EMC TEST REPORT

Test Report No.	:	KES-E1-19T0530-R1
Date of Issue	:	Nov. 21, 2019
Product name	:	802.11abgn, USB module
Model/Type No.	:	WUBR-508N
Variant Mode	:	-
Applicant	:	SprakLAN Communications, Inc.
Applicant Address	:	8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan
Manufacturer	:	SprakLAN Communications, Inc.
Manufacturer Address	:	8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan
Equipment authorization	:	**Supplier's Declaration of Conformity**
Date of Receipt	:	Jun. 14, 2019
Test date	:	Jul. 22, 2019 ~ Jul. 23, 2019
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Tae Yeon, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 04, 2019	KES-E1-19T0530	Issued
Nov. 21, 2019	KES-E1-19T0530-R1	Applicant change (DRTECH Corporation => SprakLAN Communications, Inc.)

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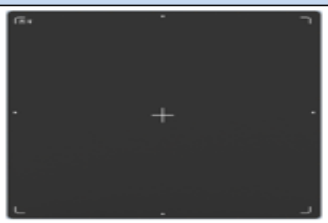
1.0 General Product Description

Main Specifications of HOST are:

	EVS 4343W / EVS 4343WG/EVS 4343WP	EVS 3643W / EVS 3643WG / EVS 3643WP
Image		
Scintillator	EVS 4343W / EVS 4343WP (Cesium Iodide) EVS 4343WG (Gadolinium Oxysulfide)	EVS 3643W/ EVS 3643WP (Cesium Iodide) EVS 3643WG (Gadolinium Oxysulfide)
Interface	Wireless: Gigabit Ethernet	
Purpose	General Radiography	
Pixel Pitch	140 um	
Image Matrix Size	3072 × 3072 pixels	2560 x 3072 pixels
Effective Imaging Area	430 x 430 mm	358 x 430 mm
Preview Time	< 2 sec	
Image Acquisition Time	< 4.6 sec	
Spatial Resolution	Min. 3.5 line pair/㎜	
Power Supply	12 Vdc, 7.08 A	
Power Consumption	15W (Max)	
Dimensions (㎜)	460 (W) × 460 (H) × 15 (D)	460 (W) × 386 (H) × 15 (D)
Weight (kg)	3.45 kg	2.98 kg
Wireless Frequency range	2412 MHz ~ 2472 MHz (802.11b,g,n (20MHz)) 2422 MHz ~ 2462 MHz (802.11n (40MHz)) 5180 MHz ~ 5240 MHz (802.11a,n (20MHz)) 5190 MHz ~ 5230 MHz (802.11n (40MHz)) 5260 MHz ~ 5320 MHz (802.11a,n (20 MHz)) 5270 MHz ~ 5310 MHz (802.11n (40 MHz)) 5500 MHz ~ 5700 MHz (802.11a,n (20 MHz)) 5510 MHz ~ 5670 MHz (802.11n (40 MHz))	
Wireless Modulation type	802.11 b,g,n,a	
Wireless Output Power	2.4 GHz : 19.12 dBm (802.11b,g,n) 5 GHz : 22.87 dBm (802.11a,n)	
Wireless Channel	2.4 GHz : 13ch / 11ch 5 GHz : 4ch / 2ch / 11ch / 5ch	
Antenna Gain (peak)	2.4 GHz : 3.0 dBi 5 GHz : 5.0 dBi	

Host model information

Host model No.	EVS 4343W
Derived model (s)	EVS 4343WG, EVS 4343WP, EVS3643WP, EVS 3643W, EVS 3643WG
Applicant	DRTECH Corporation
Address	Suite No.1, 1Floor / Suite No.2 3Floor, 29, Dunchon-daero 541 beon- gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13216, Korea
Telephone	+82-31-779-7784
Fax	+82-31-779-7790
E-mail	mwkim@drtech.co.kr
Contact name	Minwoo Kim
Manufacturer	DRTECH Corporation
Manufacturer Address	Suite No.1, 1Floor / Suite No.2 3Floor, 29, Dunchon-daero 541 beon- gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13216, Korea

1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage ☐ 230 Vac ☐ 120 Vac ☐ 24 Vac ☐ 12 Vdc ☒ BATTERY

Frequency ☐ 50 Hz ☐ 60 Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 HOST information

Description	Model Number	Serial Number	Manufacturer	Remarks
Flat Panel Digital X-ray Detector	EVS 4343W	-	DRTECH Corporation	HOST
USB C-type Gender	-	-	-	HOST
MEDICAL AC/DC ADAPTOR	MANGO60S-USB-PDA	-	Shenzhen Megmeet Electronical Co., Ltd.	HOST

