Test Report

47 CFR FCC Part 15 subpart C
Intentional Radiators

Report reference no. ..... :	28112194 005
FCC Designation Number..... :	IT0008
FCC Test Firm Registration #..... :	804595
Tested by (name + signature)……:	Roberto Radice \ Tester
Approved by (name + signature)……:	Giovanni Molteni \ TM
Date of issue ..... :	April, 19th 2019
Total number of pages ..... :	67 Pages
Testing Laboratory..... :	TÜV Rheinland Italia S.r.l.
Address ..... :	Via Mattei 3 - 20010 - Pogliano Milanese (MI) – Italy
Applicant's name ..... :	Sony Mobile Communications Inc.
Address ..... :	4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-0002, Japan
Test item description..... :	Room and desk occupancy detection system
Trade Mark..... :	Sony
Manufacturer ..... :	Sony Mobile Communications Inc. 4-12-3 Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-0002, Japan
Ratings ..... :	+5V dc via USB port.
Sample..... :	
Samples received on..... :	26/10/2018
TUV reference samples ..... :	180718 (sampled by the customer)
Samples tested n. ..... :	1
FCC ID. ..... :	PY7-70664G
Testing..... :	
Start Date: ..... :	30/10/2018
End Date: ..... :	31/10/2018

Firmato da:Roberto Radice
Data: 04/06/2019 14:45:39

Firmato da:Giovanni Molteni
Data: 07/06/2019 16:24:08

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RELEASE CONTROL RECORD		
Test report Number	**Reason of change**	**Date of Issue**
28112194 001	Original release	2018-11-16
28112194 005	Insert a new graphics of “6dB Bandwidth” test.	2019-04-19

SUMMARY

1. Reference Standards	
Standard	**Description**
FCC Part 15 (Subpart C)	§15.247 Operation within the bands 902-928 MHz, 2400-2483,5 MHz, and 5725-5850 MHz.
FCC Part 15 (Subpart C)	§15.207 Conducted Limits
FCC Part 15 (Subpart C)	§15.209 Radiated emission limits; general requirements
FCC Part 15 (Subpart C)	§15.203 Antenna Requirement
FCC Part 15 (Subpart B)	§15.107 + 15.109
ANSI C63.4:2014	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10:2013	American National Standard for Testing Unlicensed Wireless Devices
558074 D01 DTS Meas Guidance v05 - August 24,2018	Guidance for performing compliance measurements on digital transmission systems (dts) operating under §15.247

2. Summary of testing		
§ 15.203 § 15.247 (b)(4)(i)	Antenna Requirements	PASS
§ 15.207 (a)	Power Line Conducted Emission	PASS
§ 15.209 (a) (f)	Radiated Emission	PASS
§ 15.215 (a) (b) (c)	Additional provisions to the general radiated emission limitations	PASS
§ 15.247 (d)	Out-of-band emissions	PASS
§ 15.247 (d)	100 kHz Bandwidth of Frequency Band Edges	PASS
§ 15.247 (a)	Frequency Hopping Spread Spectrum Specifications	
§ 15.247(a)	20 dB Bandwidth	N.A.[1]
§ 15.247(a)(1)	Carrier frequency (Hopping Channel) Separation	N.A.[1]
§ 15.247(a)(1)(iii)	Number of Hopping Channels Used	N.A.[1]
§ 15.247(a)(1)(iii)	Time occupancy (Dwell Time) of Each Ch. within a 0,4 x Nch (sec) Period	N.A.[1]
§ 15.247(a)(2)	6dB Minimum Bandwidth	PASS
§ 15.247(b)	Maximum Peak Output Power	
§ 15.247(b) (1)	Peak Output Power, radiated (EIRP)	N.A.[1]
§ 15.247(b) (3)	RF power output, radiated (EIRP)	PASS
§ 15.247(b) (4)	Antenna gain	
§ 15.247(c)	Operation with directional antenna gains greater than 6 dBi	N.A.
§ 15.247 (e)	Power Spectral Density	PASS
§ 15.247 (f)	Hybrid systems	N.A.[1]
§ 15.247 (g)	FHSS Transmission characteristics	N.A.[1]
§ 15.247 (h)	Recognition of occupied channel and multiple transmission system	N.A
§ 15.247(i) (§ 47CFR 1.1307(b)(1))	RF humane exposure	PASS

Note 1	Not applicable for DTS equipment

Possible test case verdicts:	
- test case does not apply to the test object ....:	N/A
- test object does meet the requirement .....:	PASS
- test object does not meet the requirement ....:	FAIL

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

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"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

3. General product information

The Sony Nimway sensor system is used to detect and report occupancy in rooms and at desks. The sensor system consists of four major hardware components. One door sensor, one room sensor, one desk sensor and one access point. Typically, multiple sensors talk to one access point.

External antenna	Access Point	Siretta MIKE1A
Radio MCU and transceiver	Both	Texas Instruments CC1350

Type	Where	Value
Radio frequency	Both	ISM Band (915MHz US)
Radio maximum output power	Both	+14 dBm
Radio indoor range	Both	~ 100m
Target environment	Both	Office environment ~ 15 - 40°C
Max number of sensors per AP	Access point	At least 600 sensors
Weight	Sensor	About 60 grams

4. Equipment Used During Test

Use*	Product Type	Manufacturer	FCC ID	Comments
EUT	Gateway	Sony	PY7-70664G	---
AE	Cellular phone	---	---	Used to set Gateway parameters

Note:

* Use :

EUT - Equipment Under Test,
AE - Auxiliary/Associated Equipment, or
SIM - Simulator (Not Subjected to Test)

No other Auxiliary/Associated Equipment was connected/installed on the EUT

5. Input/Output Ports

CONNECTIONS

Port		Description	Connection	Cable lenght
1	Enclosure	Non conductive surface	Closed by 4 metallic screws	---
2	AC Power Port	AC	Port not present	---
3	DC Power Port	DC	Input +5V via USB port	No cable
4	USB	I/O	TX/RX	No cable
5	Antenna	Ant. Siretta MIKE1A	Internal sma connector	< 2m.

*Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
WN = Wired Network

6. Power Interface						
Mode #	**Voltage (V)**	**Current (A)**	**Power (W)**	**Frequency (DC/AC-Hz)**	**Phases (#)**	**Comments**
Rated	+5 dc	---	---	---	---	---

7. EUT Operation Modes	
Operation mode	**Description**
#1	Continuous Modulated RF Transmission RF setting during tests: Frequency: 904,0 MHz (low channel); 915,5MHz (mid channel); 927,0MHz (high channel); Max. Power Setting. Equipment supplied at +5V dc via battery pack
#2	Continuous Modulated RF Transmission RF setting during tests: Frequency: 904,0 MHz (low channel); 915,5MHz (mid channel); 927,0MHz (high channel); Max. Power Setting. Equipment supplied at +5V dc via USB port connected at a Personal Computer. Personal Computer connected to AC Mains Power (115Vac 60Hz)
#3	Equipment supplied at +5V dc via USB port connected at a Personal Computer. Personal Computer connected to AC Mains Power (115Vac 60Hz) EUT in stand-by mode.

8. EUT Configuration Modes

Mode #	Description
#1	Gateway supply at +5V by a battery packet provided by applicant.
#2	Gateway supply at +5V by a USB port of PC.

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength (dBμV/m) = RAW - AMP + CBL + ACF

Where: RAW = Measured level before correction (dBμV)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)

25 dBuV/m + 17.5 dB – 20 dB + 1.0 dB = 23.5 dBuV/m

9. Test Conditions and Results

9.1 TEST: Antenna requirements			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	21°C	
	Relative Humidity (%)	56%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	Enclosure	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.203 § 15.247 (B)(4)(I)		

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 Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 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 specifications	
N° of authorized antenna types	1
Antenna type	Quad Band GSM/GPRS & 3G/ 1/4 Wave Mag Mount Siretta MIKE1A
Maximum total gain	+3.0 dBi
External power amplifiers	Not present

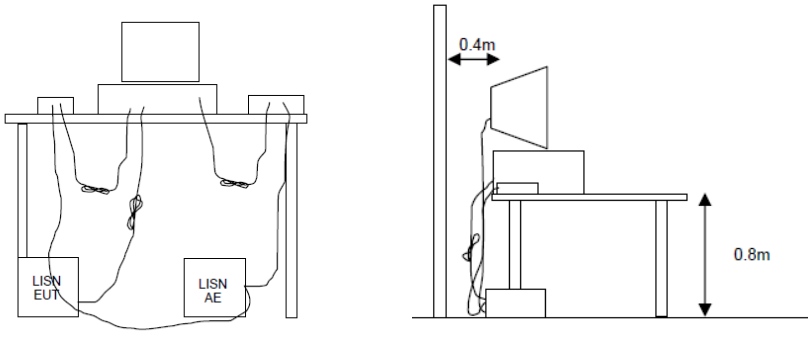
9.2 TEST: AC Power Conducted Emission			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	21°C	
	Relative Humidity (%)	56%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	115V ~ 60Hz	AC Mains	
Equipment mode:	Operation mode	#2	
FCC Standard	§15.207		

Frequency (MHz)	Quasi-peak (dBuV)	Average (dBuV)	Result
0.15-0.5	66 to 56	56 to 46	PASS
0.5-5	56	46	PASS
5-30	60	50	PASS

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

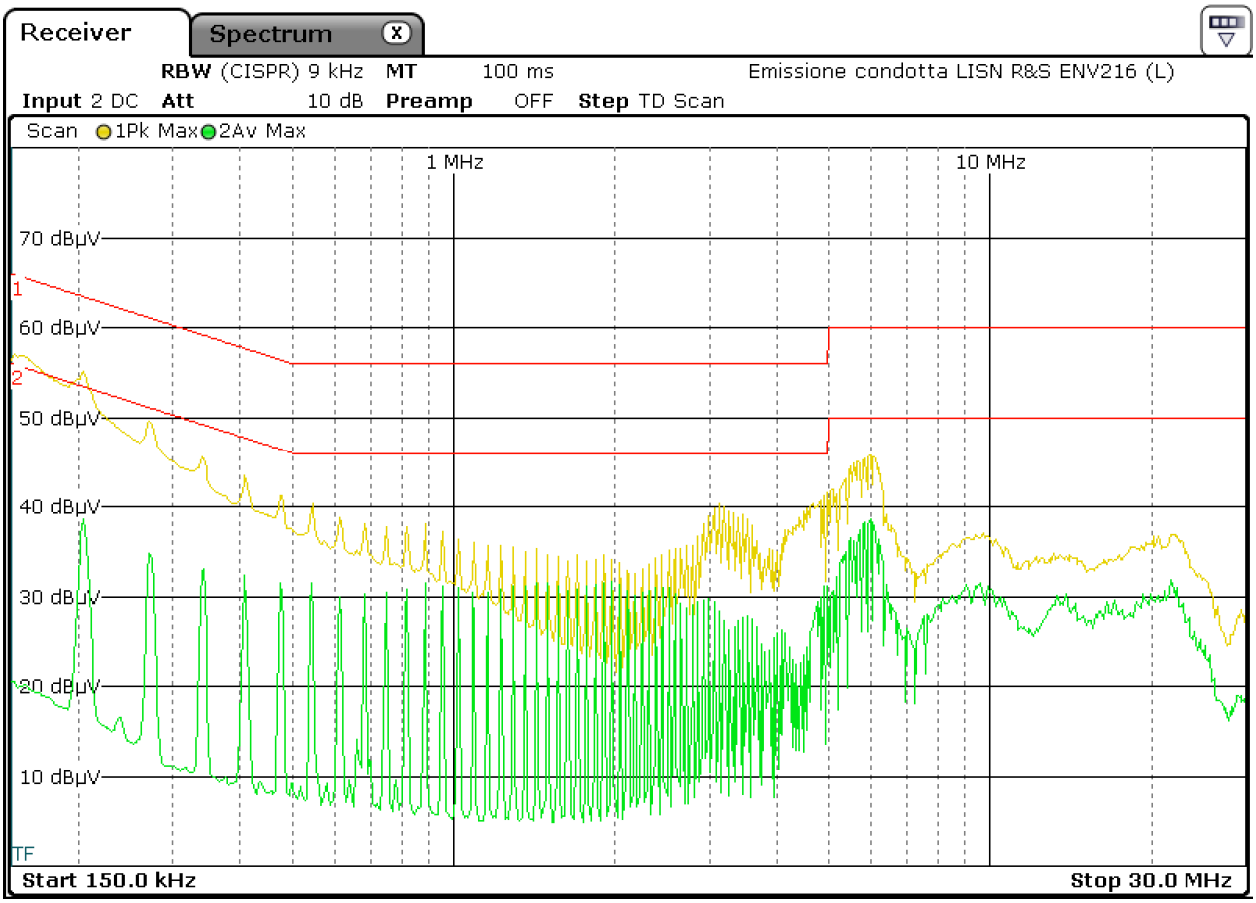
Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Further information to test setup

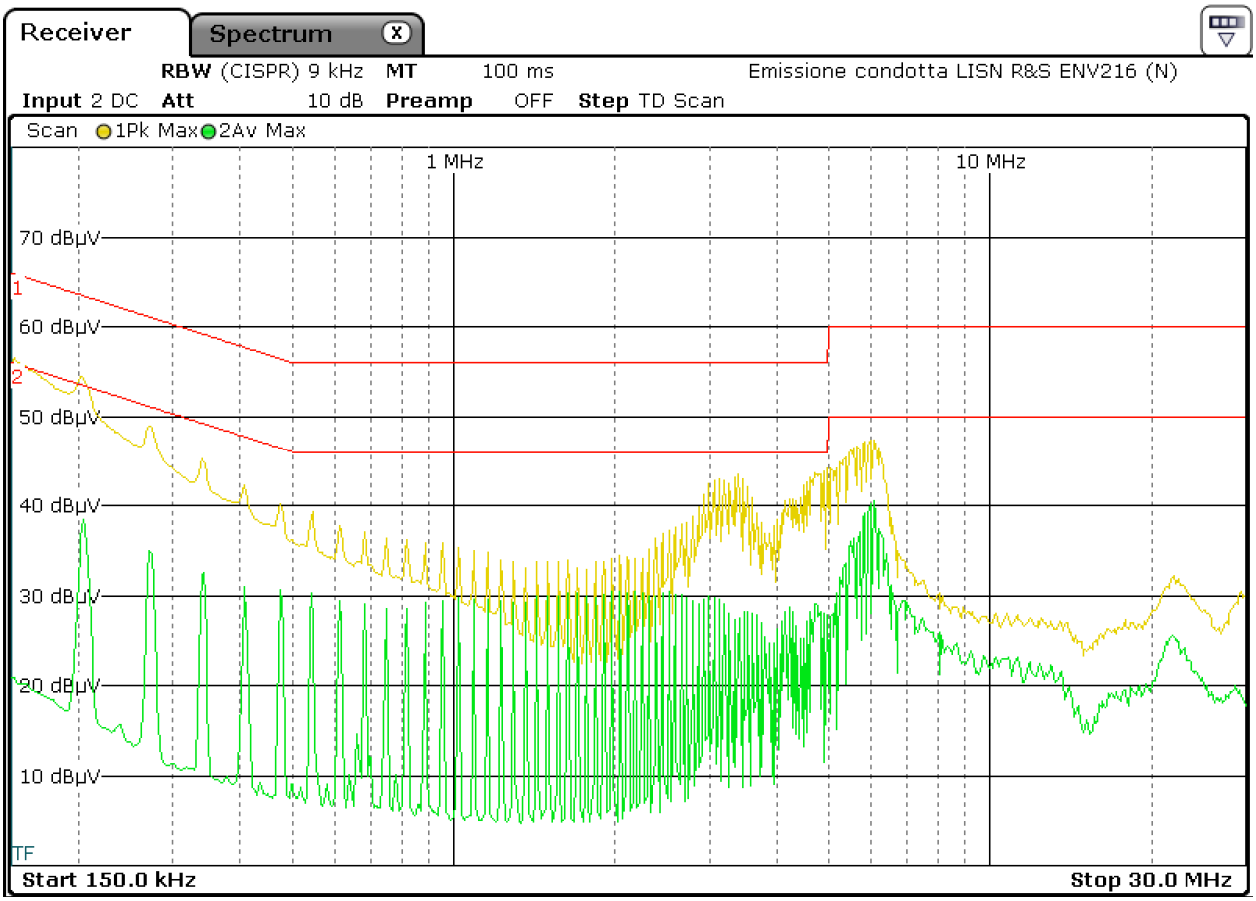


Test Equipment Used					
Description	Manufacturer	Model	TUV Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESR	87020864	12/2017	12/2018
Two line V-Network	R&S	ENV216	87020993	01/2018	01/2020
Stabilized Power Supply	Elettrotest	TPS T 30K60S	87020490	09/2018	09/2021

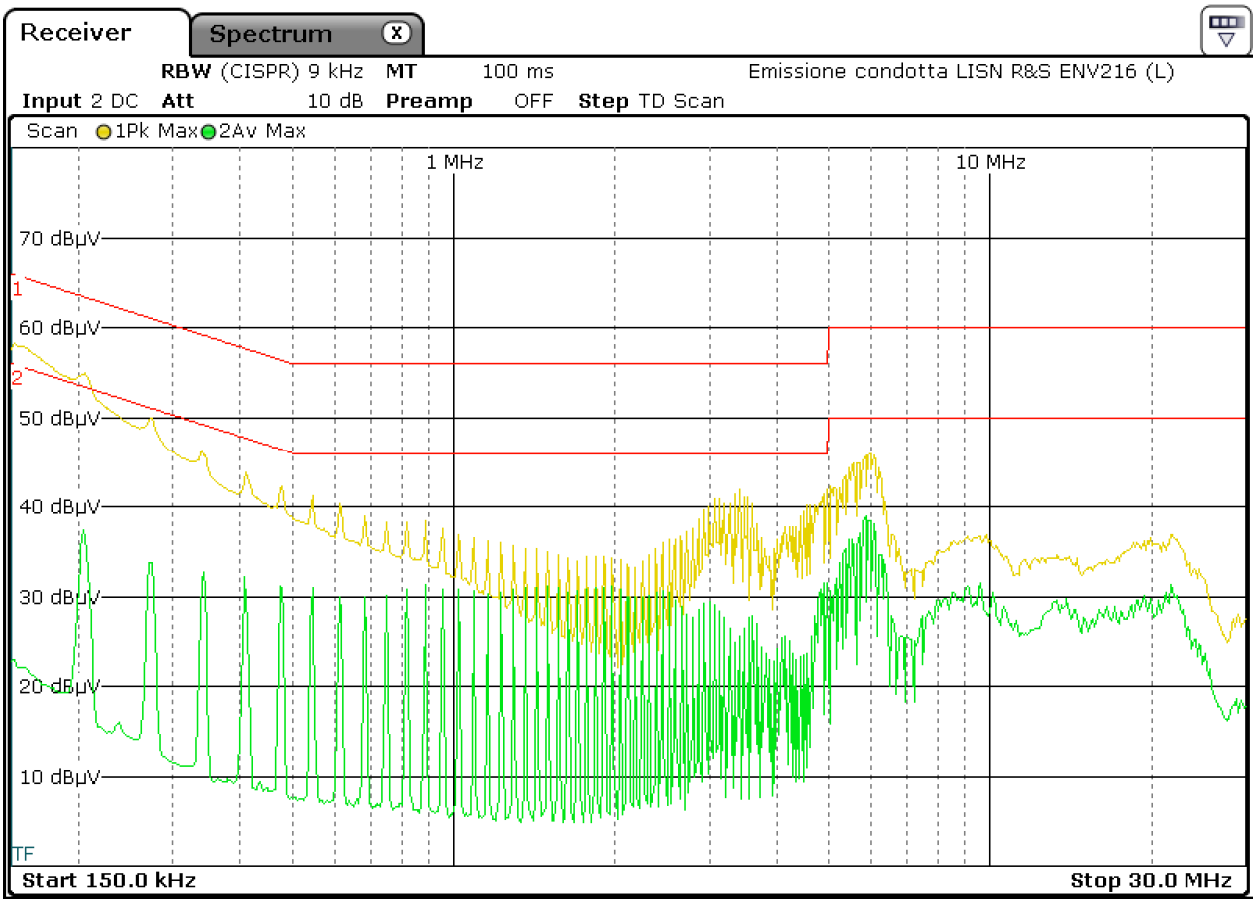
Graphical representation of Mains Terminal Disturbance Voltage Measurement
Operation Mode: #2 – Low Channel (904,0 MHz)
Phase



