

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

**Test Report No.** : OT-190-RWD-012  
**AGR No.** : A196A-181  
**Applicant** : Wizconnected Inc.  
**Address** : 2F, Seongbo Bldg., 8 Teheran-ro 104gil, Gangnam-gu, Seoul, Korea  
**Manufacturer** : Wizconnected Inc.  
**Address** : 2F, Seongbo Bldg., 8 Teheran-ro 104gil, Gangnam-gu, Seoul, Korea  
**Type of Equipment** : Repeater  
**FCC ID.** : 2ATP8WIZCOM  
**Model Name** : WIZCoM  
**Multiple Model Name** : N/A  
**Serial number** : N/A  
**Total page of Report** : 43 pages (including this page)  
**Date of Incoming** : September 20, 2019  
**Date of issue** : October 04, 2019

## SUMMARY

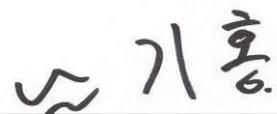
The equipment complies with the regulation; *FCC PART 15 SUBPART C Section 15.247*  
 This test report only contains the result of a single test of the sample supplied for the examination.  
 It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by:



Tae-Ho, Kim / Senior Manager  
ONETECH Corp.

Approved by:



Ki-Hong, Nam / Chief Engineer  
ONETECH Corp.

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**Revision History**

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-19O-RWD-012	October 04, 2019	Initial Release	All

**1. VERIFICATION OF COMPLIANCE**

Applicant : Wizconnected Inc.  
 Address : 2F, Seongbo Bldg., 8 Teheran-ro 104gil, Gangnam-gu, Seoul, Korea  
 Contact Person : Sung-Chang, Lee  
 Telephone No. : +82-10-7138-1428  
 FCC ID : 2ATP8WIZCOM  
 Model Name : WIZCoM  
 Brand Name : -  
 Serial Number : N/A  
 Date : October 04, 2019

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Repeater
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

## 2. TEST SUMMARY

### 2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Peak Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

### 2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

### 2.3 Related Submittal(s) / Grant(s)

Original submittal only

### 2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

### 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

### 2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-14617/ G-10666 / T-1842

IC (Industry Canada) – Registration No. Site# 3736A-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

### 3. GENERAL INFORMATION

#### 3.1 Product Description

The Wizconnected Inc., Model WIZCoM (referred to as the EUT in this report) is an Repeater, Product specification information described herein was obtained from product data sheet or user’s manual.

DEVICE TYPE	Repeater
Temperature Range	-20 °C ~ 85 °C
OPERATING FREQUENCY	903 MHz ~ 921 MHz
MODULATION TYPE	GFSK Modulation
RF OUTPUT POWER	13.56 dBm
ANTENNA TYPE	Dipole Antenna
ANTENNA GAIN	1.67 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32.768 kHz, 38.4 MHz

#### 3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

### 4. EUT MODIFICATIONS

-. None

## 5. SYSTEM TEST CONFIGURATION

### 5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Wizconnected Inc.	Repeater Dongle Ver 1.2	N/A

### 5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
WIZCoM	Wizconnected Inc.	Repeater(EUT)	-
Ideapad 100-15IBD	LENOVO	Notebook PC	EUT

### 5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at 903 MHz, 912 MHz, and 921 MHz to get a maximum emission levels from the EUT.

The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XZ” axis, but the worst data was recorded in this report.

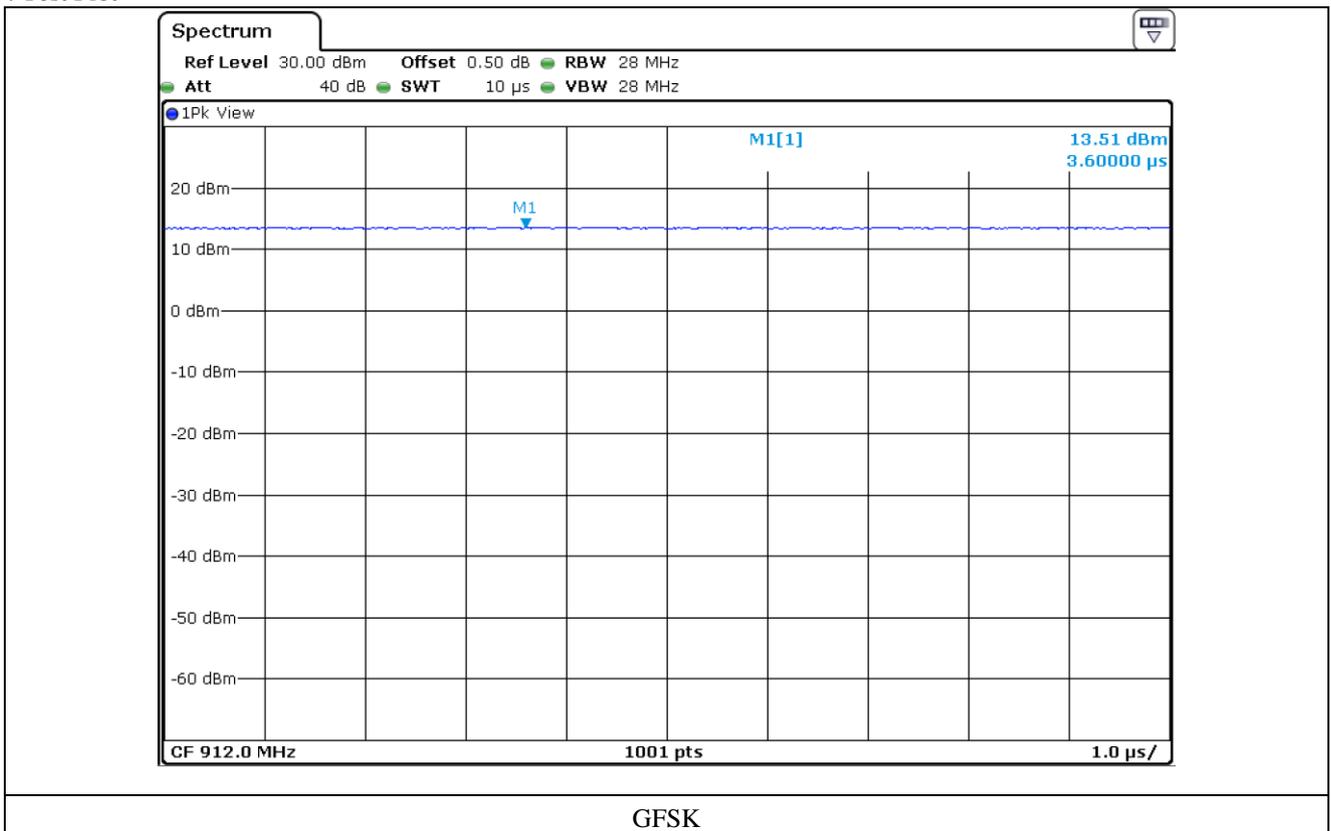
-. Duty Cycle

Mode	Tx On Time [ ms ]	Tx Off Time [ ms ]	Duty Cycle [ % ]	Correction Factor [ dB ]
GFSK	-	-	100.00	-

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) \* 100

Correction Factor : 10 \* Log(1 / (Duty Cycle / 100))

-. Test Plot



## 5.4 Configuration of Test System

**Line Conducted Test:** The EUT was connected to the power of USB was connected to Notebook PC. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

**Radiated Emission Test:** Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

## 5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **Antenna Construction:**

The antenna of the EUT is Unique coupling Dipole Antenna connector type (RP-SMA connector) on the main board in the EUT, so no consideration of replacement by the user.

## 6. PRELIMINARY TEST

### 6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

### 6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

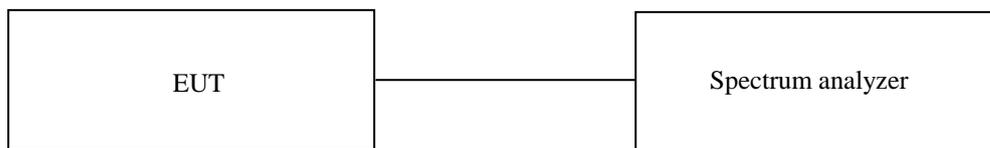
## 7. MIMIMUM 6 dB BANDWIDTH

### 7.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 45 % R.H.

### 7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



### 7.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

### 7.4 Test Data

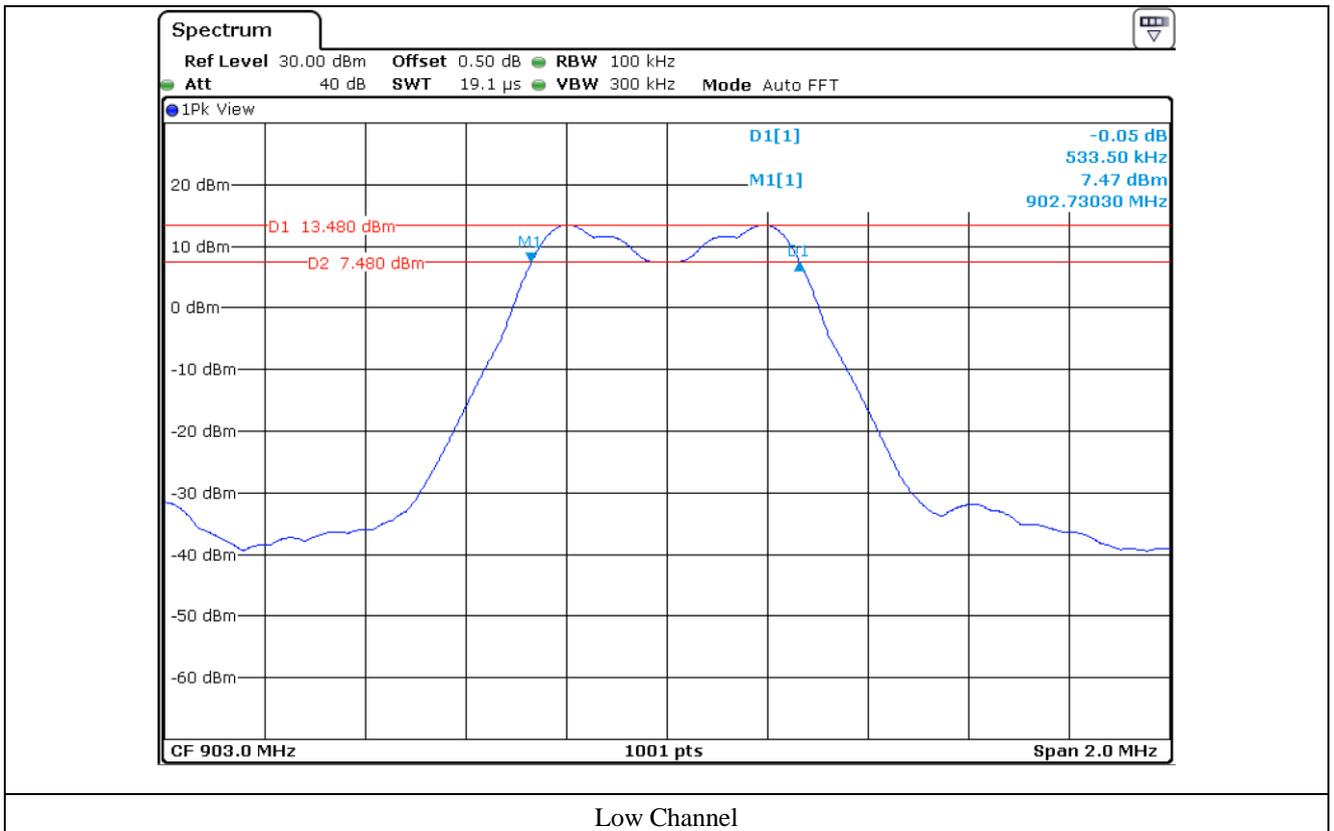
- Test Date : September 23, 2019 ~ September 27, 2019

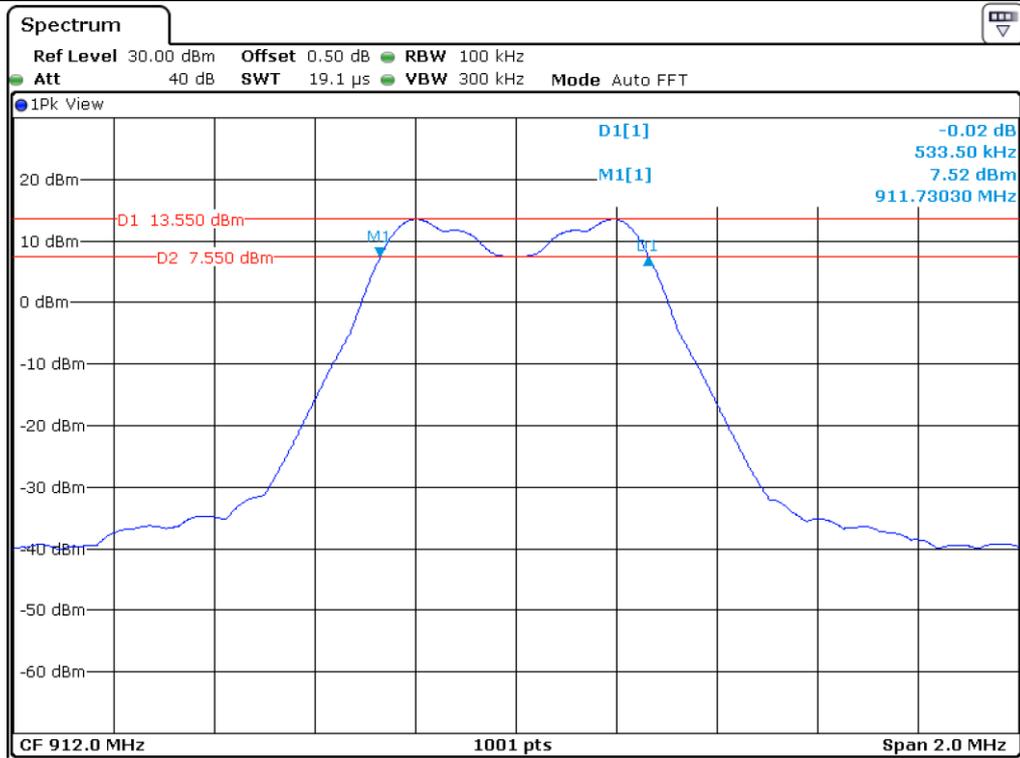
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	6 dB Bandwidth (kHz)	LIMIT (kHz)	Margin (kHz)
LOW	903.00	533.50	500.00	33.50
MIDDLE	912.00	533.50	500.00	33.50
HIGH	921.00	533.50	500.00	33.50

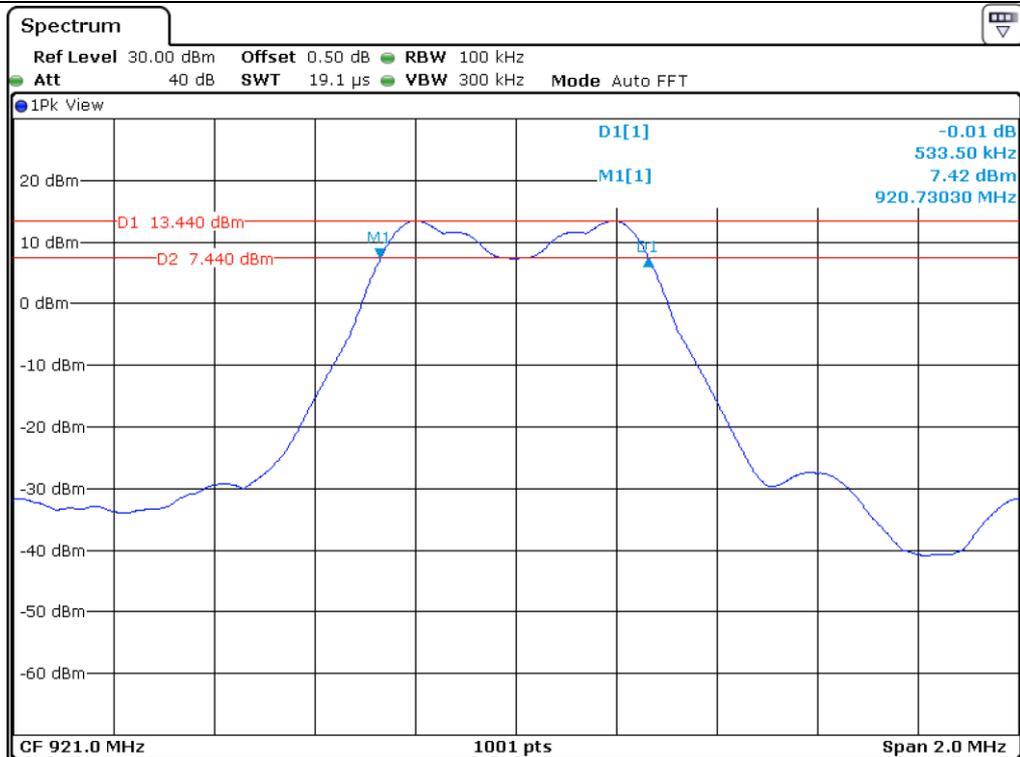
Remark. Margin = Measured Value - Limit

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

## 8. MAXIMUM PEAK OUTPUT POWER

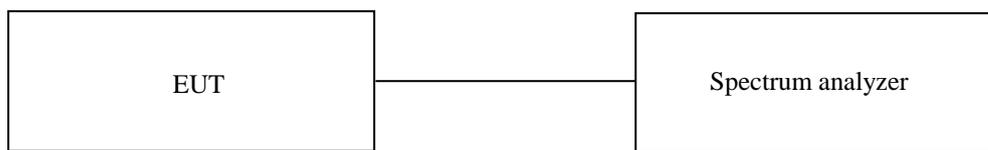
### 8.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 45 % R.H.

