





FCC CERTIFICATION TEST REPORT

Applicant:	Guangzhou Lihuan Information Technology Co., Ltd.
Address:	Room 401, No.192 kezhu Road, Huangpu District, Guangzhou, China
Manufacturer:	Guangdong Coagent Electronic Technology Co., Ltd.
Address:	Foshan City, Southwest Industrial Park, Sanshui District, Guangdong Haobangshou Electronic Technology Co., Ltd
Product Description:	Car Audio Navigation
Brand Name:	NA
Tested Model:	M903AT-11T, M903AT-10T
FCC ID:	2A7U2-M903AT-11T
Report No.:	JCF221018002-002
Received Date:	Oct. 18, 2022
Tested Date:	Oct. 18 ,2022 ~ Dec. 22, 2022
Issued Date:	Dec. 22, 2022
Test Standards:	FCC Rules and Regulations Part 15 Subpart E
Test Procedure:	ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01,
Test Result:	Pass

Prepared By:  <u>Roger/Engineer</u>	Date: Dec. 22, 2022 
Reviewed By:  <u>Jone Lv/Engineer</u>	Date: Dec. 22, 2022
Approved By:  <u>Talent Zhang/Engineer</u>	Date: Dec. 22, 2022

Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Guangzhou Jingce Testing Technology Co., Ltd. the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 22, 2022	Original Report	/

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1. Test Report Declare

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Manufacturer:	Guangdong Coagent Electronic Technology Co., Ltd.
Address:	Foshan City, Southwest Industrial Park, Sanshui District, Guangdong Haobangshou Electronic Technology Co., Ltd
Product Name:	Car Audio Navigation
Brand Name:	NA
Model Name	M903AT-11T, M903AT-10T
Difference Description:	There are two different product models in this report. They are only the heat sink is different and the installed direction is different . The antenna and RF related parts are the same.

Note:The model: M903AT-10T only test for Radiated Emission below 1GHz.

We Declare:

The equipment described above is tested by Guangzhou Jingce Testing Technology 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 Guangzhou Jingce Testing Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

2. Summary of test results

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

Clause	Description of Test Item	Standard	Verdict
1	6/26db Bandwidth	FCC 15.407 (a)&(e)	Pass
3	Maximum Conducted Output Power	FCC 15.407 (a)	Pass
4	Power Spectral Density	FCC 15.407 (a)	Pass
5	Frequency Stability Measurement	FCC 15.407 (g)	Pass
6	Radiated Band edge and Spurious Emission	FCC 15.407 (b) FCC 15.209 FCC 15.205	Pass
7	Power Line Conducted Emission	FCC 15.207	NA
8	Antenna requirement	FCC 15.203	Pass
9	Dynamic Frequency Selection	FCC 15.407 (h)	NA

Note: The conducted emission tests at AC port are not required test.

3. Test Laboratory

Guangzhou Jingce Testing Technology Co., Ltd.

Add.: No.192, Kezhu Road, Huangpu District, Guangzhou, Guangdong, China

Association for Laboratory Accreditation(A2LA). Certificate Number: 6594.01

FCC Designation Number: CN1331. Test Firm Registration Number: 360543

IC Test Firm Registration Number: 28796

Conformity Assessment Body identifier: CN0138

4. Equipment Under Test

4.1. Description of EUT

EUT Name:	Car Audio Navigation
Model Number:	M903AT-11T, M903AT-10T
EUT Function Description:	Please reference user's manual
Power Supply:	DC 12V/10A
Hardware Version:	NA
Software Version:	NA
Radio Specification:	IEEE 802 ac
Operation Frequency:	IEEE 802.11ac HT20: 5220MHz, 5765MHz, 5785MHz IEEE 802.11ac HT40: 5190MHz, 5230MHz, 5755MHz, 5795MHz IEEE 802.11ac HT80: 5210MHz, 5775MHz
Modulation:	IEEE 802.11ac (HT20/40/80): OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11ac HT20: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78Mbps IEEE 802.11ac HT40: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 180Mbps IEEE 802.11ac HT80: 29.3, 58.5, 87.8, 117.0, 175.5, 234, 263.3, 292.5, 351.0, 390.0Mbps
Antenna Type:	FPC Antenna, 4.4 dBi

Note 1: EUT is the ab. of equipment under test.

Note 2: The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.

4.2. Channel List

UNII-1 (For Bandwidth = 20 MHz)		UNII-1 (For Bandwidth = 40 MHz)		UNII-1 (For Bandwidth = 80 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
44	5220	38	5190	42	5210
/	/	46	5230	/	/

UNII-3 (For Bandwidth = 20 MHz)		UNII-3 (For Bandwidth = 40 MHz)		UNII-3 (For Bandwidth = 80 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
153	5765	151	5755	155	5775
157	5785	159	5795	/	/

4.3. Test Channel Configuration

Mode	Data rate (Mbps) (see Note)	Test Channel and Frequency
802.11ac HT20 TX Mode	MCS 0	CH44, 5220MHz
	MCS 0	CH153, 5765MHz
	MCS 0	CH157, 5785MHz
802.11ac HT40 TX Mode	MCS 0	CH38, 5190MHz
	MCS 0	CH46, 5230MHz
	MCS 0	CH151, 5755MHz
	MCS 0	CH159, 5795MHz
802.11ac HT80 TX Mode	MCS 0	CH42, 5210MHz
	MCS 0	CH155, 5775MHz

4.4. Test environment conditions

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

	Normal Conditions	Extreme Conditions
Temperature range	21-25 °C	-20 °C to +70 °C
Humidity range	40-75%	N/A
Pressure range	86-106 kPa	N/A
Power supply	NV: DC 12V from battery	DC 10.2V ~ 13.8V

Note: The Extreme temperature range and extreme voltages are declared by the manufacturer.

4.5. The Worse Case Power Setting Parameter

The Worse Case Power Setting Parameter			
Test Software	Engineer Mode		
Mode	Rate	Channel	Soft set value Ant1
11ac HT20	MCS 0	44	15
		153	16
		157	15
11ac HT40	MCS 0	38	13
		46	15
		151	15
		159	15
11ac HT80	MCS 0	42	13
		155	15

4.6. Description of Available Antennas

Test Mode	Transmit and Receive Mode	Description
802.11ac HT20	☒ 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
802.11ac HT40	☒ 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
802.11ac HT80	☒ 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.

5. Description of Test Setup

5.1. Accessory

Description of Accessories	Manufacturer	Model Number	Description	Remark
/	/	/	/	/

5.2. Support Equipment

Equipment	Brand Name	Model Name	P/N
PC	Lenovo	T480	/
Battery	BOSH	/	/

5.3. Test Setup

The EUT can work in engineering mode.

5.4. Setup Diagram for Tests



6. Measurement uncertainty

Test Item	Uncertainty
AC Power Conduction emission	1.37 dB
All Radiated emissions	5.4dB
Conducted emissions	3.09 dB
Occupied Channel Bandwidth	1.1%
Conducted Output power	0.82dB
Power Spectral Density	0.82dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k = 2.

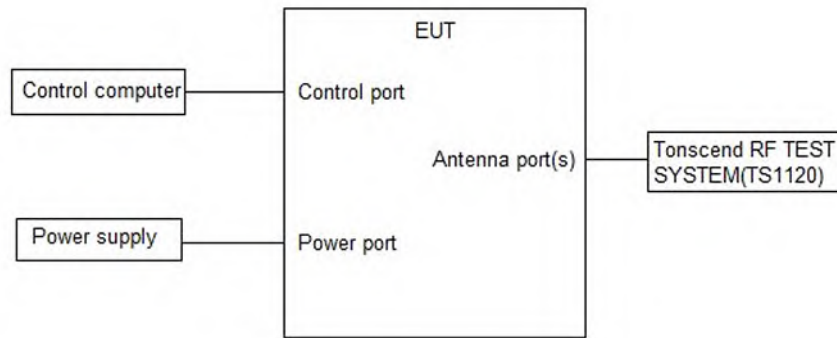
7. Measuring Instrument and Software Used

TS Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030B	MY56320512	Jul. 25, 2022	Jul. 24, 2023
<input checked="" type="checkbox"/>	Vector Signal Generator	Keysight	N5182B	MY57300334	Nov. 24, 2022	Nov. 23, 2023
<input checked="" type="checkbox"/>	Signal Generator	Keysight	N5171B	MY57280639	Nov. 24, 2022	Nov. 23, 2023
<input checked="" type="checkbox"/>	DC POWER	Keysight	E342A	MY59020356	Jul. 25, 2022	Jul. 24, 2023
<input checked="" type="checkbox"/>	Incubator thermometer	GWS	EL-02JA	21107288	Oct. 31, 2022	Oct. 30, 2023
<input checked="" type="checkbox"/>	Control unit(Power sensor)	Tonscend	JS0806-2	/	Jul. 25, 2022	Jul. 24, 2023
Software						
Used	Description	Manufacturer	Name		Version	
<input checked="" type="checkbox"/>	Test software	TS+	JS1120-3		V3.2.11	
RSE Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
<input checked="" type="checkbox"/>	EMI Receiver	R&S	ESW	101685	Jul. 24, 2022	Jul. 23, 2023
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB 9163	01416	Feb. 22, 2022	Feb. 21, 2023
<input checked="" type="checkbox"/>	Horn Antenna 1	Schwarzbeck	BBHA 9120 D	02411	May.30,2022	May. 29, 2023
<input checked="" type="checkbox"/>	Horn Antenna 2	ETS	3116C	00217677	Sep. 19, 2022	Sep. 18, 2023
<input checked="" type="checkbox"/>	Signal Pre-Amplifier	Tonscend	TAP01018050	AP21C806122	Aug. 08, 2022	Aug. 07, 2023
<input checked="" type="checkbox"/>	Signal Pre-Amplifier	Tonscend	TAP9K3G32	AP20K806104	Aug. 08, 2022	Aug. 07, 2023
<input checked="" type="checkbox"/>	Signal Pre-Amplifier	ETS	3116C-PA	00217677	Sep. 02, 2022	Sep. 01, 2023
<input checked="" type="checkbox"/>	Wideband radio communication tester	R&S	CMW500	163478	Jul. 25, 2022	Jul. 24, 2023
<input checked="" type="checkbox"/>	3m Fully-anechoic Chamber	ETS	RFD-100	/	Apr. 24, 2021	Apr. 23, 2024
Software						

Used	Description	Manufacturer	Name		Version	
<input checked="" type="checkbox"/>	Test software	TS+	TS+		V3.0.0.4	
Conducted Emission Test For AC Power Port						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
<input checked="" type="checkbox"/>	LISN	R&S	ENV216	102154	Jul. 24, 2022	Jul. 23, 2023
<input checked="" type="checkbox"/>	EMI Receiver	R&S	ESR3	102509	Jul. 24, 2022	Jul. 23, 2023
Software						
Used	Description	Manufacturer	Name		Version	
<input checked="" type="checkbox"/>	Test software	EZ	EZ-EMC		EMEC-3A1	
Other Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
<input checked="" type="checkbox"/>	Temperature & Humidity	Temperature	HTC-1	/	Jul. 24, 2022	Jul. 23, 2023

8. Duty Cycle

8.1. Block diagram of test setup



8.2. Limits

None; for reporting purposes only.

8.3. Procedure

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.B.

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.

Set $RBW \geq EBW$ if possible; otherwise,

set RBW to the largest available value. Set $VBW \geq RBW$.

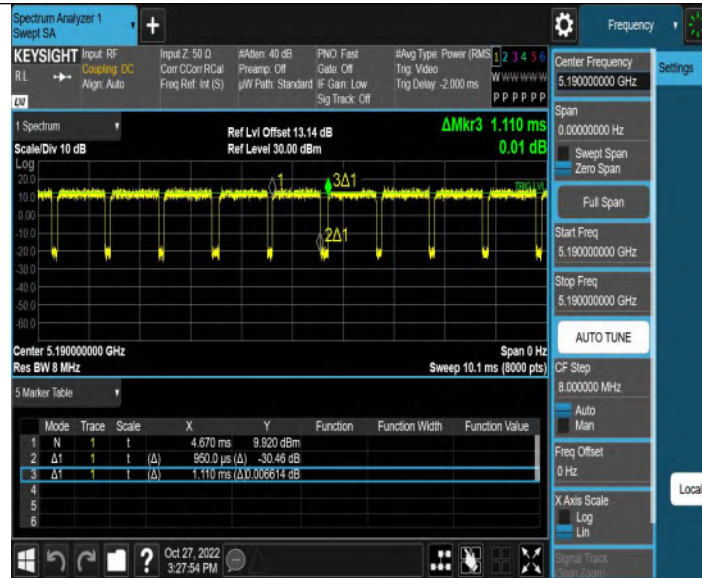
Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$, where T is defined in II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

8.4. Results

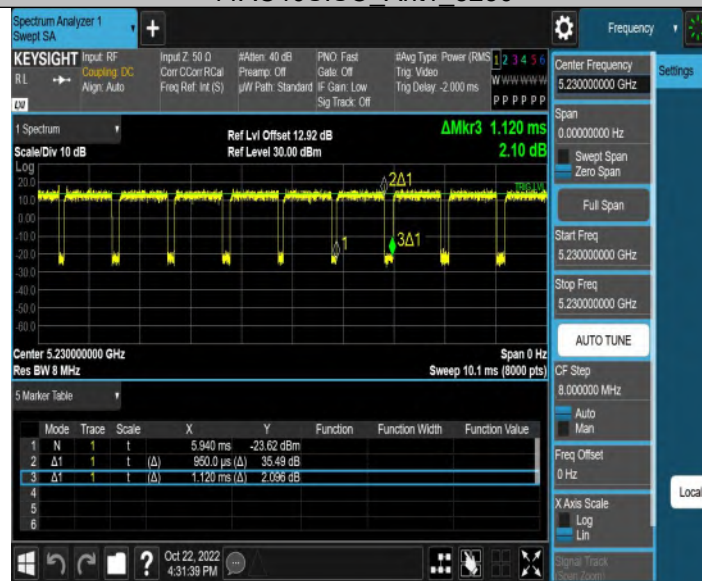
Test Mode	Ant.	Freq. (MHz)	Transmission Duration (ms)	Transmission Period (ms)	Duty Cycle (%)
11AC20SISO	Ant1	5220	1.93	2.11	91.47
		5765	1.93	2.07	93.24
		5785	1.93	2.10	91.90
11AC40SISO	Ant1	5190	0.95	1.11	85.59
		5230	0.95	1.12	84.82
		5755	0.96	1.08	88.89
		5795	0.95	1.11	85.59
11AC80SISO	Ant1	5210	0.47	0.63	74.60
		5775	0.46	0.64	71.88

8.5. Original test data

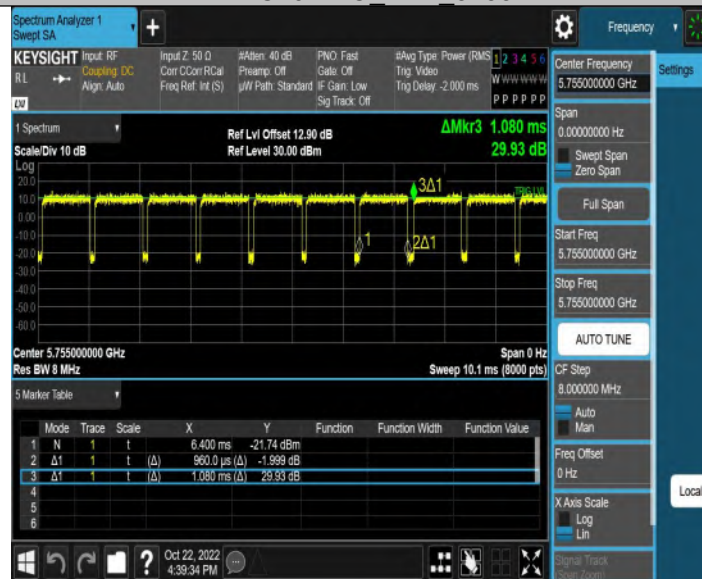




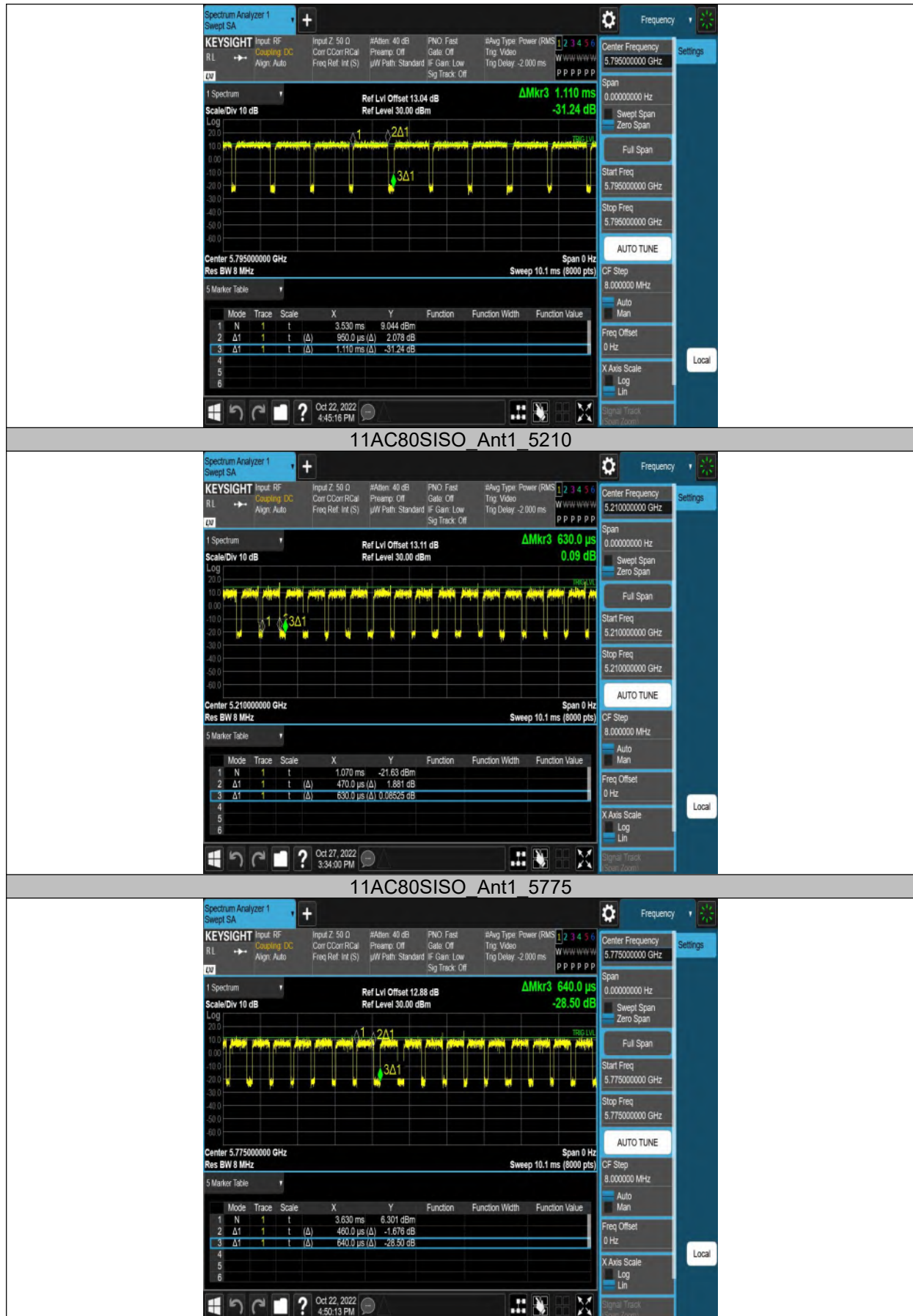
11AC40SISO Ant1 5230



11AC40SISO Ant1 5755



11AC40SISO Ant1 5795



9. 26dB Bandwidth, 6dB Bandwidth

9.1. Block diagram of test setup

Same as section 8.1

9.2. 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	For FCC: 5470 - 5725
	Minimum 500 kHz 6 dB Bandwidth	5725 - 5850

9.3. 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.

