

TEST REPORT

Product Name : Car Media Receiver
Brand Mark : DUAL/AXXERA/JENSEN
Model No. : AVM700Ui, XVM700Ui, JVM700Ui, JVM700UiS,
AVM700UiS, AVM700USN, CMM7720, CMM720,
CMR2720, XDM700U, DM620N, XVM279NAV
FCC ID : 2AFXA-AVM700UI
Report Number : BLA-EMC-202002-A1101
Date of Sample Receipt : 2020/2/27
Date of Test : 2020/3/11 to 2020/3/11
Date of Issue : 2020/3/11
Test Standard : 47 CFR Part 15, Subpart C 15.247
Test Result : Pass

Prepared for:

FengShun Peiying Electro-Acoustic Co., Ltd

2nd Floor, Block F, Hongwei Industrial Area, No.6 Liuxian 2 Road, Baocheng 70 Area,
Bao'an, Shenzhen City, Guangdong Province, P.R. China

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

IOT Test Centre of BlueAsia

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

TEL: +86-755-28682673

FAX: +86-755-28682673

Compiled by:

Jozu.

Review by:

Sweet. Wang

Approved by:

Emen-li

Date:

2020/3/11



REPORT REVISE RECORD

Version No.	Date	Description
00	2020/3/11	Original

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1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.247(a)(1)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Dwell Time	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Hopping Channel Number	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.3	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Carrier Frequencies Separation	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.2	47 CFR Part 15, Subpart C 15.247a(1)	Pass

2 GENERAL INFORMATION

Applicant	FengShun Peiying Electro-Acoustic Co., Ltd
Address	2nd Floor, Block F, Hongwei Industrial Area, No.6 Liuxian 2 Road, Baocheng 70 Area, Bao'an, Shenzhen City, Guangdong Province, P.R. China
Manufacturer	FengShun Peiying Electro-Acoustic Co., Ltd
Address	No.8, Fengda Road, Tangkeng Town Industrial Area, Fengshun County, Meizhou City, Guangdong Province, P.R. China
Factory	FengShun Peiying Electro-Acoustic Co., Ltd
Address	No.8, Fengda Road, Tangkeng Town Industrial Area, Fengshun County, Meizhou City, Guangdong Province, P.R. China

3 GENERAL DESCRIPTION OF E.U.T.

Product Name	Car Media Receiver
Test Model No.	AVM700Ui
Power	DC12V
Hardware Version	V02
Software Version	A700U.0001.15B
Operation Frequency:	2402MHz-2480MHz
Modulation Type:	GFSK, pi/4DQPSK
Channel Spacing:	1MHz
Number of Channels:	79
Antenna Type:	PCB Antenna
Antenna Gain:	1.0dBi

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	DC12V

5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation. (hopping or no hopping mode all have been tested ,only worse case is reported)
Remark: Full battery is used during all test except ac conducted emission, DH1, DH3, DH5 all have been tested, during the test, GFSK, PI/4QPSK modulation were all pre-scanned only worse case is reported.	

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %
Radiated Emission (30MHz ~ 1000MHz)	±4.35 dB
Radiated Emission (1GHz ~ 18GHz)	±4.44 dB
AC Power Line Conducted Emission	±3.45dB

7 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
Storage battery	CHILWEE	MH1805	--	--

Note:

--" means no any support device during testing.

8 LABORATORY LOCATION

All tests were performed at:
BlueAsia of Technical Services(Shenzhen) Co., Ltd.
IOT Test Centre of BlueAsia
No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673
No tests were sub-contracted.

9 TEST INSTRUMENTS LIST

Test Equipment Of Antenna Requirement					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due

Test Equipment Of Conducted Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020
Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

Test Equipment Of 20dB Bandwidth					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020
Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

Test Equipment Of Conducted Peak Output Power					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020
Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

Test Equipment Of Radiated Spurious Emissions

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	5/8/2018	5/7/2021
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Receiver	R&S	ESR7	101199	5/7/2019	5/6/2020
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	7/14/2018	7/13/2020
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	7/14/2018	7/13/2020
Amplifier	SKET	LNPA-0118-45	N/A	7/4/2019	7/3/2020
EMI software	EZ	EZ-EMC	N/A	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2/14/2019	2/13/2020

Test Equipment Of Radiated Emissions which fall in the restricted bands

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	5/8/2018	5/7/2021
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Receiver	R&S	ESR7	101199	5/7/2019	5/6/2020
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	7/14/2018	7/13/2020
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	7/14/2018	7/13/2020
Amplifier	SKET	LNPA-0118-45	N/A	7/4/2019	7/3/2020
EMI software	EZ	EZ-EMC	N/A	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2/14/2019	2/13/2020

Test Equipment Of Conducted Band Edges Measurement

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020
Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

Test Equipment Of Dwell Time

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020
Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

Test Equipment Of Hopping Channel Number

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020
Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

Test Equipment Of Carrier Frequencies Separation

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	7/4/2019	7/3/2020
Spectrum	Agilent	N9020A	MY49100060	12/18/2019	12/17/2020

Signal Generator	Agilent	N5182A	MY49060650	12/18/2019	12/17/2020
Signal Generator	Agilent	E8257D	MY44320250	5/7/2019	5/6/2020

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ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

