ETSI EN300 328 RADIO TEST REPORT

Product Name:	WiFi Module
Model Number:	WizFi630S
Applicant:	WIZNET CO.,LTD

KeySense Testing & Certification International Co., Ltd.

1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China

Test Report Verification				
Product name	WiFi Module			
Model number	WizFi630S			
Applicant	**Name**	WIZNET CO.,LTD		
	Address	5F Humax Village,216 Hwangsaeul-ro,Bundang-gu,Seongnam-si,Gyeonggi-Do,Korea		
Manufacturer	**Name**	Shenzhen Yunlink Technology CO., Ltd		
	Address	B3 Building, An'le Industiral Zone, Hangcheng Road, Gushu, Xixiang Towm, Baoan District, Shenzhen City, Guangdong, P.R.China		
Factory	**Name**	Shenzhen Yunlink Technology CO., Ltd		
	Address	B3 Building, An'le Industiral Zone, Hangcheng Road, Gushu, Xixiang Towm, Baoan District, Shenzhen City, Guangdong, P.R.China		
Trade Name	Wiznet			
Receipt date	June 28, 2019		**Quantity**	1
Standard	ETSI EN 300 328 V2.1.1: 2016-11			
Test period	June 28, 2019 to July 08, 2019		**Issue Date**	July 09, 2019
Test result	The device described above is tested by KeySense Testing & Certification International Co., Ltd. The measurement results were contained in this test report and KeySense Testing & Certification International Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the ETSI EN 300 328 requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of KeySense Testing & Certification International Co., Ltd.			

Tested by: Bing.He	**Sign:** Bing. He	**Date:** 2019. 7. 9	
Reviewed by: Lake. Wang	**Sign:** Lake Wang	**Date:** 2019. 7. 9	**(Stamp)**
Approved by: Jack. Li (Supervisor)	**Sign:** Jack. Li	**Date:** 2019. 7. 9	

KeySense Testing & Certification International Co., Ltd.

CONTENTS

Description Page

1. SUMMARY OF MEASUREMENTS AND RESULTS

1.1.Compliance with ETSI EN 300 328 V2.1.1 (2016-11)

Harmonized Standard EN300 328 The following essential requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the RE Directive 2014/53/EU				
No	Test Parameter	Clause No	Condition	Results
Transmitter Parameters				
1	RF Output Power	4.3.1.2 or 4.3.2.2	Apply all equipment	PASS
2	Power Spectral Density	4.3.2.3	Only for modulations other than FHSS	PASS
3	Duty Cycle ,Tx-Sequence, Tx-gap	4.3.1.3 or 4.3.2.4	Only for non-adaptive equipment	N/A
4	Accumulated Transmit Time, Frequency Occupation & Hopping Sequence	4.3.1.4	Only for FHSS	N/A
5	Hopping Frequency Separation	4.3.1.5	Only for FHSS	N/A
6	Medium Utilization	4.3.1.6 or 4.3.2.5	Only for non-adaptive equipment	N/A
7	Adaptivity	4.3.1.7 or 4.3.2.6	Only for adaptive equipment	PASS
8	Occupied Channel Bandwidth	4.3.1.8 or 4.3.2.7	Apply all equipment	PASS
9	Transmitter unwanted emissions in the OOB domain	4.3.1.9 or 4.3.2.8	Apply all equipment	PASS
10	Transmitter unwanted emissions in the spurious domain	4.3.1.10 or 4.3.2.9	Apply all equipment	PASS
11	Receiver spurious emissions	4.3.1.11 or 4.3.2.10	Apply all equipment	PASS
12	Receiver Blocking	4.3.1.12 or 4.3.2.11	Apply all equipment	PASS
13	Geo-location capability	4.3.1.13 or 4.3.2.12	If implemented	N/A
Note: N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device.				

2. ENERAL INFORMATION

2.1.Description of Device (EUT)

Product Name	:	WiFi Module
Model Number	:	WizFi630S
Modulation	:	IEEE 802.11b mode: DSSS(CCK,QPSK, BPSK) IEEE 802.11g mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT20 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT40 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM)
Operation Frequency	:	IEEE 802.11b/g: 2412 ~ 2472 MHz IEEE 802.11n HT20 : 2412 ~ 2472 MHz IEEE 802.11n HT40 : 2422 ~ 2462 MHz
Number of channel	:	IEEE 802.11b: 13 Channels IEEE 802.11g: 13 Channels IEEE 802.11n HT20: 13 Channels IEEE 802.11n HT40: 9 Channels
Antenna and Gain	:	External Dipole Antenna with 3.2dBi gain (Max)
Software Version	:	Ver1.0
Hardware Version	:	Rev2.0
Test Voltage:	:	DC 3.3V

2.2.Test Facilities

Site Description	1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China
Name of Firm:	KeySense Testing & Certification International Co., Ltd.
EMC Lab	Certificated by CNAS, CHINA
	Registration No.: L9678
	Date of registration: Feb 07, 2017

2.3.Measurement uncertainty

Uncertainty for Radiated Spurious Emission test in RF chamber	1 dB (Bilog antenna 30M~1000MHz)
	0.9 dB (Horn antenna 1000M~25000MHz)
Uncertainty for Conduction Spurious emission test	2.10 dB
Uncertainty for Output power test	0.94 dB
Uncertainty for Power density test	2.10 dB
Uncertainty for Temperature and humidity test	2%
	1℃
Uncertainty for Frequency range test	1×10-6
Uncertainty for Bandwidth test	1×10-6
Uncertainty for DC power test	0.042 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

Note：This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.4.Standard Description

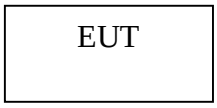
ETSI EN 300 328 V2.1.1 (2016-11): Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

2.5.Assistant equipment used for test

2.5.1.Notebook

M / N	:	VM510L
Manufacturer	:	ASUS

2.6.Block Diagram of Test Setup



(EUT: WiFi Module)

2.7.Test mode

The test software was used to control EUT work in Continuous TX or RX mode, and select test channel, wireless mode

Test mode	Lower channel	Center channel	Upper channel
IEEE 802.11b;IEEE 802.11g;IEEE 802.11n HT20 Transmitting	2412MHz	2442MHz	2472MHz
IEEE 802.11b;IEEE 802.11g;IEEE 802.11n HT20 Receiving	2412MHz	2442MHz	2472MHz
IEEE 802.11n HT40 Transmitting	2422MHz	2442MHz	2462MHz
IEEE 802.11n HT40 Receiving	2422MHz	2442MHz	2462MHz

2.8.Channel List

IEEE 802.11b;IEEE 802.11g;IEEE 802.11n HT20					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	6	2437	11	2462
2	2417	7	2442	12	2467
3	2422	8	2447	13	2472
4	2427	9	2452		
5	2432	10	2457		
IEEE 802.11n HT40					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2422	4	2437	7	2452
2	2427	5	2442	8	2457
3	2432	6	2447	9	2462

3. MEASUREMENTS OF PARAMETERS (ETSI EN 300 328)

3.1.RF Output Power

3.1.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum	Agilent	N9020A	MY48011676	Mar.20,2019	1 Year
Vector source	Agilent	N5182A	MY47420382	Mar.20,2019	1 Year
Analog signal source	Agilent	N5171B	MY51350292	Mar.20,2019	1 Year
Comprehensive measuring instrument	Rohde & Schwarz	CMW 500	1201.002K50	Mar.20,2019	1 Year
control unit	Tonscend	JS0806-2	10165	Mar.20,2019	1 Year
Testing software	Tonscend	JSTS1120-3	10165	Mar.20,2019	1 Year
N/A is an abbreviation for Not Applicable.					

3.1.2.Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.2 of EN 300 328 V2.1.1.

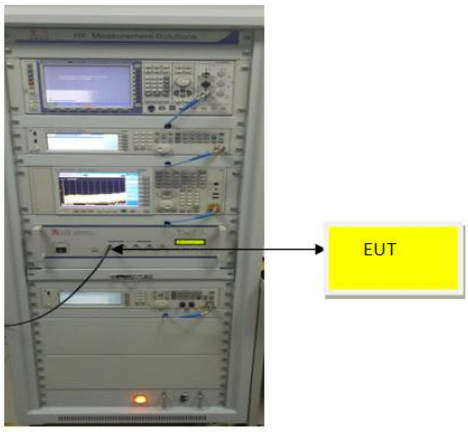
The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm.

The maximum RF output power for non-adaptive Frequency Hopping equipment shall be declared by the manufacturer. See clause 5.4.1 m). The maximum RF output power for this equipment shall be equal to or less than the value declared by the manufacturer. This declared value shall be equal to or less than 20 dBm.

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

3.1.3.Test Method

(1) Connected the antenna port to the OSP of JSTS1120-3 system, read output power of the transmitter. (As below).



(2) Test conditions refer to chapter 5.4.2.1 of EN 300 328 V2.1.1.

(3) Test method refer to chapter 5.4.2.2.1.2 of EN 300 328 V2.1.1.

