

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

Test Report No. : W176R-D058
AGR No. : A173A-493R
Applicant : ANYRACTIVE
Address : #1101 R&D Tower, Nuritkum Square, 396, World Cup-buk ro, Mapo-gu, Seoul,
South Korea
Manufacturer : ANYRACTIVE
Address : #1101 R&D Tower, Nuritkum Square, 396, World Cup-buk ro, Mapo-gu, Seoul,
South Korea
Type of Equipment : GoTouch
FCC ID. : 2AMDVGOTOUCH20
Model Name : GoTouch2.0
Serial number : N/A
Total page of Report : 32 pages (including this page)
Date of Incoming : May 12, 2017
Date of issue : June 13, 2017

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: 
 Jae-Ho Lee / Chief Engineer
 ONETECH Corp.

Approved by: 
 Keun-Young, Choi / Vice President
 ONETECH Corp.

CONTENTS

PAGE

1. VERIFICATION OF COMPLIANCE	5
2. TEST SUMMARY.....	6
2.1 TEST ITEMS AND RESULTS	6
2.2 ADDITIONS, DEVIATIONS, EXCLUSIONS FROM STANDARDS.....	6
2.3 RELATED SUBMITTAL(S) / GRANT(S)	6
2.4 PURPOSE OF THE TEST	6
2.5 TEST METHODOLOGY.....	6
2.6 TEST FACILITY.....	6
3. GENERAL INFORMATION.....	7
3.1 PRODUCT DESCRIPTION.....	7
3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT.....	7
4. EUT MODIFICATIONS.....	7
5. SYSTEM TEST CONFIGURATION	8
5.1 JUSTIFICATION.....	8
5.2 PERIPHERAL EQUIPMENT	8
5.3 MODE OF OPERATION DURING THE TEST	8
5.4 CONFIGURATION OF TEST SYSTEM.....	9
6. PRELIMINARY TEST	9
6.1 AC POWER LINE CONDUCTED EMISSIONS TESTS.....	9
6.2 GENERAL RADIATED EMISSIONS TESTS	9
7. MINIMUM 6 DB BANDWIDTH	10
7.1 OPERATING ENVIRONMENT	10
7.2 TEST SET-UP	10
7.3 TEST EQUIPMENT USED	10
7.4 TEST DATA.....	11
8. MAXIMUM PEAK OUTPUT POWER.....	13
8.1 OPERATING ENVIRONMENT	13
8.2 TEST SET-UP	13
8.3 TEST EQUIPMENT USED	13
8.4 TEST DATA.....	14
9. 100 KHZ BANDWIDTH OUTSIDE THE FREQUENCY BAND.....	16
9.1 OPERATING ENVIRONMENT	16

9.2 TEST SET-UP FOR CONDUCTED MEASUREMENT	16
9.3 TEST SET-UP FOR RADIATED MEASUREMENT.....	16
9.4 TEST EQUIPMENT USED	16
9.5 TEST DATA FOR CONDUCTED EMISSION	17
9.6 TEST DATA FOR RADIATED EMISSION.....	22
9.6.1 Radiated Emission which fall in the Restricted Band.....	22
9.6.2 Spurious & Harmonic Radiated Emission.....	23
10. PEAK POWER SPECTRAL DENSITY	24
10.1 OPERATING ENVIRONMENT	24
10.2 TEST SET-UP	24
10.3 TEST EQUIPMENT USED.....	24
10.4 TEST DATA.....	25
11. RADIATED EMISSION TEST	27
11.1 OPERATING ENVIRONMENT	27
11.2 TEST SET-UP	27
11.3 TEST EQUIPMENT USED.....	27
11.4 TEST DATA FOR TRANSMITTING MODE	28
11.4.1 Test data for 30 MHz ~ 1 GHz	28
11.4.2 Test data for Below 30 MHz	29
11.4.3 Test data for above 1 GHz	29
12. CONDUCTED EMISSION TEST.....	30
12.1 OPERATING ENVIRONMENT	30
12.2 TEST SET-UP	30
12.3 TEST EQUIPMENT USED.....	30
12.4 TEST DATA.....	31

Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
W176R-D058	June 13, 2017	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

Applicant : ANYRACTIVE
Address : #1101 R&D Tower, Nuritkum Square, 396, World Cup-buk ro, Mapo-gu, Seoul, South Korea
Contact Person : Heeyoung Eom / manager
Telephone No. : +82-70-4910-8012
FCC ID : 2AMDVGOTOUCH20
Model Name : GoTouch2.0
Serial Number : N/A
Date : June 13, 2017

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
KIND OF EQUIPMENT	GoTouch
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
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-4617/ 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 ANYRACTIVE, Model GoTouch2.0 (referred to as the EUT in this report) is a GoTouch. The product specification described herein was obtained from product data sheet or user's manual.

Device Type	GoTouch
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	-1.61 dBm
Number of Channel	40 Channel
Modulation Type	GFSK
Antenna Type	Chip Antenna
Antenna Gain	3.14 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	8 MHz
Rated Supply Voltage	DC 3.7 V

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	N/A	SURFACE2.0-MAIN-VER2.1	
Button Board	N/A	SURFACE-VER-BUTTON	
Camera Board	N/A	GoTouch-CAMERA-VER3	
Battery	N/A	N/A	
Pen Board	N/A	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
IM-A850K	PANTECH	Cellphone	-

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 2 402 MHz, 2 440 MHz, and 2 480 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 “XY axis, but the worst data was recorded in this report.

5.4 Configuration of Test System

Line Conducted Test: The EUT was tested in a Charging & Transmitting mode. The EUT was connected to USB and the power of USB was connected to Adapter. 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 a Chip Antenna 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 Tests, the following operating mode was investigated

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

6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

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

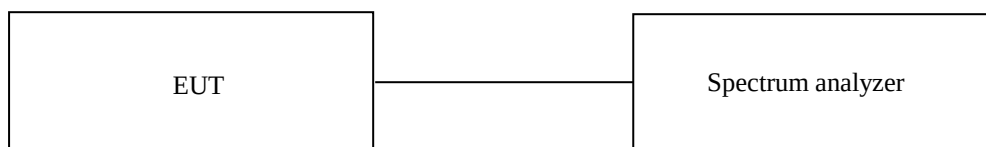
7. MINIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature : 24 °C
Relative humidity : 46 % 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	Apr. 05, 2017 (1Y)

All test equipment used is calibrated on a regular basis.