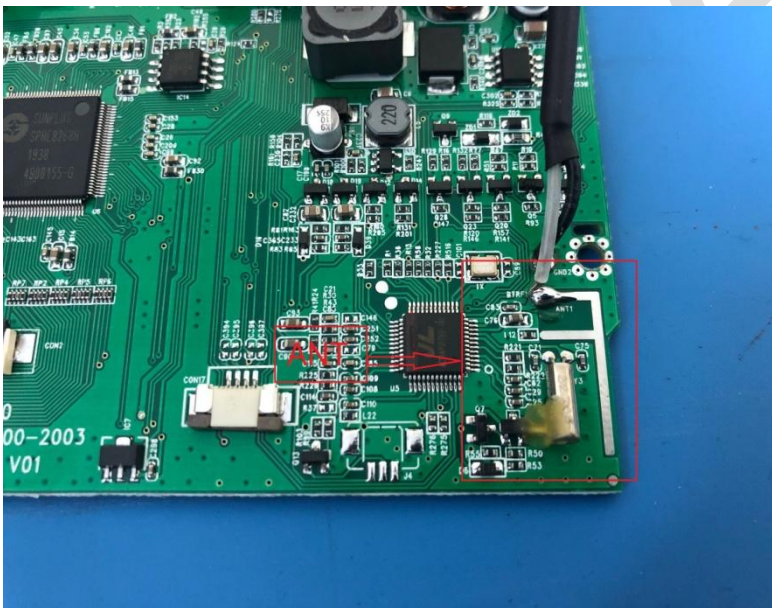
CONCLUSION

Standard Requirement:

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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.0dBi.



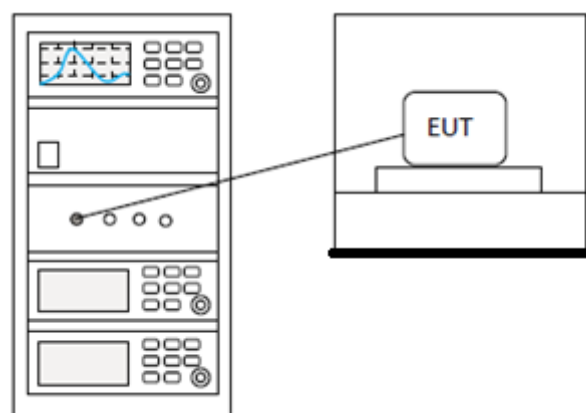
CONDUCTED SPURIOUS EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
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BLOCK DIAGRAM OF TEST SETUP



TEST DATA

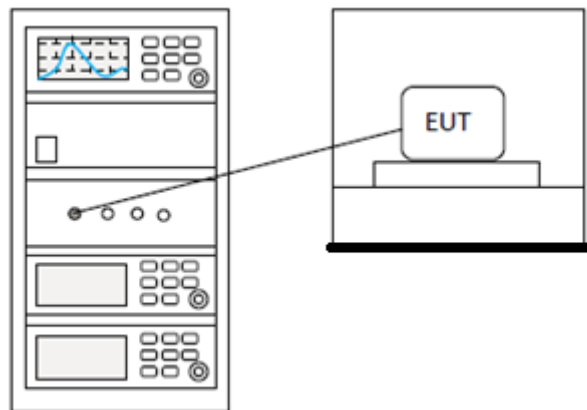
Pass: Please Refer To Appendix: Appendix1 For Details

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20DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.7
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

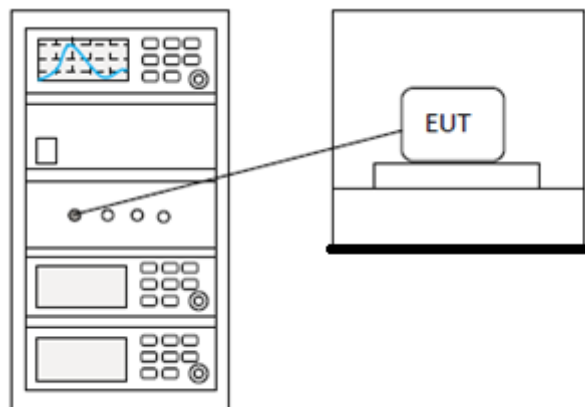
CONDUCTED PEAK OUTPUT POWER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 50 hopping channels
	0.25 for $25 \leq \text{hopping channels} < 50$
	1 for digital modulation
2400-2483.5	1 for ≥ 75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

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RADIATED SPURIOUS EMISSIONS

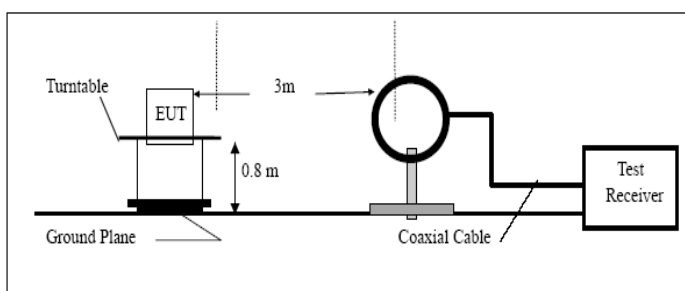
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