### 8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to  $\geq$  DTS Bandwidth, the video bandwidth is set to 3 times the resolution bandwidth.



### 8.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

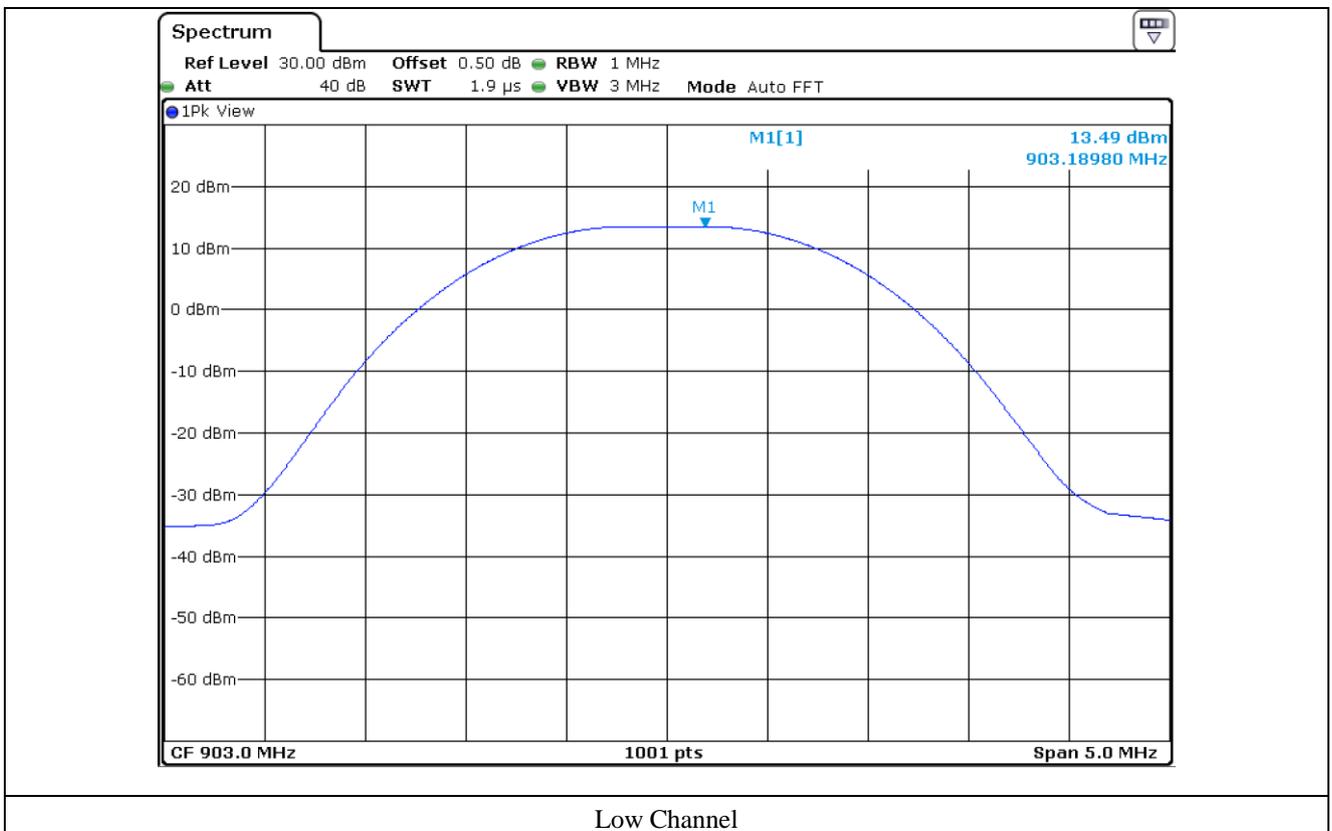
### 8.4 Test Data

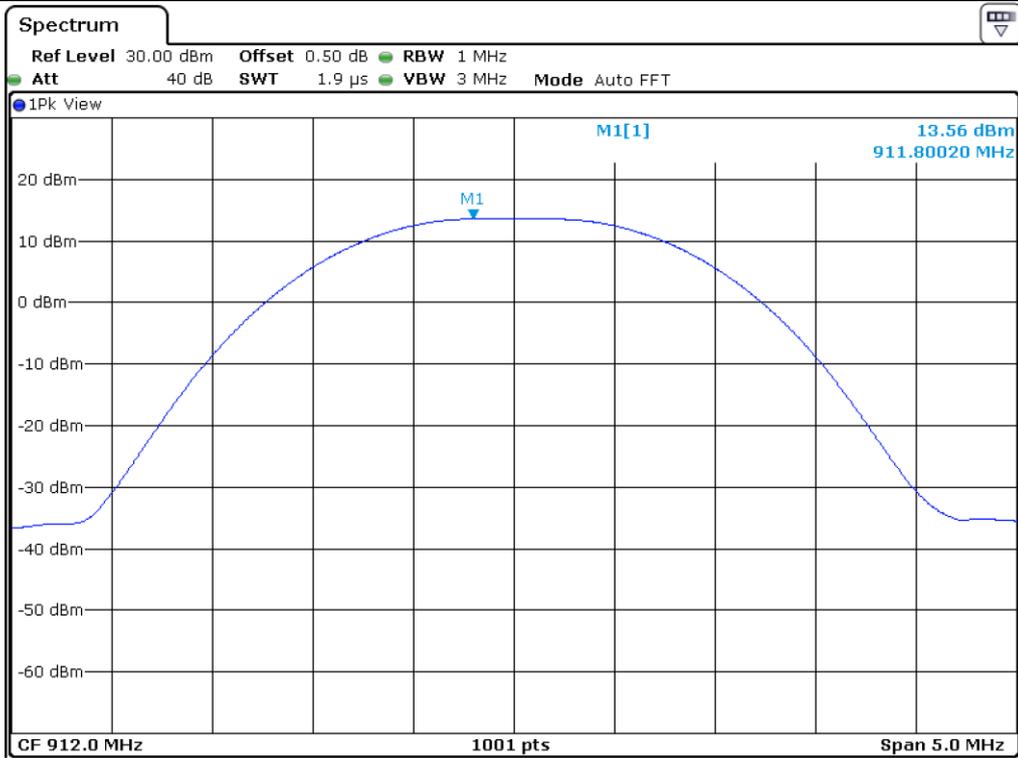
- Test Date : September 23, 2019 ~ September 27, 2019
- Test Result : Pass
- Duty Cycle : 100.00 %

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	13.49	30.00	16.51
MIDDLE	2 440.00	13.56	30.00	16.44
HIGH	2 480.00	13.45	30.00	16.55

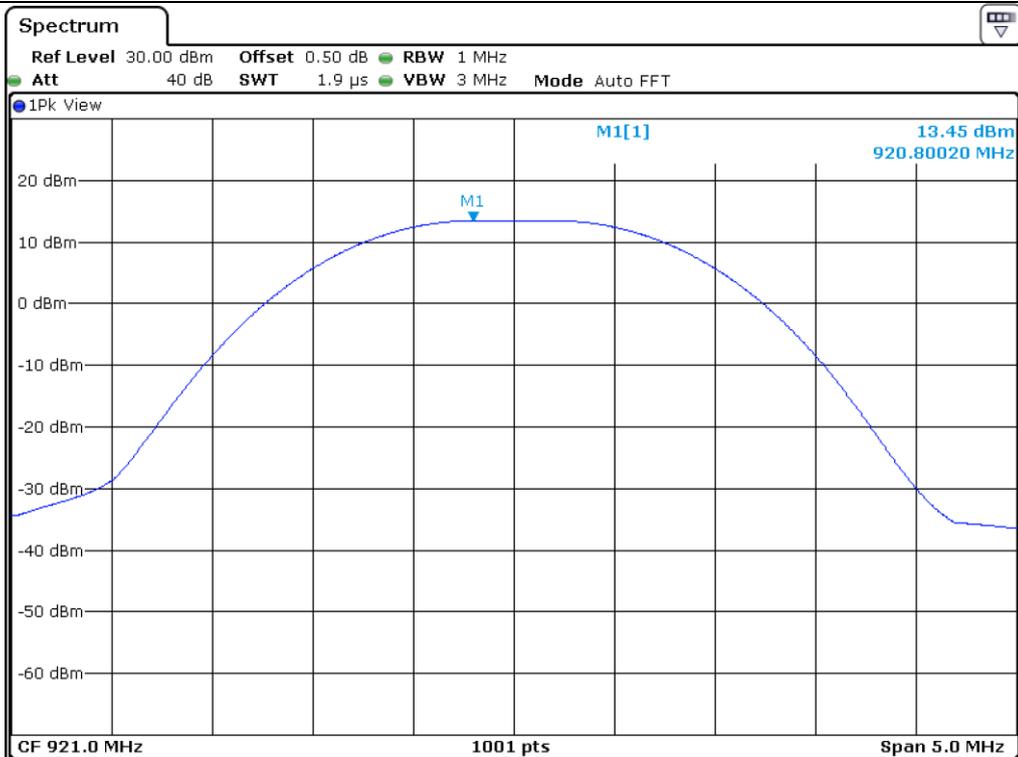
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

**Tested by: Hyung-Kwon, Oh / Assistant Manager**





Middle Channel



High Channel

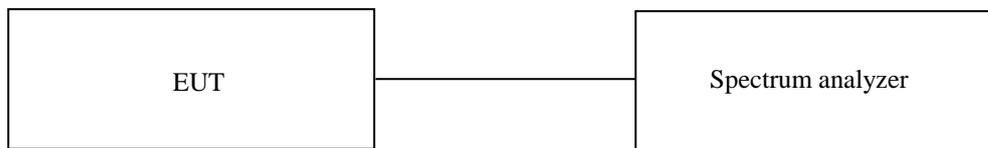
## 9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

### 9.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 45 % R.H.

### 9.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



### 9.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

The frequency spectrum from up to 10 GHz was scanned and emission levels maximized at each frequency recorded.

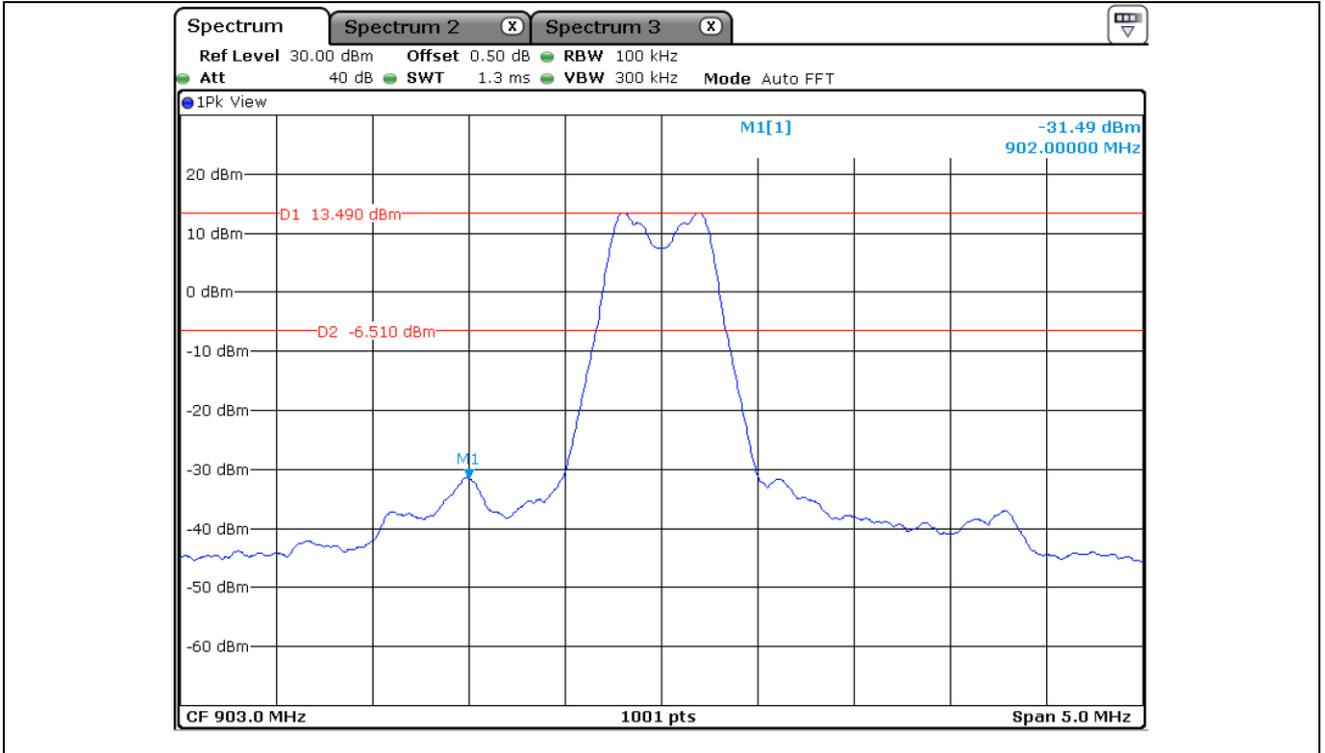
The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