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	LG15N54	410NZXE015458	LG Electronics	-
AC/DC Adaptor	ADP-90WH B	84ZW19F1747	DELTA ELECTRONICS (JIANGSU) LTD.	-
AP	A2004plus	-	IpTIME	-
AC/DC Adaptor	TY-2007	-	Zioncoin Electronics (Shenzhen) Ltd.	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
Flat Panel Digital X-ray Detector (HOST)	Wireless	AP	Wireless	-	-
AP	RJ-45	Notebook	RJ-45	5.0	S

* Unshielded=U, Shielded=S

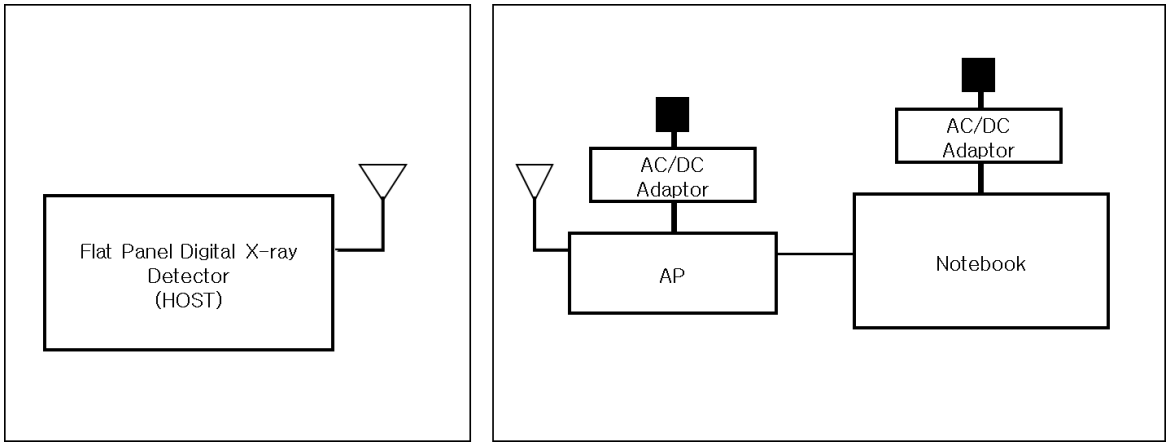
1.7 HOST Operating Mode(s)

Test mode	operating
WIFI 2.4 GHz WIFI 5 GHz	Connect HOST and Laptop Wirelessly Continuous acquisition of images at 30-second intervals.

HOST Test operating S/W		
Name	**Version**	**Manufacture Company**
ECali1	-	DRTECH Corporation

1.8 Configuration

■ AC Main
□ DC Main



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
International	**KOLAS**	EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KT489
USA	**FCC**	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	23298-1
JAPAN	**VCCI**	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	R-20056, C-20036, T-20040, G-20057
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 001633 0003

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010 ☐ Group 1 ☐ Group 2
☐ Class A ☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015 ☐ Class A ☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013

☐ **VCCI-CISPR 32:2016**	☐ Class A	☐ Class B
☐ **AS/NZS CISPR32:2015**	☐ Class A	☐ Class B
☒ **47 CFR Part 15, Subpart B**		
☐ CISPR 22:2009 +A1:2010	☐ Class A	☐ Class B
☒ ANSI C63.4-2014	☒ Class A	☐ Class B
☒ **IC Regulation ICES-003 : 2016**		
☐ CAN/CSA CISPR 22-10	☐ Class A	☐ Class B
☒ ANSI C63.4-2014	☒ Class A	☐ Class B

☐ **RE– Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

2.1 Conducted Emissions at Mains Power Ports

Test Date
N/A

Test Location
Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101781	04, 22, 2020
☐	LISN	ENV216	R & S	101787	01, 04, 2020
☐	LISN	ESH2-Z5	R & S	100450	04, 22, 2020
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019

Test Conditions
Temperature: ℃
Relative Humidity: % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
N/A

2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Jul. 22, 2019

Test Location
☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 09, 2020
☒	AMPLIFIER	SCU 01	R & S	100603	11, 26, 2019
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 11, 2020

Test Conditions
Temperature: 24,8 ℃
Relative Humidity: 57,5 % R.H.

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.3 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Jul. 23, 2019

Test Location
SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 09, 2020
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 08, 2020
☒	ATTENUATOR	8491A	HP	35496	03, 11, 2020
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	03, 12, 2020

Test Conditions
Temperature: 23,7 ℃
Relative Humidity: 53,4 % R.H.