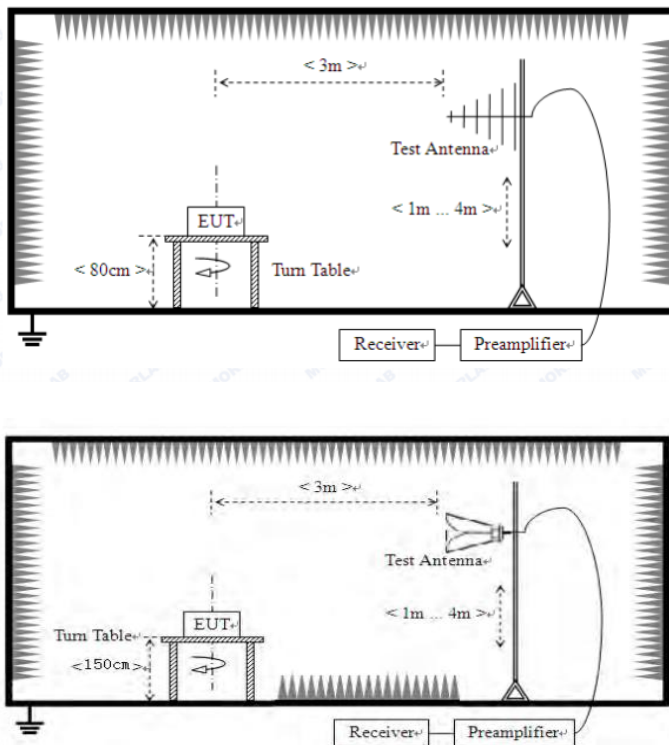
LIMITS

Frequency(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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

BLOCK DIAGRAM OF TEST SETUP





PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

TEST DATA

[Test Mode: Pi/4QPSK]

Remark: During the test, pre-scan the GFSK, Pi/4QPSK, modulation, and found the Pi/4QPSK modulation which it is worse case.

Test channel:lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	56.44	2.38	58.82	74	-15.18	Vertical
7206.00	56.08	2.17	58.25	74	-15.75	Vertical
9608.00	55.87	2.06	57.93	74	-16.07	Vertical
12010.00	*			74		Vertical
14412.00	*			74		Vertical
4804.00	57.58	2.38	59.96	74	-14.04	Horizontal
7206.00	57.66	2.17	59.83	74	-14.17	Horizontal
9608.00	56.98	2.06	59.04	74	-14.96	Horizontal
12010.00	*			74		Horizontal
14412.00	*			74		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	45.12	2.38	47.5	54	-6.5	Vertical
7206.00	44.26	2.17	46.43	54	-7.57	Vertical
9608.00	45.36	2.06	47.42	54	-6.58	Vertical
12010.00	*			54		Vertical
14412.00	*			54		Vertical
4804.00	44.74	2.38	47.12	54	-6.88	Horizontal
7206.00	45.03	2.17	47.2	54	-6.8	Horizontal
9608.00	45.15	2.06	47.21	54	-6.79	Horizontal
12010.00	*			54		Horizontal
14412.00	*			54		Horizontal

Test channel:Middle

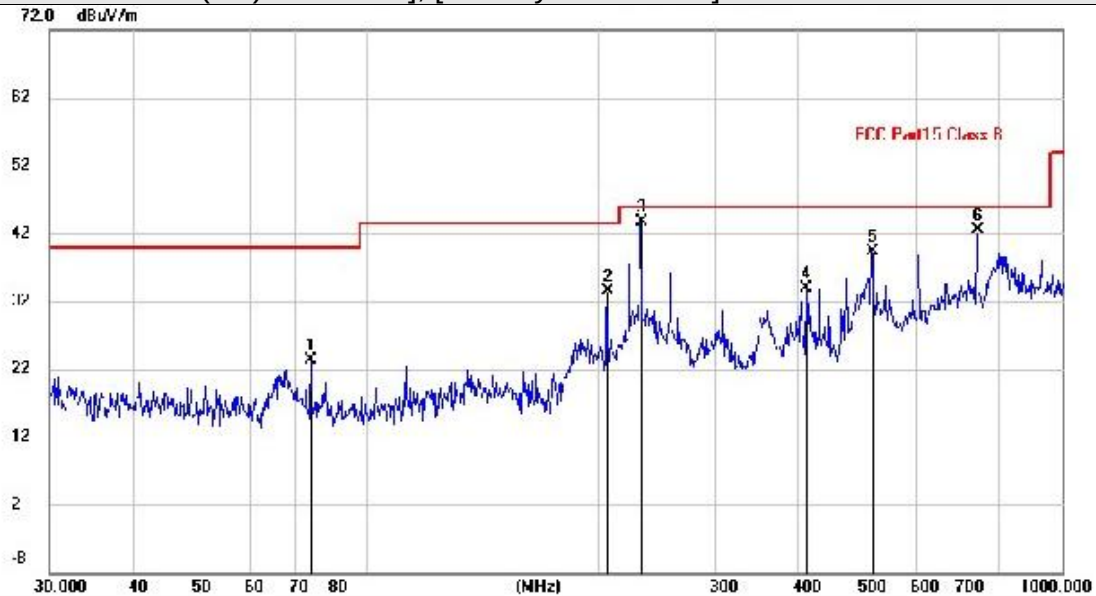
Peak value:

Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
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4882.00	54.15	0.17	54.32	74	-19.68	Vertical
7323.00	54.66	1.43	56.09	74	-17.91	Vertical
9764.00	54.48	1.26	55.74	74	-18.26	Vertical
12205.00	*			74		Vertical
14646.00	*			74		Vertical
4882.00	55.1	0.17	55.27	74	-18.73	Horizontal
7323.00	55.64	1.43	57.07	74	-16.93	Horizontal
9764.00	55.83	1.26	57.09	74	-16.91	Horizontal
12205.00	*			74		Horizontal
14646.00	*			74		Horizontal
Average value:						
Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	46.36	0.17	46.53	54	-7.47	Vertical
7323.00	45.01	1.43	46.44	54	-7.56	Vertical
9764.00	44.03	1.26	45.29	54	-8.71	Vertical
12205.00	*			54		Vertical
14646.00	*			54		Vertical
4882.00	45.36	0.17	45.53	54	-8.47	Horizontal
7323.00	44.44	1.43	45.87	54	-8.13	Horizontal
9764.00	45.03	1.26	46.29	54	-7.71	Horizontal
12205.00	*			54		Horizontal
14646.00	*			54		Horizontal
Test channel: Highest						
Peak value:						
Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	51.96	1.04	53	74	-21	Vertical
7440.00	51.24	2.59	53.83	74	-20.17	Vertical
9920.00	50.67	2.74	53.41	74	-20.59	Vertical
12400.00	*			74		Vertical
14880.00	*			74		Vertical
4960.00	55.81	1.04	56.85	74	-17.15	Horizontal
7440.00	55.88	2.59	58.47	74	-15.53	Horizontal
9920.00	53.23	2.74	55.97	74	-18.03	Horizontal
12400.00	*			74		Horizontal

14880.00	*			74		Horizontal
Average value:						
Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	44.28	1.04	45.32	54	-8.68	Vertical
7440.00	45.03	2.59	47.62	54	-6.38	Vertical
9920.00	45.19	2.74	47.93	54	-6.07	Vertical
12400.00	*			54		Vertical
14880.00	*			54		Vertical
4960.00	47.02	1.04	48.06	54	-5.94	Horizontal
7440.00	43.34	2.59	45.93	54	-8.07	Horizontal
9920.00	46.51	2.74	49.25	54	-4.75	Horizontal
12400.00	*			54		Horizontal
14880.00	*			54		Horizontal
Test Result: Pass						

[TestMode: TX mode (SE) below 1G]; [Polarity: Horizontal]



Site

Polarization: **Horizontal**

Temperature:

Limit: FCC Part15 Class B

Power: DC12V

Humidity: %

EUT: Car Multimedia Player

Distance: 3m

M/N: AVM700Ui

Mode: BT mode

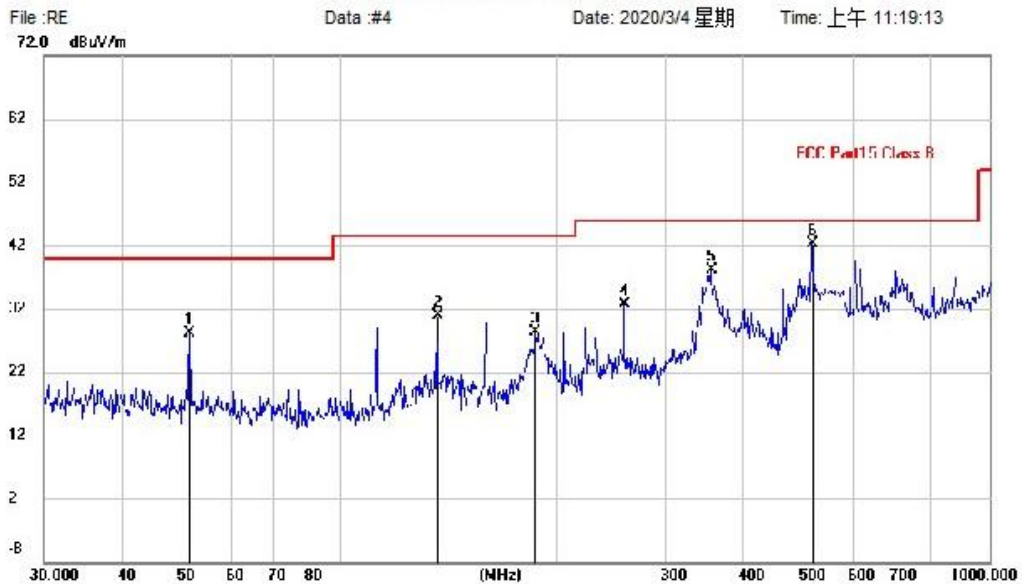
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		74.1351	3.00	20.31	23.31	40.00	-16.69	QP		
2		206.3976	12.96	20.50	33.46	43.50	-10.04	QP		
3	*	231.7179	21.25	22.42	43.67	46.00	-2.33	QP		
4		411.8240	6.64	27.27	33.91	46.00	-12.09	QP		
5		515.4374	9.85	29.36	39.21	46.00	-6.79	QP		
6		744.8661	9.16	33.44	42.60	46.00	-3.40	QP		

Test Result: Pass

TestMode: TX mode (SE) below 1G; [Polarity: Vertical]

Radiated Emission Measurement



Site
Limit: FCC Part15 Class B
EUT: Car Multimedia Player
M/N: AVM700Ui
Mode: BT mode
Note:

Polarization: **Vertical**
Power: DC12V
Distance: 3m
Temperature:
Humidity: %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1		51.4807	3.77	24.33	28.10	40.00	-11.90			QP	
2		128.5630	7.92	22.95	30.87	43.50	-12.63			QP	
3		185.1379	7.51	20.78	28.29	43.50	-15.21			QP	
4		257.4222	9.70	22.96	32.66	46.00	-13.34			QP	
5		355.4273	12.47	25.61	38.08	46.00	-7.92			QP	
6	*	515.4374	13.04	29.36	42.40	46.00	-3.60			QP	

