

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	FCCTR_178784-1	Data / Date:	27/01/2021	Pagine / Pages:	125
Scopo delle prove Test object	Prove di tipo in accordo alla Norma Type test according to standards 47 CFR FCC part 15.247				
Richiedente Applicant	Paradox Engineering SA Via Passeggiata 7 – 6883 Novazzano – CH Tel.: +41912330100				
Marchio commerciale Trade mark					
Fabbricante Manufacturer	MinabeaMitsumi Inc. 3-9-6 Mita, Minato-ku, Tokyo 108-8330 Tel.: 81-3-6758-6711				
Prodotto Product	PE IoT Engine - Sub 1-GHz IPv6/6LoWPAN communication module, radio module				
Modello testato Testing model	NDWM005 US (PRD-CMD-0002)				
Identificativo FCC FCC ID	2AKPQNDWM005				
Data ricevimento campioni Date of test samples receipt	02/11/2020				
Campioni verificati No. of tested samples	2 – Sampled by the manufacturer				
Data verifiche Testing date	From 02/11/2020 to 30/11/2020				
Sito di prova Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
Esito delle valutazioni Assessment results	CONFORME / COMPLIANT				
Verifiche effettuate da Verifications carried out by	Daniele AOSANI Tecnico laboratorio EMC & RADIO EMC & RADIO Test Engineer				
Approvato Approved by	Riccardo PFEIFFER Responsabile laboratori EMC & RADIO EMC & RADIO Laboratory manager				

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

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

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

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

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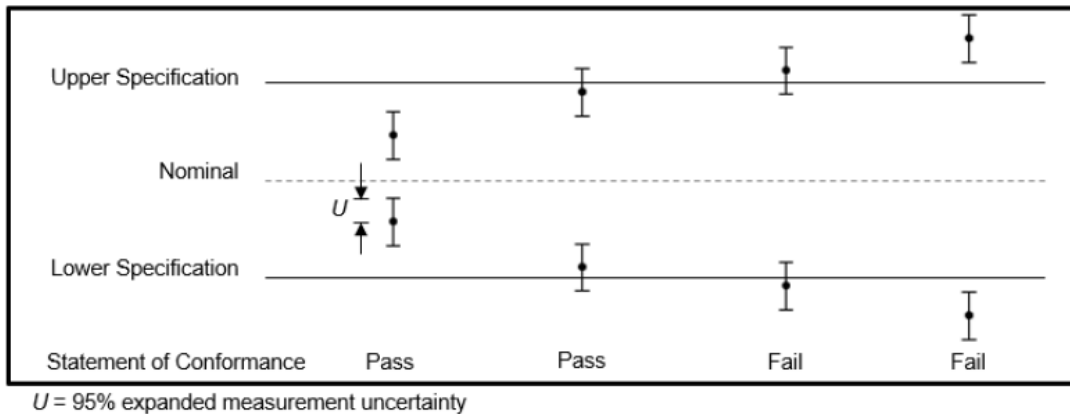
0. RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_178784-0	Original release	21/12/2020
FCCTR_178784-1	Add some information in section 3. General Remarks Corrected some typo errors	27/01/2021

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

1. DECISION RULE

PRSLAB, for declaration of conformity related to measurement result, use a simple binary statement ($w=0$), as indicated in the document ILAC-G8-09:2019



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, $AL=TL$.

2. INFORMATION PROVIDED BY CUSTOMER

- None

3. GENERAL REMARKS




The device has been provided with a plastic enclosure without any shielding in the way to stabilize EUT test board and to fix antennas during radiated tests. This test setup has any impact on the tests and is equivalent than the one with the board stand-alone.

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	PE IoT Engine - Sub 1-GHz IPv6/6LoWPAN communication module, radio module
MODEL NAME	NDWM005 US (PRD-CMD-0002)
SN	Prototype
PRSLAB INTERNAL REFERENCE	BC 313/2020 1/5 BC 313/2020 2/5
TRADEMARK	 <i>Passion to Create Value through Difference</i>
MANUFACTURER	MinebeaMitsumi Inc.
COUNTRY OF MANUFACTURER	Japan
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	DC power USB port
SUPPLY VOLTAGE	From 2 Vdc (Low Power Mode) to 5 Vdc
MAX POWER or MAX ABSORBED CURRENT	31 mA
HW VERSION	ELB-PED-0146-07
SW VERSION	FW 3.14.0 PHY 1.3.11 NET 1.1.10 RADIO TEST 1.1.6 SPIRIT2 1.2.0
OPERATING TEMPERATURE	-40°C ~ +70°C
DIMENSIONS	47x37x14 mm (LxWxH)
EUT STANDING	---

4.1 Radio module technical data

CHIP MANUFACTURER		
CHIP MODEL	S2-LPQTR	
RADIO CATEGORY	Short Range Device	
WORKING FREQUENCY BAND	902.42 – 927.58MHz	
CHANNELS	75	
CHANNEL SPACING	340kHz	
TRANSFER RATE	100kbps	
TYPE OF MODULATION	GFSK	
SENSITIVITY	-104dBm	
ANTENNA TYPE	External dipole antenna	Patch antenna
ANTENNA MODEL	ANT-916-CW-HW	2067640100
ANTENNA GAIN	1.2dBi	1.2dBi
ANTENNA MANUFACTURER		

4.2 Ports identification

PORT	DESCRIPTION	CONNECTION	NOTES
<input checked="" type="checkbox"/>	Enclosure	PCB board	---
<input type="checkbox"/>	AC Power input	Port not present	---
<input checked="" type="checkbox"/>	DC Power input	3.6V (declared by manufacturer)	Cable
<input checked="" type="checkbox"/>	Signal / Control port	USB port	<3mt
<input type="checkbox"/>	Telecomm.port	Port not present	---
<input checked="" type="checkbox"/>	Antenna port	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.

4.3 Modifications incorporated in E.U.T.

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

- None

4.4 Auxiliary equipment

- Personal computer model AH532, manufacturer by Fujitsu, with software Radio Tester 1.12.3, to set channels.
Special Test Software: Special software by the Applicant to operate the EUT at each channel frequency continuously. For example, the transmitter will be operated at each of the lowest, middle and highest frequencies individually continuously during testing.
- Variable AC/DC Power Supply model APS 1000, manufacturer ANSMANN, used to perform Conducted Emission.

5. OPERATING MODES AND TEST CONDITIONS

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

OPERATING CONDITION	DESCRIPTION
#1	EUT in the follow configuration: <ul style="list-style-type: none"> - Powered at 3.6Vdc with patch antenna, type 2067640100. - Continuous transmission, pseudorandom modulated carrier
#2	EUT in the follow configuration: <ul style="list-style-type: none"> - Powered at 5Vdc with patch antenna, type 2067640100. - Continuous transmission, pseudorandom modulated carrier
#3	EUT in the follow configuration: <ul style="list-style-type: none"> - Powered at 3.6Vdc with external dipole antenna, type ANT-916-CW-HW. - Continuous transmission, pseudorandom modulated carrier
#4	EUT in the follow configuration: <ul style="list-style-type: none"> - Powered at 5Vdc with external dipole antenna, type ANT-916-CW-HW. - Continuous transmission, pseudorandom modulated carrier
#5	Continuous transmission, pseudorandom modulated, Hopping mode, without antenna <ul style="list-style-type: none"> - Powered at 3.6Vdc
#6	Continuous transmission, pseudorandom modulated, Hopping mode, without antenna <ul style="list-style-type: none"> - Powered at 5Vdc

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

Special Hardware Used: None

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

6. REFERENCE STANDARDS

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

7. SUMMARY OF TEST RESULTS

EUT PORT	DESCRIPTION OF PHENOMENA	BASIC STANDARD	OPERATING CONDITION	RESULTS
Enclosure	Radiated Emissions	FCC Part 15 §15.205 §15.209 §15.247 (d)	#1, #2, #3, #4	Within the limits
Antenna port	Antenna requirement	FCC Part 15 §15.203	---	Compliant
	Maximum Peak Output Power	FCC Part 15 §15.247 (b) (3)	#5, #6	Within the limits
	20 dB Bandwidth 99% BW	FCC Part 15 §15.247 (a) (2)	#5, #6	Within the limits
	Band-Edge	FCC Part 15 § 15.247 (d)	#5, #6	Within the limits
	Number of Hopping Frequency	FCC Part 15 § 15.247 (d)	#5, #6	Within the limits
	Channel Separation	FCC Part 15 § 15.247 (d)	#5, #6	Within the limits
	Number of Dwell Time	FCC Part 15 § 15.247 (d)	#5, #6	Within the limits
	Conducted Emissions 9kHz ÷ 10 th Harmonic	FCC Part 15 § 15.247 (d)	#5, #6	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.

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

9. LIST OF INSTRUMENTS USED

Instrument	Manufacturer	Model	Serial n°	Calibrated on	Due to
MXE Emi Receiver	Keysight	N9038A	MY57290150	06/2020	06/2021
RF signal generator	Rohde & Schwarz	SMP04	825007/005	04/2020	04/2022
Bi-log antenna	Chase	CBL6111C	2717	03/2019	03/2022
Bi-log antenna	Chase	CBL6111A	1533	06/2020	06/2023
Horn antenna	Electro Metrics	EM-6961	100437	10/2020	10/2023
Power meter	Rohde & Schwarz	NRVD	841501/033	04/2020	04/2022
Power sensor	Keysight	U2022XA + U2032A	MY57030003	06/2020	06/2022
Semi-Anechoic Chamber	Siemens	B83117-D6019-T232	003-005-134/94C	02/2020	02/2021
Software EMC	Rohde & Schwarz	EMC32-E	V 8.40.0	N.A.	

10. TEST RESULTS

CONDUCTED EMISSIONS	12
ANTENNA REQUIREMENTS	15
MAXIMUM PEAK OUTPUT POWER	16
20dB CHANNEL BANDWIDTH	20
99% BW	20
BAND-EDGE	26
NUMBER OF HOPPING FREQUENCY	32
CHANNEL SEPARATION	36
NUMBER OF DWELL TIME	40
RADIATED EMISSION 9kHz ÷ 10th Harmonic	43
CONDUCTED SPURIOUS EMISSION 9kHz ÷ 10th Harmonic	106

TEST 1.

CONDUCTED EMISSIONS

REFERENCE DOCUMENT

FCC Cfr 47 part 15 - Subpart B - §15.207

• TEST SETUP	Acc. To ref. Std.
• TEST LOCATION	Semi-anechoic chamber
• TEST EQUIPMENT USED FOR TEST	Network simulator Spitzenberger+Spies mod. PAS5000 MXE Emi Receiver Keysight mod. N9038A LISN Rohde & Schwarz mod. ESH3-Z5
• TESTED PORT	AC input power port
• FREQUENCY RANGE	150kHz - 30MHz
• LIMITS	Acc. To ref. Std.
• UNCERTAINTY OF MEASURE	Level of confidence = 95% (k=2) Expanded uncertainty 150kHz - 30MHz = 3,28 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		AC main through External AC/DC Power Supply: 115Vac to 3.6Vdc AC main through External AC/DC Power Supply: 115Vac to 5Vdc

OPERATING CONDITION: #5, #6

RESULT: **WITHIN THE LIMITS**

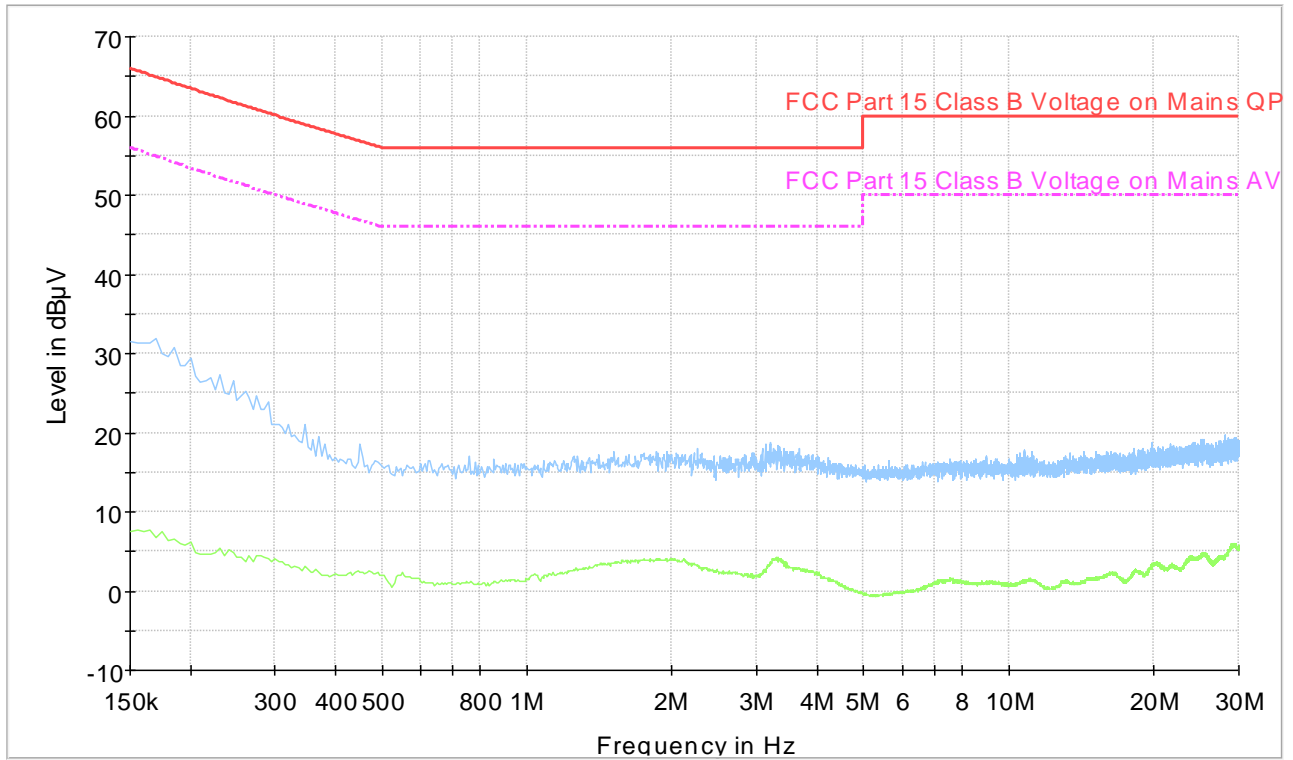
TEST RESULTS

OPERATING CONDITION #5 – 3.6Vdc to External AC/DC Power Supply

Frequency Range | 150kHz – 30MHz

Line | L+N

EN_55011_EMI_COND_3PHASE-MONO

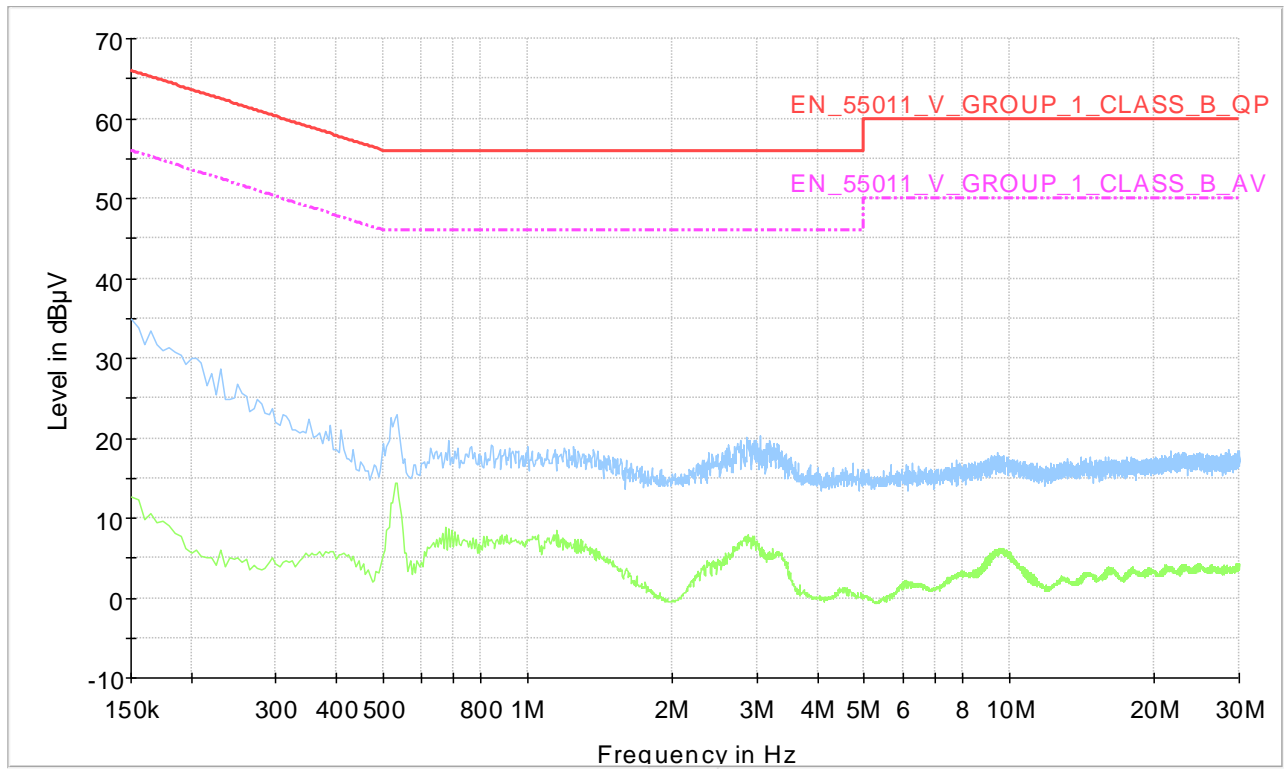


OPERATING CONDITION #6 –5Vdc to External AC/DC Power Supply

Frequency Range 150kHz – 30MHz

Line L+N

EN_55011_EMI_COND_3PHASE-MONO



TEST 2.

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

PATCH ANTENNA: UFL connector

DIPOLE ANTENNA: Reverse SMA connector

RESULT: COMPLIANT

TEST 3.

MAXIMUM PEAK OUTPUT POWER

REFERENCE DOCUMENT

According to §15.247(b) (2)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

• TEST SETUP	ANSI C63.10
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10 section 7.8.5
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40 Power sensor Keysight mod. U2022XA + U2032A
• TEST PERFORMED BY	Daniele AOSANI

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

OPERATING CONDITION: #5, #6 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER

Measured 20Db BW	230kHz
Resolution bandwidth	200kHz
Video bandwidth	1MHz
Span	1MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. Hold

TEST DESCRIPTION

- This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test.

TEST SETUP BLOCK DIAGRAM



PATCH ANTENNA type 2067640100

Operating Condition: #5

Channel	Frequency (MHz)	Max Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
0	902.42	13.69	1.2	14.89	30	WITHIN THE LIMITS
37	915.00	13.70	1.2	14.90		
74	927.58	13.73	1.2	14.93		

Incertezza di misura / Measurement Uncertainty : ± 3 dB

Note: ---

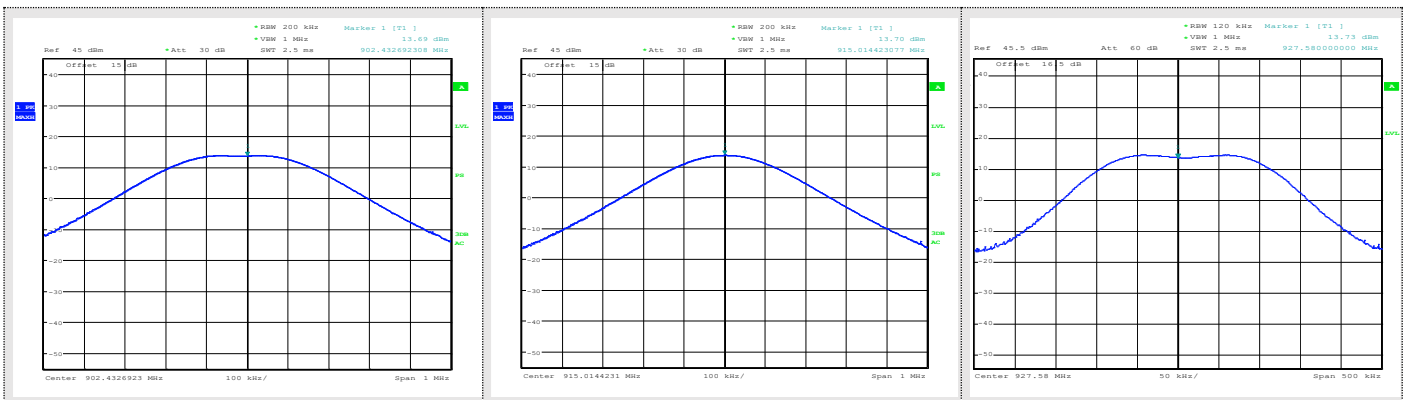
EXTERNAL DIPOLE ANTENNA type ANT-916-CW-HW

Operating Condition: #5

Channel	Frequency (MHz)	Max Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
0	902.42	13.69	1.2	14.89	30	WITHIN THE LIMITS
37	915.00	13.70	1.2	14.90		
74	927.58	13.73	1.2	14.93		

Incertezza di misura / Measurement Uncertainty : ± 3 dB

Note: ---



PATCH ANTENNA type 2067640100

Operating Condition: #6

Channel	Frequency (MHz)	Max Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
0	902.42	13.75	1.2	14.95	30	WITHIN THE LIMITS
37	915.00	13.70	1.2	14.90		
74	927.58	13.73	1.2	14.93		

Incertezza di misura / Measurement Uncertainty : ± 3 dB

Note: ---

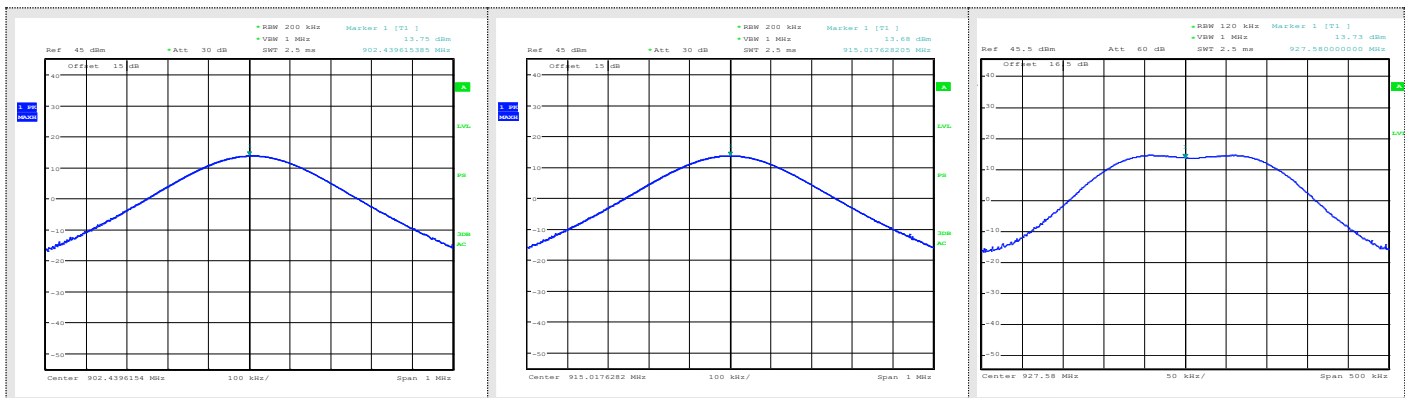
EXTERNAL DIPOLE ANTENNA type ANT-916-CW-HW

Operating Condition: #6

Channel	Frequency (MHz)	Max Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
0	902.42	13.75	1.2	14.95	30	WITHIN THE LIMITS
37	915.00	13.70	1.2	14.90		
74	927.58	13.73	1.2	14.93		

Incertezza di misura / Measurement Uncertainty : ± 3 dB

Note: ---



TEST 4.

20dB CHANNEL BANDWIDTH 99% BW

REFERENCE DOCUMENT

According to §15,247(a)(2)

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

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40
• TEST PERFORMED BY	Daniele Aosani

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

OPERATING CONDITION: #5, #6 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER

Resolution bandwidth	1kHz
Video bandwidth	5kHz
Span	1MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST DESCRIPTION

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down/99%BW one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

TEST SETUP BLOCK DIAGRAM

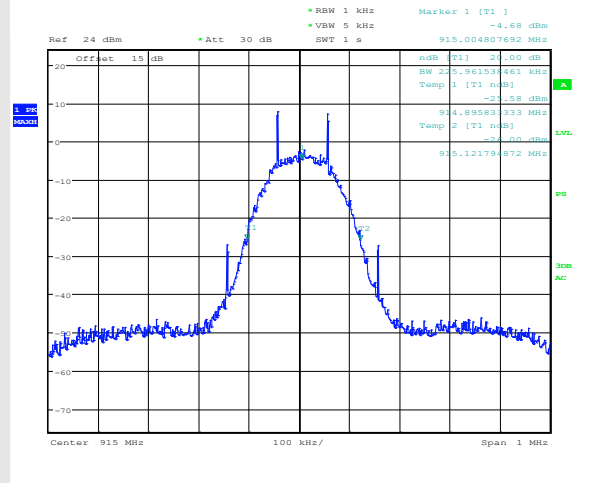
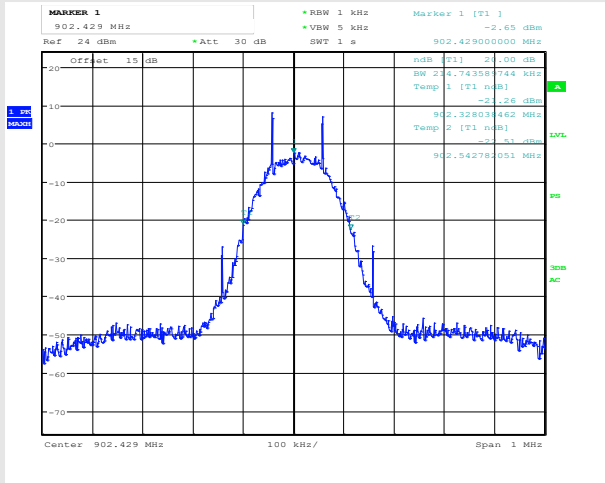


Measurement Result
- 20dB Bandwidth -

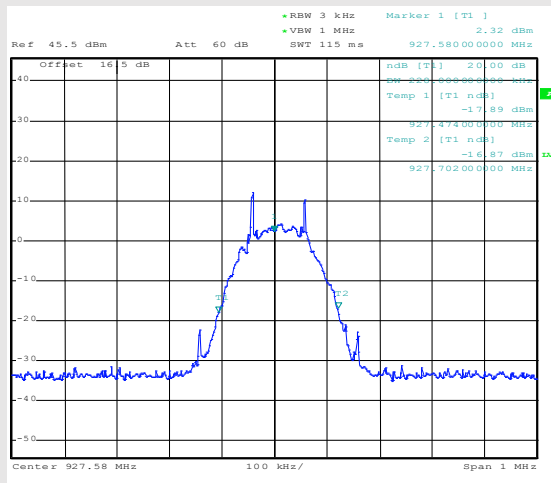
Operating Condition: #5

CHANNEL: 0

CHANNEL: 37



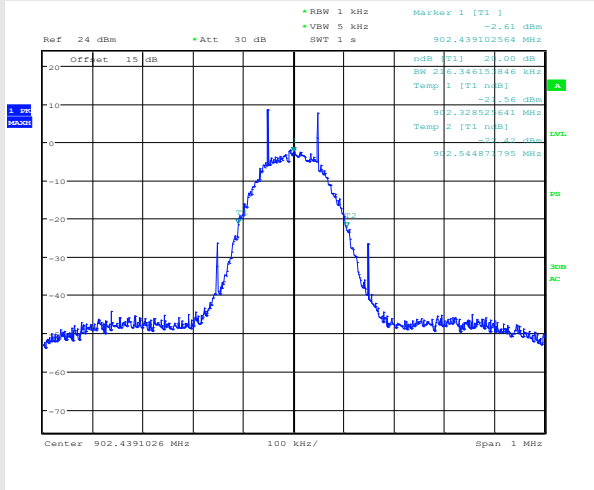
CHANNEL: 74



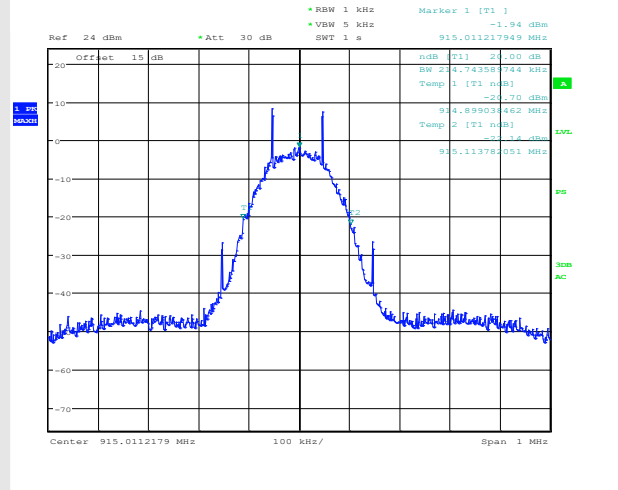
CHANNEL	20DB BANDWIDTH (kHz)	LIMIT (kHz)
0	214,7	500
37	225,9	500
74	218,0	500

Operating Condition: #6

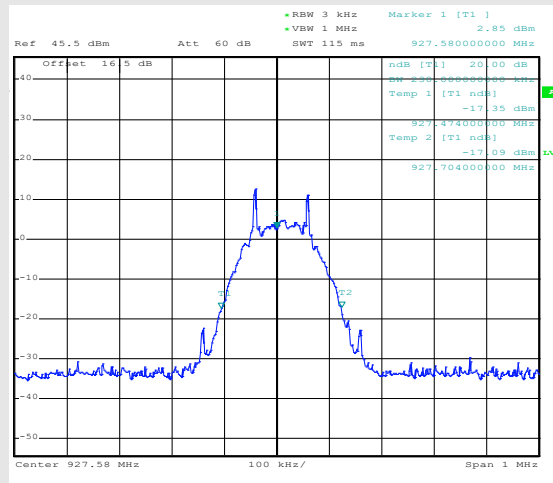
CHANNEL: 0



CHANNEL: 37



CHANNEL: 74

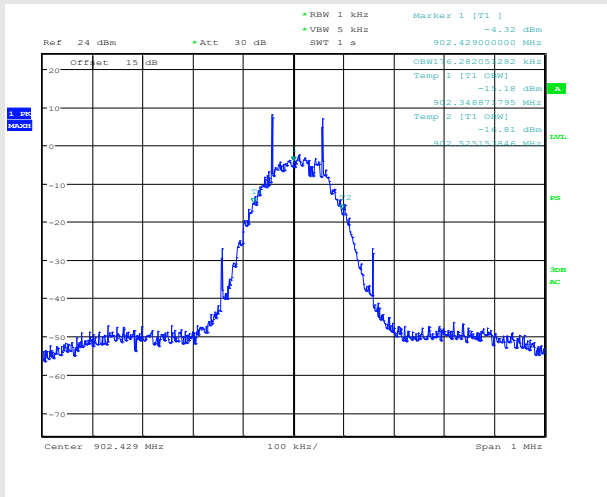


CHANNEL	20DB BANDWIDTH (kHz)	LIMIT (kHz)
0	216,3	500
37	214,7	500
74	230,0	500

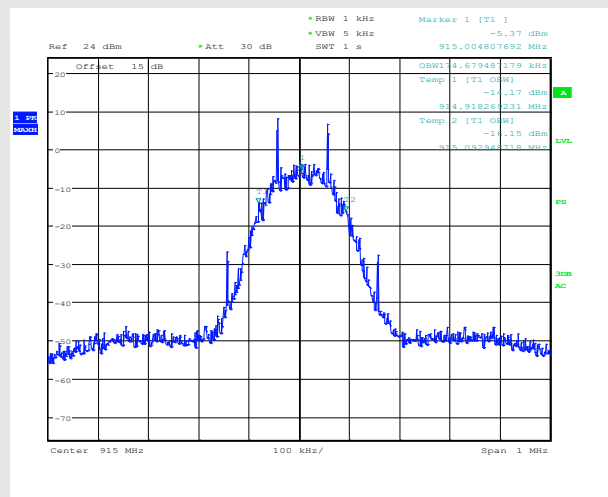
Measurement Result
- Occupied Bandwidth -

Operating Condition: #5

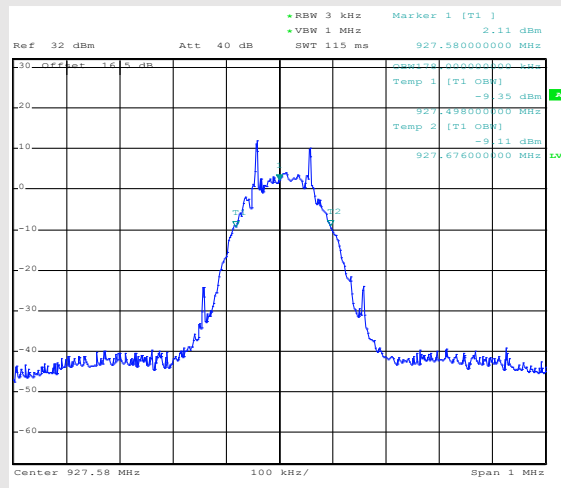
CHANNEL: 0



CHANNEL: 37



CHANNEL: 74

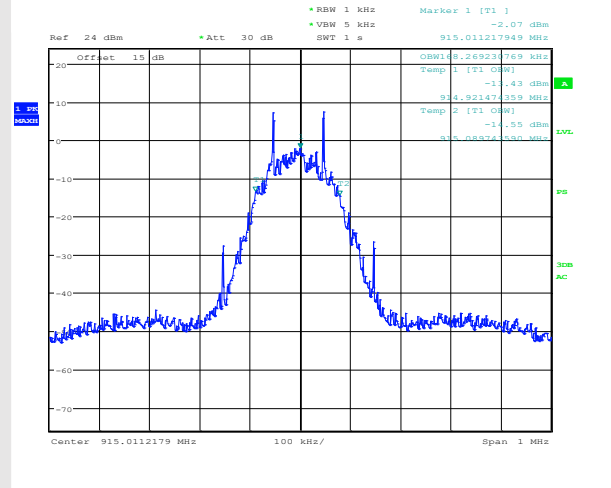
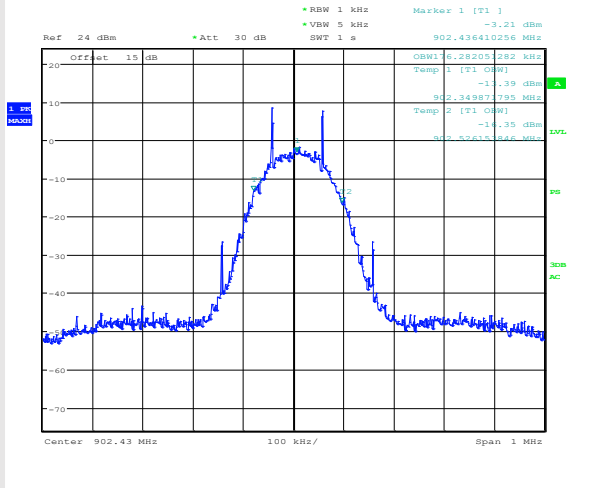


CHANNEL	OCCUPIED BANDWIDTH (kHz)	LIMIT (kHz)
0	176,3	500
37	174,7	500
74	170,0	500

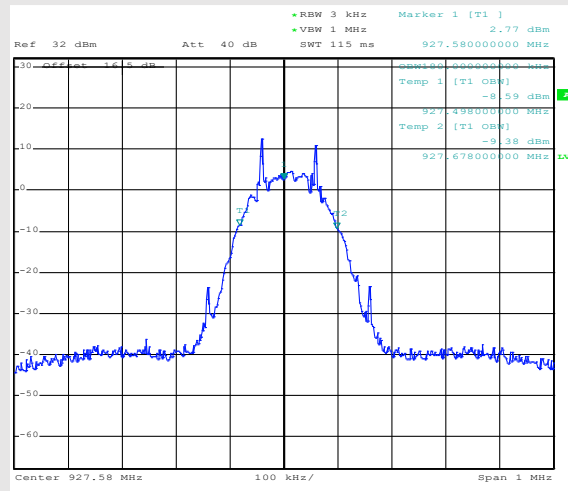
Operating Condition: #6

CHANNEL: 0

CHANNEL: 37



CHANNEL: 74



CHANNEL	OCCUPIED BANDWIDTH (kHz)	LIMIT (kHz)
0	176,3	500
37	168,3	500
74	180,0	500

TEST 5.

