

VERIFICATION OF COMPLIANCE

● **Equipment** : 802.11abgn, USB Dongle
Model No. : WUBR-508N
Applicant : SparkLAN Communications, Inc.
8F., No. 257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493,
Taiwan



I HEREBY

DECLARE THAT :

The following technical requirements and test specifications are relevant to the presumption of conformity under the **RED Directive 2014/53/EU**.

The equipment was **Passed** the test performed according to **EN 301 893 V2.1.1 (2017-05)**

The test was carried out on **Apr. 27, 2017** at **SPORTON INTERNATIONAL INC. LAB.**

Phoenix Chen
Assistant Manager

CE Test Report

Equipment : 802.11abgn, USB Dongle
Brand Name : SparkLAN
Model No. : WUBR-508N
Standard : EN 301 893 V2.1.1(2017-05)
Operating Band : 5150 MHz – 5250 MHz
5250 MHz – 5350 MHz
5470 MHz – 5725 MHz
Applicant : SparkLAN Communications, Inc.
Manufacturer : 8F., No. 257, Sec. 2, Tiding Blvd., Neihu District, Taipei
City 11493, Taiwan
Operate Mode : Slave without radar detection

The product sample received on Apr. 11, 2016 and completely tested on Apr. 27, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in EN 301 893 V2.1.1(2017-05) 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.



Phoenix Chen
SPORTON INTERNATIONAL
INC.





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APPENDIX A. TEST PHOTOS

PHOTOGRAPHS OF EUT v01

Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Limit	Result	Remark
3.1	4.2.1	Nominal Centre Frequency	EN 301 893 Clause 4.2.1.3	Complied	-
3.2	4.2.2	Nominal Channel Bandwidth (NCB) and Occupied Channel Bandwidth (OCB)	EN 301 893 Clause 4.2.2.2	Complied	-
3.3	4.2.3	RF Output Power	EN 301 893 Table 2	Complied	-
3.4	4.2.3	Transmit Power Control (TPC)	EN 301 893 Table 3	Complied	-
3.5	4.2.3	Power Density	EN 301 893 Table 2	Complied	-
3.6	4.2.4	Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands	EN 301 893 Table 4	Complied	-
3.7	4.2.4	Transmitter Unwanted Emissions within the 5 GHz RLAN Bands	EN 301 893 Figure 1	Complied	-
4.1	4.2.5	Receiver Spurious Emissions	EN 301 893 Table 5	Complied	-
5.1	4.2.7	Adaptivity (Channel Access Mechanism)	EN 301 893 Clause 4.2.7.3	Complied	-
6.1	4.2.8	Receiver Blocking	EN 301 893 Table 9	Complied	-
1.1.8	4.2.10	Geo-location capability	EN 301 893 Clause 4.2.10.3	N/A	-

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	EIRP - Output Power (dBm)
5150-5250	a	5180-5240	36-48 [4]	1	22.73
5250-5350		5260-5320	52-64 [4]	1	19.49
5470-5725		5500-5700	100-140 [11]	1	19.32
5150-5250	n (HT20)	5180-5240	36-48 [4]	2	22.52
5250-5350		5260-5320	52-64 [4]	2	20.00
5470-5725		5500-5700	100-140 [11]	2	19.99
5150-5250	n (HT40)	5190-5230	38-46 [2]	2	21.99
5250-5350		5270-5310	54-62 [2]	2	19.97
5470-5725		5510-5670	102-134 [5]	2	19.93

Note 1: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

1.1.2 Antenna Information

Antenna Category	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input checked="" type="checkbox"/>	Temporary RF connector provided
<input type="checkbox"/>	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
<input type="checkbox"/>	External antenna (dedicated antennas)
<input type="checkbox"/>	Single power level with corresponding antenna(s).
<input type="checkbox"/>	Multiple power level and corresponding antenna(s).

Antenna General Information			
No.	Ant. Cat.	Ant. Type	Gain (dBi)
1-2	Integral	Printed	6.64
Remark: 1. In modulation mode 11a, this EUT supports diversity. EUT was pre-tested Antenna Port 1 and Antenna Port 2 for single chain, and the worst case was Antenna Port 1. Therefore only the test data (Port 1) was recorded in this report. 2. In modulation mode 11n, this EUT supports 2TX.			

1.1.3 EUT Operational Condition

EUT Power Type	From DC Source					
DFS Operating Mode	<input type="checkbox"/>	Master				
	<input type="checkbox"/>	Slave with radar detection				
	<input checked="" type="checkbox"/>	Slave without radar detection				
Device Types (Adaptivity)	<input checked="" type="checkbox"/>	Initiating Device				
	<input checked="" type="checkbox"/>	Responding Device				
	<input checked="" type="checkbox"/>	Supervised Device, which implements:				
	<input checked="" type="checkbox"/>	Priority class 1	<input checked="" type="checkbox"/>	Priority class 2		
	<input type="checkbox"/>	Priority class 1 implements EN 301 893 Table 7 Note1				
	<input type="checkbox"/>	Priority class 2 implements EN 301 893 Table 7 Note1				
	<input checked="" type="checkbox"/>	Priority class 3	<input checked="" type="checkbox"/>	Priority class 4		
	<input type="checkbox"/>	Supervising Device, which implements:				
	<input type="checkbox"/>	Priority class 1	<input type="checkbox"/>	Priority class 2		
	<input type="checkbox"/>	Priority class 1 implements EN 301 893 Table 8 Note1				
	<input type="checkbox"/>	Priority class 2 implements EN 301 893 Table 8 Note1				
<input type="checkbox"/>	Priority class 2 implements EN 301 893 Table 8 Note2					
<input type="checkbox"/>	Priority class 3	<input type="checkbox"/>	Priority class 4			
Communication Mode	<input checked="" type="checkbox"/>	IP Based (Load Based)			<input type="checkbox"/>	Frame Based
TPC Function	<input checked="" type="checkbox"/>	With TPC			<input type="checkbox"/>	Without TPC
Beamforming Function	<input type="checkbox"/>	With beamforming			<input checked="" type="checkbox"/>	Without beamforming
Weather Band (5600~5650MHz)	<input checked="" type="checkbox"/>	With 5600~5650MHz			<input type="checkbox"/>	Without 5600~5650MHz
Operational Voltage	<input checked="" type="checkbox"/>	Vnom (5 V)	<input checked="" type="checkbox"/>	Vmax (5.25 V)	<input checked="" type="checkbox"/>	Vmin (4.75 V)
Operational Temperature	<input checked="" type="checkbox"/>	Tnom (20°C)	<input checked="" type="checkbox"/>	Tmax (50°C)	<input checked="" type="checkbox"/>	Tmin (0°C)
Software / Firmware Version for Adaptivity & Receiver Blocking					5.1.19.0	

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle			
<input type="checkbox"/> Operated normally mode for worst duty cycle			
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle			
Test Signal Duty Cycle (x)	N _{Tx}	Power Duty Factor [dB] – (10 log 1/x)	
<input checked="" type="checkbox"/> 100.00% - IEEE 802.11a	1	0.00	
<input checked="" type="checkbox"/> 100.00% - IEEE 802.11n (HT20)	2	0.00	
<input checked="" type="checkbox"/> 100.00% - IEEE 802.11n (HT40)	2	0.00	

1.1.5 Medium Access Protocol

Medium Access Protocol	
Medium Access Protocol:	<input checked="" type="checkbox"/> IEEE Std. 802.11-2007
	<input checked="" type="checkbox"/> IEEE Std. 802.11n-2009
	<input checked="" type="checkbox"/> IEEE Std. 802.11ac-2012-D3.0
	<input type="checkbox"/> IEEE Std. 802.15.1-2005
	<input type="checkbox"/> Other:
<p>A medium access protocol has been implemented by the equipment. With mechanism designed to facilitate spectrum sharing with other devices in a wireless network. The equipment implements an adequate spectrum sharing mechanism and users will be equal access wireless network.</p>	

1.1.6 Table for Existing Change

This product is an extension of original one reported under Sporton project number: ER232843-12AN

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Update standard to EN 301 893 V2.1.1 (2017-05)	Adaptivity and Receiver Blocking were evaluated

1.1.7 Adaptive Equipment

Adaptive Equipment	
Medium Access Mechanism:	
<input checked="" type="checkbox"/>	Option A: Procedure to verify the Medium Access Mechanism The test procedure which defined in clause 5.4.9.3.2.4.1 should be verified.
<input type="checkbox"/>	Option B: Compliance by declaration for the Medium Access Mechanism. The requirements contained in clause 4.2.7.3.2.6 and 4.2.7.3.2.7 should be declared compliance with by the manufacturer.
<input type="checkbox"/>	The related parameters are identical to EN 301 893 Table 7 for Supervised Device
<input type="checkbox"/>	The related parameters are identical to EN 301 893 Table 8 for Supervising Device
<input type="checkbox"/>	Other parameters
Maximum Channel Occupancy Time(s):	
<input checked="" type="checkbox"/>	Option A: Procedure to verify the maximum Channel Occupancy Time(s) The test procedure which defined in clause 5.4.9.3.2.5.1 should be verified.
<input type="checkbox"/>	Option B: Compliance by declaration for the maximum Channel Occupancy Time(s) The maximum Channel Occupancy Times which defined in clause 4.2.7.3.2.4 should be declared by the manufacturer.
<input type="checkbox"/>	The related parameters are identical to EN 301 893 Table 7 for Supervised Device
<input type="checkbox"/>	The related parameters are identical to EN 301 893 Table 8 for Supervising Device
<input type="checkbox"/>	Other parameters
Channel Operation Mode:	
<input checked="" type="checkbox"/>	Single Channel Operation
<input checked="" type="checkbox"/>	Multi-channel Operation
<input checked="" type="checkbox"/>	Option 1: Load Based Equipment may use any combination/grouping of 20 MHz Operating Channels out of the list of channels (Nominal Centre Frequencies) provided in clause 4.2.1, if it satisfies the channel access requirements (Channel Access Mechanism) for an Initiating Device as described in clause 4.2.7.3.2.6 on each such 20 MHz Operating Channel.
<input type="checkbox"/>	Option 2: EN 301 893 figure 3 defines bonded 40 MHz, 80 MHz or 160 MHz channels. Load Based Equipment that uses a combination/grouping of 20 MHz Operating Channels that is a subset of bonded 40 MHz, 80 MHz or 160 MHz channels, may transmit on any of the 20 MHz Operating Channels.

1.1.8 Geo-location capability supported by the equipment

Geo-location capability supported by the equipment	
<input type="checkbox"/>	Yes
<input type="checkbox"/>	The geographical location determined by the equipment as defined in EN 301 893, clause 4.2.10.3 is not accessible to the user.
<input checked="" type="checkbox"/>	No

1.2 Testing Applied Standards

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

- ♦ EN 301 893 V2.1.1 (2017-05)

1.3 Testing Location Information

Testing Location				
<input checked="" type="checkbox"/>	HWA YA	ADD :	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL :	886-3-327-3456	FAX : 886-3-327-0973
<input type="checkbox"/>	JHUBEI	ADD :	No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL :	886-3-656-9065	FAX : 886-3-656-9085
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Ian	23°C / 65%	20/Oct/2014
Radiated Emission	05CH01-HY	Monday Lin	21°C / 63%	24/Oct/2014
Adaptivity Site	DFS01-HY	Dexter	24°C / 61.1%	26/Apr/2017
Receiver Blocking	DFS01-HY	Dexter	24.2°C / 61.6%	27/Apr/2017

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Carrier Frequencies & Occupied Channel Bandwidth	5.8×10^{-7} MHz	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	2.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.5 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.3 dB	Confidence levels of 95%

Parameter	Uncertainty
RF frequency	5.8×10^{-7} MHz
RF power conducted	±1.2dB
RF power radiated	±2.5dB
Spurious emissions, radiated	±3.3dB
Humidity	±2.4%
Temperature	±0.33°C
Time	±1.44%
95% confidence level using a coverage factor of k=2	

2 Test Configuration of EUT

2.1 Test Channel Frequencies Configuration

Worst Modulation Used for Conformance Testing			
Modulation Mode	Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS
11a	1	6-54Mbps	6 Mbps
HT20	2	M8-15	MCS 8
HT40	2	M8-15	MCS 8

2.2 The Worse Case Power Setting Parameter

The Worst Case Power Setting Parameter (lower sub-band)					
Test Software Version	RT5x7x QA_V1.0.5.9				
Modulation Mode	N _{TX}	Test Frequency (MHz)			
		NCB: 20MHz		NCB: 40MHz	
		5180	5320	5190	5310
11a	1	10	0E	-	-
HT20	2	0C,0C	0F,0C	-	-
HT40	2	-	-	0E,0D	0E,0A

The Worst Case Power Setting Parameter (lower sub-band)					
Test Software Version	RT5x7x QA_V1.0.5.9				
Modulation Mode	N _{TX}	Test Frequency (MHz)			
		NCB: 20MHz		NCB: 40MHz	
		5500	5700	5510	5670
11a	1	0E	13	-	-
HT20	2	0F,0E	15,11	-	-
HT40	2	-	-	0F,0F	15,16

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Nominal Centre 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.
Modulation Mode	Un-modulation

The Worst Case Mode for Following Conformance Tests	
Tests 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	11a, HT20, HT40

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, Power Density Transmitter Unwanted Emissions within the 5 GHz RLAN Bands
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11a, HT20, HT40

The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands 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.		
User Position	<input type="checkbox"/> EUT will be placed in fixed position.		
	<input checked="" type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed three orthogonal planes.		
	<input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.		
Operating Mode	Transmit / Receive		
1	Operating Mode Description		
Modulation Mode	11a, HT20, HT40		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
		V	

The Worst Case Mode for Following Conformance Tests	
Tests 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.

The Worst Case Mode for Following Conformance Tests	
Test Item	Receiver blocking
Test Condition	Conducted measurement at one receiver chain. One channel with the lowest data rate out of the declared channels for each sub-band.

2.4 Accessories and Support Equipment

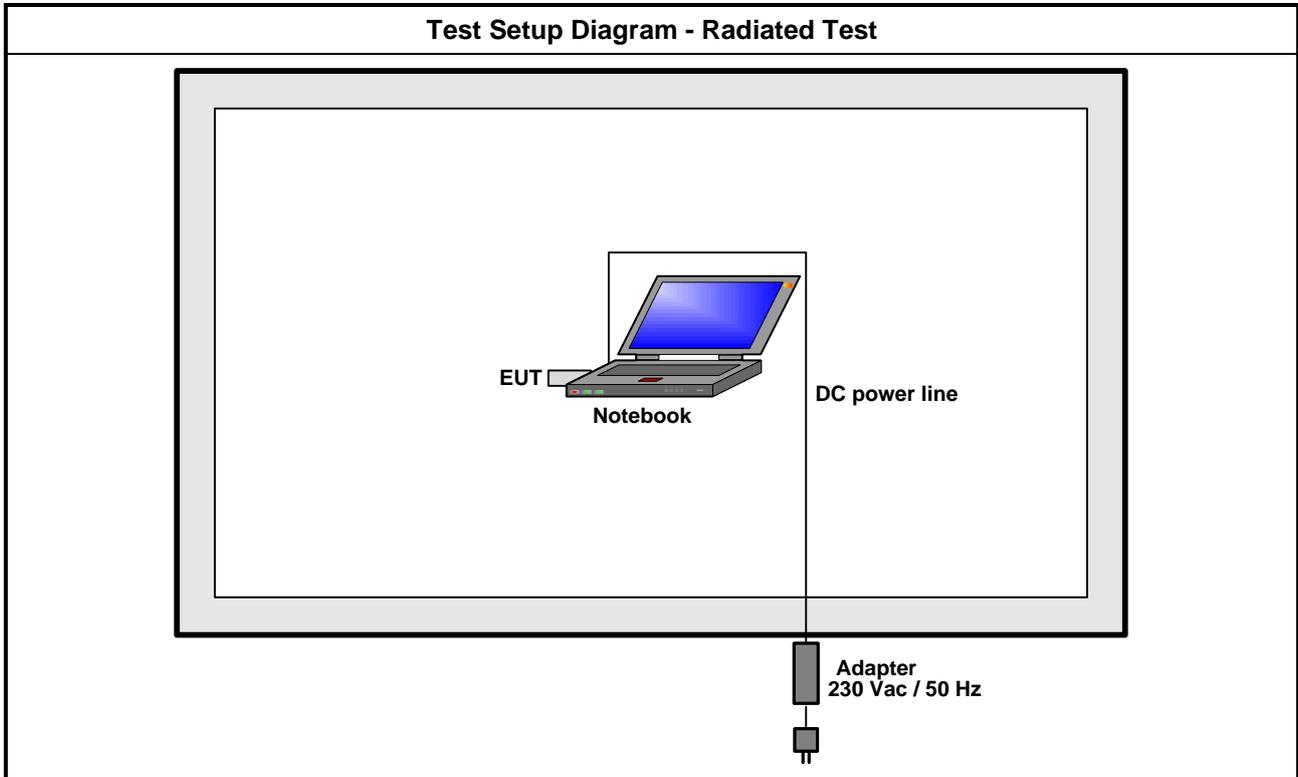
Support Equipment - RF Conducted			
No.	Equipment	Brand Name	Model Name
1	Notebook	DELL	E5500
2	AC Adaptor of Notebook	DELL	E5500

Support Equipment - Radiated Emission			
No.	Equipment	Brand Name	Model Name
1	Notebook	DELL	E5540
2	AC Adaptor of Notebook	DELL	E5540

Support Equipment - Adaptivity			
No.	Equipment	Brand Name	Model Name
1	AP (Master)	EDIMAX	BR-6228GNS V2.0
2	NoteBook	DELL	Latitude E5550
3	Adapter for NB	DELL	FA90PSO-00
4	NoteBook	DELL	Latitude E5540
5	Adapter for NB	DELL	HA65NM130

Support Equipment – Receiver Blocking			
No.	Equipment	Brand Name	Model Name
1	NoteBook	DELL	Latitude E5550
2	Adapter for NB	DELL	FA90PSO-00
3	Shielding Box	EMEC	EM-SHB-650550300-M

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 Nominal Centre Frequency

3.1.1 Nominal Centre Frequency Limit

Nominal Centre Frequency Limit
The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range $f_c \pm 20$ ppm.

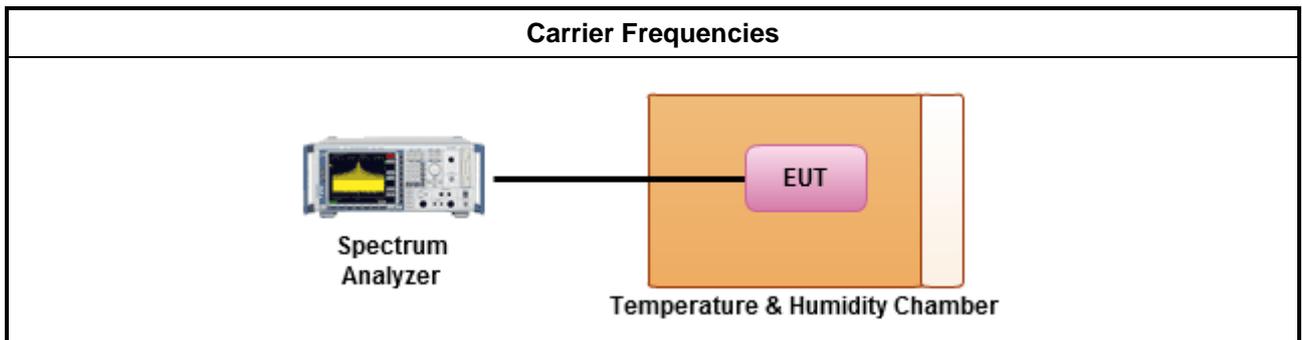
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.3.2 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.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.2 for the carrier frequencies shall be measured using one of the options below.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.2.2.1.1 for equipment operating without modulation method
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.2.2.1.2 for equipment operating with modulation method
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.2.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.2.1 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).
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.2.2.2 for radiated measurement.

3.1.4 Test Setup





3.1.5 Test Result of Nominal Centre Frequency

Test Date	Sep. 16, 2015		Carrier Frequencies Result		
Method			Carrier Stability (ppm)		
Condition	Test Mode	Freq. (MHz)	Frequency (MHz)	Carrier Stability	Carrier Stability Limit
TnomVnom	Un-modulation	5180	5179.98177	-3.52	± 20
TminVmax	Un-modulation	5180	5180.02735	5.28	± 20
TminVmin	Un-modulation	5180	5180.02692	5.20	± 20
TmaxVmax	Un-modulation	5180	5180.02388	4.61	± 20
TmaxVmin	Un-modulation	5180	5180.02214	4.27	± 20
TnomVnom	Un-modulation	5500	5499.97916	-3.79	± 20
TminVmax	Un-modulation	5500	5499.98307	-3.08	± 20
TminVmin	Un-modulation	5500	5499.98698	-2.37	± 20
TmaxVmax	Un-modulation	5500	5500.02171	3.95	± 20
TmaxVmin	Un-modulation	5500	5500.02127	3.87	± 20
Result			Complied		

3.2 Occupied Channel Bandwidth

3.2.1 Occupied Channel Bandwidth Limit

Nominal Channel Bandwidth and Occupied Channel Bandwidth Limit	
The Occupied Channel Bandwidth (OCB) is the bandwidth containing 99 % of the power of the signal. The Nominal Channel Bandwidth (NCB) shall be at least 5 MHz at all times. And the Occupied Channel Bandwidth shall be between 80 % and 100 % of the declared Nominal Channel Bandwidth.	
Nominal Channel Bandwidth (MHz)	Occupied Channel Bandwidth (MHz)
20	16 – 20
40	32 – 40
80	64 – 80
160	128 – 160

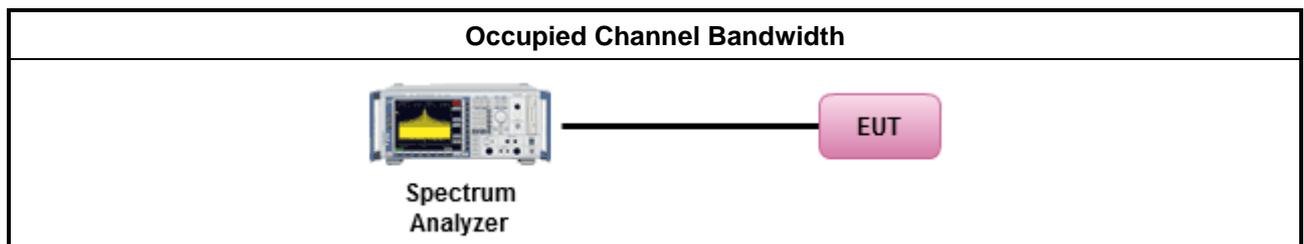
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.3.2 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.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.3.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.3.2.1 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).
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.3.2.2 for radiated measurement.