3.1.4.Test Information

EUT: WiFi Module	
M/N: WizFi630S	
Test Date: 2019.06.28	Tested by:Bing.He
Ambient Temperature: 23℃	Relative Humidity: 54%

3.1.5.Test Results

Test mode: IEEE 802.11b		Test result: Pass		
Test condition	Frequency (MHz)	Max EIRP (dBm)	Limit (dBm)	Result
Normal T:23℃ V: DC 3.3V	2412	11.73	20	Pass
	2442	11.66		Pass
	2472	10.71		Pass
Extreme T:0℃ V: DC 3.3V	2412	11.66		Pass
	2442	11.44		Pass
	2472	11.03		Pass
Extreme T:45℃ V: DC 3.3V	2412	11.69		Pass
	2442	11.11		Pass
	2472	10.21		Pass
1、 Worst case were 1Mbit/s				

Test mode: IEEE 802.11g		Test result: Pass		
Test condition	Frequency (MHz)	Max EIRP (dBm)	Limit (dBm)	Result
Normal T:23℃ V: DC 3.3V	2412	10.76	20	Pass
	2442	9.73		Pass
	2472	9.49		Pass
Extreme T:0℃ V: DC 3.3V	2412	10.53		Pass
	2442	9.69		Pass
	2472	9.25		Pass
Extreme T:45℃ V: DC 3.3V	2412	10.70		Pass
	2442	9.73		Pass
	2472	9.49		Pass
1、 Worst case were 6Mbit/s				

Test mode: IEEE 802.11n HT20		Test result: Pass		
Test condition	Frequency (MHz)	Max EIRP (dBm)	Limit (dBm)	Result
Normal T:23℃ V: DC 3.3V	2412	9.78	20	Pass
	2442	9.66		Pass
	2472	9.13		Pass
Extreme T:0℃ V: DC 3.3V	2412	9.87		Pass
	2442	9.79		Pass
	2472	9.85		Pass
Extreme T:45℃ V: DC 3.3V	2412	9.05		Pass
	2442	9.45		Pass
	2472	9.63		Pass
1、 Worst case were MCS0				

Test mode: IEEE 802.11n HT40		Test result: Pass		
Test condition	Frequency (MHz)	Max EIRP (dBm)	Limit (dBm)	Result
Normal T:23℃ V: DC 3.3V	2422	7.40	20	Pass
	2442	7.00		Pass
	2462	6.40		Pass
Extreme T:0℃ V: DC 3.3V	2422	7.50		Pass
	2442	7.10		Pass
	2462	6.40		Pass
Extreme T:45℃ V: DC 3.3V	2422	7.50		Pass
	2442	7.00		Pass
	2462	6.20		Pass
1. Worst case were MCS0				

3.2.Power Spectral Density

3.2.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum	Agilent	N9020A	MY48011676	Mar.20,2019	1 Year
Vector source	Agilent	N5182A	MY47420382	Mar.20,2019	1 Year
Analog signal source	Agilent	N5171B	MY51350292	Mar.20,2019	1 Year
Comprehensive measuring instrument	Rohde & Schwarz	CMW 500	1201.002K50	Mar.20,2019	1 Year
control unit	Tonscend	JS0806-2	10165	Mar.20,2019	1 Year
Testing software	Tonscend	JSTS1120-3	10165	Mar.20,2019	1 Year
N/A is an abbreviation for Not Applicable.					

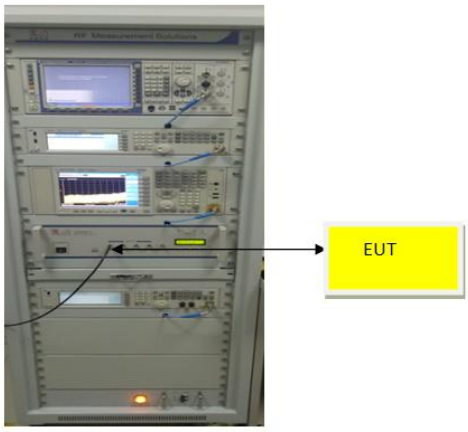
3.2.2.Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.3 of EN 300 328 V2.1.1.

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

3.2.3.Test Method

(1) Connected the antenna port to the OSP of JSTS1120-3 system, read output power of the transmitter. (As below).



(2) Configure EUT work in TX operation mode.

(3) Test conditions refer to chapter 5.4.3.1 of EN 300 328 V2.1.1.

(4) Test method refer to chapter 5.4.3.2.1 of EN 300 328 V2.1.1.

3.2.4.Test Information

EUT: WiFi Module	
M/N: WizFi630S	
Test Date: 2019.06.28	Tested by:Bing.He
Ambient Temperature: 23℃	Relative Humidity: 54%

3.2.5.Test Results

Test mode: IEEE 802.11b; IEEE 802.11g; IEEE 802.11n HT20, IEEE 802.11n HT40

Test result: Pass

Test Mode	Frequency (MHz)	Level (dBm)	Limit (dBm)	Result
IEEE 802.11b	2412	3.1	**10**	Pass
	2442	1.5		Pass
	2472	3.2		Pass
IEEE 802.11g	2412	1.8		Pass
	2442	1.5		Pass
	2472	-1.1		Pass
IEEE 802.11n HT20	2412	-2.6		Pass
	2442	-3.1		Pass
	2472	-3.3		Pass
IEEE 802.11n HT40	2422	-5.4		Pass
	2442	-5.8		Pass
	2462	-6.4		Pass

1、 IEEE 802.11b: Worst case were 1Mbit/s
2、 IEEE 802.11g: Worst case were 6Mbit/s
3、 IEEE 802.11n HT20: Worst case were MCS0
4、 IEEE 802.11n HT40: Worst case were MCS0

3.3. Duty Cycle ,Tx-Sequence, Tx-gap

N/A (Not Applicable)

These requirements apply to non-adaptive equipment or to adaptive equipment when operating in a non-adaptive mode. The equipment is using wide band modulations other than FHSS.

These requirements do not apply for equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.

3.4.Accumulated Transmit Time, Frequency Occupation and Hopping

Sequence

N/A (Not Applicable)
Only for FHSS equipment.

3.5.Medium Utilization (MU) factor

N/A (Not Applicable)
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 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p.

3.6.Adaptivity

3.6.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum	Agilent	N9020A	MY48011676	Mar.20,2019	1 Year
Vector source	Agilent	N5182A	MY47420382	Mar.20,2019	1 Year
Analog signal source	Agilent	N5171B	MY51350292	Mar.20,2019	1 Year
Comprehensive measuring instrument	Rohde & Schwarz	CMW 500	1201.002K50	Mar.20,2019	1 Year
control unit	Tonscend	JS0806-2	10165	Mar.20,2019	1 Year
Testing software	Tonscend	JSTS1120-3	10165	Mar.20,2019	1 Year
N/A is an abbreviation for Not Applicable.					

3.6.2.Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.6 of EN 300 328 V2.1.1.

4.3.2.6.2 Non-LBT based Detect and Avoid

Equipment using a modulation other than FHSS and using the non-LBT based Detect and Avoid mechanism, shall comply with the following minimum set of requirements:

1) During normal operation, the equipment shall evaluate the presence of a signal on its current operating channel. If it is determined that a signal is present with a level above the detection threshold defined in step 5 the channel shall be marked as 'unavailable'.

2) 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.

3) The total time during which an equipment has transmissions on a given channel without re-evaluating the availability of that channel, is defined as the Channel Occupancy Time.

4) The Channel Occupancy Time shall be less than 40 ms. Each such transmission sequence shall be followed by an Idle Period (no transmissions) of minimum 5 % of the Channel Occupancy Time with a minimum of 100 µs. After this, the procedure as in step 1 needs to be repeated.

5) The detection threshold shall be proportional to the transmit power of the transmitter: for a 20 dBm e.i.r.p. transmitter the detection threshold level (TL)

shall be equal to or less than -70 dBm/MHz at the input to the receiver assuming a 0 dBi (receive) antenna assembly. This threshold level (TL) may be corrected for the (receive) antenna assembly gain (G); however, beamforming gain (Y) shall not be taken into account. For power levels less than 20 dBm e.i.r.p., the detection threshold level may be relaxed to:

TL = -70 dBm/MHz + 10 × log10 (100 mW / Pout) (Pout in mW e.i.r.p.)

6）The equipment shall comply with the requirements defined in step 1 to step 4 of the present clause in the presence of an unwanted CW signal as defined in table 9.

Table 9: Unwanted Signal parameters

Wanted signal mean power from companion device (dBm)	Unwanted signal frequency (MHz)	Unwanted CW signal power (dBm)
-30	2 395 or 2 488,5 (see note 1)	-35 (see note 2)
NOTE 1: The highest frequency shall be used for testing operating channels within the range 2 400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483,5 MHz. See clause 5.4.6.1.		
NOTE 2: The level specified is the level in front of the UUT antenna. In case of conducted measurements, this level has to be corrected by the actual antenna assembly gain.		

4.3.2.6.3 LBT based Detect and Avoid

Requirements & Limits

1、Frame Based Equipment

1) Before transmission, the equipment shall perform a Clear Channel Assessment (CCA) check using energy detect. The equipment shall observe the operating channel for the duration of the CCA observation time which shall be not less than 18 µs. The channel shall be considered occupied if the energy level in the channel exceeds the threshold given in step 5 below. If the equipment finds the channel to be clear, it may transmit immediately. See figure 2 below.

2) If the equipment finds the channel occupied, it shall not transmit on this channel during the next Fixed Frame Period.

The equipment is allowed to switch to a non-adaptive mode and to continue

transmissions on this channel providing it complies with the requirements applicable to non-adaptive equipment. See clause 4.3.2.6.1. Alternatively, the equipment is also allowed to continue Short Control Signalling Transmissions on this channel providing it complies with the requirements given in clause 4.3.2.6.4.

3) The total time during which an equipment has transmissions on a given channel without re-evaluating the availability of that channel, is defined as the Channel Occupancy Time.

The Channel Occupancy Time shall be in the range 1 ms to 10 ms followed by an Idle Period of at least 5 % of the Channel Occupancy Time used in the equipment for the current Fixed Frame Period. See figure 2 below.

4) An equipment, upon correct reception of a packet which was intended for this equipment can skip CCA and immediately (see also next paragraph) proceed with the transmission of management and control frames (e.g. ACK and Block ACK frames are allowed but data frames are not allowed). A consecutive sequence of such transmissions by the equipment without a new CCA shall not exceed the maximum Channel Occupancy Time.

For the purpose of multi-cast, the ACK transmissions (associated with the same data packet) of the individual devices are allowed to take place in a sequence.