### 9.4 Test equipment used

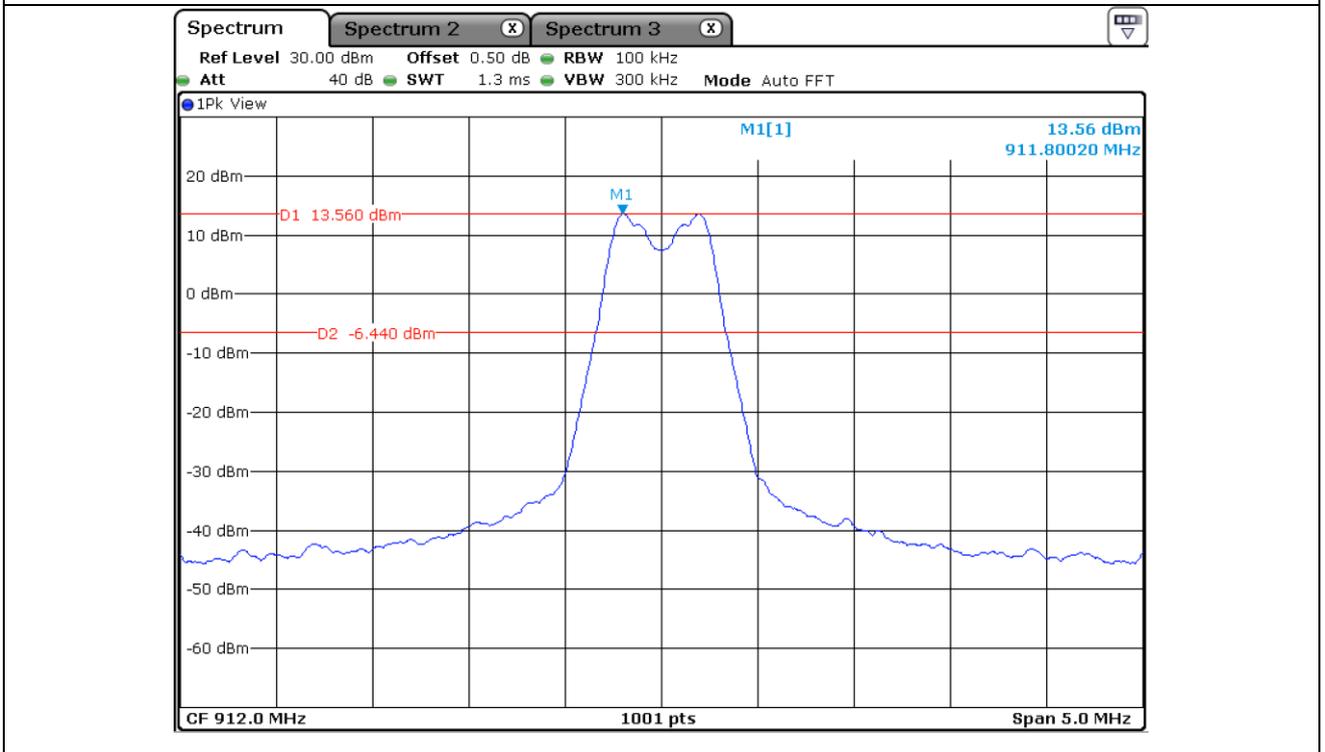
Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ - ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 28, 2019 (1Y)
■ - 310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 18, 2019 (1Y)
■ - BBV 9718B	Schwarzbeck	Amplifier	009	Mar. 20, 2019 (1Y)
■ - DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ - MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ - VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Apr. 13, 2018 (2Y)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (1Y)
■ - VAMP9243	Schwarzbeck	ROD ANTENNA	VAMP9243	Mar. 14, 2019 (2Y)
■ - WRCT	Wainwright	Tunable Band Reject Filter	7	Jul. 25, 2019 (1Y)
890/960-5/40-8SSK	Instruments GmbH			

All test equipment used is calibrated on a regular basis.

