FCC RF Test Report

FCC ID	**:**	**2AD9M-003A**
EQUIPMENT	**:**	**Smartphone**
BRAND NAME	**:**	**LEOMO**
MODEL NAME	**:**	**LEM-TS1**
MARKETING NAME	**:**	**LEOMO TYPE-S**
APPLICANT	**:**	**LEOMO, Inc.** **7-22-17 Nishi Gotanda TOC Bldg. 7F** **Shinagawa-ku,Tokyo, 1410031, Japan**
MANUFACTURER	**:**	**LEOMO, Inc.** **2000 Central Avenue, Suite 150, Boulder CO 80301, USA**
STANDARD	**:**	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	**:**	**(NII) Unlicensed National Information Infrastructure**

The product was received on Apr. 24, 2019 and testing was completed on Jun. 05, 2019. 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.

This report contains data that were produced under subcontract by SPORTON INTERNATIONAL INC.

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

James Huang

Approved by: James Huang / 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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR942441F	Rev. 01	Initial issue of report	Jun. 21, 2019
FR942441F	Rev. 02	Update the address of Appilicant.	Jul. 15, 2019

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 12.89 dB at 177.440 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 7.20 dB at 0.7755 MHz
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

LEOMO, Inc.
7-22-17 Nishi Gotanda TOC Bldg. 7F Shinagawa-ku,Tokyo, 1410031, Japan

1.2 Manufacturer

LEOMO, Inc.
2000 Central Avenue, Suite 150, Boulder CO 80301, USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Brand Name	LEOMO
Model Name	LEM-TS1
FCC ID	2AD9M-003A
EUT supports Radios application	GSM/WCDMA/LTE WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth BR/EDR/LE/ANT+ NFC and GNSS
IMEI Code	Conducted: N/A Radiation: 355681100008745/355681100008700 Conduction: 355681100008836
HW Version	DVT
SW Version	000T_1_020
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	**<5745 MHz ~ 5825 MHz>** 802.11a : 12.90 dBm / 0.0195 W 802.11n HT20 : 10.90 dBm / 0.0123 W 802.11n HT40 : 10.90 dBm / 0.0123 W
99% Occupied Bandwidth	802.11a : 17.20 MHz 802.11n HT20 : 18.05 MHz 802.11n HT40 : 36.70 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
Antenna Type / Gain	Loop Antenna with gain 1.17 dBi

1.5 Modification of EUT

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

1.6 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.**
	03CH05-KS	CN1257	314309

SPORTON INTERNATIONAL INC. is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and under the FCC-recognized accredited testing laboratories by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist. Taoyuan City Taiwan Tel: 886-3-327-3456 FAX: +886-3-327-0978		
Test Site No.	**Sporton Site No.**	**FCC designation No.**	**FCC Test Firm Registration No.**
	TH05-HY CO05-HY	TW1190	553509

Test data subcontracted: All test item of this report except Radiated Spurious Emission.

1.7 Applicable Standards

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

- 47 CFR Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules 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: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80.

2.2 Test Mode

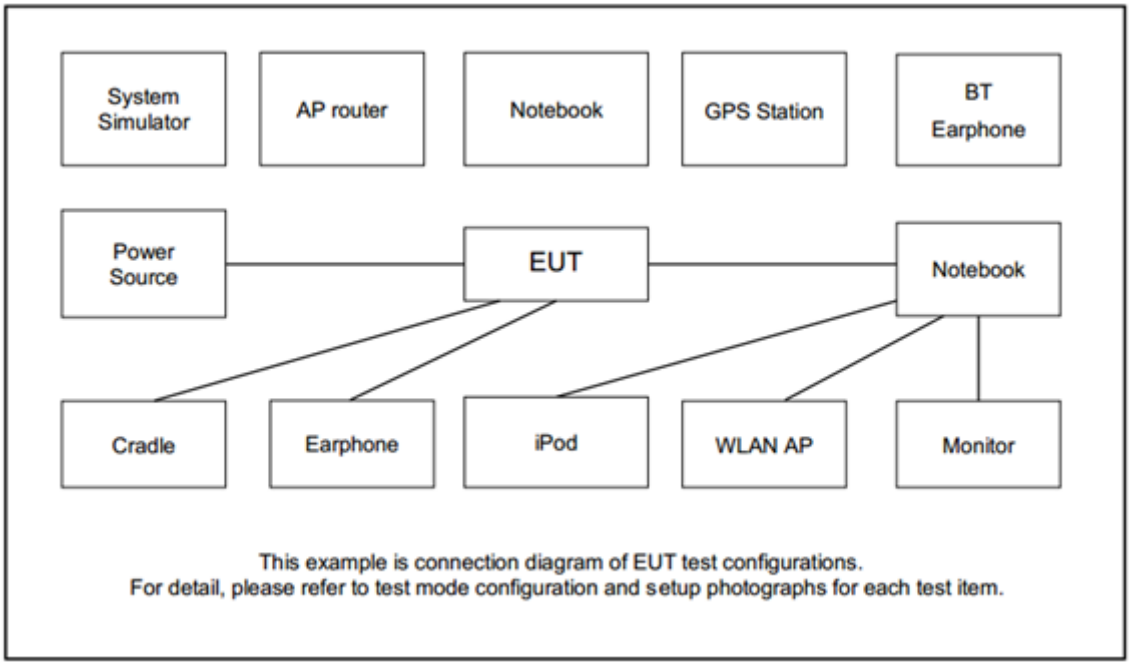
Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

AC Conducted Emission	Mode 1 : LTE Band 17 Idle + Bluetooth Link + WLAN (5G)Link + ANT+Link + Power Bank + USB Cable + Adapter

Ch. #		Band IV：5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded,1.8m
3.	Bluetooth Earphone	SonyErricsson	MW600	PY700A2029	N/A	N/A
4.	WLAN AP	ASUS	RT-AC1750	MSQ-RTAC66U B1	N/A	Unshielded,1.8m
5.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	iPod	Apple	A1285	DoC	Shielded, 1.0m	N/A
7.	Adapter	Nokia	AS-10WU	N/A	N/A	N/A
8.	USB Cable	Nokia	N/A	N/A	Shielded, 1m	N/A
9.	ANT Plus	FIH	N/A	N/A	N/A	N/A
10.	Power Bank	LEOMO	LEM-PM1	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuously transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 3.5 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 3.5 + 10 = 13.5 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

