TEST REPORT

Applicant Name :	Hangzhou Roombanker Technology Co., Ltd.
Address :	A#801 Wantong center, Hangzhou, China
Report Number:	SH1220303-07083E-00C
FCC ID:	2AUXBDSGW-210B

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	HNT Indoor Hotspot Miner
Model No.:	DSGW-210B
Trade Mark:	N/A
Date Received:	2022-03-03
Date of Test:	2022-03-05 to 2022-03-21
Report Date:	2022-03-30

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Ting Lü

EMC Engineer

Approved By:

Candy Li

EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect testresults are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	HNT Indoor Hotspot Miner
Tested Model	DSGW-210B
Frequency Range	923.3-927.5 MHz
Maximum Conducted Peak Output Power	26.78 dBm
Modulation Technique	LoRa/Chirp Spread Spectrum
Voltage Range	DC 5.0V from adapter
Antenna Specification*	Monopole Antenna: 2.44 dBi (provided by the applicant)
Sample serial number	SH1220303-07083E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
Emissions, Radiated	30MHz - 1GHz	4.28dB
	1GHz- 18GHz	4.98dB
	18GHz- 26.5GHz	5.06dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode.

Channel List

Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	923.3	5	925.7
2	923.9	6	926.3
3	924.5	7	926.9
4	925.1	8	927.5

Channel 1 and 8 were tested.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

Software “putty” was used to test and the power level is 15.

Duty cycle

Test Result: Compliant. Please refer to the Appendix.

Support Equipment List and Details

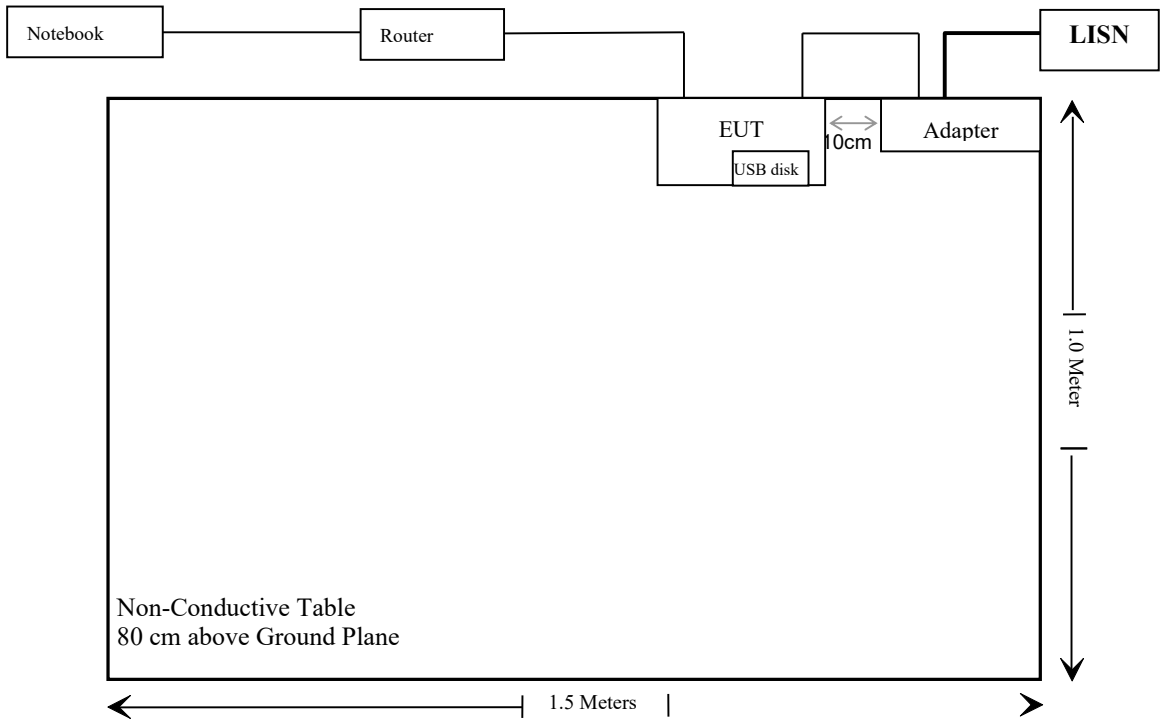
Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	T430	Unknown
HUAWEI	Wireless ADSL Router	WS5100	Unknown
SanDisk	USB Sisk	Unknown	Unknown
HUAWEI	Adapter	HW-100400C00C A38L1K1810009	Unknown

External I/O Cable

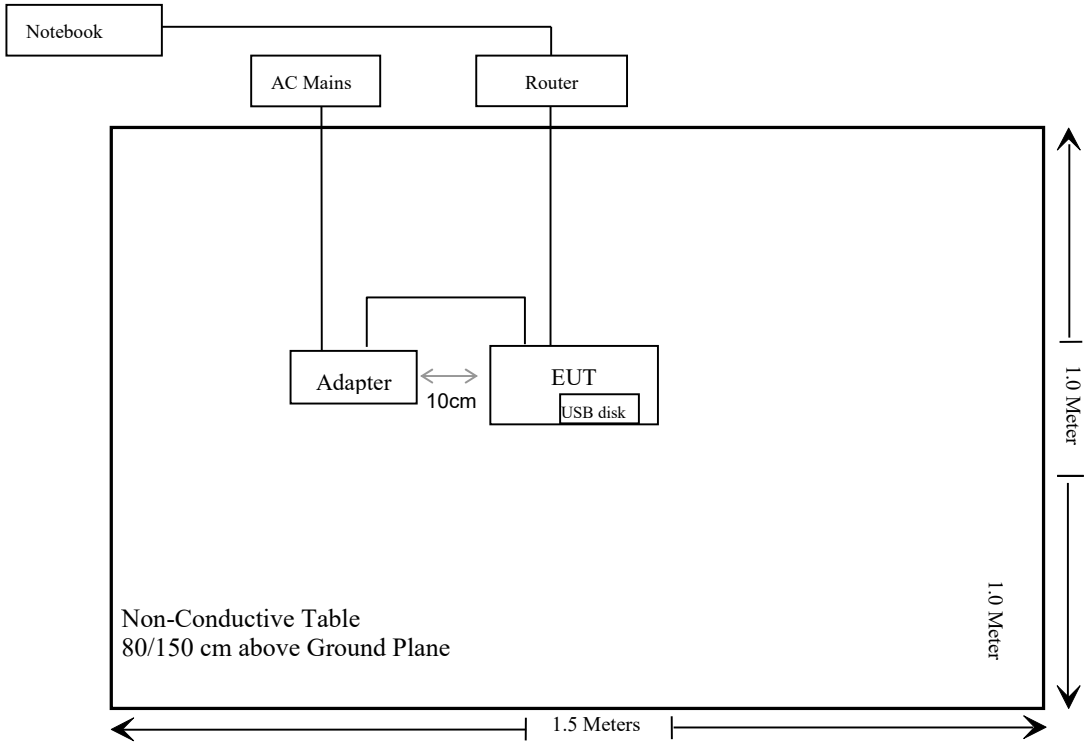
Cable Description	Length (m)	From Port	To
Power Cable	1.0	EUT	Adapter
Network cable	5.0	EUT	Router
Network cable	1.0	Notebook	Router

Block Diagram of Test Setup

For conducted emission:



For radiated emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
FCC §15.203	Antenna Requirement	Compliant
FCC §15.207(a)	AC Line Conducted Emissions	Compliant
FCC §15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
FCC§15.247 (a)(2)	6 dB Emission Bandwidth& Occupied Bandwidth	Compliant
FCC§15.247(b)(3)	Maximum Conducted Output Power	Compliant
FCC§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliant
FCC§15.247(e)	Power Spectral Density	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde & Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Unknown	Band Reject Filter	MSF880-915 MS-1149	201706003	2021/12/14	2022/12/13
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Radiated Emission Test Software: e3 19821b (V9)					
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2021/12/13	2022/12/12
WEINSCHEL	10dB Attenuator	5324	AU 3842	2021/12/14	2022/12/13
Roombanker	RF Cable	Roombanker C02	C02	Each Time	N/A

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.247 (I) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2402-2480	3.87	2.44	6.5	4.47	20	0.0022	1
2412-2462	3.19	2.09	23	199.53	20	0.083	1
902.3-914.9	2.44	1.75	22.5	177.83	20	0.0619	0.6
923.3-927.5	2.44	1.75	27	501.19	20	0.1745	0.61

Note: 1. The tune up conducted power was declared by the applicant.
2. The BLE and Wi-Fi and Lora can transmit at the same time.