*:Maximum data x:Over limit !:over margin

< Reference Only

Test Result: Pass

RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

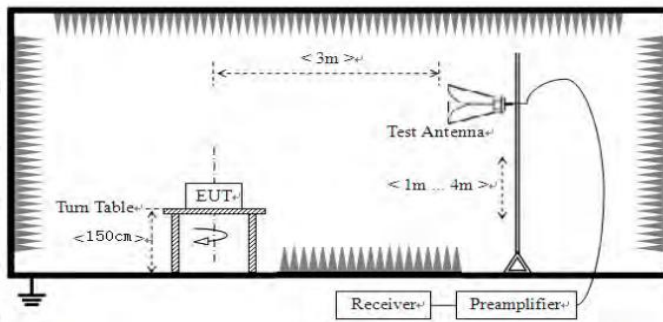
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

LIMITS

Frequency(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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

BLOCK DIAGRAM OF TEST SETUP



PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

TEST DATA

[TestMode: Pi/4QPSK]

Remark: During the test, pre-scan the GFSK, Pi/4QPSK, modulation, and found the Pi/4QPSK modulation which it is worse case.

Test channel:lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310	47.04	-4.2	42.84	74	-31.16	Horizontal
2390	48.27	-3.88	44.39	74	-29.61	Horizontal
2310	47.4	-4.49	42.91	74	-31.09	Vertical
2390	52.6	-4.21	48.39	74	-25.61	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Correct factor(dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310	37.95	-4.2	33.75	54	-20.25	Horizontal
2390	38.11	-3.88	34.23	54	-19.77	Horizontal
2310	37.96	-4.49	33.47	54	-20.53	Vertical
2390	40.93	-4.21	36.72	54	-17.28	Vertical

Test channel:Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Correct factor	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.5	52.4	-3.38	49.02	74	-24.98	Horizontal
2500	46.92	-3.3	43.62	74	-30.38	Horizontal
2483.5	51.22	-3.77	47.45	74	-26.55	Vertical
2500	50.44	-3.7	46.74	74	-27.26	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Correct factor(dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.5	43.51	-3.38	40.13	54	-13.87	Horizontal
2500	38.59	-3.3	35.29	54	-18.71	Horizontal
2483.5	42.34	-3.77	38.57	54	-15.43	Vertical

2500	41.19	-3.7	37.49	54	-16.51	Vertical
Test Result: Pass						

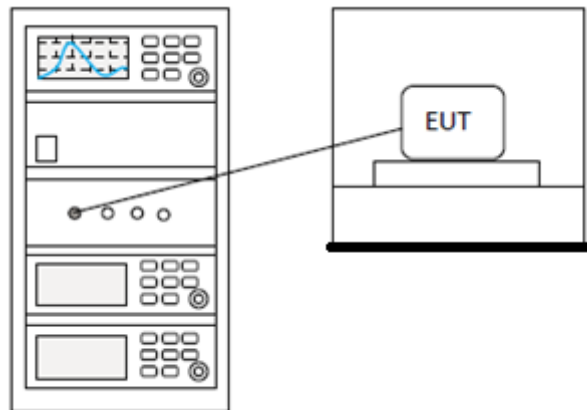
CONDUCTED BAND EDGES MEASUREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
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BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

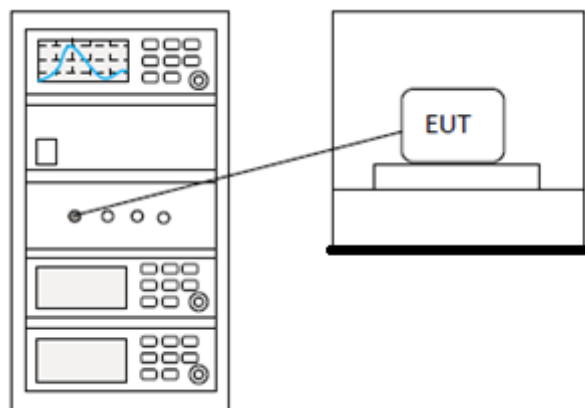
DWELL TIME

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.4
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

LIMITS

Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4S multiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

BlueAsia

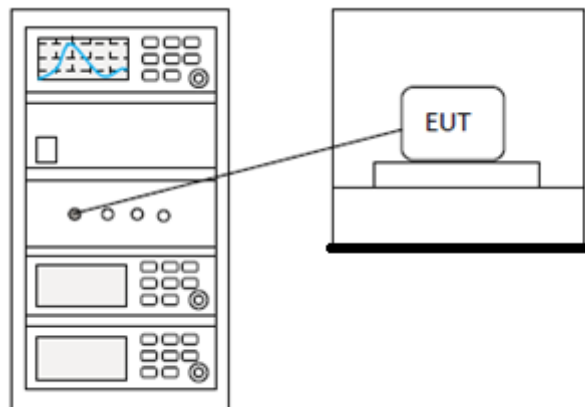
HOPPING CHANNEL NUMBER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.3
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

LIMITS

Frequency range(MHz)	Number of hopping channels (minimum)
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth ≥250kHz
2400-2483.5	15
5725-5850	75