9.4. Test result

Test Mode	Ant.	Freq. (MHz)	26db EBW (MHz)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
11AC20SISO	Ant1	5220	19.680	5210.480	5230.160	---	---
		5765	25.200	5753.880	5779.080	---	---
		5785	20.040	5775.040	5795.080	---	---
11AC40SISO	Ant1	5190	39.440	5170.240	5209.680	---	---
		5230	40.880	5209.600	5250.480	---	---
		5755	44.320	5734.040	5778.360	---	---
		5795	39.840	5775.080	5814.920	---	---
11AC80SISO	Ant1	5210	82.720	5168.240	5250.960	---	---
		5775	88.160	5728.120	5816.280	---	---

Test Mode	Ant.	Freq. (MHz)	6db EBW (MHz)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
11AC20SISO	Ant1	5765	11.240	5759.360	5770.600	0.5	PASS
		5785	15.360	5777.480	5792.840	0.5	PASS
11AC40SISO	Ant1	5755	28.160	5739.960	5768.120	0.5	PASS
		5795	29.760	5779.960	5809.720	0.5	PASS
11AC80SISO	Ant1	5775	73.760	5738.680	5812.440	0.5	PASS

9.5. Original Test Data

26dB Bandwidth:





11AC40SISO Ant1 5230



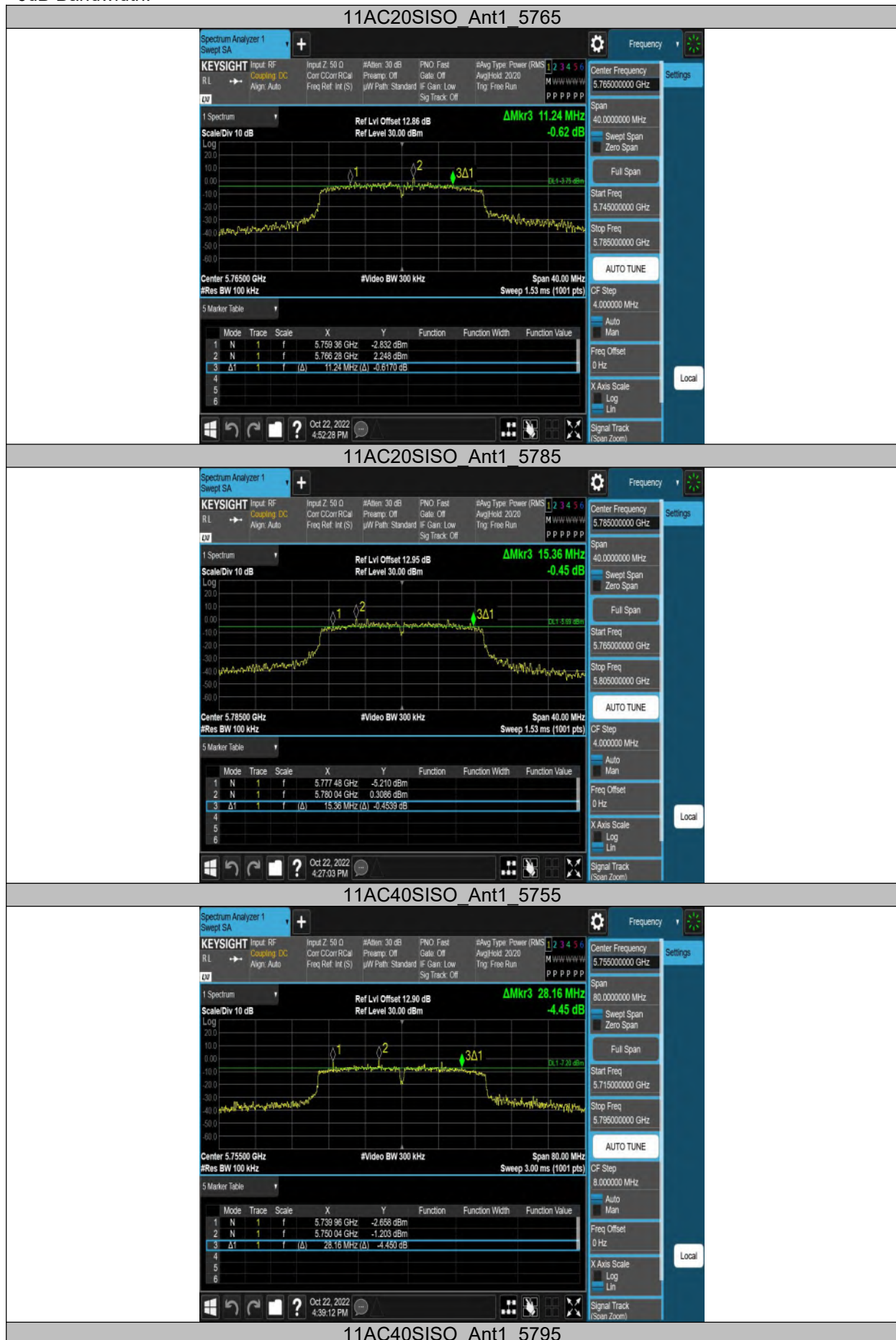
11AC40SISO Ant1 5755



11AC40SISO Ant1 5795



6dB Bandwidth:





10. Maximum Output Power

10.1. Block diagram of test setup

Same as section 8.1

10.2. Limits

FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	<input type="checkbox"/> Outdoor Access Point: 1 W (30 dBm)	5150-5250
	<input type="checkbox"/> Indoor Access Point: 1 W (30 dBm)	
	<input type="checkbox"/> Fixed Point-To-Point Access Points: 1 W (30 dBm)	
	<input checked="" type="checkbox"/> Client Devices: 250 mW (24 dBm)	
	Shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.	5250-5350 5470-5725
	Shall not exceed 1 Watt (30 dBm).	5725-5850

Note: The above limits are based upon the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in db that the directional gain of the antenna exceeds 6 dBi.

10.3. Test Procedure

Connect EUT's antenna output to power meter by RF cable and attenuator

10.4. Test Result

Test Mode	Ant.	Freq. (MHz)	Channel Power (dBm)	DC Factor (dBm)	Result (dBm)	Limit (dBm)	Verdict
11AC20SIS O	Ant1	5220	13.89	0.39	14.28	≤23.98	PASS
		5765	12.45	0.30	12.75	≤30.00	PASS
		5785	12.03	0.37	12.40	≤30.00	PASS
11AC40SIS O	Ant1	5190	12.83	0.68	13.51	≤23.98	PASS
		5230	13.62	0.72	14.34	≤23.98	PASS
		5755	11.59	0.51	12.10	≤30.00	PASS
		5795	12.09	0.68	12.77	≤30.00	PASS
11AC80SIS O	Ant1	5210	12.25	1.27	13.52	≤23.98	PASS
		5775	10.99	1.43	12.42	≤30.00	PASS

11. Power Spectral Density

11.1. Block diagram of test setup

Same as section 8.1

11.2. Limits

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	<input type="checkbox"/> Outdoor Access Point: 17 dBm/MHz <input type="checkbox"/> Indoor Access Point: 17 dBm/MHz <input type="checkbox"/> Fixed Point-To-Point Access Points: 17 dBm/MHz <input checked="" type="checkbox"/> Client Devices: 11 dBm/MHz	5150-5250
	11 dBm/MHz	5250-5350 5470-5725
	30 dBm/500 kHz	5725-5850

Note: The above limits are based upon the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in db that the directional gain of the antenna exceeds 6 dBi.

11.3. 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 analyzer 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 +30 dBm using RBW=500kHz (that is +30 dBm/500kHz), then the converted value will be +33 dBm/1MHz.

3. Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

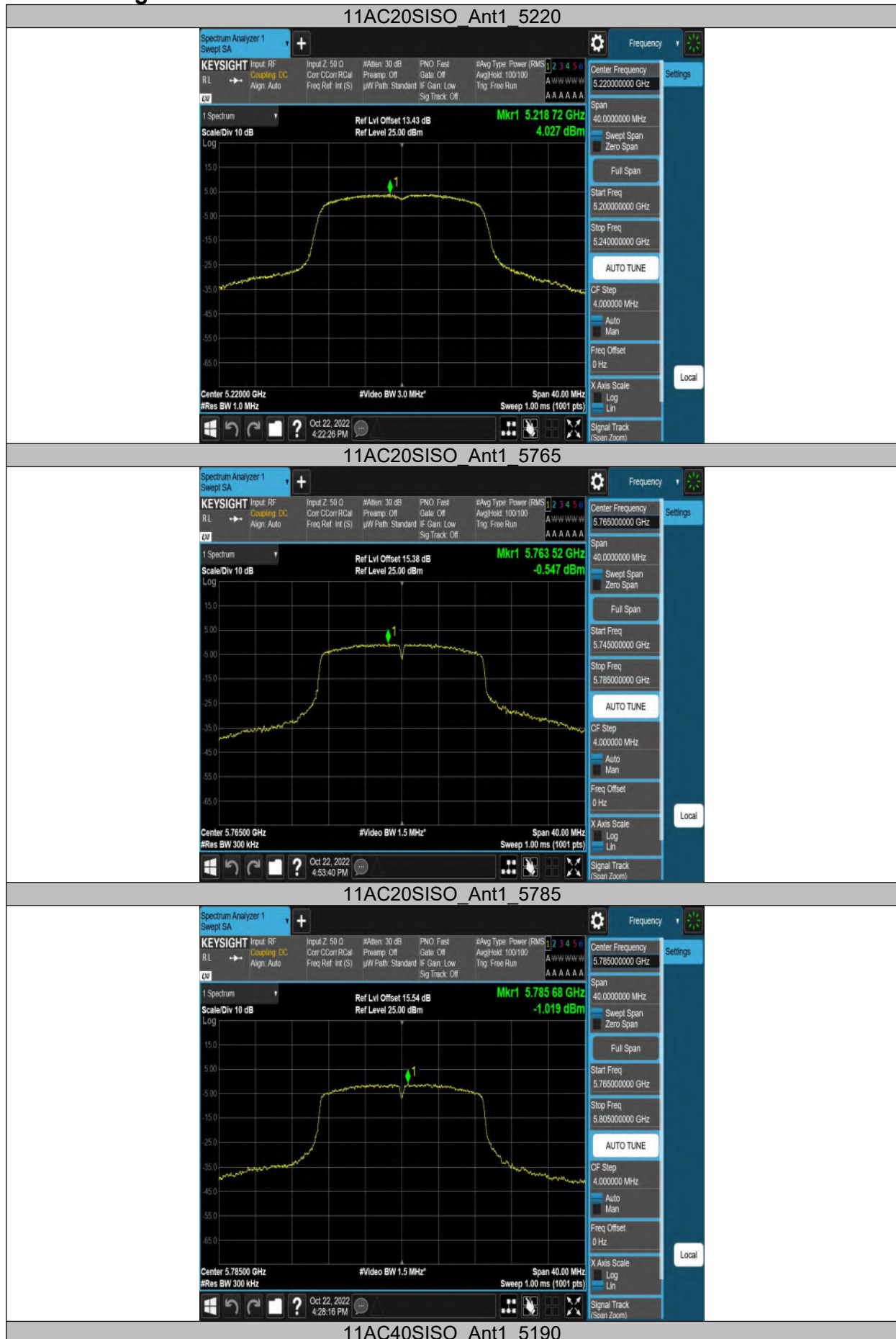
11.4. Test Result

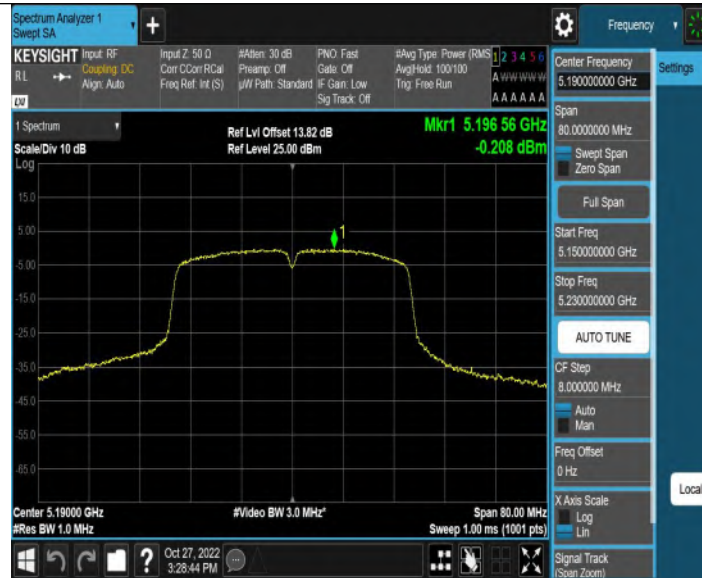
Test Mode	Ant.	Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
11AC20SISO	Ant1	5220	4.03	≤ 11.00	PASS
		5765	-0.55	≤ 30.00	PASS
		5785	-1.02	≤ 30.00	PASS
11AC40SISO	Ant1	5190	-0.21	≤ 11.00	PASS
		5230	0.94	≤ 11.00	PASS
		5755	-4.33	≤ 30.00	PASS
		5795	-3.73	≤ 30.00	PASS
11AC80SISO	Ant1	5210	-3.33	≤ 11.00	PASS
		5775	-7.4	≤ 30.00	PASS

Note: 1.The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

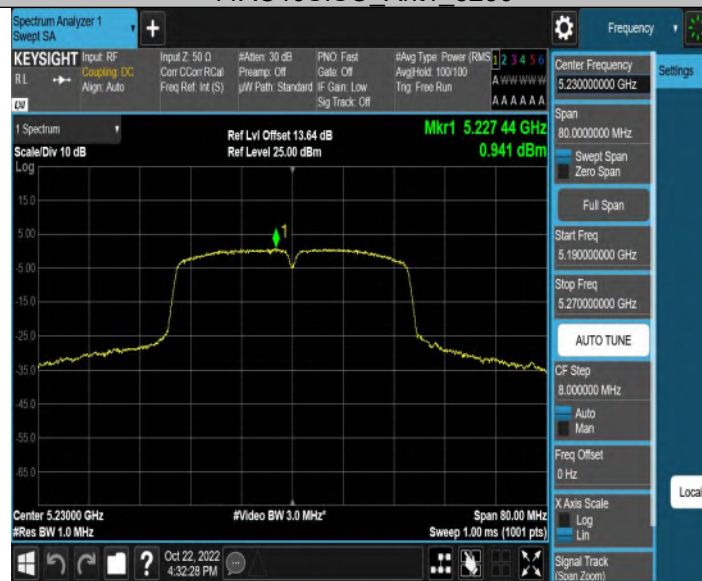
2.The Duty Cycle Factor and RBW Factor is compensated in the graph.The RBW Factor = $10\log(500/300)=2.23\text{dB}$.

