

FCC Radio Test Report

FCC ID: 2AY6XSF-0102

Report No. : BTL-FCCP-1-2201T072
Equipment : EGLTEC 2-Port UHF RFID Reader- Fixed
Model Name : SF-0102
Brand Name : EGLTEC
Applicant : EGLTEC Intelligent Technology Co., Ltd.
Address : No. 110, Ziyou Rd., Shanhua Dist, Tainan City, Taiwan

Radio Function : RFID UHF (902-928 MHz)

FCC Rule Part(s) : FCC CFR Title 47, Part 15, Subpart C (15.247)
Measurement Procedure(s) : ANSI C63.10-2013

Date of Receipt : 2022/1/19
Date of Test : 2022/1/19 ~ 2022/4/1
Issued Date : 2022/4/6

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by :

Eric Lee

Eric Lee, Engineer

Approved by :

Jerry Chuang

Jerry Chuang, Supervisor



BTL Inc.

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan

Tel: +886-2-2657-3299

Fax: +886-2-2657-3331

Web: www.newbtl.com

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

CONTENTS

1	SUMMARY OF TEST RESULTS	6
1.1	TEST FACILITY	7
1.2	MEASUREMENT UNCERTAINTY	7
1.3	TEST ENVIRONMENT CONDITIONS	8
1.4	TABLE OF PARAMETERS OF TEST SOFTWARE SETTING	8
1.5	DUTY CYCLE	9
2	GENERAL INFORMATION	10
2.1	DESCRIPTION OF EUT	10
2.2	TEST MODES	11
2.3	BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	12
2.4	SUPPORT UNITS	12
3	RADIATED EMISSIONS TEST	13
3.1	LIMIT	13
3.2	TEST PROCEDURE	14
3.3	DEVIATION FROM TEST STANDARD	14
3.4	TEST SETUP	14
3.5	EUT OPERATING CONDITIONS	15
3.6	TEST RESULT – 30 MHZ TO 1 GHZ	16
3.7	TEST RESULT – ABOVE 1 GHZ	16
4	NUMBER OF HOPPING CHANNEL	17
4.1	APPLIED PROCEDURES	17
4.2	TEST PROCEDURE	17
4.3	DEVIATION FROM STANDARD	17
4.4	TEST SETUP	17
4.5	EUT OPERATION CONDITIONS	17
4.6	TEST RESULTS	17
5	AVERAGE TIME OF OCCUPANCY	18
5.1	APPLIED PROCEDURES / LIMIT	18
5.2	TEST PROCEDURE	18
5.3	DEVIATION FROM STANDARD	18
5.4	TEST SETUP	18
5.5	EUT OPERATION CONDITIONS	18
5.6	TEST RESULTS	18
6	HOPPING CHANNEL SEPARATION MEASUREMENT	19
6.1	APPLIED PROCEDURES / LIMIT	19
6.2	TEST PROCEDURE	19
6.3	DEVIATION FROM STANDARD	19
6.4	TEST SETUP	19
6.5	TEST RESULTS	19
7	BANDWIDTH TEST	20
7.1	APPLIED PROCEDURES	20
7.2	TEST PROCEDURE	20
7.3	DEVIATION FROM STANDARD	20
7.4	TEST SETUP	20
7.5	EUT OPERATION CONDITIONS	20
7.6	TEST RESULTS	20
8	OUTPUT POWER TEST	21

8.1	APPLIED PROCEDURES / LIMIT	21
8.2	TEST PROCEDURE	21
8.3	DEVIATION FROM STANDARD	21
8.4	TEST SETUP	21
8.5	EUT OPERATION CONDITIONS	21
8.6	TEST RESULTS	21
9	ANTENNA CONDUCTED SPURIOUS EMISSION	22
9.1	APPLIED PROCEDURES / LIMIT	22
9.2	TEST PROCEDURE	22
9.3	DEVIATION FROM STANDARD	22
9.4	TEST SETUP	22
9.5	EUT OPERATION CONDITIONS	22
9.6	TEST RESULTS	22
10	LIST OF MEASURING EQUIPMENTS	23
11	EUT TEST PHOTO	25
12	EUT PHOTOS	25
APPENDIX A	RADIATED EMISSIONS - 30 MHZ TO 1 GHZ	26
APPENDIX B	RADIATED EMISSIONS - ABOVE 1 GHZ	29
APPENDIX C	NUMBER OF HOPPING CHANNEL	36
APPENDIX D	AVERAGE TIME OF OCCUPANCY	38
APPENDIX E	HOPPING CHANNEL SEPARATION MEASUREMENT	41
APPENDIX F	BANDWIDTH	43
APPENDIX G	OUTPUT POWER	45
APPENDIX H	ANTENNA CONDUCTED SPURIOUS EMISSION	47

REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2201T072	R00	Original Report.	2022/3/1	Invalid
BTL-FCCP-1-2201T072	R01	Revised Typo.	2022/3/8	Invalid
BTL-FCCP-1-2201T072	R02	Revised report to address TCB's comments.	2022/3/16	Invalid
BTL-FCCP-1-2201T072	R03	Revised report to address TCB's comments.	2022/3/29	Invalid
BTL-FCCP-1-2201T072	R04	Revised report to address TCB's comments.	2022/4/6	Valid

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

FCC CFR Title 47, Part 15, Subpart C (15.247)				
Standard(s) Section	Description	Test Result	Judgement	Remark
15.207	AC Power Line Conducted Emissions	-----	N/A NOTE (2)	-----
15.205 15.209 15.247(d)	Radiated Emissions	APPENDIX A APPENDIX B	Pass	-----
15.247 (a)(1)(i)	Number of Hopping Frequency	APPENDIX C	Pass	-----
15.247 (a)(1)(iii)	Average Time of Occupancy	APPENDIX D	Pass	-----
15.247 (a)(1)(i)	Hopping Channel Separation	APPENDIX E	Pass	-----
15.247 (a)(1)(i)	Bandwidth	APPENDIX F	Pass	-----
15.247 (b)(2)	Output Power	APPENDIX G	Pass	-----
15.247(d)	Antenna conducted Spurious Emission	APPENDIX H	Pass	-----
15.247 (a)(1)(i)	Dwell Time	APPENDIX H	Pass	-----
15.203	Antenna Requirement	-----	Pass	-----

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) Power by DC only.
- (3) The report format version is TP.1.1.1.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.

- C05 CB08 CB11 CB15 CB16
 SR05

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k = 2$, providing a level of confidence of approximately **95 %**. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

A. Radiated emissions test :

Test Site	Measurement Frequency Range	U,(dB)
CB15	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

B. Conducted test :

Test Item	U,(dB)
Number of Hopping Frequency	0.00
Average Time of Occupancy	1.20
Hopping Channel Separation	1.20
Bandwidth	1.13
Peak Output Power	1.06
Antenna conducted Spurious Emission	1.14
Dwell Time	1.20

NOTE:

Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

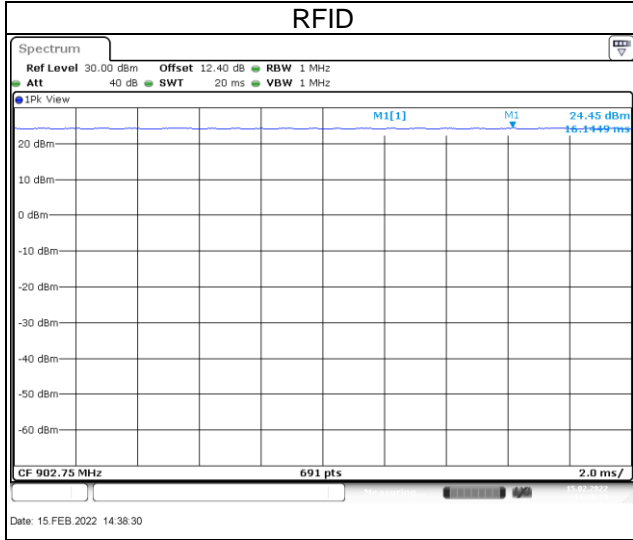
Test Item	Environment Condition	Test Voltage	Tested by
Radiated emissions below 1 GHz	20 °C, 60 %	DC 12V	Vincent Lee
Radiated emissions above 1 GHz	20 °C, 60 %	DC 12V	Vincent Lee
Number of Hopping Frequency	24.2 °C, 48 %	DC 12V	Paul Shen
Average Time of Occupancy	24.2 °C, 48 %	DC 12V	Paul Shen
Hopping Channel Separation	24.2 °C, 48 %	DC 12V	Paul Shen
Bandwidth	24.2 °C, 48 %	DC 12V	Paul Shen
Output Power	24.2 °C, 48 %	DC 12V	Paul Shen
Antenna conducted Spurious Emission	24.2 °C, 48 %	DC 12V	Paul Shen
Dwell Time	24.2 °C, 48 %	DC 12V	Paul Shen

1.4 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

Test Software	CommandDemo Ver.1.0.0.20			
Modulation Mode	902.75 MHz	914.75 MHz	927.25 MHz	Data Rate
Parameters_Ant 1	26	26	26	-
Parameters_Ant 2	26	26	26	-

1.5 DUTY CYCLE

If duty cycle is $\geq 98\%$, duty factor is not required.
 If duty cycle is $< 98\%$, duty factor shall be considered.



Remark	Delta 1			Delta 2	On Time/Period	10 log(1/Duty Cycle)
Mode	ON (ms)	Numbers (ON)	On Time (B) (ms)	Period (ON+OFF) (ms)	Duty Cycle (%)	Duty Factor (dB)
RFID	1.000	1	1.000	1.000	100.00%	0

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	EGLTEC 2-Port UHF RFID Reader- Fixed
Model Name	SF-0102
Brand Name	EGLTEC
Model Difference	N/A
Power Source	DC voltage supplied from External Power Supply.
Power Rating	12V---1.0A
Products Covered	N/A
Operation Band	902 MHz ~ 928 MHz
Operation Frequency	902.75 MHz ~ 927.25 MHz
Modulation Technology	ASK
Output Power Max.	23.85 dBm (0.2427 W)
Test Model	SF-0102
Sample Status	Engineering Sample
EUT Modification(s)	N/A

NOTE:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

(2) Channel List:

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

(3) Table for Filed Antenna:

Ant.	Brand	Model Name	Type	Connector	Gain (dBi)
1	Guangqi Technology Co., Ltd.	A1050C	PCB	SMA	3
2	Guangqi Technology Co., Ltd.	A1050C	PCB	SMA	3

Note: The antenna is the support unit for the test, which is not attached with the goods.