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

=0.083/1+0.1745/0.61+0.0022/1=0.3713 < 1

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.
Result: Pass

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has a unique antenna port arrangement for LoRa, which was employed the antenna maximum gain is 2.44dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Type	Antenna Gain	Impedance
Monopole	2.44 dBi	50 Ω

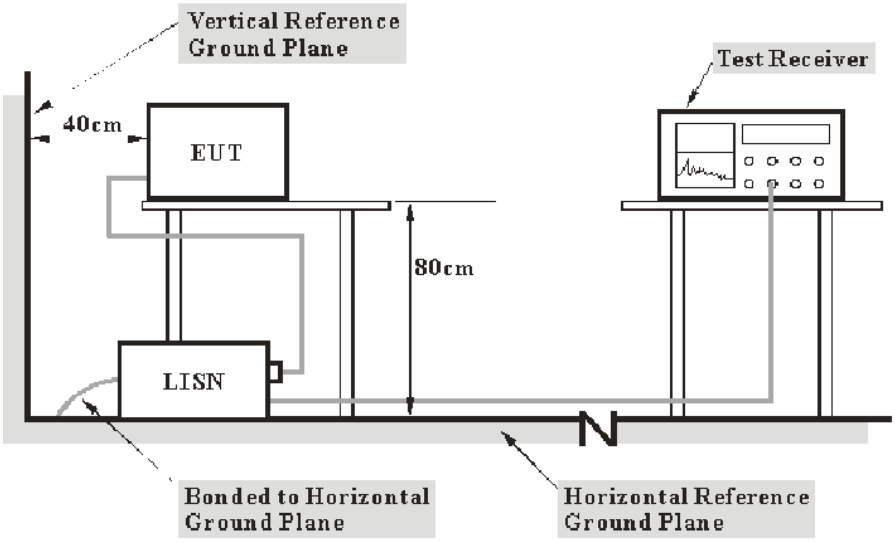
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Transd Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Transd Factor = LISN VDF + Cable Loss

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Over Limit =Level – Limit
Level= reading level + Transd Factor

Test Data

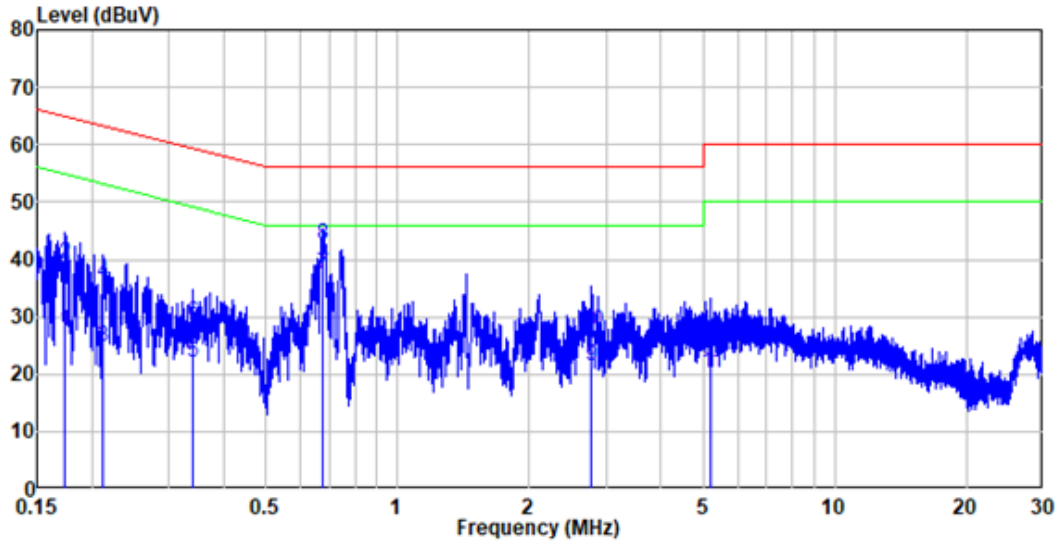
Environmental Conditions

Temperature:	23℃
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

The testing was performed by Bin Duanon 2022-03-08.

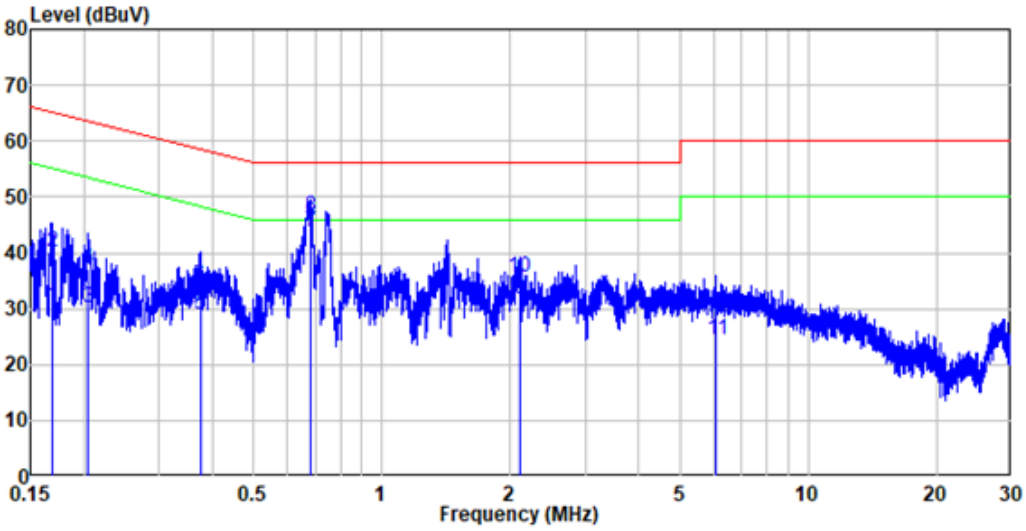
EUT operation mode: Transmission

AC 120V/60 Hz, Line



No.	Frequency	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.173	9.80	17.71	27.51	54.80	-27.29	Average
2	0.173	9.80	29.30	39.10	64.80	-25.70	QP
3	0.213	9.80	14.96	24.76	53.08	-28.32	Average
4	0.213	9.80	26.12	35.92	63.08	-27.16	QP
5	0.341	9.80	12.24	22.04	49.18	-27.14	Average
6	0.341	9.80	19.24	29.04	59.18	-30.14	QP
7	0.678	9.81	27.52	37.33	46.00	-8.67	Average
8	0.678	9.81	32.82	42.63	56.00	-13.37	QP
9	2.778	9.83	11.70	21.53	46.00	-24.47	Average
10	2.778	9.83	17.63	27.46	56.00	-28.54	QP
11	5.232	9.85	10.51	20.36	50.00	-29.64	Average
12	5.232	9.85	16.05	25.90	60.00	-34.10	QP

