Radio Test Report

Report No.: STS2504039W04

Issued for

Shenzhen Huawanlong Technology Co., Ltd.

Room 302, A, No. 2, Jihua Road, Jihua Industrial Zone, Longgang District, Shenzhen, China.

Product Name:	laptop
Brand Name:	COOYES
Model Name:	K156
Series Model(s):	N/A
FCC ID:	2BOOL-K156
Test Standard:	FCC Part15.407

TEST REPORT

Applicant's Name	Shenzhen Huawanlong Technology Co., Ltd.
Address	Room 302, A, No. 2, Jihua Road, Jihua Industrial Zone, Longgang District, Shenzhen, China.
Manufacturer's Name	Shenzhen Huawanlong Technology Co., Ltd.
Address	Room 302, A, No. 2, Jihua Road, Jihua Industrial Zone, Longgang District, Shenzhen, China.

Product Description

Product Name	laptop
Brand Name	COOYES
Model Name	K156
Series Model(s)	N/A
Test Standards	FCC Part15.407
Test Procedure	ANSI C63.10-2020

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.

Date of Test	
Date of receipt of test item	09 Apr. 2025
Date (s) of performance of tests	09 Apr. 2025 ~ 22 Apr. 2025
Date of Issue	22 Apr. 2025
Test Result	**Pass**

Testing Engineer : Aaron Bu

(Aaron Bu)

Technical Manager : Skylar Li

(Skylar Li)

Authorized Signatory : Bovey Yang

(Bovey Yang)

SHENZHEN STS TEST SERVICES CO., LTD. TESTING APPROVAL

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	22 Apr. 2025	STS2504039W04	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

§ 15.407,KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
15.407 (a) /15.407 (e)	26dB/6dB &99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)/ 15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report.

(2) All tests are according to ANSI C63.10-2020.

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF output power, conducted	±0.755dB
2	Unwanted Emissions, conducted	±2.874dB
3	All emissions, radiated 9K-30MHz	±3.80dB
4	All emissions, radiated 30M-1GHz	±4.18dB
5	All emissions, radiated 1G-6GHz	±4.90dB
6	All emissions, radiated>6G	±5.24dB
7	Conducted Emission (9KHz-150KHz)	±2.19dB
8	Conducted Emission (150KHz-30MHz)	±2.53dB
9	Occupied Channel Bandwidth	±3.5%
10	Power Spectral Density, conducted	±1.245dB
11	Duty Cycle	±3.2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

<table>
<tr><td>Product Name</td><td>laptop</td></tr>
<tr><td>Brand Name</td><td>COOYES</td></tr>
<tr><td>Model Name</td><td>K156</td></tr>
<tr><td>Series Model(s)</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a laptop
<table>
<tr><td>Operation Frequency:</td><td>IEEE 802.11a/ n(HT20):
5.745GHz-5.825GHz</td></tr>
<tr><td>Modulation Type:</td><td>802.11a(OFDM):
BPSK,QPSK,16-QAM,64-QAM
802.11n(OFDM):
BPSK,QPSK,16-QAM,64-QAM</td></tr>
<tr><td>Antenna Designation:</td><td>See Note 2</td></tr>
<tr><td>Max.Output Power(Conducted):</td><td>13.42dBm</td></tr>
</table>
More details of EUT technical specification, please refer to the User Manual.</td></tr>
<tr><td>Test Channel</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Power Rating</td><td>Output: DC5V 1A</td></tr>
<tr><td>Adapter</td><td>Input: 100-240v-50/60hz 1.5A
Output:DC 19V 3420mA</td></tr>
<tr><td>Battery</td><td>Rated Voltage:11.1V
Charge Limit Voltage:12.6V
Capacity: 4300mAh</td></tr>
<tr><td>Hardware version number</td><td>N2108067</td></tr>
<tr><td>Software version number</td><td>windows 11pro</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the Note 1.</td></tr>
</table>

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.

1.

Operation Frequency of channel	
5.745GHz-5.825GHz	
Channel	Frequency
149	5745
151	5755
153	5765
157	5785
159	5795
161	5805
165	5825

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:
Carrier Frequency Channel

5GHz:

For 802.11a/n(HT20)	
Channel	Freq.(MHz)
149	5745
157	5785
165	5825

2.

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	COOYES	K156	FPC	N/A	ANT 1:4.76 ANT 2:3.03 MIMO:6.95	WLAN Ant

Note: The antenna information refer the manufacturer provide report, applicable only to the t ested sa-mple identified in the report.

3 .KDB 662911 D01 Multiple Transmitter Output v02r01
2) Directional Gain Calculations for In-Band Measurements
d) Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, … , GN dBi
(i) If transmit signals are correlated, then
Directional gain = 10 log[(10G1 /20 + 10G2 /20 + … + 10GN/20)2 /NANT] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]
(ii) If all transmit signals are completely uncorrelated, then
Directional gain = 10 log[(10G1 /10 + 10G2 /10 + … + 10GN/10)/NANT] dBi

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 2	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0

Note: (1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

(3) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 3: Keeping TX + WLAN Link

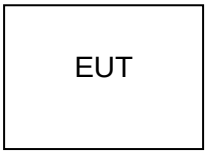
2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