3.2.4 Test Setup





3.2.5 Test Result of NCB and OCB

Test Date	Oct. 20, 2014	Occupied Channel Bandwidth Result		
Modulation Mode	Frequency (MHz)	Occupied Channel Bandwidth (MHz)	Nominal Channel Bandwidth (MHz)	Occupied Channel Bandwidth Limit (MHz)
11a	5180	16.37	20	16-20
11a	5500	16.31	20	16-20
HT20	5180	17.47	20	16-20
HT20	5500	17.47	20	16-20
HT40	5190	35.86	40	32-40
HT40	5510	35.90	40	32-40
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 <small>(note 1)</small>
5470-5725	30 <small>(note 3)</small>	27 <small>(note 3)</small>

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: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.
 Note 3: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

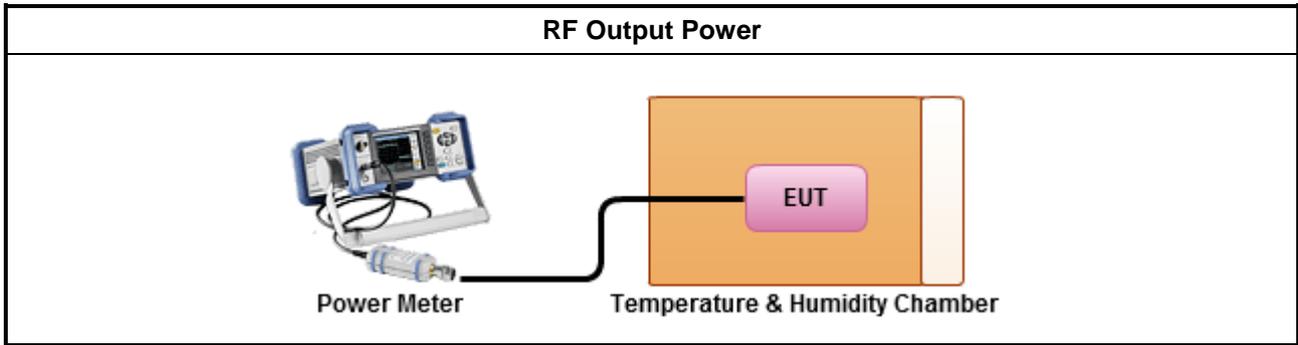
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	The measurements shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.
<input checked="" type="checkbox"/>	The EUT shall be configured to operate at the maximum stated transmitter output power level.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.4 for the RF output power shall be measured using below options:
<input type="checkbox"/>	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 5.4.4.2.1.1.2.
<input checked="" type="checkbox"/>	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 5.4.4.2.1.1.3.
<input type="checkbox"/>	Option 3: For equipment without continuous transmission capability and having simultaneous transmissions in both sub-bands. Refer as EN 301 893, clause 5.4.4.2.1.1.4.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.4.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	If multiple transmit chains, EIRP calculation could be following as methods:
<input checked="" type="checkbox"/>	$EIRP_{total} = P_{total} + G$ 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.
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.4.2.2 for radiated measurement.

3.3.4 Test Setup



3.3.5 Maximum Antenna Gain

Maximum Antenna Gain Result			
Transmit Chains No.	1	2	-
Maximum Gain (dBi)	6.64	6.64	-
Modulation Mode	N_{TX}	N_{SS}	Max. Gain (dBi)
11a,6-54Mbps	1	1	6.64
HT20,M8-15	2	2	6.64
HT40,M8-15	2	2	6.64

3.3.6 Test Result of RF Output Power at the Highest Power - P_H

RF Output Power at the Highest Power - P _H Result						
Max. Gain (dBi)			6.64	RF Output Power (dBm)		
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	Chain-Port 1	EIRP Power	EIRP Limit
TnomVnom	11a	1	5180	14.78	21.42	23.0
TminVmax	11a	1	5180	16.00	22.64	23.0
TminVmin	11a	1	5180	16.09	22.73	23.0
TmaxVmax	11a	1	5180	11.31	17.95	23.0
TmaxVmin	11a	1	5180	11.22	17.86	23.0
TnomVnom	11a	1	5320	10.82	17.46	23.0
TminVmax	11a	1	5320	12.85	19.49	23.0
TminVmin	11a	1	5320	12.76	19.40	23.0
TmaxVmax	11a	1	5320	7.53	14.17	23.0
TmaxVmin	11a	1	5320	7.41	14.05	23.0
TnomVnom	11a	1	5500	10.64	17.28	23.0
TminVmax	11a	1	5500	12.67	19.31	23.0
TminVmin	11a	1	5500	12.51	19.15	23.0
TmaxVmax	11a	1	5500	7.45	14.09	23.0
TmaxVmin	11a	1	5500	7.29	13.93	23.0
TnomVnom	11a	1	5700	10.92	17.56	23.0
TminVmax	11a	1	5700	12.68	19.32	23.0
TminVmin	11a	1	5700	12.57	19.21	23.0
TmaxVmax	11a	1	5700	7.51	14.15	23.0
TmaxVmin	11a	1	5700	7.35	13.99	23.0
Result				Complied		



RF Output Power at the Highest Power - P _H Result								
Max. Gain (dBi)			6.64	RF Output Power (dBm)				
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	Chain-Port 1	Chain-Port 2	Sum Chain	EIRP Power	EIRP Limit
TnomVnom	HT20	2	5180	10.74	10.58	13.67	20.31	23.0
TminVmax	HT20	2	5180	12.91	12.82	15.88	22.52	23.0
TminVmin	HT20	2	5180	12.78	12.70	15.75	22.39	23.0
TmaxVmax	HT20	2	5180	8.17	7.53	10.87	17.51	23.0
TmaxVmin	HT20	2	5180	7.96	7.37	10.69	17.33	23.0
TnomVnom	HT20	2	5320	8.13	9.07	11.64	18.28	23.0
TminVmax	HT20	2	5320	10.25	10.44	13.36	20.00	23.0
TminVmin	HT20	2	5320	10.16	10.51	13.35	19.99	23.0
TmaxVmax	HT20	2	5320	5.19	5.17	8.19	14.83	23.0
TmaxVmin	HT20	2	5320	4.87	4.96	7.93	14.57	23.0
TnomVnom	HT20	2	5500	8.25	7.71	11.00	17.64	23.0
TminVmax	HT20	2	5500	10.24	10.36	13.31	19.95	23.0
TminVmin	HT20	2	5500	10.11	10.24	13.19	19.83	23.0
TmaxVmax	HT20	2	5500	4.96	4.62	7.80	14.44	23.0
TmaxVmin	HT20	2	5500	4.72	4.47	7.61	14.25	23.0
TnomVnom	HT20	2	5700	9.17	9.43	12.31	18.95	23.0
TminVmax	HT20	2	5700	10.41	10.26	13.35	19.99	23.0
TminVmin	HT20	2	5700	10.33	10.31	13.33	19.97	23.0
TmaxVmax	HT20	2	5700	4.71	5.28	8.01	14.65	23.0
TmaxVmin	HT20	2	5700	4.65	5.05	7.86	14.50	23.0
Result				Complied				



RF Output Power at the Highest Power - P _H Result								
Max. Gain (dBi)			6.64	RF Output Power (dBm)				
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	Chain-Port 1	Chain-Port 2	Sum Chain	EIRP Power	EIRP Limit
TnomVnom	HT40	2	5190	10.12	9.18	12.69	19.33	23.0
TminVmax	HT40	2	5190	12.21	12.46	15.35	21.99	23.0
TminVmin	HT40	2	5190	12.10	12.33	15.23	21.87	23.0
TmaxVmax	HT40	2	5190	6.24	5.85	9.06	15.70	23.0
TmaxVmin	HT40	2	5190	6.17	5.79	8.99	15.63	23.0
TnomVnom	HT40	2	5310	7.98	7.85	10.93	17.57	23.0
TminVmax	HT40	2	5310	10.31	10.32	13.33	19.97	23.0
TminVmin	HT40	2	5310	10.19	10.28	13.25	19.89	23.0
TmaxVmax	HT40	2	5310	4.31	4.56	7.45	14.09	23.0
TmaxVmin	HT40	2	5310	4.17	4.23	7.21	13.85	23.0
TnomVnom	HT40	2	5510	8.29	7.85	11.09	17.73	23.0
TminVmax	HT40	2	5510	10.25	10.25	13.26	19.90	23.0
TminVmin	HT40	2	5510	10.11	10.14	13.14	19.78	23.0
TmaxVmax	HT40	2	5510	4.56	3.92	7.26	13.90	23.0
TmaxVmin	HT40	2	5510	4.32	3.78	7.07	13.71	23.0
TnomVnom	HT40	2	5670	8.88	7.93	11.44	18.08	23.0
TminVmax	HT40	2	5670	10.36	10.19	13.29	19.93	23.0
TminVmin	HT40	2	5670	10.21	10.11	13.17	19.81	23.0
TmaxVmax	HT40	2	5670	4.28	4.47	7.39	14.03	23.0
TmaxVmin	HT40	2	5670	4.07	4.12	7.11	13.75	23.0
Result				Complied				

3.4 Transmit Power Control (TPC)

3.4.1 Transmit Power Control (TPC) Limit

Mean e.i.r.p. Limits for RF Output Power at the Lowest Power Level	
Frequency Range	Mean e.i.r.p.
5250 MHz to 5350 MHz	17 dBm
5470 MHz to 5725 MHz	24 dBm (see note)

Note : Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

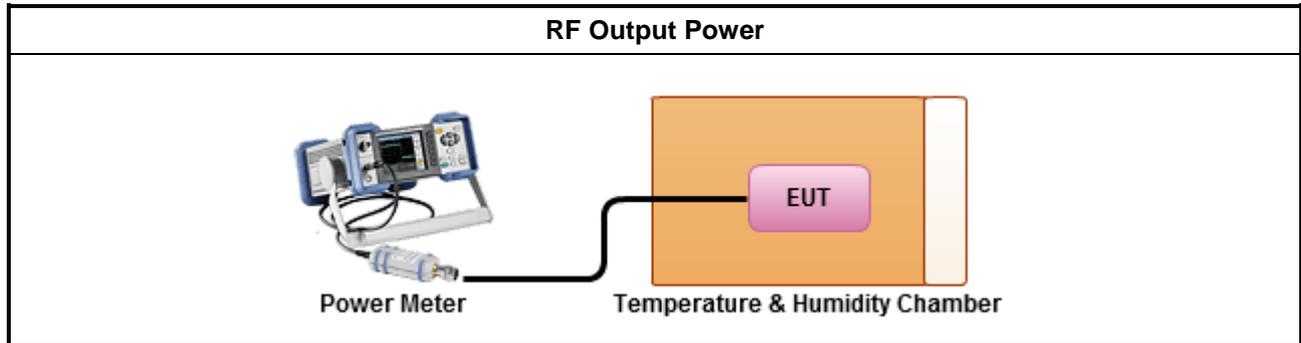
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	The measurements shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.
<input checked="" type="checkbox"/>	The EUT shall be configured to operate at the lowest stated transmitter output power level.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.3.2 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.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.3.4 for the RF output power shall be measured using below options:
<input type="checkbox"/>	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 5.4.4.2.1.2.2.
<input checked="" type="checkbox"/>	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 5.4.4.2.1.2.3.
<input type="checkbox"/>	Option 3: For equipment without continuous transmission capability and having simultaneous transmissions in both sub-bands. Refer as EN 301 893, clause 5.4.4.2.1.2.4.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.4.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	If multiple transmit chains, EIRP calculation could be following as methods:
<input checked="" type="checkbox"/>	$EIRP_{total} = P_{total} + G$ 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.
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.4.2.2 for radiated measurement.

3.4.4 Test Setup



3.4.5 Test Result of RF Output Power at the Lowest Power – P_L

RF Output Power at the Lowest Power - P _L Result					
Max. Gain (dBi)			6.64	RF Output Power (dBm)	
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	EIRP Power	EIRP Limit
TnomVnom	11a	1	5320	11.46	17.0
TminVmax	11a	1	5320	13.49	17.0
TminVmin	11a	1	5320	13.40	17.0
TmaxVmax	11a	1	5320	8.17	17.0
TmaxVmin	11a	1	5320	8.05	17.0
TnomVnom	HT20	2	5320	12.28	17.0
TminVmax	HT20	2	5320	14.00	17.0
TminVmin	HT20	2	5320	13.99	17.0
TmaxVmax	HT20	2	5320	8.83	17.0
TmaxVmin	HT20	2	5320	8.57	17.0
TnomVnom	HT40	2	5310	11.57	17.0
TminVmax	HT40	2	5310	13.97	17.0
TminVmin	HT40	2	5310	13.89	17.0
TmaxVmax	HT40	2	5310	8.09	17.0
TmaxVmin	HT40	2	5310	7.85	17.0
Result			Complied		

Note 1: N_{TX} = Number of Transmit Chains



RF Output Power at the Lowest Power - P _L Result					
Max. Gain (dBi)			6.64	RF Output Power (dBm)	
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	EIRP Power	EIRP Limit
TnomVnom	11a	1	5500	11.28	17.0
TminVmax	11a	1	5500	13.31	17.0
TminVmin	11a	1	5500	13.15	17.0
TmaxVmax	11a	1	5500	8.09	17.0
TmaxVmin	11a	1	5500	7.93	17.0
TnomVnom	11a	1	5700	11.56	17.0
TminVmax	11a	1	5700	13.32	17.0
TminVmin	11a	1	5700	13.21	17.0
TmaxVmax	11a	1	5700	8.15	17.0
TmaxVmin	11a	1	5700	7.99	17.0
Result			Complied		
Note 1: N _{TX} = Number of Transmit Chains					

RF Output Power at the Lowest Power – P _L Result					
Max. Gain (dBi)			6.64	RF Output Power (dBm)	
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	EIRP Power	EIRP Limit
TnomVnom	HT20	2	5500	11.64	17.0
TminVmax	HT20	2	5500	13.95	17.0
TminVmin	HT20	2	5500	13.83	17.0
TmaxVmax	HT20	2	5500	8.44	17.0
TmaxVmin	HT20	2	5500	8.25	17.0
TnomVnom	HT20	2	5700	12.95	17.0
TminVmax	HT20	2	5700	13.99	17.0
TminVmin	HT20	2	5700	13.97	17.0
TmaxVmax	HT20	2	5700	8.65	17.0
TmaxVmin	HT20	2	5700	8.50	17.0
Result			Complied		
Note 1: N _{TX} = Number of Transmit Chains					



RF Output Power at the Lowest Power – P _L Result					
Max. Gain (dBi)			6.64	RF Output Power (dBm)	
Condition	Modulation Mode	N _{TX}	Freq. (MHz)	EIRP Power	EIRP Limit
TnomVnom	HT40	2	5510	11.73	17.0
TminVmax	HT40	2	5510	13.90	17.0
TminVmin	HT40	2	5510	13.78	17.0
TmaxVmax	HT40	2	5510	7.90	17.0
TmaxVmin	HT40	2	5510	7.71	17.0
TnomVnom	HT40	2	5670	12.08	17.0
TminVmax	HT40	2	5670	13.93	17.0
TminVmin	HT40	2	5670	13.81	17.0
TmaxVmax	HT40	2	5670	8.03	17.0
TmaxVmin	HT40	2	5670	7.75	17.0
Result			Complied		
Note 1: N _{TX} = Number of Transmit Chains					

3.5 Power Density

3.5.1 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 <small>(note 1)</small>
5470-5725	17 <small>(note 2)</small>	14 <small>(note 2)</small>

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.

3.5.2 Measuring Instruments

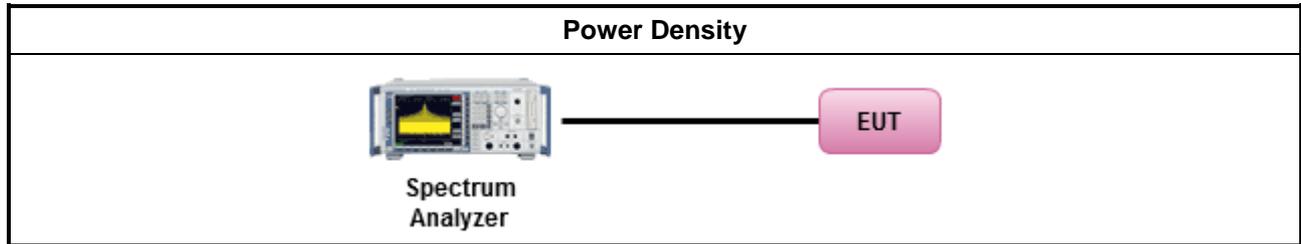
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	The measurements shall be performed at normal environmental conditions.
<input checked="" type="checkbox"/>	The EUT shall be configured to operate at the maximum stated transmitter output power level.
<input checked="" type="checkbox"/>	Power density shall be measured using one of the options below.
<input type="checkbox"/>	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 5.4.4.2.1.3.2.
<input checked="" type="checkbox"/>	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 5.4.4.2.1.3.3.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.4.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	The EUT supports multiple transmit chains using options given below:
<input checked="" type="checkbox"/>	Option 1: connect the UUT to the spectrum analyzer and use the following 5.4.4.2.1.3.2 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. $PD = D + G + Y + 10 \log (1/x)$ (dBm/MHz).

		<p><input type="checkbox"/> Option 2: connect the UUT to the spectrum analyzer and use the 5.4.4.2.1.3.3 settings, Add up the values of power for all the samples in the file using the formula below.</p> $P_{\text{Sum}} = \sum_{n=1}^k P_{\text{sample}}(n)$ <p>Normalize the individual values for power (in dBm) so that the sum is equal to the EIRP(PH) measured for this sub-band. The following formulas can be used:</p> $C_{\text{Corr}} = P_{\text{Sum}} - P_{\text{H e.i.r.p}}$ $P_{\text{Samplecorr}}(n) = P_{\text{Sample}}(n) - C_{\text{Corr}}$ <p>with 'n' being the actual sample number</p> <p>Starting from the first sample $P_{\text{Samplecorr}}(n)$ 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.</p> <p>Shift the start point of the samples added up in step (i.e. sample #2 to sample #101).</p> <p>Repeat step until the end of the data set and save the radiated power density values for each of the 1 MHz segments.</p> <p>From all the saved results, the highest value is the maximum Power Density (e.i.r.p.) for the UUT.</p>
		<p><input checked="" type="checkbox"/> 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.</p>
		<p><input type="checkbox"/> Refer as EN 301 893, clause 5.4.4.2.2 for radiated measurement.</p>

3.5.4 Test Setup



3.5.5 Test Result of Power Density

Test Date	Sep. 16, 2015		Power Density Result			
Modulation Mode	N _{TX}	Freq. (MHz)	PD (dBm/MHz)	Max. Gain (dBi)	EIRP PD (dBm/MHz)	EIRP Limit (dBm/MHz)
11a	1	5180	3.29	6.64	9.93	10
11a	1	5320	-0.72	6.64	5.92	10
11a	1	5500	-0.77	6.64	5.87	10
11a	1	5700	-1.74	6.64	4.90	10
HT20	2	5180	1.97	6.64	8.61	10
HT20	2	5320	0.22	6.64	6.86	10
HT20	2	5500	-0.54	6.64	6.10	10
HT20	2	5700	0.14	6.64	6.78	10
HT40	2	5190	-0.99	6.64	5.65	10
HT40	2	5310	-3.99	6.64	2.65	10
HT40	2	5510	-3.51	6.64	3.13	10
HT40	2	5670	-3.07	6.64	3.57	10