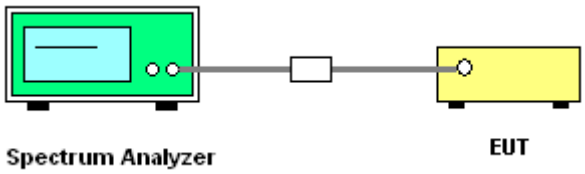
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

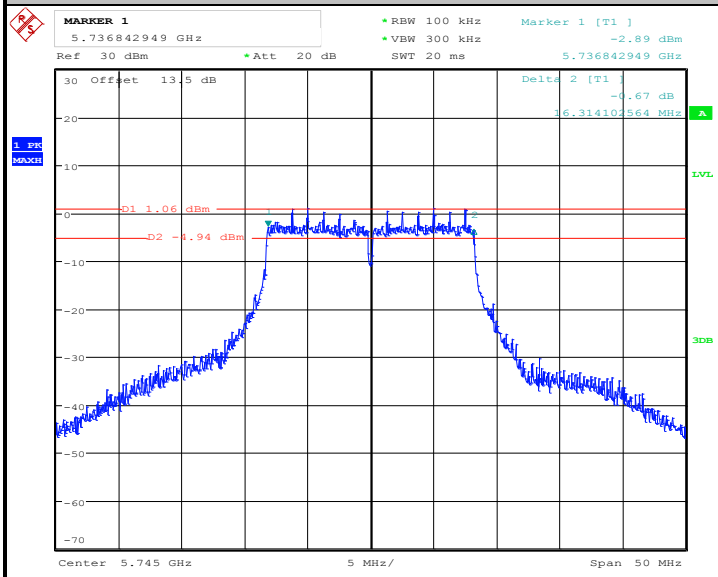
3.1.4 Test Setup



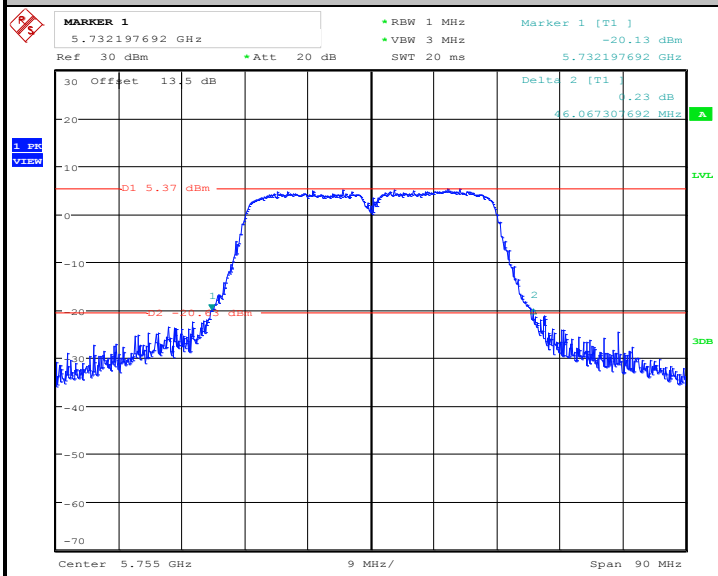
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

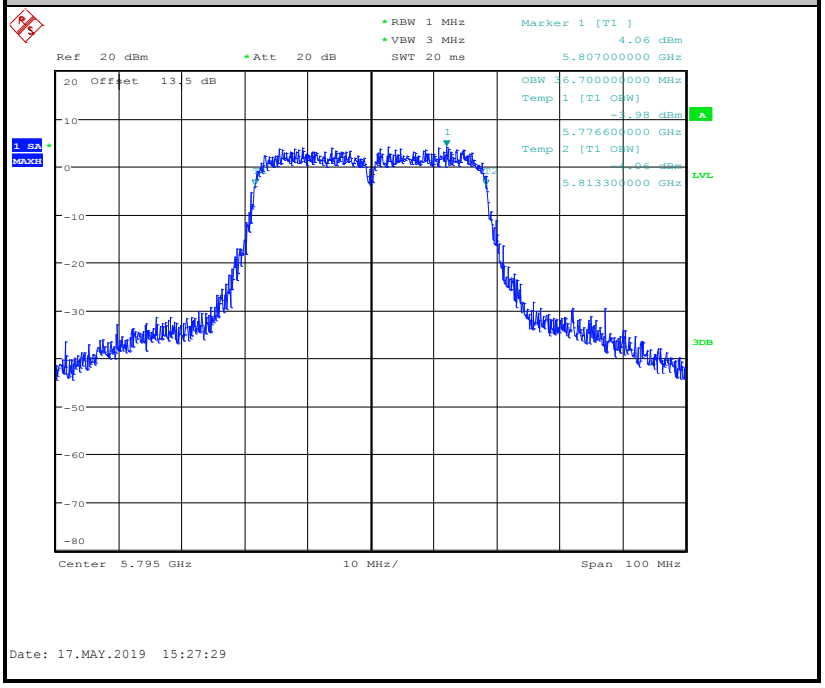
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



Maximum 99% Occupied Bandwidth



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

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 peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

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

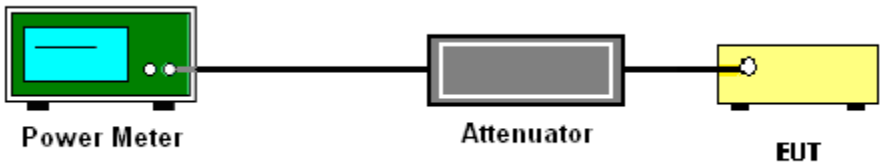
3.2.3 Test Procedures

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.
4.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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 peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

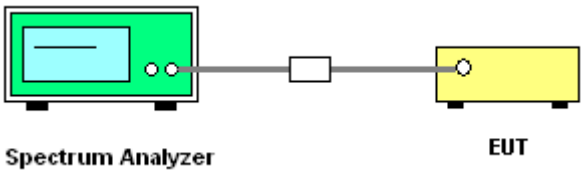
 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(500kHz/RBW) to the test result.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