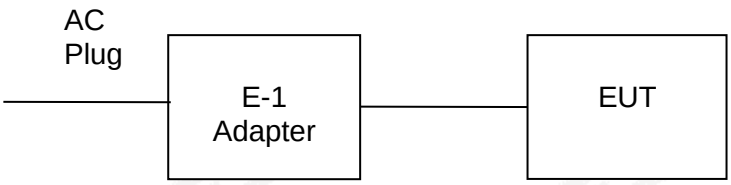
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_1 Power Class	ANT_2 Power Class	Software For Testing
WIFI(5G)	U-NII-3 (5725MHz-5895MHz)	802.11a	ANT 1:4.76 ANT 2:6.15 MIMO:6.95	Default	Default	DRTU
		802.11n(HT20)		Default	Default	

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



Conducted Emission Test



2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Note
E-1	Adapter	COOYES	JHD-AP066U-190342BA-A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
N/A	N/A	N/A	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2025.02.22	2026.02.21
Pre-Amplifier(1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2024.09.23	2025.09.22
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2025.02.22	2026.02.21
Active loop Antenna	ZHINAN	ZN30900C	16035	2025.02.25	2026.02.24
Bilog Antenna	TESEQ	CBL6111D	34678	2024.09.30	2025.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2023.09.24	2025.09.23
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2023.10.10	2025.10.09
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2024.09.23	2025.09.22
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	SC100_1	60531	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC power supply	HONGSHENGFENG	DPS-305AF	17064939	2024.09.23	2025.09.22
Test SW	EZ-EMC	Ver.STSLAB-03A1 RE			
Conduction Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2024.09.24	2025.09.23
Limtter	CYBERTEK	EM5010	N/A	2024.09.24	2025.09.23
LISN	R&S	ENV216	101242	2024.09.24	2025.09.23
LISN	EMCO	3810/2NM	23625	2024.09.24	2025.09.23
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Test SW	EZ-EMC	Ver.STSLAB-03A1 CE			
RF Connected Test					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2025.02.22	2026.02.21
Switch control box	MW	MW100-RFCB	N/A	N/A	N/A
Temperature & Humidity	SW-108	SuWei	N/A	2025.02.24	2026.02.23
Test SW	MW	MTS 8310_2.0.0.0			

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

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

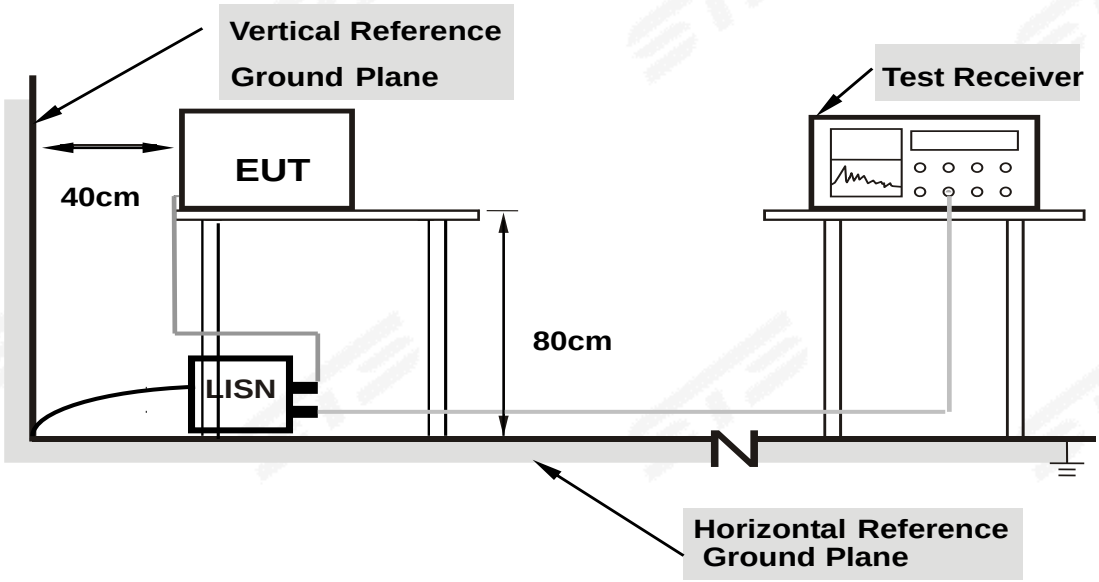
3.1.2 TEST PROCEDURE

a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN is at least 80 cm from the nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.1.5 EUT OPERATING CONDITIONS

