

Test Report

Product: CarPlay/Android Auto AI BOX

Trade Mark: N/A

Model Number: CP04

FCC ID: 2BAUM-CP0002

Prepared for

Shenzhen kingminson Electronic Co., Ltd.
301, No.192, jiangshi Road, shiwai Community, Martian Street, Guangming
District, Shenzhen, Guangdong, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's Name..... : Shenzhen kingminson Electronic Co., Ltd.
Address : 301, No.192, jiangshi Road, shiwai Community, Martian Street,
Guangming District, Shenzhen, Guangdong, China
Manufacturer's Name : Shenzhen kingminson Electronic Co., Ltd.
Address : 301, No.192, jiangshi Road, shiwai Community, Martian Street,
Guangming District, Shenzhen, Guangdong, China
Product description
Product name : CarPlay/Android Auto AI BOX
Model Number : CP04
Standards : FCC Part 15.407
IEEE/ANSI C63.10-2020
Test procedure..... : KDB 789033 D02 General U-NII Test Procedures New Rules
v01r01

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test

Date (s) of performance of tests..... : Feb. 28, 2025~ Apr. 11, 2025

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

Testing Engineer :

Zoe Su

(Z o e S u)

Technical Manager :

Ming Liu

(M i n g L i u)

Authorized Signatory :

Leo Su

(L e o S u)

[illegible]

1 General Description

1.1 Description of EUT

Product name:	CarPlay/Android Auto AI BOX
Model name:	CP04
Series Model:	CP04A, CP04B, CP04C
Different of series model:	All the models are the same circuit and module, except the colour and model No..
Frequency range:	5180 MHz to 5240 MHz
Modulation type:	IEEE 802.11a/n: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM(1024QAM, 256QAM, 64QAM, 16QAM QPSK, BPSK)
Transfer rate:	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40): MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40):NSS1, MCS0-MCS9 802.11ac(HE20): NSS1, MCS0-MCS8 802.11ac(HE40):NSS1, MCS0-MCS9
Channel bandwidth:	802.11a: 20 MHz 802.11n: 20 MHz, 40 MHz 802.11ac: 20 MHz, 40 MHz 802.11ax: 20 MHz, 40 MHz
Antenna type:	Onboard Antenna
Antenna gain:	ANT 1(8733 WIFI chip): 3.26dBi ANT 2(8800 WIFI chip): 4.45dBi
Max. output power:	8733 WIFI chip: 15.53dBm 8800 WIFI chip: 10.71dBm
Hardware version:	V1.0
Software version:	V1.0
Battery:	N/A
Power supply:	Input: DC 5V/1A
Adapter information:	N/A

1.2 Test Mode

For 802.11a/n(HT20)/ ac(VHT20)

U-NII-1 (5150 - 5250 MHz)		
Channel Number	Channel	Frequency (MHz)
36	Low	5180
40	Mid	5200
48	High	5240

For 802.11n (HT40)/ac (VHT40)

U-NII-1 (5150 - 5250 MHz)		
Channel Number	Channel	Frequency (MHz)
38	Low	5190
46	High	5230

For 802.11ac (VHT80)

80 MHz	
Channel Number	Frequency (MHz)
42	5210

1.3 Operation Channel List

For U-NII-1:

20 MHz		40 MHz		80 MHz	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	5180	38	5190	42	5120
40	5200	46	5230	--	--
44	5220	--	--	--	--
48	5240	--	--	--	--

1.4 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Power setting configuration parameters

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product. Transmitting duty cycle is no less 98%.

The software is TermAssist and SecureCRT tool Use together.

Test Items	Mode	Data Rate	TX/RX
Radiated Emissions	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
Duty Cycle	802.11a(HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
Band Edge	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
6dB Bandwidth	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
26dB Bandwidth and 99% Occupied Bandwidth	802.11a (HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
Conducted Output Power	802.11a(HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
Power Spectral Density	802.11a(HT20)	6 Mbps	TX
	802.11n/ac(HT20/40)	MCS0	TX
	802.11ax(HE20/40)	MCS0	TX
Frequency Stability	Un-modulation	/	TX

1.6 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Laptop	BDR-WDH	A3RQPM242 0004454	HONR
Adapter	CD289	35810	Ugreen Group Limited

Note: The laptop is used to assist the RF test. In order to prevent the laptop from causing unnecessary impact on the test, the laptop will be removed from the test environment after the EUT successfully transmits at a fixed frequency using the laptop.

2 Summary of Test Result

No.	Standard Section	Test Item	Result	Remark
1	15.203/15.407	Antenna Requirement	Pass	
2	15.207	Power Line Conducted Emission	Pass	
3	15.407(b) 15.209	Radiation Spurious Emission	Pass	
4	15.407(a)	RF Output Power	Pass	
5	15.407(a)	Power Spectral Density	Pass	
6	15.407(a)	26dB Emission Bandwidth and Occupied bandwidth	Pass	
7	15.407(e)	6 dB bandwidth	Pass	
8	15.407(b)	Out Of Band Emission	Pass	
9	15.407(b)	Spurious RF Conducted Emissions	Pass	
10	15.407(g)	Frequency Stability	Pass	

3 Test Facilities and Accreditations

3.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

3.2 Environmental Conditions

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

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

3.3 Measurement Uncertainty

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

The data and results quoted in this document are true and accurate values, and uncertainties are not involved in the calculations.

In addition, components and mass production processes that are similar to testing equipment may introduce additional deviations, and the manufacturer is solely responsible for the continued compliance of the equipment.

Measurement Frequency Range	U, (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
Conducted emission(150kHz~30MHz)	± 2.5 dB	
Radiated emission(9kHz-30MHz)	± 2.5 dB	
Radiated emission(30MHz~1GHz)	± 4.2 dB	
Radiated emission (above 1GHz)	± 4.7 dB	
Occupied Bandwidth	$\pm 3\%$	
Temperature	± 1 degree	
Humidity	± 5 %	

3.4 Test Software

Software name	Manufacturer	Model	Version
Conducted Emission test Software	Farad	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission test Software	Farad	EZ-EMC	FA-03A2
RF Test System	MWRF	MTS 8310	2.0.0.0

4 List of Test Equipment

Radiation emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E001	Horn Antenna	Schwarzbeck	BBHA 9120D	02592	2024-05-18	2026-05-17
2	HB-E002	Biconical log-periodic composite antenna	Schwarzbeck	VULB 9168	01340	2024-05-18	2026-05-17
3	HB-E003	SHF-EHF Horn	Schwarzbeck	BBHA 91270	01193	2024-05-18	2026-05-17
4	HB-E005	Preamplifier	Noyetec	LAN-0118	NYCM1420102	2024-05-17	2025-05-16
5	HB-E006	Preamplifier	Noyetec	LAN-1840	NYCM1420103	2024-05-17	2025-05-16
6	HB-E007	EMI TEST RECEIVER	R&S	ESR7	102520	2024-05-17	2025-05-16
7	HB-E009	POSITINAL COTROLLE R	Noyetec	N/A	N/A	/	/
8	HB-E013	RF switch	Noyetec	NY-RF4	NY0CM1420204	/	/
9	HB-E066	Illuminance Tester	TASI	TA8121	N/A	2024-05-21	2025-05-20
10	HB-E075	Active loop antenna	Schwarzbeck	FMZB 1519B	1519B-245	2024-05-18	2026-05-17
11	HB-E076	Preamplifier	Hewlett Packard	8447D	1937A02278	2024-05-17	2025-05-16
Conduction emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E014	4 Path V-LISN	Schwarzbeck	NNLK 8121	00770	2024-05-17	2025-05-16
2	HB-E015	Pulse Limiter	Schwarzbeck	VTSD 9561-F	00949	2024-05-17	2025-05-16
3	HB-E016	ZN23201	Noyetec	ZN23201	N/A	2024-05-21	2025-05-20
4	HB-E059	Attenuator	Xianghua	TS2-6-1	220215166	2024-05-17	2025-05-16
5	HB-E069	EMI TEST RECEIVER	R&S	ESCI	N/A	2024-05-17	2025-05-16
RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaio Signal	Agilent	N5181A	MY47070421	2024-05-17	2025-05-16

		Generator					
2	HB-E042	WIDEBAND RADIO COMMUNICA TION TESTER	R&S	CMW500	132108	2024-05-17	2025-05-16
3	HB-E043	MXG Anaio g Signal Generator	Agilent	N5182A	US46240335	2024-05-17	2025-05-16
4	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2024-05-17	2025-05-16
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	2024-08-19	2025-08-18
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1	N/A	2024-08-19	2025-08-18

1. the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).
2. The instrument RF Control Box, numbered HB-E045, contains power meter.

5 Test Item And Results

5.1 Antenna Requirement

5.1.1 Standard Requirement

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

5.1.2 Test Result

The antenna is Onboard Antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is ANT 1(8733 WiFi chip): 3.26dBi
ANT 2(8800 WiFi chip): 4.45dBi

5.2 Power Line Conducted Emission

5.2.1 Limits

Limits – Class B		
Frequency (MHz)	Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50
Note: 1. the tighter limit applies at the band edges. 2. the limit of "*" marked band means the limitation decreases linearly with the logarithm of the frequency in the range.		

