Shenzhen Huatongwei International Inspection Co., Ltd.
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TEST REPORT

Report Reference No. ..... :	**TRE1612006302**	R/C…….: 89392
FCC ID ..... :	**2AAA6-S471**	
Applicant's name ..... :	**SENWA MEXICO,S.A.DE C.V**	
Address.....:	Av. Javier Barros Sierra 540,Torre I, Piso 5; COL. LOMAS DE SANTA FE DELEGACION ALVARO OBREGON C.P. 01210 MEXICO,DISTRITO FEDERAL	
Manufacturer.....:	Senwa Mobile HK ltd	
Address.....:	Room 910, International Trade Centre 11-19 Sha Tsui Road, Tsuen Wan, NT, HK	
Test item description ..... :	Mobile Phone	
Trade Mark .....:	SENWA	
Model/Type reference.....:	S471	
Listed Model(s) .....:	-	
Standard ..... :	**FCC CFR Title 47 Part 15 Subpart C Section 15.247**	
Date of receipt of test sample……..:	Dec. 09, 2016	
Date of testing……:	Dec. 09, 2016 - Dec. 16, 2016	
Date of issue……..:	Dec. 18, 2016	
Result..... ……..:	**PASS**	

Compiled by (position+printedname+signature)...:	File administrators Becky Liang	Becky Liang
Supervised by (position+printedname+signature)....:	Project Engineer Lion Cai	Lion Cai
Approved by (position+printedname+signature)....:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Contents

1. APPLICABLE STANDARDS ANDTEST DESCRIPTION

1.1. Applicable Standards

The tests were performed according to following standards:
FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10-2013:AmericanNationalStandardforTestingUnlicensedWirelessDevices

KDB558074 D01 V03R05: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS)

1.2. Test Description

ReportSection	Test Item	FCC Rule	Result
4.1	Antenna requirement	15.203/15.247 (c)	Pass
4.2	Line Conducted Emission (AC Main)	15.207	Pass
4.3	Conducted Peak Output Power	15.247 (b)(3)	Pass
4.4	Power Spectral Density	15.247 (e)	Pass
4.5	6dB Bandwidth	15.247 (a)(2)	Pass
4.6	Restricted band	15.247(d)/15.205	Pass
4.7/4.8	Spurious Emission	15.247(d)/15.209	Pass

Remark: The measurement uncertainty is not included in the test result.

2. SUMMARY

2.1. Client Information

Applicant:	SENWA MEXICO,S.A.DE C.V
Address:	Av. Javier Barros Sierra 540,Torre I, Piso 5; COL. LOMAS DE SANTA FE DELEGACION ALVARO OBREGON C.P. 01210 MEXICO,DISTRITO FEDERAL
Manufacturer:	Senwa Mobile HK ltd
Address:	Room 910, International Trade Centre 11-19 Sha Tsui Road, Tsuen Wan, NT, HK

2.2. Product Description

Name of EUT	Mobile Phone
Trade Mark:	SENWA
Model No.:	S471
Listed Model(s):	-
IMEI :	352436080000995
Power supply:	DC 3.7V From internal battery
Adapter information:	Model: S471 Input: 100-240Va.c., 50-60Hz, 0.15A Output: 5Vd.c., 500mA
WIFI	
Supported type:	802.11b/802.11g/802.11n(H20)
Modulation:	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n(H20): OFDM (BPSK / QPSK / 16QAM / 64QAM)
Operation frequency:	802.11b/g/n(H20): 2412MHz~2462MHz
Channel number:	802.11b/g/n(H20): 11
Channel separation:	5MHz
Antenna type:	Integral Antenna
Antenna gain:	1.4 dBi

2.3. Operation state

◆ **Test frequency list**

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

802.11b/g/n(H20)	
Channel	Frequency (MHz)
01	2412
02	2417
03	2422
⋮	⋮
06	2437
⋮	⋮
09	2452
10	2457
11	2462

◆ **Data Rated**

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	datarate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	6.5Mbps

◆ **Test mode**

For RF test items:

the engineering test program was provided and enabled to make EUT continuous transmit/receive. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

For AC power line conducted emissions:

the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

		Length (m) :	/
		Shield :	/
		Detachable :	/
		Manufacturer :	/
		Model No. :	/

2.5. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Laboratory:Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Phone: 86-755-26748019 Fax: 86-755-26748089

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225
Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories
(identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

A2LA-Lab Cert. No. 3902.01
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2016.

FCC-Registration No.: 317478
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

IC-Registration No.: 5377A&5377B
The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.
Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

ACA
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

3.3. Equipments Used during the Test

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	11/13/2016
2	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	11/13/2016
3	EMI TEST Software	Audix	E3	N/A	N/A
4	TURNTABLE	ETS	2088	2149	N/A
5	ANTENNA MAST	ETS	2075	2346	N/A
6	EMI TEST Software	Rohde&Schwarz	ESK1	N/A	N/A
7	HORNANTENNA	ShwarzBeck	9120D	1011	11/13/2016
8	Amplifer	Sonoma	310N	E009-13	11/13/2016
9	JS amplifer	Rohde&Schwarz	JS4-00101800-28-5A	F201504	11/13/2016
10	High pass filter	Compliance Direction systems	BSU-6	34202	11/13/2016
11	HORNANTENNA	ShwarzBeck	9120D	1012	11/13/2016
12	Amplifer	Compliance Direction systems	PAP1-4060	120	11/13/2016
13	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	11/13/2016
14	TURNTABLE	MATURO	TT2.0	----	N/A
15	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
16	Horn Antenna	SCHWARZBECK	BBHA9170	25841	11/13/2016
17	ULTRA-BROADBAND ANTENNA	Rohde&Schwarz	HL562	100015	11/13/2016

Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	11/13/2016
2	Power Meter	Anritsu	ML2480B	100798	11/13/2016
3	Power Sensor	Anritsu	MA2411B	100258	11/13/2016

The Cal.Interval was one year

3.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
lative Humidity:	30~60 %
Air Pressure:	950~1050mba

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	MeasurementUncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emissio 1~18GHz	5.16 dB	(1)
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4. TEST CONDITIONS AND RESULTS

4.1. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

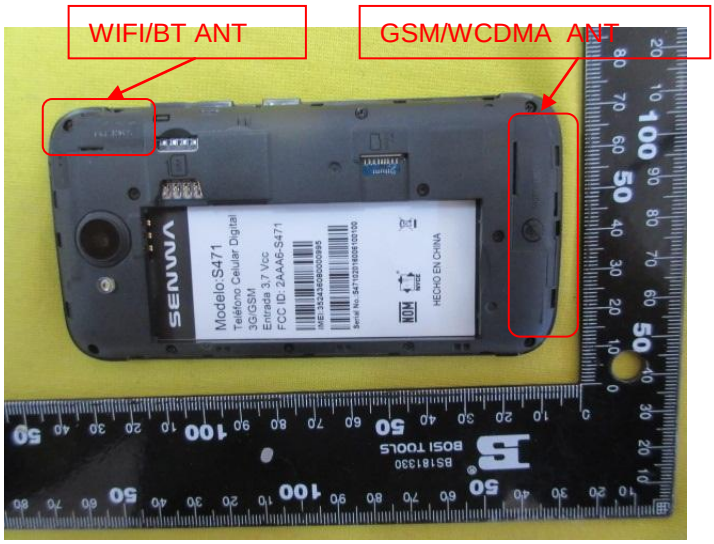
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result:

The antenna is integral antenna, the best case gain of the antenna is1.4dBi.



4.2. Conducted Emission (AC Main)

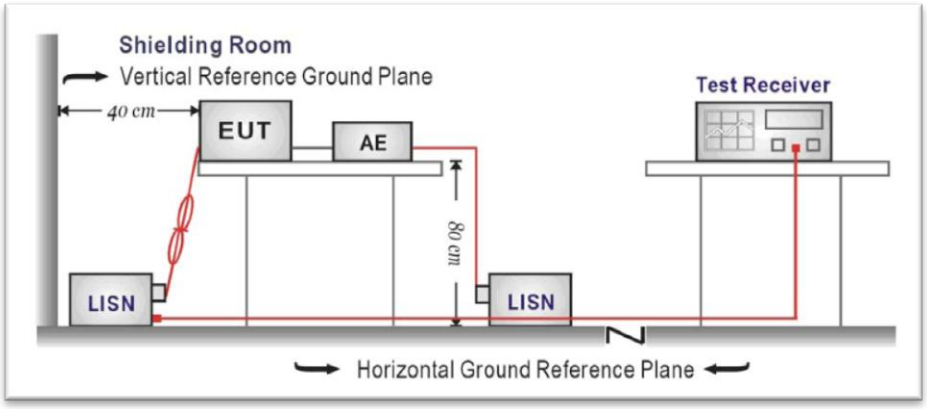
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION

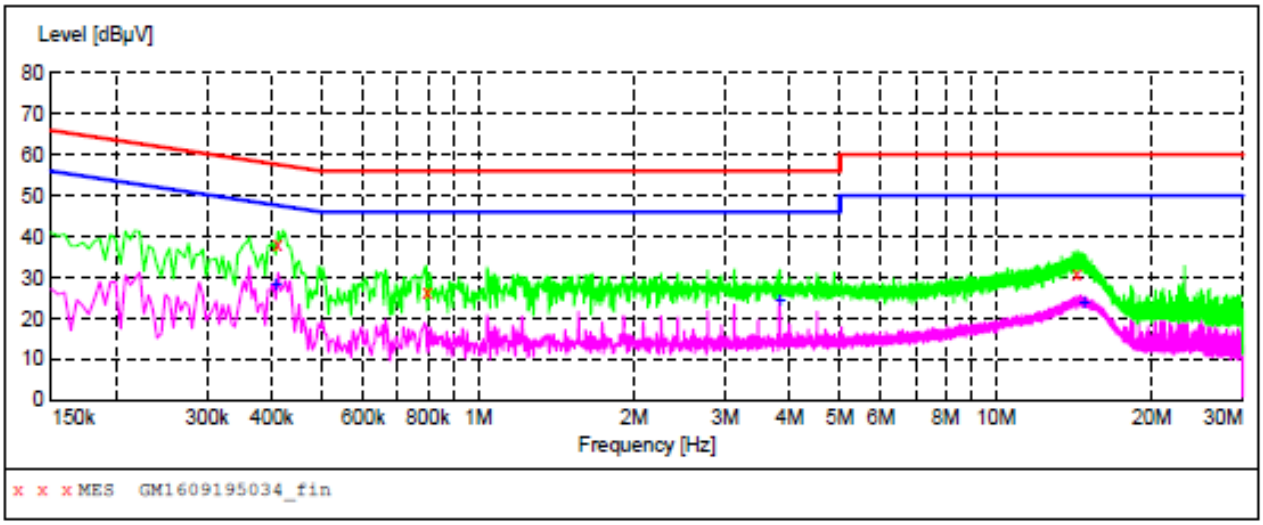


TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above theconducting ground plane. The vertical conducting plane was located 40 cm to the rear of theEUT. All other surfaces of EUT were at least 80 cm from any other grounded conductingsurface.
3. The EUT and simulators are connected to the main power through a line impedancestabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for themeasuring equipment.
4. The peripheral devices are also connected to the main power through aLISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were foldedback and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHzusing a receiver bandwidth of 9 kHz.

