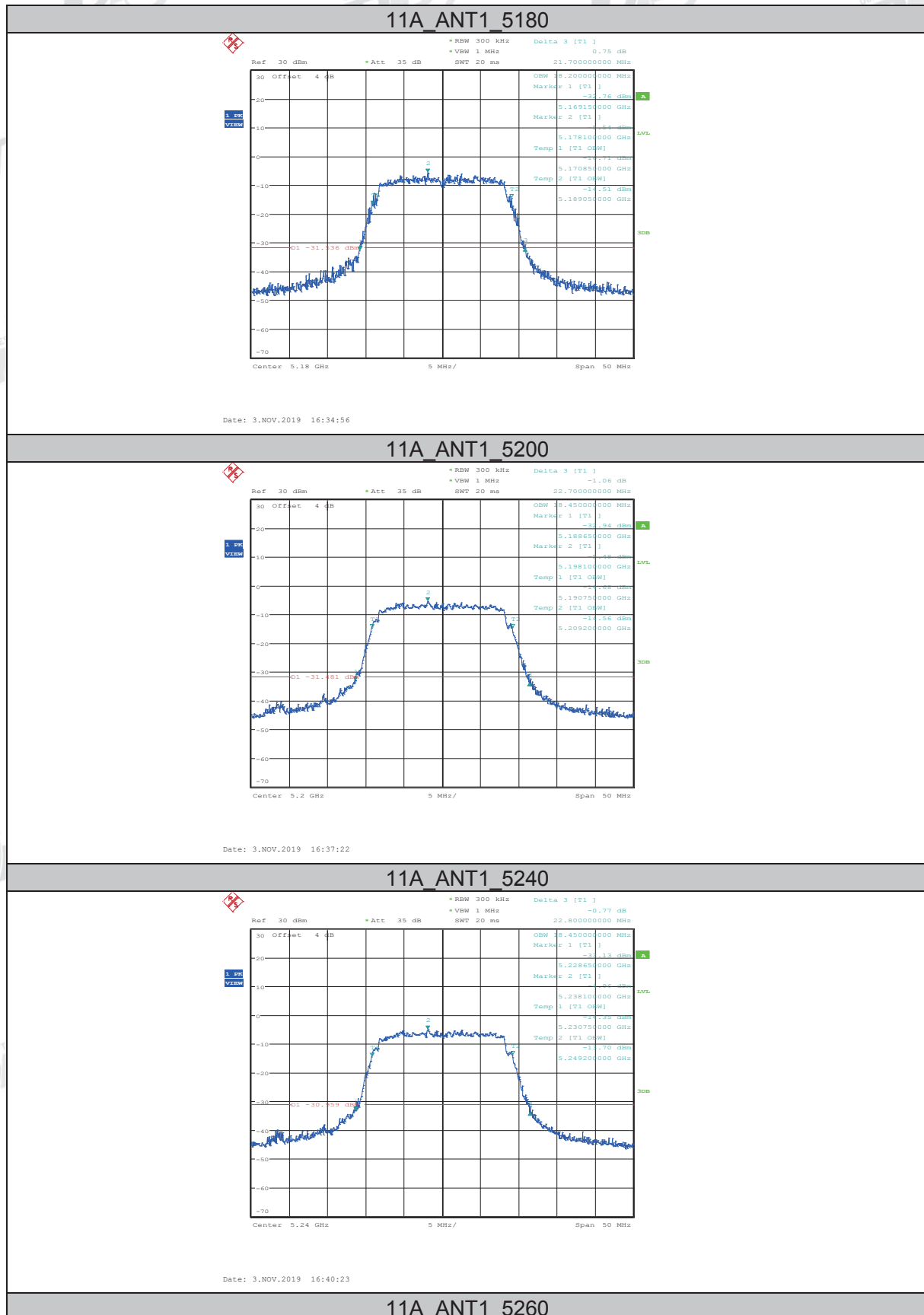
26dB Bandwidth:

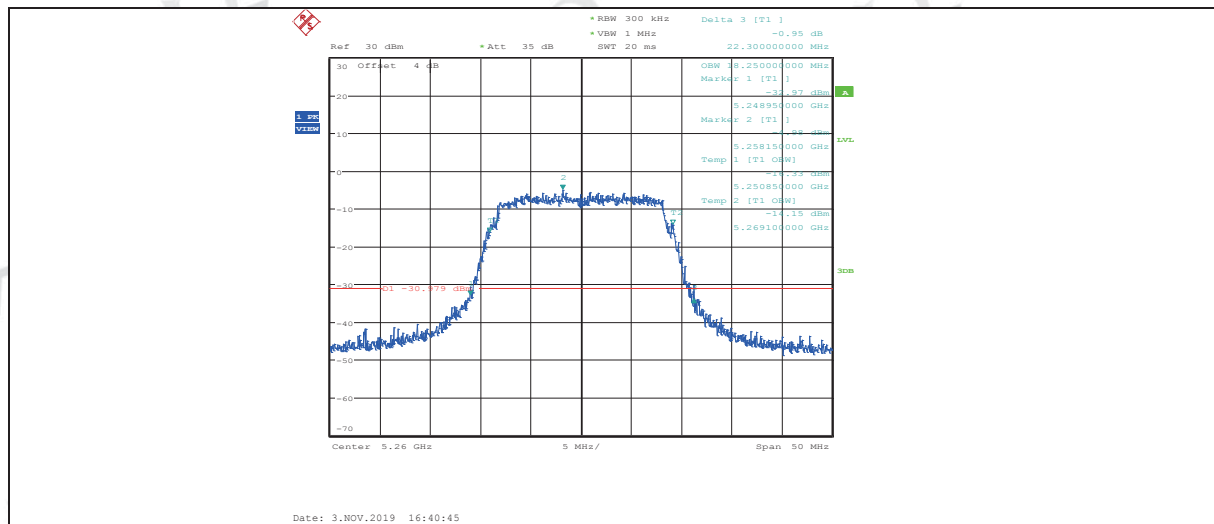
Test Mode	Antenna	Channel	EBW	Limit	Verdict
11A	ANT1	5180	21.700	---	PASS
11A	ANT1	5200	22.700	---	PASS
11A	ANT1	5240	22.800	---	PASS
11A	ANT1	5260	22.300	---	PASS
11A	ANT1	5300	21.800	---	PASS
11A	ANT1	5320	21.650	---	PASS
11A	ANT1	5500	21.500	---	PASS
11A	ANT1	5580	21.700	---	PASS
11A	ANT1	5700	21.300	---	PASS
11N20SISO	ANT1	5180	22.700	---	PASS
11N20SISO	ANT1	5200	22.800	---	PASS
11N20SISO	ANT1	5240	22.550	---	PASS
11N20SISO	ANT1	5260	22.700	---	PASS
11N20SISO	ANT1	5300	22.400	---	PASS
11N20SISO	ANT1	5320	22.450	---	PASS
11N20SISO	ANT1	5500	22.500	---	PASS
11N20SISO	ANT1	5580	22.400	---	PASS
11N20SISO	ANT1	5700	23.250	---	PASS
11N40SISO	ANT1	5190	46.600	---	PASS
11N40SISO	ANT1	5230	46.700	---	PASS
11N40SISO	ANT1	5270	46.300	---	PASS
11N40SISO	ANT1	5310	45.000	---	PASS
11N40SISO	ANT1	5510	45.900	---	PASS
11N40SISO	ANT1	5550	45.700	---	PASS
11N40SISO	ANT1	5670	44.400	---	PASS

6dB Bandwidth:

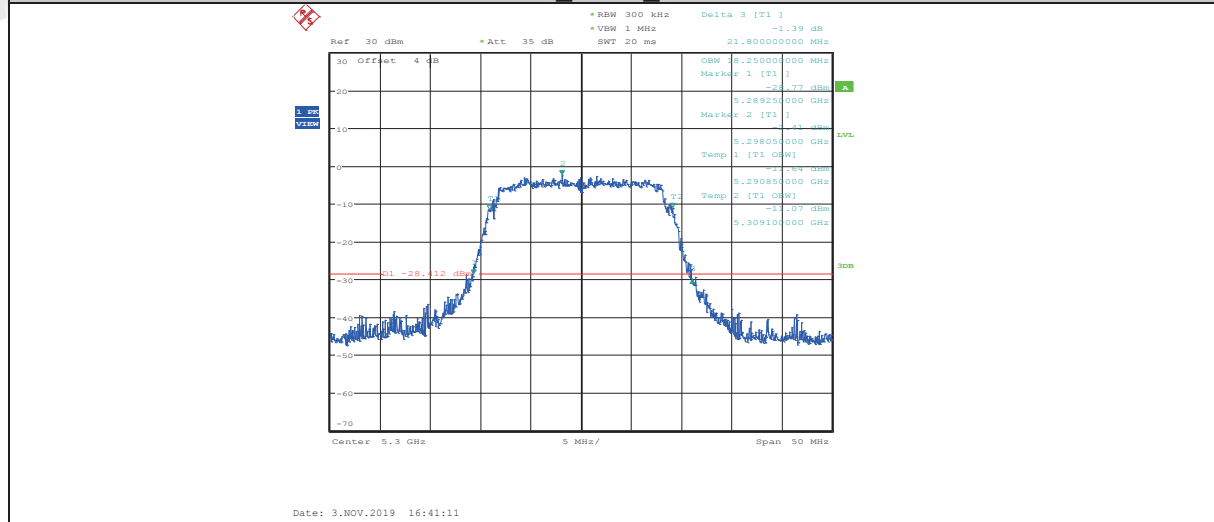
Test Mode	Antenna	Channel	EBW	Limit	Verdict
11A	ANT1	5745	16.500	0.5	PASS
11A	ANT1	5785	16.500	0.5	PASS
11A	ANT1	5825	16.500	0.5	PASS
11N20SISO	ANT1	5745	17.400	0.5	PASS
11N20SISO	ANT1	5785	17.300	0.5	PASS
11N20SISO	ANT1	5825	17.650	0.5	PASS
11N40SISO	ANT1	5755	35.900	0.5	PASS
11N40SISO	ANT1	5795	36.400	0.5	PASS

