FCC/ISED RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

MX1902

ISSUED TO
MatchX GmbH

Brückenstraße 4, 10179 Berlin

Report No.:	BL-SZ2080345-602
EUT Name:	MX1902
Model Name:	MX1902
Brand Name:	MatchX
Test Standard:	47 CFR Part 15 Subpart C RSS-Gen (Issue 5, March 2019) RSS-247 (Issue 2, February 2017)
FCC ID:	2AMPF-MX1902
ISED Number:	22886-MX1902
Test Conclusion:	Pass
Test Date:	Aug. 13, 2020 ~ Nov. 27, 2020
Date of Issue:	Dec. 22, 2020

Tested by: Ye Hongji
Date: Dec. 22, 2020

Approved by: Liao Jianming (Technical Director)
Date: Dec. 22, 2020

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Dec. 22, 2020	Initial Issue

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation (A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20℃ to 25℃
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

(1) The test report reference to the report template version v2.2.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

(7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	MatchX GmbH
Address	Brückenstraße 4, 10179 Berlin

2.2 Manufacturer Information

Manufacturer	MatchX GmbH
Address	Brückenstraße 4, 10179 Berlin

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Type	MX1902
Model Name Under Test	MX1902
Series Model Name	N/A
Description of Model name differentiation	N/A
Serial Number	N/A
Hardware Version	1.0
Software Version	1.1
Dimensions (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	WIFI 802.11b, 802.11g, 802.11n; LoRa

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology		Hybrid system
Modulation Type		LoRa
Product Type		☒ Mobile ☐ Portable ☐ Fix Location
Frequency Range		The frequency range used is 902 MHz to 928 MHz.
Number of channel		128 for FHSS, and 42 for DTS
Tested Channel		125kHz: 1 (902.3 MHz), 64 (914.9 MHz), 128 (927.7 MHz) 500kHz: 1 (902.9 MHz), 21 (914.9 MHz), 42 (927.5 MHz)
Antenna Type	Main Antenna	Dipole Antenna
	Aux. Antenna	
Antenna Gain	Main Antenna	2.1 dBi (In test items related to antenna gain, the final results reflect this figure. This value is provided by the applicant.)
	Aux. Antenna	2.1 dBi (In test items related to antenna gain, the final results reflect this figure. This value is provided by the applicant.)
Antenna System(MIMO Smart Antenna)		N/A

All channel was listed on the following table:

125kHz for FHSS

Channel number	Freq. (MHz)	Channel number	Freq. (MHz)	Channel number	Freq. (MHz)	Channel number	Freq. (MHz)
1	**902.3**	33	908.7	65	915.1	97	921.5
2	902.5	34	908.9	66	915.3	98	921.7
3	902.7	35	909.1	67	915.5	99	921.9
4	902.9	36	909.3	68	915.7	100	922.1
5	903.1	37	909.5	69	915.9	101	922.3
6	903.3	38	909.7	70	916.1	102	922.5
7	903.5	39	909.9	71	916.3	103	922.7
8	903.7	40	910.1	72	916.5	104	922.9
9	903.9	41	910.3	73	916.7	105	923.1
10	904.1	42	910.5	74	916.9	106	923.3
11	904.3	43	910.7	75	917.1	107	923.5
12	904.5	44	910.9	76	917.3	108	923.7
13	904.7	45	911.1	77	917.5	109	923.9
14	904.9	46	911.3	78	917.7	110	924.1
15	905.1	47	911.5	79	917.9	111	924.3
16	905.3	48	911.7	80	918.1	112	924.5
17	905.5	49	911.9	81	918.3	113	924.7
18	905.7	50	912.1	82	918.5	114	924.9
19	905.9	51	912.3	83	918.7	115	925.1
20	906.1	52	912.5	84	918.9	116	925.3
21	906.3	53	912.7	85	919.1	117	925.5
22	906.5	54	912.9	86	919.3	118	925.7
23	906.7	55	913.1	87	919.5	119	925.9
24	906.9	56	913.3	88	919.7	120	926.1
25	907.1	57	913.5	89	919.9	121	926.3
26	907.3	58	913.7	90	920.1	122	926.5
27	907.5	59	913.9	91	920.3	123	926.7
28	907.7	60	914.1	92	920.5	124	926.9
29	907.9	61	914.3	93	920.7	125	927.1
30	908.1	62	914.5	94	920.9	126	927.3
31	908.3	63	914.7	95	921.1	127	927.5
32	908.5	64	**914.9**	96	921.3	128	**927.7**

500kHz for DTS

Channel number	Freq. (MHz)	Channel number	Freq. (MHz)	Channel number	Freq. (MHz)	Channel number	Freq. (MHz)
1	**902.9**	12	909.5	23	916.1	34	922.7
2	903.5	13	910.1	24	916.7	35	923.3
3	904.1	14	910.7	25	917.3	36	923.9
4	904.7	15	911.3	26	917.9	37	924.5
5	905.3	16	911.9	27	918.5	38	925.1
6	905.9	17	912.5	28	919.1	39	925.7
7	906.5	18	913.1	29	919.7	40	926.3
8	907.1	19	913.7	30	920.3	41	926.9
9	907.7	20	914.3	31	920.9	42	**927.5**
10	908.3	21	**914.9**	32	921.5		
11	908.9	22	915.5	33	922.1		

2.6 Additional Instructions

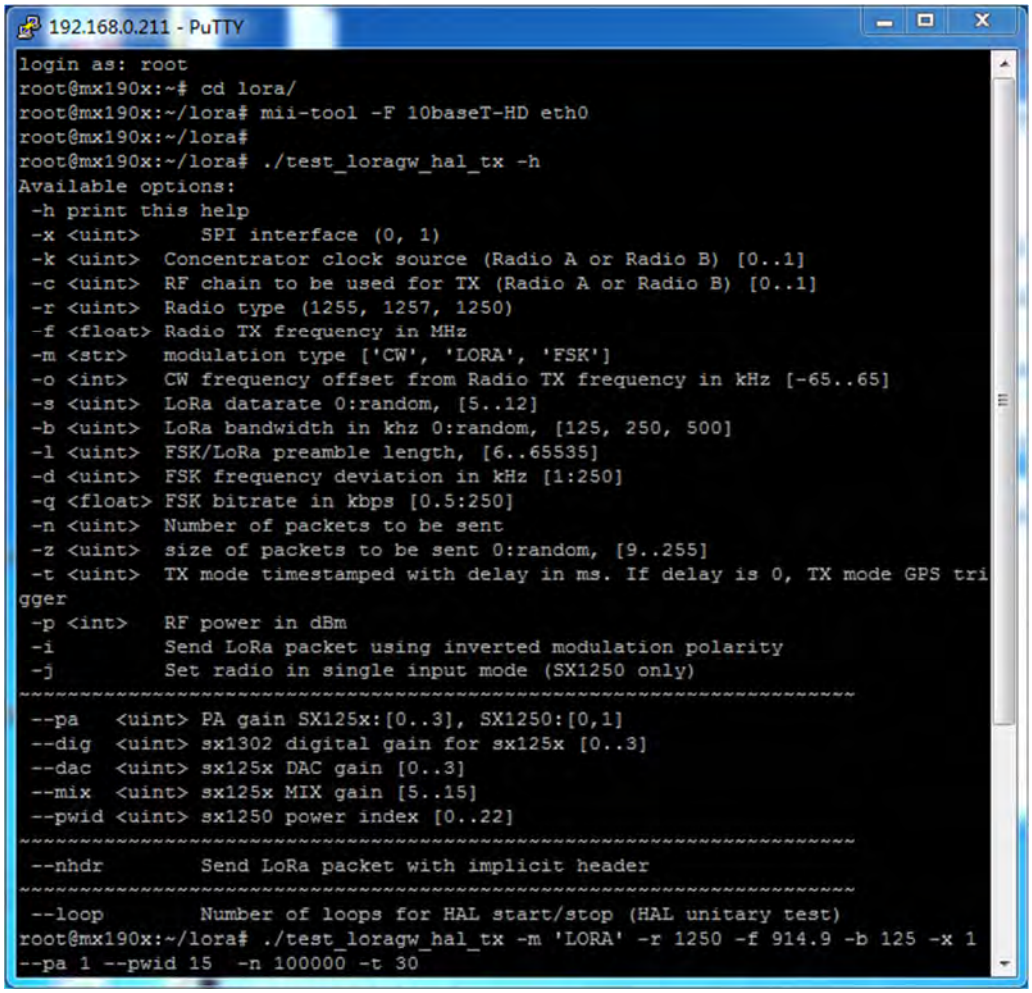
EUT Software Settings:

Mode	☒ Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power level setup in software		
Test Software Version	PUTTY	
Mode	Channel	Soft Set
125kHz	902.3	Pa1:15
	914.9	Pa1:15
	927.7	Pa1:15
500kHz	902.9	Pa1:15
	914.9	Pa1:15
	927.5	Pa1:15

Run Software



3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Miscellaneous Wireless Communications Services
2	RSS-Gen (Issue 5, Mar. 2019)	General Requirements for Compliance of Radio Apparatus
3	RSS-247 (Issue 2, February 2017)	Digital Transmission Systems (DTSs), Frequency Hopping Systems(FHSs) and Licence-Exemp Local Area Network (LE-LAN) Devices
2	KDB Publication 558074 D01v05r02	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES
4	KDB Publication 662911 D01v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
5	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	ISED Part No.	Modulation Technology	Channel	Test Result	Verdict
1	Antenna Requirement	15.203	RSS-247, 5.4 (f)	N/A	N/A	--	Pass Note1
2	Peak Output Power	15.247(b)	RSS-247, 5.4 (d)	Hybrid system	Low/Middle/ High	ANNEX A.1	Pass
3	Occupied Bandwidth	15.247(a)	RSS-GEN, 6.7; RSS-247, 5.2 (a)	Hybrid system	Low/Middle/ High	ANNEX A.2	Pass
4	Carrier Frequency Separation	15.247(a)	RSS-GEN, 6.7; RSS-247, 5.2 (a)	Frequency hopping mode	Hopping Mode	ANNEX A.3	Pass
5	Time of Occupancy (Dwell time)	15.247(a)	RSS-GEN, 6.7; RSS-247, 5.2 (a)	Frequency hopping mode	Hopping Mode	ANNEX A.4	Pass
6	Conducted Spurious Emission & Authorized-band band-edge	15.247(d)	RSS-247, 5.5;	Hybrid system	Low/Middle/ High, Hopping Mode	ANNEX A.5	Pass
7	Conducted Emission	15.207	RSS-GEN, 8.8	Hybrid system	Low/Middle/ High	ANNEX A.6	Pass
8	Radiated Spurious Emission	15.209 15.247(d)	RSS-247, 5.5	Hybrid system	Low/Middle/ High, Hopping Mode	ANNEX A.7	Pass
9	Band Edge(Restricted-band band-edge)	15.209 15.247(d)	RSS-247, 5.5	Hybrid system	Low/Middle/ High, Hopping Mode	ANNEX A.8	Pass
10	Power spectral density (PSD)	15.247(e)	RSS-247, 5.2 (b)	Hybrid system	Low/Middle/ High	ANNEX A.9	Pass
Note [1]: Please refer to section 5.1							

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	45% to 55%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	24 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2020.06.08	2021.06.07
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2020.06.08	2021.06.07
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2020.06.09	2021.06.08
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2020.06.09	2021.06.08
LISN	SCHWARZBECK	NSLK 8127	8127-687	2020.06.09	2021.06.08
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2020.06.08	2021.06.07
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2020.06.08	2021.06.07
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2020.06.08	2021.06.07
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
Temperature Chamber	AHK	SP20	1412	2020.06.10	2021.06.09
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2019.10.29	2021.10.28
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2019.07.02	2021.07.01
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1917	2019.07.02	2021.07.01
Test Antenna-Horn (18-40 GHz)	A-INFO	LB-180400KF	J211060273	2019.01.06	2021.01.05
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2022.02.20
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	N/A	2018.08.08	2021.08.07
Shielded Enclosure	ChangNing	CN-130701	130703	--	--
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2020.06.08	2021.06.07
Power Amplifier	OPHIR RF	5225F	1037	2020.02.19	2021.02.18
Power Amplifier	OPHIR RF	5273F	1016	2020.02.19	2021.02.18
Directional Coupler	Werlantone	C5982-10	109275	N/A	N/A
Directional Coupler	Werlantone	CHP-273E	S00801z-01	N/A	N/A
Sound Level Meter	B&K	NL-20	00844023	2020.10.23	2021.10.22
Ear Simulator	B&K	4192-L-001	3038758	2020.02.19	2021.02.18
Audio analyzer	B&K	UPL 16	100129	2020.02.28	2021.02.27

4.3 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

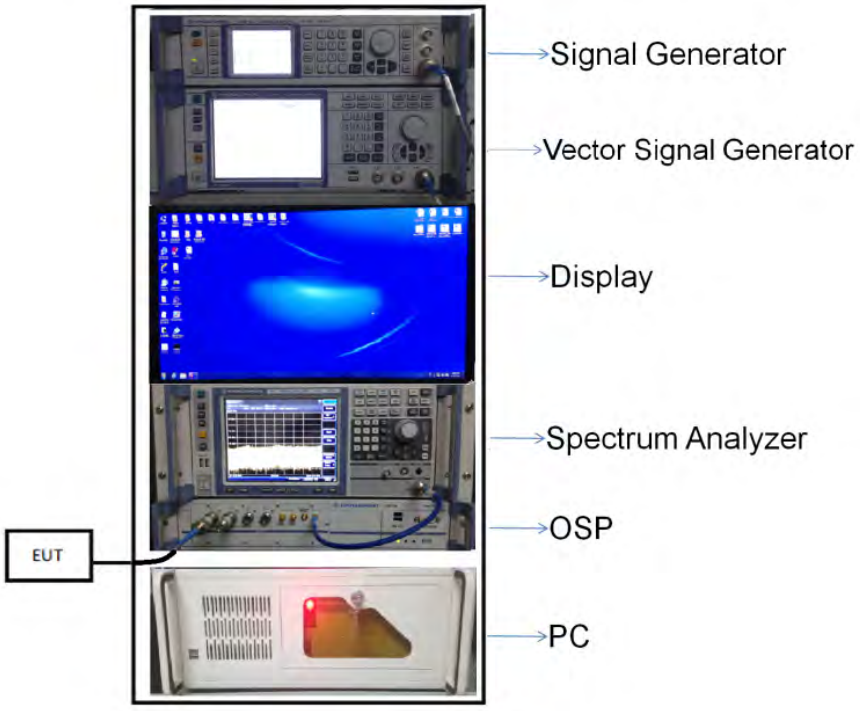
Measurement	Value
Occupied Channel Bandwidth	±4%
RF output power, conducted	±1.4 dB
Power Spectral Density, conducted	±2.5 dB
Unwanted Emissions, conducted	±2.8 dB
All emissions, radiated	±5.4 dB
Temperature	±1°C
Humidity	±4%

4.4 Description of Test Setup

4.4.1 For Antenna Port Test

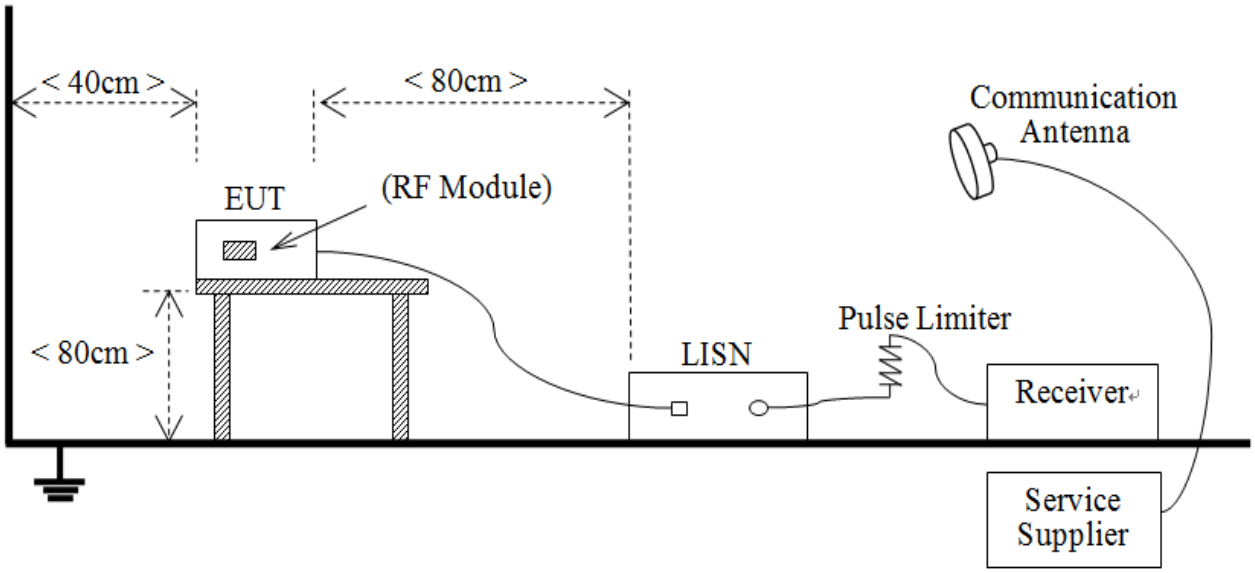
Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT:
Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm



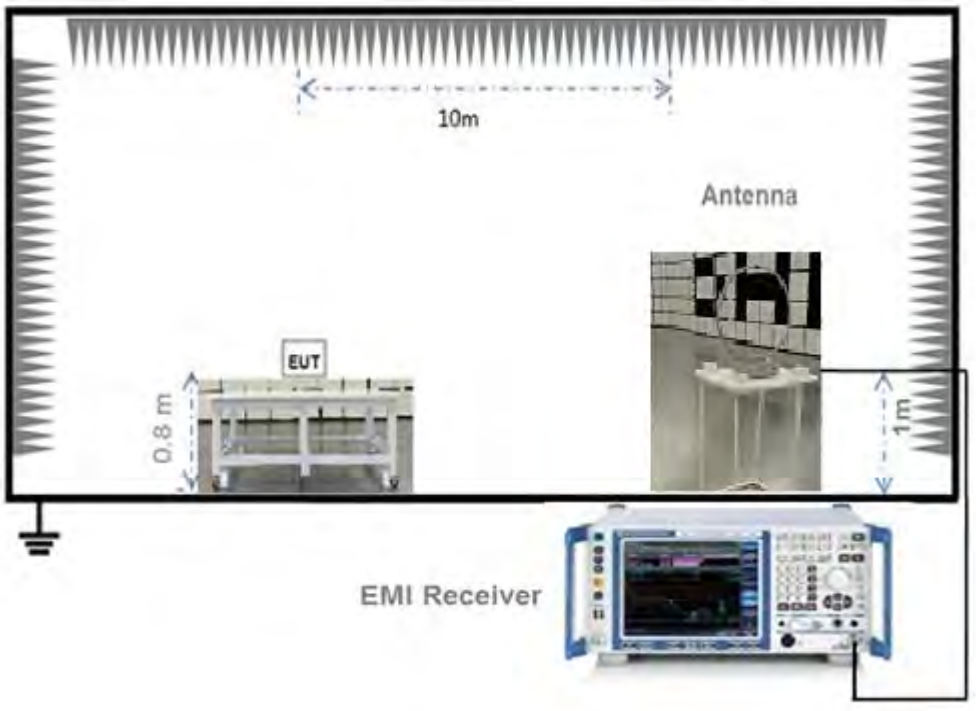
(Diagram 1)

4.4.2 For AC Power Supply Port Test



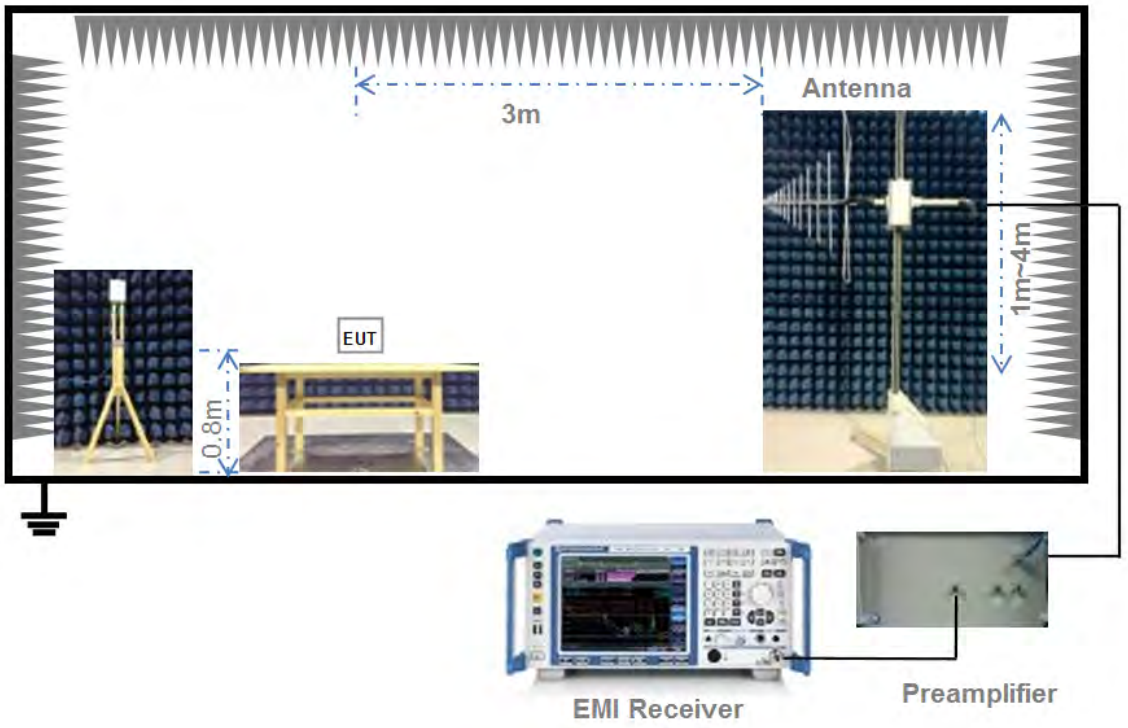
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



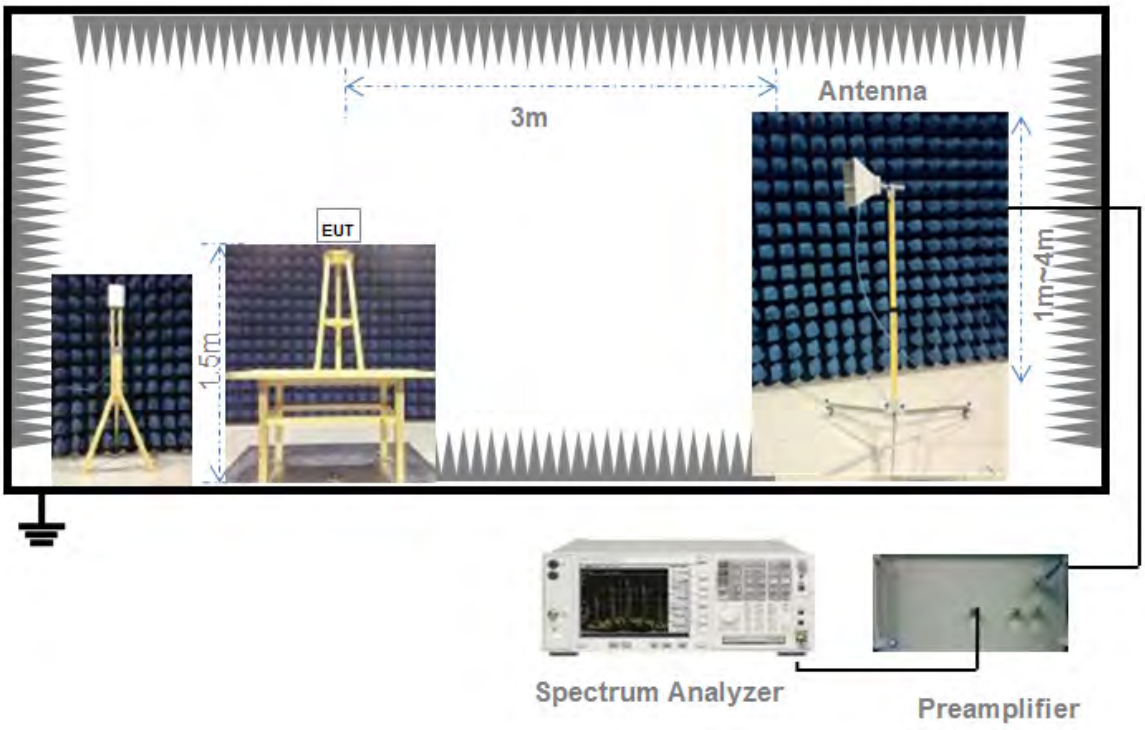
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

4.5 Measurement Results Explanation Example

4.5.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.

5 TEST ITEMS - Hybrid

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203 & 15.247(b); RSS-247, 5.4 (6)

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product	The antenna is welded on the mainboard, can't be replaced by the consumer

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 Peak Output Power and E.I.R.P

5.2.1 Test Limit

FCC § 15.247(b)(1)

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

RSS-247, 5.4 (2)

For FHSS operating in the band 902-928 MHz, the maximum peak conducted output power shall not exceed 1.0 W and the e.i.r.p. shall not exceed 4 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W and the e.i.r.p. shall not exceed 0.5 W if the hopset uses less than 75 hopping channels (see Section 5.4(5) for exceptions).

5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

The Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize.

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 Occupied Bandwidth

5.3.1 Limit

FCC §15.247(a)(1)(i); RSS-247, 5.1 (1)

Measurement of the 20dB bandwidth of the modulated signal. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW = in the range of 1% to 5% of the OBW

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate, Allow the trace to stabilize.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Carrier Frequency Separation

5.4.1 Limit

FCC §15.247(a)(1); RSS-247, 5.1 (2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span

Video (or Average) Bandwidth (VBW) ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Time of Occupancy (Dwell time)

5.5.1 Limit

FCC §15.247(a)(1)(i); RSS-247, 5.1 (4)

For the purposes of this section, hybrid systems are those that employ a combination of both frequency hopping and digital modulation techniques. The frequency hopping operation of the hybrid system, with the direct sequence or digital modulation operation turned-off, shall have an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

5.5.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Conducted Spurious Emission & Authorized-band band-edge

5.6.1 Limit

FCC §15.247(d); RSS-247, 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.6.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize

5.6.4 Test Result

Please refer to ANNEX A.6 and A.5

5.7 Conducted Emission

5.7.1 Limit

FCC §15.207; RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.7.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.7.4 Test Result

Please refer to ANNEX A.6.

5.8 Radiated Spurious Emission

5.8.1 Limit

FCC §15.209&15.247(d); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	902/F(kHz)	300
0.490 - 1.705	9020/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.8.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW

Sweep = auto
Detector function = peak
Trace = max hold
For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.8.4 Test Result

Please refer to ANNEX A.7.

5.9 Band Edge (Restricted-band band-edge)

5.9.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

5.9.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.9.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.9.4 Test Result

Please refer to ANNEX A.8.

5.10 Power Spectral density (PSD)

5.10.1 Limit

FCC §15.247(e); RSS-247, 5.2 (2)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section 5.4(4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

5.10.2 Test Setup

See section 4.4.1 (Diagram 1) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.10.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

Set the VBW ≥ 3 RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.10.4 Test Result

Please refer to ANNEX A.9.

6 TEST ITEMS - DTS

6.1 Output Power

6.1.1 Test Limit

FCC § 15.247(b)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements.

RSS-247, 5.4 (4)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

6.1.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.1.3 Test Procedure

a) Maximum peak conducted output power

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

Set the RBW ≥ DTS bandwidth.

Set VBW ≥ 3 x RBW.

Set span ≥ 3 x RBW

Sweep time = auto couple.

Detector = peak.

Trace mode = max hold.

Allow trace to fully stabilize.

Use peak marker function to determine the peak amplitude level.

b) Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.

Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.

Set VBW ≥ RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

6.1.4 Test Result

Please refer to ANNEX A.1.

6.2 Occupied Bandwidth

6.2.1 Limit

FCC §15.247(a); RSS-247, 5.1 (1); RSS-GEN, 6.6

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.

6.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.2.3 Test Procedure

Use the following spectrum analyzer settings:

Set RBW = 100 kHz.

Set the video bandwidth (VBW) ≥ 3 RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.2.4 Test Result

Please refer to ANNEX A.2.

6.3 Conducted Spurious Emission

6.3.1 Limit

FCC §15.247(d); RSS-247, 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

6.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.3.3 Test Procedure

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.

The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

Reference level measurement:

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to ≥ 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Emission level measurement:

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

Set the RBW = 100 kHz.

Set the VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

6.3.4 Test Result

Please refer to ANNEX A.5.

6.4 Band Edge (Authorized-band band-edge)

6.4.1 Limit

FCC §15.247(d); RSS-247, 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

6.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.4.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle ≥ 98%). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

Set span to 2 MHz

RBW = 100 kHz.

VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)

Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission) ± 0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission ± 0.5 MHz.

6.4.4 Test Result

Please refer to ANNEX A.5.

6.5 Conducted Emission

6.5.1 Limit

FCC §15.207; RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

6.5.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

6.5.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

6.5.4 Test Result

Please refer to ANNEX A.6.

6.6 Radiated Spurious Emission

6.6.1 Limit

FCC §15.209&15.247(d); RSS-GEN, 8.9; RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

5. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
6. In the emission tables above, the tighter limit applies at the band edges.
7. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
8. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

6.6.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.6.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW

Sweep = auto
Detector function = peak
Trace = max hold
For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

6.6.4 Test Result

Please refer to ANNEX A.7.

6.7 Band Edge (Restricted-band band-edge)

6.7.1 Limit

FCC §15.209&15.247(d); RSS-GEN, 8.9; RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

6.7.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.7.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

For transmitters operating above 1 GHz repeat the measurement with an average detector.

1.1.1 Test Result

Please refer to ANNEX A.8.

6.8 Power Spectral density (PSD)

6.8.1 Limit

FCC §15.247(e); RSS-247, 5.2 (2)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section 5.4(4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

6.8.2 Test Setup

See section 4.4.1 (Diagram 1) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

6.8.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

Set the VBW ≥ 3 RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.8.4 Test Result

Please refer to ANNEX A.9.

ANNEX A TEST RESULT

A.1 Peak Output Power

Peak Power Test Data

Main Antenna

Channel	Measured Output Peak Power		Limit		Verdict
	LoRa (125kHz)		dBm	mW	
	dBm	mW			
Low	26.11	408.32	30	1000	Pass
Middle	24.54	284.45			Pass
High	23.72	235.50			Pass

Channel	Measured Output Peak Power		Limit		Verdict
	LoRa (500kHz)		dBm	mW	
	dBm	mW			
Low	26.19	415.91	30	1000	Pass
Middle	24.44	277.97			Pass
High	23.50	223.87			Pass

Aux. Antenna

Channel	Measured Output Peak Power		Limit		Verdict
	LoRa (125kHz)		dBm	mW	
	dBm	mW			
Low	26.11	408.32	30	1000	Pass
Middle	24.70	295.12			Pass
High	24.04	253.51			Pass

Channel	Measured Output Peak Power		Limit		Verdict
	LoRa (500kHz)		dBm	mW	
	dBm	mW			
Low	26.07	404.58	30	1000	Pass
Middle	24.93	311.17			Pass
High	24.47	279.90			Pass

E.I.R.P Test Data (For ISED)

Main Antenna

Channel	E.I.R.P		Limit		Verdict
	LoRa (125kHz)		dBm	mW	
	dBm	mW			
Low	28.21	662.22	36	4000	Pass
Middle	26.64	461.32			Pass
High	25.82	381.94			Pass

Channel	E.I.R.P		Limit		Verdict
	LoRa (500kHz)		dBm	mW	
	dBm	mW			
Low	28.29	674.53	36	4000	Pass
Middle	26.54	450.82			Pass
High	25.60	363.08			Pass

Aux. Antenna

Channel	E.I.R.P		Limit		Verdict
	LoRa (125kHz)		dBm	mW	
	dBm	mW			
Low	28.21	662.22	36	4000	Pass
Middle	26.80	478.63			Pass
High	26.14	411.15			Pass

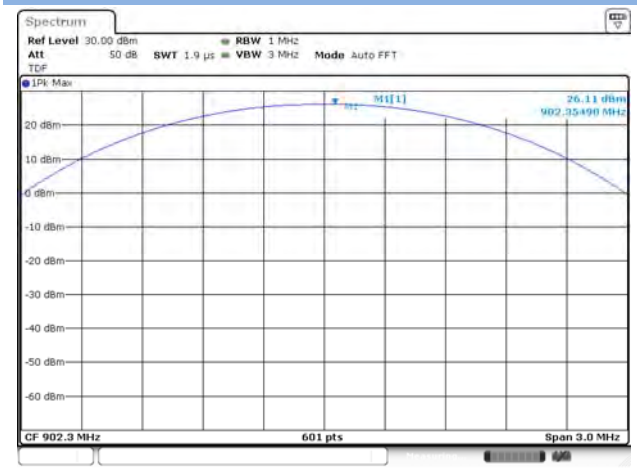
Channel	E.I.R.P		Limit		Verdict
	LoRa (500kHz)		dBm	mW	
	dBm	mW			
Low	28.17	656.15	36	4000	Pass
Middle	27.03	504.66			Pass
High	26.57	453.94			Pass

Test plots

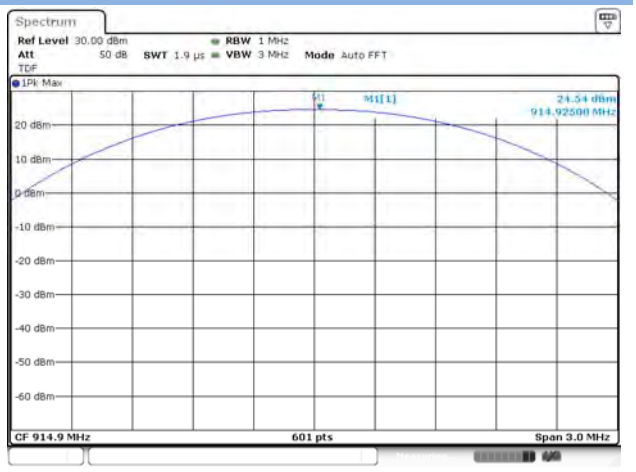
Main Antenna

125kHz

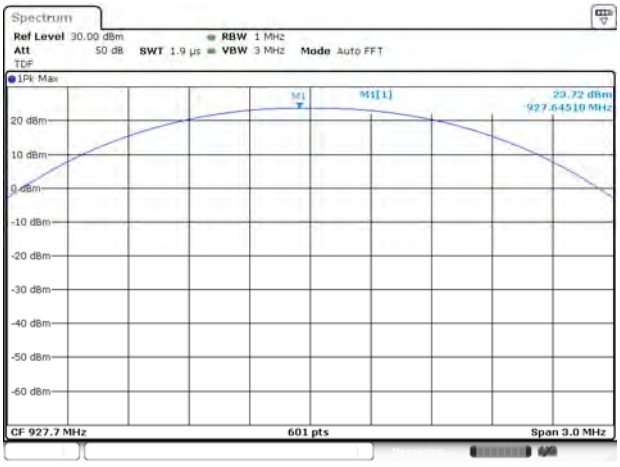
LOW CHANNEL



MIDDLE CHANNEL

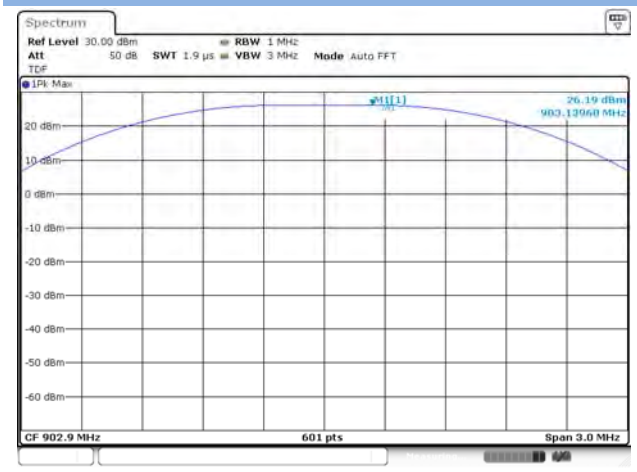


HIGH CHANNEL

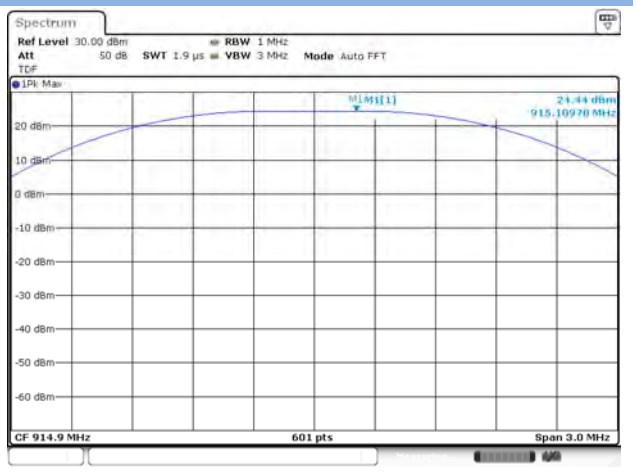


500kHz

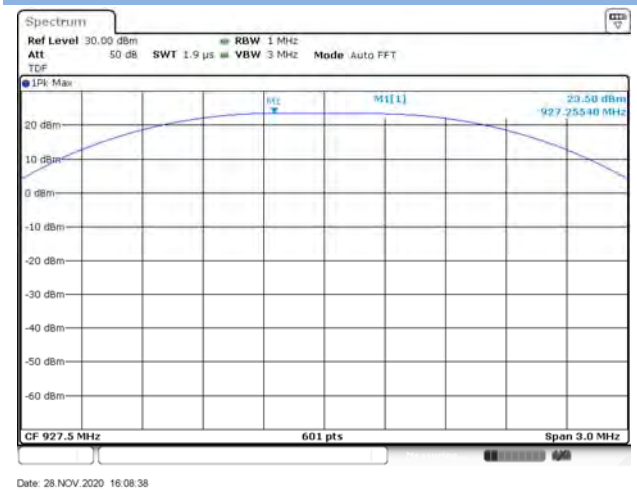
LOW CHANNEL



MIDDLE CHANNEL



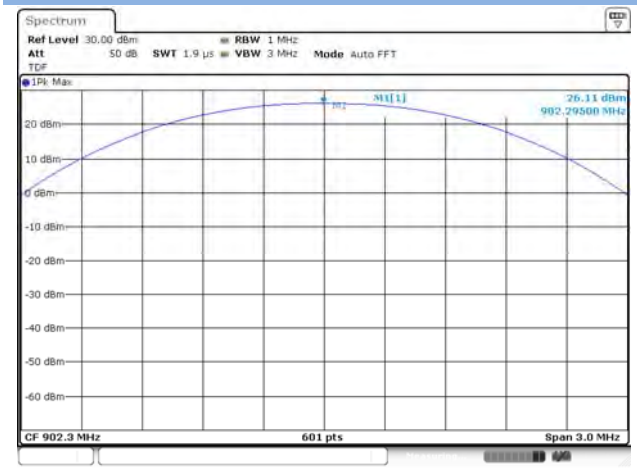
HIGH CHANNEL



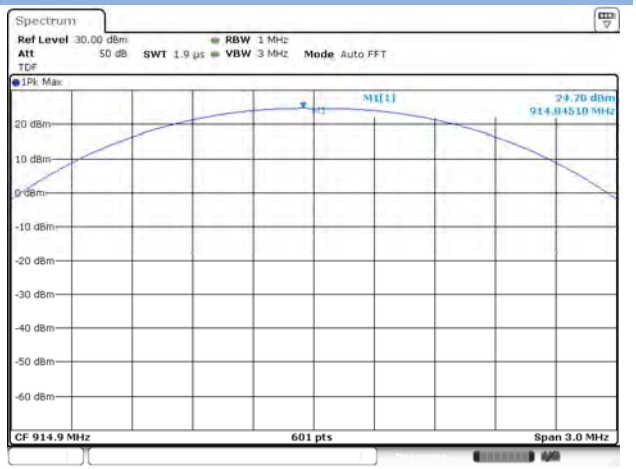
Aux. Antenna

125kHz

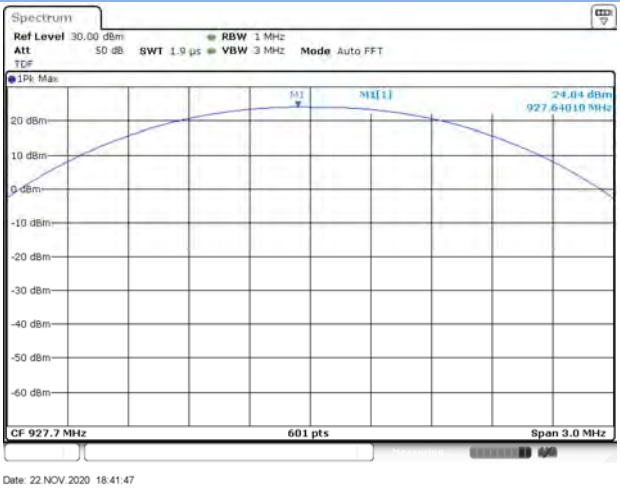
LOW CHANNEL



MIDDLE CHANNEL

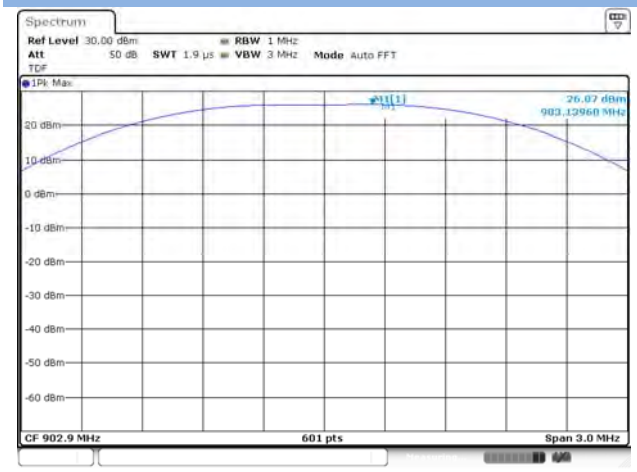


HIGH CHANNEL



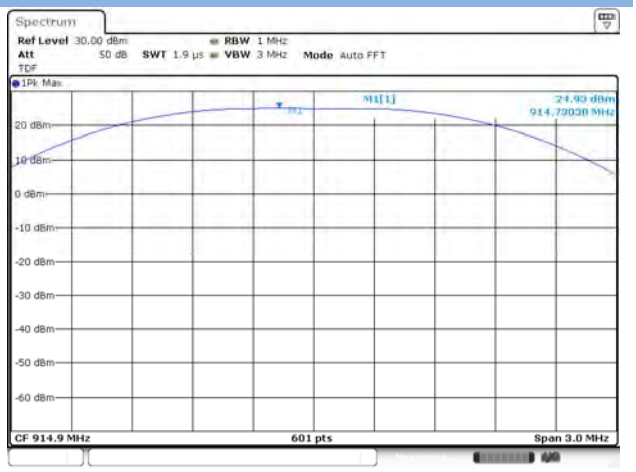
500kHz

LOW CHANNEL



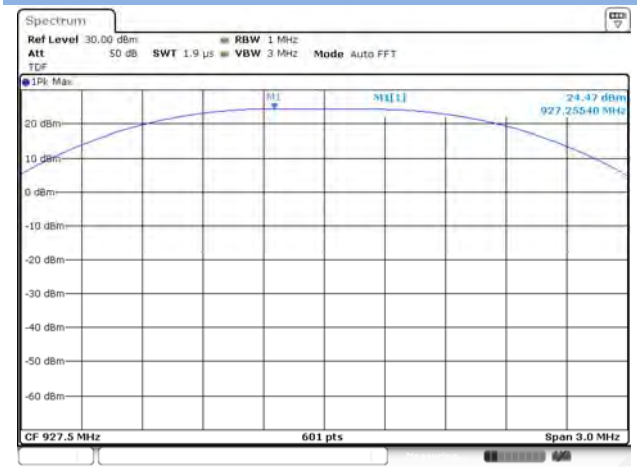
Date: 28.NOV.2020 15:26:03

MIDDLE CHANNEL



Date: 22.NOV.2020 20:16:29

HIGH CHANNEL



Date: 22.NOV.2020 20:28:04

A.2 20 dB and 99% bandwidth

Test Data

Main Antenna

LoRa (125kHz)			
Channel	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)	Verdict
Low	0.131165	0.122200	Pass
Middle	0.129333	0.122800	Pass
High	0.131531	0.123000	Pass

LoRa (500kHz)			
Channel	6 dB Bandwidth (kHz)	99% Bandwidth (kHz)	Verdict
Low	0.641296	0.658500	Pass
Middle	0.639099	0.660000	Pass
High	0.641296	0.658500	Pass

Aux. Antenna

LoRa (125kHz)			
Channel	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)	Verdict
Low	0.129761	0.122800	Pass
Middle	0.130798	0.123400	Pass
High	0.129700	0.123000	Pass

LoRa (500kHz)			
Channel	6 dB Bandwidth (kHz)	99% Bandwidth (kHz)	Verdict
Low	0.641296	0.655500	Pass
Middle	0.634766	0.655500	Pass
High	0.639160	0.652500	Pass

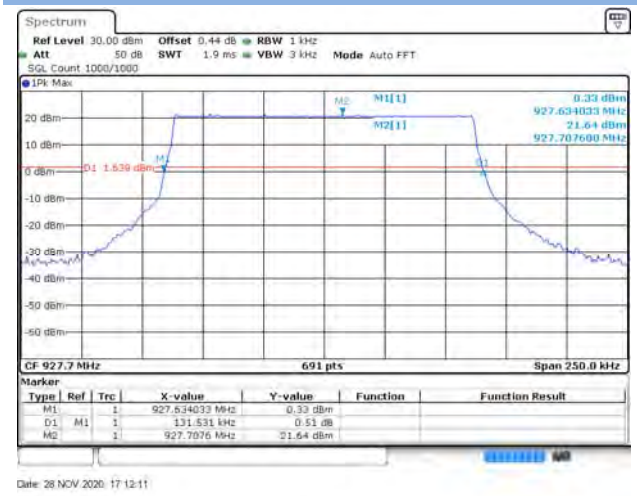
Test plots (20 dB Bandwidth) (125kHz)