11.5. Original Test Data

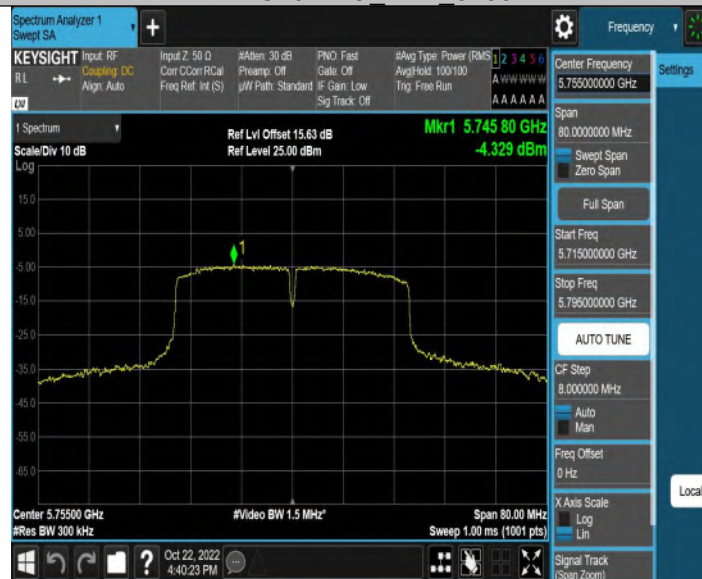




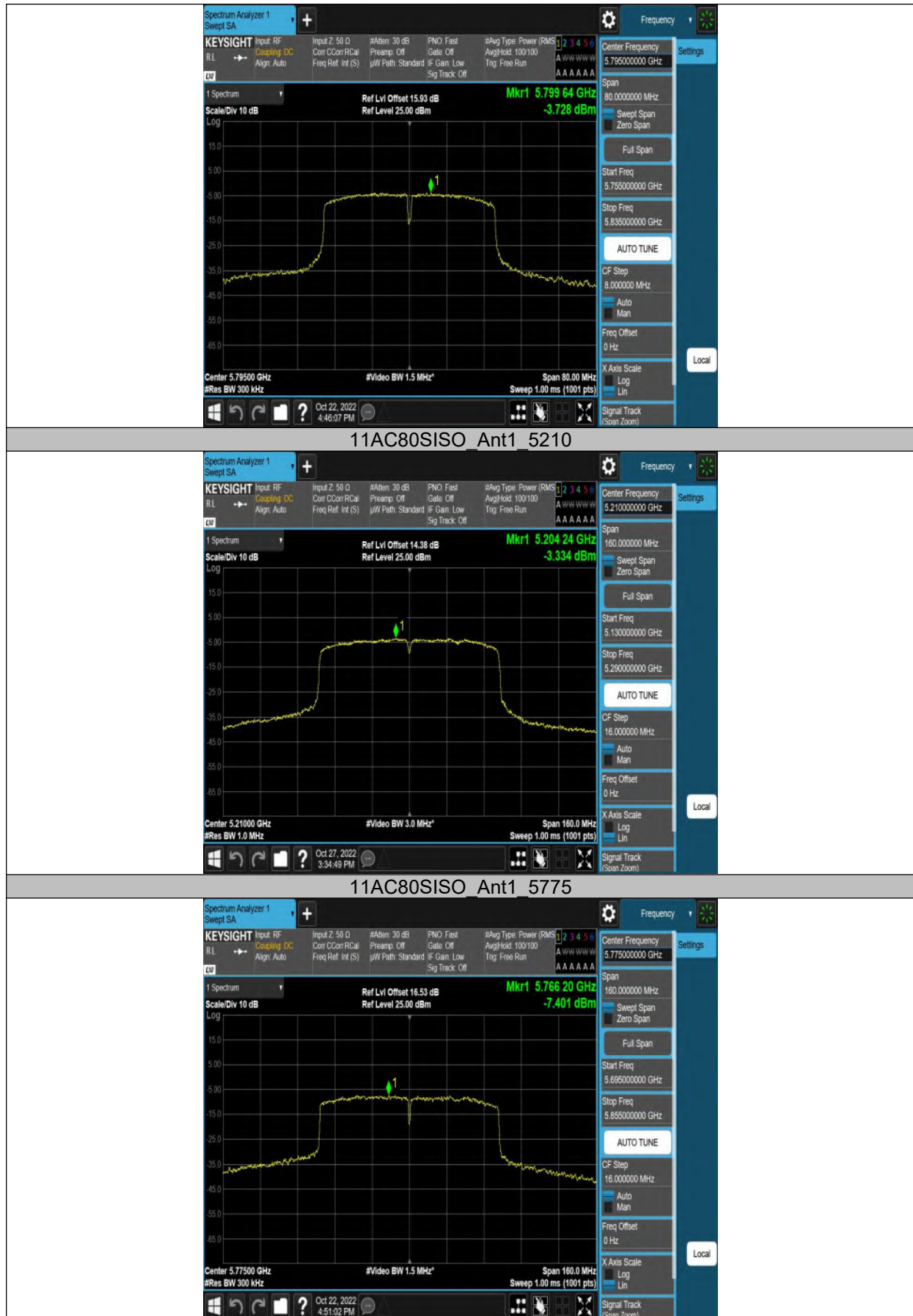
11AC40SISO_Ant1_5230



11AC40SISO_Ant1_5275



11AC40SISO_Ant1_5795



12. Frequency Stability Measurement

12.1. Block diagram of test setup

Same as section 8.1

12.2. 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.

12.3. 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.

12.4. Test Result

Voltage						
Freq. (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
5220	NV	NT	11000.00	2.107280	20	PASS
	LV	NT	11000.00	2.107280	20	PASS
	HV	NT	12000.00	2.298851	20	PASS
5765	NV	NT	1000.00	0.173461	20	PASS
	LV	NT	5000.00	0.867303	20	PASS
	HV	NT	6000.00	1.040763	20	PASS
5785	NV	NT	2000.00	0.345722	20	PASS
	LV	NT	6000.00	1.037165	20	PASS
	HV	NT	7000.00	1.210026	20	PASS
5190	NV	NT	1000.00	0.192678	20	PASS
	LV	NT	7000.00	1.348748	20	PASS
	HV	NT	9000.00	1.734104	20	PASS
5230	NV	NT	4000.00	0.764818	20	PASS
	LV	NT	10000.00	1.912046	20	PASS
	HV	NT	11000.00	2.103250	20	PASS
5755	NV	NT	2000.00	0.347524	20	PASS
	LV	NT	6000.00	1.042572	20	PASS
	HV	NT	7000.00	1.216334	20	PASS
5795	NV	NT	0.00	0.000000	20	PASS
	LV	NT	5000.00	0.862813	20	PASS
	HV	NT	6000.00	1.035375	20	PASS
5210	NV	NT	1000.00	0.191939	20	PASS
	LV	NT	7000.00	1.343570	20	PASS
	HV	NT	9000.00	1.727447	20	PASS
5775	NV	NT	2000.00	0.346320	20	PASS
	LV	NT	6000.00	1.038961	20	PASS
	HV	NT	7000.00	1.212121	20	PASS

Temperature						
Freq. (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
5220	NV	-20	12000.00	2.298851	20	PASS
	NV	-10	12000.00	2.298851	20	PASS
	NV	0	13000.00	2.490421	20	PASS

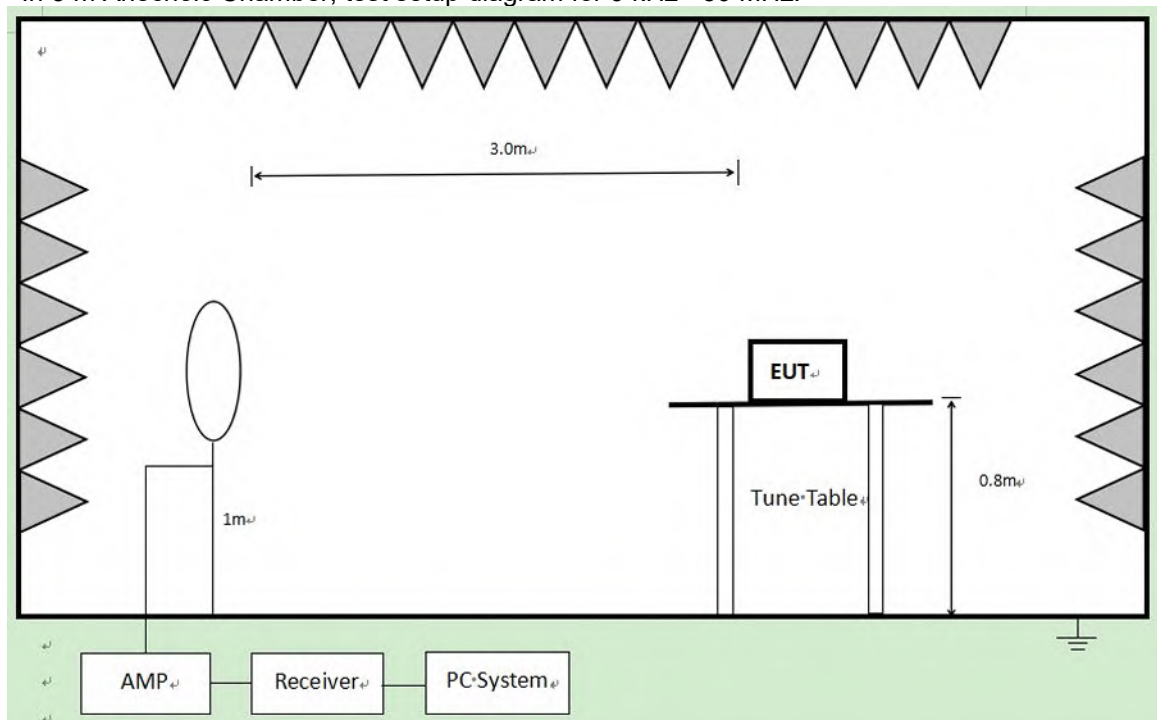
	NV	10	13000.00	2.490421	20	PASS
	NV	20	13000.00	2.490421	20	PASS
	NV	30	13000.00	2.490421	20	PASS
	NV	40	13000.00	2.490421	20	PASS
	NV	50	13000.00	2.490421	20	PASS
	NV	60	14000.00	2.681992	20	PASS
	NV	70	14000.00	2.681992	20	PASS
5765	NV	-20	6000.00	1.040763	20	PASS
	NV	-10	6000.00	1.040763	20	PASS
	NV	0	6000.00	1.040763	20	PASS
	NV	10	7000.00	1.214224	20	PASS
	NV	20	7000.00	1.214224	20	PASS
	NV	30	7000.00	1.214224	20	PASS
	NV	40	7000.00	1.214224	20	PASS
	NV	50	7000.00	1.214224	20	PASS
	NV	60	7000.00	1.214224	20	PASS
	NV	70	7000.00	1.214224	20	PASS
5785	NV	-20	8000.00	1.382887	20	PASS
	NV	-10	8000.00	1.382887	20	PASS
	NV	0	8000.00	1.382887	20	PASS
	NV	10	8000.00	1.382887	20	PASS
	NV	20	8000.00	1.382887	20	PASS
	NV	30	8000.00	1.382887	20	PASS
	NV	40	8000.00	1.382887	20	PASS
	NV	50	8000.00	1.382887	20	PASS
	NV	60	9000.00	1.555748	20	PASS
	NV	70	9000.00	1.555748	20	PASS
5190	NV	-20	10000.00	1.926782	20	PASS
	NV	-10	11000.00	2.119461	20	PASS
	NV	0	11000.00	2.119461	20	PASS
	NV	10	12000.00	2.312139	20	PASS
	NV	20	12000.00	2.312139	20	PASS
	NV	30	13000.00	2.504817	20	PASS
	NV	40	13000.00	2.504817	20	PASS
	NV	50	13000.00	2.504817	20	PASS
	NV	60	14000.00	2.697495	20	PASS
	NV	70	14000.00	2.697495	20	PASS
5230	NV	-20	12000.00	2.294455	20	PASS
	NV	-10	13000.00	2.485660	20	PASS
	NV	0	13000.00	2.485660	20	PASS
	NV	10	13000.00	2.485660	20	PASS
	NV	20	13000.00	2.485660	20	PASS
	NV	30	13000.00	2.485660	20	PASS
	NV	40	14000.00	2.676864	20	PASS
	NV	50	14000.00	2.676864	20	PASS
	NV	60	14000.00	2.676864	20	PASS
	NV	70	14000.00	2.676864	20	PASS
5755	NV	-20	7000.00	1.216334	20	PASS
	NV	-10	7000.00	1.216334	20	PASS
	NV	0	7000.00	1.216334	20	PASS
	NV	10	7000.00	1.216334	20	PASS
	NV	20	7000.00	1.216334	20	PASS
	NV	30	7000.00	1.216334	20	PASS
	NV	40	7000.00	1.216334	20	PASS
	NV	50	7000.00	1.216334	20	PASS
	NV	60	7000.00	1.216334	20	PASS
	NV	70	7000.00	1.216334	20	PASS
5795	NV	-20	7000.00	1.207938	20	PASS
	NV	-10	7000.00	1.207938	20	PASS
	NV	0	7000.00	1.207938	20	PASS
	NV	10	8000.00	1.380500	20	PASS
	NV	20	8000.00	1.380500	20	PASS
	NV	30	8000.00	1.380500	20	PASS
	NV	40	8000.00	1.380500	20	PASS
	NV	50	8000.00	1.380500	20	PASS
	NV	60	8000.00	1.380500	20	PASS
	NV	70	8000.00	1.380500	20	PASS
5210	NV	-20	11000.00	2.111324	20	PASS

	NV	-10	12000.00	2.303263	20	PASS
	NV	0	12000.00	2.303263	20	PASS
	NV	10	13000.00	2.495202	20	PASS
	NV	20	13000.00	2.495202	20	PASS
	NV	30	13000.00	2.495202	20	PASS
	NV	40	13000.00	2.495202	20	PASS
	NV	50	14000.00	2.687140	20	PASS
	NV	60	14000.00	2.687140	20	PASS
5775	NV	70	14000.00	2.687140	20	PASS
	NV	-20	8000.00	1.385281	20	PASS
	NV	-10	8000.00	1.385281	20	PASS
	NV	0	9000.00	1.558442	20	PASS
	NV	10	9000.00	1.558442	20	PASS
	NV	20	9000.00	1.558442	20	PASS
	NV	30	9000.00	1.558442	20	PASS
	NV	40	9000.00	1.558442	20	PASS
	NV	50	9000.00	1.558442	20	PASS
	NV	60	8000.00	1.385281	20	PASS
	NV	70	8000.00	1.385281	20	PASS

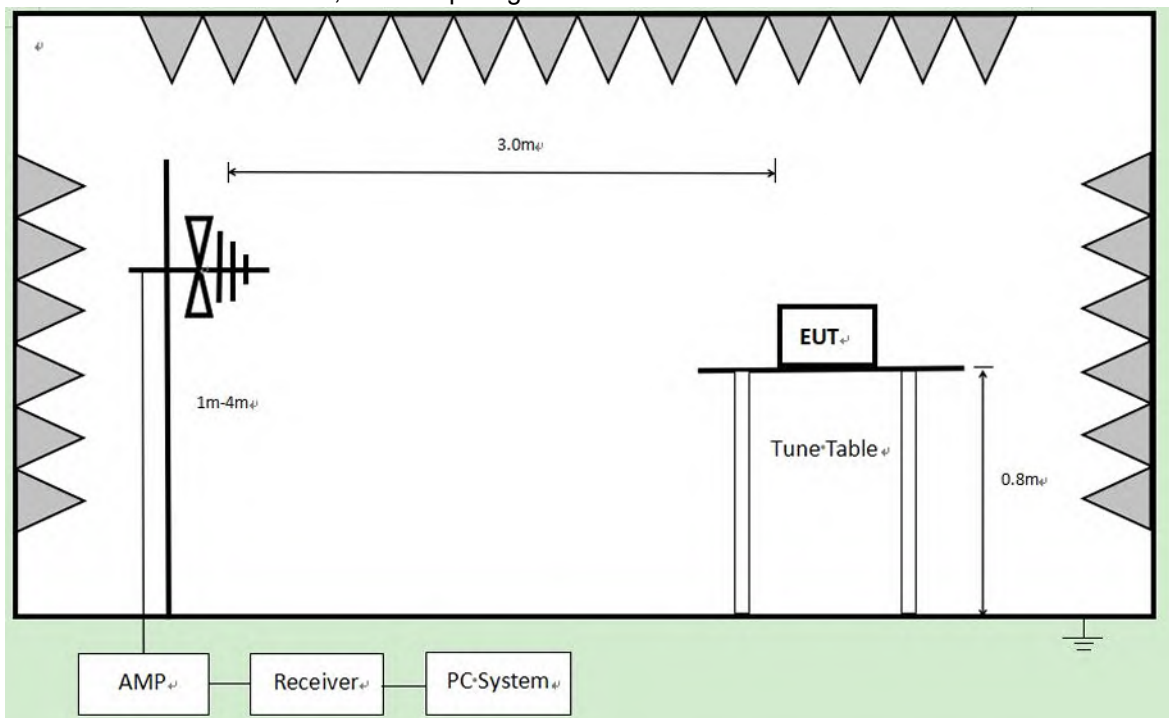
13. Radiated Emission

13.1. Block Diagram of Test Setup

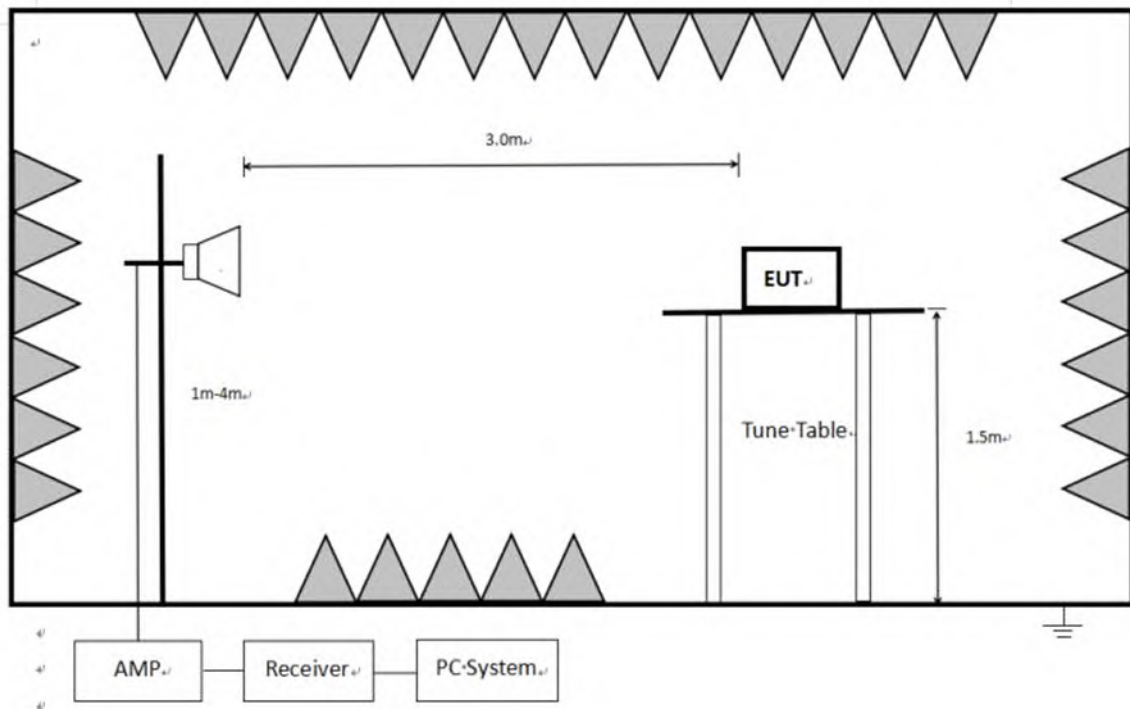
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



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

13.2. Limit

(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
¹ 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			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6

(2) FCC 15.209 Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/F(\text{kHz})$	$67.6-20\log(F)$
0.490 ~ 1.705	30	$24000/F(\text{kHz})$	$87.6-20\log(F)$
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)	

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

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

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of $-27 \text{ dBm} / \text{MHz}$.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of $-17 \text{ dBm}/\text{MHz}$; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of $-27 \text{ dBm} / \text{MHz}$.

