RADIO TEST REPORT

Report No:STS1807043W01

Issued for

Canon Electronic Business Machines (H.K.) Co., Ltd.

17/F, Tower One, Ever Gain Plaza, 82-100 Container Port Road, Kwai Chung, New Territories, Hong Kong

Product Name:	Wireless Receiver
Brand Name:	Canon
Model Name:	D20D
Series Model:	N/A
FCC ID:	Y7J-D20D
IC:	9472A-D20D
Test Standard:	FCC Part 15.249
	RSS 210 Issue 9

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TEST RESULT CERTIFICATION

Applicant's name ..... :	Canon Electronic Business Machines (H.K.) Co., Ltd.
Address ..... :	17/F, Tower One, Ever Gain Plaza, 82-100 Container Port Road, Kwai Chung, New Territories, Hong Kong
Manufacture's Name ..... :	Canon Electronic Business Machines (H.K.) Co., Ltd.
Address ..... :	17/F, Tower One, Ever Gain Plaza, 82-100 Container Port Road, Kwai Chung, New Territories, Hong Kong

Product description

Product Name ..... :	Wireless Receiver
Brand Name ..... :	Canon
Model Name ..... :	D20D
Series Model ..... :	N/A
Test Standards ..... :	FCC Part15.249
	RSS 210 Issue 9
Test procedure ..... :	ANSI C63.10-2013

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&IC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test ..... :	
Date of performance of tests .. :	29 Nov. 2018 ~24 Dec. 2018
Date of Issue ..... :	25 Dec. 2018
Test Result ..... :	**Pass**

Testing Engineer : (Chris chen)

Technical Manager : (Sunday Hu)

Authorized Signatory : (Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	25 Dec. 2018	STS1807043W01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15.249 , Subpart C RSS 210 Issue 9			
Standard Section	Test Item	Judgment	Remark
15.207 RSS-Gen Issue 5 April 2018	Conducted Emission	Pass	--
15.203 RSS-Gen Issue 5 April 2018	Antenna Requirement	Pass	--
15.249 RSS 210 Issue 9 (B.10)	Radiated Spurious Emission	Pass	--
15.205	Radiated Band Edge Emission	Pass	--
15.249 RSS-Gen Issue 5 April 2018	Occupied Bandwidth	Pass	--
RSS-Gen Issue 5 April 2018	Frequency Stability	PASS	--

NOTE:

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

(2)All tests are according to ANSI C63.10-2013

1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.: 625569
IC Registration No.: 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	±0.71dB
2	Unwanted Emissions,conducted	±0.63dB
3	All emissions,radiated 30-200MHz	±3.43dB
4	All emissions,radiated 200MHz-1GHz	±3.57dB
5	All emissions,radiated>1G	±4.13dB
6	Conducted Emission(9KHz-150KHz)	±3.18dB
7	Conducted Emission(150KHz-30MHz)	±2.70dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Wireless Receiver
Trade Name	Canon
Model Name	D20D
Series Model	N/A
Model Difference	N/A
Product Description	The EUT is a Wireless Receiver Operation Frequency: 2405~2460 MHz Modulation Type: GFSK Antenna Designation: PCB Antenna Antenna Gain(Peak): -2.5 dBi Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Power Rating	DC 5V
Hardware version number	R000
Software version number	V02

Note:

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

2.

Channel List			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2405	06	2430
02	2410	07	2435
03	2415	08	2440
04	2450	09	2445
05	2425	10	2460

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Canon	D20D	PCB Antenna	N/A	-2.5	Antenna

2.2 DESCRIPTION OF TEST MODES

For conducted test items and radiated spurious emissions
Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively..

Pretest Mode	Description	Data/Modulation
Mode 1	TX CH01	GFSK
Mode 2	TX CH06	GFSK
Mode 3	TX CH10	GFSK

Note:

(1) All above mode have been measurement, only worst data was reported.

(2) 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, and the worst case of 120V,50/60Hz is shown in the report

(3) We tested two power states of when the EUT working is by USB charging and a separate lithium battery to powers. the EUT working by USB charging power is higher, so all the test data is tested by USB charging mode.

(4) Controlled using a bespoke application on the laptop PC supplied by the customer. The application was used to enable a continuous transmission mode and to select the test channels, data rates and modulation schemes as required.

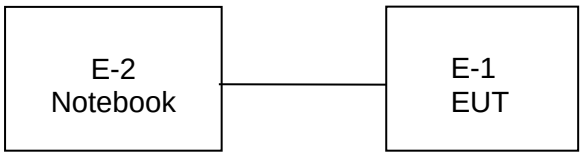
For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4 : Keeping TX

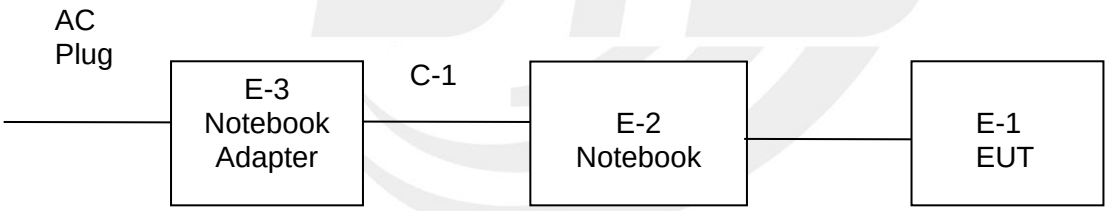
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Radiated Spurious Emission Test



Conduction Test Set



2.4 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.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	HP	500-320cx	N/A	N/A
E-3	Notebook Adapter	HP	HSTNN-CA15	N/A	N/A
C-1	DC Cable	NO	100cm	N/A	N/A

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

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

2.5 EQUIPMENTS LISTS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY51110105	2018.03.08	2019.03.07
Active loop Antenna	ZHINAN	ZN30900C	16035	2017.03.11	2020.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2017.10.27	2020.10.26
SHF-EHF Horn Antenna (15G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2019.03.10
Pre-mplifier (0.1M-3GHz)	EM	EM330	060665	2018.03.09	2019.03.08
PreAmplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2018.10.13	2019.10.12
Temperature & Humitidy	HH660	Mieo	N/A	2018.10.11	2019.10.10
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2018.10.13	2019.10.12
LISN	R&S	ENV216	101242	2018.10.13	2019.10.12
LISN	EMCO	3810/2NM	23625	2018.10.13	2019.10.12
Temperature & Humitidy	HH660	Mieo	N/A	2018.10.11	2019.10.10

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2018.10.13	2019.10.12
Signal Analyzer	Agilent	N9020A	MY49100060	2018.10.13	2019.10.12
Temperature & Humitidy	HH660	Mieo	N/A	2018.10.11	2019.10.10

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.249& RSS-Gen Issue 5 limit in the table below has to be followed.

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.

