CE Radio Test Report

Equipment	:	Metrolinq Outdoor 60GHz PTP + 5 GHz
Brand Name	:	IgniteNet
Model No.	:	ML-60-35, ML-60-35-1
Standard	:	EN 301 893 V1.8.1 (2015-03)
Frequency Range	:	5470 MHz – 5725 MHz
Applicant	:	Accton Technology Corporation No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
Manufacturer	:	Joy Technology (ShenZhen) Corporation HengKeng Ind., Shangpai, Shangwu,Aiqun Rd., Shiyan Town,Shenzhen 518108 China
Operate Mode	:	Master

The product sample received on Nov. 30, 2015 and completely tested on Jan. 19, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in EN 301 893 V1.8.1 (2015-03) and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Sam Chen
SPORTON INTERNATIONAL INC.

Testing Laboratory
1190

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Summary of Test Result

Harmonized Standard Requirements and Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
3.1	4.2	Carrier Frequencies	**<External antenna>** 3.34 ppm **<Internal antenna>** 3.34 ppm	fc ± 20 ppm	Complied
3.2	4.3	Nominal Channel Bandwidth (NCB) and Occupied Channel Bandwidth (OCB)	**<External antenna>** NCB[MHz], OCB [MHz] NCB[20]: OCB[17.60] NCB[40]: OCB[36.12] NCB[80]: OCB[75.25] **<Internal antenna>** NCB[MHz], OCB [MHz] NCB[20]: OCB[17.60] NCB[40]: OCB[36.12] NCB[80]: OCB[75.25]	NCB ≥ 5 MHz OCB = NCB x [80% ~ 100%]	Complied
3.3	4.4	RF Output Power	**<External antenna>** 26.60dBm **<Internal antenna>** 26.99dBm	EN 301 893 Table 1	Complied
-	4.4	Transmit Power Control (TPC)	w/o test (without TPC function)	EN 301 893 Table 2	-
3.4	4.4	Power Density	**<External antenna>** PD [dBm/MHz]: 13.71 **<Internal antenna>** PD [dBm/MHz]: 13.89	EN 301 893 Table 1	Complied
3.5	4.5.1	Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands	**<External antenna>** 185.20MHz -64.38 dBm (Margin 10.38dB) **<Internal antenna>** 579.99MHz -62.64 dBm (Margin 5.64dB)	EN 301 893 Table 3	Complied
3.6	4.5.2	Transmitter Unwanted Emissions within the 5 GHz RLAN Bands	Device complies with spectral mask – refer to test data	EN 301 893 Figure 1	Complied
4.1	4.6	Receiver Spurious Emissions	**<External antenna>** 164.83MHz -61.68dBm (Margin 4.68dB) **<Internal antenna>** 7373.20MHz -55.27dBm (Margin 8.27dB)	EN 301 893 Table 4	Complied
5.1	4.8	Adaptivity (Channel Access Mechanism)	Adaptivity: Pass SCST: 0.706ms	EN 301 893 Clause 4.8.3 & 4.8.3.3.2	Complied
1.1.7	4.10	Geo-location capability	N/A	EN 301 893 Clause 4.10.2	N/A

Revision History

Report No.	Version	Description	Issued Date
ER5N2614AA	Rev. 01	Initial issue of report	Feb. 22, 2016

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information			
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Frequency (MHz)**	**Channel Number**
5470-5725	a	5500-5700	100-140 [8]
5470-5725	n (HT20)	5500-5700	100-140 [8]
5470-5725	n (HT40)	5510-5670	102-134 [3]
5470-5725	ac (VHT20)	5500-5700	100-140 [8]
5470-5725	ac (VHT40)	5510-5670	102-134 [3]
5470-5725	ac (VHT80)	5530	106 [1]
Note 1: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation. Note 2: 802.11ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.			

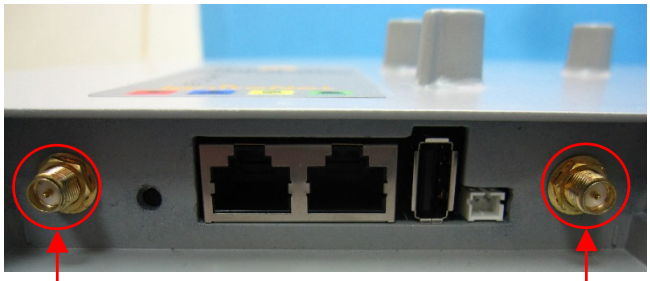
1.1.2 Antenna Information

Ant.	Brand	P/N	Antenna Type	Connector	Antenna Gain (dBi)	Cable Loss (dB)	True Gain (dBi)	Remark
1	IgniteNet	FS5-19N-120	Sector Ant. (PATCH ARRAY)	Type-N	19	1	18	External (5GHz use)

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)		Remark
					5GHz Band 3	60GHz	
2	Accton	123400001084A	Dish Ant.	N/A	17.51	42	Internal (5G&60G use)

Note:
For IEEE 802.11a/n/ac mode (2TX/2RX)
Chain 1 and Chain 2 can be use as transmitting antennas.
Chain 1 and Chain 2 can be used as receiving antennas.

<External antenna>



<Internal antenna>

1.1.3 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle
☐ Operated normally mode for worst duty cycle
☒ Operated test mode for worst duty cycle
Test Signal Duty Cycle (x)
☒ 100.00% - IEEE 802.11a
☒ 100.00% - IEEE 802.11ac (VHT20)
☒ 100.00% - IEEE 802.11ac (VHT40)
☒ 100.00% - IEEE 802.11ac (VHT80)

1.1.4 EUT Information

EUT Power Type	From PoE		
Operating Mode	☒ Master		
	☐ Slave with radar detection		
	☐ Slave without radar detection		
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based	
TPC Function	☐ With TPC	☒ Without TPC	
Weather Band (5600~5650MHz)	☐ With 5600~5650MHz	☒ Without 5600~5650MHz	
Beamforming Function	☐ With beamforming	☒ Without beamforming	
Operational Voltage	☒ Vnom (230 Vac)	☒ Vmax (253 Vac)	☒ Vmin (207 Vac)
Operational Temperature	☒ Tnom (20°C)	☒ Tmax (70°C)	☒ Tmin (-40°C)

1.1.5 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	5GHz	60GHz	Remark
ML-60-35	Internal / Dish Ant.	Internal / Dish Ant.	Outdoor use.
ML-60-35-1	External / Sector Ant.	Internal / Dish Ant.	

Note: For Adaptivity test, only the model: ML-60-35 <Internal antenna> was tested and recorded in the report due to the lowest gain antenna. For others test, both models were tested and recorded in the report.

1.1.6 Adaptive Equipment

Adaptive Equipment		
☒	Adaptive Equipment without the possibility to switch to a non-adaptive mode:	
	☒	The equipment has implemented an LBT based DAA mechanism:
		☐ The equipment is Frame Based equipment
		☒ The equipment is Load Based equipment
		☐ The equipment can switch dynamically between Frame Based and Load Based equipment
	☐	The equipment has implemented an non-LBT based DAA mechanism
	☐	The equipment can operate in more than one adaptive mode
☐	Adaptive Equipment which can also operate in a non-adaptive mode	

1.1.7 Geo-location capability supported by the equipment

Geo-location capability supported by the equipment		
☐	Yes	
	☐	The geographical location determined by the equipment as defined in EN 301 893, clause 4.10.2 is not accessible to the user.
☒	No	

1.2 Accessories

N/A

1.3 Support Equipment

Test Site: TH01-CB (Adaptivity test)

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC
2	Notebook	DELL	E4300	DoC
3	WLAN Dongle	LINKSYS	AE6000	Q87-AE6000
4	PoE	ITE	NU24-F240100-I2	N/A

Test Site: 05CH01-CB and TH01-CB (Other tests)

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	DoC
2	PoE	ITE	NU24-F240100-I2	N/A

1.4 Testing Applied Standards

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

- EN 301 893 V1.8.1 (2015-03)

1.5 Testing Location Information

Testing Location			
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973	
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085	
Test Condition			**Test Site No.**
RF Conducted			TH01-CB
Radiated Emission			05CH01-CB

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing		
Modulation Mode	**Data Rate / MCS**	**Worst Data Rate / MCS**
802.11a	6-54Mbps	6 Mbps
802.11ac (VHT20)	MCS0-9/Nss1-2	MCS0/Nss1
802.11ac (VHT40)	MCS0-9/Nss1-2	MCS0/Nss1
802.11ac (VHT80)	MCS0-9/Nss1-2	MCS0/Nss1

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40.
Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80.
Note 3: Modulation modes consist of below configuration:
11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration		
Frequency Range (MHz)	**IEEE Std. 802.11**	**Test Channel Freq. (MHz)**
5470-5725MHz	a, ac (VHT20)	5500, 5700
5470-5725MHz	ac (VHT40)	5510, 5670
5470-5725MHz	ac (VHT80)	5530

2.3 The Worst Case Power Setting Parameter

<External antenna>

The Worst Case Power Setting Parameter					
Test Software Version	MP_TEST 1.3.8.0				
Modulation Mode	**Test Frequency (MHz)**				
	NCB: 20MHz		**NCB: 40MHz**		**NCB: 80MHz**
	5500	**5700**	**5510**	**5670**	**5530**
802.11a	21/17	12/10	-	-	-
802.11ac (VHT20)	20/17	12/10	-	-	-
802.11ac (VHT40)	-	-	23/18	16/13	-
802.11ac (VHT80)	-	-	-	-	23/18

<Internal antenna>

The Worst Case Power Setting Parameter					
Test Software Version	MP_TEST 1.3.8.0				
Modulation Mode	**Test Frequency (MHz)**				
	NCB: 20MHz		**NCB: 40MHz**		**NCB: 80MHz**
	5500	**5700**	**5510**	**5670**	**5530**
802.11a	16/12	9/5	-	-	-
802.11ac (VHT20)	16/12	9/5	-	-	-
802.11ac (VHT40)	-	-	13/8	6/2	-
802.11ac (VHT80)	-	-	-	-	13/8

2.4 EUT Operation during Test

During the test, “MP_TEST 1.3.8.0” under WIN 7 was executed the test program to control the EUT continuously transmit/receive RF signal.

2.5 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Test Item	Carrier Frequencies
Test Condition	Conducted measurement at transmit chains. One channel out of the declared channels for each sub-band. In case of more than 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.
Bandwidth	20MHz, 40MHz, 80MHz

The Worst Case Mode for Following Conformance Tests	
Test Item	Occupied Channel Bandwidth
Test Condition	Conducted measurement at transmit chains. One channel out of the declared channels for each sub-band. For Occupied Channel Bandwidth, testing has been repeated for every declared nominal channel bandwidth within this sub-band.
Modulation Mode	802.11a, 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80)

The Worst Case Mode for Following Conformance Tests	
Test Items	RF Output Power Transmitter Unwanted Emissions within the 5 GHz RLAN Bands
Test Condition	Conducted measurement at transmit chains.
Modulation Mode	802.11a, 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80)

The Worst Case Mode for Following Conformance Tests	
Test Items	Power Density
Test Condition	Conducted measurement at transmit chains.
Modulation Mode	802.11a, 802.11ac (VHT20)

The Worst Case Mode for Following Conformance Tests	
Test Item	Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands
Test Condition	Radiated measurement One channel out of the declared channels for each sub-band. In case of more than 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans. If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Modulation Mode	
Below 1GHz	802.11a, 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80)
Above 1GHz	802.11a, 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80)

The Worst Case Mode for Following Conformance Tests	
Test Item	Receiver Spurious Emissions
Test Condition	Radiated measurement One channel out of the declared channels for each sub-band. In case of more than 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans. If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Bandwidth	
Below 1GHz	20MHz, 40MHz, 80MHz
Above 1GHz	20MHz, 40MHz, 80MHz

The Worst Case Mode for Following Conformance Tests	
Test Item	Adaptivity
Test Condition	Conducted measurement at transmit chains. One channel out of the declared channels for each sub-band. For Adaptivity, testing has been performed using the highest nominal channel bandwidth.
Modulation Mode	802.11ac (VHT80)

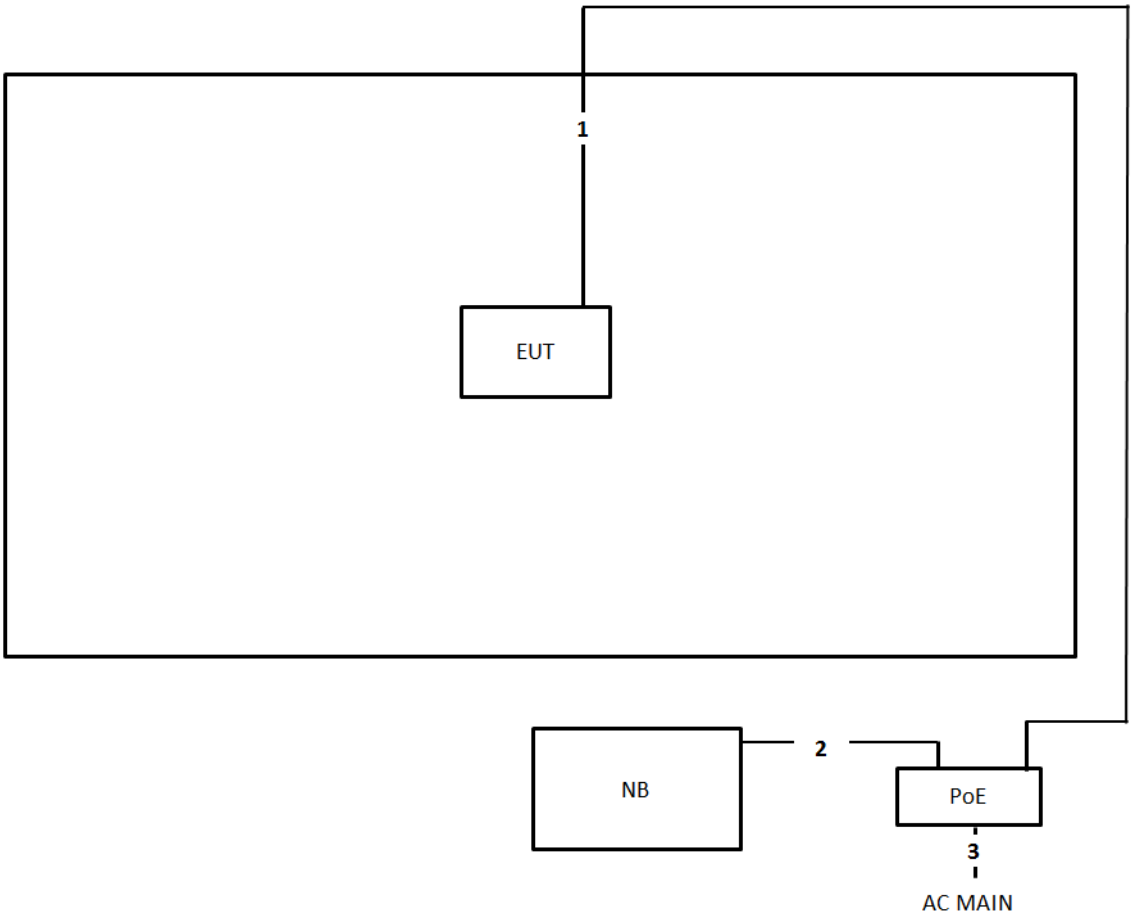
Note: 1. The EUT can only be used in Y-axis position.

2. VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.
3. For Adaptivity test, only the model: ML-60-35 <Internal antenna> was tested and recorded in the report due to the lowest gain antenna. For others test, both models were tested and recorded in the report.
4. The power of EUT is supplied by PoE. But the PoE is for measurement only, and it would not be marketed.

Equipment	Brand Name	Model Name	FCC ID
PoE	ITE	NU24-F240100-I2	N/A

2.6 Test Setup Diagram

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	0.5m
3	Power cable	No	0.3m

3 Transmitter Test Result

3.1 Carrier Frequencies

3.1.1 Carrier Frequencies Limit

Carrier Frequencies Limit
The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range f_c ± 20 ppm.

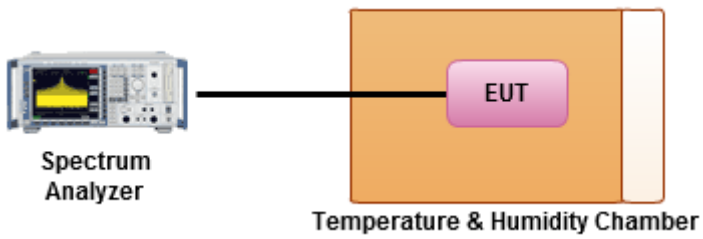
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method		
☒	Refer as EN 301 893, clause 5.1.3 for test channel. In case of more than 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.	
☒	Refer as EN 301 893, clause 5.3.2 for the carrier frequencies shall be measured using one of the options below.	
	☒	Refer as EN 301 893, clause 5.3.2.2.1.1 for equipment operating without modulation method
	☐	Refer as EN 301 893, clause 5.3.2.2.1.2 for equipment operating with modulation method
☒	Refer as EN 301 893, clause 5.3.2.2.1 for conducted measurement.	
	☒	Refer as EN 301 893, clause 5.3.2.1 for conducted measurements on smart antenna systems (equipment with multiple transmit chains) measurements need only to be performed on one of the active transmit chains (antenna outputs).
☐	Refer as EN 301 893, clause 5.3.2.2.2 for radiated measurement.	

3.1.4 Test Setup

Carrier Frequencies


3.1.5 Test Result of Carrier Frequencies

Temperature	25°C	**Humidity**	45%
Test Engineer	Serway Li / Peter Wu	**Test Date**	Dec. 24, 2015~Jan. 06, 2016

<External antenna>
Bandwidth: 20MHz

Test Conditions				**Measured Fequency (MHz)**
				5500 MHz
T nom (°C)	20	V nom (Vac)	230	5499.9956
T min (°C)	-40	V max (Vac)	253	5500.0178
		V min (Vac)	207	5500.0121
T max (°C)	70	V max (Vac)	253	5499.9884
		V min (Vac)	207	5499.9886
Max. Deviation Frequency				0.0178
Max. Frequency Error (ppm)				3.24
Limits (ppm)				20
Result				Complied

Bandwidth: 40MHz

Test Conditions				**Measured Fequency (MHz)**
				5510 MHz
T nom (°C)	20	V nom (Vac)	230	5509.9952
T min (°C)	-40	V max (Vac)	253	5510.0182
		V min (Vac)	207	5510.0184
T max (°C)	70	V max (Vac)	253	5509.9884
		V min (Vac)	207	5509.9886
Max. Deviation Frequency				0.0184
Max. Frequency Error (ppm)				3.34
Limits (ppm)				20
Result				Complied

Bandwidth: 80MHz

Test Conditions					Measured Fequency (MHz)
					5530 MHz
T nom (°C)	20	V nom (Vac)	230		5529.9956
T min (°C)	-40	V max (Vac)	253		5530.0176
		V min (Vac)	207		5530.0178
T max (°C)	70	V max (Vac)	253		5529.9882
		V min (Vac)	207		5529.9884
Max. Deviation Frequency					0.0178
Max. Frequency Error (ppm)					3.22
Limits (ppm)					20
Result					Complied

<Internal antenna>
Bandwidth: 20MHz

Test Conditions				Measured Fequency (MHz)
				5500 MHz
T nom (°C)	20	V nom (Vac)	230	5499.9956
T min (°C)	-40	V max (Vac)	253	5500.0178
		V min (Vac)	207	5500.0121
T max (°C)	70	V max (Vac)	253	5499.9884
		V min (Vac)	207	5499.9886
Max. Deviation Frequency				0.0178
Max. Frequency Error (ppm)				3.24
Limits (ppm)				20
Result				Complied

Bandwidth: 40MHz

Test Conditions				Measured Fequency (MHz)
				5510 MHz
T nom (°C)	20	V nom (Vac)	230	5509.9952
T min (°C)	-40	V max (Vac)	253	5510.0182
		V min (Vac)	207	5510.0184
T max (°C)	70	V max (Vac)	253	5509.9884
		V min (Vac)	207	5509.9886
Max. Deviation Frequency				0.0184
Max. Frequency Error (ppm)				3.34
Limits (ppm)				20
Result				Complied

Bandwidth: 80MHz

Test Conditions					Measured Fequency (MHz)
					5530 MHz
T nom (°C)	20	V nom (Vac)	230		5529.9956
T min (°C)	-40	V max (Vac)	253		5530.0176
		V min (Vac)	207		5530.0178
T max (°C)	70	V max (Vac)	253		5529.9882
		V min (Vac)	207		5529.9884
Max. Deviation Frequency					0.0178
Max. Frequency Error (ppm)					3.22
Limits (ppm)					20
Result					Complied

3.2 Occupied Channel Bandwidth

3.2.1 Occupied Channel Bandwidth Limit

Nominal Channel Bandwidth and Occupied Channel Bandwidth Limit	
The Nominal Channel Bandwidth shall be at least 5 MHz at all times. The Occupied Channel Bandwidth shall be between 80 % and 100 % of the declared Nominal Channel Bandwidth. During an established communication, the device is allowed to operate temporarily with an Occupied Channel Bandwidth below 80 % of its Nominal Channel Bandwidth with a minimum of 4 MHz.	
Nominal Channel Bandwidth (MHz)	**Occupied Channel Bandwidth (MHz)**
20	16 – 20
40	32 – 40
80	64 – 80
160	128 – 160

3.2.2 Measuring Instruments

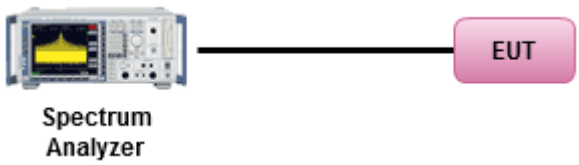
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
☒	Refer as EN 301 893, clause 5.1.3 for test channel. One channel out of the declared channels for each sub-band. For Occupied Channel Bandwidth, testing shall be repeated for every declared nominal channel bandwidth within this sub-band.
☒	Refer as EN 301 893, clause 5.3.3.2.1 for conducted measurement.
	☒ Refer as EN 301 893, clause 5.3.3.1 for conducted measurements on smart antenna systems (equipment with multiple transmit chains) measurements need only to be performed on one of the active transmit chains (antenna outputs).
☐	Refer as EN 301 893, clause 5.3.3.2.2 for radiated measurement.

3.2.4 Test Setup

Occupied Channel Bandwidth



3.2.5 Test Result of Occupied Channel Bandwidth

Temperature	25°C	Humidity	45%
Test Engineer	Serway Li / Peter Wu	Test Date	Dec. 24, 2015~Jan. 06, 2016

<External antenna>
Configuration IEEE 802.11a 6 Mbps / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)	
				5500	**5700**
T nom (°C)	20	V nom (Vac)	230	16.44	16.44
Nominal Channel Bandwidth (MHz)				20	
Occupied Channel Bandwidth Limit (MHz)				16 - 20	
Result				Complied	

Configuration IEEE 802.11ac (VHT20) MCS0/Nss1 / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)	
				5500	**5700**
T nom (°C)	20	V nom (Vac)	230	17.60	17.60
Nominal Channel Bandwidth (MHz)				20	
Occupied Channel Bandwidth Limit (MHz)				16 - 20	
Result				Complied	

Configuration IEEE 802.11ac (VHT40) MCS0/Nss1 / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)	
				5510	**5670**
T nom (°C)	20	V nom (Vac)	230	36.12	36.12
Nominal Channel Bandwidth (MHz)				40	
Occupied Channel Bandwidth Limit (MHz)				32-40	
Result				Complied	

Configuration IEEE 802.11ac (VHT80) MCS0/Nss1 / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)
				5530
T nom (°C)	20	V nom (Vac)	230	75.25
Nominal Channel Bandwidth (MHz)				80
Occupied Channel Bandwidth Limit (MHz)				64-80
Result				Complied

<Internal antenna>

Configuration IEEE 802.11a 6 Mbps / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)	
				5500	**5700**
T nom (°C)	20	V nom (Vac)	230	16.44	16.44
Nominal Channel Bandwidth (MHz)				20	
Occupied Channel Bandwidth Limit (MHz)				16 - 20	
Result				Complied	

Configuration IEEE 802.11ac (VHT20) MCS0/Nss1 / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)	
				5500	**5700**
T nom (°C)	20	V nom (Vac)	230	17.60	17.60
Nominal Channel Bandwidth (MHz)				20	
Occupied Channel Bandwidth Limit (MHz)				16 - 20	
Result				Complied	

Configuration IEEE 802.11ac (VHT40) MCS0/Nss1 / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)	
				5510	**5670**
T nom (°C)	20	V nom (Vac)	230	36.12	36.12
Nominal Channel Bandwidth (MHz)				40	
Occupied Channel Bandwidth Limit (MHz)				32-40	
Result				Complied	

Configuration IEEE 802.11ac (VHT80) MCS0/Nss1 / Chain 1

Test Conditions				Occupied Channel Bandwidth Result (MHz)
				5530
T nom (°C)	20	V nom (Vac)	230	75.25
Nominal Channel Bandwidth (MHz)				80
Occupied Channel Bandwidth Limit (MHz)				64-80
Result				Complied

3.3 RF Output Power

3.3.1 RF Output Power Limit

Frequency Range (MHz)	Mean e.i.r.p. Limit (dBm)	
	with TPC	w/o TPC
5150-5350	23	20/23 (note1)
5470-5725	30 (note2)	27 (note2)

Note 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 23 dBm.
Note 2: Slave devices without a Radar Interference Detection function shall comply with limits for band 5250 MHz to 5350 MHz.
Note 3: TPC is not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz.

3.3.2 Measuring Instruments

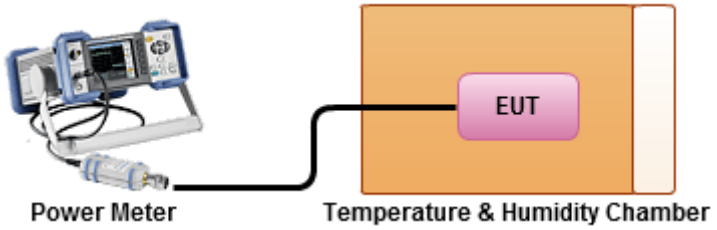
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method			
☒	The measurements shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.		
☒	The EUT shall be configured to operate at the maximum stated transmitter output power level.		
☒	Refer as EN 301 893, clause 5.3.4 for the RF output power shall be measured using below options:		
	☒	Option 1: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Based equipment). Refer as EN 301 893, clause 5.3.4.2.1.1.2.	
	☐	Option 2: For equipment without continuous transmission capability and operating (or with the capability to operate) in only one sub-band. Refer as EN 301 893, clause 5.3.4.2.1.1.3.	
	☐	Option 3: For equipment without continuous transmission capability and having simultaneous transmissions in both sub-bands. Refer as EN 301 893, clause 5.3.4.2.1.1.4.	
☒	Refer as EN 301 893, clause 5.3.4.2.1 for conducted measurement.		
	☒	In case of conducted measurements on smart antenna systems operating in a mode with multiple transmit chains active simultaneously, the output power of each transmit chain shall be measured separately to calculate the total power (value "A" in dBm) for the EUT.	
	☒	If multiple transmit chains, EIRP calculation could be following as methods:	
		☒	$EIRP_{total} = P_{total} + G$ If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used for EIRP.
☐	Refer as EN 301 893, clause 5.3.4.2.2 for radiated measurement.		