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(6) The provisions of §15.205 apply to intentional radiators operating under this section.

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

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:

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

(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.

13.3. Test Procedure

Below 30 MHz:

The setting of the spectrum Analyzer

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of 1 meter height antenna tower.
5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

Below 1 GHz and above 30 MHz:

The setting of the spectrum Analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz:

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for AVG measurements. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.
7. Restriction band: Investigated frequency range from 5.15-5.25 GHz, 5250-5350 GHz, 5470-5725 GHz, 5.725-5.85 GHz.

All restriction band should comply with 15.209, other emission should be at least 20 dB below the fundamental.

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT does not support simultaneous transmission.

Note 3: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

13.4. 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, the emission levels are 20 dB below the limit 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 11AC80_5775 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.

Note 4: 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

Note 5: For emissions Above 1 GHz, all mode have been tested, 11ac mode of is worse case and recorded in report.

13.5. Original Test Data

Below 1 GHz and above 30 MHz test data Refer to appendix A

Above 1 GHz test data Refer to appendix B

For 5150MHz~5350MHz outside of the restricted bands Emission PK margin all above 5.8dB(74-68.2), So the result comply 15.407(b)(1)

For 5725MHz~5850MHz outside of the restricted band see below table:





11AC40SISO Ant1 High 5795



11AC80SISO Ant1 Low 5775

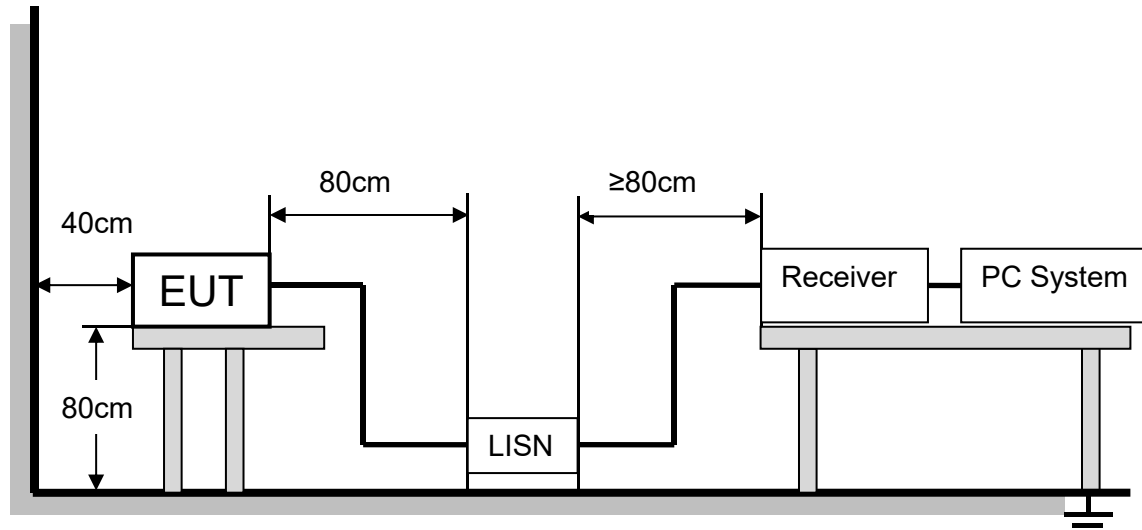


11AC80SISO Ant1 High 5775



14. AC Power Line Conducted Emissions

14.1. Block diagram of test setup



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

14.2. Limits

Please refer to CFR 47 FCC §15.207 (a).

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note 1: * Decreasing linearly with logarithm of frequency.

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

14.3. 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 2.4 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 C63.10.

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 30 MHz 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 2.4 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.

14.4. Test result

Pass. (See below detailed test result)

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

Note2: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worse case.

14.5. Original test data

NA

Note: The conducted emission tests at AC port are not required test.

15. Dynamic Frequency Selection

15.1. Applicability of DFS Requirements

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

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

Requirement	Operational Mode		
	<input type="checkbox"/> Master	<input checked="" type="checkbox"/> Client Without Radar Detection	<input type="checkbox"/> 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	
	<input type="checkbox"/> Master Device or Client with Radar Detection	<input checked="" type="checkbox"/> 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	<input type="checkbox"/> Master Device or Client with Radar Detection	<input checked="" type="checkbox"/> 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.

15.2. 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
<p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.</p> <p>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.</p> <p>Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.</p>	

(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.
<p>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.</p> <p>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.</p> <p>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.</p>	

15.3. 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

15.4. Calibration of Radar Waveform

Radar Waveform Calibration Procedure:

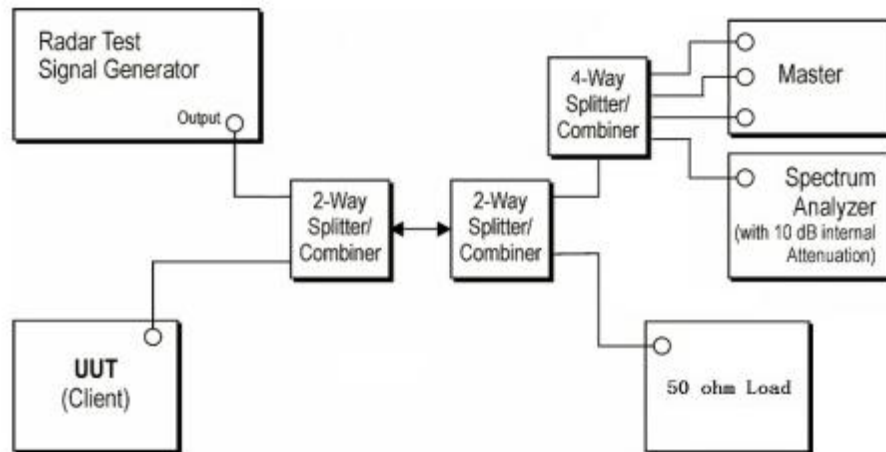
A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master

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.

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.

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:

NA

15.5. Channel Closing Transmission Time, Channel Move Time And Non-Occupancy Period

Block diagram of test setup Test Procedure:

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.

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.

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.

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.

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.

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.

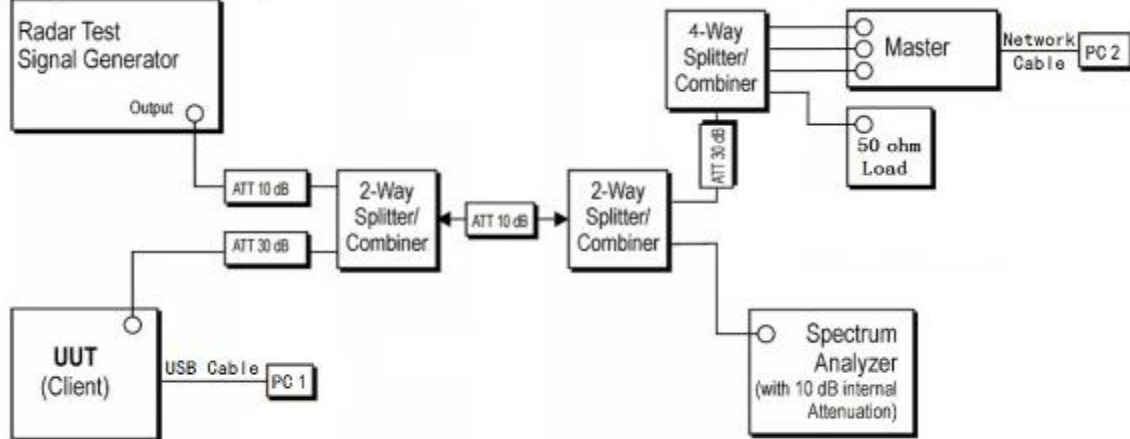
Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the

spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $Dwell (0.3ms) = S (12000ms) / B (4000)$; where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: $C (ms) = N \times Dwell (0.3ms)$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.

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

15.6. Test Setup

Setup for Client with injection at the Master



15.7. Test Result

NA

Note: The Operation Frequency not fall in the 5250-5350 MHz and/or 5470-5725 MHz bands.

16. Antenna Requirements

16.1. Applicable Requirements

Please refer to FCC §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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

16.2. Result

The device support 1T1R, the antennas both used for this product are dedicated FPC antennas and other than that furnished by the responsible party shall be used with the device, maximum antenna gain is 4.4 dBi for antenna .

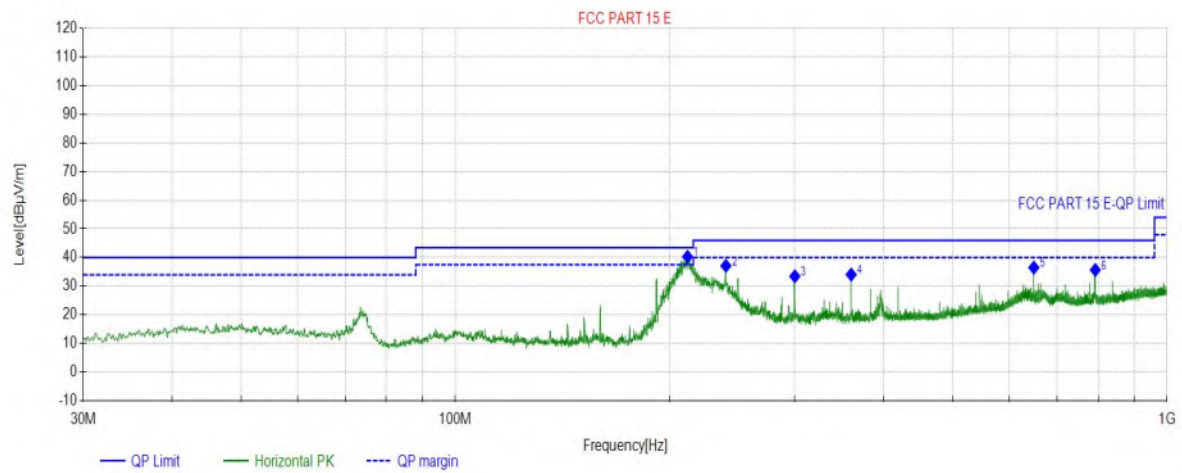
APPENDIX A – Radiated Emission Below 1GHz Test Data

Test Report

Project Information			
EUT:	Car Audio Navigation	Environment:	25℃/58%
Model:	M903AT-11T	SN:	
Mode:	11AC80_5775	Voltage:	12V/10A
Customer:		Engineer:	Roger
Remark:			
Test Standard:			

Start of Test: 2022-10-28 14:51:38

Test Graph



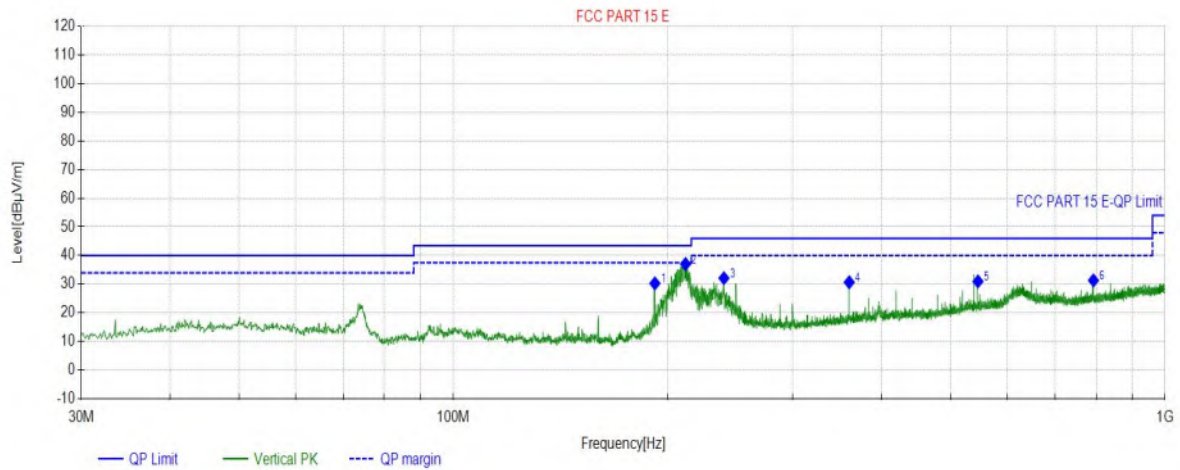
Final Data List								
NO.	Freq. (MHz)	Factor (dB)	QP Value (dBμV/m)	QP Limit (dBμV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity
1	211.9902	-21.96	40.27	43.50	3.23	100	63	Horizontal
2	240.0260	-20.70	37.12	46.00	8.88	100	360	Horizontal
3	299.9780	-19.46	33.45	46.00	12.55	100	263	Horizontal
4	360.0270	-17.72	34.06	46.00	11.94	100	267	Horizontal
5	649.9890	-11.27	36.50	46.00	9.50	100	16	Horizontal
6	792.8843	-9.21	35.71	46.00	10.29	100	182	Horizontal

Test Report

Project Information			
EUT:	Car Audio Navigation	Environment:	25℃/58%
Model:	M903AT-11T	SN:	
Mode:	11AC80_5775	Voltage:	12V/10A
Customer:		Engineer:	Roger
Remark:			
Test Standard:			

Start of Test: 2022-10-28 14:52:22

Test Graph



Final Data List

NO.	Freq. (MHz)	Factor (dB)	QP Value (dBμV/m)	QP Limit (dBμV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity
1	192.0062	-22.86	30.30	43.50	13.20	100	358	Vertical
2	211.9902	-21.96	37.05	43.50	6.45	100	358	Vertical
3	240.0260	-20.70	32.11	46.00	13.89	100	358	Vertical
4	360.0270	-17.72	30.68	46.00	15.32	100	356	Vertical
5	545.9946	-13.09	30.98	46.00	15.02	100	0	Vertical
6	793.3693	-9.21	31.34	46.00	14.66	100	179	Vertical

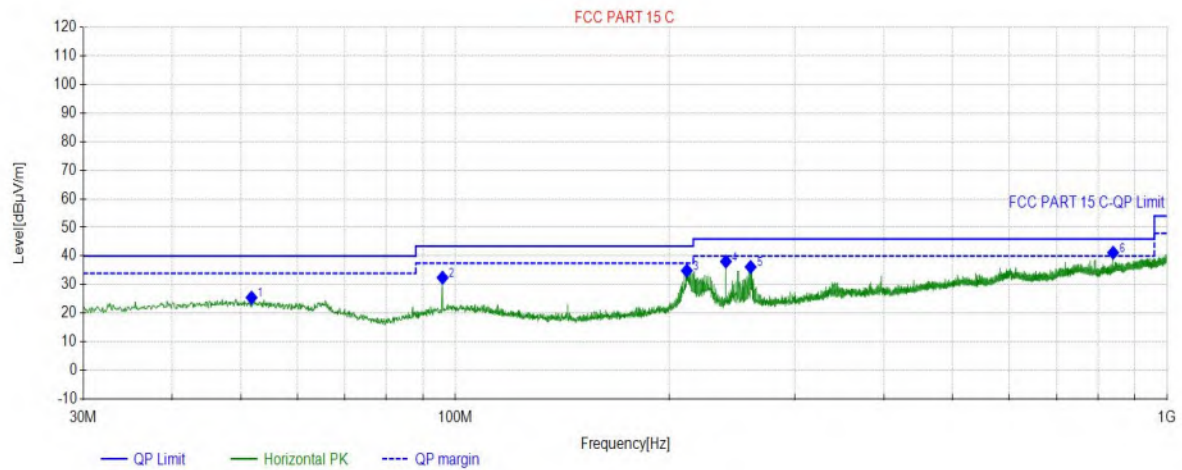
For model: M903AT-10T:

Test Report

Project Information			
EUT:	Car Audio Navigation	Environment:	25℃/58%
Model:	M903AT-10T	SN:	
Mode:	11AC80_5775	Voltage:	12V/10A
Customer:		Engineer:	
Remark:			
Test Standard:			

