ETSI EN 301 893 V2.1.1 (2017-05)

TEST REPORT

For

Wallys Communications（SuZhou）Co.,LTD

Room 2723,Le Jia building,Jia Rui Xiang No.8, Suzhou Industrial Park, Suzhou, P.R Suzhou, 215000 China

Tested Model: DR900VX
Series Model: DR900VX-4.9,DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX

Report Type:	**Product Type:**
Original Report	Dual Band 11AC wireless Module

Test Engineer:	Carry Cai
Report Number:	RKSA191022001-01C
Report Date:	2019-11-25
Reviewed By:	Oscar Ye EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Wallys Communications（SuZhou）Co.,LTD
Tested Model:	DR900VX
Series Model:	DR900VX-4.9,DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX
Model Difference:	Model names
Product Type:	Dual Band 11AC wireless Module
Power Supply:	DC 3.3V
RF Function:	2.4G Wi-Fi, 5G Wi-Fi, DFS
Operating Band/Frequency:	2.4G Wi-Fi: 2412-2472 MHz 5G Wi-Fi Band1: 5150-5250MHz,5G Wi-Fi Band2: 5250-5350MHz 5G Wi-Fi Band3: 5470-5725MHz
Channel Number:	2.4G Wi-Fi: 13; 5G Wi-Fi B1:7, B2:7, B3:18
Channel Separation:	2.4G Wi-Fi: 5MHz; 5G Wi-Fi B1,B2,B3:10MHz
Antenna Type:	Omni antenna
Antenna Gain:	2.0dBi

**All measurement and test data in this report was gathered from production sample serial number: 20191022001. (Assigned by BACL, Kunshan). The EUT was received on 2019-10-22.*

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Objective

This report is prepared on behalf of *Wallys Communications（SuZhou）Co.,LTD* in accordance with ETSI EN 301 893 V2.1.1 (2017-05), 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

The objective is to determine the compliance of EUT with ETSI EN 301 893 V2.1.1 (2017-05).

Related Submittal(s)/Grant(s)

N/A.

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 893 V2.1.1 (2017-05).

Measurement Uncertainty

Item		Uncertainty
RF Output Power with Power meter		0.5dB
Power Spectral Density, conducted		0.5dB
Unwanted Emissions, conducted		2.34 dB
Radiated emission	30MHz~1GHz	5.91dB
	1GHz~6GHz	4.68dB
	6 GHz ~18 GHz	4.92dB
	18 GHz~40 GHz	4.88dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%
Time		5 %
Supply voltages		0.4%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01), the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing according to EN 301 893

Equipment Modifications

No modifications were made to the EUT.

EUT Exercise Software

No Exercise Software.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Notebook	E6410	3094742521
TP-LINK	Router	TL-WDR5620	1188431022424

External I/O Cable

Cable Description	Shielding Type	Length (m)	From Port	To
RJ45 Cable	Unshielding	2.0	Notebook	Router

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SUMMARY OF TEST RESULTS

EN 301 893 V2.1.1 (2017-05)	Description of Test	Result
Clause 4.2.6.2.2	DFS: Channel Availability Check	Not Applicable (See Note1)
Clause 4.2.6.2.3	DFS: Off-Channel CAC – Radar Detection Threshold Level	Not Applicable (See Note1)
Clause 4.2.6.2.3	DFS: Off-Channel CAC – Detection Probability	Not Applicable (See Note1)
Clause 4.2.6.2.4	DFS: In service Monitoring	Not Applicable (See Note1)
Clause 4.2.6.2.5	DFS: Channel shutdown	Compliant
Clause 4.2.6.2.6	DFS: Non-occupancy period	Not Applicable (See Note1)
Clause 4.2.6.2.7	DFS: Uniform spreading	Not Applicable (See Note1)

Note 1: EUT is slave devices with a maximum transmit power of less than 200 mW e.i.r.p.

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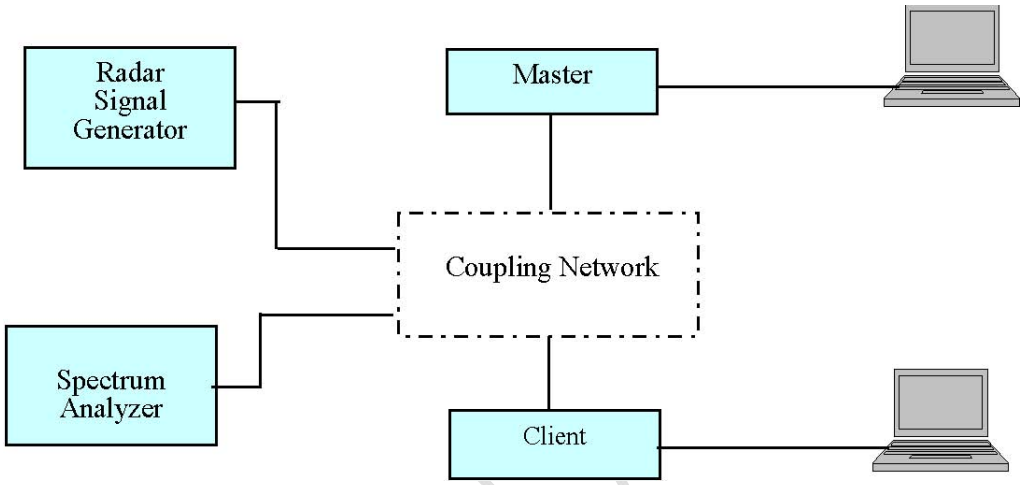
DFS Measurement System

