FCC RADIO TEST REPORT

FCC ID	:	**PY7-47198F**
Equipment	:	**GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS, FM Receiver and NFC**
Brand Name	:	**SONY**
Applicant	:	**Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0076 Japan**
Manufacturer	:	**Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0076 Japan**
Standard	:	**FCC Part 15 Subpart E §15.407**
Test Date(s)	:	**Nov. 24, 2021**

We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Jason Jia

Reviewed by: Jason Jia / Supervisor

Alex wang

Approved by: Alex Wang / Manager

ACCREDITED
Cert #5145.02

Sporton International (Kunshan) Inc.

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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History of this test report

Report No.	Version	Description	Issued Date
FR1O1907E	01	Initial issue of report	Dec. 28, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	26dB Bandwidth	–	See Note
-	2.1049	99% Occupied Bandwidth	–	See Note
4.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	–	See Note
4.2	15.407(b)	Unwanted Emissions	Pass	Under limit 3.13 dB at 5453.84 MHz
-	15.207	AC Conducted Emission	–	See Note
-	15.407(c)	Automatically Discontinue Transmission	–	See Note
4.3	15.203 15.407(a)	Antenna Requirement	Pass	-

Note: Refer to information of Section 3 Spot Check Evaluation.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n/ac, NFC, FM Receiver and GNSS.

Product Specification subjective to this standard	
Antenna Type / Gain	**<5150 MHz ~ 5250 MHz>** PIFA Antenna with gain -1.40 dBi **<5250 MHz ~ 5350 MHz>** PIFA Antenna with gain -1.20 dBi **<5470 MHz ~ 5725 MHz>** PIFA Antenna with gain -1.00 dBi

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-KS 03CH05-KS	CN1257	314309

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find Y plane as worst plane.

2.1 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11ac VHT80	MCS0

2.2 Connection Diagram of Test System

2.3 EUT Operation Test Setup

The RF test items, utility “FTM” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

3 Spot Check Evaluation

3.1 Introduction Section

Sony Corporation, hereby declares that the WLAN and Bluetooth hardware of PY7-47198F (this model) are HW identical to PY7-15465A (lead). In addition, PY7-47198F (this model) digital circuit is identical to PY7-15465A (lead). Therefore the following report of PY7-15465A (lead) may be used as reference test data for PY7-47198F (this model), along with the spot check verification data following the FCC KDB 484596 D01 v01, and takes full responsibility that the test data as referenced in this report represent compliance for the new FCC ID PY7-47198F.

3.2 Difference Section

Difference between PY7-15465A (lead) and PY7-47198F (this model):
Sony Corporation, hereby declares the differences between PY7-15465A (lead) and PY7-47198F (this model) are related only to the cellular part. Therefore the WLAN and Bluetooth report/data of PY7-15465A (lead) may represent for PY7-47198F (this model).

3.3 Spot Check Verification Data Section

Conducted power test and radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing and the verification test results similar to the original FCC ID. All tests meet FCC technical limits. Detail spot check test result can be found in the variant model report, please refer to the detail section table in section 3.4.

Summary of the spot check:

Test Item	Mode	PY7-15465A Worst Result	PY7-47198F Worst Result	Difference (dB)
Average Conducted Power (dBm)	WLAN 5GHz	13.18	13.07	0.11
Radiated Spurious Emission (dBuV/m) @ 3m	WLAN 5GHz	50.22	50.87	0.65

3.4 Reference detail Section

Rule Part	Equipment Class	Wireless Technology	Frequency Band (MHz)	Original FCC ID	Original Report	Variant Model FCC ID	Variant Model Report
15E	U-NII-1	Wi-Fi	5150~5250	PY7-15465A	Part 15E (FR1O1906E)	PY7-47198F	Part 15E (FR1O1907E)
15E	U-NII-2A	Wi-Fi	5250~5350	PY7-15465A	Part 15E (FR1O1906E)	PY7-47198F	Part 15E (FR1O1907E)
15E	U-NII-2C	Wi-Fi	5470~5725	PY7-15465A	Part 15E (FR1O1906E)	PY7-47198F	Part 15E (FR1O1907E)

4 Test Result

4.1 Maximum Conducted Output Power Measurement

4.1.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For the 5.15–5.25 GHz bands:

■ For mobile and portable 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. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the 5.25–5.725 GHz bands:

■ The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

4.1.2 Measuring Instruments

See list of measuring equipment of this test report.