4.5. Original test data

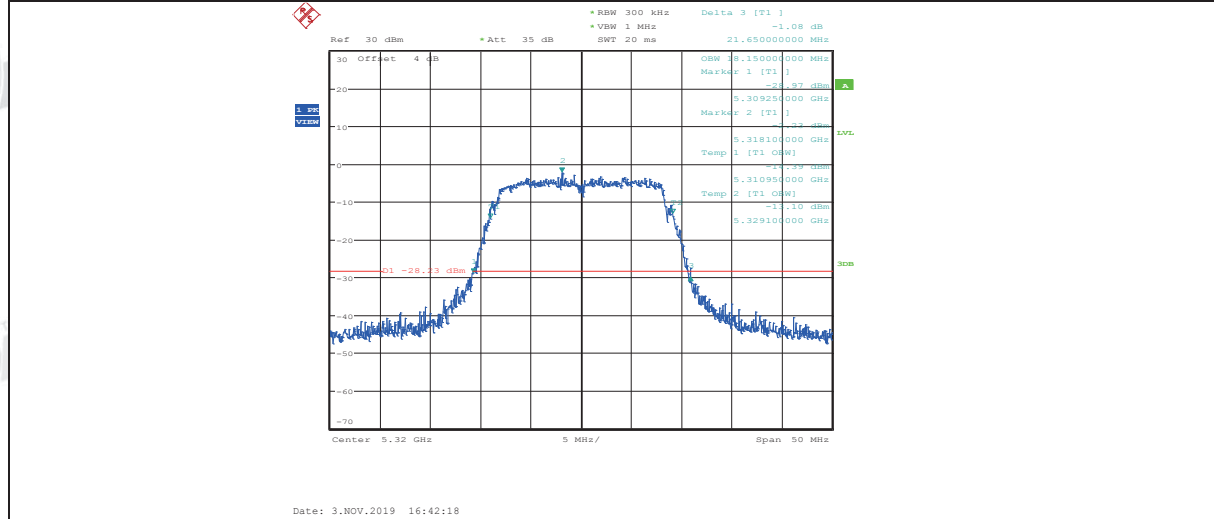




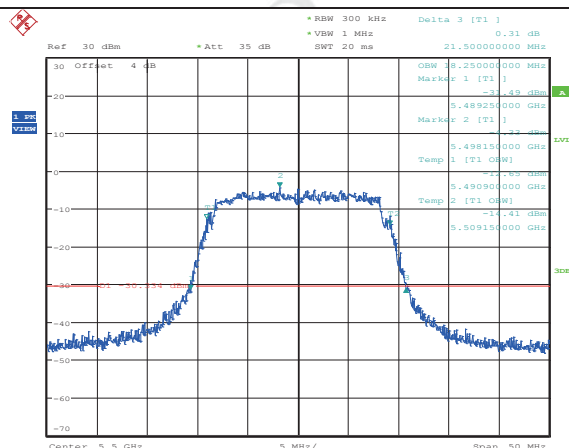
11A ANT1_5300



11A ANT1_5320

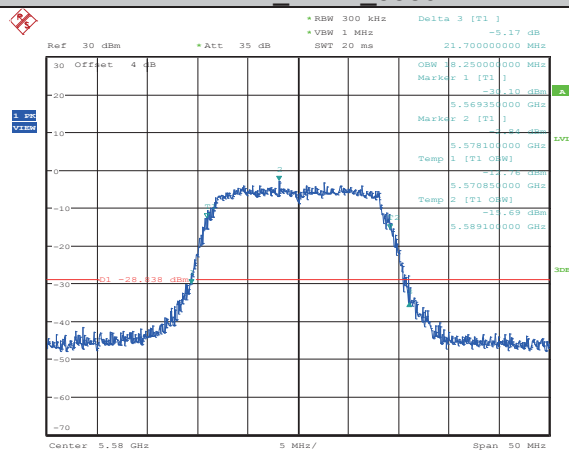


11A ANT1_5500



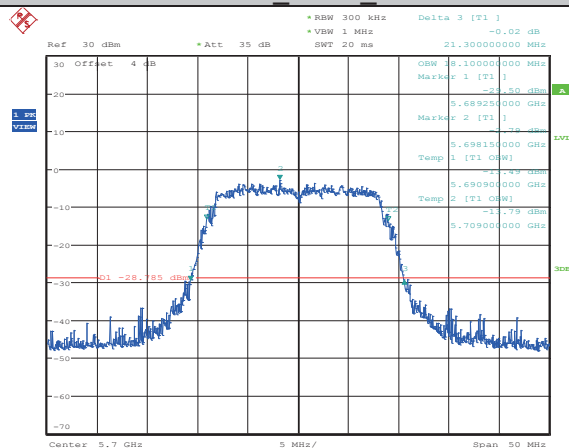
Date: 3.NOV.2019 16:42:41

11A_ANT1_5580



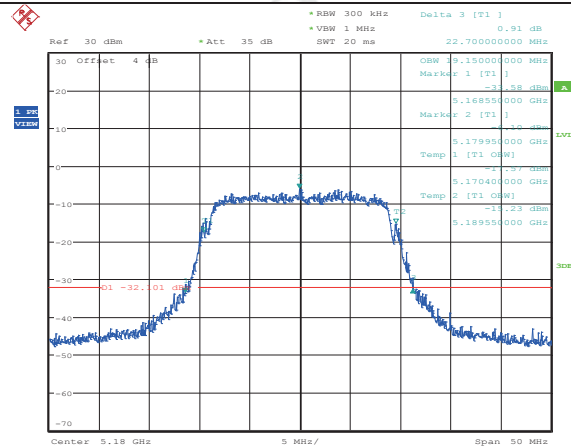
Date: 3.NOV.2019 16:43:03

11A_ANT1_5700



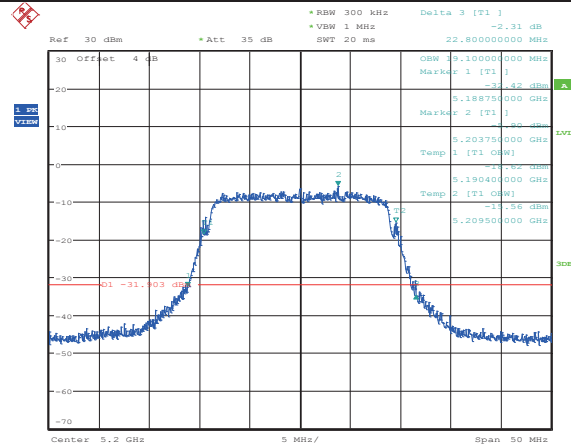
Date: 3.NOV.2019 16:43:26

11N20SISO_ANT1_5180



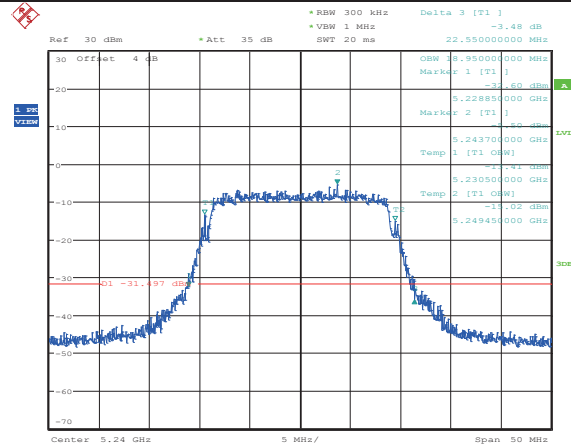
Date: 3.NOV.2019 16:45:13

11N20SISO ANT1 5200



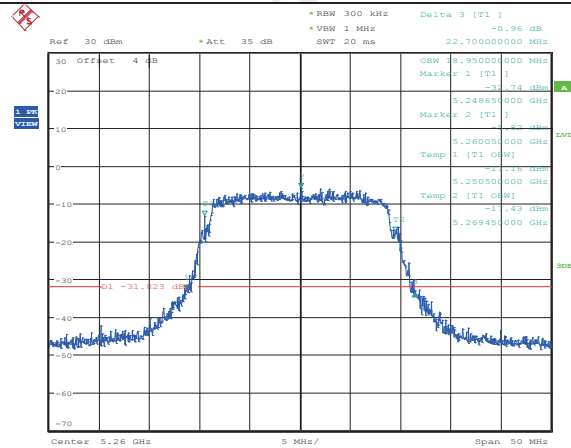
Date: 3.NOV.2019 16:45:56

11N20SISO ANT1 5240



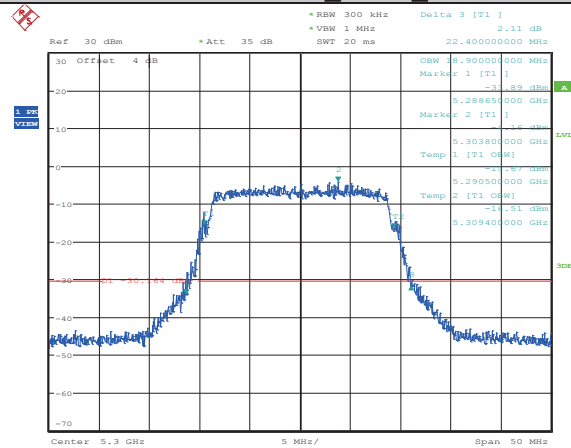
Date: 3.NOV.2019 16:46:19

11N20SISO ANT1 5260



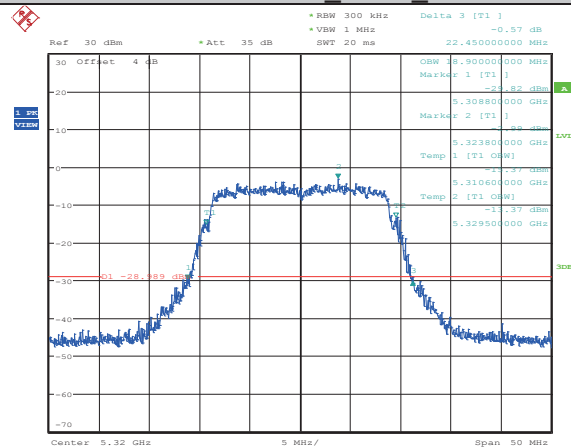
Date: 3.NOV.2019 16:46:41

11N20SISO_ANT1_5300



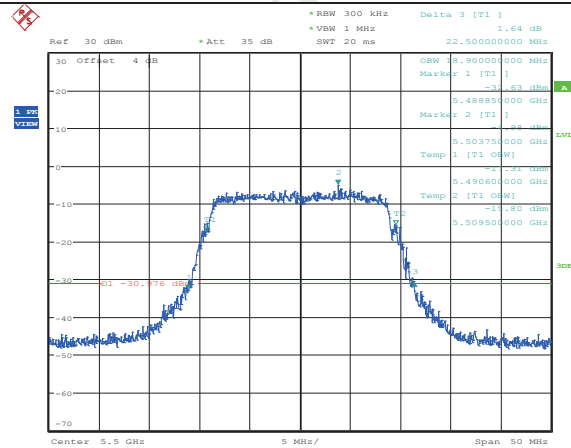
Date: 3.NOV.2019 16:47:02

11N20SISO_ANT1_5320



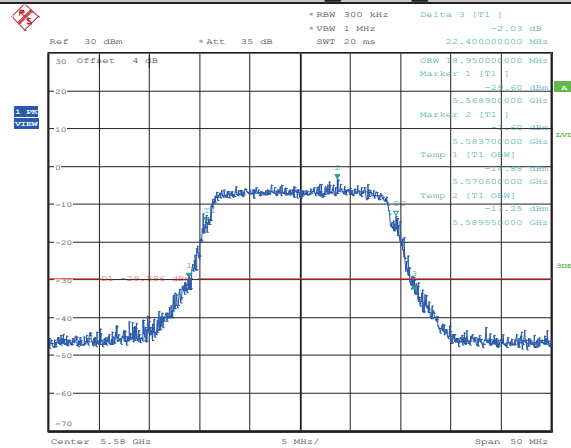
Date: 3.NOV.2019 16:47:22

11N20SISO_ANT1_5500



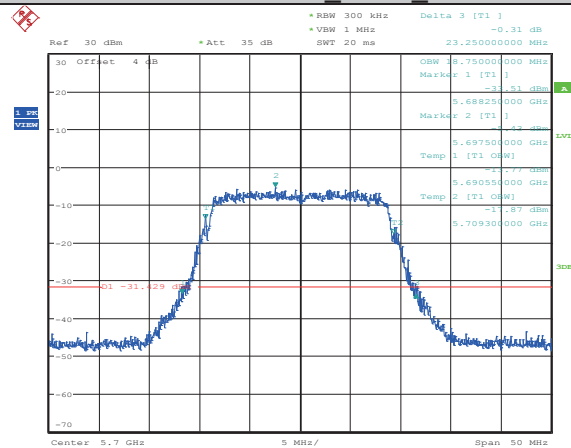
Date: 3.NOV.2019 16:47:43

11N20SISO_ANT1_5580



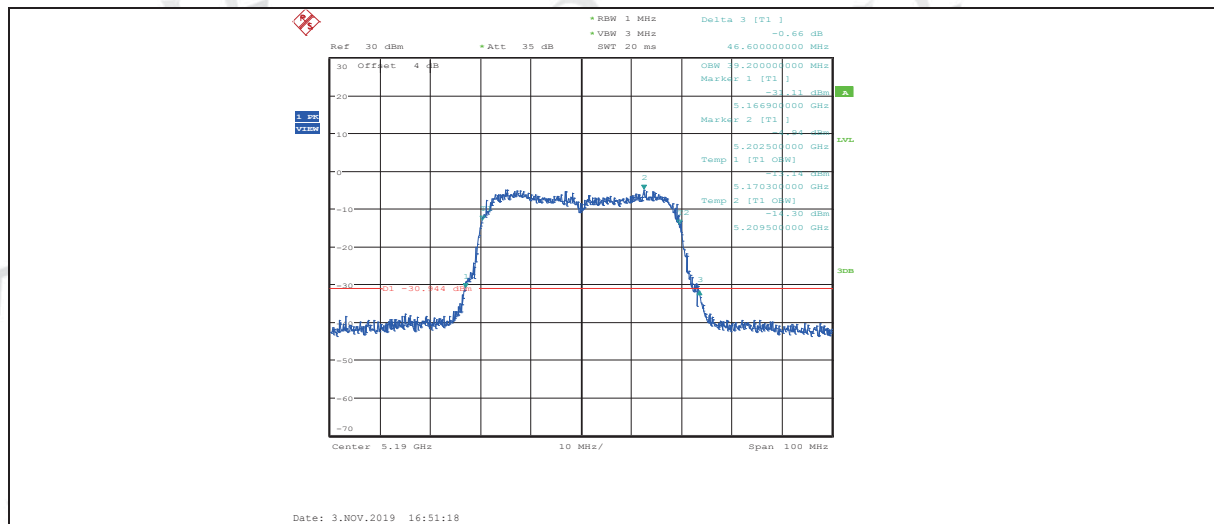
Date: 3.NOV.2019 16:48:04

11N20SISO_ANT1_5700

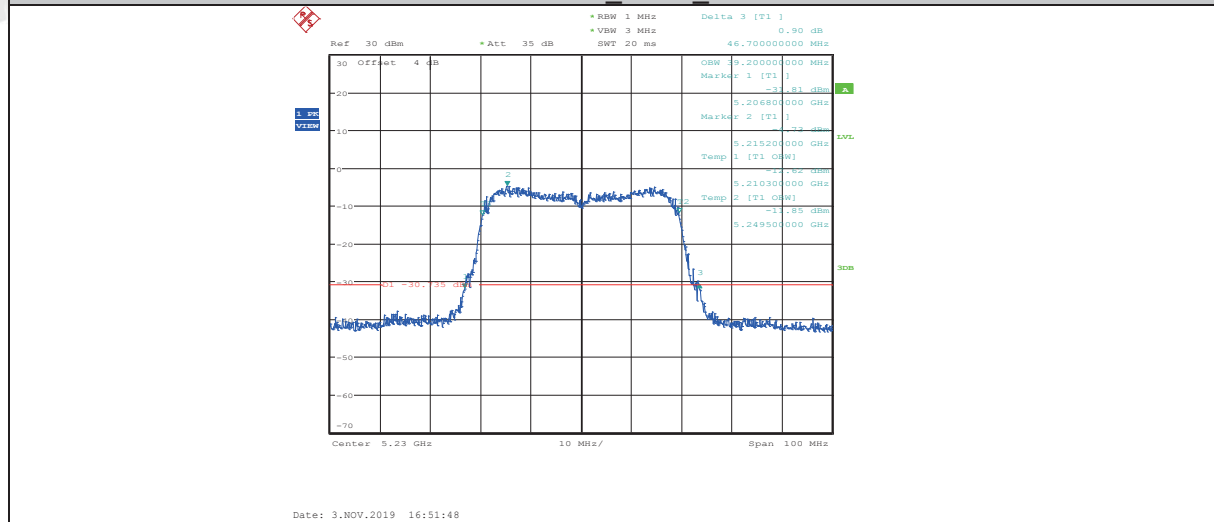


Date: 3.NOV.2019 16:48:26

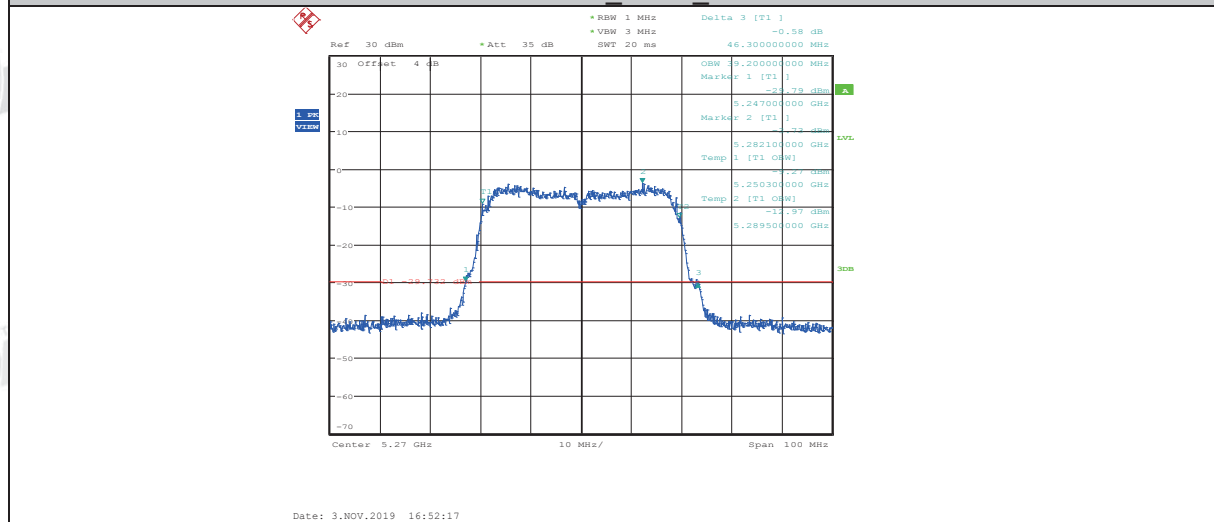
11N40SISO_ANT1_5190



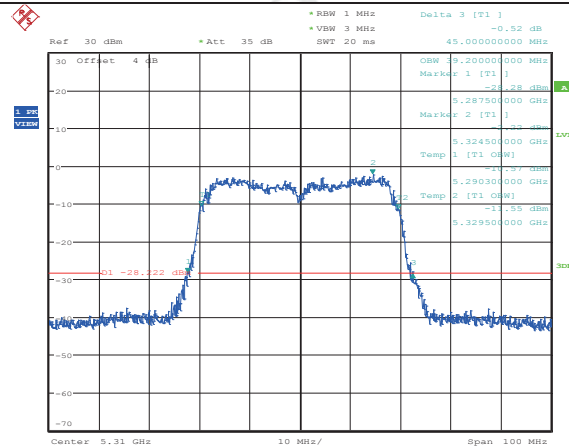
11N40SISO ANT1 5230



11N40SISO ANT1 5270

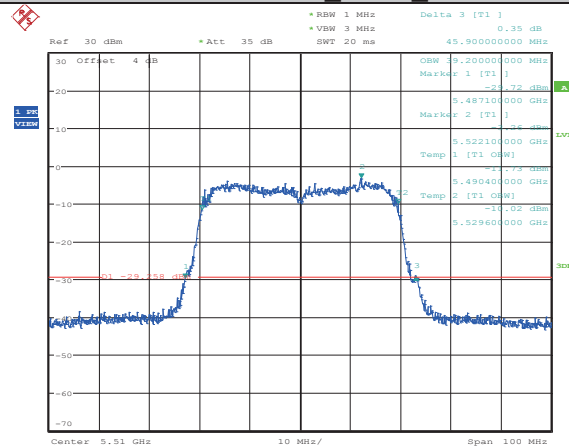


11N40SISO ANT1 5310



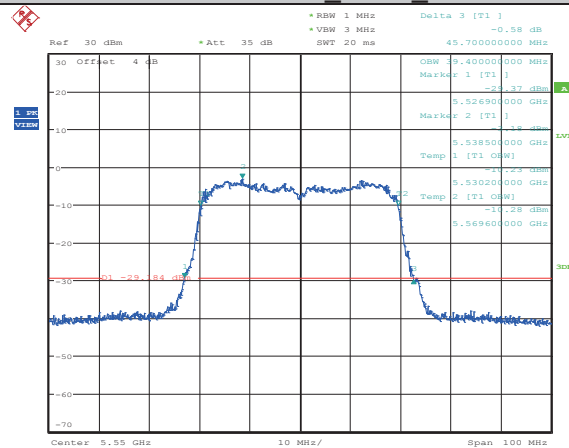
Date: 3.NOV.2019 16:52:43

11N40SISO_ANT1_5510



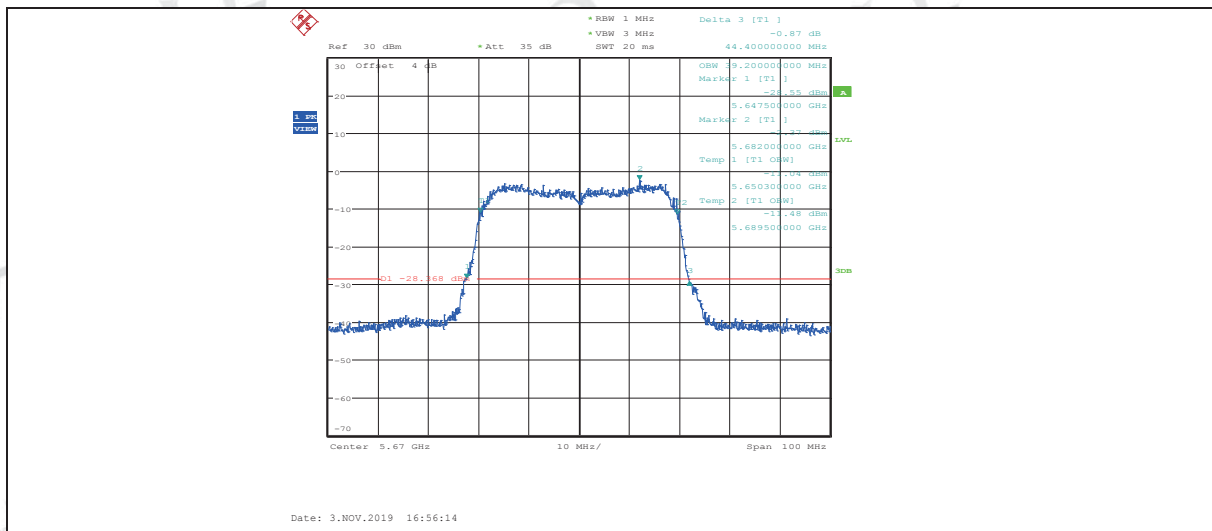
Date: 3.NOV.2019 16:53:21

11N40SISO_ANT1_5550

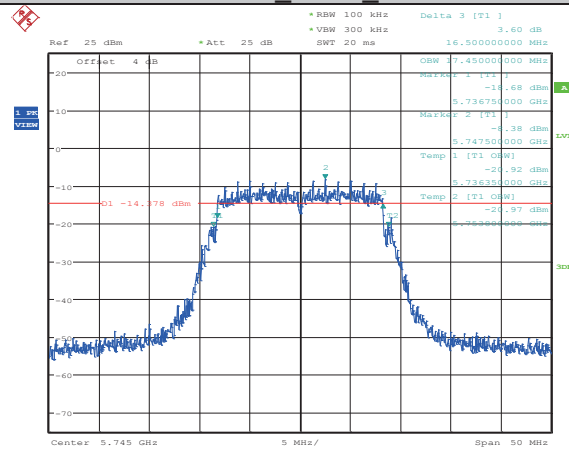


Date: 3.NOV.2019 16:55:26

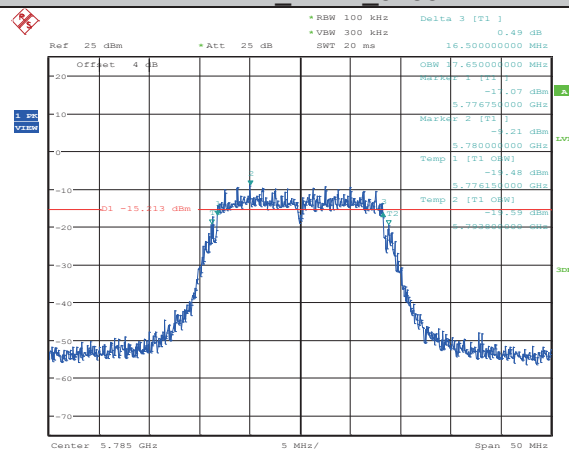
11N40SISO_ANT1_5670



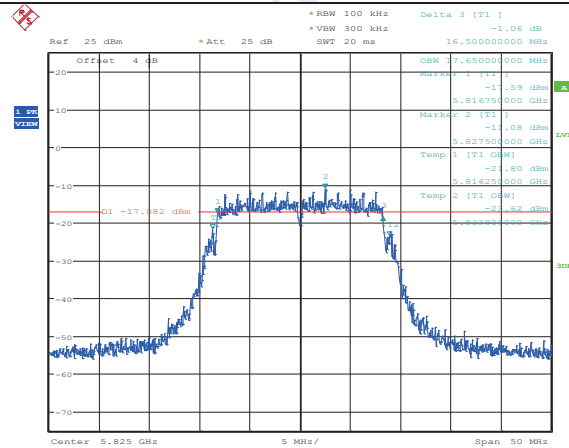
11A ANT1_5745



11A ANT1_5785

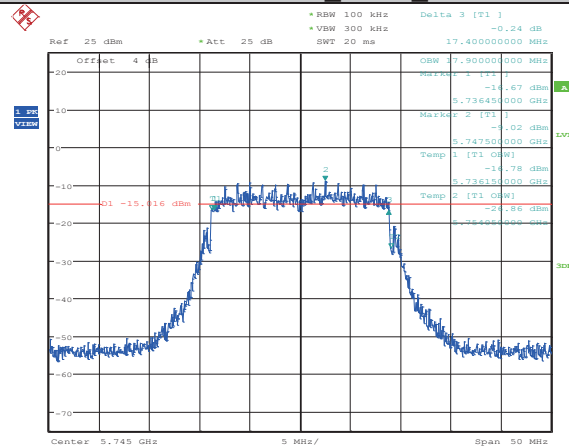


11A ANT1_5825



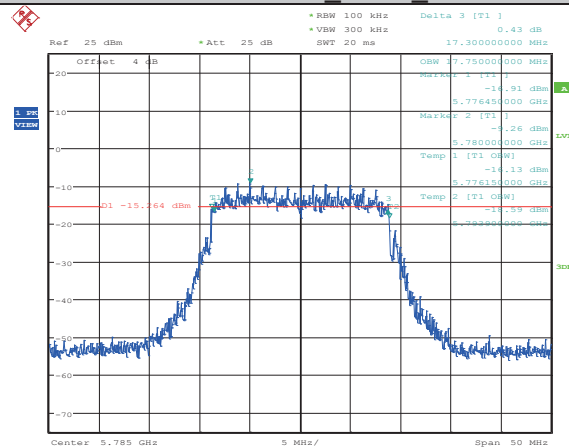
Date: 3.NOV.2019 16:44:40

11N20SISO ANT1 5745



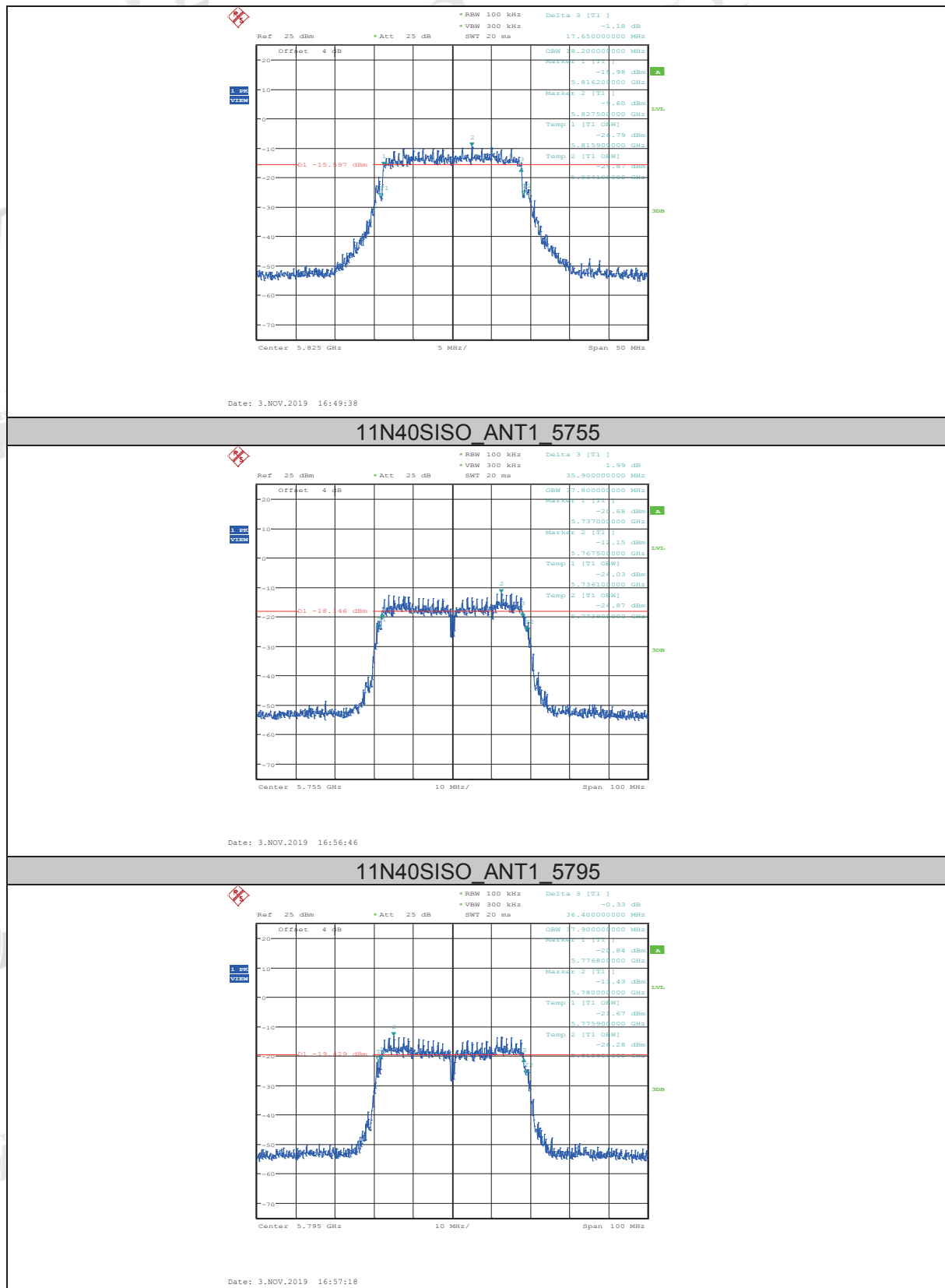
Date: 3.NOV.2019 16:48:47

11N20SISO ANT1 5785



Date: 3.NOV.2019 16:49:07

11N20SISO ANT1 5825



5. Maximum Output Power

5.1. Block diagram of test setup

Same as section 4.1

5.2. Limits

FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	For client devices: 250 mW (24 dBm)	5150-5250
	250mW (24 dBm) or $11 + 10 \log_{10} B$	5250-5350
	250 mW (24 dBm) or $11 + 10 \log_{10} B$	5470-5725
	1 Watt (30 dBm)	5725-5850
Note: B=26 bandwidth		

5.3. Test Procedure

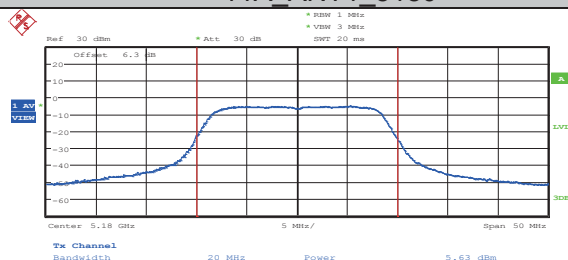
- (1) Connect each EUT's antenna output to Spectrum Analyzer by RF cable and attenuator
- (2) Add each antenna port's results to get the total output power of EUT.

5.4. Test Result

Test Mode	Antenna	Channel	Result	Limit	Verdict
11A	ANT1	5180	5.63	24	PASS
11A	ANT1	5200	5.35	24	PASS
11A	ANT1	5240	5.60	24	PASS
11A	ANT1	5260	5.50	24	PASS
11A	ANT1	5300	5.44	24	PASS
11A	ANT1	5320	5.10	24	PASS
11A	ANT1	5500	5.88	24	PASS
11A	ANT1	5580	7.40	24	PASS
11A	ANT1	5700	6.84	24	PASS
11A	ANT1	5745	7.47	30	PASS
11A	ANT1	5785	5.25	30	PASS
11A	ANT1	5825	4.15	30	PASS
11N20SISO	ANT1	5180	5.10	24	PASS
11N20SISO	ANT1	5200	5.05	24	PASS
11N20SISO	ANT1	5240	5.04	24	PASS
11N20SISO	ANT1	5260	5.09	24	PASS
11N20SISO	ANT1	5300	4.85	24	PASS

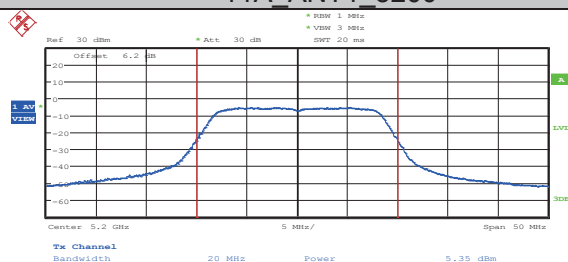
11N20SISO	ANT1	5320	4.55	24	PASS
11N20SISO	ANT1	5500	5.00	24	PASS
11N20SISO	ANT1	5580	7.06	24	PASS
11N20SISO	ANT1	5700	6.45	24	PASS
11N20SISO	ANT1	5745	6.93	30	PASS
11N20SISO	ANT1	5785	3.35	30	PASS
11N20SISO	ANT1	5825	3.10	30	PASS
11N40SISO	ANT1	5190	4.88	24	PASS
11N40SISO	ANT1	5230	4.58	24	PASS
11N40SISO	ANT1	5270	4.63	24	PASS
11N40SISO	ANT1	5310	4.84	24	PASS
11N40SISO	ANT1	5510	5.28	24	PASS
11N40SISO	ANT1	5550	4.37	24	PASS
11N40SISO	ANT1	5670	6.24	24	PASS
11N40SISO	ANT1	5755	6.00	30	PASS
11N40SISO	ANT1	5795	3.39	30	PASS