3.6 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

3.6.1 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

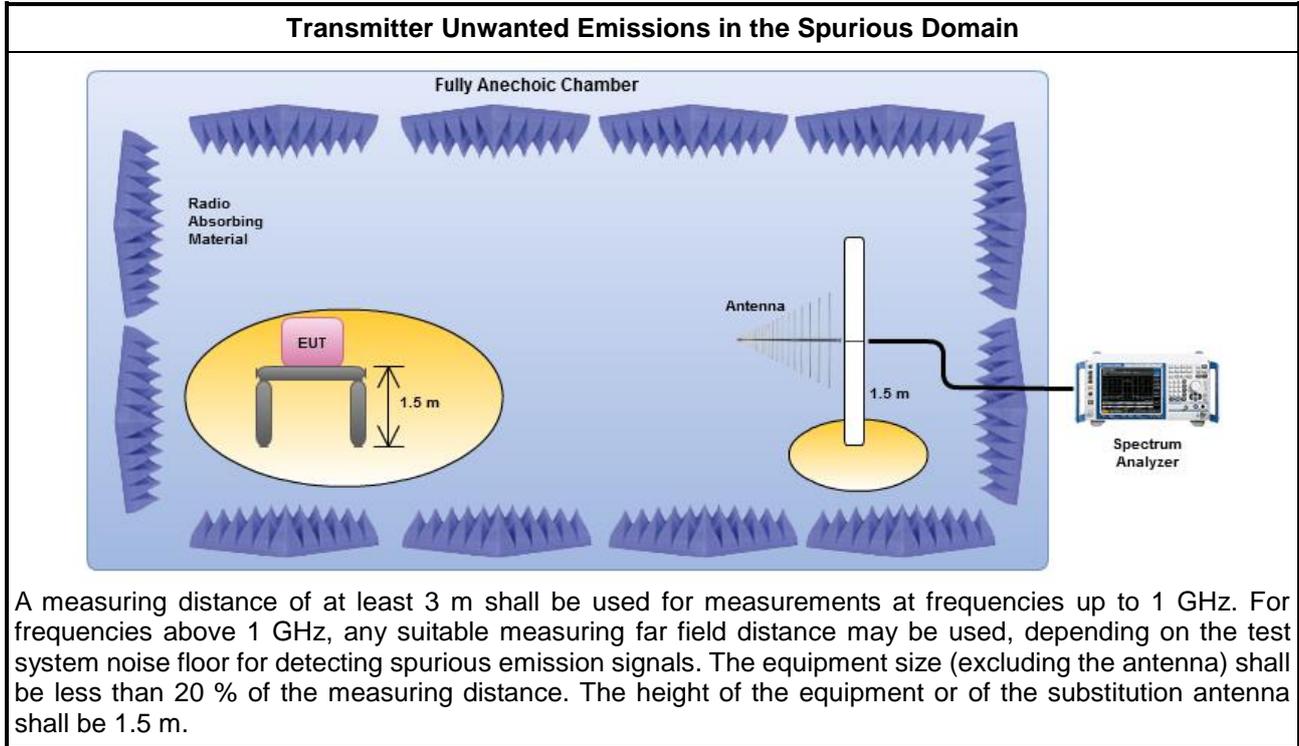
3.6.2 Measuring Instruments

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

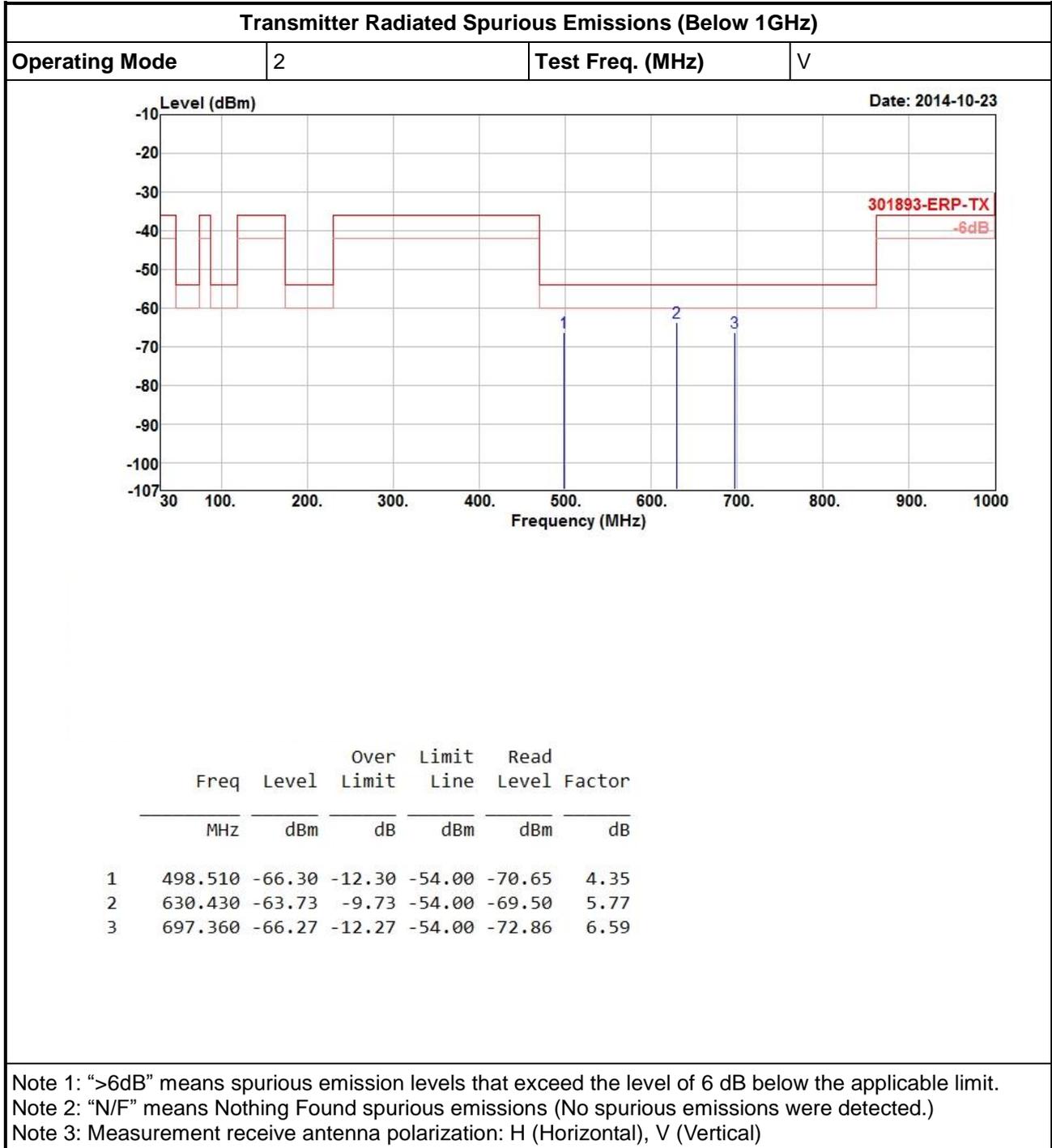
3.6.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.3.2 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.
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.5.2.1 for conducted measurement. Conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).
<input type="checkbox"/>	The EUT supports multiple transmit chains using options given below: <ul style="list-style-type: none"> <input type="checkbox"/> Option 1: The results for each of the transmit chains for the corresponding 1 MHz segments shall be added and compared with the transmitter spurious emissions limit. <input type="checkbox"/> 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 $10 \times \log_{10}(T_{ch})$. (Number of active transmit chains).
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.5.2.2 for radiated measurement.

3.6.4 Test Setup



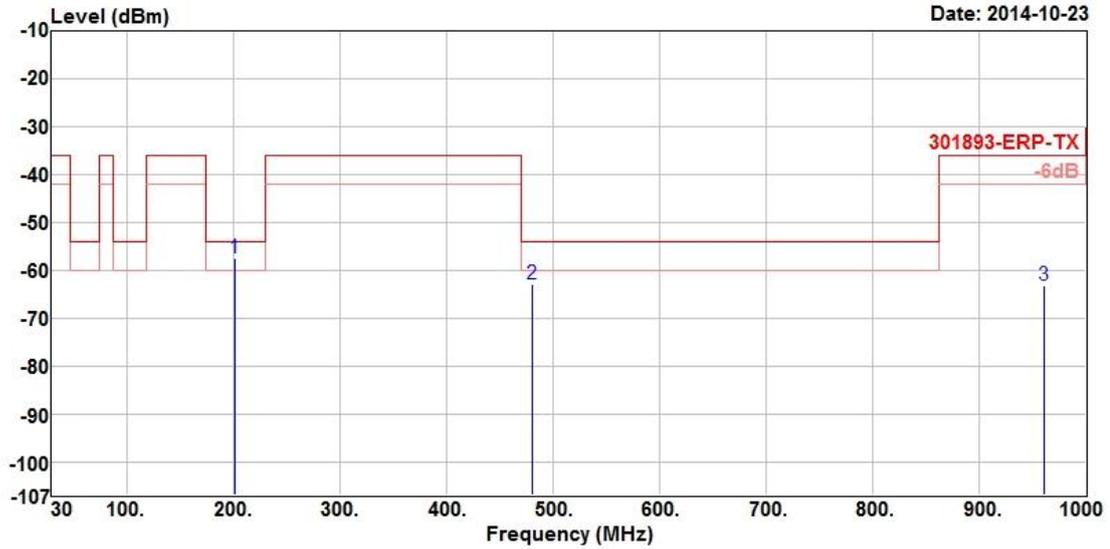
3.6.5 Transmitter Radiated Unwanted Emissions (Below 1GHz)





Transmitter Radiated Spurious Emissions (Below 1GHz)

Operating Mode	2	Polarization	H
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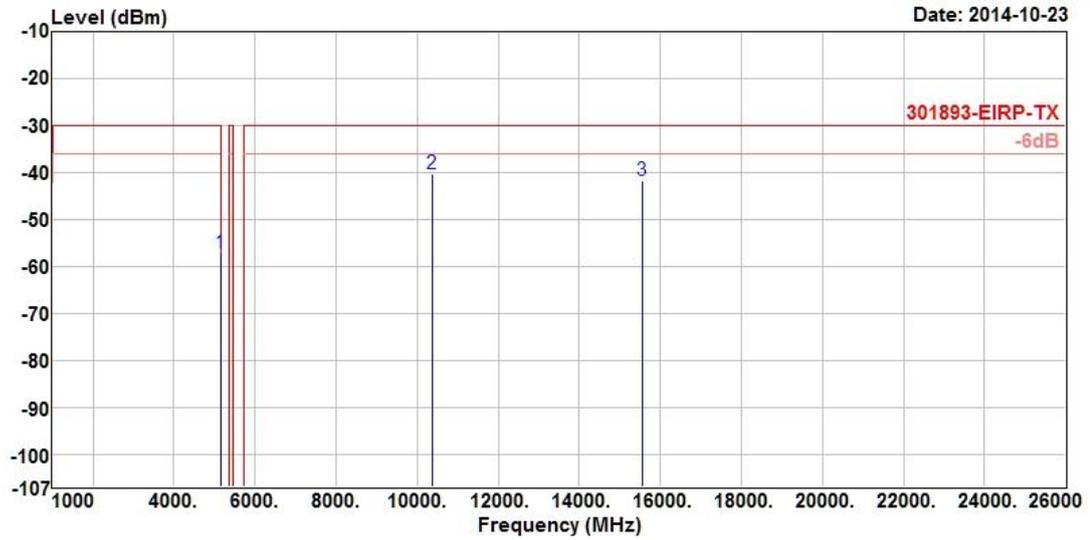


	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	201.690	-57.54	-3.54	-54.00	-53.17	-4.37
2	480.080	-62.92	-8.92	-54.00	-66.78	3.86
3	960.230	-63.09	-27.09	-36.00	-75.31	12.22

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)

3.6.6 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Transmitter Radiated Spurious Emissions (Above 1GHz)			
Modulation Mode	11a	Test Freq. (MHz)	5180
N _{TX}	1	Polarization	V



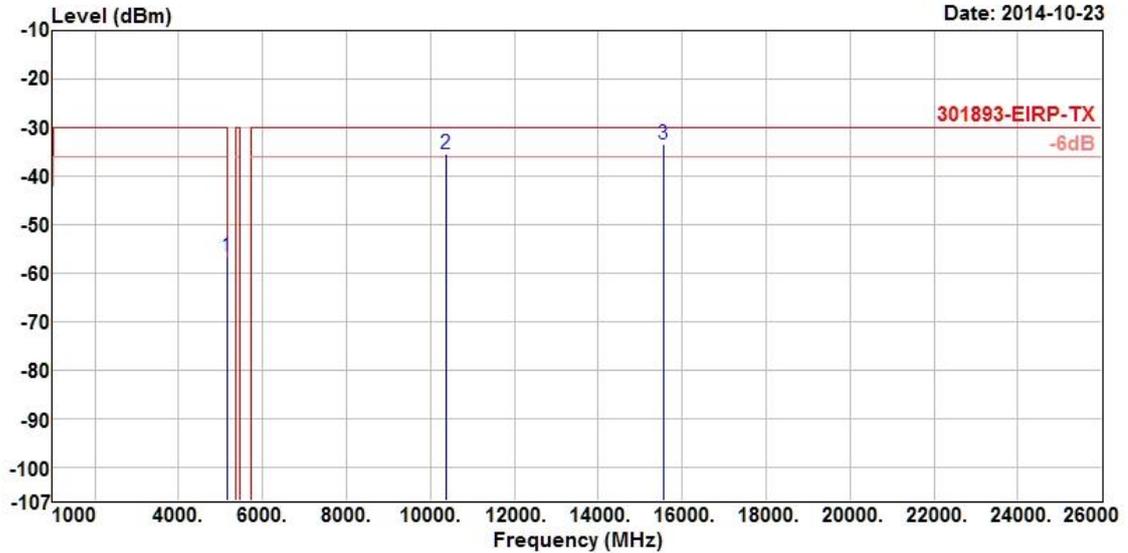
	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	5138.600	-57.13	-27.13	-30.00	-76.08	18.95
2	10360.000	-40.39	-10.39	-30.00	-70.68	30.29
3	15540.000	-41.73	-11.73	-30.00	-77.07	35.34

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	11a	Test Freq. (MHz)	5180
N _{TX}	1	Polarization	H

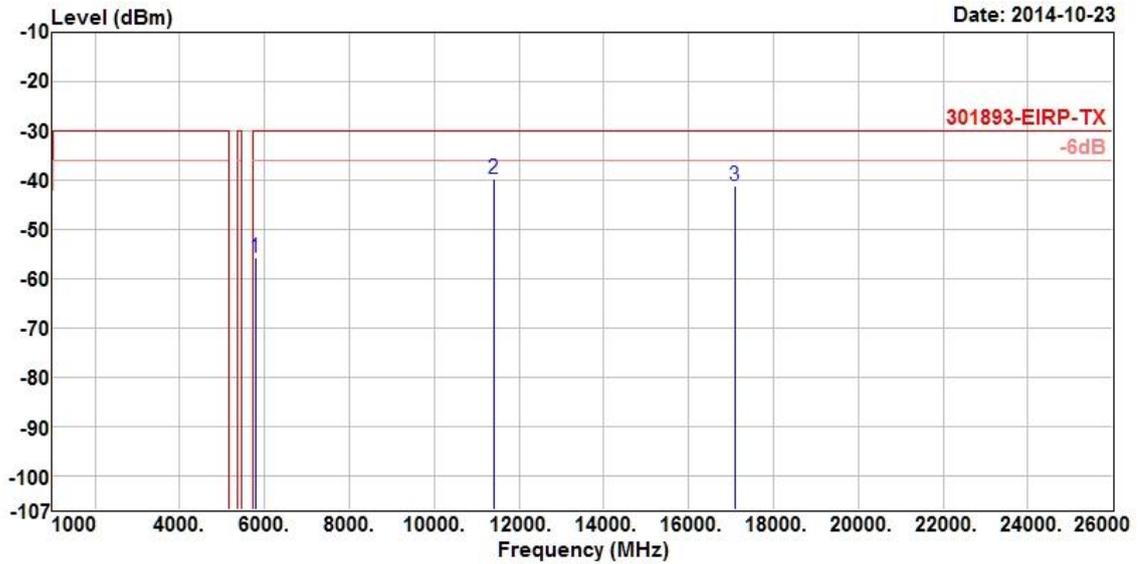


	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	5148.300	-56.62	-26.62	-30.00	-76.02	19.40
2	10360.000	-35.36	-5.36	-30.00	-64.23	28.87
3	15540.000	-33.38	-3.38	-30.00	-70.37	36.99

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)

Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	11a	Test Freq. (MHz)	5700
N _{TX}	1	Polarization	V



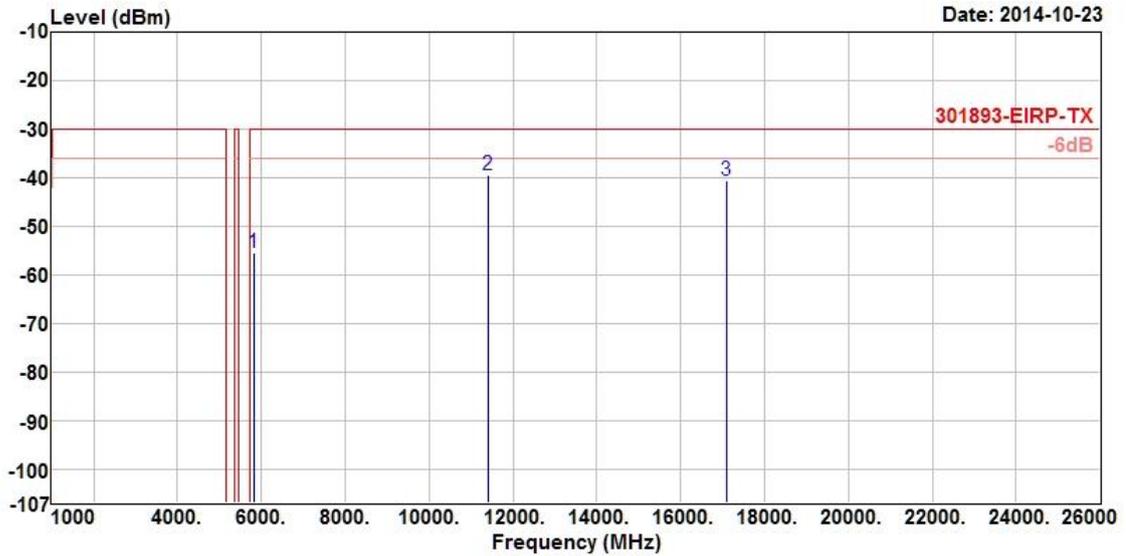
	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	5780.400	-55.87	-25.87	-30.00	-76.61	20.74
2	11400.000	-39.86	-9.86	-30.00	-70.26	30.40
3	17100.000	-41.03	-11.03	-30.00	-82.31	41.28

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	11a	Test Freq. (MHz)	5700
N _{TX}	1	Polarization	H

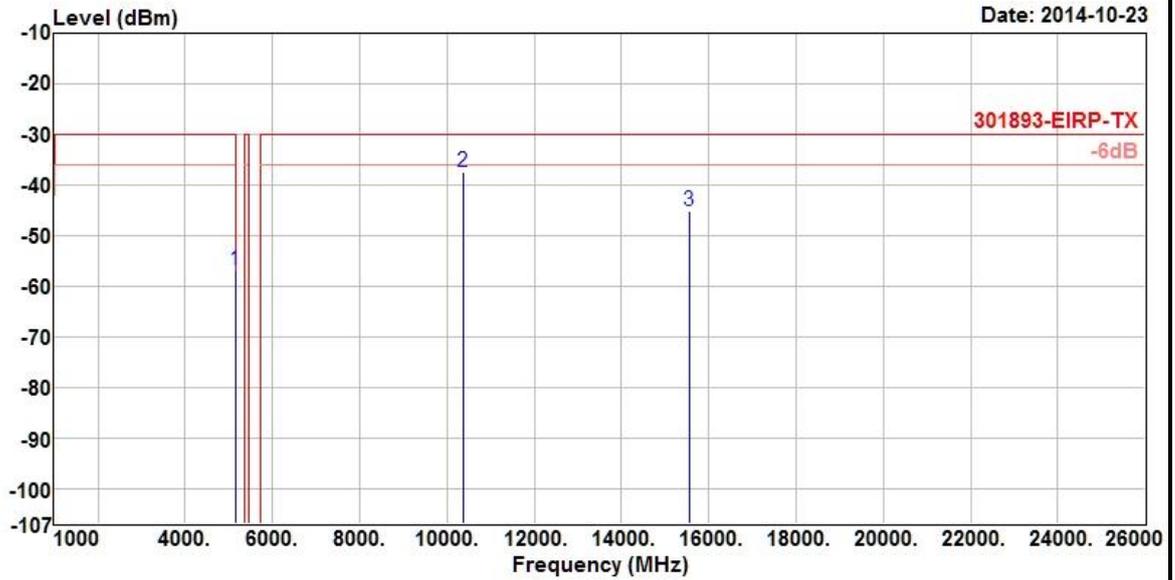


Date: 2014-10-23

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	5817.600	-55.56	-25.56	-30.00	-76.57	21.01
2	11400.000	-39.35	-9.35	-30.00	-71.59	32.24
3	17100.000	-40.68	-10.68	-30.00	-81.25	40.57

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)

Transmitter Radiated Spurious Emissions (Above 1GHz)			
Modulation Mode	HT20	Test Freq. (MHz)	5180
N _{TX}	1	Polarization	V



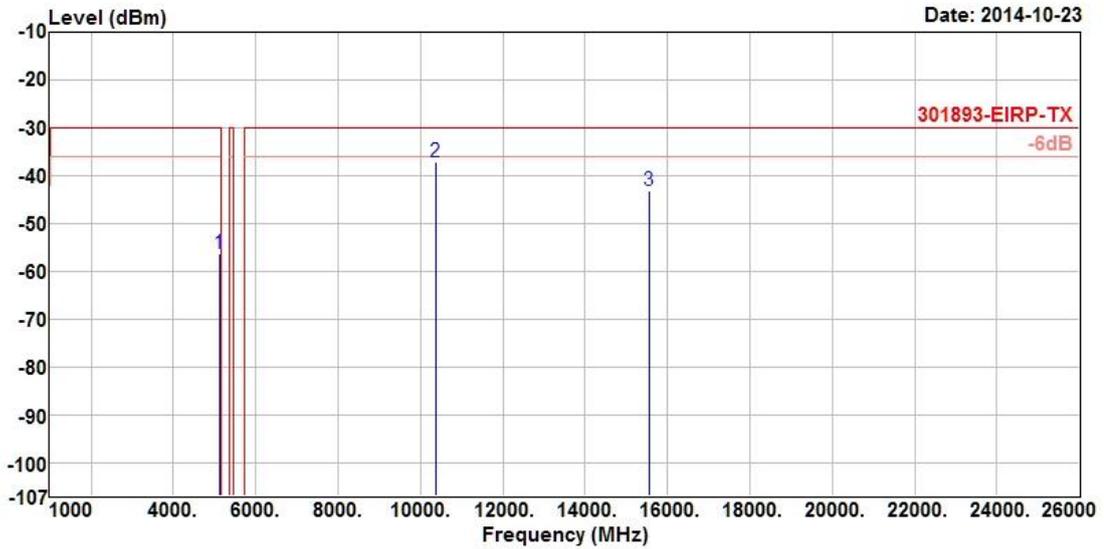
	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	5149.100	-57.02	-27.02	-30.00	-76.03	19.01
2	10360.000	-37.34	-7.34	-30.00	-67.63	30.29
3	15540.000	-45.04	-15.04	-30.00	-80.38	35.34

