



NCC TEST REPORT

Equipment : LoRa Module
Brand Name : LITE-ON
Model Name : WSL309S
Applicant : 光寶科技股份有限公司
台北市內湖區瑞光路 392 號 22 樓
Manufacturer : LITE-ON Technology (Changzhou) Co., Ltd.
A9 Building, No.88 Yanghu Road, Wujin Hi-Tech
Industrial Development Zone, Changzhou City,
Jiangsu Province 213100 China
Standard : LP0002 Section 4.8.1 (2018-01-10)

The product was received on Jan. 19, 2019, and testing was started from Mar. 01, 2019 and completed on Mar. 11, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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PHOTOGRAPHS OF EUT V01



TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: HE1-F10 Ver1.0

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	4.8.1.3	Antenna Requirement	PASS	-
3.1	2.3	AC Power-line Conducted Emissions	PASS	-
4.1	4.8.1.5	20dB Bandwidth	PASS	-
4.1	4.8.1.5	Carrier Frequency Separation	PASS	-
4.2	4.8.1.2	Maximum Conducted Output Power	PASS	-
4.3	4.8.1.5	Power Spectral Density	PASS	-
4.4	4.8.1.5	Number of Hopping Frequencies and Hopping Band edge	PASS	-
4.5	4.8.1.5	Time of Occupancy (Dwell Time)	PASS	-
4.6	4.8.1.4	Emissions in Non-restricted Frequency Bands	PASS	-
4.7	4.8.1.4	Emissions in Restricted Frequency Bands	PASS	-
4.8	2.11	Receiver Radiated Unwanted Emissions	PASS	Restricted Bands: LP0002-2.8

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

None

Reviewed by: Sam Tsai

Report Producer: Jenny Yang

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range	Lora Mode	Ch. Frequency (MHz)	Channel Number
920 MHz – 925 MHz	LoRa-125kHz	920.2 - 924.8	24
920 MHz – 925 MHz	LoRa-250kHz	920.5 – 924.5	11
920 MHz – 925 MHz	LoRa-500kHz	920.6 – 924.2	7

LoRa-125kHz	LoRa-250kHz	LoRa-500kHz
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
920.2	920.5	920.6
920.4	920.9	921.2
920.6	921.3	921.8
920.8	921.7	922.4
921.0	922.1	923.0
921.2	922.5	923.6
921.4	922.9	924.2
921.6	923.3	
921.8	923.7	
922.0	924.1	
922.2	924.5	
922.4	-	
922.6		
922.8		
923.0		
923.2		
923.4		
923.6		
923.8		
924.0		
924.2		
924.4		
924.6		
924.8		

Band	Mode	BWch (MHz)	Nant
902-928MHz	LoRa (125kHz)	0.125	1TX
902-928MHz	LoRa (250kHz)	0.25	1TX
902-928MHz	LoRa (500kHz)	0.5	1TX

Note:

- ♦ LoRa uses a GFSK and MSK modulation.
- ♦ LoRa uses as a combination of SF7, SF8, SF9, SF10, SF11, SF12.
- ♦ SF12 configuration was pretested and found to be the worst case and measured during the test.
- ♦ BWch is the channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Walsin	RFDPA131015IMRB301	Dipole Antenna	I-PEX	3.01

Note 1: The EUT has one antenna.

Ant. 1 (port 1) could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
LoRa (125kHz)	0.322	4.921	51.525m	30
LoRa (250kHz)	0.315	5.017	51.525m	30
LoRa (500kHz)	0.341	4.672	51.525m	30

1.1.4 EUT Operational Condition

Operational Condition			
EUT Power Type	From DC Power Supply		
Function	☒ Point-to-multipoint	☒ Point-to-point	
Type of EUT			
☒	Stand-alone		
☐	Combined (EUT where the radio part is fully integrated within another device)		
	Combined Equipment - Brand Name / Model No.: ...		
☐	Plug-in radio (EUT intended for a variety of host systems)		
	Host System - Brand Name / Model No.: ...		
☐	Other:		

1.2 Testing Applied Standards

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

- ♦ LP0002 Section 4.8.1 (2018-01-10)
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 558074 D01 v05r02
- ♦ ANSI C63.4-2014 NCC

1.3 Testing Location Information

Testing Location		
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973
☐	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Clara	23.3~23.7°C / 63.1~63.6%	04/Mar/2019~ 11/Mar/2019
Radiated	03CH09-HY	Andy	23.2~23.8°C / 57~59%	01/Mar/2019
AC Conduction	CO04-HY	Jeff	20.1~21.2°C / 60.2~63.4%	08/Mar/2019

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	3.3V

2.2 Test Channel Mode

Test Software	COM Port_Tool
---------------	---------------

Mode	Power Setting
LoRa (125kHz)	-
920.2MHz	9
922.4MHz	9
924.8MHz	10
LoRa (250kHz)	-
920.5MHz	15
922.5MHz	15
924.5MHz	16
LoRa (500kHz)	-
920.6MHz	20
922.4MHz	20
924.2MHz	20

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX/CRX
1	DC Power Supply mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	Maximum Conducted Output Power Power Spectral Density 20dB Bandwidth Carrier Frequency Separation Maximum Conducted Output Power Number of Hopping Frequencies and Hopping Bandedge Time of Occupancy (Dwell Time) Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands Receiver Radiated Unwanted Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	CTX/CRX
1	DC Power Supply mode
Operating Mode > 1GHz	CTX/CRX
Orthogonal Planes of EUT	Z Plane
	
Worst Planes of EUT	V



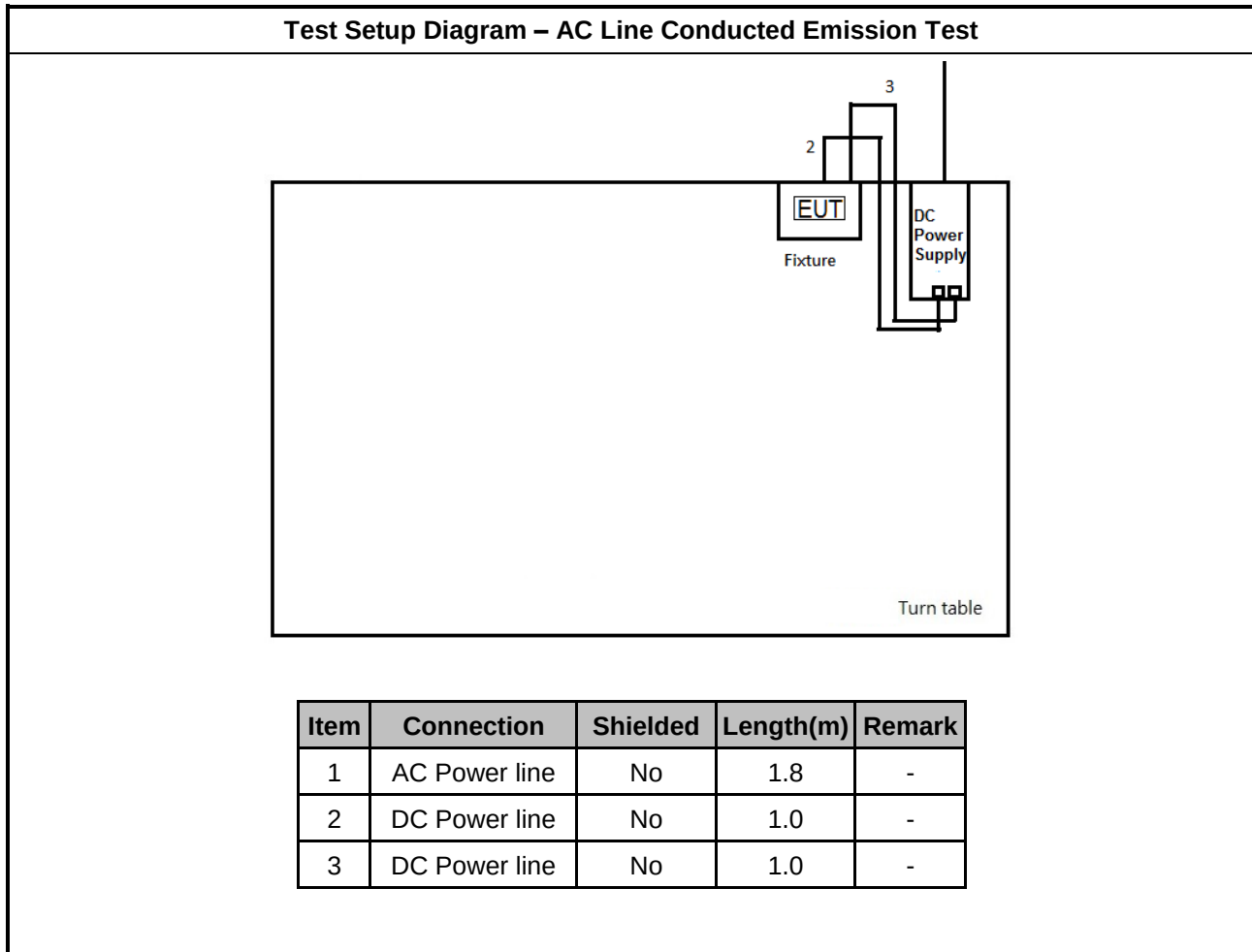
2.4 Support Equipment

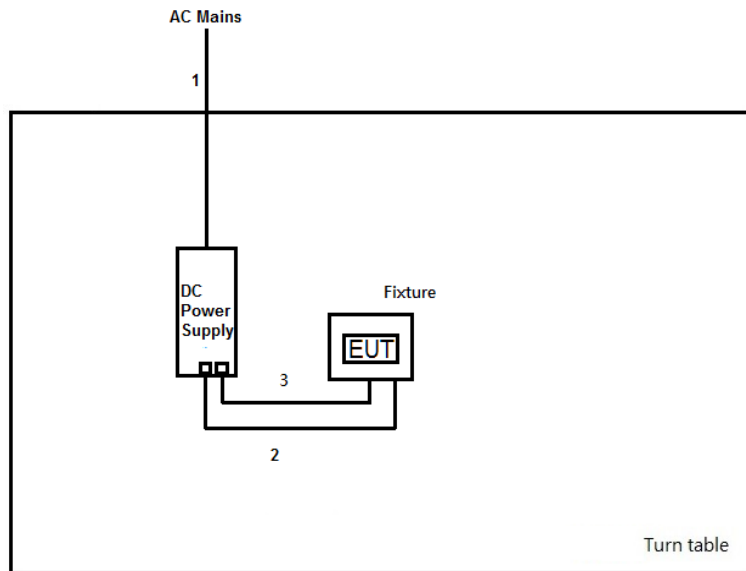
Support Equipment – AC Conduction				
No.	Equipment	Brand Name	Model Name	FCC ID
1	DC Power Supply	GW	GPS-3030DD	-
2	Fixture	-	-	-

Support Equipment – RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Fixture	-	-	-

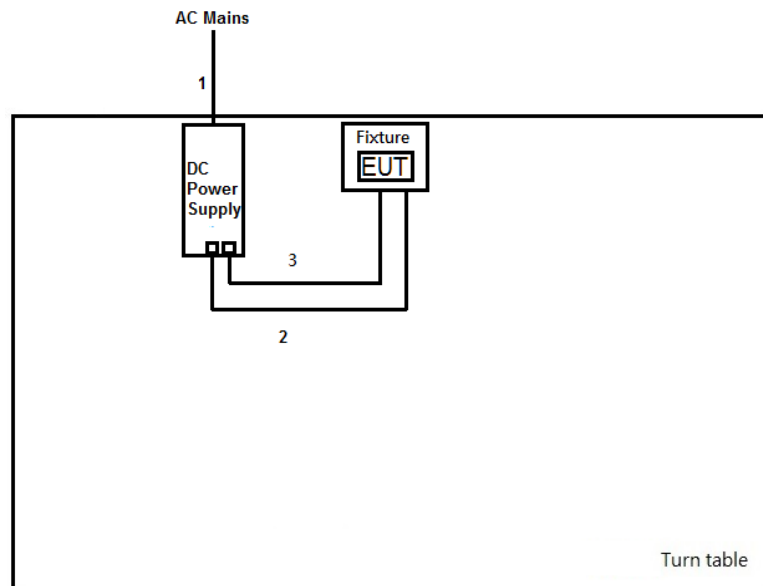
Support Equipment – Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	DC Power Supply	GW	GPS-3030DD	-
2	Fixture	-	-	-

2.5 Test Setup Diagram



Test Setup Diagram - Radiated Test (TX)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.8	-
2	DC Power line	No	1.0	-
3	DC Power line	No	1.0	-

Test Setup Diagram - Radiated Test (RX)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.8	-
2	DC Power line	No	1.0	-
3	DC Power line	No	1.0	-

3 Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

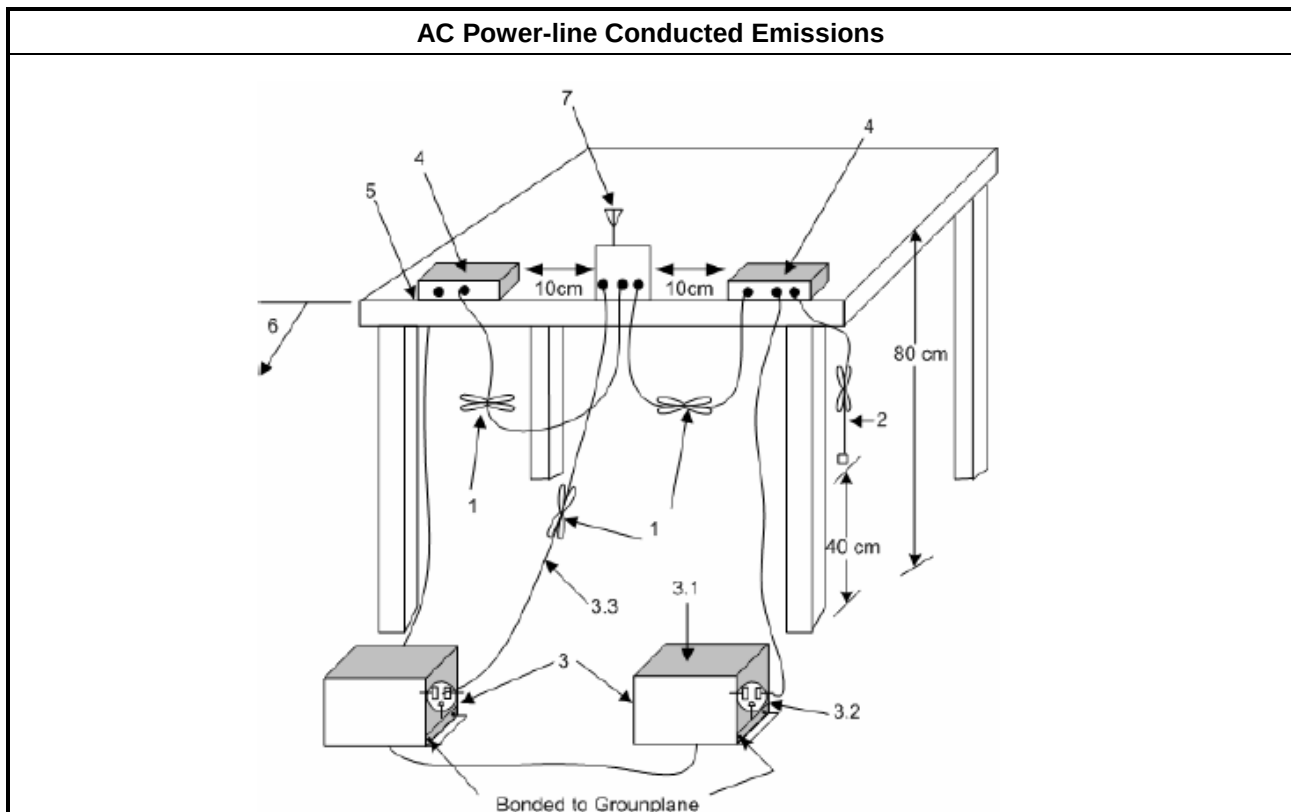
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Test Setup



**AC Power-line Conducted Emissions**

- 1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
- 2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
 - 3.1—All other equipment powered from additional LISN(s).
 - 3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
 - 3.3—LISN at least 80 cm from nearest part of EUT chassis.
- 4—Non-EUT components of EUT system being tested.
- 5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
- 6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
- 7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

4 Transmitter Test Result

4.1 20dB Bandwidth and Carrier Frequency Separation

4.1.1 20dB Bandwidth and Carrier Frequency Separation Limit

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
▪ 920-925 MHz Band:	
▪ $N \geq 50$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 250 kHz.	
▪ $50 > N \geq 25$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $>$ 250 kHz.	
▪ 2400-2483.5 MHz Band:	
▪ $N \geq 75$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz).	
▪ $75 > N \geq 15$ and $ChS \geq \text{MAX}$ (20 dB bandwidth 2/3, 25 kHz).	
▪ 5725-5850 MHz Band:	
▪ $N \geq 75$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 1 MHz.	
N: Number of Hopping Frequencies; ChS: Hopping Channel Separation	

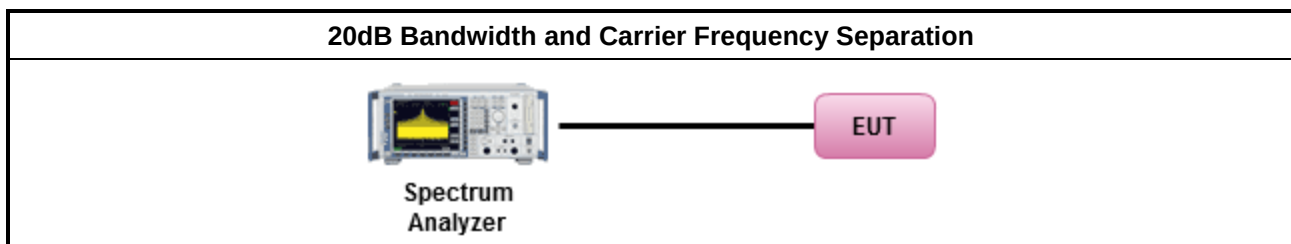
4.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

4.1.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 6.9.1 for 20 dB bandwidth measurement.
▪ Refer as ANSI C63.10-2013, clause 7.8.2 for carrier frequency separation measurement.

4.1.4 Test Setup



4.1.5 Test Result of 20dB Bandwidth

Refer as Appendix B

4.1.6 Test Result of Carrier Frequency Separation

Refer as Appendix B

4.2 Maximum Conducted Output Power

4.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	▪ Smart antenna system (SAS):
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

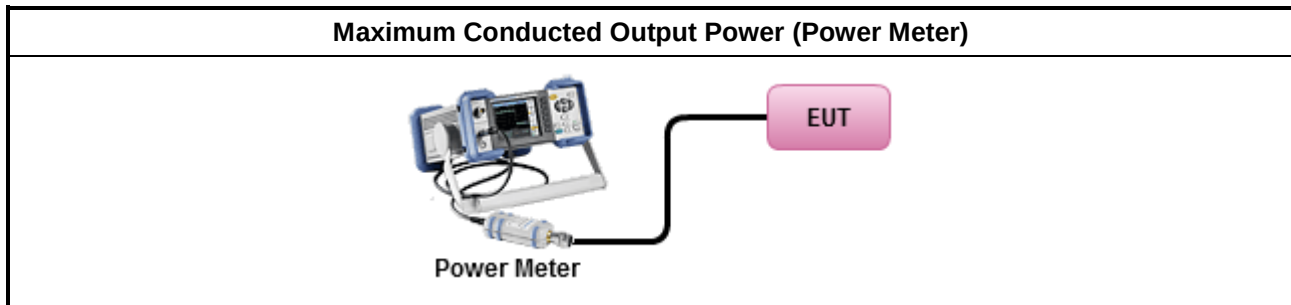
4.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

4.2.3 Test Procedures

Test Method	
Maximum Peak Conducted Output Power	
☐	Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
☒	Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
Maximum Conducted Output Power	
[duty cycle ≥ 98% or external video / power trigger]	
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
duty cycle < 98% and average over on/off periods with duty factor	
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
Measurement using a power meter (PM)	
☒	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
☐	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

4.2.4 Test Setup



4.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

4.3 Power Spectral Density

4.3.1 Power Spectral Density Limit

Power Spectral Density Limit
Power Spectral Density (PSD) ≤ 8 dBm/3kHz

4.3.2 Measuring Instruments

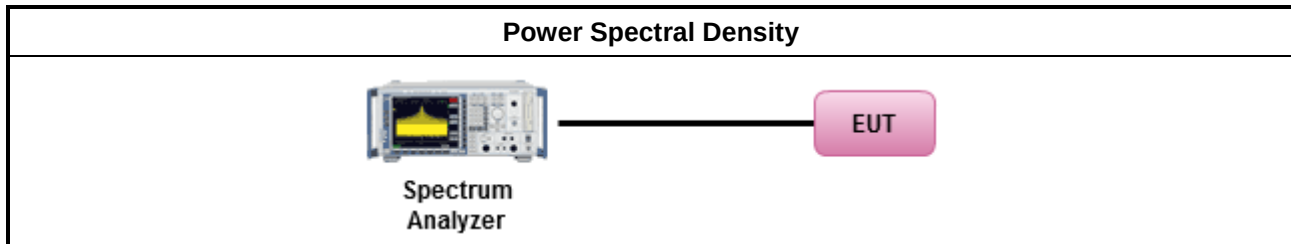
Refer a test equipment and calibration data table in this test report.

4.3.3 Test Procedures

Test Method	
Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).	
☒	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.
[duty cycle $\geq 98\%$ or external video / power trigger]	
☐	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPS-1.
☐	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPS-2.
☐	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPS-3.
duty cycle $< 98\%$ and average over on/off periods with duty factor	
☐	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPS-1A. (alternative).
☐	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPS-2A. (alternative)
☐	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPS-3A. (alternative)
For conducted measurement.	
If The EUT supports multiple transmit chains using options given below:	
☒	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
☐	Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,

- | | |
|--|--|
| | ☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit. |
|--|--|

4.3.4 Test Setup



4.3.5 Test Result of Power Spectral Density

Refer as Appendix D

4.4 Number of Hopping Frequencies and Hopping Bandedge

4.4.1 Number of Hopping Frequencies Limit

Number of Hopping Frequencies Limit	
▪ 920-925 MHz Band:	
	▪ ChS $\geq$ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 250 kHz.
	▪ ChS $\geq$ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth $>$ 250 kHz.
▪ 2400-2483.5 MHz Band:	
	▪ ChS $\geq$ MAX (20 dB bandwidth, 25 kHz).
	▪ ChS $\geq$ MAX (20 dB bandwidth 2/3, 25 kHz).
▪ 5725-5850 MHz Band:	
	▪ ChS $\geq$ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 1 MHz.
ChS : Hopping Channel Separation	

4.4.2 Hopping Bandedge Limit

Refer clause 4.6.1 and clause 4.7.1

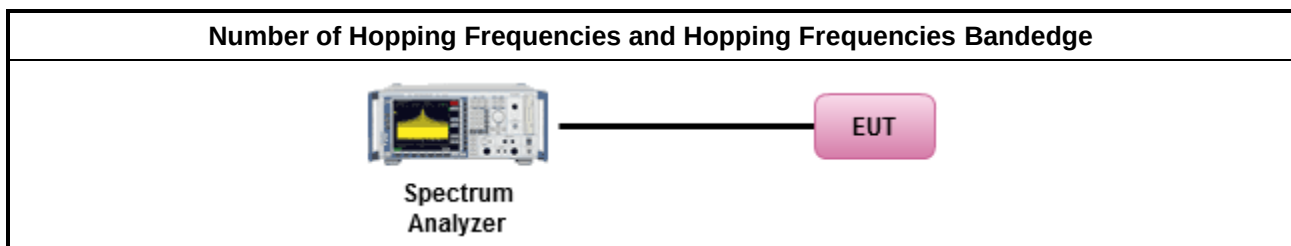
4.4.3 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

4.4.4 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 7.8.3 for number of hopping frequencies measurement.
▪ Refer as ANSI C63.10-2013, clause 7.8.6 for hopping frequencies Bandedge measurement.