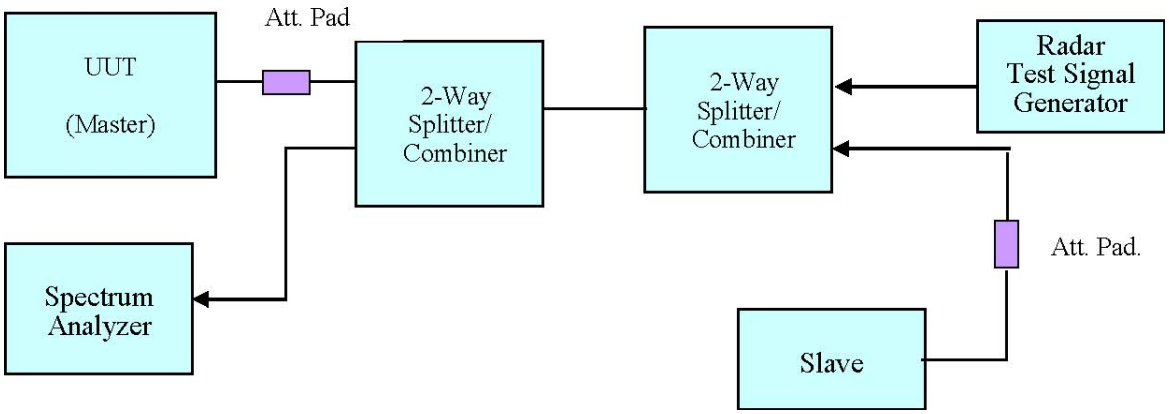
BACL DFS measurement system consists of two subsystems:

(1) The radar signal generating subsystem and
(2) The traffic monitoring subsystem.