7.4 Test data

-. Test Date : June 09, 2017

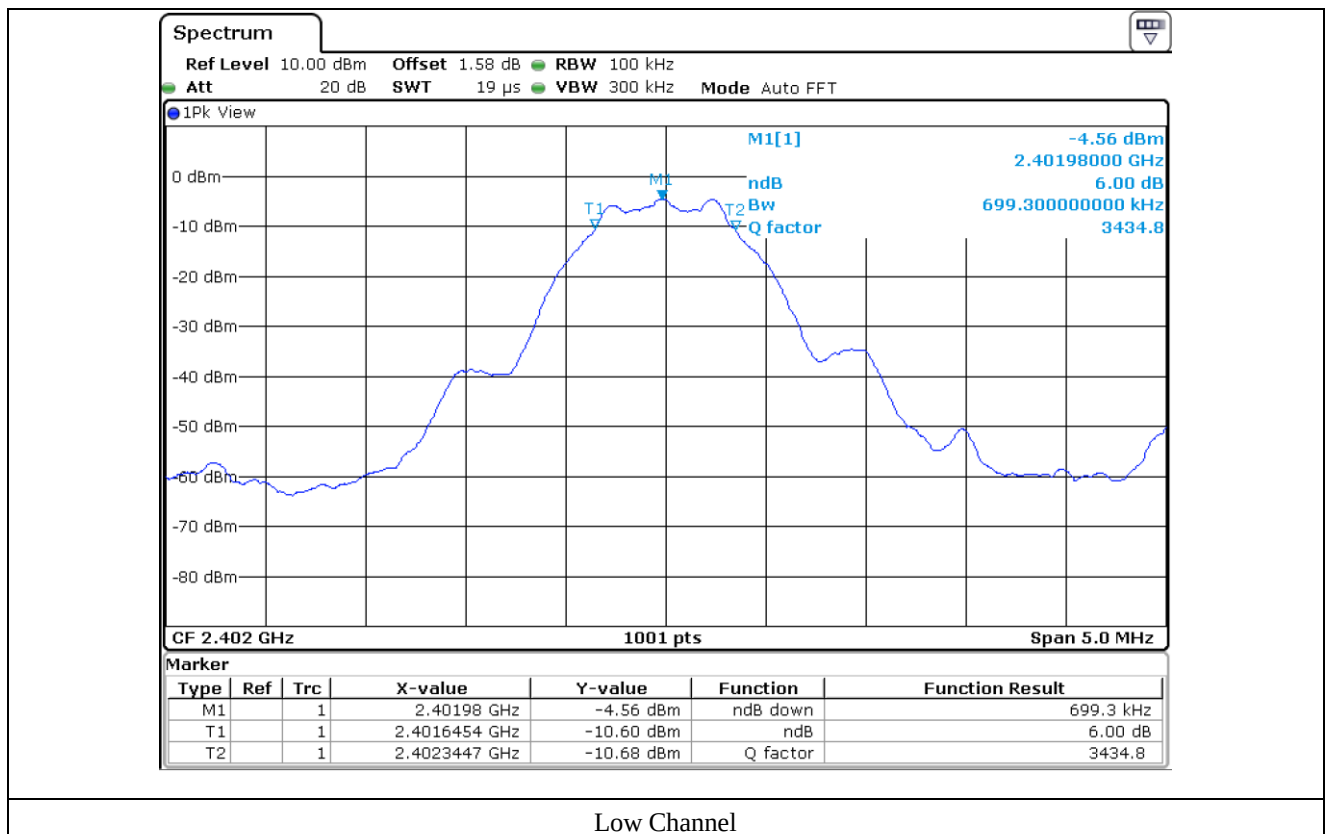
-. Test Result : Pass

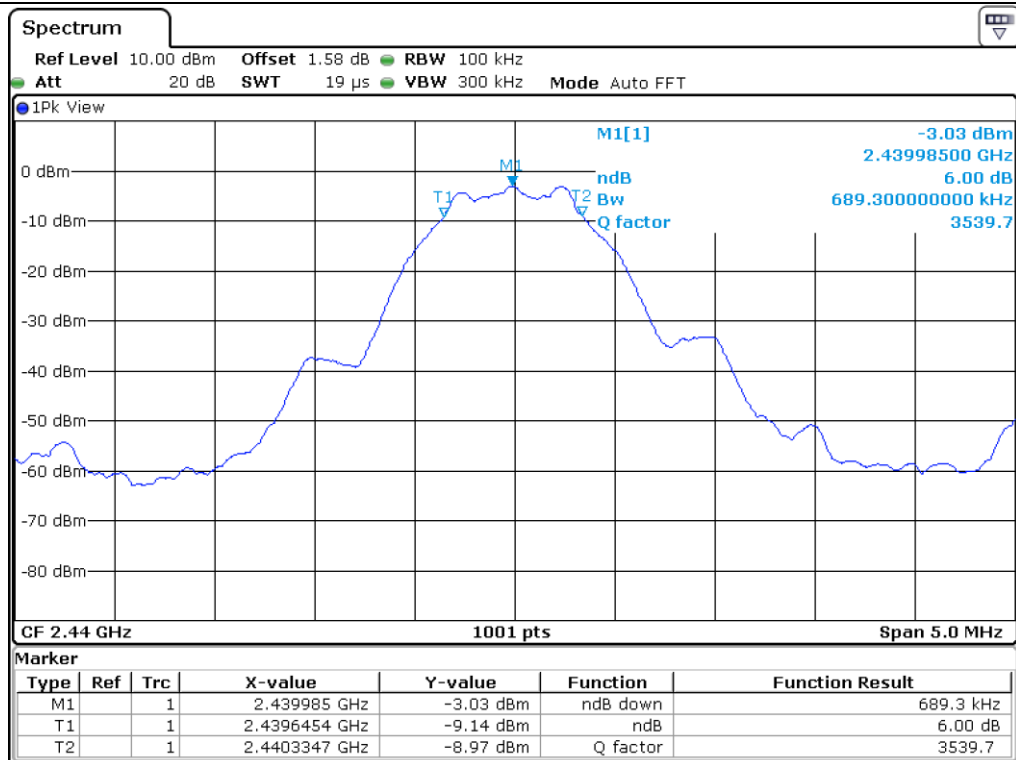
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402	699.30	500	199.30
Middle	2 440	689.30	500	189.30
High	2 480	694.30	500	194.30

Remark. Margin = Measured Value - Limit

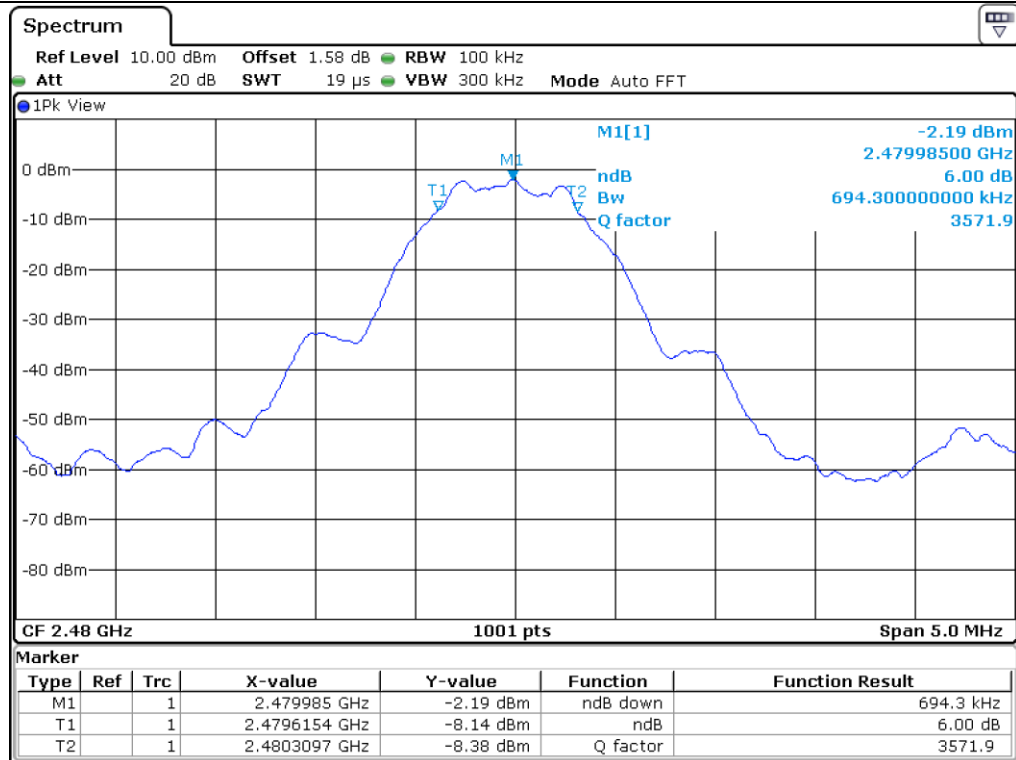


Tested by: Ha-Ram, Lee / Assistant Manager





Middle Channel



High Channel

8. MAXIMUM PEAK OUTPUT POWER

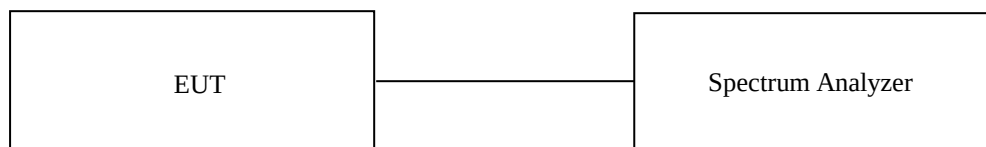
8.1 Operating environment

Temperature : 24 °C
Relative humidity : 46 % 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	Apr. 05, 2017 (1Y)

All test equipment used is calibrated on a regular basis.

