

# SPECTRUM REPORT

**Applicant:** Jinan USR IOT Technology Limited  
**Address of Applicant:** Floor 2, Wuzhou Scientific Research Building, No.1100  
Shunfeng Street, Gaoxin District, Jinan, Shandong, China

## Equipment Under Test (EUT)

**Product Name:** LoRa Gateway  
**Model No.:** USR-LG220, USR-LG210, USR-LG230, USR-LG240, USR-LG250, USR-LG260, USR-LG270, USR-LG280, USR-LG290  
**Applicable standards:** ETSI EN 300 220-1 V3.1.1 (2017-02)  
ETSI EN 300 220-2 V3.2.1 (2018-06)  
**Date of sample receipt:** 13 Aug., 2018  
**Date of Test:** 13 Aug., to 12 Dec., 2018  
**Date of report issue:** 17 Dec., 2018  
**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.



Bruce Zhang  
Laboratory Manager



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

## 2 Version

Version No.	Date	Description
00	17 Dec., 2018	Original

**Tested by:**

*Zora Lee*

**Date:**

*17 Dec., 2018*

**Test Engineer**

**Reviewed by:**

*Wimer Zhang*

**Date:**

*17 Dec., 2018*

**Project Engineer**

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## 4 Test Summary

Test Items	Test Requirement	Test method	Result
<b>Transmitter Part</b>			
Operating frequency	EN 300 220-2 Clause 4.2.1	EN 300 220-1 Clause 5.1.2	PASS
Effective Radiated Power	EN 300 220-2 Clause 4.3.1	EN 300 220-1 Clause 5.2.2	PASS
Maximum e.r.p. spectral density	EN 300 220-2 Clause 4.3.2	EN 300 220-1 Clause 5.3.2	PASS
Duty Cycle	EN 300 220-2 Clause 4.3.3	EN 300 220-1 Clause 5.4.2	PASS
Occupied Bandwidth	EN 300 220-2 Clause 4.3.4	EN 300 220-1 Clause 5.6.3	PASS
Tx Out of Band Emissions	EN 300 220-2 Clause 4.3.5	EN 300 220-1 Clause 5.8.3	PASS
Transient power	EN 300 220-2 Clause 4.3.6	EN 300 220-1 Clause 5.10.3	PASS
Adjacent Channel Power	EN 300 220-2 Clause 4.3.7	EN 300 220-1 Clause 5.11.3	N/A
TX behaviour under Low Voltage Conditions	EN 300 220-2 Clause 4.3.8	EN 300 220-1 Clause 5.12.3	PASS
Adaptive Power Control	EN 300 220-2 Clause 4.3.9	EN 300 220-1 Clause 5.13.3	N/A
FHSS equipment	EN 300 220-2 Clause 4.3.10	EN 300 220-2 Clause 4.3.10.3	N/A
Short term behaviour	EN 300 220-2 Clause 4.3.11	EN 300 220-1 Clause 5.5.2	N/A
Unwanted emissions in the spurious domain	EN 300 220-2 Clause 4.2.2	EN 300 220-1 Clause 5.9.3	PASS
<b>Receiver Part</b>			
RX sensitivity	EN 300 220-2 Clause 4.4.1	EN 300 220-1 Clause 5.14.3	N/A
Blocking	EN 300 220-2 Clause 4.4.2	EN 300 220-1 Clause 5.18.6	PASS
<b>Polite spectrum access conformance requirement</b>			
Clear Channel Assessment threshold	EN 300 220-2 Clause 4.5.2	EN 300 220-1 Clause 5.21.2.3	N/A
Polite spectrum access timing parameters	EN 300 220-2 Clause 4.5.3	EN 300 220-1 Clause 5.21.2.3	N/A
Adaptive Frequency Agility	EN 300 220-2 Clause 4.5.4	EN 300 220-1 Clause 5.21.4.2	N/A
Remark: Pass: Meet the requirement. N/A: Not Applicable for Non-adaptive equipment.			

## 5 General Information

### 5.1 Client Information

Applicant:	Jinan USR IOT Technology Limited
Address:	Floor 2, Wuzhou Scientific Research Building, No.1100 Shunfeng Street, Gaoxin District, Jinan, Shandong, China
Manufacturer/ Factory:	Jinan USR IOT Technology Limited
Address:	Floor 2, Wuzhou Scientific Research Building, No.1100 Shunfeng Street, Gaoxin District, Jinan, Shandong, China

### 5.2 General Description of E.U.T.

Product Name:	LoRa Gateway
Model No.:	USR-LG220, USR-LG210, USR-LG230, USR-LG240, USR-LG250, USR-LG260, USR-LG270, USR-LG280, USR-LG290
Operation Frequency:	865 MHz~868 MHz & 915.1 MHz
Hardware version:	V1.4
Software version:	V1.0.5
Modulation:	Lora
Antenna type:	External Antenna
Antenna Gain:	1.4 dBi
Power supply:	DC 5-36V(Nominal Match: 12V, 1A)
Remarks:	Model No.: USR-LG206, USR-LG201, USR-LG202, USR-LG203, USR-LG204, USR-LG205, USR-LG207, USR-LG208, USR-LG209 were identical inside, the electrical circuit design, layout, components used and internal wiring, with difference being model name.

Operation Frequency each of channel	
Channel No.	Frequency MHz
01	865.0
02	866.0
03	867.0
04	868.0
05	915.1

### 5.3 Test environment and mode

Transmitting mode:	Keep the TX unit in transmitting mode with modulation.
Receiving mode:	Keep the RX unit in receiving mode.
<b>Operating Environment:</b>	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -20°C ~ +55°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Transmitter: Nominal: 5-36Vdc, Extreme: Low 4.3Vdc, High 39.6Vdc
Remark:	Four Lora modules are same, and they cannot transmitting at the same time, so only tested of one Lora module.

### 5.4 Description of Support Units

The EUT has been tested as an independent unit.

### 5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Radio frequency	±0.5 ppm
RF output power, conducted	±1.5 dB
Conducted spurious emission of transmitter, valid up to 6 GHz	±3.0 dB
Conducted emission of receivers	±3.0 dB
RF level uncertainty for a given BER	±1.5 dB
Occupied BandWidth	±5 %
Temperature	±3 °C
Humidity	±10 %
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB

### 5.6 Laboratory Facility

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

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

### 5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.  
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,  
Bao'an District, Shenzhen, Guangdong, China  
Tel: +86-755-23118282, Fax: +86-755-23116366  
Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

## 5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-07-2018	03-06-2019
Signal Generator	R&S	SMR20	1008100050	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		

## 6 Radio Technical Requirements Specification in EN 300 220-2

### 6.1 Operating Frequency

Declared by the manufacturer operating frequency for 865-868MHz & 915.1MHz and OCW for 100kHz.

### 6.2 Duty Cycle

The manufacturer has declared that due to the time between transmissions by the devices, the duty cycle is less than 0.1%.

### 6.3 Adjacent Channel Power

Not applicable, since the test applies to transmitters with OCW  $\leq$  25 kHz.

### 6.4 Adaptive Power Control

Not applicable, since the test applies to EUT with adaptive power control using annex C band AA.

### 6.5 FHSS equipment

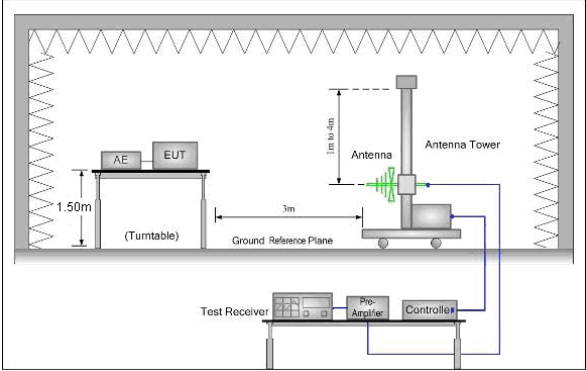
Not applicable, since the test applies to FHSS equipment.

### 6.6 Short term behaviour

Not applicable, since the test applies to EUT for operation in bands where Ton or Toff limits are specified in annex C, table C.1 or NRI.



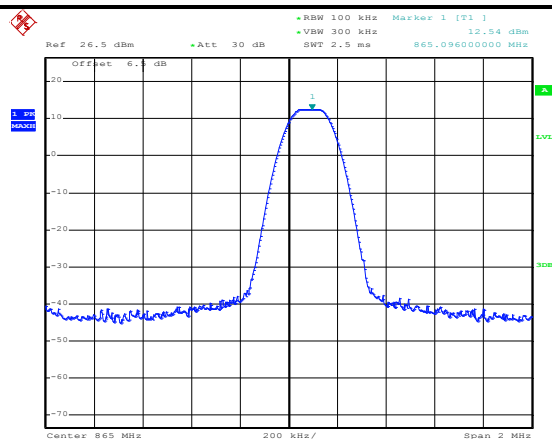
## 6.7 Effective Radiated Power

Test Requirement:	ETSI EN300 220-2 clause 4.3.1
Test Method:	ETSI EN300 220-1 clause 5.2.2.1
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector= peak
Limit:	14dBm (Refer to ETSI EN300 220-2 Annex C)
Test setup:	
Test procedure:	<ol style="list-style-type: none"> <li>1. Antenna connector of EUT by cable connection measurement receiver.</li> <li>2. The EUT is in continuous transmission mode with modulation, receiver setup measurement center frequency, record measured value.</li> <li>3. <math>ERP = P_{\text{measured value}}(\text{dBm}) + \text{antenna gain}(\text{dBi})</math>.</li> </ol>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

## Measurement Data:

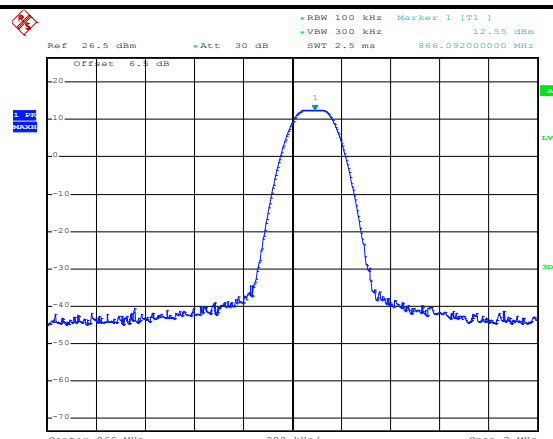
Test conditions	Frequency (MHz)	Read Level (dBm)	Antenna Gain (dBi)	ERP(dBm)	Limit (dB/m)	Result
NTNV	865.00	12.54	1.40	13.94	14	Pass
	866.00	12.55	1.40	13.95		
	867.00	12.56	1.40	13.96		
	868.00	12.53	1.40	13.93		
	915.10	12.40	1.40	13.80		
LTLV	865.00	12.53	1.40	13.93		
	866.00	12.52	1.40	13.92		
	867.00	12.52	1.40	13.92		
	868.00	12.51	1.40	13.91		
	915.10	12.38	1.40	13.78		
LTHV	865.00	12.52	1.40	13.92		
	866.00	12.52	1.40	13.92		
	867.00	12.53	1.40	13.93		
	868.00	12.52	1.40	13.92		
	915.0	12.39	1.40	13.79		
HTLV	865.00	12.51	1.40	13.91		
	866.00	12.51	1.40	13.91		
	867.00	12.52	1.40	13.92		
	868.00	12.50	1.40	13.90		
	915.10	12.37	1.40	13.77		
HTHV	865.00	12.53	1.40	13.93		
	866.00	12.52	1.40	13.92		
	867.00	12.53	1.40	13.93		
	868.00	12.51	1.40	13.91		
	915.10	12.38	1.40	13.78		

Test plot as follows:



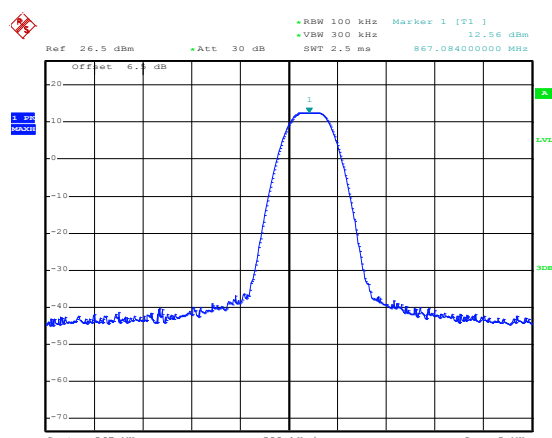
Date: 12.DEC.2018 04:22:59

Test Frequency: 865MHz



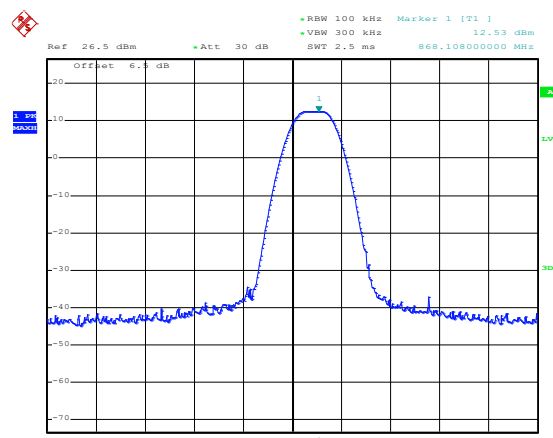
Date: 12.DEC.2018 04:23:49

Test Frequency: 866MHz



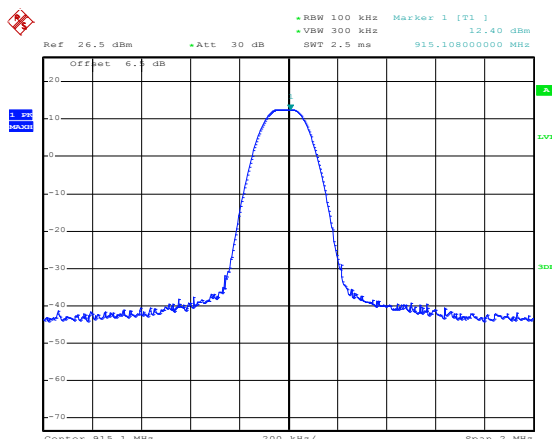
Date: 12.DEC.2018 04:24:20

Test Frequency: 867MHz



Date: 12.DEC.2018 04:24:50

Test Frequency: 868MHz



Date: 12.DEC.2018 04:34:06

Test Frequency: 915.1MHz

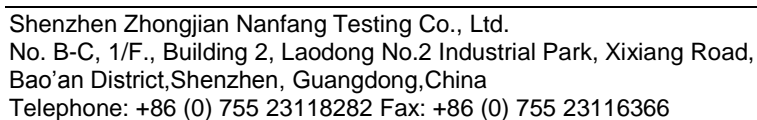
## 6.8 Occupied Bandwidth

Test Requirement:	EN300 220-2 Clause 4.3.4																					
Test Method:	EN 300 220-1 Clause 5.6.3																					
Limit:	Within of 863MHz to 870MHz & 915MHz to 915.2MHz																					
Test procedure:	<div>1. The spectrum analyser shall be configured as appropriate for the parameters shown in Table 12.</div> <div>Table 12: Test Parameters for Max Occupied Bandwidth Measurement</div> <table><tr><th>Setting</th><th>Value</th><th>Notes</th></tr><tr><td>Centre frequency</td><td>The nominal Operating Frequency</td><td>The highest or lowest Operating Frequency as declared by the manufacturer</td></tr><tr><td>RBW</td><td>1 % to 3 % of OCW without being below 100 Hz</td><td></td></tr><tr><td>VBW</td><td>3 x RBW</td><td>Nearest available analyser setting to 3 x RBW</td></tr><tr><td>Span</td><td>At least 2 x Operating Channel width</td><td>Span should be large enough to include all major components of the signal and its side bands</td></tr><tr><td>Detector Mode</td><td>RMS</td><td></td></tr><tr><td>Trace</td><td>Max hold</td><td></td></tr></table> <div>2. Step 1: Operation of the EUT shall be started, on the highest operating frequency as declared by the manufacturer, with the appropriate test signal.</div> <div>The signal attenuation shall be adjusted to ensure that the signal power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals on either side of the power envelope being included in the measurement.</div> <div>Step 2: When the trace is completed the peak value of the trace shall be located and the analyser marker placed on this peak.</div> <div>Step 3: The 99 % occupied bandwidth function of the spectrum analyser shall be used to measure the occupied bandwidth of the signal.</div>	Setting	Value	Notes	Centre frequency	The nominal Operating Frequency	The highest or lowest Operating Frequency as declared by the manufacturer	RBW	1 % to 3 % of OCW without being below 100 Hz		VBW	3 x RBW	Nearest available analyser setting to 3 x RBW	Span	At least 2 x Operating Channel width	Span should be large enough to include all major components of the signal and its side bands	Detector Mode	RMS		Trace	Max hold	
Setting	Value	Notes																				
Centre frequency	The nominal Operating Frequency	The highest or lowest Operating Frequency as declared by the manufacturer																				
RBW	1 % to 3 % of OCW without being below 100 Hz																					
VBW	3 x RBW	Nearest available analyser setting to 3 x RBW																				
Span	At least 2 x Operating Channel width	Span should be large enough to include all major components of the signal and its side bands																				
Detector Mode	RMS																					
Trace	Max hold																					
Test Instruments:	Refer to section 5.8 for details																					
Test mode:	Refer to section 5.3 for details																					
Test results:	Pass																					

## Measurement Data:

## 865-868MHz:

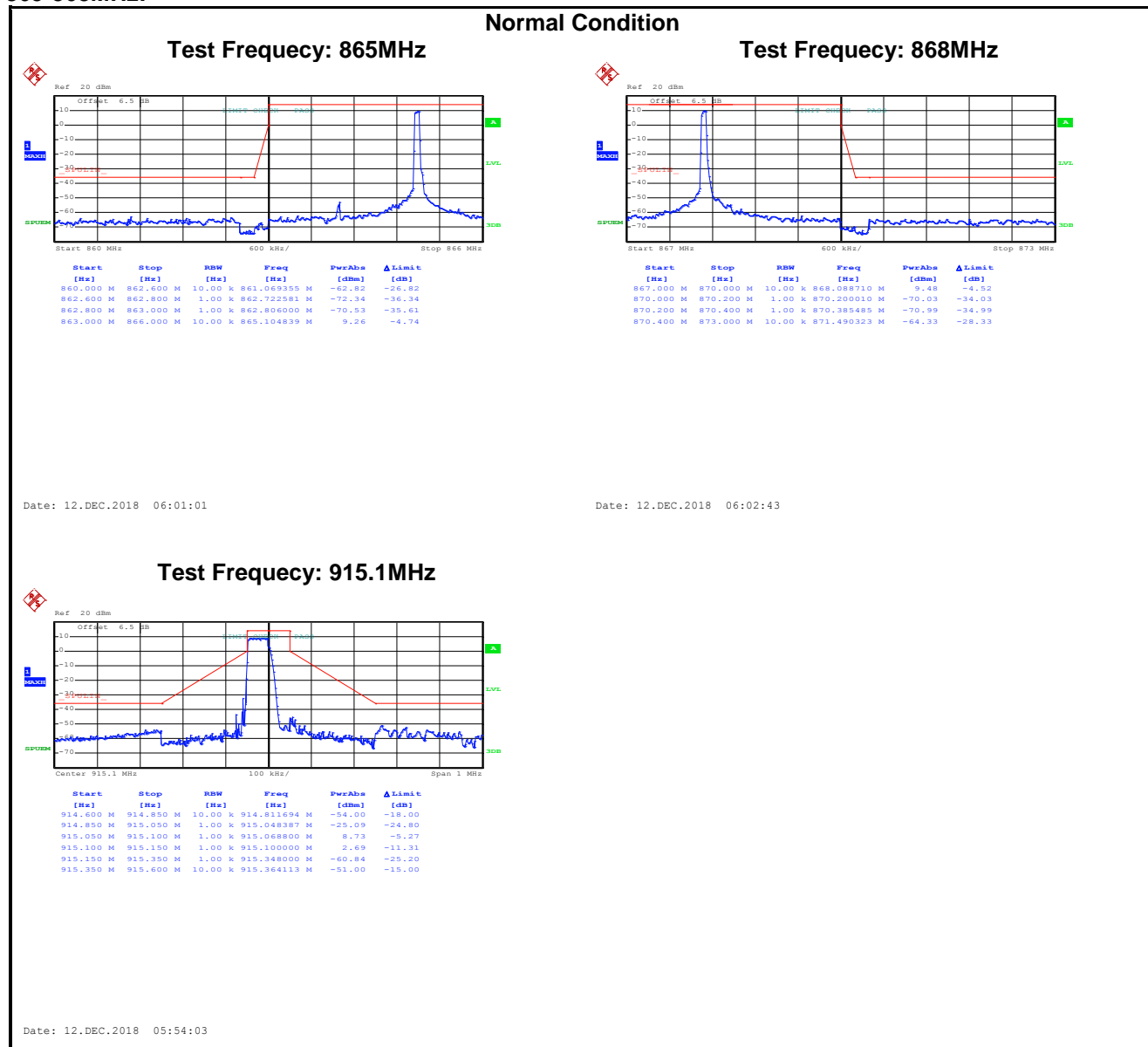
Test conditions		Test Frequency (MHz)	OBW (kHz)	Limit	Result
Volt(dc)	Temp				
5.0V	25℃	865.0	84.00	863MHz< OBW < 870MHz	Pass
4.3V	55℃		82.00		
4.3V	-20℃		80.00		
39.6V	55℃		82.00		
39.6V	-20℃		82.00		
5.0V	25℃	868.0	84.00		
4.3V	55℃		80.00		
4.3V	-20℃		82.00		
39.6V	55℃		82.00		
39.6V	-20℃		80.00		
5.0V	25℃	915.1	84.00	915MHz< OBW < 915.2MHz	Pass
4.3V	55℃		82.00		
4.3V	-20℃		80.00		
39.6V	55℃		82.00		
39.6V	-20℃		80.00		



## 6.9 Tx Out of Band Emissions

Test Requirement:	EN300 220-2 Clause 4.3.5																																						
Test Method:	EN 300 220-1 Clause 5.8.3																																						
Limit:	Refer to ETSI EN300 220-1 Clause 5.8.2																																						
Test procedure:	<div>Table 16: Test Parameters for Out Of Band for Operating Channel Measurement</div> <table><tr><th>Spectrum Analyser Setting</th><th>Value</th><th>Notes</th></tr><tr><td>Centre frequency</td><td>Operating Frequency</td><td></td></tr><tr><td>Span</td><td>6 x Operating Channel width</td><td></td></tr><tr><td>RBW</td><td>1 kHz (see note)</td><td>Resolution bandwidth for Out Of Band domain measurements</td></tr><tr><td>Detector Function</td><td>RMS</td><td></td></tr><tr><td rowspan="2">Trace Mode</td><td>Linear AVG</td><td>Applies only for EUT generating D-M2 test signal. An appropriate number of samples should be averaged to give a stable reading</td></tr><tr><td>Max Hold</td><td>Applies only for EUT generating D-M2a or D-M3 test signal.</td></tr></table> <div>NOTE: If the value of RBW used is different from <math>RBW_{REF}</math> in clause 5.8.2, use the bandwidth correction in clause 4.3.10.1.</div> <p>The test equipment shall be configured as appropriate for the parameters shown in Table 16.</p> <p><b>Step 1:</b> Operation of the EUT shall be started, on the highest operating frequency as declared by the manufacturer, with the appropriate test signal. The signal shape is recorded when stable and shall be below the spectrum mask Out Of Band for operating channel.</p> <p><b>Step 2:</b> The test equipment shall be reconfigured as appropriate for the parameter shown in Table 17.</p> <div>Table 17: Test Parameter Setting for Lower Out Of Band Measurement</div> <table><tr><th>Spectrum Analyser Setting</th><th>Value</th><th>Notes</th></tr><tr><td>Centre frequency</td><td><math>f_{c_{low}}</math></td><td>The lowest Operating Frequency in the band</td></tr><tr><td>Span</td><td><math>2 \times (500 \text{ kHz} + f_{c_{low}} - f_{low\_OFB})</math></td><td>Ensures that the left most mask specification remains within the span</td></tr></table> <div>NOTE: <math>f_{low\_OFB}</math> is the lower edge of the Operational Frequency Band.</div> <p>Operation of the EUT is restarted, with the appropriate test signal, on the lowest operating frequency as declared by the manufacturer. If the equipment is using only one operating Frequency in the operational Frequency Band, measurement shall be performed the nominal operating frequency. The signal shape is recorded when stable; and shall be below the spectrum mask for operating channel and the spectrum mask for operational frequency band.</p> <p><b>Step 3:</b> The test equipment shall be reconfigured as appropriate for the parameter shown in Table 18.</p> <div>Table 18: Test Parameter Setting for upper Out Of Band Measurement</div> <table><tr><th>Spectrum Analyser Setting</th><th>Value</th><th>Notes</th></tr><tr><td>Centre frequency</td><td><math>f_{c_{high}}</math></td><td>the highest Operating Frequency in the band</td></tr><tr><td>Span</td><td><math>2 \times (500 \text{ kHz} + f_{high\_OFB} - f_{c_{high}})</math></td><td>Ensures that the rightmost mask specification remains within the span</td></tr></table> <div>NOTE: <math>f_{high\_OFB}</math> is the higher edge of the operational frequency Band.</div> <p>Operation of the EUT is restarted, with the appropriate test signal, on the highest Operating Frequency as declared by the manufacturer. If the equipment is using only one Operating Frequency in the Operational Frequency Band, measurement shall be performed at the nominal Operating Frequency. The signal shape is recorded when stable and shall be below the spectrum mask for Out Of Band emissions for operating channel and for operational</p>	Spectrum Analyser Setting	Value	Notes	Centre frequency	Operating Frequency		Span	6 x Operating Channel width		RBW	1 kHz (see note)	Resolution bandwidth for Out Of Band domain measurements	Detector Function	RMS		Trace Mode	Linear AVG	Applies only for EUT generating D-M2 test signal. An appropriate number of samples should be averaged to give a stable reading	Max Hold	Applies only for EUT generating D-M2a or D-M3 test signal.	Spectrum Analyser Setting	Value	Notes	Centre frequency	$f_{c_{low}}$	The lowest Operating Frequency in the band	Span	$2 \times (500 \text{ kHz} + f_{c_{low}} - f_{low\_OFB})$	Ensures that the left most mask specification remains within the span	Spectrum Analyser Setting	Value	Notes	Centre frequency	$f_{c_{high}}$	the highest Operating Frequency in the band	Span	$2 \times (500 \text{ kHz} + f_{high\_OFB} - f_{c_{high}})$	Ensures that the rightmost mask specification remains within the span
Spectrum Analyser Setting	Value	Notes																																					
Centre frequency	Operating Frequency																																						
Span	6 x Operating Channel width																																						
RBW	1 kHz (see note)	Resolution bandwidth for Out Of Band domain measurements																																					
Detector Function	RMS																																						
Trace Mode	Linear AVG	Applies only for EUT generating D-M2 test signal. An appropriate number of samples should be averaged to give a stable reading																																					
	Max Hold	Applies only for EUT generating D-M2a or D-M3 test signal.																																					
Spectrum Analyser Setting	Value	Notes																																					
Centre frequency	$f_{c_{low}}$	The lowest Operating Frequency in the band																																					
Span	$2 \times (500 \text{ kHz} + f_{c_{low}} - f_{low\_OFB})$	Ensures that the left most mask specification remains within the span																																					
Spectrum Analyser Setting	Value	Notes																																					
Centre frequency	$f_{c_{high}}$	the highest Operating Frequency in the band																																					
Span	$2 \times (500 \text{ kHz} + f_{high\_OFB} - f_{c_{high}})$	Ensures that the rightmost mask specification remains within the span																																					

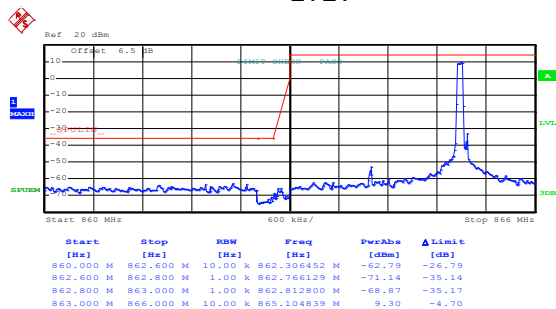
	Frequency Band. <b>Step 4:</b> For frequency agile devices, the measurement shall be repeated in each Operational Frequency Band. <b>Step 5:</b> Where required (see clause 5.8.3.1 condition 1), the measurements in step 1 to step 5 shall be repeated under extreme test conditions.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

**Test Plots:****865-868MHz:**



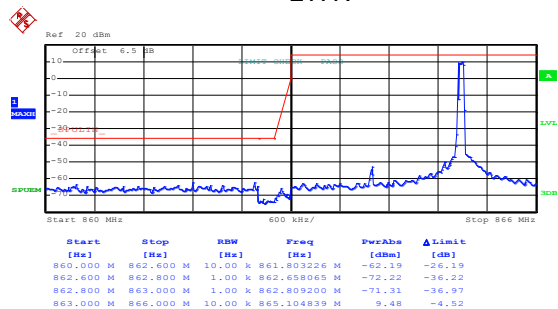
Extreme Condition  
Test Frequency: 865MHz

LTLV



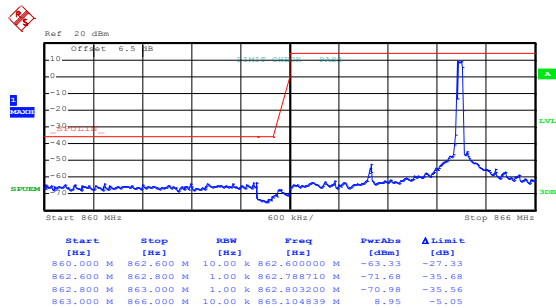
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LTHV



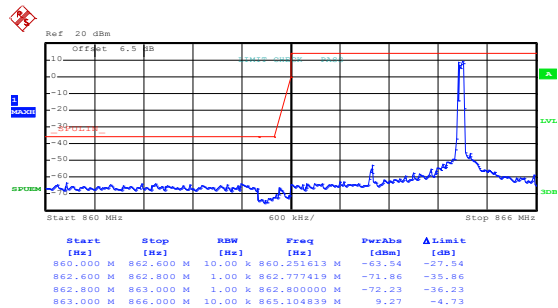
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HTLV



Date: 12,DEC,2018 06:01:50

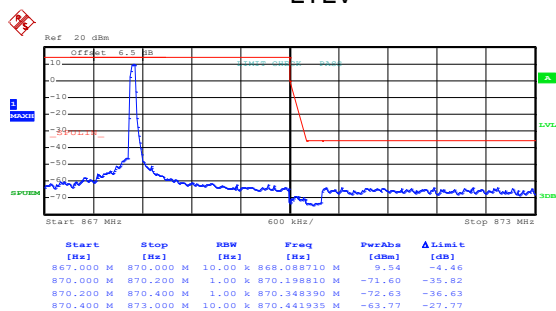
HTHV



Date: 12,DEC,2018 06:02:01

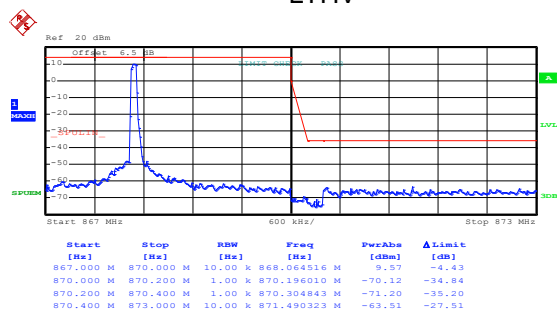
## Test Frequency: 868MHz

## LTLV



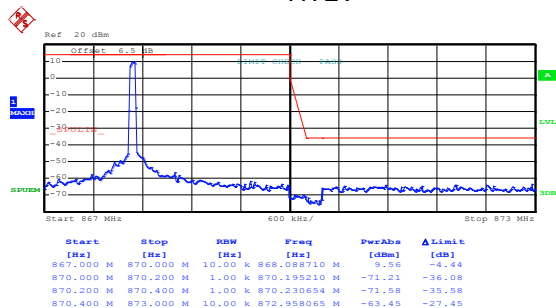
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## LTHV



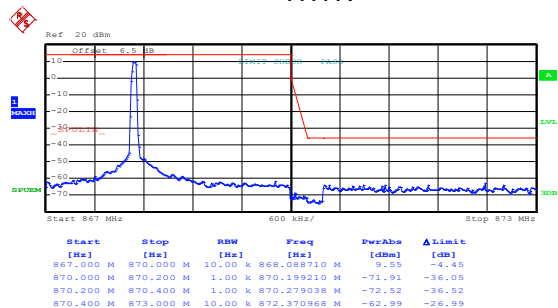
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## HTLV



Date: 12.DEC.2018 06:03:45

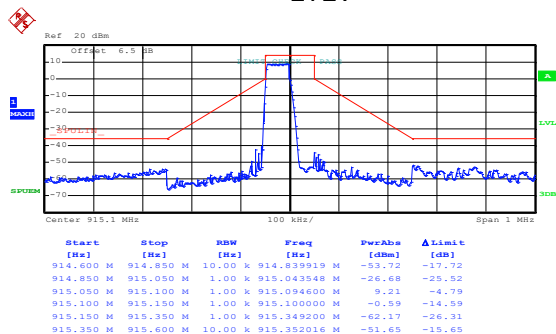
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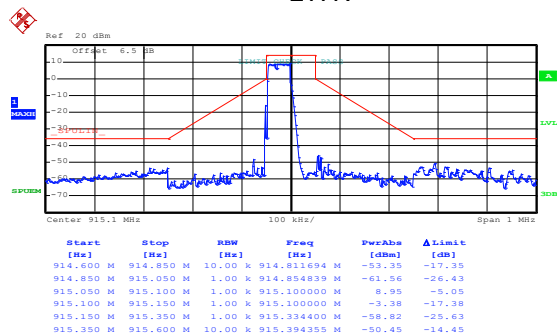
## Test Frequency: 915.1MHz

## LTLV



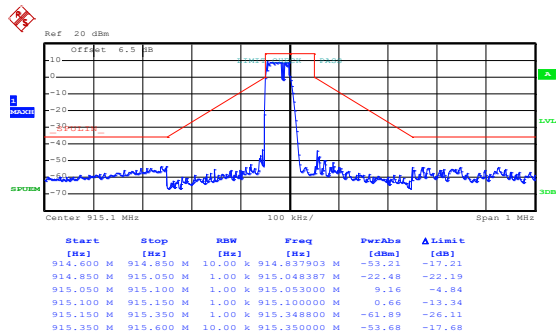
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## LTHV



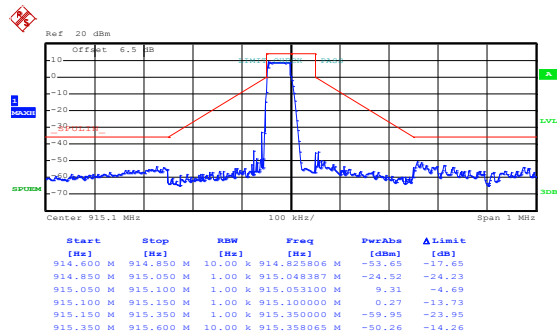
Date: 12.DEC.2018 05:55:09

## HTLV



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## HTHV



Date: 12.DEC.2018 05:56:32

## 6.10 Transient power

Test Requirement:	EN300 220-2 Clause 4.3.6																																							
Test Method:	EN 300 220-1 Clause 5.10.3																																							
Limit:	<table><tr><th colspan="3">Table 23: Transmitter Transient Power limits</th></tr><tr><th>Absolute offset from centre frequency</th><th>RBW<sub>REF</sub></th><th>Peak power limit applicable at measurement points</th></tr><tr><td>≤ 400 kHz</td><td>1 kHz</td><td>0 dBm</td></tr><tr><td>&gt; 400 kHz</td><td>1 kHz</td><td>-27 dBm</td></tr></table>	Table 23: Transmitter Transient Power limits			Absolute offset from centre frequency	RBW <sub>REF</sub>	Peak power limit applicable at measurement points	≤ 400 kHz	1 kHz	0 dBm	> 400 kHz	1 kHz	-27 dBm																											
Table 23: Transmitter Transient Power limits																																								
Absolute offset from centre frequency	RBW <sub>REF</sub>	Peak power limit applicable at measurement points																																						
≤ 400 kHz	1 kHz	0 dBm																																						
> 400 kHz	1 kHz	-27 dBm																																						
Test procedure:	<p>The output of the EUT shall be connected to a spectrum analyser or equivalent measuring equipment.</p> <p>The measurement shall be undertaken in <b>zero span</b> mode. The analyser's centre frequency shall be set to an offset from the operating centre frequency. These offset values and their corresponding RBW configurations are listed in Table 24.</p> <p>Table 24: RBW for Transient Measurement</p> <table><tr><th>Measurement points: offset from centre frequency</th><th>Analyser RBW</th><th>RBW<sub>REF</sub></th></tr><tr><td>-0,5 x OCW - 3 kHz 0,5 x OCW + 3 kHz Not applicable for OCW &lt; 25 kHz</td><td>1 kHz</td><td>1kHz</td></tr><tr><td>±12,5 kHz or ±OCW whichever is the greater</td><td>Max (RBW pattern 1, 3, 10 kHz) ≤ Offset frequency/6 (see note)</td><td>1 kHz</td></tr><tr><td>-0,5 x OCW - 400 kHz 0,5 x OCW + 400 kHz</td><td>100 kHz</td><td>1 kHz</td></tr><tr><td>-0,5 x OCW -1 200 kHz 0,5 x OCW + 1 200 kHz</td><td>300 kHz</td><td>1 kHz</td></tr></table> <p>NOTE: Max (RBW pattern 1, 3, 10 kHz) means the maximum bandwidth that falls into the commonly implemented 1, 3, 10 kHz RBW filter bandwidth incremental pattern of spectrum analysers.</p> <p>EXAMPLE: If OCW is 25 kHz then the RBW value corresponding to one OCW offset frequency is 3 kHz. The rest of the analyser settings are listed in Table 25, and if OCW is 250 kHz then the RBW value corresponding to one OCW offset frequency is 30 kHz.</p> <p>Table 25: Parameters for Transient Measurement</p> <table><tr><th>Spectrum Analyser Setting</th><th>Value</th><th>Notes</th></tr><tr><td>VBW/RBW</td><td>10</td><td>At higher RBW values VBW may be clipped to its maximum value</td></tr><tr><td>Sweep time</td><td>500 ms</td><td></td></tr><tr><td>RBW filter</td><td>Gaussian</td><td></td></tr><tr><td>Trace Detector Function</td><td>RMS</td><td></td></tr><tr><td>Trace Mode</td><td>Max hold</td><td></td></tr><tr><td>Sweep points</td><td>501</td><td></td></tr><tr><td>Measurement mode</td><td>Continuous sweep</td><td></td></tr></table> <p>NOTE: The ratio between the number of sweep points and the sweep time shall be the same ratio as above if different number of sweep points is used.</p> <p>The used modulation shall be D-M3. The analyser shall be set to the settings of Table 25 and a measurement shall be started for each offset frequency. The EUT shall transmit at least five D-M3 test signal. The peak value shall be recorded and the measurement shall be repeated at each offset frequency mentioned in Table 24.</p> <p>The recorded power values shall be converted to power values measured in RBWREF by the formula in clause 4.3.10.1.</p>	Measurement points: offset from centre frequency	Analyser RBW	RBW <sub>REF</sub>	-0,5 x OCW - 3 kHz 0,5 x OCW + 3 kHz Not applicable for OCW < 25 kHz	1 kHz	1kHz	±12,5 kHz or ±OCW whichever is the greater	Max (RBW pattern 1, 3, 10 kHz) ≤ Offset frequency/6 (see note)	1 kHz	-0,5 x OCW - 400 kHz 0,5 x OCW + 400 kHz	100 kHz	1 kHz	-0,5 x OCW -1 200 kHz 0,5 x OCW + 1 200 kHz	300 kHz	1 kHz	Spectrum Analyser Setting	Value	Notes	VBW/RBW	10	At higher RBW values VBW may be clipped to its maximum value	Sweep time	500 ms		RBW filter	Gaussian		Trace Detector Function	RMS		Trace Mode	Max hold		Sweep points	501		Measurement mode	Continuous sweep	
Measurement points: offset from centre frequency	Analyser RBW	RBW <sub>REF</sub>																																						
-0,5 x OCW - 3 kHz 0,5 x OCW + 3 kHz Not applicable for OCW < 25 kHz	1 kHz	1kHz																																						
±12,5 kHz or ±OCW whichever is the greater	Max (RBW pattern 1, 3, 10 kHz) ≤ Offset frequency/6 (see note)	1 kHz																																						
-0,5 x OCW - 400 kHz 0,5 x OCW + 400 kHz	100 kHz	1 kHz																																						
-0,5 x OCW -1 200 kHz 0,5 x OCW + 1 200 kHz	300 kHz	1 kHz																																						
Spectrum Analyser Setting	Value	Notes																																						
VBW/RBW	10	At higher RBW values VBW may be clipped to its maximum value																																						
Sweep time	500 ms																																							
RBW filter	Gaussian																																							
Trace Detector Function	RMS																																							
Trace Mode	Max hold																																							
Sweep points	501																																							
Measurement mode	Continuous sweep																																							
Test Instruments:	Refer to section 5.7 for details																																							
Test mode:	Refer to section 5.3 for details																																							
Test results:	Pass																																							

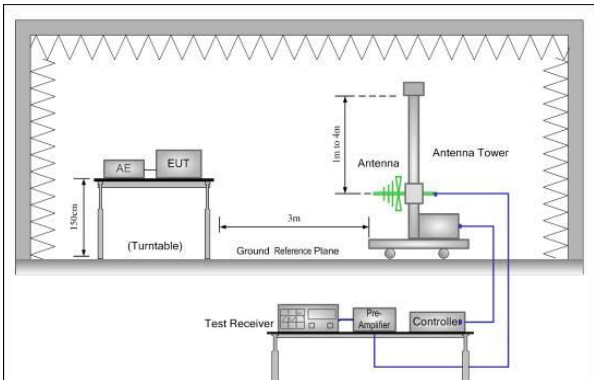
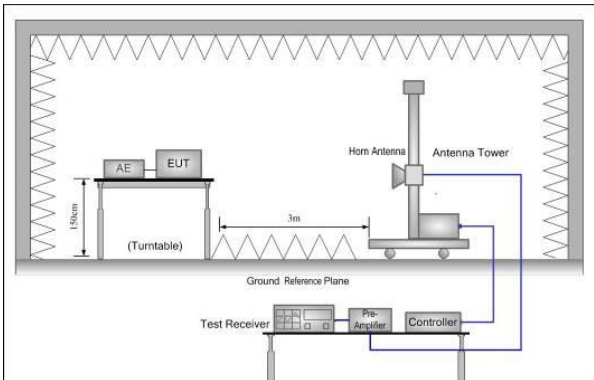
## Measurement Data

Frequency (MHz)	Test points (offset from centre frequency)	Transient power (dBm)	Limit (dBm)	Result
865	0.5*OCW-1200kHz	-35.88	-27	PASS
	0.5*OCW-400kHz	-52.37		
	-OCW	-44.41	0	PASS
	-0.5*OCW-3KHz	-34.35		
	+0.5*OCW+3KHz	-37.21		
	+OCW	-45.25		
	+0.5*OCW+400Khz	-52.25	-27	PASS
	+0.5*OCW+1200KHz	-36.92		
868	0.5*OCW-1200kHz	-37.23	-27	PASS
	0.5*OCW-400kHz	-52.78		
	-OCW	-45.22	0	PASS
	-0.5*OCW-3KHz	-34.82		
	+0.5*OCW+3KHz	-38.06		
	+OCW	-45.47		
	+0.5*OCW+400Khz	-52.81	-27	PASS
	+0.5*OCW+1200KHz	-37.81		
915.1	0.5*OCW-1200kHz	-35.26	-27	PASS
	0.5*OCW-400kHz	-48.51		
	-OCW	-35.42	0	PASS
	-0.5*OCW-3KHz	-33.75		
	+0.5*OCW+3KHz	-40.12		
	+OCW	-41.36		
	+0.5*OCW+400Khz	-48.57	-27	PASS
	+0.5*OCW+1200KHz	-37.25		

## 6.11 TX behaviour under Low-voltage Conditions

Test Requirement:	EN 300 220-2 Clause 4.3.8
Test Method:	EN 300 220-1 Clause 5.12.3
Limit:	<p>The equipment shall either:</p> <ul style="list-style-type: none"> <li>a) remain in the Operating Channel OC without exceeding any applicable limits (e.g. Duty Cycle); or</li> <li>b) reduce its effective radiated power below the Spurious Emission limits without exceeding any applicable limits (e.g. Duty Cycle); or</li> <li>c) shut down, (ceasing function);</li> </ul> <p>as the voltage falls below the manufacturers declared operating voltage.</p>
Test procedure:	<p><b>Step 1:</b> Operation of the EUT shall be started, on Operating Frequency as declared by the manufacturer, with the appropriate test signal and with the EUT operating at nominal operating voltage. The centre frequency of the transmitted signal shall be measured and noted.</p> <p><b>Step 2:</b> The operating voltage shall be reduced by appropriate steps until the voltage reaches zero. The centre frequency of the transmitted signal shall be measured and noted. Any abnormal behaviour shall be noted.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass(When the operating voltage is less than 4.3Vdc, the EUT shut down.)

## 6.12 Unwanted emissions in the spurious domain

Test Requirement:	EN 300 220-2 Clause 4.2.2																						
Test Method:	EN 300 220-1 Clause 5.9.3																						
Receiver setup:	<div>Table 20: Parameters for TX Spurious Radiations Measurement</div> <table><tr><th>Operating Mode</th><th>Frequency Range</th><th>RBW<sub>REF</sub> (see note 2)</th></tr><tr><td rowspan="9">Transmit mode</td><td>9 kHz ≤ f &lt; 150 kHz</td><td>1 kHz</td></tr><tr><td>150 kHz ≤ f &lt; 30 MHz</td><td>10 kHz</td></tr><tr><td>30 MHz ≤ f &lt; f<sub>c</sub> - m</td><td>100 kHz</td></tr><tr><td>f<sub>c</sub> - m ≤ f &lt; f<sub>c</sub> - n</td><td>10 kHz</td></tr><tr><td>f<sub>c</sub> - n ≤ f &lt; f<sub>c</sub> - p</td><td>1 kHz</td></tr><tr><td>f<sub>c</sub> + p ≤ f &lt; f<sub>c</sub> + n</td><td>1 kHz</td></tr><tr><td>f<sub>c</sub> + n ≤ f &lt; f<sub>c</sub> + m</td><td>10 kHz</td></tr><tr><td>f<sub>c</sub> + m ≤ f &lt; 1 GHz</td><td>100 kHz</td></tr><tr><td>1 GHz &lt; f ≤ 6 GHz</td><td>1 MHz</td></tr></table> <div><div>NOTE 1: f is the measurement frequency. f<sub>c</sub> is the Operating Frequency. m is 10 x OCW or 500 kHz, whichever is the greater. n is 4 x OCW or 100 kHz, whichever is the greater. p is 2,5 x OCW.</div><div>NOTE 2: If the value of RBW used for measurement is different from RBW<sub>REF</sub>, use bandwidth correction from clause 4.3.10.1.</div></div>	Operating Mode	Frequency Range	RBW <sub>REF</sub> (see note 2)	Transmit mode	9 kHz ≤ f < 150 kHz	1 kHz	150 kHz ≤ f < 30 MHz	10 kHz	30 MHz ≤ f < f <sub>c</sub> - m	100 kHz	f <sub>c</sub> - m ≤ f < f <sub>c</sub> - n	10 kHz	f <sub>c</sub> - n ≤ f < f <sub>c</sub> - p	1 kHz	f <sub>c</sub> + p ≤ f < f <sub>c</sub> + n	1 kHz	f <sub>c</sub> + n ≤ f < f <sub>c</sub> + m	10 kHz	f <sub>c</sub> + m ≤ f < 1 GHz	100 kHz	1 GHz < f ≤ 6 GHz	1 MHz
Operating Mode	Frequency Range	RBW <sub>REF</sub> (see note 2)																					
Transmit mode	9 kHz ≤ f < 150 kHz	1 kHz																					
	150 kHz ≤ f < 30 MHz	10 kHz																					
	30 MHz ≤ f < f <sub>c</sub> - m	100 kHz																					
	f <sub>c</sub> - m ≤ f < f <sub>c</sub> - n	10 kHz																					
	f <sub>c</sub> - n ≤ f < f <sub>c</sub> - p	1 kHz																					
	f <sub>c</sub> + p ≤ f < f <sub>c</sub> + n	1 kHz																					
	f <sub>c</sub> + n ≤ f < f <sub>c</sub> + m	10 kHz																					
	f <sub>c</sub> + m ≤ f < 1 GHz	100 kHz																					
	1 GHz < f ≤ 6 GHz	1 MHz																					
Limit:	<div>Table 19: Spurious domain emission limits</div> <table><tr><th>Frequency</th><th>47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz</th><th>Other frequencies below 1 000 MHz</th><th>Frequencies above 1 000 MHz</th></tr><tr><td>State</td><td></td><td></td><td></td></tr><tr><td>TX mode</td><td>-54 dBm</td><td>-36 dBm</td><td>-30 dBm</td></tr><tr><td>RX and all other modes</td><td>-57 dBm</td><td>-57 dBm</td><td>-47 dBm</td></tr></table>	Frequency	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies below 1 000 MHz	Frequencies above 1 000 MHz	State				TX mode	-54 dBm	-36 dBm	-30 dBm	RX and all other modes	-57 dBm	-57 dBm	-47 dBm						
Frequency	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies below 1 000 MHz	Frequencies above 1 000 MHz																				
State																							
TX mode	-54 dBm	-36 dBm	-30 dBm																				
RX and all other modes	-57 dBm	-57 dBm	-47 dBm																				
Test Frequency range:	25MHz to 4GHz																						
Test setup:	<div>Below 1GHz</div> <div></div> <div>Above 1GHz</div> <div></div>																						
Test procedure:	<div>Substitution method was performed to determine the actual ERP emission levels of the EUT.</div> <div>The following test procedure as below:</div> <div>Below 1GHz test procedure:</div> <div>1. On the test site as test setup graph above,the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.</div>																						

	<ol style="list-style-type: none"> <li>2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.</li> <li>3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.</li> <li>4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.</li> <li>5. Repeat step 4 for test frequency with the test antenna polarized horizontally.</li> <li>6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.</li> <li>7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.</li> <li>8. Repeat step 7 with both antennas horizontally polarized for each test frequency.</li> <li>9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:  <math display="block">ERP(dBm) = Pg(dBm) - \text{cable loss (dB)} + \text{antenna gain (dBd)}</math>           where: Pg is the generator output power into the substitution antenna.         </li> </ol> <p><b>Above 1GHz test procedure:</b></p> <p>Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass



## Measurement Data:

TX mode				
Test Frequency: 865MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.71	Vertical	-57.43	-54.00	Pass
191.07	V	-57.62		
75.18	V	-55.38		
159.78	V	-53.15	-36.00	
1730.00	V	-47.04	-30.00	
2595.00	V	-33.06		
3460.00	V	-45.68		
4325.00	V	-44.94		
52.21	Horizontal	-58.30	-54.00	
213.76	H	-56.90	-36.00	
81.21	H	-62.04		
161.47	H	-55.78		
1730.00	H	-47.24	-30.00	
2595.00	H	-32.71		
3460.00	H	-48.75		
4325.00	H	-46.59		
Test Frequency: 866MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.71	Vertical	-58.69	-54.00	Pass
191.07	V	-57.45		
75.18	V	-55.63		
159.78	V	-54.25	-36.00	
1732.00	V	-52.37	-30.00	
2598.00	V	-37.20		
3464.00	V	-47.94		
4330.00	V	-46.24		
52.21	Horizontal	-58.63	-54.00	
213.76	H	-57.45	-36.00	
81.21	H	-62.15		
161.47	H	-56.36		
1732.00	H	-41.09	-30.00	
2598.00	H	-32.19		
3464.00	H	-42.39		
4330.00	H	-46.32		
Test Frequency: 867MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.71	Vertical	-57.42	-54.00	Pass
191.07	V	-59.63		
75.18	V	-57.12		
159.78	V	-55.82	-36.00	
1734.00	V	-46.24	-30.00	
2601.00	V	-33.23		
3468.00	V	-45.55		
4335.00	V	-45.07		
52.21	Horizontal	-59.53	-54.00	
213.76	H	-57.85	-36.00	
81.21	H	-62.13		
161.47	H	-56.36		
1734.00	H	-47.56	-30.00	
2601.00	H	-35.64		
3468.00	H	-45.78		
4335.00	H	-46.78		

Test Frequency: 868MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.71	Vertical	-58.56	-54.00	Pass
191.07	V	-58.45		
75.18	V	-56.23		
159.78	V	-55.12	-36.00	
1736.00	V	-50.60	-30.00	
2604.00	V	-34.23		
3472.00	V	-46.92		
4340.00	V	-45.58		
52.21	Horizontal	-58.78	-54.00	
213.76	H	-59.15	-36.00	
81.21	H	-61.31		
161.47	H	-57.89		
1736.00	H	-42.88	-30.00	
2604.00	H	-32.90		
3472.00	H	-43.70		
4340.00	H	-44.37		
Test Frequency: 915.1MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.71	Vertical	-59.63	-54.00	Pass
191.07	V	-58.45	-36.00	
75.18	V	-56.81		
159.78	V	-55.89		
1830.20	V	-46.23	-30.00	
2745.30	V	-32.58		
3660.40	V	-45.78		
4575.50	V	-46.36		
52.21	Horizontal	-60.13	-54.00	
213.76	H	-59.24	-36.00	
81.21	H	-61.56		
161.47	H	-58.78		
1830.20	H	-45.23	-30.00	
2745.30	H	-32.45		
3660.40	H	-47.52		
4575.50	H	-46.93		

RX mode				
Test Frequency: 865MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.06	Vertical	-60.24	-57.00	Pass
162.04	V	-59.18		
1730.00	V	-61.42	-47.00	
78.41	Horizontal	-60.01	-57.00	
329.04	H	-60.75		
1730.00	H	-60.89	-47.00	
Test Frequency: 866MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.06	Vertical	-61.25	-57.00	Pass
162.04	V	-60.53		
1732.00	V	-60.78	-47.00	
78.41	Horizontal	-62.36	-57.00	
329.04	H	-61.42		
1732.00	H	-60.58	-47.00	
Test Frequency: 867MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.06	Vertical	-61.45	-57.00	Pass
162.04	V	-62.53		
1734.00	V	-60.92	-47.00	
78.41	Horizontal	-62.56	-57.00	
329.04	H	-62.36		
1734.00	H	-60.68	-47.00	
Test Frequency: 868MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.06	Vertical	-62.36	-57.00	Pass
162.04	V	-61.52		
1736.00	V	-61.34	-47.00	
78.41	Horizontal	-63.23	-57.00	
329.04	H	-61.57		
1736.00	H	-61.74	-47.00	
Test Frequency: 915.1MHz				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
50.06	Vertical	-62.14	-57.00	Pass
162.04	V	-61.35		
1830.20	V	-60.75	-47.00	
78.41	Horizontal	-62.53	-57.00	
329.04	H	-63.45		
1830.20	H	-61.47	-47.00	

## 6.13 Receiver Requirements

Receiver Classification, Table 1 of EN 300 220-1.

**Table 1: Receiver categories**

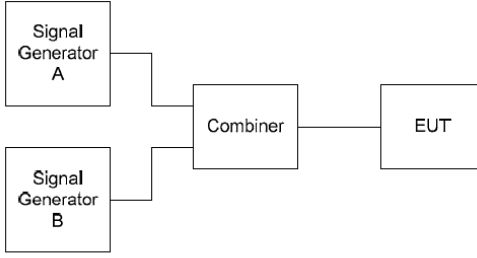
Receiver category	Description
1	Category 1 is a high performance level of receiver. In particular to be used where the operation of a SRD may have inherent safety of human life implications.
1.5	Category 1.5 is an improved performance level of receiver category 2.
2	Category 2 is standard performance level of receiver.
3	Category 3 is a low performance level of receiver. Manufacturers have to be aware that category 3 receivers are not able to work properly in case of coexistence with some services such as a mobile radio service in adjacent bands. The manufacturer shall provide another mean to overcome the weakness of the radio link or accept the failure.

Remark: The EUT (Rx part) belong to Class 3 with no polite spectrum access.

### 6.13.1 RX sensitivity

Not applicable, since the test applied to with polite spectrum access facility only.