4.4.5 Test Setup



4.4.6 Test Result of Number of Hopping Frequencies

Refer as Appendix E

4.4.7 Test Result of Number of Hopping Frequencies Bandedge

Refer as Appendix E

4.5 Time of Occupancy (Dwell Time)

4.5.1 Time of Occupancy (Dwell Time) Limit

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
▪ 920-925 MHz Band:	
▪ 0.4s in N x 0.4 period	
▪ 2400-2483.5 MHz Band:	
▪ 0.4s in N x 0.4 period	
▪ 5725-5850 MHz Band:	
▪ 0.4s in N x 0.4 period	
N: Number of Hopping Frequencies	

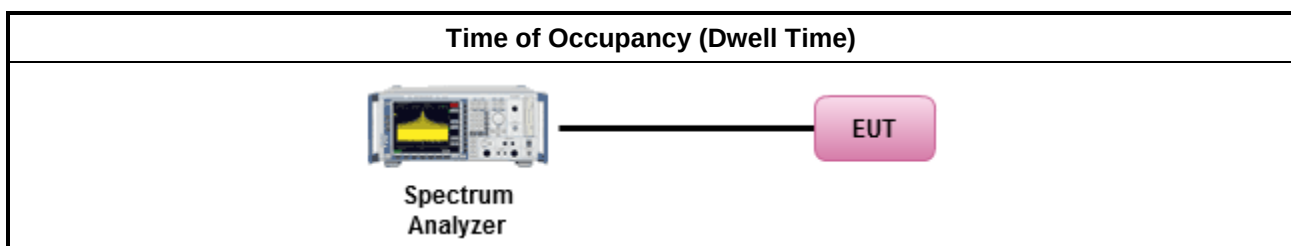
4.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

4.5.3 Test Procedures

Test Method	
▪ Refer as ANSI C63.10-2013, clause 7.8.4 for dwell time measurement.	
▪ Bluetooth ACL packets can be 1, 3, or 5 time slots. Following as dwell time. Operate DH5 at maximum dwell time and maximum duty cycle.	
▪ The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel.	

4.5.4 Test Setup



4.5.5 Test Result of Time of Occupancy (Dwell Time)

Refer as Appendix F

4.6 Emissions in Non-restricted Frequency Bands

4.6.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dBc)
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.	

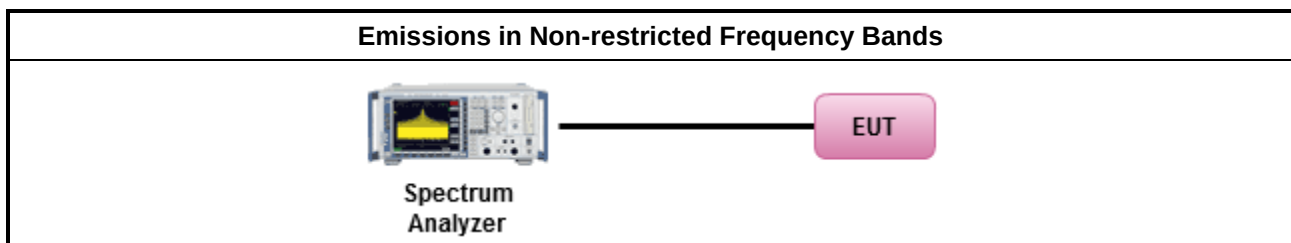
4.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

4.6.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 7.8.8 for unwanted emissions into non-restricted bands.

4.6.4 Test Setup



4.6.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix G

4.7 Emissions in Restricted Frequency Bands

4.7.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

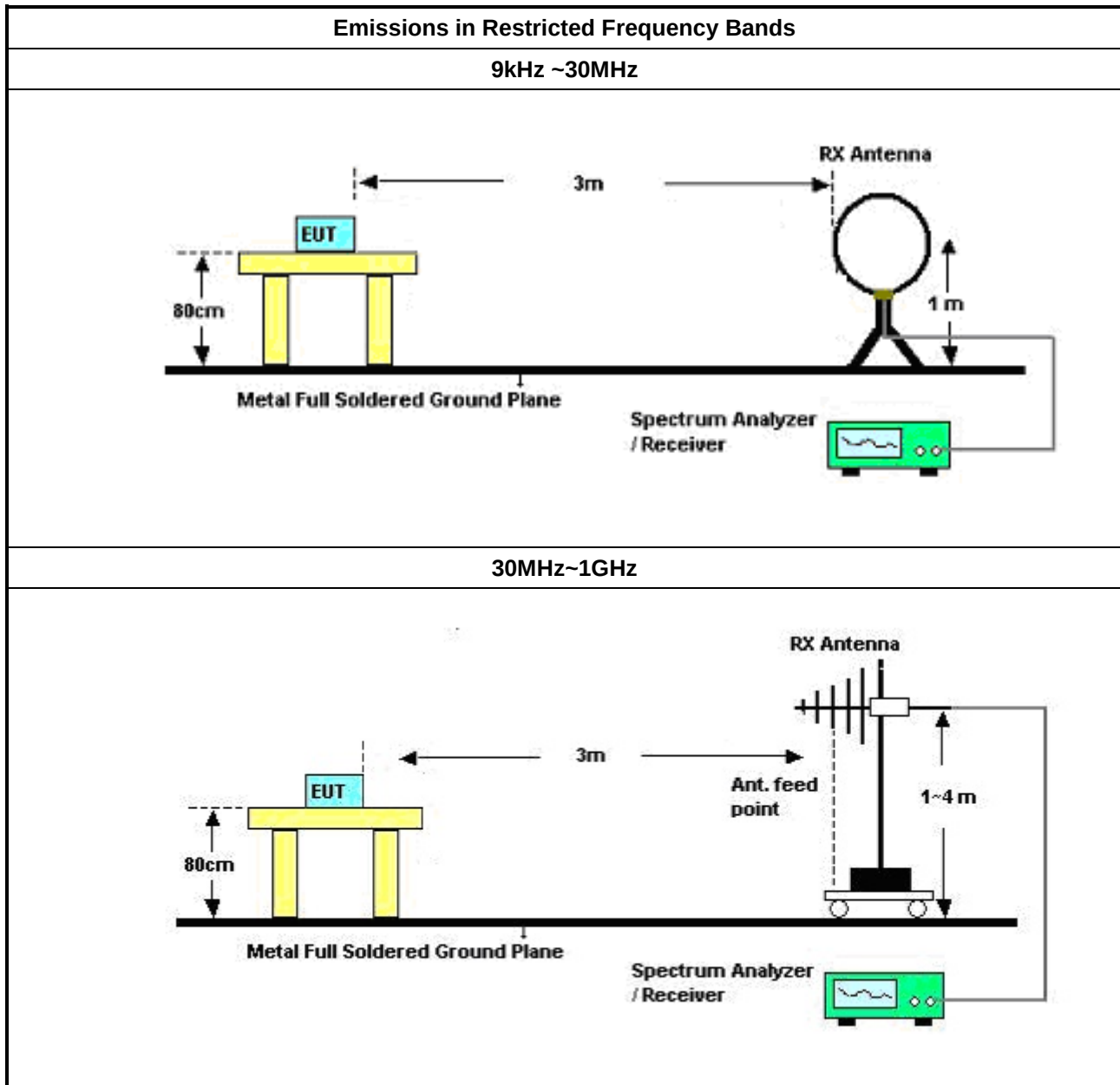
4.7.2 Measuring Instruments

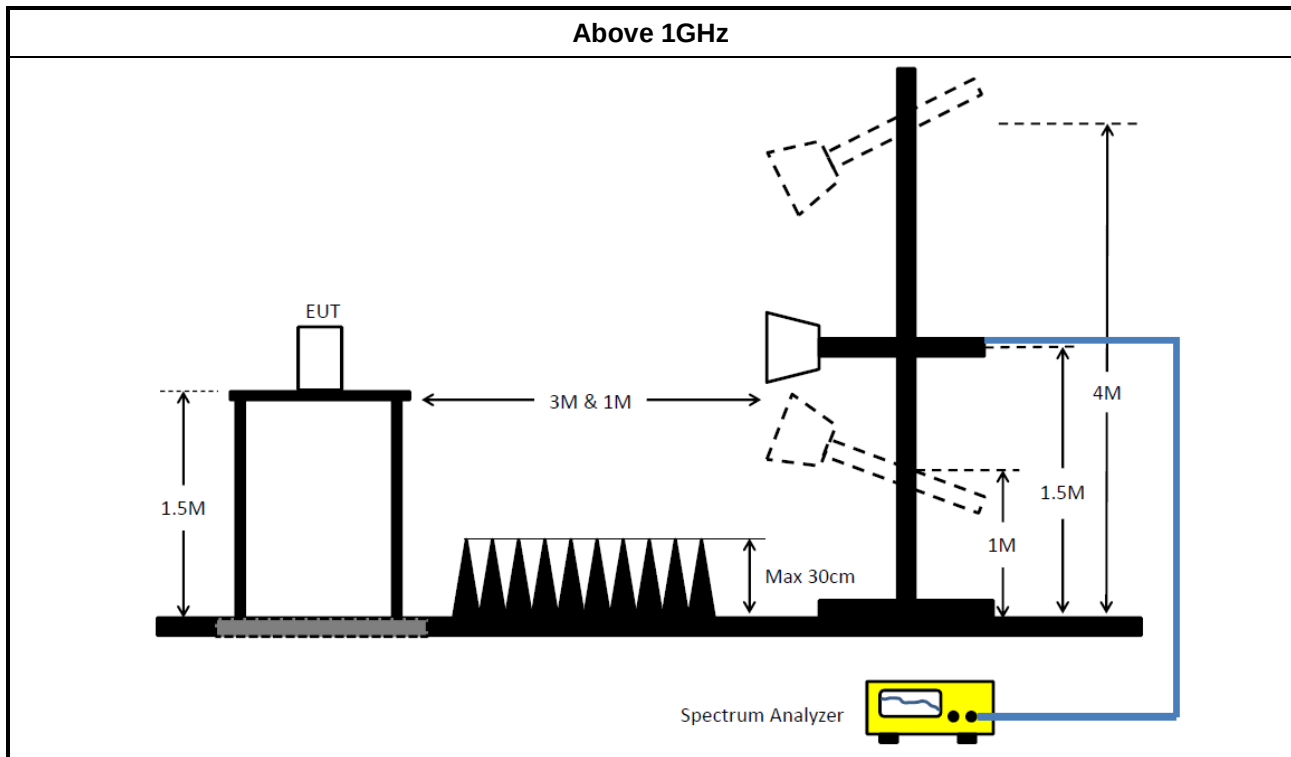
Refer a test equipment and calibration data table in this test report.

4.7.3 Test Procedures

Test Method	
▪ The average emission levels shall be measured in [hopping duty factor].	
▪ Refer as ANSI C63.10; clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
▪ For the transmitter unwanted emissions shall be measured using following options below:	
	▪ Refer as ANSI C63.10, clause 4.1.4.2.1 QP value.
	▪ Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak.
	▪ Refer as ANSI C63.10, clause 4.1.4.2.4 average value of hopping pulsed emissions.

4.7.4 Test Setup





4.7.5 Emissions in Restricted Frequency Bands (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

4.7.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix H

4.8 Receiver Radiated Spurious Emissions

4.8.1 Receiver in Radiated Spurious Emissions Limit

Restricted Spurious Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

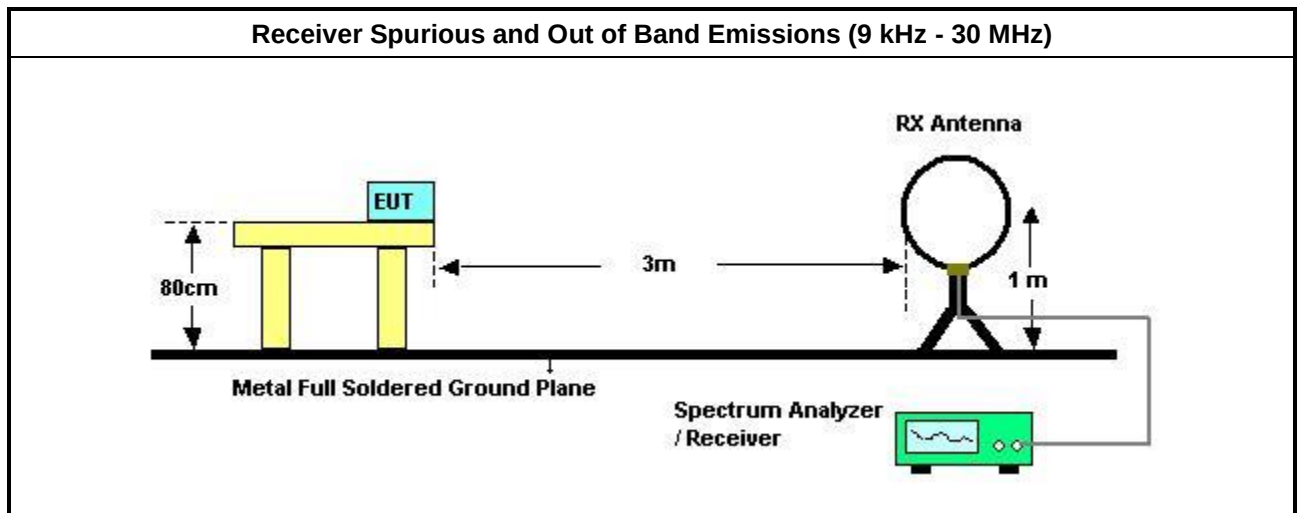
4.8.2 Measuring Instruments

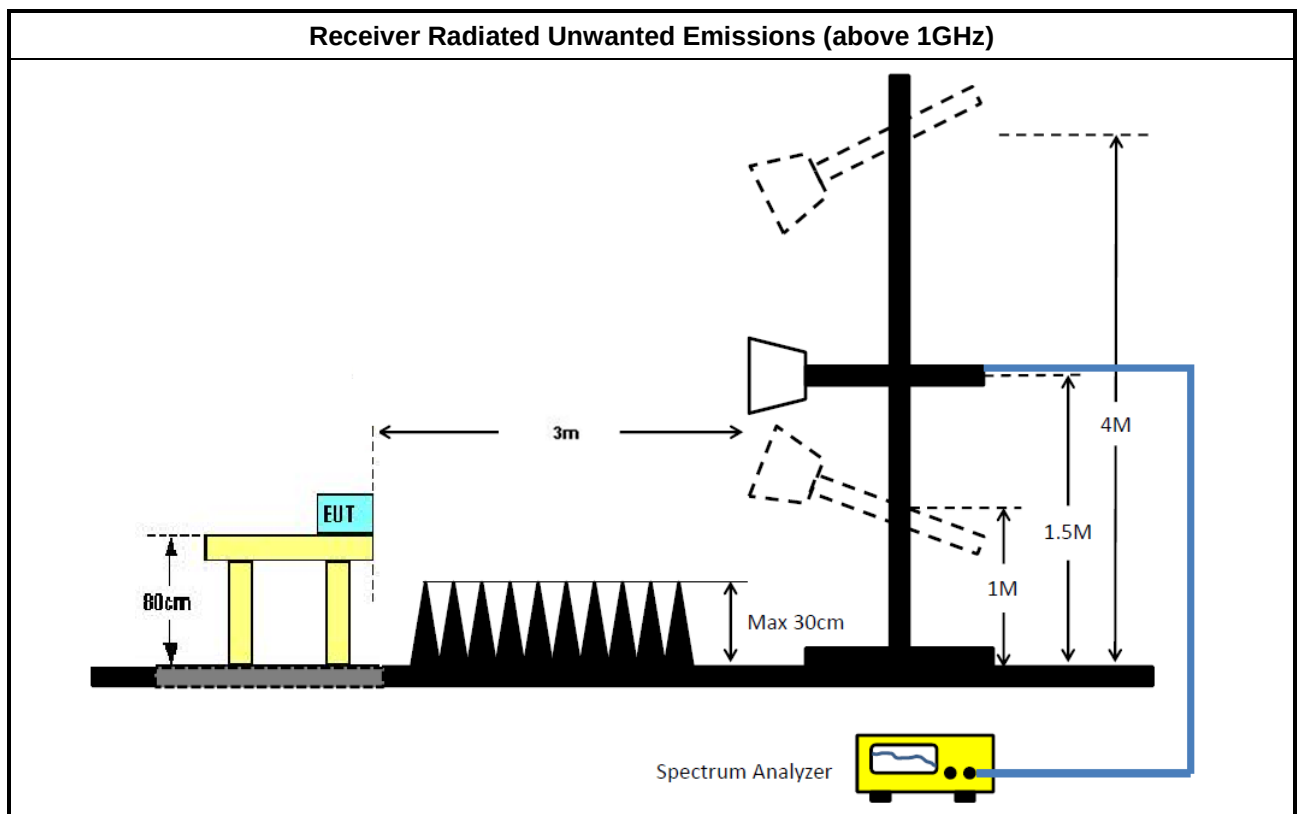
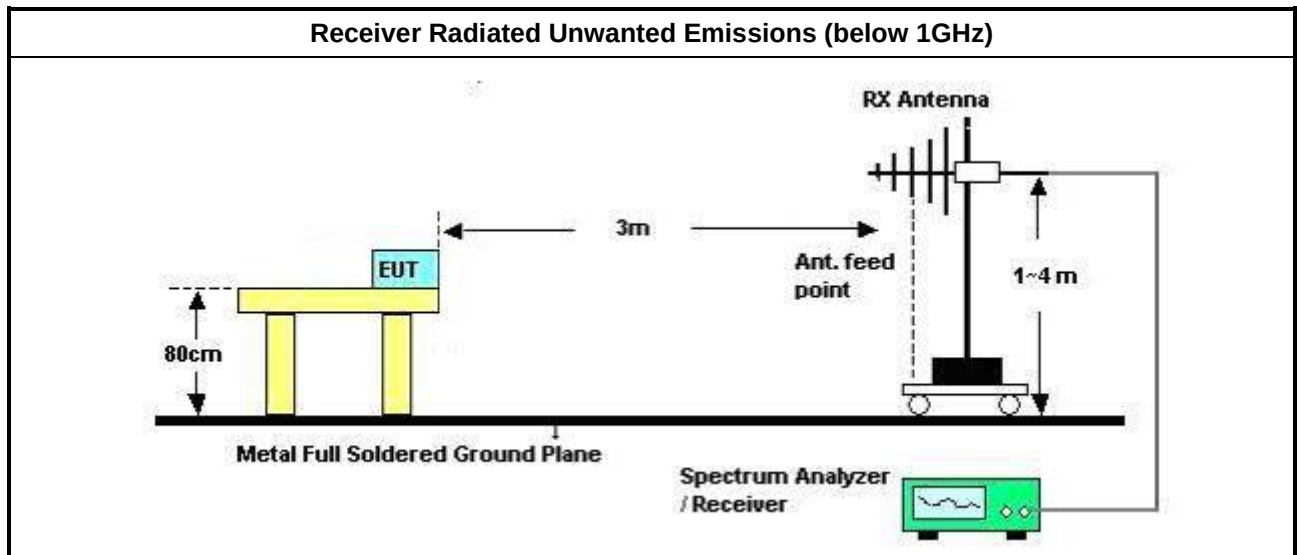
Refer a test equipment and calibration data table in this test report.

4.8.3 Test Procedures

Test Method	
☒	The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
☒	For radiated measurement, refer as ANSI C63.4, clause 8.3.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from 30 MHz-1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the QP-Limit so that the QP level does not need to be reported in addition.
☒	Refer as ANSI C63.4, clause 8.3.1.2 and 8.3.2.2 for radiated emissions from above 1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
☒	All amplitude of spurious emissions that are attenuated by more than 30 dB below the permissible value has no need to be reported.