Main Antenna

LOW CHANNEL

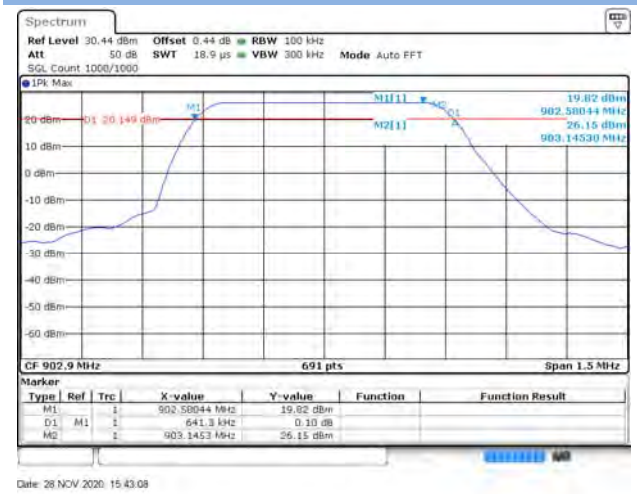
MIDDLE CHANNEL

HIGH CHANNEL

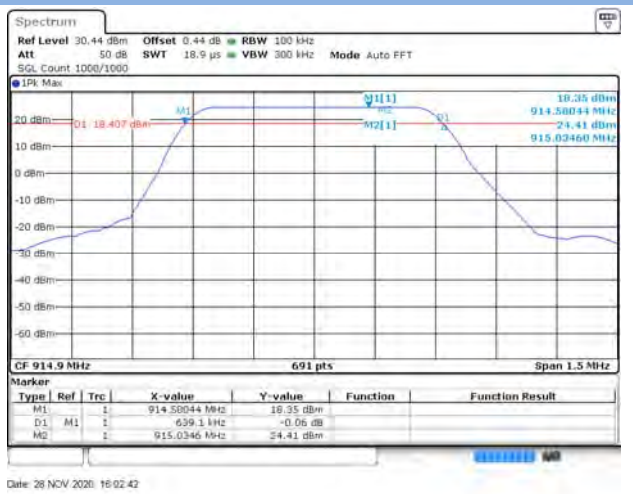


Test plots (6 dB Bandwidth) (500kHz)

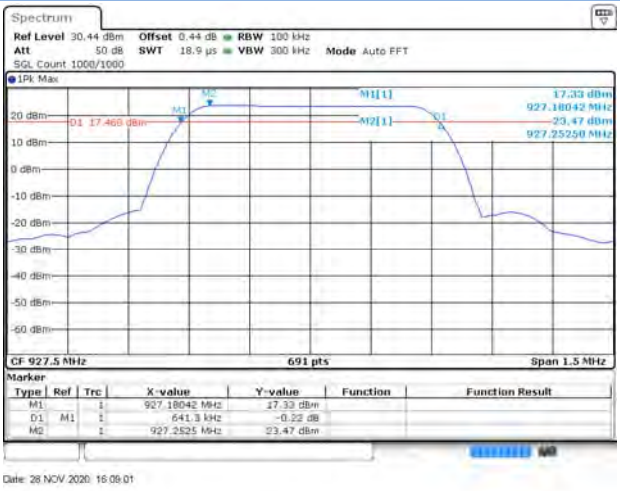
LOW CHANNEL



MIDDLE CHANNEL

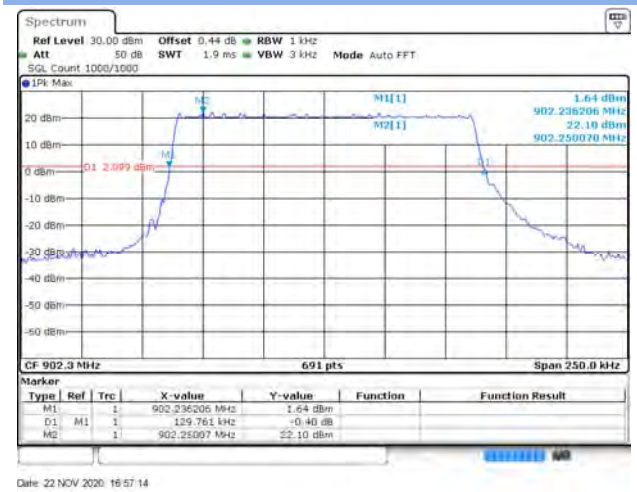


HIGH CHANNEL

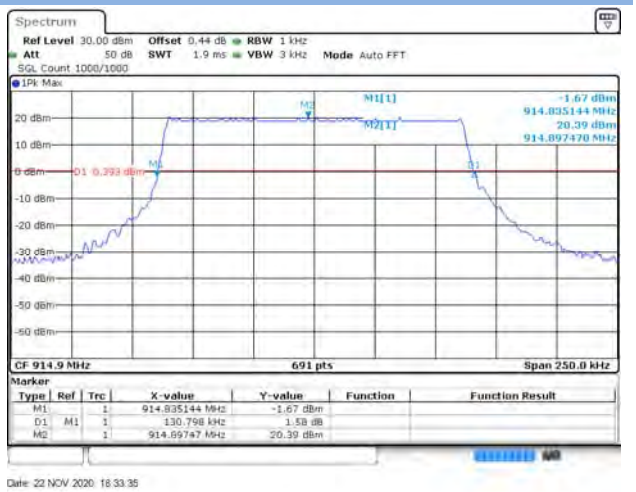


Aux. Antenna

LOW CHANNEL



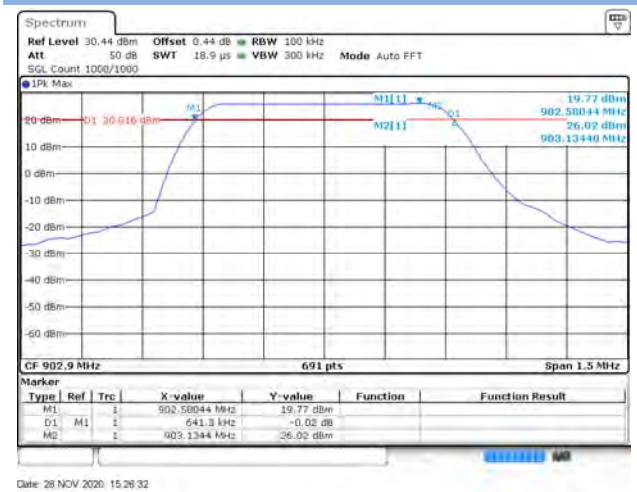
MIDDLE CHANNEL



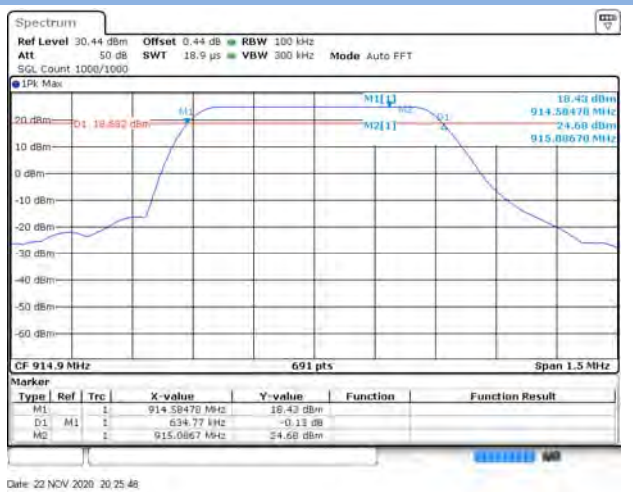
HIGH CHANNEL

Test plots (6 dB Bandwidth) (500kHz)

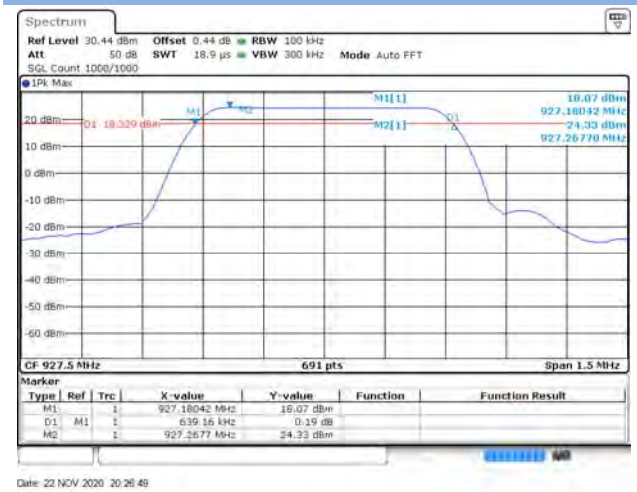
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL

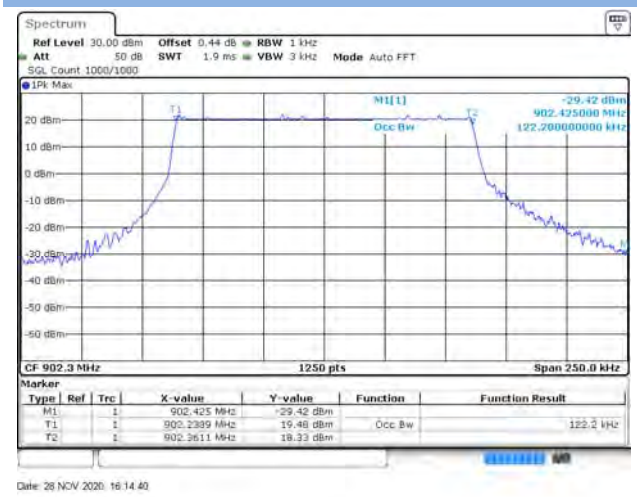


Test plots (99% Bandwidth)

Main Antenna

125kHz

LOW CHANNEL



MIDDLE CHANNEL

HIGH CHANNEL

500kHz

LOW CHANNEL

MIDDLE CHANNEL

HIGH CHANNEL

Aux. Antenna

125kHz

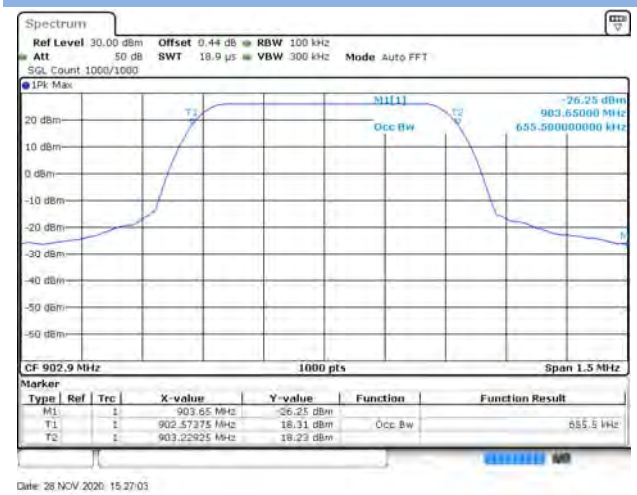
LOW CHANNEL

MIDDLE CHANNEL

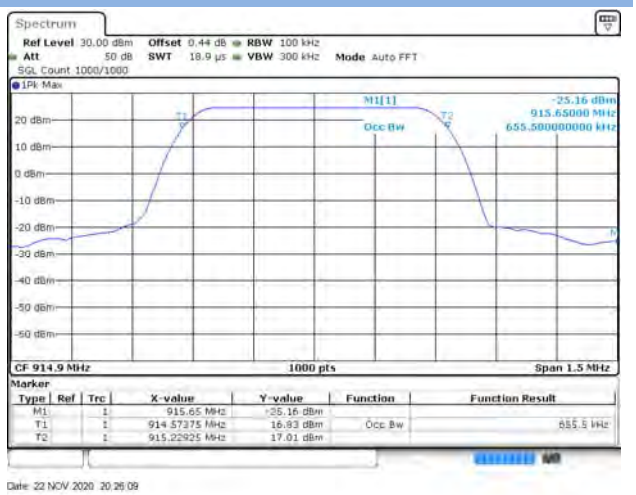
HIGH CHANNEL

500kHz

LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL

A.3 Hopping Frequency Separation

Test Data

Main Antenna

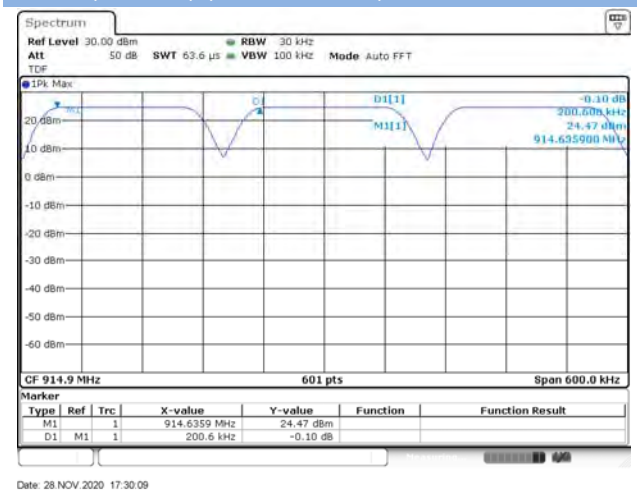
Mode	Frequency separation (MHz)	Max 20 dB Bandwidth (MHz)	Verdict
LoRa (125KHz)	0.2006	0.131531	Pass

Aux. Antenna

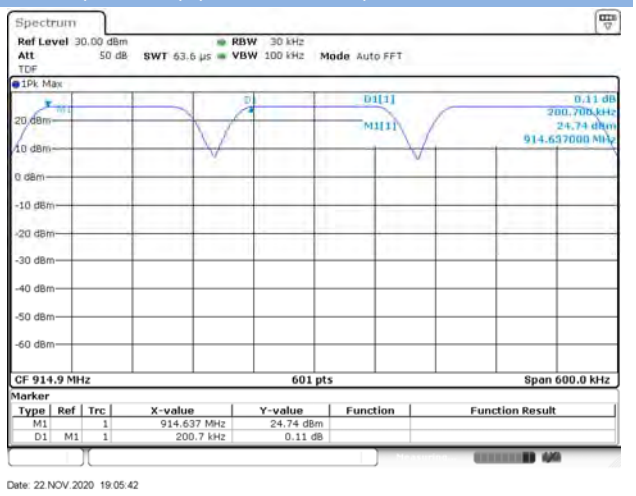
Mode	Frequency separation (MHz)	Max 20 dB Bandwidth (MHz)	Verdict
LoRa (125KHz)	0.2007	0.130798	Pass

Test Plots

LoRa (125kHz) (Main Antenna)



LoRa (125kHz) (Aux. Antenna)



A.4 Average Time of Occupancy

Test Data

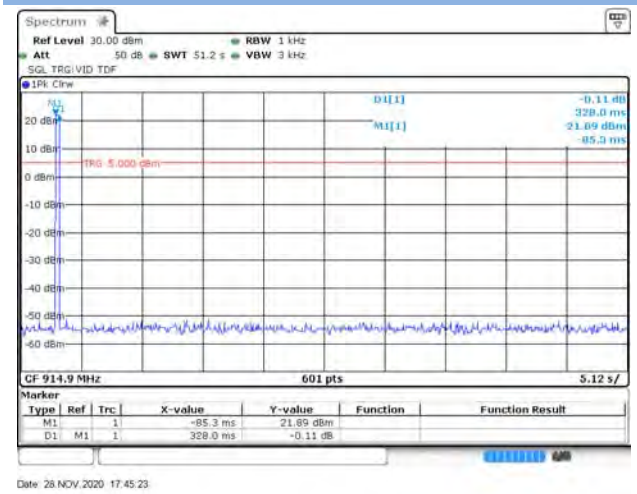
Main Antenna

Mode	Total of Dwell(ms)	Limit (sec)	Verdict
LoRa (125KHz)	328.0	0.4	Pass

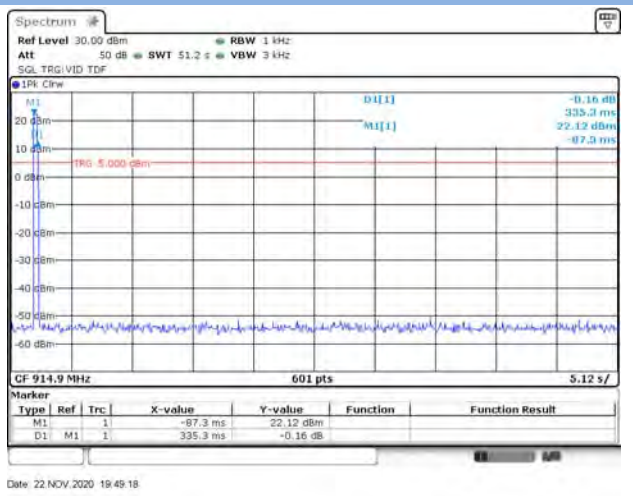
Aux. Antenna

Mode	Total of Dwell(ms)	Limit (sec)	Verdict
LoRa (125KHz)	335.3	0.4	Pass

LoRa (125kHz) (Main Antenna)



LoRa (125kHz) (Aux. Antenna)



A.5 Conducted Spurious Emissions & Authorized-band band-edge

Test Data

Main Antenna

LoRa (125kHz)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-18.45	26.06	6.06	Pass
Middle	-27.32	24.50	4.50	Pass
High	-16.88	23.65	3.65	Pass

LoRa (500kHz)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-26.86	26.08	6.08	Pass
Middle	-27.12	24.34	4.34	Pass
High	-27.22	23.45	3.45	Pass

Aux. Antenna

LoRa (125kHz)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-18.60	26.08	6.08	Pass
Middle	-26.17	24.67	4.67	Pass
High	-15.64	24.05	4.05	Pass

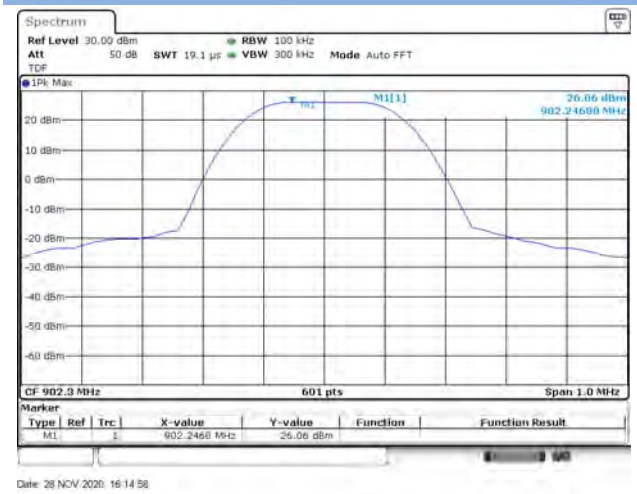
LoRa (500kHz)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-25.73	25.96	5.96	Pass
Middle	-26.59	24.92	4.92	Pass
High	-26.50	24.47	4.47	Pass

Test Plots

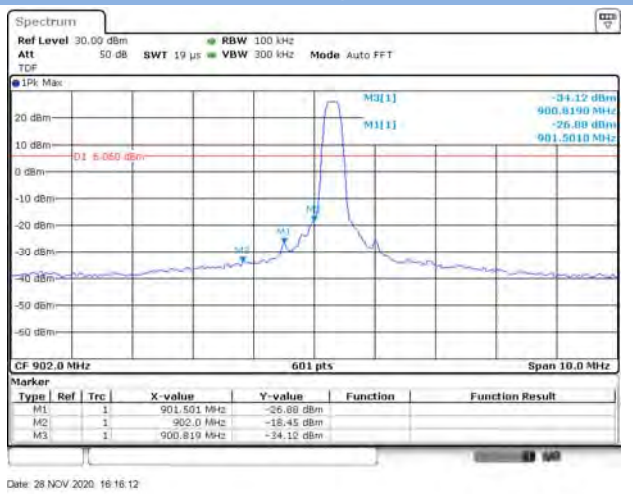
Main Antenna

125kHz

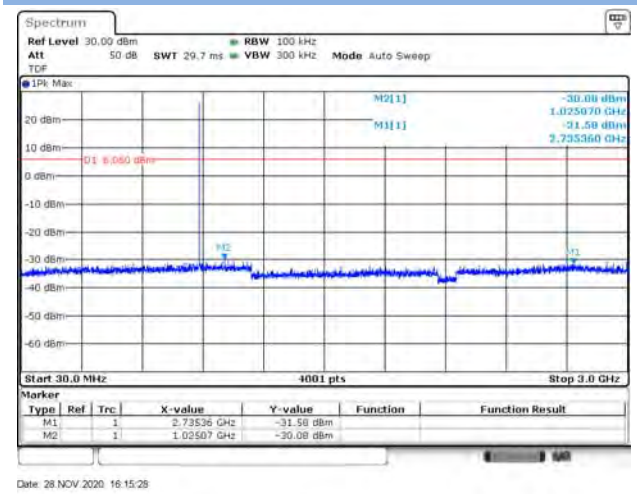
LOW CHANNEL, CARRIER LEVEL



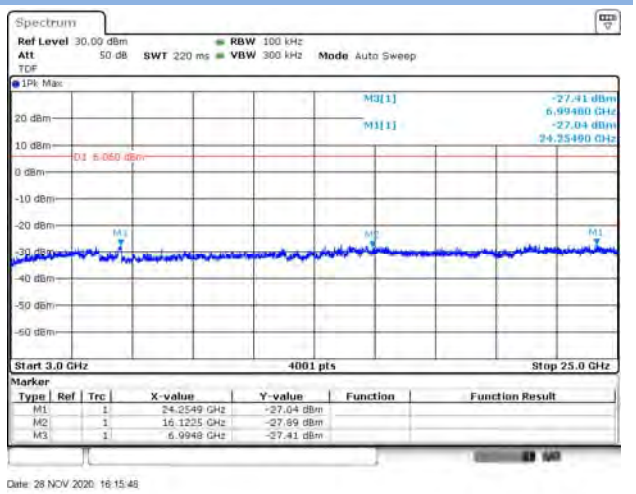
LOW CHANNEL, Band Edge



LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

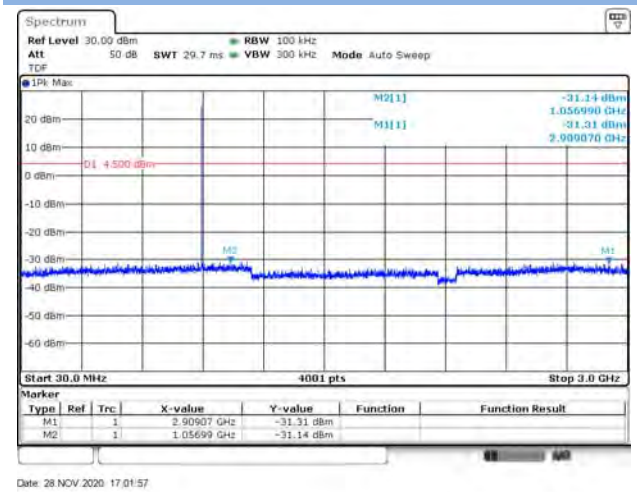


LOW CHANNEL, SPURIOUS 3 GHz ~ 25 GHz

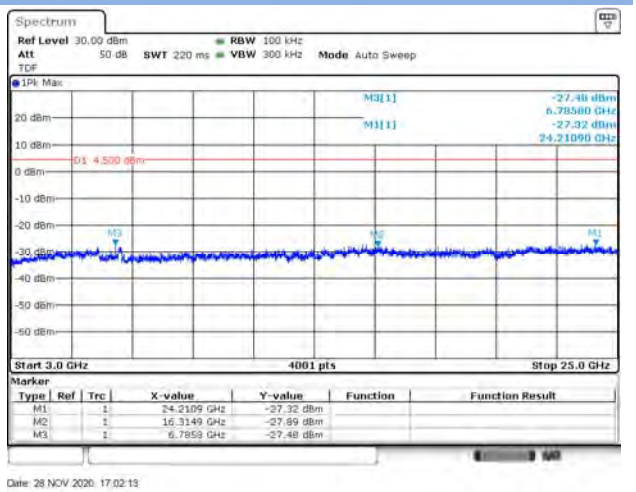


MIDDLE CHANNEL, CARRIER LEVEL

MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

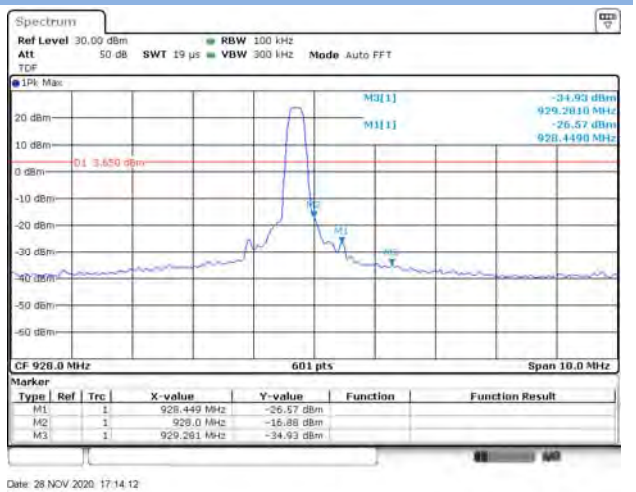


MIDDLE CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



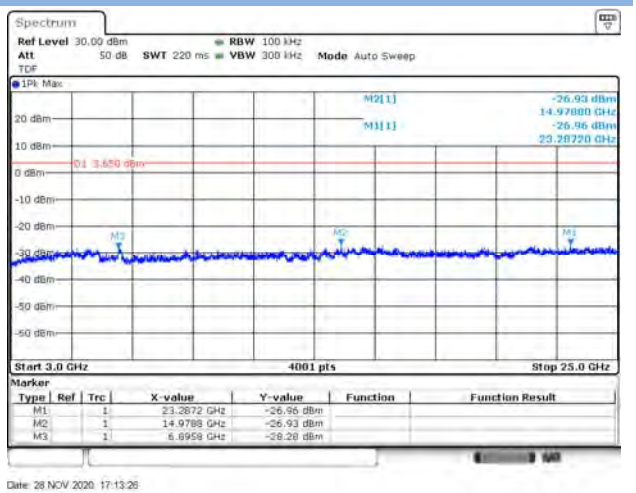
HIGH CHANNEL, CARRIER LEVEL

HIGH CHANNEL, BAND EDGE



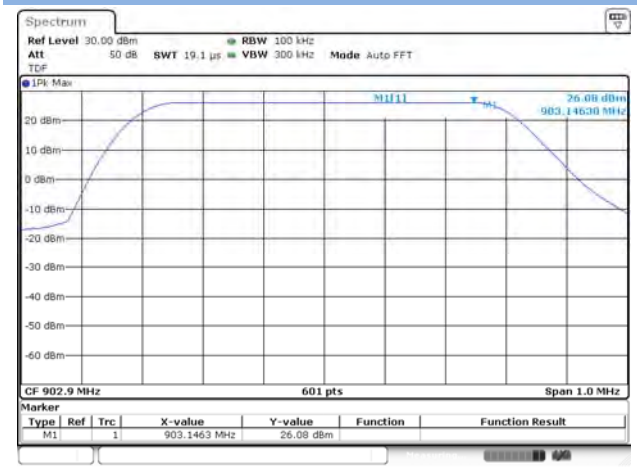
HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

HIGH CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



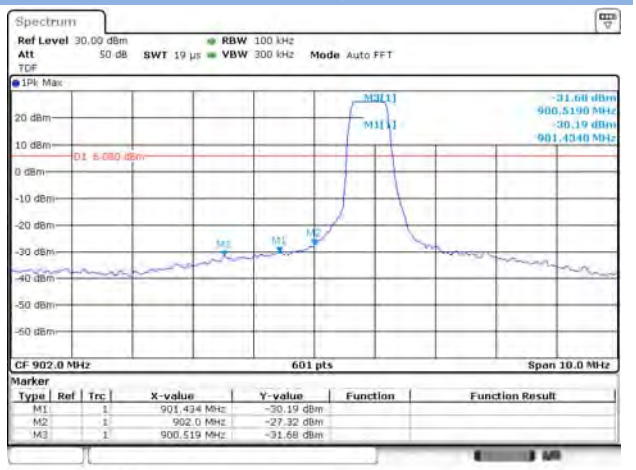
500kHz

LOW CHANNEL, CARRIER LEVEL



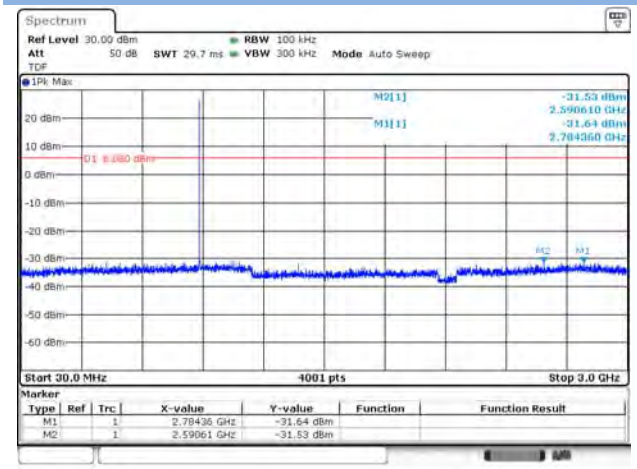
Date: 28.NOV.2020 15:44:22

LOW CHANNEL, Band Edge



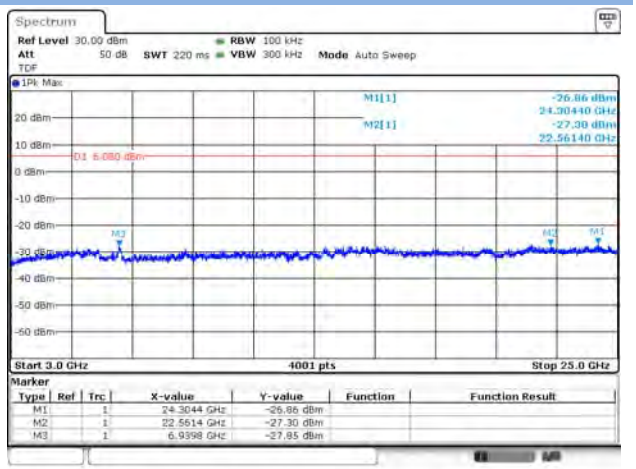
Date: 28.NOV.2020 15:45:35

LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



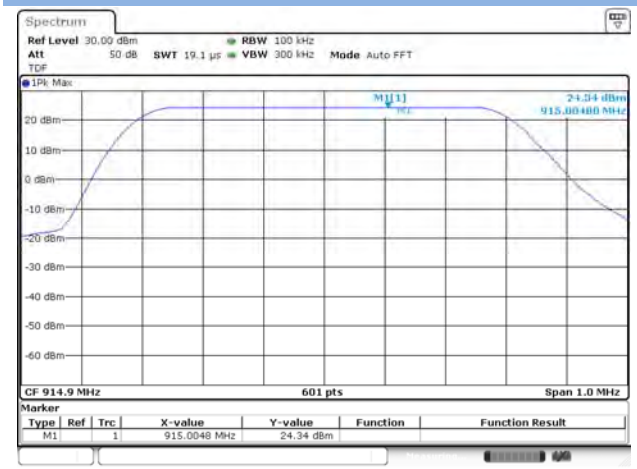
Date: 28.NOV.2020 15:44:41

LOW CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



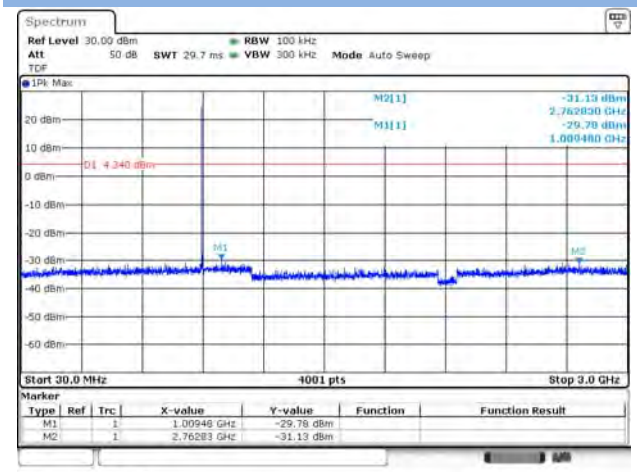
Date: 28.NOV.2020 15:44:59

MIDDLE CHANNEL, CARRIER LEVEL



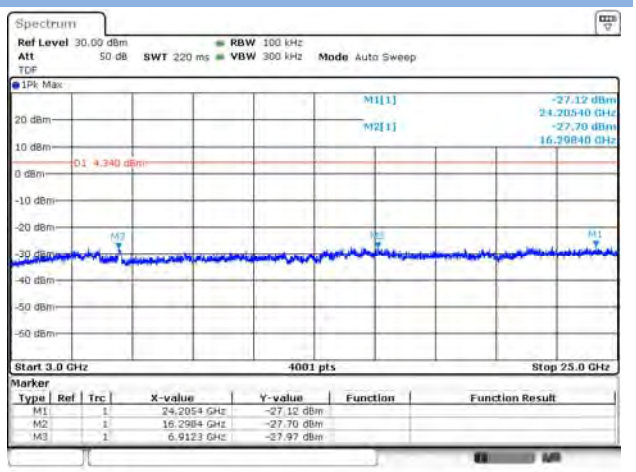
Date: 28.NOV.2020 16:03:39

MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



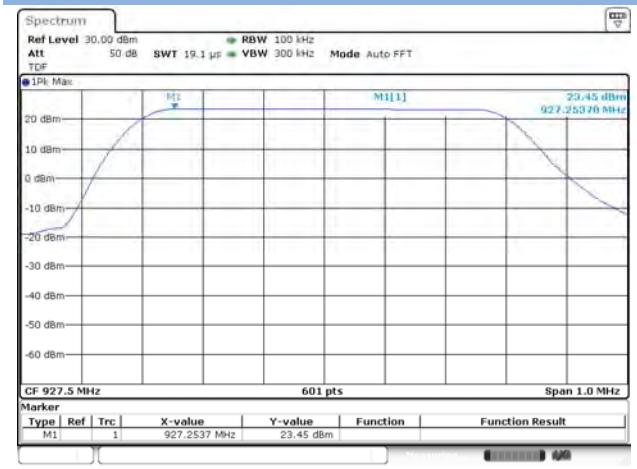
Date: 28.NOV.2020 16:04:10

MIDDLE CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



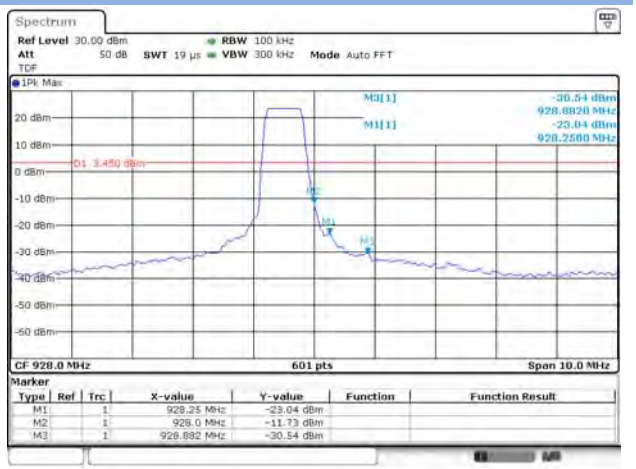
Date: 28.NOV.2020 16:04:28

HIGH CHANNEL, CARRIER LEVEL



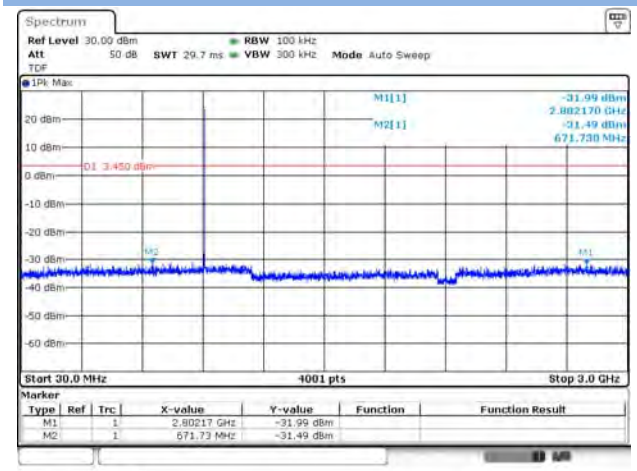
Date: 28.NOV.2020 16:09:34

HIGH CHANNEL, BAND EDGE



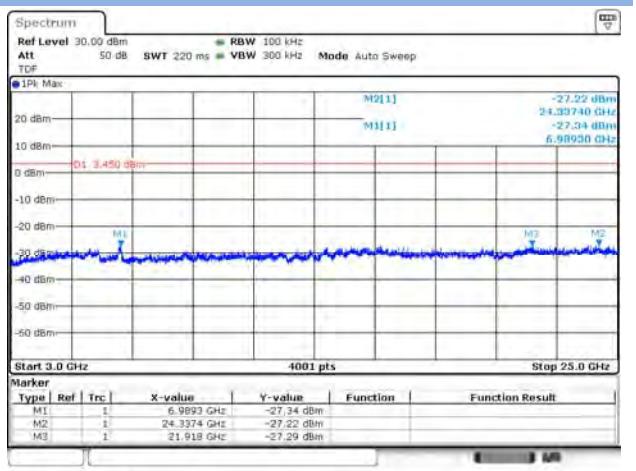
Date: 28.NOV.2020 16:10:55

HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



Date: 28.NOV.2020 16:10:02

HIGH CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



Date: 28.NOV.2020 16:10:22

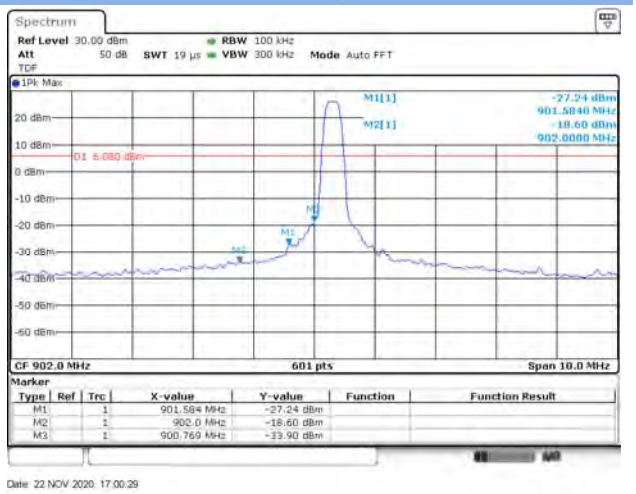
Aux. Antenna

125kHz

LOW CHANNEL, CARRIER LEVEL

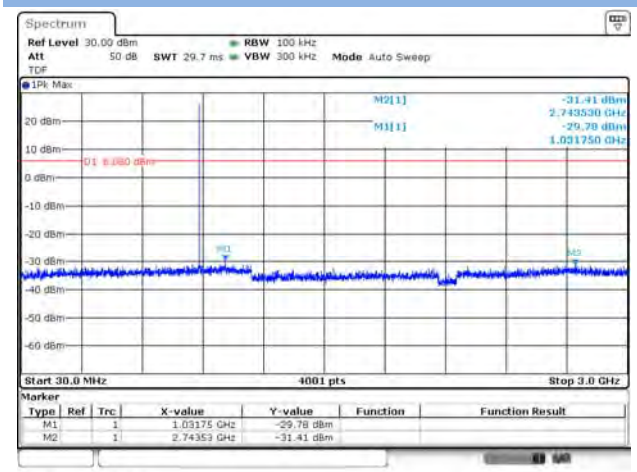
Date: 22.NOV.2020 16:59:10

LOW CHANNEL, Band Edge



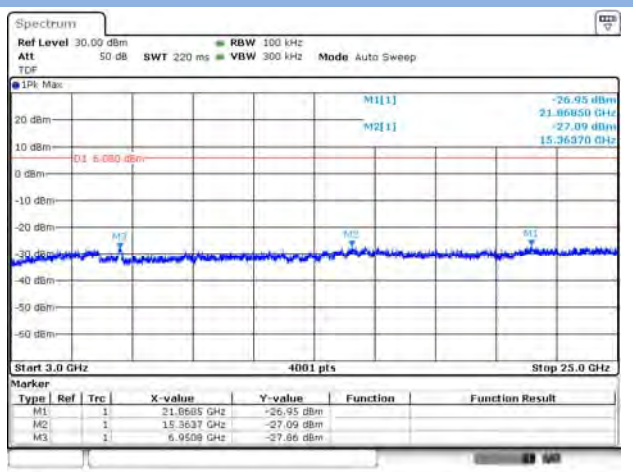
Date: 22.NOV.2020 17:00:29

LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



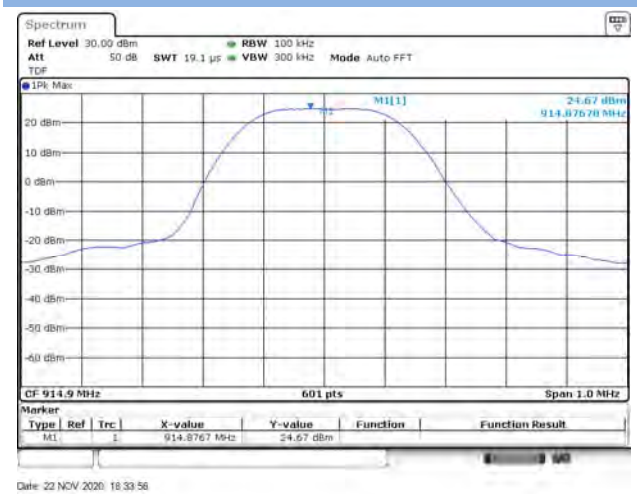
Date: 22.NOV.2020 16:59:38

LOW CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



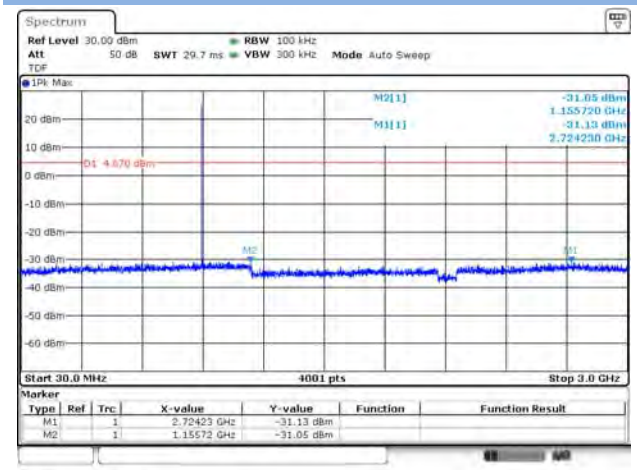
Date: 22.NOV.2020 16:59:53

MIDDLE CHANNEL, CARRIER LEVEL



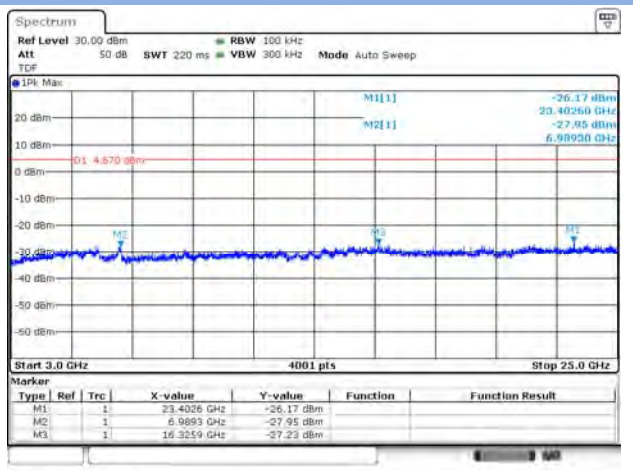
Date: 22.NOV.2020 18:33:56

MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



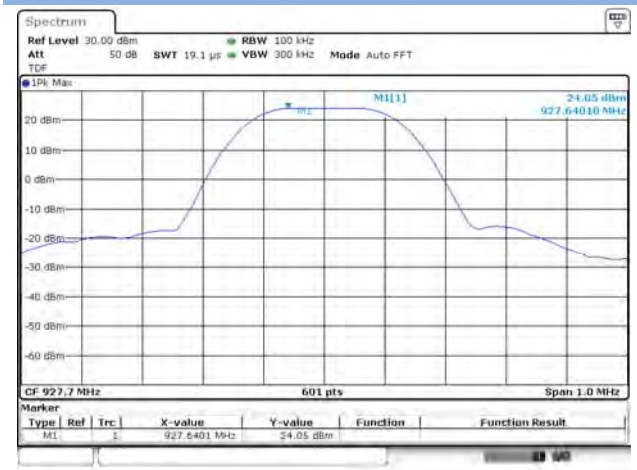
Date: 22 NOV 2020 18:34:28

MIDDLE CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



Date: 22 NOV 2020 18:34:42

HIGH CHANNEL, CARRIER LEVEL

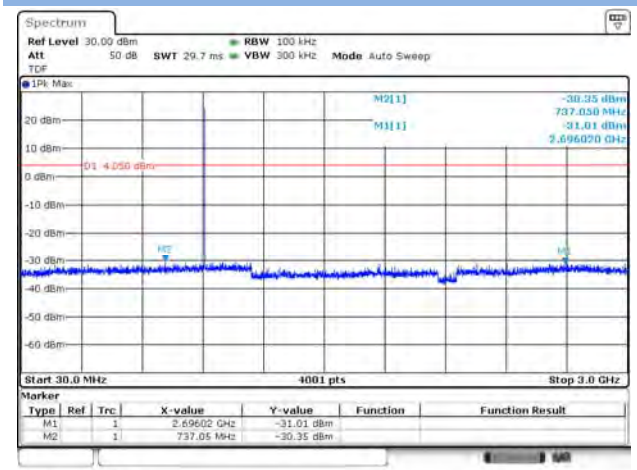


Date: 22 NOV 2020 18:42:53

HIGH CHANNEL, BAND EDGE

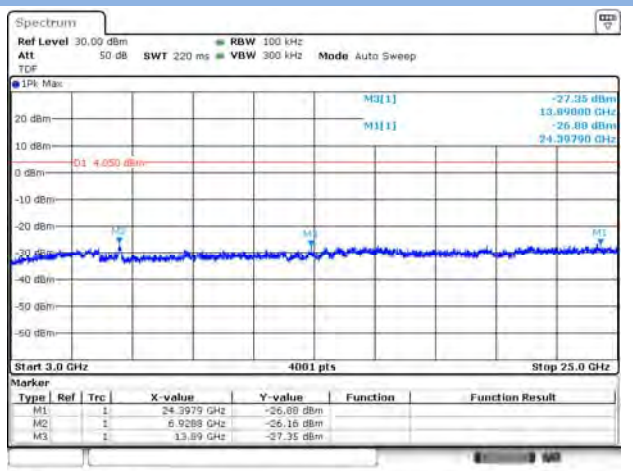
Date: 22 NOV 2020 18:44:33

HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



Date: 22 NOV 2020 18:43:21

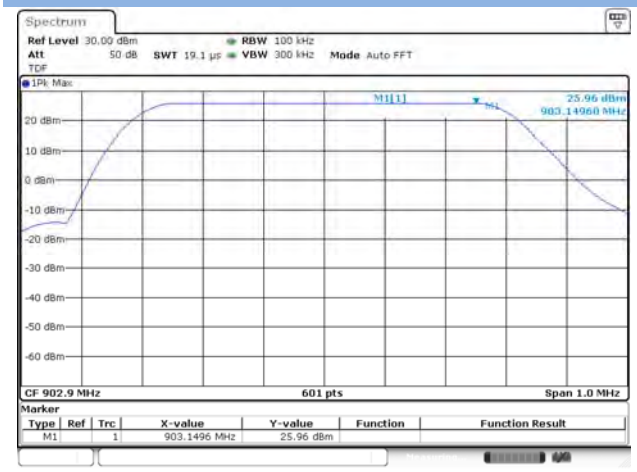
HIGH CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



