RADIO TEST REPORT

Product	:	LoRaWAN Transceiver Module
Model Name	:	RYLR933
FCC ID	:	2BNIV-LORA
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.247)
Received Date	:	2025/3/21
Test Date	:	2025/03/22 ~ 2025/06/26
Issued Date	:	2025/7/22
Applicant	:	All Inspire Health 19 Morris Avenue, Building 128, Brooklyn, NY 11205
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

REVISION HISTORY

Original Test Report No.: 4791618243E-US-R1-V0

Revision	Test report No.	Date	Page revised	Contents
Original	4791618243E-US-R1-V0	2025/7/22	-	Initial issue

Table of Contents

1. Attestation of Test Results

APPLICANT:	All Inspire Health 19 Morris Avenue, Building 128, Brooklyn, NY 11205
MANUFACTURER:	All Inspire Health 19 Morris Avenue, Building 128, Brooklyn, NY 11205
EUT DESCRIPTION:	LoRaWAN Transceiver Module
BRAND:	All Inspire Health
MODEL:	RYLR933
SAMPLE STAGE:	Design Verification Test Sample
DATE of TESTED:	2025/03/22 ~ 2025/06/26

APPLICABLE STANDARDS	
STANDARD	**Test Results**
FCC 47 CFR PART 15 Subpart C (Section 15.247)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Cindy Hsin Date : 2025/7/22
Project Handler

Approved and Authorized By:

Kent Liu Date : 2025/7/22
Senior Laboratory Engineer

2. Summary of Test Results

Summary of Test Results		
FCC Clause	**Test Items**	**Result**
15.247(b)	Conducted Output Power	PASS
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS
15.207	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB558074 D01 Meas Guidance v05r02, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013 and KDB 662911 D01 Multiple Transmitter Output v02r01.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

5. Measurement Uncertainty

For statement of conformity, Simple acceptance (Section 3.1.4 of IEC Guide 115) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Determining compliance based on the results of the compliance measurement, not considering measurement instrumentation uncertainty.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	3.0 dB
RF Conducted	9 kHz - 40GHz	2.4 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	5.6 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	4.6 dB

6. Equipment under Test

6.1. Description of EUT

Product	LoRaWAN Transceiver Module
Brand Name	All Inspire Health
Model Name	RYLR933
Normal Voltage	3.6Vdc from Host

Operating Frequency	902.3MHz ~ 914.9MHz
Modulation	Hybrid (FSK,CSS)
Maximum Output Power	9.23 dBm
Sample ID	Conducted Test:8268295
	Radiated Test:8268296

Note:

1. This report is prepared for FCC permissive change. The difference compared with the original design is as the following:
   - Change module to limited module.
   - User-installed limited module transmitters in a host, host information as below:

Product	Brand Name	Model Name	FCC ID	Remark
AUGi Sense	All Inspire Health	IN6S001	2BNIV-SNS-1	With BT LE and FMCW function

   - Add host antenna, antenna table as below:

Ant. No.	Transmitter Circuit	Frequency Range	Brand Name	Model Name	Maximum Gain (dBi)	Ant. Type	Connector Type
1	Chain0	903~920MHz	Innocomm	Sense_Lora	2	IFA	None

2. According to above changed conditions, therefore only the Radiated Spurious Emission worse case , Conducted output power and AC Power Conducted Emission need to be performed, others result please refer to the original report.

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual, the laboratory shall not be held responsible.

6.2. Channel List

64 channels are provided for LoRa mode:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	902.3	13	904.9	26	907.5	39	910.1	52	912.7
1	902.5	14	905.1	27	907.7	40	910.3	53	912.9
2	902.7	15	905.3	28	907.9	41	910.5	54	913.1
3	902.9	16	905.5	29	908.1	42	910.7	55	913.3
4	903.1	17	905.7	30	908.3	43	910.9	56	913.5
5	903.3	18	905.9	31	908.5	44	911.1	57	913.7
6	903.5	19	906.1	32	908.7	45	911.3	58	913.9
7	903.7	20	906.3	33	908.9	46	911.5	59	914.1
8	903.9	21	906.5	34	909.1	47	911.7	60	914.3
9	904.1	22	906.7	35	909.3	48	911.9	61	914.5
10	904.3	23	906.9	36	909.5	49	912.1	62	914.7
11	904.5	24	907.1	37	909.7	50	912.3	63	914.9
12	904.7	25	907.3	38	909.9	51	912.5	-	-

6.3. Test Condition

Test Item	Test Site No.	Environmental	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	23~26°C/ 62~67%RH	3.6Vdc	2025/03/22~ 2025/03/27	Rex Chen
Radiated Spurious Emission	966-2	22~26°C/ 62~68%RH	3.6Vdc	2025/03/22~ 2025/05/24	Rex Chen
AC power Line Conducted Emission	SR1	24°C/ 59%RH	120Vac/60Hz	2025/06/26	Jubo Shen

Sample Calculation:

Antenna Port Conducted Measurement:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBm) = Reading Value (dBm) +Attenuator Factor (dB) + Cable Loss (dB).
  Example: Result Value (10dBm) = Reading Value (-2dBm) +Attenuator Factor (10dB) + Cable Loss(2dB).
  *Test plot only shown the "Result Value".

Radiated Spurious Emission:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
  Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
  Example: Result Value (34.5dBuV/m) = Reading Value (40.1dBuV) + Antenna Factor (18.7dB/m) + Cable Loss (4.2dB) - Preamp Factor (28.5dB).

AC power Line Conducted Emission:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBuV) = Reading Value (dBuV) + Correction Factor (dB).
  Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).
  Example: Result Value (53.7dBuV) = Reading Value (35.1dBuV) + Insertion loss(18.1dB) + Cable loss(0.5dB).