Start of Test: 2022-12-20 17:28:12

Test Graph



Final Data List

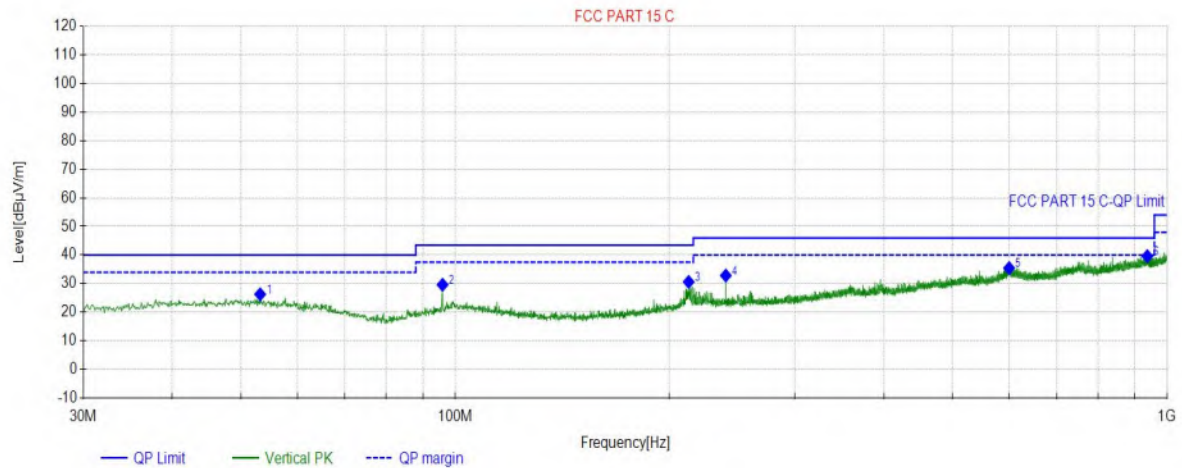
NO.	Freq. (MHz)	Factor (dB)	QP Value (dBμV/m)	QP Limit (dBμV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity
1	51.7302	22.04	25.49	40.00	14.51	200	49	Horizontal
2	95.9666	19.85	32.46	43.50	11.04	200	156	Horizontal
3	211.5052	20.75	34.89	43.50	8.61	100	340	Horizontal
4	240.0260	22.04	38.08	46.00	7.92	100	89	Horizontal
5	260.0100	22.32	36.18	46.00	9.82	100	121	Horizontal
6	840.0310	33.25	41.18	46.00	4.82	100	253	Horizontal

Test Report

Project Information			
EUT:	Car Audio Navigation	Environment:	25℃/58%
Model:	M903AT-10T	SN:	
Mode:	11AC80_5775	Voltage:	12V/10A
Customer:		Engineer:	
Remark:			
Test Standard:			

Start of Test: 2022-12-20 17:36:01

Test Graph



Final Data List

NO.	Freq. (MHz)	Factor (dB)	QP Value (dBμV/m)	QP Limit (dBμV/m)	QP Margin (dB)	Height (cm)	Angle (°)	Polarity
1	53.1853	21.84	26.27	40.00	13.73	100	246	Vertical
2	95.9666	19.85	29.61	43.50	13.89	200	278	Vertical
3	212.7663	20.81	30.62	43.50	12.88	200	5	Vertical
4	239.9290	22.04	32.84	46.00	13.16	200	49	Vertical
5	600.0290	30.83	35.43	46.00	10.57	100	333	Vertical
6	938.1078	35.48	39.61	46.00	6.39	100	184	Vertical

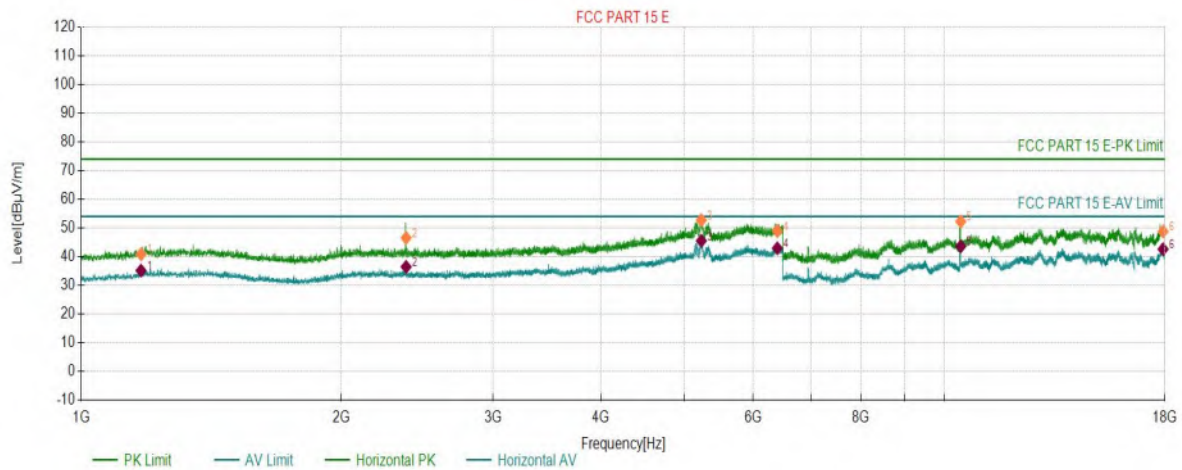
APPENDIX B – Radiated Emission Above 1GHz Test Data

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5220	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-24 19:57:51

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1173.2673	2.40	40.82	74.00	33.18	150	78	Horizontal
2	2378.9879	6.32	46.52	74.00	27.48	150	308	Horizontal
3	5227.7228	20.75	52.71	74.00	21.29	150	112	Horizontal
4	6400.9901	21.65	48.93	74.00	25.07	150	87	Horizontal
5	10440.2940	4.35	52.26	74.00	21.74	150	80	Horizontal
6	17905.6906	14.88	48.75	74.00	25.25	150	122	Horizontal

AV Final Data List

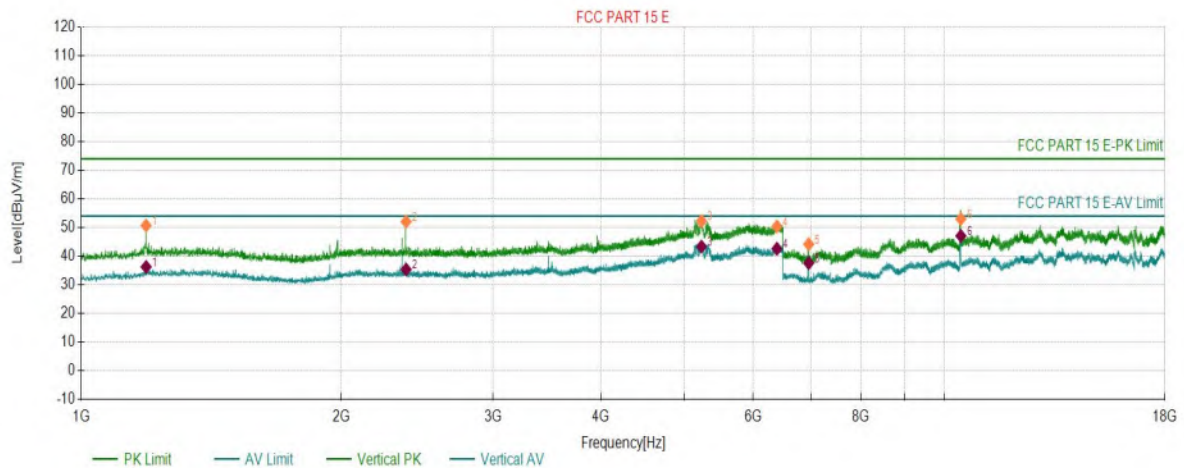
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1173.2673	2.40	35.11	54.00	18.89	150	78	Horizontal
2	2378.9879	6.32	36.40	54.00	17.60	150	308	Horizontal
3	5227.7228	20.75	45.50	54.00	8.50	150	112	Horizontal
4	6400.9901	21.65	42.91	54.00	11.09	150	87	Horizontal
5	10440.2940	4.35	43.57	54.00	10.43	150	80	Horizontal
6	17905.6906	14.88	42.59	54.00	11.41	150	122	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5220	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-24 19:59:09

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.2189	2.62	50.67	74.00	23.33	150	160	Vertical
2	2378.9879	6.32	52.04	74.00	21.96	150	175	Vertical
3	5228.8229	20.75	52.25	74.00	21.75	150	112	Vertical
4	6395.4895	21.60	50.36	74.00	23.64	150	22	Vertical
5	6960.0460	-2.52	44.18	74.00	29.82	150	151	Vertical
6	10443.7444	4.39	52.98	74.00	21.02	150	101	Vertical

AV Final Data List

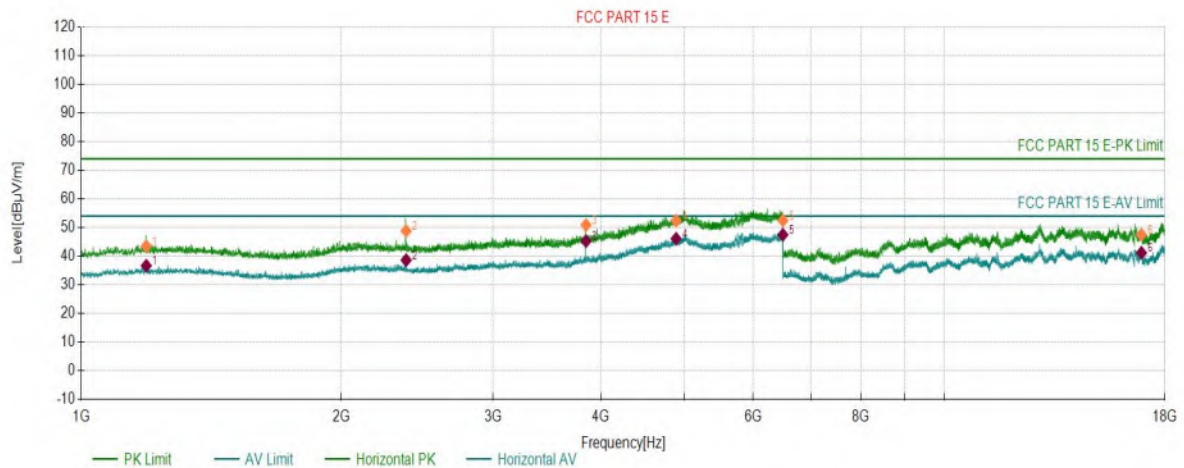
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.2189	2.62	36.20	54.00	17.80	150	160	Vertical
2	2378.9879	6.32	35.30	54.00	18.70	150	175	Vertical
3	5228.8229	20.75	43.32	54.00	10.68	150	112	Vertical
4	6395.4895	21.60	42.56	54.00	11.44	150	22	Vertical
5	6960.0460	-2.52	37.55	54.00	16.45	150	151	Vertical
6	10443.7444	4.39	47.05	54.00	6.95	150	101	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5765	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 16		
Test Standard:			

Start of Test: 2022-10-25 19:19:33

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.7690	3.57	43.43	74.00	30.57	150	165	Horizontal
2	2378.9879	7.89	48.79	74.00	25.21	150	90	Horizontal
3	3843.2343	15.34	50.86	74.00	23.14	150	220	Horizontal
4	4887.7888	21.91	52.33	74.00	21.67	150	8	Horizontal
5	6497.2497	26.13	52.45	74.00	21.55	150	22	Horizontal
6	16903.9404	11.42	47.46	74.00	26.54	150	358	Horizontal

AV Final Data List

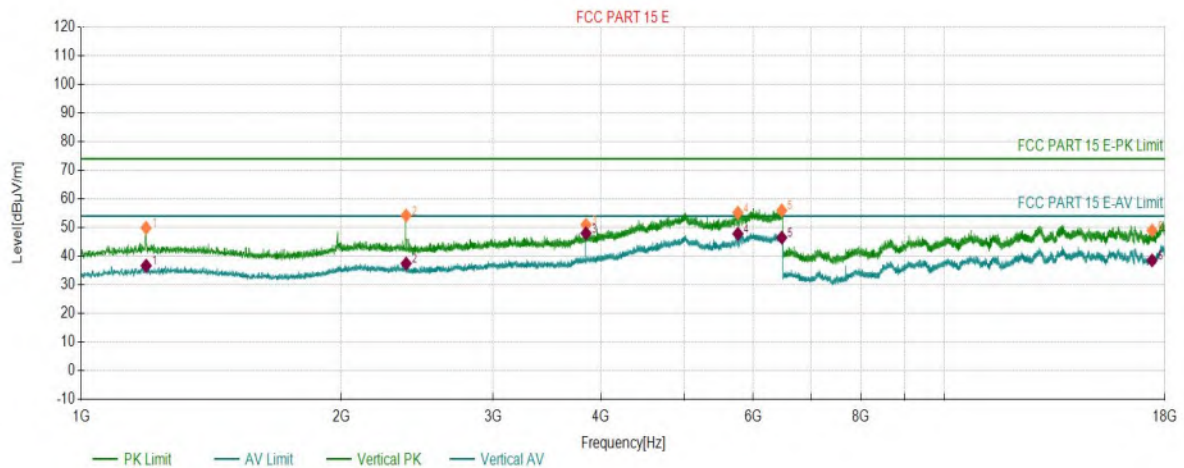
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.7690	3.57	36.64	54.00	17.36	150	165	Horizontal
2	2378.9879	7.89	38.57	54.00	15.43	150	90	Horizontal
3	3843.2343	15.34	45.23	54.00	8.77	150	220	Horizontal
4	4887.7888	21.91	46.04	54.00	7.96	150	8	Horizontal
5	6497.2497	26.13	47.44	54.00	6.56	150	22	Horizontal
6	16903.9404	11.42	41.15	54.00	12.85	150	358	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5765	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 16		
Test Standard:			

Start of Test: 2022-10-25 19:20:59

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.2189	3.56	49.86	74.00	24.14	150	149	Vertical
2	2378.9879	7.89	54.17	74.00	19.83	150	157	Vertical
3	3843.2343	15.34	50.96	74.00	23.04	150	182	Vertical
4	5762.3762	23.45	55.16	74.00	18.84	150	6	Vertical
5	6477.4477	26.04	55.94	74.00	18.06	150	360	Vertical
6	17389.2889	11.11	48.92	74.00	25.08	150	337	Vertical

AV Final Data List

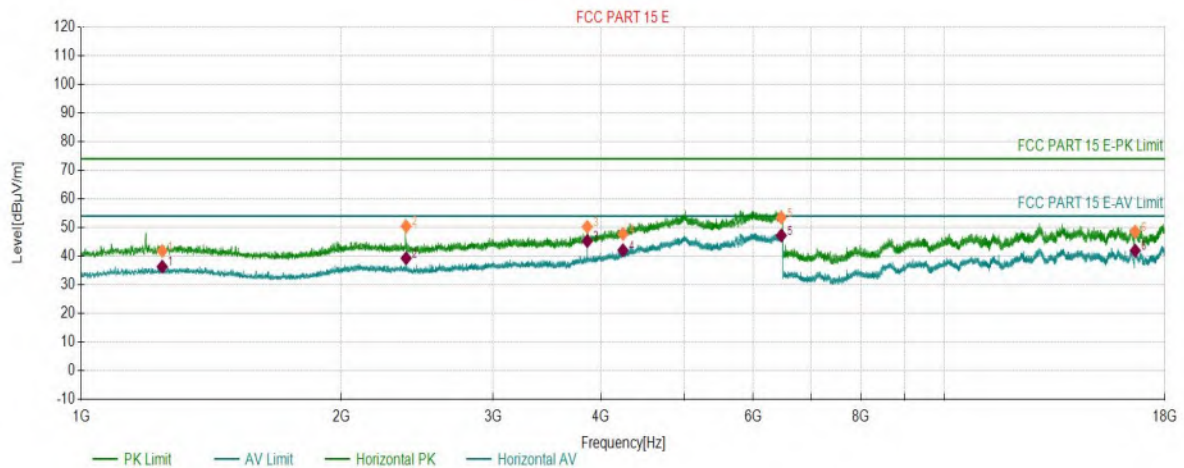
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.2189	3.56	36.63	54.00	17.37	150	149	Vertical
2	2378.9879	7.89	37.38	54.00	16.62	150	157	Vertical
3	3843.2343	15.34	47.97	54.00	6.03	150	182	Vertical
4	5762.3762	23.45	47.77	54.00	6.23	150	6	Vertical
5	6477.4477	26.04	46.46	54.00	7.54	150	360	Vertical
6	17389.2889	11.11	38.48	54.00	15.52	150	337	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5785	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 19:25:56

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1241.4741	3.76	41.77	74.00	32.23	150	15	Horizontal
2	2378.9879	7.89	50.42	74.00	23.58	150	82	Horizontal
3	3856.4356	15.42	50.25	74.00	23.75	150	356	Horizontal
4	4241.4741	17.69	47.74	74.00	26.26	150	252	Horizontal
5	6469.1969	26.00	53.46	74.00	20.54	150	6	Horizontal
6	16625.6126	10.82	48.56	74.00	25.44	150	45	Horizontal

