

Dates of Tests: June 01 ~ 13, 2016
Test Report S/N: LR500111603C
Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID.

2AIHIGPR-WIFI-001

APPLICANT

GUNPOWER Inc.

Equipment Class	:	Digital Transmission System (DTS)
Manufacturing Description	:	WiFi Module
Manufacturer	:	GUNPOWER Inc.
Model name	:	GPR-WIFI-001
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.247 Subpart C ; ANSI C-63.4-2014
Frequency Range	:	2412 ~ 2462 MHz
Max. Output Power	:	Max 16.13 dBm – Conducted
Data of issue	:	June 14, 2016

This test report is issued under the authority of:



Yong-Cheol, Wang / Manager

The test was supervised by:



Young-jin Lee, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB Code.: 200723-0

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1. General information

1-1 Test Performed

Company name : LTA Co., Ltd.
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
 Web site : <http://www.ltalab.com>
 E-mail : chahn@ltalab.com
 Telephone : +82-31-323-6008
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2016-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	610755	2017-04-21	FCC filing
FCC	U.S.A	649054	2017-04-13	FCC CAB
VCCI	JAPAN	R2133(10 m), C2307	2017-06-21	VCCI registration
VCCI	JAPAN	T-2009	2016-12-23	VCCI registration
VCCI	JAPAN	G-563	2018-12-13	VCCI registration
IC	CANADA	5799A-1	UPDATING	IC filing
KOLAS	KOREA	NO.551	2017-01-08	KOLAS accredited Lab.

2. Information about test item

2-1 Client & Manufacturer

Company name : GUNPOWER Inc.
 Address : 2 floor No.201 33 Ajung-ro, Wansan-gu, Jeonju-city,
 Jeollabuk-do, Republic of Korea
 Tel / Fax : TEL No : +82-63-278-9373 / FAX No : +82-63-278-9374

2-2 Equipment Under Test (EUT)

Trade name : **GUNPOWER**
 Model name : GPR-WIFI-001
 Serial number : Identical prototype
 Date of receipt : May 30, 2016
 EUT condition : Pre-production, not damaged
 Antenna type : Dipole Antenna (Max Gain : 2.0 dBi)
 Frequency Range : 2412 ~ 2462 MHz
 RF output power : Max 16.13 dBm – Conducted
 Number of channels : 11
 Type of Modulation : CCK, DQPSK, DBPSK for DSSS
 Power Source : 3.3 V

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2412	2437	2462

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
NOTEBOOK	PP37L	29705283757	DELL

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)	Transmitter Peak Output Power	< 1 Watt		C
15.247(d)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz		C
15.247(d)	Band Edge	> 20 dBc		C
15.209	Field Strength of Harmonics	Emission	Radiated	C
15.207	AC Conducted Emissions	Emissions	Conducted	N/A
15.203	Antenna requirement	-	-	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

→ Antenna Requirement

The **GUNPOWER Inc.** FCC ID: **2AIHIGPR-WIFI-001** unit complies with the requirement of §15.203
The antenna type is Dipole antenna.

The sample was tested according to the following specification:

- *FCC Parts 15.247; ANSI C-63.4-2014
- *FCC KDB Publication No. 558074 D01 DTS Meas Guidancev03r05
- *FCC TCB Workshop 2012, April

3.2 Technical Characteristics Test

3.2.1 6 dB Bandwidth

Procedure:

The bandwidth at 6 dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 5 MHz

VBW = 100 kHz (VBW \geq RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data : **Complies**

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2412	9.47	Complies
2437	10.12	Complies
2462	10.16	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth > 500 kHz

Measurement Setup

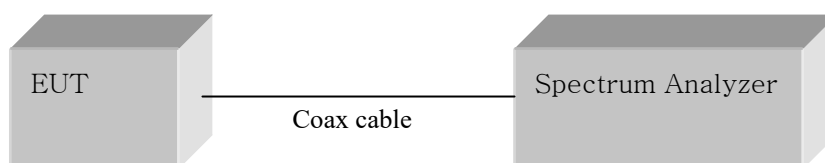
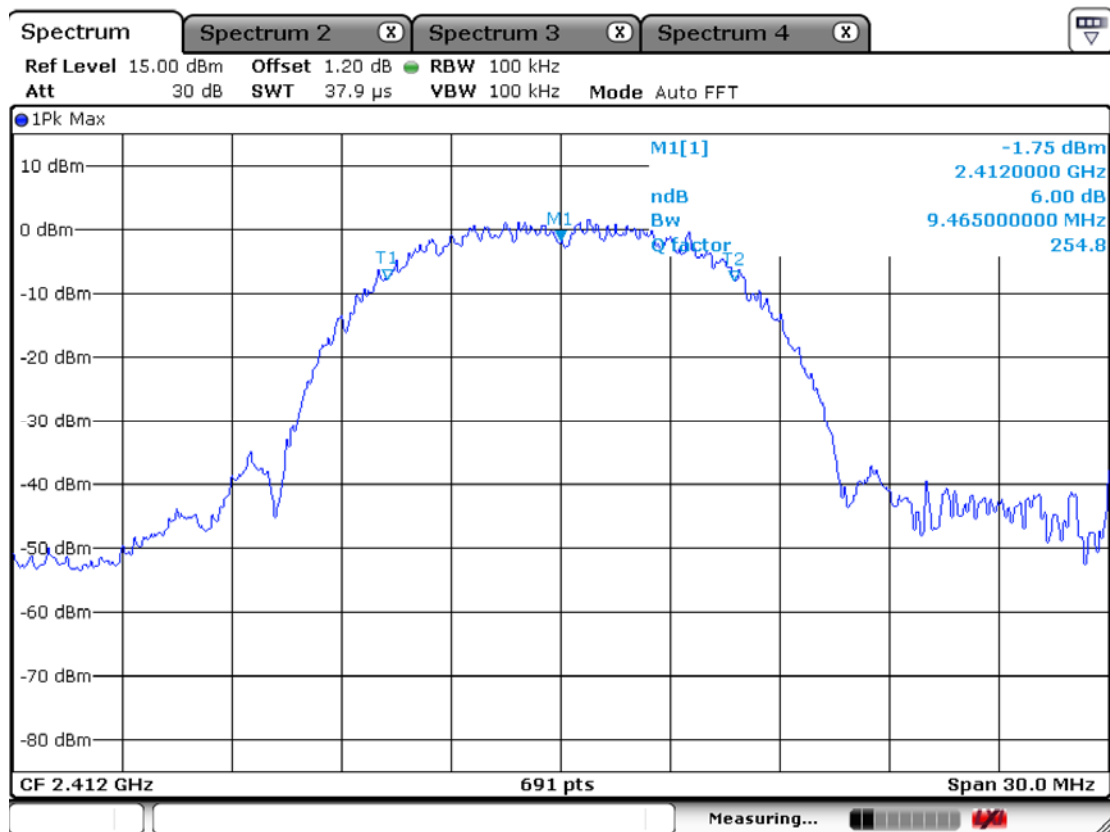
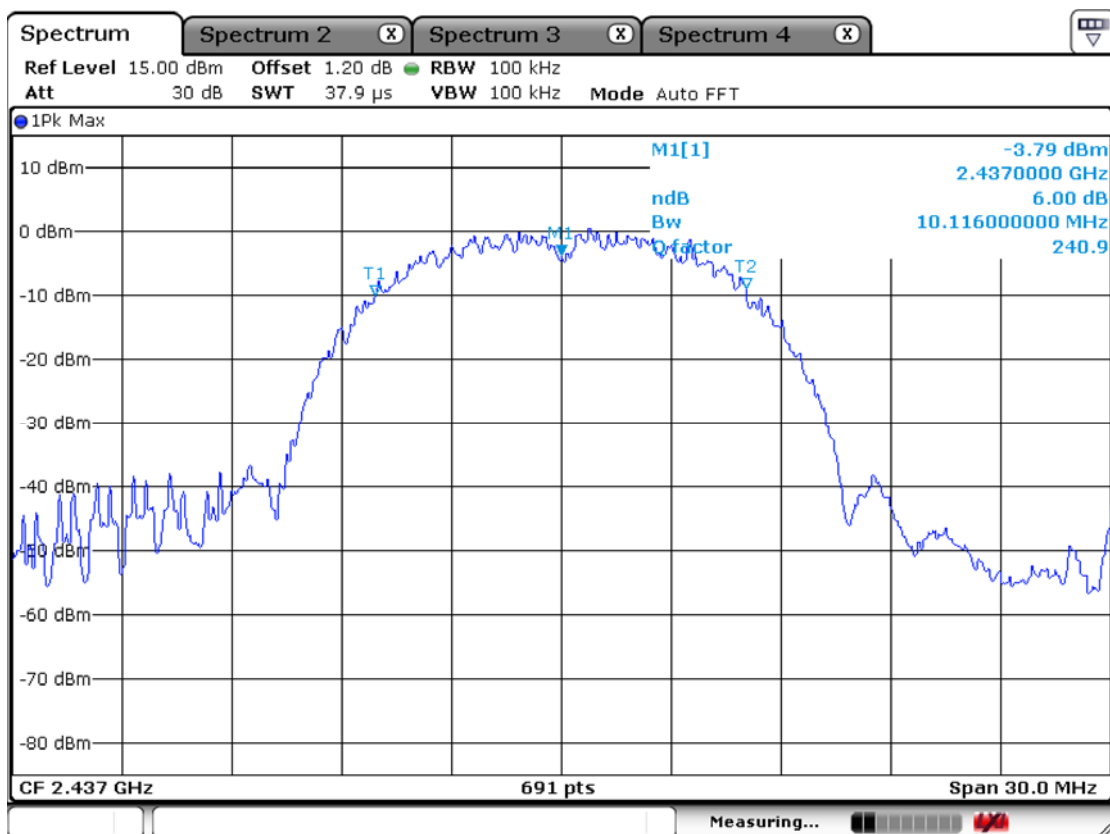


Figure 1: Measurement setup for the carrier frequency separation

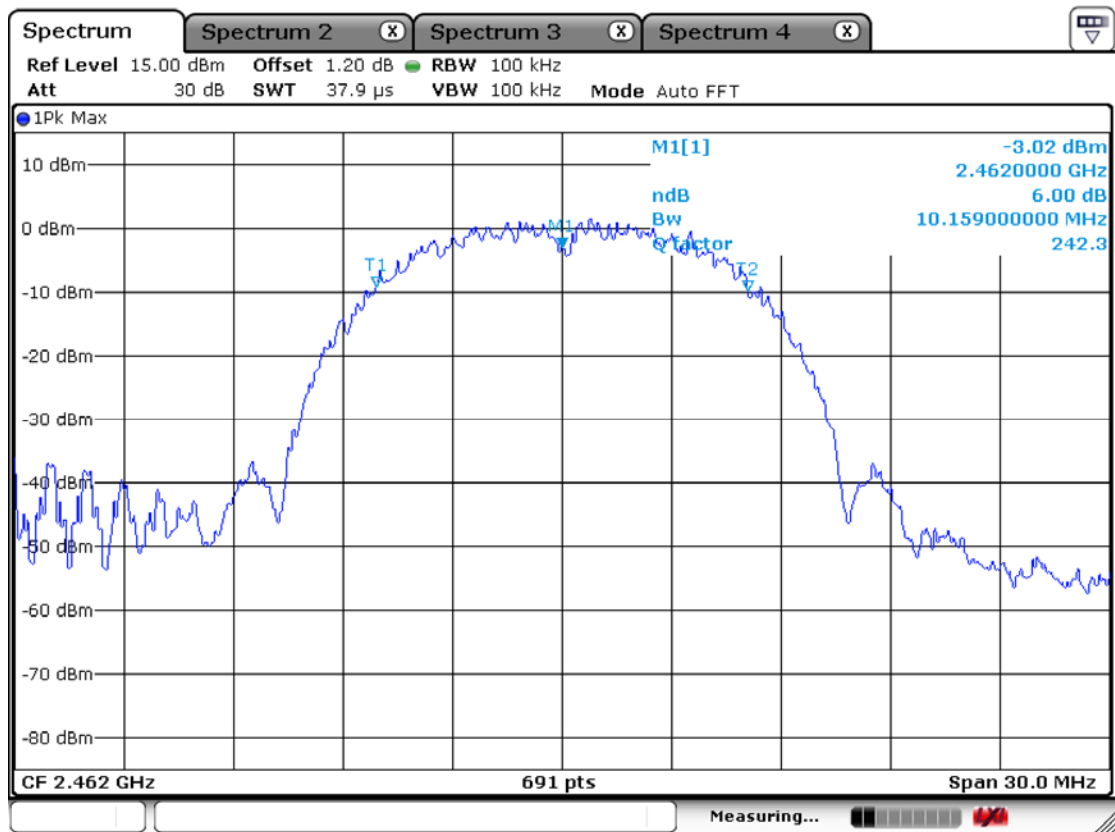
Low Channel



Middle Channel



High Channel



3.2.2 Peak Output Power Measurement

Procedure:

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99 % bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1 MHz

Span = auto

VBW = 1 MHz (VBW \geq RBW)

Sweep = auto

Detector function = peak

Measurement Data : **Complies**

Frequency (MHz)	Test Results		
	dBm	mW	Result
2412	16.13	41.02	Complies
2437	15.48	35.32	Complies
2462	16.10	40.74	Complies

- See next pages for actual measured spectrum plots.

