REPORT No.: SZ25050054W01

TEST REPORT

APPLICANT	:	Fibocom Wireless Inc.
PRODUCT NAME	:	RTK Board
MODEL NAME	:	APM665-GL
BRAND NAME	:	Fibocom
FCC ID	:	ZMOAPM665GL
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2025-05-14
TEST DATE	:	2025-06-21 to 2025-07-30
ISSUE DATE	:	2025-09-02

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

MORLAB

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DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1.0	2025-09-02	First edition

1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	/
2	N/A	Duty Cycle of Test Signal	Jun. 21&22, 2025	Lin Haoyang	PASS	/
3	15.247(b)	Maximum Peak Conducted Output Power	Jun. 21&22, 2025	Lin Haoyang	PASS	/
4	15.247(b)	Maximum Average Conducted Output Power	Jun. 21&22, 2025	Lin Haoyang	PASS	/
5	15.247(a)	Bandwidth	Jun. 21&22, 2025	Lin Haoyang	PASS	/
6	15.247(d)	Conducted Spurious Emission and Band Edge	Jun. 22, 2025	Lin Haoyang	PASS	/
7	15.247(e)	Power Spectral Density	Jun. 22, 2025	Lin Haoyang	PASS	/
8	15.207	Conducted Emission	N/A	N/A	N/A_{Note1}	/
9	15.209, 15.247(d)	Radiated Emission	Jul. 30, 2025	Zhong Xiangyun	PASS	/

Note 1: Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

Note 2: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013 and KDB 558074 D01 v05r02.

Note 3: Any additions, deviation, or exclusions from the method shall be noted in the “Remark".

1.1. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

• 47 CFR Part 15 Subpart C Radio Frequency Devices

1.2. Test Equipment List

1.2.1 Conducted Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2025.01.15	2026.01.14
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.2.2 List of Software Used

Description	Manufacturer	Software Version
Test System	MaiWei	2.0.0.0
JS32-RE	Tonscend	5.0.0

1.2.3 Radiated Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2025.05.13	2026.05.12
Test Antenna - Bi-Log	9163-274	VULB 9163	Schwarzbeck	2025.06.28	2026.06.27
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2025.05.16	2026.05.15
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2025.06.20	2026.06.19
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2025.06.20	2026.06.19
Preamplifier (10MHz-6GHz)	46732	S10M100L3802	LUCIX CORP.	2025.05.13	2026.05.12
Preamplifier (2GHz-18GHz)	61171/61172	S020180L3203	LUCIX CORP.	2025.05.13	2026.05.12
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2025.05.13	2026.05.12

RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2025.05.13	2026.05.12
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2025.05.13	2026.05.12
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2024.09.11	2025.09.10
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	2024.09.11	2025.09.10
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	2024.09.11	2025.09.10
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2025.06.21	2028.06.20
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.11.30	2025.11.29

1.3. Measurement Uncertainty

Test Items	Uncertainty	Remark
Peak Output Power	±2.22dB	Confidence levels of 95%
Power Spectral Density	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Conducted Spurious Emission	±2.77dB	Confidence levels of 95%
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	Confidence levels of 95%

1.4. Testing Laboratory

Laboratory Name	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone	+86 755 36698555
Facsimile	+86 755 36698525
FCC Designation Number	CN1192
FCC Test Firm Registration Number	226174

2. General Description

2.1. Information of Applicant and Manufacturer

Applicant	Fibocom Wireless Inc.
Applicant Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
Manufacturer	Fibocom Wireless Inc.
Manufacturer Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

2.2. Information of EUT

Product Name:	RTK Board
Sample No.:	2#, 3#
Hardware Version:	V1.1
Software Version:	LORA_APL_2_0_0_0 GD32_APL_2_1_0_0
Equipment Type:	LoRa
Modulation Type:	CSS
Operating Frequency Range:	DTS: 902.75MHz– 927.25MHz
Antenna Type:	FPC Antenna
Antenna Gain:	1.71dBi

Note 1: The EUT description presented in the report are provided by applicant and/or manufacturer, and the test laboratory is not responsible for the accuracy of the information. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.3. Channel List of EUT

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	**902.75**	16	910.25	31	917.75	46	925.25
2	903.25	17	910.75	32	918.25	47	925.75
3	903.75	18	911.25	33	918.75	48	926.25
4	904.25	19	911.75	34	919.25	49	926.75
5	904.75	20	912.25	35	919.75	**50**	**927.25**
6	905.25	21	912.75	36	920.25		
7	905.75	22	913.25	37	920.75		
8	906.25	23	913.75	38	921.25		
9	906.75	24	914.25	39	921.75		
10	907.25	25	914.75	40	922.25		
11	907.75	**26**	**915.25**	41	922.75		
12	908.25	27	915.75	42	923.25		
13	908.75	28	916.25	43	923.75		
14	909.25	29	916.75	44	924.25		
15	909.75	30	917.25	45	924.75		

Note 1: The black bold channels were selected for test.

2.4. Test Configuration of EUT

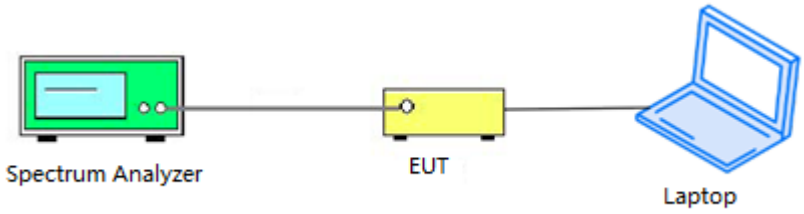
Test mode is used to control the EUT under the maximum power level during test.

2.5. Test Conditions

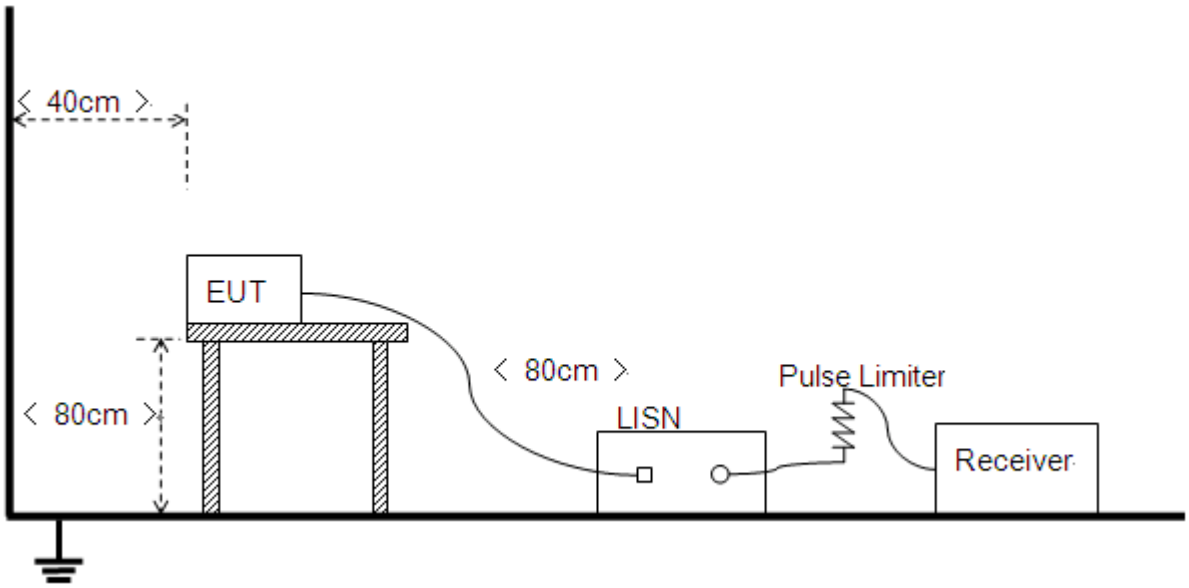
Temperature (°C)	15-35
Relative Humidity (%)	30-60
Atmospheric Pressure (kPa)	86-106

2.6. Test Setup Layout Diagram

2.6.1.Conducted Measurement

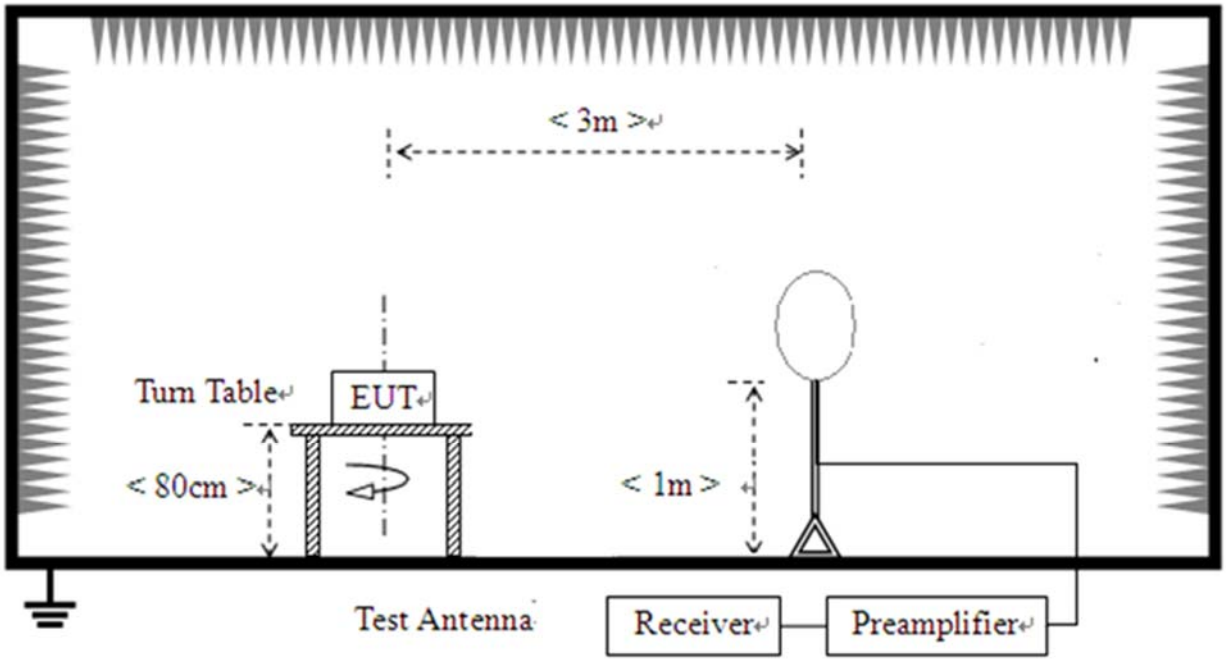


2.6.2.Conducted Emission Measurement

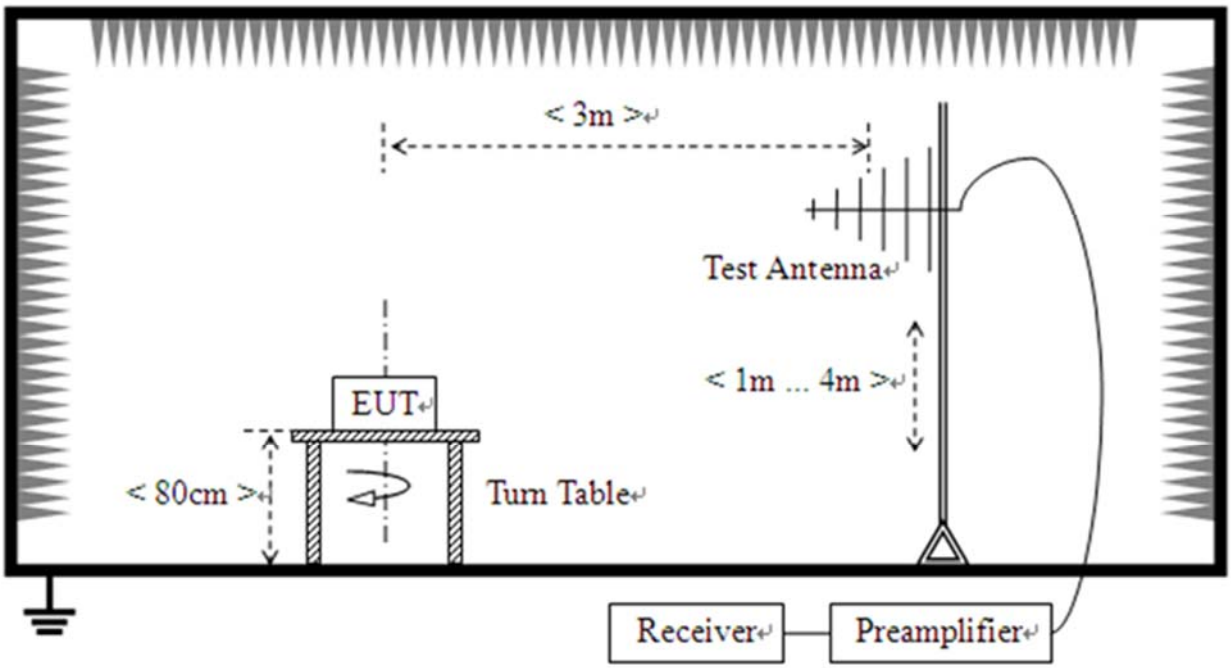


2.6.3.Radiation Measurement

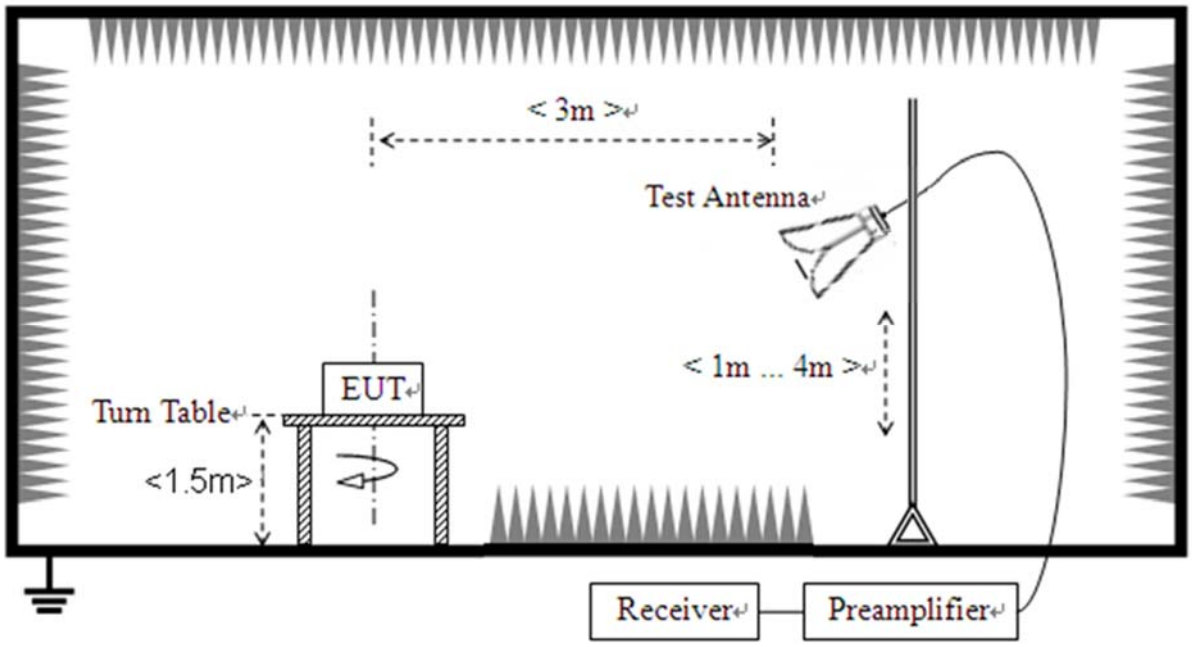
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



3. Test Results

3.1. Antenna Requirement

3.1.1.Requirement

According to FCC 15.203, 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.

