

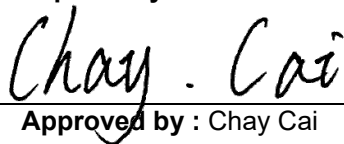
# Japan Radio Test Report

**Project No.** : 2109C096  
**Equipment** : Tapo Smart Button  
**Brand Name** : tp-link, tapo  
**Test Model** : Tapo S200B  
**Series Model** : Tapo S200D  
**Applicant** : TP-Link Corporation Limited  
**Address** : Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong  
**Manufacturer** : TP-Link Corporation Limited  
**Address** : Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong  
**Factory** : TP-LINK Technologies Co., Ltd. Guangming Science & Technology Park Branch  
**Address** : TP-LINK Guangming Science & Technology Park, Western Section, High Tech Park, Guangming District, Shenzhen, Guangdong Province, P.R.China  
**Date of Receipt** : Sep. 10, 2021  
**Date of Test** : Nov. 11, 2021 ~ Mar. 10, 2022  
**Issued Date** : Apr. 11, 2022  
**Report Version** : R01  
**Test Sample** : Engineering Sample No.: DG2021110975  
**Standard(s)** : Ordinance Regulating Radio Equipment General Provisions, Transmitting Equipment, Receiving Equipment, Article 49-14  
**Test Procedure** : Test Method Specified Radio Equipment Article 2 Paragraph 1 of item 8

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



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TESTING CERT #5123.02

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**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.

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**REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue.	Mar. 18, 2022
R01	1. Added the brand name. 2. Updated the antenna type.	Apr. 11, 2022

## 1. SUMMARY OF TEST RESULTS

Part	Description of Test	Rule Section	Result
3.1	Antenna Power and Antenna Power Tolerance and EIRP	RE: Article 6. 4 Note: No.285 of 2017 OR: Article 14. table 7 OR: Article 49-14	Pass
3.2	Frequency Tolerance	OR: Article 5 OR: Annex 1. 34 & 36 Note: No.289 of 2017 Note: No.291 of 2017	Pass
3.3	Occupied Bandwidth	OR: Article 6 OR: Annex 2. 28 Note: No.431 of 2016	Pass
3.4	Adjacent Channel Leakage Power	OR: Article 49-14	Pass
3.5	Unwanted Emission Strength	OR: Article 7 OR: Annex 3. 25	Pass
3.6	Transmission Time Restriction	OR: Article 49-14 Note: No.118 of 2019	Pass
3.7	Carrier Sensing Function	OR: Article 49-14 Note: No.118 of 2019	Good
3.8	Interference Prevention Function	OR: Article 9-4. 5 RE: Article 6-2. 3 RE: Article 6-2. 4	Good
3.9	Secondary Radiated Emission Strength	OR: Article 24. 16	Pass
3.10	Construction protection confirmation method	-	Pass

### Abbreviations used in this test report are as follows:

NC:	Normal Condition
EC:	Extreme Condition
EUT:	Equipment Under Test
OR:	Ordinance Regulating radio equipment
RE:	Regulations for Enforcement of the radio law
Note:	Notification (MIC)

## 1.1 TEST FACILITY

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

**TR13:** No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China.

## 1.2 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Frequency Error / 99% & 90% Bandwidth	$\pm 6.25 \times 10^{-7}$	Confidence levels of 95%
Antenna Power / TX-RX Emission	$\pm 0.5\text{dB}$	Confidence levels of 95%
Transmission Antenna Gain	$\pm 3.72\text{dB}$	Confidence levels of 95%
Carrier Sense Capability	$\pm 0.76\text{dB}$	Confidence levels of 95%

## 1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Antenna Power and Antenna Power Tolerance and EIRP	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Frequency Tolerance	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Occupied Bandwidth	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Adjacent Channel Leakage Power	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Unwanted Emission Strength	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Transmission Time Restriction	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Carrier Sensing Function	21°C-25°C	48%-55%	DC 3V	Longdage Feng
Secondary Radiated Emission Strength	21°C-25°C	48%-55%	DC 3V	Longdage Feng



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Tapo Smart Button
Brand Name	tp-link, tapo
Test Model	Tapo S200B
Series Model	Tapo S200D
Model Difference(s)	The difference between Tapo S200B and Tapo S200D is that the Tapo S200D has one more panel than the Tapo S200B. The panel is used to meet the requirements of the Tapo S200B 's wall installation, and the hardware design is identical (Tapo S200D=Tapo S200B+ panel).
Hardware Version	1.0
Software Version	1.x
Power Source	Battery supplied.
Power Rating	DC 3V
Operation Frequency	921MHz ~ 923 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	50Kbps
Occupied Bandwidth	0.49 MHz
Antenna Power (Rated Power)	8.61 mW
Antenna Power (Max. Conducted Power)	8.6099 mW

Note:

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

#### 2. Channel List:

Channel	Frequency (MHz)
00	922.3

#### 3. Table for Filed Antenna Table:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	tp-link	N/A	On board	N/A	-4.47

Note: The antenna gain is provided by the manufacturer.