8.4 Test data

-. Test Date : June 09, 2017

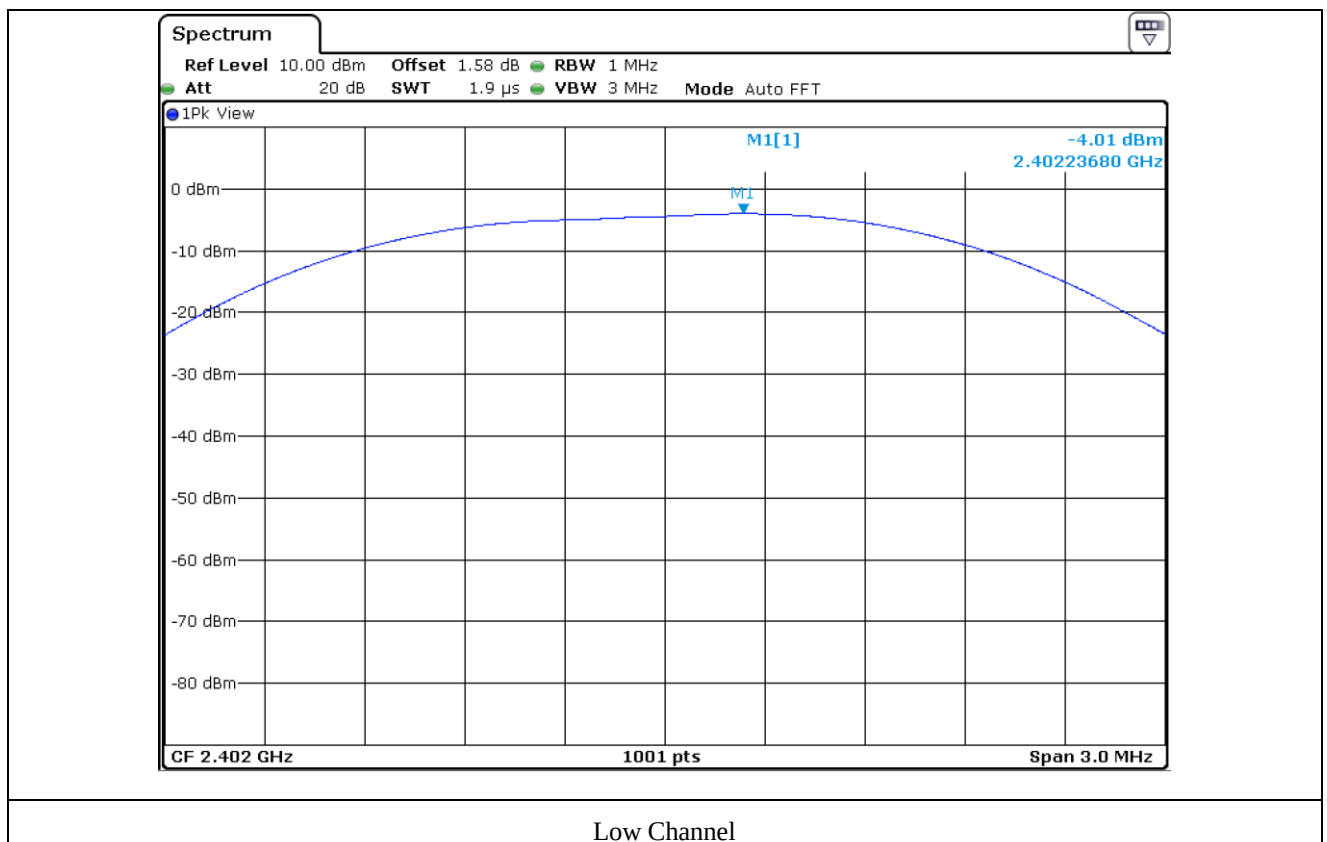
-. Test Result : Pass

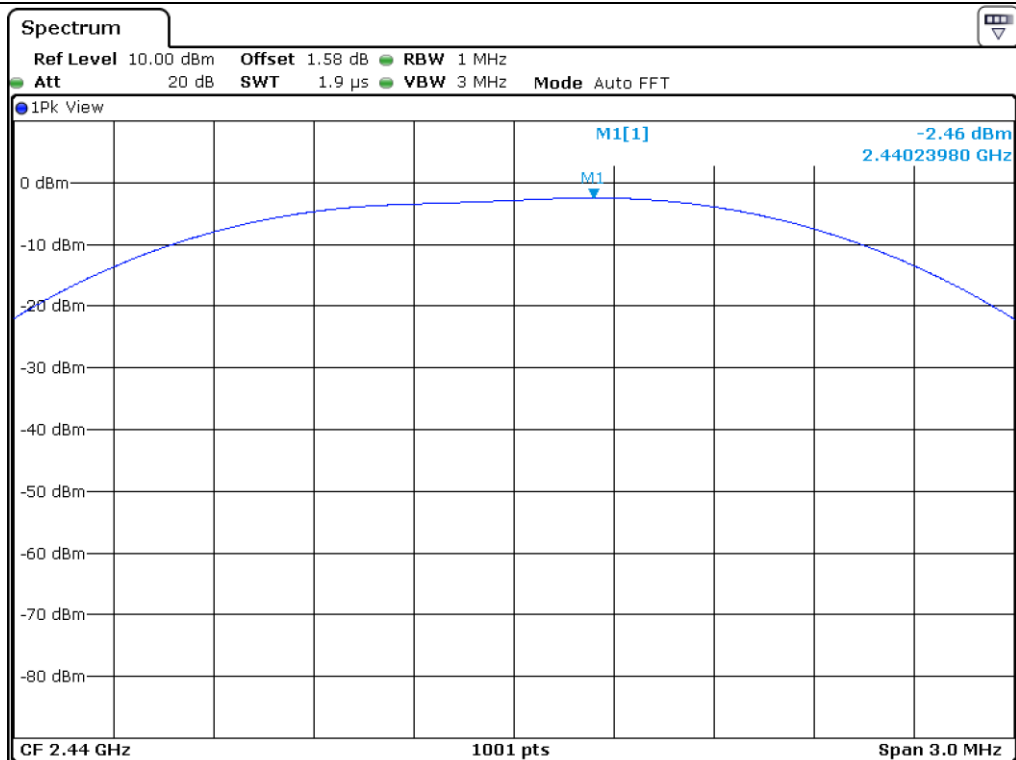
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402	-4.01	30.00	34.01
MIDDLE	2 440	-2.46	30.00	32.46
HIGH	2 480	-1.61	30.00	31.61

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

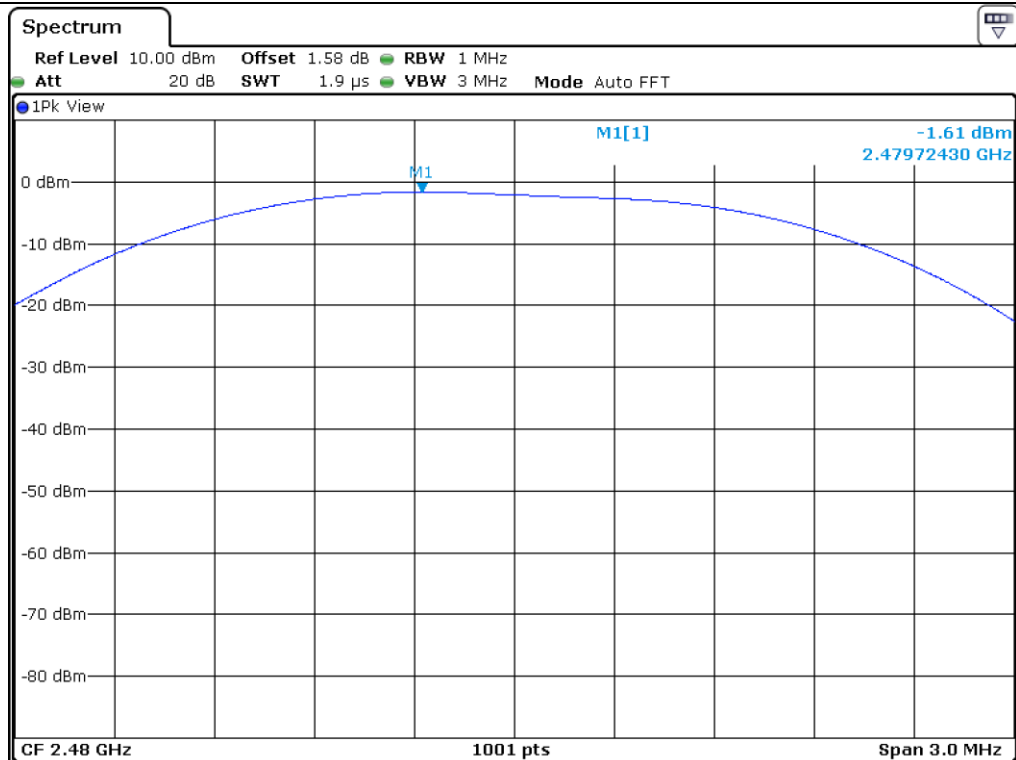


Tested by: Ha-Ram, Lee / Assistant Manager





Middle Channel



High Channel

9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature : 24 °C
Relative humidity : 46 % 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.

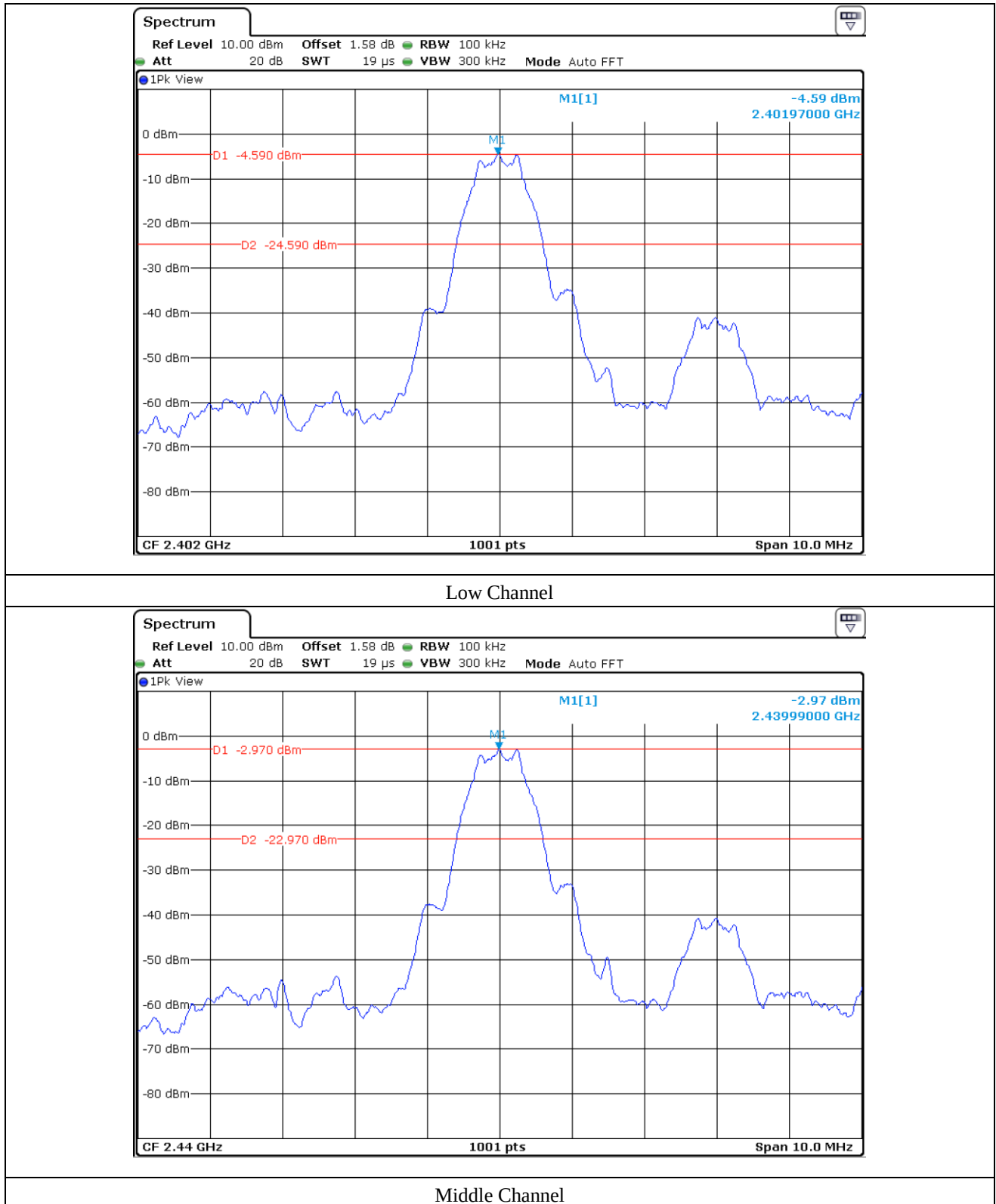
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal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