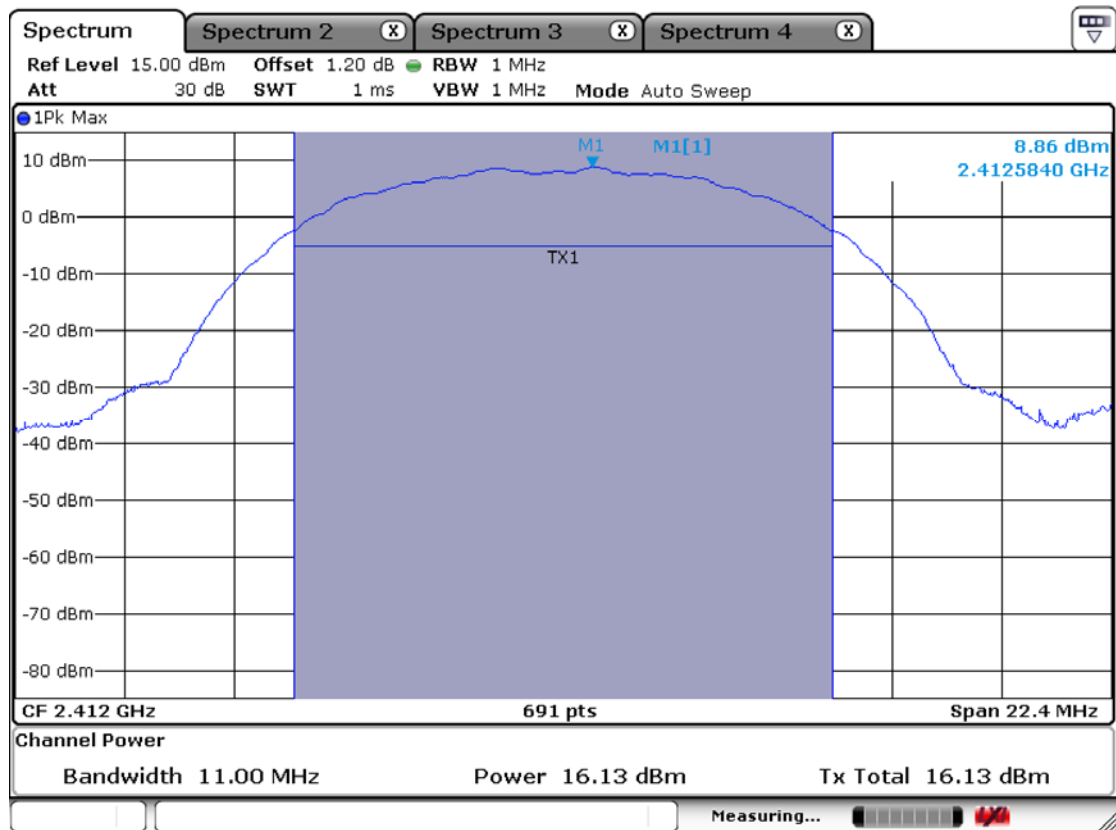
Minimum Standard:

Peak output power	< 1 W
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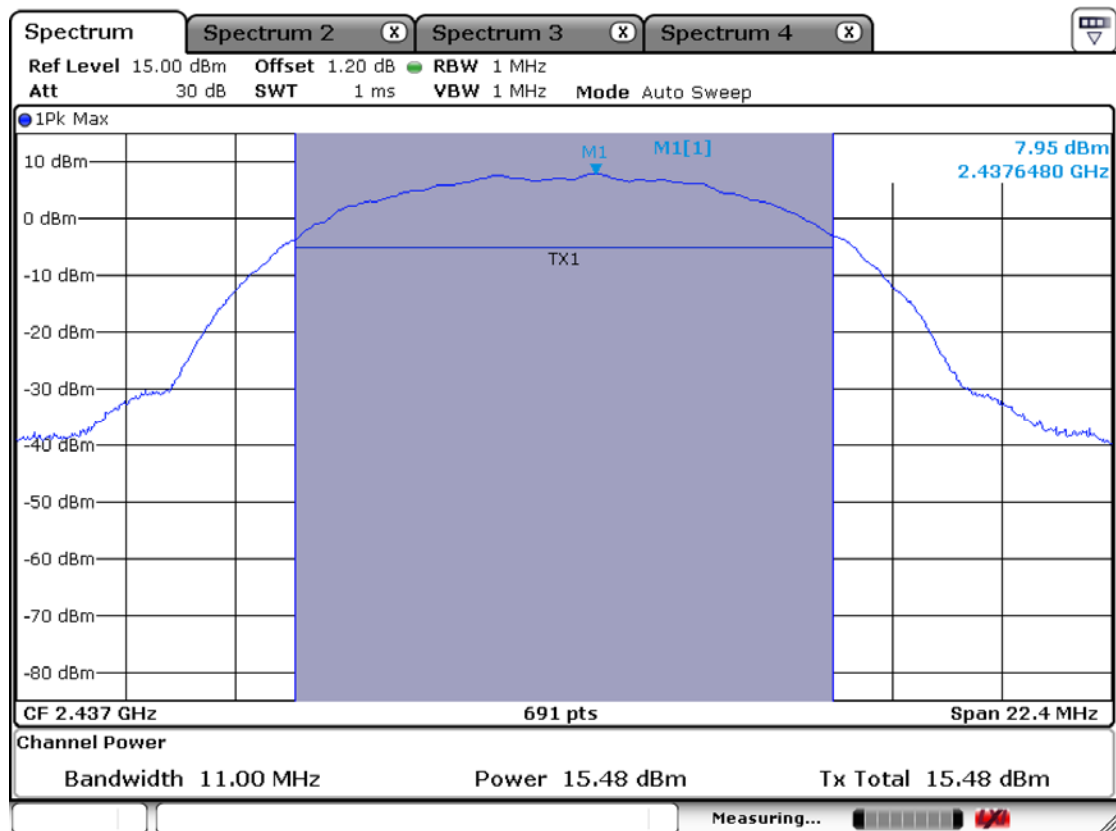
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

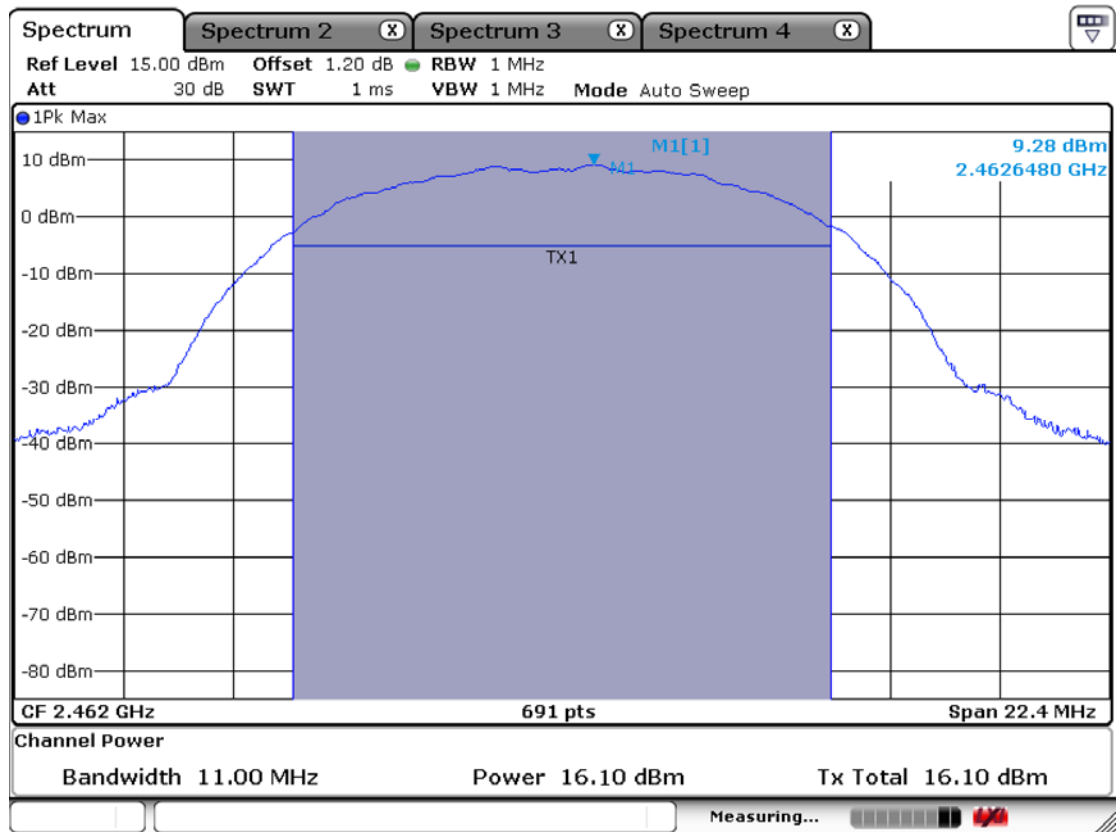
Low Channel



Middle Channel



High Channel



3.2.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz

Span = 300 kHz

VBW = 3 kHz

Sweep = auto

Detector function = peak

Trace = max hold

Measurement Data : **Complies**

Frequency (MHz)	Test Results	
	dBm	Result
2412	-13.76	Complies
2437	-15.30	Complies
2462	-14.21	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

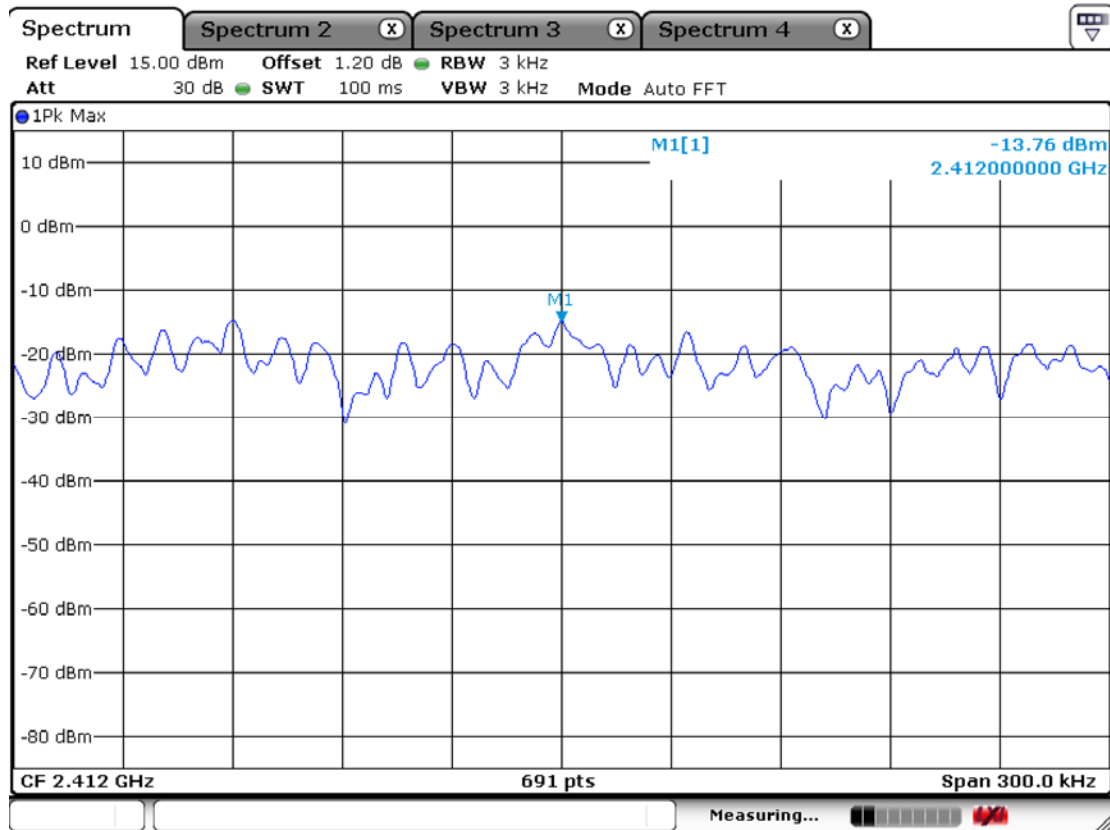
Power Spectral Density	< 8 dBm @ 3 kHz BW
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Measurement Setup