5) The energy detection threshold for the CCA shall be proportional to the transmit power of the transmitter: for a 20 dBm e.i.r.p. transmitter the CCA threshold level (TL) shall be equal to or less than -70 dBm/MHz at the input to the receiver assuming a 0 dBi (receive) antenna assembly. This threshold level (TL) may be corrected for the (receive) antenna assembly gain (G); however, beamforming gain (Y) shall not be taken into account. For power levels less than 20 dBm e.i.r.p. the CCA threshold level may be relaxed to:

TL = -70 dBm/MHz + 10 × log10 (100 mW / Pout) (Pout in mW e.i.r.p.)

6) The equipment shall comply with the requirements defined in step 1 to step 4 in the present clause in the presence of an unwanted CW signal as defined in table 10.

Table 10: Unwanted Signal parameters

Wanted signal mean power from companion device	Unwanted signal frequency (MHz)	Unwanted signal power (dBm)
sufficient to maintain the link (see note 2)	2 395 or 2 488,5 (see note 1)	-35 (see note 3)
NOTE 1: The highest frequency shall be used for testing operating channels within the range 2 400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483,5 MHz. See clause 5.4.6.1. NOTE 2: A typical value which can be used in most cases is -50 dBm/MHz. NOTE 3: The level specified is the level in front of the UUT antenna. In case of conducted measurements, this level has to be corrected by the actual antenna assembly gain.		

An example of the timing for Frame Based Equipment is provided in figure 2.

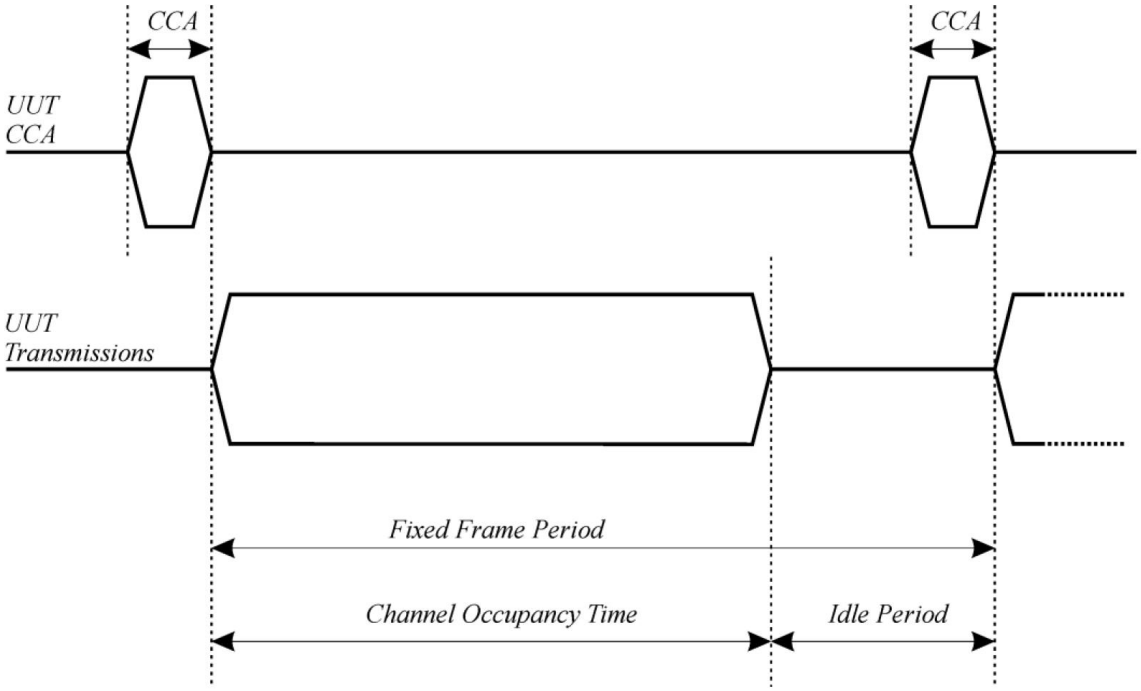


Figure 2: Example of timing for Frame Based Equipment

2、Load Based Equipment

Load Based Equipment may implement an LBT based spectrum sharing mechanism based on the Clear Channel Assessment (CCA) mode using energy detect as described in IEEE 802.11™-2012 [i.3], clause 9, clause 10, clause 16, clause 17, clause 19 and clause 20, or in IEEE 802.15.4™-2011 [i.4], clause 4,

clause 5 and clause 8 providing the equipment complies with the conformance requirements referred to in clause 4.3.2.6.3.4. Load Based Equipment not using any of the mechanisms referenced above shall comply with the following minimum set of requirements:

1) Before a transmission or a burst of transmissions, the equipment shall perform a Clear Channel Assessment (CCA) check using energy detect. The equipment shall observe the operating channel for the duration of the CCA observation time which shall be not less than 18 µs. The channel shall be considered occupied if the energy level in the channel exceeds the threshold given in step 5 below. If the equipment finds the channel to be clear, it may transmit immediately.

2) If the equipment finds the channel occupied, it shall not transmit on this channel (see also the next paragraph). The equipment shall perform an Extended CCA check in which the channel is observed for a random duration in the range between 18 µs and at least 160 µs. If the extended CCA check has determined the channel to be no longer occupied, the equipment may resume transmissions on this channel. If the Extended CCA time has determined the channel still to be occupied, it shall perform new Extended CCA checks until the channel is no longer occupied.

NOTE: The Idle Period in between transmissions is considered to be the CCA or the Extended CCA check as there are no transmissions during this period.

The equipment is allowed to switch to a non-adaptive mode and to continue transmissions on this channel providing it complies with the requirements applicable to non-adaptive equipment. Alternatively, the equipment is also allowed to continue Short Control Signalling Transmissions on this channel providing it complies with the requirements given in clause 4.3.2.6.4.

3) The total time that an equipment makes use of a RF channel is defined as the Channel Occupancy Time. This Channel Occupancy Time shall be less than 13 ms, after which the device shall perform a new CCA as described in step 1 above.

4) The equipment, upon correct reception of a packet which was intended for this equipment can skip CCA and immediately (see also next paragraph) proceed with the transmission of management and control frames (e.g. ACK and Block ACK frames are allowed but data frames are not allowed). A consecutive

sequence of transmissions by the equipment without a new CCA shall not exceed the maximum channel occupancy time as defined in step 3 above.
For the purpose of multi-cast, the ACK transmissions (associated with the same data packet) of the individual devices are allowed to take place in a sequence.
5) The energy detection threshold for the CCA shall be proportional to the transmit power of the transmitter: for a 20 dBm e.i.r.p. transmitter the CCA threshold level (TL) shall be equal to or less than -70 dBm/MHz at the input to the receiver assuming a 0 dBi (receive) antenna assembly. This threshold level (TL) may be corrected for the (receive) antenna assembly gain (G); however, beamforming gain (Y) shall not be taken into account. For power levels less than 20 dBm e.i.r.p., the CCA threshold level may be relaxed to:

$$TL = -70 \text{ dBm/MHz} + 10 \times \log10 (100 \text{ mW} / Pout)$$

6) The equipment shall comply with the requirements defined in step 1 to step 4 of the present clause in the presence of an unwanted CW signal as defined in table 11.

Table 11: Unwanted Signal parameters

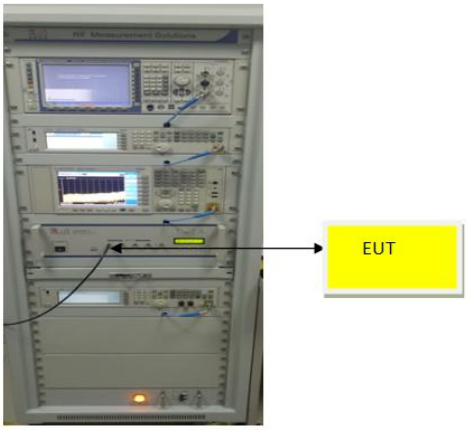
Wanted signal mean power from companion device	Unwanted signal frequency (MHz)	Unwanted signal power (dBm)
sufficient to maintain the link (see note 2)	2 395 or 2 488,5 (see note 1)	-35 (see note 3)
NOTE 1: The highest frequency shall be used for testing operating channels within the range 2 400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483,5 MHz. See clause 5.4.6.1. NOTE 2: A typical value which can be used in most cases is -50 dBm/MHz. NOTE 3: The level specified is the level in front of the UUT antenna. In case of conducted measurements, this level has to be corrected by the actual antenna assembly gain.		

Short Control Signalling Transmissions

f implemented, Short Control Signalling Transmissions of adaptive equipment using wide band modulations other than FHSS shall have a maximum TxOn / (TxOn + TxOff) ratio of 10 % within any observation period of 50 ms.
NOTE: Duty Cycle is defined in clause 4.3.2.4.2.