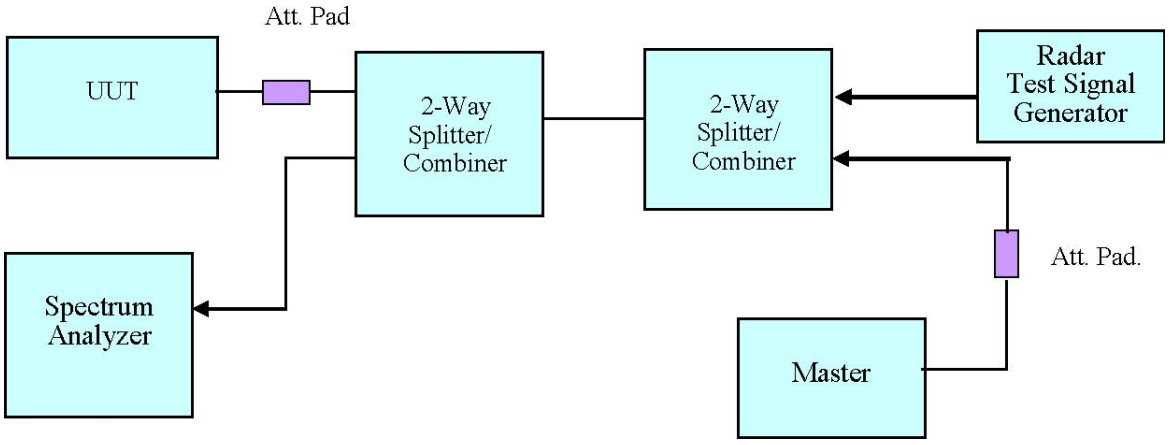
System Block Diagram



Conducted Method

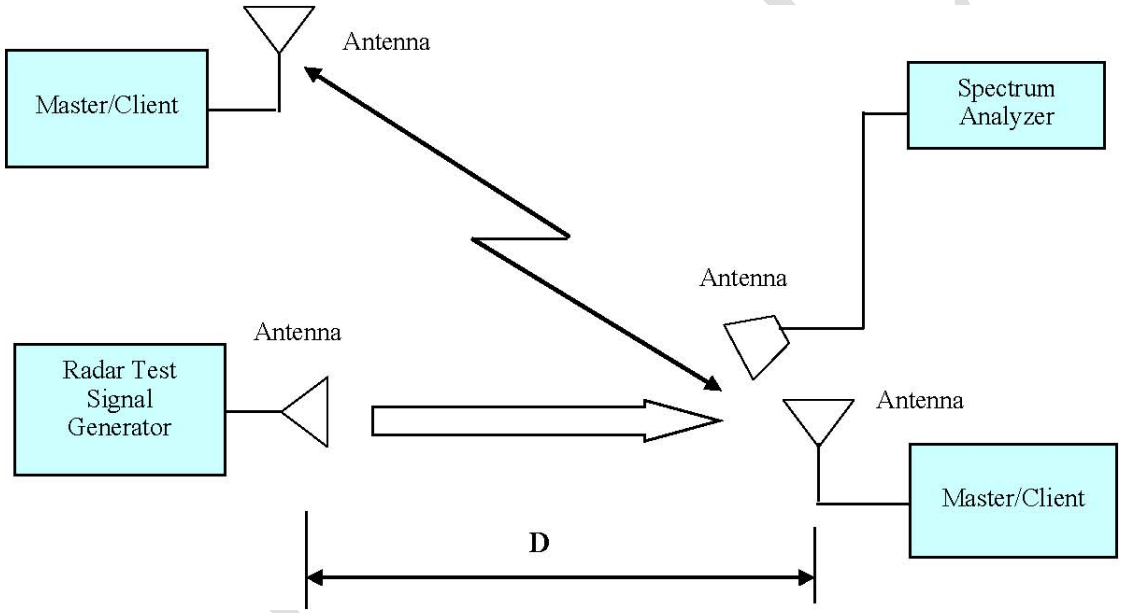


Setup for Master with injection at the Master



Setup for Client with injection at the Master

Radiated Method



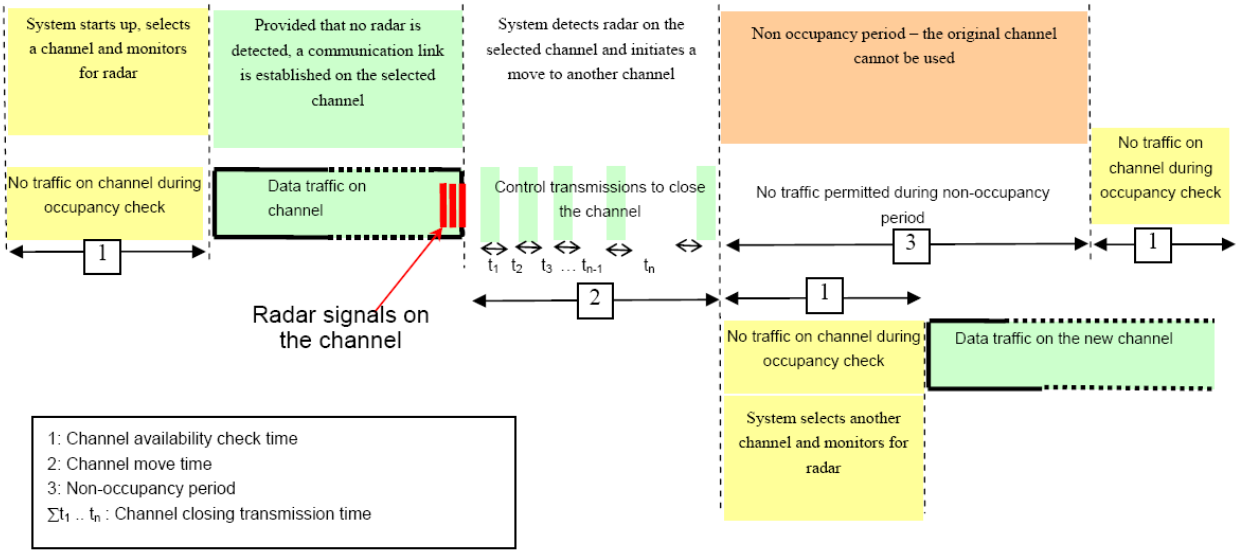
Setup for Radiated Method

Test Procedure

A spectrum analyzer is used as a monitor verifies that the EUT status including Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the diction and Channel move. It is also used to monitor EUT transmissions during the Channel Availability Check Time.

DFS Implementation

Please refer to the block diagram:



Description of EUT

The EUT operates in 5250-5350 MHz range when performing DFS testing.

The EIRP Spectrum Density of EUT for the 5250-5350MHz band (20MHz) is -2.47dBm/MHz, Therefore DFS Detection Threshold (dBm) = -62 + 10 – (4.93) + 2 = -54.93 dBm. The calibrated radiated DFS detection threshold level is set to -62.79 dBm for this band.

The EIRP Spectrum Density of EUT for the 5250-5350MHz band (40MHz) is -7.19dBm/MHz, Therefore DFS Detection Threshold (dBm) = -62 + 10 – (-3.16) + 2 = -46.84 dBm. The calibrated radiated DFS detection threshold level is set to -62.55 dBm for this band.

The EUT operates in 5470-5725 MHz range when performing DFS testing.

The EIRP Spectrum Density of EUT for the 5470-5725MHz band (20MHz) is -5.53dBm/MHz, Therefore DFS Detection Threshold (dBm) = -62 + 10 – (5.59) + 2 = -55.59 dBm. The calibrated radiated DFS detection threshold level is set to -62.30 dBm for this band.

The EIRP Spectrum Density of EUT for the 5470-5725MHz band (40MHz) is -8.30dBm/MHz, Therefore DFS Detection Threshold (dBm) = -62 + 10 – (-2.38) + 2 = -47.62 dBm. The calibrated radiated DFS detection threshold level is set to -62.22 dBm for this band.

Channel loading

The DFS tests related to the Channel CAC Check and the In-Service Monitoring shall be performed by using a test transmission sequence on the Operating Channel that shall
consist of packet transmissions that together exceed the transmitter minimum activity ratio of 30 % measured over an interval of 100 ms. The duration of the sequence shall be adequate for the DFS test purposes.