3.1.2.Test Result

Antenna location	Antenna Type	Coupling Method
☒Internal ☐External	☒FPC Antenna ☐Spring Antenna ☐Ceramic Antenna ☐Integrated Antenna ☐Dipole Antenna ☐PCB Antenna ☐PIFA Antenna ☐Inverted F Antenna	☒I-PEX Connector ☐SMA Connector ☐RP-SMA Connector ☐Metal Shrapnel ☐Layout

3.2. Duty Cycle of Test Signal

3.2.1.Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration(T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e.,no transmitter OFF-time is to be considered).
When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be non constant.

3.2.2.Test Result

Refer to Annex A.1 in this report.

3.3. Maximum Peak Conducted Output Power

3.3.1.Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

3.3.2.Test Procedures

KDB 558074 Section 8.3.1 was used in order to prove compliance.

3.3.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.3.4.Test Result

Refer to Annex A.2 in this report.

3.4. Maximum Average Conducted Output Power

3.4.1.Requirement

According to FCC section 15.247(b)(3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum average conducted output power of the intentional radiator shall not exceed 1 Watt.

3.4.2.Test Procedures

KDB 558074 Section 8.3.2 was used in order to prove compliance.

3.4.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.4.4.Test Result

Refer to Annex A.3 in this report.

3.5.6 dB Bandwidth

3.5.1.Requirement

According to FCC section 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 6dB bandwidth shall be at least 500 kHz.

3.5.1.Test Procedures

The steps for the first option are as follows:
a) Set analyzer center frequency to channel center frequency
b) Set RBW to100kHz
c) Set VBW to 300kHz
d) Detector = peak.
e) Trace mode = max hold
f) Sweep time = auto couple
g) Allow the trace to fully stabilize
h) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by6 dB relative to the maximum level measured in the fundamental emission
The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW ≥ 3 ×RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥6 dB.

3.5.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.5.3.Test Result

Refer to Annex A.4 in this report.

3.6. Conducted Spurious Emissions and Band Edge

3.6.1.Requirement

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

3.6.2.Test Procedures

KDB 558074 Section 8.5 and 8.7 was used in order to prove compliance.

3.6.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.6.4.Test Result

Refer to Annex A.5 and A.6 in this report.

3.7. Power Spectral Density

3.7.1.Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm 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.

3.7.2.Test Procedures

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:
a) Set analyzer center frequency to channel center frequency
b) Set span to1.5 times DTS
c) Set RBW to 3kHz
d) Set VBW to 10kHz
e) Detector = peak
f) Sweep time = auto couple
g) Trace mode = max hold
h) Allow trace to fully stabilize
i) Use the peak marker function to determine the maximum amplitude level within the RBW

3.7.3.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.7.4.Test Result

Refer to Annex A.7 in this report.

3.8. Conducted Emission

3.8.1.Requirement

According to FCC section 15.207, 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 within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.8.2.Test Procedures

The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

3.8.3.Test Setup Layout

Refer to chapter 2.6.2 in this report.

3.8.4.Test Result

This test case does not apply this kind of EUT.

3.9. Radiated Emission

3.9.1.Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), 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 (μV/m)	Measurement Distance (m)
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

Note1: For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
Note2: For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

3.9.2.Test Procedures

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

3.9.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.9.4.Test Result

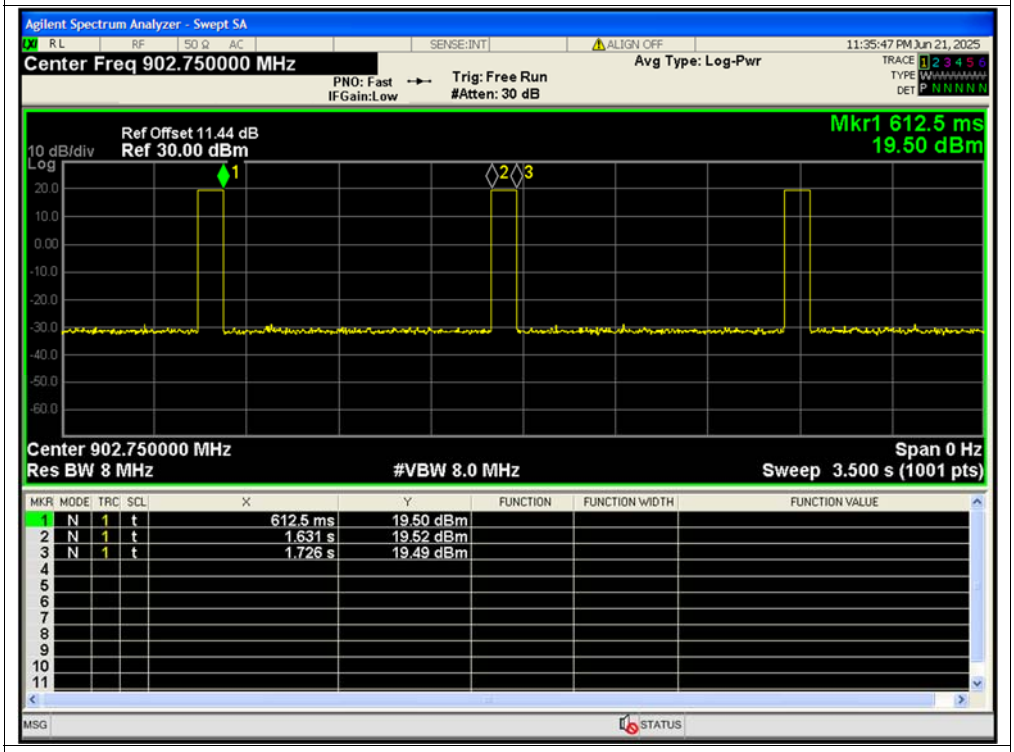
Refer to Annex A.8 in this report.

Annex A Test Data and Result

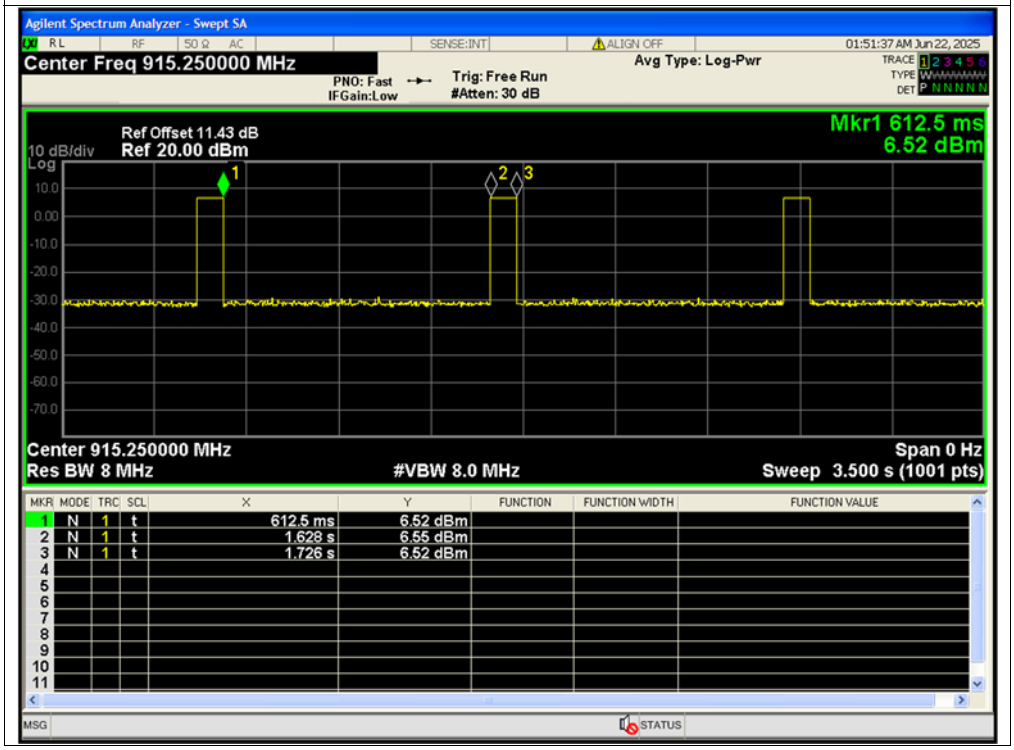
A.1. Duty Cycle of Test Signal

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	LoRa 500K	902.75	Ant1	8.49	10.71	0.01
NVNT	LoRa 500K	915.25	Ant1	8.81	10.55	0.01
NVNT	LoRa 500K	927.25	Ant1	8.81	10.55	0.01

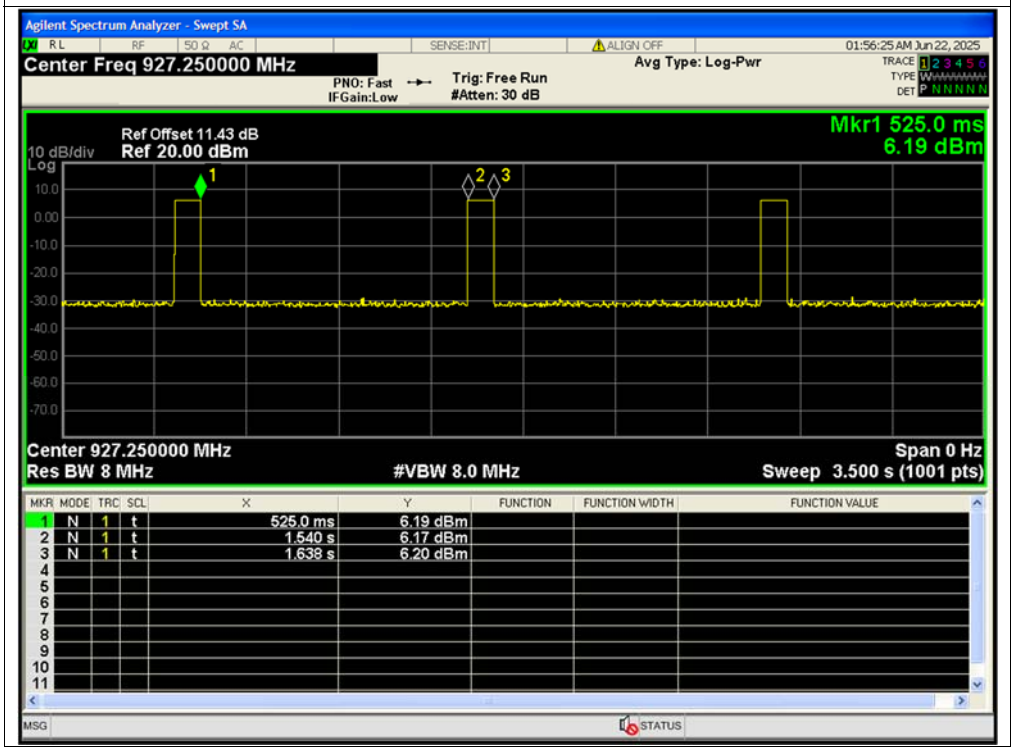
Test Graphs
Duty Cycle NVNT LoRa 500K 902.75MHz Ant1



Duty Cycle NVNT LoRa 500K 915.25MHz Ant1



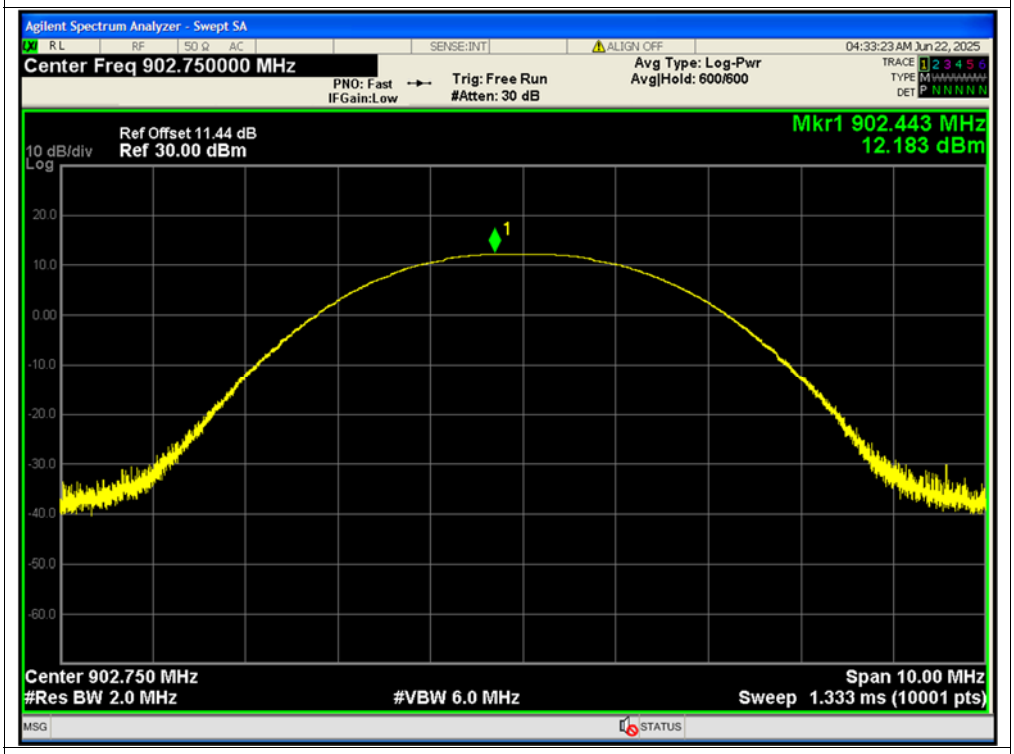
Duty Cycle NVNT LoRa 500K 927.25MHz Ant1



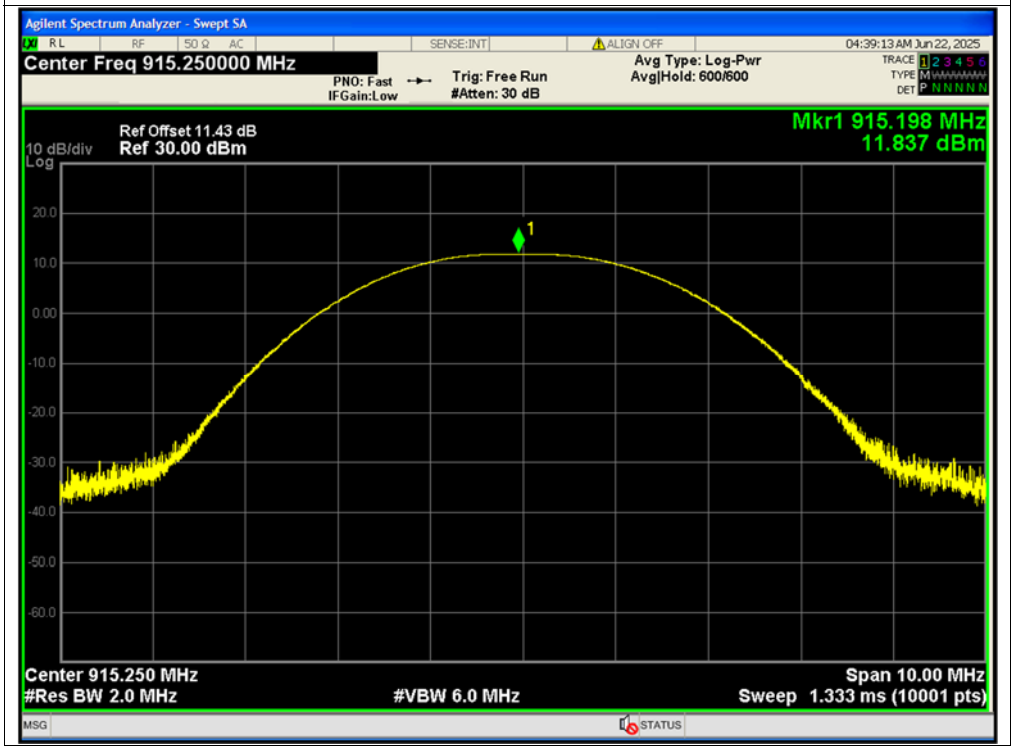
A.2. Maximum Peak Conducted Output Power