2.2 TEST MODES

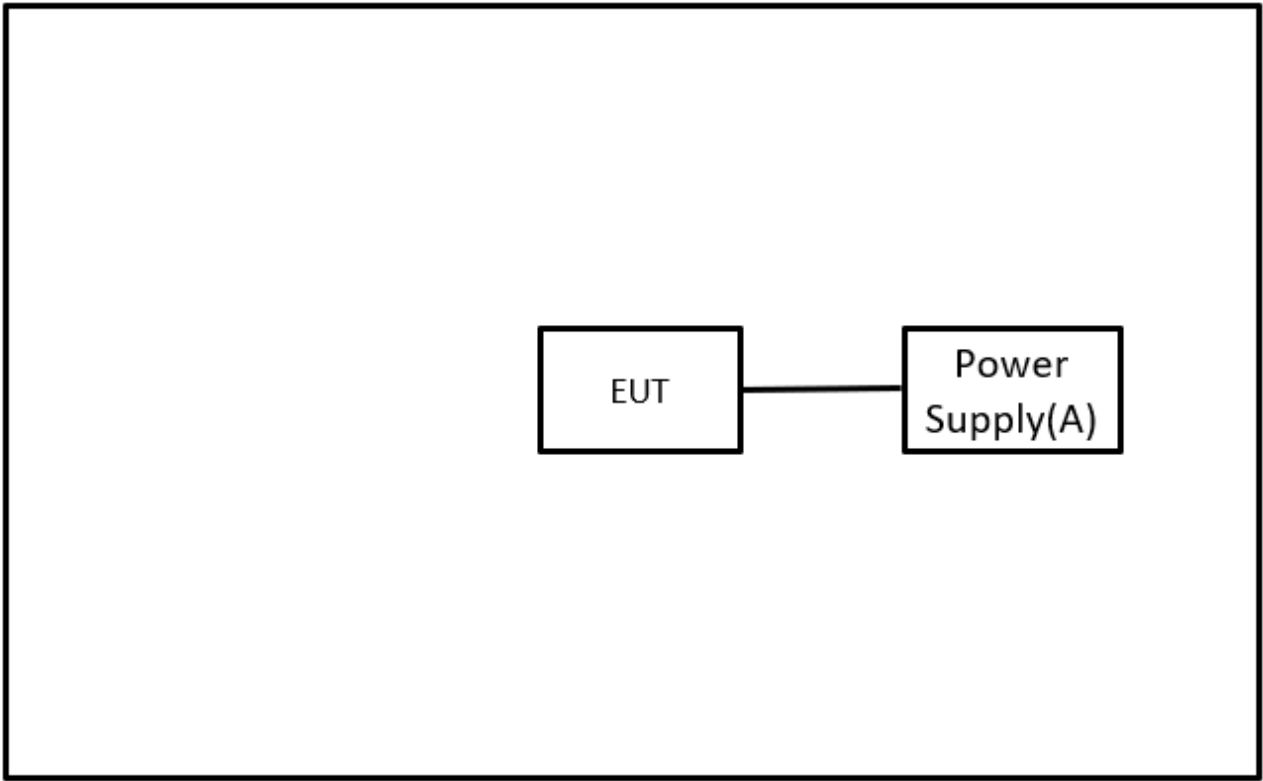
Test Items	Test mode	Channel	Note
Transmitter Radiated Emissions (below 1GHz)	TX Mode	1	-
Transmitter Radiated Emissions (above 1GHz)	TX Mode	1/25/50	-
Number of Hopping Frequency	TX Mode	1~50	-
Average Time of Occupancy	TX Mode	1/25/50	-
Hopping Channel Separation	TX Mode	1/25/50	-
Bandwidth	TX Mode	1/25/50	-
Output Power	TX Mode	1/25/50	-
Antenna conducted Spurious Emission	TX Mode	1/50	-
Dwell Time	TX Mode	1/25/50	-

NOTE:

- (1) The Radiated emissions test was verified based on the worst conducted power and Bandwidth test results reported in the original report.
- (2) All X, Y and Z axes are evaluated, but only the worst case (X axis) is recorded.
- (3) There were no emissions found below 30 MHz within 20 dB of the limit.

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	Power Supply	TWINTEX	TPS-6015	N/A	Furnished by test lab.

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
-	-	-	-	-	-

3 RADIATED EMISSIONS TEST

3.1 LIMIT

In case the emission fall within the restricted band specified on 15.205, then the 15.209 limit in the table below has to be followed.

LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz)

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
960~1000	500	3

LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	Radiated Emissions (dBuV/m)		Measurement Distance (meters)
	Peak	Average	
Above 1000	74	54	3

NOTE:

- (1) The limit for radiated test was performed according to FCC Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
 Margin Level = Measurement Value - Limit Value

Calculation example:

Reading Level		Correct Factor		Measurement Value
35.45	+	-11.37	=	24.08

Measurement Value		Limit Value		Margin Level
24.08	-	40	=	-15.92

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average

Spectrum Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz~110KHz for QP detector
Start ~ Stop Frequency	110KHz~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

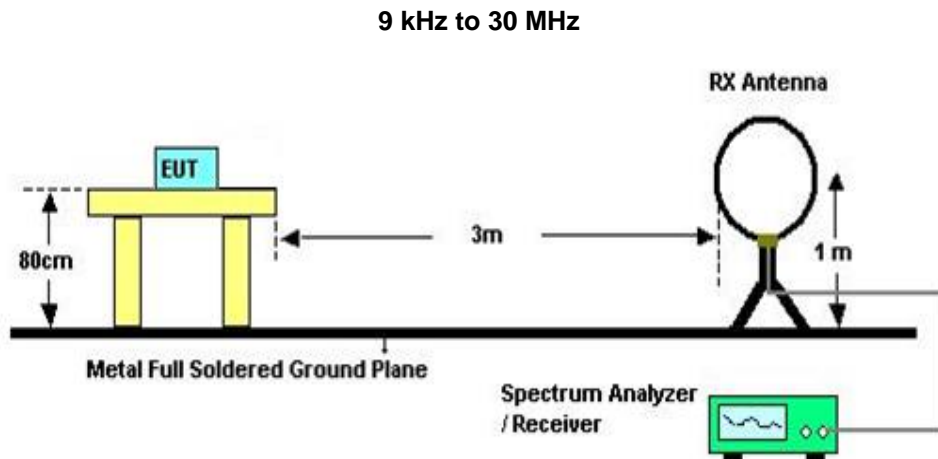
3.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item – EUT TEST PHOTO.

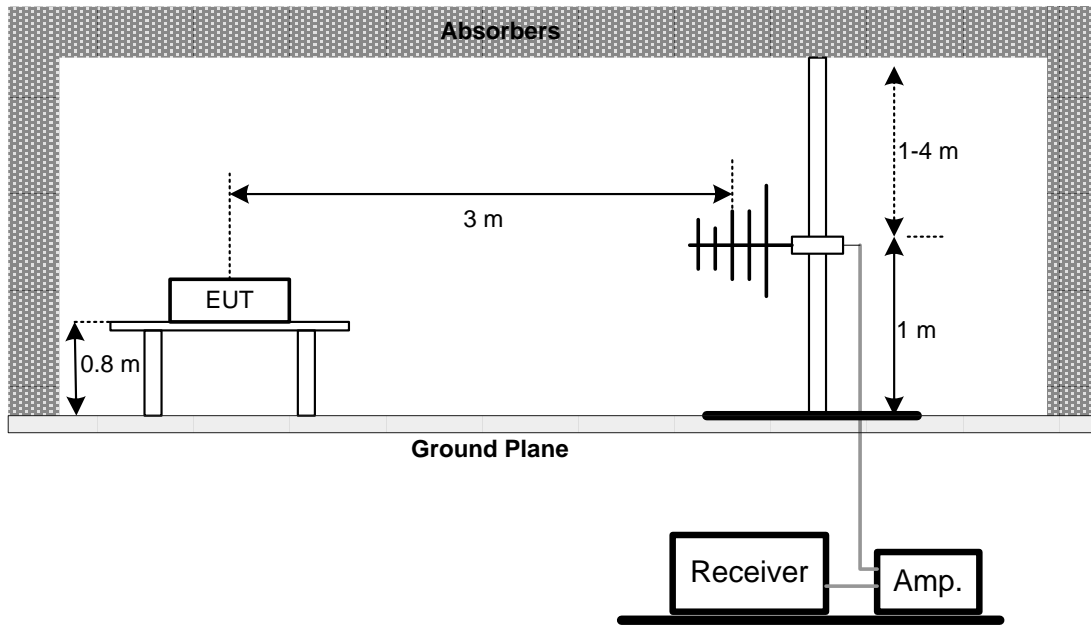
3.3 DEVIATION FROM TEST STANDARD

No deviation.

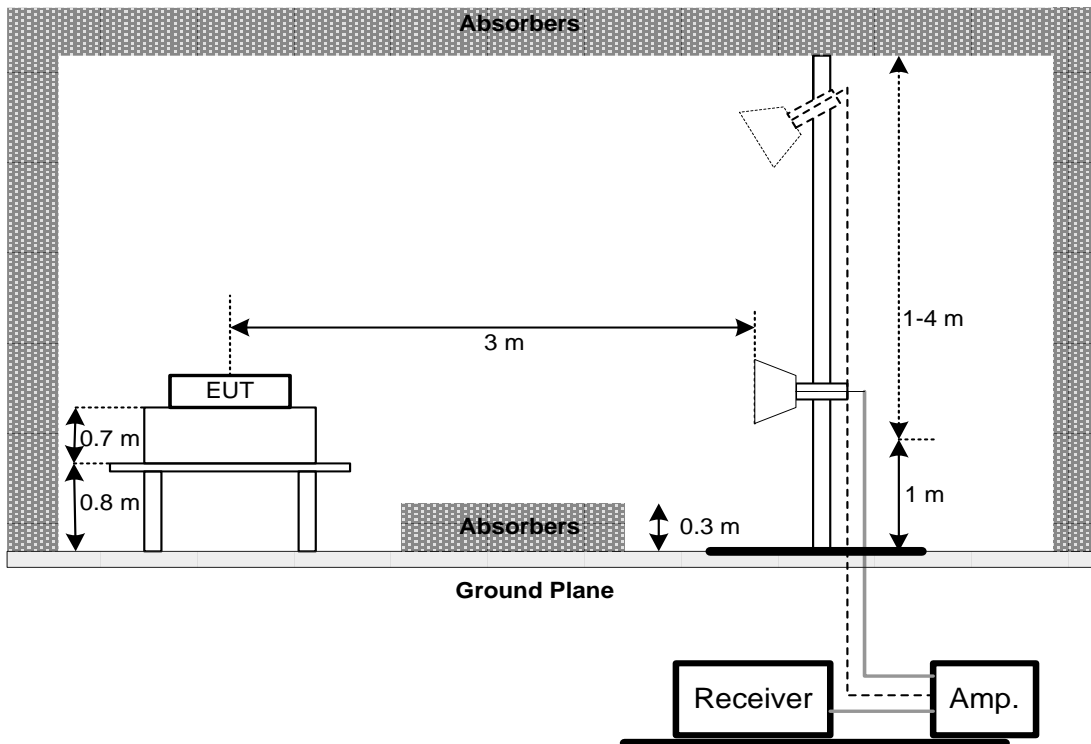
3.4 TEST SETUP



30 MHz to 1 GHz



Above 1 GHz



3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

3.6 TEST RESULT – 30 MHZ TO 1 GHZ

Please refer to the APPENDIX A.