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Frequency Range	Brand Name	Model Name	Maximum Gain (dBi)	Ant. Type	Connector Type
1	Chain0	903~920MHz	Innocomm	Sense_Lora	2	IFA	None

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual, the laboratory shall not be held responsible.

6.5. Test Mode Applicability and Tested Channel Detail

Test Item	Modulation Type	Available Channel	Test Channel
Radiated Emissions	LoRa	0 to 63	0,32,63
Radiated Emissions (Below 1GHz)	LoRa	0 to 63	0,32,63
AC Power Line Conducted Emission	LoRa	0 to 63	63
Antenna Port Conducted Measurement	LoRa	0 to 63	0,32,63

- In the transmit mode, LoRa channel 63 has the highest RF output power. Therefore, the AC conduction were performed using this worst-case mode.

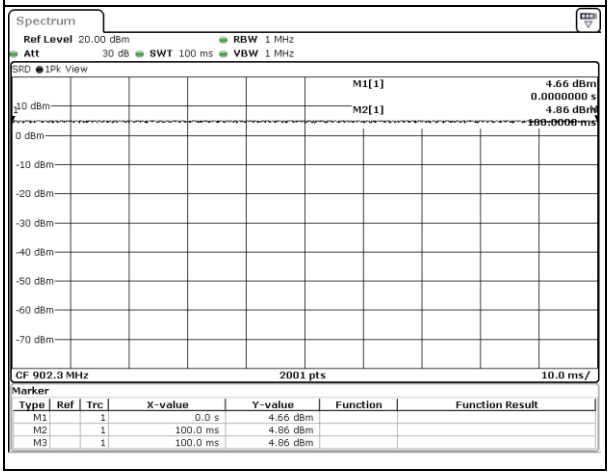
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
LoRa	100.000	100.000	1.0000	N/A	10Hz

LoRa



7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070818	2025/3/12	2026/3/11
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2024/12/24	2025/12/23
Loop Antenna	ETS lindgren	6502	00213440	2024/12/11	2025/12/10
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2024/12/30	2025/12/29
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2024/11/27	2025/11/26
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2024/12/18	2025/12/17
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2024/5/28	2025/5/27
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2025/1/13	2026/1/12
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2025/4/7	2026/4/6
Cables (9k-18 GHz)	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2024/11/22	2025/11/21
Cables (18-40GHz)	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2024/11/22	2025/11/21

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Antenna Port Conducted Measurement					
Signal Analyzer	Rohde & Schwarz	FSVA3044	101281	2025/3/5	2026/3/4
Signal Analyzer	Rohde & Schwarz	FSV40	101490	2024/7/1	2025/6/30
Attenuator	EMCI	EMC-40ATK2W10	17002	2024/11/13	2025/11/12
USB Power Sensor	Anritsu	MA24408A	12031	2024/7/13	2025/7/12
Temperature &Humidity Test Chamber	GIANT FORCE	GTH-150- 40-CP-AR	MAA1701-010	2025/2/25	2026/2/24
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2024/10/1	2025/9/30
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2024/5/14	2025/5/13
				2025/5/27	2026/5/26
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2024/8/29	2025/8/28
Cables	TITAN	CFD200	T0732ACFD 20020A300-2	2025/4/21	2026/4/20

UL Software		
Description	**Name**	**Version**
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF-Conducted-FCC 15247	ver 1.0
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2

8. Description of Test Setup

Tx Mode

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	MSI	MS-13Q2	K2402N0015485	Provide by Lab
B	Test Tool	SILICON LABS	PCB1015A A03	N/A	Supplied by Client
C	Battery	LISUN	ER14505	N/A	Supplied by Client 3.6V Battery x 3
D	Test Tool	Augi-Sense_MB	R003	N/A	Supplied by Client

I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	DC Cable	N/A	N/A	0.07	Supplied by Client