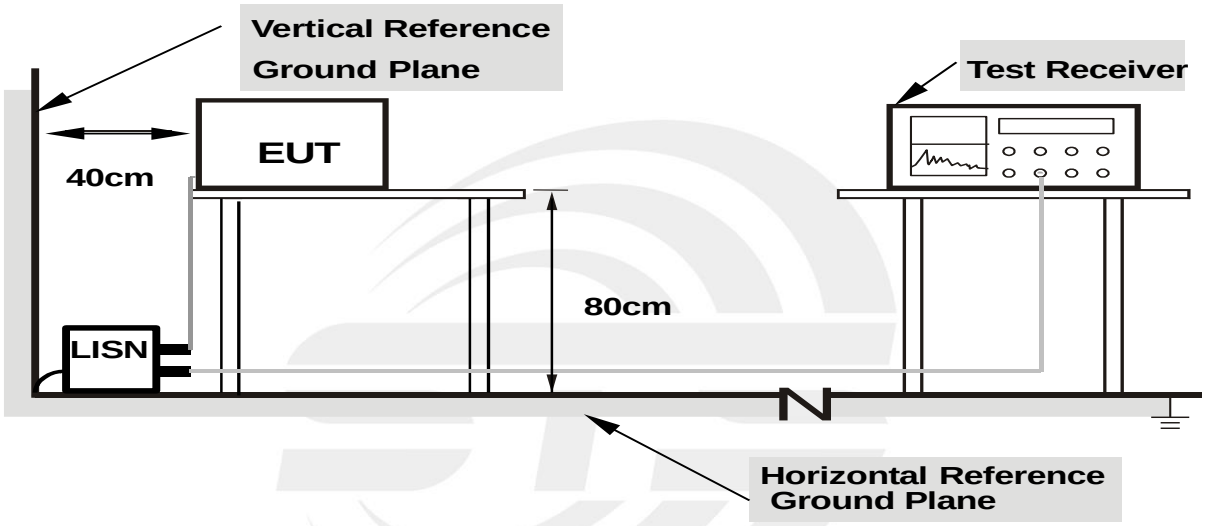
The following table is the setting of the receiver

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 was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 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 at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 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 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

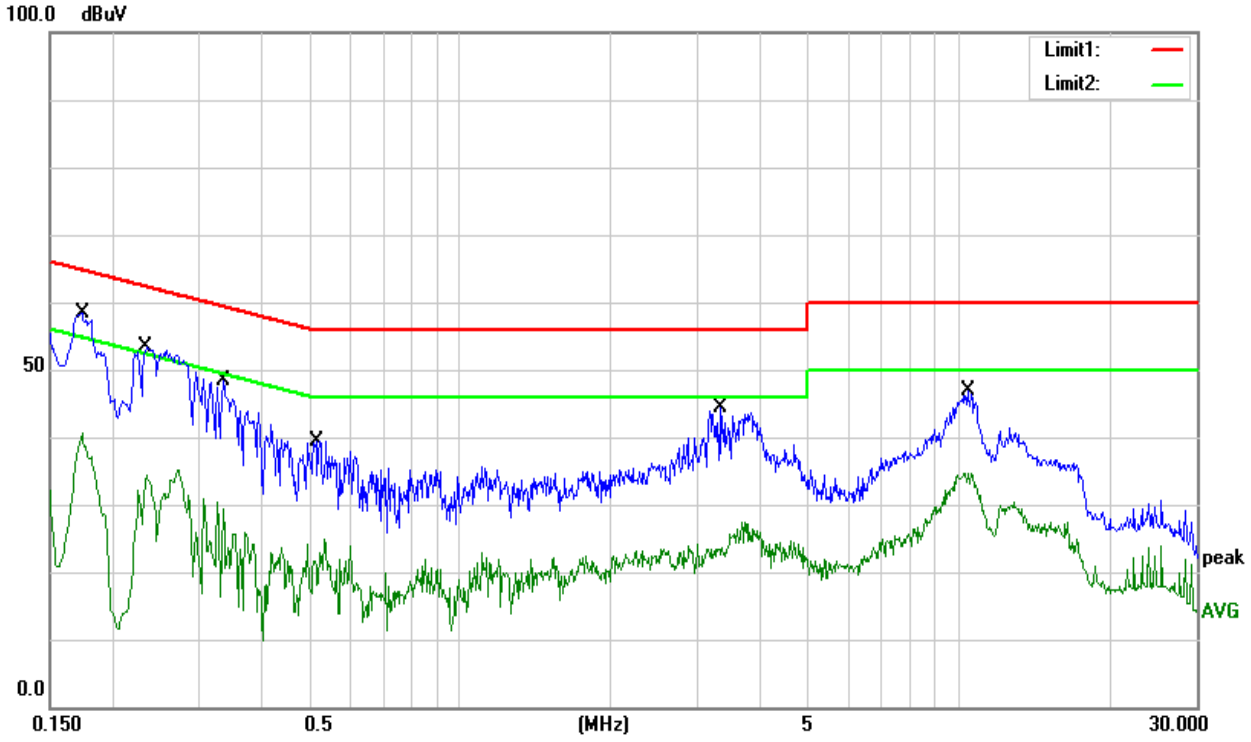
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULTS

Temperature:	27 ℃	Relative Humidity:	62.5%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 4		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1740	48.59	9.79	58.38	64.77	-6.39	QP
0.1740	30.72	9.79	40.51	54.77	-14.26	AVG
0.2341	43.47	9.93	53.40	62.30	-8.90	QP
0.2341	24.46	9.93	34.39	52.30	-17.91	AVG
0.3340	38.30	10.16	48.46	59.35	-10.89	QP
0.3340	19.27	10.16	29.43	49.35	-19.92	AVG
0.5140	29.45	10.02	39.47	56.00	-16.53	QP
0.5140	8.09	10.02	18.11	46.00	-27.89	AVG
3.3220	34.45	9.82	44.27	56.00	-11.73	QP
3.3220	12.81	9.82	22.63	46.00	-23.37	AVG
10.3980	36.65	10.21	46.86	60.00	-13.14	QP
10.3980	22.86	10.21	33.07	50.00	-16.93	AVG

