

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	FCCTR_180904-1	Data Emissione / Issue Date:	08/06/2022	Pagine / Pages:	94
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Scopo delle prove <i>Test object</i>	Prove di tipo in accordo alla Norme <i>Type test according to Standards</i> 47 CFR FCC part 15 - Subpart C - §15.247 RSS-247 Issue 2:2017				
Richiedente <i>Applicant</i>	DATALOGIC S.r.l. Via S. Vitalino 13 - 40012 Lippo Di Calderara Di Reno - Bologna - Italy Phone. +39 051 3147196 Fax +39 051 3147561				
Marchio commerciale <i>Trade mark</i>					
Fabbricante <i>Manufacturer</i>	DATALOGIC S.r.l. Via S. Vitalino 13 - 40012 Lippo Di Calderara Di Reno - Bologna - Italy				
Prodotto <i>Product</i>	Barcode reader				
Modello testato <i>Testing model</i>	QBT2500				
Tipo <i>Type</i>	QBT2500-BK				
Identificativo FCC & IC <i>FCC & IC ID</i>	FCC: U4FQBT25 IC: 3862D-QBT25				
Data ricevimento campioni <i>Date of test samples receipt</i>	09/12/2021				
Campioni verificati <i>No. of tested samples</i>	1 – Sampled by the applicant				
Data verifiche <i>Testing date</i>	From 14/12/2021 to 05/04/2022				
Sito di prova <i>Testing site</i>	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Esito delle valutazioni <i>Assessment results</i>	CONFORME / COMPLIANT				
Verifiche effettuate da <i>Verifications carried out by</i>	Daniele AOSANI Tecnico Laboratorio <i>Laboratory Engineer</i>				
Approvato <i>Approved by</i>	Riccardo PFEIFFER Responsabile Laboratorio <i>Laboratory Manager</i>				

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.

Il campione è stato fornito dal cliente ed i risultati si riferiscono al campione così come ricevuto

The sample has been provided by the customer and the results apply to the sample as received

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Conformity Assessment Body Identifier (CABID)	5347A
Identificativo FCC del sito di prova FCC designation number	IT0012

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0. RELEASE CONTROL RECORD

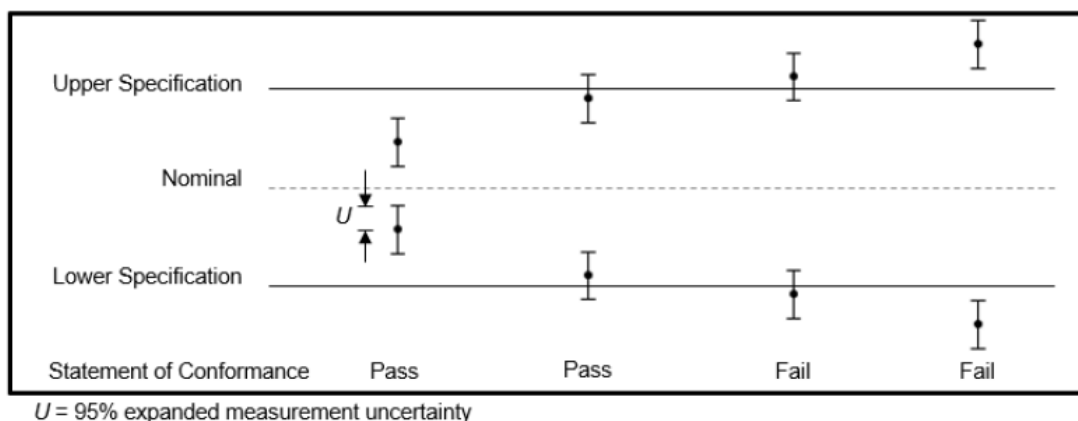
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_180904-0	Original release	20/04/2022
FCCTR_180904-1	Updated section 3 "General Remarks"	08/06/2022

This document is valid in last revision that deletes and replaces the previous one

1. DECISION RULE

PRs LAB specifies that, if the decision rules of conformity of the test results are not indicated in detail in the standard/s object of tests, it takes as a decision rule for the declaration of conformity the simple binary system ($w = 0$) stated in the ILAC-G8-09:2019 document.

The decision rule is applicable for all parts of standard



Statements of conformity are reported as:

- Pass: the measured value is below the acceptance limit, $AL=TL$.
- Fail: the measured value is above the acceptance limit, $AL=TL$.

Definitions

- Guard Band (w): interval between a tolerance limit and a corresponding acceptance limit where length $w=|TL-AL|$.
- Tolerance Limit (TL) (Specification Limit): specified upper or lower bound of permissible values of a property.
- Acceptance Limit (AL): specified upper or lower bound of permissible measured quantity values.

2. INFORMATION PROVIDED BY CUSTOMER

- None

3. GENERAL REMARKS

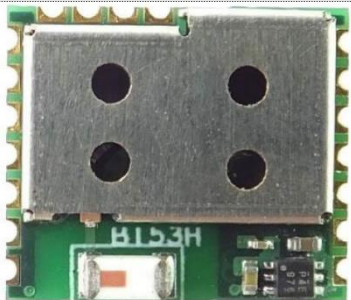
- The device has been submitted to some prescan measurement in the way to individuate the worst power emission axis. This test report shows only the results of the worst case found during prescan measurements.

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	Barcode reader
MODEL NAME	QBT2500
FCC ID	U4FQBT25
IC ID	3862D-QBT25
S/N	B21P12466
PRS LAB INTERNAL REFERENCE	BC 399/2021 2/10
TRADEMARK	
MANUFACTURER	Datalogic
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	Internal lithium battery
POWER SUPPLY NOMINAL VOLTAGE	3.6V 
MAX POWER or MAX ABSORBED CURRENT	700mA
OPERATING TEMPERATURE	+0°C ~ +50°C
DIMENSIONS	See photography documentation
EUT STANDING	Hand

4.2 Bluetooth Basic Rate / Enhanced Data Rate module technical data

CHIP MANUFACTURER			
MODEL NAME	BT53H		
ETS CATEGORY	Bluetooth - Basic Rate & EDR		
TYPE OF RADIO DEVICE	Transceiver		
FREQUENCY BAND	2402 – 2480MHz		
NUMBER OF CHANNELS	79		
CHANNEL SPACING	1MHz		
MODE	Basic Rate	Enhanced Data Rate	
TYPE OF MODULATION	GFSK	$\pi/4$ -DQPSK	8DQPSK
PACKET TYPE	DH5	2DH5	3DH5
DATA RATE (Mbit/s)	1	2	3
ANTENNA	Chip antenna		
ANTENNA GAIN	0.5dBi		
ANTENNA MANUFACTURER			
PHOTO MODULE			

4.2.1 Channel List Bluetooth Basic Rate/Enhanced Data Rate

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

4.3 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
☒	Enclosure	Plastic	Screw/pressure	---
☐	AC Power input	Port not present	---	---
☐	DC Power input	Internal battery	---	---
☐	Signal/Control port	Port not present	---	---
☐	Telecomm. port	Port not present	---	---
☐	Antenna Port	Internal	---	---

Note:

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

4.4 Modifications incorporated in E.U.T.

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

- None

4.5 Auxiliary equipment

- Datalogic Labels, used to set device

5. REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	DESCRIPTION
Title 47 Part 15 Subpart C § 15.247	Radio Frequency Devices – Intentional Radiators Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10:2013	American National Standard for Testing Unlicensed Wireless Devices
RSS-247 Issue 2:2017	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.
RSS Gen Issue 5:2018 + A1:2019+ A2:2021	General Requirements for Compliance of Radio Apparatus

6. OPERATING TEST 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 at maximum power in modulated carrier on channel 0
#2	Continuous transmission at maximum power in modulated carrier on channel 39
#3	Continuous transmission at maximum power in modulated carrier on channel 78
#4	Continuous transmission, frequency hopping mode

7. SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS				
Port	Test ¹	Reference Standard	Operating Condition	Results
Antenna port	Antenna requirement	FCC Part 15 §15.203	---	Compliant
	Maximum Peak Output Power	FCC Part 15 §15.247 (b) (1) RSS-247 § 5	#1, #2, #3	Within the limits
	Transmitter 20 dB Bandwidth 99% Bandwidth	FCC Part 15 §15.247 (a) (1) RSS-Gen	#1, #2, #3	Within the limits
	Transmitter Band Edge	FCC Part 15 § 15.247 (d) & § 15.209 (a) RSS-247 § 5.5	#1, #3	Within the limits
	RF radiated Spurious Emissions at the Transmitter Antenna Terminal	FCC Part 15 § 15.247 (d) RSS-247 § 5.5	#1, #2, #3	Within the limits
	Transmitter Radiated Emissions <1GHz	FCC Part 15 § 15.247 (d) & § 15.249 (a) RSS-247 § 5.5	#1, #2, #3	Within the limits
	Transmitter Radiated Emissions >1GHz	FCC Part 15 § 15.247 (d) & § 15.249 (a) RSS-247 § 5.5	#1, #2, #3	Within the limits
	Transmitter Carrier Frequency Separation	FCC Part 15 § 15.247 (a) (1) RSS-247 § 5.1	#4	Within the limits
	Transmitter Number of Hopping Frequencies and Average Time of Occupancy	FCC Part 15 § 15.247 (a) (1) (iii) RSS-247 § 5.1	#4	Within the limits
	Transmitter Frequency Stability	RSS-Gen	#1, #2, #3	Within the limits

Note:

¹All tests are performed with the device in position shown in the photographic documentation. It represents the worst power emission axis.

8. UNITS OF MEASUREMENTS

Conducted EMI Data is in dB μ V; dB referenced to one microvolt

Radiated EMI Data is in dB μ V/m; dB/m referenced to one microvolt per meter

Sample Calculation:

RFS = Radiated Field Strength,

FSM = Field Strength Measured,

A.F. = Receive antenna factor,

Gain = amplification gains and/or cable losses.

$$\text{RFS (dB}\mu\text{V/m @ 3m)} = \text{FSM (dB}\mu\text{V)} + \text{A.F. (dB/m)} - \text{Gain (dB)}$$

9. 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 an integrated chip antenna
RESULT: COMPLIANT

TEST 2.	MAXIMUM PEAK OUTPUT POWER
REFERENCE DOCUMENT	According to §15.247(b) (1) & RSS-247 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 signalling 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 LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
	Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2022	02/2023
	Horn antenna	Electro Metrics	EM-6961	100437	10/2020	10/2023
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	
	Power Sensor	Keysight	U2022XA + U2032A	MY57030003	03/2022	03/2024
• TESTED PORT	Antenna					
• TEST METHOD	ANSI C63.10:2013 section 11.9					
• FREQUENCY RANGE	Carrier					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty = 3 dB					

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

RESULT: WITHIN THE LIMITS

MEASUREMENT PARAMETER

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

TEST DESCRIPTION

Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously - rotating, remotely - controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency.

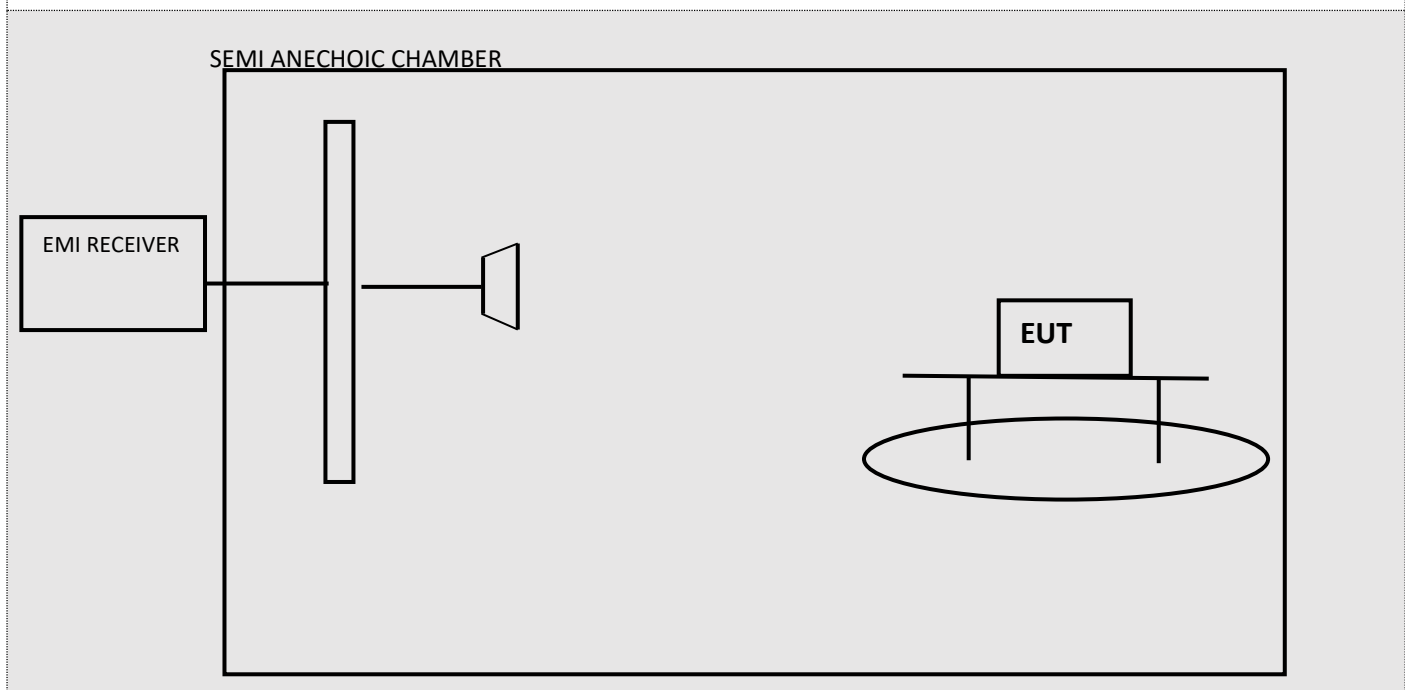
The EUT is placed at test table.

For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m

Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m~4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3m.

This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

TEST SETUP BLOCK DIAGRAM



TEST RESULTS

Mode				Basic Rate		
Modulation				GFSK		
Packet Type: (Maximum Payload):				DH5		
Channel	Frequency (MHz)	EIRP (dBm)	Antenna Gain	Max Conducted Output power	Limit (dBm)	Result
0	2402	5.78	+0.5	5.28	30	WITHIN THE LIMITS
39	2441	4.90	+0.5	4.40		
78	2480	8.11	+0.5	7.61		
Note: ---						

Mode				Enhanced Data Rate		
Modulation				π/4-DQPSK		
Packet Type: (Maximum Payload):				2DH5		
Channel	Frequency (MHz)	EIRP (dBm)	Antenna Gain	Max Conducted Output power	Limit (dBm)	Result
0	2402	5.46	+0.5	4.96	30	WITHIN THE LIMITS
39	2441	6.32	+0.5	5.82		
78	2480	9.06	+0.5	8.56		
Note: ---						

Mode				Enhanced Data Rate		
Modulation				8DQPSK		
Packet Type: (Maximum Payload):				3DH5		
Channel	Frequency (MHz)	EIRP (dBm)	Antenna Gain	Max Conducted Output power	Limit (dBm)	Result
0	2402	3.56	+0.5	3.06	30	WITHIN THE LIMITS
39	2441	6.59	+0.5	6.09		
78	2480	9.32	+0.5	8.82		
Note: ---						

TEST 3.	20dB CHANNEL BANDWIDTH 99% OCCUPIED BANDWIDTH
REFERENCE DOCUMENT	According to §15,247(a)(1) & RSS-GEN Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands, The minimum 20 dB bandwidth shall be at least 500 kHz.

• TEST LOCATION	Radio test area					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
• TESTED PORT	Antenna					
• TEST METHOD	ANSI C63.10:2013 section 6.9					
• FREQUENCY RANGE	Carrier					

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

RESULT: COMPLIANT

MEASUREMENT PARAMETER

Resolution bandwidth	30kHz
Video bandwidth	100kHz
Span	4MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST DESCRIPTION

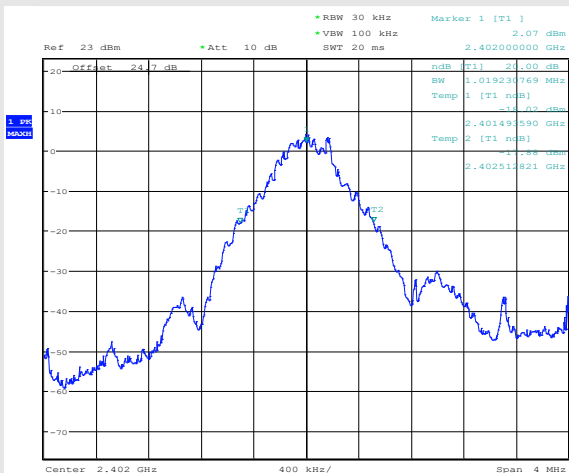
Allow the trace to stabilize.

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 20 dB relative to the maximum level measured in the fundamental emission

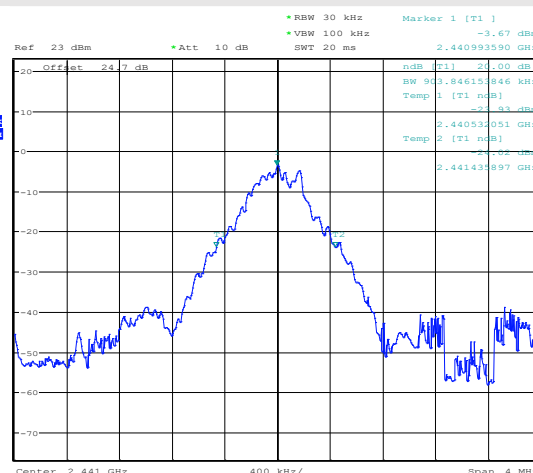
TEST RESULTS 20dB BW

Basic Rate DH5

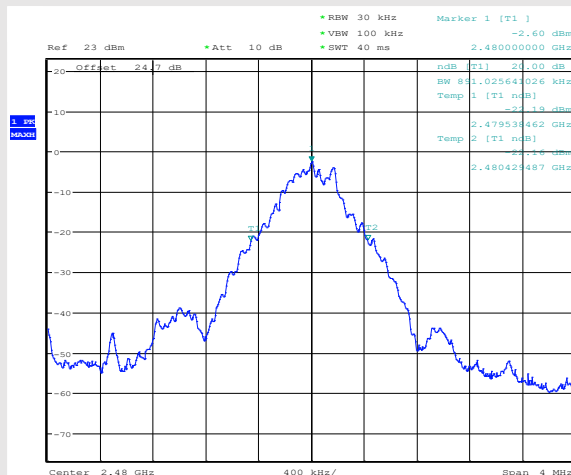
Channel: 0



Channel: 39



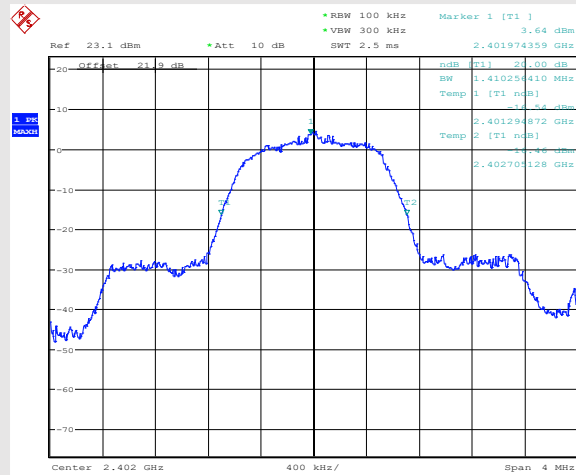
Channel: 78



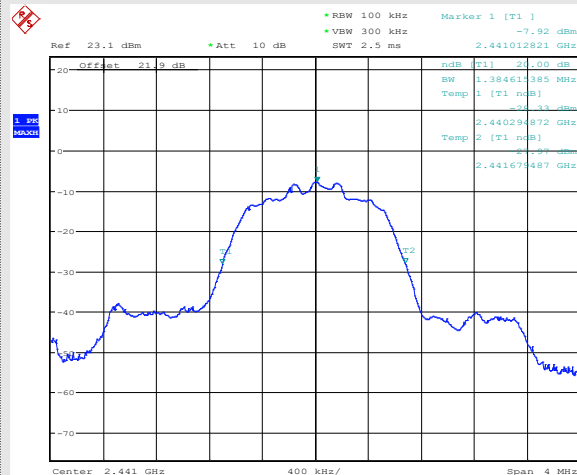
Channel	Frequency (MHz)	20dB Bandwidth (kHz)	Limits (kHz)	Result
0	2402	1.019	>500	COMPLIANT
39	2441	903	>500	COMPLIANT
78	2480	891	>500	COMPLIANT

Enhanced Data Rate 2DH5

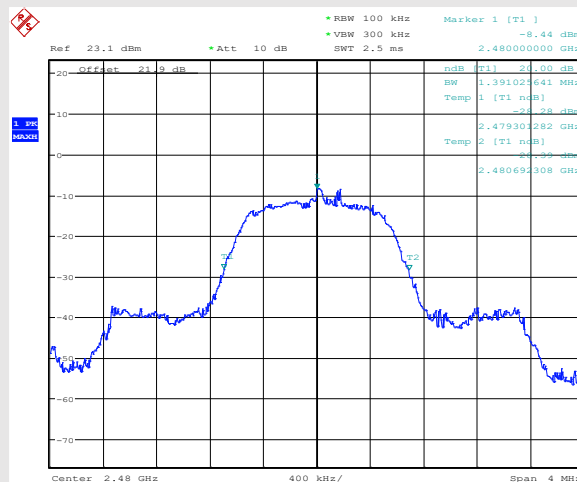
Channel: 0



Channel: 39



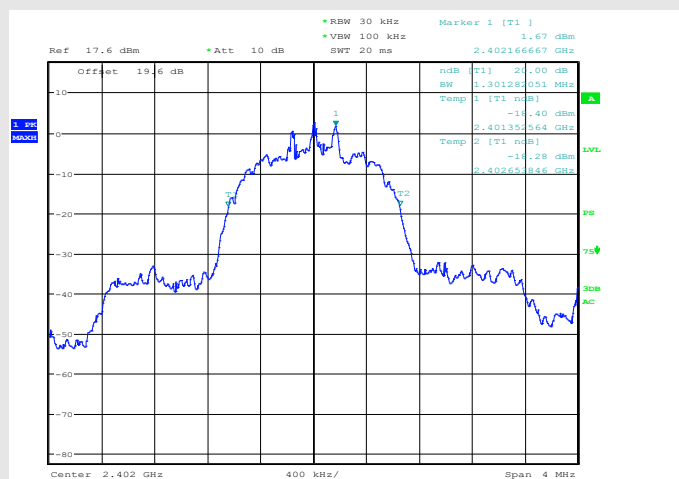
Channel: 78



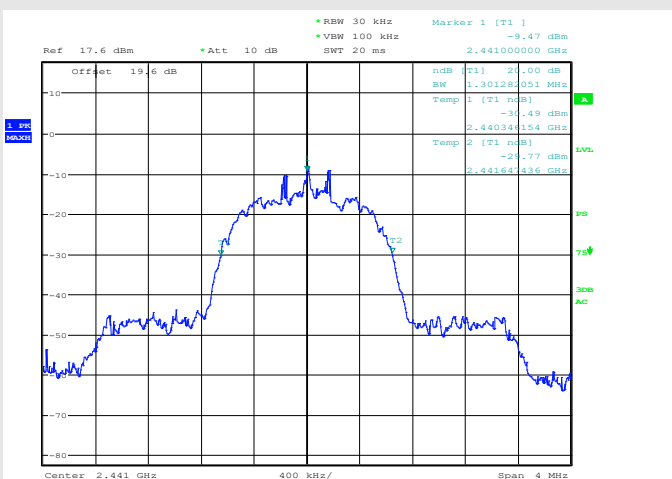
Channel	Frequency (MHz)	20dB Bandwidth (kHz)	Limits (kHz)	Result
0	2402	1.410	>500	COMPLIANT
39	2441	1.384	>500	COMPLIANT
78	2480	1.391	>500	COMPLIANT

Enhanced Data Rate 3DH5

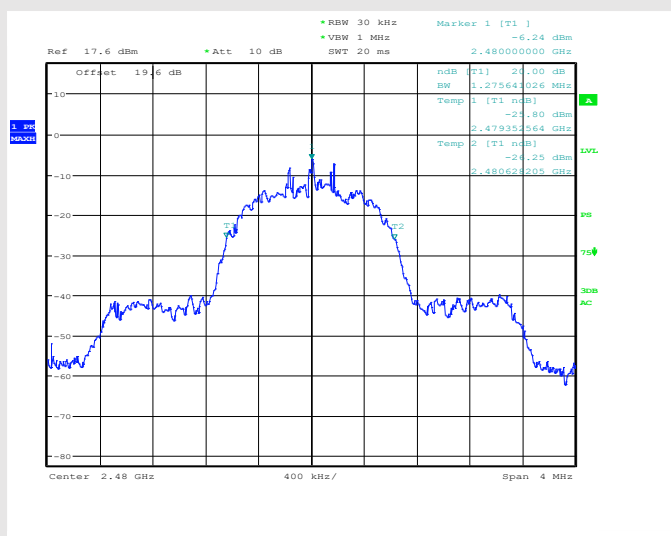
Channel: 0



Channel: 39



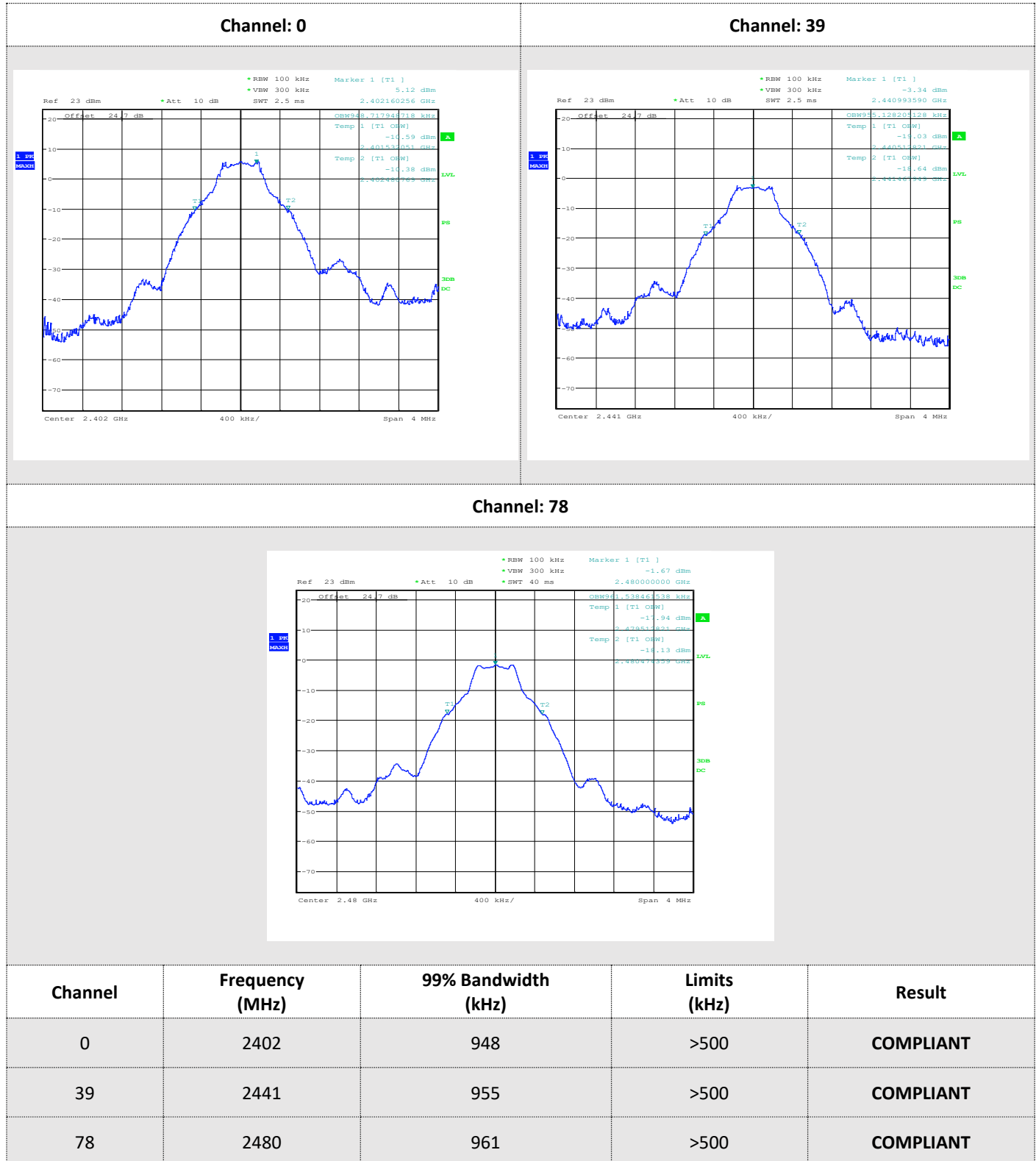
Channel: 78



Channel	Frequency (MHz)	20dB Bandwidth (kHz)	Limits (kHz)	Result
0	2402	1.301	>500	COMPLIANT
39	2441	1.301	>500	COMPLIANT
78	2480	1.275	>500	COMPLIANT

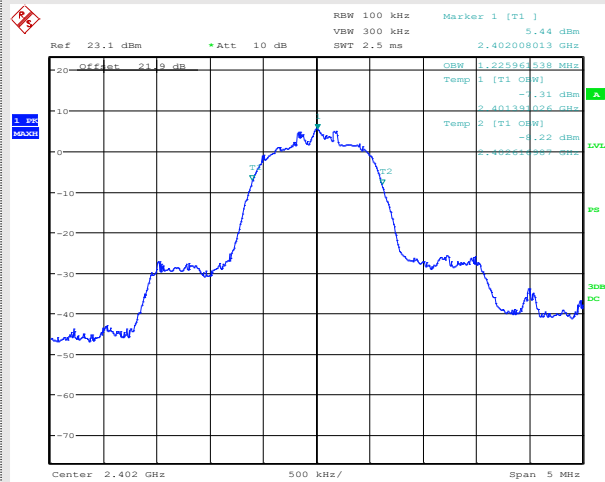
TEST RESULTS 99% BW

Basic Rate DH5

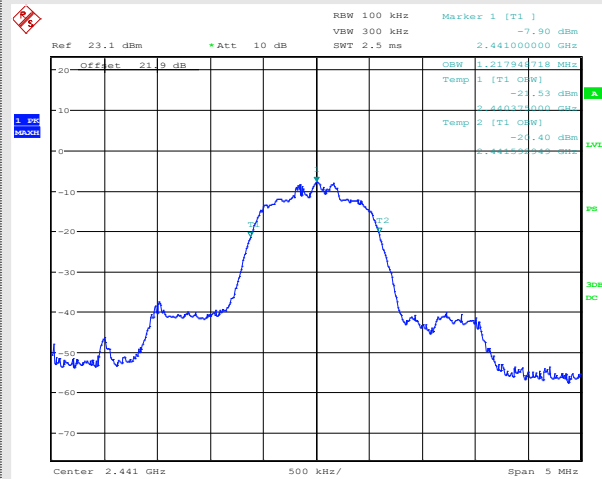


Enhanced Data Rate 2DH5

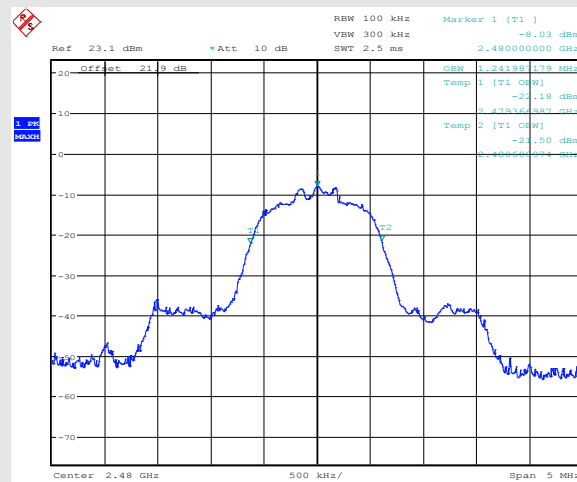
Channel: 0



Channel: 39

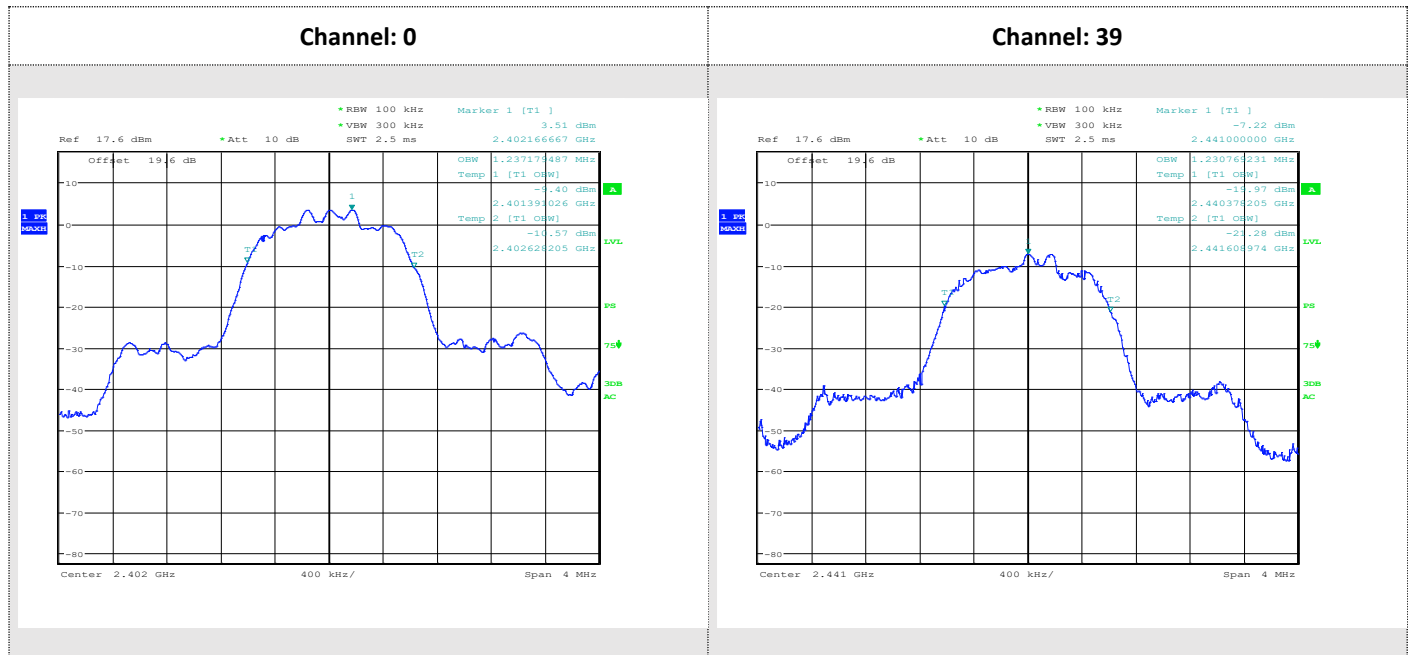


Channel: 78

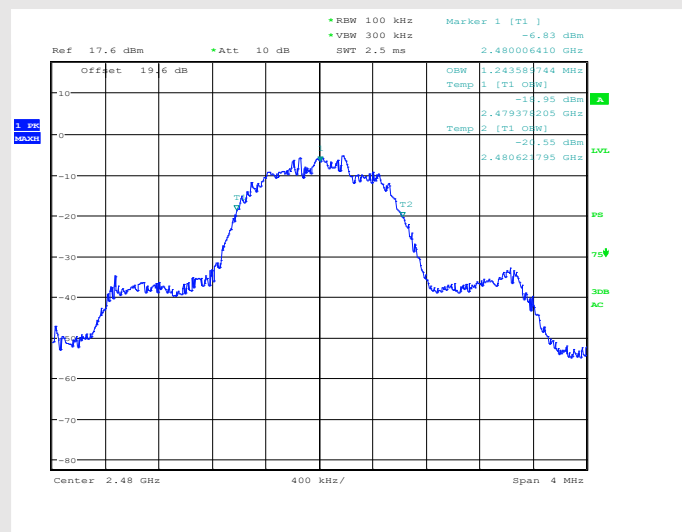


Channel	Frequency (MHz)	99% Bandwidth (kHz)	Limits (kHz)	Result
0	2402	1.225	>500	COMPLIANT
39	2441	1.217	>500	COMPLIANT
78	2480	1.241	>500	COMPLIANT

Enhanced Data Rate 3DH5



Channel: 78



Channel	Frequency (MHz)	99% Bandwidth (kHz)	Limits (kHz)	Result
0	2402	1.230	>500	COMPLIANT
39	2441	1.237	>500	COMPLIANT
78	2480	1.243	>500	COMPLIANT

TEST 4.	BAND EDGE
REFERENCE DOCUMENT	According to §15,247(d) & RSS-247 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 LOCATION	Radio test area					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
• TESTED PORT	Antenna					
• TEST METHOD	ANSI C63.10:2013 section 6.10					
• FREQUENCY RANGE	Carrier					

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

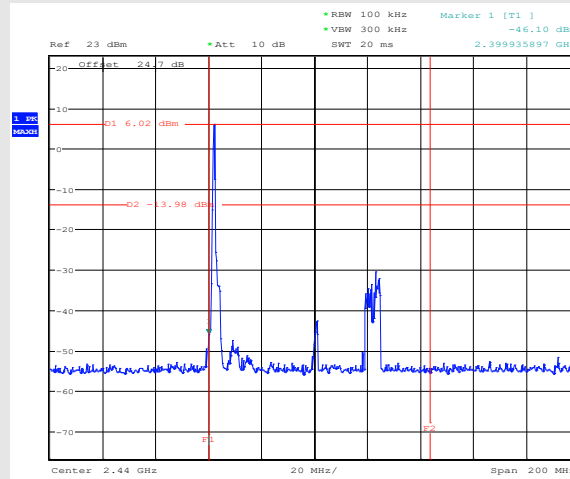
RESULT: COMPLIANT

Note: The plots shown only the results of Modulation DH5 and 3DH5 because are the worst case

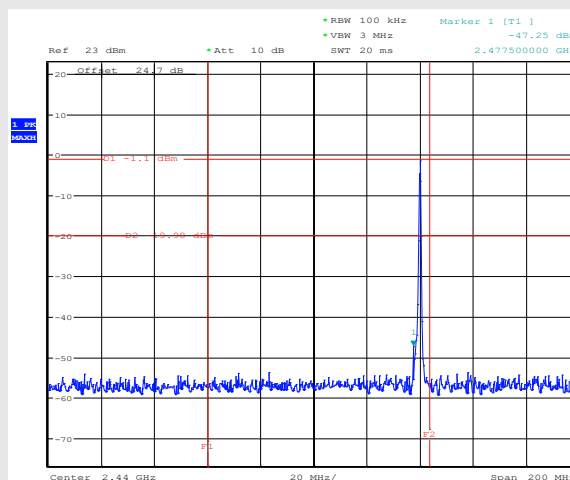
TEST RESULTS

Static Mode/Basic Rate DH5

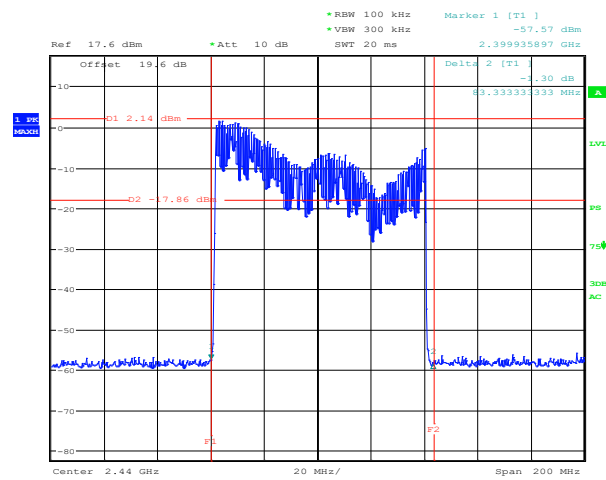
LOWER BAND-EDGE CH 0



UPPER BAND-EDGE CH 78



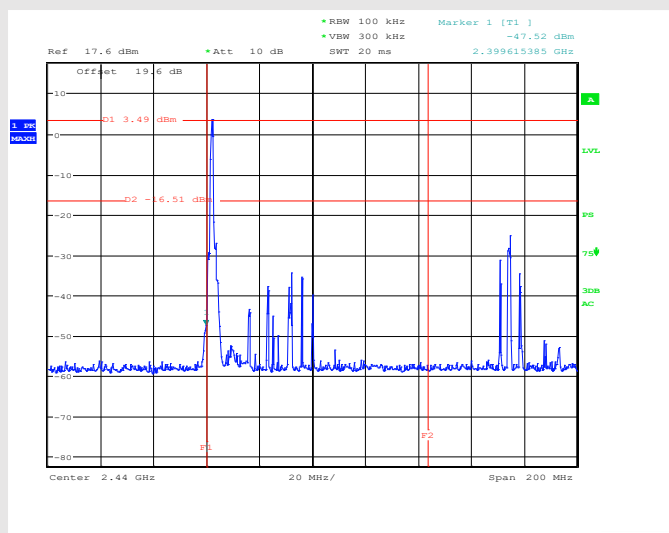
Hopping Mode/Basic Rate DH5



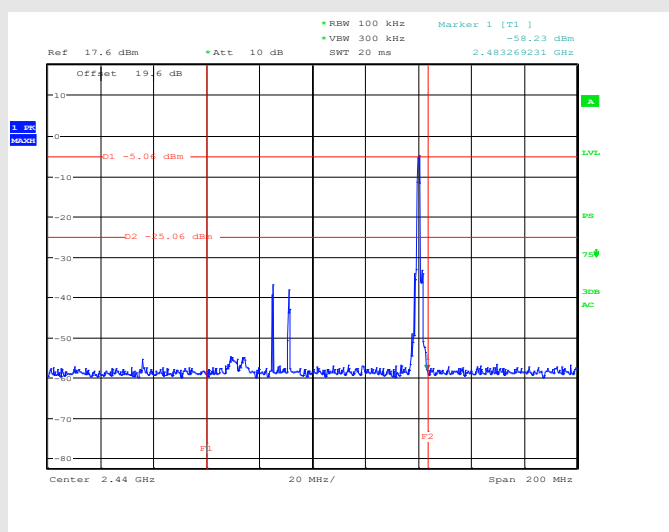
TEST RESULTS

Static Mode/Enhanced Data Rate 3DH5

LOWER BAND-EDGE
CH 0¹

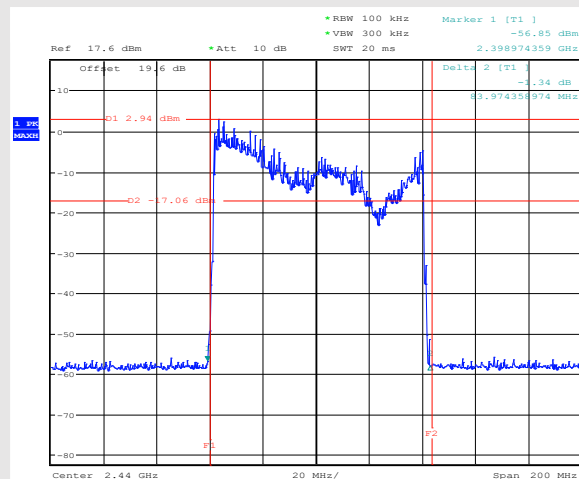


UPPER BAND-EDGE
CH 78



¹The noise out of the BT band (under the limits) is ambient noise

Hopping Mode/Enhanced Data Rate 3DH5



TEST 5.

RF RADIATED SPURIOUS EMISSIONS AT THE TRANSMITTER ANTENNA TERMINAL

REFERENCE DOCUMENT

According to § 15.247 (d) and § 15.209 (a) & ICES 003

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 LOCATION	Radio test area					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
• TESTED PORT	Enclosure					
• TEST METHOD	ANSI C63.10:2013 section 6.5 and 6.6					
• FREQUENCY RANGE	9kHz – 1GHz					
• LIMITS	Acc. To ref. Std.					

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

RESULT: **WITHIN THE LIMITS**

Note: The plots shown only the results of Modulation DH5 and 3DH5 because are the worst case

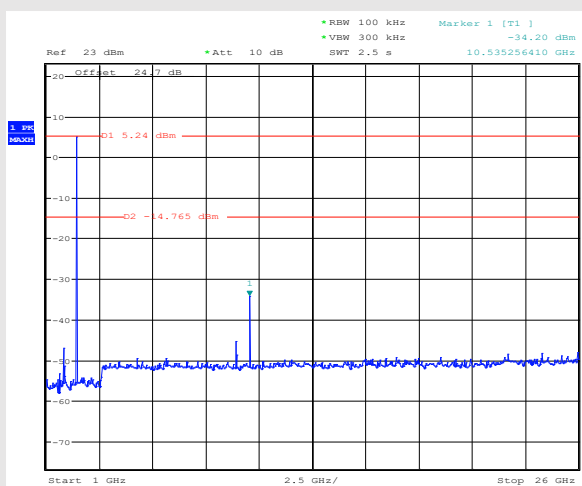
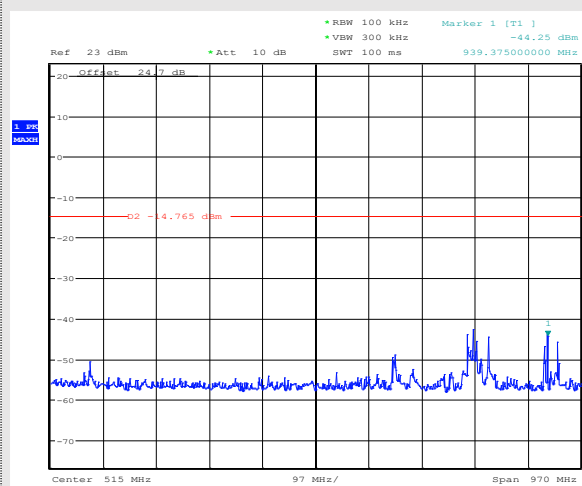
TEST RESULTS #1,#2,#3

Basic Rate DH5

Channel: 0

Frequency range: 30MHz – 1GHz

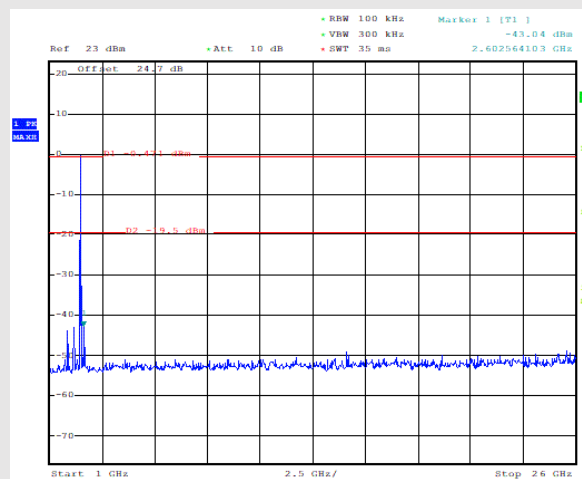
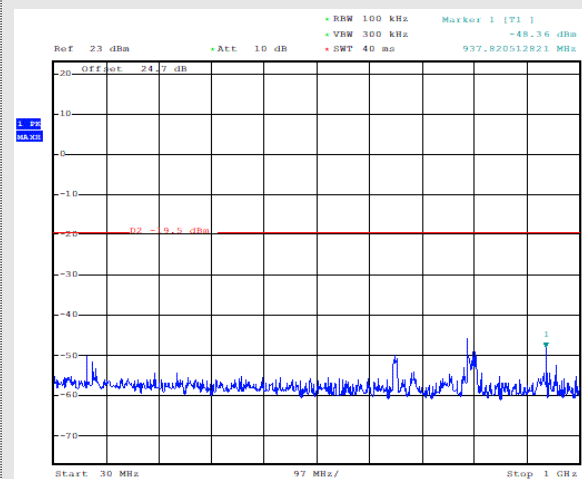
Frequency range: 1GHz – 26GHz



Channel: 39

Frequency range: 30MHz – 1GHz

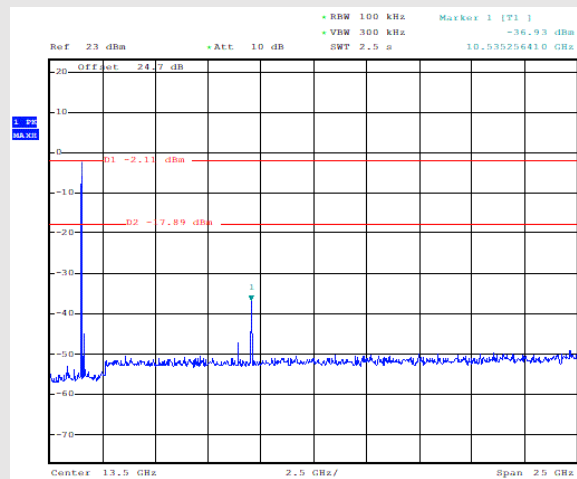
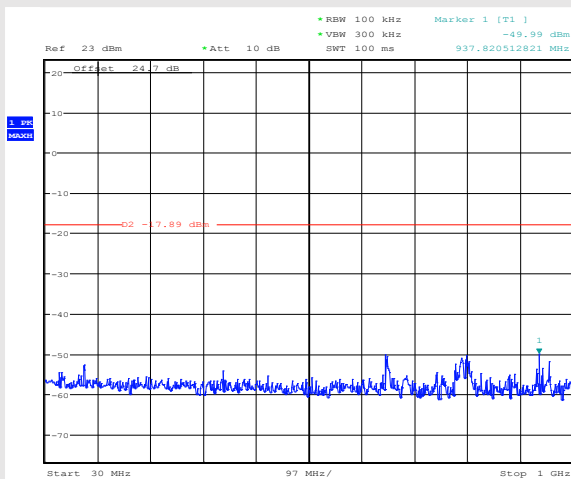
Frequency range: 1GHz – 26GHz



Channel: 78

Frequency range: 30MHz – 1GHz

Frequency range: 1GHz – 26GHz



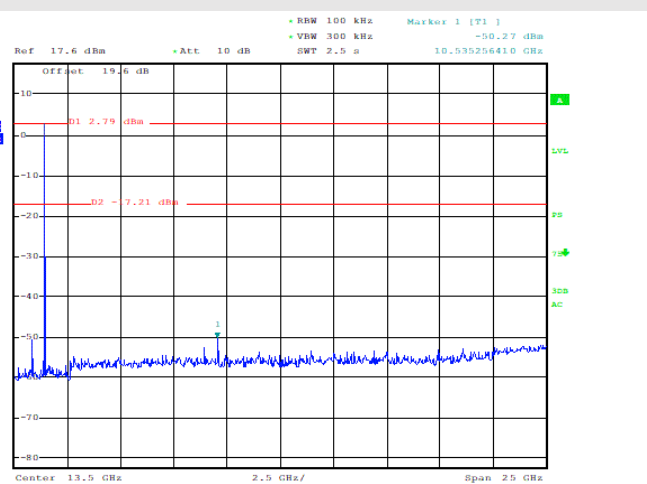
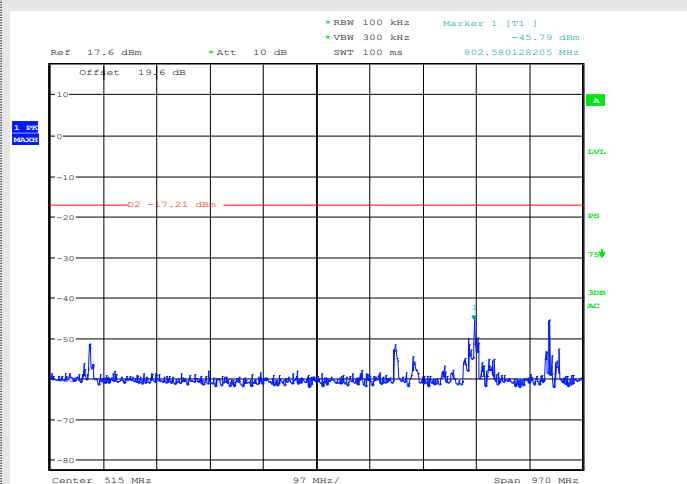
TEST RESULTS #1,#2,#3

Enhanced Data Rate 3DH5

Channel: 0

Frequency range: 30MHz – 1GHz

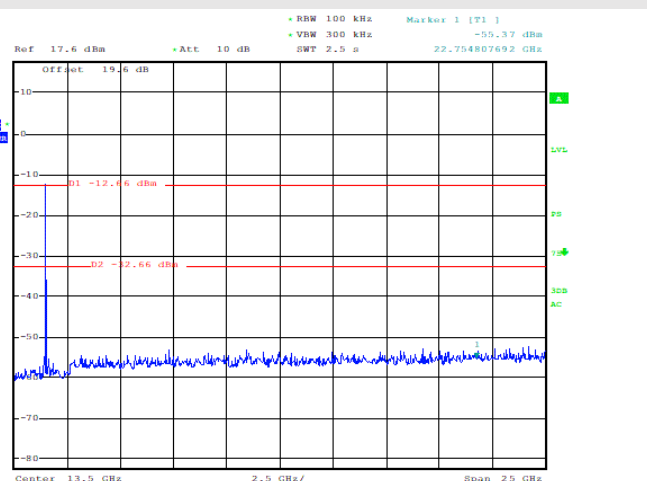
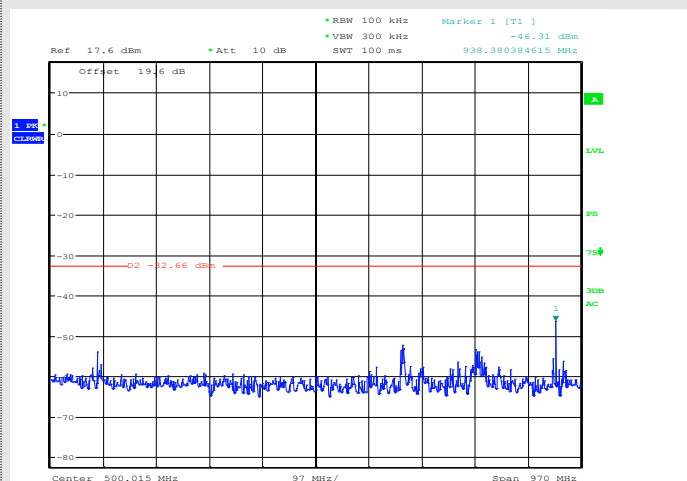
Frequency range: 1GHz – 26GHz



Channel: 39

Frequency range: 30MHz – 1GHz

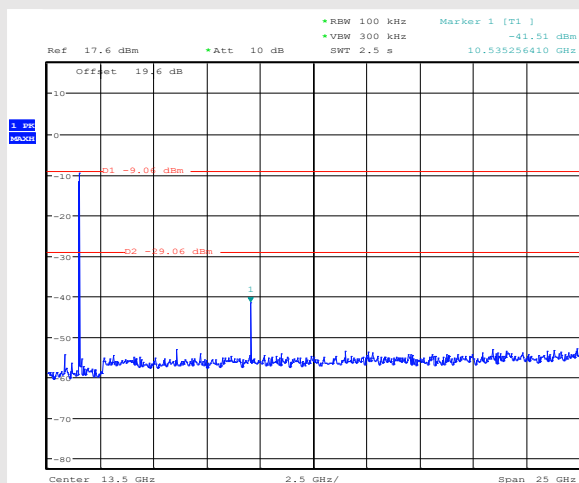
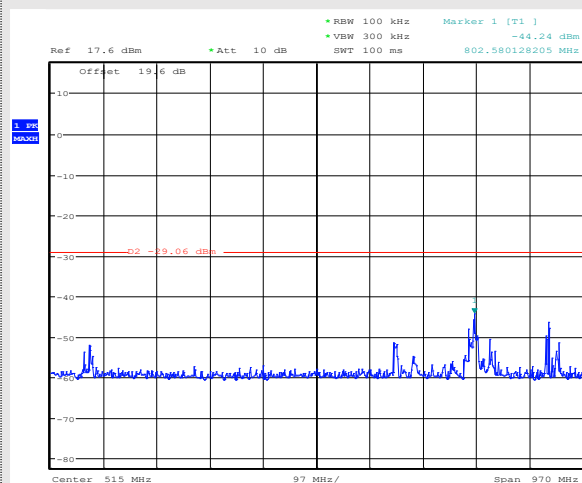
Frequency range: 1GHz – 26GHz



Channel: 78

Frequency range: 30MHz – 1GHz

Frequency range: 1GHz – 26GHz



TEST 6.	TRANSMITTER RADIATED EMISSIONS < 1GHZ
REFERENCE DOCUMENT	According to § 15.247 (d) and § 15.209 (a) & RSS-247 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 LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
	Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2022	02/2023
	Loop antenna	Rohde & Schwarz	HFH 2-Z2	841801/012	03/2020	03/2023
	Bi-log antenna	Chase	CBL6111C	2717	03/2019	03/2022
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	
• TESTED PORT	Enclosure					
• TEST METHOD	ANSI C63.10:2013 section 6.5					
• FREQUENCY RANGE	9kHz – 1GHz					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2)					
	Expanded uncertainty 9kHz – 30MHz = 4,24 dB					
	Expanded uncertainty 30MHz – 1GHz = 5,72 dB					

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

RESULT: WITHIN THE LIMITS

Note: The plots shown only the results of Modulation DH5 and 3DH5 because are the worst case. Only the plot of 3DH5 (channel 39) modulation has been shown in the page below because has been considered the worst case.

MEASUREMENT PARAMETER

Frequency Range:	9kHz – 30MHz	30MHz – 1GHz
Resolution bandwidth:	200Hz	100kHz
Video bandwidth:	1kHz	300kHz
Span:	See plots below	See plots below
Sweep time	Auto couple	Auto couple
Detector:	Peak	Peak
Trace-Mode:	Max. hold	Max. hold

TEST DESCRIPTION

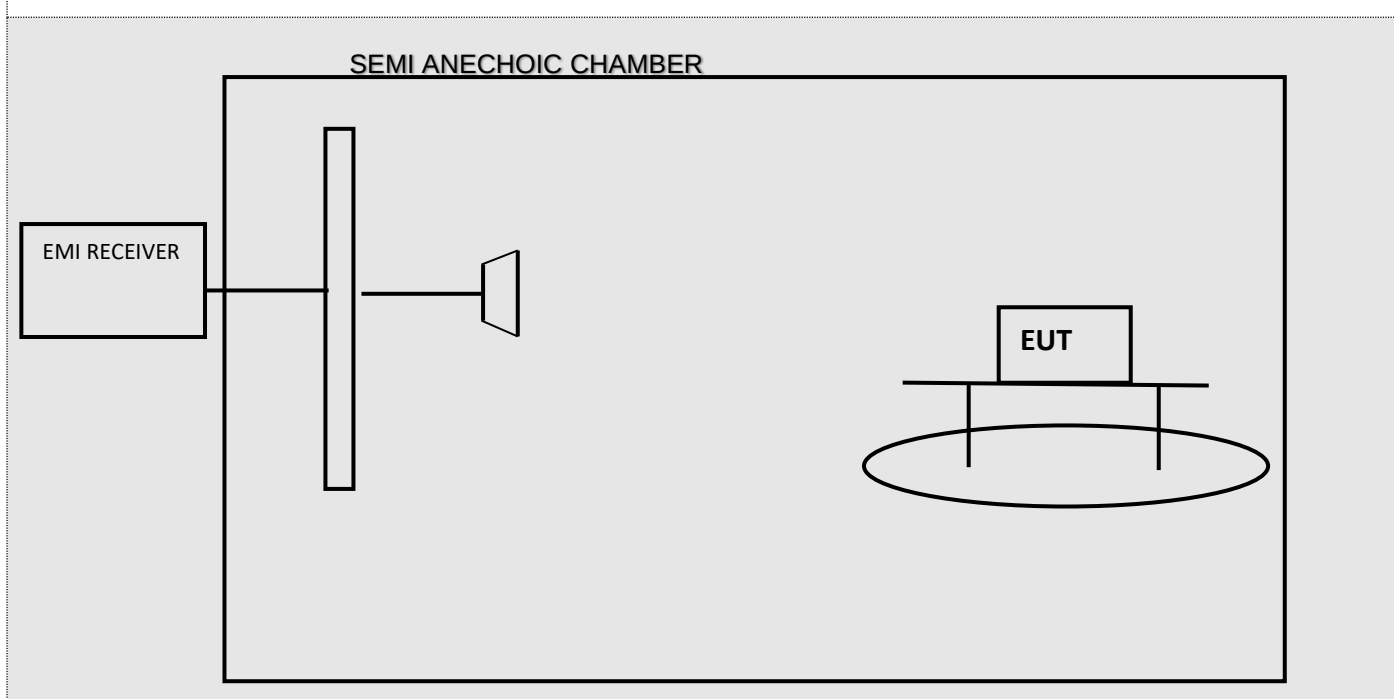
Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously - rotating, remotely - controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency.

The EUT is placed at test table height is 80 cm above the reference ground plane.

Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m~4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3m.

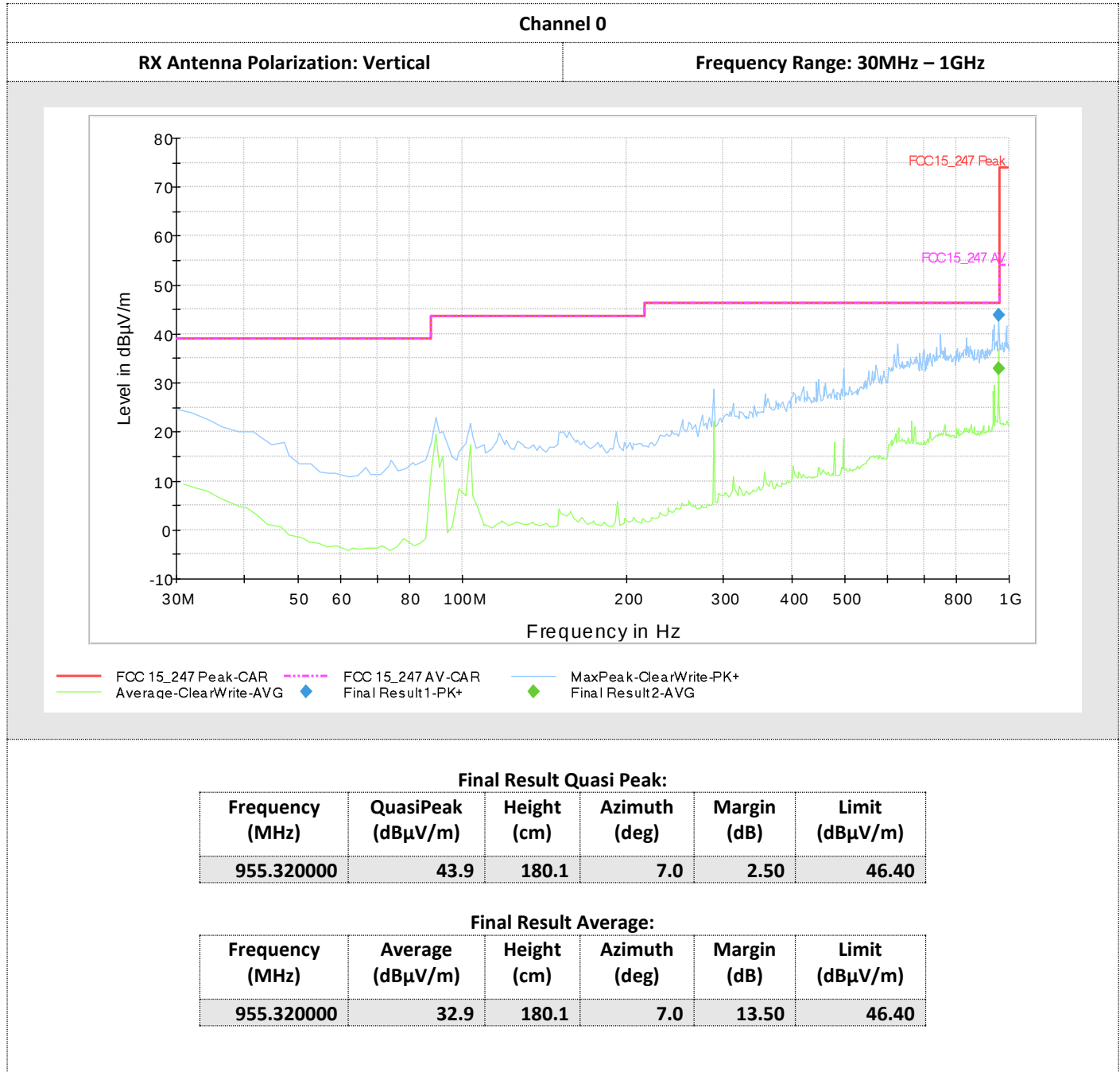
This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

TEST SETUP BLOCK DIAGRAM



TEST RESULTS #1,#2,#3

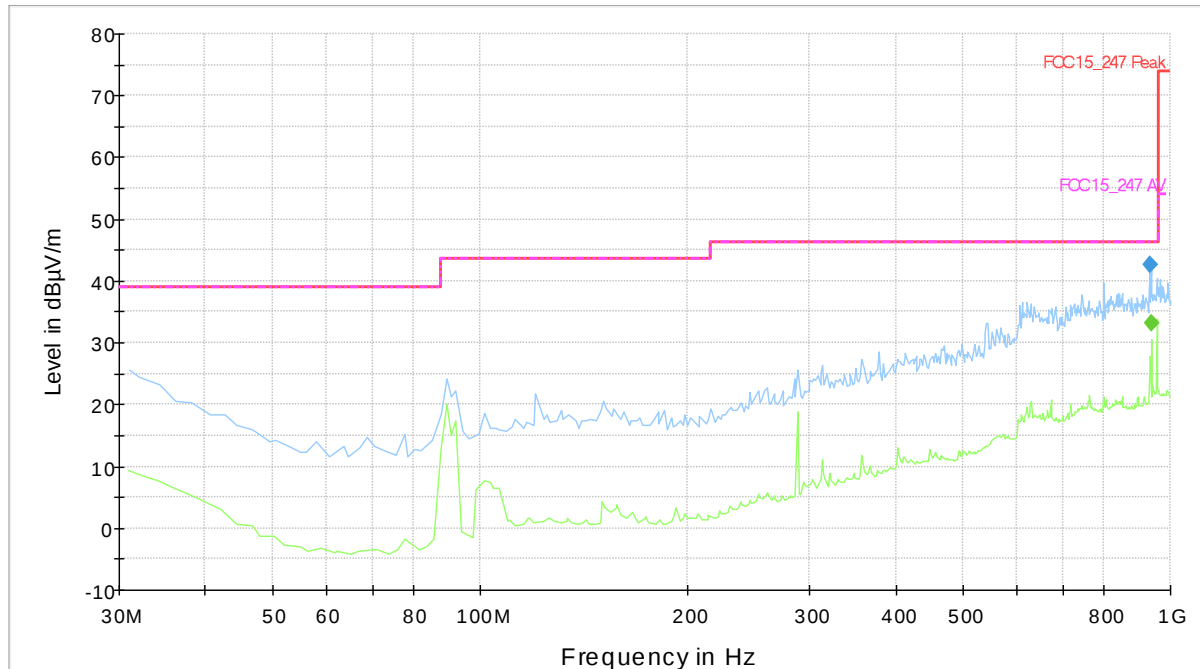
Basic Rate DH5



Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result1-PK+ ◆ Final Result2-AVG

Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
932.850000	42.6	99.8	7.0	3.80	46.40

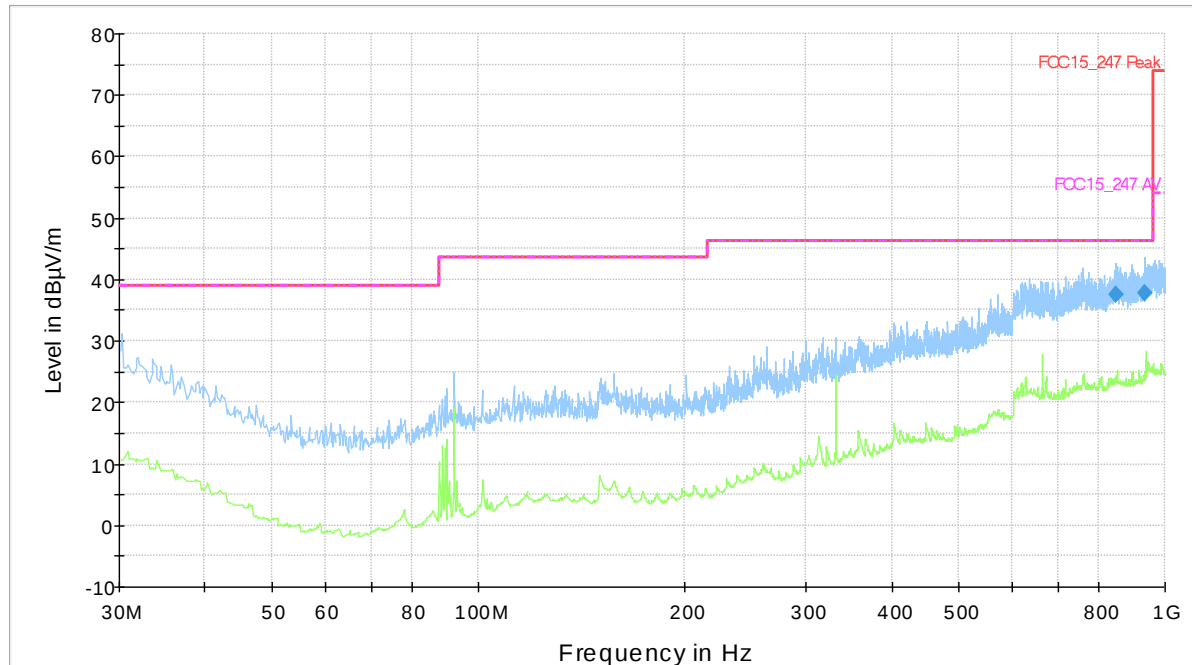
Final Result Average:

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
937.410000	33.2	99.8	7.0	13.20	46.40

Channel 39

RX Antenna Polarization: Vertical

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR - - - FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result1-PK+ ◆ Final Result2-AVG

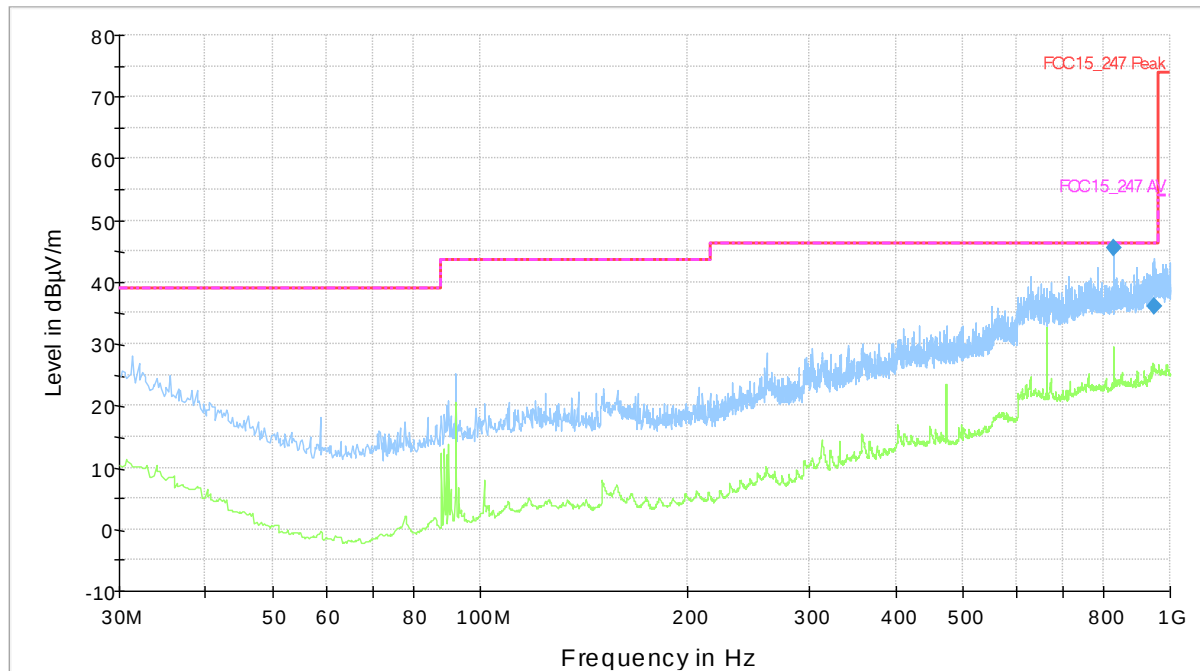
Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
847.170000	37.5	244.5	97.0	8.90	46.40
932.880000	37.8	179.5	97.0	8.60	46.40

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

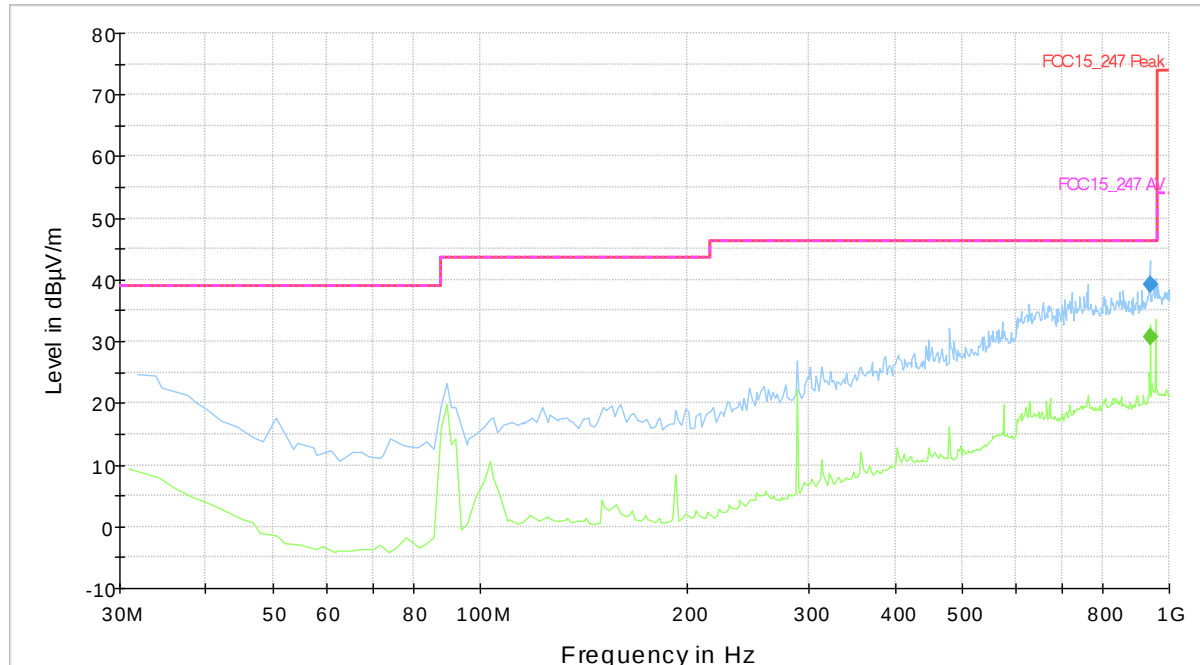
Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
830.010000	45.5	97.3	187.0	0.90	46.40
948.840000	36.1	136.6	262.0	10.30	46.40

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result1-PK+ ◆ Final Result2-AVG

Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
938.340000	39.1	99.7	-5.0	7.30	46.40

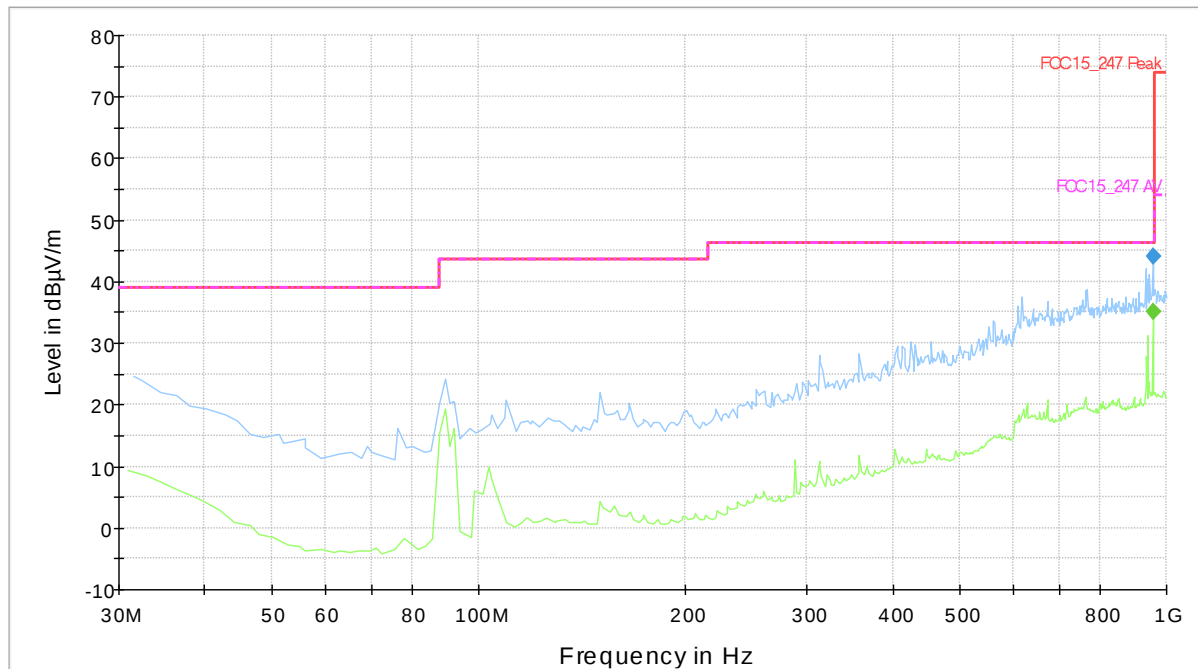
Final Result Average:

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
937.410000	30.8	99.9	7.0	15.60	46.40

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Quasi Peak:

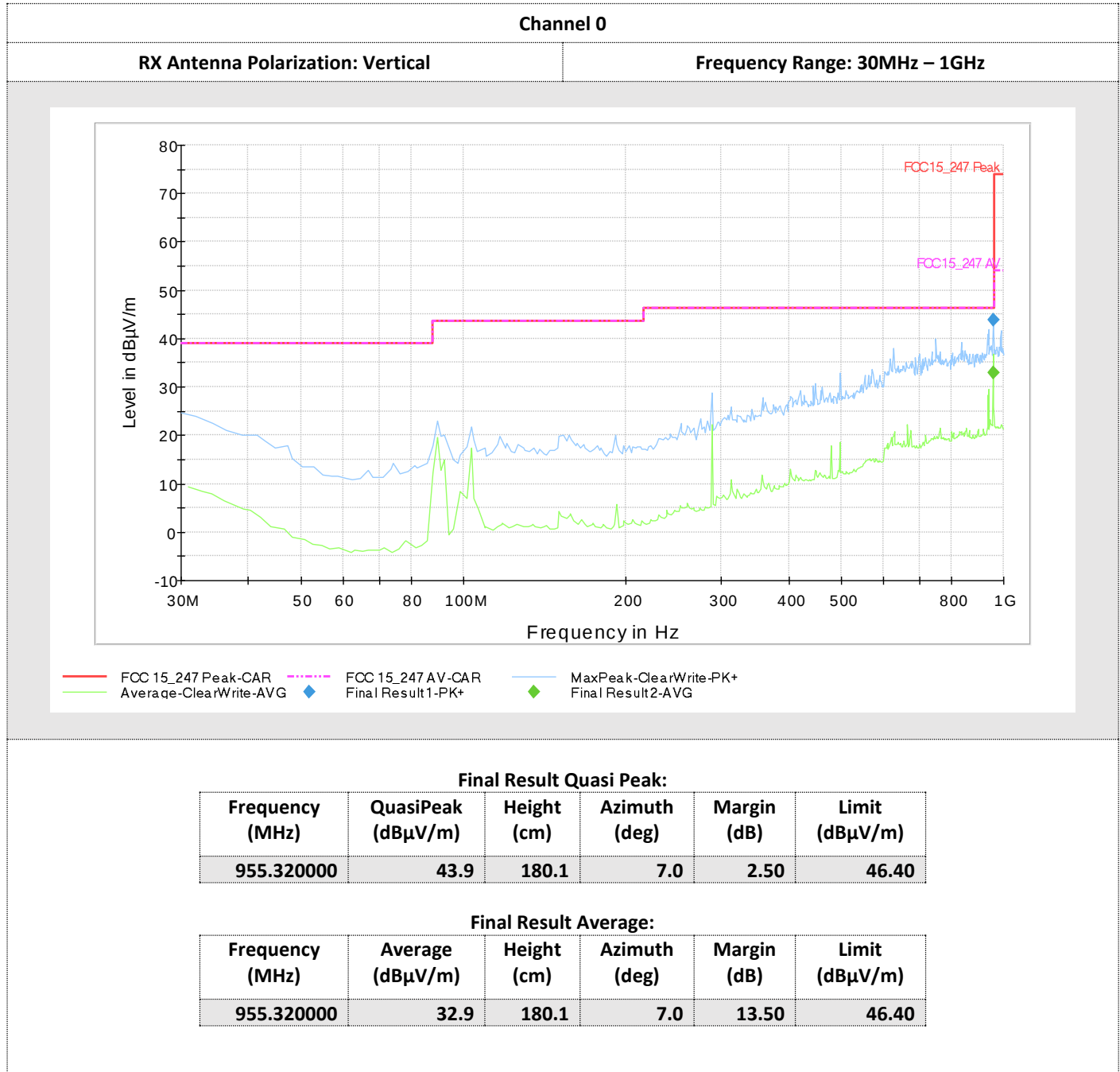
Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
955.440000	44.2	99.8	7.0	2.20	46.40

Final Result Average:

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
955.410000	35.1	151.7	0.0	11.30	46.40

TEST RESULTS #1,#2,#3

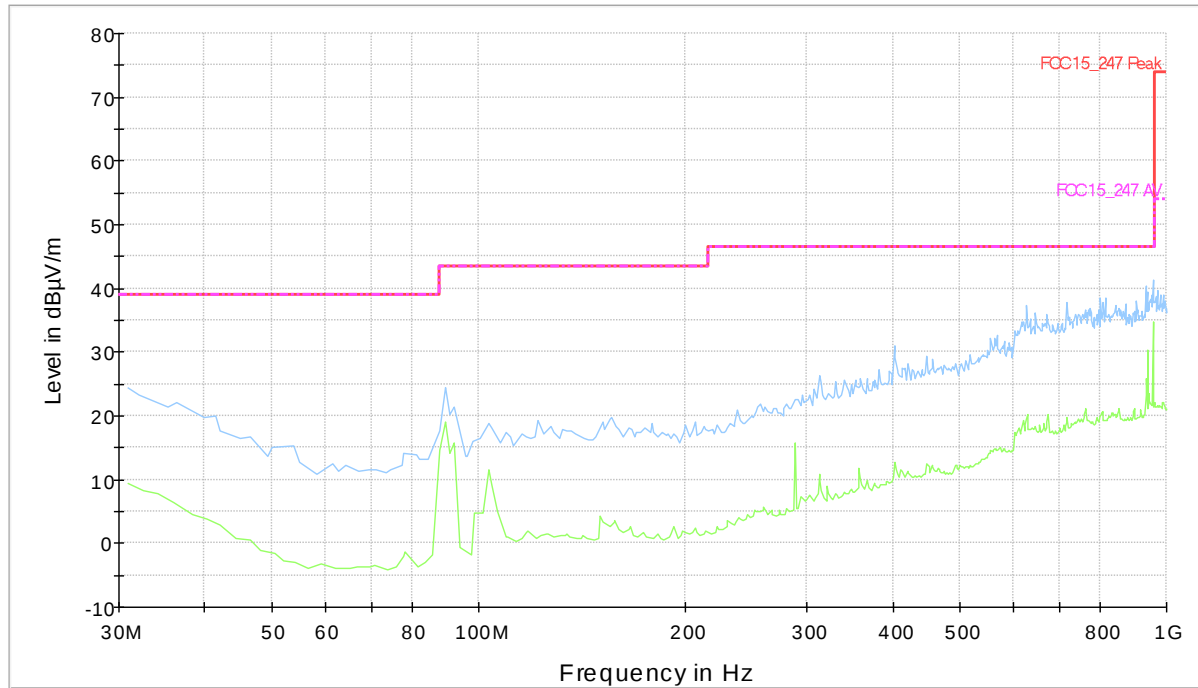
Enhanced Data Rate 3DH5



Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+ — Average-ClearWrite-AVG

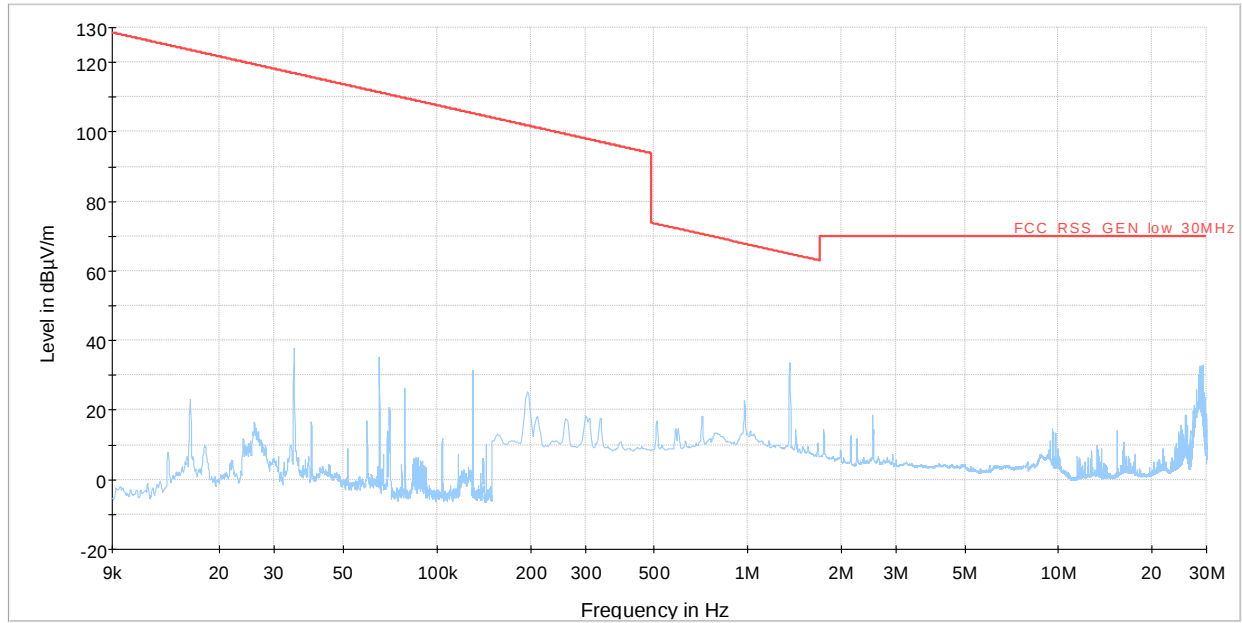
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: ---

Frequency Range: 9kHz – 30MHz



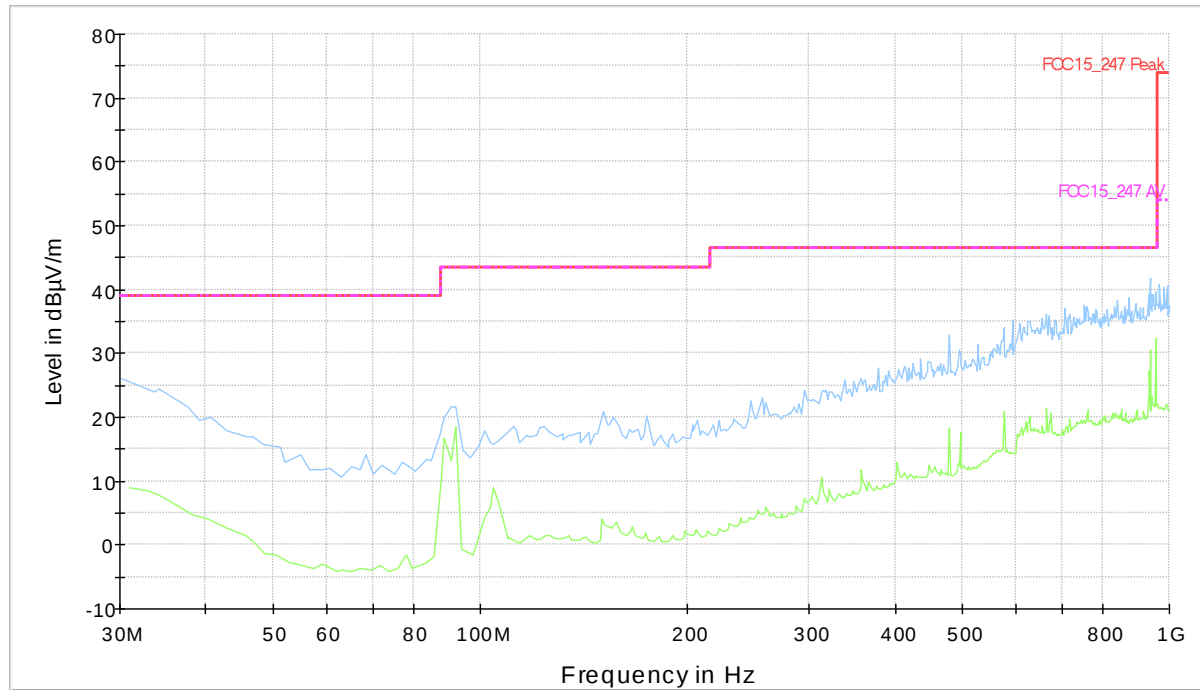
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Vertical

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+ — Average-ClearWrite-AVG

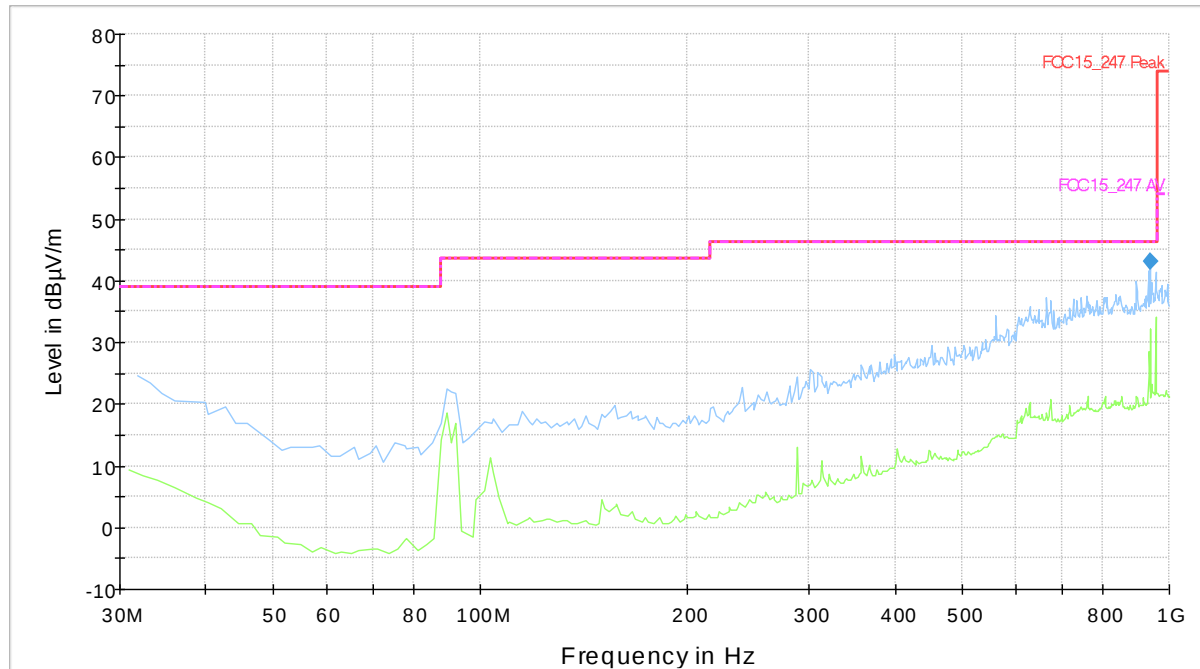
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR - - - FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

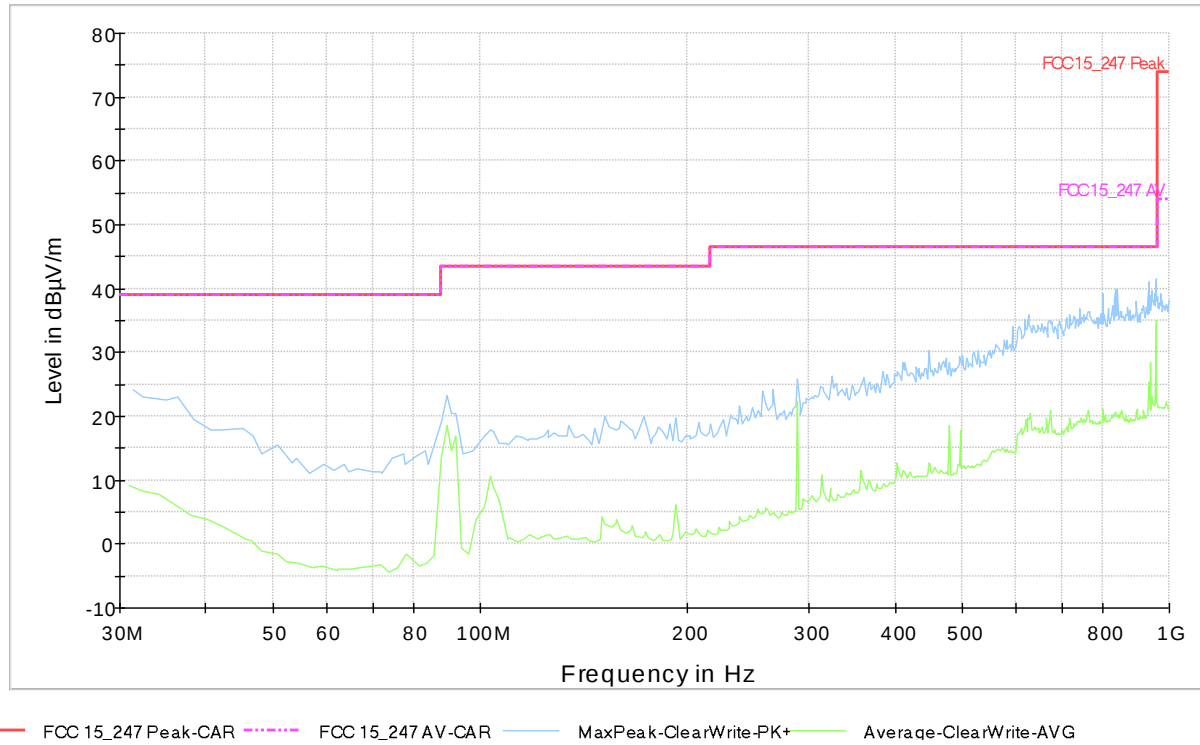
Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
937.320000	43.0	180.2	2.0	3.40	46.40

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 30MHz – 1GHz



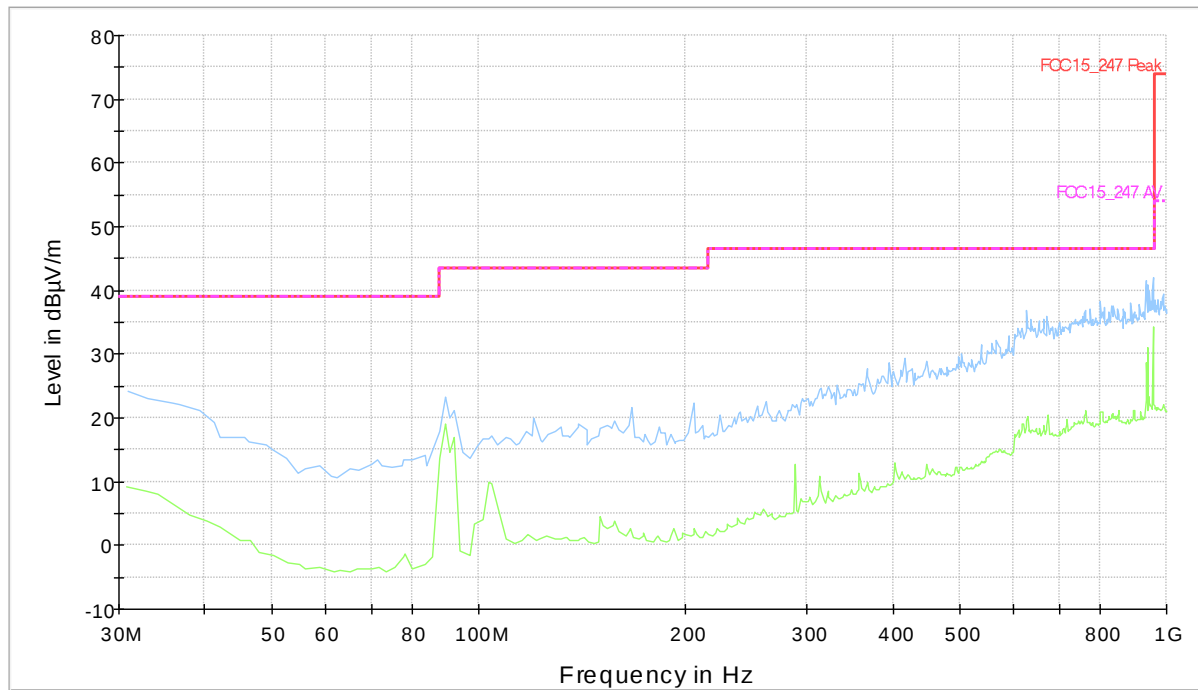
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+ — Average-ClearWrite-AVG

Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

TEST 7.

TRANSMITTER RADIATED EMISSIONS > 1GHZ

REFERENCE DOCUMENT

According to § 15.247 (d) and § 15.209 (a) & RSS-247

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 ref. Std.					
• TEST LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
	Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2022	02/2023
	Horn antenna	Electro Metrics	EM-6961	100437	10/2020	10/2023
	Horn antenna + Low Noise Preamplifier	Bonn Elektronik	BLMA 1840-1A	262WL80452	04/2021	04/2023
	High pass filter	Waineright	WHK 2,8/15G	1	10/2021	10/2023
	Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	
• TESTED PORT	Antenna					
• TEST METHOD	ANSI C63.10:2013 section 6.6					
• FREQUENCY RANGE	1GHz – 10GHz					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2)					
	Expanded uncertainty 1GHz – 18GHz = 5,15 dB					
	Expanded uncertainty 18GHz – 26GHz = 5,82 dB					

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

RESULT: **WITHIN THE LIMITS**

Note: The plots shown only the results of Modulation DH5 and 3DH5 because are the worst case

-+

RESULT: WITHIN THE LIMITS

MEASUREMENT PARAMETER 1GHz - 26GHz

Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Span:	See plots below
Sweep time	Auto couple
Detector:	Peak
Trace-Mode:	Max. hold

TEST DESCRIPTION

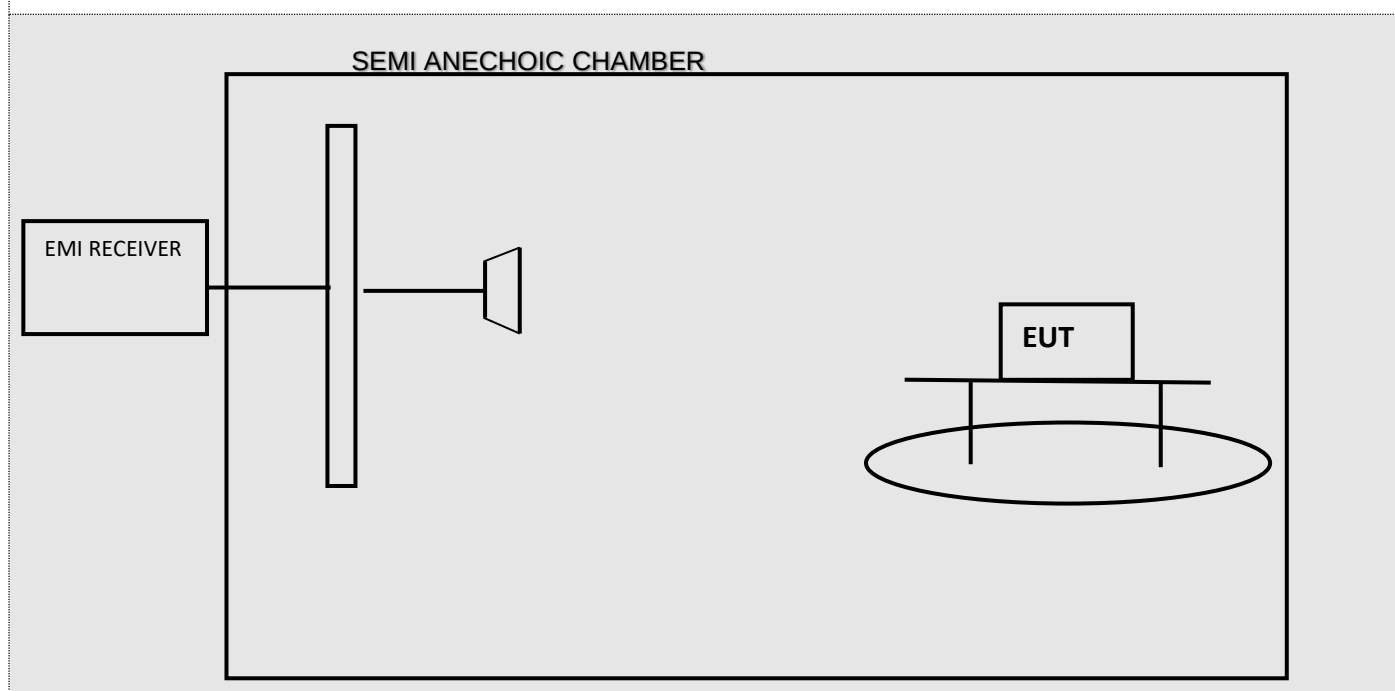
Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously - rotating, remotely - controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency.

The EUT is placed at test table height is 1.5 m

Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m~4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3m.

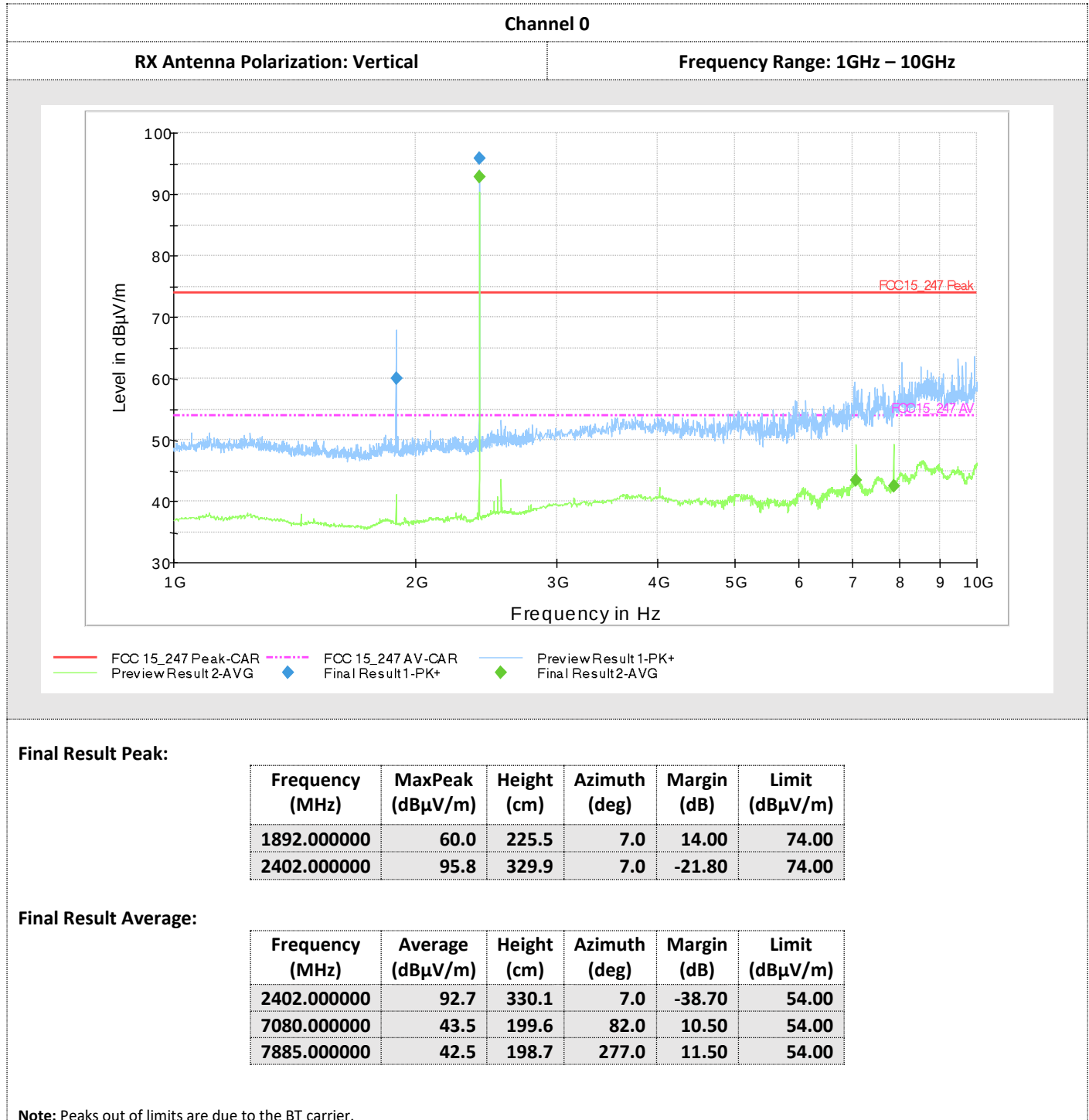
This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

TEST SETUP BLOCK DIAGRAM



TEST RESULTS #1,#2,#3

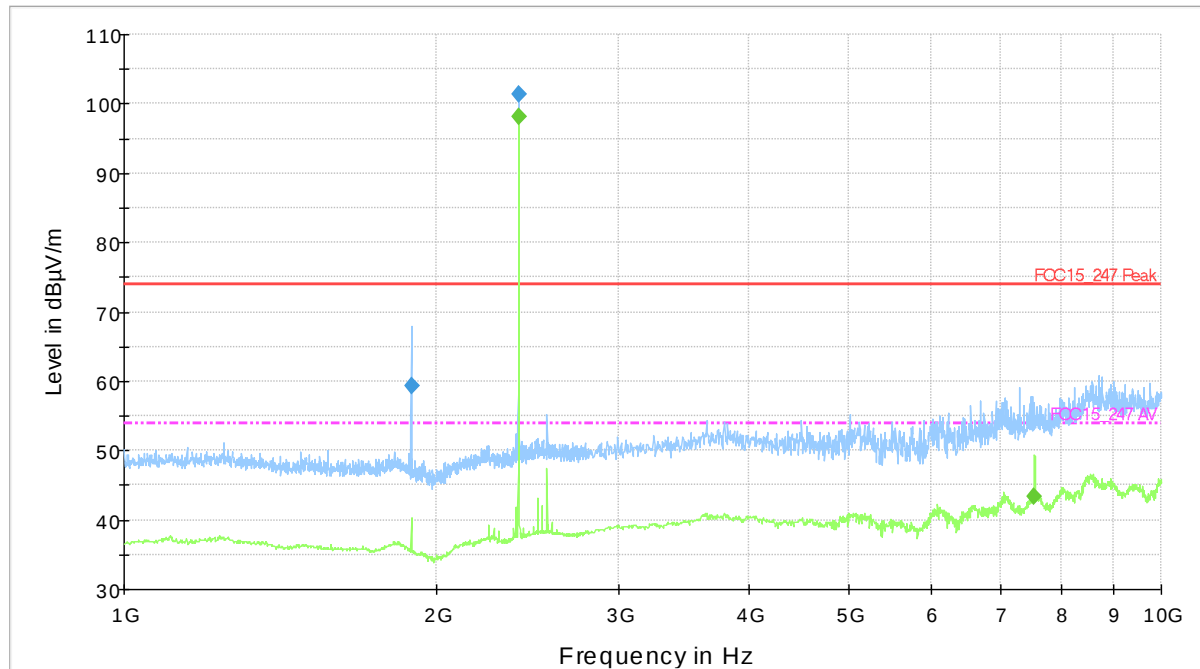
Basic Rate DH5



Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — Preview Result 1-PK+
— Preview Result 2-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
1892.000000	59.3	249.5	93.0	14.70	74.00
2402.000000	101.3	107.5	82.0	-27.30	74.00

Final Result Average:

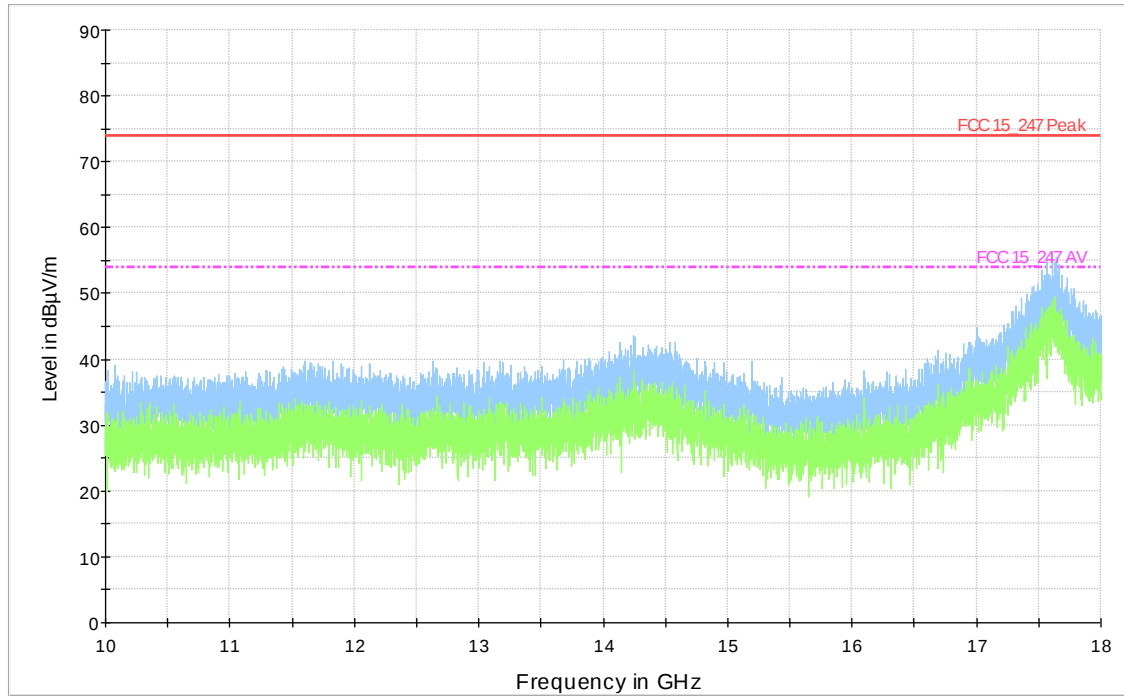
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2402.000000	98.1	107.9	82.0	-44.10	54.00
7550.000000	43.4	179.6	7.0	10.60	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel 0

RX Antenna Polarization: Vertical

Frequency Range: 10GHz – 18GHz



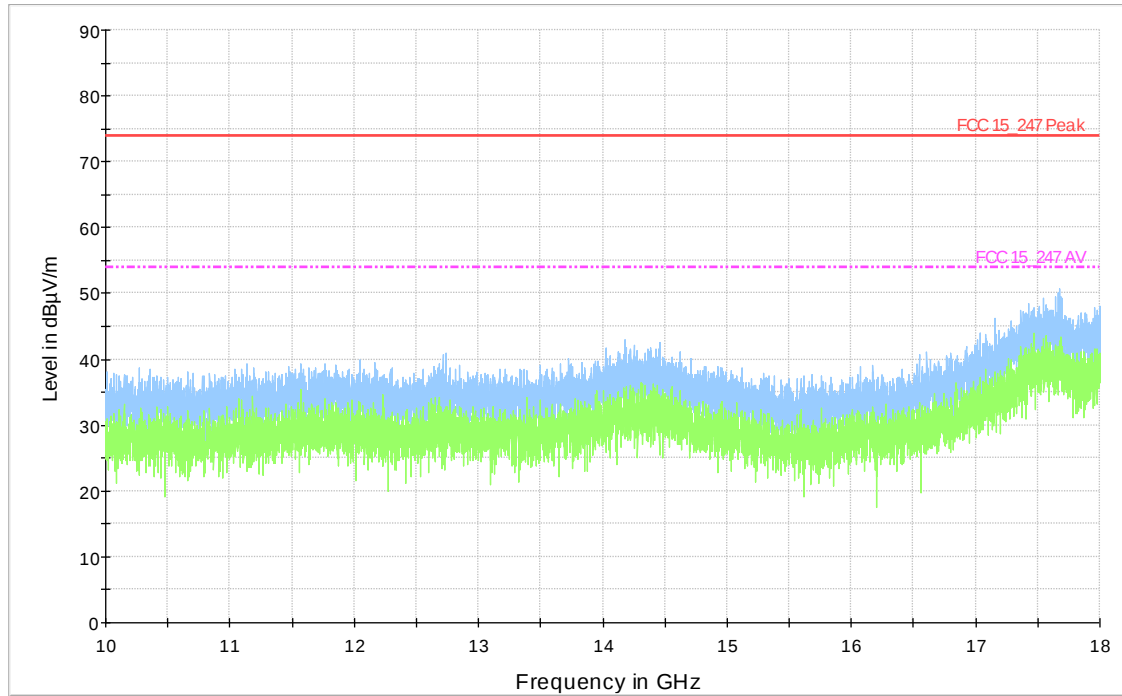
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 10GHz – 18GHz



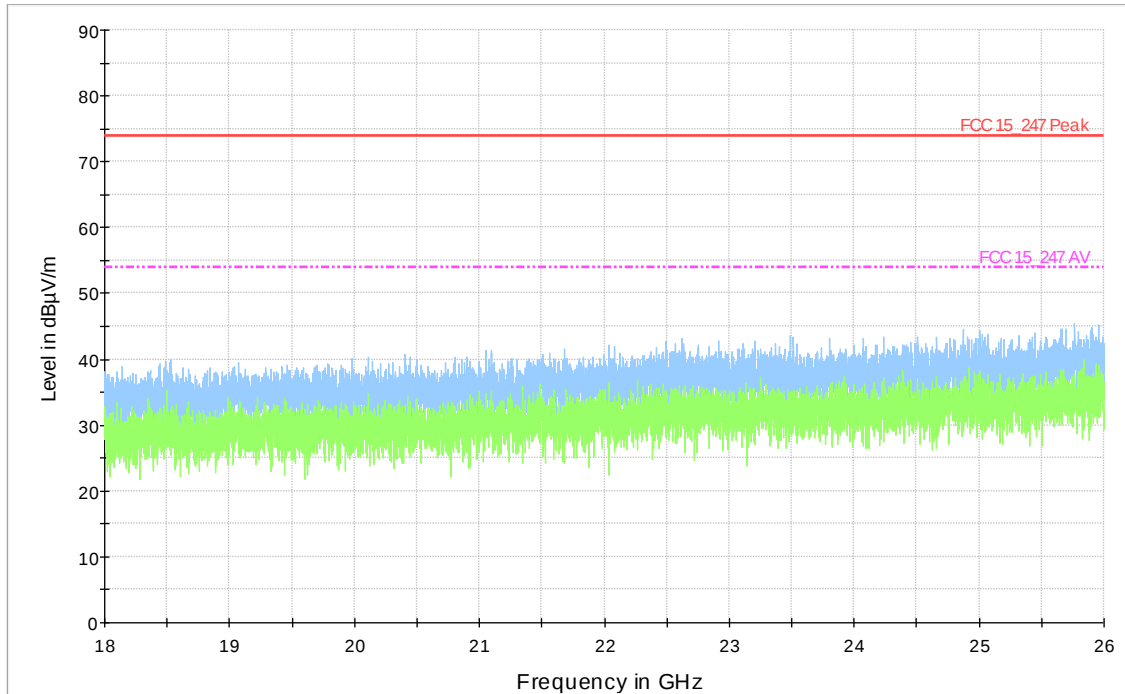
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 0

RX Antenna Polarization: Vertical

Frequency Range: 18GHz – 26GHz



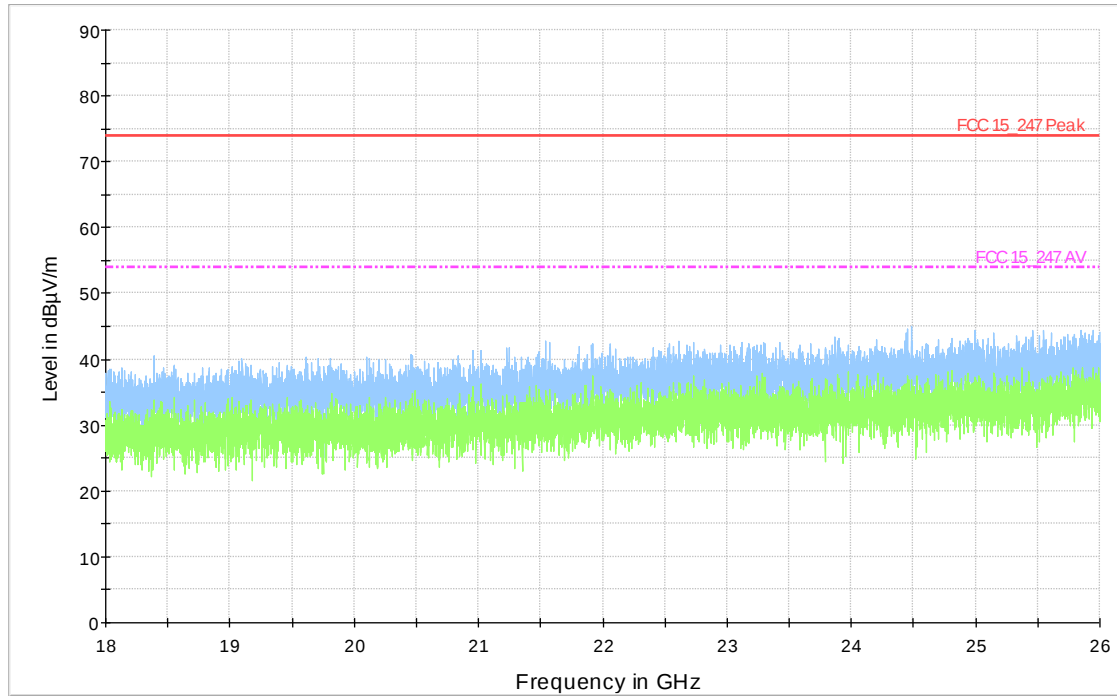
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 18GHz – 26GHz



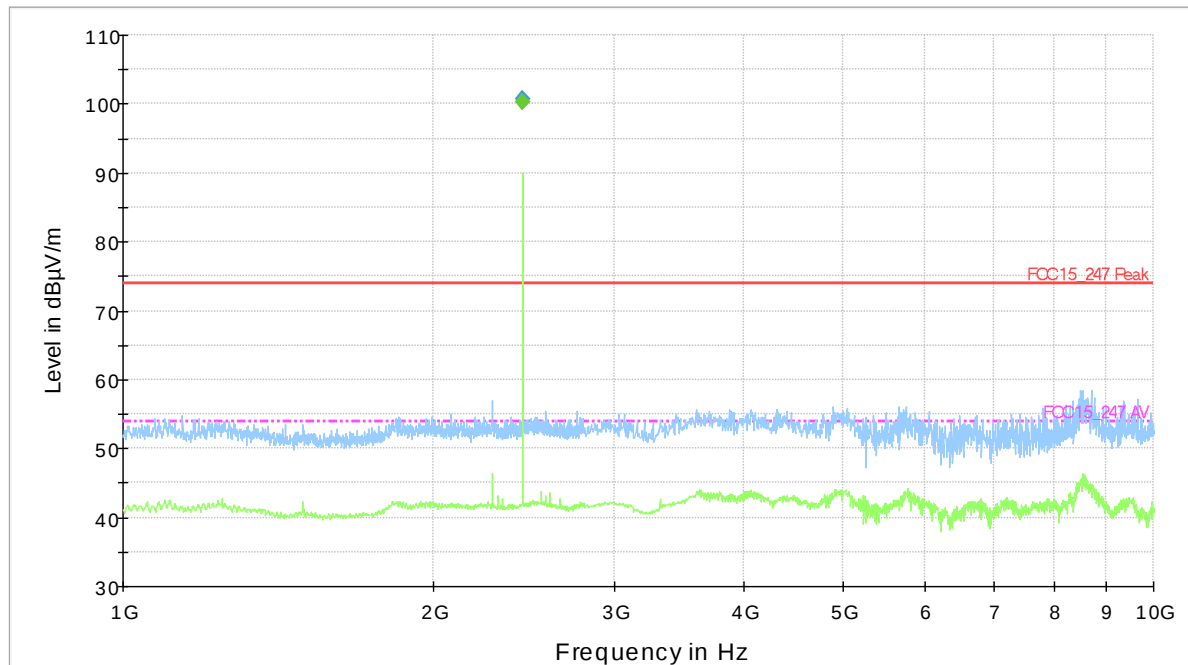
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Vertical

Frequency Range: 1GHz – 10GHz



Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	100.8	123.8	-8.0	-26.80	74.00

Final Result Average:

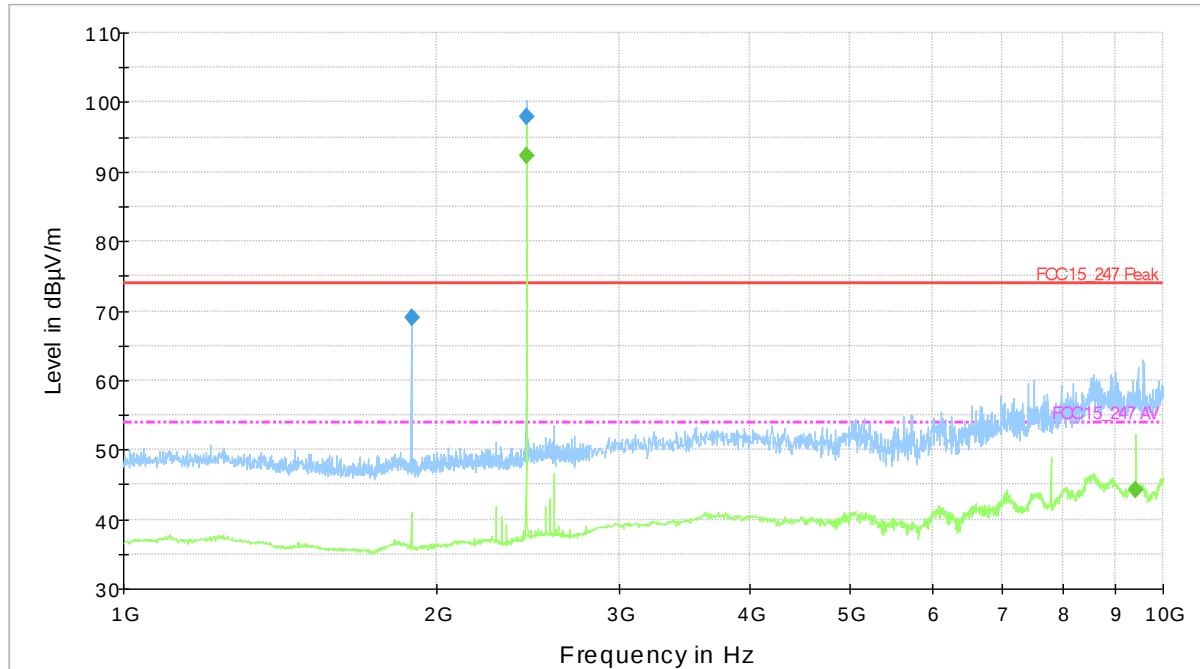
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	100.3	121.8	-8.0	-46.30	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — Preview Result 1-PK+
— Preview Result 2-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
1892.000000	69.1	175.7	3.0	4.90	74.00
2441.000000	97.8	127.9	86.0	-23.80	74.00

Final Result Average:

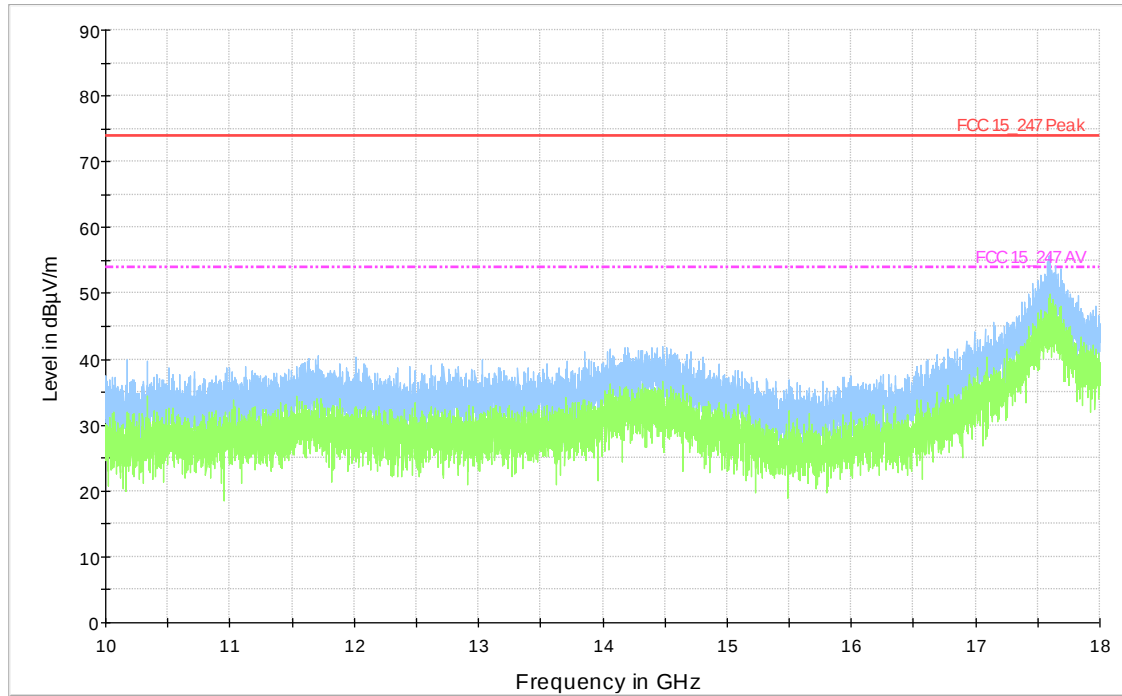
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	2441.000000	148.9	91.0	-38.40	54.00
9400.000000	9400.000000	179.7	7.0	9.70	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel39

RX Antenna Polarization: Vertical

Frequency Range: 10GHz – 18GHz



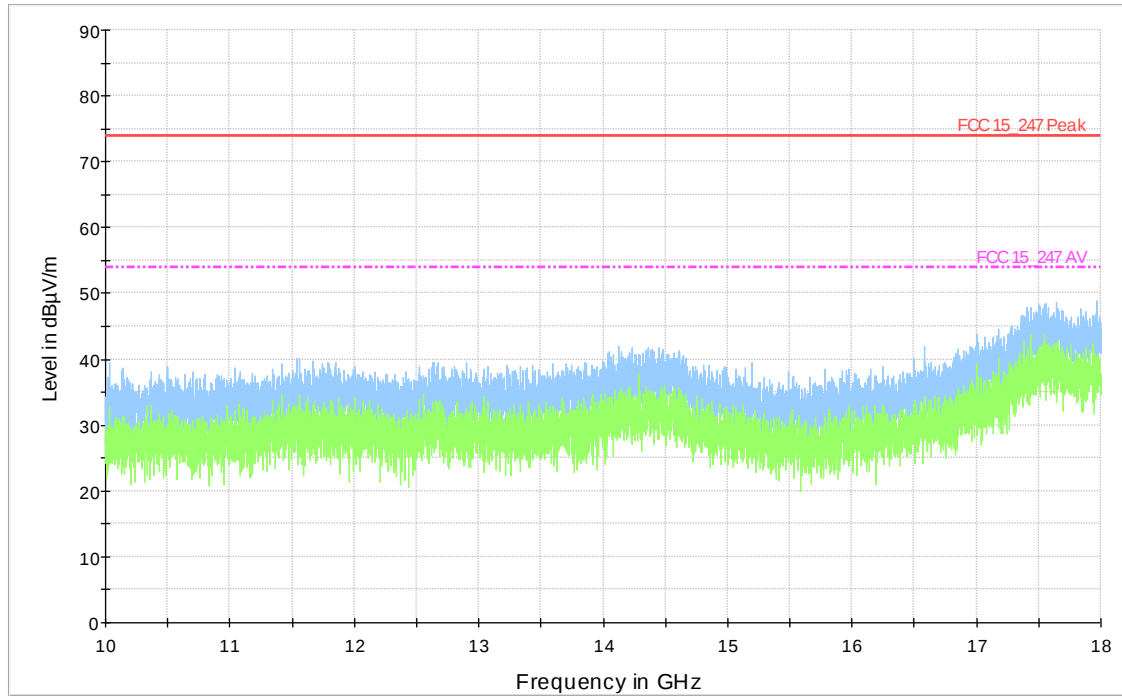
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 10GHz – 18GHz



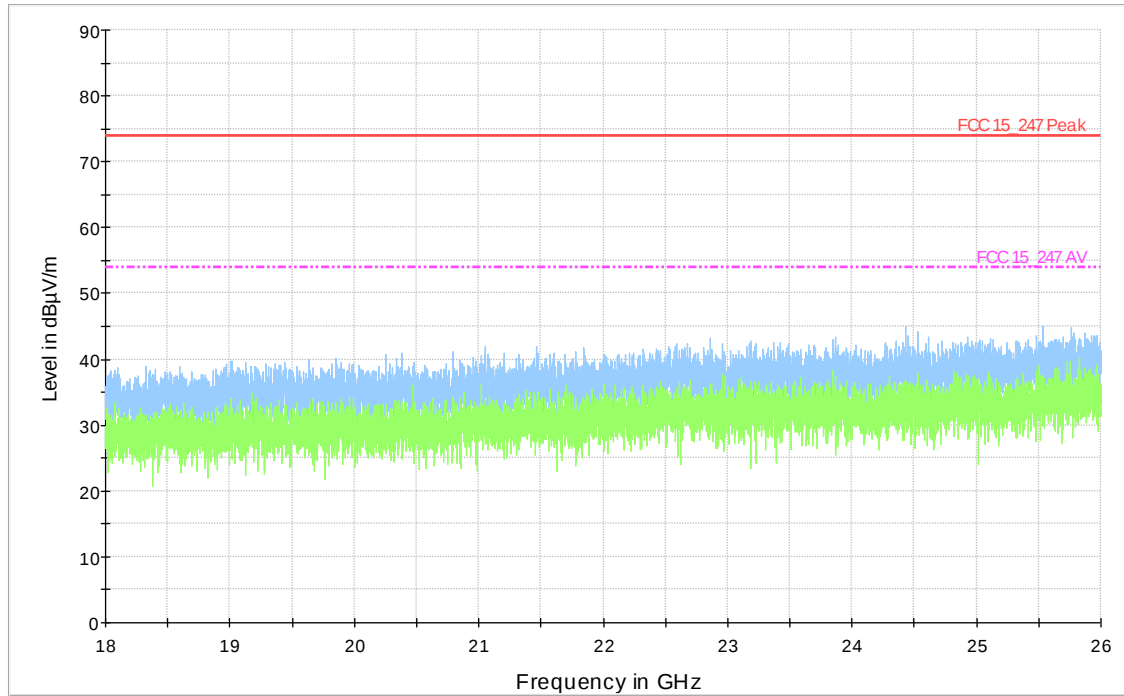
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Vertical

Frequency Range: 18GHz – 26GHz



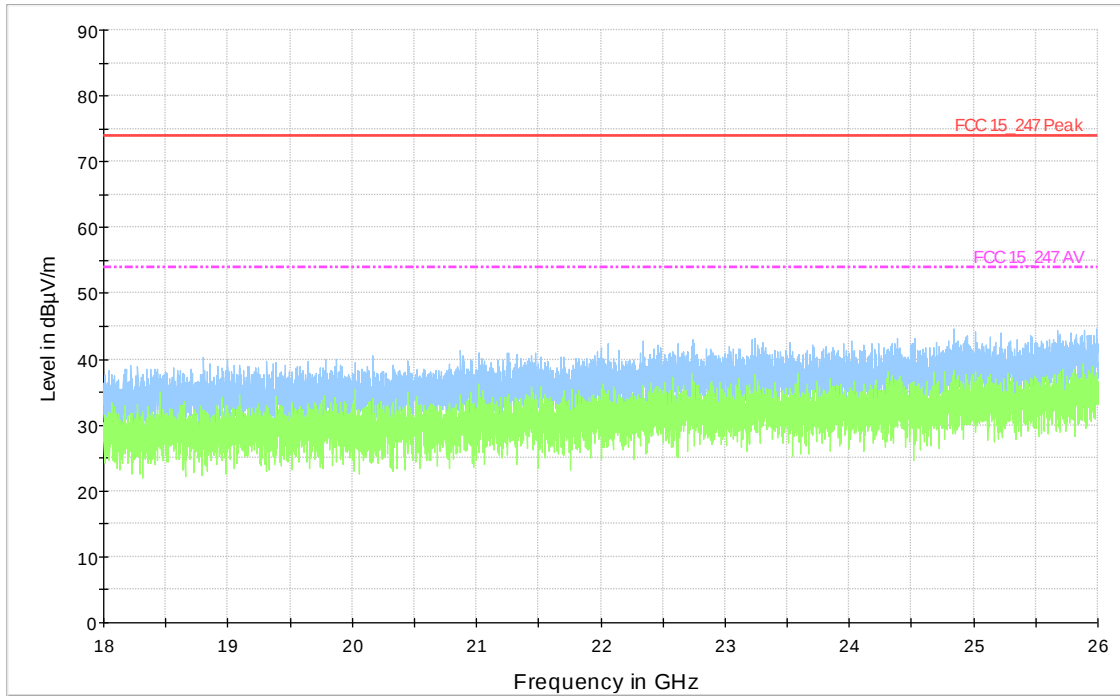
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 18GHz – 26GHz



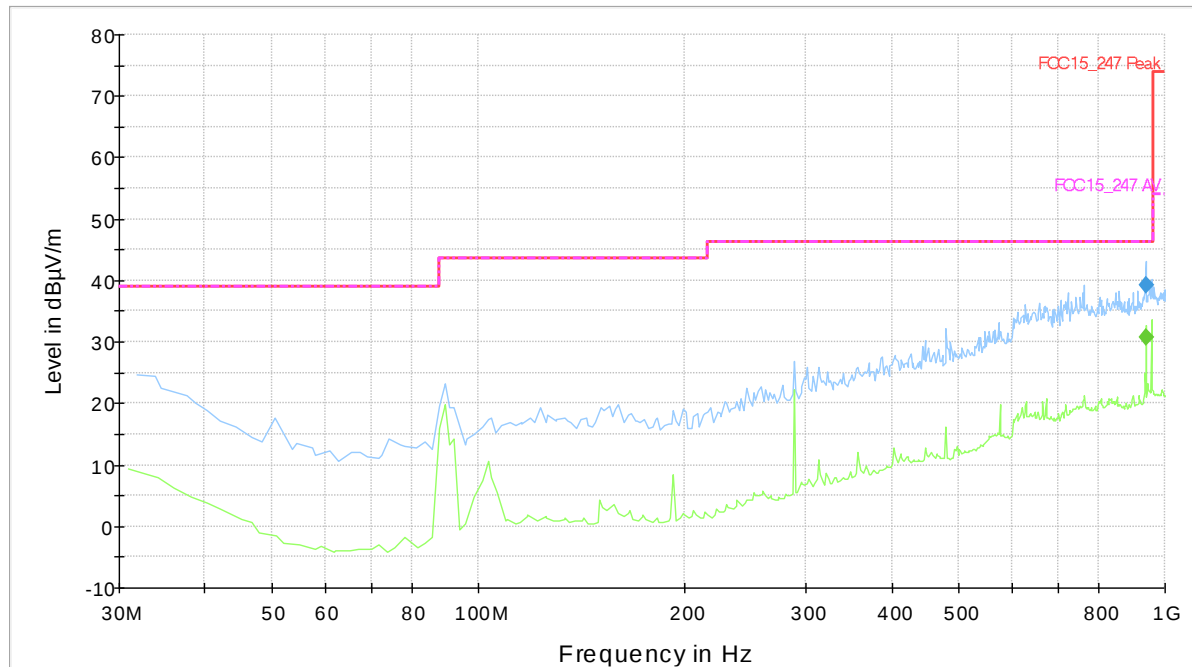
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR - - - FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
938.340000	39.1	99.7	-5.0	7.30	46.40

Final Result Average:

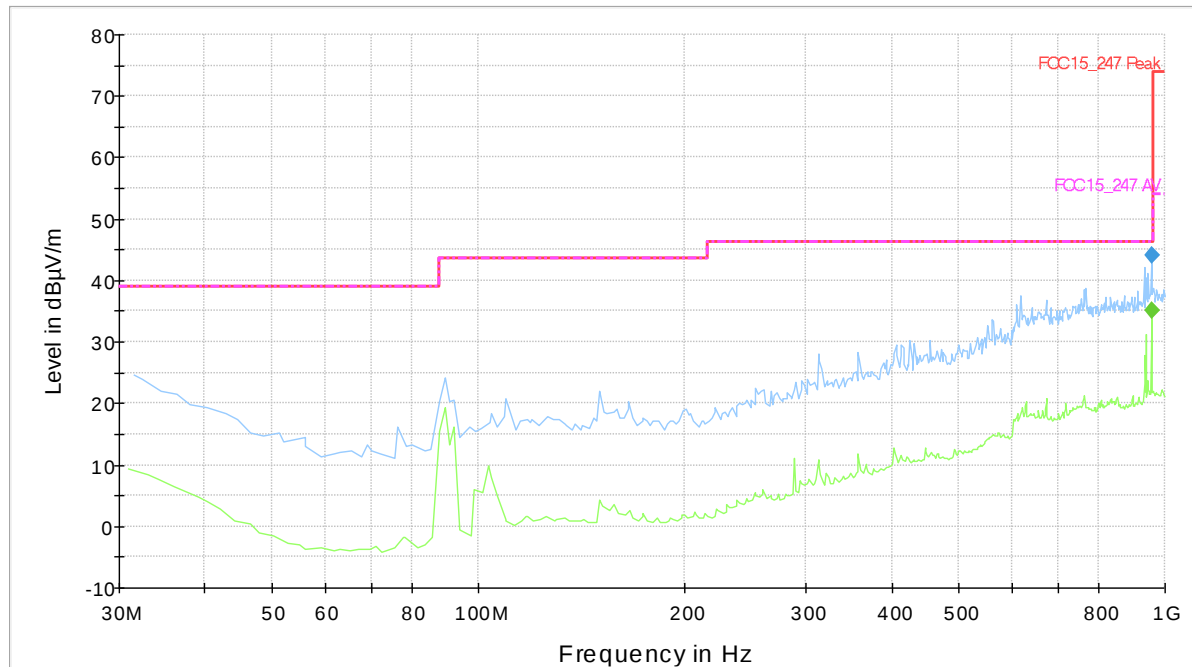
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
937.410000	30.8	99.9	7.0	15.60	46.40

Note: Peaks out of limits are due to the BT carrier.

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+
— Average-ClearWrite-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
955.440000	44.2	99.8	7.0	2.20	46.40

Final Result Average:

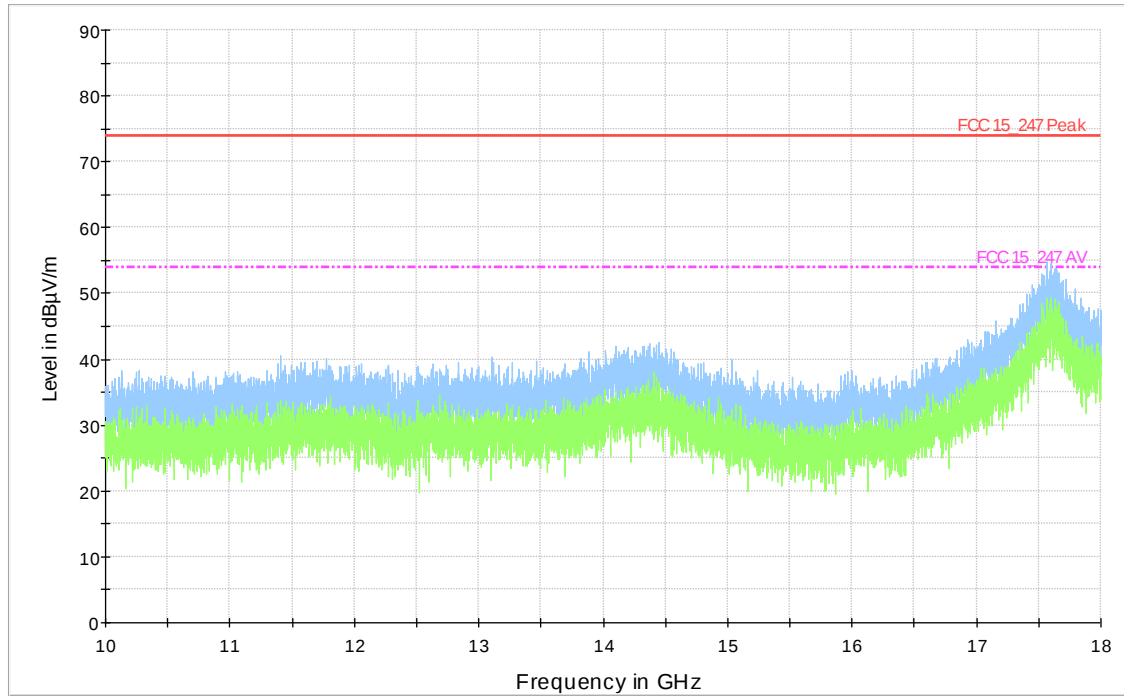
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
955.410000	35.1	151.7	0.0	11.30	46.40

Note: Peaks out of limits are due to the BT carrier.

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 10GHz – 18GHz



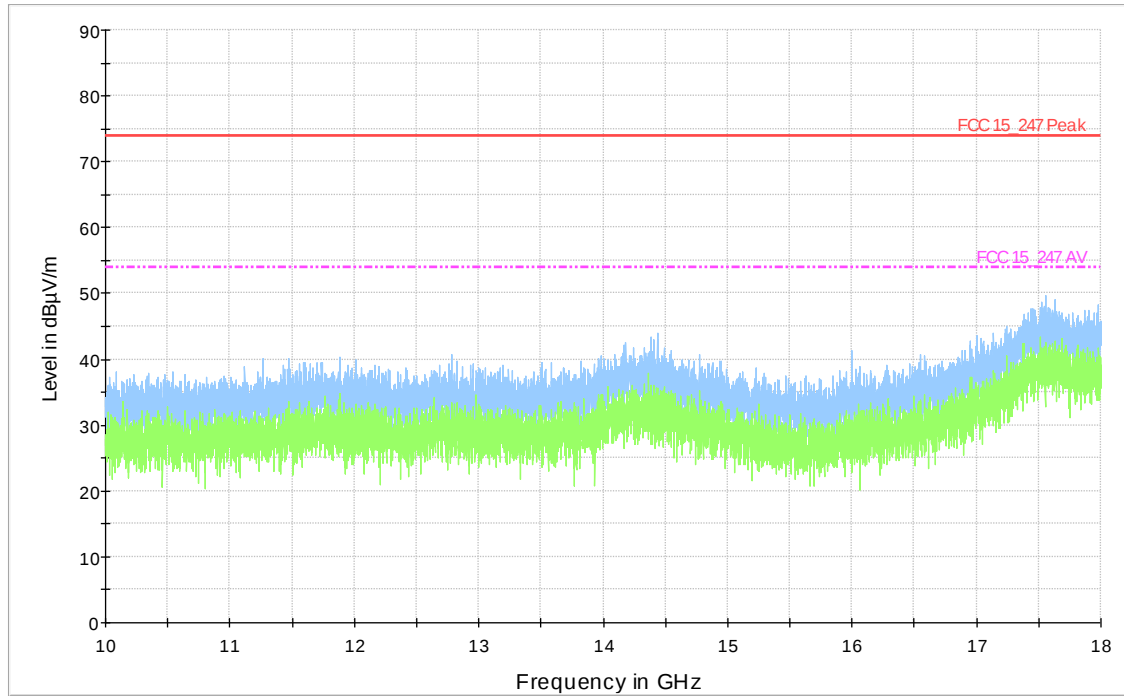
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 10GHz – 18GHz



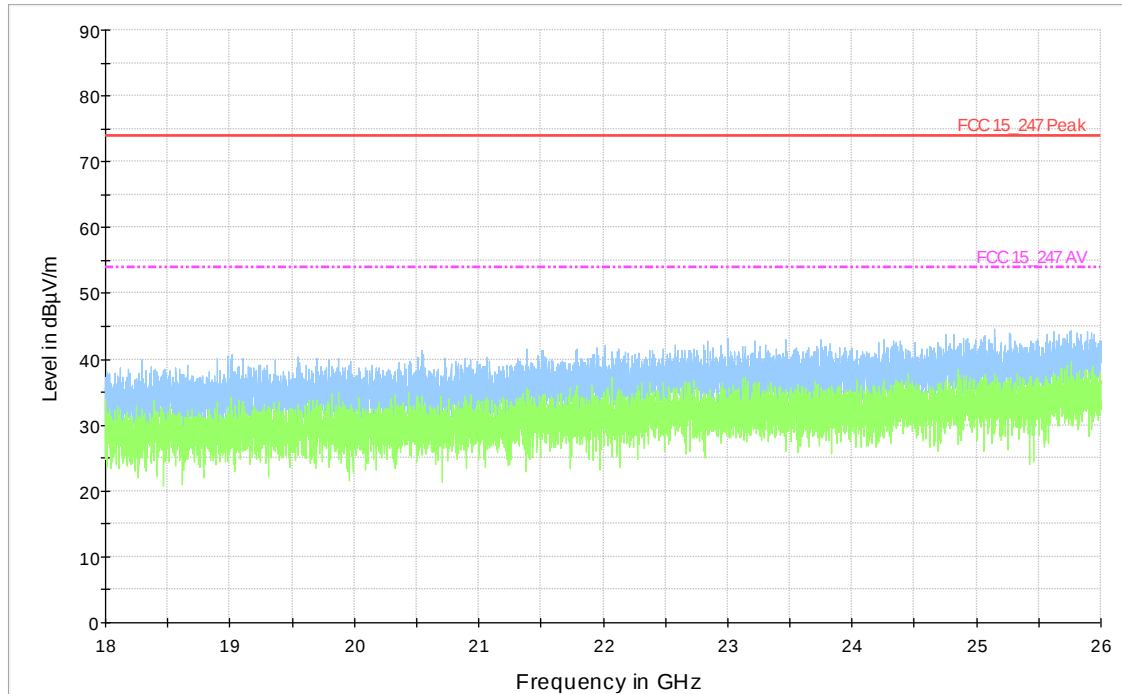
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 18GHz – 26GHz



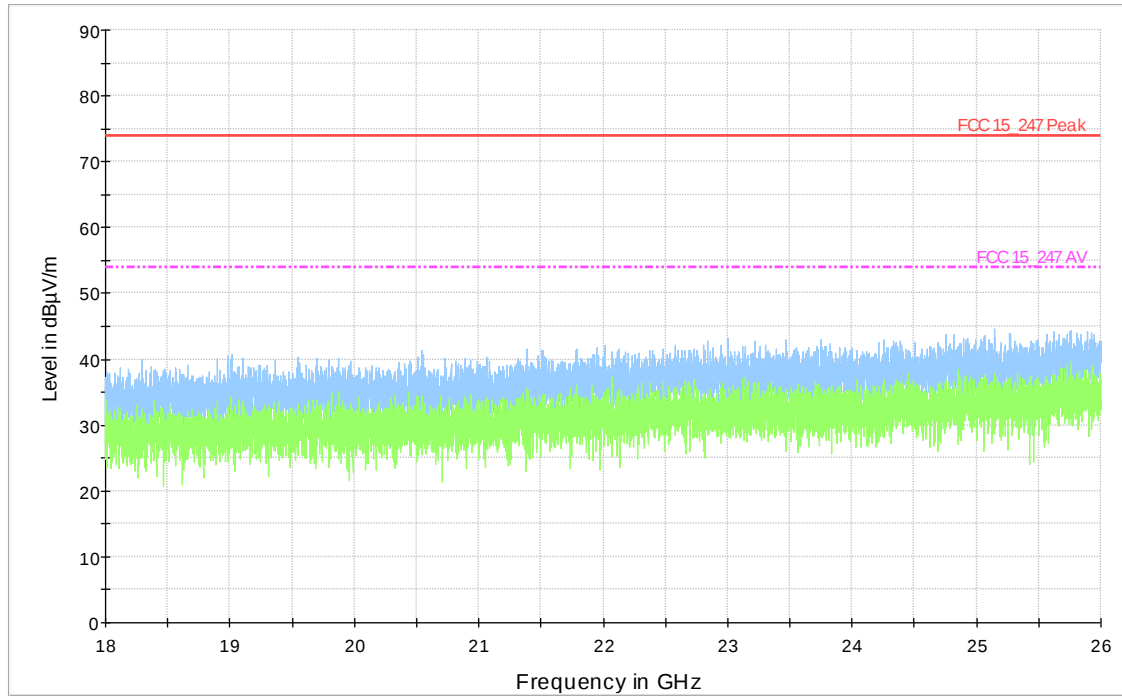
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 18GHz – 26GHz

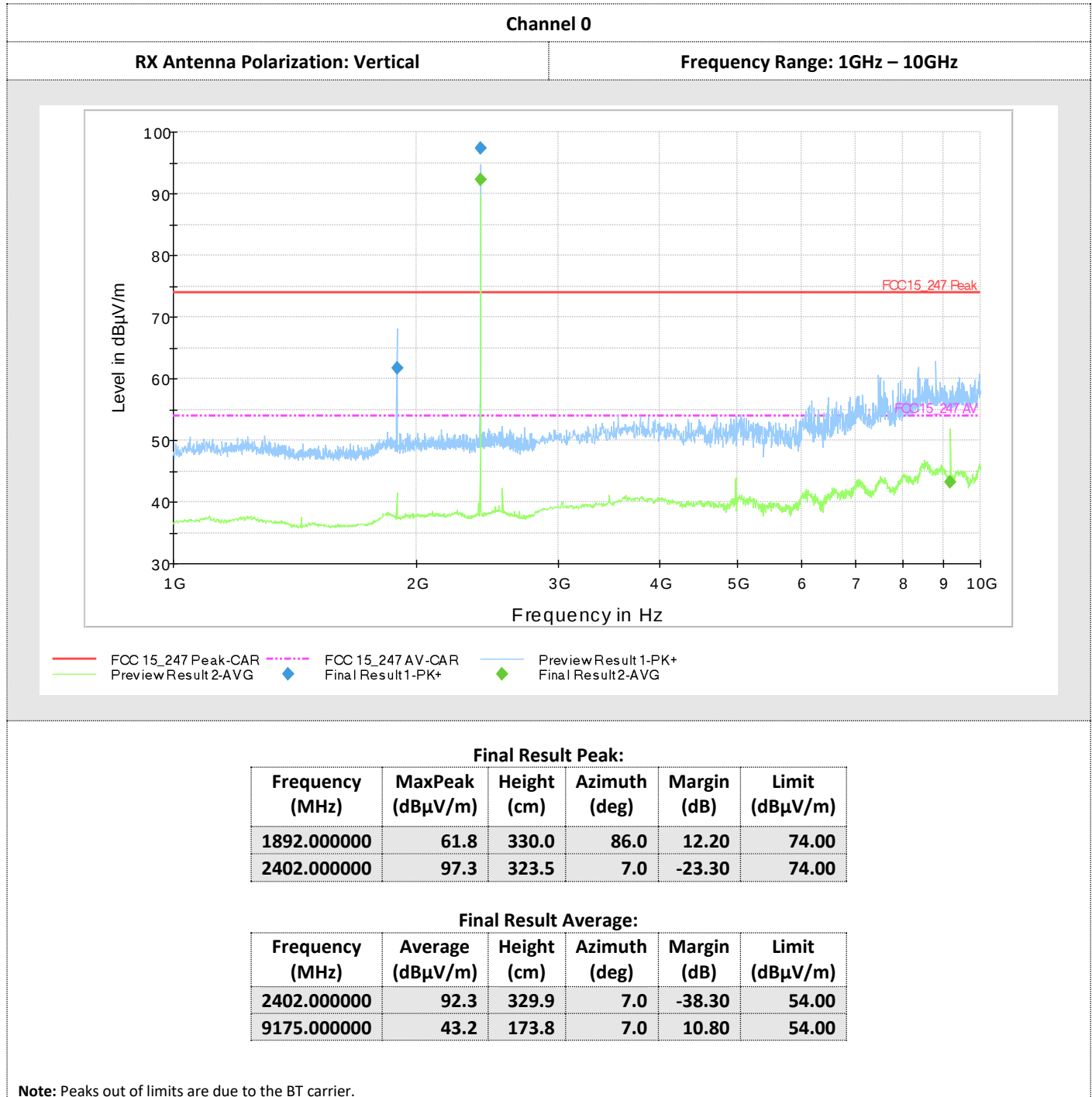


Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

TEST RESULTS #1,#2,#3

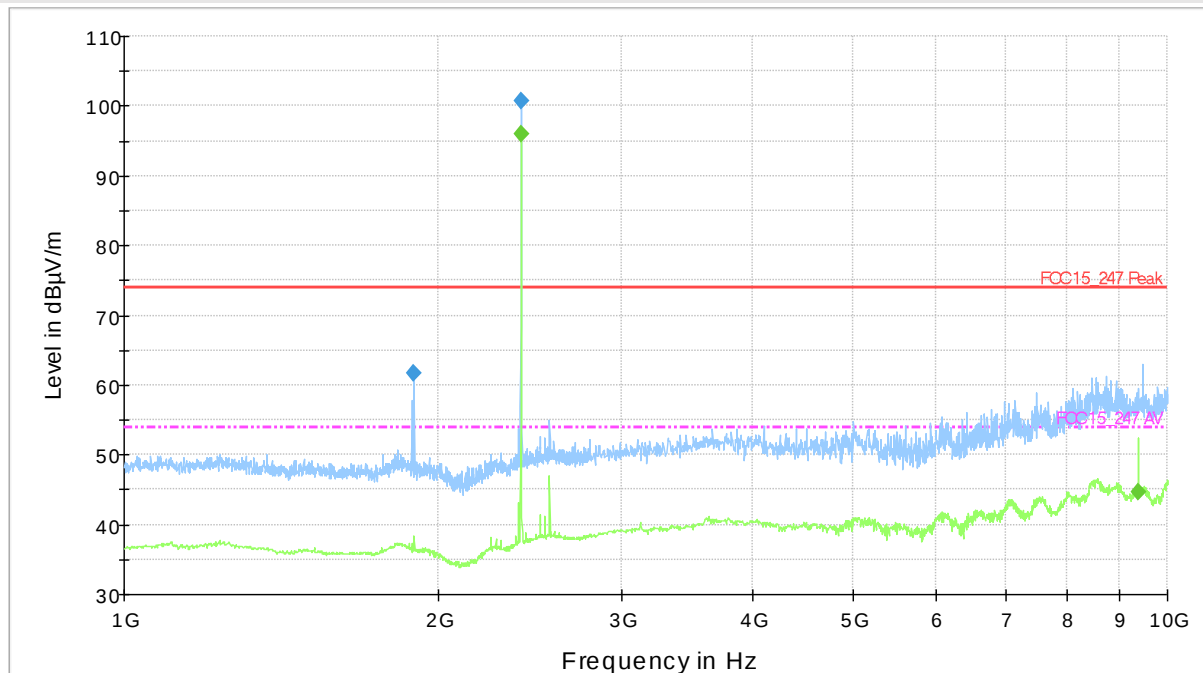
Enhanced Data Rate 3DH5



Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — Preview Result 1-PK+
— Preview Result 2-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
1897.000000	61.7	107.5	97.0	12.30	74.00
2402.000000	100.7	108.0	84.0	-26.70	74.00

Final Result Average:

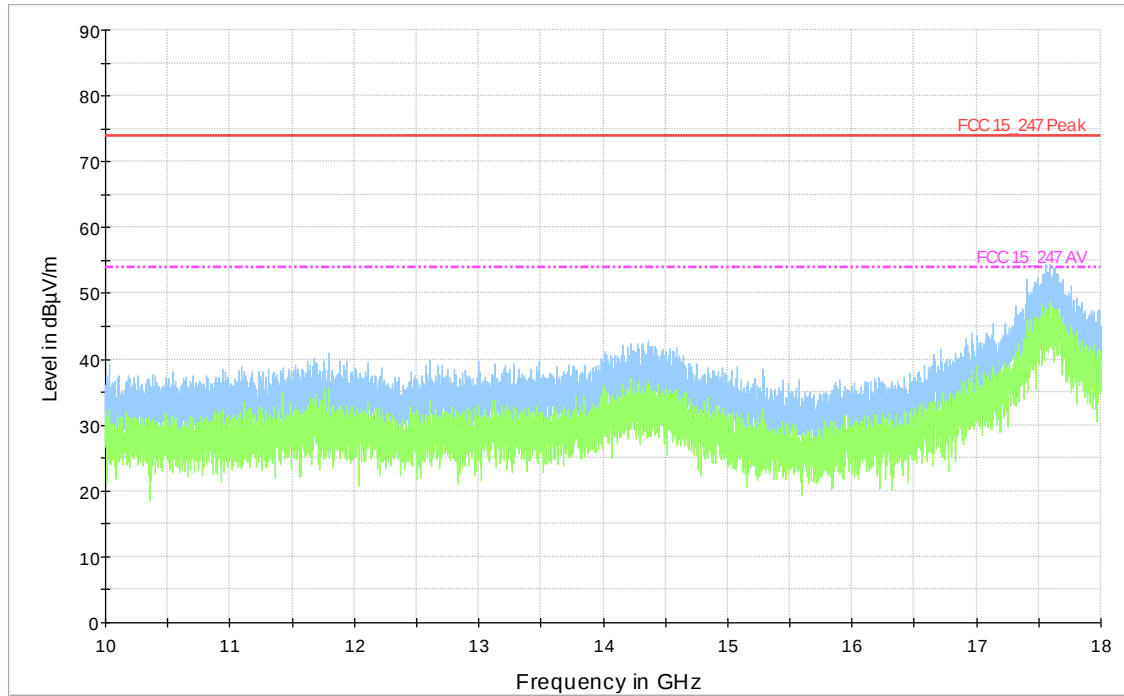
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2402.000000	96.0	107.8	82.0	-42.00	54.00
9375.000000	44.8	199.7	-8.0	9.20	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel 0

RX Antenna Polarization: Vertical

Frequency Range: 10GHz – 18GHz



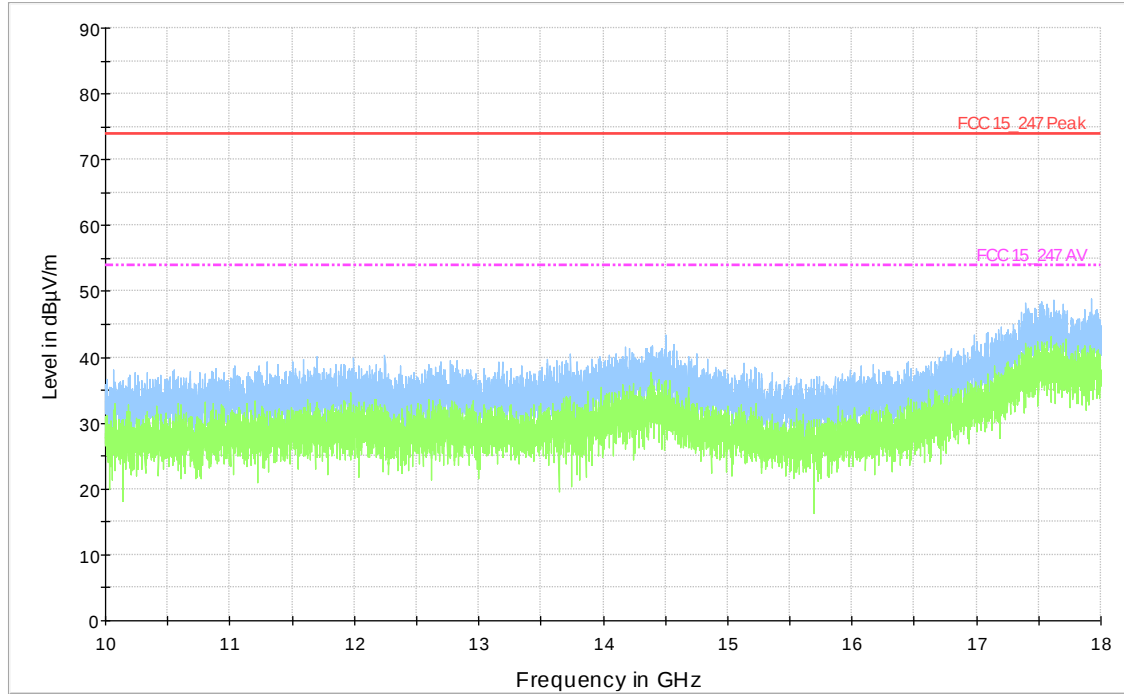
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 10GHz – 18GHz



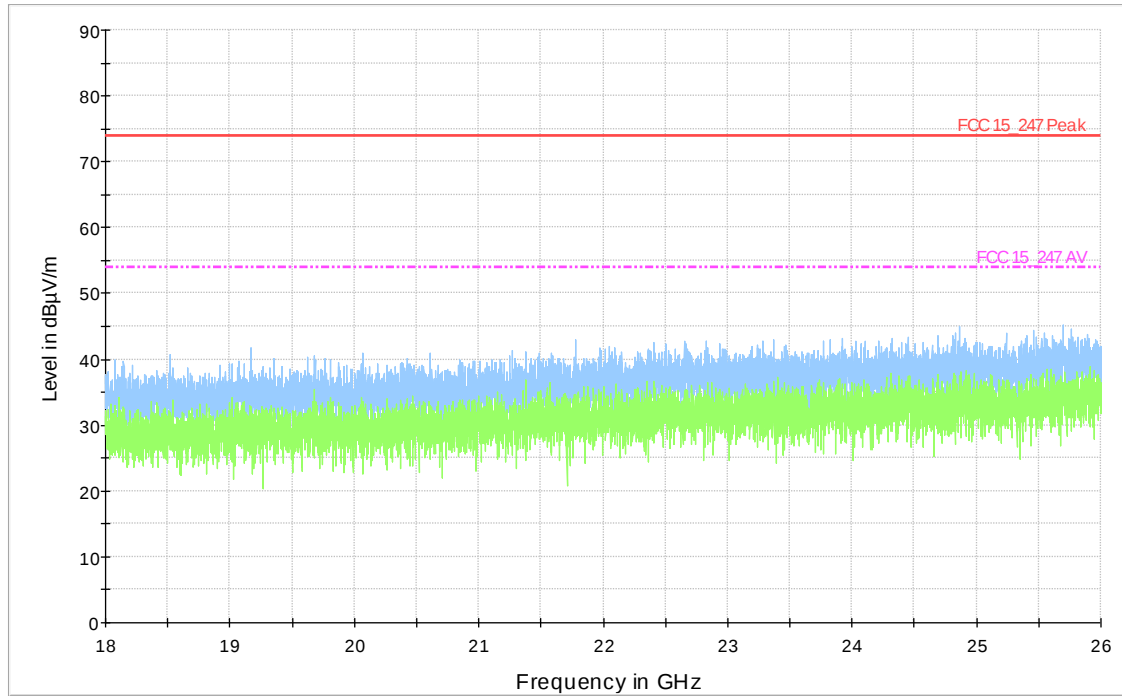
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 0

RX Antenna Polarization: Vertical

Frequency Range: 18GHz – 26GHz



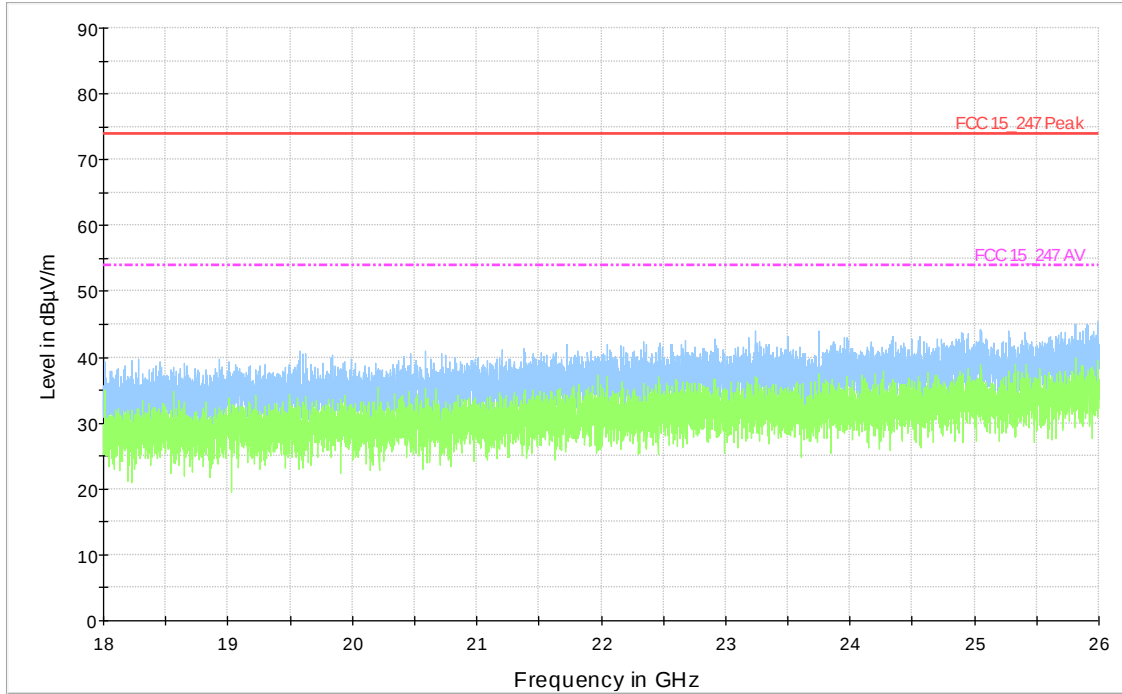
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 0

RX Antenna Polarization: Horizontal

Frequency Range: 18GHz – 26GHz



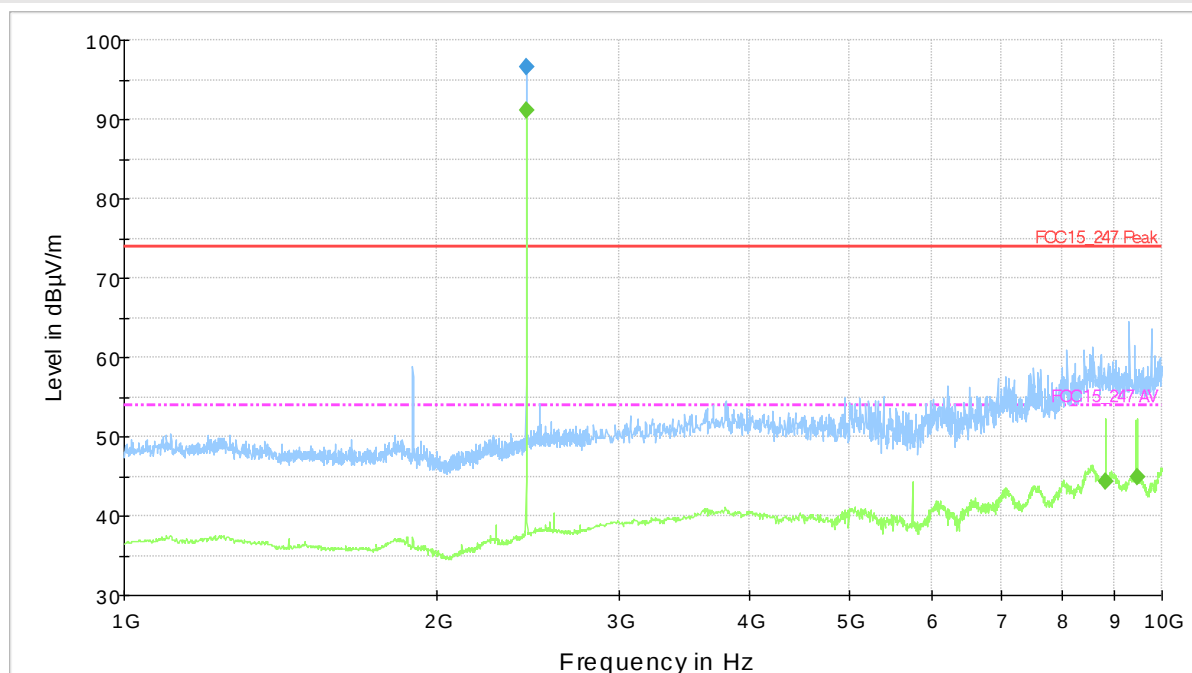
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Vertical

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — Preview Result 1-PK+
— Preview Result 2-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	96.6	254.5	7.0	-22.60	74.00

Final Result Average:

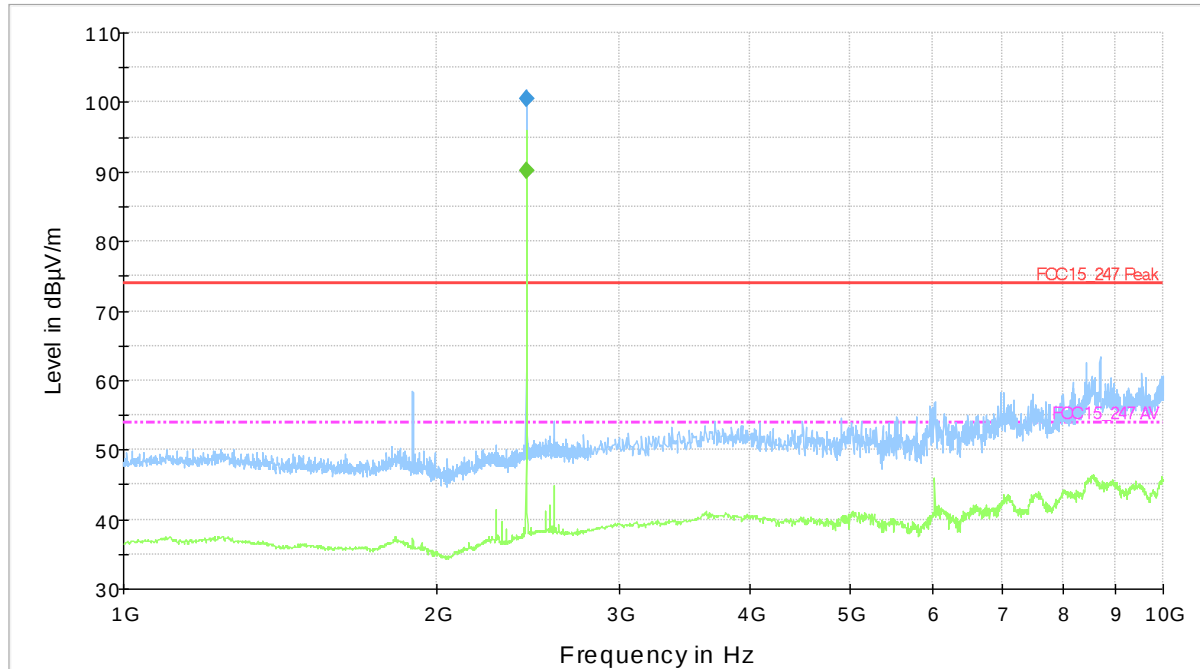
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	91.1	253.5	7.0	-37.10	54.00
8825.000000	44.4	182.1	-5.0	9.60	54.00
9465.000000	45.0	107.5	7.0	9.00	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — Preview Result 1-PK+
— Preview Result 2-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	100.6	125.8	90.0	-26.60	74.00

Final Result Average:

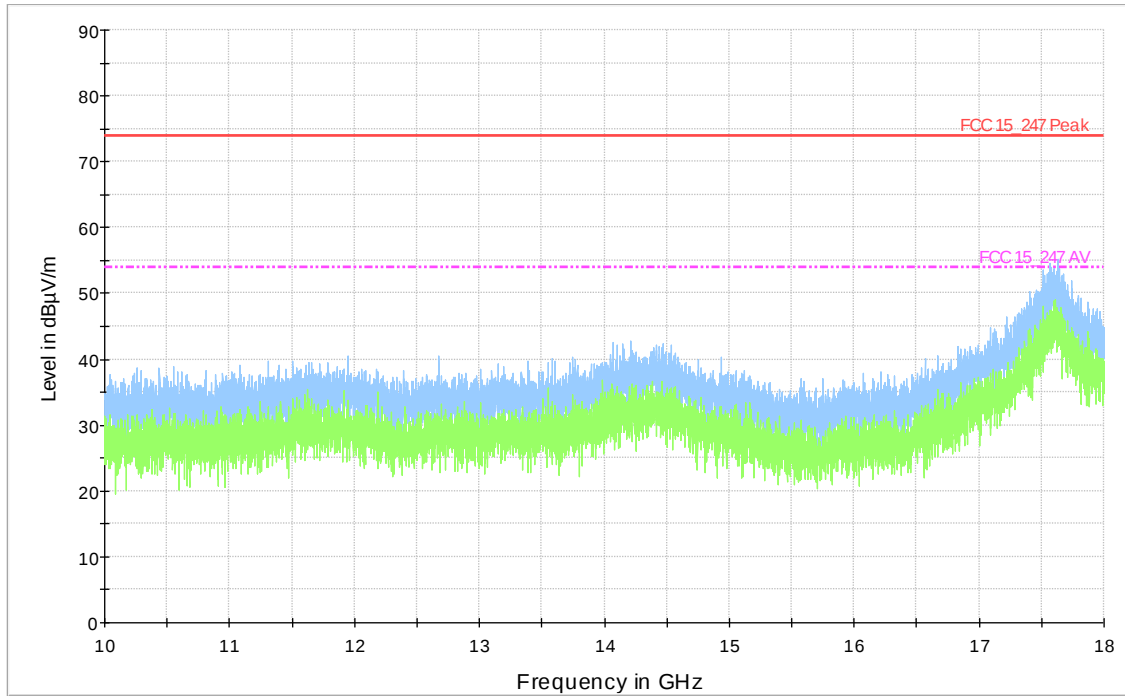
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2441.000000	90.1	148.9	90.0	-36.10	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel39

RX Antenna Polarization: Vertical

Frequency Range: 10GHz – 18GHz



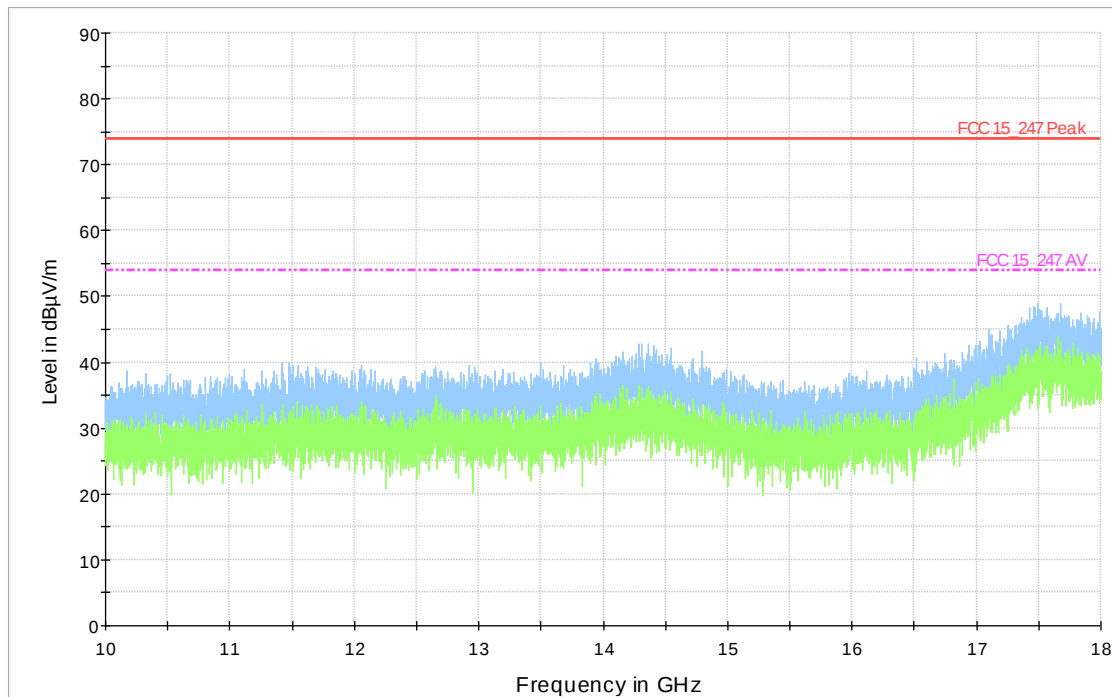
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 10GHz – 18GHz



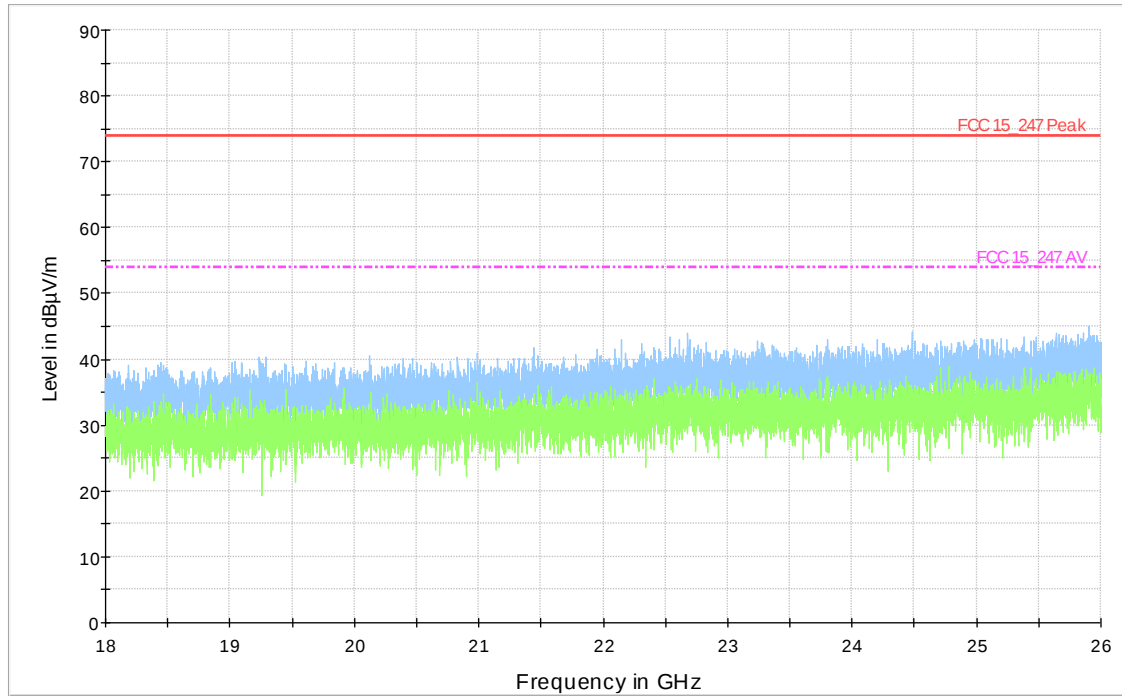
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Vertical

Frequency Range: 18GHz – 26GHz



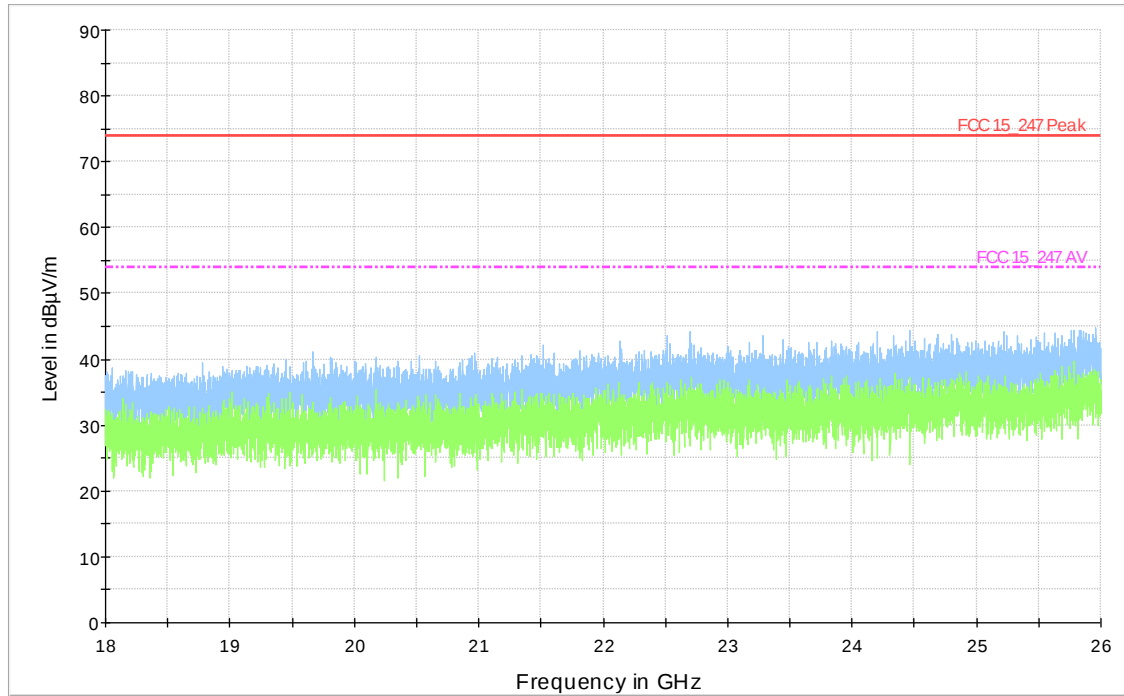
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 39

RX Antenna Polarization: Horizontal

Frequency Range: 18GHz – 26GHz



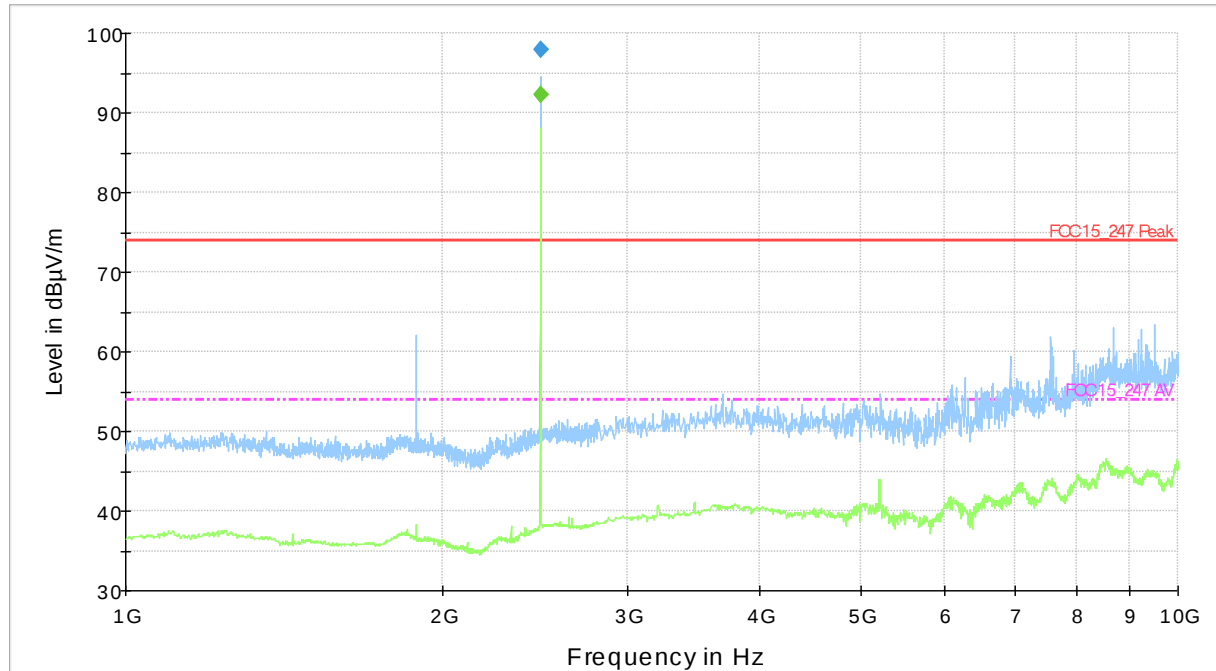
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 1GHz – 10GHz



Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	97.9	274.6	7.0	-23.90	74.00

Final Result Average:

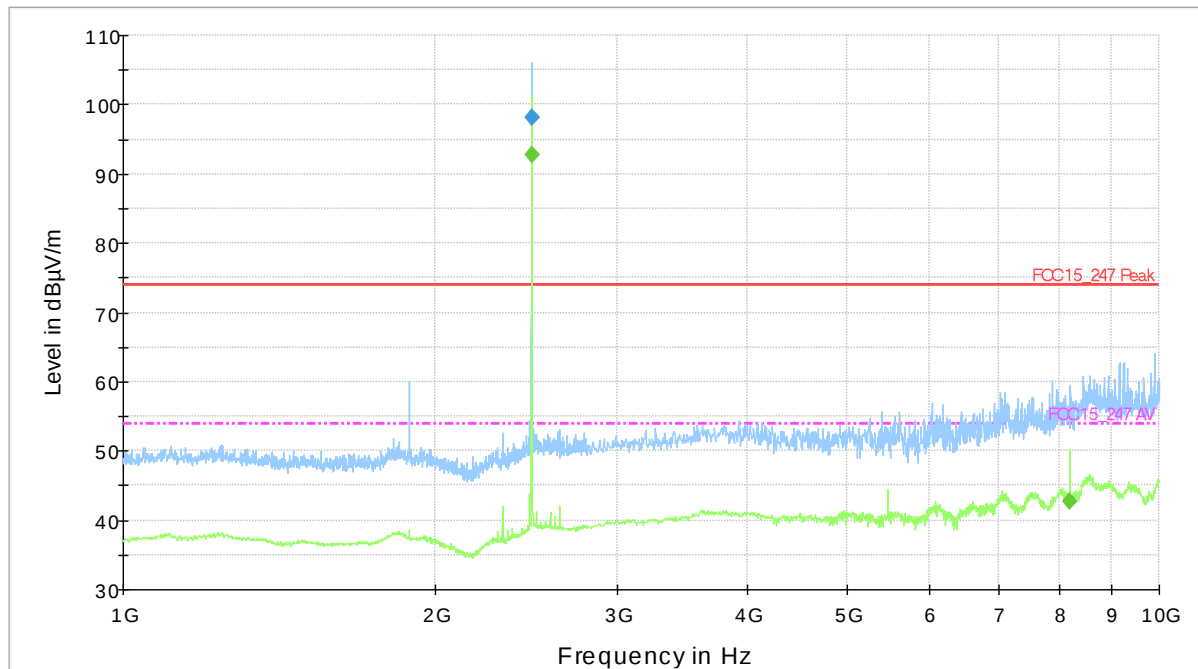
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	92.3	244.5	7.0	-38.30	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 1GHz – 10GHz



— FCC 15_247 Peak-CAR — FCC 15_247 AV-CAR — Preview Result 1-PK+
— Preview Result 2-AVG ◆ Final Result 1-PK+ ◆ Final Result 2-AVG

Final Result Peak:

Frequency (MHz)	MaxPeak (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	98.2	115.6	97.0	-24.20	74.00

Final Result Average:

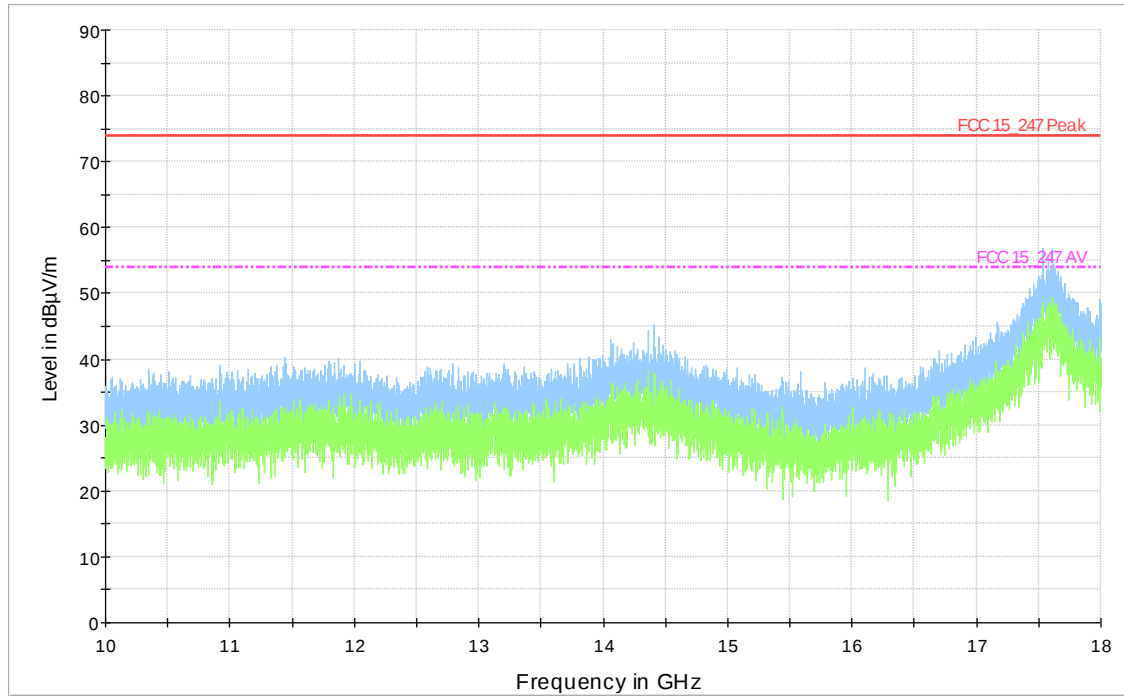
Frequency (MHz)	Average (dBμV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBμV/m)
2480.000000	92.8	115.6	97.0	-38.80	54.00
8200.000000	42.8	136.7	84.0	11.20	54.00

Note: Peaks out of limits are due to the BT carrier.

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 10GHz – 18GHz



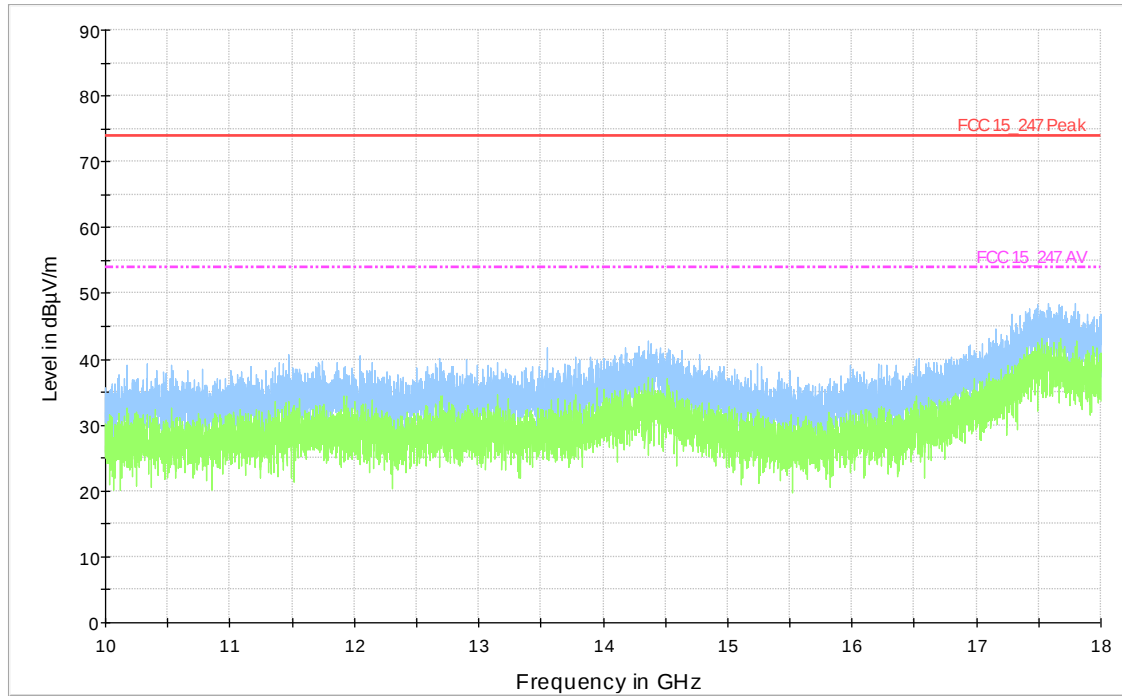
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 10GHz – 18GHz



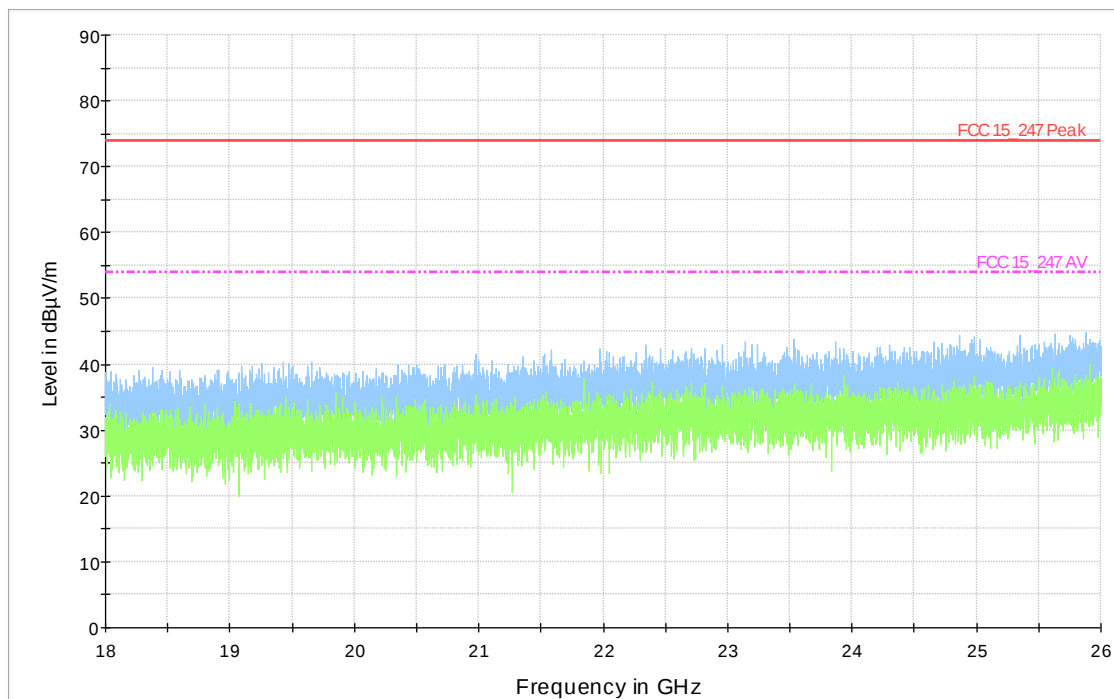
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Vertical

Frequency Range: 18GHz – 26GHz



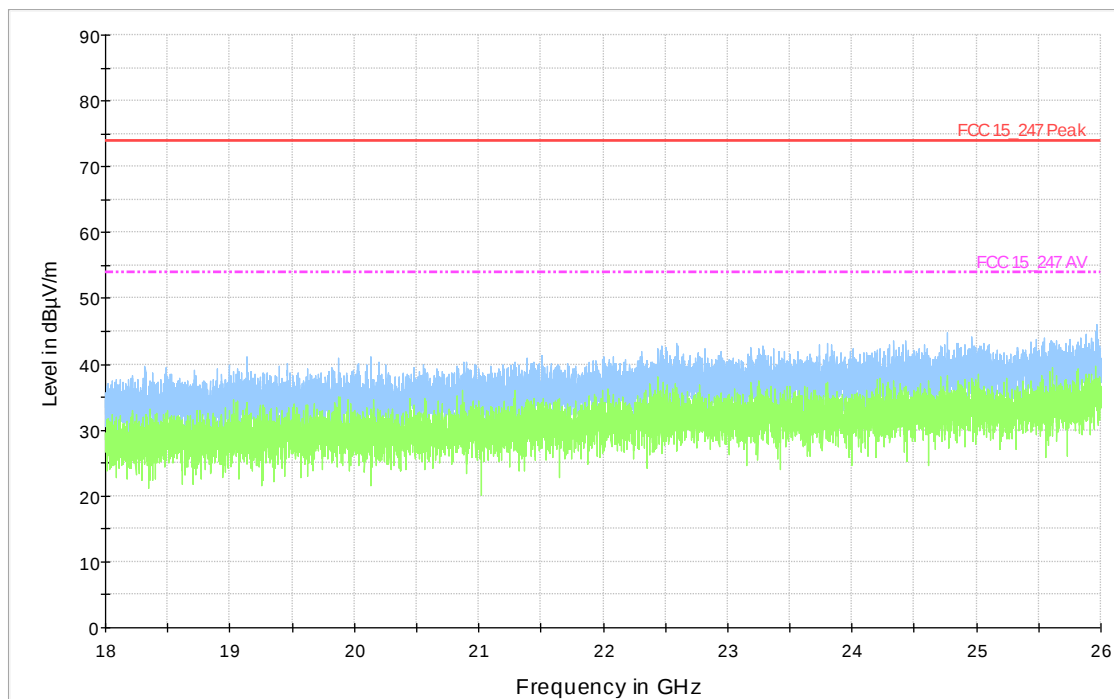
Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Channel 78

RX Antenna Polarization: Horizontal

Frequency Range: 18GHz – 26GHz



Final Result:

Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

TEST 8.	TRANSMITTER CARRIER FREQUENCY SEPARATION
REFERENCE DOCUMENT	According to § 15.247 (a) (1) & RSS-247 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.

• TEST SETUP	Acc. To ref. Std.					
• TEST LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
• TESTED PORT	Antenna					
• TEST METHOD	ANSI C63.10:2013 section 6.6					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty = 3dB					

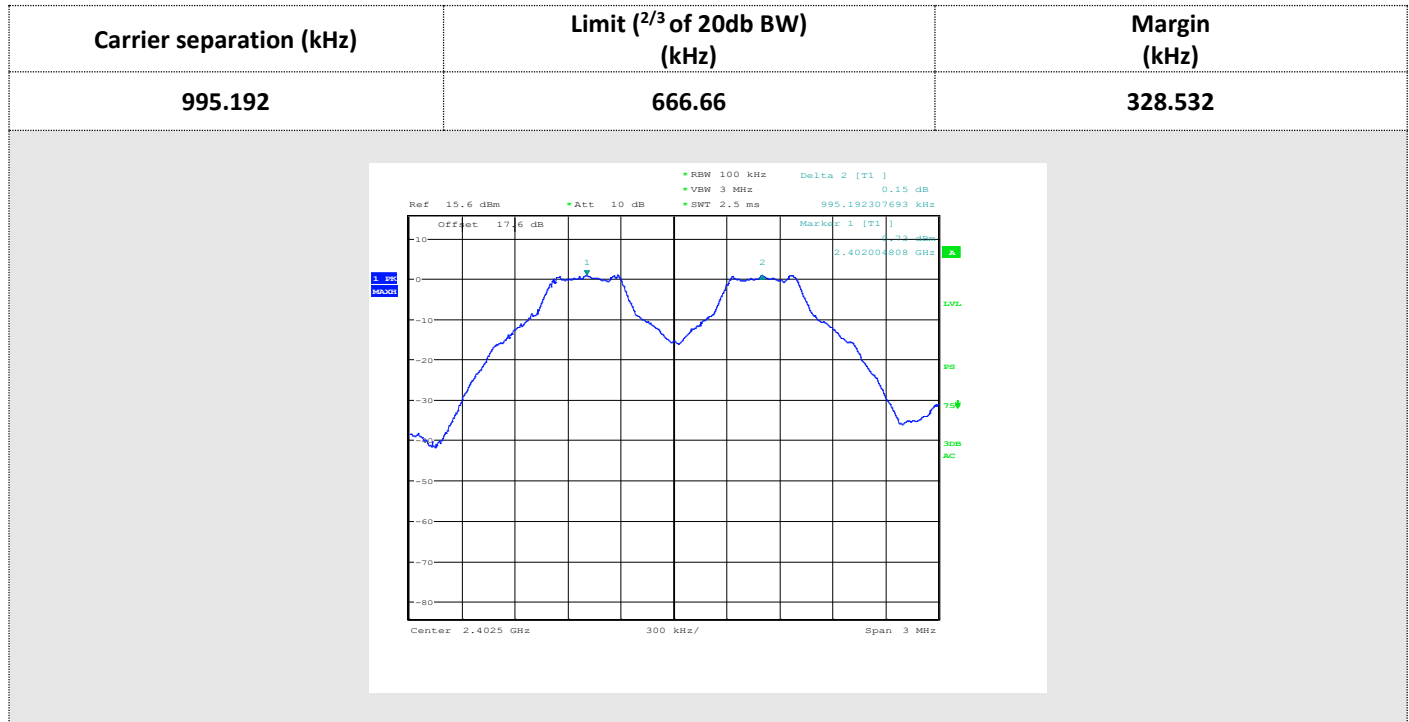
TEST CONDITIONS	REQUIRED	MEASURED
Ambient temperature	23°C ± 5°C	24 °C
Ambient humidity	25 - 75%rH	45%
Pressure	85 - 106kPa (860mbar - 1060mbar)	960 mbar

OPERATING CONDITION: #4

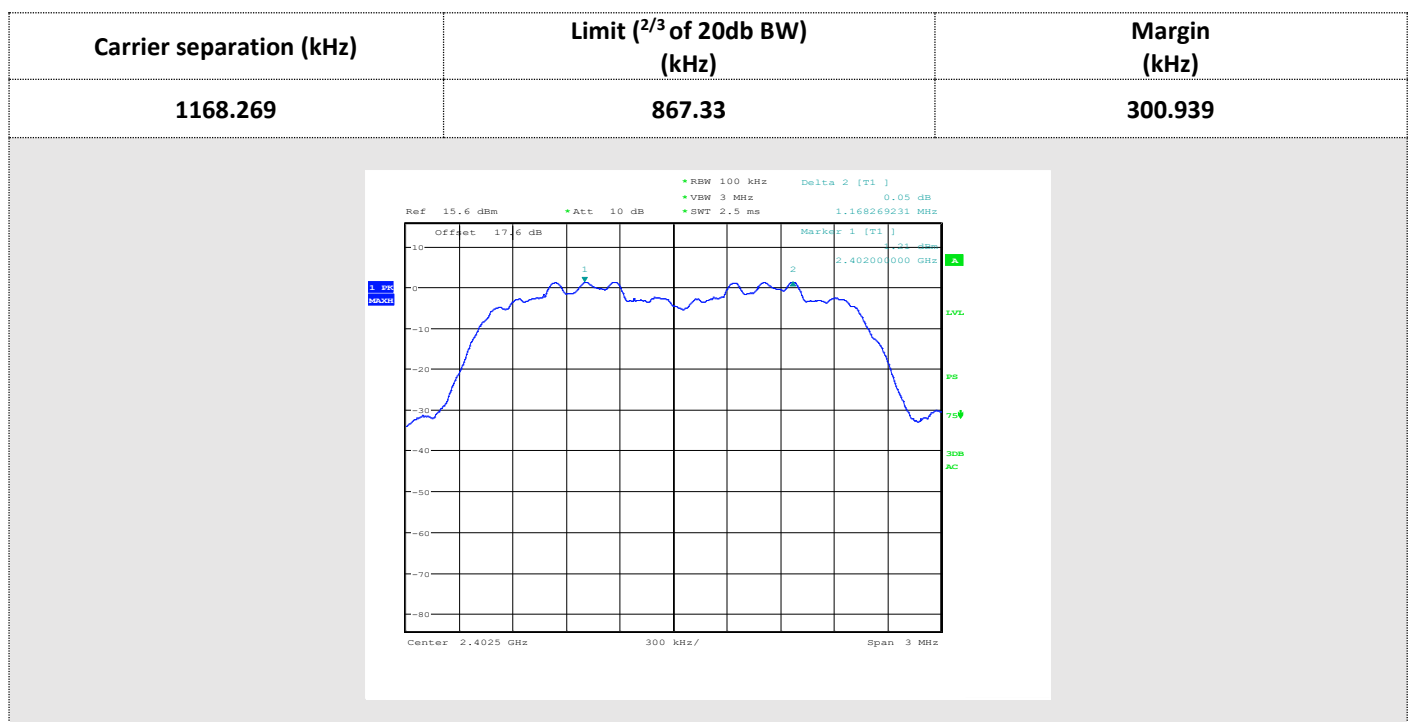
RESULT: COMPLIANT

TEST RESULTS #4

Basic Rate DH5



Enhanced Data Rate 3DH5



TEST 9.	TRANSMITTER NUMBER OF HOPPING FREQUENCIES AND AVERAGE TIME OF OCCUPANCY
REFERENCE DOCUMENT	According to § 15.247 (a) (1) (iii) & RSS-247 Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

• TEST SETUP	Acc. To ref. Std.					
• TEST LOCATION	Semi-Anechoic Chamber					
• DISTANCE OF MEASUREMENT	3m					
• TYPE OF MEASUREMENT	Radiated					
• TEST EQUIPMENT USED FOR TEST	Instrument	Manufacturer	Model	Serial n°	Calibrated On	Due to
	MXE Emi Receiver	Keysight	N9038A	MY57290150	07/2021	07/2022
• TESTED PORT	Antenna					
• TEST METHOD	ANSI C63.10:2013 section 6.6					
• FREQUENCY RANGE	1GHz – 10GHz					
• LIMITS	Acc. To ref. Std.					
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty = 3dB					

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

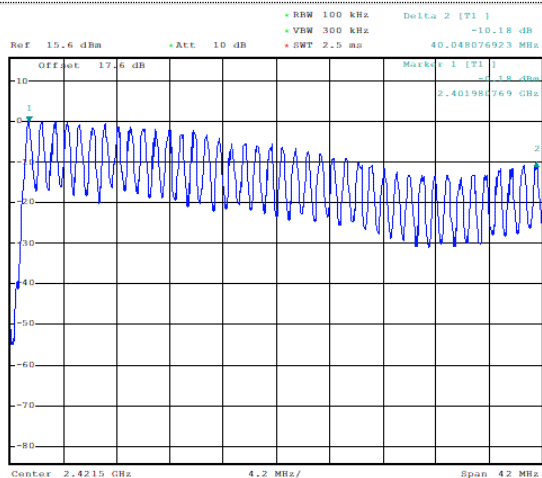
RESULT: COMPLIANT

TEST RESULTS #4

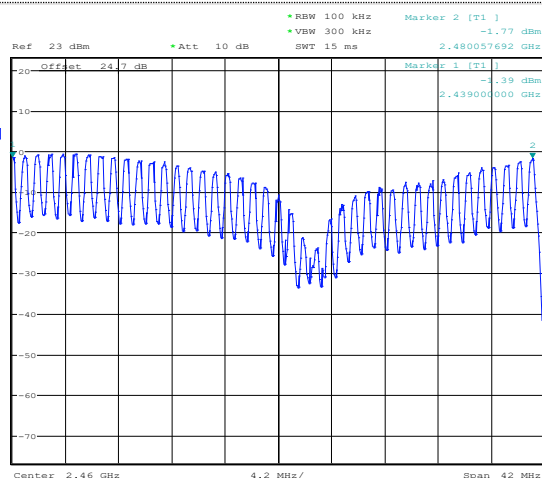
Basic Rate DH5

Emission Width (μs)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)
2907.05	104	0.302	0.4	0.098

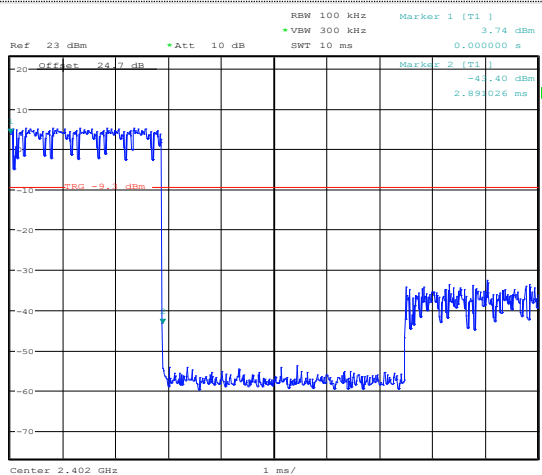
Number of Hopping part 1



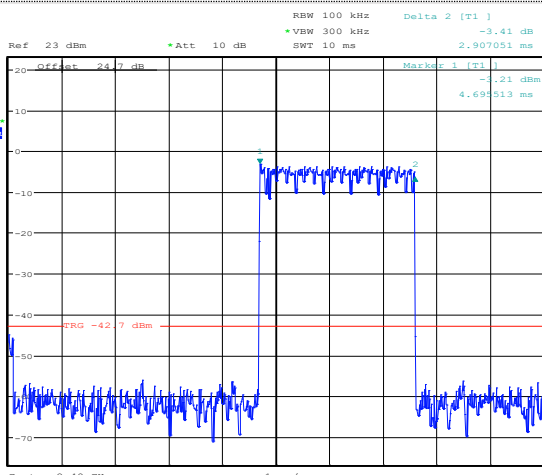
Number of Hopping part 2



Dwell time CH1

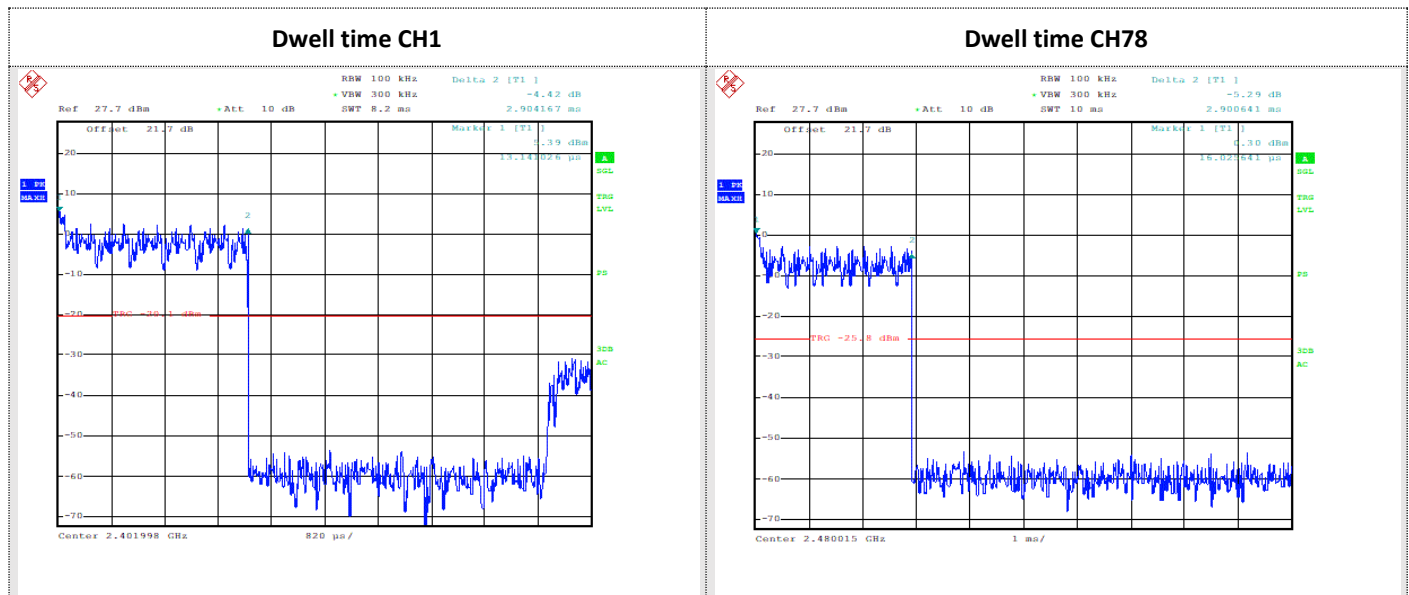
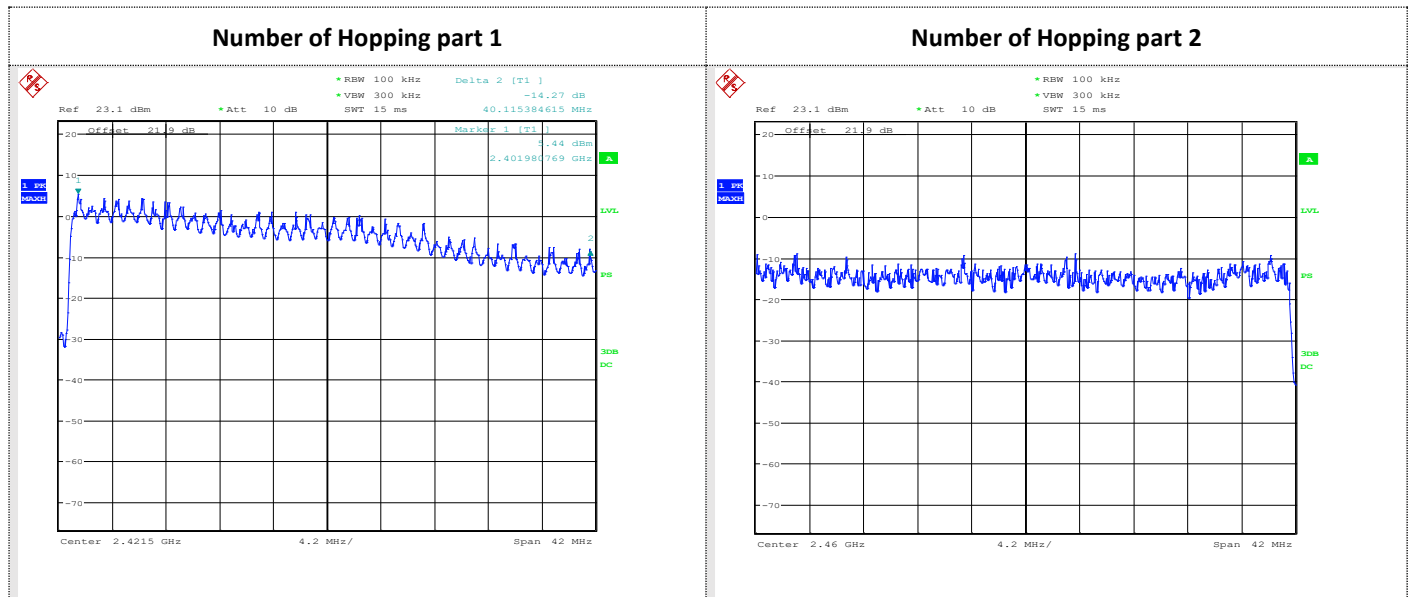


Dwell time CH78



Basic Rate 2DH5

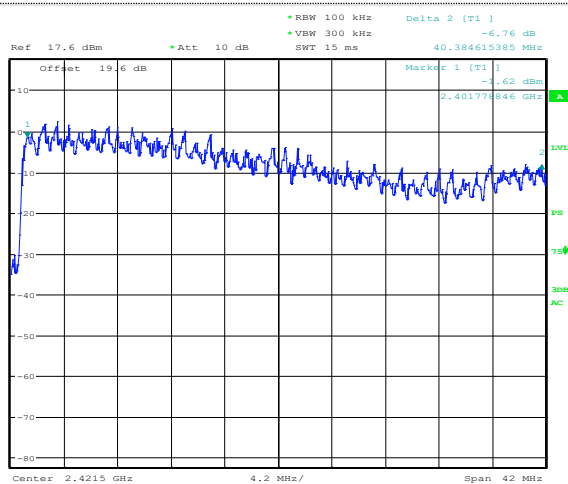
Emission Width (μ s)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)
2904.16	104	0.302	0.4	0.098



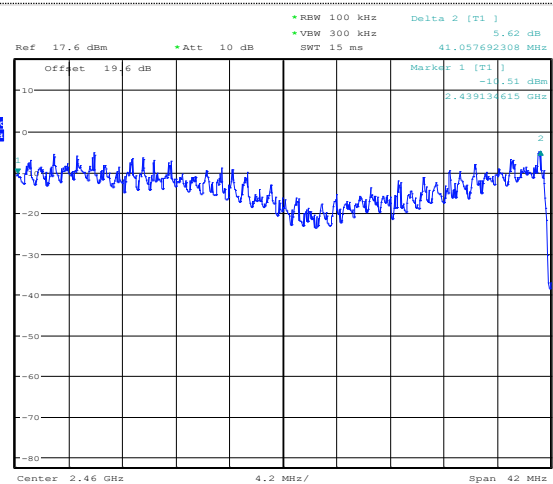
Enhanced Data Rate 3DH5

Emission Width (μ s)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)
2925.80	104	0.304	0.4	0.096

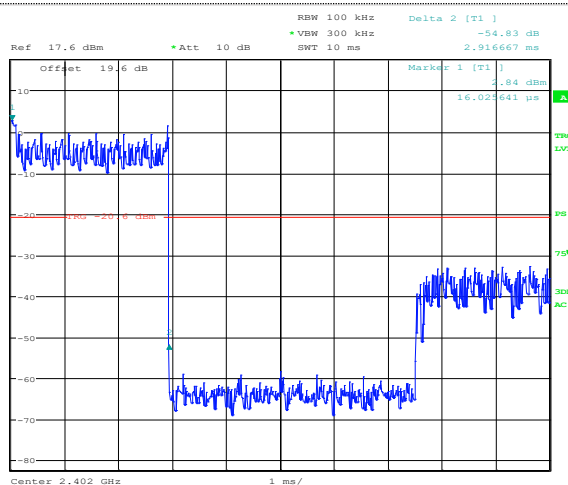
Number of Hopping part 1



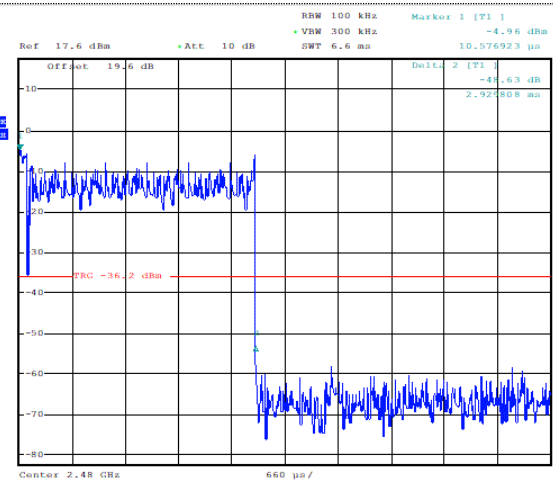
Number of Hopping part 2



Dwell time CH1



Dwell time CH78



TEST 10.	TRANSMITTER FREQUENCY STABILITY
REFERENCE DOCUMENT	RSS-GEN

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	RSS-GEN
• TEST EQUIPMENT USED FOR TEST	MXE Emi Receiver Keysight mod. N9038
• TESTED PORT	Antenna

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

RESULT: COMPLIANT

MEASUREMENT RESULTS

Channel	Voltage (V)	Temperature (°C)	Frequency (MHz)	Variation at the reference value (MHz)	Maximum variation (MHz)	Result
0	3,6	+23	2401.904	---	±1	COMPLIANT
		+0	2401.918	+0.014		
		+50	2401.898	-0.006		
	2	+23	2401.904	0		
19	3,6	+23	2440.904	---	±1	COMPLIANT
		+0	2440.904	0		
		+50	2440.898	-0.006		
	2	+23	2440.904	0		
39	3,6	+23	2479.896	---	±1	COMPLIANT
		+0	2479.902	+0.006		
		+50	2479.890	-0.004		
	2	+23	2479.910	+0.014		
Note: The test has been performed with unmodulated carrier						

END OF TEST REPORT