



FCC RF Test Report

APPLICANT : Relay, Inc.
EQUIPMENT : Relay
BRAND NAME : RelayM
MODEL NAME : RY2267
FCC ID : 2AMBHRY2267
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
TEST DATE(S) : Oct. 22, 2024 ~ Feb. 12, 2025

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

This report contains data that were produced under subcontract by Sporton International Inc. (ShenZhen)

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (Kunshan)

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR250505E	Rev. 01	Initial issue of report	Feb. 24, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)(3)	Output Power	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm/3kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	$\leq 30\text{dBc}$	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 52.52 dB at 894.27 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.46 dB at 0.549 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-
Remark: Not required means after assessing, test items are not necessary to carry out.					

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Relay, Inc.

2230 Bandmate Way, Suite 500, Raleigh, NC 27607, USA

1.2 Manufacturer

Relay, Inc.

2230 Bandmate Way, Suite 500, Raleigh, NC 27607, USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Relay
Brand Name	RelayM
Model Name	RY2267
FCC ID	2AMBHRY2267
IMEI Code/SN	Conducted: CE5CA461 Conduction: 990007540010797/990007540010789 Radiation: 0010904
HW Version	v01
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	904 MHz ~ 926 MHz
Number of Channels	23
Bandwidth / Spread Factor	500kHz / SF7
Maximum Output Power to Antenna	LoRa DTS : 27.95 dBm (0.6237 W)
99% Occupied Bandwidth	LoRa DTS : 0.52 MHz
Antenna Type / Gain	PIFA Antenna with gain -8.20 dBi
Type of Modulation	LoRa

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS TH01-KS	CN1257	314309

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-SZ	CN1256	421272

Test data subcontracted: Radiated Spurious Emission test case in section 3.5 of this report.

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	CO01-KS	AUDIX	E3	6.2009-8-24
2.	03CH04-SZ	AUDIX	E3	6.2009-8-24



1.8 Applicable Standards

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

- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq.(MHz)	Channel	Freq.(MHz)
904-926 MHz	1	904	13	916
	2	905	14	917
	3	906	15	918
	4	907	16	919
	5	908	17	920
	6	909	18	921
	7	910	19	922
	8	911	20	923
	9	912	21	924
	10	913	22	925
	11	914	23	926
	12	915	-	-

Note: The above EUT's information was declared by manufacturer.

2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

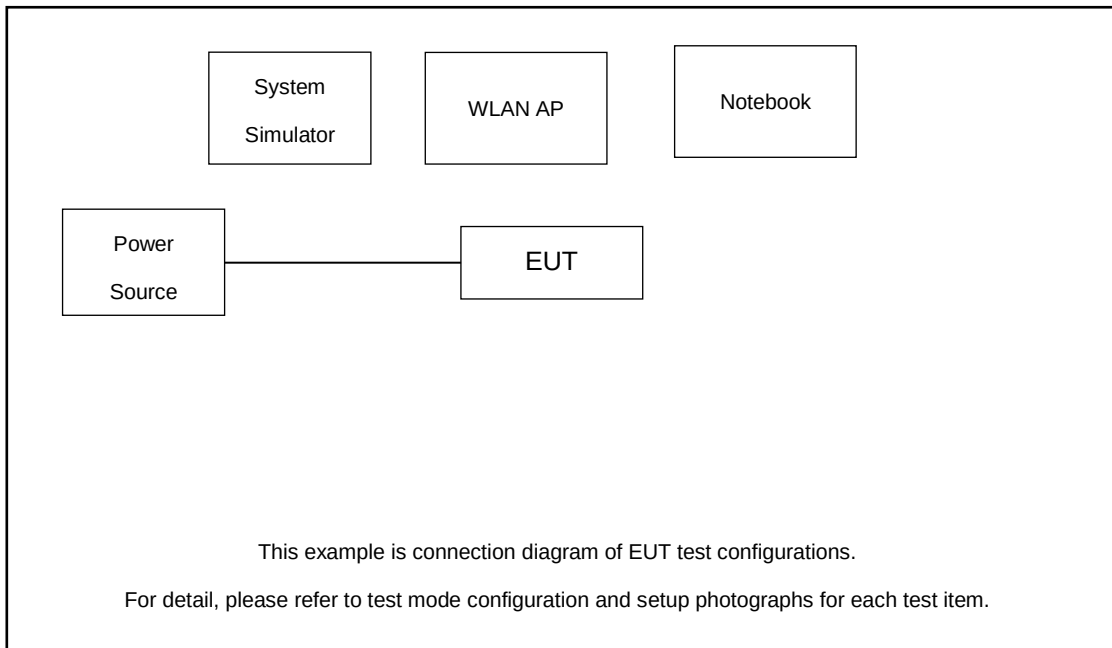
- b. AC power line Conducted Emission was tested under maximum output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

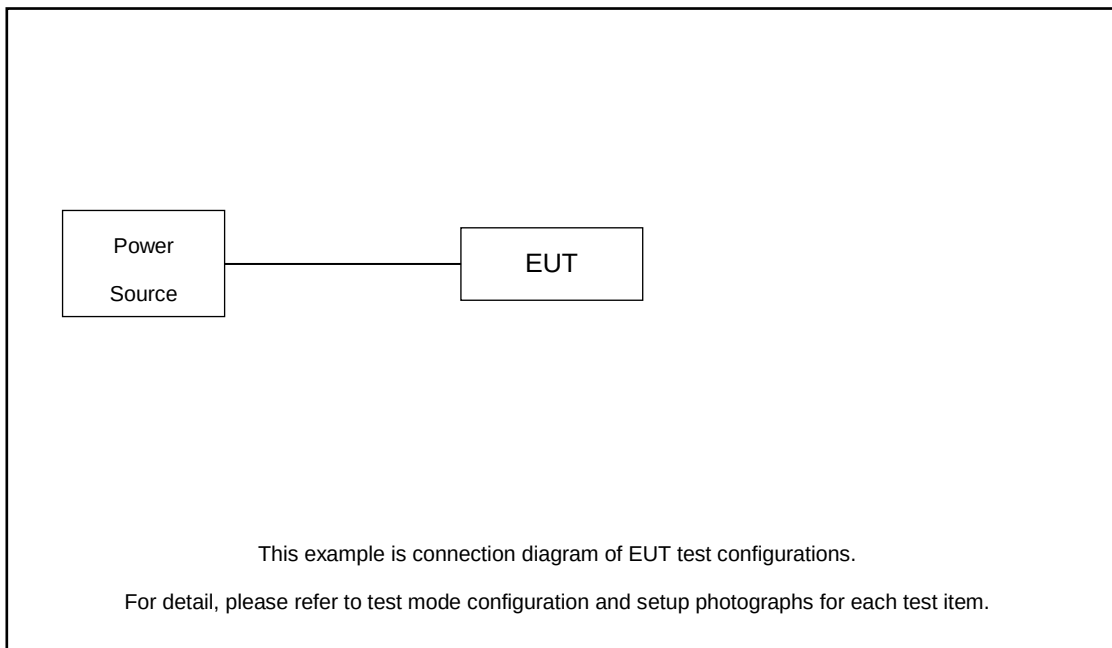
Summary table of Test Cases	
Test Item	Modulation
	Lora 500kHz DTS
Conducted TCs	Mode 1: LoRa Tx CH01_904 MHz Mode 2: LoRa Tx CH12_915 MHz Mode 3: LoRa Tx CH23_926 MHz
Radiated TCs	Mode 1: LoRa Tx CH01_904 MHz Mode 2: LoRa Tx CH12_915 MHz Mode 3: LoRa Tx CH23_926 MHz
AC Conducted Emission	Mode 1 : n12 Link + Bluetooth Link + WLAN Link(2.4G) + Lora Link

2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
2.	LTE Base Station	Anritus	MT8821C	N/A	N/A	Unshielded,1.8m
3.	5GNR Base Station	Anritus	MT8000A	N/A	N/A	Unshielded,1.8m
4.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A
5.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
6.	USB cable	Motorola	SKN6378A	Fcc DoC	N/A	Unshielded,1m
7.	Adapter	Amazon	PS57CP	Fcc DoC	N/A	N/A

2.5 EUT Operation Test Setup

For LoRa function, the engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 0.5 dB and 10dB attenuator.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 0.5 + 10 = 10.50 \text{ (dB)}
 \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

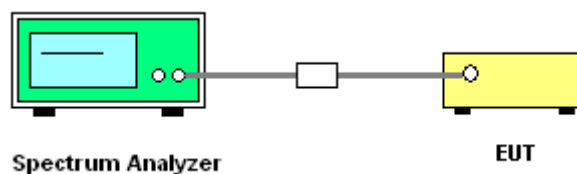
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 20kHz and set the Video bandwidth (VBW) = 100kHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup

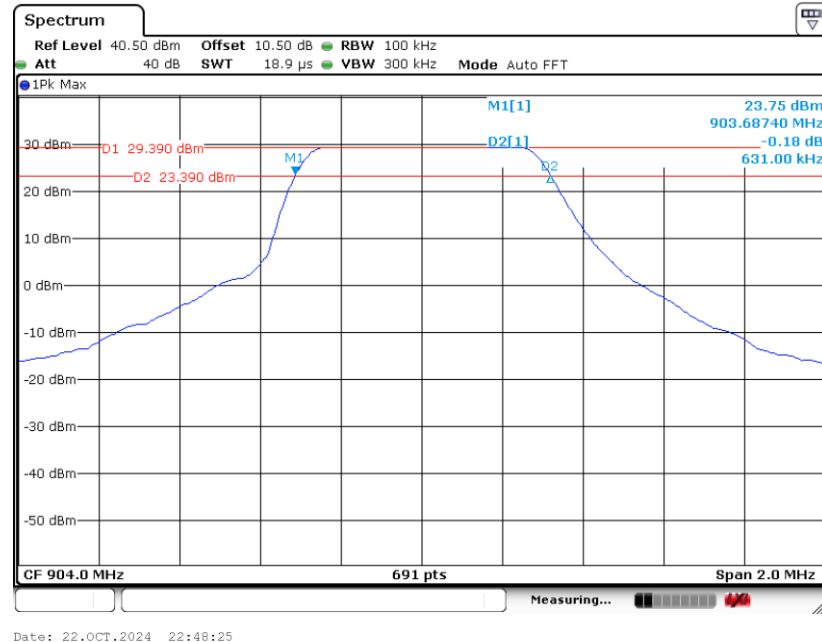




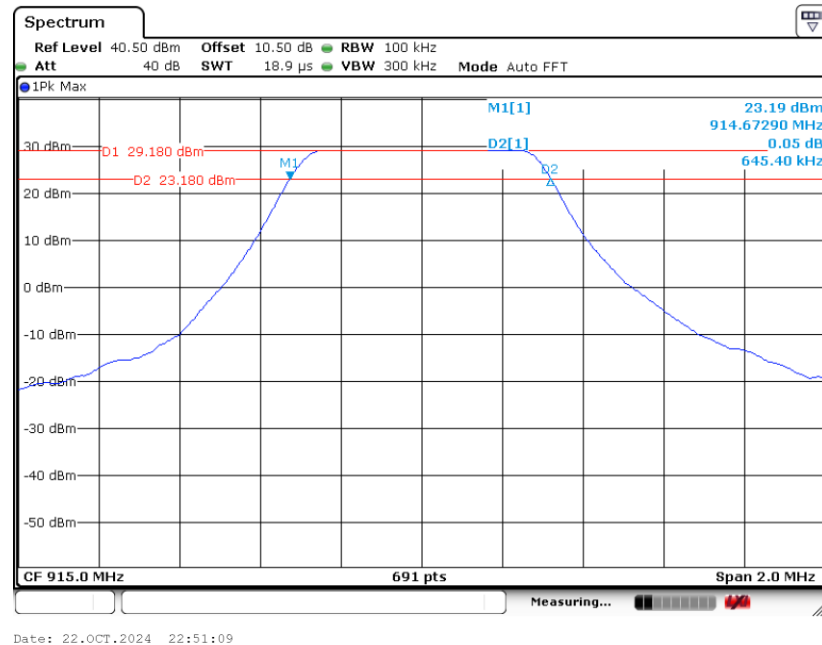
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