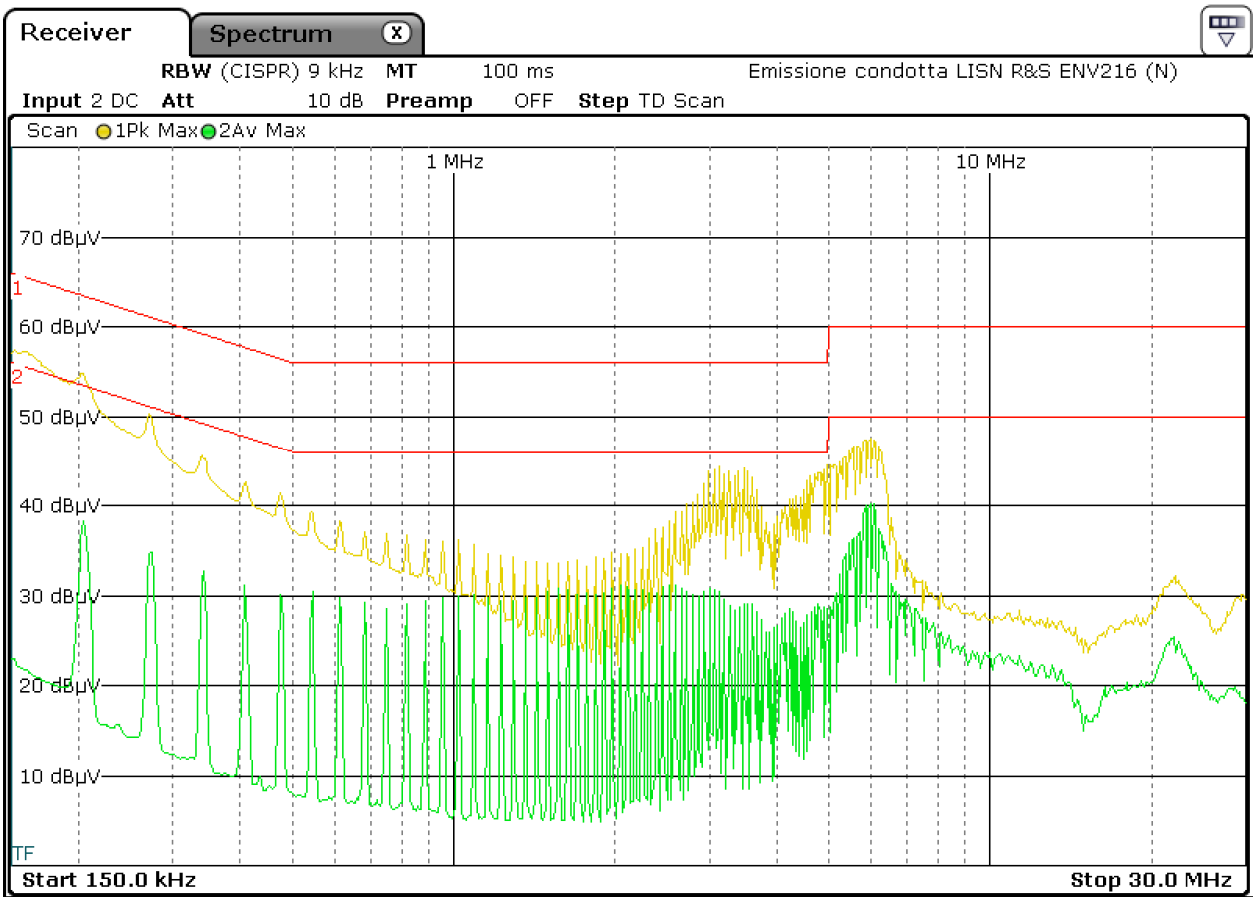
Graphical representation of Mains Terminal Disturbance Voltage Measurement
Operation Mode: #2 – Low Channel (904,0 MHz)
Neutral



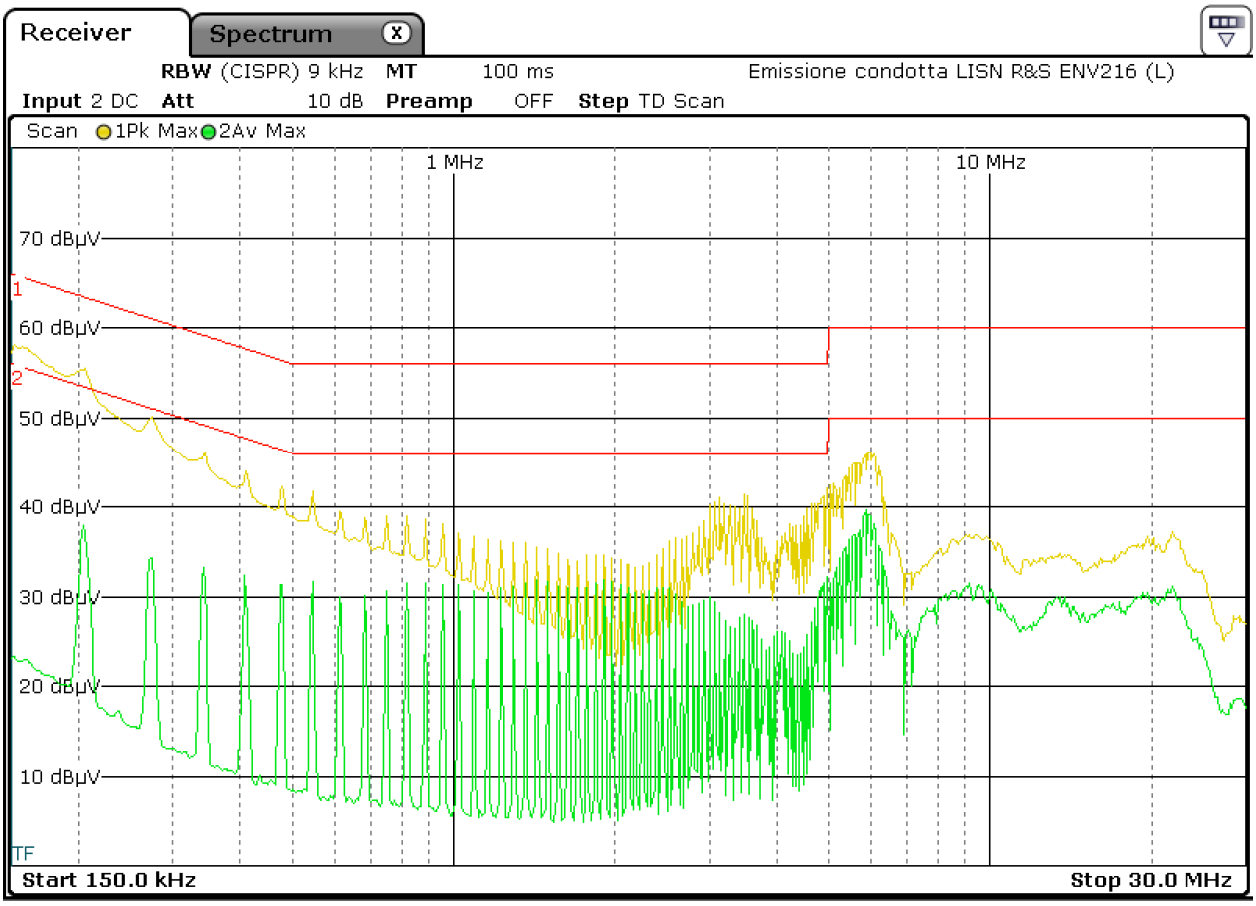
Graphical representation of Mains Terminal Disturbance Voltage Measurement
Operation Mode: #2 – Middle Channel (915,5 MHz)
Phase



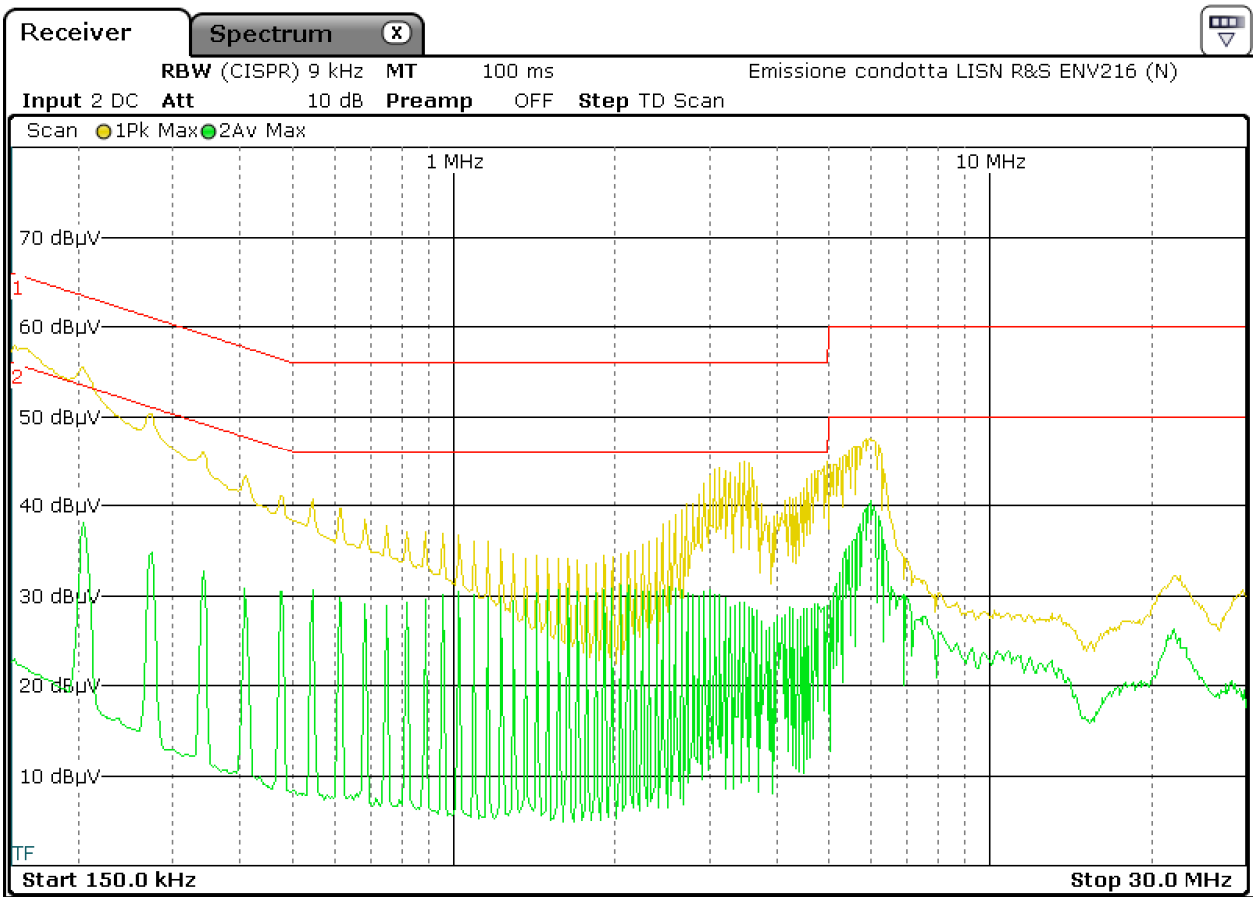
Graphical representation of Mains Terminal Disturbance Voltage Measurement
Operation Mode: #2 – Middle Channel (915,5 MHz)
Neutral



Graphical representation of Mains Terminal Disturbance Voltage Measurement
Operation Mode: #2 – High Channel (927,0 MHz)
Phase



Graphical representation of Mains Terminal Disturbance Voltage Measurement
Operation Mode: #2 – High Channel (927,0 MHz)
Neutral



9.3 TEST: Radiated Emission			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	22°C	
	Relative Humidity (%)	54%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	Enclosure	
Equipment mode:	Operation mode	#1 #3	
FCC Standard	§15.205; §15.209; §15.247		

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

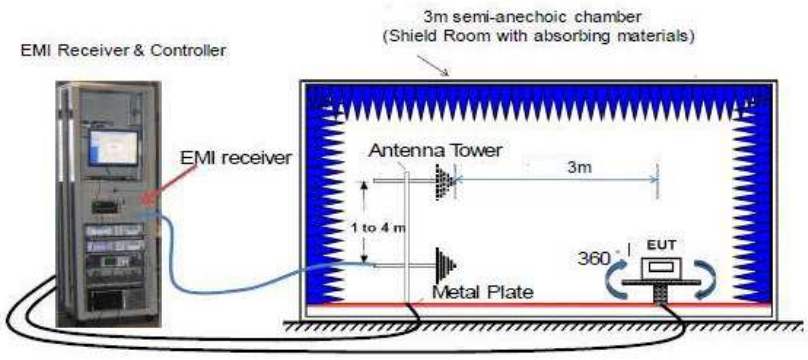
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Remark: In accordance with part 15.31 (f) (2), where the measurement distance was specified to be 30 or 300 meters, a correction factor was applied in order to permit measurement to be performed at a separation distance. The applied formula for limits at 3 meter is:Extrapolation (dB) = 40log (300meter / 3meter) = +80db Extrapolation (dB) = 40log (30meter / 3meter) = +40db

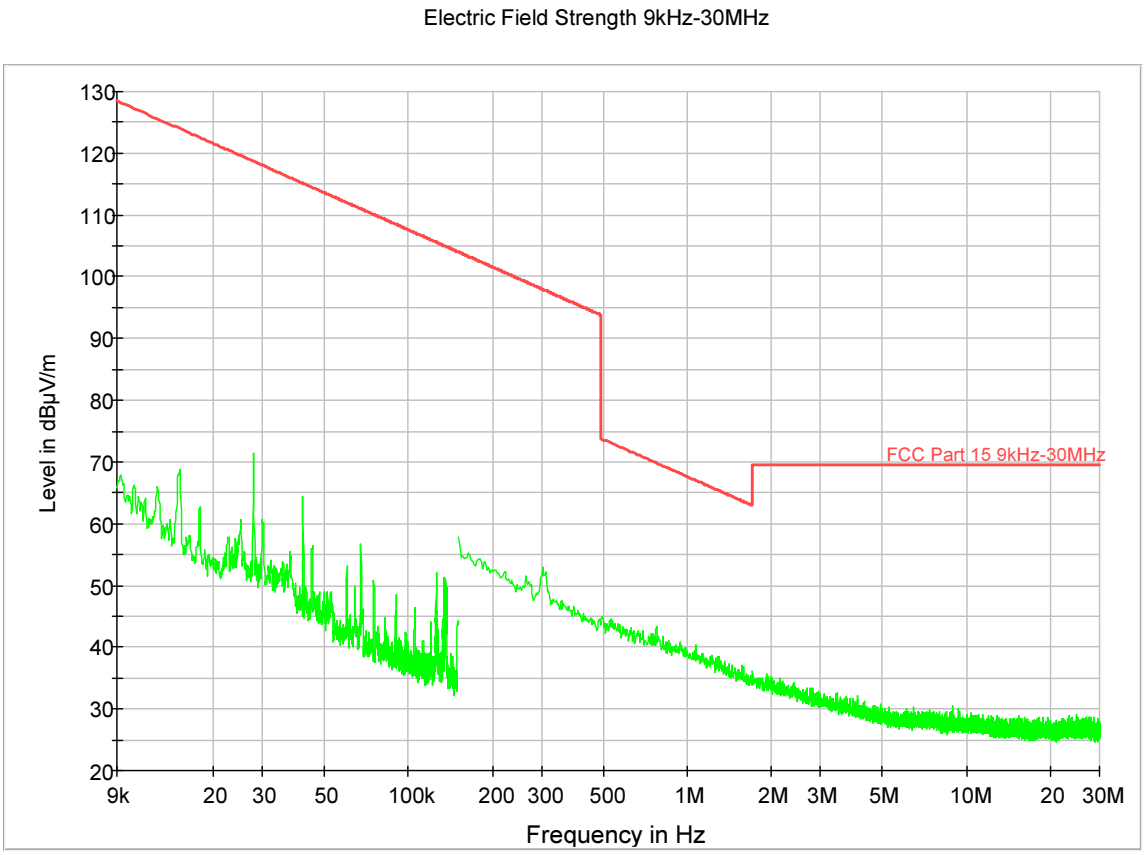
Further information to test setup.