11A_ANT1_5180



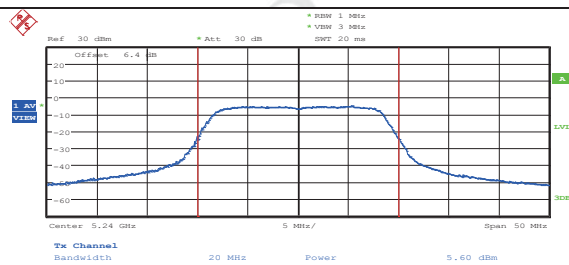
Date: 13.NOV.2019 13:04:41

11A_ANT1_5200



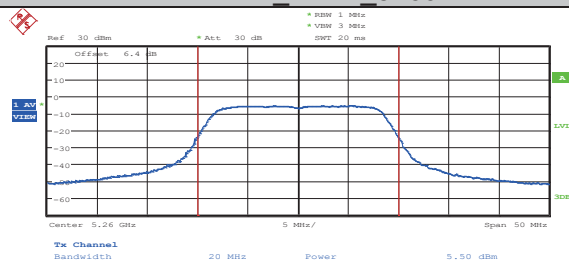
Date: 13.NOV.2019 13:05:08

11A_ANT1_5240



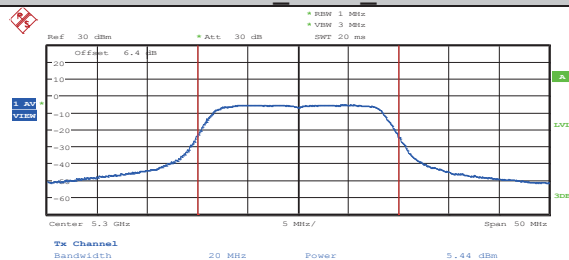
Date: 13.NOV.2019 13:05:35

11A ANT1_5260



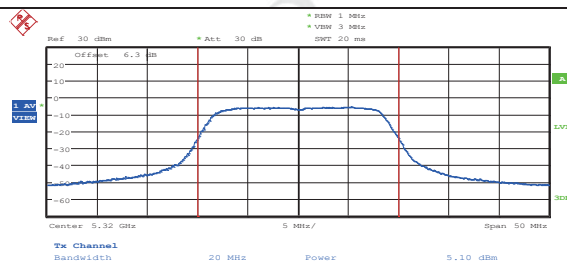
Date: 13.NOV.2019 13:06:07

11A ANT1_5300



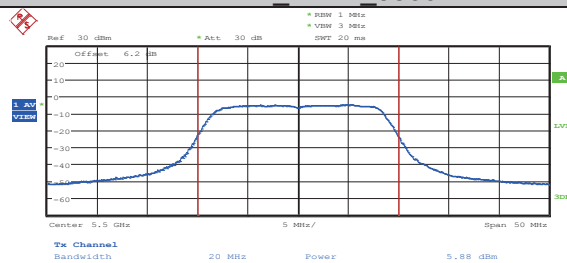
Date: 13.NOV.2019 13:06:47

11A ANT1_5320



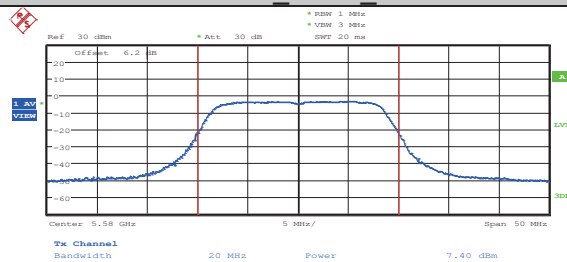
Date: 13.NOV.2019 13:07:20

11A ANT1_5500



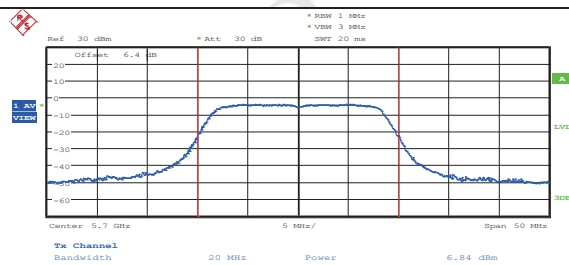
Date: 13.NOV.2019 13:13:32

11A ANT1_5580



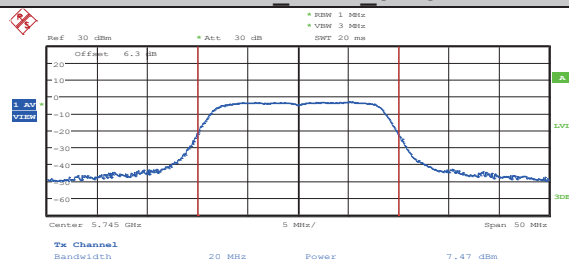
Date: 13.NOV.2019 13:16:00

11A ANT1_5700



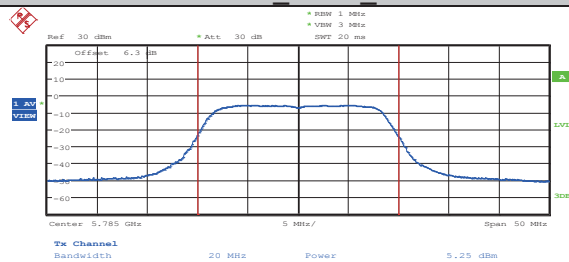
Date: 13.NOV.2019 13:16:58

11A ANT1_5745



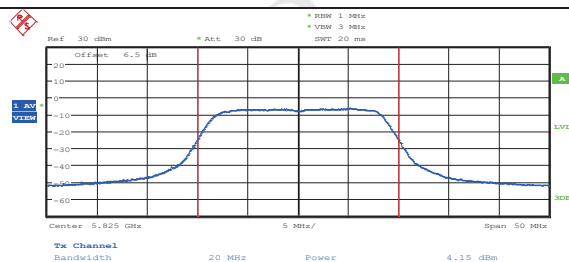
Date: 13.NOV.2019 13:17:54

11A ANT1_5785



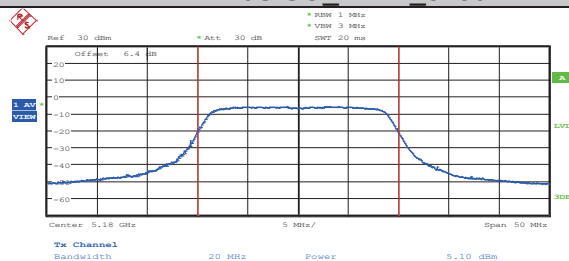
Date: 13.NOV.2019 13:19:31

11A ANT1_5825



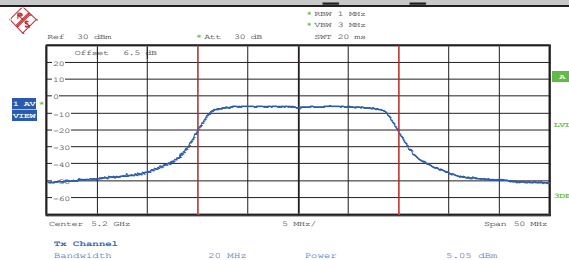
Date: 13.NOV.2019 13:21:51

11N20SISO_ANT1_5180



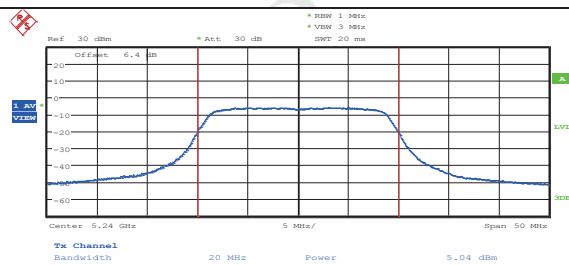
Date: 13.NOV.2019 13:22:59

11N20SISO_ANT1_5200



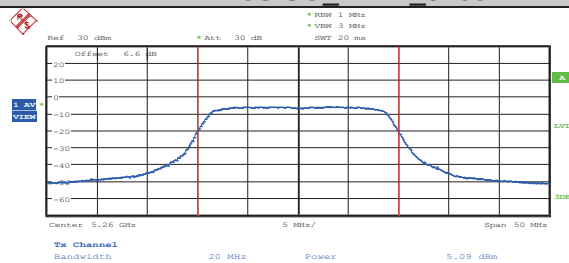
Date: 13.NOV.2019 13:24:01

11N20SISO_ANT1_5240



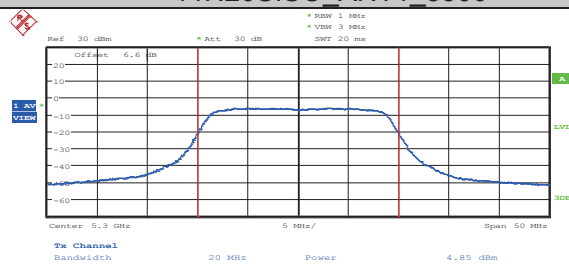
Date: 13.NOV.2019 13:25:33

11N20SISO_ANT1_5260



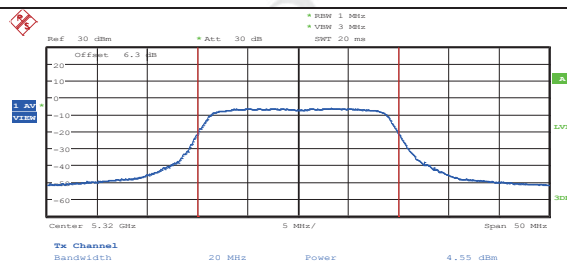
Date: 13.NOV.2019 13:26:56

11N20SISO_ANT1_5300



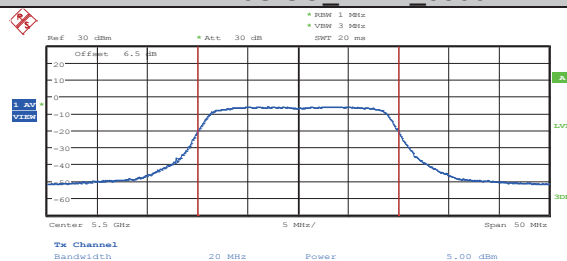
Date: 13.NOV.2019 13:28:19

11N20SISO_ANT1_5320



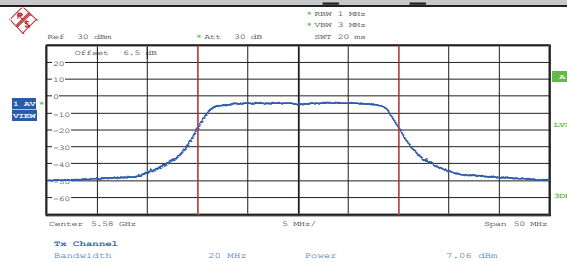
Date: 13.NOV.2019 13:29:24

11N20SISO_ANT1_5500



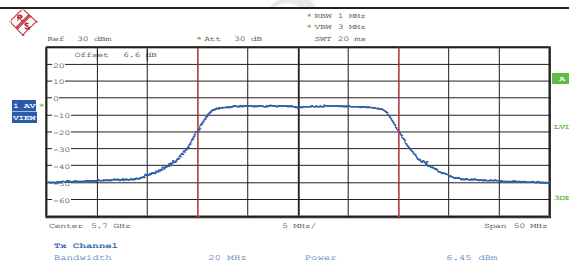
Date: 13.NOV.2019 13:30:33

11N20SISO_ANT1_5580



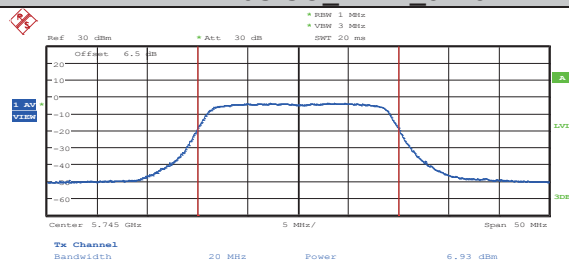
Date: 13.NOV.2019 13:32:04

11N20SISO_ANT1_5700



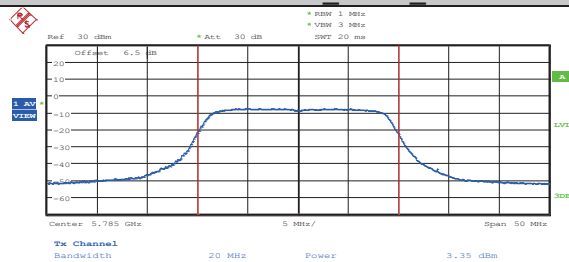
Date: 13.NOV.2019 13:33:47

11N20SISO_ANT1_5745



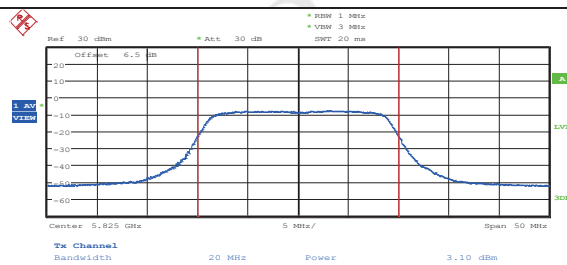
Date: 13.NOV.2019 13:34:51

11N20SISO_ANT1_5785



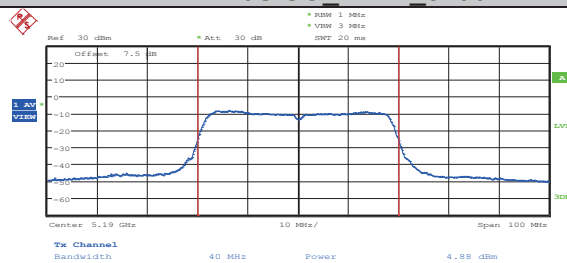
Date: 13.NOV.2019 13:39:23

11N20SISO_ANT1_5825



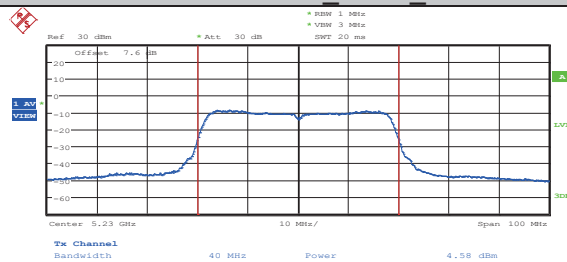
Date: 13.NOV.2019 13:40:28

11N40SISO_ANT1_5190



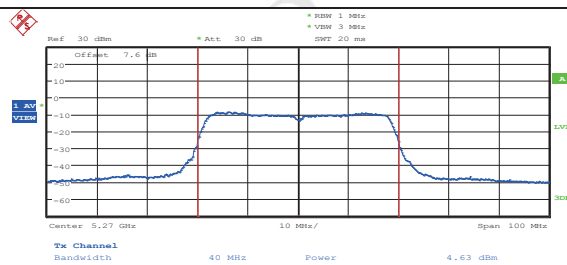
Date: 13.NOV.2019 13:41:42

11N40SISO_ANT1_5230



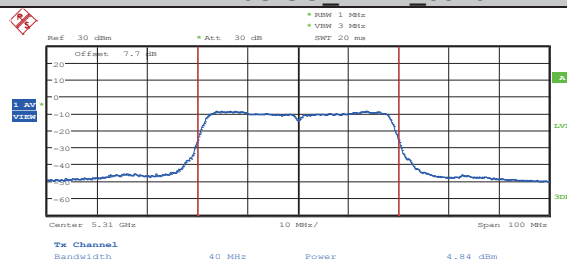
Date: 13.NOV.2019 13:42:45

11N40SISO_ANT1_5270



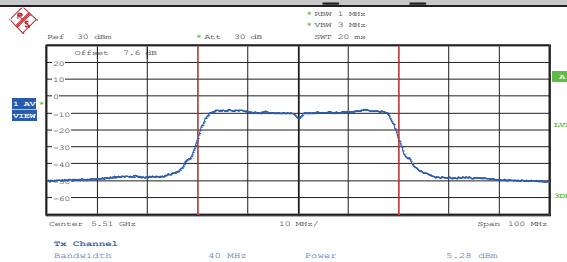
Date: 13.NOV.2019 13:43:57

11N40SISO_ANT1_5310



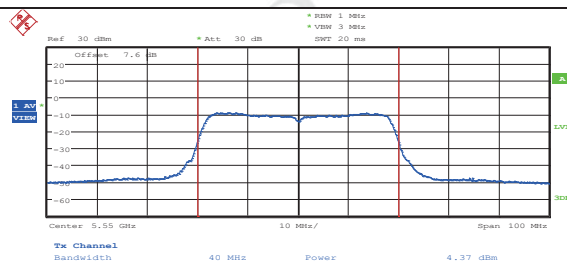
Date: 13.NOV.2019 13:45:05

11N40SISO_ANT1_5510



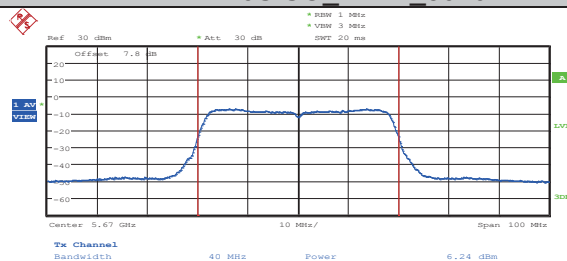
Date: 13.NOV.2019 13:46:16

11N40SISO_ANT1_5550



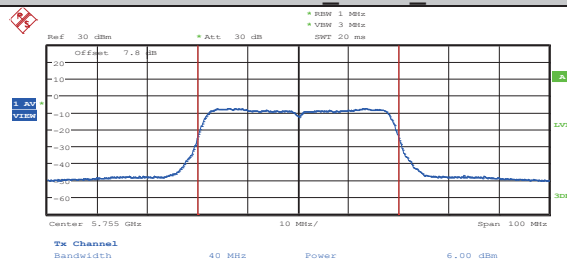
Date: 13.NOV.2019 13:47:23

11N40SISO_ANT1_5670



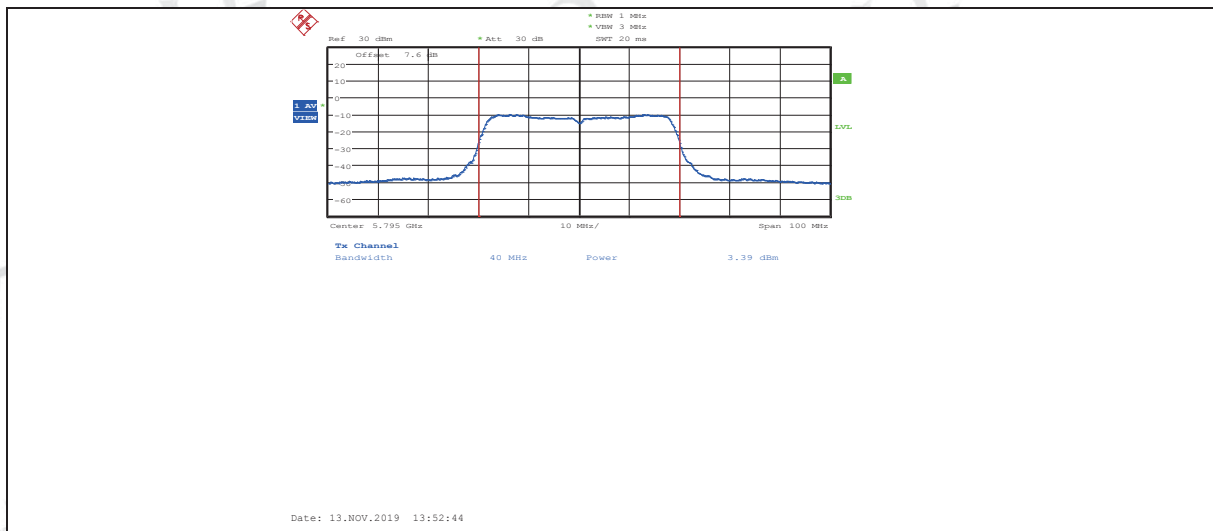
Date: 13.NOV.2019 13:48:32

11N40SISO_ANT1_5755



Date: 13.NOV.2019 13:51:28

11N40SISO_ANT1_5795



Date: 13.NOV.2019 13:52:44

6. Power Spectral Density

6.1. Block diagram of test setup

Same with 4.1

6.2. Limits

FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	Other than Mobile and portable:17 dBm/MHz Mobile and portable:11 dBm/MHz	5150-5250
	11 dBm/MHz	5250-5350
	11 dBm/MHz	5470-5725
	30 dBm/500 kHz	5725-5850

6.3. Test Procedure

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW.

Connect the UUT to the spectrum analyser and use the following settings:

5150 MHz~5250 MHz, 5250 MHz~5350 MHz, 5470 MHz~5725 MHz

Center Frequency	The centre frequency of the channel under test
Detector	RMS
RBW	1MHz
VBW	$\geq 3 \times \text{RBW}$
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

5725 MHz-5850 MHz

Center Frequency	The centre frequency of the channel under test
Detector	RMS
RBW	500 kHz
VBW	$\geq 3 \times \text{RBW}$
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Note:

1. For UNII-3, according to KDB publication 789033 D02 General U-NII Test Procedures New Rules v02r01, section II.F.5., it is acceptable to set RBW at 1 MHz and VBW at 3 MHz if the spectrum analyzer does not have 500 kHz RBW.
 2. The value measured with RBW=1MHz is to be added with $10\log(500\text{kHz}/1\text{MHz})$ which is - 3dB. For example, if the measured value is +10 dBm using RBW=1 MHz (that is +10 dBm/MHz), then the converted value will be +7 dBm/500 kHz.
- Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

6.4. Test Result

(5150-5250)

Test Mode	Ant	Test Channel	PSD [dBm/MHz]	Limit [dBm/MHz]
11A	ANT1	5180	-4.92	11
11A	ANT1	5200	-5.12	11
11A	ANT1	5240	-5.17	11
11N20	ANT1	5180	-5.77	11
11N20	ANT1	5200	-5.84	11
11N20	ANT1	5240	-5.96	11
11N40	ANT1	5190	-10.43	11
11N40	ANT1	5230	-8.79	11

(5250-5350, 5470-5725)

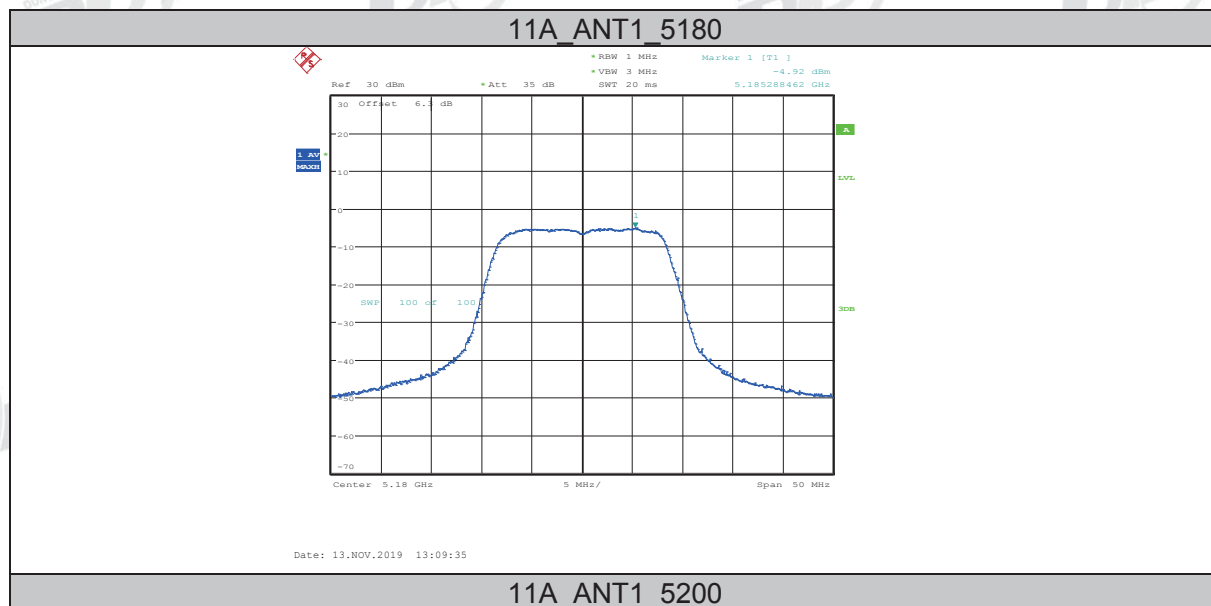
Test Mode	Ant	Test Channel	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	ANT1	5260	-5.22	11	PASS
11A	ANT1	5280	-5.34	11	PASS
11A	ANT1	5320	-5.67	11	PASS
11A	ANT1	5500	-4.74	11	PASS
11A	ANT1	5580	-2.85	11	PASS
11A	ANT1	5700	-3.93	11	PASS
11N20	ANT1	5260	-5.93	11	PASS
11N20	ANT1	5300	-6.42	11	PASS
11N20	ANT1	5320	-6.23	11	PASS
11N20	ANT1	5500	-5.85	11	PASS
11N20	ANT1	5580	-3.88	11	PASS
11N20	ANT1	5700	-4.57	11	PASS
11N40	ANT1	5270	-10.49	11	PASS
11N40	ANT1	5310	-8.95	11	PASS
11N40	ANT1	5510	-8.03	11	PASS

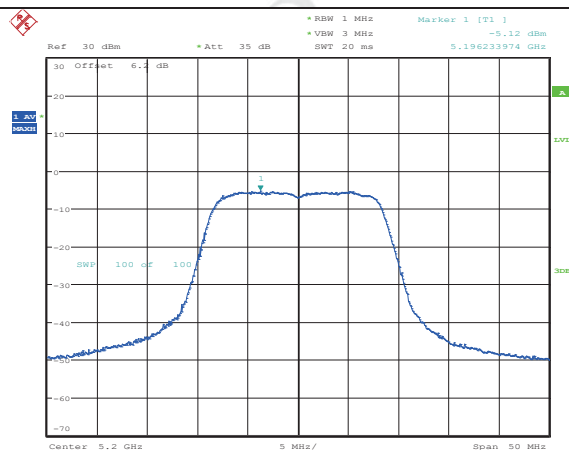
11N40	ANT1	5550	-11.02	11	PASS
11N40	ANT1	5670	-7.40	11	PASS

(5725-5850)

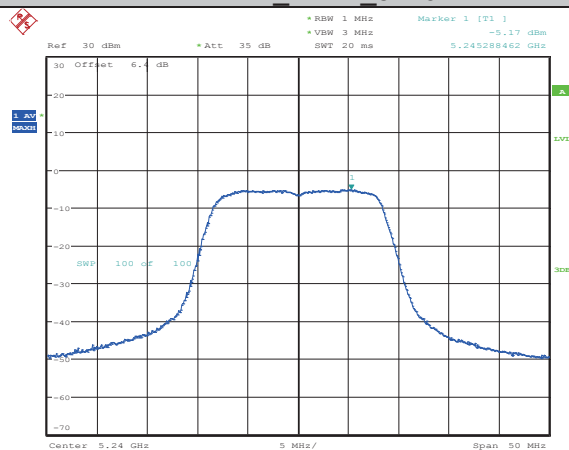
Test Mode	Test Channel	Ant	PSD [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
11A	ANT1	5745	-5.73	30	PASS
11A	ANT1	5785	-7.90	30	PASS
11A	ANT1	5825	-9.49	30	PASS
11N20	ANT1	5745	-5.99	30	PASS
11N20	ANT1	5785	-9.87	30	PASS
11N20	ANT1	5825	-9.92	30	PASS
11N40	ANT1	5755	-9.93	30	PASS
11N40	ANT1	5795	-12.64	30	PASS

6.5. Original test data

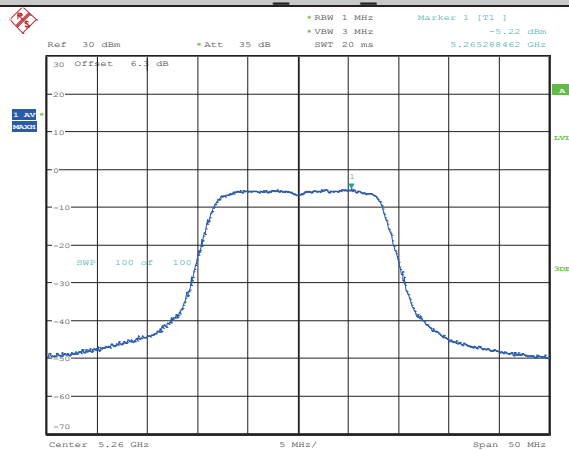




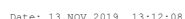
11A ANT1_5240



11A ANT1_5260



11A ANT1_5300



*RBW 1 MHz
 *VBW 3 MHz
 *SWT 20 ms

Marker 1 [T1]
 -5.67 dBm
 5.32548715 GHz

Ref 30 dBm
 *Att 35 dB

30 Offset 6.1 dB

1 A
 dBm

SWP 100 dB 100

Center 5.32 GHz
 5 MHz/
 Span 50 MHz

Date: 13.NOV.2019 13:12:44

Ref 30 dBm *Att 35 dB *RBW 1 MHz *VBW 3 MHz Marker 1 [T1] -4.74 dBm 5.505448718 GHz