AC 120V/60 Hz, Neutral



No.	Frequency	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.168	9.80	20.75	30.55	55.05	-24.50	Average
2	0.168	9.80	30.33	40.13	65.05	-24.92	QP
3	0.205	9.80	20.26	30.06	53.40	-23.34	Average
4	0.205	9.80	27.24	37.04	63.40	-26.36	QP
5	0.375	9.80	19.18	28.98	48.39	-19.41	Average
6	0.375	9.80	24.25	34.05	58.39	-24.34	QP
7	0.683	9.81	33.93	43.74	46.00	-2.26	Average
8	0.683	9.81	36.72	46.53	56.00	-9.47	QP
9	2.103	9.82	22.01	31.83	46.00	-14.17	Average
10	2.103	9.82	25.84	35.66	56.00	-20.34	QP
11	6.105	9.94	14.64	24.58	50.00	-25.42	Average
12	6.105	9.94	18.50	28.44	60.00	-31.56	QP

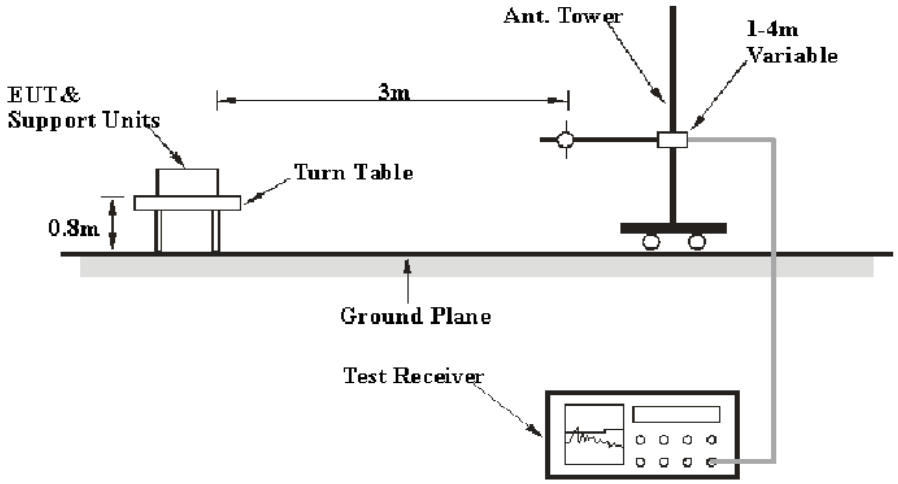
FCC §15.209, §15.205 &§15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

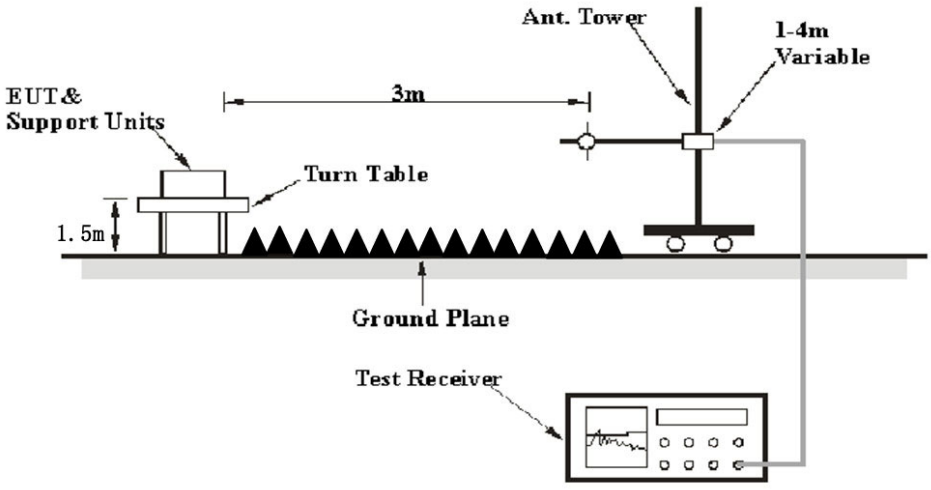
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Average
	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Factor& Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Factor = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Over Limit/Margin = Result/Corrected Amplitude–Limit
Result/Corrected Amplitude = Read Level/Reading + Factor/Correct Factor

Test Data

Environmental Conditions

Temperature:	22 ℃ ~ 25 ℃
Relative Humidity:	47 % ~ 51 %
ATM Pressure:	101.0 kPa ~ 102.0 kPa

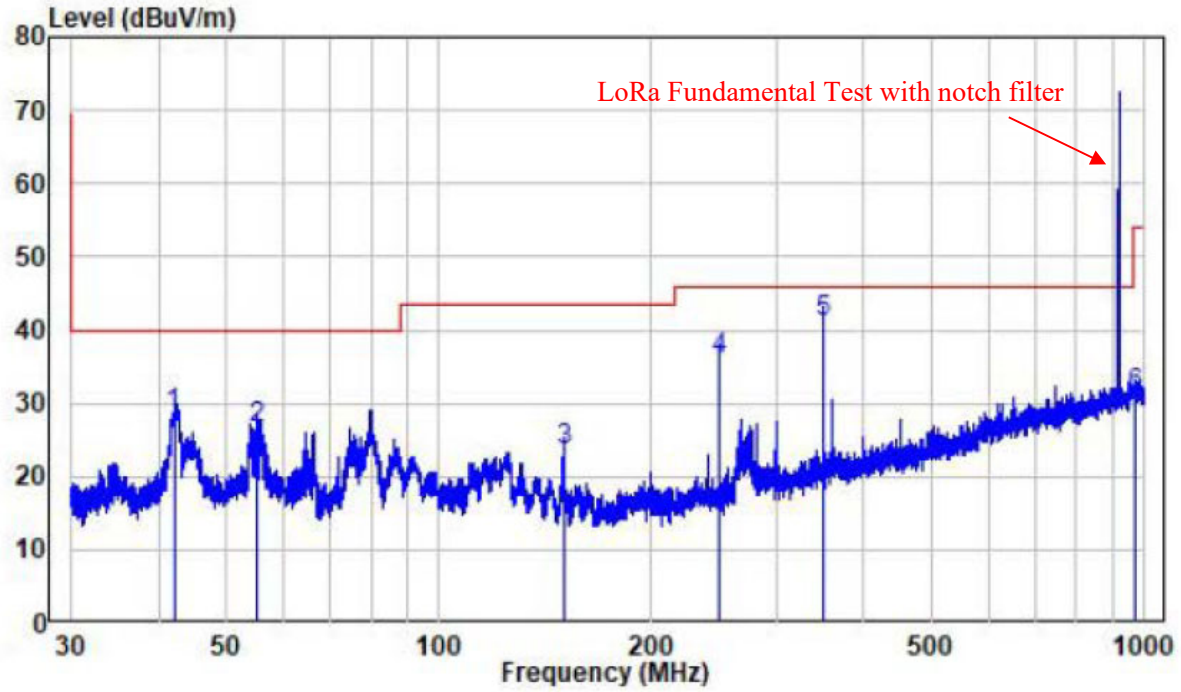
The testing was performed by Chao Moon 2022-03-15 for radiated emission, and by Key Pei on 2022-03-11 for conducted emission.