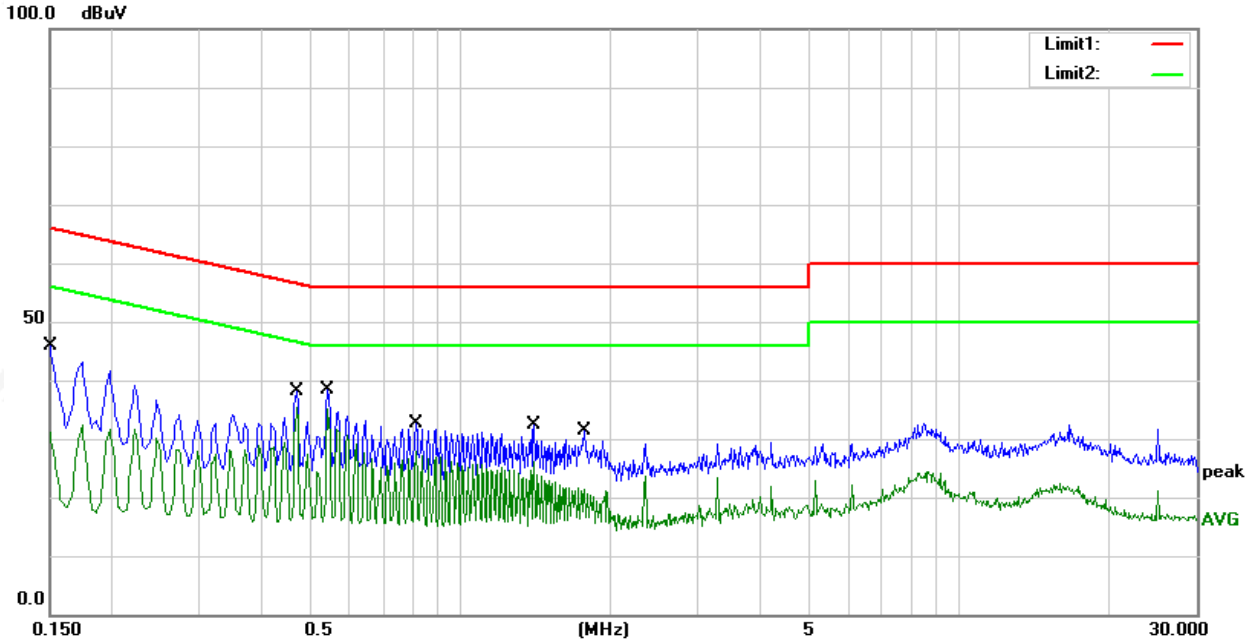
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

Temperature:	25.1℃	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode：	Mode 3		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	26.01	19.78	45.79	66.00	-20.21	QP
2	0.1500	12.51	19.78	32.29	56.00	-23.71	AVG
3	0.4700	18.12	20.01	38.13	56.51	-18.38	QP
4	0.4700	15.31	20.01	35.32	46.51	-11.19	AVG
5	0.5420	18.34	19.97	38.31	56.00	-17.69	QP
6	0.5420	15.20	19.97	35.17	46.00	-10.83	AVG
7	0.8140	12.93	19.80	32.73	56.00	-23.27	QP
8	0.8140	9.31	19.80	29.11	46.00	-16.89	AVG
9	1.4060	12.49	19.78	32.27	56.00	-23.73	QP
10	1.4060	6.37	19.78	26.15	46.00	-19.85	AVG
11	1.7780	11.48	19.78	31.26	56.00	-24.74	QP
12	1.7780	3.78	19.78	23.56	46.00	-22.44	AVG

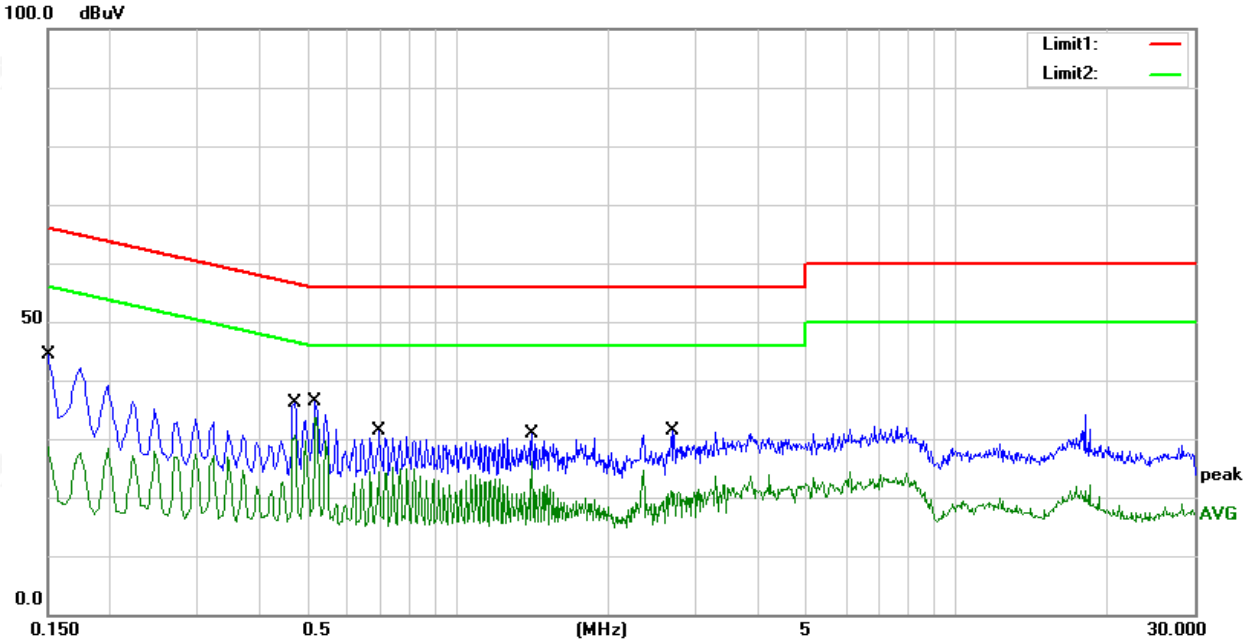
Remark:
1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)