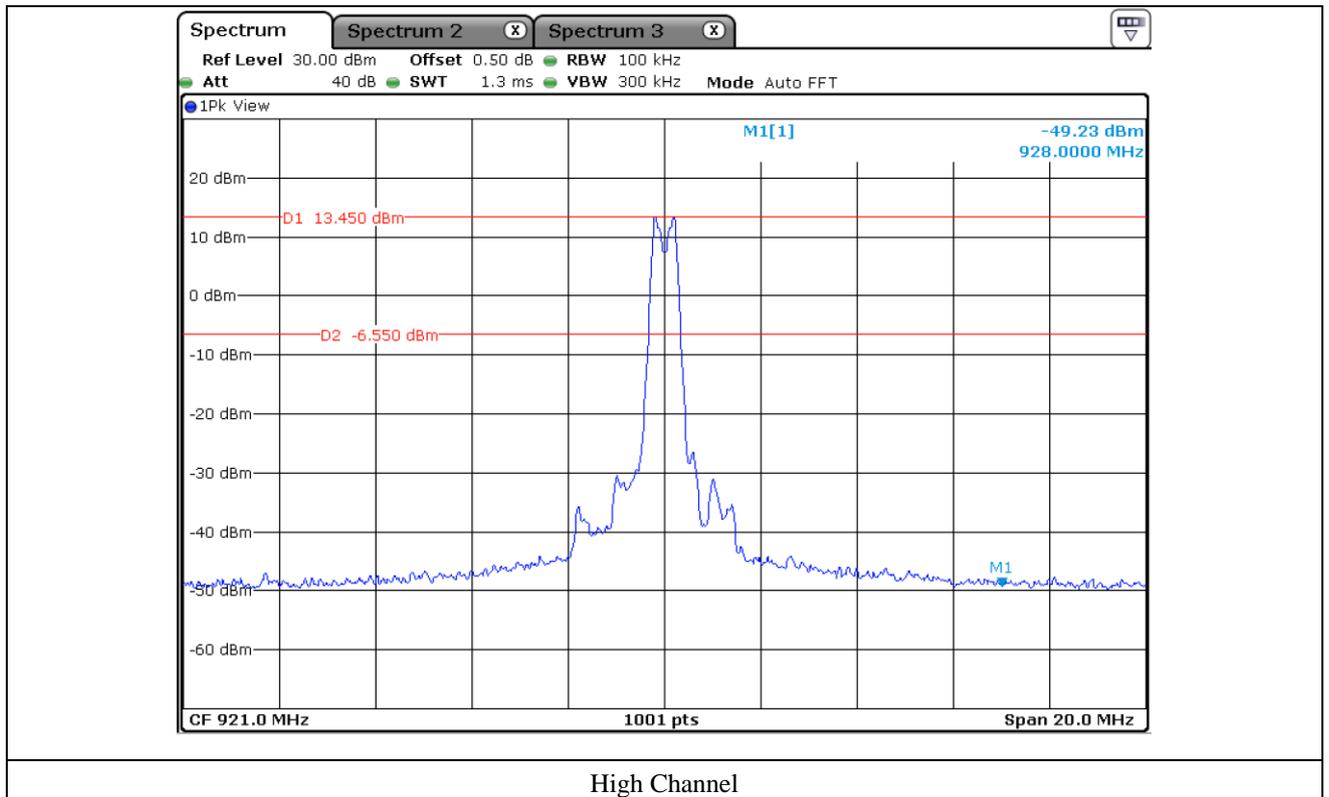
9.5 Test Data for conducted emission

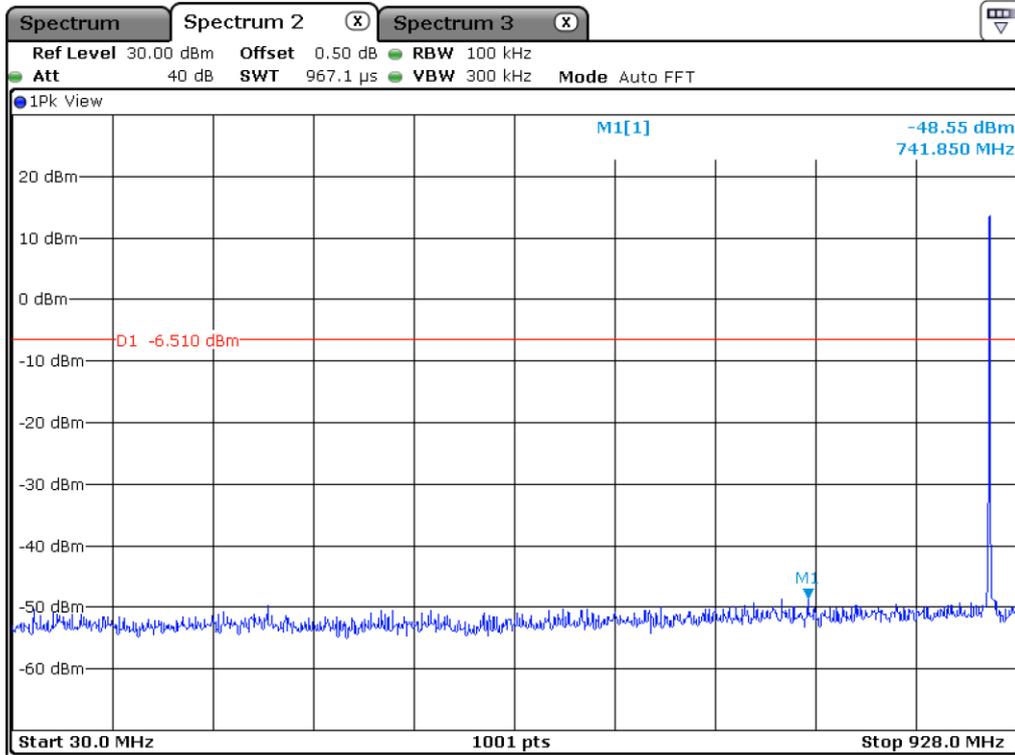


Low Channel

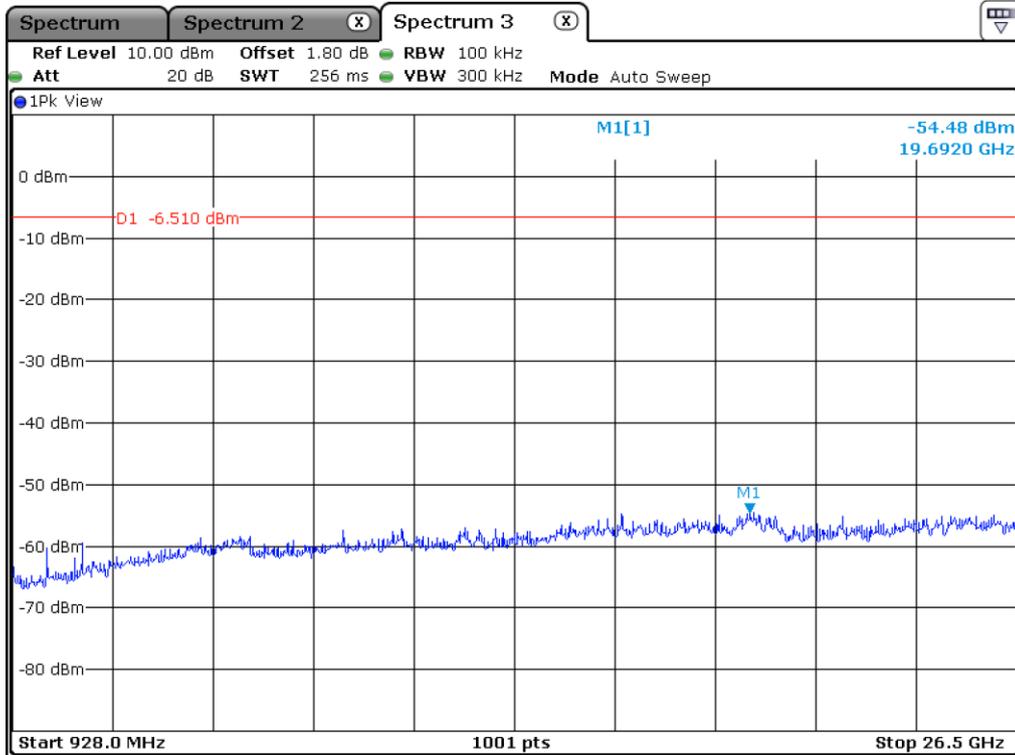


Middle Channel

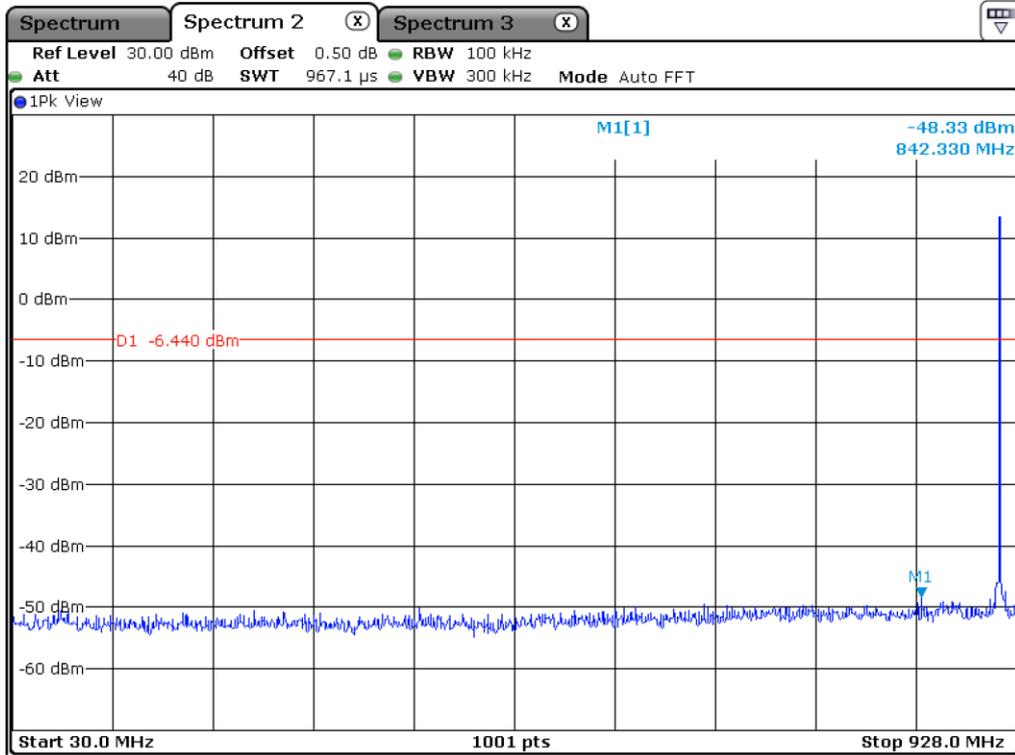




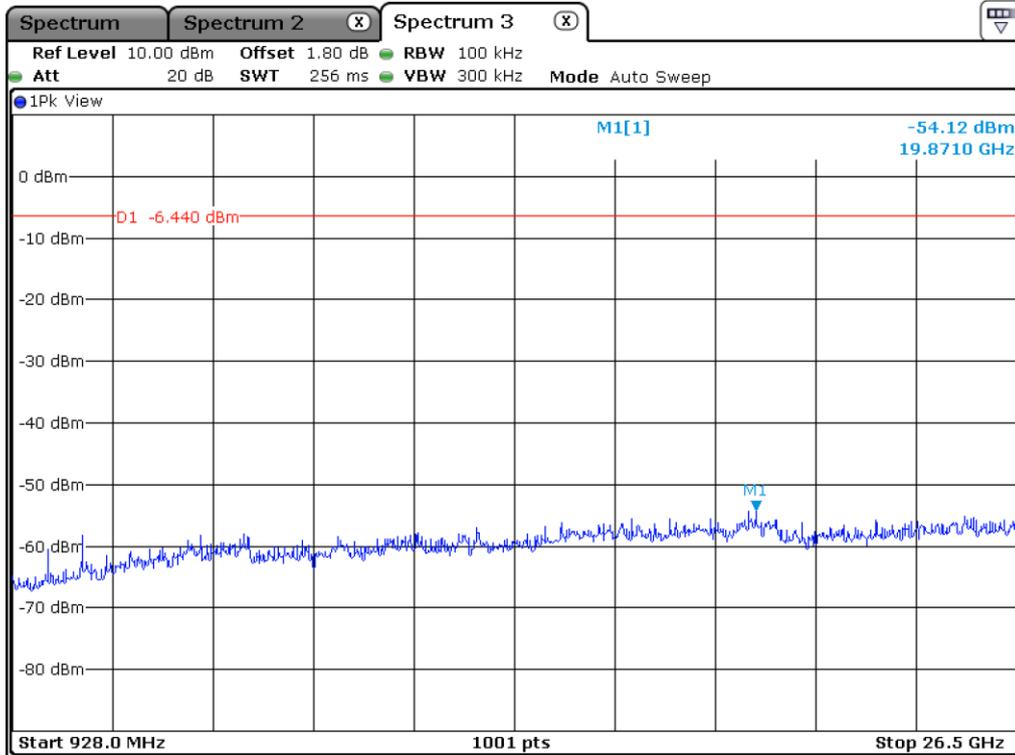
Low Channel



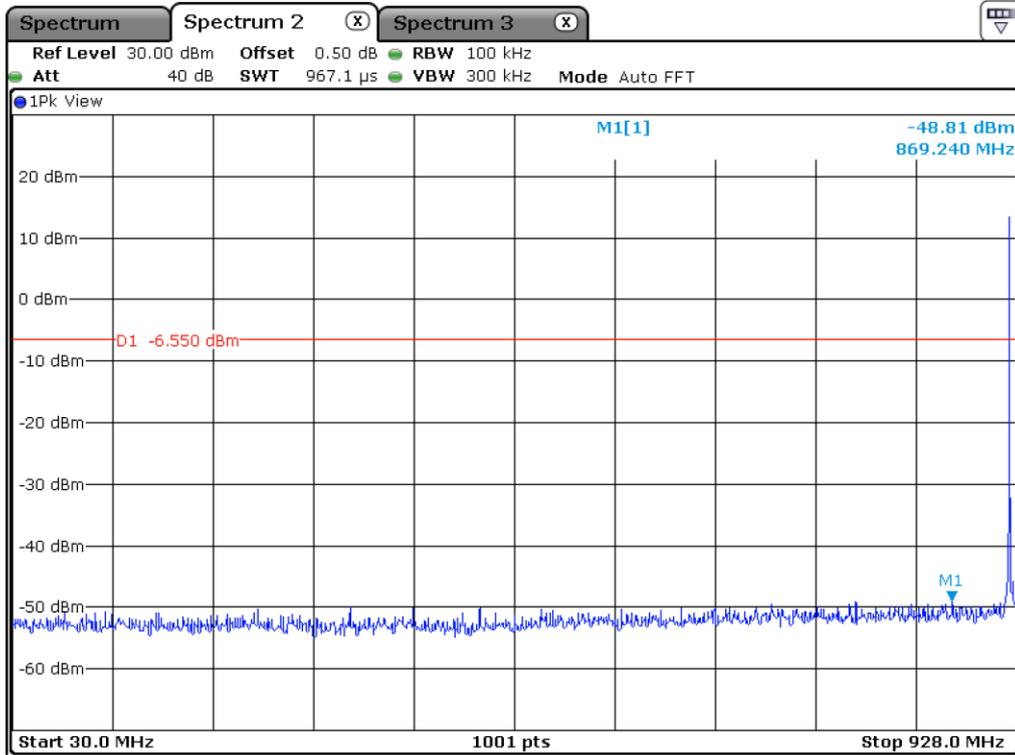
Low Channel



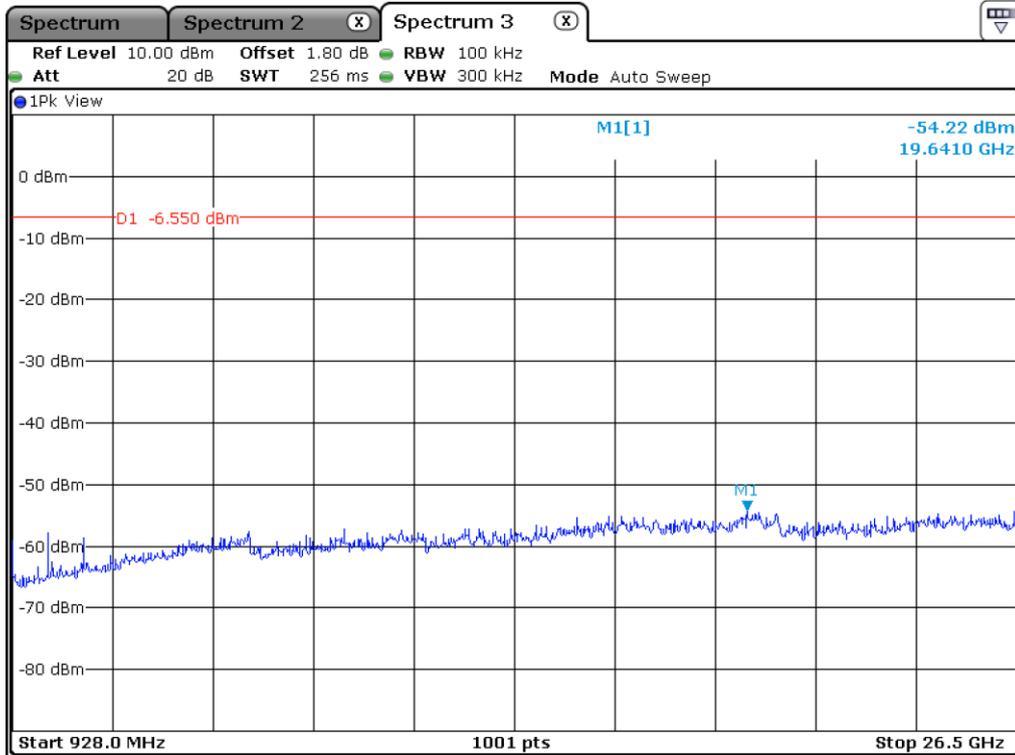
Middle Channel



Middle Channel



High Channel



High Channel

## 9.6 Test data for radiated emission

### 9.6.1 Spurious & Harmonic Radiated Emission

- Test Date : September 23, 2019 ~ September 27, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,  
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 10.0 GHz
- Measurement distance : 3 m
- Duty Cycle : 100.00 %
- Result : PASSED

Channel	Frequency (MHz)	Reading (dBuV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBuV/m)	Limits (dBuV/m)	Margin (dB)
Low	1 806.000	18.47	Peak	H	24.90	1.59	44.96	68.20	23.24
	1 806.000	18.63	Peak	V	24.90	1.59	45.12	68.20	23.08
	2 709.000	17.14	Peak	H	28.00	1.28	46.42	74.00	27.58
	2 709.000	6.87	Average	H	28.00	1.28	36.15	54.00	17.85
	2 709.000	16.52	Peak	V	28.00	1.28	45.80	74.00	28.20
	2 709.000	5.67	Average	V	28.00	1.28	34.95	54.00	19.05
	3 612.000	17.26	Peak	H	29.40	1.57	48.23	74.00	25.77
	3 612.000	5.57	Average	H	29.40	1.57	36.54	54.00	17.46
	3 612.000	16.95	Peak	V	29.40	1.57	47.92	74.00	26.08
	3 612.000	5.76	Average	V	29.40	1.57	36.73	54.00	17.27
Middle	1 824.000	16.32	Peak	H	24.90	1.59	42.81	68.20	25.39
	1 824.000	16.20	Peak	V	24.90	1.59	42.69	68.20	25.51
	2 736.000	16.87	Peak	H	28.00	1.28	46.15	74.00	27.85
	2 736.000	6.84	Average	H	28.00	1.28	36.12	54.00	17.88
	2 736.000	16.93	Peak	V	28.00	1.28	46.21	74.00	27.79
	2 736.000	5.64	Average	V	28.00	1.28	34.92	54.00	19.08
	3 648.000	18.05	Peak	H	29.40	1.57	49.02	74.00	24.98
	3 648.000	6.27	Average	H	29.40	1.57	37.24	54.00	16.76
	3 648.000	17.43	Peak	V	29.40	1.57	48.40	74.00	25.60
	3 648.000	6.73	Average	V	29.40	1.57	37.70	54.00	16.30

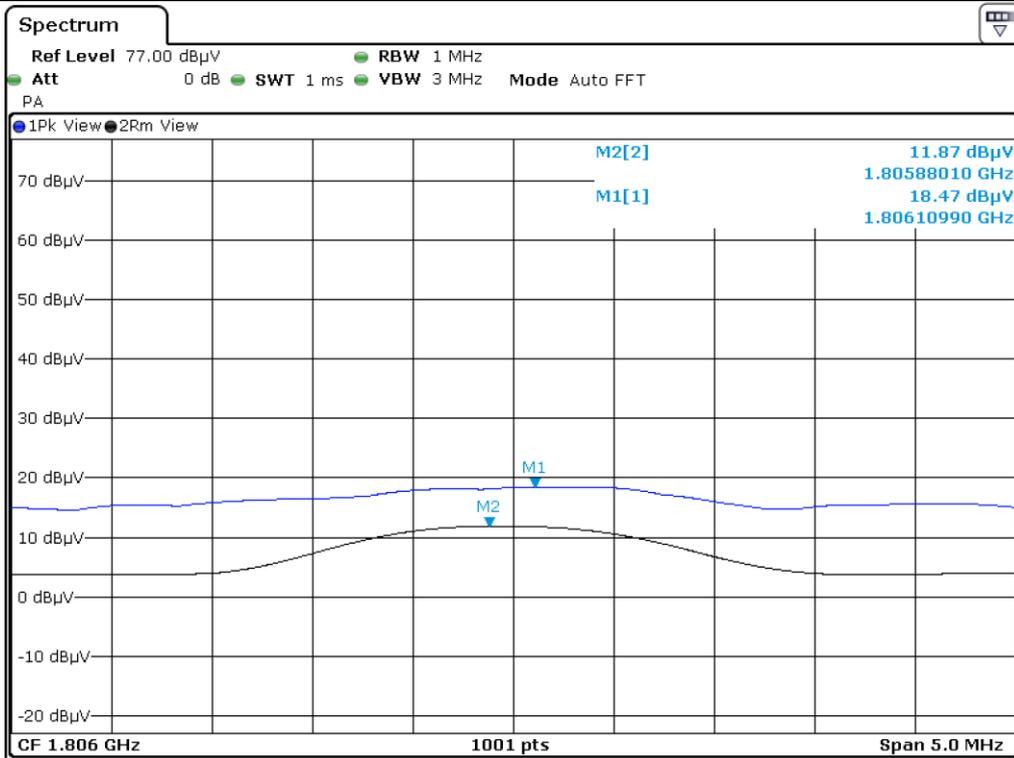
High	1 842.000	17.47	Peak	H	24.90	1.59	43.96	68.20	24.24
	1 842.000	17.01	Peak	V	24.90	1.59	43.50	68.20	24.70
	2 763.000	17.44	Peak	H	28.00	1.28	46.72	74.00	27.28
	2 763.000	6.83	Average	H	28.00	1.28	36.11	54.00	17.89
	2 763.000	16.55	Peak	V	28.00	1.28	45.83	74.00	28.17
	2 763.000	5.65	Average	V	28.00	1.28	34.93	54.00	19.07
	3 684.000	18.32	Peak	H	29.40	1.57	49.29	74.00	24.71
	3 684.000	6.03	Average	H	29.40	1.57	37.00	54.00	17.00
	3 684.000	17.73	Peak	V	29.40	1.57	48.70	74.00	25.30
	3 684.000	6.29	Average	V	29.40	1.57	37.26	54.00	16.74

Tabulated test data for Harmonic Radiated Emission

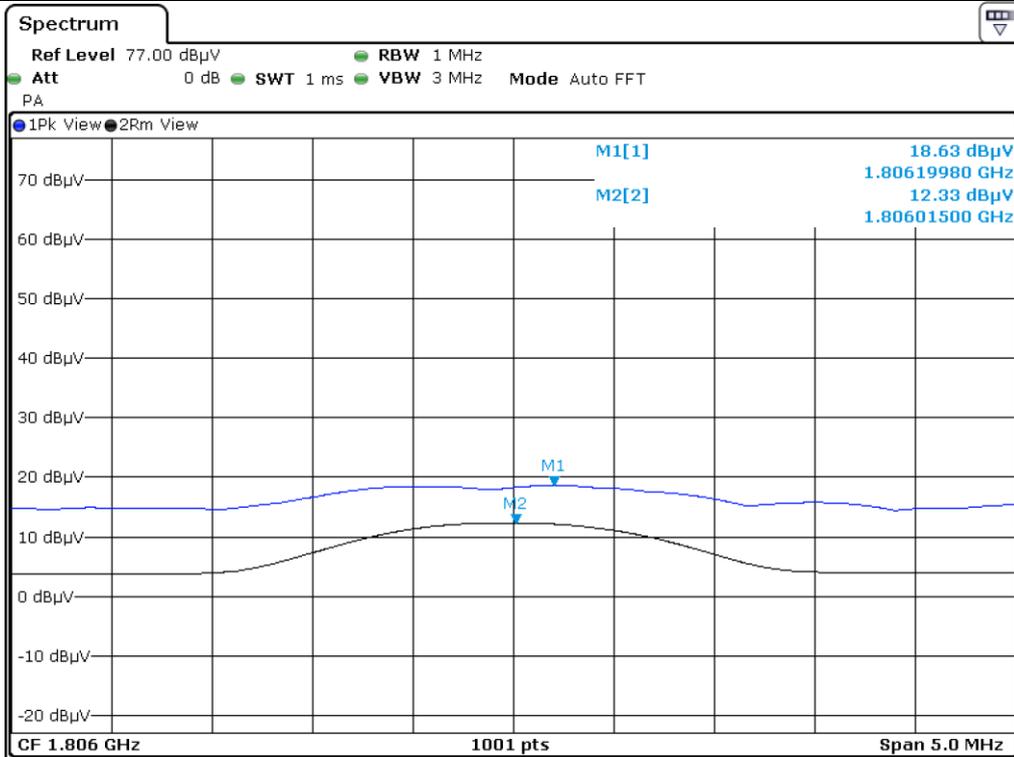
Remark: "H": Horizontal, "V": Vertical, "\*" Frequency fall in restricted band