5.2.2 Test Procedures

a) EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

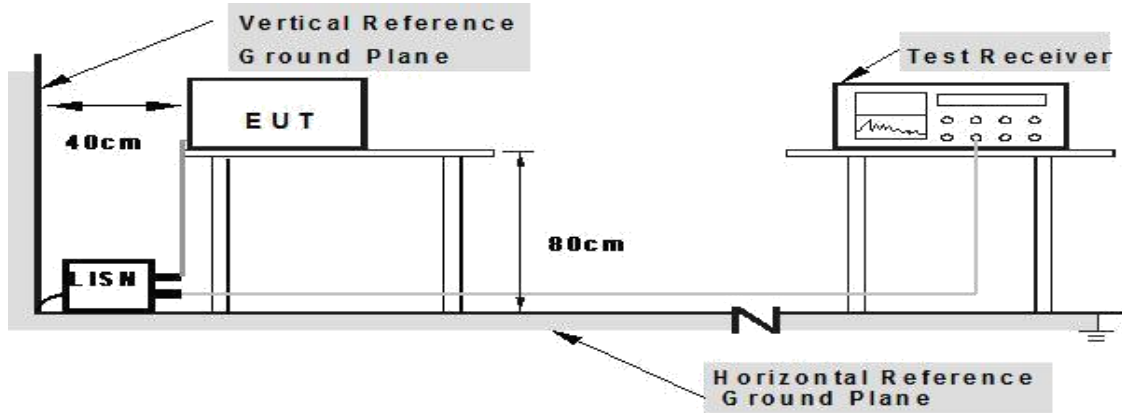
b) The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- f) LISN is at least 80 cm from nearest part of EUT chassis.
- g) For the actual test configuration, please refer to the related Item – photographs of the test

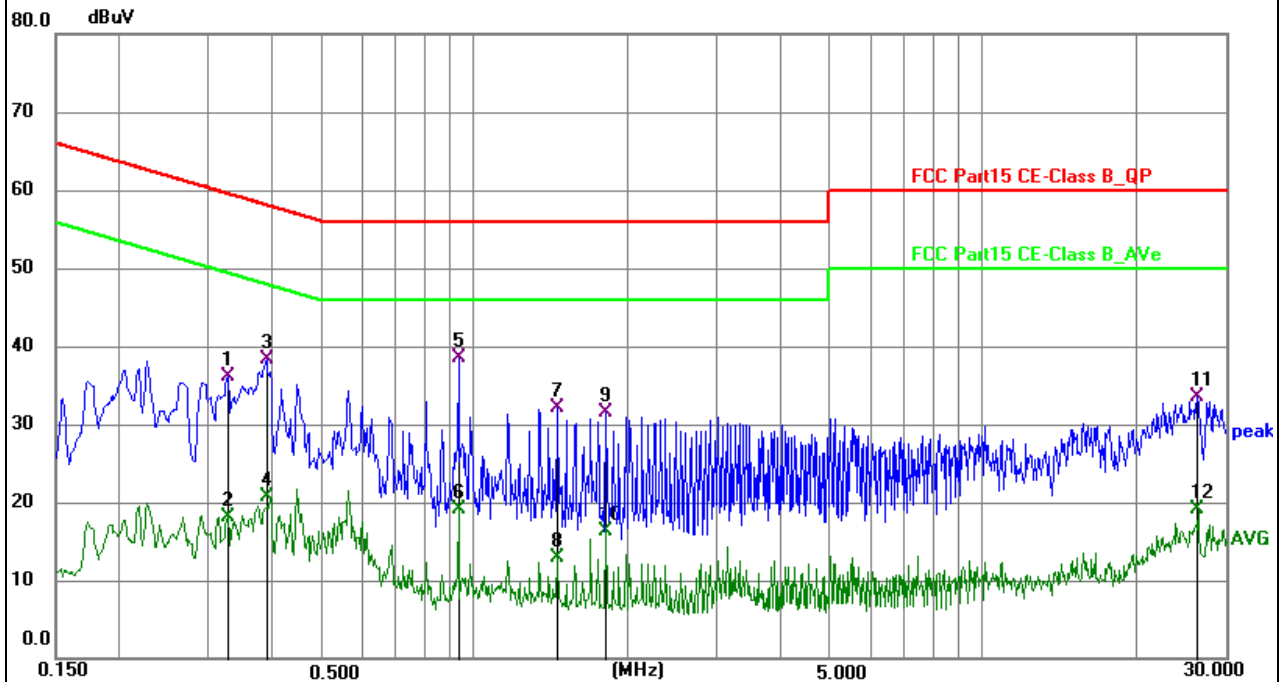
setup.

5.2.3 Test Setup

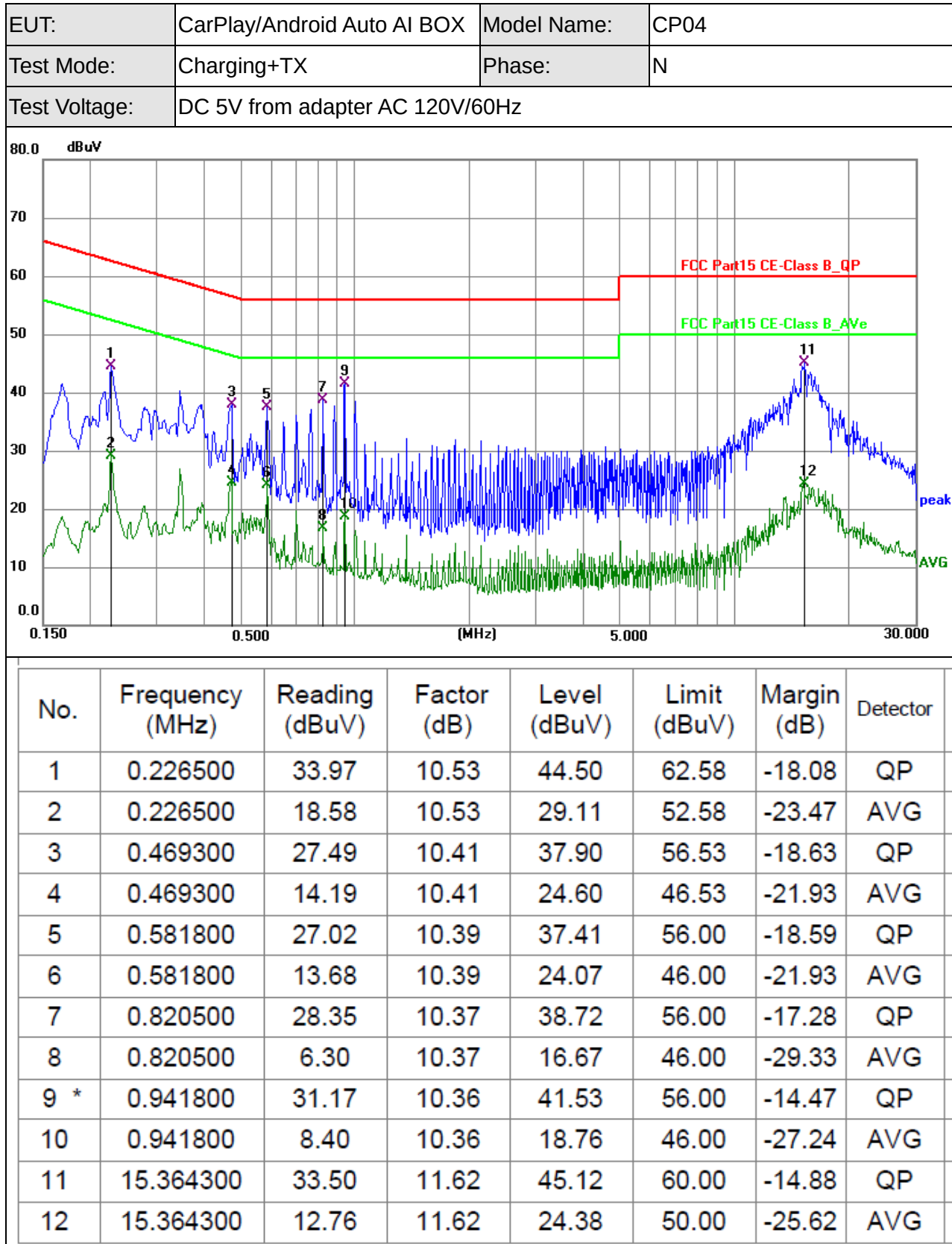


5.2.4 Test Result

EUT:	CarPlay/Android Auto AI BOX	Model Name:	CP04
Test Mode:	Charging+TX	Phase:	L
Test Voltage:	DC 5V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.325500	25.55	10.48	36.03	59.57	-23.54	QP
2	0.325500	7.69	10.48	18.17	49.57	-31.40	AVG
3	0.388500	27.88	10.49	38.37	58.10	-19.73	QP
4	0.388500	10.25	10.49	20.74	48.10	-27.36	AVG
5 *	0.928400	28.04	10.44	38.48	56.00	-17.52	QP
6	0.928400	8.58	10.44	19.02	46.00	-26.98	AVG
7	1.455000	21.61	10.44	32.05	56.00	-23.95	QP
8	1.455000	2.39	10.44	12.83	46.00	-33.17	AVG
9	1.814700	20.98	10.46	31.44	56.00	-24.56	QP
10	1.814700	5.92	10.46	16.38	46.00	-29.62	AVG
11	26.335300	20.53	13.00	33.53	60.00	-26.47	QP
12	26.335300	6.12	13.00	19.12	50.00	-30.88	AVG



5.3 Radiated Emission

5.3.1 Limits

1. For transmitters operating in the 5.15-5.25 GHz band:

All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

2. For transmitters operating in the 5.25-5.35 GHz band:

All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/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 dBm/MHz.

4. For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Frequency Range	RBW	VBW	Measurement
30MHz-1GHz	1MHz	3MHz	Peak
Above 1GHz	1MHz	10Hz ^{Note1}	Average
	1MHz	>1/T ^{Note2}	Average
Note1	When duty cycle is no less than 98%		

Note2	When duty cycle is less than 98%
-------	----------------------------------

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

5.3.2 Test Procedures

The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the floor on a support that is RF transparent for the frequencies of interest. Final measurements for the EUT require a measurement antenna height scan of 1 m to 4 m.

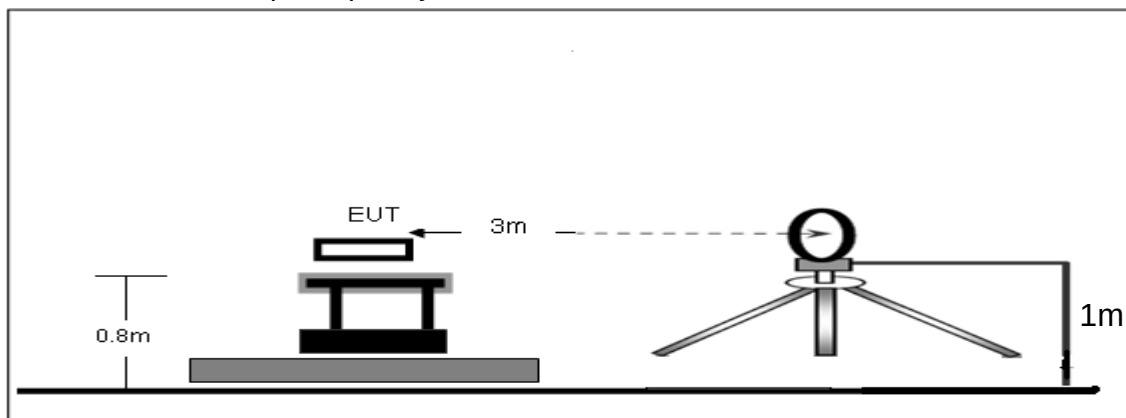
The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. For the actual test configuration, please refer to the related Item –EUT Test Photos.