4.8.4 Test Setup





4.8.5 Receiver Radiated Unwanted Emissions (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

4.8.6 Test Result of Receiver Radiated Unwanted Emissions

Refer as Appendix I

5 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	08/Nov/2018	07/Nov/2019
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Puls e Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101029	10Hz~40GHz	11/Sep/2018	10/Sep/2019
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz~1G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	1G~18G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 01	30MHz~1G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 01	1G~18G	11/Jan/2019	10/Jan/2020
Cable 0.5m	HUBER	MY10714/4	RF Cable - 05	30MHz~1G	11/Jan/2019	10/Jan/2020
Cable 0.5m	HUBER	MY10714/4	RF Cable - 05	1G~18G	11/Jan/2019	10/Jan/2020

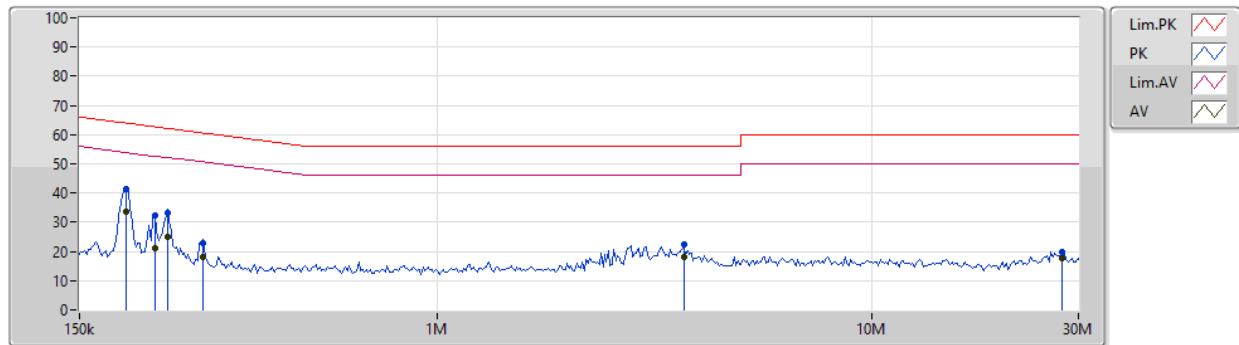
**Instrument for Radiated Test**

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	23/Apr/2018	22/Apr/2019
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	14/Jun/2018	13/Jun/2019
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	10/May/2018	09/May/2019
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	27/Apr/2018	26/Apr/2019
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	10/Apr/2018	09/Apr/2019
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	31/Jul/2018	30/Jul/2019
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30MHz~1GHz	02/Oct/2018	03/Oct/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	30/Apr/2018	29/Apr/2019
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	29/Mar/2018	28/Mar/2019
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	SN 556626/4 + 556627	1GHz ~ 40GHz	14/Mar/2018	13/Mar/2019
LF-CABLE-2019 0218	Jye Bao	RG142	CB028	9kHz ~ 1GHz	18/Feb/2019	17/Feb/2020

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	DC Power supply mode ; TX		

08/03/2019

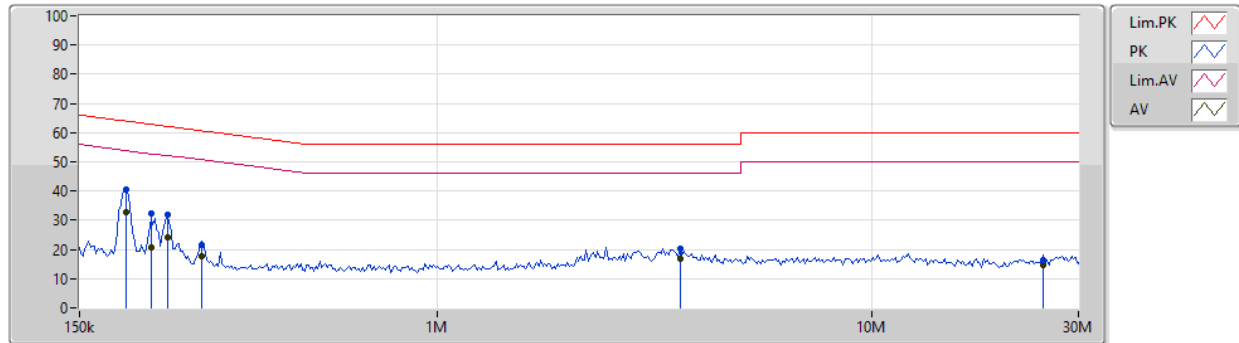


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	192.365k	41.30	63.93	-22.63	19.47	Neutral	-	21.83	9.59	0.01	9.87			
AV	192.365k	33.76	53.93	-20.17	19.47	Neutral	"Worst"	14.29	9.59	0.01	9.87			
QP	223.33k	32.50	62.69	-30.19	19.47	Neutral	-	13.03	9.59	0.01	9.87			
AV	223.33k	21.19	52.69	-31.50	19.47	Neutral	-	1.72	9.59	0.01	9.87			
QP	239.44k	33.14	62.12	-28.98	19.47	Neutral	-	13.67	9.59	0.01	9.87			
AV	239.44k	25.02	52.12	-27.10	19.47	Neutral	-	5.55	9.59	0.01	9.87			
QP	289.269k	22.68	60.55	-37.87	19.48	Neutral	-	3.20	9.59	0.01	9.88			
AV	289.269k	18.07	50.55	-32.48	19.48	Neutral	-	-1.41	9.59	0.01	9.88			
QP	3.695M	22.56	56.00	-33.44	19.54	Neutral	-	3.02	9.61	0.04	9.89			
AV	3.695M	18.24	46.00	-27.76	19.54	Neutral	-	-1.30	9.61	0.04	9.89			
QP	27.573M	19.94	60.00	-40.06	19.70	Neutral	-	0.24	9.67	0.13	9.90			
AV	27.573M	17.62	50.00	-32.38	19.70	Neutral	-	-2.08	9.67	0.13	9.90			

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	DC Power supply mode ; TX		

08/03/2019

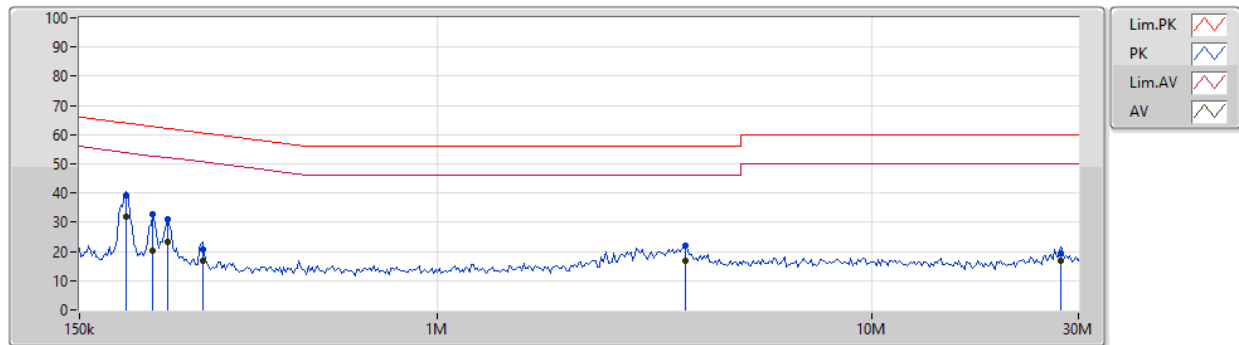


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	192.365k	40.34	63.93	-23.59	19.48	Line	-	20.86	9.60	0.01	9.87			
AV	192.365k	32.89	53.93	-21.04	19.48	Line	"Worst"	13.41	9.60	0.01	9.87			
QP	218.929k	32.51	62.86	-30.35	19.48	Line	-	13.03	9.60	0.01	9.87			
AV	218.929k	20.55	52.86	-32.31	19.48	Line	-	1.07	9.60	0.01	9.87			
QP	239.44k	31.81	62.12	-30.31	19.48	Line	-	12.33	9.60	0.01	9.87			
AV	239.44k	24.11	52.12	-28.01	19.48	Line	-	4.63	9.60	0.01	9.87			
QP	286.405k	21.73	60.63	-38.90	19.48	Line	-	2.25	9.59	0.01	9.88			
AV	286.405k	17.76	50.63	-32.87	19.48	Line	-	-1.72	9.59	0.01	9.88			
QP	3.622M	20.05	56.00	-35.95	19.56	Line	-	0.49	9.63	0.04	9.89			
AV	3.622M	16.77	46.00	-29.23	19.56	Line	-	-2.79	9.63	0.04	9.89			
QP	24.962M	16.44	60.00	-43.56	19.59	Line	-	-3.15	9.57	0.12	9.90			
AV	24.962M	14.50	50.00	-35.50	19.59	Line	-	-5.09	9.57	0.12	9.90			

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	DC Power supply mode ; RX		

08/03/2019

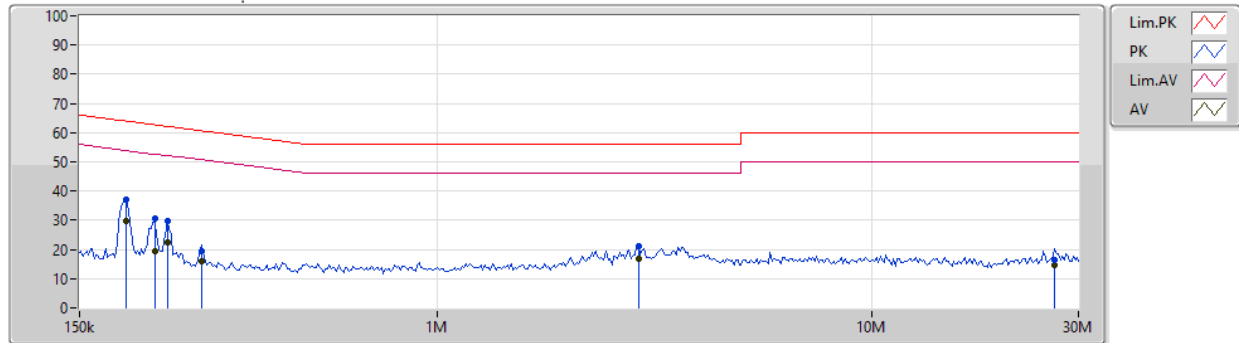


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	192.365k	39.38	63.93	-24.55	19.47	Neutral	-	19.91	9.59	0.01	9.87
AV	192.365k	32.06	53.93	-21.87	19.47	Neutral	"Worst"	12.59	9.59	0.01	9.87
QP	221.118k	32.56	62.77	-30.21	19.47	Neutral	-	13.09	9.59	0.01	9.87
AV	221.118k	20.28	52.77	-32.49	19.47	Neutral	-	0.81	9.59	0.01	9.87
QP	239.44k	31.01	62.12	-31.11	19.47	Neutral	-	11.54	9.59	0.01	9.87
AV	239.44k	23.45	52.12	-28.67	19.47	Neutral	-	3.98	9.59	0.01	9.87
QP	289.269k	20.63	60.55	-39.92	19.48	Neutral	-	1.15	9.59	0.01	9.88
AV	289.269k	16.62	50.55	-33.93	19.48	Neutral	-	-2.86	9.59	0.01	9.88
QP	3.732M	21.83	56.00	-34.17	19.54	Neutral	-	2.29	9.61	0.04	9.89
AV	3.732M	16.94	46.00	-29.06	19.54	Neutral	-	-2.60	9.61	0.04	9.89
QP	27.3M	19.47	60.00	-40.53	19.69	Neutral	-	-0.22	9.67	0.12	9.90
AV	27.3M	16.96	50.00	-33.04	19.69	Neutral	-	-2.73	9.67	0.12	9.90

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	DC Power supply mode ; RX		

08/03/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	192.365k	37.19	63.93	-26.74	19.48	Line	-	17.71	9.60	0.01	9.87			
AV	192.365k	29.83	53.93	-24.10	19.48	Line	"Worst"	10.35	9.60	0.01	9.87			
QP	223.33k	30.53	62.69	-32.16	19.48	Line	-	11.05	9.60	0.01	9.87			
AV	223.33k	19.50	52.69	-33.19	19.48	Line	-	0.02	9.60	0.01	9.87			
QP	239.44k	29.70	62.12	-32.42	19.48	Line	-	10.22	9.60	0.01	9.87			
AV	239.44k	22.41	52.12	-29.71	19.48	Line	-	2.93	9.60	0.01	9.87			
QP	286.405k	19.33	60.63	-41.30	19.48	Line	-	-0.15	9.59	0.01	9.88			
AV	286.405k	15.95	50.63	-34.68	19.48	Line	-	-3.53	9.59	0.01	9.88			
QP	2.91M	21.10	56.00	-34.90	19.56	Line	-	1.54	9.63	0.04	9.89			
AV	2.91M	16.81	46.00	-29.19	19.56	Line	-	-2.75	9.63	0.04	9.89			
QP	26.498M	16.31	60.00	-43.69	19.59	Line	-	-3.28	9.57	0.12	9.90			
AV	26.498M	14.51	50.00	-35.49	19.59	Line	-	-5.08	9.57	0.12	9.90			

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
902-928MHz	-	-	-	-	-
LoRa (125kHz)	138.125k	125.25k	125KF1D	135k	124.313k
LoRa (250kHz)	291.25k	256.747k	257KF1D	275.625k	256.434k
LoRa (500kHz)	674.375k	589.08k	589KF1D	673.125k	584.083k

Max-N dB = Maximum 20dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 20dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

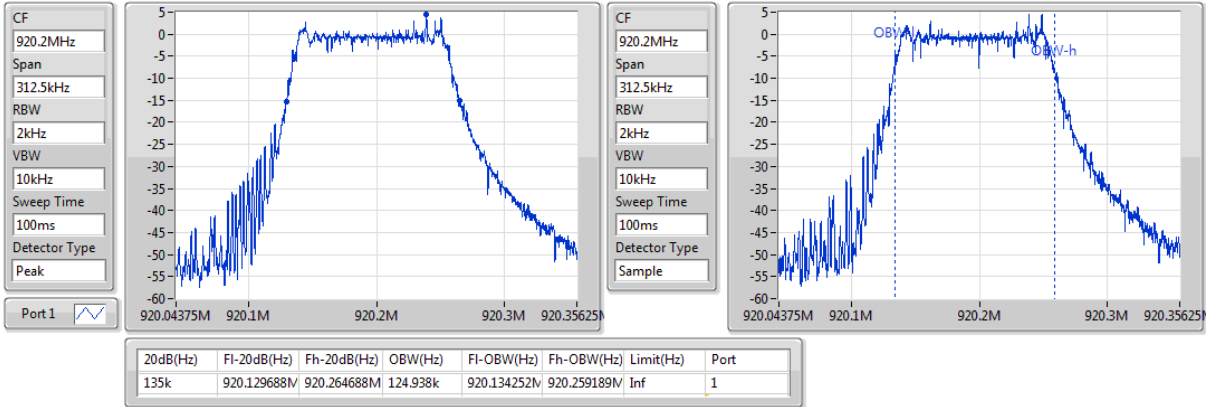
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
LoRa (125kHz)	-	-	-	-
920.2MHz	Pass	Inf	135k	124.938k
922.4MHz	Pass	Inf	138.125k	124.313k
924.8MHz	Pass	Inf	137.344k	125.25k
LoRa (250kHz)	-	-	-	-
920.5MHz	Pass	Inf	275.625k	256.434k
922.5MHz	Pass	Inf	288.125k	256.747k
924.5MHz	Pass	Inf	291.25k	256.434k
LoRa (500kHz)	-	-	-	-
920.6MHz	Pass	Inf	673.75k	584.083k
922.4MHz	Pass	Inf	674.375k	585.957k
924.2MHz	Pass	Inf	673.125k	589.08k

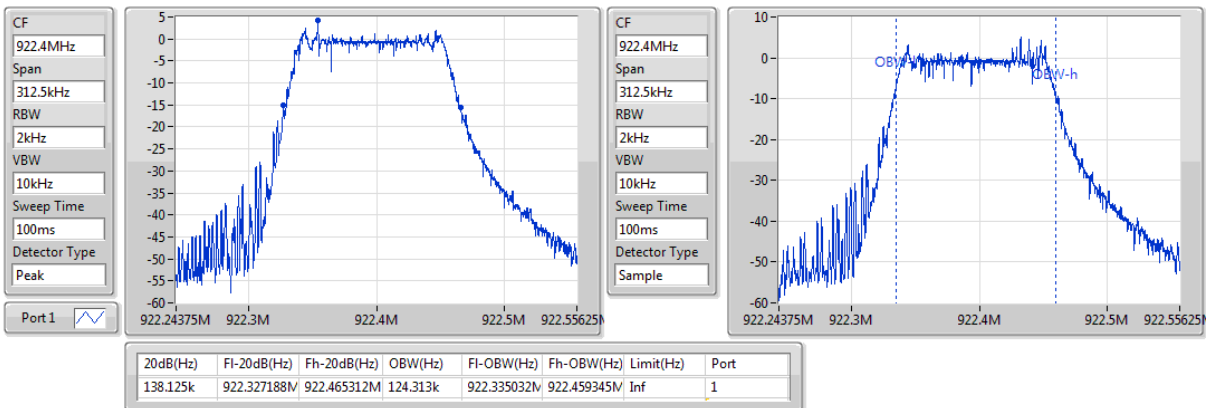
Port X-N dB = Port X 20dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

LoRa (125kHz)
920.2MHz
EBW

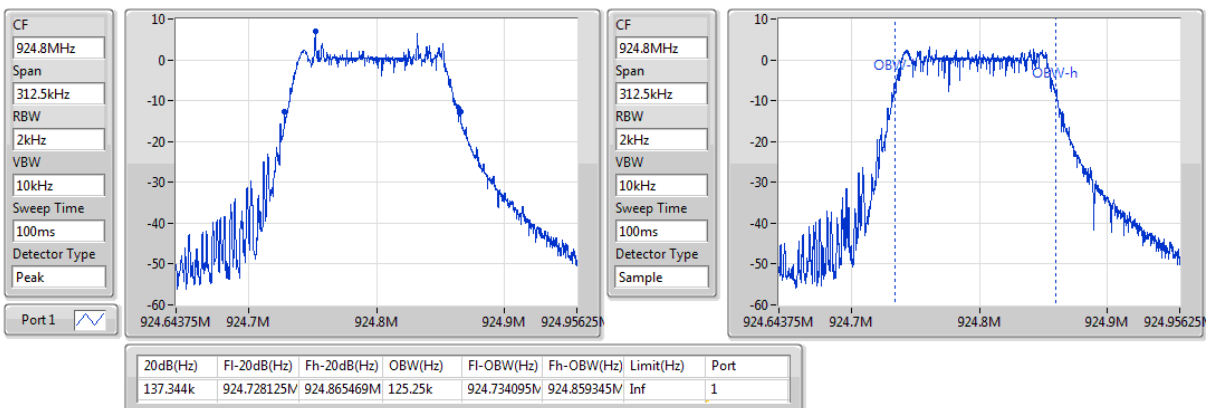
04/03/2019


LoRa (125kHz)
922.4MHz
EBW

04/03/2019

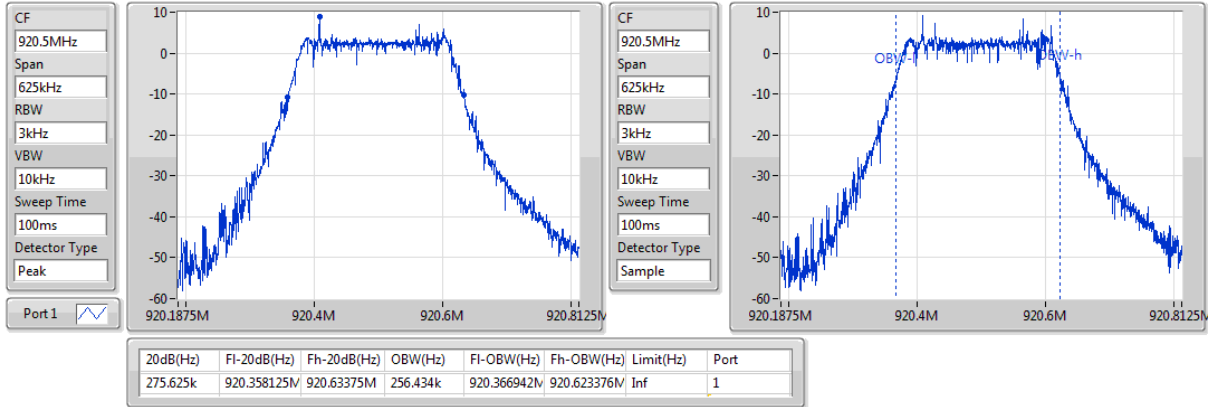

LoRa (125kHz)
924.8MHz
EBW

04/03/2019

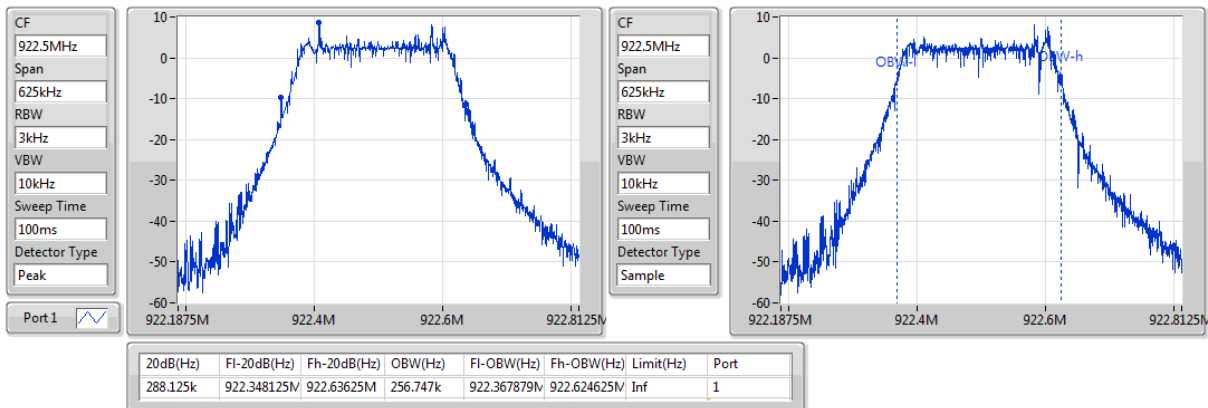


LoRa (250kHz)
EBW
920.5MHz

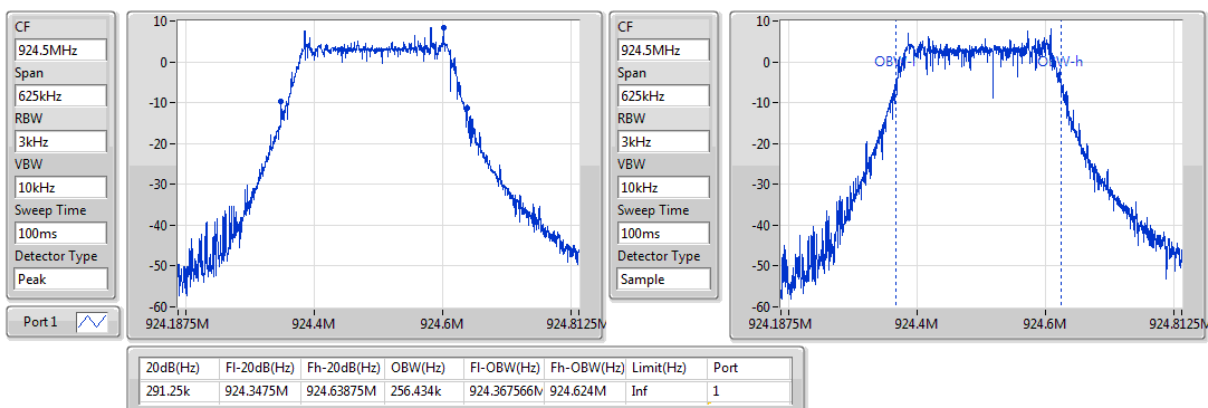
04/03/2019


LoRa (250kHz)
EBW
922.5MHz

04/03/2019


LoRa (250kHz)
EBW
924.5MHz

04/03/2019

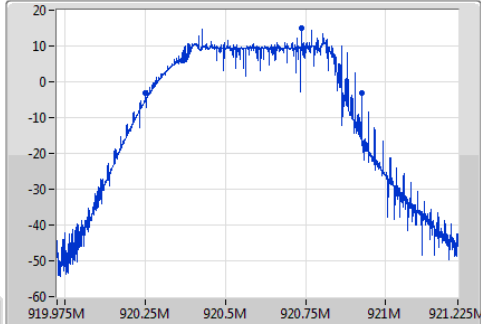


LoRa (500kHz)
920.6MHz

04/03/2019

CF
920.6MHz
Span
1.25MHz
RBW
10kHz
VBW
30kHz
Sweep Time
100ms
Detector Type
Peak

Port 1

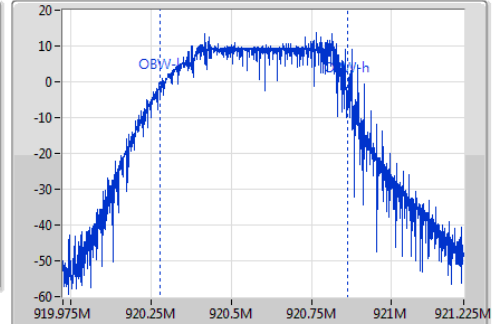


20dB(Hz)	Fl-20dB(Hz)	Fh-20dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
673.75k	920.25125M	920.925M	584.083k	920.277661M	920.861744M	Inf	1