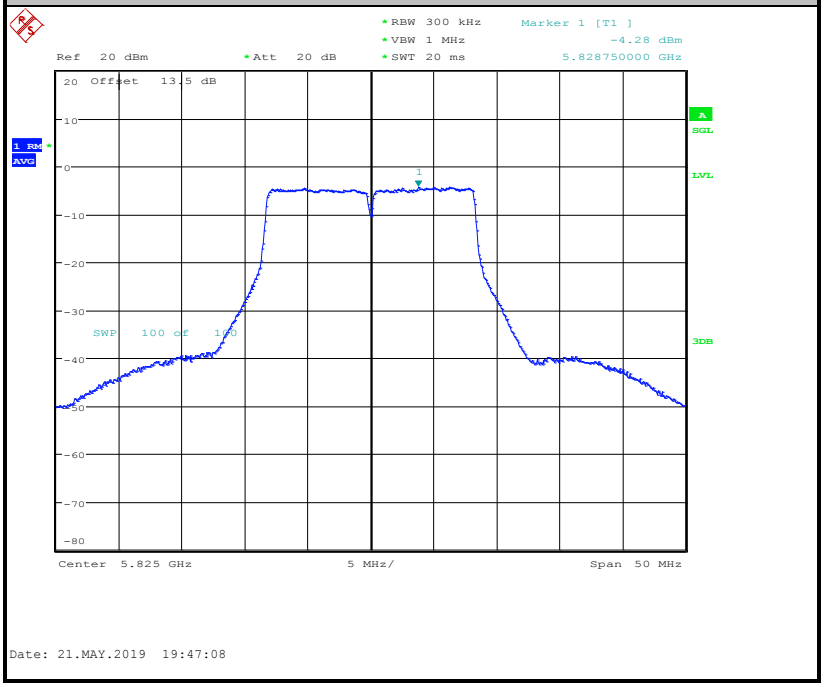
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/MHz)



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(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.

(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

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.2

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

$$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

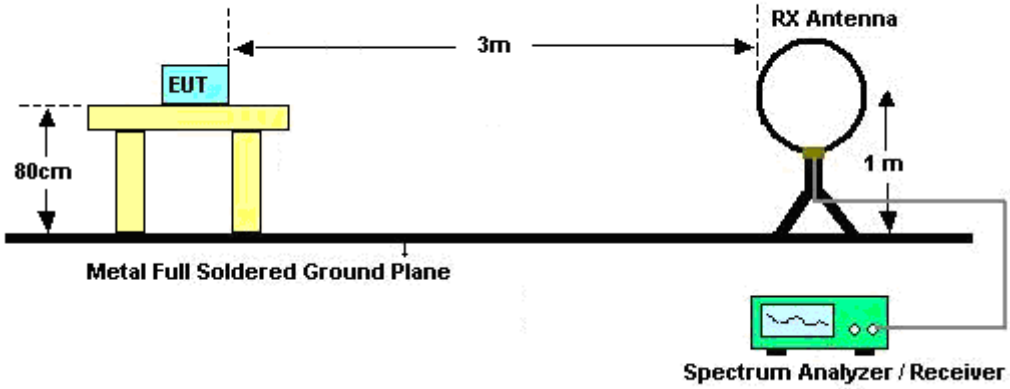
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (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

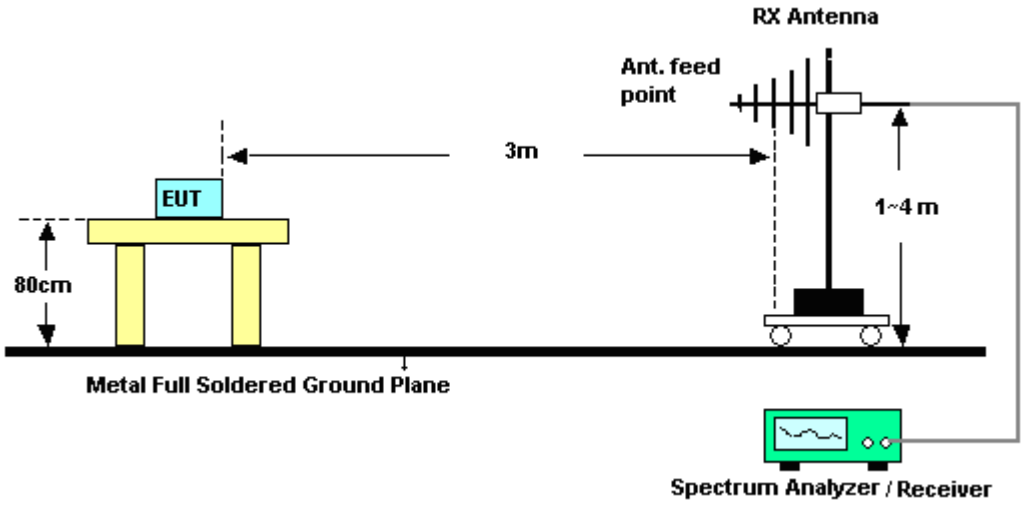
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting 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 1GHz and 1.5 meter for frequency above 1GHz 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 1GHz, 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 1GHz, the emission level of the EUT in peak mode was 20dB 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.