BAND-EDGE

REFERENCE DOCUMENT

According to §15,247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits, If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB, Attenuation below the general limits specified in Sec, 15,209(a) is not required, In addition, radiated emissions which fall in the restricted bands, as defined in Sec, 15,205(a), must also comply with the radiated emission limits specified in Sec, 15,209(a) (see Sec, 15,205(c)),

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40
• TEST PERFORMED BY	Daniele Aosani

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

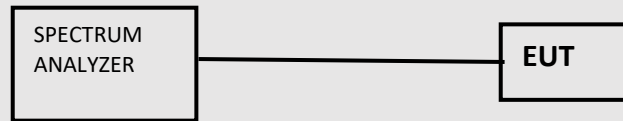
OPERATING CONDITION :#5, #6

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER

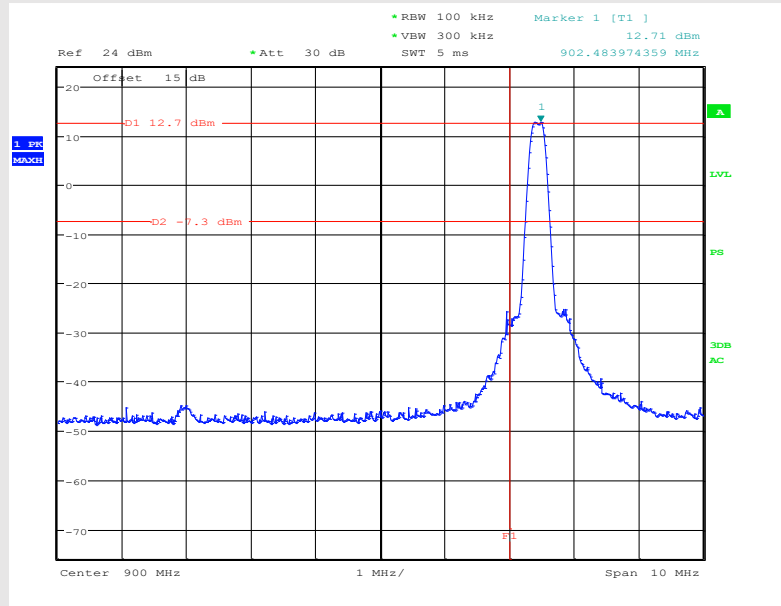
Resolution bandwidth	100kHz
Video bandwidth	300kHz
Span	15MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST SETUP BLOCK DIAGRAM

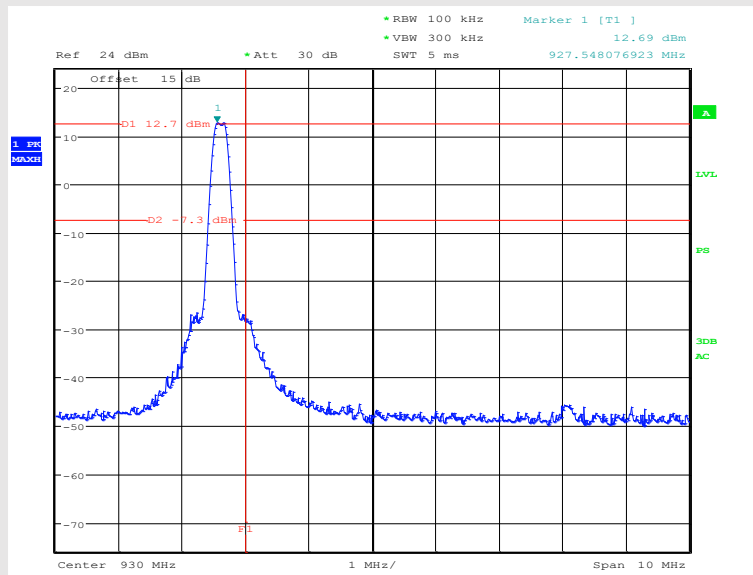


Operating Condition: #5

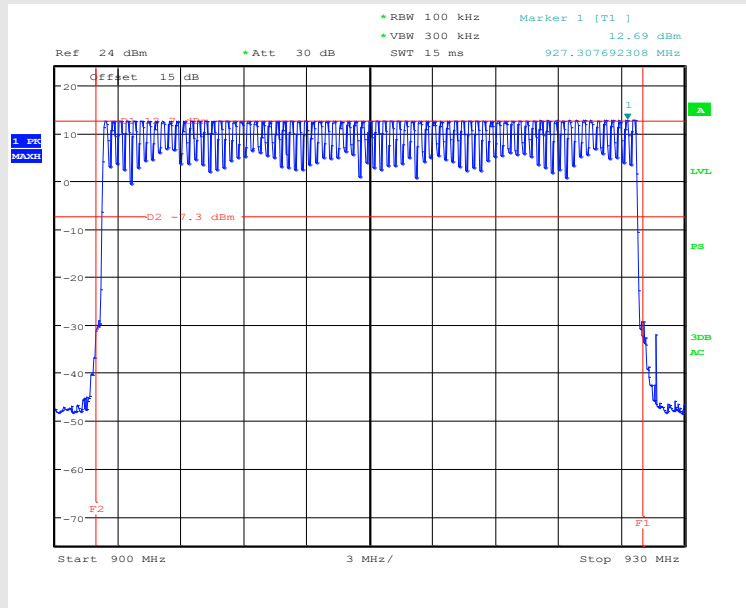
**LOWER BAND-EDGE
CH 0**



**UPPER BAND-EDGE
CH 74**

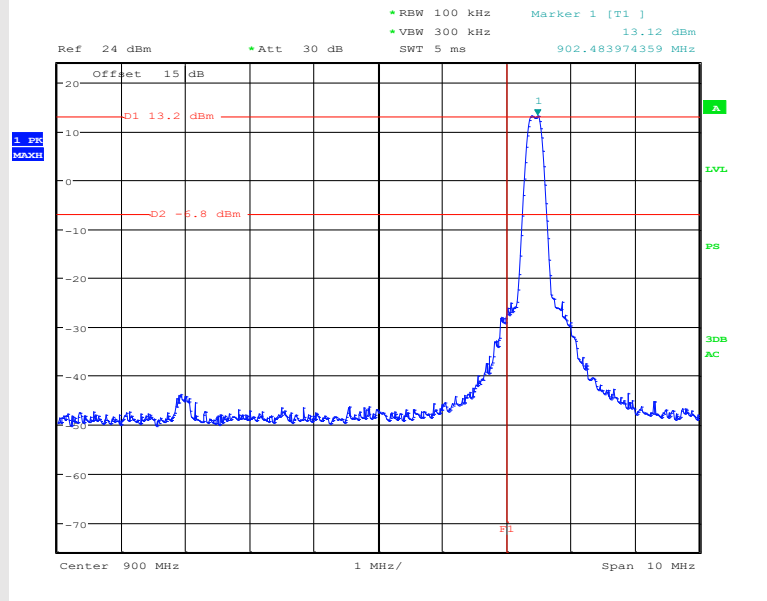


HOPPING BAND-EDGE

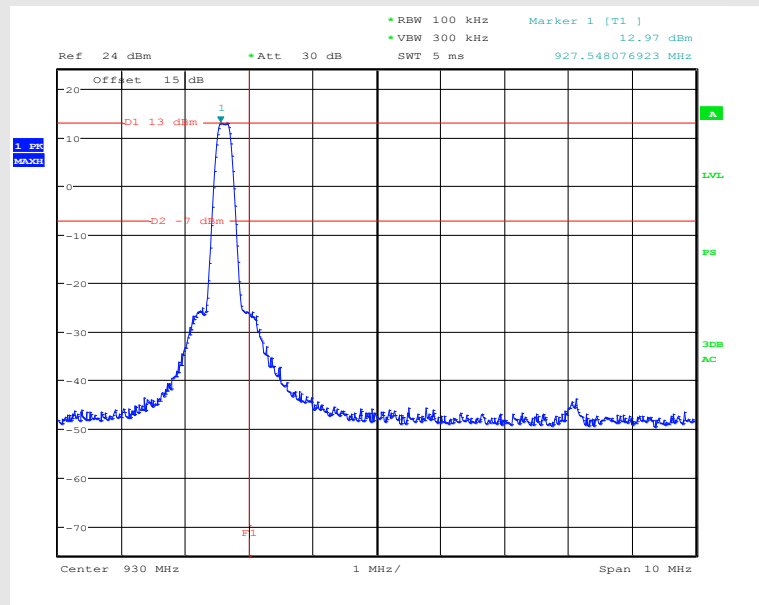


Operating Condition: #6

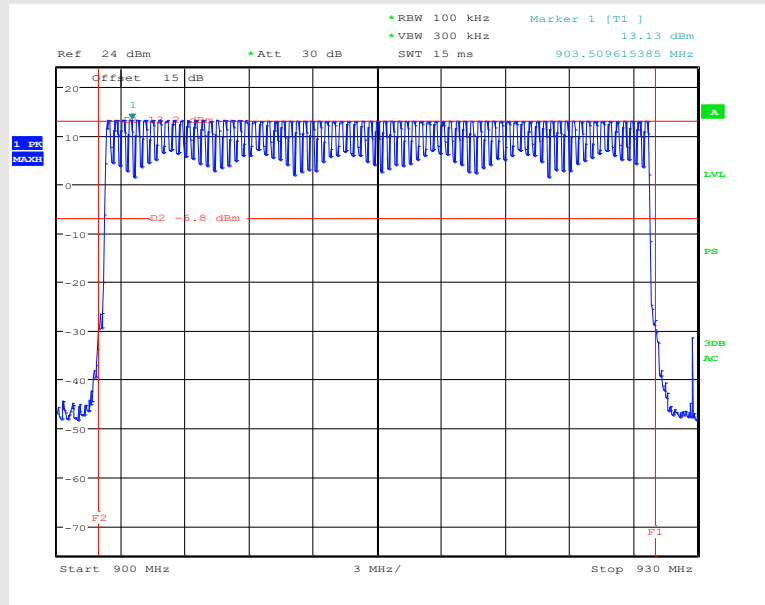
**LOWER BAND-EDGE
CH 0**



**UPPER BAND-EDGE
CH 74**



HOPPING BAND-EDGE



TEST 6.

NUMBER OF HOPPING FREQUENCY

REFERENCE DOCUMENT

According to §15,247) (a)

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

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40
• TEST PERFORMED BY	Daniele Aosani

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

OPERATING CONDITION :#5, #6 HOPPING MODE

RESULT: **WITHIN THE LIMITS**

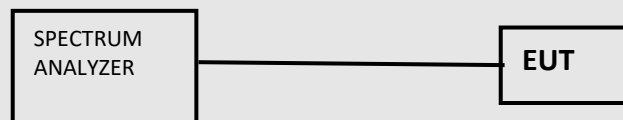
MEASUREMENT PARAMETER

Resolution bandwidth	100kHz
Video bandwidth	300kHz
Span	15MHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST DESCRIPTION

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

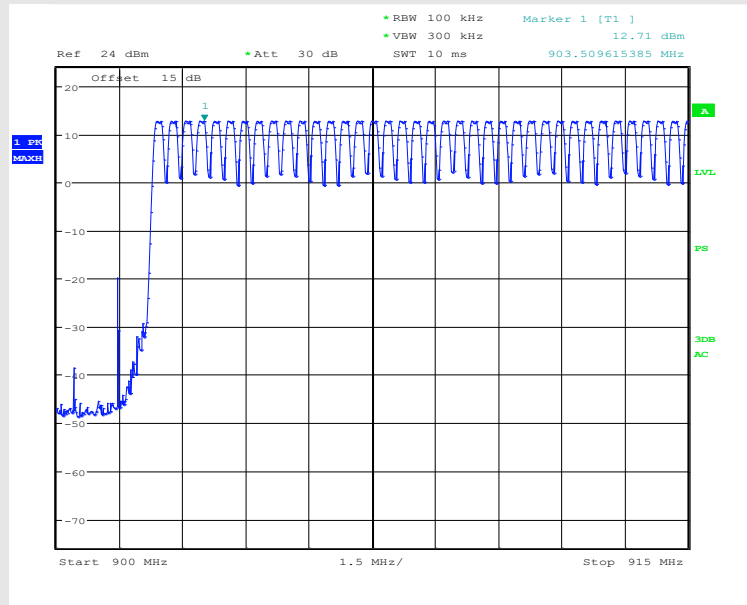
TEST SETUP BLOCK DIAGRAM



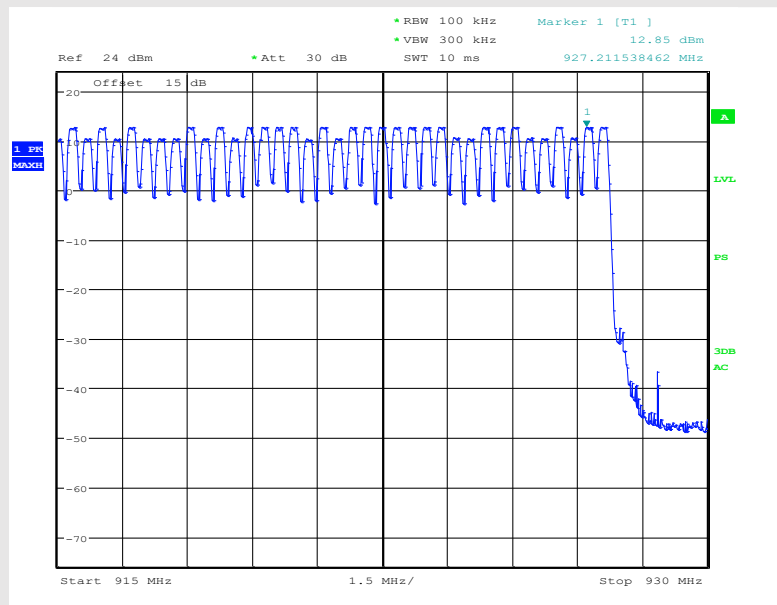
Measurement Result

Operating Condition: #5

FREQUENCY RANGE
900-915MHz



FREQUENCY RANGE
915-930MHz



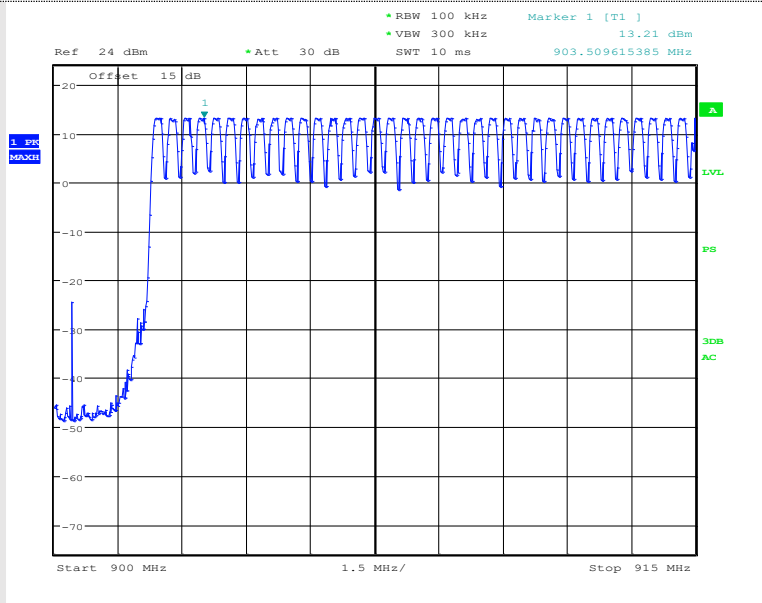
NUMBER OF HOPPING
CHANNELS

75

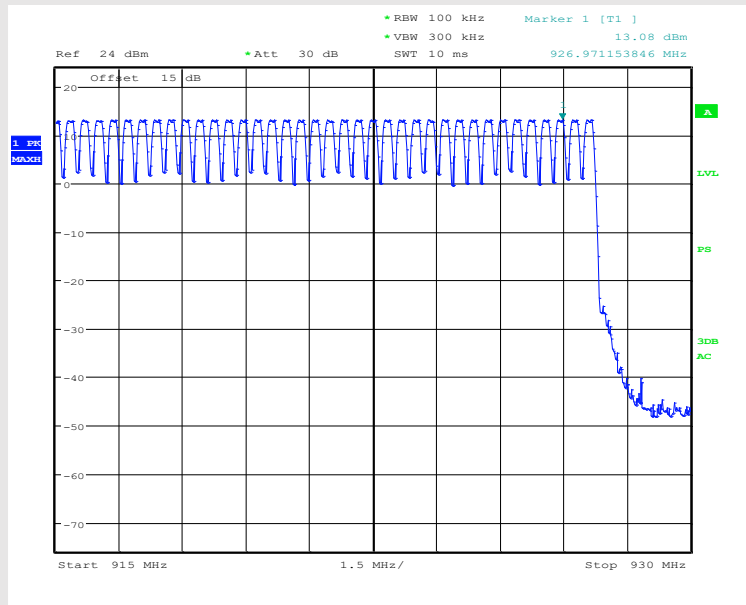
PASS

Operating Condition: #6

**FREQUENCY RANGE
900-915MHz**



**FREQUENCY RANGE
915-930MHz**



**NUMBER OF HOPPING
CHANNELS**

75

PASS

TEST 7.

CHANNEL SEPARATION

REFERENCE DOCUMENT

According to §15,247) (a) (1)

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

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40
• TEST PERFORMED BY	Daniele Aosani

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

OPERATING CONDITION :#5, #6 HOPPING MODE

RESULT: **WITHIN THE LIMITS**

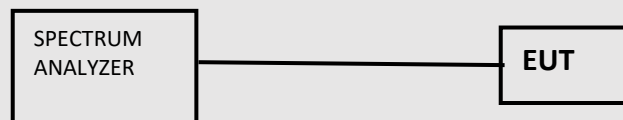
MEASUREMENT PARAMETER

Resolution bandwidth	10kHz
Video bandwidth	30kHz
Span	800kHz
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST DESCRIPTION

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

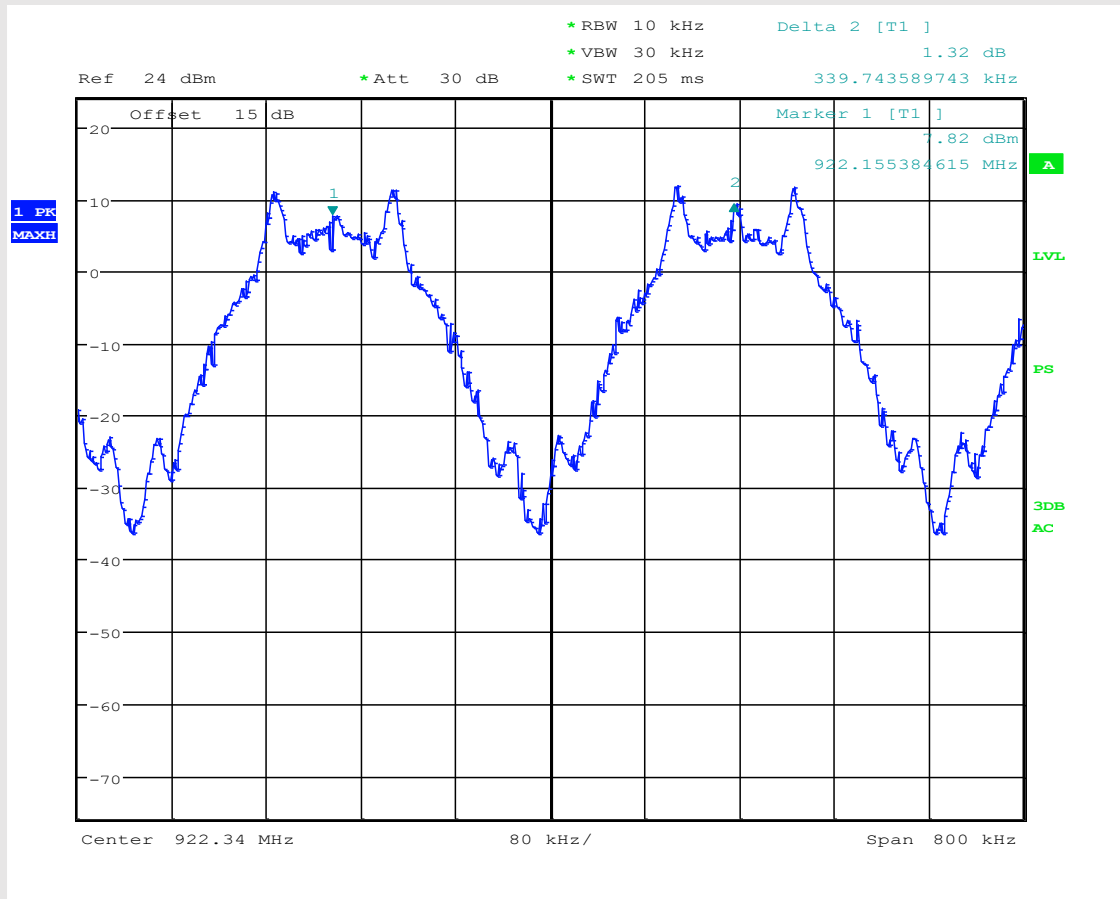
TEST SETUP BLOCK DIAGRAM



Measurement Result

CHANNEL SEPARATION

Operating Condition #5



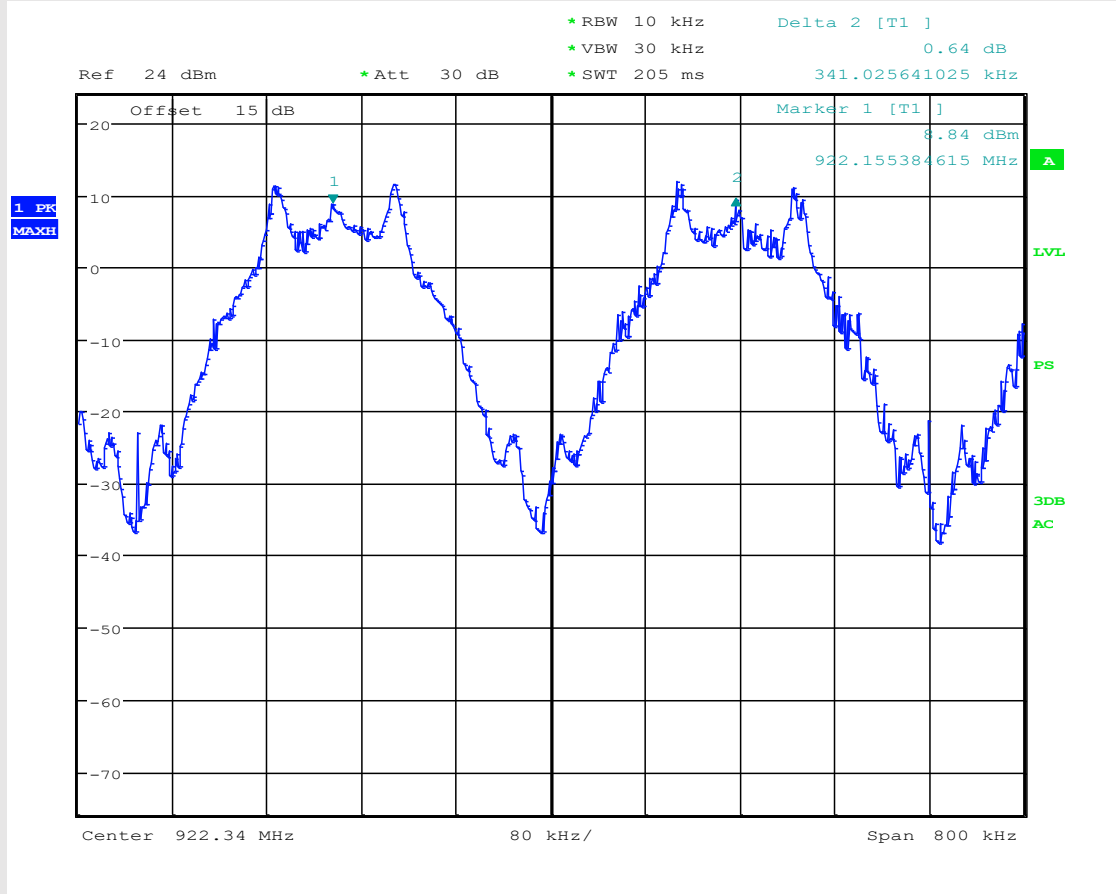
MEASURED CHANNEL SEPARATION

339,7kHz

PASS

CHANNEL SEPARATION

Operating Condition #6



MEASURED CHANNEL SEPARATION

341,0kHz

PASS

TEST 8.

NUMBER OF DWELL TIME

REFERENCE DOCUMENT

According to §15,247) (a) (1) (III)

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

• TEST SETUP	Acc. to reference document
• TEST LOCATION	Radio test area
• TEST METHOD	ANSI C63.10:2013
• TYPE OF MEASUREMENT	Conducted
• TEST EQUIPMENT USED FOR TEST	EMI Receiver Rodhe & Schwarz mod. ESU40
• TEST PERFORMED BY	Daniele Aosani

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

OPERATING CONDITION :#5, #6 HOPPING MODE

RESULT: **WITHIN THE LIMITS**

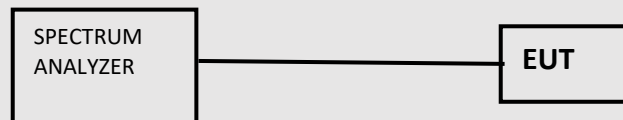
MEASUREMENT PARAMETER

Resolution bandwidth	1kHz
Video bandwidth	5kHz
Span	Zero
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

TEST DESCRIPTION

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

TEST SETUP BLOCK DIAGRAM



Measurement Result

Operating Condition #5					
Channel	Frequency (MHz)	Length of Transmission Time (msec)	Number of Transmission in 20s	Results (s)	Limit (s)
0	902.42	378	1	0,378	0.4
37	915.00	380	1	0,380	0.4
75	927.58	378	1	0,378	0.4

Operating Condition #6					
Channel	Frequency (MHz)	Length of Transmission Time (msec)	Number of Transmission in 20s	Results (s)	Limit (s)
0	902.42	380	1	0,380	0.4
37	915.00	380	1	0,380	0.4
75	927.58	378	1	0,378	0.4

TEST 9.

RADIATED EMISSION 9kHz ÷ 10th HARMONIC

REFERENCE DOCUMENT

According to §15,247) d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 Db below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 Db instead of 20 Db. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

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

OPERATING CONDITION :#1, #2, #3, #4 Duty Cycle 100%

RESULT: WITHIN THE LIMITS

MEASUREMENT PARAMETER 9kHz – 30MHz

Resolution bandwidth:	200Hz
Video bandwidth:	1kHz
Span:	See plots below
Sweep time	Auto couple
Detector:	Peak
Trace-Mode:	Max. hold

MEASUREMENT PARAMETER 30MHz – 1GHz

Resolution bandwidth:	100kHz
Video bandwidth:	300kHz
Span:	See plots below
Sweep time	Auto couple
Detector:	Peak
Trace-Mode:	Max. hold

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.

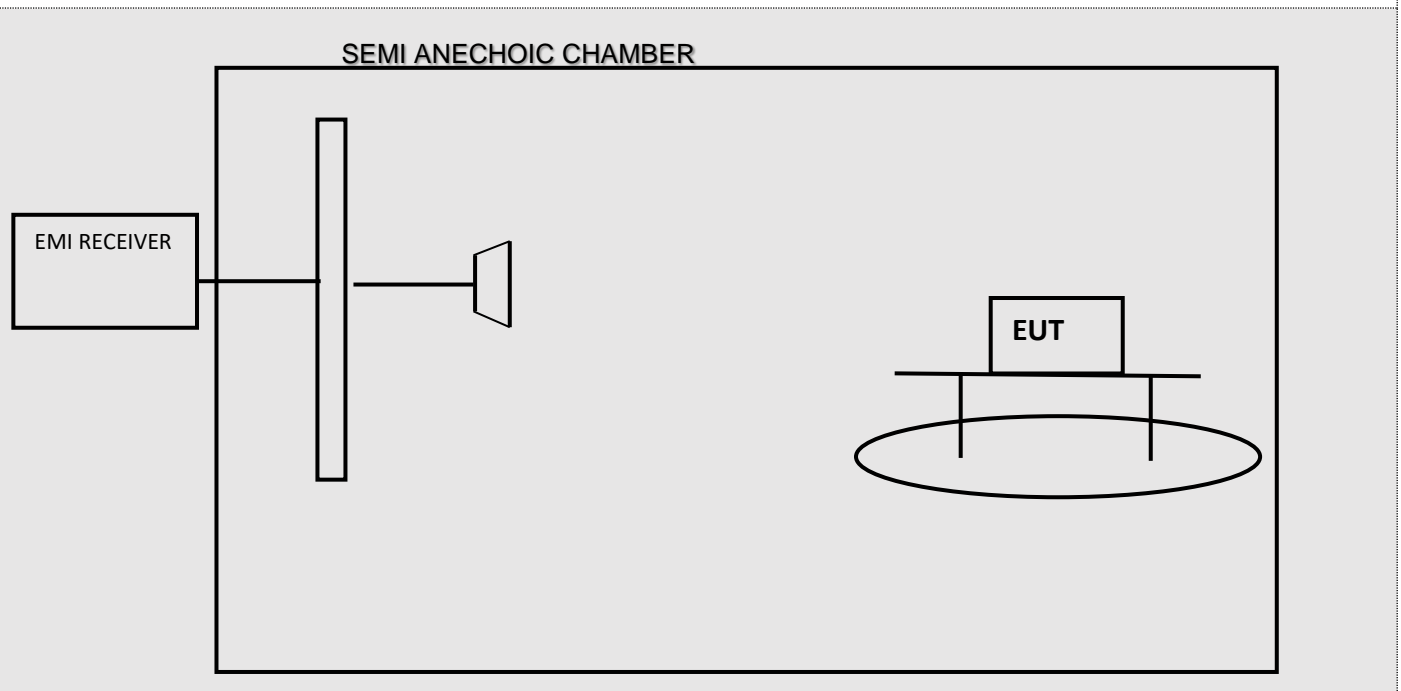
The EUT is placed at test table.

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

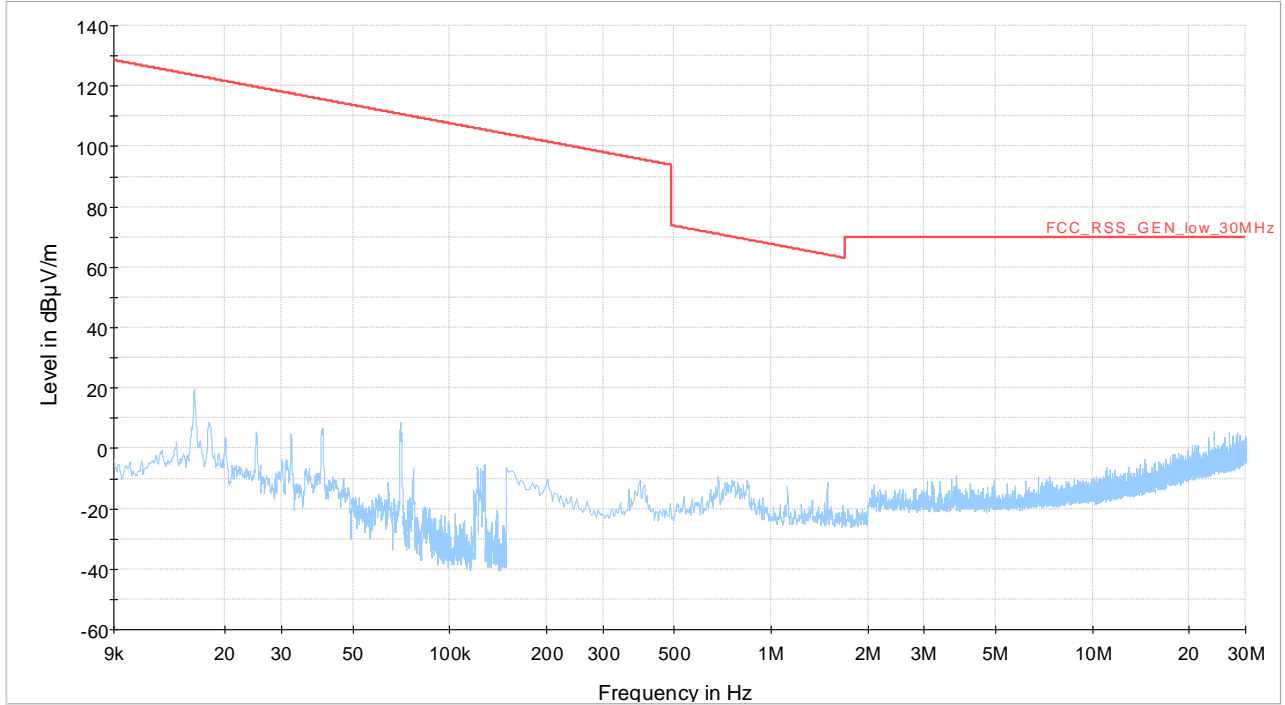
Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m~4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3m.

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



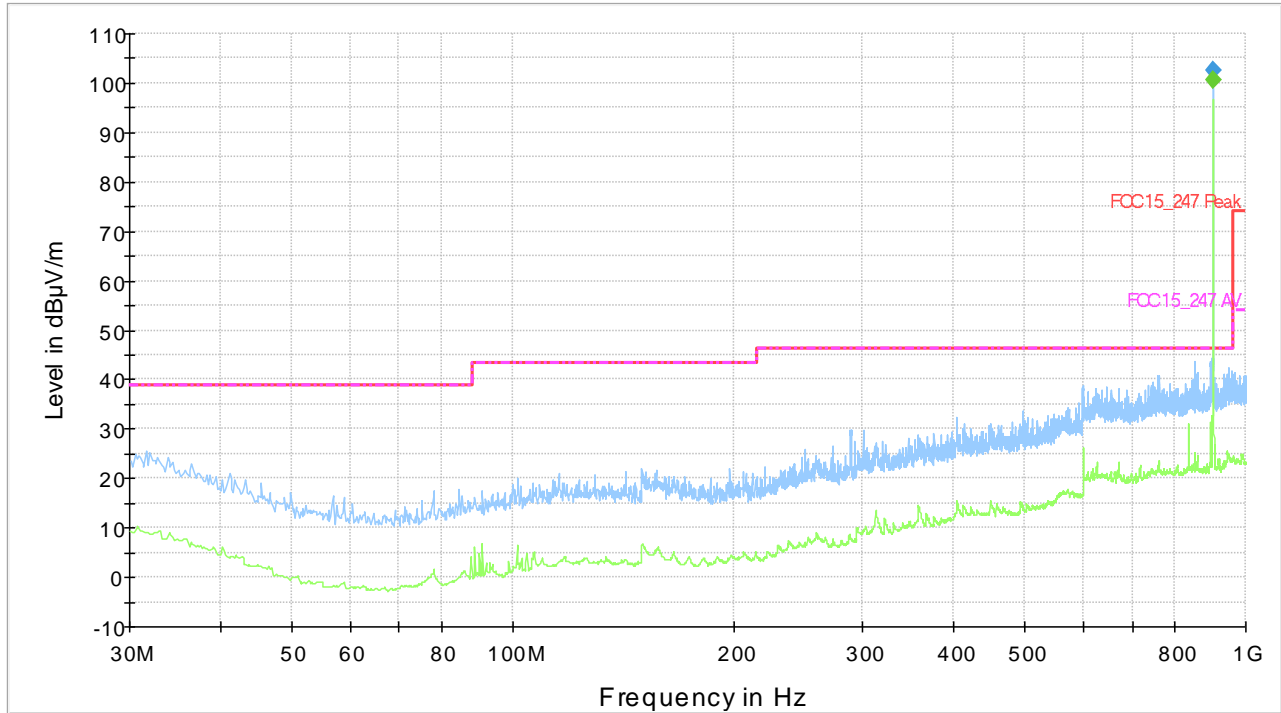
OPERATING CONDITION	#1
CHANNEL	0
FREQUENCY RANGE	9kHz - 30MHz



— FCC_RSS_GEN_low_30MHz — MaxPeak-ClearWrite-PK+

CHANNEL	0
OPERATING CONDITION	#1
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	102.5	70.0	120.000	179.8	V	7.0	34.9	-56.10	46.40

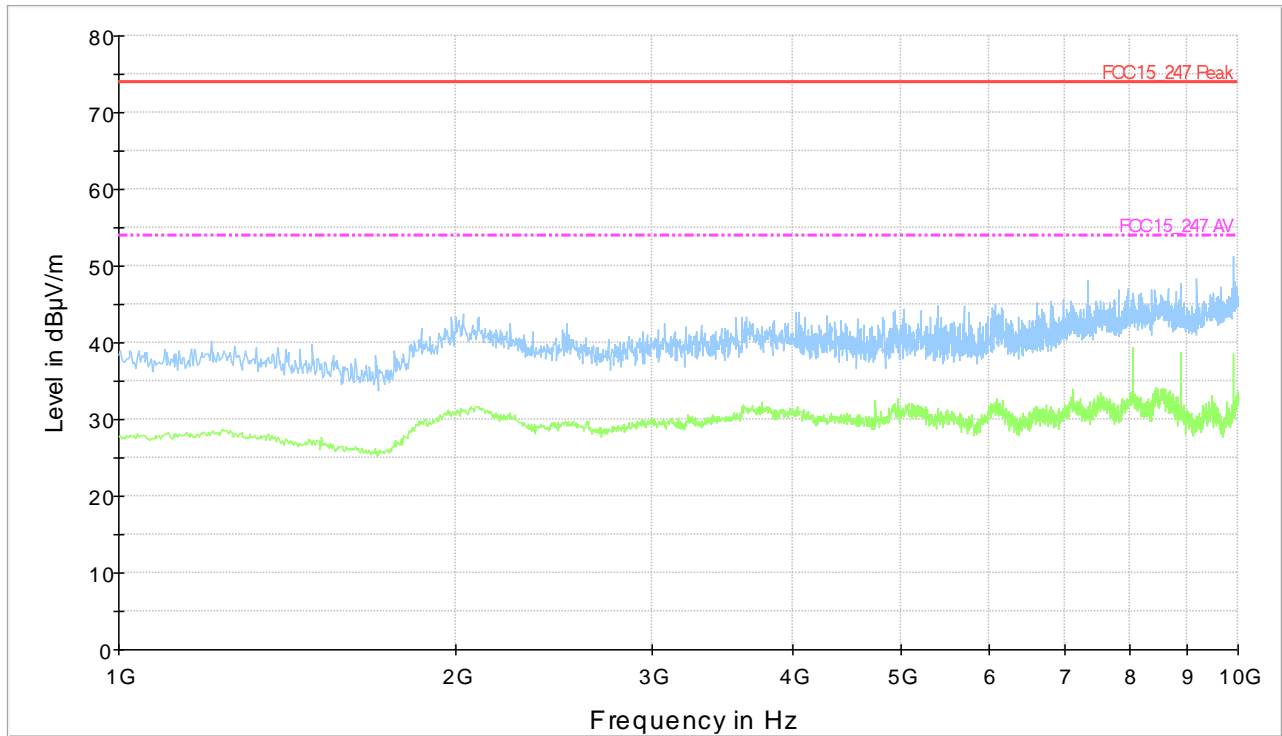
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	100.7	70.0	120.000	179.7	V	7.0	34.9	-54.30	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#1
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

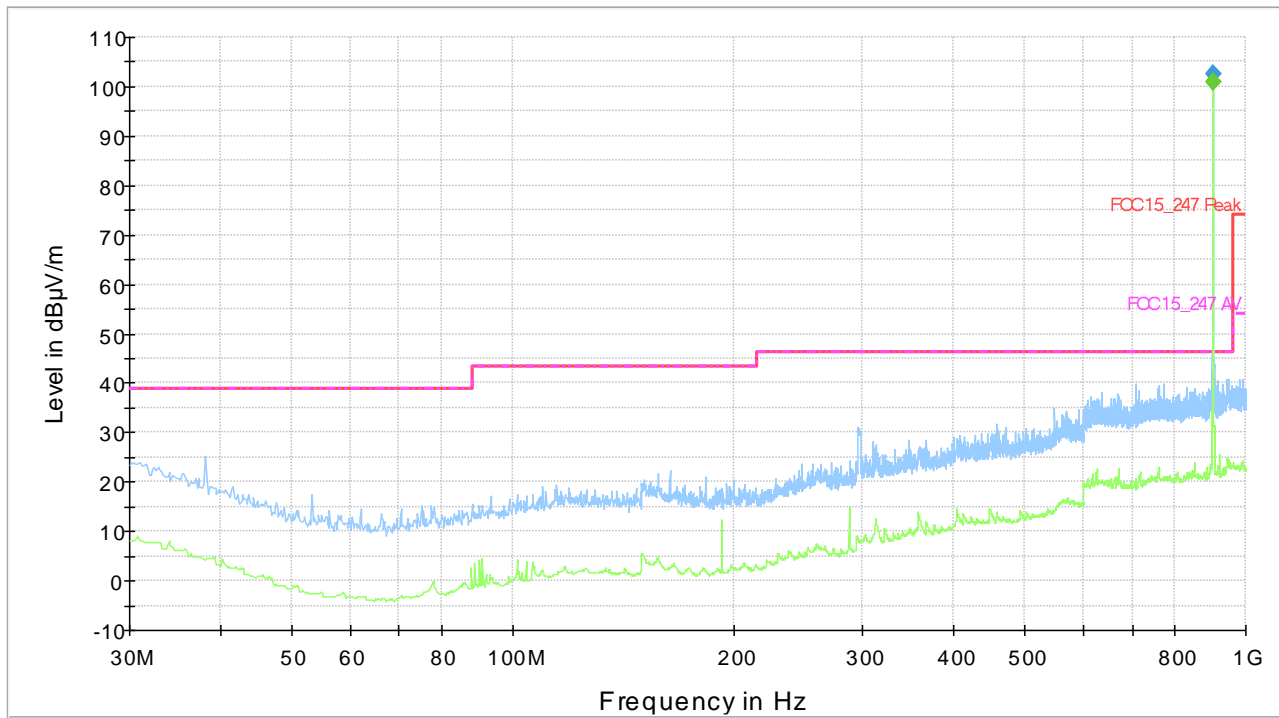
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	0
OPERATING CONDITION	#1
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	102.5	70.0	120.000	180.0	H	-8.0	34.9	-56.10	46.40