For frequencies above 1GHz, the anechoic material is also placed on the metallic floor between EUT and Antenna

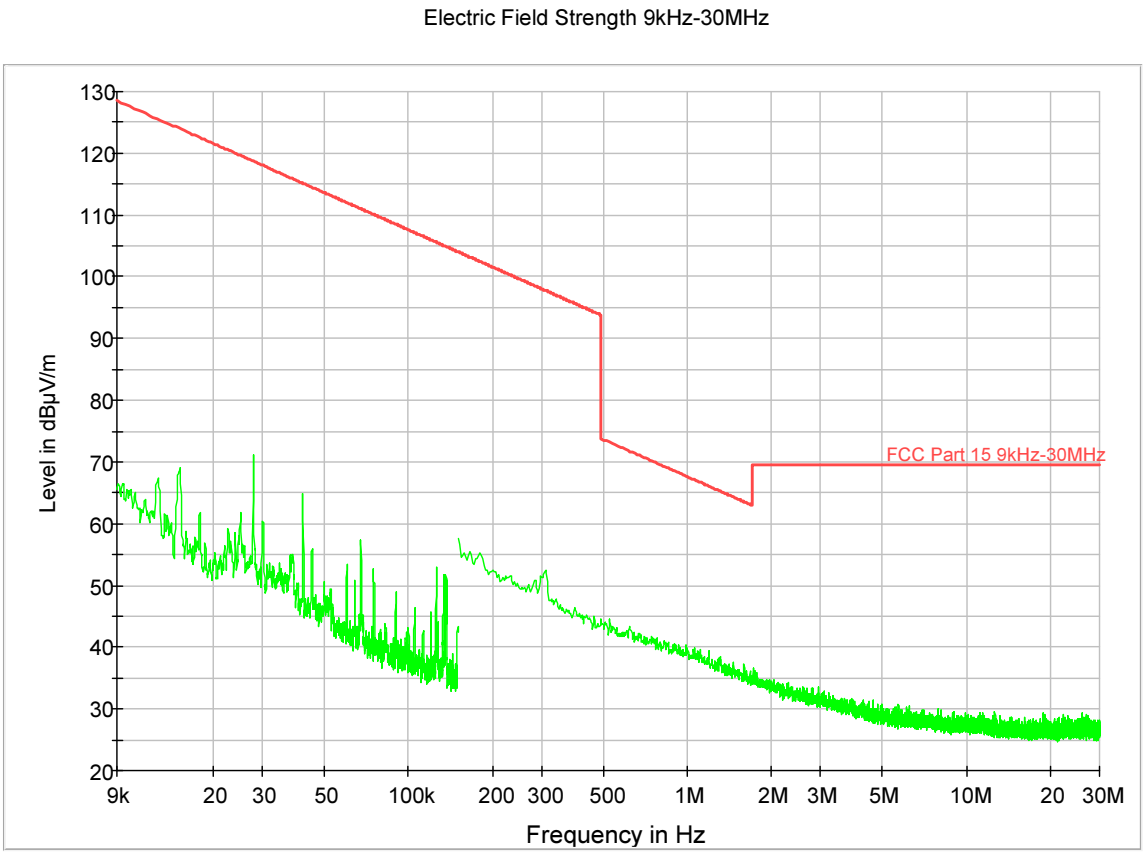


Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
CSSA	ETS Lindgren	FACT3	87020484	03/2018	03/2020
EMI Test Receiver	R&S	ESW44	87020967	07/2018	07/2019
Loop Antenna	EMCO	6512	87020465	02/2017	02/2020
Antenna BiConiLog	ETS Lindgren	3124E-PA	87020457	04/2017	04/2020
Antenna Horn with Preamplifier	ETS Lindgren	3117-PA	87020458	04/2017	04/2020
Highpass Filter	Wainwright Instr.	WHKX10-1170-1300	87020800	05/2018	05/2019
Stabilized Power Supply	Elettrotest	TPS T 30K60S	87020490	09/2018	09/2021

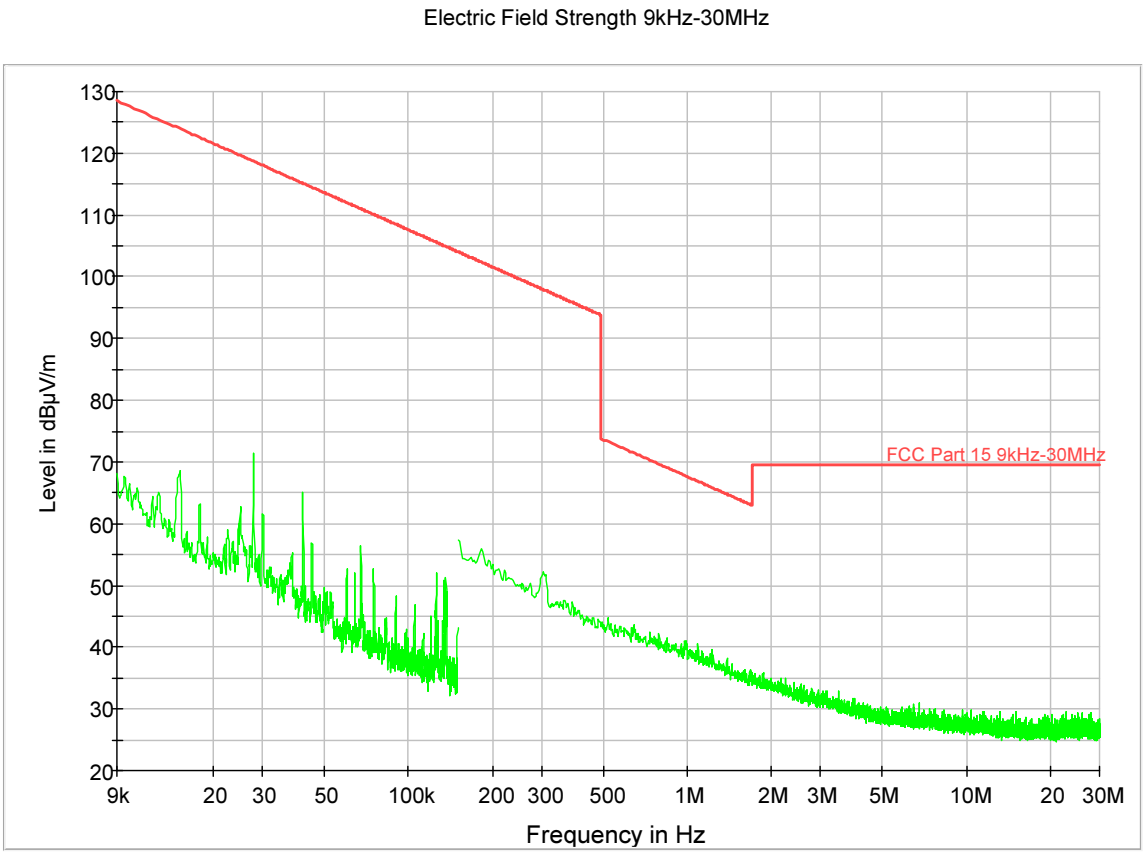
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Low Channel (904,0 MHz)
Frequency: 9kHz – 30MHz



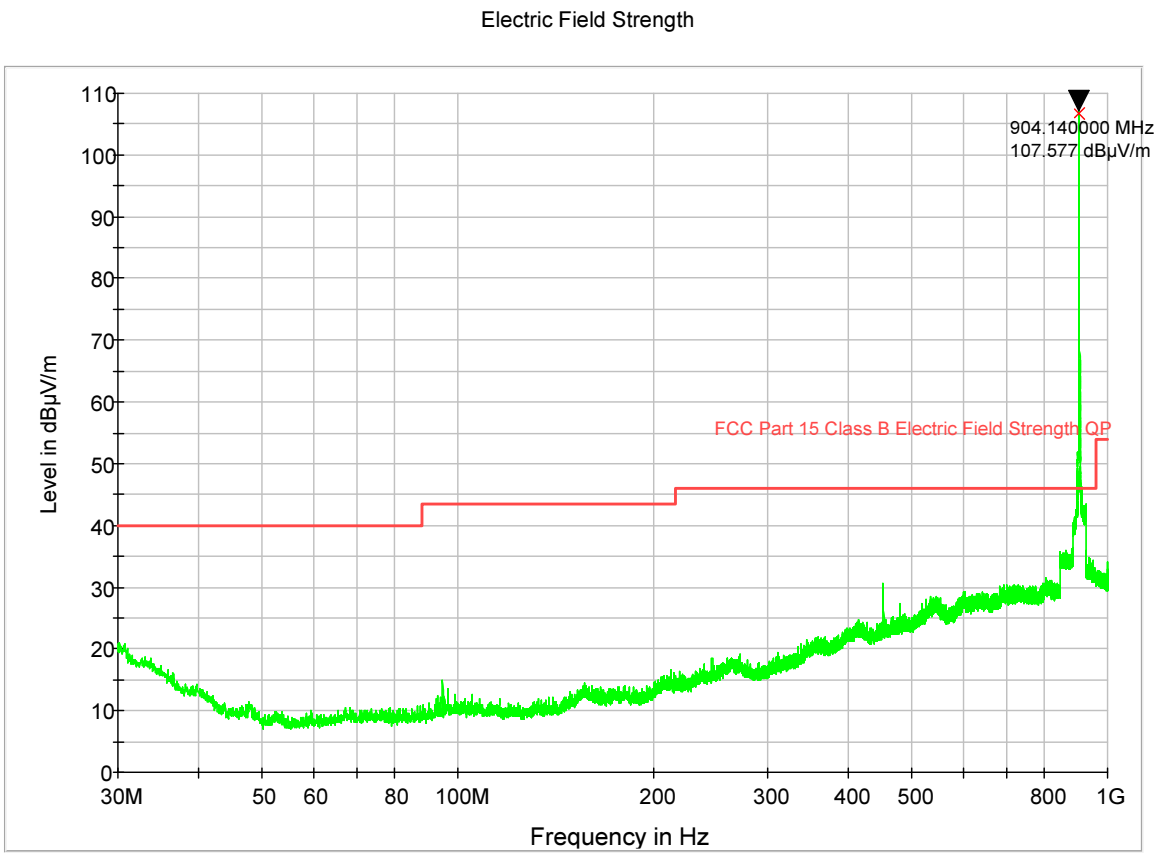
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Middle Channel (915,5 MHz)
Frequency: 9kHz – 30MHz



Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – High Channel (927,0 MHz)
Frequency: 9kHz – 30MHz



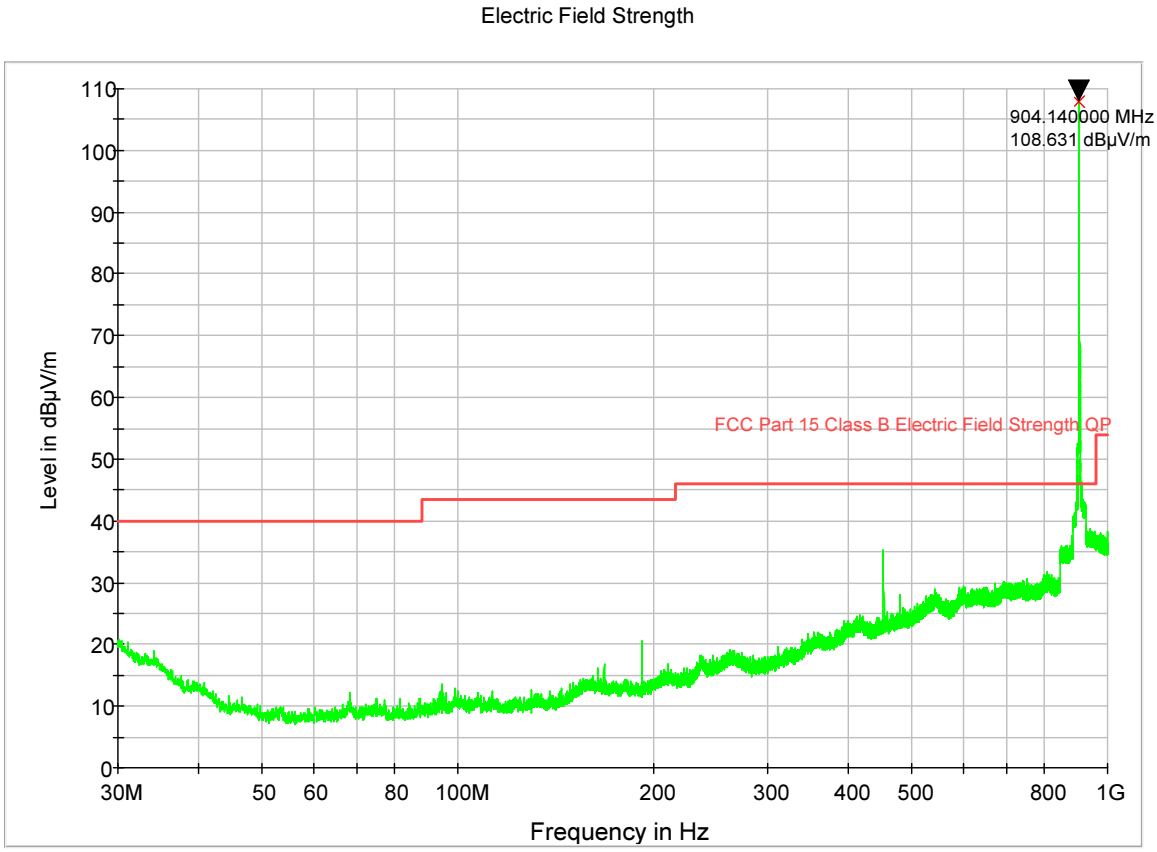
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Low Channel (904,0 MHz)
Frequency: 30MHz – 1GHz
Antenna Polarization: Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
904.140000	---	106.8	1000.0	120.000	107.0	V	340.0	27.4	

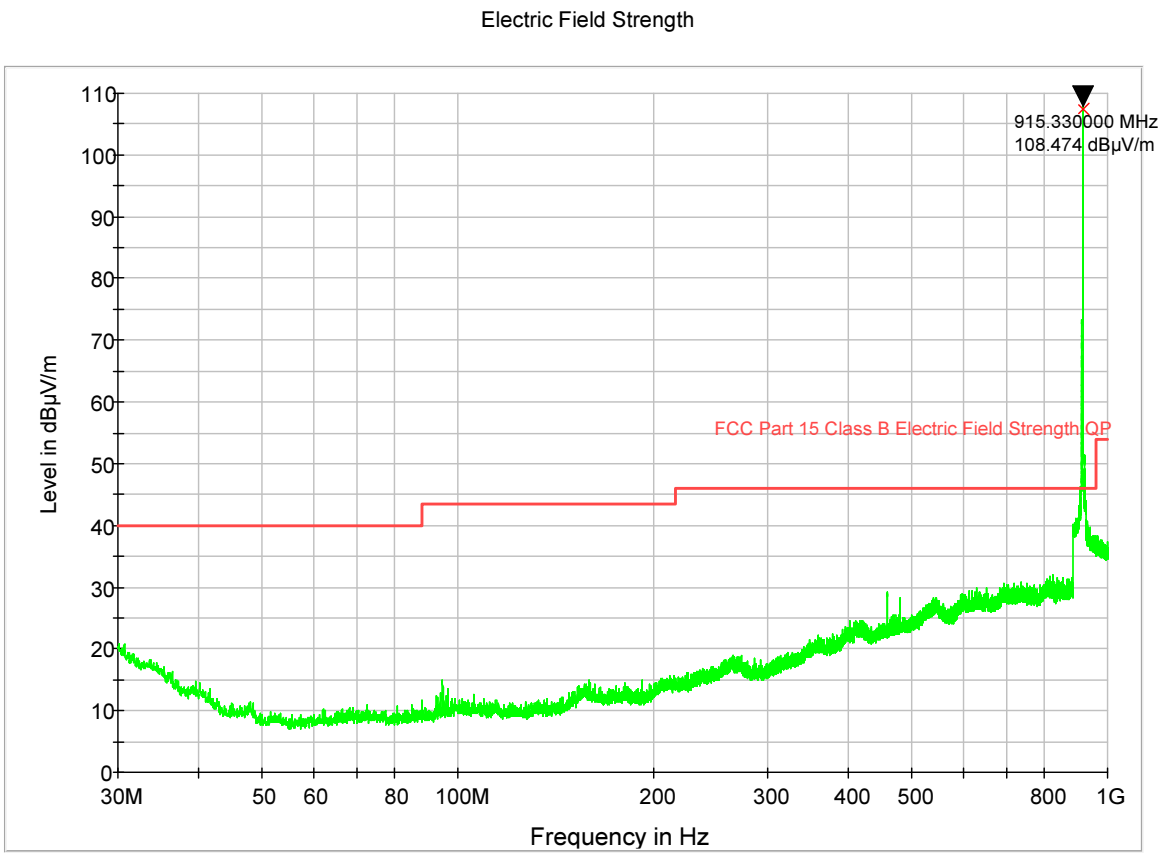
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Low Channel (904,0 MHz)
Frequency: 30MHz – 1GHz
Antenna Polarization: Horizontal



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
904.140000	---	107.9	1000.0	120.000	179.0	H	286.0	27.4	

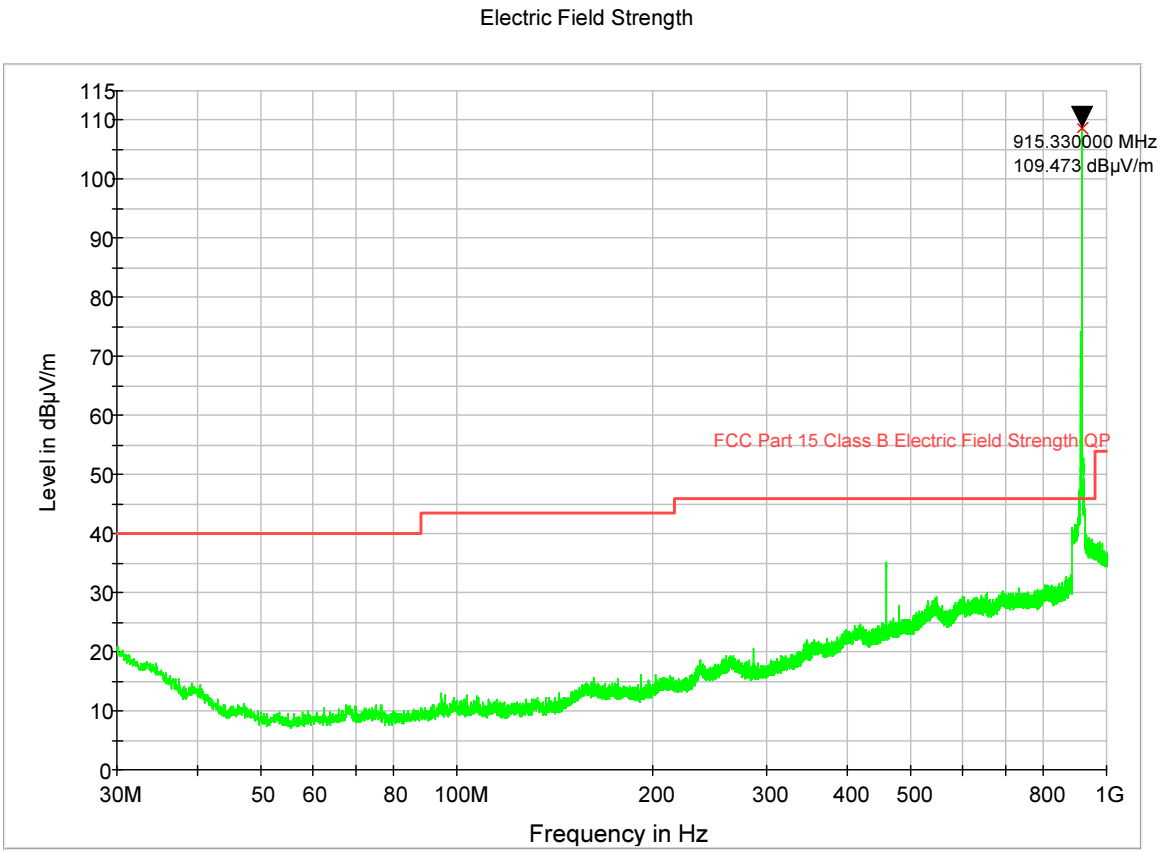
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Middle Channel (915,5 MHz)
Frequency: 30MHz – 1GHz
Antenna Polarization: Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
915.330000	---	107.5	1000.0	120.000	107.0	V	340.0	28.0	