3.3.4 Test Setup

RF Output Power



3.3.5 Test Result of RF Output Power at the Highest Power – P_H

Temperature	25°C	Humidity	45%
Test Engineer	Serway Li / Peter Wu	Test Date	Dec. 24, 2015~Jan. 06, 2016

<External antenna>
Configuration 802.11a 6 Mbps

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	5.09	4.91	26.01	27
				5700	4.87	4.95	25.92	27
T min(°C)	-40	V max(Vac)	253	5500	3.34	3.15	24.26	27
				5700	3.06	3.12	24.10	27
		V min(Vac)	207	5500	3.36	3.17	24.28	27
				5700	3.08	3.14	24.12	27
T max(°C)	70	V max(Vac)	253	5500	3.14	3.02	24.09	27
				5700	3.17	2.96	24.08	27
		V min(Vac)	207	5500	3.16	3.04	24.11	27
				5700	3.19	2.98	24.10	27
Result					Complied			

Configuration 802.11ac (VHT20) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	4.73	4.79	25.77	27
				5700	4.71	4.92	25.83	27
T min(°C)	-40	V max(Vac)	253	5500	3.22	3.18	24.21	27
				5700	3.35	3.24	24.31	27
		V min(Vac)	207	5500	3.24	3.20	24.23	27
				5700	3.37	3.26	24.33	27
T max(°C)	70	V max(Vac)	253	5500	2.84	2.91	23.89	27
				5700	2.91	2.89	23.91	27
		V min(Vac)	207	5500	2.86	2.93	23.91	27
				5700	2.95	2.91	23.94	27
Result					Complied			

Configuration 802.11ac (VHT40) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5510	5.72	5.43	26.59	27
				5670	5.65	5.52	26.60	27
T min(°C)	-40	V max(Vac)	253	5510	4.16	4.23	25.21	27
				5670	4.07	4.19	25.14	27
		V min(Vac)	207	5510	4.18	4.25	25.23	27
				5670	4.09	4.21	25.16	27
T max(°C)	70	V max(Vac)	253	5510	3.57	3.65	24.62	27
				5670	3.68	3.72	24.71	27
		V min(Vac)	207	5510	3.59	3.67	24.64	27
				5670	3.70	3.74	24.73	27
Result					Complied			

Configuration 802.11ac (VHT80) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5530	5.56	5.47	26.53	27
T min(°C)	-40	V max(Vac)	253	5530	4.25	4.31	25.29	27
		V min(Vac)	207	5530	4.27	4.33	25.31	27
T max(°C)	70	V max(Vac)	253	5530	3.84	3.79	24.83	27
		V min(Vac)	207	5530	3.86	3.81	24.85	27
Result					Complied			

<Internal antenna>

Configuration 802.11a 6 Mbps

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	6.19	6.27	26.75	27
				5700	6.42	6.23	26.85	27
T min(°C)	-40	V max(Vac)	253	5500	4.08	4.04	24.58	27
				5700	4.25	4.15	24.72	27
		V min(Vac)	207	5500	4.09	4.06	24.60	27
				5700	4.28	4.17	24.75	27
T max(°C)	70	V max(Vac)	253	5500	4.35	4.16	24.78	27
				5700	4.23	4.32	24.80	27
		V min(Vac)	207	5500	4.39	4.18	24.81	27
				5700	4.25	4.33	24.81	27
Result					Complied			

Configuration 802.11ac (VHT20) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	6.53	6.24	26.91	27
				5700	6.39	6.21	26.82	27
T min(°C)	-40	V max(Vac)	253	5500	4.42	4.37	24.92	27
				5700	4.31	4.22	24.79	27
		V min(Vac)	207	5500	4.45	4.27	24.88	27
				5700	4.32	4.31	24.84	27
T max(°C)	70	V max(Vac)	253	5500	4.59	4.34	24.99	27
				5700	4.37	4.32	24.87	27
		V min(Vac)	207	5500	4.49	4.16	24.85	27
				5700	4.35	4.36	24.88	27
Result					Complied			

Configuration 802.11ac (VHT40) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5510	6.36	6.35	26.88	27
				5670	6.16	6.12	26.66	27
T min(°C)	-40	V max(Vac)	253	5510	4.47	4.35	24.93	27
				5670	4.26	3.95	24.63	27
		V min(Vac)	207	5510	4.48	4.37	24.95	27
				5670	4.28	3.97	24.65	27
T max(°C)	70	V max(Vac)	253	5510	4.01	3.95	24.50	27
				5670	3.79	3.48	24.16	27
		V min(Vac)	207	5510	4.06	3.98	24.54	27
				5670	3.85	3.51	24.20	27
Result					Complied			

Configuration 802.11ac (VHT80) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Average Power (dBm)		Total EIRP Power (dBm)	EIRP Limit (dBm)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5530	6.51	6.42	26.99	27
T min(°C)	-40	V max(Vac)	253	5530	4.48	4.29	24.91	27
		V min(Vac)	207	5530	4.49	4.31	24.92	27
T max(°C)	70	V max(Vac)	253	5530	4.12	3.98	24.57	27
		V min(Vac)	207	5530	4.14	4.06	24.62	27
Result					Complied			

3.4 Power Density

3.4.1 Power Density Limit

Frequency Range (MHz)	Mean e.i.r.p. Density Limit (dBm/MHz)	
	with TPC	w/o TPC
5150-5350	10	7/10 (note1)
5470-5725	17 (note2)	14 (note2)

Note 1: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 10 dBm/MHz.
Note 2: Slave devices without a Radar Interference Detection function shall comply with limits for band 5250 MHz to 5350 MHz.

3.4.2 Measuring Instruments

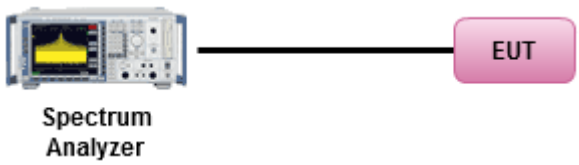
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method			
☒	The measurements shall be performed at normal environmental conditions.		
☒	The EUT shall be configured to operate at the maximum stated transmitter output power level.		
☒	Power density shall be measured using one of the options below.		
	☒	Option 1: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Based equipment). Refer as EN 301 893, clause 5.3.4.2.1.3.2.	
	☐	Option 2: For equipment without continuous transmission capability and without the capability to transmit with a constant duty cycle. Refer as EN 301 893, clause 5.3.4.2.1.3.3.	
☒	Refer as EN 301 893, clause 5.3.4.2.1 for conducted measurement.		
	☒	The EUT supports multiple transmit chains using options given below:	
		☒	Option 1: connect the UUT to the spectrum analyser and use the following 5.3.4.2.1.3.2 settings, find the peak value of the trace and place the analyzer marker on this peak. This level is recorded as the highest mean power (power density) D in a 1 MHz band. In case of conducted measurements on smart antenna systems operating in a mode with multiple transmit chains active simultaneously, the power density of each transmit chain shall be measured separately to calculate the total power density (value "D" in dBm/MHz) for the UUT. The maximum spectral power density is calculated from the measured power density (D), the observed duty cycle x , the applicable antenna assembly gain "G" in dBi and if applicable the beamforming gain "Y" in dB, according to the formula below. PD = D + G + Y + 10 log (1/x).

		☐ Option 2: connect the UUT to the spectrum analyzer and use the 5.3.4.2.1.3.3 settings, Add up the values of power for all the samples in the file using the formula below. $P_{Sum} = \sum_{n=1}^{k} P_{sample}(n)$ Normalize the individual values for power (in dBm) so that the sum is equal to the EIRP(PH) measuredfor this sub-band. The following formulas can be used: $C_{Corr} = P_{Sum} - P_{H\,e.i.r.p}$ $P_{Samplecorr}(n) = P_{Sample}(n) - C_{Corr}$ with 'n' being the actual sample number Starting from the first sample $P_{Samplecorr}(n)$ in the file, add up the power (in mW) of the following samples representing a 1 MHz segment and record the results for power and position (i.e. sample #1 to sample #100). This is the Power Density (e.i.r.p.) for the first 1 MHz segment which shall be saved. Shift the start point of the samples added up in step (i.e. sample #2 to sample #101). Repeat step until the end of the data set and save the radiated power density values for each of the 1 MHz segments. From all the saved results, the highest value is the maximum Power Density (e.i.r.p.) for the UUT.
		☒ If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used for EIRP PSD.
☐ Refer as EN 301 893, clause 5.3.4.2.2 for radiated measurement.		

3.4.4 Test Setup

Power Density


3.4.5 Test Result of Power Density

Temperature	25°C	Humidity	45%
Test Engineer	Serway Li / Peter Wu	Test Date	Dec. 24, 2015~Jan. 06, 2016

<External antenna>
Configuration 802.11a 6 Mbps

Test Conditions				Frequency (MHz)	Conducted Power Density (dBm/MHz)		Total EIRP Power Density (dBm/MHz)	EIRP Power Density Limit (dBm/MHz)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	-7.27	-7.34	13.71	14
				5700	-7.31	-7.45	13.63	14
Result					Complied			

Configuration 802.11ac (VHT20) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Power Density (dBm/MHz)		Total EIRP Power Density (dBm/MHz)	EIRP Power Density Limit (dBm/MHz)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	-7.51	-7.46	13.53	14
				5700	-7.55	-7.37	13.55	14
Result					Complied			

<Internal antenna>
Configuration 802.11a 6 Mbps

Test Conditions				Frequency (MHz)	Conducted Power Density (dBm/MHz)		Total EIRP Power Density (dBm/MHz)	EIRP Power Density Limit (dBm/MHz)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	-6.85	-6.87	13.66	14
				5700	-6.36	-6.91	13.89	14
Result					Complied			

Configuration 802.11ac (VHT20) MCS0/Nss1

Test Conditions				Frequency (MHz)	Conducted Power Density (dBm/MHz)		Total EIRP Power Density (dBm/MHz)	EIRP Power Density Limit (dBm/MHz)
					Chain 1	Chain 2		
T nom(°C)	20	V nom(Vac)	230	5500	-6.47	-7.07	13.76	14
				5700	-6.74	-7.26	13.53	14
Result					Complied			

3.5 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

3.5.1 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands Limit

Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 5,15 GHz	-30 dBm	1 MHz
5,35 GHz to 5,47 GHz	-30 dBm	1 MHz
5,725 GHz to 26 GHz	-30 dBm	1 MHz

3.5.2 Measuring Instruments

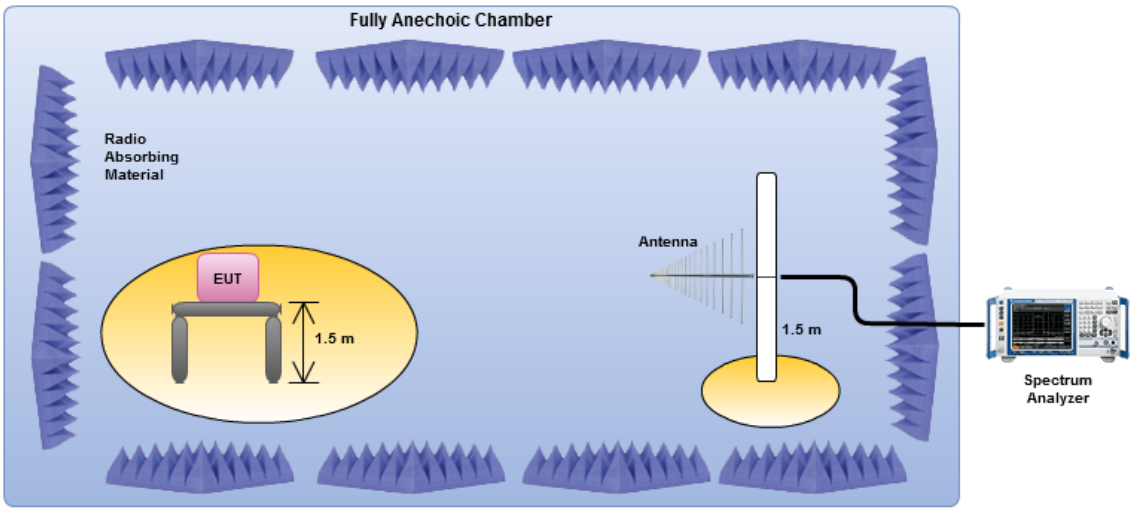
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method			
☒	Refer as EN 301 893, clause 5.1.3 for test channel. One channel out of the declared channels for each sub-band. In case of more than 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.		
☐	Refer as EN 301 893, clause 5.3.5.2.1 for conducted measurement. Conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).		
	☐	The EUT supports multiple transmit chains using options given below:	
		☐	Option 1: The trace data for each transmit chain has to be individually recorded and each transmit chain trace data shall be added and compared with the transmitter spurious emissions limit.
		☐	Option 2: the results for each of the transmit chains shall be individually compared with the transmitter spurious emissions limit. After that these limits have been reduced with 10 x $\log_{10}$ (A_{ch}). (Number of active transmit chains).
☒	Refer as EN 301 893, clause 5.3.5.2.2 for radiated measurement.		

3.5.4 Test Setup

Transmitter Unwanted Emissions in the Spurious Domain



A measuring distance of at least 3 m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring far field distance may be used, depending on the test system noise floor for detecting spurious emission signals. The equipment size (excluding the antenna) shall be less than 20 % of the measuring distance. The height of the equipment or of the substitution antenna shall be 1.5 m.