EBW

CF
920.6MHz
Span
1.25MHz
RBW
10kHz
VBW
30kHz
Sweep Time
100ms
Detector Type
Sample

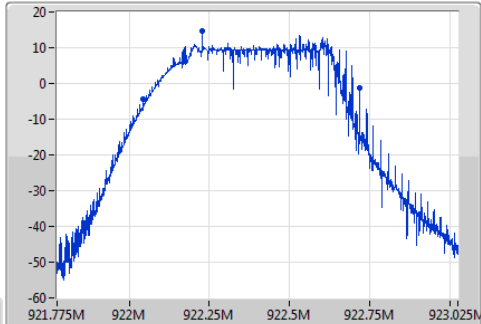
Port 1


LoRa (500kHz)
922.4MHz

04/03/2019

CF
922.4MHz
Span
1.25MHz
RBW
10kHz
VBW
30kHz
Sweep Time
100ms
Detector Type
Peak

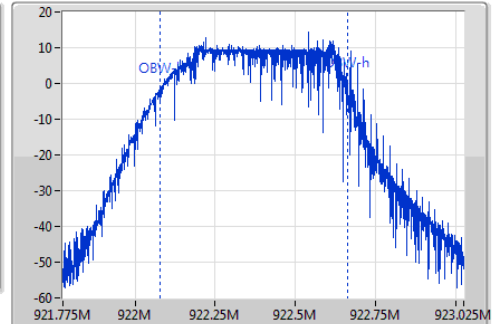
Port 1



20dB(Hz)	Fl-20dB(Hz)	Fh-20dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
674.375k	922.04375M	922.718125M	585.957k	922.077036M	922.662994M	Inf	1

CF
922.4MHz
Span
1.25MHz
RBW
10kHz
VBW
30kHz
Sweep Time
100ms
Detector Type
Sample

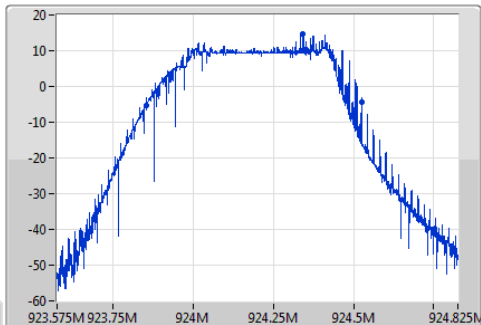
Port 1


LoRa (500kHz)
924.2MHz

04/03/2019

CF
924.2MHz
Span
1.25MHz
RBW
10kHz
VBW
30kHz
Sweep Time
100ms
Detector Type
Peak

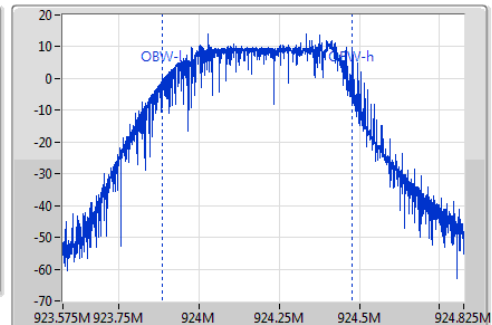
Port 1



20dB(Hz)	Fl-20dB(Hz)	Fh-20dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
673.125k	923.851875M	924.525M	589.08k	923.886407M	924.475487M	Inf	1

CF
924.2MHz
Span
1.25MHz
RBW
10kHz
VBW
30kHz
Sweep Time
100ms
Detector Type
Sample

Port 1



Summary

Mode	Max-Space (Hz)	Min-Space (Hz)
902-928MHz	-	-
LoRa (125kHz)	250.2k	191.4k
LoRa (250kHz)	420k	397.8k
LoRa (500kHz)	612.9k	602.1k

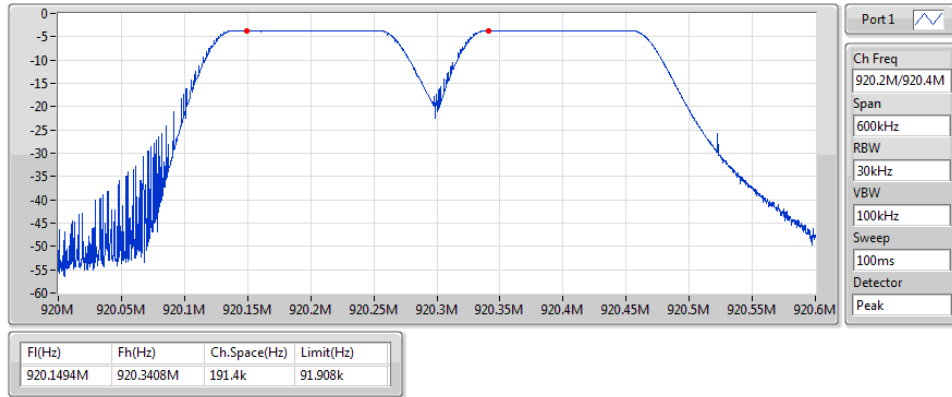
Result

Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
LoRa (125kHz)	-	-	-	-	-
920.2MHz	Pass	920.1494M	920.3408M	191.4k	91.908k
922.4MHz	Pass	922.3437M	922.5939M	250.2k	94.572k
924.8MHz	Pass	924.5377M	924.7489M	211.2k	94.239k
LoRa (250kHz)	-	-	-	-	-
920.5MHz	Pass	920.5956M	920.9964M	400.8k	186.48k
922.5MHz	Pass	922.604M	923.0018M	397.8k	197.136k
924.5MHz	Pass	924.18M	924.6M	420k	181.818k
LoRa (500kHz)	-	-	-	-	-
920.6MHz	Pass	920.8091M	921.4121M	603k	452.0475k
922.4MHz	Pass	922.6091M	923.2112M	602.1k	453.0465k
924.2MHz	Pass	923.7947M	924.4076M	612.9k	447.552k

LoRa (125kHz)

Channel Separation

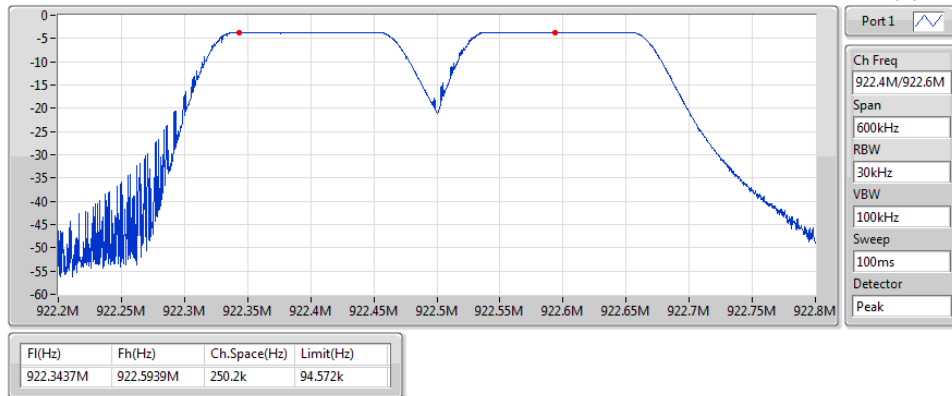
920.2M/920.4MHz



LoRa (125kHz)

Channel Separation

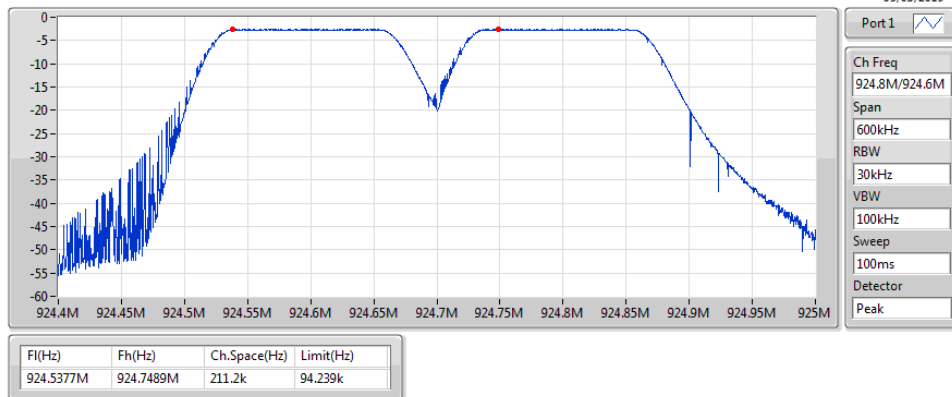
922.4M/922.6MHz



LoRa (125kHz)

Channel Separation

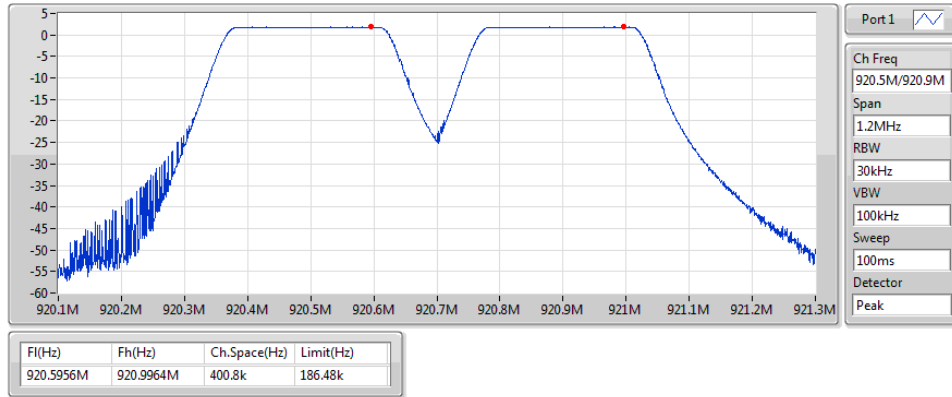
924.8M/924.6MHz



LoRa (250kHz)

Channel Separation

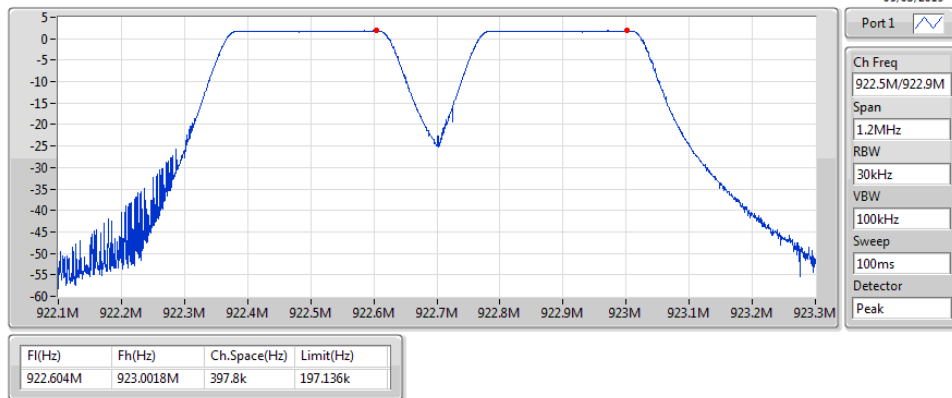
920.5M/920.9MHz



LoRa (250kHz)

Channel Separation

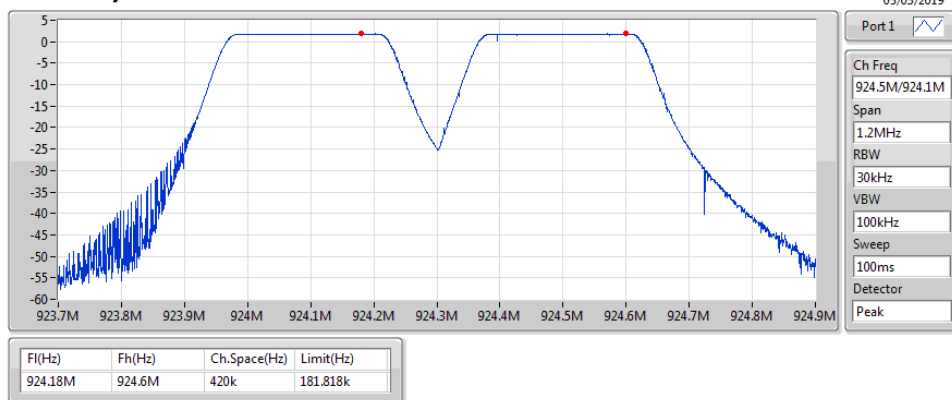
922.5M/922.9MHz



LoRa (250kHz)

Channel Separation

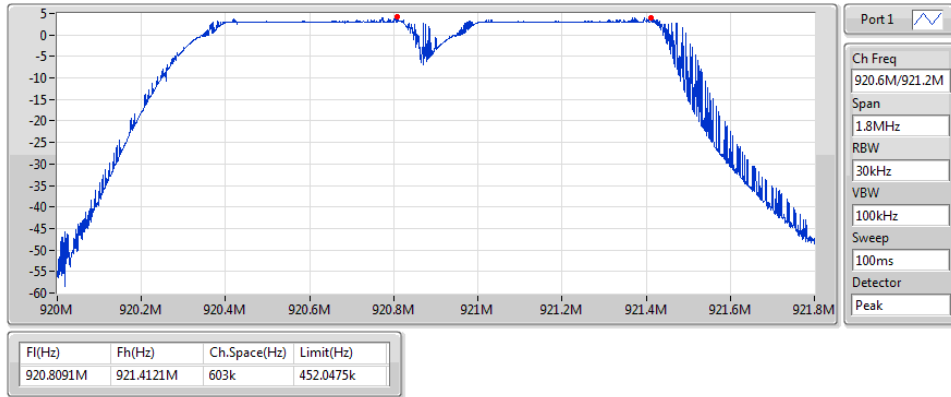
924.5M/924.1MHz



LoRa (500kHz)

Channel Separation

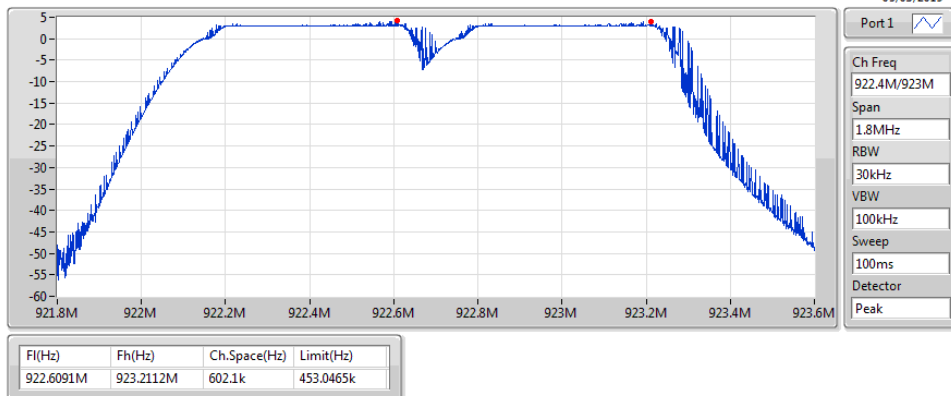
920.6M/921.2MHz



LoRa (500kHz)

Channel Separation

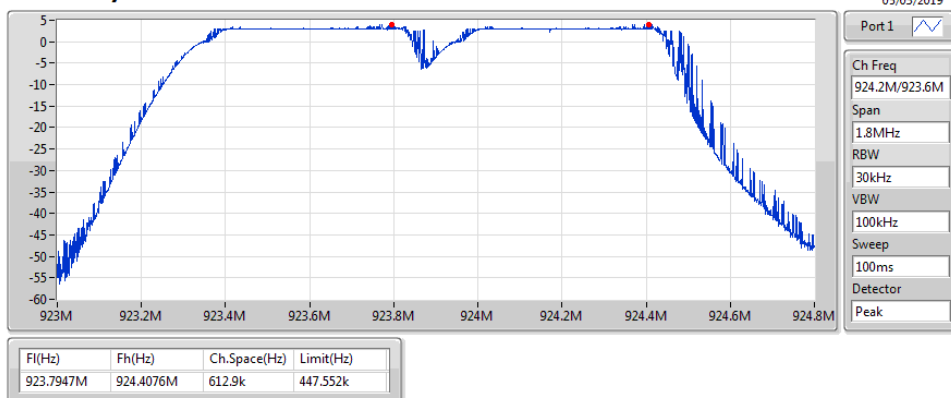
922.4M/923MHz



LoRa (500kHz)

Channel Separation

924.2M/923.6MHz



Summary

Mode	Power (dBm)	Power (W)
902-928MHz	-	-
LoRa (125kHz)	11.53	0.01422
LoRa (250kHz)	16.75	0.04732
LoRa (500kHz)	18.53	0.07129

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
LoRa (125kHz)	-	-	-	-
920.2MHz	Pass	3.01	10.55	30.00
922.4MHz	Pass	3.01	10.51	30.00
924.8MHz	Pass	3.01	11.53	30.00
LoRa (250kHz)	-	-	-	-
920.5MHz	Pass	3.01	16.06	30.00
922.5MHz	Pass	3.01	16.02	30.00
924.5MHz	Pass	3.01	16.75	30.00
LoRa (500kHz)	-	-	-	-
920.6MHz	Pass	3.01	18.53	30.00
922.4MHz	Pass	3.01	18.53	30.00
924.2MHz	Pass	3.01	18.51	30.00

Summary

Mode	Power	Power
	(dBm)	(W)
902-928MHz	-	-
LoRa (125kHz)	11.43	0.01390
LoRa (250kHz)	16.71	0.04688
LoRa (500kHz)	18.51	0.07096

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
LoRa (125kHz)	-	-	-	-
920.2MHz	Pass	3.01	10.42	30.00
922.4MHz	Pass	3.01	10.38	30.00
924.8MHz	Pass	3.01	11.43	30.00
LoRa (250kHz)	-	-	-	-
920.5MHz	Pass	3.01	16.01	30.00
922.5MHz	Pass	3.01	15.98	30.00
924.5MHz	Pass	3.01	16.71	30.00
LoRa (500kHz)	-	-	-	-
920.6MHz	Pass	3.01	18.51	30.00
922.4MHz	Pass	3.01	18.49	30.00
924.2MHz	Pass	3.01	18.48	30.00

Summary

Mode	PD (dBm/RBW)
902-928MHz	-
LoRa (125kHz)	7.13
LoRa (250kHz)	7.92
LoRa (500kHz)	6.01

RBW=3kHz.

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
LoRa (125kHz)	-	-	-	-
920.2MHz	Pass	3.01	7.12	8.00
922.4MHz	Pass	3.01	6.37	8.00
924.8MHz	Pass	3.01	7.13	8.00
LoRa (250kHz)	-	-	-	-
920.5MHz	Pass	3.01	7.44	8.00
922.5MHz	Pass	3.01	7.92	8.00
924.5MHz	Pass	3.01	7.72	8.00
LoRa (500kHz)	-	-	-	-
920.6MHz	Pass	3.01	5.77	8.00
922.4MHz	Pass	3.01	6.01	8.00
924.2MHz	Pass	3.01	5.57	8.00

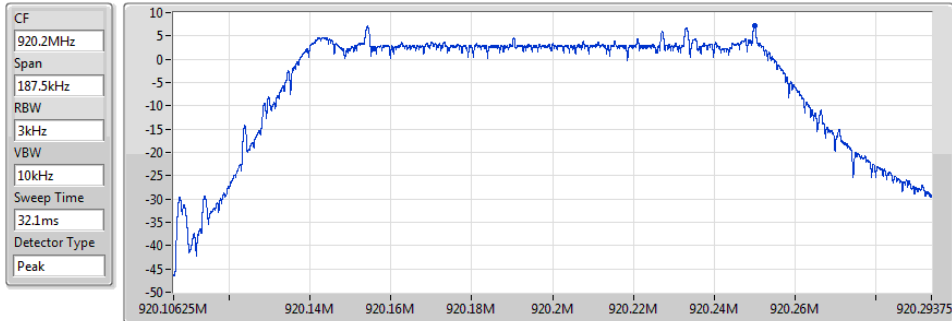
RBW=3kHz.