3.6.3.Test method

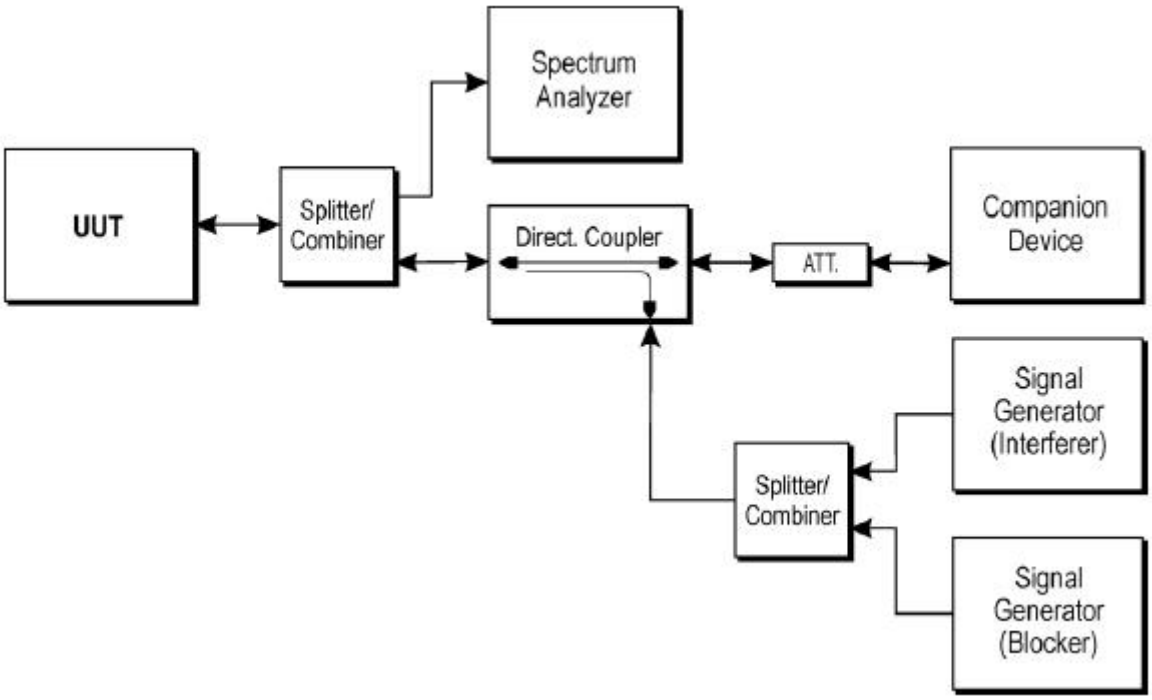
(1) Connected the antenna port to the OSP of JSTS1120-3 system



(3) Test conditions refer to chapter 5.4.6.1 of EN 300 328 V2.1.1.

(4) Test method refer to chapter 5.4.6.2 of EN 300 328 V2.1.1.

(4) Test Setup:



3.6.4.Test Information

EUT: WiFi Module	
M/N: WizFi630S	
Test Date: 2019.06.30	Tested by:Bing.He
Ambient Temperature: 23℃	Relative Humidity: 54%

3.6.5.Test Results

Test result: Pass

Module Mode	Frequency (MHz)	Test Step	No. of Bursts	COT (ms)	Limit (ms)	CCA Time (μs)	Limit (μs)	Short Signaling (%)	Limit (%)
IEEE 802.11b	Low CH	1	3677	0.420	<13	47	>18	---	---
		2	---	---	---	---	---	4.528	<10
		2_2and	---	---	---	---	---	3.752	<10
	High CH	1	1694	3.312	<13	20	>18	---	---
		2	---	---	---	---	---	8.624	<10
		2_2and	---	---	---	---	---	7.888	<10
IEEE 802.11g	Low CH	1	4466	0.370	<13	47	>18	---	---
		2	---	---	---	---	---	8.328	<10
		2_2and	---	---	---	---	---	4.824	<10
	High CH	1	1897	3.312	<13	36	>18	---	---
		2	---	---	---	---	---	8.744	<10
		2_2and	---	---	---	---	---	7.264	<10

1、 The energy detection threshold for the CCA shall be proportional to the transmit power of the transmitter: for a 20 dBm e.i.r.p. transmitter the CCA threshold level (TL) shall be equal to or less than -70 dBm/MHz at the input to the receiver assuming a 0 dBi (receive) antenna assembly. This threshold level (TL) may be corrected for the (receive) antenna assembly gain (G); however, beamforming gain (Y) shall not be taken into account. For power levels less than 20 dBm e.i.r.p., the CCA threshold level may be relaxed to:

TL = -70 dBm/MHz + 10 × log10 (100 mW / Pout) (Pout in mW e.i.r.p.)

2、 “Pout e.i.r.p”please refer 3.1.4 at this report.

3、 Test step 1: EUT signal measurement without interferer.

4、 Test step 2: Short signaling triggered measurement, armed one COT after interferer is switched on and triggered measurement at the end of the 60s monitoring time.

5、 Test step 2_2and: Unwanted signal measurement, interferer is switched on and triggered measurement at the end of the 60s monitoring time.

Test result: Pass

Module Mode	Frequency (MHz)	Test Step	No. of Bursts	COT (ms)	Limit (ms)	CCA Time (μs)	Limit (μs)	Short Signaling (%)	Limit (%)
IEEE 802.11n (HT20)	Low CH	1	3677	0.420	<13	47	>18	---	---
		2	---	---	---	---	---	4.528	<10
		2_2and	---	---	---	---	---	3.752	<10
	High CH	1	1694	3.312	<13	20	>18	---	---
		2	---	---	---	---	---	8.624	<10
		2_2and	---	---	---	---	---	7.888	<10
IEEE 802.11n (HT40)	Low CH	1	4466	0.370	<13	47	>18	---	---
		2	---	---	---	---	---	8.328	<10
		2_2and	---	---	---	---	---	4.824	<10
	High CH	1	1897	3.312	<13	36	>18	---	---
		2	---	---	---	---	---	8.744	<10
		2_2and	---	---	---	---	---	7.264	<10

1、 The energy detection threshold for the CCA shall be proportional to the transmit power of the transmitter: for a 20 dBm e.i.r.p. transmitter the CCA threshold level (TL) shall be equal to or less than -70 dBm/MHz at the input to the receiver assuming a 0 dBi (receive) antenna assembly. This threshold level (TL) may be corrected for the (receive) antenna assembly gain (G); however, beamforming gain (Y) shall not be taken into account. For power levels less than 20 dBm e.i.r.p., the CCA threshold level may be relaxed to:

TL = -70 dBm/MHz + 10 × log10 (100 mW / Pout) (Pout in mW e.i.r.p.)

2、 “Pout e.i.r.p”please refer 3.1.4 at this report.

3、 Test step 1: EUT signal measurement without interferer.

4、 Test step 2: Short signaling triggered measurement, armed one COT after interferer is switched on and triggered measurement at the end of the 60s monitoring time.

5、 Test step 2_2and: Unwanted signal measurement, interferer is switched on and triggered measurement at the end of the 60s monitoring time.

3.7.Occupied Channel Bandwidth

3.7.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum	Agilent	N9020A	MY48011676	Mar.20,2019	1 Year
Vector source	Agilent	N5182A	MY47420382	Mar.20,2019	1 Year
Analog signal source	Agilent	N5171B	MY51350292	Mar.20,2019	1 Year
Comprehensive measuring instrument	Rohde & Schwarz	CMW 500	1201.002K50	Mar.20,2019	1 Year
control unit	Tonscend	JS0806-2	10165	Mar.20,2019	1 Year
Testing software	Tonscend	JSTS1120-3	10165	Mar.20,2019	1 Year
N/A is an abbreviation for Not Applicable.					

3.7.2.Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.7 of EN 300 328 V2.1.1.
This requirement applies to all types of equipment using wide band modulations other than FHSS.

The Occupied Channel Bandwidth is the bandwidth that contains 99 % of the power of the signal.

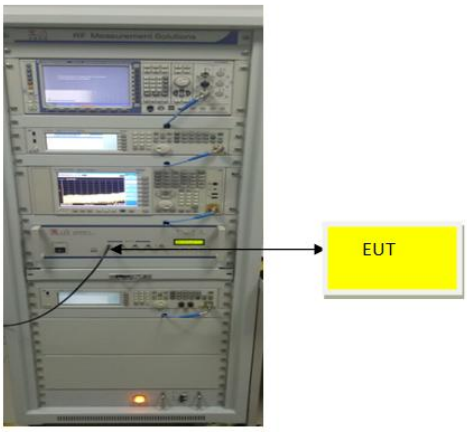
The Occupied Channel Bandwidth shall fall completely within the band given in table 1.
In addition, for non-adaptive equipment using wide band modulations other than FHSS and with e.i.r.p. greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

Table 1: Service frequency bands

	Service frequency bands
Transmit	2 400 MHz to 2 483,5 MHz
Receive	2 400 MHz to 2 483,5 MHz

3.7.3.Test method

(1) Connected the antenna port to the OSP of JSTS1120-3 system, read output power of the transmitter. (As below).



(2) Configure EUT work in lowest and highest TX frequency.

(3) Test conditions refer to chapter 5.4.7.1 of EN 300 328 V2.1.1.

(4) Test method refer to chapter 5.4.7.2.1 of EN 300 328 V2.1.1.

3.7.4.Test Information

EUT: WiFi Module	
M/N: WizFi630S	
Test Date: 2019.07.01	Tested by:Bing.He
Ambient Temperature: 23℃	Relative Humidity: 54%

3.7.5.Test Results

Test result: Pass

Module Mode	Channel	Occupied Channel Bandwidth (MHz)	Lower Band Edge (MHz)	Upper Band Edge (MHz)	Conclusion
IEEE 802.11b	Low CH	13.483315	2405.260842	2418.744157	PASS
	High CH	13.548307	2465.220848	2478.769154	PASS
IEEE 802.11g	Low CH	17.457818	2403.241095	2420.698913	PASS
	High CH	17.502812	2463.231096	2480.733908	PASS
IEEE 802.11n HT 20	Low CH	18.327709	2402.776153	2421.103862	PASS
	High CH	18.392701	2462.751156	2481.143857	PASS
IEEE 802.11n HT 40	Low CH	36.405449	2403.742282	2440.147732	PASS
	High CH	36.505437	2443.632296	2480.137733	PASS

3.8.Transmitter unwanted emissions in the out-of-band domain

3.8.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum	Agilent	N9020A	MY48011676	Mar.20,2019	1 Year
Vector source	Agilent	N5182A	MY47420382	Mar.20,2019	1 Year
Analog signal source	Agilent	N5171B	MY51350292	Mar.20,2019	1 Year
Comprehensive measuring instrument	Rohde & Schwarz	CMW 500	1201.002K50	Mar.20,2019	1 Year
control unit	Tonscend	JS0806-2	10165	Mar.20,2019	1 Year
Testing software	Tonscend	JSTS1120-3	10165	Mar.20,2019	1 Year
N/A is an abbreviation for Not Applicable.					