TEST RESULTS

Test mode:AC 120V	WIFI	Polarization	L



MEASUREMENT RESULT: "GM1609195034_fin"

12/12/2016 5:51PM

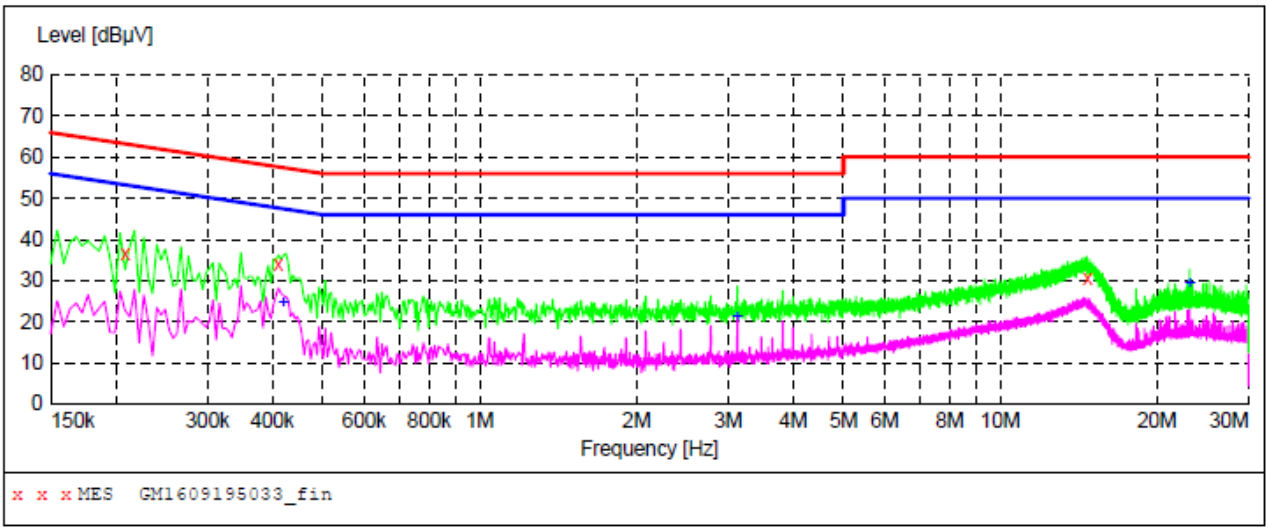
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.411000	38.40	10.2	58	19.2	QP	L1	GND
0.798000	26.40	10.2	56	29.6	QP	L1	GND
14.352000	30.70	10.7	60	29.3	QP	L1	GND

MEASUREMENT RESULT: "GM1609195034_fin2"

12/12/2016 5:51PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.406500	28.60	10.2	48	19.1	AV	L1	GND
3.822000	24.50	10.4	46	21.5	AV	L1	GND
14.806500	24.00	10.7	50	26.0	AV	L1	GND

Test mode: AC 120V	WIFI	Polarization	N



MEASUREMENT RESULT: "GM1609195033_fin"

12/12/2016 5:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.208500	36.70	10.2	63	26.6	QP	N	GND
0.411000	33.90	10.2	58	23.7	QP	N	GND
14.716500	30.60	10.7	60	29.4	QP	N	GND

MEASUREMENT RESULT: "GM1609195033_fin2"

12/12/2016 5:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.420000	24.70	10.2	47	22.7	AV	N	GND
3.124500	21.20	10.4	46	24.8	AV	N	GND
23.127000	29.40	10.8	50	20.6	AV	N	GND

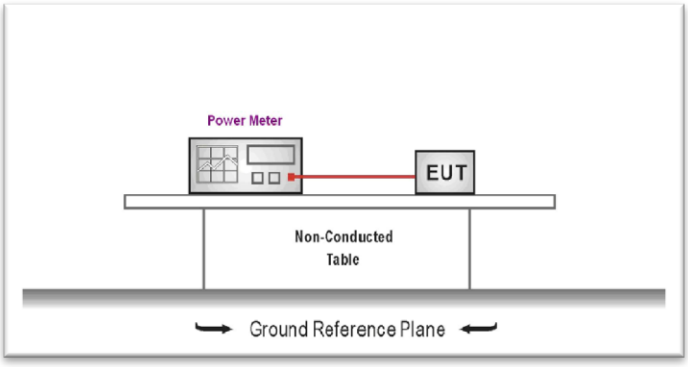
Remark:Transd=Cable lose+PULSE LIMITER factor+ARTIFICIAL MAINS factor;Margin=Limit-Level

4.3. Conducted Peak Output Power

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): **30dBm**

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10: 2013 for compliance to FCC 47CFR 15.247requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
4. Record the measurement data.

TEST RESULTS

Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11b	01	17.32	30.00	Pass
	06	17.52		
	11	17.52		
802.11g	01	15.64	30.00	Pass
	06	15.89		
	11	16.34		
802.11n(H20)	01	12.87	30.00	Pass
	06	13.16		
	11	13.68		

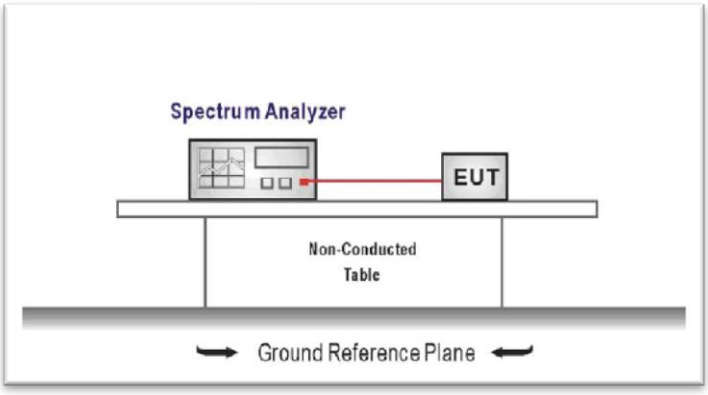
4.4. Power Spectral Density

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e): **8dBm/3KHz**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST CONFIGURATION



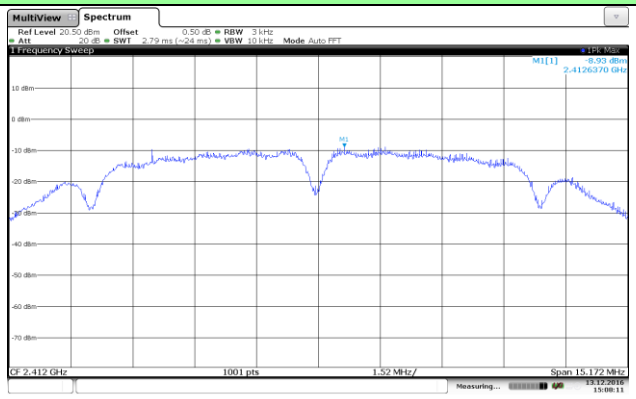
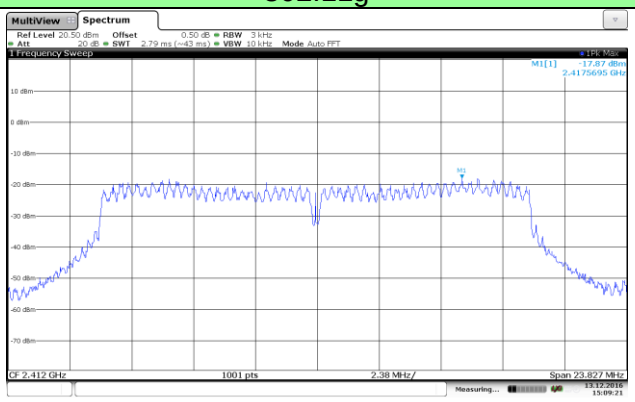
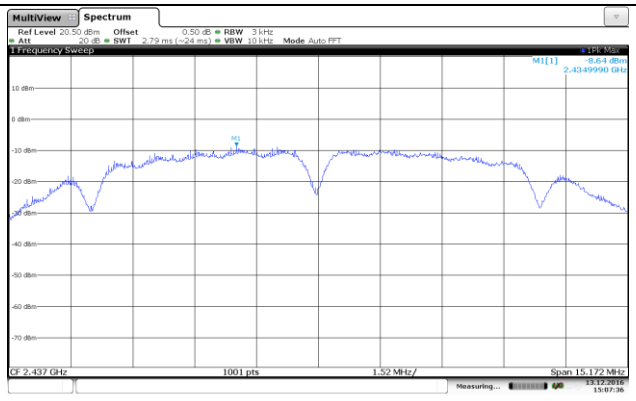
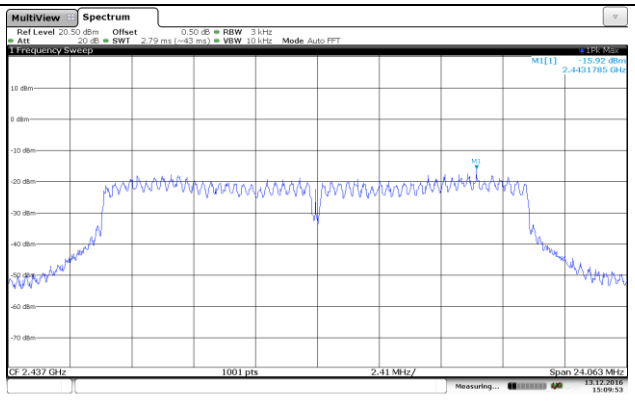
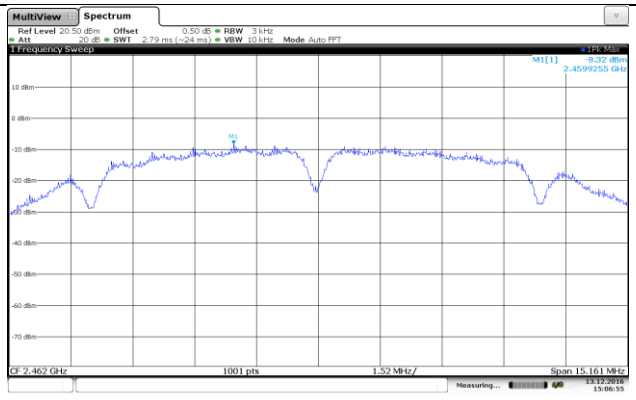
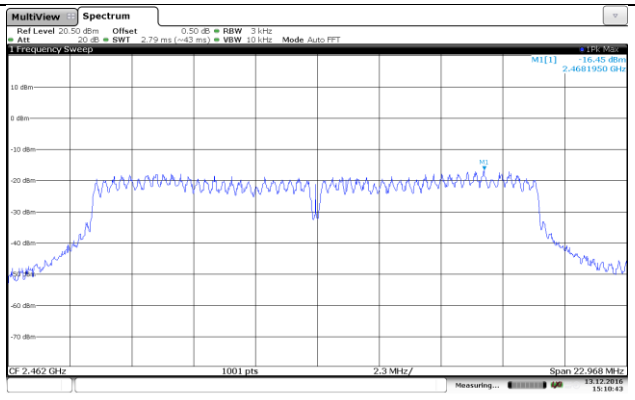
TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configurethe spectrum analyzer as shown below:
   Center frequency=DTS channel center frequency
   Span =1.5 times the DTS bandwidth
   RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × RBW
   Sweep time = auto couple
   Detector = peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