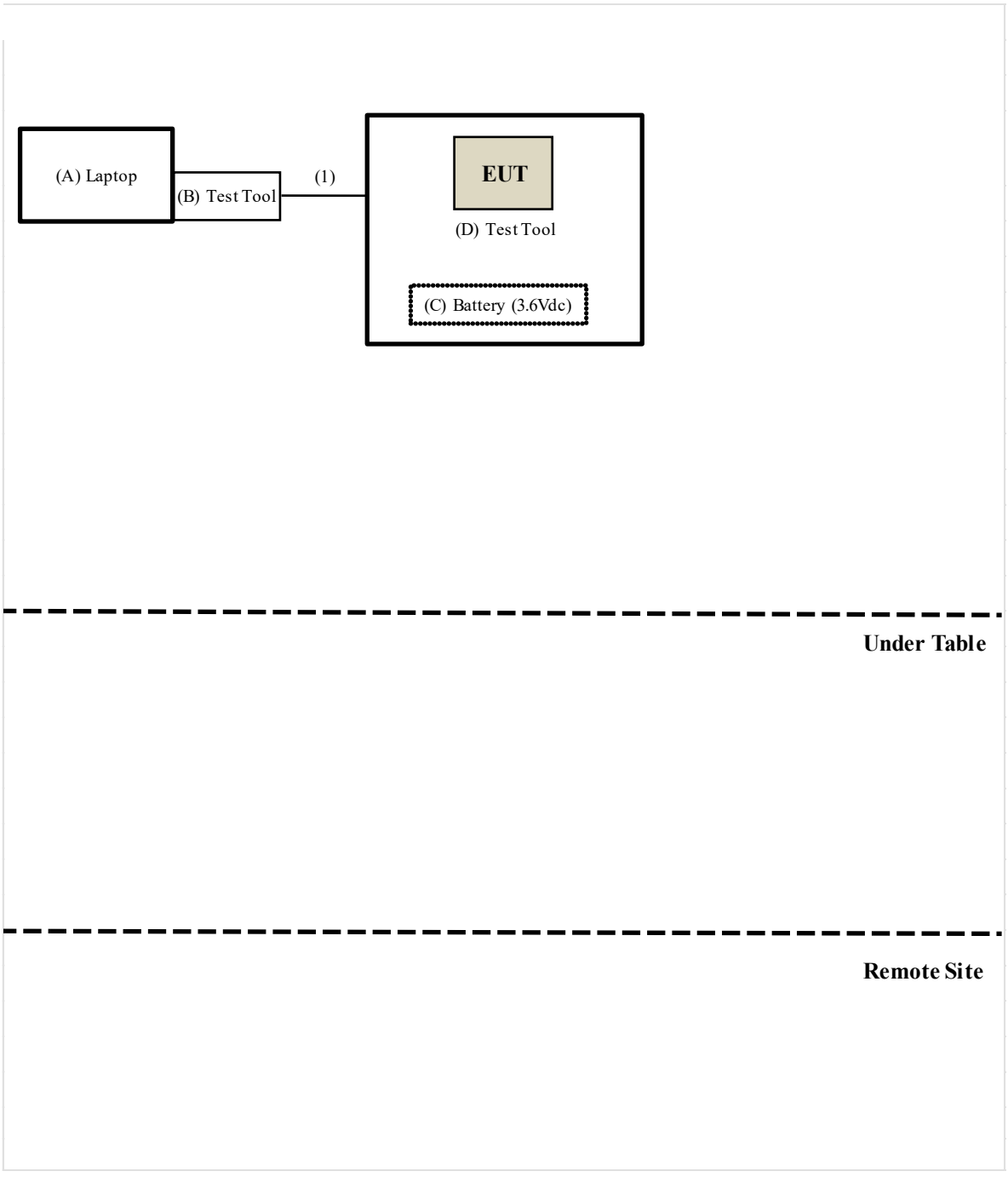
Test Setup

The EUT was worked in engineering mode to transmit signal.

Controlled using a bespoke application (QCOM_V1.6) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Setup Diagram for Test

Tx Mode



9. Test Results

9.1. Conducted Output Power

Requirements

For systems using digital modulation in the 2400-2483.5 MHz bands: 1 Watt.

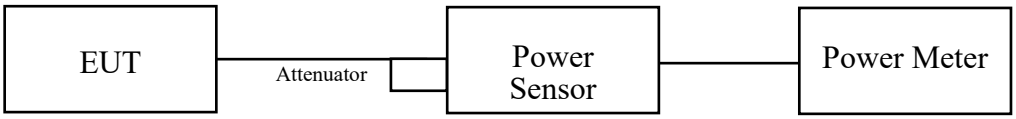
Note:
1. P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi, B is the 26 dB emission bandwidth in megahertz
2. If EUT with Multiple Transmitter Output:
   a. Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{Gn/20})^2$ / Nant] dBi.
   Nant: Number of Transmit Antennas
   G1, G2,..., Gn: Gain of Individual Antennas
   Example: two antenna and gain 5 dBi / 3dBi, so if it was used for TxBF power measurement
   Directional Gain = 10 log[(105/20 + 103/20)2 / 2] dBi = 7.07 dBi
   b. Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices, CDD
   Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
   Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.
   Example: Maximum antenna gain = 5 dBi and NANT ≤ 4, so if it was used for CDD power measurement
   Directional Gain = 5 dBi + Array Gain = 5 dBi + 0 dB = 5 dBi
   c. For power measurement of KDB 662911 is used with multiple transmitter output. Total conducted power is the sum of the conducted power levels measured at the various output ports.

Test Procedure

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

a. Set the RBW ≥ DTS bandwidth.
b. Set VBW ≥ 3 × RBW.
c. Set span ≥ 3 x RBW.
d. Sweep time = auto couple.
e. Detector = peak.
f. Trace mode = max hold.
g. Allow trace to fully stabilize.
h. Use peak marker function to determine the peak amplitude level.

Test Setup



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

Mode	CH	Freq. (MHz)	Peak Power (dBm)	Total Power (mW)	Total Power (dBm)	AVG Power (dBm)	Total Power (mW)	Total Power (dBm)	Limit (dBm)	Result
			Chain 0			Chain 0				
LoRa (Hybrid mode)	0	902.3	9.16	8.241	9.16	9.1	8.128	9.1	30	Pass
	32	908.7	9.17	8.26	9.17	9.11	8.147	9.11	30	Pass
	63	914.9	9.23	8.375	9.23	9.13	8.185	9.13	30	Pass

Note: Average Power is for reference Only.

9.2. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test Procedures

[For 9 kHz ~ 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

Peak

Frequency	RBW	VBW
9 kHz~150 kHz	200 Hz	600 Hz
150 kHz~30 MHz	10 kHz	30 kHz
30 MHz~1 GHz	120 kHz	360 kHz
Above 1GHz	1 MHz	3 MHz