30 Offset 6.4 dB

10

0

-10

-20

-30

-40

-50

-60

-70

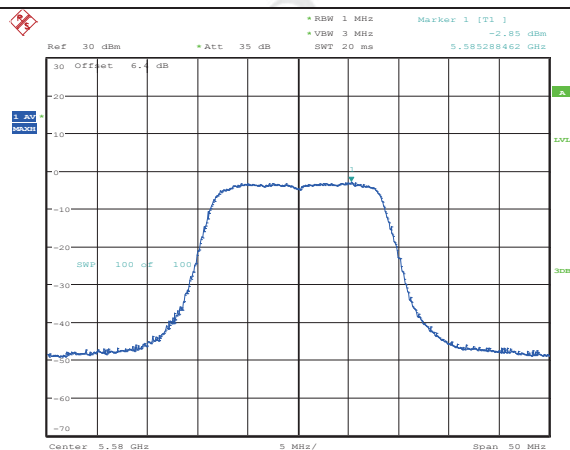
SWP 100.00

1

Center 5.5 GHz 5 MHz/ Span 50 MHz

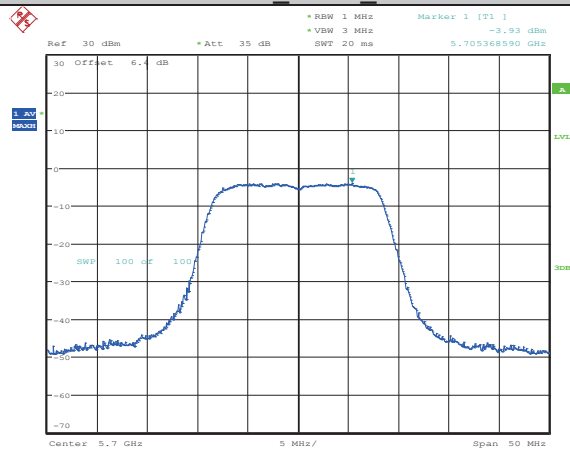
Date: 13.NOV.2019 13:13:59

11A ANT1 5580



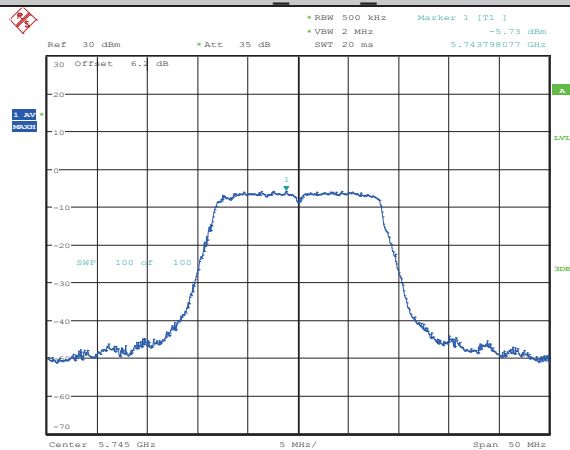
Date: 13.NOV.2019 13:16:27

11A ANT1_5700



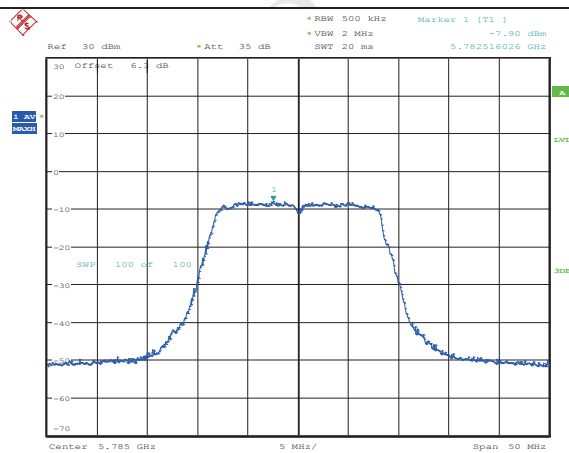
Date: 13.NOV.2019 13:17:25

11A ANT1_5745

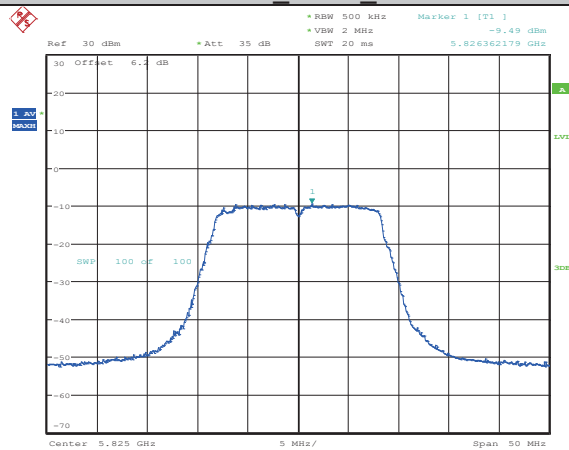


Date: 13.NOV.2019 13:18:21

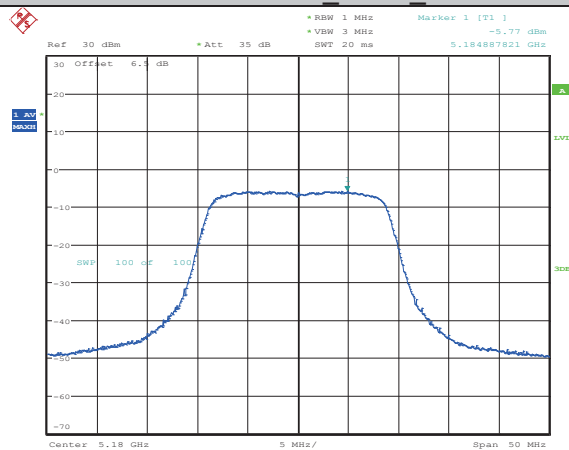
11A ANT1_5785



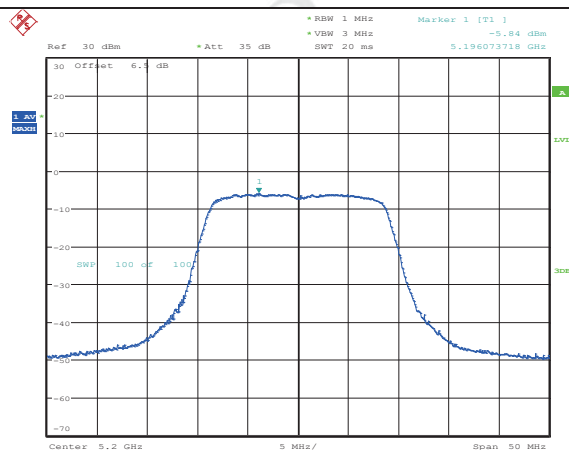
11A_ANT1_5825



11N20SISO_ANT1_5180

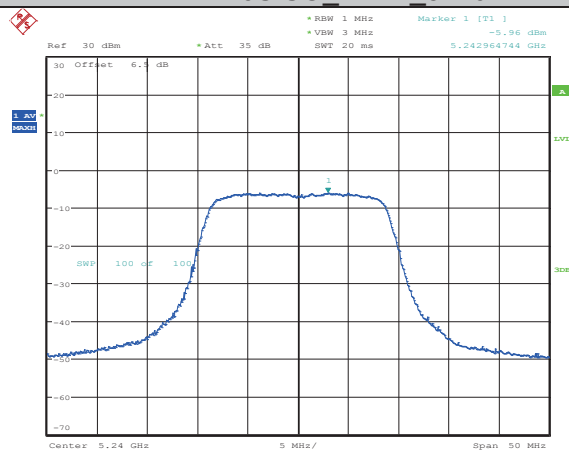


11N20SISO_ANT1_5200



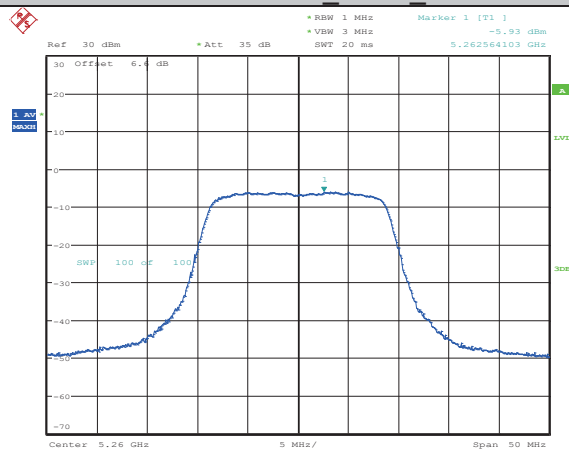
Date: 13.NOV.2019 13:24:29

11N20SISO ANT1_5240



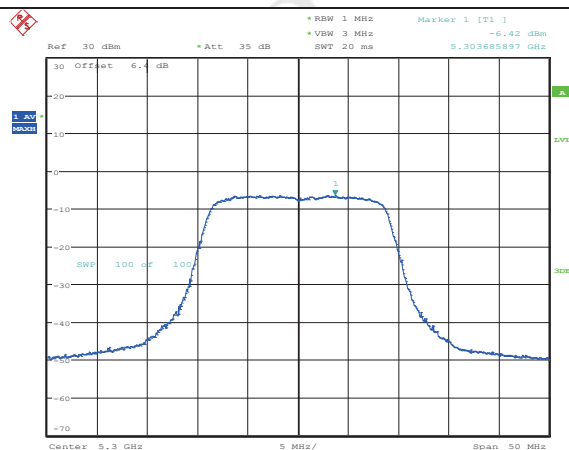
Date: 13.NOV.2019 13:26:00

11N20SISO ANT1_5260



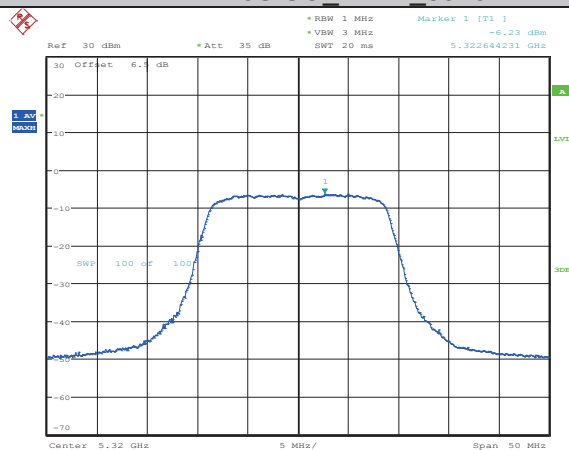
Date: 13.NOV.2019 13:27:23

11N20SISO ANT1_5300



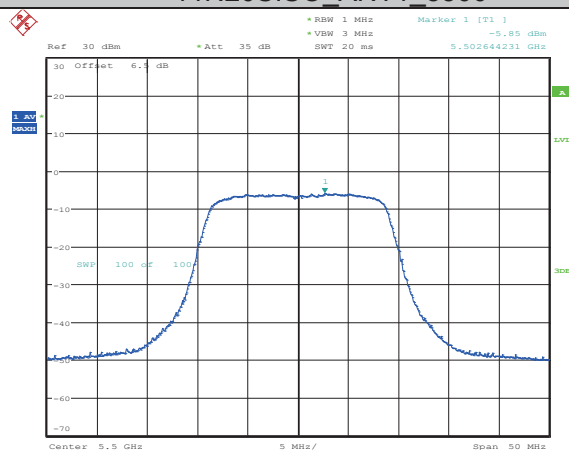
Date: 13.NOV.2019 13:28:46

11N20SISO ANT1_5320



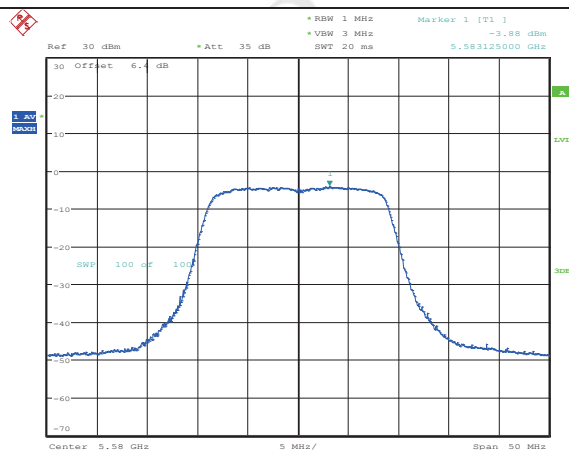
Date: 13.NOV.2019 13:29:51

11N20SISO ANT1_5500



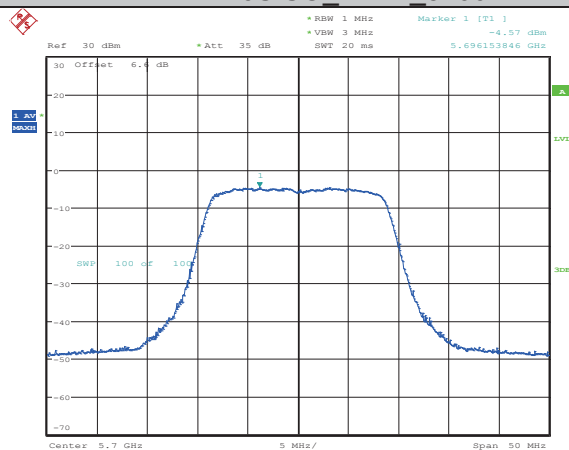
Date: 13.NOV.2019 13:31:00

11N20SISO ANT1_5580



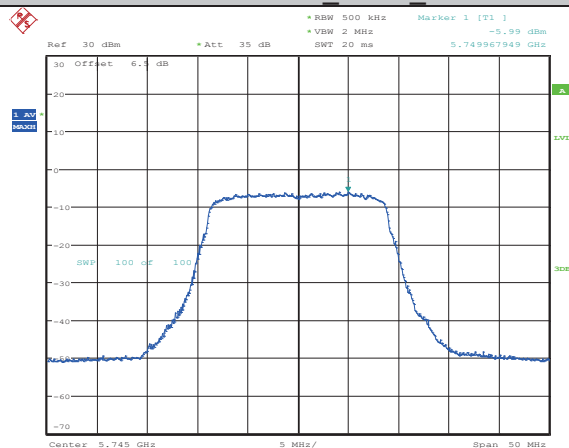
Date: 13.NOV.2019 13:32:30

11N20SISO_ANT1_5700



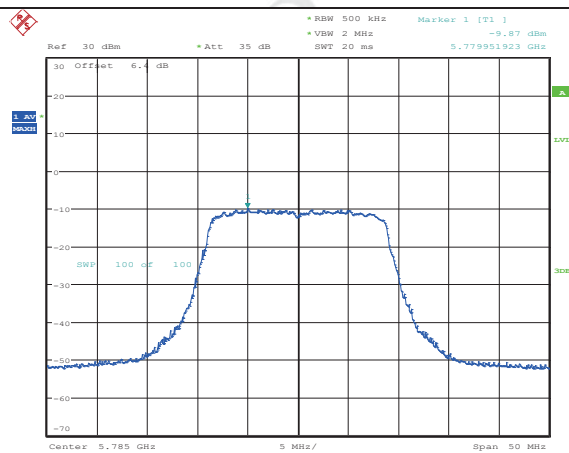
Date: 13.NOV.2019 13:34:14

11N20SISO_ANT1_5745



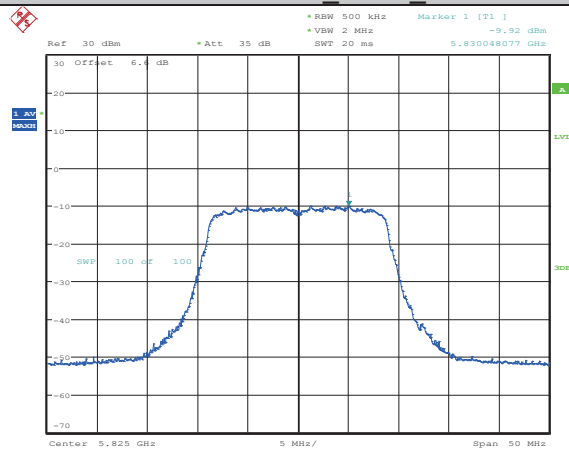
Date: 13.NOV.2019 13:38:44

11N20SISO_ANT1_5785



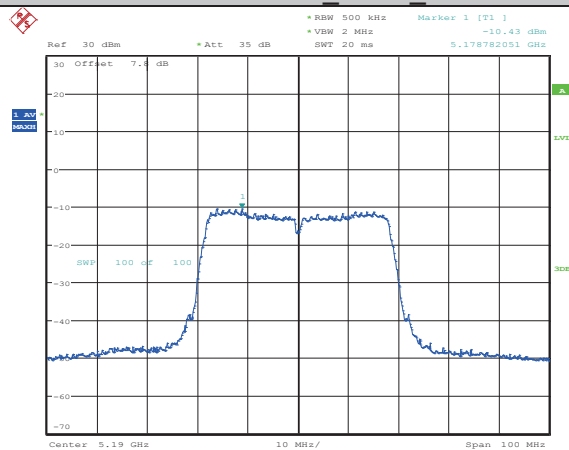
Date: 13.NOV.2019 13:39:50

11N20SISO ANT1_5825



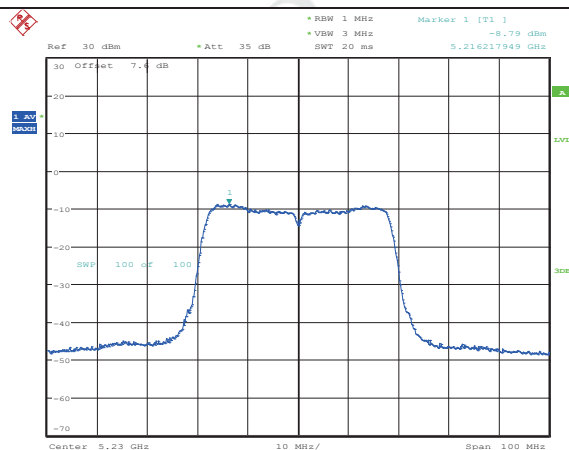
Date: 13.NOV.2019 13:40:55

11N40SISO ANT1_5190

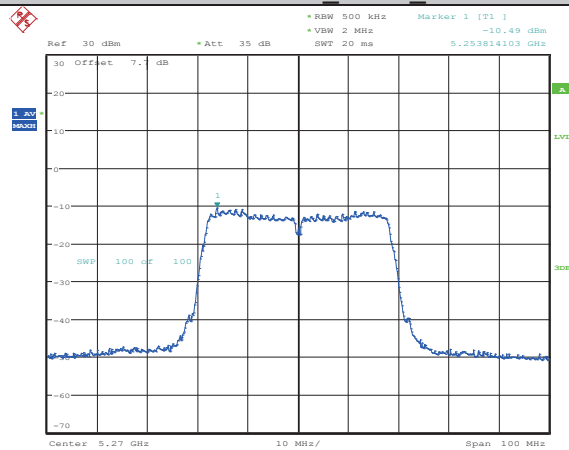


Date: 13.NOV.2019 13:42:09

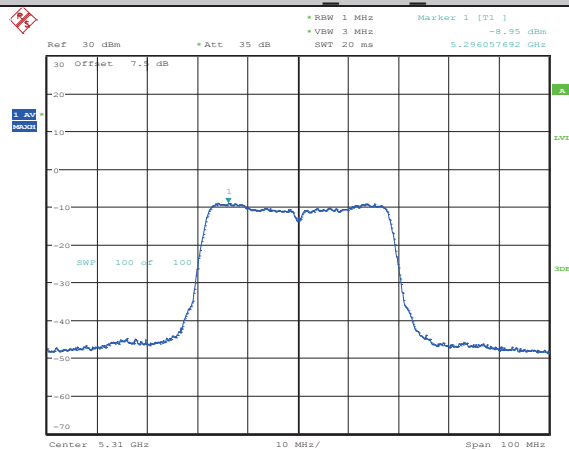
11N40SISO ANT1_5230



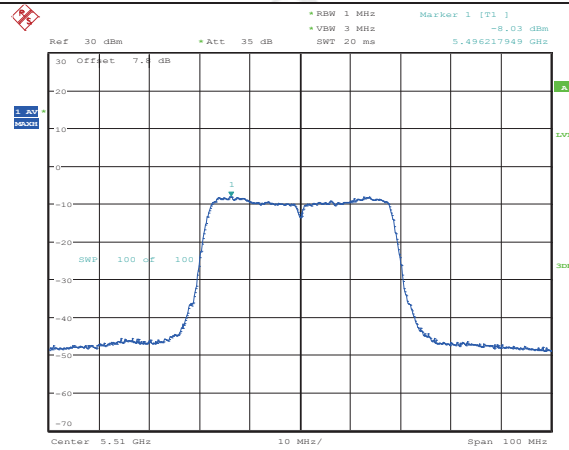
11N40SISO ANT1_5270



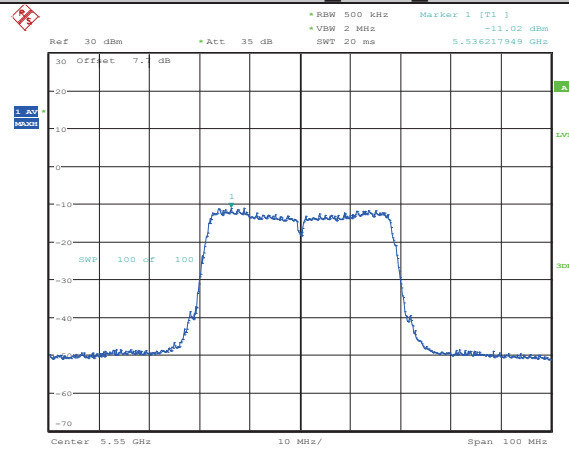
11N40SISO ANT1_5310



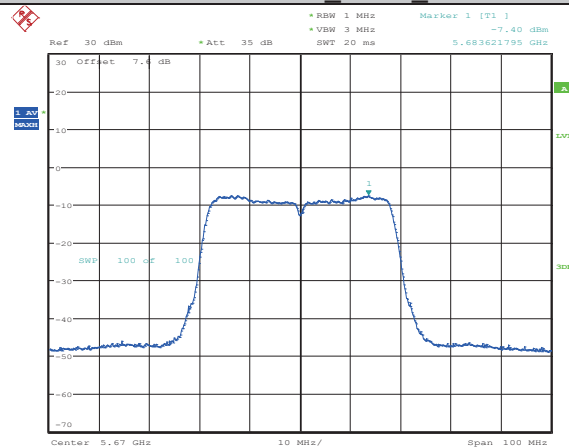
11N40SISO ANT1_5510



11N40SISO ANT1_5550



11N40SISO ANT1_5670



11N40SISO ANT1_5755



7. Frequency Stability Measurement

7.1. Limit of Frequency Stability

Manufacturers 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.

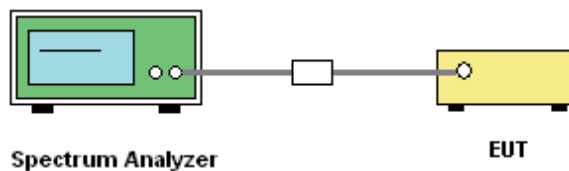
7.2. Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

7.3. Test Procedures

- (1) To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- (2) The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
- (3) The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

7.4. Test Setup



7.5. Test Result

Voltage								
Test Mode	Antenna	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	ANT1	5180	NV	NT	200	0.03861	20	PASS
11A	ANT1	5180	LV	NT	200	0.03861	20	PASS
11A	ANT1	5180	HV	NT	200	0.03861	20	PASS
11A	ANT1	5190	NV	NT	200	0.038536	20	PASS
11A	ANT1	5190	LV	NT	200	0.038536	20	PASS
11A	ANT1	5190	HV	NT	200	0.038536	20	PASS
11A	ANT1	5200	NV	NT	200	0.038462	20	PASS
11A	ANT1	5200	LV	NT	400	0.076923	20	PASS
11A	ANT1	5200	HV	NT	200	0.038462	20	PASS
11A	ANT1	5230	NV	NT	200	0.038241	20	PASS
11A	ANT1	5230	LV	NT	200	0.038241	20	PASS
11A	ANT1	5230	HV	NT	200	0.038241	20	PASS
11A	ANT1	5240	NV	NT	200	0.038168	20	PASS
11A	ANT1	5240	LV	NT	200	0.038168	20	PASS
11A	ANT1	5240	HV	NT	200	0.038168	20	PASS

11A	ANT1	5260	NV	NT	200	0.038023	20	PASS
11A	ANT1	5260	LV	NT	0	0	20	PASS
11A	ANT1	5260	HV	NT	200	0.038023	20	PASS
11A	ANT1	5270	NV	NT	200	0.037951	20	PASS
11A	ANT1	5270	LV	NT	200	0.037951	20	PASS
11A	ANT1	5270	HV	NT	200	0.037951	20	PASS
11A	ANT1	5300	NV	NT	200	0.037736	20	PASS
11A	ANT1	5300	LV	NT	200	0.037736	20	PASS
11A	ANT1	5300	HV	NT	200	0.037736	20	PASS
11A	ANT1	5310	NV	NT	200	0.037665	20	PASS
11A	ANT1	5310	LV	NT	200	0.037665	20	PASS
11A	ANT1	5310	HV	NT	200	0.037665	20	PASS
11A	ANT1	5320	NV	NT	200	0.037594	20	PASS
11A	ANT1	5320	LV	NT	200	0.037594	20	PASS
11A	ANT1	5320	HV	NT	200	0.037594	20	PASS
11A	ANT1	5500	NV	NT	200	0.036364	20	PASS
11A	ANT1	5500	LV	NT	200	0.036364	20	PASS
11A	ANT1	5500	HV	NT	200	0.036364	20	PASS
11A	ANT1	5510	NV	NT	200	0.036298	20	PASS
11A	ANT1	5510	LV	NT	200	0.036298	20	PASS
11A	ANT1	5510	HV	NT	200	0.036298	20	PASS
11A	ANT1	5550	NV	NT	200	0.036036	20	PASS
11A	ANT1	5550	LV	NT	200	0.036036	20	PASS
11A	ANT1	5550	HV	NT	200	0.036036	20	PASS
11A	ANT1	5580	NV	NT	200	0.035842	20	PASS
11A	ANT1	5580	LV	NT	200	0.035842	20	PASS
11A	ANT1	5580	HV	NT	200	0.035842	20	PASS
11A	ANT1	5670	NV	NT	200	0.035273	20	PASS
11A	ANT1	5670	LV	NT	200	0.035273	20	PASS
11A	ANT1	5670	HV	NT	200	0.035273	20	PASS
11A	ANT1	5700	NV	NT	200	0.035088	20	PASS
11A	ANT1	5700	LV	NT	200	0.035088	20	PASS
11A	ANT1	5700	HV	NT	200	0.035088	20	PASS
11A	ANT1	5745	NV	NT	200	0.034813	20	PASS
11A	ANT1	5745	LV	NT	200	0.034813	20	PASS
11A	ANT1	5745	HV	NT	200	0.034813	20	PASS
11A	ANT1	5755	NV	NT	0	0	20	PASS
11A	ANT1	5755	LV	NT	200	0.034752	20	PASS
11A	ANT1	5755	HV	NT	200	0.034752	20	PASS
11A	ANT1	5785	NV	NT	200	0.034572	20	PASS
11A	ANT1	5785	LV	NT	200	0.034572	20	PASS
11A	ANT1	5785	HV	NT	200	0.034572	20	PASS
11A	ANT1	5795	NV	NT	200	0.034513	20	PASS
11A	ANT1	5795	LV	NT	200	0.034513	20	PASS
11A	ANT1	5795	HV	NT	200	0.034513	20	PASS
11A	ANT1	5825	NV	NT	200	0.034335	20	PASS
11A	ANT1	5825	LV	NT	200	0.034335	20	PASS
11A	ANT1	5825	HV	NT	200	0.034335	20	PASS

Temperature								
Test Mode	Antenna	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	ANT1	5180	NV	-30	0	0	20	PASS
11A	ANT1	5180	NV	-20	200	0.03861	20	PASS
11A	ANT1	5180	NV	-10	200	0.03861	20	PASS
11A	ANT1	5180	NV	0	0	0	20	PASS
11A	ANT1	5180	NV	10	200	0.03861	20	PASS
11A	ANT1	5180	NV	20	200	0.03861	20	PASS
11A	ANT1	5180	NV	30	200	0.03861	20	PASS
11A	ANT1	5180	NV	40	0	0	20	PASS
11A	ANT1	5180	NV	50	400	0.07722	20	PASS
11A	ANT1	5190	NV	-30	200	0.038536	20	PASS
11A	ANT1	5190	NV	-20	200	0.038536	20	PASS
11A	ANT1	5190	NV	-10	200	0.038536	20	PASS
11A	ANT1	5190	NV	0	200	0.038536	20	PASS
11A	ANT1	5190	NV	10	200	0.038536	20	PASS
11A	ANT1	5190	NV	20	200	0.038536	20	PASS
11A	ANT1	5190	NV	30	200	0.038536	20	PASS
11A	ANT1	5190	NV	40	200	0.038536	20	PASS
11A	ANT1	5190	NV	50	200	0.038536	20	PASS
11A	ANT1	5200	NV	-30	200	0.038462	20	PASS
11A	ANT1	5200	NV	-20	200	0.038462	20	PASS
11A	ANT1	5200	NV	-10	200	0.038462	20	PASS
11A	ANT1	5200	NV	0	200	0.038462	20	PASS
11A	ANT1	5200	NV	10	200	0.038462	20	PASS
11A	ANT1	5200	NV	20	200	0.038462	20	PASS
11A	ANT1	5200	NV	30	200	0.038462	20	PASS
11A	ANT1	5200	NV	40	200	0.038462	20	PASS
11A	ANT1	5200	NV	50	200	0.038462	20	PASS
11A	ANT1	5230	NV	-30	200	0.038241	20	PASS
11A	ANT1	5230	NV	-20	200	0.038241	20	PASS
11A	ANT1	5230	NV	-10	200	0.038241	20	PASS
11A	ANT1	5230	NV	0	200	0.038241	20	PASS
11A	ANT1	5230	NV	10	200	0.038241	20	PASS
11A	ANT1	5230	NV	20	200	0.038241	20	PASS
11A	ANT1	5230	NV	30	200	0.038241	20	PASS
11A	ANT1	5230	NV	40	200	0.038241	20	PASS
11A	ANT1	5230	NV	50	200	0.038241	20	PASS
11A	ANT1	5240	NV	-30	200	0.038168	20	PASS
11A	ANT1	5240	NV	-20	200	0.038168	20	PASS
11A	ANT1	5240	NV	-10	200	0.038168	20	PASS
11A	ANT1	5240	NV	0	200	0.038168	20	PASS
11A	ANT1	5240	NV	10	200	0.038168	20	PASS
11A	ANT1	5240	NV	20	200	0.038168	20	PASS
11A	ANT1	5240	NV	30	200	0.038168	20	PASS
11A	ANT1	5240	NV	40	200	0.038168	20	PASS
11A	ANT1	5240	NV	50	200	0.038168	20	PASS
11A	ANT1	5260	NV	-30	400	0.076046	20	PASS
11A	ANT1	5260	NV	-20	0	0	20	PASS
11A	ANT1	5260	NV	-10	200	0.038023	20	PASS

11A	ANT1	5260	NV	0	200	0.038023	20	PASS
11A	ANT1	5260	NV	10	200	0.038023	20	PASS
11A	ANT1	5260	NV	20	200	0.038023	20	PASS
11A	ANT1	5260	NV	30	400	0.076046	20	PASS
11A	ANT1	5260	NV	40	400	0.076046	20	PASS
11A	ANT1	5260	NV	50	400	0.076046	20	PASS
11A	ANT1	5270	NV	-30	200	0.037951	20	PASS
11A	ANT1	5270	NV	-20	200	0.037951	20	PASS
11A	ANT1	5270	NV	-10	200	0.037951	20	PASS
11A	ANT1	5270	NV	0	200	0.037951	20	PASS
11A	ANT1	5270	NV	10	200	0.037951	20	PASS
11A	ANT1	5270	NV	20	200	0.037951	20	PASS
11A	ANT1	5270	NV	30	200	0.037951	20	PASS
11A	ANT1	5270	NV	40	200	0.037951	20	PASS
11A	ANT1	5270	NV	50	200	0.037951	20	PASS
11A	ANT1	5300	NV	-30	200	0.037736	20	PASS
11A	ANT1	5300	NV	-20	200	0.037736	20	PASS
11A	ANT1	5300	NV	-10	200	0.037736	20	PASS
11A	ANT1	5300	NV	0	200	0.037736	20	PASS
11A	ANT1	5300	NV	10	200	0.037736	20	PASS
11A	ANT1	5300	NV	20	200	0.037736	20	PASS
11A	ANT1	5300	NV	30	200	0.037736	20	PASS
11A	ANT1	5300	NV	40	200	0.037736	20	PASS
11A	ANT1	5300	NV	50	200	0.037736	20	PASS
11A	ANT1	5310	NV	-30	200	0.037665	20	PASS
11A	ANT1	5310	NV	-20	200	0.037665	20	PASS
11A	ANT1	5310	NV	-10	200	0.037665	20	PASS
11A	ANT1	5310	NV	0	200	0.037665	20	PASS
11A	ANT1	5310	NV	10	200	0.037665	20	PASS
11A	ANT1	5310	NV	20	200	0.037665	20	PASS
11A	ANT1	5310	NV	30	200	0.037665	20	PASS
11A	ANT1	5310	NV	40	200	0.037665	20	PASS
11A	ANT1	5310	NV	50	200	0.037665	20	PASS
11A	ANT1	5320	NV	-30	200	0.037594	20	PASS
11A	ANT1	5320	NV	-20	200	0.037594	20	PASS
11A	ANT1	5320	NV	-10	200	0.037594	20	PASS
11A	ANT1	5320	NV	0	200	0.037594	20	PASS
11A	ANT1	5320	NV	10	200	0.037594	20	PASS
11A	ANT1	5320	NV	20	200	0.037594	20	PASS
11A	ANT1	5320	NV	30	200	0.037594	20	PASS
11A	ANT1	5320	NV	40	200	0.037594	20	PASS
11A	ANT1	5320	NV	50	200	0.037594	20	PASS
11A	ANT1	5500	NV	-30	200	0.036364	20	PASS
11A	ANT1	5500	NV	-20	200	0.036364	20	PASS
11A	ANT1	5500	NV	-10	200	0.036364	20	PASS
11A	ANT1	5500	NV	0	200	0.036364	20	PASS
11A	ANT1	5500	NV	10	0	0	20	PASS
11A	ANT1	5500	NV	20	200	0.036364	20	PASS
11A	ANT1	5500	NV	30	200	0.036364	20	PASS
11A	ANT1	5500	NV	40	200	0.036364	20	PASS
11A	ANT1	5500	NV	50	200	0.036364	20	PASS

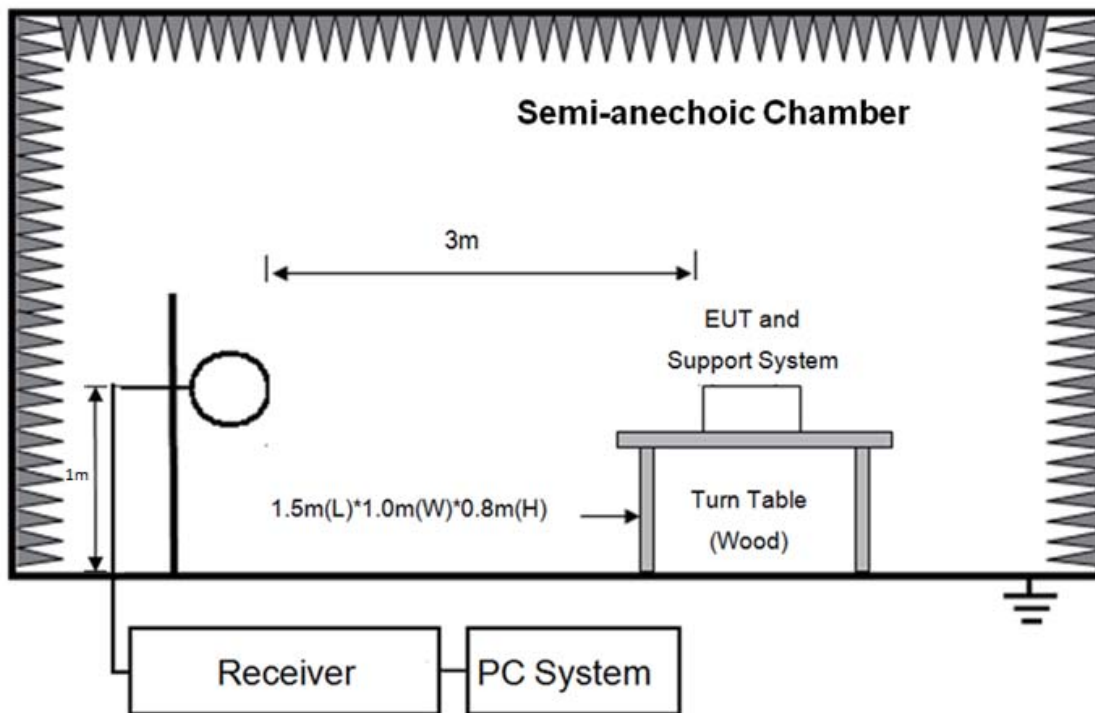
11A	ANT1	5510	NV	-30	200	0.036298	20	PASS
11A	ANT1	5510	NV	-20	200	0.036298	20	PASS
11A	ANT1	5510	NV	-10	200	0.036298	20	PASS
11A	ANT1	5510	NV	0	200	0.036298	20	PASS
11A	ANT1	5510	NV	10	200	0.036298	20	PASS
11A	ANT1	5510	NV	20	200	0.036298	20	PASS
11A	ANT1	5510	NV	30	200	0.036298	20	PASS
11A	ANT1	5510	NV	40	200	0.036298	20	PASS
11A	ANT1	5510	NV	50	200	0.036298	20	PASS
11A	ANT1	5550	NV	-30	200	0.036036	20	PASS
11A	ANT1	5550	NV	-20	200	0.036036	20	PASS
11A	ANT1	5550	NV	-10	200	0.036036	20	PASS
11A	ANT1	5550	NV	0	200	0.036036	20	PASS
11A	ANT1	5550	NV	10	200	0.036036	20	PASS
11A	ANT1	5550	NV	20	200	0.036036	20	PASS
11A	ANT1	5550	NV	30	200	0.036036	20	PASS
11A	ANT1	5550	NV	40	200	0.036036	20	PASS
11A	ANT1	5550	NV	50	200	0.036036	20	PASS
11A	ANT1	5580	NV	-30	200	0.035842	20	PASS
11A	ANT1	5580	NV	-20	200	0.035842	20	PASS
11A	ANT1	5580	NV	-10	200	0.035842	20	PASS
11A	ANT1	5580	NV	0	200	0.035842	20	PASS
11A	ANT1	5580	NV	10	200	0.035842	20	PASS
11A	ANT1	5580	NV	20	400	0.071685	20	PASS
11A	ANT1	5580	NV	30	200	0.035842	20	PASS
11A	ANT1	5580	NV	40	200	0.035842	20	PASS
11A	ANT1	5580	NV	50	200	0.035842	20	PASS
11A	ANT1	5670	NV	-30	200	0.035273	20	PASS
11A	ANT1	5670	NV	-20	200	0.035273	20	PASS
11A	ANT1	5670	NV	-10	200	0.035273	20	PASS
11A	ANT1	5670	NV	0	200	0.035273	20	PASS
11A	ANT1	5670	NV	10	200	0.035273	20	PASS
11A	ANT1	5670	NV	20	200	0.035273	20	PASS
11A	ANT1	5670	NV	30	200	0.035273	20	PASS
11A	ANT1	5670	NV	40	200	0.035273	20	PASS
11A	ANT1	5670	NV	50	200	0.035273	20	PASS
11A	ANT1	5700	NV	-30	200	0.035088	20	PASS
11A	ANT1	5700	NV	-20	200	0.035088	20	PASS
11A	ANT1	5700	NV	-10	200	0.035088	20	PASS
11A	ANT1	5700	NV	0	200	0.035088	20	PASS
11A	ANT1	5700	NV	10	200	0.035088	20	PASS
11A	ANT1	5700	NV	20	200	0.035088	20	PASS
11A	ANT1	5700	NV	30	200	0.035088	20	PASS
11A	ANT1	5700	NV	40	200	0.035088	20	PASS
11A	ANT1	5700	NV	50	200	0.035088	20	PASS
11A	ANT1	5745	NV	-30	200	0.034813	20	PASS
11A	ANT1	5745	NV	-20	200	0.034813	20	PASS
11A	ANT1	5745	NV	-10	200	0.034813	20	PASS
11A	ANT1	5745	NV	0	200	0.034813	20	PASS
11A	ANT1	5745	NV	10	200	0.034813	20	PASS
11A	ANT1	5745	NV	20	200	0.034813	20	PASS