AV Final Data List

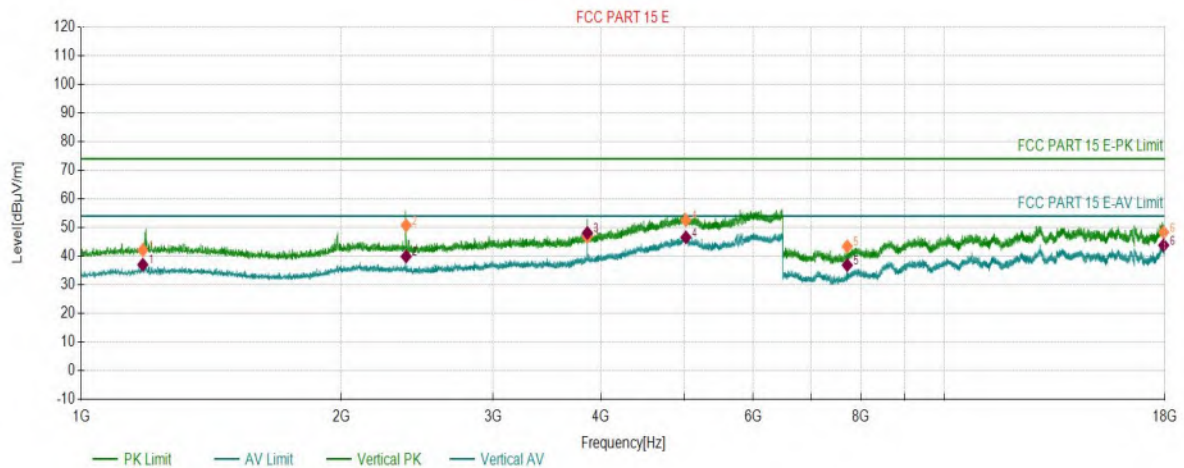
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1241.4741	3.76	36.29	54.00	17.71	150	15	Horizontal
2	2378.9879	7.89	39.23	54.00	14.77	150	82	Horizontal
3	3856.4356	15.42	45.24	54.00	8.76	150	356	Horizontal
4	4241.4741	17.69	42.03	54.00	11.97	150	252	Horizontal
5	6469.1969	26.00	47.20	54.00	6.80	150	6	Horizontal
6	16625.6126	10.82	41.92	54.00	12.08	150	45	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5785	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 19:27:22

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1178.7679	3.47	42.08	74.00	31.92	150	5	Vertical
2	2378.9879	7.89	50.72	74.00	23.28	150	148	Vertical
3	3856.9857	15.43	46.70	74.00	27.30	150	184	Vertical
4	5016.5017	22.89	52.51	74.00	21.49	150	71	Vertical
5	7713.3713	-0.64	43.38	74.00	30.62	150	109	Vertical
6	17935.5936	14.68	48.31	74.00	25.69	150	160	Vertical

AV Final Data List

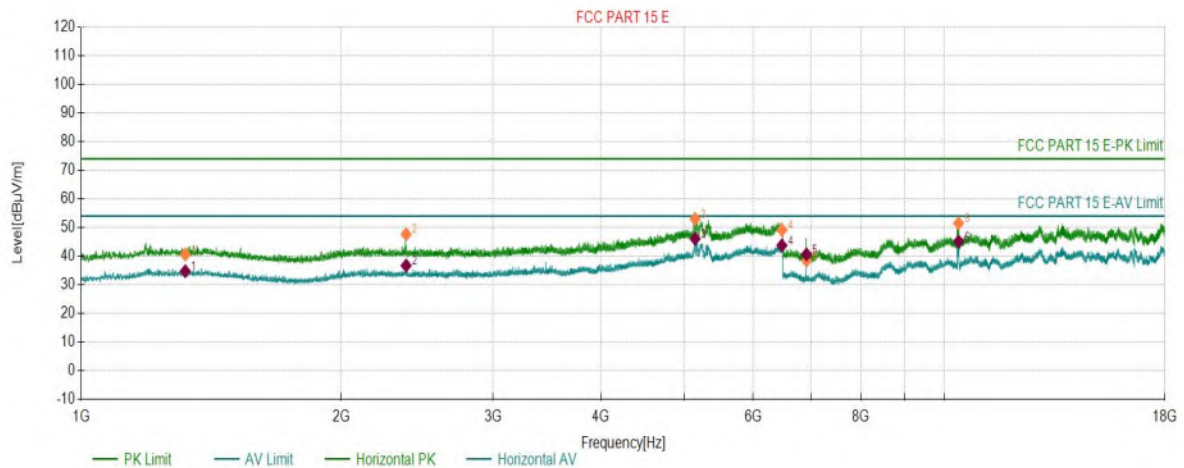
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1178.7679	3.47	36.98	54.00	17.02	150	5	Vertical
2	2378.9879	7.89	39.87	54.00	14.13	150	148	Vertical
3	3856.9857	15.43	48.05	54.00	5.95	150	184	Vertical
4	5016.5017	22.89	46.55	54.00	7.45	150	71	Vertical
5	7713.3713	-0.64	36.83	54.00	17.17	150	109	Vertical
6	17935.5936	14.68	43.78	54.00	10.22	150	160	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5190	Voltage:	12V/10A
Environment:	25°C/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 19:31:10

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1320.1320	3.17	40.55	74.00	33.45	150	301	Horizontal
2	2378.9879	6.32	47.66	74.00	26.34	150	343	Horizontal
3	5140.8141	20.89	52.97	74.00	21.03	150	133	Horizontal
4	6480.1980	21.73	49.11	74.00	24.89	150	10	Horizontal
5	6919.7920	-2.47	38.43	74.00	35.57	150	50	Horizontal
6	10379.3379	3.99	51.48	74.00	22.52	150	141	Horizontal

AV Final Data List

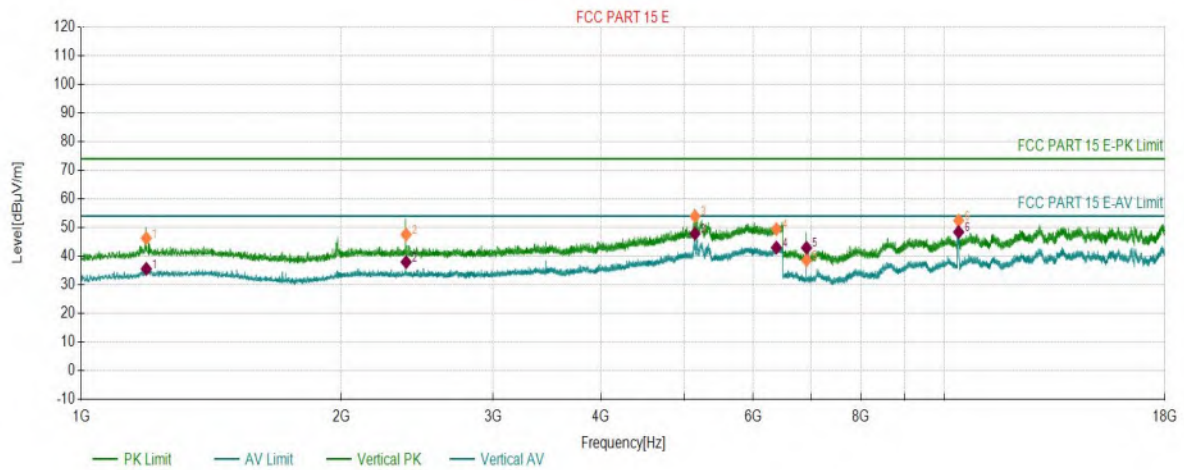
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1320.1320	3.17	34.70	54.00	19.30	150	301	Horizontal
2	2378.9879	6.32	36.69	54.00	17.31	150	343	Horizontal
3	5140.8141	20.89	46.06	54.00	7.94	150	133	Horizontal
4	6480.1980	21.73	43.71	54.00	10.29	150	10	Horizontal
5	6919.7920	-2.47	40.61	54.00	13.39	150	50	Horizontal
6	10379.3379	3.99	45.11	54.00	8.89	150	141	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5190	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 19:32:28

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.7690	2.63	46.23	74.00	27.77	150	156	Vertical
2	2378.9879	6.32	47.56	74.00	26.44	150	156	Vertical
3	5139.7140	20.82	53.91	74.00	20.09	150	114	Vertical
4	6386.6887	21.49	49.45	74.00	24.55	150	106	Vertical
5	6919.7920	-2.47	38.56	74.00	35.44	150	150	Vertical
6	10381.6382	3.98	52.41	74.00	21.59	150	92	Vertical

AV Final Data List

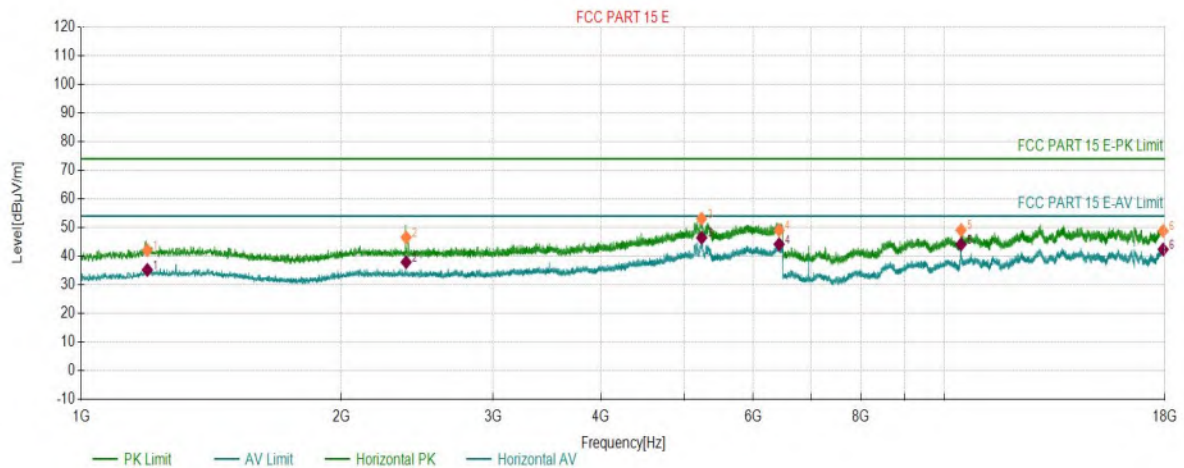
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.7690	2.63	35.53	54.00	18.47	150	156	Vertical
2	2378.9879	6.32	37.91	54.00	16.09	150	156	Vertical
3	5139.7140	20.82	47.82	54.00	6.18	150	114	Vertical
4	6386.6887	21.49	42.94	54.00	11.06	150	106	Vertical
5	6919.7920	-2.47	42.89	54.00	11.11	150	150	Vertical
6	10381.6382	3.98	48.38	54.00	5.62	150	92	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5230	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:05:20

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1193.0693	2.67	42.04	74.00	31.96	150	148	Horizontal
2	2378.9879	6.32	46.53	74.00	27.47	150	316	Horizontal
3	5231.5732	20.75	53.09	74.00	20.91	150	72	Horizontal
4	6431.7932	21.68	49.04	74.00	24.96	150	258	Horizontal
5	10448.3448	4.44	49.08	74.00	24.92	150	144	Horizontal
6	17909.1409	14.86	48.79	74.00	25.21	150	287	Horizontal

AV Final Data List

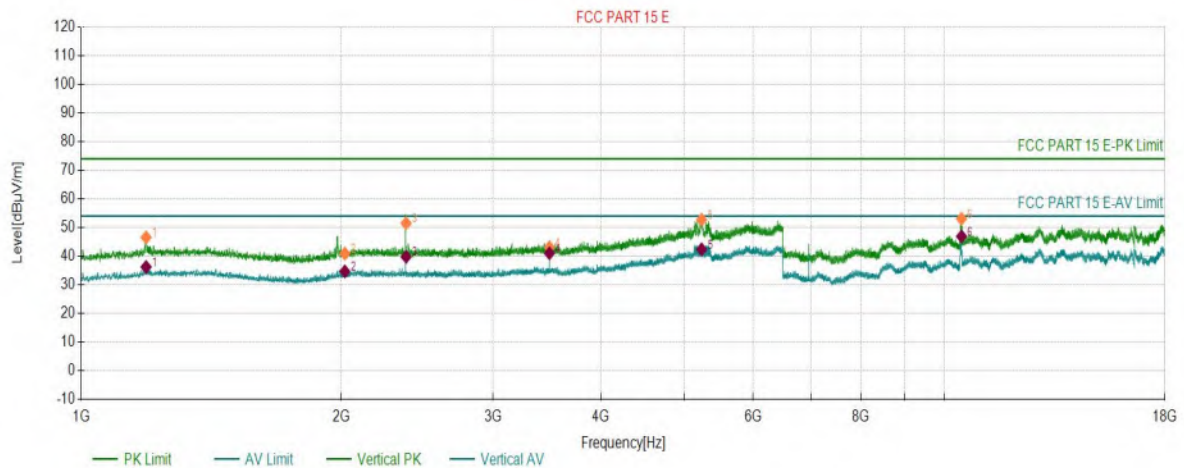
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1193.0693	2.67	35.17	54.00	18.83	150	148	Horizontal
2	2378.9879	6.32	37.87	54.00	16.13	150	316	Horizontal
3	5231.5732	20.75	46.38	54.00	7.62	150	72	Horizontal
4	6431.7932	21.68	44.13	54.00	9.87	150	258	Horizontal
5	10448.3448	4.44	44.11	54.00	9.89	150	144	Horizontal
6	17909.1409	14.86	42.32	54.00	11.68	150	287	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5230	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:06:38

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.2189	2.62	46.51	74.00	27.49	150	149	Vertical
2	2020.3520	5.55	40.88	74.00	33.12	150	82	Vertical
3	2378.9879	6.32	51.49	74.00	22.51	150	139	Vertical
4	3486.7987	10.30	43.06	74.00	30.94	150	124	Vertical
5	5231.5732	20.75	52.75	74.00	21.25	150	115	Vertical
6	10460.9961	4.59	53.02	74.00	20.98	150	94	Vertical

AV Final Data List

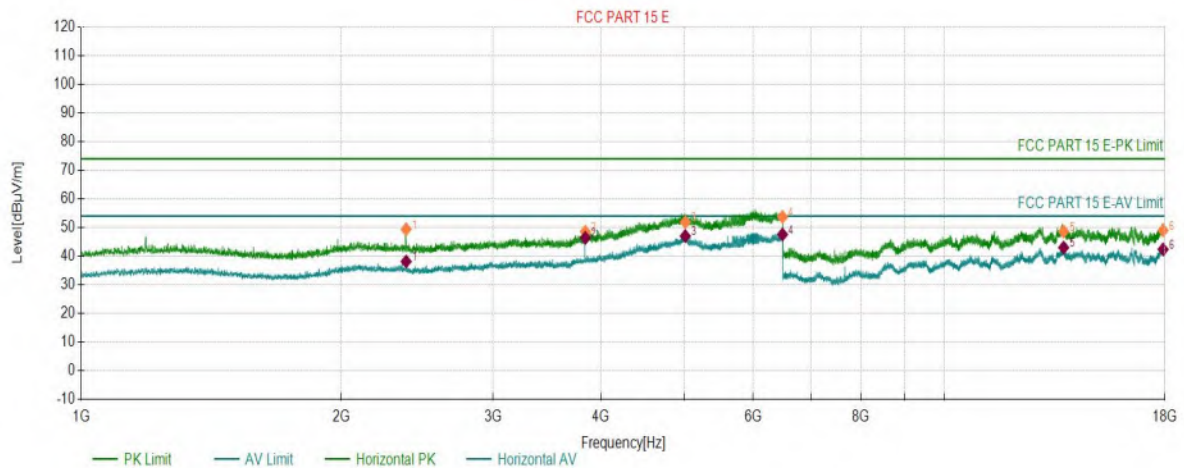
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1189.2189	2.62	36.18	54.00	17.82	150	149	Vertical
2	2020.3520	5.55	34.62	54.00	19.38	150	82	Vertical
3	2378.9879	6.32	39.74	54.00	14.26	150	139	Vertical
4	3486.7987	10.30	40.99	54.00	13.01	150	124	Vertical
5	5231.5732	20.75	42.35	54.00	11.65	150	115	Vertical
6	10460.9961	4.59	46.89	54.00	7.11	150	94	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5755	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:12:40

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	49.36	74.00	24.64	150	336	Horizontal
2	3836.6337	15.29	48.49	74.00	25.51	150	218	Horizontal
3	5008.2508	22.90	51.87	74.00	22.13	150	91	Horizontal
4	6490.0990	26.10	53.69	74.00	20.31	150	22	Horizontal
5	13736.5237	11.11	48.60	74.00	25.40	150	122	Horizontal
6	17907.9908	14.87	48.97	74.00	25.03	150	262	Horizontal

AV Final Data List

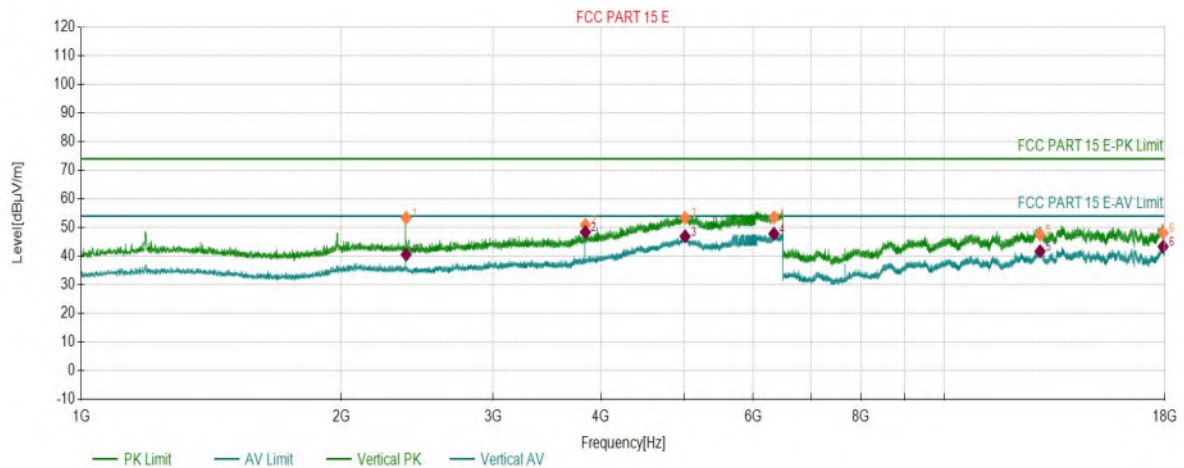
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	38.11	54.00	15.89	150	336	Horizontal
2	3836.6337	15.29	46.36	54.00	7.64	150	218	Horizontal
3	5008.2508	22.90	46.98	54.00	7.02	150	91	Horizontal
4	6490.0990	26.10	47.56	54.00	6.44	150	22	Horizontal
5	13736.5237	11.11	42.97	54.00	11.03	150	122	Horizontal
6	17907.9908	14.87	42.33	54.00	11.67	150	262	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5755	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:14:06