3.7 TEST RESULT – ABOVE 1 GHZ

Please refer to the APPENDIX B.

NOTE:

- (1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

4 NUMBER OF HOPPING CHANNEL

4.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(i)	Number of Hopping Channel	902-928	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

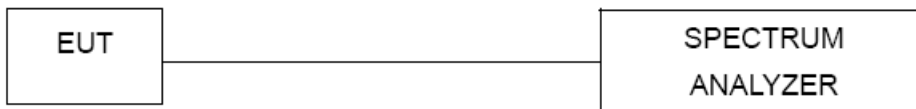
4.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW=100KHz, VBW=100KHz, Sweep time = Auto.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

Please refer to the APPENDIX C.

5 AVERAGE TIME OF OCCUPANCY

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(i)	Average Time of Occupancy	0.4sec	902-928	PASS

5.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. AFH: Packet permit maximum $416/16/15 = 1.733$ hops per second in each channel(12 time slots Tx, 4 time slots Stop). So, the dwell time is the time duration of the pulse times $1.733 \times 6 = 10.4$ within 6 seconds.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

Please refer to the APPENDIX D.

6 HOPPING CHANNEL SEPARATION MEASUREMENT

6.1 APPLIED PROCEDURES / 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.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

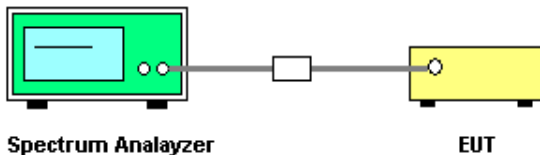
6.2 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels
 Resolution (or IF) Bandwidth (RBW) \geq 1% of the span
 Video (or Average) Bandwidth (VBW) \geq RBW
 Sweep = Auto
 Detector function = Peak
 Trace = Max Hold

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 TEST RESULTS

Please refer to the APPENDIX E.

7 BANDWIDTH TEST

7.1 APPLIED PROCEDURES

If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Frequency Range (MHz)
15.247(a)(1)(i)	Bandwidth	902-928

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz (20dB Bandwidth)
VBW	100 KHz (20dB Bandwidth)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

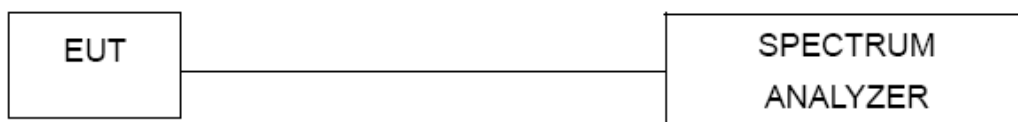
7.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep Time = Auto.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULTS

Please refer to the APPENDIX F.

8 OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(2)	Peak Output Power	1 Watt or 30dBm (hopping channel >=50) 0.25 Watt or 23.98dBm (25<=hopping channels <50)	902-928	PASS

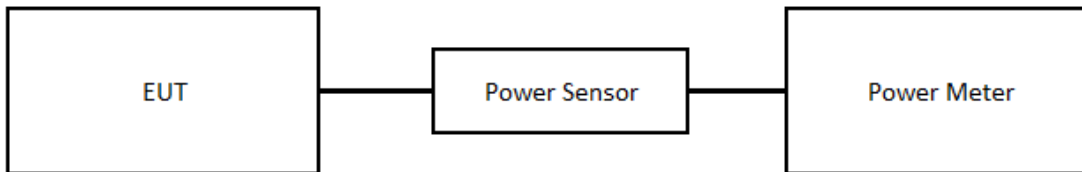
8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULTS

Please refer to the APPENDIX G.

9 ANTENNA CONDUCTED SPURIOUS EMISSION

9.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

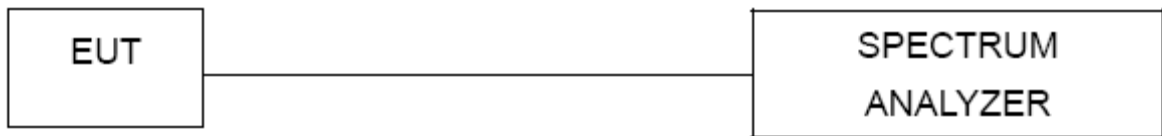
9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.
- c. Offset=antenna gain+cable loss

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

Please refer to the APPENDIX H.

10 LIST OF MEASURING EQUIPMENTS

Radiated Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC02325	980217	2021/4/8	2022/4/7
2	Preamplifier	EMCI	EMC012645B	980222	2021/4/8	2022/4/7
3	Preamplifier	EMCI	EMC001340	980555	2021/4/8	2022/4/7
4	Test Cable	EMCI	EMC104-SM-1000	180809	2021/4/8	2022/4/7
5	Test Cable	EMCI	EMC104-SM-SM-3000	151205	2021/4/8	2022/4/7
6	Test Cable	EMCI	EMC-SM-SM-7000	180408	2021/4/8	2022/4/7
7	MXE EMI Receiver	Agilent	N9038A	MY56400087	2021/5/27	2022/5/26
8	Signal Analyzer	Agilent	N9010A	MY56480554	2021/8/25	2022/8/24
9	Loop Ant	Electro-Metrics	EMCI-LPA600	274	2021/6/1	2022/5/31
10	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	2021/6/2	2022/6/1
11	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-352	2021/8/11	2022/8/10
12	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0625	2021/8/11	2022/8/10
13	Measurement Software	EZ	EZ EMC (Version NB-03A1-01)	N/A	N/A	N/A

Number of Hopping Frequency						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2021/3/5	2022/3/4
2	Spectrum Analyzer	R&S	FSV7	103032	2021/8/17	2022/8/16

Average Time of Occupancy						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2021/3/5	2022/3/4
2	Spectrum Analyzer	R&S	FSV7	103032	2021/8/17	2022/8/16

Hopping Channel Separation						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2021/3/5	2022/3/4
2	Spectrum Analyzer	R&S	FSV7	103032	2021/8/17	2022/8/16

Bandwidth						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2021/3/5	2022/3/4
2	Spectrum Analyzer	R&S	FSV7	103032	2021/8/17	2022/8/16

Output Power						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2021/3/5	2022/3/4
2	Power Meter	Anritsu	ML2487A	6K00004714	2021/8/15	2022/8/14
3	Power Sensor	Anritsu	MA2491A	034138	2021/8/15	2022/8/14

Antenna conducted Spurious Emission						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	R&S	FSP38	101139	2021/3/5	2022/3/4
2	Spectrum Analyzer	R&S	FSV7	103032	2021/8/17	2022/8/16

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.
 All calibration period of equipment list is one year.

11 EUT TEST PHOTO

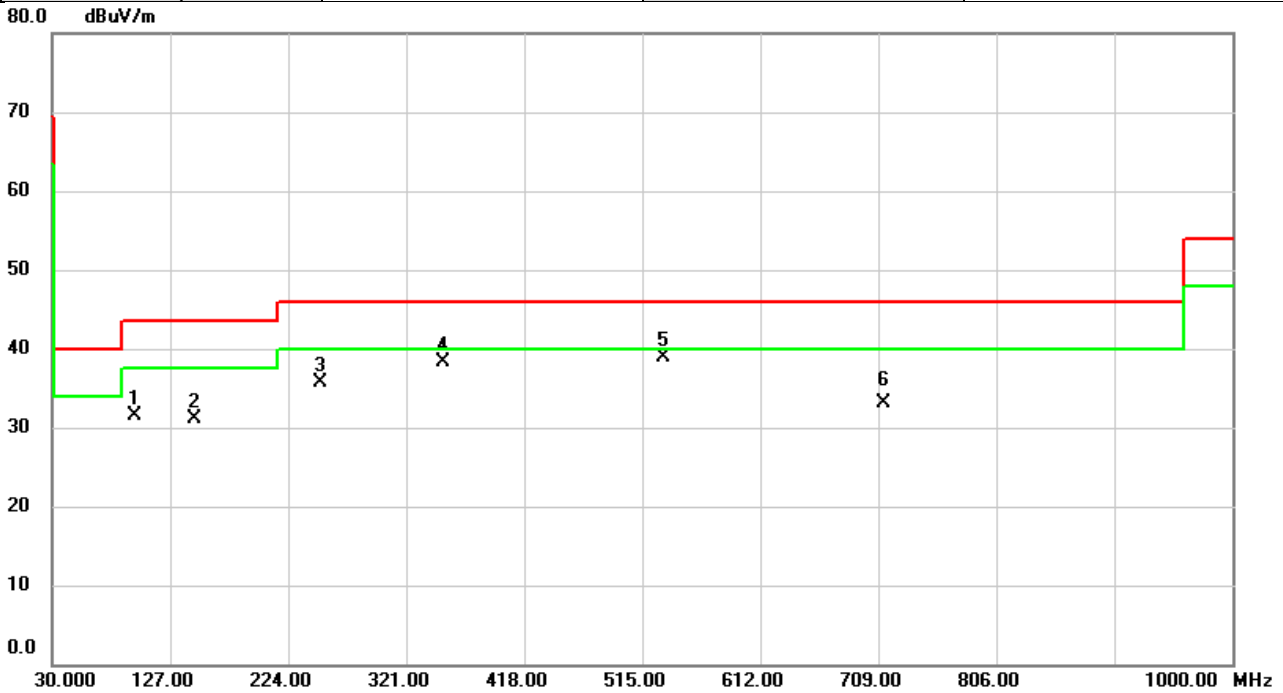
Please refer to document Appendix No.: TP-2201T072-FCCP-1 (APPENDIX-TEST PHOTOS).