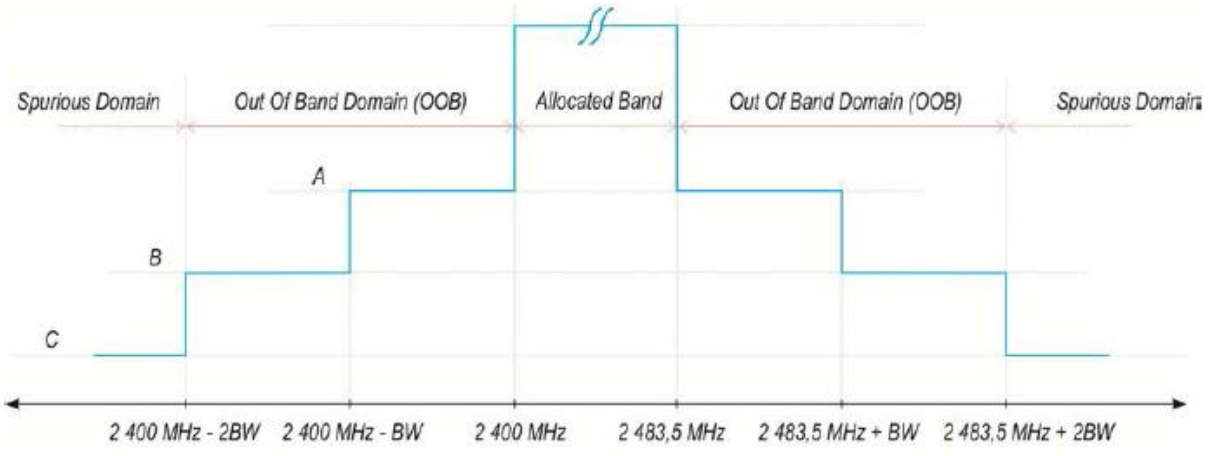
3.8.2.Limit ((ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.8 of EN 300 328 V2.1.1.

This requirement applies to all types of equipment using wide band modulations other than FHSS.

Transmitter unwanted emissions in the out-of-band domain are emissions when the equipment is in Transmit mode, on frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask as follow:

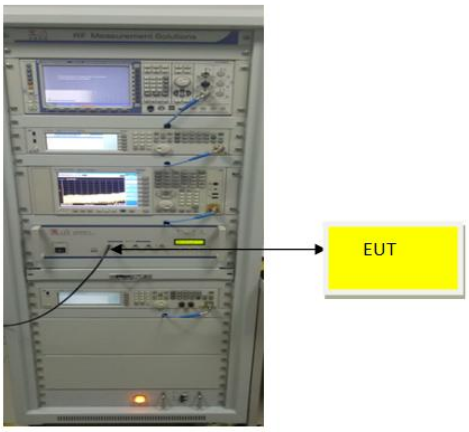


A: -10 dBm/MHz e.i.r.p.
B: -20 dBm/MHz e.i.r.p.
C: Spurious Domain limits

BW = Occupied Channel Bandwidth in MHz or 1 MHz whichever is greater

3.8.3.Test method

(1) Connected the antenna port to theOSP of JSTS1120-3 system, read output power of the transmitter. (As below)



(2) Configure EUT work in TX mode.

(3) Test conditions refer to chapter 5.4.8.1 of EN 300 328 V2.1.1.

(4) Test method refer to chapter 5.4.8.2.1 of EN 300 328 V2.1.1.

3.8.4.Test Information

EUT: WiFi Module	
M/N: WizFi630S	
Test Date: 2019.07.01	Tested by:Bing.He
Ambient Temperature: 23℃	Relative Humidity: 54%

3.8.5.Test Results

Test mode: IEEE 802.11b			Test result: Pass		
Test Band (MHz)		2412 MHz Results (dBm)	2472MHz Results (dBm)	Limit (dBm)	Result
Test condition: Normal					
1	2400-2*BW	-43.8	-43.3	-20	PASS
2	2400-BW	-40.3	-43.9	-10	PASS
3	2483.5+BW	-43.4	-41.0	-10	PASS
4	2483.5+2*BW	-42.8	-42.9	-20	PASS
Test condition: T:0℃ V: DC 3.3V					
1	2400-2*BW	-43.6	-43.2	-20	PASS
2	2400-BW	-39.2	-43.6	-10	PASS
3	2483.5+BW	-43.4	-40.9	-10	PASS
4	2483.5+2*BW	-42.5	-42.7	-20	PASS
Test condition: T:45℃ V: DC 3.3V					
1	2400-2*BW	-43.6	-43.6	-20	PASS
2	2400-BW	-39.7	-43.9	-10	PASS
3	2483.5+BW	-43.8	-40.7	-10	PASS
4	2483.5+2*BW	-42.9	-42.8	-20	PASS

Test mode: IEEE 802.11g			Test result: Pass		
Test Band (MHz)		2412 MHz Results (dBm)	2472MHz Results (dBm)	Limit (dBm)	Result
Test condition: Normal					
1	2400-2*BW	-43.8	-43.3	-20	PASS
2	2400-BW	-40.3	-43.9	-10	PASS
3	2483.5+BW	-43.4	-41.0	-10	PASS
4	2483.5+2*BW	-42.8	-42.9	-20	PASS
Test condition: T:0℃ V: DC 3.3V					
1	2400-2*BW	-43.6	-43.2	-20	PASS
2	2400-BW	-39.2	-43.6	-10	PASS
3	2483.5+BW	-43.4	-40.9	-10	PASS
4	2483.5+2*BW	-42.5	-42.7	-20	PASS
Test condition: T:45℃ V: DC 3.3V					
1	2400-2*BW	-43.6	-43.6	-20	PASS
2	2400-BW	-39.7	-43.9	-10	PASS
3	2483.5+BW	-43.8	-40.7	-10	PASS
4	2483.5+2*BW	-42.9	-42.8	-20	PASS

Test mode: IEEE 802.11n HT20			Test result: Pass		
Test Band (MHz)		2412 MHz Results (dBm)	2472MHz Results (dBm)	Limit (dBm)	Result
Test condition: Normal					
1	2400-2*BW	-43.8	-43.1	-20	PASS
2	2400-BW	-37.8	-43.6	-10	PASS
3	2483.5+BW	-43.6	-40.8	-10	PASS
4	2483.5+2*BW	-42.4	-42.0	-20	PASS
Test condition: T:0℃ V: DC 3.3V					
1	2400-2*BW	-43.8	-42.5	-20	PASS
2	2400-BW	-38.0	-43.0	-10	PASS
3	2483.5+BW	-43.7	-41.1	-10	PASS
4	2483.5+2*BW	-42.1	-42.7	-20	PASS
Test condition: T:45℃ V: DC 3.3V					
1	2400-2*BW	-43.6	-43.3	-20	PASS
2	2400-BW	-37.8	-43.5	-10	PASS
3	2483.5+BW	-43.5	-39.7	-10	PASS
4	2483.5+2*BW	-42.7	-42.7	-20	PASS

Test mode: IEEE 802.11n HT40			Test result: Pass		
Test Band (MHz)		2422 MHz Results (dBm)	2462MHz Results (dBm)	Limit (dBm)	Result
Test condition: Normal					
1	2400-2*BW	-43.2	-41.1	-20	PASS
2	2400-BW	-37.1	-43.2	-10	PASS
3	2483.5+BW	-43.0	-40.3	-10	PASS
4	2483.5+2*BW	-41.4	-41.0	-20	PASS
Test condition: T:0℃ V: DC 3.3V					
1	2400-2*BW	-43.0	-42.0	-20	PASS
2	2400-BW	-38.0	-43.0	-10	PASS
3	2483.5+BW	-44.0	-41.3	-10	PASS
4	2483.5+2*BW	-42.0	-42.6	-20	PASS
Test condition: T:45℃ V: DC 3.3V					
1	2400-2*BW	-43.1	-43.2	-20	PASS
2	2400-BW	-37.3	-43.0	-10	PASS
3	2483.5+BW	-43.2	-39.1	-10	PASS
4	2483.5+2*BW	-42.3	-42.1	-20	PASS

3.9. Transmitter unwanted emissions in the spurious domain

3.9.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Spectrum analyzer	R&S	FSV30	103559	2019.01.30	1 year
Trilog-board band antenna	Schwarzbeck	VULB 9163D	9163-971	2019.04.13	3 years
Horn antenna	Schwarzbeck	BBHA 9120D	9120D-1590	2019.04.13	3 years
Horn antenna	ETS	3160-09	00208373	2019.04.13	3 years
Pre-amplifier (Low Freq)	Claviio	BDLNA-0001-272007	1600015	2019.04.13	3 years
Pre-amplifier (High Freq)	Claviio	BDLNA-0118-352810	1600019	2019.04.13	3 years
Pre-amplifier (High Freq)	Claviio	BDLNA-1826-483105	1600013	2019.04.13	3 years

3.9.2. Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.9 of EN 300 328 V2.1.1.

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 12.