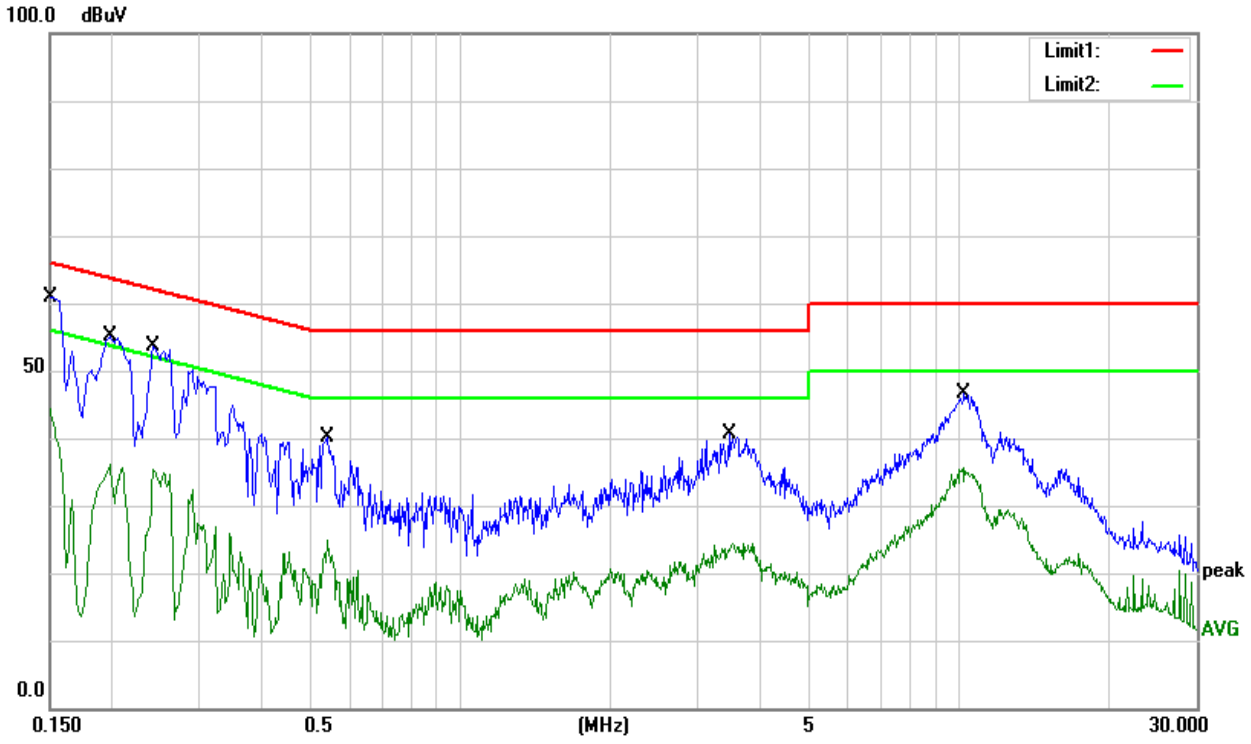
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	27℃	Relative Humidity:	62.5%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 4		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1500	51.10	9.79	60.89	66.00	-5.11	QP
0.1500	34.58	9.79	44.37	56.00	-11.63	AVG
0.1980	45.38	9.78	55.16	63.69	-8.53	QP
0.1980	26.42	9.78	36.20	53.69	-17.49	AVG
0.2420	43.65	9.97	53.62	62.03	-8.41	QP
0.2420	25.47	9.97	35.44	52.03	-16.59	AVG
0.5420	30.11	9.99	40.10	56.00	-15.90	QP
0.5420	14.86	9.99	24.85	46.00	-21.15	AVG
3.4580	30.79	9.82	40.61	56.00	-15.39	QP
3.4580	13.95	9.82	23.77	46.00	-22.23	AVG
10.2460	36.49	10.21	46.70	60.00	-13.30	QP
10.2460	23.51	10.21	33.72	50.00	-16.28	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 and the Part 15.209(a) limit in the table below has to be followed.

Standard FCC 15.209

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
960~1000	500	3
Above 1000	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	3

Standard FCC 15.249

Frequency of Emission (MHz)	**Field Strength of fundamental (millivolts /meter)**	**Field Strength of Harmonics (microvolts/meter)**
900~928	50	500
2400~2483.5	50	500
5725~5875	50	500
24000~242500	250	2500

Notes:

(1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

In case the emission fall within the restricted band specified on RSS-Gen Issue 4 limit in the followed
. In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given below:
(a) If the equipment operates below 10 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency, as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported.
When limits are expressed in absolute terms, compliance with the emission limits below 1000 MHz shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limits can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.
Above 1000 MHz, compliance with the emission limits shall be demonstrated using an average detector with a minimum resolution bandwidth of 1 MHz.

In case the emission fall within the restricted band specified on RSS 210 Issue 9 (B.10) limit in the followed
1. The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.
The field strength limits shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector.
2. Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

NOTE:
(1)The limit for radiated test was performed according to RSS 210 Issue 9
(2)Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Detector	Peak/AV
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB (emission in restricted band)	>20BW
VB (emission in restricted band)	=3xRB

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

3.2.2 TEST PROCEDURE

a. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of arotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)

b. The measuring distance of 3m shall used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)

c. The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.

d. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

e. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform (Below 1GHz)

f. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

g. For the actual test configuration, please refer to the related Item –EUT Test Photos.

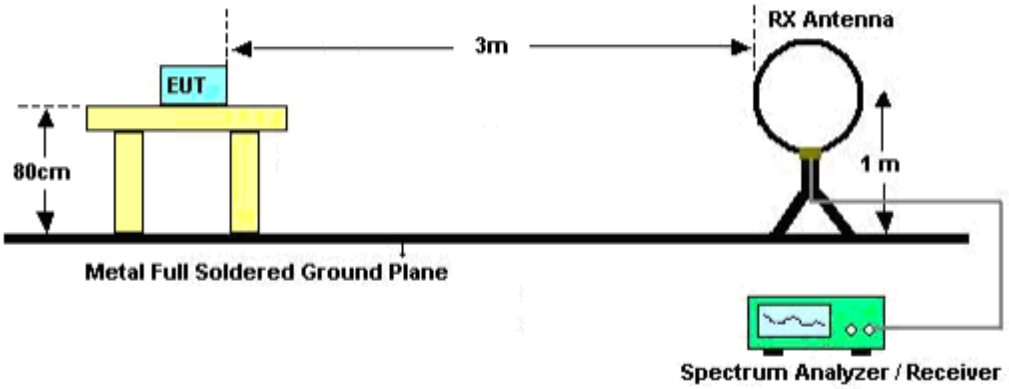
Note: Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