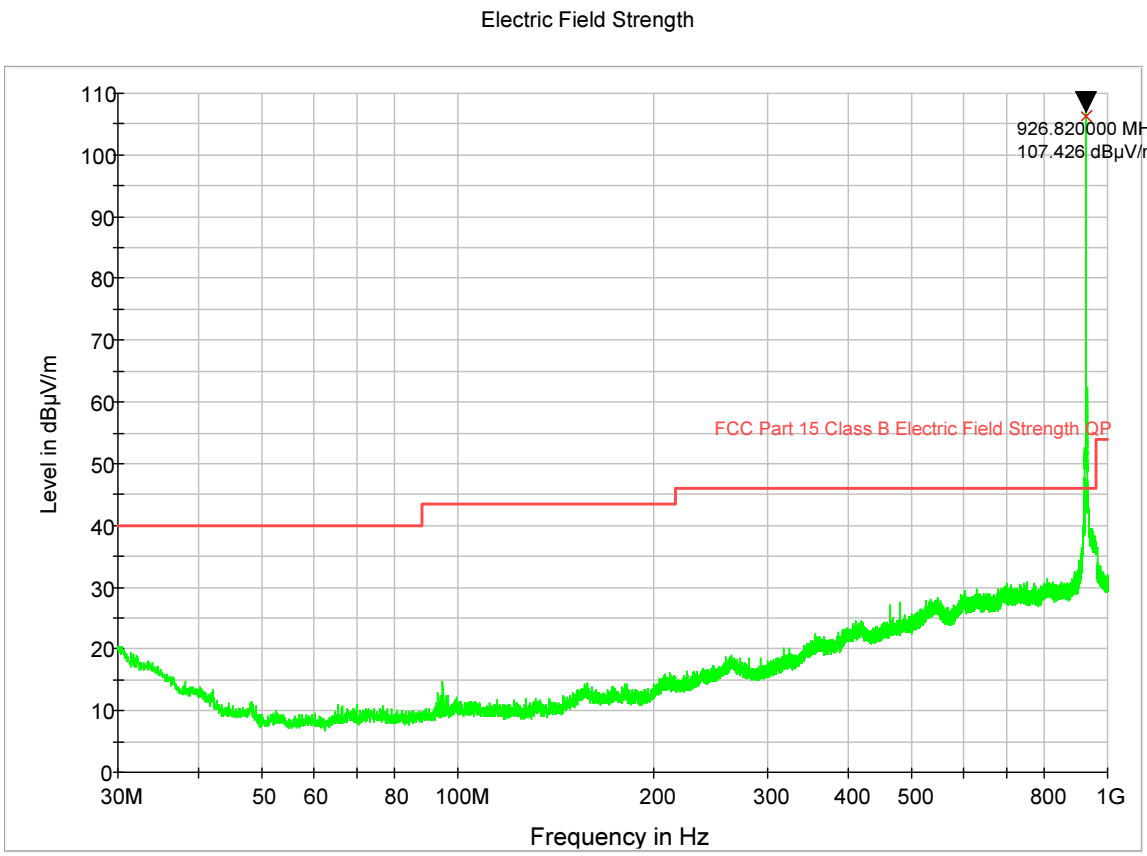
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Middle Channel (915,5 MHz)
Frequency: 30MHz – 1GHz
Antenna Polarization: Horizontal



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
915.330000	---	108.6	1000.0	120.000	179.0	H	286.0	28.0	

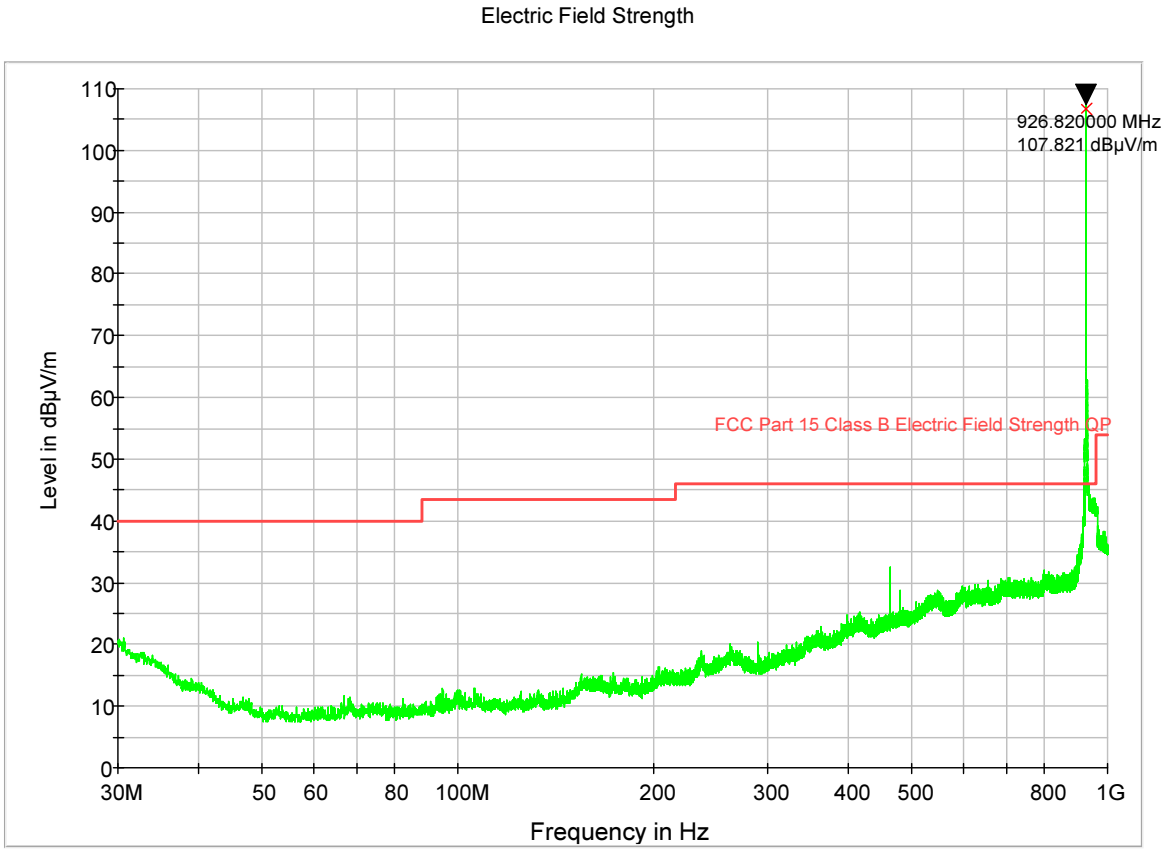
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – High Channel (927,0 MHz)
Frequency: 30MHz – 1GHz
Antenna Polarization: Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
926.820000	---	106.3	1000.0	120.000	107.0	V	340.0	28.7	

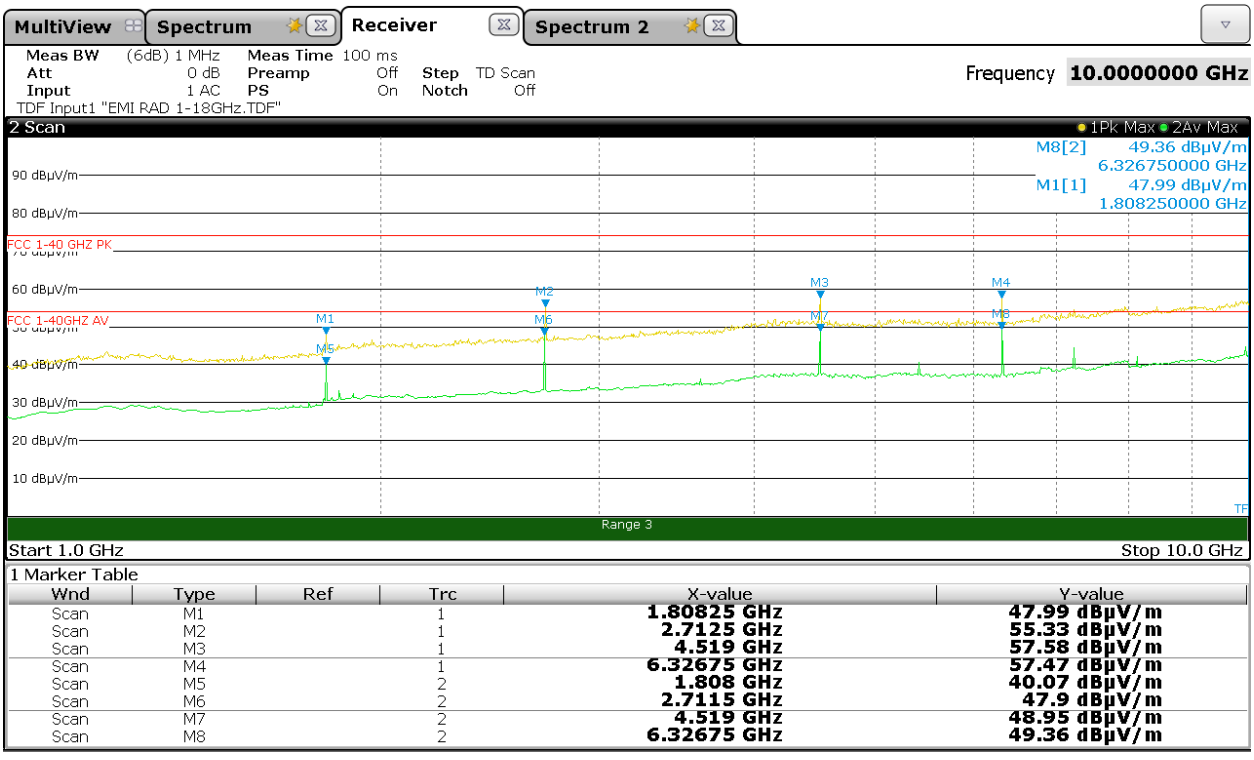
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – High Channel (927,0 MHz)
Frequency: 30MHz – 1GHz
Antenna Polarization: Horizontal



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
926.820000	---	106.7	1000.0	120.000	179.0	H	286.0	28.7	

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Low Channel (904,0 MHz)
Frequency: 1GHz – 10GHz
Antenna Polarization: Vertical



1 Marker Table

Wnd	Type	Ref	Trc	X-value	Y-value
Scan	M1		1	**1.80825 GHz**	**47.99 dBµV/m**
Scan	M2		1	**2.7125 GHz**	**55.33 dBµV/m**
Scan	M3		1	**4.519 GHz**	**57.58 dBµV/m**
Scan	M4		1	**6.32675 GHz**	**57.47 dBµV/m**
Scan	M5		2	**1.808 GHz**	**40.07 dBµV/m**
Scan	M6		2	**2.7115 GHz**	**47.9 dBµV/m**
Scan	M7		2	**4.519 GHz**	**48.95 dBµV/m**
Scan	M8		2	**6.32675 GHz**	**49.36 dBµV/m**

PEAK RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**PK Limit (AV Limit + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1808 (2nd harm)	57,29	-14,58	5,28	**47,99**	no	87,57*	39,58
2712 (3rd harm)	60,79	-12,14	6,68	**55,33**	yes	74,00	18,67
4520 (5th harm)	58,67	-9,65	8,56	**57,58**	yes	74,00	16,42
6328 (7th harm)	55,22	-8,03	10,28	**57,47**	no	87,57*	30,1
*=fundamental level in Vertical polarization – 20dB							

AVERAGE RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1808 (2nd harm)	49,37	-14,58	5,28	**40,07**	no	67,57*	27,5
2712 (3rd harm)	53,36	-12,14	6,68	**47,90**	yes	54,00	6,1
4520 (5th harm)	50,04	-9,65	8,56	**48,95**	yes	54,00	5,05
6328 (7th harm)	47,11	-8,03	10,28	**49,36**	no	67,57*	18,21
*=Peak limit – 20dB							

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Low Channel (904,0 MHz)
Frequency: 1GHz – 10GHz
Antenna Polarization: Horizontal

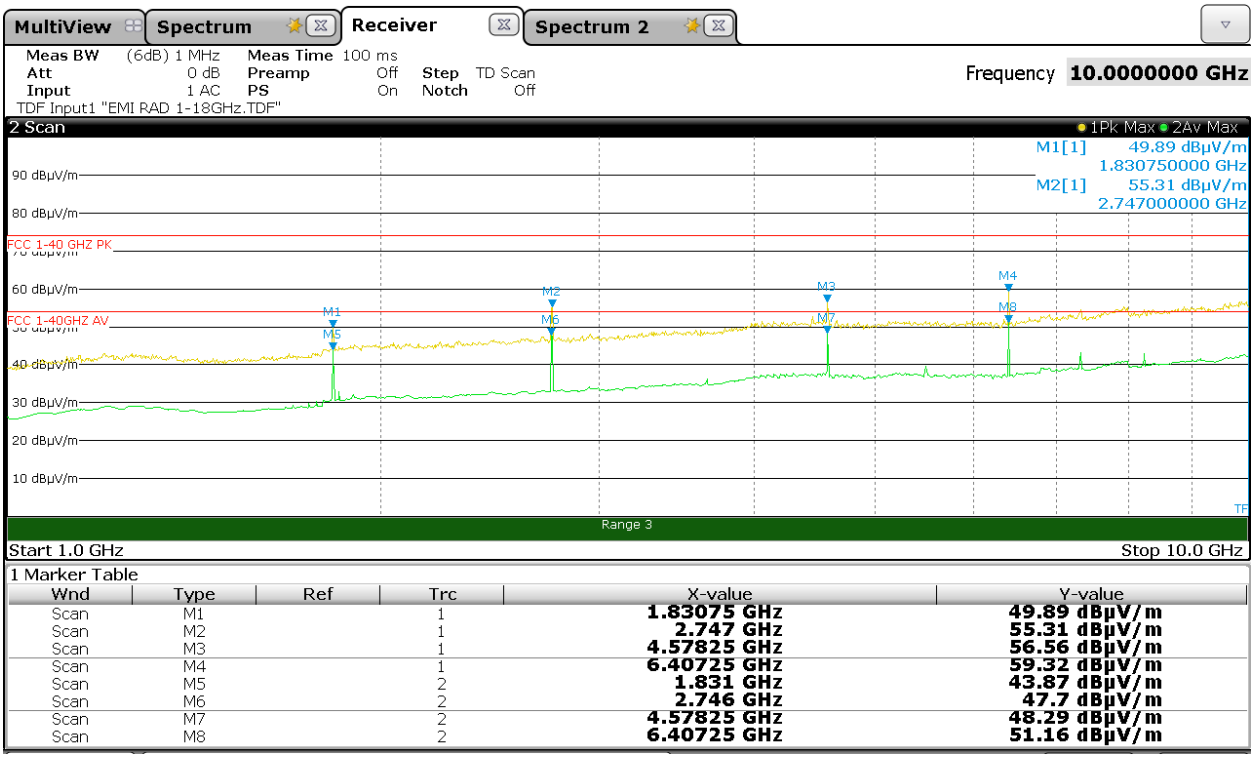
1 Marker Table

Wnd	Type	Ref	Trc	X-value	Y-value
Scan	M1		1	**1.80775 GHz**	**50.11 dBµV/m**
Scan	M2		1	**2.7125 GHz**	**54.69 dBµV/m**
Scan	M3		1	**4.519 GHz**	**55.83 dBµV/m**
Scan	M4		1	**6.32675 GHz**	**54.88 dBµV/m**
Scan	M5		2	**1.808 GHz**	**43.91 dBµV/m**
Scan	M6		2	**2.7115 GHz**	**46.83 dBµV/m**
Scan	M7		2	**4.519 GHz**	**47.08 dBµV/m**
Scan	M8		2	**6.32675 GHz**	**46.07 dBµV/m**

PEAK RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**PK Limit (AV Limit + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1808 (2nd harm)	59,41	-14,58	5,28	**50,11**	no	88,63*	38,52
2712 (3rd harm)	60,15	-12,14	6,68	**54,69**	yes	74,00	19,31
4520 (5th harm)	56,92	-9,65	8,56	**55,83**	yes	74,00	18,17
6328 (7th harm)	52,63	-8,03	10,28	**54,88**	no	88,63*	33,75
*=fundamental level in Horizontal polarization – 20dB							

AVERAGE RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1808 (2nd harm)	53,21	-14,58	5,28	**43,91**	no	68,63*	24,72
2712 (3rd harm)	52,29	-12,14	6,68	**46,83**	yes	54,00	7,17
4520 (5th harm)	48,17	-9,65	8,56	**47,08**	yes	54,00	6,92
6328 (7th harm)	43,82	-8,03	10,28	**46,07**	no	68,63*	22,56
*=Peak limit – 20dB							

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Middle Channel (915,5 MHz)
Frequency: 1GHz – 10GHz
Antenna Polarization: Vertical



1 Marker Table

Wnd	Type	Ref	Trc	X-value	Y-value
Scan	M1		1	1.83075 GHz	49.89 dBµV/m
Scan	M2		1	2.747 GHz	55.31 dBµV/m
Scan	M3		1	4.57825 GHz	56.56 dBµV/m
Scan	M4		1	6.40725 GHz	59.32 dBµV/m
Scan	M5		2	1.831 GHz	43.87 dBµV/m
Scan	M6		2	2.746 GHz	47.7 dBµV/m
Scan	M7		2	4.57825 GHz	48.29 dBµV/m
Scan	M8		2	6.40725 GHz	51.16 dBµV/m

PEAK RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**PK Limit (AV Limit + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1831 (2nd harm)	58,91	-14,34	5,32	**49,89**	no	88,47*	38,58
2747 (3rd harm)	60,77	-12,15	6,69	**55,31**	yes	74,00	18,69
4578 (5th harm)	57,54	-9,63	8,65	**56,56**	yes	74,00	17,44
6408 (7th harm)	56,93	-7,99	10,38	**59,32**	no	88,47*	29,15
*=fundamental level in Vertical polarization – 20dB							

AVERAGE RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1831 (2nd harm)	52,89	-14,34	5,32	**43,87**	no	68,47*	24,6
2747 (3rd harm)	53,16	-12,15	6,69	**47,70**	yes	54,00	6,30
4578 (5th harm)	49,27	-9,63	8,65	**48,29**	yes	54,00	5,71
6408 (7th harm)	48,77	-7,99	10,38	**51,16**	no	68,47*	17,31
*=Peak limit – 20dB							

Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – Middle Channel (915,5 MHz)
Frequency: 1GHz – 10GHz
Antenna Polarization: Horizontal

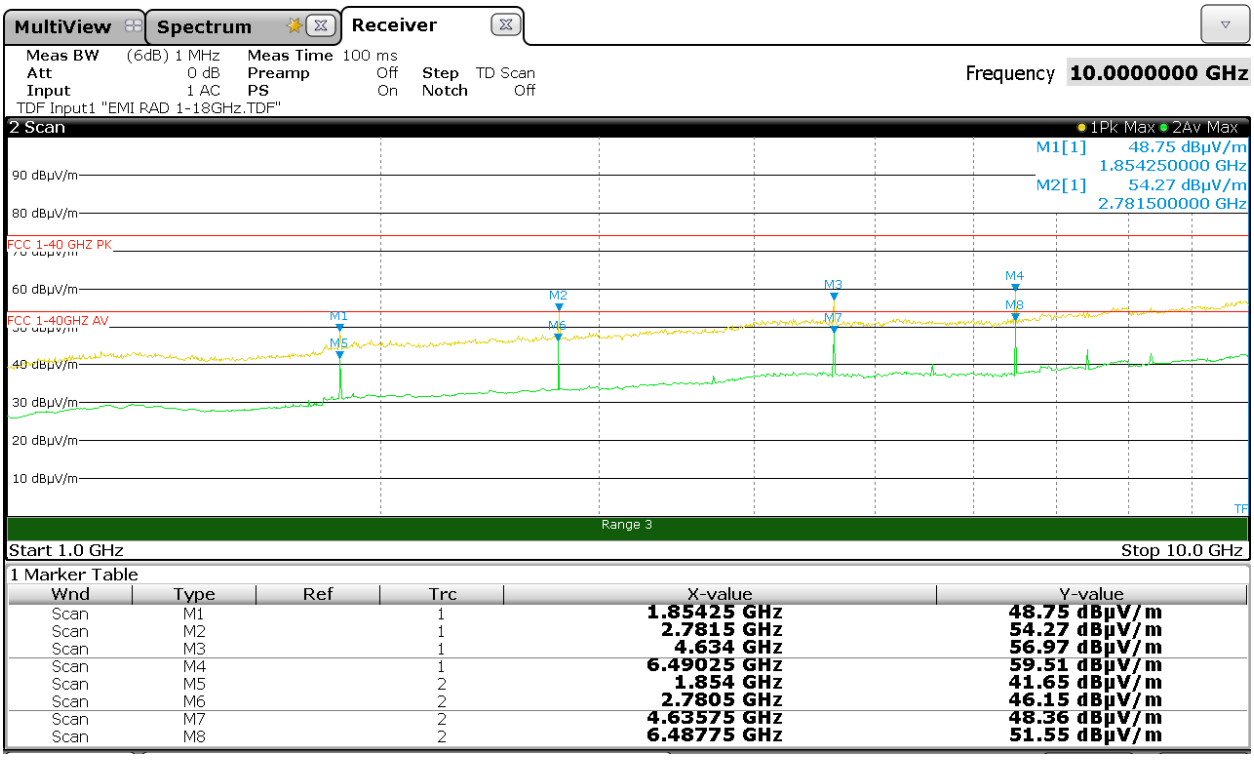
1 Marker Table

Wnd	Type	Ref	Trc	X-value	Y-value
Scan	M1		1	**1.8305 GHz**	**50.49 dBµV/m**
Scan	M2		1	**2.747 GHz**	**54.02 dBµV/m**
Scan	M3		1	**4.57825 GHz**	**56.14 dBµV/m**
Scan	M4		1	**6.4095 GHz**	**56.91 dBµV/m**
Scan	M5		2	**1.831 GHz**	**45.05 dBµV/m**
Scan	M6		2	**2.746 GHz**	**46.23 dBµV/m**
Scan	M7		2	**4.57825 GHz**	**47.32 dBµV/m**
Scan	M8		2	**6.40725 GHz**	**48.69 dBµV/m**