11A	ANT1	5745	NV	30	200	0.034813	20	PASS
11A	ANT1	5745	NV	40	200	0.034813	20	PASS
11A	ANT1	5745	NV	50	200	0.034813	20	PASS
11A	ANT1	5755	NV	-30	200	0.034752	20	PASS
11A	ANT1	5755	NV	-20	200	0.034752	20	PASS
11A	ANT1	5755	NV	-10	200	0.034752	20	PASS
11A	ANT1	5755	NV	0	200	0.034752	20	PASS
11A	ANT1	5755	NV	10	0	0	20	PASS
11A	ANT1	5755	NV	20	200	0.034752	20	PASS
11A	ANT1	5755	NV	30	0	0	20	PASS
11A	ANT1	5755	NV	40	200	0.034752	20	PASS
11A	ANT1	5755	NV	50	200	0.034752	20	PASS
11A	ANT1	5785	NV	-30	200	0.034572	20	PASS
11A	ANT1	5785	NV	-20	200	0.034572	20	PASS
11A	ANT1	5785	NV	-10	200	0.034572	20	PASS
11A	ANT1	5785	NV	0	200	0.034572	20	PASS
11A	ANT1	5785	NV	10	200	0.034572	20	PASS
11A	ANT1	5785	NV	20	200	0.034572	20	PASS
11A	ANT1	5785	NV	30	200	0.034572	20	PASS
11A	ANT1	5785	NV	40	200	0.034572	20	PASS
11A	ANT1	5785	NV	50	200	0.034572	20	PASS
11A	ANT1	5795	NV	-30	200	0.034513	20	PASS
11A	ANT1	5795	NV	-20	200	0.034513	20	PASS
11A	ANT1	5795	NV	-10	200	0.034513	20	PASS
11A	ANT1	5795	NV	0	200	0.034513	20	PASS
11A	ANT1	5795	NV	10	200	0.034513	20	PASS
11A	ANT1	5795	NV	20	200	0.034513	20	PASS
11A	ANT1	5795	NV	30	200	0.034513	20	PASS
11A	ANT1	5795	NV	40	200	0.034513	20	PASS
11A	ANT1	5795	NV	50	200	0.034513	20	PASS
11A	ANT1	5825	NV	-30	200	0.034335	20	PASS
11A	ANT1	5825	NV	-20	200	0.034335	20	PASS
11A	ANT1	5825	NV	-10	200	0.034335	20	PASS
11A	ANT1	5825	NV	0	200	0.034335	20	PASS
11A	ANT1	5825	NV	10	200	0.034335	20	PASS
11A	ANT1	5825	NV	20	200	0.034335	20	PASS
11A	ANT1	5825	NV	30	200	0.034335	20	PASS
11A	ANT1	5825	NV	40	200	0.034335	20	PASS
11A	ANT1	5825	NV	50	200	0.034335	20	PASS

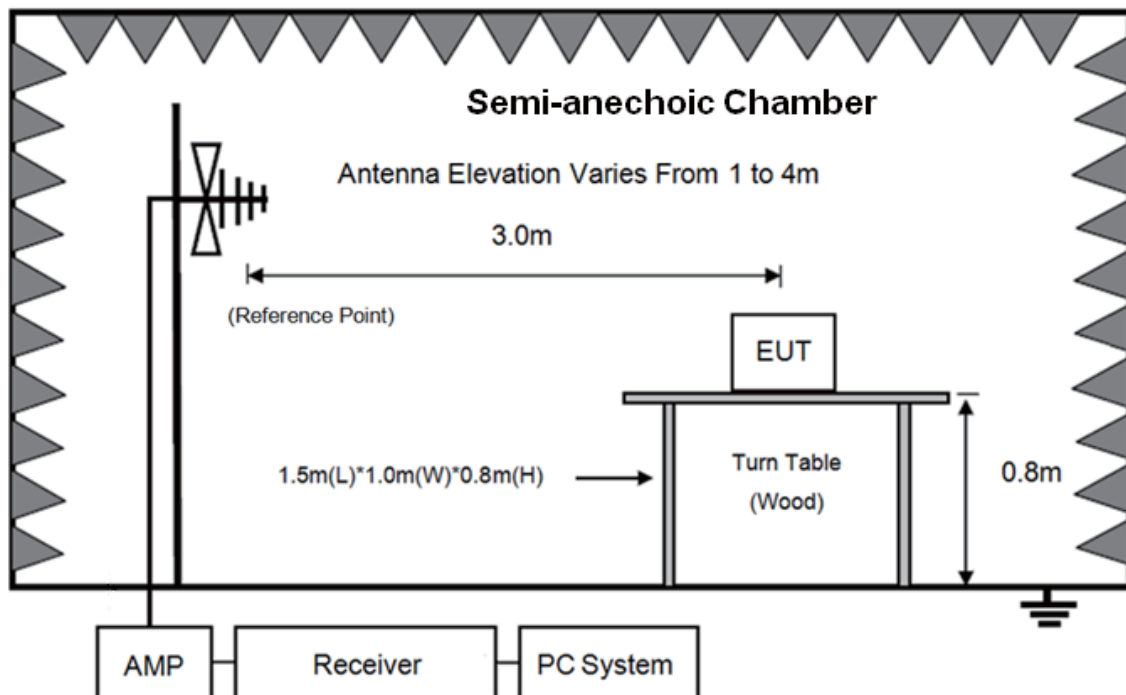
8. Emissions in restricted frequency bands

8.1. Block diagram of test setup

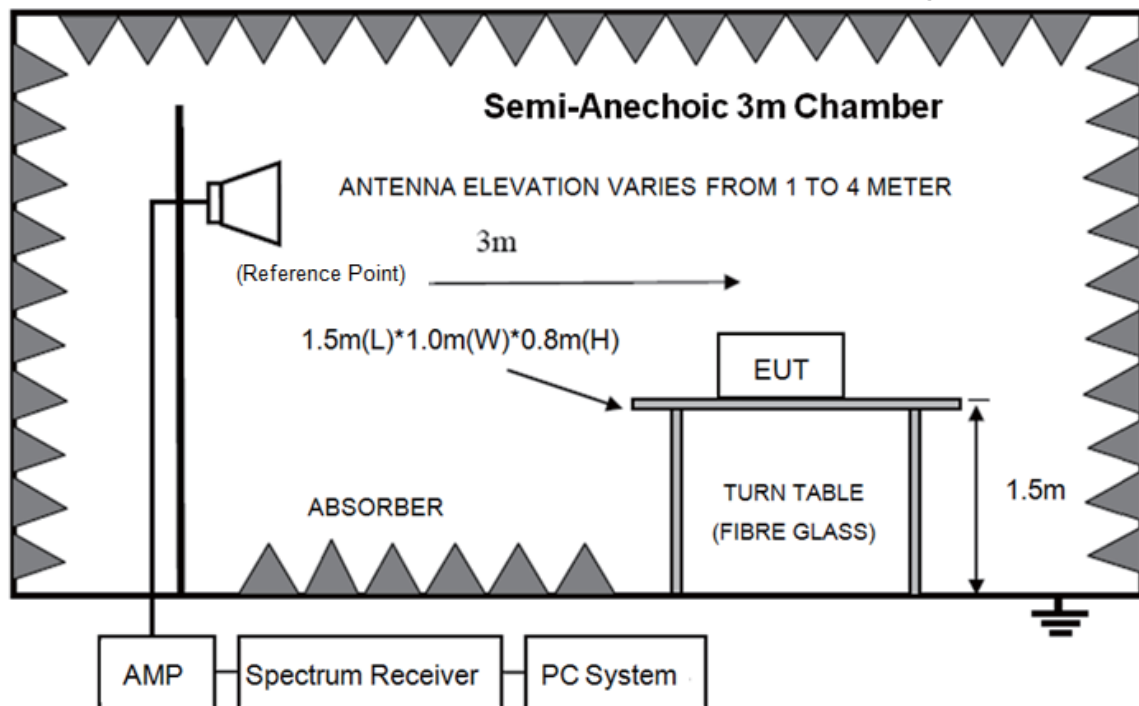
In 3m Anechoic Chamber Test Setup Diagram for 9kHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for 30MHz-1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

8.2. Limit

8.3.1 FCC 15.205 Restricted frequency band

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
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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			

8.3.2 FCC 15.209 Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V}/\text{m}) + 40\text{Log}(30\text{m}/3\text{m})$$

8.3.3 Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 limits.

8.3. Test Procedure

- (1) EUT height should be 0.8 m for below 1 GHz at a semi - anechoic chamber while EUT height should be 1.5 m for above 1GHz at full chamber or semi - anechoic chamber ground with absorbers
- (2) Setup EUT and assistant system according clause 2.3 and 8.2
- (3) Test antenna was located 3m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test distance
9 kHz-30 MHz	Active Loop antenna	3 m
30 MHz-1 GHz	Trilog Broadband Antenna	3 m
1 GHz-18 GHz	Double Ridged Horn Antenna(1GHz-18GHz)	3 m
18 GHz-40 GHz	Horn Antenna(18GHz-40GHz)	1 m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical

axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(4) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 40 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 40 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so below final test was performed with frequency range from 30 MHz to 18 GHz.

(5) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10:2013 on Radiated Emission test.

(6) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9kHz-90kHz, 110kHz-490kHz and above 1GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(7) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9 kHz-150 kHz	200 Hz
150 kHz-30 MHz	9 kHz
30 MHz-1 GHz	120 kHz

(8) For emissions above 1 GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3MHz for Peak measure, the RBW is set at 1 MHz, VBW is set at 10 Hz for AV value.

8.4. Test result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9kHz to 40GHz were comply with 15.209 limit.

Note1: According exploratory test no any obvious emission was detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 11a mode.

Note3: For below test data, when the limit tabular marked “/” means this frequency point is the fundamental emission and no need comply with this limit.

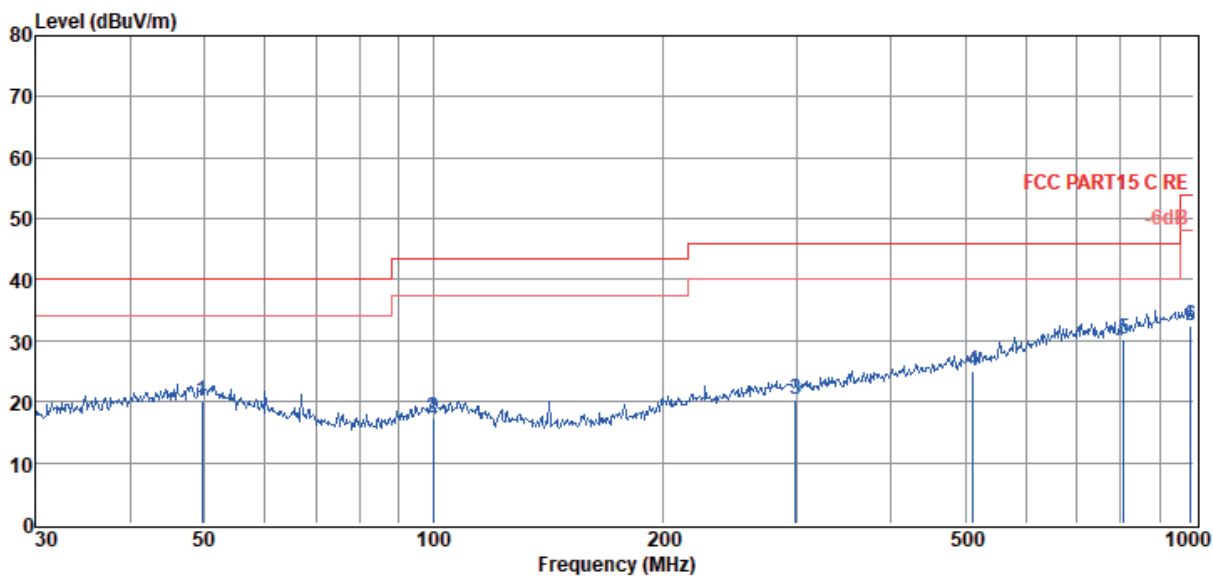
Radiated Emission test (below 1GHz)

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#
Test Date : 2019-11-11
EUT : Portable High Resolution Music Player
Power Supply : Battery
Condition : Temp:24.5°C, Humi:55%, Press:101.4kPa
Memo :

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC BELOW1G.EM6
Tested By : Jacky
Model Number : M11 Pro
Test Mode : Tx mode
Antenna/Distance : 2018 VULB 9163 1#/3m/VERTICAL

Data: 7



Item (Mark)	Freq. (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	49.71	1.54	14.57	3.87	19.98	40.00	-20.02	QP	VERTICAL
2	99.88	1.34	11.68	4.20	17.22	43.50	-26.28	QP	VERTICAL
3	299.32	1.17	13.99	5.18	20.34	46.00	-25.66	QP	VERTICAL
4	511.84	1.81	17.28	5.86	24.95	46.00	-21.05	QP	VERTICAL
5	807.43	2.95	20.78	6.62	30.35	46.00	-15.65	QP	VERTICAL
6	989.54	2.74	22.69	7.06	32.49	54.00	-21.51	QP	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
BELOW1G.EM6

Test Date : 2019-11-11

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

Power Supply : Battery

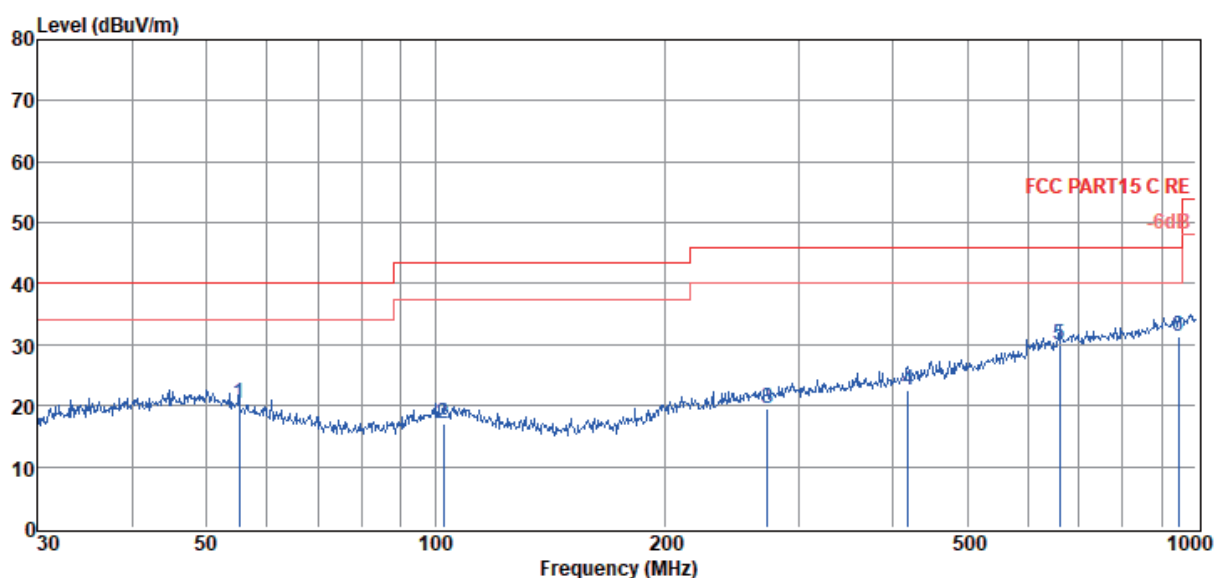
Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:101.4kPa

Antenna/Distance : 2018 VULB 9163 1#/3m/HORIZONTAL

Memo :

Data: 8



Item (Mark)	Freq. (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	55.22	3.60	12.86	3.91	20.37	40.00	-19.63	QP	HORIZONTAL
2	102.36	1.05	11.72	4.22	16.99	43.50	-26.51	QP	HORIZONTAL
3	273.23	1.11	13.40	5.09	19.60	46.00	-26.40	QP	HORIZONTAL
4	417.64	0.96	15.89	5.57	22.42	46.00	-23.58	QP	HORIZONTAL
5	661.15	4.25	19.51	6.27	30.03	46.00	-15.97	QP	HORIZONTAL
6	948.76	2.00	22.25	7.06	31.31	46.00	-14.69	QP	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Radiated Emission test (above 1GHz)

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	PRM Factor(dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
11a CH36									
5760.00	44.78	34.51	43.12	6.36	42.53	74.00	-31.47	Peak	HORIZONTAL
7936.00	45.00	36.25	43.18	7.26	45.33	74.00	-28.67	Peak	HORIZONTAL
9755.00	45.46	37.26	43.14	8.54	48.12	74.00	-25.88	Peak	HORIZONTAL
10979.00	44.81	37.51	41.41	8.99	49.90	74.00	-24.10	Peak	HORIZONTAL
12866.00	44.64	38.25	42.87	10.49	50.51	74.00	-23.49	Peak	HORIZONTAL
14515.00	43.65	40.31	41.73	11.16	53.39	74.00	-20.61	Peak	HORIZONTAL
5981.00	43.99	34.69	43.16	6.59	42.11	74.00	-31.89	Peak	VERTICAL
8769.00	43.31	36.80	42.18	7.79	45.72	74.00	-28.28	Peak	VERTICAL
11234.00	44.34	38.02	41.91	9.02	49.47	74.00	-24.53	Peak	VERTICAL
13070.00	45.61	38.40	42.75	10.74	52.00	74.00	-22.00	Peak	VERTICAL
13971.00	44.26	40.13	41.79	11.09	53.69	74.00	-20.31	Peak	VERTICAL
16470.00	42.54	41.95	42.39	10.48	52.58	74.00	-21.42	Peak	VERTICAL
11a CH40									
5726.00	43.97	34.49	43.13	6.33	41.66	74.00	-32.34	Peak	HORIZONTAL
8599.00	43.96	36.80	42.17	7.69	46.28	74.00	-27.72	Peak	HORIZONTAL
11319.00	44.11	38.21	42.11	9.03	49.24	74.00	-24.76	Peak	HORIZONTAL
12951.00	44.89	38.28	42.84	10.63	50.96	74.00	-23.04	Peak	HORIZONTAL
14974.00	43.55	40.68	41.70	11.22	53.75	74.00	-20.25	Peak	HORIZONTAL
16555.00	42.86	42.12	42.33	10.53	53.18	74.00	-20.82	Peak	HORIZONTAL
5420.00	44.44	34.24	43.28	6.01	41.41	74.00	-32.59	Peak	VERTICAL
8616.00	43.45	36.80	42.17	7.70	45.78	74.00	-28.22	Peak	VERTICAL
10775.00	44.57	37.59	41.90	8.94	49.20	74.00	-24.80	Peak	VERTICAL
12050.00	46.10	38.01	42.70	9.18	50.59	74.00	-23.41	Peak	VERTICAL
14260.00	43.27	40.25	41.74	11.13	52.91	74.00	-21.09	Peak	VERTICAL
16555.00	43.41	42.12	42.33	10.53	53.73	74.00	-20.27	Peak	VERTICAL
11a CH48									
5556.00	44.64	34.35	43.19	6.15	41.95	74.00	-32.05	Peak	HORIZONTAL
9840.00	45.14	37.31	43.18	8.61	47.88	74.00	-26.12	Peak	HORIZONTAL
12050.00	46.50	38.01	42.70	9.18	50.99	74.00	-23.01	Peak	HORIZONTAL
14141.00	43.11	40.23	41.75	11.12	52.71	74.00	-21.29	Peak	HORIZONTAL
15076.00	43.70	40.67	41.75	11.14	53.76	74.00	-20.24	Peak	HORIZONTAL
16436.00	43.20	41.90	42.40	10.46	53.16	74.00	-20.84	Peak	HORIZONTAL
6474.00	44.61	35.27	43.04	6.40	43.24	74.00	-30.76	Peak	VERTICAL
8820.00	42.89	36.80	42.18	7.82	45.33	74.00	-28.67	Peak	VERTICAL
9789.00	45.59	37.28	43.15	8.57	48.29	74.00	-25.71	Peak	VERTICAL
11625.00	45.32	38.45	42.56	9.06	50.27	74.00	-23.73	Peak	VERTICAL
14379.00	44.10	40.28	41.74	11.15	53.79	74.00	-20.21	Peak	VERTICAL
16334.00	43.54	41.74	42.44	10.41	53.25	74.00	-20.75	Peak	VERTICAL
Conclusion: Pass									
Note: $-27 \text{ dBm/MHz Limit} = 95.2 + \text{EIRP}[\text{dBm}] = 95.2 - 27 = 68.2 \text{ dBμV/m}$ For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.									

Note:1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	PRM Factor(dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
11a CH52									
6151.00	44.42	34.89	43.12	6.54	42.73	74.00	-31.27	Peak	HORIZONTAL
7936.00	45.04	36.25	43.18	7.26	45.37	74.00	-28.63	Peak	HORIZONTAL
10860.00	44.42	37.56	41.69	8.96	49.25	74.00	-24.75	Peak	HORIZONTAL
13070.00	44.67	38.40	42.75	10.74	51.06	74.00	-22.94	Peak	HORIZONTAL
14651.00	43.18	40.42	41.72	11.18	53.06	74.00	-20.94	Peak	HORIZONTAL
16385.00	43.25	41.82	42.42	10.44	53.09	74.00	-20.91	Peak	HORIZONTAL
5556.00	44.16	34.35	43.19	6.15	41.47	74.00	-32.53	Peak	VERTICAL
7851.00	45.19	36.18	43.22	7.16	45.31	74.00	-28.69	Peak	VERTICAL
10401.00	44.62	37.64	42.69	8.84	48.41	74.00	-25.59	Peak	VERTICAL
12050.00	46.38	38.01	42.70	9.18	50.87	74.00	-23.13	Peak	VERTICAL
13920.00	44.06	40.01	41.84	11.07	53.30	74.00	-20.70	Peak	VERTICAL
14719.00	43.36	40.48	41.72	11.19	53.31	74.00	-20.69	Peak	VERTICAL
11a CH56									
9160.00	43.82	36.90	42.46	8.05	46.31	74.00	-27.69	Peak	HORIZONTAL
11336.00	44.58	38.24	42.15	9.03	49.70	74.00	-24.30	Peak	HORIZONTAL
12475.00	45.21	38.10	42.96	9.86	50.21	74.00	-23.79	Peak	HORIZONTAL
13920.00	43.87	40.01	41.84	11.07	53.11	74.00	-20.89	Peak	HORIZONTAL
16385.00	43.66	41.82	42.42	10.44	53.50	74.00	-20.50	Peak	HORIZONTAL
6950.00	45.27	35.57	43.13	6.18	43.89	74.00	-30.11	Peak	VERTICAL
9636.00	45.74	37.19	43.08	8.44	48.29	74.00	-25.71	Peak	VERTICAL
12611.00	45.94	38.15	42.94	10.08	51.23	74.00	-22.77	Peak	VERTICAL
14141.00	43.61	40.23	41.75	11.12	53.21	74.00	-20.79	Peak	VERTICAL
16436.00	43.33	41.90	42.40	10.46	53.29	74.00	-20.71	Peak	VERTICAL
11a CH64									
6729.00	45.57	35.44	43.08	6.28	44.21	74.00	-29.79	Peak	HORIZONTAL
10911.00	44.27	37.53	41.57	8.98	49.21	74.00	-24.79	Peak	HORIZONTAL
12050.00	45.67	38.01	42.70	9.18	50.16	74.00	-23.84	Peak	HORIZONTAL
13920.00	42.82	40.01	41.84	11.07	52.06	74.00	-21.94	Peak	HORIZONTAL
16130.00	43.43	41.41	42.51	10.29	52.62	74.00	-21.38	Peak	HORIZONTAL
6049.00	43.87	34.76	43.15	6.59	42.07	74.00	-31.93	Peak	VERTICAL
7834.00	44.69	36.17	43.22	7.14	44.78	74.00	-29.22	Peak	VERTICAL
9551.00	44.83	37.14	43.04	8.37	47.30	74.00	-26.70	Peak	VERTICAL
11251.00	44.54	38.06	41.95	9.03	49.68	74.00	-24.32	Peak	VERTICAL
12050.00	45.48	38.01	42.70	9.18	49.97	74.00	-24.03	Peak	VERTICAL
12849.00	44.69	38.24	42.87	10.47	50.53	74.00	-23.47	Peak	VERTICAL
Conclusion: Pass									
Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.									

Note:1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	PRM Factor(dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
11a CH110									
8259.00	44.33	36.56	42.64	7.49	45.74	74.00	-28.26	Peak	HORIZONTAL
10214.00	46.04	37.53	42.95	8.80	49.42	74.00	-24.58	Peak	HORIZONTAL
12050.00	46.29	38.01	42.70	9.18	50.78	74.00	-23.22	Peak	HORIZONTAL
14396.00	43.95	40.28	41.74	11.15	53.64	74.00	-20.36	Peak	HORIZONTAL
16334.00	43.44	41.74	42.44	10.41	53.15	74.00	-20.85	Peak	HORIZONTAL
6304.00	44.82	35.07	43.08	6.47	43.28	74.00	-30.72	Peak	VERTICAL
8089.00	45.62	36.39	42.98	7.39	46.42	74.00	-27.58	Peak	VERTICAL
11251.00	45.99	38.06	41.95	9.03	51.13	74.00	-22.87	Peak	VERTICAL
13971.00	43.14	40.13	41.79	11.09	52.57	74.00	-21.43	Peak	VERTICAL
15314.00	43.54	40.57	41.93	10.91	53.09	74.00	-20.91	Peak	VERTICAL
16725.00	42.08	42.50	42.19	10.63	53.02	74.00	-20.98	Peak	VERTICAL
11a CH116									
8514.00	43.79	36.80	42.16	7.64	46.07	74.00	-27.93	Peak	HORIZONTAL
10911.00	44.49	37.53	41.57	8.98	49.43	74.00	-24.57	Peak	HORIZONTAL
12050.00	47.72	38.01	42.70	9.18	52.21	74.00	-21.79	Peak	HORIZONTAL
14039.00	44.28	40.21	41.76	11.10	53.83	74.00	-20.17	Peak	HORIZONTAL
16385.00	43.79	41.82	42.42	10.44	53.63	74.00	-20.37	Peak	HORIZONTAL
7596.00	44.57	35.98	43.31	6.86	44.10	74.00	-29.90	Peak	VERTICAL
10690.00	45.56	37.62	42.10	8.92	50.00	74.00	-24.00	Peak	VERTICAL
13019.00	45.92	38.33	42.81	10.72	52.16	74.00	-21.84	Peak	VERTICAL
14260.00	43.14	40.25	41.74	11.13	52.78	74.00	-21.22	Peak	VERTICAL
16385.00	43.74	41.82	42.42	10.44	53.58	74.00	-20.42	Peak	VERTICAL
11a CH140									
7800.00	44.92	36.14	43.24	7.10	44.92	74.00	-29.08	Peak	HORIZONTAL
11744.00	45.08	38.30	42.60	9.07	49.85	74.00	-24.15	Peak	HORIZONTAL
13376.00	44.62	38.83	42.42	10.86	51.89	74.00	-22.11	Peak	HORIZONTAL
14141.00	43.51	40.23	41.75	11.12	53.11	74.00	-20.89	Peak	HORIZONTAL
16351.00	43.93	41.76	42.43	10.42	53.68	74.00	-20.32	Peak	HORIZONTAL
6066.00	43.12	34.78	43.14	6.58	41.34	74.00	-32.66	Peak	VERTICAL
8259.00	44.21	36.56	42.64	7.49	45.62	74.00	-28.38	Peak	VERTICAL
10979.00	44.67	37.51	41.41	8.99	49.76	74.00	-24.24	Peak	VERTICAL
13495.00	44.91	38.99	42.30	10.90	52.50	74.00	-21.50	Peak	VERTICAL
14549.00	43.37	40.34	41.73	11.17	53.15	74.00	-20.85	Peak	VERTICAL
16266.00	43.67	41.63	42.46	10.37	53.21	74.00	-20.79	Peak	VERTICAL
Conclusion: Pass									
Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.									