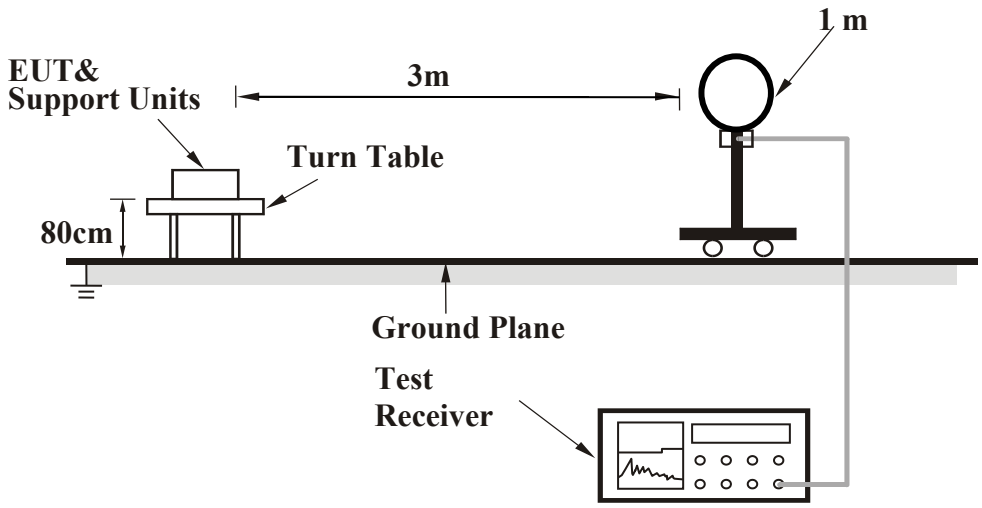
Average for above 1GHz

RBW	VBW
1MHz	Refer to section 6.6 for duty cycle.

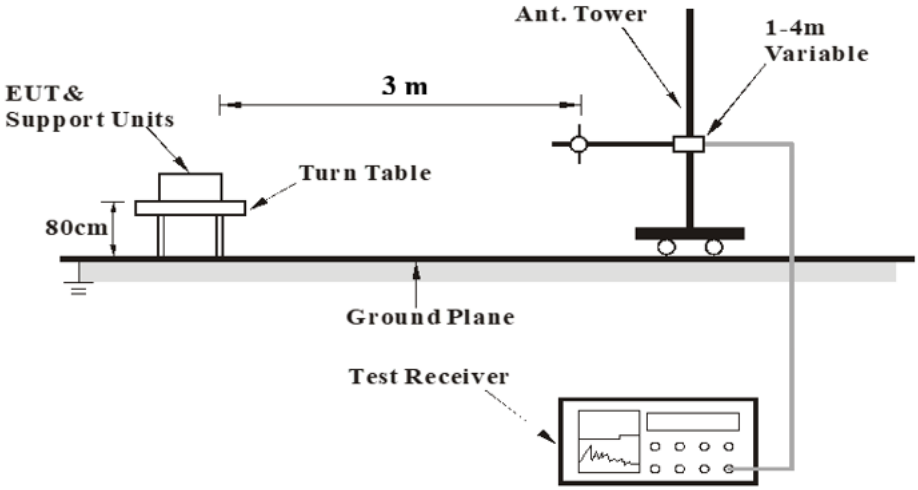
d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
e. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
f. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
g. Test data of Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
h. Test data of Notation "@" = Fundamental Frequency
i. Test data of Notation " * " = The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

Test Setup

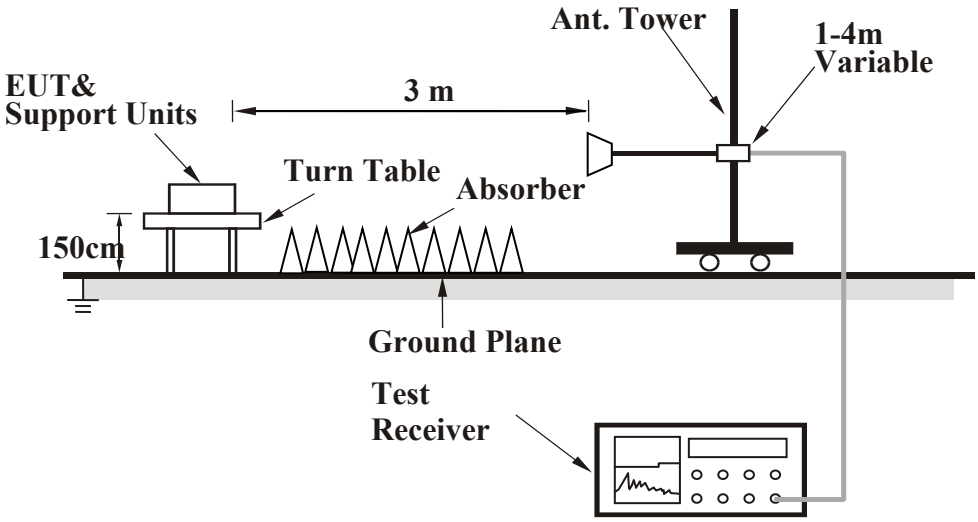
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.