EUT operation mode: Transmission

30MHz-1GHz:

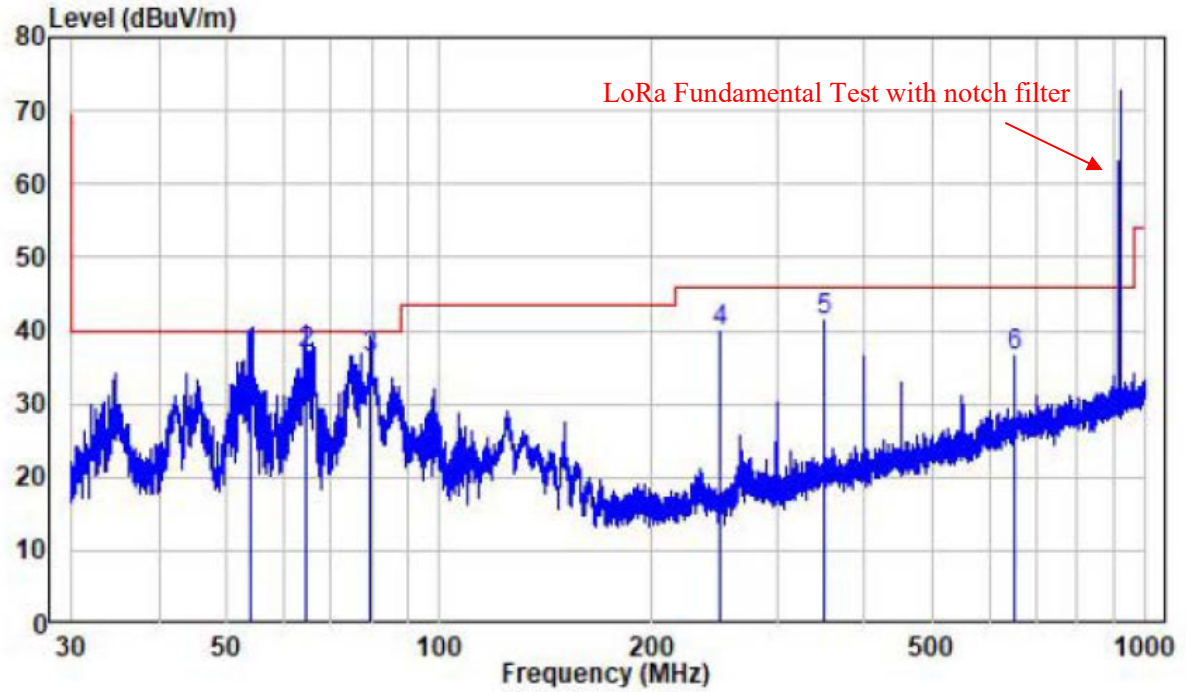
*Pre-scan in the X, Y and Z axes of orientation, the worst case **in X-axis of orientation** was recorded*

Horizontal



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	42.062	-10.02	38.37	28.35	40.00	-11.65	QP
2	55.318	-10.25	36.68	26.43	40.00	-13.57	QP
3	150.011	-15.27	38.78	23.51	43.50	-19.99	QP
4	249.972	-10.74	46.67	35.93	46.00	-10.07	QP
5	350.016	-7.31	48.48	41.17	46.00	-4.83	QP
6	968.934	2.48	28.59	31.07	54.00	-22.93	QP

Vertical



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	53.905	-10.33	47.18	36.85	40.00	-3.15	QP
2	64.773	-12.43	49.19	36.76	40.00	-3.24	QP
3	79.975	-16.79	53.10	36.31	40.00	-3.69	QP
4	249.972	-10.74	50.51	39.77	46.00	-6.23	QP
5	350.016	-7.31	48.57	41.26	46.00	-4.74	QP
6	649.945	-1.74	38.34	36.60	46.00	-9.40	QP

1-10GHz (worst case):

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H/V)				
Low channel									
9233	48.74	PK	210	2.1	H	5.76	54.50	74	-19.50
9233	39.54	AV	210	2.1	H	5.76	45.30	54	-8.70
9233	50.28	PK	359	1.8	V	5.76	56.04	74	-17.96
9233	39.75	AV	359	1.8	V	5.76	45.51	54	-8.49
High channel									
9275	48.39	PK	150	1.6	H	5.82	54.21	74	-19.79
9275	39.24	AV	150	1.6	H	5.82	45.06	54	-8.94
9275	49.47	PK	12	1.5	V	5.82	55.29	74	-18.71
9275	39.40	AV	12	1.5	V	5.82	45.22	54	-8.78

Bandedge Emissions Test:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/AV		Height (m)	Polar (H/V)				
Low channel									
923.3	126.41	PK	334	1.5	H	1.58	127.99	--	--
923.3	117.09	PK	215	1.3	V	1.58	118.67	--	--
902	31.84	PK	359	1.5	H	1.37	33.21	107.99	-74.78
902	31.72	PK	211	1.3	V	1.37	33.09	98.67	-65.58
High channel									
927.5	104.69	PK	348	1.7	H	1.62	127.86	--	--
927.5	94.90	PK	223	1.2	V	1.62	118.53	--	--
928	126.24	PK	337	1.7	H	1.62	106.31	107.86	-1.55
928	116.91	PK	238	1.2	V	1.62	96.52	98.53	-2.01

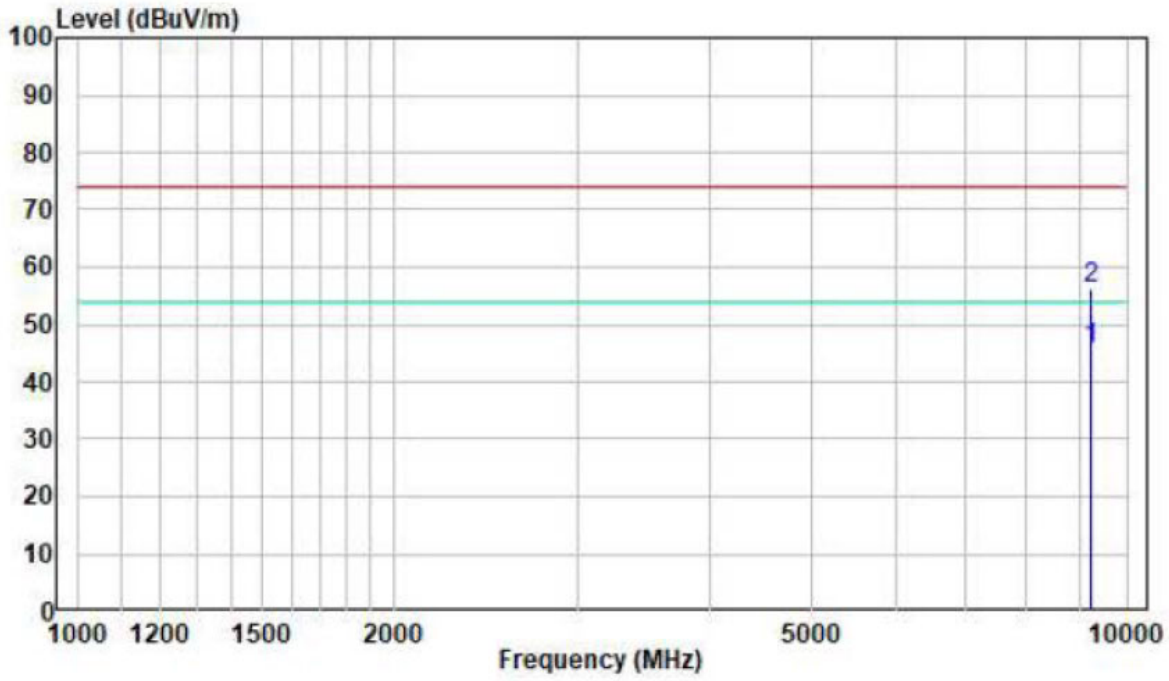
Note:
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Absolute Level (Corrected Amplitude) = Factor + Reading
Margin = Absolute Level - Limit
The other spurious emission which is in the noise floor level was not recorded.
For above 1GHz, the test result of peak was 20dB below to the limit of peak, which can be compliant to the average limit, so just peak value was recorded.