Date: 22 NOV 2020 18:44:00

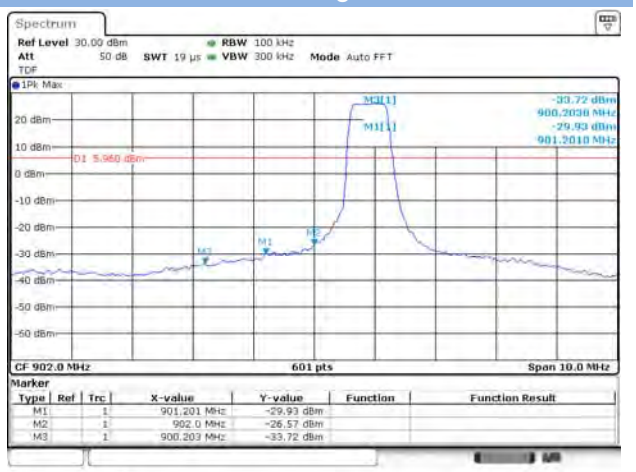
500kHz

LOW CHANNEL, CARRIER LEVEL



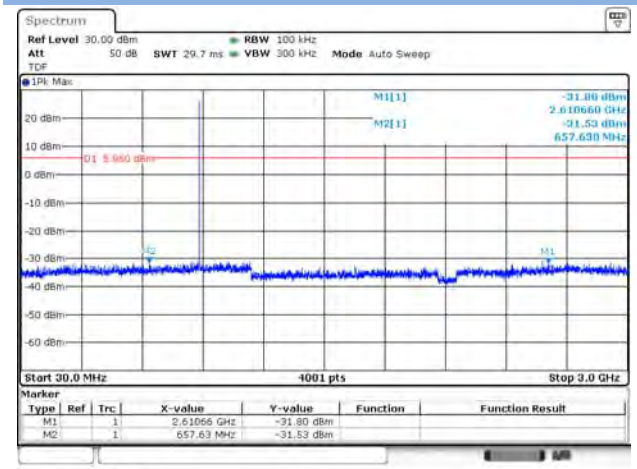
Date: 28.NOV.2020 15:27:17

LOW CHANNEL, Band Edge



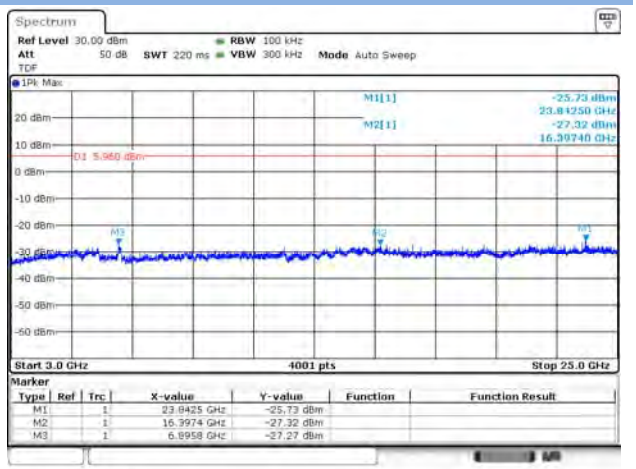
Date: 28.NOV.2020 15:28:54

LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



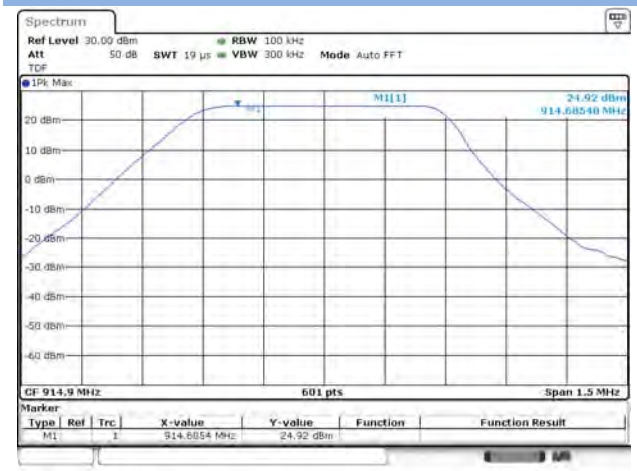
Date: 28.NOV.2020 15:27:37

LOW CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



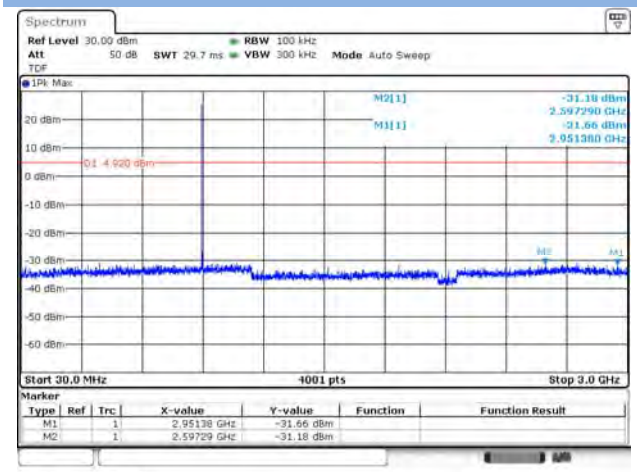
Date: 28.NOV.2020 15:27:54

MIDDLE CHANNEL, CARRIER LEVEL



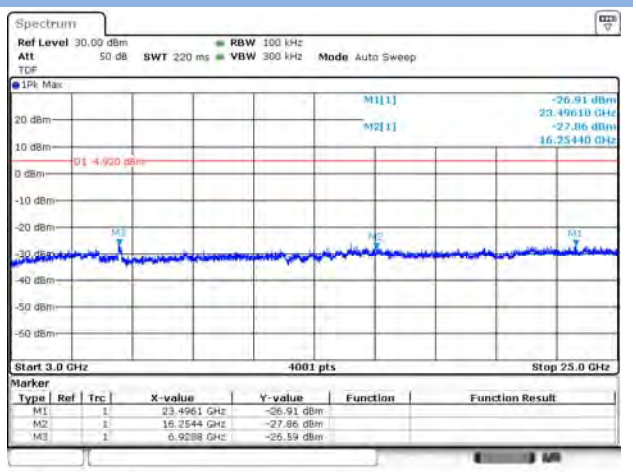
Date: 22.NOV.2020 20:17:13

MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



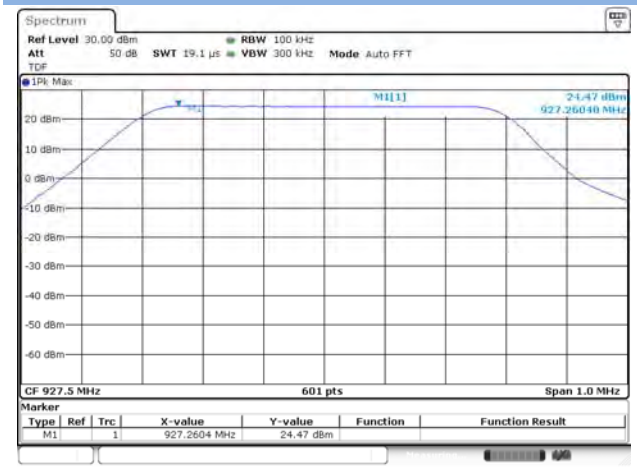
Date: 22.NOV.2020 20:17:39

MIDDLE CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



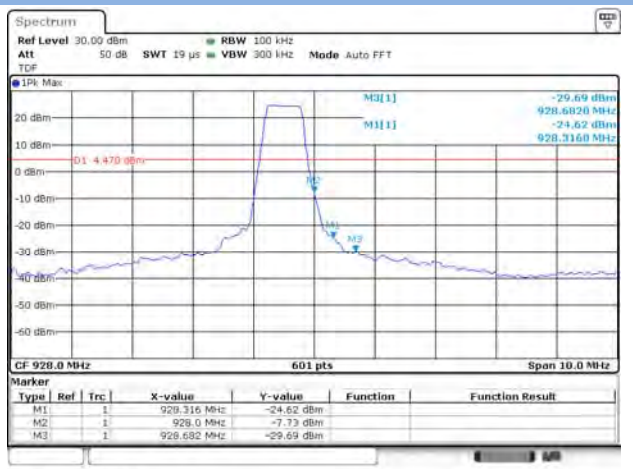
Date: 22.NOV.2020 20:17:58

HIGH CHANNEL, CARRIER LEVEL



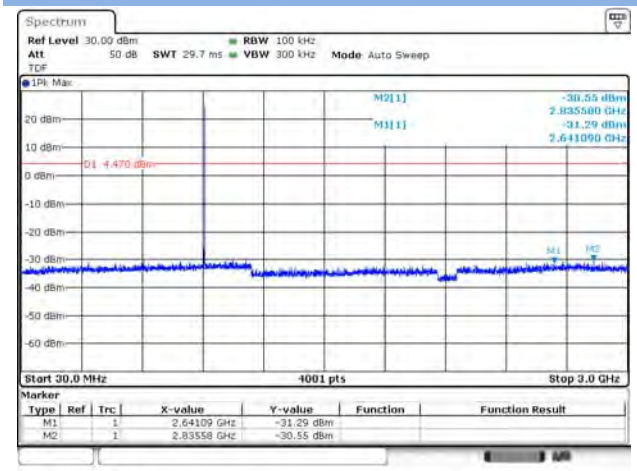
Date: 22.NOV.2020 20:28:28

HIGH CHANNEL, BAND EDGE



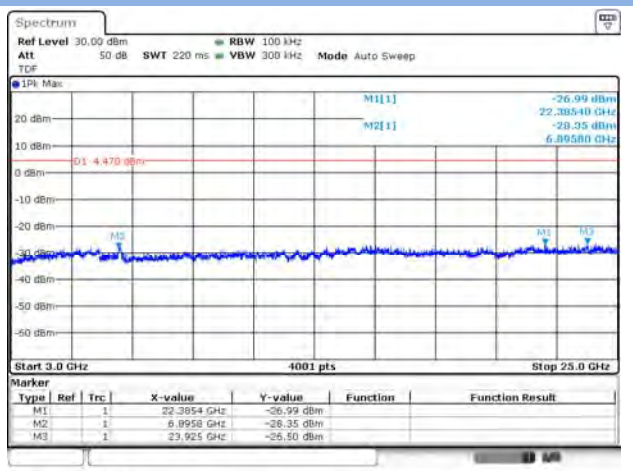
Date: 22.NOV.2020 20:30:18

HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



Date: 22.NOV.2020 20:29:08

HIGH CHANNEL, SPURIOUS 3 GHz ~ 25 GHz

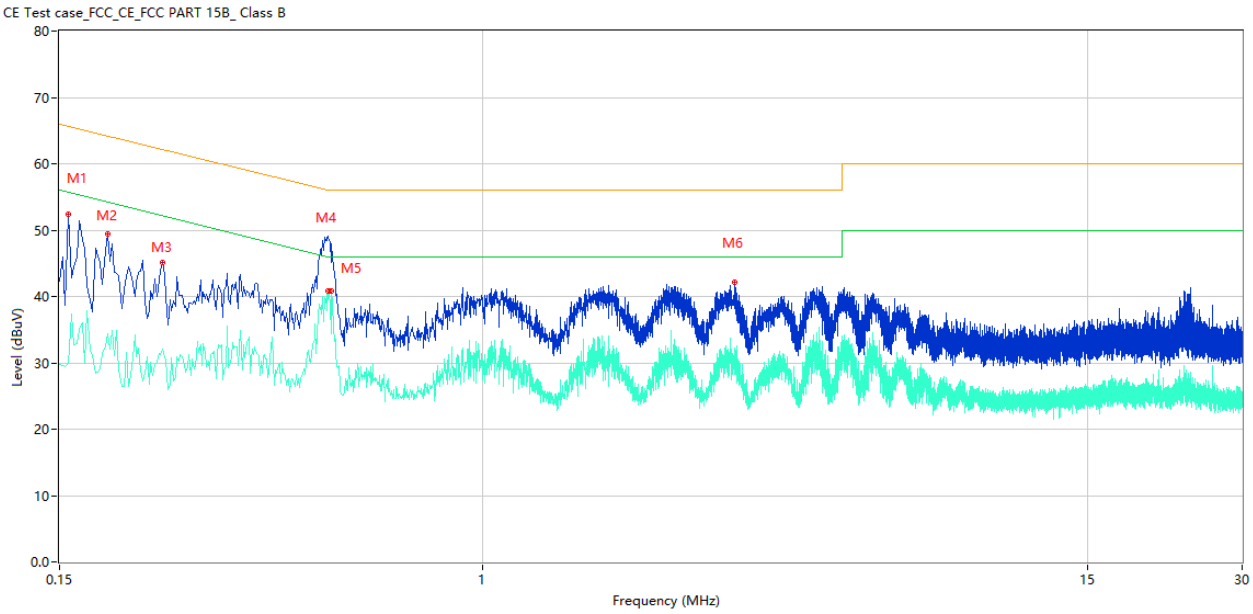


Date: 22.NOV.2020 20:29:31

A.6 Conducted Emissions

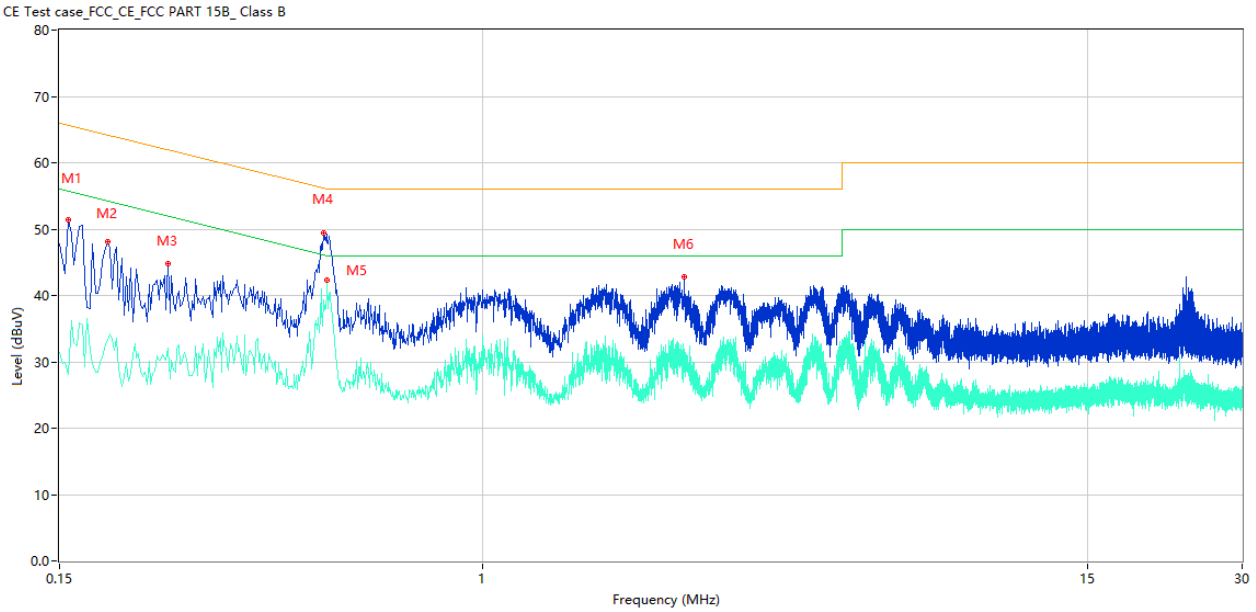
Note [1]: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.
Note [2]: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.
Note [3]: Results (dBuV) = Original reading level of Spectrum Analyzer (dBuV) + Factor (dB)
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.156	52.32	10.41	65.67	-13.35	Peak	L	Pass
1**	0.156	29.85	10.41	55.67	-25.82	AV	L	Pass
2	0.186	49.47	10.39	64.21	-14.74	Peak	L	Pass
2**	0.186	34.31	10.39	54.21	-19.90	AV	L	Pass
3	0.238	45.20	10.35	62.17	-16.97	Peak	L	Pass
3**	0.238	32.02	10.35	52.17	-20.15	AV	L	Pass
4	0.500	49.11	10.30	56.00	-6.89	Peak	L	Pass
4**	0.500	40.83	10.30	46.00	-5.17	AV	L	Pass
5	0.508	47.97	10.30	56.00	-8.03	Peak	L	Pass
5**	0.508	40.87	10.30	46.00	-5.13	AV	L	Pass
6	3.084	42.08	10.29	56.00	-13.92	Peak	L	Pass
6**	3.084	31.31	10.29	46.00	-14.69	AV	L	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.156	51.46	10.41	65.67	-14.21	Peak	N	Pass
1**	0.156	28.03	10.41	55.67	-27.64	AV	N	Pass
2	0.186	48.07	10.39	64.21	-16.14	Peak	N	Pass
2**	0.186	33.30	10.39	54.21	-20.91	AV	N	Pass
3	0.244	44.78	10.34	61.96	-17.18	Peak	N	Pass
3**	0.244	31.99	10.34	51.96	-19.97	AV	N	Pass
4	0.490	49.47	10.29	56.17	-6.70	Peak	N	Pass
4**	0.490	39.38	10.29	46.17	-6.79	AV	N	Pass
5	0.498	48.10	10.29	56.03	-7.93	Peak	N	Pass
5**	0.498	42.26	10.29	46.03	-3.77	AV	N	Pass
6	2.462	42.78	10.27	56.00	-13.22	Peak	N	Pass
6**	2.462	31.85	10.27	46.00	-14.15	AV	N	Pass

A.7 Radiated Spurious Emission

Note [1]: The symbol of "--" in the table which means not application.

Note [2]: For the test data above 1 GHz, according the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

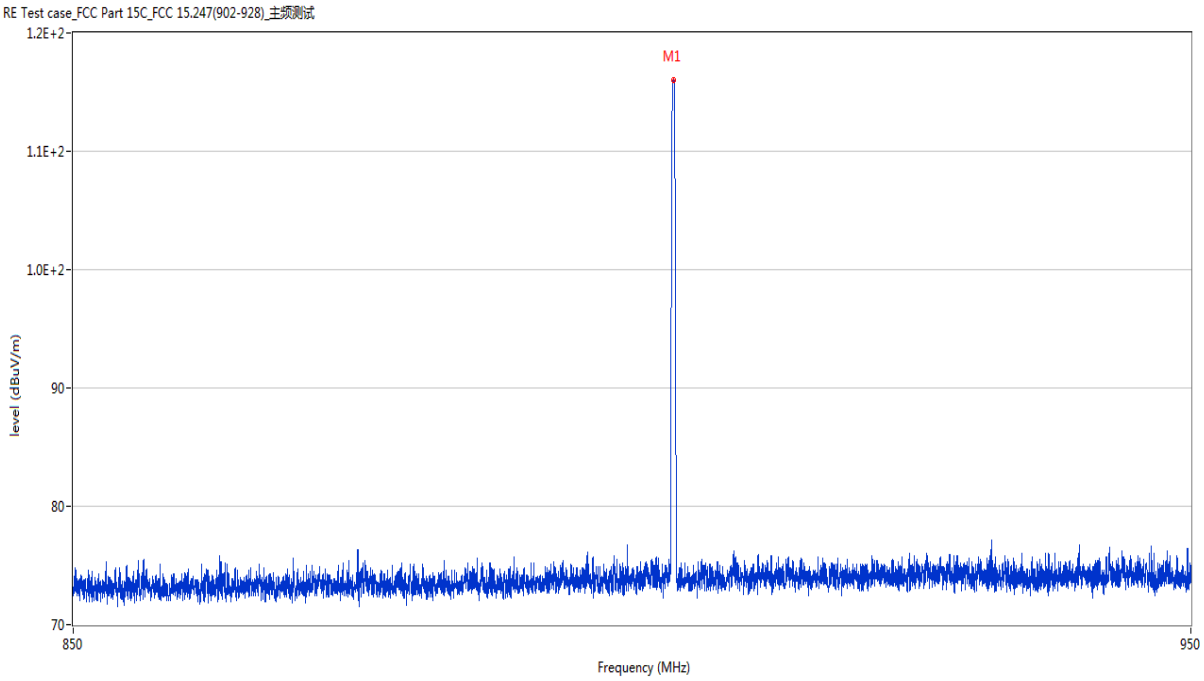
Note [3]: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Test Data and Plots

Main Antenna

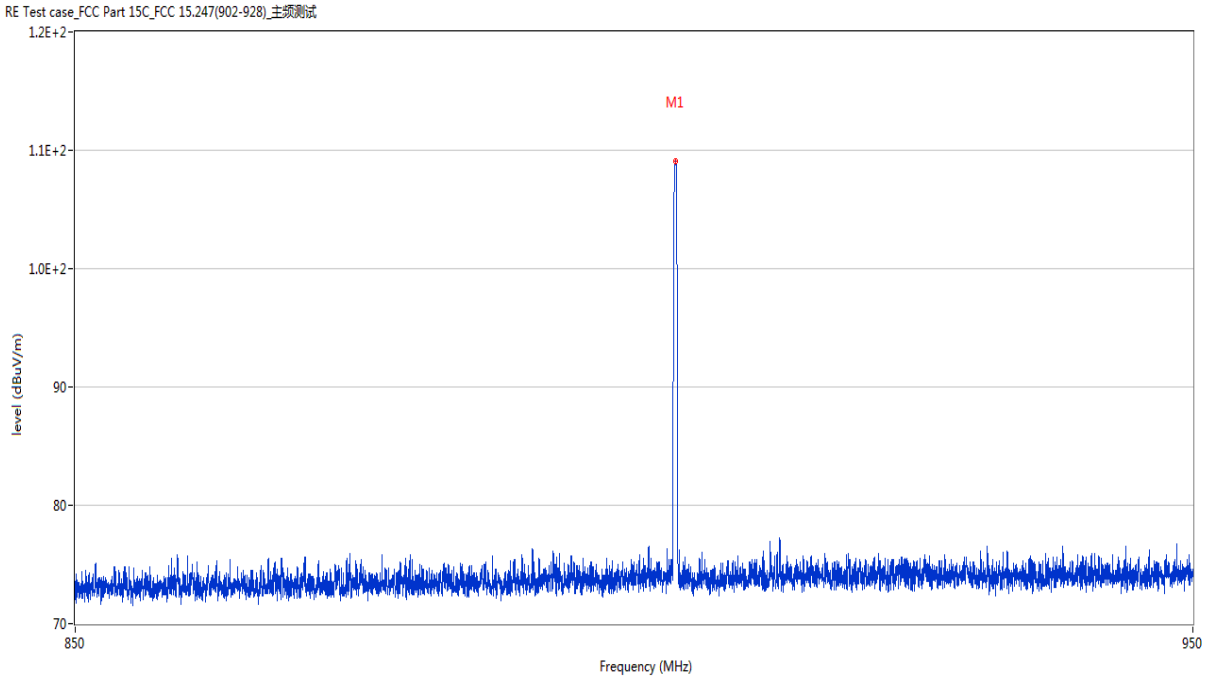
125kHz

LOW CHANNEL, 850 MHz to 950 MHz, ANT H



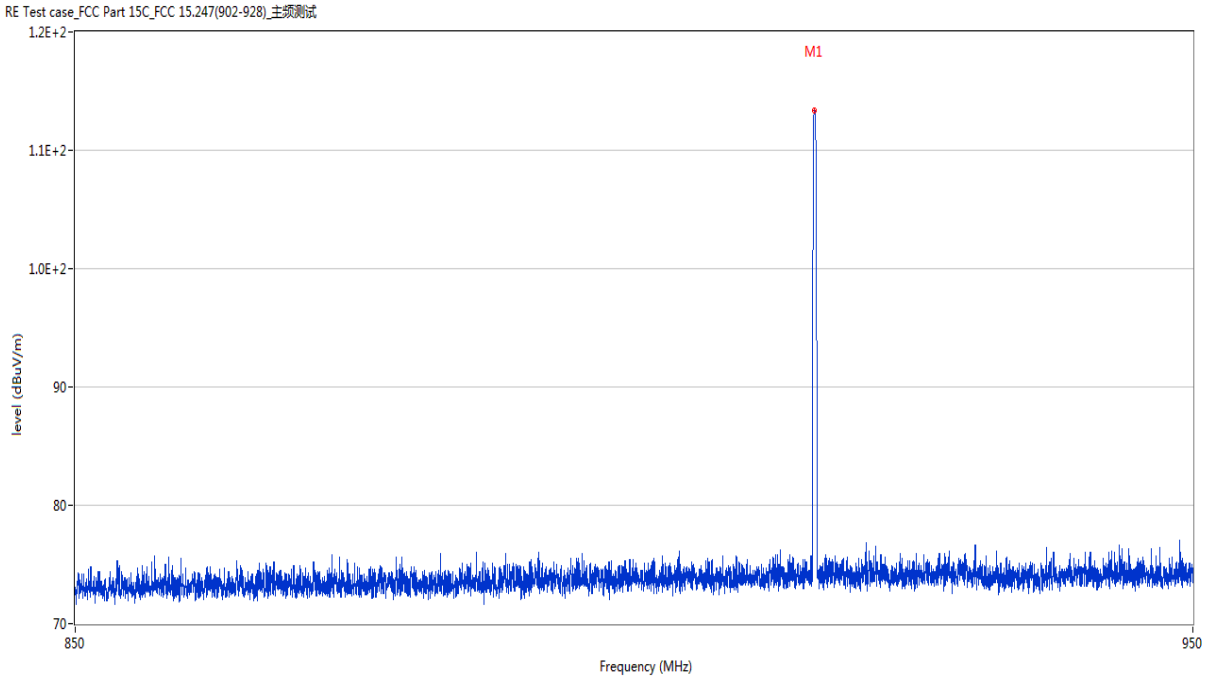
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.965	115.99	30.01	--	--	Peak	113.00	150	Horizontal	N/A

LOW CHANNEL, 850 MHz to 950 MHz, ANT V



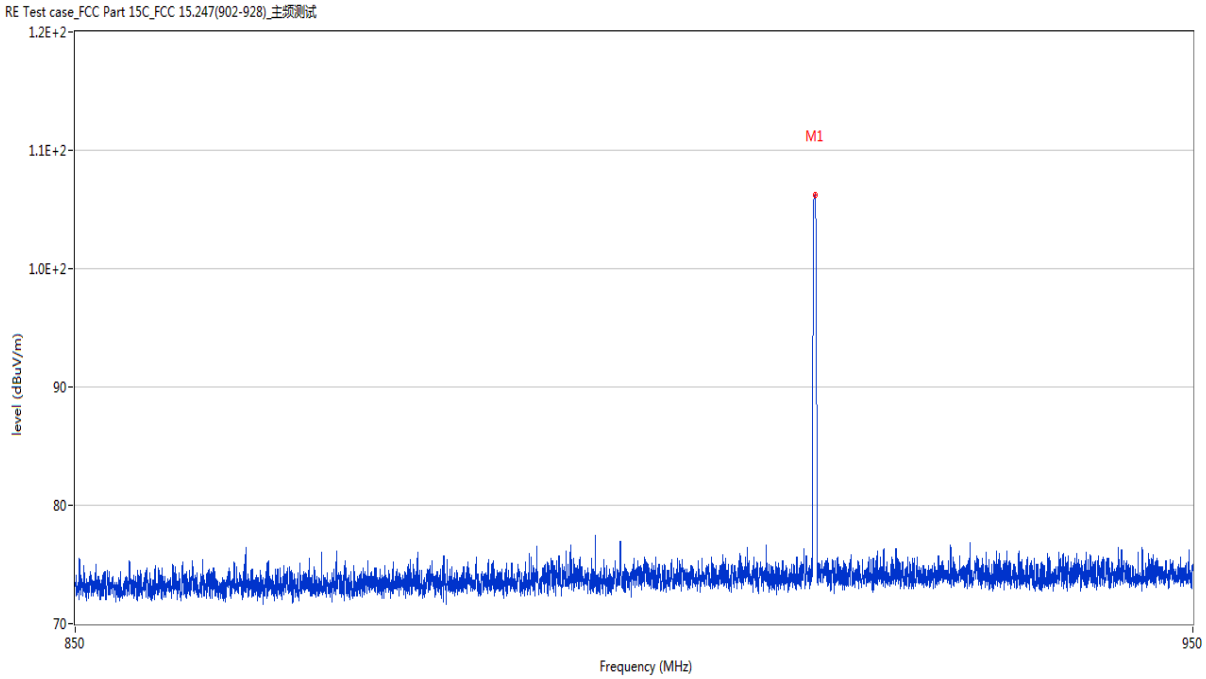
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.955	109.05	30.01	--	--	Peak	149.00	150	Vertical	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT H



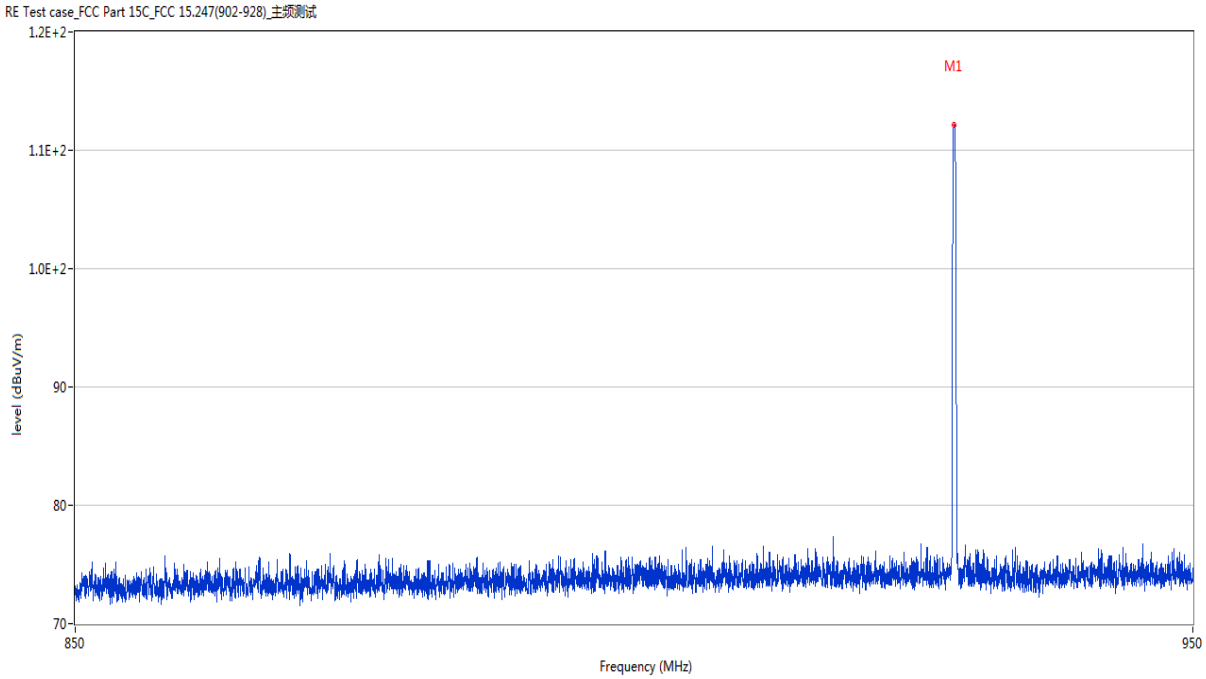
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	914.870	113.37	30.39	--	--	Peak	121.00	150	Horizontal	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT V



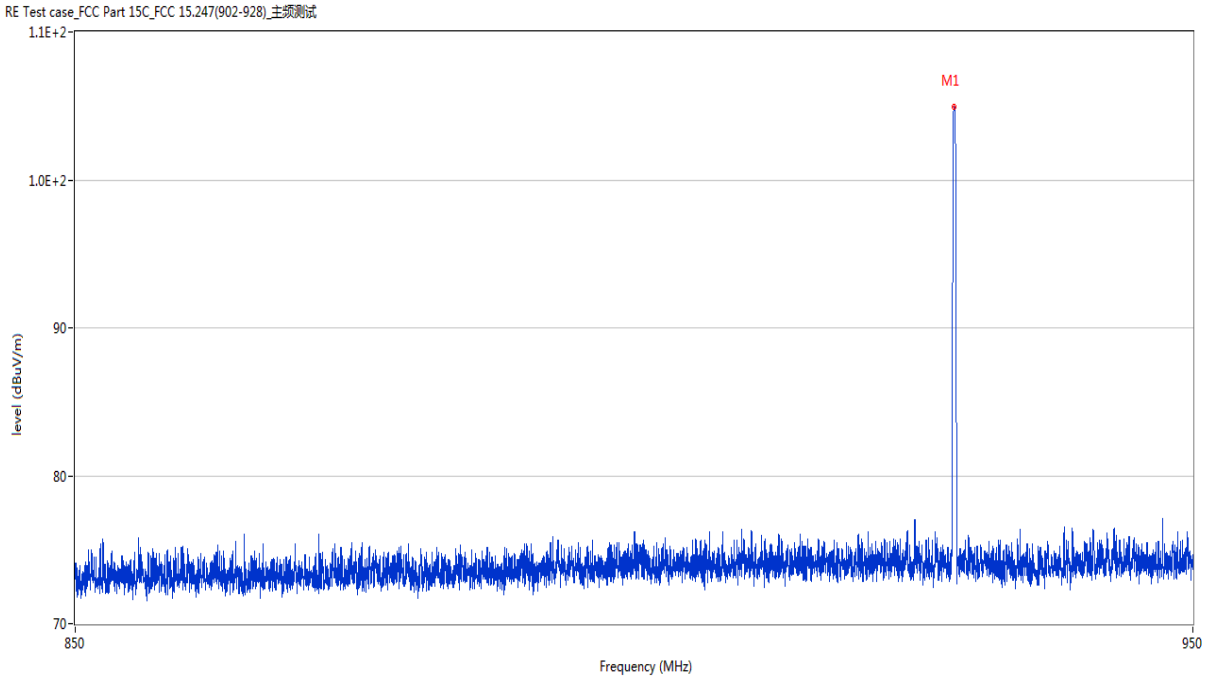
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	914.960	106.22	30.39	--	--	Peak	130.00	150	Vertical	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT H



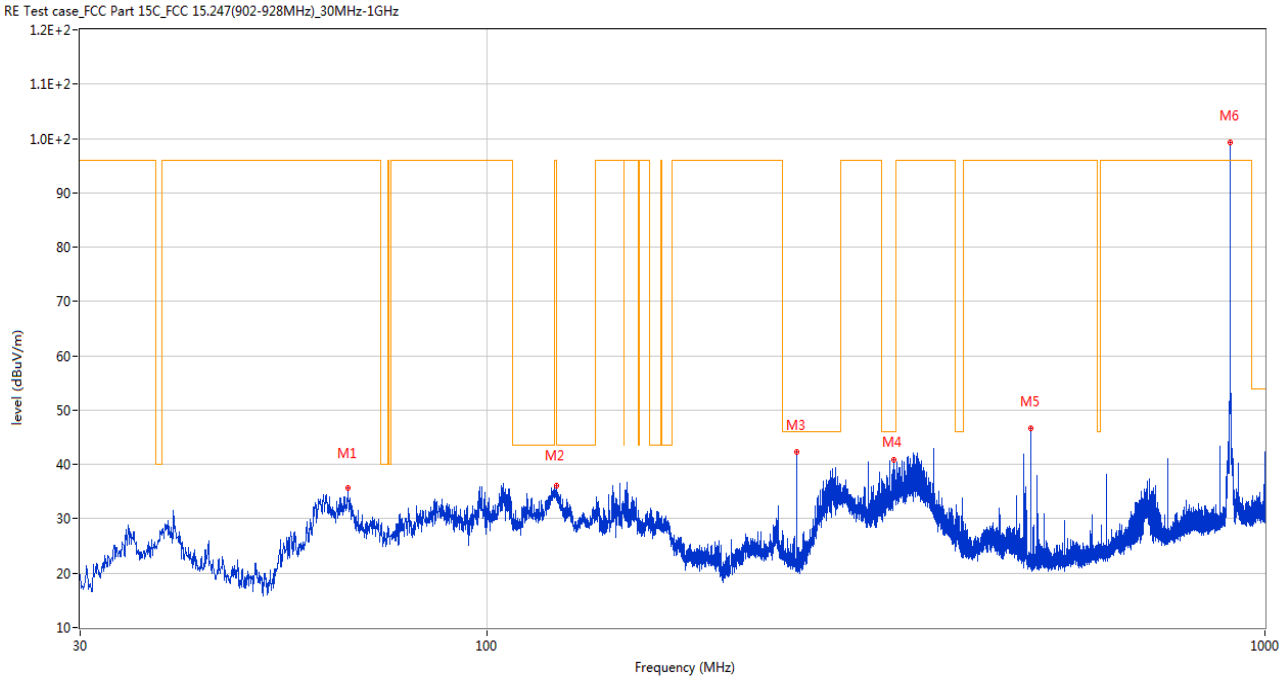
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.695	112.14	30.59	--	--	Peak	119.00	150	Horizontal	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT V



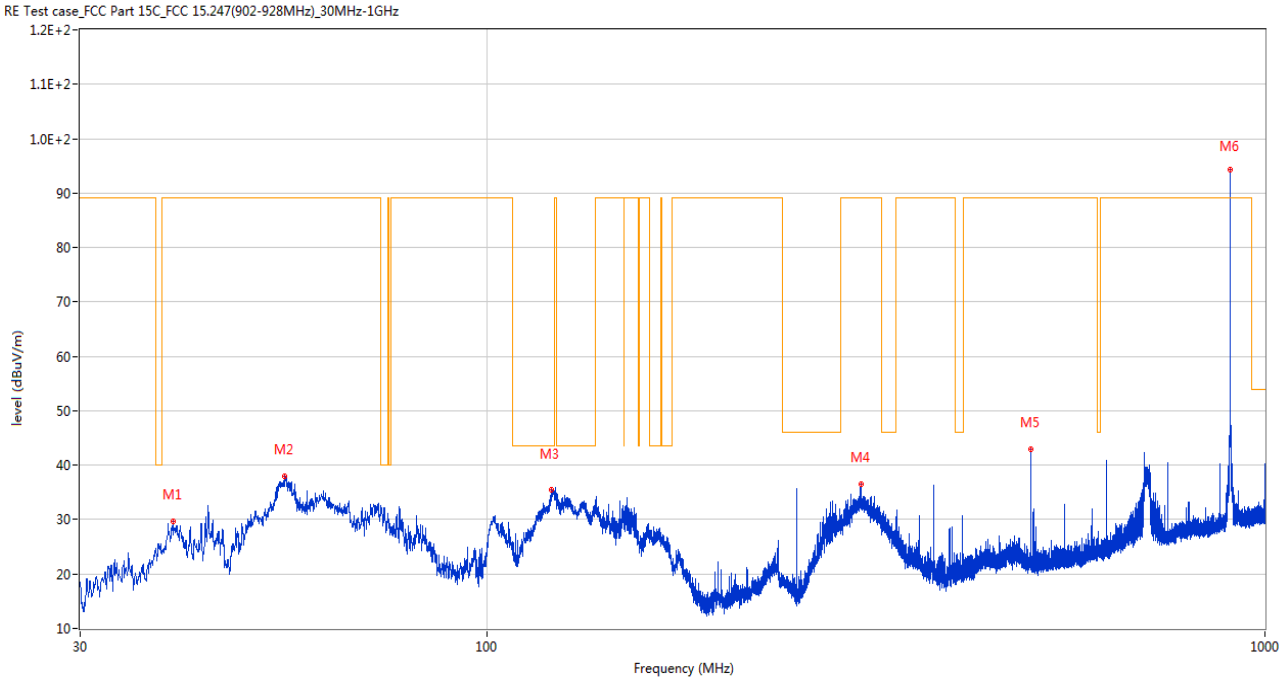
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.660	104.93	30.58	--	--	Peak	124.00	150	Vertical	N/A

LOW CHANNEL ANT H



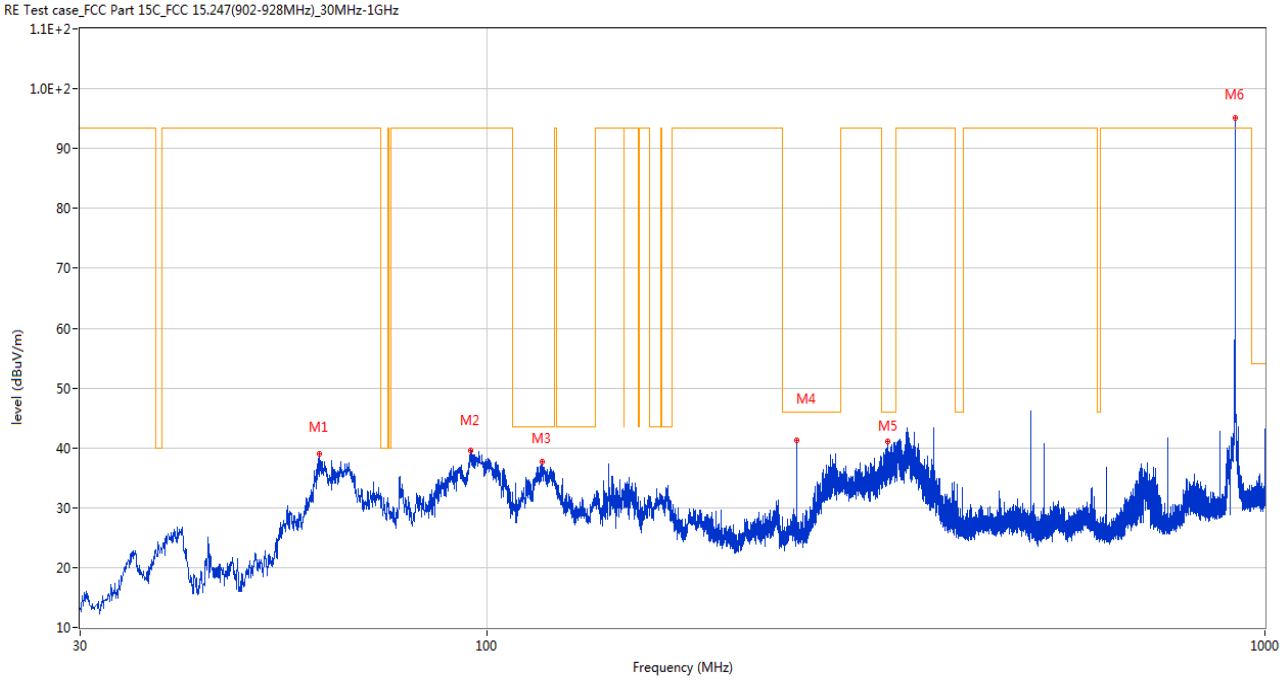
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	66.230	35.79	-27.53	96.0	-60.21	Peak	156.00	200	Horizontal	Pass
2	122.684	36.09	-25.92	96.0	-59.91	Peak	294.00	200	Horizontal	Pass
3	249.996	42.38	-24.63	46.0	-3.62	Peak	171.00	100	Horizontal	Pass
4	333.658	40.77	-21.08	46.0	-5.23	Peak	33.00	100	Horizontal	Pass
5	500.014	46.57	-16.60	96.0	-49.43	Peak	164.00	100	Horizontal	Pass
6	902.924	99.28	-7.47	96.0	3.28	Peak	192.00	100	Horizontal	N/A

LOW CHANNEL, ANT V



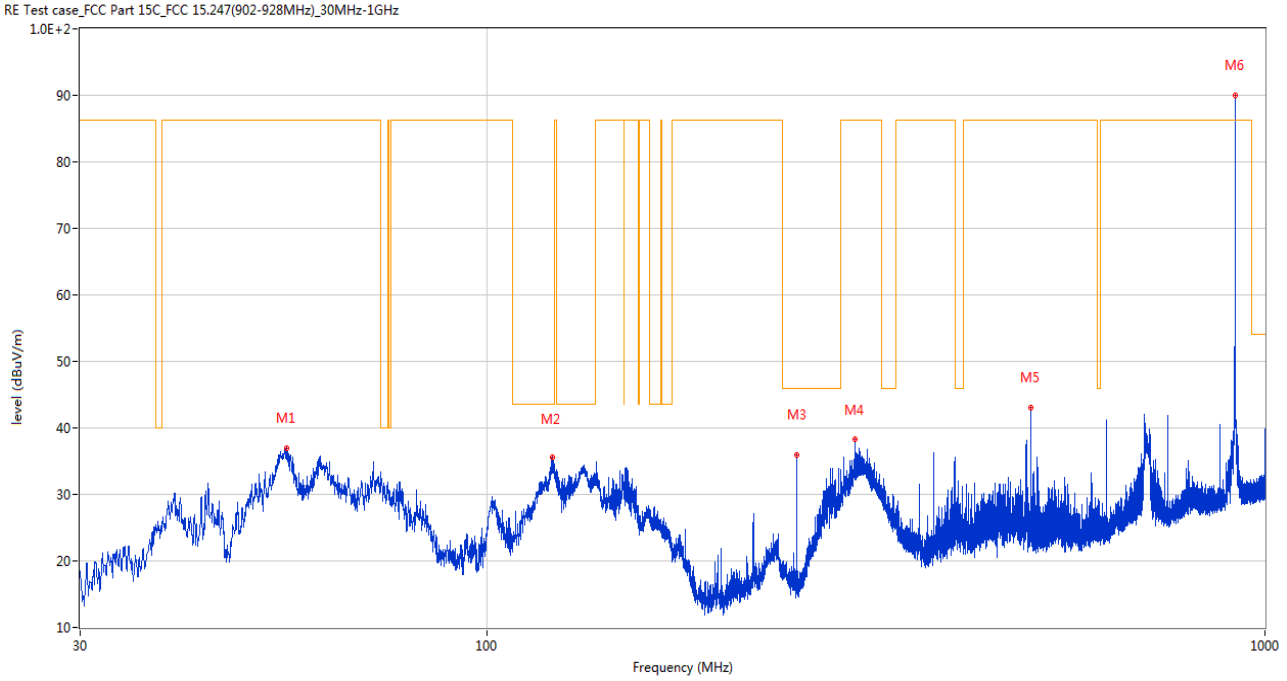
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	39.458	29.66	-25.76	89.1	-59.44	Peak	156.00	100	Vertical	Pass
2	55.026	37.97	-26.41	89.1	-51.13	Peak	240.00	100	Vertical	Pass
3	120.889	35.49	-26.02	43.5	-8.01	Peak	247.00	100	Vertical	Pass
4	302.764	36.51	-21.93	89.1	-52.59	Peak	360.00	200	Vertical	Pass
5	500.014	42.90	-16.60	89.1	-46.20	Peak	329.00	200	Vertical	Pass
6	902.924	94.34	-7.47	89.1	5.24	Peak	163.00	100	Vertical	N/A