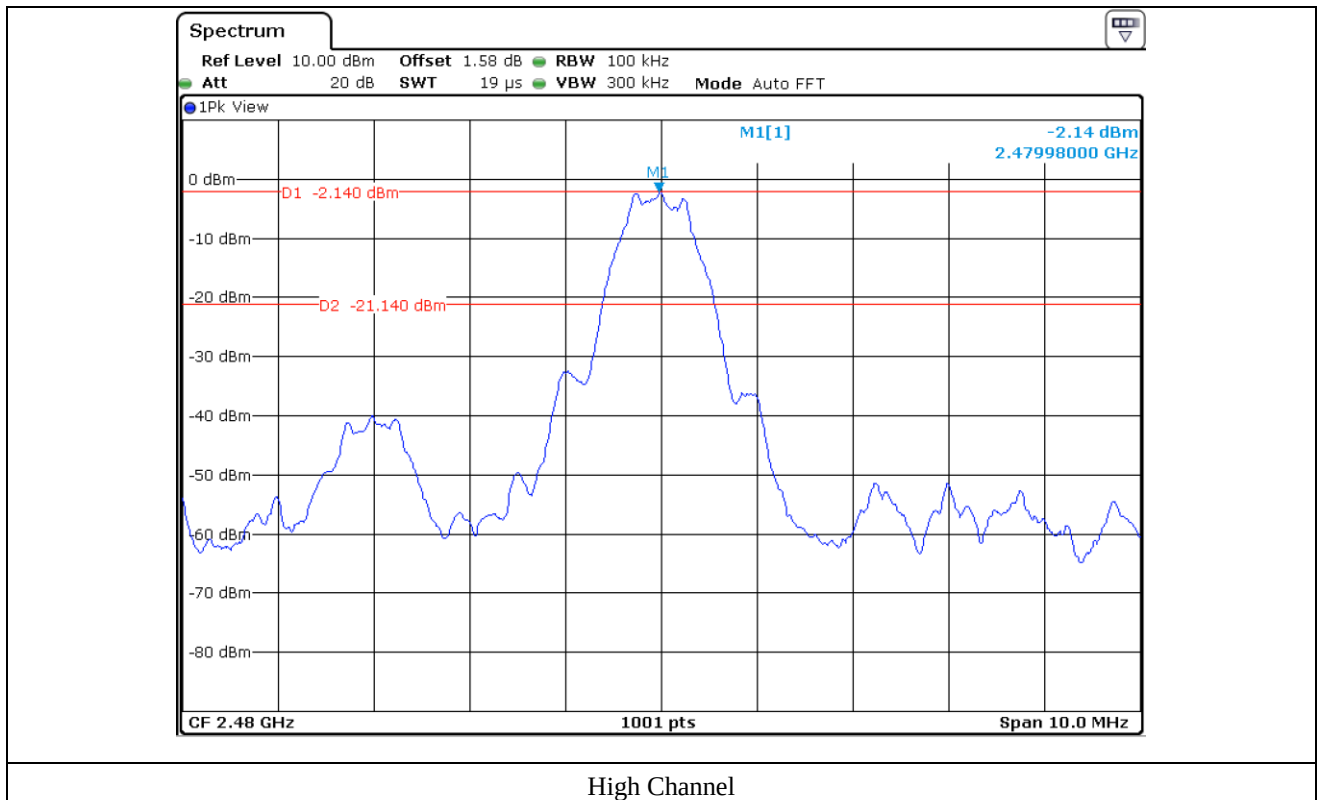
9.4 Test equipment used

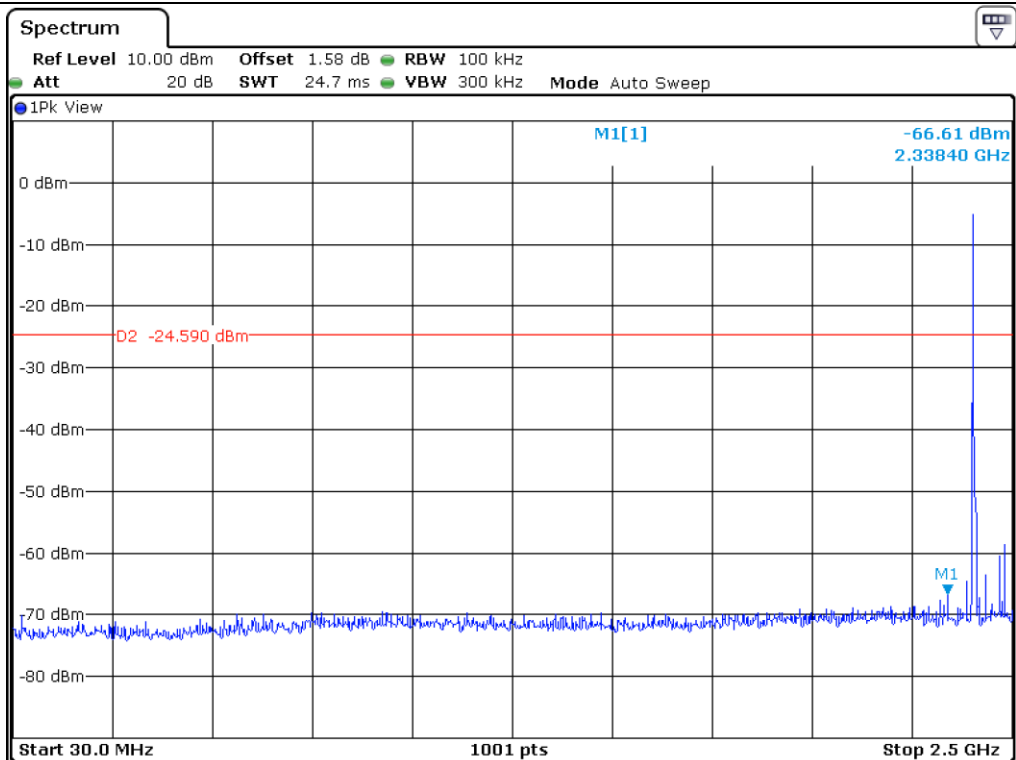
	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
☐ -	ESCI	Rohde & Schwarz	EMI Test Receiver	101012	Nov. 01, 2016 (1Y)
☒ -	ESU	Rohde & Schwarz	EMI Test Receiver	100261	Apr. 05, 2017 (1Y)
☐ -	8564E	HP	Spectrum Analyzer	3650A00756	Sep. 29, 2016 (1Y)
☐ -	FSP	Rohde & Schwarz	Spectrum Analyzer	100017	Sep. 28, 2016 (1Y)
☒ -	310N	Sonoma Instrument	AMPLIFIER	312544	Apr. 04, 2017 (1Y)
☒ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Nov. 10, 2016 (1Y)
☒ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	102266	Apr. 04, 2017 (1Y)
☒ -	MA240	HD GmbH	Antenna Master	N/A	N/A
☐ -	HD100	HD GmbH	Position Controller	N/A	N/A
☒ -	DS420S	HD GmbH	Turn Table	N/A	N/A
☐ -	FMZB 1513	Schwarzbeck	LOOP ANTENNA	1513-235	Jun. 10, 2016 (2Y)
☒ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-255	May 20, 2016 (2Y)
☒ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D1349	Aug. 31, 2015 (2Y)
☒ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Aug. 31, 2015 (2Y)
☒ -	83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 06, 2017 (1Y)

All test equipment used is calibrated on a regular basis.

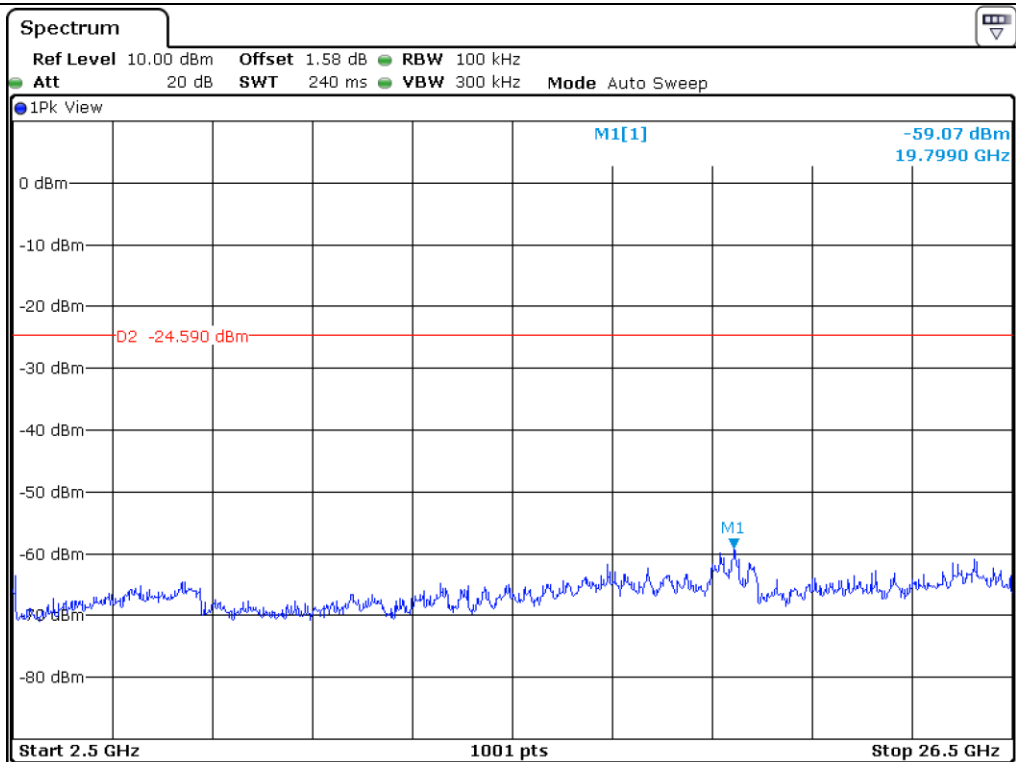
9.5 Test data for conducted emission



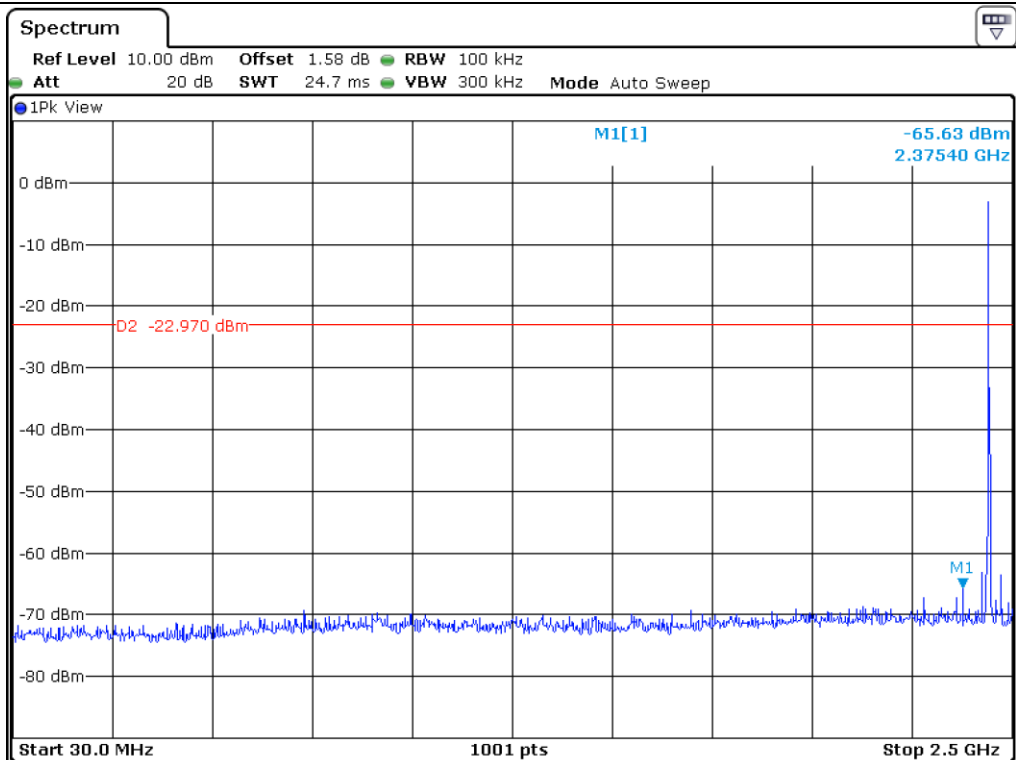




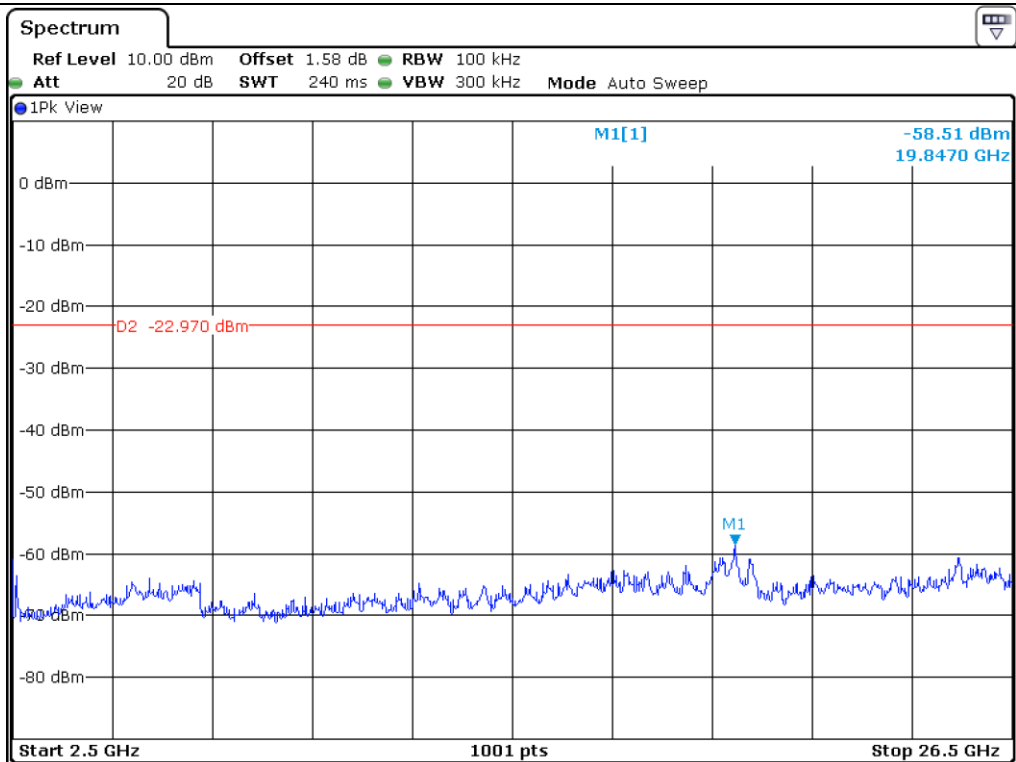
Low Channel



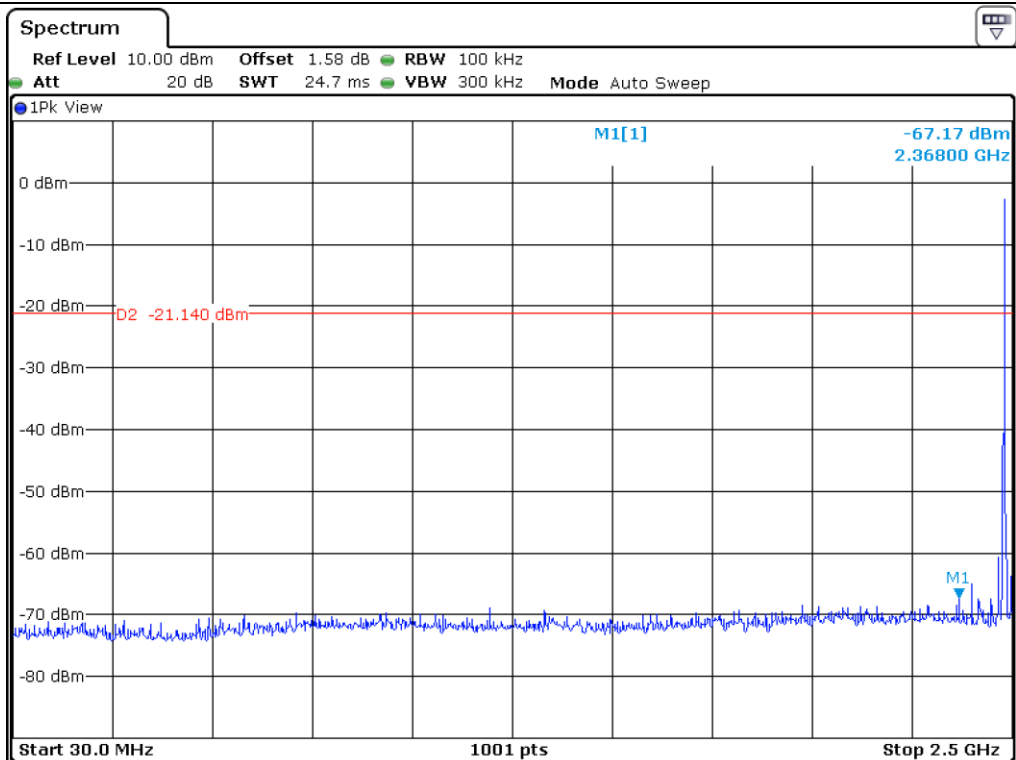
Low Channel



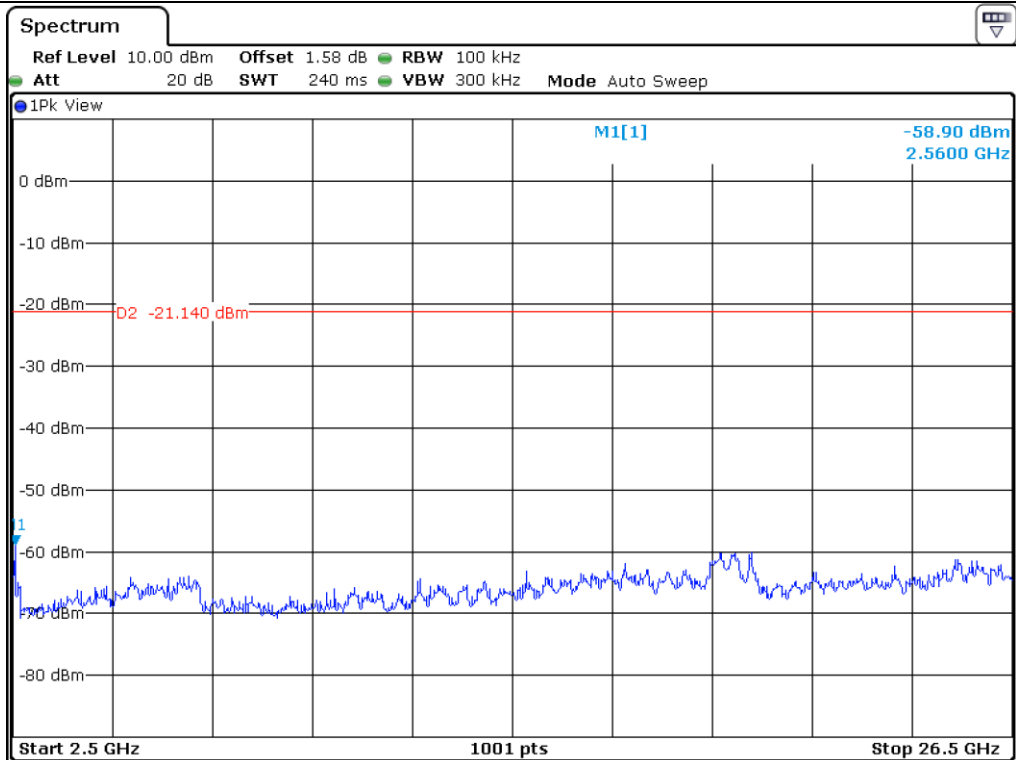
Middle Channel



Middle Channel



High Channel



High Channel

9.6 Test data for radiated emission

9.6.1 Radiated Emission which fall in the Restricted Band

- . Test Date : June 07, 2017
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Detector : Peak Mode(Peak), Average Mode(RMS)
- . Measurement distance : 3 m
- . Result : PASSED

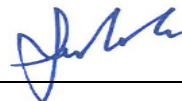
Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel									
2 345.29	37.38	Peak	H	27.10	7.50	43.00	28.98	74.00	45.02
	24.64	Average	H				16.24	54.00	37.76
2 315.24	44.92	Peak	V				36.52	74.00	37.48
	32.53	Average	V				24.13	54.00	29.87
Test Data for High Channel									
2 484.81	38.37	Peak	H	27.10	7.50	43.00	29.97	74.00	44.03
	25.46	Average	H				17.06	54.00	36.94
2 489.56	38.05	Peak	V				29.65	74.00	44.35
	24.86	Average	V				16.46	54.00	37.54

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-Amplifier Gain}$$



Tested by: Ha-Ram, Lee / Assistant Manager

9.6.2 Spurious & Harmonic Radiated Emission

- Test Date : June 07, 2017
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Detector : Peak Mode(Peak), Average Mode(RMS)
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Result : PASSED

Frequency (GHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel									
4 804.00	35.63	Peak	H	30.60	11.10	42.50	34.83	74.00	39.17
	28.97	Average	H				28.17	54.00	25.83
	34.46	Peak	V				33.66	74.00	40.34
	28.06	Average	V				27.26	54.00	26.74
Test Data for Middle Channel									
4 880.00	30.82	Peak	H	30.70	11.20	42.50	30.22	74.00	43.78
	24.85	Average	H				24.25	54.00	29.75
	32.54	Peak	V				31.94	74.00	42.06
	26.38	Average	V				25.78	54.00	28.22
Test Data for High Channel									
4 960.00	30.89	Peak	H	30.80	11.30	42.50	42.50	30.49	74.00
	24.75	Average	H				42.50	24.35	54.00
	36.83	Peak	V				42.50	36.43	74.00
	29.06	Average	V				42.50	28.66	54.00

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss – Pre-Amplifier Gain



Tested by: Ha-Ram, Lee / Assistant Manager

10. PEAK POWER SPECTRAL DENSITY

10.1 Operating environment

Temperature : 24 °C
Relative humidity : 46 % 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	Apr. 05, 2017 (1Y)

All test equipment used is calibrated on a regular basis.

10.4 Test data

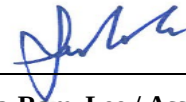
-. Test Date : June 09, 2017

-. Test Result : Pass

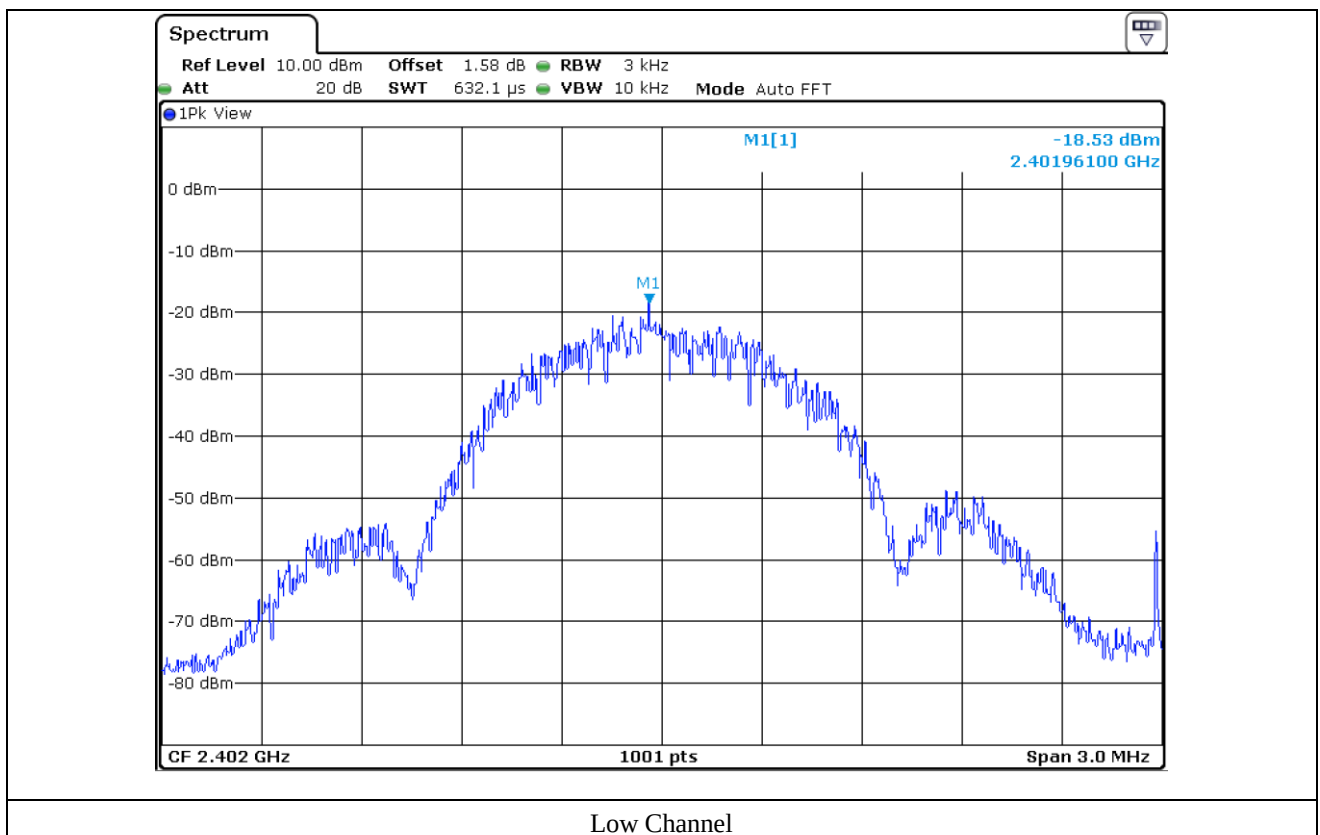
-. Operating Condition : Continuous transmitting mode

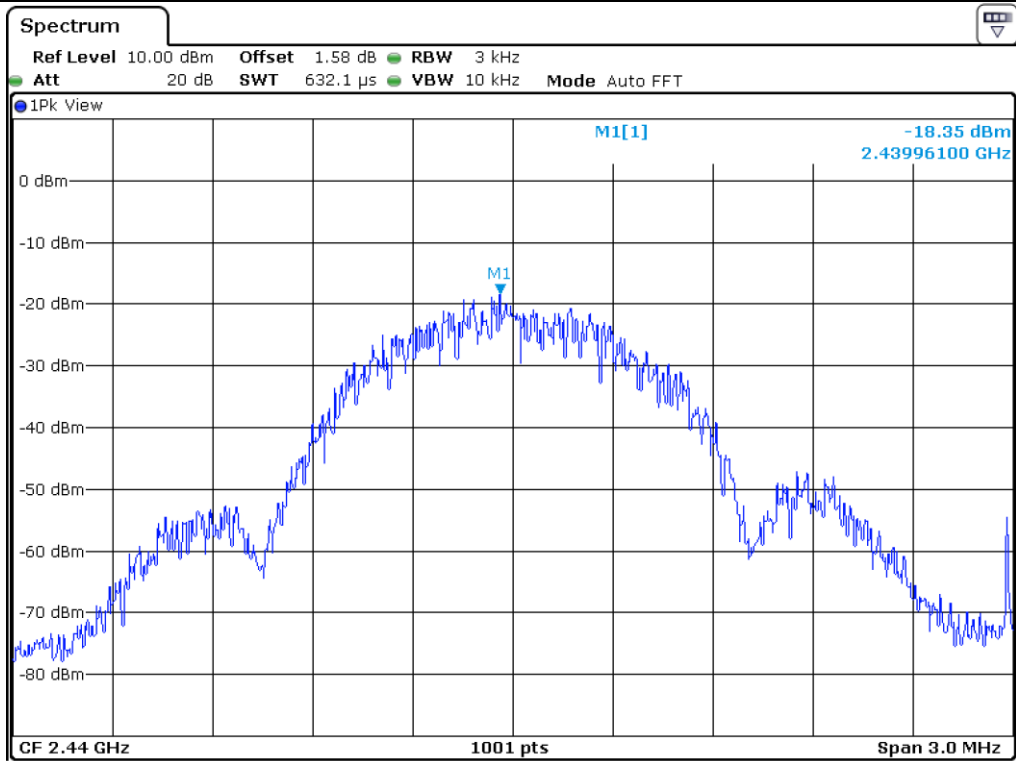
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402	-18.53	8.00	26.53
Middle	2 440	-18.35	8.00	26.35
High	2 480	-17.27	8.00	25.27

Remark. Margin = Limit – Measured value

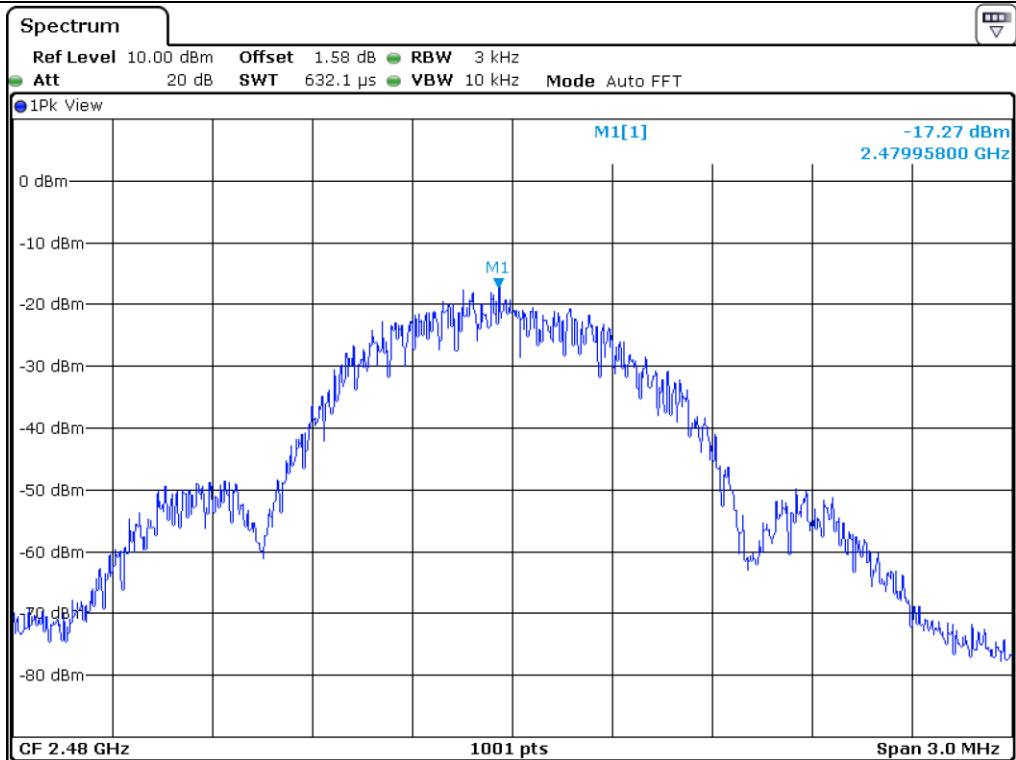


Tested by: Ha-Ram, Lee / Assistant Manager





Middle Channel



High Channel

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 24 °C
Relative humidity : 46 % 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 a non-conductive 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.(Interval)
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Apr. 05, 2017 (1Y)
■ - ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 01, 2016 (1Y)
■ - 310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 04, 2017 (1Y)
■ - SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 02, 2016 (1Y)
■ - DT3000	Innco System	Turn Table	930611	N/A
■ - MA4000-EP	Innco System	Antenna Master	3320611	N/A
■ - VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	Apr. 15, 2016 (2Y)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 31, 2015 (2Y)
■ - BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Apr. 30, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

11.4 Test data for Transmitting Mode

11.4.1 Test data for 30 MHz ~ 1 GHz

Humidity Level : 46 % R.H.

Temperature: 24 °C

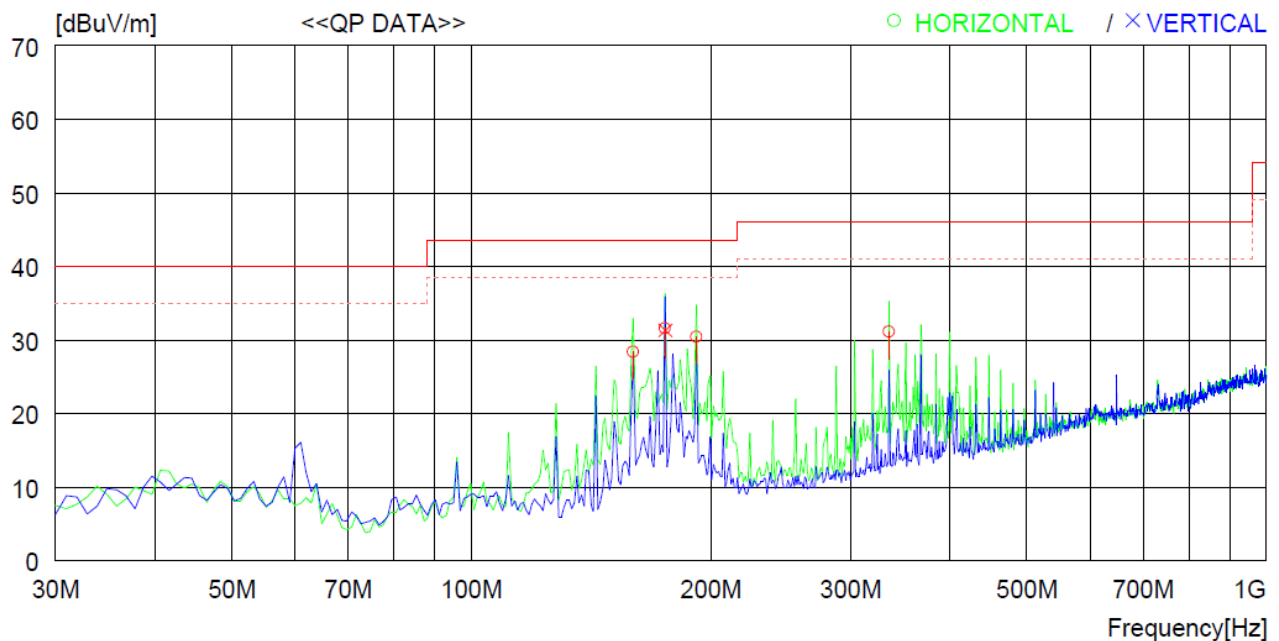
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : GoTouch

Date: June 07, 2017

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



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	159.980	49.7	8.7	3.0	33.0	28.4	43.5	15.1	200	2
2	175.500	52.1	9.4	3.2	33.1	31.6	43.5	11.9	200	182
3	191.990	49.3	10.9	3.3	33.1	30.4	43.5	13.1	200	359
4	335.550	45.5	14.4	4.3	33.1	31.1	46.0	14.9	100	253
----- Vertical -----										
5	175.500	51.8	9.4	3.2	33.1	31.3	43.5	12.2	300	68

Tested by: Ha-Ram, Lee / Assistant Manager

11.4.2 Test data for Below 30 MHz

- . Test Date : June 07, 2017
- . 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)
Any emissions less than 20 dB below the limit were not observed.									

11.4.3 Test data for above 1 GHz

- . Test Date : June 07, 2017
- . 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 ~ 26.5 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)
Any emissions less than 20 dB below the limit were not observed.									



Tested by: Ha-Ram, Lee / Assistant Manager

12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 24 °C
Relative humidity : 46 % 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 μ H + 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.

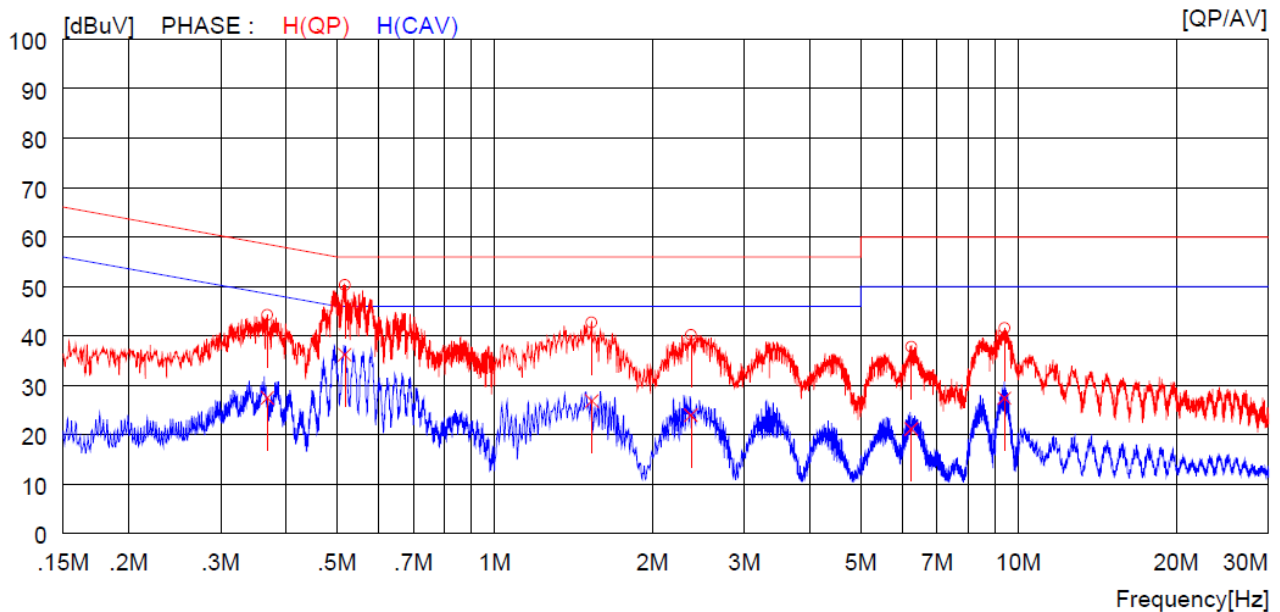
12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESPI	Rohde & Schwarz	EMI Test Receiver	101278	Nov. 01, 2016 (1Y)
□ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	Apr. 03, 2017 (1Y)
□	NSLK8128	Schwarzbeck	AMN	8128-216	Apr. 05, 2017 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Apr. 03, 2017 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Apr. 06, 2017 (1Y)
■ --	3825/2	EMCO	AMN	9109-1867	Apr. 07, 2017 (1Y)

All test equipment used is calibrated on a regular basis.

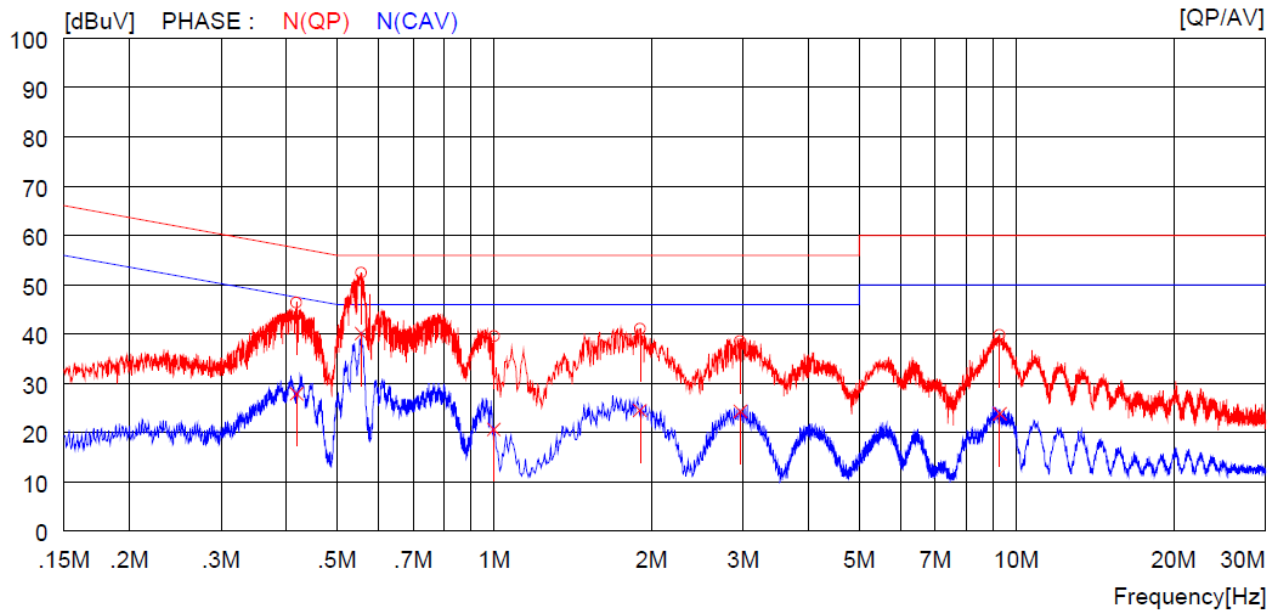
12.4 Test data

- Test Date : June 09, 2017
- 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	0.36800	34.2	----	10.0	44.2	----	58.5	----	14.3	----	H (QP)
2	0.51700	40.2	----	10.0	50.2	----	56.0	----	5.8	----	H (QP)
3	1.53200	32.6	----	10.1	42.7	----	56.0	----	13.3	----	H (QP)
4	2.36800	30.1	----	10.1	40.2	----	56.0	----	15.8	----	H (QP)
5	6.24500	27.4	----	10.3	37.7	----	60.0	----	22.3	----	H (QP)
6	9.40500	31.1	----	10.4	41.5	----	60.0	----	18.5	----	H (QP)
7	0.36800	----	17.5	10.0	----	27.5	----	48.5	----	21.0	H (CAV)
8	0.51700	----	26.2	10.0	----	36.2	----	46.0	----	9.8	H (CAV)
9	1.53200	----	16.7	10.1	----	26.8	----	46.0	----	19.2	H (CAV)
10	2.36800	----	13.8	10.1	----	23.9	----	46.0	----	22.1	H (CAV)
11	6.24500	----	10.8	10.3	----	21.1	----	50.0	----	28.9	H (CAV)
12	9.40500	----	17.0	10.4	----	27.4	----	50.0	----	22.6	H (CAV)

-. Tested Line : NEGATIVE 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	0.41800	36.3	----	10.0	46.3	----	57.5	----	11.2	----	N (QP)
2	0.55600	42.3	----	10.1	52.4	----	56.0	----	3.6	----	N (QP)
3	0.99800	29.4	----	10.1	39.5	----	56.0	----	16.5	----	N (QP)
4	1.90000	30.9	----	10.1	41.0	----	56.0	----	15.0	----	N (QP)
5	2.95600	28.3	----	10.2	38.5	----	56.0	----	17.5	----	N (QP)
6	9.29500	29.4	----	10.4	39.8	----	60.0	----	20.2	----	N (QP)
7	0.41800	----	17.9	10.0	----	27.9	----	47.5	----	19.6	N (CAV)
8	0.55600	----	30.0	10.1	----	40.1	----	46.0	----	5.9	N (CAV)
9	0.99800	----	10.5	10.1	----	20.6	----	46.0	----	25.4	N (CAV)
10	1.90000	----	14.4	10.1	----	24.5	----	46.0	----	21.5	N (CAV)
11	2.95600	----	14.1	10.2	----	24.3	----	46.0	----	21.7	N (CAV)
12	9.29500	----	13.4	10.4	----	23.8	----	50.0	----	26.2	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: Ha-Ram, Lee / Assistant Manager