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	5180
N _{TX}	1	Polarization	H

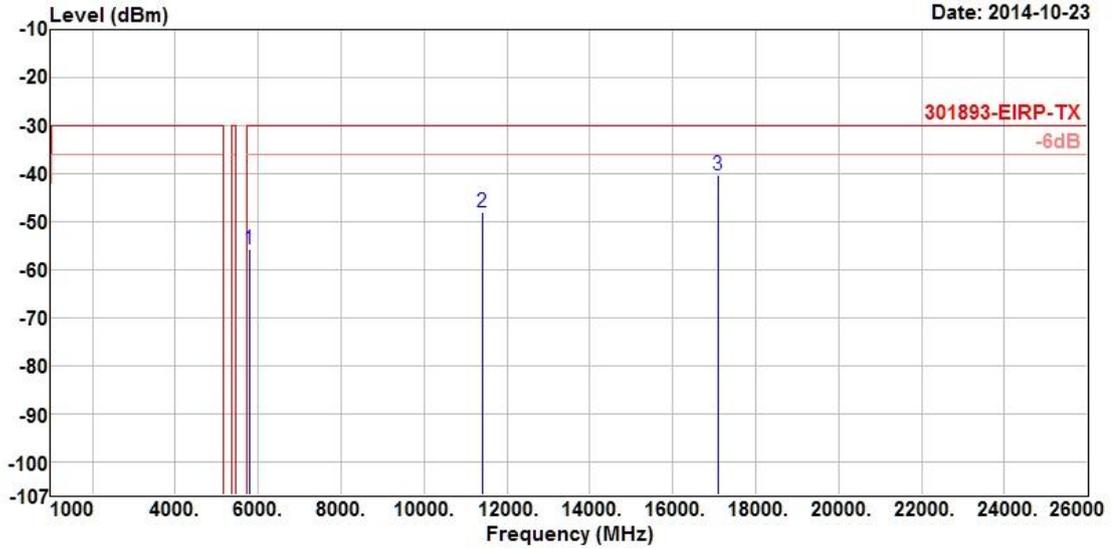


	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	5128.400	-56.22	-26.22	-30.00	-75.59	19.37
2	10360.000	-37.21	-7.21	-30.00	-66.08	28.87
3	15540.000	-43.31	-13.31	-30.00	-80.30	36.99

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)

Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	5700
N _{TX}	1	Polarization	V



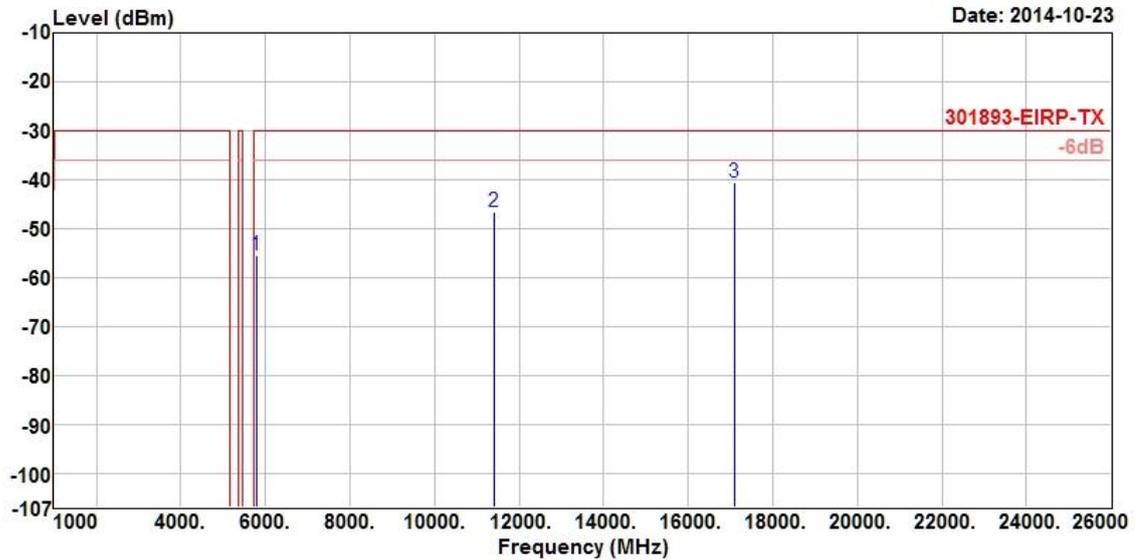
	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	5777.900	-55.71	-25.71	-30.00	-76.45	20.74
2	11400.000	-47.94	-17.94	-30.00	-78.34	30.40
3	17100.000	-40.30	-10.30	-30.00	-81.58	41.28

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT20	Test Freq. (MHz)	5700
N _{TX}	1	Polarization	H



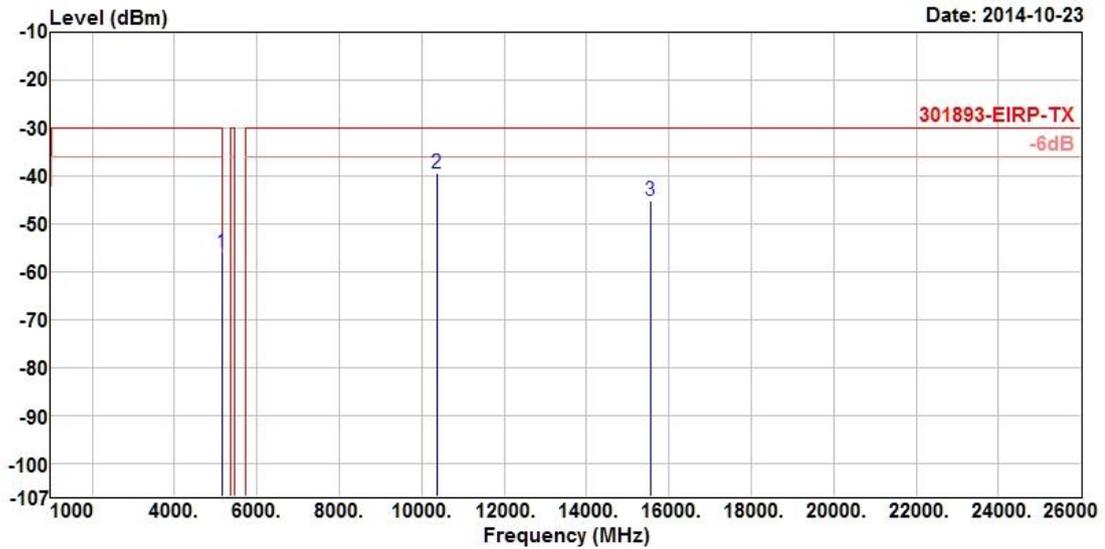
	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	5785.300	-55.57	-25.57	-30.00	-76.50	20.93
2	11400.000	-46.62	-16.62	-30.00	-78.86	32.24
3	17100.000	-40.74	-10.74	-30.00	-81.31	40.57

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	5190
N _{TX}	1	Polarization	V



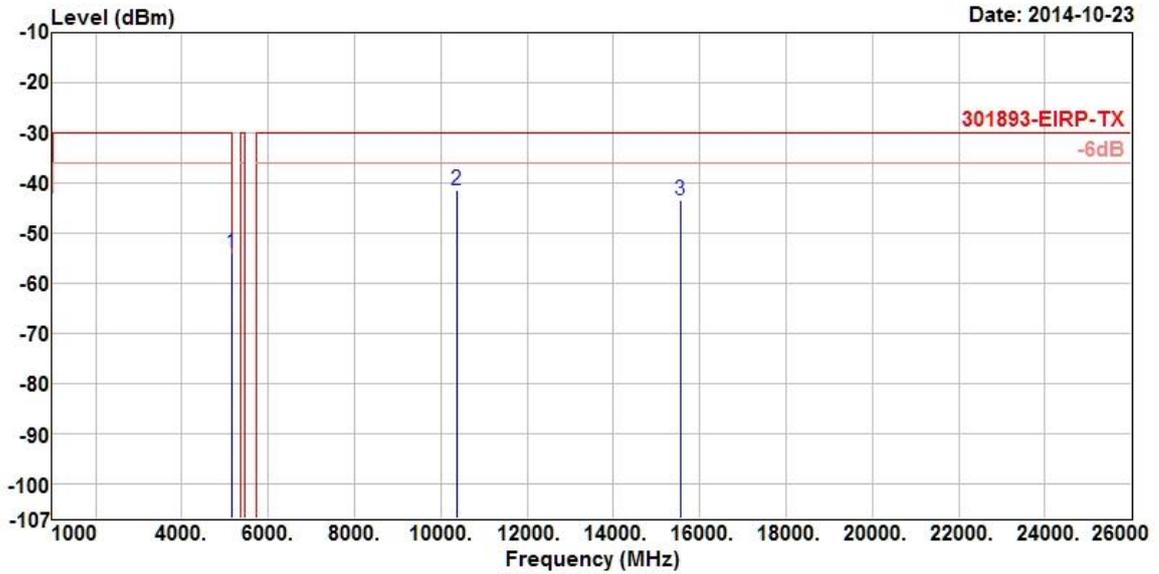
	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	5149.800	-56.19	-26.19	-30.00	-75.20	19.01
2	10380.000	-39.48	-9.48	-30.00	-69.82	30.34
3	15570.000	-45.27	-15.27	-30.00	-80.63	35.36

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	5190
N _{TX}	1	Polarization	H



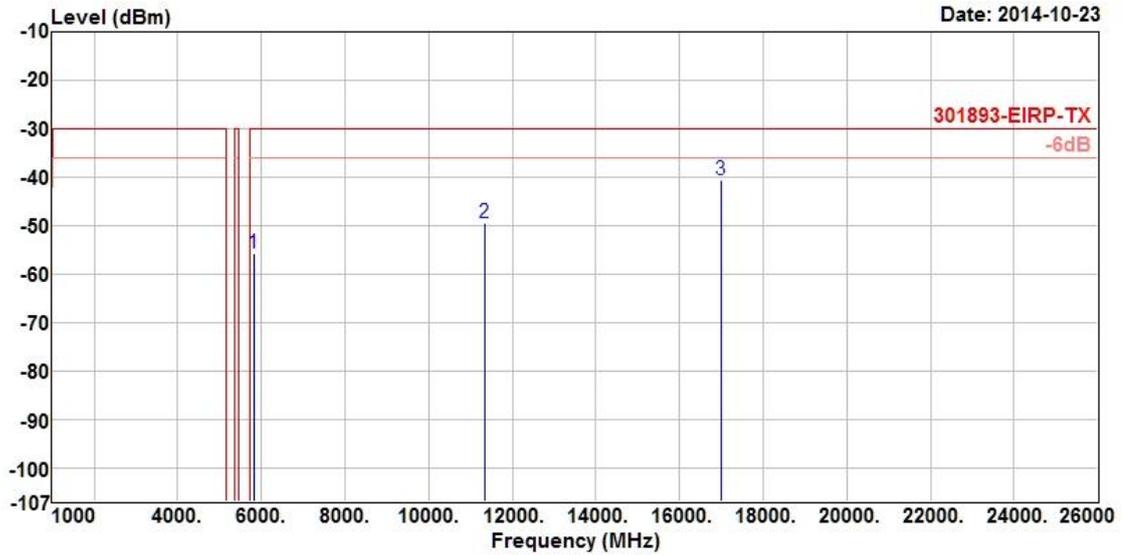
	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	5149.400	-54.10	-24.10	-30.00	-73.50	19.40
2	10380.000	-41.57	-11.57	-30.00	-70.46	28.89
3	15570.000	-43.36	-13.36	-30.00	-80.34	36.98

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	5670
N _{TX}	1	Polarization	V



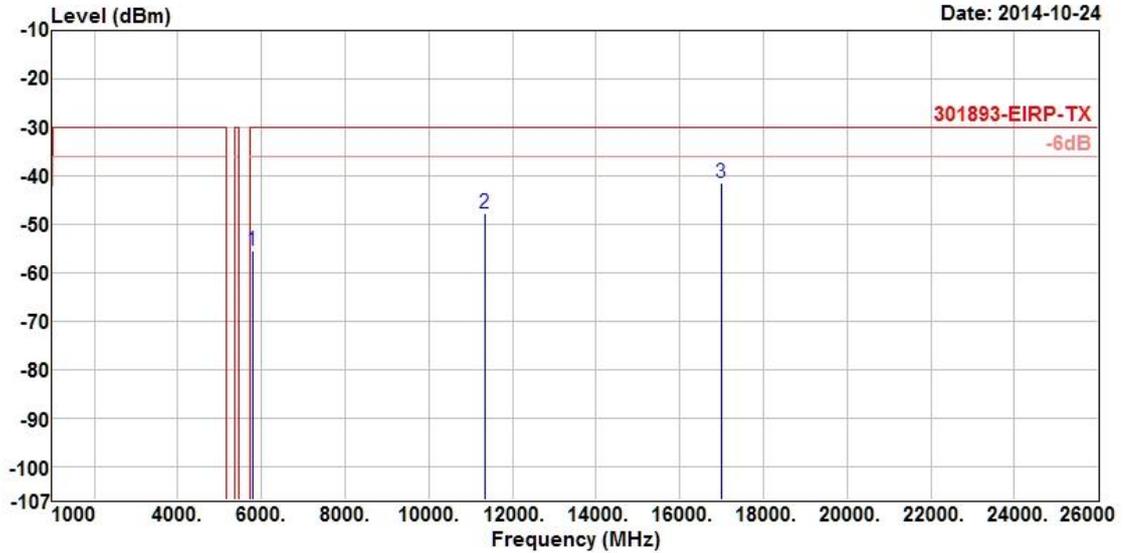
	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	5818.000	-55.76	-25.76	-30.00	-76.55	20.79
2	11340.000	-49.45	-19.45	-30.00	-79.68	30.23
3	17010.000	-40.52	-10.52	-30.00	-81.48	40.96

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)



Transmitter Radiated Spurious Emissions (Above 1GHz)

Modulation Mode	HT40	Test Freq. (MHz)	5670
N _{TX}	1	Polarization	H

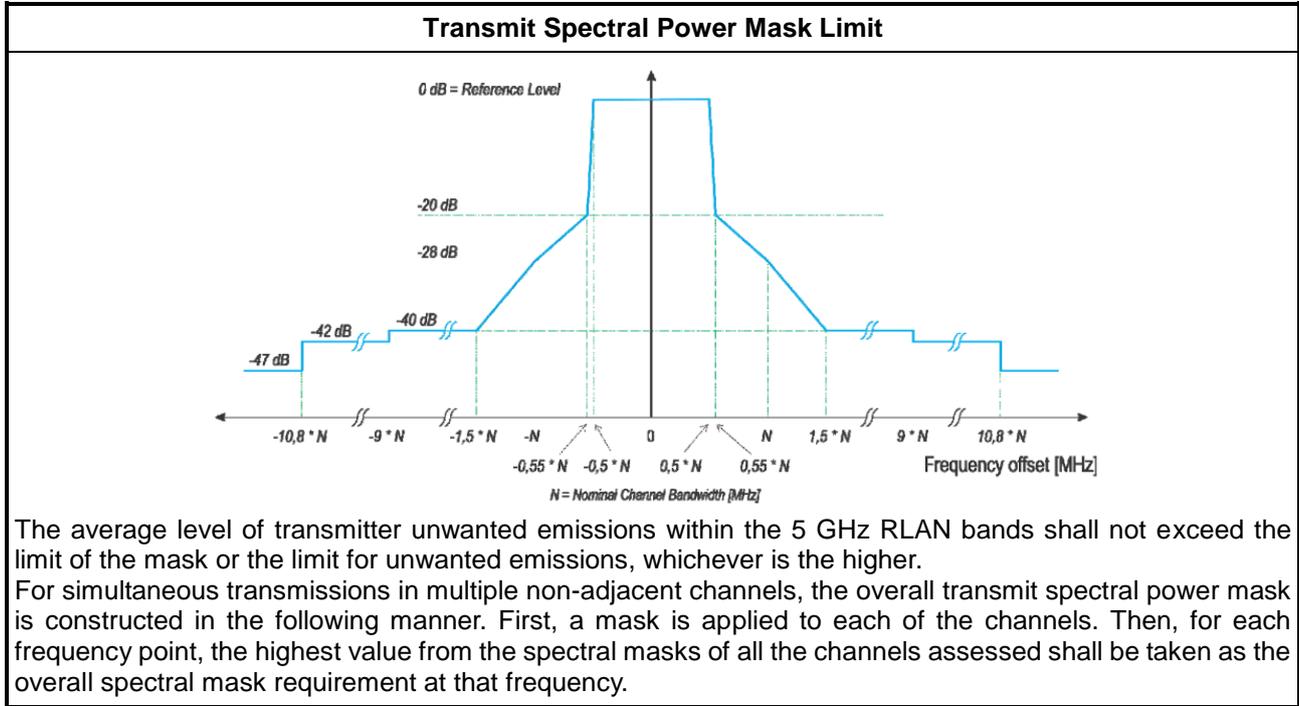


	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	5781.500	-55.49	-25.49	-30.00	-76.42	20.93
2	11340.000	-47.64	-17.64	-30.00	-79.52	31.88
3	17010.000	-41.60	-11.60	-30.00	-81.82	40.22

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)

3.7 Transmitter Unwanted Emissions within the 5 GHz RLAN Band

3.7.1 Transmitter Unwanted Emissions within the 5 GHz RLAN Band Limit



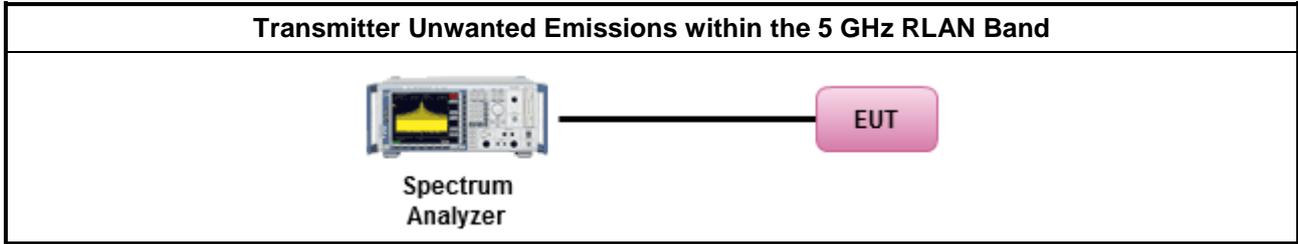
3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

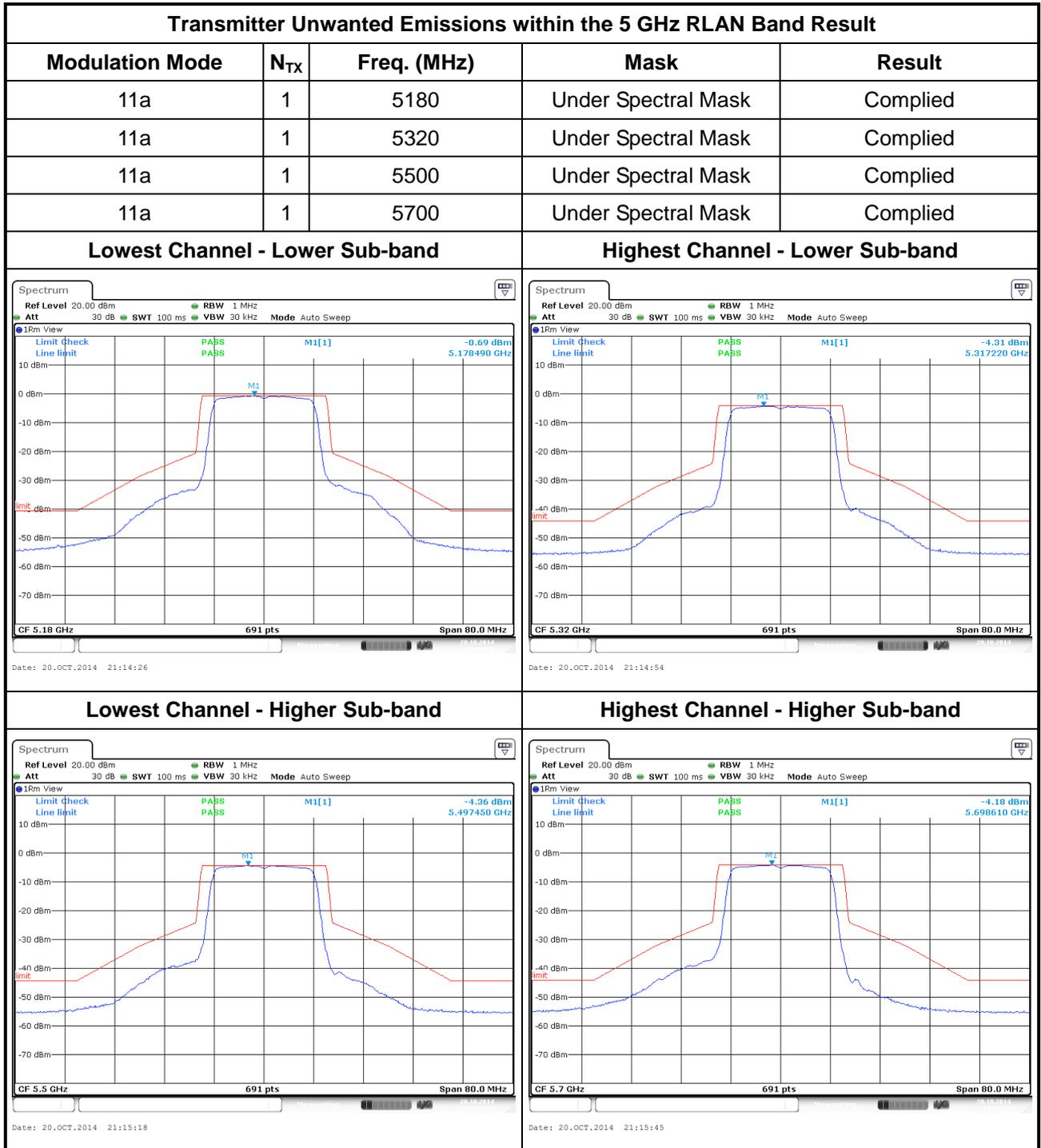
Test Method	
<input checked="" type="checkbox"/>	The measurements shall be performed at both normal environmental conditions.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.6 for the transmit spectral power mask shall be measured using one of the options below:
<input checked="" type="checkbox"/>	Option 1: For equipment with continuous transmission capability (duty cycle equal to 100 %)
<input type="checkbox"/>	Option 2: For equipment without continuous transmission capability (duty cycle < 100 %)
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.6.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.6.1 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).
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.6.2.2 for radiated measurement.