LoRa (125kHz)

PSD

920.2MHz

04/03/2019



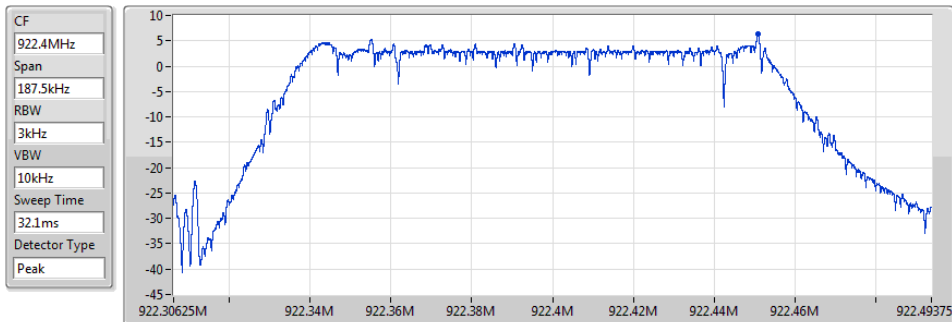
Sum	PD	Port 1
(dBm/100Hz)	(dBm/100Hz)	(dBm/100Hz)
7.12	7.12	7.12

LoRa (125kHz)

PSD

922.4MHz

04/03/2019



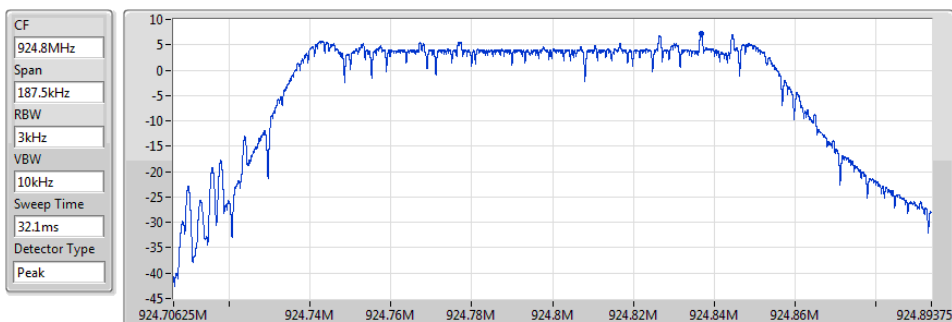
Sum	PD	Port 1
(dBm/100Hz)	(dBm/100Hz)	(dBm/100Hz)
6.37	6.37	6.37

LoRa (125kHz)

PSD

924.8MHz

04/03/2019



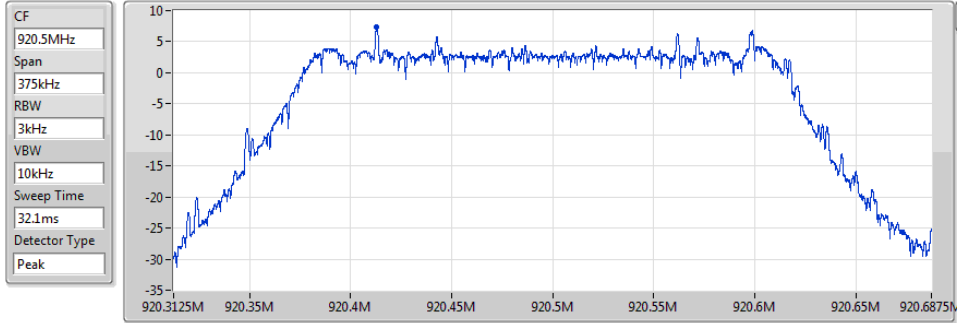
Sum	PD	Port 1
(dBm/100Hz)	(dBm/100Hz)	(dBm/100Hz)
7.13	7.13	7.13

LoRa (250kHz)

PSD

920.5MHz

04/03/2019



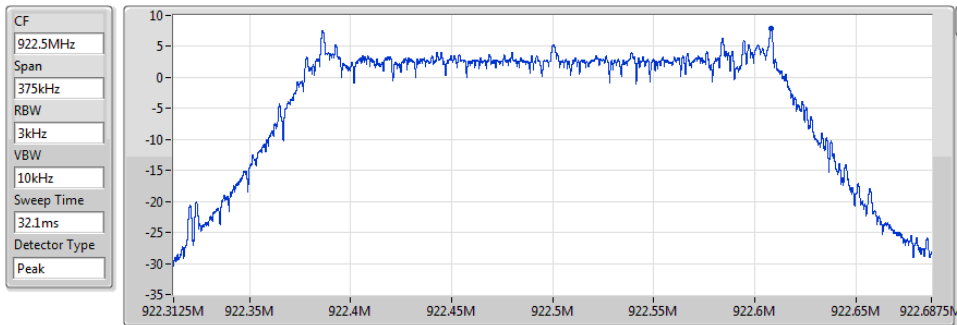
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
7.44	7.44	7.44

LoRa (250kHz)

PSD

922.5MHz

04/03/2019



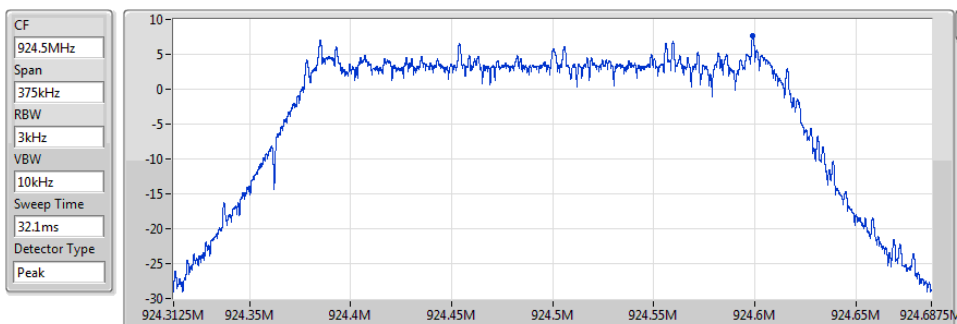
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
7.92	7.92	7.92

LoRa (250kHz)

PSD

924.5MHz

04/03/2019



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
7.72	7.72	7.72

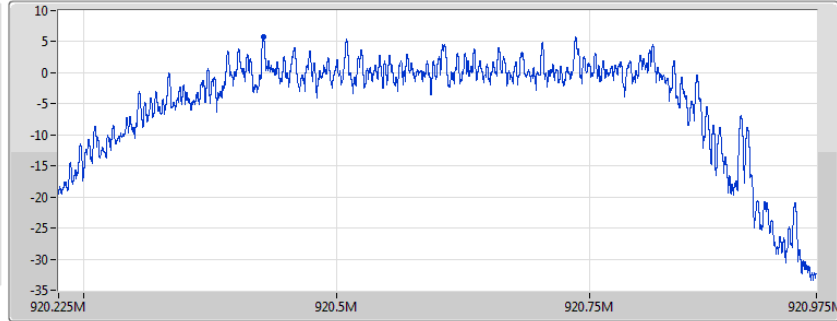
LoRa (500kHz)

PSD

920.6MHz

04/03/2019

CF
920.6MHz
Span
750kHz
RBW
3kHz
VBW
10kHz
Sweep Time
32.1ms
Detector Type
Peak



Port 1

Sum (dBm/RBW)	PD (dBm/RBW)	Port 1 (dBm/RBW)
5.77	5.77	5.77

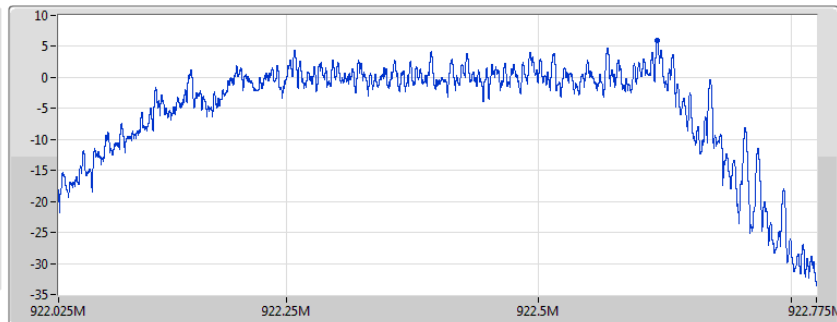
LoRa (500kHz)

PSD

922.4MHz

04/03/2019

CF
922.4MHz
Span
750kHz
RBW
3kHz
VBW
10kHz
Sweep Time
32.1ms
Detector Type
Peak



Port 1

Sum (dBm/RBW)	PD (dBm/RBW)	Port 1 (dBm/RBW)
6.01	6.01	6.01

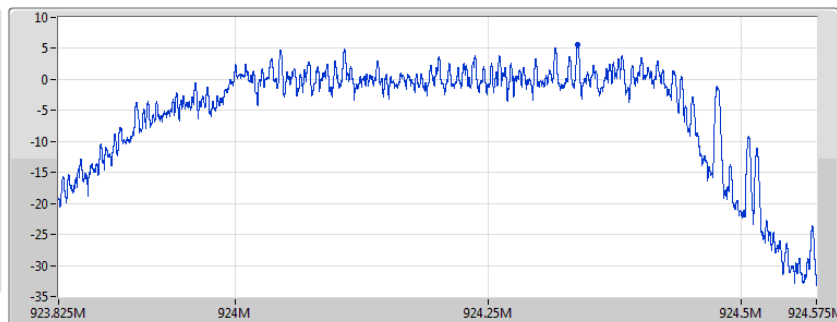
LoRa (500kHz)

PSD

924.2MHz

04/03/2019

CF
924.2MHz
Span
750kHz
RBW
3kHz
VBW
10kHz
Sweep Time
32.1ms
Detector Type
Peak



Port 1

Sum (dBm/RBW)	PD (dBm/RBW)	Port 1 (dBm/RBW)
5.57	5.57	5.57

Summary

Mode	Max-Hop No
922-928MHz	-
LoRa (125kHz)	24
LoRa (250kHz)	11
LoRa (500kHz)	7

Result

Mode	Result	Hopping No	Limit
LoRa (125kHz)	-	-	-
922.4MHz	Pass	24	Inf
LoRa (250kHz)	-	-	-
922.5MHz	Pass	11	Inf
LoRa (500kHz)	-	-	-
922.4MHz	Pass	7	Inf

Summary

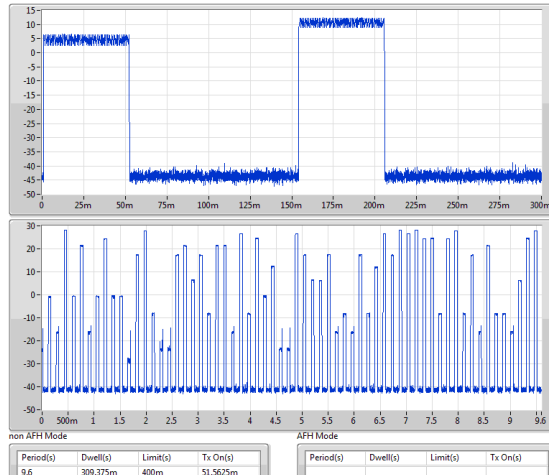
Mode	Max-Dwell (s)
922-928MHz	-
LoRa (125kHz)	309.375m
LoRa (250kHz)	154.8m
LoRa (500kHz)	129.25m

Result

Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (s)
LoRa (125kHz)	-	-	-	-	-
922.4MHz	Pass	9.6	309.375m	400m	51.5625m
LoRa (250kHz)	-	-	-	-	-
922.5MHz	Pass	4.4	154.8m	400m	25.8m
LoRa (500kHz)	-	-	-	-	-
922.4MHz	Pass	2.8	129.25m	400m	12.925m

LoRa (125kHz)

922.4MHz



Dwell

11/03/2019

Port1

Ch Freq
922.4MHz

RBW
1MHz

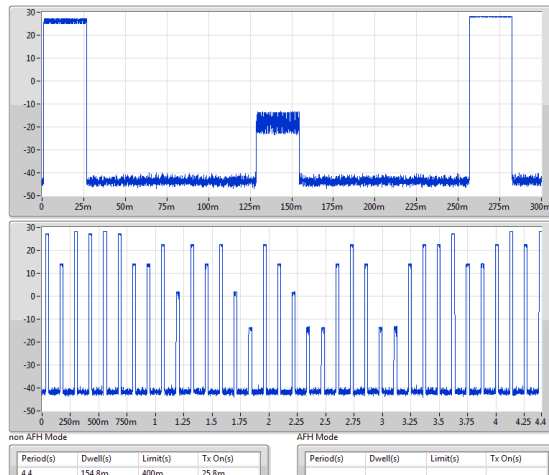
VBW
3MHz

Sweep Time
300ms

TX Time
51.5675ms

LoRa (250kHz)

922.5MHz



Dwell

11/03/2019

Port1

Ch Freq
922.5MHz

RBW
1MHz

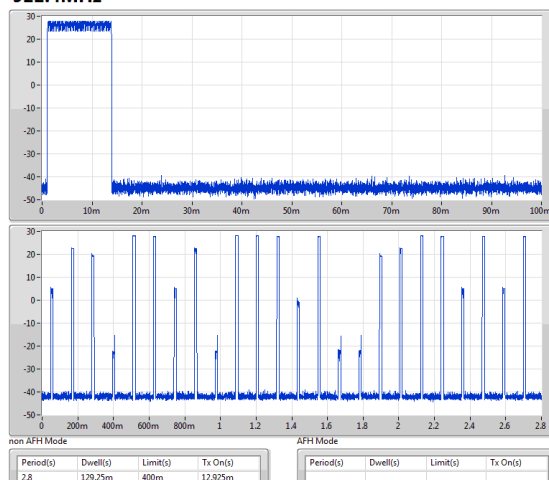
VBW
3MHz

Sweep Time
300ms

TX Time
25.8ms

LoRa (500kHz)

922.4MHz



Dwell

11/03/2019

Port1

Ch Freq
922.4MHz

RBW
1MHz

VBW
3MHz

Sweep Time
100ms

TX Time
12.925ms

Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
902-928MHz	-	-	-	-	-	-	-	-	-	-	-	-	-
LoRa (125kHz)	Pass	920.2M	9.79	-10.21	837.35M	-46.68	901.8M	-45.32	928.06M	-45.49	9.96371G	-37.06	1
LoRa (250kHz)	Pass	920.42M	15.41	-4.59	792.34M	-45.85	901.65M	-45.64	928.05M	-45.73	7.07444G	-36.76	1
LoRa (500kHz)	Pass	920.69M	17.89	-2.11	812.05M	-46.39	901.97M	-45.64	928.67M	-45.40	9.93197G	-36.65	1

Result

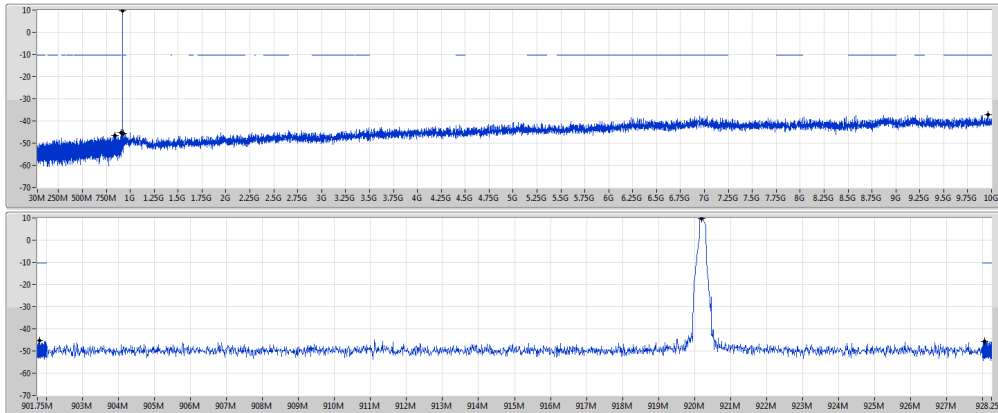
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
LoRa (125kHz)	-	-	-	-	-	-	-	-	-	-	-	-	-
920.2MHz	Pass	920.2M	9.79	-10.21	837.35M	-46.68	901.8M	-45.32	928.06M	-45.49	9.96371G	-37.06	1
922.4MHz	Pass	922.4M	9.77	-10.23	881.48M	-46.18	901.86M	-45.81	928.04M	-45.79	9.93763G	-37.17	1
924.8MHz	Pass	924.79M	10.80	-9.20	734.59M	-46.24	901.91M	-45.96	928.22M	-45.40	6.86571G	-36.72	1
LoRa (250kHz)	-	-	-	-	-	-	-	-	-	-	-	-	-
920.5MHz	Pass	920.42M	15.41	-4.59	792.34M	-45.85	901.65M	-45.64	928.05M	-45.73	7.07444G	-36.76	1
922.5MHz	Pass	922.62M	15.37	-4.63	695.5M	-45.60	901.95M	-45.58	928.41M	-45.45	8.83318G	-37.28	1
924.5MHz	Pass	924.44M	16.08	-3.92	863.92M	-46.30	901.96M	-45.70	928.08M	-45.48	9.84805G	-36.85	1
LoRa (500kHz)	-	-	-	-	-	-	-	-	-	-	-	-	-
920.6MHz	Pass	920.69M	17.89	-2.11	812.05M	-46.39	901.97M	-45.64	928.67M	-45.40	9.93197G	-36.65	1
922.4MHz	Pass	922.22M	17.88	-2.12	690.65M	-46.57	901.02M	-44.96	928.26M	-44.60	8.88313G	-37.41	1
924.2MHz	Pass	924.13M	17.90	-2.10	654.51M	-46.66	901.84M	-45.23	928.54M	-45.70	9.73127G	-36.86	1

LoRa (125kHz) 920.2MHz

CSE NdB

04/03/2019

Port 1



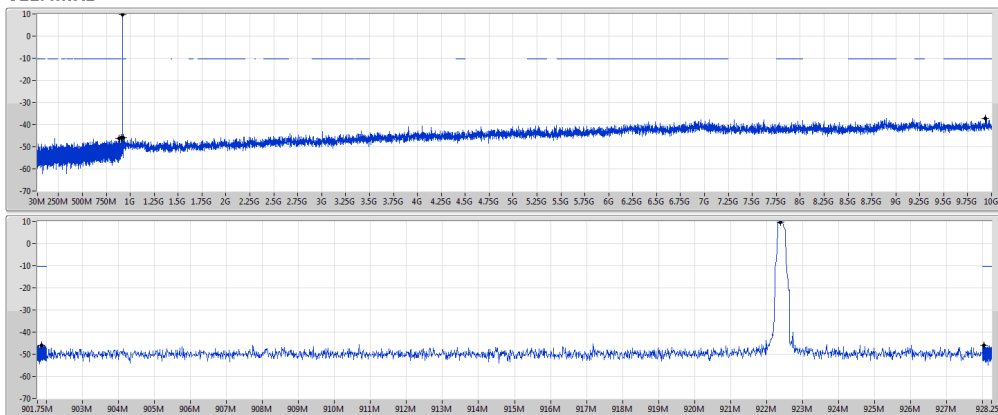
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
920.2M	9.79	-10.21	837.35M	-46.68	901.8M	-45.32	928.06M	-45.49	9.96371G	-37.06	1

LoRa (125kHz) 922.4MHz

CSE NdB

04/03/2019

Port 1



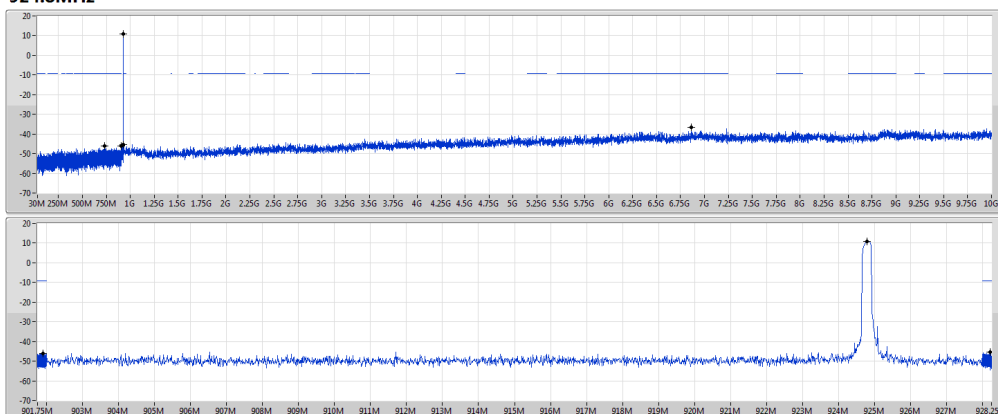
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
922.4M	9.77	-10.23	881.48M	-46.18	901.86M	-45.81	928.04M	-45.79	9.9763G	-37.17	1

LoRa (125kHz) 924.8MHz

CSE NdB

04/03/2019

Port 1



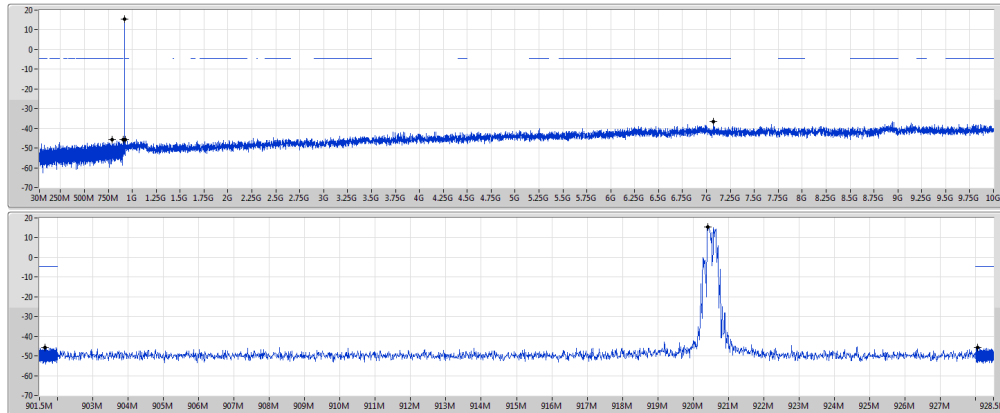
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
924.79M	10.80	-9.20	734.59M	-46.24	901.91M	-45.96	928.22M	-45.40	6.86571G	-36.72	1

LoRa (250kHz)
920.5MHz

CSE NdB

04/03/2019

Port 1



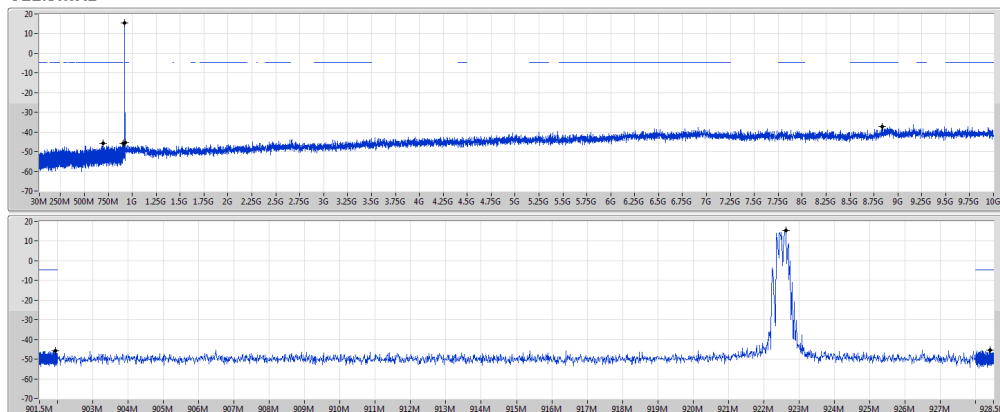
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
920.42M	15.41	-4.59	792.34M	-45.85	901.65M	-45.64	928.05M	-45.73	7.07444G	-36.76	1

LoRa (250kHz)
922.5MHz

CSE NdB

04/03/2019

Port 1



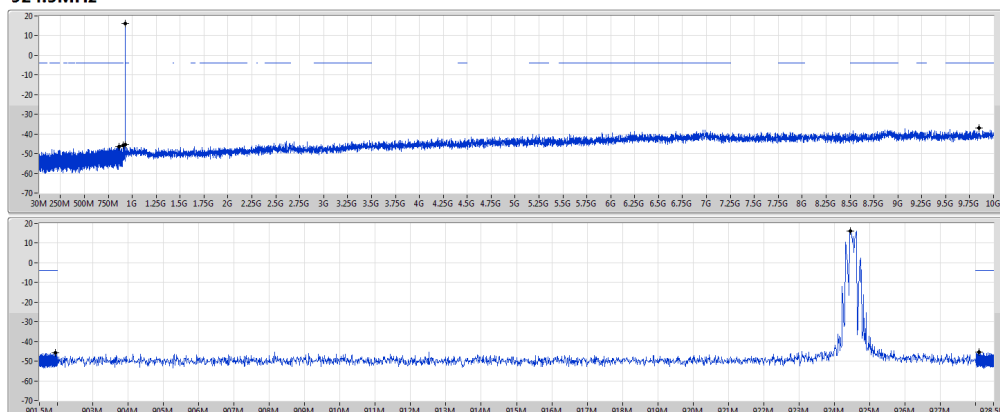
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
922.62M	15.37	-4.63	695.3M	-45.60	901.95M	-45.58	928.41M	-45.45	8.83318G	-37.28	1