3.4.4 Test Setup

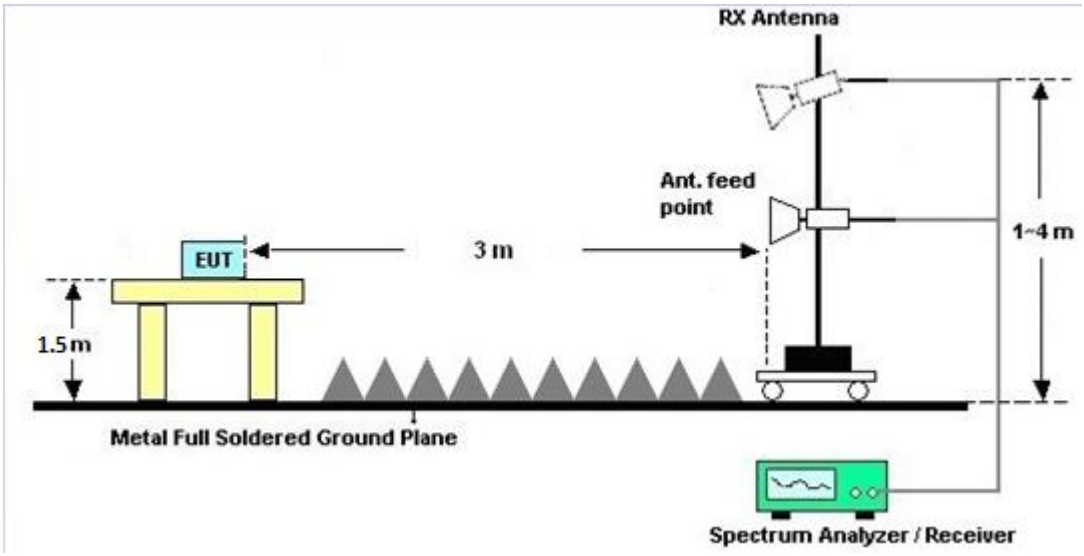
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

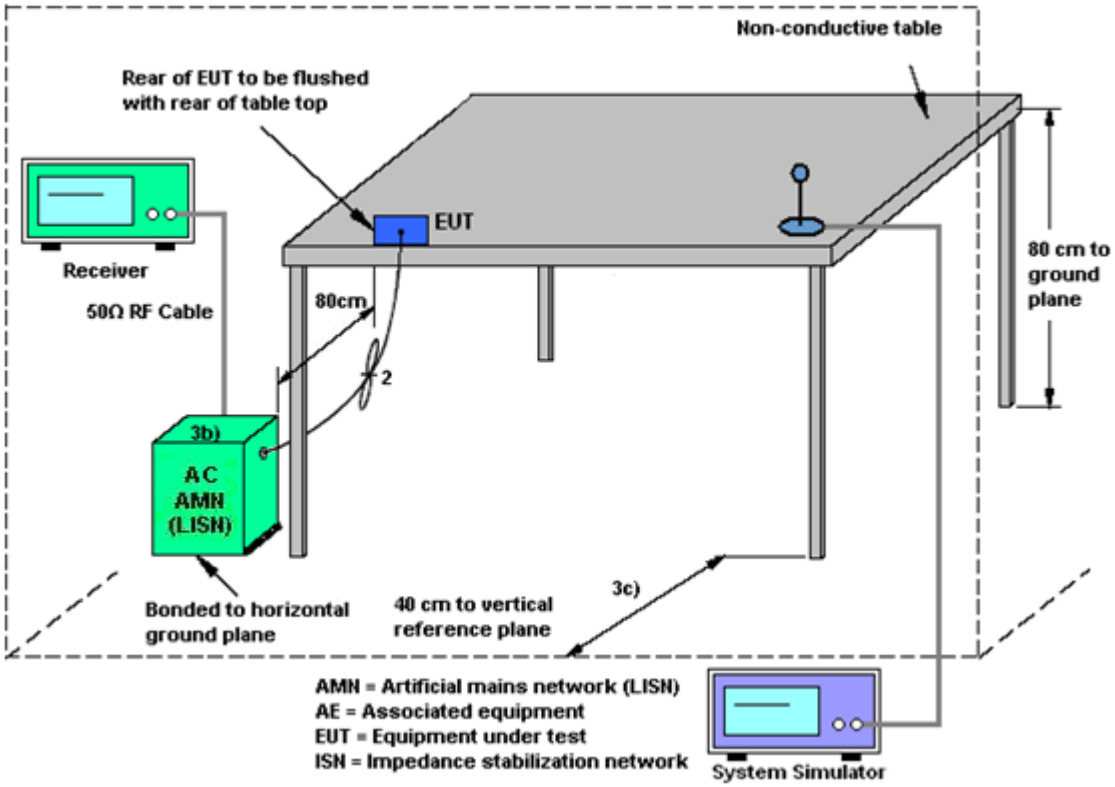
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.6.2 Measuring Instruments

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

3.6.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 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.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	DTM-303A	TP157075	N/A	Nov. 05, 2018	May 17, 2019~ May 21, 2019	Nov. 04, 2019	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	13I00030SNO32	9kHz~6GHz	Dec. 03, 2018	May 17, 2019~ May 21, 2019	Dec. 02, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 21, 2018	May 17, 2019~ May 21, 2019	Nov. 20, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV 30	100895	9kHz~30GHz	Apr. 20, 2018	May 17, 2019~ May 21, 2019	Apr. 19, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1208382	N/A	Mar. 27, 2019	May 17, 2019~ May 21, 2019	Mar. 26, 2020	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 02, 2018	May 17, 2019~ May 21, 2019	Oct. 01, 2019	Conducted (TH05-HY)
EMI Test Receiver	Keysight	N9038A	MY57290151	3Hz~8.5GHz;Max 30dBm	Jun. 25, 2018	Jun. 05, 2019	Jun. 24, 2019	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44GHz	Oct. 09, 2018	Jun. 05, 2019	Oct. 08, 2019	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 19, 2018	Jun. 05, 2019	Oct. 18, 2019	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Dec. 28, 2018	Jun. 05, 2019	Dec. 27, 2019	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 27, 2019	Jun. 05, 2019	Jan. 26, 2020	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2019	Jun. 05, 2019	Jan. 04, 2020	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Aug. 06.2018	Jun. 05, 2019	Aug. 05, 2019	Radiation (03CH05-KS)
Amplifier	MITEQ	TTA1840-35-HG	2014749	18~40GHz	Jan. 14, 2019	Jun. 05, 2019	Jan. 13, 2020	Radiation (03CH05-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Aug. 17, 2018	Jun. 05, 2019	Aug. 16, 2019	Radiation (03CH05-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Dec. 22, 2018	Jun. 05, 2019	Dec. 21, 2019	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jun. 05, 2019	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jun. 05, 2019	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jun. 05, 2019	NCR	Radiation (03CH05-KS)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	May. 28, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9KHz~3.6GHz	Nov. 12, 2018	May. 28, 2019	Nov. 11, 2019	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Mar. 19, 2019	May. 28, 2019	Mar. 18, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 14, 2018	May. 28, 2019	Nov. 13, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 09, 2018	May. 28, 2019	Nov. 08, 2019	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May. 28, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	May. 28, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	May. 28, 2019	Dec. 30, 2019	Conduction (CO05-HY)