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	53.34	74.00	20.66	150	151	Vertical
2	3836.6337	15.29	50.90	74.00	23.10	150	302	Vertical
3	5005.5006	22.91	53.32	74.00	20.68	150	48	Vertical
4	6343.7844	25.51	53.46	74.00	20.54	150	168	Vertical
5	12899.2399	11.05	47.49	74.00	26.51	150	0	Vertical
6	17907.9908	14.87	48.07	74.00	25.93	150	202	Vertical

AV Final Data List

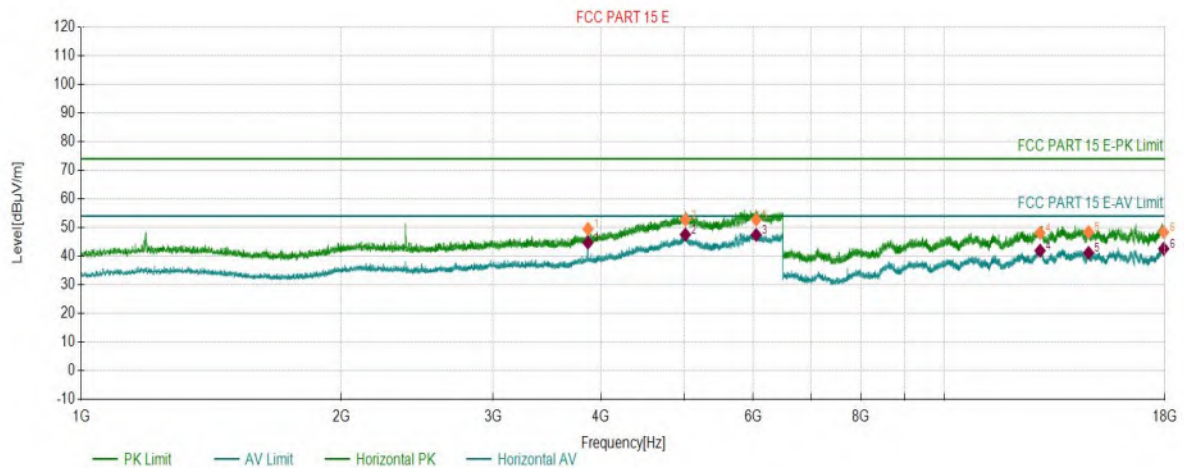
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	40.50	54.00	13.50	150	151	Vertical
2	3836.6337	15.29	48.37	54.00	5.63	150	302	Vertical
3	5005.5006	22.91	46.90	54.00	7.10	150	48	Vertical
4	6343.7844	25.51	47.80	54.00	6.20	150	168	Vertical
5	12899.2399	11.05	41.68	54.00	12.32	150	0	Vertical
6	17907.9908	14.87	43.29	54.00	10.71	150	202	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5795	Voltage:	12V/10A
Environment:	25°C/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:25:32

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	3863.0363	15.47	49.49	74.00	24.51	150	195	Horizontal
2	5009.3509	22.90	52.72	74.00	21.28	150	2	Horizontal
3	6050.6051	24.95	52.72	74.00	21.28	150	355	Horizontal
4	12898.0898	11.02	48.07	74.00	25.93	150	158	Horizontal
5	14680.7681	12.61	48.40	74.00	25.60	150	5	Horizontal
6	17935.5936	14.68	48.36	74.00	25.64	150	0	Horizontal

AV Final Data List

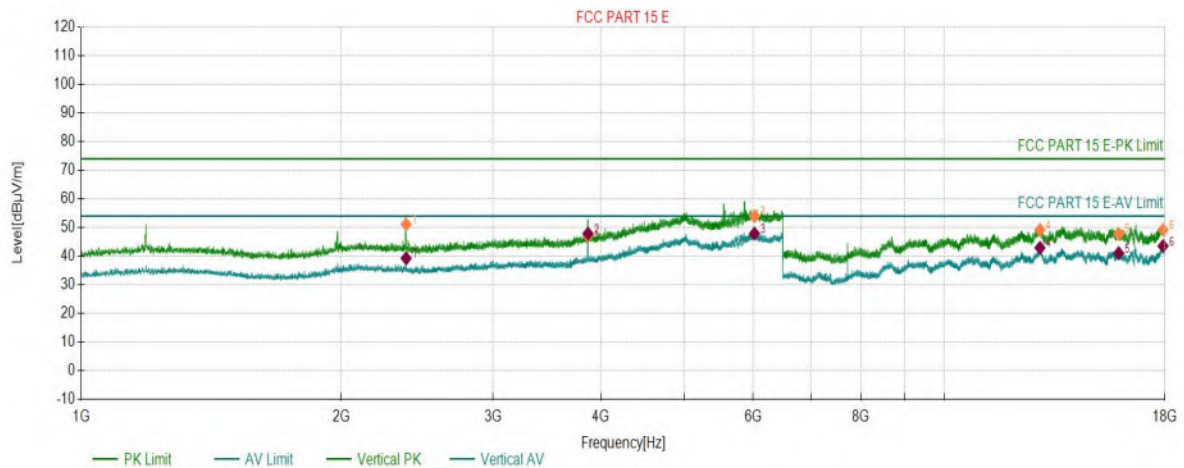
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	3863.0363	15.47	44.68	54.00	9.32	150	195	Horizontal
2	5009.3509	22.90	47.49	54.00	6.51	150	2	Horizontal
3	6050.6051	24.95	47.39	54.00	6.61	150	355	Horizontal
4	12898.0898	11.02	41.87	54.00	12.13	150	158	Horizontal
5	14680.7681	12.61	41.10	54.00	12.90	150	5	Horizontal
6	17935.5936	14.68	42.56	54.00	11.44	150	0	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5795	Voltage:	12V/10A
Environment:	25°C/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:26:57

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	51.08	74.00	22.92	150	145	Vertical
2	3863.5864	15.47	47.03	74.00	26.97	150	187	Vertical
3	6023.6524	24.94	53.91	74.00	20.09	150	40	Vertical
4	12894.6395	10.96	49.14	74.00	24.86	150	0	Vertical
5	15906.7907	11.72	47.72	74.00	26.28	150	86	Vertical
6	17904.5405	14.89	49.18	74.00	24.82	150	354	Vertical

AV Final Data List

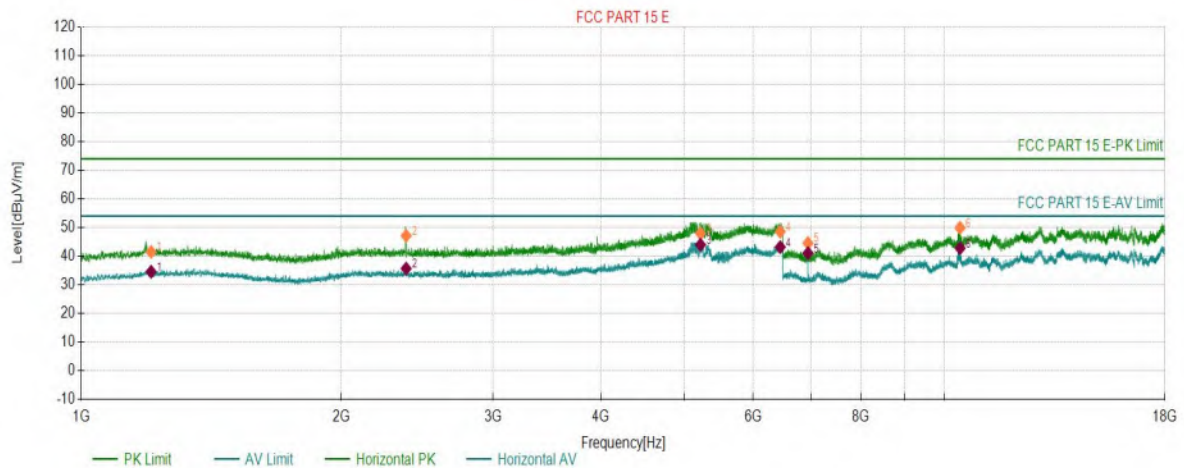
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	39.21	54.00	14.79	150	145	Vertical
2	3863.5864	15.47	47.85	54.00	6.15	150	187	Vertical
3	6023.6524	24.94	47.87	54.00	6.13	150	40	Vertical
4	12894.6395	10.96	42.89	54.00	11.11	150	0	Vertical
5	15906.7907	11.72	41.01	54.00	12.99	150	86	Vertical
6	17904.5405	14.89	43.50	54.00	10.50	150	354	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC80_5210	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:38:24

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1205.1705	2.79	41.44	74.00	32.56	150	300	Horizontal
2	2378.9879	6.32	47.11	74.00	26.89	150	347	Horizontal
3	5215.0715	20.76	47.94	74.00	26.06	150	284	Horizontal
4	6451.0451	21.70	48.52	74.00	25.48	150	360	Horizontal
5	6946.2446	-2.50	44.55	74.00	29.45	150	141	Horizontal
6	10419.5920	4.11	49.87	74.00	24.13	150	141	Horizontal

AV Final Data List

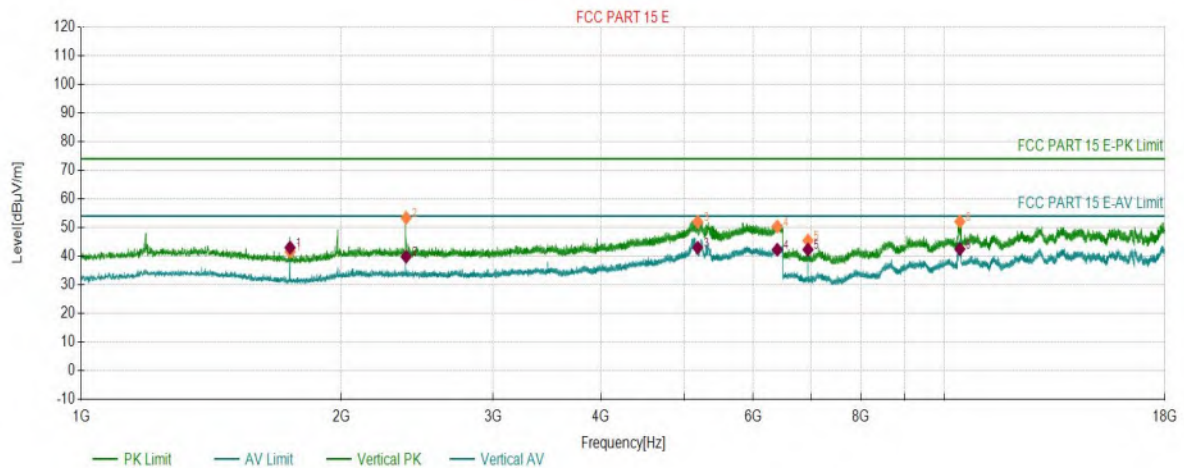
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1205.1705	2.79	34.52	54.00	19.48	150	300	Horizontal
2	2378.9879	6.32	35.63	54.00	18.37	150	347	Horizontal
3	5215.0715	20.76	43.96	54.00	10.04	150	284	Horizontal
4	6451.0451	21.70	43.14	54.00	10.86	150	360	Horizontal
5	6946.2446	-2.50	41.02	54.00	12.98	150	141	Horizontal
6	10419.5920	4.11	42.78	54.00	11.22	150	141	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC80_5210	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:39:50

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1745.8746	3.40	41.52	74.00	32.48	150	201	Vertical
2	2378.9879	6.32	53.34	74.00	20.66	150	159	Vertical
3	5176.5677	20.81	51.99	74.00	22.01	150	83	Vertical
4	6400.4400	21.65	50.34	74.00	23.66	150	217	Vertical
5	6946.2446	-2.50	45.37	74.00	28.63	150	151	Vertical
6	10413.8414	4.04	52.09	74.00	21.91	150	84	Vertical

AV Final Data List

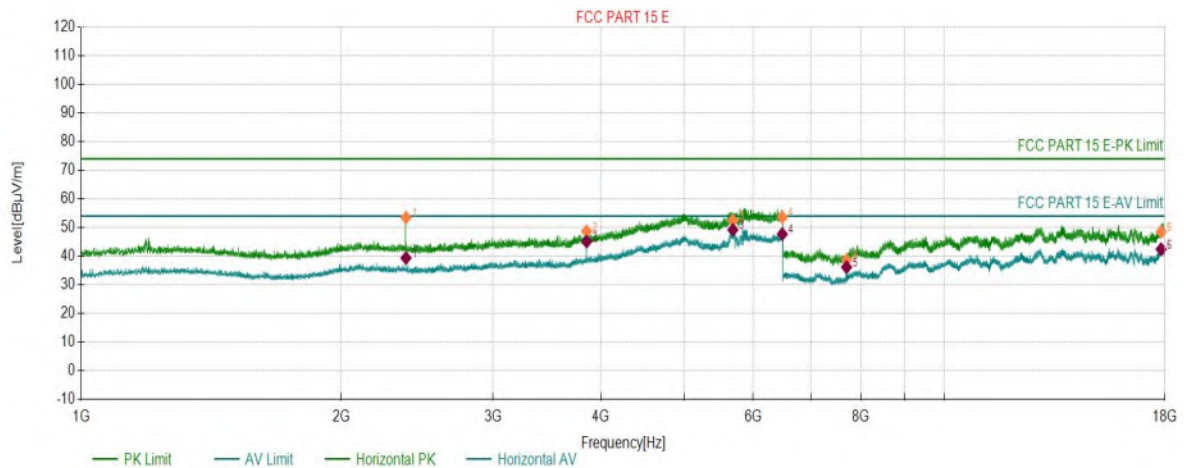
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1745.8746	3.40	42.97	54.00	11.03	150	201	Vertical
2	2378.9879	6.32	39.79	54.00	14.21	150	159	Vertical
3	5176.5677	20.81	42.96	54.00	11.04	150	83	Vertical
4	6400.4400	21.65	42.22	54.00	11.78	150	217	Vertical
5	6946.2446	-2.50	42.27	54.00	11.73	150	151	Vertical
6	10413.8414	4.04	42.44	54.00	11.56	150	84	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC80_5775	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 20:59:43

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.4378	7.89	53.47	74.00	20.53	150	338	Horizontal
2	3849.8350	15.38	48.65	74.00	25.35	150	329	Horizontal
3	5685.9186	22.87	52.46	74.00	21.54	150	183	Horizontal
4	6486.7987	26.08	53.57	74.00	20.43	150	43	Horizontal
5	7699.5700	-0.67	38.56	74.00	35.44	150	141	Horizontal
6	17813.6814	13.56	48.47	74.00	25.53	150	217	Horizontal

AV Final Data List

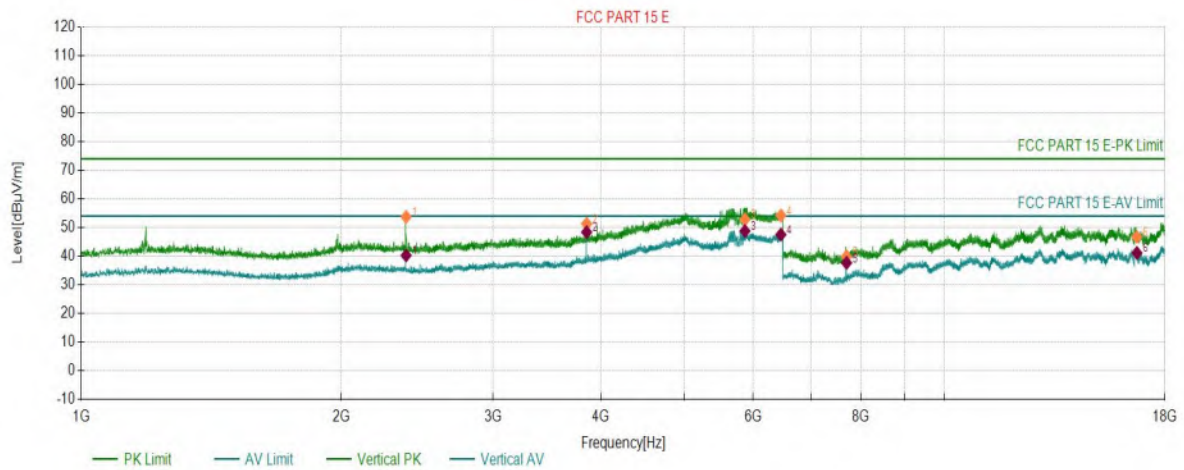
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.4378	7.89	39.33	54.00	14.67	150	338	Horizontal
2	3849.8350	15.38	45.08	54.00	8.92	150	329	Horizontal
3	5685.9186	22.87	49.17	54.00	4.83	150	183	Horizontal
4	6486.7987	26.08	47.68	54.00	6.32	150	43	Horizontal
5	7699.5700	-0.67	36.10	54.00	17.90	150	141	Horizontal
6	17813.6814	13.56	42.40	54.00	11.60	150	217	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC80_5775	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 21:04:17

Test Graph



PK Final Data List

NO.	Freq. (MHz)	Factor (dB)	PK Value (dBµV/m)	PK Limit (dBµV/m)	PK Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	53.67	74.00	20.33	150	149	Vertical
2	3849.8350	15.38	51.30	74.00	22.70	150	185	Vertical
3	5871.8372	23.91	52.82	74.00	21.18	150	23	Vertical
4	6462.5963	25.97	54.18	74.00	19.82	150	65	Vertical
5	7699.5700	-0.67	39.89	74.00	34.11	150	125	Vertical
6	16700.3700	10.55	46.71	74.00	27.29	150	4	Vertical