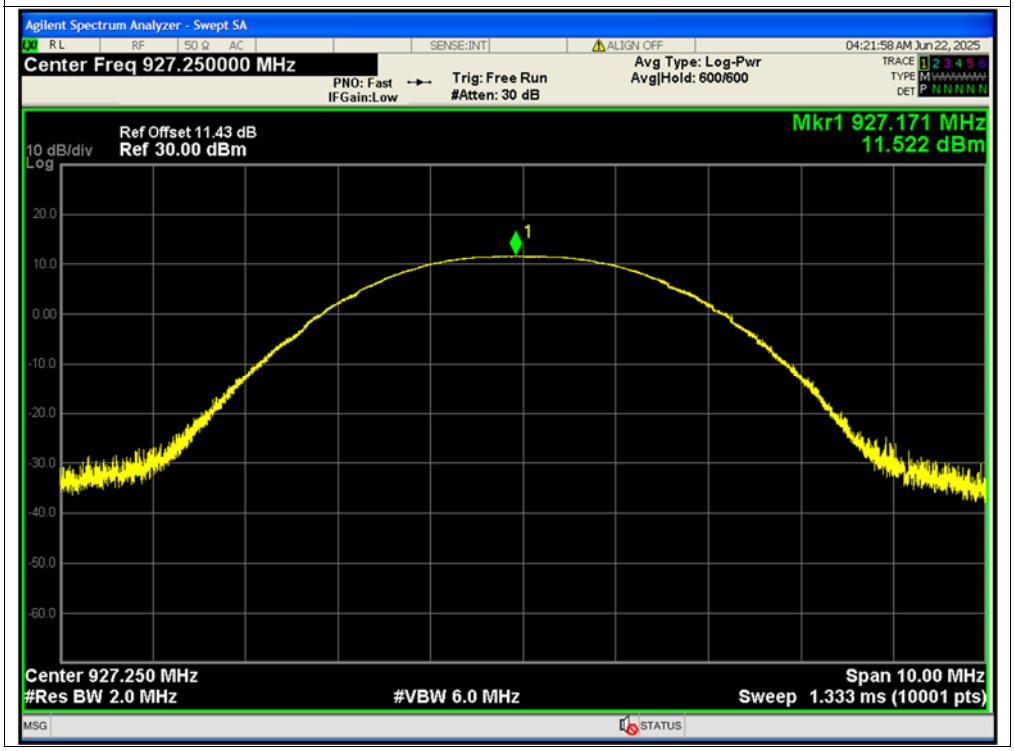
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit (dBm)	Verdict
NVNT	LoRa 500K	902.75	Ant1	12.18	0	12.18	0.01652	30	Pass
NVNT	LoRa 500K	915.25	Ant1	11.84	0	11.84	0.01528	30	Pass
NVNT	LoRa 500K	927.25	Ant1	11.52	0	11.52	0.01419	30	Pass

Test Graphs
Peak Power NVNT LoRa 500K 902.75MHz Ant1



Peak Power NVNT LoRa 500K 915.25MHz Ant1

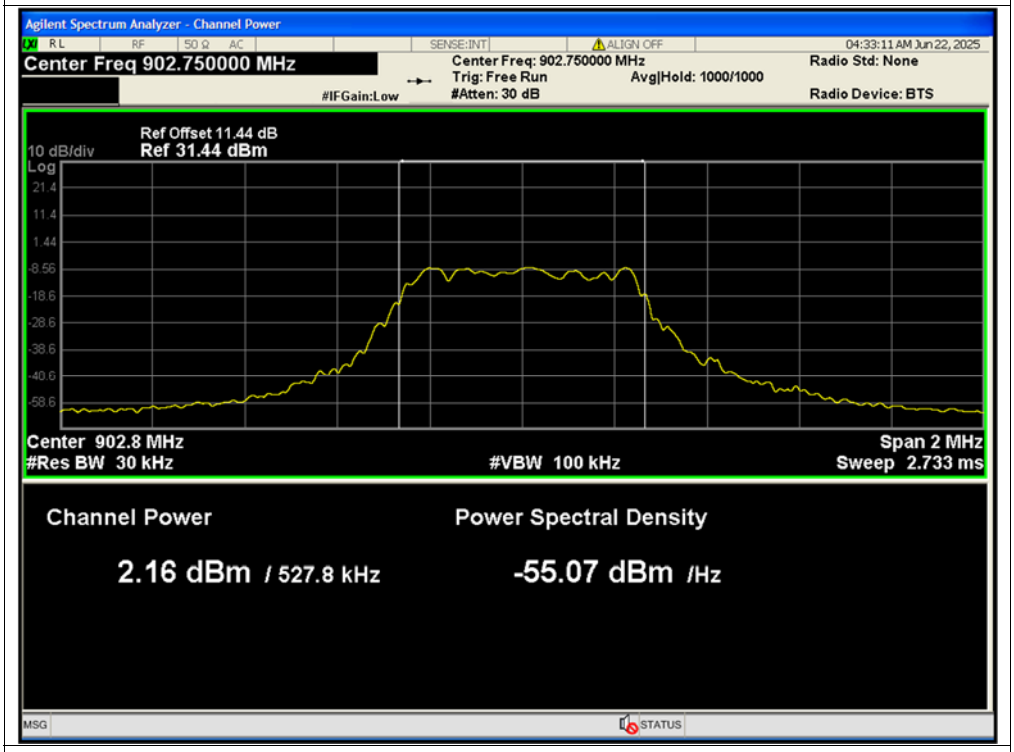


Peak Power NVNT LoRa 500K 927.25MHz Ant1


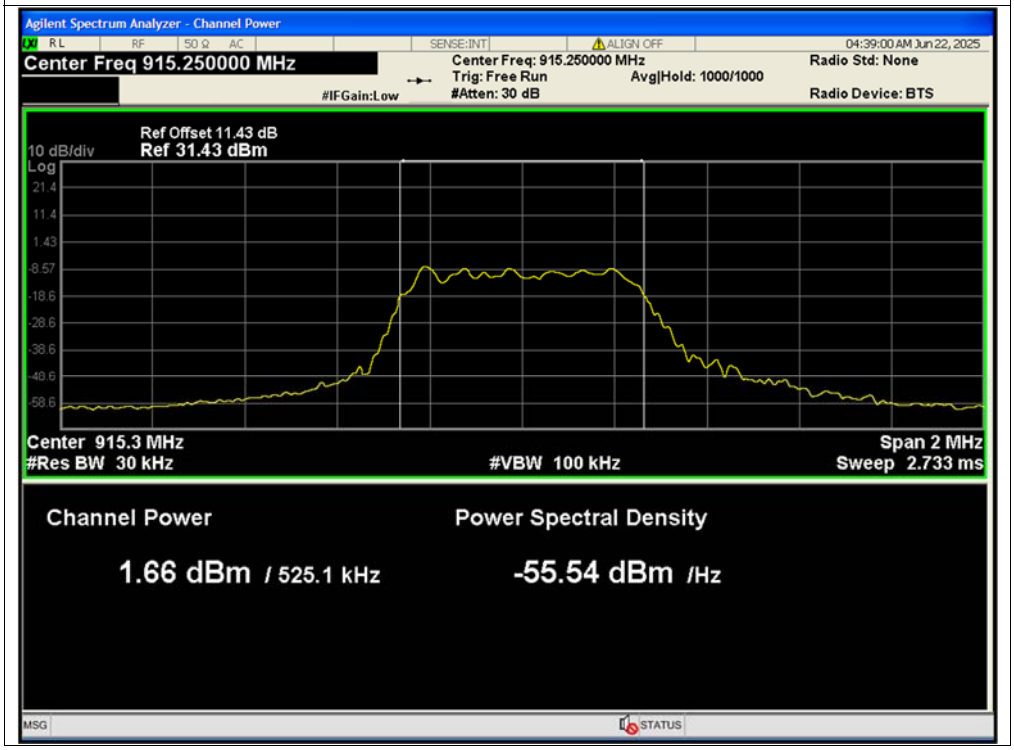
A.3. Maximum Average Conducted Output Power

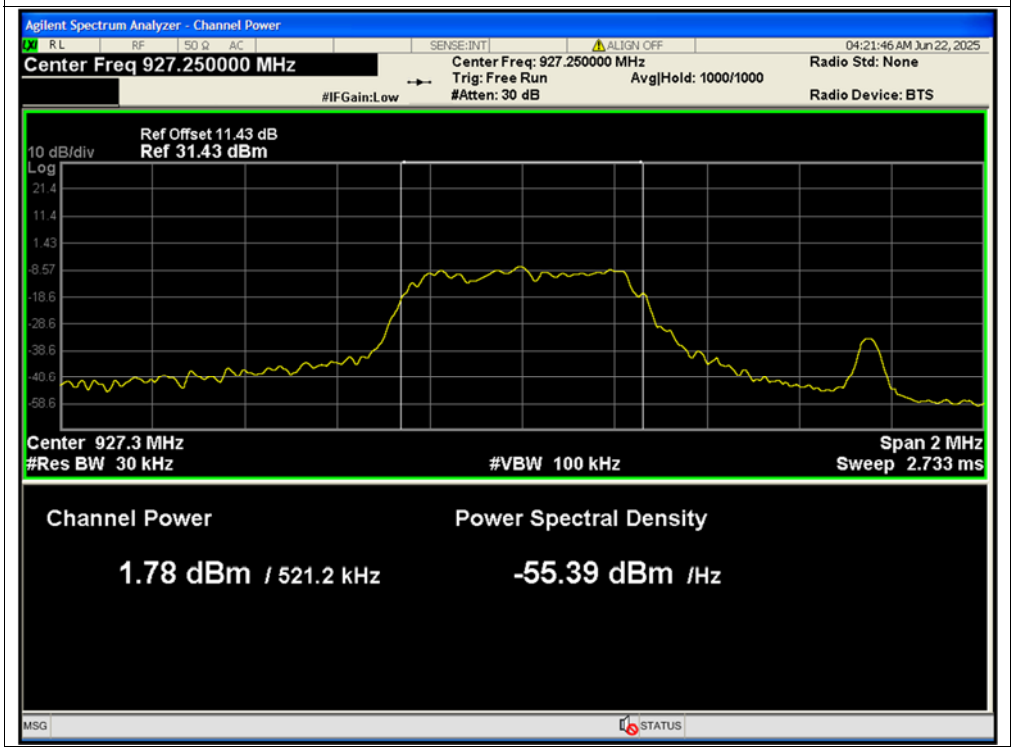
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit (dBm)	Verdict
NVNT	LoRa 500K	902.75	Ant1	2.16	10.71	12.87	0.01936	30	Pass
NVNT	LoRa 500K	915.25	Ant1	1.66	10.55	12.21	0.01663	30	Pass
NVNT	LoRa 500K	927.25	Ant1	1.78	10.55	12.33	0.0171	30	Pass

Test Graphs
Average Power NVNT LoRa 500K 902.75MHz Ant1



Average Power NVNT LoRa 500K 915.25MHz Ant1

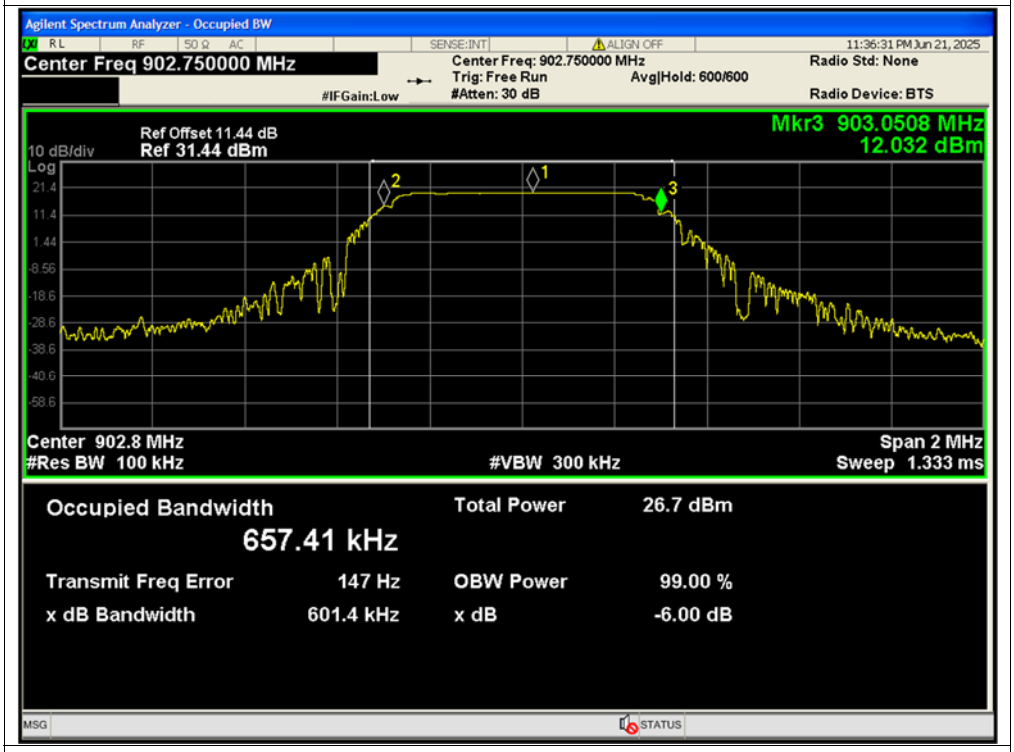


Average Power NVNT LoRa 500K 927.25MHz Ant1


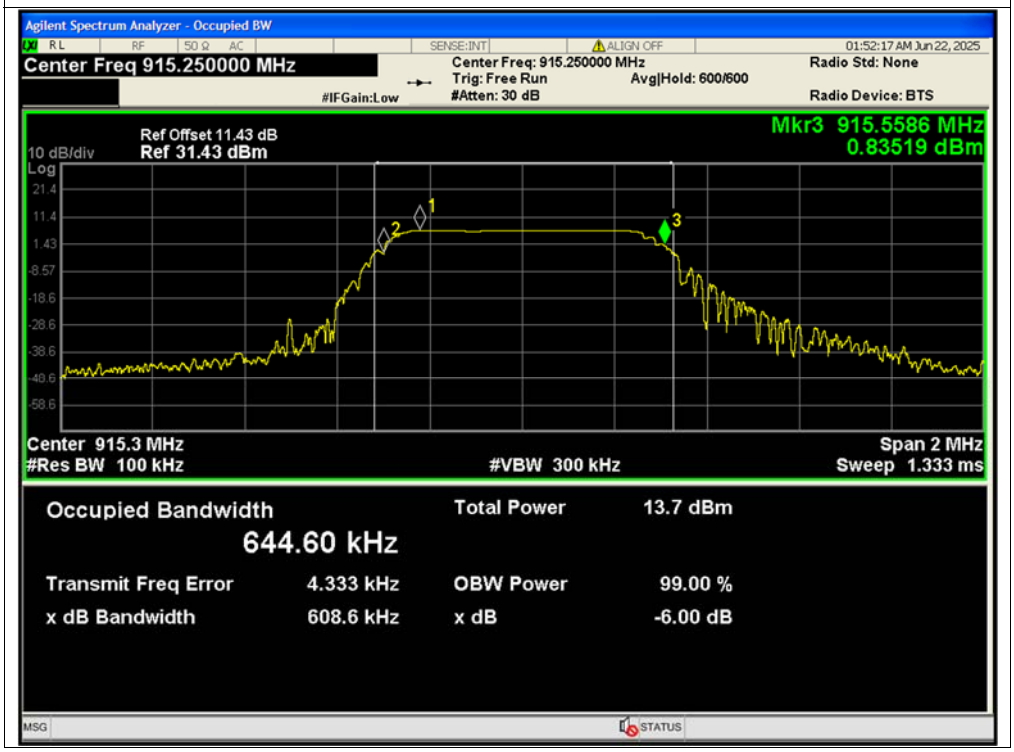
A.4. 6 dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	LoRa 500K	902.75	Ant1	0.6014	0.5	Pass
NVNT	LoRa 500K	915.25	Ant1	0.6086	0.5	Pass
NVNT	LoRa 500K	927.25	Ant1	0.6036	0.5	Pass