6 dB Bandwidth Plot on 904MHz

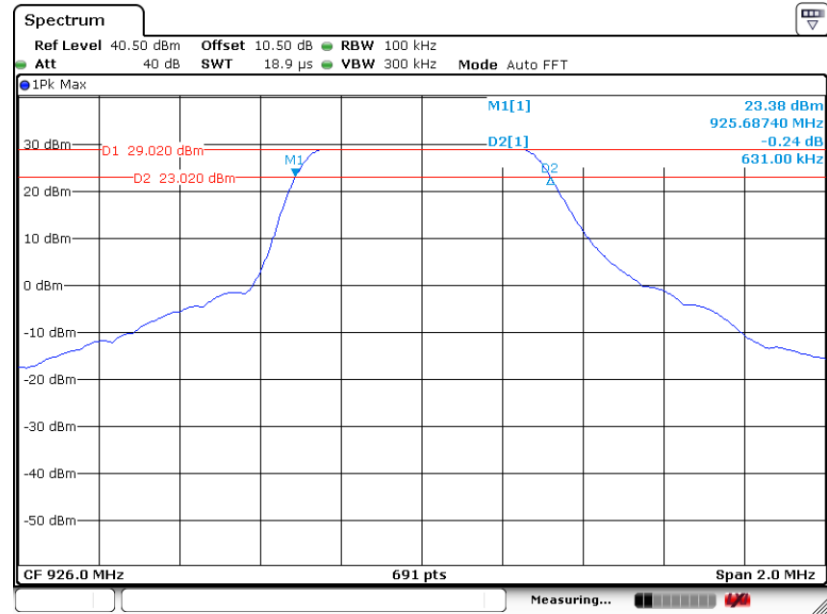


6 dB Bandwidth Plot on 915 MHz





6 dB Bandwidth Plot on 926 MHz



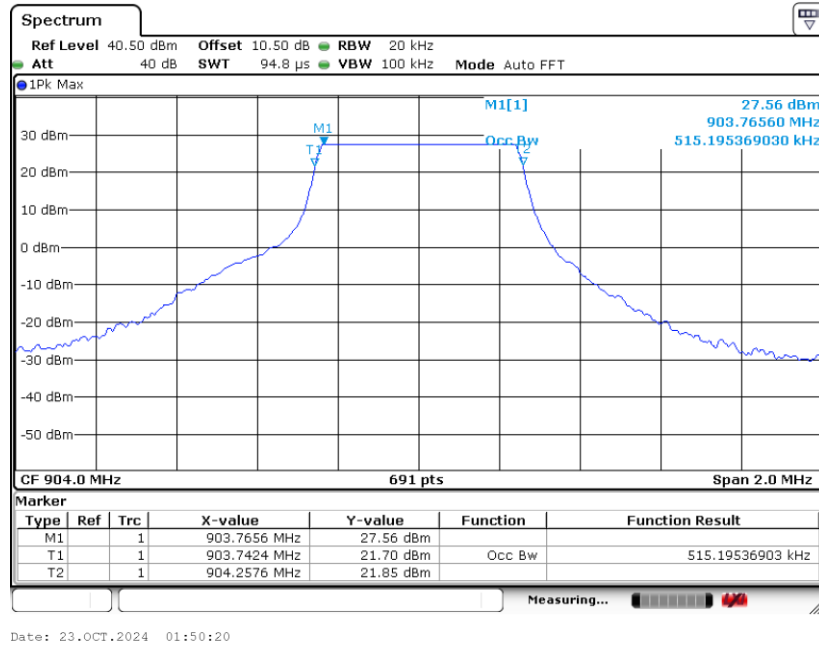
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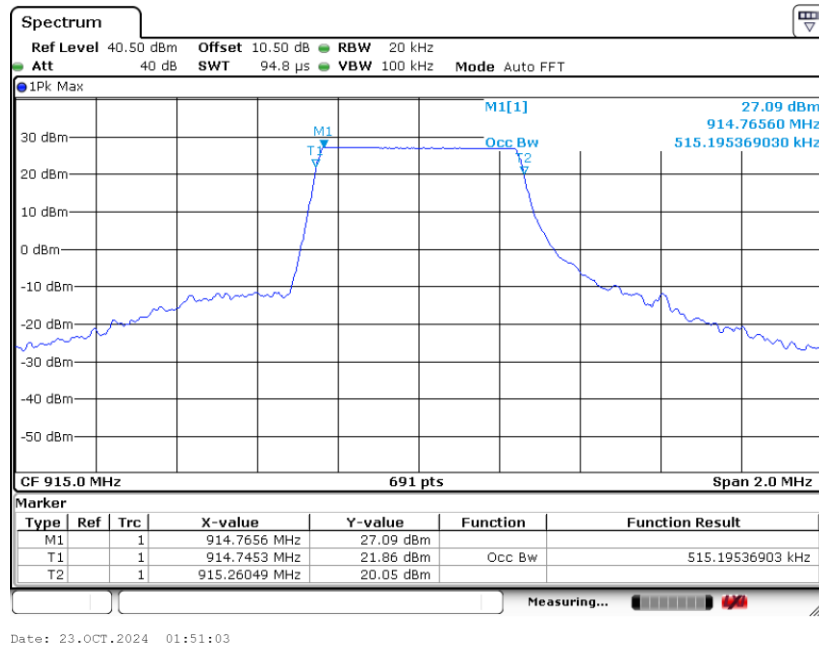
3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

99% Bandwidth Plot on 904MHz

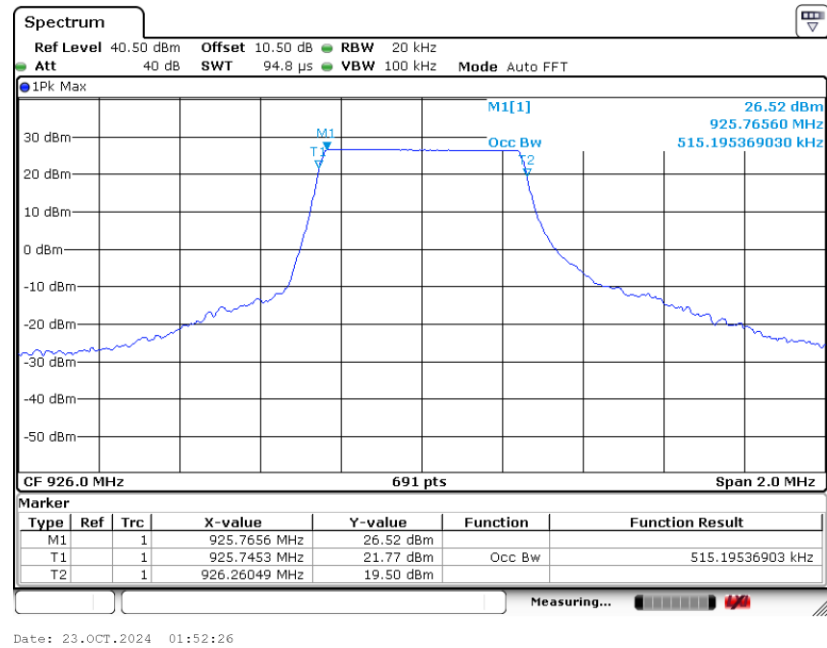


99% Bandwidth Plot on 915 MHz





99% Bandwidth Plot on 926 MHz



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 902-928MHz, the limit for output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

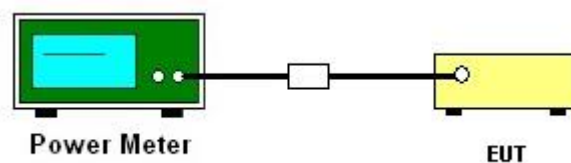
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.2.3.2 Method AVGPM-G method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

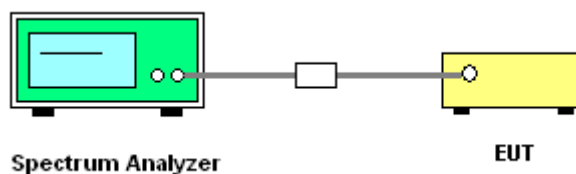
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.5 Method AVGPSD-2.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = power averaging (rms), Sweep time = auto couple. Use the peak marker function to determine the maximum power level.
6. Employ trace averaging (rms) mode over a minimum of 100 traces.
7. Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span} / \text{RBW}]$.
8. Measure and record the results in the test report.
9. Add $[10 \log (1 / D)]$, where D is the duty cycle.
10. The Measured power density (dBm)/ 100kHz is a reference level and used as 30dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup

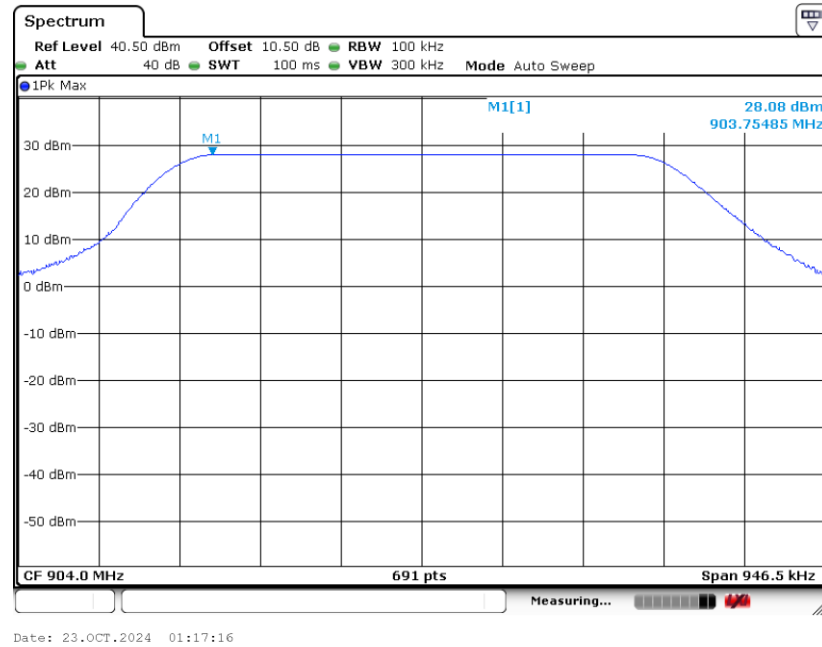


3.3.5 Test Result of Power Spectral Density

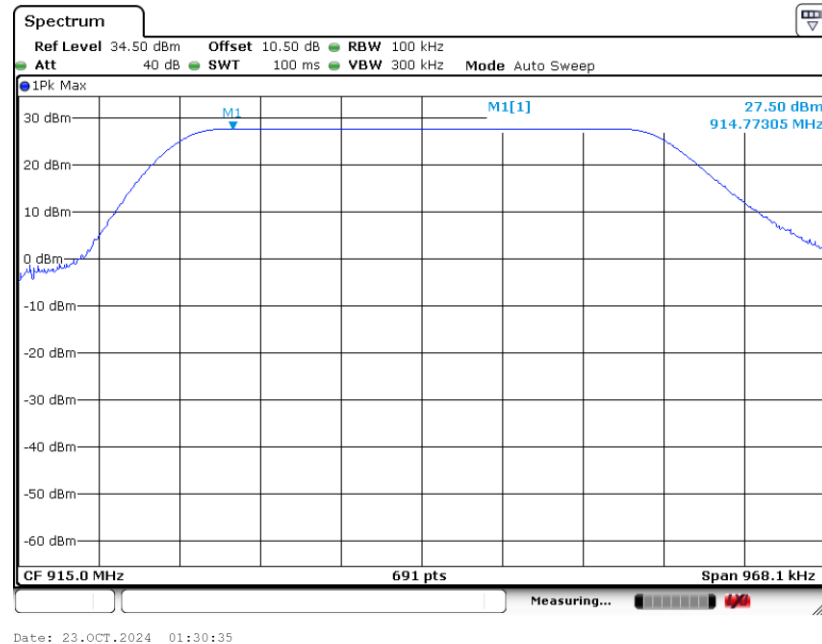
Please refer to Appendix A.

3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 904 MHz

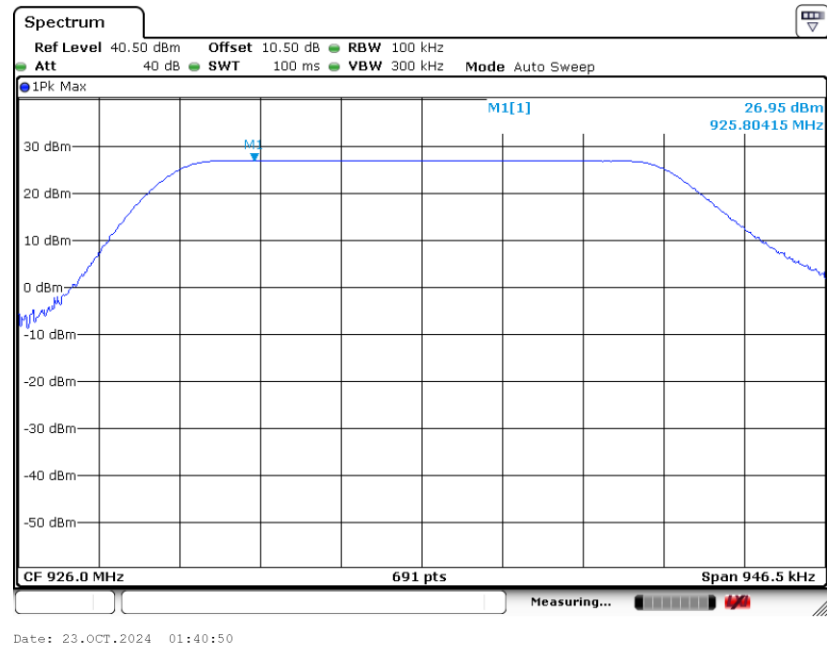


PSD 100kHz Plot on 915 MHz





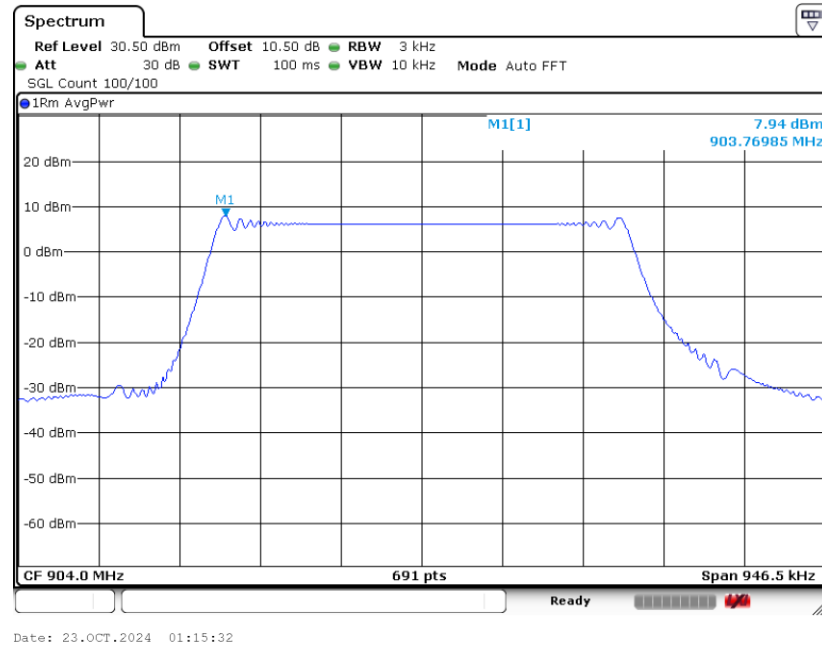
PSD 100kHz Plot on 926 MHz



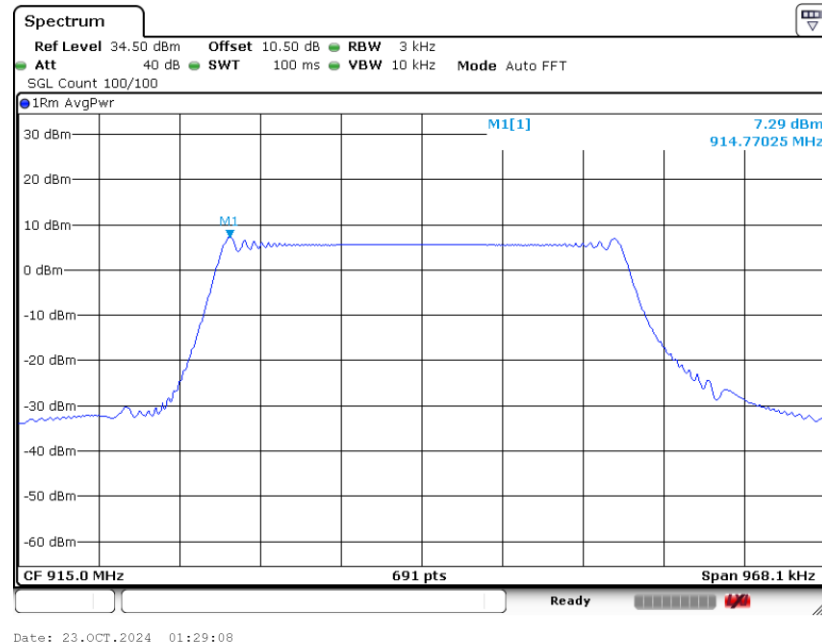


3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 904 MHz

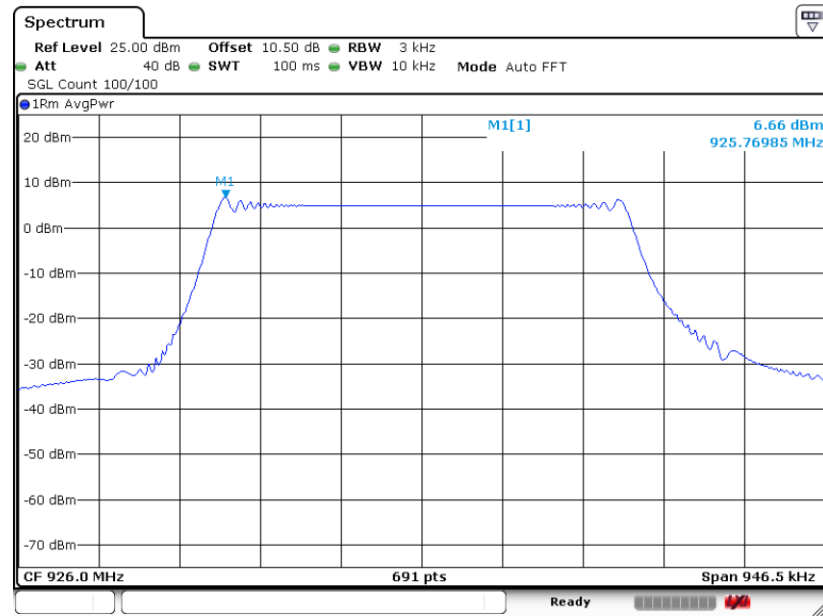


PSD 3kHz Plot on 915 MHz





PSD 3kHz Plot on 926 MHz



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 30 dB down from the highest emission level within the authorized band.