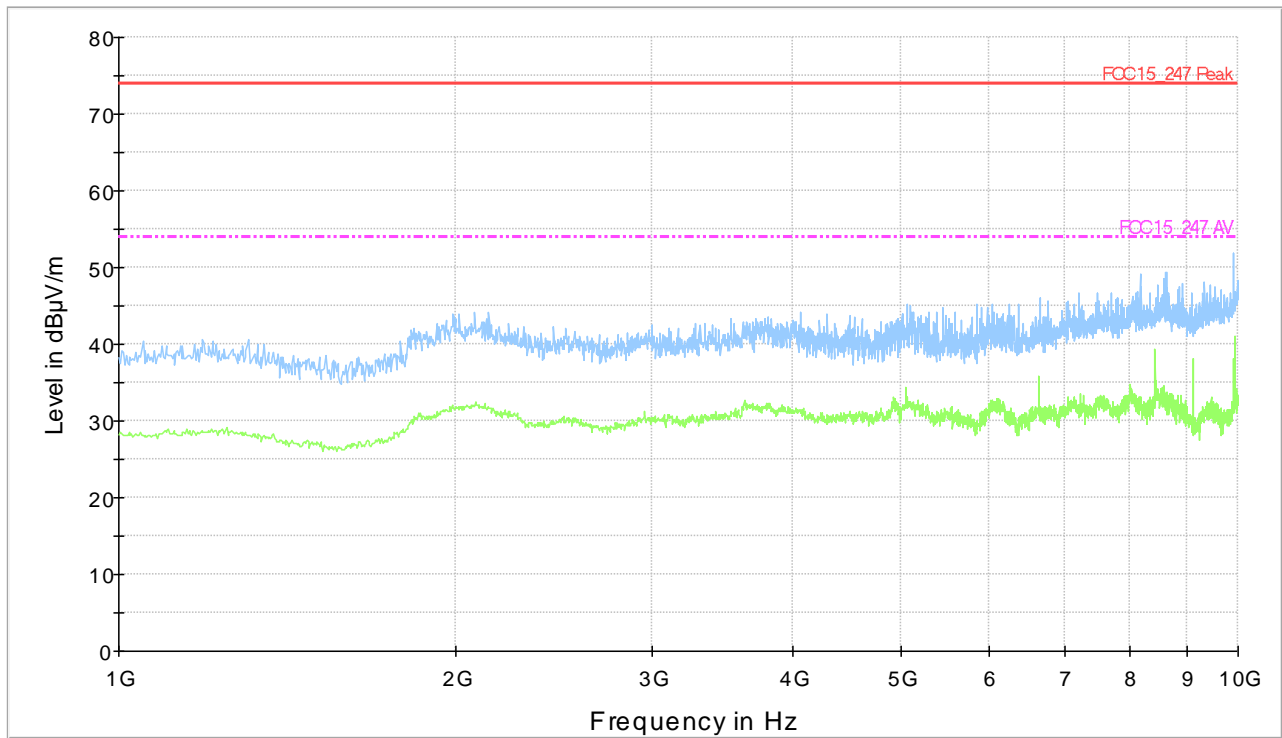
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	100.9	70.0	120.000	99.9	H	-8.0	34.9	-54.50	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#1
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

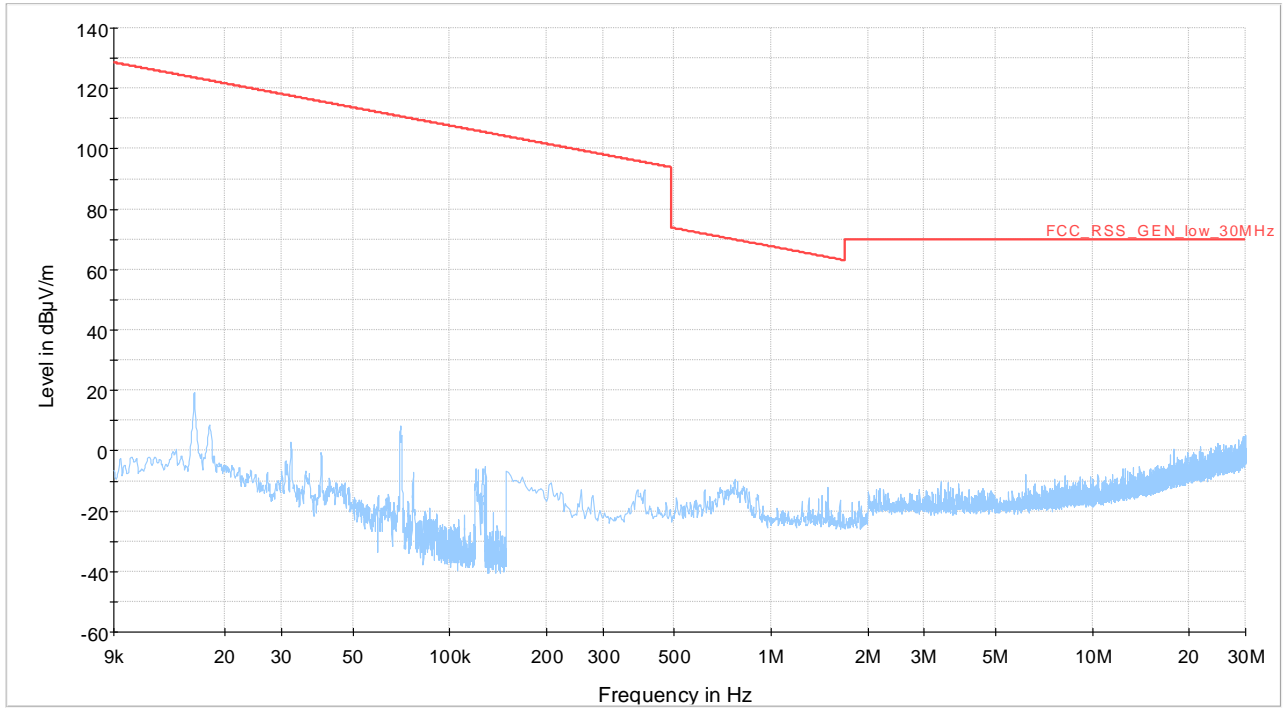
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

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

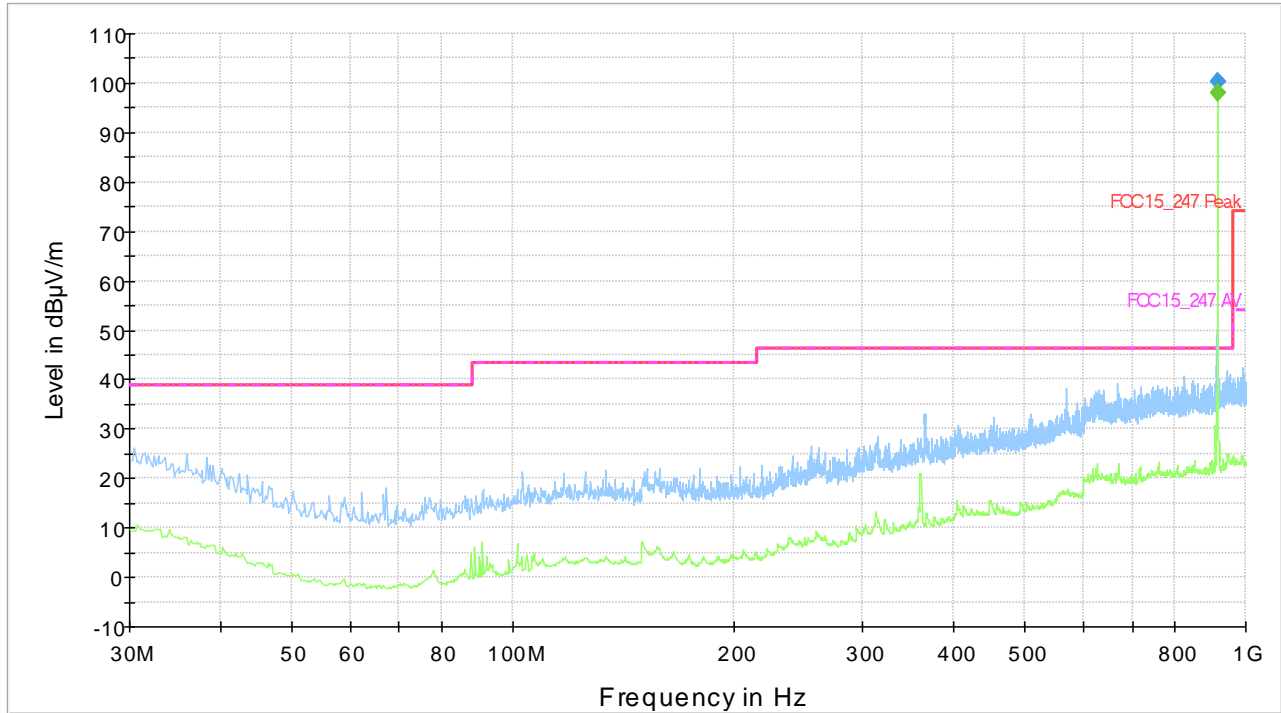
CHANNEL	37
OPERATING CONDITION	#1
FREQUENCY RANGE	9kHz - 30MHz



FCC_RSS_GEN_low_30MHz MaxPeak-ClearWrite-PK+

CHANNEL	37
OPERATING CONDITION	#1
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.000000	100.4	70.0	120.000	180.1	V	7.0	35.3	-54.00	46.40

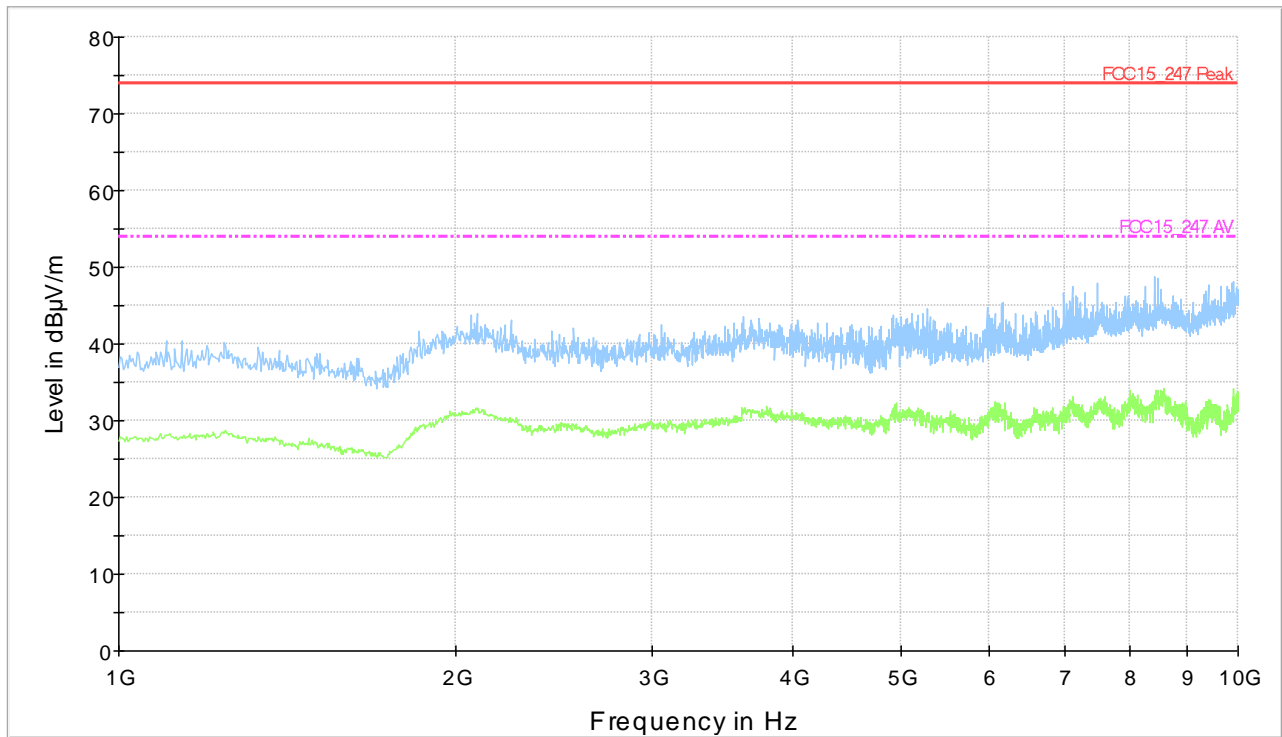
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.000000	98.1	70.0	120.000	175.9	V	7.0	35.3	-51.70	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	37
OPERATING CONDITION	#1
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

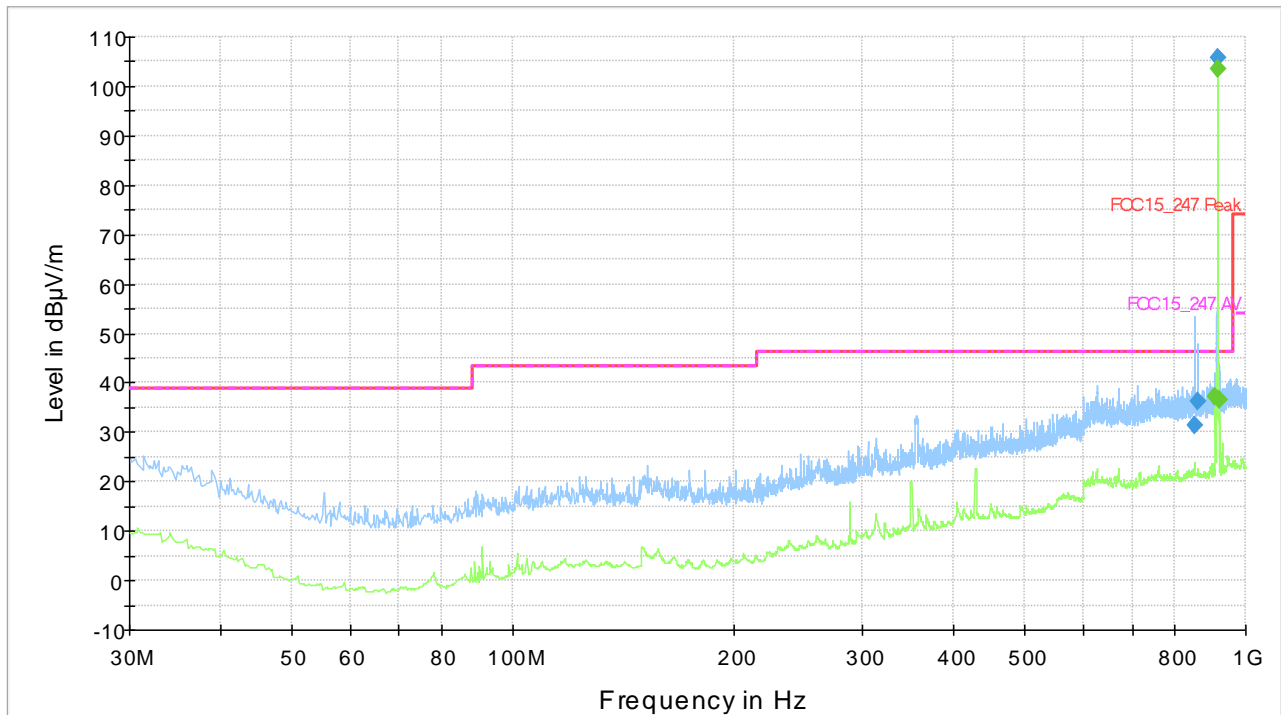
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	37
OPERATING CONDITION	#1
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
852.540000	31.5	70.0	120.000	330.2	H	2.0	34.8	14.90	46.40
861.420000	36.3	70.0	120.000	179.8	H	7.0	34.8	10.10	46.40
914.970000	105.9	70.0	120.000	99.7	H	-8.0	35.3	-59.50	46.40

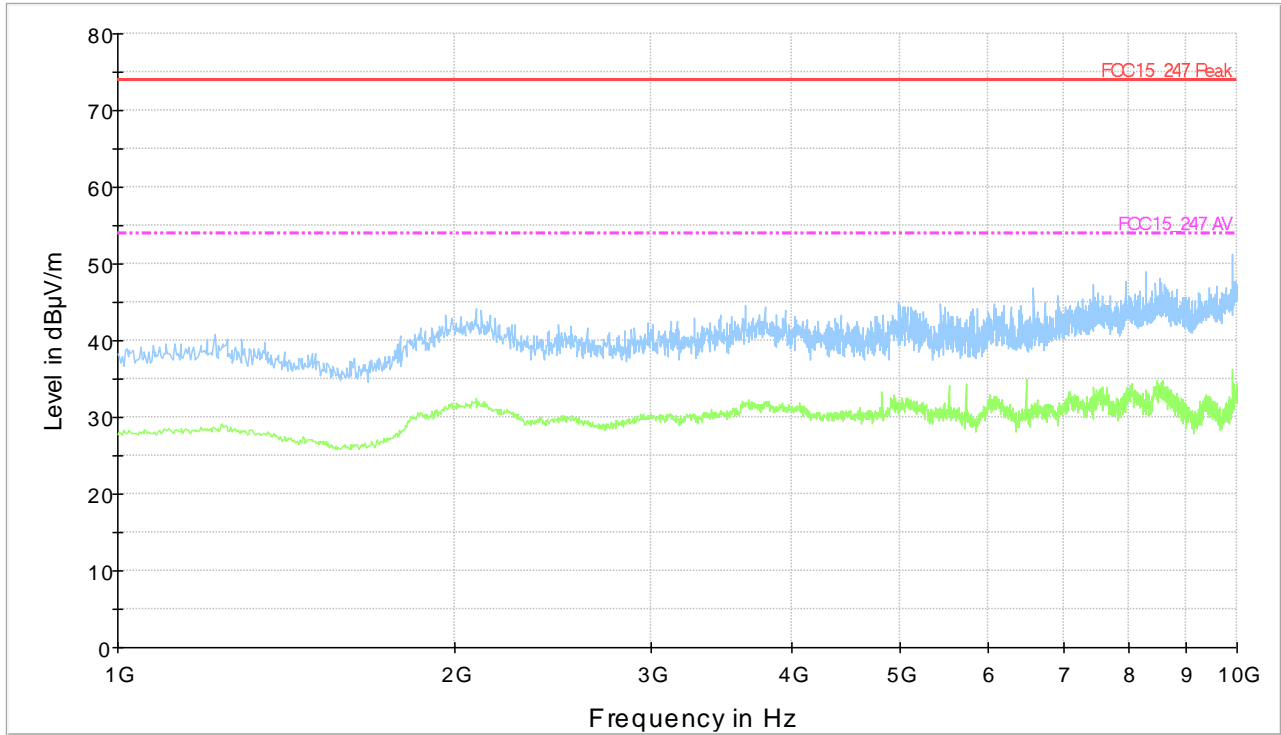
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
909.540000	37.3	70.0	120.000	99.7	H	-8.0	35.1	9.10	46.40
915.030000	103.6	70.0	120.000	176.9	H	-8.0	35.3	-57.20	46.40
920.490000	36.5	70.0	120.000	99.7	H	-8.0	35.4	9.90	46.40

*Peaks out of limits are due to the radio carrier

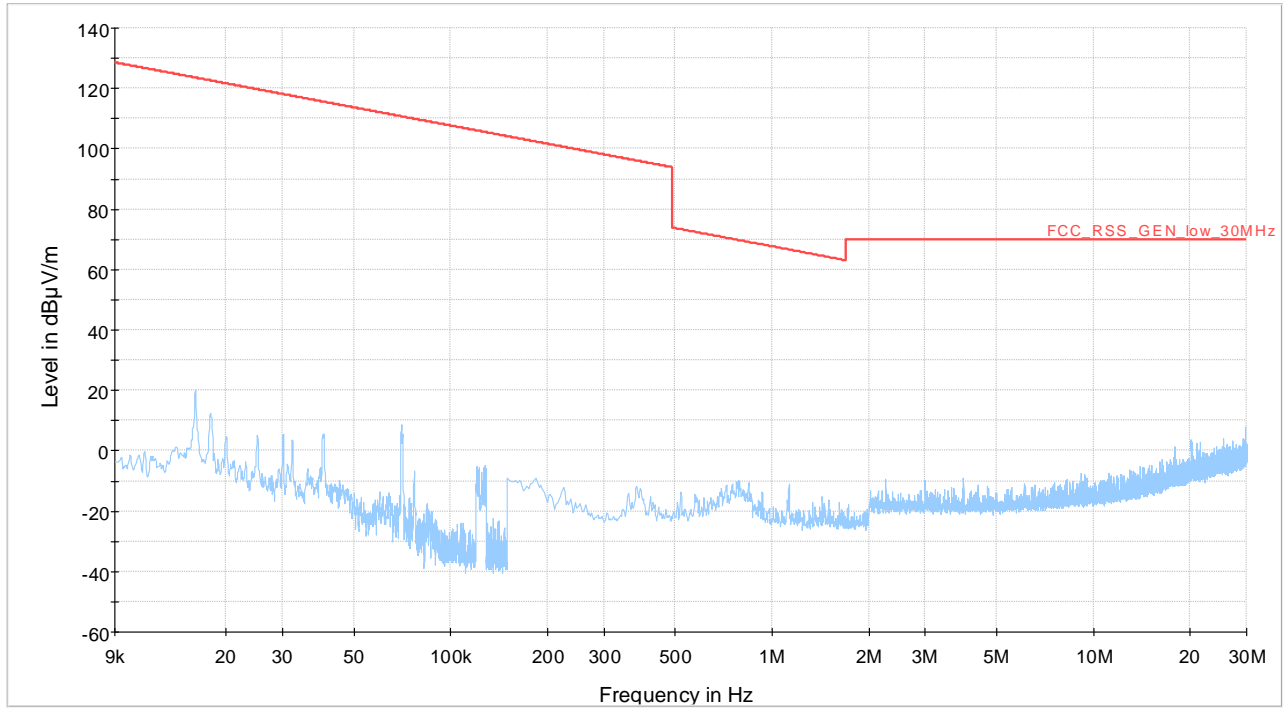
CHANNEL	37
OPERATING CONDITION	#1
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

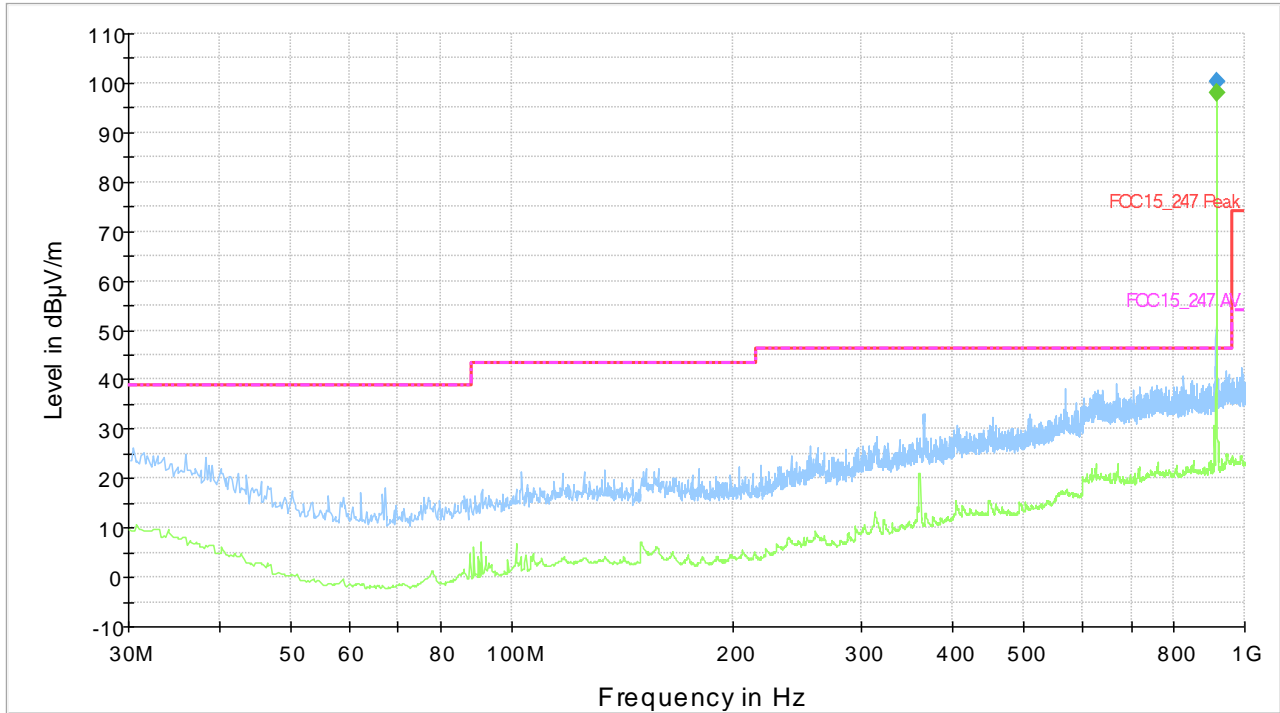
CHANNEL	74
OPERATING CONDITION	#1
FREQUENCY RANGE	9kHz - 30MHz



FCC_RSS_GEN_low_30MHz MaxPeak-ClearWrite-PK+

CHANNEL	74
OPERATING CONDITION	#1
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	100.7	70.0	120.000	180.1	V	7.0	35.3	-54.30	46.40

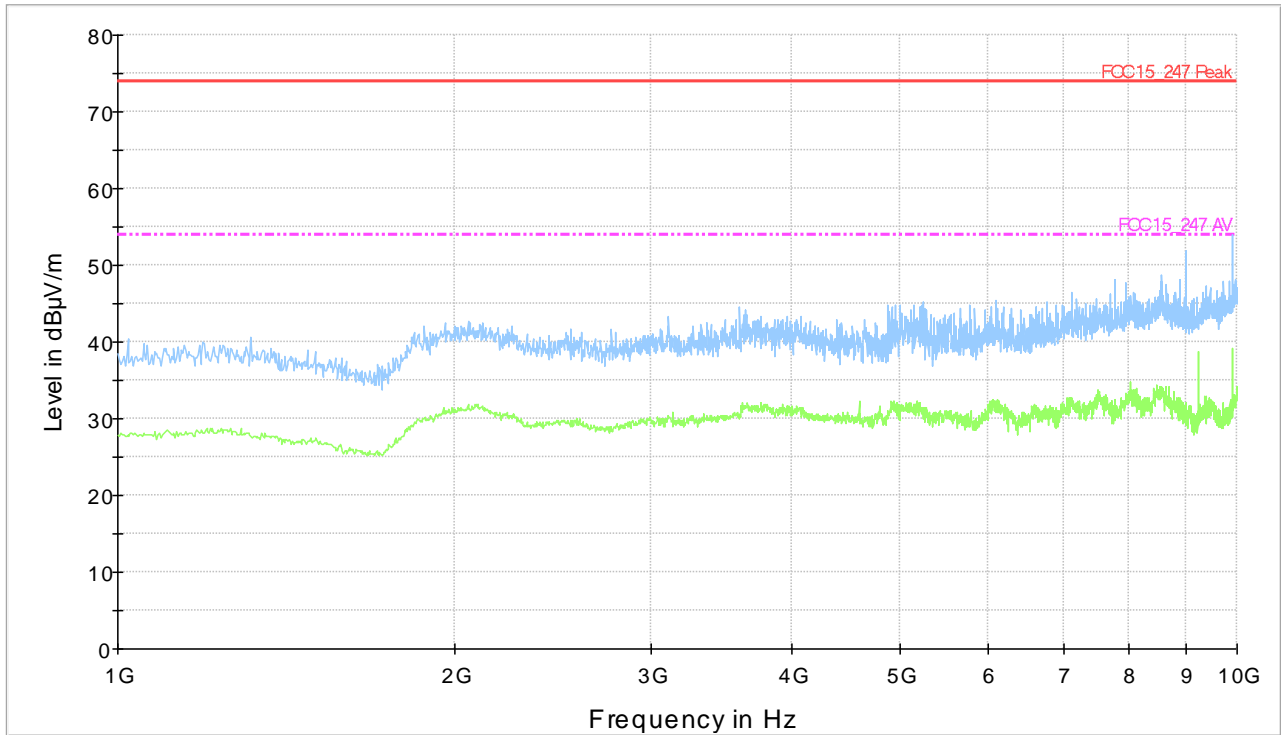
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	98.7	70.0	120.000	175.9	V	7.0	35.3	-52.30	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	74
OPERATING CONDITION	#1
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

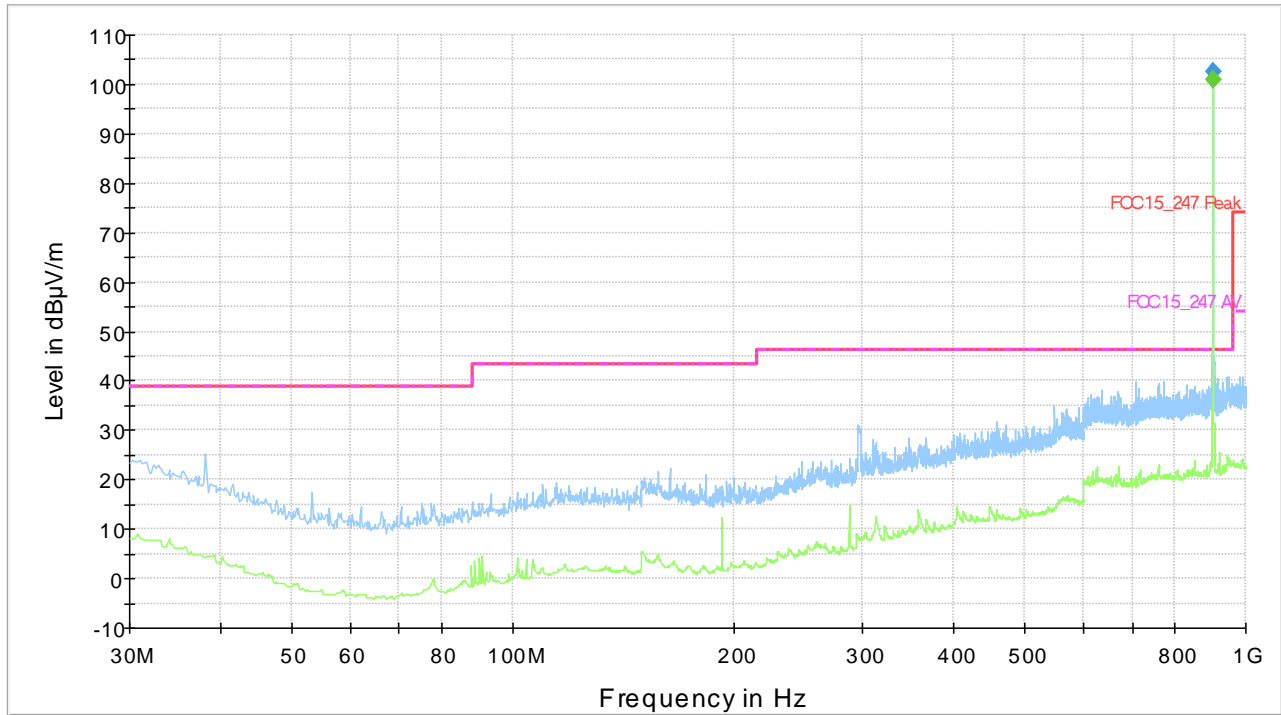
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	74
OPERATING CONDITION	#1
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.60000	102.1	70.0	120.000	180.0	H	-8.0	34.9	-55.70	46.40

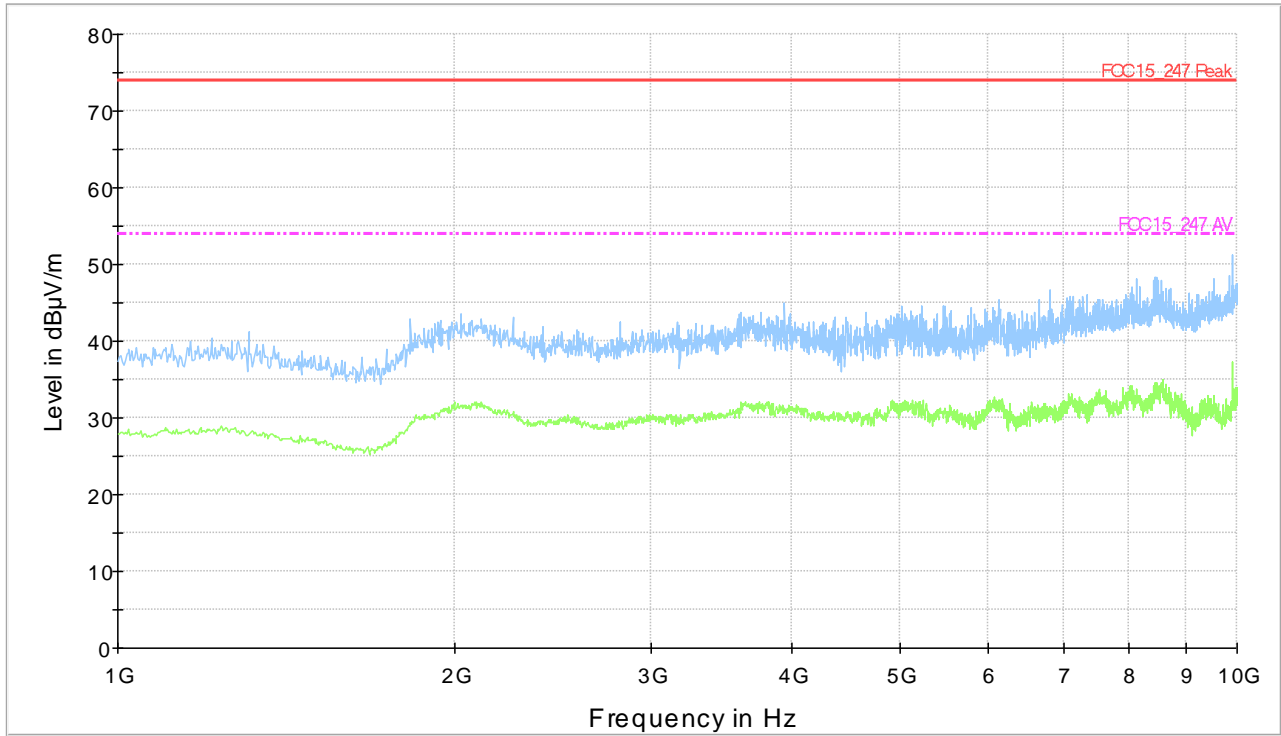
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.60000	100.4	70.0	120.000	99.9	H	-8.0	34.9	-54.00	46.40

*Peaks out of limits are due to the radio carrier

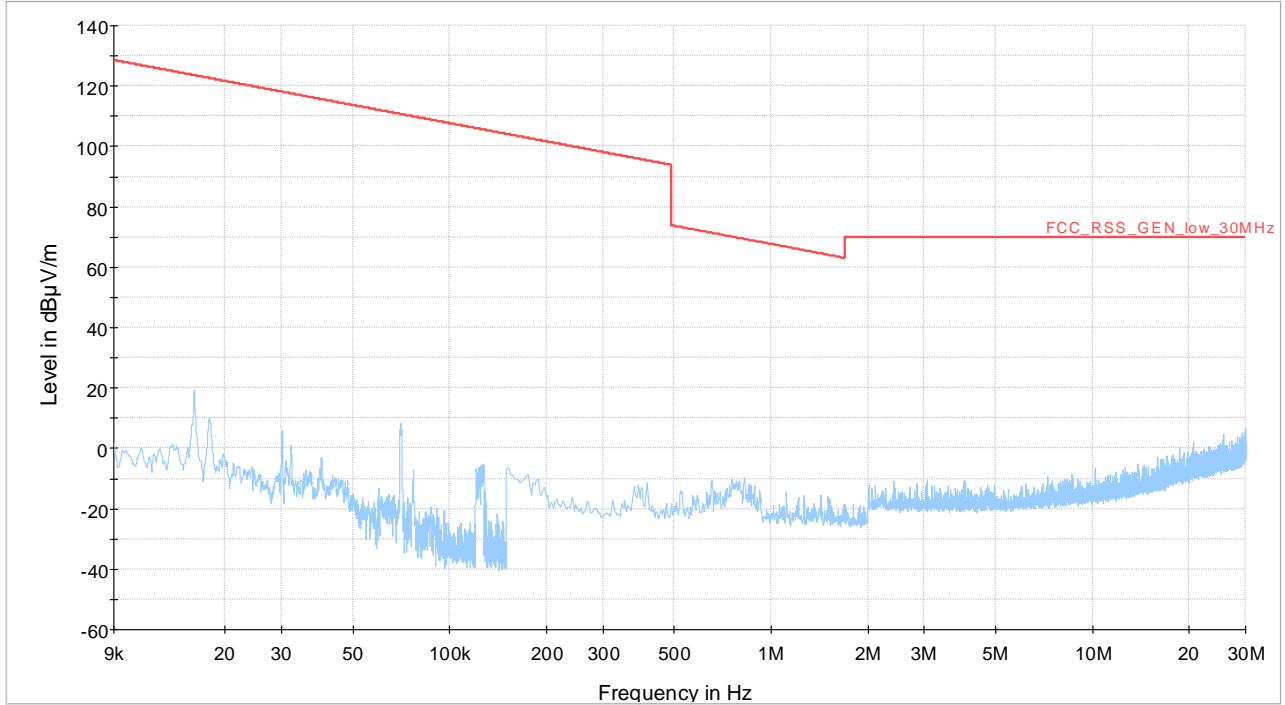
CHANNEL	74
OPERATING CONDITION	#1
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