Temperature:	25.1℃	Relative Humidity:	59%
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 13		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	24.67	19.74	44.41	66.00	-21.59	QP
2	0.1500	8.64	19.74	28.38	56.00	-27.62	AVG
3	0.4700	16.08	19.98	36.06	56.51	-20.45	QP
4	0.4700	10.68	19.98	30.66	46.51	-15.85	AVG
5	0.5180	16.45	19.95	36.40	56.00	-19.60	QP
6	0.5180	13.77	19.95	33.72	46.00	-12.28	AVG
7	0.6940	11.59	19.84	31.43	56.00	-24.57	QP
8	0.6940	5.26	19.84	25.10	46.00	-20.90	AVG
9	1.4060	11.04	19.82	30.86	56.00	-25.14	QP
10	1.4060	6.25	19.82	26.07	46.00	-19.93	AVG
11	2.6900	11.45	19.91	31.36	56.00	-24.64	QP
12	2.6900	4.65	19.91	24.56	46.00	-21.44	AVG

Remark:
1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor=LISN factor+Cable loss+Limiter (10dB)



3.2 RADIATED EMISSION AND (BANDEDGE) MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.407(b)7&15.205/209(a), then the limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	68.2	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15E.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Note: In case the emission radiated emission above 1000MHz fall within the restricted band the restricted frequency bands, the peak limit is 74 dBuV/m.

LIMITS OF EMISSIONS OUTSIDE OF THE FREQUENCY BANDS

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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

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

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

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

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

Note: dBuV/m(at 3M) = EIRP(dBm) + 95.2.

Peak Limit = -27dBm/MHz + 95.2 = 68.2 dBuV/m.

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic (Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

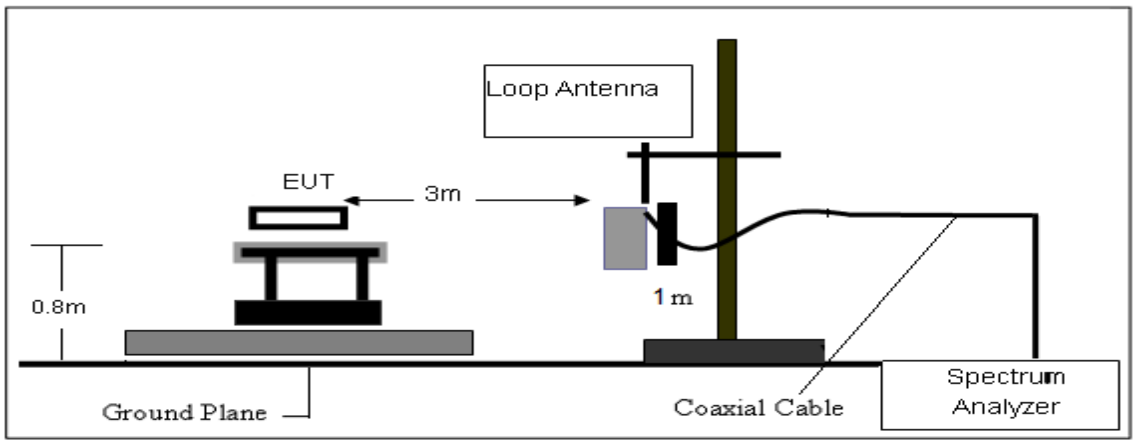
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.2 DEVIATION FROM TEST STANDARD