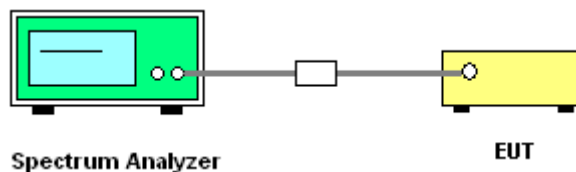
3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.4.3 Test Procedure

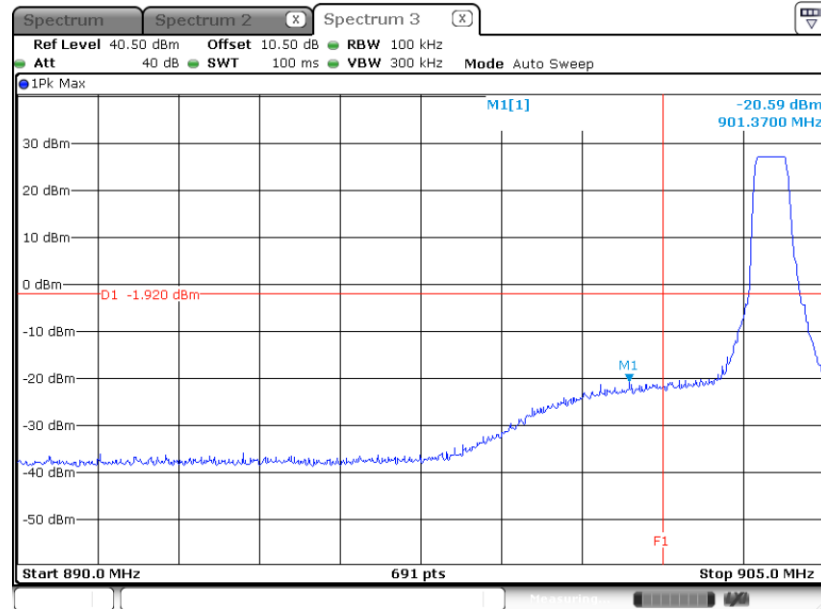
1. The testing follows ANSI C63.10-2013 clause 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz when the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



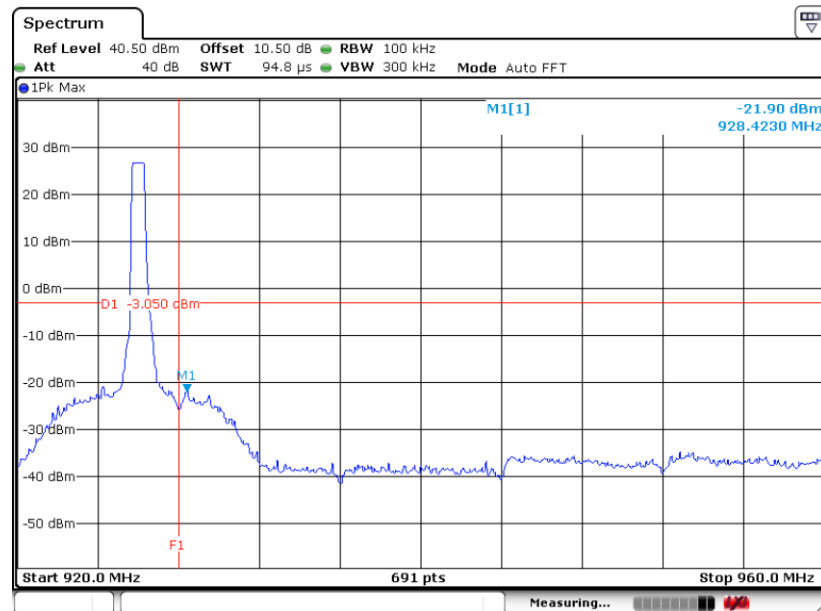
3.4.5 Test Result of Conducted Band Edges Plots

Low Band Edge Plot on 904 MHz



Date: 12.FEB.2025 10:18:34

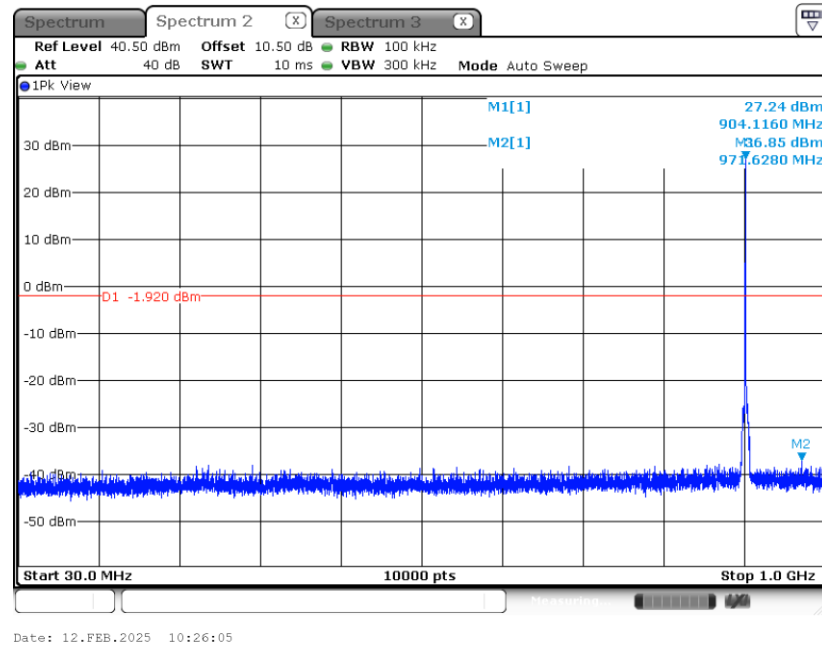
High Band Edge Plot on 926 MHz



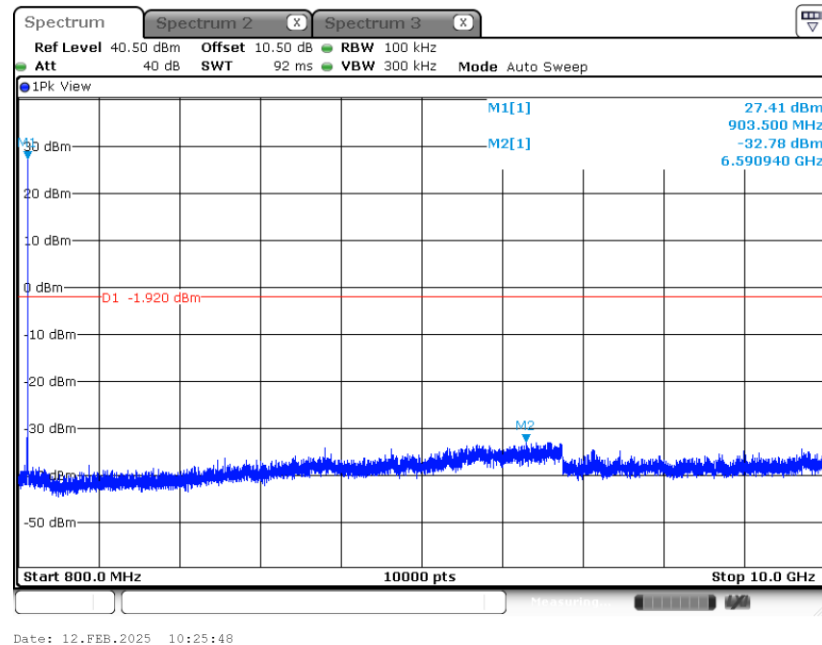
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3.4.6 Test Result of Conducted Spurious Emission Plots

Conducted Spurious Emission Plot on 904 MHz

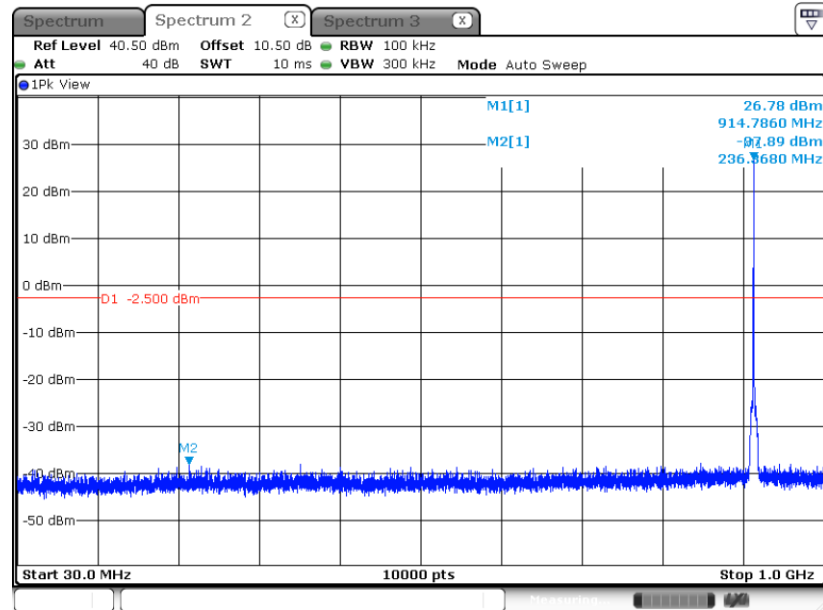


Conducted Spurious Emission Plot on 904 MHz



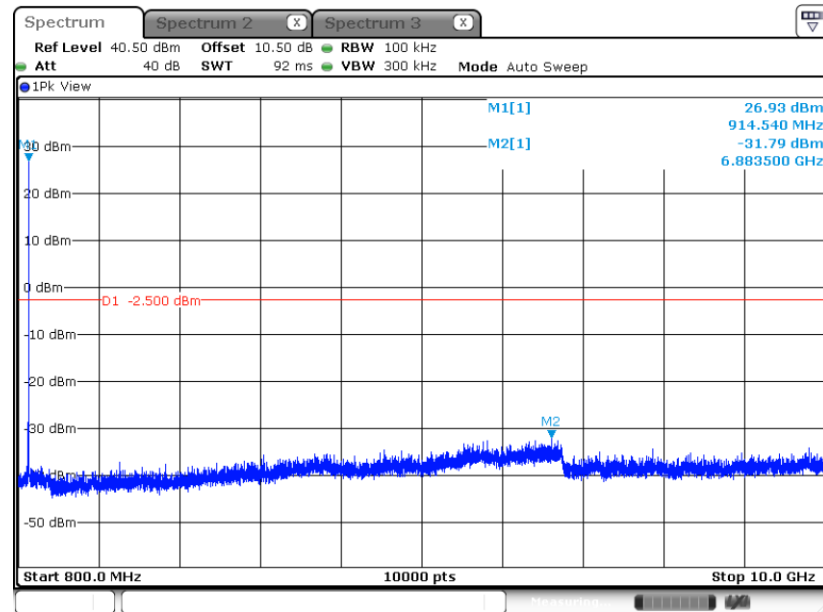


Conducted Spurious Emission Plot on 915 MHz



Date: 12.FEB.2025 10:25:02

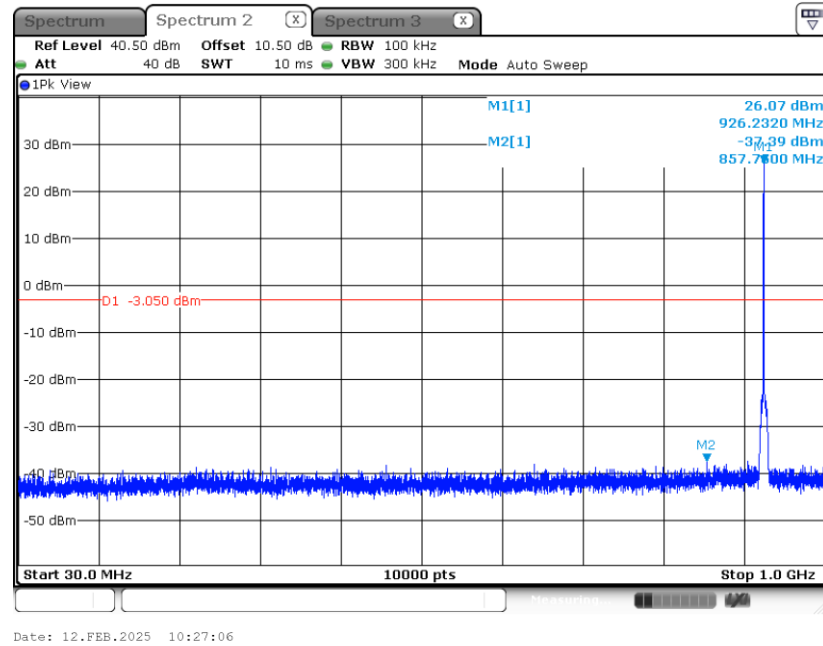
Conducted Spurious Emission Plot on 915 MHz