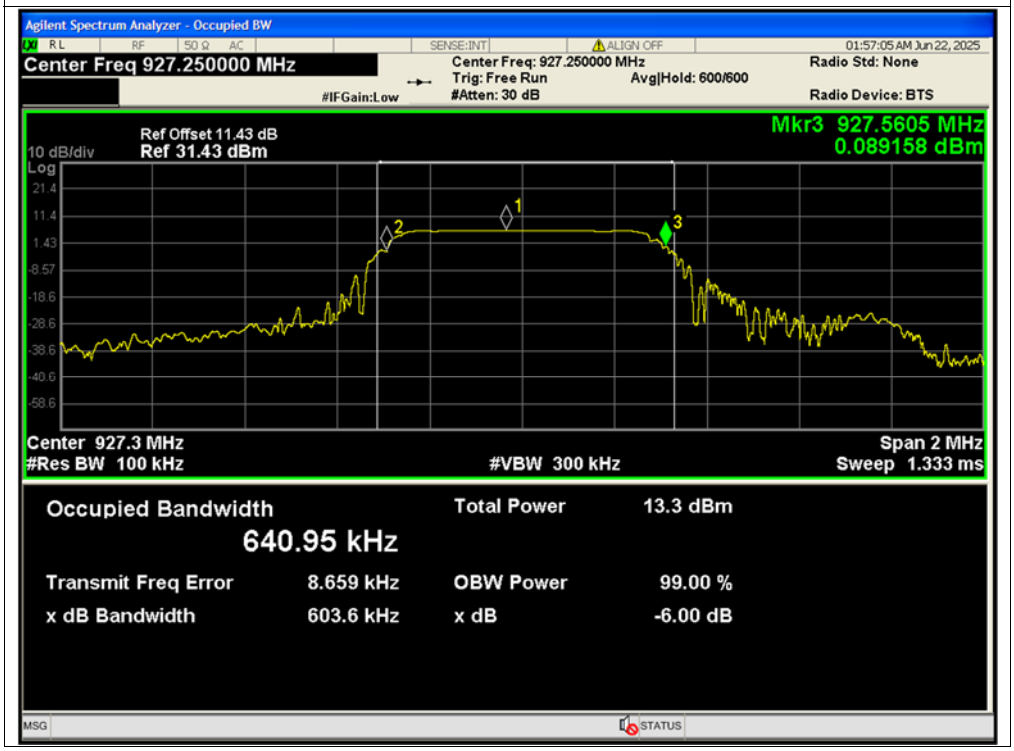
Test Graphs
-6dB Bandwidth NVNT LoRa 500K 902.75MHz Ant1



-6dB Bandwidth NVNT LoRa 500K 915.25MHz Ant1



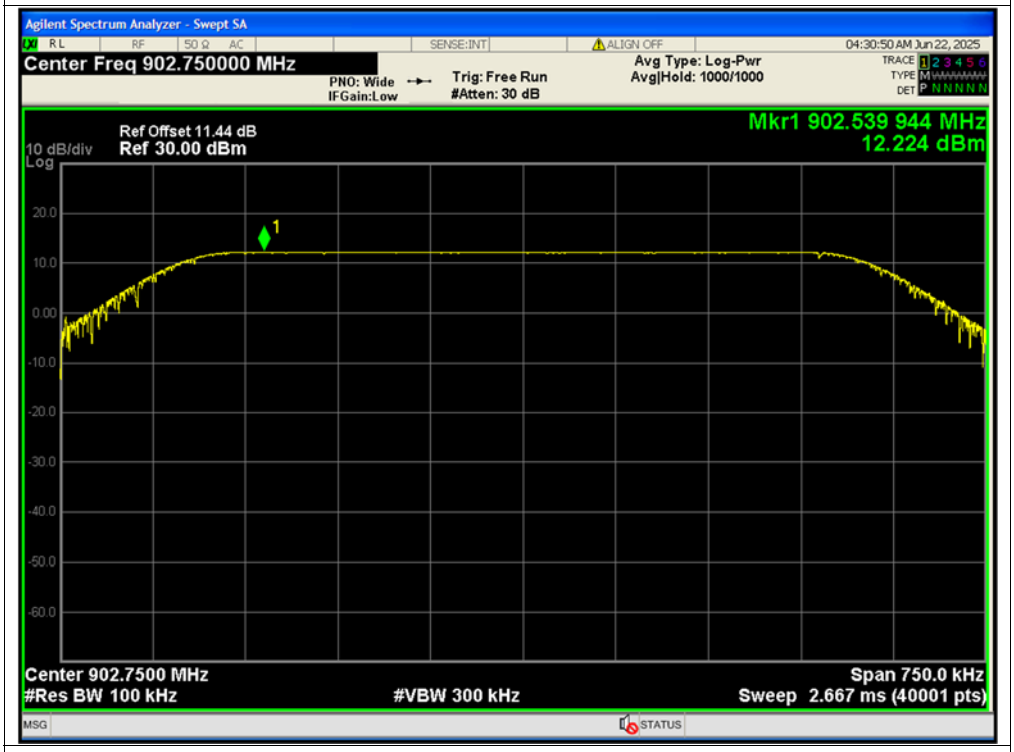
-6dB Bandwidth NVNT LoRa 500K 927.25MHz Ant1



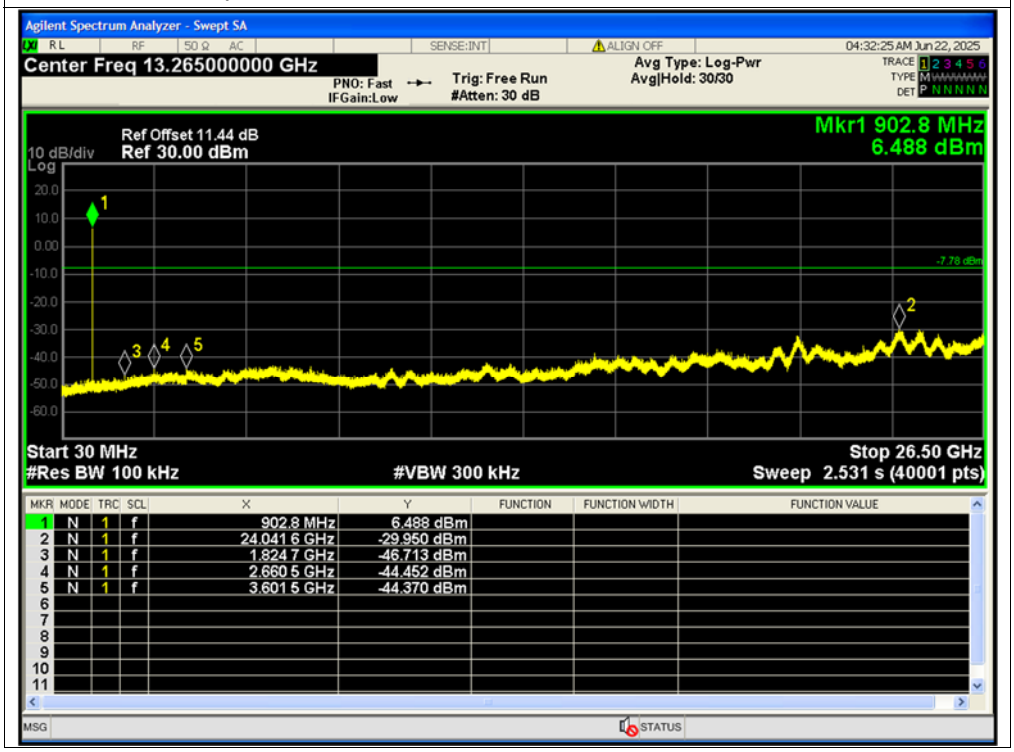
A.5. Conducted Spurious Emissions

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	LoRa 500K	902.75	Ant1	-42.17	-20	Pass
NVNT	LoRa 500K	915.25	Ant1	-41.75	-20	Pass
NVNT	LoRa 500K	927.25	Ant1	-41.64	-20	Pass

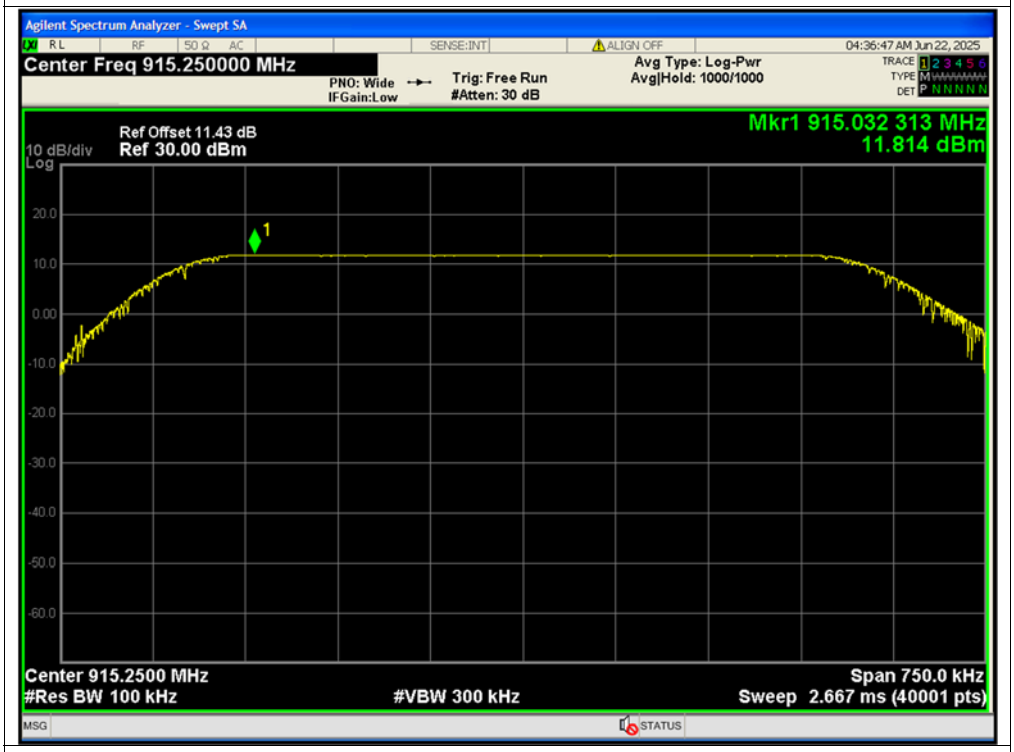
Test Graphs
Tx. Spurious NVNT LoRa 500K 902.75MHz Ant1 Ref



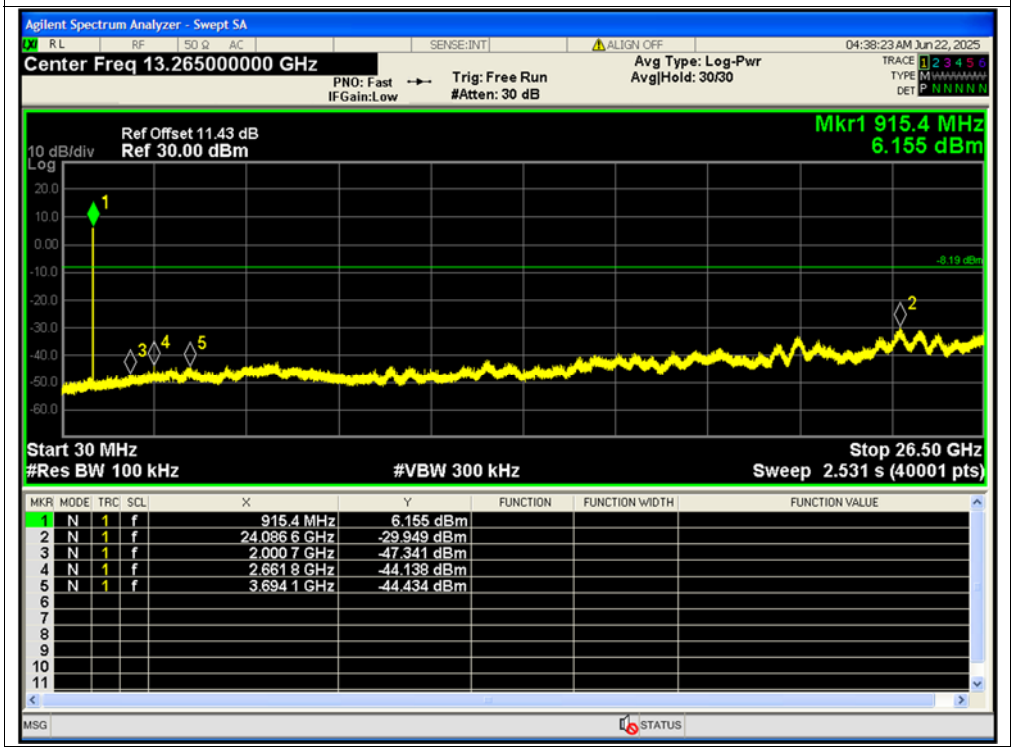
Tx. Spurious NVNT LoRa 500K 902.75MHz Ant1 Emission