MIDDLE CHANNEL, ANT H



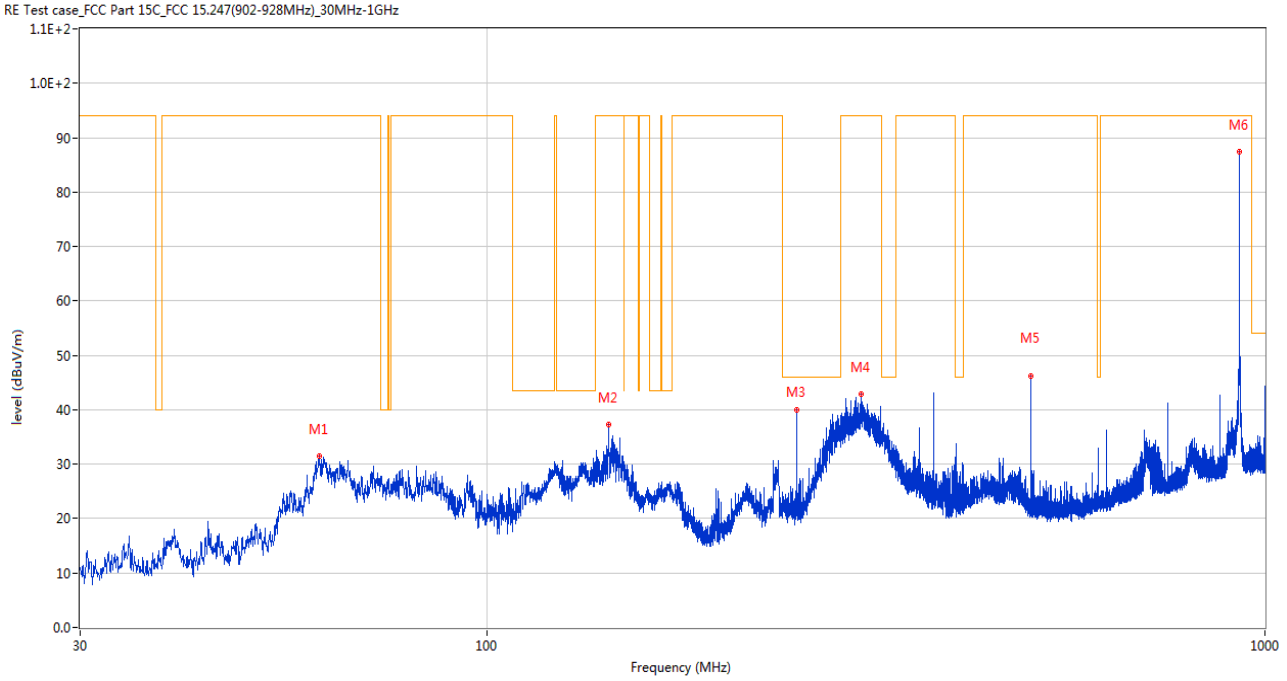
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	60.846	38.96	-26.76	93.4	-54.44	Peak	145.00	200	Horizontal	Pass
2	95.184	39.65	-28.87	93.4	-53.75	Peak	22.00	200	Horizontal	Pass
3	117.591	37.59	-26.36	43.5	-5.91	Peak	166.00	200	Horizontal	Pass
4	249.996	41.18	-24.63	46.0	-4.82	Peak	163.00	100	Horizontal	Pass
5	327.741	41.14	-21.51	46.0	-4.86	Peak	107.00	100	Horizontal	Pass
6	914.931	95.15	-7.18	93.4	1.75	Peak	231.00	100	Horizontal	N/A

MIDDLE CHANNEL, ANT V



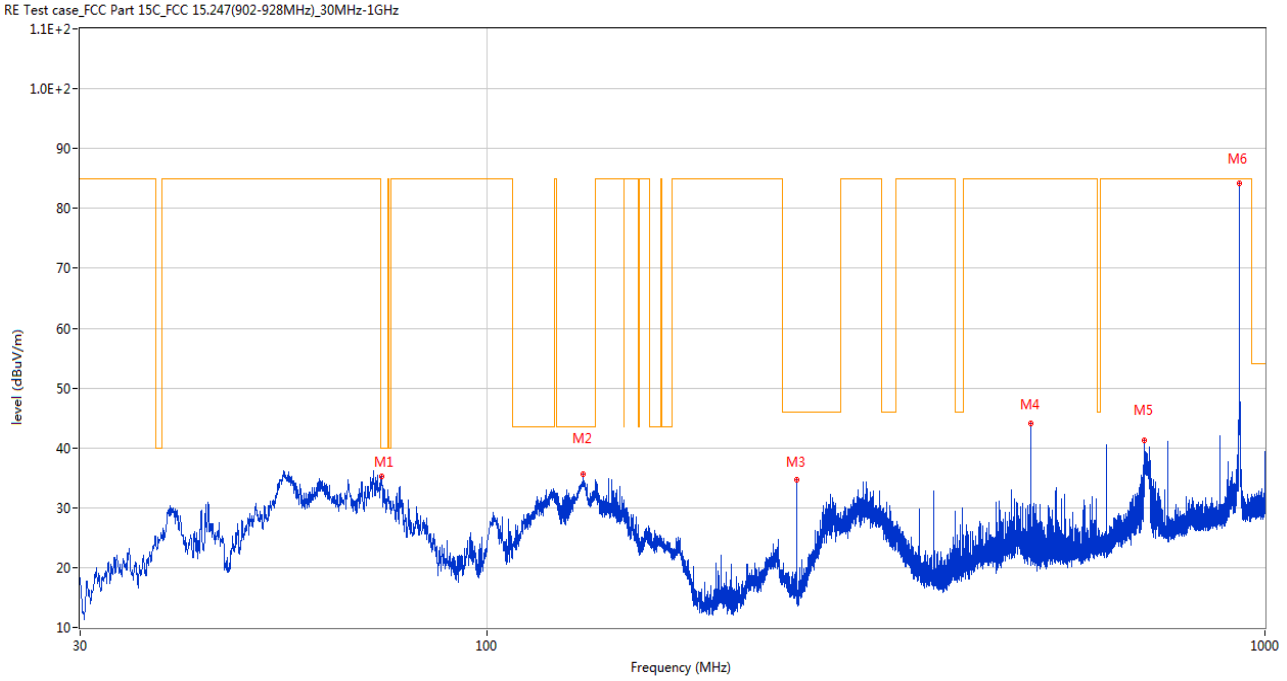
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	55.220	36.93	-26.40	86.2	-49.27	Peak	251.00	100	Vertical	Pass
2	121.229	35.53	-25.99	43.5	-7.97	Peak	251.00	100	Vertical	Pass
3	249.996	35.96	-24.63	46.0	-10.04	Peak	307.00	100	Vertical	Pass
4	297.623	38.35	-22.36	86.2	-47.85	Peak	121.00	200	Vertical	Pass
5	500.014	43.01	-16.60	86.2	-43.19	Peak	326.00	200	Vertical	Pass
6	914.931	89.92	-7.18	86.2	3.72	Peak	151.00	100	Vertical	N/A

HIGH CHANNEL, ANT H



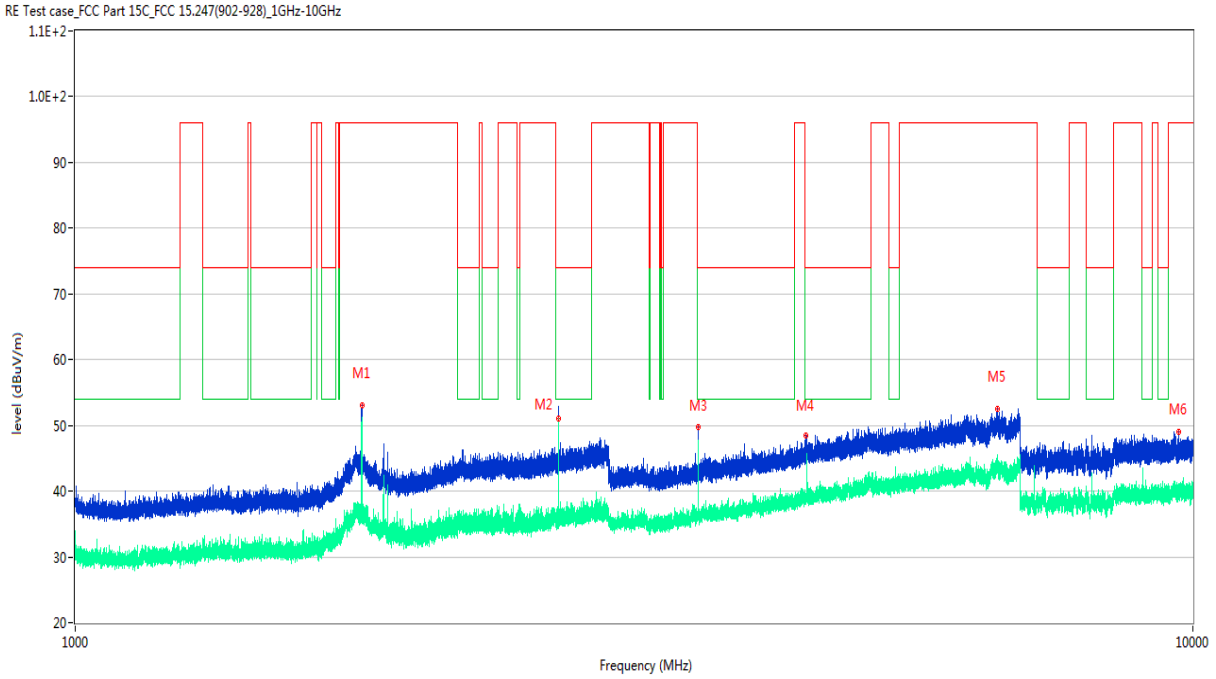
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	60.846	31.56	-26.76	92.1	-62.54	Peak	188.00	100	Horizontal	Pass
2	143.248	37.30	-24.51	92.1	-56.80	Peak	188.00	100	Horizontal	Pass
3	249.996	39.94	-24.63	46.0	-6.06	Peak	194.00	100	Horizontal	Pass
4	302.570	42.82	-21.96	92.1	-51.28	Peak	87.00	100	Horizontal	Pass
5	500.014	46.26	-16.60	92.1	-47.84	Peak	165.00	100	Horizontal	Pass
6	927.638	87.51	-7.38	92.1	-6.59	Peak	194.00	100	Horizontal	N/A

HIGH CHANNEL, ANT V



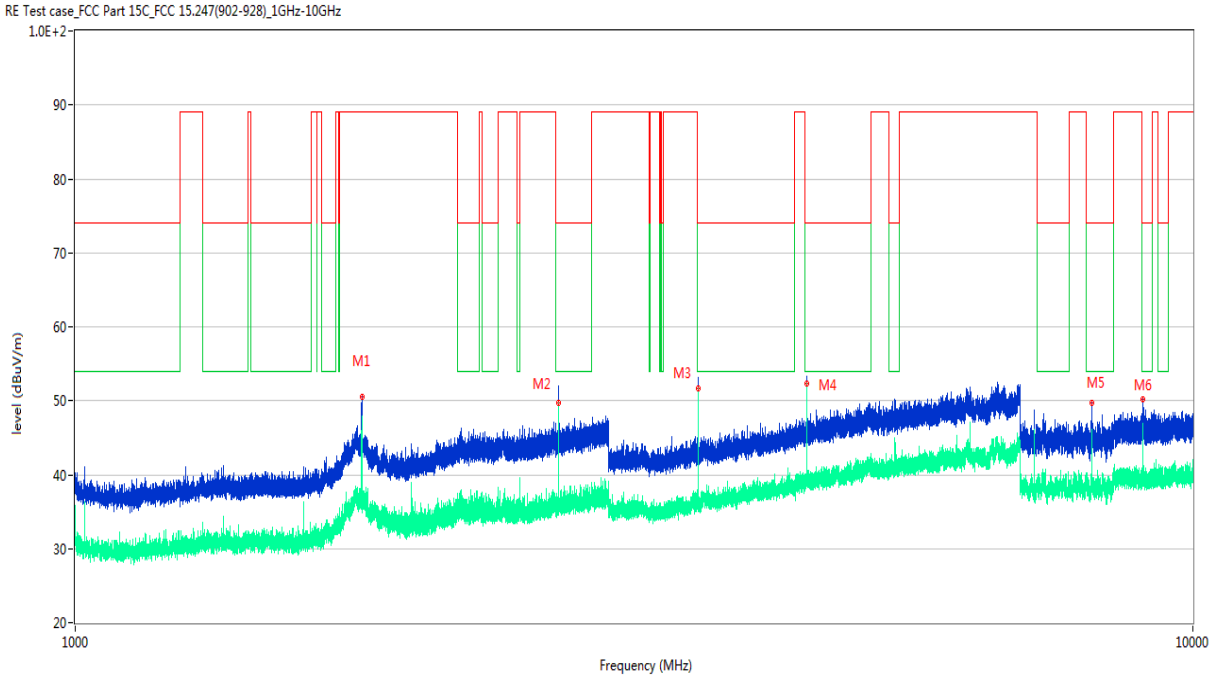
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.165	35.21	-28.72	40.0	-4.79	Peak	92.00	100	Vertical	Pass
2	132.917	35.58	-25.06	43.5	-7.92	Peak	78.00	100	Vertical	Pass
3	249.996	34.67	-24.63	46.0	-11.33	Peak	284.00	100	Vertical	Pass
4	500.014	44.13	-16.60	84.9	-40.77	Peak	242.00	100	Vertical	Pass
5	699.882	41.34	-11.31	84.9	-43.56	Peak	344.00	100	Vertical	Pass
6	927.638	84.25	-7.38	84.9	-0.65	Peak	155.00	100	Vertical	N/A

LOW CHANNEL 1 GHz to 10 GHz, ANT H



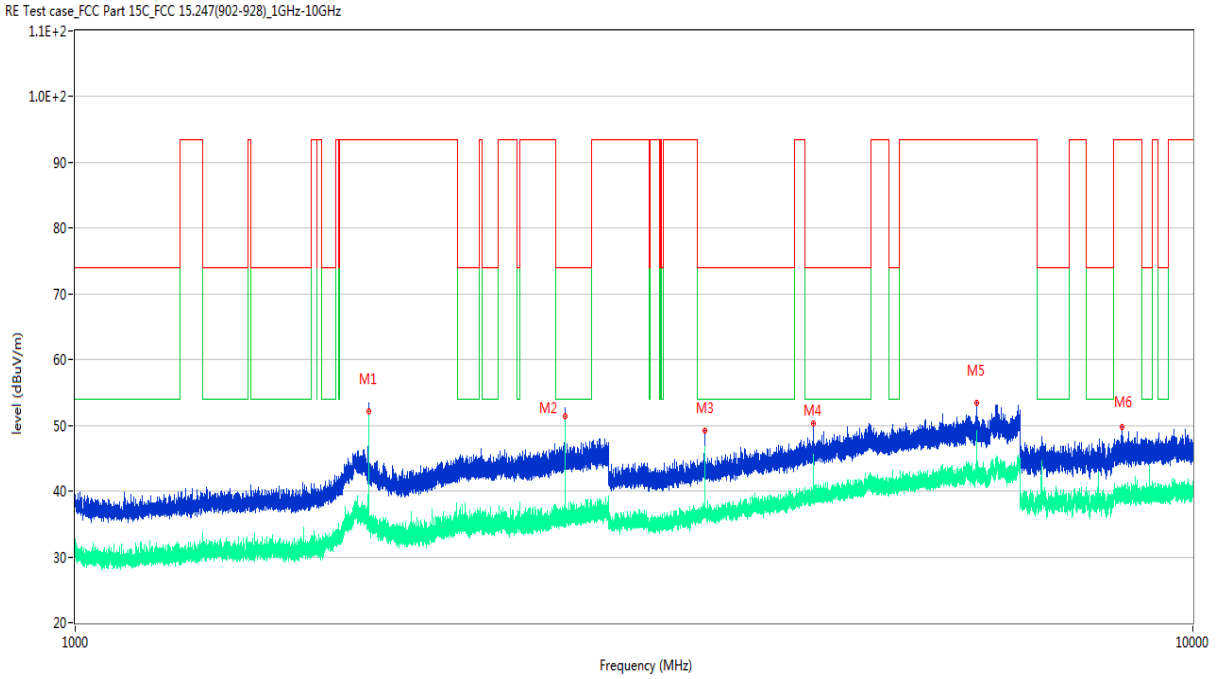
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.500	52.99	-8.73	96.0	-43.01	Peak	143.00	150	Horizontal	Pass
1**	1804.500	50.87	-8.73	96.0	-45.13	AV	143.00	150	Horizontal	Pass
2	2707.000	52.68	-7.53	74.0	-21.32	Peak	143.00	150	Horizontal	Pass
2**	2707.000	51.07	-7.53	54.0	-2.93	AV	143.00	150	Horizontal	Pass
3	3609.000	49.70	-7.17	74.0	-24.30	Peak	126.00	150	Horizontal	Pass
3**	3609.000	46.12	-7.17	54.0	-7.88	AV	126.00	150	Horizontal	Pass
4	4509.600	48.55	-4.12	74.0	-25.45	Peak	279.00	150	Horizontal	Pass
4**	4509.600	38.65	-4.12	54.0	-15.35	AV	279.00	150	Horizontal	Pass
5	6687.000	52.46	-0.22	96.0	-43.54	Peak	241.00	150	Horizontal	Pass
5**	6687.000	43.92	-0.22	96.0	-52.08	AV	241.00	150	Horizontal	Pass
6	9720.401	48.94	-0.48	96.0	-47.06	Peak	256.00	150	Horizontal	Pass
6**	9720.401	39.22	-0.48	96.0	-56.78	AV	256.00	150	Horizontal	Pass

LOW CHANNEL 1 GHz to 10 GHz, ANT H



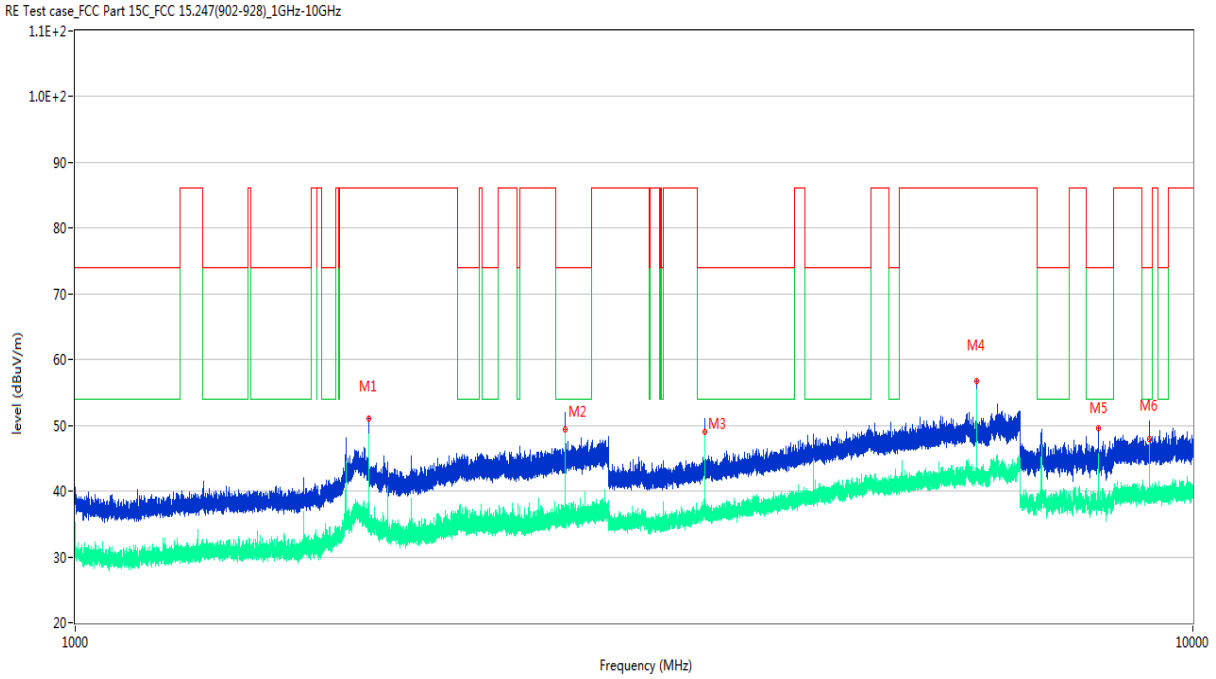
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.600	50.50	-8.73	89.1	-38.60	Peak	360.00	150	Vertical	Pass
1**	1804.600	47.12	-8.73	89.1	-41.98	AV	360.00	150	Vertical	Pass
2	2707.000	50.85	-7.53	74.0	-23.15	Peak	180.00	150	Vertical	Pass
2**	2707.000	49.72	-7.53	54.0	-4.28	AV	180.00	150	Vertical	Pass
3	3609.400	52.64	-7.14	74.0	-21.36	Peak	164.00	150	Vertical	Pass
3**	3609.400	51.73	-7.14	54.0	-2.27	AV	164.00	150	Vertical	Pass
4	4511.600	53.21	-4.12	74.0	-20.79	Peak	339.00	150	Vertical	Pass
4**	4511.600	52.29	-4.12	54.0	-1.71	AV	339.00	150	Vertical	Pass
5	8121.100	49.70	-2.80	74.0	-24.30	Peak	221.00	150	Vertical	Pass
5**	8121.100	45.03	-2.80	54.0	-8.97	AV	221.00	150	Vertical	Pass
6	9023.651	50.25	-0.61	74.0	-23.75	Peak	48.00	150	Vertical	Pass
6**	9023.651	46.11	-0.61	54.0	-7.89	AV	48.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT H



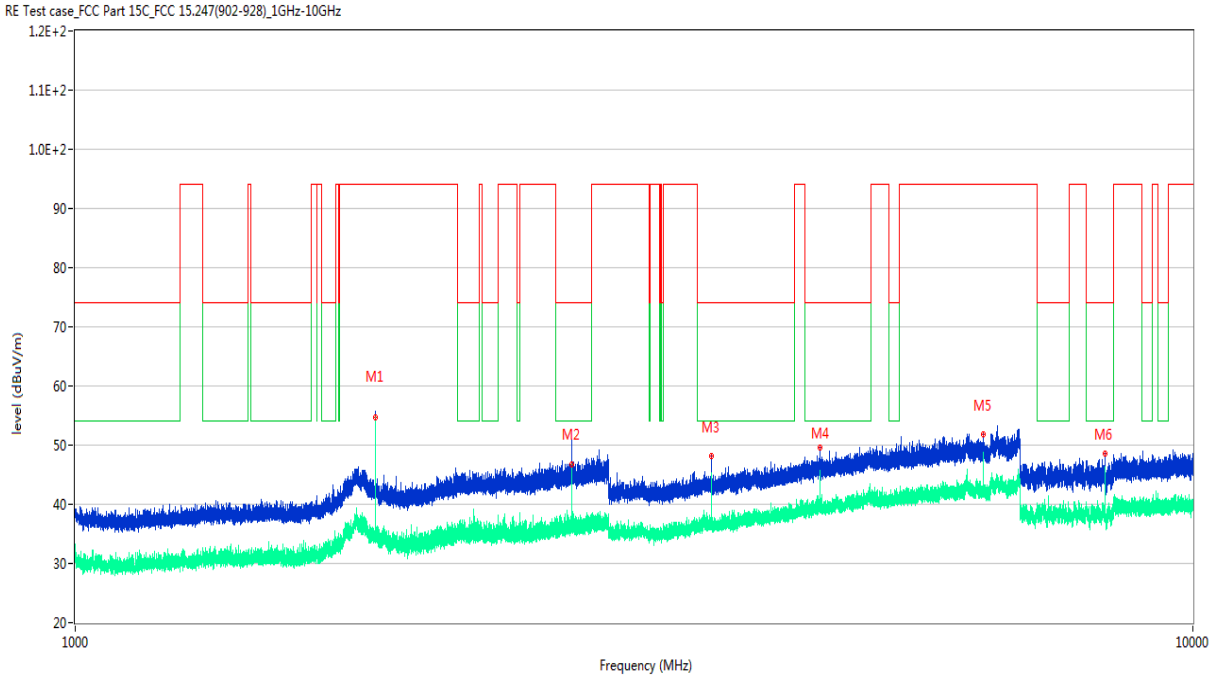
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1829.800	53.38	-10.07	93.4	-40.02	Peak	155.00	150	Horizontal	Pass
1**	1829.800	52.14	-10.07	93.4	-41.26	AV	155.00	150	Horizontal	Pass
2	2744.600	52.33	-7.12	74.0	-21.67	Peak	131.00	150	Horizontal	Pass
2**	2744.600	51.41	-7.12	54.0	-2.59	AV	131.00	150	Horizontal	Pass
3	3659.600	49.13	-6.81	74.0	-24.87	Peak	189.00	150	Horizontal	Pass
3**	3659.600	46.58	-6.81	54.0	-7.42	AV	189.00	150	Horizontal	Pass
4	4574.200	50.23	-3.89	74.0	-23.77	Peak	177.00	150	Horizontal	Pass
4**	4574.200	42.89	-3.89	54.0	-11.11	AV	177.00	150	Horizontal	Pass
5	6405.200	53.45	-0.78	93.4	-39.95	Peak	140.00	150	Horizontal	Pass
5**	6405.200	47.72	-0.78	93.4	-45.68	AV	140.00	150	Horizontal	Pass
6	8641.000	49.76	-1.83	93.4	-43.64	Peak	192.00	150	Horizontal	Pass
6**	8641.000	39.13	-1.83	93.4	-54.27	AV	192.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT V



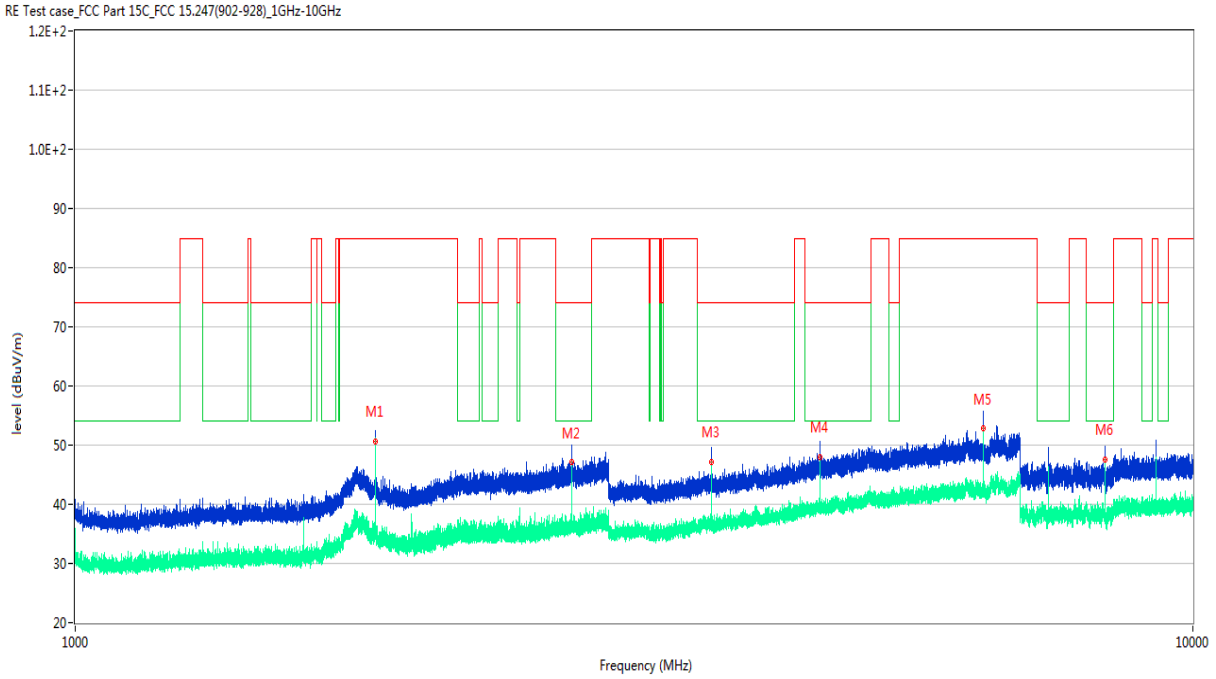
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1829.900	50.98	-10.09	86.2	-35.22	Peak	33.00	150	Vertical	Pass
1**	1829.900	48.40	-10.09	86.2	-37.80	AV	33.00	150	Vertical	Pass
2	2744.800	51.19	-7.12	74.0	-22.81	Peak	72.00	150	Vertical	Pass
2**	2744.800	49.30	-7.12	54.0	-4.70	AV	72.00	150	Vertical	Pass
3	3659.800	50.98	-6.81	74.0	-23.02	Peak	181.00	150	Vertical	Pass
3**	3659.800	49.04	-6.81	54.0	-4.96	AV	181.00	150	Vertical	Pass
4	6404.000	56.75	-0.86	86.2	-29.45	Peak	94.00	150	Vertical	Pass
4**	6404.000	52.98	-0.86	86.2	-33.22	AV	94.00	150	Vertical	Pass
5	8233.750	49.61	-2.03	74.0	-24.39	Peak	31.00	150	Vertical	Pass
5**	8233.750	43.70	-2.03	54.0	-10.30	AV	31.00	150	Vertical	Pass
6	9148.599	49.63	-1.51	74.0	-24.37	Peak	31.00	150	Vertical	Pass
6**	9148.599	47.97	-1.51	54.0	-6.03	AV	31.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.400	55.76	-9.98	92.1	-38.34	Peak	141.00	150	Horizontal	Pass
1**	1855.400	54.27	-9.98	92.1	-39.83	AV	141.00	150	Horizontal	Pass
2	2783.000	49.01	-6.61	74.0	-24.99	Peak	290.00	150	Horizontal	Pass
2**	2783.000	46.69	-6.61	54.0	-7.31	AV	290.00	150	Horizontal	Pass
3	3711.200	48.14	-6.39	74.0	-25.86	Peak	119.00	150	Horizontal	Pass
3**	3711.200	45.26	-6.39	54.0	-8.74	AV	119.00	150	Horizontal	Pass
4	4638.400	49.52	-3.58	74.0	-24.48	Peak	157.00	150	Horizontal	Pass
4**	4638.400	45.69	-3.58	54.0	-8.31	AV	157.00	150	Horizontal	Pass
5	6493.800	51.76	-1.77	92.1	-42.34	Peak	157.00	150	Horizontal	Pass
5**	6493.800	48.06	-1.77	92.1	-46.04	AV	157.00	150	Horizontal	Pass
6	8349.100	48.61	-3.10	74.0	-25.39	Peak	261.00	150	Horizontal	Pass
6**	8349.100	46.28	-3.10	54.0	-7.72	AV	261.00	150	Horizontal	Pass

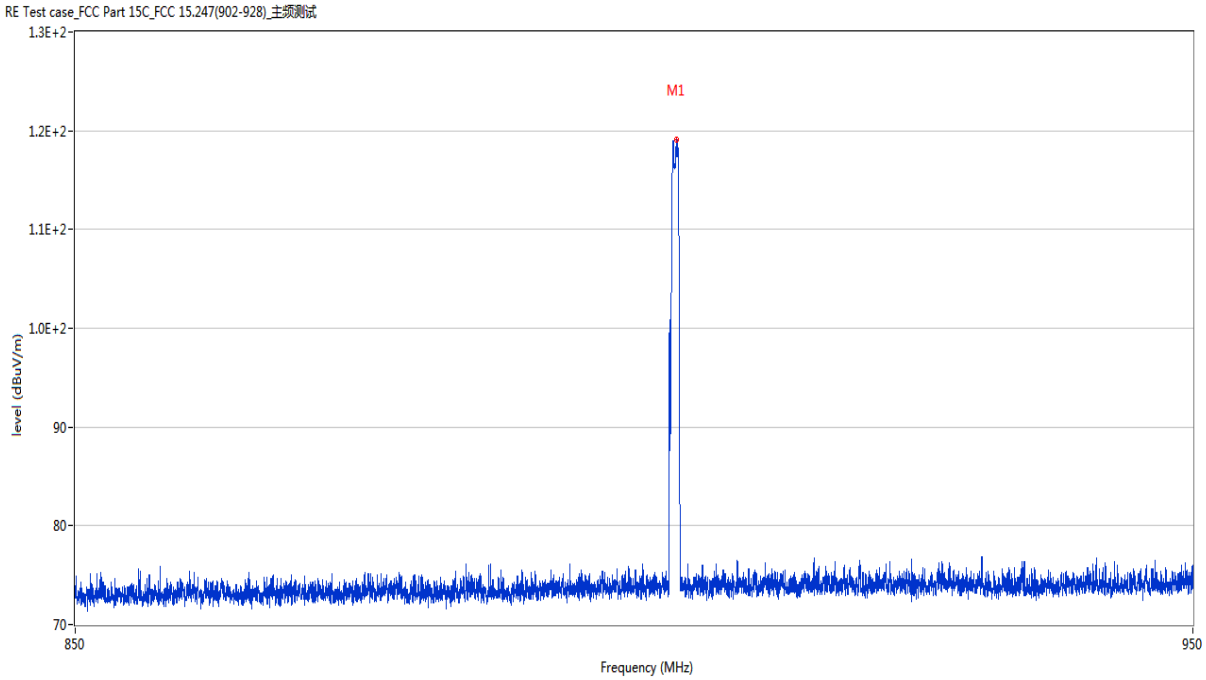
HIGH CHANNEL 1 GHz to 10 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.300	52.40	-9.97	84.9	-32.50	Peak	167.00	150	Vertical	Pass
1**	1855.300	50.57	-9.97	84.9	-34.33	AV	167.00	150	Vertical	Pass
2	2783.100	49.66	-6.61	74.0	-24.34	Peak	231.00	150	Vertical	Pass
2**	2783.100	47.14	-6.61	54.0	-6.86	AV	231.00	150	Vertical	Pass
3	3710.800	49.52	-6.39	74.0	-24.48	Peak	168.00	150	Vertical	Pass
3**	3710.800	47.08	-6.39	54.0	-6.92	AV	168.00	150	Vertical	Pass
4	4638.600	50.67	-3.57	74.0	-23.33	Peak	168.00	150	Vertical	Pass
4**	4638.600	48.00	-3.57	54.0	-6.00	AV	168.00	150	Vertical	Pass
5	6494.400	54.45	-1.75	84.9	-30.45	Peak	81.00	150	Vertical	Pass
5**	6494.400	52.89	-1.75	84.9	-32.01	AV	81.00	150	Vertical	Pass
6	8349.700	49.21	-3.02	74.0	-24.79	Peak	53.00	150	Vertical	Pass
6**	8349.700	47.51	-3.02	54.0	-6.49	AV	53.00	150	Vertical	Pass

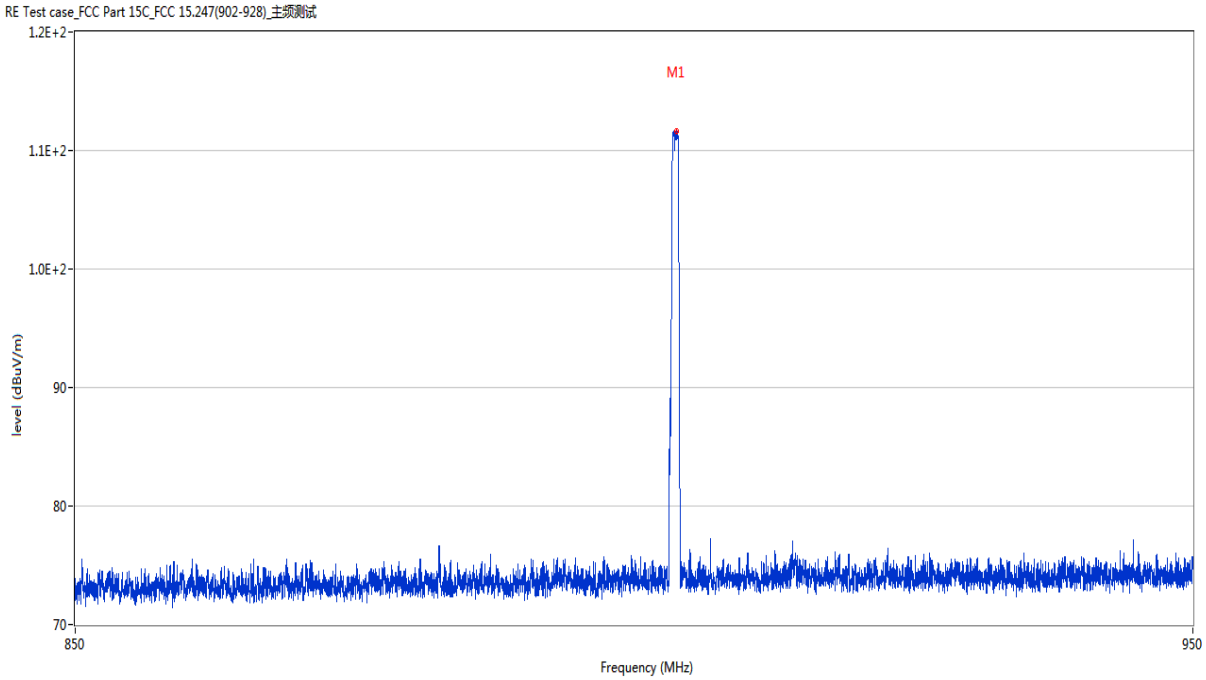
500kHz

LOW CHANNEL, 850 MHz to 950 MHz, ANT H



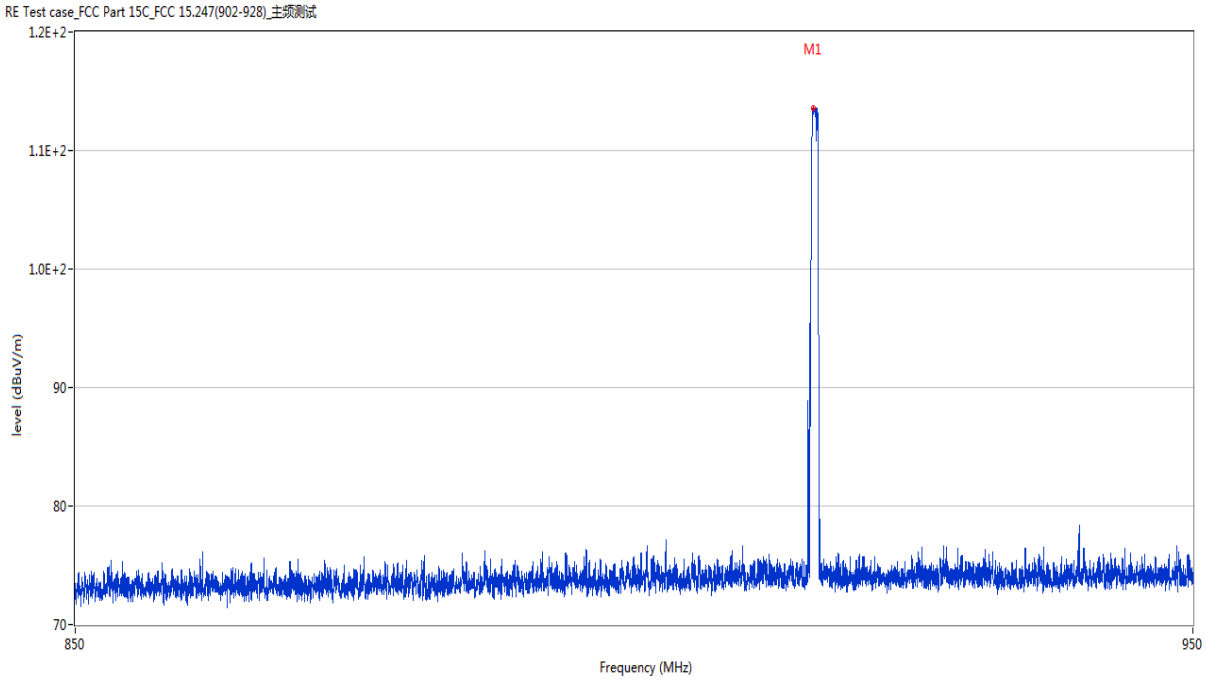
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.905	119.11	30.01	--	--	Peak	129.00	150	Horizontal	N/A

LOW CHANNEL, 850 MHz to 950 MHz, ANT V



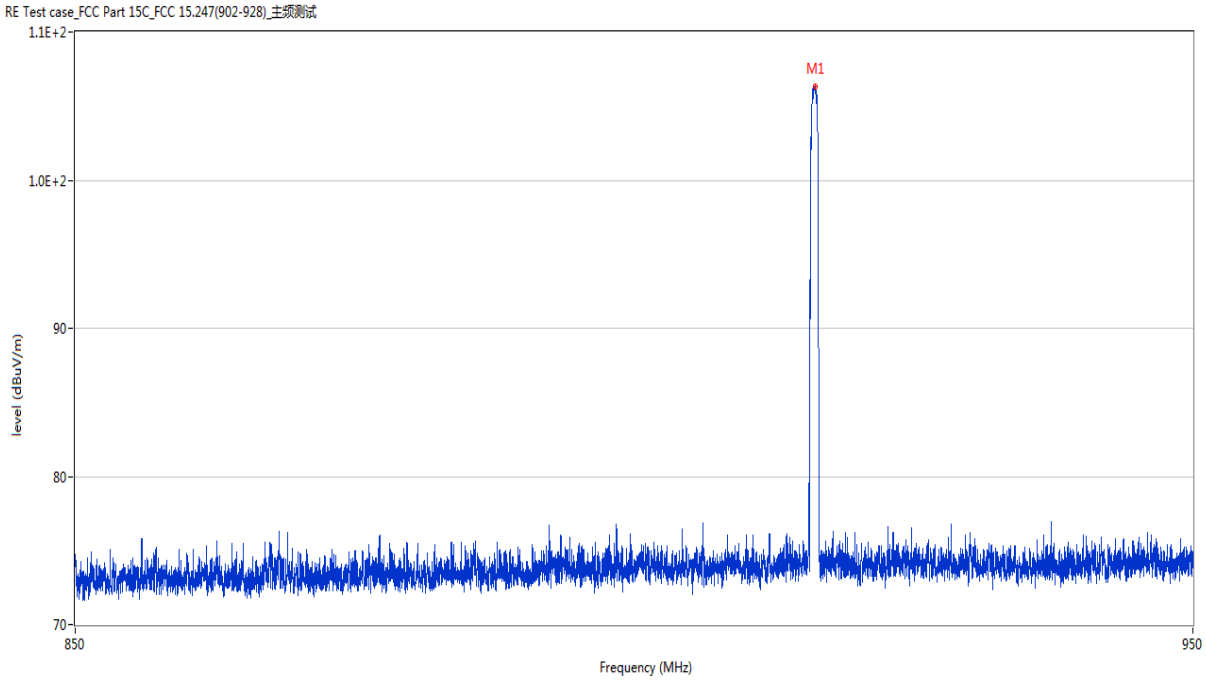
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.895	111.60	30.01	--	--	Peak	200.00	150	Vertical	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT H



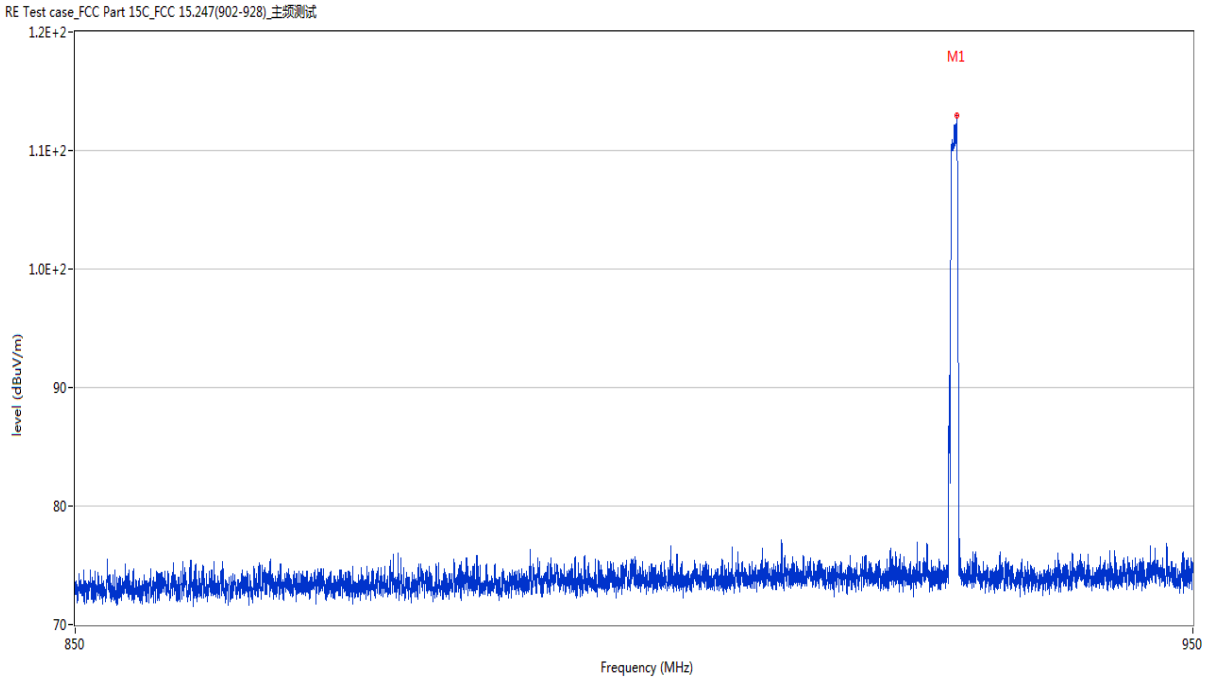
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	914.775	113.62	30.39	--	--	Peak	113.00	150	Horizontal	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT V



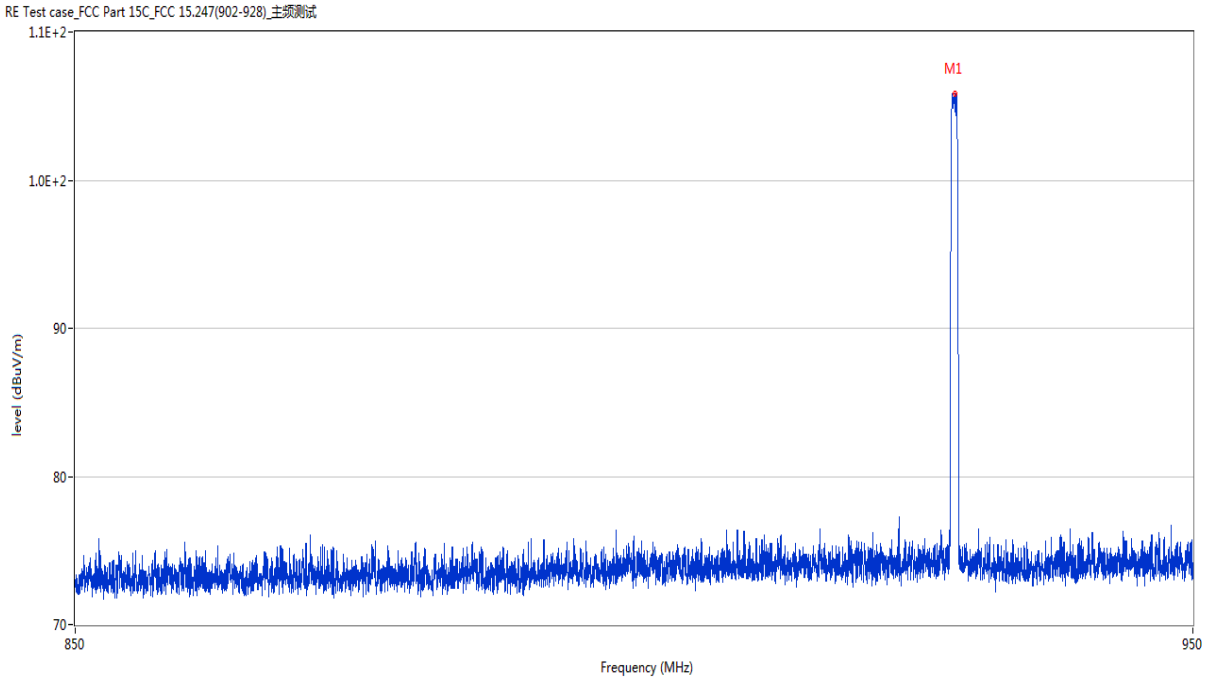
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	914.975	106.29	30.39	--	--	Peak	134.00	150	Vertical	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT H



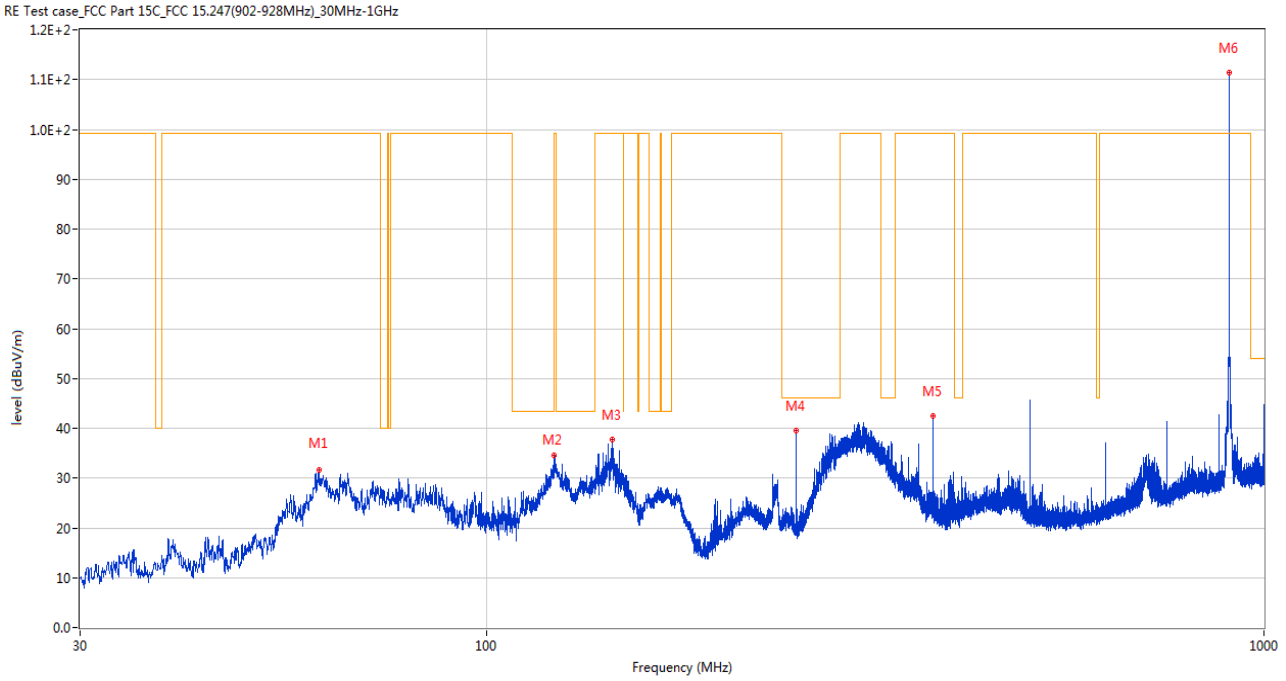
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.740	113.00	30.59	--	--	Peak	115.00	150	Horizontal	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT V



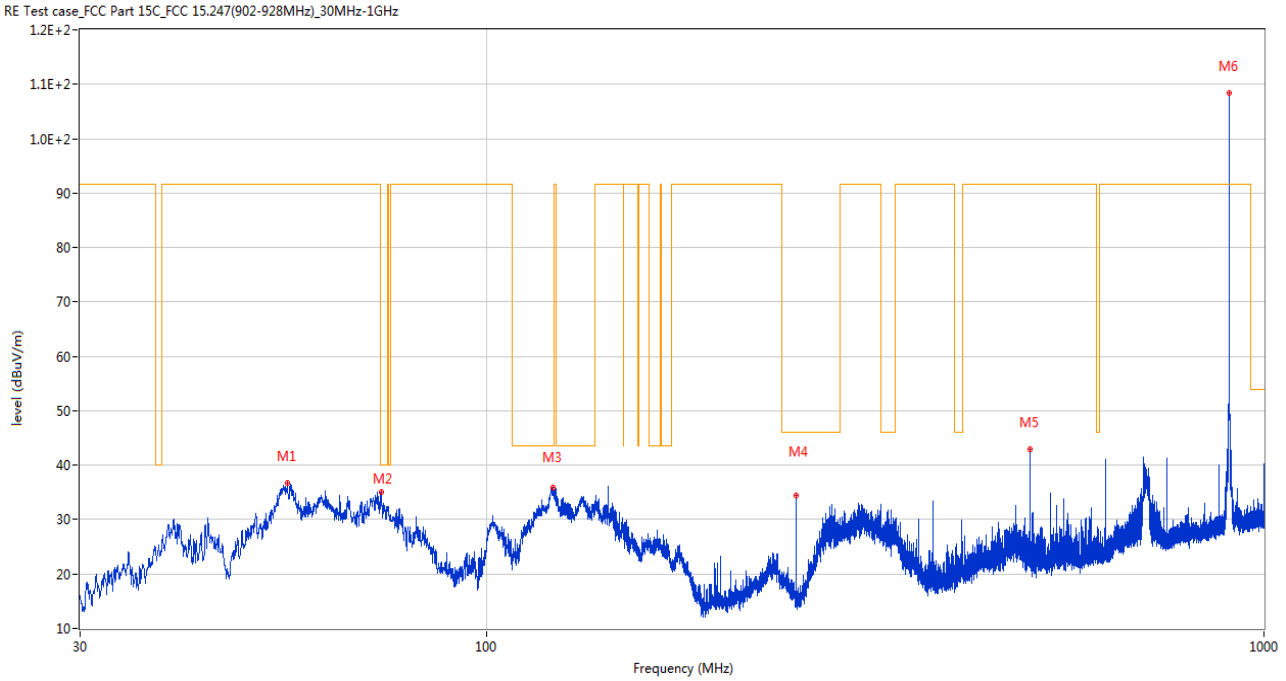
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.615	105.85	30.59	--	--	Peak	127.00	150	Vertical	N/A

LOW CHANNEL, ANT H



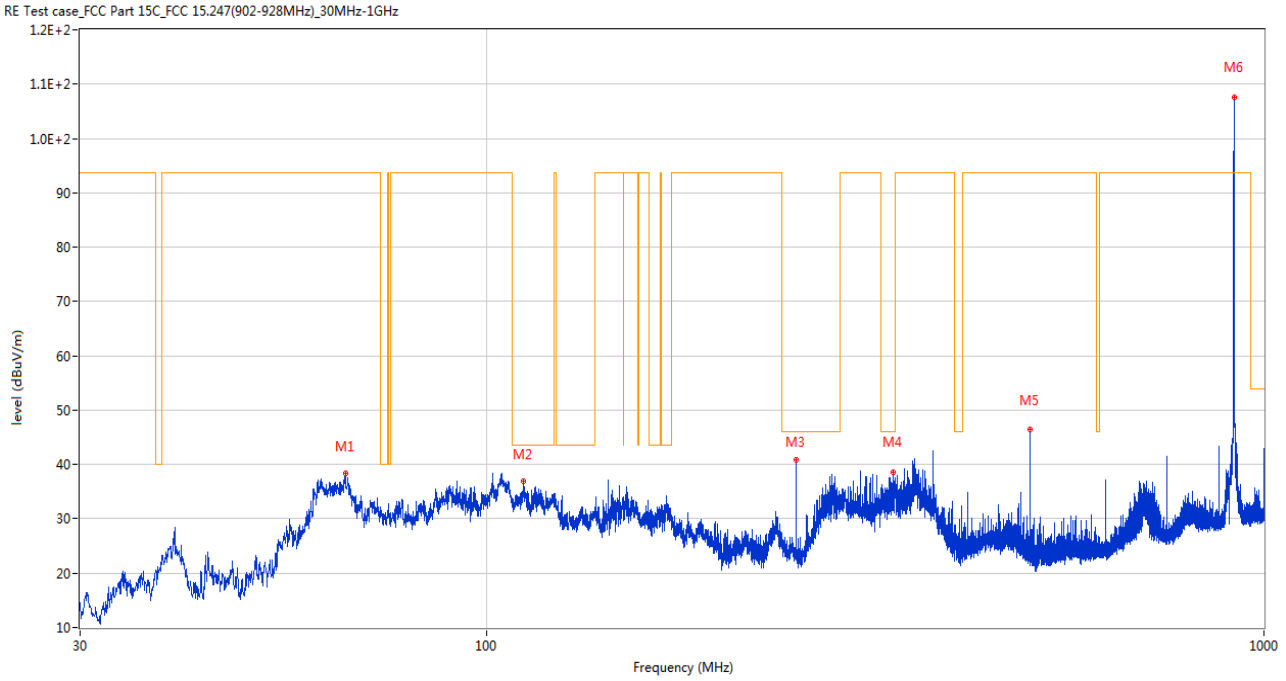
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	60.846	31.74	-26.76	99.1	-67.36	Peak	177.00	200	Horizontal	Pass
2	122.296	34.50	-25.91	99.1	-64.60	Peak	289.00	100	Horizontal	Pass
3	145.236	37.67	-24.15	99.1	-61.43	Peak	170.00	100	Horizontal	Pass
4	249.996	39.53	-24.63	46.0	-6.47	Peak	170.00	200	Horizontal	Pass
5	374.981	42.52	-19.93	99.1	-56.58	Peak	18.00	100	Horizontal	Pass
6	902.930	111.30	-7.46	99.1	12.20	Peak	254.00	100	Horizontal	N/A

LOW CHANNEL, ANT V



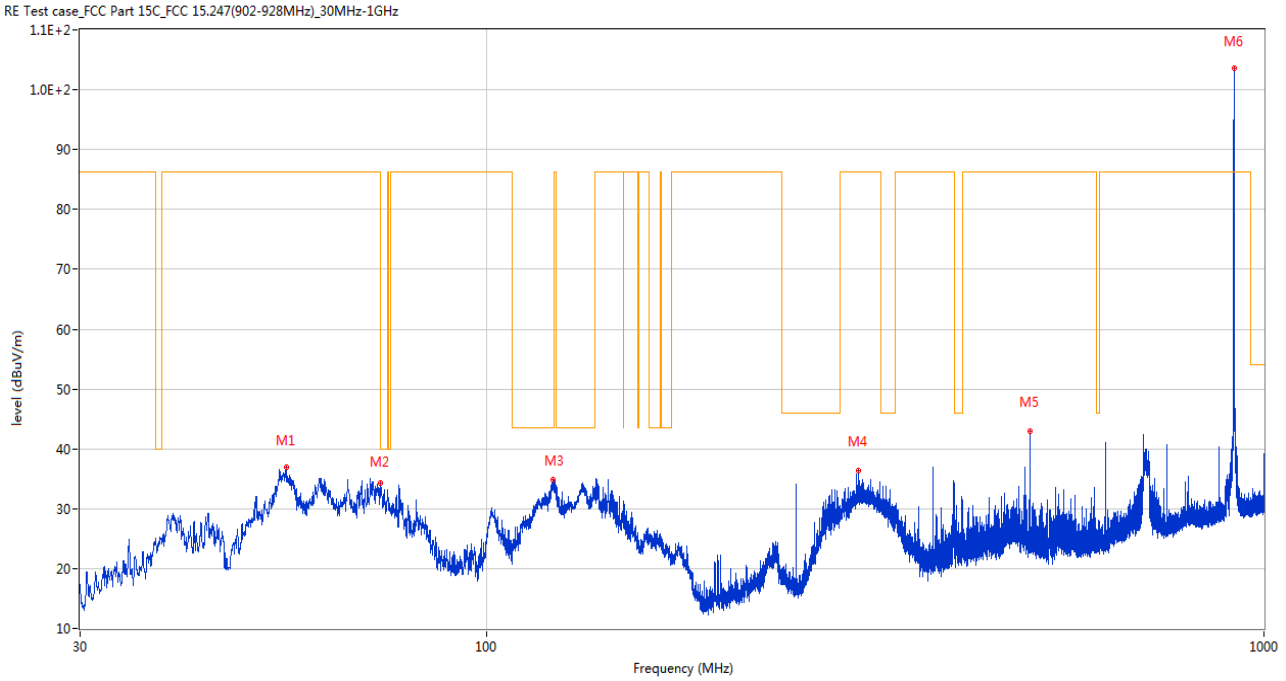
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	55.462	36.67	-26.43	91.6	-54.93	Peak	287.00	100	Vertical	Pass
2	73.165	35.06	-28.72	40.0	-4.94	Peak	94.00	200	Vertical	Pass
3	121.617	35.80	-25.95	43.5	-7.70	Peak	80.00	100	Vertical	Pass
4	249.996	34.41	-24.63	46.0	-11.59	Peak	296.00	200	Vertical	Pass
5	500.014	42.84	-16.60	91.6	-48.76	Peak	253.00	100	Vertical	Pass
6	902.978	108.48	-7.46	91.6	16.88	Peak	171.00	100	Vertical	N/A

MIDDLE CHANNEL, ANT H



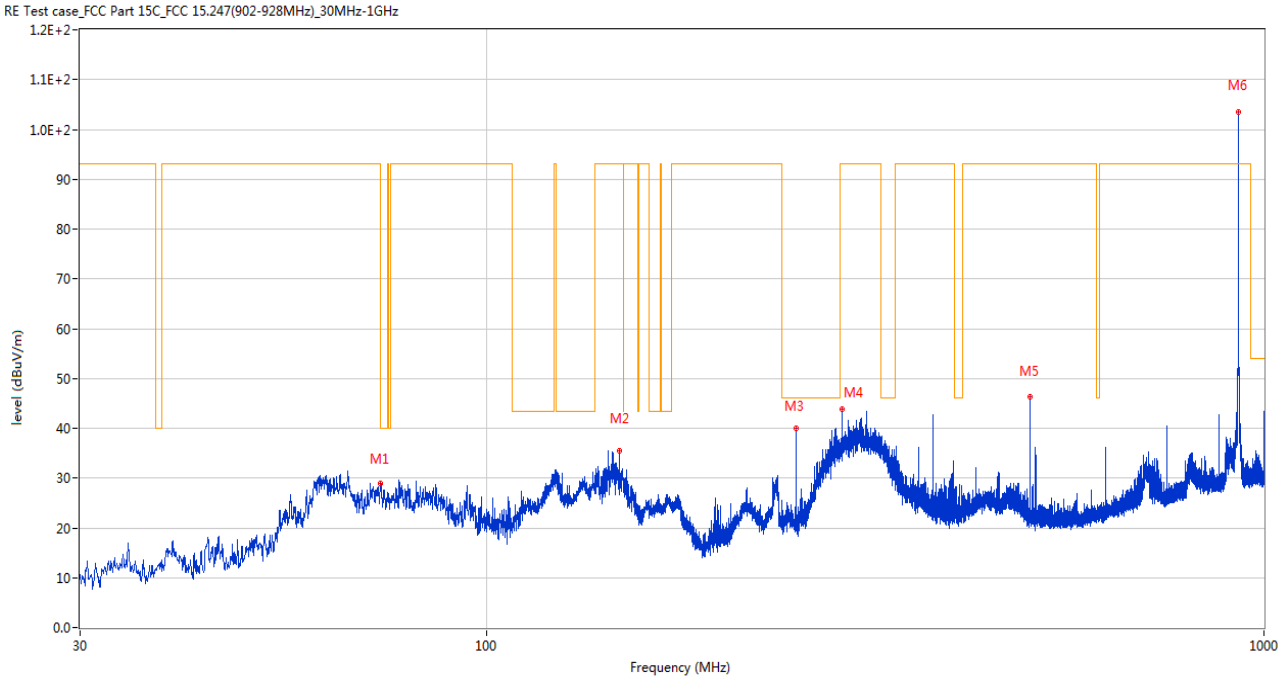
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	65.793	38.48	-27.45	93.6	-55.12	Peak	157.00	200	Horizontal	Pass
2	111.577	37.02	-27.17	43.5	-6.48	Peak	150.00	200	Horizontal	Pass
3	249.996	40.91	-24.63	46.0	-5.09	Peak	170.00	100	Horizontal	Pass
4	333.853	38.66	-21.05	46.0	-7.34	Peak	94.00	100	Horizontal	Pass
5	500.014	46.49	-16.60	93.6	-47.11	Peak	178.00	100	Horizontal	Pass
6	915.125	107.59	-7.16	93.6	13.99	Peak	227.00	100	Horizontal	N/A

MIDDLE CHANNEL, ANT V



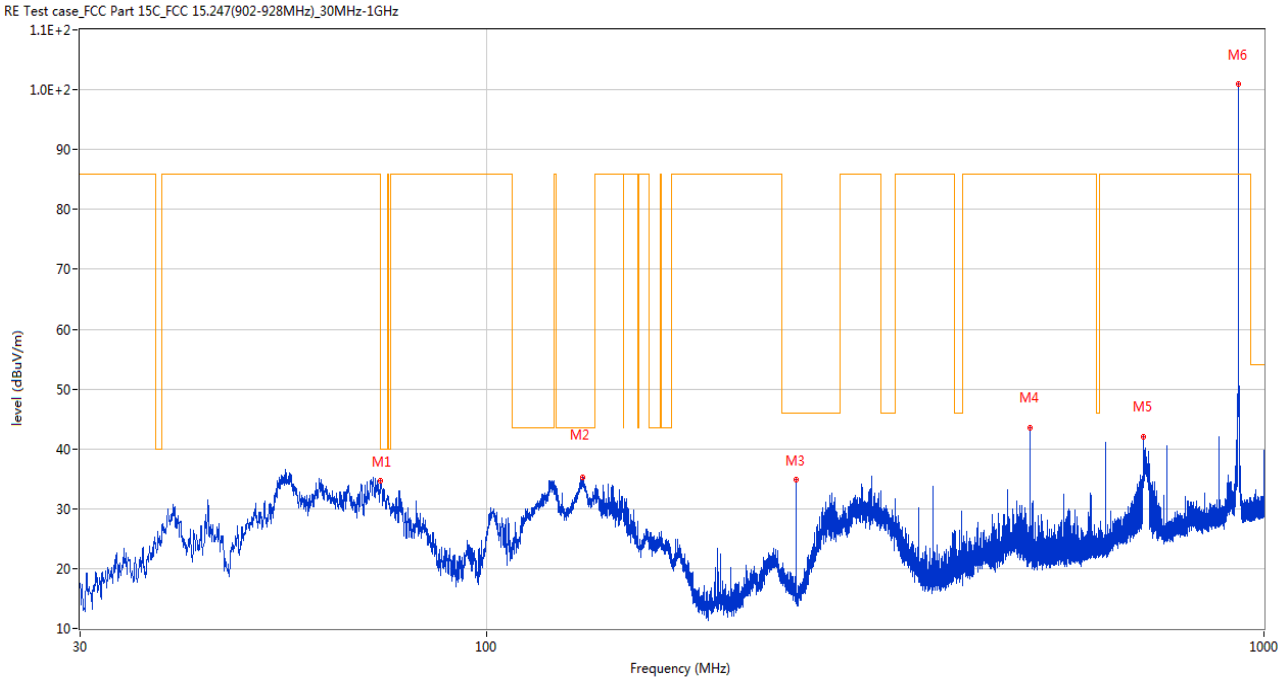
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	55.269	36.97	-26.41	86.3	-49.33	Peak	280.00	100	Vertical	Pass
2	73.117	34.29	-28.71	40.0	-5.71	Peak	114.00	100	Vertical	Pass
3	121.665	34.82	-25.95	43.5	-8.68	Peak	66.00	200	Vertical	Pass
4	301.261	36.27	-22.04	86.3	-50.03	Peak	129.00	100	Vertical	Pass
5	500.014	42.90	-16.60	86.3	-43.40	Peak	114.00	200	Vertical	Pass
6	915.125	103.65	-7.16	86.3	17.35	Peak	169.00	100	Vertical	N/A

HIGH CHANNEL, ANT H



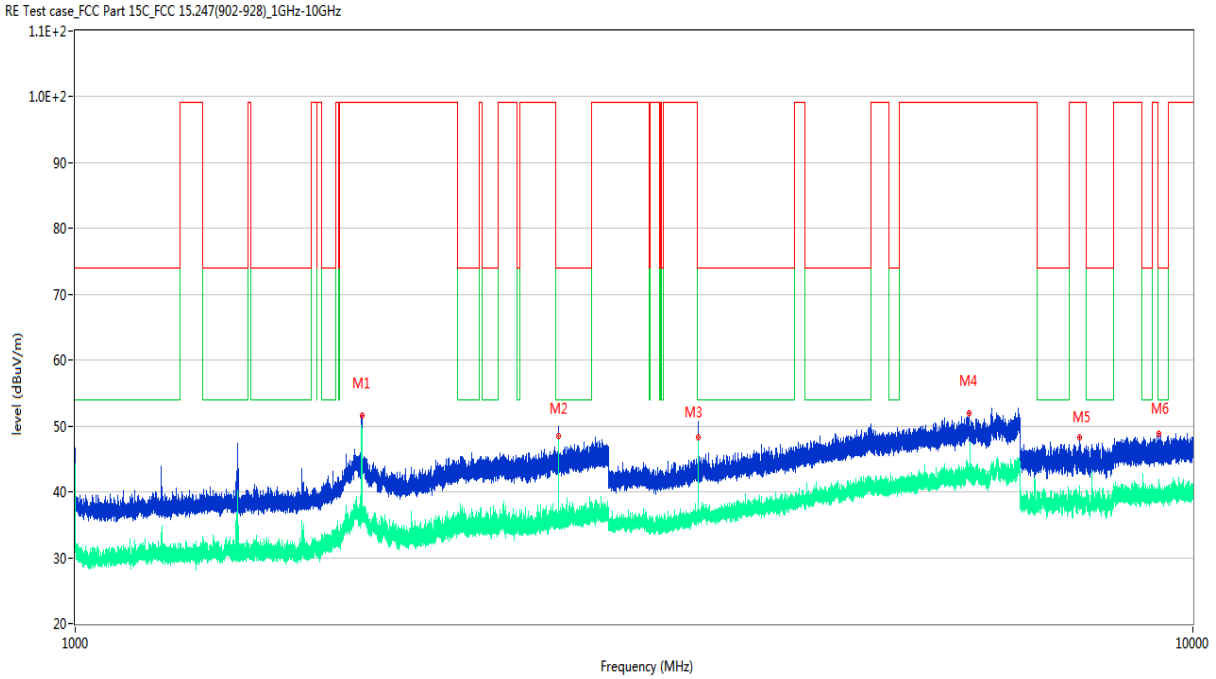
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.117	28.96	-28.71	40.0	-11.04	Peak	8.00	100	Horizontal	Pass
2	148.146	35.37	-23.97	93.0	-57.63	Peak	175.00	100	Horizontal	Pass
3	249.996	40.05	-24.63	46.0	-5.95	Peak	175.00	100	Horizontal	Pass
4	286.517	43.92	-22.50	93.0	-49.08	Peak	64.00	200	Horizontal	Pass
5	500.014	46.32	-16.60	93.0	-46.68	Peak	153.00	200	Horizontal	Pass
6	927.298	99.30	-7.33	93.0	6.30	Peak	264.00	100	Horizontal	N/A

HIGH CHANNEL, ANT V



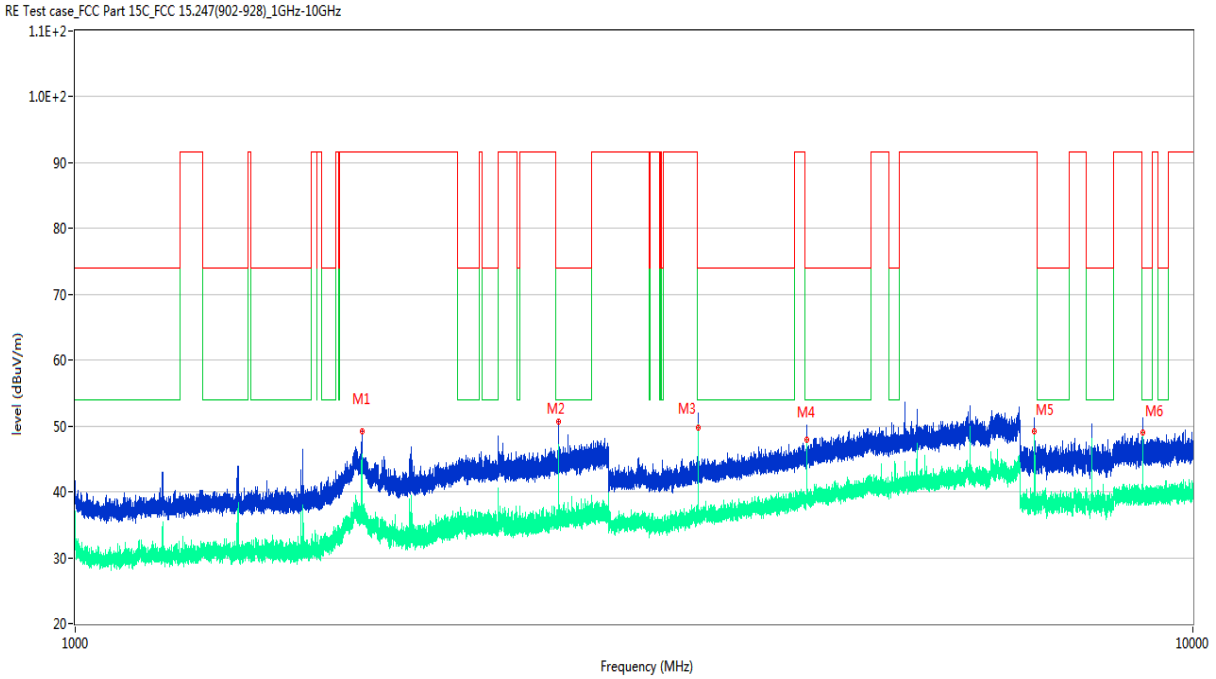
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.117	34.66	-28.71	40.0	-5.34	Peak	103.00	100	Vertical	Pass
2	132.820	35.32	-25.07	43.5	-8.18	Peak	267.00	200	Vertical	Pass
3	249.996	34.89	-24.63	46.0	-11.11	Peak	295.00	100	Vertical	Pass
4	500.014	43.58	-16.60	85.9	-42.32	Peak	245.00	100	Vertical	Pass
5	699.882	42.11	-11.31	85.9	-43.79	Peak	360.00	100	Vertical	Pass
6	927.250	100.90	-7.33	85.9	15.00	Peak	167.00	100	Vertical	N/A

LOW CHANNEL 1 GHz to 10 GHz, ANT H



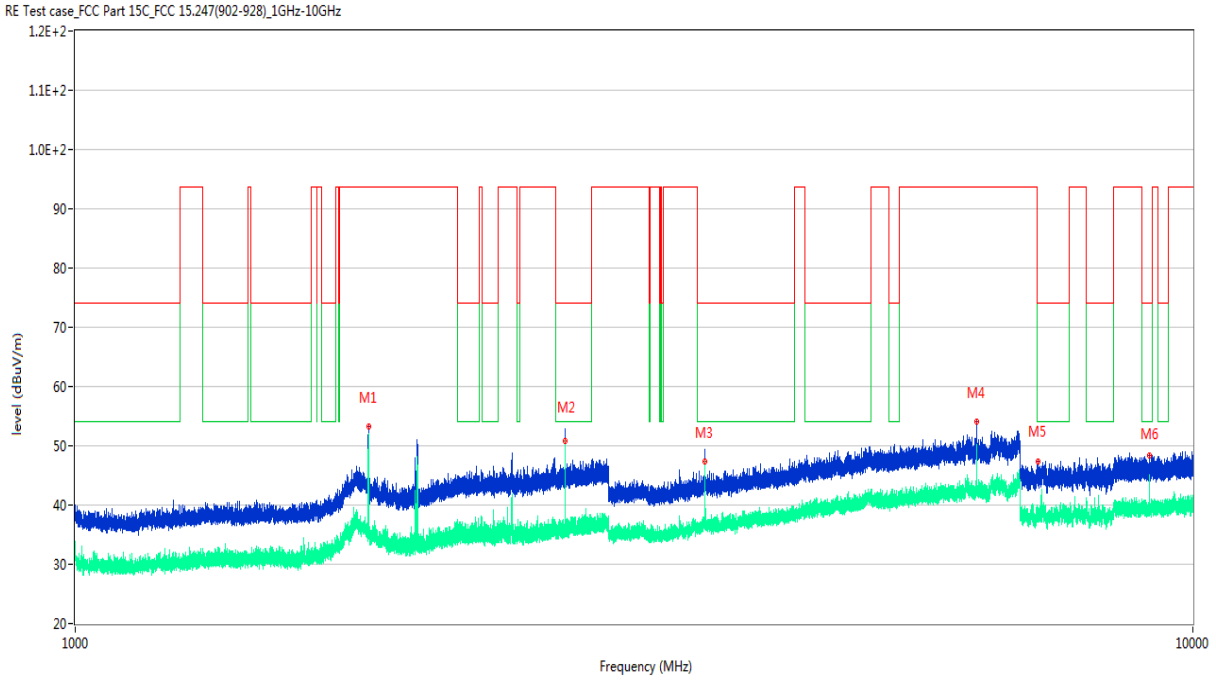
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.500	51.62	-8.73	99.1	-47.48	Peak	356.00	150	Horizontal	Pass
1**	1804.500	49.27	-8.73	99.1	-49.83	AV	356.00	150	Horizontal	Pass
2	2707.100	49.34	-7.51	74.0	-24.66	Peak	131.00	150	Horizontal	Pass
2**	2707.100	48.41	-7.51	54.0	-5.59	AV	131.00	150	Horizontal	Pass
3	3609.200	50.07	-7.16	74.0	-23.93	Peak	168.00	150	Horizontal	Pass
3**	3609.200	48.24	-7.16	54.0	-5.76	AV	168.00	150	Horizontal	Pass
4	6302.000	51.98	-0.96	99.1	-47.12	Peak	119.00	150	Horizontal	Pass
4**	6302.000	42.10	-0.96	99.1	-57.00	AV	119.00	150	Horizontal	Pass
5	7912.900	48.30	-2.35	99.1	-50.80	Peak	30.00	150	Horizontal	Pass
5**	7912.900	39.24	-2.35	99.1	-59.86	AV	30.00	150	Horizontal	Pass
6	9317.950	48.80	-0.95	74.0	-25.20	Peak	291.00	150	Horizontal	Pass
6**	9317.950	40.38	-0.95	54.0	-13.62	AV	291.00	150	Horizontal	Pass

LOW CHANNEL 1 GHz to 10 GHz, ANT H



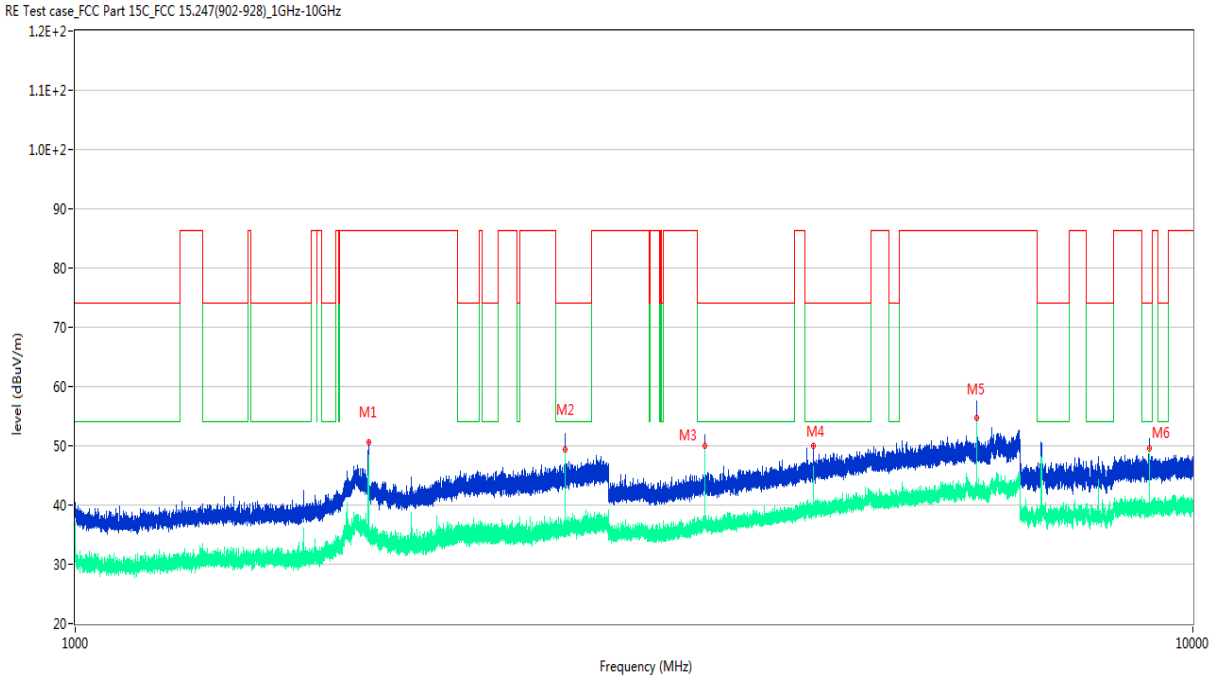
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.600	49.17	-8.73	91.6	-42.43	Peak	75.00	150	Vertical	Pass
1**	1804.600	44.60	-8.73	91.6	-47.00	AV	75.00	150	Vertical	Pass
2	2707.700	50.69	-7.47	74.0	-23.31	Peak	204.00	150	Vertical	Pass
2**	2707.700	45.00	-7.47	54.0	-9.00	AV	204.00	150	Vertical	Pass
3	3609.400	50.81	-7.14	74.0	-23.19	Peak	249.00	150	Vertical	Pass
3**	3609.400	49.78	-7.14	54.0	-4.22	AV	249.00	150	Vertical	Pass
4	4512.000	50.19	-4.07	74.0	-23.81	Peak	173.00	150	Vertical	Pass
4**	4512.000	47.89	-4.07	54.0	-6.11	AV	173.00	150	Vertical	Pass
5	7216.750	49.89	-4.40	91.6	-41.71	Peak	87.00	150	Vertical	Pass
5**	7216.750	49.21	-4.40	91.6	-42.39	AV	87.00	150	Vertical	Pass
6	9021.250	51.00	-0.53	74.0	-23.00	Peak	19.00	150	Vertical	Pass
6**	9021.250	49.04	-0.53	54.0	-4.96	AV	19.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT H



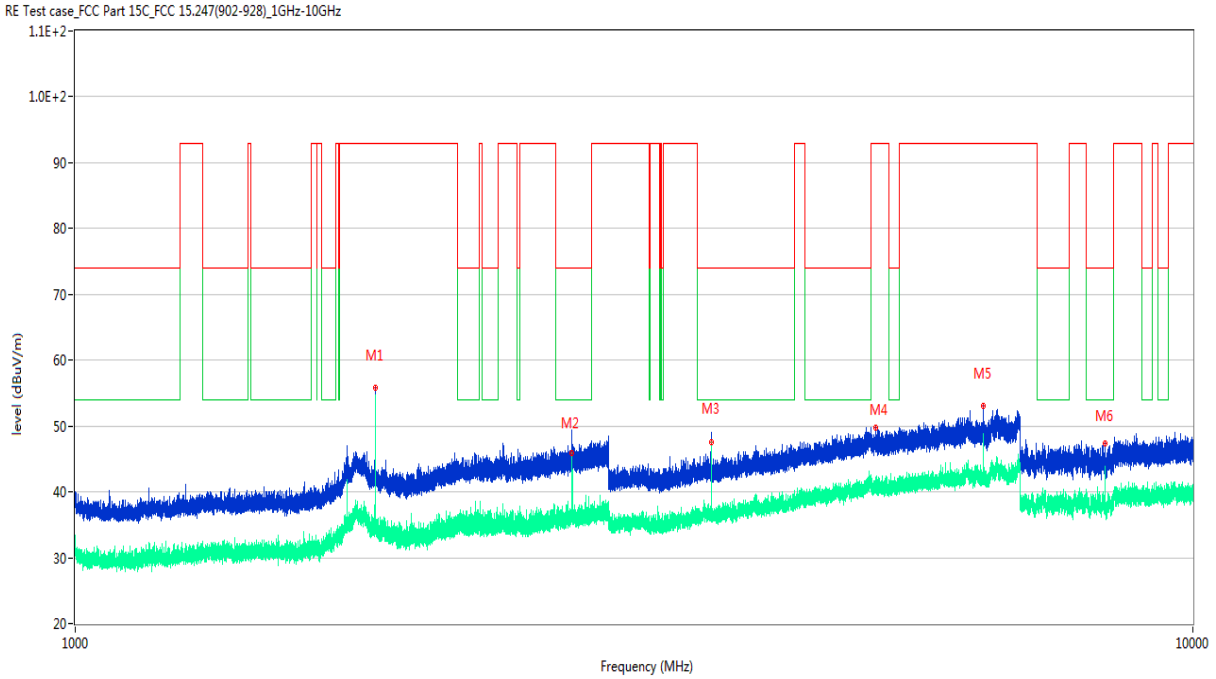
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1829.800	53.23	-10.07	93.6	-40.37	Peak	155.00	100	Horizontal	Pass
1**	1829.800	51.00	-10.07	93.6	-42.60	AV	155.00	100	Horizontal	Pass
2	2744.400	52.09	-7.11	74.0	-21.91	Peak	131.00	100	Horizontal	Pass
2**	2744.400	50.72	-7.11	54.0	-3.28	AV	131.00	100	Horizontal	Pass
3	3659.000	48.84	-6.77	74.0	-25.16	Peak	179.00	100	Horizontal	Pass
3**	3659.000	47.41	-6.77	54.0	-6.59	AV	179.00	100	Horizontal	Pass
4	6405.000	54.11	-0.78	93.6	-39.49	Peak	155.00	100	Horizontal	Pass
4**	6405.000	47.52	-0.78	93.6	-46.08	AV	155.00	100	Horizontal	Pass
5	7262.650	47.27	-3.10	74.0	-26.73	Peak	221.00	100	Horizontal	Pass
5**	7262.650	39.11	-3.10	54.0	-14.89	AV	221.00	100	Horizontal	Pass
6	9149.950	48.40	-1.54	74.0	-25.60	Peak	135.00	100	Horizontal	Pass
6**	9149.950	42.09	-1.54	54.0	-11.91	AV	135.00	100	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT V



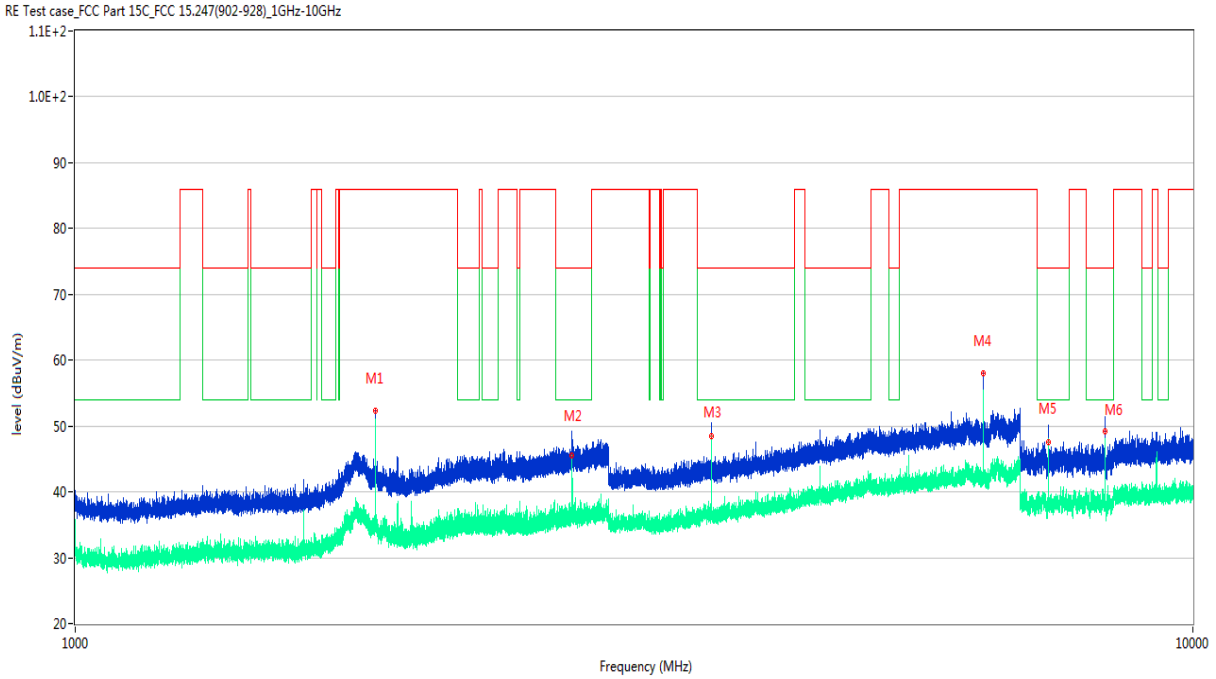
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1829.900	50.71	-10.09	86.3	-42.89	Peak	219.00	150	Vertical	Pass
1**	1829.900	47.99	-10.09	86.3	-45.61	AV	219.00	150	Vertical	Pass
2	2744.300	50.87	-7.11	74.0	-23.13	Peak	85.00	150	Vertical	Pass
2**	2744.300	49.41	-7.11	54.0	-4.59	AV	85.00	150	Vertical	Pass
3	3659.800	51.67	-6.81	74.0	-22.33	Peak	164.00	150	Vertical	Pass
3**	3659.800	50.04	-6.81	54.0	-3.96	AV	164.00	150	Vertical	Pass
4	4575.400	49.92	-3.88	74.0	-24.08	Peak	289.00	150	Vertical	Pass
4**	4575.400	44.31	-3.88	54.0	-9.69	AV	289.00	150	Vertical	Pass
5	6403.200	55.19	-0.94	86.3	-38.41	Peak	89.00	150	Vertical	Pass
5**	6403.200	54.65	-0.94	86.3	-38.95	AV	89.00	150	Vertical	Pass
6	9147.850	50.54	-1.50	74.0	-23.46	Peak	48.00	150	Vertical	Pass
6**	9147.850	49.53	-1.50	54.0	-4.47	AV	48.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.100	55.82	-9.99	93.0	-37.18	Peak	146.00	150	Horizontal	Pass
1**	1855.100	54.67	-9.99	93.0	-38.33	AV	146.00	150	Horizontal	Pass
2	2782.600	47.74	-6.61	74.0	-26.26	Peak	61.00	150	Horizontal	Pass
2**	2782.600	45.98	-6.61	54.0	-8.02	AV	61.00	150	Horizontal	Pass
3	3711.200	48.17	-6.39	74.0	-25.83	Peak	192.00	150	Horizontal	Pass
3**	3711.200	47.50	-6.39	54.0	-6.50	AV	192.00	150	Horizontal	Pass
4	5198.600	49.76	-2.70	93.0	-43.24	Peak	218.00	150	Horizontal	Pass
4**	5198.600	41.42	-2.70	93.0	-51.58	AV	218.00	150	Horizontal	Pass
5	6492.800	53.02	-1.75	93.0	-39.98	Peak	304.00	150	Horizontal	Pass
5**	6492.800	47.97	-1.75	93.0	-45.03	AV	304.00	150	Horizontal	Pass
6	8348.401	47.32	-3.06	74.0	-26.68	Peak	0.00	150	Horizontal	Pass
6**	8348.401	39.59	-3.06	54.0	-14.41	AV	0.00	150	Horizontal	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT V

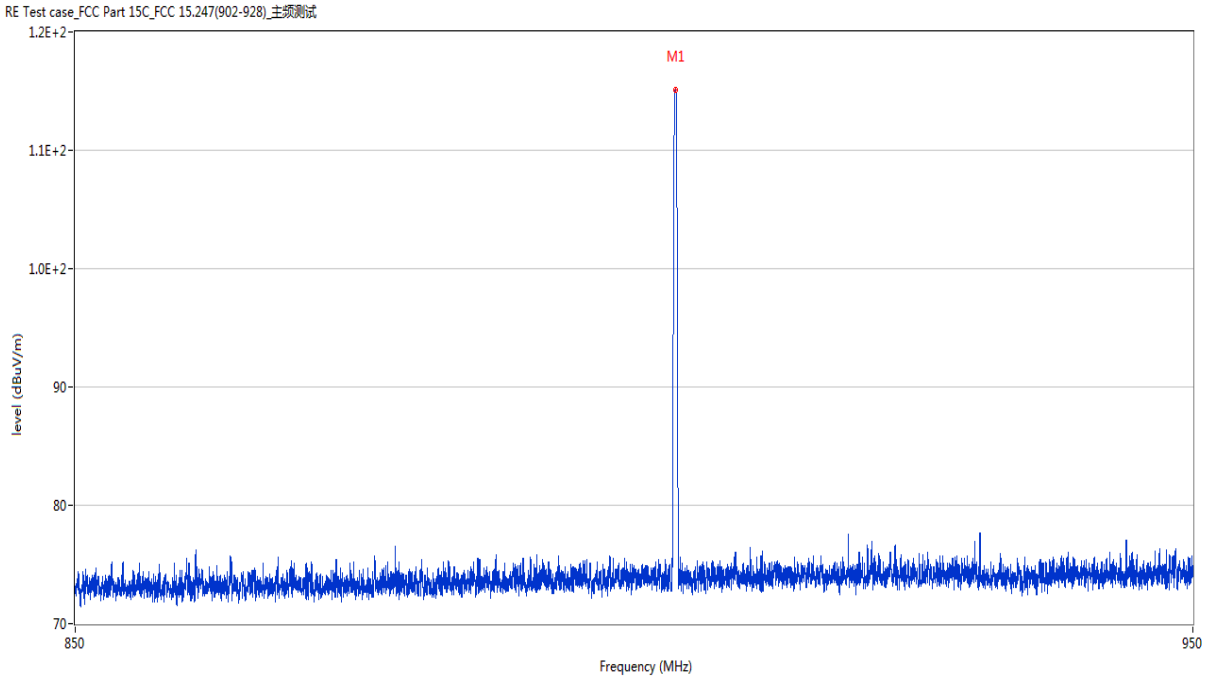


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.100	52.31	-9.96	85.9	-33.59	Peak	161.00	150	Vertical	Pass
1**	1855.100	50.17	-9.96	85.9	-35.73	AV	161.00	150	Vertical	Pass
2	2782.600	49.20	-6.61	74.0	-24.80	Peak	161.00	150	Vertical	Pass
2**	2782.600	45.52	-6.61	54.0	-8.48	AV	161.00	150	Vertical	Pass
3	3711.100	49.87	-6.39	74.0	-24.13	Peak	157.00	150	Vertical	Pass
3**	3711.100	48.42	-6.39	54.0	-5.58	AV	157.00	150	Vertical	Pass
4	6491.800	58.02	-1.76	85.9	-27.88	Peak	95.00	150	Vertical	Pass
4**	6491.800	55.18	-1.76	85.9	-30.72	AV	95.00	150	Vertical	Pass
5	7420.100	50.12	-4.01	74.0	-23.88	Peak	91.00	150	Vertical	Pass
5**	7420.100	47.63	-4.01	54.0	-6.37	AV	91.00	150	Vertical	Pass
6	8347.850	49.14	-3.00	74.0	-24.86	Peak	91.00	150	Vertical	Pass
6**	8347.850	45.26	-3.00	54.0	-8.74	AV	91.00	150	Vertical	Pass

Aux. Antenna

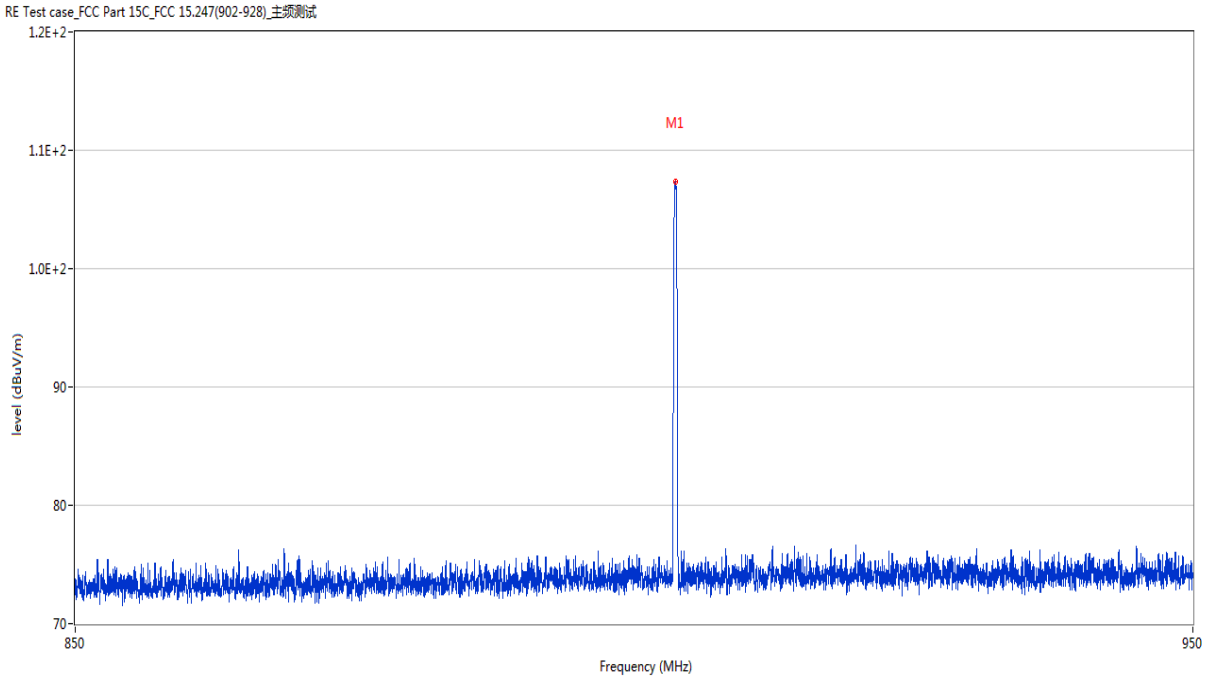
125kHz

LOW CHANNEL, 850 MHz to 950 MHz, ANT H



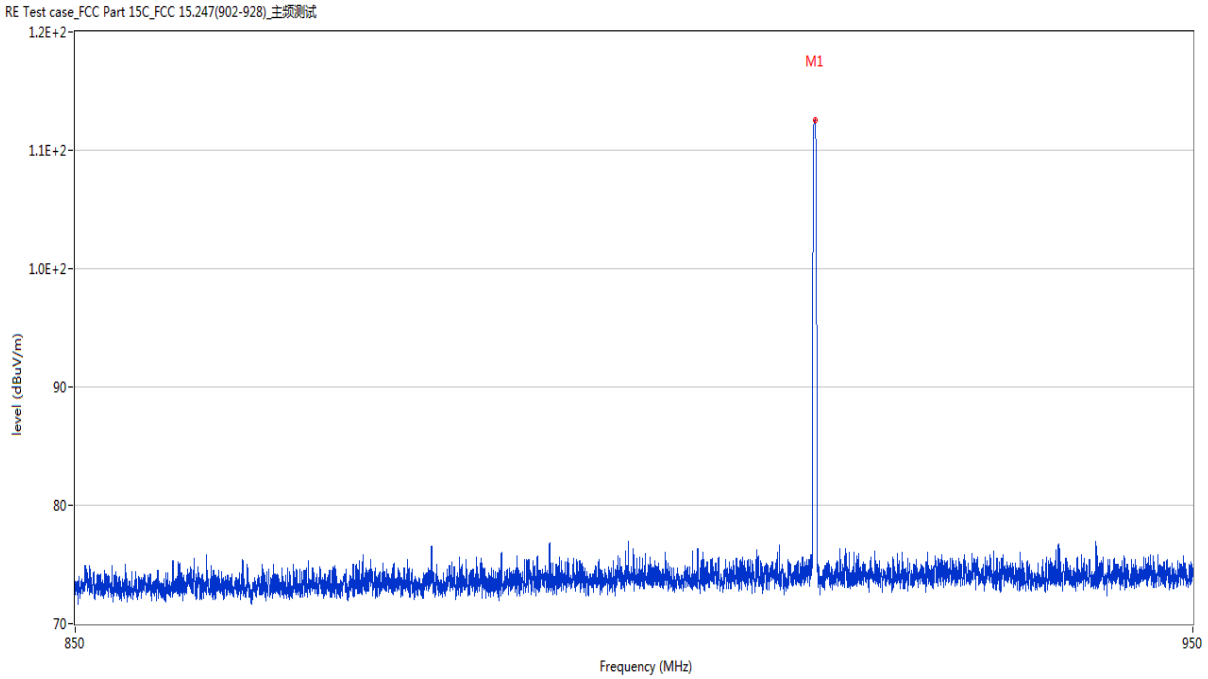
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.945	115.11	30.01	--	--	Peak	119.00	150	Horizontal	N/A

LOW CHANNEL, 850 MHz to 950 MHz, ANT V



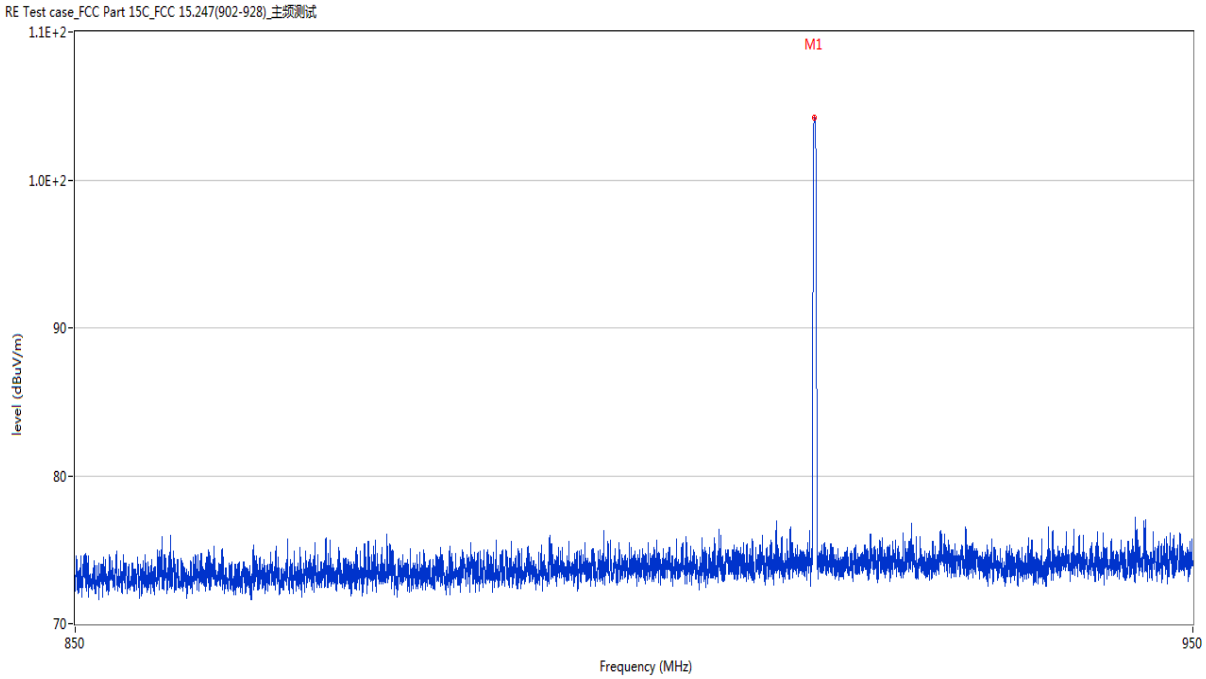
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.890	107.31	30.01	--	--	Peak	140.00	150	Vertical	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT H



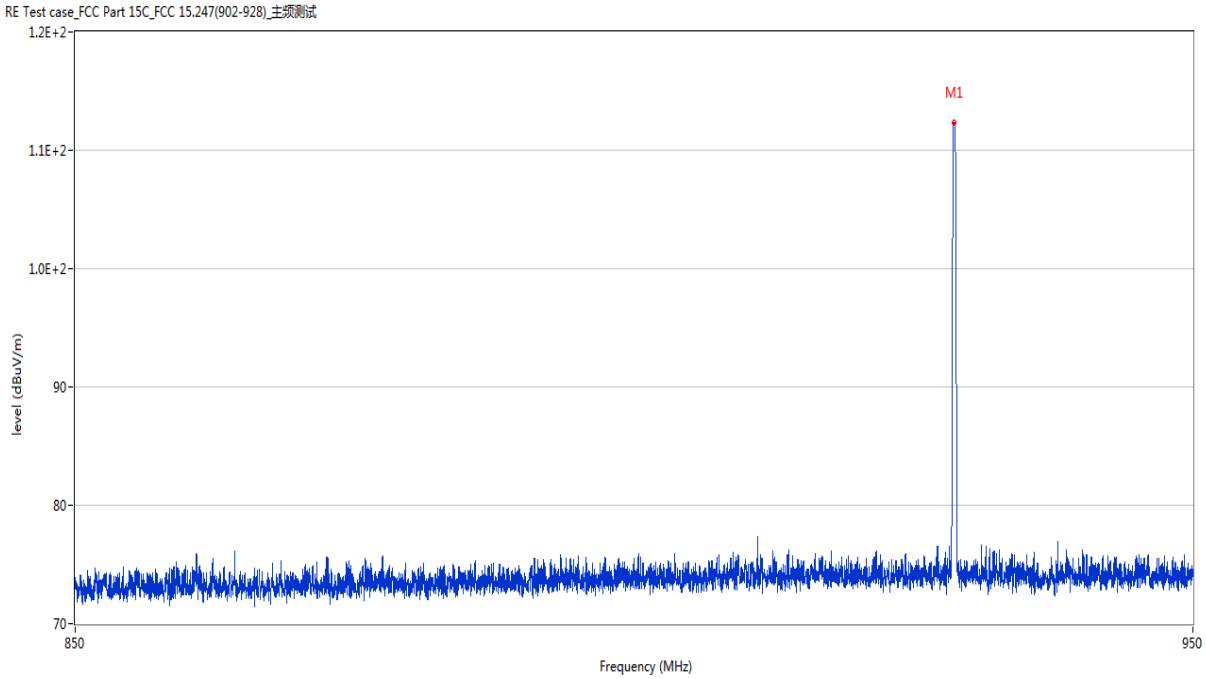
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	914.965	112.54	30.39	--	--	Peak	115.00	150	Horizontal	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT V



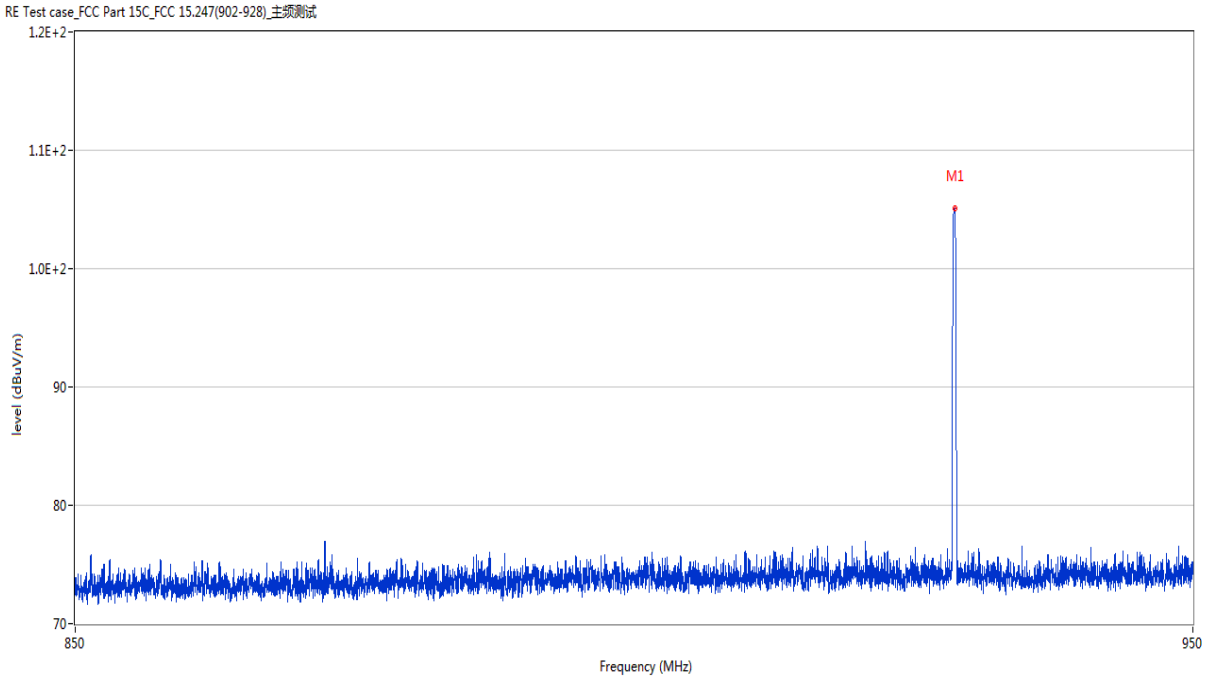
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	914.905	104.20	30.39	--	--	Peak	137.00	150	Vertical	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT H



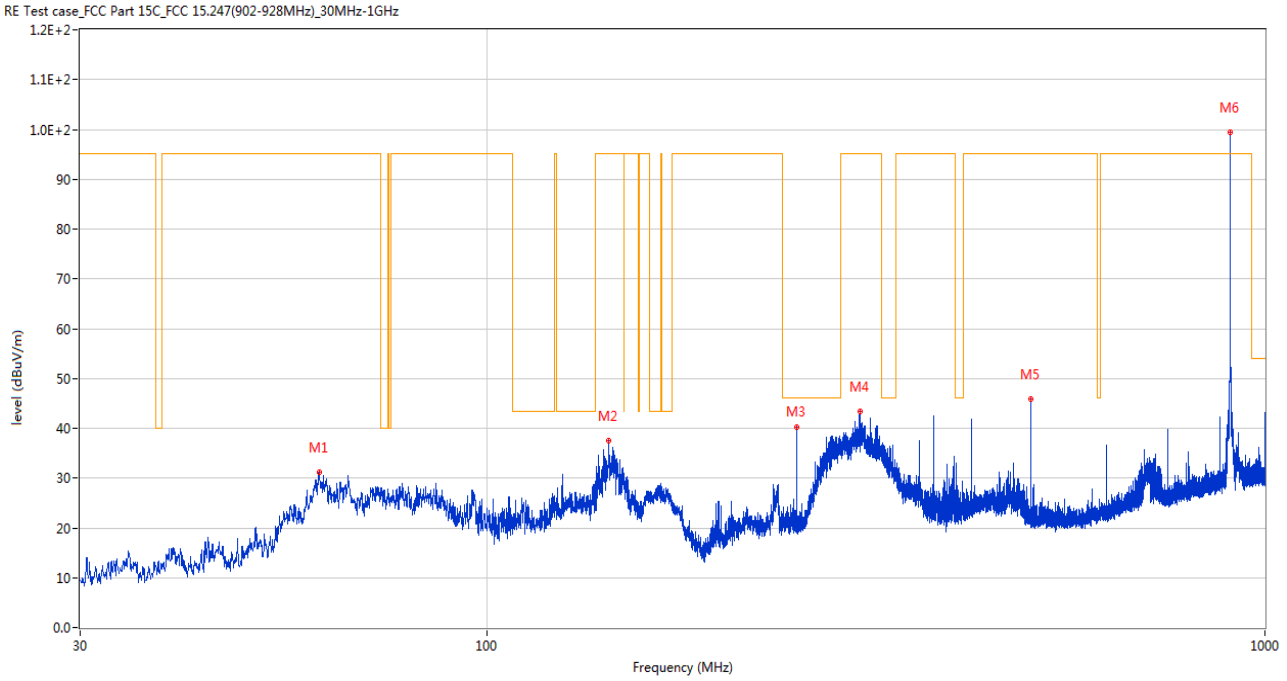
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.710	112.37	30.59	--	--	Peak	121.00	150	Horizontal	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT V



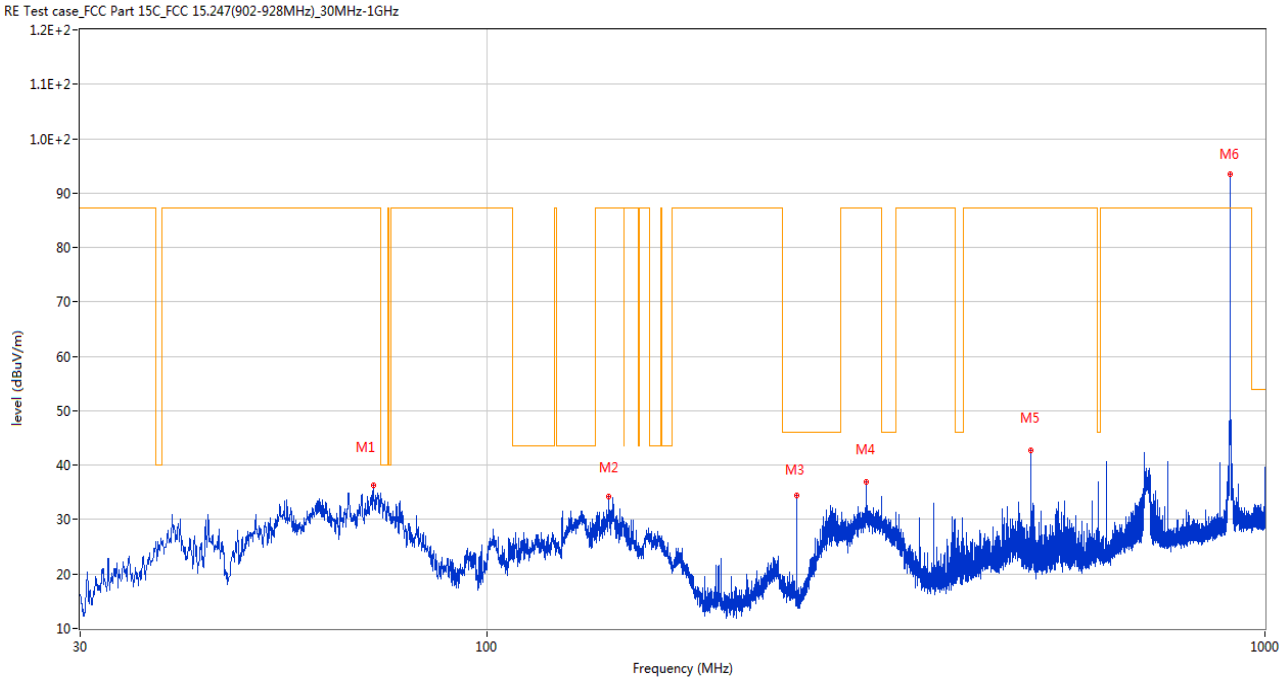
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.755	105.15	30.59	--	--	Peak	118.00	150	Vertical	N/A

LOW CHANNEL ANT H



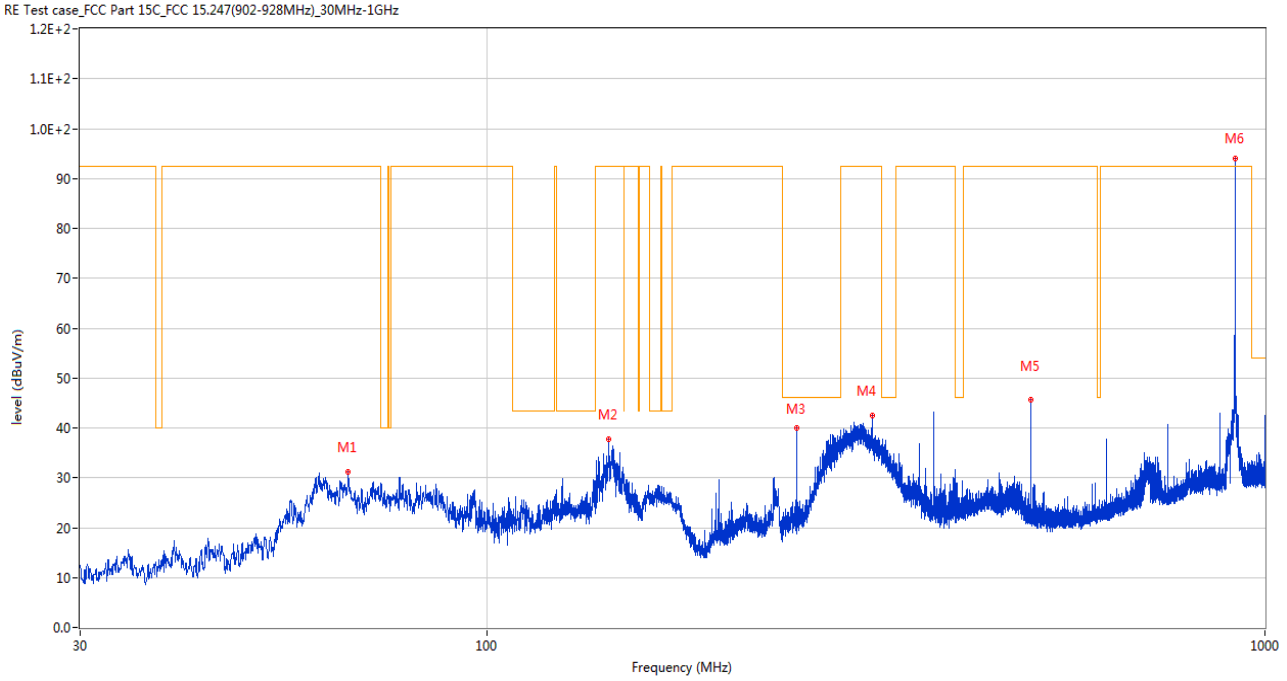
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	60.846	31.10	-26.76	95.1	-64.00	Peak	196.00	100	Horizontal	Pass
2	143.344	37.50	-24.48	95.1	-57.60	Peak	196.00	200	Horizontal	Pass
3	249.996	40.22	-24.63	46.0	-5.78	Peak	0.00	100	Horizontal	Pass
4	301.746	43.36	-21.96	95.1	-51.74	Peak	80.00	200	Horizontal	Pass
5	500.014	45.80	-16.60	95.1	-49.30	Peak	162.00	100	Horizontal	Pass
6	902.924	99.38	-7.47	95.1	4.28	Peak	189.00	100	Horizontal	N/A

LOW CHANNEL, ANT V



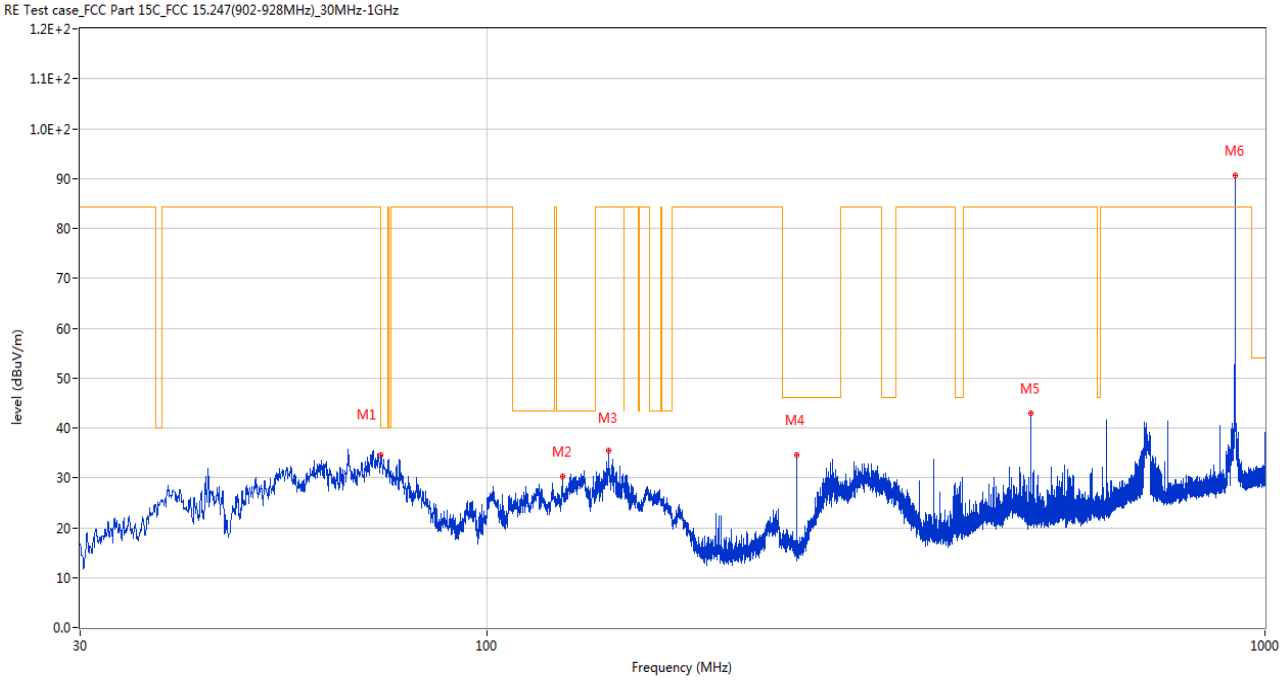
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	71.419	36.25	-28.52	87.3	-51.05	Peak	93.00	100	Vertical	Pass
2	143.248	34.23	-24.51	87.3	-53.07	Peak	211.00	100	Vertical	Pass
3	249.996	34.50	-24.63	46.0	-11.50	Peak	301.00	200	Vertical	Pass
4	307.129	37.01	-22.07	87.3	-50.29	Peak	170.00	100	Vertical	Pass
5	500.014	42.72	-16.60	87.3	-44.58	Peak	232.00	100	Vertical	Pass
6	902.924	93.43	-7.47	87.3	6.13	Peak	155.00	100	Vertical	N/A

MIDDLE CHANNEL, ANT H



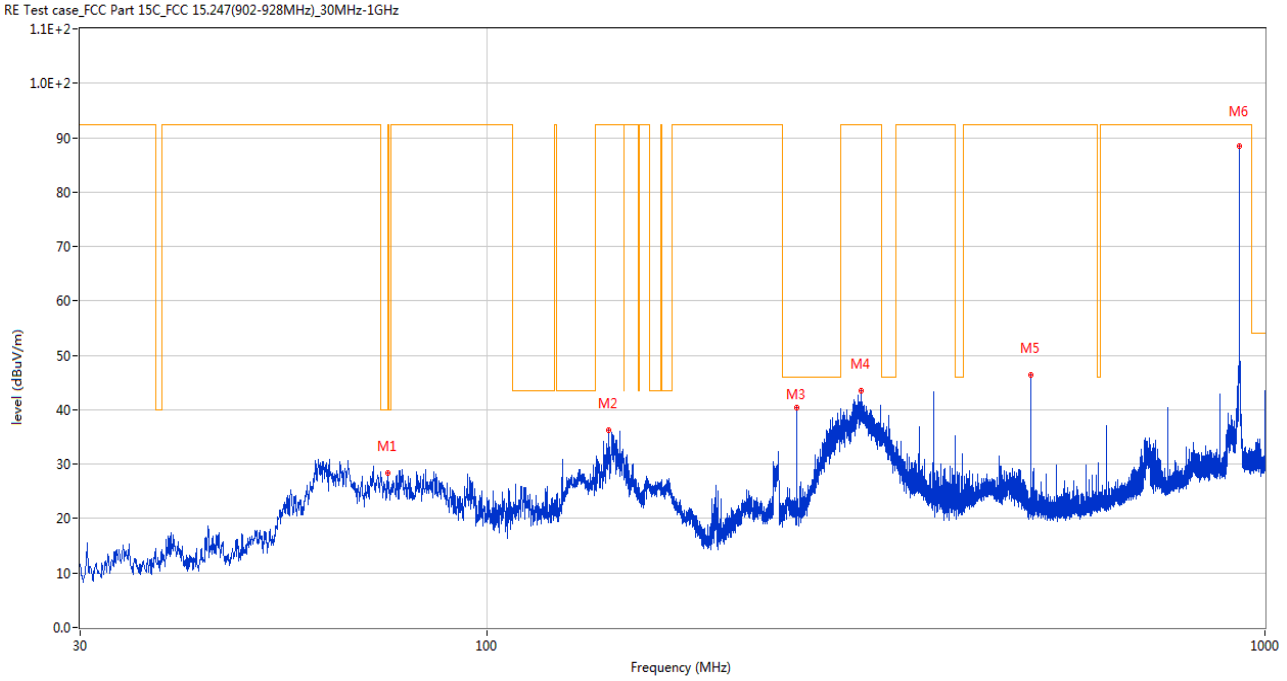
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	66.326	31.21	-27.55	92.5	-61.29	Peak	182.00	100	Horizontal	Pass
2	143.248	37.67	-24.51	92.5	-54.83	Peak	175.00	200	Horizontal	Pass
3	249.996	40.00	-24.63	46.0	-6.00	Peak	252.00	100	Horizontal	Pass
4	313.240	42.56	-22.11	92.5	-49.94	Peak	68.00	100	Horizontal	Pass
5	500.014	45.57	-16.60	92.5	-46.93	Peak	154.00	200	Horizontal	Pass
6	914.931	94.04	-7.18	92.5	1.54	Peak	61.00	100	Horizontal	N/A

MIDDLE CHANNEL, ANT V



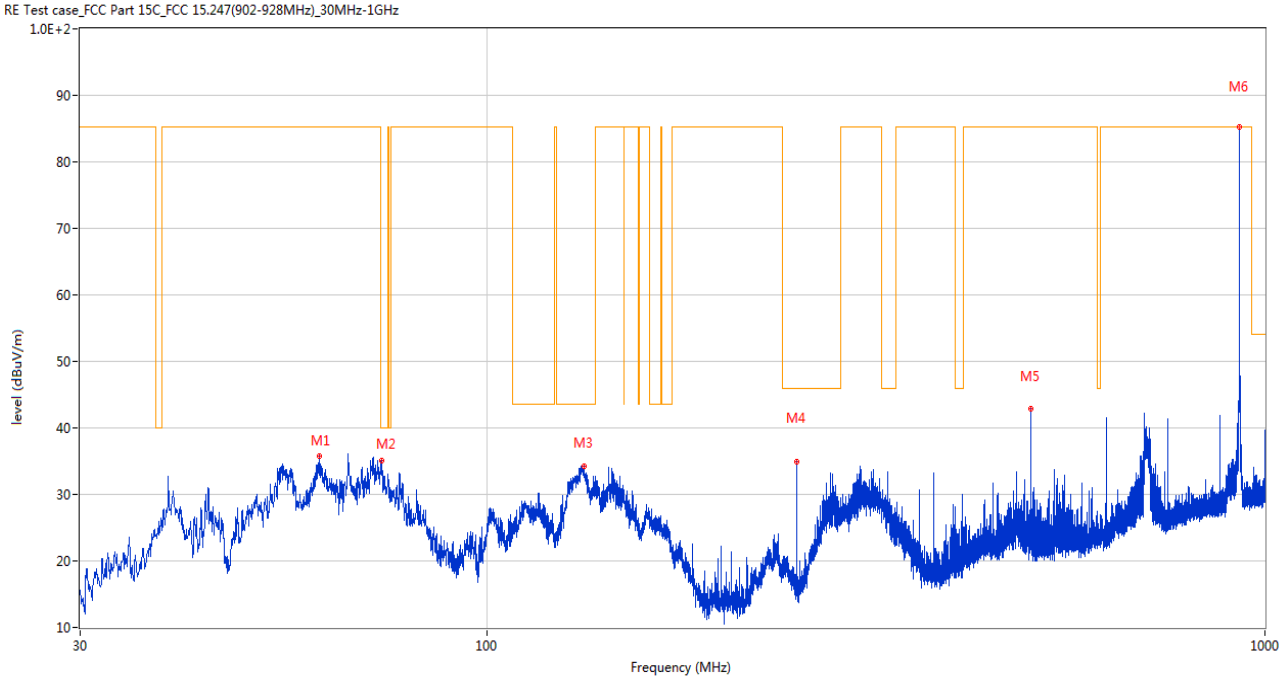
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.068	34.59	-28.70	40.0	-5.41	Peak	136.00	200	Vertical	Pass
2	125.011	30.29	-26.01	43.5	-13.21	Peak	95.00	100	Vertical	Pass
3	143.248	35.54	-24.51	84.2	-48.66	Peak	248.00	100	Vertical	Pass
4	249.996	34.47	-24.63	46.0	-11.53	Peak	289.00	200	Vertical	Pass
5	500.014	42.98	-16.60	84.2	-41.22	Peak	248.00	100	Vertical	Pass
6	914.931	90.51	-7.18	84.2	6.31	Peak	171.00	100	Vertical	N/A

HIGH CHANNEL, ANT H



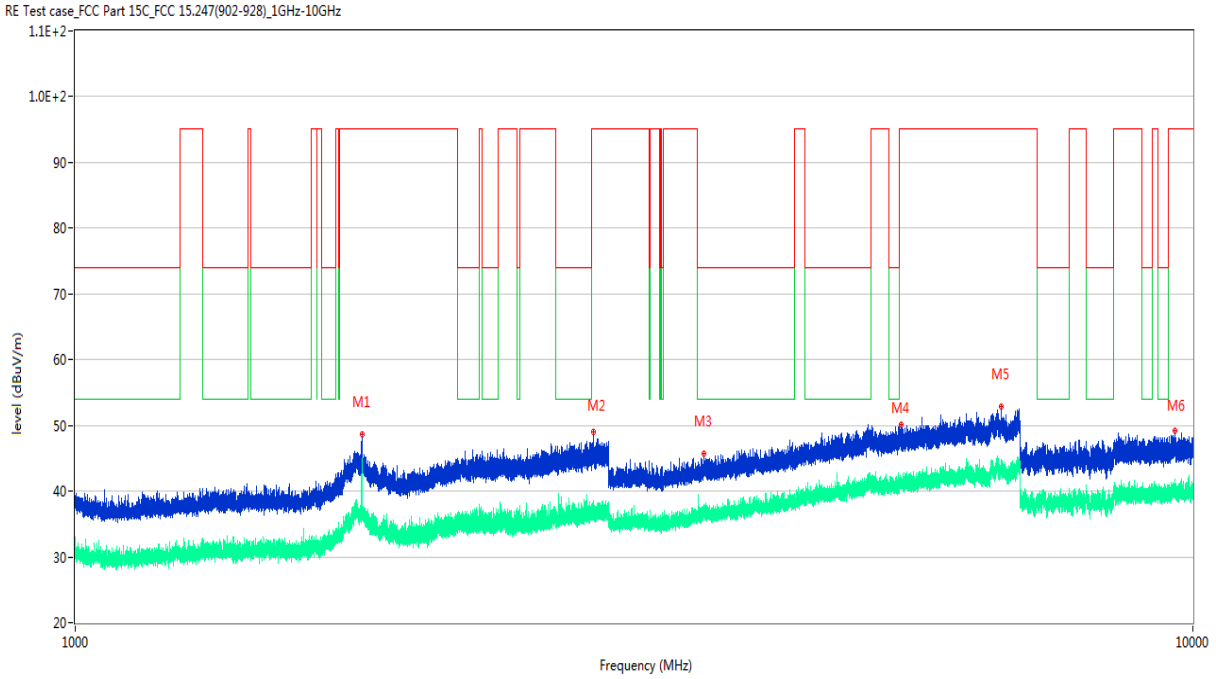
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	74.572	28.31	-28.96	40.0	-11.69	Peak	19.00	200	Horizontal	Pass
2	143.248	36.31	-24.51	92.4	-56.09	Peak	193.00	100	Horizontal	Pass
3	249.996	40.50	-24.63	46.0	-5.50	Peak	5.00	200	Horizontal	Pass
4	302.425	43.40	-21.97	92.4	-49.00	Peak	61.00	100	Horizontal	Pass
5	500.014	46.42	-16.60	92.4	-45.98	Peak	154.00	100	Horizontal	Pass
6	927.638	88.49	-7.38	92.4	-3.91	Peak	186.00	100	Horizontal	N/A

HIGH CHANNEL, ANT V



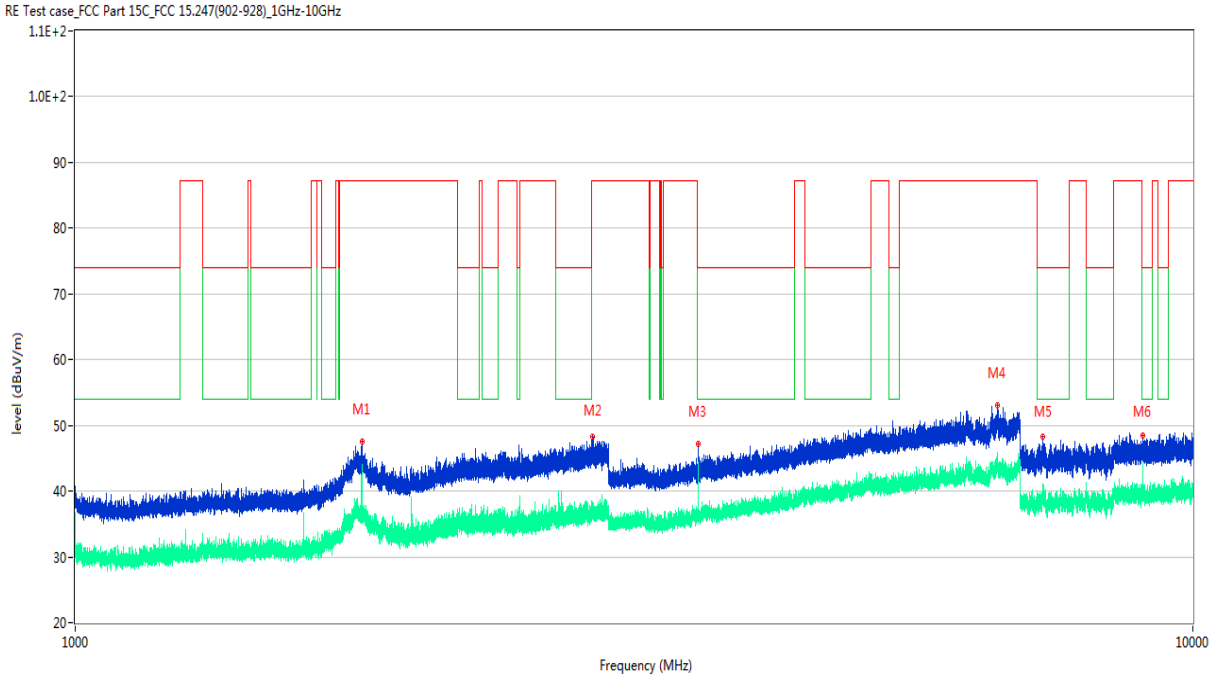
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	60.895	35.70	-26.75	85.2	-49.50	Peak	252.00	100	Vertical	Pass
2	73.165	35.06	-28.72	40.0	-4.94	Peak	92.00	200	Vertical	Pass
3	133.208	34.31	-25.02	43.5	-9.19	Peak	274.00	100	Vertical	Pass
4	249.996	34.87	-24.63	46.0	-11.13	Peak	302.00	100	Vertical	Pass
5	500.014	42.95	-16.60	85.2	-42.25	Peak	245.00	100	Vertical	Pass
6	927.638	85.28	-7.38	85.2	0.08	Peak	170.00	100	Vertical	N/A

LOW CHANNEL 1 GHz to 10 GHz, ANT H



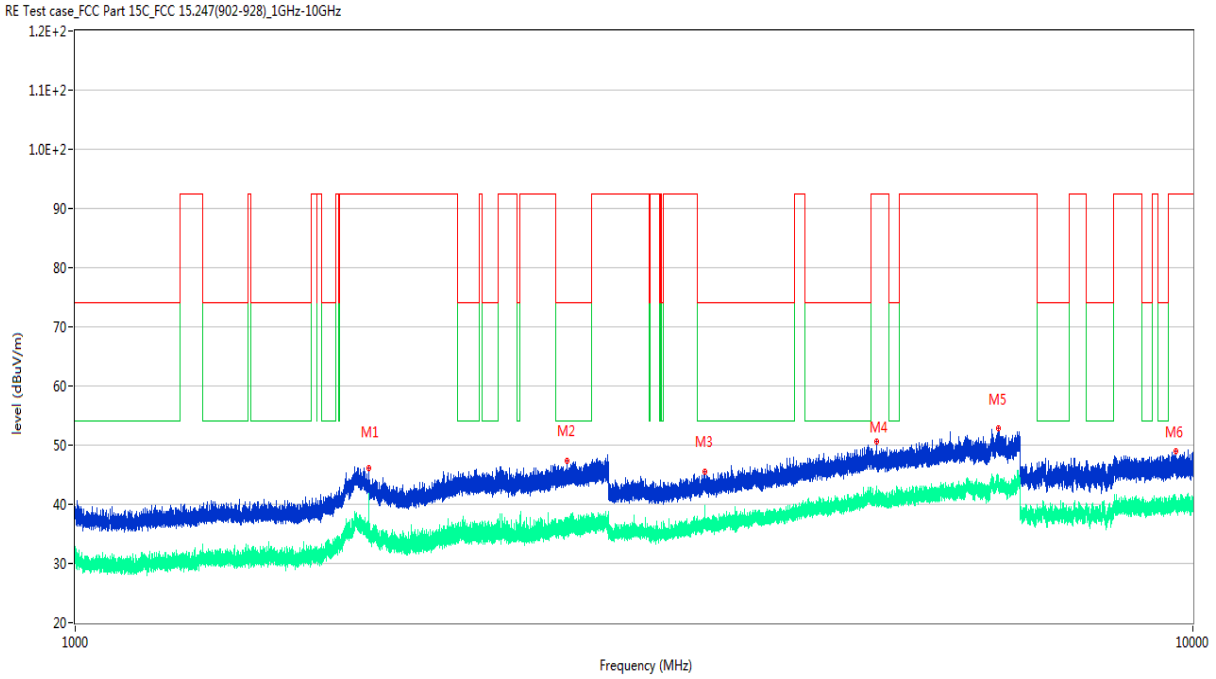
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.700	48.67	-8.73	95.1	-46.43	Peak	229.00	150	Horizontal	Pass
1**	1804.700	44.92	-8.73	95.1	-50.18	AV	229.00	150	Horizontal	Pass
2	2907.300	49.00	-5.37	95.1	-46.10	Peak	300.00	150	Horizontal	Pass
2**	2907.300	36.58	-5.37	95.1	-58.52	AV	300.00	150	Horizontal	Pass
3	3650.200	45.63	-6.19	74.0	-28.37	Peak	360.00	150	Horizontal	Pass
3**	3650.200	37.96	-6.19	54.0	-16.04	AV	360.00	150	Horizontal	Pass
4	5488.200	50.16	-2.36	95.1	-44.94	Peak	33.00	150	Horizontal	Pass
4**	5488.200	41.36	-2.36	95.1	-53.74	AV	33.00	150	Horizontal	Pass
5	6738.800	52.80	-0.19	95.1	-42.30	Peak	132.00	150	Horizontal	Pass
5**	6738.800	43.33	-0.19	95.1	-51.77	AV	132.00	150	Horizontal	Pass
6	9645.850	49.27	-0.12	95.1	-45.83	Peak	151.00	150	Horizontal	Pass
6**	9645.850	40.31	-0.12	95.1	-54.79	AV	151.00	150	Horizontal	Pass

LOW CHANNEL 1 GHz to 10 GHz, ANT H



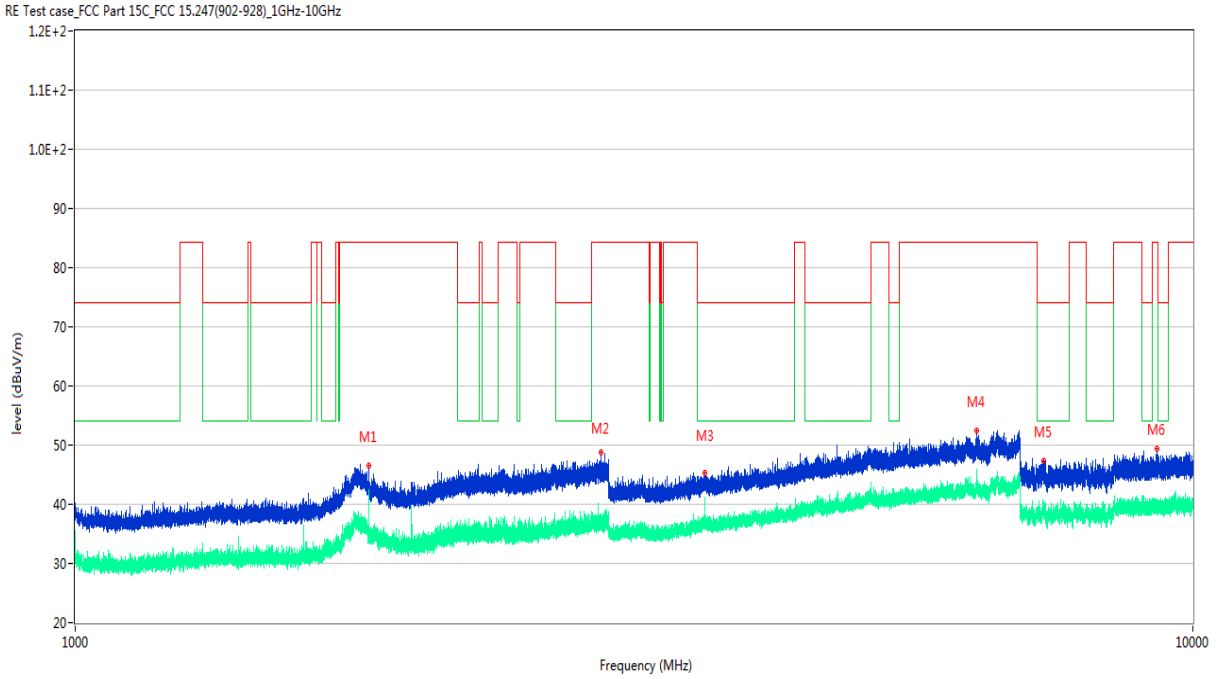
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.600	47.48	-8.73	87.3	-39.82	Peak	162.00	150	Vertical	Pass
1**	1804.600	43.53	-8.73	87.3	-43.77	AV	162.00	150	Vertical	Pass
2	2905.000	48.36	-5.18	87.3	-38.94	Peak	137.00	150	Vertical	Pass
2**	2905.000	35.92	-5.18	87.3	-51.38	AV	137.00	150	Vertical	Pass
3	3609.200	47.12	-7.16	74.0	-26.88	Peak	360.00	150	Vertical	Pass
3**	3609.200	42.68	-7.16	54.0	-11.32	AV	360.00	150	Vertical	Pass
4	6690.600	53.09	-0.28	87.3	-34.21	Peak	148.00	150	Vertical	Pass
4**	6690.600	43.83	-0.28	87.3	-43.47	AV	148.00	150	Vertical	Pass
5	7341.250	48.25	-3.62	74.0	-25.75	Peak	275.00	150	Vertical	Pass
5**	7341.250	41.12	-3.62	54.0	-12.88	AV	275.00	150	Vertical	Pass
6	9023.799	48.51	-0.61	74.0	-25.49	Peak	258.00	150	Vertical	Pass
6**	9023.799	41.32	-0.61	54.0	-12.68	AV	258.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT H



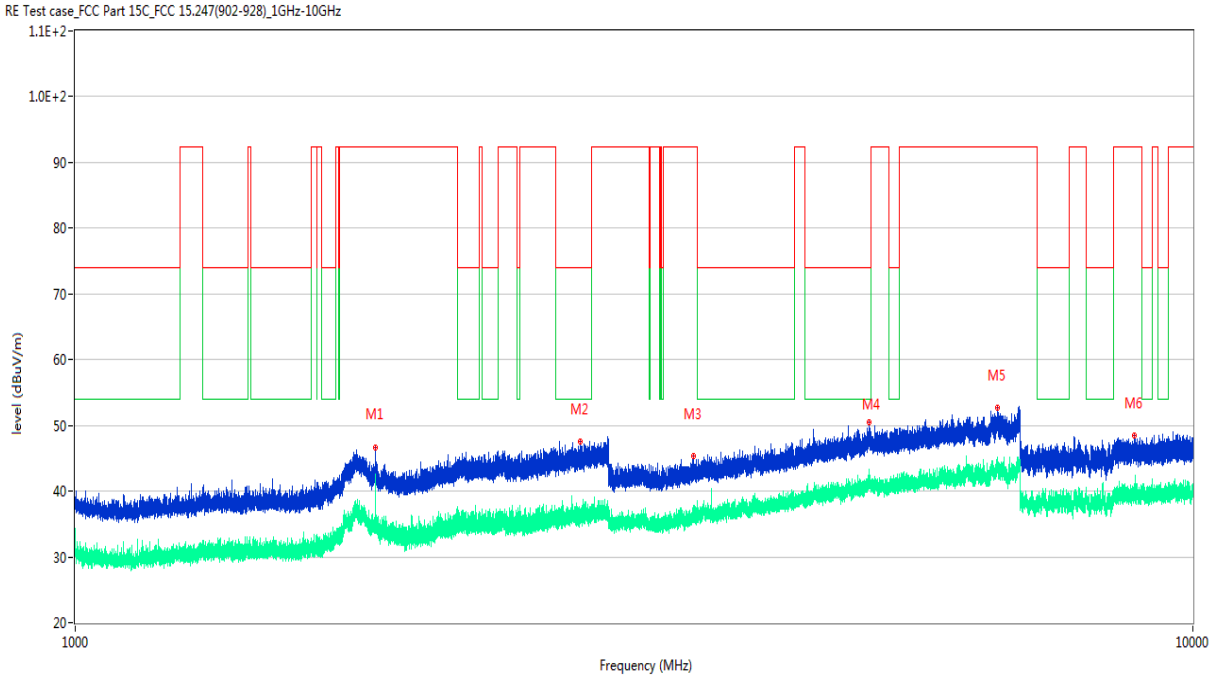
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1829.500	46.08	-10.05	92.5	-46.42	Peak	235.00	150	Horizontal	Pass
1**	1829.500	40.84	-10.05	92.5	-51.66	AV	235.00	150	Horizontal	Pass
2	2752.600	47.36	-6.83	74.0	-26.64	Peak	235.00	150	Horizontal	Pass
2**	2752.600	35.67	-6.83	54.0	-18.33	AV	235.00	150	Horizontal	Pass
3	3659.200	45.59	-6.78	74.0	-28.41	Peak	133.00	150	Horizontal	Pass
3**	3659.200	36.11	-6.78	54.0	-17.89	AV	133.00	150	Horizontal	Pass
4	5208.400	50.53	-2.60	92.5	-41.97	Peak	9.00	150	Horizontal	Pass
4**	5208.400	40.80	-2.60	92.5	-51.70	AV	9.00	150	Horizontal	Pass
5	6694.000	52.78	-0.34	92.5	-39.72	Peak	360.00	150	Horizontal	Pass
5**	6694.000	43.62	-0.34	92.5	-48.88	AV	360.00	150	Horizontal	Pass
6	9651.849	48.96	-0.16	92.5	-43.54	Peak	66.00	150	Horizontal	Pass
6**	9651.849	39.36	-0.16	92.5	-53.14	AV	66.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT V



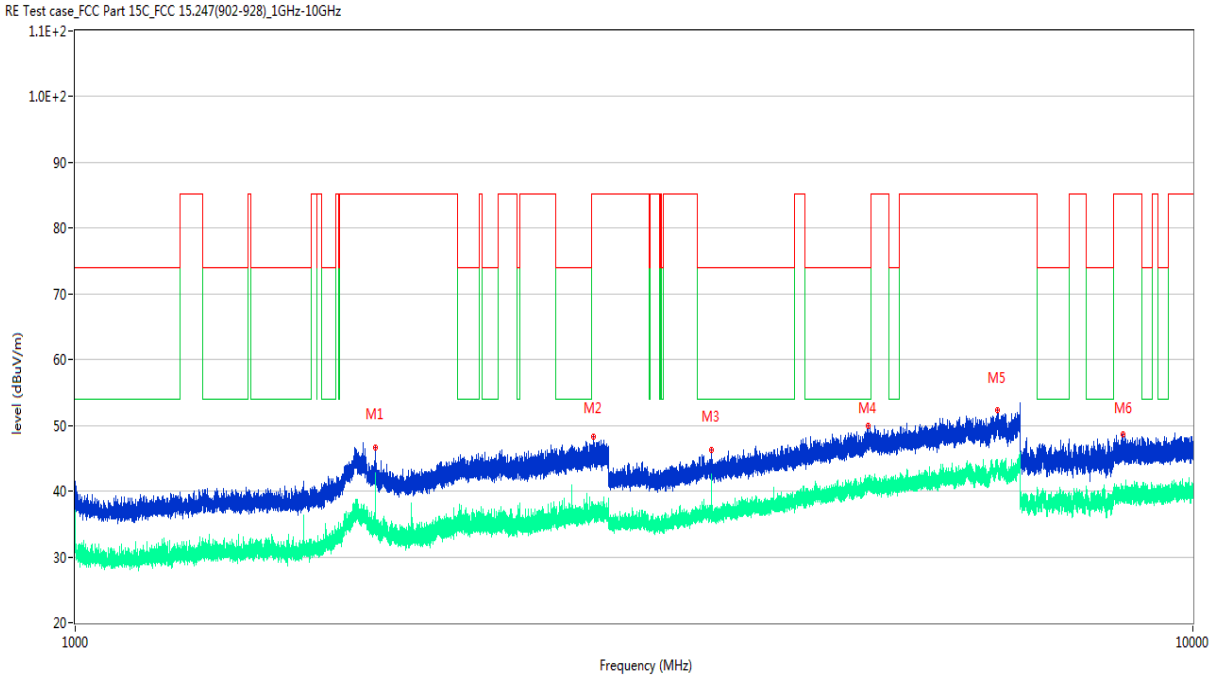
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1829.600	46.44	-10.06	84.2	-37.76	Peak	157.00	150	Vertical	Pass
1**	1829.600	41.66	-10.06	84.2	-42.54	AV	157.00	150	Vertical	Pass
2	2957.000	48.83	-5.68	84.2	-35.37	Peak	290.00	150	Vertical	Pass
2**	2957.000	36.61	-5.68	84.2	-47.59	AV	290.00	150	Vertical	Pass
3	3659.600	45.29	-6.81	74.0	-28.71	Peak	167.00	150	Vertical	Pass
3**	3659.600	40.20	-6.81	54.0	-13.80	AV	167.00	150	Vertical	Pass
4	6408.400	52.42	-0.83	84.2	-31.78	Peak	77.00	150	Vertical	Pass
4**	6408.400	42.43	-0.83	84.2	-41.77	AV	77.00	150	Vertical	Pass
5	7350.250	47.34	-3.88	74.0	-26.66	Peak	67.00	150	Vertical	Pass
5**	7350.250	38.82	-3.88	54.0	-15.18	AV	67.00	150	Vertical	Pass
6	9291.850	49.45	-1.31	84.2	-34.75	Peak	172.00	150	Vertical	Pass
6**	9291.850	40.34	-1.31	84.2	-43.86	AV	172.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.500	46.72	-9.99	92.4	-45.68	Peak	147.00	150	Horizontal	Pass
1**	1855.500	41.71	-9.99	92.4	-50.69	AV	147.00	150	Horizontal	Pass
2	2831.000	47.47	-6.43	74.0	-26.53	Peak	334.00	150	Horizontal	Pass
2**	2831.000	35.99	-6.43	54.0	-18.01	AV	334.00	150	Horizontal	Pass
3	3576.200	45.42	-6.81	92.4	-46.98	Peak	69.00	150	Horizontal	Pass
3**	3576.200	35.94	-6.81	92.4	-56.46	AV	69.00	150	Horizontal	Pass
4	5128.000	50.46	-2.25	74.0	-23.54	Peak	205.00	150	Horizontal	Pass
4**	5128.000	41.50	-2.25	54.0	-12.50	AV	205.00	150	Horizontal	Pass
5	6689.200	52.66	-0.26	92.4	-39.74	Peak	181.00	150	Horizontal	Pass
5**	6689.200	44.17	-0.26	92.4	-48.23	AV	181.00	150	Horizontal	Pass
6	8868.850	48.52	-0.81	92.4	-43.88	Peak	235.00	150	Horizontal	Pass
6**	8868.850	40.89	-0.81	92.4	-51.51	AV	235.00	150	Horizontal	Pass

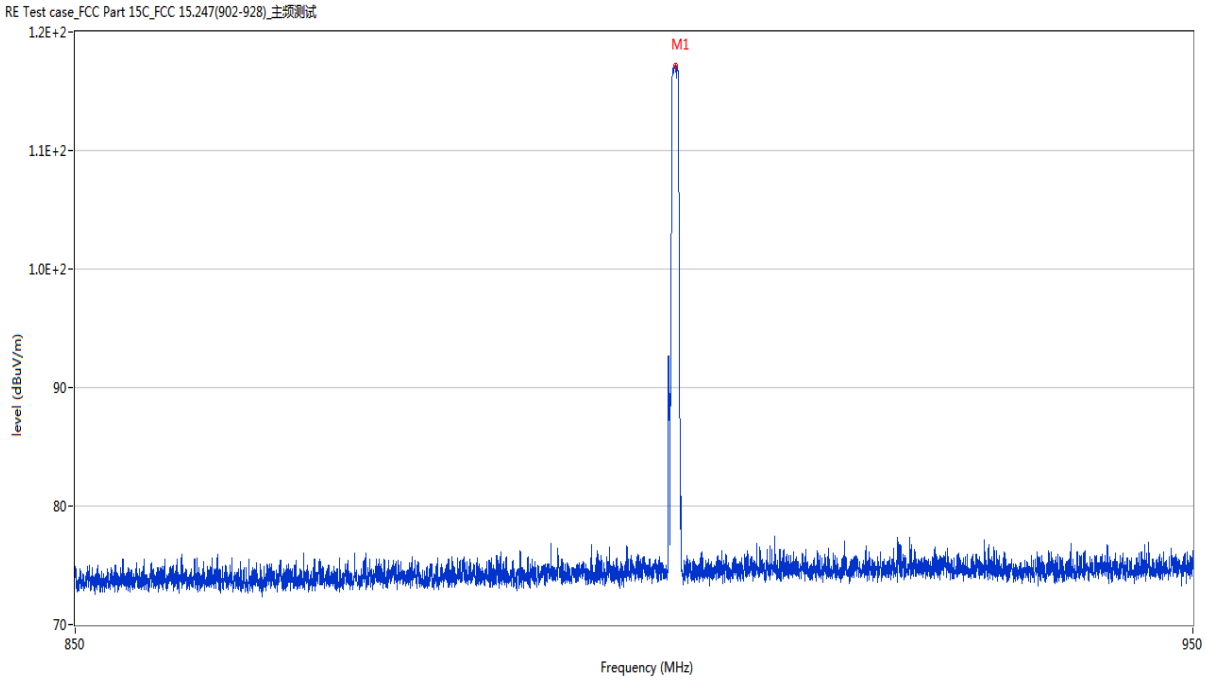
HIGH CHANNEL 1 GHz to 10 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.100	46.71	-9.96	85.2	-38.49	Peak	149.00	150	Vertical	Pass
1**	1855.100	39.11	-9.96	85.2	-46.09	AV	149.00	150	Vertical	Pass
2	2906.000	48.22	-5.26	85.2	-36.98	Peak	212.00	150	Vertical	Pass
2**	2906.000	36.46	-5.26	85.2	-48.74	AV	212.00	150	Vertical	Pass
3	3710.000	46.35	-6.34	74.0	-27.65	Peak	360.00	150	Vertical	Pass
3**	3710.000	35.86	-6.34	54.0	-18.14	AV	360.00	150	Vertical	Pass
4	5119.600	49.95	-2.25	74.0	-24.05	Peak	0.00	150	Vertical	Pass
4**	5119.600	41.83	-2.25	54.0	-12.17	AV	0.00	150	Vertical	Pass
5	6685.800	52.27	-0.19	85.2	-32.93	Peak	86.00	150	Vertical	Pass
5**	6685.800	43.17	-0.19	85.2	-42.03	AV	86.00	150	Vertical	Pass
6	8660.500	48.63	-2.05	85.2	-36.57	Peak	4.00	150	Vertical	Pass
6**	8660.500	38.82	-2.05	85.2	-46.38	AV	4.00	150	Vertical	Pass

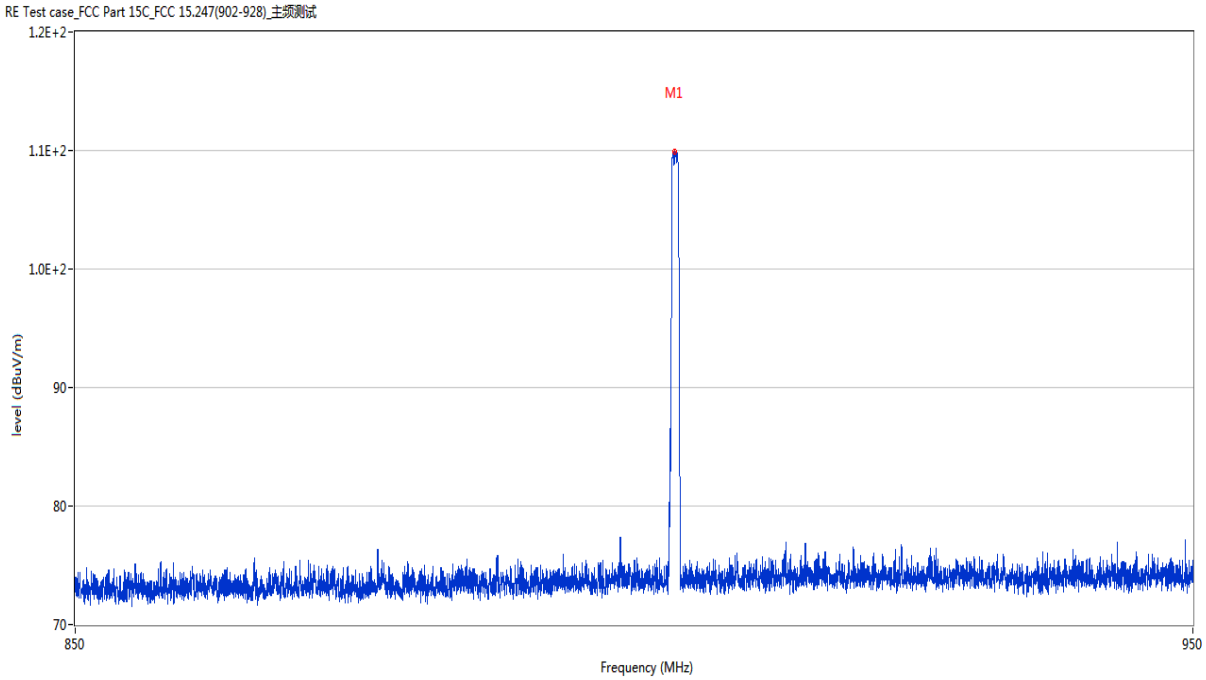
500kHz

LOW CHANNEL, 850 MHz to 950 MHz, ANT H



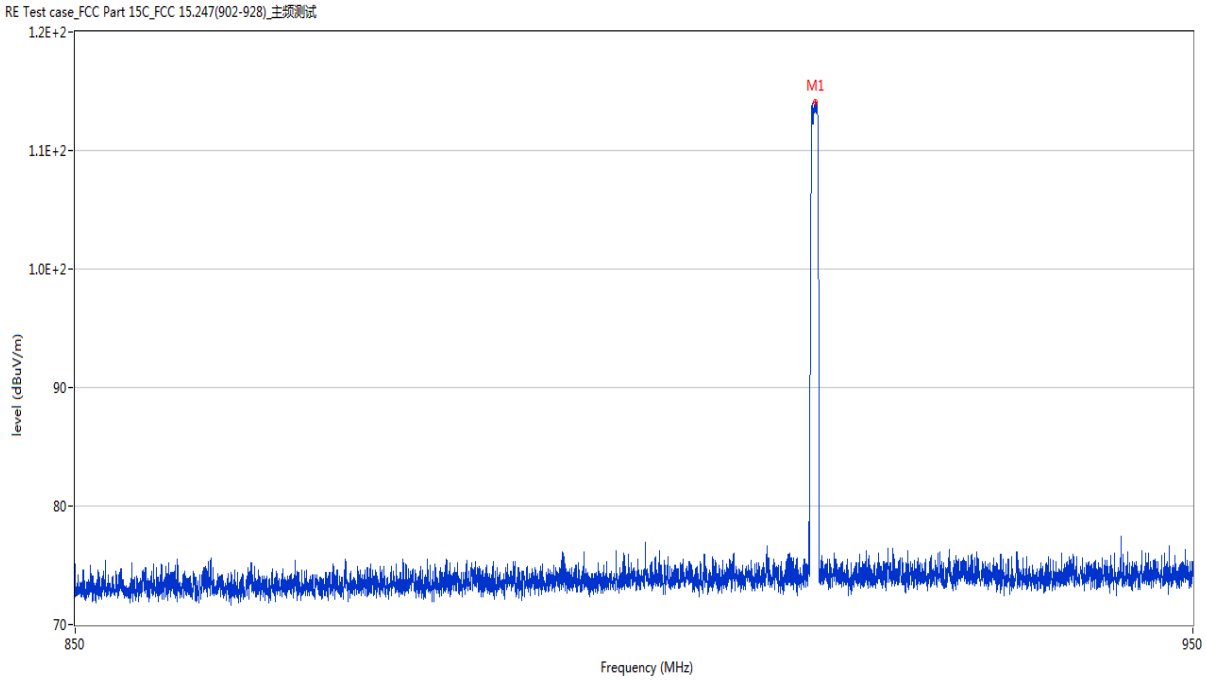
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.890	117.10	30.01	--	--	Peak	134.00	150	Horizontal	N/A

LOW CHANNEL, 850 MHz to 950 MHz, ANT V



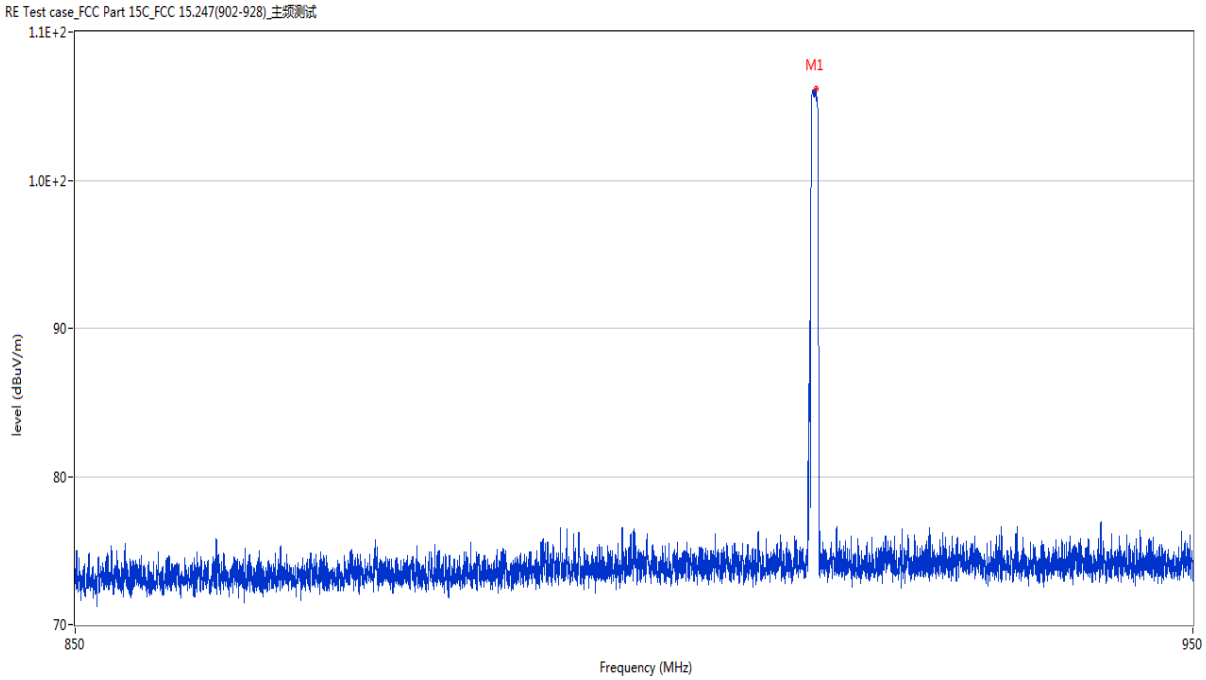
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	902.960	109.94	30.01	--	--	Peak	201.00	150	Vertical	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT H



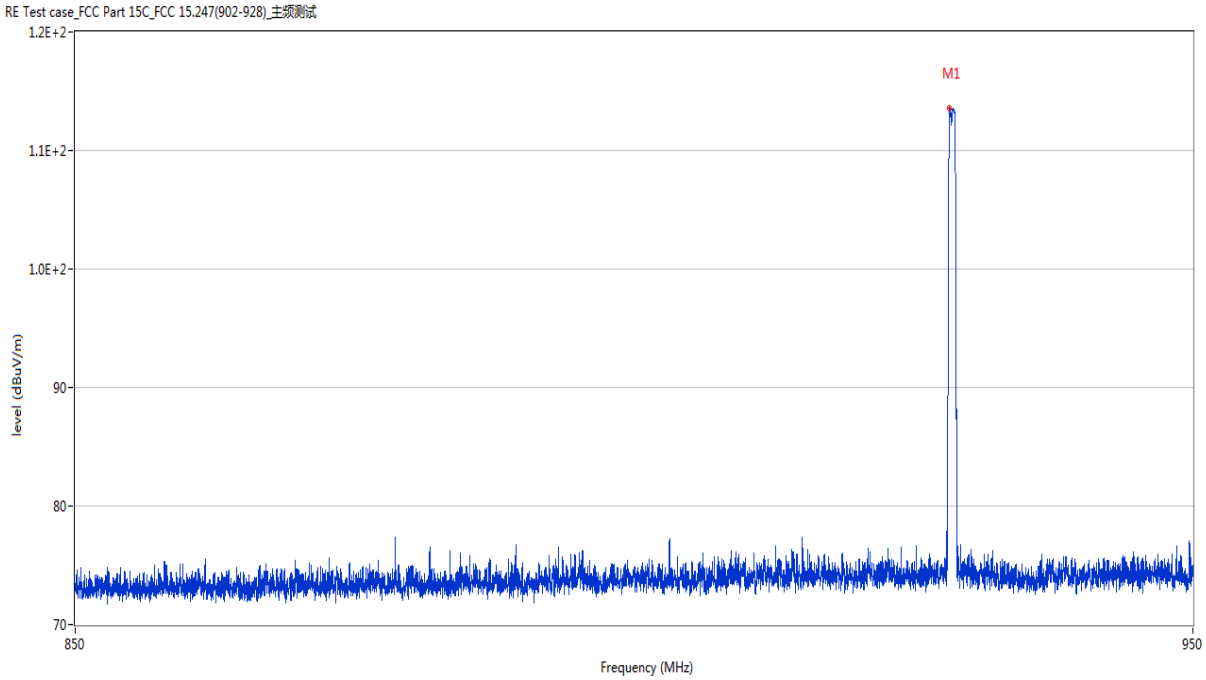
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	915.005	114.07	30.39	--	--	Peak	115.00	150	Horizontal	N/A

MIDDLE CHANNEL, 850 MHz to 950 MHz, ANT V



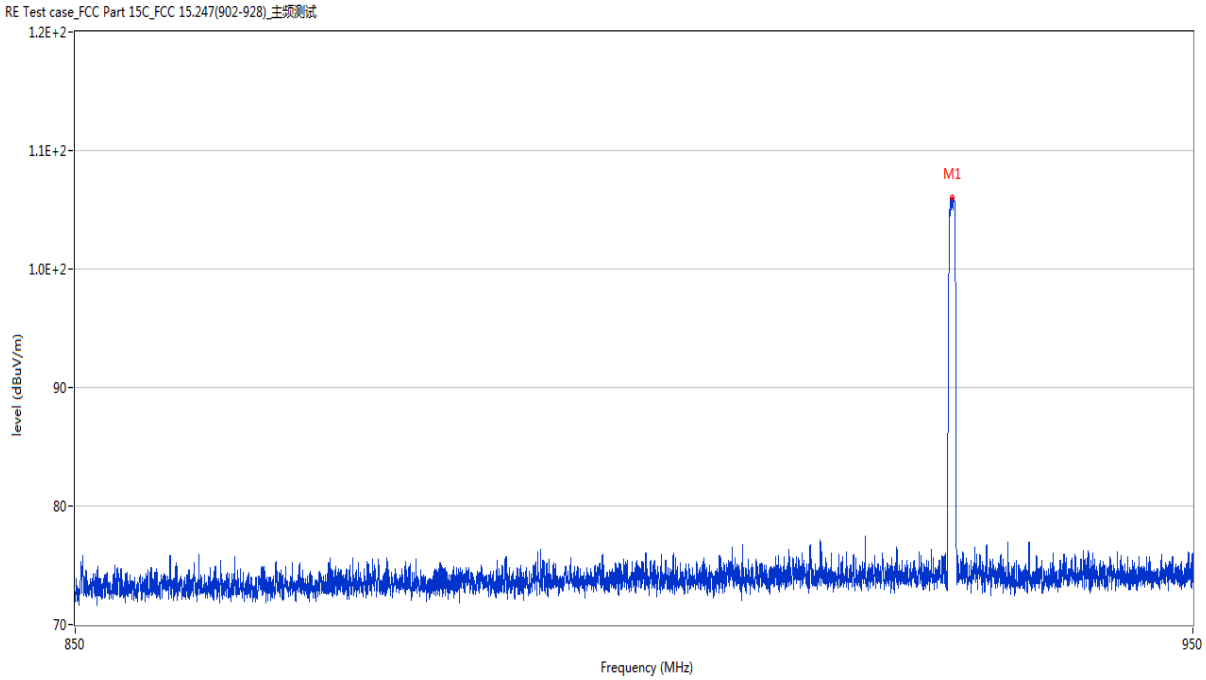
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	915.040	106.13	30.39	--	--	Peak	136.00	150	Vertical	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT H



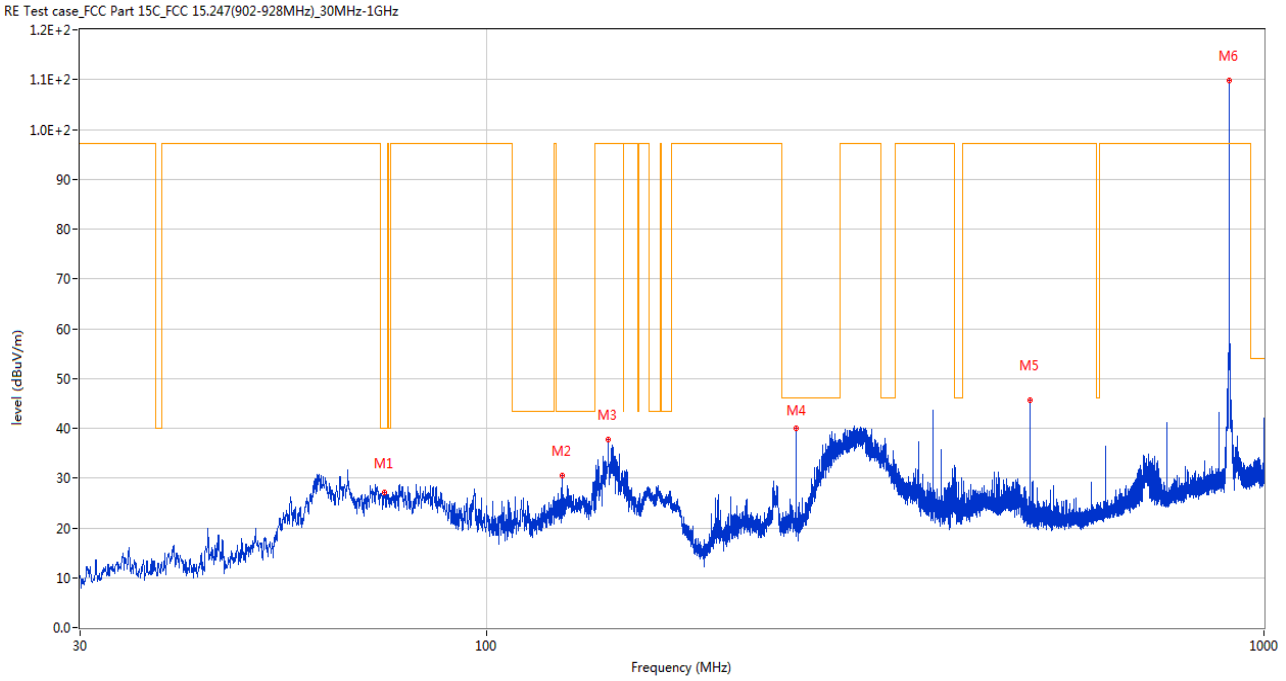
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.270	113.58	30.57	--	--	Peak	116.00	150	Horizontal	N/A

HIGH CHANNEL, 850 MHz to 950 MHz, ANT V



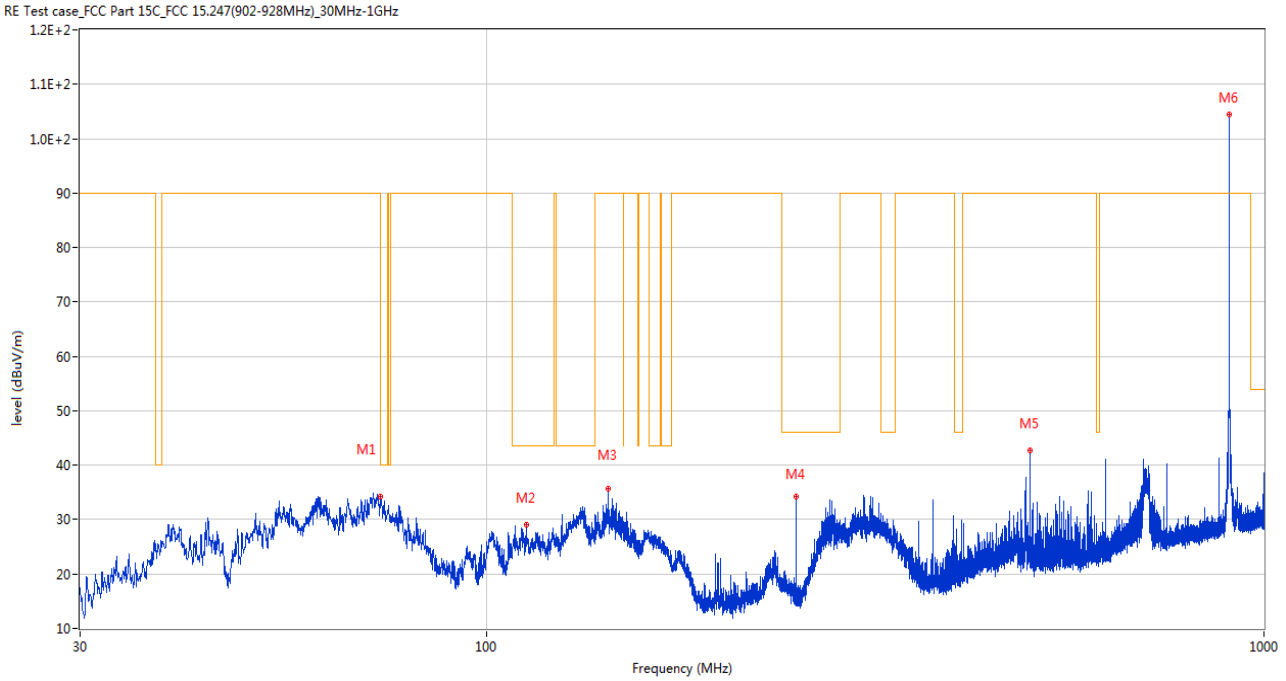
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	927.550	106.03	30.58	--	--	Peak	125.00	150	Vertical	N/A

LOW CHANNEL, ANT H



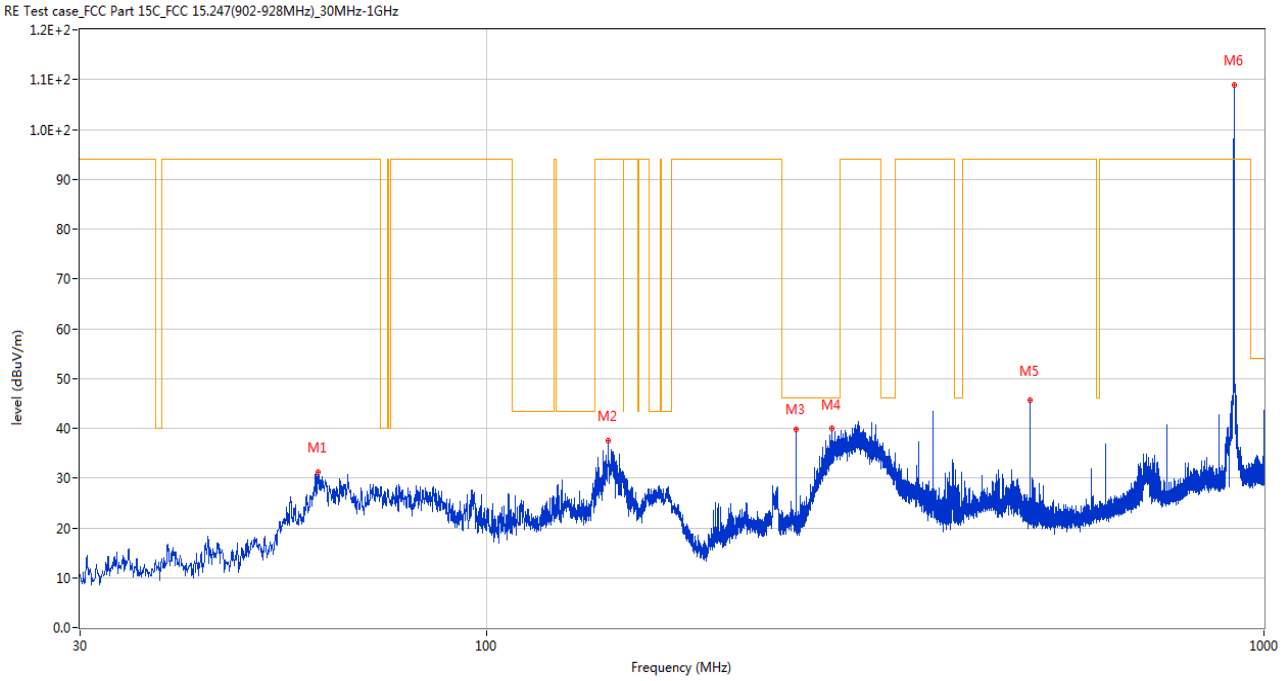
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.941	27.19	-28.87	40.0	-12.81	Peak	14.00	200	Horizontal	Pass
2	125.011	30.44	-26.01	43.5	-13.06	Peak	192.00	100	Horizontal	Pass
3	143.248	37.71	-24.51	97.1	-59.39	Peak	200.00	200	Horizontal	Pass
4	249.996	40.05	-24.63	46.0	-5.95	Peak	258.00	100	Horizontal	Pass
5	500.014	45.72	-16.60	97.1	-51.38	Peak	149.00	100	Horizontal	Pass
6	902.912	109.89	-7.48	97.1	12.79	Peak	185.00	100	Horizontal	N/A

LOW CHANNEL, ANT V



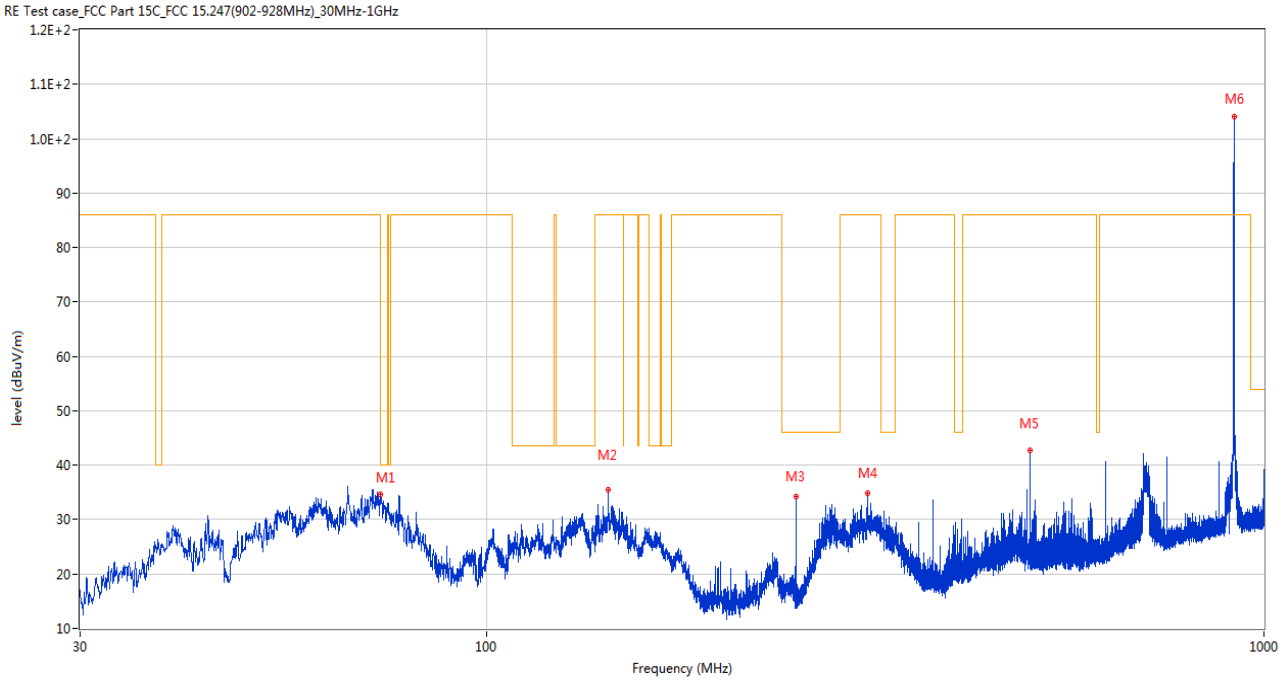
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.117	34.20	-28.71	40.0	-5.80	Peak	113.00	100	Vertical	Pass
2	112.498	29.01	-27.08	43.5	-14.49	Peak	232.00	200	Vertical	Pass
3	143.248	35.71	-24.51	89.9	-54.19	Peak	260.00	200	Vertical	Pass
4	249.996	34.31	-24.63	46.0	-11.69	Peak	301.00	100	Vertical	Pass
5	500.014	42.63	-16.60	89.9	-47.27	Peak	309.00	100	Vertical	Pass
6	902.893	104.39	-7.48	89.9	14.49	Peak	162.00	100	Vertical	N/A

MIDDLE CHANNEL, ANT H



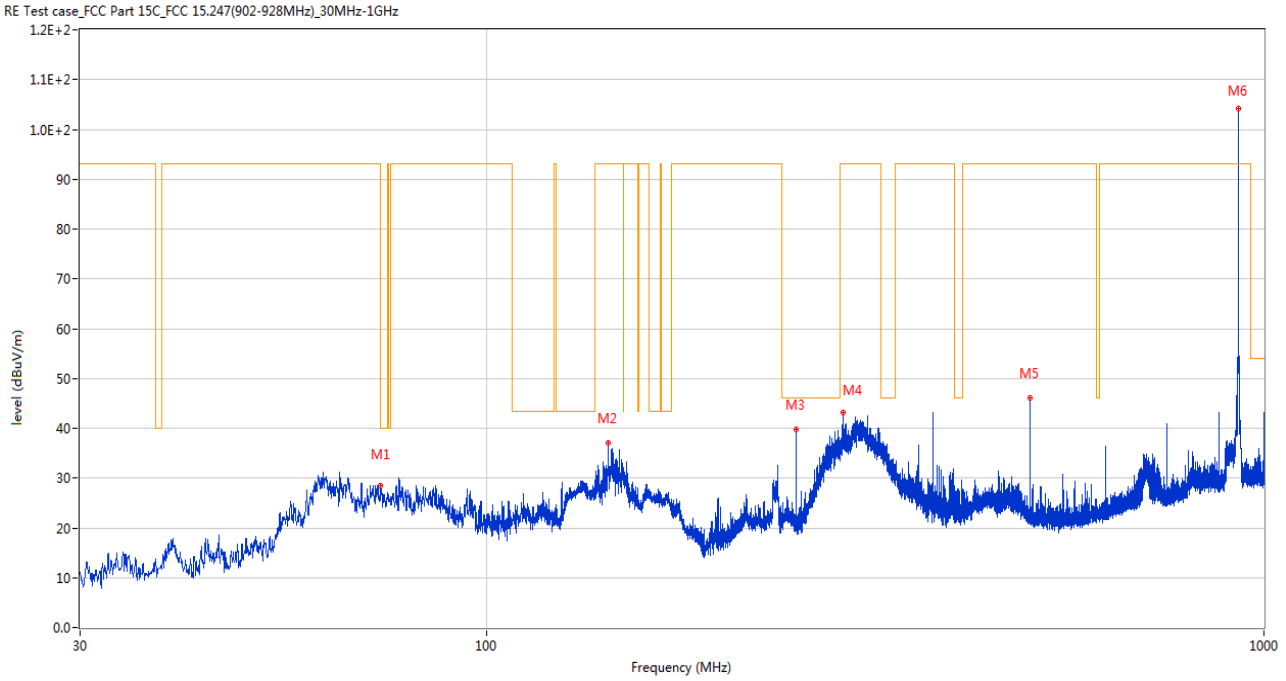
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	60.652	31.10	-26.80	94.1	-63.00	Peak	186.00	100	Horizontal	Pass
2	143.344	37.60	-24.48	94.1	-56.50	Peak	200.00	200	Horizontal	Pass
3	249.996	39.68	-24.63	46.0	-6.32	Peak	264.00	200	Horizontal	Pass
4	278.369	39.98	-23.29	46.0	-6.02	Peak	74.00	100	Horizontal	Pass
5	500.014	45.55	-16.60	94.1	-48.55	Peak	157.00	100	Horizontal	Pass
6	915.125	108.93	-7.16	94.1	14.83	Peak	193.00	100	Horizontal	N/A

MIDDLE CHANNEL, ANT V



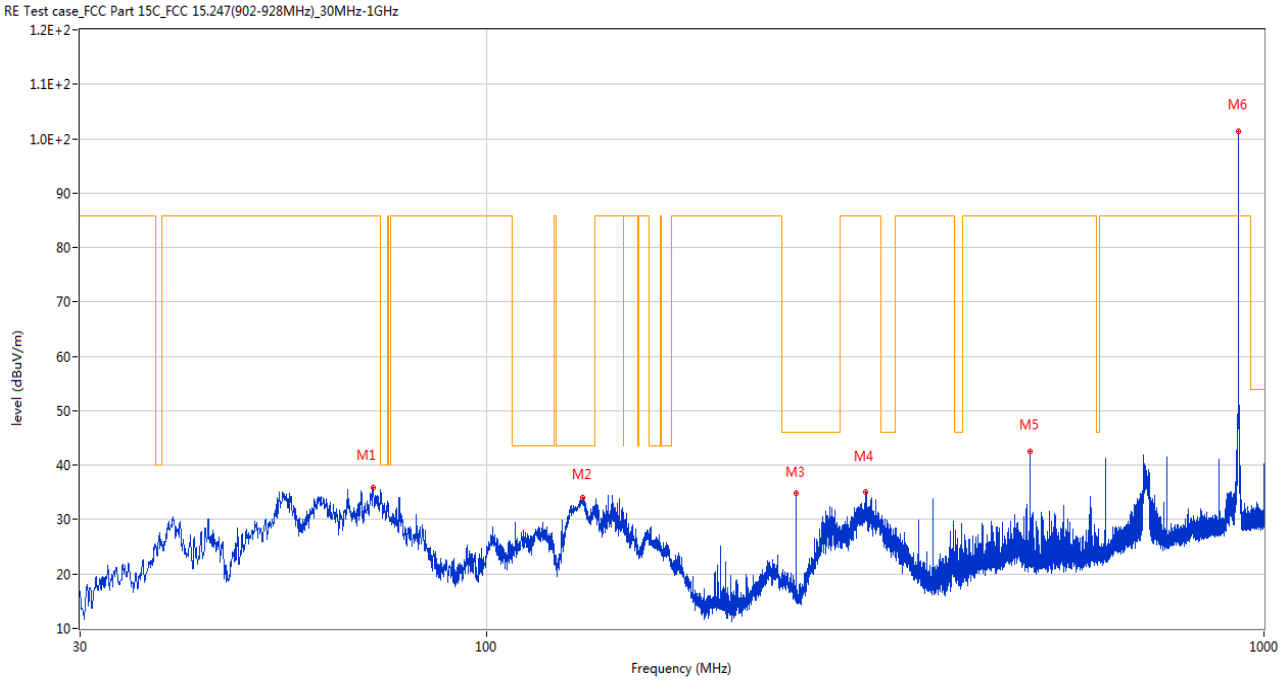
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.117	34.60	-28.71	40.0	-5.40	Peak	133.00	100	Vertical	Pass
2	143.393	35.40	-24.47	86.1	-50.70	Peak	252.00	100	Vertical	Pass
3	249.996	34.15	-24.63	46.0	-11.85	Peak	294.00	200	Vertical	Pass
4	308.972	34.80	-22.19	86.1	-51.30	Peak	182.00	200	Vertical	Pass
5	500.014	42.83	-16.60	86.1	-43.27	Peak	245.00	100	Vertical	Pass
6	915.125	103.99	-7.16	86.1	17.89	Peak	154.00	100	Vertical	N/A

HIGH CHANNEL, ANT H



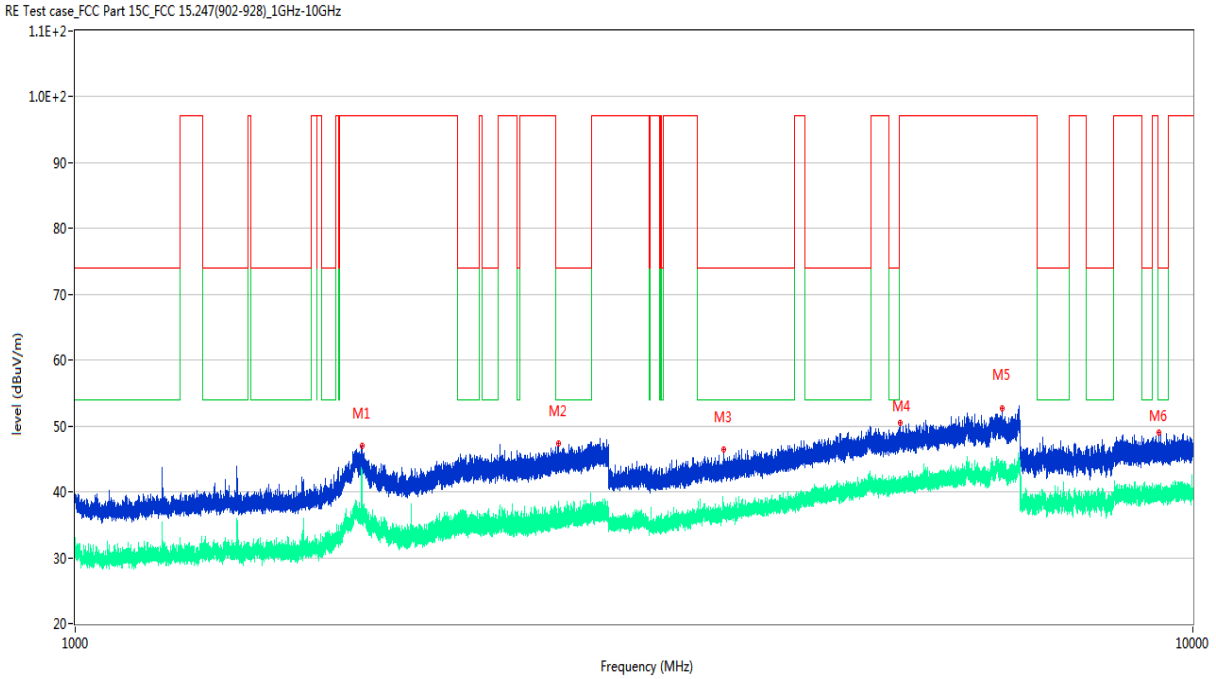
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	73.117	28.37	-28.71	40.0	-11.63	Peak	17.00	100	Horizontal	Pass
2	143.344	37.15	-24.48	93.6	-55.85	Peak	195.00	100	Horizontal	Pass
3	250.044	39.72	-24.63	46.0	-6.28	Peak	0.00	200	Horizontal	Pass
4	287.874	43.16	-22.49	93.6	-49.84	Peak	92.00	100	Horizontal	Pass
5	500.014	46.05	-16.60	93.6	-46.95	Peak	160.00	100	Horizontal	Pass
6	927.250	104.29	-7.33	93.6	11.29	Peak	223.00	100	Horizontal	N/A

HIGH CHANNEL, ANT V



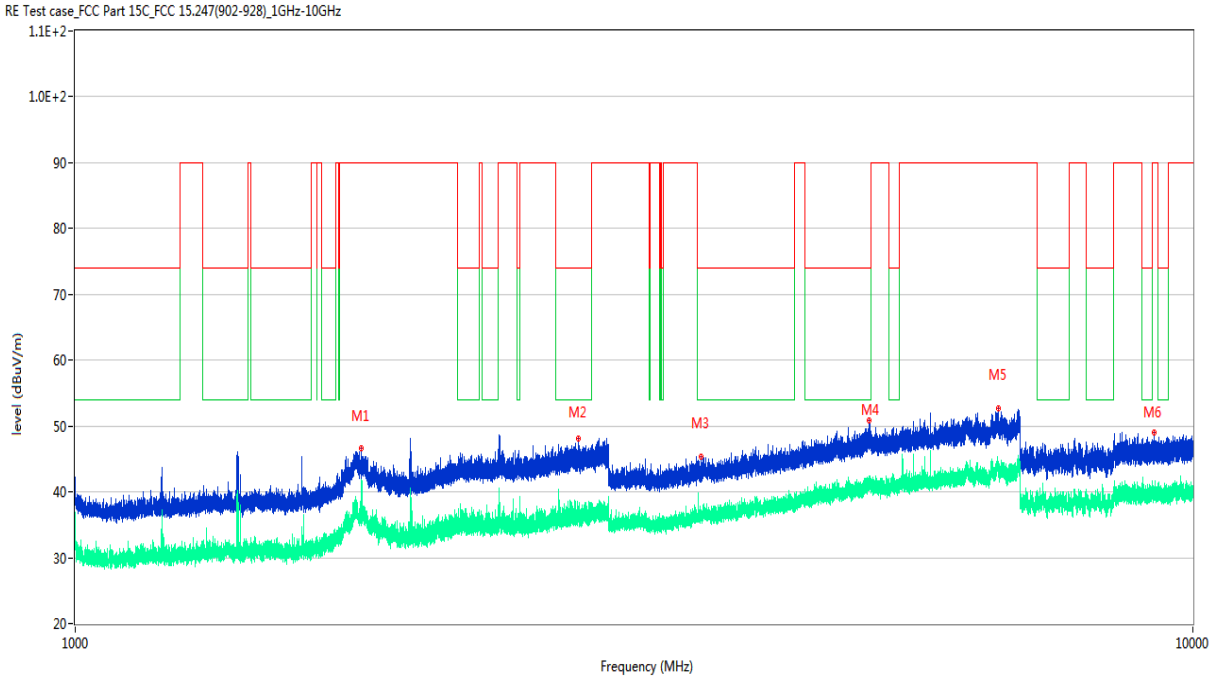
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	71.419	35.94	-28.52	86	-49.96	Peak	104.00	100	Vertical	Pass
2	133.014	34.05	-25.04	43.5	-9.45	Peak	63.00	100	Vertical	Pass
3	249.996	34.80	-24.63	46.0	-11.20	Peak	282.00	200	Vertical	Pass
4	307.759	35.13	-22.09	86	-50.77	Peak	153.00	100	Vertical	Pass
5	500.014	42.53	-16.60	86	-43.37	Peak	255.00	200	Vertical	Pass
6	927.250	101.41	-7.33	86	15.51	Peak	146.00	100	Vertical	N/A

LOW CHANNEL 1 GHz to 10 GHz, ANT H



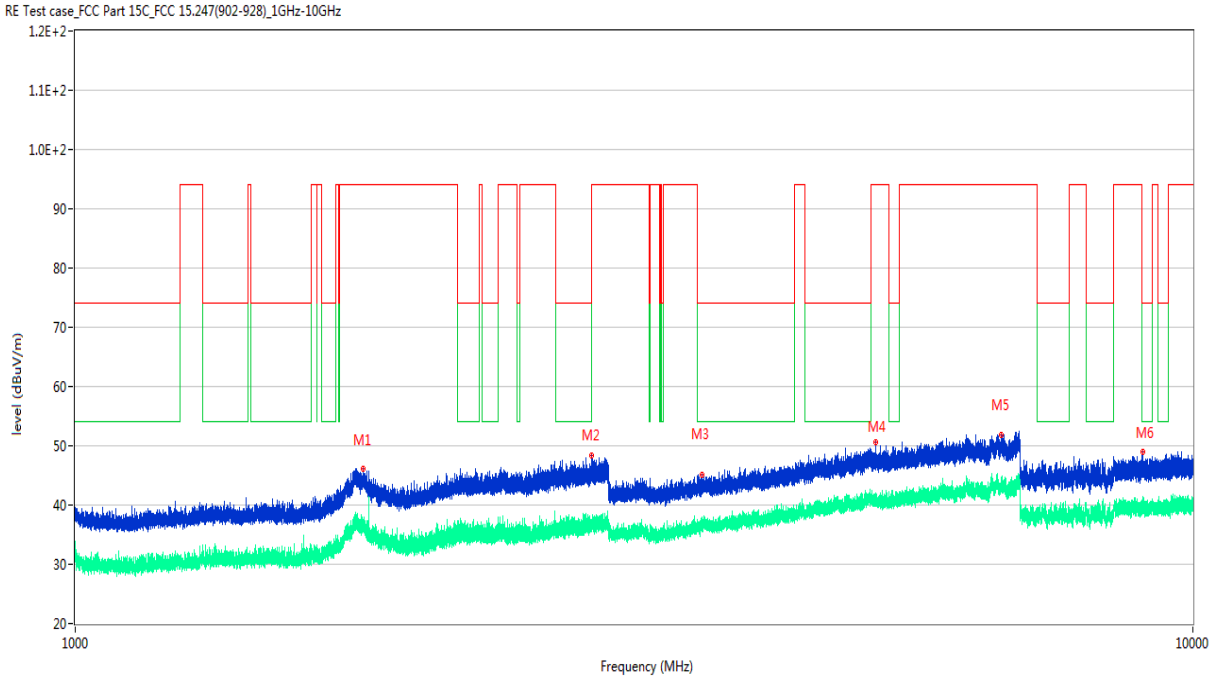
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.700	46.94	-8.73	97.1	-50.16	Peak	238.00	150	Horizontal	Pass
1**	1804.700	42.56	-8.73	97.1	-54.54	AV	238.00	150	Horizontal	Pass
2	2707.700	47.37	-7.47	74.0	-26.63	Peak	67.00	150	Horizontal	Pass
2**	2707.700	37.21	-7.47	54.0	-16.79	AV	67.00	150	Horizontal	Pass
3	3805.400	46.47	-5.53	74.0	-27.53	Peak	212.00	150	Horizontal	Pass
3**	3805.400	36.91	-5.53	54.0	-17.09	AV	212.00	150	Horizontal	Pass
4	5471.000	50.45	-2.12	97.1	-46.65	Peak	94.00	150	Horizontal	Pass
4**	5471.000	41.56	-2.12	97.1	-55.54	AV	94.00	150	Horizontal	Pass
5	6750.400	52.62	-0.68	97.1	-44.48	Peak	313.00	150	Horizontal	Pass
5**	6750.400	42.98	-0.68	97.1	-54.12	AV	313.00	150	Horizontal	Pass
6	9328.151	48.93	-1.18	74.0	-25.07	Peak	119.00	150	Horizontal	Pass
6**	9328.151	40.10	-1.18	54.0	-13.90	AV	119.00	150	Horizontal	Pass

LOW CHANNEL 1 GHz to 10 GHz, ANT H



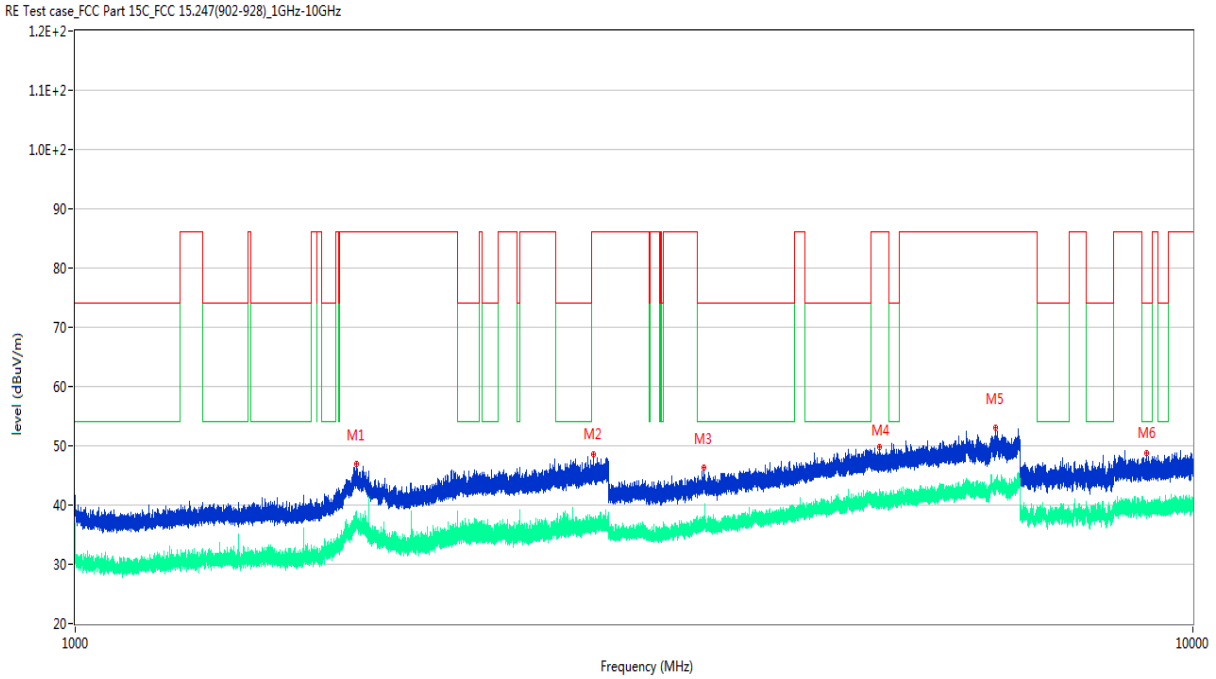
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1804.300	46.55	-8.74	89.9	-43.35	Peak	298.00	150	Vertical	Pass
1**	1804.300	39.99	-8.74	89.9	-49.91	AV	298.00	150	Vertical	Pass
2	2820.800	48.08	-6.27	74.0	-25.92	Peak	57.00	150	Vertical	Pass
2**	2820.800	36.76	-6.27	54.0	-17.24	AV	57.00	150	Vertical	Pass
3	3629.600	45.43	-7.17	74.0	-28.57	Peak	284.00	150	Vertical	Pass
3**	3629.600	37.09	-7.17	54.0	-16.91	AV	284.00	150	Vertical	Pass
4	5133.000	50.84	-2.25	74.0	-23.16	Peak	72.00	150	Vertical	Pass
4**	5133.000	42.40	-2.25	54.0	-11.60	AV	72.00	150	Vertical	Pass
5	6693.200	52.77	-0.32	89.9	-37.13	Peak	235.00	150	Vertical	Pass
5**	6693.200	43.15	-0.32	89.9	-46.75	AV	235.00	150	Vertical	Pass
6	9241.150	48.95	-1.25	89.9	-40.95	Peak	239.00	150	Vertical	Pass
6**	9241.150	40.72	-1.25	89.9	-49.18	AV	239.00	150	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT H



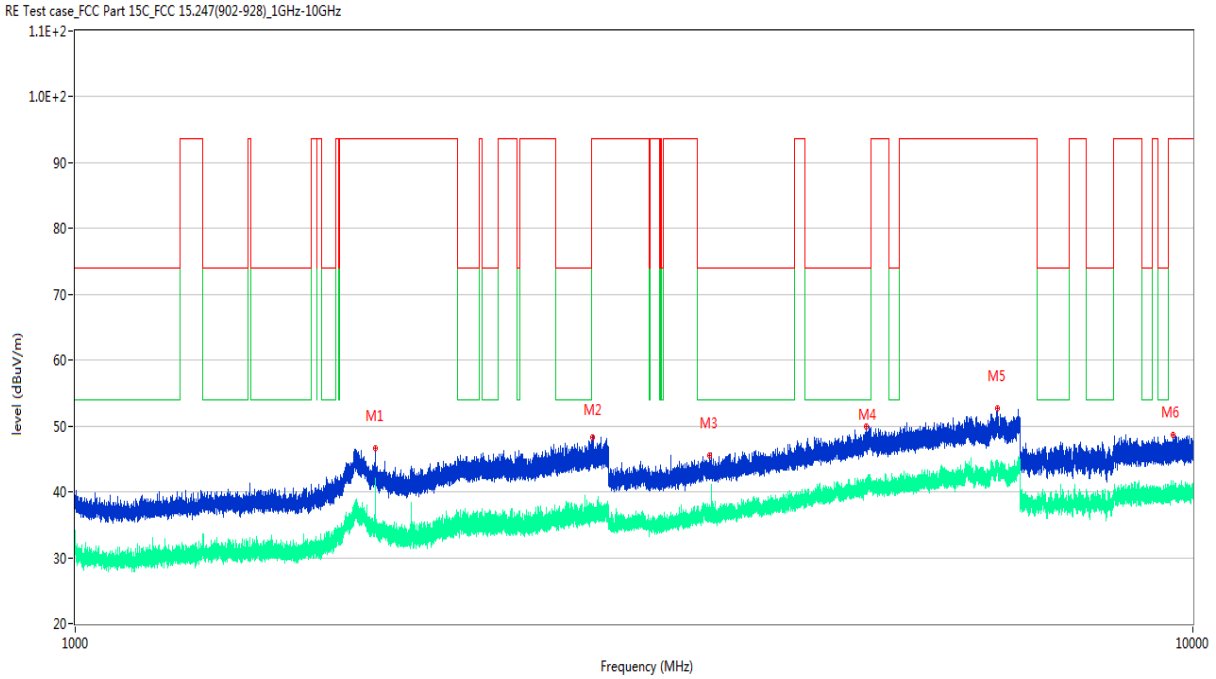
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1809.900	46.11	-8.57	94.1	-47.99	Peak	68.00	150	Horizontal	Pass
1**	1809.900	36.49	-8.57	94.1	-57.61	AV	68.00	150	Horizontal	Pass
2	2897.800	48.38	-5.62	74.0	-25.62	Peak	53.00	150	Horizontal	Pass
2**	2897.800	36.72	-5.62	54.0	-17.28	AV	53.00	150	Horizontal	Pass
3	3634.400	45.06	-6.84	74.0	-28.94	Peak	71.00	150	Horizontal	Pass
3**	3634.400	36.85	-6.84	54.0	-17.15	AV	71.00	150	Horizontal	Pass
4	5201.400	50.55	-2.60	94.1	-43.55	Peak	157.00	150	Horizontal	Pass
4**	5201.400	41.03	-2.60	94.1	-53.07	AV	157.00	150	Horizontal	Pass
5	6736.200	51.89	-0.36	94.1	-42.21	Peak	309.00	150	Horizontal	Pass
5**	6736.200	43.38	-0.36	94.1	-50.72	AV	309.00	150	Horizontal	Pass
6	9019.450	49.02	-0.49	74.0	-24.98	Peak	210.00	150	Horizontal	Pass
6**	9019.450	38.85	-0.49	54.0	-15.15	AV	210.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT V



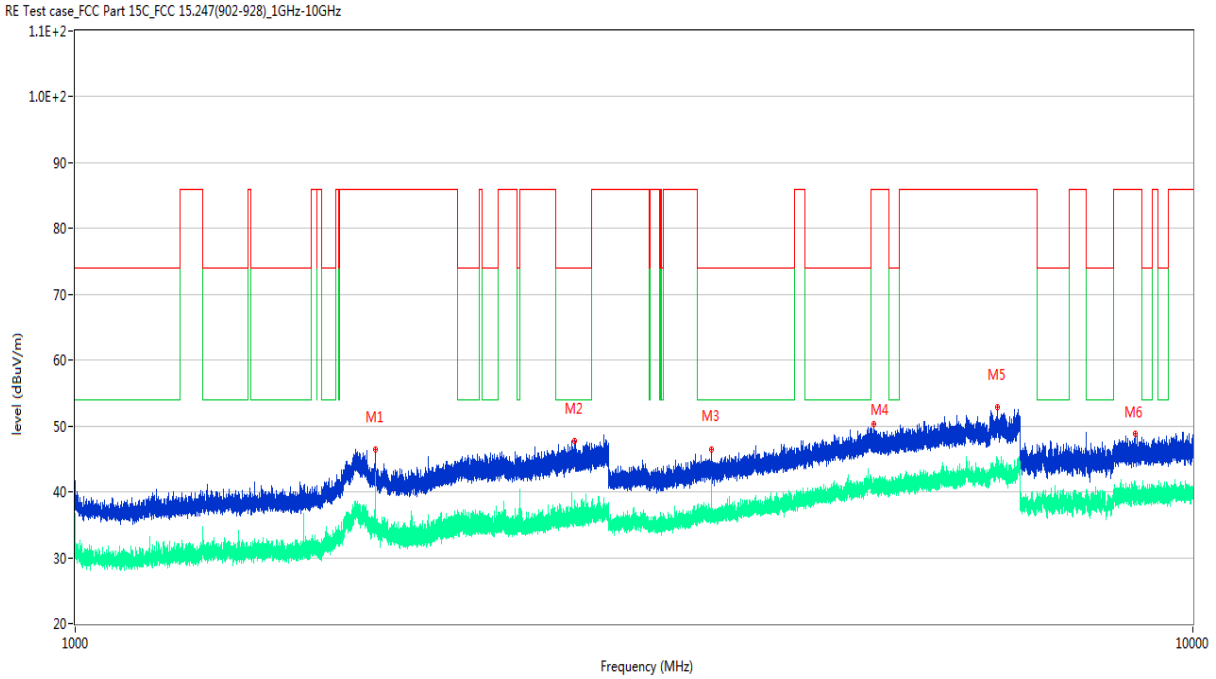
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1783.500	46.91	-7.79	86.1	-39.19	Peak	332.00	150	Vertical	Pass
1**	1783.500	36.34	-7.79	86.1	-49.76	AV	332.00	150	Vertical	Pass
2	2906.000	48.52	-5.26	86.1	-37.58	Peak	323.00	150	Vertical	Pass
2**	2906.000	37.60	-5.26	86.1	-48.50	AV	323.00	150	Vertical	Pass
3	3651.400	46.24	-6.23	74.0	-27.76	Peak	252.00	150	Vertical	Pass
3**	3651.400	36.22	-6.23	54.0	-17.78	AV	252.00	150	Vertical	Pass
4	5240.400	49.71	-2.70	86.1	-36.39	Peak	54.00	150	Vertical	Pass
4**	5240.400	40.55	-2.70	86.1	-45.55	AV	54.00	150	Vertical	Pass
5	6665.400	53.02	-0.87	86.1	-33.08	Peak	338.00	150	Vertical	Pass
5**	6665.400	42.12	-0.87	86.1	-43.98	AV	338.00	150	Vertical	Pass
6	9093.850	48.68	-1.27	74.0	-25.32	Peak	133.00	150	Vertical	Pass
6**	9093.850	39.32	-1.27	54.0	-14.68	AV	133.00	150	Vertical	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1854.800	46.60	-9.97	93.6	-47.00	Peak	82.00	150	Horizontal	Pass
1**	1854.800	40.96	-9.97	93.6	-52.64	AV	82.00	150	Horizontal	Pass
2	2900.800	48.27	-5.41	93.6	-45.33	Peak	106.00	150	Horizontal	Pass
2**	2900.800	37.47	-5.41	93.6	-56.13	AV	106.00	150	Horizontal	Pass
3	3693.800	45.48	-5.90	74.0	-28.52	Peak	34.00	150	Horizontal	Pass
3**	3693.800	37.23	-5.90	54.0	-16.77	AV	34.00	150	Horizontal	Pass
4	5100.800	49.95	-2.51	74.0	-24.05	Peak	352.00	150	Horizontal	Pass
4**	5100.800	40.14	-2.51	54.0	-13.86	AV	352.00	150	Horizontal	Pass
5	6681.000	52.72	-0.52	93.6	-40.88	Peak	327.00	150	Horizontal	Pass
5**	6681.000	43.30	-0.52	93.6	-50.30	AV	327.00	150	Horizontal	Pass
6	9597.550	48.59	0.02	93.6	-45.01	Peak	257.00	150	Horizontal	Pass
6**	9597.550	39.80	0.02	93.6	-53.80	AV	257.00	150	Horizontal	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1855.100	46.42	-9.96	86.0	-39.58	Peak	155.00	150	Vertical	Pass
1**	1855.100	42.95	-9.96	86.0	-43.05	AV	155.00	150	Vertical	Pass
2	2799.600	47.71	-6.25	74.0	-26.29	Peak	360.00	150	Vertical	Pass
2**	2799.600	35.85	-6.25	54.0	-18.15	AV	360.00	150	Vertical	Pass
3	3710.800	46.51	-6.39	74.0	-27.49	Peak	302.00	150	Vertical	Pass
3**	3710.800	40.97	-6.39	54.0	-13.03	AV	302.00	150	Vertical	Pass
4	5186.800	50.27	-2.74	86.0	-35.73	Peak	189.00	150	Vertical	Pass
4**	5186.800	41.37	-2.74	86.0	-44.63	AV	189.00	150	Vertical	Pass
5	6689.000	52.86	-0.26	86.0	-33.14	Peak	5.00	150	Vertical	Pass
5**	6689.000	43.91	-0.26	86.0	-42.09	AV	5.00	150	Vertical	Pass
6	8878.900	48.91	-0.82	86.0	-37.09	Peak	170.00	150	Vertical	Pass
6**	8878.900	40.40	-0.82	86.0	-45.60	AV	170.00	150	Vertical	Pass

A.8 Band Edge (Restricted-band band-edge)

Note [1]: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.
Note [2]: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.
Note [3]: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.
Note [4]: The Level (dBuV/m) has been corrected by factor.

Main Antenna

Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Factor (dB)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
LORA (125kHz)	Low	614	42.198	3.16	74	31.802	PEAK	Pass
		614	N/A	N/A	54	N/A	AVERAGE	Pass
LORA (125kHz)	HIGH	960	47.357	28.00	74	26.643	PEAK	Pass
		960	N/A	N/A	54	N/A	AVERAGE	Pass
LORA (500kHz)	Low	614	42.218	3.16	74	31.782	PEAK	Pass
		614	N/A	N/A	54	N/A	AVERAGE	Pass
LORA (500kHz)	HIGH	960	47.464	28.00	74	26.536	PEAK	Pass
		960	N/A	N/A	54	N/A	AVERAGE	Pass

Aux. Antenna

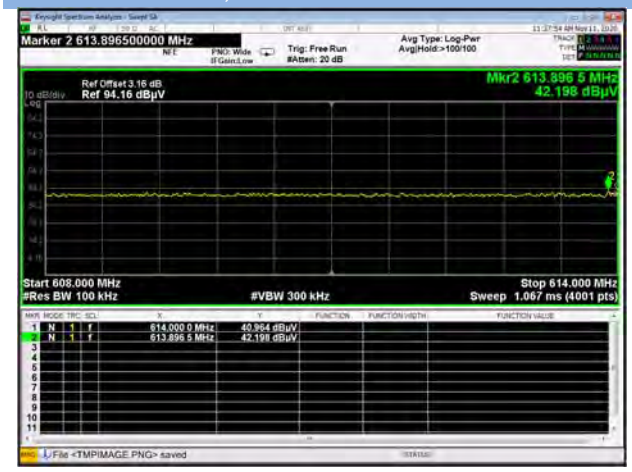
Test Mode	Test Channel	Frequency (MHz)	Level (dBuV/m)	Factor (dB)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
LORA (125kHz)	Low	614	42.022	3.16	74	31.978	PEAK	Pass
		614	N/A	N/A	54	N/A	AVERAGE	Pass
LORA (125kHz)	HIGH	960	47.953	28.00	74	26.047	PEAK	Pass
		960	N/A	N/A	54	N/A	AVERAGE	Pass
LORA (500kHz)	Low	614	42.154	3.16	74	31.846	PEAK	Pass
		614	N/A	N/A	54	N/A	AVERAGE	Pass
LORA (500kHz)	HIGH	960	48.323	28.00	74	25.677	PEAK	Pass
		960	N/A	N/A	54	N/A	AVERAGE	Pass

Test Plots

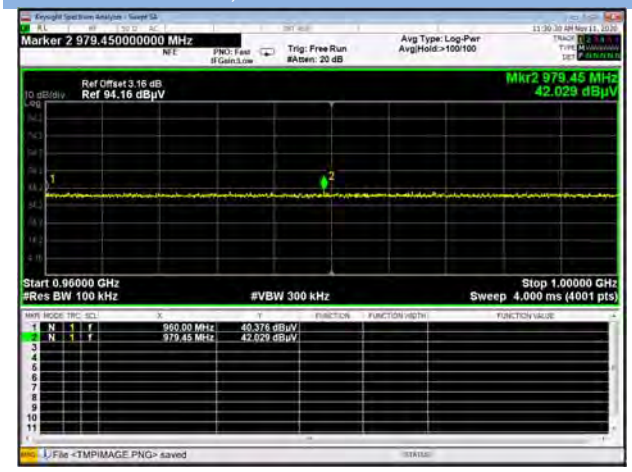
Main Antenna

125kHz

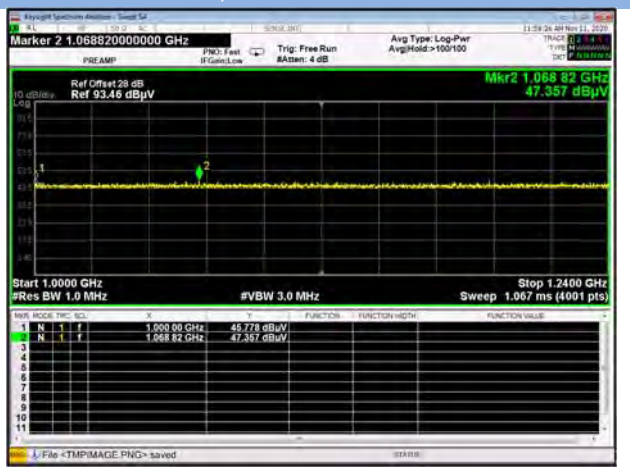
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK

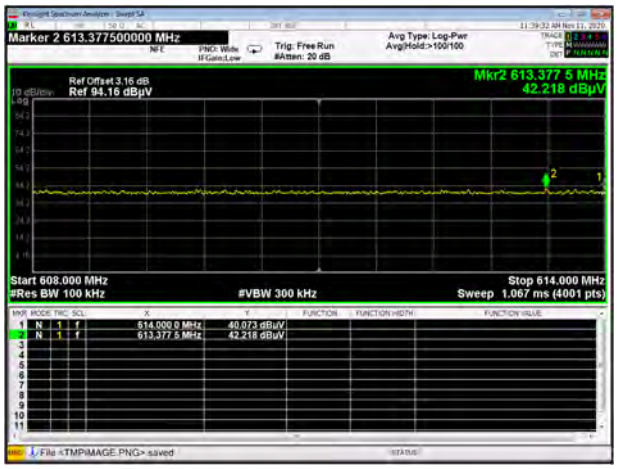


HIGH CHANNEL, PEAK

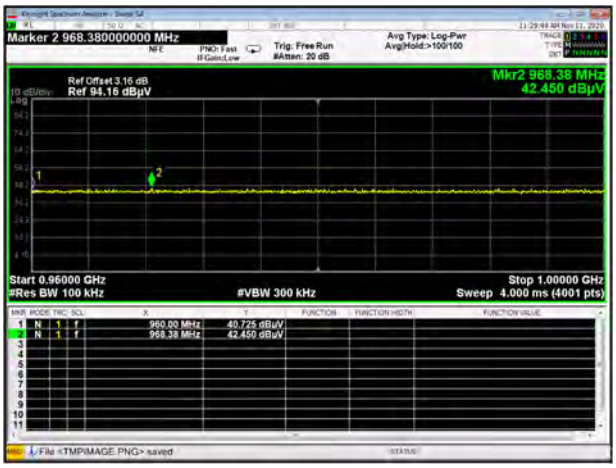


500kHz

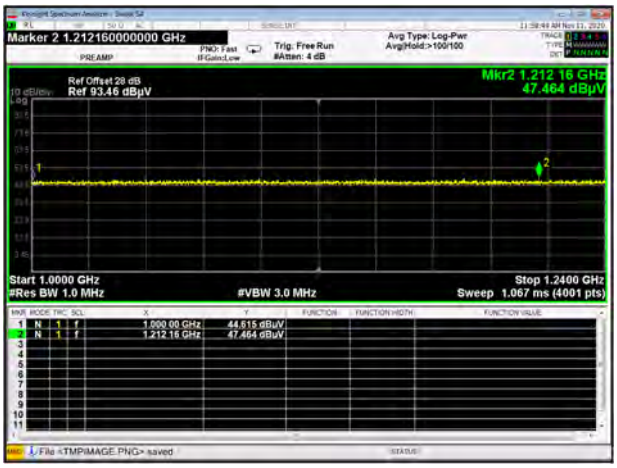
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK



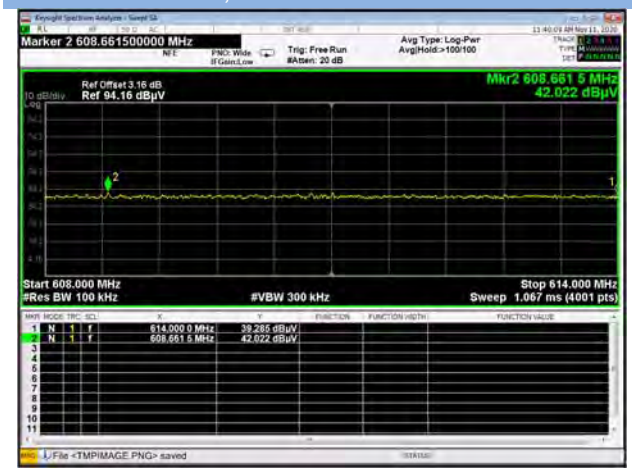
HIGH CHANNEL, PEAK



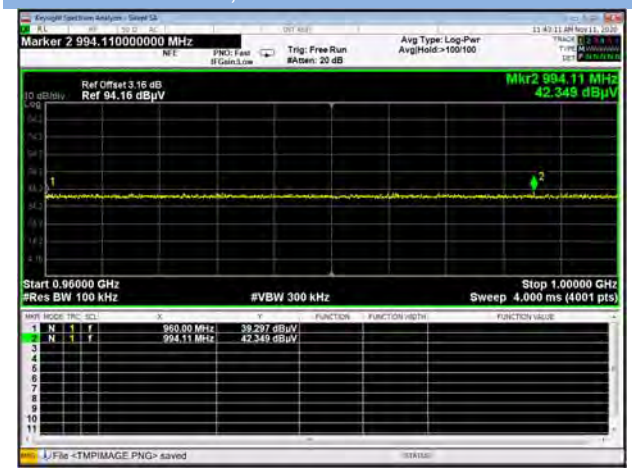
Aux. Antenna

125kHz

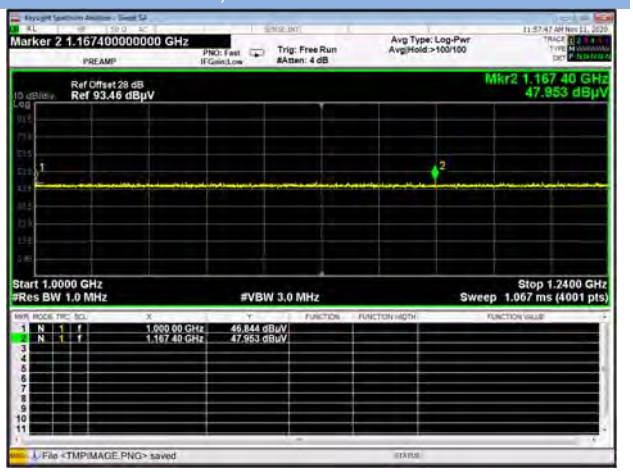
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK

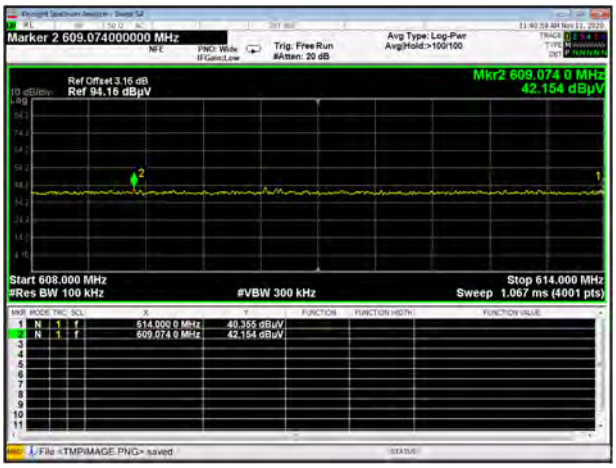


HIGH CHANNEL, PEAK

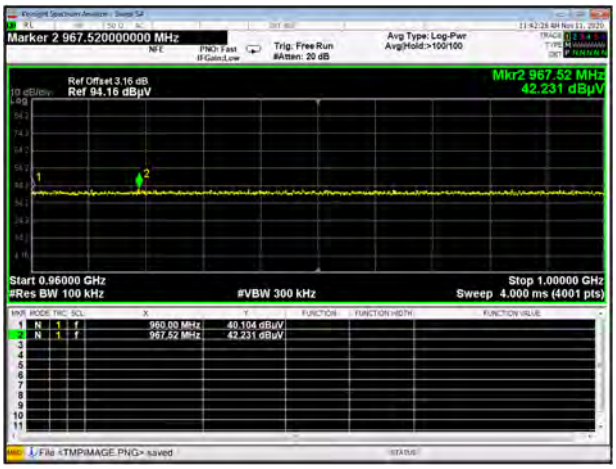


500kHz

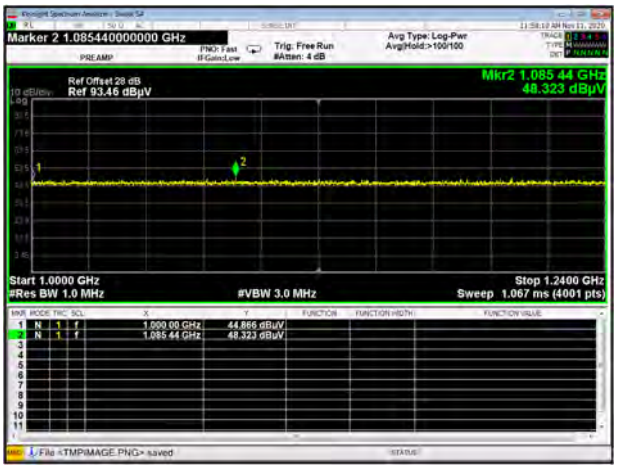
LOW CHANNEL, PEAK



HIGH CHANNEL, PEAK



HIGH CHANNEL, PEAK



A.9 Power Spectral Density (PSD)

Test Data

500KHz

Main Antenna

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low Channel	5.54	8	Pass
Middle Channel	3.65	8	Pass
High Channel	2.83	8	Pass

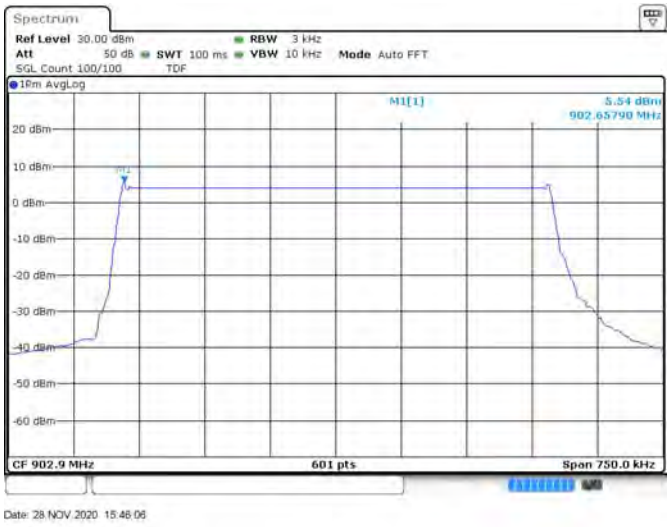
Aux. Antenna

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low Channel	5.25	8	Pass
Middle Channel	3.93	8	Pass
High Channel	3.65	8	Pass

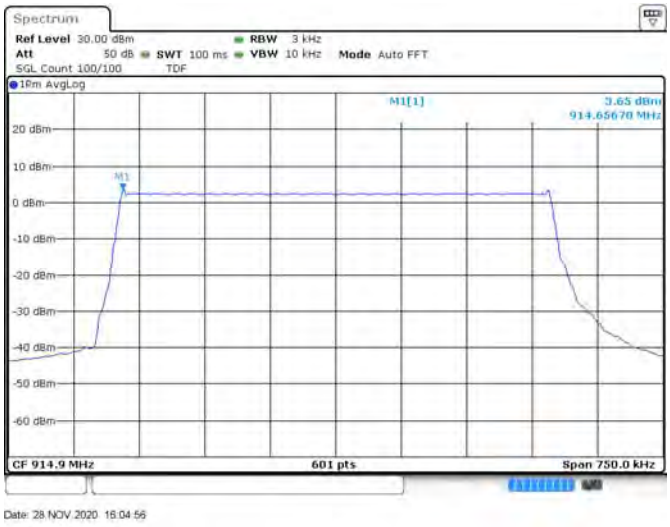
Test plots

Main Antenna

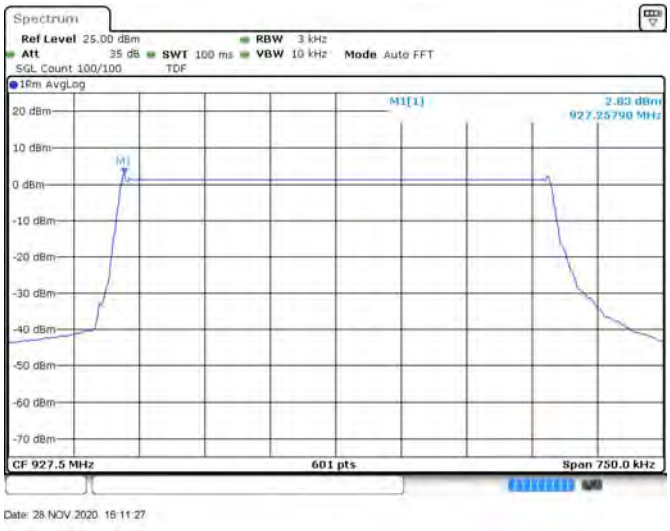
LOW CHANNEL



MIDDLE CHANNEL

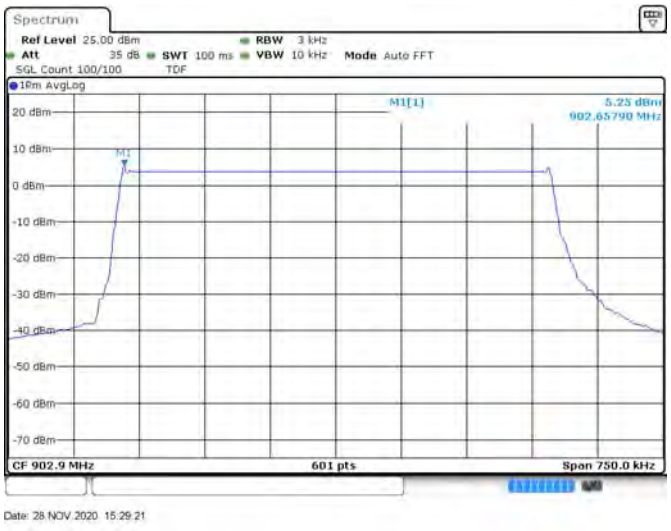


HIGH CHANNEL

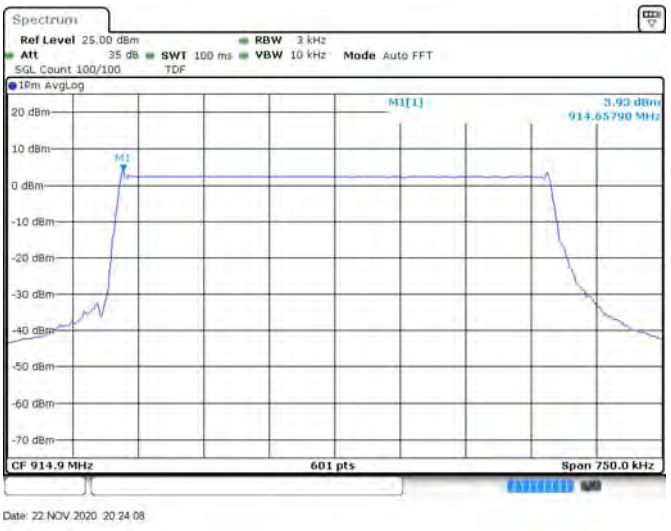


Aux. Antenna

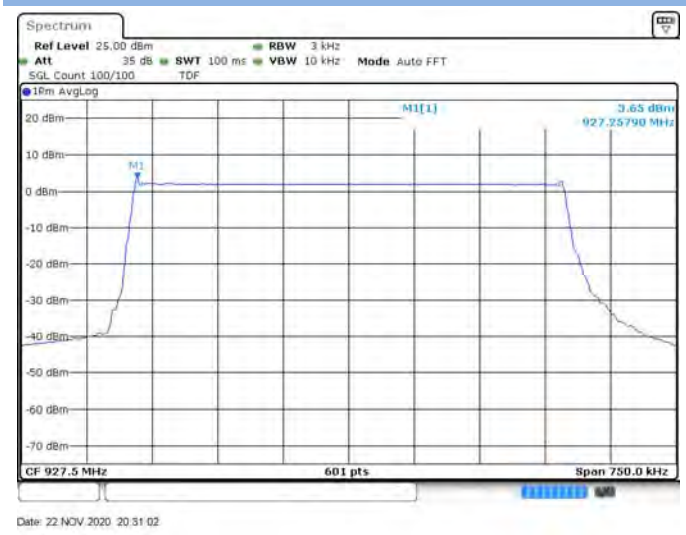
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2080345-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2080345-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2080345-AI.PDF”.

--END OF REPORT--