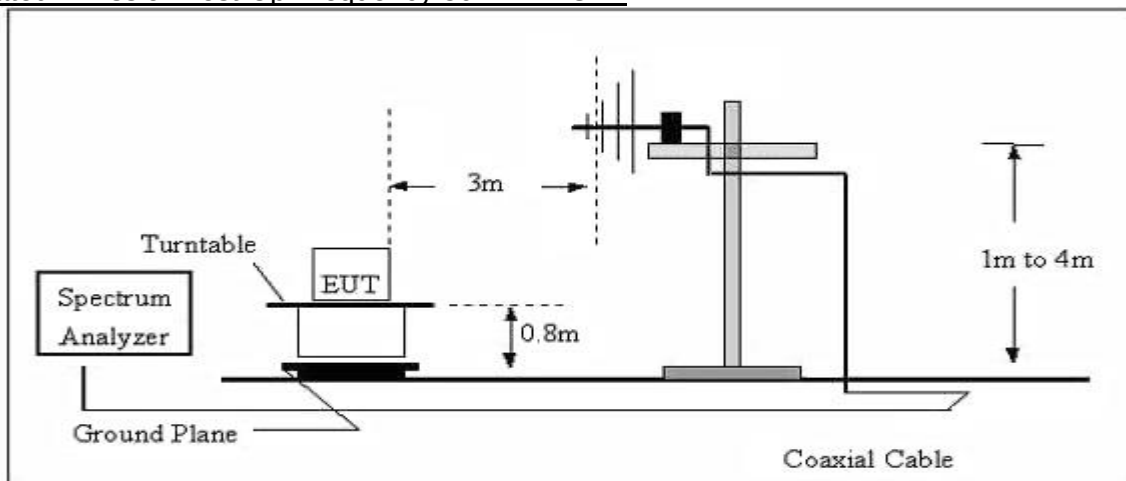
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.3.3 Test Setup

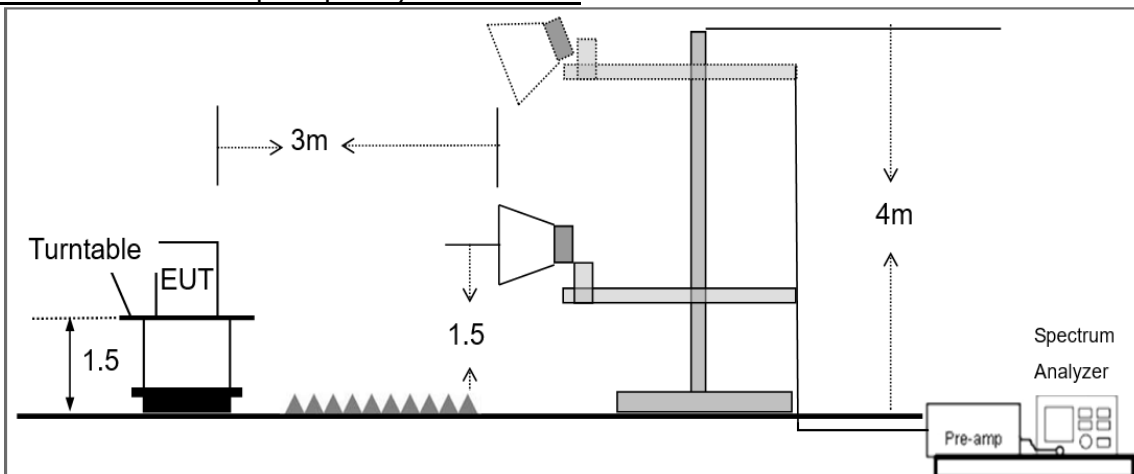
Radiated Emission Test-Up Frequency Below 30MHz



Radiated Emission Test-Up Frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.3.4 Test Result

Below 30MHz

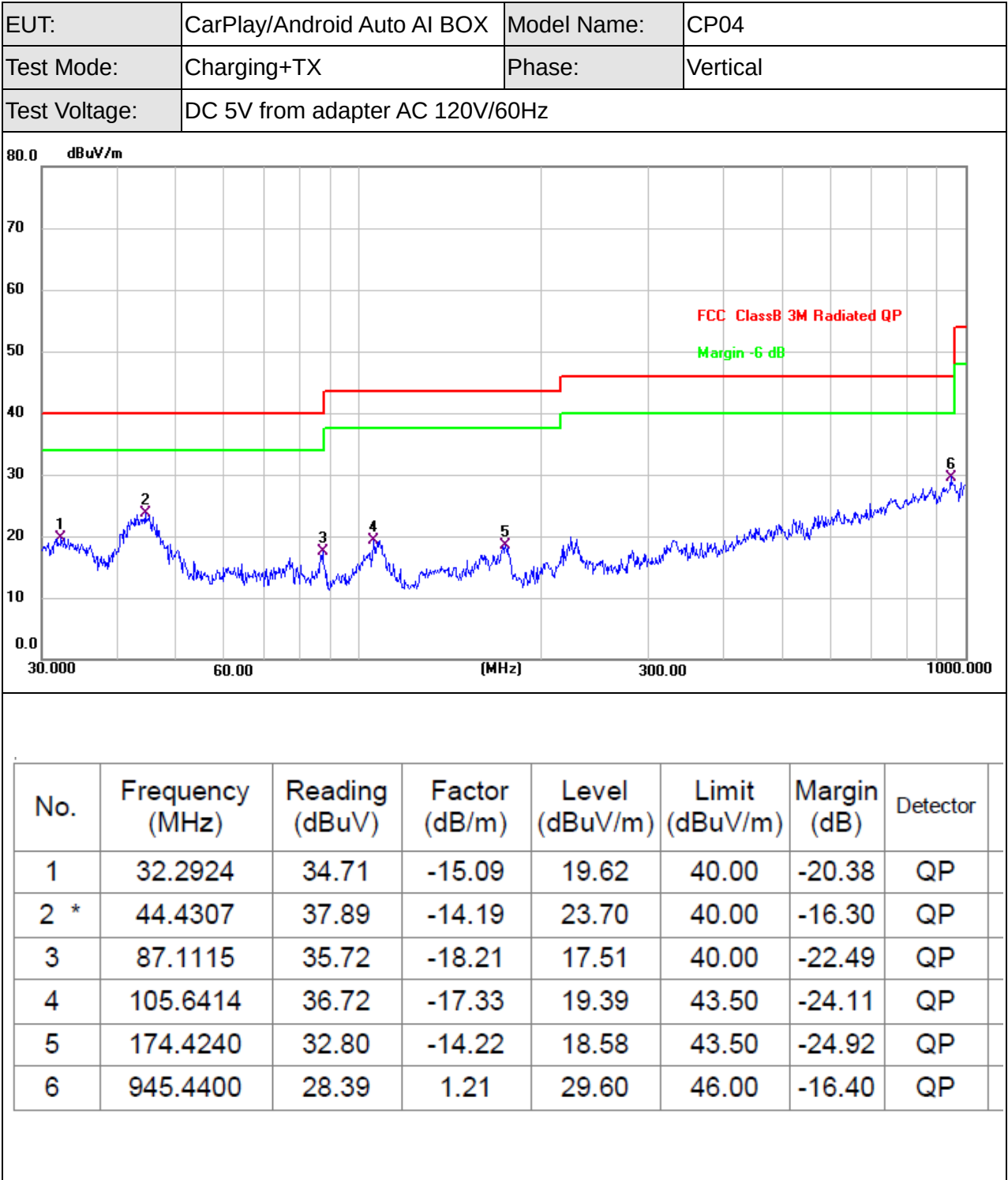
EUT:	CarPlay/Android Auto AI BOX	Model Name:	CP04
Pressure:	1010 hPa	Test Voltage:	DC 5V from adapter AC 120V/60Hz
Test Mode:	Charging+TX	Polarization:	--