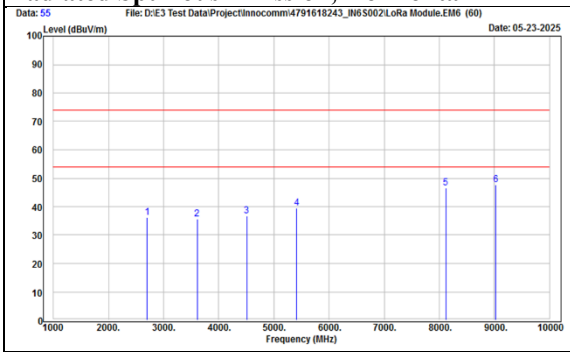
Test Data

Above 1 GHz

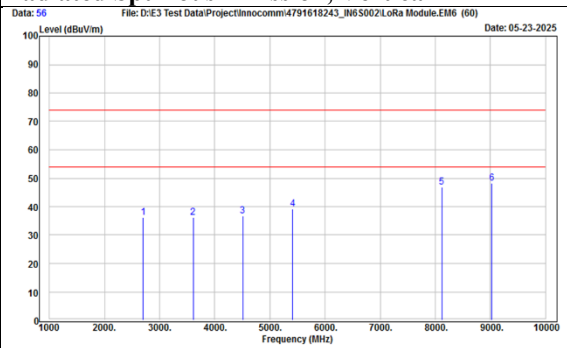
Mode	LoRa	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2706.9	39.22	-3.02	36.2	74	-37.8	PK
	*	3609.2	36.13	-0.63	35.5	74	-38.5	PK
	*	4511.5	35.17	1.67	36.84	74	-37.16	PK
		5413.8	35.63	3.7	39.33	74	-34.67	PK
	*	8120.7	33.93	12.56	46.49	74	-27.51	PK
	*	9023	33.4	14.26	47.66	74	-26.34	PK
Vertical		2706.9	39.08	-3.02	36.06	74	-37.94	PK
	*	3609.2	36.77	-0.63	36.14	74	-37.86	PK
	*	4511.5	34.95	1.67	36.62	74	-37.38	PK
		5413.8	35.42	3.7	39.12	74	-34.88	PK
	*	8120.7	34.33	12.56	46.89	74	-27.11	PK
	*	9023	33.92	14.26	48.18	74	-25.82	PK

TX, LoRa (Ch 0)
Radiated Spurious Emission, Horizontal



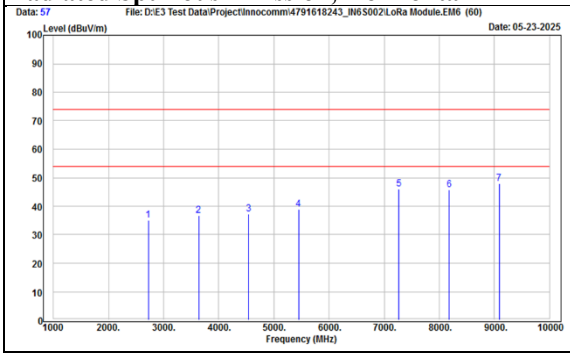
TX, LoRa (Ch 0)
Radiated Spurious Emission, Vertical



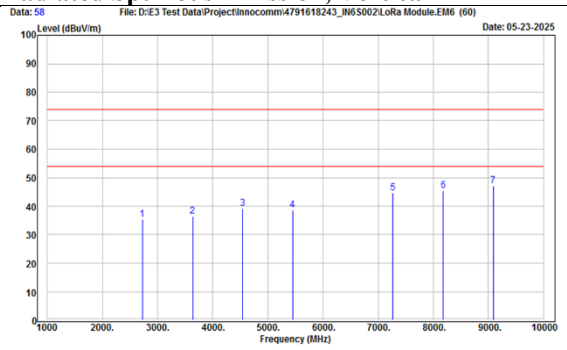
Mode	LoRa	Channel	32

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2726.1	37.96	-2.95	35.01	74	-38.99	PK
	*	3634.8	37.17	-0.52	36.65	74	-37.35	PK
	*	4543.5	35.45	1.7	37.15	74	-36.85	PK
		5452.2	34.87	3.91	38.78	74	-35.22	PK
	*	7269.6	35.27	10.63	45.9	74	-28.1	PK
	*	8178.3	33.44	12.26	45.7	74	-28.3	PK
	*	9087	33.28	14.58	47.86	74	-26.14	PK
Vertical		2726.1	38.21	-2.95	35.26	74	-38.74	PK
	*	3634.8	36.85	-0.52	36.33	74	-37.67	PK
	*	4543.5	37.36	1.7	39.06	74	-34.94	PK
		5452.2	34.7	3.91	38.61	74	-35.39	PK
	*	7269.6	34.01	10.63	44.64	74	-29.36	PK
	*	8178.3	33.15	12.26	45.41	74	-28.59	PK
	*	9087	32.42	14.58	47	74	-27	PK

TX, LoRa (Ch 32)
Radiated Spurious Emission, Horizontal



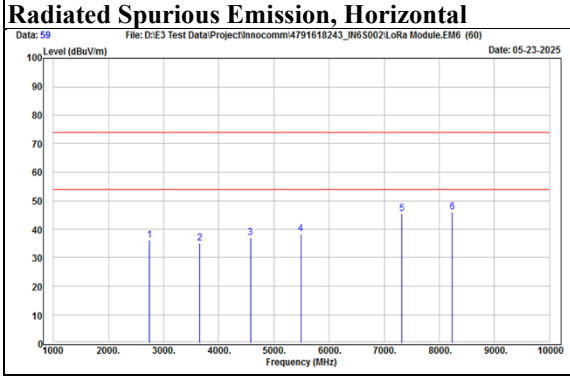
TX, LoRa (Ch 32)
Radiated Spurious Emission, Vertical



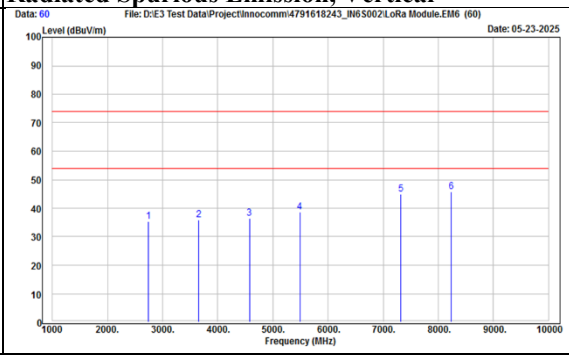
Mode	LoRa	Channel	63

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	2744.7	38.91	-2.87	36.04	74	-37.96	PK
	*	3659.6	35.41	-0.46	34.95	74	-39.05	PK
	*	4574.5	35.13	1.87	37	74	-37	PK
	*	5489.4	34.4	4.08	38.48	74	-35.52	PK
	*	7319.2	34.86	10.58	45.44	74	-28.56	PK
	*	8234.1	33.93	12.06	45.99	74	-28.01	PK
Vertical	*	2744.7	38.34	-2.87	35.47	74	-38.53	PK
	*	3659.6	36.29	-0.46	35.83	74	-38.17	PK
	*	4574.5	34.65	1.87	36.52	74	-37.48	PK
	*	5489.4	34.62	4.08	38.7	74	-35.3	PK
	*	7319.2	34.3	10.58	44.88	74	-29.12	PK
	*	8234.1	33.73	12.06	45.79	74	-28.21	PK