3.7.4 Test Setup





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



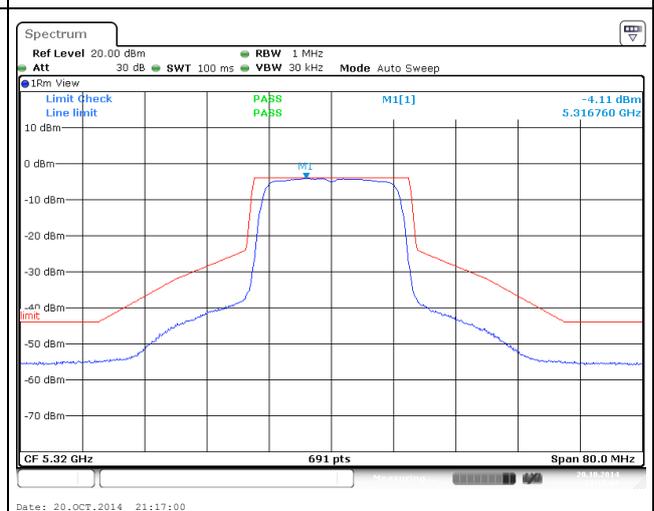
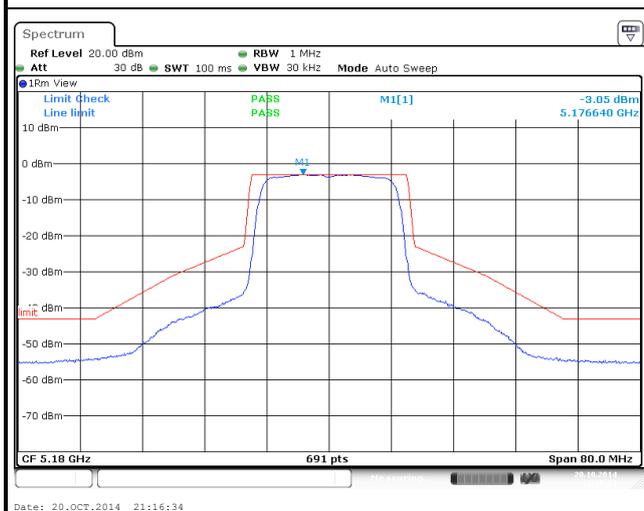


Transmitter Unwanted Emissions within the 5 GHz RLAN Band Result

Modulation Mode	N _{TX}	Freq. (MHz)	Mask	Result
HT20	2	5180	Under Spectral Mask	Complied
HT20	2	5320	Under Spectral Mask	Complied
HT20	2	5500	Under Spectral Mask	Complied
HT20	2	5700	Under Spectral Mask	Complied

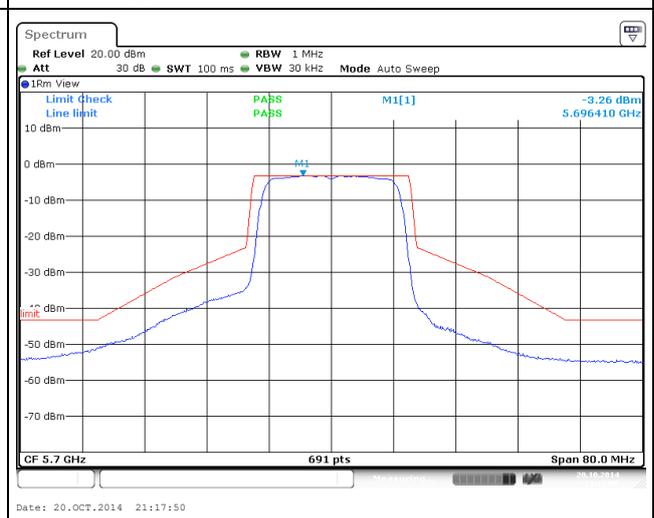
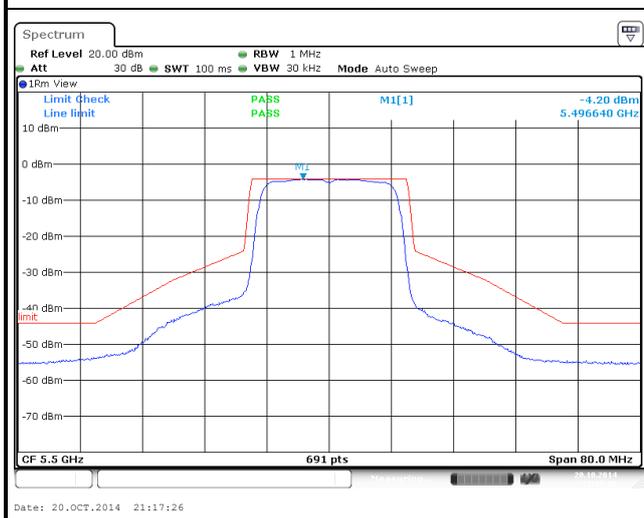
Lowest Channel - Lower Sub-band

Highest Channel - Lower Sub-band



Lowest Channel - Higher Sub-band

Highest Channel - Higher Sub-band



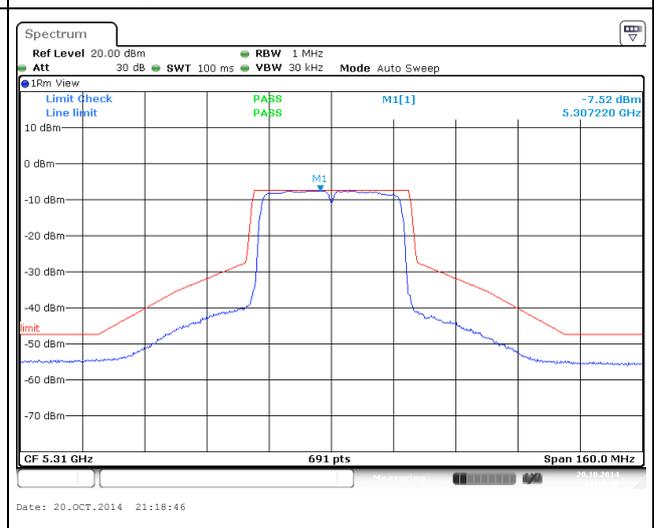
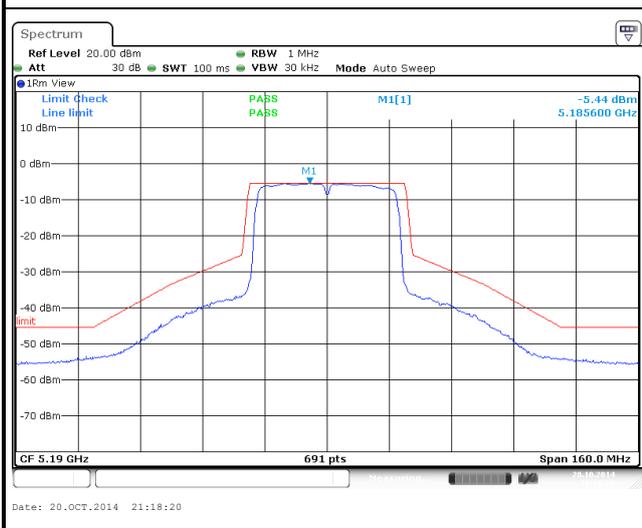


Transmitter Unwanted Emissions within the 5 GHz RLAN Band Result

Modulation Mode	N _{TX}	Freq. (MHz)	Mask	Result
HT40	2	5180	Under Spectral Mask	Complied
HT40	2	5320	Under Spectral Mask	Complied
HT40	2	5500	Under Spectral Mask	Complied
HT40	2	5700	Under Spectral Mask	Complied

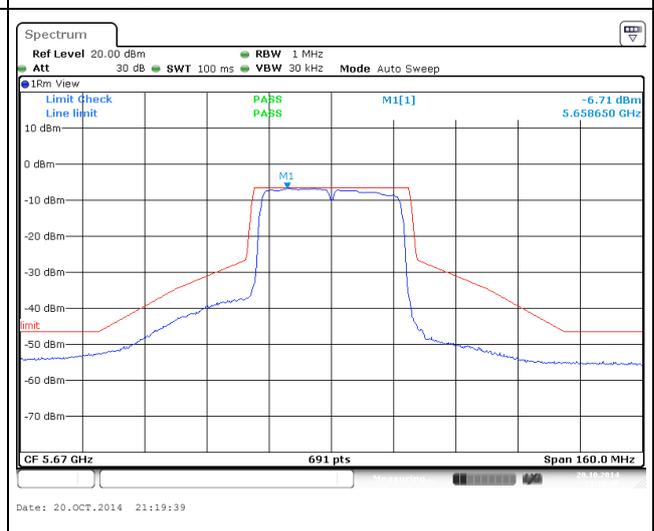
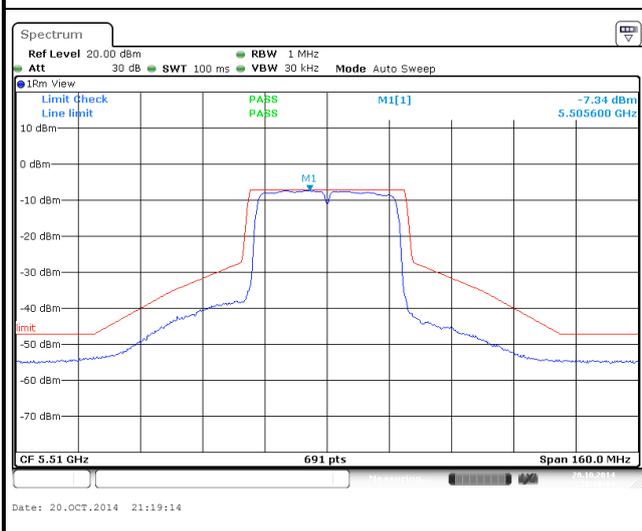
Lowest Channel - Lower Sub-band

Highest Channel - Lower Sub-band



Lowest Channel - Higher Sub-band

Highest Channel - Higher Sub-band



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

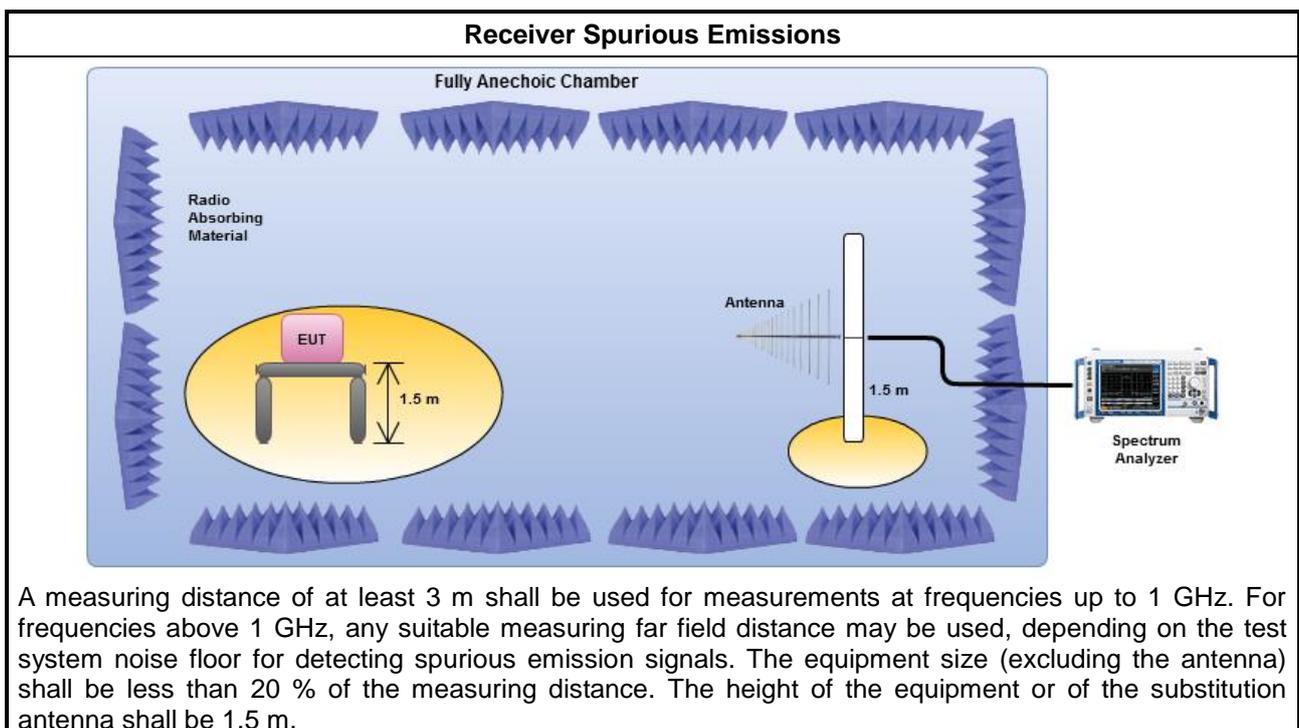
4.1.2 Measuring Instruments

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

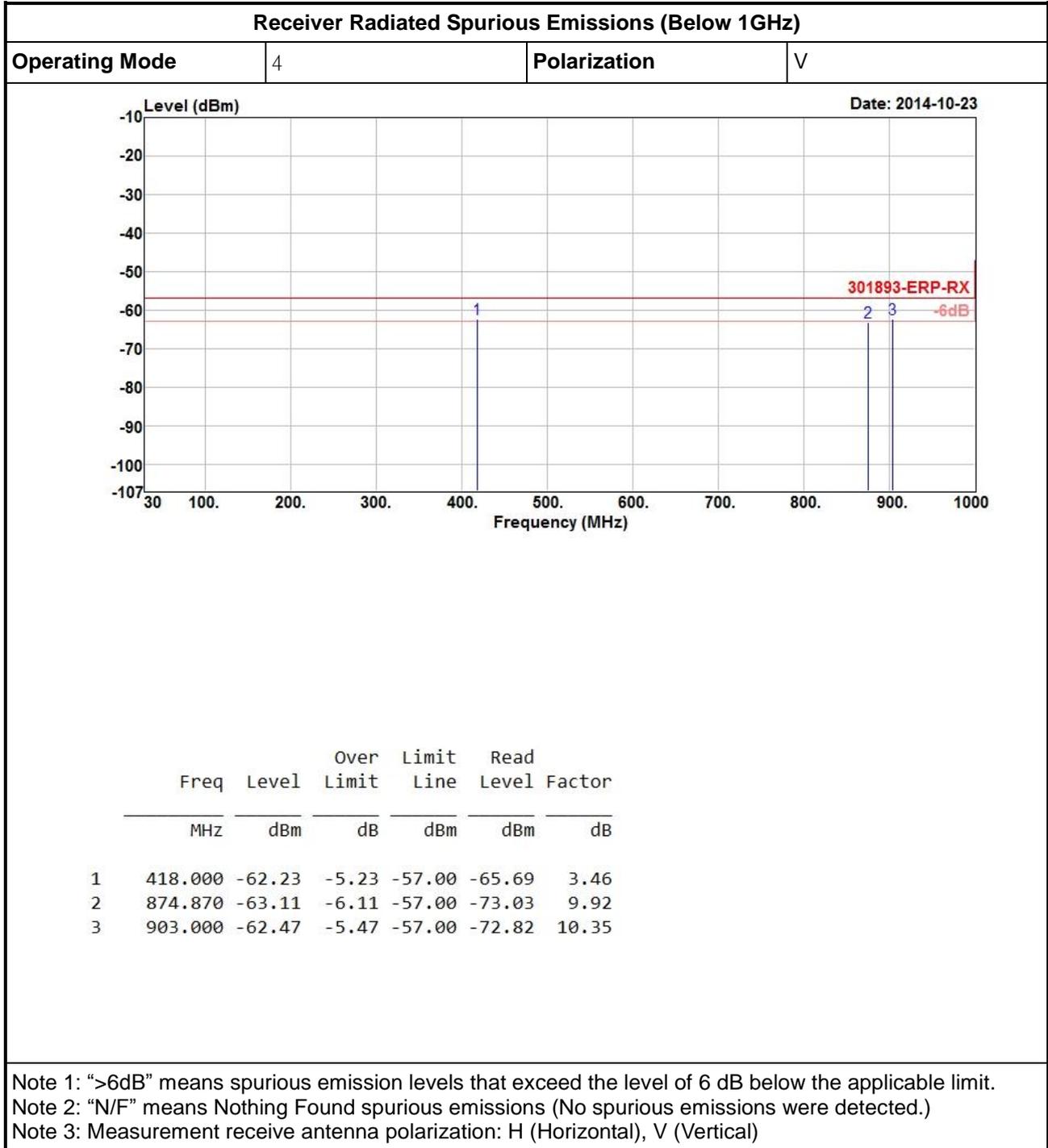
4.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.2.3 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.
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.7.2.1 for conducted measurement. Conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).
<input type="checkbox"/>	The EUT supports multiple receive chains, EN 301 893 clause 5.4.7.2.1 step 2 shall be repeated for each of the active receive chains, then sum the measured power (within the observed window) for each of the active receive chains.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.7.2.2 for radiated measurement.

4.1.4 Test Setup



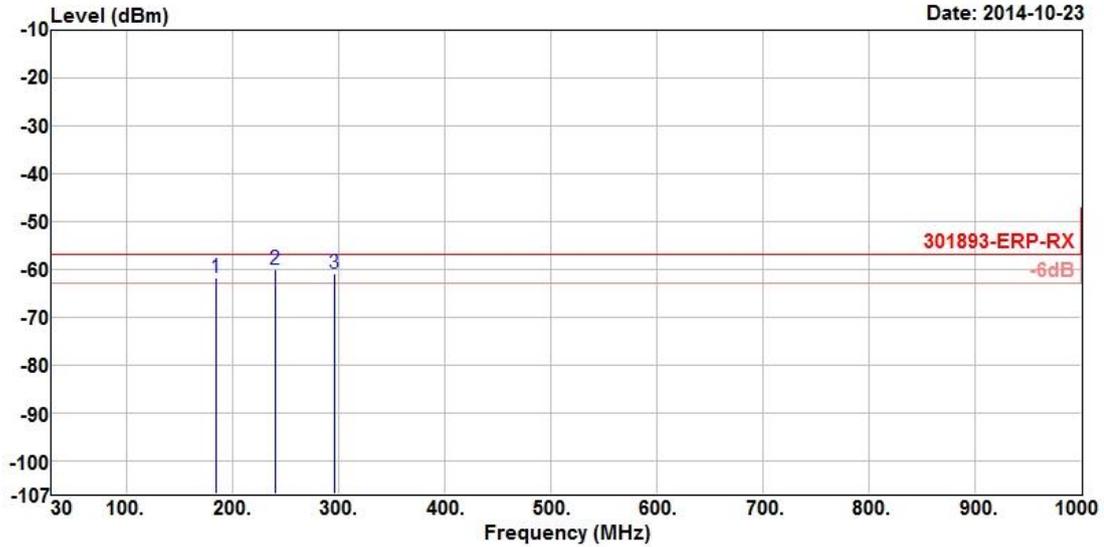
4.1.5 Receiver Radiated Spurious Emissions (Below 1GHz)





Receiver Radiated Spurious Emissions (Below 1GHz)