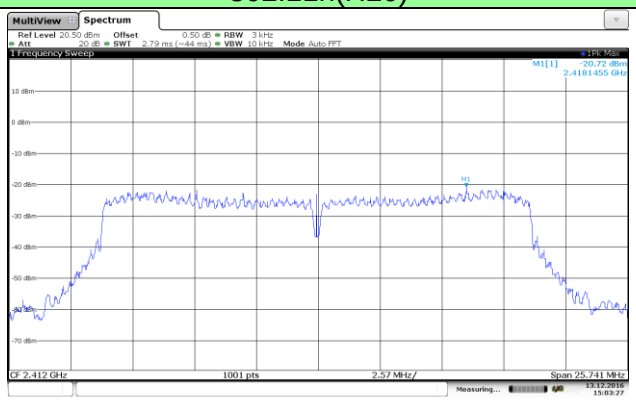
TEST RESULTS

Type	Channel	Power Spectral Density(dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-8.93	8.00	Pass
	06	-8.64		
	11	-8.32		
802.11g	01	-17.87	8.00	Pass
	06	-15.92		
	11	-16.45		
802.11n(H20)	01	-20.72	8.00	Pass
	06	-20.65		
	11	-20.35		

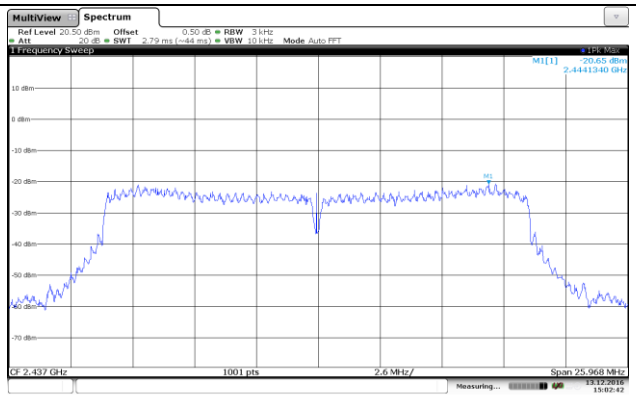
Test plot as follows:

802.11b	802.11g
	
CH01	*CH01*
	
CH06	*CH06*
	
CH11	*CH11*

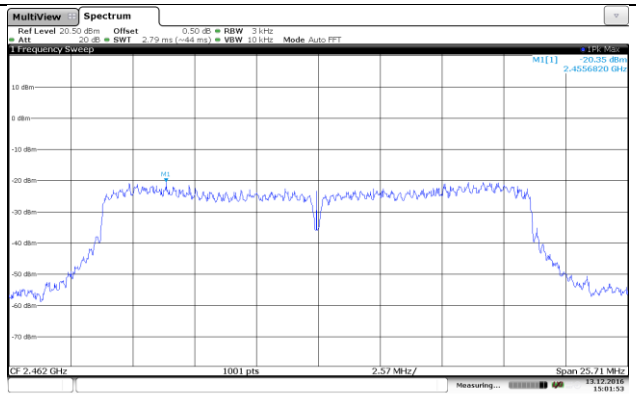
802.11n(H20)



CH01



CH06



CH11

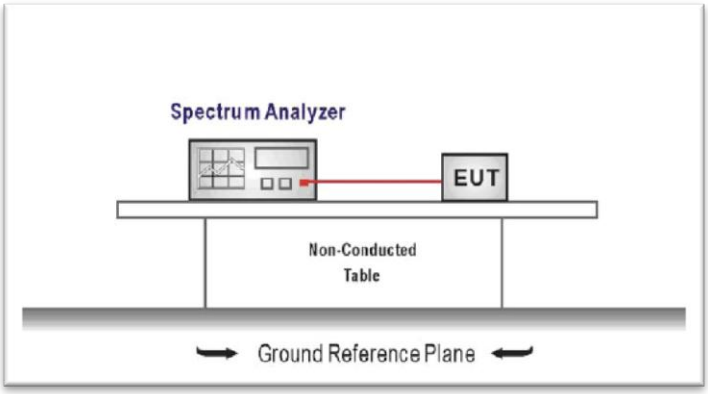
4.5. 6dB bandwidth

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2): **at least 500KHz**

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST CONFIGURATION



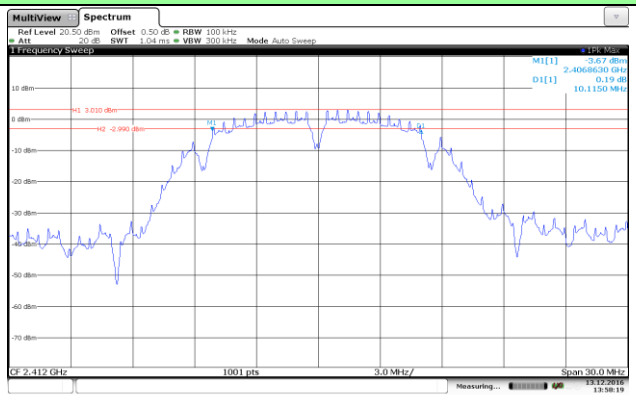
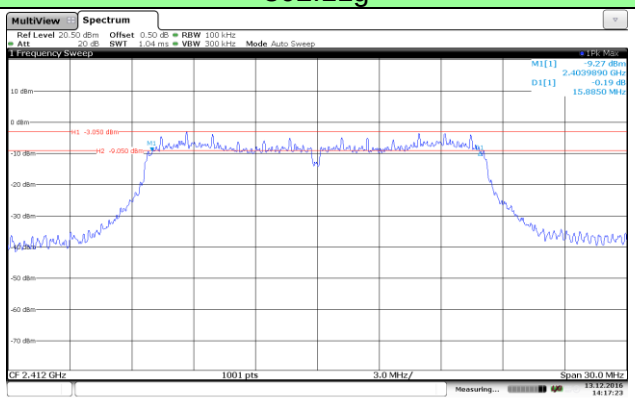
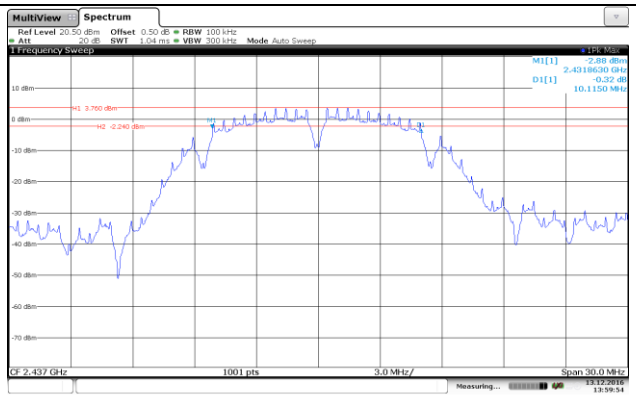
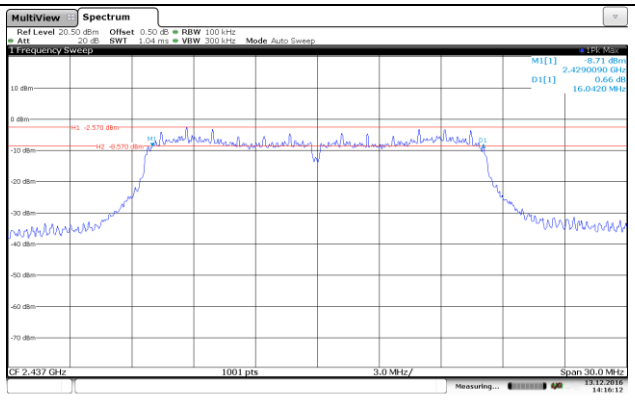
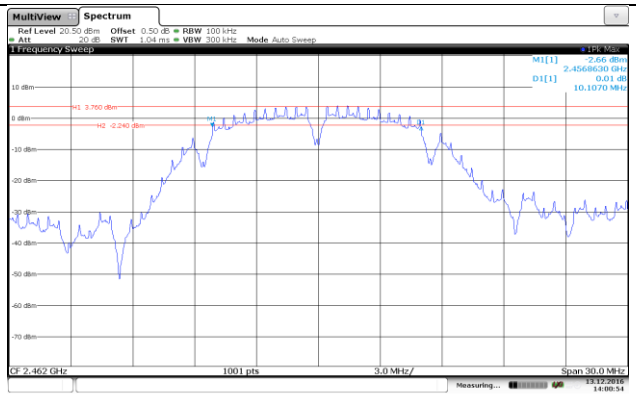
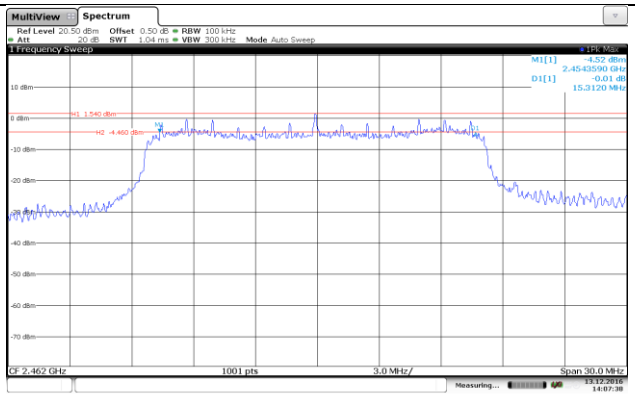
TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output andthe spectrum analyzer).
   Center Frequency =DTS channel center frequency
   Span=2 x DTS bandwidth
   RBW = 100 kHz, VBW ≥ 3 × RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. 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, andrecord the pertinent measurements.