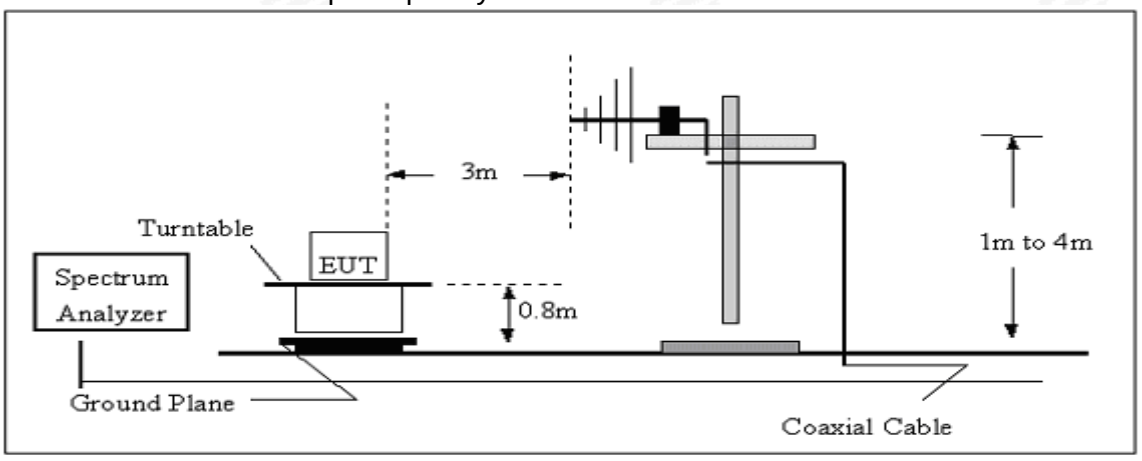
No deviation

3.2.3 TEST SETUP

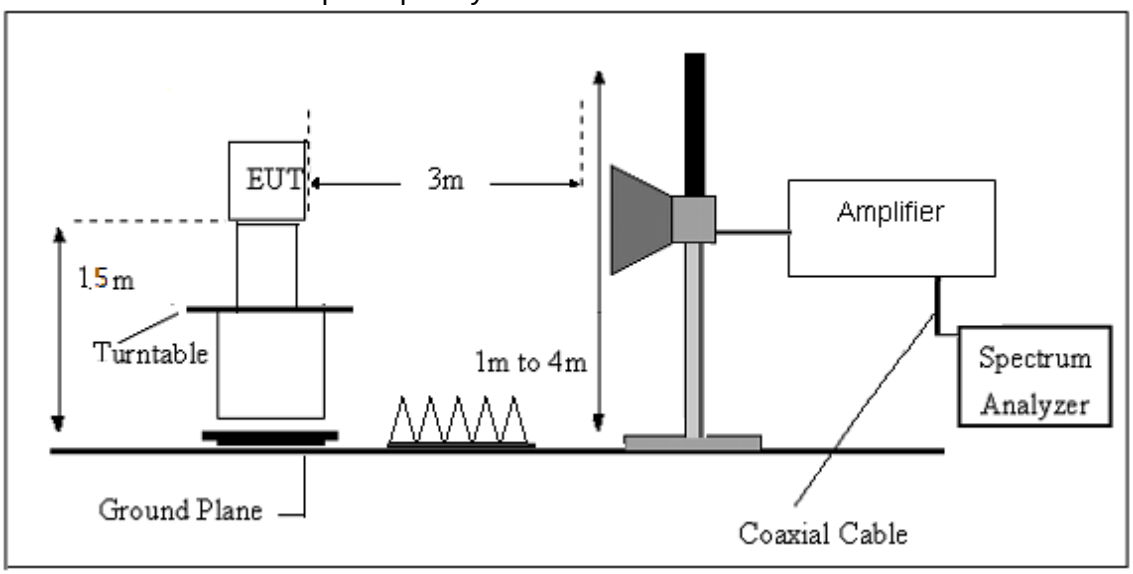
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:
FS = RA + AF + CL - AG
Where
FS = Field Strength
CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude
AG = Amplifier Gain
AF = Antenna Factor
For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

3.2.6 TEST RESULTS (Between 9KHz – 30 MHz)

Temperature:	23.4℃	Relative Humidtity:	60%
Test Voltage:	DC 11.1V From Battery	Polarization :	--
Test Mode:	TX Mode		

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

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

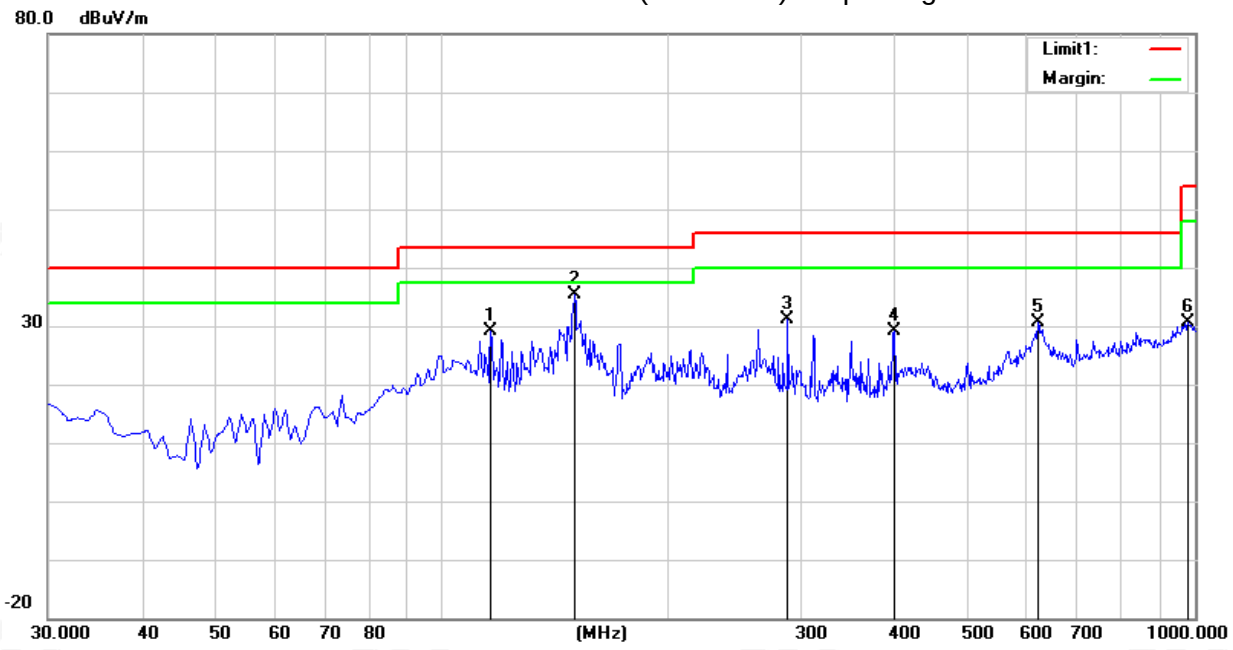
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (Between 30MHz – 1GHz)