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.7 dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

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

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

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

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

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

Appendix A. Conducted Test Results

Report Number : FR942441F

Test Engineer:	Howard Lin	Temperature:	21~25	°C
Test Date:	2019/5/17~2019/05/21	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	1	149	5745	17.15	-	35.64	-	16.31	-	0.5	Pass
11a	6Mbps	1	157	5785	17.20	-	29.79	-	16.35	-	0.5	Pass
11a	6Mbps	1	165	5825	17.20	-	34.04	-	16.39	-	0.5	Pass
HT20	MCS0	1	149	5745	18.05	-	25.75	-	17.56	-	0.5	Pass
HT20	MCS0	1	157	5785	18.05	-	24.60	-	17.56	-	0.5	Pass
HT20	MCS0	1	165	5825	18.05	-	25.00	-	17.48	-	0.5	Pass
HT40	MCS0	1	151	5755	36.50	-	46.07	-	34.99	-	0.5	Pass
HT40	MCS0	1	159	5795	36.70	-	45.49	-	34.99	-	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	12.90	-		30.00	-	1.17	-	Pass
11a	6Mbps	1	157	5785	12.90	-		30.00	-	1.17	-	Pass
11a	6Mbps	1	165	5825	12.80	-		30.00	-	1.17	-	Pass
HT20	MCS0	1	149	5745	10.90	-		30.00	-	1.17	-	Pass
HT20	MCS0	1	157	5785	10.80	-		30.00	-	1.17	-	Pass
HT20	MCS0	1	165	5825	10.90	-		30.00	-	1.17	-	Pass
HT40	MCS0	1	151	5755	10.90	-		30.00	-	1.17	-	Pass
HT40	MCS0	1	159	5795	10.90	-		30.00	-	1.17	-	Pass

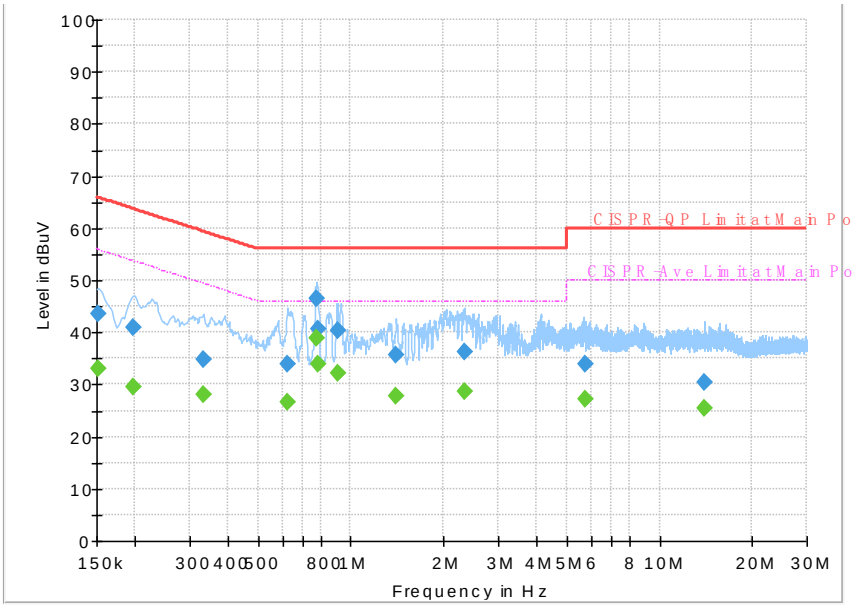
Report Number : FR942441F

TEST RESULTS DATA
Power Spectral Density

Band IV																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	0.61	-	2.22	-	-1.73	-		30.00	-	1.17	-	Pass
11a	6Mbps	1	157	5785	0.61	-	2.22	-	-1.71	-		30.00	-	1.17	-	Pass
11a	6Mbps	1	165	5825	0.61	-	2.22	-	-1.45	-		30.00	-	1.17	-	Pass
HT20	MCS0	1	149	5745	0.63	-	2.22	-	-3.97	-		30.00	-	1.17	-	Pass
HT20	MCS0	1	157	5785	0.63	-	2.22	-	-3.73	-		30.00	-	1.17	-	Pass
HT20	MCS0	1	165	5825	0.63	-	2.22	-	-4.25	-		30.00	-	1.17	-	Pass
HT40	MCS0	1	151	5755	0.65	-	2.22	-	-7.17	-		30.00	-	1.17	-	Pass
HT40	MCS0	1	159	5795	0.65	-	2.22	-	-7.21	-		30.00	-	1.17	-	Pass