Frequency Range of Measurement
1 ㎓ to 5 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:
☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
Operating mode exclosion Bandi 2.4 ㎓, 5㎓

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

N/A

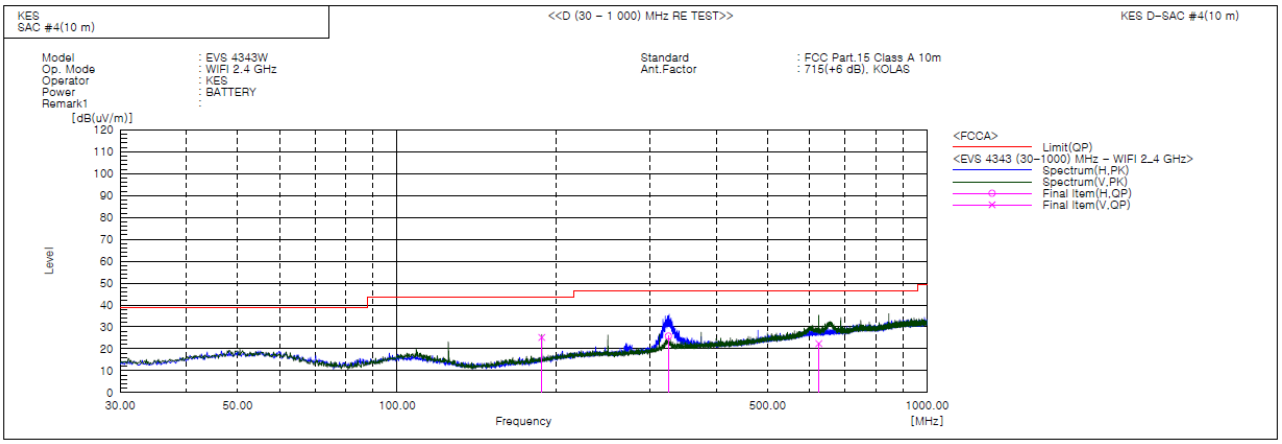
NEUTRAL LINE

N/A

◆ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Radiated Electric Field Emissions(Below 1 ㎓)

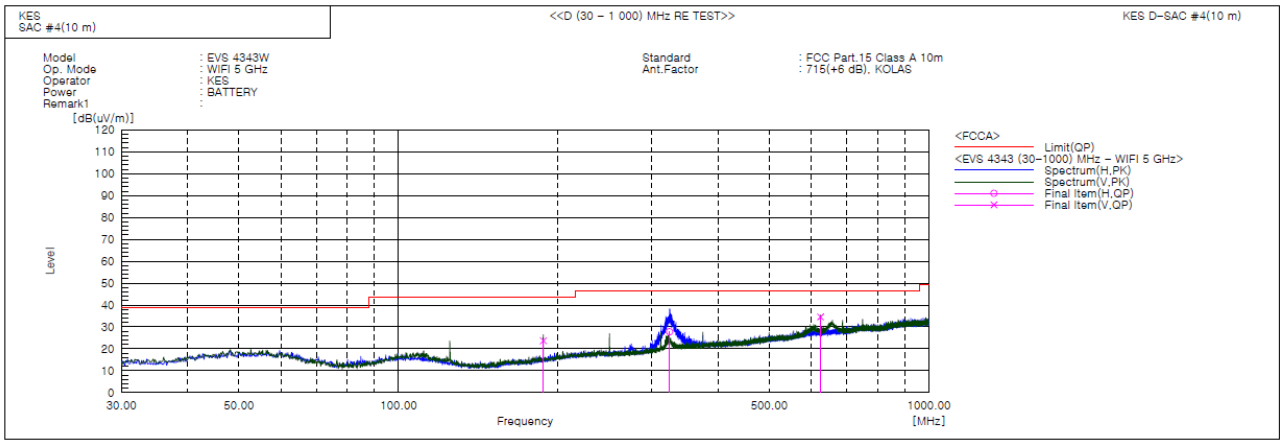
- WIFI 2.4 GHz



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	187.504	V	48.3	-23.1	25.2	43.5	18.3	100.0	177.0	
2	325.123	H	42.9	-17.1	25.8	46.5	20.7	400.0	349.0	
3	625.095	V	31.9	-9.5	22.4	46.5	24.1	154.0	258.0	

