



FCC RADIO TEST REPORT

Applicant : Ubiquiti Inc.
Address : 685 Third Avenue, New York, New York 10017, USA
Equipment : Environmental Sensor
Model No. : USL-Environmental
Trade Name : UBIQUITI
FCC ID : SWX-USLE

I HEREBY CERTIFY THAT :

The sample was received on Nov. 18, 2024 and the testing was completed on Dec. 17, 2024 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Supervisor

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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History of this test report

Report No.	Issued Date	Description
24110248-TRFCC01	Dec. 17, 2024	Original



1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

FCC Rule	Description of Test	Result
15.203	Antenna Requirement	PASS
15.207	AC Power Line Conducted Emission	N/A
15.209 15.205	Radiated Spurious Emission	PASS
15.247(d)	Conducted Spurious Emission	PASS
15.247(a)(1)	Channel Carrier Frequencies Separation	PASS
15.247(a)(1)	20dB Bandwidth	PASS
15.247(a)(1)	Dwell Time	PASS
15.247(b)	Number of Hopping Channels	PASS
15.247(b)	Peak Output Power Measurement Data	PASS

*The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement, measurement uncertainty evaluation is not considered.



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Operation Frequency Range	915MHz – 928MHz
Center Frequency Range	915.2MHz – 927.8MHz
Modulation Type	GFSK
Modulation Technology	FHSS
Antenna Type	PIFA FPC
Antenna Gain	0 dBi

Note:

1. EUT only support LoRa: SF5 ~ SF12 / 125kHz.
2. LoRa worst case is SF5.
3. For more details, please refer to the User's manual of the EUT.

2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
*00	915.2	25	920.2	50	925.2
01	915.4	26	920.4	51	925.4
02	915.6	27	920.6	52	925.6
03	915.8	28	920.8	53	925.8
04	916	29	921	54	926
05	916.2	30	921.2	55	926.2
06	916.4	*31	921.4	56	926.4
07	916.6	32	921.6	57	926.6
08	916.8	33	921.8	58	926.8
09	917	34	922	59	927
10	917.2	35	922.2	60	927.2
11	917.4	36	922.4	61	927.4
12	917.6	37	922.6	62	927.6
13	917.8	38	922.8	*63	927.8
14	918	39	923		
15	918.2	40	923.2		
16	918.4	41	923.4		
17	918.6	42	923.6		
18	918.8	43	923.8		
19	919	44	924		
20	919.2	45	924.2		
21	919.4	46	924.4		
22	919.6	47	924.6		
23	919.8	48	924.8		
24	920	49	925		

Note: Channels remarked * are selected to perform test.



2.3 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
- An executive program, "command Ver.: 10.0.19044.3086" under Windows 10 system was executed to transmit and receive data via LoRa.
- The test mode was performed for the test:

Radiated Emissions (30MHz ~ 1GHz)	
Test Mode 1	TX Mode, Power from Battery 3V
Radiated Emissions (1GHz ~ 10GHz)	
Test Mode 1	TX Mode, Power from Battery 3V

Modulation Type	TX CONFIGURATION
GFSK	1TX

2.4 Description of Test System

RF Conducted				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	lenovo	S1GL2W	N/A	N/A
Type-C (Blue)	kolin	KEX-DLCP08	1m / NS	N/A
Test Fixture	N/A	N/A	N/A	N/A

Radiated Emissions				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	DELL	Latitude E5470	N/A	Adapter / 1.8m / NS
Type-C (Blue)	kolin	KEX-DLCP08	1m / NS	N/A
Test Fixture	N/A	N/A	N/A	N/A



2.5 General Information of Test

☒ Test Site	CerpPASS Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel: +886-3-3226-888 Fax: +886-3-3226-881	
	FCC	TW1439, TW1079
	IC	4934E-1, 4934E-2
Frequency Range Investigated	Conducted: from 150kHz to 30 MHz Radiation: from 9 kHz to 10,000MHz	
Test Distance	The test distance of radiated emission from antenna to EUT is 3 M.	

Test Item	Test Site	Test Period	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2024/11/21	25.2°C / 56%	Leon Huang
RF Conducted	RFCON01-NK	2024/11/22	24.9°C / 58%	Leon Huang
RF Conducted	RFCON01-NK	2024/12/06	25.1°C / 50%	Leon Huang
RF Conducted	RFCON01-NK	2024/12/11	24.7°C / 57%	Leon Huang
RF Conducted	RFCON01-NK	2024/12/17	24.9°C / 52%	Leon Huang
Radiated Emissions	3M02-NK	2024/11/20	19.5°C / 46%	Park Chen

2.6 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)).

Measurement Item	Uncertainty
AC Power Line Conduction(150K~30MHz)	±3.2dB
Radiated Spurious Emission(9KHz~30MHz)	±3.405dB
Radiated Spurious Emission(30MHz~1GHz)	±5.326dB
Radiated Spurious Emission(1GHz~25GHz)	±5.918dB
Conducted Spurious Emission	±2.156dB
20dB Bandwidth	±4.40%
Peak Output Power(Conducted Power Meter)	±1.31dB
Dwell Time	±0.11%
Duty Cycle	±0.17%



3. Test Equipment and Ancillaries Used for Tests

Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M02-NK)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	369	2024/02/19	2025/02/18
Active Loop Antenna	Schwarzbeck	FMZB 1513	414	2024/01/16	2025/01/15
Horn Antenna	EMCO	3115	31589	2024/02/26	2025/02/25
Horn Antenna	EMCO	3116	31970	2024/02/23	2025/02/22
EMI Receiver	R&S	ESR 7	101906	2024/05/13	2025/05/12
Spectrum Analyzer	R&S	FSV 40-N	101329	2024/07/16	2025/07/15
Preamplifier	Agilent	8449B	3008A01954	2024/03/01	2025/02/28
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2024/10/15	2025/10/14
Preamplifier	EM Electronics corp.	EM330	60659	2024/02/17	2025/02/16
Cable-4m (9k-3G)	EMEC	RG-223	18274M	2024/08/08	2025/08/07
Cable-3in1 (30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1315	2024/02/23	2025/02/22
Cable-0.5m (1G-40G)	HUBER SUHNER	SUCOFLEX 104	805443/4	2024/03/05	2025/03/04
Cable-3m (1G-40G)	HUBER SUHNER	SUCOFLEX 104	805796/4	2024/03/05	2025/03/04
Cable-8m (1G-26.5G)	WOKEN	WCBA-WCA20 3SM	CCE1374	2024/03/05	2025/03/04
Cable-3m (10M-40G)	HUBER SUHNER	SF102	804619/2	2024/10/14	2025/10/13
Cable-1m (10M-40G)	HUBER SUHNER	SF102	804398/2	2024/10/14	2025/10/13
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA
Highpass Filter	WOKEN	WFIL-H1400-10000F	WR866WC2B1	2024/05/13	2025/05/12

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Spectrum Analyzer	R&S	FSP 40	100047	2024/03/01	2025/02/28
Attenuator	KEYSIGHT	8491B	MY39250703	2024/02/20	2025/02/19
Cable-0.5m (1G-26.5G)	HUBER SUHNER	SUCOFLEX 102	28422/2	2024/5/13	2025/05/12
Power Meter	Anritsu	ML2495A	1224005	2024/02/17	2025/02/16
Power Sensor	Anritsu	MA2411B	1207295	2024/02/17	2025/02/16
Switch Box	Theda	1-4	TW5451159	NA	NA



4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Antenna Construction and Directional Gain

Antenna Type	PIFA FPC
Antenna Gain	0 dBi



5. Test of AC Power Line Conducted Emission

5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

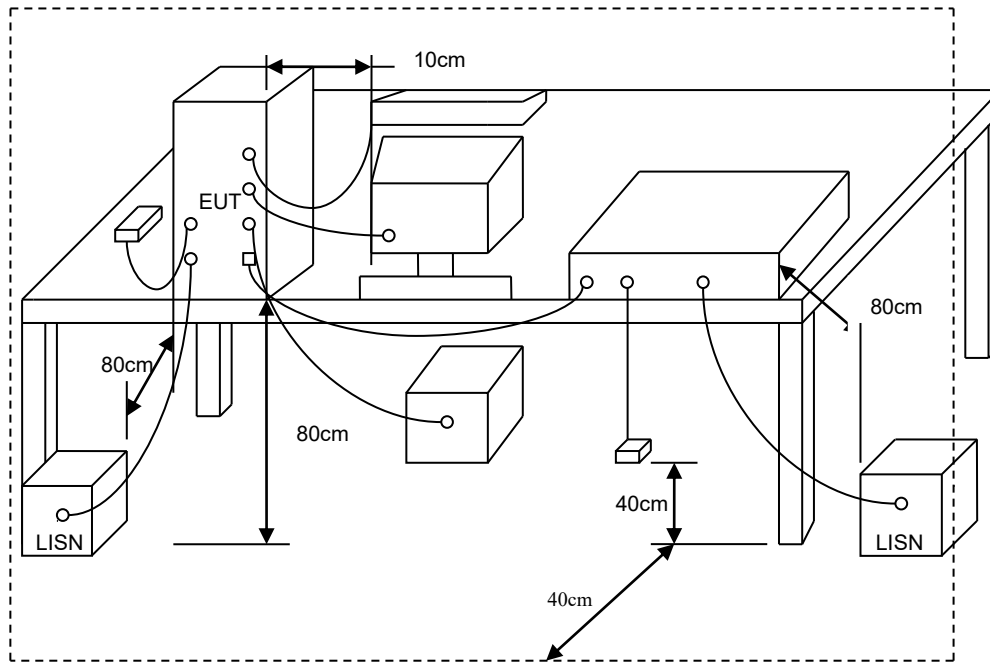
*Decreases with the logarithm of the frequency.