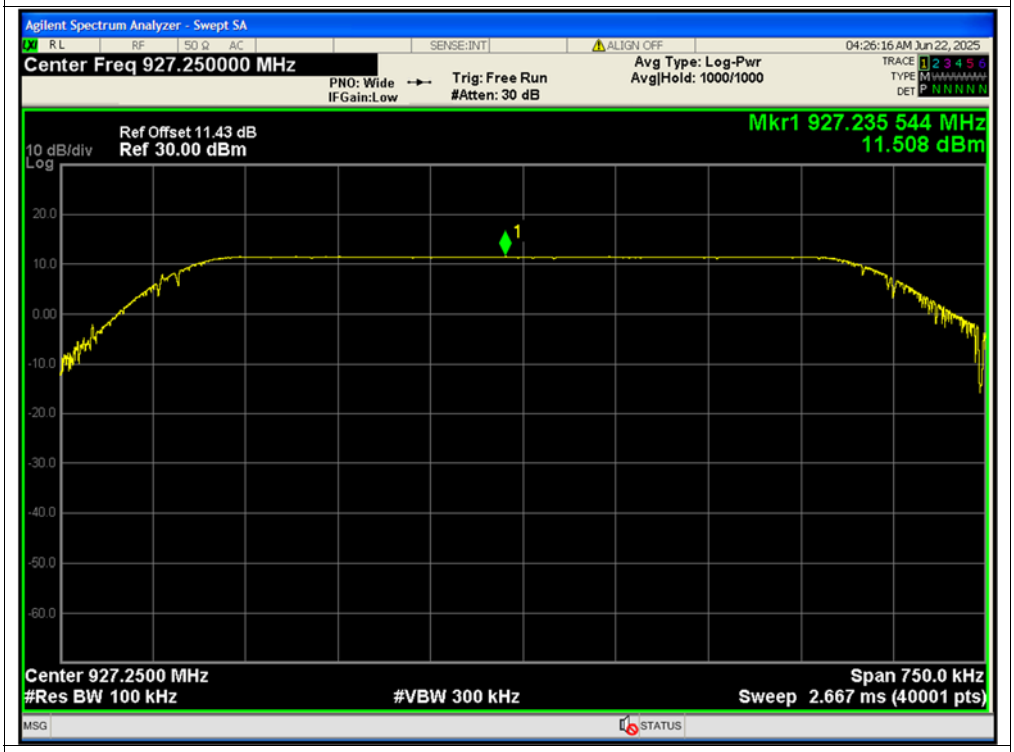
Tx. Spurious NVNT LoRa 500K 915.25MHz Ant1 Ref



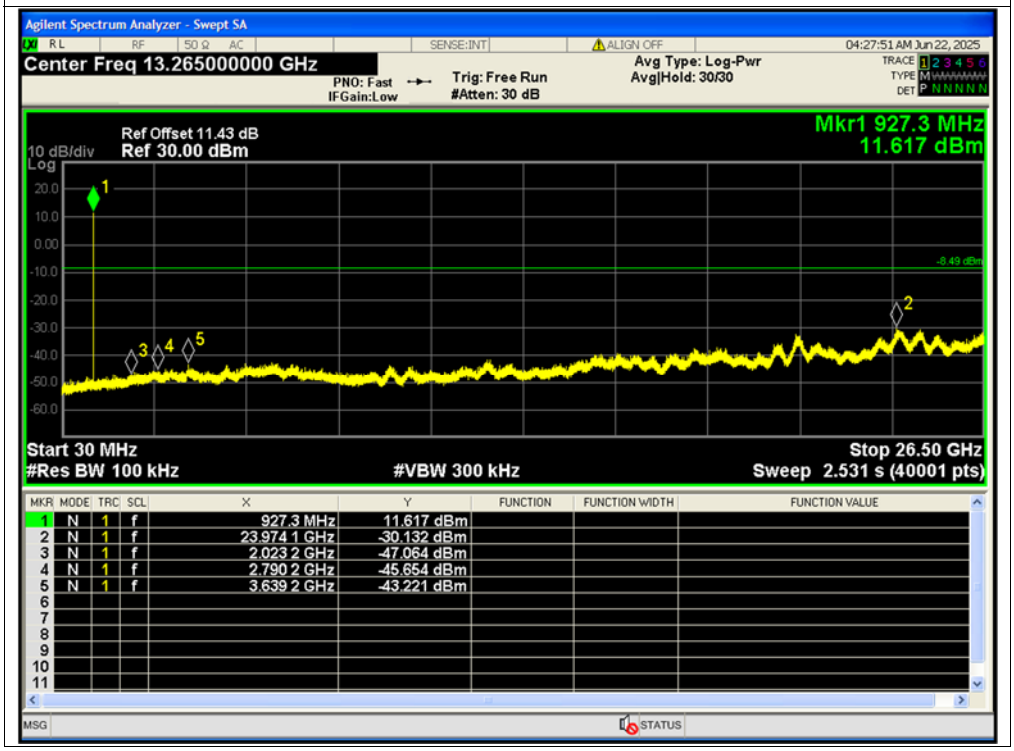
Tx. Spurious NVNT LoRa 500K 915.25MHz Ant1 Emission



Tx. Spurious NVNT LoRa 500K 927.25MHz Ant1 Ref



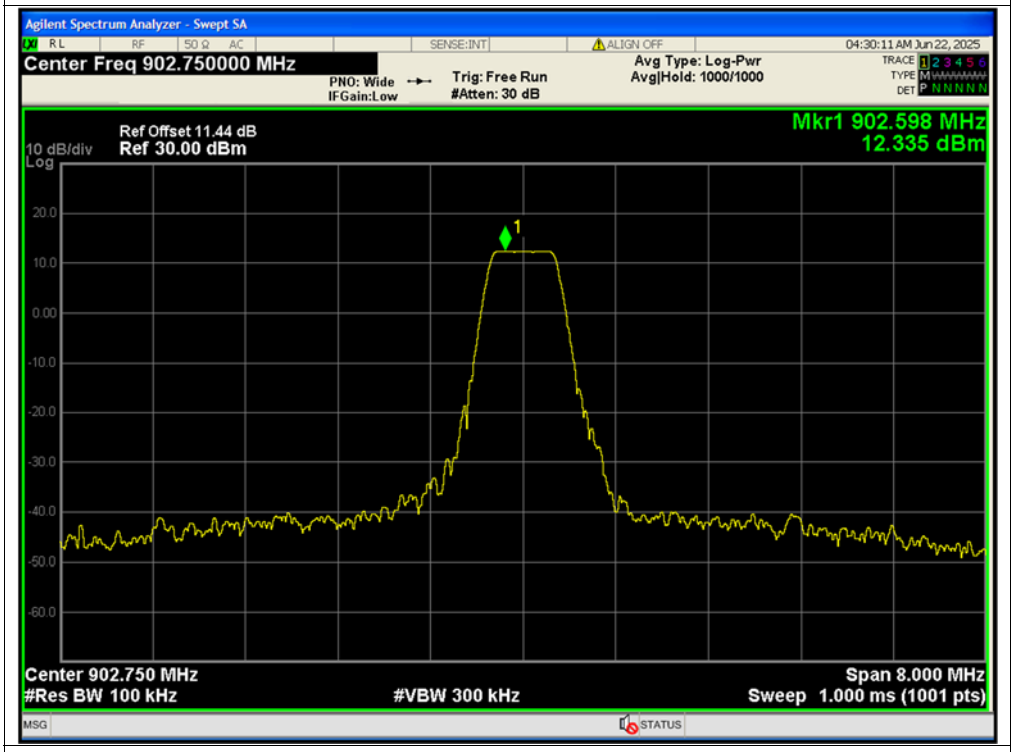
Tx. Spurious NVNT LoRa 500K 927.25MHz Ant1 Emission



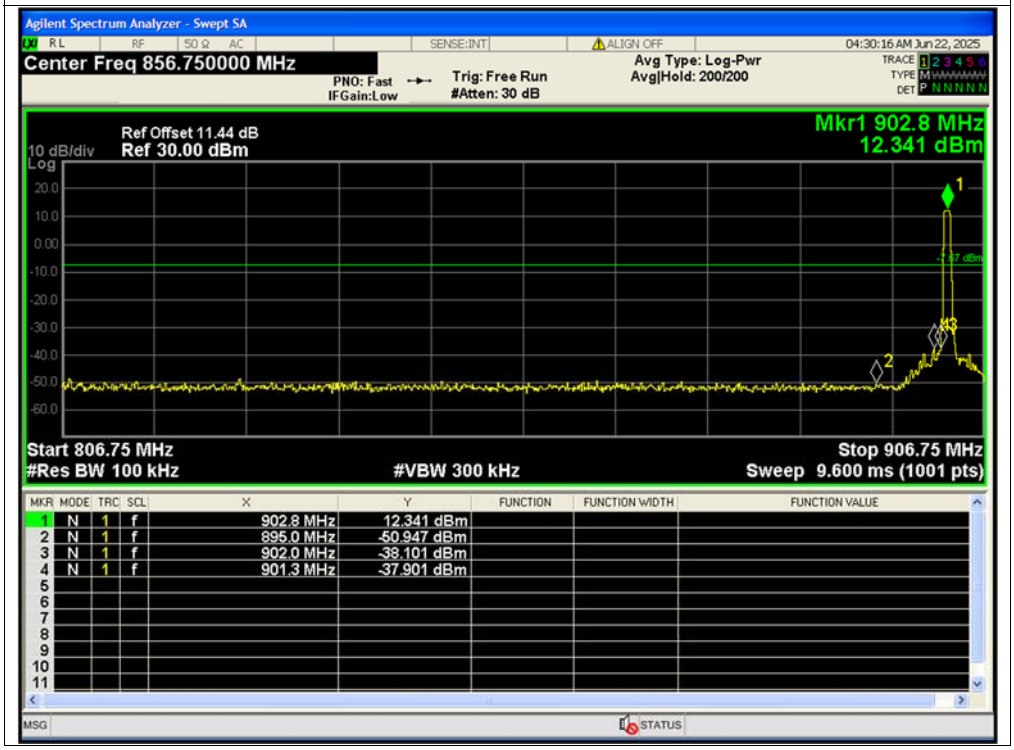
A.6. Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	LoRa 500K	902.75	Ant1	-50.24	-20	Pass
NVNT	LoRa 500K	927.25	Ant1	-32.25	-20	Pass

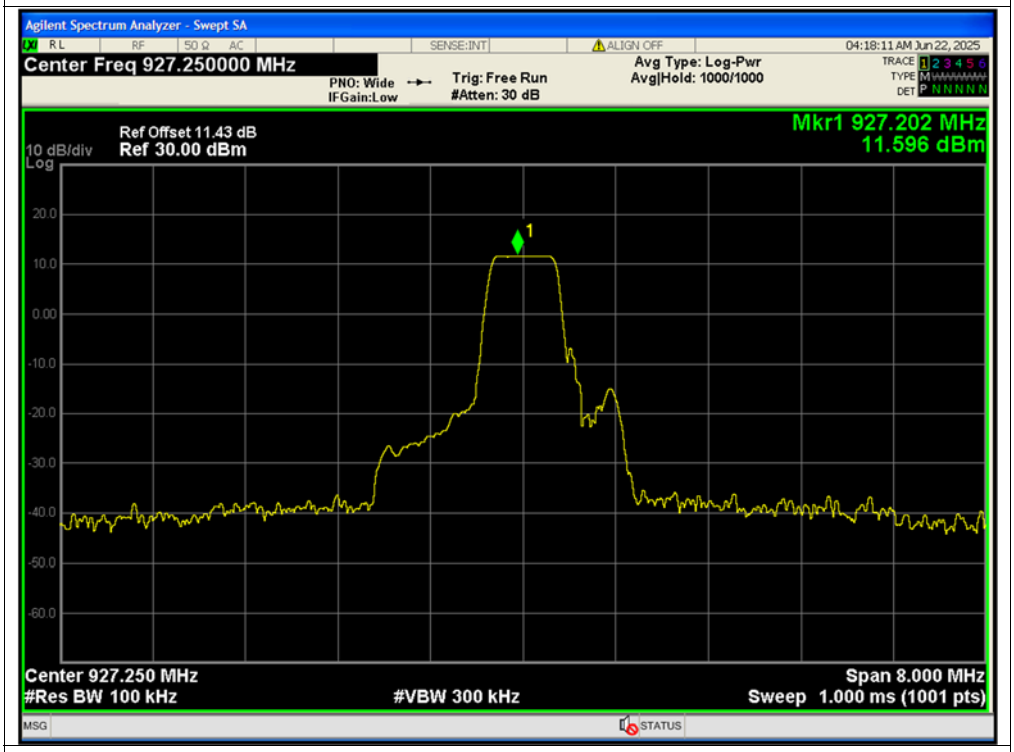
Test Graphs
Band Edge NVNT LoRa 500K 902.75MHz Ant1 Ref



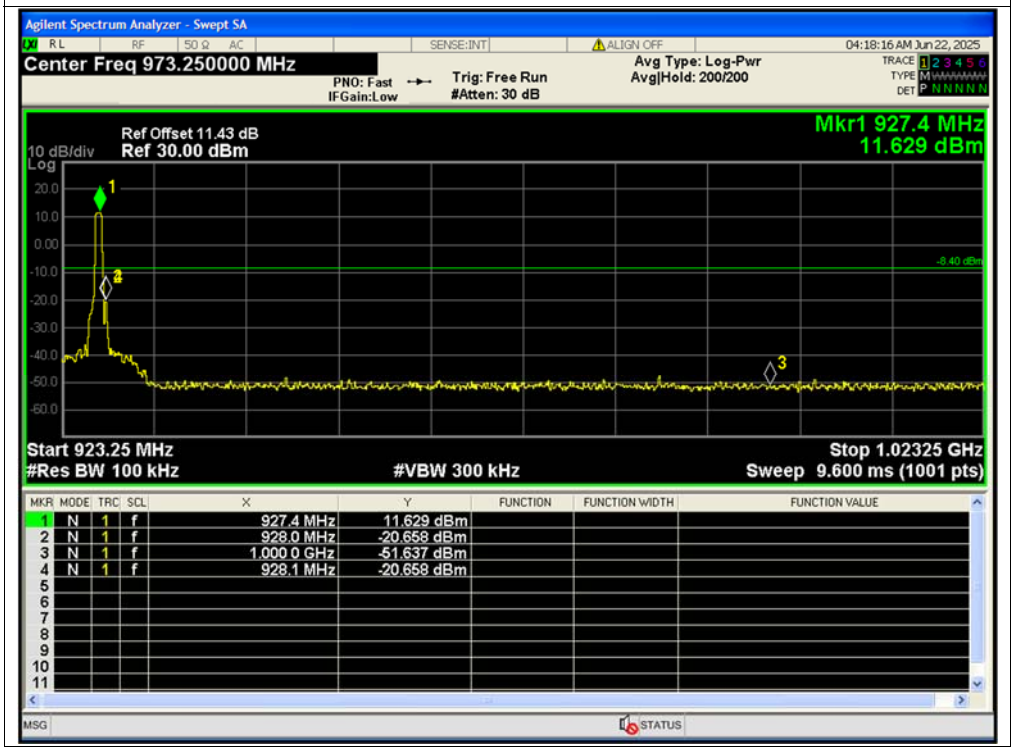
Band Edge NVNT LoRa 500K 902.75MHz Ant1 Emission