Temperature	23.4℃	Relative Humidtity:	60%
Test Voltage	DC 11.1V From Battery	Polarization:	Horizontal
Test Mode	Mode 1/2(Mode 2 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	116.3300	47.61	-18.51	29.10	43.50	-14.40	peak
2	150.2800	53.86	-18.53	35.33	43.50	-8.17	peak
3	288.0200	46.40	-15.26	31.14	46.00	-14.86	peak
4	399.5700	40.37	-11.16	29.21	46.00	-16.79	peak
5	618.7900	36.22	-5.49	30.73	46.00	-15.27	peak
6	982.5400	28.21	2.52	30.73	54.00	-23.27	peak

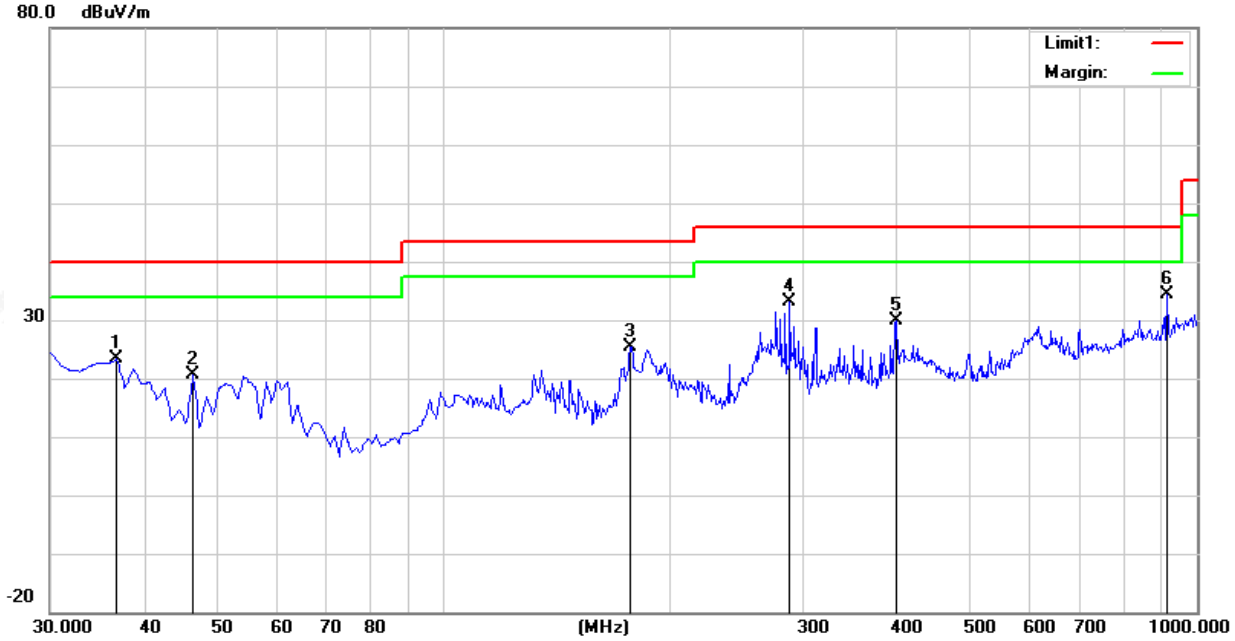
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature	23.4℃	Relative Humidtity:	60%
Test Voltage	DC 11.1V From Battery	Polarization:	Vertical
Test Mode	Mode 1/2(Mode 2 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	36.7900	39.68	-16.39	23.29	40.00	-16.71	peak
2	46.4900	41.95	-21.41	20.54	40.00	-19.46	peak
3	177.4400	45.48	-20.03	25.45	43.50	-18.05	peak
4	288.0200	48.39	-15.26	33.13	46.00	-12.87	peak
5	399.5700	41.04	-11.16	29.88	46.00	-16.12	peak
6	913.6700	34.46	-0.13	34.33	46.00	-11.67	peak

