

## RAPPORTO DI PROVA

### TEST REPORT

Rif. / Ref. n.	<b>FCCTR_174134-1</b>	Data / Date:	<b>13/11/2018</b>	Pagine / Pages:	<b>66</b>
Scopo delle prove Test object	Prove di tipo in accordo alla Norma Type test according to standards <b>47 CFR FCC part 15.247</b>				
Richiedente Applicant	<b>Paradox Engineering SA</b> Via Passeggiata 7 – 6883 Novazzano – CH Tel.: +41912330100				
Marchio commerciale Trade mark					
Fabbricante Manufacturer	<b>MinabeaMitsumi Inc.</b> 3-9-6 Mita, Minato-ku, Tokyo 108-8330 Tel.: 81-3-6758-6711				
Prodotto Product	Gateway for wireless IoT integrated network solution for smart urban networks				
Modello testato Testing model	<b>AR41004 US (PE Smart Gateway Neptune US)</b>				
Identificativo FCC FCC ID	<b>2AKPQAR41004</b>				
Data ricevimento campioni Date of test samples receipt	10/07/2018				
Campioni verificati No. of tested samples	1 – Sample by the applicant				
Data verifiche Testing date	10-23/07/2018				
Sito di prova Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Esito delle valutazioni Assessment results	<b>CONFORME / COMPLIANT</b>				
Verifiche effettuate da Verifications carried out by	<b>Daniele AOSANI</b> Tecnico laboratorio EMC & RADIO EMC & RADIO Test Engineer				
Approvato Approved by	<b>Riccardo PFEIFFER</b> Responsabile laboratori EMC & RADIO EMC & RADIO Laboratory manager				

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati.

The test results reported in this test report shall refer only to the samples tested.

Questo Report non può essere riprodotto in modo parziale, salvo espressa autorizzazione scritta da parte del Laboratorio

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## 0. RELEASE CONTROL RECORD


TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_174134-1	Original Release	13/11/2018

## 1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

### 1.1 EUT Identification

DESCRIPTION	Gateway for wireless IoT integrated network solution for smart urban networks
MODEL NAME	AR41004 US (PE Smart Gateway Neptune US)
SERIAL NO.	Prototype
TRADEMARK	 <i>Passion to Create Value through Difference</i>
MANUFACTURER	MinabeaMitsumi Inc.
COUNTRY OF MANUFACTURER	Japan
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	AC mains
SUPPLY VOLTAGE	115Vac ~ 60Hz
MAX POWER or ABSORBED CURRENT	80-130mA
OPERATING TEMPERATURE	-25°C ~ +50°C
DIMENSIONS	269mm x 239mm x 82mm
EUT STANDING	Fixed (Pole mounting)
CONFIGURATION	The EUT is equipped with: Port1: Routerboard Mikrotik RB953GS-5HnT (5GHz) Port2: WiFi card Compex WLE600VX (2,4GHz) Port3: WiFi card Compex WLE600VX (5GHz) Port4: Narrowband Paradox board 868MHz

## 1.1 RADIO module technical data

<b>RADIO PROTOCOL</b>	802.15.4g – 6LoWPAN
<b>WORKING FREQUENCY BAND</b>	902.42 – 927.58MHz
<b>CHANNELS</b>	75
<b>CHANNEL SPACING</b>	340kHz
<b>TRANSFER RATE</b>	100kbps
<b>TYPE OF MODULATION</b>	GFSK
<b>SENSITIVITY</b>	-99dBm
<b>ANTENNA</b>	Outdoor Rubber Antenna
<b>ANTENNA GAIN</b>	2dBi
<b>ANTENNA TYPE</b>	<b>MEGWX-1551SAAX-920</b>
<b>ANTENNA MANUFACTURER</b>	

## 1.2 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
<input checked="" type="checkbox"/>	Enclosure	Metallic	Screws	---
<input checked="" type="checkbox"/>	AC Power input	230V ~ 50Hz	Plug	>3m
<input type="checkbox"/>	DC Power input	Port not present	---	---
<input type="checkbox"/>	Signal / Control port	Port not present	---	---
<input checked="" type="checkbox"/>	Telecomm. port	LAN	Standard RJ45 cable	<30m
<input checked="" type="checkbox"/>	Antenna port	External x4	SMA	---

**Note:**

During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

## 1.3 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

## 1.4 Auxiliary equipment

- None

## 2. OPERATING MODES AND TEST CONDITIONS

In the following table there are the operating conditions adopted during tests identified by an indicator (#) at which has been referred the item "Operating condition of the equipment under test"

OPERATING CONDITION	DESCRIPTION
#1	Continuous transmission, modulated carrier, on channel 0
#2	Continuous transmission, modulated carrier, on channel 37
#3	Continuous transmission, modulated carrier, on channel 74
#4	Continuous transmission, modulated carrier, on Hopping mode

**Special Test Software:** Special software by the Applicant to operate the EUT at each channel frequency continuously. For example, the transmitter will be operated at each of the lowest, middle and highest frequencies individually continuously during testing.

**Special Hardware Used:** None

**Transmitter Test Antenna:** The EUT has been tested with the antenna fitted in a manner typical of normal intended

## 3. REFERENCE STANDARDS

REFERENCE STANDARD	
Cfr 47 part 15 subpart C par. 15.247	Radio Frequency Devices – Intentional Radiators Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz
KDB 558074 D01	Guidance for performing Compliance measurements on Digital Transmission Systems (DTS) Operating under §15.247
ANSI C63.10:2013	American National Standard for Testing Unlicensed Wireless Devices
Title 47 Part 1 Subpart I § 1.1310	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
Title 47 Part 2 Subpart J § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
ANSI C63.4:2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

## 4. SUMMARY OF TEST RESULTS

EUT PORT	DESCRIPTION OF PHENOMENA	BASIC STANDARD	OPERATING CONDITION	RESULTS
Enclosure	Radiated Emissions	FCC Part 15 §15.205 §15.209 §15.247 (d)	#4	Within the limits
Antenna port	Antenna requirement	FCC Part 15 §15.203	---	Compliant
	Maximum Peak Output Power	FCC Part 15 §15.247 (b) (3)	#1, #2, #3	Within the limits
	20 dB Bandwidth	FCC Part 15 §15.247 (a) (2)	#1, #2, #3	Within the limits
	Band-Edge	FCC Part 15 § 15.247 (d)	#1, #3, #4	Within the limits
	Number of Hopping Frequency	FCC Part 15 § 15.247 (d)	#4	Within the limits
	Channel Separation	FCC Part 15 § 15.247 (d)	#4	Within the limits
	Number of Dwell Time	FCC Part 15 § 15.247 (d)	#4	Within the limits
	Radiated Emissions 9kHz ÷ 10th Harmonic	FCC Part 15 § 15.247 (d)	#1, #2, #3	Within the limits

## 5. MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Occupied channel BW	±5%
RF Output Power, conducted	±1,5dB
Power spectral density, conducted	±3dB
All Emissions Radiated	±6dB
Temperature	±1°C
Humidity	±5%
DC Voltage	±3%
AC Voltage	±3%
Time	±5%

## 6. LIST OF INSTRUMENTS USED

Instrument	Manufacturer	Model	Serial n°	Last Call	Call Due
Emi Receiver / analyzer	Rohde & Schwarz	ESU40	100111	04/2018	04/2019
RF signal generator	Rohde & Schwarz	SMP04	825007/005	04/2018	04/2019
Bi-log antenna	Chase	CBL6111C	2717	12/2015	12/2018
Bi-log antenna	Chase	CBL6111A	1533	04/2017	04/2020
Horn antenna	Electro Metrics	EM-6961	100437	07/2017	07/2020
Power meter	Rohde & Schwarz	NRVD	841501/033	04/2018	04/2019
Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	09/2018	09/2019



## 7. TEST RESULTS

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## TEST 1.

### ANTENNA REQUIREMENTS

#### REFERENCE DOCUMENT

#### According to §15.203 / 15.204

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 Sec. 15.211, Sec. 15.213, Sec. 15.217, Sec. 15.219, or Sec. 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 Sec. 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

#### Antenna Requirements

The EUT has been classified as Professional, Class A equipment

**RESULT: COMPLIANT**

## TEST 2.

### MAXIMUM PEAK OUTPUT POWER

#### REFERENCE DOCUMENT

#### According to §15.247(b) (2)

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. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Semi-anechoic chamber Radio test area
• TEST METHOD	ANSI C63.10:2013
• TEST EQUIPMENT USED FOR TEST	Spectrum Analyzer R&S mod. FSP40 EMI Receiver Rodhe & Schwarz mod. ESU40 Bi-log antenna CHASE mod. CBL6111A Fast Power Sensor mod. U2022XA + U2032A
• TEST PERFORMED BY	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

OPERATING CONDITION :#1, #2, #3 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

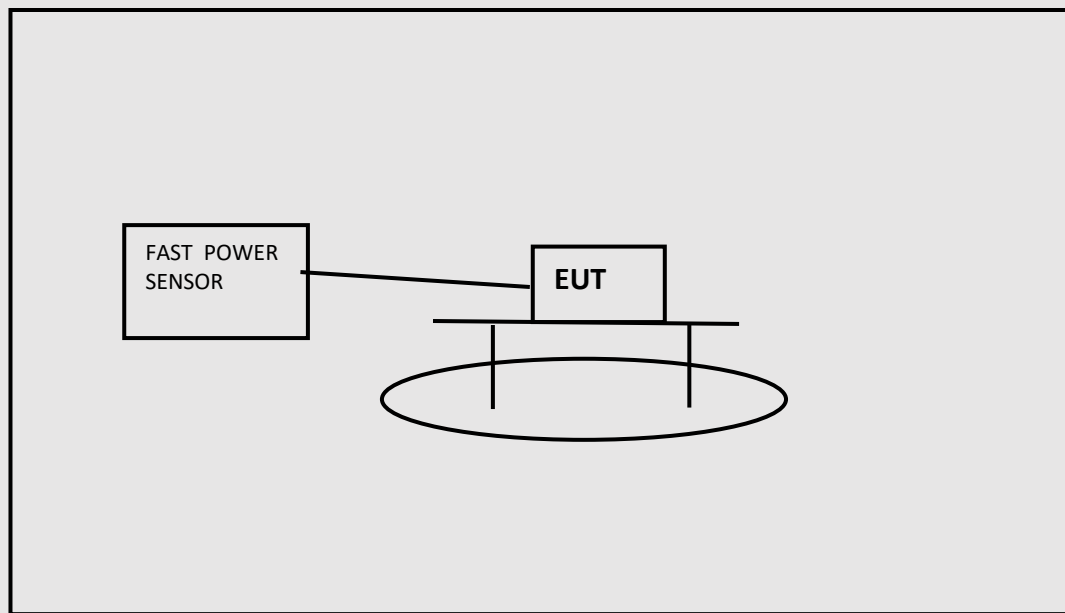
**MEASUREMENT PARAMETER**

<b>Resolution bandwidth</b>	RBW $\geq$ DTS bandwidth
<b>Video bandwidth</b>	VBW $\geq$ 3 x RBW
<b>Span</b>	span $\geq$ 3 x RBW
<b>Sweep time</b>	Auto couple
<b>Detector</b>	Peak
<b>Trace-Mode</b>	Max. hold

**TEST DESCRIPTION**

Measurement is made in a LAB with a Fast Power Sensor.

**TEST SETUP BLOCK DIAGRAM**



Channel	Frequency (MHz)	Max Conducted Output power	Antenna Gain	EIRP (dBm)	Limit (dBm)	Result
0	902.43	22.4	+2.0	24.4	30	<b>WITHIN THE LIMITS</b>
37	915.01	20.2	+2.0	22.2		
74	927.59	22.1	+2.0	24.1		
Incertezza di misura / Measurement Uncertainty : $\pm 3$ dB						
Note: ---						

## TEST 3.

### 20dB CHANNEL BANDWIDTH

#### REFERENCE DOCUMENT

#### According to §15,247(a)(2)

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	Spectrum Analyzer R&S mod. FSP40
• TEST PERFORMED BY	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

OPERATING CONDITION :#1, #2, #3 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

#### MEASUREMENT PARAMETER

<b>Resolution bandwidth</b>	100kHz
<b>Video bandwidth</b>	300kHz
<b>Span</b>	1MHz
<b>Sweep time</b>	Auto couple
<b>Detector</b>	Peak
<b>Trace-Mode</b>	Max. hold

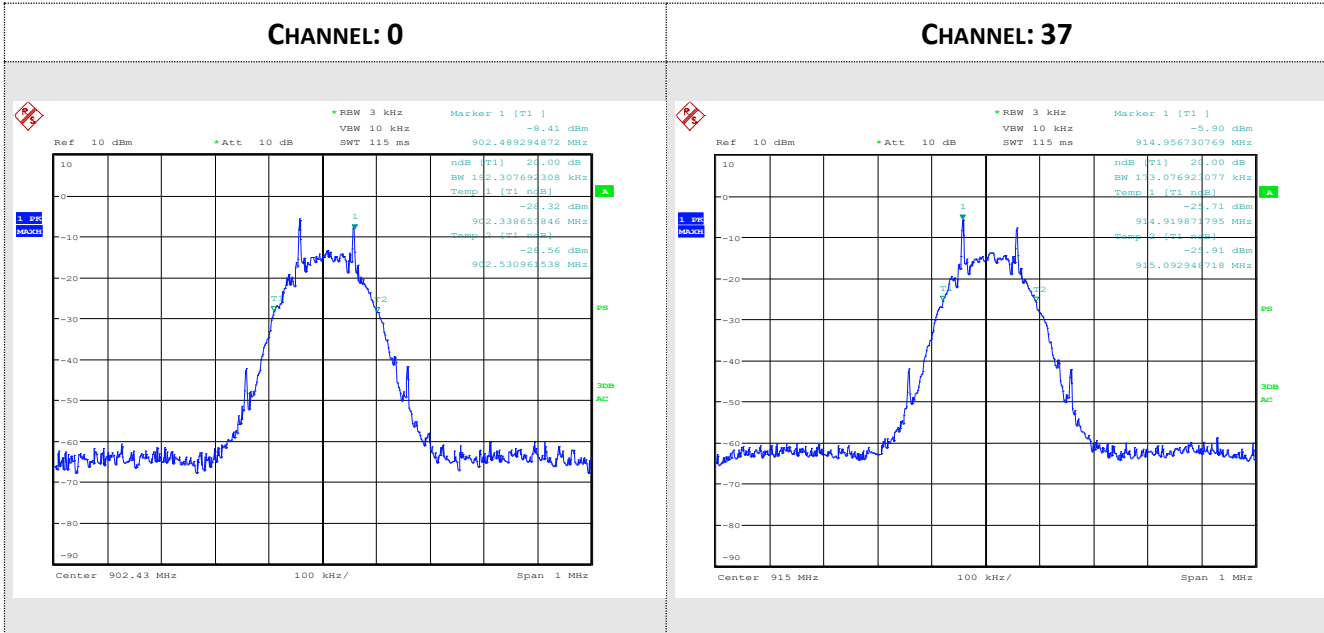
#### TEST DESCRIPTION

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

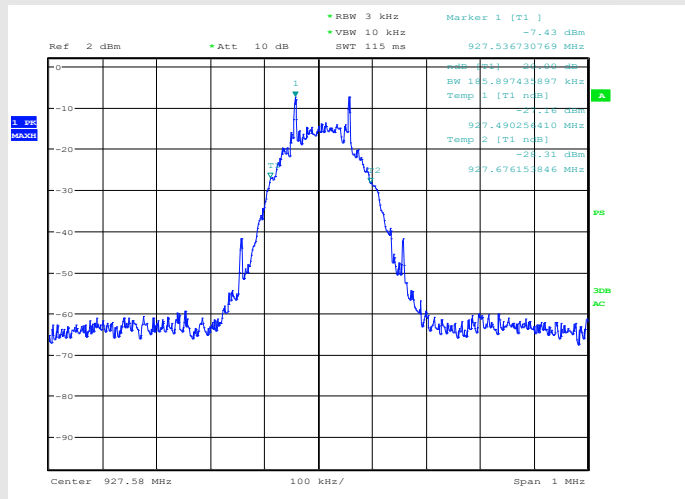
#### TEST SETUP BLOCK DIAGRAM



**Measurement Result**  
- 20dB Bandwidth -



**CHANNEL: 74**

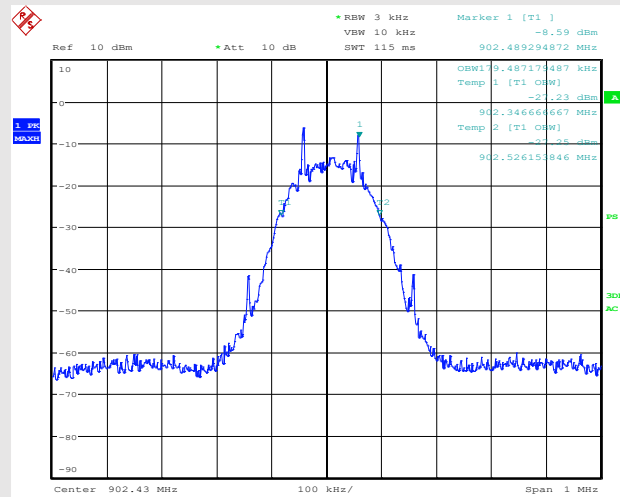


CHANNEL	20DB BANDWIDTH (kHz)	LIMIT (kHz)
0	192.307	500
37	173.076	500
74	187.897	500

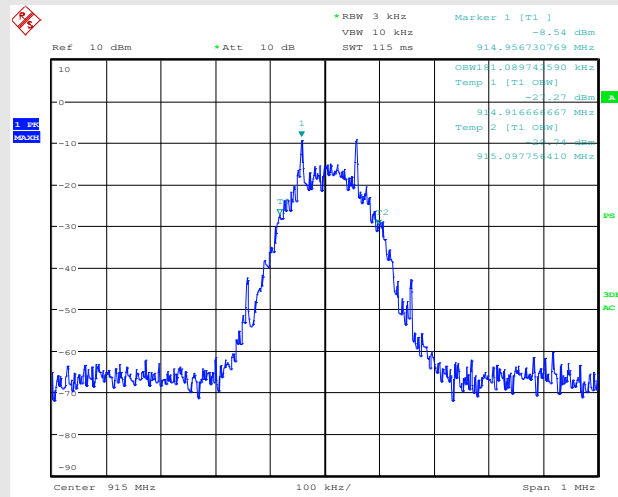


**Measurement Result**  
- Occupied Bandwidth -

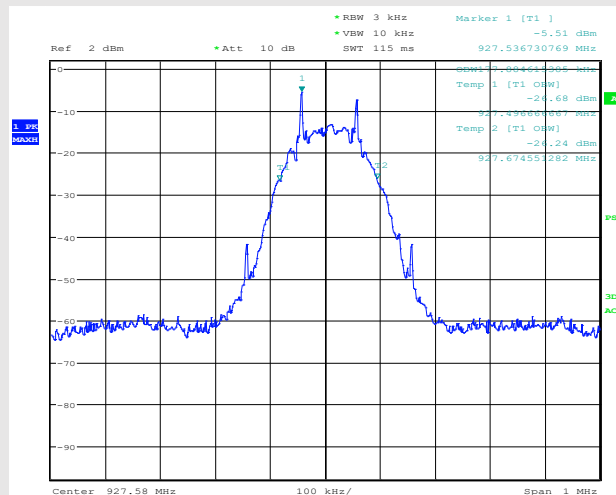
**CHANNEL: 0**



**CHANNEL: 37**



**CHANNEL: 74**



CHANNEL	OCCUPIED BANDWIDTH (kHz)	LIMIT (kHz)
0	179.487	500
37	181.089	500
74	177.884	500

## TEST 4.

### BAND-EDGE

#### REFERENCE DOCUMENT

#### According to §15,247(d)

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, provided the transmitter demonstrates compliance with the peak conducted power limits, If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB, Attenuation below the general limits specified in Sec, 15,209(a) is not required, In addition, radiated emissions which fall in the restricted bands, as defined in Sec, 15,205(a), must also comply with the radiated emission limits specified in Sec, 15,209(a) (see Sec, 15,205(c)),