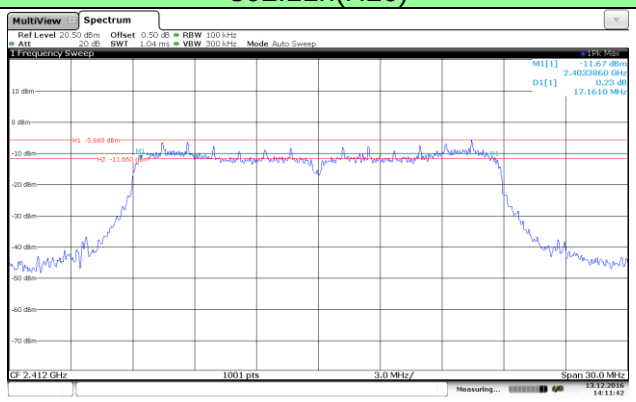
TEST RESULTS

Type	Channel	6dB Bandwidth(MHz)	Limit (KHz)	Result
802.11b	01	10.12	⩾500	Pass
	06	10.12		
	11	10.11		
802.11g	01	15.89	⩾500	Pass
	06	16.04		
	11	15.31		
802.11n(H20)	01	17.16	⩾500	Pass
	06	17.31		
	11	17.14		

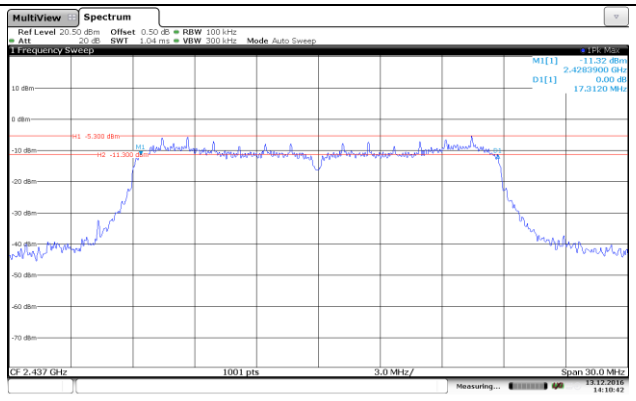
Test plot as follows:

802.11b	802.11g
	
CH01	*CH01*
	
CH06	*CH06*
	
CH11	*CH11*

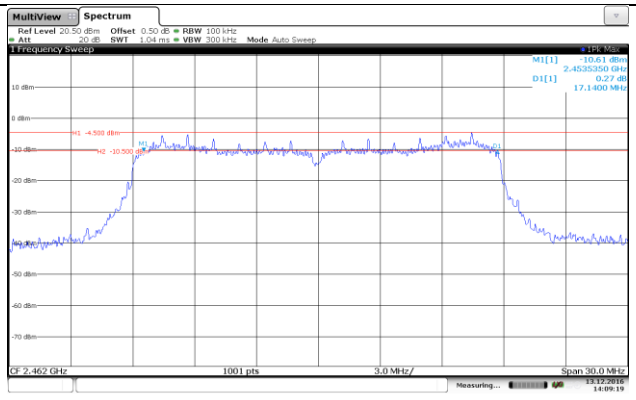
802.11n(H20)



CH01



CH06



CH11

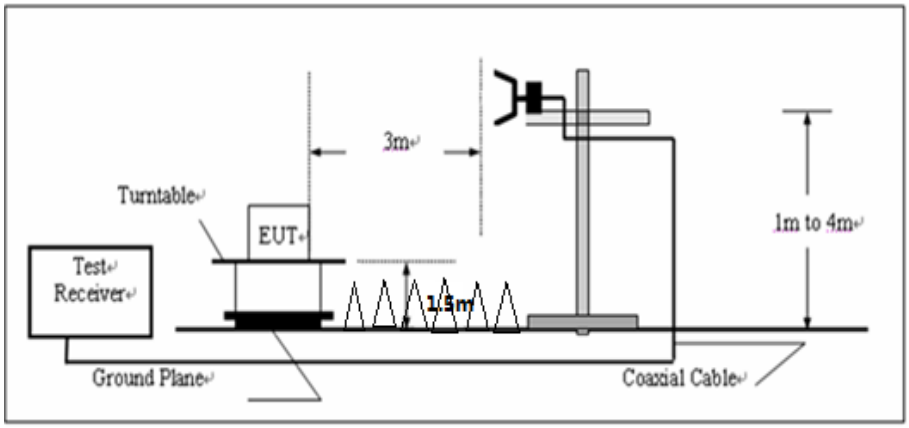
4.6. Restricted band

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated360 degrees to determine the position of the maximum emission level.
3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
   RBW=1MHz, VBW=3MHz for Peak value
   RBW=1MHz, VBW=10Hz for Average value.
6. Pre-scan 2310-2390MHz,2483.5-2500MHz,and only mark the worst case data in the test report

TEST RESULTS

CH01 for 802.11b									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2310.00	18.63	27.27	6.62	0.00	52.52	74.00	-21.48	Vertical	Peak
2390.01	17.72	27.53	6.75	0.00	52.00	74.00	-22.00	Vertical	
2310.00	17.59	27.27	6.62	0.00	51.48	74.00	-22.52	Horizontal	
2390.01	17.44	27.53	6.75	0.00	51.72	74.00	-22.28	Horizontal	
2310.00	10.96	27.27	6.62	0.00	44.85	54.00	-9.15	Vertical	Average
2390.01	10.58	27.53	6.75	0.00	44.86	54.00	-9.14	Vertical	
2310.00	10.98	27.27	6.62	0.00	44.87	54.00	-9.13	Horizontal	
2390.01	10.61	27.53	6.75	0.00	44.89	54.00	-9.11	Horizontal	

CH11 for 802.11b									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2483.50	18.56	27.85	6.83	0.00	53.24	74.00	-20.76	Vertical	Peak
2500.00	17.34	27.90	6.84	0.00	52.08	74.00	-21.92	Vertical	
2483.50	21.54	27.85	6.83	0.00	56.22	74.00	-17.78	Horizontal	
2500.00	18.49	27.90	6.84	0.00	53.23	74.00	-20.77	Horizontal	
2483.50	14.77	27.85	6.83	0.00	49.45	54.00	-4.55	Vertical	Average
2500.00	10.68	27.90	6.84	0.00	45.42	54.00	-8.58	Vertical	
2483.50	15.54	27.85	6.83	0.00	50.22	54.00	-3.78	Horizontal	
2500.00	10.68	27.90	6.84	0.00	45.42	54.00	-8.58	Horizontal	

CH01 for 802.11g									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2310.00	17.47	27.27	6.62	0.00	51.36	74.00	-22.64	Vertical	Peak
2390.01	17.91	27.53	6.75	0.00	52.19	74.00	-21.81	Vertical	
2310.00	18.06	27.27	6.62	0.00	51.95	74.00	-22.05	Horizontal	
2390.01	18.34	27.53	6.75	0.00	52.62	74.00	-21.38	Horizontal	
2310.00	10.96	27.27	6.62	0.00	44.85	54.00	-9.15	Vertical	Average
2390.01	10.56	27.53	6.75	0.00	44.84	54.00	-9.16	Vertical	
2310.00	11.00	27.27	6.62	0.00	44.89	54.00	-9.11	Horizontal	
2390.01	10.57	27.53	6.75	0.00	44.85	54.00	-9.15	Horizontal	

CH11 for 802.11g									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2483.50	18.63	27.85	6.83	0.00	53.31	74.00	-20.69	Vertical	Peak
2500.00	17.74	27.90	6.84	0.00	52.48	74.00	-21.52	Vertical	
2483.50	17.86	27.85	6.83	0.00	52.54	74.00	-21.46	Horizontal	
2500.00	17.56	27.90	6.84	0.00	52.30	74.00	-21.70	Horizontal	
2483.50	11.35	27.85	6.83	0.00	46.03	54.00	-7.97	Vertical	Average
2500.00	10.55	27.90	6.84	0.00	45.29	54.00	-8.71	Vertical	
2483.50	12.53	27.85	6.83	0.00	47.21	54.00	-6.79	Horizontal	
2500.00	10.55	27.90	6.84	0.00	45.29	54.00	-8.71	Horizontal	

CH01 for 802.11n(H20)									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2310.00	18.52	27.27	6.62	0.00	52.41	74.00	-21.59	Vertical	Peak
2390.01	18.10	27.53	6.75	0.00	52.38	74.00	-21.62	Vertical	
2310.00	17.89	27.27	6.62	0.00	51.78	74.00	-22.22	Horizontal	
2390.01	17.87	27.53	6.75	0.00	52.15	74.00	-21.85	Horizontal	
2310.00	10.99	27.27	6.62	0.00	44.88	54.00	-9.12	Vertical	Average
2390.01	10.60	27.53	6.75	0.00	44.88	54.00	-9.12	Vertical	
2310.00	11.00	27.27	6.62	0.00	44.89	54.00	-9.11	Horizontal	
2390.01	10.62	27.53	6.75	0.00	44.90	54.00	-9.10	Horizontal	