Note:1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and

reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Freq (MHz)	Read level (dBμV)	Antenna Factor (dB/m)	PRM Factor(dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector type	Polarization
11a CH149									
6695.00	44.93	35.42	43.07	6.30	43.58	74.00	-30.42	Peak	HORIZONTAL
9279.00	43.08	36.97	42.65	8.15	45.55	74.00	-28.45	Peak	HORIZONTAL
11251.00	44.27	38.06	41.95	9.03	49.41	74.00	-24.59	Peak	HORIZONTAL
13444.00	44.88	38.92	42.35	10.88	52.33	74.00	-21.67	Peak	HORIZONTAL
14634.00	42.97	40.41	41.72	11.18	52.84	74.00	-21.16	Peak	HORIZONTAL
16555.00	42.95	42.12	42.33	10.53	53.27	74.00	-20.73	Peak	HORIZONTAL
6151.00	43.46	34.89	43.12	6.54	41.77	74.00	-32.23	Peak	VERTICAL
8565.00	43.62	36.80	42.16	7.67	45.93	74.00	-28.07	Peak	VERTICAL
10979.00	44.67	37.51	41.41	8.99	49.76	74.00	-24.24	Peak	VERTICAL
12050.00	45.65	38.01	42.70	9.18	50.14	74.00	-23.86	Peak	VERTICAL
14090.00	43.31	40.22	41.75	11.11	52.89	74.00	-21.11	Peak	VERTICAL
16266.00	43.67	41.63	42.46	10.37	53.21	74.00	-20.79	Peak	VERTICAL
11a CH157									
6185.00	43.83	34.93	43.11	6.53	42.18	74.00	-31.82	Peak	HORIZONTAL
8565.00	43.32	36.80	42.16	7.67	45.63	74.00	-28.37	Peak	HORIZONTAL
10894.00	44.43	37.54	41.61	8.97	49.33	74.00	-24.67	Peak	HORIZONTAL
12050.00	45.39	38.01	42.70	9.18	49.88	74.00	-24.12	Peak	HORIZONTAL
14549.00	43.49	40.34	41.73	11.17	53.27	74.00	-20.73	Peak	HORIZONTAL
16504.00	43.02	42.01	42.38	10.50	53.15	74.00	-20.85	Peak	HORIZONTAL
6304.00	44.55	35.07	43.08	6.47	43.01	74.00	-30.99	Peak	VERTICAL
9211.00	42.74	36.93	42.54	8.09	45.22	74.00	-28.78	Peak	VERTICAL
11064.00	44.39	37.64	41.51	9.01	49.53	74.00	-24.47	Peak	VERTICAL
13920.00	43.38	40.01	41.84	11.07	52.62	74.00	-21.38	Peak	VERTICAL
15076.00	43.58	40.67	41.75	11.14	53.64	74.00	-20.36	Peak	VERTICAL
16334.00	43.28	41.74	42.44	10.41	52.99	74.00	-21.01	Peak	VERTICAL
11a CH165									
7715.00	44.81	36.08	43.27	7.00	44.62	74.00	-29.38	Peak	HORIZONTAL
10299.00	44.31	37.58	42.83	8.82	47.88	74.00	-26.12	Peak	HORIZONTAL
11744.00	45.48	38.30	42.60	9.07	50.25	74.00	-23.75	Peak	HORIZONTAL
14396.00	43.95	40.28	41.74	11.15	53.64	74.00	-20.36	Peak	HORIZONTAL
16249.00	44.22	41.60	42.47	10.36	53.71	74.00	-20.29	Peak	HORIZONTAL
9041.00	43.30	36.83	42.26	7.95	45.82	74.00	-28.18	Peak	VERTICAL
10945.00	44.65	37.52	41.49	8.99	49.67	74.00	-24.33	Peak	VERTICAL
13325.00	44.16	38.76	42.48	10.84	51.28	74.00	-22.72	Peak	VERTICAL
13920.00	44.28	40.01	41.84	11.07	53.52	74.00	-20.48	Peak	VERTICAL
16674.00	42.51	42.39	42.23	10.60	53.27	74.00	-20.73	Peak	VERTICAL
Conclusion: Pass									
Note: -27 dBm/MHz Limit=95.2+EIRP[dBm]=95.2-27=68.2 dBμV/m For transmitters operating in the 5150MHz-5250MHz, 5250MHz-5350MHz, 5470MHz-5725MHz, 5725MHz-5850MHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.									

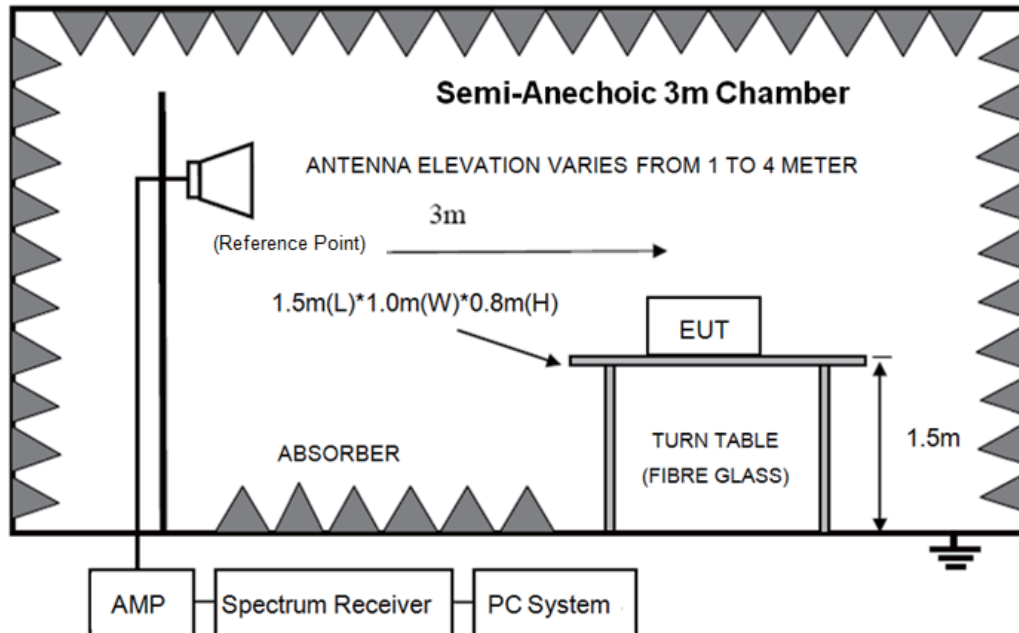
Note: 1. 30MHz~40GHz: (11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.)

2. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

9. Band Edge Compliance

9.1. Block diagram of test setup



9.2. Limit

For transmitters operating in the 5.15-5.25 GHz and 5.725-5.85 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

$$-27 \text{ dBm/MHz Limit} = 95.2 + \text{EIRP}[\text{dBm}] = 95.2 - 27 = 68.2 \text{ dB}\mu\text{V/m}$$

9.3. Test Procedure

Same with clause 8.3 except change investigated frequency range from 5.15-5.25 GHz, 5250-5350 GHz, 5470-5725 GHz, 5.725-5.85 GHz.

Remark: All restriction band have been tested, and only the worst case is shown in report.

9.4. Test result

PASS. (See below detailed test result)

Note1: As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit

Note2: 11a, 11n20, n40 mode all have been tested, only 11a mode is the worst case and reported.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-06

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

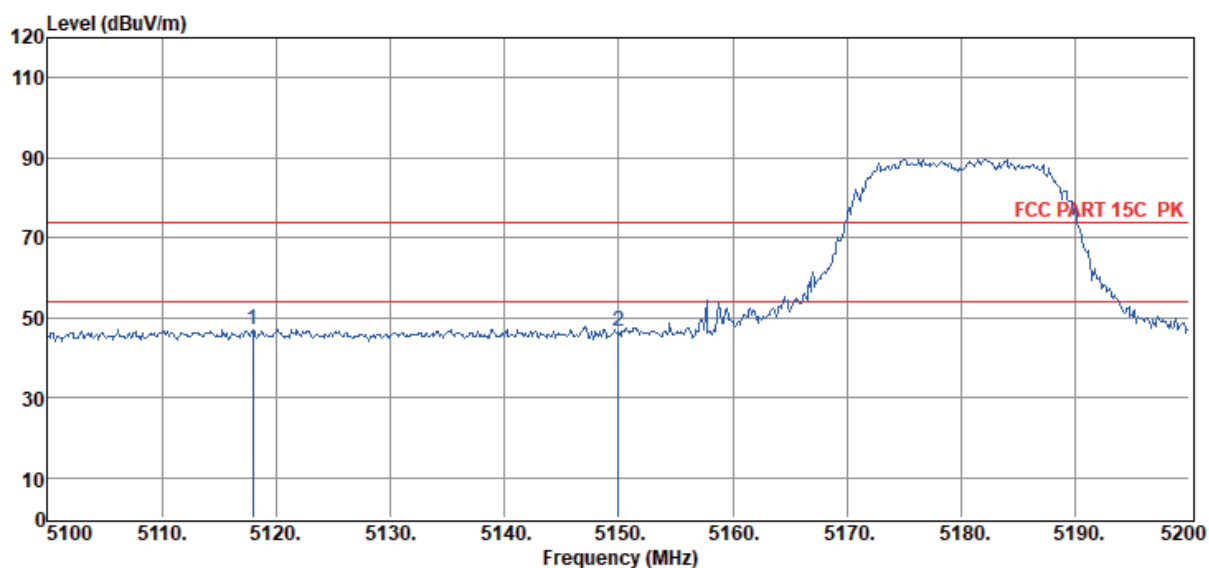
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11A 5180

Data: 45



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5118.00	53.29	31.69	43.56	5.70	47.12	74.00	-26.88	Peak	VERTICAL
2	5150.00	52.61	31.72	43.53	5.73	46.53	74.00	-27.47	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-06

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

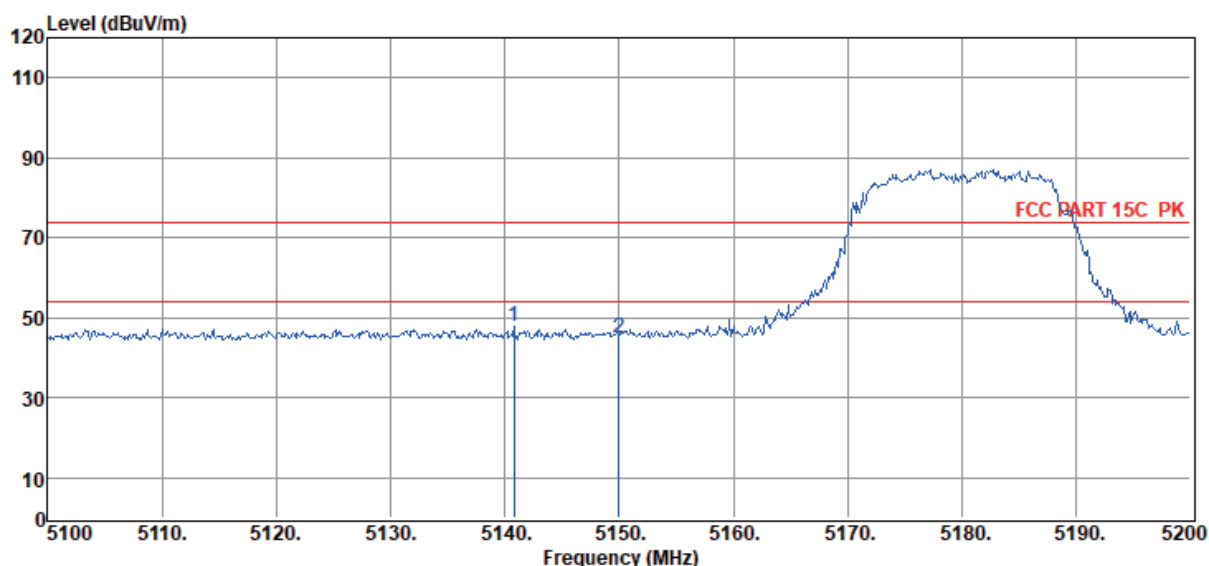
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11A 5180

Data: 46



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5140.80	53.80	31.71	43.54	5.73	47.70	74.00	-26.30	Peak	HORIZONTAL
2	5150.00	51.13	31.72	43.53	5.73	45.05	74.00	-28.95	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

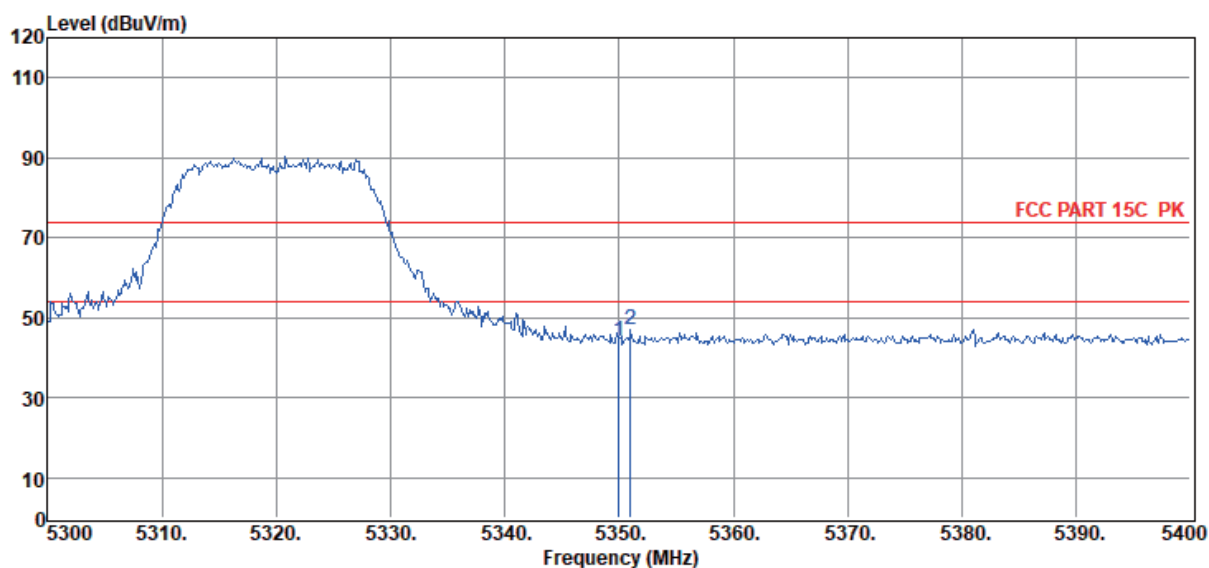
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11A 5320

Data: 47



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5350.00	49.67	31.88	43.34	5.94	44.15	74.00	-29.85	Peak	VERTICAL
2	5351.00	52.65	31.88	43.34	5.94	47.13	74.00	-26.87	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

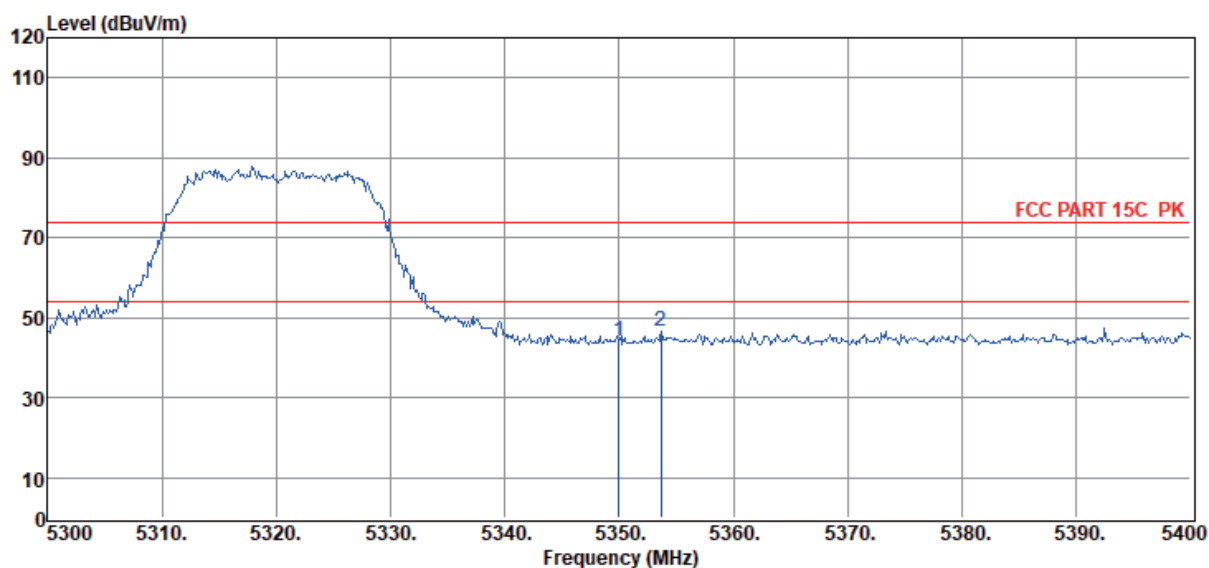
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11A 5320

Data: 48



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5350.00	49.53	31.88	43.34	5.94	44.01	74.00	-29.99	Peak	HORIZONTAL
2	5353.70	52.28	31.88	43.34	5.94	46.76	74.00	-27.24	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

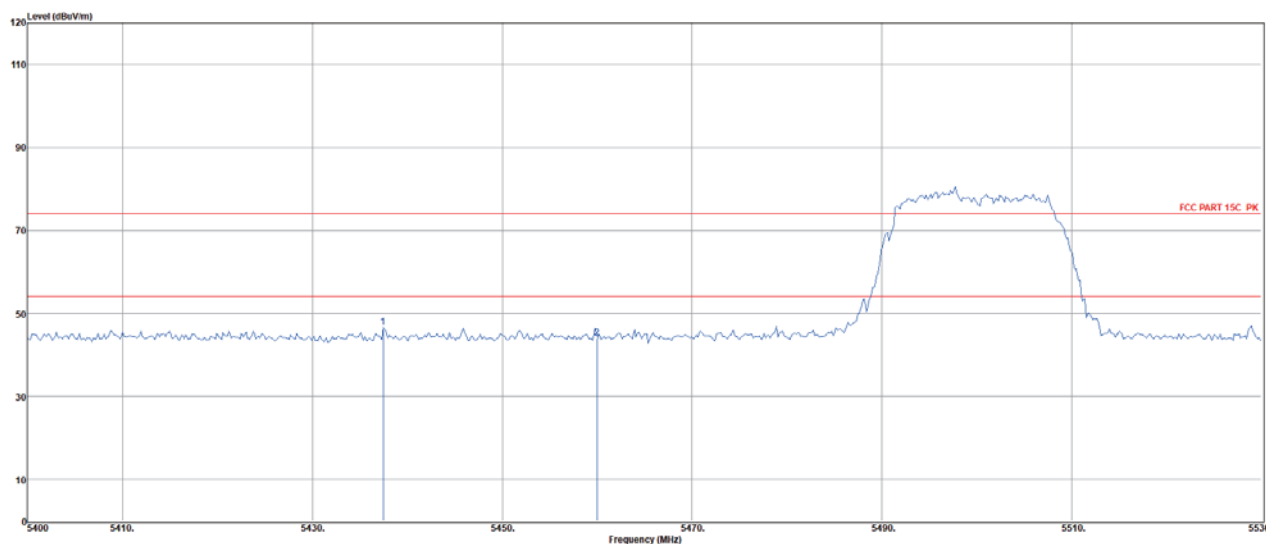
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11A 5500

Data: 49



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5437.44	51.93	31.95	43.27	6.03	46.64	74.00	-27.36	Peak	HORIZONTAL
2	5460.00	49.38	31.97	43.25	6.05	44.15	74.00	-29.85	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

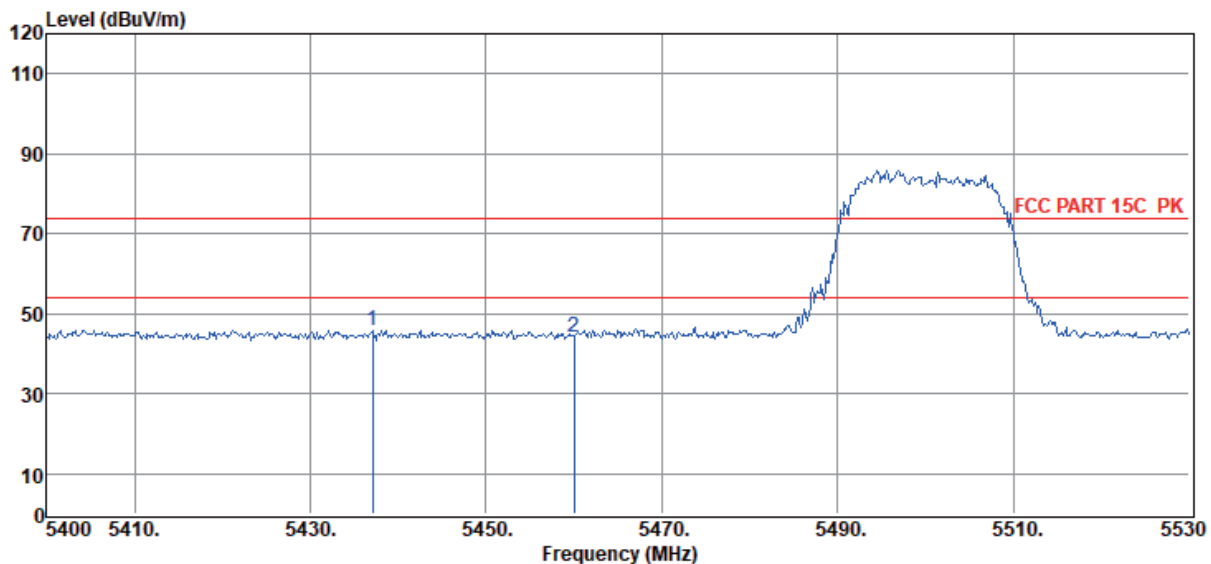
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11A 5500

Data: 50



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5437.05	51.08	31.95	43.27	6.03	45.79	74.00	-28.21	Peak	VERTICAL
2	5460.00	49.27	31.97	43.25	6.05	44.04	74.00	-29.96	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

Power Supply : Battery

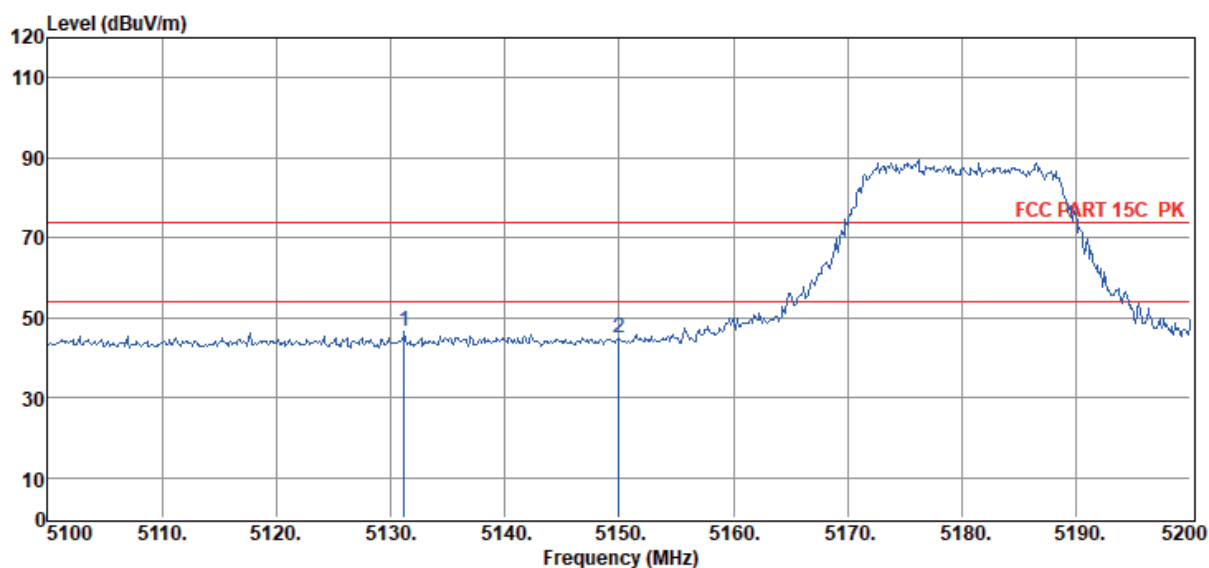
Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa

Antenna/Distance : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11N20 5180

Data: 51



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5131.20	52.60	31.70	43.55	5.72	46.47	74.00	-27.53	Peak	VERTICAL
2	5150.00	51.14	31.72	43.53	5.73	45.06	74.00	-28.94	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

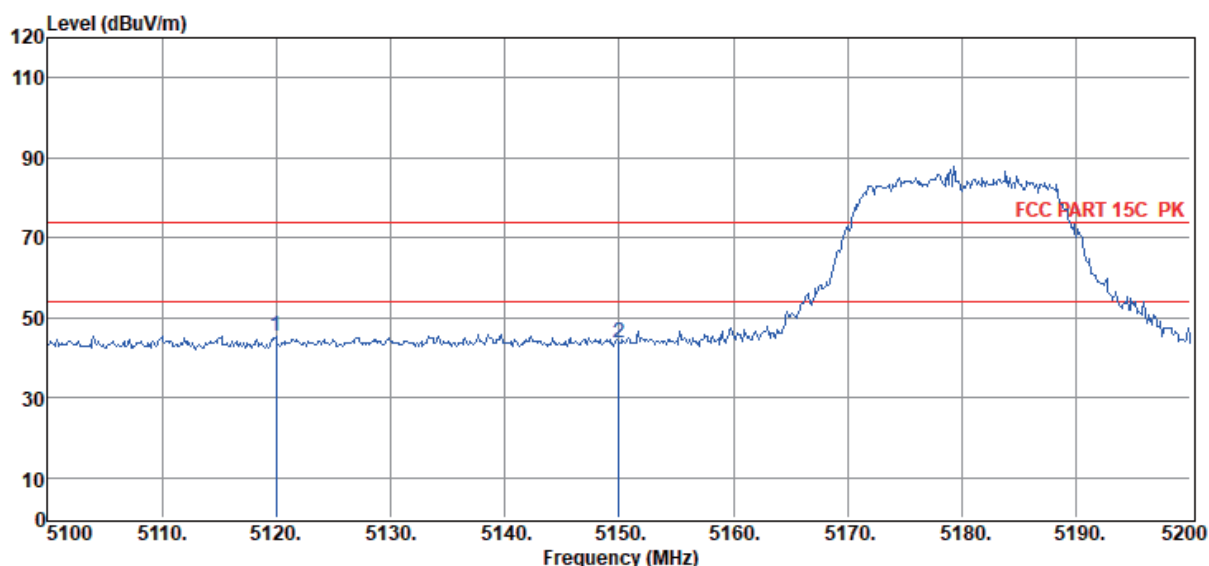
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11N20 5180