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



3.2.8 TEST RESULTS (Above 1000 MHz)

U-NII-3 (5.725-5.850) GHz

Band IV(5.725-5.85) GHz										
Frequency (MHz)	Reading (dBuV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Orrected Factor （dB）	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11n20/ 5745 MHz)										
3258.55	44.06	44.70	6.70	28.20	-9.80	34.26	68.20	-33.94	Pk	Vertical
3258.55	41.70	44.70	6.70	28.20	-9.80	31.90	54.00	-22.10	AV	Vertical
3249.10	44.92	44.70	6.70	28.20	-9.80	35.12	68.20	-33.08	Pk	Horizontal
3249.10	41.83	44.70	6.70	28.20	-9.80	32.03	54.00	-21.97	AV	Horizontal
3981.55	38.76	44.20	7.90	29.70	-6.60	32.16	74.00	-41.84	Pk	Vertical
3981.55	35.98	44.20	7.90	29.70	-6.60	29.38	54.00	-24.62	AV	Vertical
3992.98	39.04	44.20	7.90	29.70	-6.60	32.44	74.00	-41.56	Pk	Horizontal
3992.98	35.64	44.20	7.90	29.70	-6.60	29.04	54.00	-24.96	AV	Horizontal
7224.54	36.63	43.50	11.40	35.50	3.40	40.03	68.20	-28.17	Pk	Vertical
7224.54	34.11	43.50	11.40	35.50	3.40	37.51	54.00	-16.49	AV	Vertical
7220.16	36.85	43.50	11.40	35.50	3.40	40.25	68.20	-27.95	Pk	Horizontal
7220.16	33.95	43.50	11.40	35.50	3.40	37.35	54.00	-16.65	AV	Horizontal
10509.33	38.93	44.50	13.90	38.80	8.20	47.13	68.20	-21.07	Pk	Vertical
10509.33	36.59	44.50	13.90	38.80	8.20	44.79	54.00	-9.21	AV	Vertical
10509.33	39.65	44.50	13.90	38.80	8.20	47.85	68.20	-20.35	Pk	Horizontal
10509.33	36.85	44.50	13.90	38.80	8.20	45.05	54.00	-8.95	AV	Horizontal
11490.35	34.15	43.60	14.30	39.50	10.20	44.35	74.00	-29.65	Pk	Vertical
11490.35	30.95	43.60	14.30	39.50	10.20	41.15	54.00	-12.85	AV	Vertical
11490.00	33.12	43.60	14.30	39.50	10.20	43.32	74.00	-30.68	Pk	Horizontal
11490.00	30.55	43.60	14.30	39.50	10.20	40.75	54.00	-13.25	AV	Horizontal
13286.88	32.15	42.60	15.90	38.90	12.20	44.35	74.00	-29.65	Pk	Vertical
13286.88	29.94	42.60	15.90	38.90	12.20	42.14	54.00	-11.86	AV	Vertical
13294.82	32.86	42.60	15.90	38.90	12.20	45.06	74.00	-28.94	Pk	Horizontal
13294.82	29.35	42.60	15.90	38.90	12.20	41.55	54.00	-12.45	AV	Horizontal
Mid Channel (802.11n20/ 5785 MHz)										
3247.99	45.18	44.70	6.70	28.20	-9.80	35.38	68.20	-32.82	Pk	Vertical
3247.99	41.41	44.70	6.70	28.20	-9.80	31.61	54.00	-22.39	AV	Vertical
3247.08	45.16	44.70	6.70	28.20	-9.80	35.36	68.20	-32.84	Pk	Horizontal
3247.08	42.05	44.70	6.70	28.20	-9.80	32.25	54.00	-21.75	AV	Horizontal
3984.68	38.72	44.20	7.90	29.70	-6.60	32.12	74.00	-41.88	Pk	Vertical
3984.68	36.15	44.20	7.90	29.70	-6.60	29.55	54.00	-24.45	AV	Vertical
3982.18	39.83	44.20	7.90	29.70	-6.60	33.23	74.00	-40.77	Pk	Horizontal
3982.18	36.01	44.20	7.90	29.70	-6.60	29.41	54.00	-24.59	AV	Horizontal
7225.93	36.88	43.50	11.40	35.50	3.40	40.28	68.20	-27.92	Pk	Vertical
7225.93	34.32	43.50	11.40	35.50	3.40	37.72	54.00	-16.28	AV	Vertical
7234.75	37.44	43.50	11.40	35.50	3.40	40.84	68.20	-27.36	Pk	Horizontal
7234.75	34.59	43.50	11.40	35.50	3.40	37.99	54.00	-16.01	AV	Horizontal
10594.89	38.76	44.50	13.80	38.80	8.10	46.86	68.20	-21.34	Pk	Vertical
10594.89	36.22	44.50	13.80	38.80	8.10	44.32	54.00	-9.68	AV	Vertical
10598.95	40.00	44.50	13.80	38.80	8.10	48.10	68.20	-20.10	Pk	Horizontal
10598.95	36.81	44.50	13.80	38.80	8.10	44.91	54.00	-9.09	AV	Horizontal
11570.12	32.70	43.60	14.30	39.50	10.20	42.90	74.00	-31.10	Pk	Vertical
11570.12	30.64	43.60	14.30	39.50	10.20	40.84	54.00	-13.16	AV	Vertical
11570.24	34.01	43.60	14.30	39.50	10.20	44.21	74.00	-29.79	Pk	Horizontal
11570.24	30.69	43.60	14.30	39.50	10.20	40.89	54.00	-13.11	AV	Horizontal
13288.99	32.62	42.60	15.90	38.90	12.20	44.82	74.00	-29.18	Pk	Vertical
13288.99	29.37	42.60	15.90	38.90	12.20	41.57	54.00	-12.43	AV	Vertical
13286.77	32.34	42.60	15.90	38.90	12.20	44.54	74.00	-29.46	Pk	Horizontal
13286.77	28.95	42.60	15.90	38.90	12.20	41.15	54.00	-12.85	AV	Horizontal