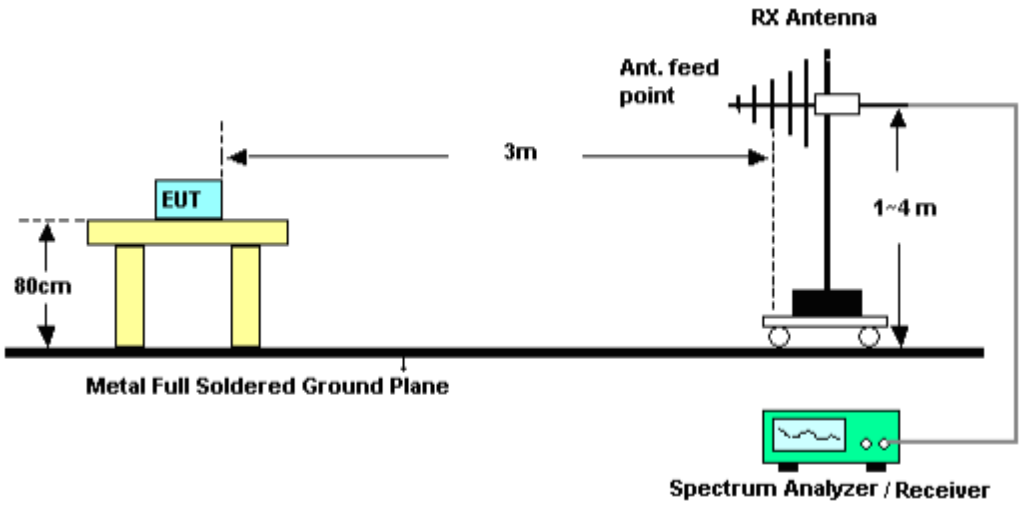
No deviation

3.2.4 TEST SETUP

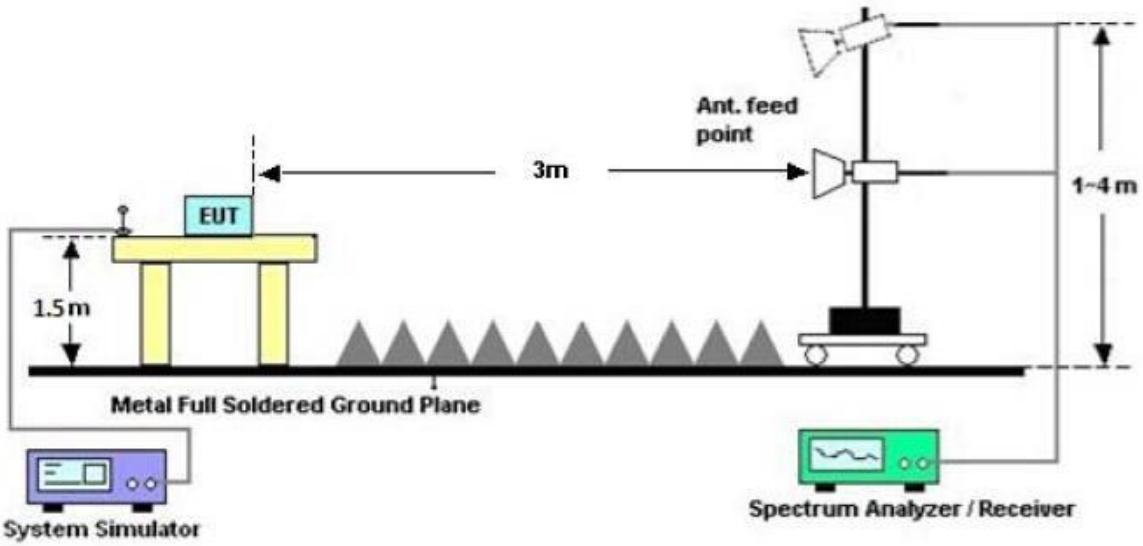
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 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 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.

Below 30 MHz

Temperature:	27.1℃	Relative Humidtity:	59%
Test Voltage:	DC 5V from USB	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);

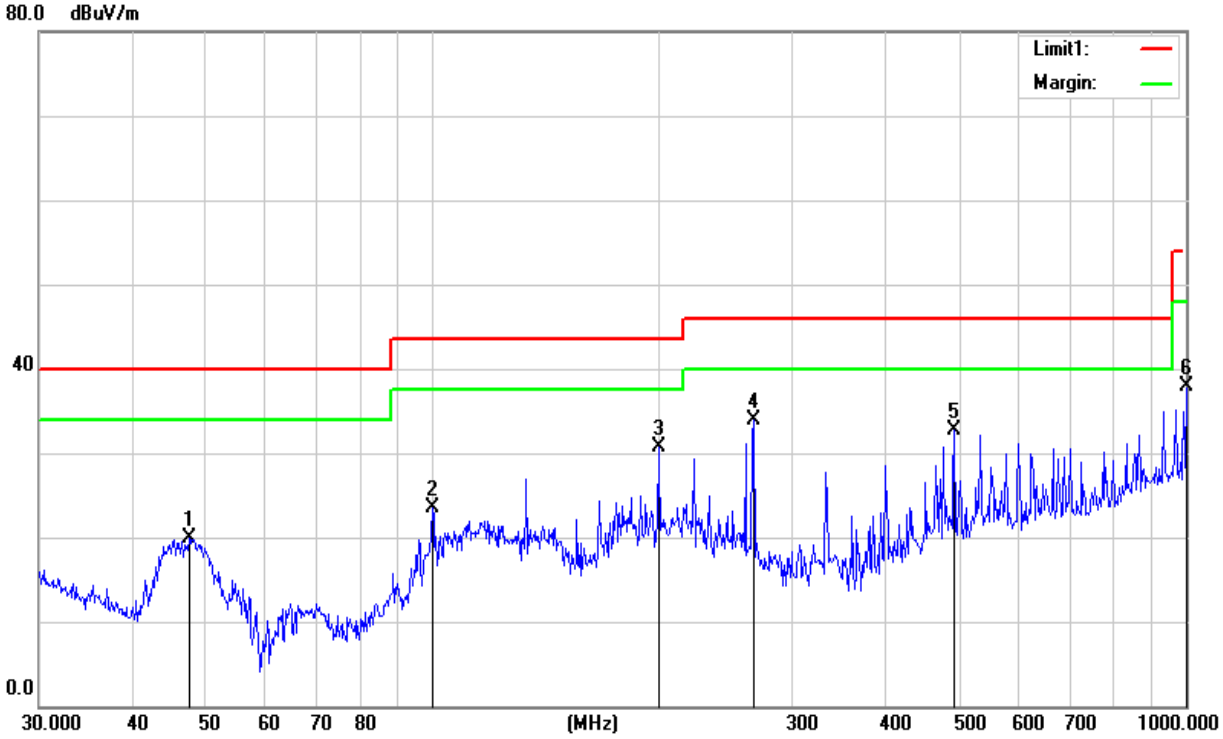
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	27.1 ℃	Relative Humidity:	59%
Test Voltage:	DC 5V from USB	Phase:	Horizontal
Test Mode:	Mode 1/2/3(Model 1 worst)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
47.4917	40.15	-20.19	19.96	40.00	-20.04	QP
99.8777	42.70	-19.20	23.50	43.50	-20.00	QP
199.2855	50.96	-20.17	30.79	43.50	-12.71	QP
266.6090	49.25	-15.33	33.92	46.00	-12.08	QP
492.4685	41.81	-9.09	32.72	46.00	-13.28	QP
1000.0000	38.04	-0.07	37.97	54.00	-16.03	QP

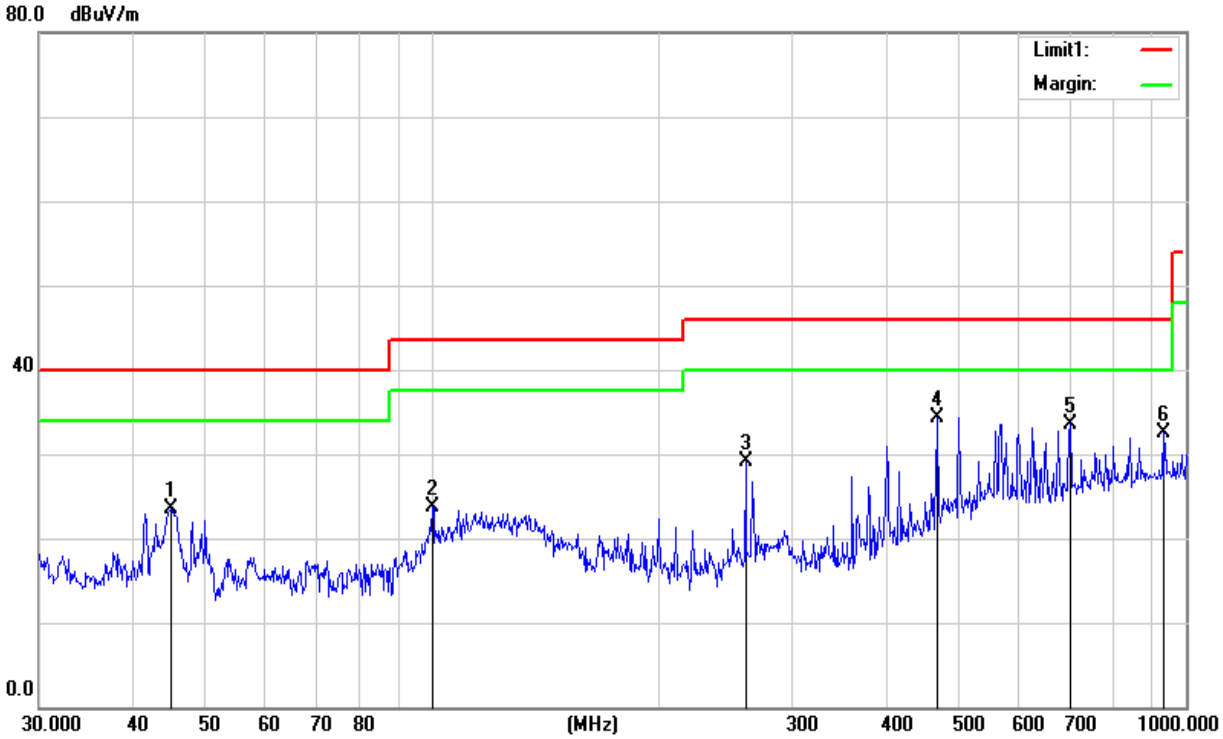
Remark:
1. All readings are Quasi-Peak .
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	27.1 ℃	Relative Humidity:	59%
Test Voltage:	DC 5V from USB	Phase:	Vertical
Test Mode:	Mode 1/2/3(Model 1 worst)		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
44.9004	42.30	-18.86	23.44	40.00	-16.56	QP
99.8777	42.98	-19.20	23.78	43.50	-19.72	QP
260.1444	44.23	-15.07	29.16	46.00	-16.84	QP
467.2348	44.27	-9.87	34.40	46.00	-11.60	QP
701.7610	38.74	-5.29	33.45	46.00	-12.55	QP
932.2712	33.50	-1.05	32.45	46.00	-13.55	QP

Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



Fundamental frequency:

PK

Frequency (MHz)	Reading (dBμV/m)	Amplifier	Loss	Antenna Factor	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarization
	PEAK	（dB）	（dB）	（dB/m）		PEAK	PEAK	PEAK	
2405	90.548	44.40	6.03	27.60	-10.77	79.78	114	-34.22	Vertical
2405	91.360	44.40	6.03	27.60	-10.77	80.59	114	-33.41	Horizontal
2430	90.601	44.40	6.04	27.63	-10.73	79.87	114	-34.13	Vertical
2430	91.166	44.40	6.04	27.63	-10.73	80.44	114	-33.56	Horizontal
2460	90.620	44.40	6.06	27.66	-10.68	79.94	114	-34.06	Vertical
2460	91.269	44.40	6.06	27.66	-10.68	80.59	114	-33.41	Horizontal

AV

Frequency (MHz)	Reading (dBμV/m)	Amplifier	Loss	Antenna Factor	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin(dB)	Polarization
	AV	（dB）	（dB）	（dB/m）		AV	AV	AV	
2405	76.446	44.40	6.03	27.60	-10.77	65.68	94	-28.32	Vertical
2405	75.360	44.40	6.03	27.60	-10.77	64.59	94	-29.41	Horizontal
2430	76.059	44.40	6.04	27.63	-10.73	65.33	94	-28.67	Vertical
2430	74.625	44.40	6.04	27.63	-10.73	63.90	94	-30.10	Horizontal
2460	75.053	44.40	6.06	27.66	-10.68	64.38	94	-29.62	Vertical
2460	73.600	44.40	6.06	27.66	-10.68	62.92	94	-31.08	Horizontal

Note: RBW>20BW; VBW=3xRBW

Above 1G Radiation Spurious

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Low Channel (2405 MHz)										
3264.73	48.21	44.70	6.70	28.20	-9.80	38.41	74.00	-35.59	PK	Vertical
3264.73	38.70	44.70	6.70	28.20	-9.80	28.90	54.00	-25.10	AV	Vertical
3264.83	48.09	44.70	6.70	28.20	-9.80	38.29	74.00	-35.71	PK	Horizontal
3264.83	38.31	44.70	6.70	28.20	-9.80	28.51	54.00	-25.49	AV	Horizontal
4810.51	59.32	44.20	9.04	31.60	-3.56	55.76	74.00	-18.24	PK	Vertical
4810.51	38.25	44.20	9.04	31.60	-3.56	34.69	54.00	-19.31	AV	Vertical
4810.54	59.25	44.20	9.04	31.60	-3.56	55.69	74.00	-18.31	PK	Horizontal
4810.54	38.76	44.20	9.04	31.60	-3.56	35.20	54.00	-18.80	AV	Horizontal
5359.71	46.38	44.20	9.86	32.00	-2.34	44.04	74.00	-29.96	PK	Vertical
5359.71	38.35	44.20	9.86	32.00	-2.34	36.01	54.00	-17.99	AV	Vertical
5359.83	46.39	44.20	9.86	32.00	-2.34	44.05	74.00	-29.95	PK	Horizontal
5359.83	38.11	44.20	9.86	32.00	-2.34	35.77	54.00	-18.23	AV	Horizontal
7215.93	51.48	43.50	11.40	35.50	3.40	54.88	74.00	-19.12	PK	Vertical
7215.93	33.22	43.50	11.40	35.50	3.40	36.62	54.00	-17.38	AV	Vertical
7215.90	51.12	43.50	11.40	35.50	3.40	54.52	74.00	-19.48	PK	Horizontal
7215.90	32.99	43.50	11.40	35.50	3.40	36.39	54.00	-17.61	AV	Horizontal

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
Middle Channel (2430 MHz)										
3264.75	49.13	44.70	6.70	28.20	-9.80	39.33	74.00	-34.67	PK	Vertical
3264.75	39.11	44.70	6.70	28.20	-9.80	29.31	54.00	-24.69	AV	Vertical
3264.61	48.45	44.70	6.70	28.20	-9.80	38.65	74.00	-35.35	PK	Horizontal
3264.61	38.13	44.70	6.70	28.20	-9.80	28.33	54.00	-25.67	AV	Horizontal
4860.40	58.48	44.20	9.04	31.60	-3.56	54.92	74.00	-19.08	PK	Vertical
4860.40	39.34	44.20	9.04	31.60	-3.56	35.78	54.00	-18.22	AV	Vertical
4860.37	59.25	44.20	9.04	31.60	-3.56	55.69	74.00	-18.31	PK	Horizontal
4860.37	39.57	44.20	9.04	31.60	-3.56	36.01	54.00	-17.99	AV	Horizontal
5359.59	45.30	44.20	9.86	32.00	-2.34	42.96	74.00	-31.04	PK	Vertical
5359.59	38.20	44.20	9.86	32.00	-2.34	35.86	54.00	-18.14	AV	Vertical
5359.60	45.60	44.20	9.86	32.00	-2.34	43.26	74.00	-30.74	PK	Horizontal
5359.60	37.94	44.20	9.86	32.00	-2.34	35.60	54.00	-18.40	AV	Horizontal
7290.72	51.46	43.50	11.40	35.50	3.40	54.86	74.00	-19.14	PK	Vertical
7290.72	33.16	43.50	11.40	35.50	3.40	36.56	54.00	-17.44	AV	Vertical
7290.88	50.62	43.50	11.40	35.50	3.40	54.02	74.00	-19.98	PK	Horizontal
7290.88	33.18	43.50	11.40	35.50	3.40	36.58	54.00	-17.42	AV	Horizontal