TX, LoRa (Ch 63)
Radiated Spurious Emission, Horizontal



TX, LoRa (Ch 63)
Radiated Spurious Emission, Vertical

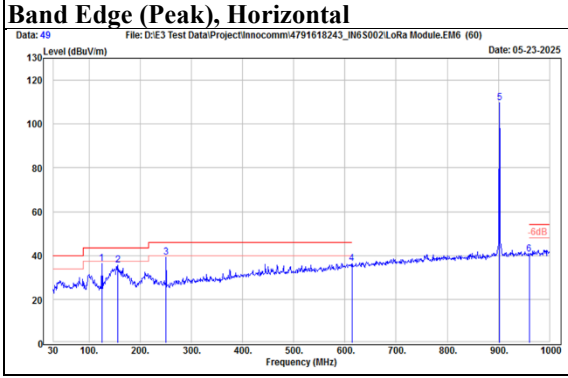


Below 1 GHz

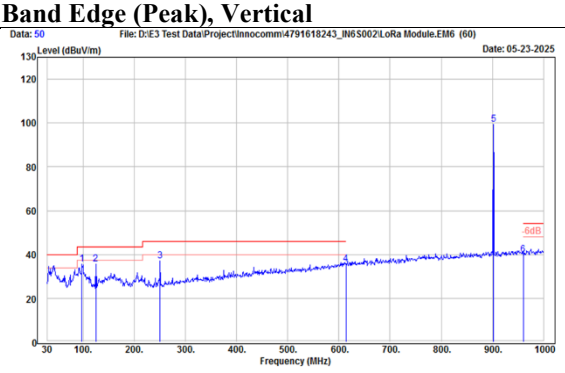
Mode	LoRa	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		125.06	48.9	-12.45	36.45	43.5	-7.05	PK
		156.1	45.61	-9.98	35.63	43.5	-7.87	PK
		250.19	49.85	-10.78	39.07	46	-6.93	PK
		614	36.7	-0.48	36.22	46	-9.78	PK
	@	902.3	105.53	4.18	109.71	N/A	N/A	PK
		960	35.49	4.98	40.47	54	-13.53	PK
Vertical		97.9	51.02	-15.5	35.52	43.5	-7.98	PK
		125.06	47.93	-12.45	35.48	43.5	-8.02	PK
		250.19	47.95	-10.78	37.17	46	-8.83	PK
		614	35.99	-0.48	35.51	46	-10.49	PK
	@	902.3	95.2	4.18	99.38	N/A	N/A	PK
		960	34.74	4.98	39.72	54	-14.28	PK

TX, LoRa (Ch 0)
Band Edge (Peak), Horizontal



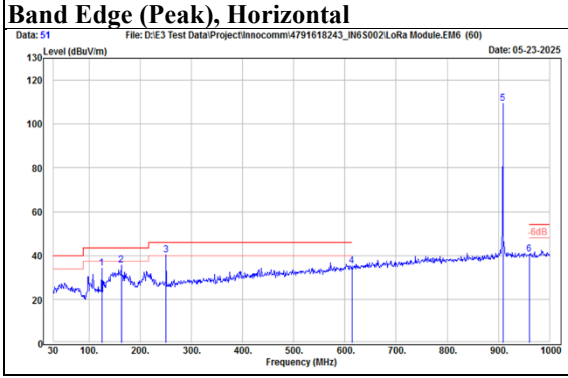
TX, LoRa (Ch 0)
Band Edge (Peak), Vertical



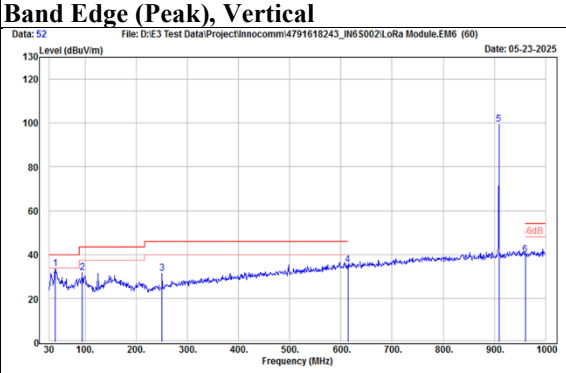
Mode	LoRa	Channel	32

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		125.06	46.68	-12.45	34.23	43.5	-9.27	PK
		162.89	45.7	-10.04	35.66	43.5	-7.84	PK
		250.19	51.16	-10.78	40.38	46	-5.62	PK
		614	35.92	-0.48	35.44	46	-10.56	PK
	@	908.7	104.95	4.34	109.29	N/A	N/A	PK
		960	35.51	4.98	40.49	54	-13.51	PK
Vertical		41.64	44.82	-11.26	33.56	40	-6.44	PK
		94.99	47.75	-16.06	31.69	43.5	-11.81	PK
		250.19	42.15	-10.78	31.37	46	-14.63	PK
		614	35.65	-0.48	35.17	46	-10.83	PK
	@	908.7	95.13	4.34	99.47	N/A	N/A	PK
		960	34.86	4.98	39.84	54	-14.16	PK