4.1.3 Test Procedures

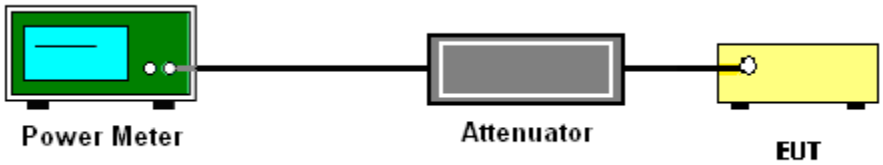
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

4.1.4 Test Setup



4.1.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

4.2 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

4.2.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table:

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

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

(3) KDB789033 D02 v02r01 G)2)c)

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of −27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

4.2.2 Measuring Instruments

See list of measuring equipment of this test report.

4.2.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000 MHz

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

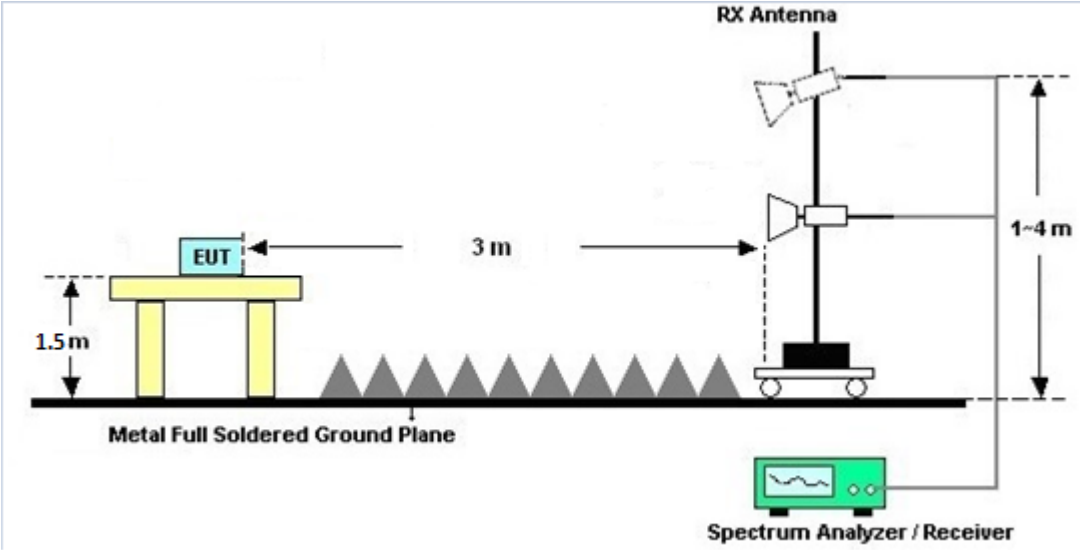
(3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

2. The EUT was placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1 GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

4.2.4 Test Setup

For radiated test from 1GHz to 18GHz



4.2.5 Test Result of Radiated Spurious Emissions

Please refer to Appendix B and C.

4.2.6 Duty Cycle

Please refer to Appendix D.