CH11 for 802.11n(H20)									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2483.50	17.21	27.85	6.83	0.00	51.89	74.00	-22.11	Vertical	Peak
2500.00	16.79	27.90	6.84	0.00	51.53	74.00	-22.47	Vertical	
2483.50	17.00	27.85	6.83	0.00	51.68	74.00	-22.32	Horizontal	
2500.00	17.76	27.90	6.84	0.00	52.50	74.00	-21.50	Horizontal	
2483.50	11.82	27.85	6.83	0.00	46.50	54.00	-7.50	Vertical	Average
2500.00	10.55	27.90	6.84	0.00	45.29	54.00	-8.71	Vertical	
2483.50	13.39	27.85	6.83	0.00	48.07	54.00	-5.93	Horizontal	
2500.00	10.56	27.90	6.84	0.00	45.30	54.00	-8.70	Horizontal	

Note:Level=Read+Antenna Factor+Cable Loss-Preamp Factor

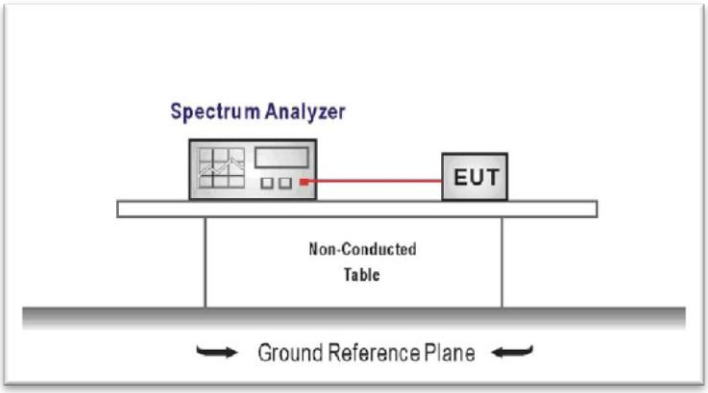
4.7. Band edge and Spurious Emission (conducted)

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

TEST CONFIGURATION



TEST PROCEDURE

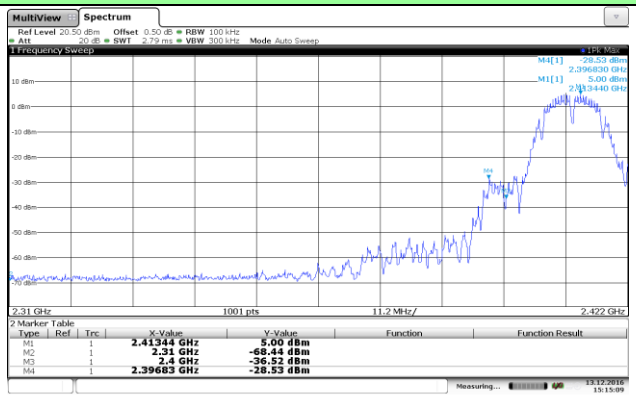
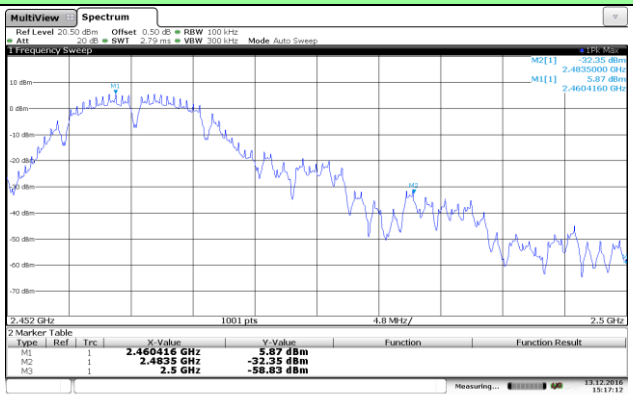
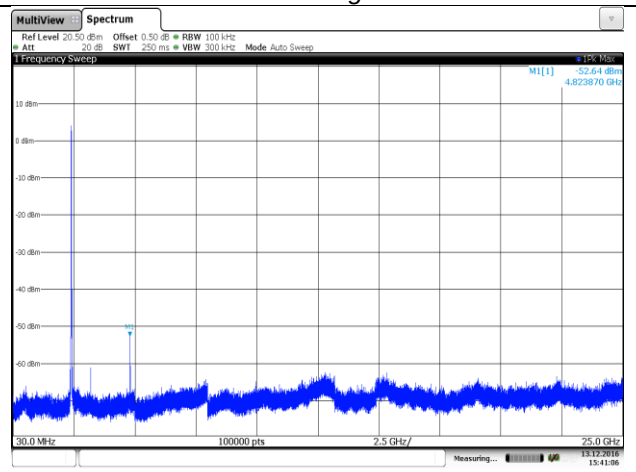
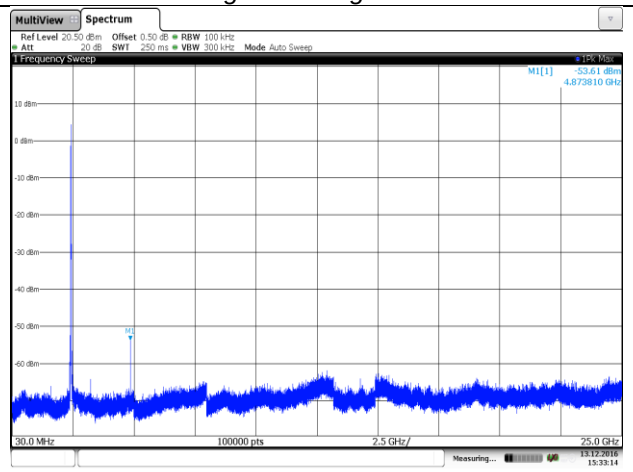
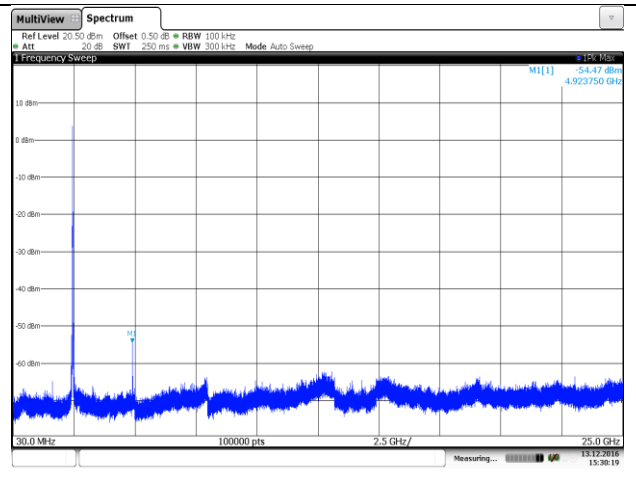
1. Connect the antenna port(s) to the spectrum analyzer input.
2. **Establish a reference level by using the following procedure**
   Center frequency=DTS channel center frequency
   The span = 1.5 times the DTS bandwidth.
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum PSD level

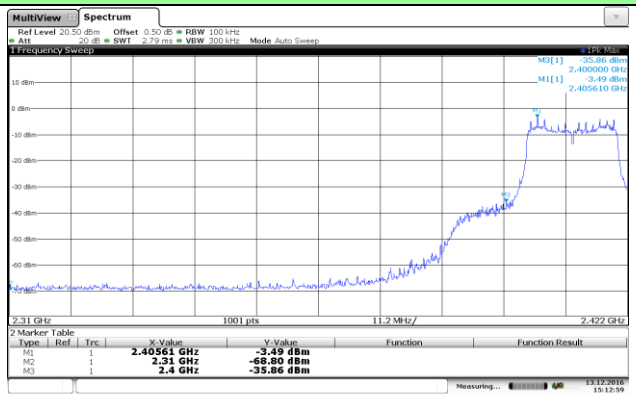
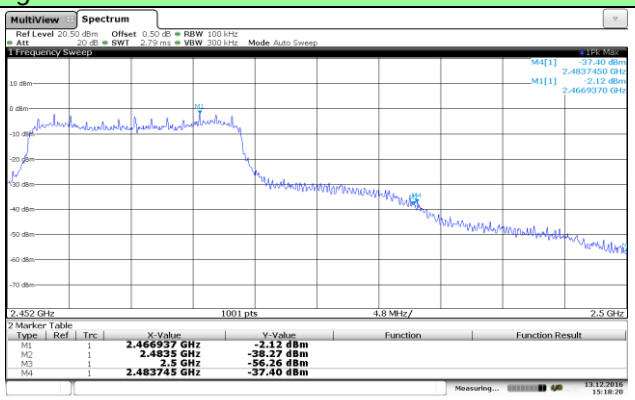
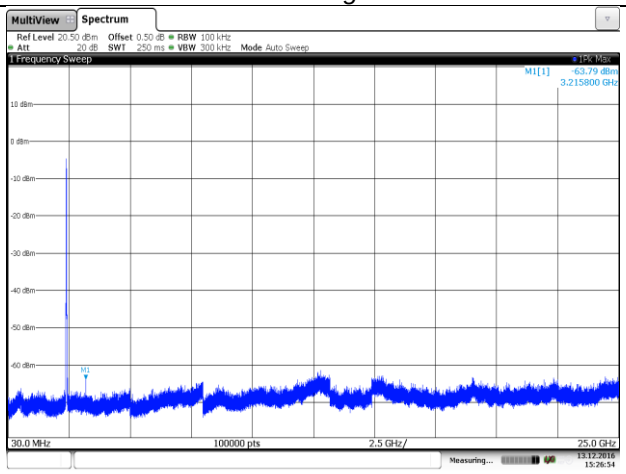
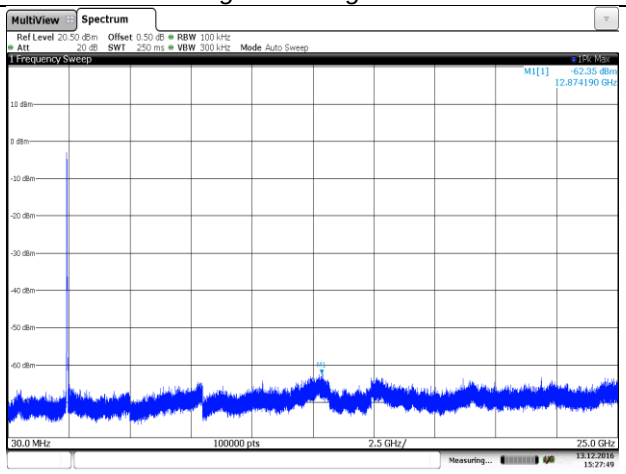
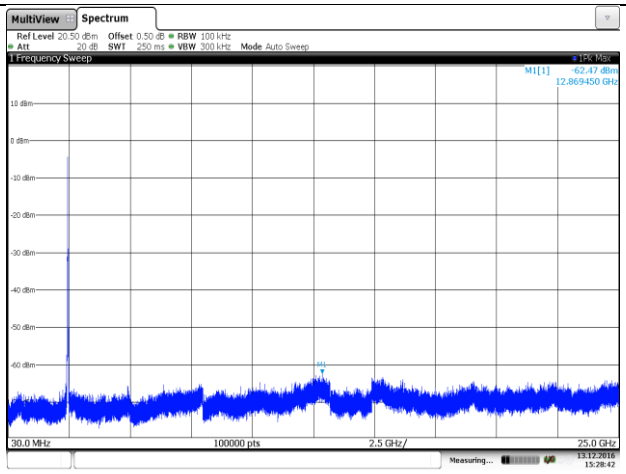
   Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