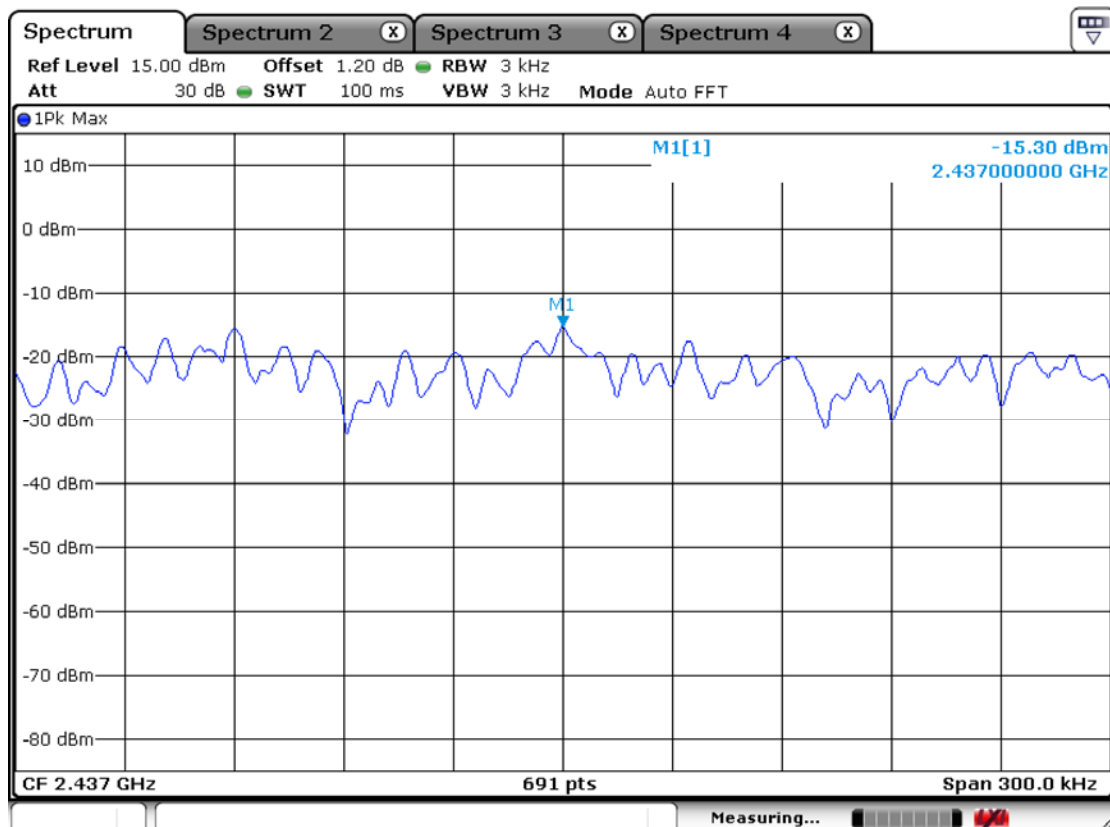
Same as the Chapter 3.2.1 (Figure 1)

Power Density Measurement

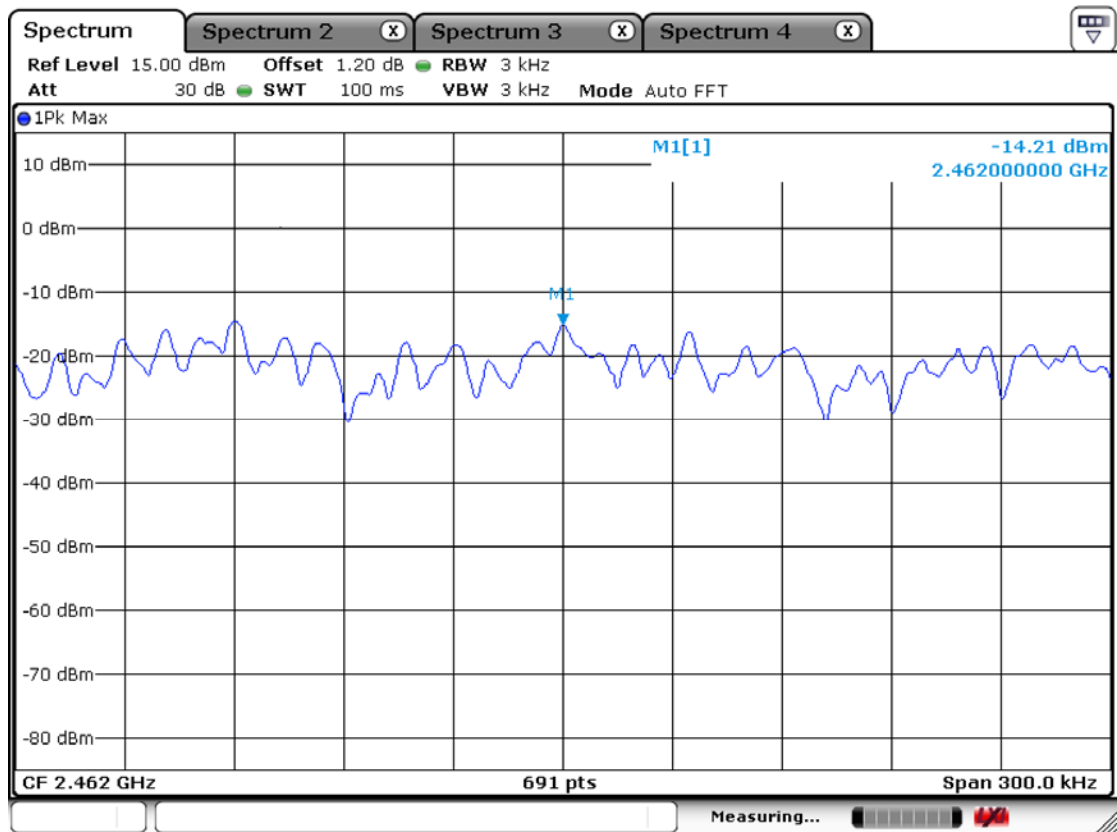
Low Channel



Middle Channel



High Channel



3.2.4 Band Edge

Procedure:

The bandwidth at 20 dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz

Span = 80 MHz

Detector function = peak

Trace = max hold

Sweep = auto

Radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

The spectrum analyzer is set to:

Center frequency = the highest, the lowest channels

PEAK:

RBW = VBW = 1 MHz, Sweep=Auto

Average:

RBW = 1 MHz, VBW=10 Hz, Sweep=Auto

Measurement Distance:

3 m

Polarization:

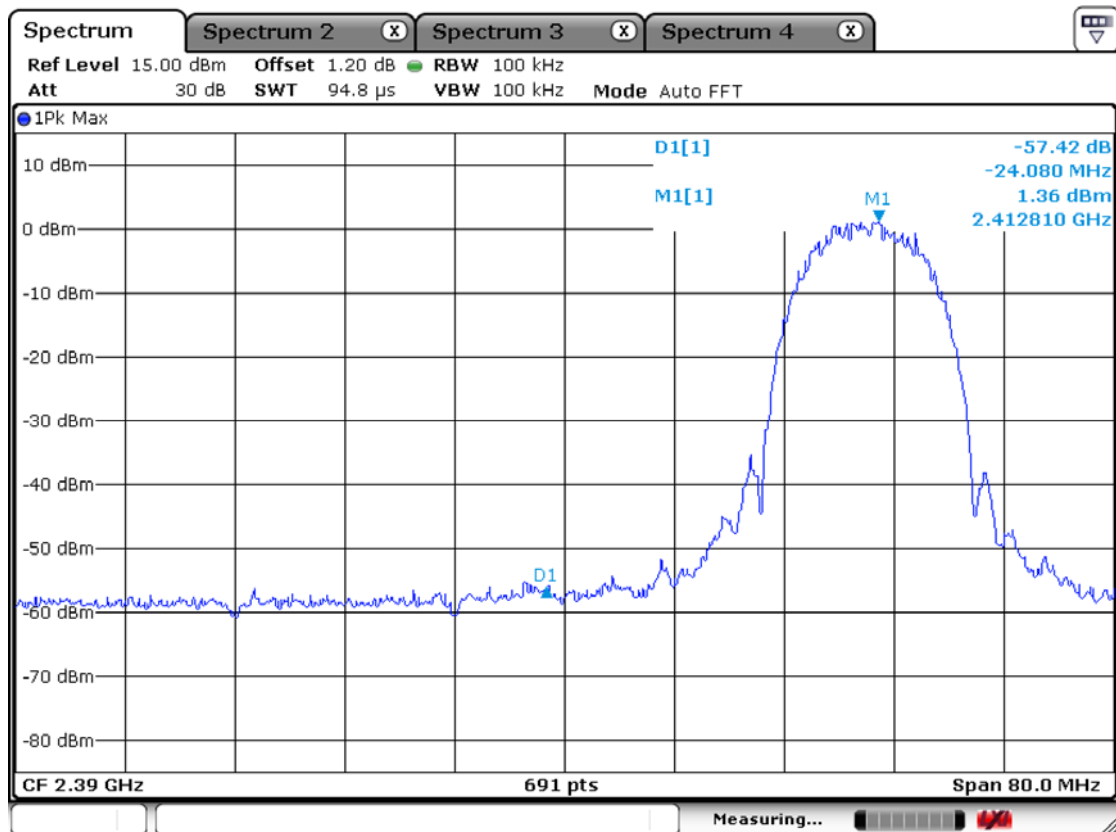
Horizontal / Vertical

Measurement Data: Complies

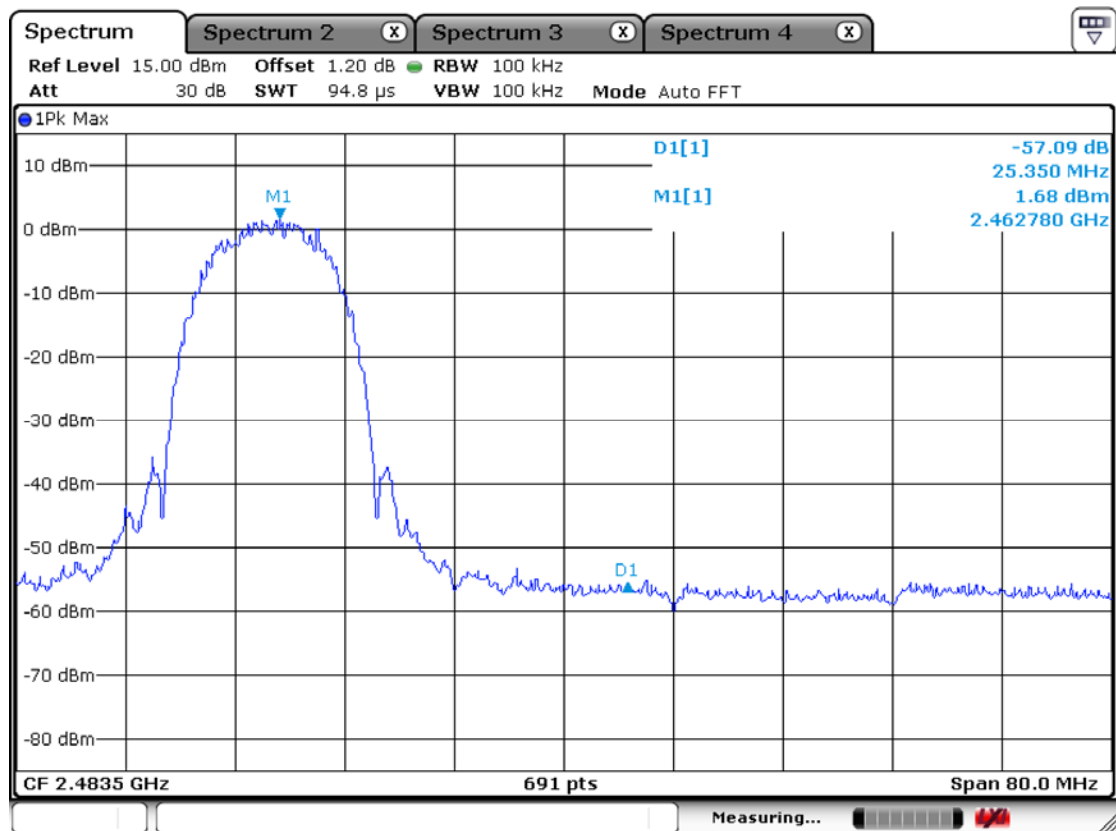
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20 dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc
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Band edge Lower edge