4.3 Antenna Requirements

4.3.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

4.3.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 07, 2021	Nov. 24, 2021	Jan. 06, 2022	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 07, 2021	Nov. 24, 2021	Jan. 06, 2022	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr.13, 2021	Nov. 24, 2021	Apr. 12, 2022	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 24, 2021	Nov. 24, 2021	Apr. 23, 2022	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 06, 2021	Nov. 24, 2021	Jan. 05, 2022	Radiation (03CH05-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2012228	1Ghz-18Ghz	Oct. 16, 2021	Nov. 24, 2021	Oct. 15, 2022	Radiation (03CH05-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 07, 2021	Nov. 24, 2021	Jan. 06, 2022	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 24, 2021	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 24, 2021	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 24, 2021	NCR	Radiation (03CH05-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jack Fan	Temperature:	21~25	°C
Test Date:	2021/11/24	Relative Humidity:	51~54	%

Report Number : FR1O1907E

TEST RESULTS DATA
Average Power Table

FCC U-NII-1										
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	-	12.73	24.00	-1.40		Pass
11a	6Mbps	1	44	5220	-	12.14	24.00	-1.40		Pass
11a	6Mbps	1	48	5240	-	12.16	24.00	-1.40		Pass
HT20	MCS0	1	36	5180	-	12.61	24.00	-1.40		Pass
HT20	MCS0	1	44	5220	-	12.15	24.00	-1.40		Pass
HT20	MCS0	1	48	5240	-	12.20	24.00	-1.40		Pass
HT40	MCS0	1	38	5190	0.15	13.06	24.00	-1.40		Pass
HT40	MCS0	1	46	5230	0.15	12.55	24.00	-1.40		Pass
VHT20	MCS0	1	36	5180	0.09	12.60	24.00	-1.40		Pass
VHT20	MCS0	1	44	5220	0.09	12.17	24.00	-1.40		Pass
VHT20	MCS0	1	48	5240	0.09	12.24	24.00	-1.40		Pass
VHT40	MCS0	1	38	5190	0.16	13.03	24.00	-1.40		Pass
VHT40	MCS0	1	46	5230	0.16	12.48	24.00	-1.40		Pass
VHT80	MCS0	1	42	5210	0.31	11.93	24.00	-1.40		Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A										
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	52	5260	-	12.18	23.98	-1.20	26.99	Pass
11a	6M bps	1	60	5300	-	12.15	23.98	-1.20	26.99	Pass
11a	6M bps	1	64	5320	-	12.22	23.98	-1.20	26.99	Pass
HT20	MCS 0	1	52	5260	-	12.14	23.98	-1.20	26.99	Pass
HT20	MCS 0	1	60	5300	-	12.04	23.98	-1.20	26.99	Pass
HT20	MCS 0	1	64	5320	-	12.11	23.98	-1.20	26.99	Pass
HT40	MCS 0	1	54	5270	0.15	12.49	23.98	-1.20	26.99	Pass
HT40	MCS 0	1	62	5310	0.15	12.57	23.98	-1.20	26.99	Pass
VHT20	MCS 0	1	52	5260	0.09	12.25	23.98	-1.20	26.99	Pass
VHT20	MCS 0	1	60	5300	0.09	12.18	23.98	-1.20	26.99	Pass
VHT20	MCS 0	1	64	5320	0.09	12.14	23.98	-1.20	26.99	Pass
VHT40	MCS 0	1	54	5270	0.16	12.40	23.98	-1.20	26.99	Pass
VHT40	MCS 0	1	62	5310	0.16	12.04	23.98	-1.20	26.99	Pass
VHT80	MCS 0	1	58	5290	0.31	11.91	23.98	-1.20	26.99	Pass