12 EUT PHOTOS

Please refer to document Appendix No.: EP-2201T072-1 (APPENDIX-EUT PHOTOS).

APPENDIX A RADIATED EMISSIONS - 30 MHZ TO 1 GHZ

Test Mode	RFID	Test Date	2022/2/14
Test Frequency	902.75MHz	Polarization	Vertical
Temp	20°C	Hum.	60%

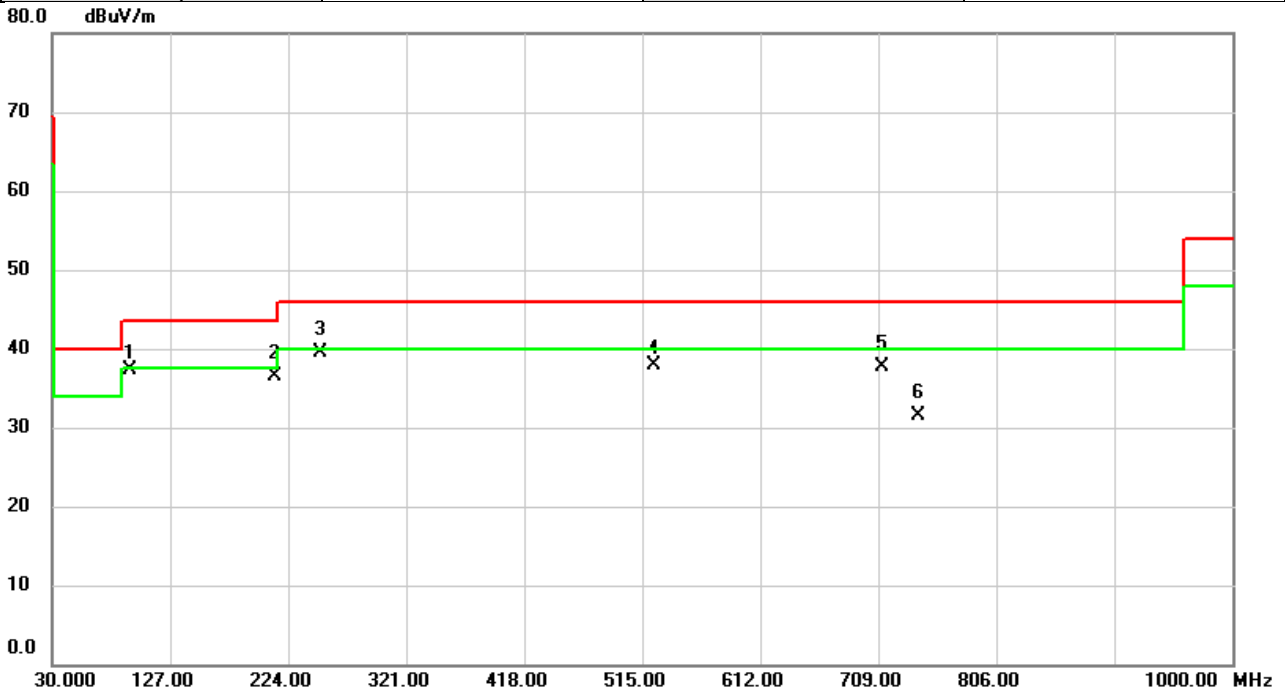


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		97.6090	45.55	-14.07	31.48	43.50	-12.02	peak	
2		147.4670	40.49	-9.41	31.08	43.50	-12.42	peak	
3		249.9960	45.93	-10.31	35.62	46.00	-10.38	peak	
4		350.7467	45.47	-7.26	38.21	46.00	-7.79	peak	
5	*	532.6216	41.85	-2.99	38.86	46.00	-7.14	peak	
6		712.9447	32.75	0.44	33.19	46.00	-12.81	QP	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	RFID	Test Date	2022/2/14
Test Frequency	902.75MHz	Polarization	Horizontal
Temp	20°C	Hum.	60%



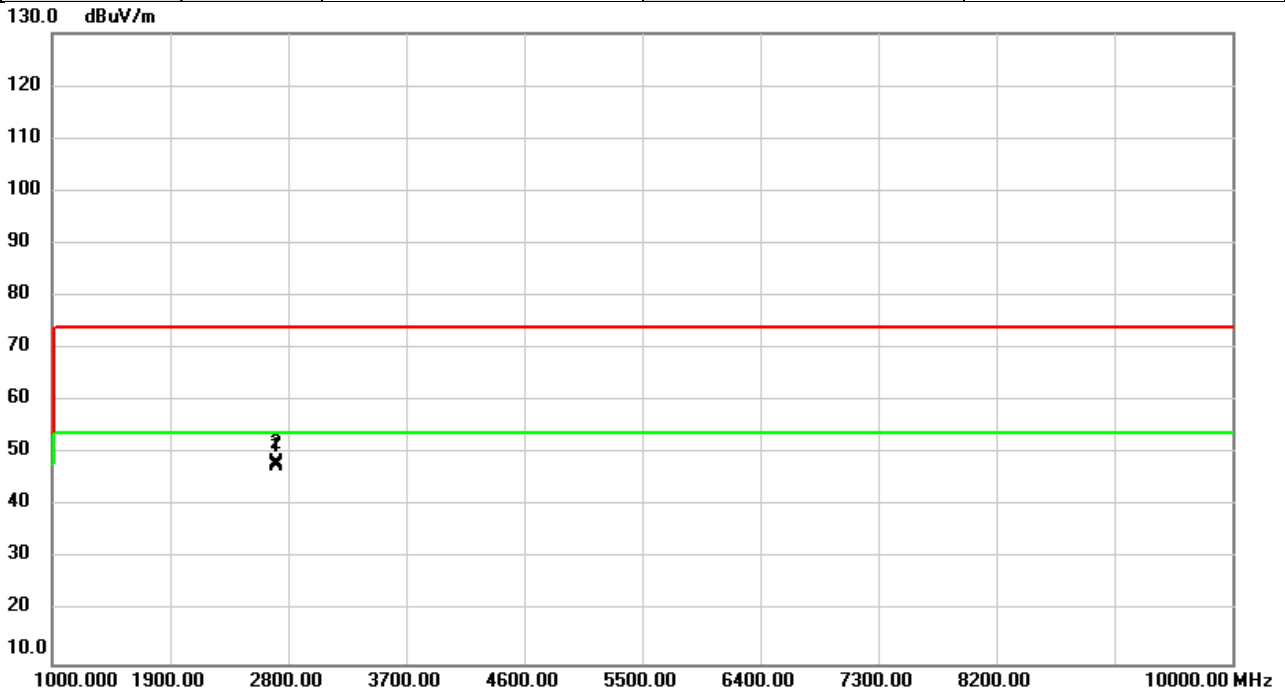
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	94.3433	51.90	-14.55	37.35	43.50	-6.15	peak	
2		213.1360	48.57	-12.08	36.49	43.50	-7.01	QP	
3		249.9960	49.78	-10.31	39.47	46.00	-6.53	QP	
4		524.6352	41.09	-3.16	37.93	46.00	-8.07	peak	
5		712.7830	37.35	0.44	37.79	46.00	-8.21	QP	
6		742.0770	30.35	1.24	31.59	46.00	-14.41	QP	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX B RADIATED EMISSIONS - ABOVE 1 GHZ

Test Mode	TX	Test Date	2022/2/14
Test Frequency	902.75MHz	Polarization	Vertical
Temp	20°C	Hum.	60%

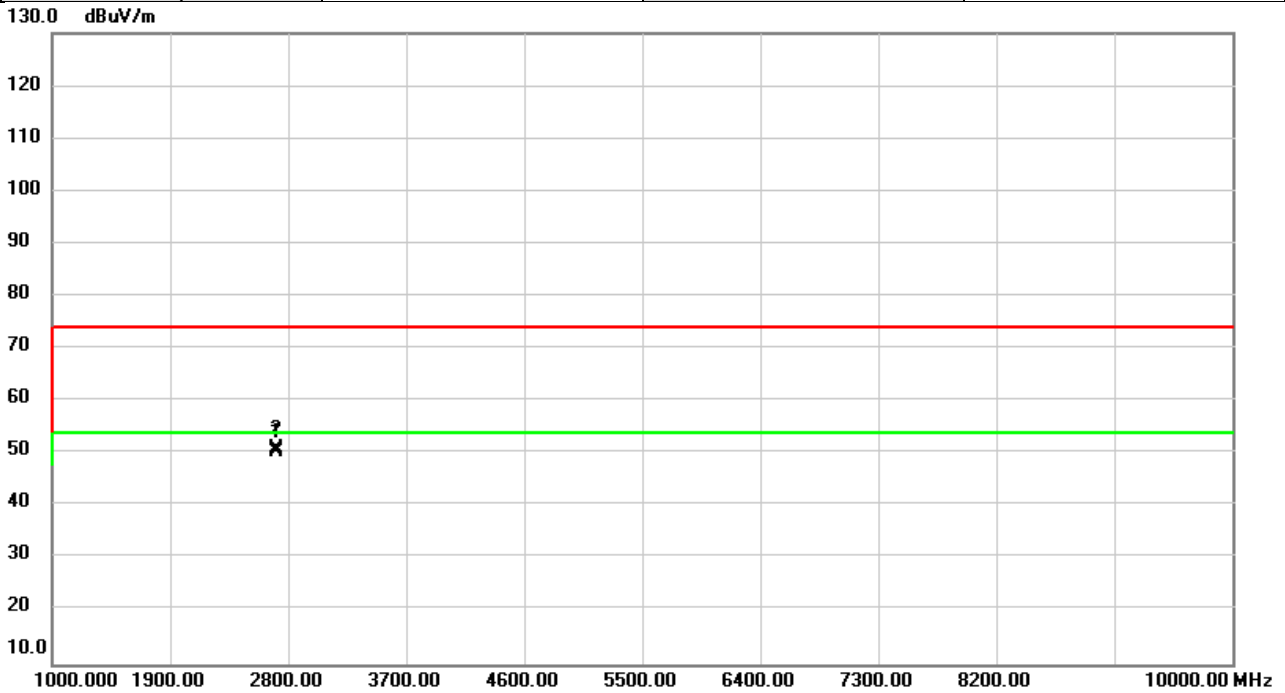


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2708.250	62.55	-14.23	48.32	74.00	-25.68	peak	
2	*	2708.250	61.78	-14.23	47.55	54.00	-6.45	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX	Test Date	2022/2/14
Test Frequency	902.75MHz	Polarization	Horizontal
Temp	20°C	Hum.	60%