LoRa (250kHz)
924.5MHz

CSE NdB

04/03/2019

Port 1



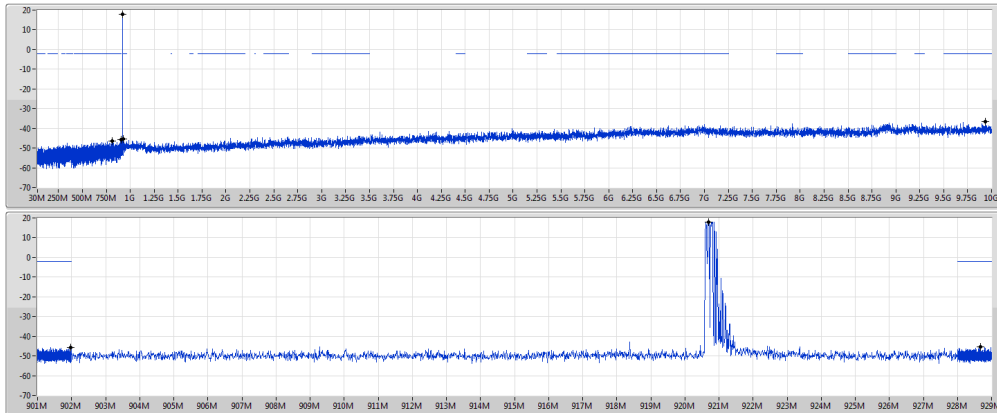
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
924.44M	16.08	-3.92	863.92M	-46.30	901.96M	-45.70	928.08M	-45.48	9.84805G	-36.85	1

LoRa (500kHz)
920.6MHz

CSE NdB

04/03/2019

Port 1



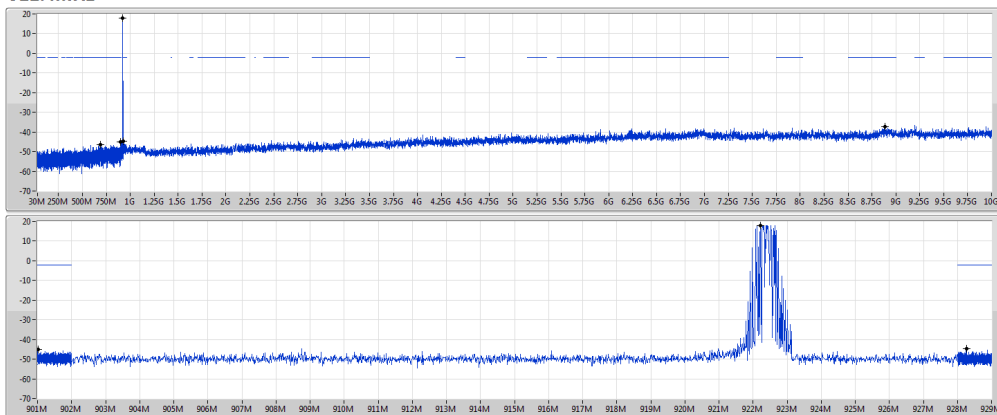
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
920.69M	17.89	-2.11	812.05M	-46.39	901.97M	-45.64	928.67M	-45.40	9.93197G	-36.65	1

LoRa (500kHz)
922.4MHz

CSE NdB

04/03/2019

Port 1



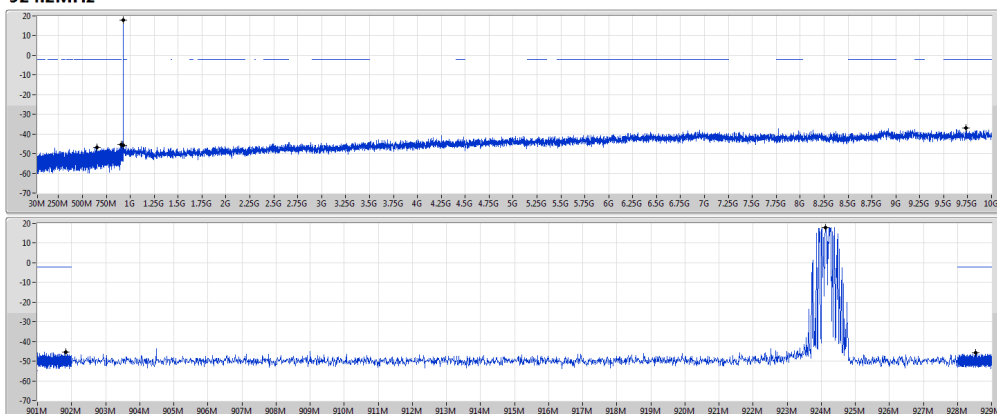
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
922.22M	17.88	-2.12	690.65M	-46.57	901.02M	-44.96	928.26M	-44.60	8.88313G	-37.41	1

LoRa (500kHz)
924.2MHz

CSE NdB

04/03/2019

Port 1



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
924.13M	17.90	-2.10	654.51M	-46.66	901.84M	-45.23	928.54M	-45.70	9.73127G	-36.86	1



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
902-928MHz	-	-	-	-	-	-	-	-	-	-	-	-
LoRa (500kHz)	Pass	PK	608.12M	25.75	46.00	-20.25	-10.19	3	Horizontal	0	3.00	-

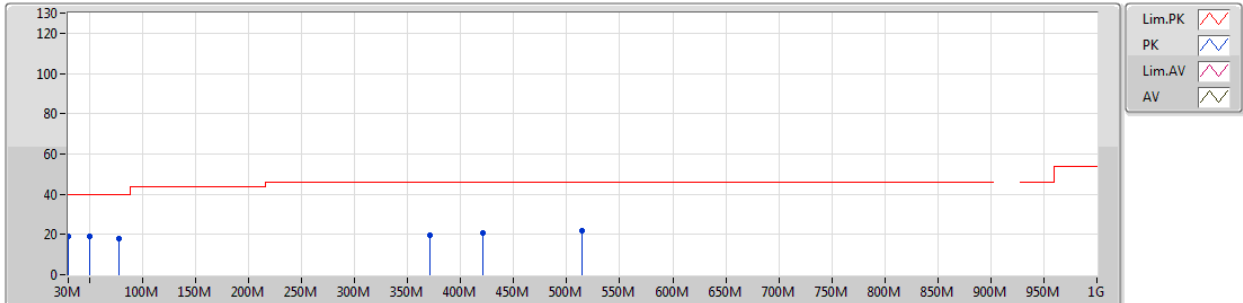
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
LoRa (500kHz)	-	-	-	-	-	-	-	-	-	-	-	-
922.4MHz	Pass	PK	30M	19.05	40.00	-20.95	-13.24	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	50.37M	19.28	40.00	-20.72	-23.40	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	77.53M	17.67	40.00	-22.33	-24.10	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	371.44M	19.62	46.00	-26.38	-14.82	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	420.91M	20.58	46.00	-25.42	-13.01	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	514.03M	21.92	46.00	-24.08	-11.81	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	77.53M	11.83	40.00	-28.17	-24.10	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	134.76M	15.75	43.50	-27.75	-19.00	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	191.99M	13.97	43.50	-29.53	-21.24	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	384.05M	20.67	46.00	-25.33	-14.45	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	474.26M	23.21	46.00	-22.79	-12.19	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	608.12M	25.75	46.00	-20.25	-10.19	3	Horizontal	0	3.00	-

LoRa (500kHz)

922.4MHz_DC Power Supply

01/03/2019

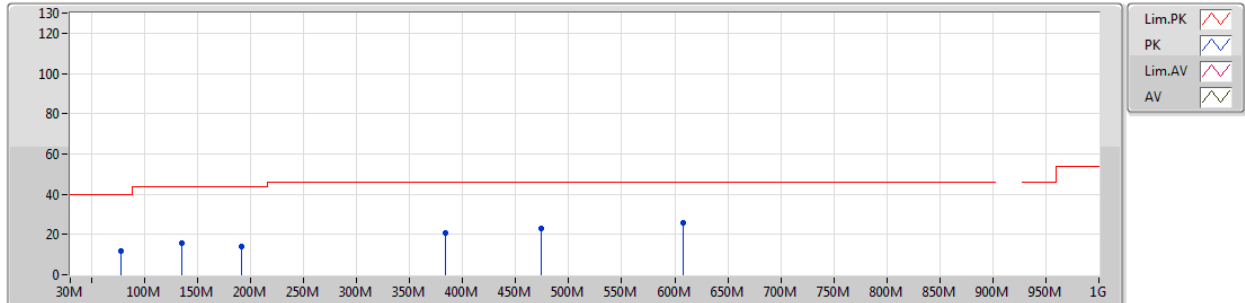


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	30M	19.05	40.00	-20.95	-13.24	3	Vertical	360	3.00	-
PK	50.37M	19.28	40.00	-20.72	-23.40	3	Vertical	360	3.00	-
PK	77.53M	17.67	40.00	-22.33	-24.10	3	Vertical	360	3.00	-
PK	371.44M	19.62	46.00	-26.38	-14.82	3	Vertical	360	3.00	-
PK	420.91M	20.58	46.00	-25.42	-13.01	3	Vertical	360	3.00	-
PK	514.03M	21.92	46.00	-24.08	-11.81	3	Vertical	360	3.00	-

LoRa (500kHz)

922.4MHz_DC Power Supply

01/03/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	77.53M	11.83	40.00	-28.17	-24.10	3	Horizontal	0	3.00	-
PK	134.76M	15.75	43.50	-27.75	-19.00	3	Horizontal	0	3.00	-
PK	191.99M	13.97	43.50	-29.53	-21.24	3	Horizontal	0	3.00	-
PK	384.05M	20.67	46.00	-25.33	-14.45	3	Horizontal	0	3.00	-
PK	474.26M	23.21	46.00	-22.79	-12.19	3	Horizontal	0	3.00	-
PK	608.12M	25.75	46.00	-20.25	-10.19	3	Horizontal	0	3.00	-

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
902-928MHz	-	-	-	-	-	-	-	-	-	-	-	-
LoRa (125kHz)	Pass	AV	1.8496G	53.24	54.00	-0.76	-4.01	3	Vertical	260	2.85	-
LoRa (250kHz)	Pass	AV	1.8489G	47.00	54.00	-7.00	-4.01	3	Vertical	285	2.97	-
LoRa (500kHz)	Pass	AV	1.84127G	45.85	54.00	-8.15	-4.02	3	Vertical	119	2.99	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
LoRa (125kHz)	-	-	-	-	-	-	-	-	-	-	-	-
920.2MHz	Pass	AV	1.84031G	51.99	54.00	-2.01	-4.02	3	Vertical	300	1.08	-
920.2MHz	Pass	AV	2.76054G	42.57	54.00	-11.43	-1.56	3	Vertical	329	1.50	-
920.2MHz	Pass	AV	3.68074G	32.62	54.00	-21.38	0.31	3	Vertical	155	1.50	-
920.2MHz	Pass	PK	1.84042G	57.04	74.00	-16.96	-4.02	3	Vertical	300	1.08	-
920.2MHz	Pass	PK	2.76047G	48.65	74.00	-25.35	-1.56	3	Vertical	329	1.50	-
920.2MHz	Pass	PK	3.68078G	44.87	74.00	-29.13	0.31	3	Vertical	155	1.50	-
920.2MHz	Pass	AV	1.8405G	51.96	54.00	-2.04	-4.02	3	Horizontal	218	1.48	-
920.2MHz	Pass	AV	2.76067G	43.21	54.00	-10.79	-1.56	3	Horizontal	63	1.50	-
920.2MHz	Pass	AV	3.68079G	36.88	54.00	-17.12	0.31	3	Horizontal	145	1.83	-
920.2MHz	Pass	PK	1.84037G	56.45	74.00	-17.55	-4.02	3	Horizontal	218	1.48	-
920.2MHz	Pass	PK	2.76055G	48.41	74.00	-25.59	-1.56	3	Horizontal	63	1.50	-
920.2MHz	Pass	PK	3.68079G	45.53	74.00	-28.47	0.31	3	Horizontal	145	1.83	-
922.4MHz	Pass	AV	1.84486G	52.77	54.00	-1.23	-4.02	3	Vertical	299	2.29	-
922.4MHz	Pass	AV	2.76711G	43.15	54.00	-10.85	-1.54	3	Vertical	29	1.50	-
922.4MHz	Pass	AV	3.68954G	35.93	54.00	-18.07	0.33	3	Vertical	197	2.96	-
922.4MHz	Pass	PK	1.84485G	56.99	74.00	-17.01	-4.02	3	Vertical	299	2.29	-
922.4MHz	Pass	PK	2.76715G	48.43	74.00	-25.57	-1.54	3	Vertical	29	1.50	-
922.4MHz	Pass	PK	3.68952G	45.52	74.00	-28.48	0.33	3	Vertical	197	2.96	-
922.4MHz	Pass	AV	1.84474G	49.09	54.00	-4.91	-4.02	3	Horizontal	342	1.01	-
922.4MHz	Pass	AV	2.76721G	43.05	54.00	-10.95	-1.54	3	Horizontal	181	1.50	-
922.4MHz	Pass	AV	3.68959G	36.56	54.00	-17.44	0.33	3	Horizontal	150	1.08	-
922.4MHz	Pass	PK	1.84479G	53.17	74.00	-20.83	-4.02	3	Horizontal	342	1.01	-
922.4MHz	Pass	PK	2.76736G	48.47	74.00	-25.53	-1.54	3	Horizontal	181	1.50	-
922.4MHz	Pass	PK	3.68955G	45.78	74.00	-28.22	0.33	3	Horizontal	150	1.08	-
924.8MHz	Pass	AV	1.8496G	53.24	54.00	-0.76	-4.01	3	Vertical	260	2.85	-
924.8MHz	Pass	AV	2.77436G	42.31	54.00	-11.69	-1.52	3	Vertical	45	1.04	-
924.8MHz	Pass	AV	3.69912G	35.18	54.00	-18.82	0.35	3	Vertical	201	2.98	-
924.8MHz	Pass	PK	1.8497G	57.18	74.00	-16.82	-4.01	3	Vertical	260	2.85	-
924.8MHz	Pass	PK	2.77442G	48.51	74.00	-25.49	-1.52	3	Vertical	45	1.04	-
924.8MHz	Pass	PK	3.69914G	45.67	74.00	-28.33	0.35	3	Vertical	201	2.98	-
924.8MHz	Pass	AV	1.84947G	50.54	54.00	-3.46	-4.01	3	Horizontal	152	2.66	-
924.8MHz	Pass	AV	2.77433G	44.79	54.00	-9.21	-1.52	3	Horizontal	147	2.82	-
924.8MHz	Pass	AV	3.69922G	35.82	54.00	-18.18	0.35	3	Horizontal	152	1.50	-
924.8MHz	Pass	PK	1.84951G	56.33	74.00	-17.67	-4.01	3	Horizontal	152	2.66	-
924.8MHz	Pass	PK	2.77448G	50.23	74.00	-23.77	-1.52	3	Horizontal	147	2.82	-
924.8MHz	Pass	PK	3.69923G	45.92	74.00	-28.08	0.35	3	Horizontal	152	1.50	-
LoRa (250kHz)	-	-	-	-	-	-	-	-	-	-	-	-
920.5MHz	Pass	AV	1.84097G	45.47	54.00	-8.53	-4.02	3	Vertical	300	1.50	-
920.5MHz	Pass	AV	2.76141G	37.86	54.00	-16.14	-1.56	3	Vertical	33	1.50	-
920.5MHz	Pass	AV	3.68194G	31.23	54.00	-22.77	0.32	3	Vertical	35	1.50	-
920.5MHz	Pass	PK	1.84093G	56.37	74.00	-17.63	-4.02	3	Vertical	300	1.50	-
920.5MHz	Pass	PK	2.76117G	47.23	74.00	-26.77	-1.56	3	Vertical	33	1.50	-
920.5MHz	Pass	PK	3.68232G	45.27	74.00	-28.73	0.32	3	Vertical	35	1.50	-
920.5MHz	Pass	AV	1.84091G	42.98	54.00	-11.02	-4.02	3	Horizontal	189	2.19	-
920.5MHz	Pass	AV	2.76153G	38.89	54.00	-15.11	-1.56	3	Horizontal	147	2.89	-
920.5MHz	Pass	AV	3.68201G	34.57	54.00	-19.43	0.32	3	Horizontal	149	1.01	-
920.5MHz	Pass	PK	1.84096G	54.36	74.00	-19.64	-4.02	3	Horizontal	189	2.19	-

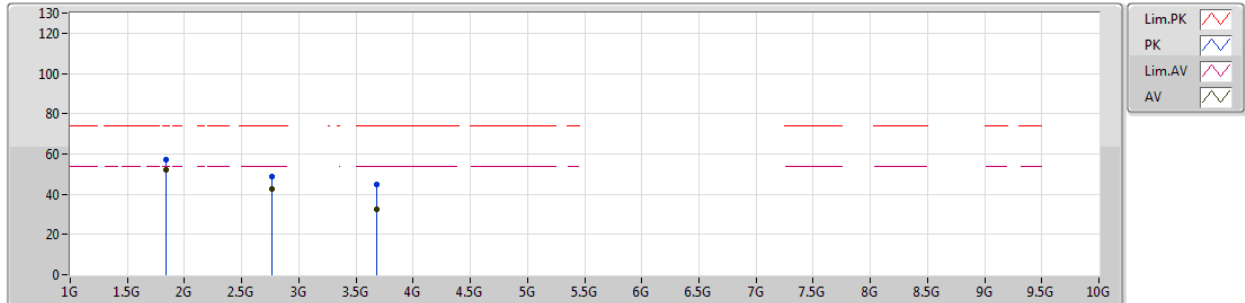
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
920.5MHz	Pass	PK	2.7612G	48.80	74.00	-25.20	-1.56	3	Horizontal	147	2.89	-
920.5MHz	Pass	PK	3.68225G	46.95	74.00	-27.05	0.32	3	Horizontal	149	1.01	-
922.5MHz	Pass	AV	1.8451G	46.38	54.00	-7.62	-4.01	3	Vertical	60	2.99	-
922.5MHz	Pass	AV	2.76749G	38.68	54.00	-15.32	-1.54	3	Vertical	40	2.96	-
922.5MHz	Pass	AV	3.68997G	33.01	54.00	-20.99	0.33	3	Vertical	78	2.87	-
922.5MHz	Pass	PK	1.8452G	57.69	74.00	-16.31	-4.01	3	Vertical	60	2.99	-
922.5MHz	Pass	PK	2.76774G	48.20	74.00	-25.80	-1.53	3	Vertical	40	2.96	-
922.5MHz	Pass	PK	3.68968G	46.04	74.00	-27.96	0.33	3	Vertical	78	2.87	-
922.5MHz	Pass	AV	1.84494G	41.42	54.00	-12.58	-4.02	3	Horizontal	176	2.70	-
922.5MHz	Pass	AV	2.76753G	38.04	54.00	-15.96	-1.53	3	Horizontal	145	2.93	-
922.5MHz	Pass	AV	3.68997G	33.92	54.00	-20.08	0.33	3	Horizontal	150	1.02	-
922.5MHz	Pass	PK	1.84476G	53.40	74.00	-20.60	-4.02	3	Horizontal	176	2.70	-
922.5MHz	Pass	PK	2.76715G	48.26	74.00	-25.74	-1.54	3	Horizontal	145	2.93	-
922.5MHz	Pass	PK	3.69001G	46.05	74.00	-27.95	0.33	3	Horizontal	150	1.02	-
924.5MHz	Pass	AV	1.8489G	47.00	54.00	-7.00	-4.01	3	Vertical	285	2.97	-
924.5MHz	Pass	AV	2.77346G	38.45	54.00	-15.55	-1.52	3	Vertical	44	2.96	-
924.5MHz	Pass	AV	3.6979G	33.23	54.00	-20.77	0.35	3	Vertical	29	2.86	-
924.5MHz	Pass	PK	1.84882G	56.89	74.00	-17.11	-4.01	3	Vertical	285	2.97	-
924.5MHz	Pass	PK	2.77318G	48.23	74.00	-25.77	-1.52	3	Vertical	44	2.96	-
924.5MHz	Pass	PK	3.69765G	45.45	74.00	-28.55	0.35	3	Vertical	29	2.86	-
924.5MHz	Pass	AV	1.84902G	44.07	54.00	-9.93	-4.01	3	Horizontal	165	1.01	-
924.5MHz	Pass	AV	2.77354G	36.88	54.00	-17.12	-1.52	3	Horizontal	219	1.68	-
924.5MHz	Pass	AV	3.69807G	31.13	54.00	-22.87	0.35	3	Horizontal	89	1.97	-
924.5MHz	Pass	PK	1.84878G	54.68	74.00	-19.32	-4.01	3	Horizontal	165	1.01	-
924.5MHz	Pass	PK	2.77308G	45.41	74.00	-28.59	-1.52	3	Horizontal	219	1.68	-
924.5MHz	Pass	PK	3.69722G	43.49	74.00	-30.51	0.34	3	Horizontal	89	1.97	-
LoRa (500kHz)	-	-	-	-	-	-	-	-	-	-	-	-
920.6MHz	Pass	AV	1.84127G	45.85	54.00	-8.15	-4.02	3	Vertical	119	2.99	-
920.6MHz	Pass	AV	2.76183G	39.85	54.00	-14.15	-1.56	3	Vertical	68	1.11	-
920.6MHz	Pass	AV	3.6819G	28.22	54.00	-25.78	0.32	3	Vertical	80	2.36	-
920.6MHz	Pass	PK	1.84086G	55.80	74.00	-18.20	-4.02	3	Vertical	119	2.99	-
920.6MHz	Pass	PK	2.76192G	49.63	74.00	-24.37	-1.56	3	Vertical	68	1.11	-
920.6MHz	Pass	PK	3.68042G	41.83	74.00	-32.17	0.30	3	Vertical	80	2.36	-
920.6MHz	Pass	AV	1.8413G	42.05	54.00	-11.95	-4.02	3	Horizontal	128	1.39	-
920.6MHz	Pass	AV	2.76163G	36.23	54.00	-17.77	-1.56	3	Horizontal	301	2.30	-
920.6MHz	Pass	AV	3.682G	28.61	54.00	-25.39	0.32	3	Horizontal	50	1.53	-
920.6MHz	Pass	PK	1.83981G	52.66	74.00	-21.34	-4.02	3	Horizontal	128	1.39	-
920.6MHz	Pass	PK	2.76234G	46.65	74.00	-27.35	-1.56	3	Horizontal	301	2.30	-
920.6MHz	Pass	PK	3.68129G	42.46	74.00	-31.54	0.31	3	Horizontal	50	1.53	-
922.4MHz	Pass	AV	1.84458G	44.70	54.00	-9.30	-4.02	3	Vertical	73	1.11	-
922.4MHz	Pass	AV	2.76734G	34.55	54.00	-19.45	-1.54	3	Vertical	347	1.27	-
922.4MHz	Pass	AV	3.68991G	30.27	54.00	-23.73	0.33	3	Vertical	295	2.04	-
922.4MHz	Pass	PK	1.84432G	54.99	74.00	-19.01	-4.02	3	Vertical	73	1.11	-
922.4MHz	Pass	PK	2.76669G	44.05	74.00	-29.95	-1.54	3	Vertical	347	1.27	-
922.4MHz	Pass	PK	3.68845G	43.58	74.00	-30.42	0.33	3	Vertical	295	2.04	-
922.4MHz	Pass	AV	1.84459G	42.71	54.00	-11.29	-4.02	3	Horizontal	156	1.02	-
922.4MHz	Pass	AV	2.76752G	32.06	54.00	-21.94	-1.53	3	Horizontal	102	1.71	-
922.4MHz	Pass	AV	3.6901G	28.24	54.00	-25.76	0.33	3	Horizontal	54	2.13	-
922.4MHz	Pass	PK	1.8447G	52.57	74.00	-21.43	-4.02	3	Horizontal	156	1.02	-