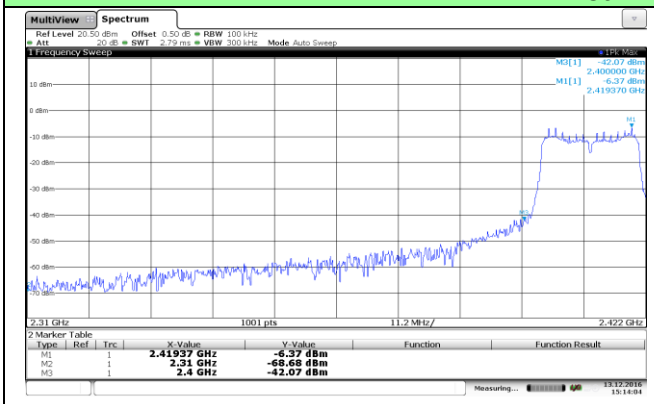
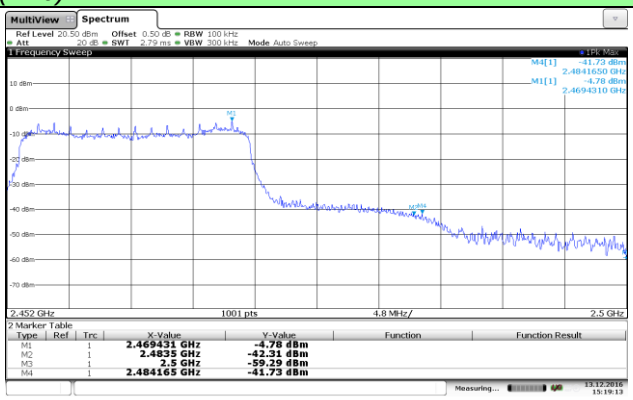
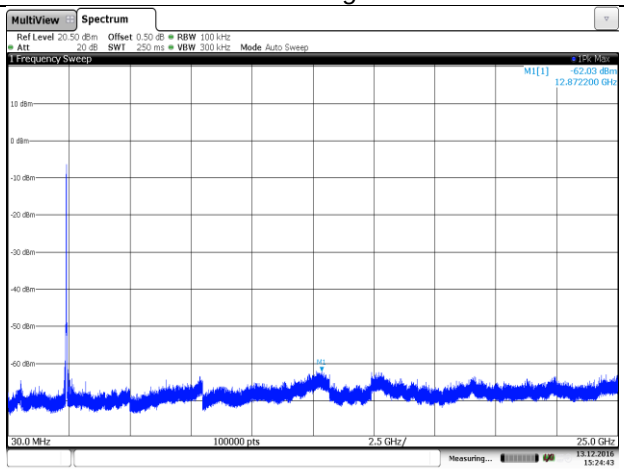
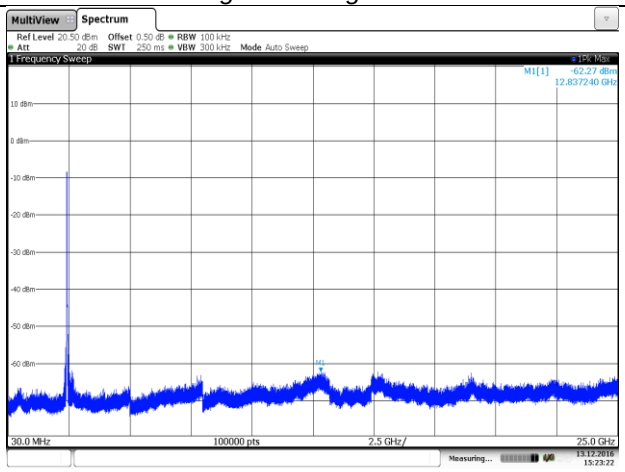
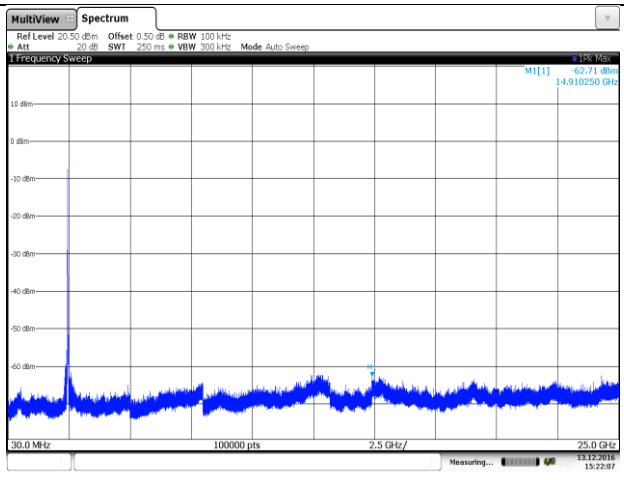
3. **Emission level measurement**
   Set the center frequency and span to encompass frequency range to be measured
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emissions relative to the limit.

TEST RESULTS

Test plot as follows:

802.11b	
	
Low bandedge Plot	*High bandedge Plot*
	
CH01	*CH06*
	
CH11	

802.11g	
	
Low bandedge Plot	*High bandedge Plot*
	
CH01	*CH06*
	
CH11	

802.11n(H20)	
	
Low bandedge Plot	*High bandedge Plot*
	
CH01	*CH06*
	
CH11	

4.8. Spurious Emission (radiated)

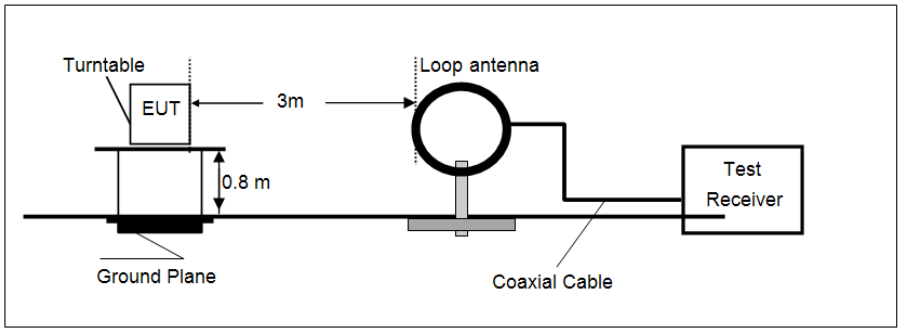
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

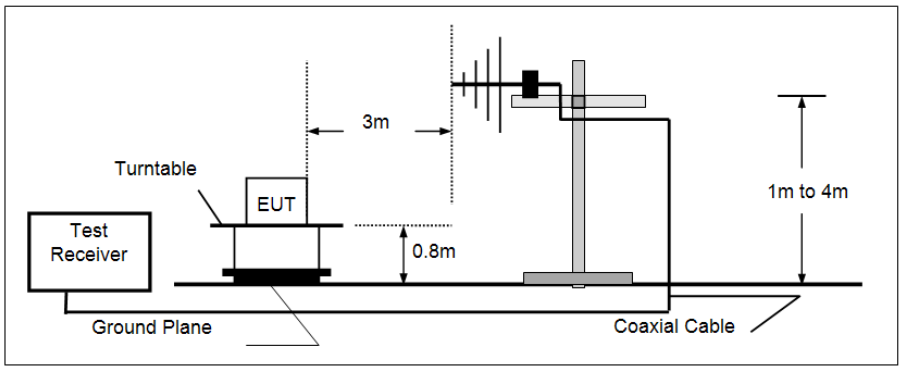
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

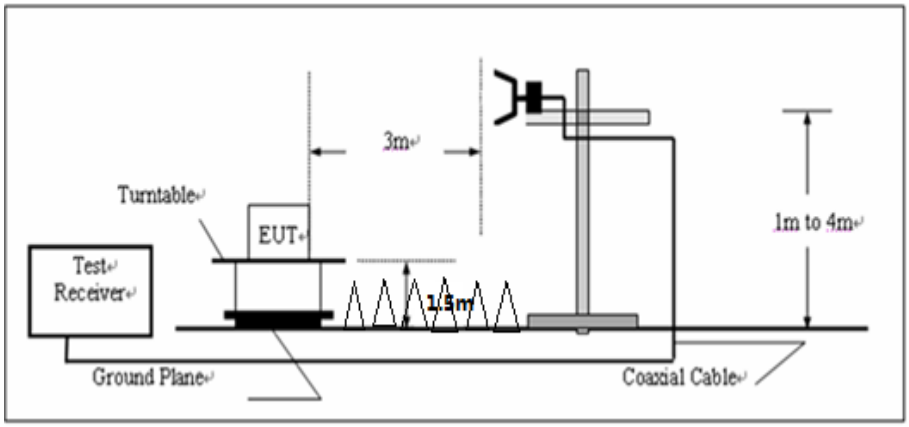
- 9KHz ~30MHz



- 30MHz ~ 1GHz



- Above 1GHz



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1GHz,and 1.5m for above 1GHz. The turn table is rotated360 degrees to determine the position of the maximum emission level.
3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. Use the following spectrum analyzer settings
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Below 1GHz, RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold; *If the emission level of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, theemission measurement will be repeated using the quasi-peak detector and reported.*
   (3) Above 1GHz, RBW=1MHz, VBW=3MHz for Peak value
   RBW=1MHz, VBW=10Hz for Average value.