3.5.5 Transmitter Radiated Unwanted Emissions (30MHz~1GHz)

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11a 6 Mbps	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-72.26	-18.26	-54.00	-61.10	-11.16	HORIZONTAL
2	185.20	-64.38	-10.38	-54.00	-50.57	-13.81	HORIZONTAL
3	239.52	-66.36	-30.36	-36.00	-57.50	-8.86	HORIZONTAL
4	500.45	-67.97	-13.97	-54.00	-62.84	-5.13	HORIZONTAL
5	624.61	-67.91	-13.91	-54.00	-65.79	-2.12	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	50.37	-65.77	-11.77	-54.00	-51.85	-13.92	VERTICAL
2	88.20	-68.92	-14.92	-54.00	-59.11	-9.81	VERTICAL
3	164.83	-61.63	-25.63	-36.00	-49.32	-12.31	VERTICAL
4	250.19	-65.54	-29.54	-36.00	-54.99	-10.55	VERTICAL
5	500.45	-65.89	-11.89	-54.00	-60.83	-5.06	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT20) MCS0/Nss1	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-72.99	-18.99	-54.00	-61.83	-11.16	HORIZONTAL
2	84.32	-75.39	-39.39	-36.00	-60.39	-15.00	HORIZONTAL
3	190.05	-65.90	-11.90	-54.00	-51.95	-13.95	HORIZONTAL
4	239.52	-66.44	-30.44	-36.00	-57.58	-8.86	HORIZONTAL
5	499.48	-67.26	-13.26	-54.00	-62.11	-5.15	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	50.37	-67.13	-13.13	-54.00	-53.21	-13.92	VERTICAL
2	93.05	-67.96	-13.96	-54.00	-59.50	-8.46	VERTICAL
3	164.83	-61.82	-25.82	-36.00	-49.51	-12.31	VERTICAL
4	499.48	-66.41	-12.41	-54.00	-61.33	-5.08	VERTICAL
5	624.61	-67.51	-13.51	-54.00	-65.28	-2.23	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT40) MCS0/Nss1	Test Freq. (MHz)	5510
Test Date	Jan. 07, 2016	Test Model	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-71.89	-17.89	-54.00	-60.73	-11.16	HORIZONTAL
2	185.20	-64.55	-10.55	-54.00	-50.74	-13.81	HORIZONTAL
3	239.52	-66.06	-30.06	-36.00	-57.20	-8.86	HORIZONTAL
4	500.45	-67.60	-13.60	-54.00	-62.47	-5.13	HORIZONTAL
5	624.61	-67.22	-13.22	-54.00	-65.10	-2.12	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	49.40	-66.85	-12.85	-54.00	-53.30	-13.55	VERTICAL
2	93.05	-68.17	-14.17	-54.00	-59.71	-8.46	VERTICAL
3	164.83	-61.46	-25.46	-36.00	-49.15	-12.31	VERTICAL
4	250.19	-65.71	-29.71	-36.00	-55.16	-10.55	VERTICAL
5	499.48	-66.92	-12.92	-54.00	-61.84	-5.08	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT80) MCS0/Nss1	**Test Freq. (MHz)**	5530
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-72.20	-18.20	-54.00	-61.04	-11.16	HORIZONTAL
2	185.20	-65.00	-11.00	-54.00	-51.19	-13.81	HORIZONTAL
3	239.52	-65.93	-29.93	-36.00	-57.07	-8.86	HORIZONTAL
4	500.45	-67.59	-13.59	-54.00	-62.46	-5.13	HORIZONTAL
5	624.61	-68.02	-14.02	-54.00	-65.90	-2.12	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	84.32	-72.40	-36.40	-36.00	-59.97	-12.43	VERTICAL
2	180.35	-65.03	-11.03	-54.00	-52.90	-12.13	VERTICAL
3	500.45	-67.39	-13.39	-54.00	-62.33	-5.06	VERTICAL
4	624.61	-67.58	-13.58	-54.00	-65.35	-2.23	VERTICAL
5	693.48	-66.48	-12.48	-54.00	-67.66	1.18	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Modulation Mode	802.11a 6 Mbps	Test Freq. (MHz)	5500
Test Date	Jan. 07, 2016	Test Model	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	204.60	-65.58	-11.58	-54.00	-52.02	-13.56	HORIZONTAL
2	250.19	-64.60	-28.60	-36.00	-57.02	-7.58	HORIZONTAL
3	399.57	-69.47	-33.47	-36.00	-62.80	-6.67	HORIZONTAL
4	499.48	-65.03	-11.03	-54.00	-59.88	-5.15	HORIZONTAL
5	579.99	-64.20	-10.20	-54.00	-60.97	-3.23	HORIZONTAL
6	632.37	-69.44	-15.44	-54.00	-67.53	-1.91	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	125.06	-68.99	-32.99	-36.00	-64.25	-4.74	VERTICAL
2	159.98	-67.60	-31.60	-36.00	-55.42	-12.18	VERTICAL
3	215.27	-66.17	-12.17	-54.00	-53.55	-12.62	VERTICAL
4	250.19	-66.50	-30.50	-36.00	-55.95	-10.55	VERTICAL
5	500.45	-65.96	-11.96	-54.00	-60.90	-5.06	VERTICAL
6	579.99	-62.73	-8.73	-54.00	-58.91	-3.82	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT20) MCS0/Nss1	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	159.98	-69.03	-12.03	-57.00	-56.61	-12.42	HORIZONTAL
2	215.27	-64.34	-7.34	-57.00	-52.30	-12.04	HORIZONTAL
3	250.19	-64.22	-7.22	-57.00	-56.64	-7.58	HORIZONTAL
4	399.57	-70.56	-13.56	-57.00	-63.89	-6.67	HORIZONTAL
5	500.45	-65.74	-8.74	-57.00	-60.61	-5.13	HORIZONTAL
6	579.99	-63.38	-6.38	-57.00	-60.15	-3.23	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	41.64	-66.69	-9.69	-57.00	-55.44	-11.25	VERTICAL
2	159.98	-67.28	-10.28	-57.00	-55.10	-12.18	VERTICAL
3	215.27	-65.68	-8.68	-57.00	-53.06	-12.62	VERTICAL
4	250.19	-66.63	-9.63	-57.00	-56.08	-10.55	VERTICAL
5	500.45	-65.68	-8.68	-57.00	-60.62	-5.06	VERTICAL
6	579.99	-62.84	-5.84	-57.00	-59.02	-3.82	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT40) MCS0/Nss1	**Test Freq. (MHz)**	5510
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	83.35	-71.31	-14.31	-57.00	-56.28	-15.03	HORIZONTAL
2	215.27	-64.05	-7.05	-57.00	-52.01	-12.04	HORIZONTAL
3	250.19	-63.65	-6.65	-57.00	-56.07	-7.58	HORIZONTAL
4	399.57	-70.05	-13.05	-57.00	-63.38	-6.67	HORIZONTAL
5	500.45	-65.08	-8.08	-57.00	-59.95	-5.13	HORIZONTAL
6	579.99	-63.16	-6.16	-57.00	-59.93	-3.23	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	41.64	-67.97	-10.97	-57.00	-56.72	-11.25	VERTICAL
2	125.06	-68.02	-11.02	-57.00	-63.28	-4.74	VERTICAL
3	215.27	-65.24	-8.24	-57.00	-52.62	-12.62	VERTICAL
4	250.19	-66.69	-9.69	-57.00	-56.14	-10.55	VERTICAL
5	499.48	-65.43	-8.43	-57.00	-60.35	-5.08	VERTICAL
6	579.99	-62.64	-5.64	-57.00	-58.82	-3.82	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT80) MCS0/Nss1	Test Freq. (MHz)	5530
Test Date	Jan. 07, 2016	Test Model	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	215.27	-64.41	-7.41	-57.00	-52.37	-12.04	HORIZONTAL
2	250.19	-63.35	-6.35	-57.00	-55.77	-7.58	HORIZONTAL
3	407.33	-74.03	-17.03	-57.00	-67.49	-6.54	HORIZONTAL
4	500.45	-65.77	-8.77	-57.00	-60.64	-5.13	HORIZONTAL
5	579.99	-63.46	-6.46	-57.00	-60.23	-3.23	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	42.61	-67.31	-10.31	-57.00	-55.95	-11.36	VERTICAL
2	164.83	-68.59	-11.59	-57.00	-56.28	-12.31	VERTICAL
3	210.42	-66.89	-9.89	-57.00	-53.96	-12.93	VERTICAL
4	250.19	-65.82	-8.82	-57.00	-55.27	-10.55	VERTICAL
5	500.45	-65.92	-8.92	-57.00	-60.86	-5.06	VERTICAL
6	579.99	-63.76	-6.76	-57.00	-59.94	-3.82	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

3.5.6 Transmitter Radiated Unwanted Emissions (1GHz~26.5GHz)

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11a 6 Mbps	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.47	-15.47	-30.00	-57.26	11.79	HORIZONTAL
2	11004.67	-54.14	-24.14	-30.00	-73.57	19.43	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.74	-17.74	-30.00	-57.73	9.99	VERTICAL
2	10999.82	-54.12	-24.12	-30.00	-73.08	18.96	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT20) MCS0/Nss1	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.49	-15.49	-30.00	-57.28	11.79	HORIZONTAL
2	11001.36	-54.00	-24.00	-30.00	-73.44	19.44	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.76	-17.76	-30.00	-57.75	9.99	VERTICAL
2	11002.19	-54.98	-24.98	-30.00	-73.94	18.96	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT40) MCS0/Nss1	**Test Freq. (MHz)**	5510
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.45	-15.45	-30.00	-57.24	11.79	HORIZONTAL
2	11019.94	-51.53	-21.53	-30.00	-70.92	19.39	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.69	-17.69	-30.00	-57.68	9.99	VERTICAL
2	11019.91	-54.09	-24.09	-30.00	-73.05	18.96	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT80) MCS0/Nss1	**Test Freq. (MHz)**	5530
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.13	-15.13	-30.00	-56.92	11.79	HORIZONTAL
2	11061.49	-54.05	-24.05	-30.00	-73.32	19.27	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.52	-17.52	-30.00	-57.51	9.99	VERTICAL
2	11060.26	-54.23	-24.23	-30.00	-73.21	18.98	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11a 6 Mbps	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.33	-15.33	-30.00	-57.12	11.79	HORIZONTAL
2	10999.89	-54.87	-24.87	-30.00	-74.32	19.45	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.23	-17.23	-30.00	-57.22	9.99	VERTICAL
2	10999.97	-55.56	-25.56	-30.00	-74.52	18.96	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT20) MCS0/Nss1	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.46	-15.46	-30.00	-57.25	11.79	HORIZONTAL
2	11000.09	-54.70	-24.70	-30.00	-74.15	19.45	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.44	-17.44	-30.00	-57.43	9.99	VERTICAL
2	10999.48	-55.04	-25.04	-30.00	-74.00	18.96	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT40) MCS0/Nss1	**Test Freq. (MHz)**	5510
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.39	-15.39	-30.00	-57.18	11.79	HORIZONTAL
2	11019.42	-54.54	-24.54	-30.00	-73.93	19.39	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-47.56	-17.56	-30.00	-57.55	9.99	VERTICAL
2	11020.52	-55.17	-25.17	-30.00	-74.13	18.96	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Modulation Mode	802.11ac (VHT80) MCS0/Nss1	**Test Freq. (MHz)**	5530
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-45.06	-15.06	-30.00	-56.85	11.79	HORIZONTAL
2	11060.45	-54.69	-24.69	-30.00	-73.96	19.27	HORIZONTAL

Vertical

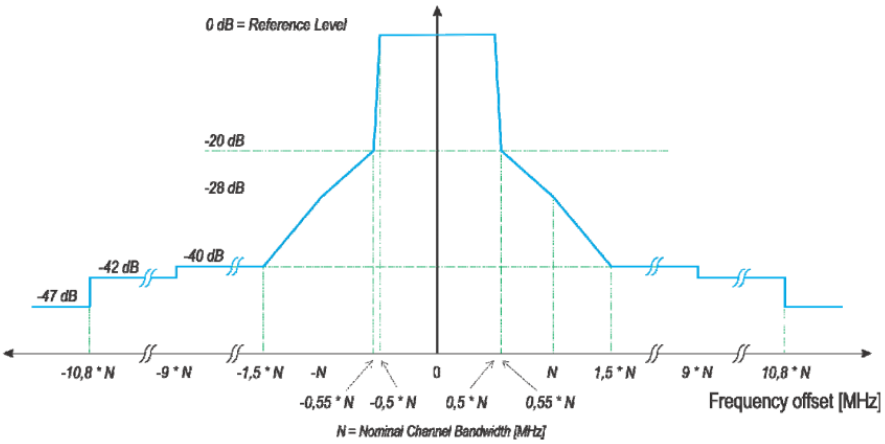
	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	5470.00	-46.53	-16.53	-30.00	-56.52	9.99	VERTICAL
2	11059.31	-54.59	-24.59	-30.00	-73.56	18.97	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

3.6 Transmitter Unwanted Emissions within the 5 GHz RLAN Band

3.6.1 Transmitter Unwanted Emissions within the 5 GHz RLAN Band Limit

Transmit Spectral Power Mask Limit



The average level of transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limit of the mask or the limit for unwanted emissions, whichever is the higher.
For simultaneous transmissions in multiple non-adjacent channels, the overall transmit spectral power mask is constructed in the following manner. First, a mask is applied to each of the channels. Then, for each frequency point, the highest value from the spectral masks of all the channels assessed shall be taken as the overall spectral mask requirement at that frequency.

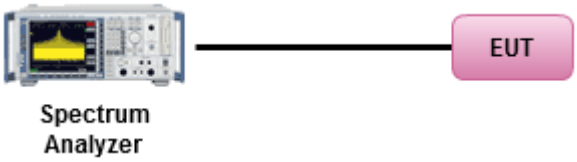
3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method	
☒	The measurements shall be performed at both normal environmental conditions.
☒	Refer as EN 301 893, clause 5.3.6 for the transmit spectral power mask shall be measured using one of the options below:
	☒ Option 1: For equipment with continuous transmission capability (duty cycle equal to 100 %)
	☐ Option 2: For equipment without continuous transmission capability (duty cycle ≤ 100 %)
☒	Refer as EN 301 893, clause 5.3.6.2.1 for conducted measurement.
	☒ Refer as EN 301 893, clause 5.3.6.1 for conducted measurements on smart antenna systems (equipment with multiple transmit chains) measurements need only to be performed on one of the active transmit chains (antenna outputs).
☐	Refer as EN 301 893, clause 5.3.6.2.2 for radiated measurement.

3.6.4 Test Setup

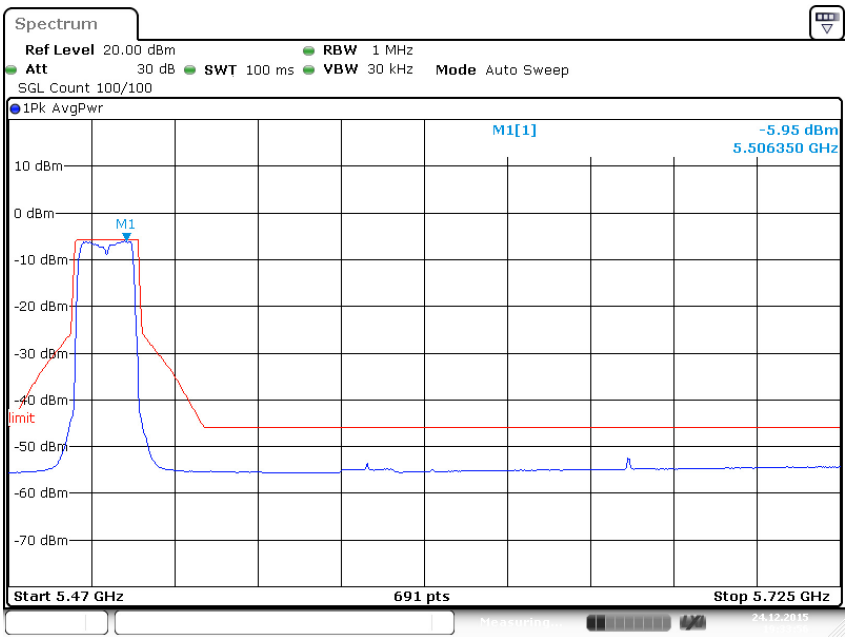
Transmitter Unwanted Emissions within the 5 GHz RLAN Band


3.6.5 Test Result of Transmitter Unwanted Emissions within the 5 GHz RLAN Band

Temperature	25°C	**Humidity**	45%
Test Engineer	Serway Li / Peter Wu		

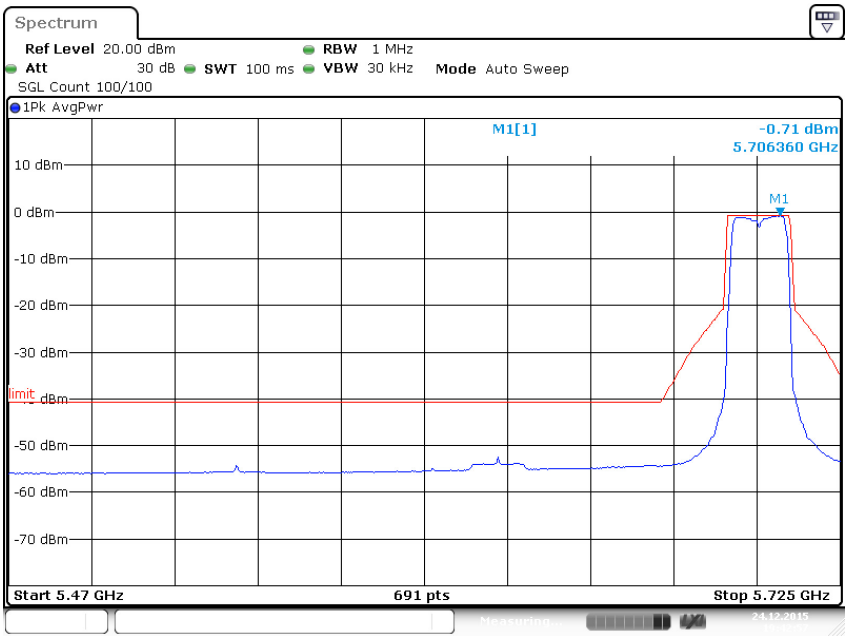
<External antenna>

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11a 6 Mbps	Chain 1	5500	Under Spectral Mask	Complied