PEAK RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**PK Limit (AV Limit + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1831 (2nd harm)	59,51	-14,34	5,32	**50,49**	no	89,43*	38,94
2747 (3rd harm)	59,48	-12,15	6,69	**54,02**	yes	74,00	19,98
4578 (5th harm)	57,12	-9,63	8,65	**56,14**	yes	74,00	17,86
6408 (7th harm)	54,52	-7,99	10,38	**56,91**	no	89,43*	32,52
*=fundamental level in Horizontal polarization – 20dB							

AVERAGE RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1831 (2nd harm)	54,07	-14,34	5,32	**45,05**	no	69,43*	24,38
2747 (3rd harm)	51,69	-12,15	6,69	**46,23**	yes	54,00	7,77
4578 (5th harm)	48,30	-9,63	8,65	**47,32**	yes	54,00	6,68
6408 (7th harm)	46,30	-7,99	10,38	**48,69**	no	69,43*	20,74
*=Peak limit – 20dB							

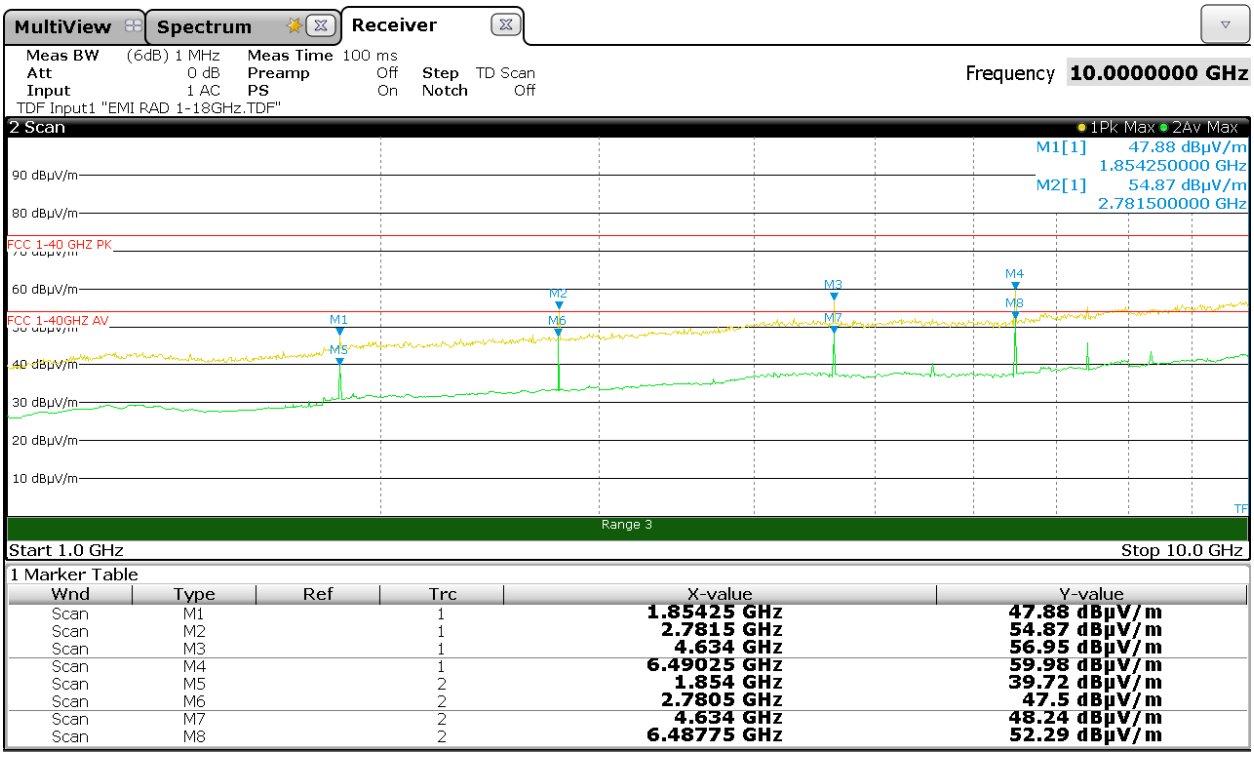
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – High Channel (927,0 MHz)
Frequency: 1GHz – 10GHz
Antenna Polarization: Vertical



PEAK RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**PK Limit (AV Limit + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1854 (2nd harm)	59,35	-14,21	5,35	**50,49**	no	87,42*	36,93
2781 (3rd harm)	59,40	-12,08	6,70	**54,02**	yes	74,00	19,98
4635 (5th harm)	57,03	-9,61	8,72	**56,14**	yes	74,00	17,86
6489 (7th harm)	54,36	-7,95	10,50	**56,91**	no	87,42*	30,51
*=fundamental level in Vertical polarization – 20dB							

AVERAGE RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1854 (2nd harm)	53,91	-14,21	5,35	**45,05**	no	67,42*	22,37
2781 (3rd harm)	51,61	-12,08	6,70	**46,23**	yes	54,00	7,77
4635 (5th harm)	48,21	-9,61	8,72	**47,32**	yes	54,00	6,68
6489 (7th harm)	46,14	-7,95	10,50	**48,69**	no	67,42*	18,73
*=Peak limit – 20dB							

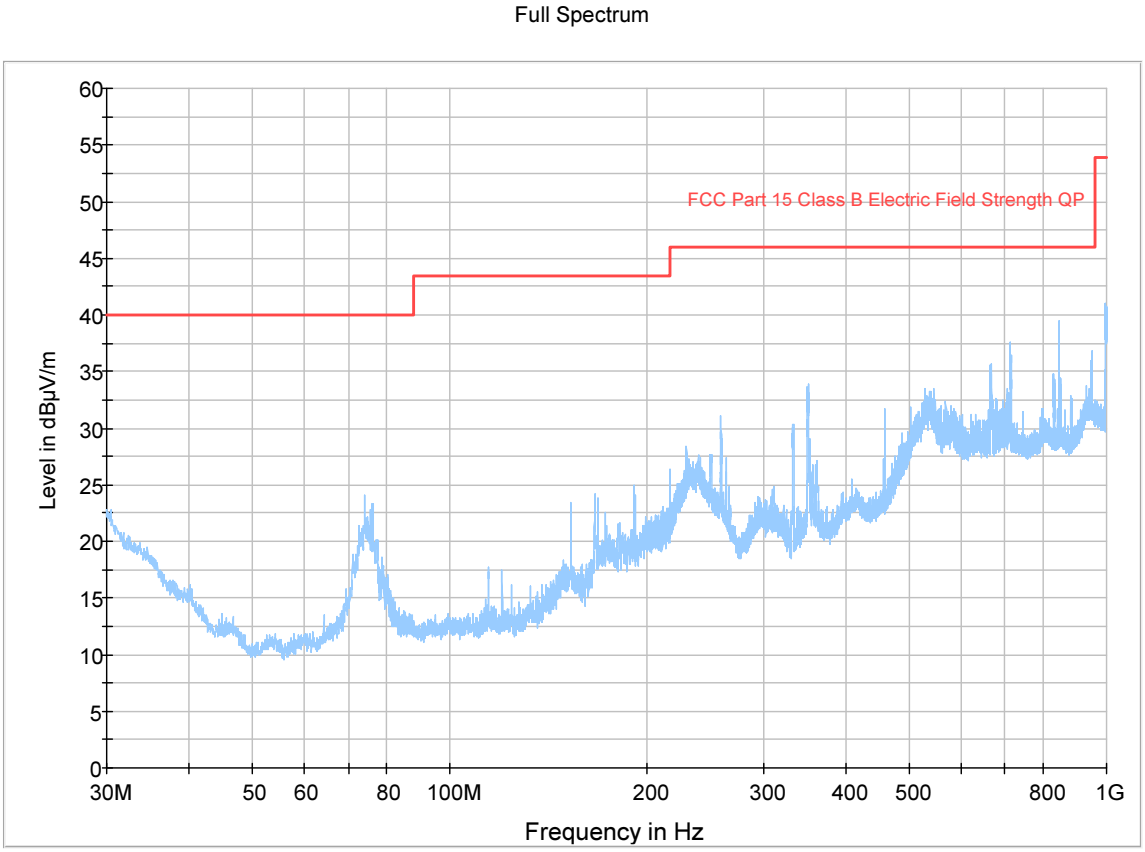
Graphical representation of Radiated Emission Measurement
Operation Mode: #1 – High Channel (927,0 MHz)
Frequency: 1GHz – 10GHz
Antenna Polarization: Horizontal

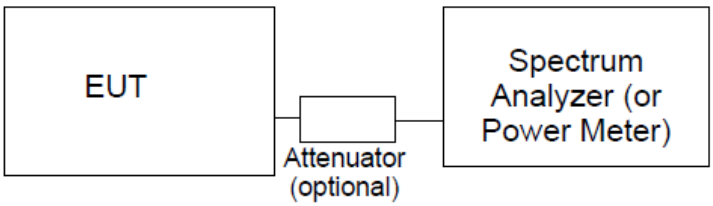


PEAK RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**PK Limit (AV Limit + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1854 (2nd harm)	56,74	-14,21	5,35	**47,88**	no	87,82*	39,94
2781 (3rd harm)	60,25	-12,08	6,70	**54,87**	yes	74,00	19,13
4635 (5th harm)	57,84	-9,61	8,72	**56,95**	yes	74,00	17,05
6489 (7th harm)	57,43	-7,95	10,50	**59,98**	no	87,82*	27,84
*=fundamental level in Horizontal polarization – 20dB							

AVERAGE RESULT (RBW=1MHz)							
Frequency	**Reading value**	**Antenna Factor with Pre-Amp. Gain**	**Cable Loss**	**Correcting reading**	**Restricted band**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dBµV/m)**	**/**	**(dBµV/m)**	**(dB)**
1854 (2nd harm)	48,58	-14,21	5,35	**39,72**	no	67,82*	28,10
2781 (3rd harm)	52,88	-12,08	6,70	**47,50**	yes	54,00	6,50
4635 (5th harm)	49,13	-9,61	8,72	**48,24**	yes	54,00	5,76
6489 (7th harm)	49,74	-7,95	10,50	**52,29**	no	67,82*	15,53
*=Peak limit – 20dB							

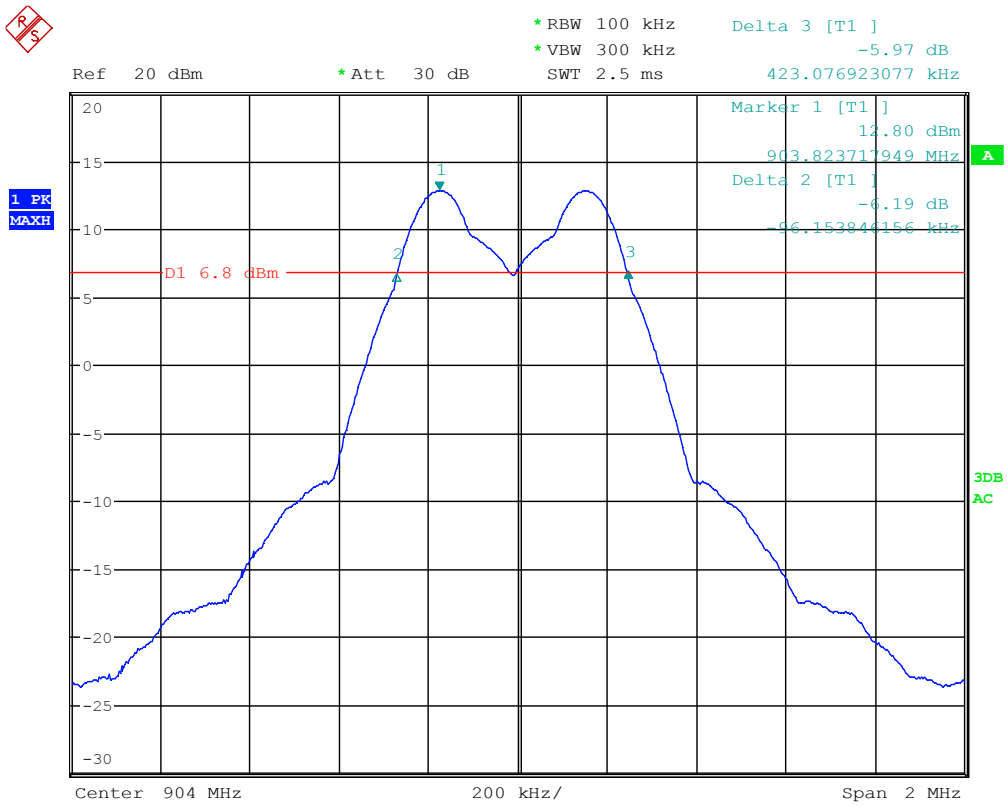
Graphical representation of Radiated Emission Measurement
Operation Mode: #3
Frequency: 30MHz – 1GHz
Unintentional mode – Equipment supplied at +5V by USB port of Personal Computer



9.4 TEST: 6dB Bandwidth			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	24°C	
	Relative Humidity (%)	48%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	SMA Connector	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247 (A)(2)		
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.			
Further information to test setup			

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	2782345	05/2018	05/2019

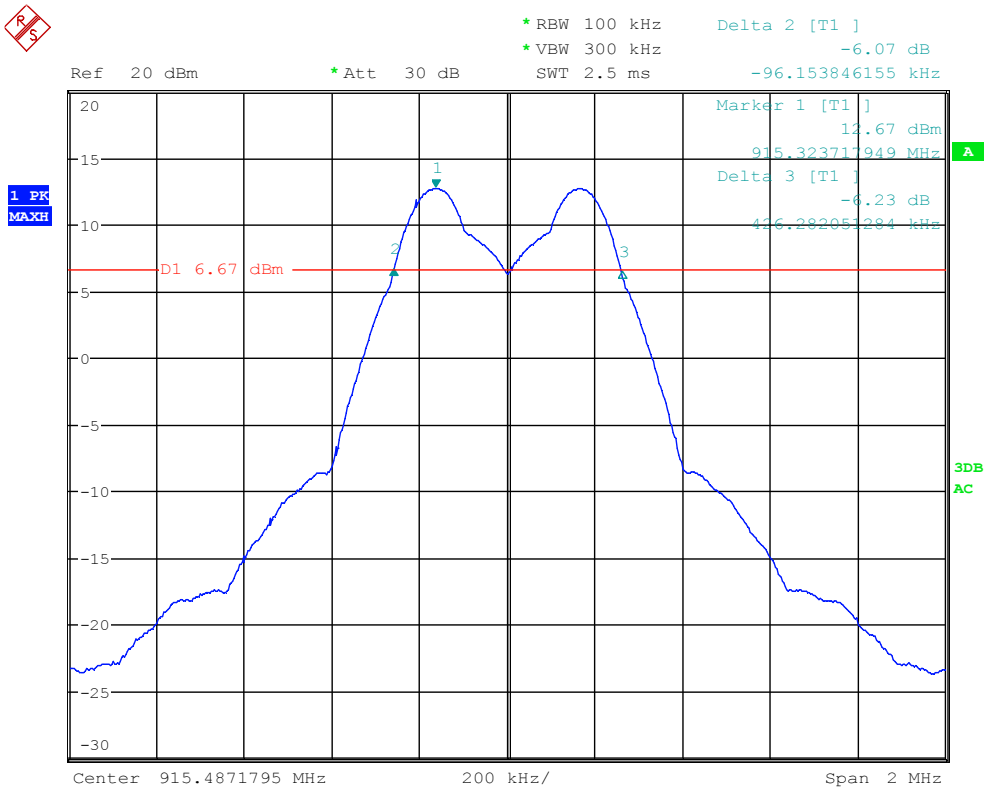
Graphical representation of 6dB Bandwidth
Operation Mode: #1 – Low Channel (904,0 MHz)
Plot n°1



Channel (No.)	Frequency (MHz)	Channel Bandwidth at -6dB (kHz)	Limit (kHz)	Plot (No.)
Low	**904,00**	**519,230**	**≥ 500**	**1**

Bandwidth at -6dB (Fmin and Fmax)			
Fmin	**903,727 MHz**	**Fmax**	**904,246 MHz**

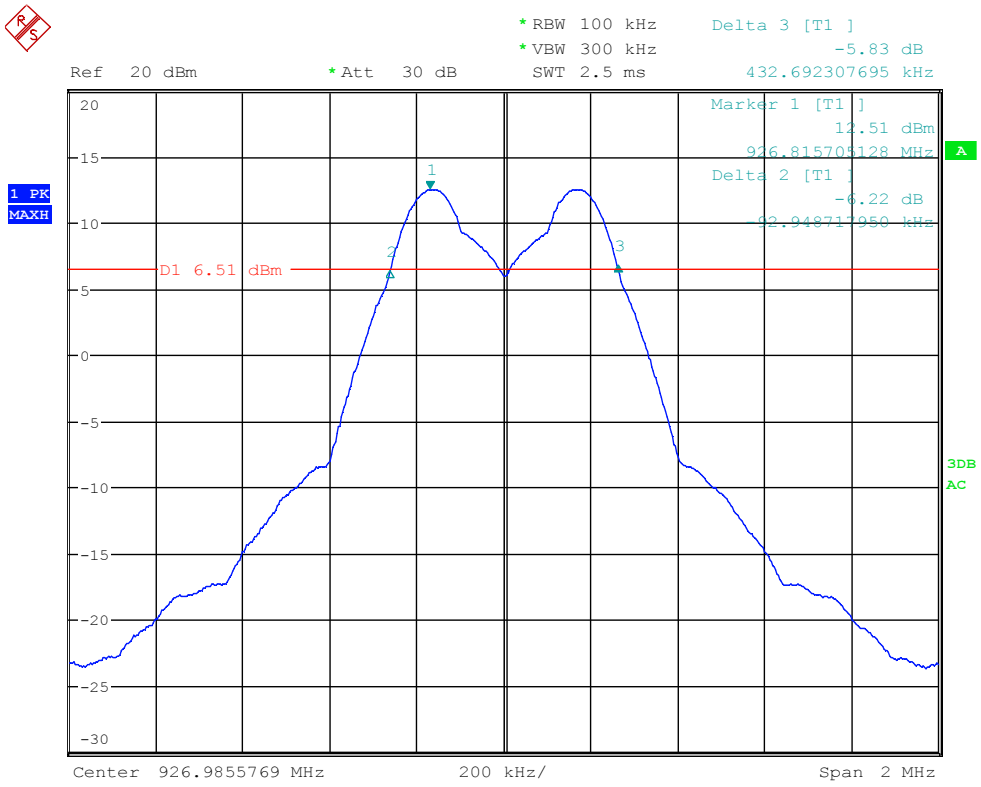
Graphical representation of 6dB Bandwidth
Operation Mode: #1 – Middle Channel (915,5 MHz)
Plot n°2



Channel (No.)	Frequency (MHz)	Channel Bandwidth at -6dB (kHz)	Limit (kHz)	Plot (No.)
Middle	**915,50**	**522,46**	**≥ 500**	**2**

Bandwidth at -6dB (Fmin and Fmax)			
Fmin	**915,227 MHz**	**Fmax**	**915,749 MHz**

Graphical representation of 6dB Bandwidth
Operation Mode: #1 – High Channel (927,0 MHz)
Plot n°3



Channel (No.)	Frequency (MHz)	Channel Bandwidth at -6dB (kHz)	Limit (kHz)	Plot (No.)
High	**927,00**	**525,640**	**≥ 500**	**3**

Bandwidth at -6dB (Fmin and Fmax)			
Fmin	**926,723 MHz**	**Fmax**	**927,247 MHz**

9.5 TEST: RF power output, radiated (EIRP)			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	22,5°C	
	Relative Humidity (%)	51%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	SMA Connector	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247 (B) (3)		

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

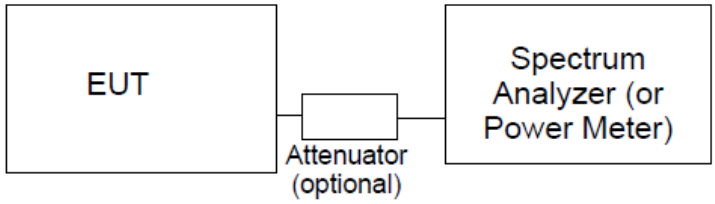
(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

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

(3) 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.