TEST RESULTS

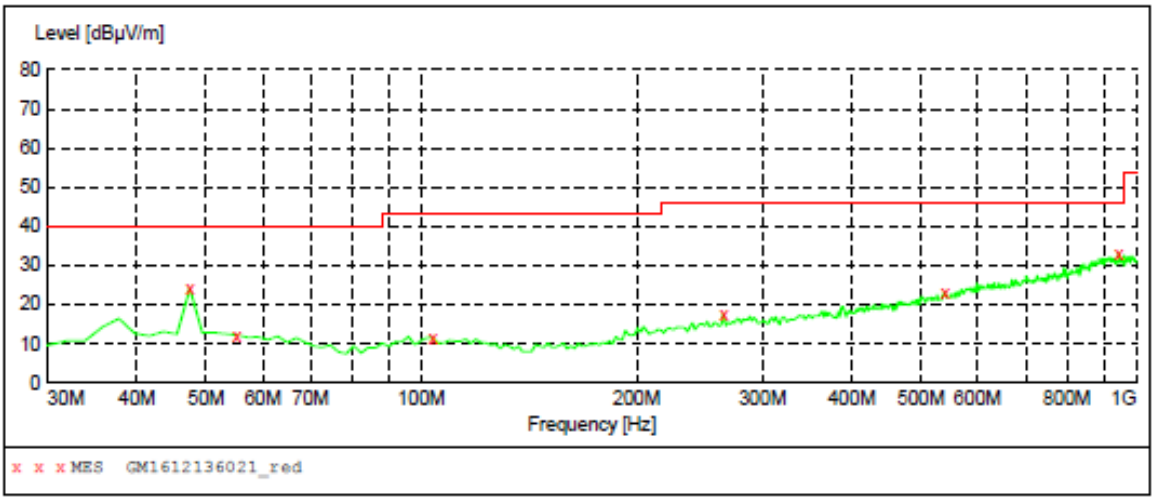
Noted:
Below 1GHz,Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

Measurement data:

■ **9kHz ~ 30MHz**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

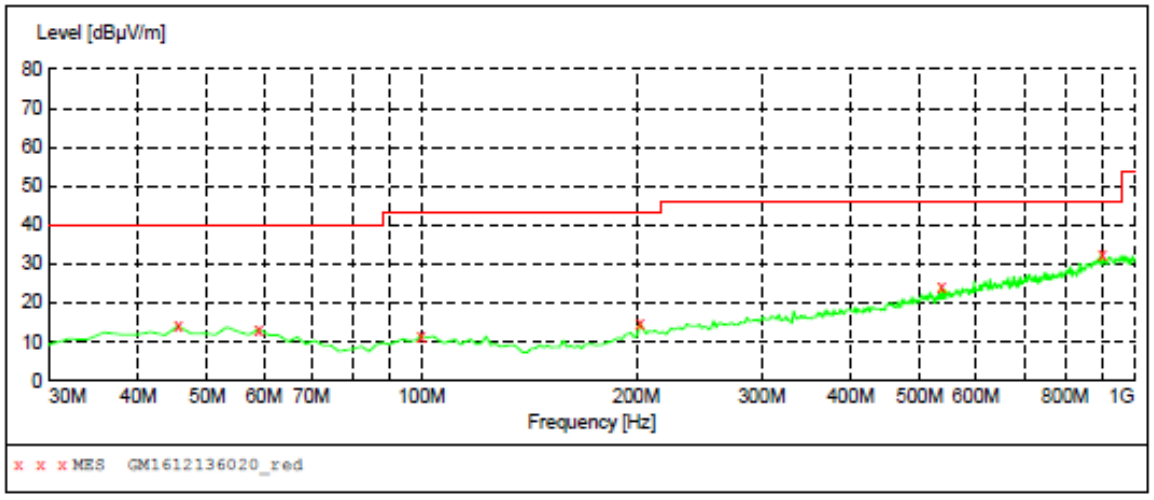
■ **30MHz ~ 1GHz**



MEASUREMENT RESULT: "GM1612136021_red"

12/13/2016 10:42AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	24.10	-16.3	40.0	15.9	QP	300.0	360.00	HORIZONTAL
55.220000	12.20	-16.7	40.0	27.8	QP	300.0	71.00	HORIZONTAL
103.720000	11.60	-17.5	43.5	31.9	QP	100.0	0.00	HORIZONTAL
264.740000	17.50	-13.9	46.0	28.5	QP	100.0	71.00	HORIZONTAL
540.220000	23.10	-6.5	46.0	22.9	QP	100.0	282.00	HORIZONTAL
945.680000	33.20	1.6	46.0	12.8	QP	300.0	263.00	HORIZONTAL



MEASUREMENT RESULT: "GM1612136020_red"

12/13/2016 10:39AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.520000	14.00	-16.5	40.0	26.0	QP	100.0	253.00	VERTICAL
59.100000	13.30	-17.1	40.0	26.7	QP	100.0	356.00	VERTICAL
99.840000	11.60	-17.4	43.5	31.9	QP	100.0	171.00	VERTICAL
202.660000	14.90	-15.9	43.5	28.6	QP	100.0	0.00	VERTICAL
536.340000	23.90	-6.6	46.0	22.1	QP	100.0	3.00	VERTICAL
901.060000	32.40	1.2	46.0	13.6	QP	100.0	156.00	VERTICAL

Remark:Transd=Cable lose+Antenna factor-Pre-amplifier;Margin=Limit-Level

Above 1GHz

CH01 for 802.11b									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1286.61	37.97	24.51	4.81	36.52	30.77	74.00	-43.23	Vertical	Peak
1768.62	37.76	25.50	5.90	37.07	32.09	74.00	-41.91	Vertical	
3534.54	38.04	28.77	8.17	38.36	36.62	74.00	-37.38	Vertical	
4559.15	35.31	30.94	9.39	37.30	38.34	74.00	-35.66	Vertical	
5703.86	34.46	32.72	10.44	35.58	42.04	74.00	-31.96	Vertical	
7470.56	34.50	36.18	12.30	34.88	48.10	74.00	-25.90	Vertical	
1326.51	37.03	24.55	4.88	36.50	29.96	74.00	-44.04	Horizontal	
1689.41	38.34	25.27	5.74	36.91	32.44	74.00	-41.56	Horizontal	
4065.71	36.62	29.67	8.83	37.96	37.16	74.00	-36.84	Horizontal	
4821.76	37.17	31.09	9.55	36.90	40.91	74.00	-33.09	Horizontal	
6611.33	33.19	35.24	11.37	35.34	44.46	74.00	-29.54	Horizontal	
8166.69	32.38	36.89	12.69	34.55	47.41	74.00	-26.59	Horizontal	

CH06 for 802.11b									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1195.05	37.25	24.42	4.65	36.57	29.75	74.00	-44.25	Vertical	Peak
1818.84	36.29	25.64	5.99	37.16	30.76	74.00	-43.24	Vertical	
3436.94	36.93	28.68	8.02	38.50	35.13	74.00	-38.87	Vertical	
4700.57	34.61	31.02	9.50	37.09	38.04	74.00	-35.96	Vertical	
6235.36	33.44	34.08	11.01	35.29	43.24	74.00	-30.76	Vertical	
6781.78	31.97	35.49	11.58	35.02	44.02	74.00	-29.98	Vertical	
1213.44	37.20	24.44	4.68	36.56	29.76	74.00	-44.24	Horizontal	Peak
1737.38	37.43	25.41	5.84	37.01	31.67	74.00	-42.33	Horizontal	
3208.66	37.26	28.59	7.73	38.22	35.36	74.00	-38.64	Horizontal	
4524.47	34.88	30.92	9.34	37.35	37.79	74.00	-36.21	Horizontal	
6511.12	32.29	35.10	11.20	35.34	43.25	74.00	-30.75	Horizontal	
8549.59	32.65	37.27	12.88	34.45	48.35	74.00	-25.65	Horizontal	

CH11 for 802.11b									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1182.94	37.94	24.41	4.62	36.58	30.39	74.00	-43.61	Vertical	Peak
1711.05	36.71	25.34	5.79	36.95	30.89	74.00	-43.11	Vertical	
3151.99	37.80	28.56	7.66	38.21	35.81	74.00	-38.19	Vertical	
4366.07	35.56	30.55	9.10	37.58	37.63	74.00	-36.37	Vertical	
5762.24	33.59	32.83	10.53	35.42	41.53	74.00	-32.47	Vertical	
7840.75	31.67	36.54	13.06	34.96	46.31	74.00	-27.69	Vertical	
1293.17	37.08	24.52	4.82	36.52	29.90	74.00	-44.10	Horizontal	
1719.78	37.06	25.37	5.80	36.97	31.26	74.00	-42.74	Horizontal	
3168.08	36.93	28.57	7.68	38.20	34.98	74.00	-39.02	Horizontal	
3681.47	36.94	29.01	8.36	38.25	36.06	74.00	-37.94	Horizontal	
4871.10	36.57	31.13	9.59	36.76	40.53	74.00	-33.47	Horizontal	
6816.39	32.83	35.55	11.62	34.97	45.03	74.00	-28.97	Horizontal	

CH01 for 802.11g									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1207.28	36.98	24.43	4.67	36.57	29.51	74.00	-44.49	Vertical	Peak
1741.81	37.19	25.43	5.85	37.02	31.45	74.00	-42.55	Vertical	
3135.99	37.18	28.56	7.64	38.21	35.17	74.00	-38.83	Vertical	
3690.85	36.91	29.02	8.37	38.25	36.05	74.00	-37.95	Vertical	
4821.76	38.16	31.09	9.55	36.90	41.90	74.00	-32.10	Vertical	
6938.94	32.92	35.72	11.77	34.85	45.56	74.00	-28.44	Vertical	
1162.05	37.44	24.39	4.57	36.59	29.81	74.00	-44.19	Horizontal	
1711.05	38.74	25.34	5.79	36.95	32.92	74.00	-41.08	Horizontal	
3342.04	37.09	28.64	7.89	38.45	35.17	74.00	-38.83	Horizontal	
4138.80	36.00	29.89	8.89	37.79	36.99	74.00	-37.01	Horizontal	
4821.76	40.96	31.09	9.55	36.90	44.70	74.00	-29.3	Horizontal	
7245.81	36.35	36.00	11.91	35.02	49.24	74.00	-24.76	Horizontal	