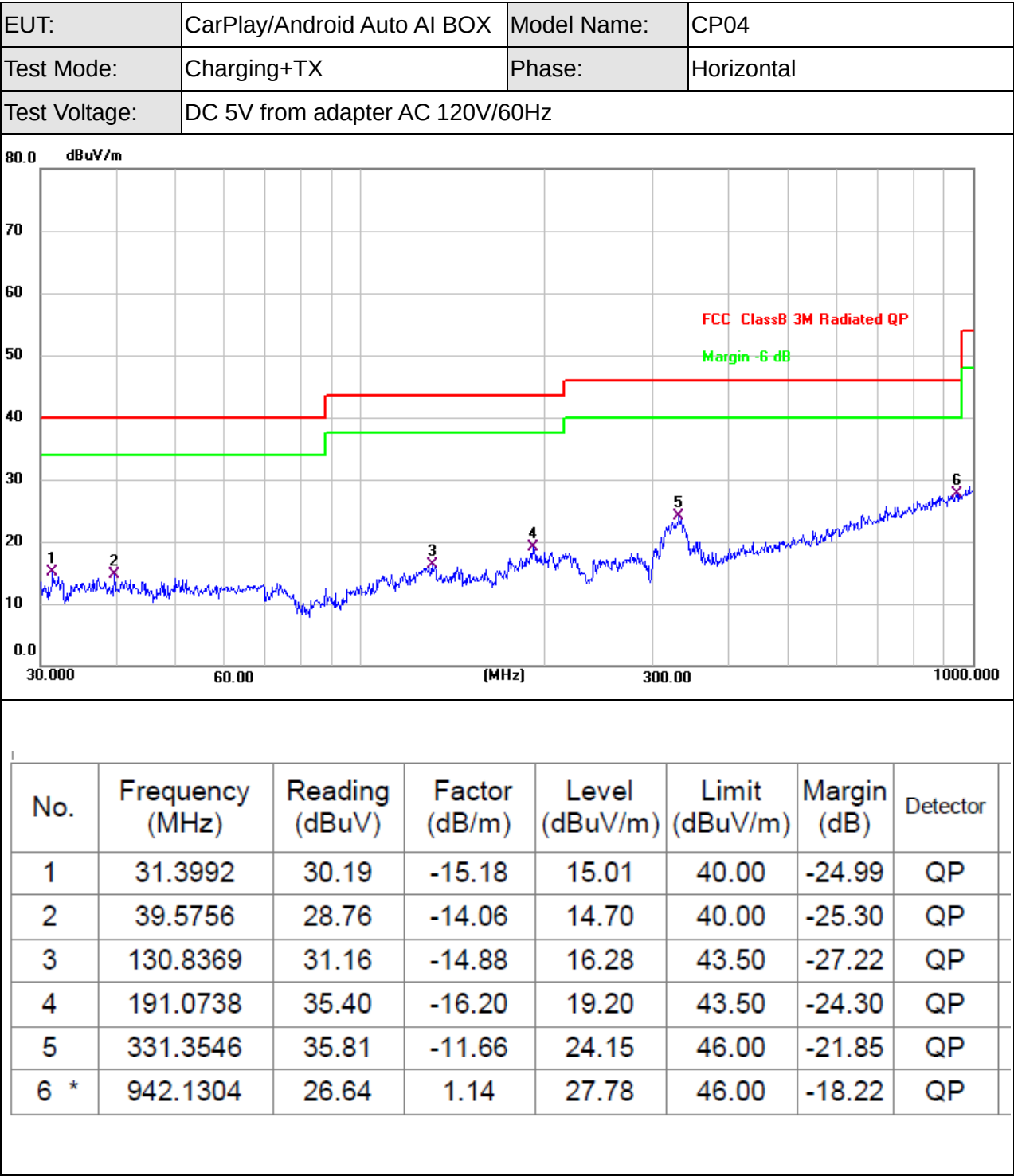
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

1. For 9kHz-30MHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
3. Limit line = specific limits (dBuV) + distance extrapolation factor.

Frequency range (30MHz – 1GHz)





Frequency range (1GHz-40GHz)

For U-NII-1

8733 Bluetooth chip:

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamplifier Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
Vertical	4435.203	56.56	5.94	35.40	44.00	53.90	74.00	-20.10	Pk
Vertical	4434.730	45.17	5.94	35.40	44.00	42.51	54.00	-11.49	AV
Vertical	10371.751	62.39	8.46	39.75	44.50	66.10	74.00	-7.90	Pk
Vertical	10370.761	43.41	8.46	39.75	44.50	47.12	54.00	-6.88	Pk
Vertical	15541.606	56.86	10.12	38.80	44.10	61.68	74.00	-12.32	AV
Horizontal	15541.454	43.06	10.12	38.80	42.70	49.28	54.00	-4.72	Pk
Horizontal	4435.378	58.41	5.94	35.18	44.00	55.53	74.00	-18.47	AV
Horizontal	4435.883	43.51	5.94	35.18	44.00	40.63	54.00	-13.37	Pk
Horizontal	10372.092	61.19	8.46	38.71	44.50	63.86	74.00	-10.14	Pk
Horizontal	10730.693	45.53	8.46	38.71	44.50	48.20	54.00	-5.80	AV
middle Channel (5200 MHz)-Above 1G									
Vertical	4593.719	57.89	6.48	36.35	44.05	56.67	74.00	-17.33	Pk
Vertical	4593.828	42.74	6.48	36.35	44.05	41.52	54.00	-12.48	AV
Vertical	10402.762	62.03	8.47	37.88	44.51	63.87	74.00	-10.13	Pk
Vertical	10402.768	46.29	8.47	37.88	44.51	48.13	54.00	-5.87	Pk
Vertical	15600.653	58.34	10.12	38.8	44.10	63.16	74.00	-10.84	AV
Horizontal	15602.058	42.52	10.12	38.8	42.70	48.74	54.00	-5.26	Pk
Horizontal	4593.058	58.94	6.48	36.37	44.05	57.74	74.00	-16.26	AV
Horizontal	4594.223	42.24	6.48	36.37	44.05	41.04	54.00	-12.96	Pk
Horizontal	10402.291	61.35	8.47	38.64	44.50	63.96	74.00	-10.04	Pk
Horizontal	10401.088	46.30	8.47	38.64	44.50	48.91	54.00	-5.09	AV
High Channel (5240 MHz)-Above 1G									
Vertical	4741.242	60.46	7.10	37.24	43.50	61.30	74.00	-12.70	Pk
Vertical	4740.799	45.16	7.10	37.24	43.50	46.00	54.00	-8.00	AV
Vertical	10482.062	60.99	8.46	37.68	44.50	62.63	74.00	-11.37	Pk
Vertical	10480.276	47.03	8.46	37.68	44.50	48.67	54.00	-5.33	Pk
Vertical	15722.310	58.20	10.12	38.8	44.10	63.02	74.00	-10.98	AV
Horizontal	15721.510	42.30	10.12	38.8	42.70	48.52	54.00	-5.48	Pk
Horizontal	4739.266	60.03	7.10	37.24	43.50	60.87	74.00	-13.13	AV
Horizontal	4740.536	43.71	7.10	37.24	43.50	44.55	54.00	-9.45	Pk
Horizontal	10481.891	59.02	8.46	38.57	44.50	61.55	74.00	-12.45	Pk
Horizontal	10482.476	42.24	8.46	38.57	44.50	44.77	54.00	-9.23	AV

8800 Bluetooth chip:

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamplifier Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
Vertical	4434.850	54.89	5.94	35.40	44.00	52.23	74.00	-21.77	Pk
Vertical	4435.679	44.67	5.94	35.40	44.00	42.01	54.00	-11.99	AV
Vertical	10371.224	63.06	8.46	39.75	44.50	66.77	74.00	-7.23	Pk
Vertical	10370.821	44.63	8.46	39.75	44.50	48.34	54.00	-5.66	Pk
Vertical	15541.837	56.57	10.12	38.80	44.10	61.39	74.00	-12.61	AV
Horizontal	15541.687	42.96	10.12	38.80	42.70	49.18	54.00	-4.82	Pk
Horizontal	4434.519	57.68	5.94	35.18	44.00	54.80	74.00	-19.20	AV
Horizontal	4435.026	42.87	5.94	35.18	44.00	39.99	54.00	-14.01	Pk
Horizontal	10370.783	60.40	8.46	38.71	44.50	63.07	74.00	-10.93	Pk
Horizontal	10731.247	46.27	8.46	38.71	44.50	48.94	54.00	-5.06	AV
middle Channel (5200 MHz)-Above 1G									
Vertical	4593.310	57.74	6.48	36.35	44.05	56.52	74.00	-17.48	Pk
Vertical	4592.476	42.57	6.48	36.35	44.05	41.35	54.00	-12.65	AV
Vertical	10401.514	60.69	8.47	37.88	44.51	62.53	74.00	-11.47	Pk
Vertical	10403.131	46.49	8.47	37.88	44.51	48.33	54.00	-5.67	Pk
Vertical	15601.185	57.53	10.12	38.8	44.10	62.35	74.00	-11.65	AV
Horizontal	15601.039	40.89	10.12	38.8	42.70	47.11	54.00	-6.89	Pk
Horizontal	4592.738	60.76	6.48	36.37	44.05	59.56	74.00	-14.44	AV
Horizontal	4594.020	42.97	6.48	36.37	44.05	41.77	54.00	-12.23	Pk
Horizontal	10401.148	61.13	8.47	38.64	44.50	63.74	74.00	-10.26	Pk
Horizontal	10400.907	47.69	8.47	38.64	44.50	50.30	54.00	-3.70	AV
High Channel (5240 MHz)-Above 1G									
Vertical	4739.392	60.08	7.10	37.24	43.50	60.92	74.00	-13.08	Pk
Vertical	4741.054	46.00	7.10	37.24	43.50	46.84	54.00	-7.16	AV
Vertical	10480.668	60.89	8.46	37.68	44.50	62.53	74.00	-11.47	Pk
Vertical	10480.305	47.20	8.46	37.68	44.50	48.84	54.00	-5.16	Pk
Vertical	15721.580	57.19	10.12	38.8	44.10	62.01	74.00	-11.99	AV
Horizontal	15720.593	43.90	10.12	38.8	42.70	50.12	54.00	-3.88	Pk
Horizontal	4740.087	60.57	7.10	37.24	43.50	61.41	74.00	-12.59	AV
Horizontal	4739.739	43.74	7.10	37.24	43.50	44.58	54.00	-9.42	Pk
Horizontal	10482.844	59.51	8.46	38.57	44.50	62.04	74.00	-11.96	Pk
Horizontal	10482.514	44.28	8.46	38.57	44.50	46.81	54.00	-7.19	AV

Note:

All modes have been tested, and only the worst mode 802.11a mode is mentioned in the report.