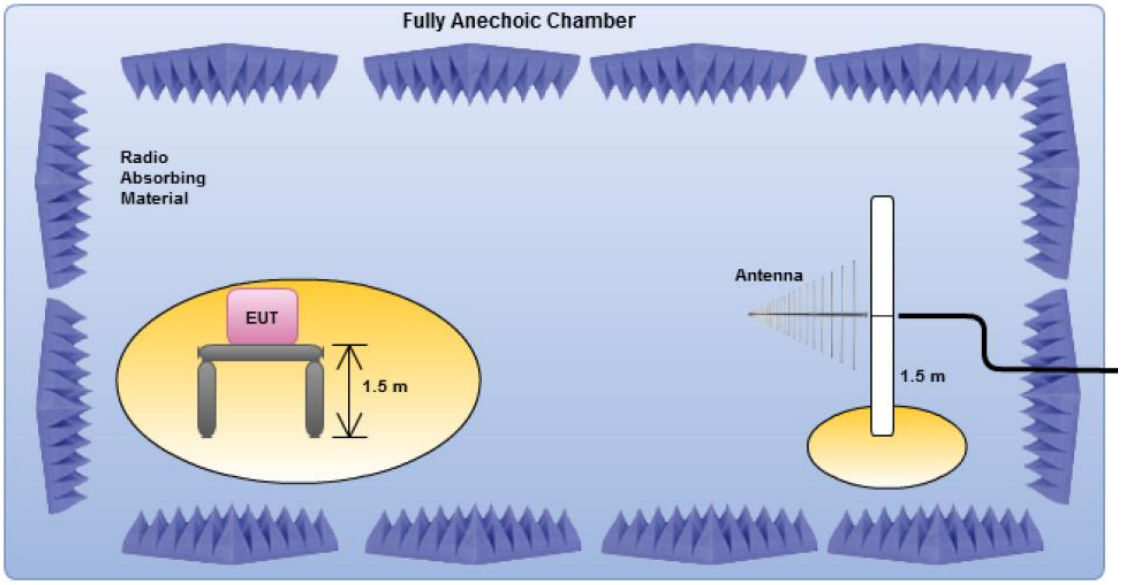
n case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

Table 12: Transmitter limits for spurious emissions

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

3.9.3.Test Method

(1) Test Setup.(As Below)



(2) Test conditions refer to chapter 5.4.9.1 of EN 300 328 V2.1.1.

(3) Test method refer to chapter 5.4.9.2.2 of EN 300 328 V2.1.1.

3.9.4.Test Information

EUT:	WiFi Module
M/N:	WizFi630S
Test Date:	2019.07.02
Test standard:	ETSI EN 300 328, V2.1.1/2016-11
Test mode:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20, IEEE 802.11n HT40
Test By:	Bing.He

3.9.5.Test Results

30MHz to 1GHz					
EUT mode	Frequency (MHz)	Spurious emissions level (dBm)	Limit (dBm)	Conclusion	Antenna Pole (H/V)
TX Mode	45.66	-60.93	-54.00	Pass	H
	88.63	-64.66	-54.00	Pass	V
1、“H” mean is horizontal direction, “V” mean is vertical direction.。 2、The worst case has recorded in the report.					

Above 1GHz					
EUT mode	Frequency (MHz)	Spurious emissions level (dBm)	Limit (dBm)	Conclusion	Antenna Pole (H/V)
IEEE 802.11b 2412MHz	4824.00	-46.36	-30.00	Pass	H
	7236.00	-49.52	-30.00	Pass	H
	4824.00	-47.25	-30.00	Pass	V
	7236.00	-49.45	-30.00	Pass	V
IEEE 802.11b 2472MHz	4944.00	-48.44	-30.00	Pass	H
	7416.00	-52.66	-30.00	Pass	H
	4944.00	-46.66	-30.00	Pass	V
	7416.00	-55.21	-30.00	Pass	V
Note: “H” mean is horizontal direction, “V” mean is vertical direction.					

Above 1GHz					
EUT mode	Frequency (MHz)	Spurious emissions level (dBm)	Limit (dBm)	Conclusion	Antenna Pole (H/V)
IEEE 802.11g 2412MHz	4824.00	-48.33	-30.00	Pass	H
	7236.00	-52.45	-30.00	Pass	H
	4824.00	-46.78	-30.00	Pass	V
	7236.00	-54.78	-30.00	Pass	V
IEEE 802.11g 2472MHz	4944.00	-47.82	-30.00	Pass	H
	7416.00	-55.03	-30.00	Pass	H
	4944.00	-49.10	-30.00	Pass	V
	7416.00	-57.12	-30.00	Pass	V
Note: “H” mean is horizontal direction, “V” mean is vertical direction.					

Above 1GHz					
EUT mode	Frequency (MHz)	Spurious emissions level (dBm)	Limit (dBm)	Conclusion	Antenna Pole (H/V)
IEEE 802.11n HT20 2412MHz	4824.00	-50.11	-30.00	Pass	H
	7236.00	-59.30	-30.00	Pass	H
	4824.00	-50.00	-30.00	Pass	V
	7236.00	-57.26	-30.00	Pass	V
IEEE 802.11n HT20 2472MHz	4944.00	-49.89	-30.00	Pass	H
	7416.00	-52.98	-30.00	Pass	H
	4944.00	-47.97	-30.00	Pass	V
	7416.00	-51.29	-30.00	Pass	V
Note: “H” mean is horizontal direction, “V” mean is vertical direction.					

Above 1GHz					
EUT mode	Frequency (MHz)	Spurious emissions level (dBm)	Limit (dBm)	Conclusion	Antenna Pole (H/V)
IEEE 802.11n HT40 2422MHz	4844.00	-45.79	-30.00	Pass	H
	7266.00	-49.34	-30.00	Pass	H
	4844.00	-46.04	-30.00	Pass	V
	7266.00	-49.26	-30.00	Pass	V
IEEE 802.11n HT40 2462MHz	4924.00	-46.41	-30.00	Pass	H
	7386.00	-48.78	-30.00	Pass	H
	4924.00	-47.85	-30.00	Pass	V
	7386.00	-50.28	-30.00	Pass	V
Note: “H” mean is horizontal direction, “V” mean is vertical direction.					

3.10.Receiver Spurious Emissions

3.10.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal and Spectrum Analyzer	Rohde &Schwarz	FSV	103173	2019.01.30	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	2019.04.13	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA9120D1002	2019.01.30	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170242	2019.04.13	1Year
Signal Amplifier	SCHWARZBECK	BBV9718	9718-212	2019.01.30	1 Year
Signal Amplifier	Rohde &Schwarz	SCU40	100437	2019.01.30	1 Year
Test Software	Audix	e3-6.111221a	/	/	/
Calibration Lab: CEPREI Calibration and Testing Center					

3.10.2.Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.10 of EN 300 328 V2.1.1.

This requirement applies to all types of equipment using wide band modulations other than FHSS.

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

The spurious emissions of the receiver shall not exceed the values given in table 13.

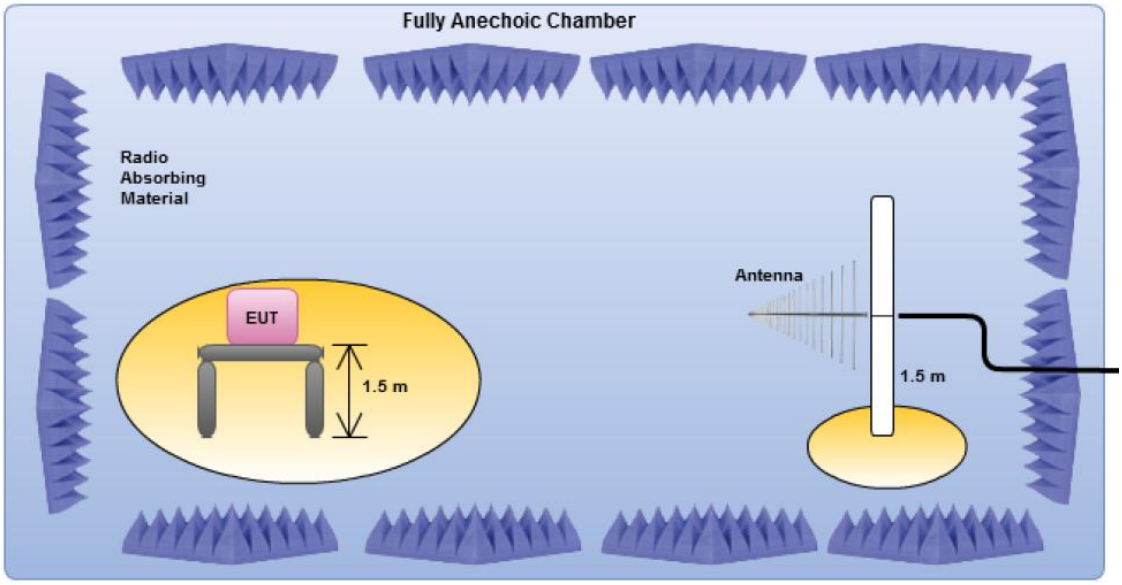
In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or for emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Table 13: Spurious emission limits for receivers

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

3.10.3.Test Method

(1) Test Setup.(As Below)



(2) Test conditions refer to chapter 5.4.10.1 of EN 300 328 V2.1.1.

(3) Test method refer to chapter 5.4.10.2.2 of EN 300 328 V2.1.1.

3.10.4.Test Information

EUT:	WiFi Module
M/N:	WizFi630S
Test Date:	2019.07.03
Test standard:	ETSI EN 300 328, V2.1.1/2016-11
Test mode:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n HT20, IEEE 802.11n HT40
Test By:	Bing.He

3.10.5.Test Results

EUT mode	Frequency (MHz)	Spurious emissions level (dBm)	Limit (dBm)	Conclusion	Antenna Pole (H/V)
RX Mode	35.66	-68.46	–57.00	Pass	H
	2869.36	-59.00	–47.00	Pass	H
	45.11	-64.96	–57.00	Pass	V
	3045.36	-60.11	–47.00	Pass	V
1、“H” mean is horizontal direction, “V” mean is vertical direction.。 2、The worst case has recorded in the report.					

3.11.Receiver Blocking

3.11.1.Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum	Agilent	N9020A	MY48011676	Mar.20,2019	1 Year
Vector source	Agilent	N5182A	MY47420382	Mar.20,2019	1 Year
Analog signal source	Agilent	N5171B	MY51350292	Mar.20,2019	1 Year
Comprehensive measuring instrument	Rohde & Schwarz	CMW 500	1201.002K50	Mar.20,2019	1 Year
control unit	Tonscend	JS0806-2	10165	Mar.20,2019	1 Year
Testing software	Tonscend	JSTS1120-3	10165	Mar.20,2019	1 Year
N/A is an abbreviation for Not Applicable.					