Band Edge NVNT LoRa 500K 927.25MHz Ant1 Ref



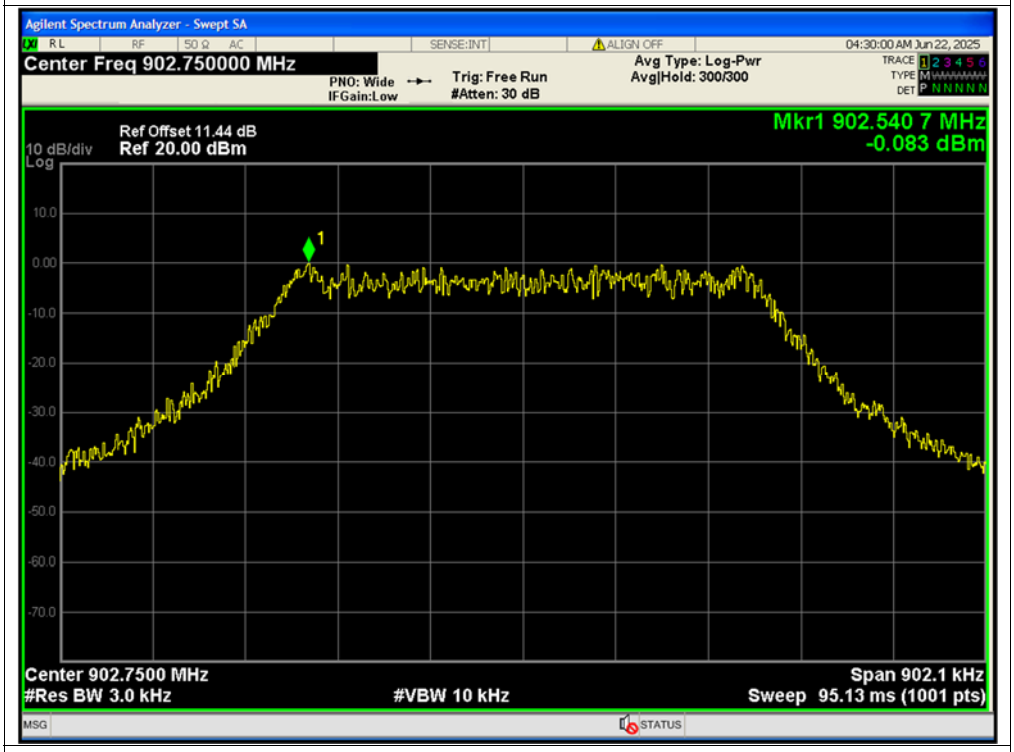
Band Edge NVNT LoRa 500K 927.25MHz Ant1 Emission



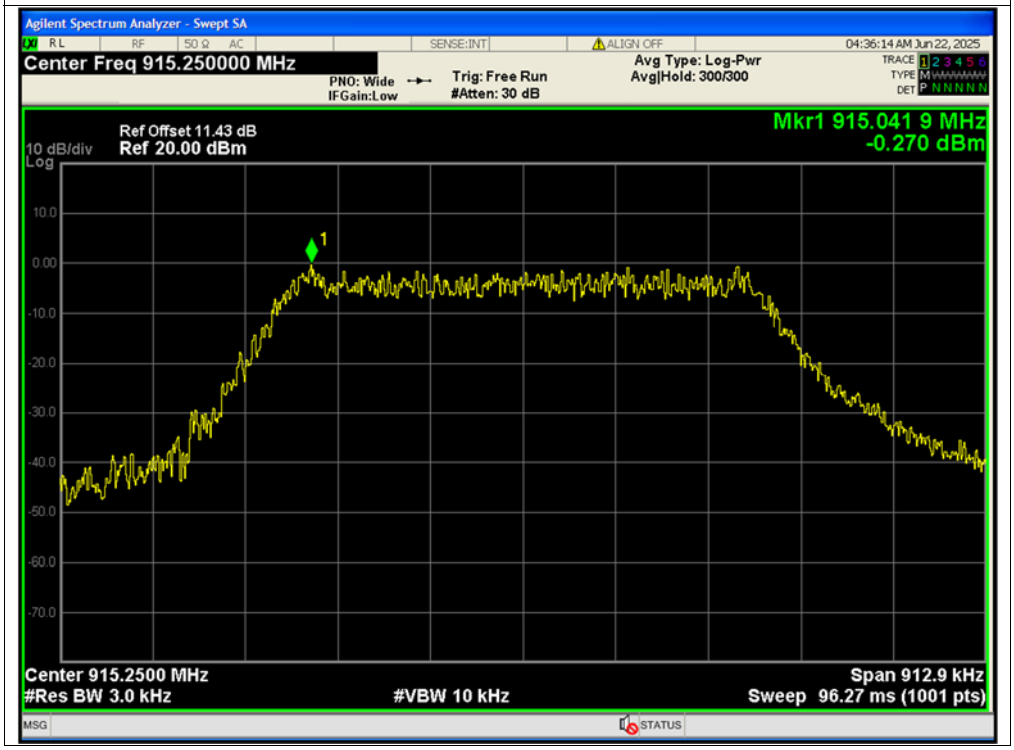
A.7. Power Spectral Density

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Duty Factor (dB)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	LoRa 500K	902.75	Ant1	-0.08	0	-0.08	8	Pass
NVNT	LoRa 500K	915.25	Ant1	-0.27	0	-0.27	8	Pass
NVNT	LoRa 500K	927.25	Ant1	-1.12	0	-1.12	8	Pass

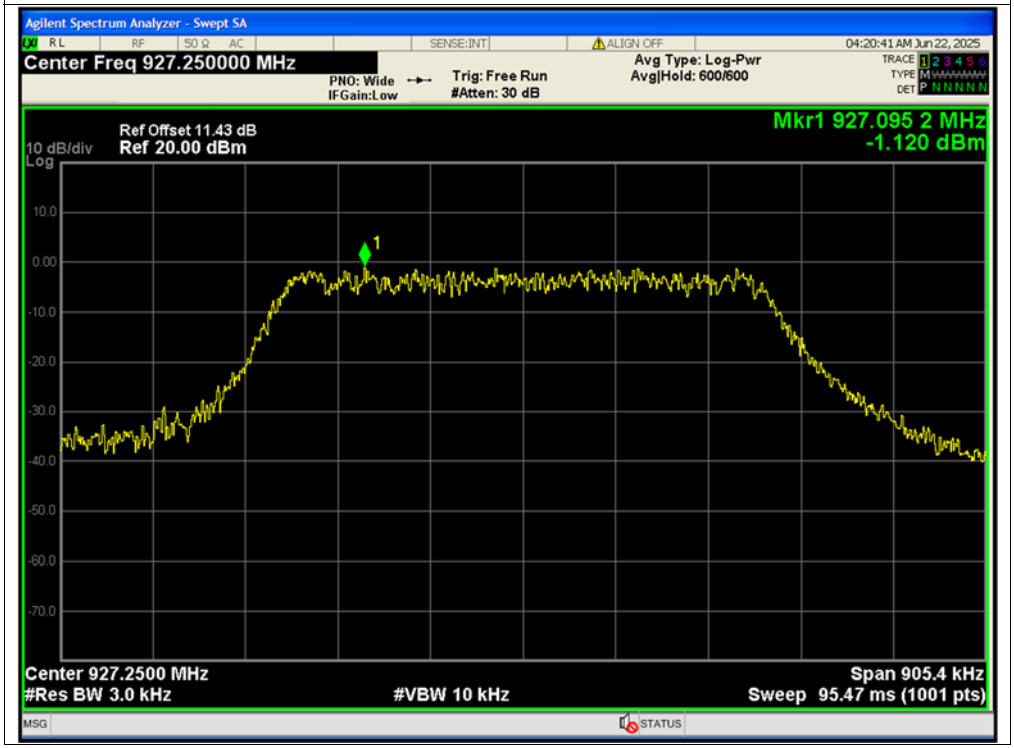
Test Graphs
PSD NVNT LoRa 500K 902.75MHz Ant1



PSD NVNT LoRa 500K 915.25MHz Ant1



PSD NVNT LoRa 500K 927.25MHz Ant1



A.8. Radiated Emission

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

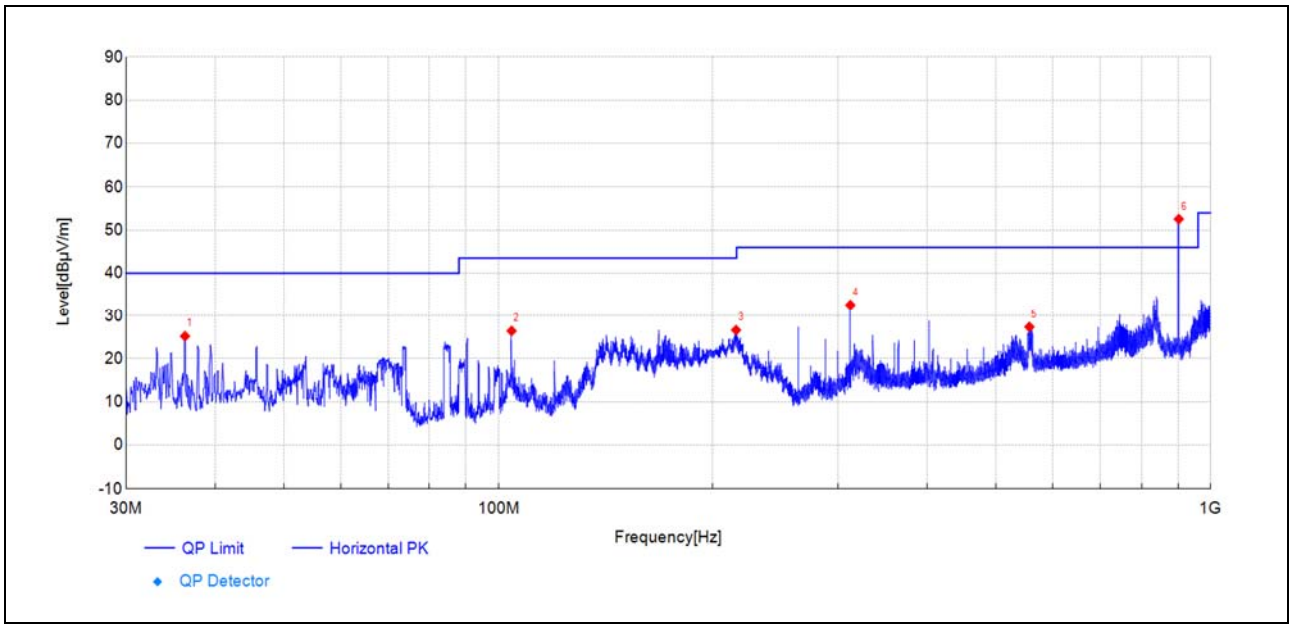
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

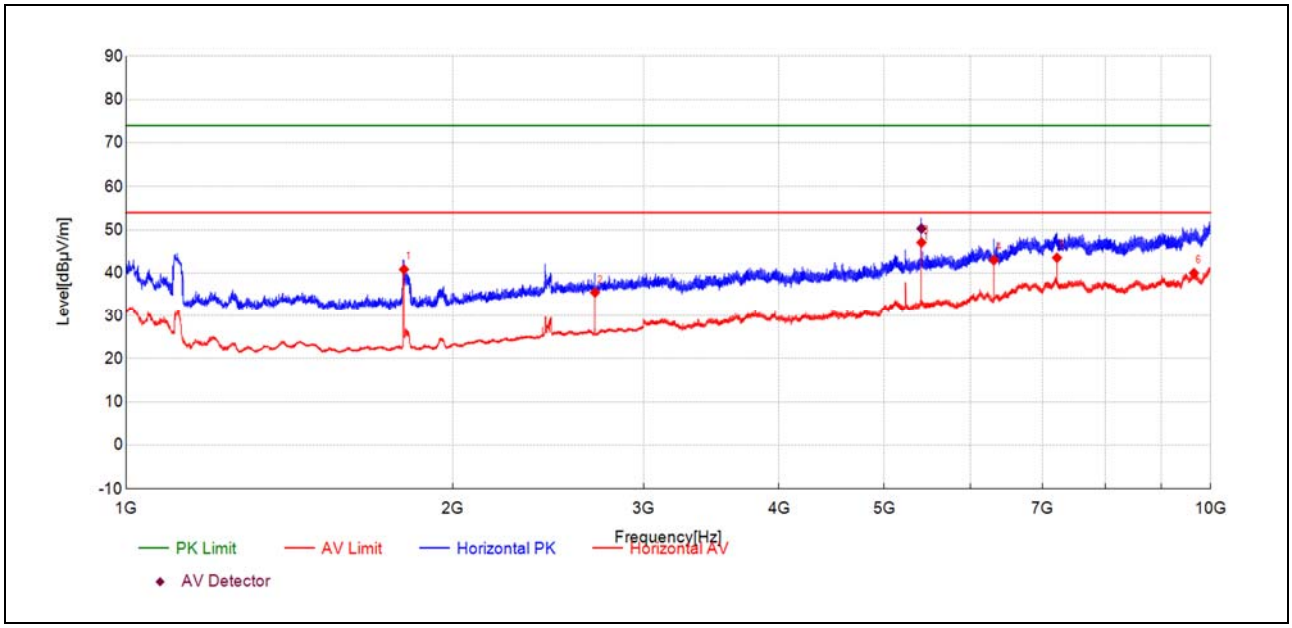
Note 3: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

Plot for Channel 1



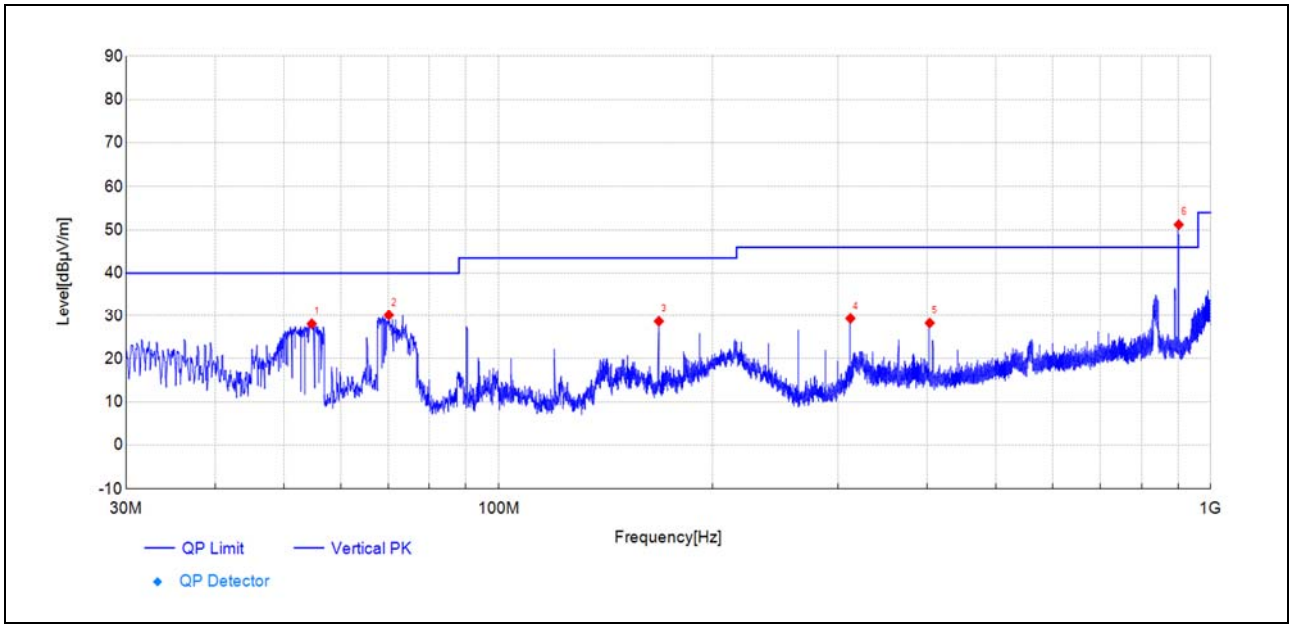
(Antenna Horizontal, 30MHz to 1GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
36.31	54.6	25.19	-29.430	40.00	14.81	59	PK	PASS
104.35	55.8	26.41	-29.410	43.50	17.09	290	PK	PASS
215.62	55.2	26.60	-28.630	43.50	16.90	9	PK	PASS
311.99	57.9	32.57	-25.320	46.00	13.43	310	PK	PASS
556.49	46.2	27.34	-18.900	46.00	18.66	121	PK	PASS
901.93	64.5	52.57	-11.900	-	-	352	PK	NA