Upper edge



Radiated Band-edges in the restricted band 2310-2390 MHz measurement

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor		Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain + Cable Loss	AV / Peak		AV / Peak		AV / Peak	
2390.0	41.1	61.6	H	32.3	26.2	54.0	74.0	47.2	67.7	6.8	6.3

Radiated Band-edges in the restricted band 2483.5-2500 MHz measurement

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor		Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain + Cable Loss	AV / Peak		AV / Peak		AV / Peak	
2483.5	43.5	62.7	H	32.3	26.2	54.0	74.0	49.6	68.8	4.4	5.2

Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented

3.2.5 Conducted Spurious Emissions

Procedure:

The test follows KDB558074. The conducted spurious emissions were measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, set the marker on the peak of any spurious emission recorded.

The spectrum analyzer is set to:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions

RBW = 100 kHz

Sweep = auto

VBW = 100 kHz

Detector function = peak

Trace = max hold

Measurement Data: Complies

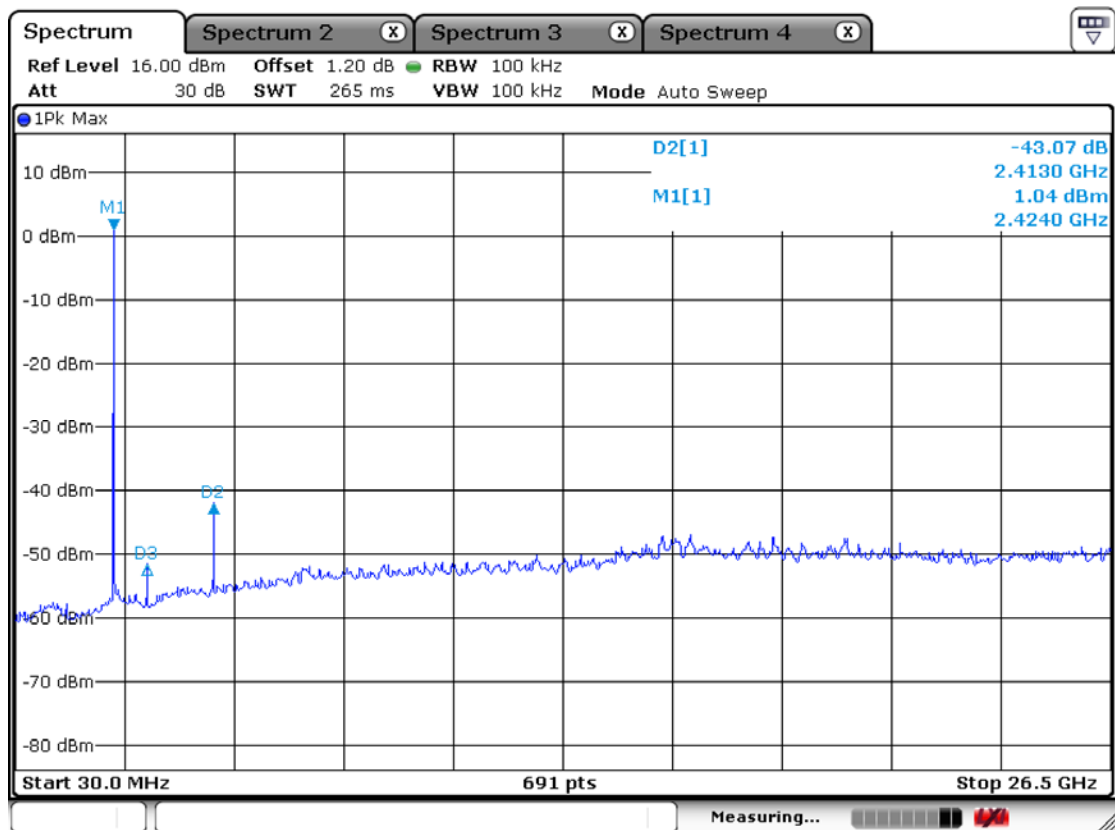
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20 dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc
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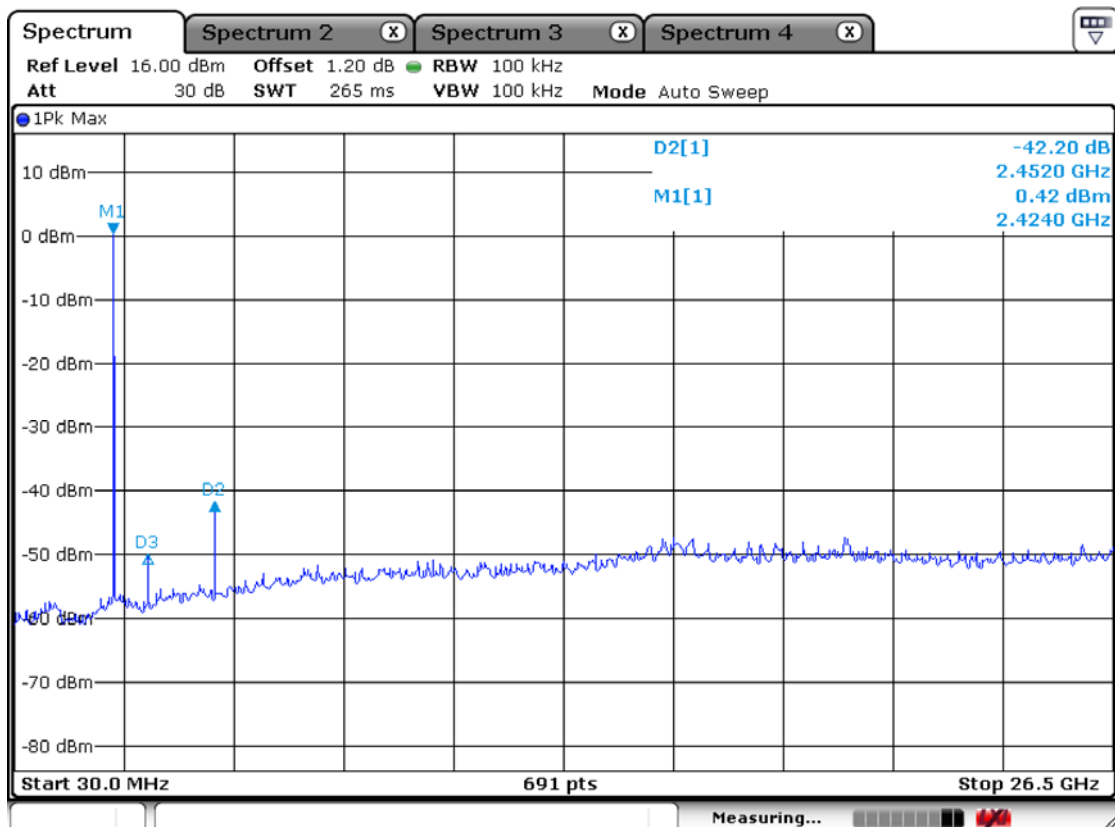
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

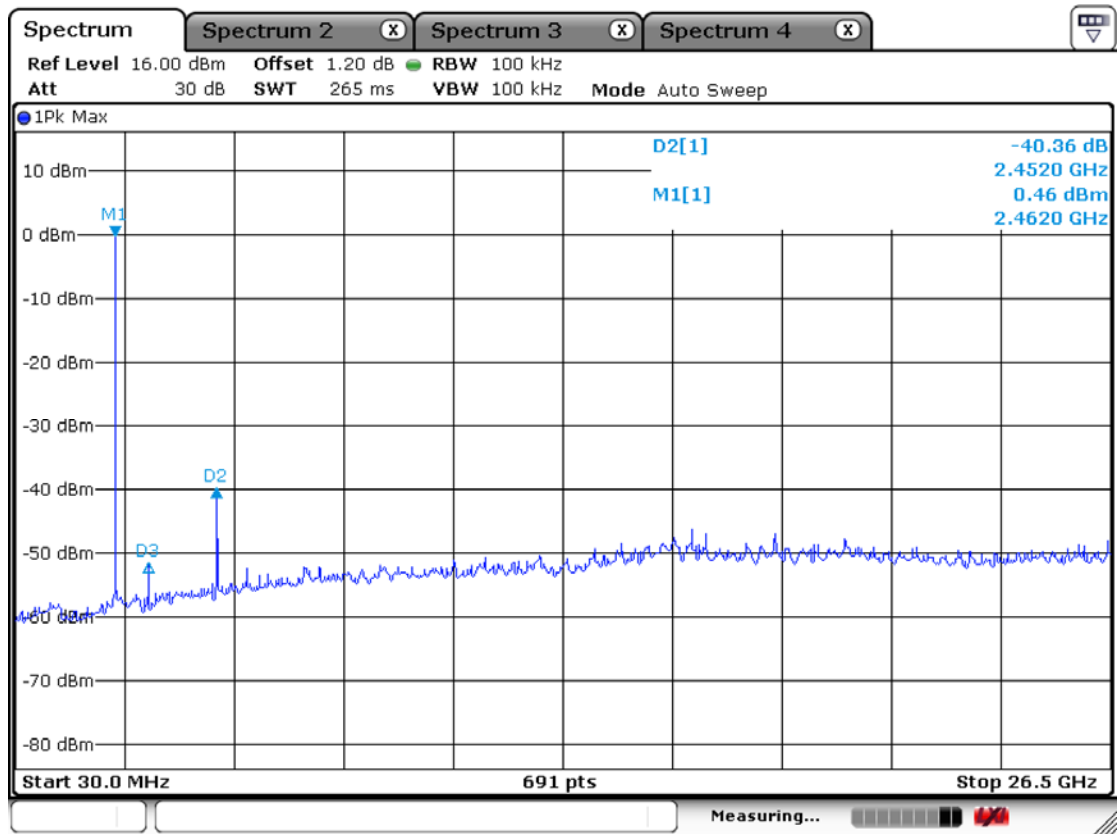
Unwanted Emission – Low Channel
Frequency Range = 30 MHz ~ 26.5 GHz



Unwanted Emission – Middle Channel
Frequency Range = 30 MHz ~ 26.5 GHz



Unwanted Emission – High Channel
Frequency Range = 30 MHz ~ 26.5 GHz



3.2.6 Radiated Spurious Emissions

Procedure:

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2009.

The EUT was placed on a 0.8 m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 9 kHz ~ 10th harmonic.