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

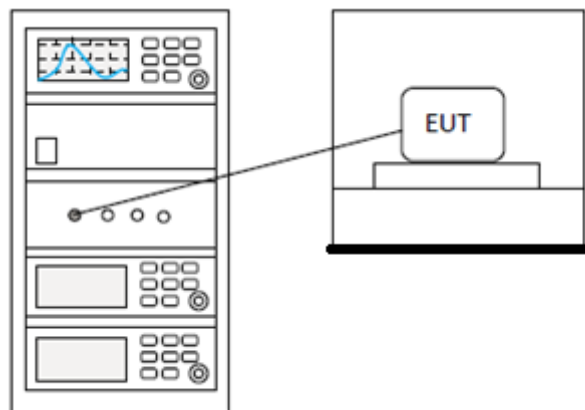
CARRIER FREQUENCIES SEPARATION

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

LIMITS

Limit:	2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W
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BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

10 APPENDIX

Appendix1

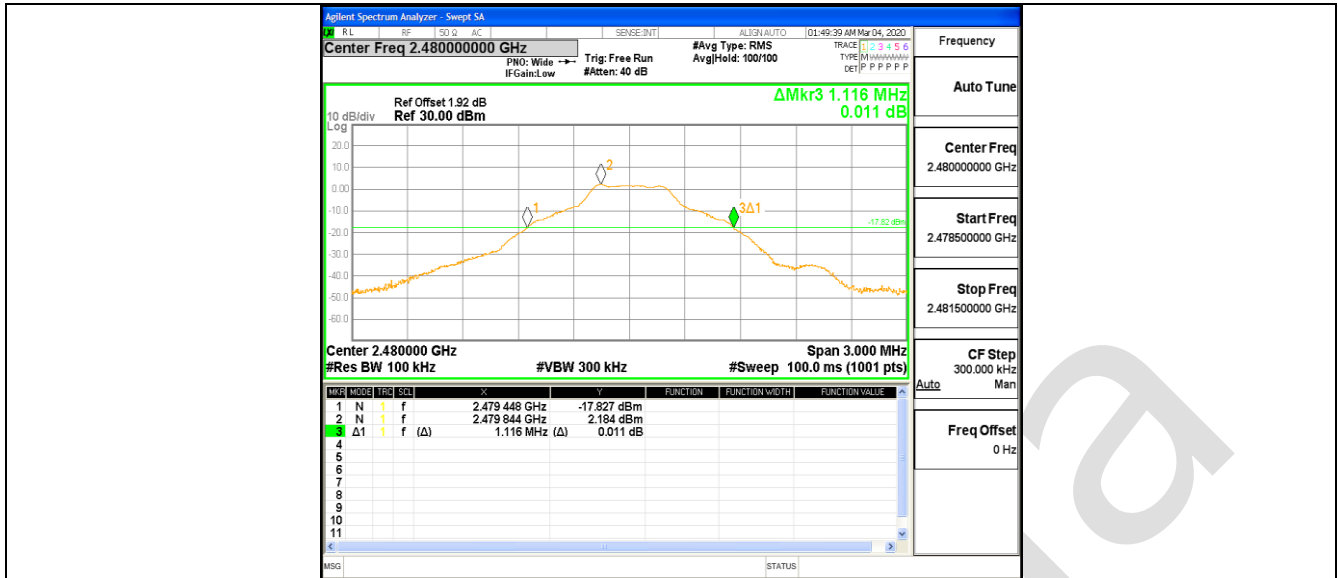
10.1 APPENDIX: 20DBEMISSION BANDWIDTH

Test Result

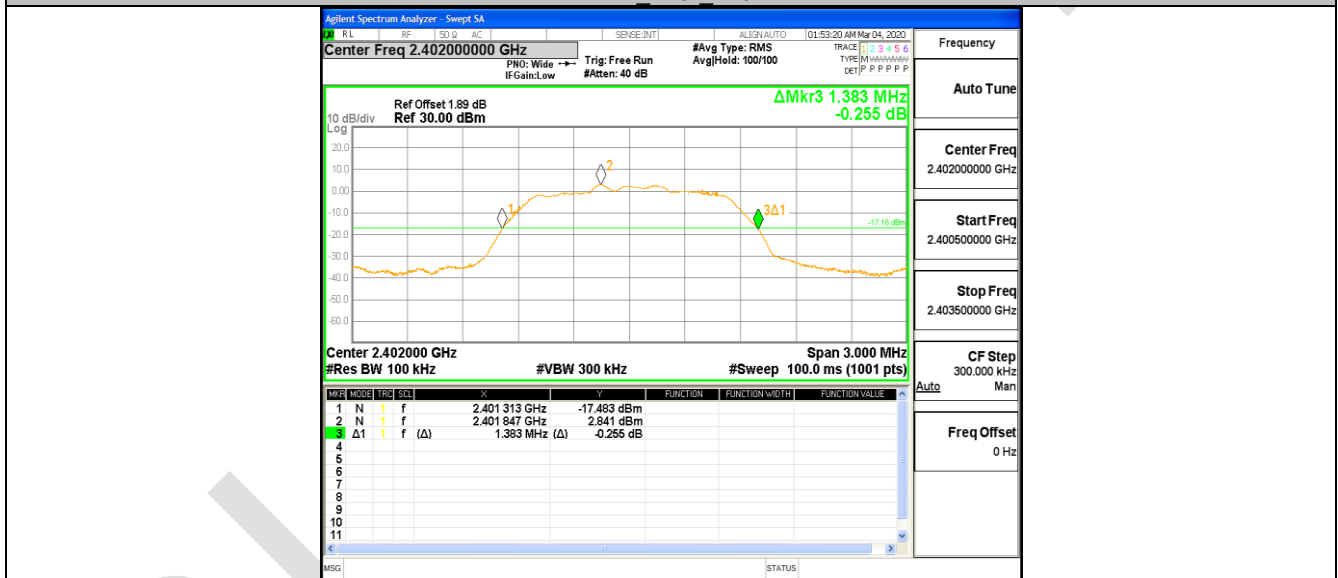
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.119	2401.448	2402.567	---	PASS
		2441	1.116	2440.448	2441.564	---	PASS
		2480	1.116	2479.448	2480.564	---	PASS
2DH1	Ant1	2402	1.383	2401.313	2402.696	---	PASS
		2441	1.383	2440.313	2441.696	---	PASS
		2480	1.383	2479.313	2480.696	---	PASS