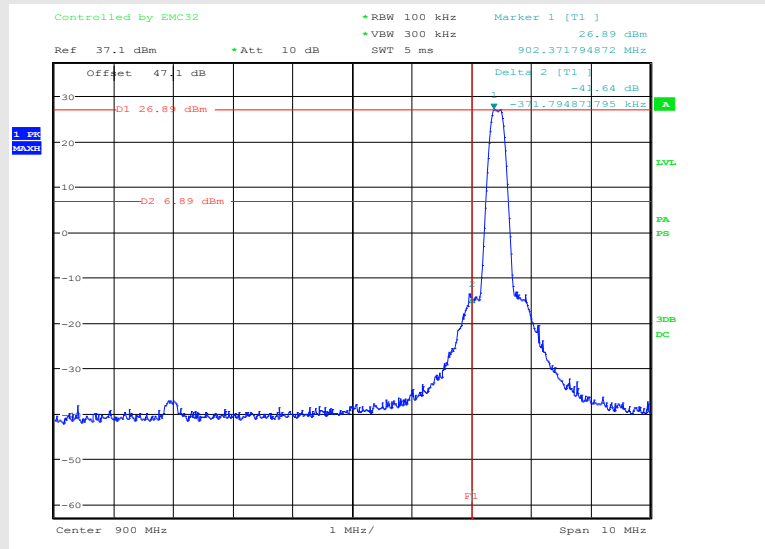
• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	Spectrum Analyzer R&S mod. FSP40
• TEST PERFORMED BY	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

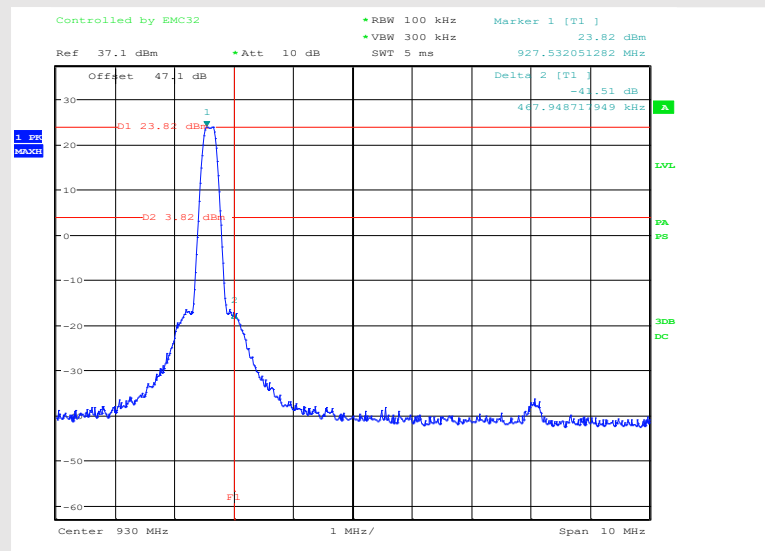
OPERATING CONDITION :#1, #3, #4 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

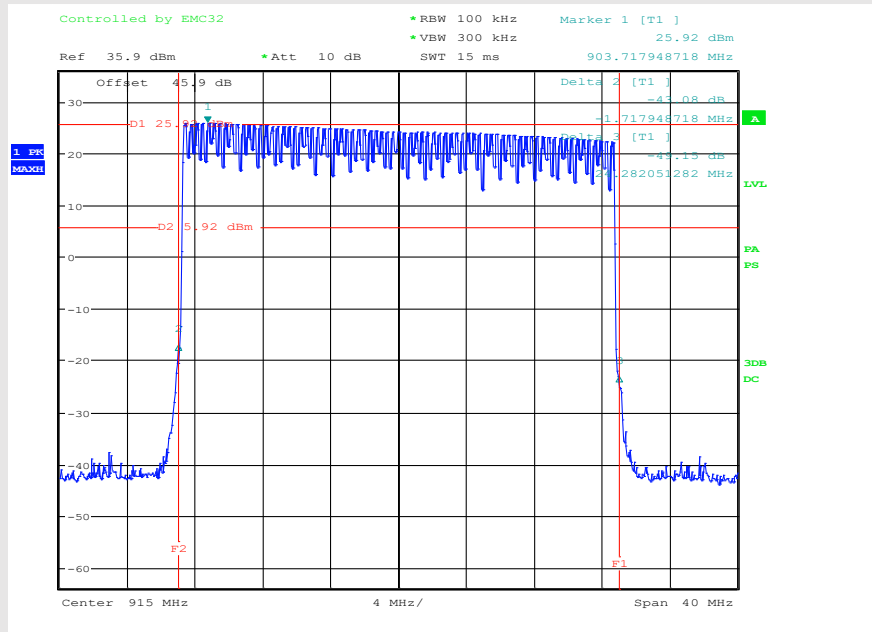
**LOWER BAND-EDGE  
CH 0**



**UPPER BAND-EDGE  
CH 74**



**HOPPING BAND-EDGE**



## TEST 5.

### NUMBER OF HOPPING FREQUENCY

#### REFERENCE DOCUMENT

#### According to §15,247) (a)

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	FCC Public notice DA 00-705 ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	Spectrum Analyzer R&S mod. FSP40
• TEST PERFORMED BY	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

OPERATING CONDITION :#4 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

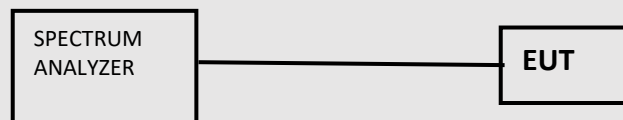
**MEASUREMENT PARAMETER**

<b>Resolution bandwidth</b>	200kHz
<b>Video bandwidth</b>	500kHz
<b>Span</b>	15MHz
<b>Sweep time</b>	Auto couple
<b>Detector</b>	Peak
<b>Trace-Mode</b>	Max. hold

**TEST DESCRIPTION**

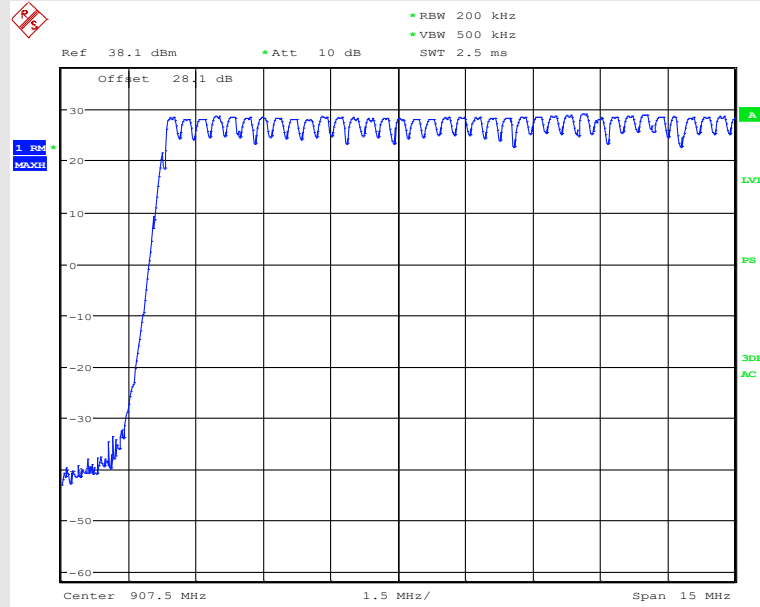
Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

**TEST SETUP BLOCK DIAGRAM**

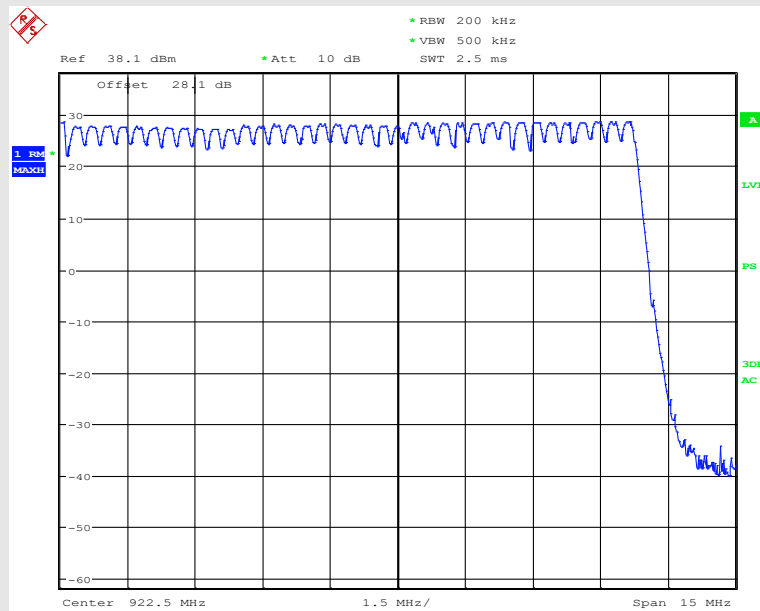


**Measurement Result**

**FREQUENCY RANGE  
900-915MHz**



**FREQUENCY RANGE  
915-930MHz**



## TEST 6.

### CHANNEL SEPARATION

#### REFERENCE DOCUMENT

#### According to §15,247) (a) (1)

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. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

• <b>TEST SETUP</b>	Acc. to reference document
• <b>TEST LOCATION</b>	Radio test area
• <b>TEST METHOD</b>	FCC Public notice DA 00-705 ANSI C63.10:2013
• <b>TYPE OF MEASUREMENT</b>	Conducted
• <b>TEST EQUIPMENT USED FOR TEST</b>	Spectrum Analyzer R&S mod. FSP40
• <b>TEST PERFORMED BY</b>	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
<b>Ambient temperature</b>	23°C ± 5°C	24 °C
<b>Ambient humidity</b>	25 - 75%rH	45%
<b>Pressure</b>	85 - 106kPa (860mbar - 1060mbar)	960 mbar

**OPERATING CONDITION :#4 Duty Cycle 100%**

**RESULT: WITHIN THE LIMITS**



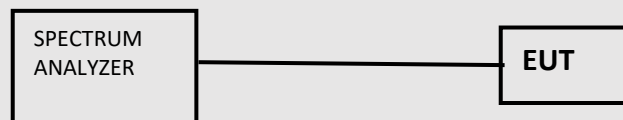
**MEASUREMENT PARAMETER**

<b>Resolution bandwidth</b>	1kHz
<b>Video bandwidth</b>	3kHz
<b>Span</b>	800kHz
<b>Sweep time</b>	Auto couple
<b>Detector</b>	Peak
<b>Trace-Mode</b>	Max. hold

**TEST DESCRIPTION**

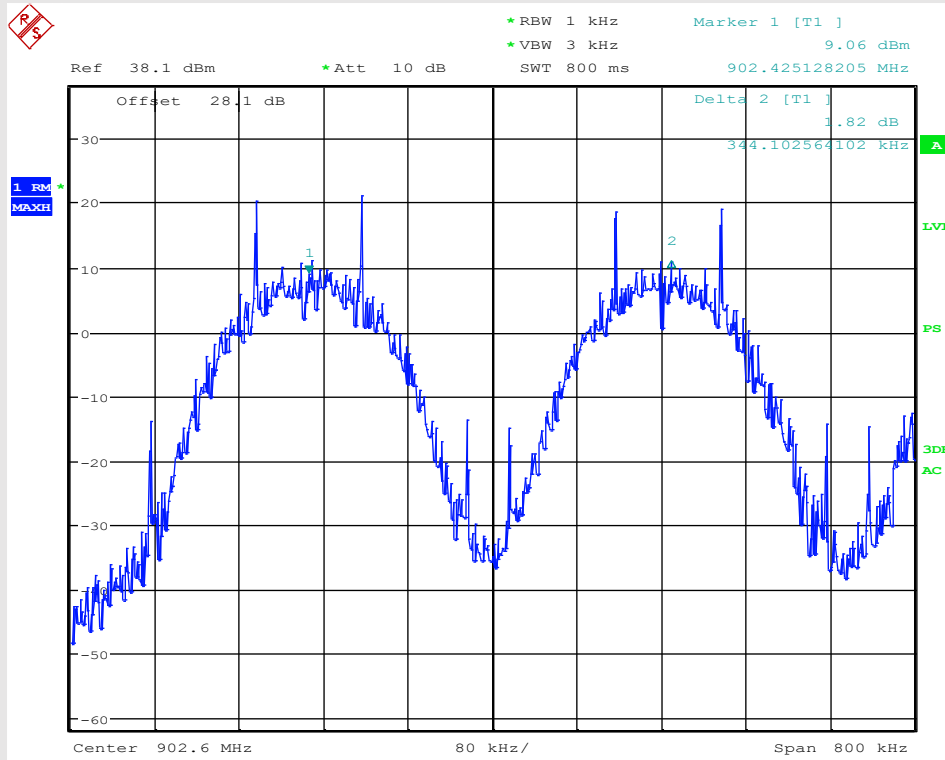
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

**TEST SETUP BLOCK DIAGRAM**



## Measurement Result

### CHANNEL SEPARATION



## TEST 7.

### NUMBER OF DWELL TIME

#### REFERENCE DOCUMENT

#### According to §15,247) (a) (1) (III)

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	FCC Public notice DA 00-705 ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	Spectrum Analyzer R&S mod. FSP40
• TEST PERFORMED BY	Daniele Aosani

TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

OPERATING CONDITION :#4 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

**MEASUREMENT PARAMETER**

<b>Resolution bandwidth</b>	30kHz
<b>Video bandwidth</b>	100kHz
<b>Span</b>	Zero
<b>Sweep time</b>	Auto couple
<b>Detector</b>	Peak
<b>Trace-Mode</b>	Max. hold

**TEST DESCRIPTION**

Enable gating and trigger function of spectrum analyzer to measure burst on time.

Single burst duration = 384ms.