Frequency (MHz)	Reading (dBμV)	Amplifier （dB）	Loss （dB）	Antenna Factor （dB/m）	Corrected Factor （dB）	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
High Channel (2460 MHz)										
3264.77	48.17	44.70	6.70	28.20	-9.80	38.37	74.00	-35.63	PK	Vertical
3264.77	38.36	44.70	6.70	28.20	-9.80	28.56	54.00	-25.44	AV	Vertical
3264.71	48.00	44.70	6.70	28.20	-9.80	38.20	74.00	-35.80	PK	Horizontal
3264.71	38.31	44.70	6.70	28.20	-9.80	28.51	54.00	-25.49	AV	Horizontal
4920.43	58.47	44.20	9.04	31.60	-3.56	54.91	74.00	-19.09	PK	Vertical
4920.43	39.25	44.20	9.04	31.60	-3.56	35.69	54.00	-18.31	AV	Vertical
4920.37	59.13	44.20	9.04	31.60	-3.56	55.57	74.00	-18.43	PK	Horizontal
4920.37	38.89	44.20	9.04	31.60	-3.56	35.33	54.00	-18.67	AV	Horizontal
5359.81	45.92	44.20	9.86	32.00	-2.34	43.58	74.00	-30.42	PK	Vertical
5359.81	37.52	44.20	9.86	32.00	-2.34	35.18	54.00	-18.82	AV	Vertical
5359.62	46.48	44.20	9.86	32.00	-2.34	44.14	74.00	-29.86	PK	Horizontal
5359.62	38.21	44.20	9.86	32.00	-2.34	35.87	54.00	-18.13	AV	Horizontal
7380.72	51.74	43.50	11.40	35.50	3.40	55.14	74.00	-18.86	PK	Vertical
7380.72	32.58	43.50	11.40	35.50	3.40	35.98	54.00	-18.02	AV	Vertical
7380.79	51.50	43.50	11.40	35.50	3.40	54.90	74.00	-19.10	PK	Horizontal
7380.79	33.62	43.50	11.40	35.50	3.40	37.02	54.00	-16.98	AV	Horizontal

Note:

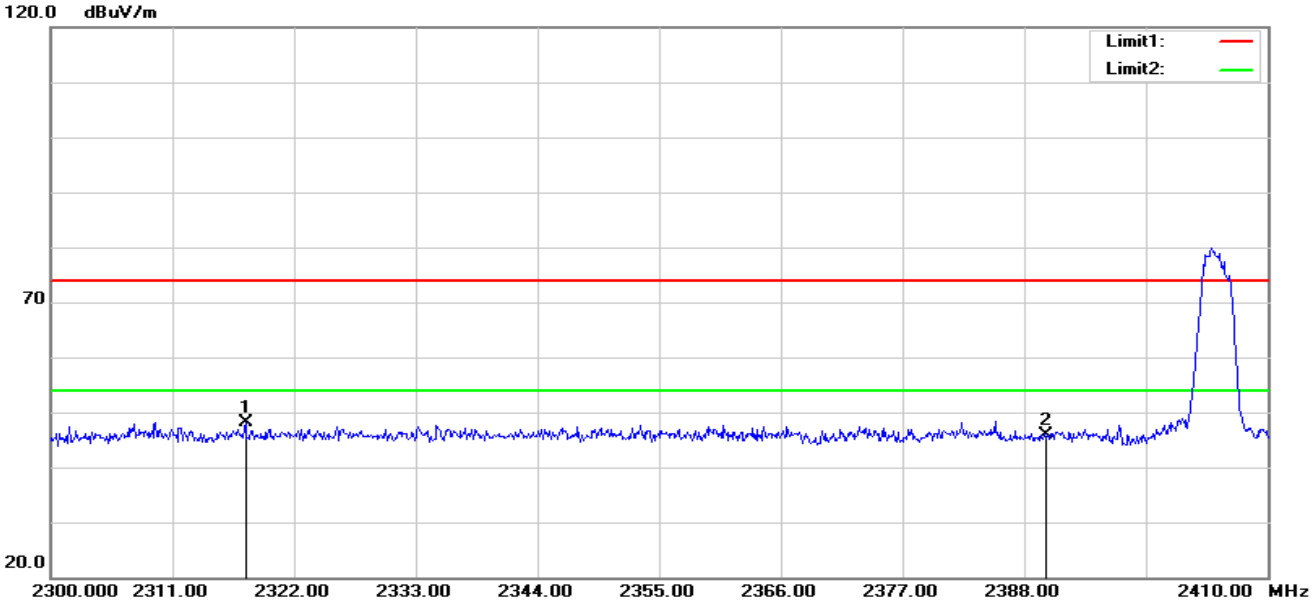
1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor

2) The frequency emission of peak points that did not show above the forms are below the limit, the frequency emission is mainly from the environment noise.

(Restricted Bands)

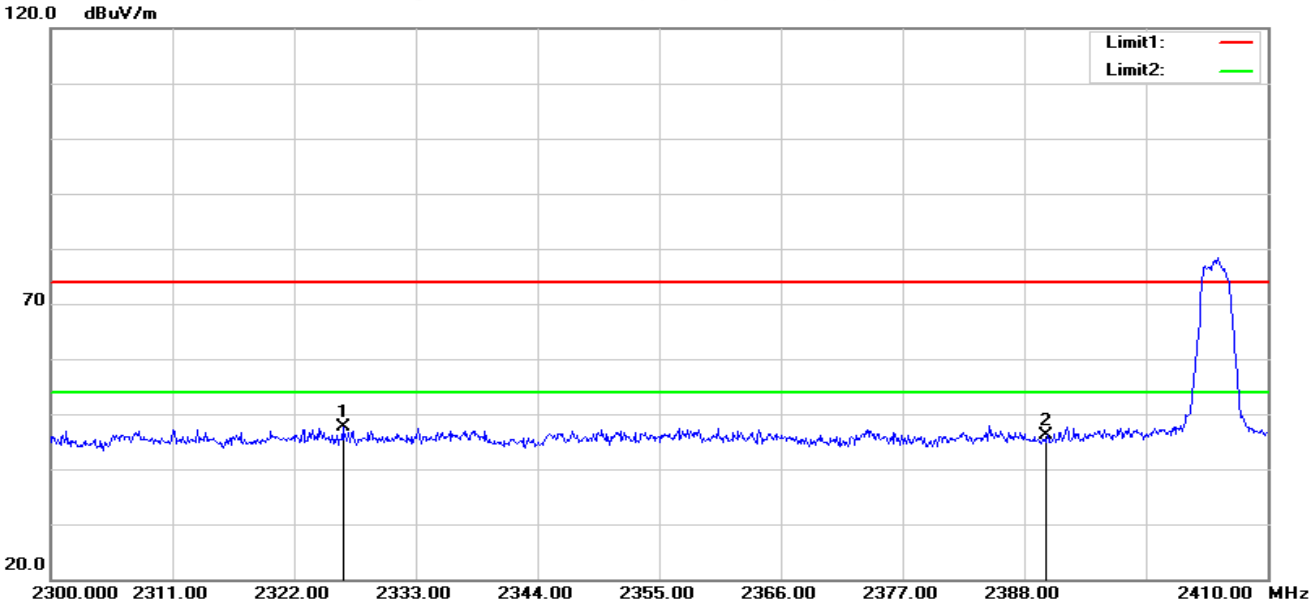
GFSK-Low

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2317.600	59.33	-11.22	48.11	74.00	-25.89	peak
2	2390.000	56.57	-10.75	45.82	74.00	-28.18	peak