Data: 52



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5120.00	51.56	31.70	43.56	5.70	45.40	74.00	-28.60	Peak	HORIZONTAL
2	5150.00	49.65	31.72	43.53	5.73	43.57	74.00	-30.43	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

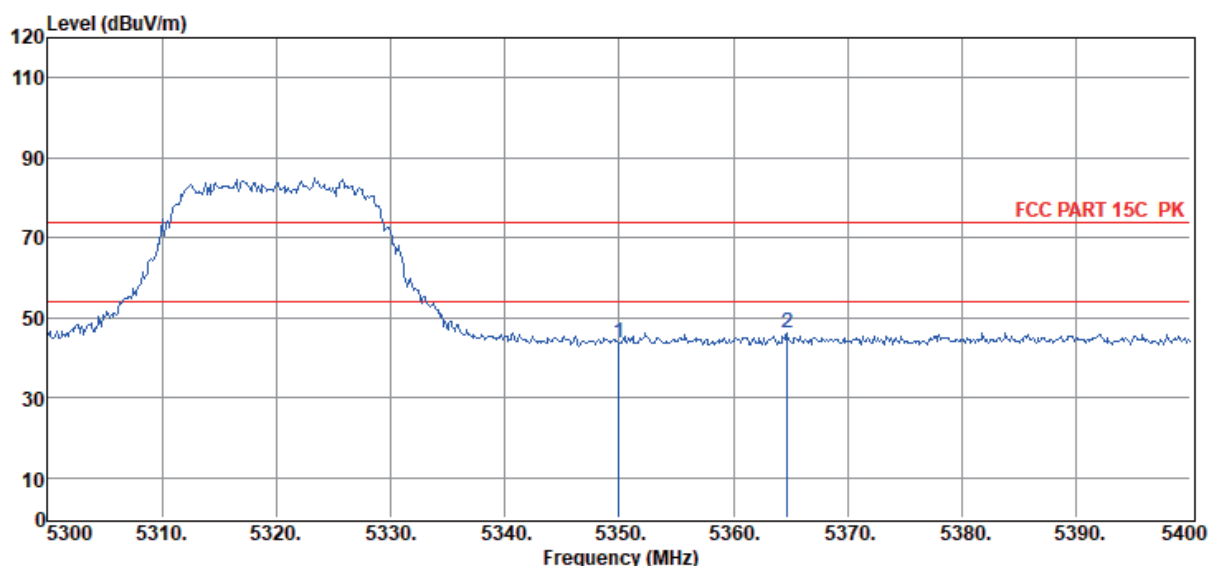
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11N20 5320

Data: 53



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5350.00	49.16	31.88	43.34	5.94	43.64	74.00	-30.36	Peak	HORIZONTAL
2	5364.70	51.56	31.89	43.33	5.96	46.08	74.00	-27.92	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

Power Supply : Battery

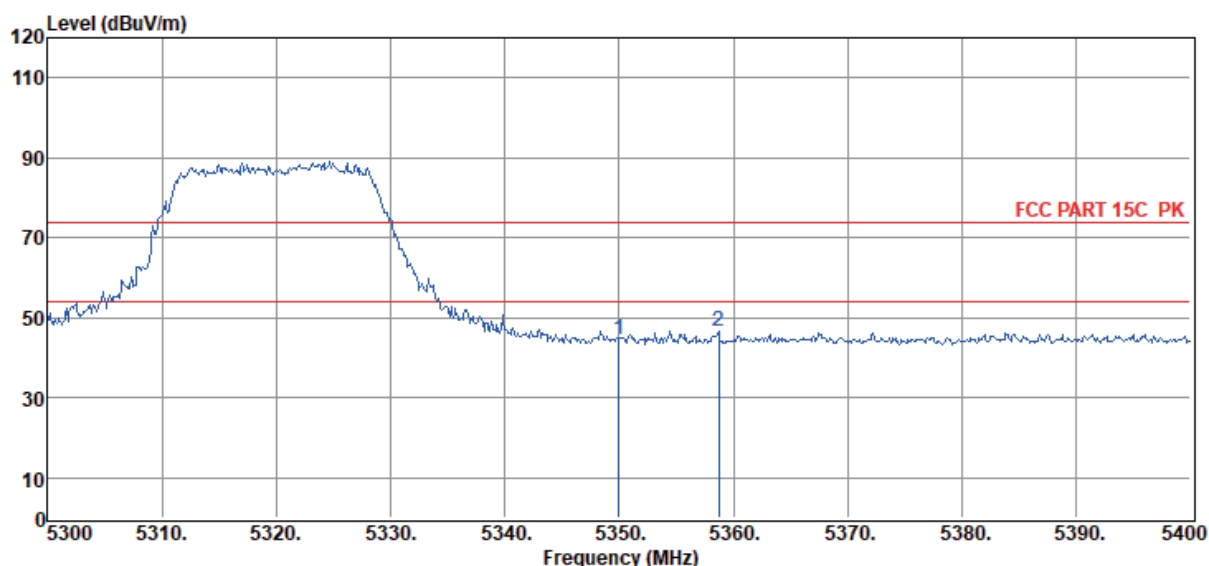
Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa

Antenna/Distance : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11N20 5320

Data: 54



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5350.00	50.20	31.88	43.34	5.94	44.68	74.00	-29.32	Peak	VERTICAL
2	5358.70	51.93	31.89	43.33	5.95	46.44	74.00	-27.56	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

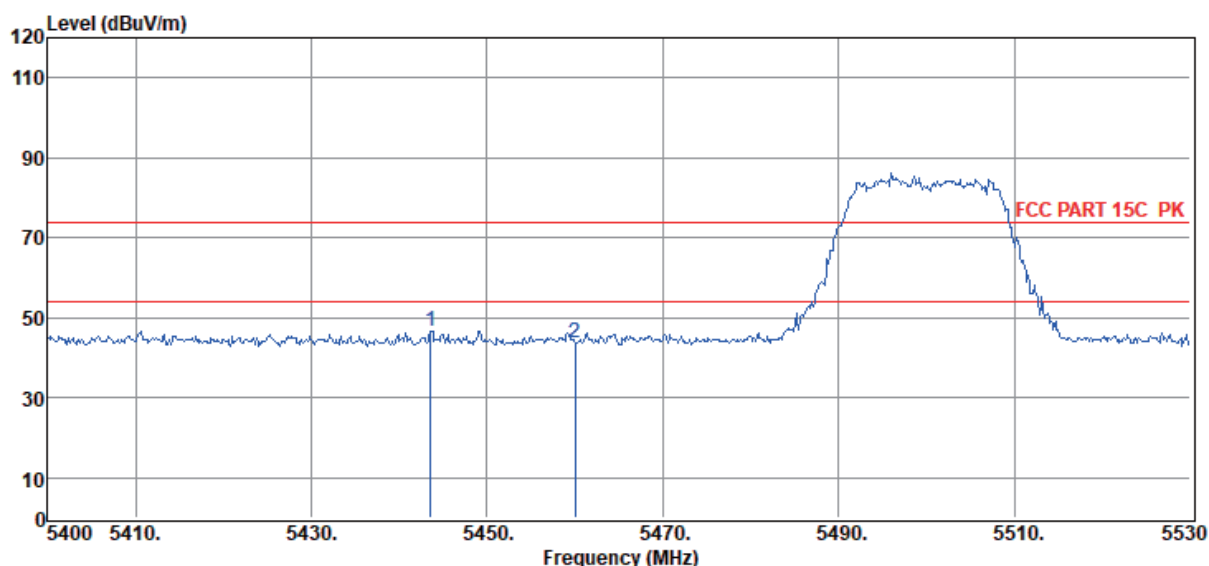
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11N20 5500

Data: 55



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5443.55	52.06	31.95	43.26	6.04	46.79	74.00	-27.21	Peak	VERTICAL
2	5460.00	48.99	31.97	43.25	6.05	43.76	74.00	-30.24	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

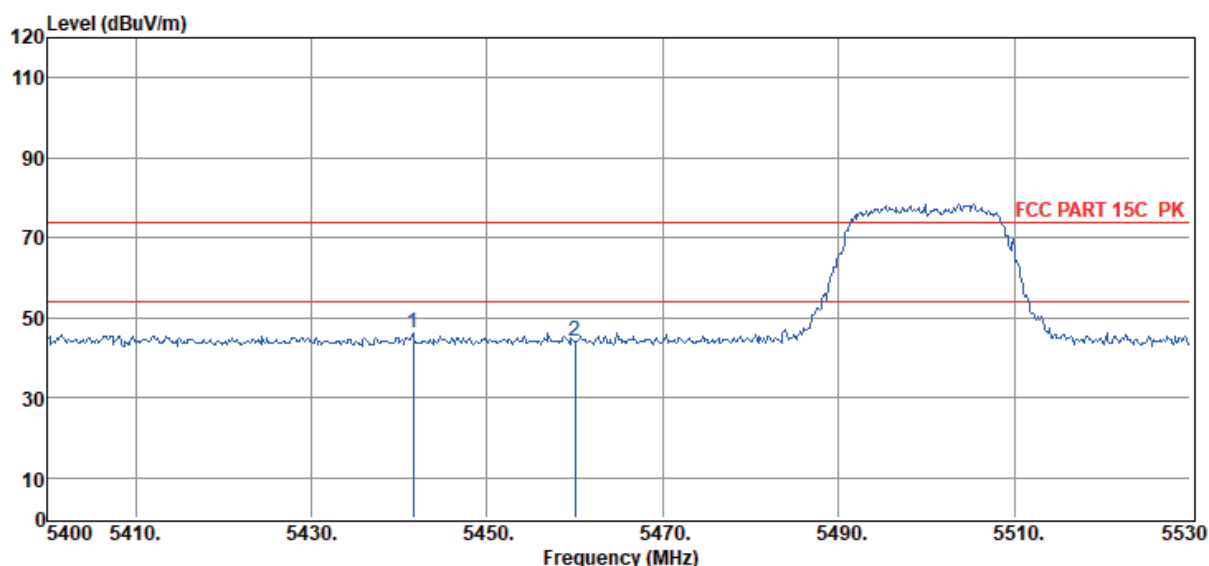
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11N20 5500

Data: 56



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5441.60	51.27	31.95	43.26	6.03	45.99	74.00	-28.01	Peak	HORIZONTAL
2	5460.00	49.35	31.97	43.25	6.05	44.12	74.00	-29.88	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

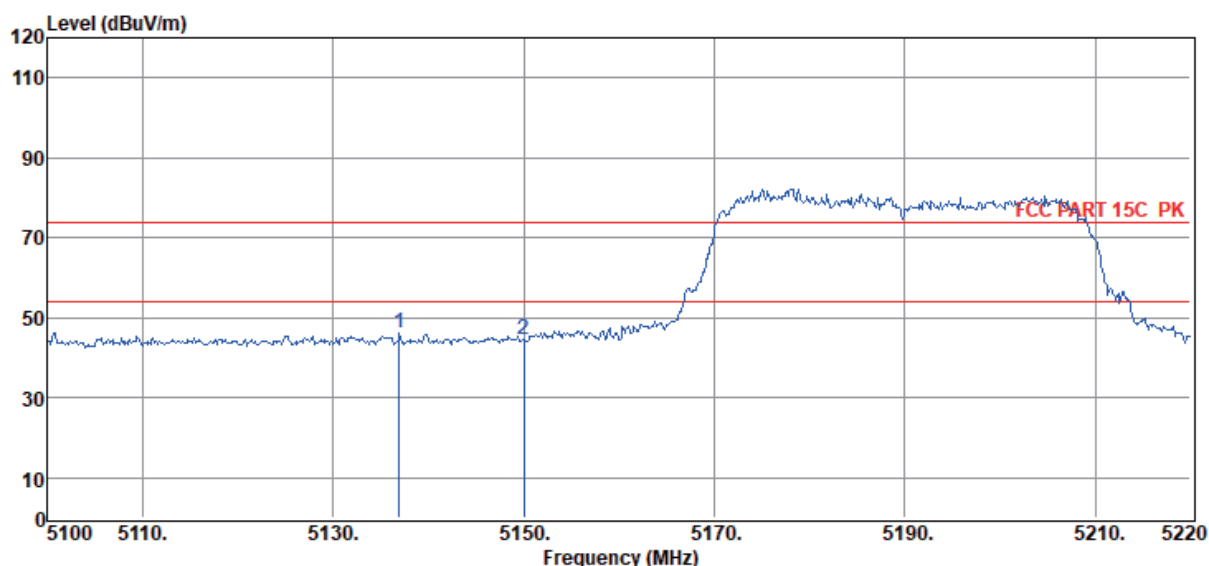
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11N40 5190

Data: 57



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5136.96	52.13	31.71	43.54	5.72	46.02	74.00	-27.98	Peak	HORIZONTAL
2	5150.00	50.49	31.72	43.53	5.73	44.41	74.00	-29.59	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

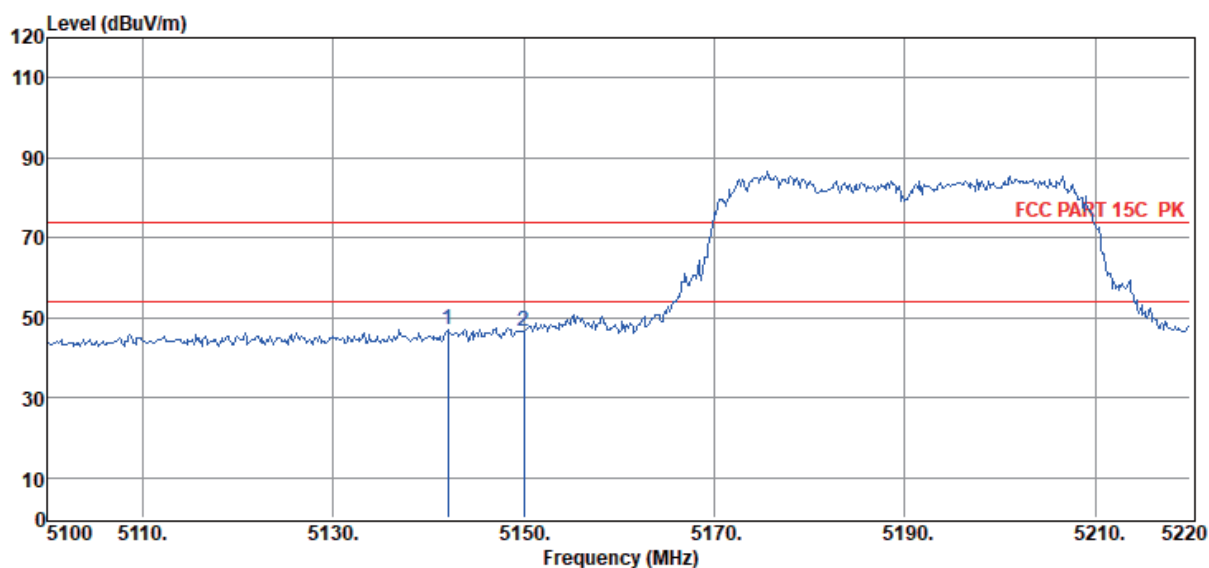
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11N40 5190

Data: 58



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5142.00	53.20	31.71	43.54	5.73	47.10	74.00	-26.90	Peak	VERTICAL
2	5150.00	52.55	31.72	43.53	5.73	46.47	74.00	-27.53	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

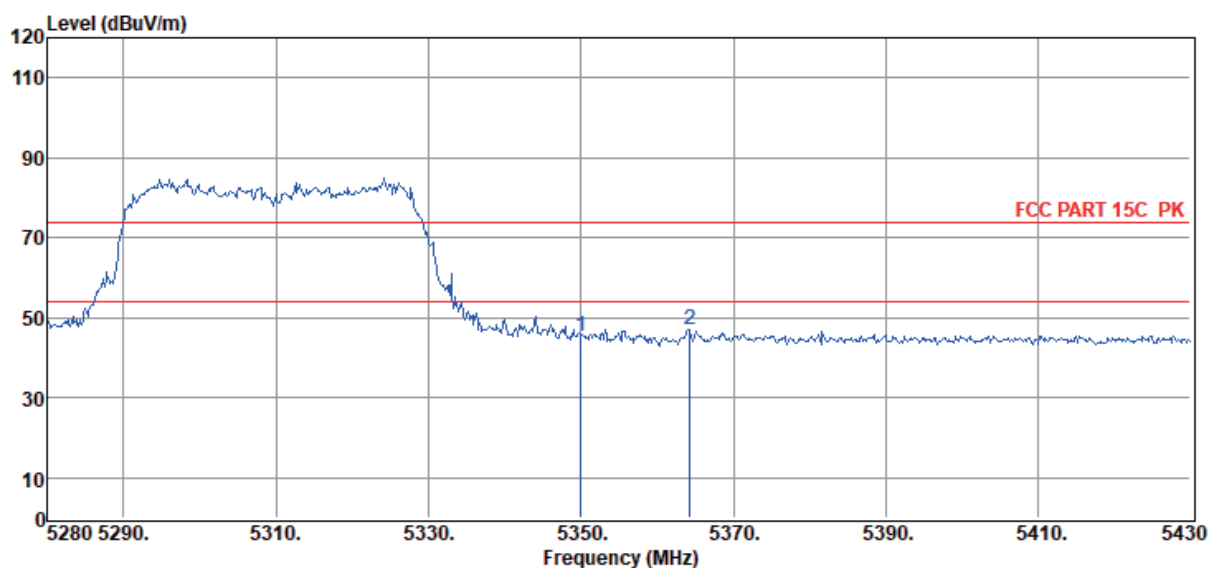
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11N40 5310

Data: 59



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5350.00	50.74	31.88	43.34	5.94	45.22	74.00	-28.78	Peak	VERTICAL
2	5364.30	52.63	31.89	43.33	5.96	47.15	74.00	-26.85	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC
ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

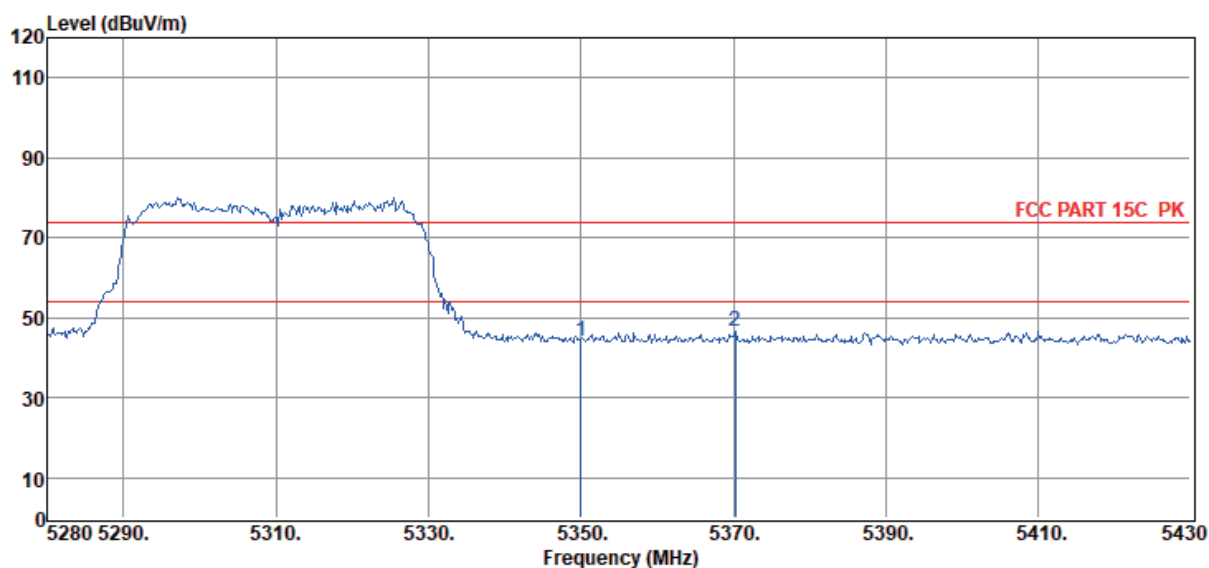
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11N40 5310

Data: 60



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5350.00	49.74	31.88	43.34	5.94	44.22	74.00	-29.78	Peak	HORIZONTAL
2	5370.30	52.05	31.90	43.32	5.96	46.59	74.00	-27.41	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

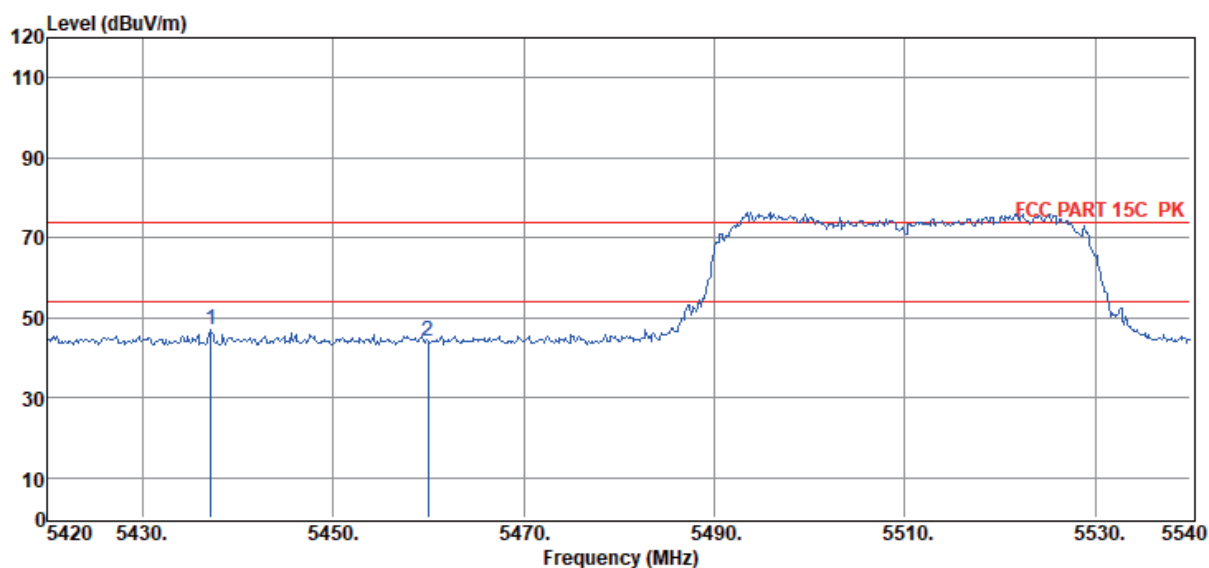
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/HORIZONTAL

Memo : 11N40 5310

Data: 61



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5437.16	52.34	31.95	43.27	6.03	47.05	74.00	-26.95	Peak	HORIZONTAL
2	5460.00	49.33	31.97	43.25	6.05	44.10	74.00	-29.90	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber 1#

D:\2019 RE1# Report Data\Q19081209-1E M11PRO\FCC ABOVE 1G.EM6

Test Date : 2019-11-18

Tested By : Jacky

EUT : Portable High Resolution Music Player

Model Number : M11 Pro

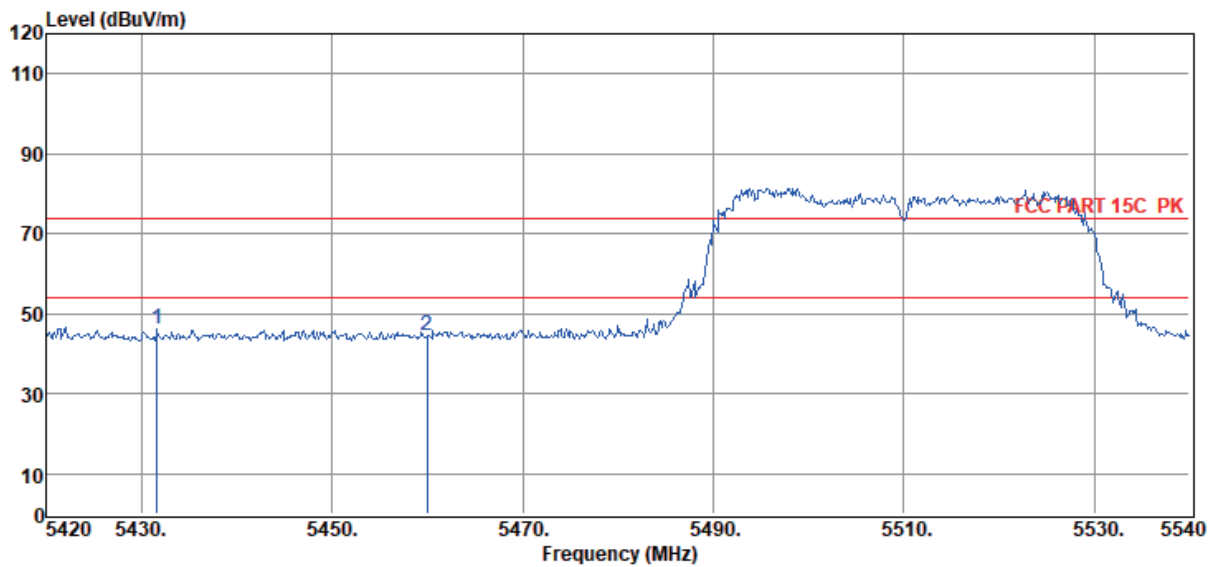
Power Supply : Battery

Test Mode : Tx mode

Condition : Temp:24.5°C, Humi:55%, Press:100.1kPa **Antenna/Distance** : 2019 BBHA 9120 D/3m/VERTICAL

Memo : 11N40 5310

Data: 62



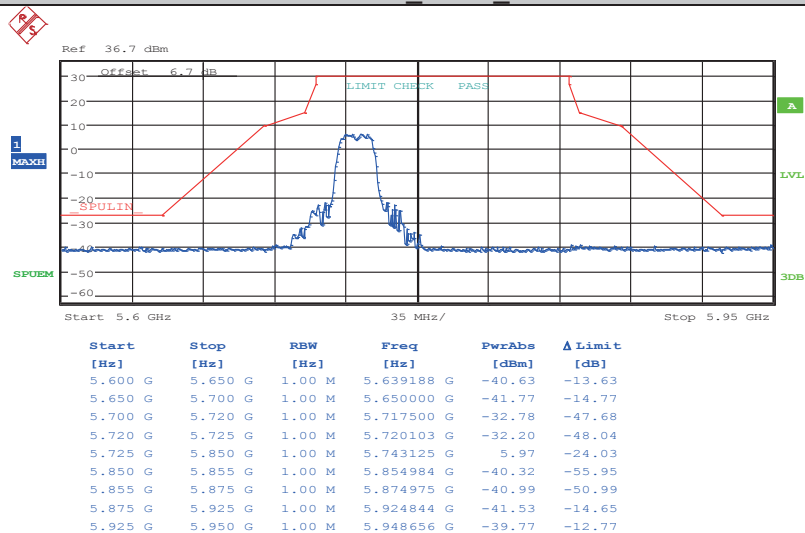
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	5431.64	51.38	31.95	43.27	6.02	46.08	74.00	-27.92	Peak	VERTICAL
2	5460.00	49.66	31.97	43.25	6.05	44.43	74.00	-29.57	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

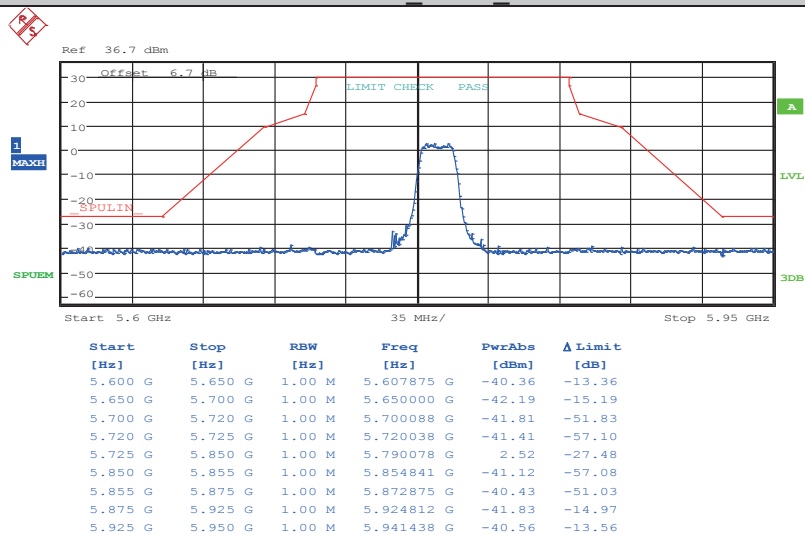
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