5.3.5 Radiated Band Edge

For U-NII-1

8733 Bluetooth chip:

For 802.11a mode: (CH36 5180MHz&CH48 5240MHz)

Polarization	Frequency (MHz)	Read Level (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamplifier Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Over Limit (dB)	Detector Type
Horizontal	5150	65.75	8.69	29.4	42.59	61.25	74	-12.75	Pk
Vertical	5150	67.55	9.21	29.4	42.59	63.57	74	-10.43	Pk
Horizontal	5150	46.10	8.69	29.4	42.59	41.60	54	-12.40	AV
Vertical	5150	49.22	9.21	29.4	42.59	45.24	54	-8.76	AV

For 802.11n-(HT20) mode: (CH36 5180MHz&CH48 5240MHz)

Polarization	Frequency (MHz)	Read Level (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamplifier Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Over Limit (dB)	Detector Type
Horizontal	5150	65.64	8.69	29.4	42.59	61.14	74	-12.86	Pk
Vertical	5150	65.01	9.21	29.4	42.59	61.03	74	-12.97	Pk
Horizontal	5150	47.19	8.69	29.4	42.59	42.69	54	-11.31	AV
Vertical	5150	49.83	9.21	29.4	42.59	45.85	54	-8.15	AV

For 802.11n-(HT40) mode: (CH38 5190MHz&CH46 5230MHz)

Polarization	Frequency (MHz)	Read Level (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamplifier Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Over Limit (dB)	Detector Type
Horizontal	5150	66.80	8.69	29.4	42.59	62.30	74	-11.70	Pk
Vertical	5150	65.09	9.21	29.4	42.59	61.11	74	-12.89	Pk
Horizontal	5150	47.11	8.69	29.4	42.59	42.61	54	-11.39	AV
Vertical	5150	49.58	9.21	29.4	42.59	45.60	54	-8.40	AV

8800 Bluetooth chip:

For 802.11a mode: (CH36 5180MHz&CH48 5240MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	67.04	8.69	29.4	42.59	62.54	74	-11.46	Pk
Vertical	5150	68.06	9.21	29.4	42.59	64.08	74	-9.92	Pk
Horizontal	5150	45.86	8.69	29.4	42.59	41.36	54	-12.64	AV
Vertical	5150	48.64	9.21	29.4	42.59	44.66	54	-9.34	AV

For 802.11n-(HT20) mode: (CH36 5180MHz&CH48 5240MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	64.72	8.69	29.4	42.59	60.22	74	-13.78	Pk
Vertical	5150	66.58	9.21	29.4	42.59	62.60	74	-11.40	Pk
Horizontal	5150	47.82	8.69	29.4	42.59	43.32	54	-10.68	AV
Vertical	5150	50.05	9.21	29.4	42.59	46.07	54	-7.93	AV

For 802.11n-(HT40) mode: (CH38 5190MHz&CH46 5230MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	66.72	8.69	29.4	42.59	62.22	74	-11.78	Pk
Vertical	5150	64.31	9.21	29.4	42.59	60.33	74	-13.67	Pk
Horizontal	5150	45.97	8.69	29.4	42.59	41.47	54	-12.53	AV
Vertical	5150	50.48	9.21	29.4	42.59	46.50	54	-7.50	AV

For 802.11ac-(HT20) mode: (CH36 5180MHz&CH48 5240MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	65.17	8.69	29.4	42.59	60.67	74	-13.33	Pk
Vertical	5150	64.99	9.21	29.4	42.59	61.01	74	-12.99	Pk
Horizontal	5150	48.29	8.69	29.4	42.59	43.79	54	-10.21	AV
Vertical	5150	49.81	9.21	29.4	42.59	45.83	54	-8.17	AV

For 802.11ac-(HT40) mode: (CH38 5190MHz&CH46 5230MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	68.40	8.69	29.4	42.59	63.90	74	-10.10	Pk
Vertical	5150	63.83	9.21	29.4	42.59	59.85	74	-14.15	Pk
Horizontal	5150	47.12	8.69	29.4	42.59	42.62	54	-11.38	AV
Vertical	5150	50.22	9.21	29.4	42.59	46.24	54	-7.76	AV

For 802.11ax-(HT20) mode: (CH36 5180MHz&CH48 5240MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	65.81	8.69	29.4	42.59	61.31	74	-12.69	Pk
Vertical	5150	64.90	9.21	29.4	42.59	60.92	74	-13.08	Pk
Horizontal	5150	47.96	8.69	29.4	42.59	43.46	54	-10.54	AV
Vertical	5150	49.72	9.21	29.4	42.59	45.74	54	-8.26	AV

For 802.11ax-(HT40) mode: (CH38 5190MHz&CH46 5230MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	67.25	8.69	29.4	42.59	62.75	74	-11.25	Pk
Vertical	5150	64.73	9.21	29.4	42.59	60.75	74	-13.25	Pk
Horizontal	5150	45.86	8.69	29.4	42.59	41.36	54	-12.64	AV
Vertical	5150	49.84	9.21	29.4	42.59	45.86	54	-8.14	AV

5.4 Peak Output Power

5.4.1 Limit

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz band

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

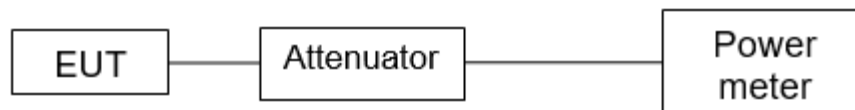
For the band 5.725-5.85 GHz

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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.

5.4.2 Test Procedure

The maximum peak conducted output power may be measured using a broadband Average RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector.

5.4.3 Test Setup



5.4.4 Test Results

EUT:	CarPlay/Android Auto AI BOX	Model Name:	CP04
Test Mode:	Charging+TX	Test Voltage:	DC 5V from adapter AC 120V/60Hz

For U-NII-1

8733 Bluetooth chip:

Modulation mode	Test Channel	Frequency(MHz)	Conducted Power (dBm)	Limit(dBm)
11a	CH36	5180	15.53	24
11a	CH40	5200	15.39	24
11a	CH48	5240	15.35	24
11n (HT20)	CH36	5180	15.25	24
11n (HT20)	CH40	5200	15.12	24
11n (HT20)	CH48	5240	15.2	24
11n (HT40)	CH38	5190	13.17	24
11n (HT40)	CH46	5230	13.86	24

8800 Bluetooth chip:

Modulation mode	Test Channel	Frequency(MHz)	Conducted Power (dBm)	Limit(dBm)
11a	CH36	5180	9.69	24
11a	CH40	5200	10.45	24
11a	CH48	5240	10.13	24
11n (HT20)	CH36	5180	10.67	24
11n (HT20)	CH40	5200	10.69	24
11n (HT20)	CH48	5240	10.34	24
11n (HT40)	CH38	5190	10.66	24
11n (HT40)	CH46	5230	10.5	24
11ac (HT20)	CH36	5180	10.54	24
11ac (HT20)	CH40	5200	10.36	24
11ac (HT20)	CH48	5240	9.99	24
11ac (HT40)	CH38	5190	10.71	24
11ac (HT40)	CH46	5230	10.23	24
11ax (HE20)	CH36	5180	10.52	24
11ax (HE20)	CH40	5200	10.61	24
11ax (HE20)	CH48	5240	10.31	24
11ax (HE40)	CH38	5190	10.7	24
11ax (HE40)	CH46	5230	10.47	24

5.5 Power Spectral Density

5.5.1 Limit

For the band 5.15-5.25 GHz

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

For the band 5.25-5.35 GHz and 5.47-5.725 GHz

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.5.2 Test Procedure

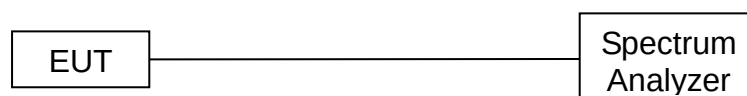
For U-NII-1

1. Set analyzer center frequency to NII channel center frequency.
2. Set the RBW $\geq$ 1MHz.
3. Set the VBW $\geq$ 3 x RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

For U-NII-3

1. Set analyzer center frequency to NII channel center frequency.
2. Set the RBW $\geq$ 510kHz.
3. Set the VBW $\geq$ 3 x RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

5.5.3 Test Setup



5.5.4 Test Results

For U-NII-1

8733 Bluetooth chip:

Mode	Channel	Frequency(MHz)	Measurement PSD (dBm/MHz)	Limit (dBm/MHz)	Result
11a	CH36	5180	6.32	11	Pass
11a	CH44	5220	5.9	11	Pass
11a	CH48	5240	6.02	11	Pass
11n(HT20)	CH36	5180	5.59	11	Pass
11n(HT20)	CH44	5220	5.66	11	Pass
11n(HT20)	CH48	5240	5.7	11	Pass
11n(HT40)	CH38	5190	0.77	11	Pass
11n(HT40)	CH46	5230	1.41	11	Pass

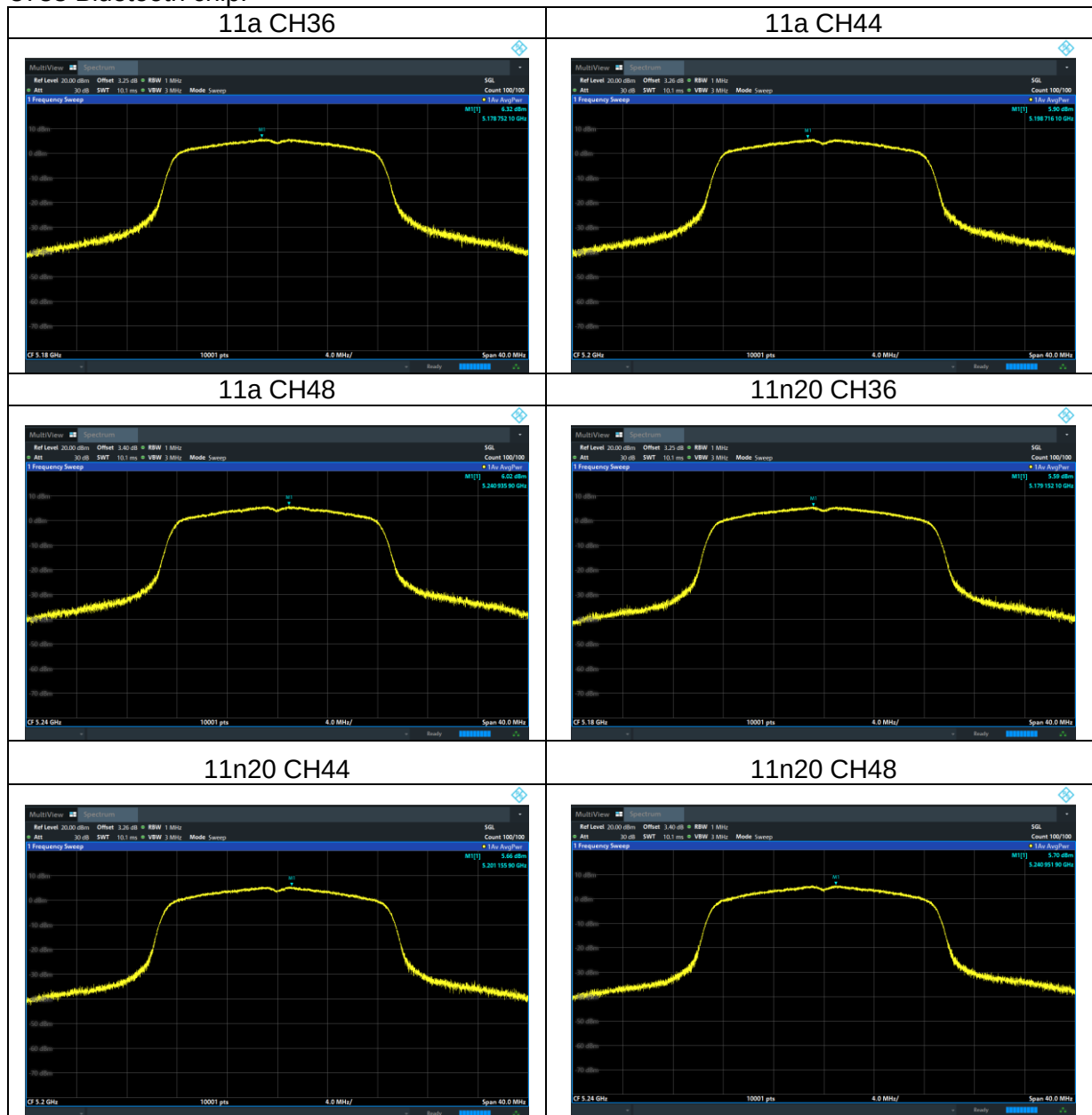
8800 Bluetooth chip:

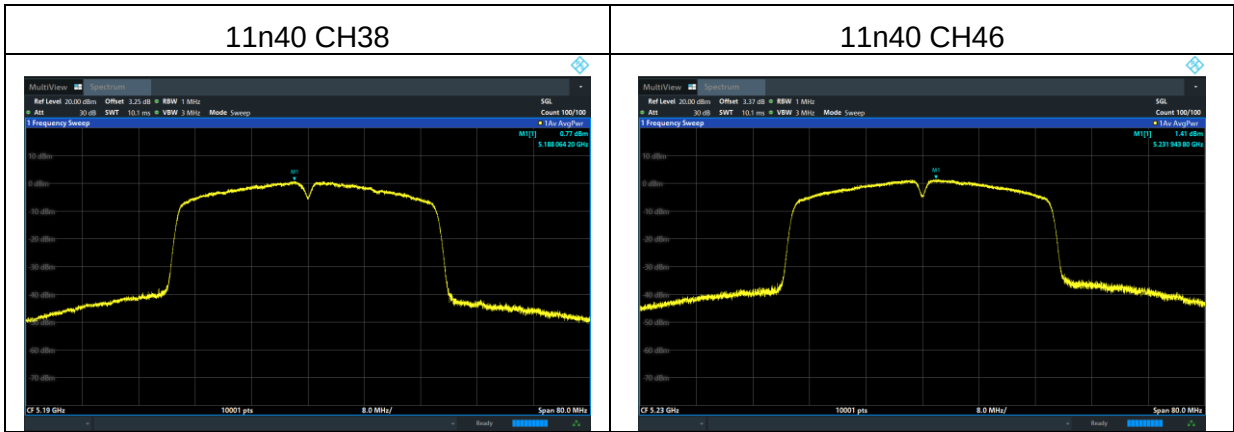
Mode	Channel	Frequency(MHz)	Measurement PSD (dBm/MHz)	Limit (dBm/MHz)	Result
11a	CH36	5180	0.01	11	Pass
11a	CH40	5200	-0.04	11	Pass
11a	CH48	5240	-0.35	11	Pass
11n (HT20)	CH36	5180	-0.06	11	Pass
11n (HT20)	CH40	5200	-0.15	11	Pass
11n (HT20)	CH48	5240	-0.23	11	Pass
11n (HT40)	CH38	5190	-3.12	11	Pass
11n (HT40)	CH46	5230	-3.31	11	Pass
11ac (HT20)	CH36	5180	-0.18	11	Pass
11ac (HT20)	CH40	5200	-0.18	11	Pass
11ac (HT20)	CH48	5240	-0.59	11	Pass
11ac (HT40)	CH38	5190	-3.03	11	Pass
11ac (HT40)	CH46	5230	-3.54	11	Pass
11ax (HE20)	CH36	5180	-0.37	11	Pass
11ax (HE20)	CH40	5200	-0.17	11	Pass
11ax (HE20)	CH48	5240	-0.69	11	Pass
11ax (HE40)	CH38	5190	-3.06	11	Pass
11ax (HE40)	CH46	5230	-3.56	11	Pass