AV Final Data List

NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	2378.9879	7.89	40.23	54.00	13.77	150	149	Vertical
2	3849.8350	15.38	48.34	54.00	5.66	150	185	Vertical
3	5871.8372	23.91	48.74	54.00	5.26	150	23	Vertical
4	6462.5963	25.97	47.50	54.00	6.50	150	65	Vertical
5	7699.5700	-0.67	37.60	54.00	16.40	150	125	Vertical
6	16700.3700	10.55	41.10	54.00	12.90	150	4	Vertical

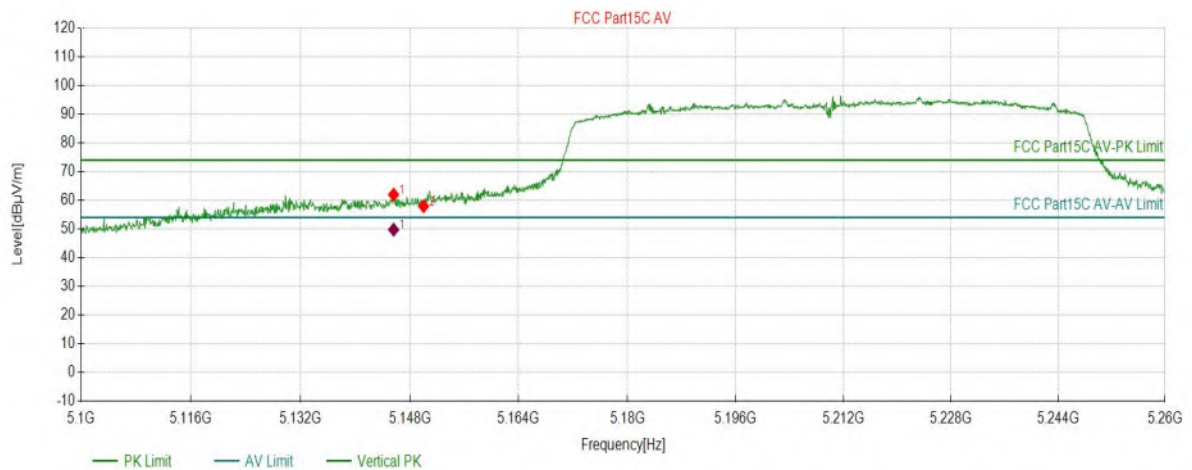
Restricted frequency bandedge

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC80_5210	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 13		
Test Standard:			

Start of Test: 2022-10-25 20:51:46

Test Graph



Suspected Data List

NO.	Freq. (MHz)	Level (dBµV/m)	Factor (dB)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5145.6228	61.96	17.13	74.00	12.04	150	107	PK	Vertical
2	5150.0250	57.92	17.13	74.00	16.08	150	90	PK	Vertical

AV Final Data List

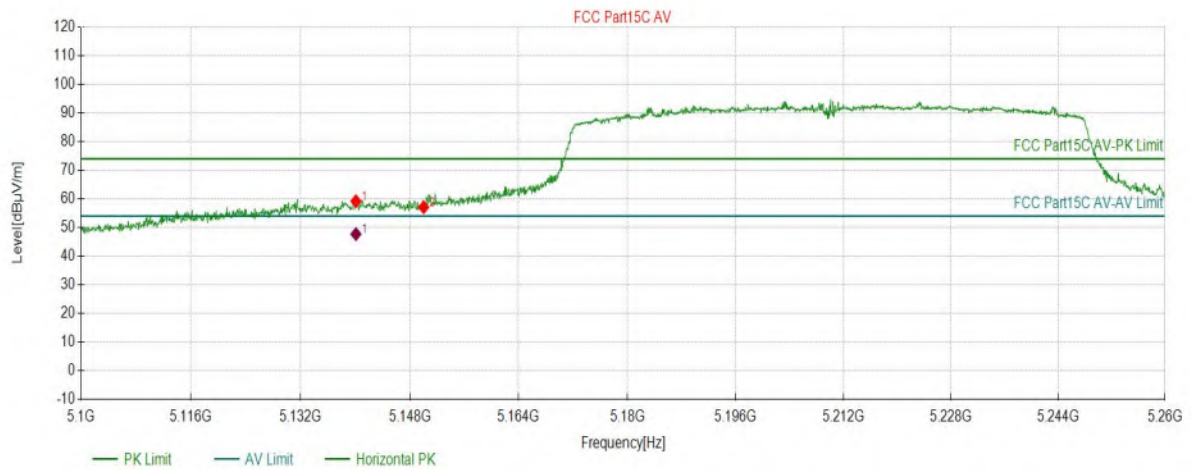
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	5145.6230	17.13	49.73	54.00	4.27	150	107.1	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC80_5210	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 13		
Test Standard:			

Start of Test: 2022-10-25 20:55:28

Test Graph



Suspected Data List

NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5140.1001	59.18	17.13	74.00	14.82	150	142	PK	Horizontal
2	5150.0250	57.06	17.13	74.00	16.94	150	146	PK	Horizontal

AV Final Data List

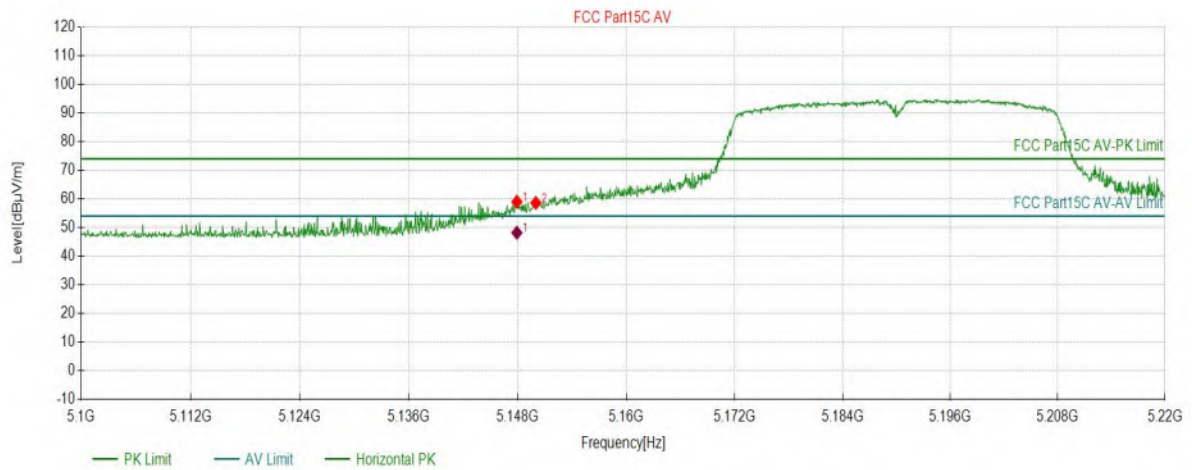
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	5140.1001	17.13	47.69	54.00	6.31	150	142	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5190	Voltage:	12V/10A
Environment:	25°C/58%	Engineer:	Roger
Remark:	power set: 13		
Test Standard:			

Start of Test: 2022-10-25 21:15:35

Test Graph



Suspected Data List

NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5147.9040	58.97	17.13	74.00	15.03	150	126	PK	Horizontal
2	5150.0050	58.59	17.13	74.00	15.41	150	126	PK	Horizontal

AV Final Data List

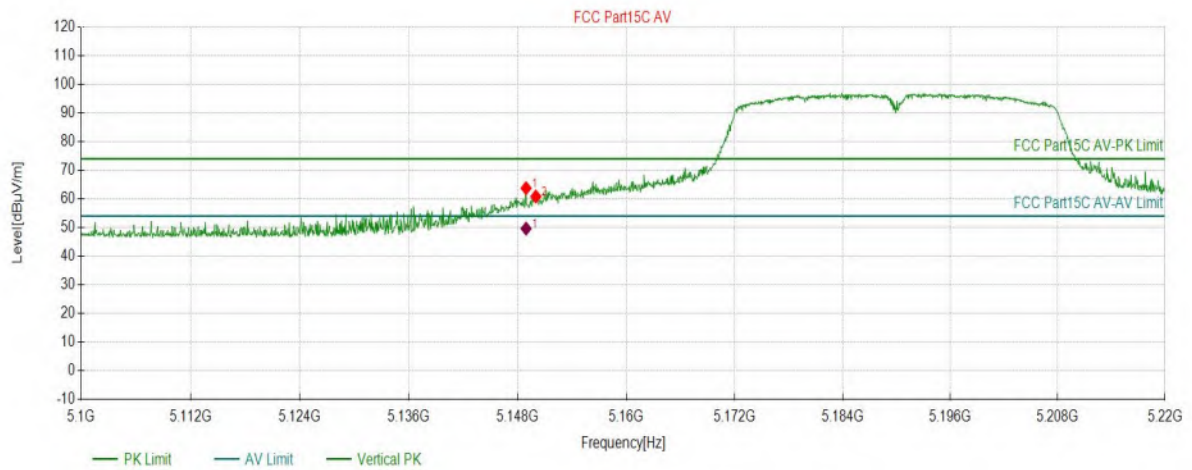
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	5147.9040	17.13	48.13	54.00	5.87	150	126	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5190	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 13		
Test Standard:			

Start of Test: 2022-10-25 21:16:22

Test Graph



Suspected Data List

NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5148.9245	63.73	17.13	74.00	10.27	150	105	PK	Vertical
2	5150.0050	60.83	17.13	74.00	13.17	150	110	PK	Vertical

AV Final Data List

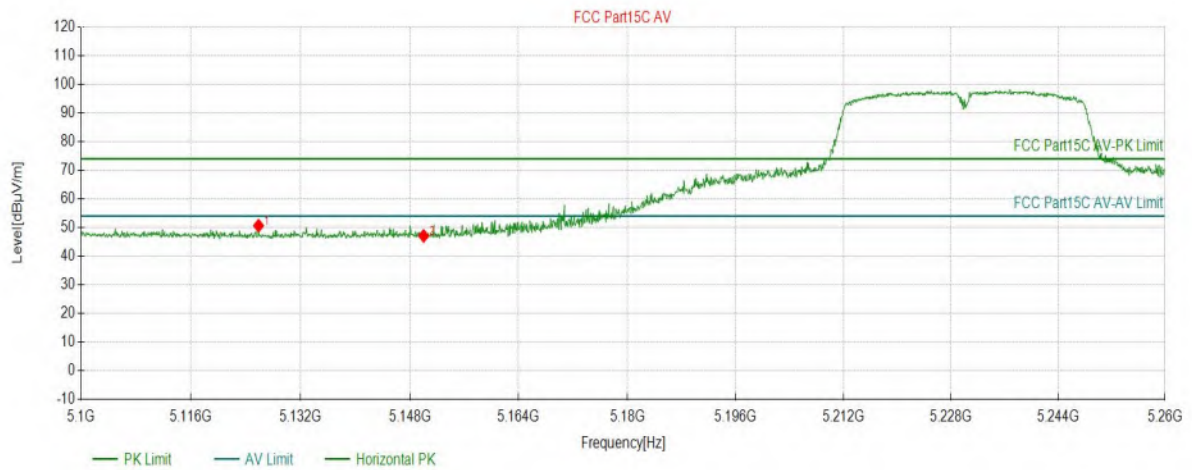
NO.	Freq. (MHz)	Factor (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	5148.9245	17.13	49.59	54.00	4.41	150	110.1	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5230	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 21:25:21

Test Graph



Suspected Data List

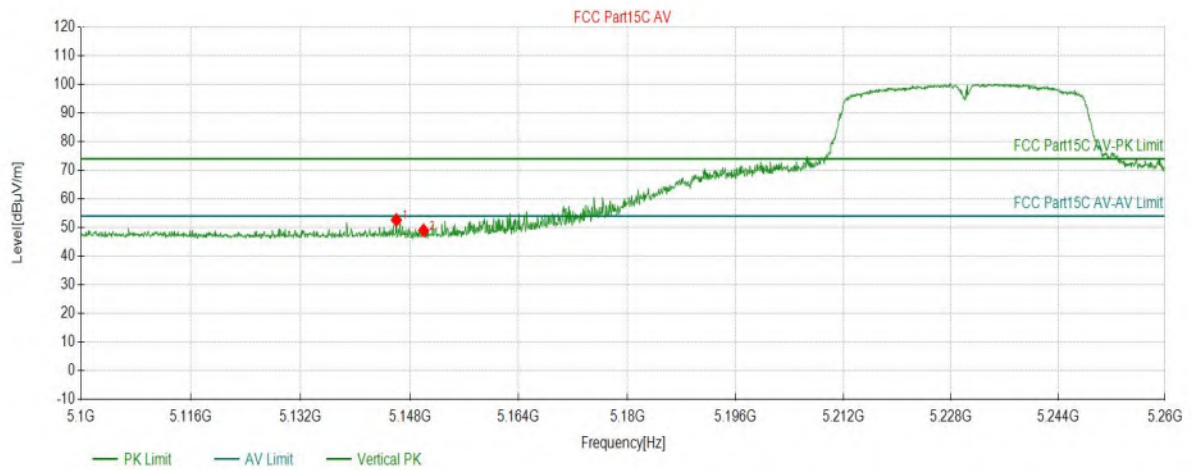
NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5125.8529	50.62	17.13	74.00	23.38	150	124	PK	Horizontal
2	5150.0250	47.06	17.13	74.00	26.94	150	352	PK	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC40_5230	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 21:26:09

Test Graph



Suspected Data List

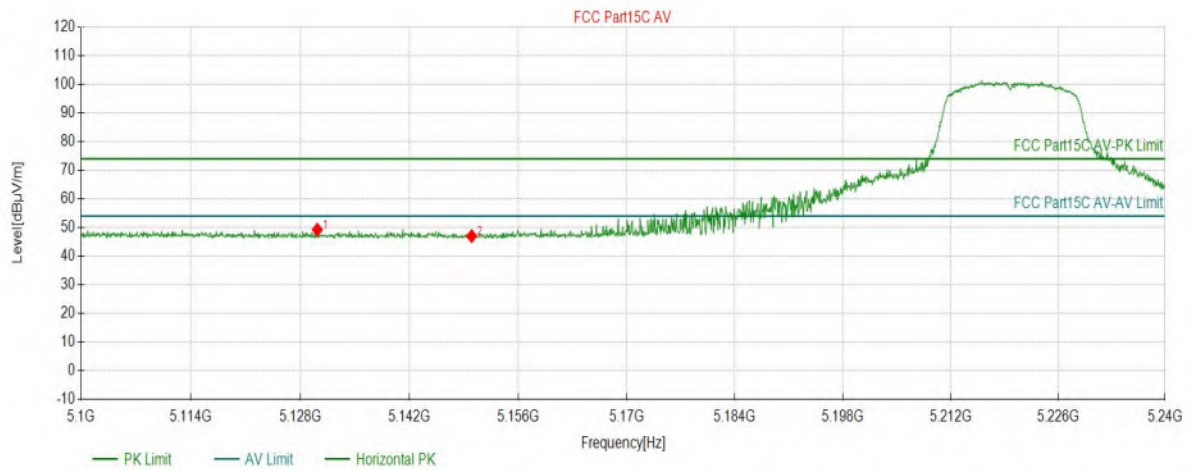
NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5146.0230	52.61	17.13	74.00	21.39	150	108	PK	Vertical
2	5150.0250	48.95	17.13	74.00	25.05	150	111	PK	Vertical

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5220	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 21:34:43

Test Graph



Suspected Data List

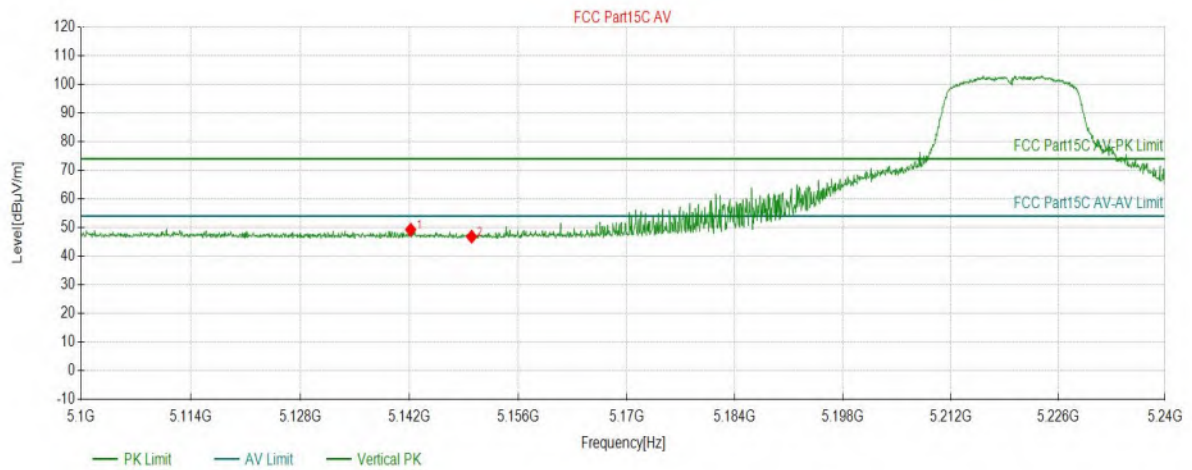
NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5130.1851	49.23	17.13	74.00	24.77	150	49	PK	Horizontal
2	5150.0050	46.98	17.13	74.00	27.02	150	128	PK	Horizontal

Test Report

Project Information			
Customer:		EUT:	Car Audio Navigation
Model:	M903AT-11T	SN:	
Mode:	11AC20_5220	Voltage:	12V/10A
Environment:	25℃/58%	Engineer:	Roger
Remark:	power set: 15		
Test Standard:			

Start of Test: 2022-10-25 21:35:22

Test Graph



Suspected Data List

NO.	Freq. (MHz)	Level (dBμV/m)	Factor (dB)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Angle (°)	Detector	Polarity
1	5142.1611	49.22	17.13	74.00	24.78	150	1	PK	Vertical
2	5150.0050	46.79	17.13	74.00	27.21	150	79	PK	Vertical

END OF REPORT