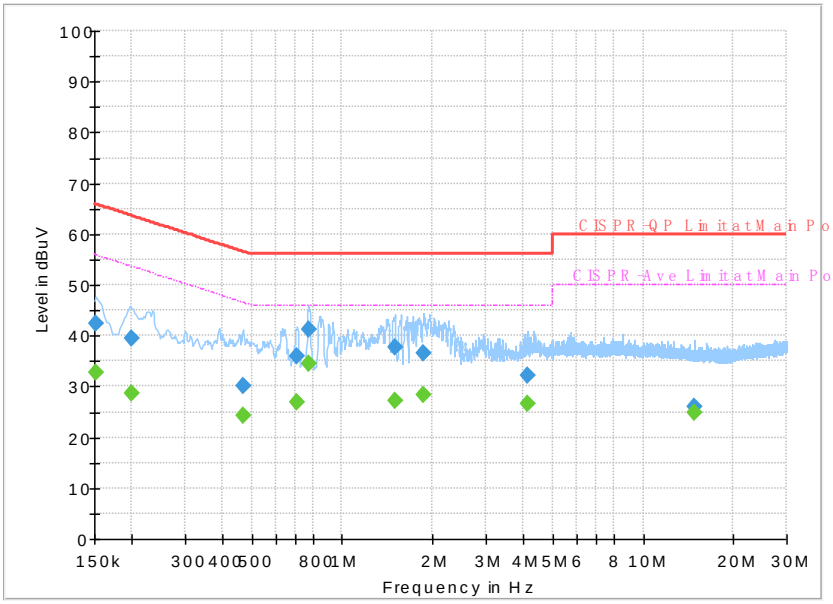
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Jimmy Chang	**Temperature :**	24~26℃
		Relative Humidity :	54~56%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	33.03	55.88	22.85	L1	OFF	19.5
0.152250	43.53	---	65.88	22.35	L1	OFF	19.5
0.197250	---	29.44	53.73	24.29	L1	OFF	19.5
0.197250	41.03	---	63.73	22.70	L1	OFF	19.5
0.332250	---	28.00	49.40	21.40	L1	OFF	19.5
0.332250	34.86	---	59.40	24.54	L1	OFF	19.5
0.620250	---	26.63	46.00	19.37	L1	OFF	19.6
0.620250	34.05	---	56.00	21.95	L1	OFF	19.6
0.775500	---	38.80	46.00	7.20	L1	OFF	19.6
0.775500	46.39	---	56.00	9.61	L1	OFF	19.6
0.784500	---	33.85	46.00	12.15	L1	OFF	19.6
0.784500	40.78	---	56.00	15.22	L1	OFF	19.6
0.903750	---	32.03	46.00	13.97	L1	OFF	19.6
0.903750	40.48	---	56.00	15.52	L1	OFF	19.6
1.398750	---	27.65	46.00	18.35	L1	OFF	19.6
1.398750	35.70	---	56.00	20.30	L1	OFF	19.6
2.334750	---	28.69	46.00	17.31	L1	OFF	19.5
2.334750	36.27	---	56.00	19.73	L1	OFF	19.5
5.741250	---	27.21	50.00	22.79	L1	OFF	19.8
5.741250	34.00	---	60.00	26.00	L1	OFF	19.8
14.023500	---	25.39	50.00	24.61	L1	OFF	20.1
14.023500	30.31	---	60.00	29.69	L1	OFF	20.1

Test Engineer :	Jimmy Chang	**Temperature :**	24~26℃
		Relative Humidity :	54~56%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Frequency	QuasiPeak	Average	Limit	Margin	Line	Filter	Corr.
0.152250	---	32.74	55.88	23.14	N	OFF	19.5
0.152250	42.32	---	65.88	23.56	N	OFF	19.5
0.199500	---	28.55	53.63	25.08	N	OFF	19.5
0.199500	39.48	---	63.63	24.15	N	OFF	19.5
0.467250	---	24.31	46.56	22.25	N	OFF	19.5
0.467250	30.26	---	56.56	26.30	N	OFF	19.5
0.710250	---	26.94	46.00	19.06	N	OFF	19.6
0.710250	35.94	---	56.00	20.06	N	OFF	19.6
0.777750	---	34.61	46.00	11.39	N	OFF	19.6
0.777750	41.19	---	56.00	14.81	N	OFF	19.6
1.493250	---	27.08	46.00	18.92	N	OFF	19.6
1.493250	37.86	---	56.00	18.14	N	OFF	19.6
1.869000	---	28.49	46.00	17.51	N	OFF	19.6
1.869000	36.69	---	56.00	19.31	N	OFF	19.6
4.110000	---	26.50	46.00	19.50	N	OFF	19.7
4.110000	32.29	---	56.00	23.71	N	OFF	19.7
14.743500	---	24.74	50.00	25.26	N	OFF	20.1
14.743500	26.14	---	60.00	33.86	N	OFF	20.1