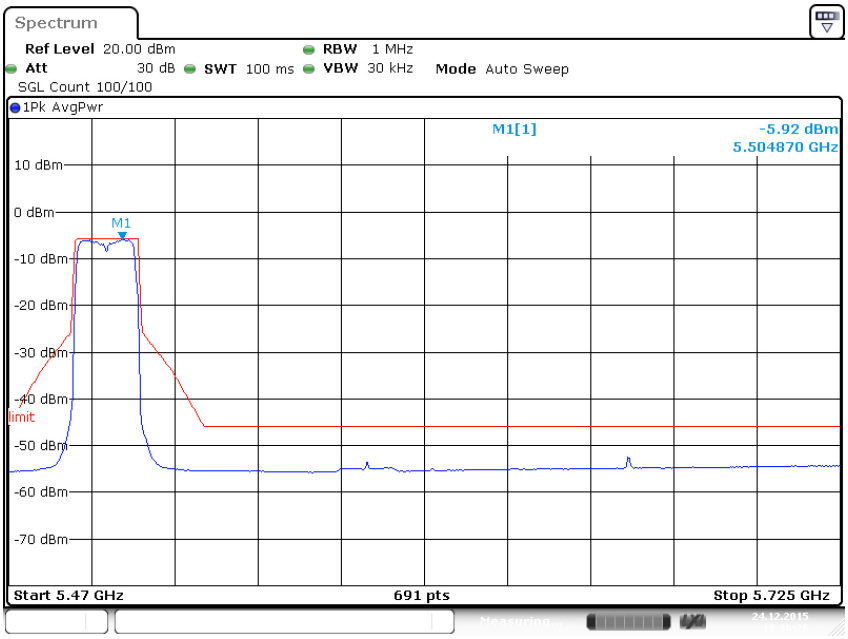
Date: 24.DEC.2015 19:33:56

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11a 6 Mbps	Chain 1	5700	Under Spectral Mask	Complied



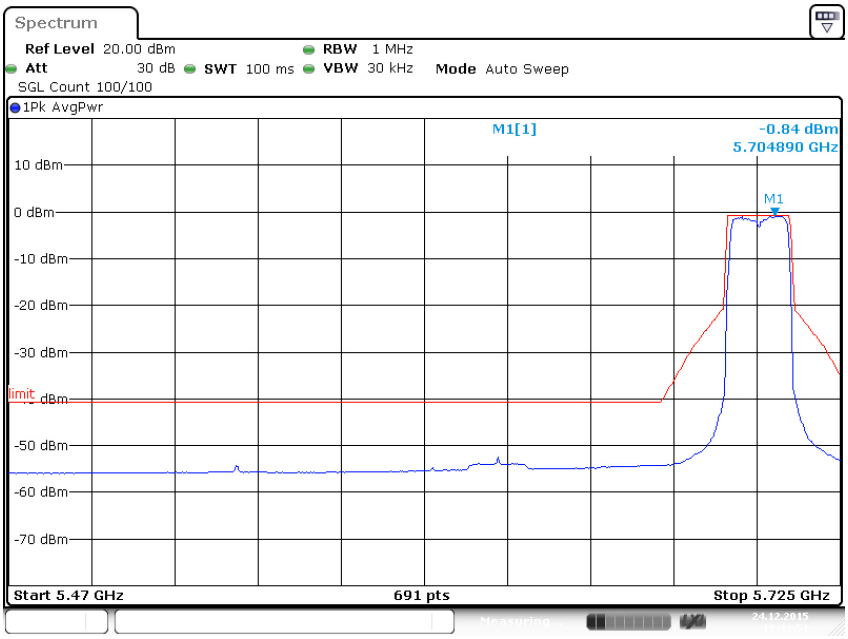
Date: 24.DEC.2015 19:42:57

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT20) MCS0/Nss1	Chain 1	5500	Under Spectral Mask	Complied



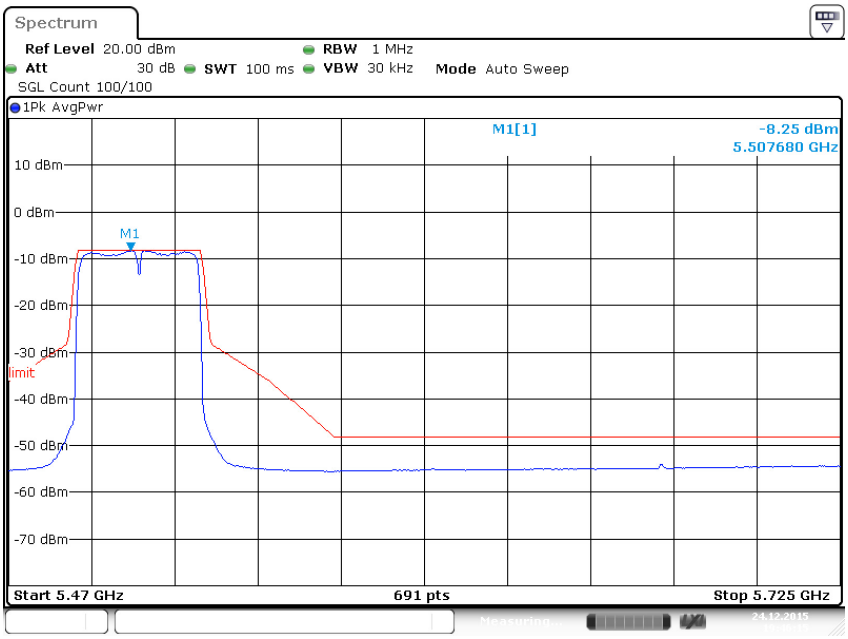
Date: 24.DEC.2015 19:36:26

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT20) MCS0/Nss1	Chain 1	5700	Under Spectral Mask	Complied



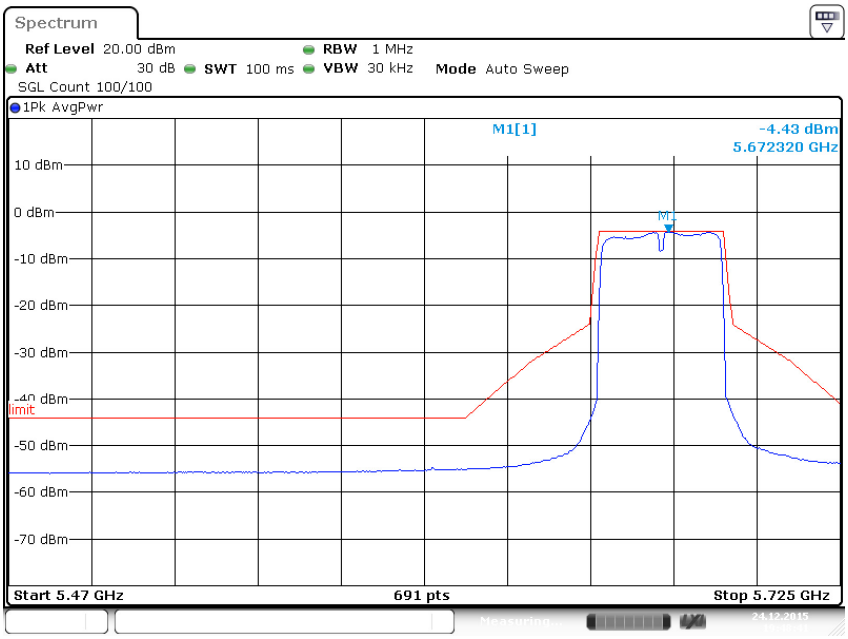
Date: 24.DEC.2015 19:41:52

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT40) MCS0/Nss1	Chain 1	5510	Under Spectral Mask	Complied



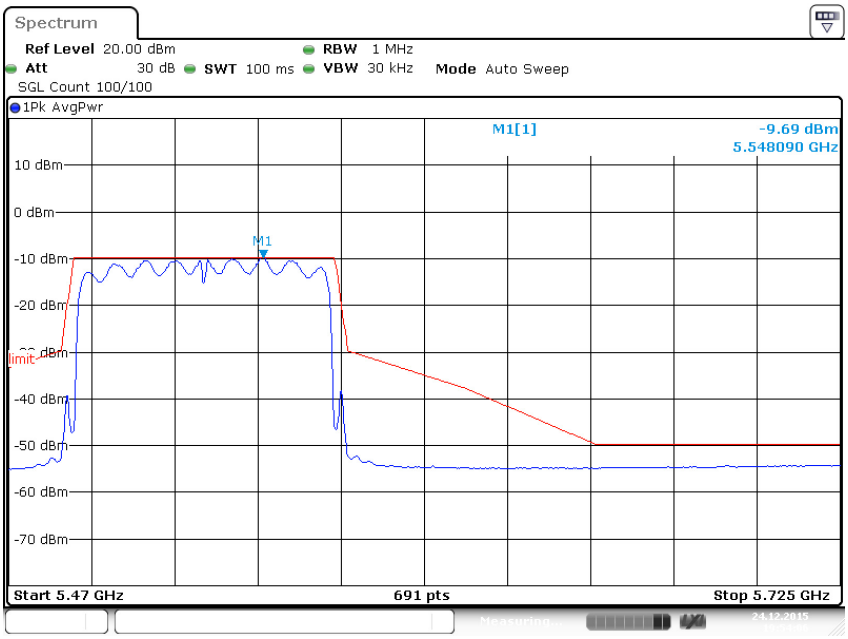
Date: 24.DEC.2015 19:46:15

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT40) MCS0/Nss1	Chain 1	5670	Under Spectral Mask	Complied



Date: 24.DEC.2015 19:48:41

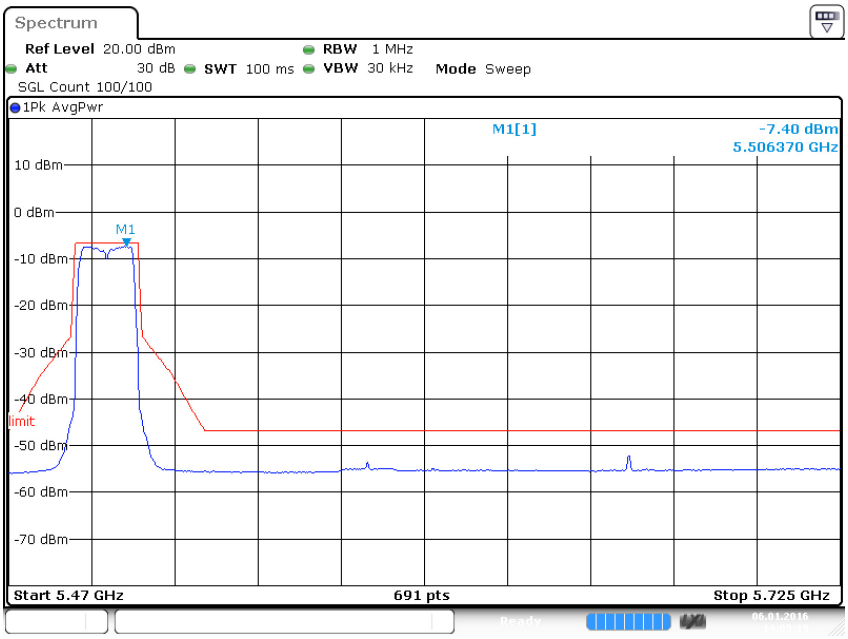
Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT80) MCS0/Nss1	Chain 1	5530	Under Spectral Mask	Complied



Date: 24.DEC.2015 19:54:06

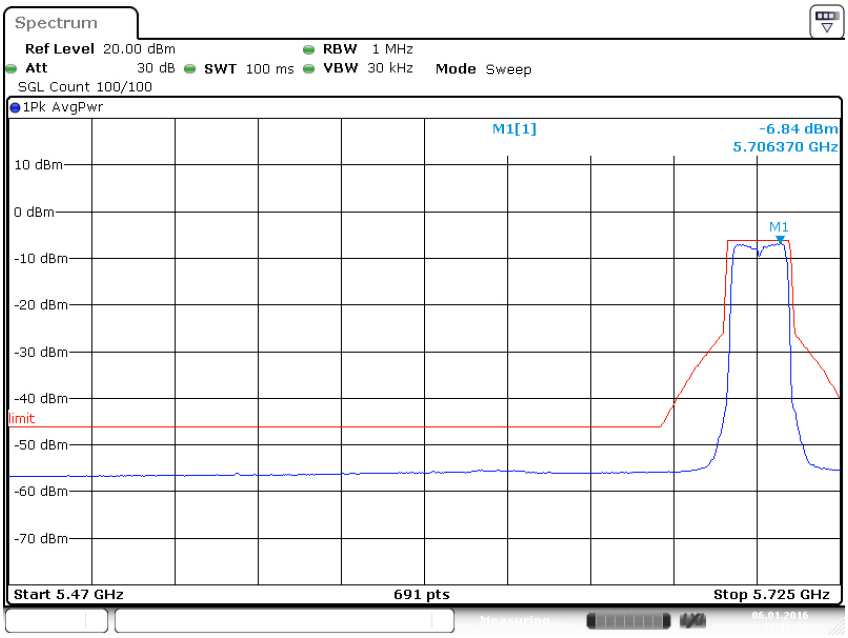
<Internal antenna>

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11a 6 Mbps	Chain 1	5500	Under Spectral Mask	Complied



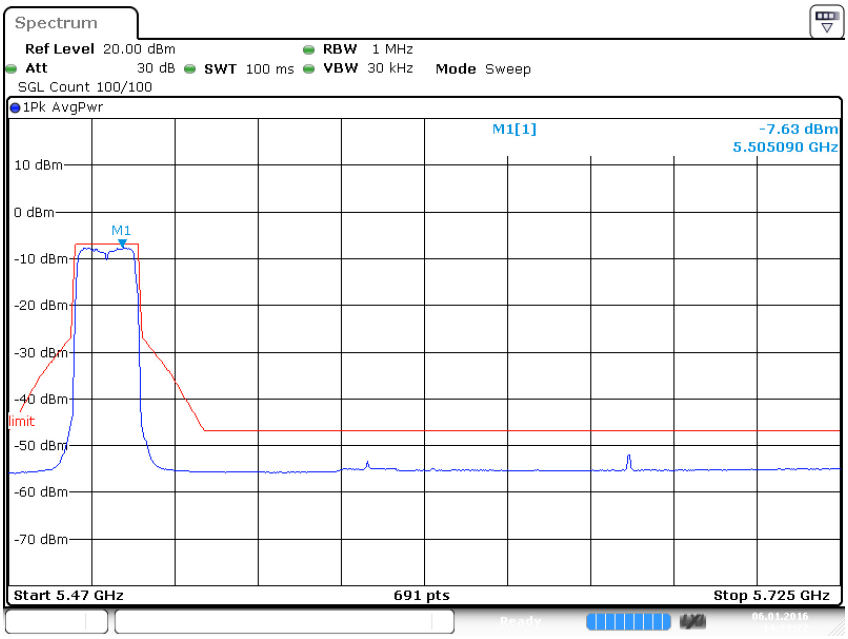
Date: 6.JAN.2016 14:09:18

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11a 6 Mbps	Chain 1	5700	Under Spectral Mask	Complied