Report Number : FR1O1907E

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	100	5500	-	12.05	23.98	-1.00	26.99	Pass
11a	6M bps	1	116	5580	-	12.36	23.98	-1.00	26.99	Pass
11a	6M bps	1	140	5700	-	12.47	23.98	-1.00	26.99	Pass
11a	6Mbps	1	144	5720	-	12.38	23.98	-1.00	26.99	Pass
HT20	MCS 0	1	100	5500	-	12.06	23.98	-1.00	26.99	Pass
HT20	MCS 0	1	116	5580	-	12.38	23.98	-1.00	26.99	Pass
HT20	MCS 0	1	140	5700	-	12.36	23.98	-1.00	26.99	Pass
HT20	MCS0	1	144	5720	-	12.31	23.98	-1.00	26.99	Pass
HT40	MCS 0	1	102	5510	0.15	12.39	23.98	-1.00	26.99	Pass
HT40	MCS 0	1	110	5550	0.15	12.76	23.98	-1.00	26.99	Pass
HT40	MCS 0	1	134	5670	0.15	13.07	23.98	-1.00	26.99	Pass
HT40	MCS0	1	142	5710	0.15	12.80	23.98	-1.00	26.99	Pass
VHT20	MCS 0	1	100	5500	0.09	12.04	23.98	-1.00	26.99	Pass
VHT20	MCS 0	1	116	5580	0.09	12.55	23.98	-1.00	26.99	Pass
VHT20	MCS 0	1	140	5700	0.09	12.57	23.98	-1.00	26.99	Pass
VHT20	MCS0	1	144	5720	0.09	12.40	23.98	-1.00	26.99	Pass
VHT40	MCS 0	1	102	5510	0.16	12.52	23.98	-1.00	26.99	Pass
VHT40	MCS 0	1	110	5550	0.16	12.41	23.98	-1.00	26.99	Pass
VHT40	MCS 0	1	134	5670	0.16	12.94	23.98	-1.00	26.99	Pass
VHT40	MCS0	1	142	5710	0.16	12.78	23.98	-1.00	26.99	Pass
VHT80	MCS 0	1	106	5530	0.31	12.19	23.98	-1.00	26.99	Pass
VHT80	MCS 0	1	122	5610	0.31	12.36	23.98	-1.00	26.99	Pass
VHT80	MCS0	1	138	5690	0.31	12.42	23.98	-1.00	26.99	Pass

Appendix B. Radiated Spurious Emission

Test Engineer :	Henzy Li	Temperature :	27~30°C
		Relative Humidity :	55~60%

Band U-NII-2C - 5470~5725MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 106 5530MHz		5459.28	60.14	-13.86	74	46.14	35.32	11.91	33.23	200	318	P	H
		5469.68	60.71	-7.59	68.3	46.67	35.34	11.93	33.23	200	318	P	H
		5453.84	50.87	-3.13	54	36.87	35.32	11.91	33.23	200	318	A	H
		5524	98.87	-	-	84.53	35.39	11.97	33.02	200	318	P	H
		5524	90.97	-	-	76.63	35.39	11.97	33.02	200	318	A	H
		5737	55.96	-12.34	68.3	40.98	35.68	12.16	32.86	200	318	P	H
		5442	56.1	-17.9	74	42.23	35.31	11.89	33.33	231	265	P	V
		5464.24	57.49	-10.81	68.3	43.45	35.34	11.93	33.23	231	265	P	V
		5453.68	48.3	-5.7	54	34.3	35.32	11.91	33.23	231	265	A	V
		5536	93.96	-	-	79.49	35.4	11.99	32.92	231	265	P	V
		5536	86.05	-	-	71.58	35.4	11.99	32.92	231	265	A	V
		5759.8	56.38	-11.92	68.3	41.45	35.72	12.18	32.97	231	265	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band U-NII-2C - 5470~5725MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 106 5530MHz		11059.05	44.22	-29.78	74	48.75	38.55	17.45	60.53	100	360	P	H
		11059.05	44.55	-29.45	74	49.08	38.55	17.45	60.53	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

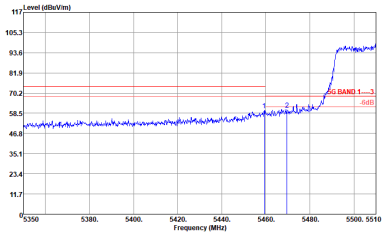
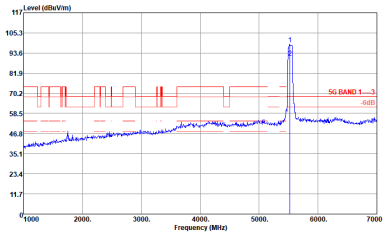
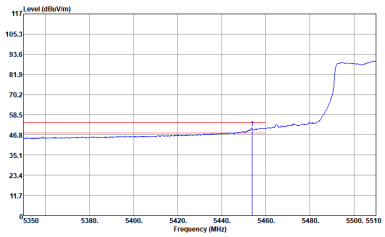
Both peak and average measured complies with the limit line, so test result is “PASS”.