5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



5.3 Typical Test Setup



5.4 Test Result and Data

The EUT is powered from Battery, this test item is not applicable.



6. Test of Spurious Emission (Radiated)

6.1 Test Limit

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. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3



6.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

Note:

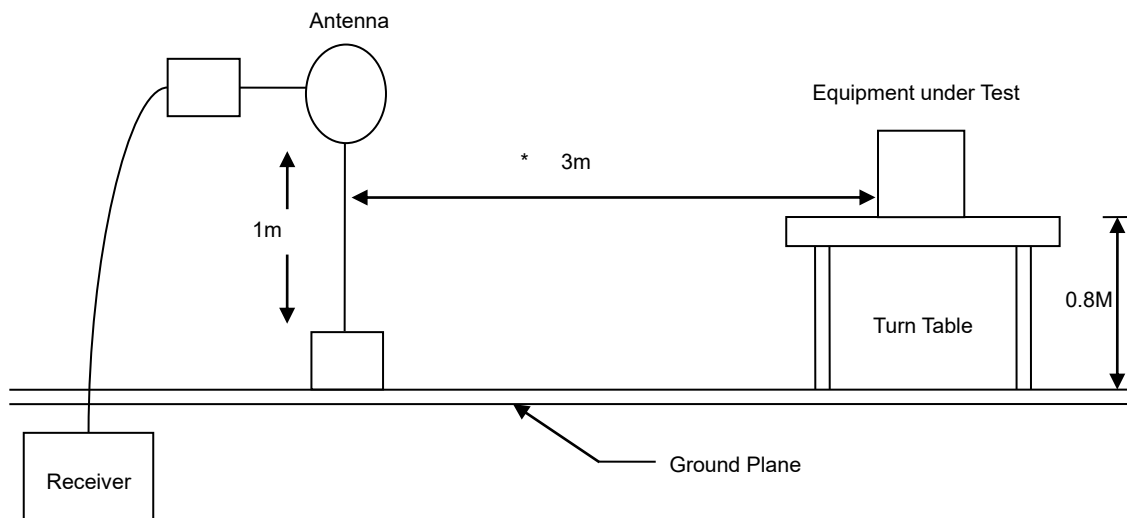
- 1.The supporting fixture shall permit orientation of the EUT in each of three orthogonal axis positions such that emissions from the EUT are maximized. (Z-AXIS is the worst.)
- 2.Due to the test software function limit the operation band setting(200dBuV/m).

There's no corresponding limitation in the actual test item.

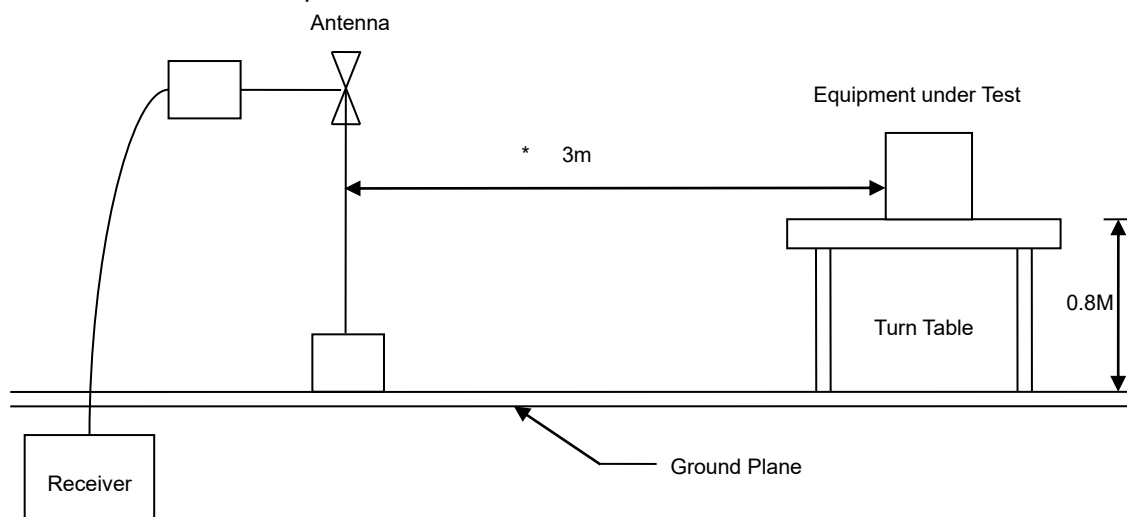


6.3 Typical Test Setup

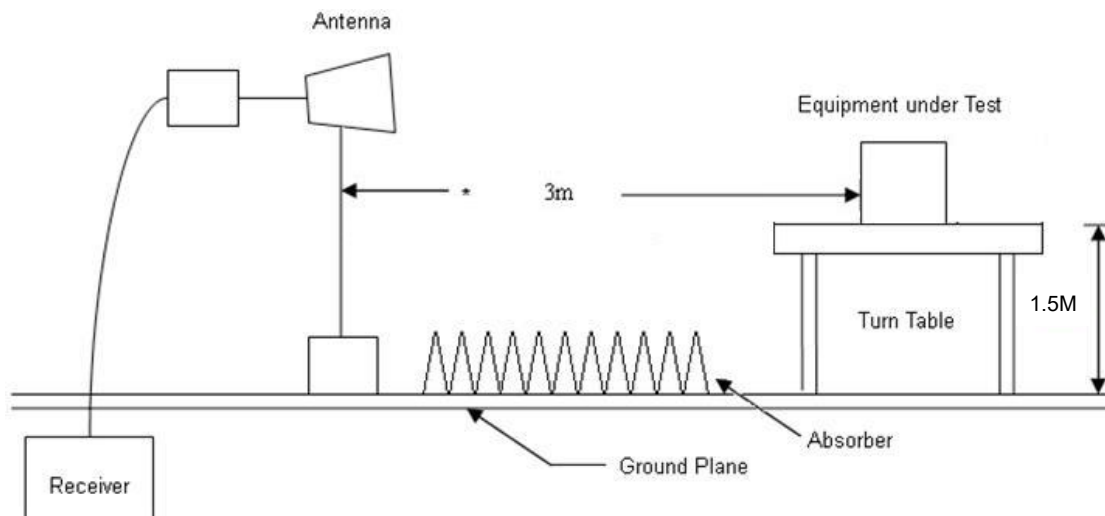
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup

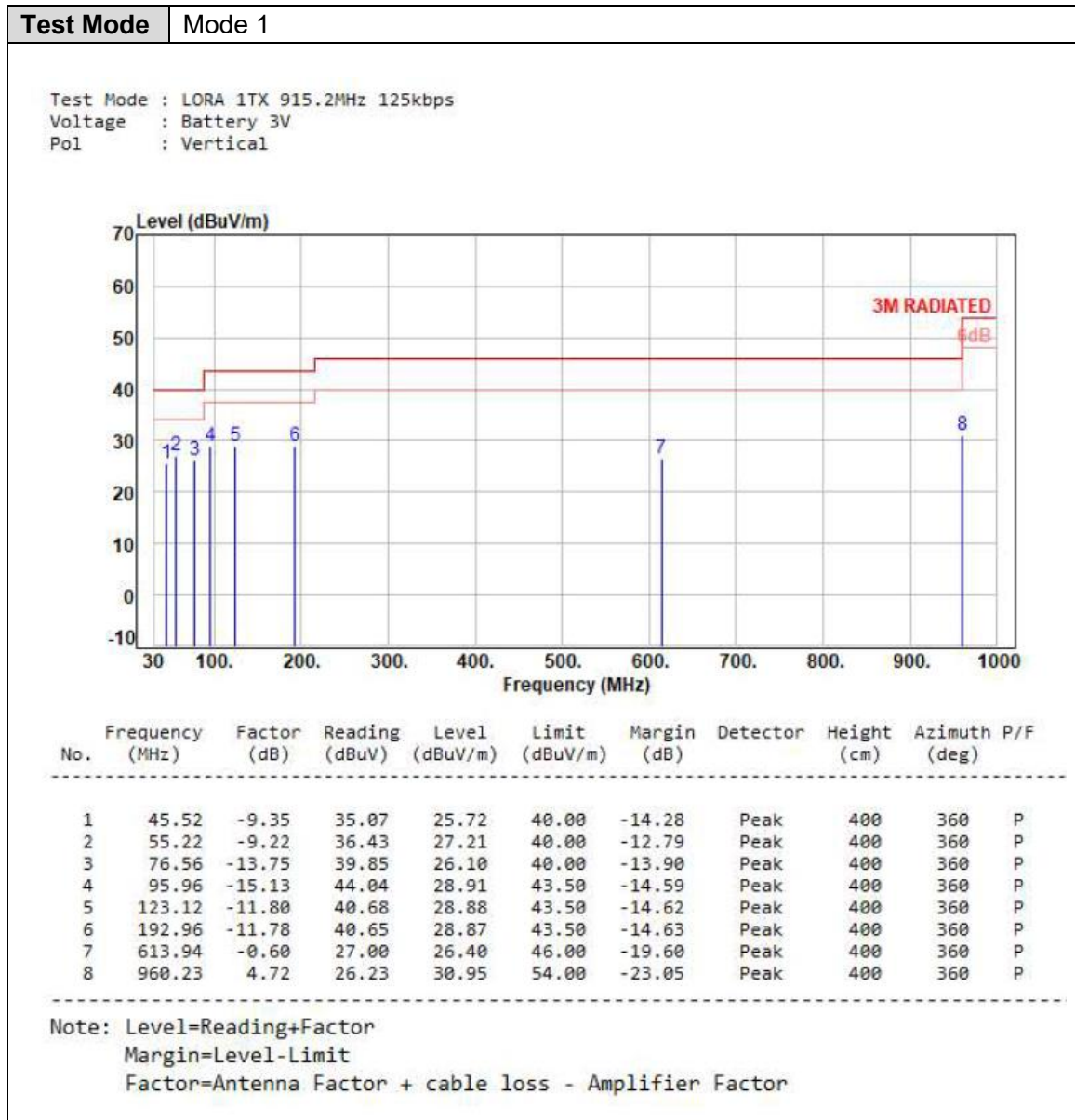


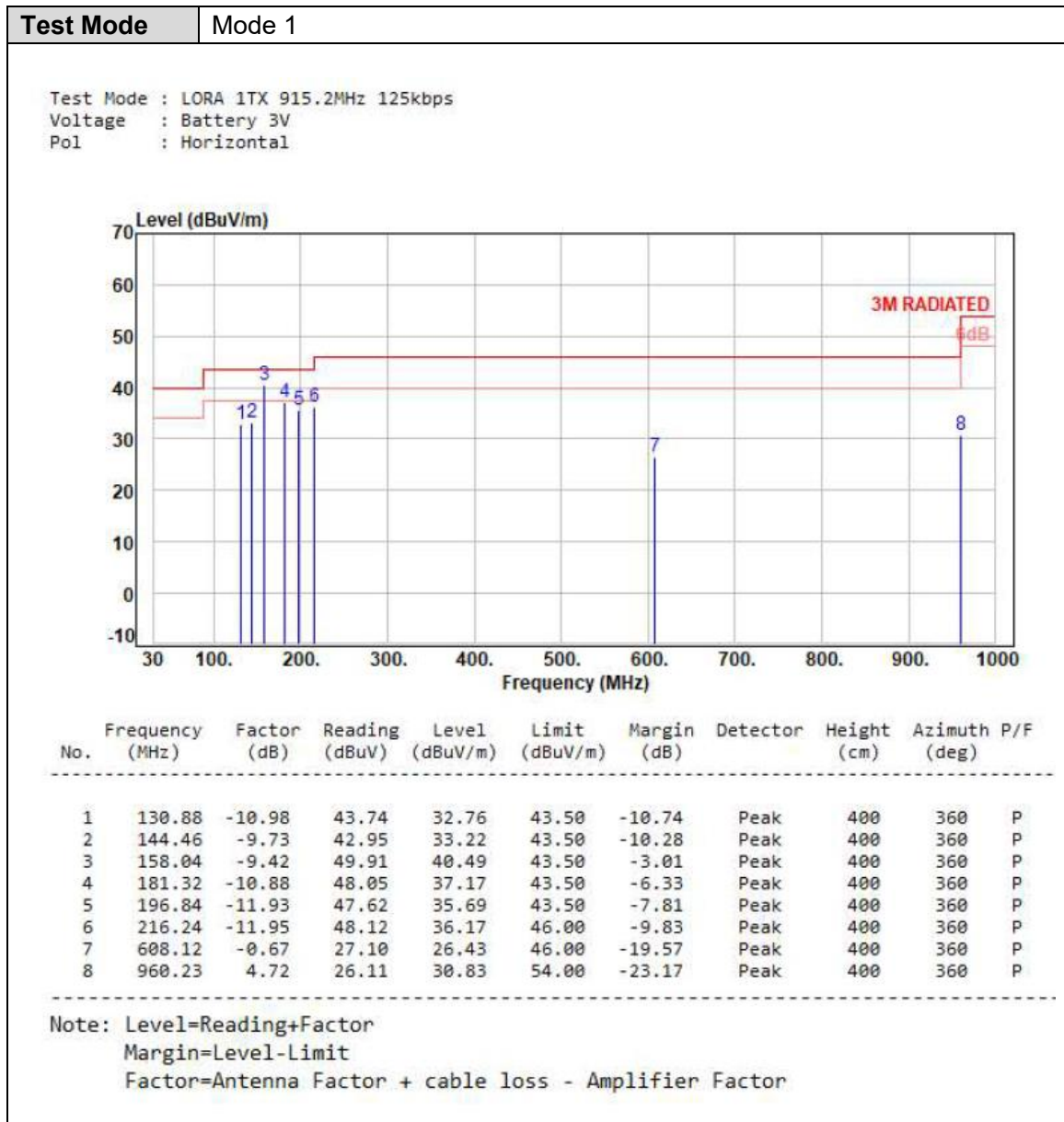


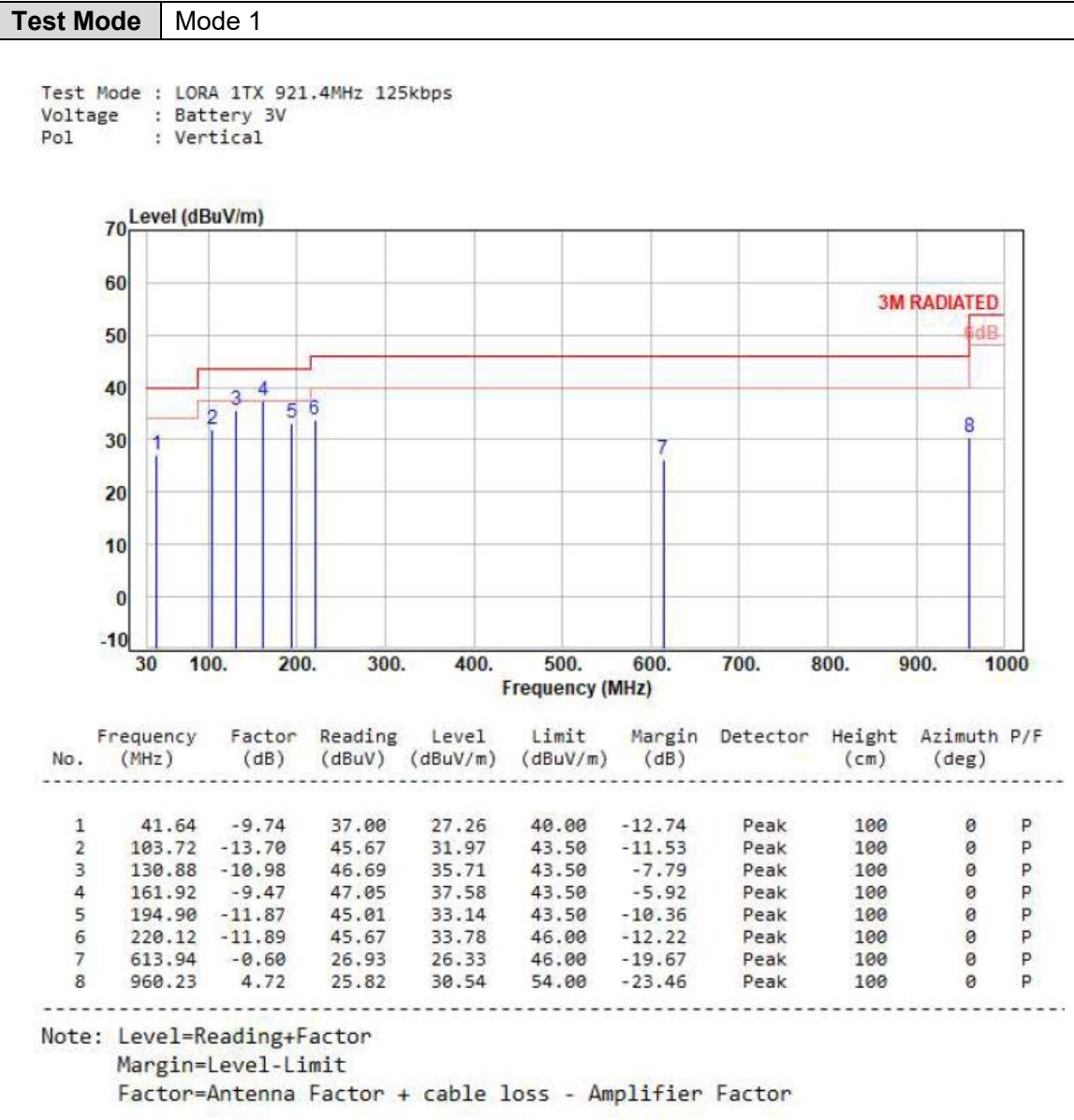
6.4 Test Result and Data (9kHz ~ 30MHz)