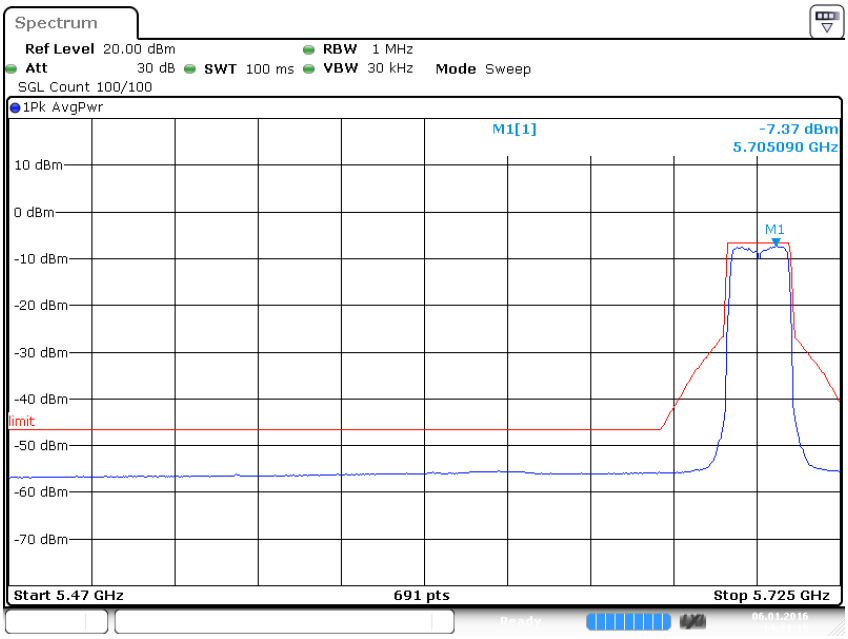
Date: 6.JAN.2016 14:16:39

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT20) MCS0/Nss1	Chain 1	5500	Under Spectral Mask	Complied



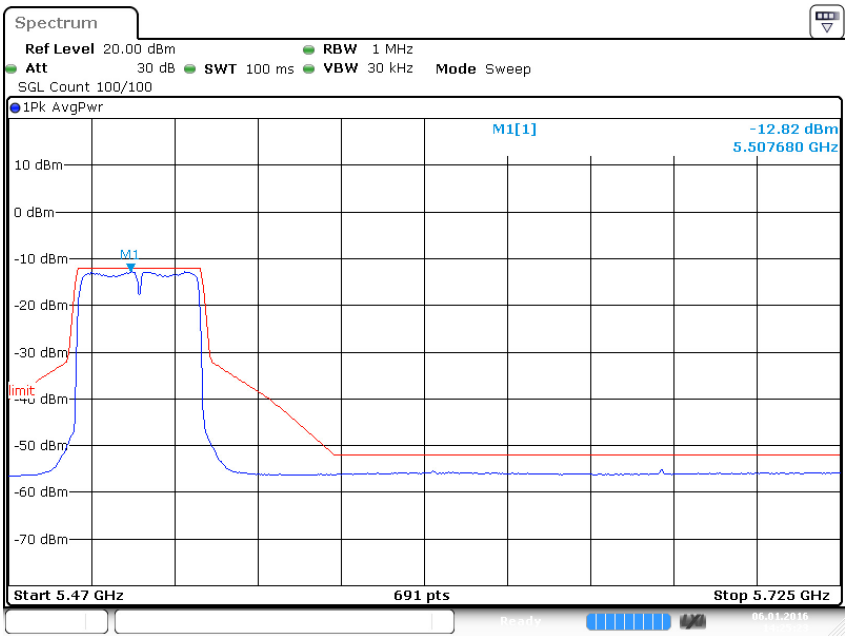
Date: 6.JAN.2016 14:23:23

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT20) MCS0/Nss1	Chain 1	5700	Under Spectral Mask	Complied



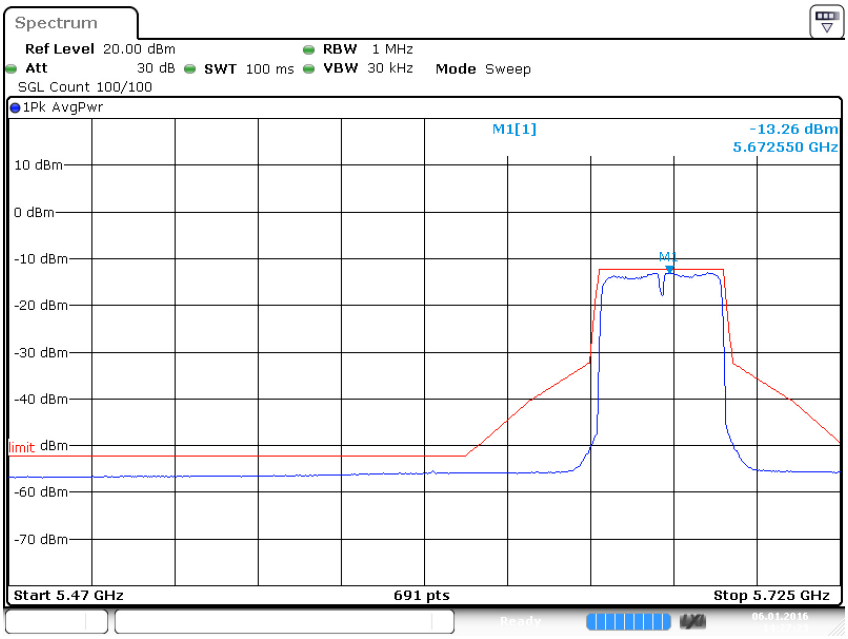
Date: 6.JAN.2016 14:21:16

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT40) MCS0/Nss1	Chain 1	5510	Under Spectral Mask	Complied



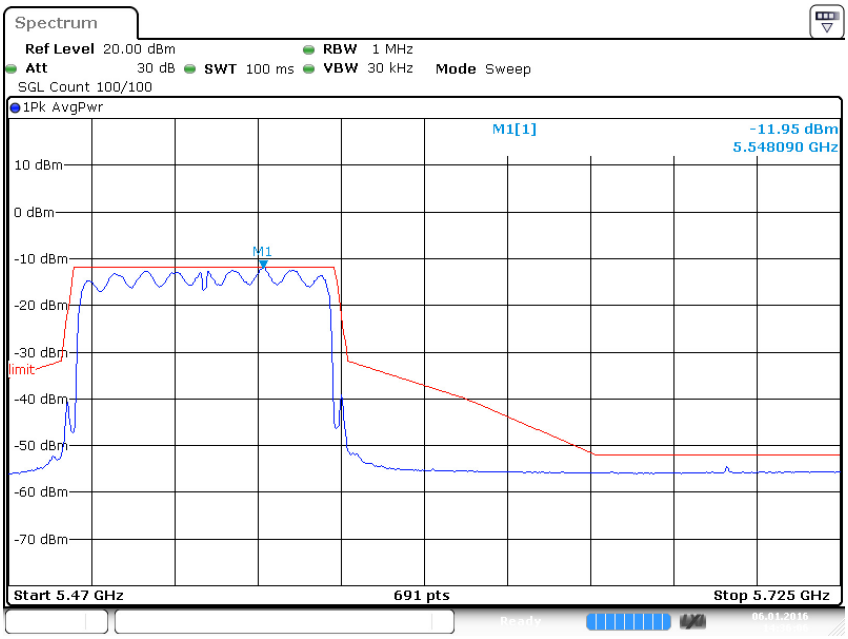
Date: 6.JAN.2016 14:25:23

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT40) MCS0/Nss1	Chain 1	5670	Under Spectral Mask	Complied



Date: 6.JAN.2016 14:27:23

Modulation Mode	Test Chain	Freq. (MHz)	Mask	Result
802.11ac (VHT80) MCS0/Nss1	Chain 1	5530	Under Spectral Mask	Complied



Date: 6.JAN.2016 14:36:06

4 Receiver Test Result

4.1 Receiver Spurious Emissions

4.1.1 Receiver Spurious Emissions Limit

Frequency Range	Maximum Power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 26 GHz	-47 dBm	1 MHz

4.1.2 Measuring Instruments

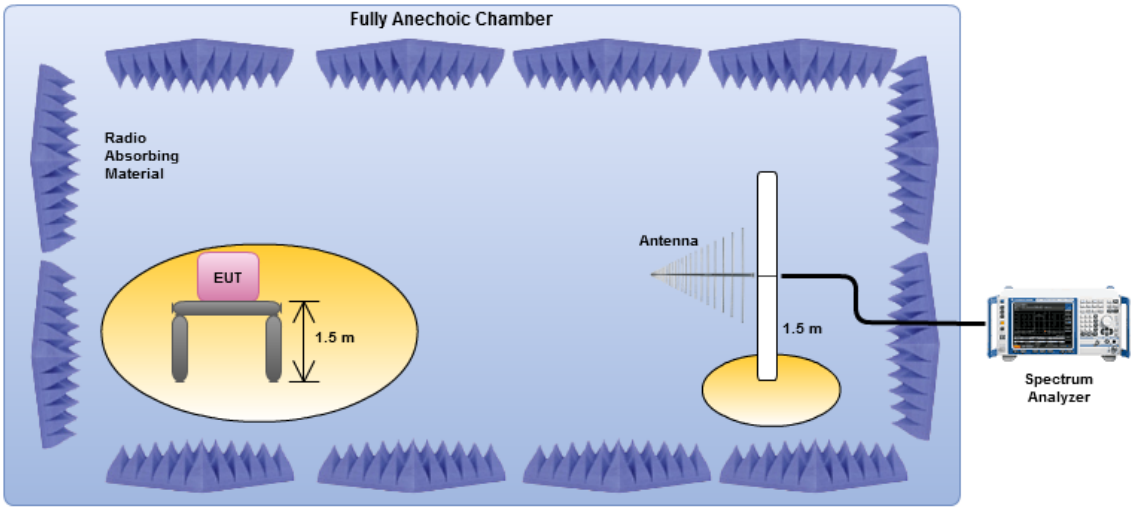
Refer a test equipment and calibration data table in this test report.

4.1.3 Test Procedures

Test Method			
☒	Refer as EN 301 893, clause 5.1.3 for test channel. One channel out of the declared channels for each sub-band. In case of more than 1 channel plan has been declared, testing of these specific requirements need only be performed using one of the declared channel plans.		
☐	Refer as EN 301 893, clause 5.3.7.2.1 for conducted measurement. Conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).		
	☐	The EUT supports multiple receive chains using options given below:	
		☐	Option 1: The trace data for each receive chain has to be individually recorded and each receive chain trace data shall be added and compared with the receiver spurious emissions limit.
		☐	Option 2: the results for each of the receive chains shall be individually compared with the receiver spurious emissions limit. After that these limits have been reduced with 10 x $\log_{10}$ (A_{ch}). (Number of active receive chains).
		☐	Option 3: A power splitter/combiner shall be used to combine all the receive chains (antenna outputs) into a single test point. The insertion loss of the power splitter/combiner shall be taken into account.
☒	Refer as EN 301 893, clause 5.3.7.2.2 for radiated measurement.		

4.1.4 Test Setup

Receiver Spurious Emissions



A measuring distance of at least 3 m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring far field distance may be used, depending on the test system noise floor for detecting spurious emission signals. The equipment size (excluding the antenna) shall be less than 20 % of the measuring distance. The height of the equipment or of the substitution antenna shall be 1.5 m.