1-10GHz: (Pre-Scan plots for Worst case)

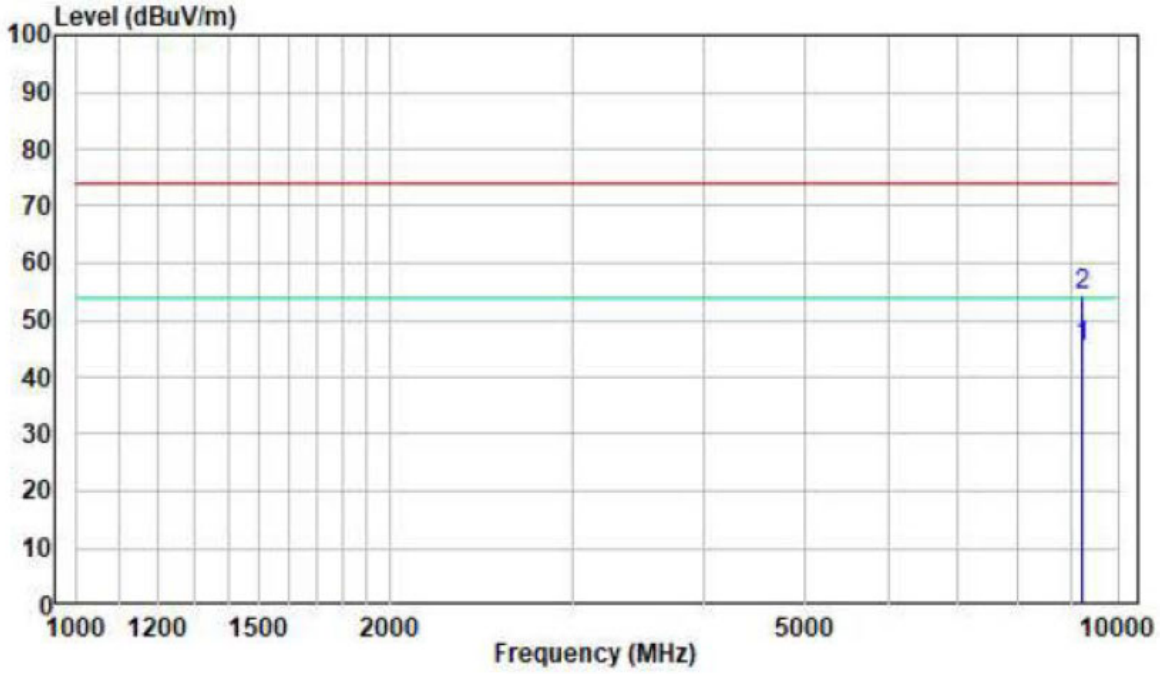
*Pre-scan in the X, Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded.*

Low Channel

Horizontal



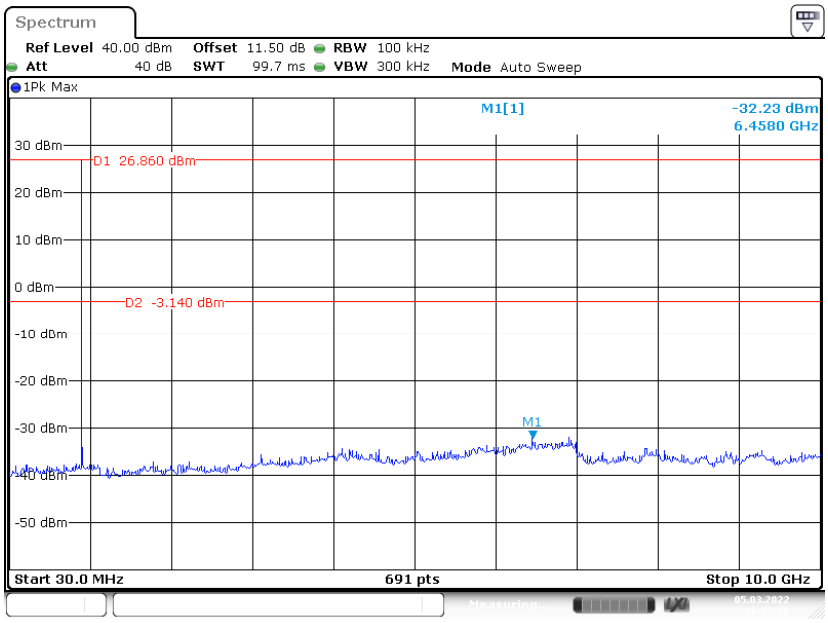
Vertical


Level (dBuV/m)
100
90
80
70
60
50
40
30
20
10
0
1000
1200
1500
2000
5000
10000
Frequency (MHz)
2
1

Conducted spurious emissions:

Low Channel:

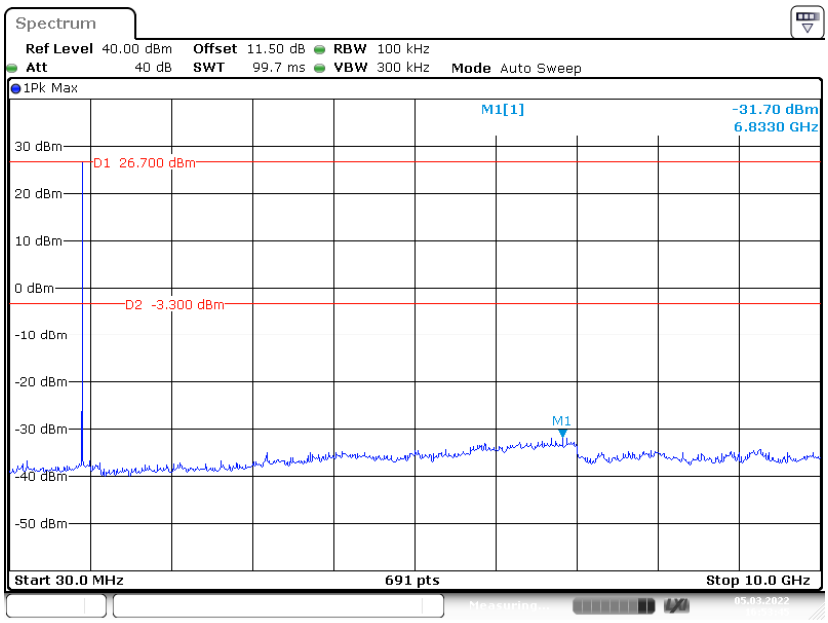
30MHz-10 GHz:



Date: 5.MAR.2022 16:52:01

High Channel:

30MHz-10GHz:



Date: 5.MAR.2022 16:53:45

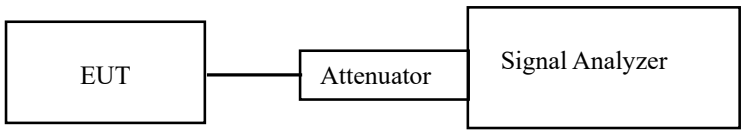
FCC §15.247(a) (2)– 6dB EMISSION BANDWIDTH& OCCUPIED BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	48 %
ATM Pressure:	101.0 kPa

The testing was performed by Key Peion 2022-03-05.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

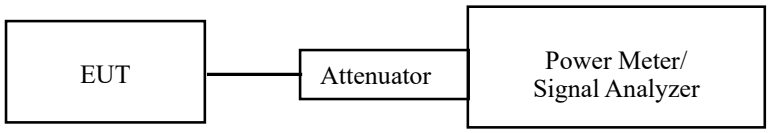
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ [3 × RBW].
d) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
e) Manually set sweep time ≥ [10 × (number of points in sweep) × (transmission symbol period)], but not less than the automatic default sweep time.
f) Set detector = RMS (power averaging).
g) The EUT shall be operated at ≥98% duty cycle or sweep triggering/signal gating shall be employed such that the sweep time is less than or equal to the transmission duration T.
h) Perform a single sweep.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.