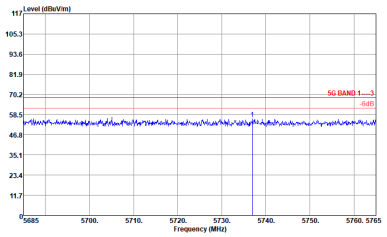
Appendix C. Radiated Spurious Emission

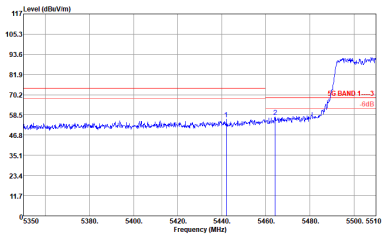
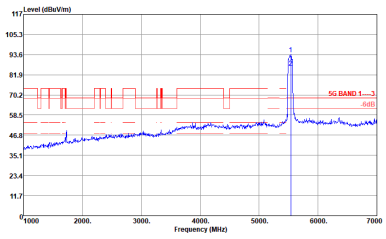
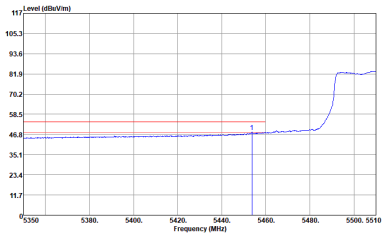
Test Engineer :	Henzy Li	**Temperature :**	27~30°C
		Relative Humidity :	55~60%

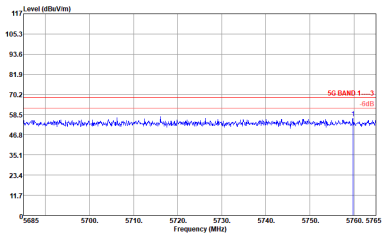
UNII 2C - 5470~5725MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	UNII 2C 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 5459.28 60.14 -13.86 74.00 46.14 35.32 11.91 33.23 200 318 Peak HORIZONT 2 5469.68 60.71 -7.59 68.30 46.67 35.34 11.93 33.23 200 318 Peak HORIZONT	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 * 5524.00 98.87 30.57 68.30 84.53 35.39 11.97 33.02 200 318 Peak HORIZONT 2 5524.00 90.97 ------ ------ 76.63 35.39 11.97 33.02 200 318 Average HORIZONT
Avg.	 Site : 03CH05-KS Condition : 5G BAND 1----3 (AVG) 3m 3117 00218652 HORIZONTAL : RBW:1000.000KHz VBW:2.200KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 ! 5453.84 50.87 -3.13 54.00 36.87 35.32 11.91 33.23 200 318 Average HORIZONT	Left blank

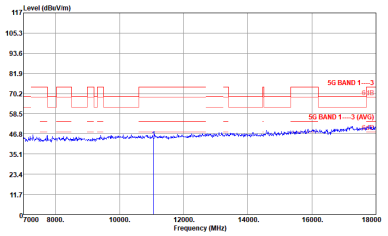
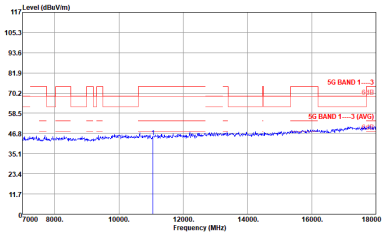
WIFI	UNII 2C 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level factor Cable Loss Preamp factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 5737.00 55.96 -12.34 68.30 40.98 35.68 12.16 32.86 200 318 Peak HORIZONT	Left blank