TX, LoRa (Ch 32)
Band Edge (Peak), Horizontal



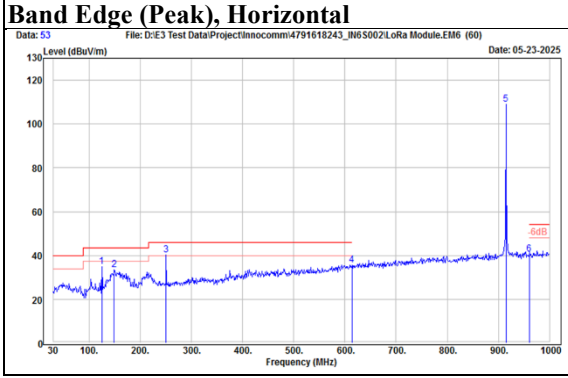
TX, LoRa (Ch 32)
Band Edge (Peak), Vertical



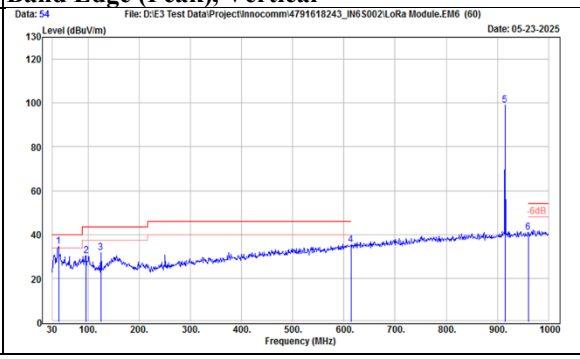
Mode	LoRa	Channel	63

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		125.06	47.21	-12.45	34.76	43.5	-8.74	PK
		149.31	43.55	-10.19	33.36	43.5	-10.14	PK
		250.19	50.88	-10.78	40.1	46	-5.9	PK
		614	36.13	-0.48	35.65	46	-10.35	PK
	@	914.9	104.52	4.39	108.91	N/A	N/A	PK
		960	35.75	4.98	40.73	54	-13.27	PK
Vertical		42.61	45.53	-11.02	34.51	40	-5.49	PK
		95.96	45.94	-15.67	30.27	43.5	-13.23	PK
		125.06	44.32	-12.45	31.87	43.5	-11.63	PK
		614	35.87	-0.48	35.39	46	-10.61	PK
	@	914.9	94.61	4.39	99	N/A	N/A	PK
		960	36	4.98	40.98	54	-13.02	PK

TX, LoRa (Ch 63)
Band Edge (Peak), Horizontal



TX, LoRa (Ch 63)
Band Edge (Peak), Vertical



9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

KDB 414788 D01 OATS and Chamber Correlation Justification

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

9.3. AC Power Line Conducted Emission

Requirements

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

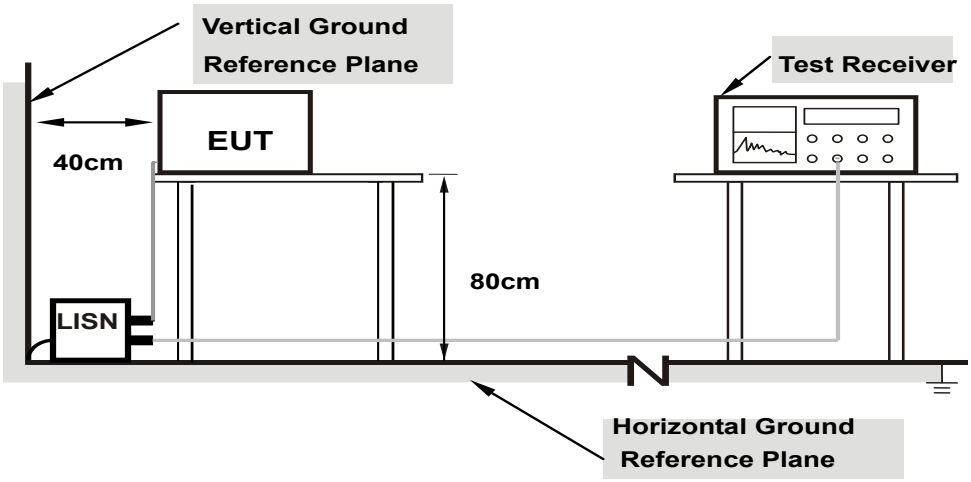
Note:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.
2. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
3. Test data of Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB).
4. Test data of Margin(dB) = Result value (dBuV) - Limit value (dBuV).
5. Test data of Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).