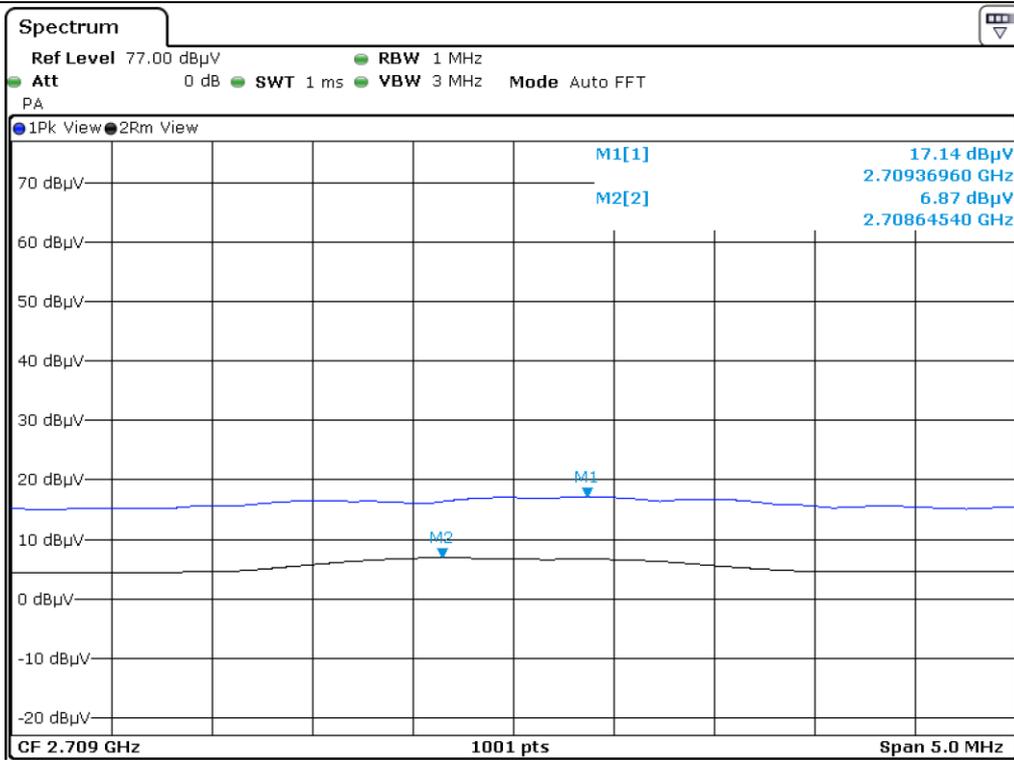
**Tested by: Hyung-Kwon, Oh / Assistant Manager**