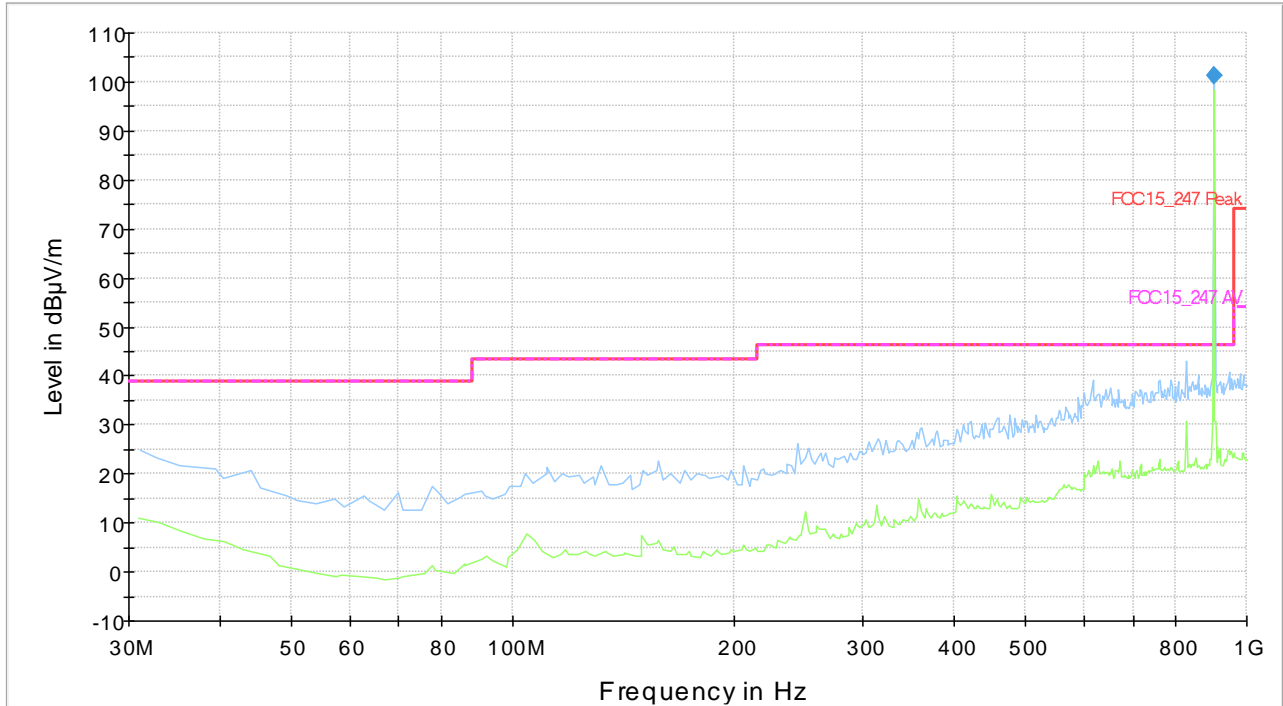
OPERATING CONDITION	#2
CHANNEL	0
FREQUENCY RANGE	9kHz - 30MHz



— FCC_RSS_GEN_low_30MHz — MaxPeak-ClearWrite-PK+

CHANNEL	0
OPERATING CONDITION	#2
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC



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

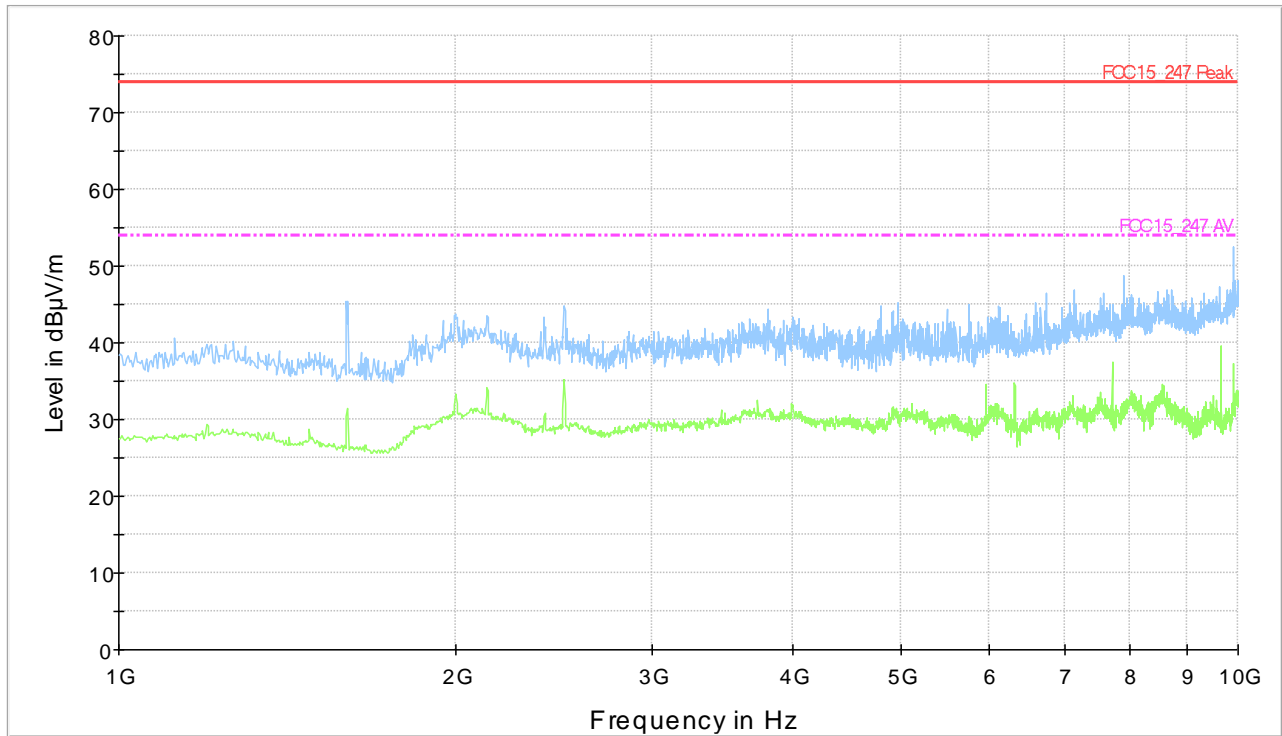
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	101.2	1000.0	120.000	99.8	V	-8.0	34.9	-54.80	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#2
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

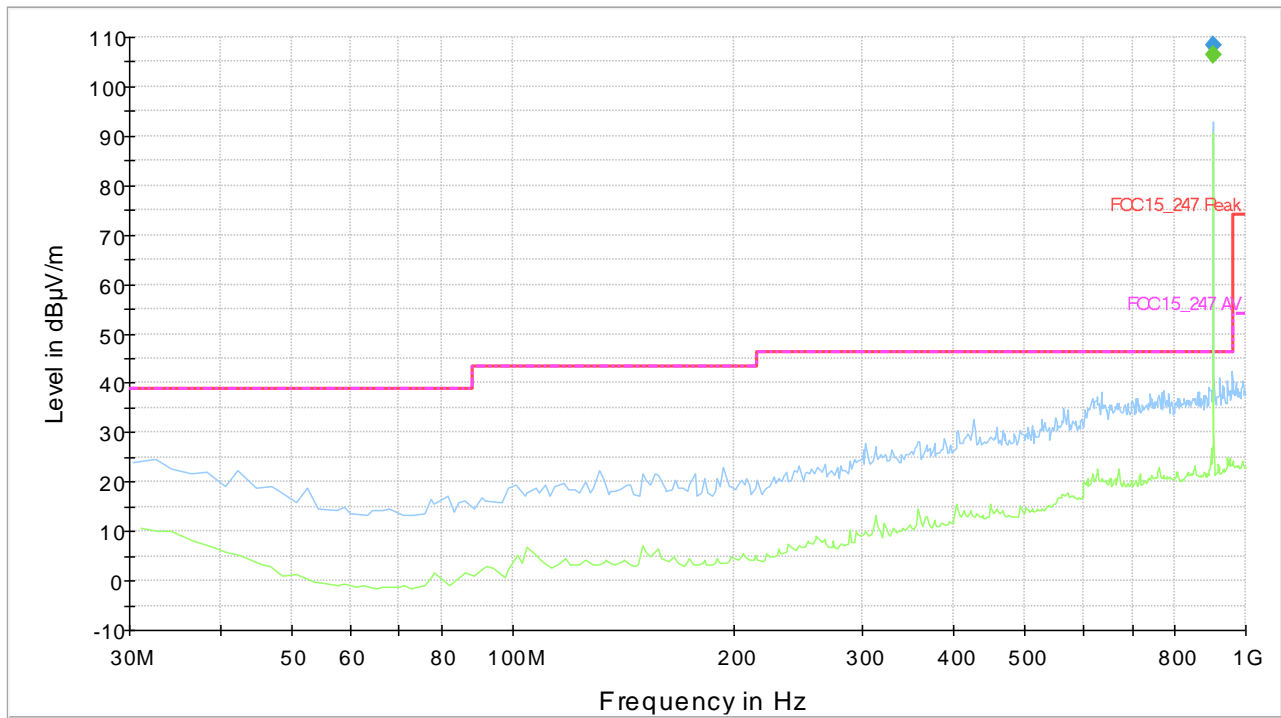
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	0
OPERATING CONDITION	#2
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.520000	108.4	70.0	120.000	123.8	H	7.0	34.9	-62.00	46.40

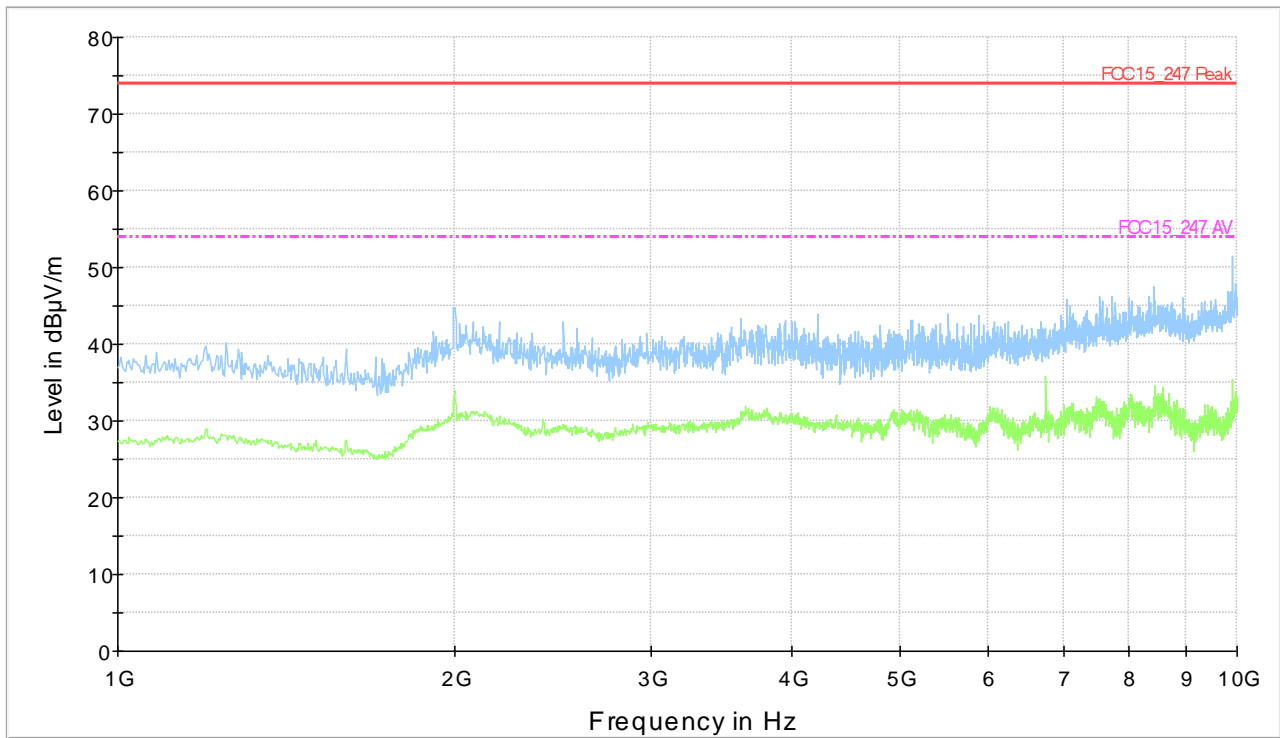
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	106.3	70.0	120.000	124.8	H	7.0	34.9	-59.90	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#2
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

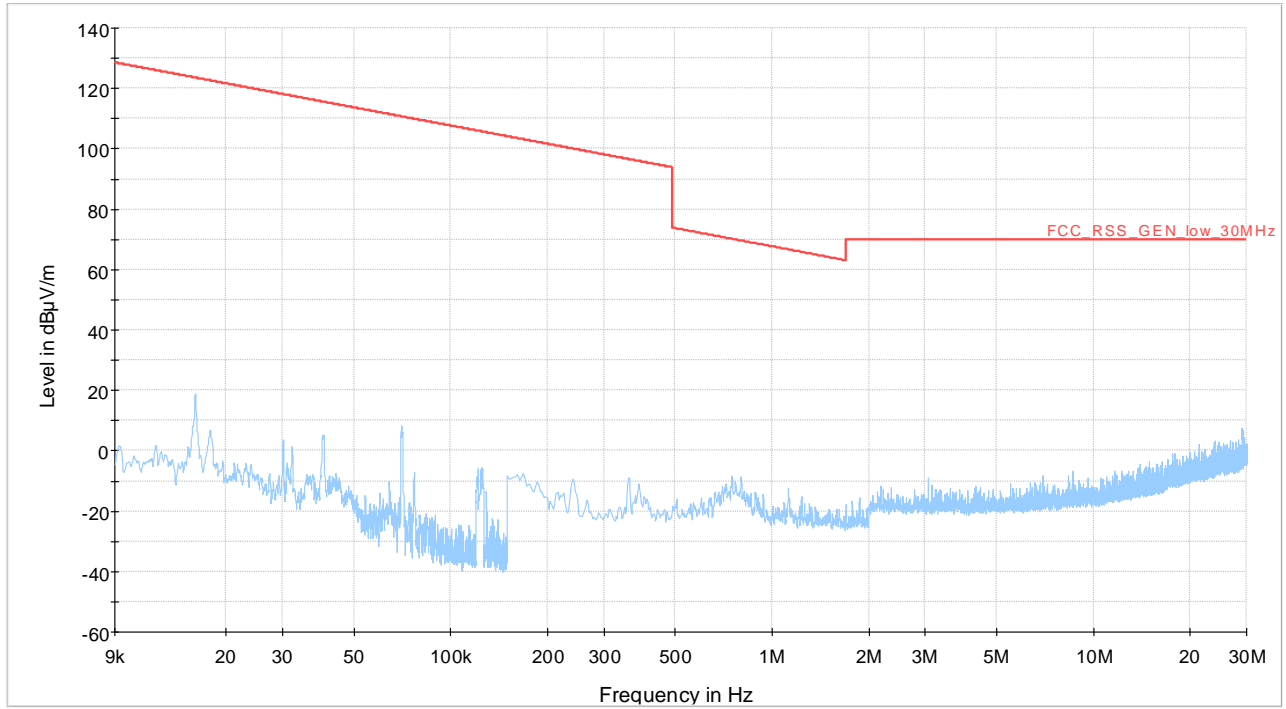
Emissione Radiata_FCC



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

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

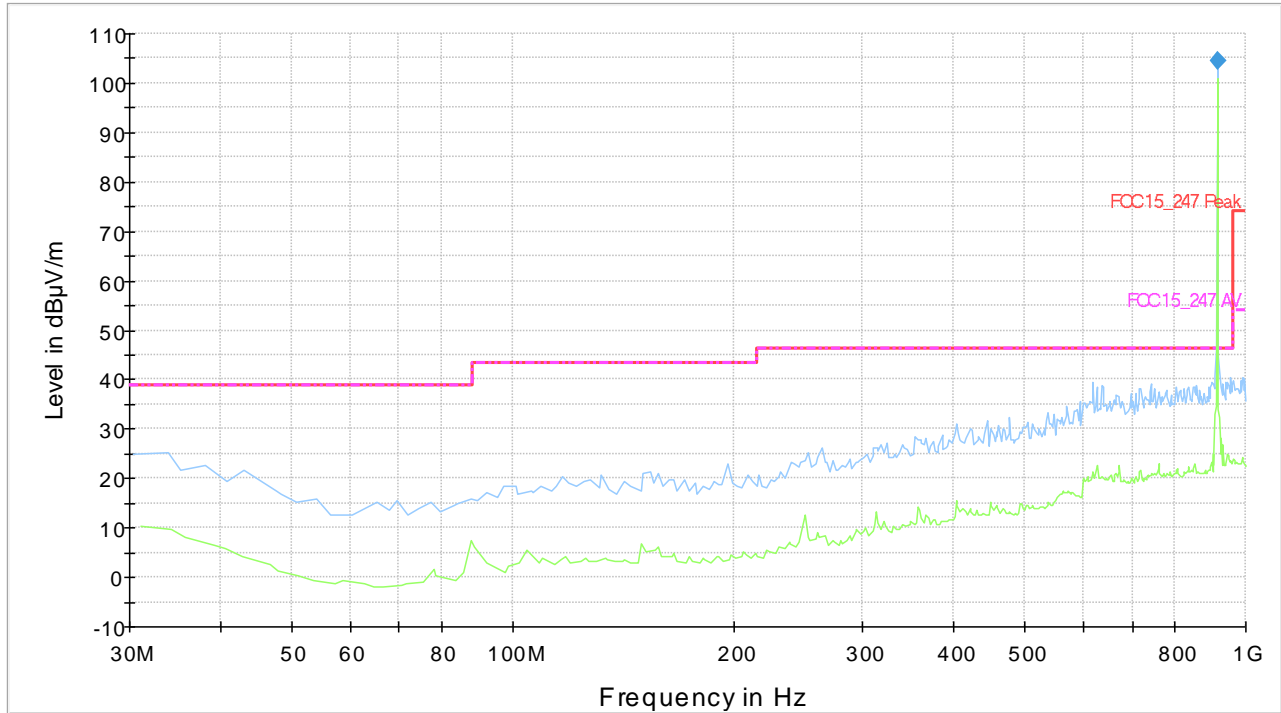
CHANNEL	37
OPERATING CONDITION	#2
FREQUENCY RANGE	9kHz - 30MHz



— FCC_RSS_GEN_low_30MHz — MaxPeak-ClearWrite-PK+

CHANNEL	37
OPERATING CONDITION	#2
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC



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

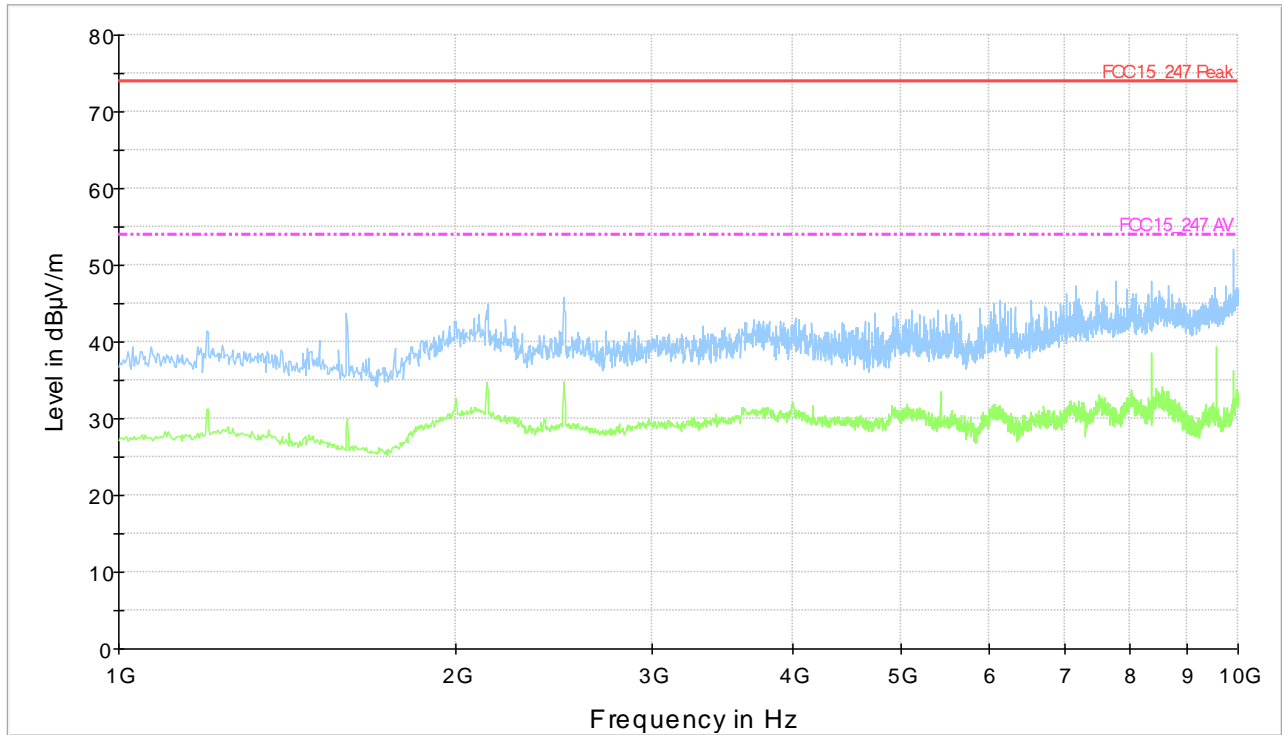
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
914.970000	104.5	1000.0	120.000	99.7	V	-6.0	35.3	-58.10	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	37
OPERATING CONDITION	#2
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

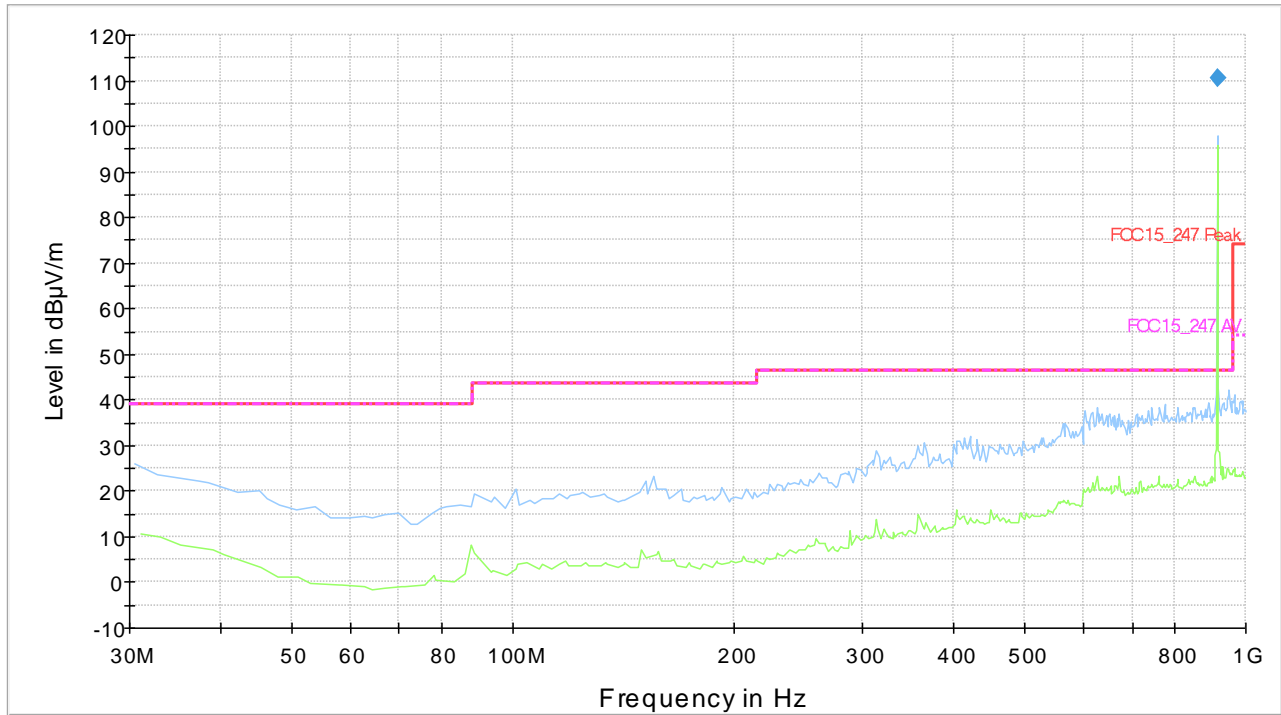
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	37
OPERATING CONDITION	#2
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

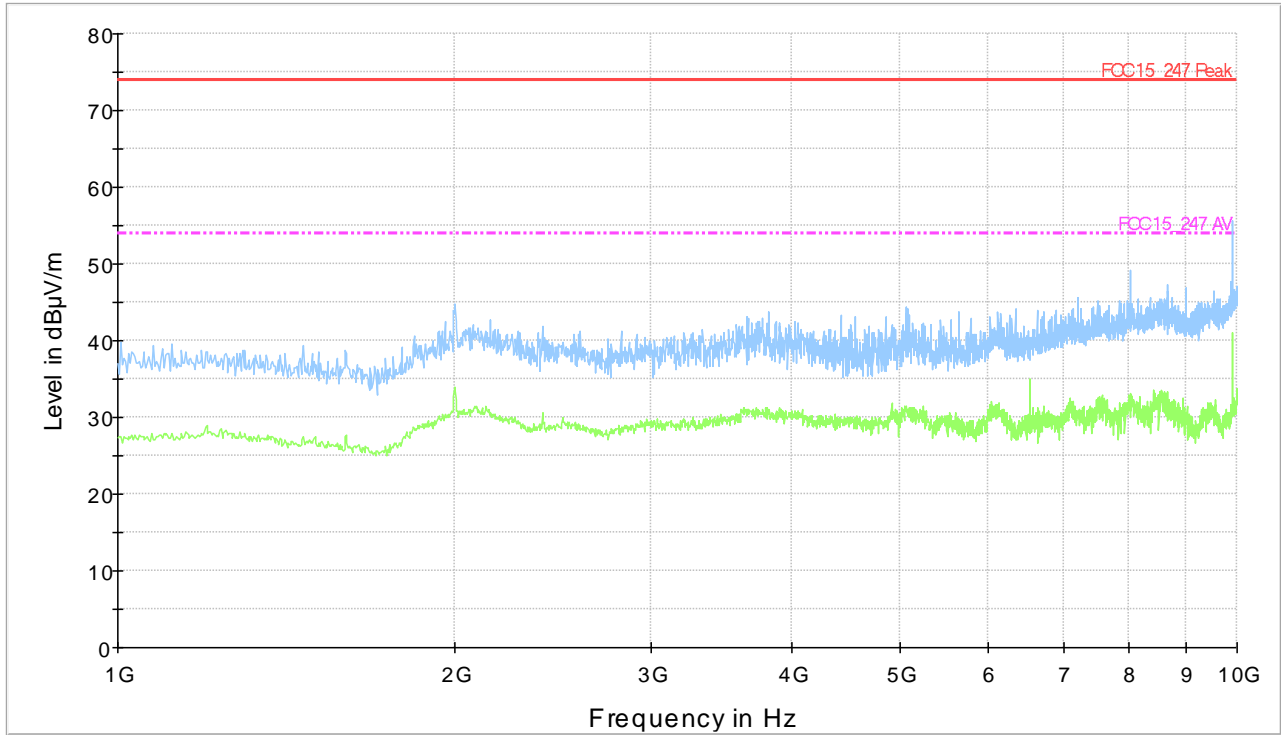
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.000000	110.6	1000.0	120.000	125.7	H	7.0	35.3	-64.20	46.40

*Peaks out of limits are due to the radio carrier

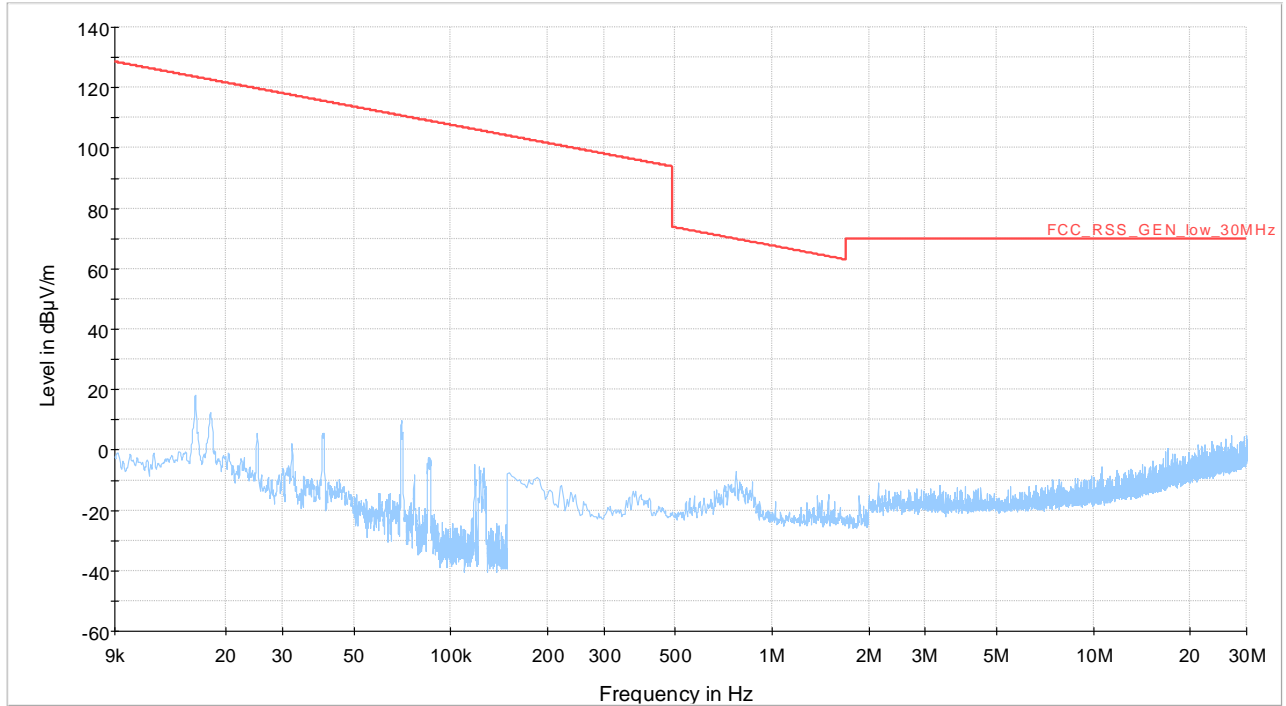
CHANNEL	37
OPERATING CONDITION	#2
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

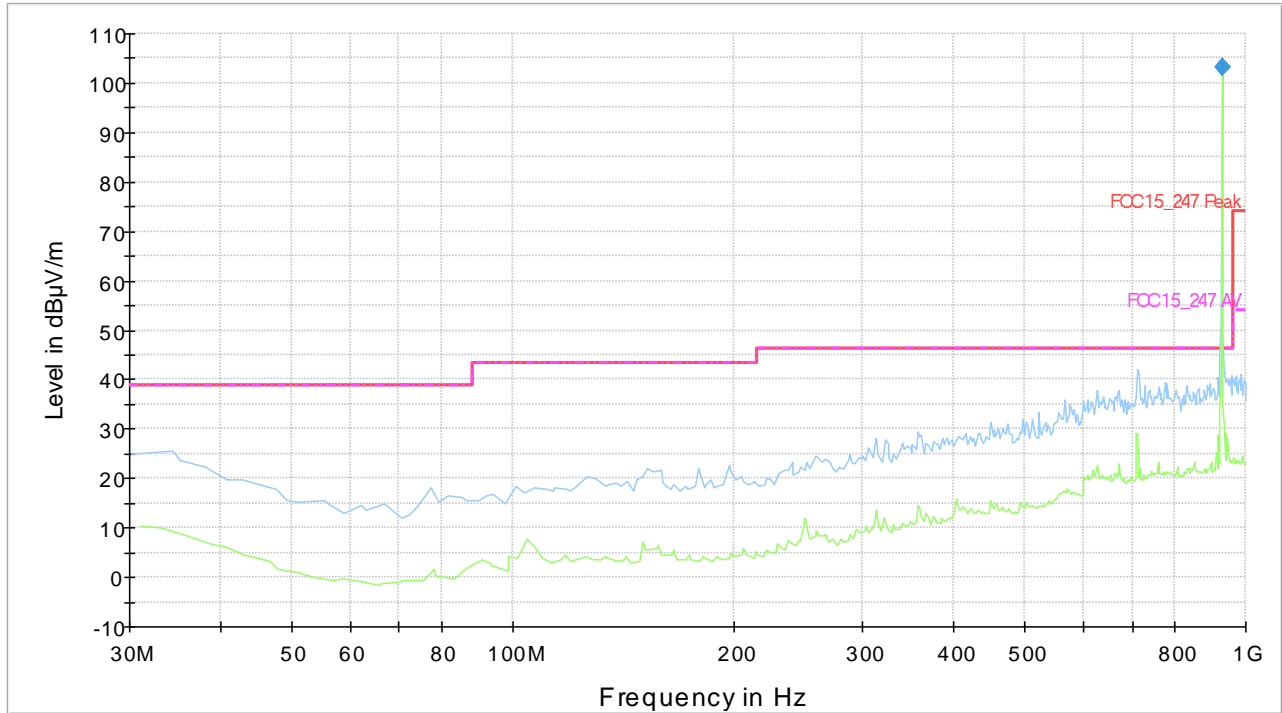
CHANNEL	74
OPERATING CONDITION	#2
FREQUENCY RANGE	9kHz - 30MHz



— FCC_RSS_GEN_low_30MHz — MaxPeak-ClearWrite-PK+ * Data Reduction Result 1 [1]-PK+

CHANNEL	74
OPERATING CONDITION	#2
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC



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

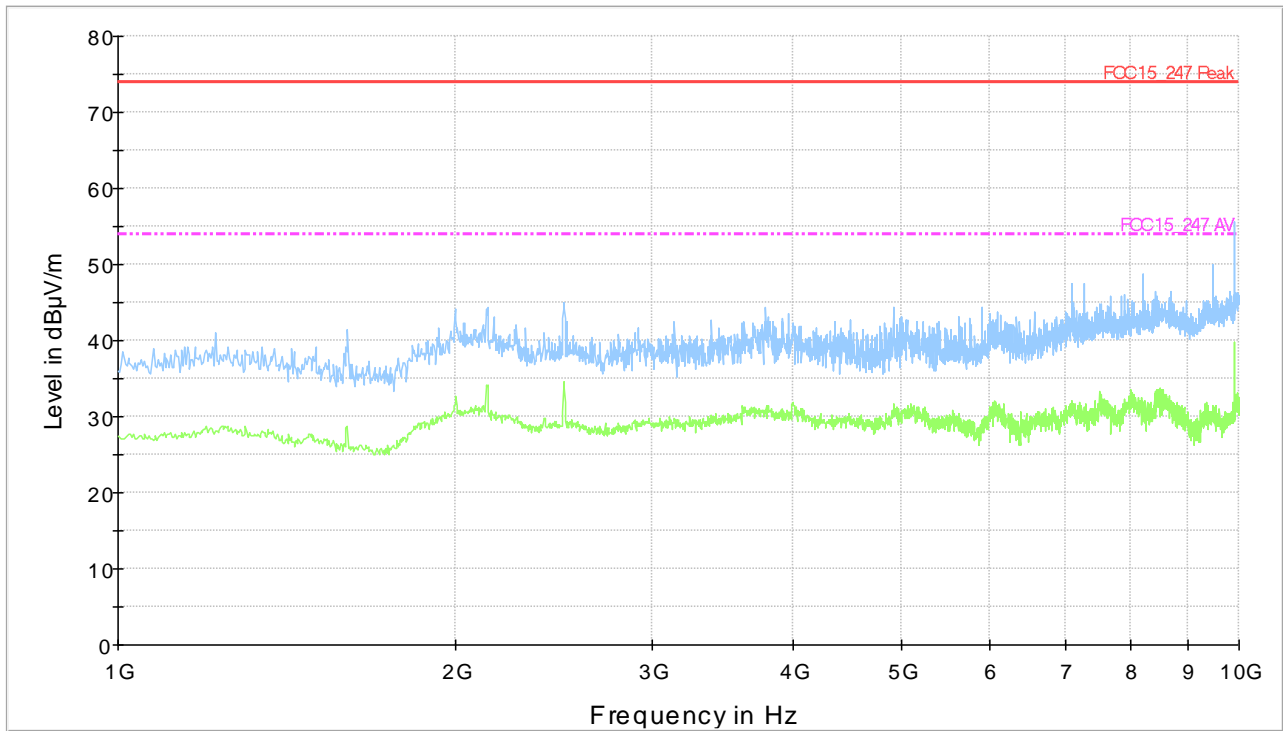
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	103.3	1000.0	120.000	99.9	V	-8.0	35.8	-56.90	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	74
OPERATING CONDITION	#2
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

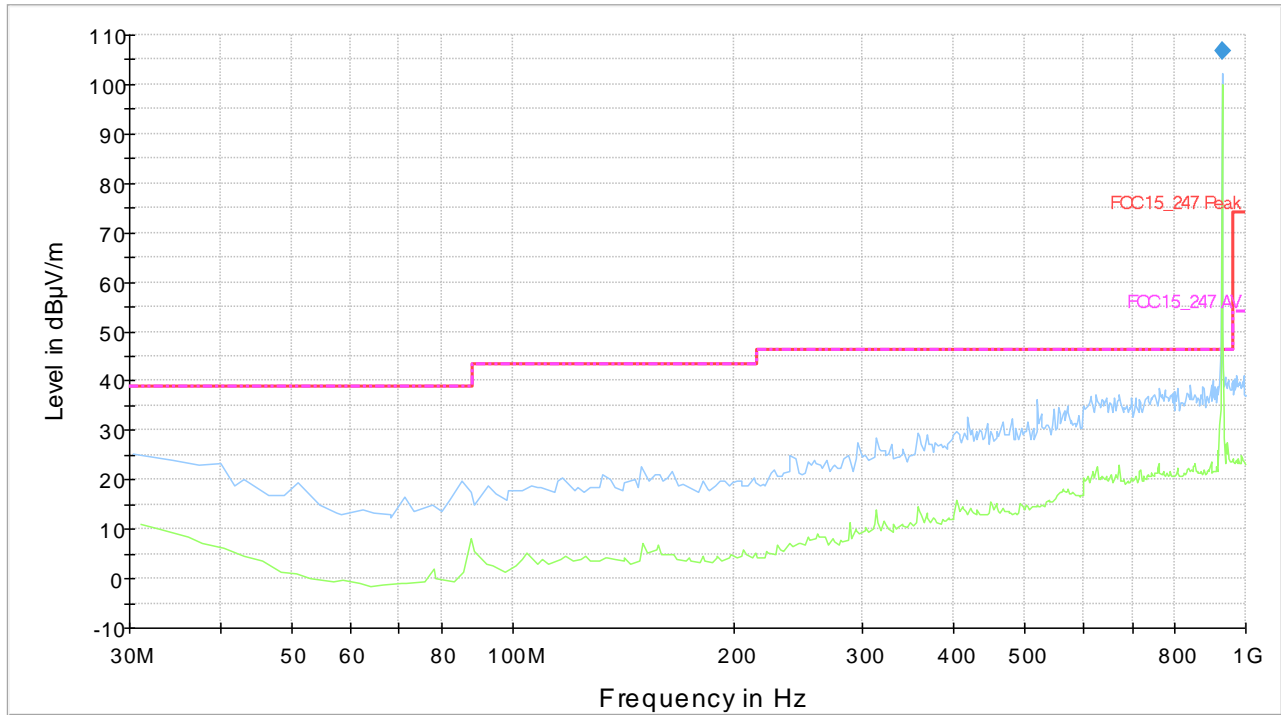
Emissione Radiata_FCC



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

CHANNEL	74
OPERATING CONDITION	#2
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