CH06 for 802.11g									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1251.08	37.09	24.48	4.75	36.54	29.78	74.00	-44.22	Vertical	Peak
1800.42	36.58	25.58	5.96	37.14	30.98	74.00	-43.02	Vertical	
3507.65	37.02	28.72	8.13	38.40	35.47	74.00	-38.53	Vertical	
4883.52	41.32	31.14	9.59	36.73	45.32	74.00	-28.68	Vertical	
6764.54	33.52	35.46	11.56	35.06	45.48	74.00	-28.52	Vertical	
8593.22	32.42	37.34	12.89	34.51	48.14	74.00	-25.86	Vertical	
1263.88	37.11	24.49	4.77	36.53	29.84	74.00	-44.16	Horizontal	
1750.70	37.16	25.46	5.86	37.04	31.44	74.00	-42.56	Horizontal	
3249.76	37.16	28.61	7.78	38.29	35.26	74.00	-38.74	Horizontal	
4444.56	35.17	30.76	9.20	37.49	37.64	74.00	-36.36	Horizontal	
4871.10	38.16	31.13	9.59	36.76	42.12	74.00	-31.88	Horizontal	
7319.96	35.17	36.07	11.99	34.92	48.31	74.00	-25.69	Horizontal	

CH11 for 802.11g									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1207.28	37.44	24.43	4.67	36.57	29.97	74.00	-44.03	Vertical	Peak
1818.84	37.45	25.64	5.99	37.16	31.92	74.00	-42.08	Vertical	
3690.85	37.77	29.02	8.37	38.25	36.91	74.00	-37.09	Vertical	
4933.50	43.04	31.16	9.63	36.59	47.24	74.00	-26.76	Vertical	
6764.54	33.47	35.46	11.56	35.06	45.43	74.00	-28.57	Vertical	
8484.55	33.18	37.20	12.87	34.37	48.88	74.00	-25.12	Vertical	
1165.01	37.85	24.39	4.58	36.59	30.23	74.00	-43.77	Horizontal	
1814.22	36.46	25.62	5.98	37.15	30.91	74.00	-43.09	Horizontal	
3200.50	38.41	28.58	7.72	38.20	36.51	74.00	-37.49	Horizontal	
4310.85	35.90	30.41	9.05	37.60	37.76	74.00	-36.24	Horizontal	
4946.07	42.51	31.17	9.63	36.55	46.76	74.00	-27.24	Horizontal	
7413.73	37.36	36.13	12.11	34.83	50.77	74.00	-23.23	Horizontal	

CH01 for 802.11n(H20)									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1135.73	37.56	24.36	4.52	36.60	29.84	74.00	-44.16	Vertical	Peak
1724.17	37.75	25.37	5.81	36.98	31.95	74.00	-42.05	Vertical	
3241.50	38.18	28.60	7.77	38.27	36.28	74.00	-37.72	Vertical	
4501.49	35.51	30.90	9.30	37.39	38.32	74.00	-35.68	Vertical	
5689.36	33.75	32.72	10.41	35.62	41.26	74.00	-32.74	Vertical	
7527.83	32.84	36.22	12.49	34.92	46.63	74.00	-27.37	Vertical	
1340.09	36.39	24.56	4.90	36.49	29.36	74.00	-44.64	Horizontal	
1724.17	37.75	25.37	5.81	36.98	31.95	74.00	-42.05	Horizontal	
3644.18	37.89	28.94	8.32	38.26	36.89	74.00	-37.11	Horizontal	
4676.70	35.18	31.01	9.49	37.13	38.55	74.00	-35.45	Horizontal	
5940.97	32.99	33.09	10.65	35.41	41.32	74.00	-32.68	Horizontal	
7527.83	32.84	36.22	12.49	34.92	46.63	74.00	-27.37	Horizontal	

CH06 for 802.11n(H20)									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1153.21	37.74	24.38	4.55	36.59	30.08	74.00	-43.92	Vertical	Peak
1842.14	36.99	25.69	6.03	37.17	31.54	74.00	-42.46	Vertical	
3588.94	37.81	28.85	8.25	38.29	36.62	74.00	-37.38	Vertical	
4676.70	35.33	31.01	9.49	37.13	38.70	74.00	-35.30	Vertical	
7027.82	32.40	35.83	11.85	34.83	45.25	74.00	-28.75	Vertical	
8063.40	33.83	36.77	12.45	34.54	48.51	74.00	-25.49	Vertical	
1153.21	37.74	24.38	4.55	36.59	30.08	74.00	-43.92	Horizontal	
1702.36	37.26	25.32	5.77	36.93	31.42	74.00	-42.58	Horizontal	
3498.74	37.78	28.70	8.11	38.41	36.18	74.00	-37.82	Horizontal	
4676.70	35.33	31.01	9.49	37.13	38.70	74.00	-35.30	Horizontal	
6527.71	32.61	35.13	11.23	35.34	43.63	74.00	-30.37	Horizontal	
8063.40	33.83	36.77	12.45	34.54	48.51	74.00	-25.49	Horizontal	

CH11 for 802.11n(H20)									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1238.41	37.63	24.46	4.73	36.55	30.27	74.00	-43.73	Vertical	Peak
1768.62	37.78	25.50	5.90	37.07	32.11	74.00	-41.89	Vertical	
3274.67	38.06	28.61	7.81	38.33	36.15	74.00	-37.85	Vertical	
4310.85	37.71	30.41	9.05	37.60	39.57	74.00	-34.43	Vertical	
5617.41	33.05	32.59	10.30	35.82	40.12	74.00	-33.88	Vertical	
7527.83	33.26	36.22	12.49	34.92	47.05	74.00	-26.95	Vertical	
1216.53	37.00	24.44	4.69	36.56	29.57	74.00	-44.43	Horizontal	
1880.04	37.33	25.79	6.08	37.20	32.00	74.00	-42.00	Horizontal	
3489.84	37.63	28.70	8.10	38.42	36.01	74.00	-37.99	Horizontal	
4310.85	37.71	30.41	9.05	37.60	39.57	74.00	-34.43	Horizontal	
5940.97	33.25	33.09	10.65	35.41	41.58	74.00	-32.42	Horizontal	
7527.83	33.26	36.22	12.49	34.92	47.05	74.00	-26.95	Horizontal	

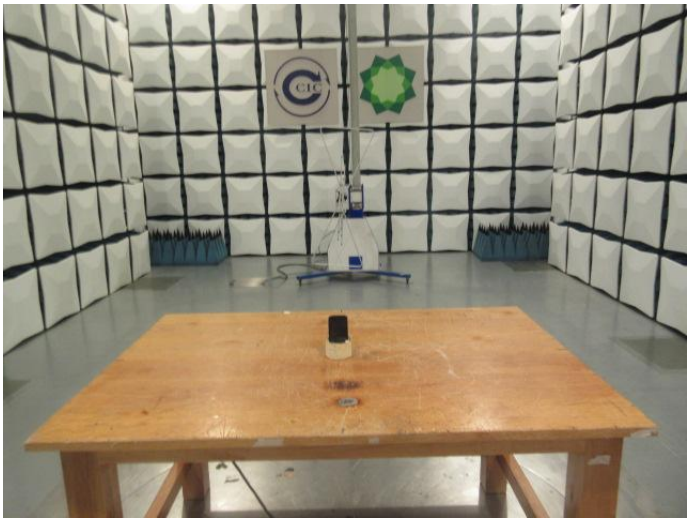
Remark:

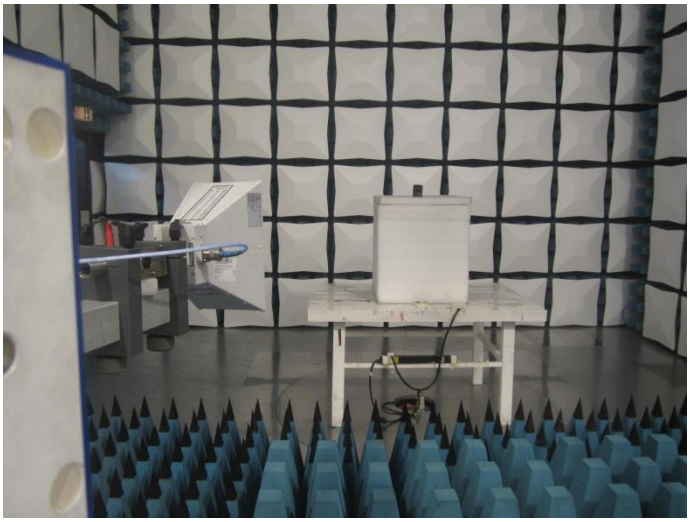
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. The measurement result of peak value is smaller than the AVG Limit, so the AVG value is not show in the test report.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

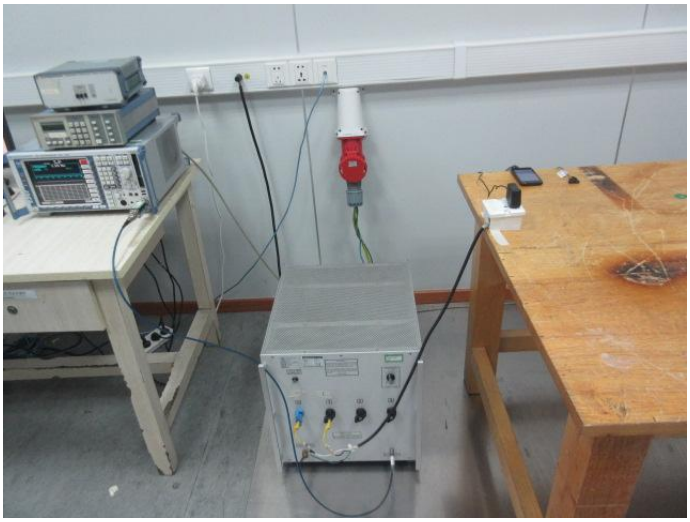
5. Test Setup Photos of the EUT

Radiated Emission





Conducted Emission (AC Mains)



6. External and Internal Photos of the EUT

Reference to Test Report No.: TRE1612006301.

.....End of Report.....