Test Data

Environmental Conditions

Temperature:	24.3℃
Relative Humidity:	50%
ATM Pressure:	101.0 kPa

The testing was performed by Key Pei on 2022-03-12.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

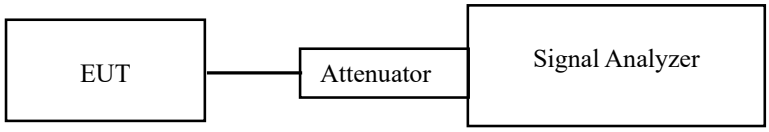
FCC §15.247(d) – 100kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 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 the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Data

Environmental Conditions

Temperature:	24.5℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Key Pei on 2022-03-05

EUT operation mode: Transmitting

Test Result: Compliant.

Conducted Band Edge Result:

Please refer to the Appendix.

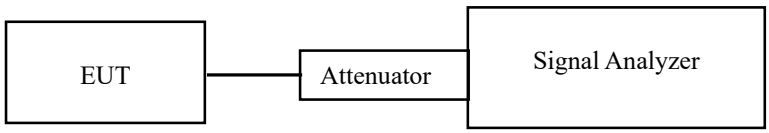
FCC §15.247(e)- POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

a) Set instrument center frequency to DTS channel center frequency.
b) Set the instrument span to 1.5 times the OBW.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = power average (rms).
f) Ensure that the number of measurement points in the sweep ≥ 2 × span / RBW.
g) Manually set the sweep time to: ≥ [10 × (number of measurement points in sweep) × (transmission symbol period)], but no less than the auto sweep time.
h) Perform the measurement over a single sweep.
i) Use the peak marker function to determine the maximum amplitude level.
j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).



Test Data

Environmental Conditions

Temperature:	24.5℃
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

The testing was performed by Key Peion 2022-03-12.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

APPENDIX

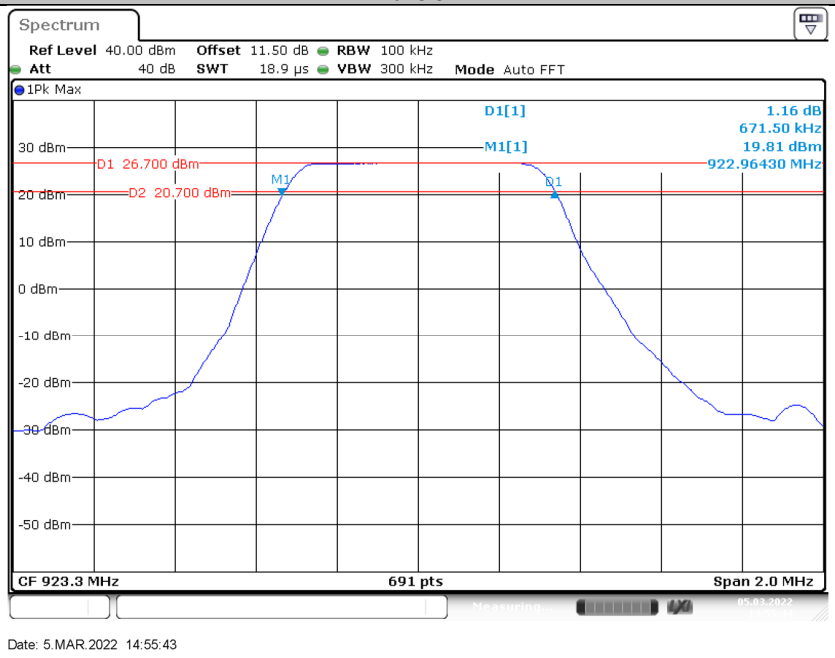
Appendix A: 6dB Emission Bandwidth

Test Result

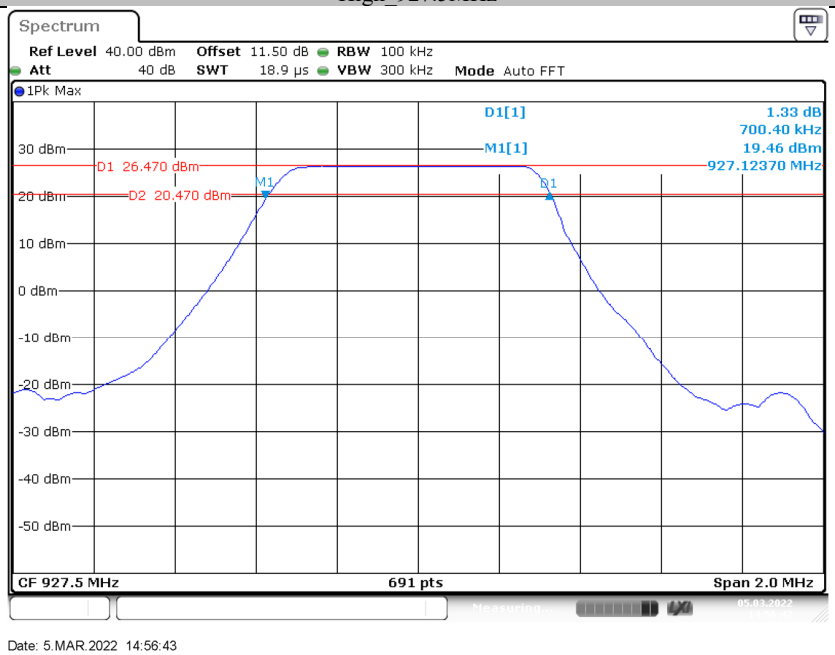
Channel [MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
923.3	0.672	0.5	PASS
927.5	0.700	0.5	PASS