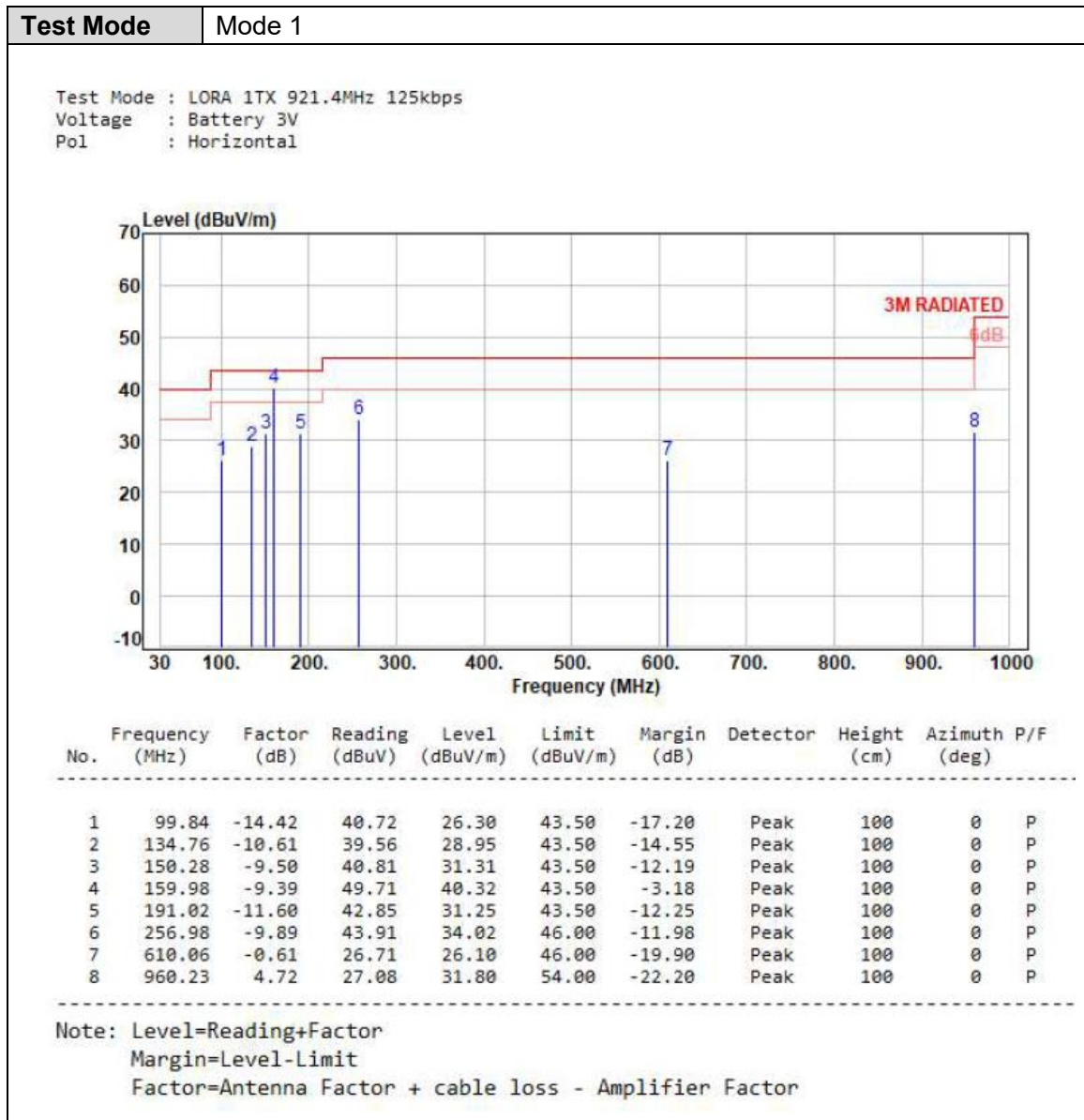
The 9kHz - 30MHz spurious emission is under limit 20dB more.

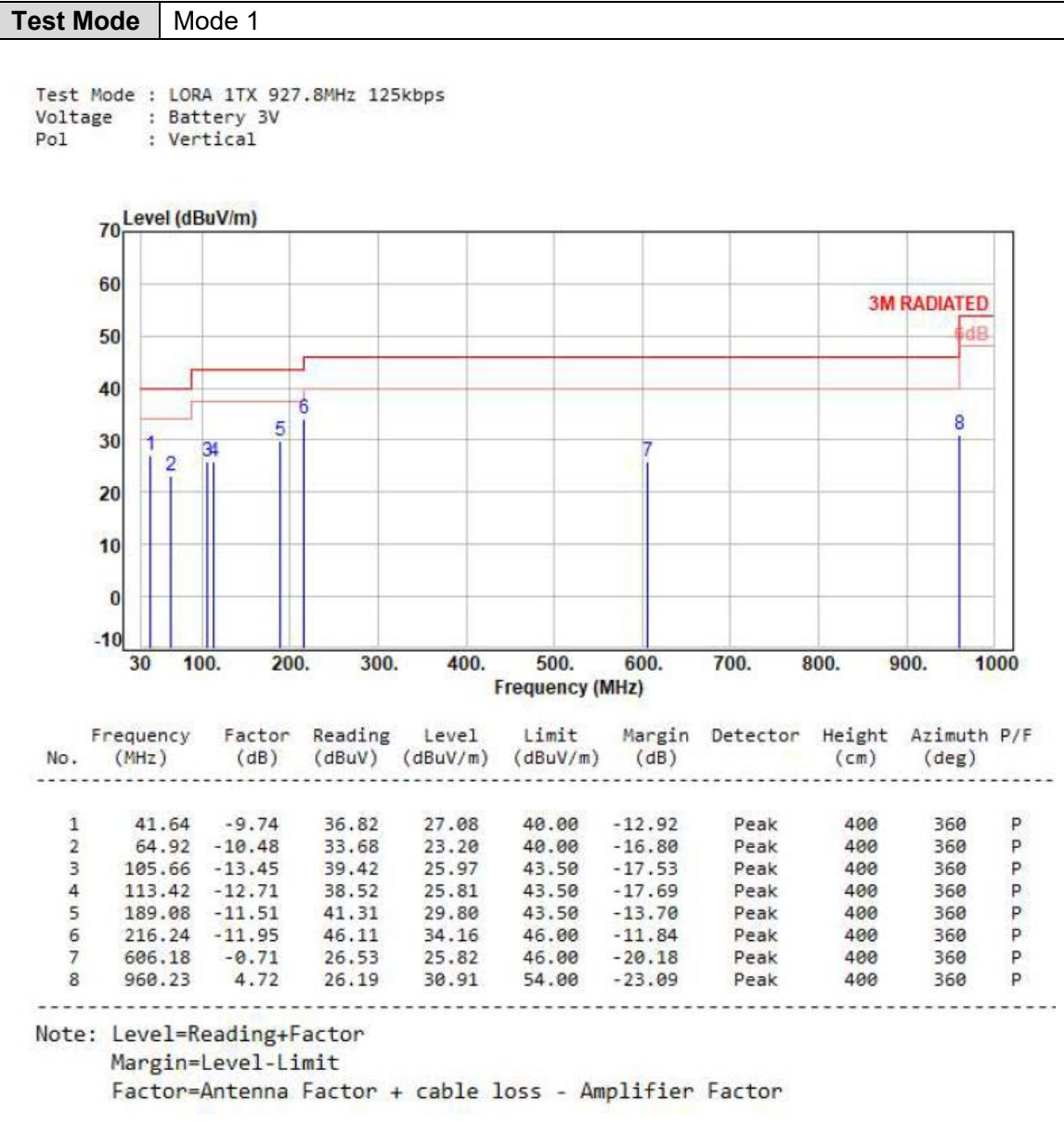
6.5 Test Result and Data (30MHz ~ 1GHz)





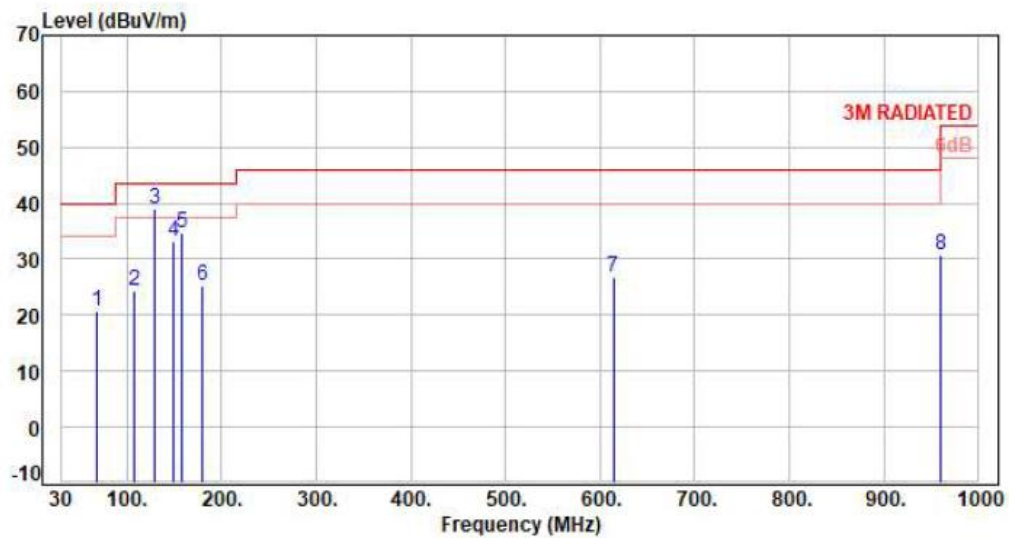






**Test Mode** Mode 1

Test Mode : LORA 1TX 927.8MHz 125kbps
Voltage : Battery 3V
Pol : Horizontal



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	68.80	-11.49	32.16	20.67	40.00	-19.33	Peak	400	360	P
2	107.60	-13.28	37.59	24.31	43.50	-19.19	Peak	400	360	P
3	128.94	-11.37	50.32	38.95	43.50	-4.55	Peak	400	360	P
4	148.34	-9.57	42.89	33.32	43.50	-10.18	Peak	400	360	P
5	158.04	-9.42	44.00	34.58	43.50	-8.92	Peak	400	360	P
6	179.38	-10.66	36.07	25.41	43.50	-18.09	Peak	400	360	P
7	613.94	-0.60	27.47	26.87	46.00	-19.13	Peak	400	360	P
8	960.23	4.72	26.02	30.74	54.00	-23.26	Peak	400	360	P