Test Setup



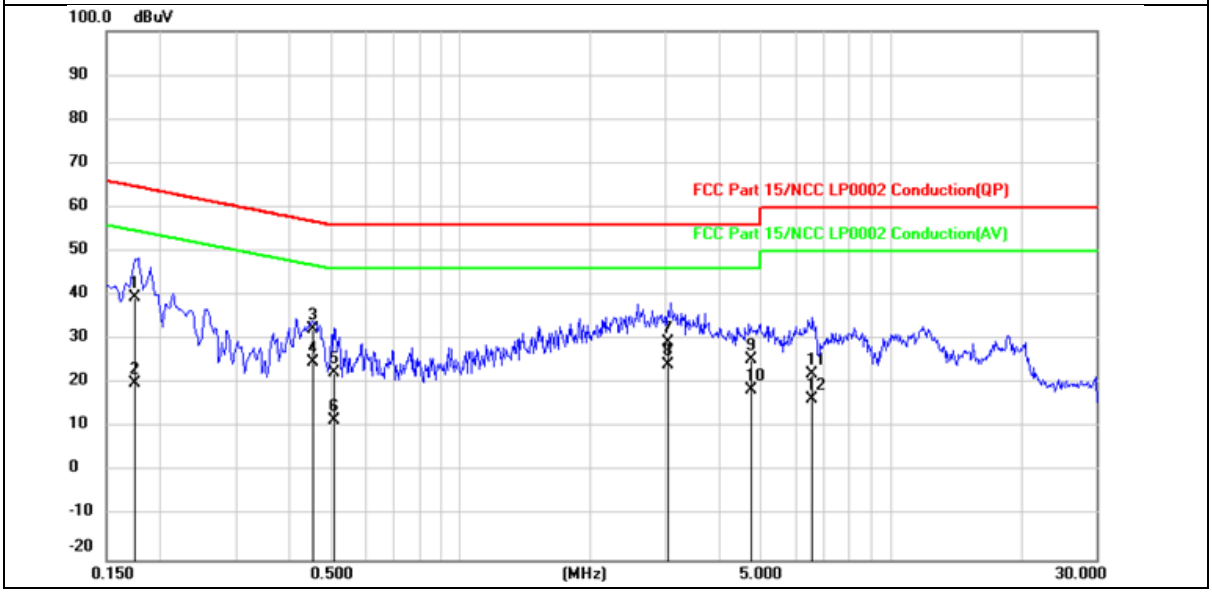
Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the Setup Configurations.

Test Data

Mode	Lora_TX902.3	Channel	0

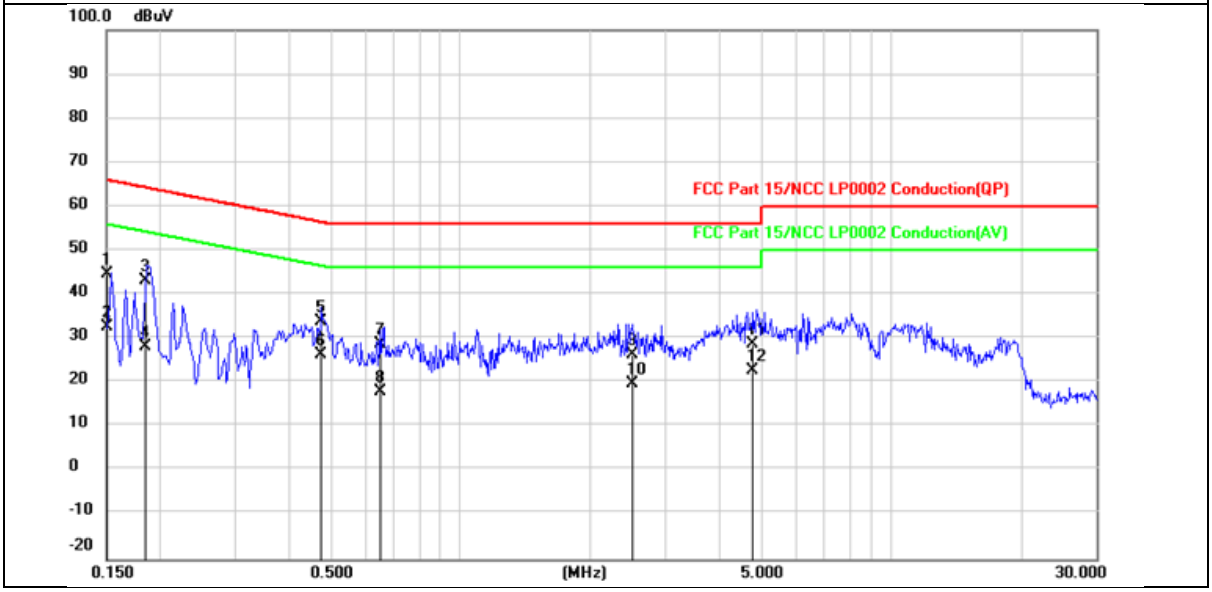
Phase: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1742	29.68	9.96	39.64	64.76	-25.12	QP
2	0.1742	10.15	9.96	20.11	54.76	-34.65	AVG
3	0.4522	22.29	9.97	32.26	56.83	-24.57	QP
4	0.4522	14.90	9.97	24.87	46.83	-21.96	AVG
5	0.5098	12.39	9.97	22.36	56.00	-33.64	QP
6	0.5098	1.58	9.97	11.55	46.00	-34.45	AVG
7	3.0439	19.22	10.07	29.29	56.00	-26.71	QP
8	3.0439	14.14	10.07	24.21	46.00	-21.79	AVG
9	4.7462	15.28	10.11	25.39	56.00	-30.61	QP
10	4.7462	8.42	10.11	18.53	46.00	-27.47	AVG
11	6.6019	11.87	10.17	22.04	60.00	-37.96	QP
12	6.6019	6.19	10.17	16.36	50.00	-33.64	AVG

Mode	Lora_ TX902.3	Channel	0

Phase: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1503	34.77	9.94	44.71	65.98	-21.27	QP
2	0.1503	22.78	9.94	32.72	55.98	-23.26	AVG
3	0.1842	33.32	9.94	43.26	64.29	-21.03	QP
4	0.1842	18.28	9.94	28.22	54.29	-26.07	AVG
5	0.4771	24.05	9.95	34.00	56.39	-22.39	QP
6	0.4771	16.35	9.95	26.30	46.39	-20.09	AVG
7	0.6491	18.80	9.95	28.75	56.00	-27.25	QP
8	0.6491	8.09	9.95	18.04	46.00	-27.96	AVG
9	2.5162	16.28	10.02	26.30	56.00	-29.70	QP
10	2.5162	9.82	10.02	19.84	46.00	-26.16	AVG
11	4.7792	18.78	10.08	28.86	56.00	-27.14	QP
12	4.7792	12.61	10.08	22.69	46.00	-23.31	AVG

END OF REPORT