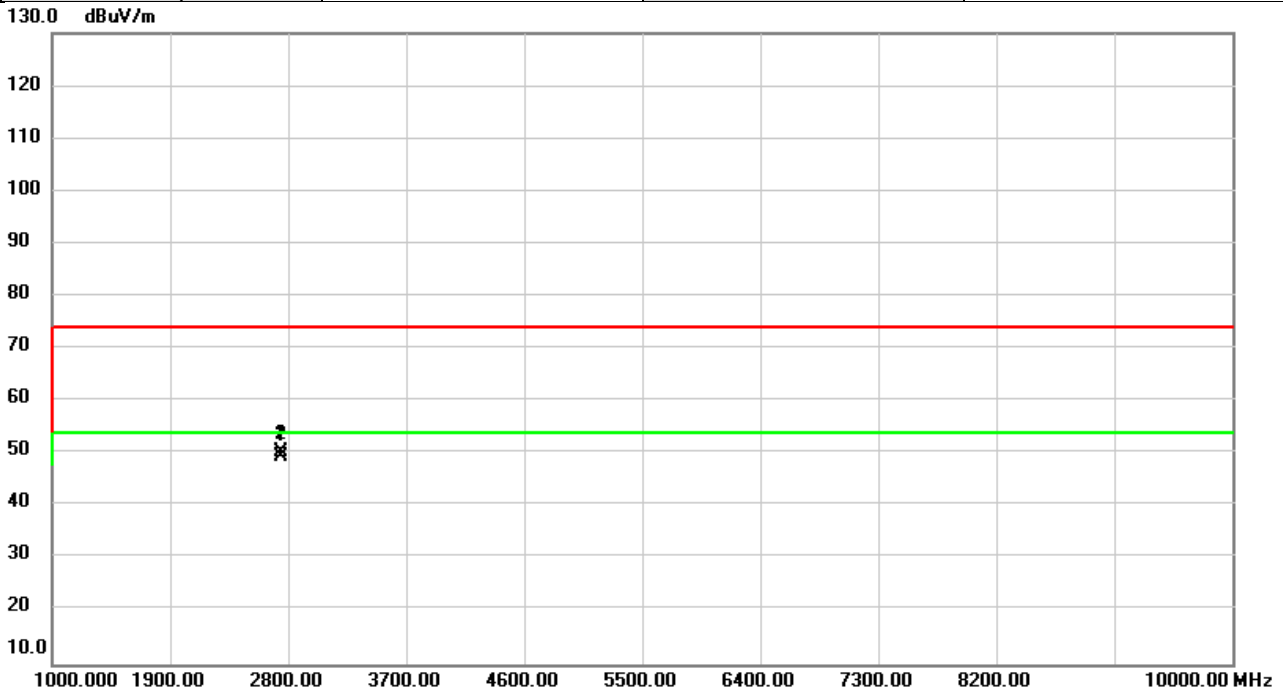


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2708.250	65.19	-14.23	50.96	74.00	-23.04	peak	
2	*	2708.250	64.56	-14.23	50.33	54.00	-3.67	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX	Test Date	2022/2/14
Test Frequency	914.75MHz	Polarization	Vertical
Temp	20°C	Hum.	60%

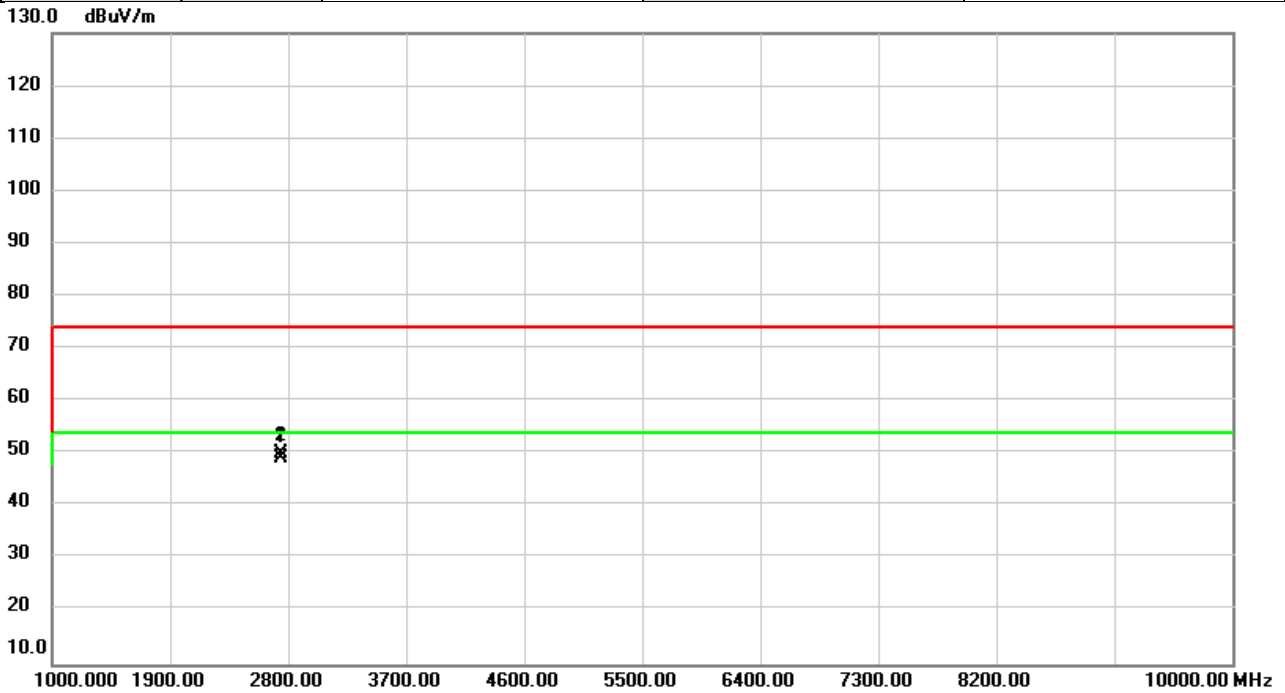


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2744.250	64.46	-14.12	50.34	74.00	-23.66	peak	
2	*	2744.250	63.50	-14.12	49.38	54.00	-4.62	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX	Test Date	2022/2/14
Test Frequency	914.75MHz	Polarization	Horizontal
Temp	20°C	Hum.	60%

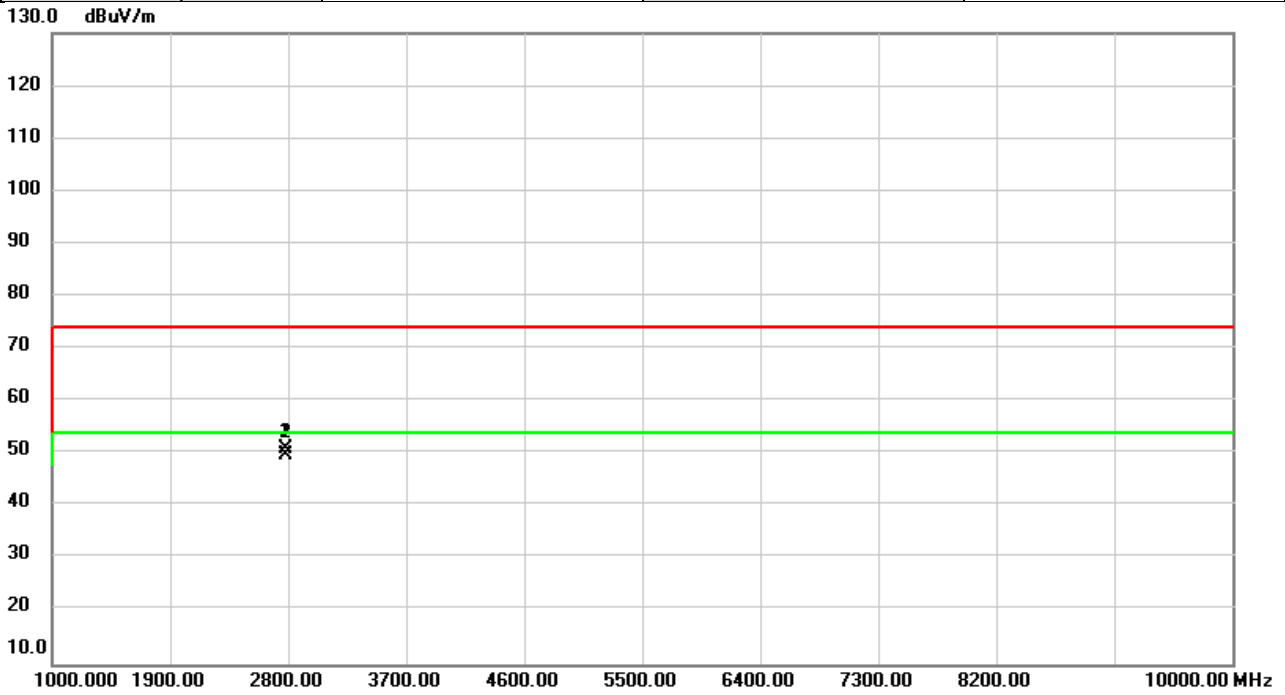


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2744.250	64.06	-14.12	49.94	74.00	-24.06	peak	
2	*	2744.250	63.15	-14.12	49.03	54.00	-4.97	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX	Test Date	2022/2/14
Test Frequency	927.25MHz	Polarization	Vertical
Temp	20°C	Hum.	60%