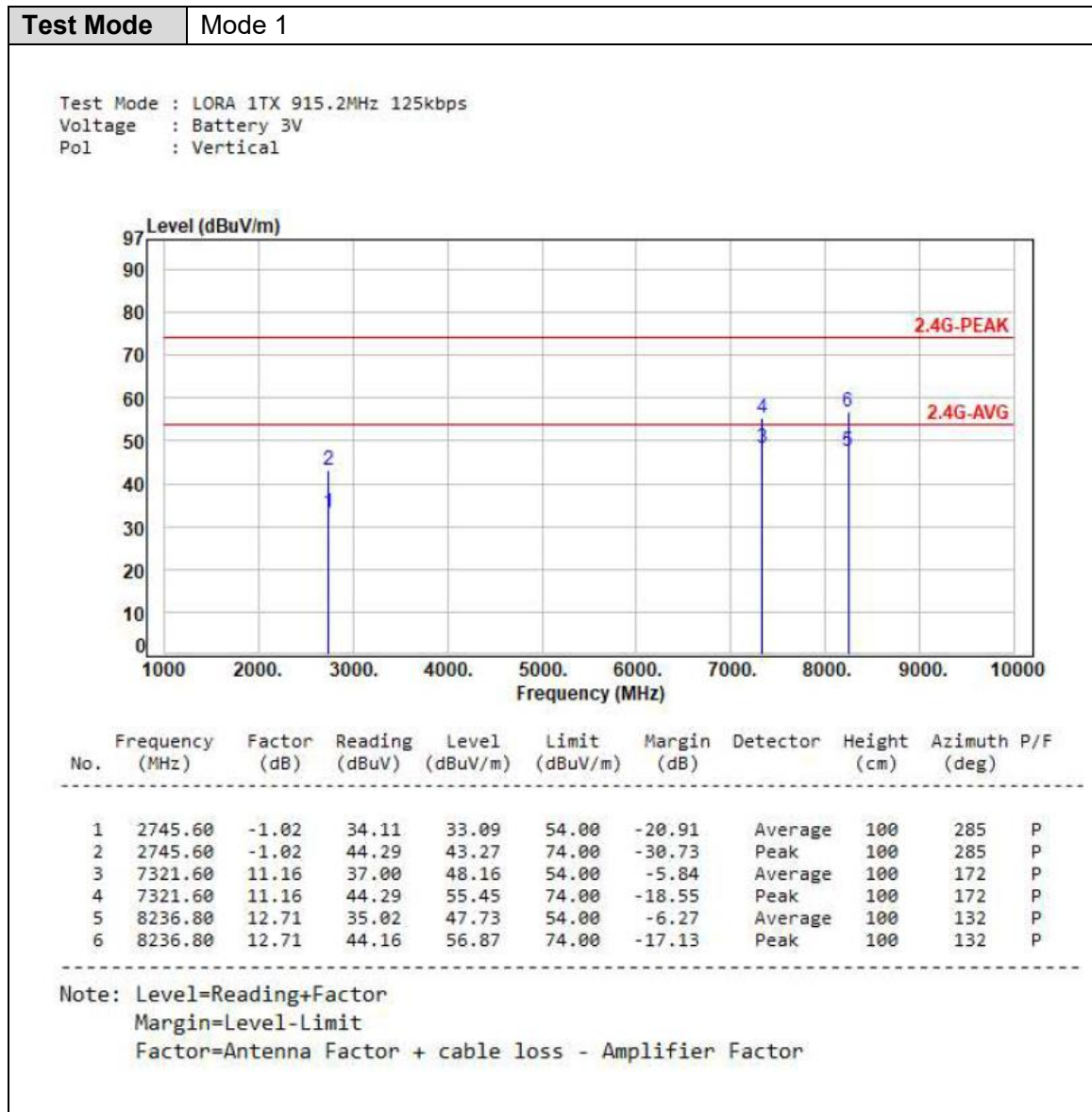
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



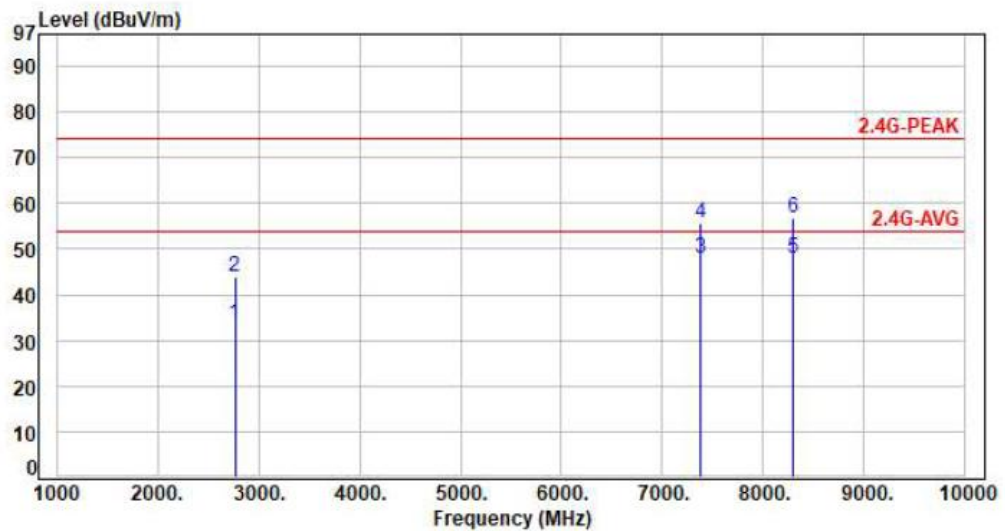
6.6 Test Result and Data (1GHz ~ 10GHz)





**Test Mode** Mode 1

Test Mode : LORA 1TX 921.4MHz 125kbps
Voltage : Battery 3V
Pol : Vertical

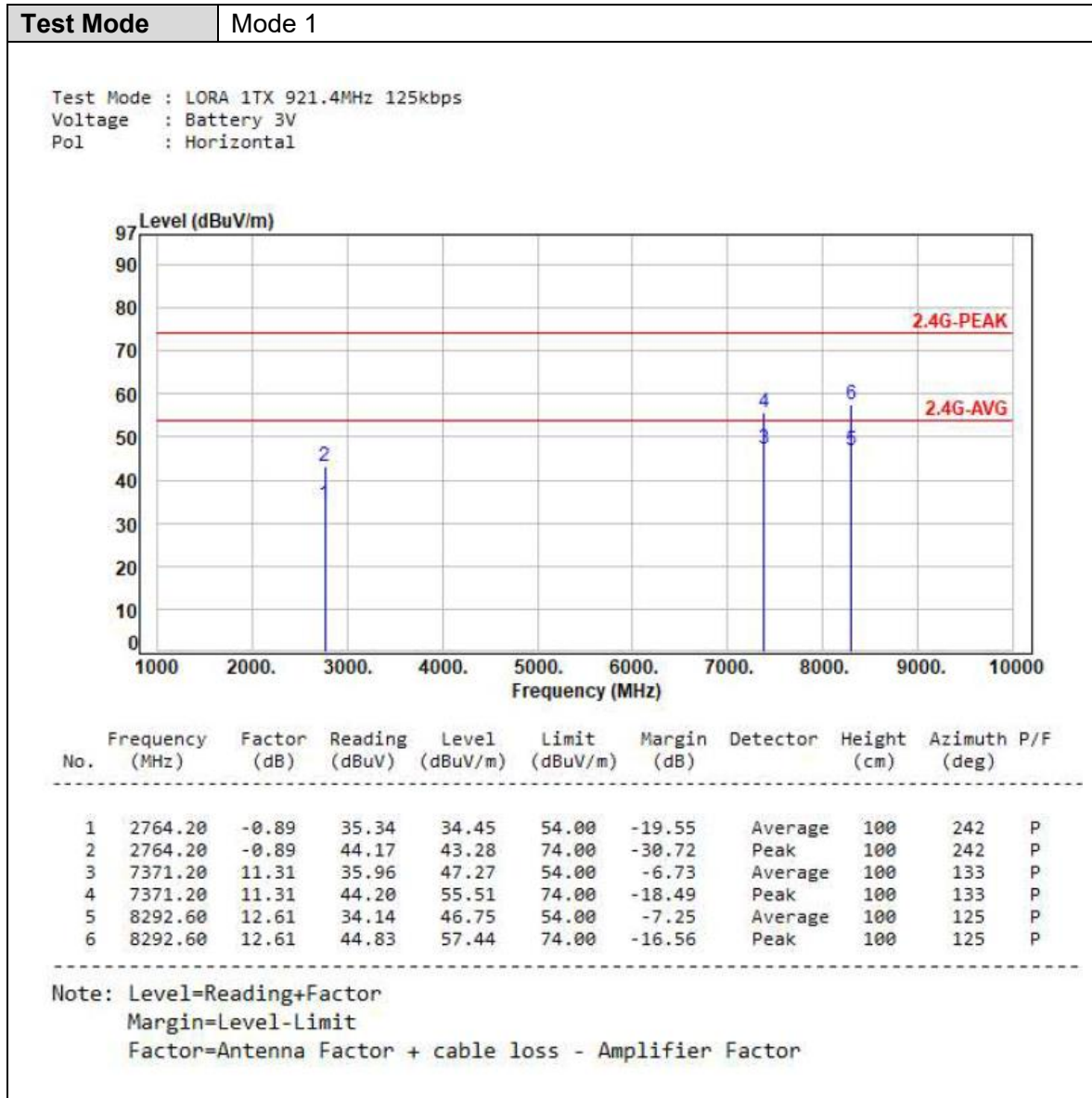


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2764.20	-0.89	34.38	33.49	54.00	-20.51	Average	100	284	P
2	2764.20	-0.89	44.69	43.80	74.00	-30.20	Peak	100	284	P
3	7371.20	11.31	36.50	47.81	54.00	-6.19	Average	100	174	P
4	7371.20	11.31	44.34	55.65	74.00	-18.35	Peak	100	174	P
5	8292.60	12.61	35.41	48.02	54.00	-5.98	Average	100	130	P
6	8292.60	12.61	44.24	56.85	74.00	-17.15	Peak	100	130	P