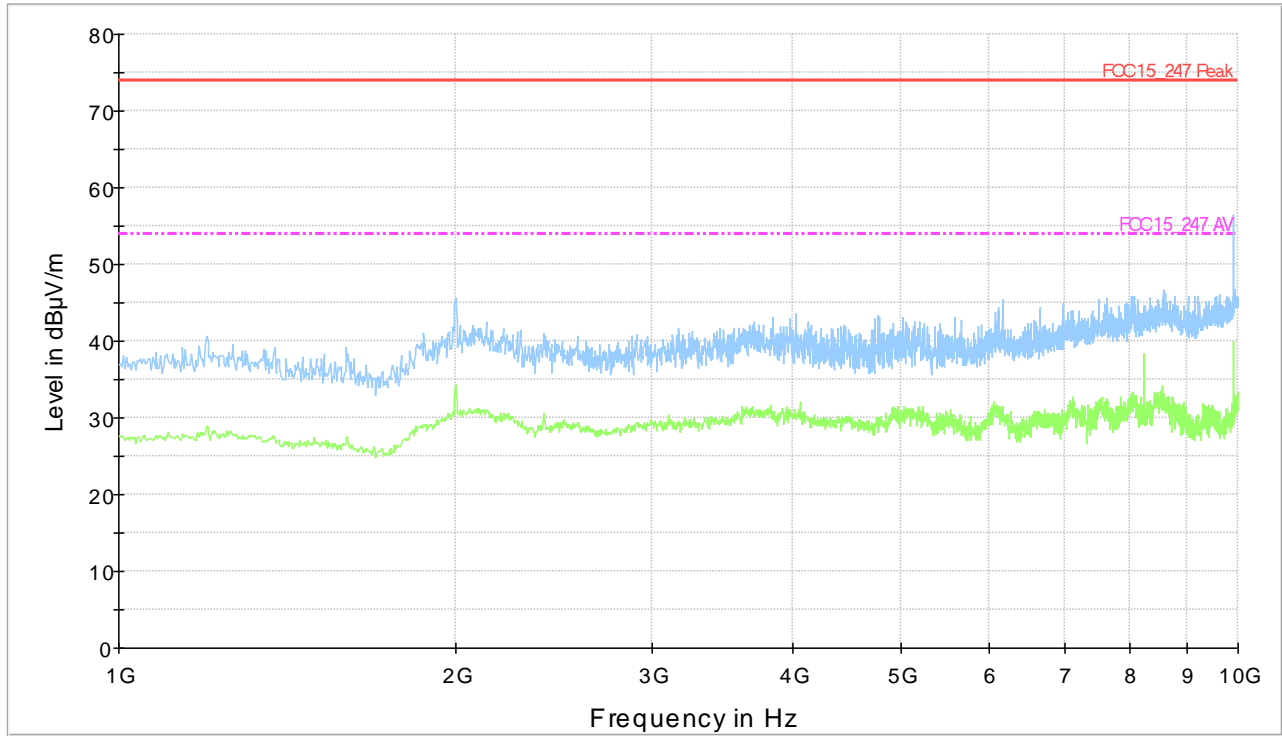
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	106.8	1000.0	120.000	155.7	H	7.0	35.8	-60.40	46.40

*Peaks out of limits are due to the radio carrier

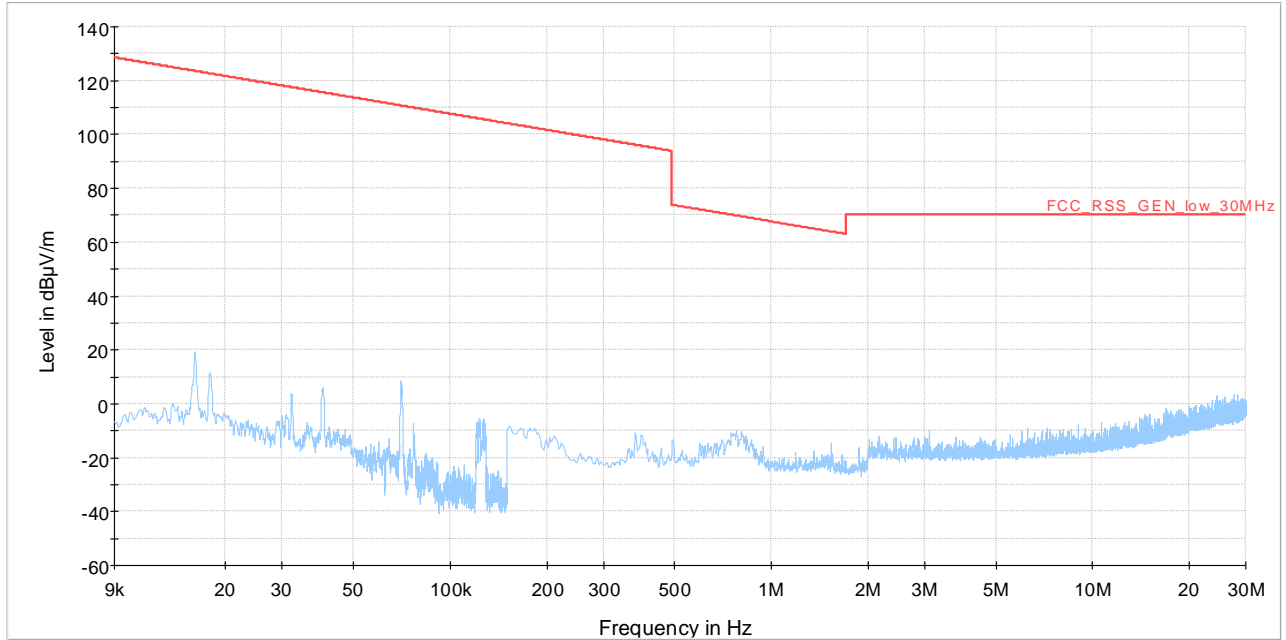
CHANNEL	74
OPERATING CONDITION	#2
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

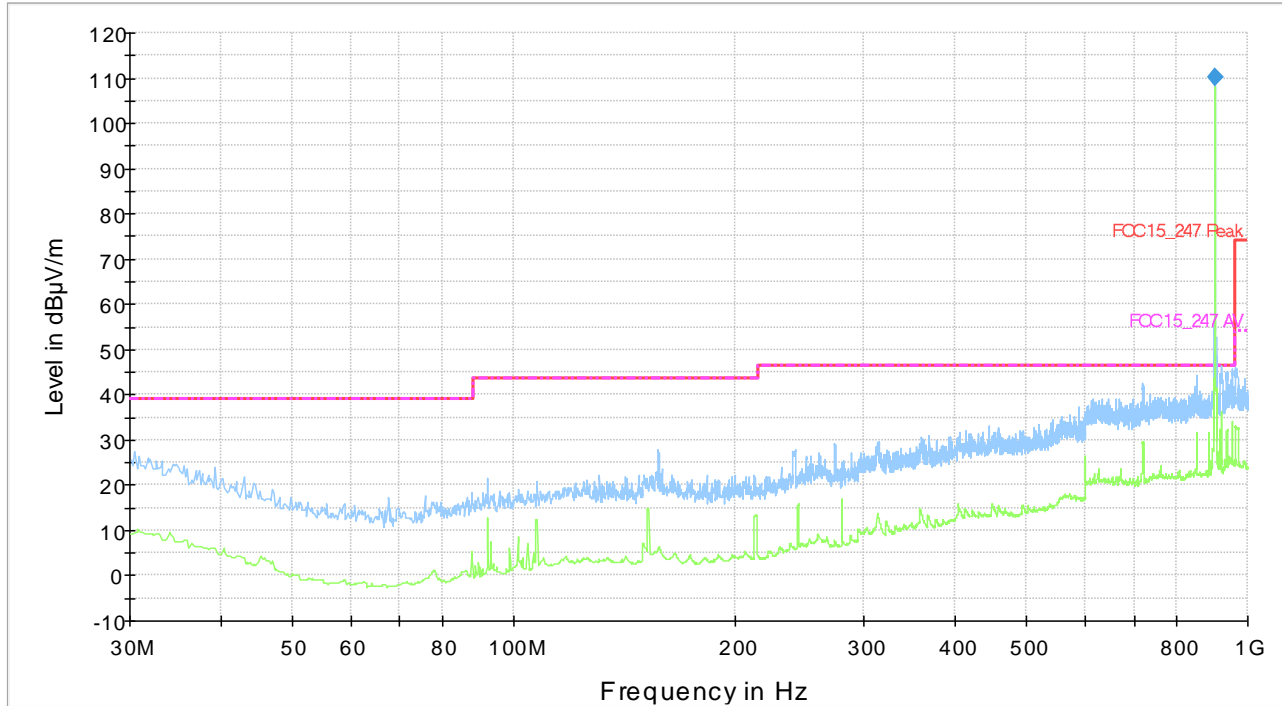
OPERATING CONDITION	#3
CHANNEL	0
FREQUENCY RANGE	9kHz - 30MHz



FCC_RSS_GEN_low_30MHz — Preview Result 1-PK+

CHANNEL	0
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC



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

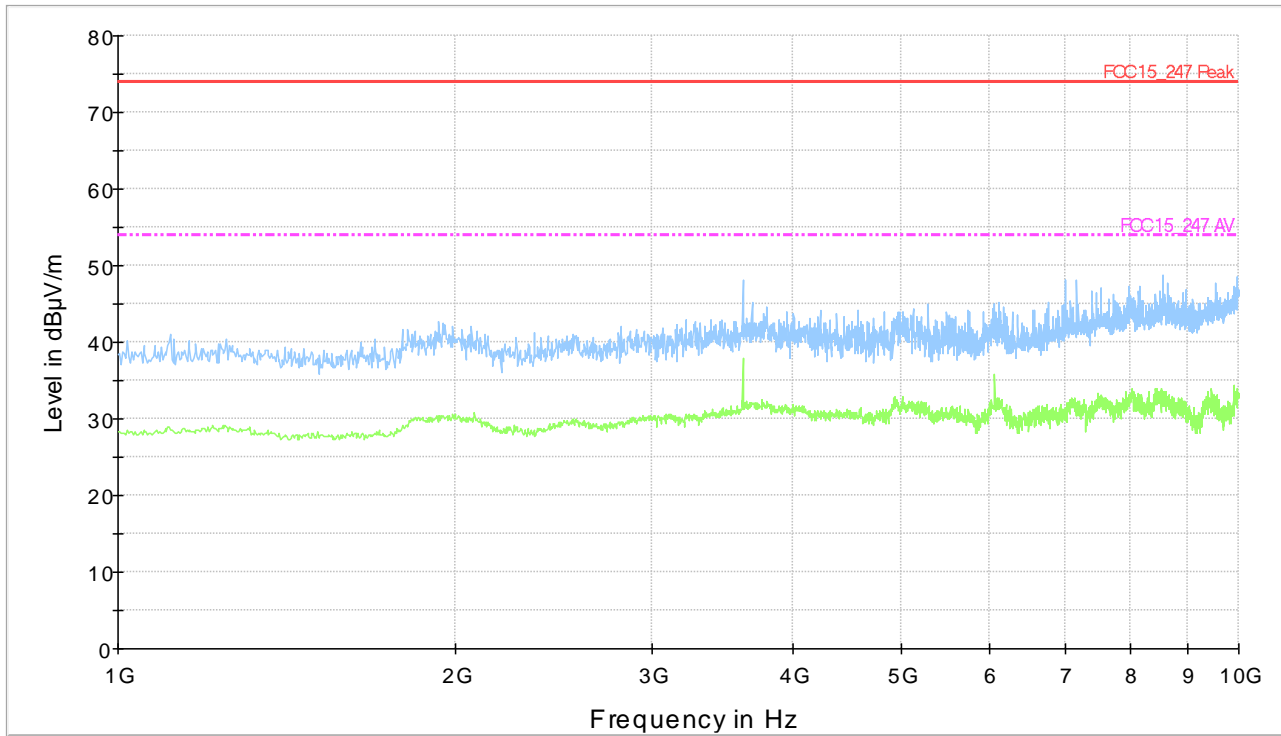
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.520000	110.3	1000.0	120.000	99.7	V	97.0	34.9	-63.90	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#3
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

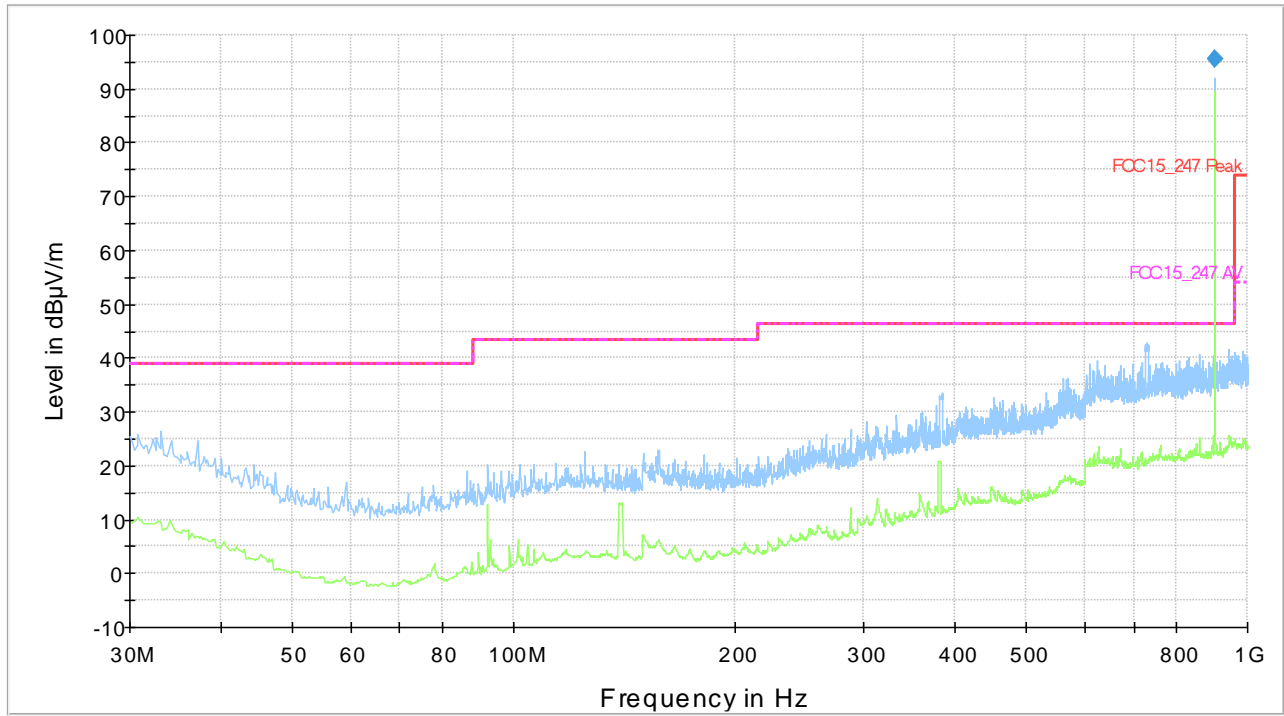
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	0
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

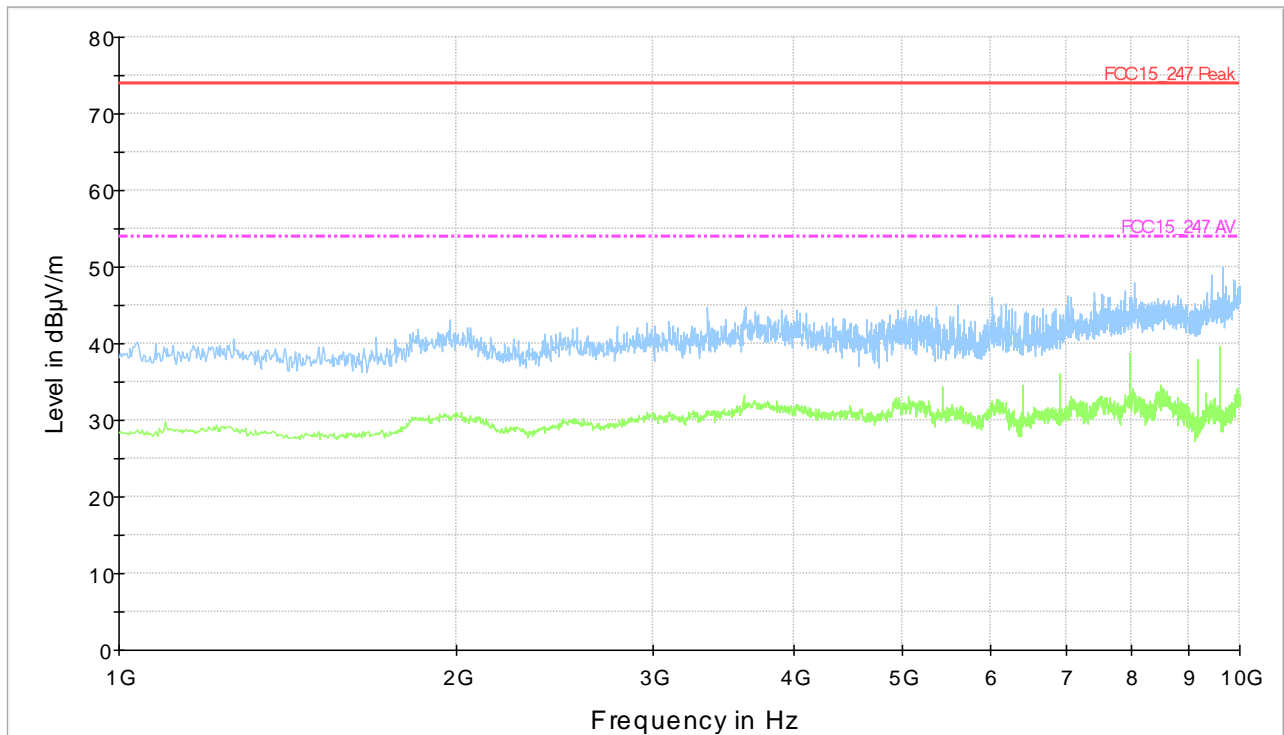
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.430000	95.5	1000.0	120.000	180.2	H	7.0	34.9	-49.10	46.40

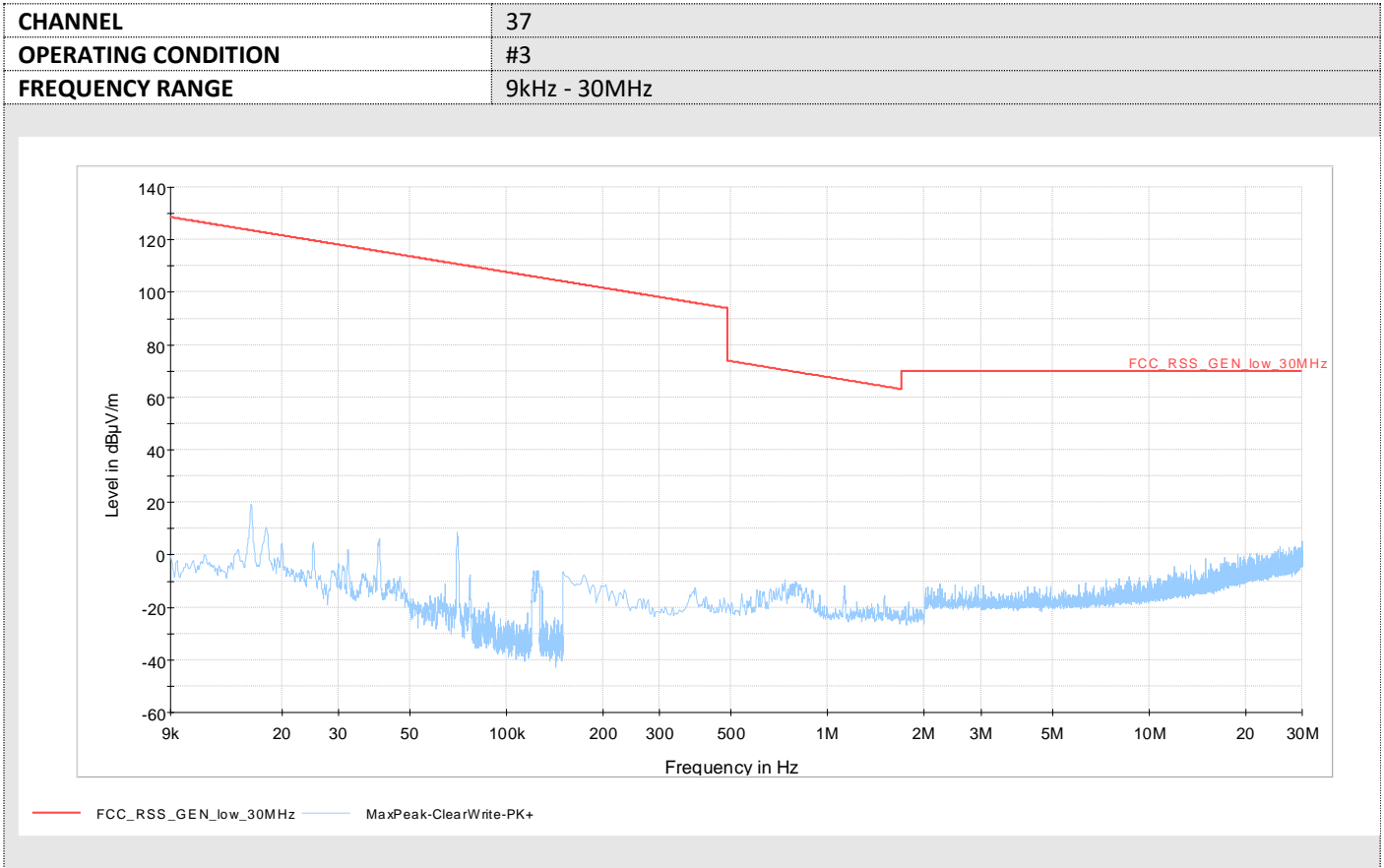
*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#3
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC

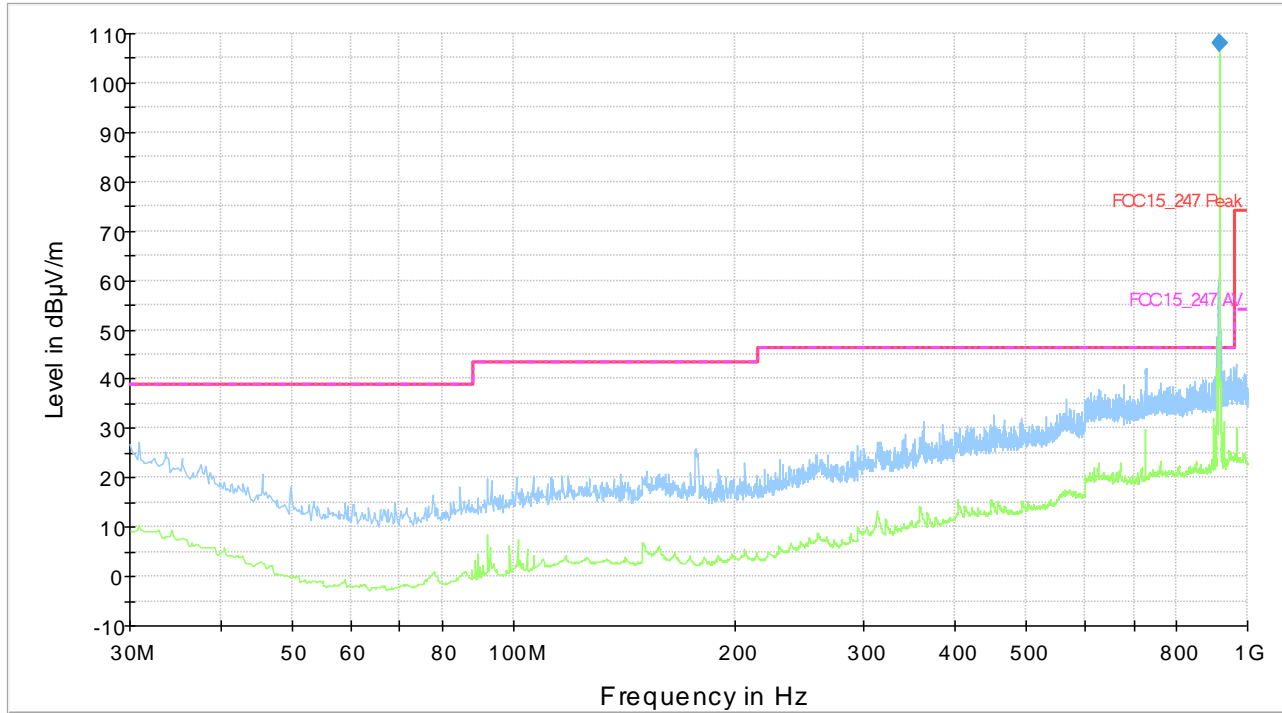


— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG



CHANNEL	37
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC



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

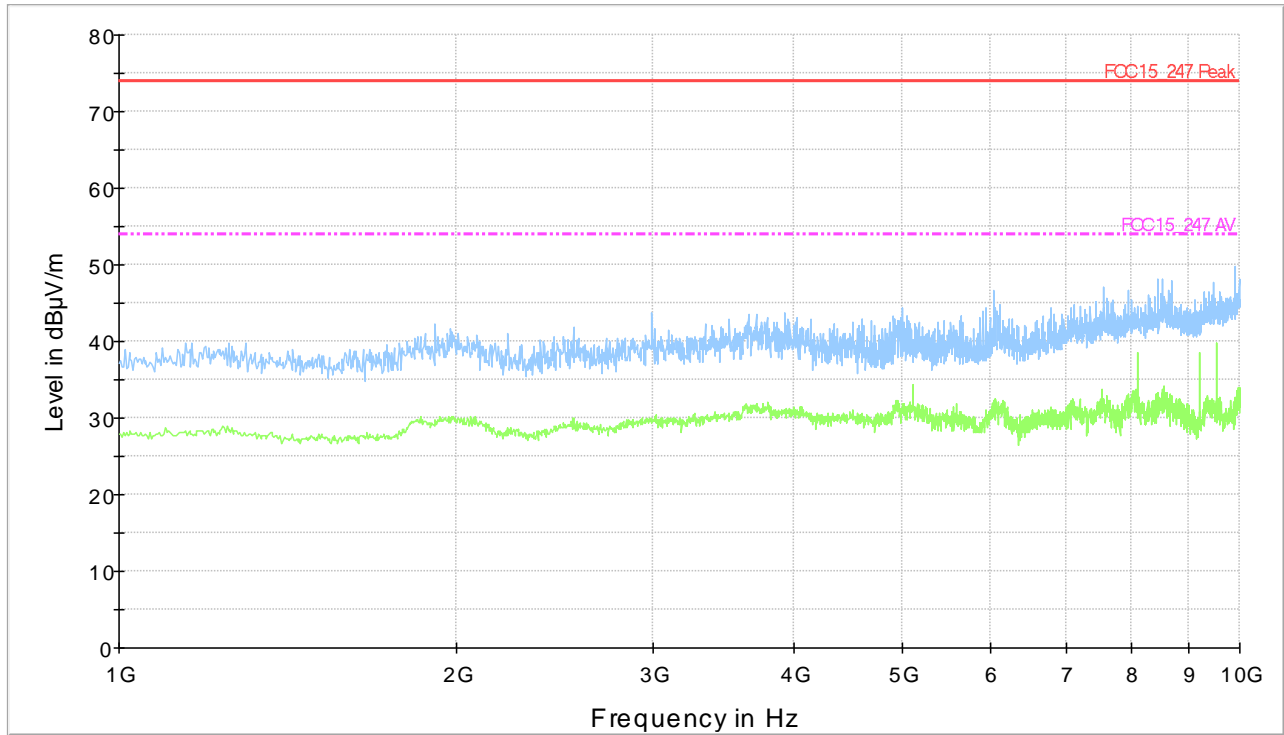
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.030000	108.1	1000.0	120.000	99.8	V	-3.0	35.3	-61.70	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	37
OPERATING CONDITION	#3
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

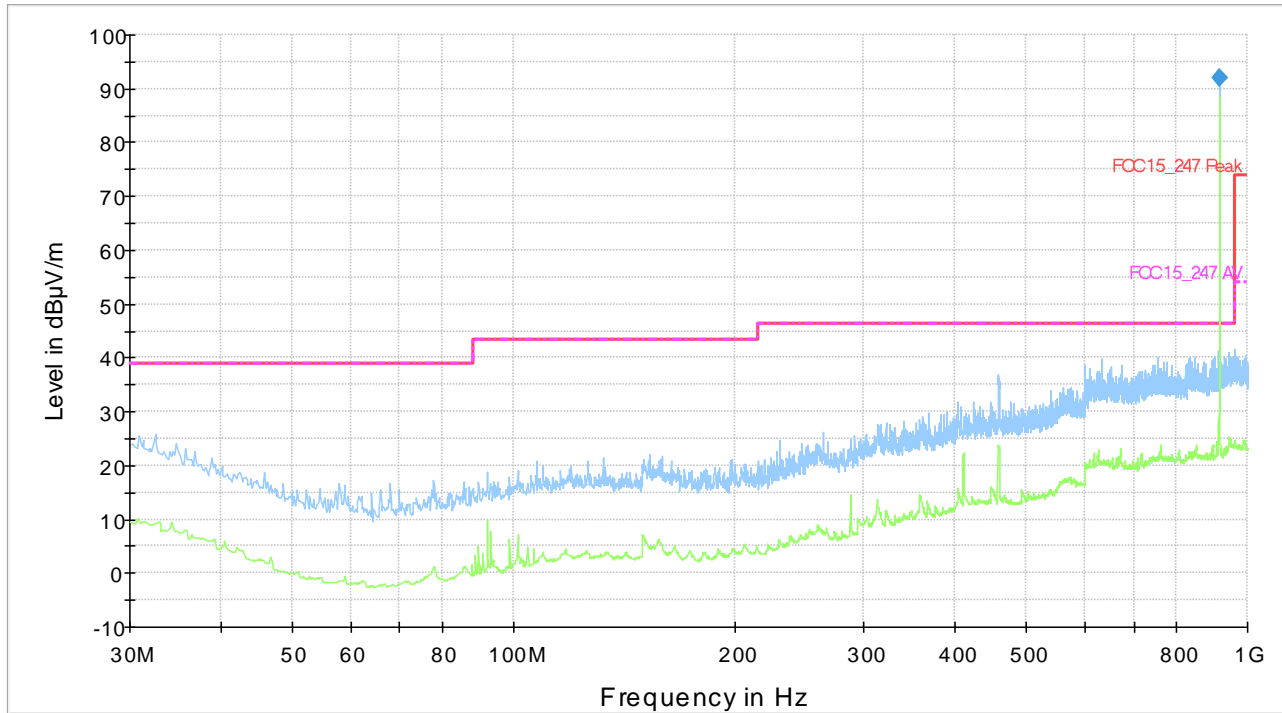
Emissione Radiata_FCC



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

CHANNEL	37
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

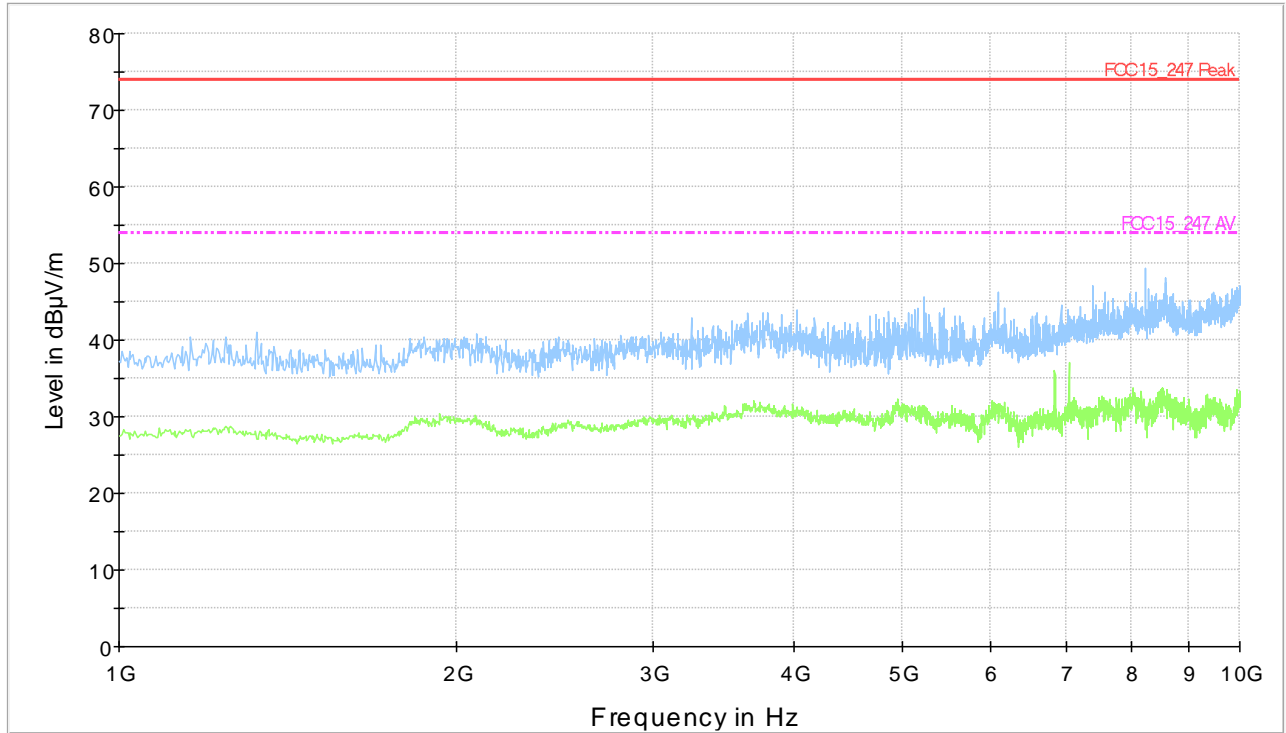
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.000000	91.9	1000.0	120.000	99.7	H	-8.0	35.3	-45.50	46.40

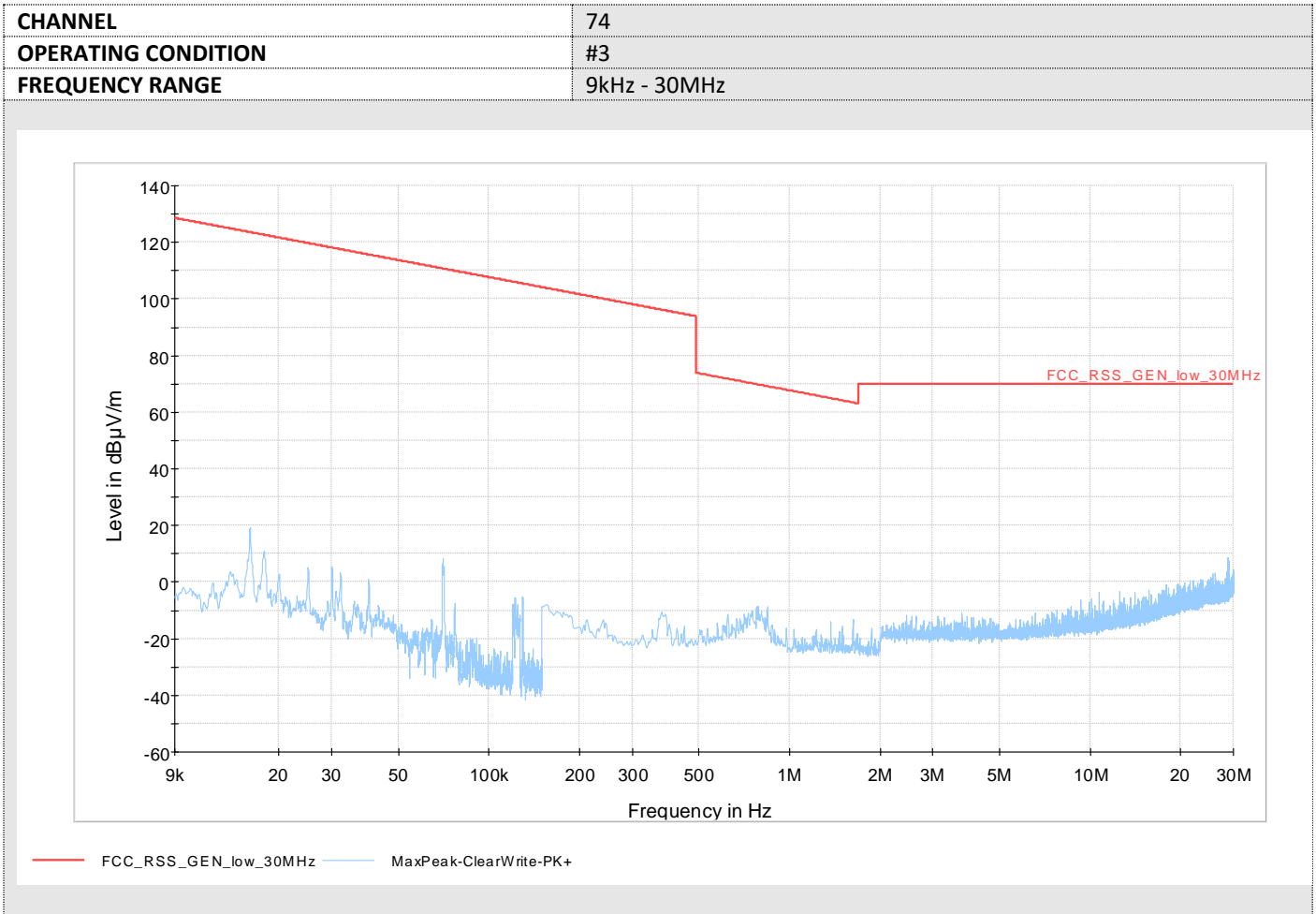
*Peaks out of limits are due to the radio carrier

CHANNEL	37
OPERATING CONDITION	#3
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC

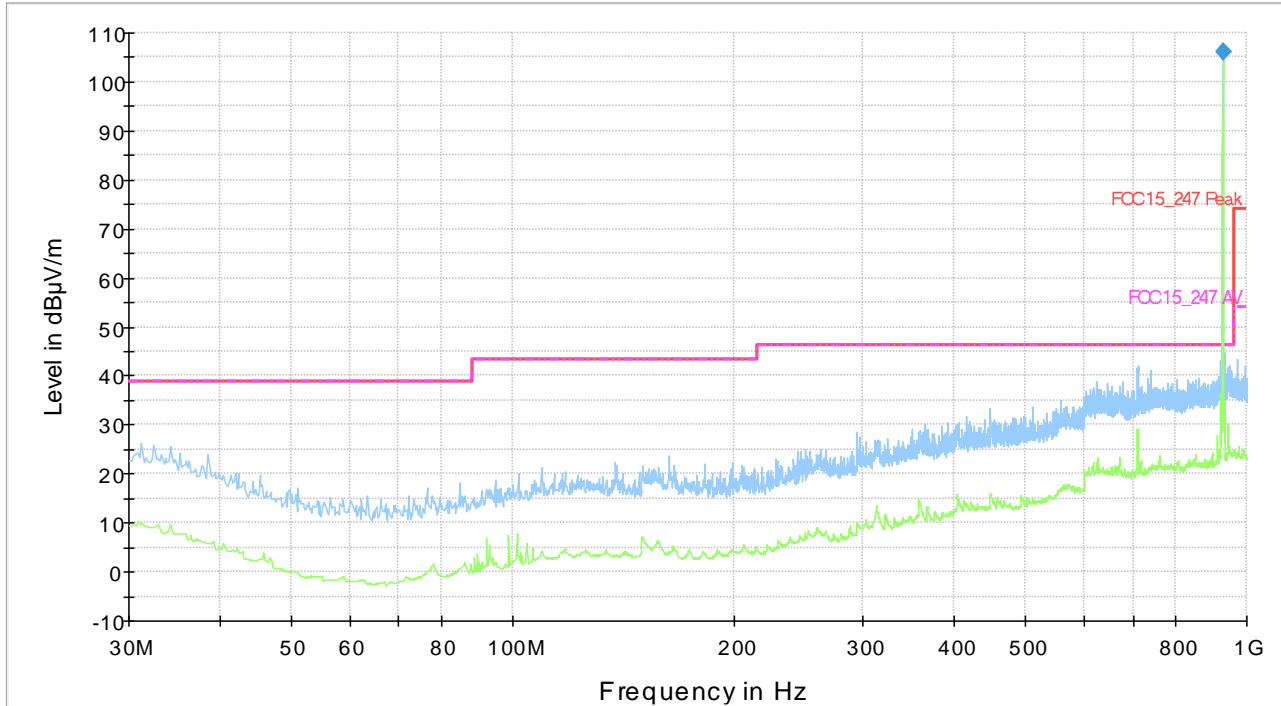


— FCC 15_247 Peak-CAR - - - - - FCC 15_247 AV-CAR — MaxPeak-ClearWrite-PK+ — Average-ClearWrite-AVG



CHANNEL	74
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC



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

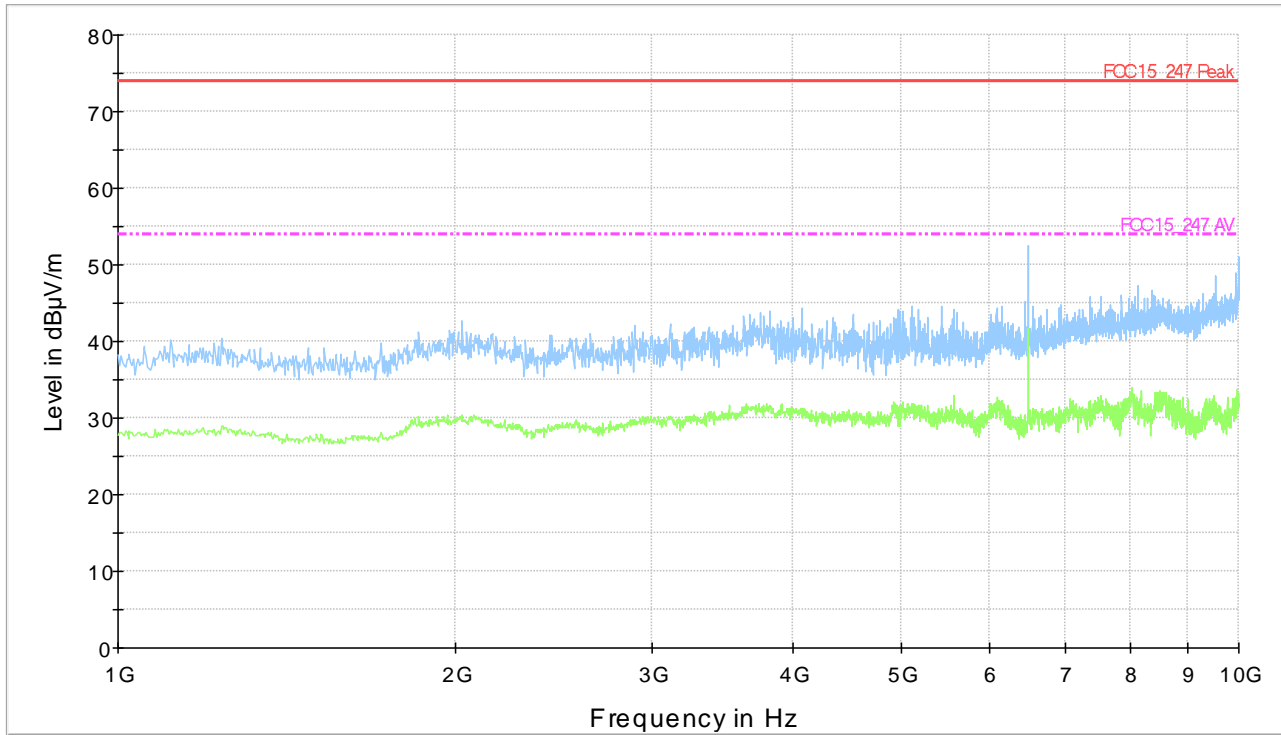
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.630000	106.0	1000.0	120.000	173.7	V	0.0	35.8	-59.60	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	74
OPERATING CONDITION	#3
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

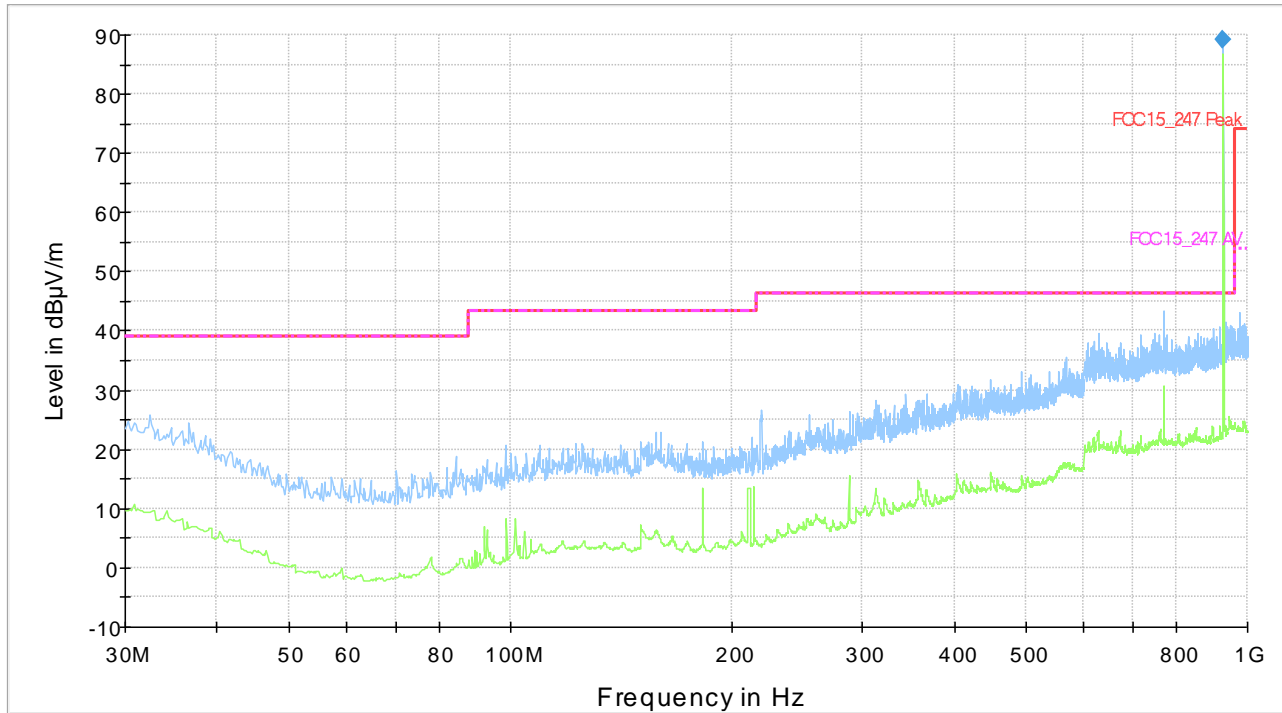
Emissione Radiata_FCC



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

CHANNEL	74
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

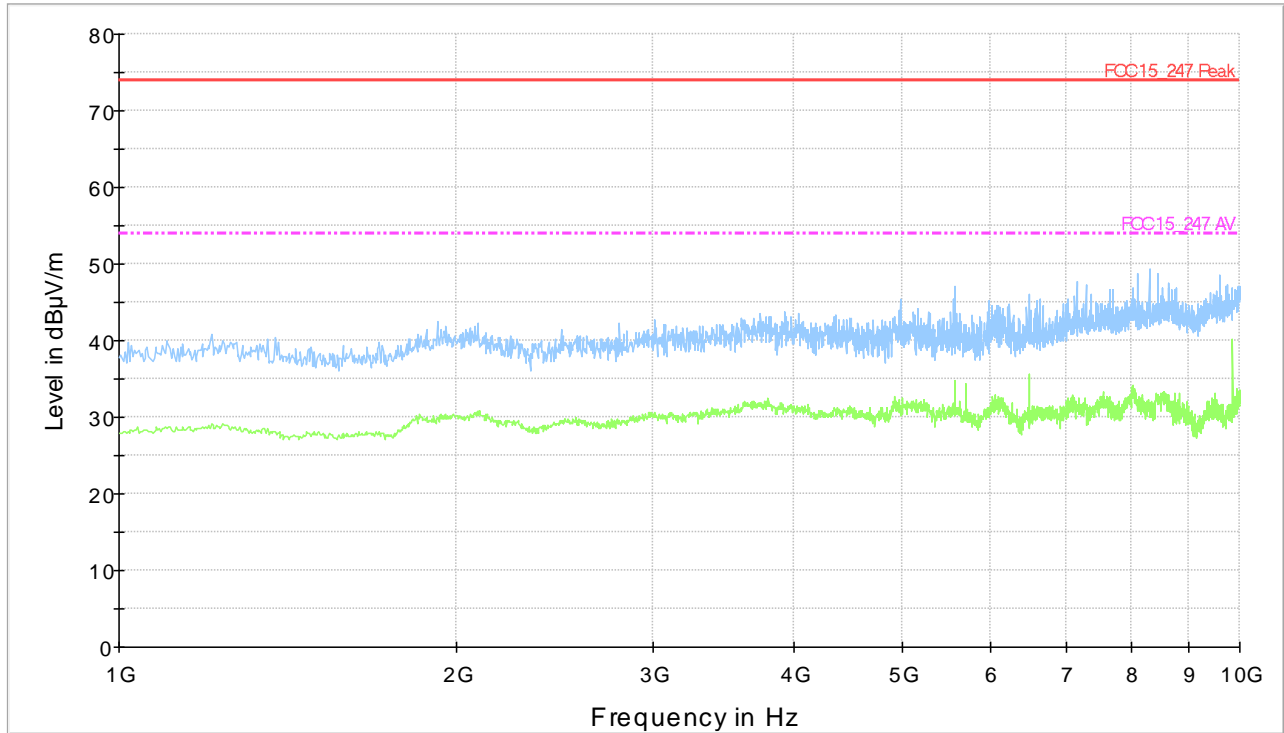
Final Result Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	89.3	1000.0	120.000	179.7	H	-4.0	35.8	-42.90	46.40

*Peaks out of limits are due to the radio carrier

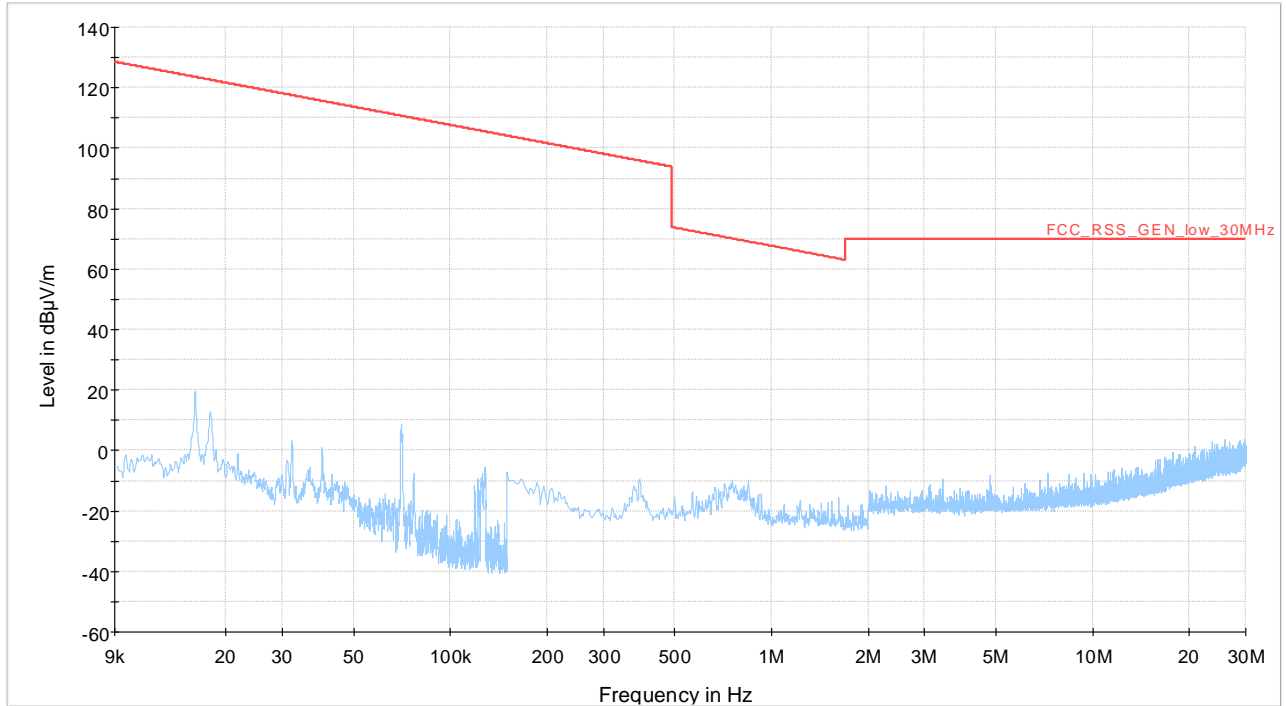
CHANNEL	74
OPERATING CONDITION	#3
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



— FCC_15_247 Peak-CAR - - - - FCC_15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

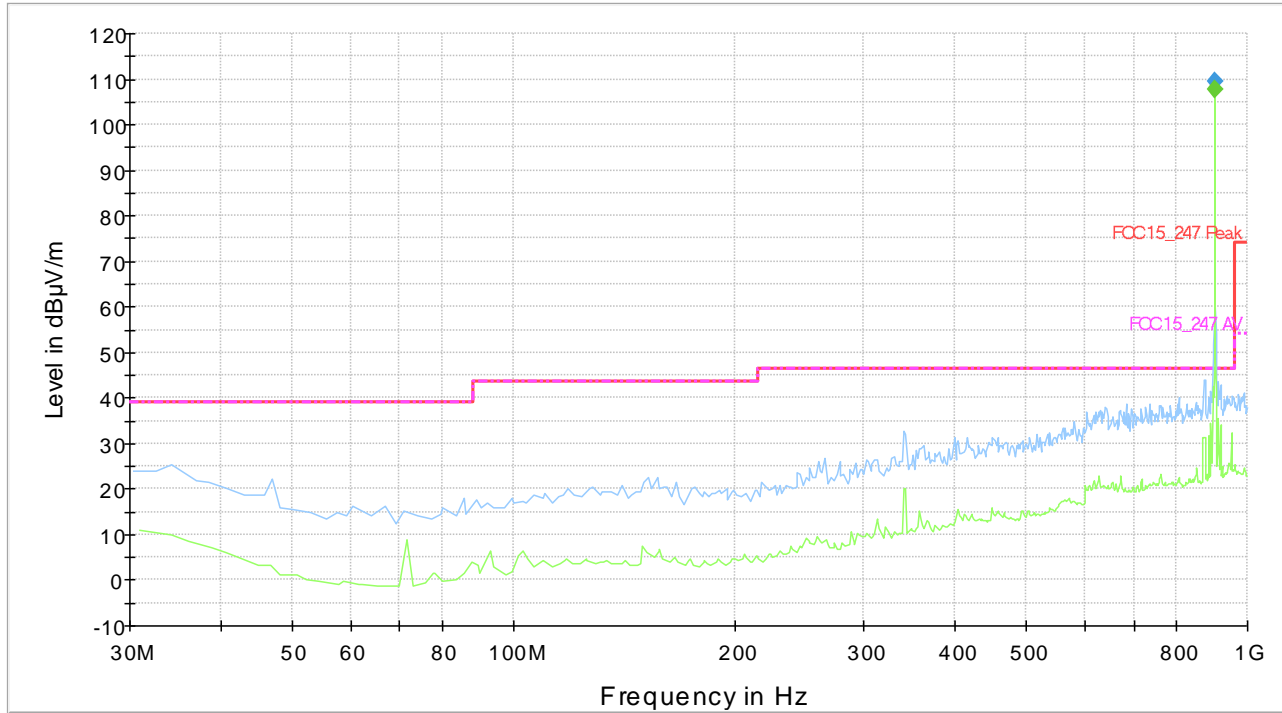
OPERATING CONDITION	#4
CHANNEL	0
FREQUENCY RANGE	9kHz - 30MHz



FCC_RSS_GEN_low_30MHz MaxPeak-ClearWrite-PK+

CHANNEL	0
OPERATING CONDITION	#3
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	109.4	70.0	120.000	99.7	V	-4.0	34.9	-63.00	46.40

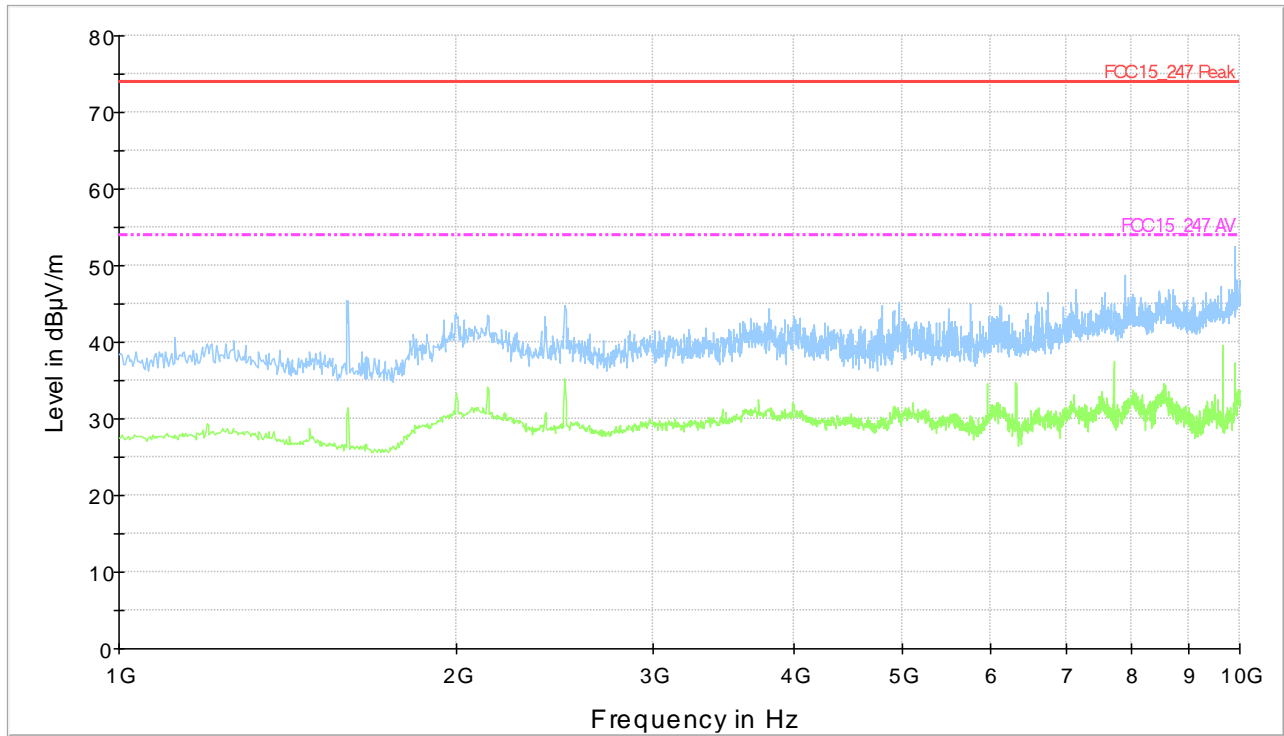
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	107.6	70.0	120.000	99.8	V	-4.0	34.9	-61.20	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	0
OPERATING CONDITION	#4
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

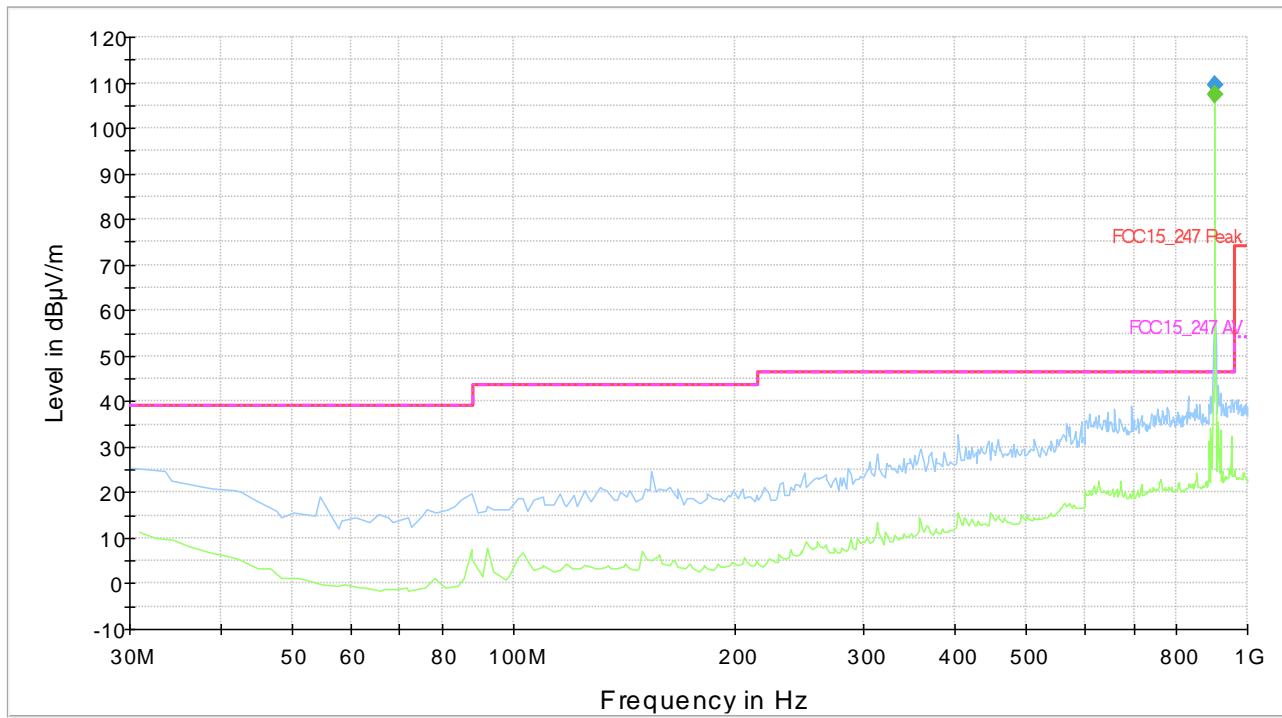
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	0
OPERATING CONDITION	#4
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	109.4	70.0	120.000	99.8	V	-3.0	34.9	-63.00	46.40

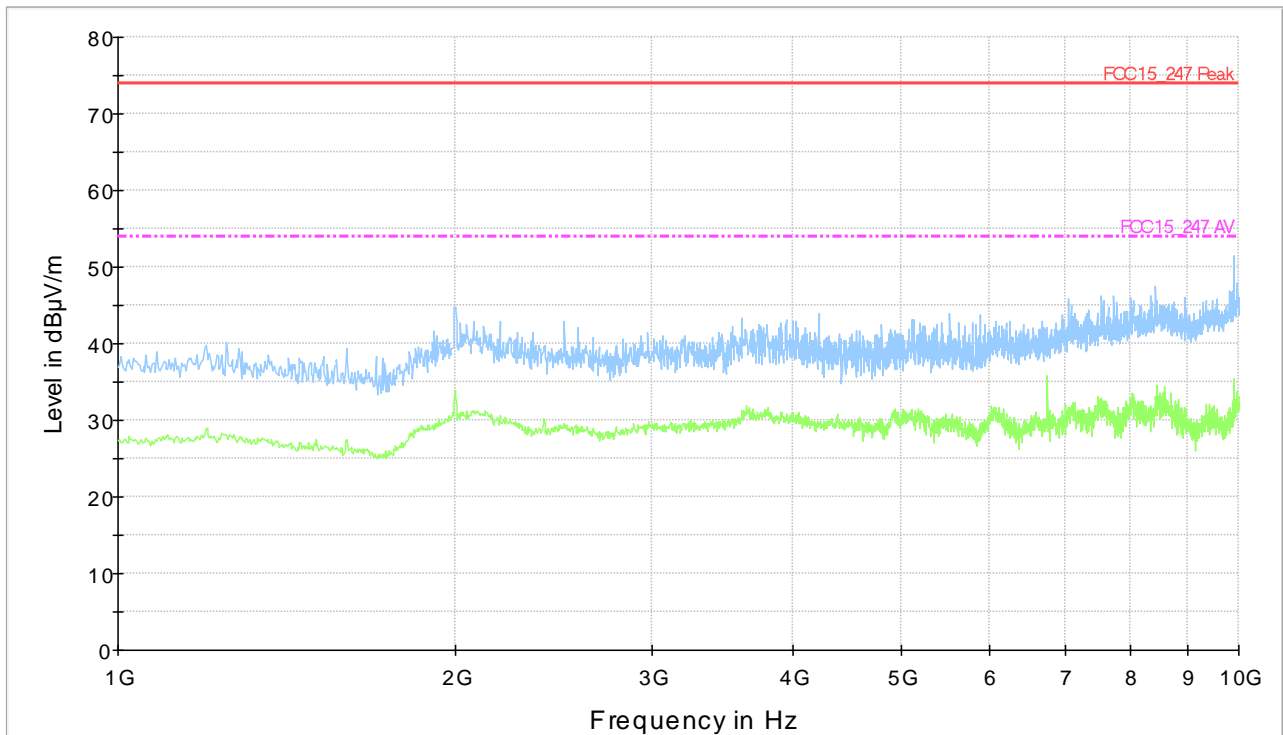
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
902.490000	107.5	70.0	120.000	99.7	V	-4.0	34.9	-61.10	46.40

*Peaks out of limits are due to the radio carrier

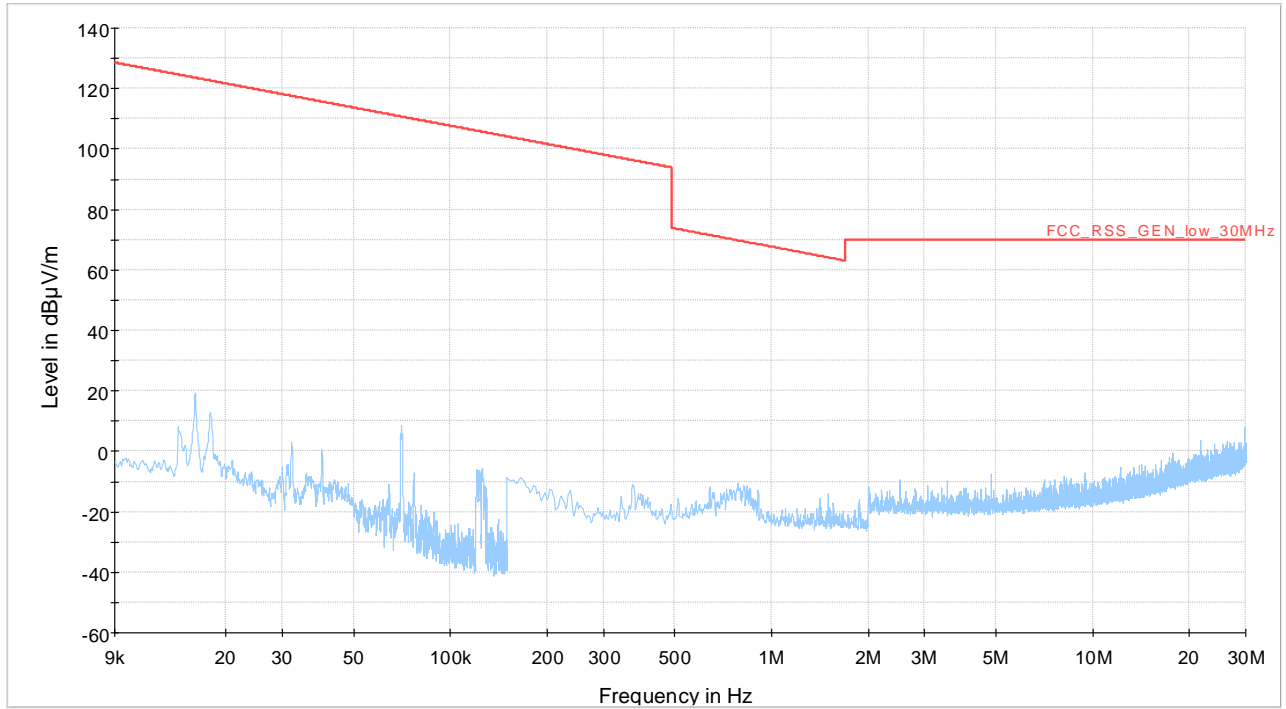
CHANNEL	0
OPERATING CONDITION	#4
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

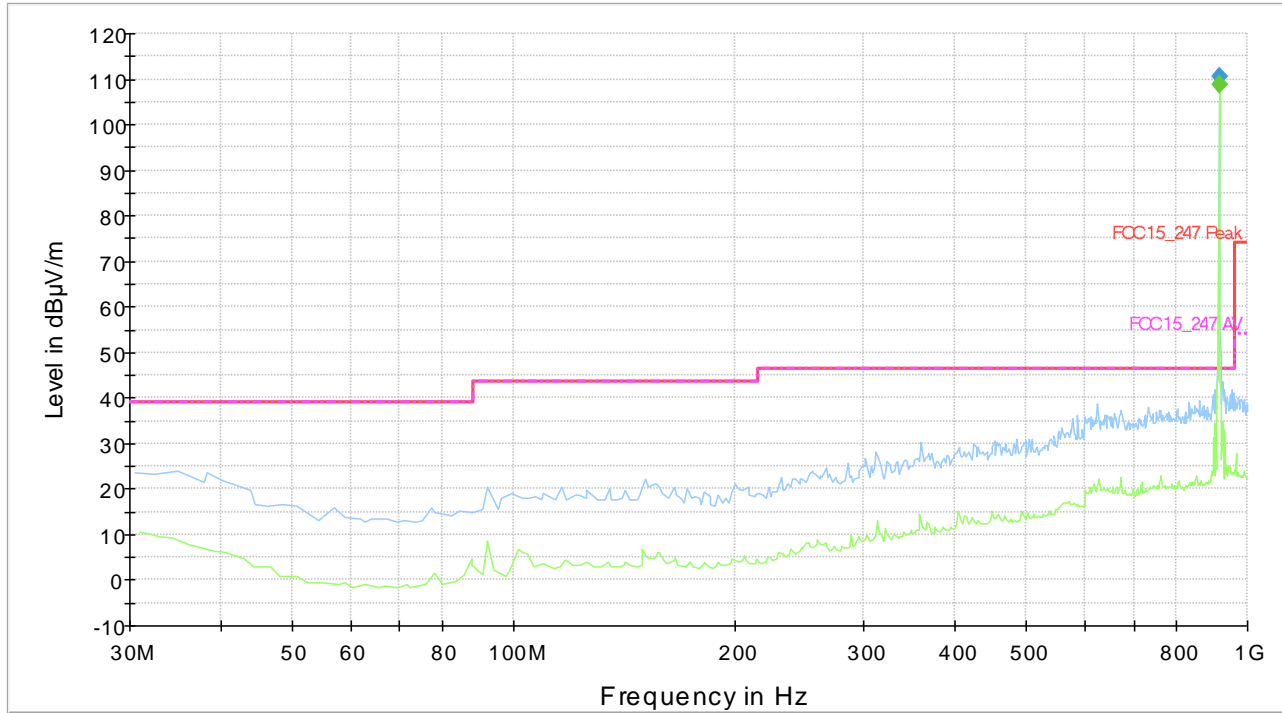
CHANNEL	37
OPERATING CONDITION	#4
FREQUENCY RANGE	9kHz - 30MHz



— FCC_RSS_GEN_low_30MHz — MaxPeak-ClearWrite-PK+

CHANNEL	37
OPERATING CONDITION	#4
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.030000	110.6	70.0	120.000	99.8	V	7.0	35.3	-64.20	46.40

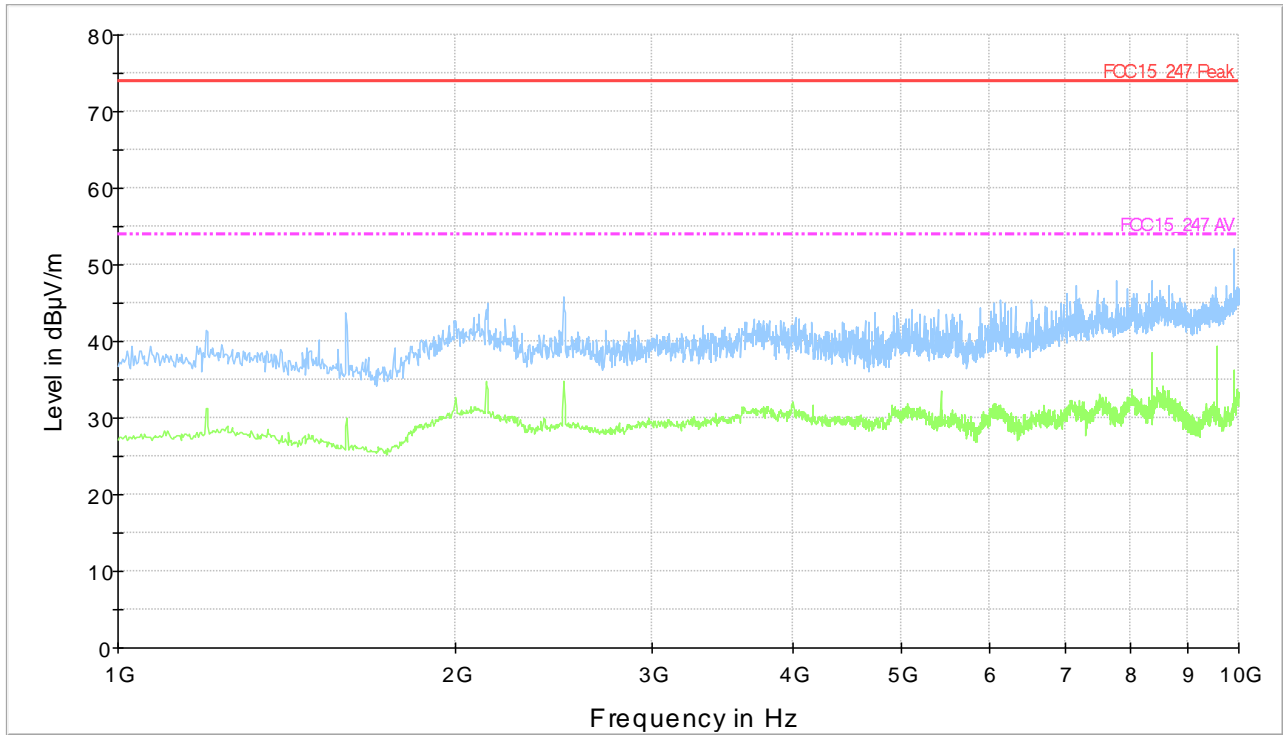
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.030000	108.7	70.0	120.000	99.8	V	7.0	35.3	-62.30	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	37
OPERATING CONDITION	#4
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

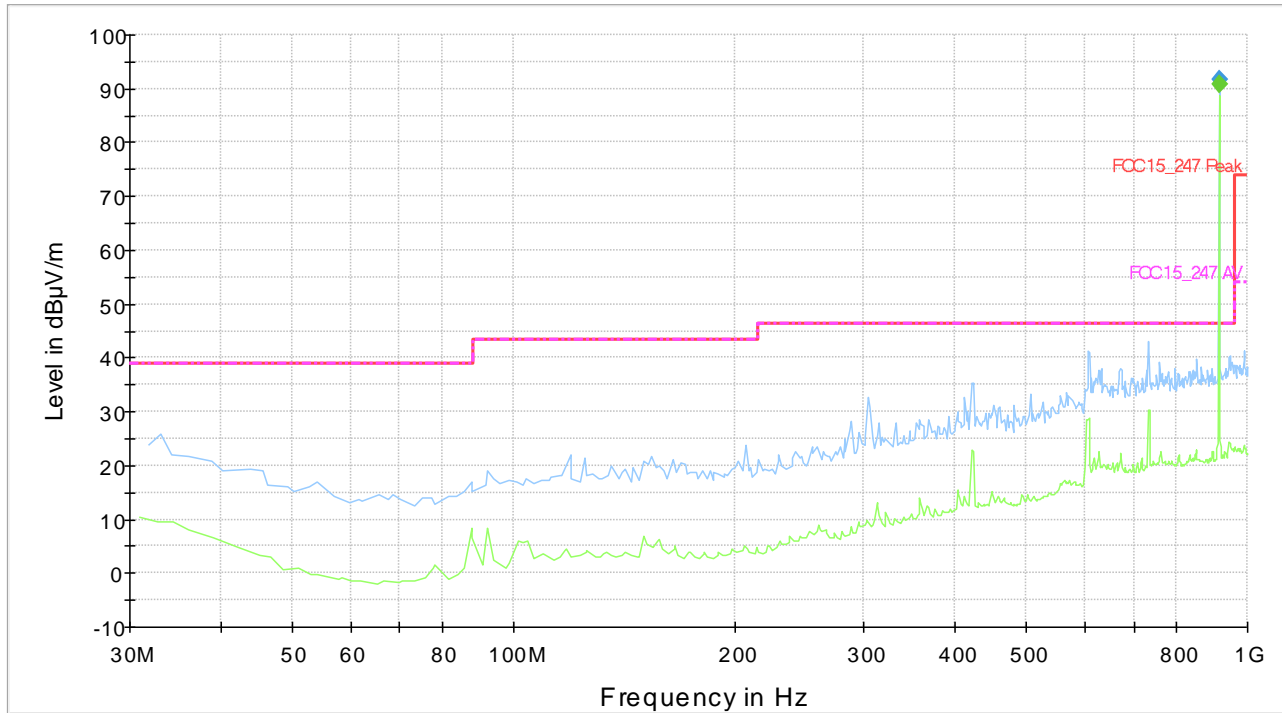
Emissione Radiata_FCC



— FCC 15_247 Peak-CAR - - - - - FCC 15_247 AV-CAR — PreviewResult 1-PK+ — PreviewResult 2-AVG