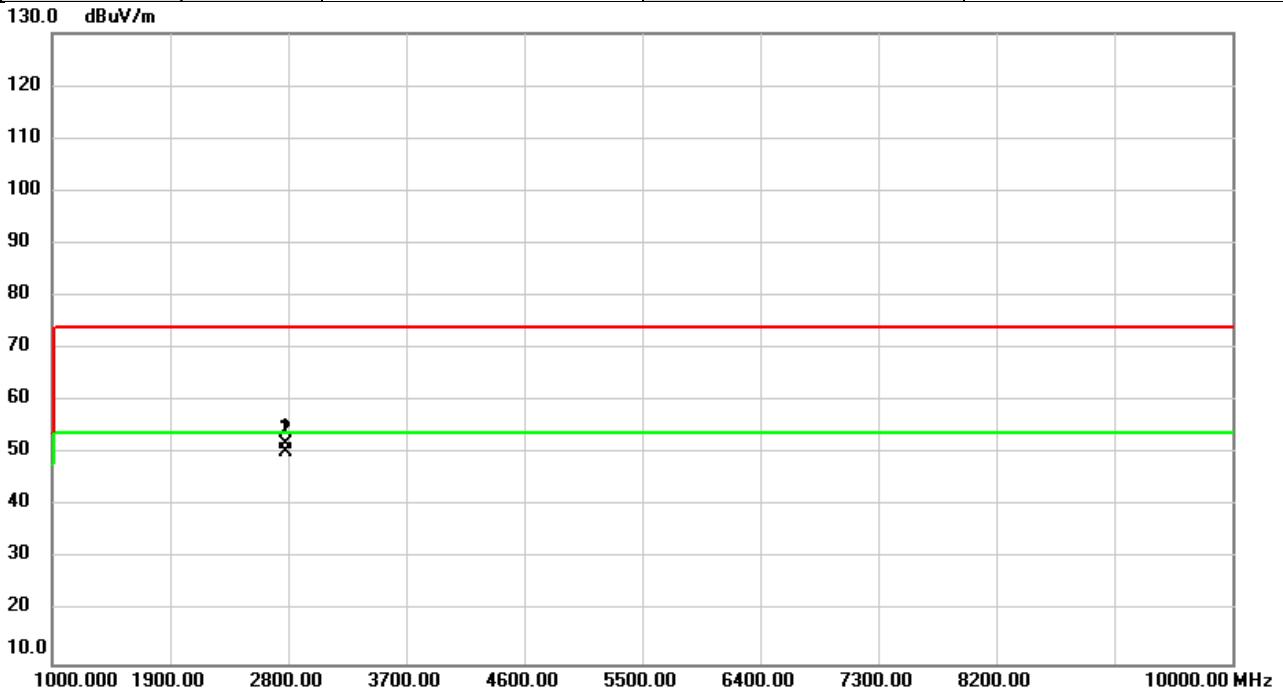


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2781.750	64.91	-13.99	50.92	74.00	-23.08	peak	
2	*	2781.750	63.78	-13.99	49.79	54.00	-4.21	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX	Test Date	2022/2/14
Test Frequency	927.25MHz	Polarization	Horizontal
Temp	20°C	Hum.	60%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2782.000	65.70	-13.99	51.71	74.00	-22.29	peak	
2	*	2782.000	64.21	-13.99	50.22	54.00	-3.78	AVG	

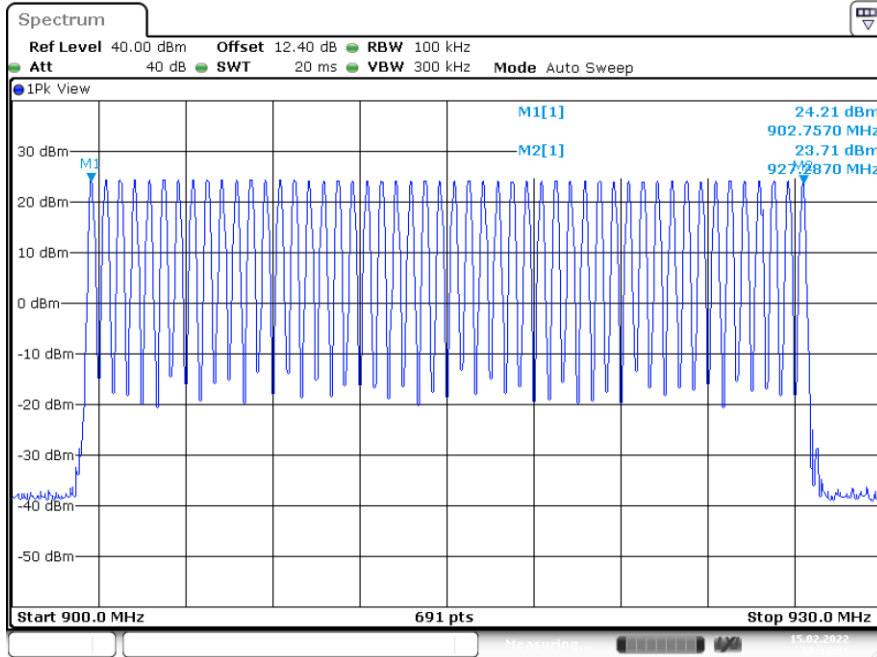
REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX C NUMBER OF HOPPING CHANNEL

Test Mode TX

Number of Hopping Channel 50



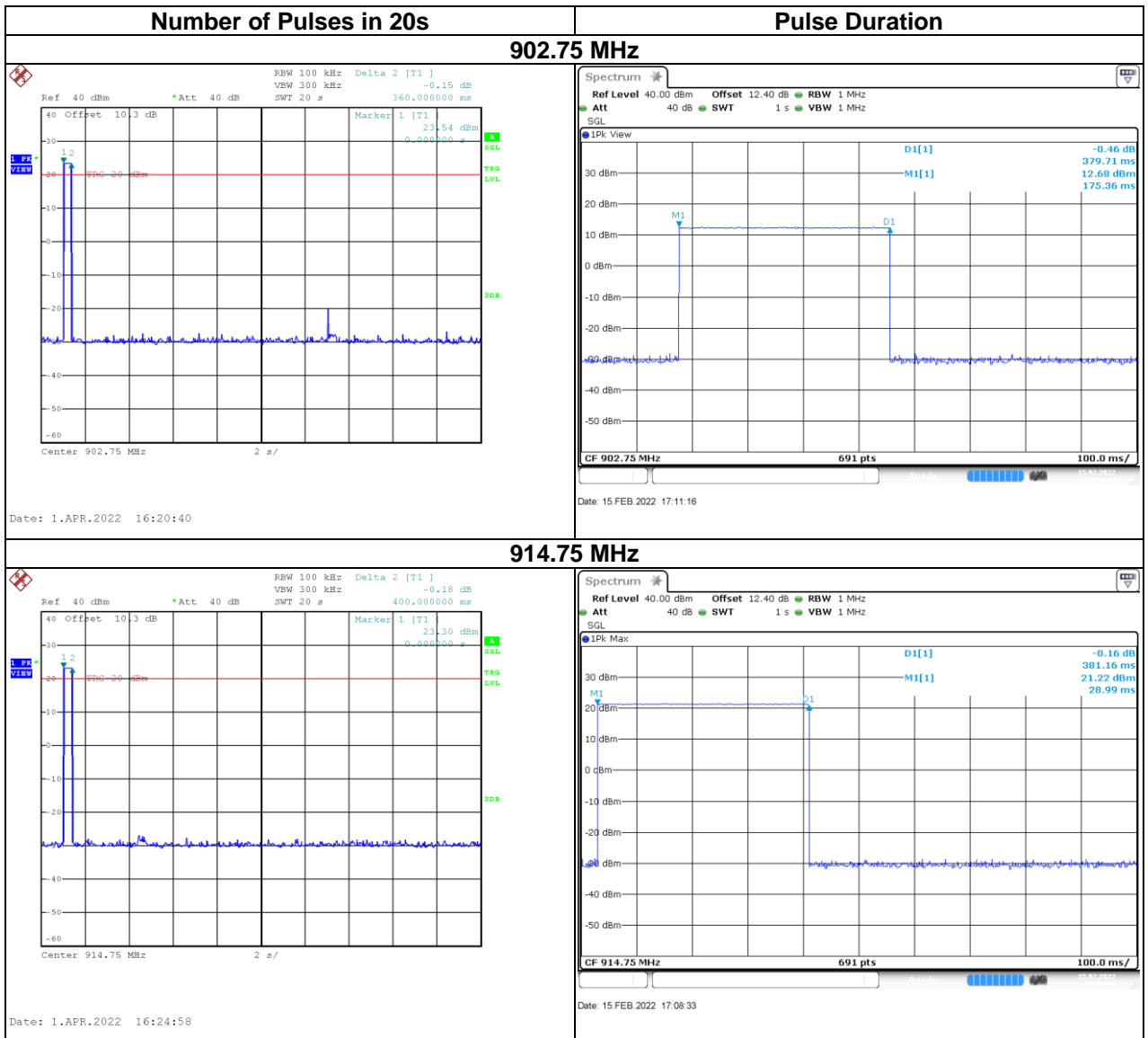
Date: 15.FEB.2022 17:33:41

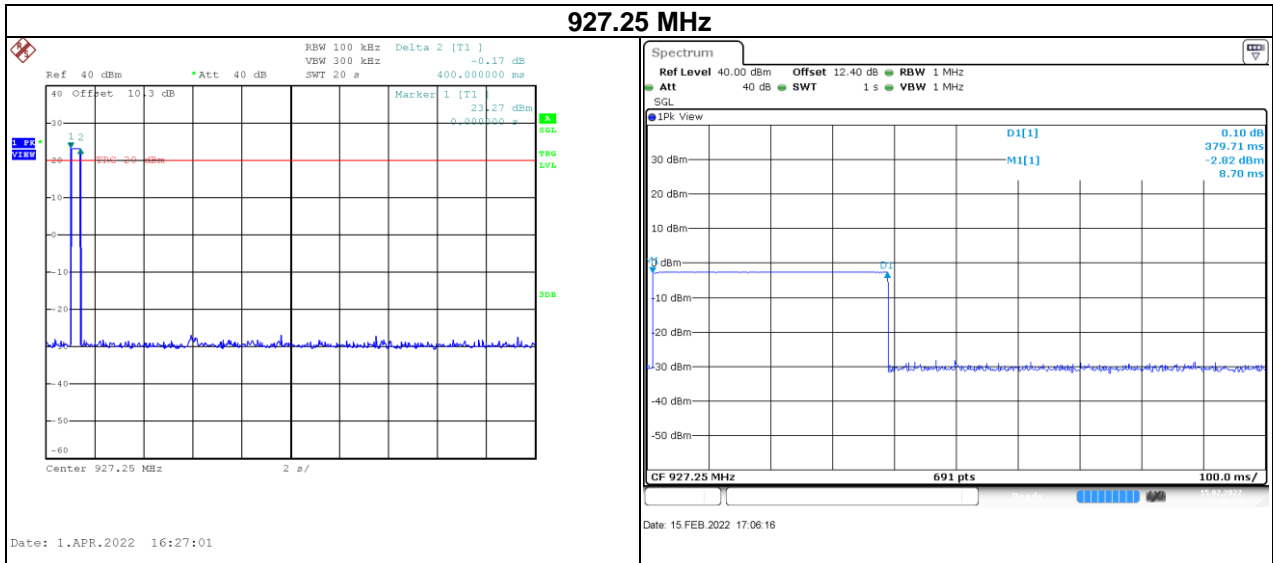
APPENDIX D AVERAGE TIME OF OCCUPANCY

Test Mode : TX

Frequency (MHz)	Pulse Duration (s)	Number of Pulses in 20s	Dwell Time (s)	Limits (s)	Test Result
902.75	0.3797	1	0.3797	0.4000	Pass
914.75	0.3812	1	0.3812	0.4000	Pass
927.25	0.3797	1	0.3797	0.4000	Pass