High Channel (802.11n20/ 5825 MHz)										
3259.54	44.26	44.70	6.70	28.20	-9.80	34.46	68.20	-33.74	Pk	Vertical
3259.54	40.92	44.70	6.70	28.20	-9.80	31.12	54.00	-22.88	AV	Vertical
3247.93	44.03	44.70	6.70	28.20	-9.80	34.23	68.20	-33.97	Pk	Horizontal
3247.93	41.18	44.70	6.70	28.20	-9.80	31.38	54.00	-22.62	AV	Horizontal
3981.51	40.11	44.20	7.90	29.70	-6.60	33.51	74.00	-40.49	Pk	Vertical
3981.51	36.32	44.20	7.90	29.70	-6.60	29.72	54.00	-24.28	AV	Vertical
3994.38	39.89	44.20	7.90	29.70	-6.60	33.29	74.00	-40.71	Pk	Horizontal
3994.38	35.75	44.20	7.90	29.70	-6.60	29.15	54.00	-24.85	AV	Horizontal
7218.43	36.75	43.50	11.40	35.50	3.40	40.15	68.20	-28.05	Pk	Vertical
7218.43	33.79	43.50	11.40	35.50	3.40	37.19	54.00	-16.81	AV	Vertical
7235.27	37.55	43.50	11.40	35.50	3.40	40.95	68.20	-27.25	Pk	Horizontal
7235.27	34.28	43.50	11.40	35.50	3.40	37.68	54.00	-16.32	AV	Horizontal
10623.34	39.64	44.50	13.80	38.80	8.10	47.74	74.00	-26.26	Pk	Vertical
10623.34	35.72	44.50	13.80	38.80	8.10	43.82	54.00	-10.18	AV	Vertical
10640.28	39.17	44.50	13.80	38.80	8.10	47.27	74.00	-26.73	Pk	Horizontal
10640.28	36.52	44.50	13.80	38.80	8.10	44.62	54.00	-9.38	AV	Horizontal
11650.08	33.46	43.60	14.30	39.50	10.20	43.66	74.00	-30.34	Pk	Vertical
11650.08	30.97	43.60	14.30	39.50	10.20	41.17	54.00	-12.83	AV	Vertical
11650.01	33.93	43.60	14.30	39.50	10.20	44.13	74.00	-29.87	Pk	Horizontal
11650.01	30.95	43.60	14.30	39.50	10.20	41.15	54.00	-12.85	AV	Horizontal
13287.56	32.64	42.70	18.00	37.10	12.40	45.04	74.00	-28.96	Pk	Vertical
13287.56	28.61	42.70	18.00	37.10	12.40	41.01	54.00	-12.99	AV	Vertical
13286.67	32.38	42.70	18.00	37.10	12.40	44.78	74.00	-29.22	Pk	Horizontal
13286.67	29.62	42.70	18.00	37.10	12.40	42.02	54.00	-11.98	AV	Horizontal

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. All modes have been measurement, only worst mode was reported.
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

4. POWER SPECTRAL DENSITY TEST

4.1 LIMIT

1. For mobile and portable client devices in the 5.15-5.25 GHz band, , the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output 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.

4.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB D02 General UNII Test Procedures New Rules v01r03.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (*i.e.,* 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/*T*, where *T* is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP

4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

Note: The test data please reference to attachment “STS2504039W04_Appendix 5G WIFI”.

5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > =RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

Note: The test data please reference to attachment “STS2504039W04_Appendix 5G WIFI”.

5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

The following procedure shall be used for measuring (99 %) power bandwidth.

5.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

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

4. Set VBW ≥ 3 · RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP

5.2.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.2.5 TEST RESULTS

Note: The test data please reference to attachment “STS2504039W04_Appendix 5G WIFI”.

5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

5.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP

5.3.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.3.5 TEST RESULTS

Note: The test data please reference to attachment “STS2504039W04_Appendix 5G WIFI”.

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 LIMIT

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 provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz 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,If transmitting antennas of directional gain greater than 6 dBi are used.

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.

<table>
<tr><td colspan="5">FCC Part15 (15.407) , Subpart E</td></tr>
<tr><td>Section</td><td>Test Item</td><td>Limit</td><td>Frequency Range (MHz)</td><td>Result</td></tr>
<tr><td rowspan="2">15.407(a) (1) (iv)</td><td rowspan="3">Peak Output Power</td><td>0.25 watt</td><td>5150-5250</td><td rowspan="3">PASS</td></tr>
<tr><td>The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)</td><td>5250-5350
5470-5725</td></tr>
<tr><td>15.407(a) (3)</td><td>1 watt</td><td>5725-5895</td></tr>
</table>

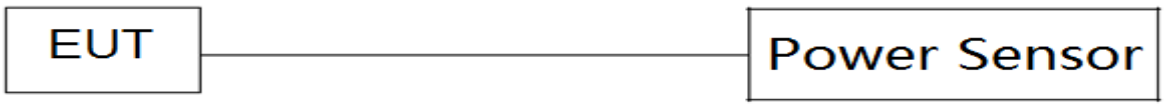
6.2 TEST PROCEDURE

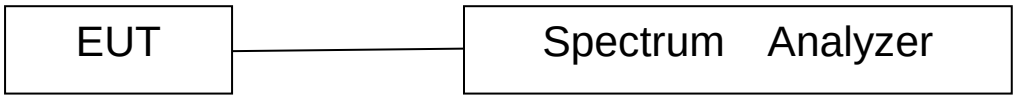
The EUT was directly connected to the Power Sensor&PC

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP





6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

Note: The test data please reference to attachment “STS2504039W04_Appendix 5G WIFI”.

7. AUTOMATICALLY DISCONTINUE TRANSMISSION

7.1 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.

7.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, 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.

8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

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

8.2 EUT ANTENNA

The EUT antenna is FPC Antenna. It comply with the standard requirement.

APPENDIX - PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※