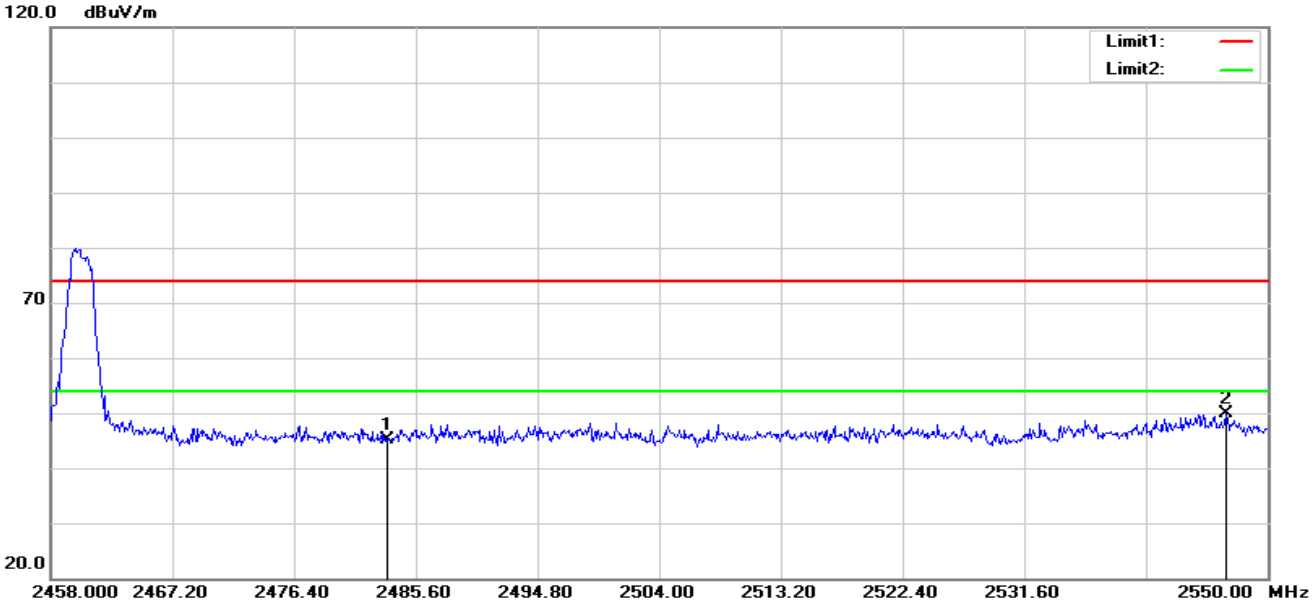
Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2326.400	58.82	-11.17	47.65	74.00	-26.35	peak
2	2390.000	56.91	-10.75	46.16	74.00	-27.84	peak

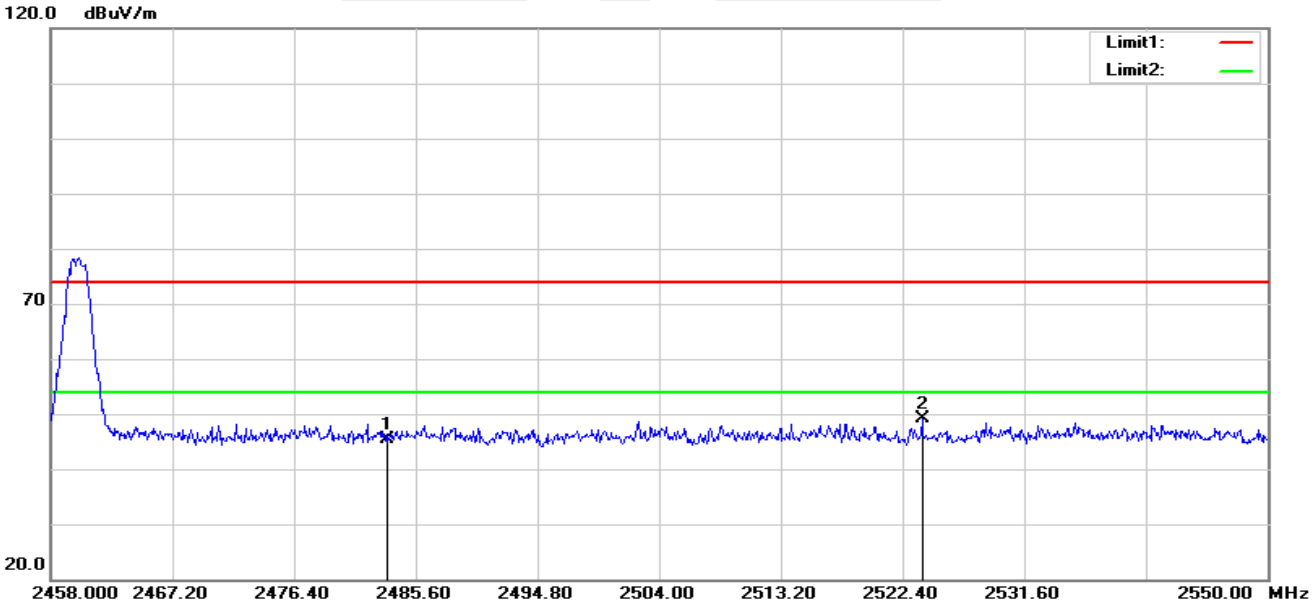
GFSK-High

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	55.36	-10.29	45.07	74.00	-28.93	peak
2	2546.872	59.84	-10.08	49.76	74.00	-24.24	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	55.74	-10.29	45.45	74.00	-28.55	peak
2	2523.872	59.26	-10.14	49.12	74.00	-24.88	peak

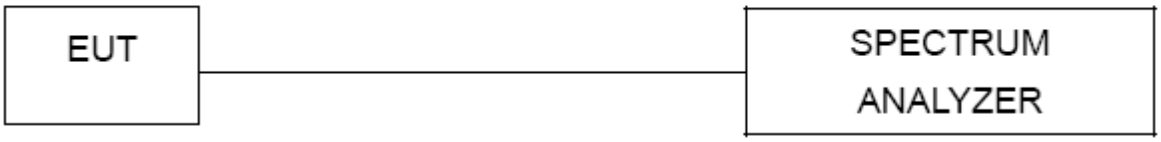
4. BANDWIDTH TEST

4.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b. Spectrum Setting : RBW= 30KHz, VBW≧RBW, Sweep time = Auto.