Dwell Time=Pulse Duration(s) *Number of Pulses in 20s

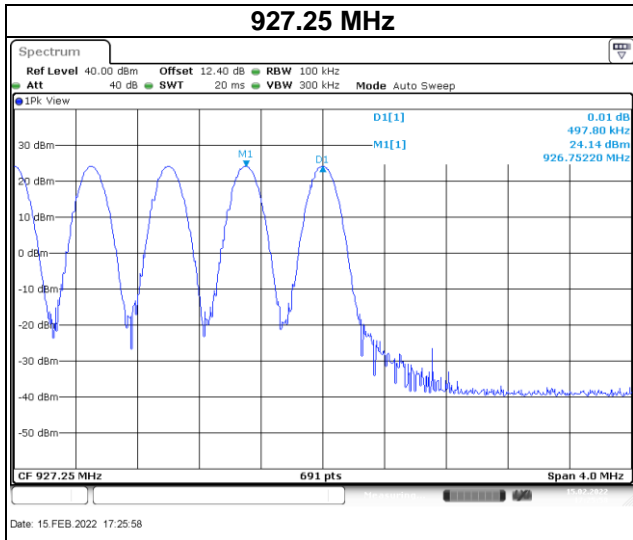
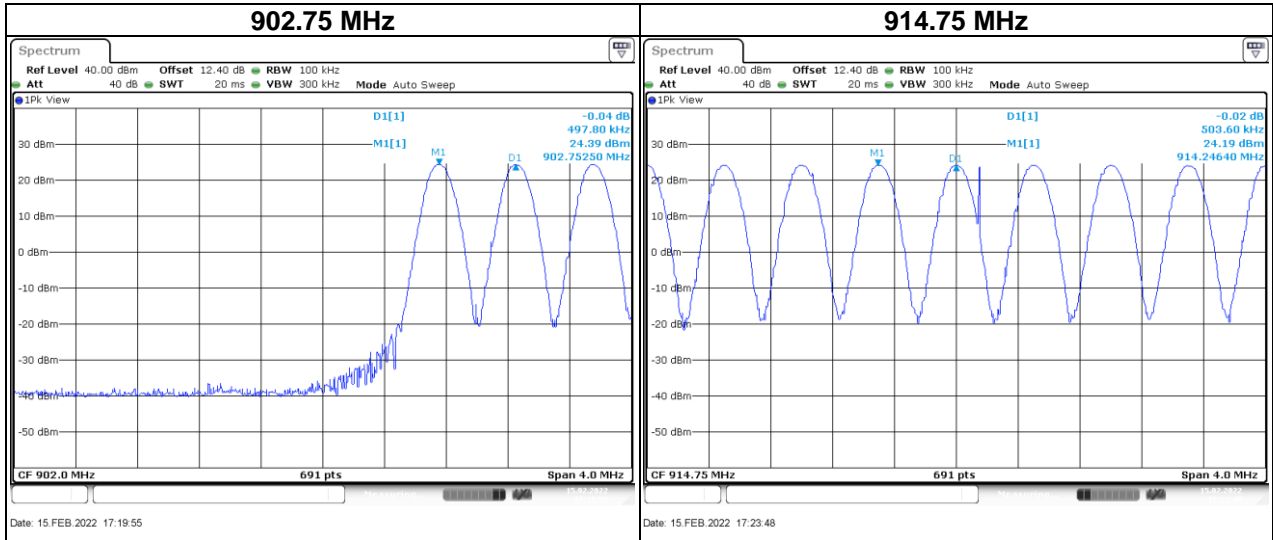




APPENDIX E HOPPING CHANNEL SEPARATION MEASUREMENT

Test Mode : Hopping on _TX

Frequency (MHz)	Channel Separation (kHz)	20dB Bandwidth (kHz)	Test Result
902.75	497.800	77.42	Pass
914.75	503.600	95.51	Pass
927.25	497.800	97.68	Pass

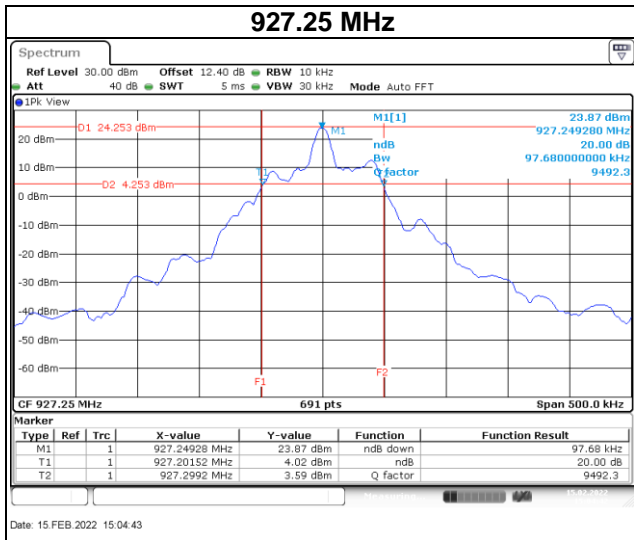
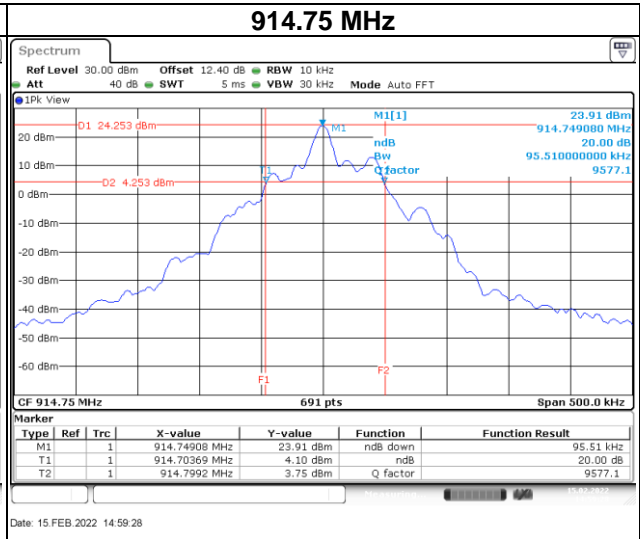
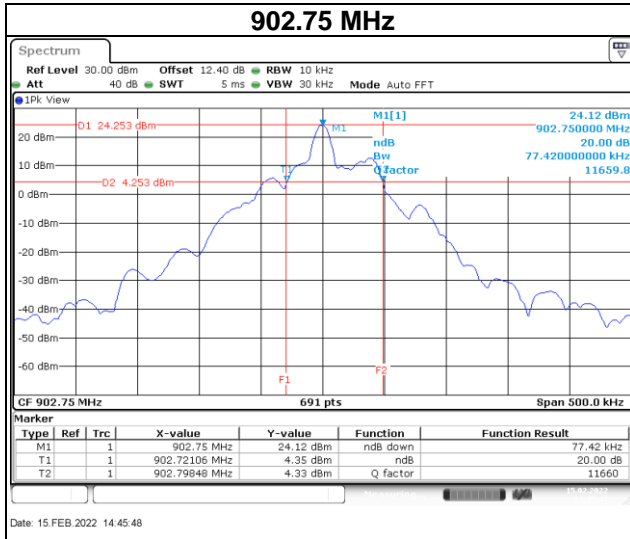


-
-

APPENDIX F BANDWIDTH

Test Mode : TX

Frequency (MHz)	20dB Bandwidth (kHz)	99% Occupied BW (kHz)	Max. Limit (kHz)	Test Result
902.75	77.42	102.000	250	Pass
914.75	95.51	102.000	250	Pass
927.25	97.68	102.000	250	Pass



APPENDIX G OUTPUT POWER

Test Mode :	TX _ Ant 1	Tested Date	2022/2/15
-------------	------------	-------------	-----------