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
922.4MHz	Pass	PK	2.76747G	42.60	74.00	-31.40	-1.54	3	Horizontal	102	1.71	-
922.4MHz	Pass	PK	3.68992G	42.32	74.00	-31.68	0.33	3	Horizontal	54	2.13	-
924.2MHz	Pass	AV	1.84822G	45.17	54.00	-8.83	-4.01	3	Vertical	284	2.45	-
924.2MHz	Pass	AV	2.77468G	38.66	54.00	-15.34	-1.52	3	Vertical	203	2.33	-
924.2MHz	Pass	AV	3.69513G	28.01	54.00	-25.99	0.34	3	Vertical	184	1.24	-
924.2MHz	Pass	PK	1.84947G	55.20	74.00	-18.80	-4.01	3	Vertical	284	2.45	-
924.2MHz	Pass	PK	2.77241G	48.53	74.00	-25.47	-1.53	3	Vertical	203	2.33	-
924.2MHz	Pass	PK	3.69558G	41.65	74.00	-32.35	0.34	3	Vertical	184	1.24	-
924.2MHz	Pass	AV	1.85062G	43.28	54.00	-10.72	-4.01	3	Horizontal	28	1.94	-
924.2MHz	Pass	AV	2.77438G	36.68	54.00	-17.32	-1.52	3	Horizontal	232	1.66	-
924.2MHz	Pass	AV	3.69511G	28.06	54.00	-25.94	0.34	3	Horizontal	5	1.28	-
924.2MHz	Pass	PK	1.85059G	53.31	74.00	-20.69	-4.01	3	Horizontal	28	1.94	-
924.2MHz	Pass	PK	2.77242G	46.14	74.00	-27.86	-1.53	3	Horizontal	232	1.66	-
924.2MHz	Pass	PK	3.69556G	46.57	74.00	-27.43	0.34	3	Horizontal	5	1.28	-

LoRa (125kHz)

920.2MHz_TX

01/03/2019

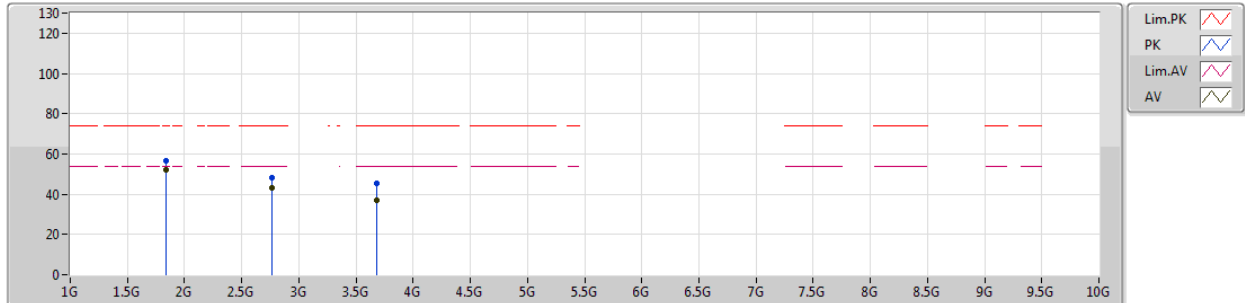


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84031G	51.99	54.00	-2.01	-4.02	3	Vertical	300	1.08	-
AV	2.76054G	42.57	54.00	-11.43	-1.56	3	Vertical	329	1.50	-
AV	3.68074G	32.62	54.00	-21.38	0.31	3	Vertical	155	1.50	-
PK	1.84042G	57.04	74.00	-16.96	-4.02	3	Vertical	300	1.08	-
PK	2.76047G	48.65	74.00	-25.35	-1.56	3	Vertical	329	1.50	-
PK	3.68078G	44.87	74.00	-29.13	0.31	3	Vertical	155	1.50	-

LoRa (125kHz)

920.2MHz_TX

01/03/2019

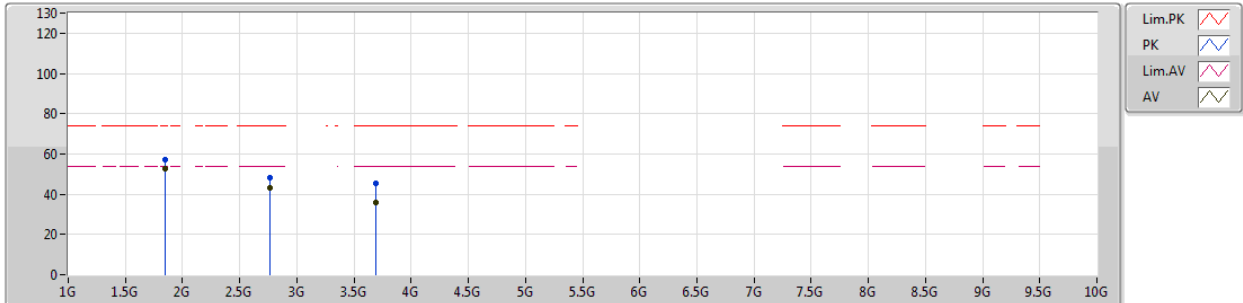


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.8405G	51.96	54.00	-2.04	-4.02	3	Horizontal	218	1.48	-
AV	2.76067G	43.21	54.00	-10.79	-1.56	3	Horizontal	63	1.50	-
AV	3.68079G	36.88	54.00	-17.12	0.31	3	Horizontal	145	1.83	-
PK	1.84037G	56.45	74.00	-17.55	-4.02	3	Horizontal	218	1.48	-
PK	2.76055G	48.41	74.00	-25.59	-1.56	3	Horizontal	63	1.50	-
PK	3.68079G	45.53	74.00	-28.47	0.31	3	Horizontal	145	1.83	-

LoRa (125kHz)

922.4MHz_TX

01/03/2019

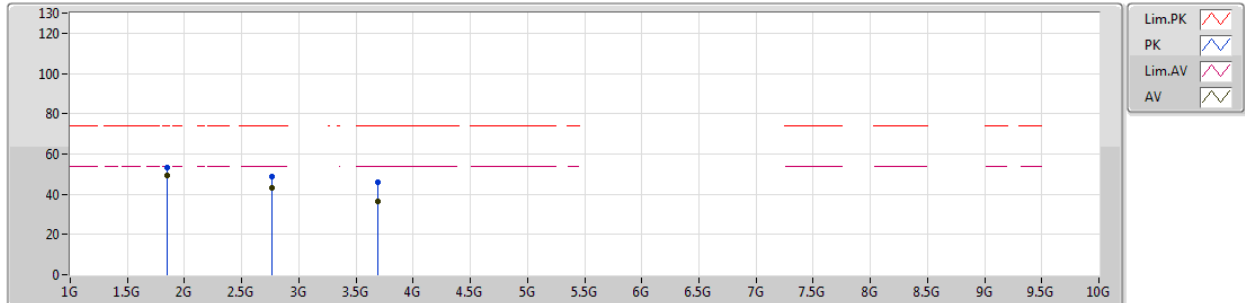


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84486G	52.77	54.00	-1.23	-4.02	3	Vertical	299	2.29	-
AV	2.76711G	43.15	54.00	-10.85	-1.54	3	Vertical	29	1.50	-
AV	3.68954G	35.93	54.00	-18.07	0.33	3	Vertical	197	2.96	-
PK	1.84485G	56.99	74.00	-17.01	-4.02	3	Vertical	299	2.29	-
PK	2.76715G	48.43	74.00	-25.57	-1.54	3	Vertical	29	1.50	-
PK	3.68952G	45.52	74.00	-28.48	0.33	3	Vertical	197	2.96	-

LoRa (125kHz)

922.4MHz_TX

01/03/2019

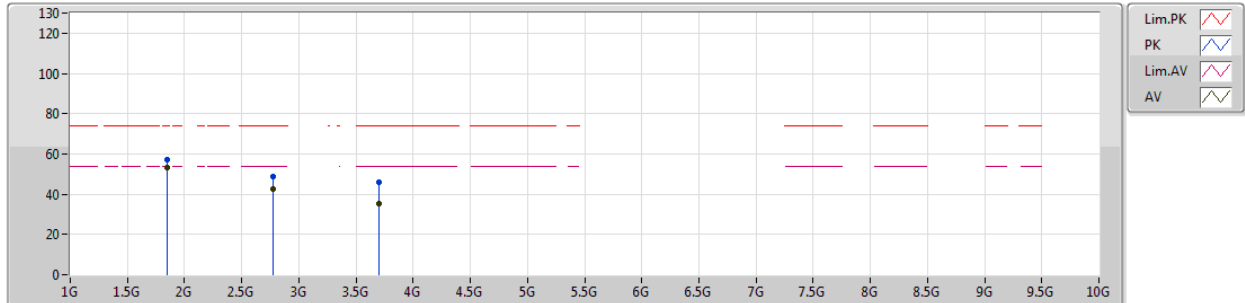


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84474G	49.09	54.00	-4.91	-4.02	3	Horizontal	342	1.01	-
AV	2.76721G	43.05	54.00	-10.95	-1.54	3	Horizontal	181	1.50	-
AV	3.68959G	36.56	54.00	-17.44	0.33	3	Horizontal	150	1.08	-
PK	1.84479G	53.17	74.00	-20.83	-4.02	3	Horizontal	342	1.01	-
PK	2.76736G	48.47	74.00	-25.53	-1.54	3	Horizontal	181	1.50	-
PK	3.68955G	45.78	74.00	-28.22	0.33	3	Horizontal	150	1.08	-

LoRa (125kHz)

924.8MHz_TX

01/03/2019

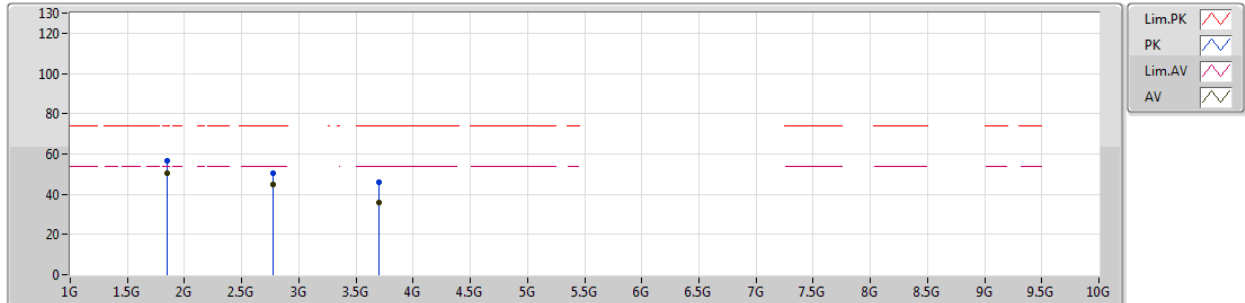


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.8496G	53.24	54.00	-0.76	-4.01	3	Vertical	260	2.85	-
AV	2.77436G	42.31	54.00	-11.69	-1.52	3	Vertical	45	1.04	-
AV	3.69912G	35.18	54.00	-18.82	0.35	3	Vertical	201	2.98	-
PK	1.8497G	57.18	74.00	-16.82	-4.01	3	Vertical	260	2.85	-
PK	2.77442G	48.51	74.00	-25.49	-1.52	3	Vertical	45	1.04	-
PK	3.69914G	45.67	74.00	-28.33	0.35	3	Vertical	201	2.98	-

LoRa (125kHz)

924.8MHz_TX

01/03/2019

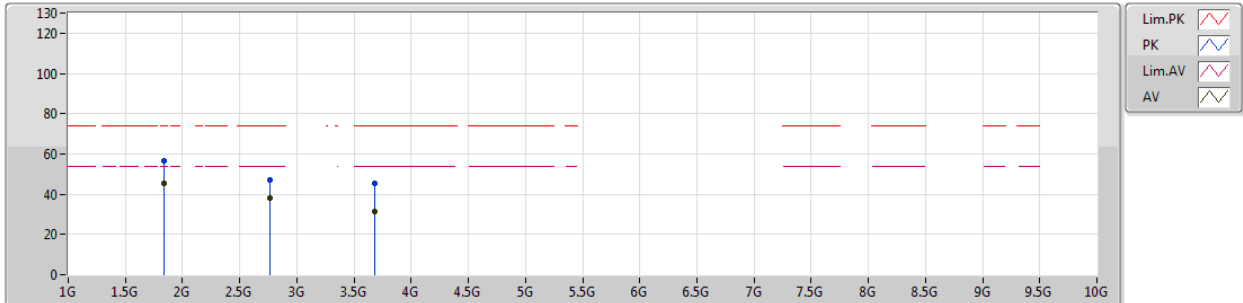


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84947G	50.54	54.00	-3.46	-4.01	3	Horizontal	152	2.66	-
AV	2.77433G	44.79	54.00	-9.21	-1.52	3	Horizontal	147	2.82	-
AV	3.69922G	35.82	54.00	-18.18	0.35	3	Horizontal	152	1.50	-
PK	1.84951G	56.33	74.00	-17.67	-4.01	3	Horizontal	152	2.66	-
PK	2.77448G	50.23	74.00	-23.77	-1.52	3	Horizontal	147	2.82	-
PK	3.69923G	45.92	74.00	-28.08	0.35	3	Horizontal	152	1.50	-

LoRa (250kHz)

920.5MHz_TX

01/03/2019

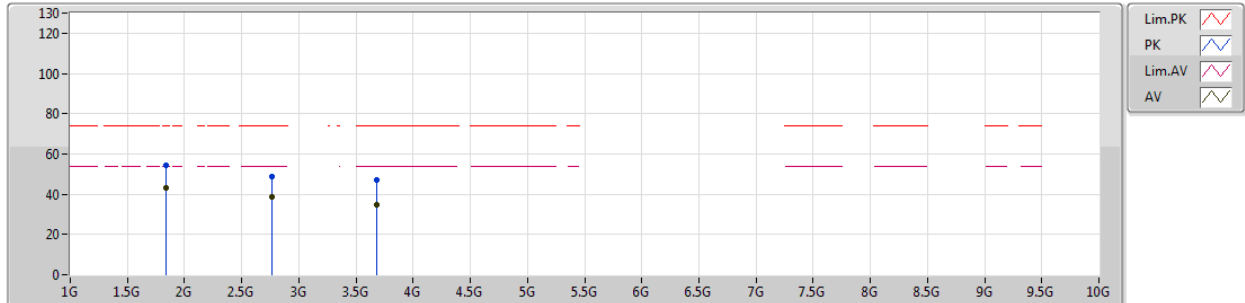


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84097G	45.47	54.00	-8.53	-4.02	3	Vertical	300	1.50	-
AV	2.76141G	37.86	54.00	-16.14	-1.56	3	Vertical	33	1.50	-
AV	3.68194G	31.23	54.00	-22.77	0.32	3	Vertical	35	1.50	-
PK	1.84093G	56.37	74.00	-17.63	-4.02	3	Vertical	300	1.50	-
PK	2.76117G	47.23	74.00	-26.77	-1.56	3	Vertical	33	1.50	-
PK	3.68232G	45.27	74.00	-28.73	0.32	3	Vertical	35	1.50	-

LoRa (250kHz)

920.5MHz_TX

01/03/2019

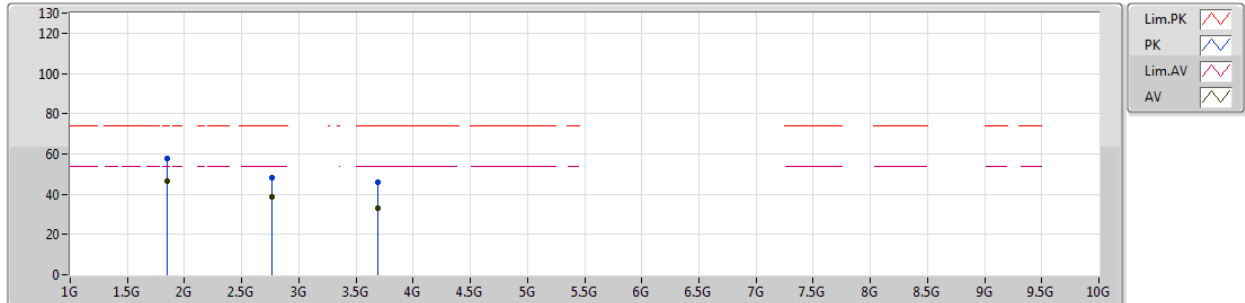


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84091G	42.98	54.00	-11.02	-4.02	3	Horizontal	189	2.19	-
AV	2.76153G	38.89	54.00	-15.11	-1.56	3	Horizontal	147	2.89	-
AV	3.68201G	34.57	54.00	-19.43	0.32	3	Horizontal	149	1.01	-
PK	1.84096G	54.36	74.00	-19.64	-4.02	3	Horizontal	189	2.19	-
PK	2.7612G	48.80	74.00	-25.20	-1.56	3	Horizontal	147	2.89	-
PK	3.68225G	46.95	74.00	-27.05	0.32	3	Horizontal	149	1.01	-

LoRa (250kHz)

922.5MHz_TX

01/03/2019

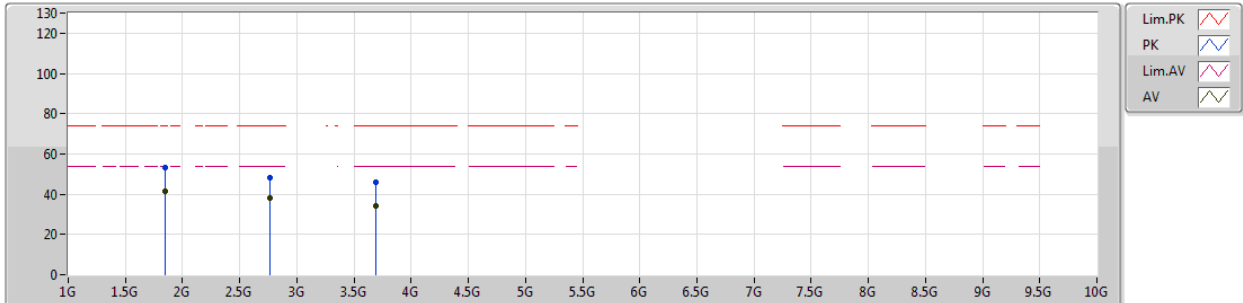


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.8451G	46.38	54.00	-7.62	-4.01	3	Vertical	60	2.99	-
AV	2.76749G	38.68	54.00	-15.32	-1.54	3	Vertical	40	2.96	-
AV	3.68997G	33.01	54.00	-20.99	0.33	3	Vertical	78	2.87	-
PK	1.8452G	57.69	74.00	-16.31	-4.01	3	Vertical	60	2.99	-
PK	2.76774G	48.20	74.00	-25.80	-1.53	3	Vertical	40	2.96	-
PK	3.68968G	46.04	74.00	-27.96	0.33	3	Vertical	78	2.87	-

LoRa (250kHz)

922.5MHz_TX

01/03/2019

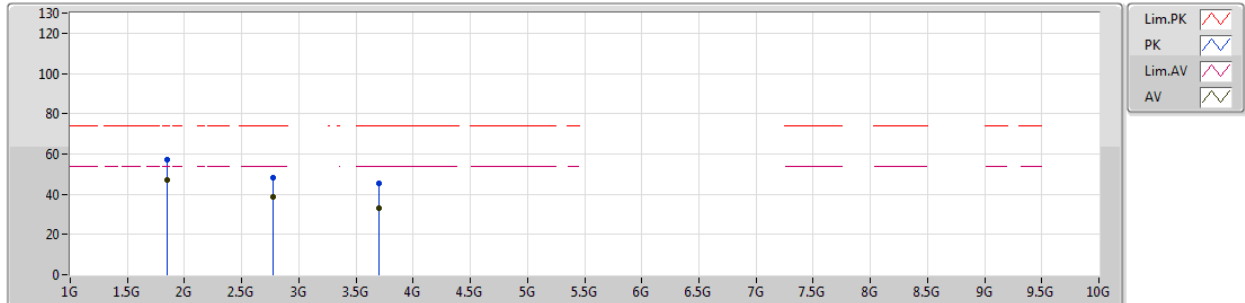


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84494G	41.42	54.00	-12.58	-4.02	3	Horizontal	176	2.70	-
AV	2.76753G	38.04	54.00	-15.96	-1.53	3	Horizontal	145	2.93	-
AV	3.68997G	33.92	54.00	-20.08	0.33	3	Horizontal	150	1.02	-
PK	1.84476G	53.40	74.00	-20.60	-4.02	3	Horizontal	176	2.70	-
PK	2.76715G	48.26	74.00	-25.74	-1.54	3	Horizontal	145	2.93	-
PK	3.69001G	46.05	74.00	-27.95	0.33	3	Horizontal	150	1.02	-

LoRa (250kHz)

924.5MHz_TX

01/03/2019

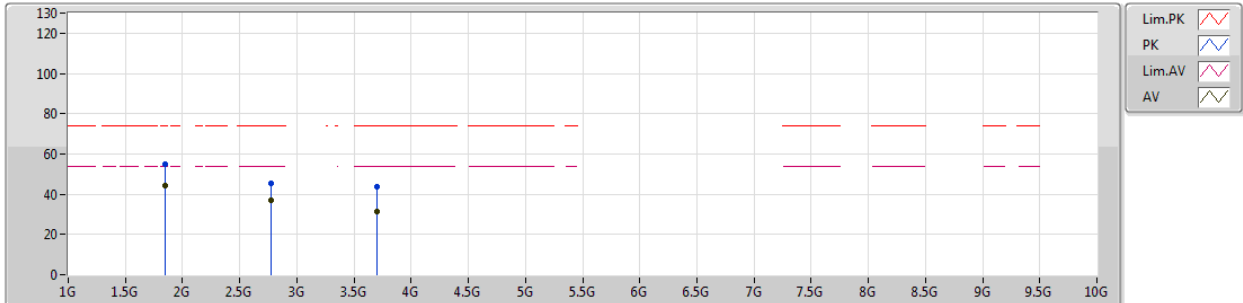


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.8489G	47.00	54.00	-7.00	-4.01	3	Vertical	285	2.97	-
AV	2.77346G	38.45	54.00	-15.55	-1.52	3	Vertical	44	2.96	-
AV	3.6979G	33.23	54.00	-20.77	0.35	3	Vertical	29	2.86	-
PK	1.84882G	56.89	74.00	-17.11	-4.01	3	Vertical	285	2.97	-
PK	2.77318G	48.23	74.00	-25.77	-1.52	3	Vertical	44	2.96	-
PK	3.69765G	45.45	74.00	-28.55	0.35	3	Vertical	29	2.86	-