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Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	SIGNAL ANALYZER	FSV40	101116	2019-07-22	2020-07-21
Rohde & Schwarz	VECTOR SIGNAL GENERATOR	SMBV100A	261558	2019-07-22	2020-07-21
Tonscend Corporation	RF Control Unit	JS0806-2	/	2019-08-01	2020-07-31
Tonscend Corporation	RF Test System	JS1120-3	/	N/A	N/A

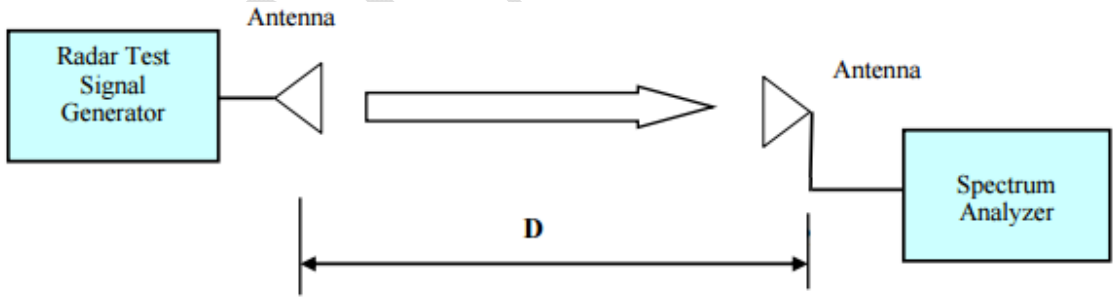
Statement of Traceability: BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

Environmental Conditions

Temperature:	24.5℃
Relative Humidity:	50 %
ATM Pressure:	1010 hPa

The testing was performed by Carry Cai on 2019-11-18.

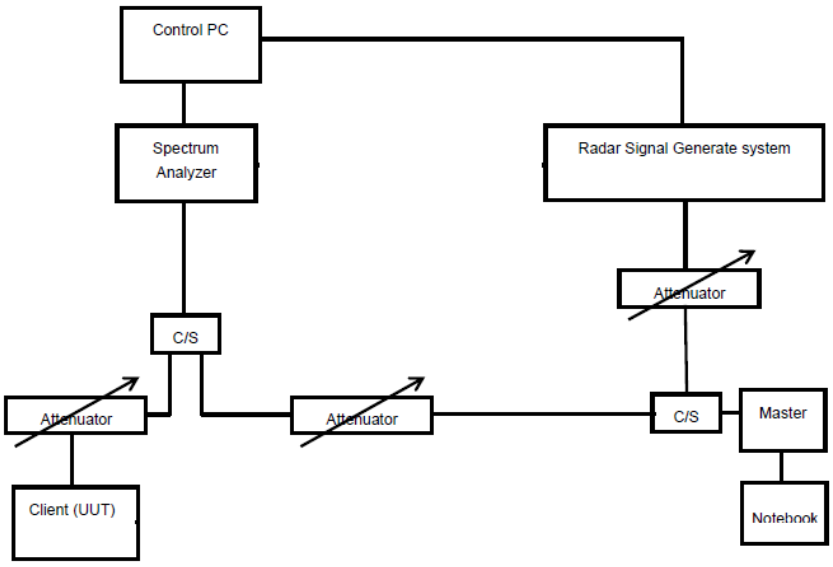
Radar Waveform Calibration



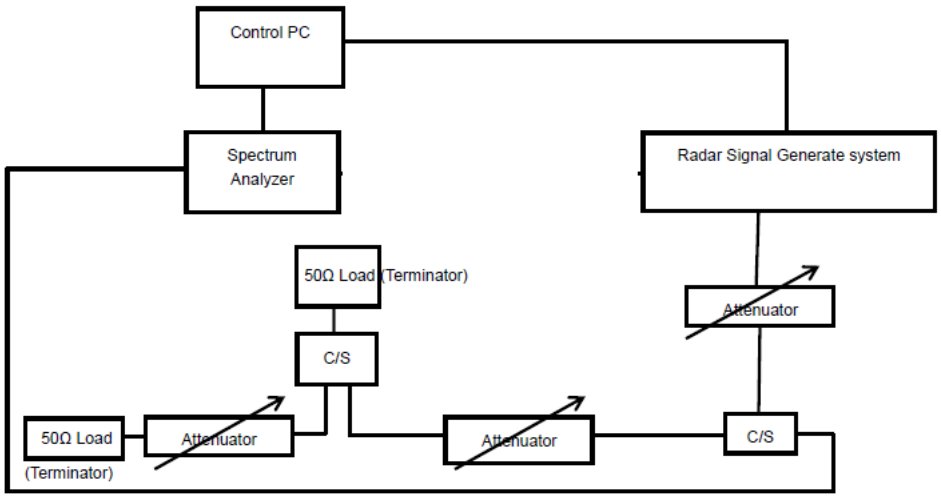
Radiated Calibration Setup Block Diagram

Note: the calibration distance(D) was 3 meter.

Conduted Test Setup Configuration



Cablibration of DFS Detection Threshold Level



CHANNEL SHUTDOWN

Test Procedure:

Perform radar at a level of 10 dB above the level defined in clause 5.4.8.2.1 on the selected channel.
The aggregate channel closing transmission time is calculated as follows:
Aggregate Transmission Time = N * Dwell Time
N is the number of spectrum analyzer bins showing a device transmission
Dwell Time is the dwell time per bin (i.e. Dwell Time = S/B, S is the sweep time and B is the number of bin, i.e. 8001)

Results:

Frequency(MHz)	Bandwidth (MHz)	Results
5320	20	Compliant
5500	20	Compliant
5310	40	Compliant
5510	40	Compliant

Please refer to the following tables and plots.