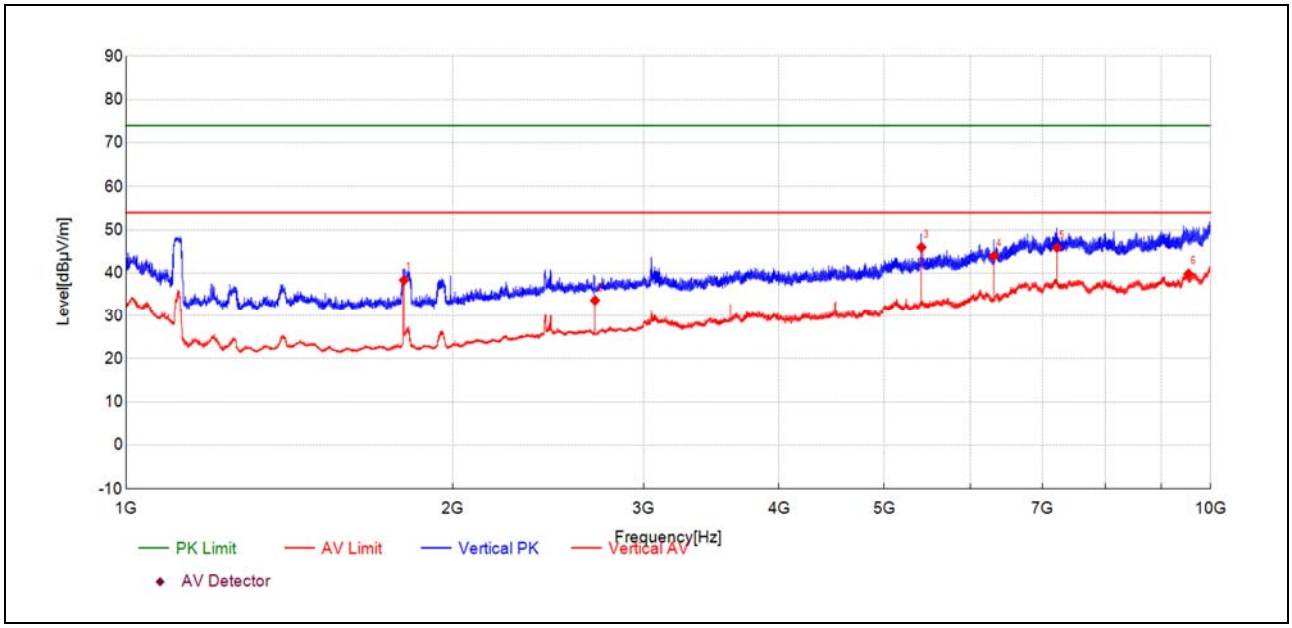
(Antenna Horizontal, 1GHz to 10GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
1804.16	59.4	40.86	-18.520	54.00	13.14	360	AV	PASS
2706.34	48.8	35.51	-13.300	54.00	18.49	31	AV	PASS
5411.89	48.8	47.09	-1.710	54.00	6.91	176	AV	PASS
5411.89	52.03	50.32	-1.710	54.00	3.68	187	AV	PASS
6313.55	42.3	43.05	0.780	54.00	10.95	49	AV	PASS
7216.15	38.7	43.56	4.880	54.00	10.44	161	AV	PASS
9649.98	30.5	40.02	9.510	54.00	13.98	112	AV	PASS



(Antenna Vertical, 30MHz to 1GHz)

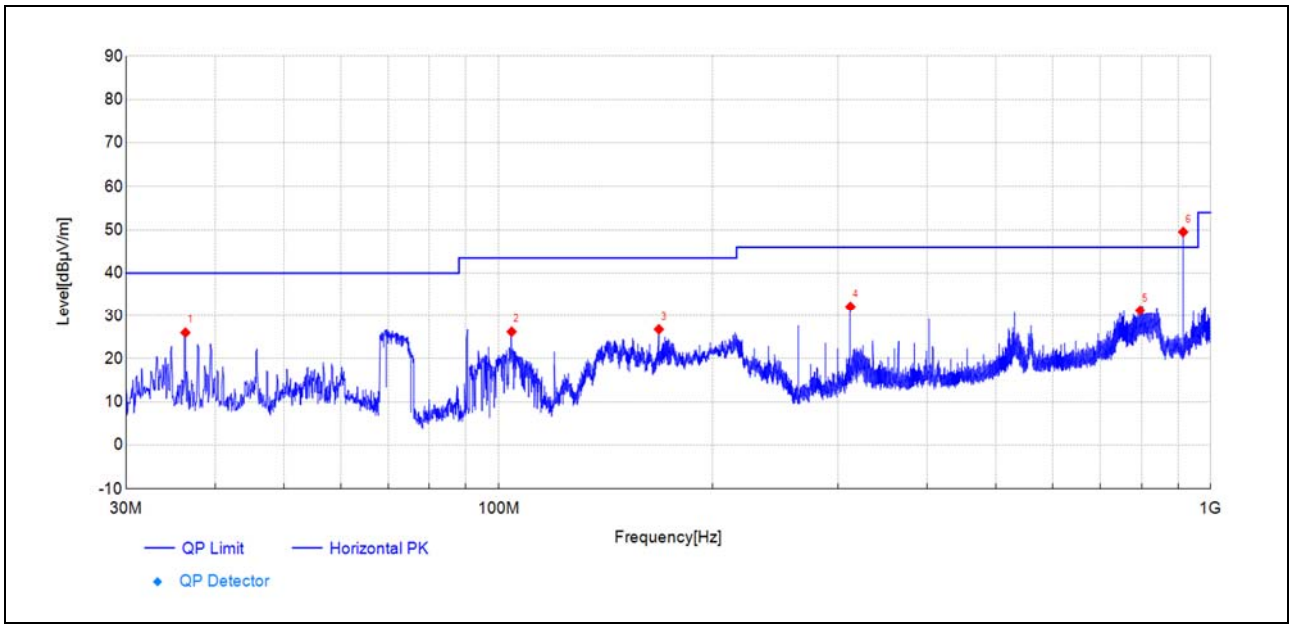
Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
54.69	55.8	28.08	-27.690	40.00	11.92	109	PK	PASS
70.16	61.3	30.08	-31.240	40.00	9.92	79	PK	PASS
167.99	59.4	28.65	-30.710	43.50	14.85	208	PK	PASS
311.99	54.6	29.31	-25.320	46.00	16.69	8	PK	PASS
403.18	50.9	28.25	-22.610	46.00	17.75	99	PK	PASS
901.88	63.1	51.22	-11.900	-	-	0	PK	NA



(Antenna Vertical, 1GHz to 10GHz)

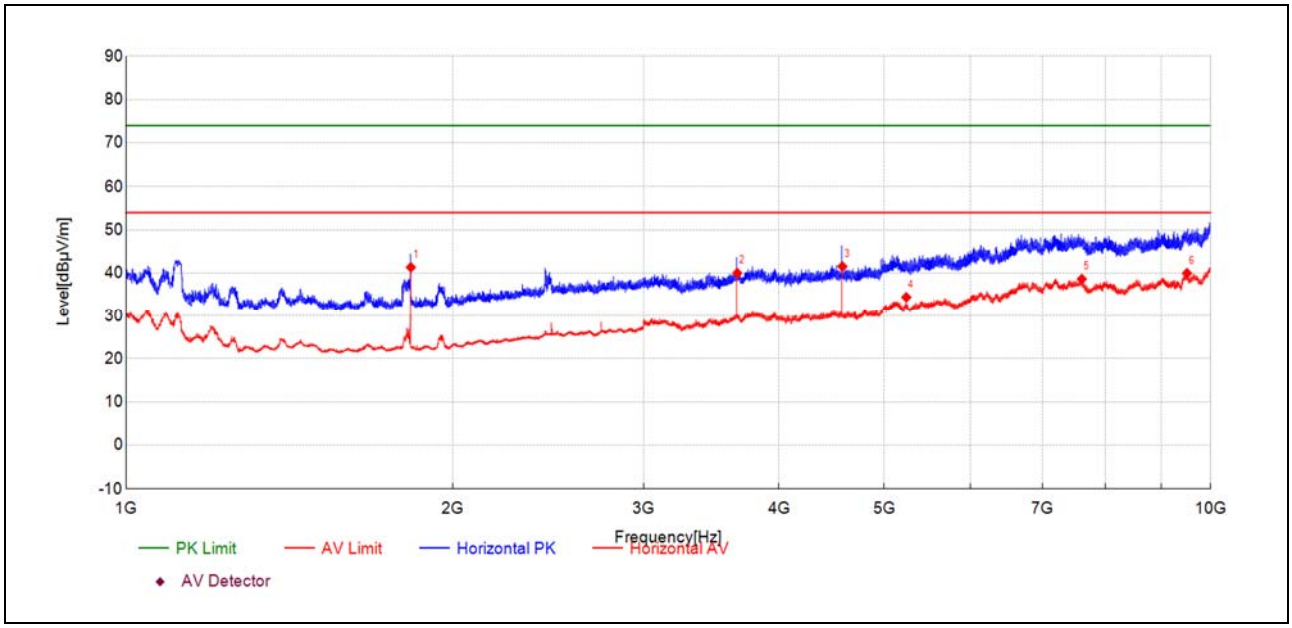
Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
1804.16	56.9	38.37	-18.520	54.00	15.63	325	AV	PASS
2706.34	47.0	33.67	-13.300	54.00	20.33	107	AV	PASS
5411.89	47.7	45.99	-1.710	54.00	8.01	136	AV	PASS
6313.55	43.2	44.00	0.780	54.00	10.00	105	AV	PASS
7216.15	41.0	45.86	4.880	54.00	8.14	97	AV	PASS
9539.84	31.7	39.84	8.120	54.00	14.16	224	AV	PASS

Plot for Channel 26



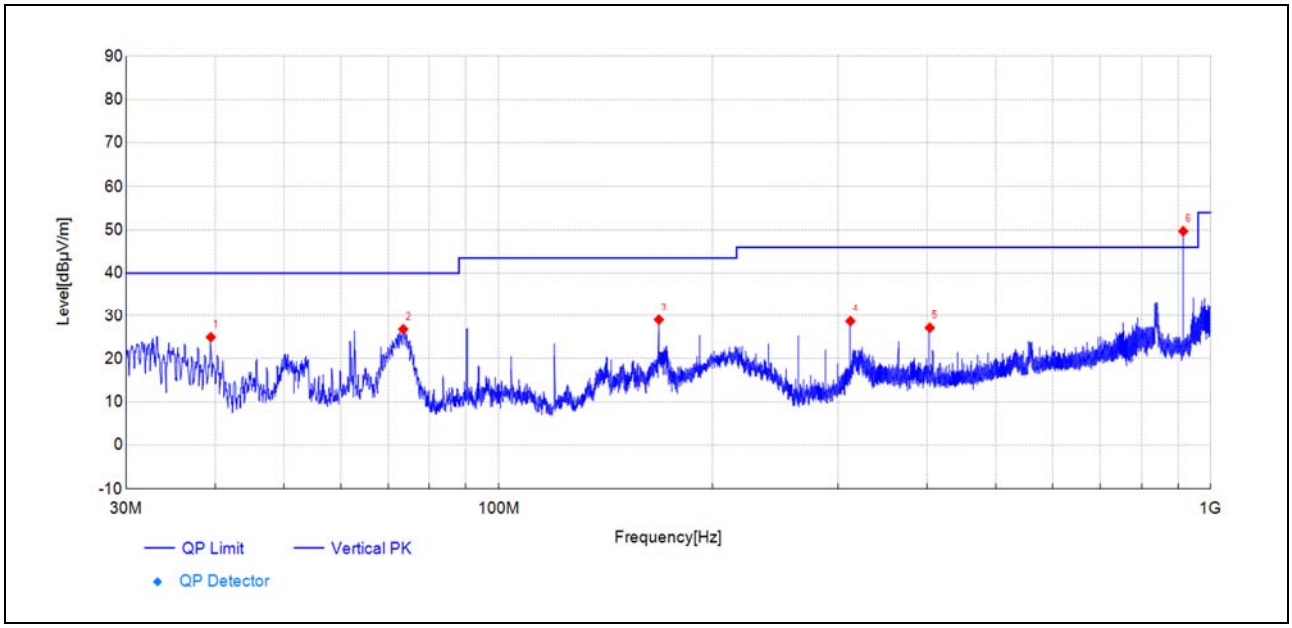
(Antenna Horizontal, 30MHz to 1GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
36.35	55.4	26.01	-29.410	40.00	13.99	194	PK	PASS
104.35	55.6	26.22	-29.410	43.50	17.28	137	PK	PASS
167.99	57.5	26.78	-30.710	43.50	16.72	101	PK	PASS
311.99	57.5	32.18	-25.320	46.00	13.82	332	PK	PASS
795.66	45.1	31.26	-13.830	46.00	14.74	137	PK	PASS
914.88	61.9	49.52	-12.420	-	-	9	PK	NA



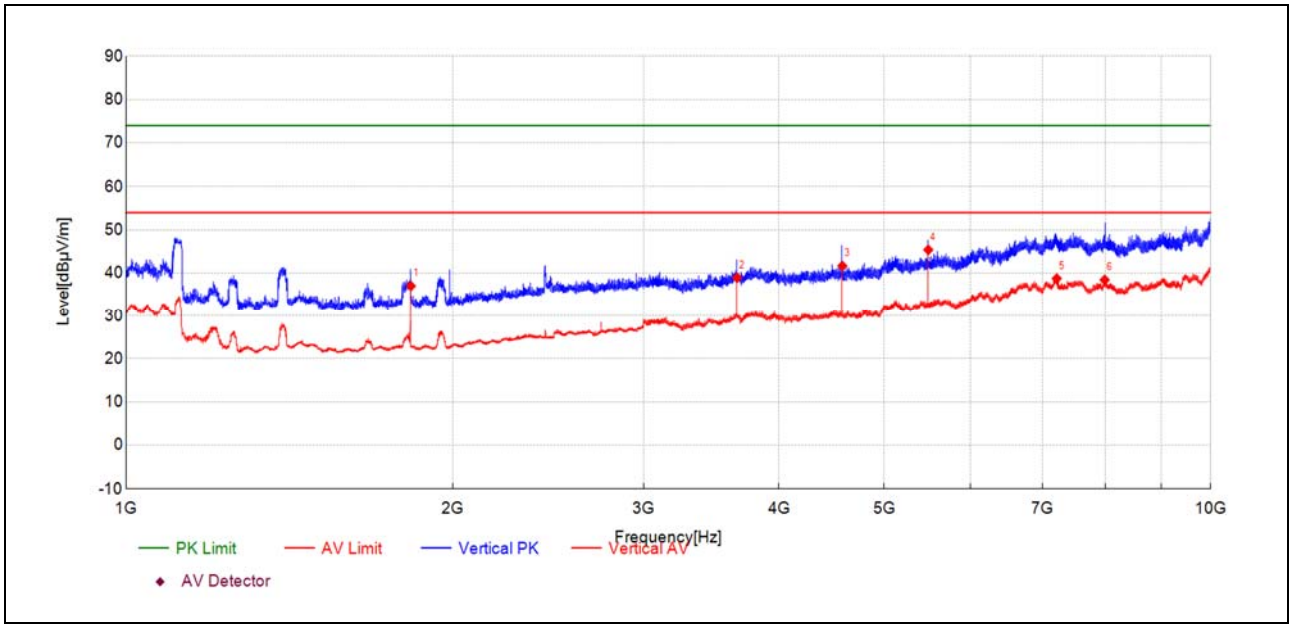
(Antenna Horizontal, 1GHz to 10GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
1830.57	59.7	41.35	-18.380	54.00	12.65	356	AV	PASS
3660.38	48.9	40.01	-8.890	54.00	13.99	25	AV	PASS
4575.57	48.1	41.54	-6.590	54.00	12.46	25	AV	PASS
5240.15	37.4	34.40	-3.010	54.00	19.60	256	AV	PASS
7606.31	33.7	38.63	4.920	54.00	15.37	168	AV	PASS
9509.03	31.6	39.98	8.380	54.00	14.02	343	AV	PASS