LoRa (250kHz)

924.5MHz_TX

01/03/2019

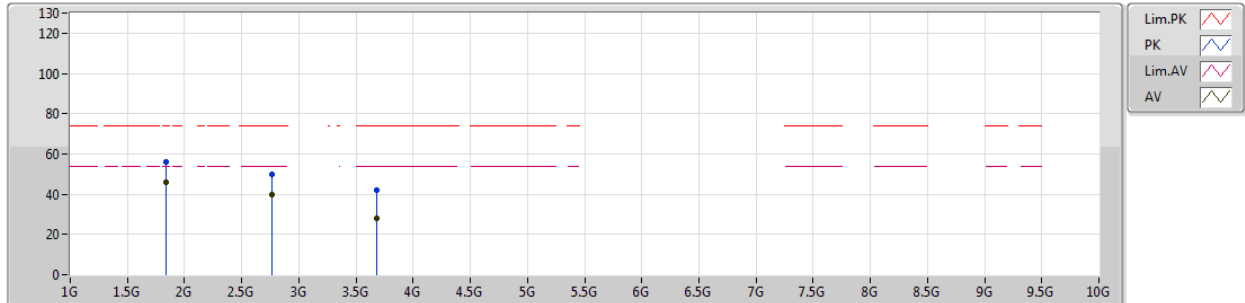


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84902G	44.07	54.00	-9.93	-4.01	3	Horizontal	165	1.01	-
AV	2.77354G	36.88	54.00	-17.12	-1.52	3	Horizontal	219	1.68	-
AV	3.69807G	31.13	54.00	-22.87	0.35	3	Horizontal	89	1.97	-
PK	1.84878G	54.68	74.00	-19.32	-4.01	3	Horizontal	165	1.01	-
PK	2.77308G	45.41	74.00	-28.59	-1.52	3	Horizontal	219	1.68	-
PK	3.69722G	43.49	74.00	-30.51	0.34	3	Horizontal	89	1.97	-

LoRa (500kHz)

920.6MHz_TX

01/03/2019

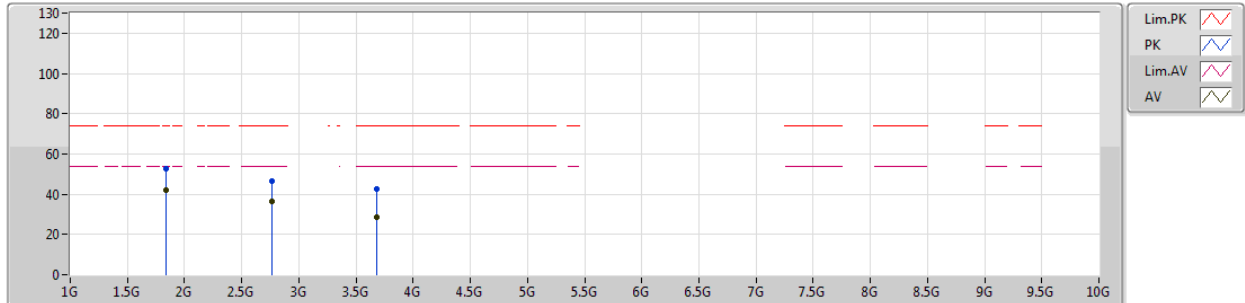


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84127G	45.85	54.00	-8.15	-4.02	3	Vertical	119	2.99	-
AV	2.76183G	39.85	54.00	-14.15	-1.56	3	Vertical	68	1.11	-
AV	3.6819G	28.22	54.00	-25.78	0.32	3	Vertical	80	2.36	-
PK	1.84086G	55.80	74.00	-18.20	-4.02	3	Vertical	119	2.99	-
PK	2.76192G	49.63	74.00	-24.37	-1.56	3	Vertical	68	1.11	-
PK	3.68042G	41.83	74.00	-32.17	0.30	3	Vertical	80	2.36	-

LoRa (500kHz)

920.6MHz_TX

01/03/2019

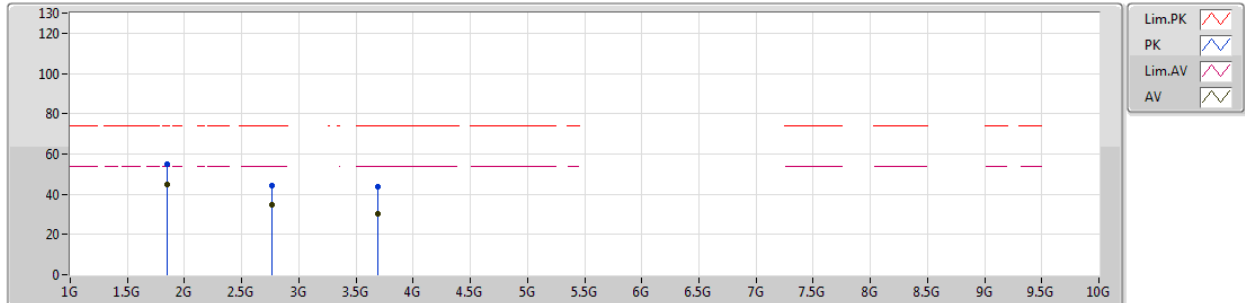


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.8413G	42.05	54.00	-11.95	-4.02	3	Horizontal	128	1.39	-
AV	2.76163G	36.23	54.00	-17.77	-1.56	3	Horizontal	301	2.30	-
AV	3.682G	28.61	54.00	-25.39	0.32	3	Horizontal	50	1.53	-
PK	1.83981G	52.66	74.00	-21.34	-4.02	3	Horizontal	128	1.39	-
PK	2.76234G	46.65	74.00	-27.35	-1.56	3	Horizontal	301	2.30	-
PK	3.68129G	42.46	74.00	-31.54	0.31	3	Horizontal	50	1.53	-

LoRa (500kHz)

922.4MHz_TX

01/03/2019

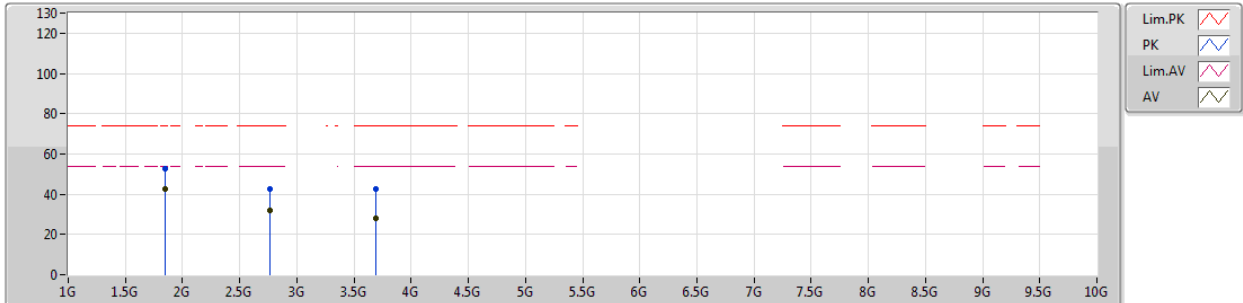


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84458G	44.70	54.00	-9.30	-4.02	3	Vertical	73	1.11	-
AV	2.76734G	34.55	54.00	-19.45	-1.54	3	Vertical	347	1.27	-
AV	3.68991G	30.27	54.00	-23.73	0.33	3	Vertical	295	2.04	-
PK	1.84432G	54.99	74.00	-19.01	-4.02	3	Vertical	73	1.11	-
PK	2.76669G	44.05	74.00	-29.95	-1.54	3	Vertical	347	1.27	-
PK	3.68845G	43.58	74.00	-30.42	0.33	3	Vertical	295	2.04	-

LoRa (500kHz)

922.4MHz_TX

01/03/2019

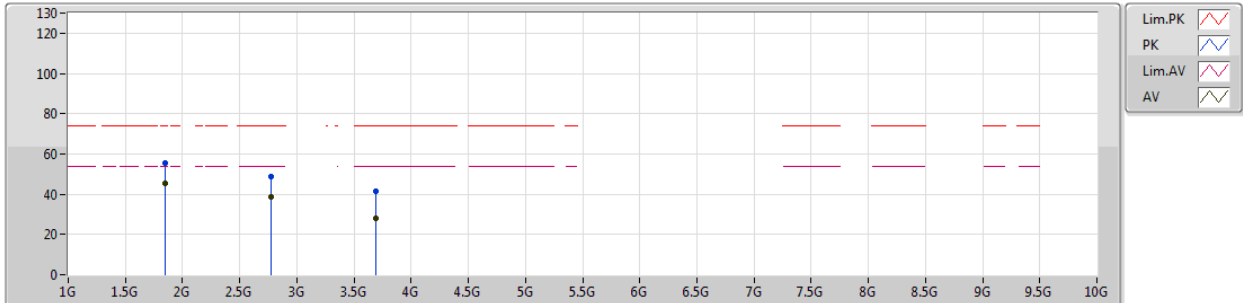


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84459G	42.71	54.00	-11.29	-4.02	3	Horizontal	156	1.02	-
AV	2.76752G	32.06	54.00	-21.94	-1.53	3	Horizontal	102	1.71	-
AV	3.6901G	28.24	54.00	-25.76	0.33	3	Horizontal	54	2.13	-
PK	1.8447G	52.57	74.00	-21.43	-4.02	3	Horizontal	156	1.02	-
PK	2.76747G	42.60	74.00	-31.40	-1.54	3	Horizontal	102	1.71	-
PK	3.68992G	42.32	74.00	-31.68	0.33	3	Horizontal	54	2.13	-

LoRa (500kHz)

924.2MHz_TX

01/03/2019

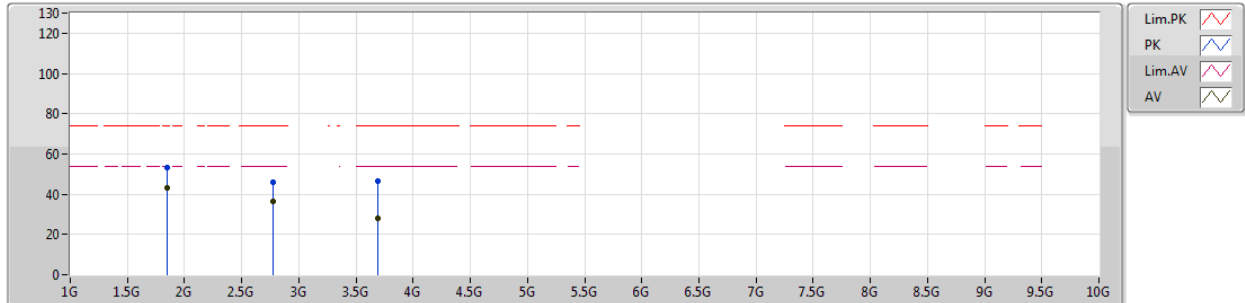


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.84822G	45.17	54.00	-8.83	-4.01	3	Vertical	284	2.45	-
AV	2.77468G	38.66	54.00	-15.34	-1.52	3	Vertical	203	2.33	-
AV	3.69513G	28.01	54.00	-25.99	0.34	3	Vertical	184	1.24	-
PK	1.84947G	55.20	74.00	-18.80	-4.01	3	Vertical	284	2.45	-
PK	2.77241G	48.53	74.00	-25.47	-1.53	3	Vertical	203	2.33	-
PK	3.69558G	41.65	74.00	-32.35	0.34	3	Vertical	184	1.24	-

LoRa (500kHz)

924.2MHz_TX

01/03/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	1.85062G	43.28	54.00	-10.72	-4.01	3	Horizontal	28	1.94	-
AV	2.77438G	36.68	54.00	-17.32	-1.52	3	Horizontal	232	1.66	-
AV	3.69511G	28.06	54.00	-25.94	0.34	3	Horizontal	5	1.28	-
PK	1.85059G	53.31	74.00	-20.69	-4.01	3	Horizontal	28	1.94	-
PK	2.77242G	46.14	74.00	-27.86	-1.53	3	Horizontal	232	1.66	-
PK	3.69556G	46.57	74.00	-27.43	0.34	3	Horizontal	5	1.28	-



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
902-928MHz	-	-	-	-	-	-	-	-	-	-	-	-
LoRa (500kHz)	Pass	PK	30M	22.55	40.00	-17.45	-13.24	3	Vertical	360	3.00	-

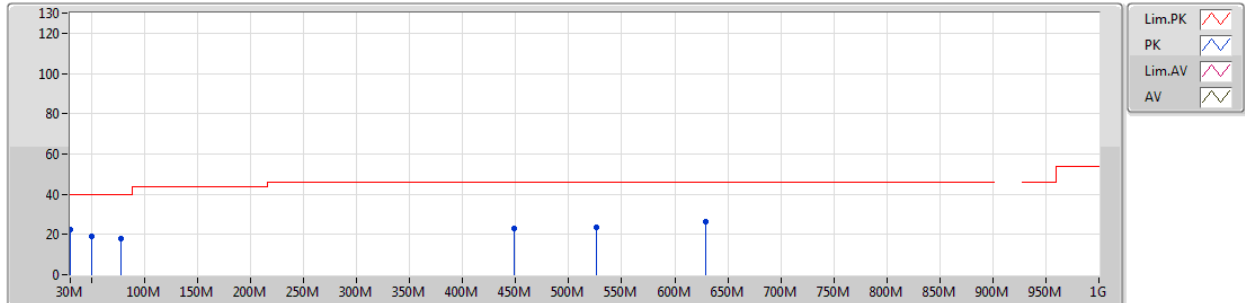
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
LoRa (500kHz)	-	-	-	-	-	-	-	-	-	-	-	-
922.4MHz	Pass	PK	50.37M	18.78	40.00	-21.22	-23.40	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	77.53M	17.67	40.00	-22.33	-24.10	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	30M	22.55	40.00	-17.45	-13.24	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	448.07M	22.82	46.00	-23.18	-12.63	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	526.64M	23.78	46.00	-22.22	-11.76	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	629.46M	26.34	46.00	-19.66	-9.64	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	35.82M	18.60	40.00	-21.40	-16.12	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	148.34M	14.97	43.50	-28.53	-19.25	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	282.2M	17.94	46.00	-28.06	-17.01	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	414.12M	21.37	46.00	-24.63	-13.27	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	474.26M	22.71	46.00	-23.29	-12.19	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	576.11M	26.86	46.00	-19.14	-10.44	3	Horizontal	0	3.00	-

LoRa (500kHz)RX

01/03/2019

922.4MHz_DC Power Supply

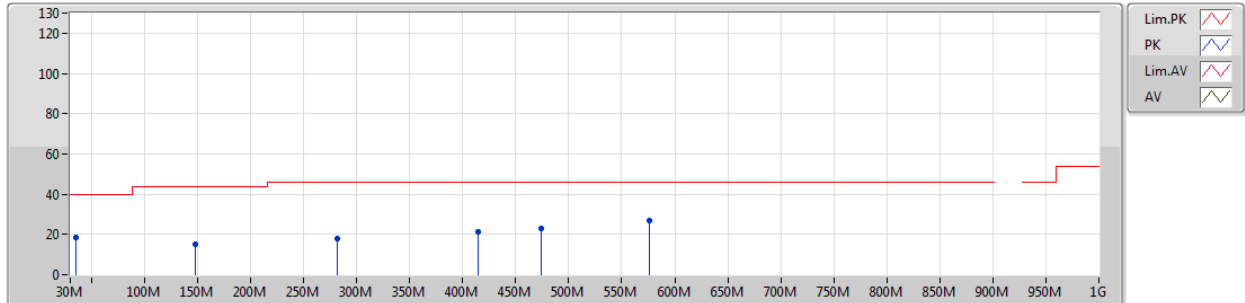


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	50.37M	18.78	40.00	-21.22	-23.40	3	Vertical	360	3.00	-
PK	77.53M	17.67	40.00	-22.33	-24.10	3	Vertical	360	3.00	-
PK	30M	22.55	40.00	-17.45	-13.24	3	Vertical	360	3.00	-
PK	448.07M	22.82	46.00	-23.18	-12.63	3	Vertical	360	3.00	-
PK	526.64M	23.78	46.00	-22.22	-11.76	3	Vertical	360	3.00	-
PK	629.46M	26.34	46.00	-19.66	-9.64	3	Vertical	360	3.00	-

LoRa (500kHz)RX

922.4MHz_DC Power Supply

01/03/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	35.82M	18.60	40.00	-21.40	-16.12	3	Horizontal	0	3.00	-
PK	148.34M	14.97	43.50	-28.53	-19.25	3	Horizontal	0	3.00	-
PK	282.2M	17.94	46.00	-28.06	-17.01	3	Horizontal	0	3.00	-
PK	414.12M	21.37	46.00	-24.63	-13.27	3	Horizontal	0	3.00	-
PK	474.26M	22.71	46.00	-23.29	-12.19	3	Horizontal	0	3.00	-
PK	576.11M	26.86	46.00	-19.14	-10.44	3	Horizontal	0	3.00	-

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
902-928MHz	-	-	-	-	-	-	-	-	-	-	-	-
LoRa (500kHz)	Pass	AV	3.88G	34.39	54.00	-19.61	-0.42	3	Horizontal	0	3.00	-

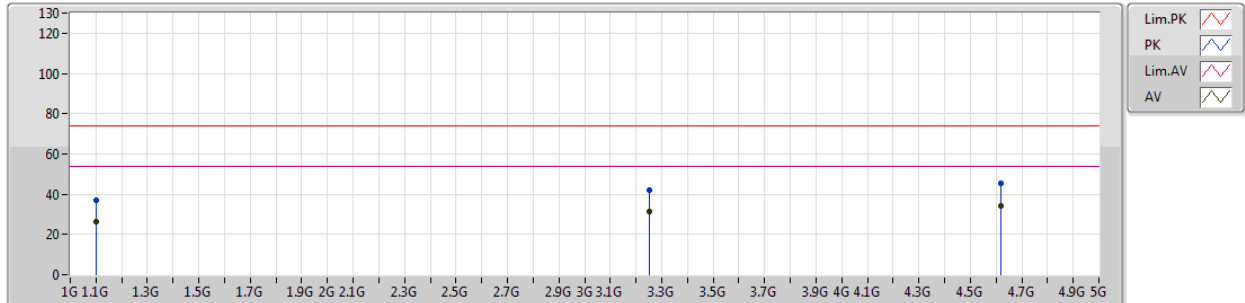
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
LoRa (500kHz)	-	-	-	-	-	-	-	-	-	-	-	-
922.4MHz	Pass	PK	1.1G	37.14	74.00	-36.86	-8.00	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	3.25G	42.09	74.00	-31.91	-1.72	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	4.62G	45.15	74.00	-28.85	2.42	3	Vertical	360	3.00	-
922.4MHz	Pass	AV	1.1G	26.11	74.00	-47.89	-8.00	3	Vertical	360	3.00	-
922.4MHz	Pass	AV	3.25G	31.54	74.00	-42.46	-1.72	3	Vertical	360	3.00	-
922.4MHz	Pass	AV	4.62G	34.03	74.00	-39.97	1.62	3	Vertical	360	3.00	-
922.4MHz	Pass	PK	1.29G	40.32	74.00	-33.68	-6.97	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	2.66G	43.52	74.00	-30.48	-2.89	3	Horizontal	0	3.00	-
922.4MHz	Pass	PK	3.88G	45.50	74.00	-28.50	-0.42	3	Horizontal	0	3.00	-
922.4MHz	Pass	AV	1.29G	29.55	54.00	-24.45	-6.97	3	Horizontal	0	3.00	-
922.4MHz	Pass	AV	2.66G	33.25	54.00	-20.75	-2.89	3	Horizontal	0	3.00	-
922.4MHz	Pass	AV	3.88G	34.39	54.00	-19.61	-0.42	3	Horizontal	0	3.00	-

LoRa (500kHz)RX

922.4MHz_RX

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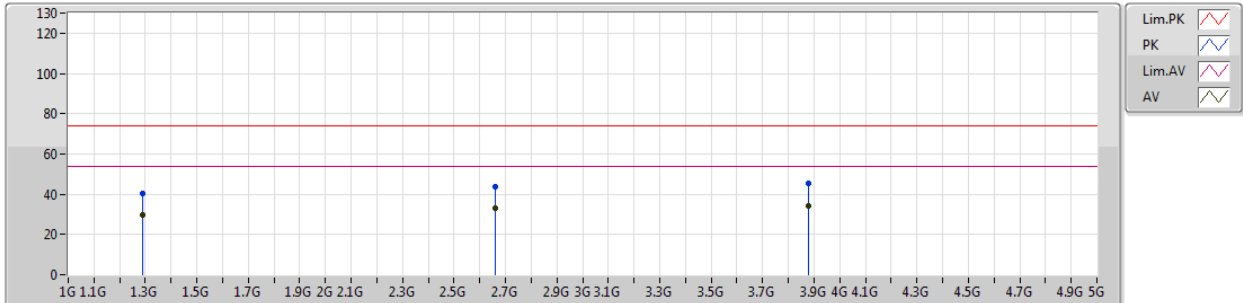


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	1.1G	37.14	74.00	-36.86	-8.00	3	Vertical	360	3.00	-
PK	3.25G	42.09	74.00	-31.91	-1.72	3	Vertical	360	3.00	-
PK	4.62G	45.15	74.00	-28.85	2.42	3	Vertical	360	3.00	-
AV	1.1G	26.11	74.00	-47.89	-8.00	3	Vertical	360	3.00	-
AV	3.25G	31.54	74.00	-42.46	-1.72	3	Vertical	360	3.00	-
AV	4.62G	34.03	74.00	-39.97	1.62	3	Vertical	360	3.00	-

LoRa (500kHz)RX

922.4MHz_RX

01/03/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	1.29G	40.32	74.00	-33.68	-6.97	3	Horizontal	0	3.00	-
PK	2.66G	43.52	74.00	-30.48	-2.89	3	Horizontal	0	3.00	-
PK	3.88G	45.50	74.00	-28.50	-0.42	3	Horizontal	0	3.00	-
AV	1.29G	29.55	54.00	-24.45	-6.97	3	Horizontal	0	3.00	-
AV	2.66G	33.25	54.00	-20.75	-2.89	3	Horizontal	0	3.00	-
AV	3.88G	34.39	54.00	-19.61	-0.42	3	Horizontal	0	3.00	-