Appendix C. Radiated Spurious Emission

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5632.8	49.16	-19.14	68.3	41.7	35.3	8.55	36.39	325	202	P	H
		5676.8	49.59	-38.58	88.17	42.15	35.27	8.58	36.41	325	202	P	H
		5716	50.33	-59.45	109.78	42.9	35.24	8.61	36.42	325	202	P	H
		5724.8	55.71	-66.13	121.84	48.31	35.22	8.61	36.43	325	202	P	H
		5742	94.72	-	-	87.31	35.21	8.64	36.44	325	202	P	H
		5742	87.56	-	-	80.15	35.21	8.64	36.44	325	202	A	H
		5642.4	49.86	-18.44	68.3	42.4	35.3	8.55	36.39	275	180	P	V
		5692	51.32	-48.08	99.4	43.91	35.25	8.58	36.42	275	180	P	V
		5719.2	55.41	-55.27	110.68	48.01	35.22	8.61	36.43	275	180	P	V
		5724.8	62.26	-59.58	121.84	54.86	35.22	8.61	36.43	275	180	P	V
		5748	100.56	-	-	93.15	35.21	8.64	36.44	275	180	P	V
		5748	93.75	-	-	86.34	35.21	8.64	36.44	275	180	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz		5820	94.46	-	-	87.09	35.13	8.72	36.48	276	34	P	H
		5820	86.98	-	-	79.61	35.13	8.72	36.48	276	34	A	H
		5850.4	51.33	-70.06	121.39	43.98	35.12	8.72	36.49	276	34	P	H
		5865.6	50.13	-57.8	107.93	42.76	35.1	8.77	36.5	276	34	P	H
		5910	49.94	-29.43	79.37	42.55	35.09	8.82	36.52	276	34	P	H
		5932.4	51.61	-16.69	68.3	44.22	35.09	8.82	36.52	276	34	P	H
		5820	100.67	-	-	93.3	35.13	8.72	36.48	199	120	P	V
		5820	93.29	-	-	85.92	35.13	8.72	36.48	199	120	A	V
		5850.4	54.83	-66.56	121.39	47.48	35.12	8.72	36.49	199	120	P	V
		5857.6	53.97	-56.2	110.17	46.6	35.1	8.77	36.5	199	120	P	V
		5877.2	51.04	-52.63	103.67	43.68	35.1	8.77	36.51	199	120	P	V
		5938.8	50.48	-17.82	68.3	43.04	35.09	8.88	36.53	199	120	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11a (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	43.54	-30.46	74	55.64	37.99	12.74	62.83	100	360	P	H
		11490	43.7	-30.3	74	55.8	37.99	12.74	62.83	100	360	P	V
802.11a CH 157 5785MHz		11570	43.33	-30.67	74	55.3	38.06	12.79	62.82	100	0	P	H
		11570	43.64	-30.36	74	55.61	38.06	12.79	62.82	100	0	P	V
802.11a CH 165 5825MHz		11650	44.2	-29.8	74	56.05	38.11	12.85	62.81	100	360	P	H
		11650	45.85	-28.15	74	57.7	38.11	12.85	62.81	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5623.6	49.96	-18.34	68.3	42.51	35.29	8.55	36.39	326	199	P	H
		5697.6	49.82	-53.71	103.53	42.41	35.25	8.58	36.42	326	199	P	H
		5719.98	51.41	-59.48	110.89	44.01	35.22	8.61	36.43	326	199	P	H
		5724.4	57.26	-63.67	120.93	49.86	35.22	8.61	36.43	326	199	P	H
		5742	93.33	-	-	85.92	35.21	8.64	36.44	326	199	P	H
		5742	85.94	-	-	78.53	35.21	8.64	36.44	326	199	A	H
		5612.8	49.64	-18.66	68.3	42.24	35.28	8.52	36.4	273	172	P	V
		5693.6	51.15	-49.43	100.58	43.74	35.25	8.58	36.42	273	172	P	V
		5719.98	55.32	-55.57	110.89	47.92	35.22	8.61	36.43	273	172	P	V
		5722.8	60.07	-57.21	117.28	52.67	35.22	8.61	36.43	273	172	P	V
		5740	99.06	-	-	91.65	35.21	8.64	36.44	273	172	P	V
		5740	91.44	-	-	84.03	35.21	8.64	36.44	273	172	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz		5830	92.34	-	-	84.97	35.13	8.72	36.48	300	30	P	H
		5830	84.86	-	-	77.49	35.13	8.72	36.48	300	30	A	H
		5850.4	50.45	-70.94	121.39	43.1	35.12	8.72	36.49	300	30	P	H
		5873.6	49.63	-56.06	105.69	42.27	35.1	8.77	36.51	300	30	P	H
		5882	50.04	-50.06	100.1	42.68	35.1	8.77	36.51	300	30	P	H
		5990.8	49.63	-18.67	68.3	42.16	35.08	8.93	36.54	300	30	P	H
		5830	97.67	-	-	90.3	35.13	8.72	36.48	300	110	P	V
		5830	90.78	-	-	83.41	35.13	8.72	36.48	300	110	A	V
		5854.4	52.25	-60.02	112.27	44.93	35.1	8.72	36.5	300	110	P	V
		5855.4	51.78	-59.01	110.79	44.46	35.1	8.72	36.5	300	110	P	V
		5909.2	50.53	-29.43	79.96	43.14	35.09	8.82	36.52	300	110	P	V
		5973.6	50.72	-17.58	68.3	43.24	35.09	8.93	36.54	300	110	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	43.51	-30.49	74	55.61	37.99	12.74	62.83	100	360	P	H
		11490	44.68	-29.32	74	56.78	37.99	12.74	62.83	100	360	P	V
802.11n HT20 CH 157 5785MHz		11570	44.15	-29.85	74	56.12	38.06	12.79	62.82	100	0	P	H
		11570	43.52	-30.48	74	55.49	38.06	12.79	62.82	100	0	P	V
802.11n HT20 CH 165 5825MHz		11650	44.3	-29.7	74	56.15	38.11	12.85	62.81	100	360	P	H
		11650	45.43	-28.57	74	57.28	38.11	12.85	62.81	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5617.2	50.39	-17.91	68.3	42.97	35.29	8.52	36.39	328	204	P	H
		5664.4	49.82	-29.17	78.99	42.36	35.28	8.58	36.4	328	204	P	H
		5718	53.96	-56.38	110.34	46.56	35.22	8.61	36.43	328	204	P	H
		5722.8	57.53	-59.75	117.28	50.13	35.22	8.61	36.43	328	204	P	H
		5740	90.42	-	-	83.01	35.21	8.64	36.44	328	204	P	H
		5740	83.04	-	-	75.63	35.21	8.64	36.44	328	204	A	H
		5852.8	49.63	-66.29	115.92	42.28	35.12	8.72	36.49	328	204	P	H
		5868	49.59	-57.67	107.26	42.22	35.1	8.77	36.5	328	204	P	H
		5924.8	49.44	-19.01	68.45	42.05	35.09	8.82	36.52	328	204	P	H
		5944	49.56	-18.74	68.3	42.12	35.09	8.88	36.53	328	204	P	H
		5611.2	49.59	-18.71	68.3	42.19	35.28	8.52	36.4	273	181	P	V
		5699.6	50.28	-54.73	105.01	42.84	35.25	8.61	36.42	273	181	P	V
		5716	60.48	-49.3	109.78	53.05	35.24	8.61	36.42	273	181	P	V
		5724	60.92	-59.1	120.02	53.52	35.22	8.61	36.43	273	181	P	V
		5746	95.8	-	-	88.39	35.21	8.64	36.44	273	181	P	V
		5746	88.49	-	-	81.08	35.21	8.64	36.44	273	181	A	V
		5850.8	49.09	-71.39	120.48	41.74	35.12	8.72	36.49	273	181	P	V
		5859.2	49.67	-60.05	109.72	42.3	35.1	8.77	36.5	273	181	P	V
		5900.4	49.5	-36.96	86.46	42.09	35.1	8.82	36.51	273	181	P	V
		5999.6	49.3	-19	68.3	41.83	35.08	8.93	36.54	273	181	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5606.4	49.78	-18.52	68.3	42.38	35.28	8.52	36.4	315	35	P	H
		5668	49.53	-32.13	81.66	42.09	35.27	8.58	36.41	315	35	P	H
		5701.2	49.05	-56.59	105.64	41.62	35.24	8.61	36.42	315	35	P	H
		5722.8	49.97	-67.31	117.28	42.57	35.22	8.61	36.43	315	35	P	H
		5782	89.79	-	-	82.4	35.18	8.67	36.46	315	35	P	H
		5782	82.19	-	-	74.8	35.18	8.67	36.46	315	35	A	H
		5852.4	47.89	-68.94	116.83	40.54	35.12	8.72	36.49	315	35	P	H
		5855.6	49.16	-61.57	110.73	41.79	35.1	8.77	36.5	315	35	P	H
		5898	49.34	-38.9	88.24	41.93	35.1	8.82	36.51	315	35	P	H
		5938.4	49.38	-18.92	68.3	41.93	35.09	8.88	36.52	315	35	P	H
		5631.6	49.33	-18.97	68.3	41.88	35.29	8.55	36.39	238	176	P	V
		5665.2	50.28	-29.3	79.58	42.82	35.28	8.58	36.4	238	176	P	V
		5703.6	48.9	-57.41	106.31	41.47	35.24	8.61	36.42	238	176	P	V
		5724	48.98	-71.04	120.02	41.58	35.22	8.61	36.43	238	176	P	V
		5790	95.93	-	-	88.57	35.16	8.67	36.47	238	176	P	V
		5790	88.31	-	-	80.95	35.16	8.67	36.47	238	176	A	V
		5854.4	57.71	-54.56	112.27	50.39	35.1	8.72	36.5	238	176	P	V
		5855.8	56.72	-53.96	110.68	49.35	35.1	8.77	36.5	238	176	P	V
		5898.8	49.87	-37.78	87.65	42.46	35.1	8.82	36.51	238	176	P	V
		5943.2	50.62	-17.68	68.3	43.18	35.09	8.88	36.53	238	176	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	43.4	-30.6	74	55.49	38	12.74	62.83	100	360	P	H
		11510	45.98	-28.02	74	58.07	38	12.74	62.83	100	360	P	V
802.11n HT40 CH 159 5795MHz		11590	42.92	-31.08	74	54.84	38.07	12.82	62.81	100	360	P	H
		11590	43.92	-30.08	74	55.84	38.07	12.82	62.81	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11a LF		53.28	18.94	-21.06	40	37.21	12.84	0.84	31.95	-	-	P	H
		177.44	25.13	-18.37	43.5	39.72	15.8	1.53	31.92	-	-	P	H
		188.11	25.36	-18.14	43.5	40.13	15.56	1.58	31.91	-	-	P	H
		198.78	26.03	-17.47	43.5	40.98	15.32	1.63	31.9	100	0	P	H
		842.86	24.5	-21.5	46	26.57	26.43	3.34	31.84	-	-	P	H
		926.28	24.7	-21.3	46	25.41	27.01	3.5	31.22	-	-	P	H
		53.28	23.42	-16.58	40	41.69	12.84	0.84	31.95	-	-	P	V
		177.44	30.61	-12.89	43.5	45.2	15.8	1.53	31.92	100	0	P	V
		188.11	29.39	-14.11	43.5	44.16	15.56	1.58	31.91	-	-	P	V
		198.78	27.36	-16.14	43.5	42.31	15.32	1.63	31.9	-	-	P	V
		825.4	24.96	-21.04	46	27.35	26.25	3.31	31.95	-	-	P	V
		931.13	25.53	-20.47	46	26.14	27.05	3.51	31.17	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against 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	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(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. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable 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) + Cable 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)