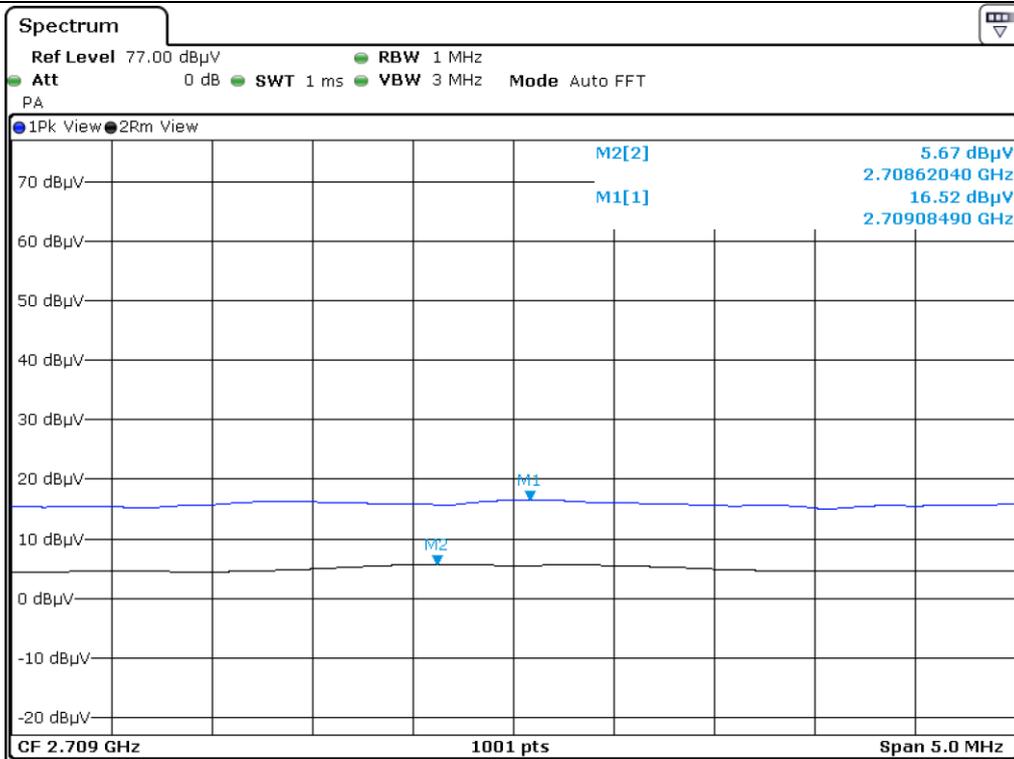
Low Channel\_2<sup>nd</sup>\_H



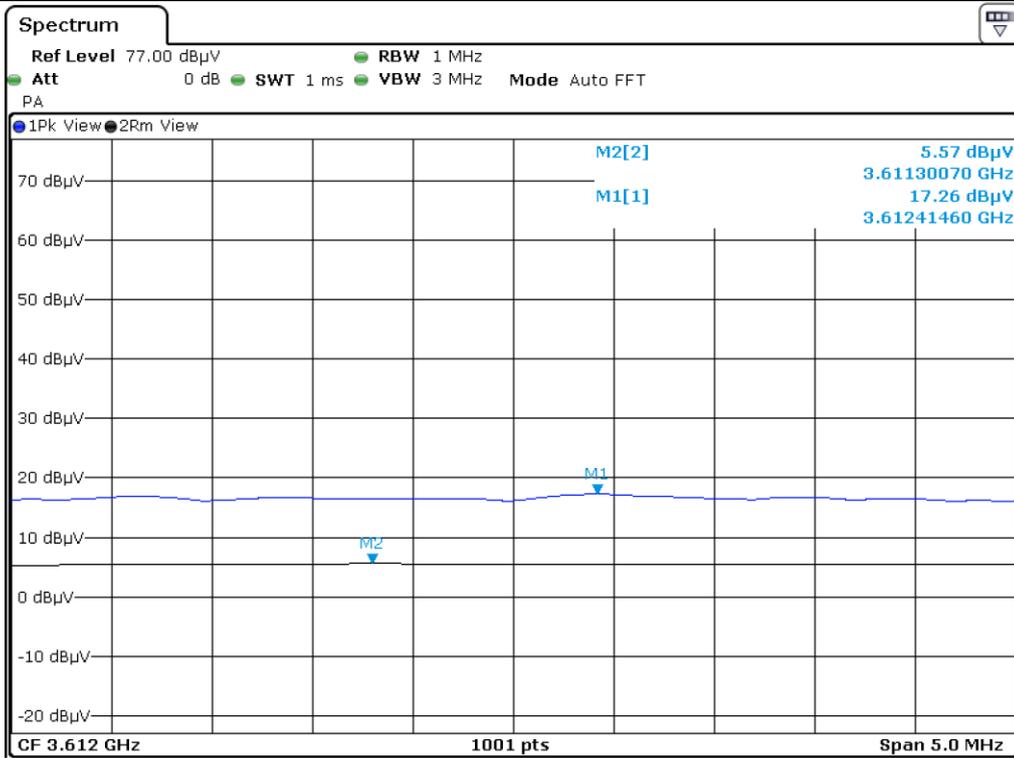
Low Channel\_2<sup>nd</sup>\_V



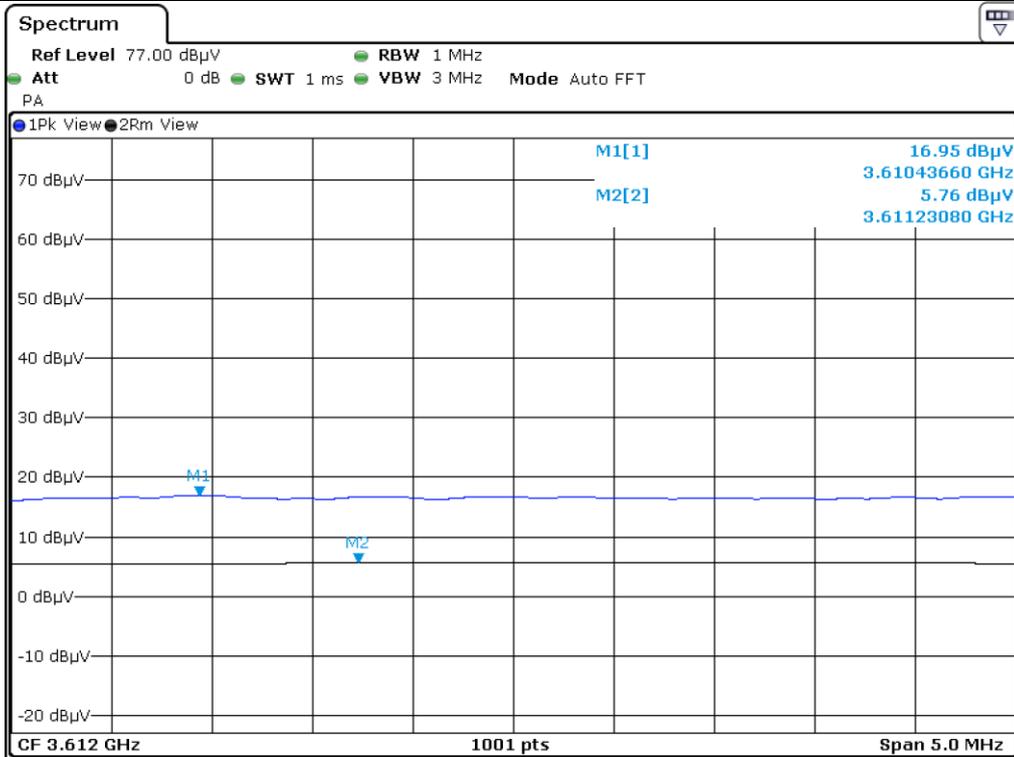
Low Channel\_3<sup>rd</sup>\_H



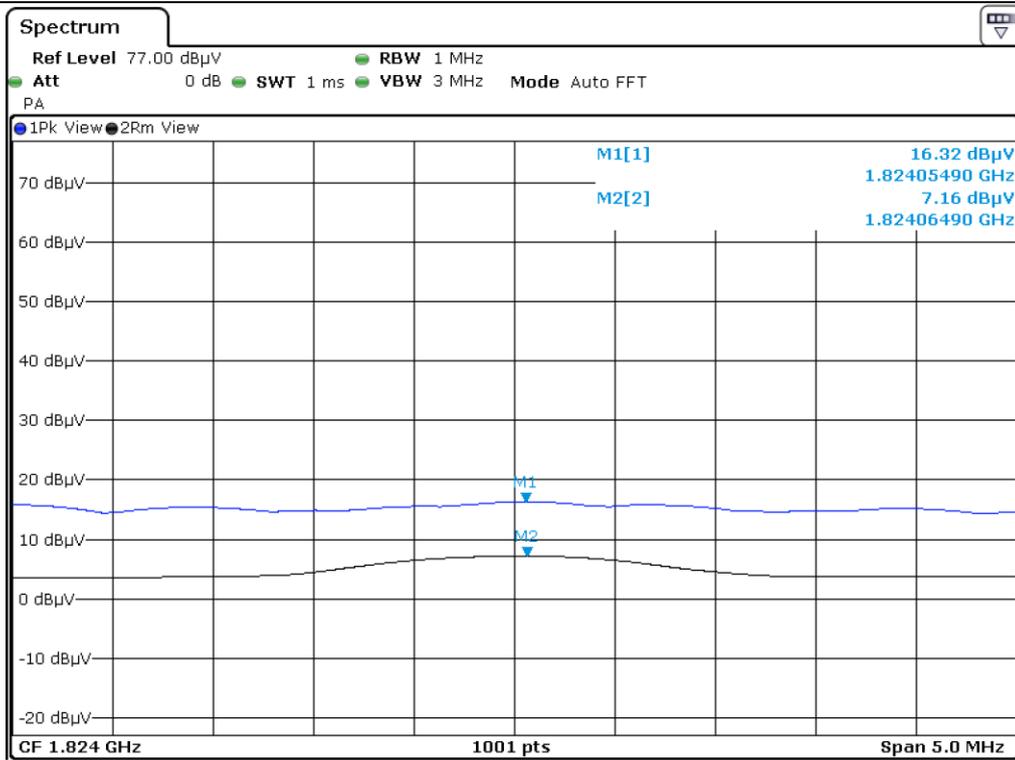
Low Channel\_3<sup>rd</sup>\_V



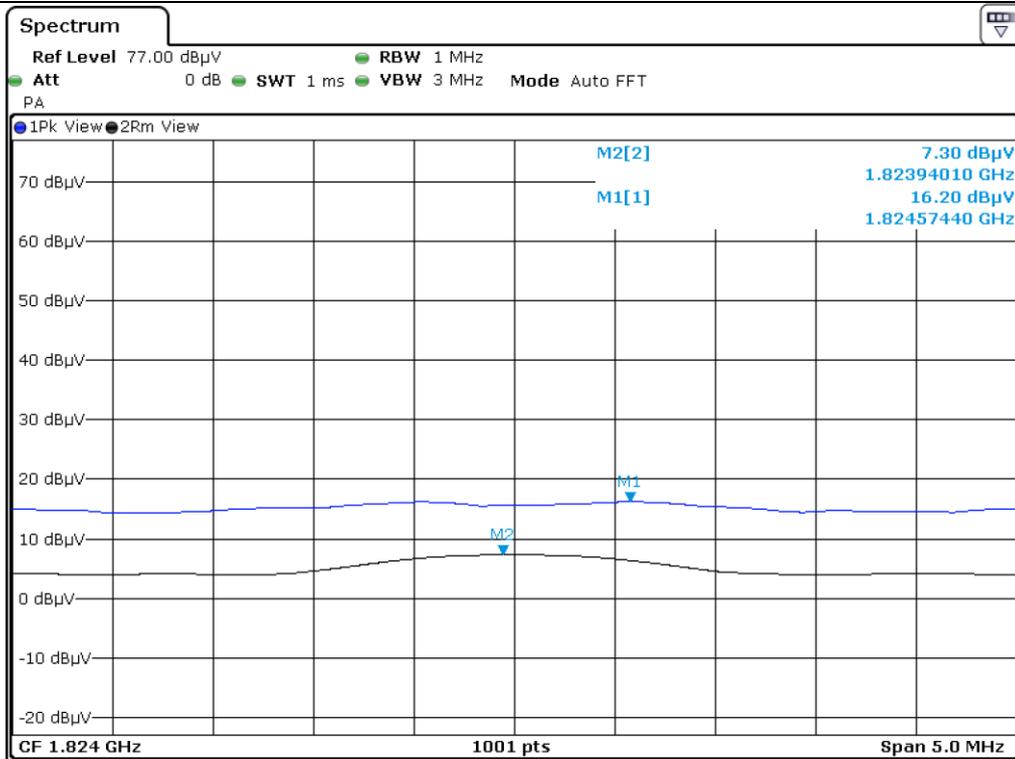
Low Channel\_4<sup>th</sup>\_H



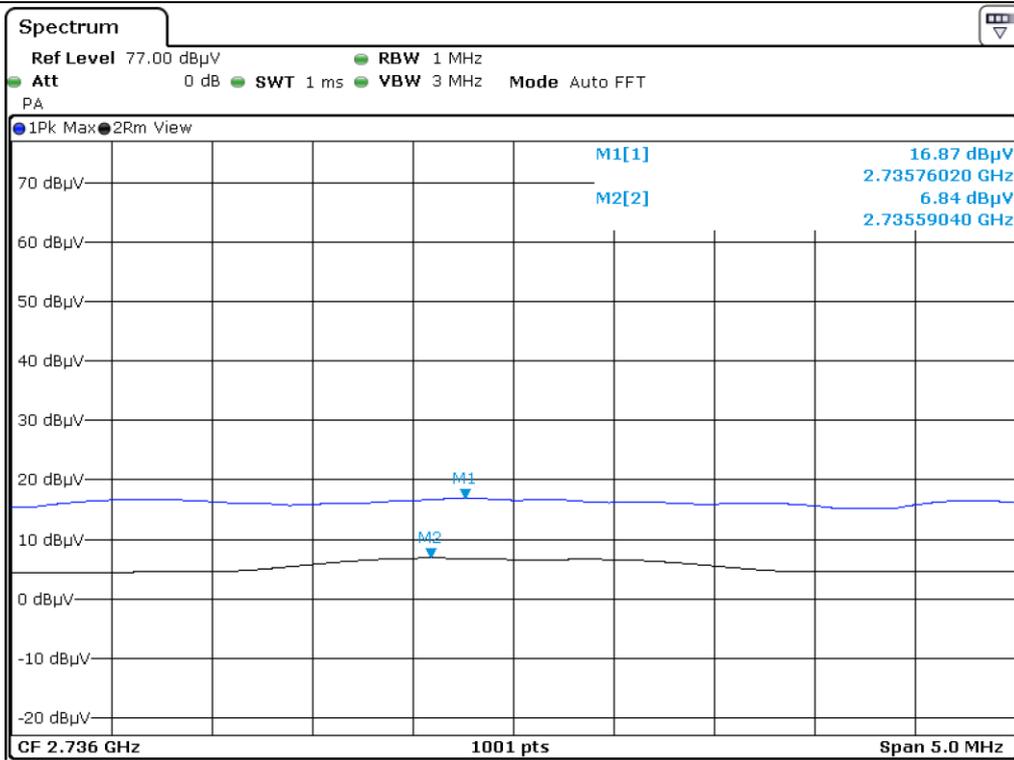
Low Channel\_4<sup>th</sup>\_V



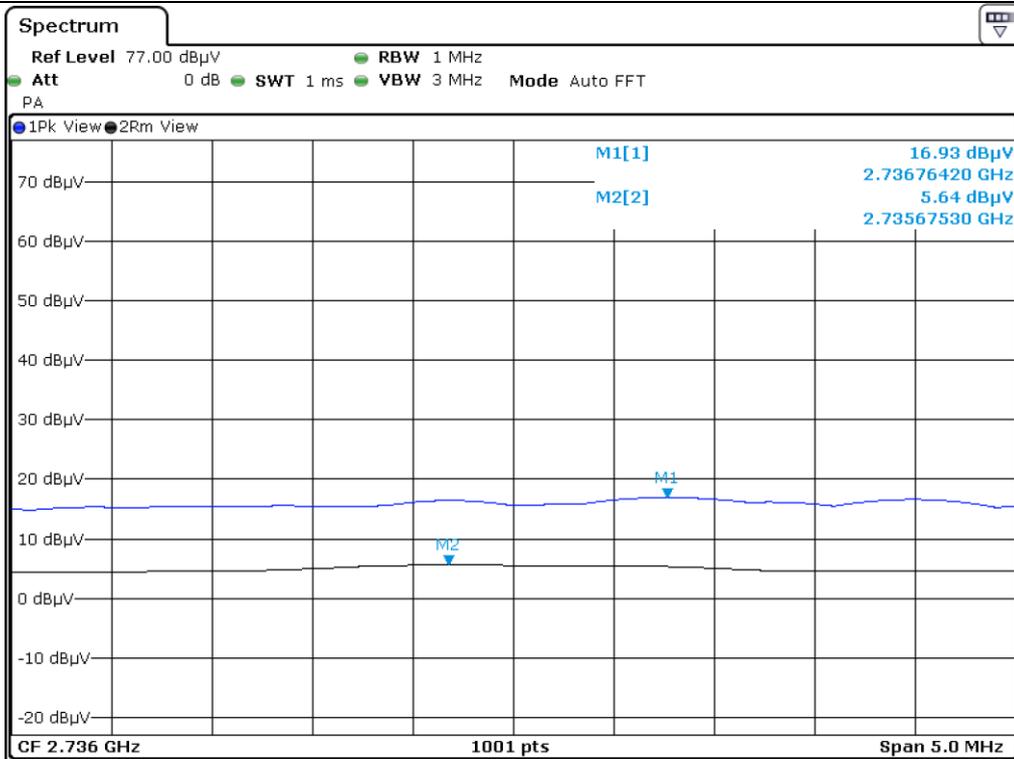
Middle Channel\_2<sup>nd</sup>\_H



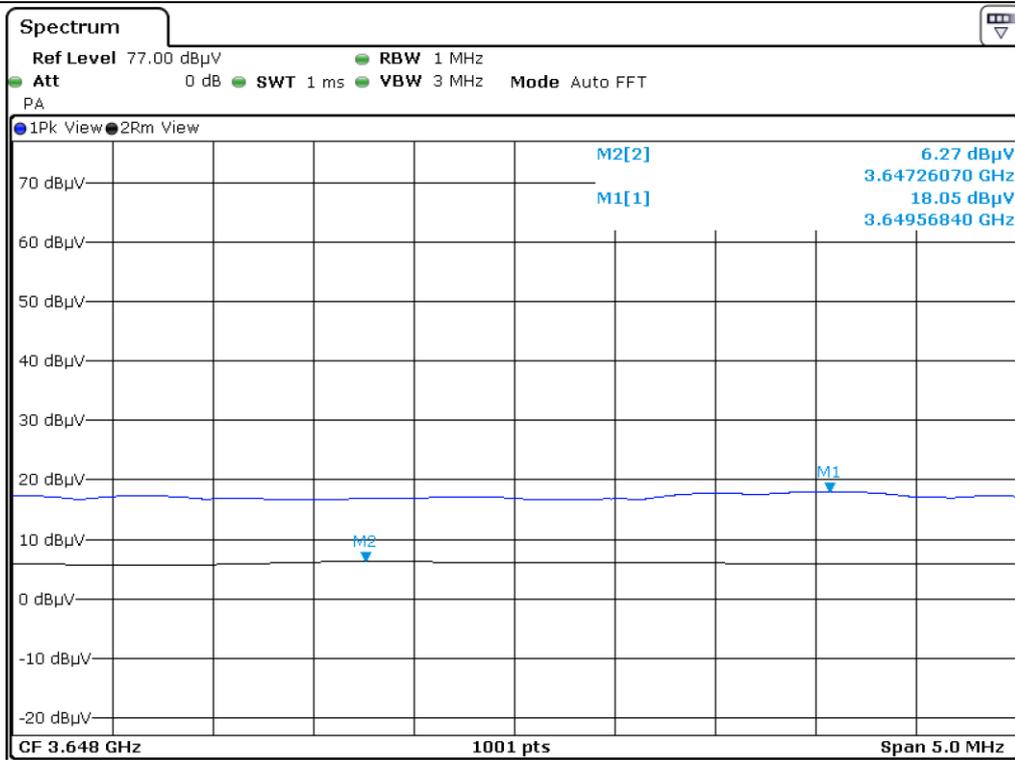
Middle Channel\_2<sup>nd</sup>\_V



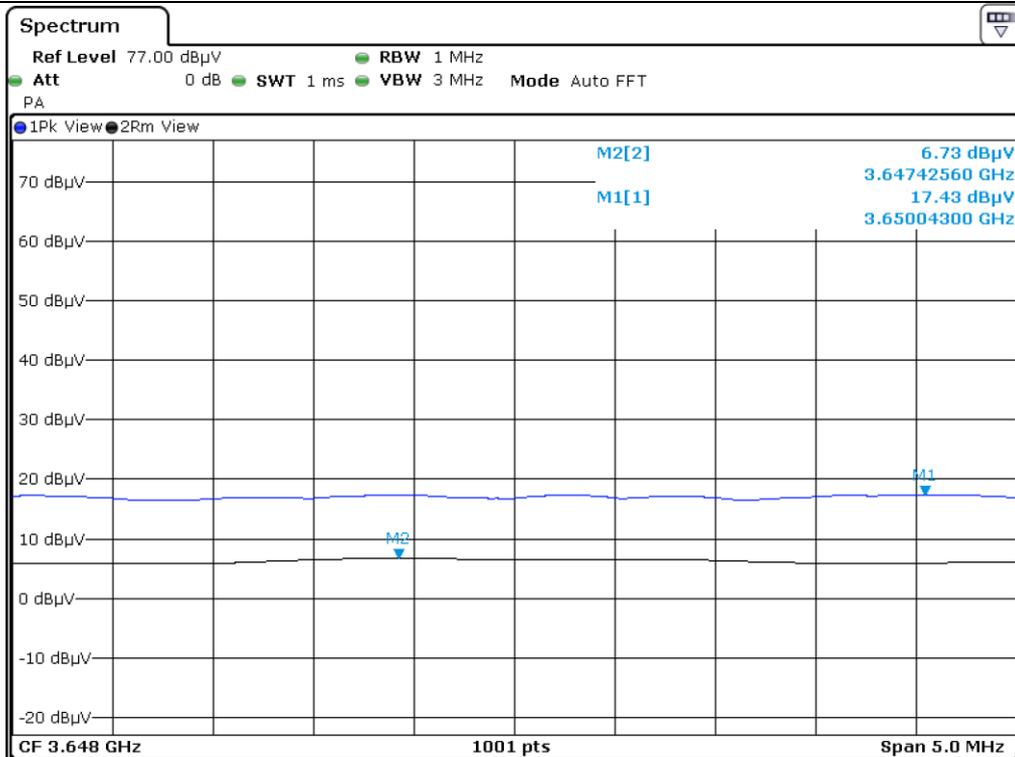
Middle Channel\_3<sup>rd</sup>\_H



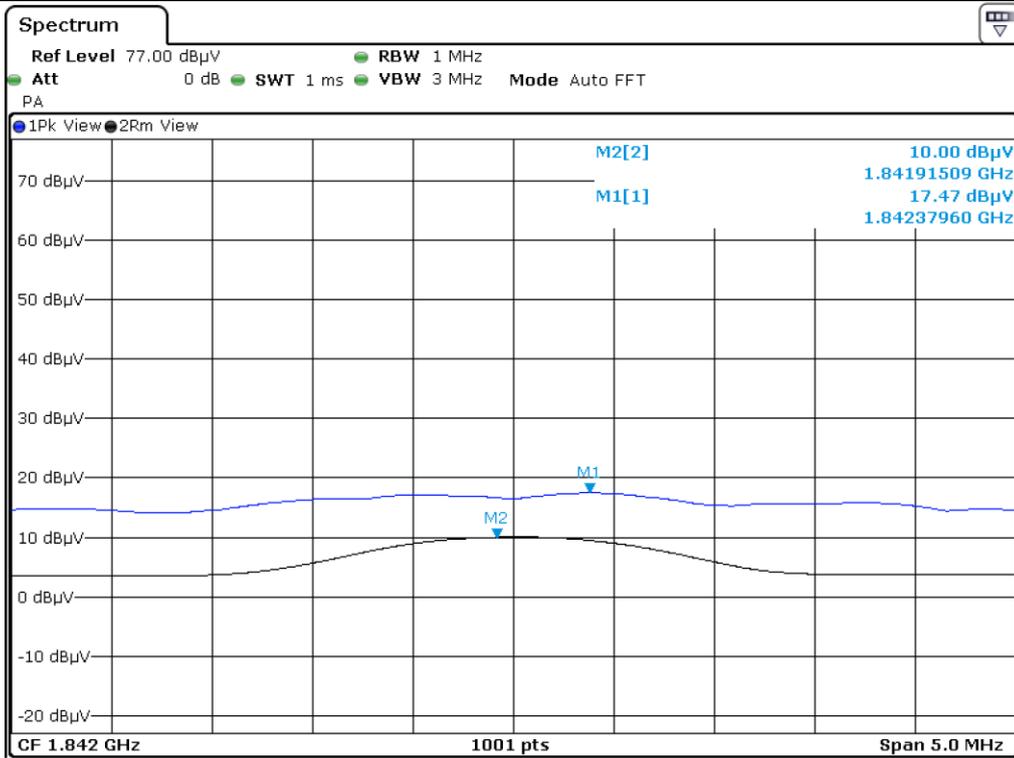
Middle Channel\_3<sup>rd</sup>\_V



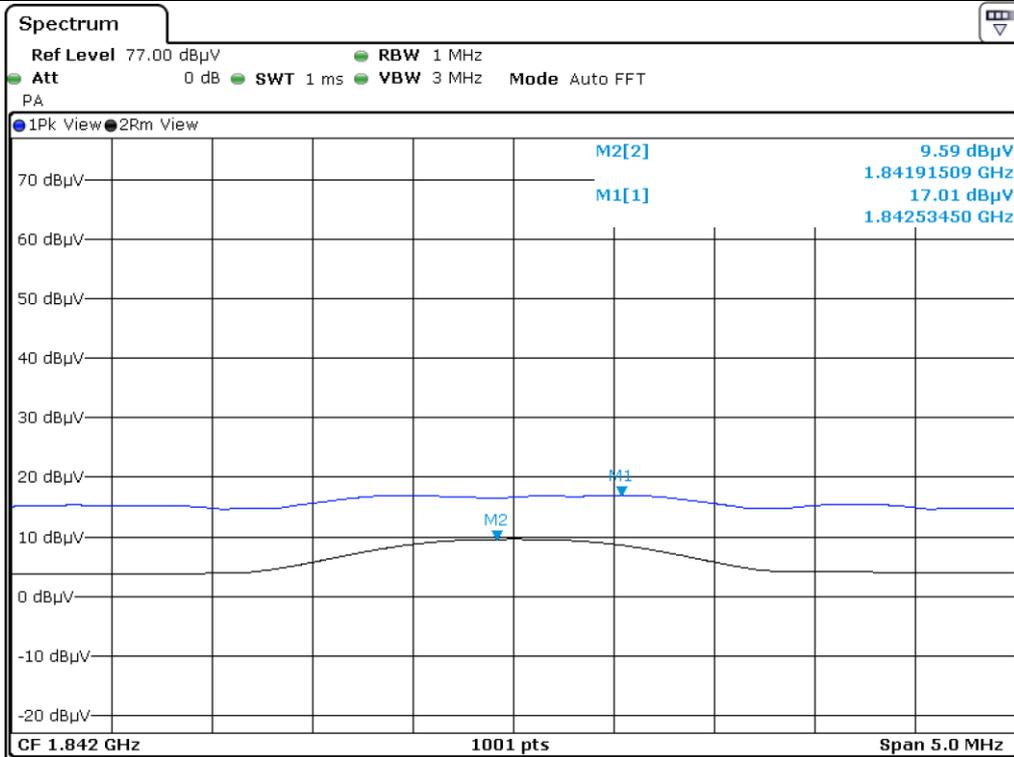
Middle Channel\_4<sup>th</sup>\_H



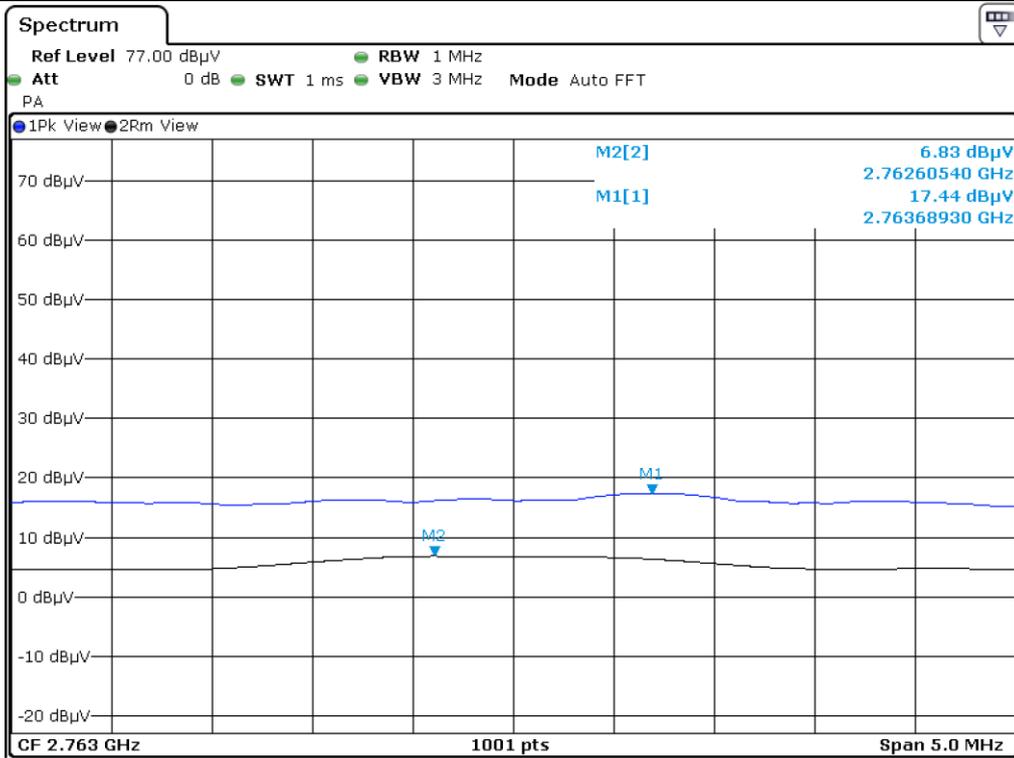
Middle Channel\_4<sup>th</sup>\_V



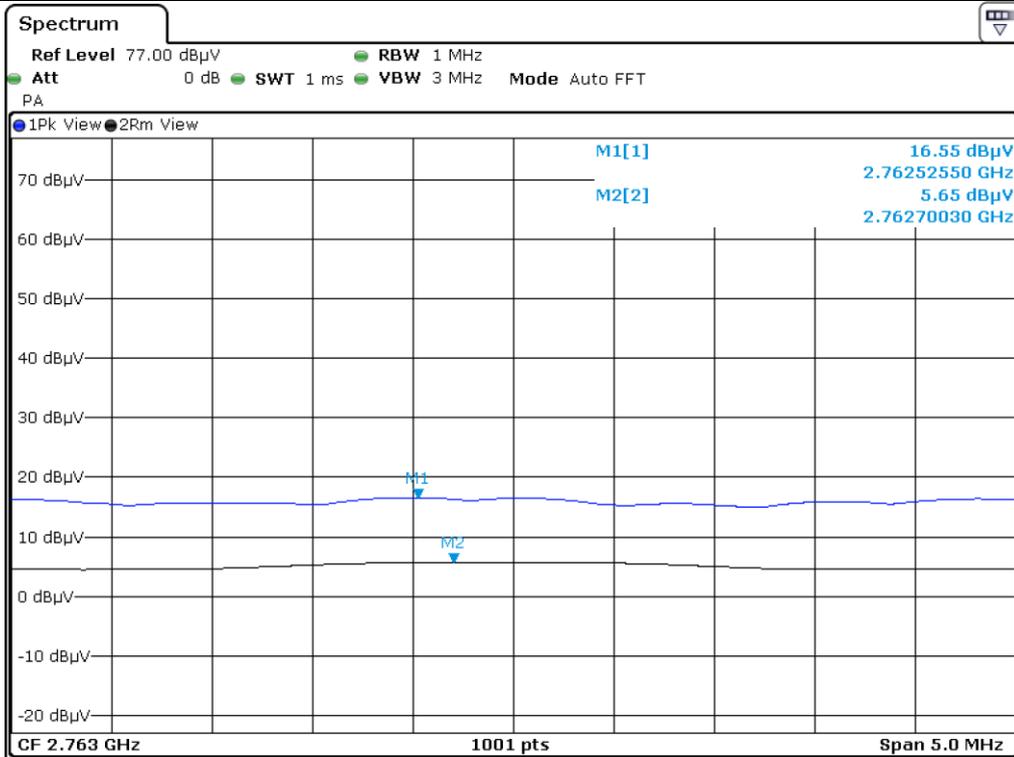