4.2 TEST SETUP



4.3 EUT OPERATION CONDITIONS

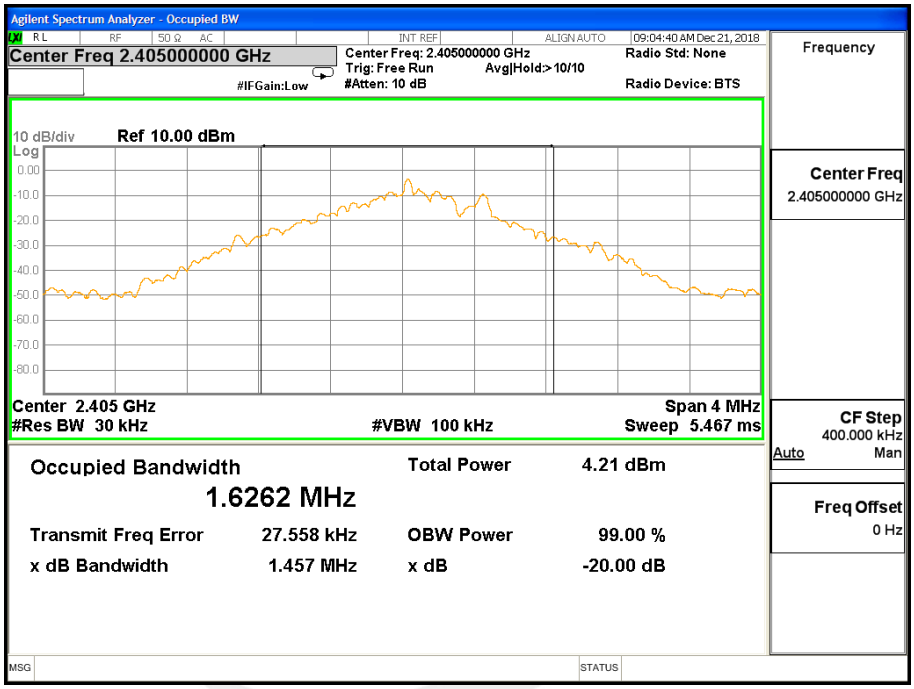
TX mode.

4.4 TEST RESULTS

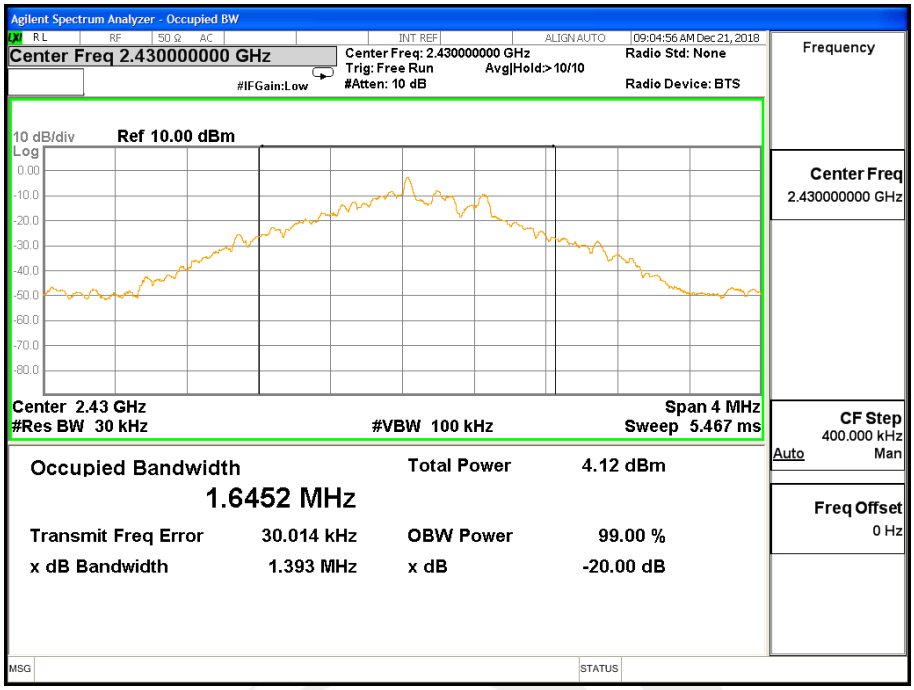
Temperature:	25 ℃	Relative Humidity:	50%
Test Voltage:	AC120V/60Hz		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	2405	1.457	1.6262
CH06	2430	1.393	1.6452
CH10	2460	1.402	1.6493

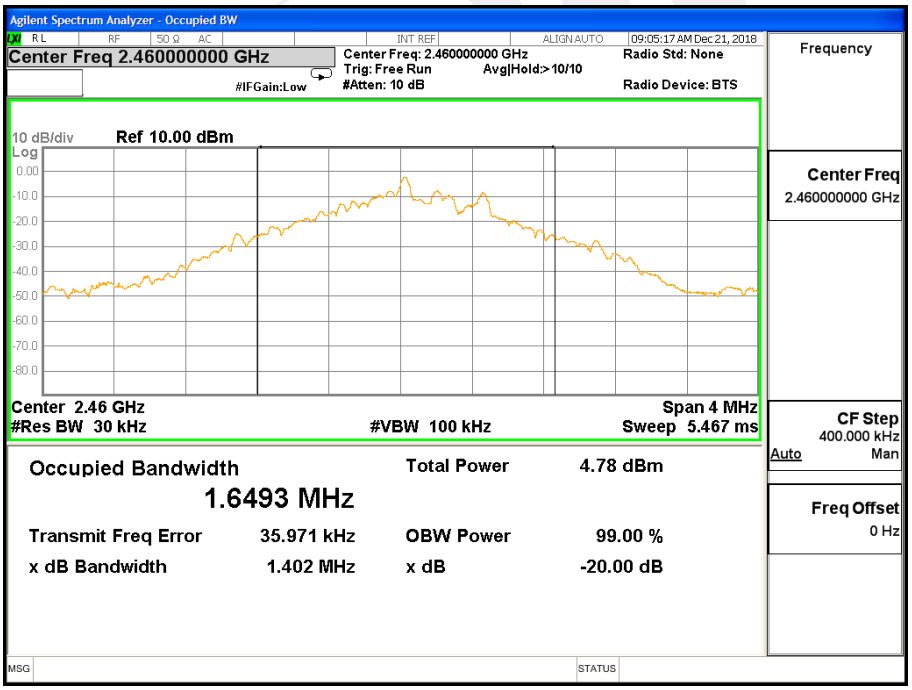
The Lowest Channel:2405MHz



The Middle Channel:2430MHz



The High Channel: 2460MHz



5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203& RSS-Gen Issue 5, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.2 EUT ANTENNA

The EUT antenna is PCB Antenna.It conforms to the standard requirements.

6.FREQUENCY STABILITY

6.1 LIMITS

The frequency tolerance of the carrier signal shall be maintained within +/-0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage,and for a variation in primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees.

6.2 TEST PROCEDURE

1.The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2.Turn the EUT on and couple its output to spectrum analyzer.
3.Turn the EUT off and set the chamber to the highest temperature specified.
4.Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize,turn the EUT on and measure the operating frequency after 2,5,and 10 minutes.
5.Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6.The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes.The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

6.3 TEST RESULT

Channel 06 (2430MHz)

Voltage vs. Frequency Stability

Voltage vs. Frequency Stability Voltage(V)	Measurement Frequency(MHz)
5.75	2430.0025
5	2430.0022
4.25	2430.0017
Max.Deviation(MHz)	0.0025
Max.Deviation(ppm)	1.03

Rated working voltage:DC 5V

Temperature vs. Frequency Stability

Temperature(℃)	Measurement Frequency(MHz)
-30	2430.0031
-20	2430.0021
-10	2430.0024
0	2430.0030
10	2430.0030
20	2430.0028
30	2430.0026
40	2430.0029
50	2430.0021
Max.Deviation(MHz)	0.0031
Max.Deviation(ppm)	1.28

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※※※※※