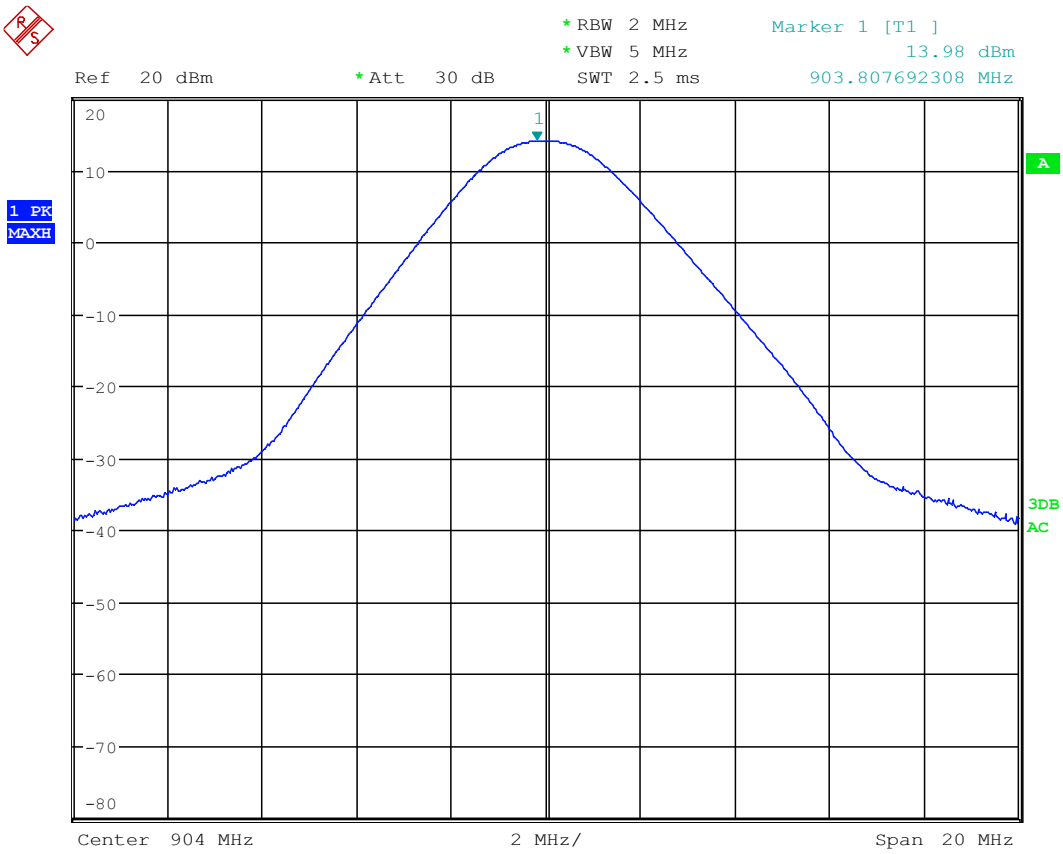
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Further information to test setup



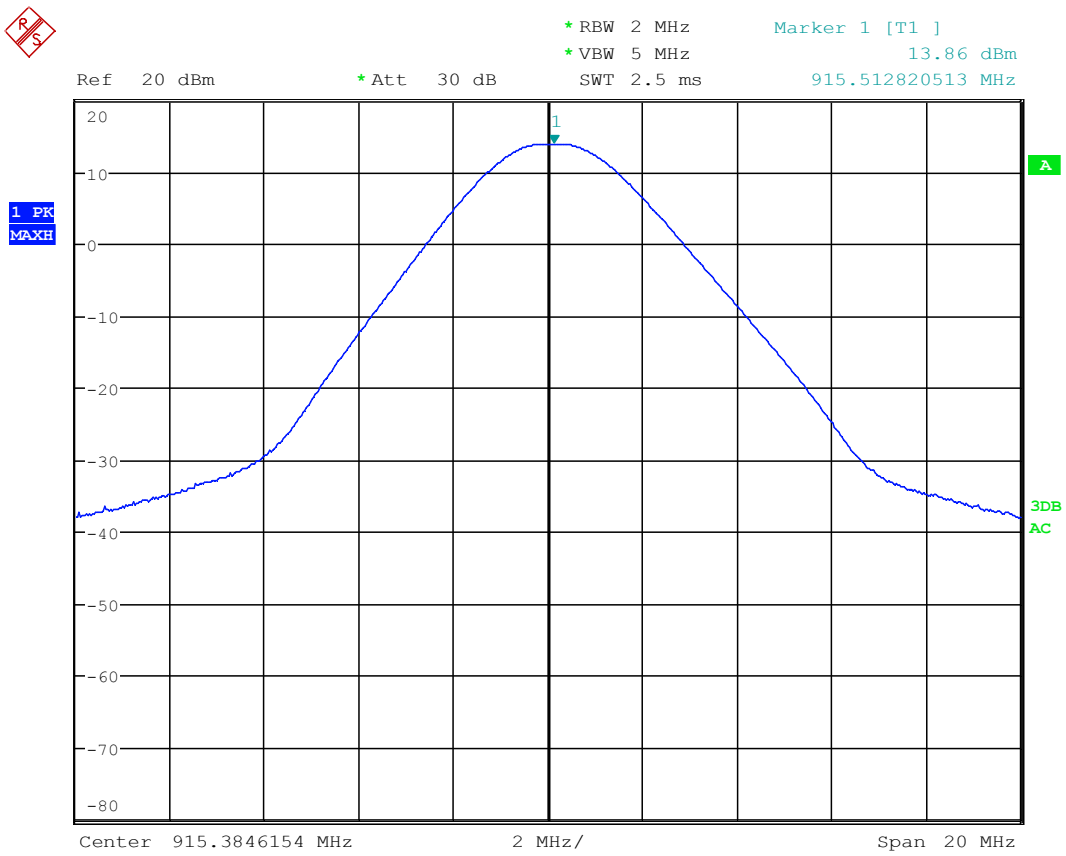
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	2782345	05/2018	05/2019

Graphical representation of RF power output
Operation Mode: #1 – Low Channel (904,0 MHz)
Plot n°1



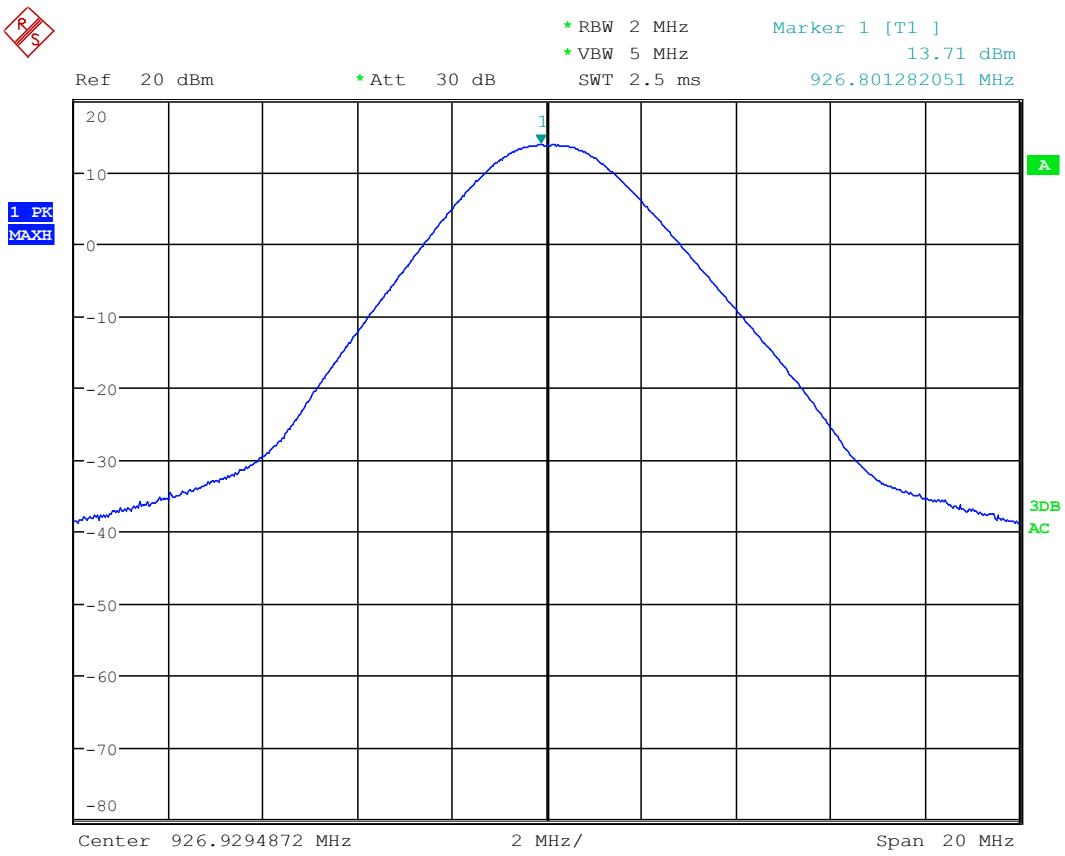
Channel (No.)	Frequency (MHz)	Conducted Output Power		Limit (W)
		(dBm)	(mW)	
Low	**904,00**	**13,64**	**23,12**	**1**

Graphical representation of RF power output
Operation Mode: #1 – Middle Channel (915,5 MHz)
Plot n°2

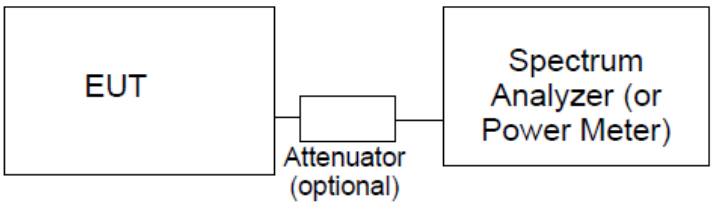


Channel (No.)	Frequency (MHz)	Conducted Output Power		Limit (W)
		(dBm)	(mW)	
Middle	**915,50**	**13,86**	**24,32**	**1**

Graphical representation of RF power output
Operation Mode: #1 – High Channel (927,0 MHz)
Plot n°3



Channel (No.)	Frequency (MHz)	Conducted Output Power		Limit (W)
		(dBm)	(mW)	
High	**927,00**	**13,71**	**23,49**	**1**

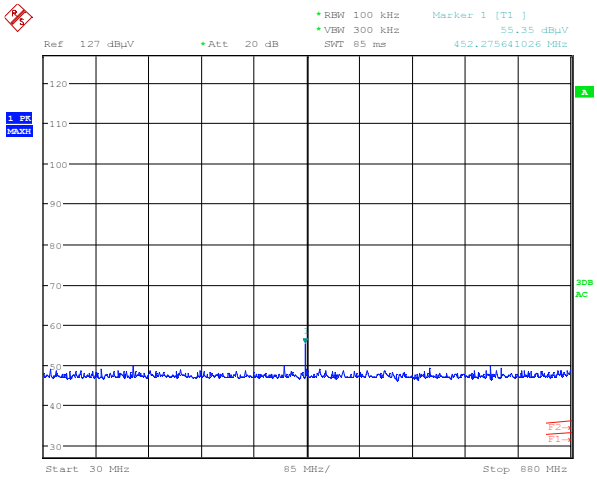
9.6 TEST: Out-of-band emissions			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	22°C	
	Relative Humidity (%)	50%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	SMA Connector	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247 (D)		
(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)).			
Further information to test setup			

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	2782345	05/2018	05/2019
Highpass Filter	Wainwright Instr.	WHKX10-1170-1300	87020800	05/2018	05/2019

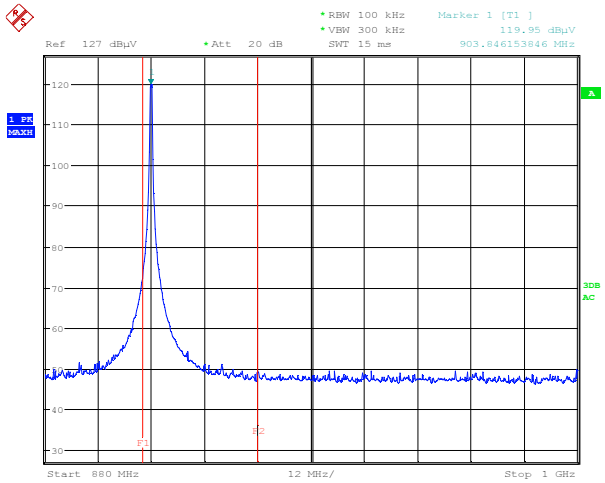
Graphical representation of Antenna Port Spurious Emission - Conducted

Operation Mode: #1 – Low Channel (904,0 MHz)

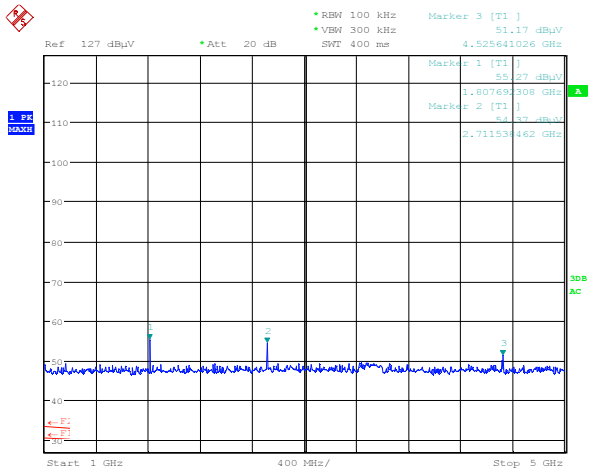
Frequency: 30MHz – 880MHz



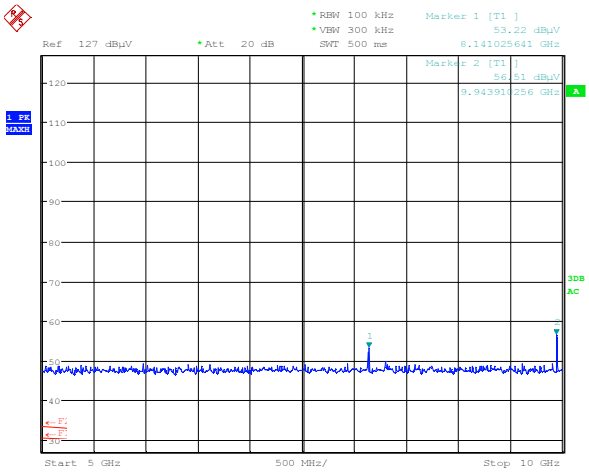
Frequency: 880MHz – 1GHz

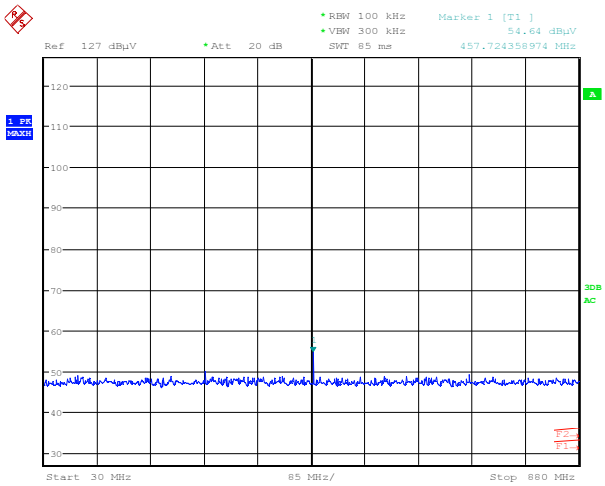
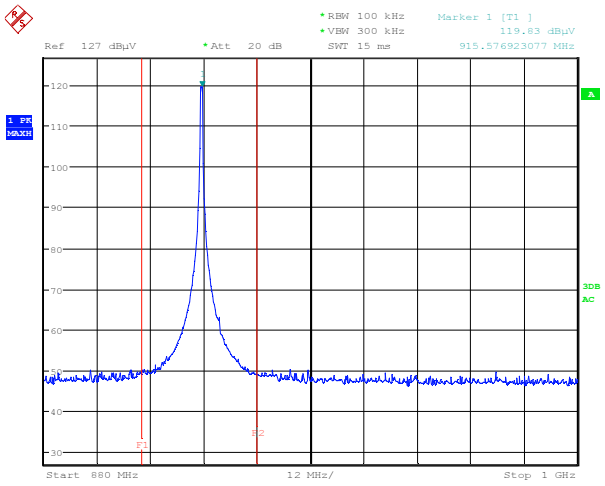
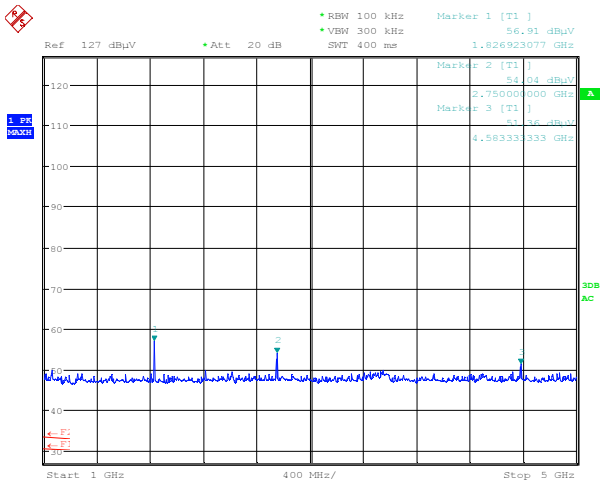
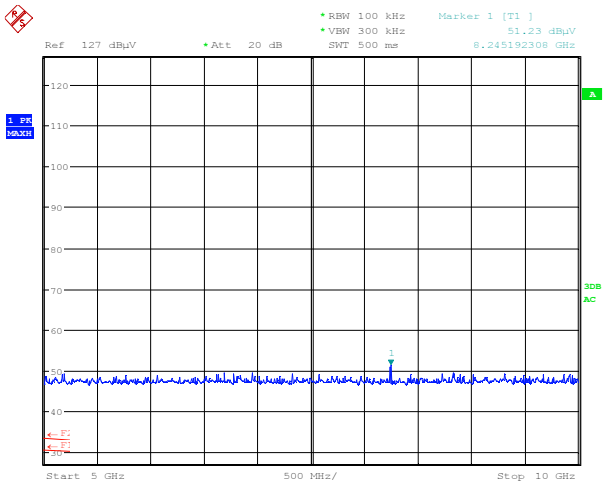