High Channel\_2<sup>nd</sup>\_H



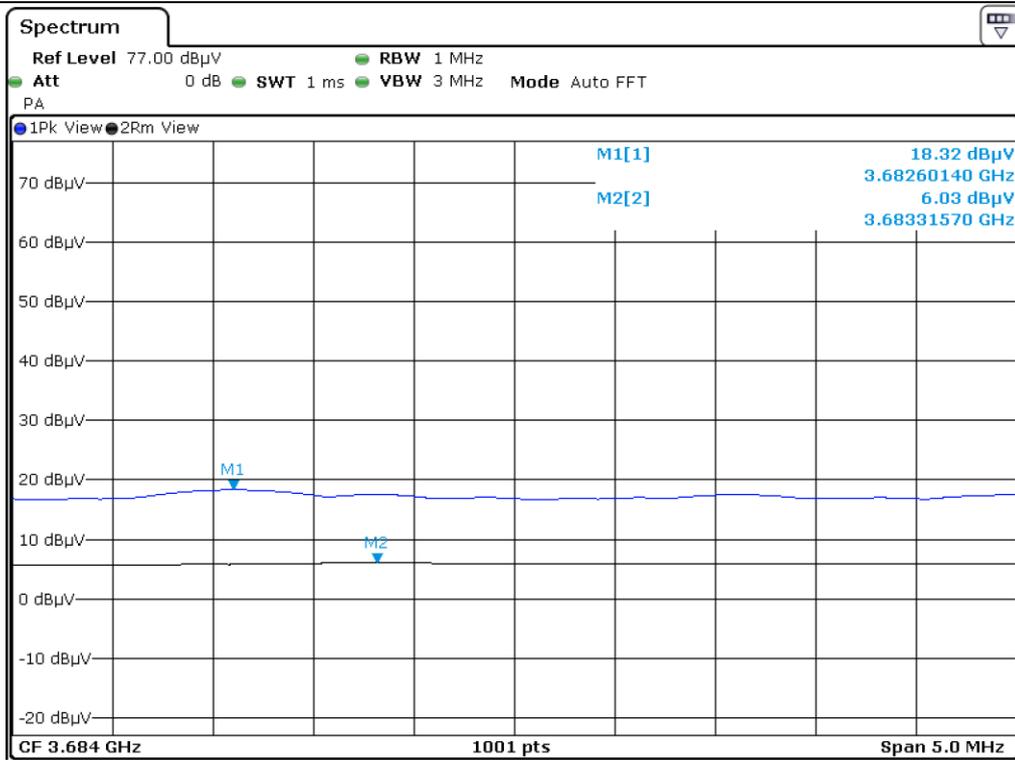
High Channel\_2<sup>nd</sup>\_V



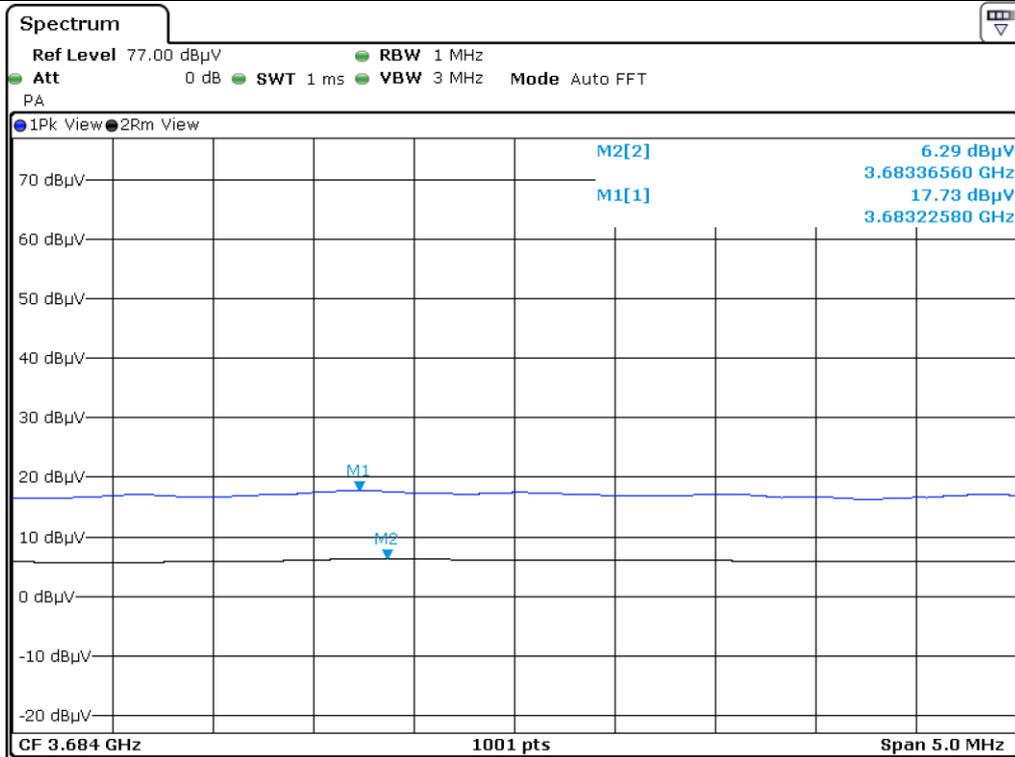
High Channel\_3<sup>rd</sup>\_H



High Channel\_3<sup>rd</sup>\_V



High Channel\_4<sup>th</sup>\_H



High Channel\_4<sup>th</sup>\_V

## 10. PEAK POWER SPECTRUL DENSITY

### 10.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 45 % R.H.

### 10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$  , the video bandwidth is set to 3 times the resolution bandwidth.



### 10.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

**10.4 Test Data**

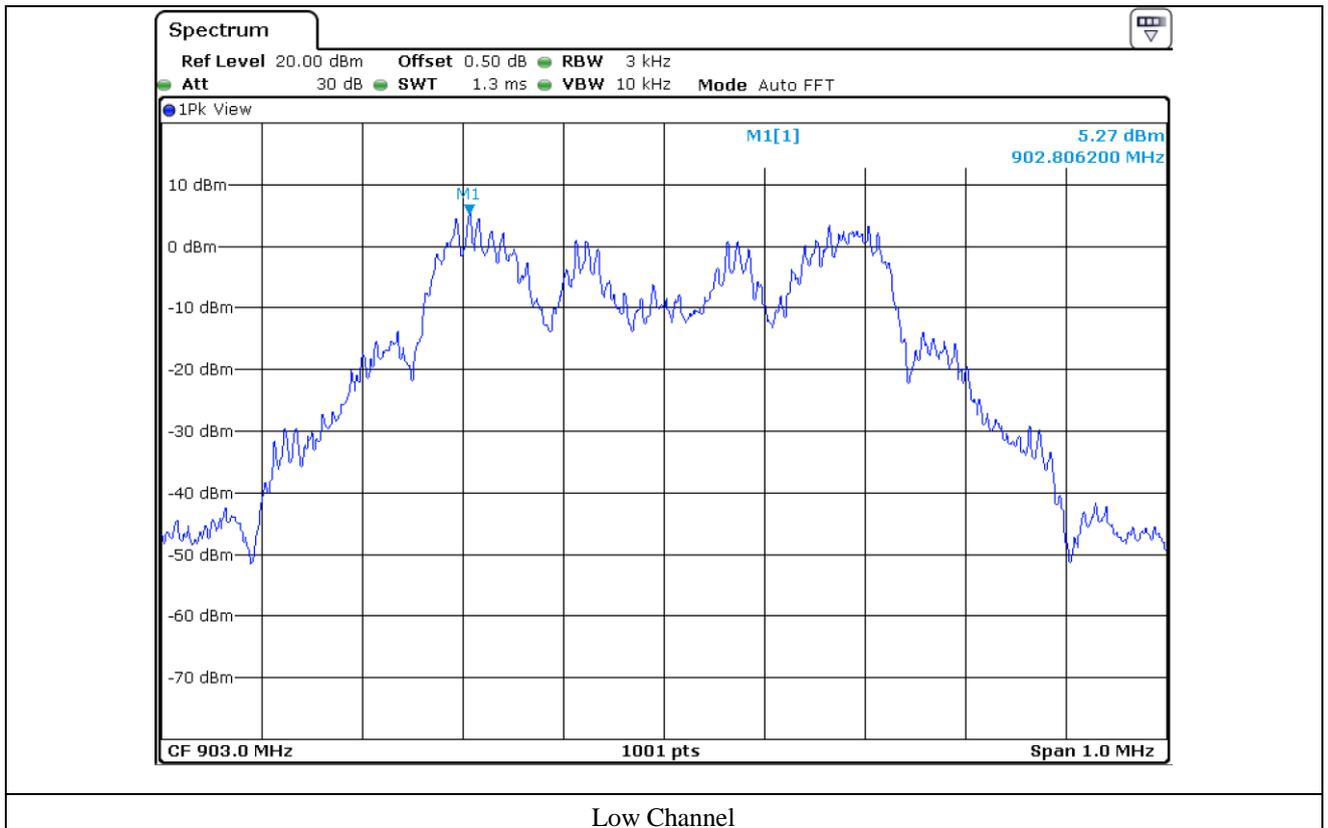
- Test Date : September 23, 2019 ~ September 27, 2019
- Test Result : Pass
- Operating Condition : Continuous transmitting mode

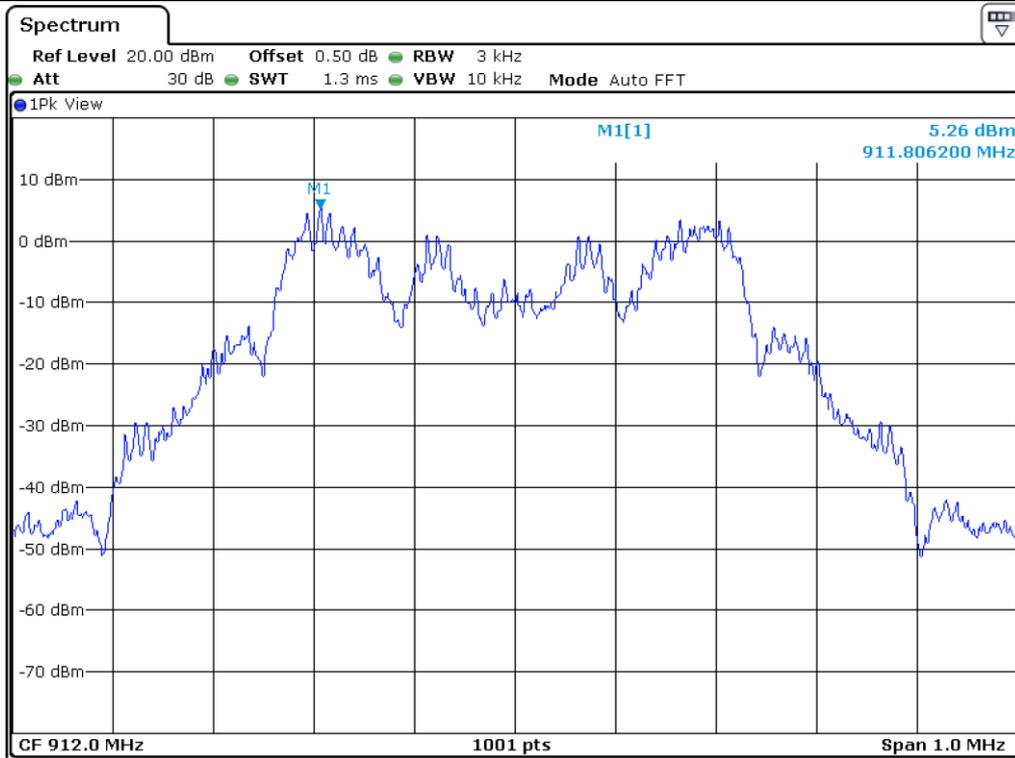
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	903.00	5.27	8.00	2.73
Middle	912.00	5.26	8.00	2.74
High	921.00	5.22	8.00	2.78