Test Graphs

Low 923.3MHz



High_927.5MHz



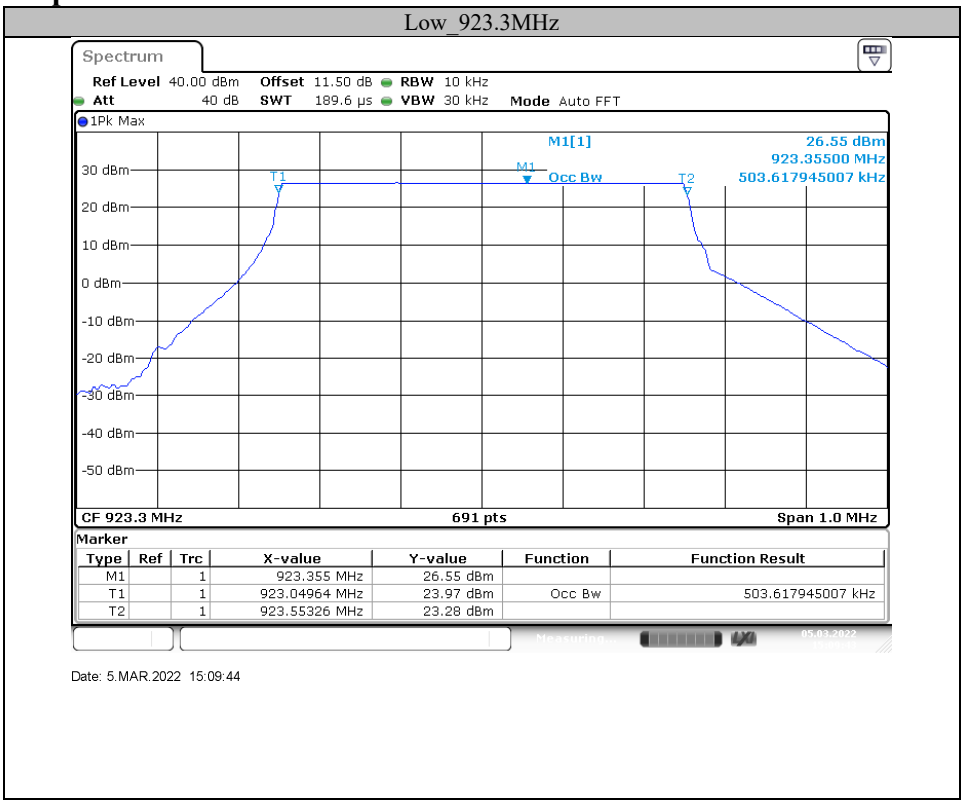
Appendix B: Occupied Channel Bandwidth

Test Result

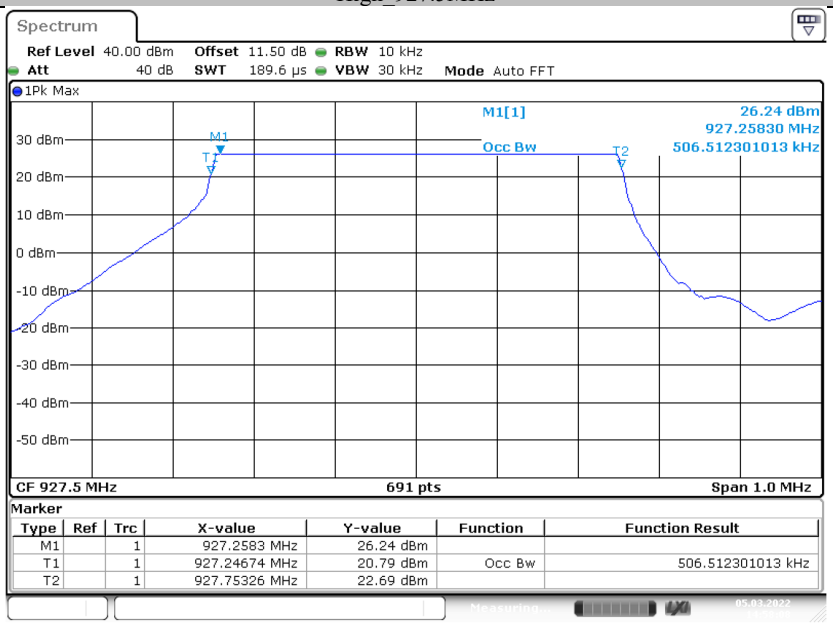
Channel [MHz]	OCB [MHz]	Limit [dBm]	Verdict
923.3	0.504	---	PASS
927.5	0.507	---	PASS

Test Graphs

Low_923.3MHz



High_927.5MHz



Appendix C: Maximum conducted (Average) output power

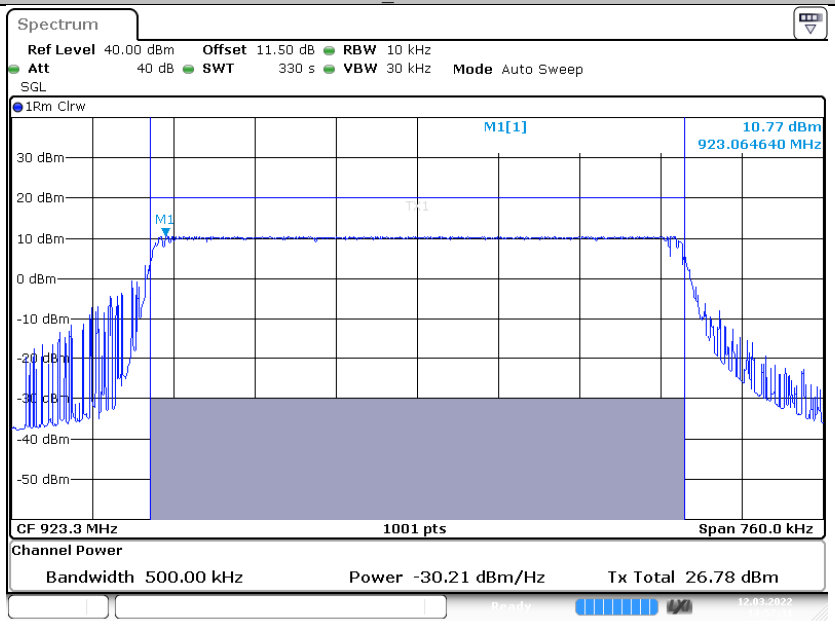
Test Result

Channel [MHz]	Result [dBm]	Limit [dBm]	Verdict
923.3	26.78	<=30	PASS
927.5	26.47	<=30	PASS

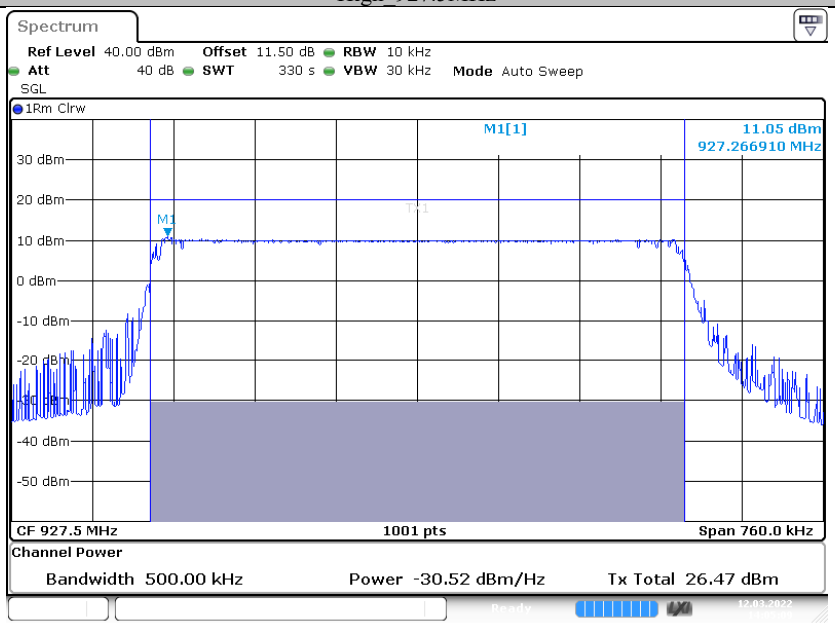
Note: The maximum antenna gain is 2.44 dBi.

Test Graphs

Low_923.3MHz



High_927.5MHz



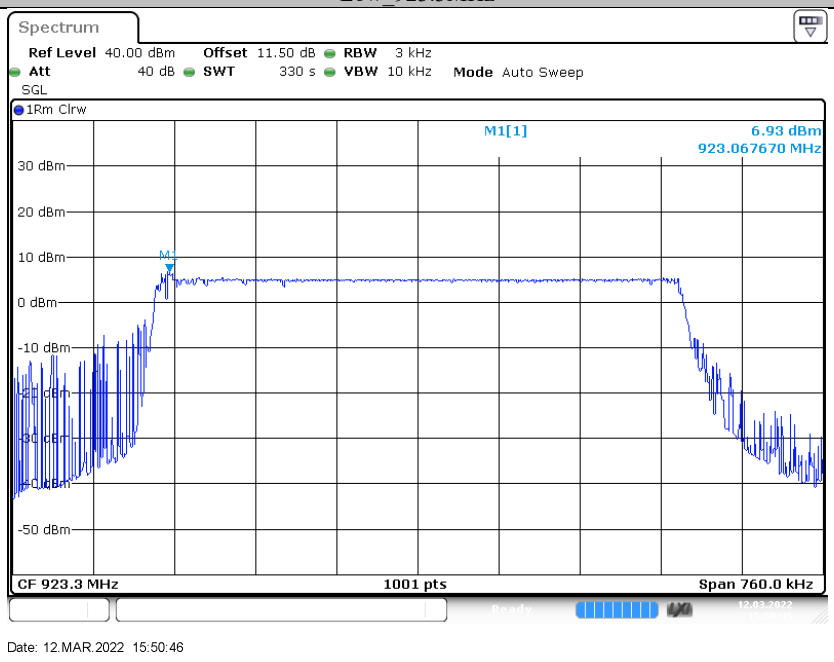
Appendix D: Power spectral density

Test Result

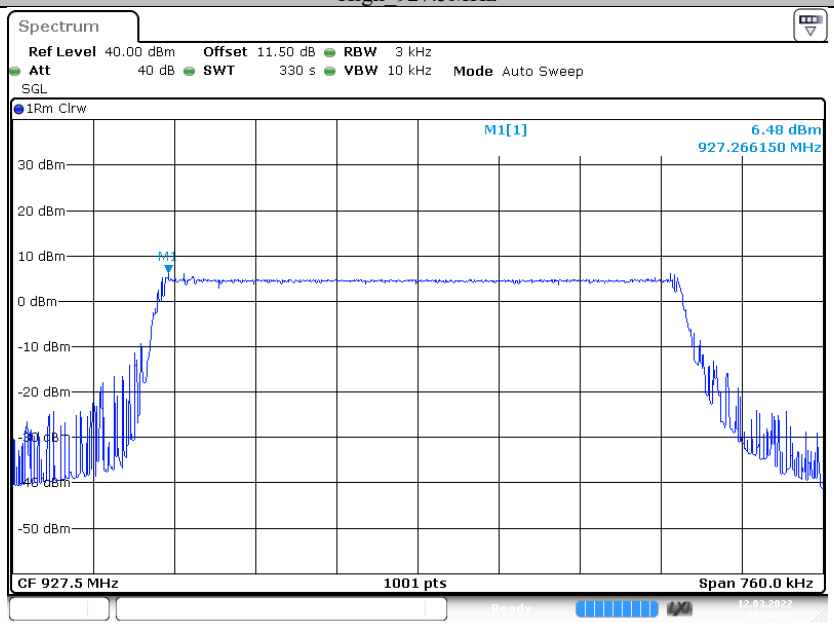
Channel [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
923.3	6.93	<=8	PASS
927.5	6.48	<=8	PASS

Test Graphs

Low_923.3MHz



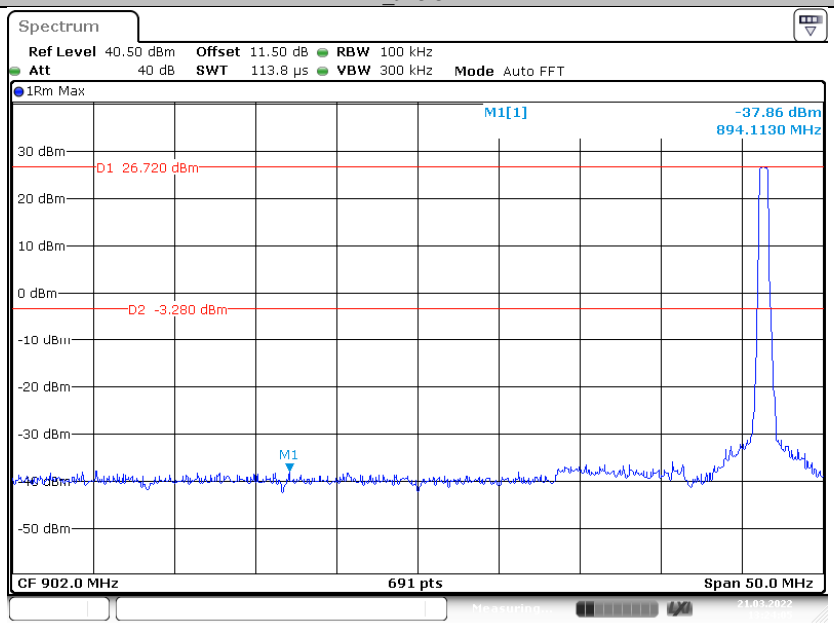
High_927.5MHz



Appendix E: Band edge measurements

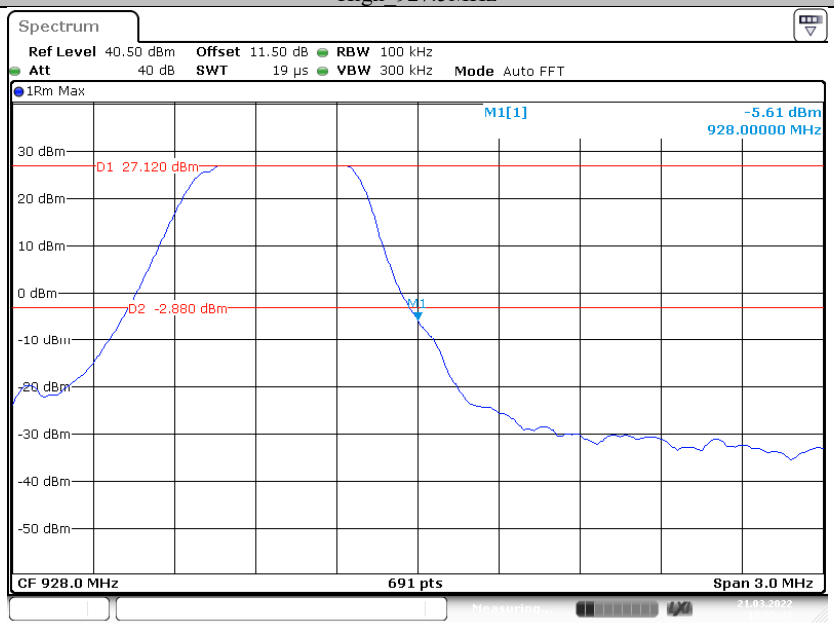
Test Graphs

Low_923.3MHz



Date: 21.MAR.2022 13:24:05

High_927.5MHz



Date: 21.MAR.2022 13:25:37

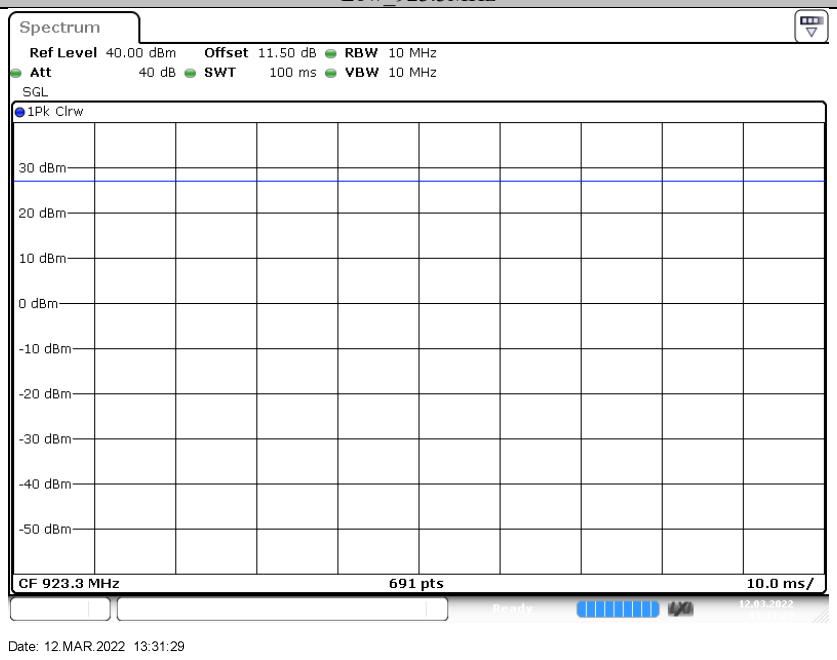
Appendix F: Duty Cycle

Test Result

Channel [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
923.3	100	100	100

Test Graphs

Low_923.3MHz



******* END OF REPORT *******