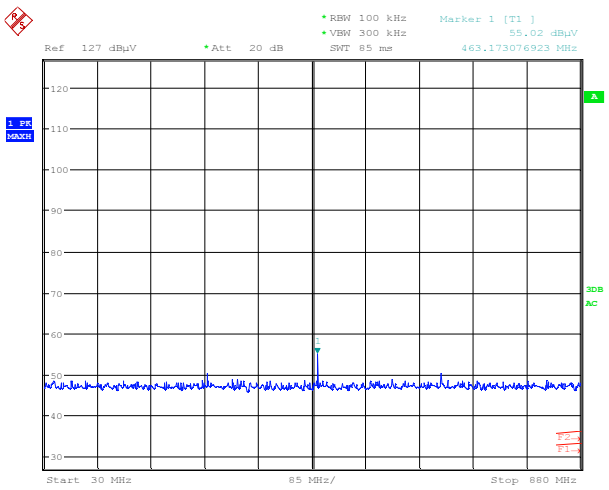
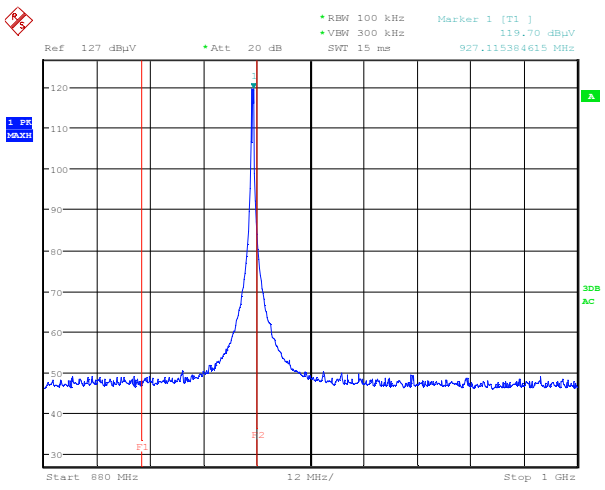
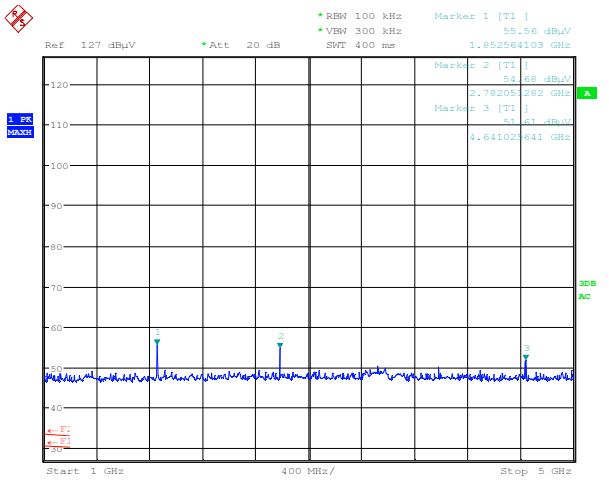
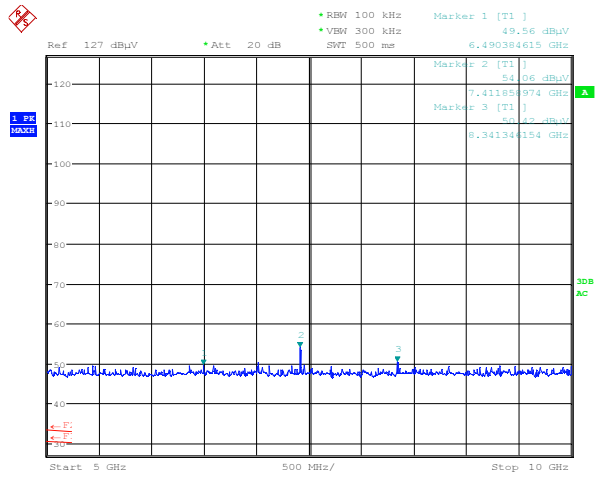
Frequency: 1GHz – 5GHz



Frequency: 5GHz – 10GHz



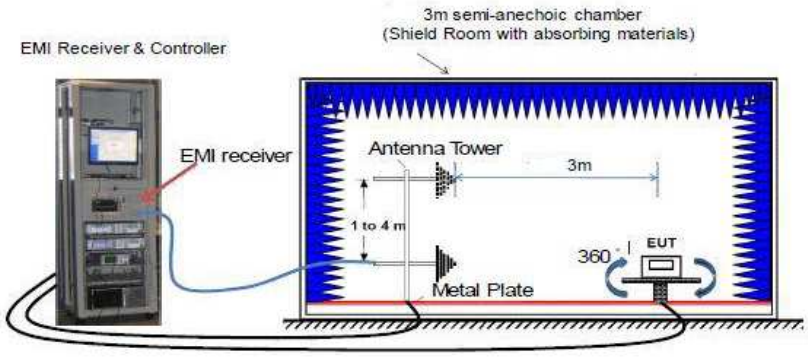
Graphical representation of Antenna Port Spurious Emission - Conducted	
Operation Mode: #1 – Middle Channel (915,5 MHz)	
Frequency: 30MHz – 880MHz	Frequency: 880MHz – 1GHz
	
Frequency: 1GHz – 5GHz	Frequency: 5GHz – 10GHz
	

Graphical representation of Antenna Port Spurious Emission - Conducted	
Operation Mode: #1 – High Channel (927,0 MHz)	
Frequency: 30MHz – 880MHz	Frequency: 880MHz – 1GHz
	
Frequency: 1GHz – 5GHz	Frequency: 5GHz – 10GHz
	

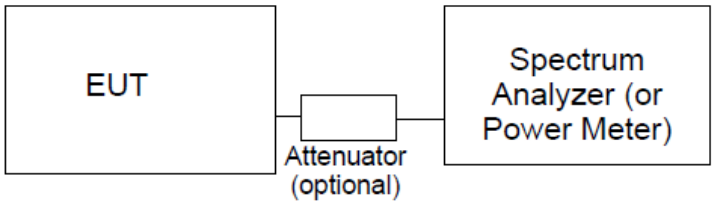
9.7 TEST: 100 kHz Bandwidth of Frequency Band Edges			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	21°C	
	Relative Humidity (%)	52%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	SMA Connector Enclosure	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247 (D)		

(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)).

Further information to test setup (Radiated)



Further information to test setup (conducted)

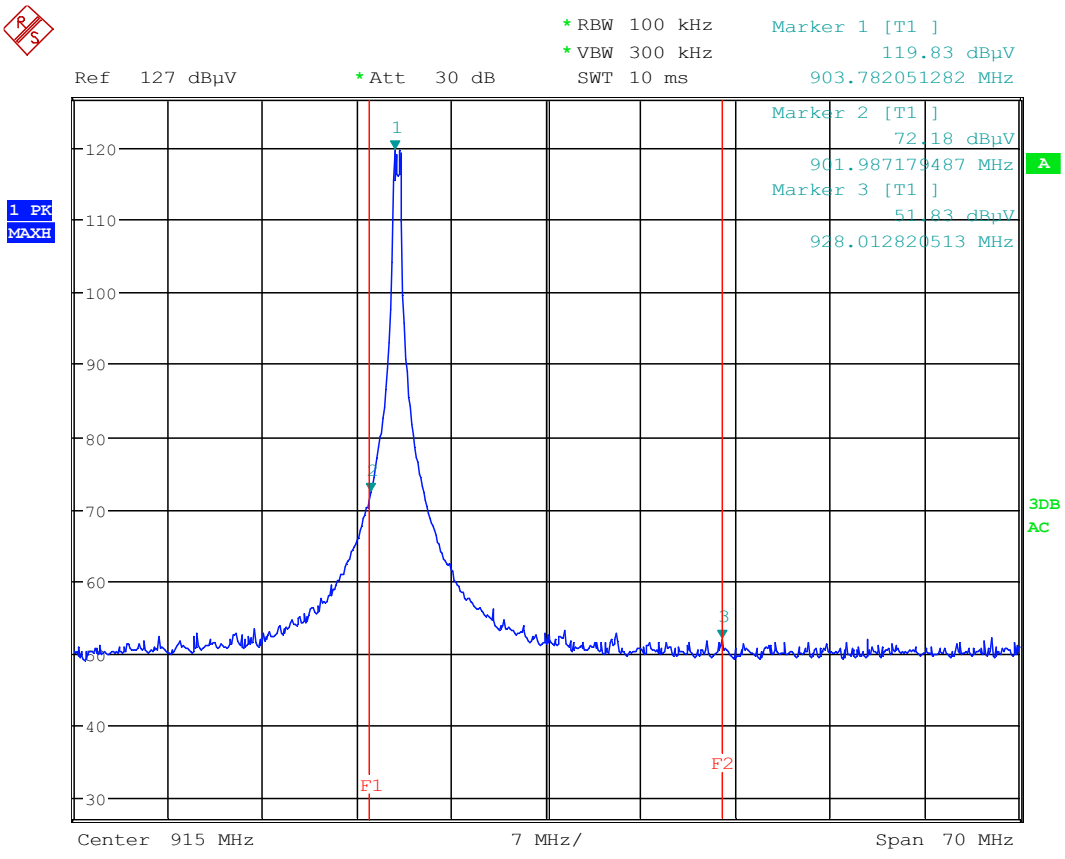


Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
CSSA	ETS Lindgren	FACT3	87020484	03/2018	03/2020
EMI Test Receiver	R&S	ESW44	87020967	07/2018	07/2019
EMI Test Receiver	R&S	ESU40	2782345	05/2018	05/2019
Antenna BiConiLog	ETS Lindgren	3124E-PA	87020457	04/2017	04/2020

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Conducted

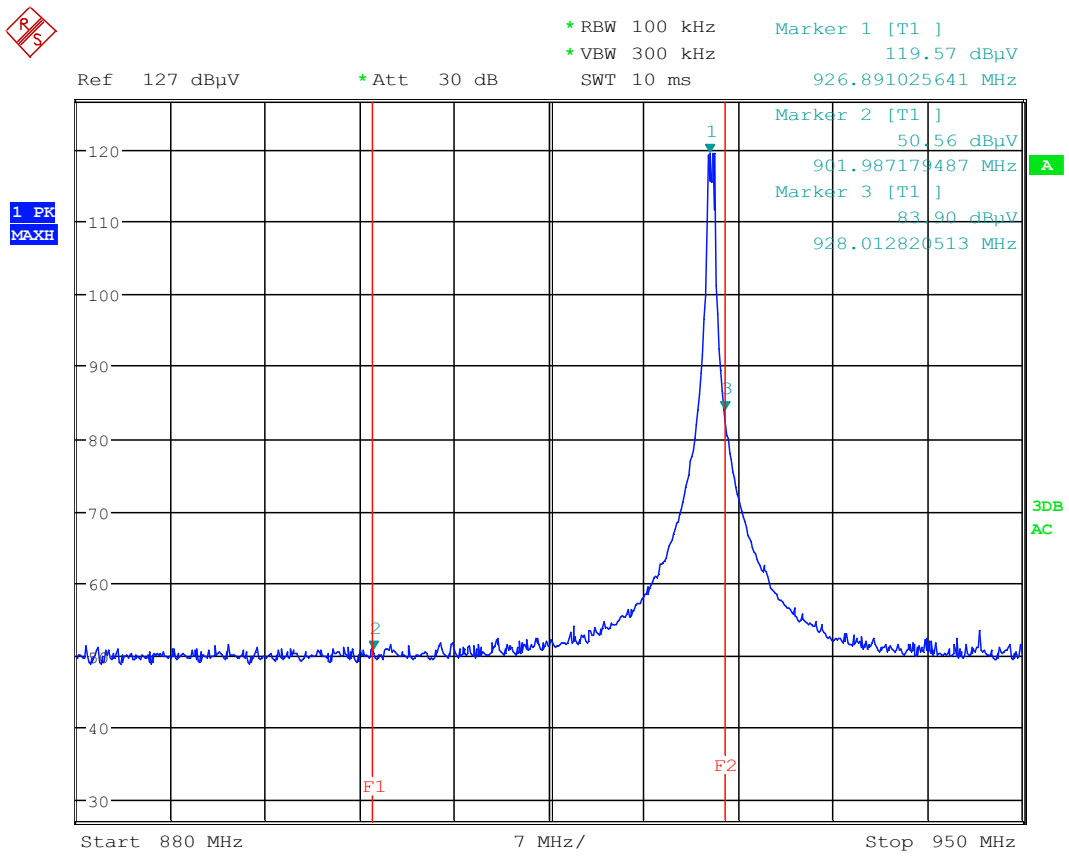
Operation Mode: #1 – Low Channel (904,0 MHz)

Plot n°1



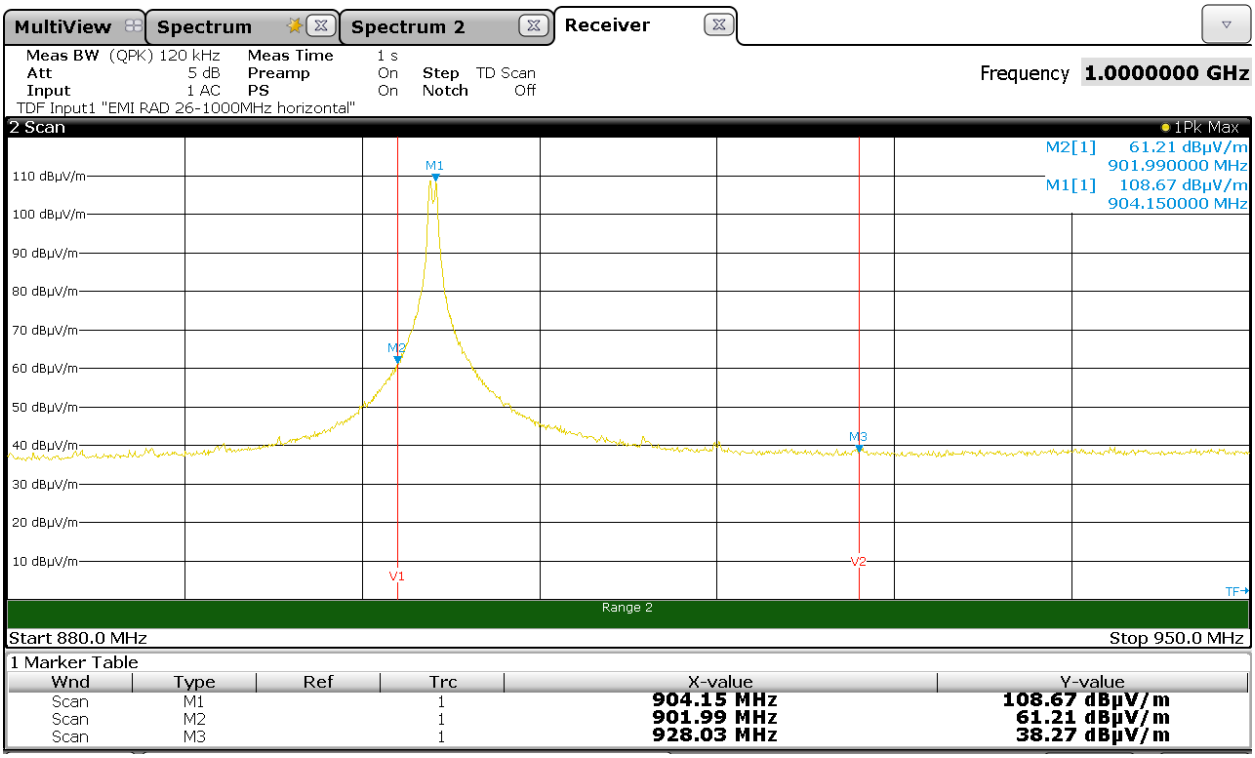
Frequency (MHz	Measured power at the band edge (dBµV)	Measured peak power at fundamental frequency (dBµV)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBµV)	Margin (dB)
902	**72,18**	**119,83**	**47,65**	**99,83**	**27,65**
928	**51,83**	**119,83**	**68,00**	**99,83**	**48,00**

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Conducted
Operation Mode: #1 – High Channel (927,0 MHz)
Plot n°2



Frequency (MHz	Measured power at the band edge (dBµV)	Measured peak power at fundamental frequency (dBµV)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBµV)	Margin (dB)
902	**50,56**	**119,57**	**69,01**	**99,57**	**49,01**
928	**83,90**	**119,57**	**35,67**	**99,57**	**15,67**

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Radiated
Operation Mode: #1 – Low Channel (904,0 MHz) – Horizontal polarization
Plot n°3