4.1.5 Receiver Radiated Spurious Emissions (30MHz~1GHz)

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Bandwidth	20MHz	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-71.47	-14.47	-57.00	-60.31	-11.16	HORIZONTAL
2	159.98	-66.00	-9.00	-57.00	-53.58	-12.42	HORIZONTAL
3	190.05	-66.23	-9.23	-57.00	-52.28	-13.95	HORIZONTAL
4	239.52	-66.44	-9.44	-57.00	-57.58	-8.86	HORIZONTAL
5	320.03	-70.57	-13.57	-57.00	-62.49	-8.08	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	50.37	-66.53	-9.53	-57.00	-52.61	-13.92	VERTICAL
2	164.83	-62.07	-5.07	-57.00	-49.76	-12.31	VERTICAL
3	215.27	-67.05	-10.05	-57.00	-54.43	-12.62	VERTICAL
4	250.19	-66.08	-9.08	-57.00	-55.53	-10.55	VERTICAL
5	499.48	-65.72	-8.72	-57.00	-60.64	-5.08	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Bandwidth	40MHz	Test Freq. (MHz)	5510
Test Date	Jan. 07, 2016	Test Model	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-73.01	-16.01	-57.00	-61.85	-11.16	HORIZONTAL
2	83.35	-73.41	-16.41	-57.00	-58.38	-15.03	HORIZONTAL
3	185.20	-64.49	-7.49	-57.00	-50.68	-13.81	HORIZONTAL
4	239.52	-66.36	-9.36	-57.00	-57.50	-8.86	HORIZONTAL
5	500.45	-68.08	-11.08	-57.00	-62.95	-5.13	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	50.37	-67.30	-10.30	-57.00	-53.38	-13.92	VERTICAL
2	164.83	-61.68	-4.68	-57.00	-49.37	-12.31	VERTICAL
3	250.19	-65.77	-8.77	-57.00	-55.22	-10.55	VERTICAL
4	500.45	-66.50	-9.50	-57.00	-61.44	-5.06	VERTICAL
5	624.61	-67.11	-10.11	-57.00	-64.88	-2.23	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Bandwidth	80MHz	Test Freq. (MHz)	5530
Test Date	Jan. 07, 2016	Test Model	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	48.43	-72.71	-15.71	-57.00	-61.55	-11.16	HORIZONTAL
2	159.98	-65.89	-8.89	-57.00	-53.47	-12.42	HORIZONTAL
3	190.05	-66.56	-9.56	-57.00	-52.61	-13.95	HORIZONTAL
4	250.19	-66.88	-9.88	-57.00	-59.30	-7.58	HORIZONTAL
5	500.45	-67.42	-10.42	-57.00	-62.29	-5.13	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	50.37	-67.98	-10.98	-57.00	-54.06	-13.92	VERTICAL
2	88.20	-69.06	-12.06	-57.00	-59.25	-9.81	VERTICAL
3	164.83	-63.80	-6.80	-57.00	-51.49	-12.31	VERTICAL
4	239.52	-66.17	-9.17	-57.00	-55.02	-11.15	VERTICAL
5	500.45	-66.69	-9.69	-57.00	-61.63	-5.06	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Bandwidth	20MHz	Test Freq. (MHz)	5500
Test Date	Jan. 07, 2016	Test Model	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	199.75	-68.14	-14.14	-54.00	-53.91	-14.23	HORIZONTAL
2	250.19	-67.05	-31.05	-36.00	-59.47	-7.58	HORIZONTAL
3	321.97	-70.13	-34.13	-36.00	-62.09	-8.04	HORIZONTAL
4	386.96	-70.33	-34.33	-36.00	-63.46	-6.87	HORIZONTAL
5	500.45	-66.33	-12.33	-54.00	-61.20	-5.13	HORIZONTAL
6	579.99	-64.42	-10.42	-54.00	-61.19	-3.23	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	42.61	-66.56	-30.56	-36.00	-55.20	-11.36	VERTICAL
2	169.68	-67.48	-31.48	-36.00	-55.04	-12.44	VERTICAL
3	224.97	-66.30	-12.30	-54.00	-54.29	-12.01	VERTICAL
4	321.97	-66.20	-30.20	-36.00	-58.00	-8.20	VERTICAL
5	579.99	-62.97	-8.97	-54.00	-59.15	-3.82	VERTICAL
6	709.00	-63.78	-9.78	-54.00	-64.99	1.21	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Bandwidth	40MHz	Test Freq. (MHz)	5510
Test Date	Jan. 07, 2016	Test Model	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	81.41	-70.49	-34.49	-36.00	-55.38	-15.11	HORIZONTAL
2	204.60	-65.83	-11.83	-54.00	-52.27	-13.56	HORIZONTAL
3	250.19	-62.88	-26.88	-36.00	-55.30	-7.58	HORIZONTAL
4	399.57	-68.37	-32.37	-36.00	-61.70	-6.67	HORIZONTAL
5	500.45	-64.99	-10.99	-54.00	-59.86	-5.13	HORIZONTAL
6	579.99	-62.74	-8.74	-54.00	-59.51	-3.23	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	42.61	-67.80	-31.80	-36.00	-56.44	-11.36	VERTICAL
2	169.68	-66.71	-30.71	-36.00	-54.27	-12.44	VERTICAL
3	250.19	-65.97	-29.97	-36.00	-55.42	-10.55	VERTICAL
4	321.97	-68.49	-32.49	-36.00	-60.29	-8.20	VERTICAL
5	500.45	-67.08	-13.08	-54.00	-62.02	-5.06	VERTICAL
6	579.99	-64.31	-10.31	-54.00	-60.49	-3.82	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Bandwidth	80MHz	**Test Freq. (MHz)**	5530
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	82.38	-72.28	-36.28	-36.00	-57.21	-15.07	HORIZONTAL
2	215.27	-65.09	-11.09	-54.00	-53.05	-12.04	HORIZONTAL
3	250.19	-63.79	-27.79	-36.00	-56.21	-7.58	HORIZONTAL
4	500.45	-65.56	-11.56	-54.00	-60.43	-5.13	HORIZONTAL
5	579.99	-63.79	-9.79	-54.00	-60.56	-3.23	HORIZONTAL
6	644.98	-67.49	-13.49	-54.00	-65.91	-1.58	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	42.61	-67.13	-31.13	-36.00	-55.77	-11.36	VERTICAL
2	169.68	-67.26	-31.26	-36.00	-54.82	-12.44	VERTICAL
3	224.97	-66.17	-12.17	-54.00	-54.16	-12.01	VERTICAL
4	321.97	-65.45	-29.45	-36.00	-57.25	-8.20	VERTICAL
5	579.99	-63.72	-9.72	-54.00	-59.90	-3.82	VERTICAL
6	711.91	-65.75	-11.75	-54.00	-66.88	1.13	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

4.1.6 Receiver Radiated Spurious Emissions (1GHz~26.5GHz)

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Bandwidth	20MHz	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7334.36	-56.93	-9.93	-47.00	-73.65	16.72	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7335.00	-58.86	-11.86	-47.00	-73.70	14.84	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Bandwidth	40MHz	Test Freq. (MHz)	5510
Test Date	Jan. 07, 2016	Test Model	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7346.68	-58.36	-11.36	-47.00	-75.11	16.75	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7346.67	-58.98	-11.98	-47.00	-73.86	14.88	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	Humidity	6%
Test Engineer	Lucas Huang	Test Chain	Chain 1 + Chain 2
Bandwidth	80MHz	Test Freq. (MHz)	5530
Test Date	Jan. 07, 2016	Test Model	External antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7372.91	-58.21	-11.21	-47.00	-75.01	16.80	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7373.33	-56.75	-9.75	-47.00	-71.68	14.93	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Bandwidth	20MHz	**Test Freq. (MHz)**	5500
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7333.02	-55.75	-8.75	-47.00	-72.47	16.72	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7333.53	-57.99	-10.99	-47.00	-72.83	14.84	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Bandwidth	40MHz	**Test Freq. (MHz)**	5510
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7346.13	-55.76	-8.76	-47.00	-72.50	16.74	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7345.73	-57.23	-10.23	-47.00	-72.11	14.88	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

Temperature	24℃	**Humidity**	6%
Test Engineer	Lucas Huang	**Test Chain**	Chain 1 + Chain 2
Bandwidth	80MHz	**Test Freq. (MHz)**	5530
Test Date	Jan. 07, 2016	**Test Model**	Internal antenna

Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7373.20	-55.27	-8.27	-47.00	-72.07	16.80	HORIZONTAL

Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
	MHz	dBm	dB	dBm	dBm	dB	
1	7372.70	-57.50	-10.50	-47.00	-72.43	14.93	VERTICAL

Note:
Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: Factor: Transmit Antenna Gain + Signal Generator Level - SA reading - Transmit Cable Loss.
Level= Read Level + Factor.

5 Adaptivity Test Result

5.1 Adaptivity

5.1.1 Adaptivity Limit

Adaptivity Limit
☐ LBT based Detect and Avoid (Frame Based Equipment): ◆ minimum Clear Channel Assessment (CCA) time = 20 us; ◆ CCA declared by the supplier ◆ COT = 1 ms to 10 ms ◆ Idle Period = 5% of COT ◆ e.g. CCA [120us] + COT [10ms] + Idle Period [0.5ms - 5% of COT]; ◆ detection threshold level = -73 dBm/MHz + 23 - Pout e.i.r.p. (Pout in dBm);
☒ LBT based Detect and Avoid (Load Based Equipment with spectrum sharing mechanism IEEE Std.): ◆ Load based Equipment may implement an LBT based spectrum sharing mechanism based on the Clear Channel Assessment (CCA) mode using "energy detect", as described in IEEE 802.11™-2012 [8], clause 9, clause 10, clause 18 and clause 20 or as described in IEEE 802.11ac™-2013 [9], clause 8, clause 9, clause 10 and clause 22. ◆ TL = -73 dBm / MHz + (23 dBm - PH) / (1 MHz)
☒ LBT based Detect and Avoid (Load Based Equipment): ☐Option A ◆ minimum Clear Channel Assessment (CCA) time = 20 us; ◆ Extended CCA >18us ◆ N = Unoccupied ECCA slots , range 1~q (q = 16 ~ 1024) ◆ Minimum of Idle period limit >20us ◆ Max COT < 10ms ☒Option B ◆ minimum Clear Channel Assessment (CCA) time = 20 us; ◆ COT ≤ (13 / 32) x q ms; q=[4~32] ; 1.625ms – 13ms; ◆ R = number of clear idle slots are randomly [1~q]. Every time an Extended CCA is required and the R value stored in a counter. Extended CCA = R x CCA ◆ i.e. for channel occupied then R = 4 idle slots; COT [1.625ms; q=4]; idle slots [1] - Extended CCA [60us, R=3];
☒ Short Control Signalling Transmissions: ◆ Short Control Signalling Transmissions shall have a maximum duty cycle of 5 % within an observation period of 50 ms.

5.1.2 Measuring Instruments

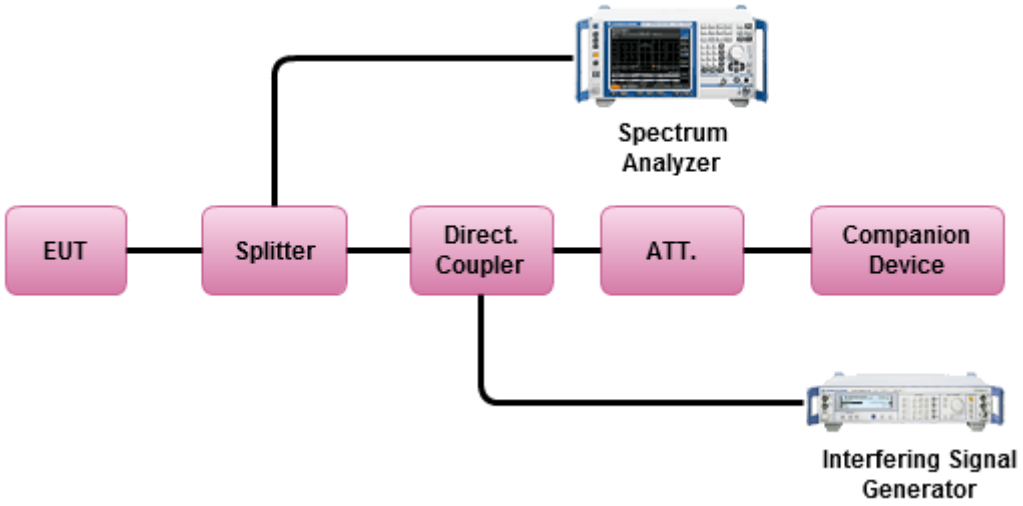
Refer a test equipment and calibration data table in this test report.

5.1.3 Test Procedures

Test Method	
☒	Refer as EN 301 893, clause 5.1.3 for test channel. One channel out of the declared channels for each sub-band. For Adaptivity, testing shall be performed using the highest nominal channel bandwidth.
☒	Refer as EN 301 893, clause 5.3.9.2.1 for conducted measurement.
	☒ For conducted measurements on devices with multiple transmit chains and receive chains. The power splitter/combiner shall be used to combine all the transmit/receive chains (antenna outputs) into a single test point. The insertion loss of the power splitter/combiner shall be taken into account.
☐	Refer as EN 301 893, clause 5.3.9.2.2 for radiated measurement.

5.1.4 Test Setup

Adaptivity



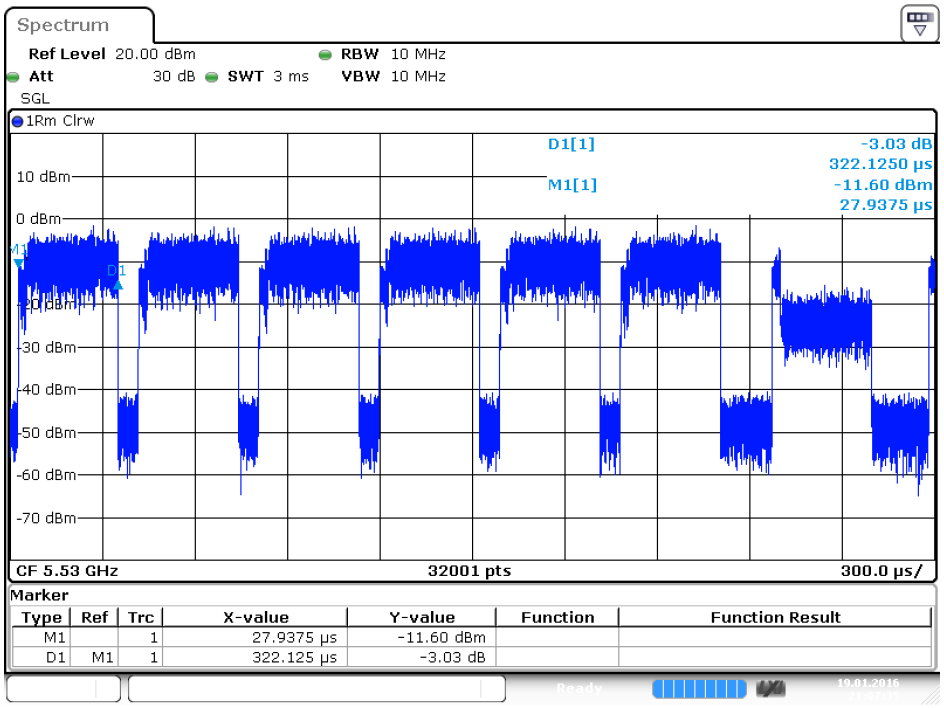
5.1.5 Test Result of Adaptivity

Temperature	20.6°C	**Humidity**	45%
Test Engineer	Taka Hsu	**Software / Firmware Version**	1.1.2-8119M

Adaptivity Result							
Detection Threshold Level		**-73 dBm/MHz**					
Modulation Mode	**Freq. (MHz)**	**Adaptivity**	**Short Control Signalling Transmissions (ms)**	**Declaration Value**		**Channel Occupancy Time (ms)**	**Idle Period (us)**
				CCA (us)	**q**		
802.11ac (VHT80) MCS0/Nss1	5530	Pass	0.706	20	32	0.322	64.500
Limit		N/A	2.5	N/A	N/A	13	20
Result		**Complied**					
Note: Channel Occupancy Time and Idle Period Time follow as IEEE Std. 802.11-2007 and IEEE 802.11n-2009 specification without restriction.							