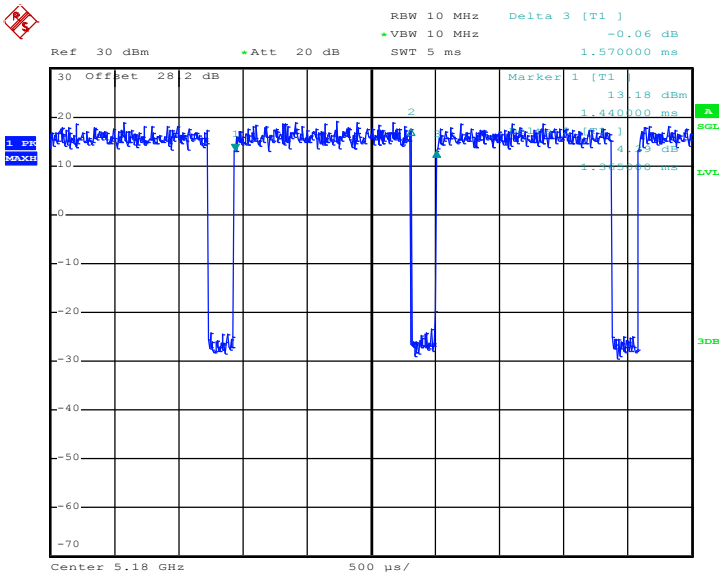
= -10.46(dB)

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

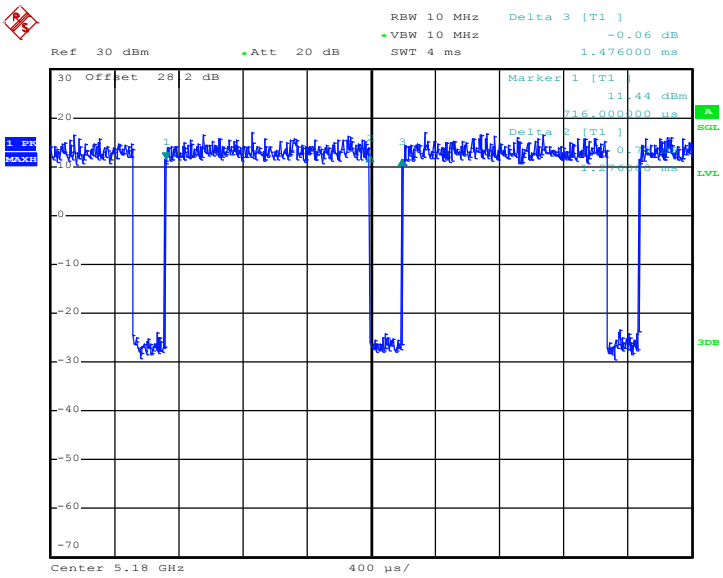
Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	86.94	1.365	0.733	0.75KHz
802.11n HT20	86.45	1.276	0.784	0.82KHz
802.11n HT20	86.06	1.229	0.814	0.82KHz

802.11a



802.11n HT20



802.11n HT40