CHANNEL	37
OPERATING CONDITION	#4
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.030000	91.8	70.0	120.000	124.9	H	-8.0	35.3	-45.40	46.40

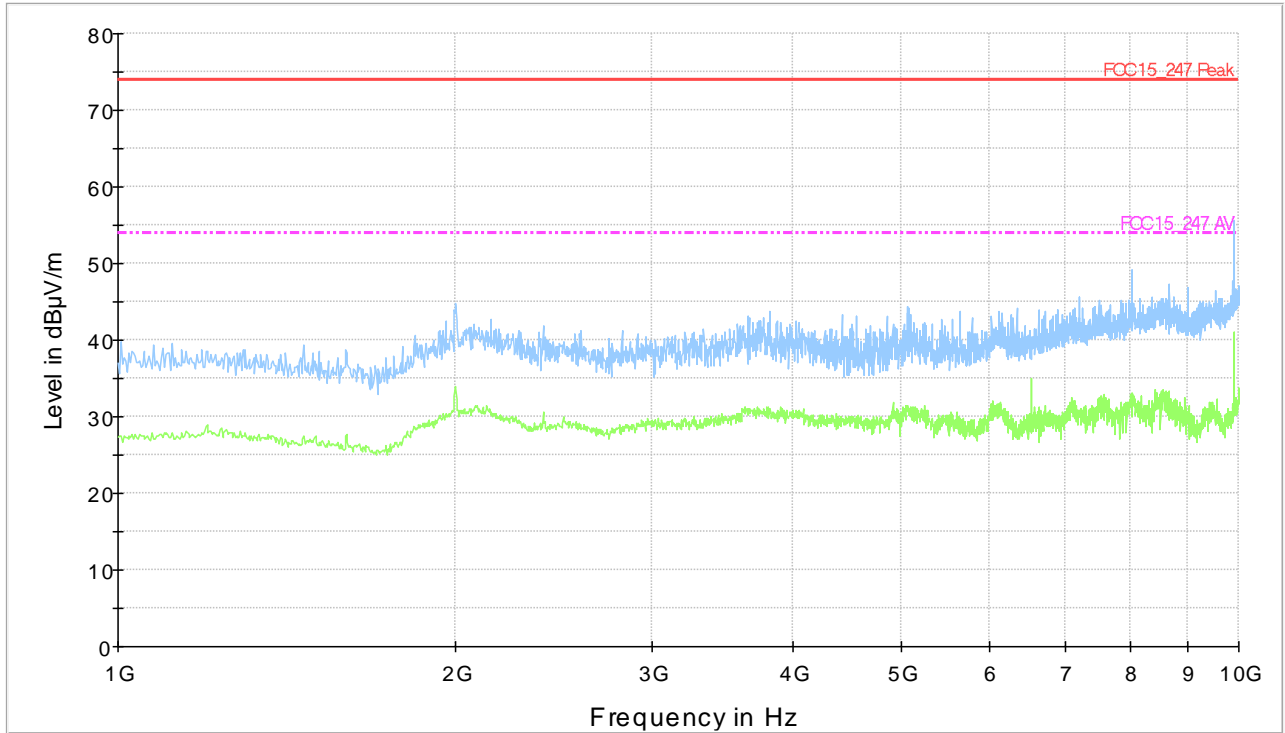
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
915.030000	90.9	70.0	120.000	99.8	H	-8.0	35.3	-44.50	46.40

*Peaks out of limits are due to the radio carrier

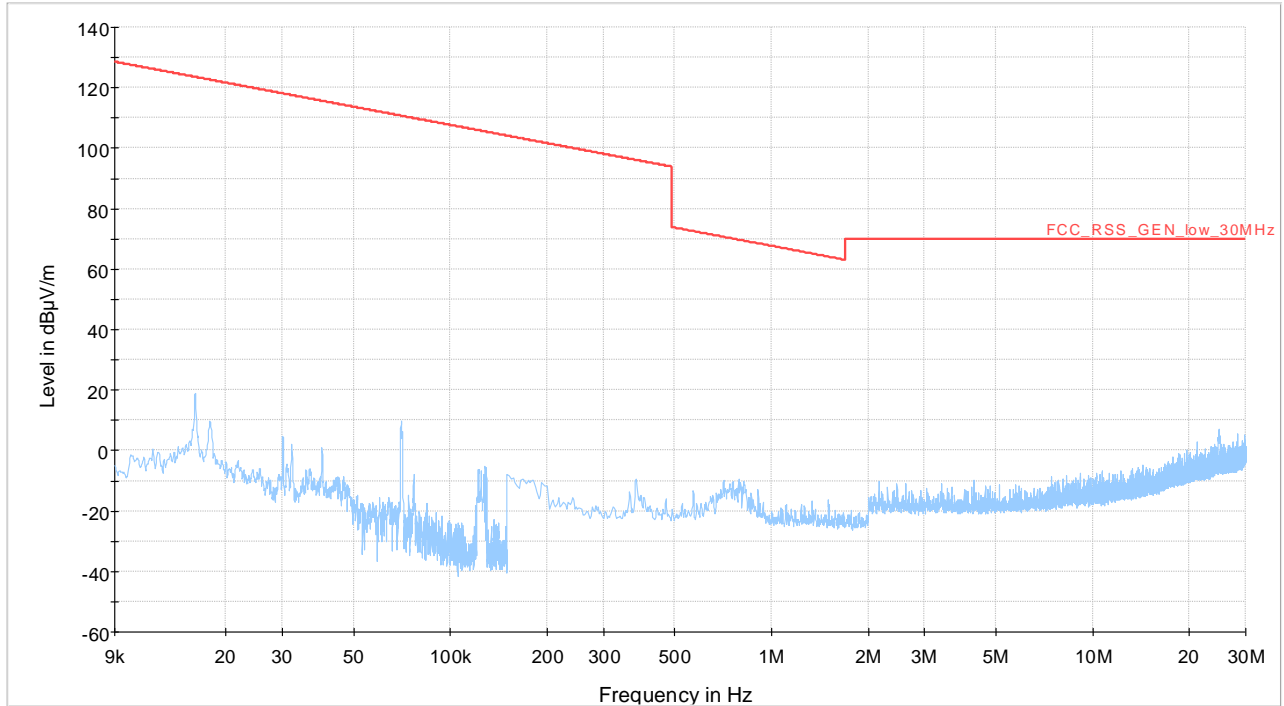
CHANNEL	37
OPERATING CONDITION	#4
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

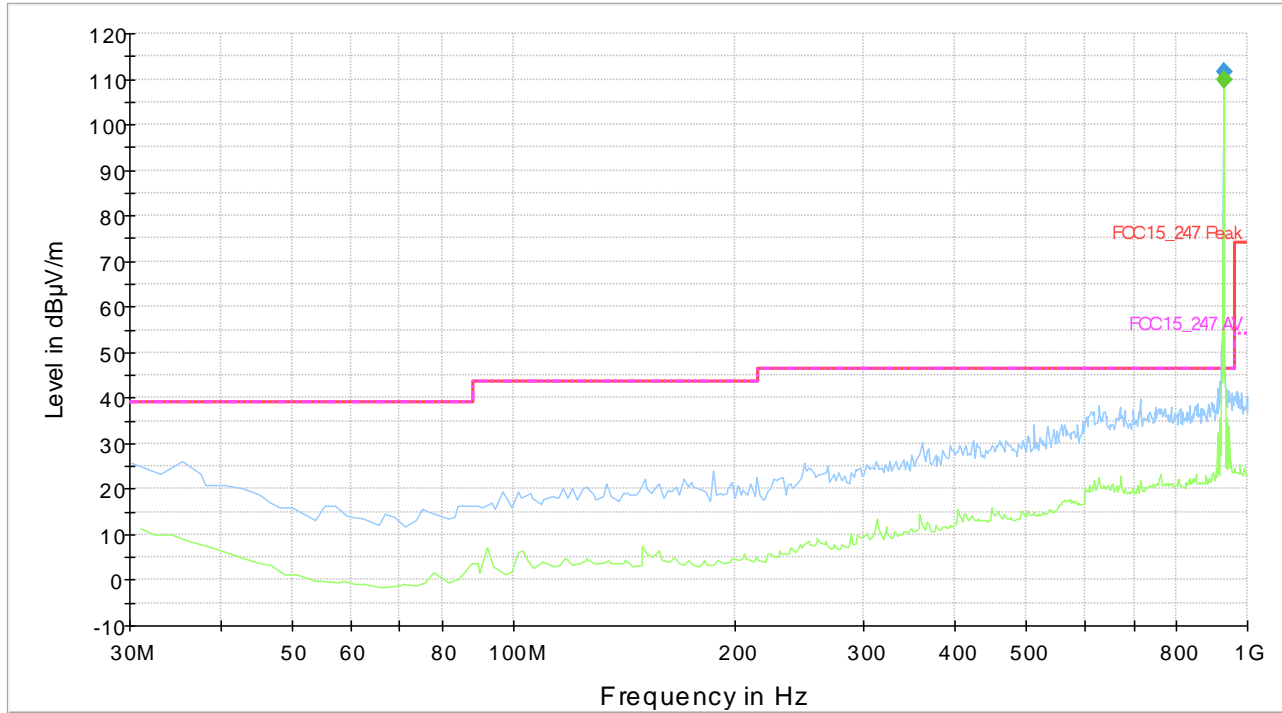
CHANNEL	74
OPERATING CONDITION	#4
FREQUENCY RANGE	9kHz - 30MHz



— FCC_RSS_GEN_low_30MHz — MaxPeak-ClearWrite-PK+

CHANNEL	74
OPERATING CONDITION	#4
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	VERTICAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	111.6	70.0	120.000	99.9	V	7.0	35.8	-65.20	46.40

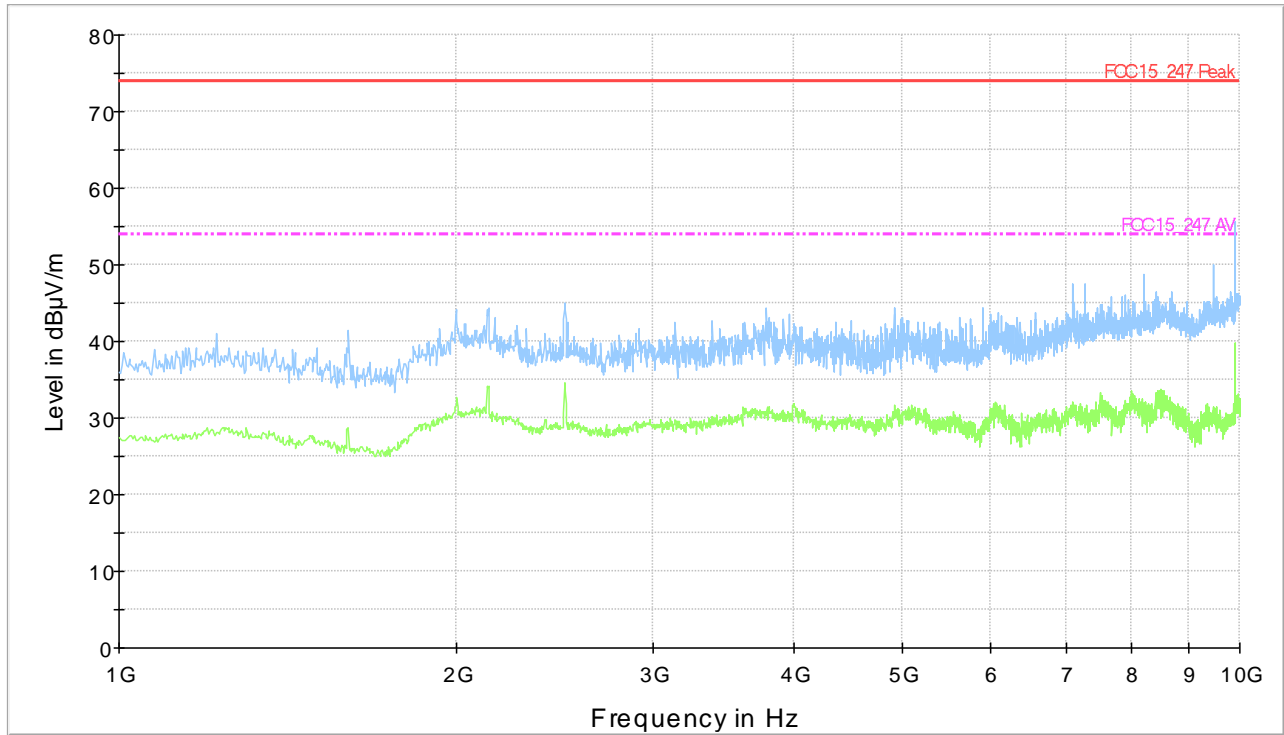
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	109.9	70.0	120.000	99.8	V	7.0	35.8	-63.50	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	74
OPERATING CONDITION	#4
FREQUENCY RANGE	1-10GHz
POLARIZATION	VERTICAL

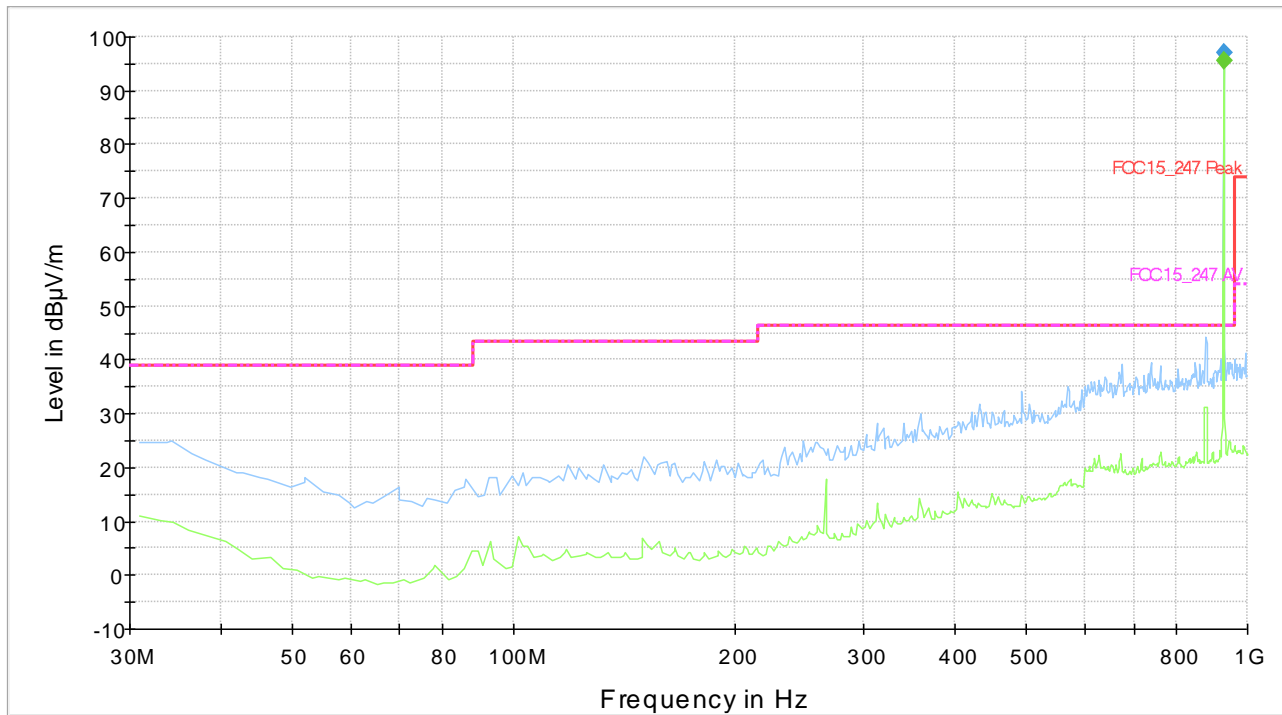
Emissione Radiata_FCC



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

CHANNEL	74
OPERATING CONDITION	#4
FREQUENCY RANGE	30MHz – 1GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC_Spurie



— 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)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	97.1	70.0	120.000	99.8	H	7.0	35.8	-50.70	46.40

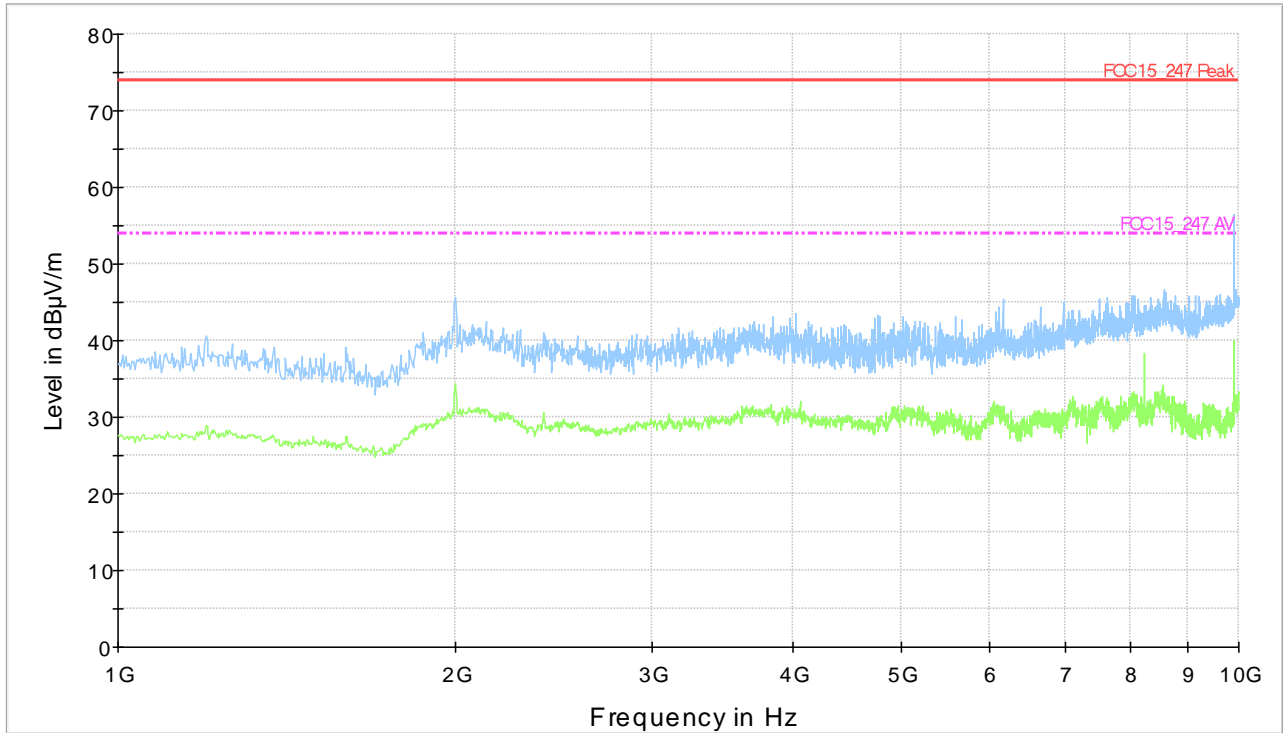
Final Result Average

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
927.600000	95.4	70.0	120.000	99.9	H	7.0	35.8	-49.00	46.40

*Peaks out of limits are due to the radio carrier

CHANNEL	74
OPERATING CONDITION	#4
FREQUENCY RANGE	1-10GHz
POLARIZATION	HORIZONTAL

Emissione Radiata_FCC



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

TEST 10.

CONDUCTED SPURIOUS EMISSION 9kHz ÷ 10th HARMONIC

REFERENCE DOCUMENT

According to §15,247) d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 Db below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 Db instead of 20 Db. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

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

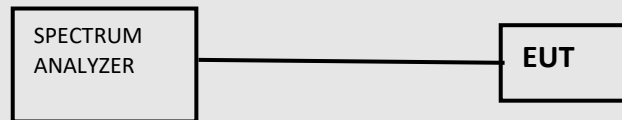
OPERATING CONDITION :#5, #6 Duty Cycle 100%

RESULT: **WITHIN THE LIMITS**

MEASUREMENT PARAMETER 9kHz-10GHz

Resolution bandwidth	100kHz
Video bandwidth	300kHz
Span	See plots below
Sweep time	Auto couple
Detector	Peak
Trace-Mode	Max. hold