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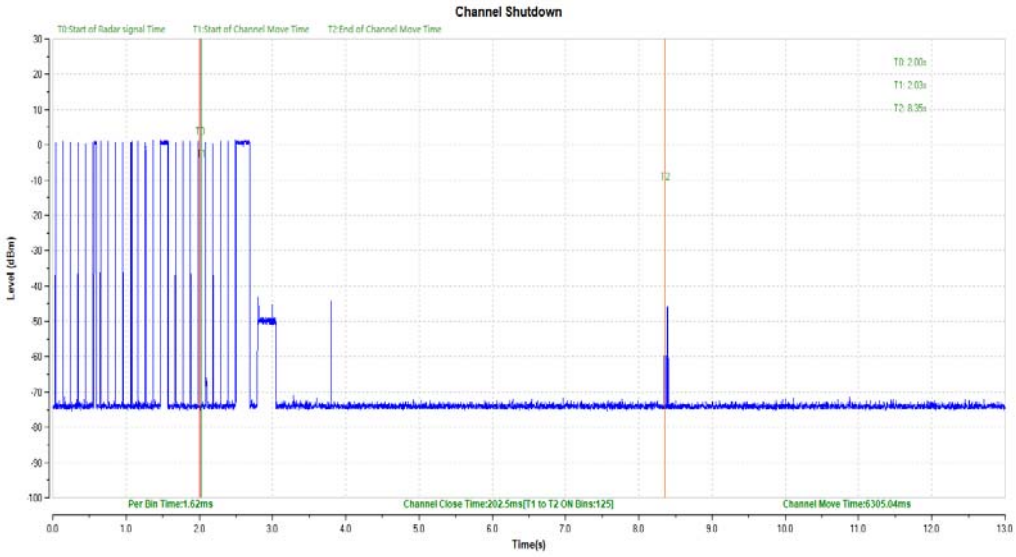
5320 MHz Bandwidth 20 MHz

Channel move time result:

Item	Time (s)	Limit (s)
Channel move time	6.305	10

Channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)
202.5	1000



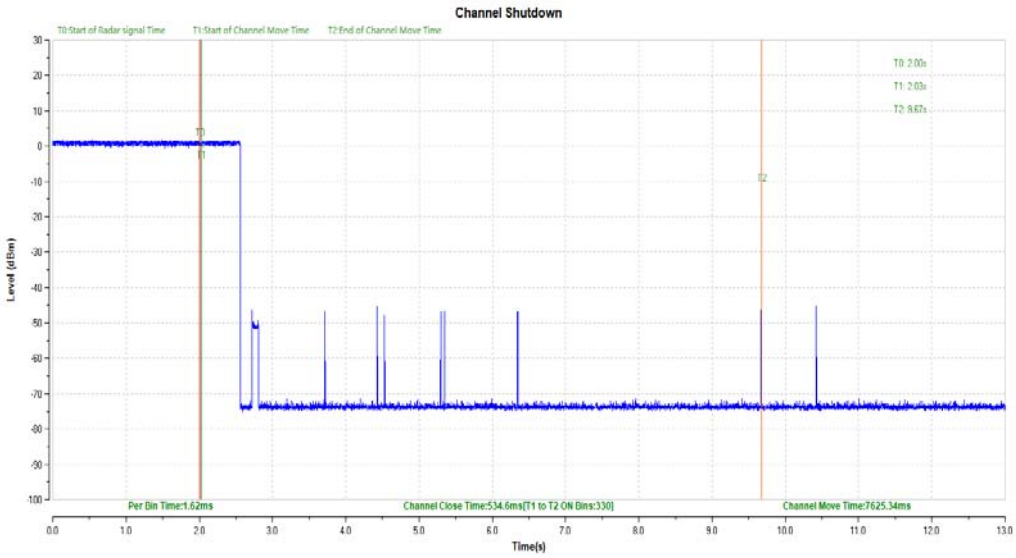
5500 MHz Bandwidth 20 MHz

Channel move time result:

Item	Time (s)	Limit (s)
Channel move time	7.625	10

Channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)
534.6	1000



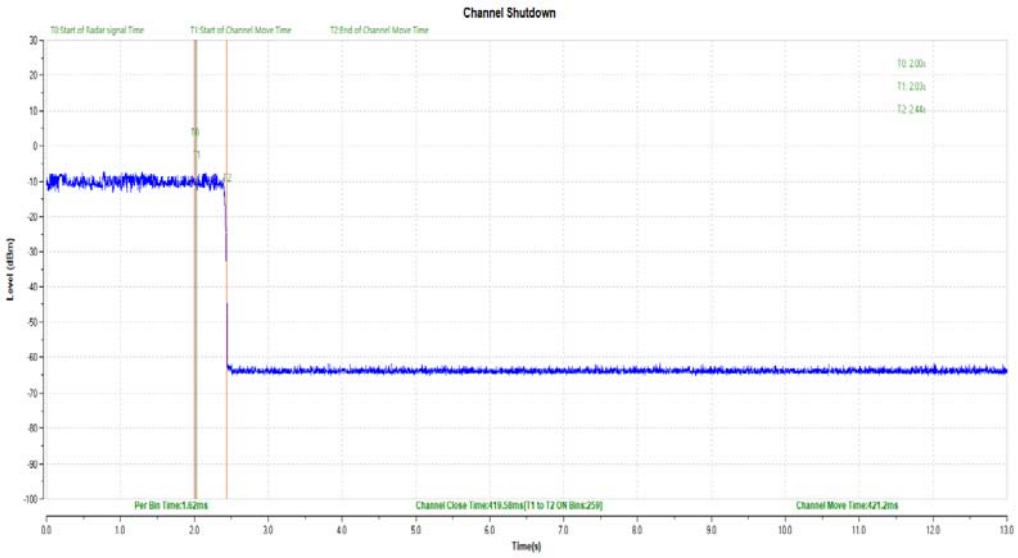
5310 MHz Bandwidth 40 MHz

Channel move time result:

Item	Time (s)	Limit (s)
Channel move time	0.421	10

Channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)
419.58	1000



5510 MHz Bandwidth 40 MHz

Channel move time result:

Item	Time (s)	Limit (s)
Channel move time	0.411	10

Channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)
409.86	1000

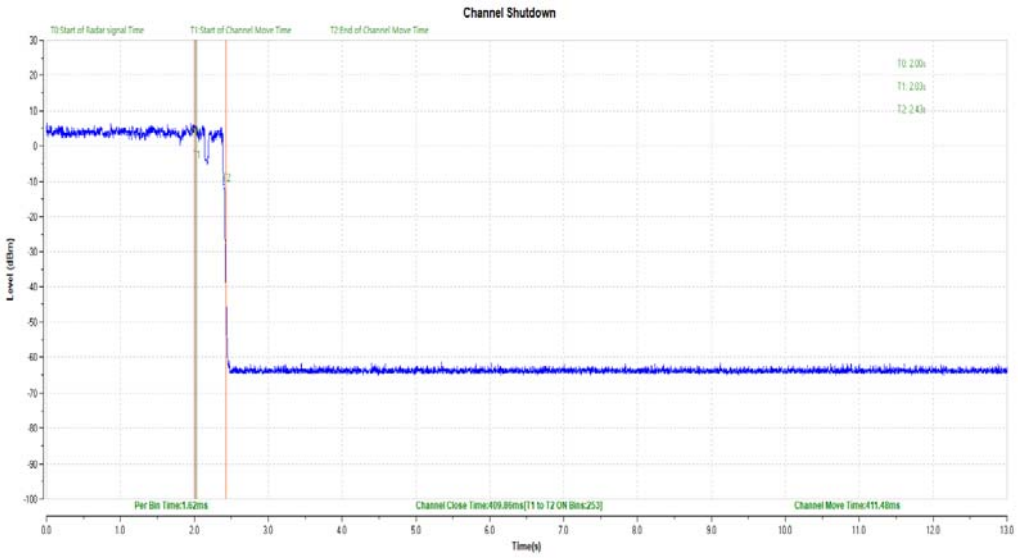
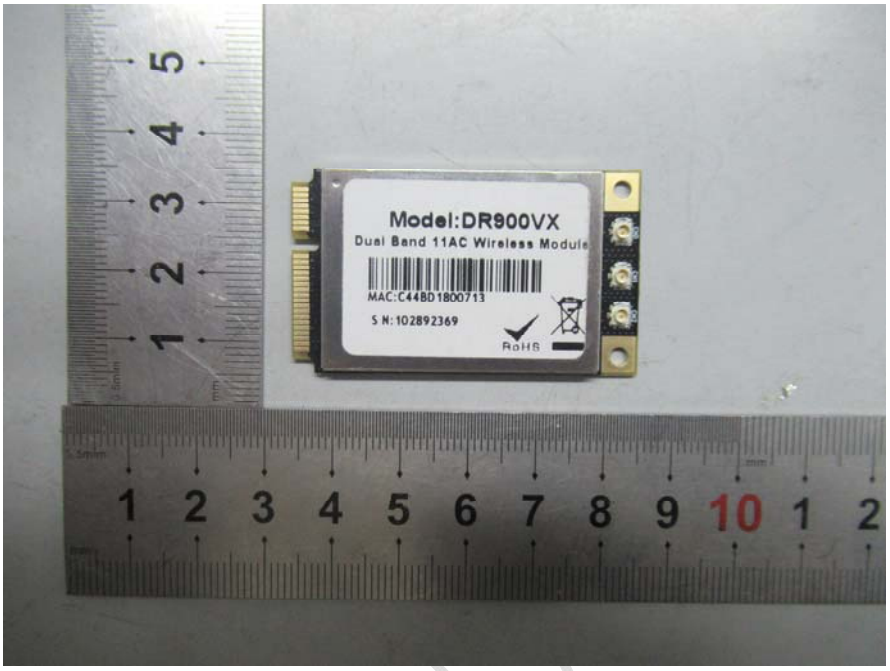
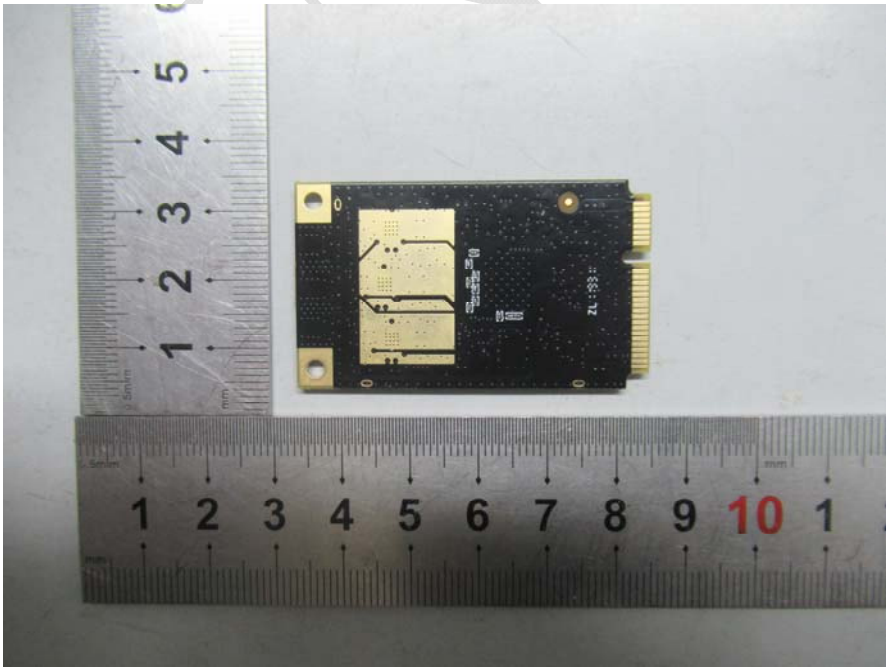