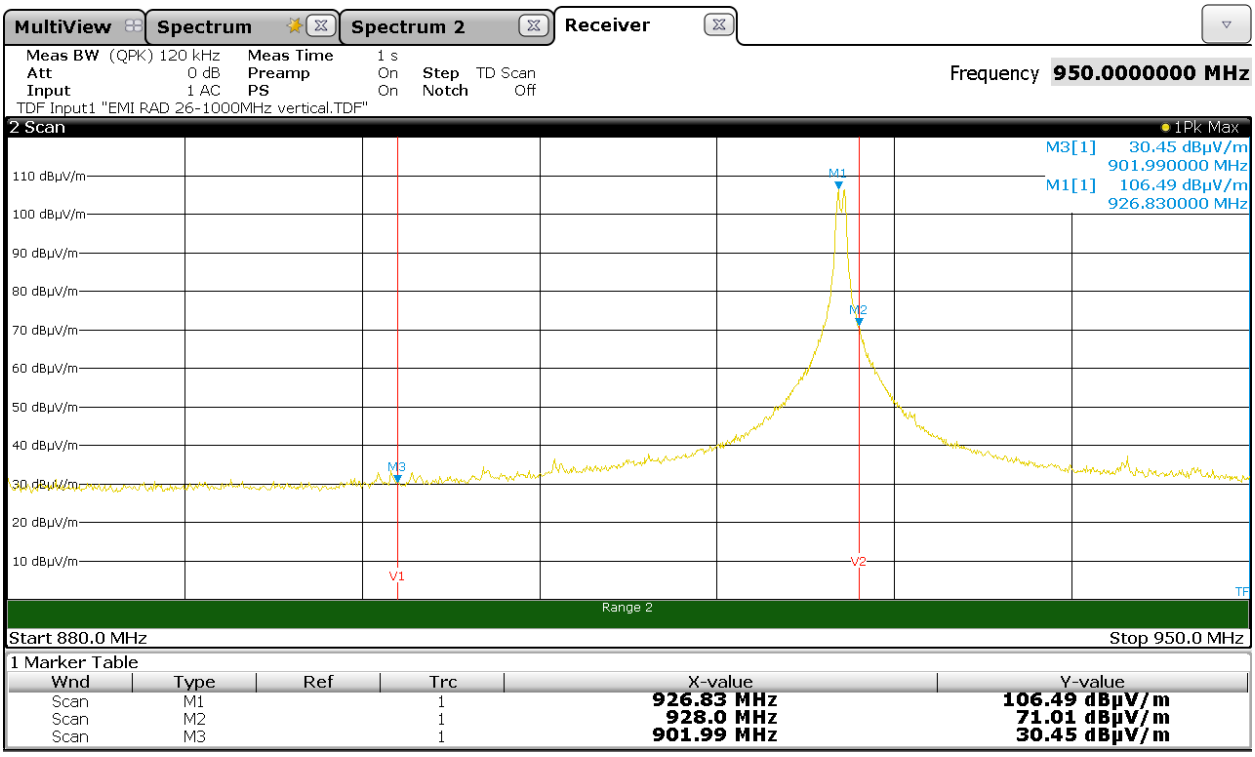


Frequency (MHz	Measured power at the band edge (dBµV/m)	Measured peak power at fundamental frequency (dBµV/m)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBµV/m)	Margin (dB)
902	**61,21**	**108,67**	**47,46**	**88,67**	**27,46**
928	**38,27**	**108,67**	**70,40**	**88,67**	**50,40**

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Radiated
Operation Mode: #1 – Low Channel (904,0 MHz) – Vertical polarization
Plot n°4

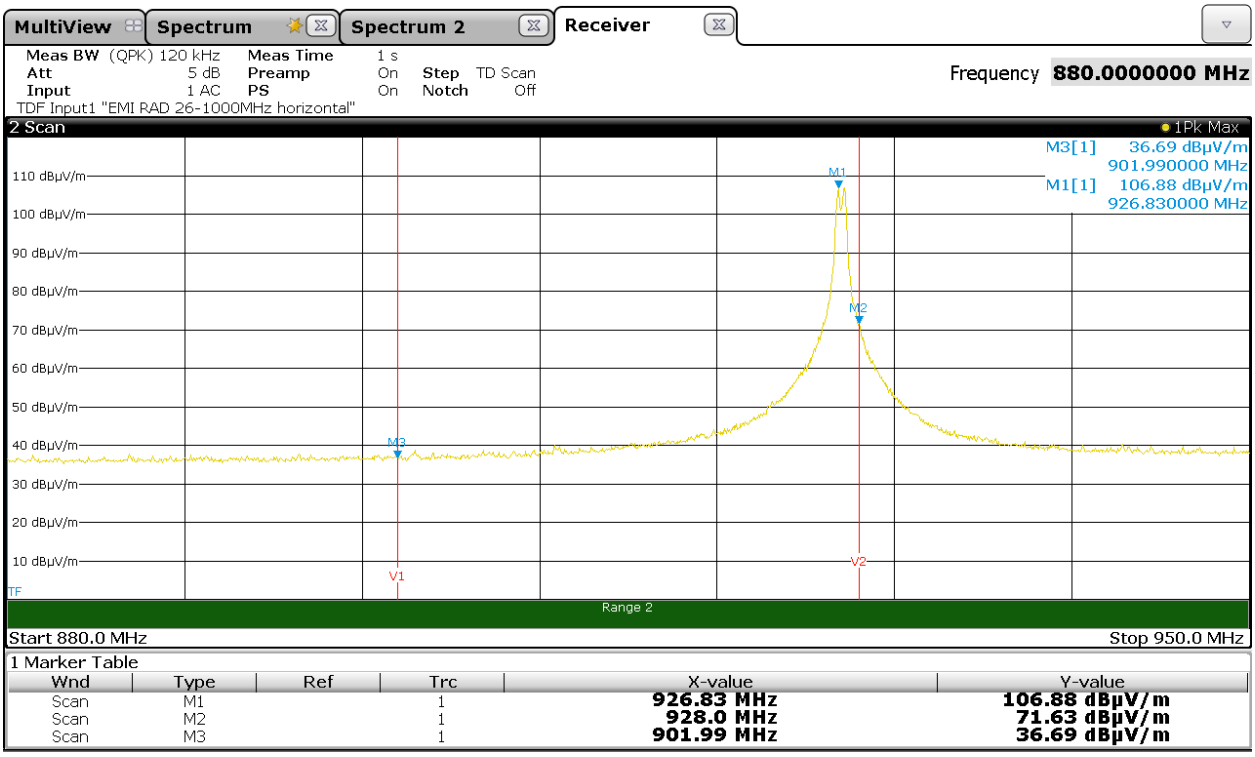
Frequency (MHz	Measured power at the band edge (dBµV/m)	Measured peak power at fundamental frequency (dBµV/m)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBµV/m)	Margin (dB)
902	**59,62**	**107,19**	**47,57**	**87,19**	**27,57**
928	**34,37**	**107,19**	**72,82**	**87,19**	**52,82**

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Radiated
Operation Mode: #1 – High Channel (927,0 MHz) – Horizontal polarization
Plot n°5

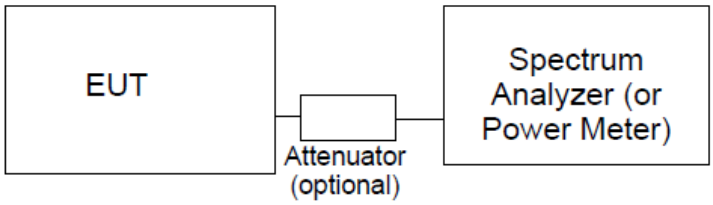


Frequency (MHz	Measured power at the band edge (dBµV/m)	Measured peak power at fundamental frequency (dBµV/m)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBµV/m)	Margin (dB)
902	**30,45**	**106,49**	**76,04**	**86,49**	**56,04**
928	**71,01**	**106,49**	**35,48**	**86,49**	**15,48**

Graphical representation of 100 kHz Bandwidth of Frequency Band Edges - Radiated
Operation Mode: #1 – High Channel (927,0 MHz) – Vertical polarization
Plot n°6

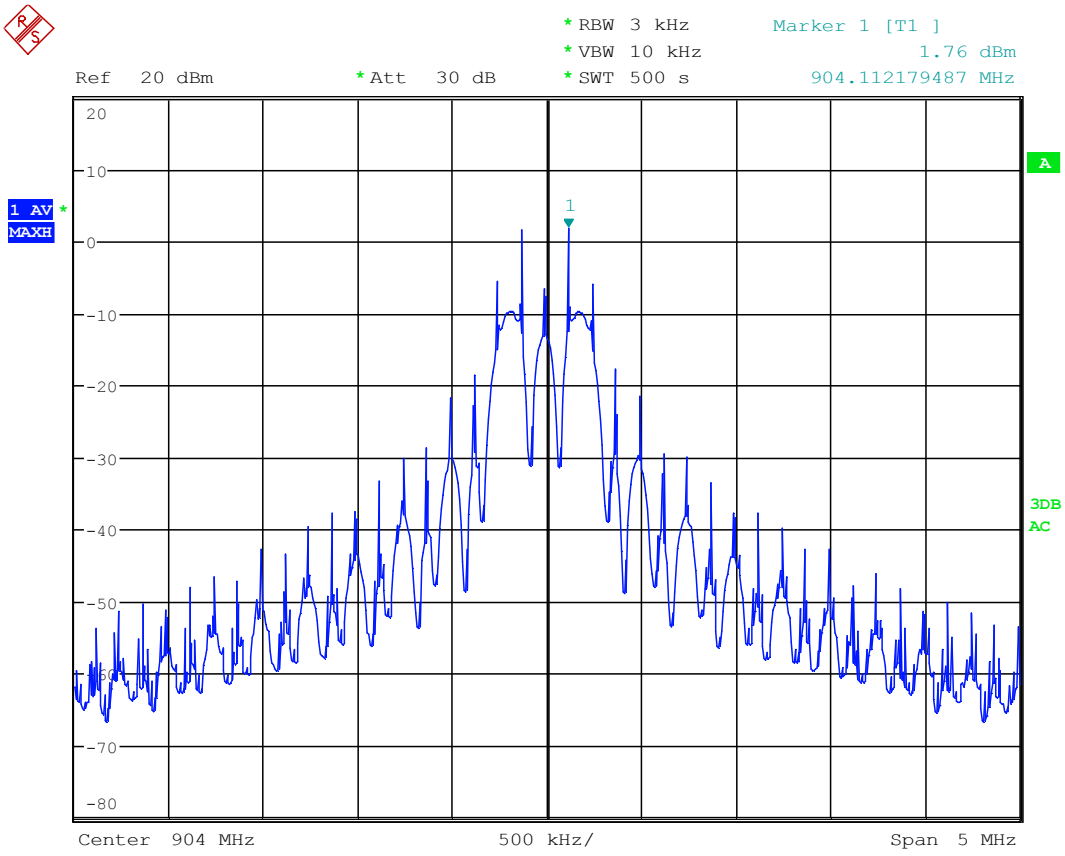


Frequency (MHz	Measured power at the band edge (dBµV/m)	Measured peak power at fundamental frequency (dBµV/m)	Difference Peak / band edge (dB)	Peak Limit at PK power –20 dB (dBµV/m)	Margin (dB)
902	**36,69**	**106,88**	**70,19**	**86,88**	**50,19**
928	**71,69**	**106,88**	**35,19**	**86,88**	**15,19**

9.8 TEST: Power Spectral Density			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	24°C	
	Relative Humidity (%)	37%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	SMA Connector	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.247 (E)		
(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.			
Further information to test setup			

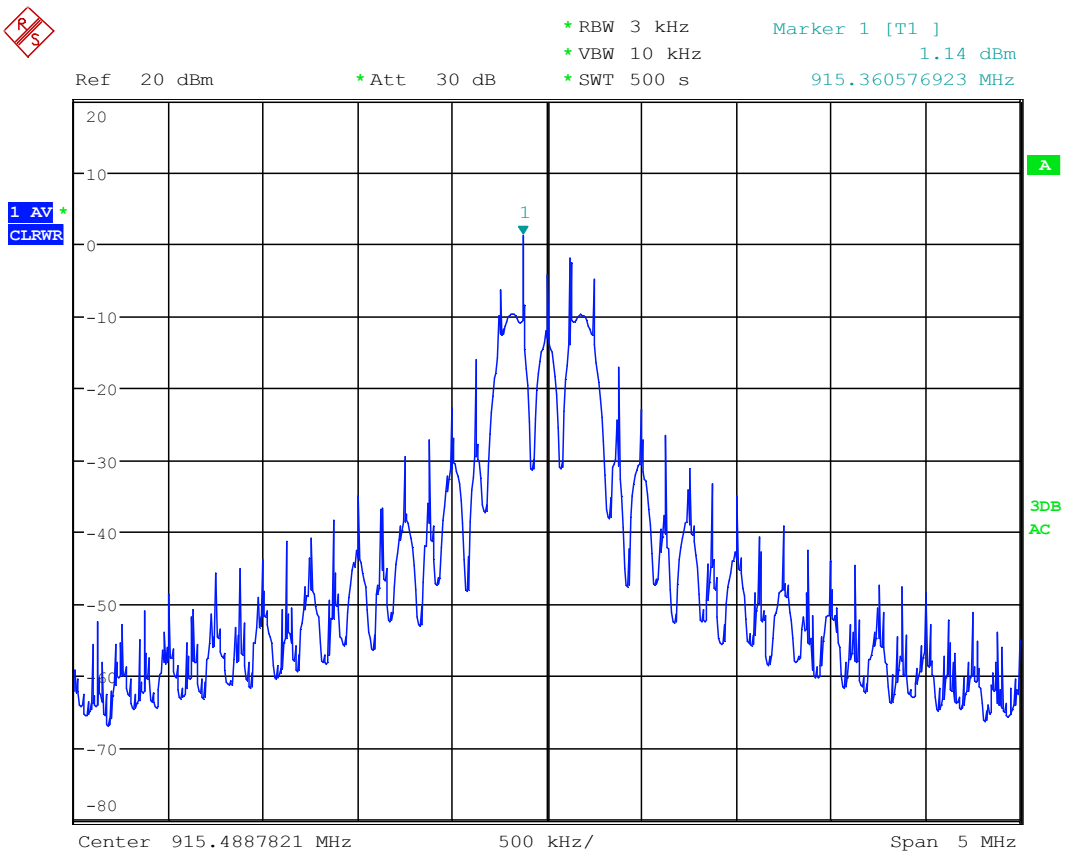
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Calibration date	Calibration due
EMI Test Receiver	R&S	ESU40	2782345	05/2018	05/2019

Graphical representation of Power Spectral Density
Operation Mode: #1 – Low Channel (904,0 MHz)
Plot n°1



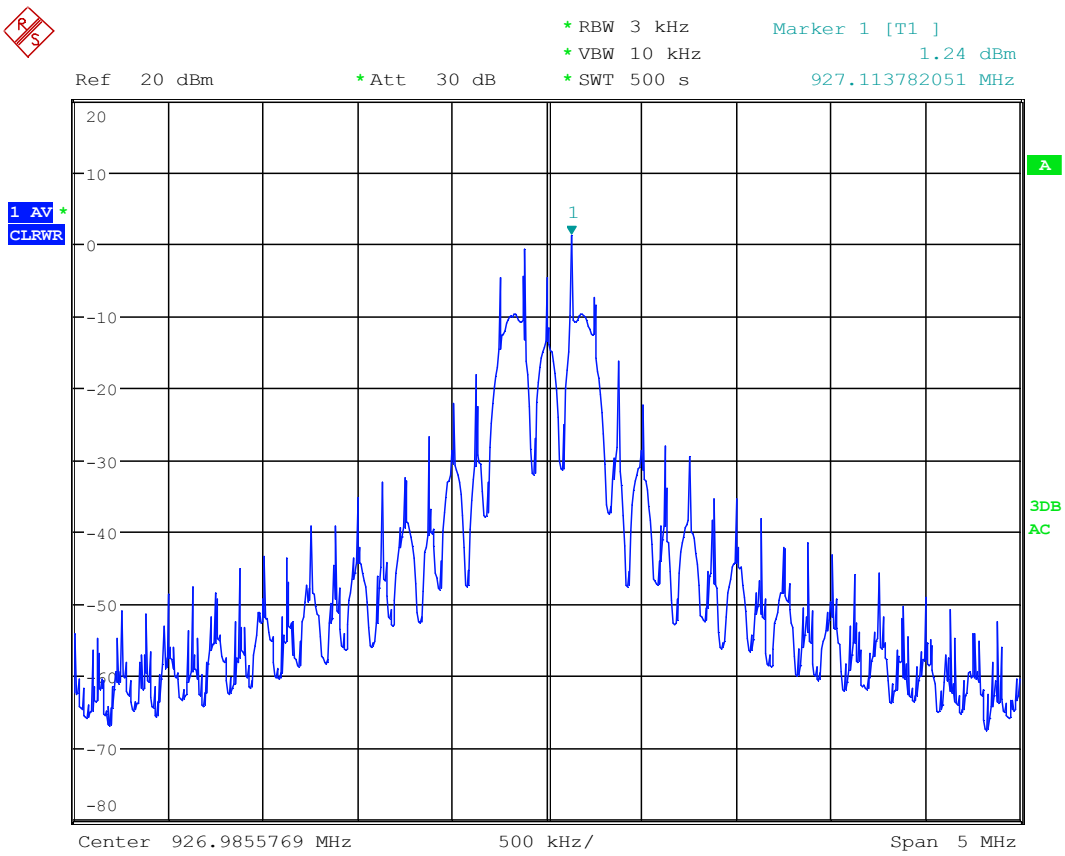
Channel (No.)	Frequency (MHz)	Conducted Power Spectral Density (dBm)	Limit (dBm)
Low	**904,00**	**1,76**	**8**

Graphical representation of Power Spectral Density
Operation Mode: #1 – Middle Channel (915,5 MHz)
Plot n°2



Channel (No.)	Frequency (MHz)	Conducted Power Spectral Density (dBm)	Limit (dBm)
Middle	**915,50**	**1,14**	**8**

Graphical representation of Power Spectral Density
Operation Mode: #1 – High Channel (927,0 MHz)
Plot n°3



Channel (No.)	Frequency (MHz)	Conducted Power Spectral Density (dBm)	Limit (dBm)
High	**927,00**	**1,24**	**8**

9.9 TEST: Additional provisions to the general radiated emission limitations.			**PASS**
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	24°C	
	Relative Humidity (%)	37%	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	---------	
Equipment mode:	Operation mode	#1	
FCC Standard	§15.215 (A) (B) (C)		
(A) The regulations in §§ 15.217-15.257 provide alternatives to the general radiated emission limits for intentional radiators operating in specified frequency bands. Unless otherwise stated, there are no restrictions as to the types of operation permitted under these sections.			
(B) In most cases, unwanted emissions outside of the frequency bands shown in these alternative provisions must be attenuated to the emission limits shown in Section 15.209. In no case shall the level of the unwanted emissions from an intentional radiator operating under these additional provisions exceed the field strength of the fundamental emission.			VERDICT PASS
(C) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least			VERDICT PASS

9.10 TEST: RF Exposure Requirements			PASS
Parameters required prior to the test	Laboratory Ambient Temperature (°C)	15 to 35 °C	
	Relative Humidity (%)	30 to 60 %	
Parameters recorded during the test	Laboratory Ambient Temperature (°C)	---	
	Relative Humidity (%)	---	
	Air pressure (hPa)	1020	
—	Power Supply / Frequency	Application Point	
Fully configured sample tested at the power line frequency	+5V dc	---	
Equipment mode:	Operation mode	#1	
FCC Standard	§ 1.1310 (1) (B)		
Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines § 1.1310, table (1) (b)			
EUT classification (fixed, mobile or portable devices)	Fixed equipment used in Uncontrolled Exposure environment		
Limits Freq. Range 300÷1500MHz	f/1500 (Power Density (mW/cm^2))		
Power Density (mW/cm^2)	$S = P * G / 4\pi r^2$		

Note:
P = Conducted Power (mW); G = Numeric Gain ($10^{(dBi/10)}$); r = distance (cm)

Operation Mode: #1							
CH	Frequency	Conducted Output Power	Conducted Output Power (P)	Numeric Gain (G)	Distance (r)	Power Density (S)	Limits (f/1500)
	(MHz)	(dBm)	(mW)		(cm)		
Low	904,00	13,64	23,12	2	20	0,009179	0,6026
Mid	915,50	13,86	24,32	2	20	0,009656	0,6103
High	927,00	13,71	23,49	2	20	0,009330	0,6180
VERDICT							
The EUT Radiated Power density at evaluation distance is WHITIN THE LIMIT at the distance of 20cm. The EUT Radiated Power density is OUT OF THE LIMIT if the distance is < 2,516cm							

END OF TEST REPORT