WIFI	UNII 2C 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 5442.00 56.10 -17.90 74.00 42.23 35.31 11.89 33.33 231 265 Peak VERTICAL 2 5464.24 57.49 -10.81 68.30 43.45 35.54 11.93 33.23 231 265 Peak VERTICAL	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 * 5536.00 93.96 25.66 68.30 79.49 35.40 11.99 32.92 231 265 Peak VERTICAL 2 5536.00 86.85 ------ ------ 71.58 35.40 11.99 32.92 231 265 Average VERTICAL
Avg.	 Site : 03CH05-KS Condition : 5G BAND 1----3 (AVG) 3m 3117 00218652 VERTICAL : RBW:1000.000KHz VBW:2.200KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level Factor Cable Loss Preamp Factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 ! 5453.68 48.30 -5.70 54.00 34.30 35.32 11.91 33.23 231 265 Average VERTICAL	Left blank

WIFI	UNII 2C 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Freq Level Over Limit Limit Line ReadAntenna Level factor Cable Loss Preamp factor A/Pos T/Pos Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 5759.80 56.38 -11.92 68.30 41.45 35.72 12.18 32.97 231 265 Peak VERTICAL	Left blank

UNII 2C - 5470~5725MHz

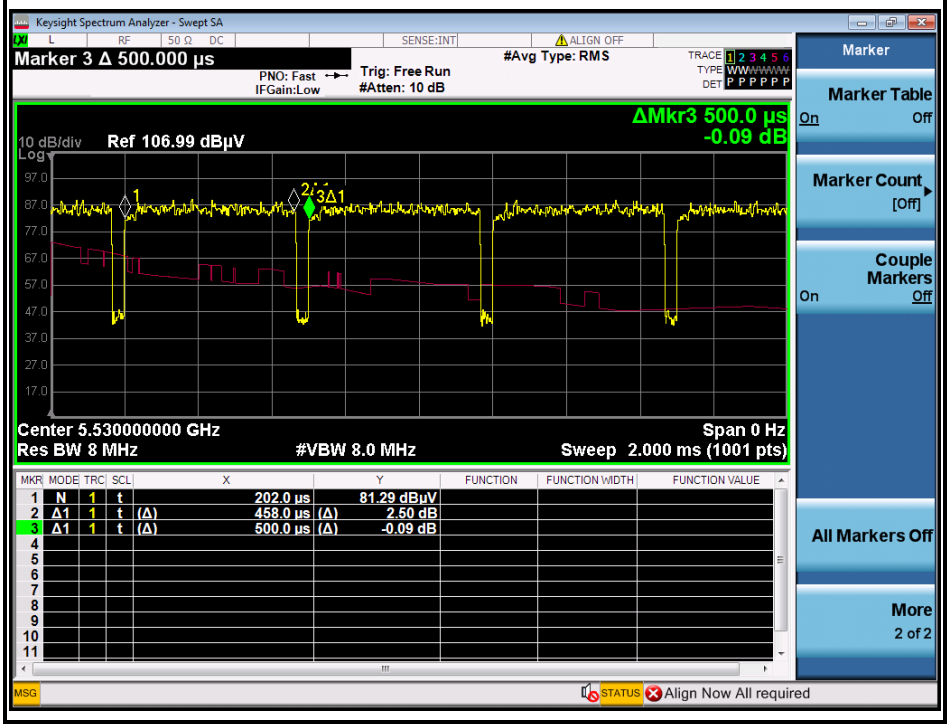
WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	UNII 2C 5470~5725MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Over Limit Limit ReadAntenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 11059.05 44.22 -29.78 74.00 48.75 38.55 17.45 60.53 100 360 Peak HORIZONT	 Site : 03CH05-KS Condition : 5G BAND 1----3 3m 3117 00218652 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Over Limit Limit ReadAntenna Cable Preamp A/Pos T/Pos Freq Level Limit Line Level Factor Loss Factor Remark Pol/Phas MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg 1 11059.05 44.55 -29.45 74.00 49.08 38.55 17.45 60.53 100 360 Peak VERTICAL

Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
WLAN 5GHz 802.11ac VHT80	91.60	0.458	2.183	2.2kHz

802.11ac VHT80-DVT1



———THE END———