- WIFI 5 GHz



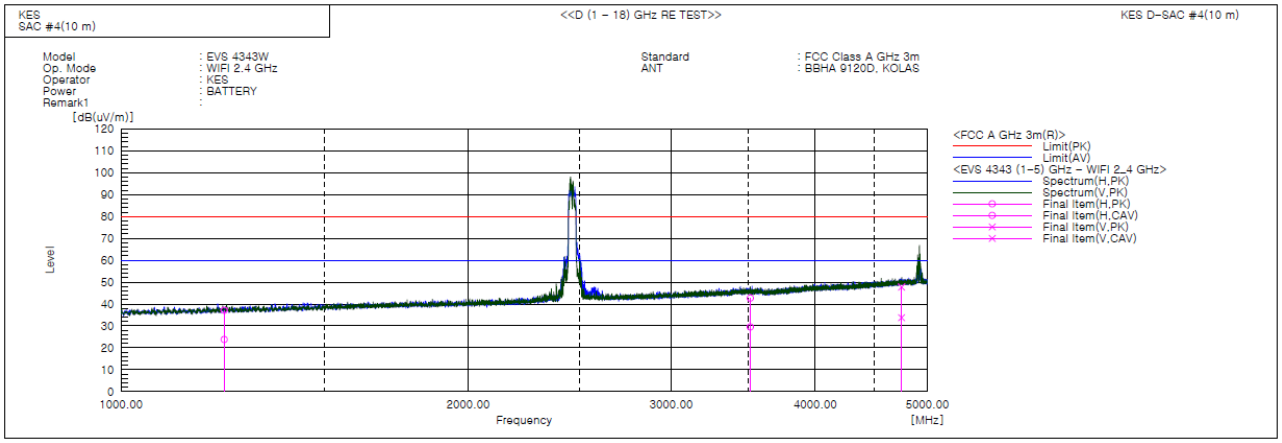
Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	187.534	V	46.8	-23.1	23.7	43.5	19.8	100.0	94.2	
2	324.516	H	45.0	-17.2	27.8	46.5	18.7	400.0	284.0	
3	624.974	V	44.1	-9.5	34.6	46.5	11.9	139.0	257.0	

♦ Calculation – SAC #4(10 m)
Result(QP) [dB(㎶/m)] = (Reading(QP)[dB(㎶)] + c.f[dB(1/m)]
Margin(QP)[dB] = Limit[dB(㎶/m)] - Result(QP) [dB(㎶/m)]
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Radiated Electric Field Emissions(Above 1 ㎓)

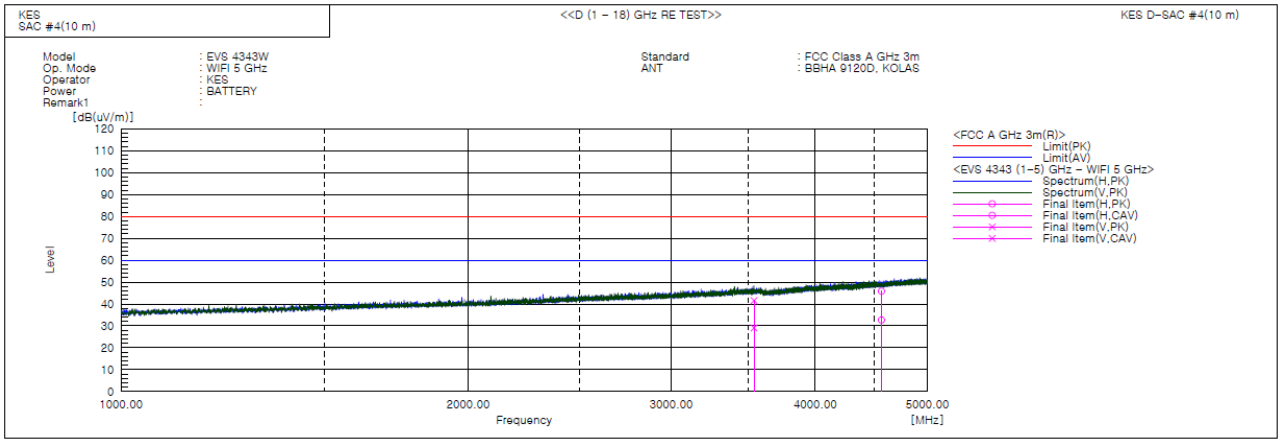
- (1-5) GHz - WIFI 2.4 GHz



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1229.025	H	41.8	28.5	-4.7	37.1	23.8	42.9	36.2	215.0	145.0	
2	3512.870	H	37.4	24.3	5.3	42.7	29.6	37.3	30.4	344.0	74.0	
3	4750.520	V	37.3	23.3	10.5	47.8	33.8	32.2	26.2	352.0	151.0	
4	2448.000	H	--------	--------	1.6	--------	--------	--------	--------	100.0	139.0	
5	4896.000	H	--------	--------	11.0	--------	--------	--------	--------	400.0	29.0	
6	2453.500	V	--------	--------	1.6	--------	--------	--------	--------	100.0	7.0	
7	4906.000	V	--------	--------	11.1	--------	--------	--------	--------	100.0	263.0	

- (1-5) GHz - WIFI 5 GHz



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	4564.500	H	36.0	22.9	9.8	45.8	32.7	34.2	27.3	400.0	203.0	
2	3539.000	V	36.2	23.7	5.4	41.6	29.1	38.4	30.9	400.0	158.0	

♦ Calculation

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)]

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

* No Sphrious emission were dectected above 5 GHz