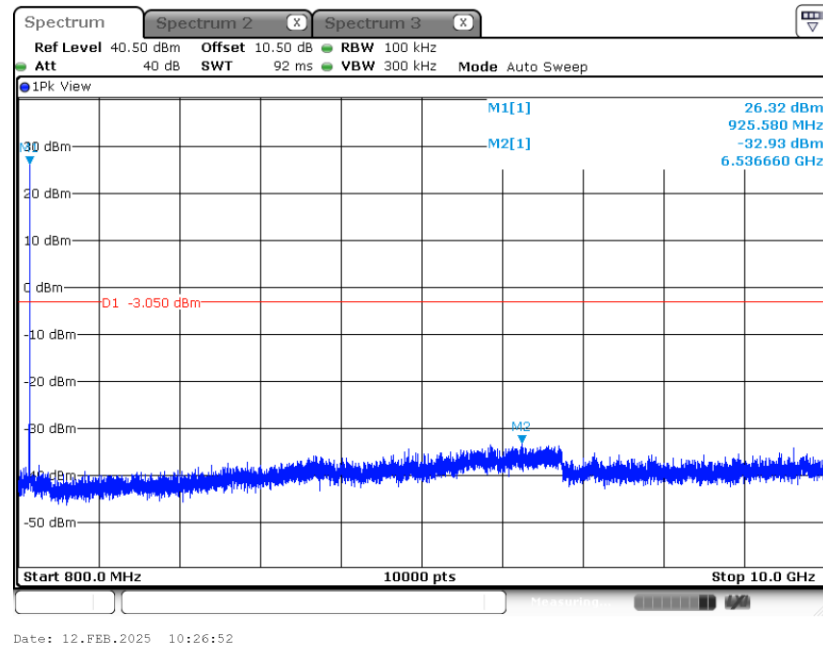
Date: 12.FEB.2025 10:24:48



Conducted Spurious Emission Plot on 926 MHz



Conducted Spurious Emission Plot on 926 MHz



3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.5.2 Measuring Instruments

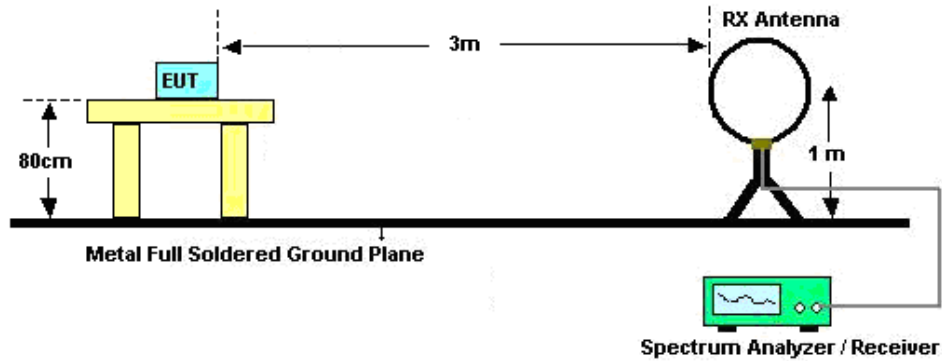
The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.5.3 Test Procedures

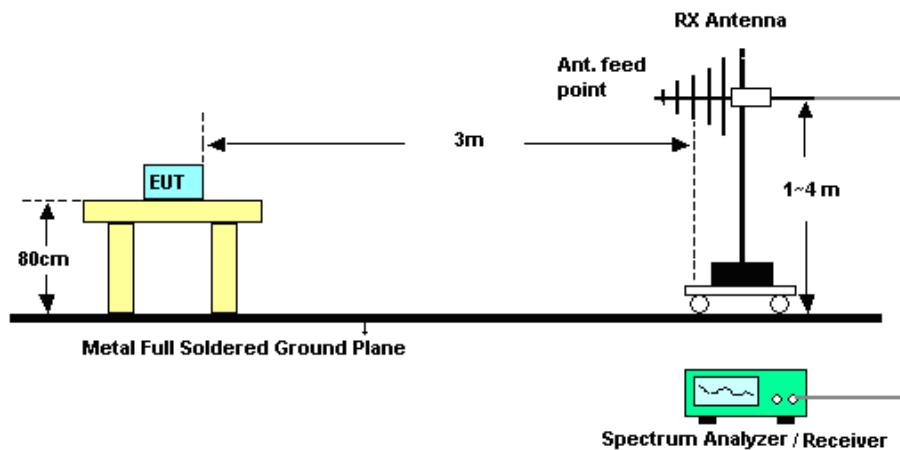
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. 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 average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

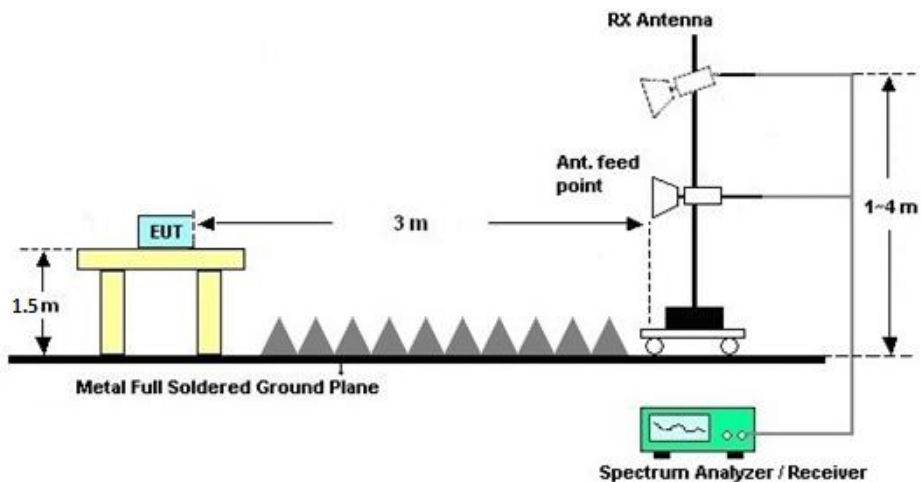
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



**3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C&D.

3.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C&D.

3.5.8 Duty cycle

Mode	Duty Cycle
LoRa DTS SF7	100%

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

*Decreases with the logarithm of the frequency.

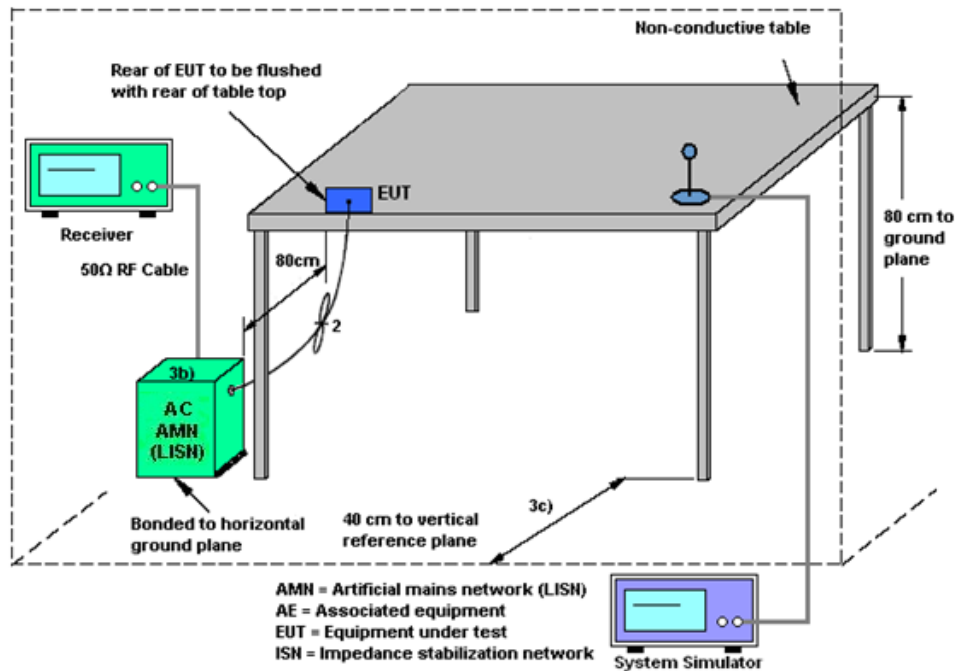
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. 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.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024	Oct. 22, 2024~ Feb. 12, 2025	Oct. 09, 2025	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 03, 2024	Oct. 22, 2024~ Feb. 12, 2025	Jan. 02, 2025	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2025		Jan. 01, 2026	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 03, 2024	Oct. 22, 2024~ Feb. 12, 2025	Jan. 02, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2025		Jan. 01, 2026	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 14, 2024	Jan. 09, 2025~ Feb. 12, 2025	Oct. 13, 2025	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY551502 13	10Hz~44GHz	Jul. 03, 2024	Jan. 09, 2025~ Feb. 12, 2025	Jul. 02, 2025	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 28, 2024	Jan. 09, 2025~ Feb. 12, 2025	Dec. 27, 2025	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 09, 2024	Jan. 09, 2025~ Feb. 12, 2025	May 08, 2025	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-147 4	1GHz~18GHz	Jul. 07, 2023	Jan. 09, 2025~ Feb. 12, 2025	Jul. 06, 2025	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~ 3000MHz	Oct. 18, 2024	Jan. 09, 2025~ Feb. 12, 2025	Oct. 17, 2025	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-001 01800-30-10 P-R	1943528	1GHz~18GHz	Oct. 14, 2024	Jan. 09, 2025~ Feb. 12, 2025	Oct. 13, 2025	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY572801 36	500MHz~26.5GHz	Jul. 03, 2024	Jan. 09, 2025~ Feb. 12, 2025	Jul. 02, 2025	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F11905001 9	N/A	Oct. 14, 2024	Jan. 09, 2025~ Feb. 12, 2025	Oct. 13, 2025	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 09, 2025~ Feb. 12, 2025	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 09, 2025~ Feb. 12, 2025	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Feb. 05, 2025	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	Feb. 05, 2025	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Feb. 05, 2025	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	Feb. 05, 2025	Oct. 08, 2025	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Conducted Power Spectral Density	±0.90 dB
Frequency	±0.4 Hz

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.84 dB
---	---------

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.5 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8dB
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----- THE END -----