Test plots

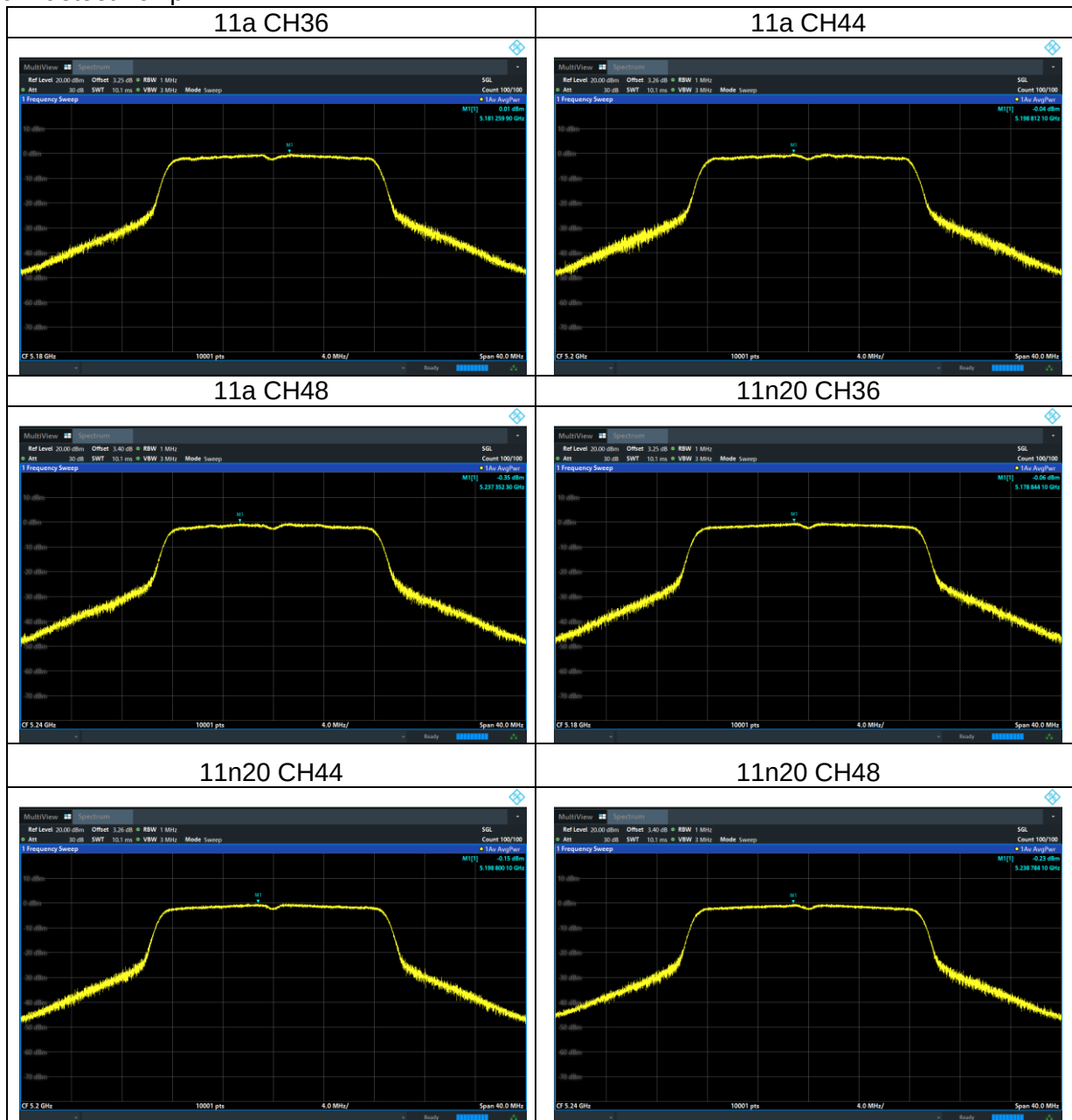
For U-NII-1

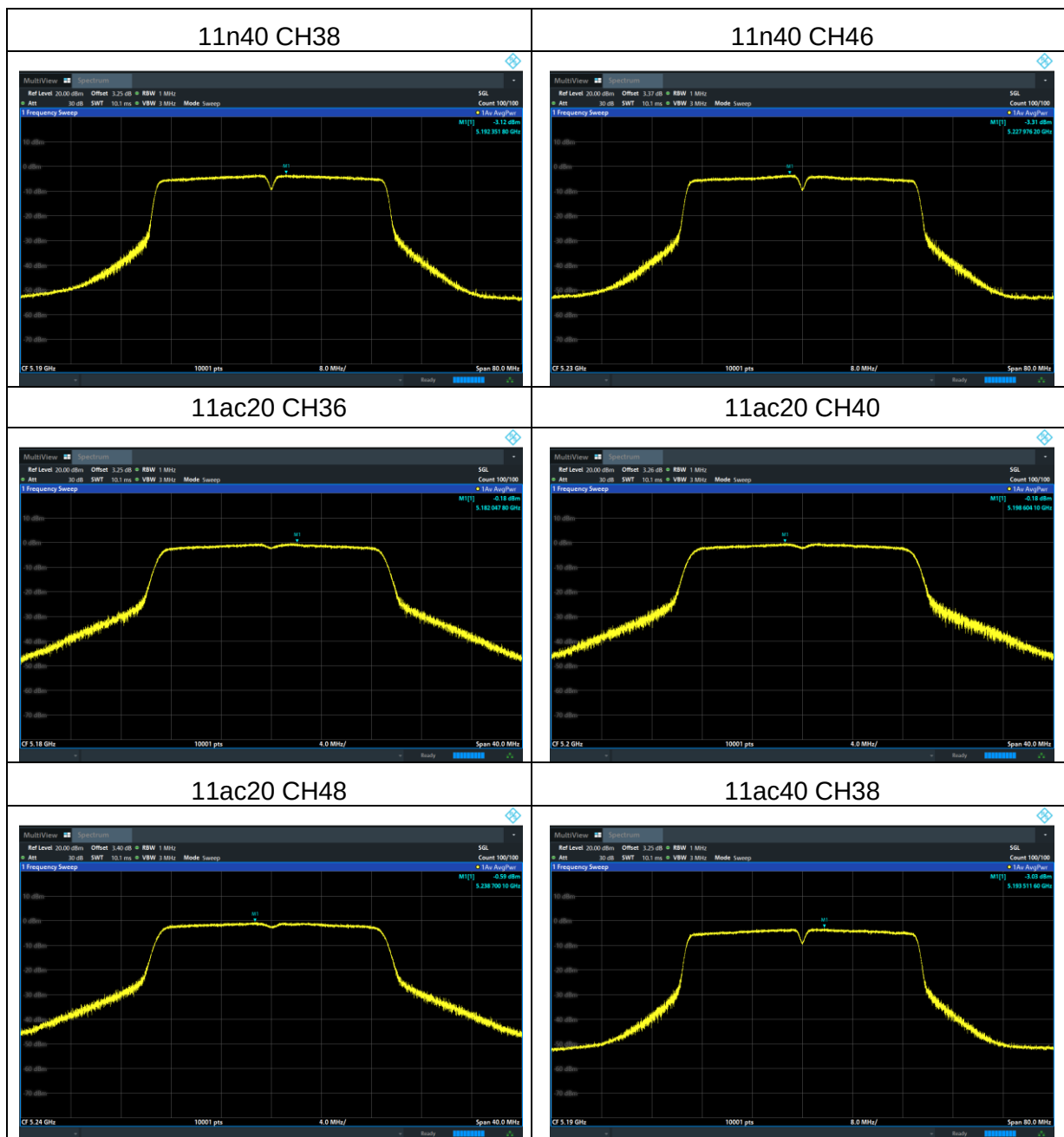
8733 Bluetooth chip:

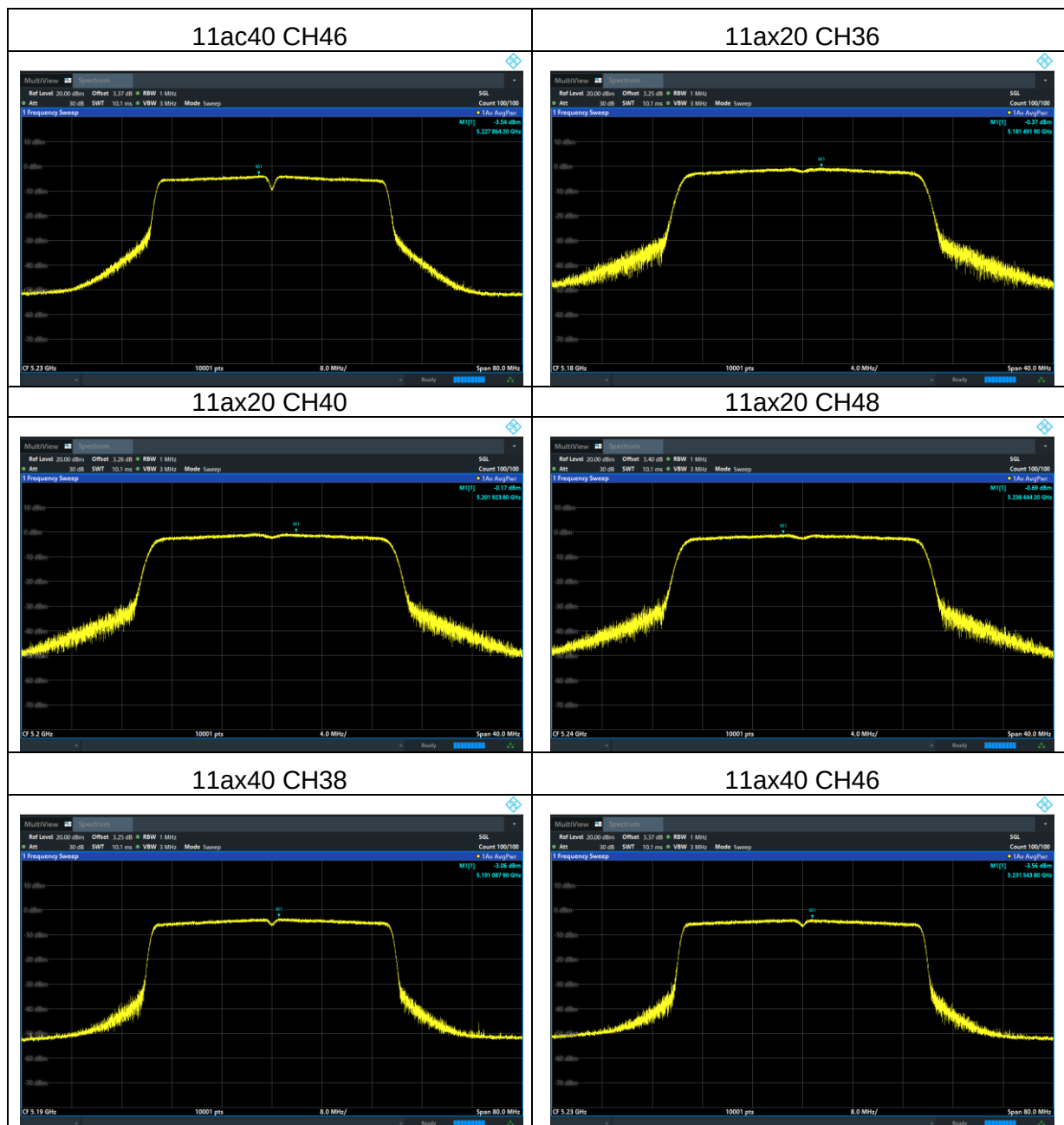




8800 Bluetooth chip:







5.6 26dB Emission Bandwidth and Occupied bandwidth

5.6.1 Limit

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

5.6.2 Test Procedure

26dB Emission bandwidth

Set RBW = approximately 1% of the emission bandwidth.

Set VBW $\geq 3 \times \text{RBW}$

Detector = Peak.

Trace mode = Max hold.

Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

Occupied Bandwidth

Set Span = 1.5 times to 5.0 times the OBW

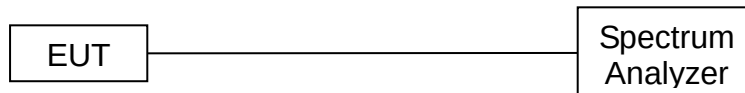
Set RBW = 1% to 5% of the OBW.

Set VBW $\geq 3 \times \text{RBW}$, Detector = Peak.

Trace mode = Max hold.

Use the 99% power bandwidth function of the instrument.

5.6.3 Test Setup



5.6.4 Test Results

For U-NII-1

8733 Bluetooth chip:

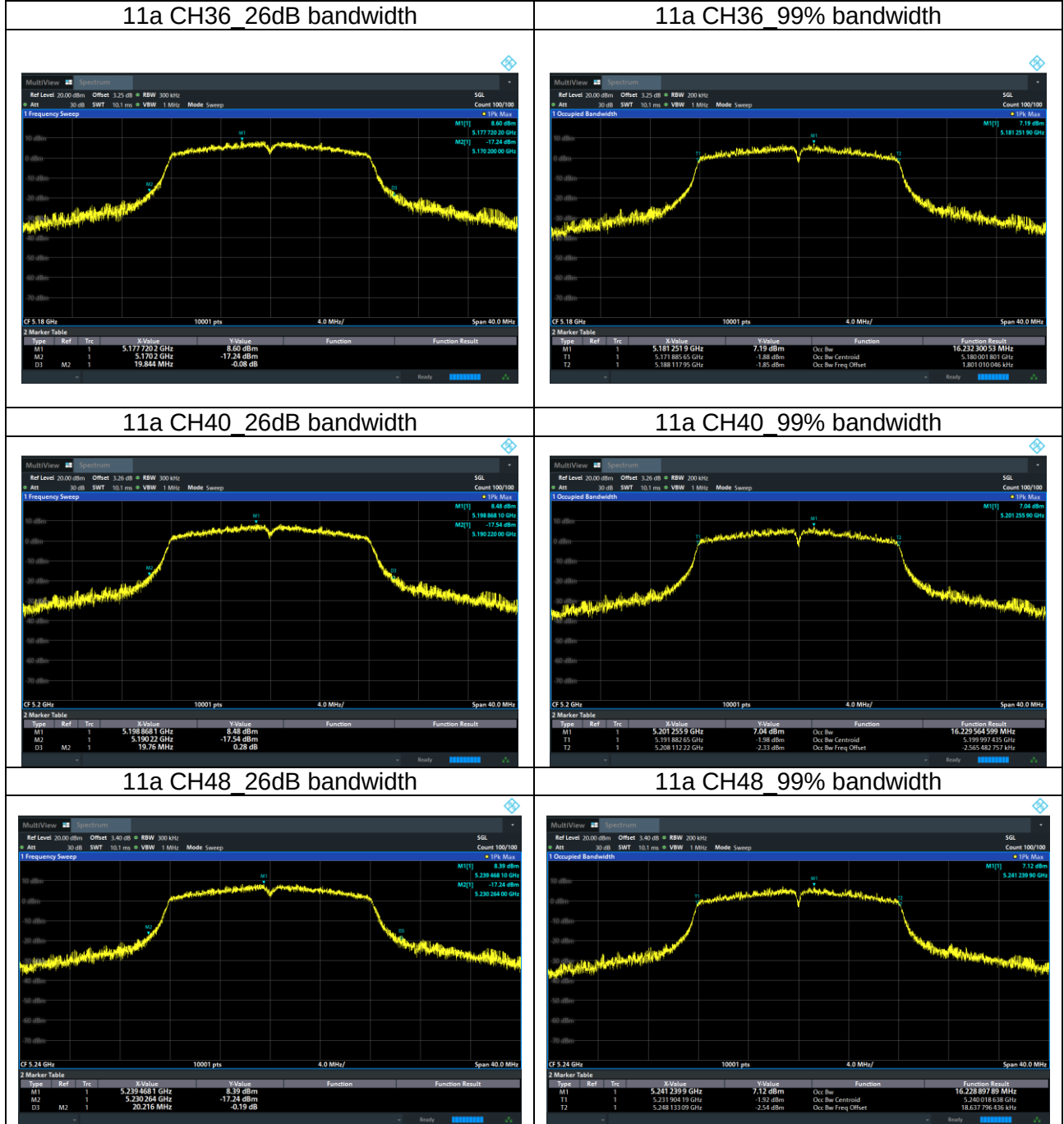
Channel	Test Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
11a	CH36	5180	19.844	16.232	/	Pass
11a	CH40	5200	19.76	16.23	/	Pass
11a	CH48	5240	20.216	16.229	/	Pass
11n (HT20)	CH36	5180	20.868	17.34	/	Pass
11n (HT20)	CH40	5200	20.804	17.335	/	Pass
11n (HT20)	CH48	5240	20.82	17.327	/	Pass
11n (HT40)	CH38	5190	37.704	35.181	/	Pass
11n (HT40)	CH46	5230	37.736	35.285	/	Pass