Test Graphs





2DH1_Ant1_2402



2DH1_Ant1_2441

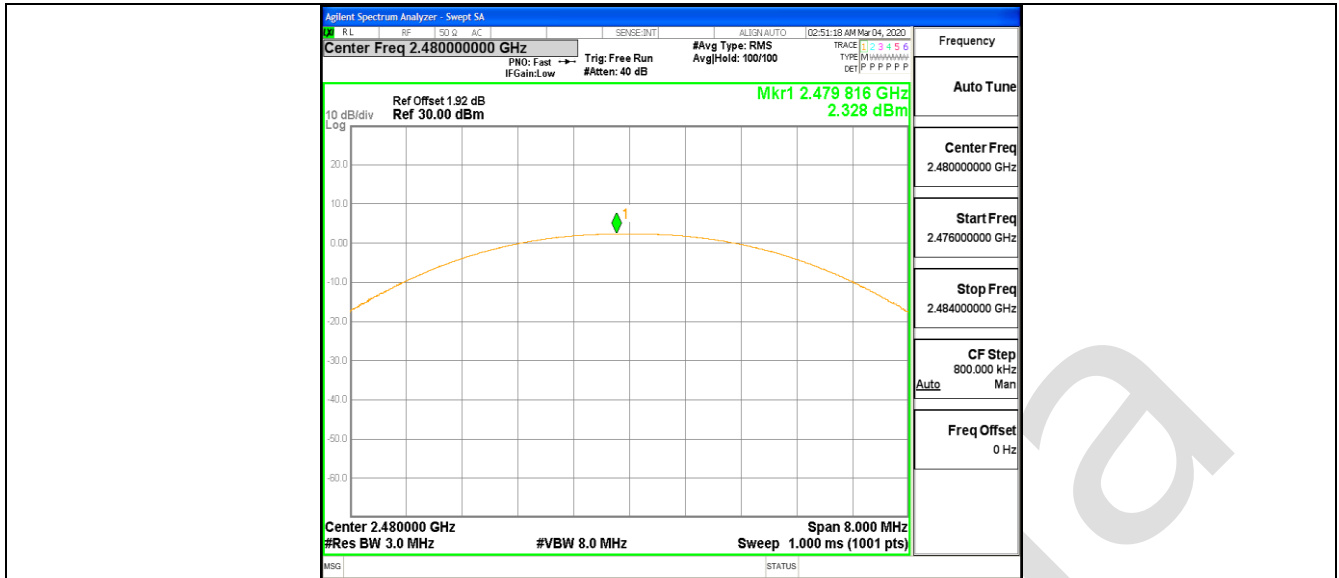


10.2 APPENDIX: MAXIMUM CONDUCTED OUTPUT POWER**Test Result**

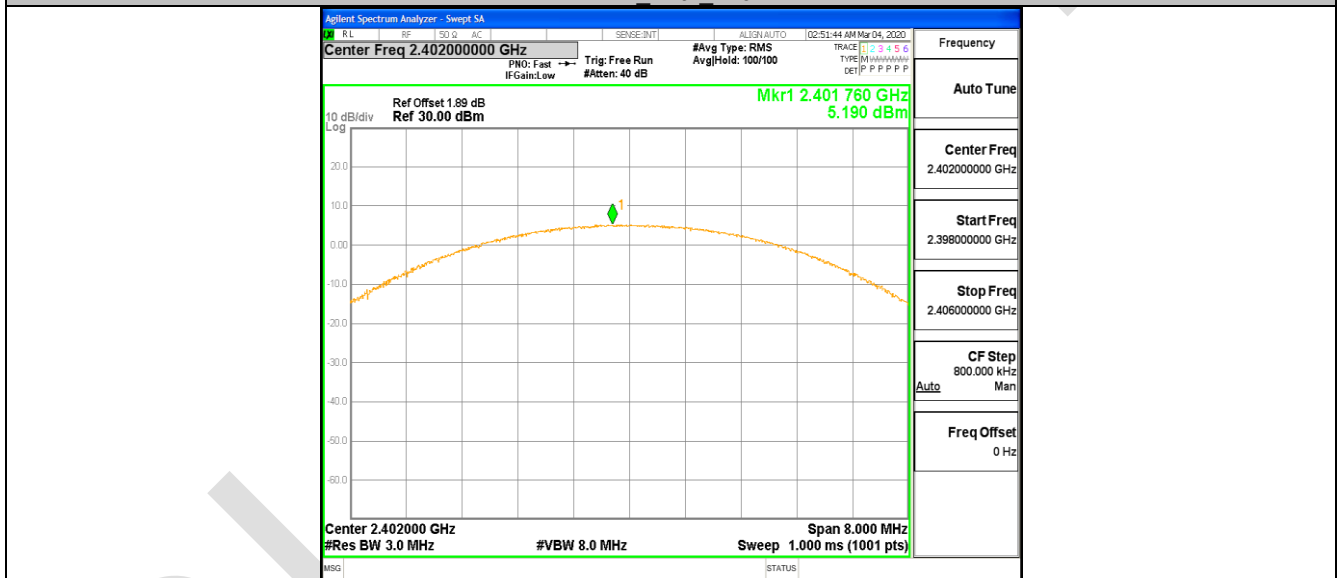
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH1	Ant1	2402	2.94	≤ 20.97	PASS
		2441	2.66	≤ 20.97	PASS
		2480	2.33	≤ 20.97	PASS
2DH1	Ant1	2402	5.19	≤ 20.97	PASS
		2441	4.97	≤ 20.97	PASS
		2480	4.67	≤ 20.97	PASS