Note: Level=Reading+Factor

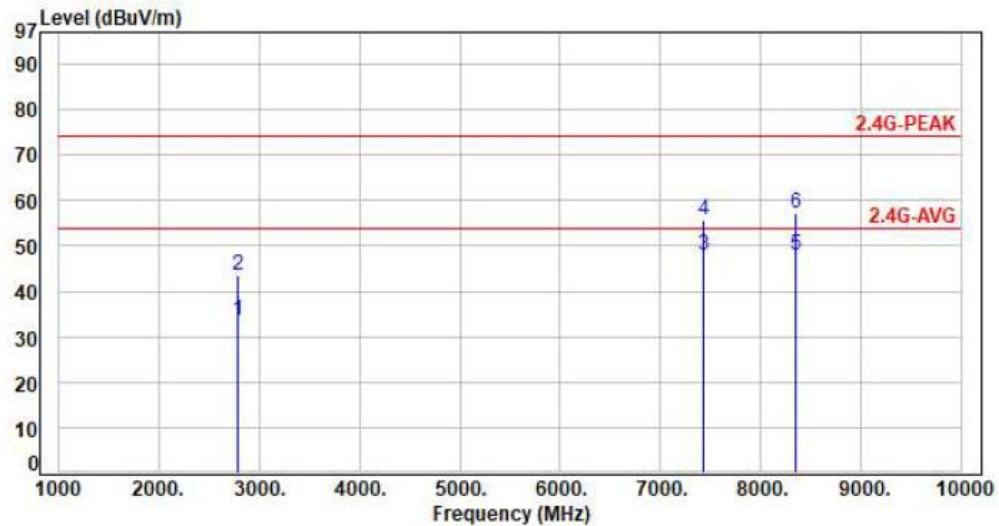
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



**Test Mode** Mode 1

Test Mode : LORA 1TX 927.8MHz 125kbps
Voltage : Battery 3V
Pol : Vertical

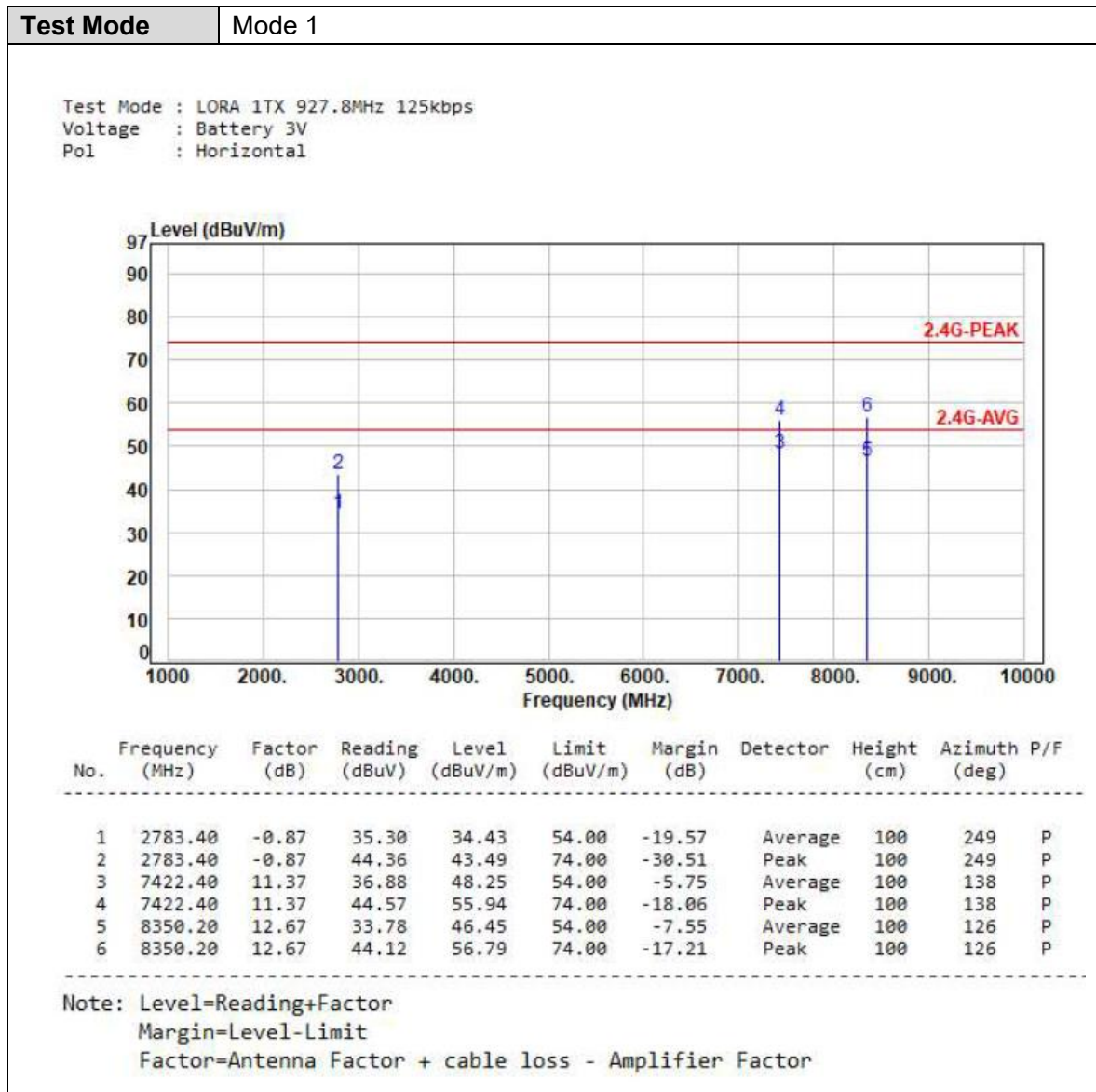


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2783.40	-0.87	34.51	33.64	54.00	-20.36	Average	100	287	P
2	2783.40	-0.87	44.42	43.55	74.00	-30.45	Peak	100	287	P
3	7422.40	11.37	36.67	48.04	54.00	-5.96	Average	100	177	P
4	7422.40	11.37	44.49	55.86	74.00	-18.14	Peak	100	177	P
5	8350.20	12.67	35.37	48.04	54.00	-5.96	Average	100	133	P
6	8350.20	12.67	44.31	56.98	74.00	-17.02	Peak	100	133	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor





6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.250
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz



7. Test of Spurious Emission (Conducted)

7.1 Test Limit

According to the methods defined in ANSI C63.10-2013 Section 11.11.1

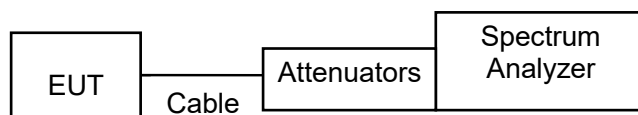
Below -20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

According to the methods defined in ANSI C63.10-2013 Section 11.11.2 & 11.11.3

- The transmitter output was connected to the spectrum analyzer via a low loss cable.
- Set both RBW and VBW of spectrum analyzer to 100 KHz and 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- The band edges was measured and recorded.

7.3 Test Setup Layout

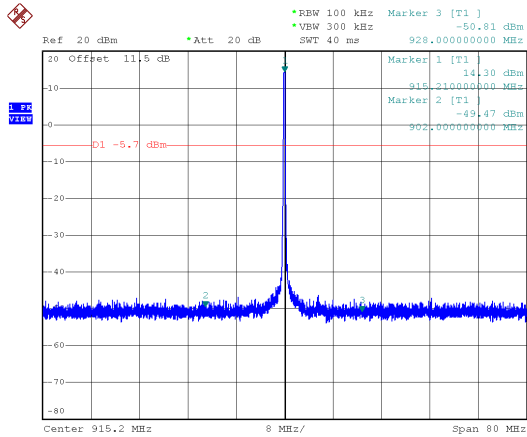


7.4 Test Result and Data

Note: Test plots refer to the following pages.