**TEST SETUP BLOCK DIAGRAM**



### Measurement Result

Channel	Frequency (MHz)	Length of Transmission Time (msec)	Number of Transmission in 20s	Results (s)	Limit (s)
0	902	380	1	0,380	0.4
37	915	384	1	0,384	0.4
75	927,5	384	1	0,384	0.4

## TEST 8.

### RADIATED EMISSION 9kHz ÷ 10th HARMONIC

#### REFERENCE DOCUMENT

#### According to §15,247) d)

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 Db instead of 20 Db. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

• <b>TEST SETUP</b>	Acc. to reference document
• <b>TEST LOCATION</b>	Semi-anechoic chamber with measure distance at 3 meters
• <b>TYPE OF MEASUREMENT</b>	Radiated
• <b>TEST METHOD</b>	ANSI C63.10:2013
• <b>TEST EQUIPMENT USED FOR TEST</b>	EMI Receiver Rodhe & Schwarz mod. ESU40 Bi-log antenna CHASE mod. CBL6111A Horn antenna Electro Metrics mod. EM-6961
• <b>TEST PERFORMED BY</b>	Daniele Aosani
• <b>UNCERTAINTY OF MEASURE:</b>	Combined uncertainty = ± 1,75 dB Total uncertainty = (k=2) ± 3,5 dB

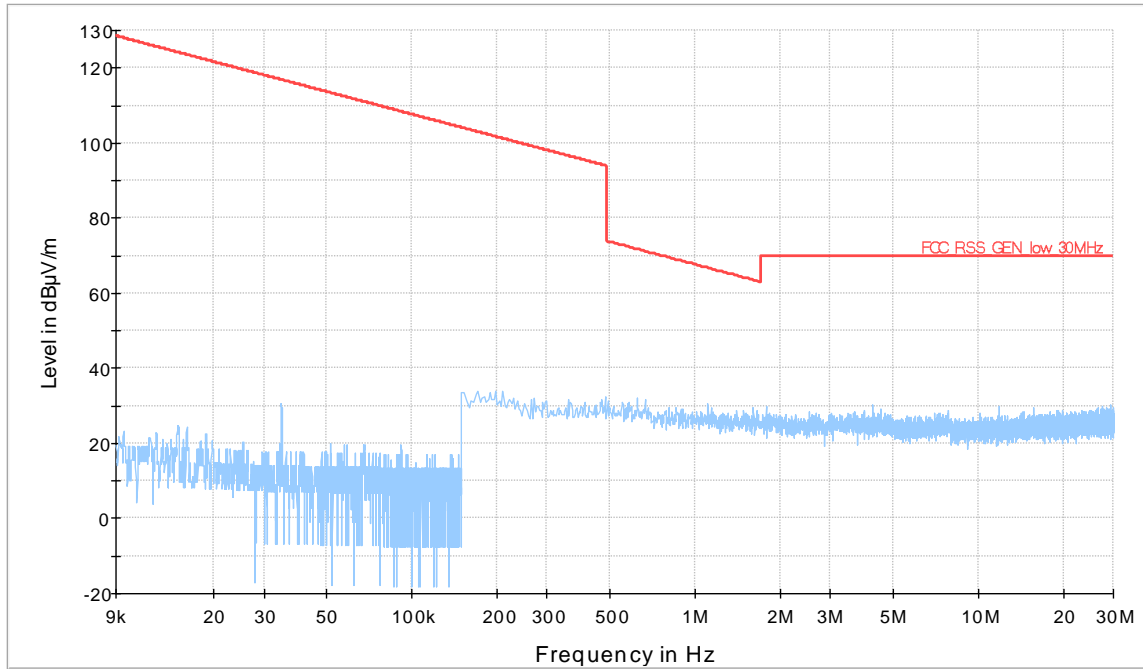
TEST CONDITIONS	REQUIRED	MEASURED
<b>Ambient temperature</b>	<b>23°C ± 5°C</b>	24 °C
<b>Ambient humidity</b>	<b>25 - 75%rH</b>	45%
<b>Pressure</b>	<b>85 - 106kPa (860mbar - 1060mbar)</b>	960 mbar

**OPERATING CONDITION :#1, #2, #3 Duty Cycle 100%**

**RESULT: WITHIN THE LIMITS**

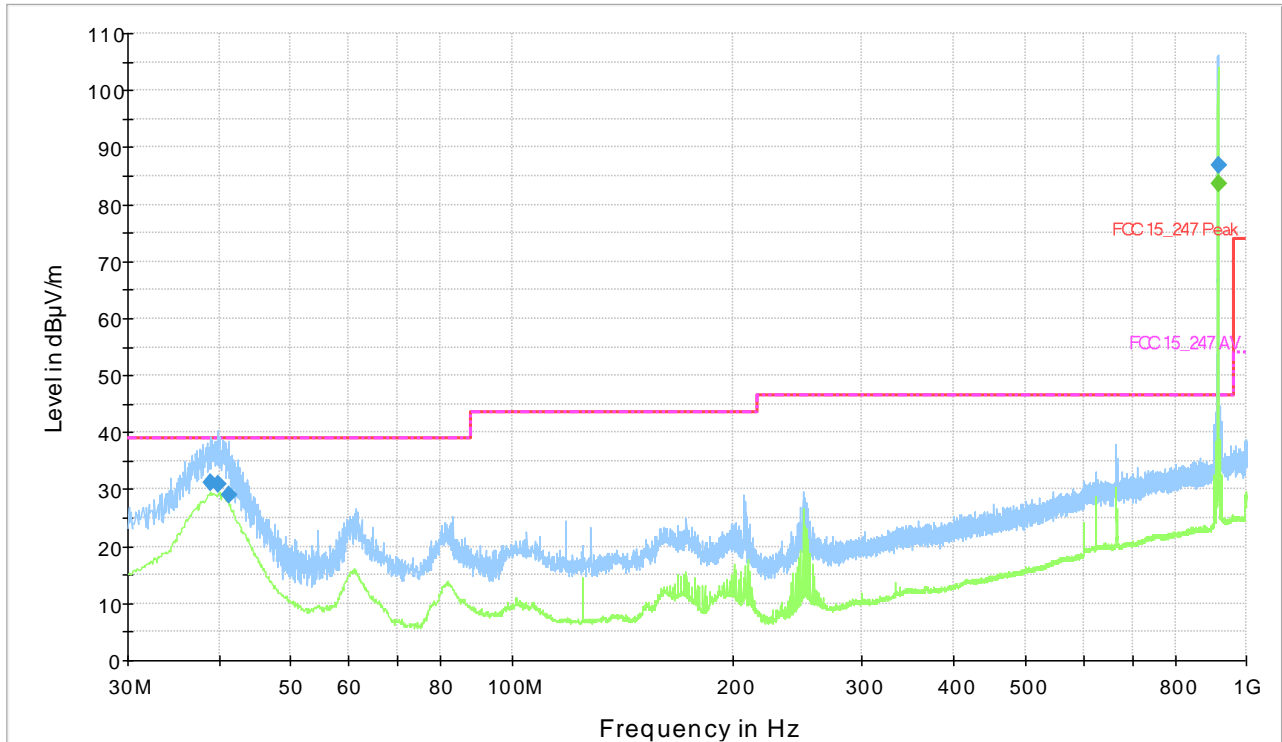
<b>CHANNEL</b>	0
<b>FREQUENCY RANGE</b>	9kHz - 30MHz
<b>POLARIZATION</b>	VERTICAL

EMI\_RAD\_9k\_30M\_sweep\_dBuV/m



CHANNEL	0
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
62.398000	37.5	104.8	0.0	1.50	39.00
90.819000	34.9	104.8	90.0	8.60	43.50
665.641000	45.0	255.0	180.0	1.40	46.40
902.515000	84.7	104.8	0.0	-38.30	46.40
998.351000	41.4	104.8	180.0	32.60	74.00

**Final Result Average**

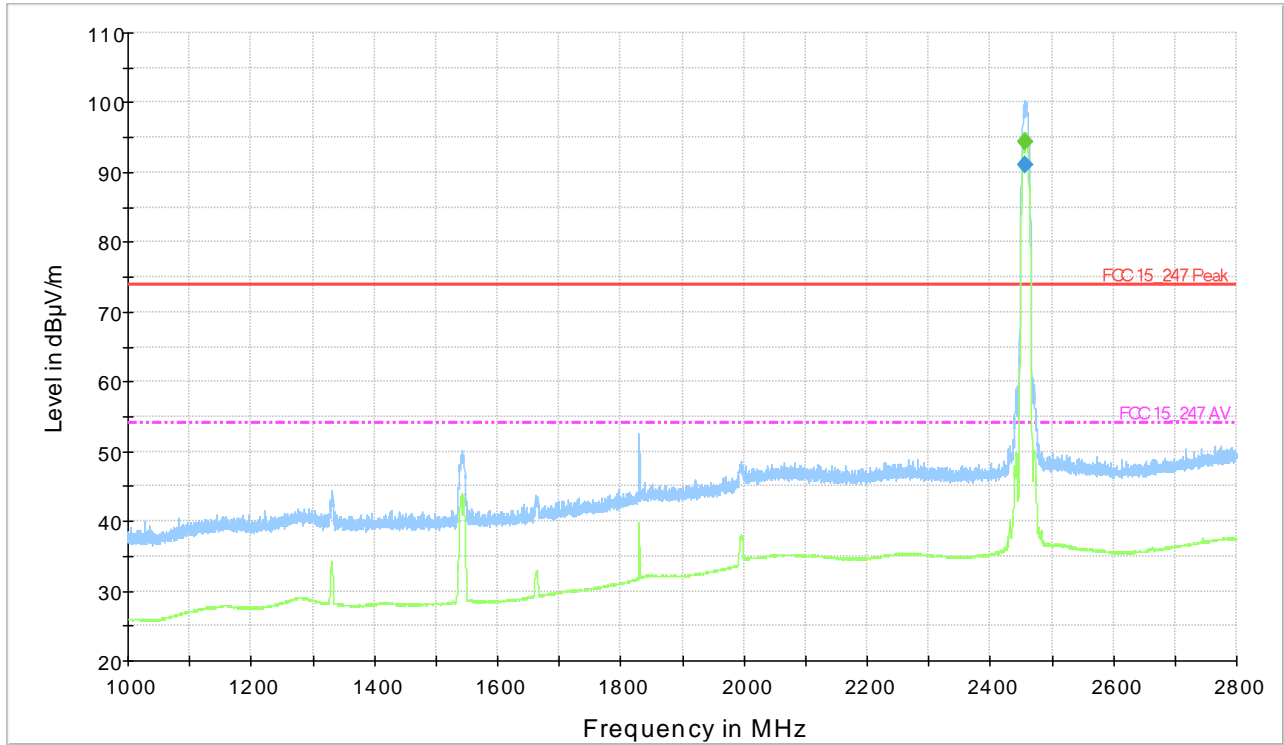
Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
62.398000	29.9	104.8	0.0	9.10	39.00
90.819000	22.8	104.8	90.0	20.70	43.50
665.350000	40.6	255.0	180.0	5.80	46.40
902.515000	77.2	104.8	0.0	-30.80	46.40
998.545000	34.3	104.8	180.0	19.70	54.00

\*Peaks out of limits are due to the radio carrier



<b>CHANNEL</b>	0
<b>FREQUENCY RANGE</b>	1-2.8GHz
<b>POLARIZATION</b>	VERTICAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



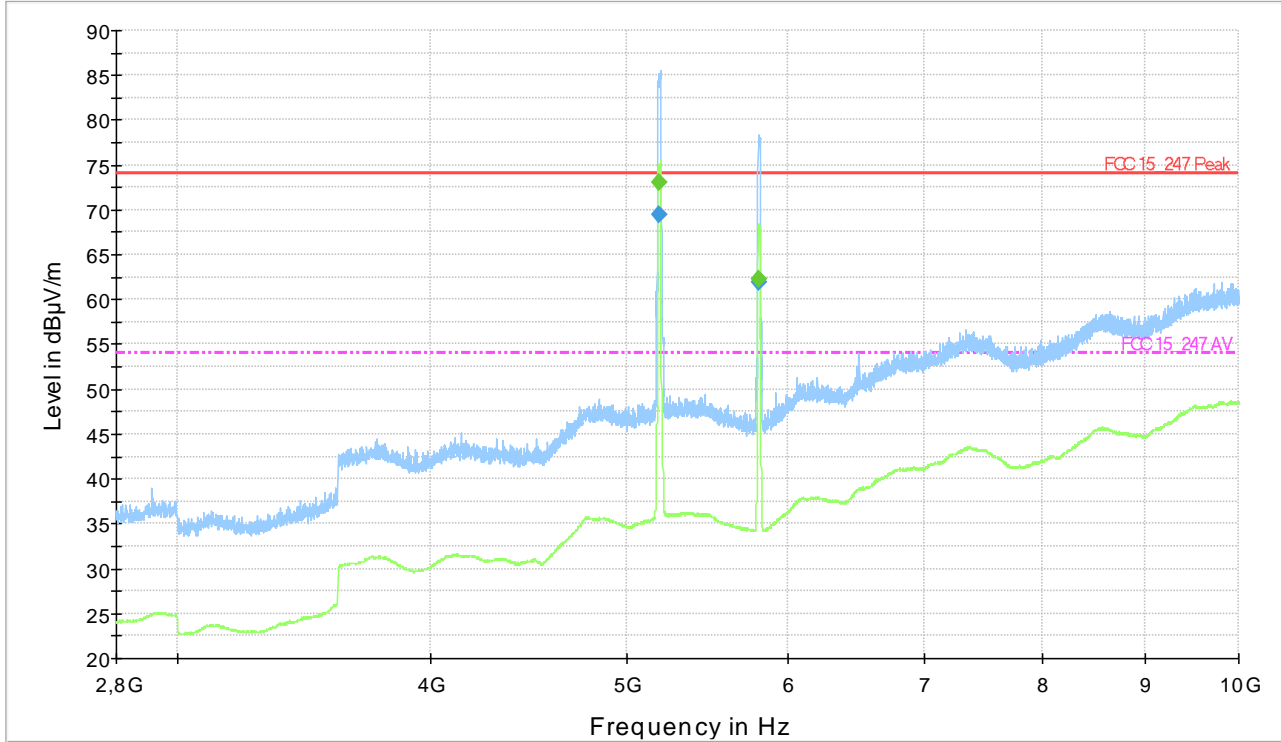
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
2455.480000	91.0	1000.0	1000.000	255.2	V	0.0	3.00

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
2455.300000	94.4	1000.0	1000.000	255.2	V	0.0	-20.40	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation

<b>CHANNEL</b>	0
<b>FREQUENCY RANGE</b>	2.8-10GHz
<b>POLARIZATION</b>	VERTICAL

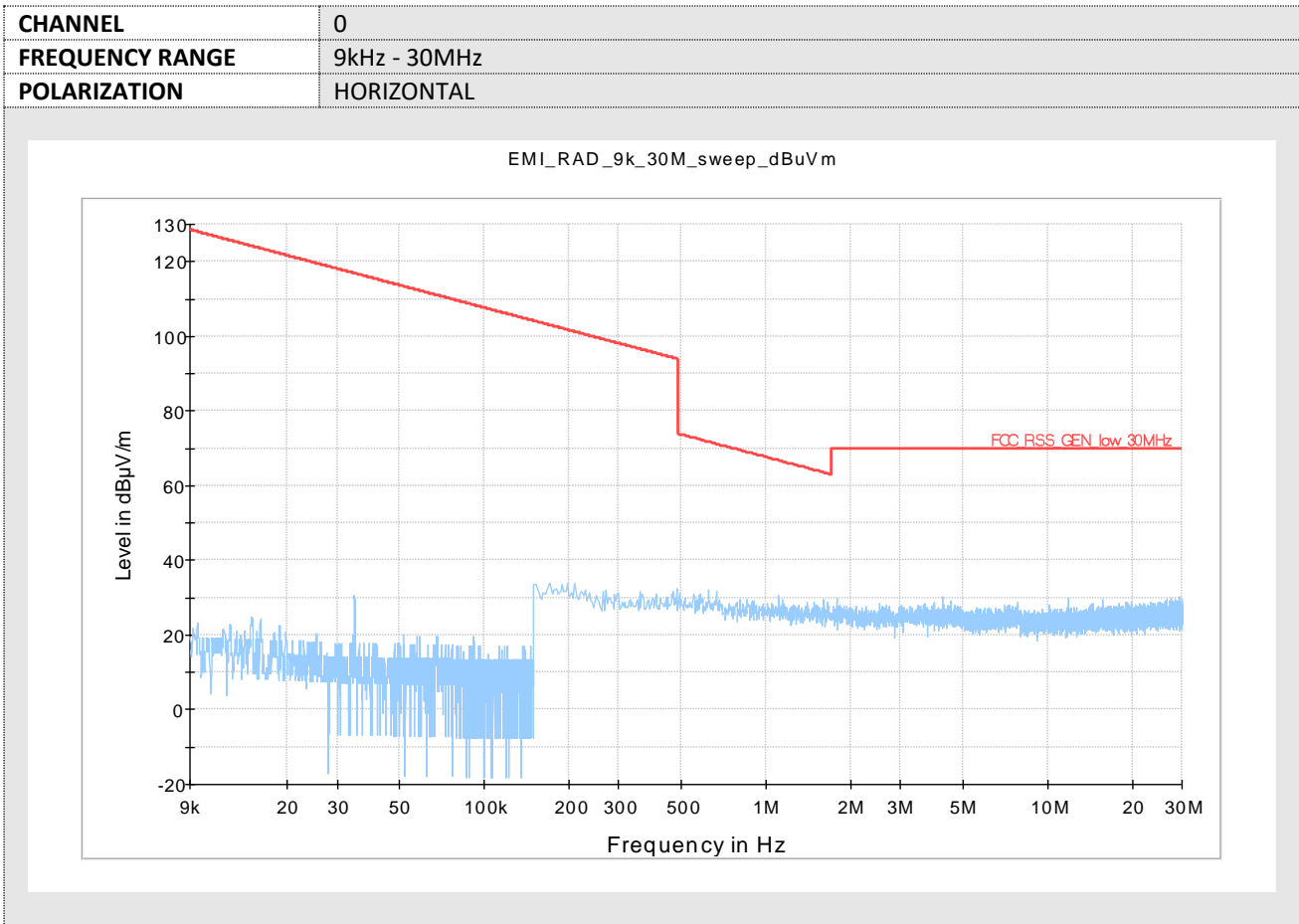
FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
5181.040000	69.5	1000.0	1000.000	255.0	V	0.0	4.50
5803.120000	62.0	1000.0	1000.000	255.0	V	180.0	12.00

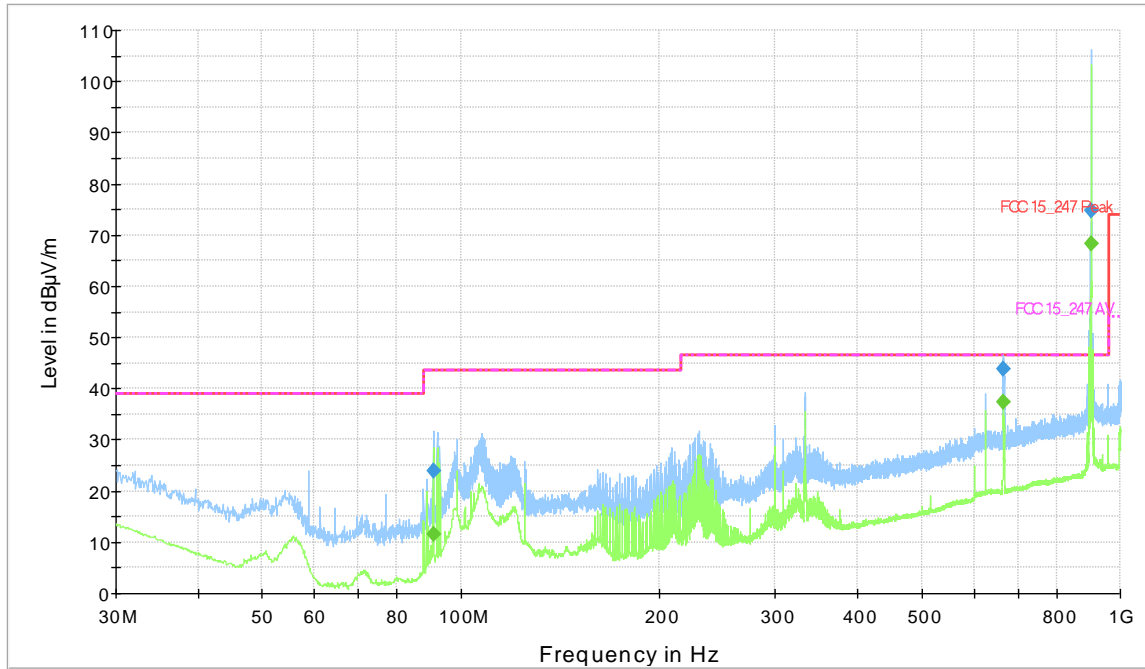
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
5181.040000	73.1	1000.0	1000.000	255.0	V	0.0	-19.10	54.00
5803.120000	62.2	1000.0	1000.000	255.0	V	180.0	-8.20	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation



<b>CHANNEL</b>	0
<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
90.819000	24.0	104.7	90.0	19.50	43.50
665.447000	43.7	104.7	180.0	2.70	46.40
902.515000	74.8	255.0	0.0	-28.40	46.40

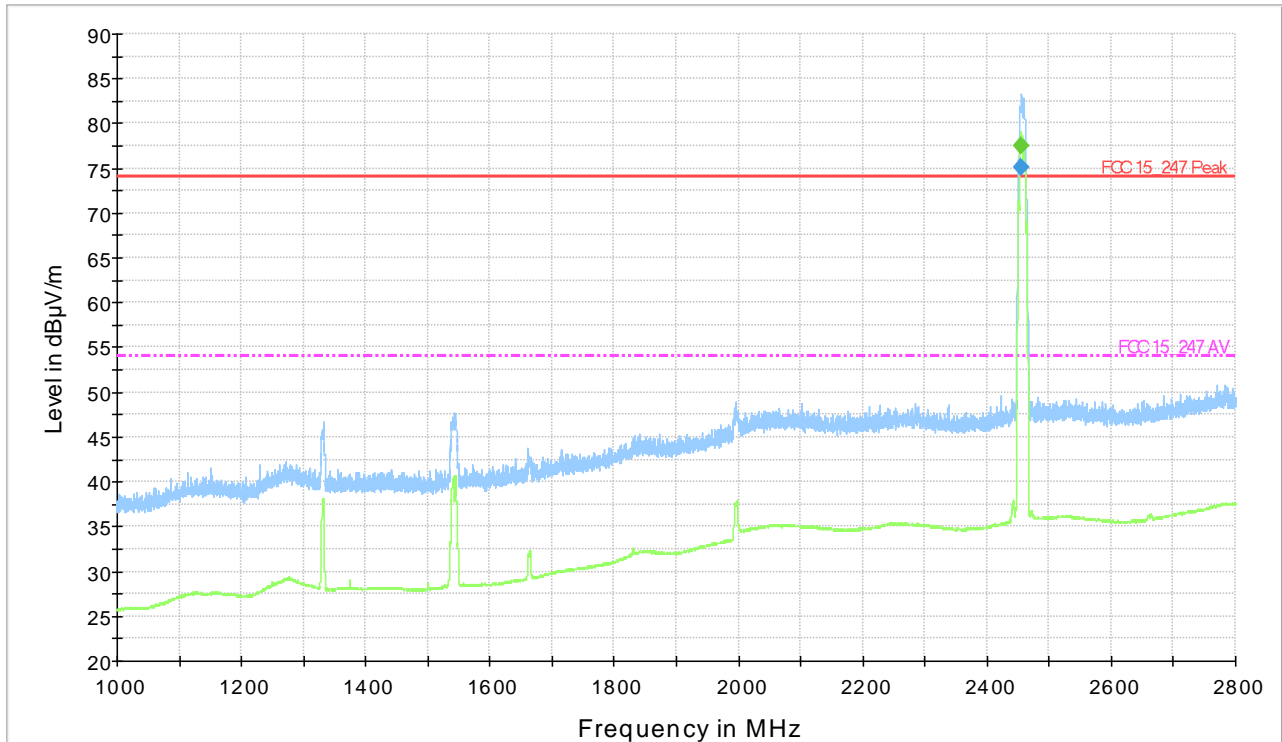
**Final Result Average**

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
90.819000	11.7	104.7	90.0	31.80	43.50
665.447000	37.4	104.7	180.0	9.00	46.40
902.515000	68.4	255.0	0.0	-522.00	46.40

\*Peaks out of limits are due to the radio carrier

<b>CHANNEL</b>	0
<b>FREQUENCY RANGE</b>	1-2,8GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



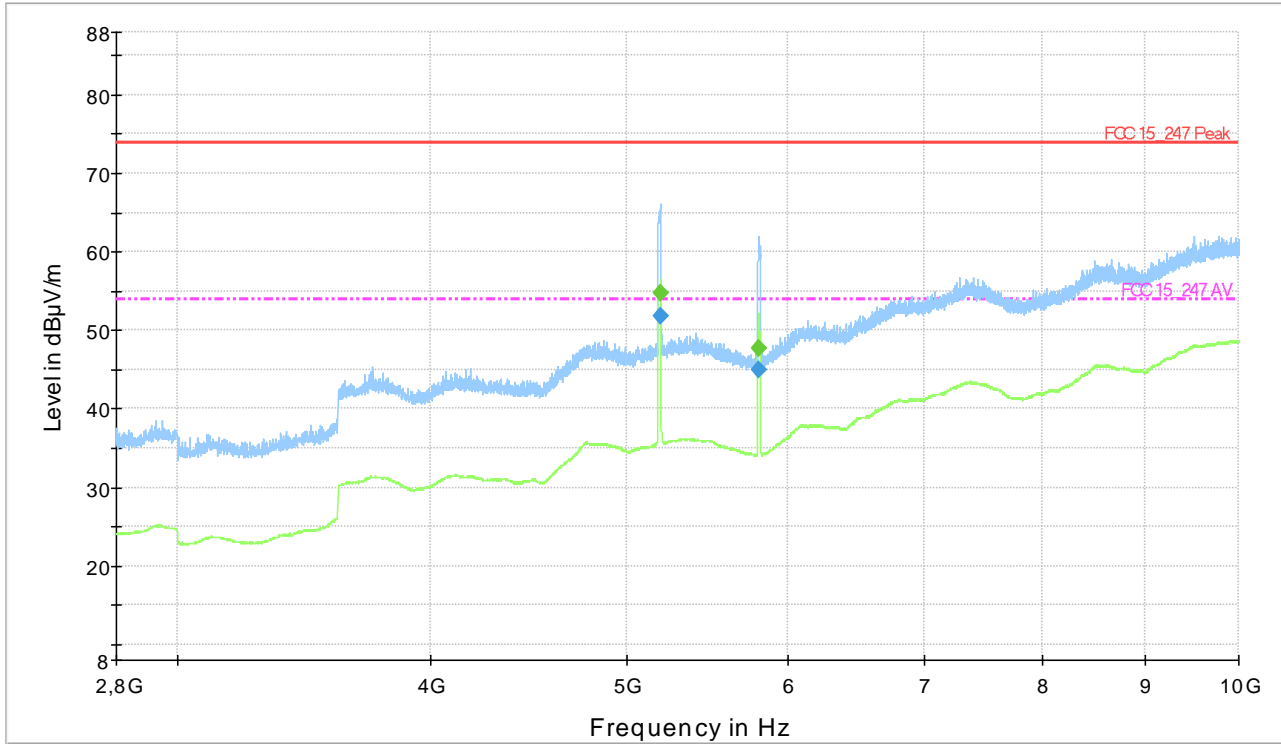
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
2456.020000	75.1	1000.0	1000.000	255.0	H	90.0	18.90

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
2455.300000	77.5	1000.0	1000.000	255.0	H	90.0	-3.50	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation

<b>CHANNEL</b>	0
<b>FREQUENCY RANGE</b>	2,8-10GHz
<b>POLARIZATION</b>	HORIZONTAL

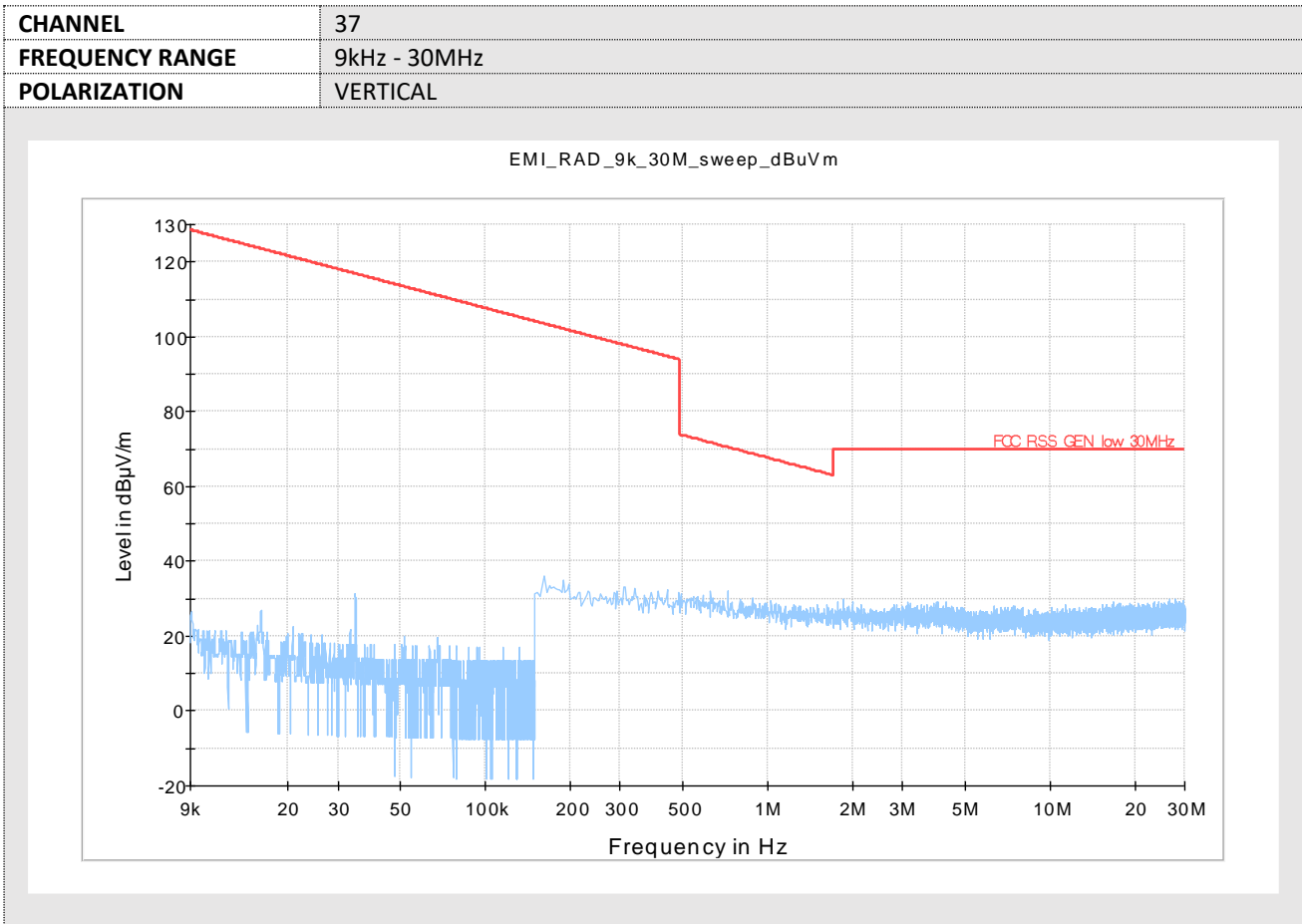
FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
5190.400000	51.8	1000.0	1000.000	255.0	H	180.0	22.20
5800.960000	45.0	1000.0	1000.000	255.0	H	180.0	29.00

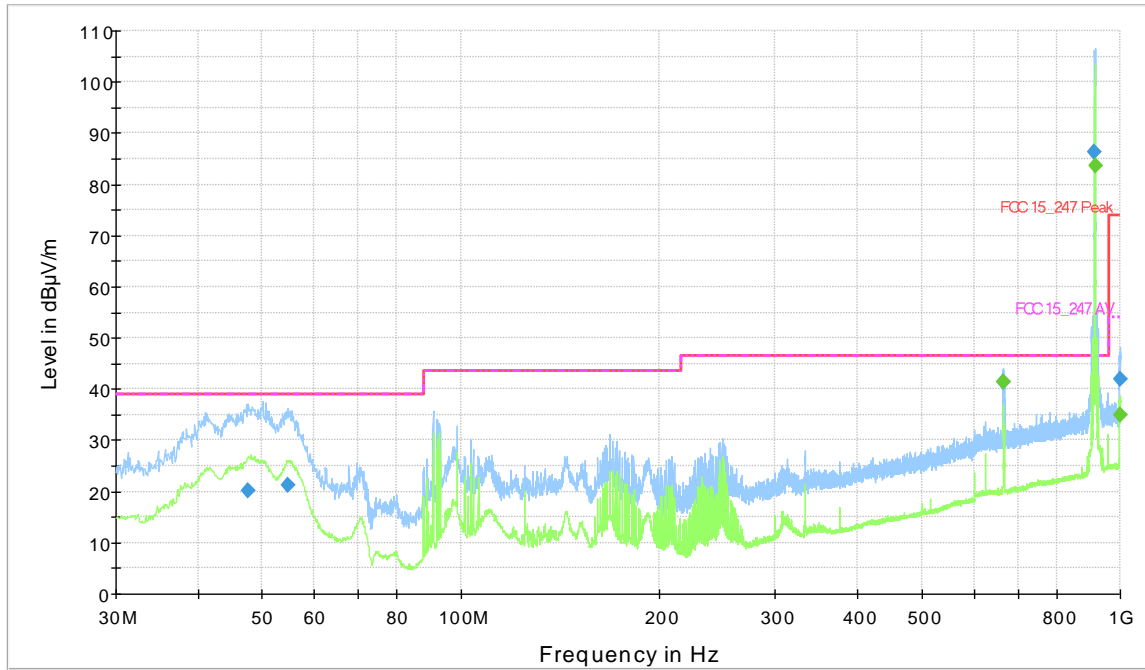
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
5189.680000	54.7	1000.0	1000.000	255.0	H	180.0	-0.70	54.00
5803.120000	47.6	1000.0	1000.000	255.0	H	180.0	6.40	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation



<b>CHANNEL</b>	37
<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>POLARIZATION</b>	VERTICAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
47.654000	20.3	104.7	0.0	18.70	39.00
54.735000	21.2	255.0	0.0	17.80	39.00
665.447000	41.5	254.9	180.0	4.90	46.40
914.931000	86.4	104.7	90.0	-40.00	46.40
998.836000	41.9	104.7	180.0	32.10	74.00

**Final Result Average**

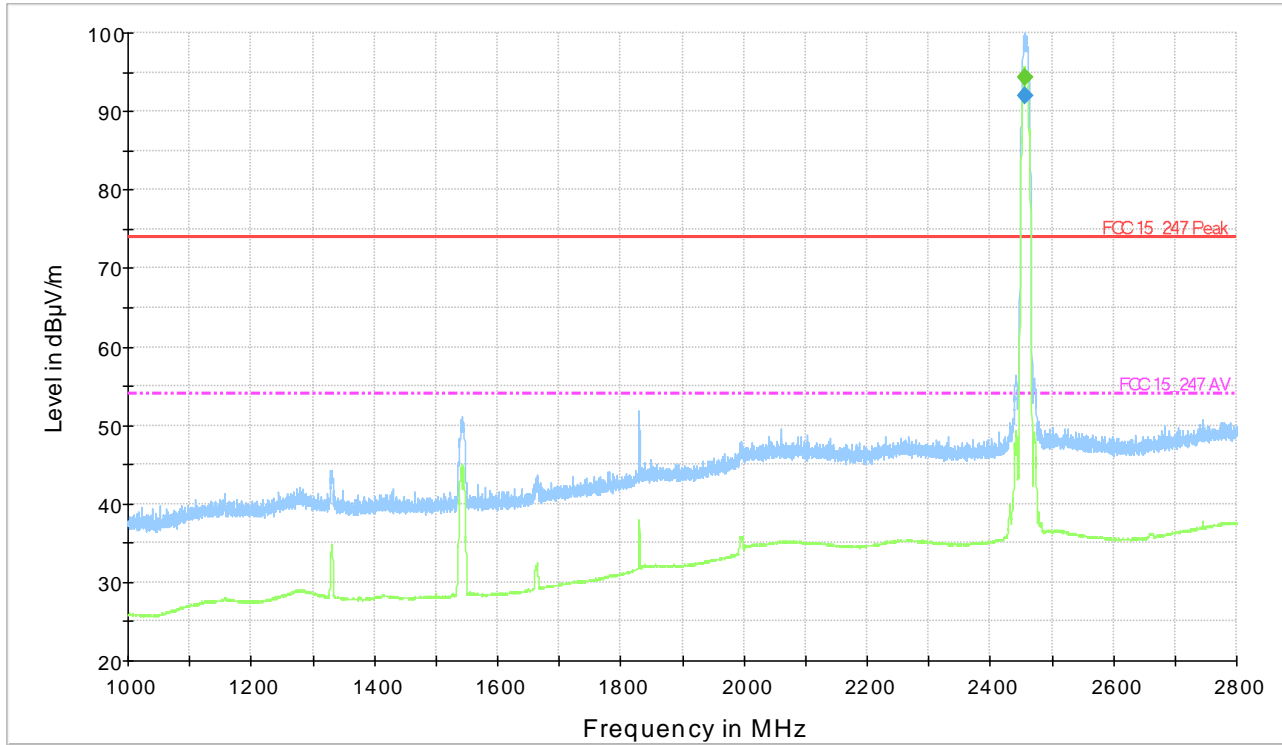
Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
665.350000	41.5	254.9	180.0	4.90	46.40
915.028000	83.6	104.7	90.0	-37.20	46.40
999.030000	35.1	104.7	180.0	18.90	54.00

\*Peaks out of limits are due to the radio carrier



<b>CHANNEL</b>	37
<b>FREQUENCY RANGE</b>	1-2.8GHz
<b>POLARIZATION</b>	VERTICAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



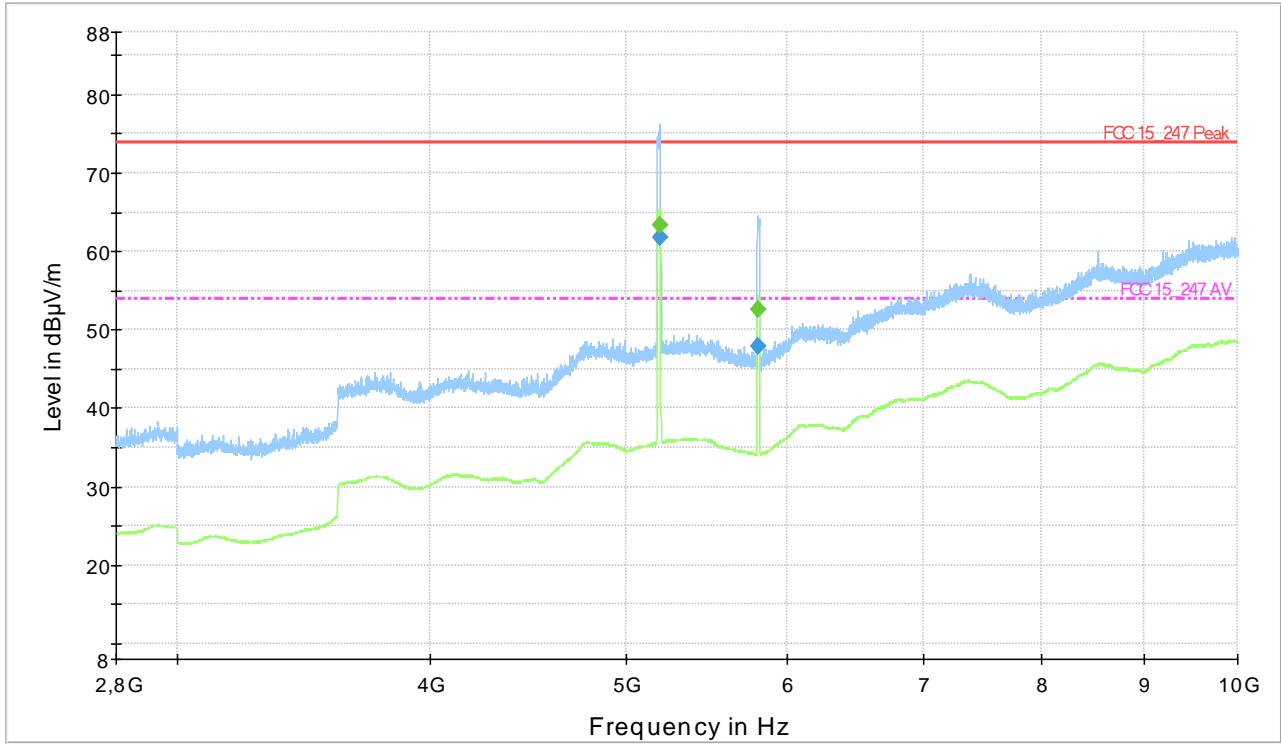
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
2456.020000	92.0	1000.0	1000.000	255.1	V	0.0	2.00

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
2455.300000	94.3	1000.0	1000.000	255.1	V	0.0	-20.30	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation

<b>CHANNEL</b>	37
<b>FREQUENCY RANGE</b>	2.8-10GHz
<b>POLARIZATION</b>	VERTICAL

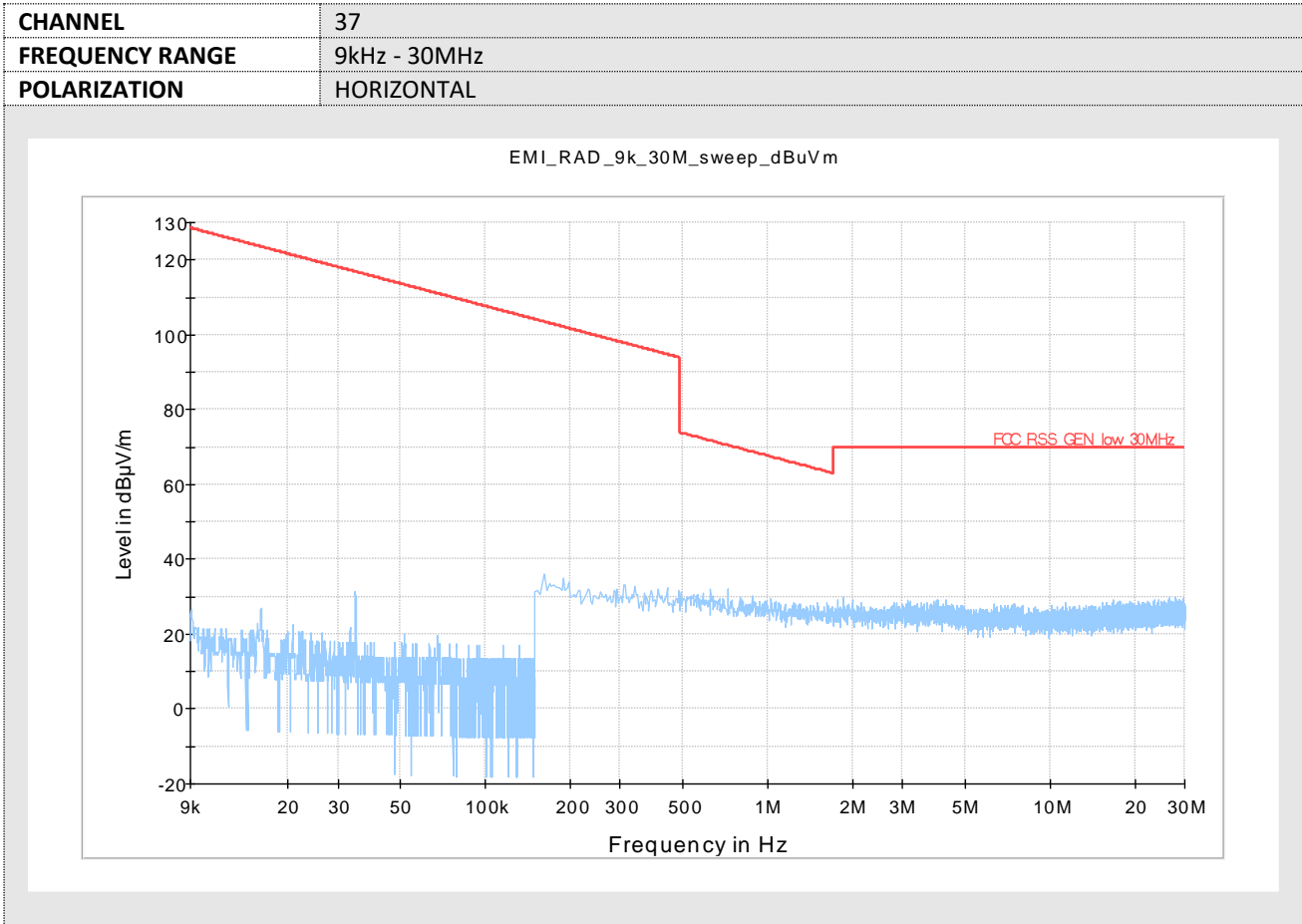
FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
5187.520000	61.7	1000.0	1000.000	106.9	V	0.0	12.30
5798.800000	48.0	1000.0	1000.000	255.1	V	0.0	26.00

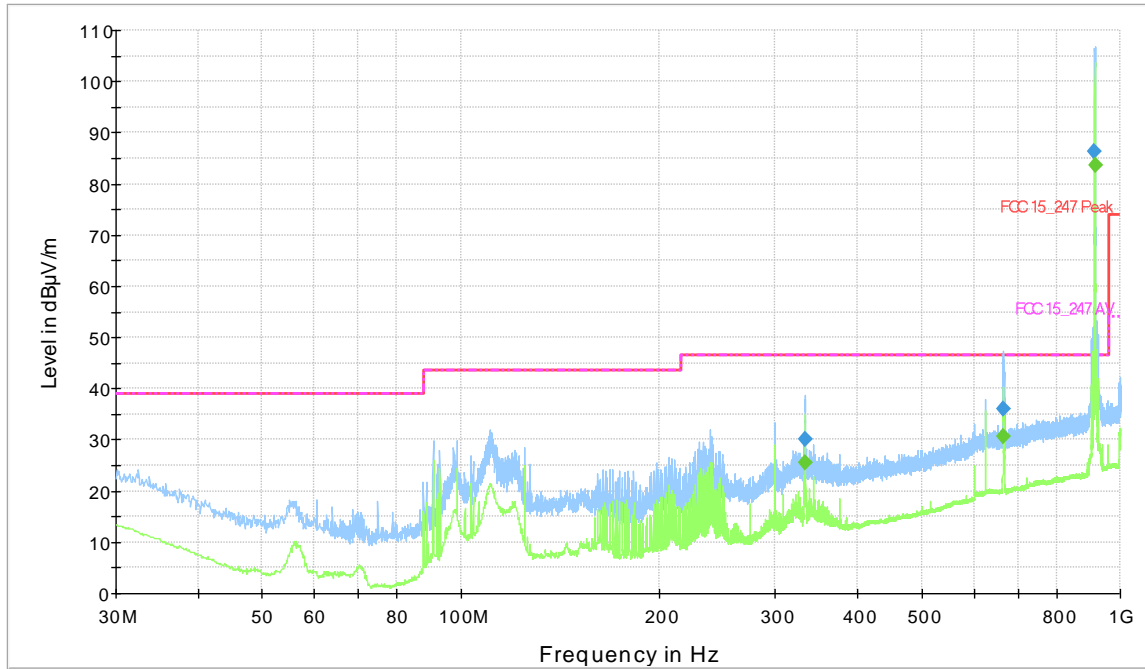
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
5186.800000	63.3	1000.0	1000.000	106.9	V	0.0	-9.30	54.00
5798.080000	52.7	1000.0	1000.000	255.1	V	0.0	1.30	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation



<b>CHANNEL</b>	37
<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
332.737000	30.2	104.7	90.0	16.20	46.40
665.253000	36.1	104.7	180.0	10.30	46.40
914.931000	86.3	255.0	180.0	-39.90	46.40

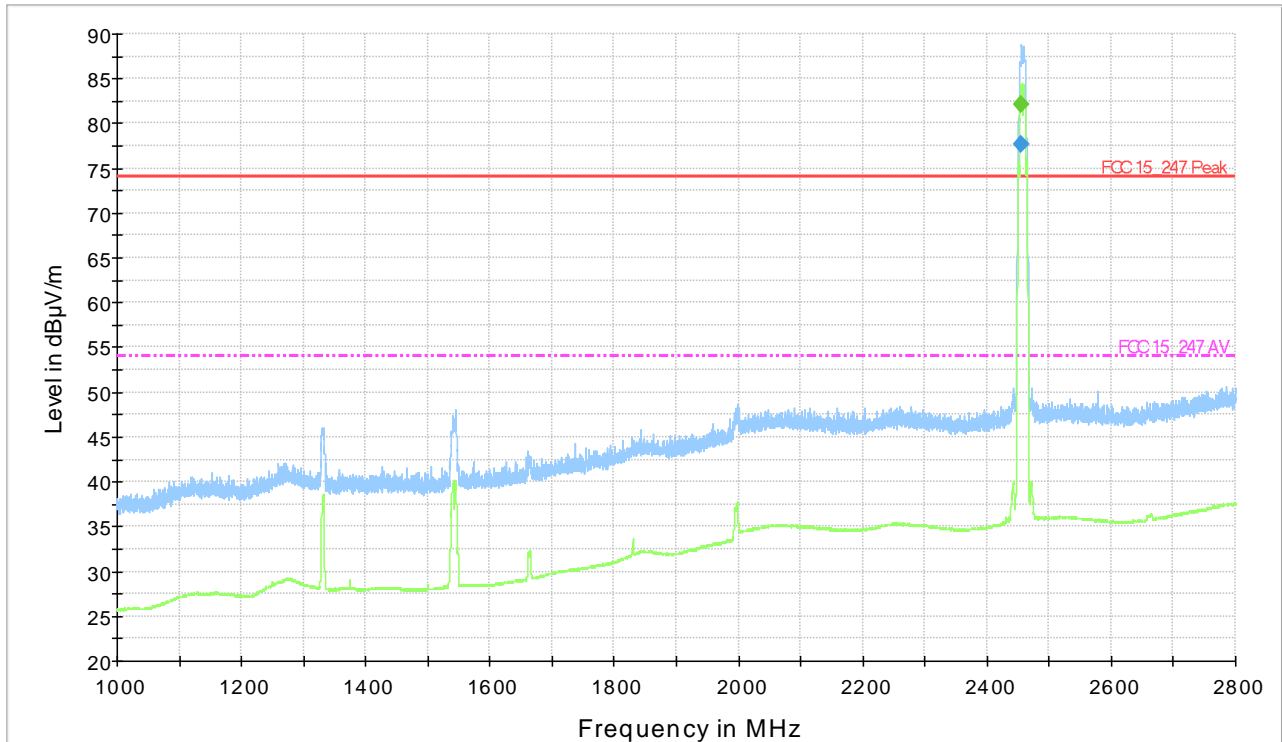
**Final Result Average**

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
332.737000	25.4	104.7	90.0	21.00	46.40
665.350000	30.8	104.7	180.0	15.60	46.40
915.028000	83.7	104.7	180.0	-37.30	46.40

\*Peaks out of limits are due to the radio carrier

<b>CHANNEL</b>	37
<b>FREQUENCY RANGE</b>	1-2.8GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



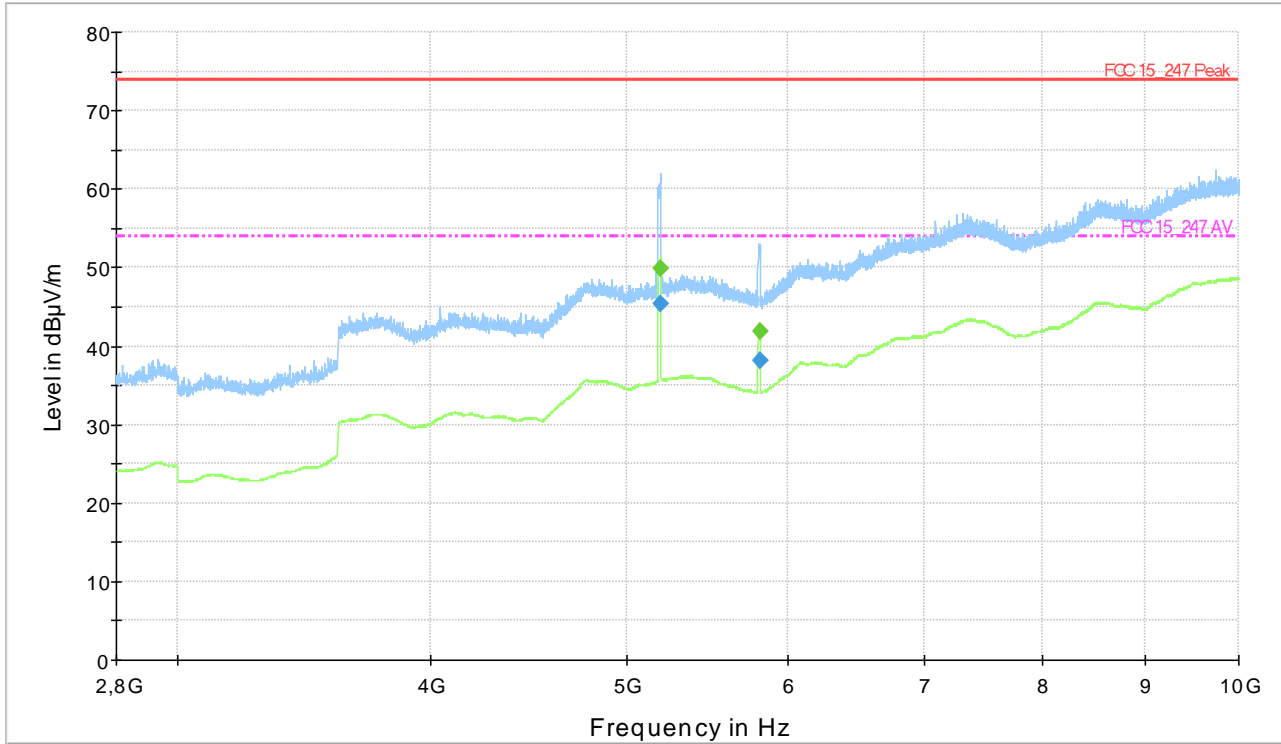
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
2455.840000	77.7	1000.0	1000.000	255.1	H	180.0	16.30

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
2456.020000	82.2	1000.0	1000.000	255.1	H	180.0	-8.20	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation

<b>CHANNEL</b>	37
<b>FREQUENCY RANGE</b>	2.8-10GHz
<b>POLARIZATION</b>	HORIZONTAL

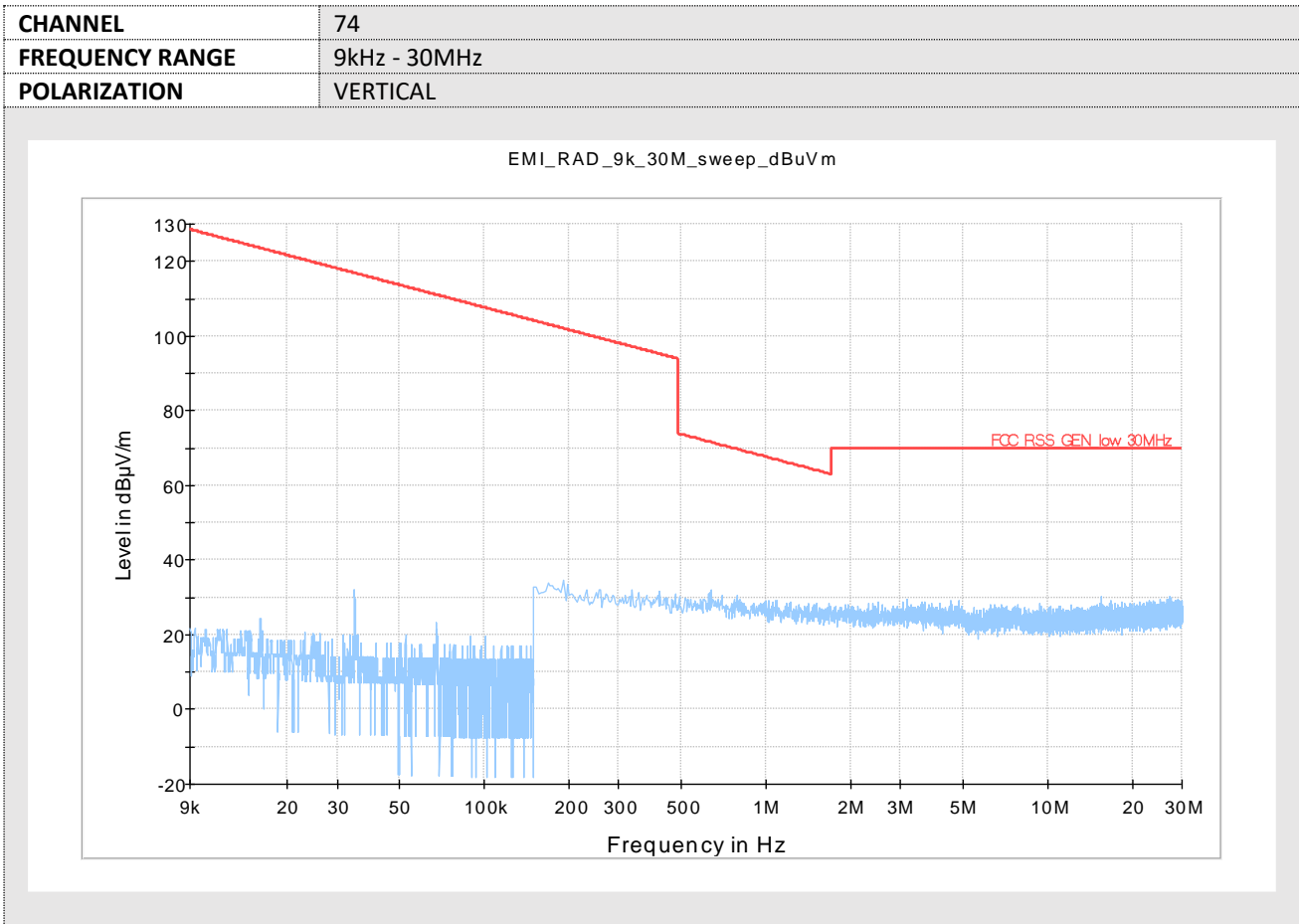
FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
5188.240000	45.4	1000.0	1000.000	255.0	H	0.0	28.60
5808.160000	38.1	1000.0	1000.000	255.0	H	0.0	35.90

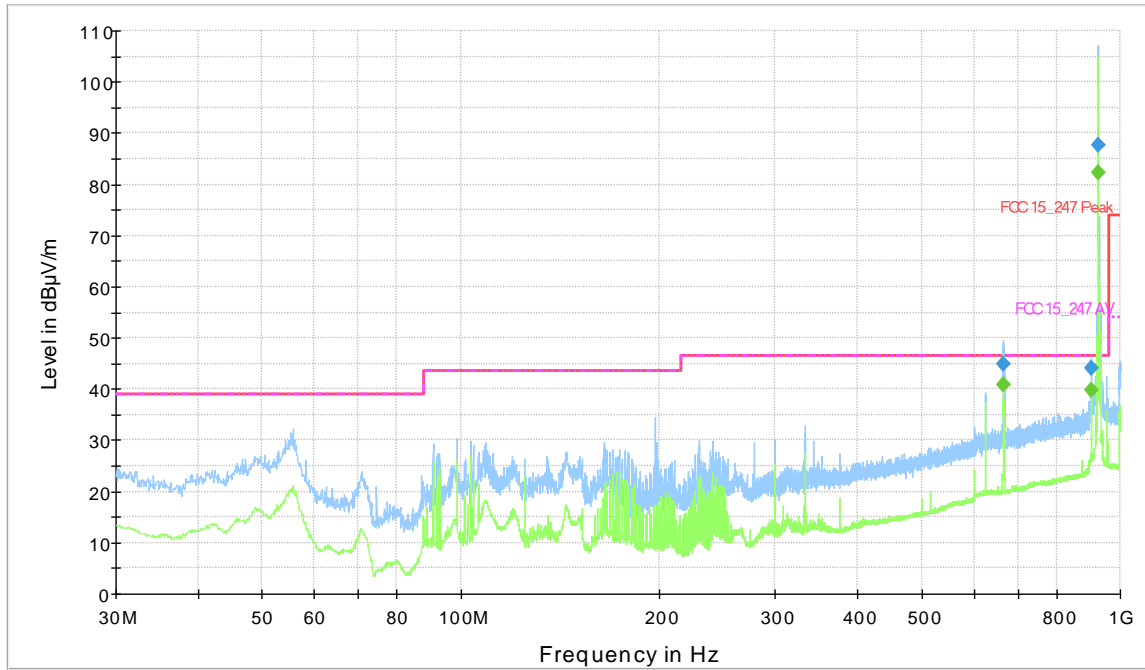
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
5190.400000	49.9	1000.0	1000.000	255.0	H	0.0	4.10	54.00
5808.880000	41.8	1000.0	1000.000	255.0	H	0.0	12.20	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation



<b>CHANNEL</b>	74
<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>POLARIZATION</b>	VERTICAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
665.447000	45.0	255.0	180.0	1.60	46.40
902.612000	44.2	104.6	180.0	2.20	46.40
927.541000	87.8	104.7	270.0	-41.40	46.40

**Final Result Average**

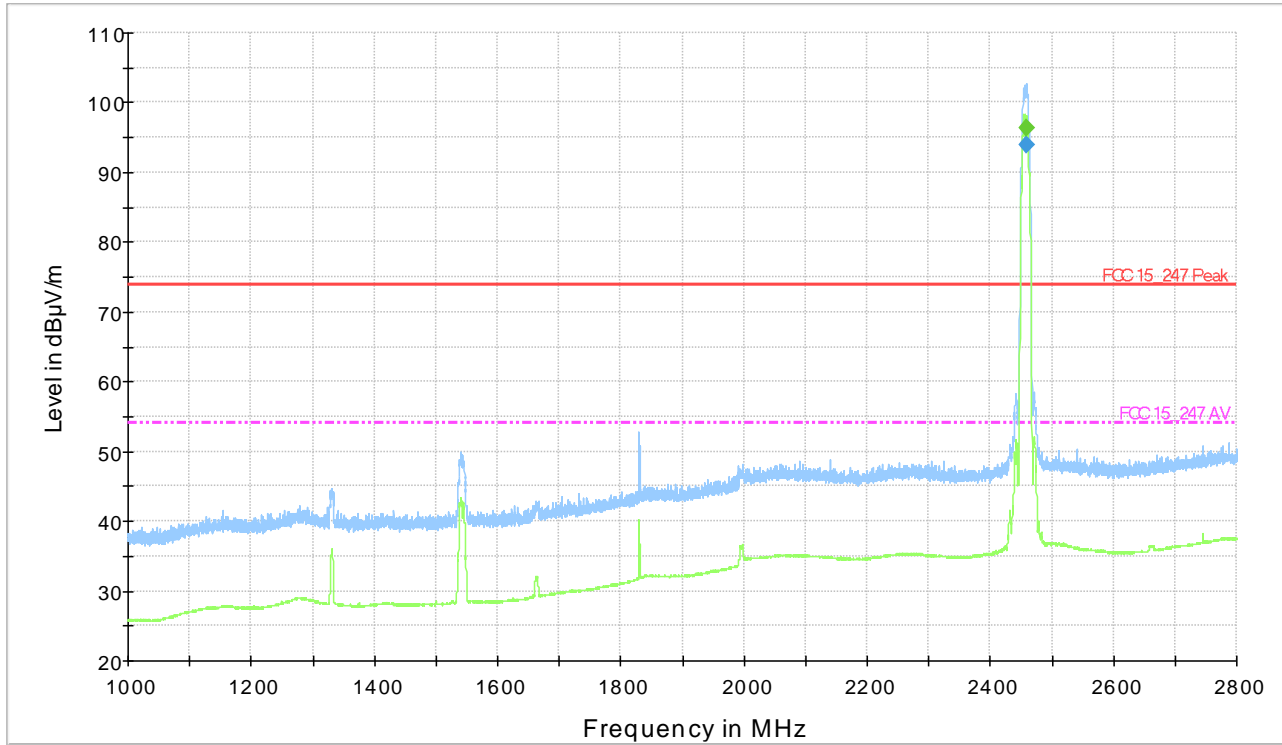
Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
665.447000	40.8	255.0	180.0	5.60	46.40
902.612000	39.9	104.6	180.0	6.50	46.40
927.638000	82.4	104.6	90.0	-36.00	46.40

\*Peaks out of limits are due to the radio carrier



<b>CHANNEL</b>	74
<b>FREQUENCY RANGE</b>	1-2.8GHz
<b>POLARIZATION</b>	VERTICAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



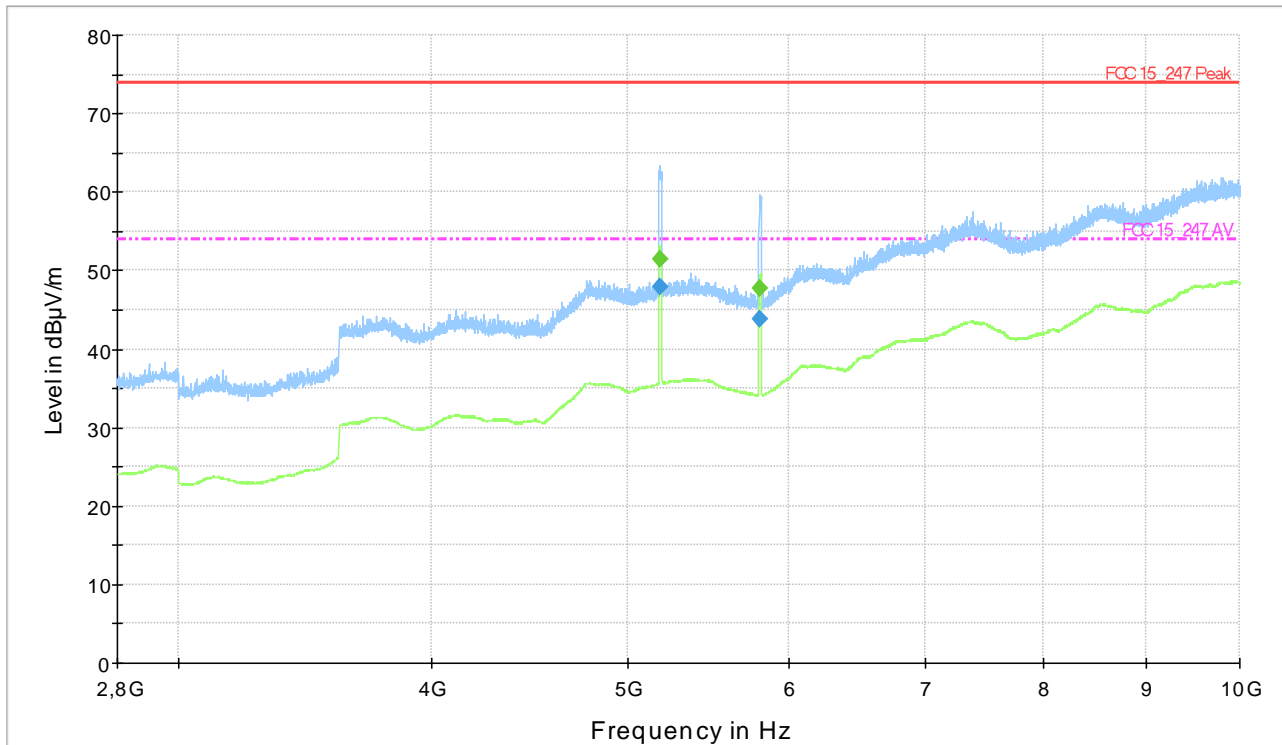
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
2458.540000	94.0	1000.0	1000.000	255.0	V	0.0	0.00

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2458.900000	96.4	1000.0	1000.000	255.0	V	0.0	10.0	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation

<b>CHANNEL</b>	74
<b>FREQUENCY RANGE</b>	2.8-10GHz
<b>POLARIZATION</b>	VERTICAL

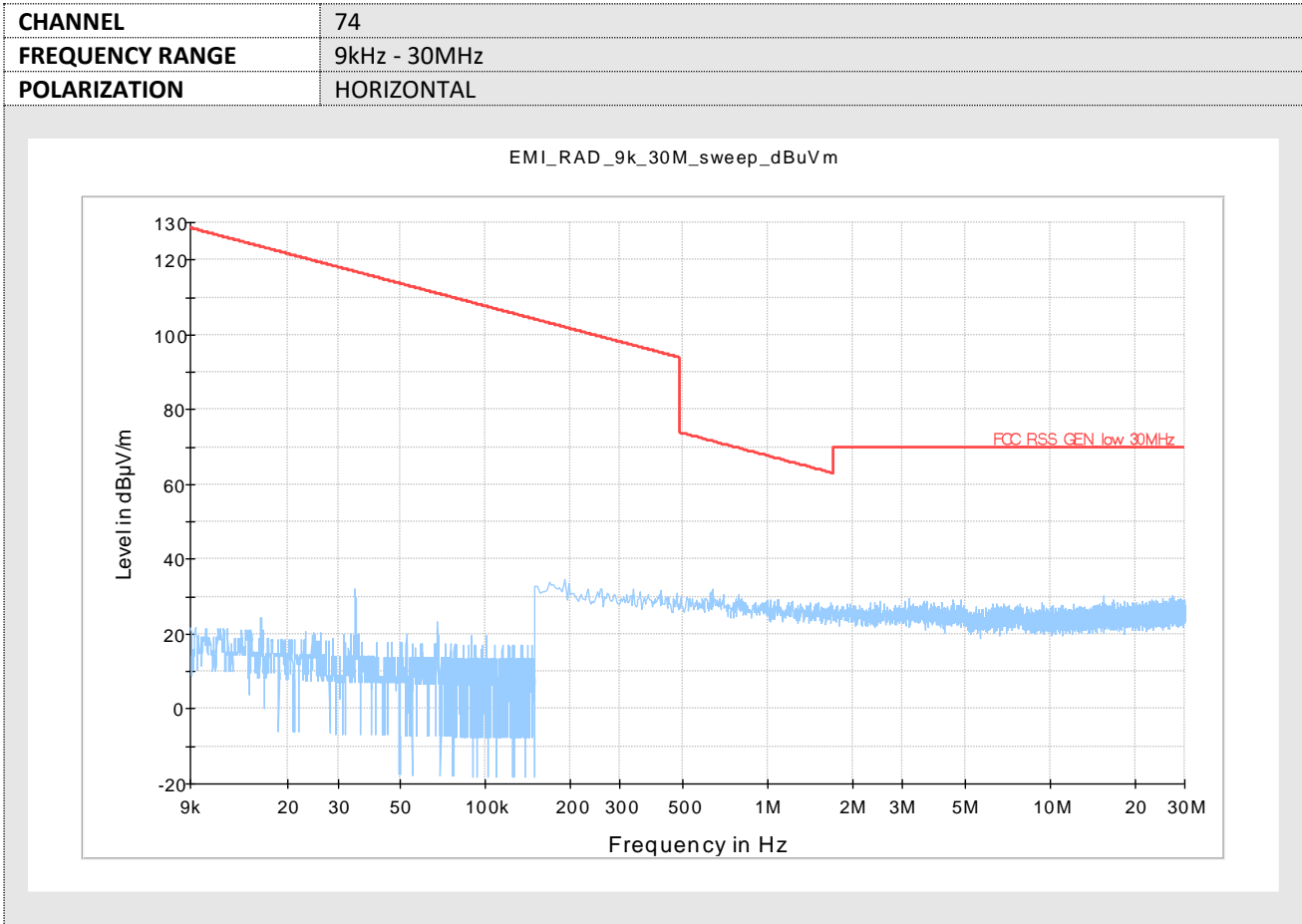
FCC\_15\_247\_RADIATED\_SPURIOUS\_VERTICAL



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
5180.320000	47.9	1000.0	1000.000	106.8	V	0.0	26.10
5803.120000	43.8	1000.0	1000.000	106.8	V	0.0	30.20

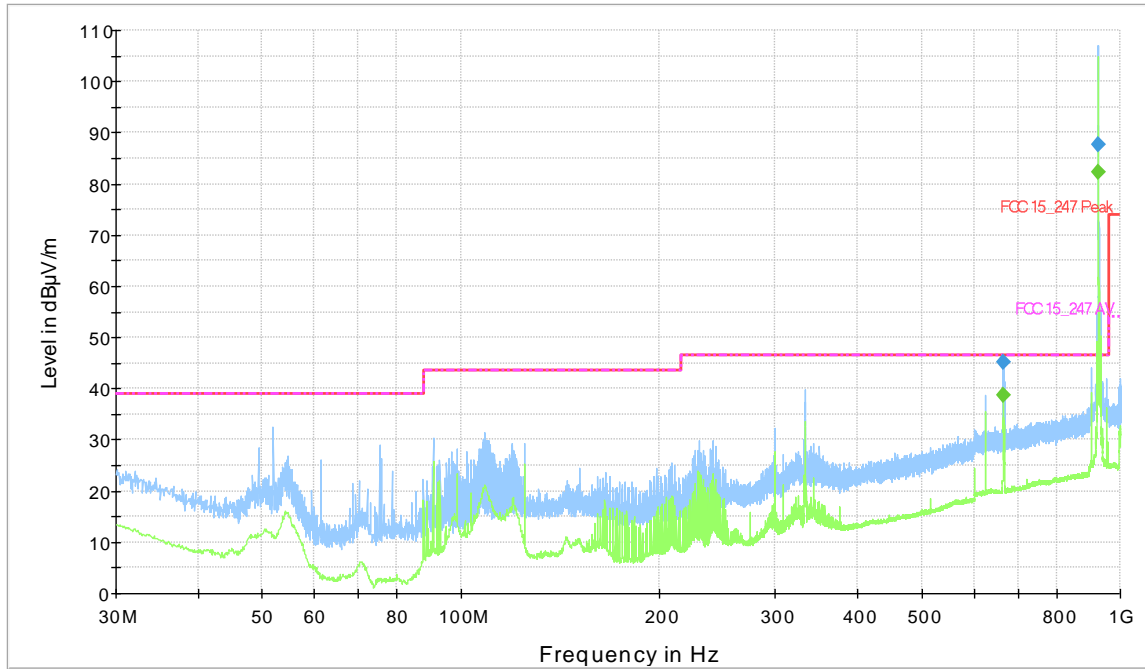
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
5180.320000	51.4	1000.0	1000.000	106.8	V	0.0	2.60	54.00
5803.120000	47.8	1000.0	1000.000	106.8	V	0.0	6.20	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation



<b>CHANNEL</b>	74
<b>FREQUENCY RANGE</b>	30MHz – 1GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
665.447000	45.1	104.8	180.0	1.30	46.40
927.541000	87.8	255.0	180.0	-41.40	46.40

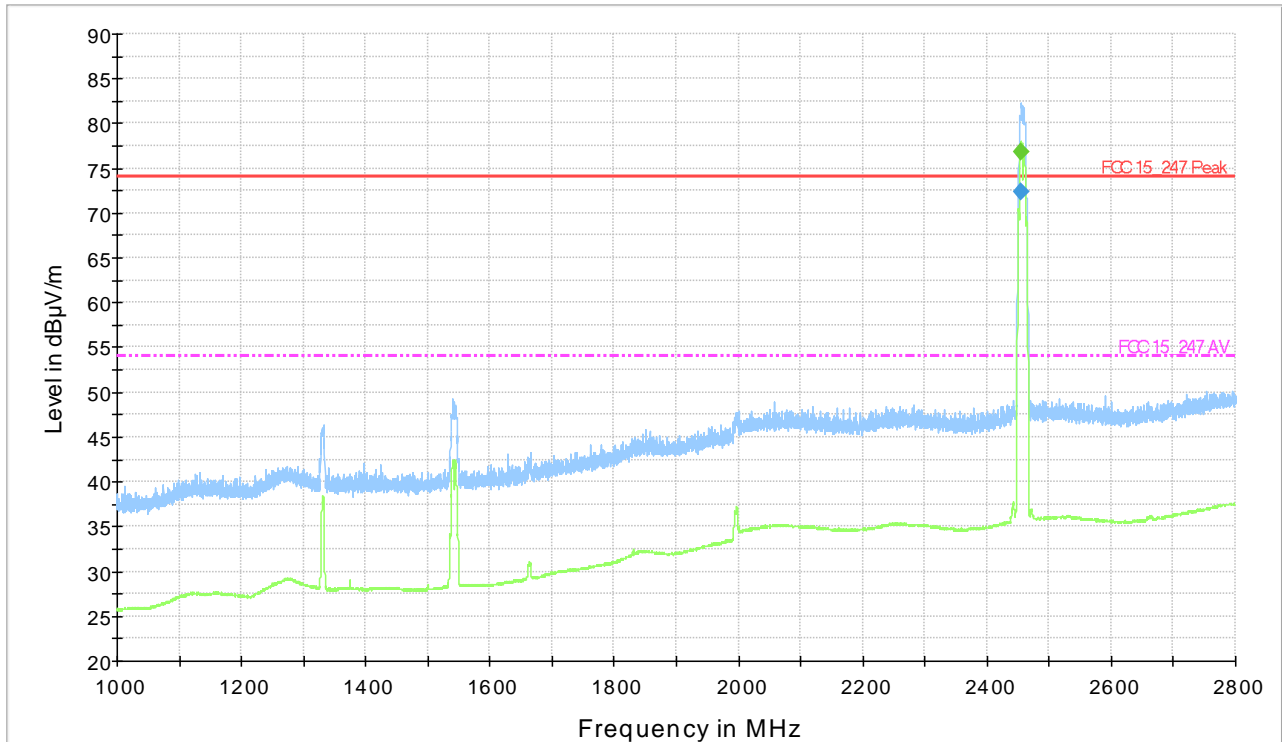
**Final Result Average**

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
665.447000	38.8	104.8	180.0	7.60	46.40
927.638000	82.4	255.0	180.0	-36.00	46.40

\*Peaks out of limits are due to the radio carrier

<b>CHANNEL</b>	74
<b>FREQUENCY RANGE</b>	1-2.8GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



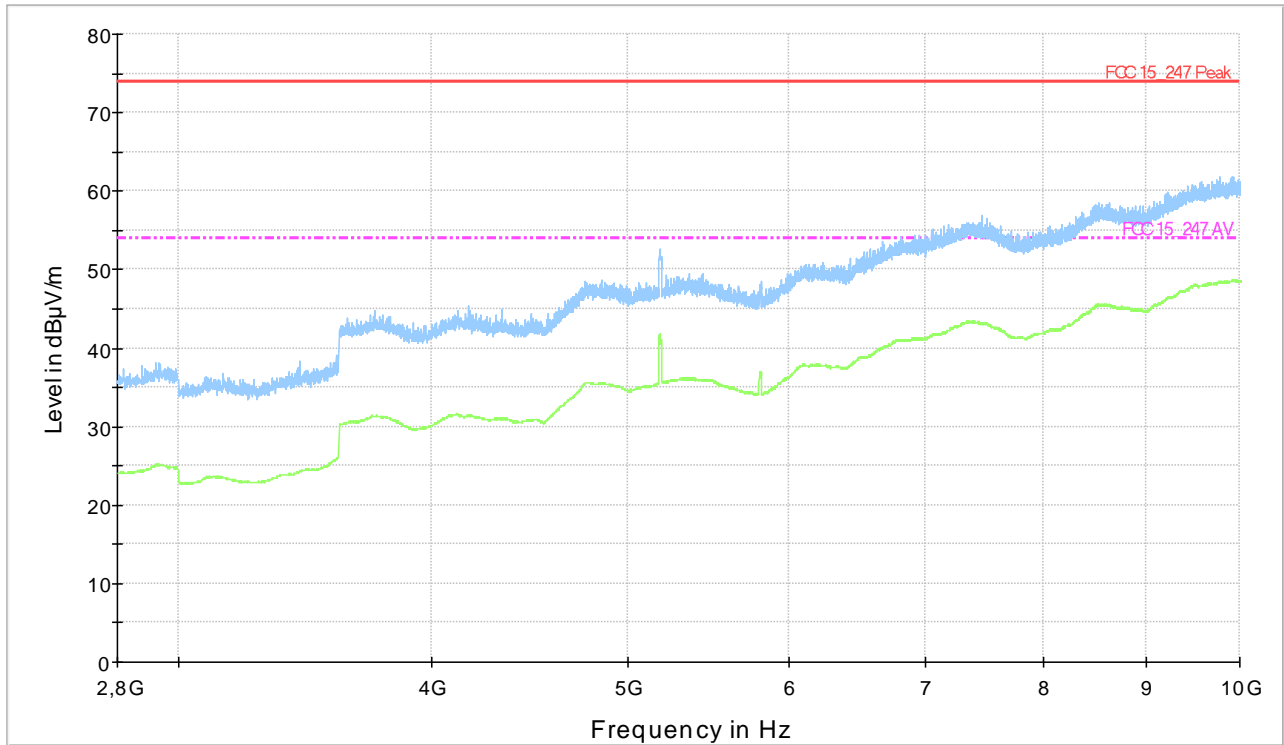
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)
2455.660000	72.4	1000.0	1000.000	255.0	H	180.0	21.60

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
2455.480000	76.8	1000.0	1000.000	255.0	H	180.0	-2.80	54.00

\*Peak out of the limits is related to The Carrier of RF Modules colocation

<b>CHANNEL</b>	74
<b>FREQUENCY RANGE</b>	2.8-10GHz
<b>POLARIZATION</b>	HORIZONTAL

FCC\_15\_247\_RADIATED\_SPURIOUS\_HORIZONTAL



## TEST 9.

### CONDUCTED SPURIOUS EMISSION 9kHz ÷ 10th HARMONIC

#### REFERENCE DOCUMENT

#### According to §15,247) d)

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 Db instead of 20 Db. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio/EMC Area
• TYPE OF MEASUREMENT	Conducted
• TEST METHOD	ANSI C63.10:2013
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40
• TEST PERFORMED BY	Daniele Aosani
• UNCERTAINTY OF MEASURE:	Combined uncertainty = $\pm 1,75$ dB Total uncertainty = (k=2) $\pm 3,5$ dB

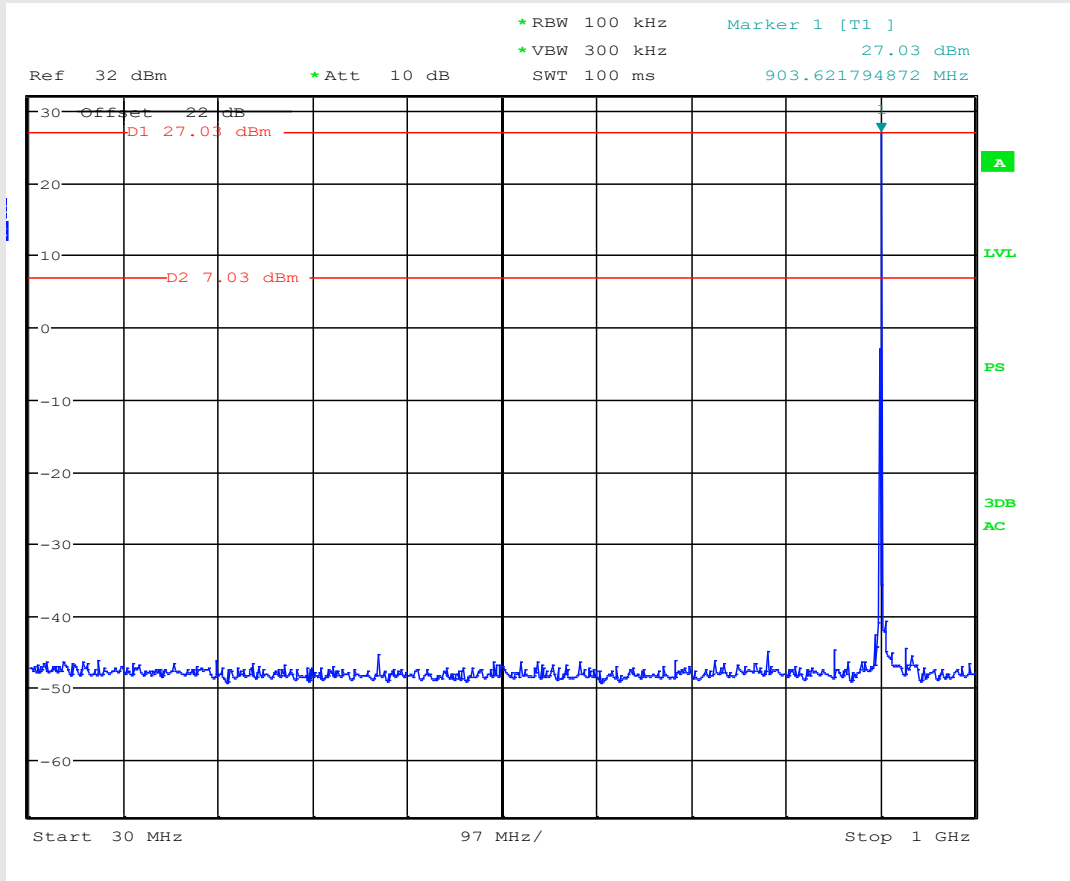
TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C $\pm$ 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

OPERATING CONDITION :#1, #2, #3 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

**FREQ. RANGE 30MHz to 1GHz**

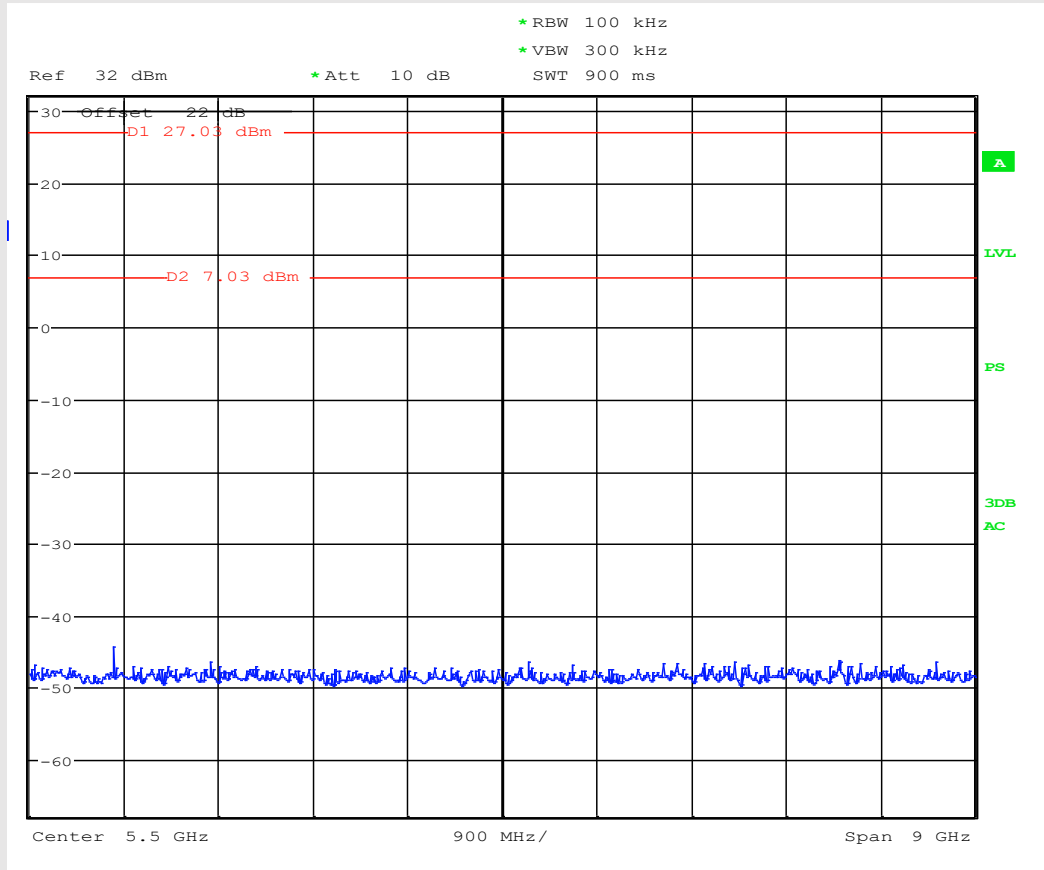
**CHO**





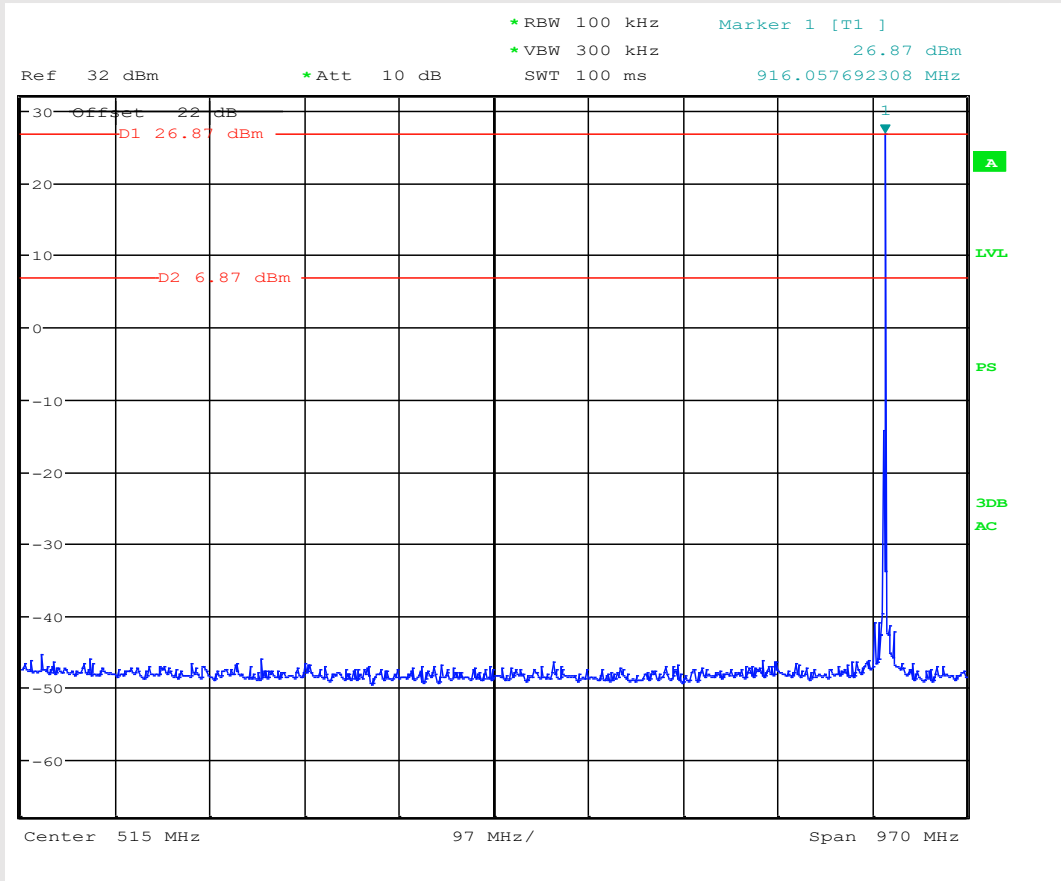
**FREQ. RANGE 1GHz to10GHz**

**CHO**



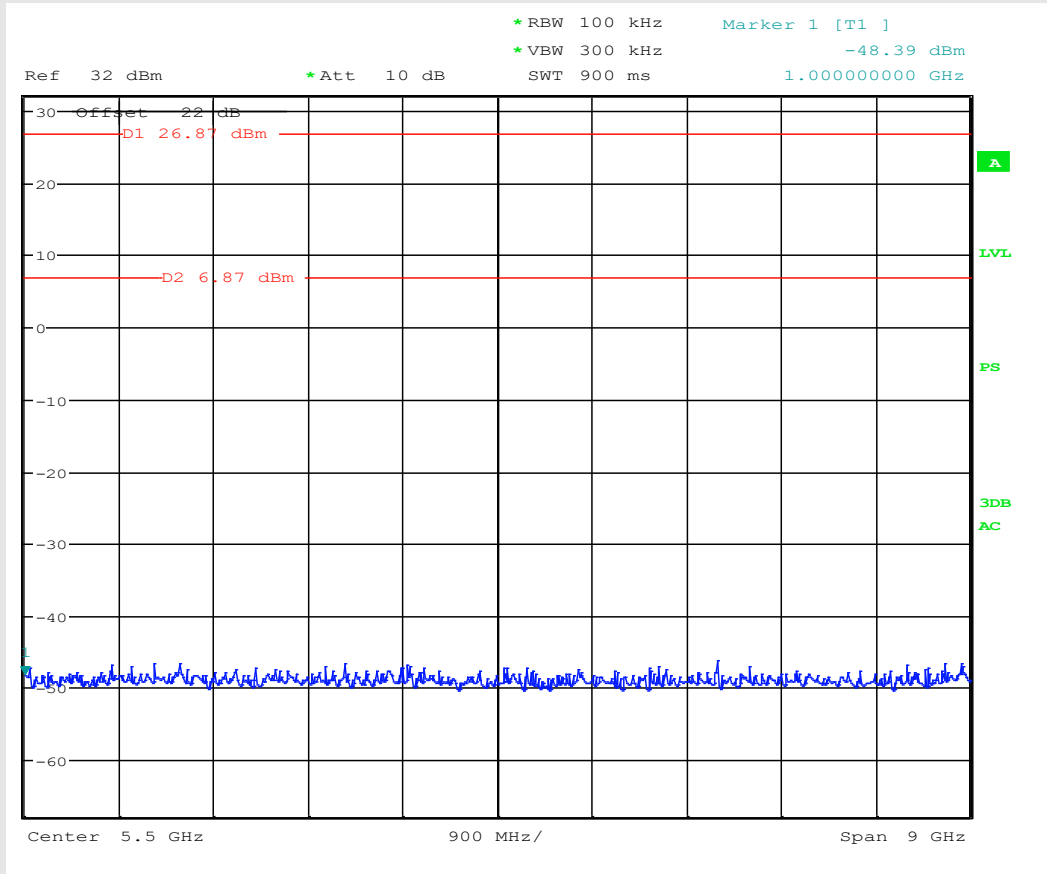
**FREQ. RANGE 30MHz to 1GHz**

**CH37**



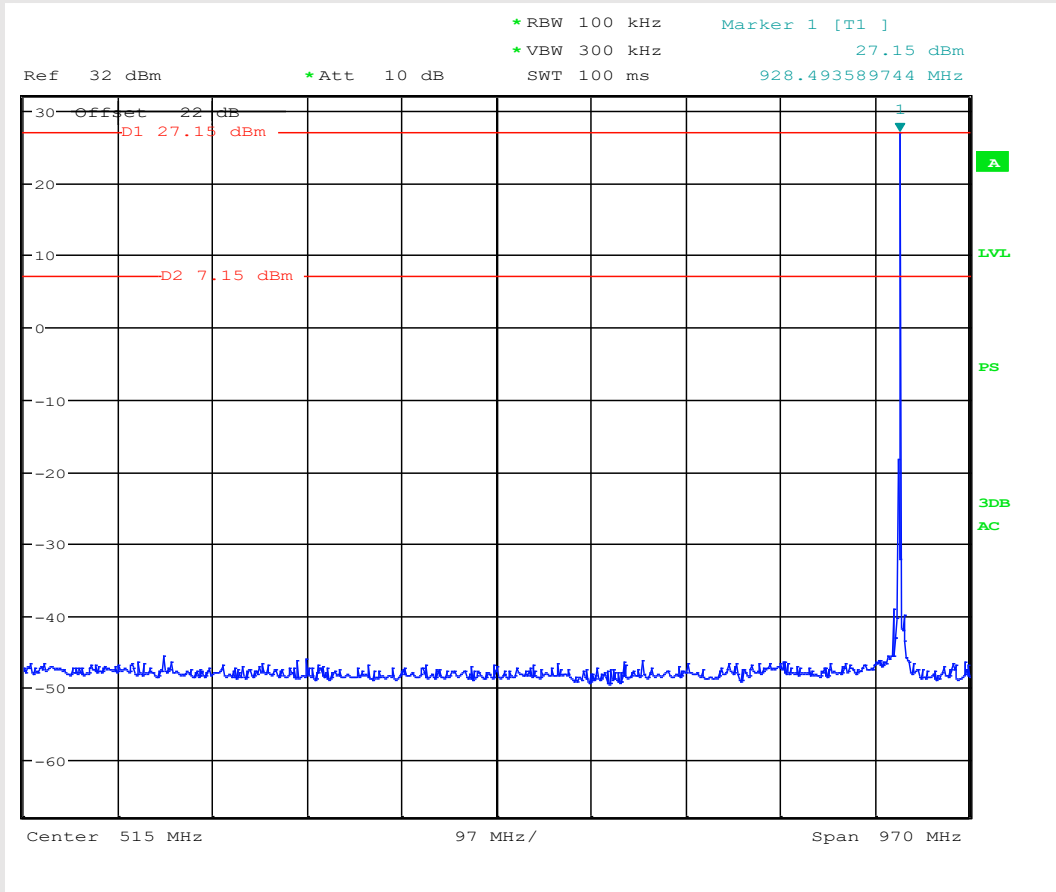
**FREQ. RANGE 1GHz to10GHz**

**CH37**



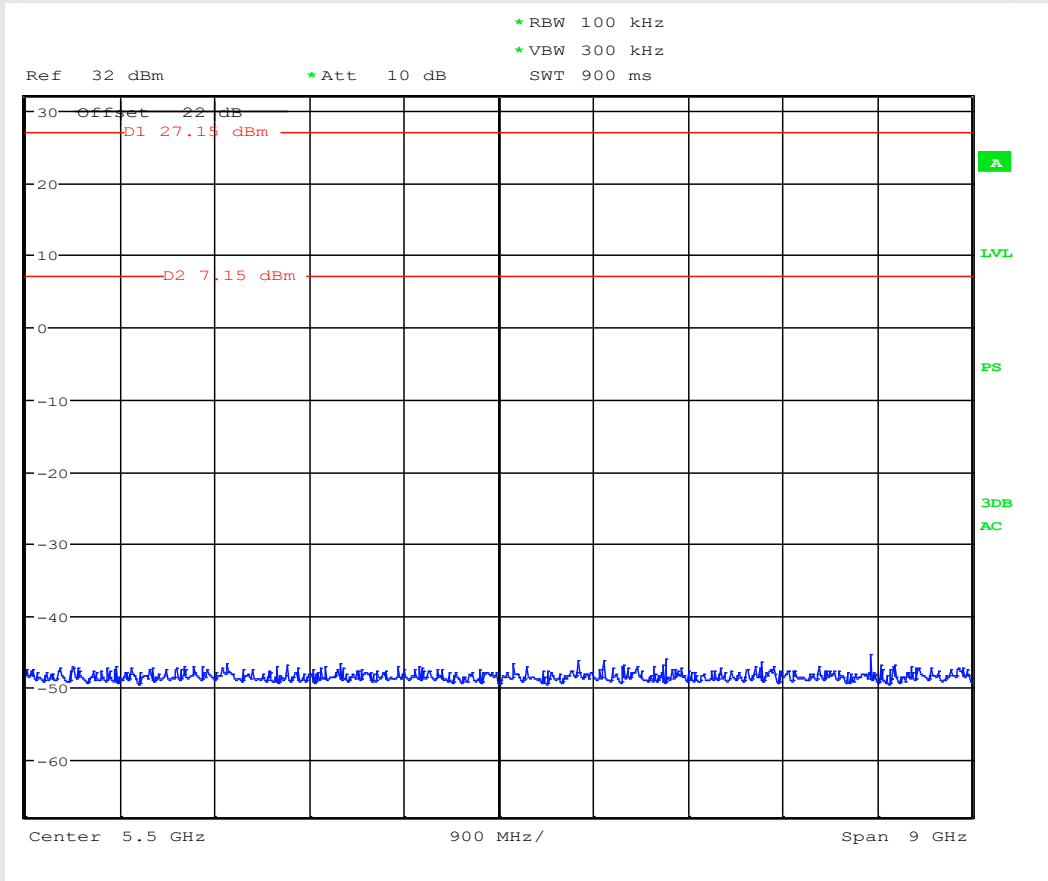
**FREQ. RANGE 30MHz to 1GHz**

**CH75**



**FREQ. RANGE 1GHz to10GHz**

**CH79**



## TEST 10.

### RADIATED EMISSION

REFERENCE DOCUMENT

FCC Cfr 47 part 15 - Subpart B - §15.109

• <b>TEST SETUP</b>	Acc. to reference document
• <b>TEST LOCATION</b>	Semi-anechoic chamber with measure distance at 3 meters
• <b>TYPE OF MEASUREMENT</b>	Radiated
• <b>TEST EQUIPMENT USED FOR TEST</b>	EMI Receiver Rodhe & Schwarz mod. ESU40 Bi-log antenna CHASE mod. CBL6111A Horn antenna Electro Metrics mod. EM-6961
• <b>TEST PERFORMED BY</b>	Daniele Aosani
• <b>UNCERTAINTY OF MEASURE:</b>	Combined uncertainty = $\pm 1,75$ dB Total uncertainty = (k=2) $\pm 3,5$ dB

TEST CONDITIONS	REQUIRED	MEASURED
<b>Ambient temperature</b>	<b>23°C <math>\pm</math> 5°C</b>	24 °C
<b>Ambient humidity</b>	<b>25 - 75%rH</b>	45%
<b>Pressure</b>	<b>85 - 106kPa (860mbar - 1060mbar)</b>	960 mbar

OPERATING CONDITION :#4 Duty Cycle 100%

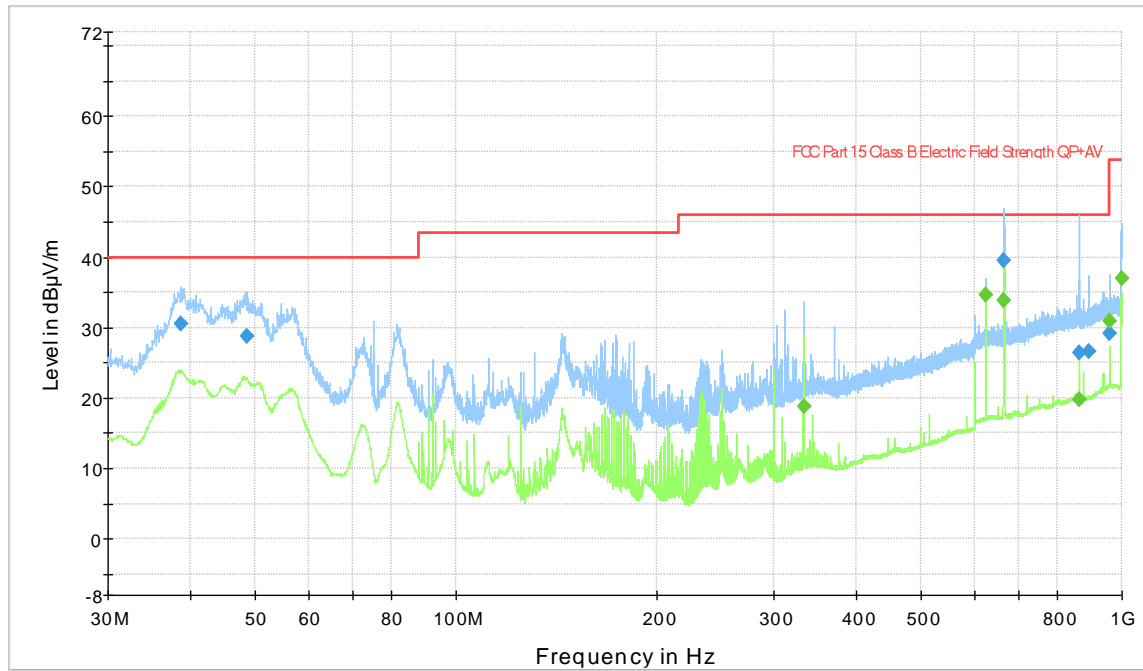
RESULT: **WITHIN THE LIMITS**

## TEST RESULTS

### FREQ. RANGE 30MHz to 1GHz

### VERTICAL POLARIZATION

FCC\_15\_109\_RADIATED\_EMISSIONS\_VERTICAL



#### Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
38.520000	30.5	99.8	0.0	9.5	40.0
48.600000	28.8	99.8	90.0	11.2	40.0
665.520000	39.6	154.7	180.0	6.4	46.0
861.360000	26.5	139.7	270.0	19.5	46.0
892.320000	26.6	99.8	0.0	19.4	46.0
957.720000	29.2	204.8	0.0	16.8	46.0

#### Final Result Average

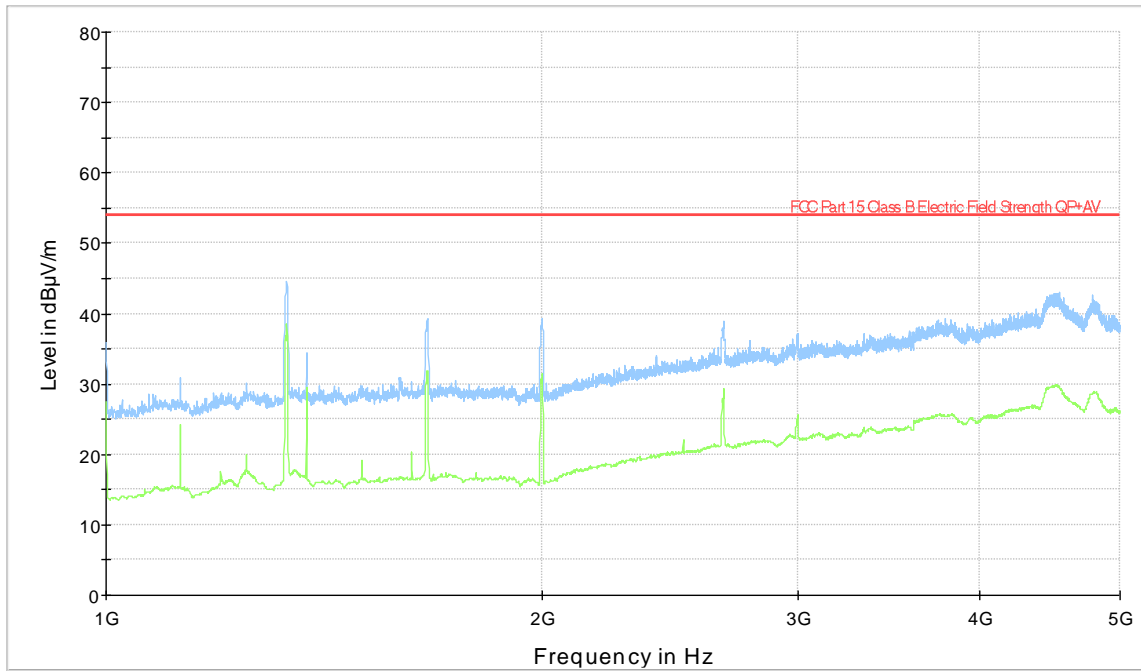
Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
332.760000	18.8	254.6	90.0	27.2	46.0
625.020000	34.7	99.8	0.0	11.3	46.0
665.520000	33.8	154.7	180.0	12.2	46.0
861.360000	19.8	119.3	270.0	26.2	46.0
957.240000	30.9	254.6	270.0	15.1	46.0
999.060000	37.0	99.8	180.0	17.0	54.0

\*Peaks out of limits are due to the radio carrier

**FREQ. RANGE 1GHz to 6GHz**

**VERTICAL POLARIZATION**

FCC\_15\_109\_RADIATED\_EMISSIONS\_VERTICAL

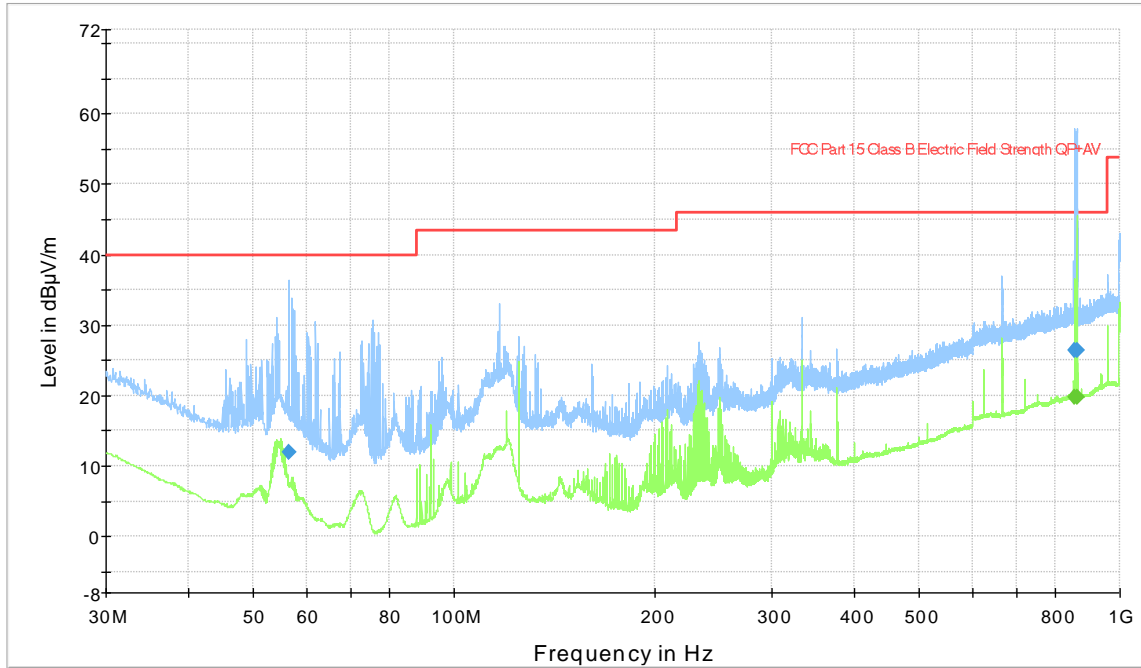




**FREQ. RANGE 30MHz to 1GHz**

**HORIZONTAL POLARIZATION**

FCC\_15\_109\_RADIATED\_EMISSIONS\_HORIZONTAL



**Final Result Quasi Peak**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
56.520000	12.0	99.7	-8.0	28.0	40.0
854.280000	26.4	244.7	269.0	19.6	46.0
860.880000	26.4	179.8	90.0	19.6	46.0

**Final Result Average**

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
854.280000	19.7	179.6	292.0	20.3	40.0
860.880000	19.8	292.7	68.0	26.2	46.0

\*Peaks out of limits are due to the radio carrier

**FREQ. RANGE 1GHz to 6GHz**

**HORIZONTAL POLARIZATION**

FCC\_15\_109\_RADIATED\_EMISSIONS\_HORIZONTAL