Test Graphs

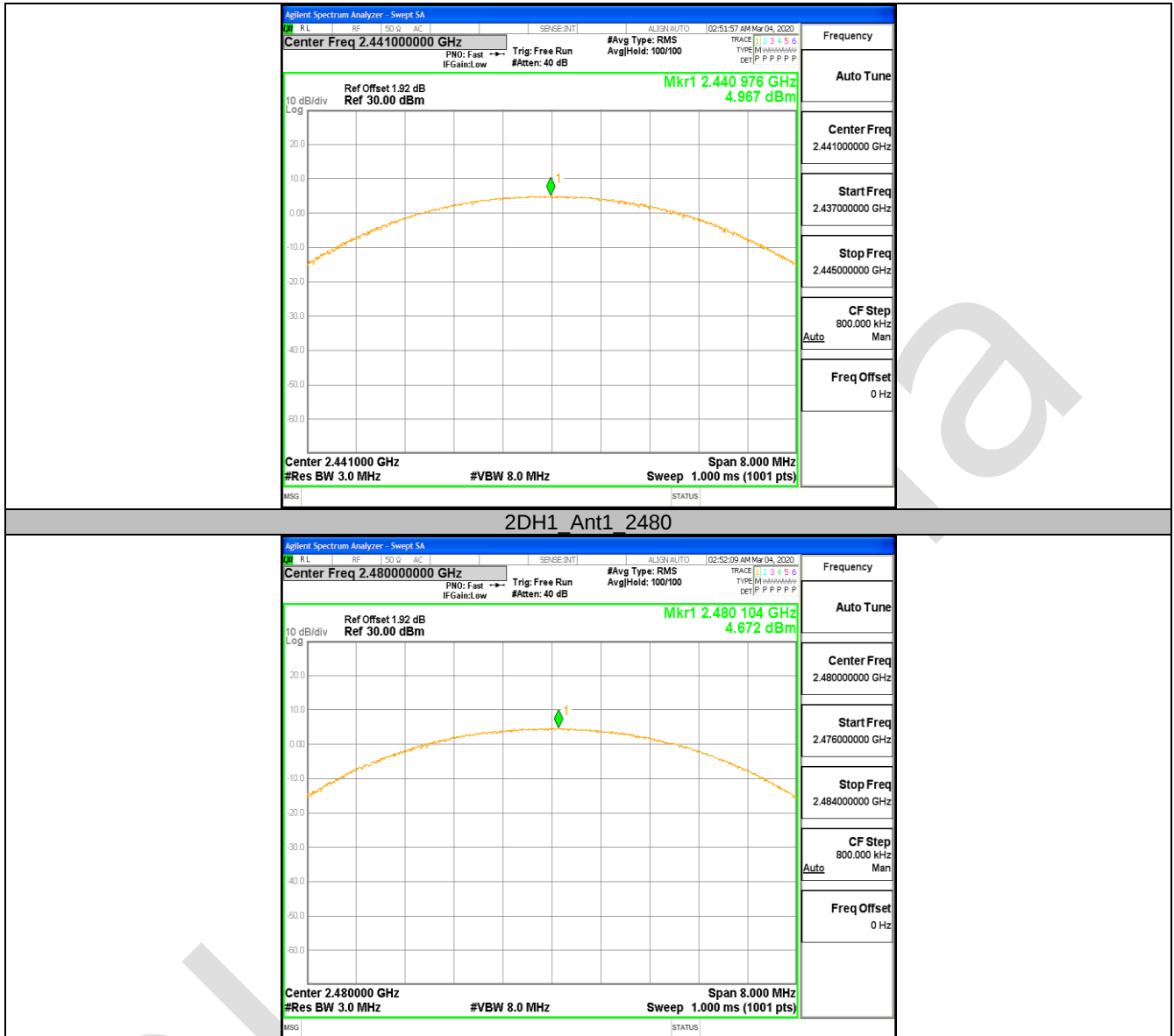




2DH1_Ant1_2402



2DH1_Ant1_2441



10.3 APPENDIX: CARRIER FREQUENCY SEPARATION

Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	0.994	≥ 0.746	PASS
2DH1	Ant1	Hop	0.99	≥ 0.922	PASS

Test Graphs



10.4 APPENDIX: TIME OF OCCUPANCY

Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.39	320	0.124	≤ 0.4	PASS
DH3	Ant1	Hop	1.64	140	0.23	≤ 0.4	PASS
DH5	Ant1	Hop	2.89	70	0.203	≤ 0.4	PASS

Test Graphs