Appendix A. Conducted Test Results

LoRa-DTS-Spreading Factor 7

Test Engineer:	Jacob Zhang	Temperature:	20~26	°C
Test Date:	2024/10/22~2024/10/23	Relative Humidity:	40~51	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Channel	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
	L	904Mhz	0.52	0.63	0.50	Pass
	M	915Mhz	0.52	0.65	0.50	Pass
	H	926Mhz	0.52	0.63	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
	L	904Mhz	0.00	27.95
	M	915Mhz	0.00	27.41
	H	926Mhz	0.00	26.77

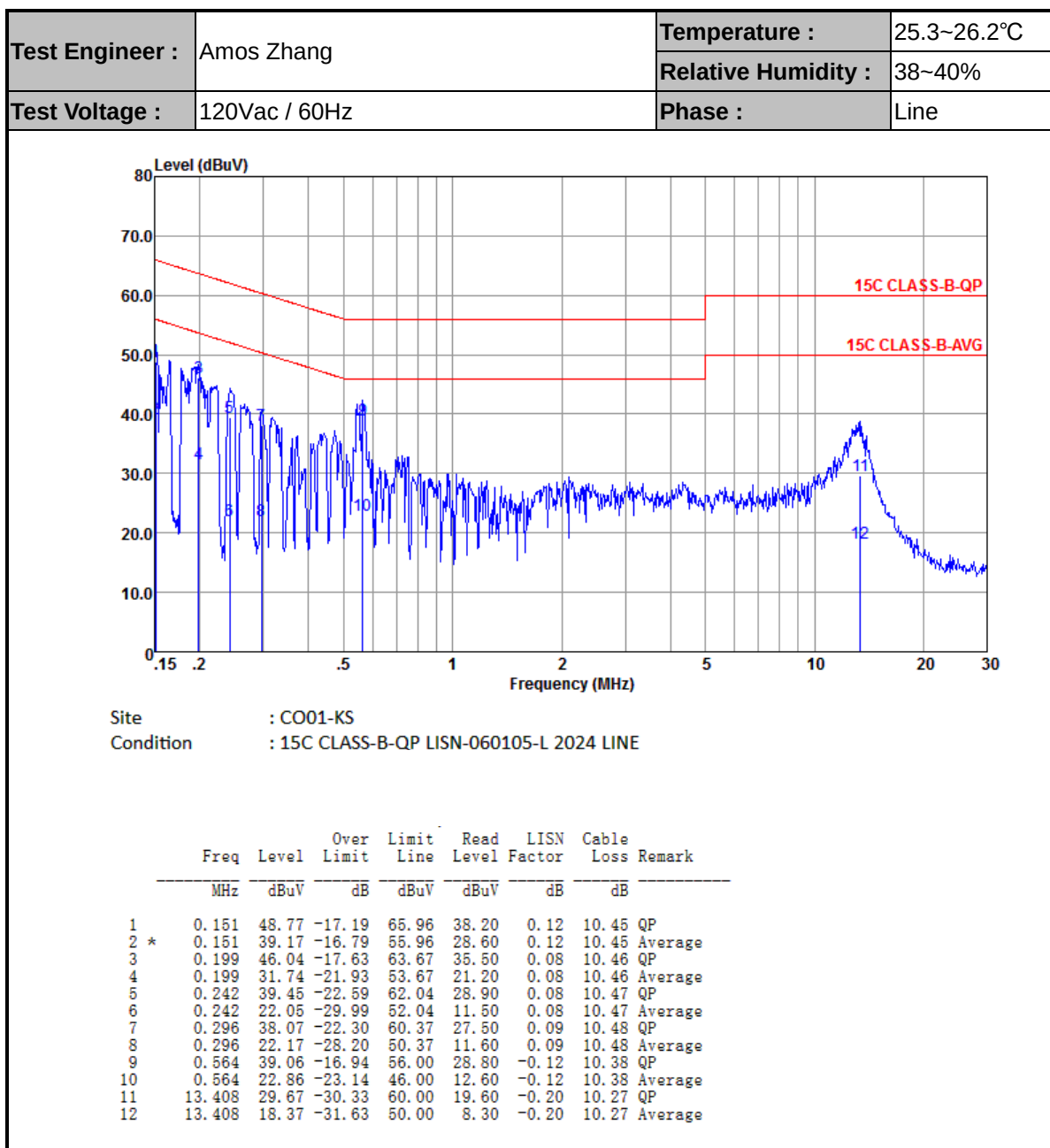
TEST RESULTS DATA
Peak Power Density

Mod.	Channel	Freq. (MHz)	Peak PSD (dBm /100kHz)	PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
	L	904Mhz	28.08	7.94	-8.20	8.00	Pass
	M	915Mhz	27.50	7.29	-8.20	8.00	Pass
	H	926Mhz	26.95	6.66	-8.20	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

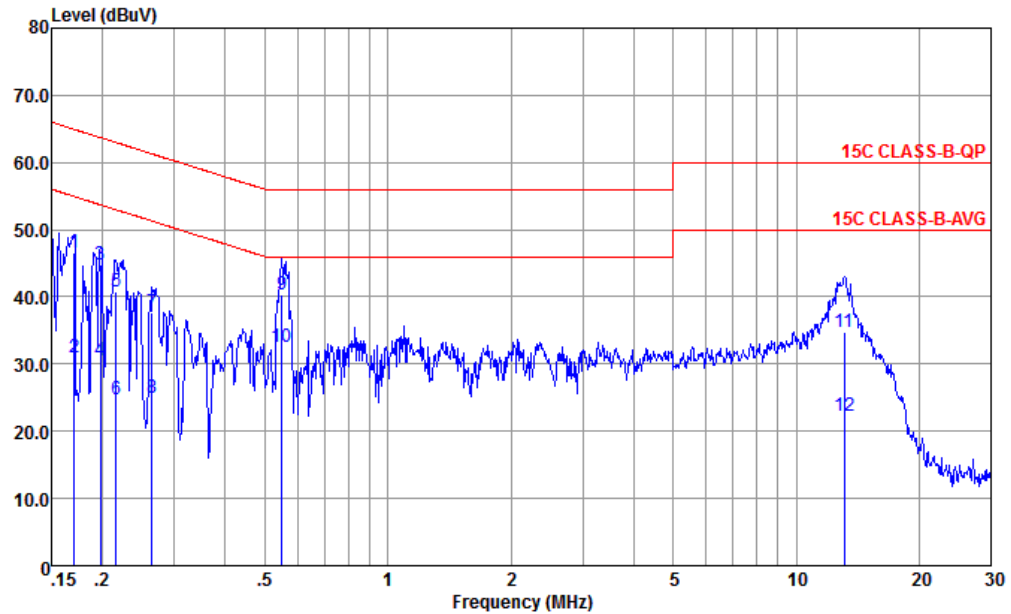


Appendix B. AC Conducted Emission Test Results





Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-KS
Condition : 15C CLASS-B-QP LISN-060105-N 2024 NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.170	46.68	-18.26	64.94	36.11	0.12	10.45	QP
2	0.170	30.88	-24.06	54.94	20.31	0.12	10.45	Average
3	0.198	44.79	-18.92	63.71	34.20	0.13	10.46	QP
4	0.198	30.49	-23.22	53.71	19.90	0.13	10.46	Average
5	0.216	40.74	-22.22	62.96	30.20	0.08	10.46	QP
6	0.216	24.74	-28.22	52.96	14.20	0.08	10.46	Average
7	0.264	37.63	-23.66	61.29	27.21	-0.05	10.47	QP
8	0.264	25.03	-26.26	51.29	14.61	-0.05	10.47	Average
9	0.549	40.44	-15.56	56.00	30.20	-0.15	10.39	QP
10 *	0.549	32.54	-13.46	46.00	22.30	-0.15	10.39	Average
11	13.127	34.85	-25.15	60.00	24.79	-0.21	10.27	QP
12	13.127	22.25	-27.75	50.00	12.19	-0.21	10.27	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



Appendix C. Radiated Spurious Emission

904~926MHz

LoRa DTS 500KHz SF=7 (30MHz-1Ghz@ 3m)

	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
904MHz		102.75	29.56	-13.94	43.5	43.71	16.51	1.03	31.69	-	-	P	H
		225.94	28.44	-17.56	46	42.4	16	1.54	31.5	-	-	P	H
	*	904	116.99	-	-	115.01	29.8	3.17	30.99	-	-	P	H
		101.78	28.92	-14.58	43.5	42.19	17.4	1.03	31.7	-	-	P	V
		195.87	24.89	-18.61	43.5	39.4	15.58	1.42	31.51	-	-	P	V
	*	904	113.36	-	-	114.37	26.81	3.17	30.99	-	-	P	V
915MHz		99.84	32.42	-11.08	43.5	46.99	16.11	1.02	31.7	-	-	P	H
		228.85	24.78	-21.22	46	38.54	16.18	1.56	31.5	-	-	P	H
	*	915	117.65	-	-	115.43	29.99	3.18	30.95	-	-	P	H
		99.84	31.09	-12.41	43.5	44.65	17.12	1.02	31.7	-	-	P	V
		199.75	24.11	-19.39	43.5	38.71	15.47	1.43	31.5	-	-	P	V
	*	915	113.29	-	-	114.32	26.74	3.18	30.95	-	-	P	V
926MHz		98.87	30.93	-12.57	43.5	45.65	15.97	1.01	31.7	-	-	P	H
		261.83	25.67	-20.33	46	35.86	19.64	1.69	31.52	-	-	P	H
	*	926	115.07	-	-	112.5	30.29	3.2	30.92	-	-	P	H
		97.9	29.3	-14.2	43.5	43.28	16.72	1	31.7	-	-	P	V
		189.08	23.64	-19.86	43.5	38.49	15.27	1.4	31.52	-	-	P	V
	*	926	108.88	-	-	109.69	26.91	3.2	30.92	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



LoRa 500KHz SF=7 (Band Edge @ 3m)

	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
904MHz		871.96	41.22	-55.77	96.99	39.73	29.42	3.1	31.03	100	154	P	H
	*	904	116.99	----	----	115.01	29.8	3.17	30.99	100	154	P	H
		935.98	39.86	-57.13	96.99	36.83	30.71	3.21	30.89	100	154	P	H
		861.29	33.92	-59.44	93.36	35.31	26.57	3.08	31.04	100	65	P	V
	*	904	113.36	----	----	114.37	26.81	3.17	30.99	100	65	P	V
		935.98	35.38	-57.98	93.36	35.83	27.23	3.21	30.89	100	65	P	V
915MHz		882.63	43.76	-53.89	97.65	42.21	29.45	3.12	31.02	100	136	P	H
	*	915	117.65	----	----	115.43	29.99	3.18	30.95	100	136	P	H
		946.65	37.93	-59.72	97.65	34.32	31.24	3.23	30.86	100	136	P	H
		883.6	38	-55.29	93.29	38.99	26.91	3.12	31.02	100	89	P	V
	*	915	113.29	----	----	114.32	26.74	3.18	30.95	100	89	P	V
		946.65	34.68	-58.61	93.29	35.01	27.3	3.23	30.86	100	89	P	V
926MHz		894.27	42.55	-52.52	95.07	40.81	29.6	3.15	31.01	100	174	P	H
	*	926	115.07	----	----	112.5	30.29	3.2	30.92	100	174	P	H
		957.32	37.54	-57.53	95.07	33.44	31.69	3.24	30.83	100	174	P	H
		894.27	35.81	-53.01	88.88	36.76	26.91	3.15	31.01	100	81	P	V
	*	926	108.88	----	----	109.69	26.91	3.2	30.92	100	81	P	V
		958.29	31.75	-57.13	88.88	32.11	27.23	3.24	30.83	100	81	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