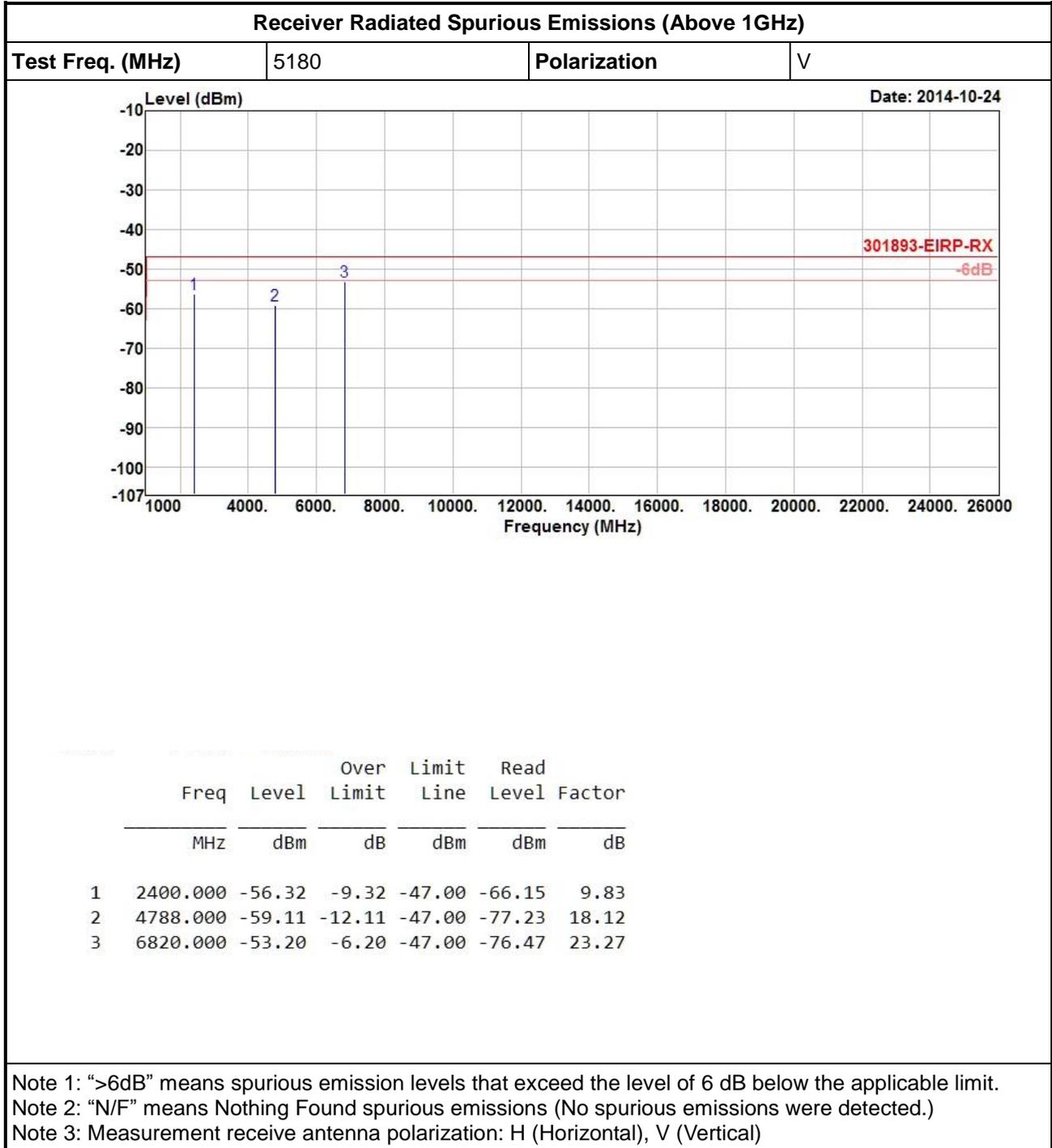
Operating Mode	4	Polarization	H
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	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	185.200	-61.92	-4.92	-57.00	-57.29	-4.63
2	240.490	-60.12	-3.12	-57.00	-57.18	-2.94
3	296.750	-60.88	-3.88	-57.00	-60.33	-0.55

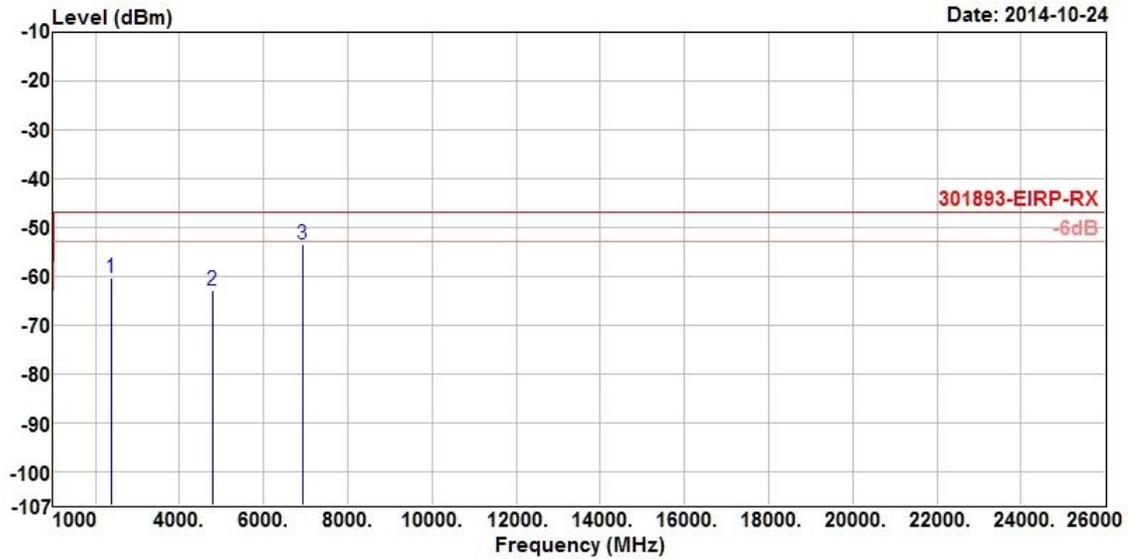
Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

4.1.6 Receiver Radiated Spurious Emissions (Above 1GHz)



Receiver Radiated Spurious Emissions (Above 1GHz)

Test Freq. (MHz)	5180	Polarization	H
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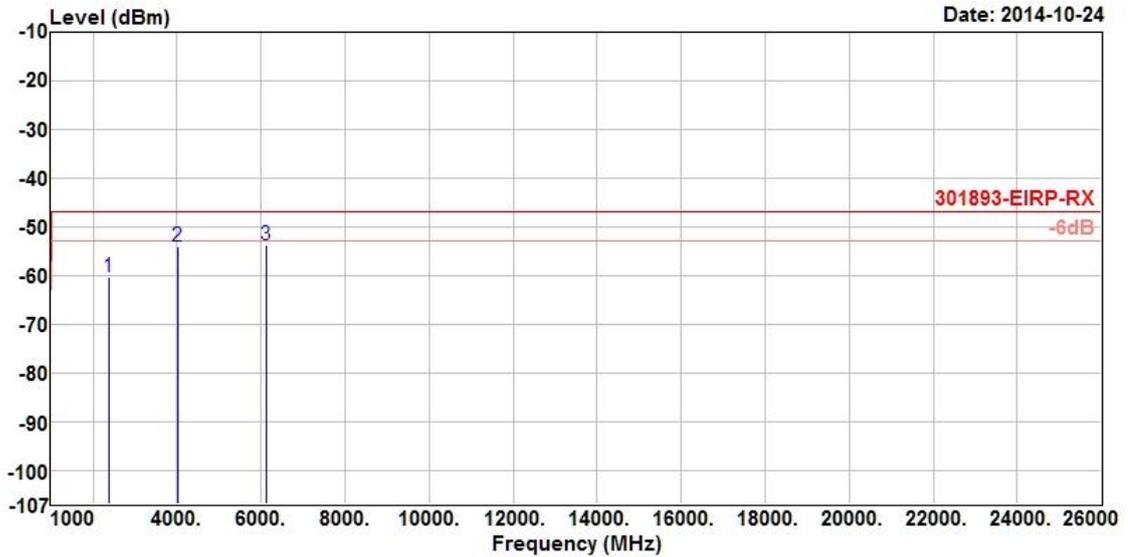
	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor
			dB	dBm	dBm	dB
1	2374.000	-60.28	-13.28	-47.00	-70.77	10.49
2	4780.000	-62.96	-15.96	-47.00	-81.61	18.65
3	6930.000	-53.53	-6.53	-47.00	-76.26	22.73

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)



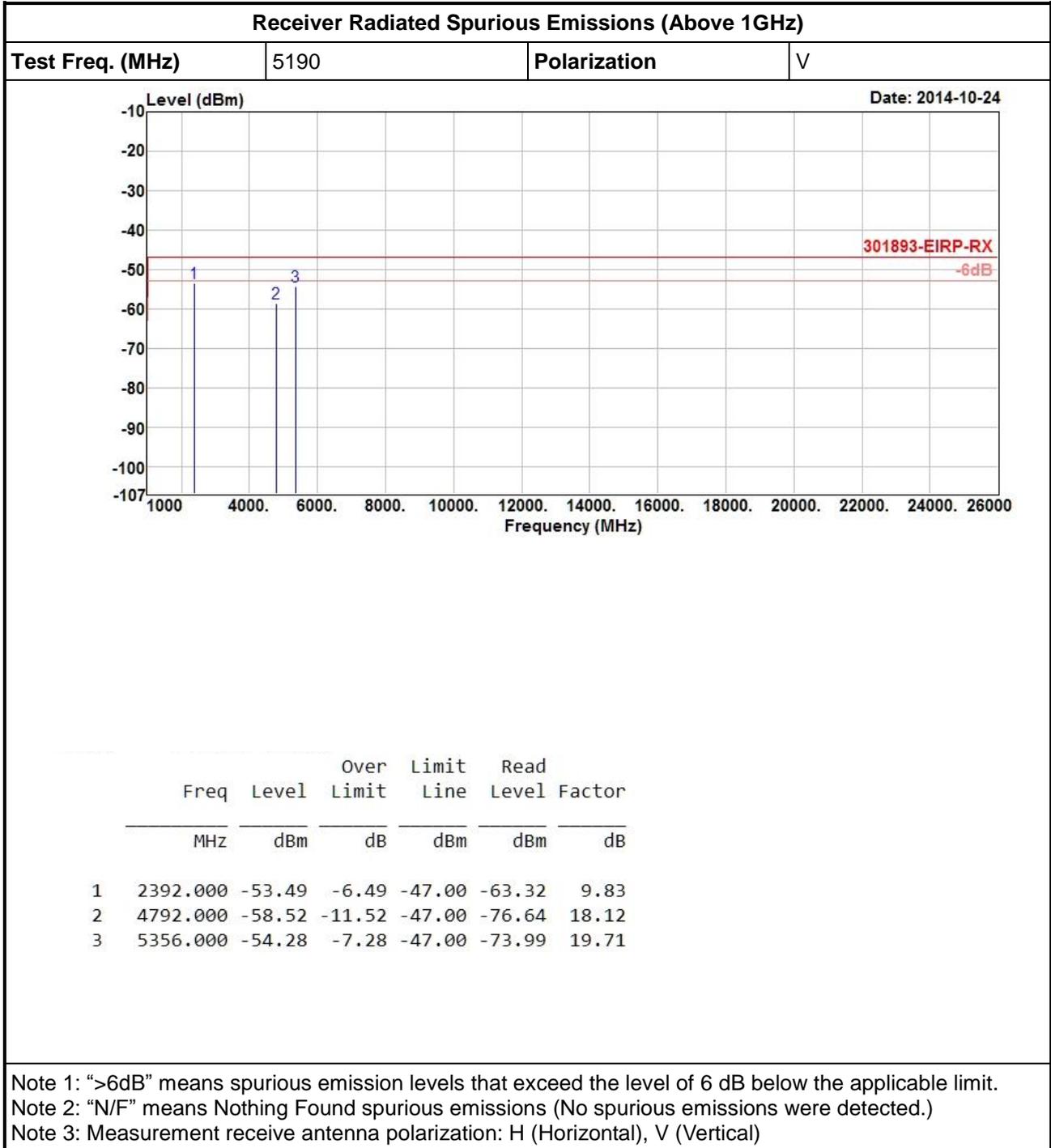
Receiver Radiated Spurious Emissions (Above 1GHz)

Test Freq. (MHz)	5700	Polarization	V
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	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	2366.000	-60.36	-13.36	-47.00	-70.78	10.42
2	4028.000	-54.06	-7.06	-47.00	-71.81	17.75
3	6134.000	-53.70	-6.70	-47.00	-75.07	21.37

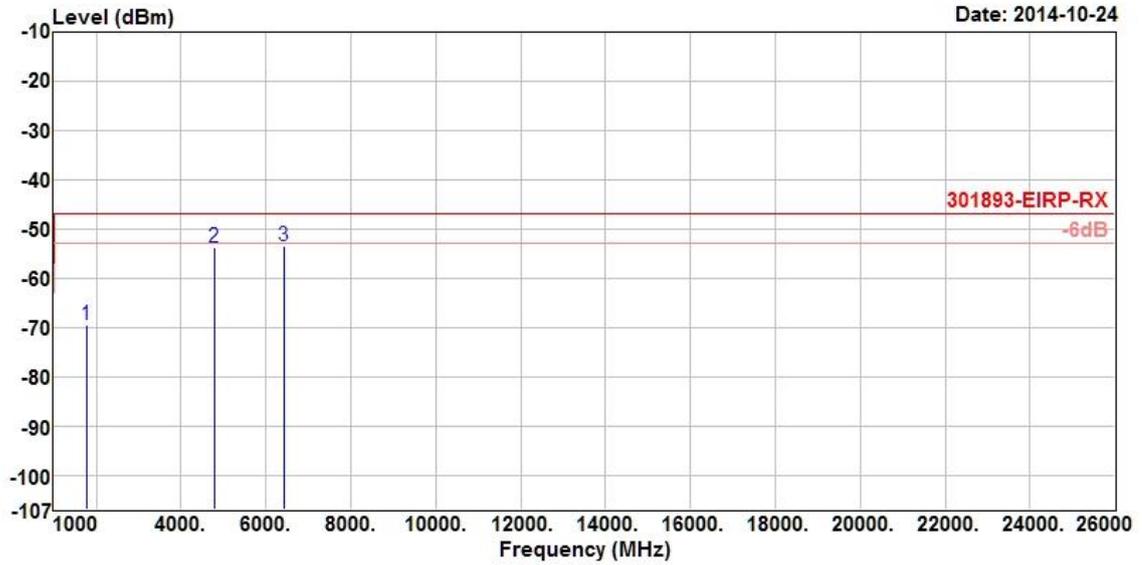
Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)





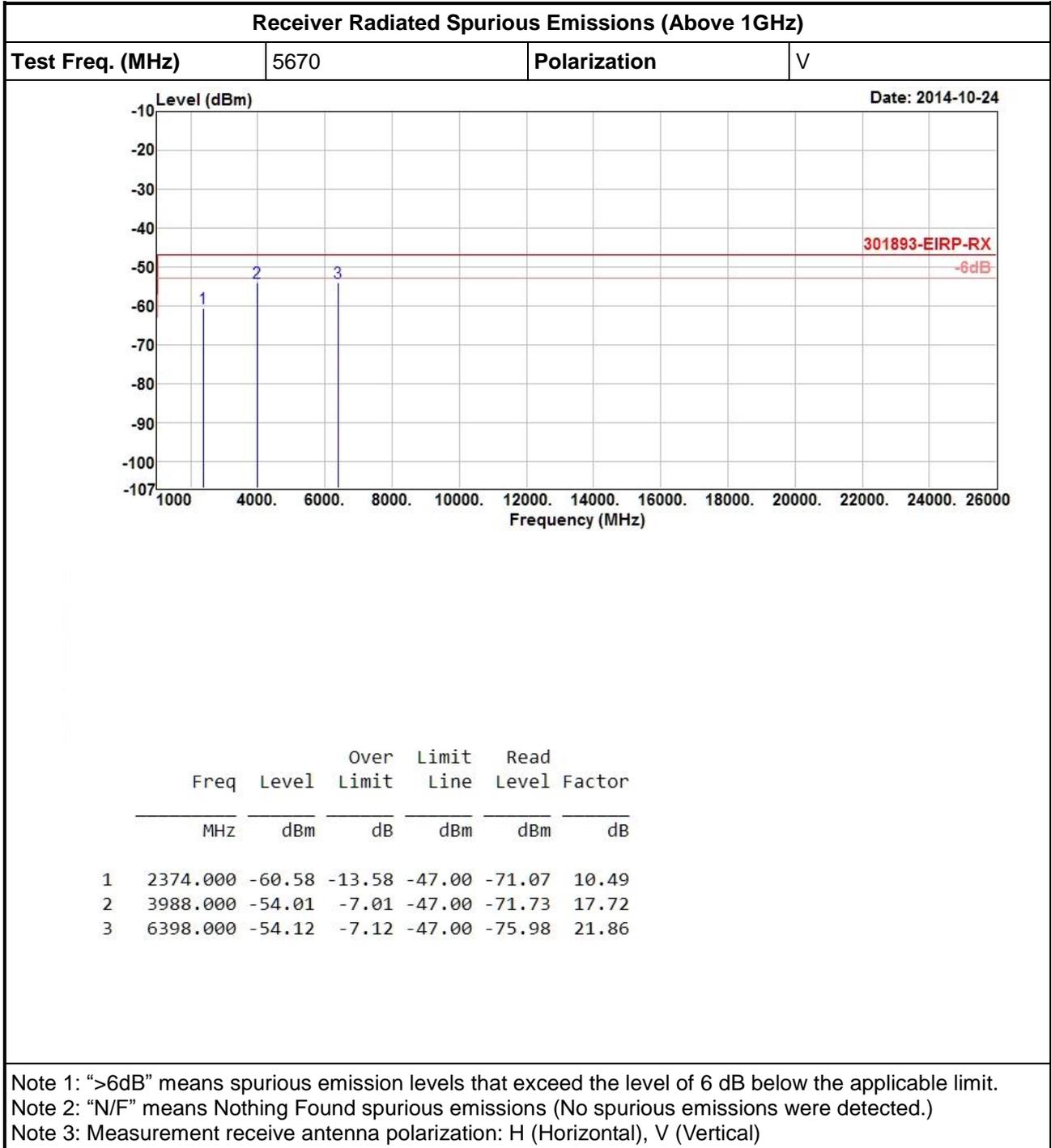
Receiver Radiated Spurious Emissions (Above 1GHz)

Test Freq. (MHz)	5190	Polarization	H
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	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	1772.000	-69.42	-22.42	-47.00	-75.52	6.10
2	4792.000	-53.87	-6.87	-47.00	-72.57	18.70
3	6424.000	-53.58	-6.58	-47.00	-75.47	21.89

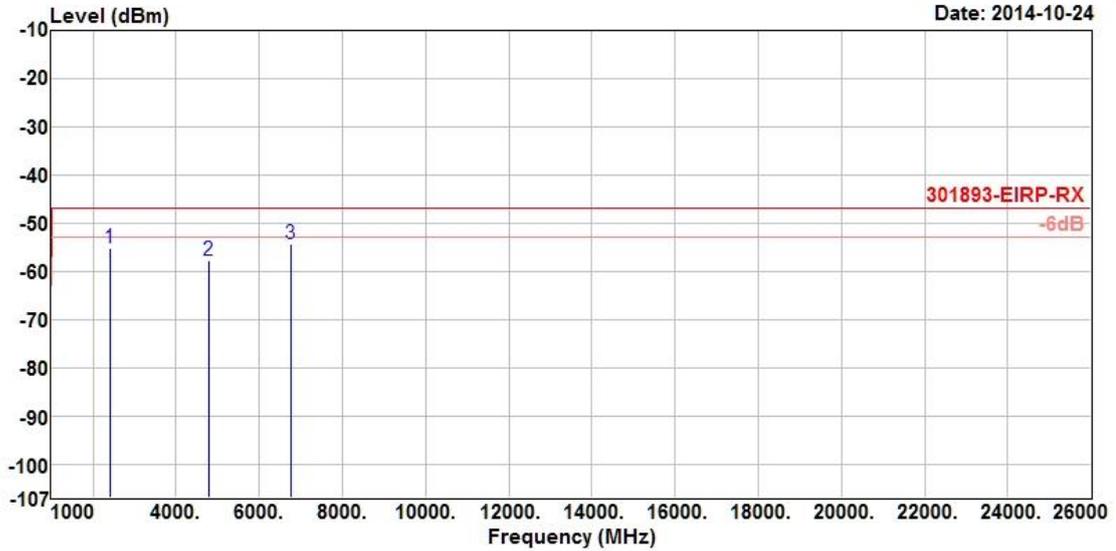
Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)





Receiver Radiated Spurious Emissions (Above 1GHz)

Test Freq. (MHz)	5670	Polarization	H
------------------	------	--------------	---



	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBm	dB	dBm	dBm	dB
1	2418.000	-55.34	-8.34	-47.00	-65.17	9.83
2	4786.000	-57.63	-10.63	-47.00	-75.74	18.11
3	6762.000	-54.25	-7.25	-47.00	-77.43	23.18

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)

5 Adaptivity Test Result

5.1 Adaptivity

5.1.1 Adaptivity Limit

Adaptivity Limit				
<input checked="" type="checkbox"/> Priority Class dependent Channel Access parameters for Supervised Devices:				
Class #	p ₀	CW _{min}	CW _{max}	Maximum Channel Occupancy Time (COT)
<input checked="" type="checkbox"/> 4	2	3	7	2 ms
<input checked="" type="checkbox"/> 3	2	7	15	4 ms
<input checked="" type="checkbox"/> 2	3	15	1 023	6 ms (see note 1)
<input checked="" type="checkbox"/> 1	7	15	1 023	6 ms (see note 1)
NOTE 1: The maximum <i>Channel Occupancy Time</i> (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 μs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time. NOTE 2: the values for p ₀ , CW _{min} , CW _{max} are minimum values. Greater values are allowed.				
<input type="checkbox"/> Priority Class dependent Channel Access parameters for Supervising Devices:				
Class #	p ₀	CW _{min}	CW _{max}	maximum Channel Occupancy Time (COT)
<input type="checkbox"/> 4	1	3	7	2 ms
<input type="checkbox"/> 3	1	7	15	4 ms
<input type="checkbox"/> 2	3	15	63	6 ms (see note 1 and note 2)
<input type="checkbox"/> 1	7	15	1 023	6 ms (see note 1)
NOTE 1: The maximum <i>Channel Occupancy Time</i> (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 μs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time. NOTE 2: The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 10 ms by extending CW to CW × 2 + 1 when selecting the random number q for any backoff(s) that precede the Channel Occupancy that may exceed 6 ms or which follow the Channel Occupancy that exceeded 6 ms. The choice between preceding or following a Channel Occupancy shall remain unchanged during the operation time of the device. NOTE 3: The values for p ₀ , CW _{min} , CW _{max} are minimum values. Greater values are allowed.				
Energy Detect Threshold (ED Threshold):				
<input checked="" type="checkbox"/> Option 1: For equipment that for its operation in the 5 GHz bands is conforming to IEEE 802.11™ac-2013 [10], clause 22, or to IEEE 802.11™-2012, clause 18 or clause 20, or any combination of these clauses, the Energy Detect Threshold (ED Threshold) is independent of the equipment's maximum transmit power (P _H). The Energy Detect Threshold (ED Threshold) shall be: <div style="text-align: center; margin-top: 10px;"> $TL = -75 \text{ dBm/MHz}$ </div>				
<input type="checkbox"/> Option 2: For equipment conforming to one or more of the clauses listed in Option 1, and to at least one other operating mode, and for equipment conforming to none of the clauses listed in Option 1, the Energy Detect Threshold (ED Threshold) shall be proportional to the equipment's maximum transmit power (P _H). Assuming a 0 dBi receive antenna the Energy Detect Threshold (ED Threshold) shall be: <div style="margin-left: 40px; margin-top: 10px;"> For P_H ≤ 13 dBm: TL= -75 dBm/MHz For 13 dBm < P_H < 23 dBm: TL= -85 dBm/MHz + (23 dBm - P_H) For P_H ≥ 23 dBm: TL= -85 dBm/MHz </div>				

- Short Control Signalling Transmissions:
 - ♦ Within an observation period of 50 ms, the number of Short Control Signalling Transmissions by the equipment shall be equal to or less than 50.
 - ♦ The total duration of the equipment's Short Control Signalling Transmissions shall be less than 2 500 μ s within said observation period.