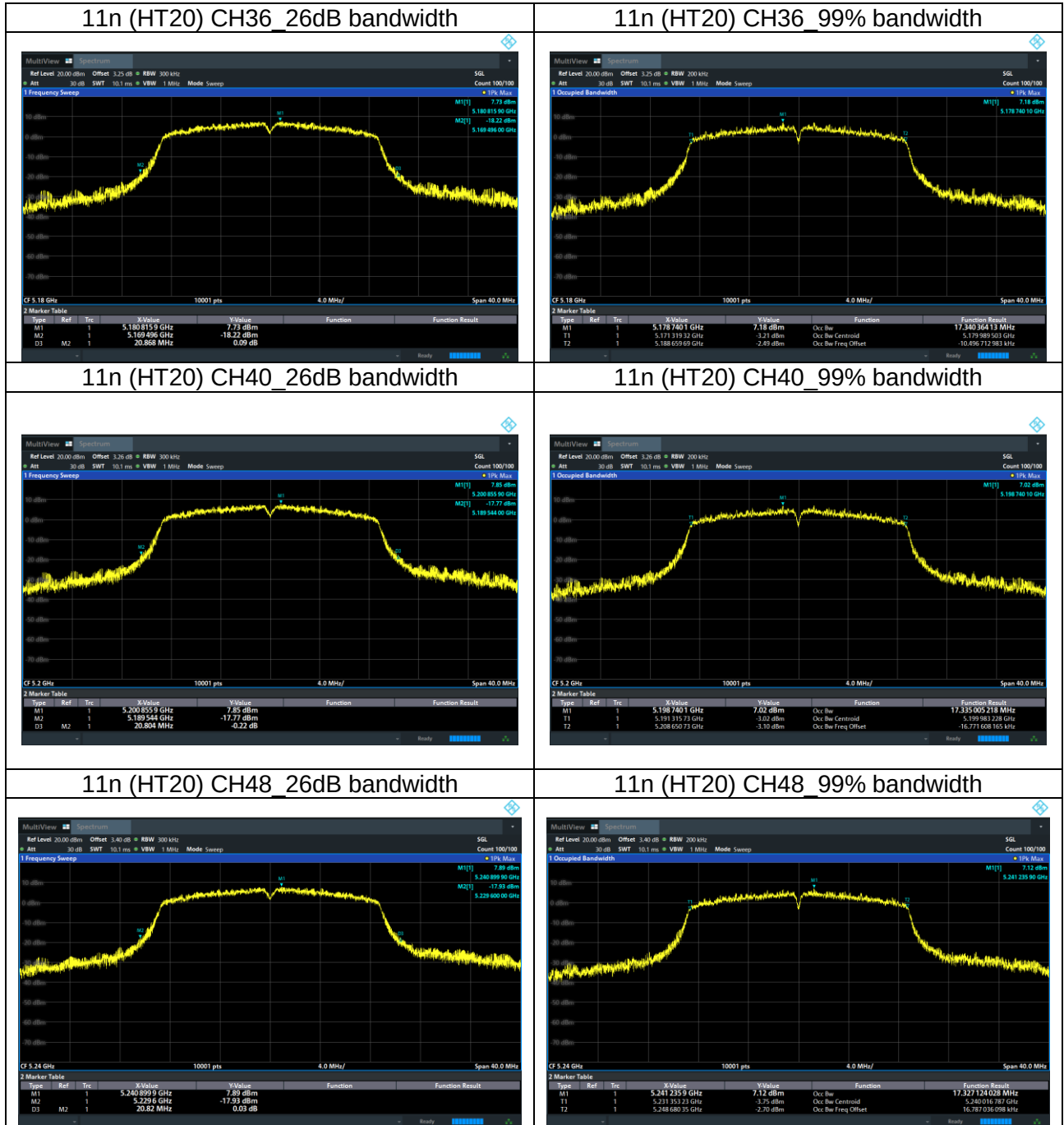
8800 Bluetooth chip:

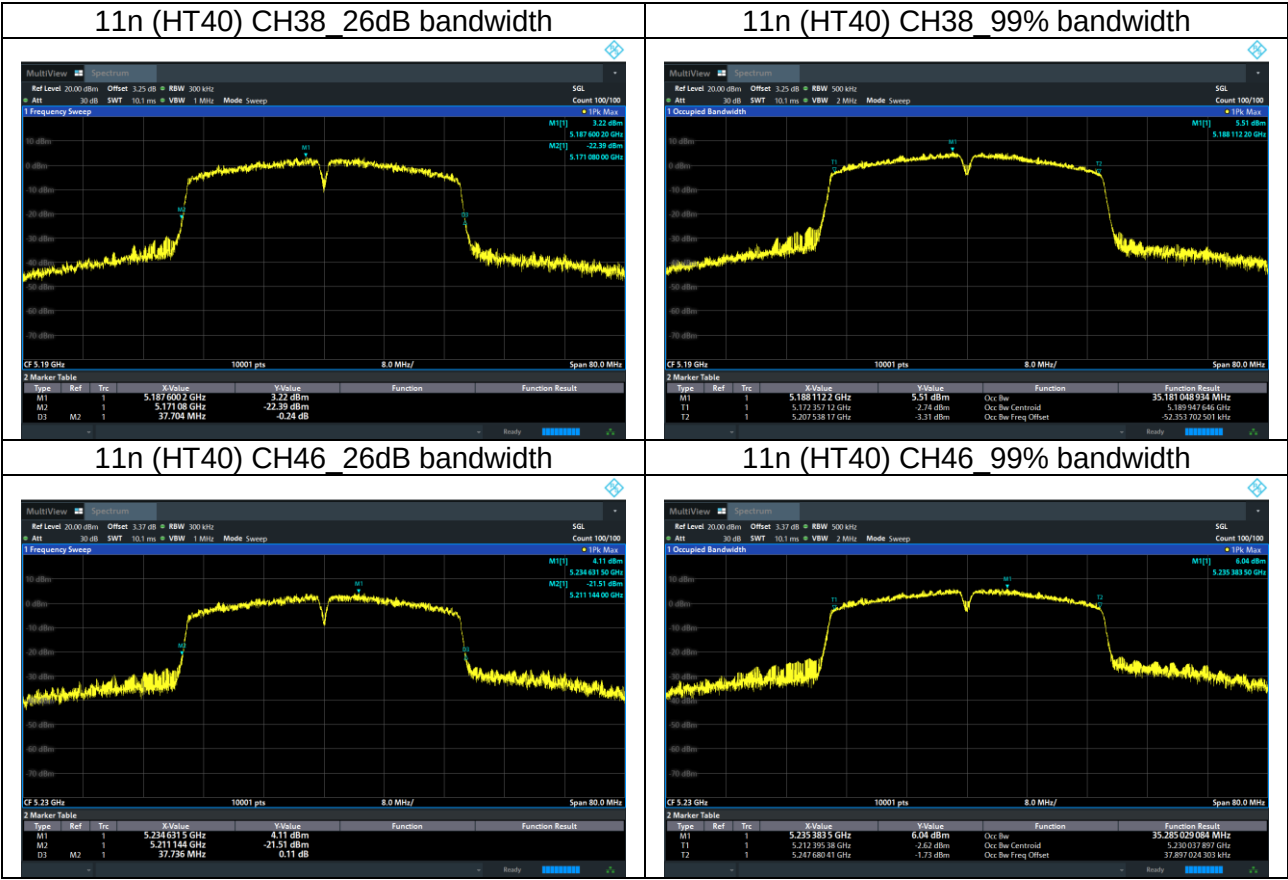
Channel	Test Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
11a	CH36	5180	26.288	16.675	/	Pass
11a	CH40	5200	25.456	16.69	/	Pass
11a	CH48	5240	25.708	16.715	/	Pass
11n (HT20)	CH36	5180	26.192	17.895	/	Pass
11n (HT20)	CH40	5200	27.168	17.919	/	Pass
11n (HT20)	CH48	5240	26.236	17.919	/	Pass
11n (HT40)	CH38	5190	45.016	36.566	/	Pass
11n (HT40)	CH46	5230	44.448	36.617	/	Pass
11ac (HT20)	CH36	5180	26.376	17.895	/	Pass
11ac (HT20)	CH40	5200	27.464	17.897	/	Pass
11ac (HT20)	CH48	5240	26.528	17.907	/	Pass
11ac (HT40)	CH38	5190	44.504	36.538	/	Pass
11ac (HT40)	CH46	5230	45.24	36.581	/	Pass
11ax (HE20)	CH36	5180	26.56	19.047	/	Pass
11ax (HE20)	CH40	5200	26.82	19.057	/	Pass
11ax (HE20)	CH48	5240	25.808	19.07	/	Pass
11ax (HE40)	CH38	5190	43.768	37.925	/	Pass
11ax (HE40)	CH46	5230	43.776	37.928	/	Pass

Test plots:
For U-NII-1

8733 Bluetooth chip:







8800 Bluetooth chip:

