RADIO TEST REPORT

For

SHENZHEN UNIWINS TECHNOLOGY CO.,LTD

WIFI Storage

Test Model: UD-4267

Prepared for	:	
Address	:	
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	February 02, 2018
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	February 02, 2018~March 19, 2018
Date of Report	:	March 19, 2018

RADIO TEST REPORT
ETSI EN 300 328 V2.1.1 (2016-11)

Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques;
Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Report Reference No.	**: LCS180131018AEA**
Date of Issue	: March 19, 2018
Testing Laboratory Name	**: Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	: Full application of Harmonised standards ■ Partial application of Harmonised standards ☐ Other standard testing method ☐
Applicant's Name.....	:
Address	:
Test Specification	
Standard	: ETSI EN 300 328 V2.1.1 (2016-11)
Test Report Form No.	: LCSEMC-1.0
TRF Originator.....	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	: Dated 2011-03

Test Item Description.	**: WIFI Storage**
Trade Mark.....	: N/A
Test Model	: UD-4267
Ratings	: Input : DC 5V/500mA
Result	**: Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Dick Su	Calvin Weng	Gavin Liang
Dick Su/ Administrators	Calvin Weng/ Technique principal	Gavin Liang/ Manager

RADIO -- TEST REPORT

Test Report No. : LCS180131018AEA	March 19, 2018 Date of issue

Test Model.....	: UD-4267
EUT.....	: WIFI Storage
Applicant.....	**:**
Address.....	:
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**:**
Address.....	:
Telephone.....	: /
Fax.....	: /
Factory.....	**:**
Address.....	:
Telephone.....	: /
Fax.....	: /

Test Result	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	March 19, 2018	Initial Issue	Gavin Liang

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Test Report Description Page

1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT	:	WIFI Storage
Test Model	:	UD-4267
Power Supply	:	Input : DC 5V/500mA
Hardware Version	:	/
Software Version	:	1.1.36.16-A178(V.01)
WIFI(2.4G Band)	:	
Frequency Range	:	2412-2472MHz
Channel Spacing	:	5MHz
Channel Number	:	13 Channel for 20MHz bandwidth(2412~2472MHz) 9 channels for 40MHz bandwidth(2422~2462MHz)
Modulation Type	:	802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	:	Internal Antenna, 1.0 dBi(Max.)

1.2. Objective

This Type approval report is prepared on behalf of
in accordance with ETSI EN 300 328 V2.1.1 (2016-11), Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques;
Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

The objective is to determine compliance with ETSI EN 300 328 V2.1.1 (2016-11).

1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

1.4. Test Methodology

All measurements contained in this report were conducted with ETSI EN 300 328 V2.1.1 (2016-11).

1.5. Description of Test Facility

FCC Registration Number. is 254912.
Industry Canada Registration Number. is 9642A-1.
ESMD Registration Number. is ARCB0108.
UL Registration Number. is 100571-492.
TUV SUD Registration Number. is SCN1081.
TUV RH Registration Number. is UA 50296516-001
NVLAP Registration Code is 600167-0

1.6. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
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1.7. External I/O

I/O Port Description	Quantity	Cable
USB Port	1	N/A

1.8. List Of Measuring Equipment

Instrument	Manufacture	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Jun 18, 2017	Jun 17, 2018
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	Jul 16, 2017	Jul 15, 2018
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	Jun 18, 2017	Jun 17, 2018
LISN	EMCO	3819/2NM	9703-1839	9KHz-30MHz	Jun 18, 2017	Jun 17, 2018
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	Jun 18, 2017	Jun 17, 2018
ISN	SCHAFFNE	ISN ST08	21653	9KHz-30MHz	Jun 18, 2017	Jun 17, 2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-18GHz	Jun 18, 2017	Jun 17, 2018
Amplifier	SCHAFFNE	COA9231A	18667	9kHz-2GHzz	Apr 18, 2017	Apr 17, 2018
Amplifier	Agilent	8449B	3008A021	1GHz-26.5GHz	Apr 18, 2017	Apr 17, 2018
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	Apr 18, 2017	Apr 17, 2018
Loop Antenna	R&S	HFH2-Z2	860004/00	9k-30MHz	Apr 18, 2017	Apr 17, 2018
By-log Antenna	SCHWARZB	VULB9163	9163-470	30MHz-1GHz	Apr 18, 2017	Apr 17, 2018
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	Apr 18, 2017	Apr 17, 2018
Horn Antenna	SCHWARZB	BBHA9170	BBHA9170	15GHz-40GHz	Apr 18, 2017	Apr 17, 2018
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	Jun 18, 2017	Jun 17, 2018
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-H	1GHz-40GHz	Jun 18, 2017	Jun 17, 2018
Power Meter	R&S	NRVS	100444	DC-40GHz	Jun 18, 2017	Jun 17, 2018
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	Jun 18, 2017	Jun 17, 2018
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	Jun 18, 2017	Jun 17, 2018
AC Power Source	HPC	HPA-500E	HPA-9100	AC 0~300V	Jun 18, 2017	Jun 17, 2018
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	Jun 18, 2017	Jun 17, 2018
Temp. and Humidigy Chamber	Giant Force	GTH-225-20-S	MAB0103-00	N/A	Jun 18, 2017	Jun 17, 2018
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	Jun 18, 2017	Jun 17, 2018
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	Jun 18, 2017	Jun 17, 2018
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	Jul 16, 2017	Jul 15, 2018
Universal Radio Communication Tester	R&S	CMU200	112012	N/A	Oct 27, 2017	Oct 26, 2018
Wideband Radia Communication Tester	R&S	CMW500	1201.0002K50	N/A	Nov 19, 2017	Nov 18, 2018
MXG Vector Signal Generator	Agilent	N5182A	MY47071151	250KHz~6GHz	Oct 27, 2017	Oct 26, 2018
MXG Vector Signal Generator	Agilent	E4438C	MY42081396	250KHz~6GHz	Oct 27, 2017	Oct 26, 2018
PSG Analog Signal Generator	Agilent	N8257D	MY46520521	250KHz~20GHz	Nov 19, 2017	Nov 18, 2018
MXA Signal Analyzer	Agilent	N9020A	MY50510140	10Hz~26.5GHz	Oct 27, 2017	Oct 26, 2018
DC Power Supply	Agilent	E3642A	/	0-8V,5A/0-20V,2.5A	May 20, 2017	May 19, 2018
RF Control Unit	Tonscend	JS0806-1	/	/	Nov 19, 2017	Nov 18, 2018
LTE Test Software	Tonscend	JS1120-1	/	Version: 2.5.7.0	N/A	N/A

X-series USB Peak and Average Power Sensor Agilent	Agilent	U2021XA	MY54080022	/	Oct 27, 2017	Oct 26, 2018
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	MY54080016	/	Oct 27, 2017	Oct 26, 2018
Test Software	Ascentest	AT890-SW	20141230	Version:	N/A	N/A
Splitter/Combiner(Qty: 2)	Mini-Circuits	ZAPD-50W 4.2-6.0 GHz	NN256400424	/	Oct 27, 2017	Oct 26, 2018
Splitter/Combine(Qty: 2)	MCLI	PS3-7	4463/4464	/	Oct 27, 2017	Oct 26, 2018
ATT (Qty: 1)	Mini-Circuits	VAT-30+	30912	/	Oct 27, 2017	Oct 26, 2018

1.9. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Occupied Channel Bandwidth	5 %
RF output power, conducted	1,5 dB
Power Spectral Density, conducted	3 dB
Unwanted Emissions, conducted	3 dB
All emissions, radiated	6 dB
Temperature	1 ℃
Humidity	5 %
DC and low frequency voltages	3 %
Time	5 %
Duty Cycle	5 %

1.10. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	25
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

1.11. Description Of Test Modes

LCS has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit by 802.11b
Mode 2: Transmit by 802.11g
Mode 3: Transmit by 802.11n(20MHz)
Mode 4: Receive by 802.11b
Mode 5: Receive by 802.11g
Mode 6: Receive by 802.11n(20MHz)

Note:

(1) For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case (X axis) on this report.

(2) Regard to the frequency band operation for systems using Wide Band modulation: the lowest, middle, highest frequency channel for conducted test, and the lowest, highest frequency channel for radiation spurious test.

(3) The extreme test condition for voltage and temperature were declared by the manufacturer.

2. SYSTEM TEST CONFIGURATION

2.1. Justification

The system was configured for testing in engineering mode.

2.2. EUT Exercise Software

N/A.

2.3. Special Accessories

N/A.

2.4. Block Diagram/Schematics

Please refer to the related document.

2.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

2.6. Configuration of Test Setup

Please refer to the test setup photo.

3. SUMMARY OF TEST RESULT

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Technical requirements for the equipment using wide band modulations other than FHSS:

Performed Test Item	Normative References	Test Performed	Deviation
RF Output Power & Receiver Category	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Power Spectral Density	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Duty cycle, Tx-Sequence, Tx-gap	ETSI EN 300 328 V2.1.1 (2016-11)	N/A	N/A
Medium Utilisation (MU) factor	ETSI EN 300 328 V2.1.1 (2016-11)	N/A	N/A
Adaptivity	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Occupied Channel Bandwidth	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Transmitter unwanted emissions in the out-of-band domain	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Transmitter unwanted emissions in the spurious domain	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Receiver Spurious Emissions	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No
Receiver Blocking	ETSI EN 300 328 V2.1.1 (2016-11)	Yes	No

Note:
1. The EUT can operate in an adaptive mode, and can't operate in a non-adaptive mode which is stated by the supplier.
2. The EUT is equipment which using wide band modulations other than FHSS. It is an adaptive equipment which can't operate in non-adaptive mode.
3. The Camera support 802.11b,g,n20&n40 mode; The NVR only support 802.11b,g mode.

4. RF OUTPUT POWER

4.1. Limit

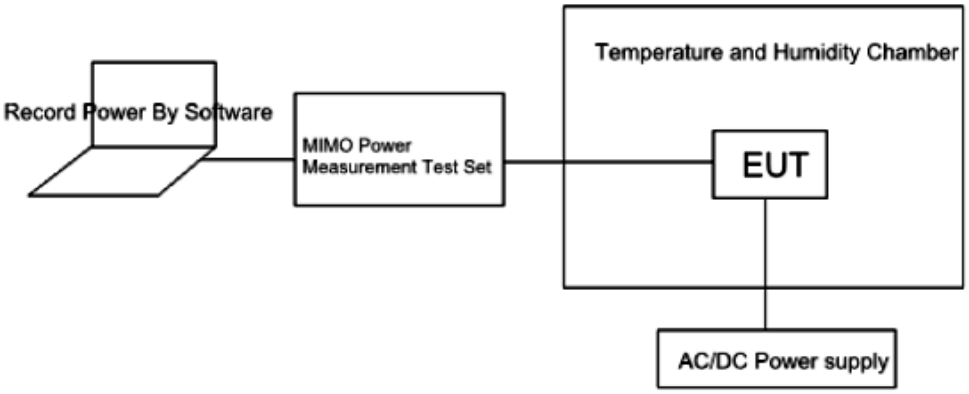
For adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the supplier and shall not exceed 20 dBm. For non-adaptive equipment using wide band modulations other than FHSS, the maximum RF output power shall be equal to or less than the value declared by the supplier.

This limit shall apply for any combination of power level and intended antenna assembly.

4.2. Test Setup

For Conducted Measurement



4.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.2

Step 1:

• The fast power sensor use the following setting: Sample speed 1 MS/s.

Step 2:

• Connect the power sensor to the transmit port, sample the transmit signal and store the raw data.Use these stored samples in all following steps.

Step 3:

• Find the start and stop times of each burst in the stored measurement samples.

Step 4:

• Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these Pburst values, as well as the start and stop times for each burst.

Step 5:

• The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

Step 6:

• Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.
• If applicable, add the additional beamforming gain "Y" in dB.

The RF Output Power (P) shall be calculated using the formula below:
P = A + G + Y

4.4. Test Result

Pass

***Note: 20 bursts had been captured for power measurement.

Product	:	WIFI Storage
Test Item	:	RF Output Power
Test Mode	:	Mode 1: Transmit by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 5V)	2412	14.04	20
		2442	14.61	
		2472	13.79	
Tmax (40℃)	Vnom (DC 5V)	2412	14.15	20
		2442	14.55	
		2472	13.77	
Tmin (-20℃)	Vnom (DC 5V)	2412	14.02	20
		2442	14.49	
		2472	13.73	

Product	:	WIFI Storage
Test Item	:	RF Output Power
Test Mode	:	Mode 2: Transmit by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 5V)	2412	12.07	20
		2442	12.26	
		2472	12.91	
Tmax (40℃)	Vnom (DC 5V)	2412	12.09	20
		2442	12.13	
		2472	12.81	
Tmin (-20℃)	Vnom (DC 5V)	2412	12.14	20
		2442	12.13	
		2472	12.80	

Product	:	WIFI Storage
Test Item	:	RF Output Power
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 5V)	2412	11.12	20
		2442	11.41	
		2472	11.70	
Tmax (40℃)	Vnom (DC 5V)	2412	11.02	20
		2442	11.40	
		2472	11.70	
Tmin (-20℃)	Vnom (DC 5V)	2412	11.16	20
		2442	11.49	
		2472	11.81	

4.5. Receiver Category

Receiver Category 1: Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.

Receiver Category 2:Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.

Receiver Category 3: Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.

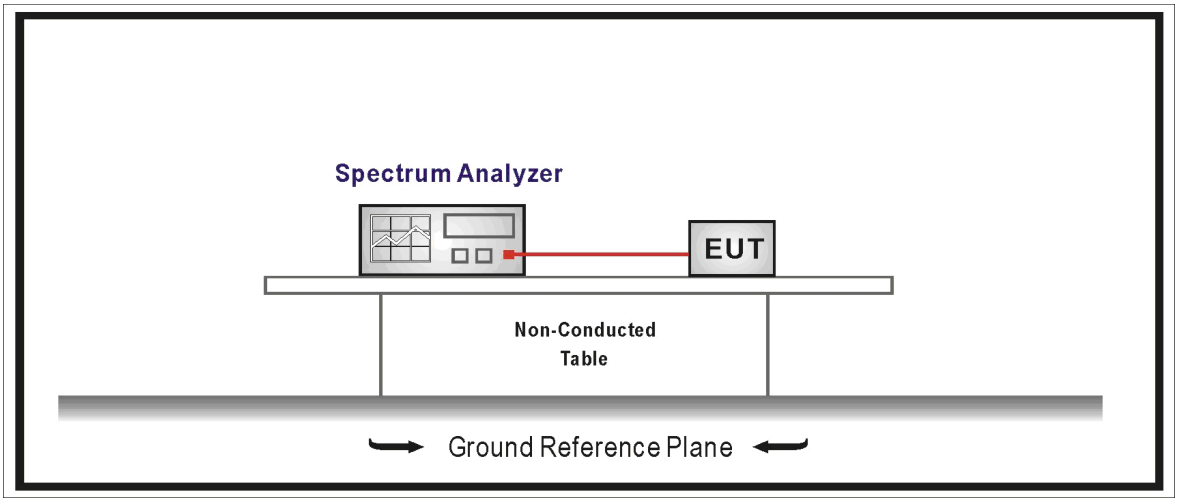
As this an adaptivity device with a maximum power of greater than 10dBm, **it belongs to recevier category 1**.

5. POWER SPECTRAL DENSITY

5.1. Limit

For equipment using wide band modulations other than FHSS, the maximum Power Spectral Density is limited to 10dBm per MHz.

5.2. Test Setup



5.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.3

Step 1:

Connect the UUT to the spectrum analyzer and use the following settings:

- Start Frequency: 2 400 MHz
- Stop Frequency: 2 483,5 MHz
- Resolution BW: 10 kHz
- Video BW: 30 kHz
- Sweep Points: > 8 350
- Detector: RMS
- Trace Mode: Max Hold
- Sweep time: Auto

For non-continuous signals, wait for the trace to be completed. Save the (trace) data set to a file.

Step 2:

For each frequency point, add up the amplitude (power) values for the different transmit chains and use this as the new data set.

Step 3:

Add up the values for amplitude (power) for all the samples in the file.

Step 4:

Normalize the individual values for amplitude so that the sum is equal to the RF Output Power (e.i.r.p.).

Step 5:

Starting from the first sample in the file (lowest frequency), add up the power of the following samples representing a 1 MHz segment and record the results for power and position (i.e. sample #1 to #100). This is the Power Spectral Density (e.i.r.p.) for the first 1 MHz segment which shall be recorded.

Step 6:

Shift the start point of the samples added up in step 5 by 1 sample and repeat the procedure in step 5 (i.e. sample #2 to #101).

Step 7:

Repeat step 6 until the end of the data set and record the radiated Power Spectral Density values for each of the 1 MHz segments. From all the recorded results, the highest value is the maximum Power Spectral Density for the UUT.

5.4. Test Result

Product	:	WIFI Storage
Test Item	:	Maximum Spectral Power Density
Test Mode	:	Mode 1: Transmit by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Total Power Density (dBm/MHz)	Limit (dBm/MHz)
2412	2.15	10.00
2442	2.43	10.00
2472	2.85	10.00

Product	:	WIFI Storage
Test Item	:	Maximum Spectral Power Density
Test Mode	:	Mode 2: Transmit by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Total Power Density (dBm/MHz)	Limit (dBm/MHz)
2412	-1.93	10.00
2442	-1.49	10.00
2472	-1.30	10.00

Product	:	WIFI Storage
Test Item	:	Maximum Spectral Power Density
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

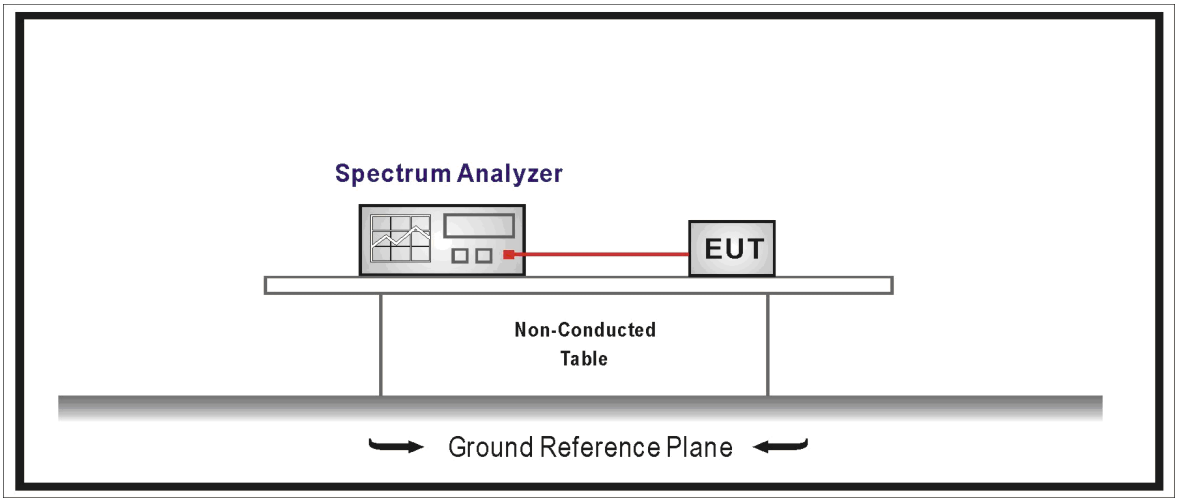
Frequency (MHz)	Total Power Density (dBm/MHz)	Limit (dBm/MHz)
2412	-4.18	10.00
2442	-3.77	10.00
2472	-3.34	10.00

6. DUTY CYCLE, TX-SEQUENCE, TX-GAP

6.1. Limit

The Duty Cycle shall be equal to or less than the maximum value declared by the supplier.
The maximum Tx-sequence Time and the minimum Tx-gap Time shall be according to the formula below: Maximum Tx-Sequence Time = Minimum Tx-gap Time = M
where M is in the range of 3,5 ms to 10 ms.

6.2. Test Setup



6.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.2

6.4. Test Result

These requirements apply to non-adaptive frequency hopping equipment or to adaptive frequency hopping equipment operating in a non-adaptive mode.
These requirements do not apply for equipment with a maximum declared RF Output power of less than 10dBm E.I.R.P. or for equipment when operating in a mode where the RF Output power is less than 10dBm E.I.R.P.
No applicable.

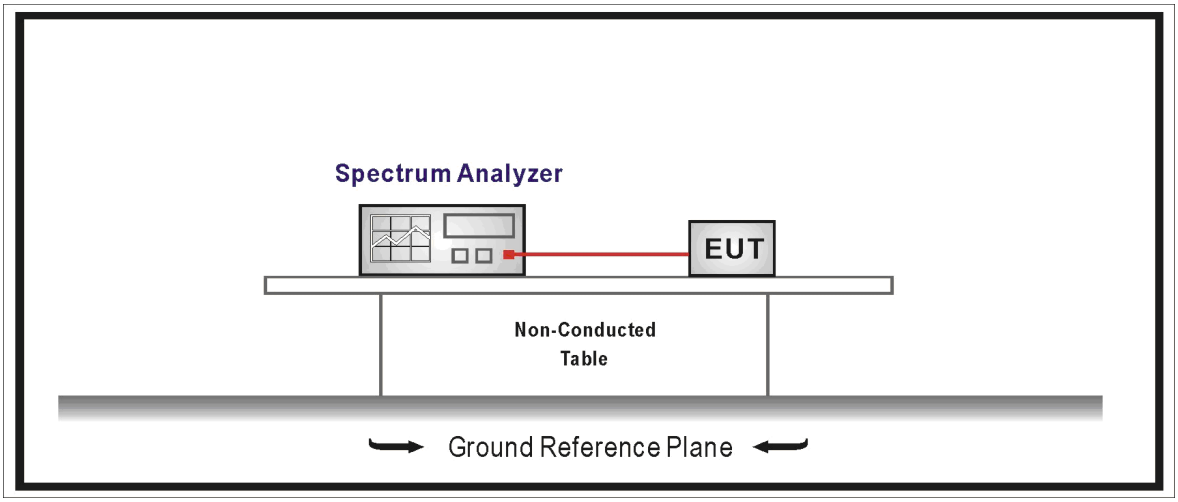
7. MEDIUM UTILISATION (MU) FACTOR

7.1. Limit

For non-adaptive equipment

The maximum Medium Utilisation factor for non-adaptive Frequency Hopping equipment shall be 10 %.

7.2. Test Setup



7.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.2

7.4. Test Result

This requirement does not apply to adaptive equipment unless operating in a non-adaptive mode.
In addition, this requirement does not apply for equipment with a maximum declared RF Output power level of less than 10dBm E.I.R.P. or for equipment when operating in a mode where the RF Output power is less than 10dBm E.I.R.P.
No applicable.

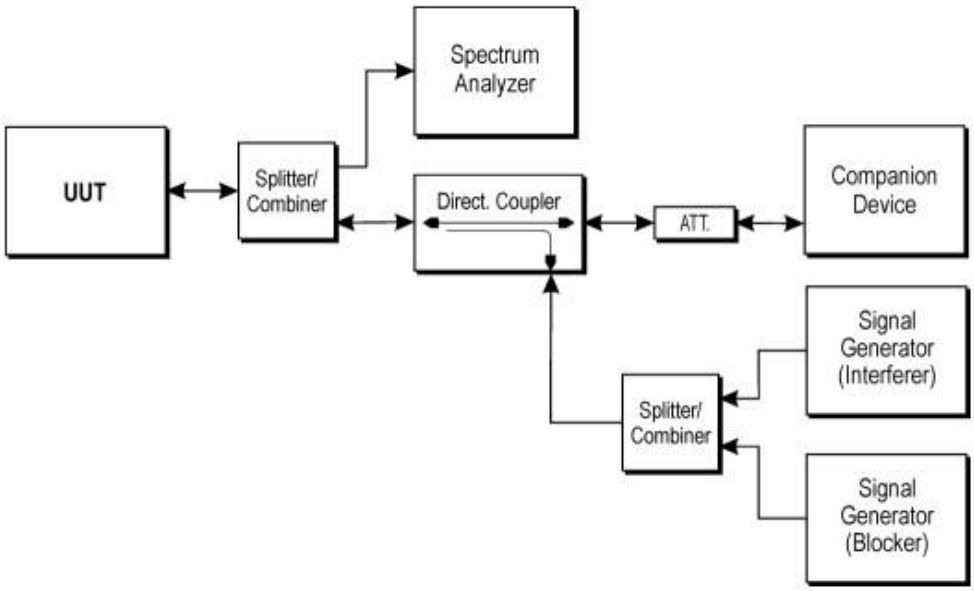
8. ADAPTIVITY AND RECEIVER BLOCKING

8.1. Limit

Adaptivity Limit
☐ Non-LBT based Detect and Avoid --- The channel shall remain unavailable for a minimum time equal to 1 s after which the channel may be considered again as an 'available' channel; --- COT ≤ 40 ms; --- COT ≤ 60 ms; --- Idle Period shall be minimum 5% of COT with a minimum of 100us; --- Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm);
☐ LBT based Detect and Avoid(Frame Based Equipment) --- The CCA observation time shall be not less than 20 us; --- The CCA time used by the equipment shall be declared by the supplier; --- COT = 1-10 ms; --- Idle Period = 5% of COT; --- Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm);
☒ LBT based Detect and Avoid(Load Based Equipment) --- The CCA observation time shall be not less than 20 us; --- The CCA time used by the equipment shall be declared by the supplier; --- COT ≤ (13 / 32) * q ms; q = [4~32]; 1.625ms~13ms; --- R = number of clear idle slots are randomly [1~q]. Every time an Extended CCA is required and the 'R' value stored in a counter. --- Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm);
☐ Short Control Signalling Transmissions: --- Short Control Signalling Transmissions shall have a maximum duty cycle of 10% within an observation period of 50ms.

8.2. Test Setup

Conducted measurements



8.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.7

1) The EUT connect to a companion device during the test. Adjust the received signal level at the EUT to the value defined in table 6 of ETSI EN 300 328 V2.1.1 (2016-11) Clause 4.3.2.10.2
2) the analyzer shall be set as below: RBW=8MHz and VBW=28MHz.
3) Configure the EUT for normal transmission with a sufficiently high payload to allow demonstration of compliance of the adaptive mechanism on the channel being tested.
4) Adding the interference signal and blocking signal.
5) Record the data.

8.4. Test Result

Product	:	WIFI Storage
Test Item	:	Adaptivity and Receiver Blocking
Test Result	:	Pass
Test Environment	:	24.6℃ 52.9%RH

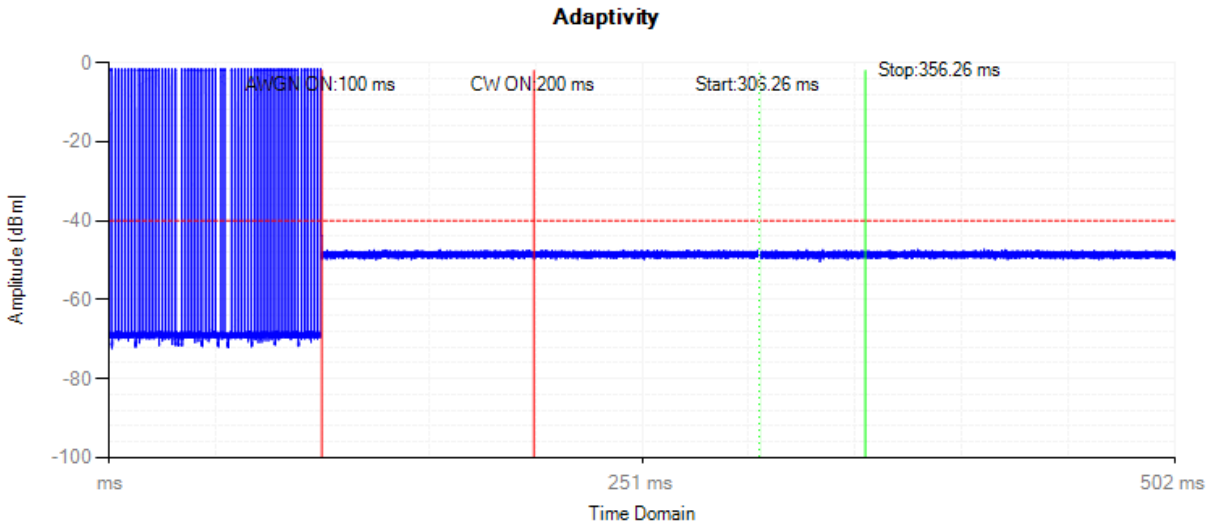
Summary Of Test Result		
Test Mode	Channel	Conclusion
802.11b	Low	Pass
	High	Pass
802.11g	Low	Pass
	High	Pass
802.11n20	Low	Pass
	High	Pass
Note: All modulation of EUT which maximum output power is more than 10dbm have been tested.		

The Worst Test Mode	802.11b: Low Channel
AWGN Interference Level (dBm)	-61.16
Blocking Interference Level (dBm)	-35
Interference Start Time (ms)	100
Stop time after interfering signal(ms)	100
Blocking ON Time (ms)	200
Suggest q Level	4
Max. COT (ms)	3.37
Pulse width (ms)	0
Duty Cycle (%)	0
The Worst Test Mode	802.11b: High Channel
AWGN Interference Level (dBm)	-61.02
Blocking Interference Level (dBm)	-35
Interference Start Time (ms)	100
Stop time after interfering signal(ms)	100
Blocking ON Time (ms)	200
Suggest q Level	4
Max COT (ms)	3.08
Pulse width (ms)	0
Duty Cycle (%)	0

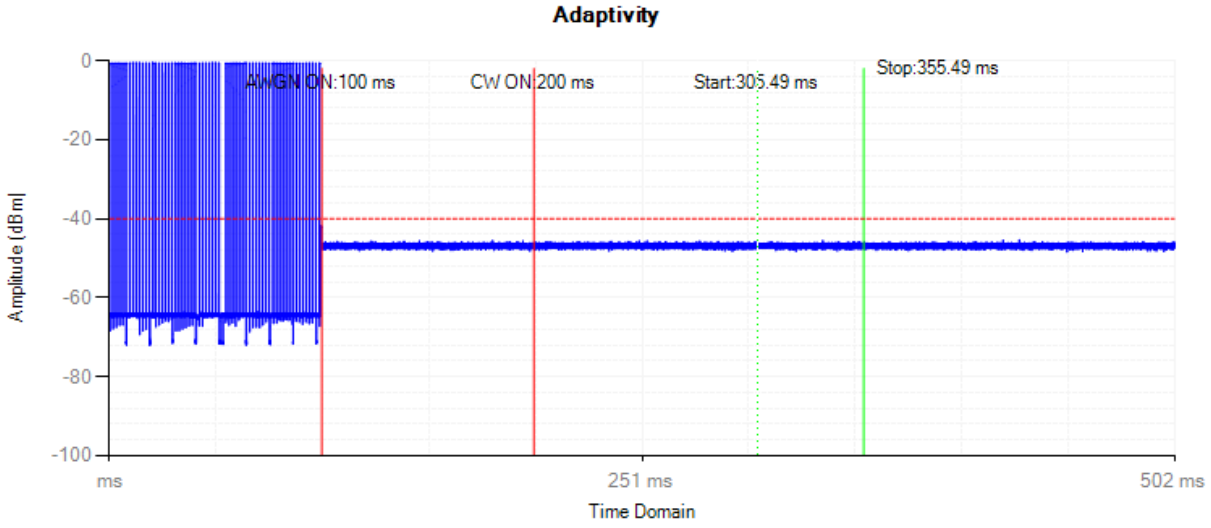
Test Mode	802.11g: Low Channel
AWGN Interference Level (dBm)	-61.70
Blocking Interference Level (dBm)	-35
Interference Start Time (ms)	100
Stop time after interfering signal(ms)	100
Blocking ON Time (ms)	200
Suggest q Level	4
Max COT (ms)	1.76
Pulse width (ms)	0
Duty Cycle (%)	0
Test Mode	802.11g: High Channel
AWGN Interference Level (dBm)	-61.26
Blocking Interference Level (dBm)	-35
Interference Start Time (ms)	100
Stop time after interfering signal(ms)	100
Blocking ON Time (ms)	200
Suggest q Level	4
Max COT (ms)	2.11
Pulse width (ms)	0
Duty Cycle (%)	0

The Worst Test Mode	802.11n20: Low Channel
AWGN Interference Level (dBm)	-60.01
Blocking Interference Level (dBm)	-35
Interference Start Time (ms)	100
Stop time after interfering signal(ms)	100
Blocking ON Time (ms)	200
Suggest q Level	4
Max. COT (ms)	2.05
Pulse width (ms)	0
Duty Cycle (%)	0
The Worst Test Mode	802.11n20: High Channel
AWGN Interference Level (dBm)	-60.57
Blocking Interference Level (dBm)	-35
Interference Start Time (ms)	100
Stop time after interfering signal(ms)	100
Blocking ON Time (ms)	200
Suggest q Level	4
Max COT (ms)	2.46
Pulse width (ms)	0
Duty Cycle (%)	0

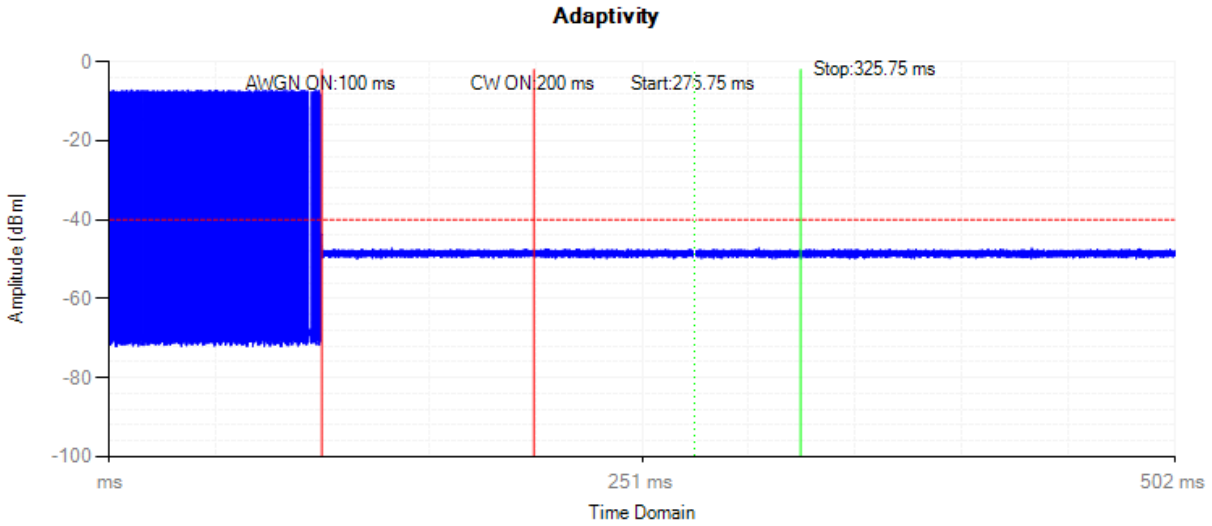
Test plot (802.11b-Low channel):



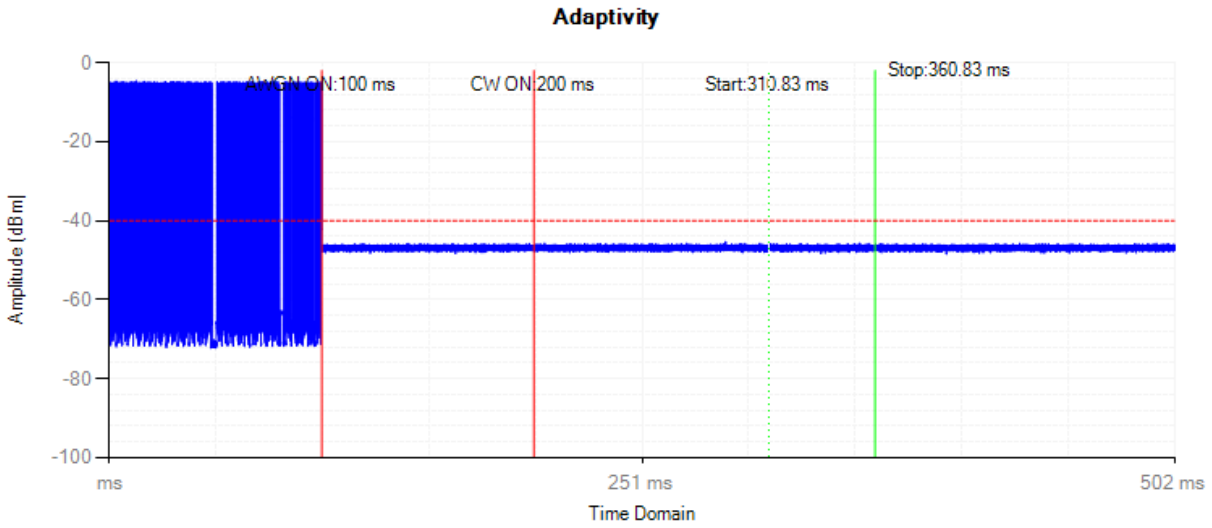
Test plot (802.11b-High channel):



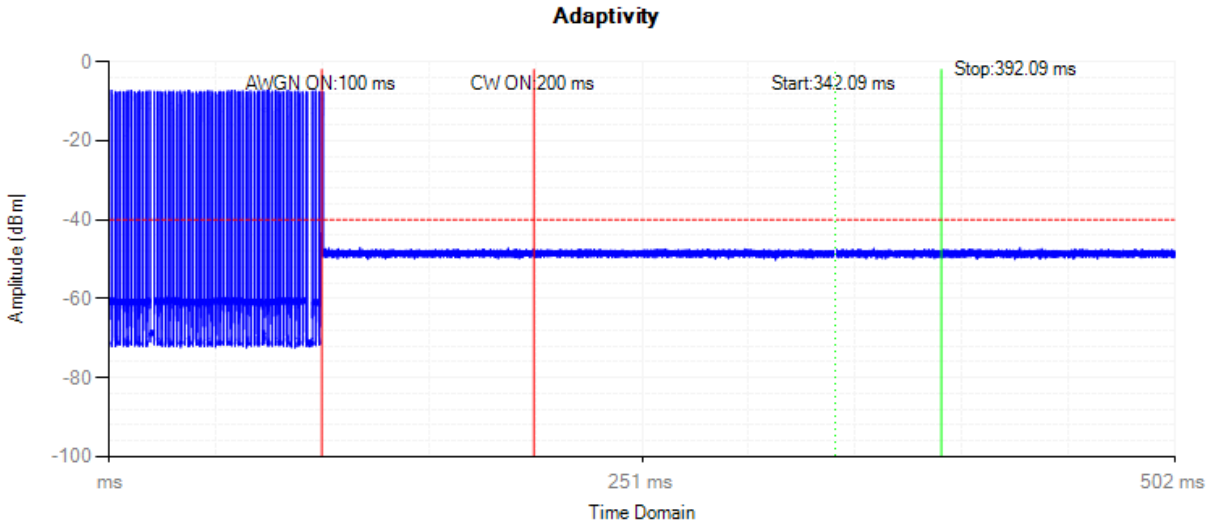
Test plot (802.11g-Low channel):



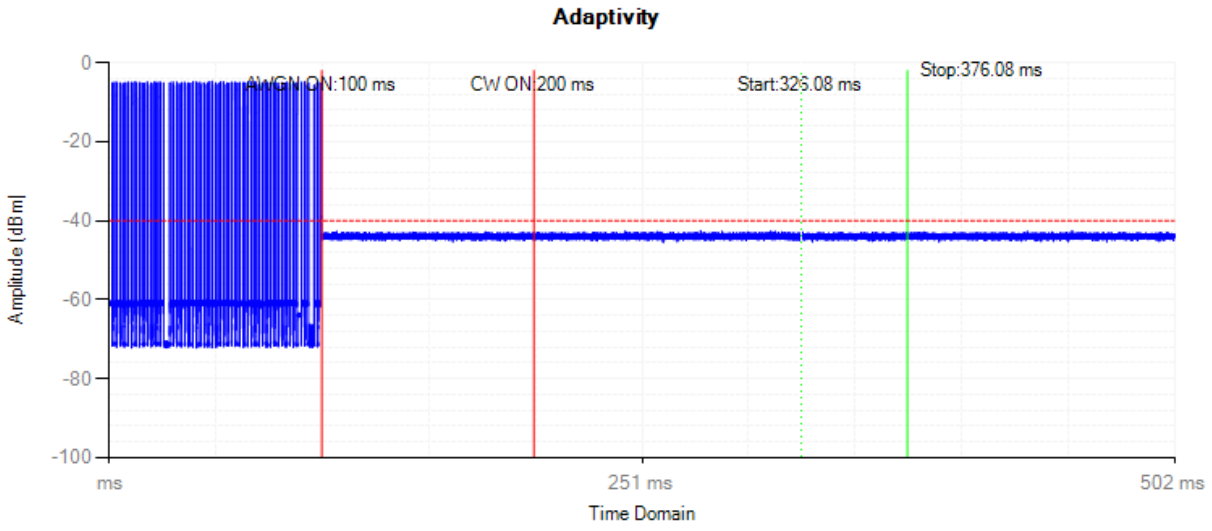
Test plot (802.11g-High channel):



Test plot (802.11n20-Low channel):



Test plot (802.11n20-High channel):



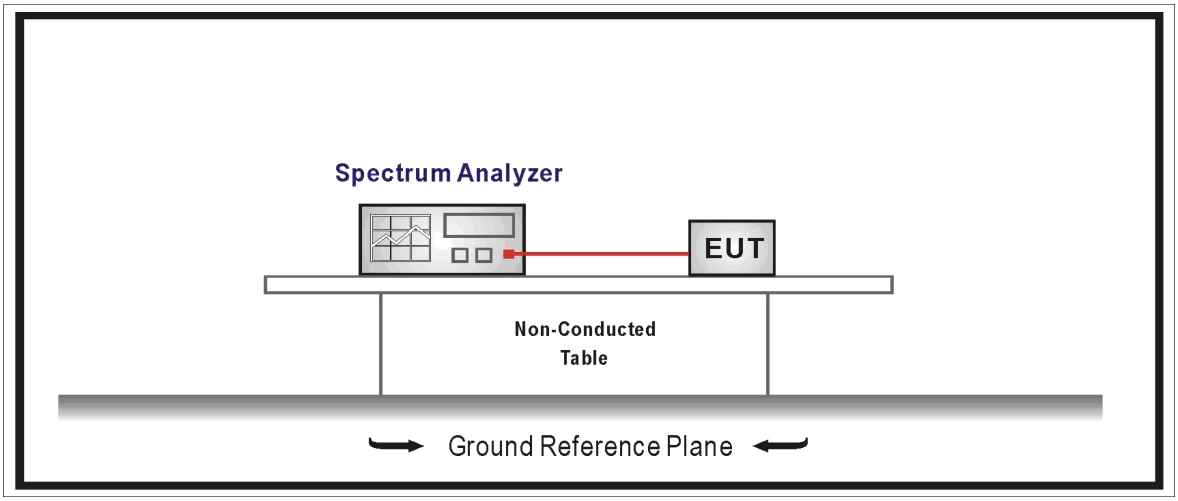
9. OCCUPIED CHANNEL BANDWIDTH

9.1. Limit

The Occupied Channel Bandwidth shall fall completely within the band given in 2.4GHz to 2.4835GHz.

In addition, for non-adaptive systems using wide band modulations other than FHSS and with e.i.r.p greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

9.2. Test Setup



9.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.8

Step 1:

Connect the UUT to the spectrum analyzer and use the following settings:

• Centre Frequency: The centre frequency of the channel under test

• Resolution BW: ~ 1 % of the span without going below 1 %

(we set RBW=390KHz for 802.11b/g/n20 and 820KHz for 802.11n40)

• Video BW: 3 × RBW (we set VBW=1.2MHz for 802.11b/g/n20 and 2.4MHz for 802.11n40)

• Frequency Span: 2 × Occupied Channel Bandwidth

(we set Span=40MHz(for 802.11b/g/n20) & 80MHz(for 802.11n40))

• Detector Mode: RMS

• Trace Mode: Max Hold

Step 2:

Wait until the trace is completed. Find the peak value of the trace and place the analyzer marker on this peak.

Step 3:

Use the 99 % bandwidth function of the spectrum analyzer to measure the Occupied Channel Bandwidth of the UUT. This value shall be recorded.

9.4. Test Result

Product	:	WIFI Storage
Test Item	:	Occupied Channel Bandwidth
Test Mode	:	Mode 1: Transmit by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	Limit
01	2412	11.55	Within the band 2400.0MHz~2483.5MHz
13	2472	11.93	

Product	:	WIFI Storage
Test Item	:	Occupied Channel Bandwidth
Test Mode	:	Mode 2: Transmit by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	Limit
01	2412	16.01	Within the band 2400.0MHz~2483.5MHz
13	2472	16.17	

Product	:	WIFI Storage
Test Item	:	Occupied Channel Bandwidth
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	Limit
01	2412	17.47	Within the band 2400.0MHz~2483.5MHz
13	2472	17.40	

10. TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

10.1. Limit

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 3.

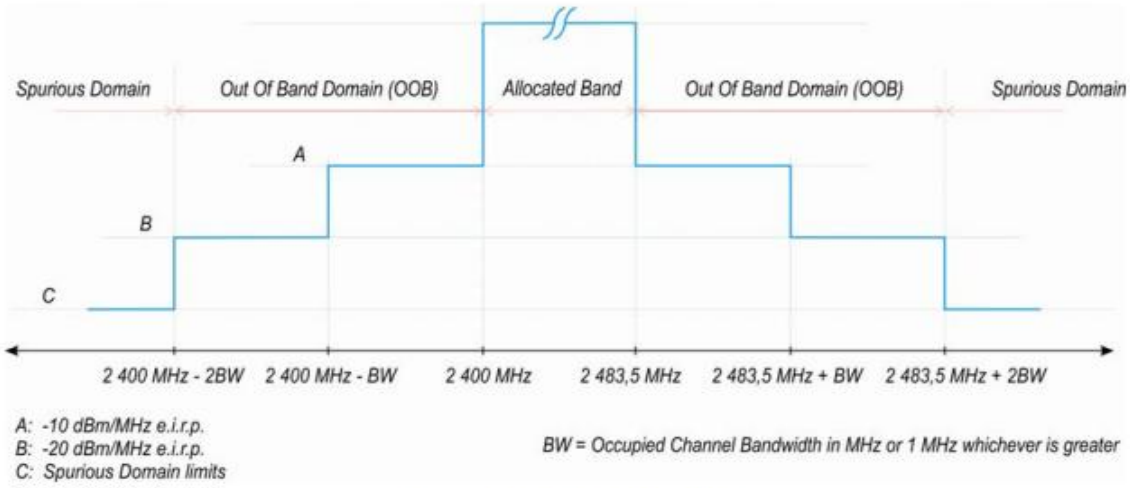
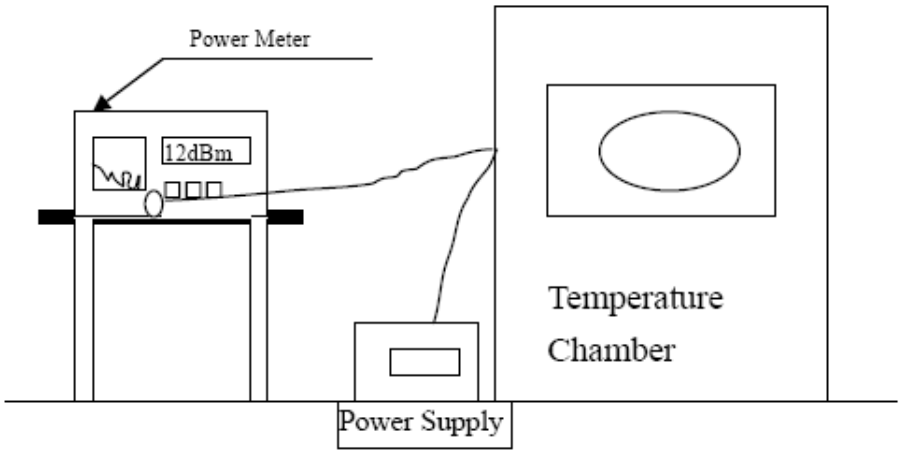


Figure 3: Transmit mask

10.2. Test Setup

For Conducted Measurement



10.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.9

Step 1:

• Connect the UUT to the spectrum analyzer and use the following settings:
- Centre Frequency: 2 484 MHz
- Span: 0 Hz
- Resolution BW: 1 MHz
- Filter mode: Channel filter
- Video BW: 3 MHz
- Detector Mode: RMS
- Trace Mode: Clear / Write
- Sweep Mode: Continuous
- Sweep Points: 5 000
- Trigger Mode: Video trigger

NOTE 1: In case video triggering is not possible, an external trigger source may be used.
- Sweep Time: Suitable to capture one transmission burst

Step 2: (segment 2 483,5 MHz to 2 483,5 MHz + BW)

• Adjust the trigger level to select the transmissions with the highest power level.
• For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signal bursts with different power levels. In this case the burst with the highest power level shall be selected.
• Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS power shall be measured using the Time Domain Power function.
• Select RMS power to be measured within the selected window and note the result which is the RMS power within this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limit provided by the mask.
• Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

Step 3: (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW)

• Change the centre frequency of the analyzer to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483,5 MHz + BW to 2 483,5 MHz + 2BW. Increase the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW - 0,5 MHz.

Step 4: (segment 2 400 MHz - BW to 2 400 MHz)

• Change the centre frequency of the analyzer to 2 399,5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz.

Step 5: (segment 2 400 MHz - 2BW to 2 400 MHz - BW)

• Change the centre frequency of the analyzer to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz.

Step 6:

• In case of conducted measurements on equipment with a single transmit chain, the declared antenna assembly gain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limits provided by the mask given in figures 1 or 3. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

• In case of conducted measurements on smart antenna systems (equipment with multiple transmit chains), the measurements need to be repeated for each of the active transmit chains. The declared antenna assembly gain "G" in dBi for a single antenna shall be added to these results. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered. Comparison with the applicable limits shall be done using any of the options given below:

- Option 1: the results for each of the transmit chains for the corresponding 1 MHz segments shall be added. The additional beamforming gain "Y" in dB shall be added as well and the resulting values compared with the limits provided by the mask given in figures 1 or 3.

- Option 2: the limits provided by the mask given in figures 1 or 3 shall be reduced by 10 x log10(Ach) and the additional beamforming gain "Y" in dB. The results for each of the transmit chains shall be individually compared with these reduced limits.

NOTE 2: Ach refers to the number of active transmit chains.

It shall be recorded whether the equipment complies with the mask provided in figures 1 or 3.

10.4. Test Result

Product	:	WIFI Storage
Test Item	:	Transmitter unwanted emissions in the out-of-band domain
Test Mode	:	Mode 1: Transmit by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Test Conditions (℃)	Max measured Values (dBm/MHz)	Limit (dBm/MHz)
2400–2BW~ 2400-BW	25	-58.40	-20
2400–BW~2400	25	-39.28	-10
2483.5~ 2483.5+BW	25	-45.38	-10
2483.5+BW~ 2483.5+2BW	25	-60.84	-20

Product	:	WIFI Storage
Test Item	:	Transmitter unwanted emissions in the out-of-band domain
Test Mode	:	Mode 2: Transmit by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Test Conditions (℃)	Max measured Values (dBm/MHz)	Limit (dBm/MHz)
2400–2BW~ 2400-BW	25	-69.30	-20
2400–BW~2400	25	-51.91	-10
2483.5~ 2483.5+BW	25	-42.03	-10
2483.5+BW~ 2483.5+2BW	25	-68.92	-20

Product	:	WIFI Storage
Test Item	:	Transmitter unwanted emissions in the out-of-band domain
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Test Conditions (℃)	Max measured Values (dBm/MHz)	Limit (dBm/MHz)
2400–2BW~ 2400-BW	25	-68.90	-20
2400–BW~2400	25	-53.32	-10
2483.5~ 2483.5+BW	25	-43.36	-10
2483.5+BW~ 2483.5+2BW	25	-68.43	-20

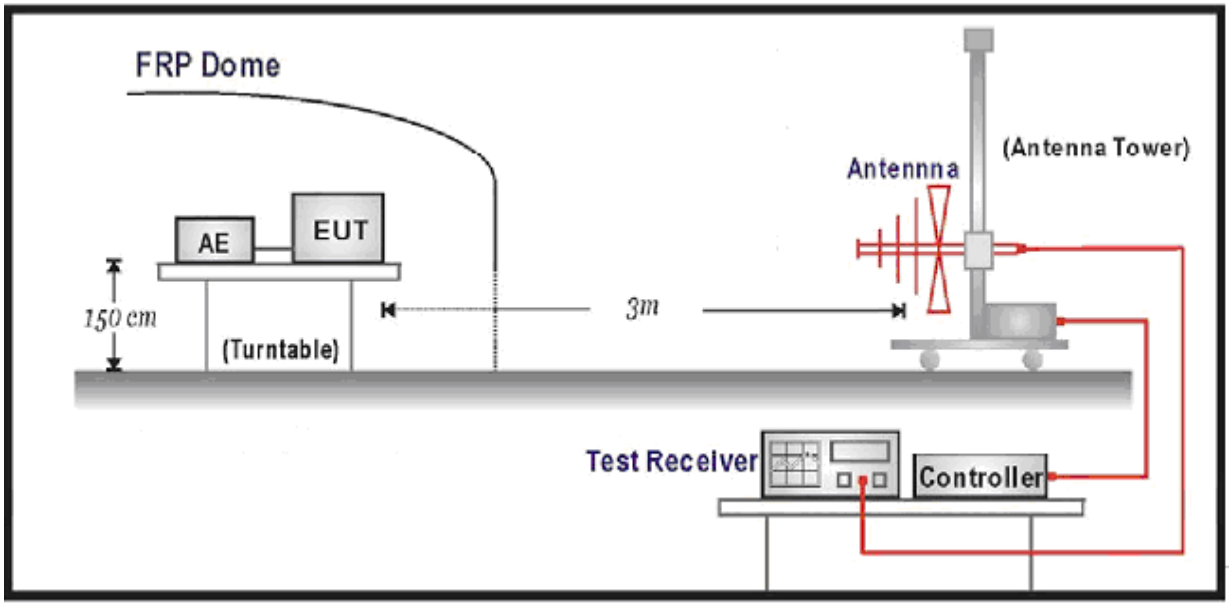
11. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

11.1. Limit

Transmitter Limits for Spurious Emissions		
Frequency Range	Maximum power E.R.P. (≤ 1GHz) E.I.R.P. (> 1GHz)	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 12,75 GHz	-30 dBm	1 MHz

11.2. Test Setup

For Radiated Measurement



11.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.10

Step 1:

The sensitivity of the spectrum analyzer should be such that the noise floor is at least 12 dB below the limits given in tables 1 or 4.

Step 2:

The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyzer settings:

• Resolution bandwidth: 100 kHz

• Video bandwidth: 300 kHz

• Detector mode: Peak

• Trace Mode: Max Hold

• Sweep Points: ≥ 9 970

NOTE 1: For spectrum analyzers not supporting this high number of sweep points, the frequency band may need to be segmented.

• Sweep time: For non continuous transmissions (duty cycle less than 100 %), the sweep time shall be sufficiently long, such that for each 100 kHz frequency step, the measurement time is greater than two transmissions of the UUT. For Frequency Hopping equipment operating in a normal operating (hopping not disabled) mode, the sweep time shall be further increased to capture multiple transmissions on the same hopping frequency in different hopping sequences. Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.10.2.1.2 and compared to the limits given in tables 1 or 4.

Step 3:

The emissions over the range 1 GHz to 12,75 GHz shall be identified.

Spectrum analyzer settings:

• Resolution bandwidth: 1 MHz

• Video bandwidth: 3 MHz

• Detector mode: Peak

• Trace Mode: Max Hold

• Sweep Points: ≥ 11 750

NOTE 2: For spectrum analyzers not supporting this high number of sweep points, the frequency band may need to be segmented.

• Sweep time: For non continuous transmissions (duty cycle less than 100 %), the sweep time shall be sufficiently long, such that for each 1 MHz frequency step, the measurement time is greater than two transmissions of the UUT.

11.4. Test Result

Product	:	WIFI Storage
Test Item	:	Transmitter spurious emissions(radiated)
Test Mode	:	Mode 1: Transmit by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
113.55	H	-69.78	-54.00	-15.78	PK
260.33	V	-51.41	-36.00	-15.41	PK
853.33	H	-64.67	-54.00	-10.67	PK
886.61	V	-47.33	-36.00	-11.33	PK
4823.97	H	-42.34	-30.00	-12.34	PK
4823.99	V	-43.52	-30.00	-13.52	PK
7236.02	H	-41.67	-30.00	-11.67	PK
7235.97	V	-41.41	-30.00	-11.41	PK
Channel 13 (2472MHz)					
199.35	H	-66.74	-54.00	-12.74	PK
242.85	V	-49.58	-36.00	-13.58	PK
933.33	H	-48.45	-36.00	5.55	PK
984.06	V	-47.26	-36.00	-11.26	PK
4944.01	H	-43.38	-30.00	-13.38	PK
4943.98	V	-43.17	-30.00	-13.17	PK
7416.03	H	-44.79	-30.00	-14.79	PK
7416.03	V	-44.65	-30.00	-14.65	PK

Product	:	WIFI Storage
Test Item	:	Transmitter spurious emissions(conducted)
Test Mode	:	Mode 1: Transmit by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)				
162.63	-52.16	-36.00	-16.16	PK
997.75	-45.30	-36.00	-9.30	PK
4823.99	-44.92	-30.00	-14.92	PK
7236.01	-44.09	-30.00	-14.09	PK
Channel 13 (2472MHz)				
292.04	-49.07	-36.00	-13.07	PK
814.44	-65.25	-54.00	-29.25	PK
4943.99	-42.11	-30.00	-12.11	PK
7415.98	-41.44	-30.00	-11.44	PK

Product	:	WIFI Storage
Test Item	:	Transmitter spurious emissions(radiated)
Test Mode	:	Mode 2: Transmit by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
156.31	H	-47.85	-36.00	-11.85	PK
271.07	V	-49.18	-36.00	-13.18	PK
975.43	H	-49.58	-36.00	-13.58	PK
848.00	V	-70.04	-54.00	-16.04	PK
4824.02	H	-41.46	-30.00	-11.46	PK
4824.02	V	-43.73	-30.00	-13.73	PK
7236.03	H	-41.23	-30.00	-11.23	PK
7235.98	V	-44.43	-30.00	-14.43	PK
Channel 13 (2472MHz)					
296.55	H	-48.71	-36.00	-12.71	PK
207.02	V	-65.76	-54.00	-29.76	PK
809.40	H	-66.88	-54.00	-30.88	PK
815.42	V	-64.35	-54.00	-10.35	PK
4943.97	H	-39.79	-30.00	-9.79	PK
4944.01	V	-41.15	-30.00	-11.15	PK
7415.98	H	-46.07	-30.00	-16.07	PK
7415.97	V	-43.37	-30.00	-13.37	PK

Product	:	WIFI Storage
Test Item	:	Transmitter spurious emissions(conducted)
Test Mode	:	Mode 2: Transmit by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)				
264.29	-51.26	-36.00	-15.26	PK
837.17	-68.55	-54.00	-14.55	PK
4824.02	-44.89	-30.00	-14.89	PK
7235.96	-41.25	-30.00	-11.25	PK
Channel 13 (2472MHz)				
246.08	-46.40	-36.00	-10.40	PK
967.81	-47.58	-36.00	-11.58	PK
4944.00	-42.24	-30.00	-12.24	PK
7416.01	-41.77	-30.00	-11.77	PK

Product	:	WIFI Storage
Test Item	:	Transmitter spurious emissions(radiated)
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
260.75	H	-50.33	-36.00	-14.33	PK
143.49	V	-46.05	-36.00	-10.05	PK
831.80	H	-66.35	-54.00	-12.35	PK
932.82	V	-46.25	-36.00	-10.25	PK
4824.04	H	-41.41	-30.00	-11.41	PK
4824.02	V	-42.35	-30.00	-12.35	PK
7236.01	H	-42.49	-30.00	-12.49	PK
7236.04	V	-43.03	-30.00	-13.03	PK
Channel 13 (2472MHz)					
199.54	H	-67.87	-54.00	-13.87	PK
136.59	V	-48.39	-36.00	-12.39	PK
886.16	H	-49.77	-36.00	-13.77	PK
956.63	V	-51.03	-36.00	-15.03	PK
4944.03	H	-41.98	-30.00	-11.98	PK
4943.99	V	-41.01	-30.00	-11.01	PK
7416.00	H	-43.07	-30.00	-13.07	PK
7416.00	V	-39.70	-30.00	-9.70	PK

Product	:	WIFI Storage
Test Item	:	Transmitter spurious emissions(conducted)
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)				
295.57	-46.82	-36.00	-10.82	PK
853.17	-65.28	-54.00	-11.28	PK
4823.98	-42.58	-30.00	-12.58	PK
7235.97	-40.57	-30.00	-10.57	PK
Channel 13 (2472MHz)				
142.99	-48.48	-36.00	-12.48	PK
919.29	-51.17	-36.00	-15.17	PK
4944.00	-39.33	-30.00	-9.33	PK
7416.00	-41.16	-30.00	-11.16	PK

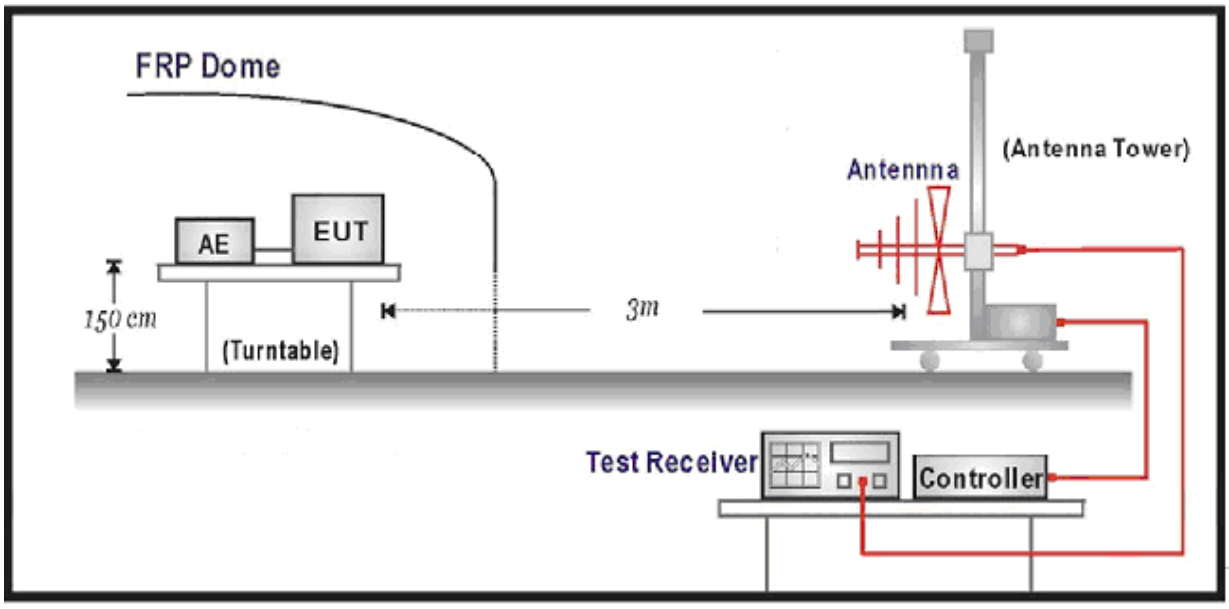
12. RECEIVER SPURIOUS EMISSIONS

12.1. Limit

Spurious emissions limits for receivers		
Frequency Range	Maximum power E.R.P. (≤ 1GHz) E.I.R.P. (> 1GHz)	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

12.2. Test Setup

For Radiated Measurement



12.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.3.11

Step 1:

The sensitivity of the spectrum analyzer should be such that the noise floor is at least 12 dB below the limits given in tables 2 or 5.

Step 2:

The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyzer settings:

- Resolution bandwidth: 100 kHz
- Video bandwidth: 300 kHz
- Detector mode: Peak
- Trace Mode: Max Hold
- Sweep Points: ≥ 9 970
- Sweep time: Auto

Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.11.2.1.2 and compared to the limits given in tables 2 or 5.

Step 3:

The emissions over the range 1 GHz to 12,75 GHz shall be identified.

Spectrum analyzer settings:

- Resolution bandwidth: 1 MHz
- Video bandwidth: 3 MHz
- Detector mode: Peak
- Trace Mode: Max Hold
- Sweep Points: ≥ 11 750
- Sweep time: Auto

Allow the trace to stabilize. Any emissions identified during the sweeps above that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.11.2.1.2 and compared to the limits given in tables 2 or 5. Frequency Hopping equipment may generate a block (or several blocks) of spurious emissions anywhere within the spurious domain. If this is the case, only the highest peak of each block of emissions shall be measured using the procedure in clause 5.3.11.2.1.2.

Step 4:

- In case of conducted measurements on smart antenna systems (equipment with multiple receive chains), the steps 2 and 3 need to be repeated for each of the active receive chains (Ach).The limits used to identify emissions during this pre-scan need to be reduced with 10 × log10 (Ach) (number of active receive chains).

12.4. Test Result

Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(radiated)
Test Mode	:	Mode 5: Receive by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
111.74	H	-69.87	-57.00	-12.87	PK
264.87	V	-72.75	-57.00	-15.75	PK
816.42	H	-68.99	-57.00	-11.99	PK
841.09	V	-70.55	-57.00	-13.55	PK
1618.34	H	-59.88	-47.00	-12.88	PK
1433.74	V	-61.25	-47.00	-14.25	PK
2452.57	H	-58.66	-47.00	-11.66	PK
2371.47	V	-58.78	-47.00	-11.78	PK
Channel 13 (2472MHz)					
218.95	H	-72.78	-57.00	-15.78	PK
196.44	V	-70.66	-57.00	-13.66	PK
978.72	H	-71.18	-57.00	-14.18	PK
901.84	V	-69.84	-57.00	-12.84	PK
1817.27	H	-57.83	-47.00	-10.83	PK
1794.63	V	-58.46	-47.00	-11.46	PK
2883.12	H	-56.74	-47.00	-9.74	PK
2579.20	V	-59.64	-47.00	-12.64	PK

Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(conducted)
Test Mode	:	Mode 5: Receive by 802.11b
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)				
265.03	-70.08	-57.00	-13.08	PK
805.54	-66.94	-57.00	-9.94	PK
1339.51	-58.86	-47.00	-11.86	PK
2841.35	-61.64	-47.00	-14.64	PK
Channel 13 (2472MHz)				
143.60	-70.99	-57.00	-13.99	PK
802.86	-70.27	-57.00	-13.27	PK
1417.82	-56.34	-47.00	-9.34	PK
2831.98	-55.75	-47.00	-8.75	PK

Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(radiated)
Test Mode	:	Mode 6: Receive by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
163.8	H	-82.53	-57	-25.53	PK
61.8	V	-82.93	-57	-25.93	PK
920.5	H	-74.68	-57	-17.68	PK
912.6	V	-71.33	-57	-14.33	PK
1299.6	H	-68.05	-47	-21.05	PK
1378.1	V	-67.79	-47	-20.79	PK
2283.0	H	-61.44	-47	-14.44	PK
2338.6	V	-62.84	-47	-15.84	PK
Channel 13 (2472MHz)					
165.6	H	-83.31	-57	-26.31	PK
62.2	V	-81.46	-57	-24.46	PK
921.1	H	-75.19	-57	-18.19	PK
913.5	V	-67.72	-57	-10.72	PK
1431.7	H	-69.14	-47	-22.14	PK
1468.5	V	-69.60	-47	-22.60	PK
2410.8	H	-61.67	-47	-14.67	PK
2557.1	V	-64.42	-47	-17.42	PK

Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(conducted)
Test Mode	:	Mode 6: Receive by 802.11g
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)				
262.92	-66.85	-57.00	-9.85	PK
831.32	-67.20	-57.00	-10.20	PK
1548.63	-59.21	-47.00	-12.21	PK
2587.99	-58.44	-47.00	-11.44	PK
Channel 13 (2472MHz)				
280.21	-69.16	-57.00	-12.16	PK
966.99	-66.56	-57.00	-9.56	PK
1468.76	-58.25	-47.00	-11.25	PK
2562.45	-62.47	-47.00	-15.47	PK

Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(radiated)
Test Mode	:	Mode 7: Receive by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
165.0	H	-82.54	-57	-25.54	PK
60.9	V	-82.45	-57	-25.45	PK
920.5	H	-72.79	-57	-15.79	PK
913.4	V	-69.79	-57	-12.79	PK
1342.4	H	-68.18	-47	-21.18	PK
1362.1	V	-67.89	-47	-20.89	PK
2683.7	H	-64.60	-47	-17.60	PK
2761.9	V	-64.34	-47	-17.34	PK
Channel 13 (2472MHz)					
165.5	H	-83.88	-57	-26.88	PK
61.8	V	-80.68	-57	-23.68	PK
921.6	H	-74.16	-57	-17.16	PK
912.7	V	-69.93	-57	-12.93	PK
1143.6	H	-66.77	-47	-19.77	PK
1236.0	V	-68.59	-47	-21.59	PK
2060.9	H	-61.69	-47	-14.69	PK
2133.4	V	-66.78	-47	-19.78	PK

Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(conducted)
Test Mode	:	Mode 7: Receive by 802.11n(20MHz)
Test Environment	:	24.6℃ 52.9%RH

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)				
245.16	-69.29	-57.00	-12.29	PK
891.53	-70.97	-57.00	-13.97	PK
1573.95	-55.81	-47.00	-8.81	PK
2732.53	-58.73	-47.00	-11.73	PK
Channel 13 (2472MHz)				
239.01	-71.63	-57.00	-14.63	PK
886.76	-67.91	-57.00	-10.91	PK
1692.06	-60.24	-47.00	-13.24	PK
2318.93	-58.83	-47.00	-11.83	PK

13. RECEIVER BLOCKING

14.1. Limit

Adaptive Frequency Hopping equipment shall comply with the requirements defined in clause 4.3.1.12.4

Table 6: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P_{min} + 6 dB	2 380 2 503,5	-53	CW
P_{min} + 6 dB	2 300 2 330 2 360	-47	CW
P_{min} + 6 dB	2 523,5 2 553,5 2 583,5 2 613,5 2 643,5 2 673,5	-47	CW
NOTE 1: P_{min} is the minimum level of wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 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 levels have to be corrected by the actual antenna assembly gain.			

Table 7: Receiver Blocking parameters receiver category 2 equipment

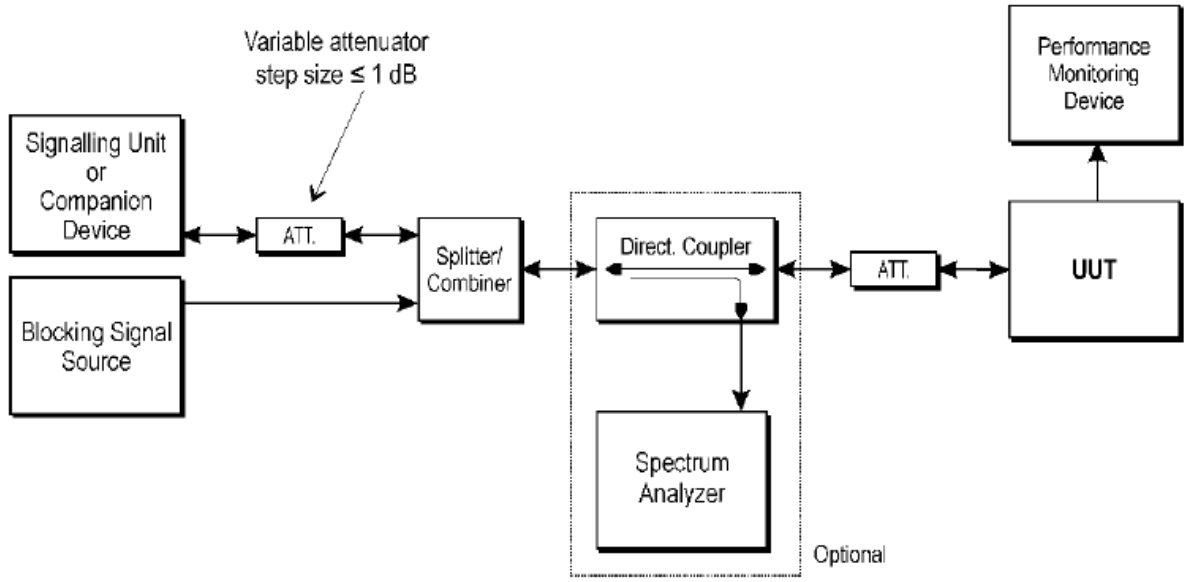
Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P_{min} + 6 dB	2 380 2 503,5	-57	CW
P_{min} + 6 dB	2 300 2 583,5	-47	CW
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 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 levels have to be corrected by the actual antenna assembly gain.			

Table 8: Receiver Blocking parameters receiver category 3 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P_{min} + 12 dB	2 380 2 503,5	-57	CW
P_{min} + 12 dB	2 300 2 583,5	-47	CW
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 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 levels have to be corrected by the actual antenna assembly gain.			

14.2. Test Setup

Conducted measurements



14.3. Test Procedure

Step 1:

• For non-frequency hopping equipment, the UUT shall be set to the lowest operating channel.

Step 2:

• The blocking signal generator is set to the first frequency as defined in the appropriate table corresponding to the receiver category and type of equipment.

Step 3:

• With the blocking signal generator switched off, a communication link is established between the UUT and the associated companion device using the test setup shown in figure 6. The attenuation of the variable attenuator shall be increased in 1 dB steps to a value at which the minimum performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still met. The resulting level for the wanted signal at the input of the UUT is Pmin.

• This signal level (Pmin) is increased by the value provided in the table corresponding to the receiver category and type of equipment.

Step 4:

• The blocking signal at the UUT is set to the level provided in the table corresponding to the receiver category and type of equipment. It shall be verified and recorded in the test report that the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is met.

Step 5:

• Repeat step 4 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.

Step 6:

• For non-frequency hopping equipment, repeat step 2 to step 5 with the UUT operating at the highest operating channel.

14.4. Test Result

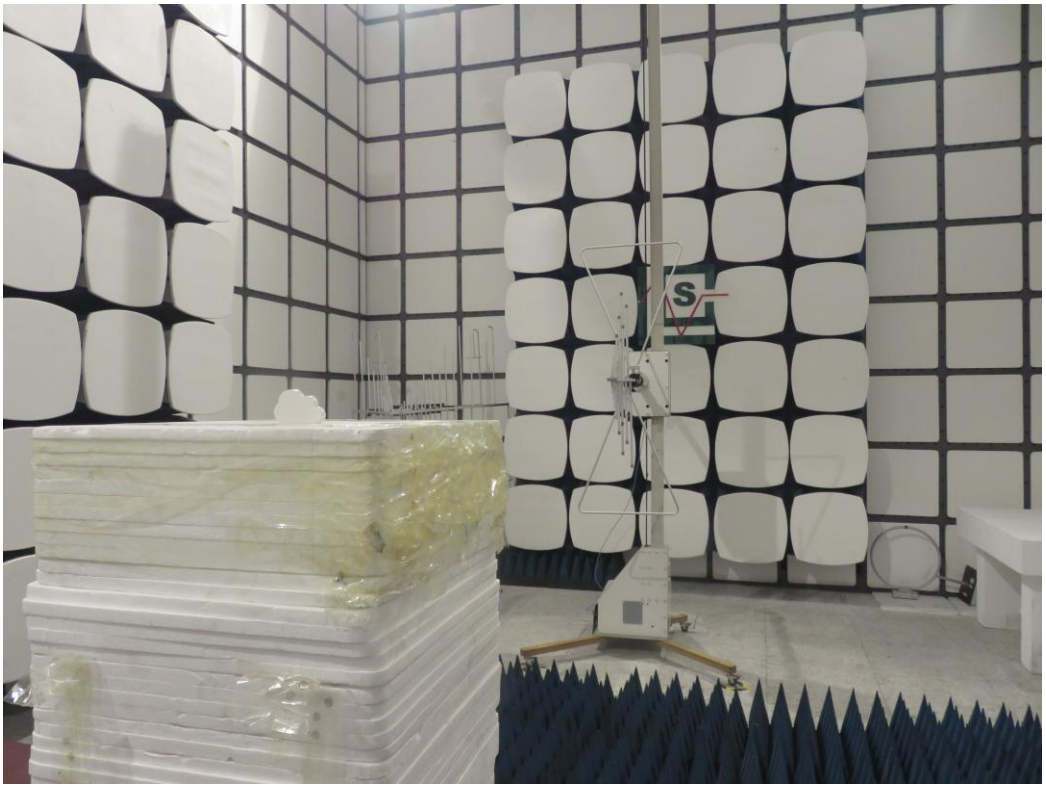
Product	:	WIFI Storage
Test Item	:	Receiver spurious emissions(conducted)
Test Mode	:	Receiving
Test Environment	:	25℃ 43.5%RH

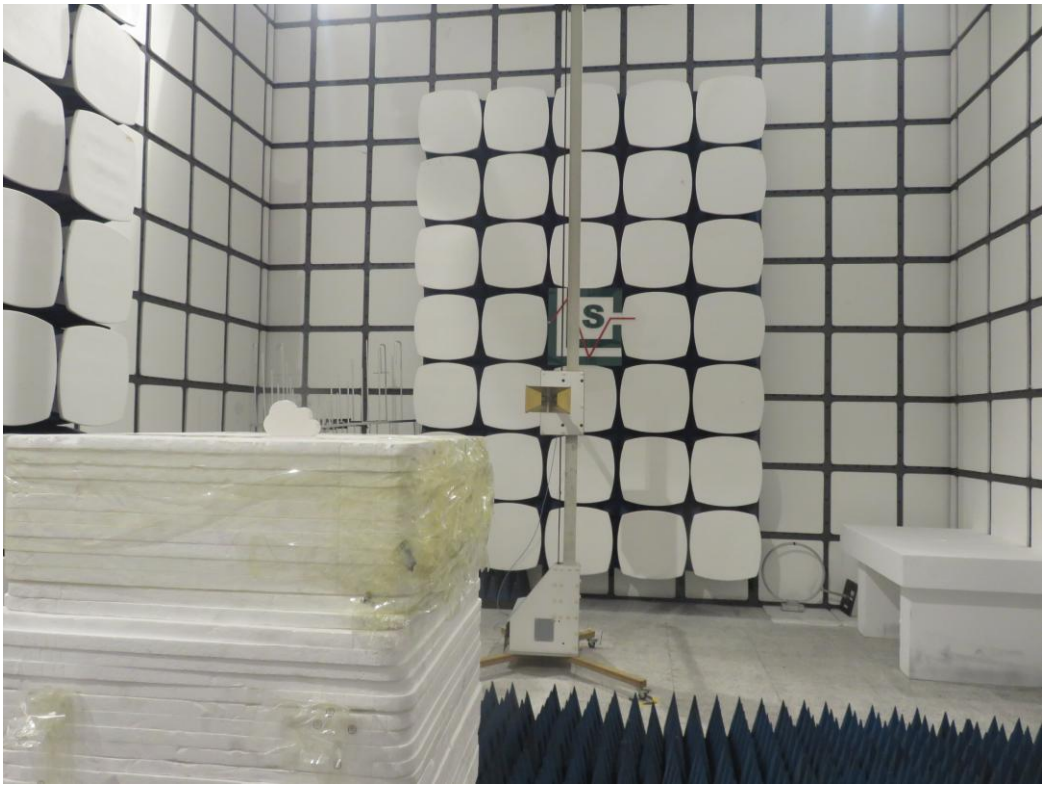
Wanted signal mean power from companion device (dBm)	Test mode	Test channel (MHz)	Blocking signal frequency (MHz)	Pmin	Blocking signal power (dBm)		Type of blocking signal	PER(%)		Test Result
					Test Value	Limit		Test Value	Limit	
Pmin + 6 dB	802.11b	2412	2380	-86	-27	≥-53	CW	4.32	10	Pass
			2503.5	-86	-25	≥-53	CW	4.62	10	Pass
			2300	-86	-25	≥-47	CW	3.68	10	Pass
			2330	-86	-20	≥-47	CW	4.30	10	Pass
			2360	-86	-23	≥-47	CW	3.51	10	Pass
			2523.5	-86	-20	≥-47	CW	4.28	10	Pass
			2553.5	-86	-19	≥-47	CW	3.52	10	Pass

			2583.5	-86	-17	≥-47	CW	4.26	10	Pass
			2613.5	-86	-21	≥-47	CW	4.81	10	Pass
			2643.5	-86	-17	≥-47	CW	3.56	10	Pass
			2673.5	-86	-17	≥-47	CW	4.06	10	Pass
		2472	2380	-88	-29	≥-53	CW	4.97	10	Pass
			2503.5	-88	-30	≥-53	CW	4.02	10	Pass
			2300	-88	-27	≥-47	CW	3.25	10	Pass
			2330	-88	-22	≥-47	CW	3.22	10	Pass
			2360	-88	-19	≥-47	CW	4.97	10	Pass
			2523.5	-88	-22	≥-47	CW	3.81	10	Pass
			2553.5	-88	-22	≥-47	CW	4.76	10	Pass
			2583.5	-88	-24	≥-47	CW	4.80	10	Pass
			2613.5	-88	-24	≥-47	CW	3.41	10	Pass
			2643.5	-88	-22	≥-47	CW	3.99	10	Pass
			2673.5	-88	-13	≥-47	CW	4.26	10	Pass
	802.11g	2412	2380	-86	-27	≥-53	CW	3.66	10	Pass
			2503.5	-86	-26	≥-53	CW	4.45	10	Pass
			2300	-86	-19	≥-47	CW	3.96	10	Pass
			2330	-86	-21	≥-47	CW	3.41	10	Pass
			2360	-86	-15	≥-47	CW	3.03	10	Pass
			2523.5	-86	-25	≥-47	CW	3.43	10	Pass
			2553.5	-86	-27	≥-47	CW	4.05	10	Pass
			2583.5	-86	-21	≥-47	CW	3.63	10	Pass
			2613.5	-86	-22	≥-47	CW	4.75	10	Pass
			2643.5	-86	-14	≥-47	CW	4.82	10	Pass
			2673.5	-86	-20	≥-47	CW	3.26	10	Pass
		2472	2380	-87	-30	≥-53	CW	4.86	10	Pass
			2503.5	-87	-33	≥-53	CW	4.95	10	Pass
			2300	-87	-26	≥-47	CW	3.60	10	Pass
			2330	-87	-18	≥-47	CW	4.01	10	Pass
			2360	-87	-19	≥-47	CW	3.59	10	Pass
			2523.5	-87	-20	≥-47	CW	3.98	10	Pass
			2553.5	-87	-27	≥-47	CW	3.24	10	Pass
			2583.5	-87	-23	≥-47	CW	3.37	10	Pass
			2613.5	-87	-23	≥-47	CW	3.32	10	Pass
			2643.5	-87	-19	≥-47	CW	3.76	10	Pass
			2673.5	-87	-14	≥-47	CW	3.66	10	Pass
	802.11n 20	2412	2380	-87	-28	≥-53	CW	4.21	10	Pass
			2503.5	-87	-33	≥-53	CW	4.72	10	Pass
			2300	-87	-26	≥-47	CW	4.23	10	Pass
			2330	-87	-19	≥-47	CW	3.53	10	Pass
			2360	-87	-21	≥-47	CW	4.30	10	Pass
			2523.5	-87	-20	≥-47	CW	4.40	10	Pass

			2553.5	-87	-20	≥-47	CW	4.17	10	Pass
			2583.5	-87	-25	≥-47	CW	3.66	10	Pass
			2613.5	-87	-24	≥-47	CW	4.99	10	Pass
			2643.5	-87	-20	≥-47	CW	3.69	10	Pass
			2673.5	-87	-19	≥-47	CW	4.59	10	Pass
		2472	2380	-88	-31	≥-53	CW	3.59	10	Pass
			2503.5	-88	-27	≥-53	CW	3.39	10	Pass
			2300	-88	-25	≥-47	CW	4.60	10	Pass
			2330	-88	-26	≥-47	CW	3.75	10	Pass
			2360	-88	-22	≥-47	CW	3.83	10	Pass
			2523.5	-88	-26	≥-47	CW	4.16	10	Pass
			2553.5	-88	-28	≥-47	CW	4.29	10	Pass
			2583.5	-88	-16	≥-47	CW	4.71	10	Pass
			2613.5	-88	-16	≥-47	CW	3.48	10	Pass
			2643.5	-88	-17	≥-47	CW	3.98	10	Pass
			2673.5	-88	-12	≥-47	CW	4.21	10	Pass

14. PHOTOGRAPHS OF TEST SETUP





15.EUT PHOTOGRAPHS

Fig. 1

Fig. 2

Fig. 3

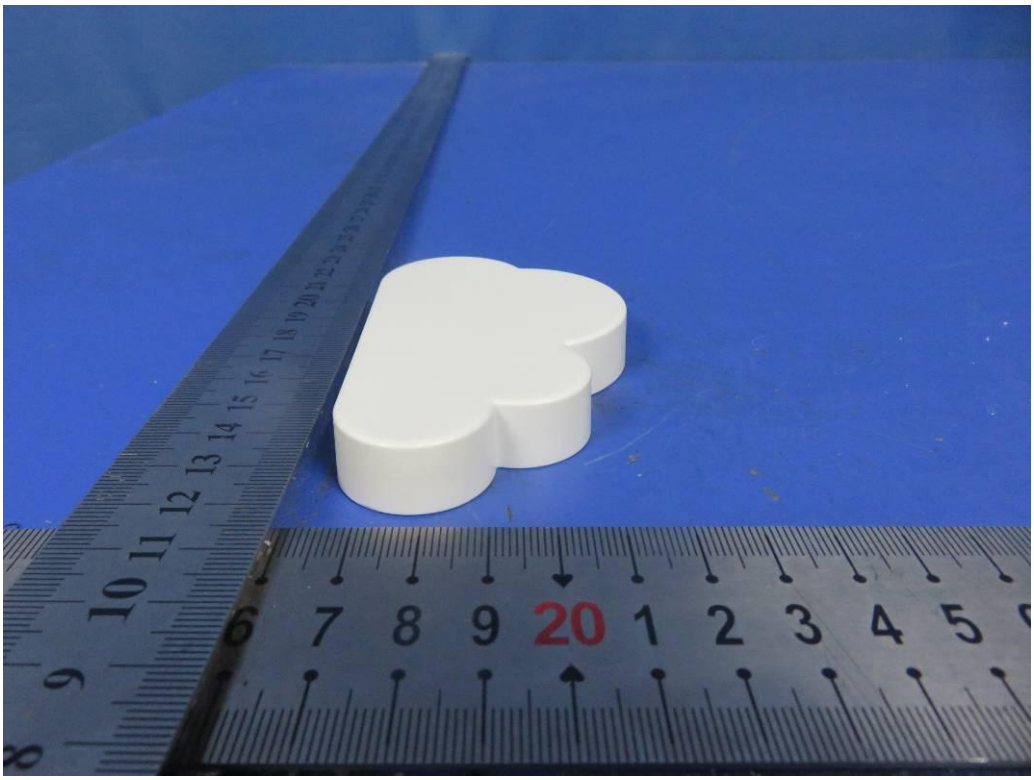


Fig. 4

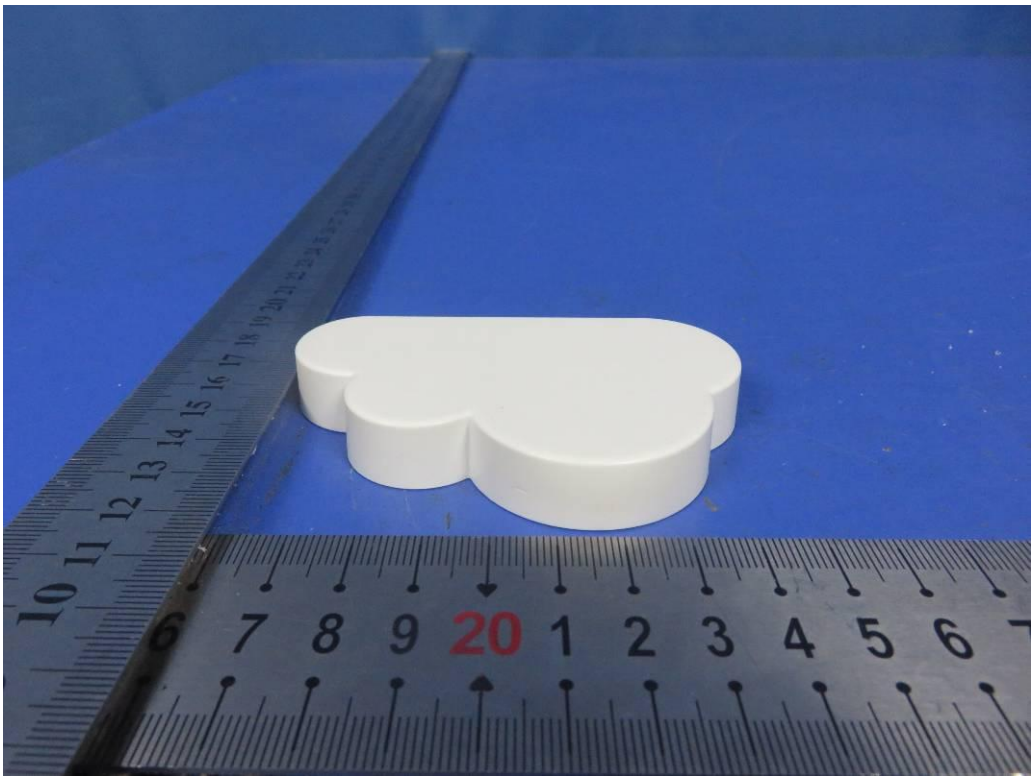


Fig. 5

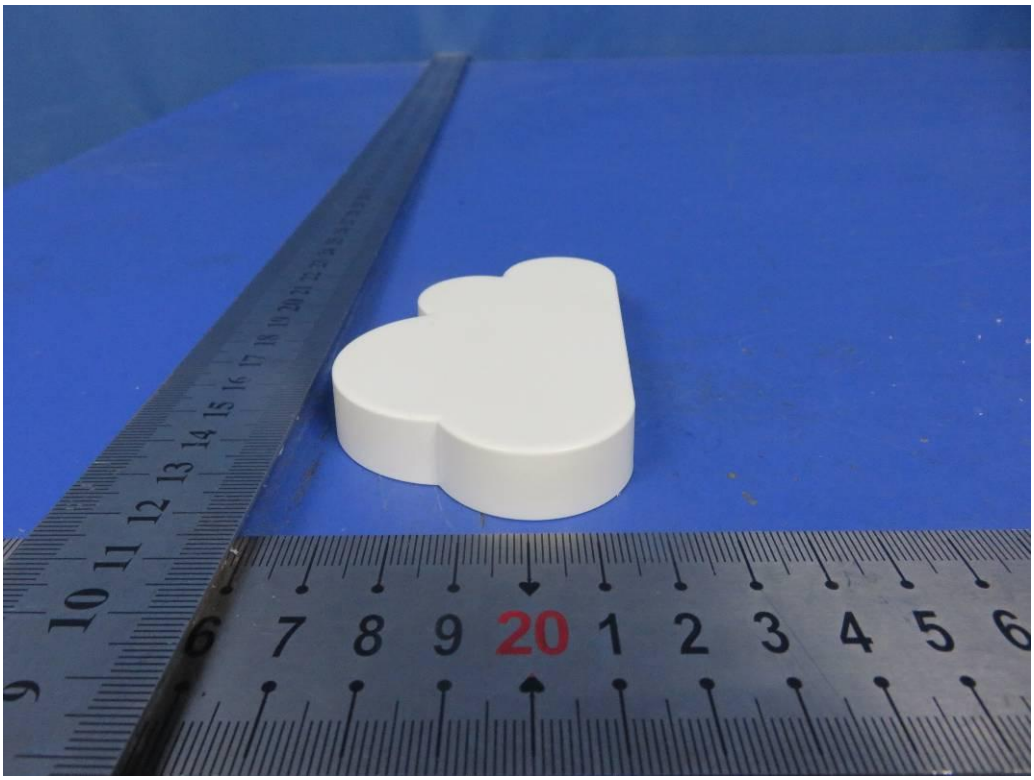


Fig. 6

Fig. 7

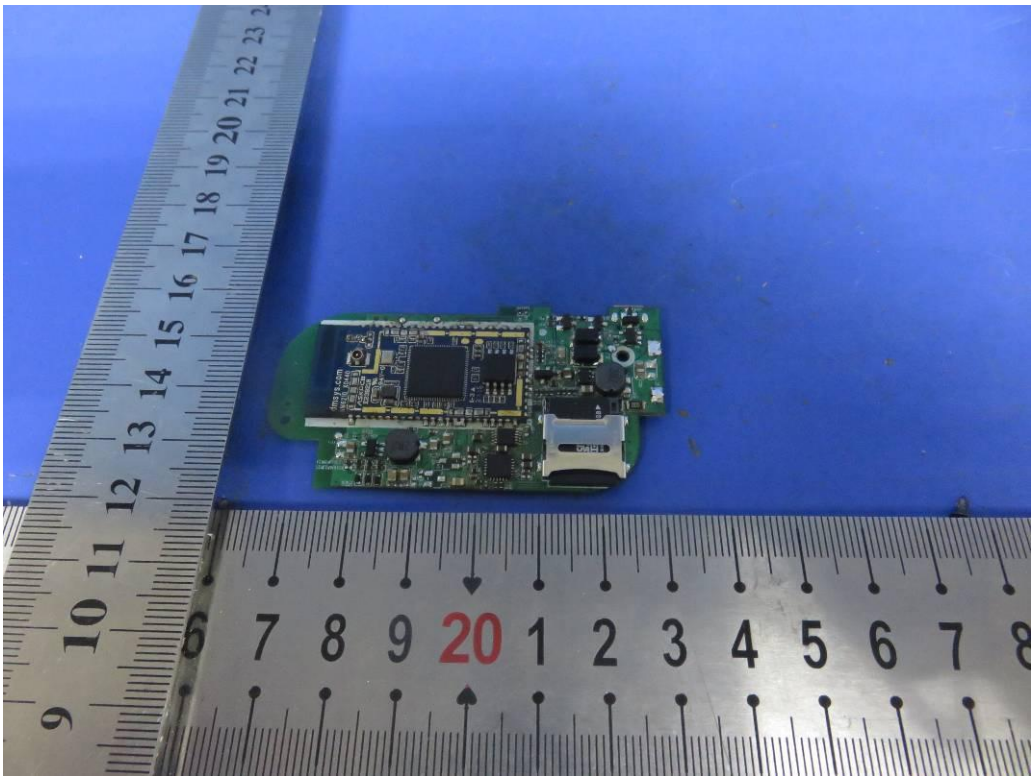


Fig. 8

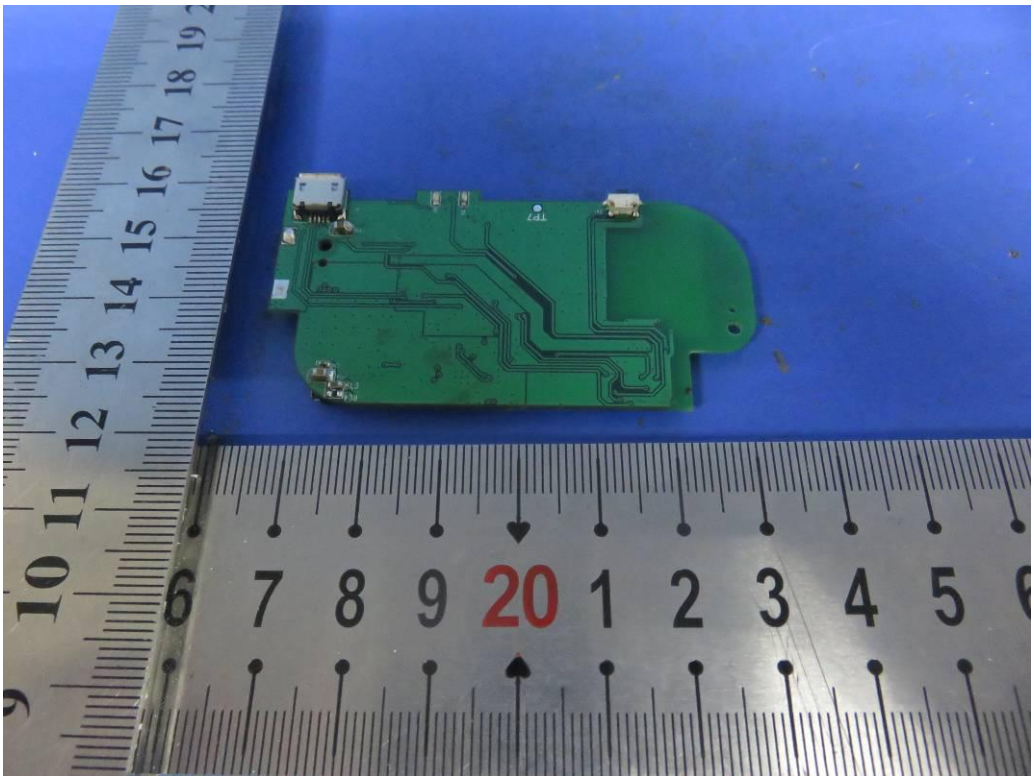


Fig. 9

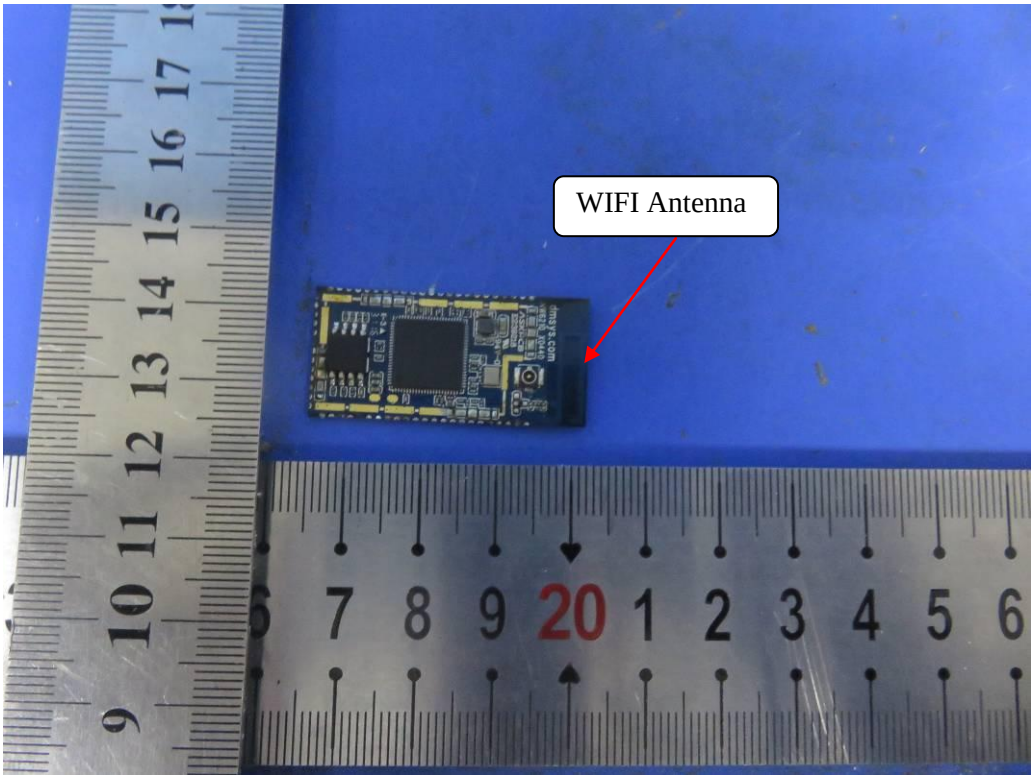


Fig. 10

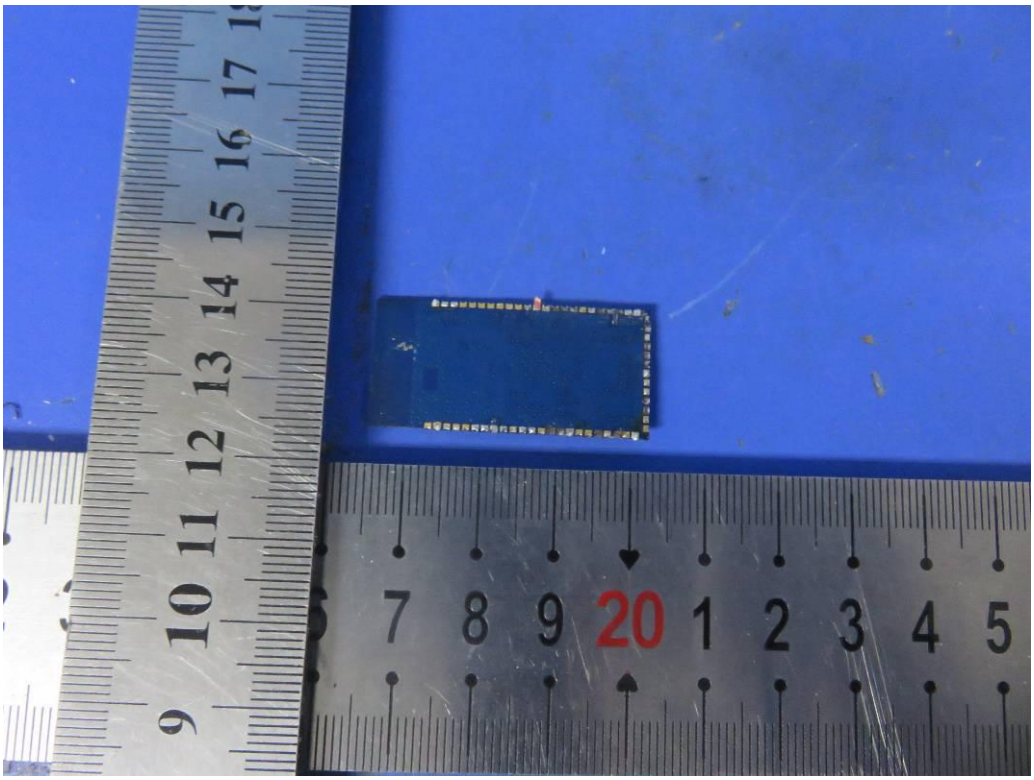


Fig. 11

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