RBW = 100 kHz (30 MHz ~ 1 GHz)

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

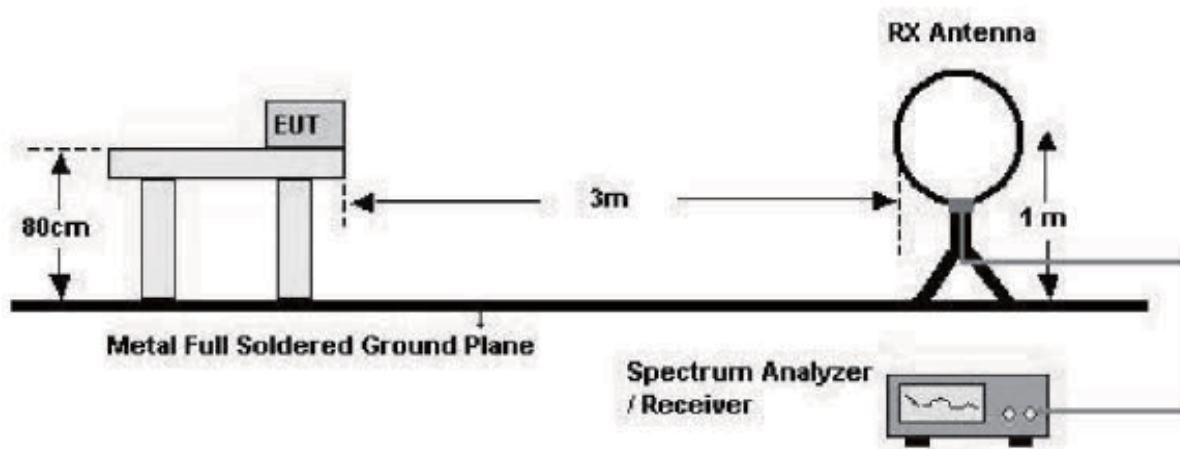
Trace = max hold

VBW \geq RBW

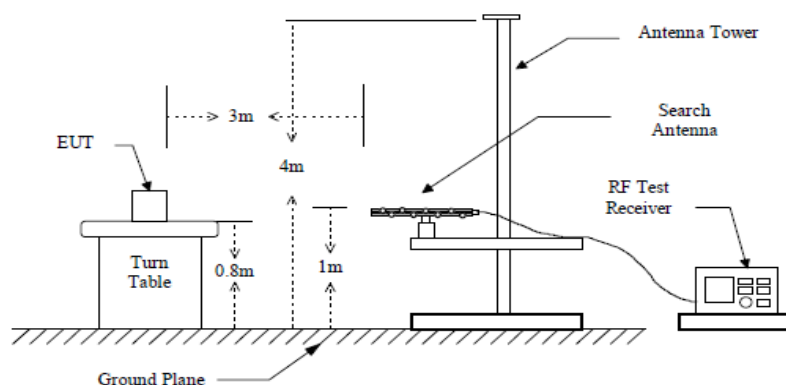
Detector function = peak

Sweep = auto

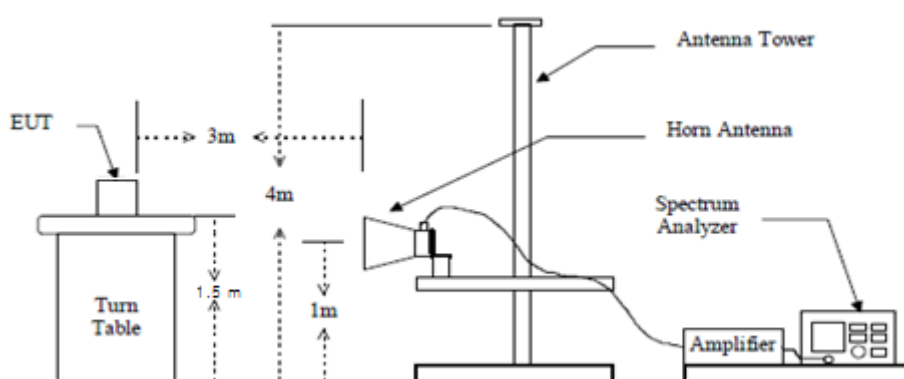
below 30 MHz



below 1 GHz (30 MHz to 1 GHz)



above 1 GHz



Measurement Data: Complies

- See next pages for actual measured data.
- No other emissions were detected at a level greater than 20 dB below limit include from 9 kHz to 30 MHz.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3 m
0.009 ~ 0.490	2400/F(kHz) (@ 300 m)
0.490 ~ 1.705	24000/F(kHz) (@ 30 m)
1.705 ~ 30	30(@ 30 m)
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Measurement Data : (Above 1 GHz)

Frequency	Reading		Pol.	Correction		Limits		Result		Margin	
	[dBuV/m]			Factor		[dBuV/m]		[dBuV/m]		[dB]	
	AV / Peak			Antenna	Amp.Gain+Cable	AV/Peak		AV/Peak		AV / Peak	
4821.6	41.0	61.5	V	32.3	27.3	54.0	74.0	46.0	66.5	8.0	7.5
4889.1	39.8	60.3	V	32.3	27.3	54.0	74.0	44.8	65.3	9.2	8.7
4892.2	40.3	59.1	V	32.3	27.3	54.0	74.0	45.3	64.1	8.7	9.9

- No other emissions were detected at a level greater than 20 dB below limit.

Measurement Data : (9 kHz – 30 MHz)

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor		Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp.Gain+Cable	AV / Peak	AV / Peak	AV / Peak	AV / Peak		
-	-	-	-	-	-	-	-	-	-	-	-
No emissions were detected at a level greater than 20 dB below limit.											
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

*No emissions were detected at a level greater than 20 dB below limit.

Radiated Emissions – Wi-Fi (LOW) mode

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Fax:+82-31-3236010

EUT/Model No.: GPR-WIFI-001

TEST MODE: Wi-Fi (LOW) mode

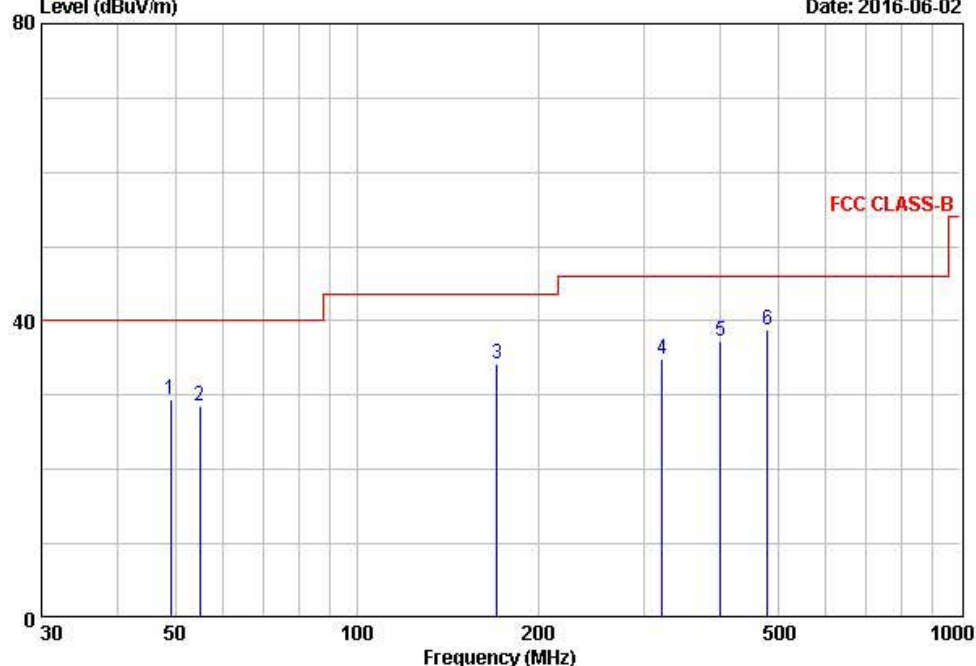
Temp Humi : 29 / 33

Tested by: SIN S U

Data: 11

Level (dBuV/m)

Date: 2016-06-02



	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1	49.20	45.20	-15.67	29.53	40.00	10.47	100	82	VERTICAL
2	54.90	44.00	-15.37	28.63	40.00	11.37	100	58	VERTICAL
3	170.60	48.90	-14.63	34.27	43.50	9.23	100	208	HORIZONTAL
4	320.50	46.80	-11.96	34.84	46.00	11.16	344	254	HORIZONTAL
5	400.70	47.00	-9.72	37.28	46.00	8.72	400	157	HORIZONTAL
6	480.00	46.80	-7.92	38.88	46.00	7.12	400	344	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions – Wi-Fi (MID) mode

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Cheoin-gu, Youngin-si, Gyeonggi-do,
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EUT/Model No.: GPR-WIFI-001

TEST MODE: Wi-Fi (MID) mode

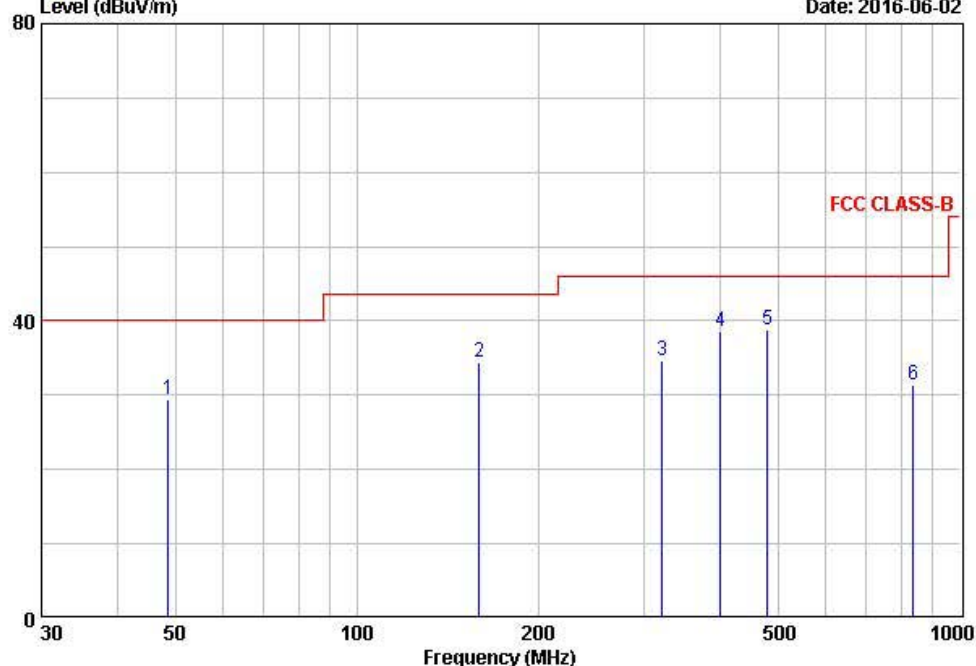
Temp Humi : 29 / 33

Tested by: SIN S U

Data: 12

Level (dBuV/m)

Date: 2016-06-02



	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1	48.60	45.20	-15.69	29.51	40.00	10.49	100	156	VERTICAL
2	159.70	48.20	-13.78	34.42	43.50	9.08	382	74	HORIZONTAL
3	320.50	46.60	-11.96	34.64	46.00	11.36	400	151	HORIZONTAL
4	400.70	48.20	-9.72	38.48	46.00	7.52	400	37	HORIZONTAL
5	480.00	46.70	-7.92	38.78	46.00	7.22	400	198	HORIZONTAL
6	836.90	30.20	1.12	31.32	46.00	14.68	258	360	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions – Wi-Fi (HIGH) mode

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Cheoin-gu, Youngin-si, Gyeonggi-do,
449-822 Korea
Tel :+82-31-3236008,9
Fax:+82-31-3236010