EXHIBIT A - EUT PHOTOGRAPHS

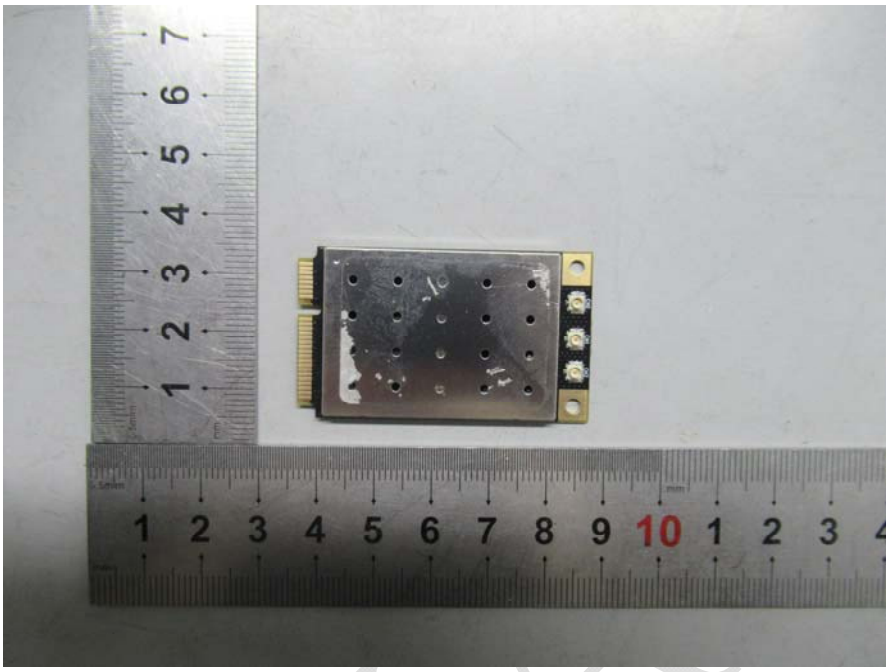
EUT – Top View



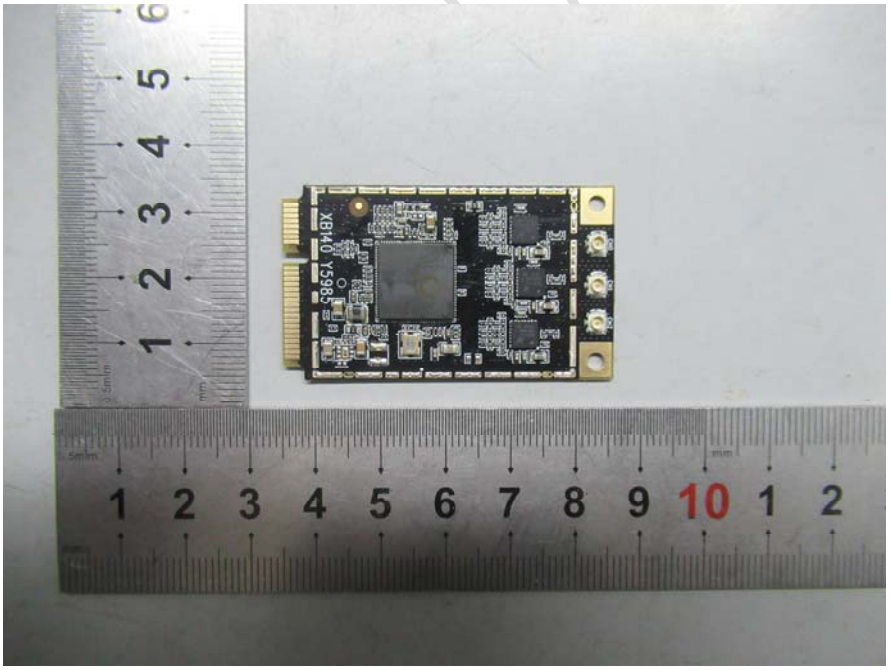
EUT – Bottom View



EUT – PCB Top View

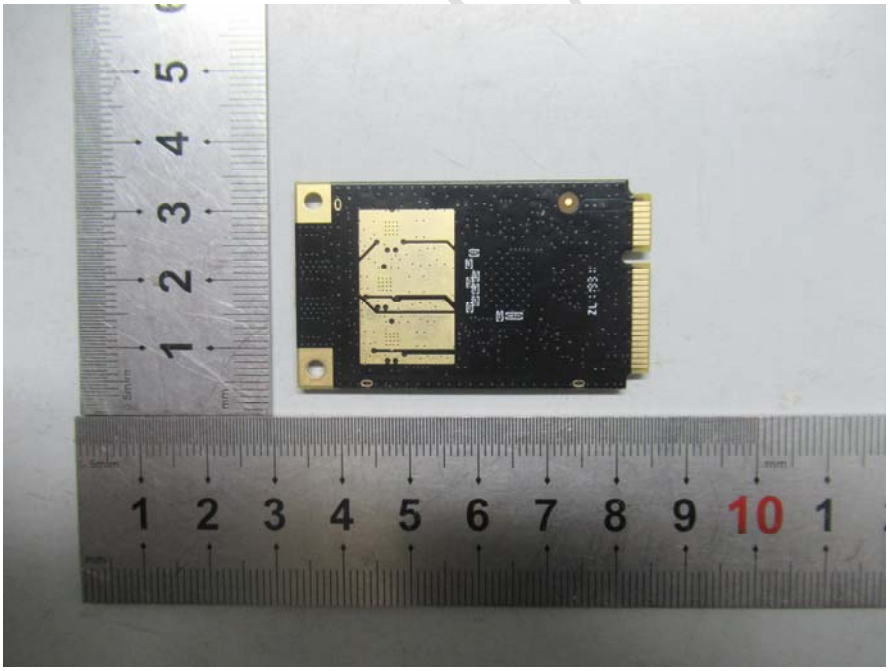


EUT – PCB Top Shielding off View

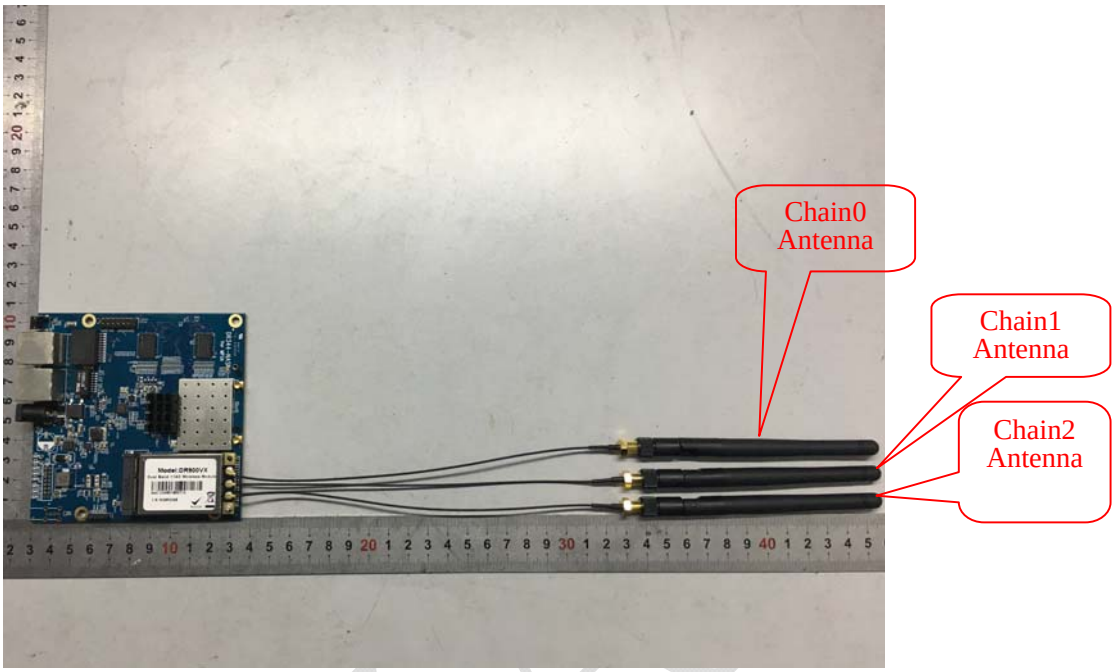


EUT – PCB Top Chip View

EUT – PCB Bottom View



EUT with Base plate View



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PRODUCT SIMILARITY DECLARATION LETTER

Wallys Communications（SuZhou）Co.,LTD
Add: Room 2723,Le Jia building,Jia Rui Xiang No.8, Suzhou Industrial Park, Suzhou, P.R Suzhou, 215000 China
Tel: 18913094531
Fax: 0512-62815802
Mail: richard_zhu@wallystech.com
Date: 2019-10-20

DECLARATION OF SIMILARITY

Dear Sir or Madam:

We, Wallys Communications（SuZhou）Co.,LTD, hereby declare that product:

Dual Band 11AC wireless Module , as following models: DR900VX, DR900VX-4.9, DR600VX,DR600VX-4.9,DR900VX-MX,DR600VX-MX.And only DR900VX was tested by BACL with the same electromagnetic emissions and electromagnetic compatibility characteristics.

The detail differences description as below:
All the products are the different model name, with the same appearance, structure, power and size, and schematic and PCB design.
Please contact me if there is need for any additional clarification or information.

Best Regards,
Signature: 

Contact Person: Richard
Title: Engineer

******* END OF REPORT *******