(Antenna Vertical, 30MHz to 1GHz)

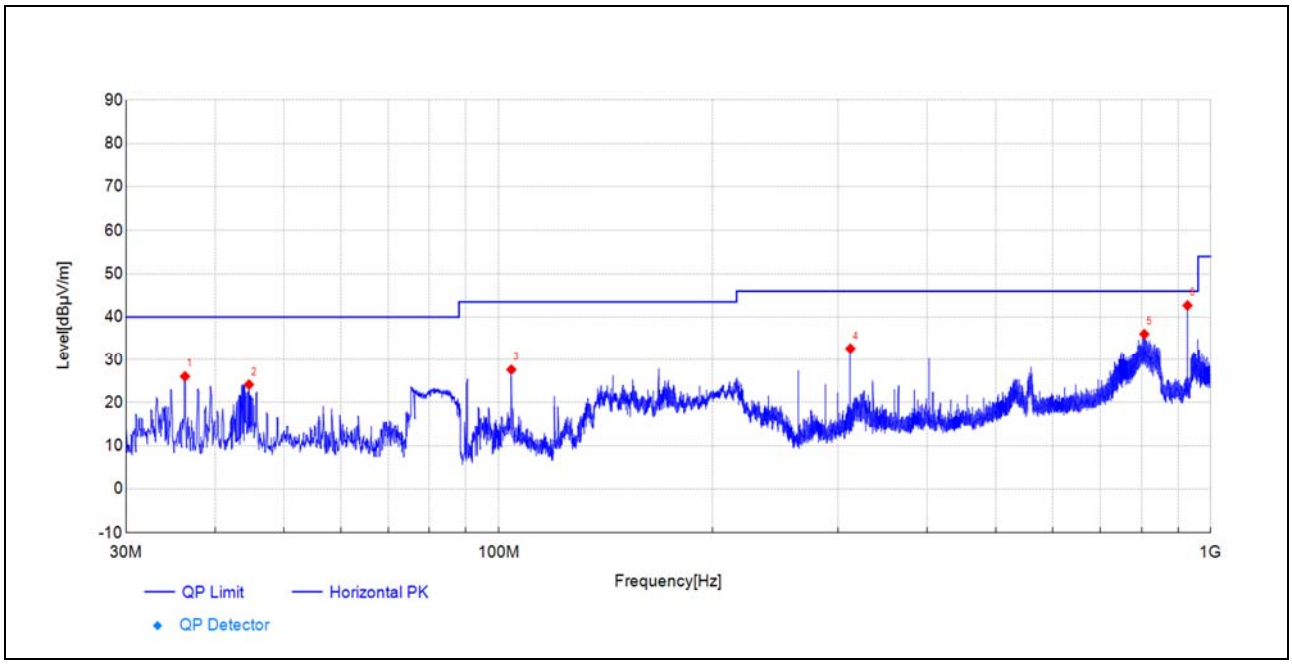
Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
39.46	53.9	24.97	-28.950	40.00	15.03	279	PK	PASS
73.51	59.0	26.80	-32.190	40.00	13.20	300	PK	PASS
167.99	59.7	29.02	-30.710	43.50	14.48	314	PK	PASS
311.99	54.0	28.68	-25.320	46.00	17.32	5	PK	PASS
403.18	49.7	27.13	-22.610	46.00	18.87	126	PK	PASS
915.07	62.1	49.71	-12.410	-	-	0	PK	NA



(Antenna Vertical, 1GHz to 10GHz)

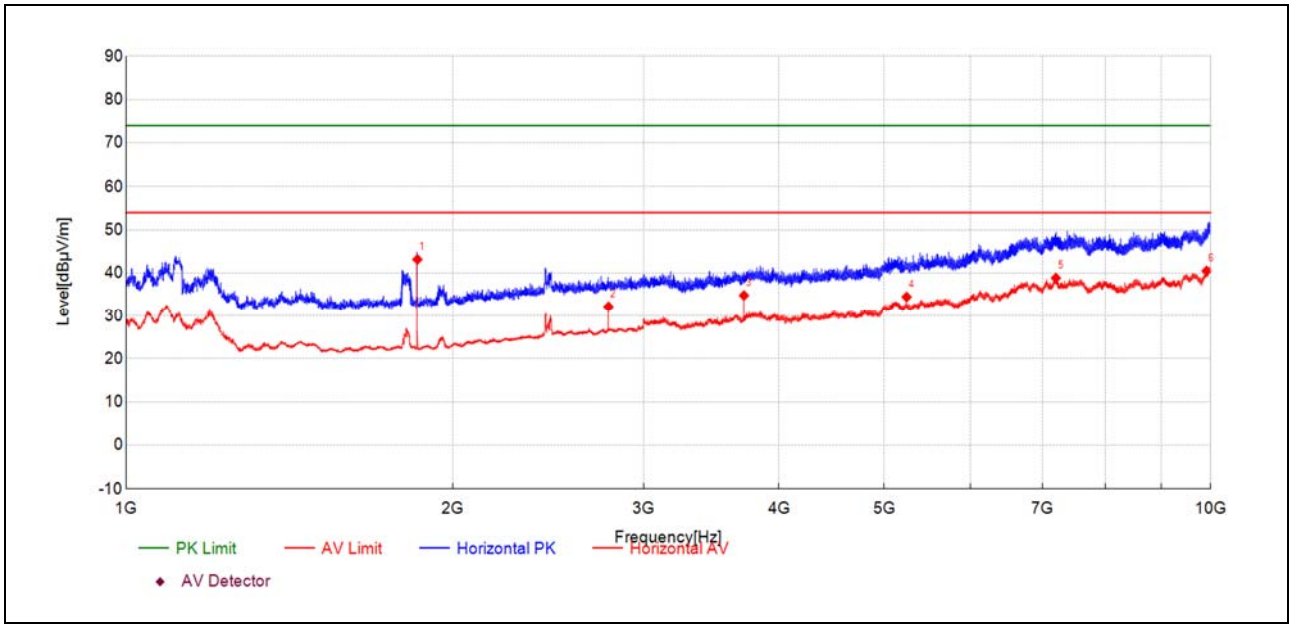
Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
1830.57	55.4	37.02	-18.380	54.00	16.98	360	AV	PASS
3659.91	47.8	38.93	-8.890	54.00	15.07	6	AV	PASS
4575.11	48.3	41.68	-6.590	54.00	12.32	22	AV	PASS
5490.77	47.4	45.40	-2.000	54.00	8.60	22	AV	PASS
7211.95	33.8	38.77	4.940	54.00	15.23	262	AV	PASS
7984.33	33.5	38.44	4.920	54.00	15.56	2	AV	PASS

Plot for Channel 50



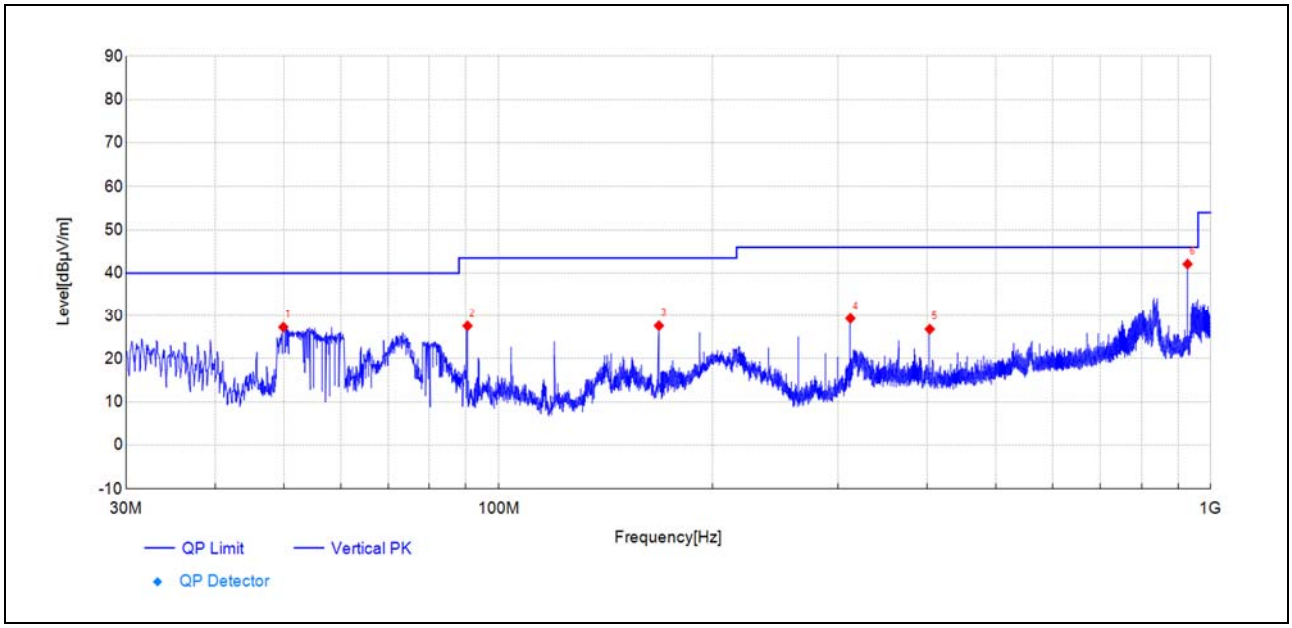
(Antenna Horizontal, 30MHz to 1GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
36.31	55.5	26.05	-29.430	40.00	13.95	36	PK	PASS
44.65	52.1	24.15	-27.980	40.00	15.85	97	PK	PASS
104.26	57.1	27.62	-29.460	43.50	15.88	259	PK	PASS
311.99	58.0	32.66	-25.320	46.00	13.34	326	PK	PASS
806.91	50.4	36.04	-14.380	46.00	9.96	51	PK	PASS
927.88	54.7	42.68	-11.990	-	-	51	PK	NA



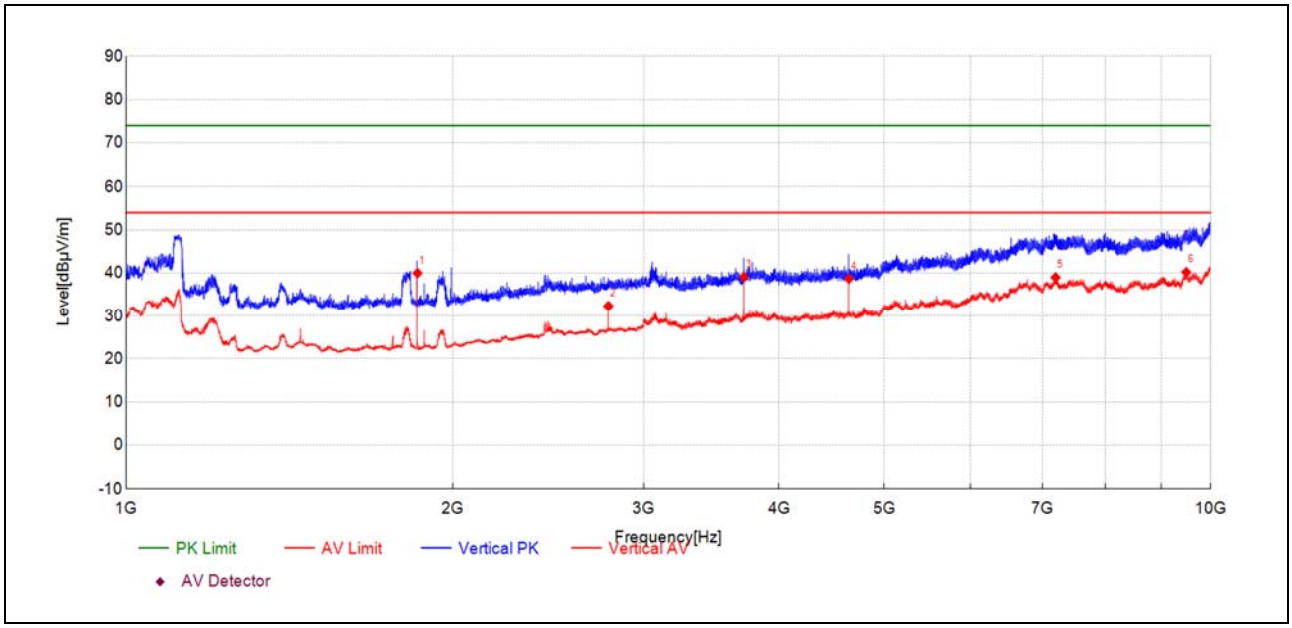
(Antenna Horizontal, 1GHz to 10GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
1856.17	61.4	43.17	-18.250	54.00	10.83	10	AV	PASS
2784.76	44.9	32.18	-12.750	54.00	21.82	2	AV	PASS
3712.65	43.9	34.81	-9.080	54.00	19.19	337	AV	PASS
5243.88	37.4	34.46	-2.940	54.00	19.54	130	AV	PASS
7198.88	33.8	38.86	5.110	54.00	15.14	274	AV	PASS
9910.86	31.2	40.51	9.290	54.00	13.49	122	AV	PASS



(Antenna Vertical, 30MHz to 1GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
49.89	55.3	27.30	-27.960	40.00	12.70	152	PK	PASS
90.48	58.9	27.59	-31.350	43.50	15.91	285	PK	PASS
167.99	58.3	27.62	-30.710	43.50	15.88	230	PK	PASS
311.99	54.7	29.34	-25.320	46.00	16.66	14	PK	PASS
403.23	49.4	26.82	-22.620	46.00	19.18	56	PK	PASS
928.02	54.1	42.10	-11.980	-	-	9	PK	NA



(Antenna Vertical, 1GHz to 10GHz)

Frequency [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Angle [°]	Detector	Verdict
1856.57	58.2	39.98	-18.250	54.00	14.02	346	AV	PASS
2784.36	45.0	32.29	-12.750	54.00	21.71	96	AV	PASS
3712.65	48.2	39.11	-9.080	54.00	14.89	113	AV	PASS
4640.44	45.0	38.68	-6.300	54.00	15.32	352	AV	PASS
7194.68	33.9	38.99	5.070	54.00	15.01	9	AV	PASS
9495.03	31.8	40.21	8.450	54.00	13.79	17	AV	PASS

END OF REPORT