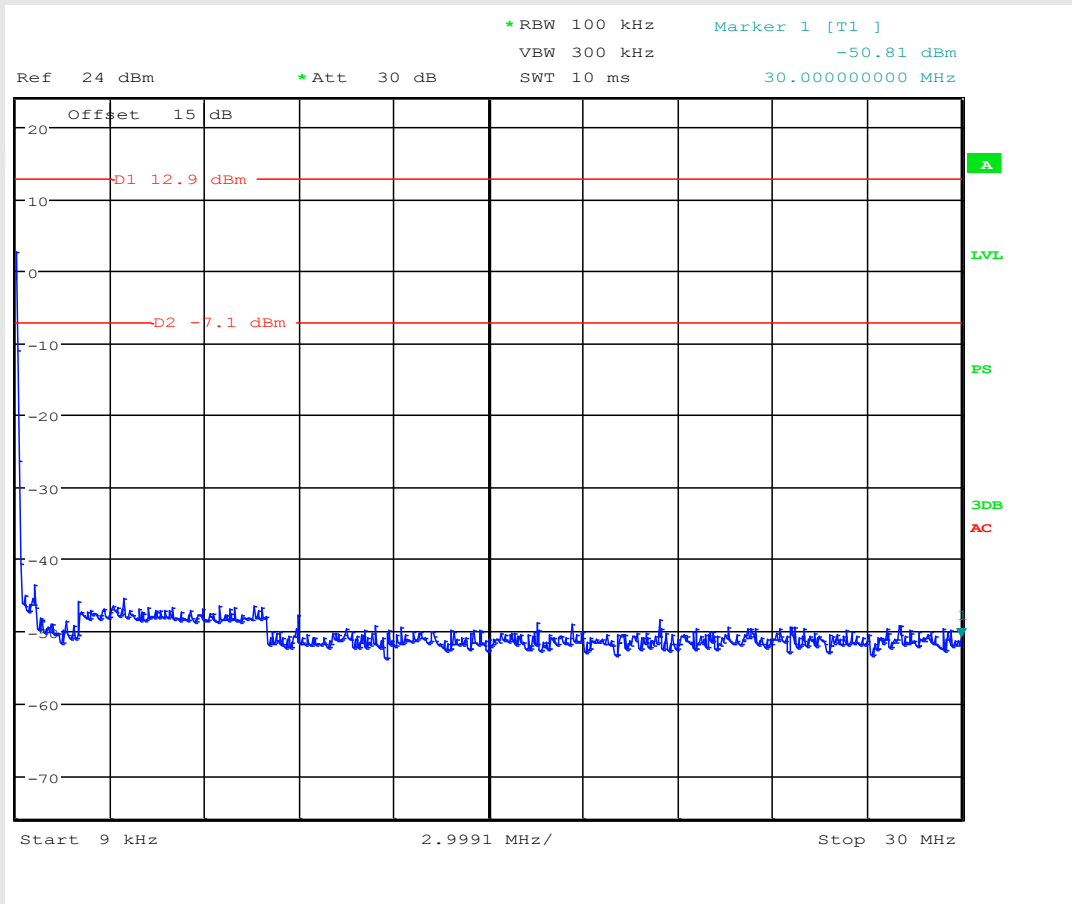
TEST SETUP BLOCK DIAGRAM



Operating Condition #5

FREQ. RANGE 9kHz to 30MHz

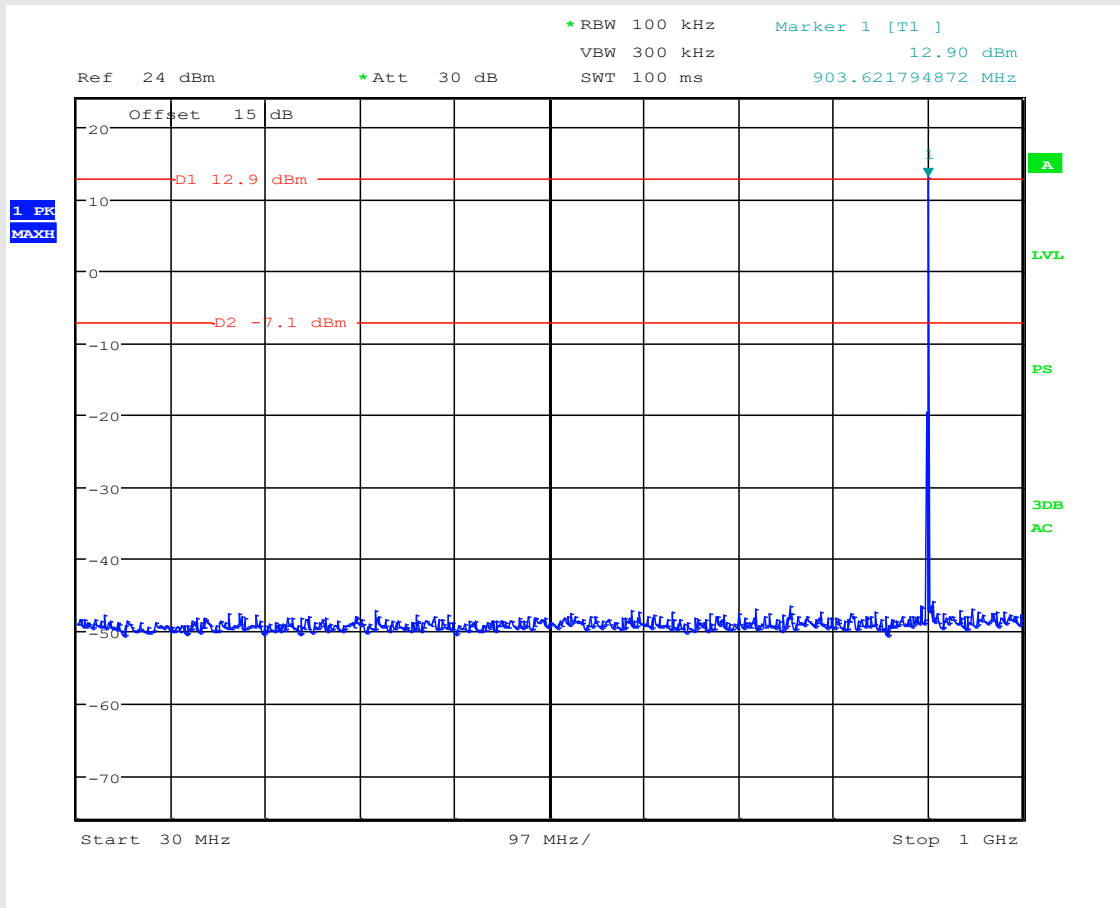
CHO



Operating Condition #5

FREQ. RANGE 30MHz to 1GHz

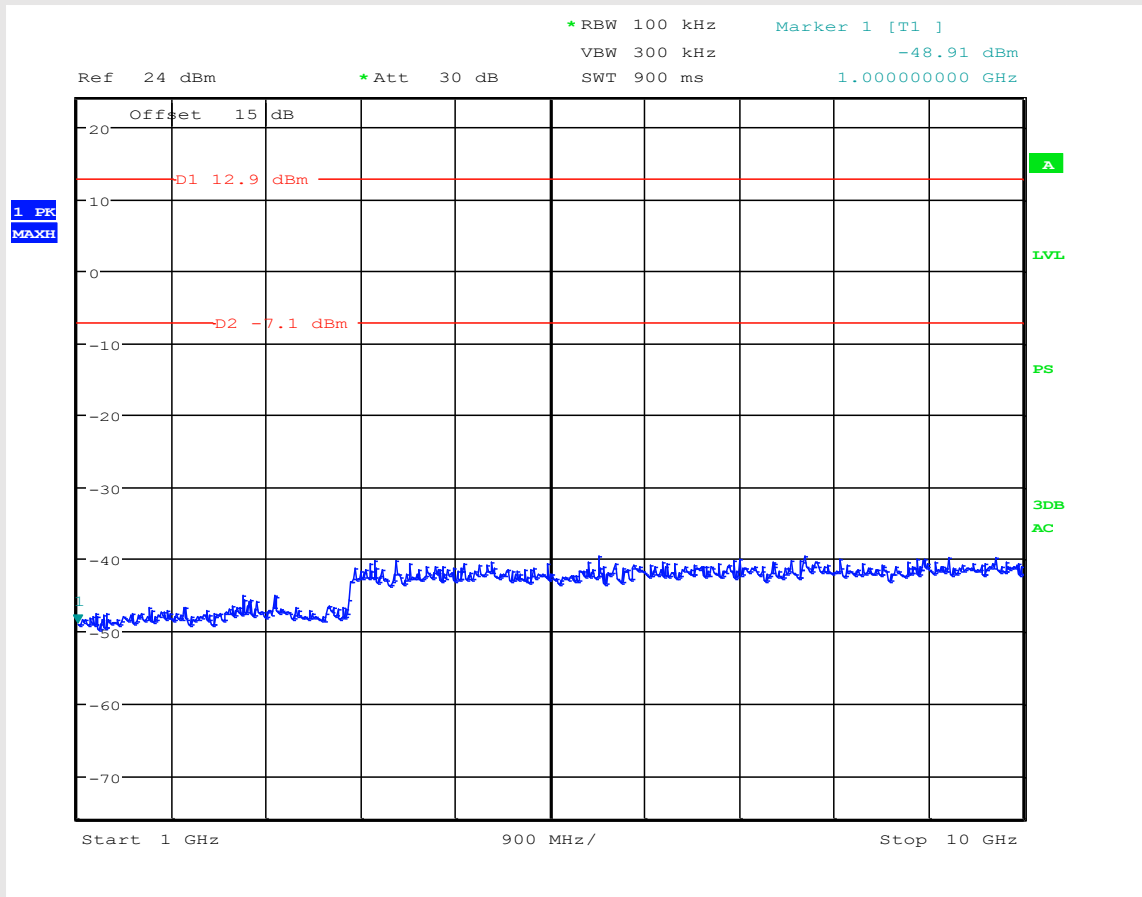
CHO



Operating Condition #5

FREQ. RANGE 1GHz to10GHz

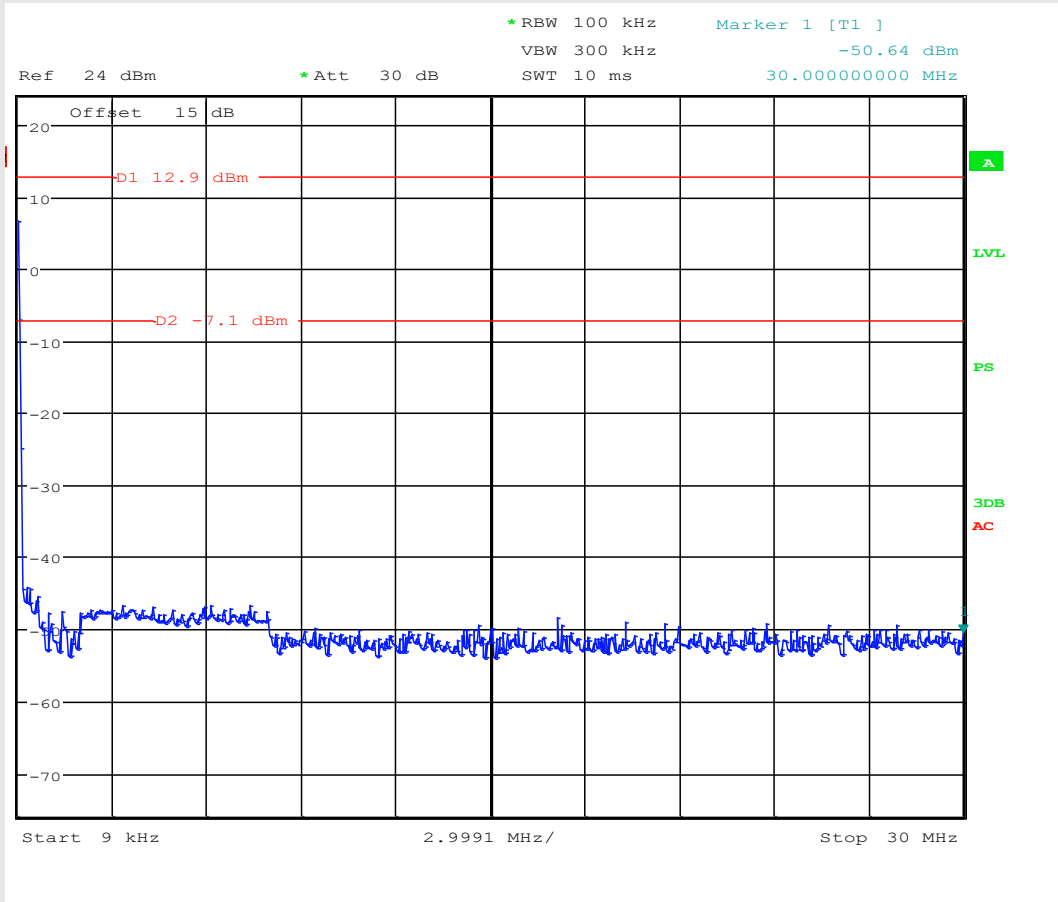
CHO



Operating Condition #5

FREQ. RANGE 9kHz to 30MHz

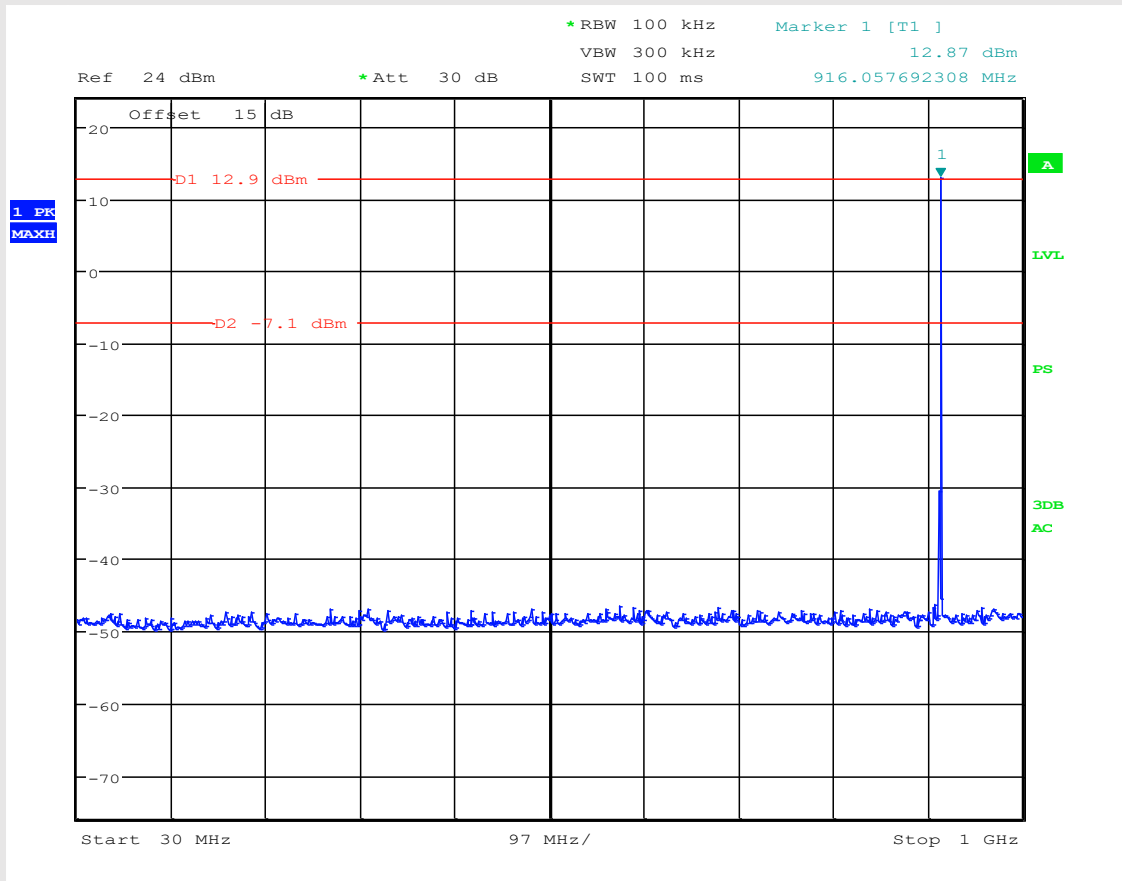
CH37



Operating Condition #5

FREQ. RANGE 30MHz to 1GHz

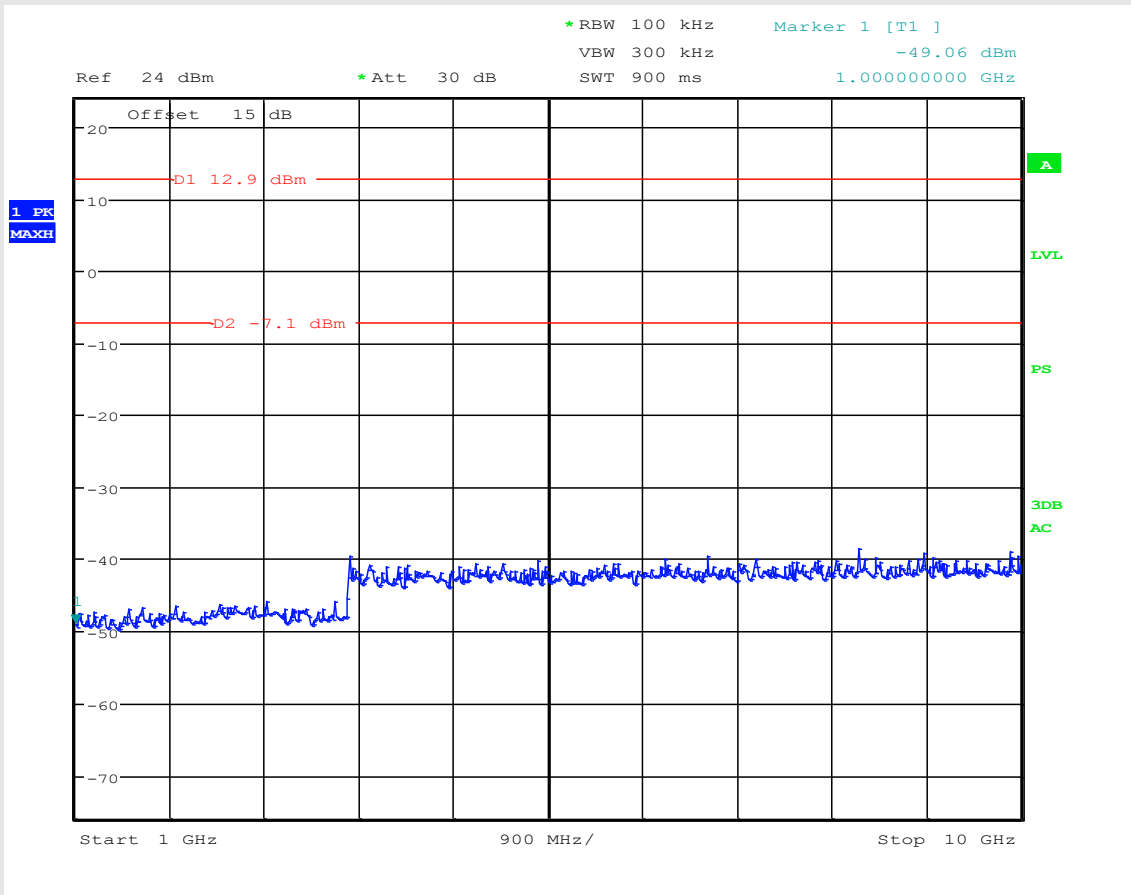
CH37



Operating Condition #5

FREQ. RANGE 1GHz to10GHz

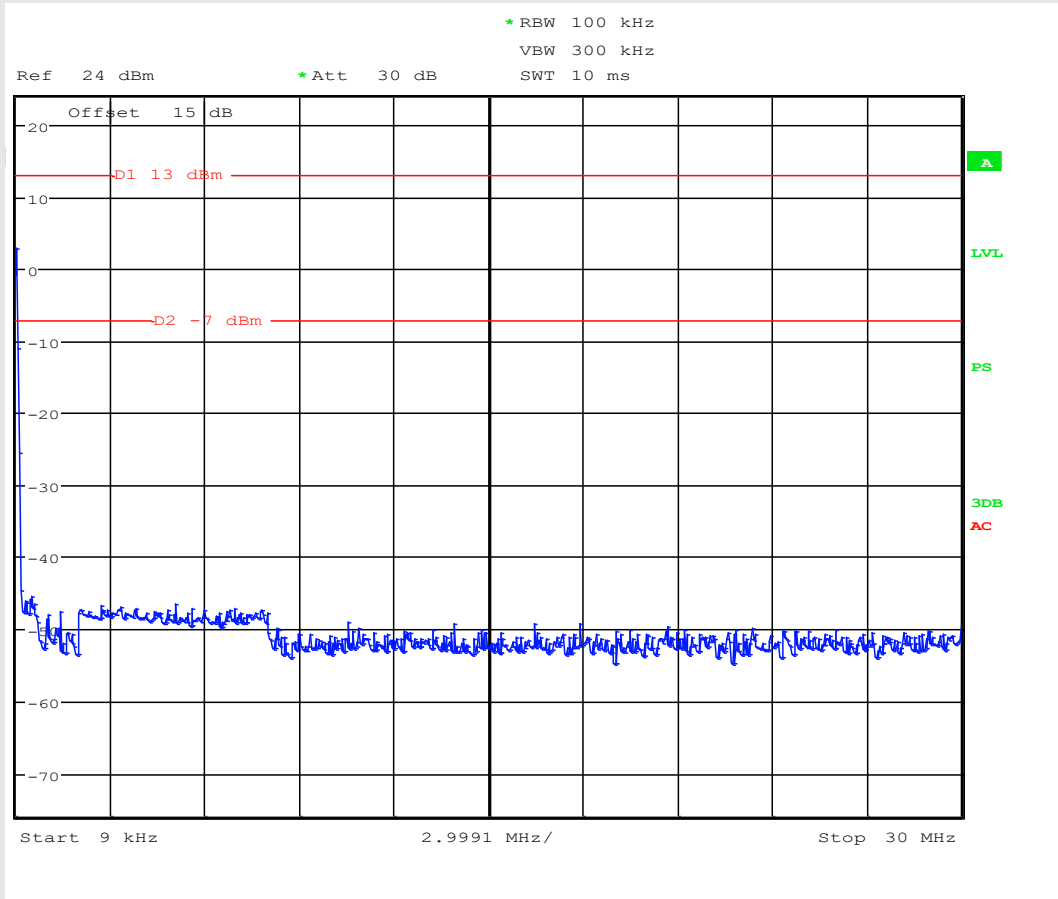
CH37



Operating Condition #5

FREQ. RANGE 9kHz to 30MHz

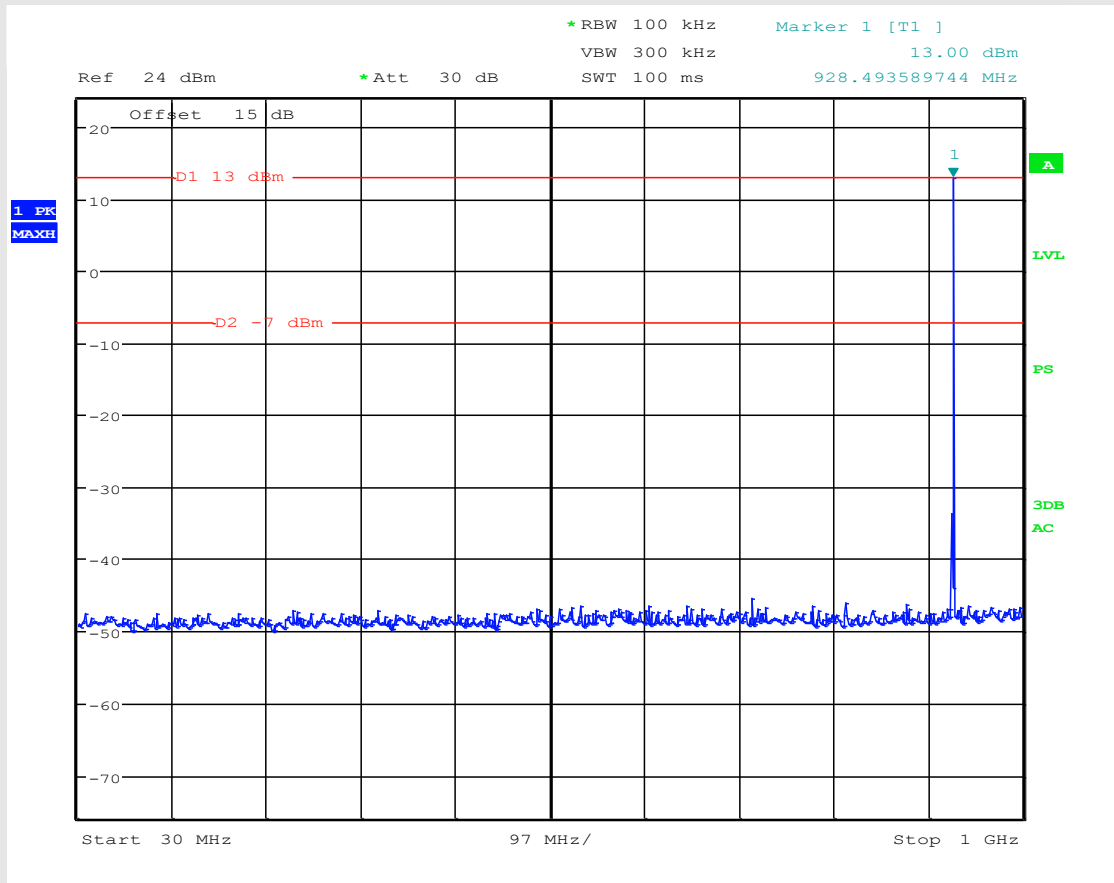
CH74



Operating Condition #5

FREQ. RANGE 30MHz to 1GHz

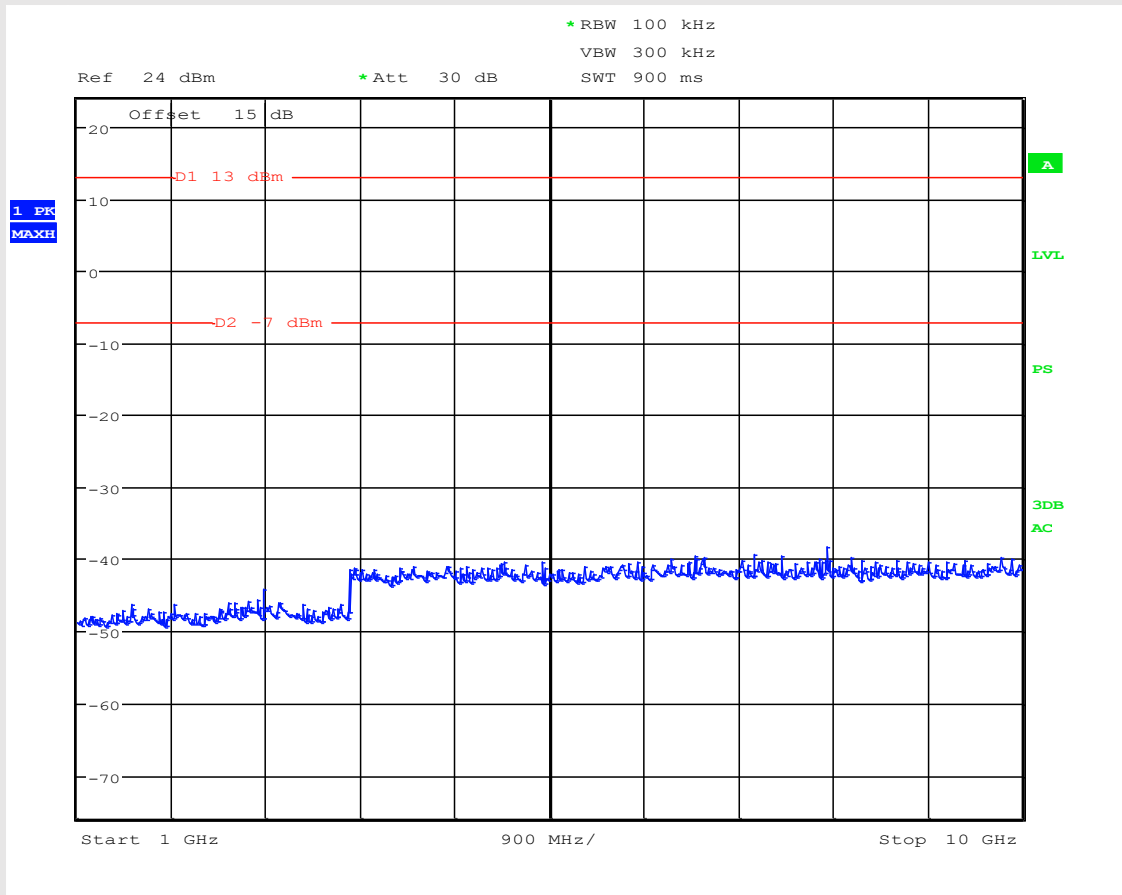
CH74



Operating Condition #5

FREQ. RANGE 1GHz to10GHz

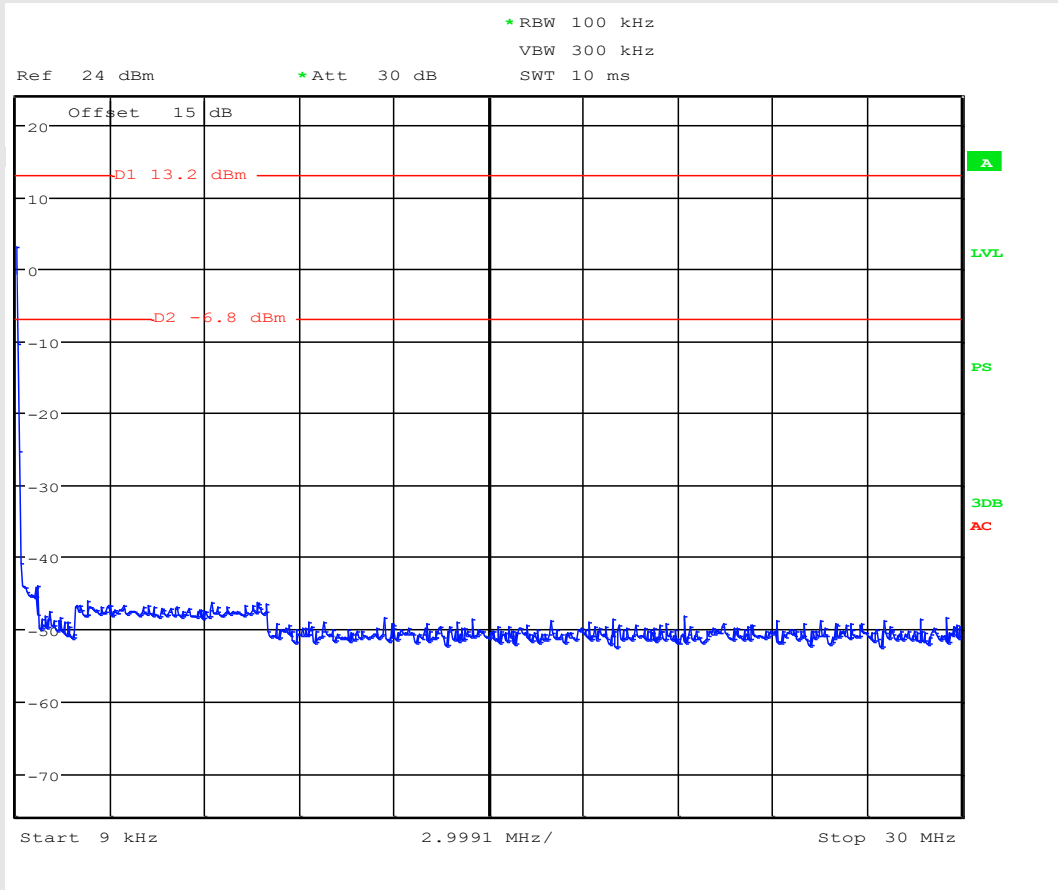
CH74



Operating Condition #6

FREQ. RANGE 9kHz to 30MHz

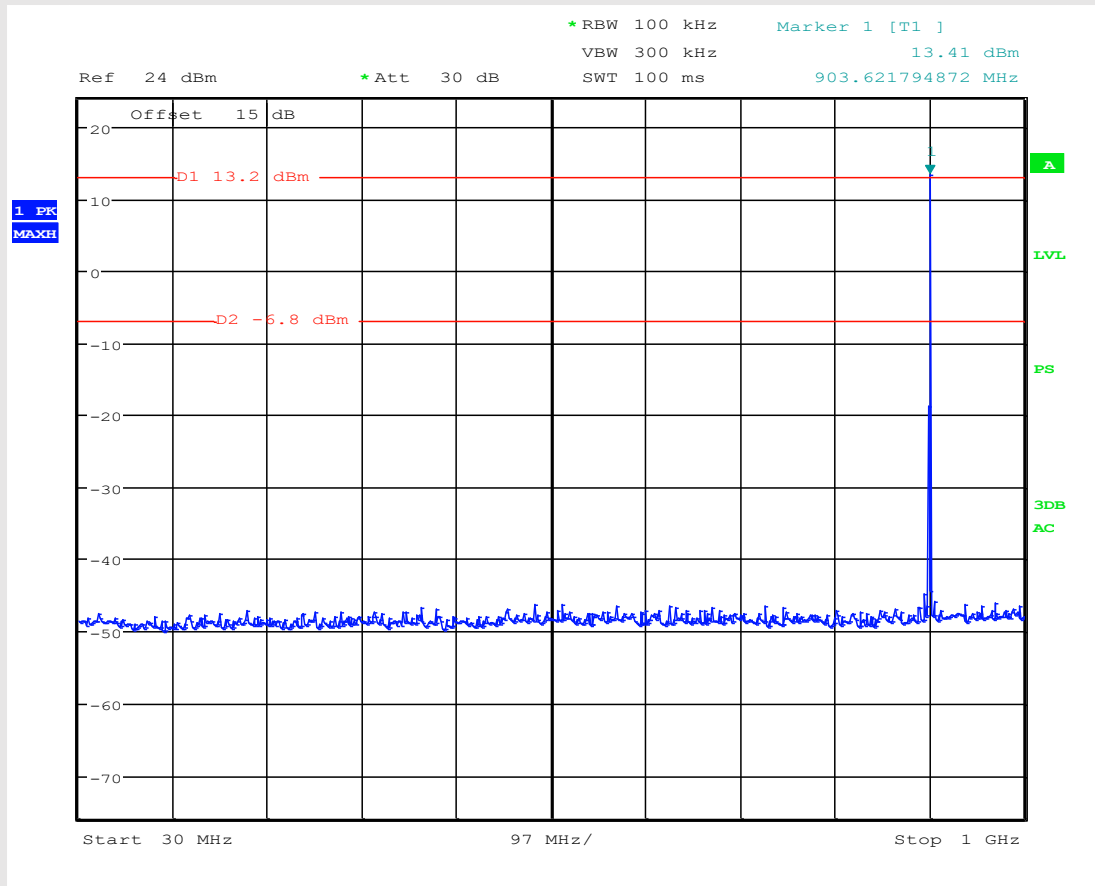
CHO



Operating Condition #6

FREQ. RANGE 30MHz to 1GHz

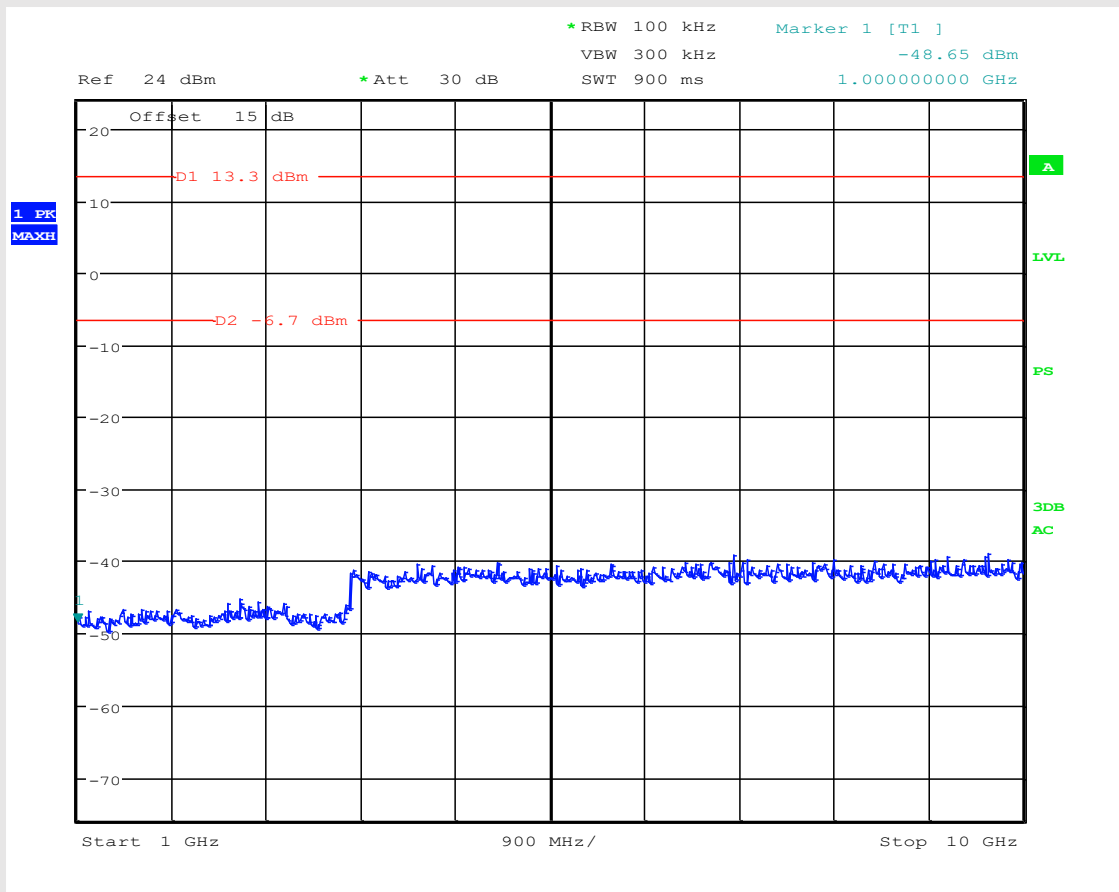
CHO



Operating Condition #6

FREQ. RANGE 1GHz to10GHz

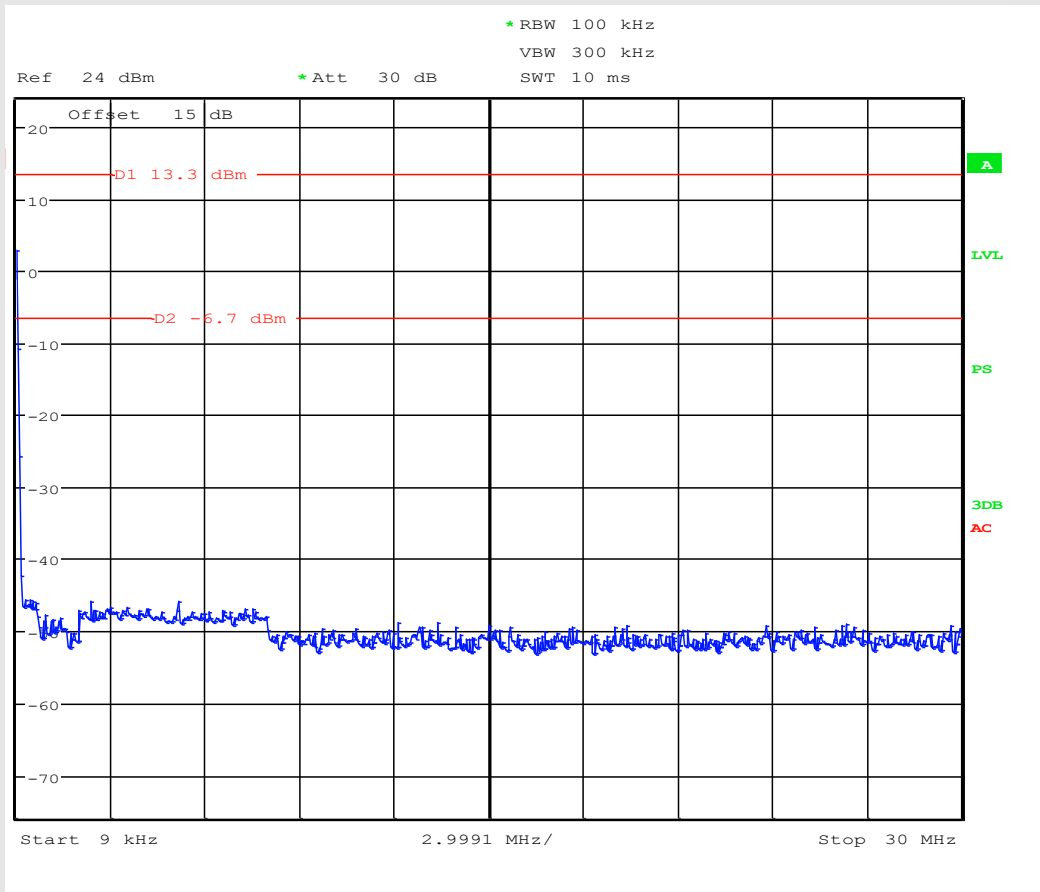
CHO



Operating Condition #6

FREQ. RANGE 9kHz to 30MHz

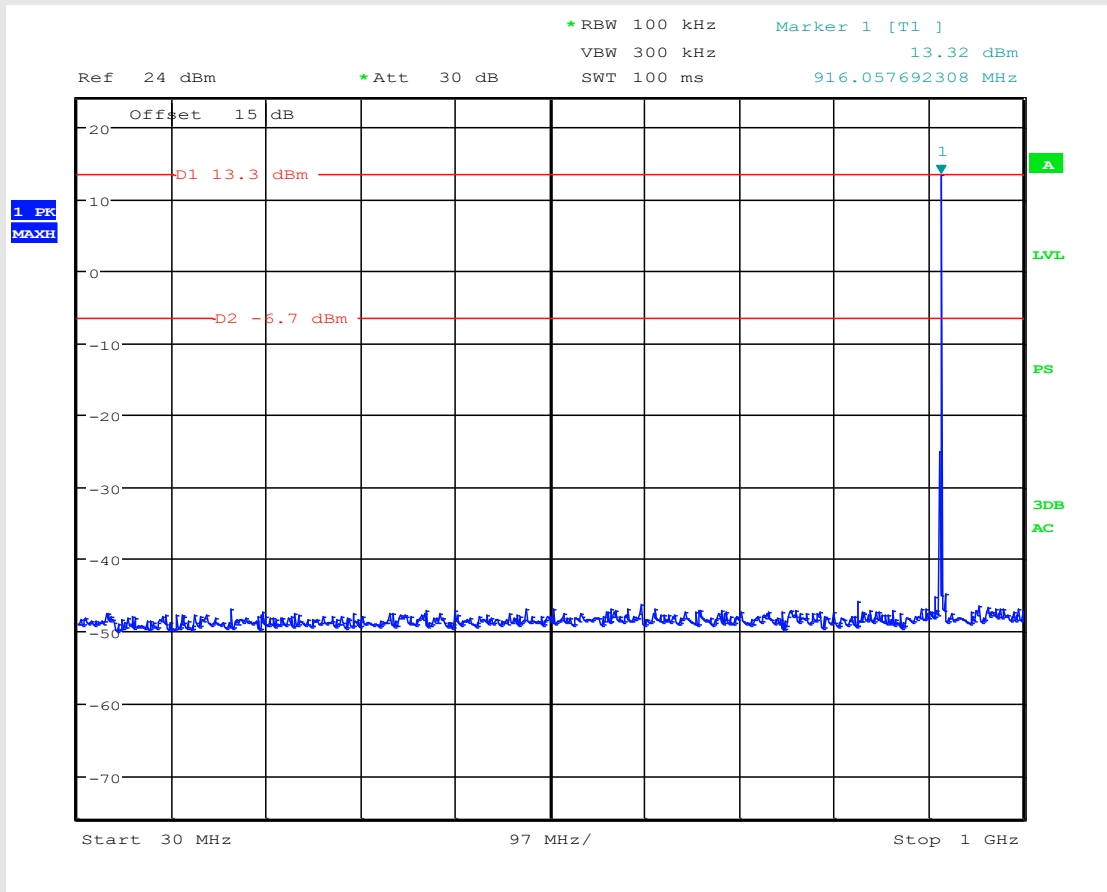
CH37



Operating Condition #6

FREQ. RANGE 30MHz to 1GHz

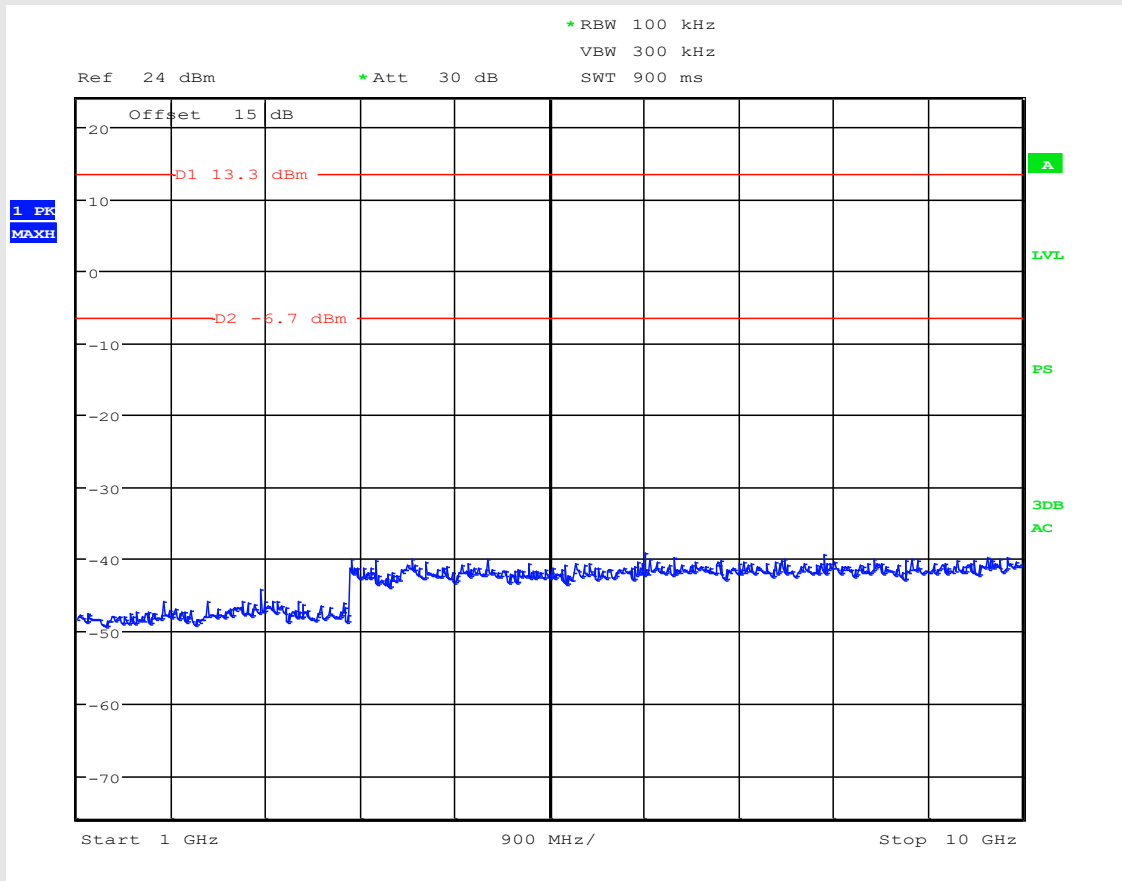
CH37



Operating Condition #6

FREQ. RANGE 1GHz to10GHz

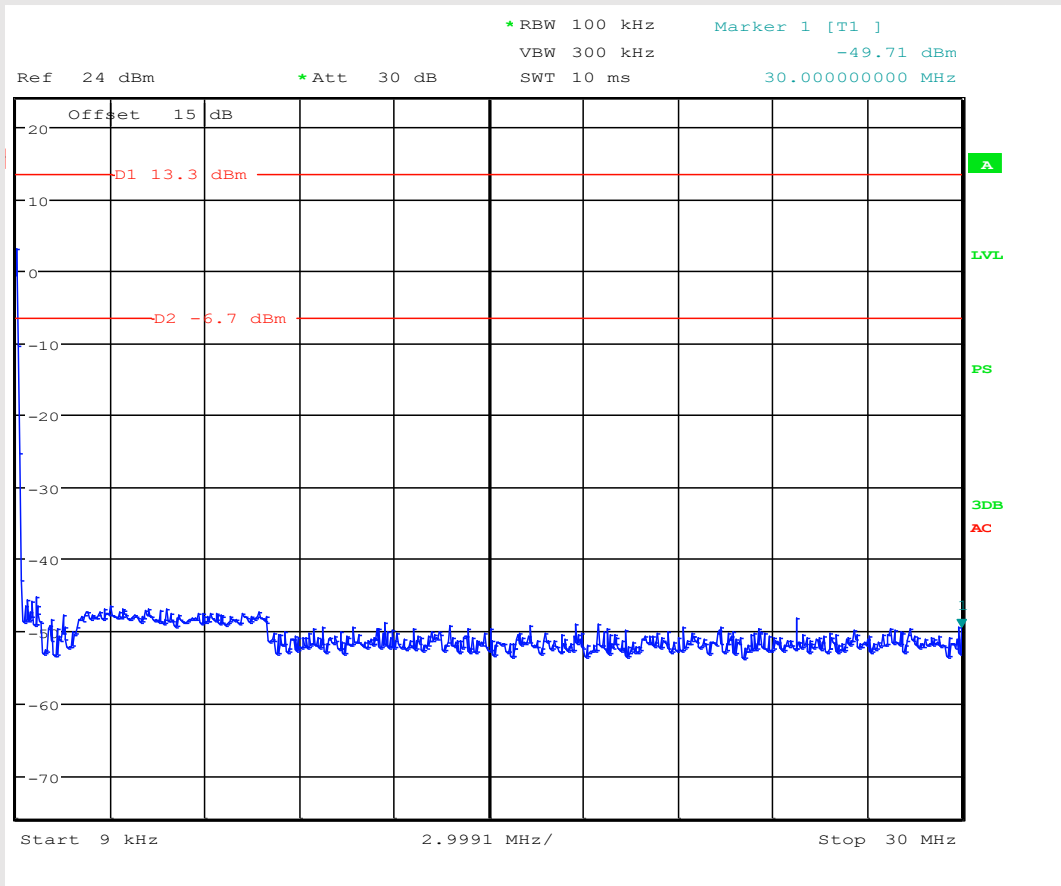
CH37



Operating Condition #6

FREQ. RANGE 9kHz to 30MHz

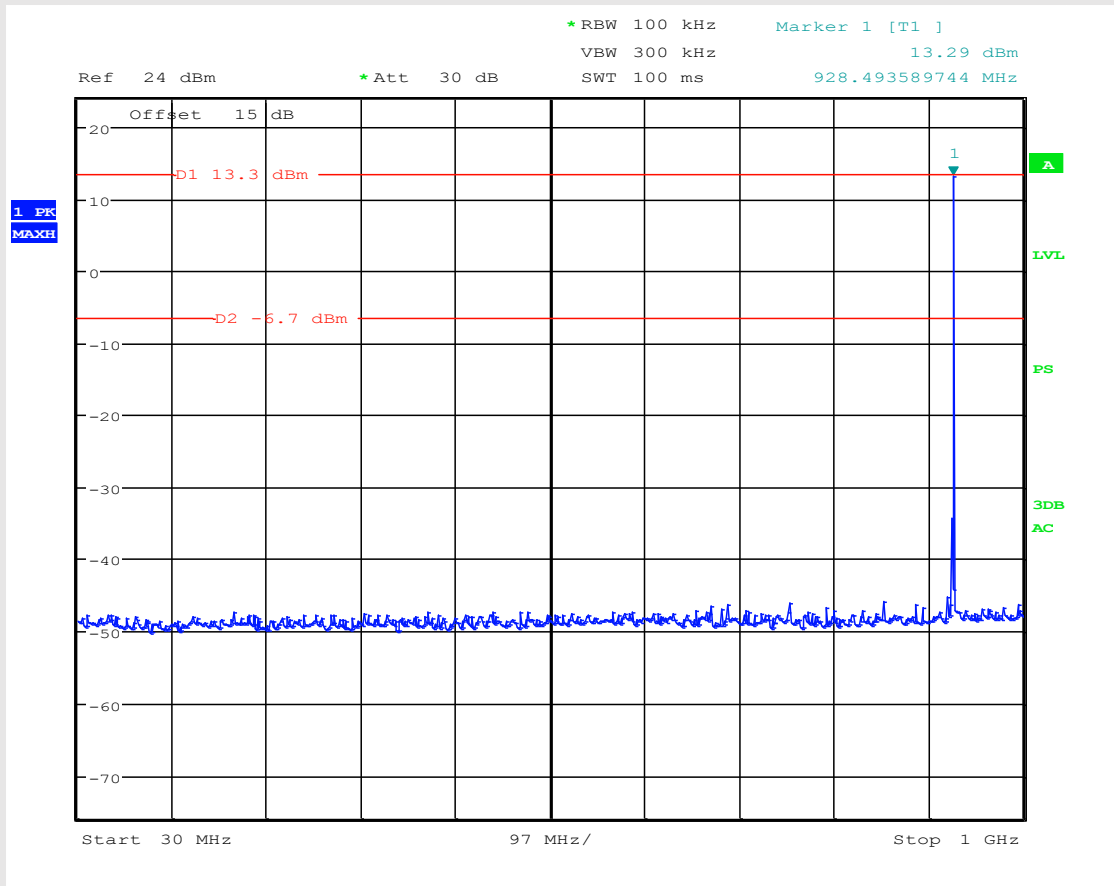
CH74



Operating Condition #6

FREQ. RANGE 30MHz to 1GHz

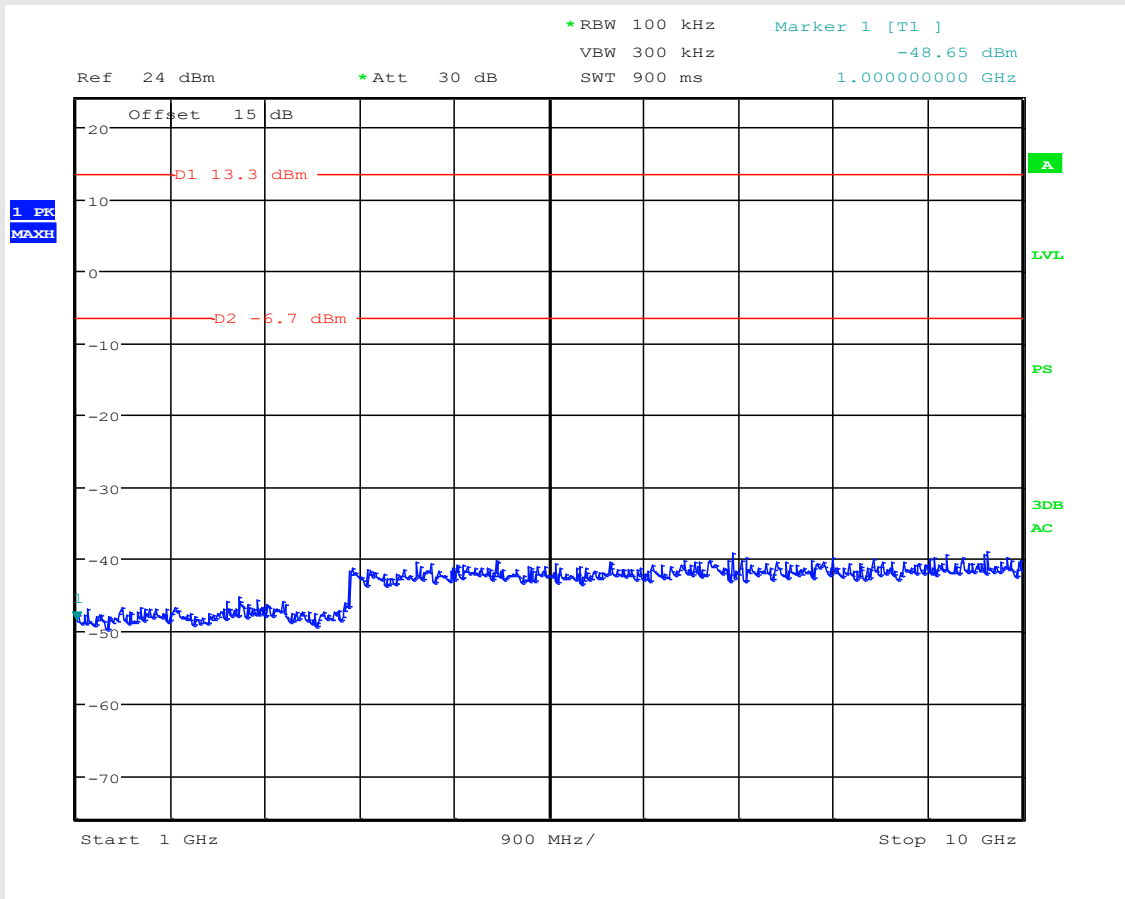
CH74



Operating Condition #6

FREQ. RANGE 1GHz to10GHz

CH74



END OF TEST REPORT