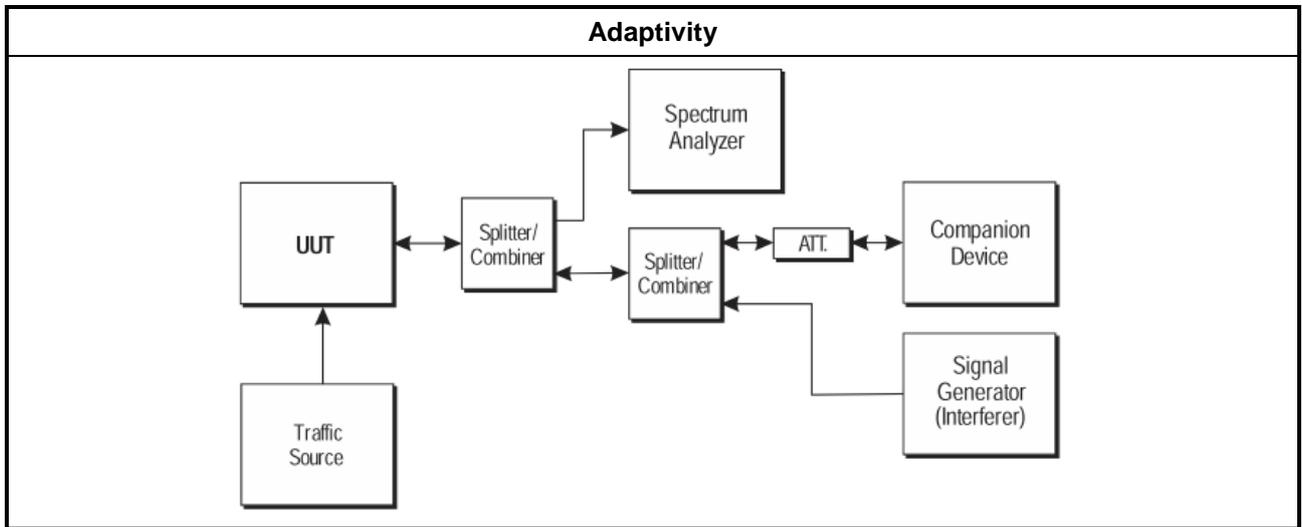
5.1.2 Measuring Instruments

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

5.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.3.2 for test channel: One channel out of the declared channels.
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.9.3.2 for conducted measurement.
<input checked="" type="checkbox"/>	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.
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.9.3.4 for radiated measurement.

5.1.4 Test Setup



5.1.5 Test Result of Adaptivity

Adaptivity Result				
Detection Threshold Level		-68.36 dBm/MHz		
Modulation Mode	Freq. (MHz)	Adaptivity Interference Signals		
		AWGN	LTE	OFDM
802.11n 20M	5180	Pass	Pass	Pass
802.11n 40M	5190	Pass	-	-
Result	Complied			

Short Control Signal Transmissions Result									
Modulation Mode	Freq. (MHz)	Adaptivity Interference Signals							
		AWGN	LTE	OFDM	Limit (ms)	AWGN	LTE	OFDM	Limit
		SCST (ms)				Number of SCST			
802.11n 20M	5180	0.379	1.525	1.553	2.5	8	1	2	50
802.11n 40M	5190	1.276	-	-	2.5	3	-	-	50
Result	Complied								

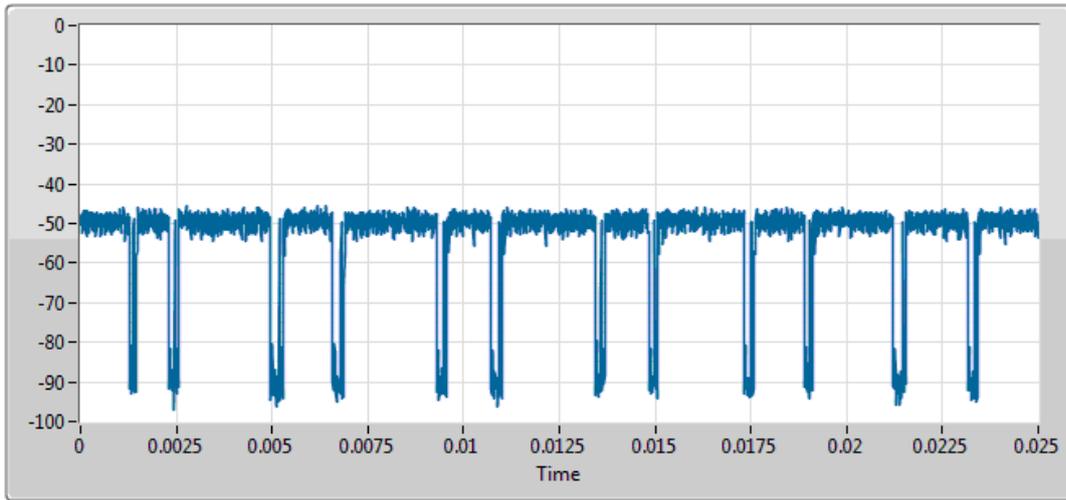
Medium Access Mechanism & Maximum Channel Occupancy Time(s) Result					
Modulation Mode	Freq. (MHz)	Measured Data			
		Max. Value within 10000 Channel Occupancy Time(s)		Cumulative Probabilities p(n)	
		Result (ms)	Limit	Result	Limit
802.11n 20M	5180	1.463	Class 2	Pass	Class 2
802.11n 40M	5190	1.75	Class 2	Pass	Class 2
Result	Complied				



802.11an 20M -5180MHz

Duty Cycle Plot

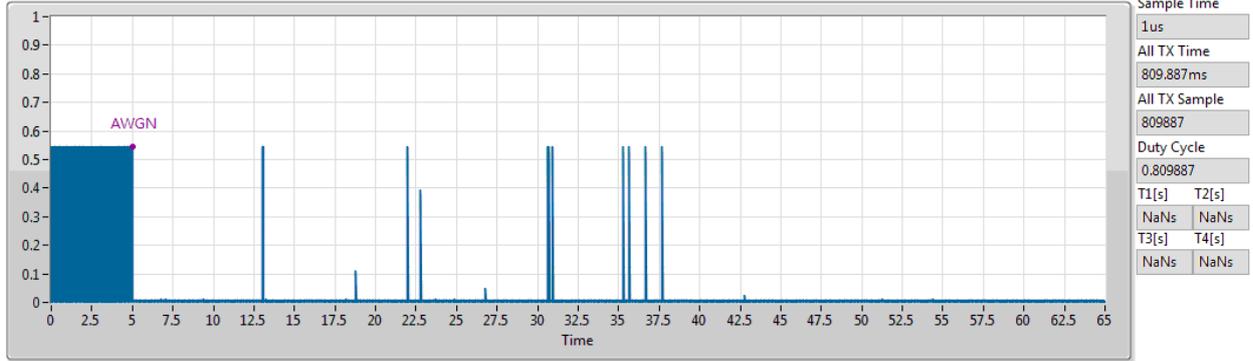
Time Analysis



Sample Time	3.125us
All TX Time	22.209375ms
All TX Sample	7107
Duty Cycle	0.888264
T1[s]	T2[s]
NaNs	NaNs
T3[s]	T4[s]
NaNs	NaNs

Adaptivity Result - AWGN

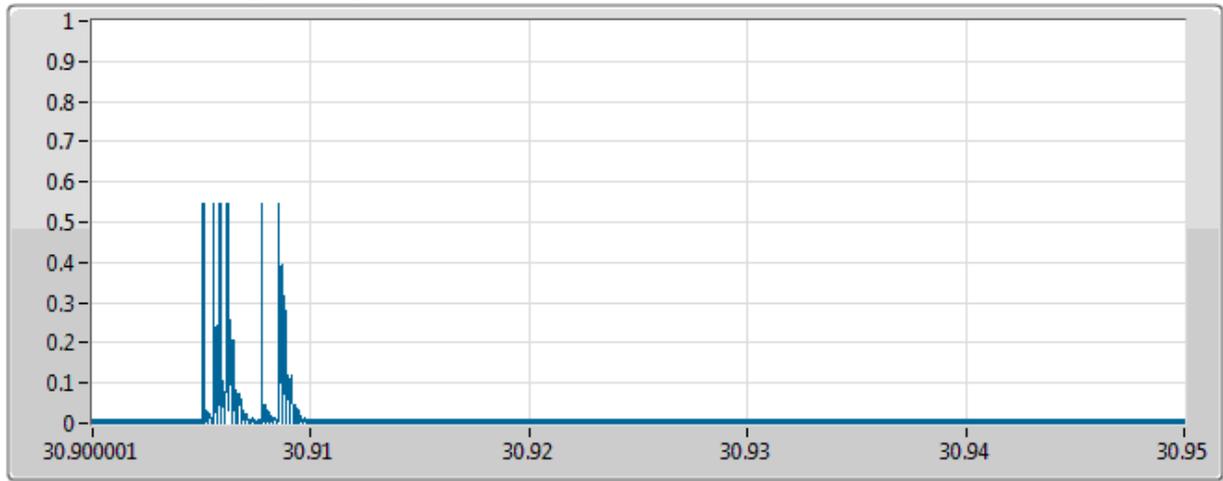
Time Analysis



AWGN: Adding the interference signal.

Short Control Signalling Transmissions - AWGN

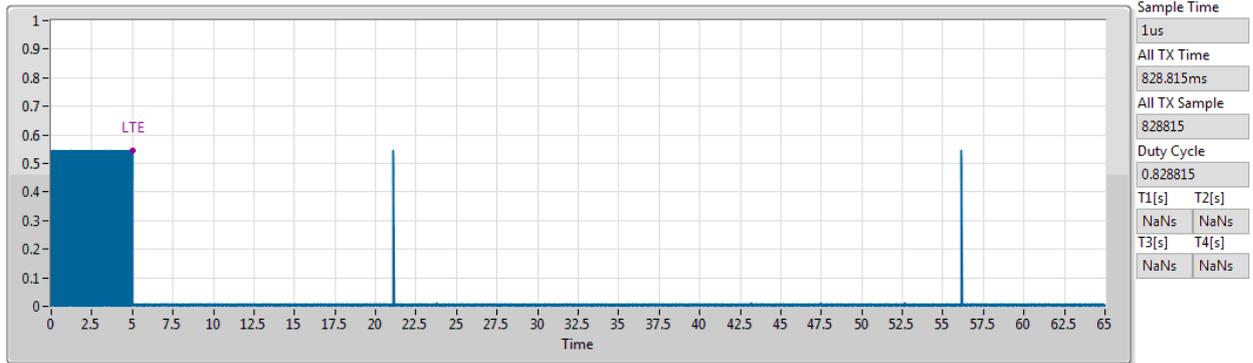
Short Control Signalling Transmissions



Time: Number:

Adaptivity Result - LTE

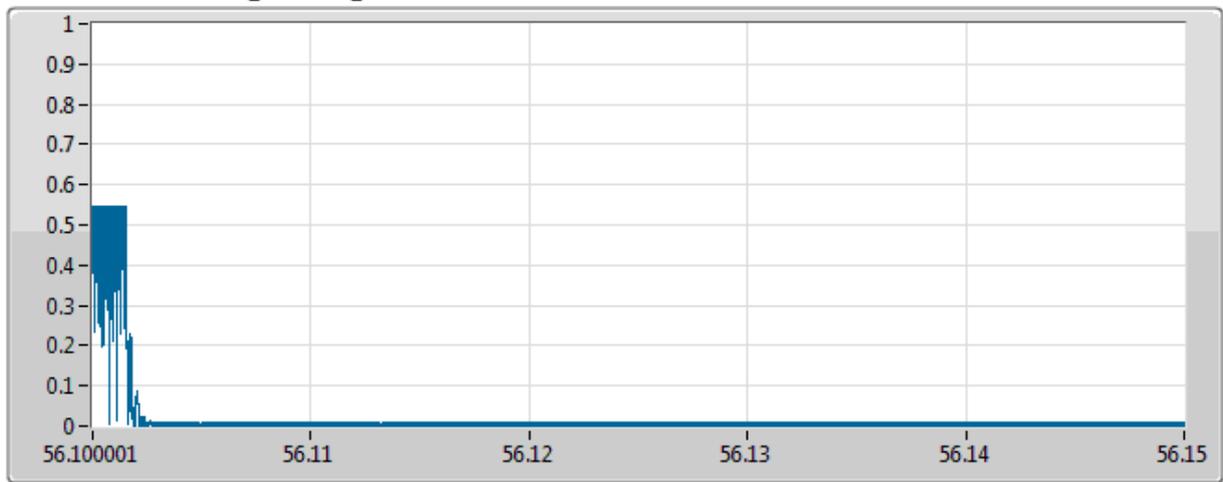
Time Analysis



LTE: Adding the interference signal.

Short Control Signalling Transmissions - LTE

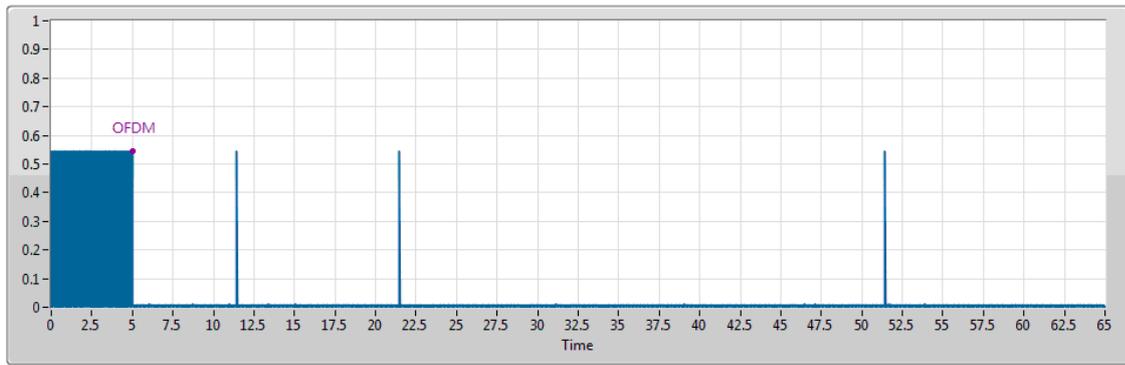
Short Control Signalling Transmissions



Time: Number:

Adaptivity Result - OFDM

Time Analysis

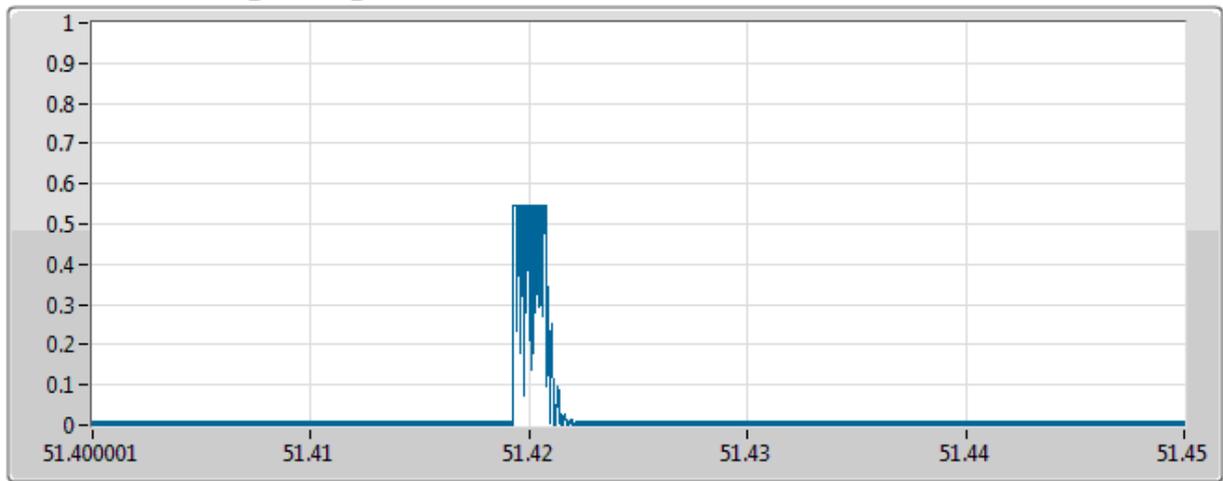


Sample Time	1us
All TX Time	759.87ms
All TX Sample	759870
Duty Cycle	0.75987
T1[s]	T2[s]
NaNs	NaNs
T3[s]	T4[s]
NaNs	NaNs

OFDM: Adding the interference signal.

Short Control Signalling Transmissions - OFDM

Short Control Signalling Transmissions

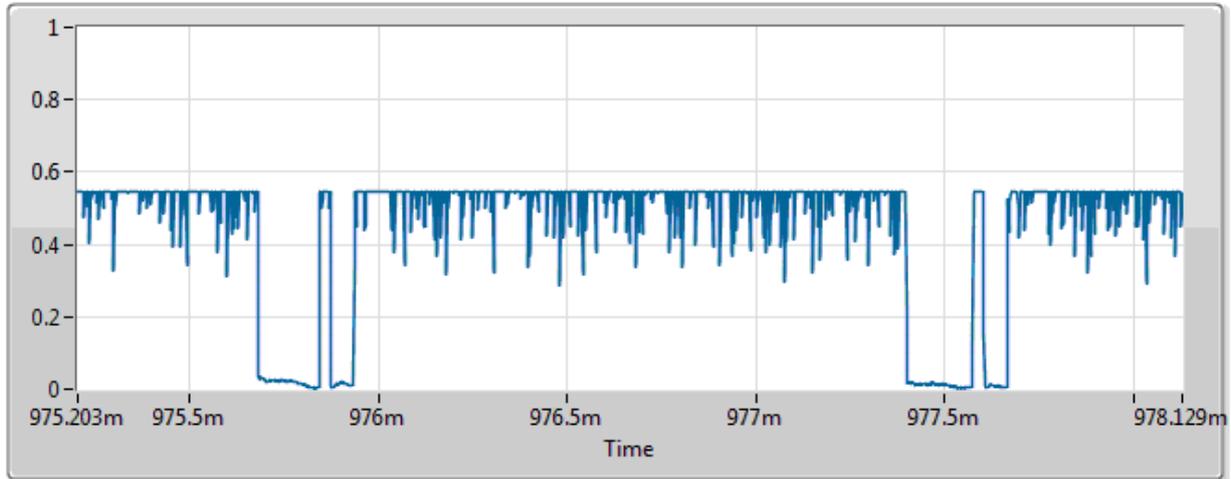


Time	Number
1.553ms	2



Max. Channel Occupancy Time

Max On Time



1.463ms



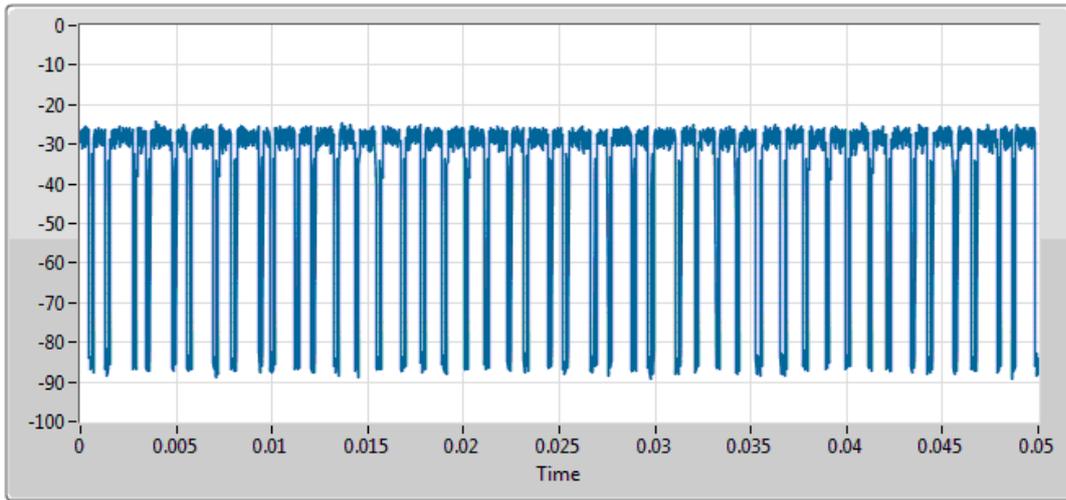
Priority Class	Class 2
Operating Type	Supervised Device

n	H(Bn)	Pn	Pn Limit	Result
0	213	0.01826	0.05000	Pass
1	488	0.06008	0.12000	Pass
2	586	0.11031	0.18250	Pass
3	1268	0.21899	0.24500	Pass
4	722	0.28088	0.30750	Pass
5	739	0.34422	0.37000	Pass
6	655	0.40036	0.43250	Pass
7	687	0.45924	0.49500	Pass
8	701	0.51933	0.55750	Pass
9	679	0.57753	0.62000	Pass
10	779	0.64430	0.68250	Pass
11	739	0.70764	0.74500	Pass
12	661	0.76429	0.80750	Pass
13	720	0.82600	0.87000	Pass
14	695	0.88557	0.93250	Pass
15	695	0.94514	0.99500	Pass
16	640	1.00000	1.00000	Pass