EUT/Model No.: GPR-WIFI-001

TEST MODE: Wi-Fi (HIGH) mode

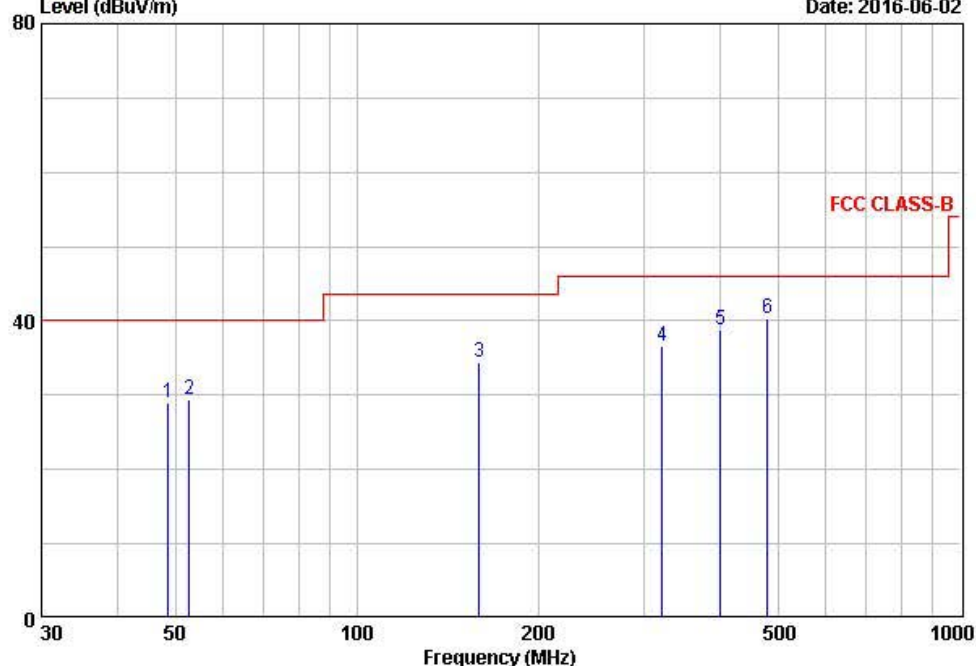
Temp Humi : 29 / 33

Tested by: SIN S U

Data: 13

Level (dBuV/m)

Date: 2016-06-02



	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1	48.60	44.60	-15.69	28.91	40.00	11.09	100	244	VERTICAL
2	52.80	45.00	-15.49	29.51	40.00	10.49	100	120	VERTICAL
3	159.70	48.20	-13.78	34.42	43.50	9.08	100	37	VERTICAL
4	320.50	48.50	-11.96	36.54	46.00	9.46	400	244	HORIZONTAL
5	400.70	48.60	-9.72	38.88	46.00	7.12	400	39	HORIZONTAL
6	480.00	48.20	-7.92	40.28	46.00	5.72	400	110	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions (Above 1 GHz) – Wi-Fi (LOW) mode

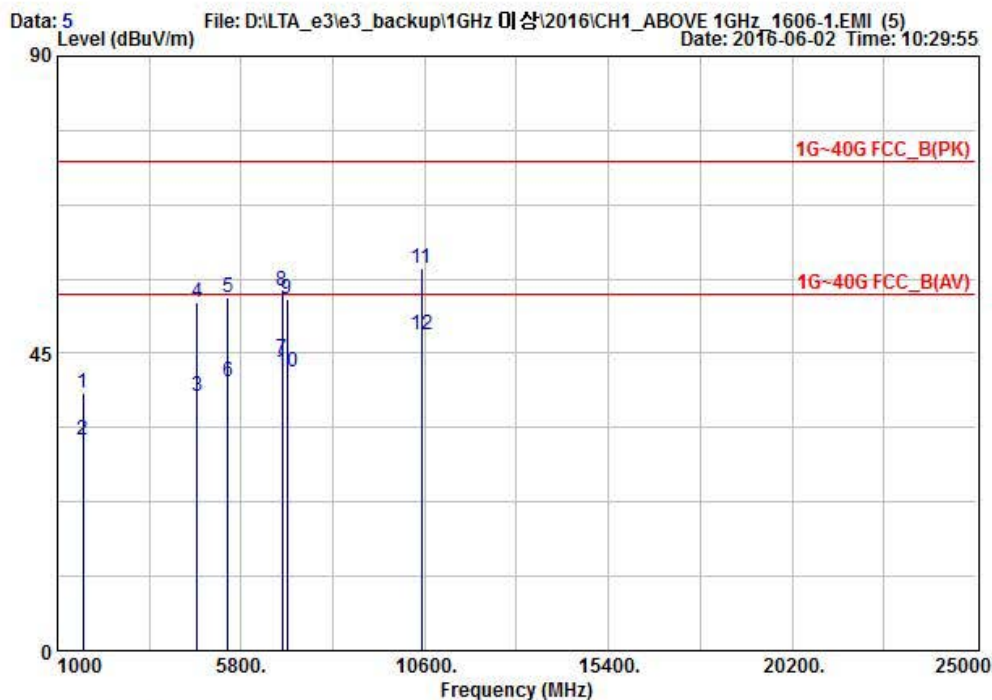
EMI Chamber of LTA CO.,LTD.
4, Songjuro236Beon-gil, Yangji-myeon,
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Tel :+82-31-3236008,9 www.ltalab.com
Fax:+82-31-3236010

EUT/Model No. : GPR-WIFI-001

Test Mode: Wi-Fi (LOW) mode

Tested by : SIN S U

Temp/Humi: 25 / 51



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1 1667.80	40.70	-1.71	38.99	74.00	35.01	HORIZONTAL
2 1667.80	33.50	-1.71	31.79	54.00	22.21	HORIZONTAL
3 4655.00	21.10	17.50	38.60	54.00	15.40	HORIZONTAL
4 4655.00	35.20	17.50	52.70	74.00	21.30	HORIZONTAL
5 5465.40	33.20	20.36	53.56	74.00	20.44	HORIZONTAL
6 5465.40	20.30	20.36	40.66	54.00	13.34	HORIZONTAL
7 6864.40	18.50	25.55	44.05	54.00	9.95	VERTICAL
8 6864.40	28.90	25.55	54.45	74.00	19.55	VERTICAL
9 7003.50	26.90	26.20	53.10	74.00	20.90	VERTICAL
10 7003.50	15.90	26.20	42.10	54.00	11.90	VERTICAL
11 10516.90	25.90	31.99	57.89	74.00	16.11	HORIZONTAL
12 10516.90	15.80	31.99	47.79	54.00	6.21	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain
Blue : Vertical Black : Horizontal

Radiated Emissions (Above 1 GHz) – Wi-Fi (MID) mode

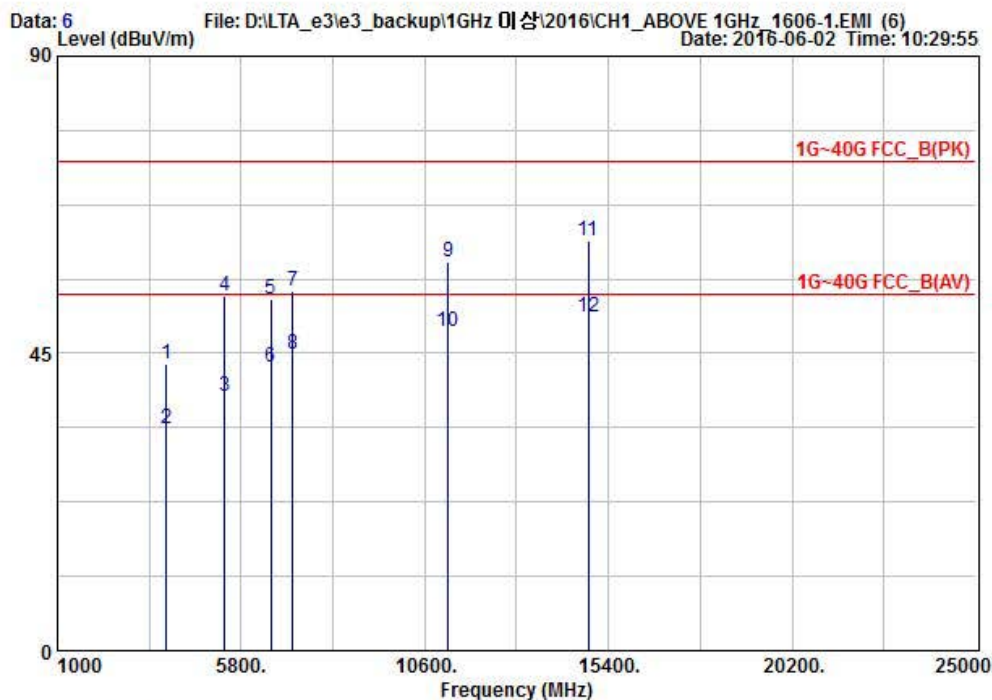
EMI Chamber of LTA CO.,LTD.
 4, Songjuro236Beon-gil, Yangji-myeon,
 Yongin-si, Gyeonggi-do, Korea Autho.by NVLAP
 Tel :+82-31-3236008,9 www.ltalab.com
 Fax:+82-31-3236010

EUT/Model No. : GPR-WIFI-001

Test Mode: Wi-Fi (MID) mode

Tested by : SIN S U

Temp/Humi: 25 / 51



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1 3840.30	30.20	13.17	43.37	74.00	30.63	HORIZONTAL
2 3840.30	20.40	13.17	33.57	54.00	20.43	HORIZONTAL
3 5361.20	18.50	19.88	38.38	54.00	15.62	HORIZONTAL
4 5361.20	33.90	19.88	53.78	74.00	20.22	HORIZONTAL
5 6580.50	29.00	24.30	53.30	74.00	20.70	VERTICAL
6 6580.50	18.60	24.30	42.90	54.00	11.10	VERTICAL
7 7155.80	26.00	28.47	54.47	74.00	19.53	VERTICAL
8 7155.80	16.30	28.47	44.77	54.00	9.23	VERTICAL
9 11208.00	24.80	34.09	58.89	74.00	15.11	HORIZONTAL
10 11208.00	14.30	34.09	48.39	54.00	5.61	HORIZONTAL
11 14882.00	20.20	41.76	61.96	74.00	12.04	HORIZONTAL
12 14882.00	8.80	41.76	50.56	54.00	3.44	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain
 Blue : Vertical Black : Horizontal

Radiated Emissions (Above 1 GHz) – Wi-Fi (HIGH) mode

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Yongin-si, Gyeonggi-do, Korea Autho.by NVLAP
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Fax:+82-31-3236010

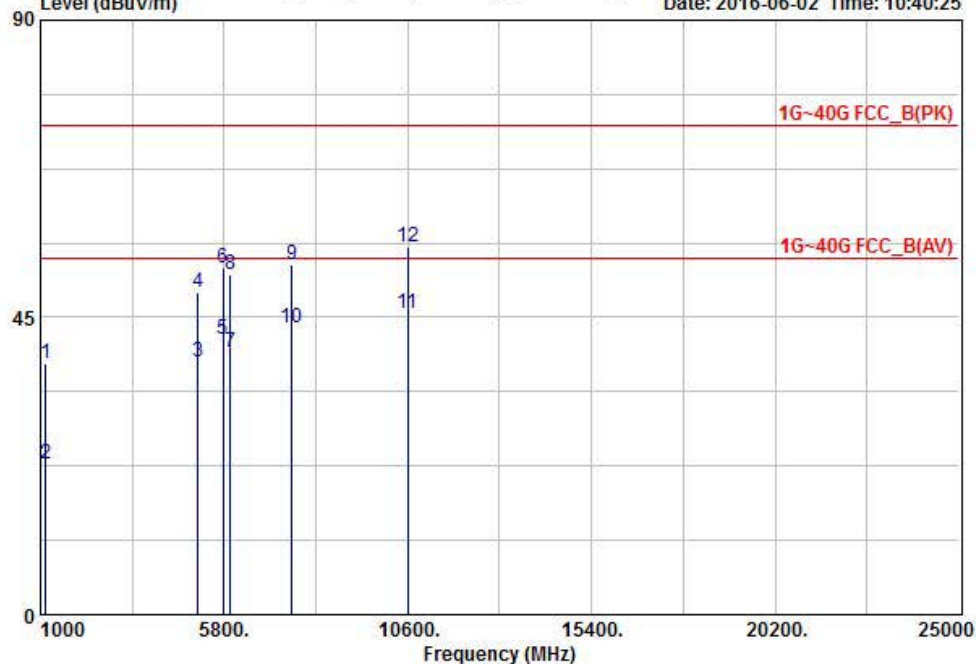
EUT/Model No.: GPR-WIFI-001

Test Mode: Wi-Fi (HIGH) mode

Tested by : SIN S U

Temp/Humi: 25 / 51

Data: 7 File: D:\LTA_e3\3_backup\1GHz 이상\2016\CH1_ABOVE 1GHz_1606-1.EMI (7)
Level (dBuV/m) Date: 2016-06-02 Time: 10:40:25