## 6.13.2 Blocking

Test Requirement:	EN 300 220-2 Clause 4.4.2										
Test Method:	EN 300 220-1 Clause 5.18.6										
Limit:	<p><b>Table 40: Blocking level parameters for RX category 3</b></p> <table> <tr> <th>Requirement</th><th>Limits</th></tr> <tr> <td></td><td><b>Receiver category 3</b></td></tr> <tr> <td>Blocking at <math>\pm 2</math> MHz from OC edge <math>f_{high}</math> and <math>f_{low}</math></td><td><math>\geq -80</math> dBm</td></tr> <tr> <td>Blocking at <math>\pm 10</math> MHz from OC edge <math>f_{high}</math> and <math>f_{low}</math></td><td><math>\geq -60</math> dBm</td></tr> <tr> <td>Blocking at <math>\pm 5\%</math> of Centre Frequency or 15 MHz, whichever is the greater</td><td><math>\geq -60</math> dBm</td></tr> </table>	Requirement	Limits		<b>Receiver category 3</b>	Blocking at $\pm 2$ MHz from OC edge $f_{high}$ and $f_{low}$	$\geq -80$ dBm	Blocking at $\pm 10$ MHz from OC edge $f_{high}$ and $f_{low}$	$\geq -60$ dBm	Blocking at $\pm 5\%$ of Centre Frequency or 15 MHz, whichever is the greater	$\geq -60$ dBm
Requirement	Limits										
	<b>Receiver category 3</b>										
Blocking at $\pm 2$ MHz from OC edge $f_{high}$ and $f_{low}$	$\geq -80$ dBm										
Blocking at $\pm 10$ MHz from OC edge $f_{high}$ and $f_{low}$	$\geq -60$ dBm										
Blocking at $\pm 5\%$ of Centre Frequency or 15 MHz, whichever is the greater	$\geq -60$ dBm										
Test setup:	 <p><b>Figure 10: Blocking measurement arrangement</b></p>										
Test procedure:	<p><b>Step 1:</b> Signal generator B shall be powered off. Signal generator A shall be set to the minimum level which gives the wanted performance criterion of EUT or the reference level in Table 32, whichever is the higher. The output level of generator A shall then be increased by 3 dB unless otherwise specified in technical requirement.</p> <p><b>Step 2:</b> Signal generator B is powered on and set to operate at the nominal operating frequency - offset frequency. Signal generator B is then switched on and the signal amplitude is adjusted to the minimum level at which the wanted performance criterion is not achieved. With signal generator B settings unchanged, the receiver shall be replaced with a suitable RF power measuring equipment. The power into the measuring equipment shall be measured and noted. The blocking level is then the conducted power received from generator B at the EUT antenna connector. This can either be measured on the antenna connector for conducted test or be calculated for radiated test (see clause C.5.4). The blocking level shall be higher or equal to the blocking power level requested in the technical requirement clause.</p> <p><b>Step 3:</b> The measurement in steps 1 to 3 shall be repeated with signal offsets at required frequencies.</p> <p><b>Step 4:</b> The information shown in Table 44 shall be recorded in the test report for each measured signal level and unwanted signal offset.</p> <p><b>Table 44: Information Recorded in the Test Report</b></p> <table> <tr> <th>Value</th><th>Notes</th></tr> <tr> <td>Operating Frequency</td><td>Nominal centre frequency of the receiver</td></tr> <tr> <td>Signal generator A</td><td>Power level of signal generator A</td></tr> <tr> <td>Blocking level</td><td>Power level of signal generator B</td></tr> </table> <p>For equipment using CCA whatever is the receiver category, steps 1 to 4 shall be repeated with signal generator A level adjusted +13 dB higher than in the measurements in clause 5.18.6.4.</p>	Value	Notes	Operating Frequency	Nominal centre frequency of the receiver	Signal generator A	Power level of signal generator A	Blocking level	Power level of signal generator B		
Value	Notes										
Operating Frequency	Nominal centre frequency of the receiver										
Signal generator A	Power level of signal generator A										
Blocking level	Power level of signal generator B										
Test Instruments:	Refer to section 5.8 for details										
Test mode:	Refer to section 5.3 for details										
Test results:	Pass										

## Measurement Data:

## 865MHz-868MHz:

Requirement	blocking level (dBm)	Limits	Test Result
		Receiver category 3	
Blocking at $\pm 2$ MHz from OC edge fhigh and flow	-77	$\geq -80$ dBm	Pass
Blocking at $\pm 10$ MHz from OC edge fhigh and flow	-56	$\geq -60$ dBm	Pass
Blocking at $\pm 5$ % of Centre Frequency or 15 MHz, whichever is the greater	-57	$\geq -60$ dBm	Pass

## 915.1MHz:

Requirement	blocking level (dBm)	Limits	Test Result
		Receiver category 3	
Blocking at $\pm 2$ MHz from OC edge fhigh and flow	-76	$\geq -80$ dBm	Pass
Blocking at $\pm 10$ MHz from OC edge fhigh and flow	-56	$\geq -60$ dBm	Pass
Blocking at $\pm 5$ % of Centre Frequency or 15 MHz, whichever is the greater	-57	$\geq -60$ dBm	Pass

## 6.14 Polite spectrum access requirements

### 6.14.1 Clear Channel Assessment threshold

Not applicable, since the test applied to with polite spectrum access facility only.

### 6.14.2 Polite spectrum access timing parameters

Not applicable, since the test applied to with polite spectrum access facility only.

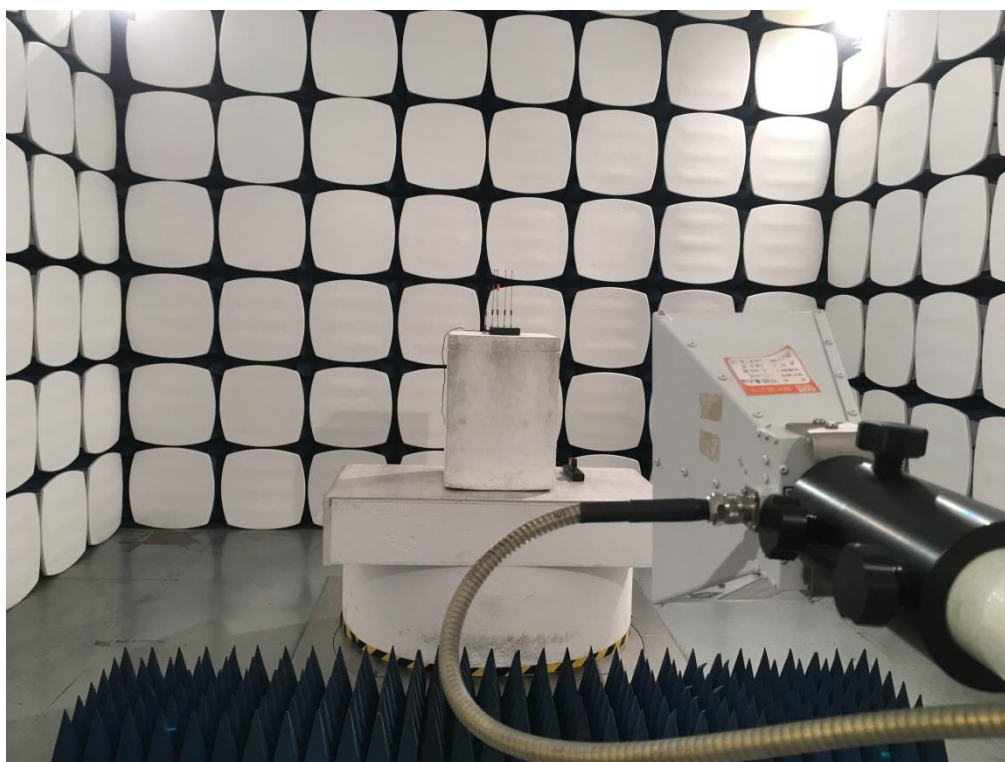
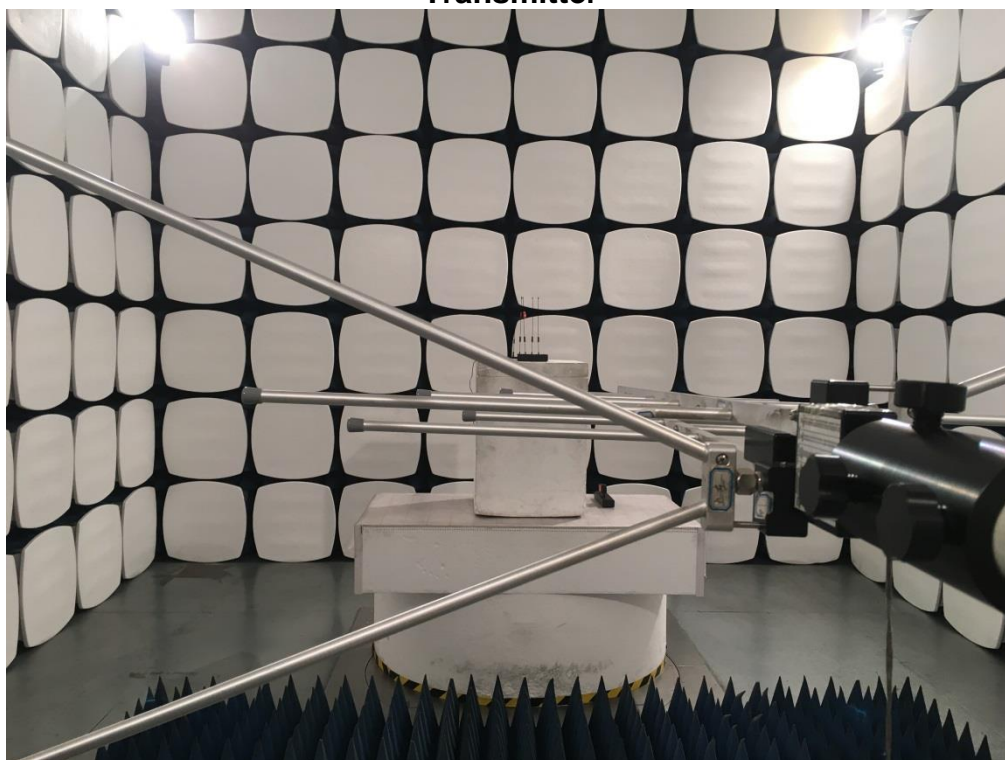
### 6.14.3 Adaptive Frequency Agility

Not applicable, since the test applied to with polite spectrum access facility only.



## 7 Test Setup Photo

Transmitter





**8 EUT Constructional Details**

Reference to the test report No. CCISE180803401.

-----End of report-----