LoRa DTS 500KHz SF=7 (Harmonic @ 3m)

	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
904MHz		1808	51.75	-45.24	96.99	70.21	29.97	4.67	53.1	-	-	P	H
		2712	42.62	-31.38	74	58.65	31.35	5.68	53.06	-	-	P	H
		3616	39.88	-34.12	74	52.74	33.61	6.68	53.15	-	-	P	H
		1808	51.06	-42.3	93.36	69.52	29.97	4.67	53.1	-	-	P	V
		2712	41.22	-32.78	74	57.25	31.35	5.68	53.06	-	-	P	V
		3616	40.06	-33.94	74	52.92	33.61	6.68	53.15	-	-	P	V
915MHz		1830	49.76	-47.89	97.65	68.14	30.05	4.67	53.1	-	-	P	H
		2745	42.28	-31.72	74	58.18	31.44	5.71	53.05	-	-	P	H
		3660	39.69	-34.31	74	52.4	33.69	6.74	53.14	-	-	P	H
		1830	50.59	-42.7	93.29	68.97	30.05	4.67	53.1	-	-	P	V
		2745	43.76	-30.24	74	59.66	31.44	5.71	53.05	-	-	P	V
		3660	39.2	-34.8	74	51.91	33.69	6.74	53.14	-	-	P	V
926MHz		1852	49.38	-45.69	95.07	67.63	30.14	4.71	53.1	-	-	P	H
		2778	40.31	-33.69	74	56.09	31.52	5.74	53.04	-	-	P	H
		3704	39.93	-34.07	74	52.48	33.77	6.8	53.12	-	-	P	H
		1852	52.33	-36.55	88.88	70.58	30.14	4.71	53.1	-	-	P	V
		2778	39.69	-34.31	74	55.47	31.52	5.74	53.04	-	-	P	V
		3704	39.72	-34.28	74	52.27	33.77	6.8	53.12	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	P eak or A verage
H/V	H orizontal or V ertical



A calculation example for radiated spurious emission is shown as below:

	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
902.5MHz		2708.20	51.89	-22.11	74	76.80	33.05	7.58	65.54	333	243	P	H
		2708.20	50.19	-3.81	54	75.10	33.05	7.58	65.54	333	243	A	H

1. $\text{Level(dB}\mu\text{V/m)} = \text{Antenna Factor(dB/m)} + \text{Cable Loss(dB)} + \text{Read Level(dB}\mu\text{V)} - \text{Preamp Factor(dB)}$
2. $\text{Over Limit(dB)} = \text{Level(dB}\mu\text{V/m)} - \text{Limit Line(dB}\mu\text{V/m)}$

For Peak Limit @ 2708.20MHz:

1. $\text{Level(dB}\mu\text{V/m)}$
 $= \text{Antenna Factor(dB/m)} + \text{Cable Loss(dB)} + \text{Read Level(dB}\mu\text{V)} - \text{Preamp Factor(dB)}$
 $= 33.05(\text{dB/m}) + 7.58(\text{dB}) + 76.80(\text{dB}\mu\text{V}) - 65.54(\text{dB})$
 $= 51.89(\text{dB}\mu\text{V/m})$
2. Over Limit(dB)
 $= \text{Level(dB}\mu\text{V/m)} - \text{Limit Line(dB}\mu\text{V/m)}$
 $= 51.89(\text{dB}\mu\text{V/m}) - 74(\text{dB}\mu\text{V/m})$
 $= -22.11(\text{dB})$

For Average Limit @ 2708.20MHz:

1. $\text{Level(dB}\mu\text{V/m)}$
 $= \text{Antenna Factor(dB/m)} + \text{Cable Loss(dB)} + \text{Read Level(dB}\mu\text{V)} - \text{Preamp Factor(dB)}$
 $= 33.05(\text{dB/m}) + 7.58(\text{dB}) + 75.10(\text{dB}\mu\text{V}) - 65.54(\text{dB})$
 $= 50.19(\text{dB}\mu\text{V/m})$
2. Over Limit(dB)
 $= \text{Level(dB}\mu\text{V/m)} - \text{Limit Line(dB}\mu\text{V/m)}$
 $= 50.19(\text{dB}\mu\text{V/m}) - 54(\text{dB}\mu\text{V/m})$
 $= -3.81(\text{dB})$

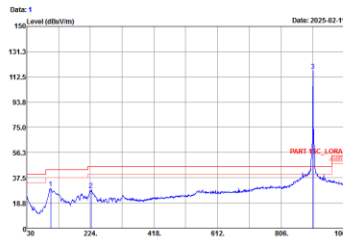
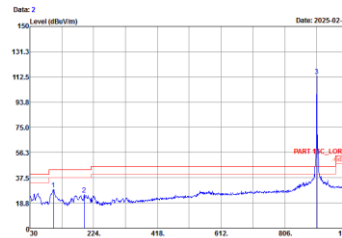
Both peak and average measured complies with the limit line, so test result is "PASS".



Appendix D. Radiated Spurious Emission Plots

904~926MHz

LoRa DTS 500KHz SF=7 (30Mhz-1Ghz@ 3m)

LoRa	904~926 (30Mhz-1Ghz@ 3m)																																																																																																																					
ANT	LoRa 500KHz DTS 904Mhz																																																																																																																					
	Horizontal	Vertical																																																																																																																				
Peak	Date: 1 Date: 2025-02-11  Site : 03CH04-SZ Condition : PART 15C, LORA 3m LF_ANT_41009 HORIZONTAL Project : 250505 Mode : 1 IMEI : #21-0010904 Plane : 1Z with Accessories 500K Power setting 5 <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>Line</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>182.75</td><td>29.56</td><td>-13.94</td><td>43.50</td><td>43.71</td><td>16.51</td><td>1.83</td><td>31.69</td><td>---</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>225.94</td><td>28.44</td><td>-17.56</td><td>46.00</td><td>42.40</td><td>16.80</td><td>1.54</td><td>31.50</td><td>---</td><td>---</td><td>Peak</td></tr><tr><td>3 *</td><td>904.00</td><td>116.99</td><td>70.99</td><td>46.00</td><td>115.01</td><td>29.80</td><td>3.17</td><td>30.99</td><td>100</td><td>154</td><td>Peak</td></tr></table>		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark		MHz	dBuV/m	Line	Line	Level	Factor	Loss	Factor	cm	deg	1	182.75	29.56	-13.94	43.50	43.71	16.51	1.83	31.69	---	---	Peak	2	225.94	28.44	-17.56	46.00	42.40	16.80	1.54	31.50	---	---	Peak	3 *	904.00	116.99	70.99	46.00	115.01	29.80	3.17	30.99	100	154	Peak	Date: 2 Date: 2025-02-11  Site : 03CH04-SZ Condition : PART 15C, LORA 3m LF_ANT47611_20 VERTICAL Project : 250505 Mode : 1 IMEI : #21-0010904 Plane : 1Z with Accessories 500K Power setting 5 <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>Line</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>181.78</td><td>28.92</td><td>-14.58</td><td>43.50</td><td>42.19</td><td>17.40</td><td>1.83</td><td>31.70</td><td>---</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>195.87</td><td>24.89</td><td>-18.61</td><td>43.50</td><td>39.40</td><td>15.58</td><td>1.42</td><td>31.51</td><td>---</td><td>---</td><td>Peak</td></tr><tr><td>3 *</td><td>904.00</td><td>113.36</td><td>67.36</td><td>46.00</td><td>114.37</td><td>26.81</td><td>3.17</td><td>30.99</td><td>100</td><td>65</td><td>Peak</td></tr></table>		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark		MHz	dBuV/m	Line	Line	Level	Factor	Loss	Factor	cm	deg	1	181.78	28.92	-14.58	43.50	42.19	17.40	1.83	31.70	---	---	Peak	2	195.87	24.89	-18.61	43.50	39.40	15.58	1.42	31.51	---	---	Peak	3 *	904.00	113.36	67.36	46.00	114.37	26.81	3.17	30.99	100	65	Peak
		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark																																																																																																											
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LoRa	904~926 (30Mhz-1Ghz@ 3m)																																																																																																							
ANT	LoRa 500KHz DTS 915 Mhz																																																																																																							
	Horizontal	Vertical																																																																																																						
Peak	Date: 1 Level (dBuV/m) Date: 2025-02-11 Site : 03CH04-SZ Condition : PART 15C, LORA 3m LF_ANT_41909 HORIZONTAL Project : 250505 Mode : 2 IMEI : #21-0010904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>99.84</td><td>32.42</td><td>-11.08</td><td>43.50</td><td>46.99</td><td>16.11</td><td>1.02</td><td>31.70</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>228.85</td><td>24.78</td><td>-21.22</td><td>46.00</td><td>38.54</td><td>16.18</td><td>1.56</td><td>31.50</td><td>---</td><td>Peak</td></tr><tr><td>3 *</td><td>915.00</td><td>117.65</td><td>71.65</td><td>46.00</td><td>115.43</td><td>29.99</td><td>3.18</td><td>30.95</td><td>100</td><td>136 Peak</td></tr></table>	Freq	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	cm	deg		1	99.84	32.42	-11.08	43.50	46.99	16.11	1.02	31.70	---	Peak	2	228.85	24.78	-21.22	46.00	38.54	16.18	1.56	31.50	---	Peak	3 *	915.00	117.65	71.65	46.00	115.43	29.99	3.18	30.95	100	136 Peak	Date: 2 Level (dBuV/m) Date: 2025-02-11 Site : 03CH04-SZ Condition : PART 15C, LORA 3m LF_ANT47611_20 VERTICAL Project : 250505 Mode : 2 IMEI : #21-0010904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>99.84</td><td>31.09</td><td>-12.41</td><td>43.50</td><td>44.65</td><td>17.12</td><td>1.02</td><td>31.70</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>399.75</td><td>24.11</td><td>-19.39</td><td>43.50</td><td>38.71</td><td>15.47</td><td>1.43</td><td>31.50</td><td>---</td><td>Peak</td></tr><tr><td>3 *</td><td>915.00</td><td>113.29</td><td>67.29</td><td>46.00</td><td>114.32</td><td>26.74</td><td>3.18</td><td>30.95</td><td>100</td><td>89 Peak</td></tr></table>	Freq	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	cm	deg		1	99.84	31.09	-12.41	43.50	44.65	17.12	1.02	31.70	---	Peak	2	399.75	24.11	-19.39	43.50	38.71	15.47	1.43	31.50	---	Peak	3 *	915.00	113.29	67.29	46.00	114.32	26.74	3.18	30.95	100	89 Peak
	Freq	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark																																																																																															
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LoRa	904~926 (30Mhz-1Ghz@ 3m)																																																																																																							
ANT	LoRa 500KHz DTS 926Mhz																																																																																																							
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Peak	Date: 1 Level (dBuV/m) Date: 2025-02-11 Site : 03CH04-SZ Condition : PA1T 15C_LORA 3m LF_ANT_41909 HORIZONTAL Project : 250505 Mode : 3 IMEI : #21-0010904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>98.87</td><td>38.93</td><td>-12.57</td><td>43.50</td><td>45.65</td><td>15.97</td><td>1.01</td><td>31.70</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>261.83</td><td>25.67</td><td>-28.33</td><td>46.00</td><td>35.86</td><td>19.64</td><td>1.69</td><td>31.52</td><td>---</td><td>Peak</td></tr><tr><td>3 *</td><td>926.00</td><td>115.07</td><td>69.07</td><td>46.00</td><td>112.50</td><td>30.29</td><td>3.20</td><td>30.92</td><td>100</td><td>81 Peak</td></tr></table>	Freq	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	1	98.87	38.93	-12.57	43.50	45.65	15.97	1.01	31.70	---	Peak	2	261.83	25.67	-28.33	46.00	35.86	19.64	1.69	31.52	---	Peak	3 *	926.00	115.07	69.07	46.00	112.50	30.29	3.20	30.92	100	81 Peak	Date: 2 Level (dBuV/m) Date: 2025-02-11 Site : 03CH04-SZ Condition : PA1T 15C_LORA 3m LF_ANT47611_20 VERTICAL Project : 250505 Mode : 3 IMEI : #21-0010904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>97.90</td><td>29.30</td><td>-14.20</td><td>43.50</td><td>43.28</td><td>16.72</td><td>1.00</td><td>31.70</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>189.00</td><td>23.64</td><td>-19.86</td><td>43.50</td><td>38.49</td><td>15.27</td><td>1.40</td><td>31.52</td><td>---</td><td>Peak</td></tr><tr><td>3 *</td><td>926.00</td><td>188.00</td><td>62.00</td><td>46.00</td><td>189.69</td><td>26.91</td><td>3.20</td><td>30.92</td><td>100</td><td>81 Peak</td></tr></table>	Freq	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	1	97.90	29.30	-14.20	43.50	43.28	16.72	1.00	31.70	---	Peak	2	189.00	23.64	-19.86	43.50	38.49	15.27	1.40	31.52	---	Peak	3 *	926.00	188.00	62.00	46.00	189.69	26.91	3.20	30.92	100	81 Peak
	Freq	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark																																																																																															
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LoRa 500KHz SF=7 (Band Edge @ 3m)