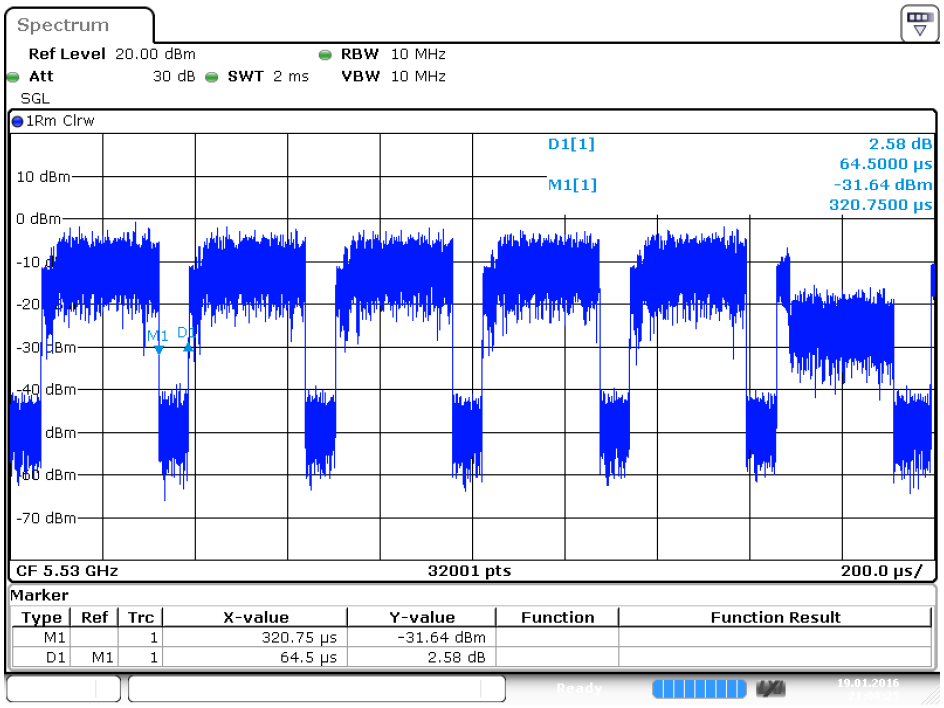
802.11ac (VHT80) MCS0/Nss1 – 5530MHz

Channel Occupancy Time



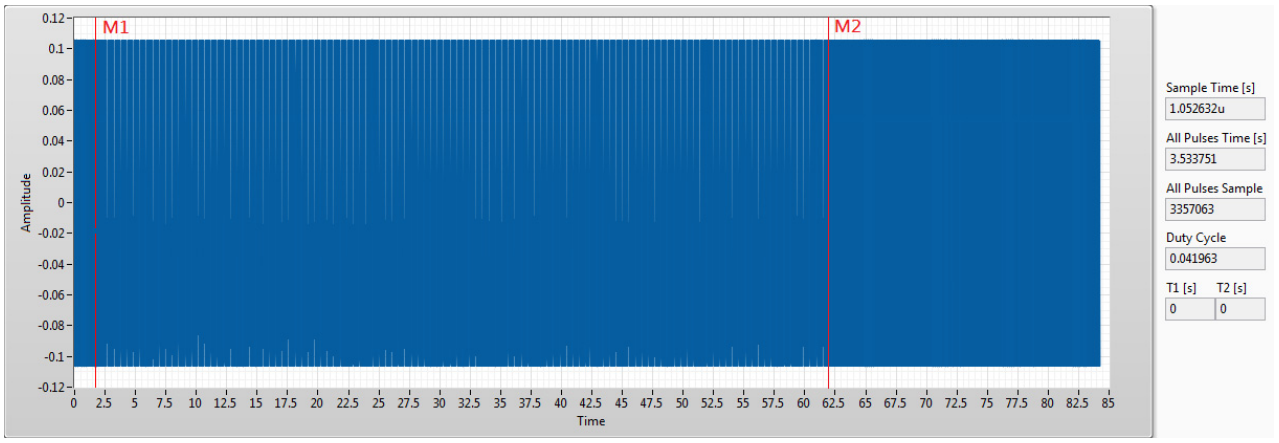
Date: 19.JAN.2016 21:07:34

Idle Periodic Time



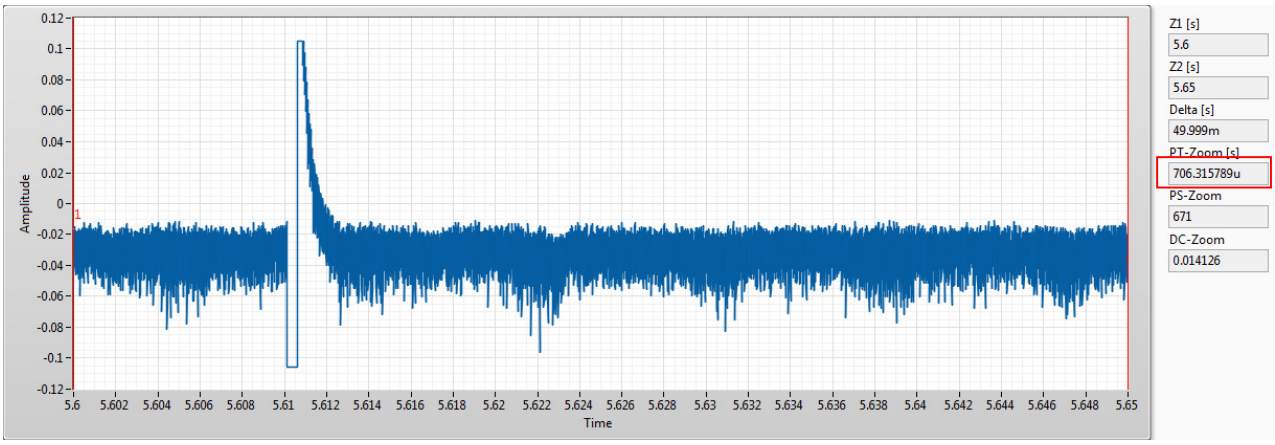
Date: 19.JAN.2016 21:08:25

Adaptivity Result Time Plots



Marker 1: Adding the interference signal.
Marker 2: Removing the interference.

Short Control Signalling Transmissions Plots



Marker 1: Adding the interference signal.

6 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Mar. 23, 2015	Radiation (05CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02121	1GHz ~ 26.5GHz	Jul. 20, 2015	Radiation (05CH01-CB)
Pre-Amplifier	Schaffner	CPA9231A	3566	0.1MHz ~ 2GHz	Mar. 24, 2015	Radiation (05CH01-CB)
Bilog Antenna	Schaffner	CBL6112B	2894	30MHz ~ 1GHz	Mar. 13, 2015	Radiation (05CH01-CB)
Horn Antenna	COM-POWER	AH-118	071028	1GHz ~ 18GHz	Jun. 05, 2015	Radiation (05CH01CB)
RF Cable-low	Woken	RG402	Low Cable-6	30MHz ~ 1GHz	Nov. 02, 2015	Radiation (05CH01-CB)
RF Cable-high	Woken	RG402	High Cable-25	1GHz ~ 26.5GHz	Nov. 02, 2015	Radiation (05CH01-CB)
RF Cable-high	Woken	RG402	High Cable-26	1GHz ~ 26.5GHz	Nov. 02, 2015	Radiation (05CH01-CB)
Test Software	Audix	E3	5.04.1019f	N/A	N/A	Radiation (05CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410002	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)
Test Software	Agilent	N/A	Ver :1.141209	N/A	N.C.R	Conducted (TH01-CB)
Vector Signal generator	R&S	SMU200A	102782	25MHz-6GHz	Nov. 06, 2015	Conducted (TH01-CB)
RF Power Divider	ANAREN	2 Way	DFS-01-DV-02	1GHz ~ 6GHz	Nov. 07, 2015	Conducted (TH01-CB)
RF Power Divider	MTJ	2 Way	DFS-01-DV-03	1GHz ~ 6GHz	Nov. 07, 2015	Conducted (TH01-CB)
RF Power Divider	ANAREN	4 Way	DFS-01-DV-01	1GHz ~ 6GHz	Nov. 07, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-53	1 GHz –18 GHz	Nov. 02, 2015	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-54	1 GHz –18 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-56	1 GHz –18 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-60	1 GHz –18 GHz	Nov. 02, 2015	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.
N.C.R. means Non-Calibration required.

7 Measurement Uncertainty

Test Items	Uncertainty	Remark
Carrier Frequencies & Occupied Channel Bandwidth	$6.6*10^{-8}$ MHz	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	2.7 dB	Confidence levels of 95%

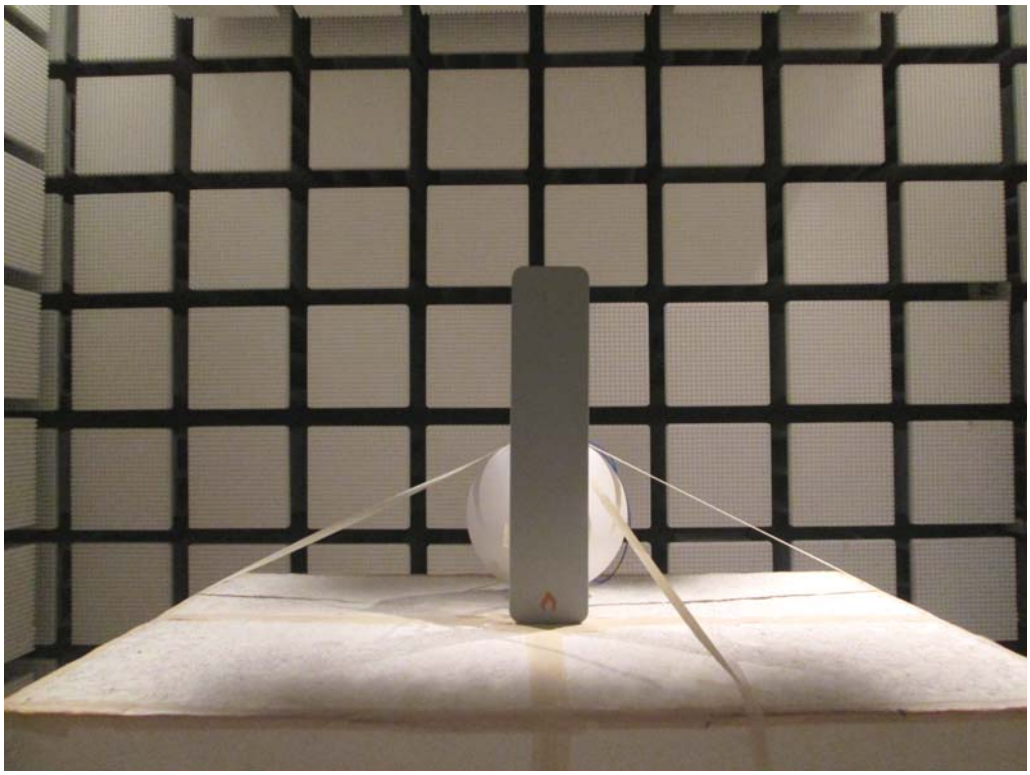
Parameter	Uncertainty
RF frequency	$\pm 1.1x10^{-6}$
RF power conducted	±1.0dB
RF power radiated	±2.9dB
Spurious emissions, radiated	±2.9dB
Humidity	±2.5%
Temperature	±0.7°C
Time	±3%
95% confidence level using a coverage factor of k=2	

Appendix A. Test Photos

1. Photographs of Test Configuration

<External antenna>

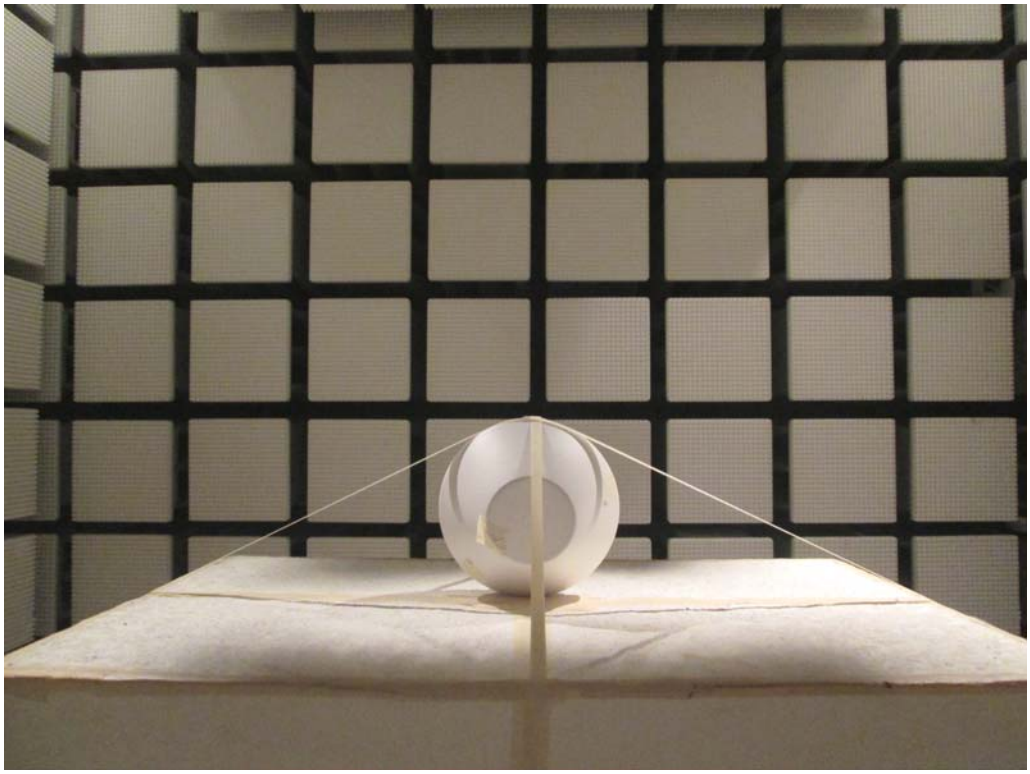
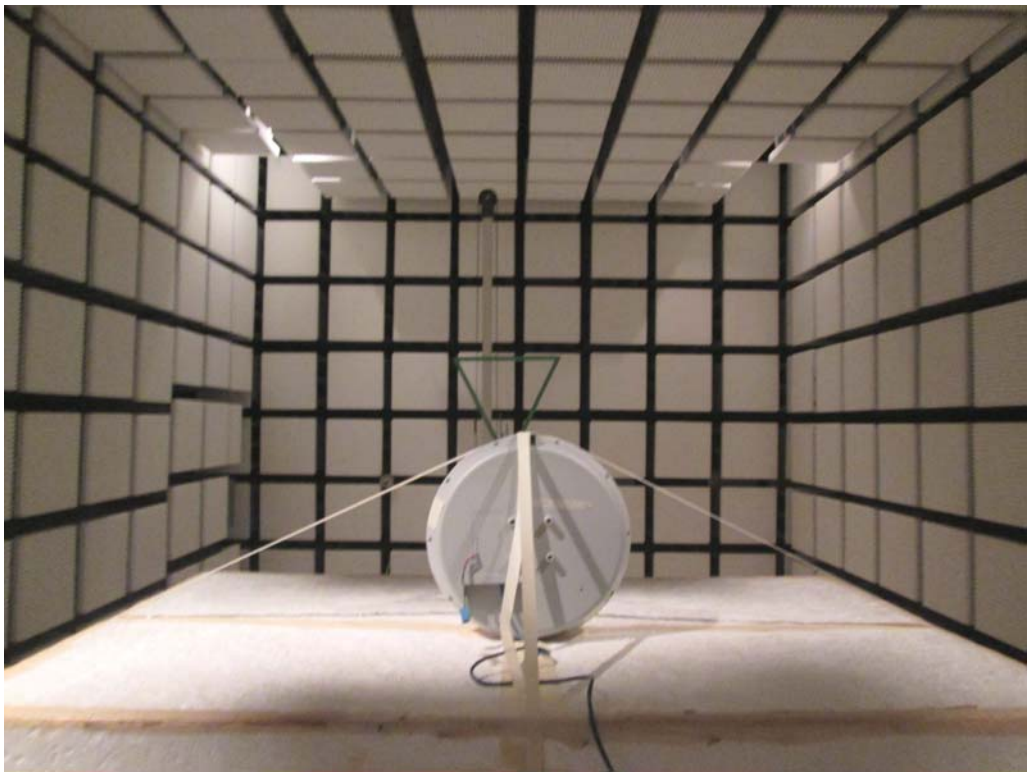
FRONT VIEW



REAR VIEW

<Internal antenna>

FRONT VIEW



REAR VIEW