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1 1128.60	45.80	-7.70	38.10	74.00	35.90	VERTICAL
2 1128.60	30.60	-7.70	22.90	54.00	31.10	VERTICAL
3 5107.50	19.60	18.71	38.31	54.00	15.69	HORIZONTAL
4 5107.50	30.00	18.71	48.71	74.00	25.29	HORIZONTAL
5 5778.40	19.80	21.95	41.75	54.00	12.25	HORIZONTAL
6 5778.40	30.50	21.95	52.45	74.00	21.55	HORIZONTAL
7 5962.00	16.90	22.89	39.79	54.00	14.21	HORIZONTAL
8 5962.00	28.70	22.89	51.59	74.00	22.41	HORIZONTAL
9 7573.50	20.30	32.76	53.06	74.00	20.94	HORIZONTAL
10 7573.50	10.60	32.76	43.36	54.00	10.64	HORIZONTAL
11 10589.40	13.50	32.24	45.74	54.00	8.26	HORIZONTAL
12 10589.40	23.50	32.24	55.74	74.00	18.26	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain
Blue : Vertical Black : Horizontal

3.2.7 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Minimum Standard: FCC Part 15.207(a) / EN 55022

Class B

Frequency Range	quasi-peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

Conducted Emissions – Wi-Fi (LOW) mode-LINE

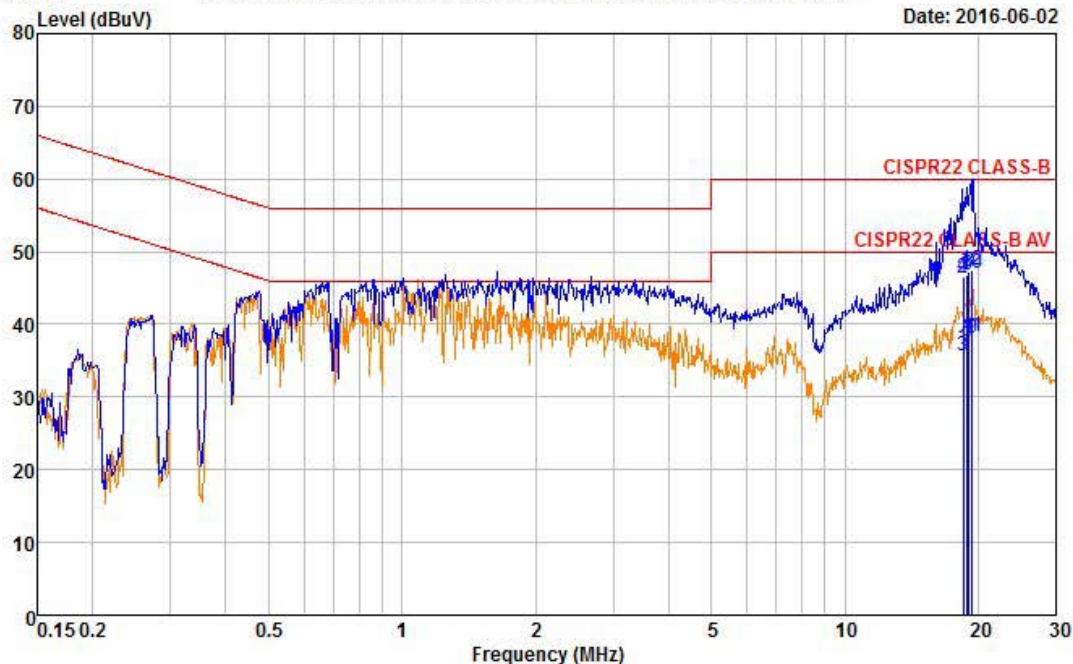
4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : GPR-WIFI-001	Phase : LINE
Test Mode : Wi-Fi(LOW) mode	Test Power : 120 / 60
Temp. / Humi. : 25 / 40	Test Engineer : SIN S U

Data: 19

File: D:\Conducted Data\2015\2016\LTA_Conduction_2016_06.EM6 (19)

Date: 2016-06-02



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
18.508	26.46	16.88	19.92	46.38	36.80	60.00	50.00	13.62	13.20
18.520	26.69	15.82	19.92	46.61	35.74	60.00	50.00	13.39	14.26
18.925	26.96	17.67	19.92	46.88	37.59	60.00	50.00	13.12	12.41
19.083	27.21	17.90	19.94	47.15	37.84	60.00	50.00	12.85	12.16
19.364	27.18	18.20	19.94	47.12	38.14	60.00	50.00	12.88	11.86
19.417	27.56	18.39	19.94	47.50	38.33	60.00	50.00	12.50	11.67

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

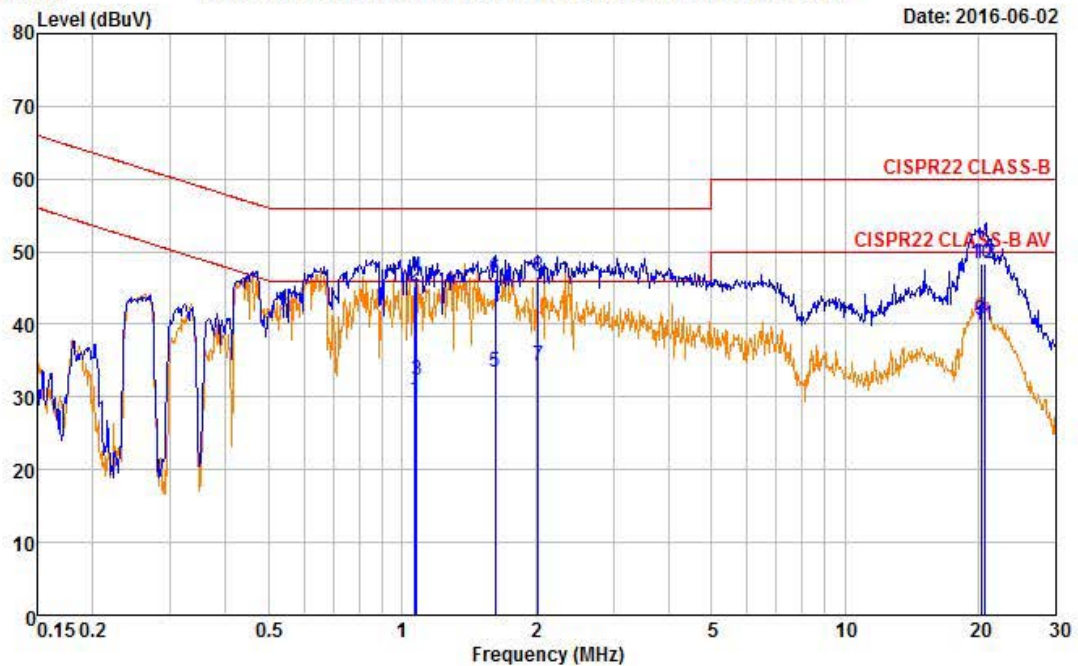
Conducted Emissions – Wi-Fi (MID) mode-LINE

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : GPR-WIFI-001	Phase : LINE
Test Mode : Wi-Fi(MID) mode	Test Power : 120 / 60
Temp. / Humi. : 25 / 40	Test Engineer : SIN S U

Data: 31

File: D:\Conducted Data\2015\2016\LTA_Conduction_2016_06.EM6 (31)



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
1.070	25.43	9.99	19.72	45.15	29.71	56.00	46.00	10.85	16.29
1.081	26.82	12.52	19.72	46.54	32.24	56.00	46.00	9.46	13.76
1.624	26.71	13.91	19.61	46.32	33.52	56.00	46.00	9.68	12.48
2.031	26.93	14.75	19.55	46.48	34.30	56.00	46.00	9.52	11.70
20.362	28.47	20.60	20.00	48.47	40.60	60.00	50.00	11.53	9.40
20.655	28.23	19.93	20.03	48.26	39.96	60.00	50.00	11.74	10.04

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

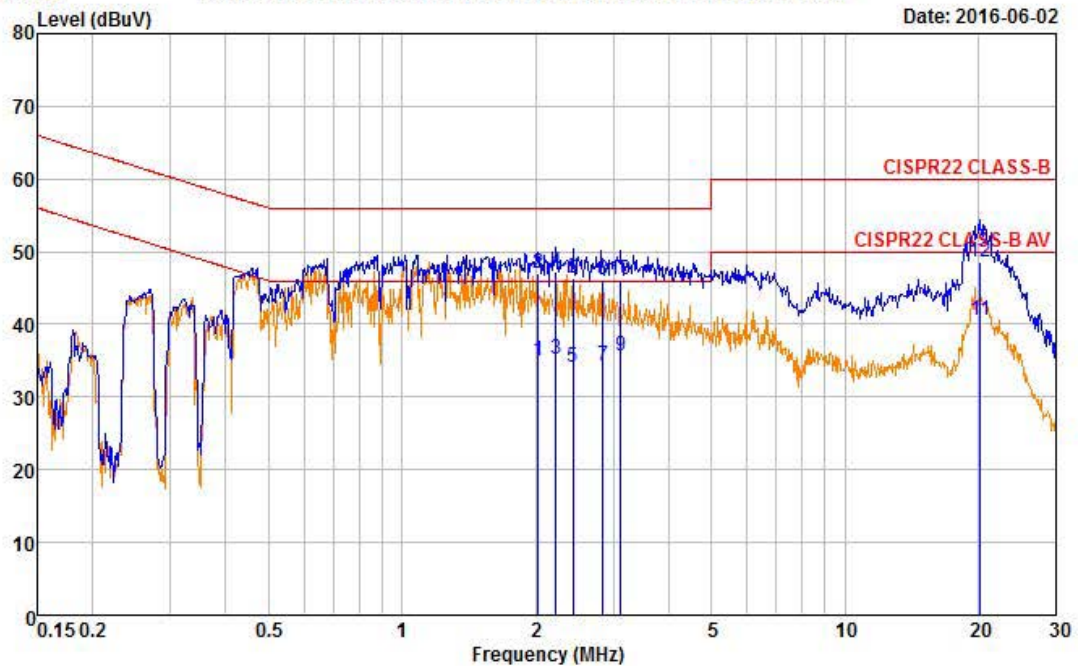
Conducted Emissions – Wi-Fi (HIGH) mode-LINE

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : GPR-WIFI-001	Phase : LINE
Test Mode : Wi-Fi(HIGH) mode	Test Power : 120 / 60
Temp. / Humi. : 25 / 40	Test Engineer : SIN S U

Data: 35

File: D:\Conducted Data\2015\2016\LTA_Conduction_2016_06.EM6 (35)



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
2.029	27.50	15.44	19.55	47.05	34.99	56.00	46.00	8.95	11.01
2.231	27.71	15.76	19.55	47.26	35.31	56.00	46.00	8.74	10.69
2.431	26.79	14.45	19.56	46.35	34.01	56.00	46.00	9.65	11.99
2.837	26.52	14.68	19.56	46.08	34.24	56.00	46.00	9.92	11.76
3.114	26.59	16.01	19.57	46.16	35.58	56.00	46.00	9.84	10.42
20.274	28.63	20.51	19.99	48.62	40.50	60.00	50.00	11.38	9.50

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions – Wi-Fi (LOW) – NEUTRAL