11A_ANT1_5745



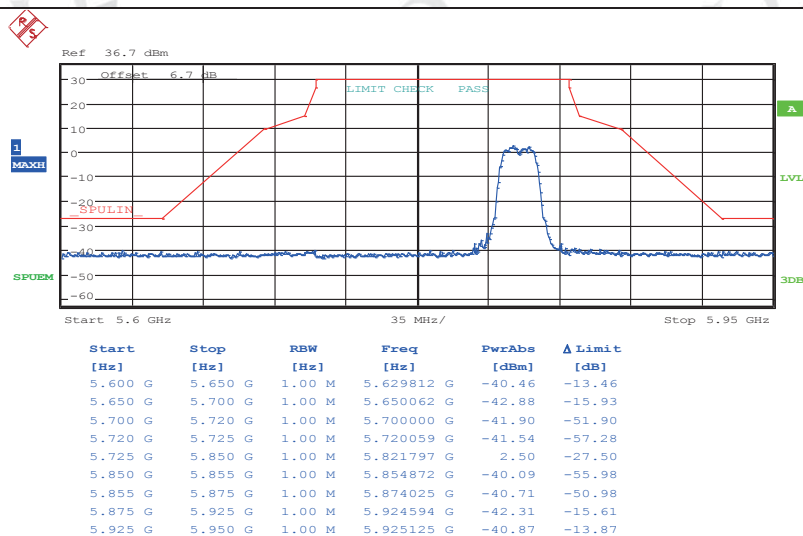
Date: 13.NOV.2019 14:04:27

11A_ANT1_5785



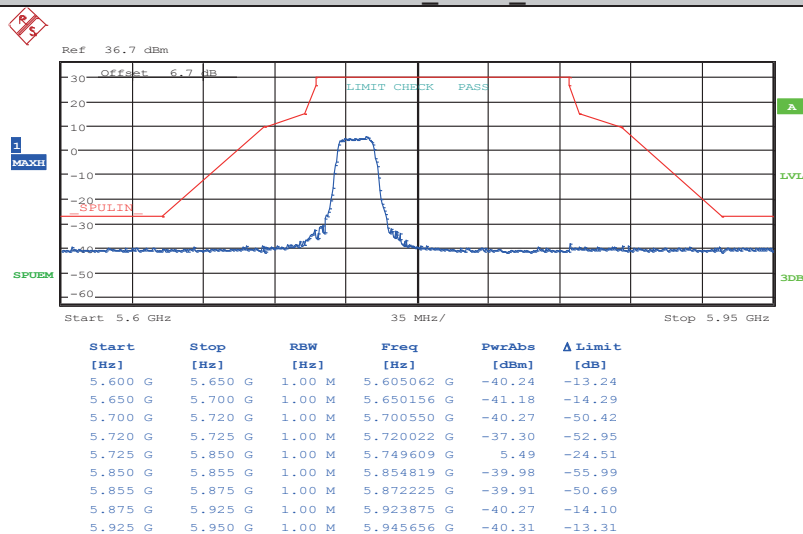
Date: 13.NOV.2019 14:06:25

11A_ANT1_5825



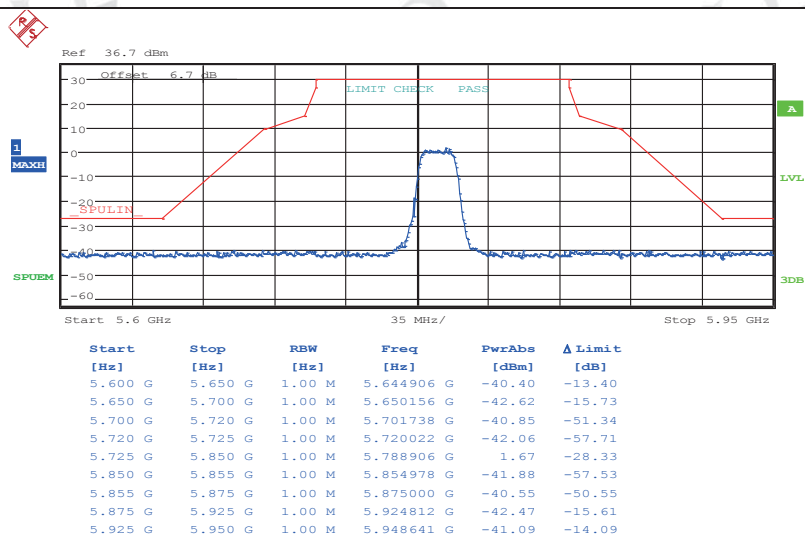
Date: 13.NOV.2019 14:12:43

11N20_ANT1_5745



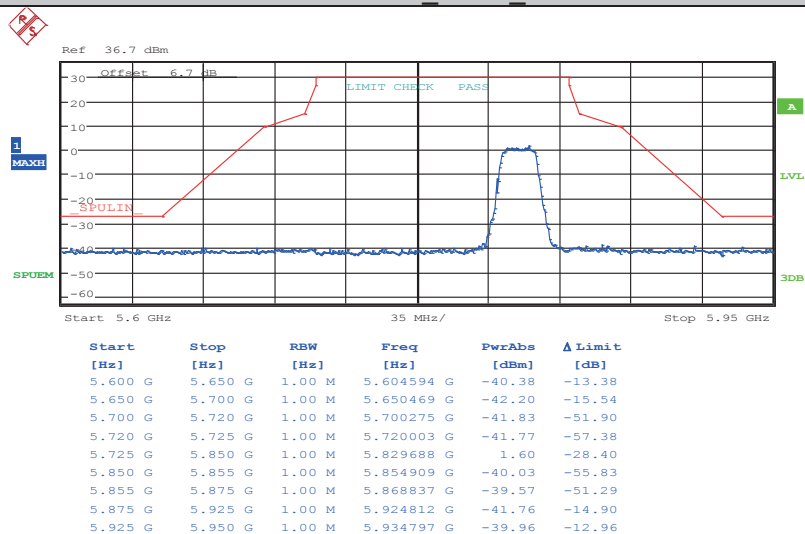
Date: 13.NOV.2019 14:09:30

11N20_ANT1_5785



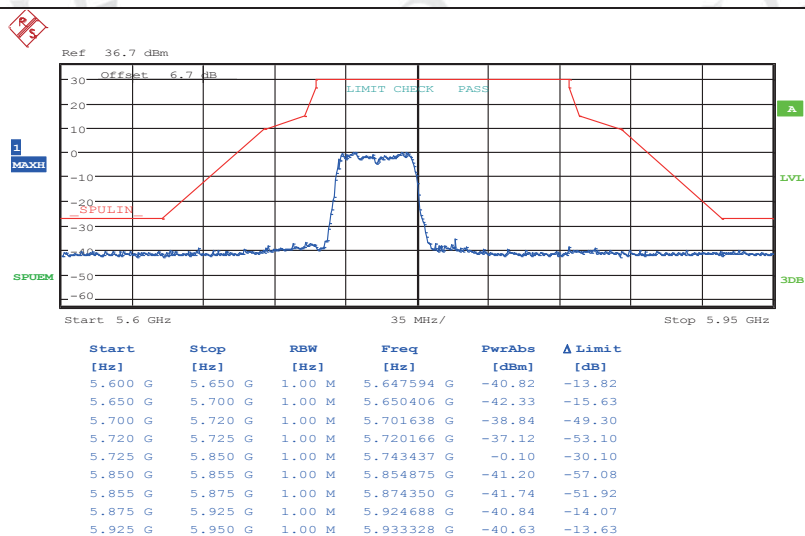
Date: 13.NOV.2019 14:10:48

11N20_ANT1_5825



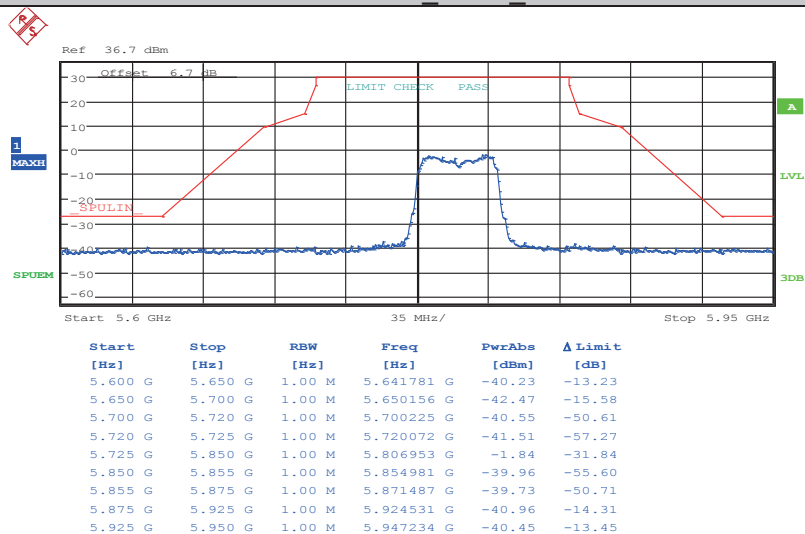
Date: 13.NOV.2019 14:11:29

11N40_ANT1_5755



Date: 13.NOV.2019 14:14:11

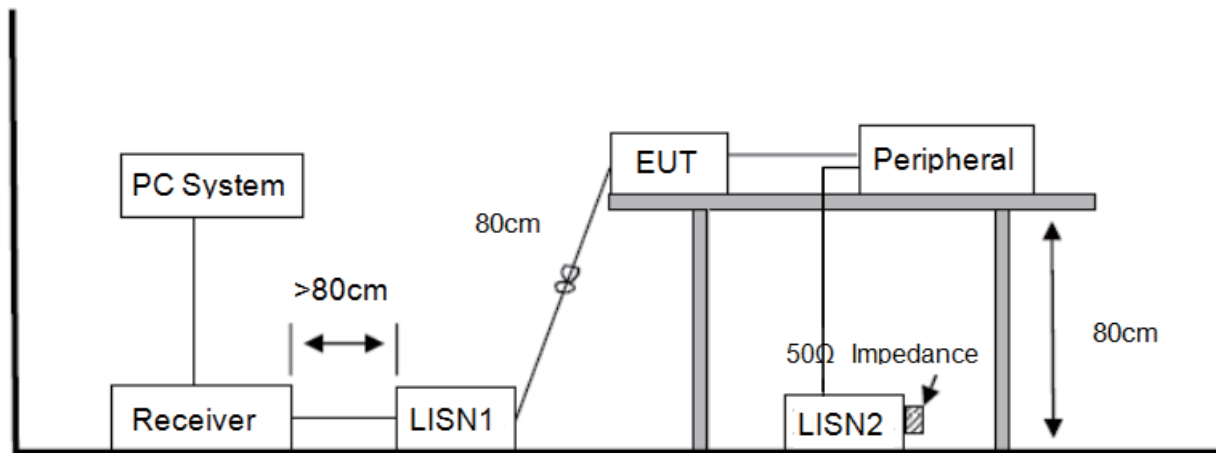
11N40_ANT1_5795



Date: 13.NOV.2019 13:59:48

10. Power Line Conducted Emission

10.1. Block diagram of test setup



10.2. Power Line Conducted Emission Limits (Class B)

Frequency	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

10.3. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.3 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test. EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

10.4. Test Result

PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

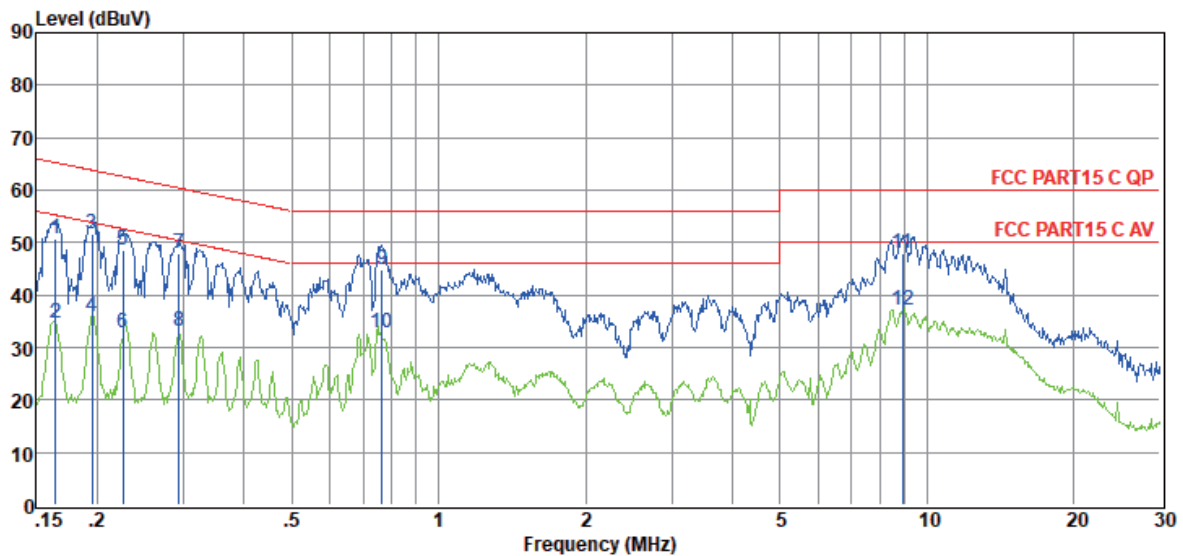
Note2: “----” means peak detection; “-----” means average detection

Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/60Hz, recorded worse case (AC 120V/60Hz).

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **D:\2019 CE report data\Q19081209-1E\CE.EM6**
Test Date : 2019-08-19 **Tested By** : Lori
EUT : Portable High Resolution Music Player **Model Number** : M11 Pro
Power Supply : AC 120V/60Hz **Test Mode** : Tx mode
Condition : Temp:24.5°C, Humi:71.2%,
 Press:101.4kPa **LISN** : 2018 ENV216/LINE
Memo :

Data: 11



Item	Freq.	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)		
1	0.16	31.32	9.63	0.02	9.86	50.83	65.25	-14.42	QP	LINE
2	0.16	15.26	9.63	0.02	9.86	34.77	55.25	-20.48	Average	LINE
3	0.20	32.22	9.63	0.02	9.86	51.73	63.80	-12.07	QP	LINE
4	0.20	16.22	9.63	0.02	9.86	35.73	53.80	-18.07	Average	LINE
5	0.23	28.99	9.63	0.02	9.86	48.50	62.61	-14.11	QP	LINE
6	0.23	13.23	9.63	0.02	9.86	32.74	52.61	-19.87	Average	LINE
7	0.29	28.40	9.63	0.02	9.86	47.91	60.41	-12.50	QP	LINE
8	0.29	13.49	9.63	0.02	9.86	33.00	50.41	-17.41	Average	LINE
9	0.77	25.21	9.64	0.04	9.86	44.75	56.00	-11.25	QP	LINE
10	0.77	13.25	9.64	0.04	9.86	32.79	46.00	-13.21	Average	LINE
11	8.92	28.23	9.76	0.07	9.90	47.96	60.00	-12.04	QP	LINE
12	8.92	17.46	9.76	0.07	9.90	37.19	50.00	-12.81	Average	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

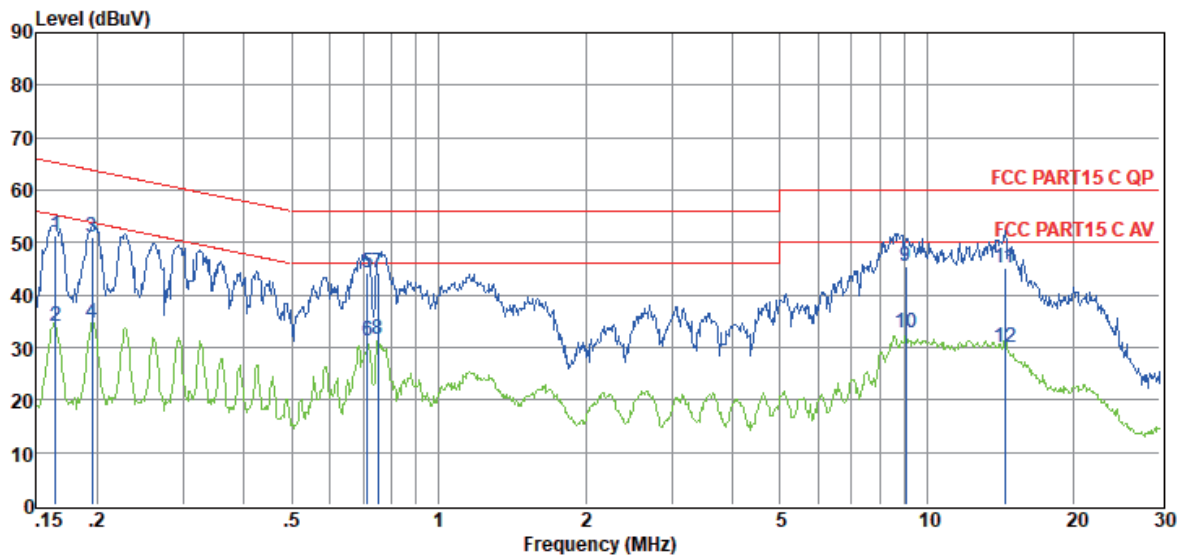
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **D:\2019 CE report data\Q19081209-1E\CE.EM6**
Test Date : 2019-08-19 **Tested By** : Lori
EUT : Portable High Resolution Music Player **Model Number** : M11 Pro
Power Supply : AC 120V/60Hz **Test Mode** : Tx mode
Condition : Temp:24.5°C, Humi:71.2%,
 Press:101.4kPa **LISN** : 2018 ENV216/NEUTRAL

Memo :

Data: 12



Item	Freq.	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)		
1	0.16	31.71	9.64	0.02	9.86	51.23	65.25	-14.02	QP	NEUTRAL
2	0.16	14.43	9.64	0.02	9.86	33.95	55.25	-21.30	Average	NEUTRAL
3	0.20	31.65	9.64	0.02	9.86	51.17	63.80	-12.63	QP	NEUTRAL
4	0.20	14.98	9.64	0.02	9.86	34.50	53.80	-19.30	Average	NEUTRAL
5	0.72	24.81	9.64	0.04	9.86	44.35	56.00	-11.65	QP	NEUTRAL
6	0.72	11.63	9.64	0.04	9.86	31.17	46.00	-14.83	Average	NEUTRAL
7	0.75	24.57	9.64	0.04	9.86	44.11	56.00	-11.89	QP	NEUTRAL
8	0.75	12.13	9.64	0.04	9.86	31.67	46.00	-14.33	Average	NEUTRAL
9	9.06	25.72	9.79	0.08	9.90	45.49	60.00	-14.51	QP	NEUTRAL
10	9.06	13.01	9.79	0.08	9.90	32.78	50.00	-17.22	Average	NEUTRAL
11	14.44	24.88	10.27	0.05	9.93	45.13	60.00	-14.87	QP	NEUTRAL
12	14.44	9.81	10.27	0.05	9.93	30.06	50.00	-19.94	Average	NEUTRAL

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

11. Antenna Requirements

11.1. Limit

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2. Result

The antenna used for this product is dedicated FPC antenna and other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 2.67 dBi.

12. Dynamic Frequency Selection

12.1. Applicability of DFS requirements

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 Device or Client with Radar Detection	☒ Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	☐ Master Device 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 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.

12.2. Limit

(1) DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

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.
 Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

(2) DFS Response Requirements

Table 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 U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
 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 facilitating a Channel move (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 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

12.3. Parameters of radar test waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B			
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
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					
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					

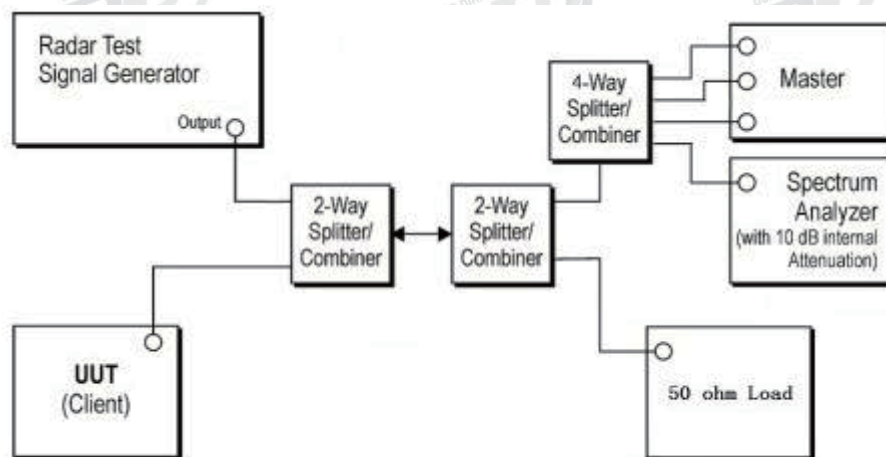
A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are 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. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4

12.4. Calibration of radar waveform

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 $-62\text{dBm} + 0\text{dBi} + 1\text{dB} = -61\text{dBm}$ 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 $-62\text{dBm} + 0\text{dBi} + 1\text{dB} = -61\text{dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup:

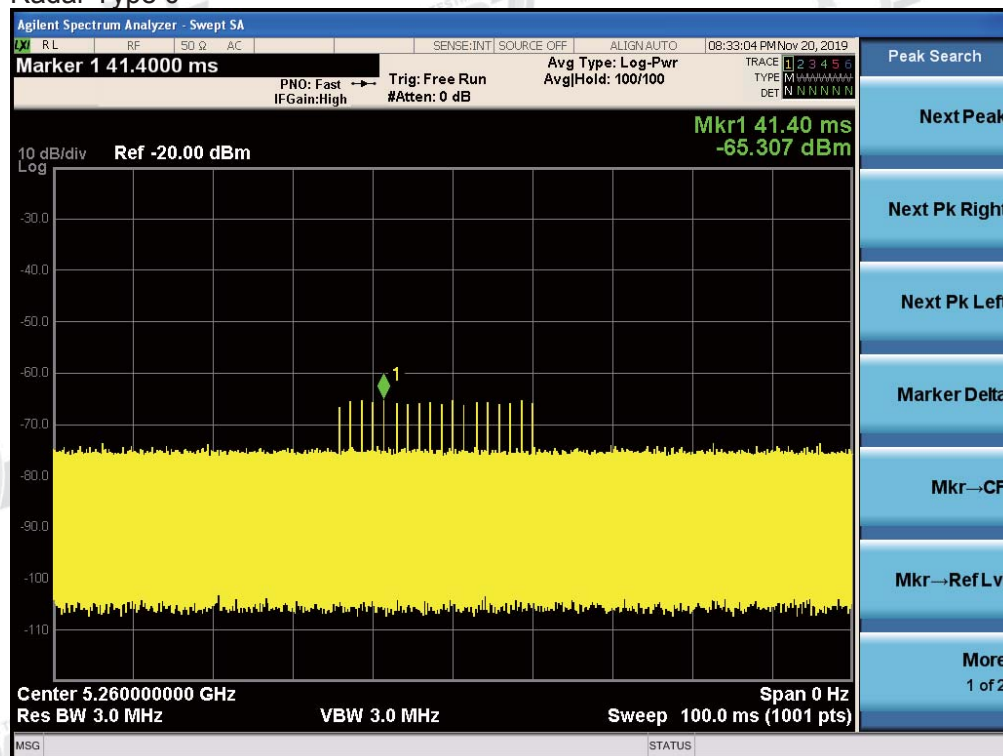


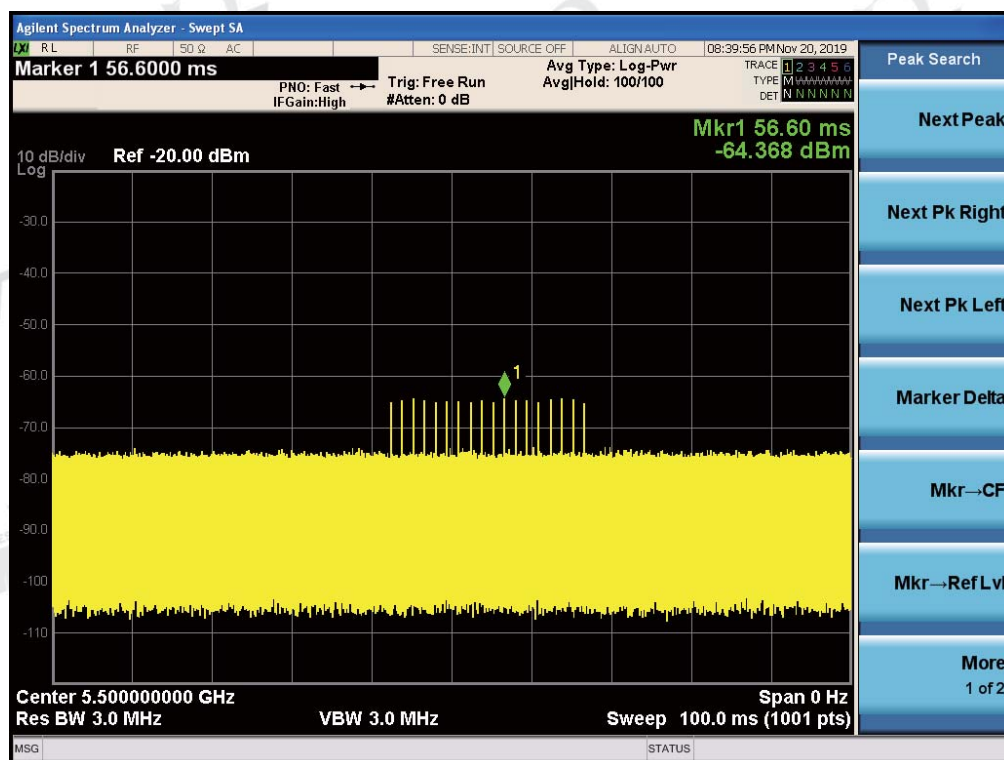
Note: 1. Use the software "Web" to set the frequency channel.

2. EUT is not support TPC and not with Radar detection.

Radar Waveform Calibration Result:

Radar Type 0





12.5. Channel closing transmission time, channel move time and non-occupancy period

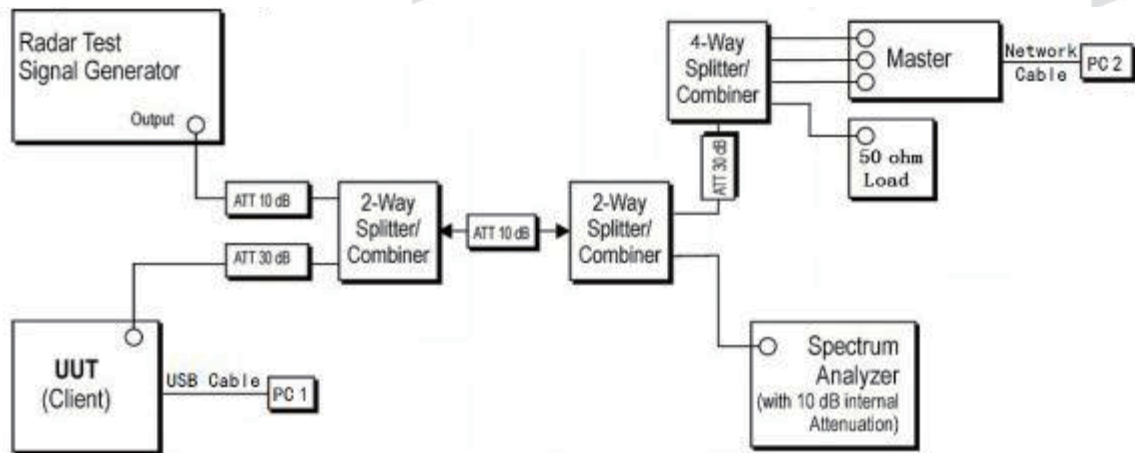
Block diagram of test setup Test Procedure:

- (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 Test Software 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
- (8) 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.

Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

12.6. Test setup

Setup for Client with injection at the Master



12.7. Test result

BW/Channel	Test Item	Test Result	Limit	Results
40M/5260MHz	Channel Move Time	0.679s	< 10s	pass
	Channel Closing Transmission Time	0.200s	< 0.26s	pass
40M/5500MHz	Channel Move Time	0.759s	< 10s	pass
	Channel Closing Transmission Time	0.240s	< 0.26s	pass
40M/5260MHz	Non-Occupancy Period	> 30min	30min	pass
40M/5500MHz	Non-Occupancy Period	> 30min	30min	pass

Test plots as follows:

