

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	FCCTR_180160B-0	Data Emissione / Issue Date:	14/03/2022	Pagine / Pages:	47
Scopo delle prove Test object	Prove di tipo in accordo alla Norme Type test according to Standards FCC Cfr 47 part 15 - Subpart C - §15.209 (a) and §15.247 (d)				
Richiedente Applicant	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 Trade mark					
Fabbricante Manufacturer	DATALOGIC S.r.l.				
Prodotto Product	Radio module				
Modello testato Testing model	MIZAR RADIO MODULE 915MHZ				
Identificativo FCC FCC ID	U4F0022				
Data ricevimento campioni Date of test samples receipt	08/07/2021				
Campioni verificati No. of tested samples	1 – Sampled by the manufacturer				
Data verifiche Testing date	From 12/11/2021 to 18/11/2021				
Sito di prova Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Identificativo FCC del sito di prova FCC designation number	IT0012				
Esito delle valutazioni Assessment results	CONFORME / COMPLIANT				
Verifiche effettuate da Verifications carried out by	Daniele AOSANI Tecnico Laboratorio Laboratory Engineer				
Approvato Approved by	Riccardo PFEIFFER Responsabile Laboratorio 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.

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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0. RELEASE CONTROL RECORD

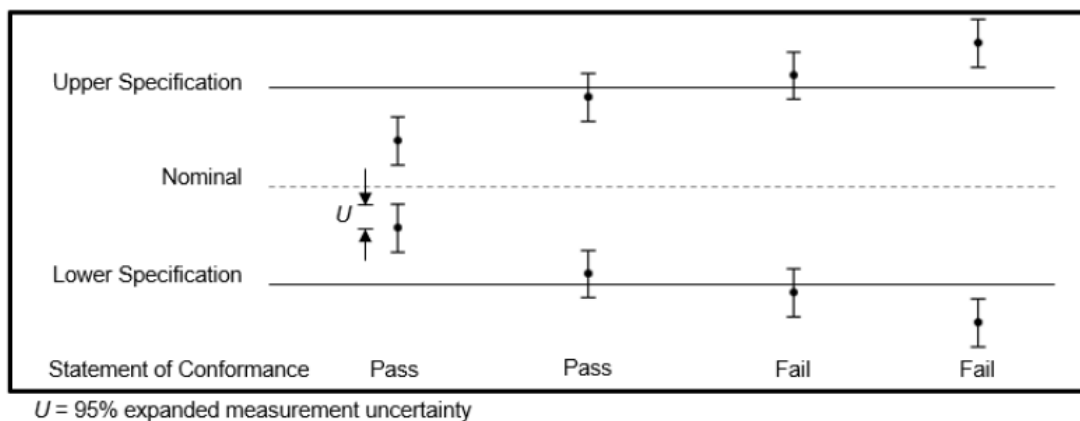
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_180160B-0	Original release	14/03/2022

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

1. DECISION RULE

PRSLAB 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

- The tested module can be used with two different (same type) antennas:

- 1.Wire Antenna (Model: Helical) → Max Gain declared 0.5dBd (2.65dBi)
- 2.Wire Antenna (Model: Folded) → Max Gain declared -5dBd (-2.85dBi)

The ratings and measurements shown in this report take into consideration the antenna with the highest gain.


3. GENERAL REMARKS

In order to qualify for a Class 2 permissive change it must be established that the RF output power (DSS and DTS equipment class) and the field strength of the fundamental emission (DXE equipment class) are not higher than the levels for which the original Grants have been issued.

Original Grant Values	New values
DTS – Max measured power: 14,64dBm peak	DTS – Max measured power: 14,46dBm peak
DSS - Max measured power: 16,60dBm peak	DSS - Max measured power: 15,50dBm peak

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	Radio module
MODEL NAME	MIZAR MODULE 915MHZ
FCC ID	U4F0022
S/N	G19LBGEL000C59C0
PRSLAB INTERNAL REFERENCE	BC 239/2021
TRADEMARK	
MANUFACTURER	DATALOGIC S.r.l.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	DC power from board
POWER SUPPLY NOMINAL VOLTAGE	3.3Vdc
OPERATING TEMPERATURE	-20°C ÷ +55°C
DIMENSIONS	See photography documentation
EUT STANDING	Table, wall or portable system

4.2 Radio module technical data

TYPE OF RADIO DEVICE	Transceiver		
MODULATION	Manchester RZ (for DSS) & NRZ (for DTS)		
DATA RATE	36.846 kbps (for DSS) 500 kbps (for DTS)		
TRANSMITTER FREQUENCY RANGE	From 902MHz to 928MHz		
TRANSMITTER CHANNELS TESTED for DTS	Channel ID	Channel number	Channel Frequency (MHz)
	Lowest	1	902,8005
	Default	8	910,0000
	Highest	25	927,4845
TRANSMITTER CHANNELS TESTED for DSS	Channel	Channel Index	Channel Frequency (MHz)
	Lowest	1	903,6490
	Default	4	910,0000
	Highest	12	926,9360
RECEIVER FREQUENCY RANGE	From 902MHz to 928MHz		
RECEIVER CHANNELS TESTED	Channel ID	Channel number	Channel Frequency (MHz)
	Default	8	910,0000
TESTED ANTENNA TYPE	Wire Antenna		
MAXIMUM ANTENNA GAIN	0.5dBd (2.65dBi)		
TESTED ANTENNA MODEL	Helical		

4.3 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
<input type="checkbox"/>	Enclosure	Electronic board	Screws	---
<input type="checkbox"/>	AC Power input	Port not present	---	---
<input checked="" type="checkbox"/>	DC Power input	3.3Vdc	---	---
<input type="checkbox"/>	Signal/Control port	Port not present	---	---
<input checked="" type="checkbox"/>	Antenna	External	UFL	---

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

- Laboratory laptop used to set radio channels.
- RJ485 to USB cable to provide power supply and communicate to the auxiliary PC.
- Electronic board.

5. REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	DESCRIPTION
Title 47 Part 15 Subpart B § 15.209	Radio Frequency Devices – Intentional Radiators Radiated emission limits; general requirements
Title 47 Part 15 Subpart B § 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

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, modulated carrier
#2	Continuous transmission, pseudorandom modulated, Hopping mode

7. SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS				
Port	Test	Reference Standard	Operating Condition	Results
Antenna	Transmitter Radiated Emissions DSS Technology	FCC Part 15 § 15.247 (d) - §15.209 (a)	#1	Within the limits
	Transmitter Band-Edge DSS Technology	FCC Part 15 § 15.247 (d) - §15.209 (a)	#1, #2	Within the limits
	Transmitter Radiated Emissions DTS Technology	FCC Part 15 § 15.247 (d) - §15.209 (a)	#1	Within the limits
	Transmitter Band-Edge DTS Technology	FCC Part 15 § 15.247 (d) - §15.209 (a)	#1	Within the limits

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.

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

9. TEST RESULTS

TRANSMITTER RADIATED EMISSIONS < 1GHz	10
TRANSMITTER RADIATED EMISSIONS > 1GHz	30
BAND-EDGE	44

TEST 1.

TRANSMITTER RADIATED EMISSIONS < 1GHZ

REFERENCE DOCUMENT

According to § 15.247 (d) and § 15.209 (a)

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	02/2021	02/2022
	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	Antenna					
• 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
Voltage		3.3Vdc from board

OPERATING CONDITION :#2

RESULT: **WITHIN THE LIMITS**

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

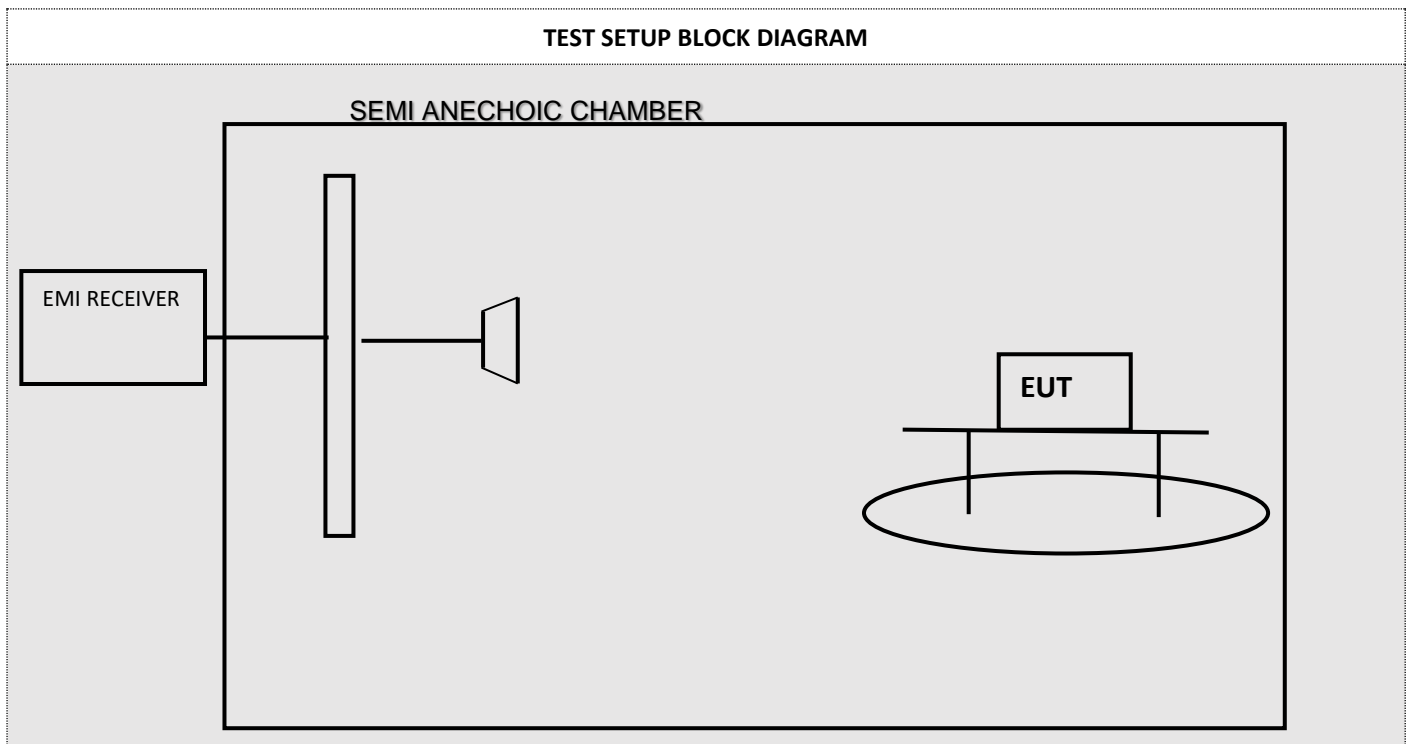
Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously - rotating, remotely - controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

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

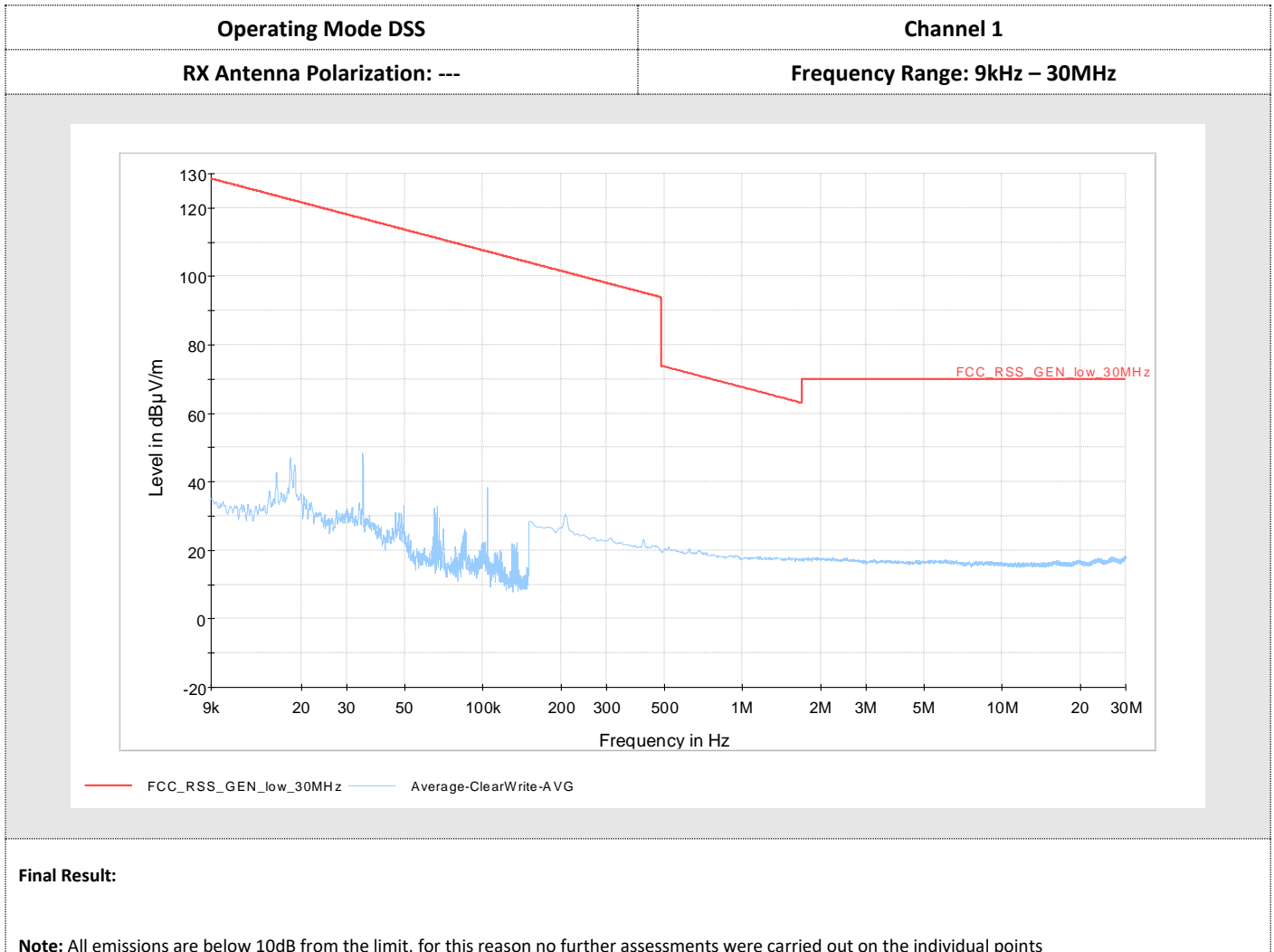
Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m~4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3m.

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.

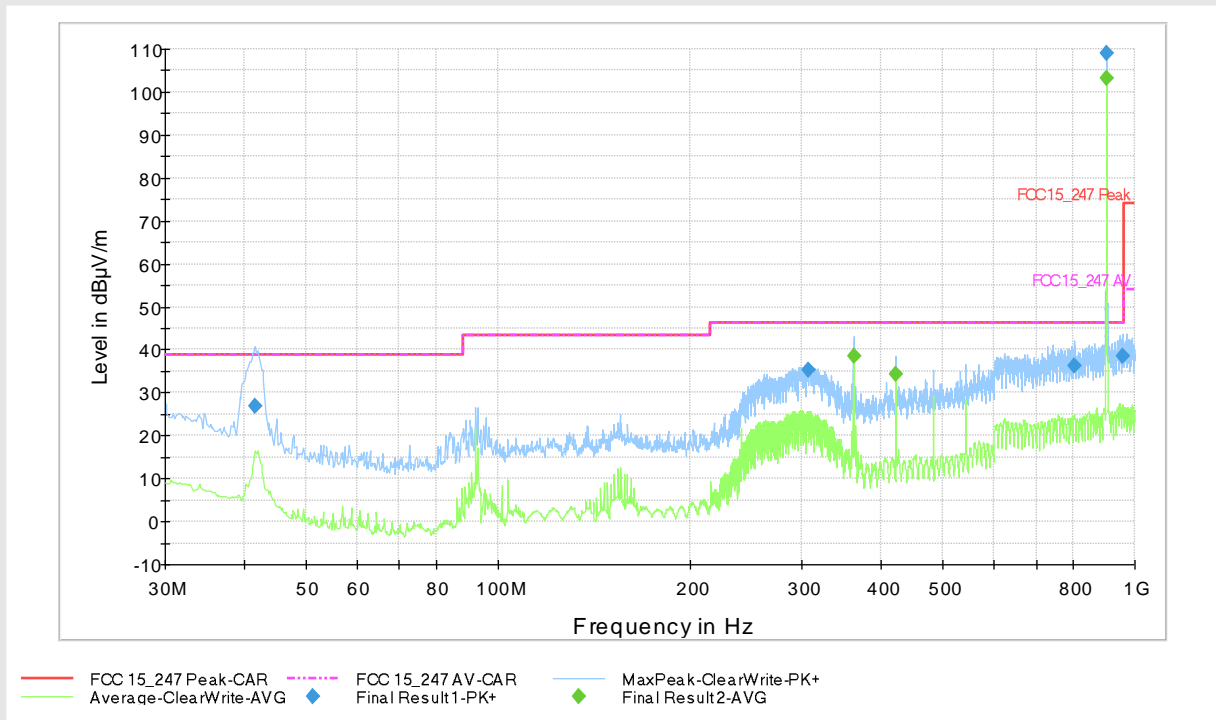
TEST SETUP BLOCK DIAGRAM



TEST RESULTS



Operating Mode DSS	Channel 1
RX Antenna Polarization: Vertical	Frequency Range: 30MHz – 1GHz



Final Result Quasi Peak:

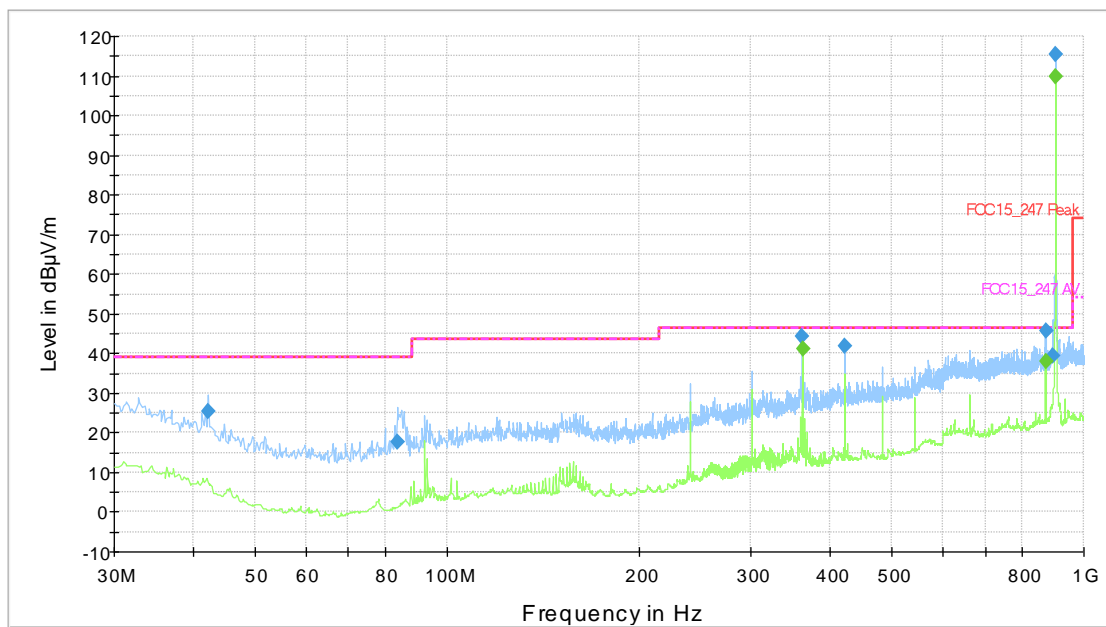
Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
41.520000	26.8	97.4	7.0	12.20	39.00
307.170000	35.3	97.4	187.0	11.10	46.40
802.500000	36.2	273.6	97.0	10.20	46.40
902.730000	108.9	116.7	92.0	-62.50	46.40
954.990000	38.6	179.5	92.0	7.80	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.560000	38.6	97.4	180.0	7.80	46.40
421.830000	34.3	97.3	177.0	12.10	46.40
902.880000	103.3	115.6	90.0	-56.90	46.40

NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DSS	Channel 1
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)
42.150000	25.4	179.7	97.0	13.60	39.00
83.580000	17.6	179.5	277.0	21.40	39.00
361.500000	44.5	97.4	277.0	1.90	46.40
421.830000	41.9	323.8	277.0	4.50	46.40
870.900000	45.9	97.4	7.0	0.50	46.40
893.130000	39.4	180.0	7.0	7.00	46.40
902.730000	115.3	97.4	7.0	-68.90	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.560000	41.3	97.3	277.0	5.10	46.40
870.870000	37.8	104.7	0.0	8.60	46.40
902.880000	109.7	97.3	7.0	-63.30	46.40

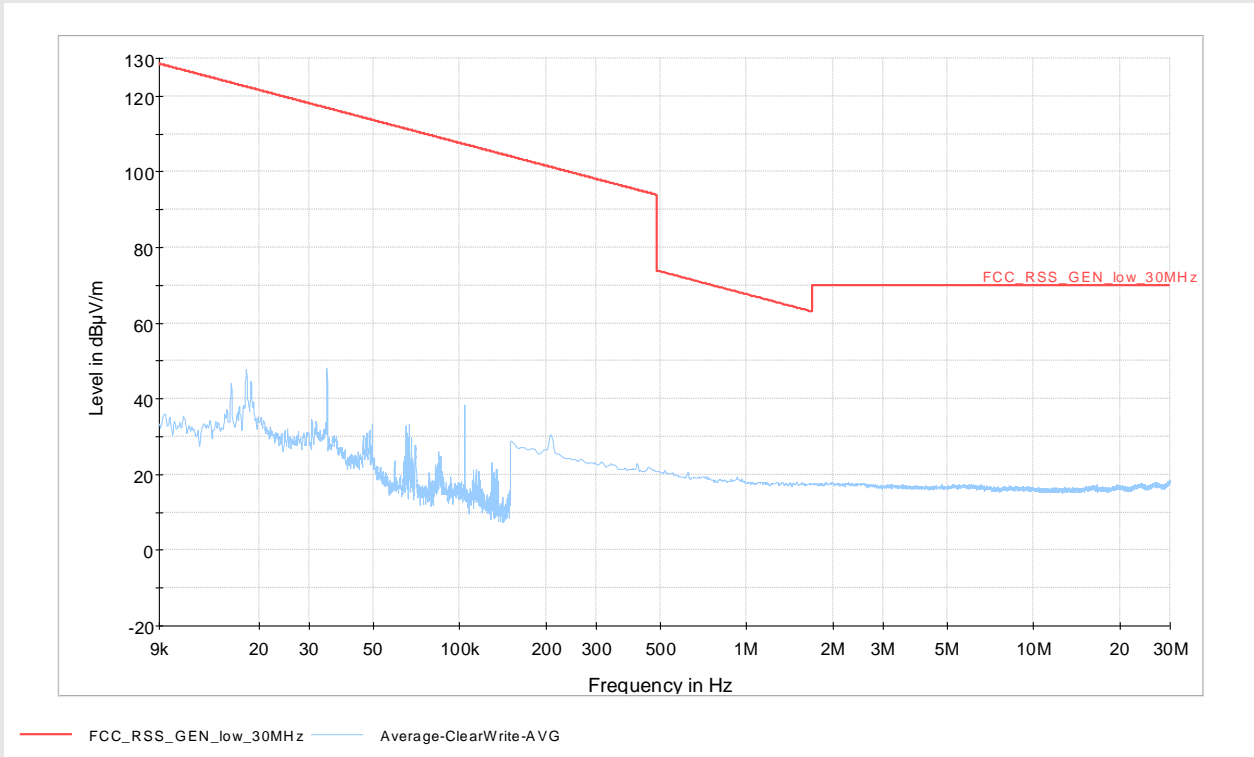
NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DSS

Channel 4

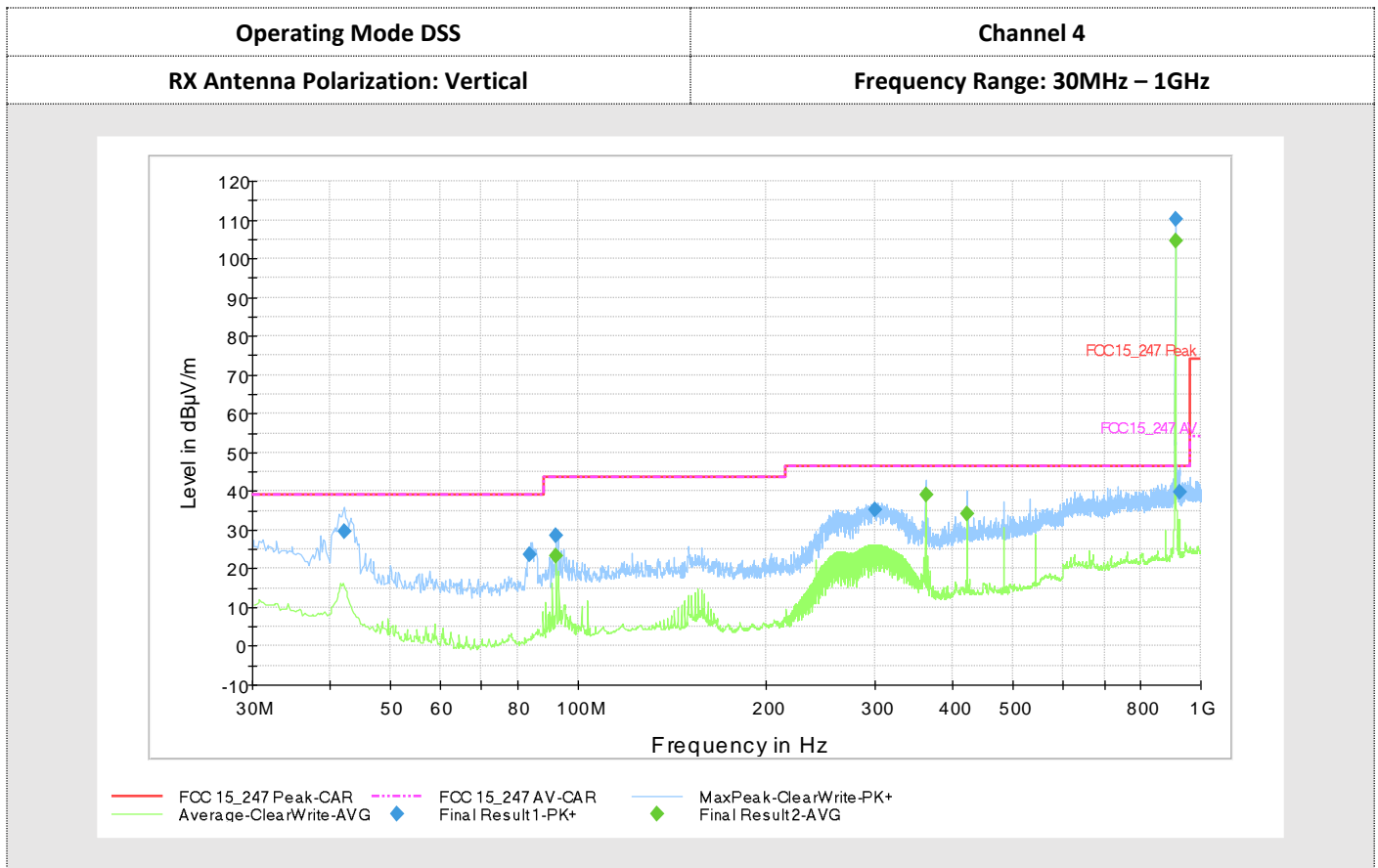
RX Antenna Polarization: ---

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



Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
42.090000	29.6	322.6	187.0	9.40	39.00
83.790000	23.6	179.6	174.0	15.40	39.00
92.190000	28.5	274.6	7.0	15.00	43.50
300.420000	35.2	97.3	187.0	11.20	46.40
909.930000	110.2	115.6	93.0	-63.80	46.40
923.430000	39.6	97.3	97.0	6.80	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
42.090000	29.6	322.6	187.0	9.40	39.00
83.790000	23.6	179.6	174.0	15.40	39.00
92.190000	28.5	274.6	7.0	15.00	43.50
300.420000	35.2	97.3	187.0	11.20	46.40
909.930000	110.2	115.6	93.0	-63.80	46.40
923.430000	39.6	97.3	97.0	6.80	46.40

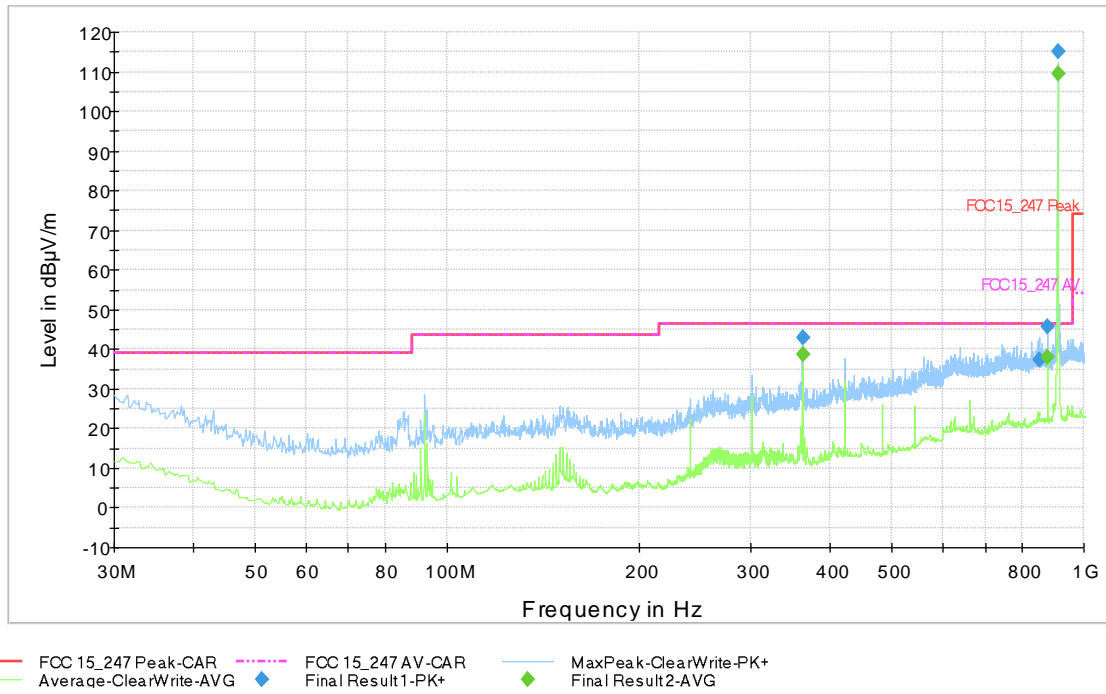
NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DSS

Channel 4

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.590000	42.7	97.4	187.0	3.70	46.40
851.550000	37.4	97.3	-6.0	9.00	46.40
877.920000	45.7	97.4	7.0	0.70	46.40
909.930000	115.2	97.4	7.0	-68.80	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.560000	38.7	104.7	187.0	7.70	46.40
877.920000	38.1	97.4	7.0	8.30	46.40
910.080000	109.6	97.3	7.0	-63.20	46.40

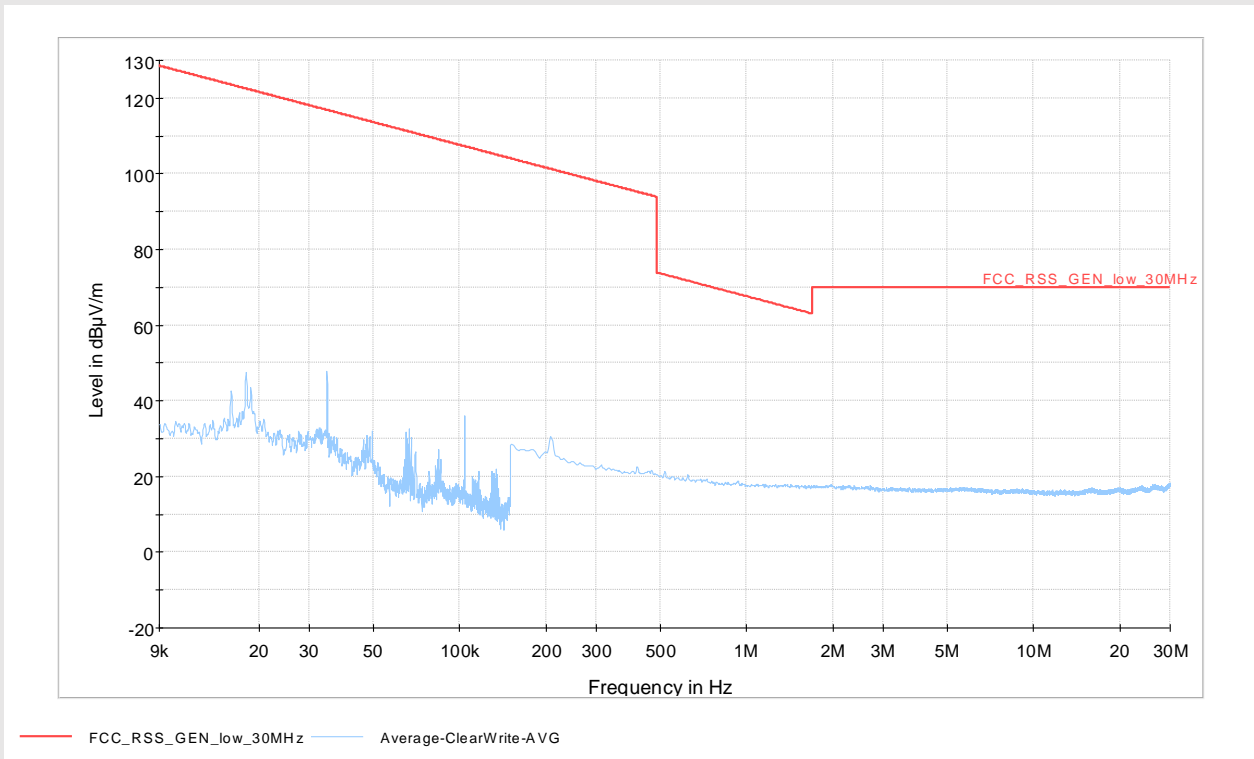
NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DSS

Channel 12

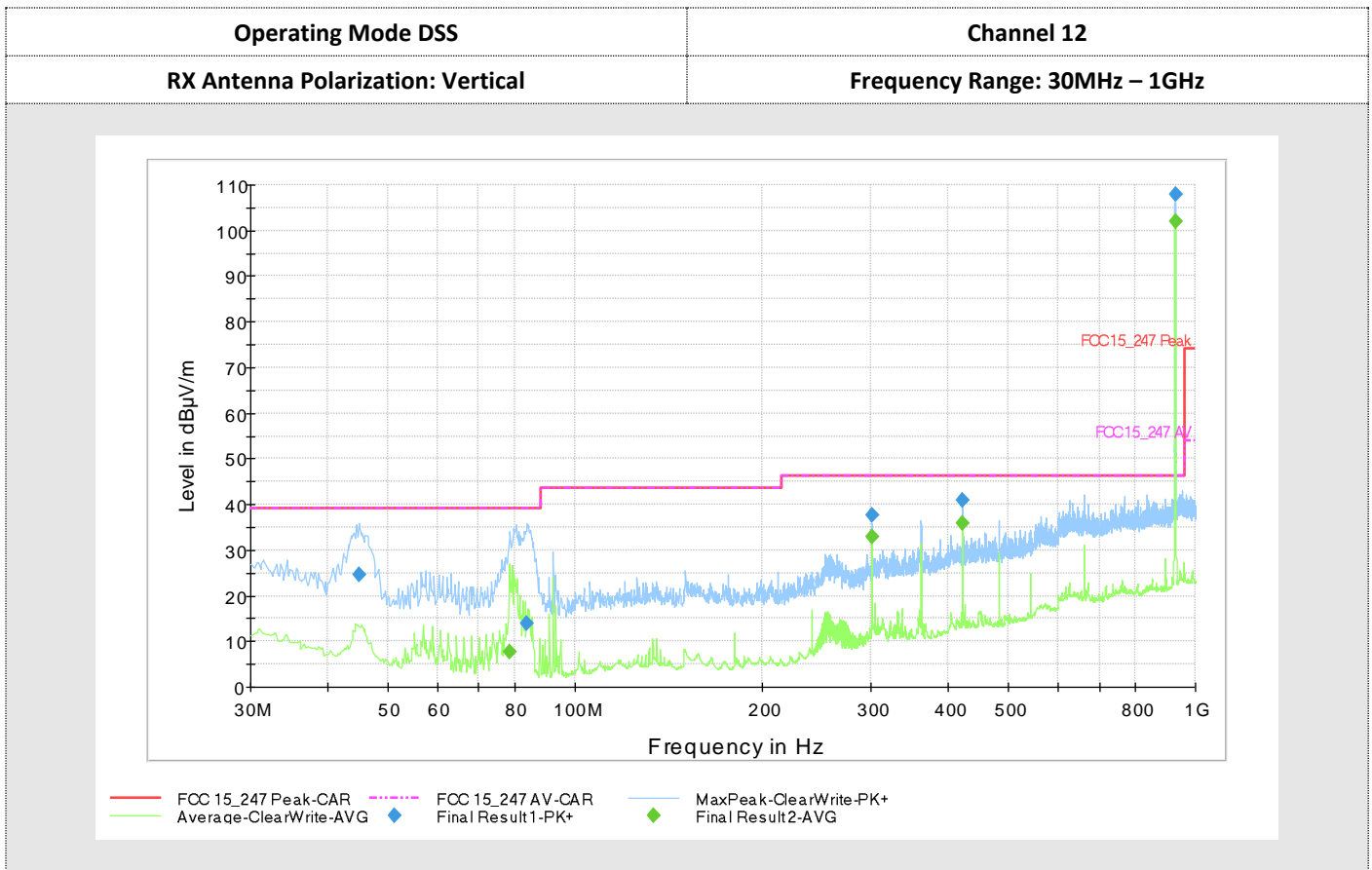
RX Antenna Polarization: ---

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



Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
44.850000	24.7	97.3	7.0	14.30	39.00
83.700000	14.1	116.6	187.0	24.90	39.00
301.230000	37.7	179.5	172.0	8.70	46.40
421.710000	40.9	300.6	172.0	5.50	46.40
927.570000	107.8	142.6	187.0	-61.40	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
78.330000	7.8	179.6	265.0	31.20	39.00
301.230000	32.9	179.5	172.0	13.50	46.40
421.740000	35.9	274.6	172.0	10.50	46.40
927.570000	102.0	143.6	187.0	-55.60	46.40

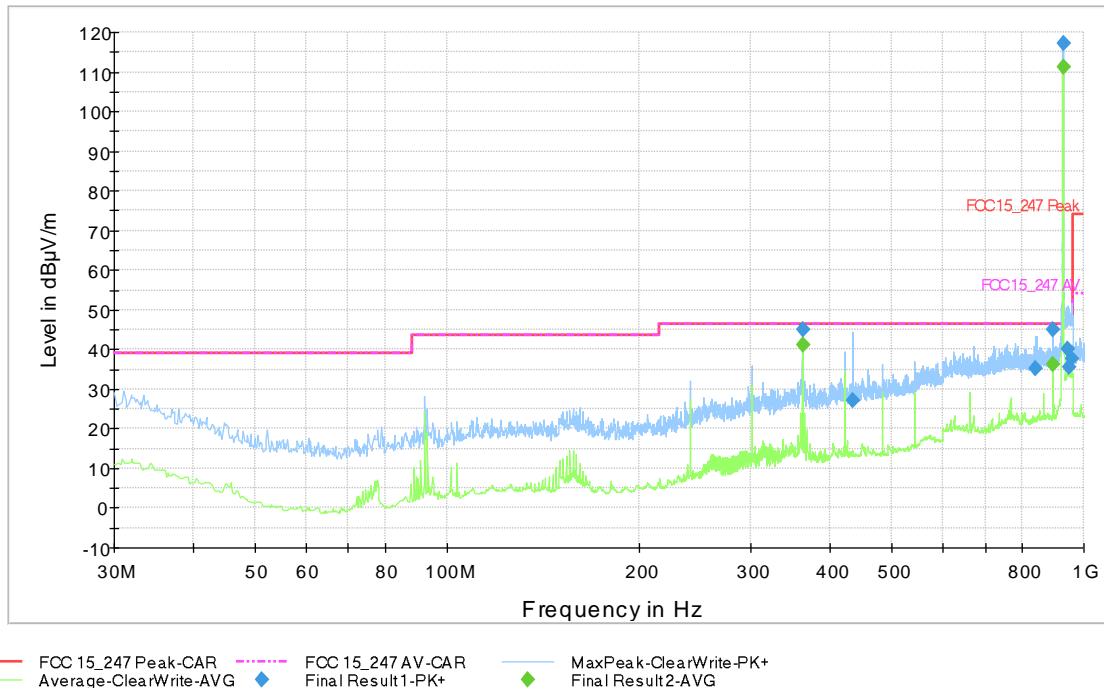
NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DSS

Channel 12

RX Antenna Polarization: Horizontal

Frequency Range: 30MHz – 1GHz



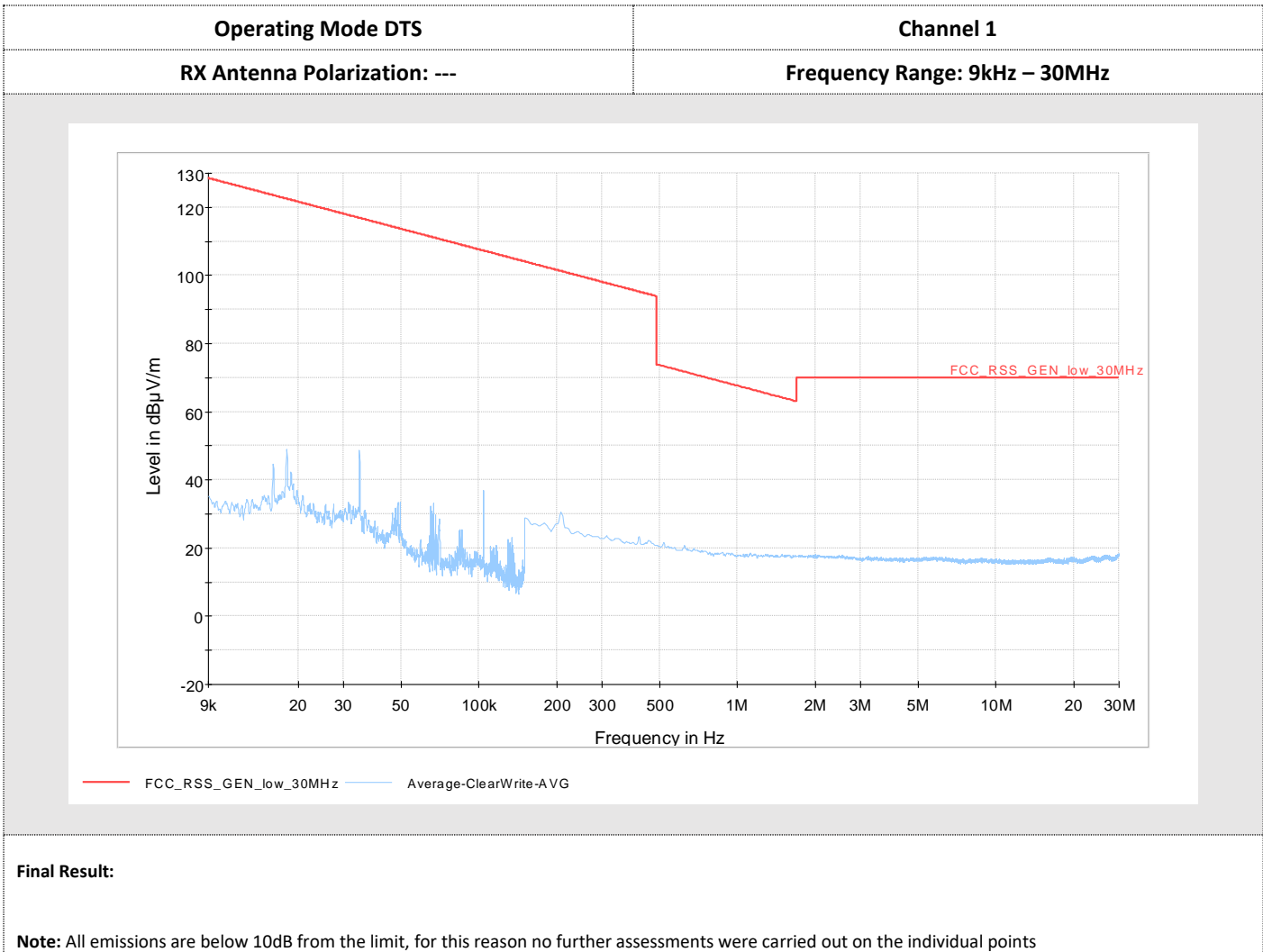
Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.560000	45.1	97.3	277.0	1.30	46.40
433.680000	27.0	227.5	266.0	19.40	46.40
840.930000	35.2	104.7	-6.0	11.20	46.40
895.530000	44.9	97.4	7.0	1.50	46.40
927.570000	117.1	97.3	7.0	-70.70	46.40
942.480000	40.1	97.3	7.0	6.30	46.40
947.430000	35.6	165.7	7.0	10.80	46.40
956.970000	37.8	97.3	7.0	8.60	46.40
361.560000	45.1	97.3	277.0	1.30	46.40
433.680000	27.0	227.5	266.0	19.40	46.40

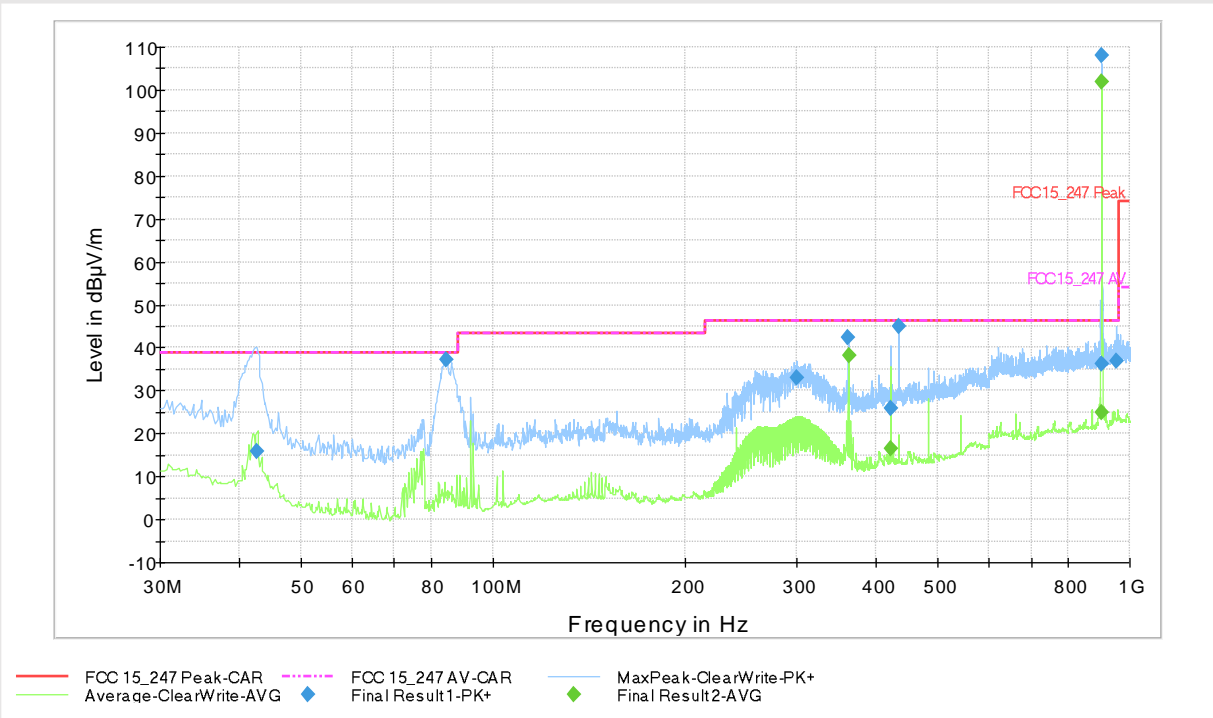
Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.560000	41.1	97.4	277.0	5.30	46.40
895.560000	36.4	97.3	7.0	10.00	46.40
927.570000	111.4	97.4	7.0	-65.00	46.40

NOTE: Peak out of limits is due to Radio carrier.



Operating Mode DTS	Channel 1
RX Antenna Polarization: Vertical	Frequency Range: 30MHz – 1GHz



Final Result Quasi Peak:

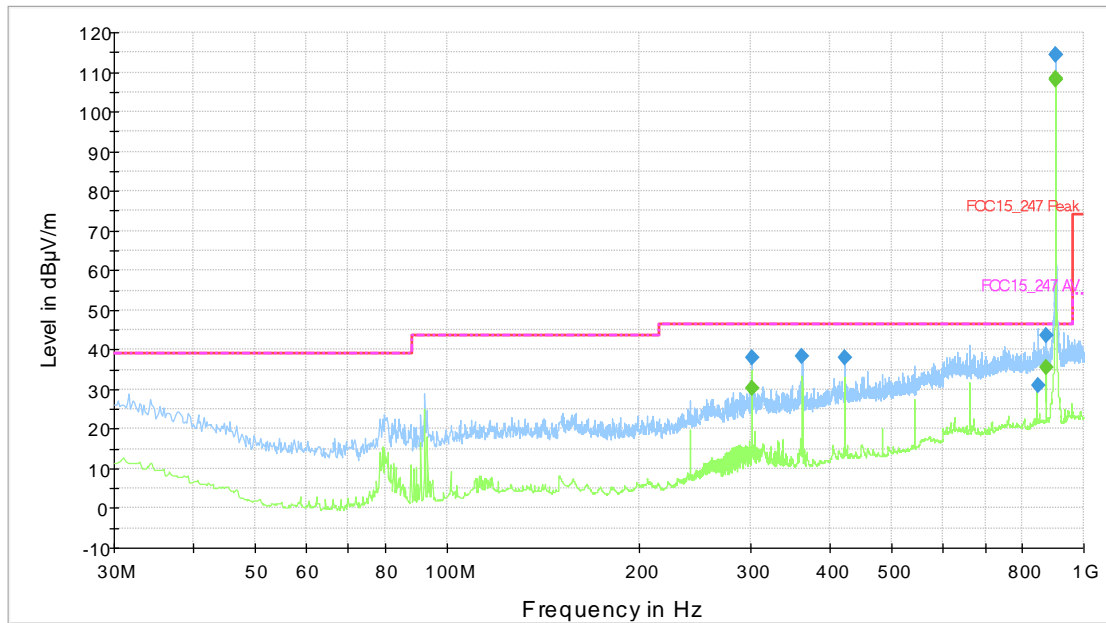
Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
42.510000	16.0	115.7	277.0	23.00	39.00
84.390000	37.3	179.5	97.0	1.70	39.00
299.430000	33.1	97.4	187.0	13.30	46.40
361.500000	42.3	97.3	187.0	4.10	46.40
421.800000	25.9	272.6	187.0	20.50	46.40
434.160000	45.0	274.7	-8.0	1.40	46.40
903.420000	108.2	116.7	187.0	-61.80	46.40
903.870000	36.3	116.6	187.0	10.10	46.40
951.300000	37.1	180.0	277.0	9.40	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.530000	38.1	97.4	180.0	8.30	46.40
421.770000	16.5	179.6	182.0	29.90	46.40
903.390000	101.9	116.7	187.0	-55.50	46.40
903.900000	25.0	115.7	174.0	21.40	46.40

NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DTS	Channel 1
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)
301.290000	38.1	97.4	264.0	8.30	46.40
361.470000	38.2	97.3	97.0	8.20	46.40
421.800000	37.8	97.4	93.0	8.60	46.40
846.240000	31.1	225.5	91.0	15.30	46.40
871.410000	43.5	97.4	7.0	2.90	46.40
903.420000	114.5	97.4	7.0	-68.10	46.40

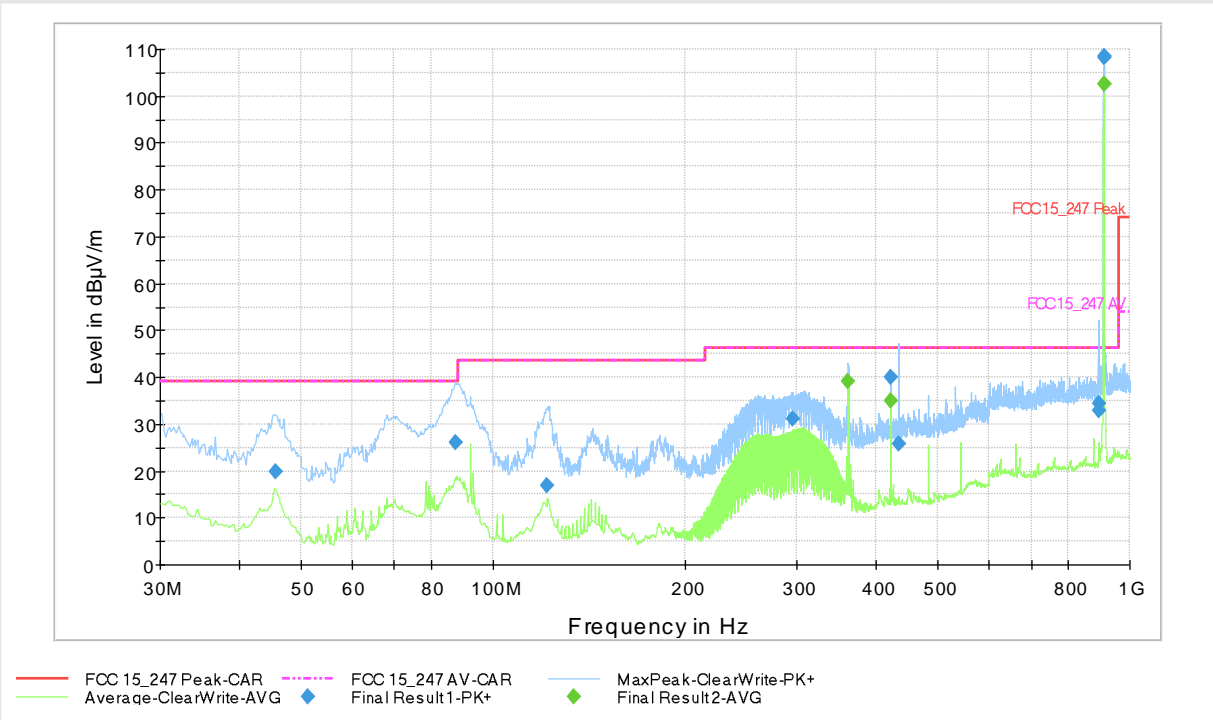
Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
301.320000	30.1	97.7	277.0	16.30	46.40
871.890000	35.7	97.4	7.0	10.70	46.40
903.900000	108.4	97.4	7.0	-62.00	46.40

NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DTS	Channel 8
RX Antenna Polarization: ---	Frequency Range: 9kHz – 30MHz
<p>The graph displays the radio frequency emission levels. The y-axis represents the level in dBµV/m, ranging from -20 to 130. The x-axis represents the frequency in Hz on a logarithmic scale from 9k to 30M. A red line indicates the FCC RSS GEN_low_30MHz limit, which starts at 130 dBµV/m at 9kHz and decreases to approximately 70 dBµV/m at 30MHz. A blue line shows the Average-ClearWrite-AVG measurement, which remains consistently below the limit, starting around 35 dBµV/m at 9kHz and decreasing to about 18 dBµV/m at 30MHz.</p>	
<p>Final Result:</p> <p>Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points</p>	

Operating Mode DTS	Channel 8
RX Antenna Polarization: Vertical	Frequency Range: 30MHz – 1GHz



Final Result Quasi Peak:

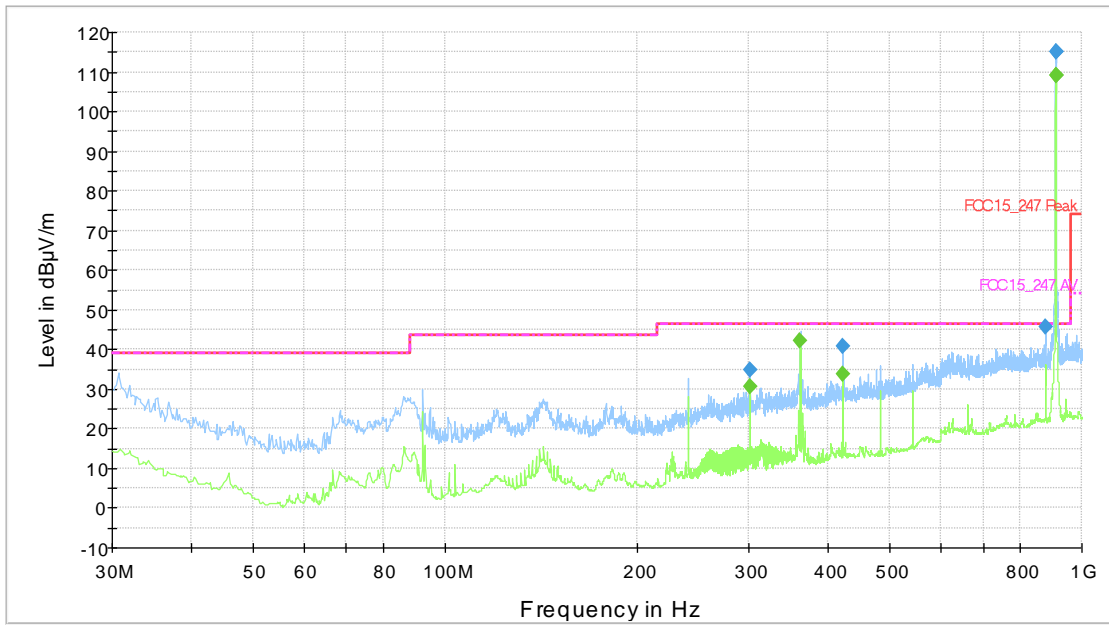
Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
45.630000	20.0	139.6	277.0	19.00	39.00
87.240000	26.2	97.3	97.0	12.80	39.00
121.500000	16.8	179.8	187.0	26.70	43.50
295.260000	31.1	115.7	187.0	15.30	46.40
421.740000	39.9	329.9	175.0	6.50	46.40
433.920000	25.7	179.6	181.0	20.70	46.40
892.470000	33.0	117.6	277.0	13.40	46.40
893.340000	34.5	97.4	265.0	11.90	46.40
909.780000	108.6	116.6	84.0	-62.20	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.500000	39.1	104.8	180.0	7.30	46.40
421.740000	35.0	279.5	172.0	11.40	46.40
909.750000	102.5	118.7	84.0	-56.10	46.40

NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DTS	Channel 8
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)
301.290000	35.0	115.7	266.0	11.40	46.40
421.800000	40.9	97.3	270.0	5.50	46.40
878.220000	45.8	104.6	-5.0	0.60	46.40
909.780000	115.2	97.4	-5.0	-68.80	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
361.560000	38.7	104.7	187.0	7.70	46.40
877.920000	38.1	97.4	7.0	8.30	46.40
910.080000	109.6	97.3	7.0	-63.20	46.40

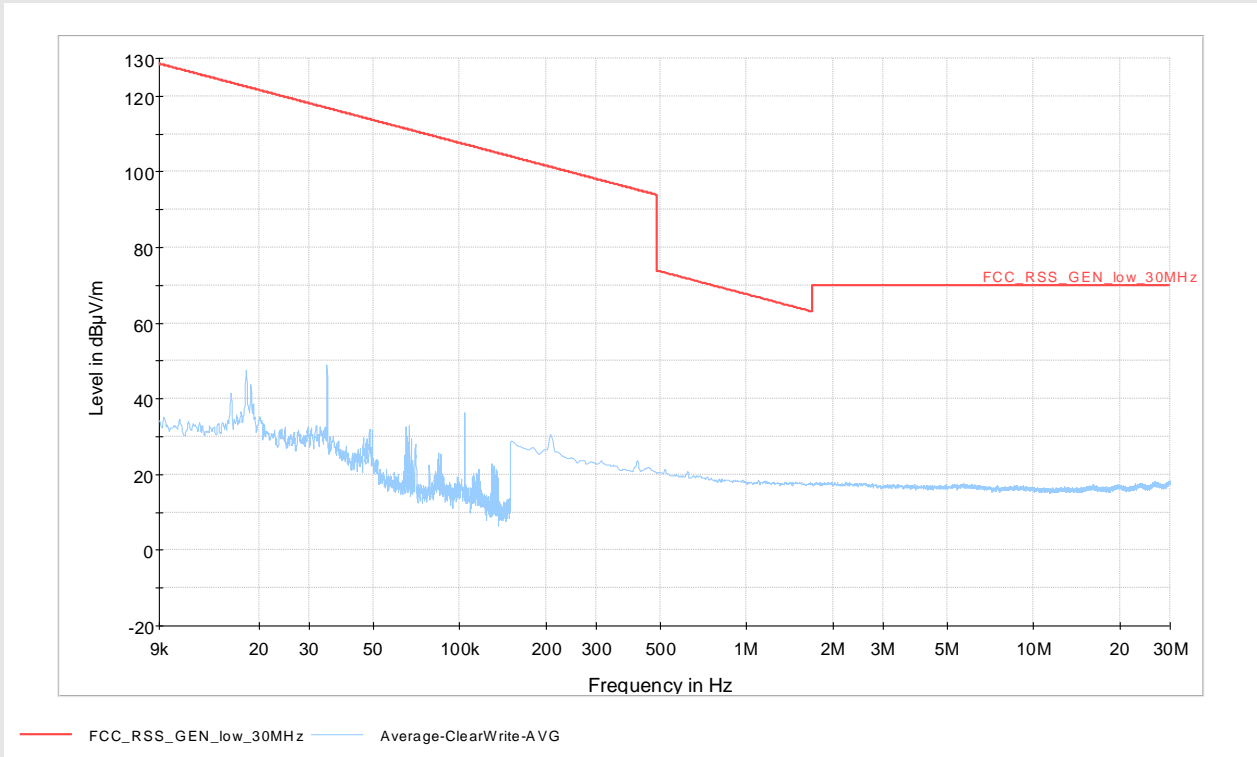
NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DTS

Channel 25

RX Antenna Polarization: ---

Frequency Range: 9kHz – 30MHz



Final Result:

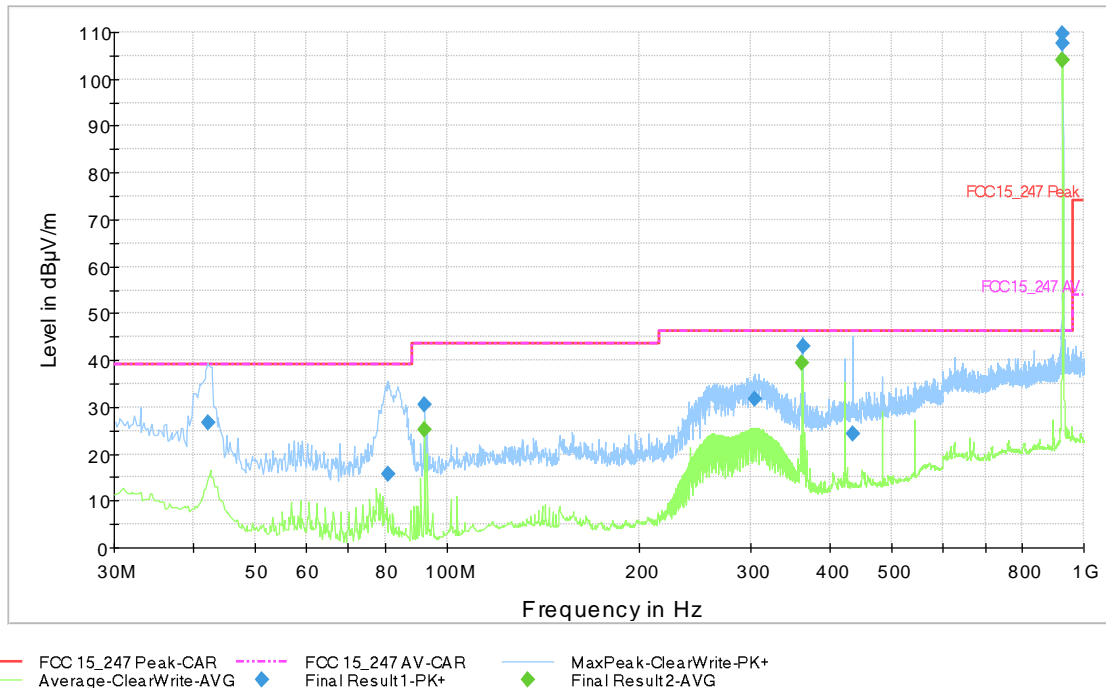
Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

Operating Mode DTS

Channel 25

RX Antenna Polarization: Vertical

Frequency Range: 30MHz – 1GHz



Final Result Quasi Peak:

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
42.210000	26.5	97.3	-4.0	12.50	39.00
80.670000	15.9	97.3	84.0	23.10	39.00
92.160000	30.4	303.7	92.0	13.10	43.50
304.350000	31.9	97.4	187.0	14.50	46.40
361.530000	43.0	97.3	174.0	3.40	46.40
433.680000	24.5	249.5	83.0	22.00	46.40
926.700000	109.8	115.6	92.0	-63.40	46.40
927.150000	107.6	140.6	93.0	-61.20	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
92.190000	25.3	276.7	92.0	18.20	43.50
361.470000	39.4	97.3	174.0	7.00	46.40
926.700000	104.0	118.6	86.0	-57.60	46.40
927.180000	104.1	115.6	91.0	-57.70	46.40

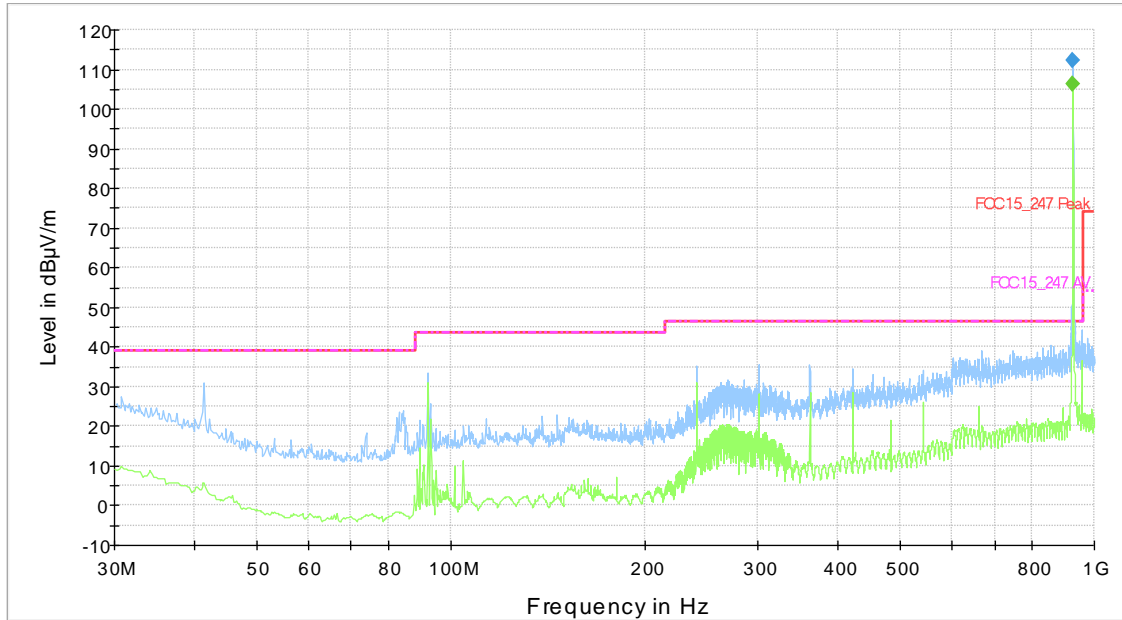
NOTE: Peak out of limits is due to Radio carrier.

Operating Mode DTS

Channel 25

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)
927.150000	112.4	97.4	7.0	-66.00	46.40

Final Result Average:

Frequency (MHz)	Average (dBµV/m)	Height (cm)	Azimuth (deg)	Margin (dB)	Limit (dBµV/m)
926.700000	106.2	97.3	277.0	-59.80	46.40

NOTE: Peak out of limits is due to Radio carrier.

TEST 2.

TRANSMITTER RADIATED EMISSIONS > 1GHZ

REFERENCE DOCUMENT

According to § 15.247 (d) and § 15.209 (a)

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	02/2021	02/2022
	Horn antenna	Electro Metrics	EM-6961	100437	10/2020	10/2023
	High pass filter	Wainwright	WHK 1,3/15G	9	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 – 10GHz = 5,15 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
Voltage		3.3Vdc from board

OPERATING CONDITION: #1

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER 1GHz - 10GHz

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

TEST DESCRIPTION

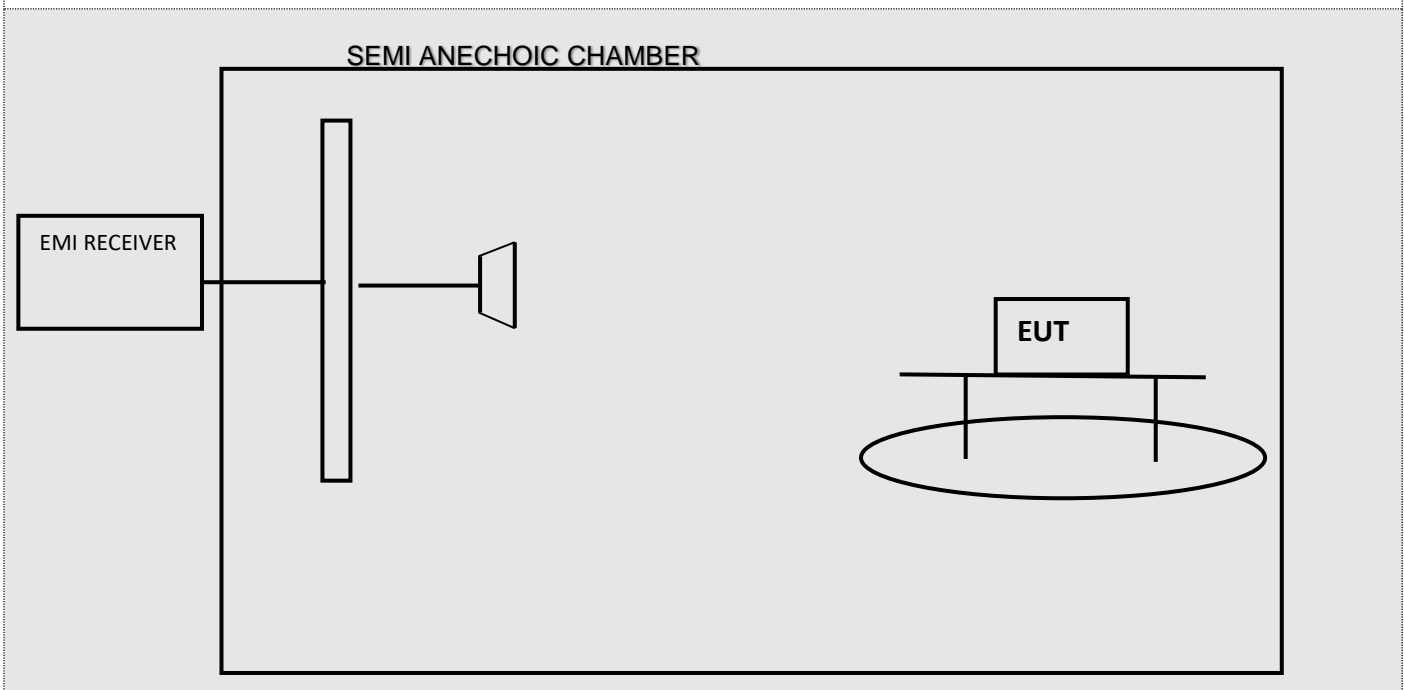
Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously - rotating, remotely - controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

The EUT is placed at test table height is 1.5 m

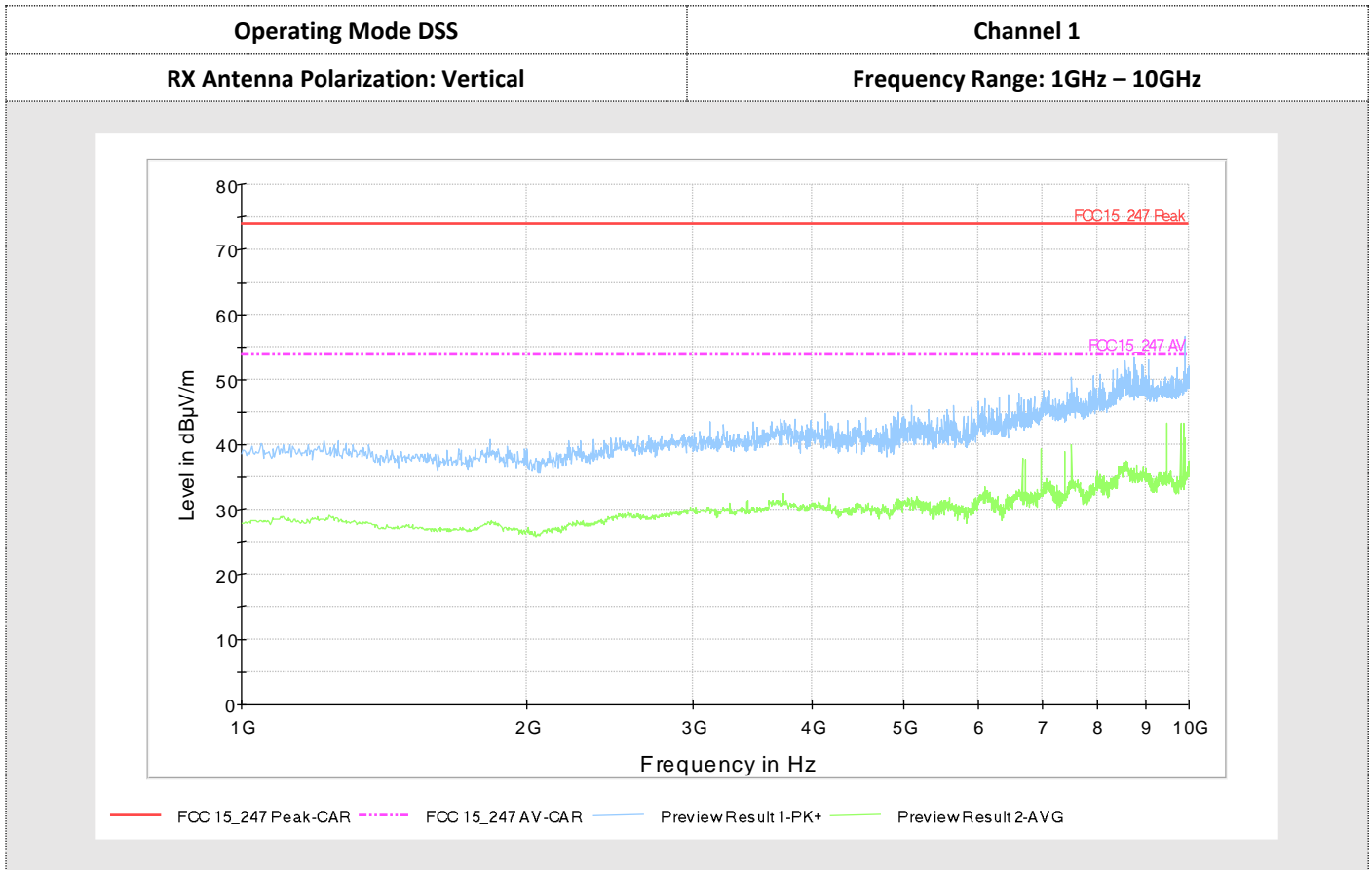
Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m~4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3m.

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

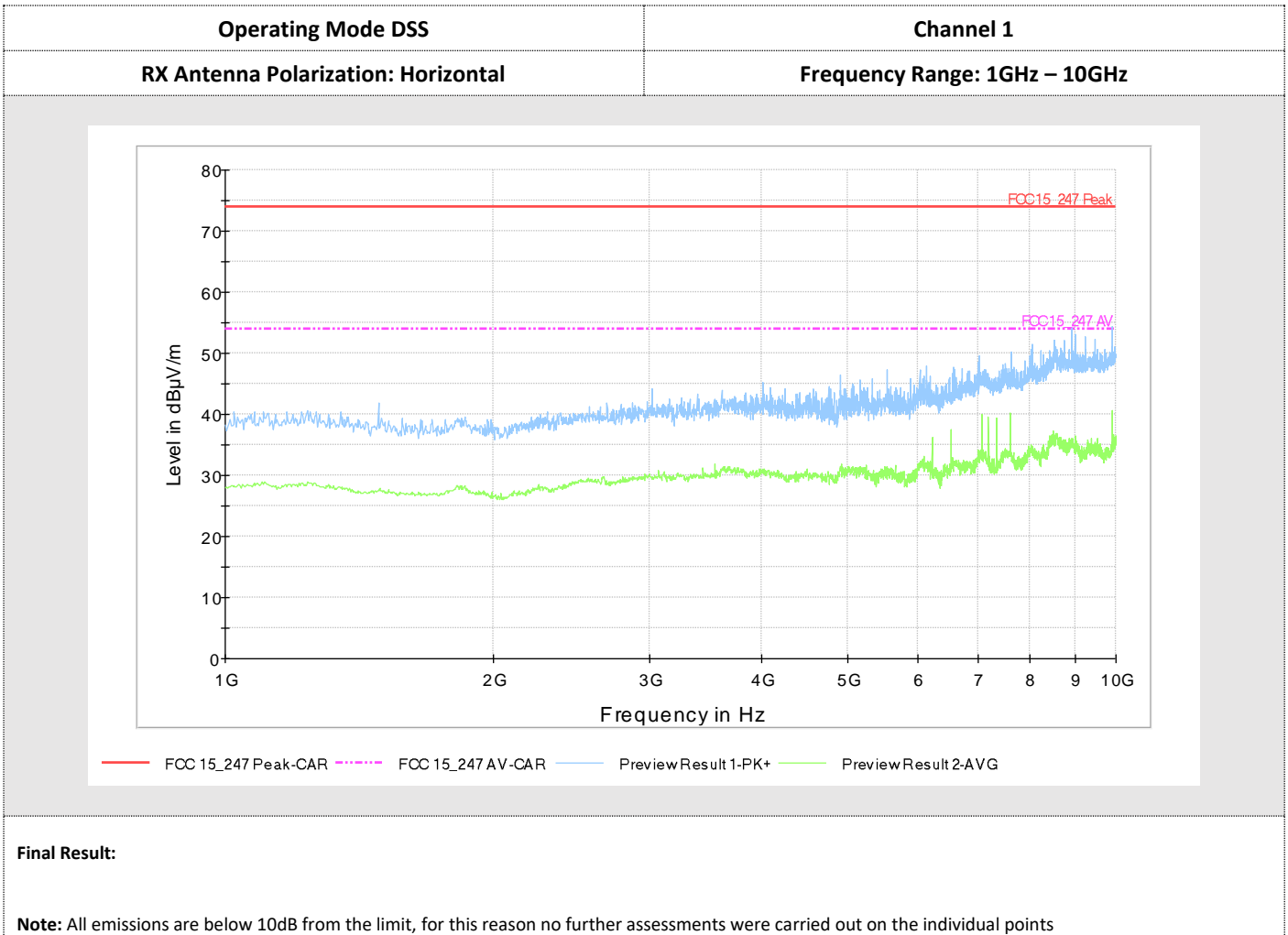


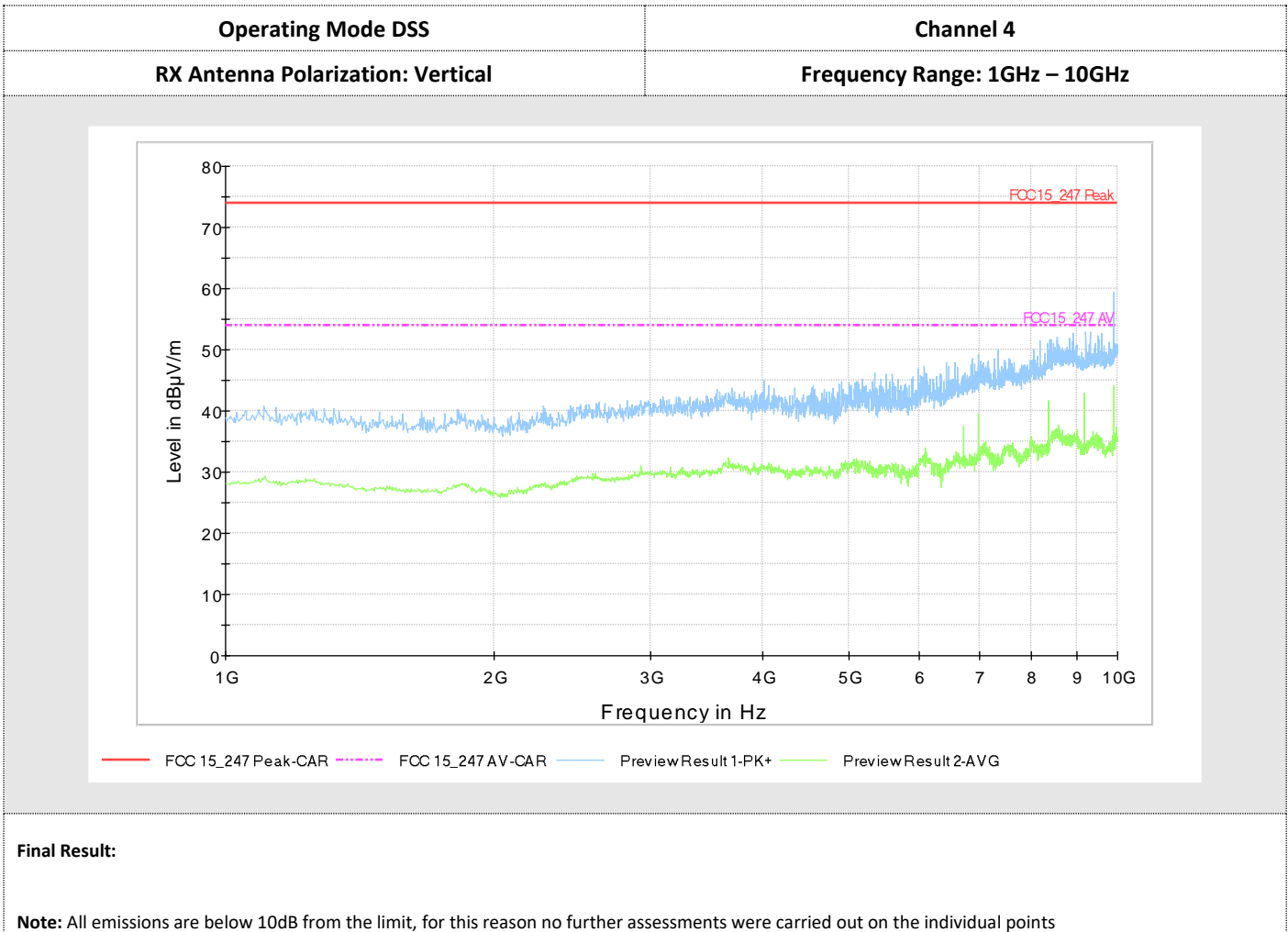
TEST RESULTS

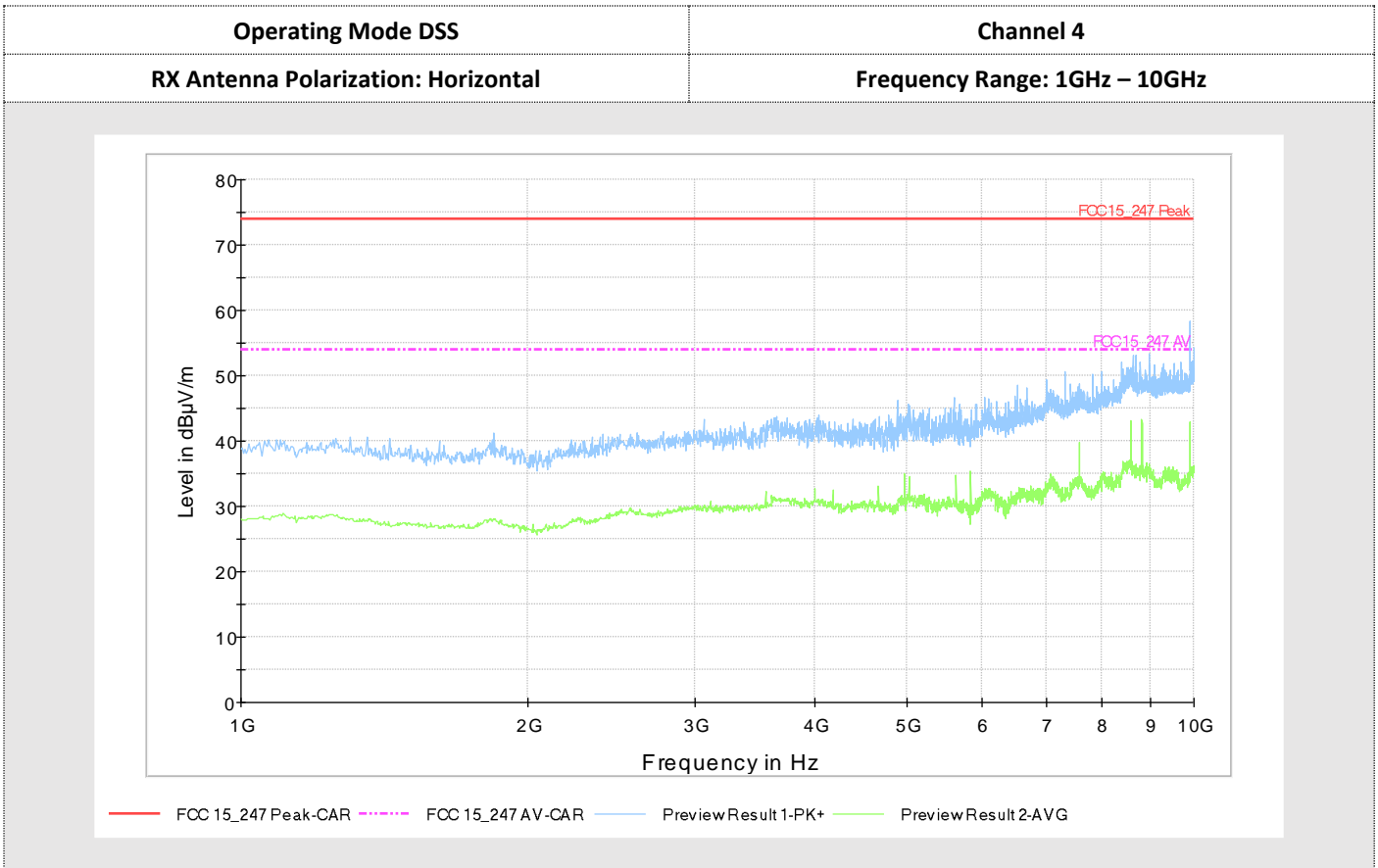


Final Result:

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

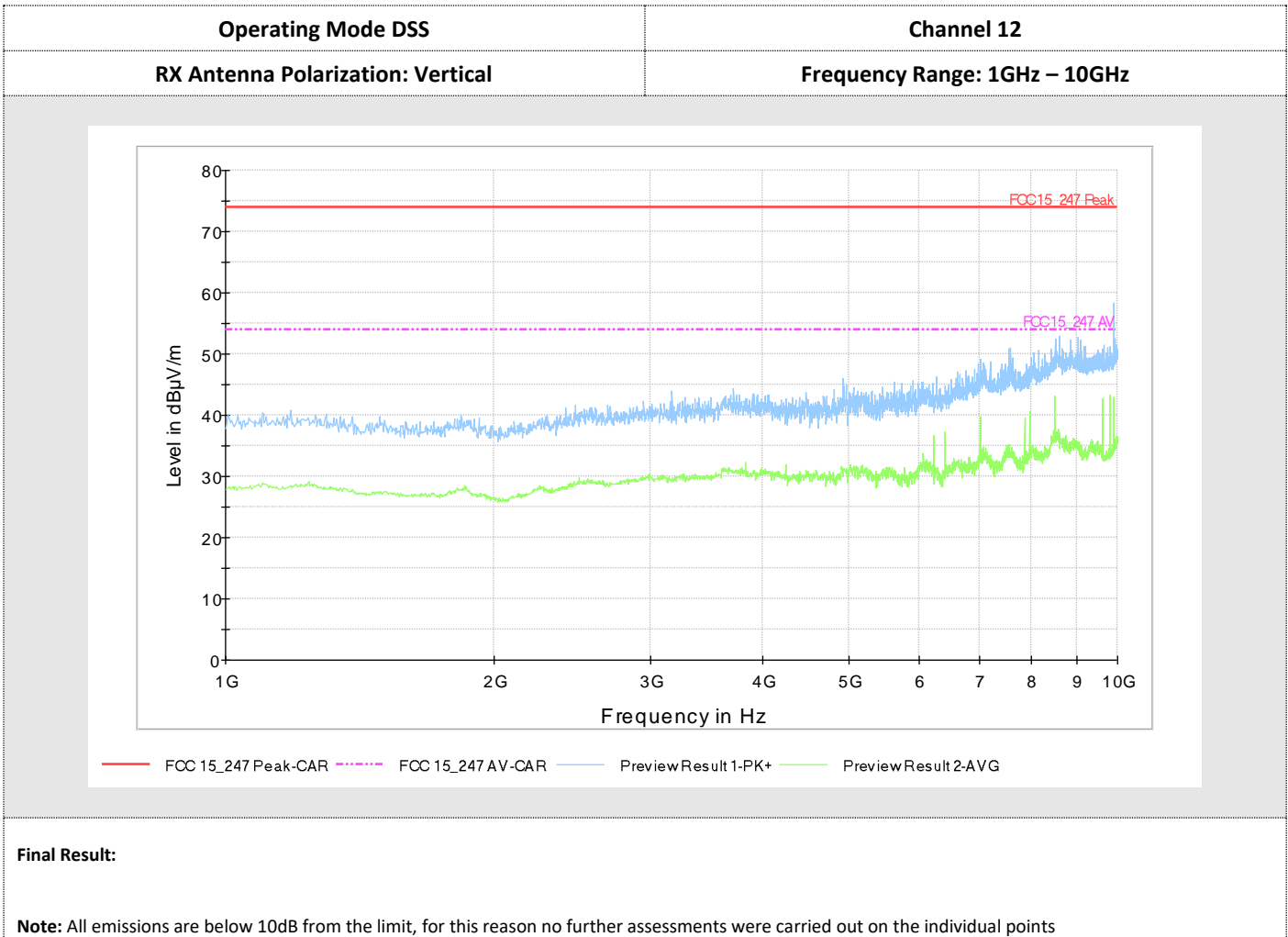


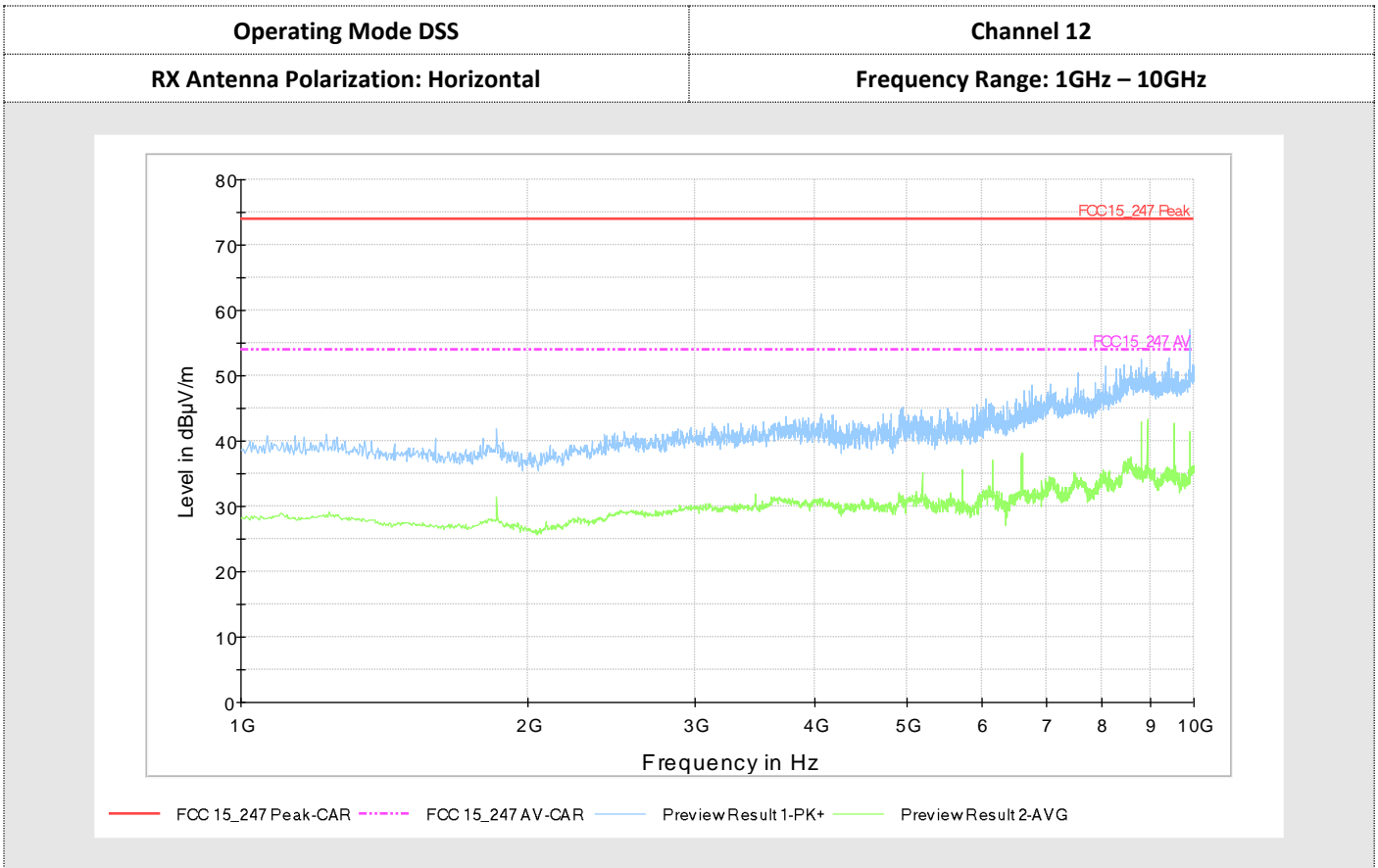




Final Result:

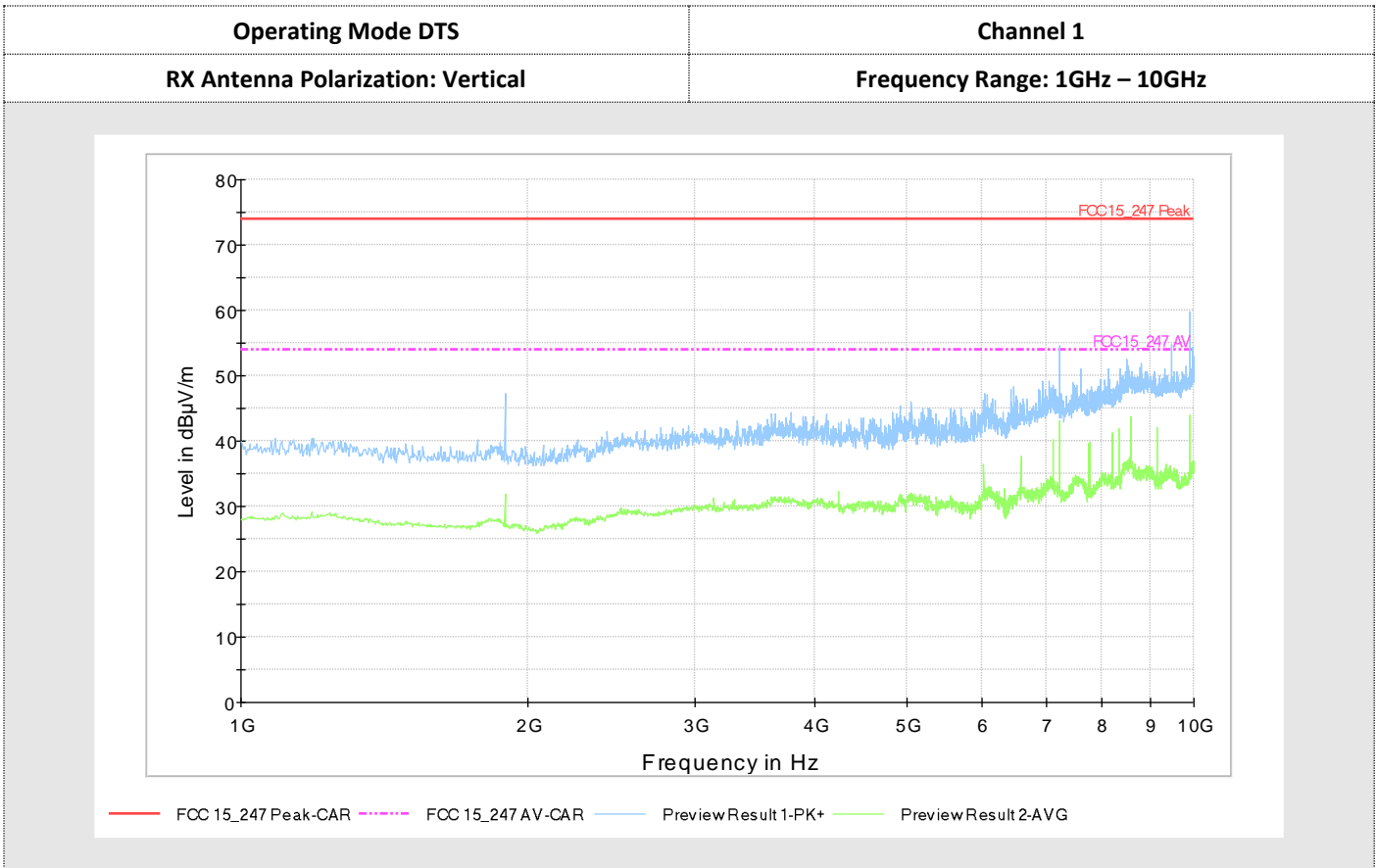
Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points





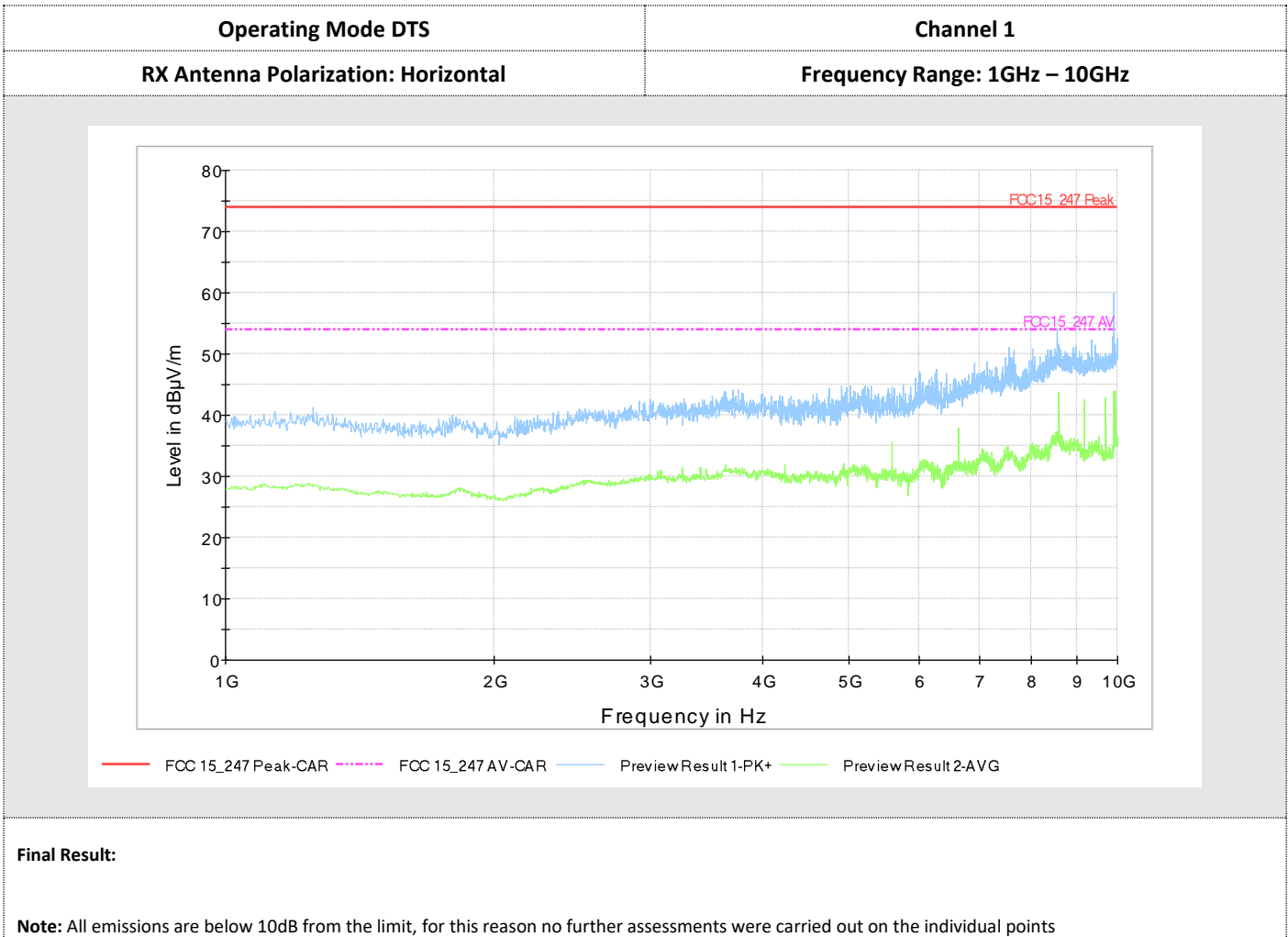
Final Result:

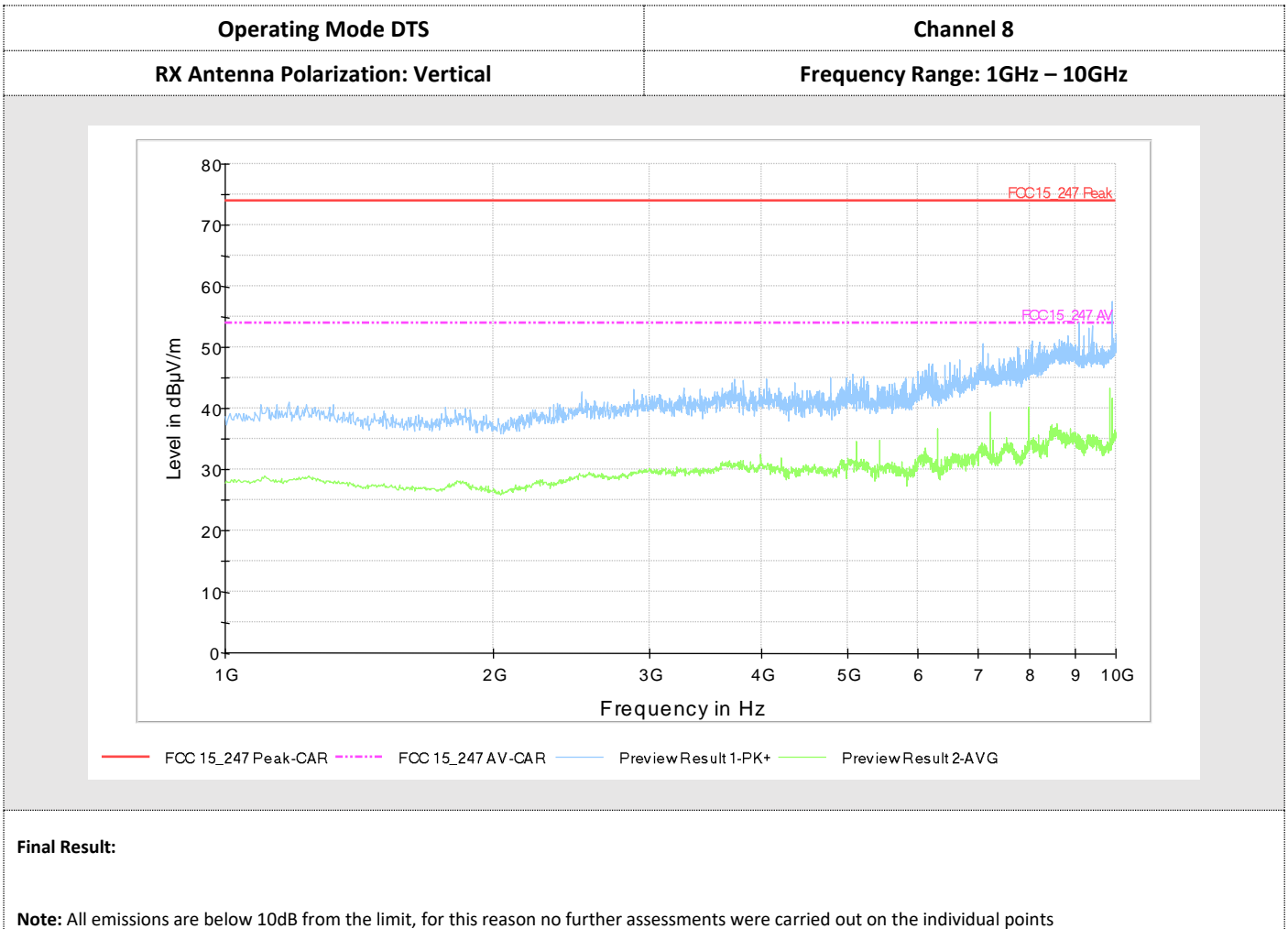
Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points

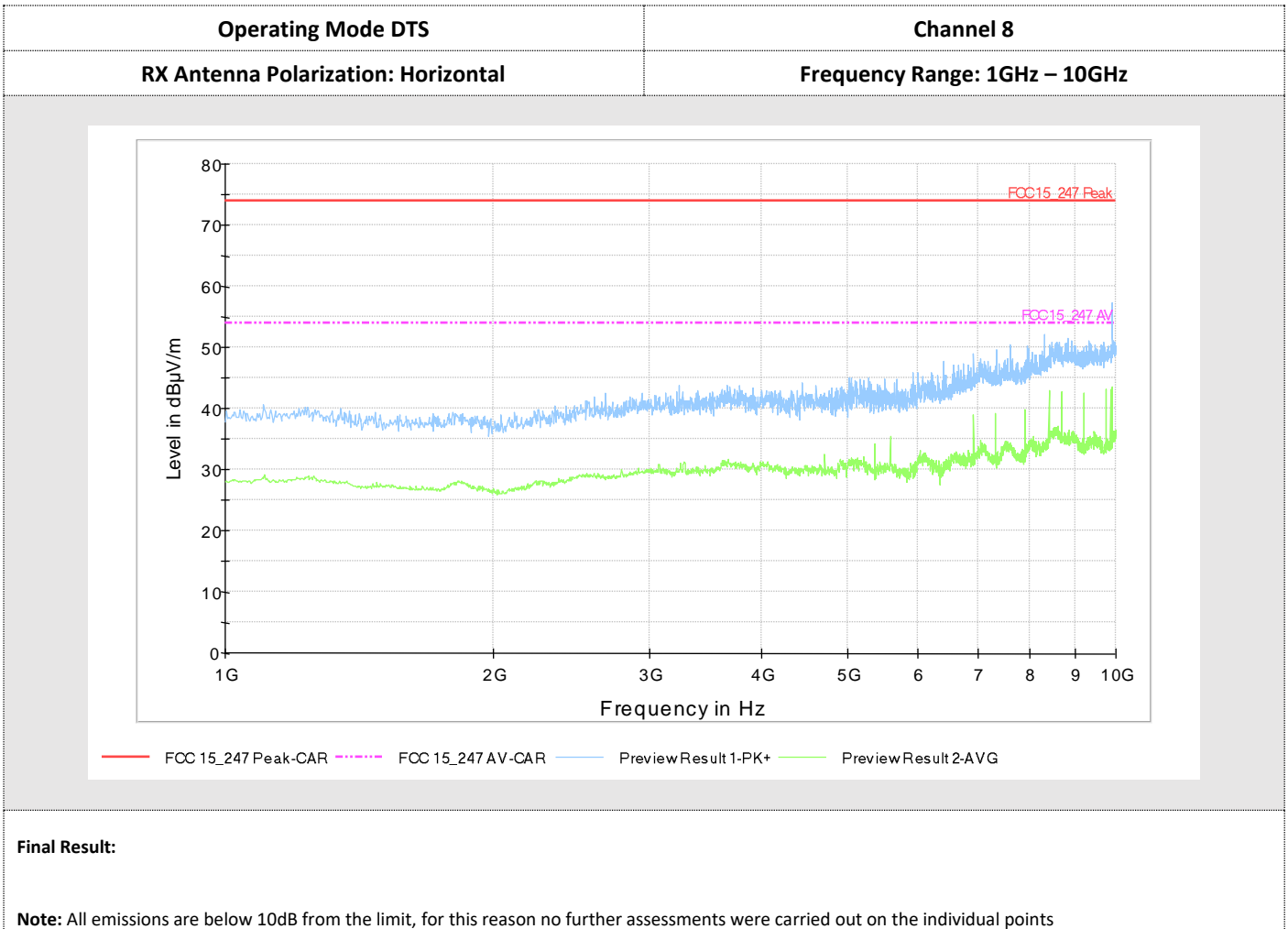


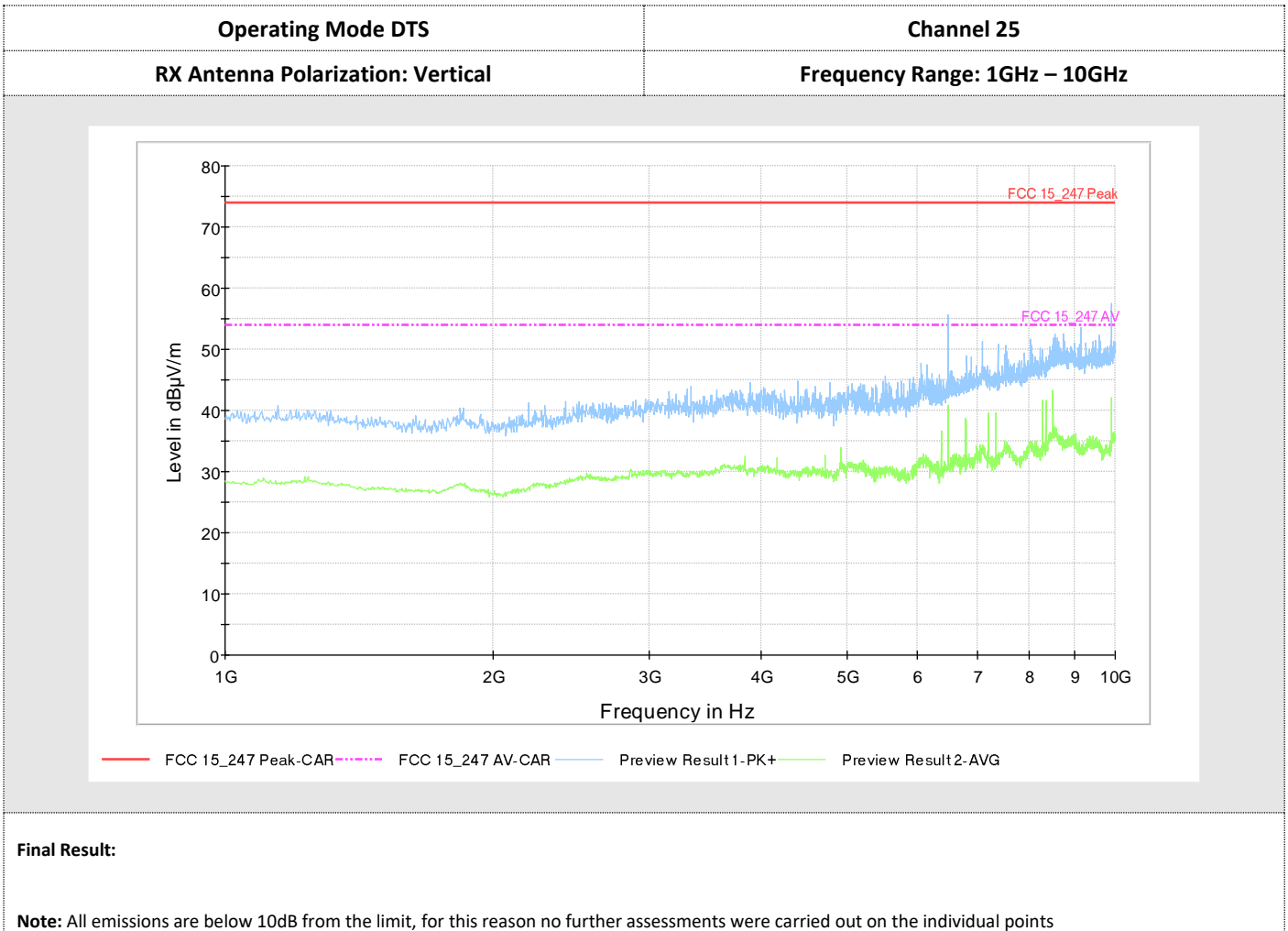
Final Result:

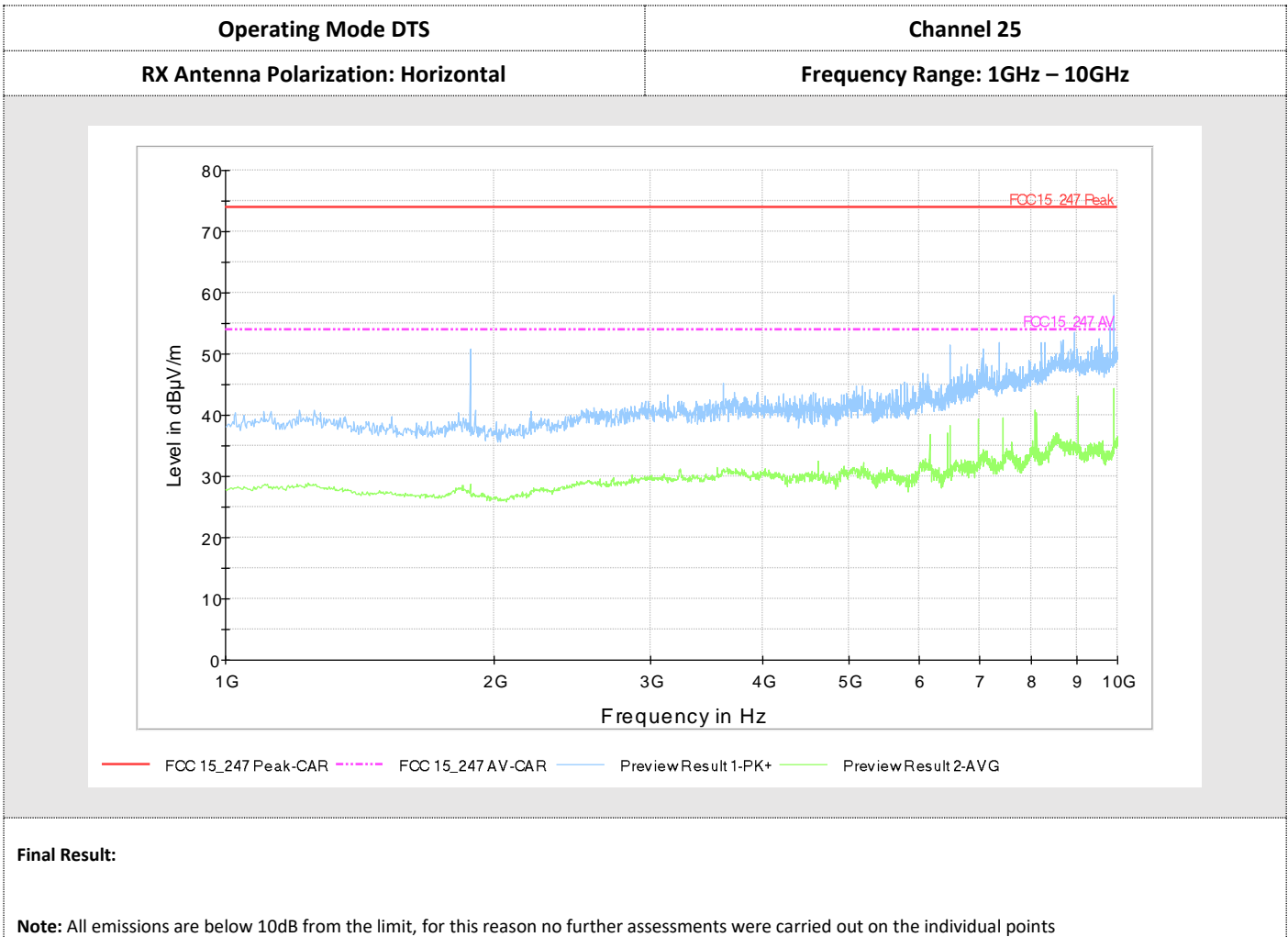
Note: All emissions are below 10dB from the limit, for this reason no further assessments were carried out on the individual points











TEST 3.

BAND-EDGE

REFERENCE DOCUMENT

According to § 15.247 (d) and § 15.209 (a)

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 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 7.8.6 (for DSS) ANSI C63.10:2013 section 6.10 (for DTS)					

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

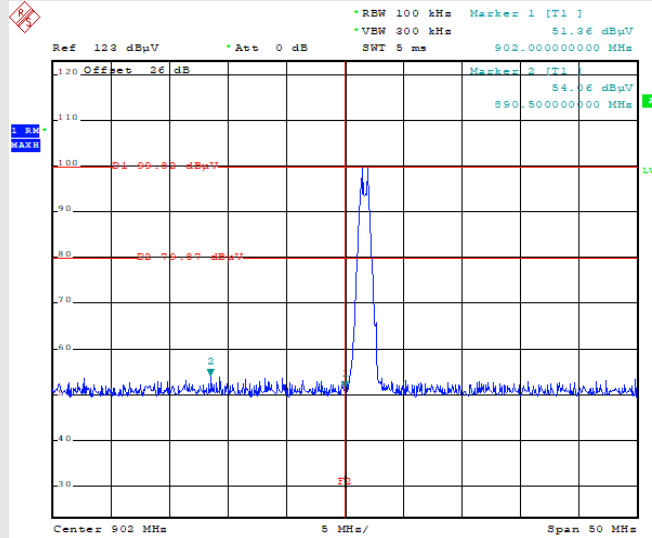
RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER	
Resolution bandwidth	100kHz
Video bandwidth	300kHz
Span	50MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

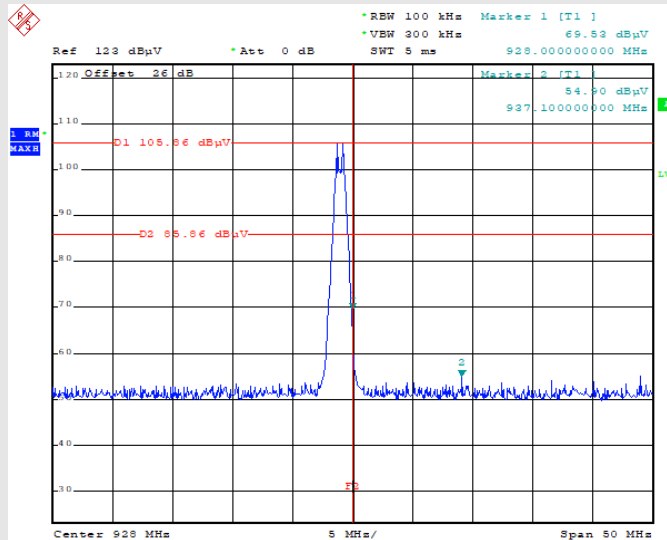
MEASUREMENT RESULT

Operating Mode DTS

**LOWER BAND-EDGE
CH 1**

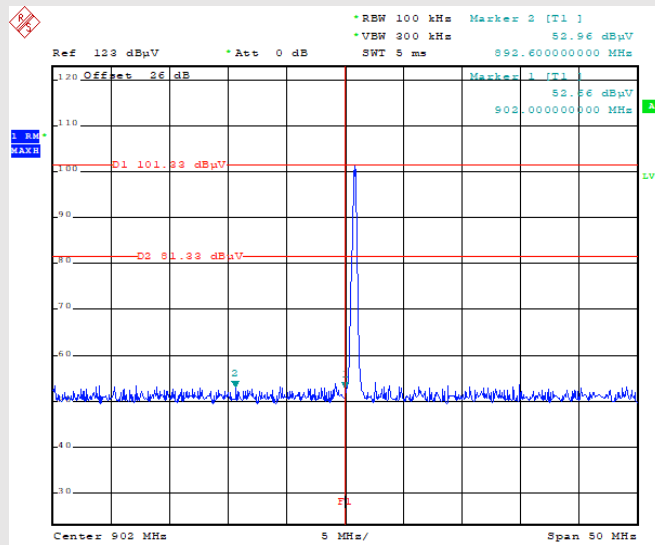


**UPPER BAND-EDGE
CH 25**

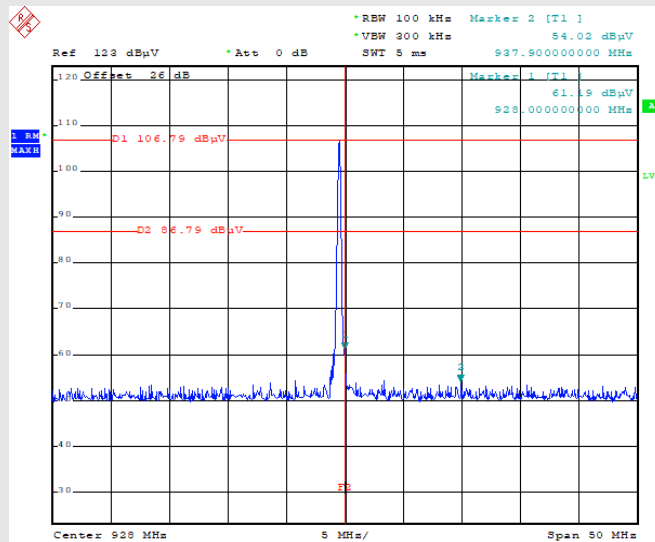


Operating Mode DSS

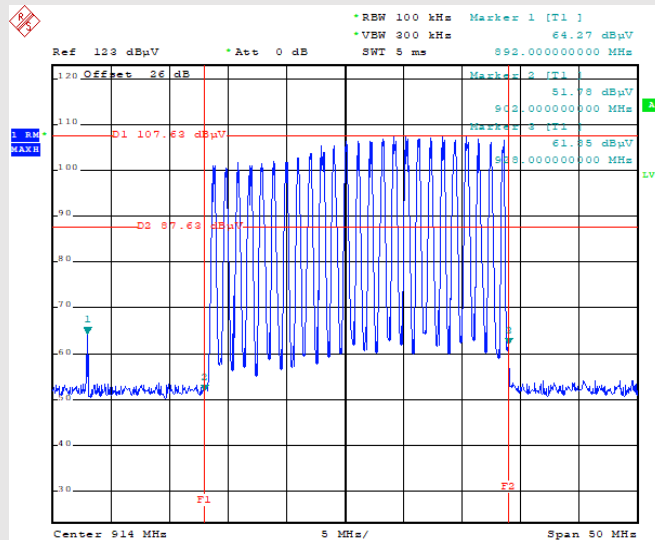
**LOWER BAND-EDGE
CH 1**



**UPPER BAND-EDGE
CH 12**



HOPPING BAND-EDGE



END OF TEST REPORT