3.11.2.Limit (ETSI EN 300 328, V2.1.1/2016-11)

Refer to chapter 4.3.2.11 of EN 300 328 V2.1.1.

While maintaining the minimum performance criteria as defined in clause 4.3.2.11.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for the applicable receiver category provided in table 14, table 15 or table 16.

This requirement applies to all receiver categories.

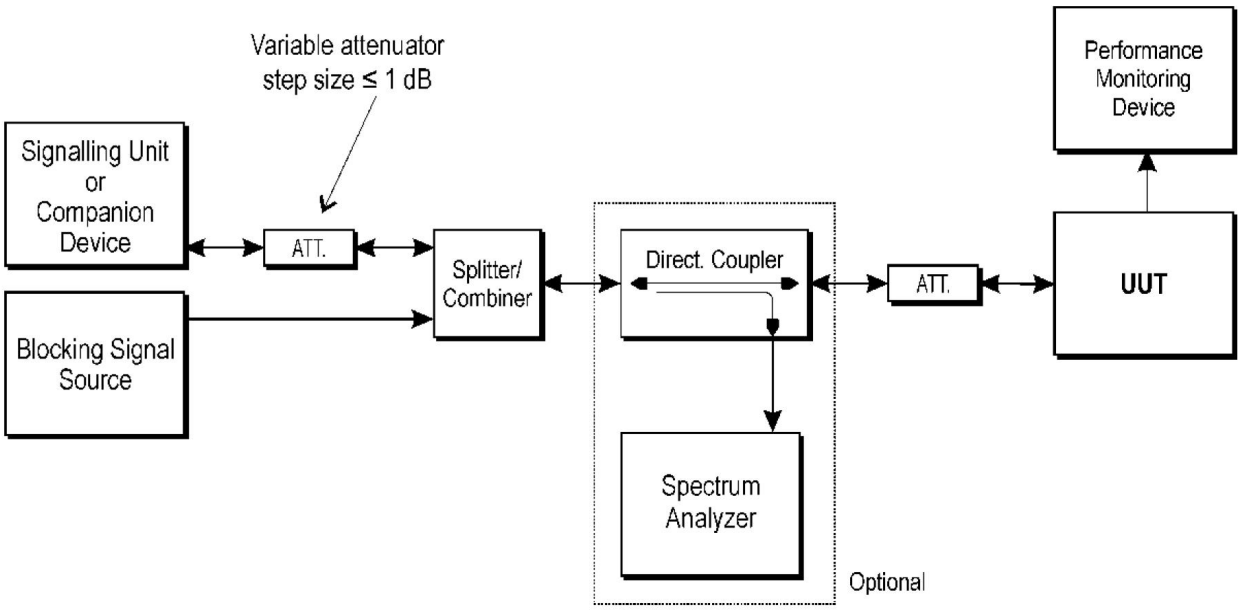
Receiver Catergory		
☒Category 1	☐ Category 2	☐ Category 3
Minimum performance criterion	☒PER ≤ 10%	
	☐Alternative performance criteria(See Note)	
Note: The manufacturer was declared performance criteria is x% for the intended use of the equipment		

Table 14: 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 the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 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.			

3.11.3.Test Method

(1) Test Setup.(As Below)



(2) Test conditions refer to chapter 5.4.11.1 of EN 300 328 V2.1.1.

(3) Test method refer to chapter 5.4.11.2.1 of EN 300 328 V2.1.1.

3.11.4.Test information

EUT:	WiFi Module
M/N:	WizFi630S
Test Date:	2019.07.02
Test standard:	ETSI EN 300 328 V2.1.1/2016-11
Test mode:	IEEE 802.11b Low Channel and High Channel (Worst)
Test By:	Bing.He

3.11.5.Test Results

Frequency (MHz)	Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)	PER (%)	Limit	Result
2412MHz	$P_{min + 6}$	2380	-53	3.1	10%	Pass
		2503.5	-53	3.0	10%	Pass
		2300	-47	4.1	10%	Pass
		2330	-47	4.0	10%	Pass
		2360	-47	4.1	10%	Pass
		2523.5	-47	3.0	10%	Pass
		2553.5	-47	3.0	10%	Pass
		2583.5	-47	3.0	10%	Pass
		2613.5	-47	3.0	10%	Pass
		2643.5	-47	3.0	10%	Pass
		2673.5	-47	3.0	10%	Pass
2472MHz	$P_{min + 6}$	2380	-53	4.2	10%	Pass
		2503.5	-53	4.2	10%	Pass
		2300	-47	4.9	10%	Pass
		2330	-47	4.9	10%	Pass
		2360	-47	4.9	10%	Pass
		2523.5	-47	4.4	10%	Pass
		2553.5	-47	4.4	10%	Pass
		2583.5	-47	4.4	10%	Pass
		2613.5	-47	4.4	10%	Pass
		2643.5	-47	4.4	10%	Pass
		2673.5	-47	4.4	10%	Pass

3.12. Geo-location capability

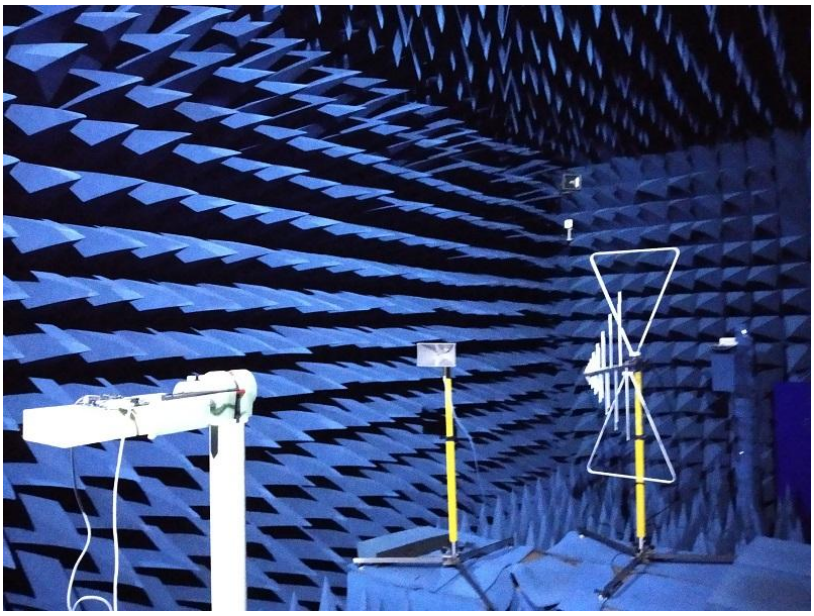
N/A (Not Applicable)
This requirement only applies to equipment with geo-location capability.

Geo-location capability is a feature of the equipment to determine its geographical location with the purpose to configure itself according to the regulatory requirements applicable at the geographical location where it operates.

The geo-location capability may be present in the equipment or in an external device (temporary) associated with the equipment operating at the same geographical location during the initial power up of the equipment. The geographical location may also be available in equipment already installed and operating at the same geographical location.

4. PHOTOGRAPHS OF TEST SETUP

4.1. Set-up for Transmitter & Receiver Spurious Emissions, Below 1GHz & Above 1GHz

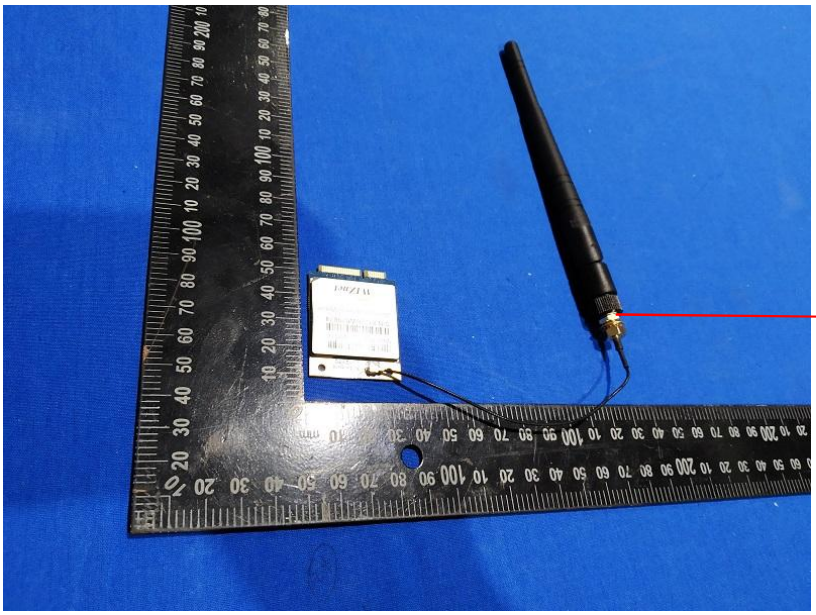


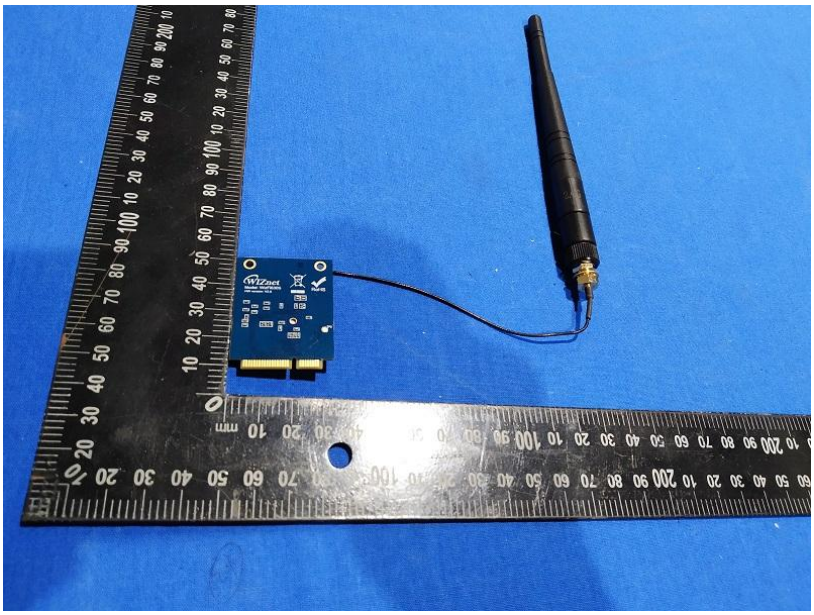
4.2. Set-up for Radio Spectrum Testing, Condition