802.11an 40M – 5190MHz

Duty Cycle Plot

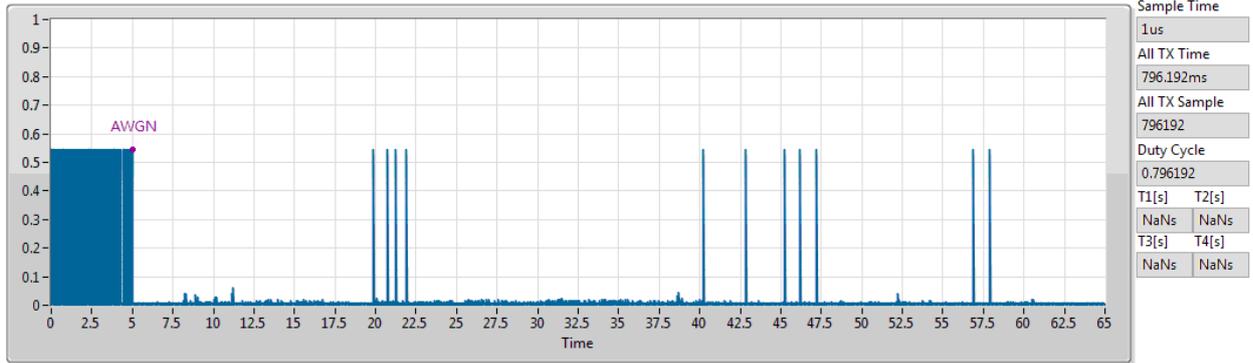
Time Analysis



Sample Time	6.25us	
All TX Time	40.825ms	
All TX Sample	6532	
Duty Cycle	0.816398	
T1[s]	T2[s]	
NaNs	NaNs	
T3[s]	T4[s]	
NaNs	NaNs	

Adaptivity Result – AWGN

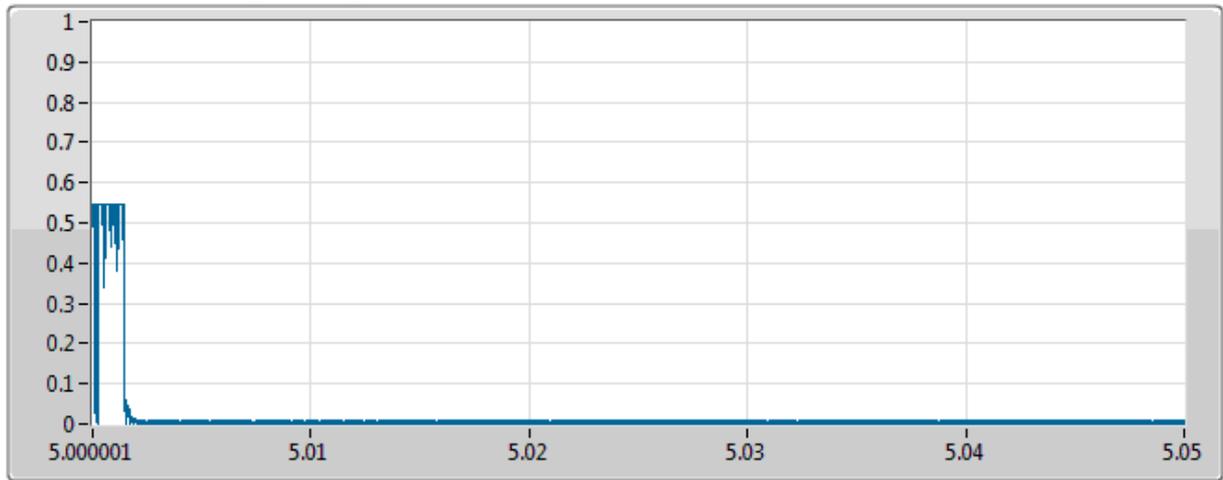
Time Analysis



AWGN: Adding the interference signal.

Short Control Signalling Transmissions

Short Control Signalling Transmissions

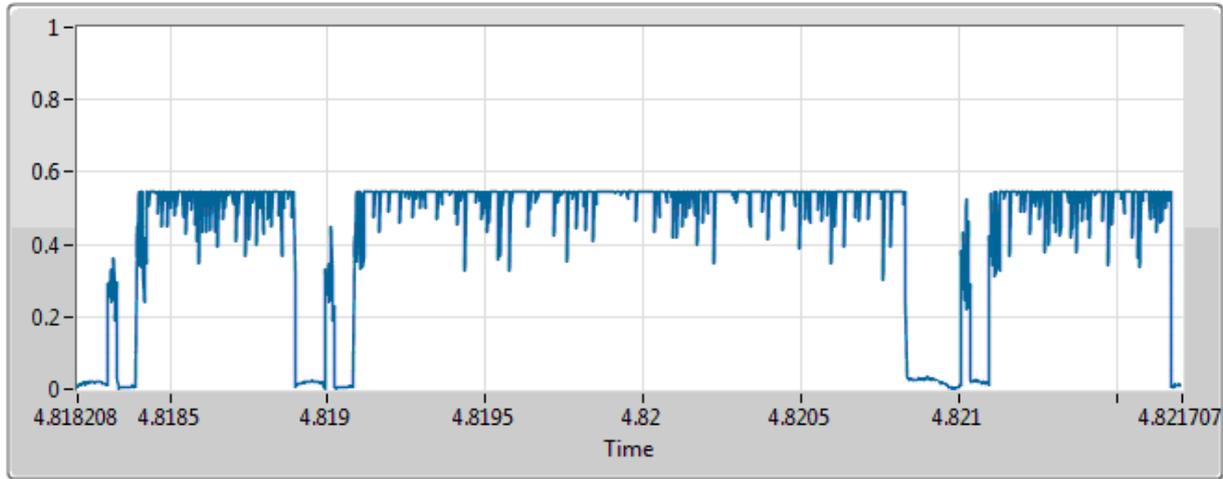


Time: 1.276ms
 Number: 3



Max. Channel Occupancy Time

Max On Time



1.75ms



Priority Class	Class 2
Operating Type	Supervised Device

n	H(Bn)	Pn	Pn Limit	Result
0	39	0.00335	0.05000	Pass
1	390	0.03687	0.12000	Pass
2	587	0.08732	0.18250	Pass
3	1191	0.18969	0.24500	Pass
4	745	0.25372	0.30750	Pass
5	763	0.31930	0.37000	Pass
6	687	0.37834	0.43250	Pass
7	718	0.44005	0.49500	Pass
8	716	0.50159	0.55750	Pass
9	715	0.56304	0.62000	Pass
10	755	0.62793	0.68250	Pass
11	723	0.69007	0.74500	Pass
12	788	0.75780	0.80750	Pass
13	709	0.81874	0.87000	Pass
14	727	0.88122	0.93250	Pass
15	681	0.93975	0.99500	Pass
16	701	1.00000	1.00000	Pass

6 Receiver Blocking Test Result

6.1 Receiver Blocking

6.1.1 Receiver Blocking Limit

Receiver Blocking Limit				
Receiver Blocking Parameters				
Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note2)		Type of blocking signal
		Master or Slave with radar detection	Slave without radar detection	
$P_{min} + 6 \text{ dB}$	5 100	-53	-59	CW
$P_{min} + 6 \text{ dB}$	4 900 5 000 5 975	-47	-53	CW

NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal.

NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.

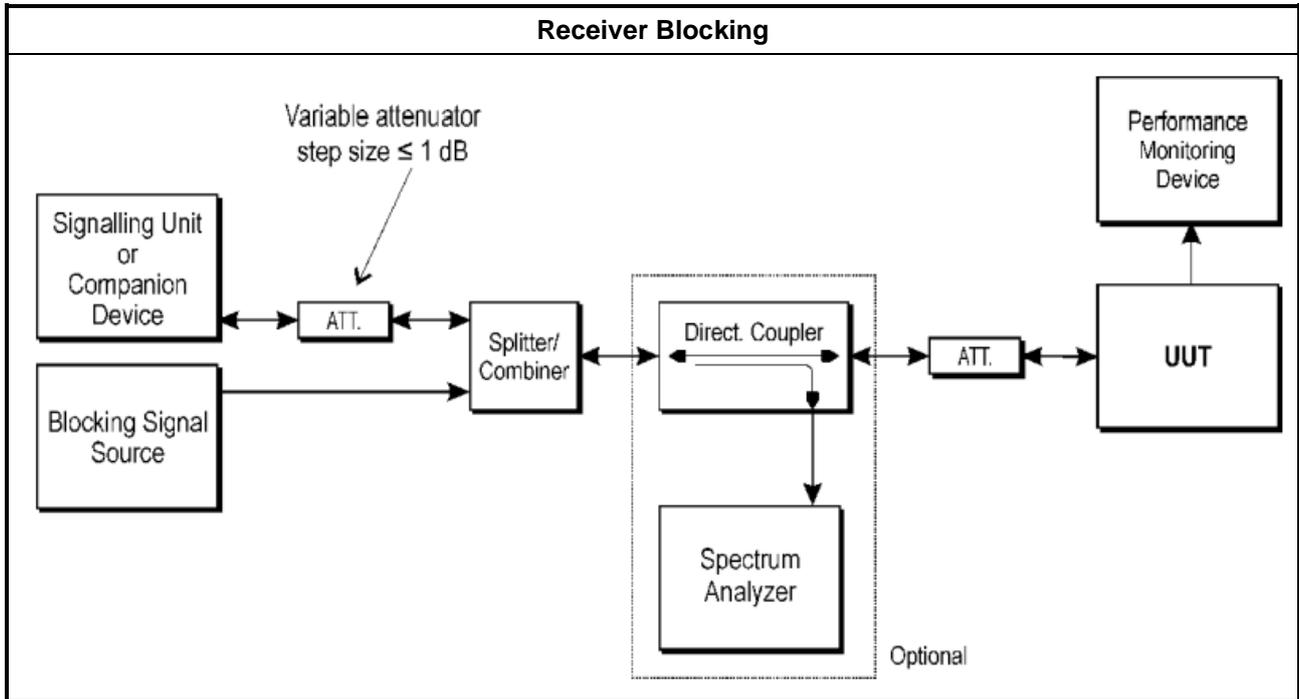
6.1.2 Measuring Instruments

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

6.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as EN 301 893, clause 5.4.10.2.1 for conducted measurement.
<input checked="" type="checkbox"/>	For systems using multiple receive chains only one chain (antenna port) need to be tested. All other receiver inputs shall be terminated.
<input type="checkbox"/>	Refer as EN 301 893, clause 5.4.10.2.2 for radiated measurement.

6.1.4 Test Setup





6.1.5 Test Result of Receiver Blocking

Receiver Blocking Result							
$P_{min}(dBm)$	-84.5						
Modulation Mode	Operation Frequency (MHz)	Wanted Signal Mean Power from Companion Device (dBm) $P_{min} + 6 dB$	Receiver Blocking Power (dBm)	Blocking Signal Frequency (MHz)	Type of Blocking Signal	Test Result	Blocking Signal Level at which the Performance Criteria is no longer met (dBm)
802.11a	5180	-78.5	-46.36	5100	CW	Pass	-28
	5180	-78.5	-40.36	4900	CW	Pass	-21
	5180	-78.5	-40.36	5000	CW	Pass	-21
	5180	-78.5	-40.36	5975	CW	Pass	-6
Limit	PER(Packet Error Rate) \leq 10%						
Result	Complied						

Receiver Blocking Result							
$P_{min}(dBm)$	-84.2						
Modulation Mode	Operation Frequency (MHz)	Wanted Signal Mean Power from Companion Device (dBm) $P_{min} + 6 dB$	Receiver Blocking Power (dBm)	Blocking Signal Frequency (MHz)	Type of Blocking Signal	Test Result	Blocking Signal Level at which the Performance Criteria is no longer met (dBm)
802.11a	5500	-78.2	-46.36	5100	CW	Pass	-21
	5500	-78.2	-40.36	4900	CW	Pass	-17
	5500	-78.2	-40.36	5000	CW	Pass	-18
	5500	-78.2	-40.36	5975	CW	Pass	-11
Limit	PER(Packet Error Rate) \leq 10%						
Result	Complied						

7 Test Equipment and Calibration Data

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9KHz~40GHz	25/Jan/2014	24/Jan/2015
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	20/Nov/2013	19/Nov/2014
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	31/Jul/2014	30/Jul/2015
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	28/Jan/2014	27/Jan/2015
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	28/Jan/2014	27/Jan/2015
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345675/4	30MHz ~ 26.5GHz	02/Dec/2013	01/Dec/2014

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101514	10Hz~40GHz	13/Jun/2014	12/Jun/2015
Amplifier	Agilent	8447D	2944A11146	10kHz ~ 1.3GHz	15/Jul/2014	14/Jul/2015
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	27/Mar/2014	26/Mar/2015
Bilog Antenna	SCHAFFNER	CBL6111C	2737	25MHz ~ 2GHz	20/Sep/2014	19/Sep/2015
Horn Antenna	ETS	3115	6744	1GHz ~ 18GHz	05/May/2014	04/May/2015
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170221	15GHz ~ 40GHz	22/Jan/2014	21/Jan/2015

Instrument for Adaptivity

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSP7	100644	9kHz ~ 7GHz	08/Nov/2016	07/Nov/2017
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	12/Jan/2017	11/Jan/2018
RF cable 0.5m	MTJ Cooperation	000000-MT26A-50	D5105	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017
RF cable 0.5m	MTJ Cooperation	000000-MT26A-50	D5106	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017
RF cable 0.2m	MTJ Cooperation	000000-MT26A-20	D5101	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017



Instrument for Receiver Blocking

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSP7	100644	9kHz ~ 7GHz	08/Nov/2016	07/Nov/2017
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	12/Jan/2017	11/Jan/2018
Wireless connectivity tester	R&S	CMW270	100855	70 MHz ~ 6 GHz	17/Nov/2016	16/Nov /2017
RF cable 0.5m	MTJ Cooperation	000000-MT26A-50	D5105	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017
RF cable 0.5m	MTJ Cooperation	000000-MT26A-50	D5106	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017
RF cable 0.5m	MTJ Cooperation	000000-MT26A-50	D5107	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017
RF cable 2m	MTJ Cooperation	000000-MT18A-200	D5100	1 GHz ~ 40 GHz	02/Nov/2016	01/Nov/2017

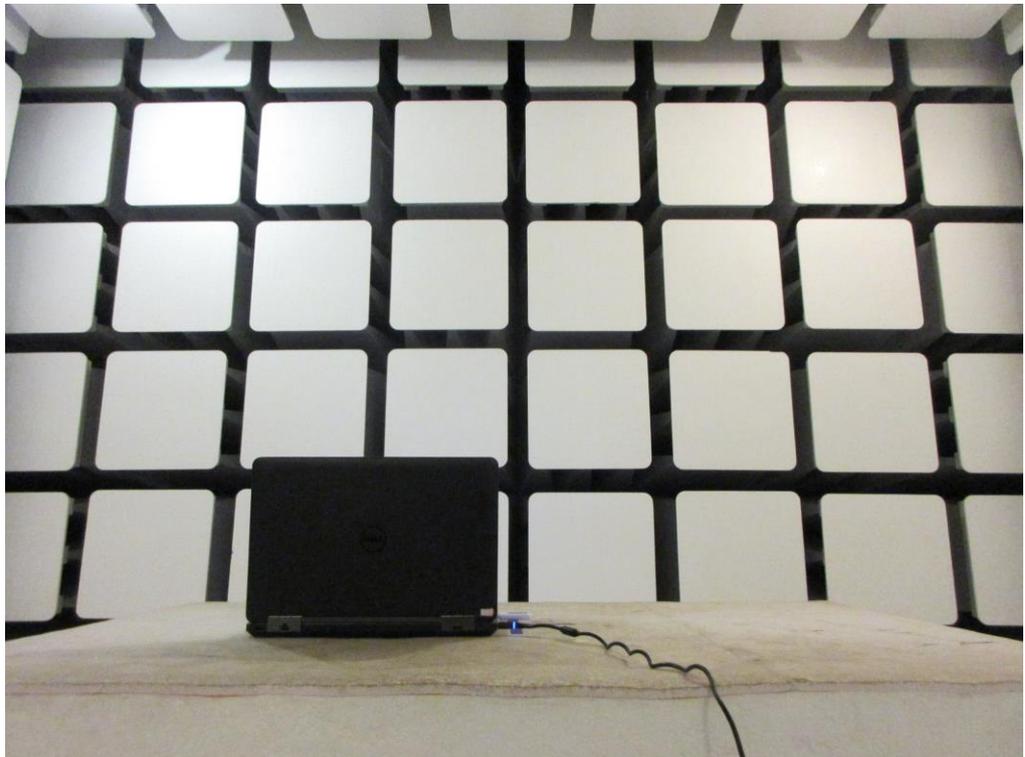
Appendix A. Test Photos

1. Photographs of Radiated Emissions Test Configuration

Front view



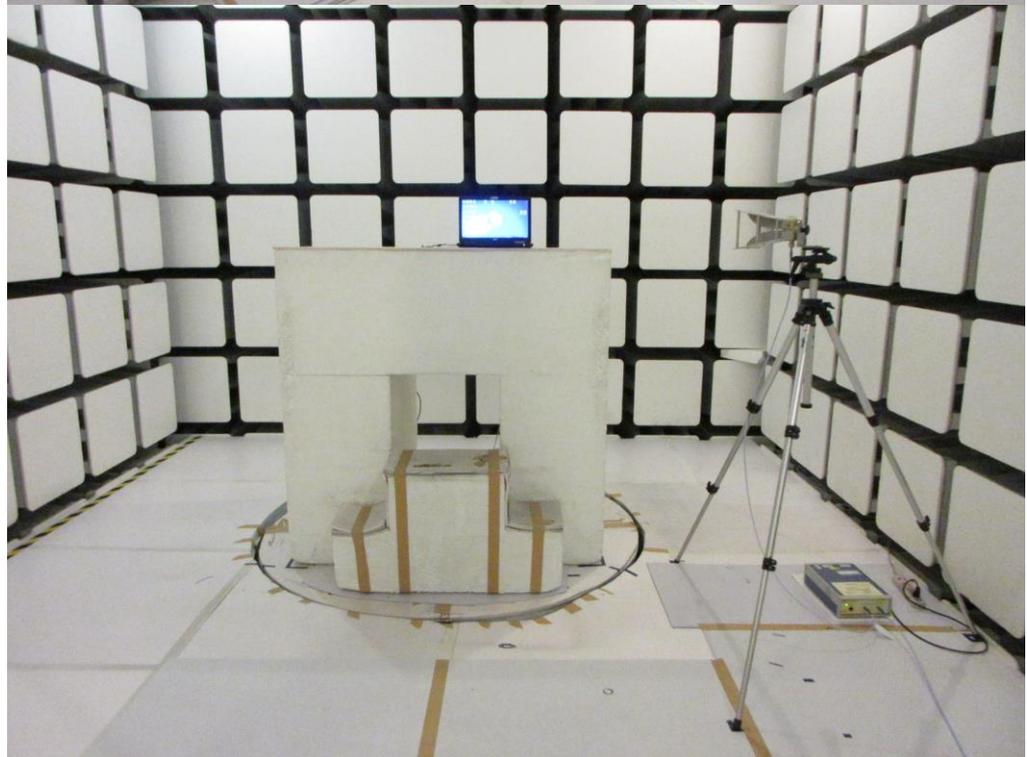
Rear view



Below 1GHz



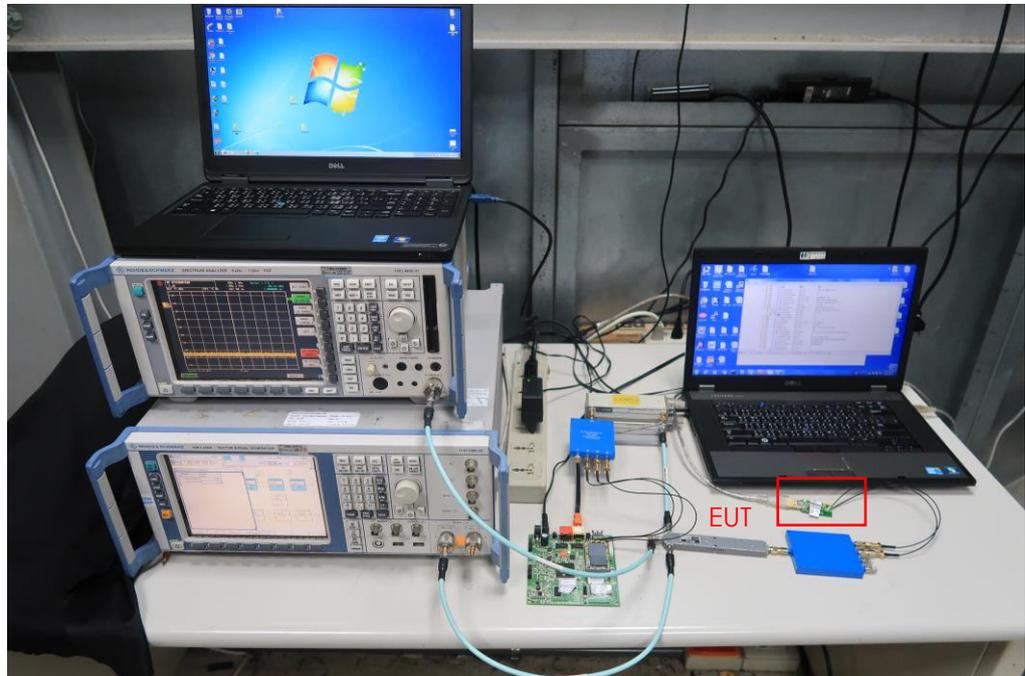
Above 1GHz



EUT took a close view



2. Photographs of Adaptivity Test Configuration



3. Photographs of Receiver Blocking Test Configuration