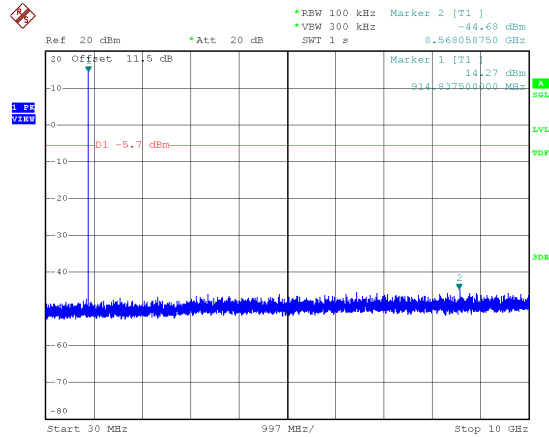


CH00



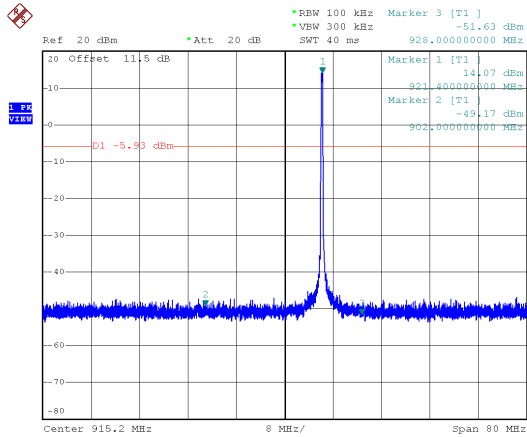
Date: 21.NOV.2024 16:24:01

CH00



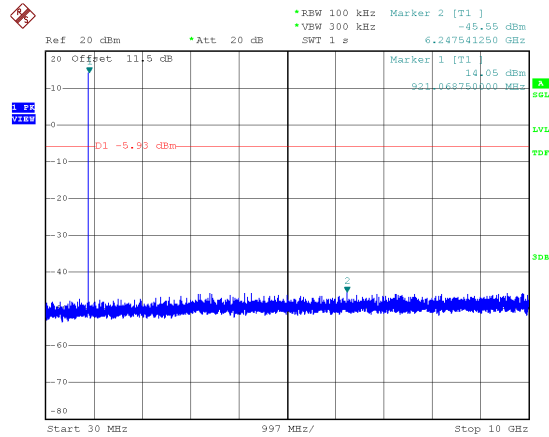
Date: 21.NOV.2024 16:25:55

CH31



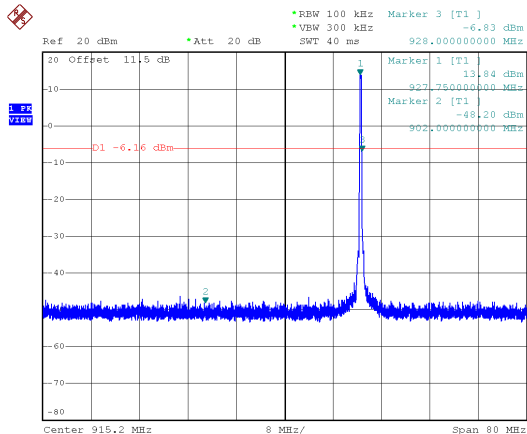
Date: 21.NOV.2024 16:27:18

CH31



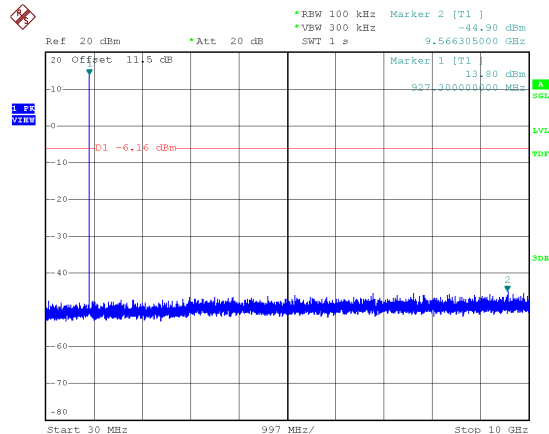
Date: 21.NOV.2024 16:27:44

CH63



Date: 21.NOV.2024 16:29:44

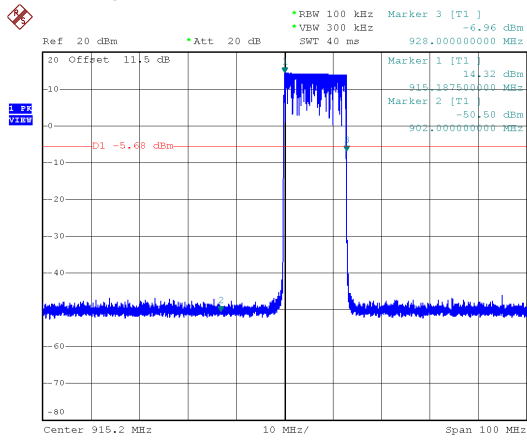
CH63



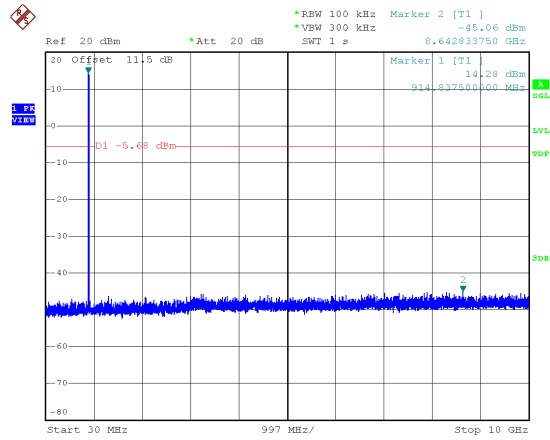
Date: 21.NOV.2024 16:30:10



Hopping



Date: 21.NOV.2024 16:49:44



Date: 21.NOV.2024 16:50:28



8. 20dB Bandwidth Measurement Data

8.1 Test Limit

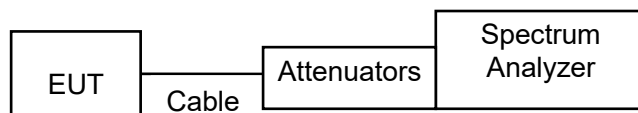
The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

8.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 6.9

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 10 KHz and VBW to 30 KHz.
- The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

8.3 Test Setup Layout

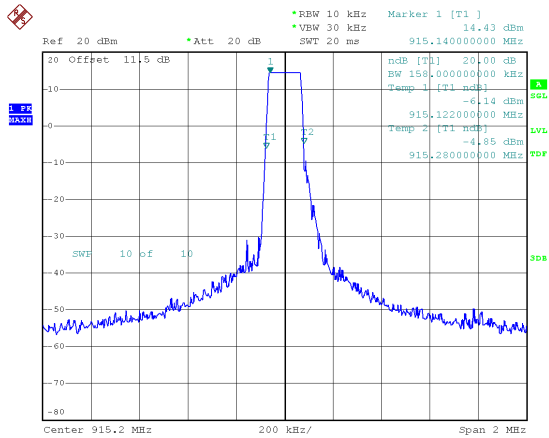


8.4 Test Result and Data

Modulation Type	Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
GFSK	0	915.2	0.158	0.500
	31	921.4	0.160	0.500
	63	927.8	0.160	0.500

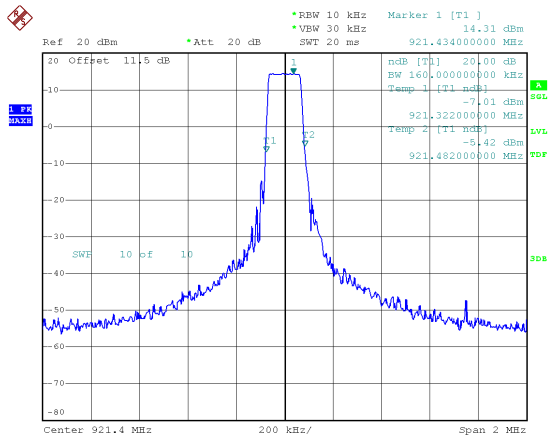


CH00



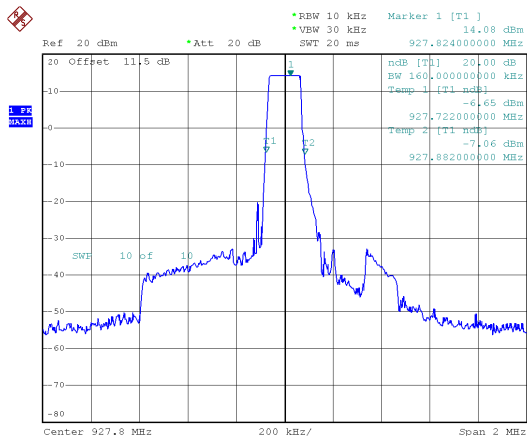
Date: 21.NOV.2024 14:38:49

CH31



Date: 21.NOV.2024 16:03:46

CH63



Date: 21.NOV.2024 16:59:21



9. Frequencies Separation

9.1 Test Limit

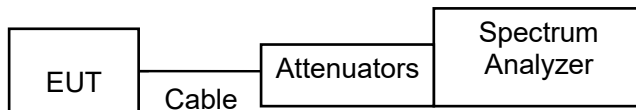
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

9.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.2

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 30 KHz and VBW to 100 KHz.
- By using the MaxHold function record the separation of two adjacent channels.
- Measure the frequency difference of these two adjacent channels.

9.3 Test Setup Layout

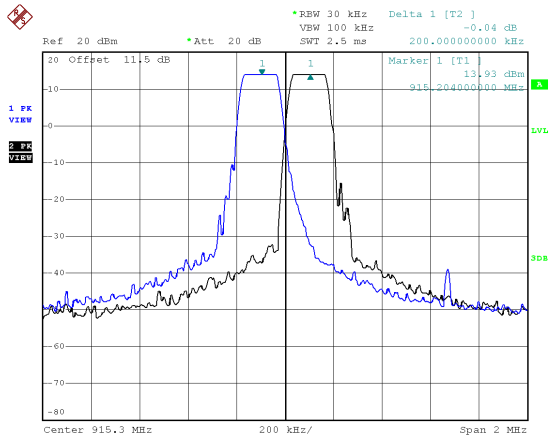


9.4 Test Result and Data

Modulation Type	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	0	915.2	0.20	0.158
	31	921.4	0.20	0.16
	63	927.8	0.20	0.16

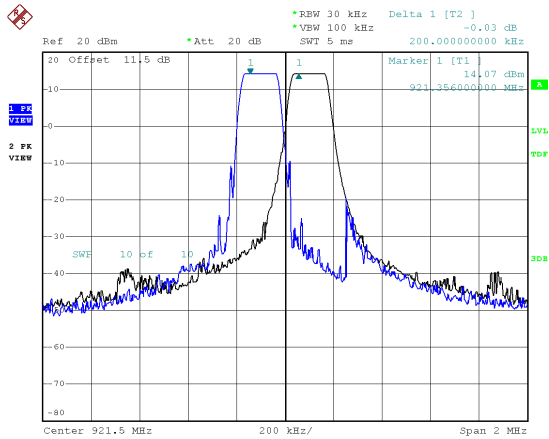


CH00



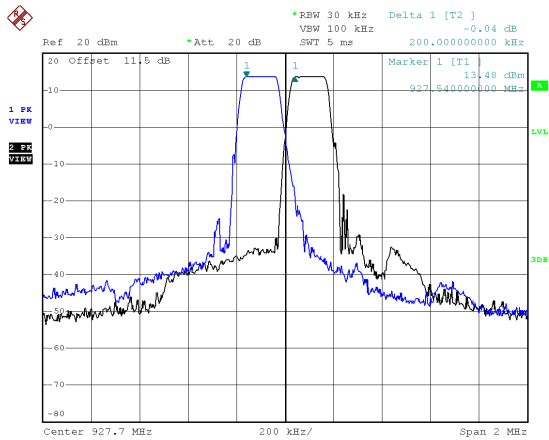
Date: 21.NOV.2024 15:27:40

CH31



Date: 21.NOV.2024 16:03:03

CH63



Date: 21.NOV.2024 16:15:05



10. Dwell Time on each channel

10.1 Test Limit

For frequency hopping systems operating in the 902-928 MHz band:

if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period;

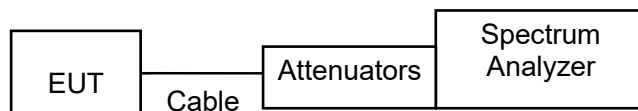
if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

10.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.4

1. The transmitter output was connected to the spectrum analyzer.
2. Adjust the center frequency to measure frequency, then set zero span mode.
2. Set RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz.
4. Measure the time duration of one transmission on the measured frequency.