5. PHOTOGRAPHS OF EUT

External Photos

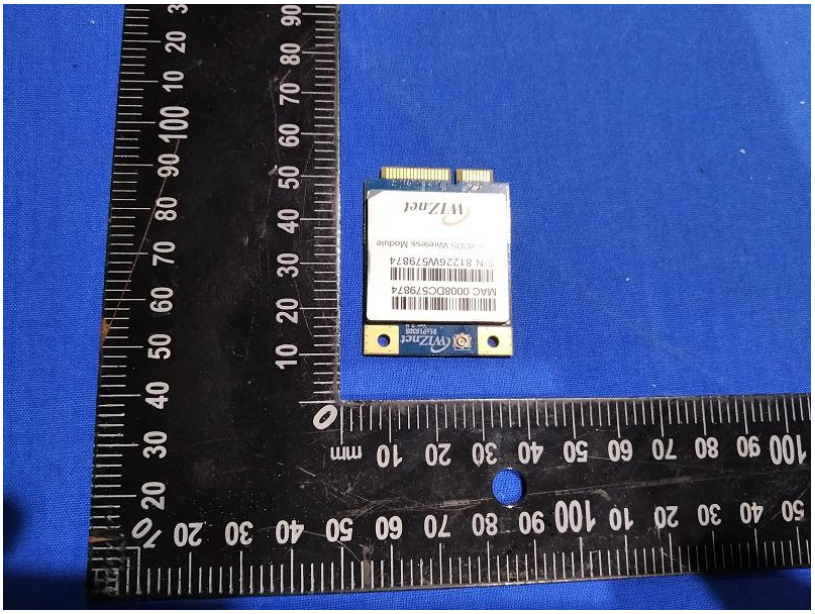
Model: WizFi630S

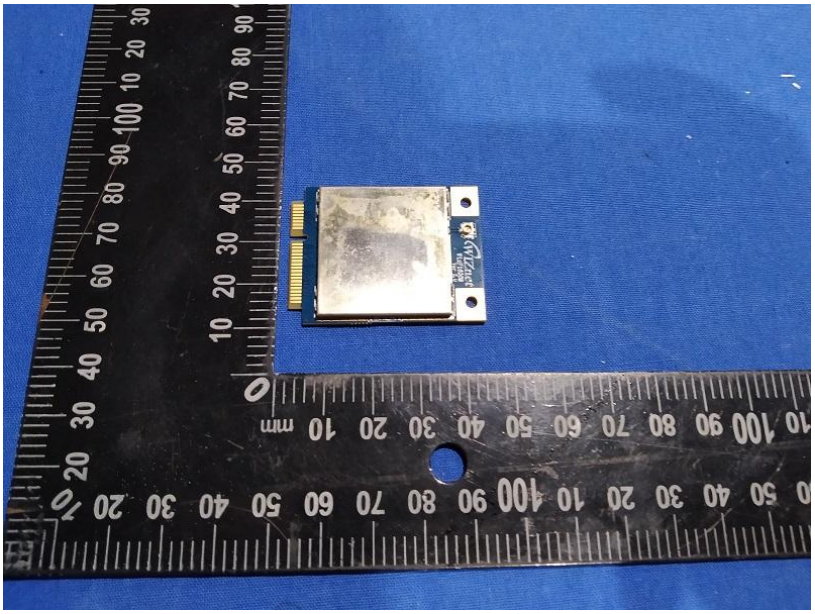




Internal Photos

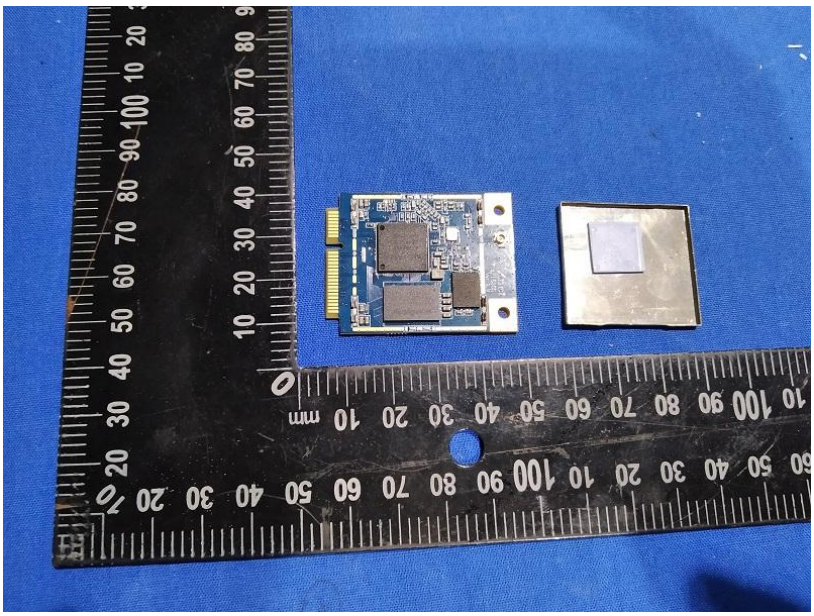
M/N: WizFi630S

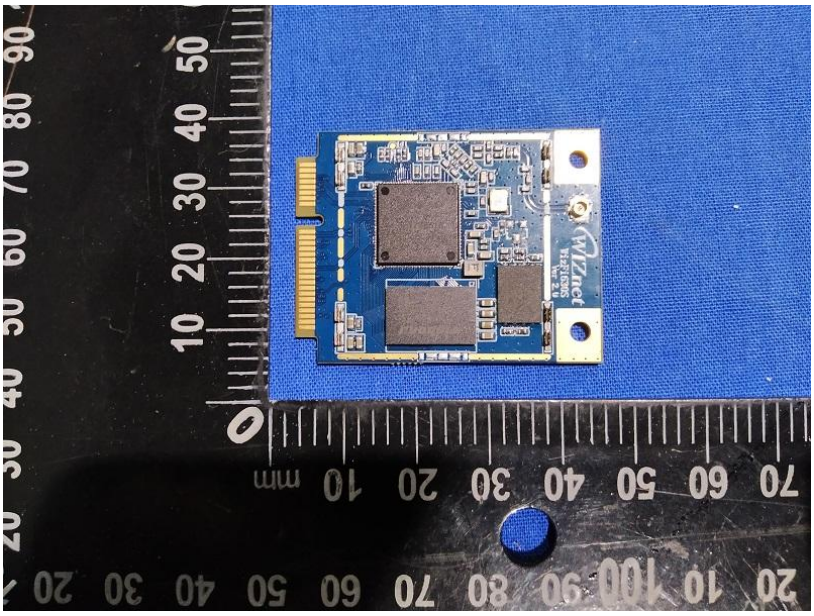




Internal Photos

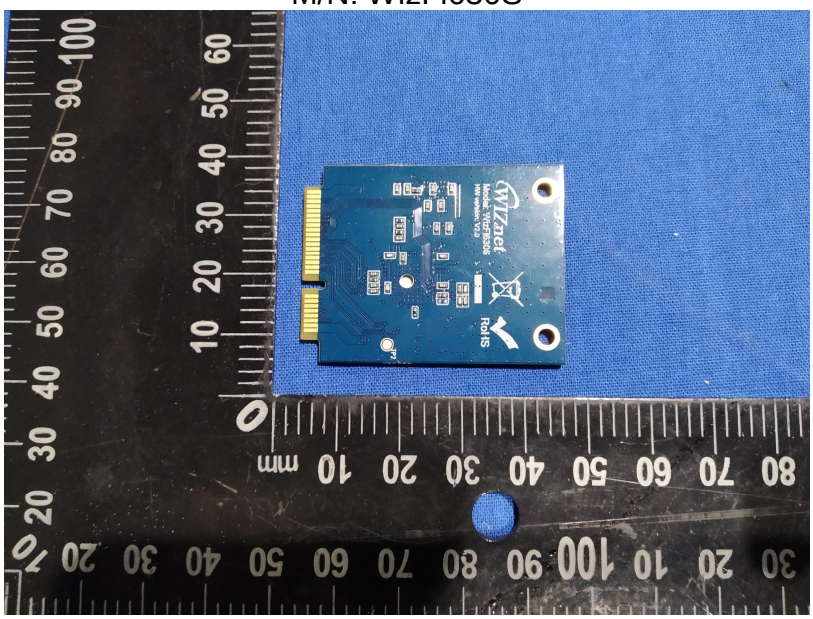
M/N: WizFi630S





Internal Photos

M/N: WizFi630S



End of Report

Statement

1. The calibration and measurement of test equipments used in our laboratory are traceable to National primary standard of measurement and BIPM.
2. The report is invalid without the special test seal of the company.
3. The test report is invalid without the signature of main tester,examiner and approver.
4. The report is invalid if altered and added or deleted.
5. The test results in this report only apply to the tested samples.
6. This test report shall not be reproduced except in full, without the written approval of our laboratory.
7. “☆”item cannot be Accredited by CNAS.
8. Any objections must be raised to KeySense within 15days since the date when report is received.

Test Laboratory: KeySense Testing & Certification International Co., Ltd.
Address: 1-3F,Lab Building,No.29 District,ZhongKai Hi-Tech Industrial Development Park,Huizhou,Guangdong,China
Postcode: 516006 Fax: 0752-3219929
Tel: 0752-3219929 E-mail: keysense@kst-cert.com