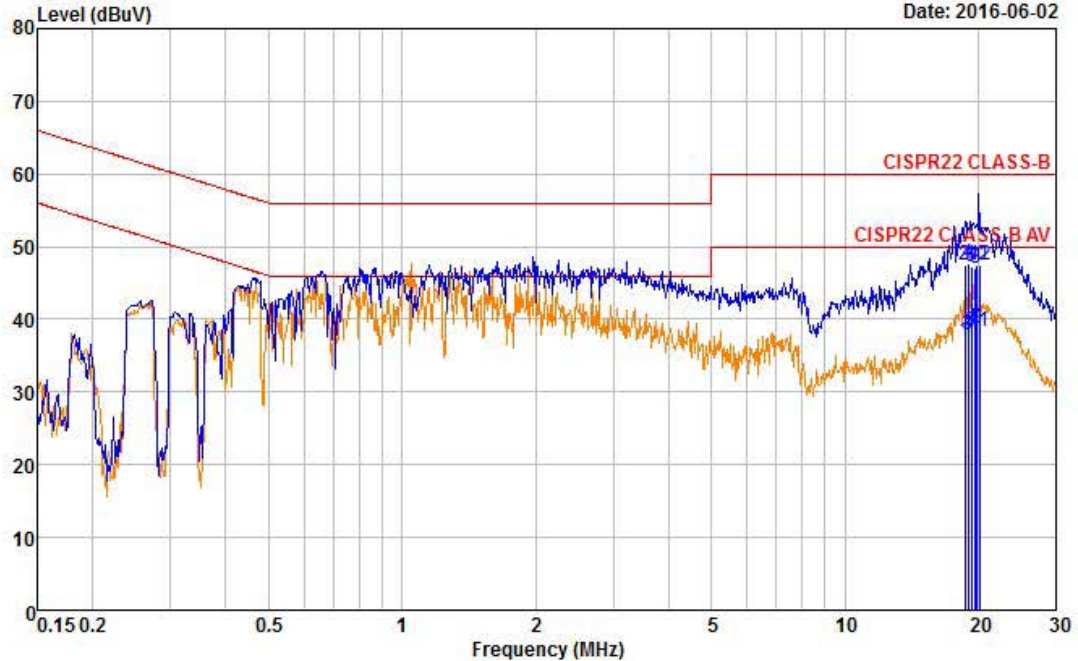
4, Songjuro 236 Beon-gil, Yangji-myeon
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449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : GPR-WIFI-001	Phase : NEUTRAL
Test Mode : Wi-Fi(LOW) mode	Test Power : 120 / 60
Temp. / Humi. : 25 / 40	Test Engineer : SIN S U

Data: 23

File: D:\Conducted Data\2015\2016\LTA_Conduction_2016_06.EM6 (23)

Date: 2016-06-02



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
18.715	27.52	17.07	19.95	47.47	37.02	60.00	50.00	12.53	12.98
19.010	27.66	17.95	19.96	47.62	37.91	60.00	50.00	12.38	12.09
19.343	27.37	18.29	19.96	47.33	38.25	60.00	50.00	12.67	11.75
19.691	27.13	18.85	19.99	47.12	38.84	60.00	50.00	12.88	11.16
19.906	27.48	18.83	19.99	47.47	38.82	60.00	50.00	12.53	11.18
20.124	27.50	18.36	20.00	47.50	38.36	60.00	50.00	12.50	11.64

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

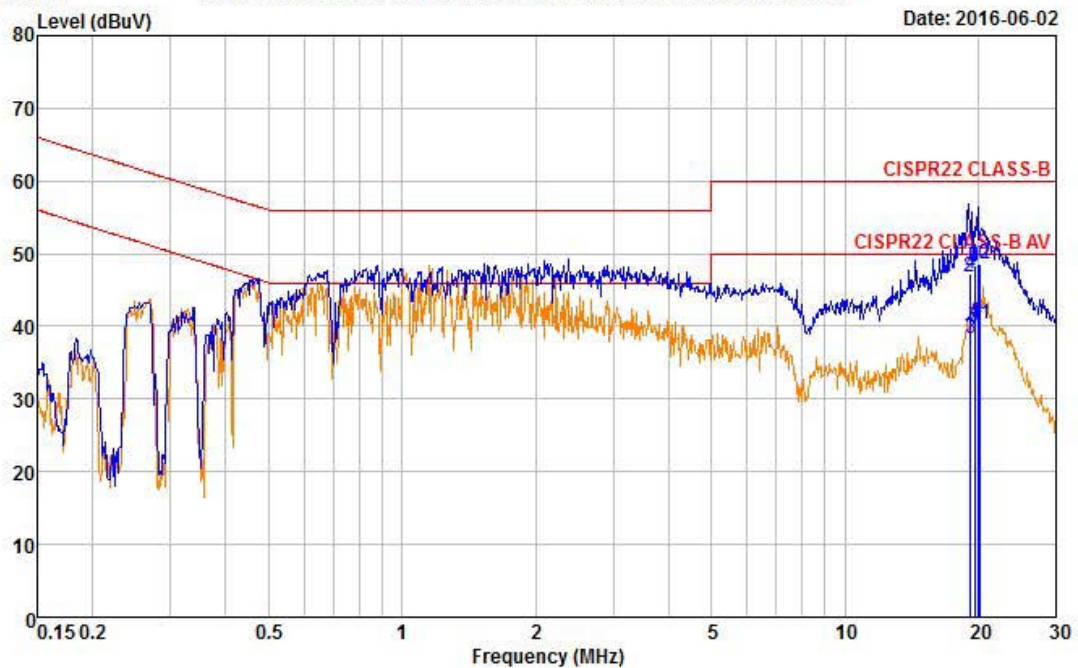
Conducted Emissions – Wi-Fi (MID) – NEUTRAL

4, Songjuro 236 Beon-gil, Yangji-myeon
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449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : GPR-WIFI-001	Phase : NEUTRAL
Test Mode : Wi-Fi(MID) mode	Test Power : 120 / 60
Temp. / Humi. : 25 / 40	Test Engineer : SIN S U

Data: 27

File: D:\Conducted Data\2015\2016\LTA_Conduction_2016_06.EM6 (27)



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
19.182	26.79	18.84	19.96	46.75	38.80	60.00	50.00	13.25	11.20
19.270	27.17	18.46	19.96	47.13	38.42	60.00	50.00	12.87	11.58
19.610	28.44	20.02	19.97	48.41	39.99	60.00	50.00	11.59	10.01
19.614	28.24	19.88	19.97	48.21	39.85	60.00	50.00	11.79	10.15
19.965	28.62	20.55	19.99	48.61	40.54	60.00	50.00	11.39	9.46
20.246	28.56	20.22	20.01	48.57	40.23	60.00	50.00	11.43	9.77

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

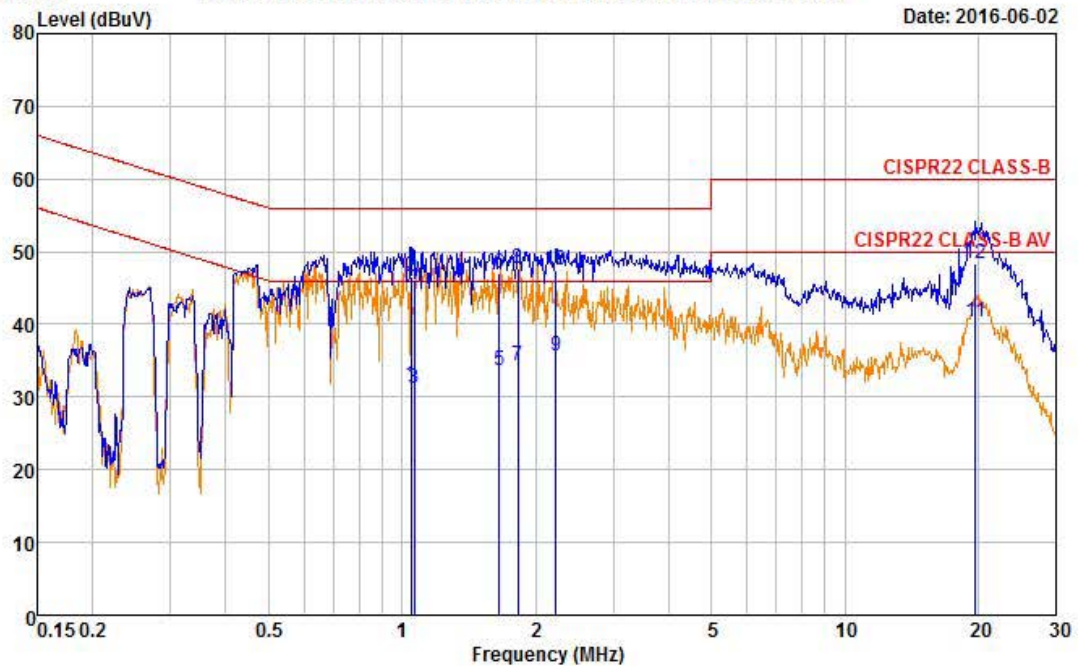
Conducted Emissions – Wi-Fi (HIGH) – NEUTRAL

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : GPR-WIFI-001	Phase : NEUTRAL
Test Mode : Wi-Fi(HIGH) mode	Test Power : 120 / 60
Temp. / Humi. : 25 / 40	Test Engineer : SIN S U

Data: 39

File: D:\Conducted Data\2015\2016\LTA_Conduction_2016_06.EM6 (39)



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
1.049	26.92	11.99	19.74	46.66	31.73	56.00	46.00	9.34	14.27
1.067	26.47	11.36	19.73	46.20	31.09	56.00	46.00	9.80	14.91
1.658	27.31	14.02	19.61	46.92	33.63	56.00	46.00	9.08	12.37
1.825	28.11	14.62	19.60	47.71	34.22	56.00	46.00	8.29	11.78
2.230	27.95	16.07	19.57	47.52	35.64	56.00	46.00	8.48	10.36
19.709	28.35	20.42	19.99	48.34	40.41	60.00	50.00	11.66	9.59

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	Signal Analyzer (9 kHz ~ 30 GHz)	FSV30	100757	R&S	1 year	2016-03-22
2	Signal Generator (~ 3.2 GHz)	8648C	3623A02597	HP	1 year	2016-03-21
3	SYNTHESIZED CW GENERATOR	83711B	US34490456	HP	1 year	2016-03-21
4	Attenuator (3 dB)	8491A	37822	HP	1 year	2015-09-14
5	Attenuator (10 dB)	8491A	63196	HP	1 year	2015-09-14
6	Test Receiver (~ 30 MHz)	ESHS10	828404/009	R&S	1 year	2016-03-21
7	EMI Test Receiver (~ 7 GHz)	ESCI7	100722	R&S	1 year	2015-09-15
8	RF Amplifier (~ 1.3 GHz)	8447D OPT 010	2944A07684	HP	1 year	2015-09-14
9	RF Amplifier (1 ~ 26.5 GHz)	8449B	3008A02126	HP	1 year	2016-03-22
10	Horn Antenna (1 ~ 18 GHz)	3115	00114105	ETS	1 year	2016-04-21
11	DRG Horn (Small)	3116B	81109	ETS-Lindgren	1 year	2016-02-26
12	DRG Horn (Small)	3116B	133350	ETS-Lindgren	1 year	2016-02-26
13	TRILOG Antenna	VULB 9160	9160-3237	SCHWARZBECK	2 year	2015-04-21
14	Temp.Humidity Data Logger	SK-L200TH II A	00801	SATO	1 year	2016-03-22
15	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
16	Power Divider	11636A	06243	HP	1 year	2015-09-14
17	DC Power Supply	6674A	3637A01657	Agilent	-	-
18	Frequency Counter	5342A	2826A12411	HP	1 year	2016-03-21
19	Power Meter	EPM-441A	GB32481702	HP	1 year	2016-03-22
20	Power Sensor	8481A	3318A94972	HP	1 year	2016-01-05
21	Audio Analyzer	8903B	3729A18901	HP	1 year	2015-09-14
22	Modulation Analyzer	8901B	3749A05878	HP	1 year	2015-09-15
23	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2015-09-14
24	Stop Watch	HS-3	812Q08R	CASIO	2 year	2016-03-22
25	LISN	KNW-407	8-1430-1	Kyoritsu	1 year	2015-09-14
26	Two-Lime V-Network	ESH3-Z5	893045/017	R&S	1 year	2016-03-21
27	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	1 year	2016-03-21
28	Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	1 year	2016-03-21
29	Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	1 year	2016-03-21
30	Active Loop Antenna	FMZB1519	1519-031	SCHWARZBECK	2 year	2016-01-12
31	OSP120 BASE UNIT	OSP120	101230	R&S	1 year	2016-03-22
32	Signal Generator(100 kHz ~ 40 GHz)	SMB100A	177621	R&S	1 year	2016-03-22
33	Signal Analyzer (10 Hz ~ 40 GHz)	FSV40	101367	R&S	1 year	2016-03-22