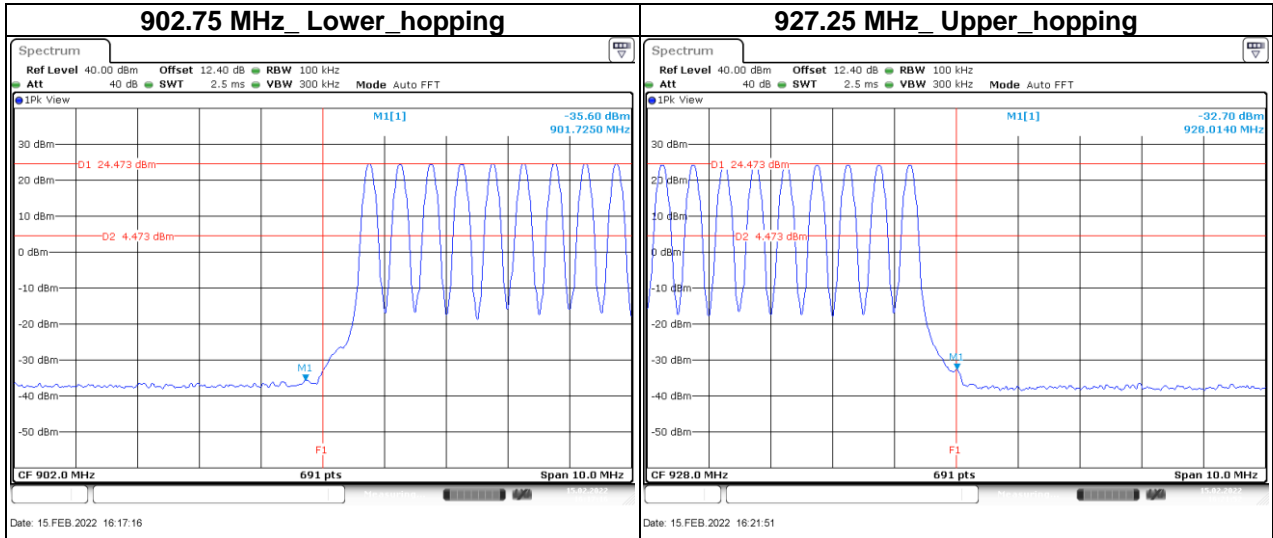
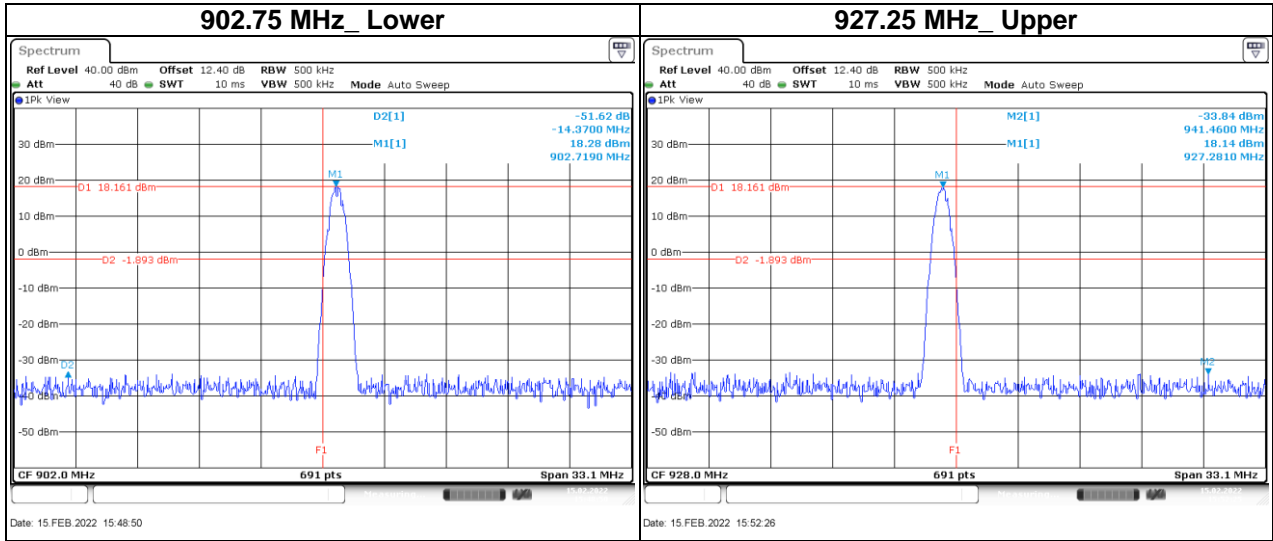
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
902.75	23.81	0.2404	30.00	1.0000	Pass
914.75	23.69	0.2339	30.00	1.0000	Pass
927.25	23.61	0.2296	30.00	1.0000	Pass

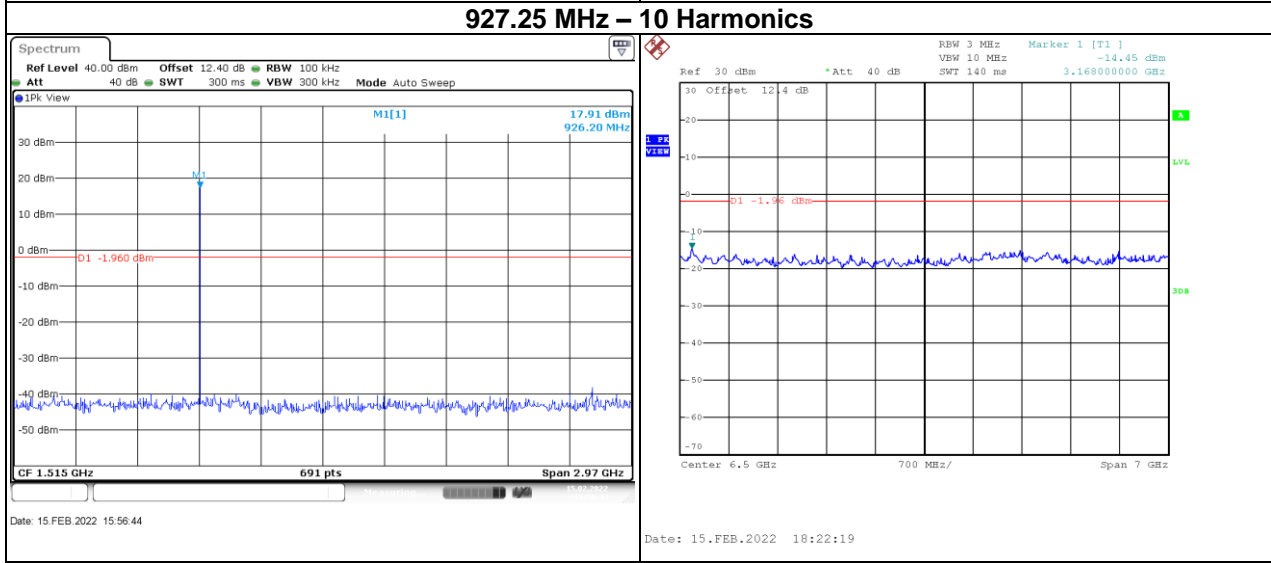
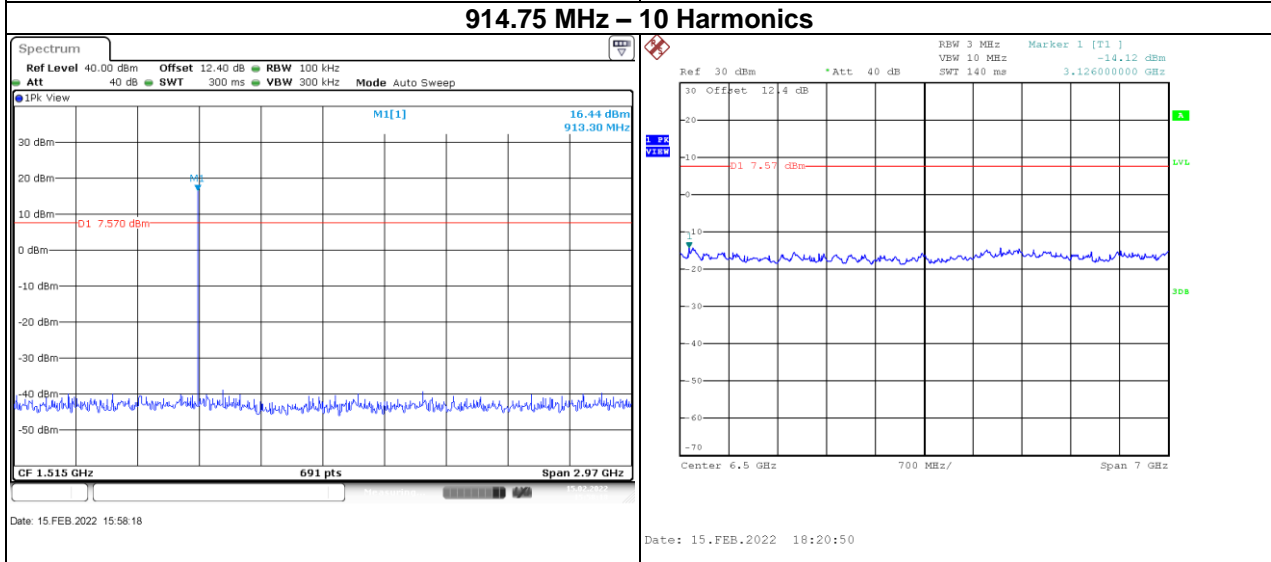
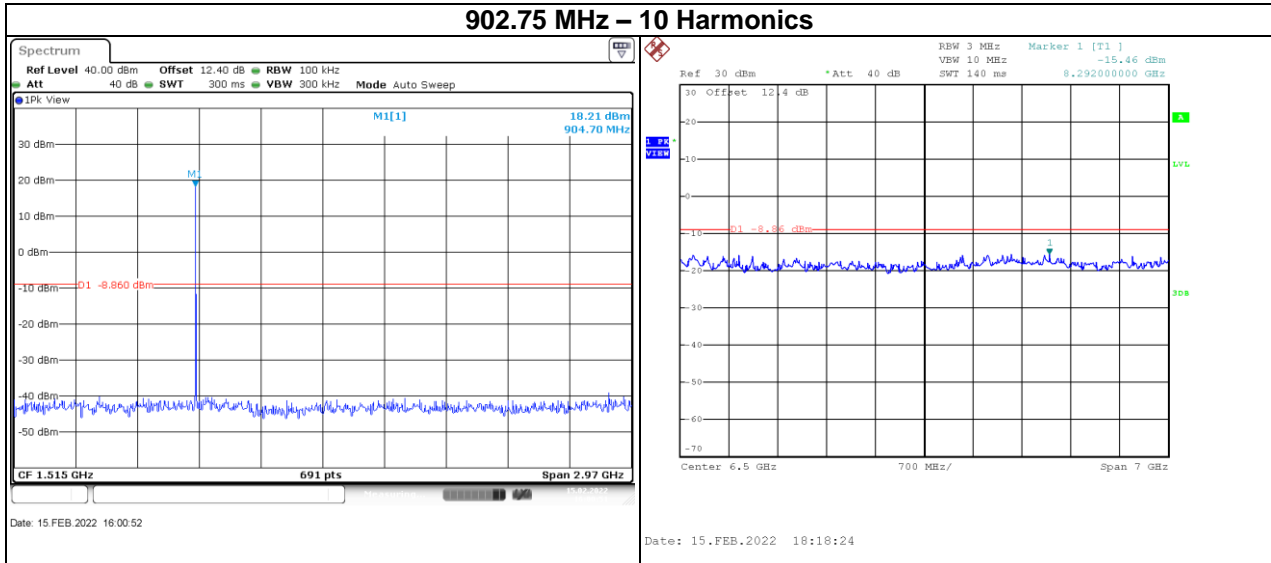
Test Mode :	TX _ Ant 2	Tested Date	2022/2/15
-------------	------------	-------------	-----------

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
902.75	23.85	0.2427	30.00	1.0000	Pass
914.75	23.77	0.2382	30.00	1.0000	Pass
927.25	23.64	0.2312	30.00	1.0000	Pass

APPENDIX H ANTENNA CONDUCTED SPURIOUS EMISSION

Test Mode TX





End of Test Report