10.3 Test Setup Layout

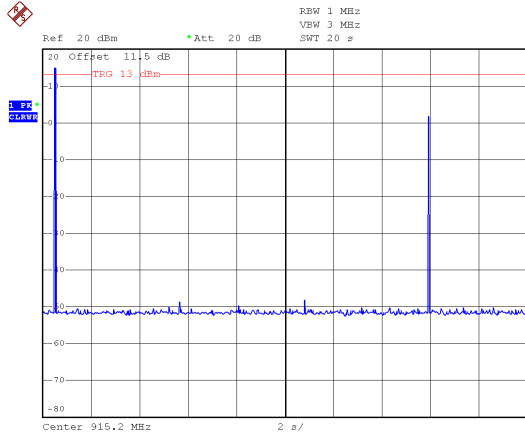


10.4 Test Result and Data

Channel	Frequency (MHz)	Length of transmission time (ms)	Number of transmission in a 20 sec	Dwell Time(ms)	Limit (ms)
0	915.2	13.400	1.00	13.40	400
31	921.4	13.440	1.00	13.44	400
63	927.8	13.440	1.00	13.44	400

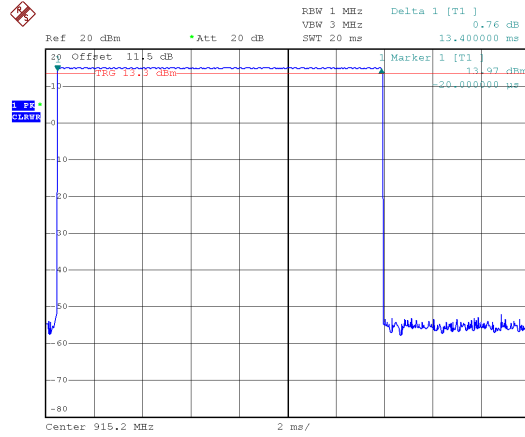


CH00



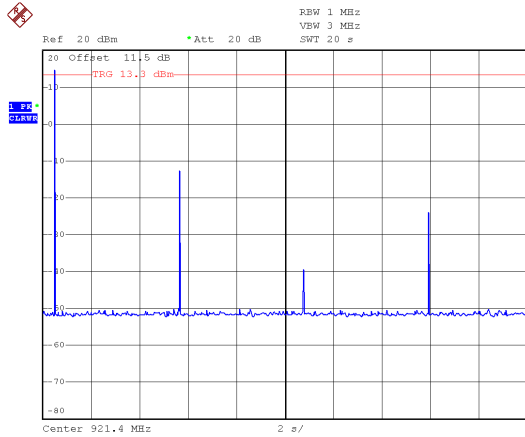
Date: 17.DEC.2024 10:56:32

CH00



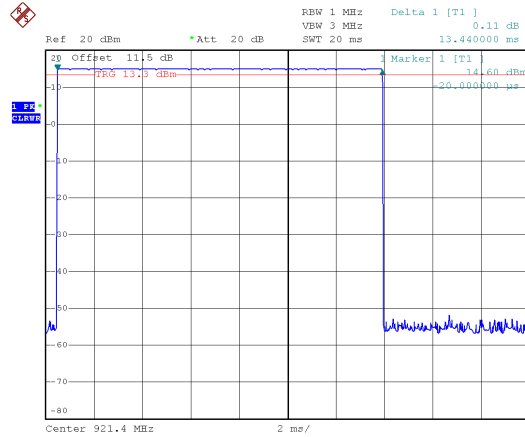
Date: 17.DEC.2024 11:02:40

CH31



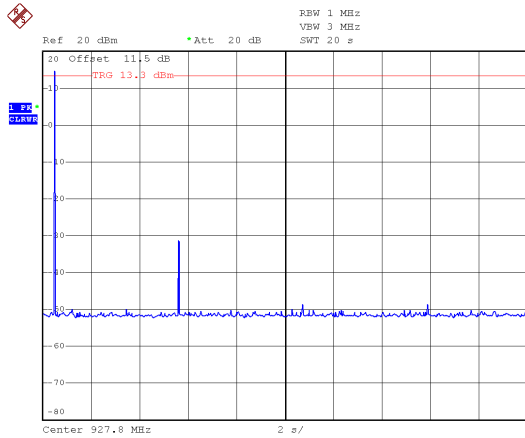
Date: 17.DEC.2024 11:06:05

CH31



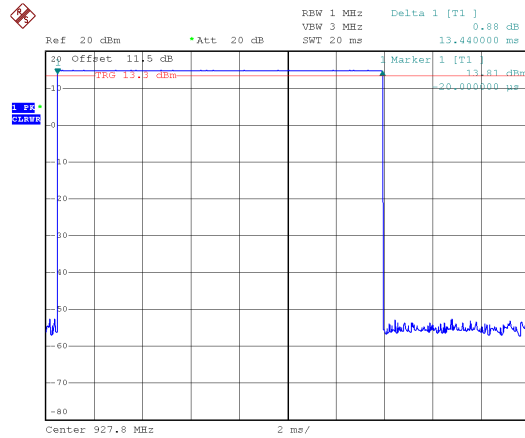
Date: 17.DEC.2024 11:07:09

CH63



Date: 17.DEC.2024 11:08:36

CH63



Date: 17.DEC.2024 11:16:54



11. Number of Hopping Channels

11.1 Test Limit

For frequency hopping systems operating in the 902-928 MHz band:

if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies

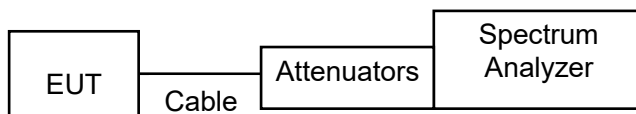
if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies

11.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.3

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100 KHz and VBW to 300 KHz.
- Set the MaxHold function, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been record.

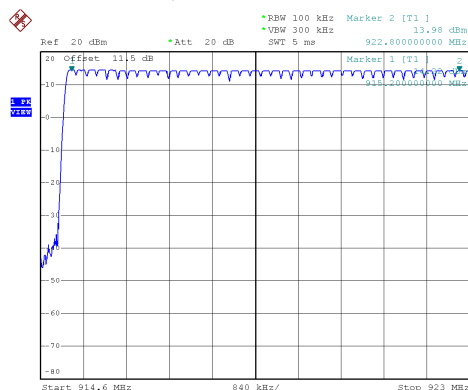
11.3 Test Setup Layout



11.4 Test Result and Data

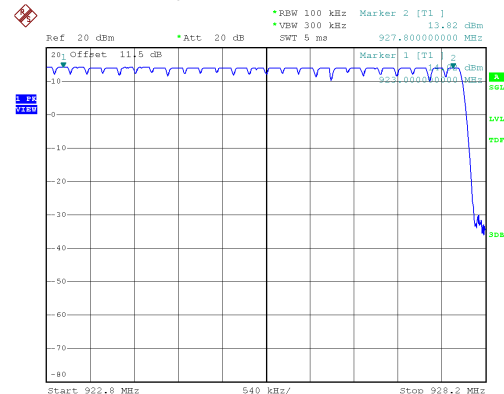
Modulation Type	Hopping Channels	Limit
GFSK	64	50

Modulation Type: GFSK



Date: 21.NOV.2024 16:35:07

Modulation Type: GFSK



Date: 21.NOV.2024 16:35:50



12. Maximum Peak Output Power

12.1 Test Limit

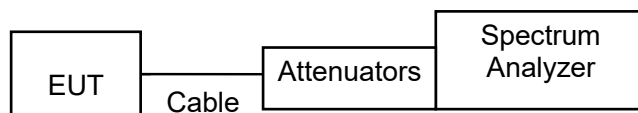
The Maximum Peak Output Power Measurement is 30dBm.

12.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 7.8.5

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

12.3 Test Setup Layout



12.4 Test Result and Data

Setting	Modulation Type	Channel	Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Limit (dBm)
15	GFSK	0	915.2	13.83	24.155	30.000
15		31	921.4	13.57	22.751	30.000
15		63	927.8	13.29	21.330	30.000

Setting	Modulation Type	Channel	Frequency (MHz)	AV Output Power (dBm)	AV Output Power (mW)
15	GFSK	0	915.2	13.79	23.933
15		31	921.4	13.53	22.542
15		63	927.8	13.25	21.135

*Average power is for reference only.

-----THE END OF REPORT-----