Remark. Margin = Limit – Measured value

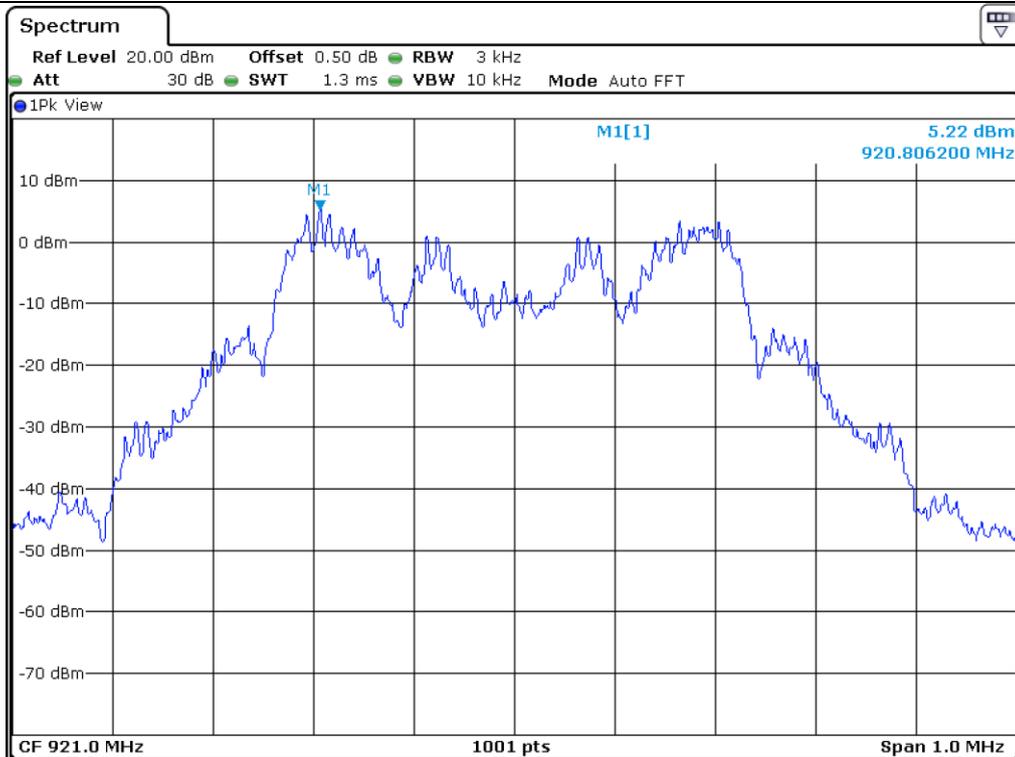


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

## 11. RADIATED EMISSION TEST

### 11.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 45 % R.H.

### 11.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

### 11.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ - ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 28, 2019 (1Y)
■ - 310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 18, 2019 (1Y)
■ - BBV 9718B	Schwarzbeck	Amplifier	009	Mar. 20, 2019 (1Y)
■ - DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ - MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ - VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Apr. 13, 2018 (2Y)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (1Y)
■ - VAMP9243	Schwarzbeck	ROD ANTENNA	VAMP9243	Mar. 14, 2019 (2Y)

All test equipment used is calibrated on a regular basis.

11.4 Test Data

11.4.1 Test data for 30 MHz ~ 1 GHz

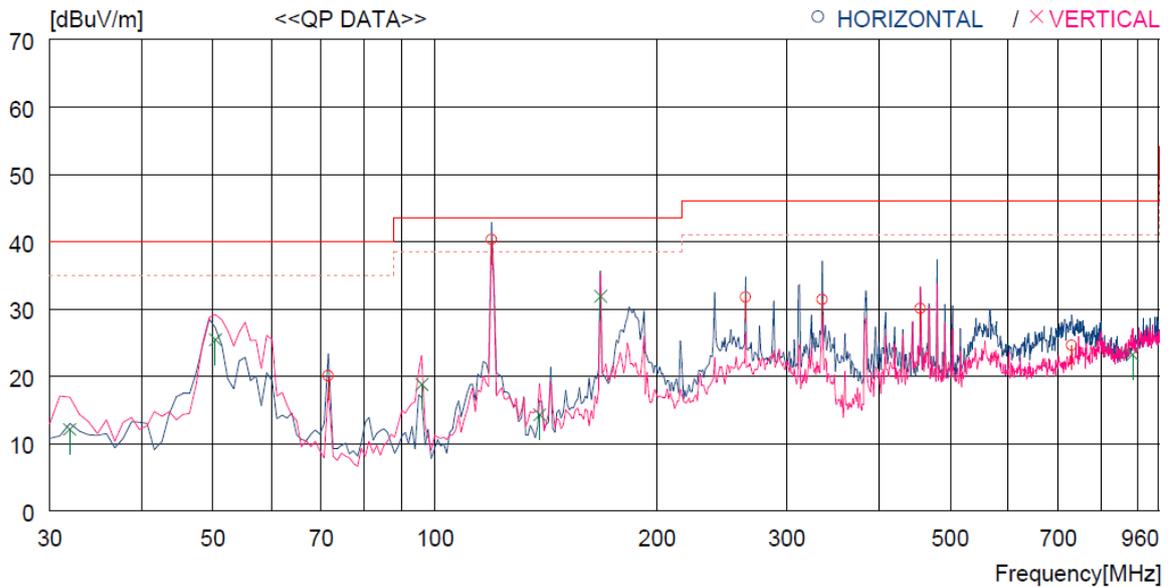
Humidity Level : 45 % R.H. Temperature: 23 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Repeater Date: September 23, 2019 ~ September 27, 2019

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	119.240	60.7	10.5	2.2	33.1	40.3	43.5	3.2	300	212
2	335.550	45.7	14.4	4.3	33.0	31.4	46.0	14.6	100	218
3	71.710	42.2	9.0	2.0	33.1	20.1	40.0	19.9	300	359
4	263.770	48.0	12.9	3.8	33.0	31.7	46.0	14.3	100	128
5	455.831	42.0	16.3	4.9	33.1	30.1	46.0	15.9	200	202
6	730.334	31.1	20.4	6.3	33.2	24.6	46.0	21.4	100	359
----- Vertical -----										
7	50.370	42.9	14.1	1.5	33.1	25.4	40.0	14.6	100	0
8	31.940	31.2	12.7	1.3	33.1	12.1	40.0	27.9	100	234
9	95.960	37.6	12.0	2.2	33.0	18.8	43.5	24.7	100	0
10	138.640	36.1	8.5	2.7	33.0	14.3	43.5	29.2	100	170
11	167.740	52.9	9.0	3.0	33.0	31.9	43.5	11.6	100	290
12	883.589	26.4	22.3	7.0	32.5	23.2	46.0	22.8	100	194

Tested by: Hyung-Kwon, Oh / Assistant Manager

**11.4.2 Test Data for Below 30 MHz**

- Test Date : September 23, 2019 ~ September 27, 2019
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

**11.4.3 Test Data for above 1 GHz**

- Test Date : September 23, 2019 ~ September 27, 2019
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 10.0 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



**Tested by: Hyung-Kwon, Oh / Assistant Manager**

## 12. CONDUCTED EMISSION TEST

### 12.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 45 % R.H.

### 12.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μH + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

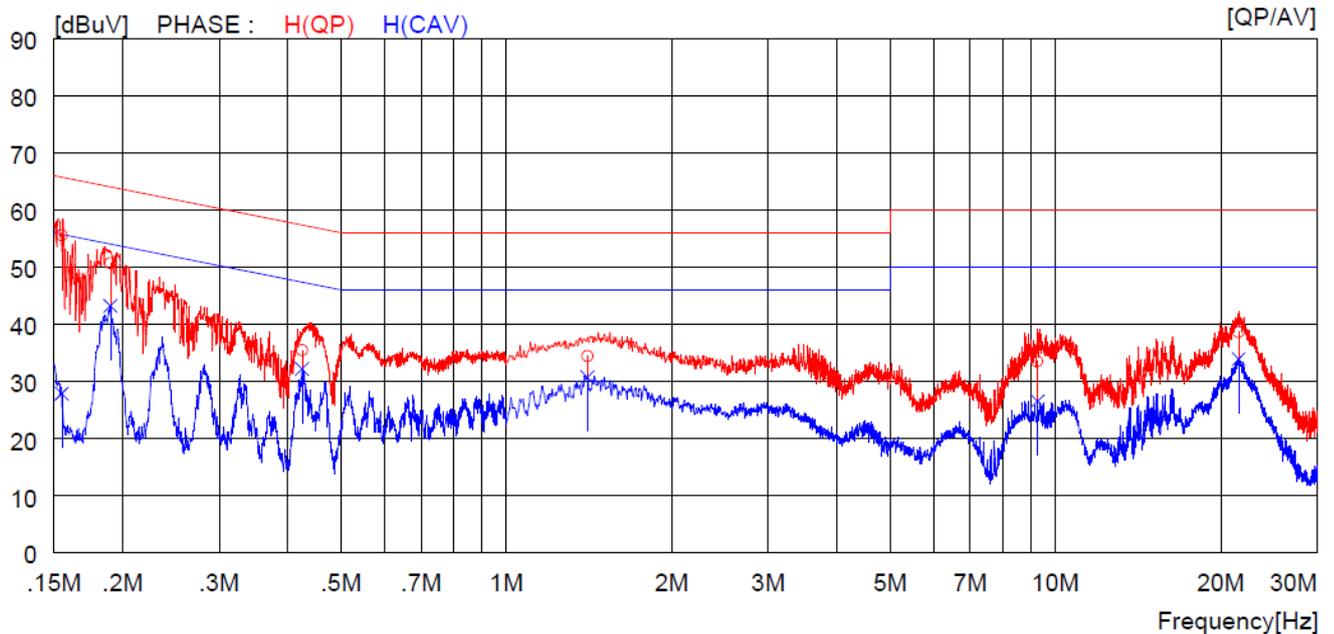
### 12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Oct. 22, 2018 (1Y)
□ -	NSLK8128	Schwarzbeck	AMN	8128-216	Mar. 20, 2019 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 19, 2019 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Mar. 19, 2019 (1Y)
■ -	3825/2	EMCO	AMN	9109-1867	Mar. 27, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

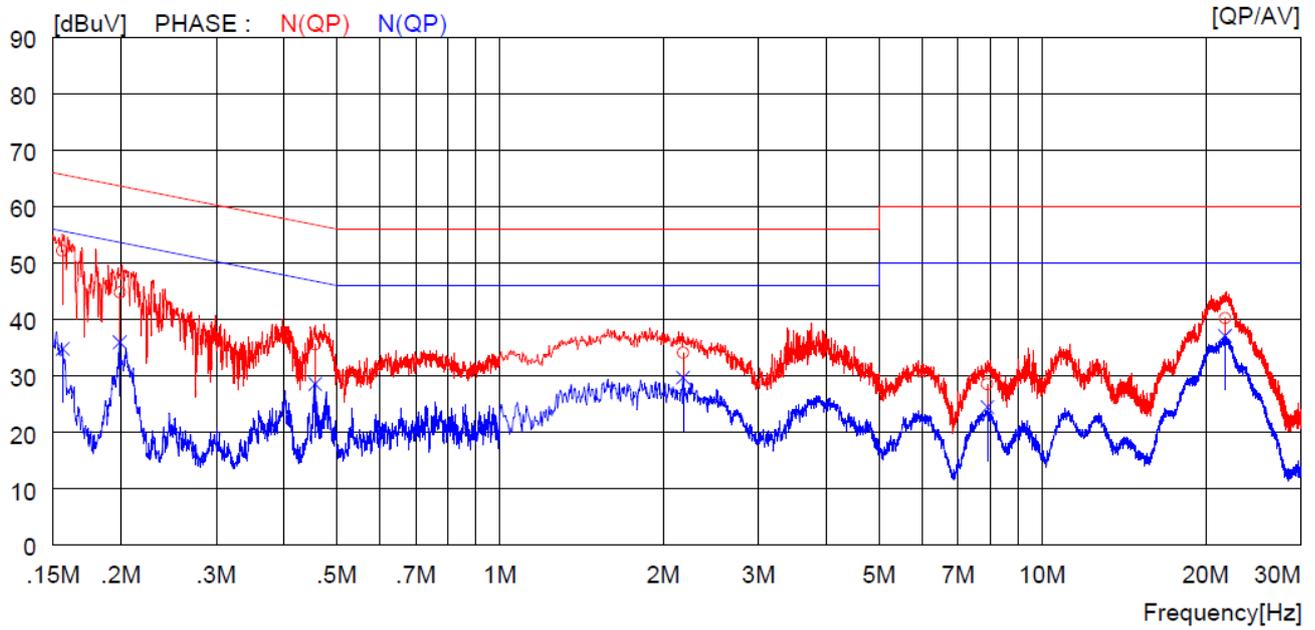
### 12.4 Test data

- Test Date : September 23, 2019 ~ September 27, 2019
- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT LINE



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15500	45.6	----	10.0	55.6	----	65.7	----	10.1	----	H(QP)
2	0.19000	40.7	----	10.0	50.7	----	64.0	----	13.3	----	H(QP)
3	0.42400	25.5	----	10.0	35.5	----	57.4	----	21.9	----	H(QP)
4	1.40400	24.3	----	10.1	34.4	----	56.0	----	21.6	----	H(QP)
5	9.27000	23.2	----	10.3	33.5	----	60.0	----	26.5	----	H(QP)
6	21.56000	28.0	----	10.7	38.7	----	60.0	----	21.3	----	H(QP)
7	0.15500	----	17.9	10.0	----	27.9	----	55.7	----	27.8	H(CAV)
8	0.19000	----	33.3	10.0	----	43.3	----	54.0	----	10.7	H(CAV)
9	0.42400	----	22.2	10.0	----	32.2	----	47.4	----	15.2	H(CAV)
10	1.40400	----	20.7	10.1	----	30.8	----	46.0	----	15.2	H(CAV)
11	9.27000	----	16.3	10.3	----	26.6	----	50.0	----	23.4	H(CAV)
12	21.56000	----	23.2	10.7	----	33.9	----	50.0	----	16.1	H(CAV)

- Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15600	42.2	----	10.0	52.2	----	65.7	----	13.5	----	N (QP)
2	0.19900	34.8	----	10.0	44.8	----	63.7	----	18.9	----	N (QP)
3	0.45600	25.6	----	10.0	35.6	----	56.8	----	21.2	----	N (QP)
4	2.17600	24.0	----	10.1	34.1	----	56.0	----	21.9	----	N (QP)
5	7.92000	18.3	----	10.2	28.5	----	60.0	----	31.5	----	N (QP)
6	21.72000	29.5	----	10.7	40.2	----	60.0	----	19.8	----	N (QP)
7	0.15600	----	24.8	10.0	----	34.8	----	55.7	----	20.9	N (CAV)
8	0.19900	----	26.0	10.0	----	36.0	----	53.7	----	17.7	N (CAV)
9	0.45600	----	18.6	10.0	----	28.6	----	46.8	----	18.2	N (CAV)
10	2.17600	----	19.6	10.1	----	29.7	----	46.0	----	16.3	N (CAV)
11	7.92000	----	14.3	10.2	----	24.5	----	50.0	----	25.5	N (CAV)
12	21.72000	----	26.4	10.7	----	37.1	----	50.0	----	12.9	N (CAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

**Tested by: Hyung-Kwon, Oh / Assistant Manager**