LoRa	904~926 Band Edge @ 3m																																																																																																															
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Peak	Date: 1 Date: 2025-01-10 Site : 03CH04-SZ Condition : ISC_LORA 3m LF_ANT_41909 HORIZONTAL Project : Z50505 Mode : 1 IMEI : #2100010904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>871.96</td><td>41.22</td><td>-----</td><td>39.73</td><td>29.42</td><td>3.18</td><td>31.83</td><td>100</td><td>154</td><td>Peak</td></tr><tr><td>2 *</td><td>904.00</td><td>116.99</td><td>-13.81</td><td>130.80</td><td>115.01</td><td>29.88</td><td>3.17</td><td>30.99</td><td>100</td><td>154 Peak</td></tr><tr><td>3</td><td>935.98</td><td>39.86</td><td>-----</td><td>36.83</td><td>30.71</td><td>3.21</td><td>30.89</td><td>100</td><td>154</td><td>Peak</td></tr></table>		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	dB	cm	deg		1	871.96	41.22	-----	39.73	29.42	3.18	31.83	100	154	Peak	2 *	904.00	116.99	-13.81	130.80	115.01	29.88	3.17	30.99	100	154 Peak	3	935.98	39.86	-----	36.83	30.71	3.21	30.89	100	154	Peak	Date: 2 Date: 2025-01-10 Site : 03CH04-SZ Condition : ISC_LORA 3m LF_ANT47611_20 VERTICAL Project : Z50505 Mode : 1 IMEI : #2100010904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th></th><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>861.29</td><td>33.92</td><td>-----</td><td>35.31</td><td>26.57</td><td>3.08</td><td>31.64</td><td>100</td><td>65</td><td>Peak</td></tr><tr><td>2 *</td><td>904.00</td><td>113.36</td><td>-16.64</td><td>130.00</td><td>114.37</td><td>26.81</td><td>3.17</td><td>30.99</td><td>100</td><td>65 Peak</td></tr><tr><td>3</td><td>935.98</td><td>35.38</td><td>-----</td><td>35.83</td><td>27.23</td><td>3.21</td><td>30.89</td><td>100</td><td>65</td><td>Peak</td></tr></table>		Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	dB	cm	deg		1	861.29	33.92	-----	35.31	26.57	3.08	31.64	100	65	Peak	2 *	904.00	113.36	-16.64	130.00	114.37	26.81	3.17	30.99	100	65 Peak	3	935.98	35.38	-----	35.83	27.23	3.21	30.89	100	65	Peak
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Peak	Date: 1 Level (dBuV/m) Date: 2025-01-10 Site : 03CH04-SZ Condition : 15C_LORA 3m LF_ANT_41000 HORIZONTAL Project : 250505 Mode : 2 IMEI : #21-00100904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>882.63</td><td>43.76</td><td>-----</td><td>42.21</td><td>29.45</td><td>3.12</td><td>31.02</td><td>100</td><td>136 Peak</td></tr><tr><td>2 *</td><td>915.00</td><td>117.65</td><td>-12.35</td><td>130.00</td><td>115.43</td><td>29.99</td><td>3.18</td><td>30.95</td><td>100 136 Peak</td></tr><tr><td>3</td><td>946.65</td><td>37.93</td><td>-----</td><td>34.32</td><td>31.24</td><td>3.23</td><td>30.86</td><td>100</td><td>136 Peak</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	Line	Level	Factor	Loss	dB	cm	deg	1	882.63	43.76	-----	42.21	29.45	3.12	31.02	100	136 Peak	2 *	915.00	117.65	-12.35	130.00	115.43	29.99	3.18	30.95	100 136 Peak	3	946.65	37.93	-----	34.32	31.24	3.23	30.86	100	136 Peak	Date: 2 Level (dBuV/m) Date: 2025-01-10 Site : 03CH04-SZ Condition : 15C_LORA 3m LF_ANT47611_20 VERTICAL Project : 250505 Mode : 2 IMEI : #21-00100904 Plane : Z with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>883.60</td><td>38.00</td><td>-----</td><td>38.99</td><td>26.91</td><td>3.12</td><td>31.02</td><td>100</td><td>89 Peak</td></tr><tr><td>2 *</td><td>915.00</td><td>113.29</td><td>-16.71</td><td>130.00</td><td>114.32</td><td>26.74</td><td>3.18</td><td>30.95</td><td>100 89 Peak</td></tr><tr><td>3</td><td>946.65</td><td>34.68</td><td>-----</td><td>35.01</td><td>27.30</td><td>3.23</td><td>30.86</td><td>100</td><td>89 Peak</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	Line	Level	Factor	Loss	dB	cm	deg	1	883.60	38.00	-----	38.99	26.91	3.12	31.02	100	89 Peak	2 *	915.00	113.29	-16.71	130.00	114.32	26.74	3.18	30.95	100 89 Peak	3	946.65	34.68	-----	35.01	27.30	3.23	30.86	100	89 Peak
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LoRa DTS 500KHz SF=7 (Harmonic @ 3m)

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Peak	Date: 3 Level (dBuV/m) PEAK_74 AVG_54 Site : 03CH04-SZ Condition : PEAK_74 3m HF_3117_ANT_0057 HORIZONTAL Project : 250505 Mode : 3 IMEI : #21-0010904 Plane : 1 X with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1 *</td><td>1852.00</td><td>49.38</td><td>-24.62</td><td>74.00</td><td>67.63</td><td>30.14</td><td>4.71</td><td>53.10</td><td>--- Peak</td></tr><tr><td>2</td><td>2778.00</td><td>40.31</td><td>-33.69</td><td>74.00</td><td>56.89</td><td>31.52</td><td>5.74</td><td>53.04</td><td>--- Peak</td></tr><tr><td>3</td><td>3704.00</td><td>39.93</td><td>-34.07</td><td>74.00</td><td>52.48</td><td>33.77</td><td>6.80</td><td>53.12</td><td>--- Peak</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1 *	1852.00	49.38	-24.62	74.00	67.63	30.14	4.71	53.10	--- Peak	2	2778.00	40.31	-33.69	74.00	56.89	31.52	5.74	53.04	--- Peak	3	3704.00	39.93	-34.07	74.00	52.48	33.77	6.80	53.12	--- Peak	Date: 4 Level (dBuV/m) PEAK_74 AVG_54 Site : 03CH04-SZ Condition : PEAK_74 3m HF_3117_ANT_0057 VERTICAL Project : 250505 Mode : 3 IMEI : #21-0010904 Plane : 1 X with Accessories 500K Power setting 5 <table><tr><th>Freq</th><th>Level</th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable</th><th>Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>cm</th><th>deg</th><th></th></tr><tr><td>1</td><td>1852.00</td><td>50.88</td><td>-3.12</td><td>54.00</td><td>69.13</td><td>30.14</td><td>4.71</td><td>53.10</td><td>100 243 Average</td></tr><tr><td>2 *</td><td>1852.00</td><td>52.33</td><td>-21.67</td><td>74.00</td><td>70.58</td><td>30.14</td><td>4.71</td><td>53.10</td><td>100 243 Peak</td></tr><tr><td>3</td><td>2778.00</td><td>39.69</td><td>-34.31</td><td>74.00</td><td>55.47</td><td>31.52</td><td>5.74</td><td>53.04</td><td>--- Peak</td></tr><tr><td>4</td><td>3704.00</td><td>39.72</td><td>-34.28</td><td>74.00</td><td>52.27</td><td>33.77</td><td>6.80</td><td>53.12</td><td>--- Peak</td></tr></table>	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		1	1852.00	50.88	-3.12	54.00	69.13	30.14	4.71	53.10	100 243 Average	2 *	1852.00	52.33	-21.67	74.00	70.58	30.14	4.71	53.10	100 243 Peak	3	2778.00	39.69	-34.31	74.00	55.47	31.52	5.74	53.04	--- Peak	4	3704.00	39.72	-34.28	74.00	52.27	33.77	6.80	53.12	--- Peak
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