## 2.2 DESCRIPTION OF TEST MODES

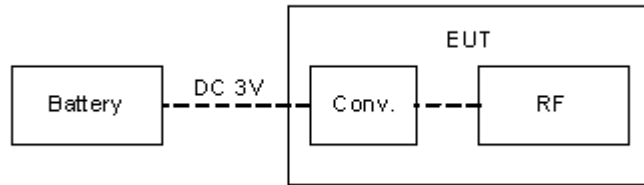
The EUT was tested while in a continuous transmitter / receiver mode.

The EUT continuously transmitted a modulated packet with payload, while transmitting the EUT was setup to operate at the intended maximum power output available to the end user.

For all test case pre/scans were completed in all modes to determine worst case levels.

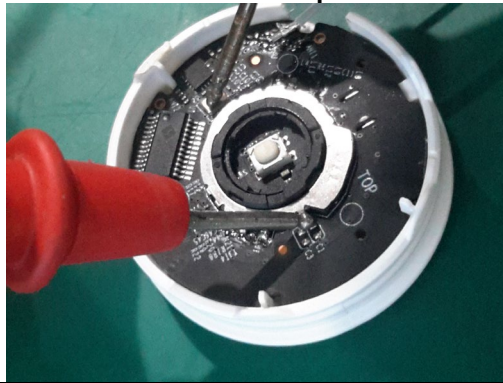
Test Mode	Description
Mode 1	922.3MHz

### Power Supply Voltage Fluctuation Test



Voltage Fluctuation Test	Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
Input: DC Power	3V	3.3V	2.7V
Output: DC Power	2.937V	2.937V	2.937V
Voltage Variation (%)	-	0	0

Measurement point



Note:

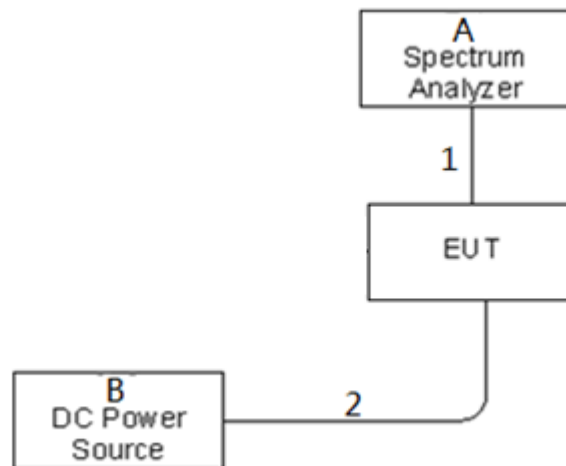
Voltage Variation (%)

$$= (\text{Output High Voltage or Low Voltage} - \text{Output Normal Voltage}) / \text{Output Normal Voltage} * 100$$

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/- 1%.

Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.

## 2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	Spectrum Analyzer	R&S	FSP40	100185
B	DC Power Source	GW Instek	GPC-3030DN	EK880675

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	RF Cable	YES	NO	0.1m
2	AC Power Cable	YES	NO	1.2m

## 2.5 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	N/A
-----------------------	-----

### 3. TEST RESULTS

#### 3.1 ANTENNA POWER AND ANTENNA POWER TOLERANCE AND EIRP

##### 3.1.1 LIMIT

Item	Limits
Antenna Power	$\leq 20 \text{ mW}$ (Note)
EIRP	16 dBm
Tolerance for antenna power	- 80% ~ + 20%

Note: When the radio equipment shall be housed in a single cabinet, and the cabinet shall not be capable of being opened easily & an EIRP is less than a 16dBm.

##### 3.1.2 MEASURING INSTRUMENTS AND SETTING

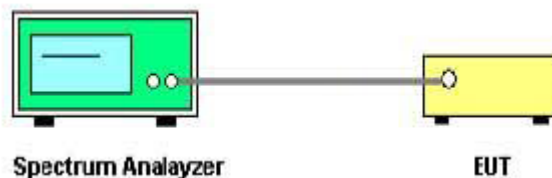
The following table is the setting of the spectrum analyzer.

Spectrum Analyzer	Setting
Resolution Bandwidth	1 MHz
Video Bandwidth	3 MHz
Frequency Span	2 MHz
Sweep Time	Auto
Trace Mode	Max Hold
Detector Mode	Peak

##### 3.1.3 TEST PROCEDURES

1. Connect the EUT to the spectrum analyzer by conducted method.
2. Keep EUT continuously transmitting under fixed channels.
3. Center the test frequency in the spectrum, then set spectrum parameters according to 3.1.2, and offset cable loss.
4. Upon completion of auto scanning, use the MARK function of spectrum analyzer to mark the peak point of waveform. The reading value was antenna power density A and antenna power tolerance  $B = (B - P_C) / P_C \times 100\%$  and the limit is less than 250 mW.

##### 3.1.4 TEST SETUP LAYOUT



##### 3.1.5 EST DEVIATION

There is no deviation with the original standard.

##### 3.1.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

##### 3.1.7 TEST RESULTS

Please refer to the Appendix A.

### 3.2 FREQUENCY TOLERANCE

#### 3.2.1 LIMIT

Item	Limits
Frequency Tolerance	$\leq \pm 20$ ppm

#### 3.2.2 MEASURING INSTRUMENTS AND SETTING

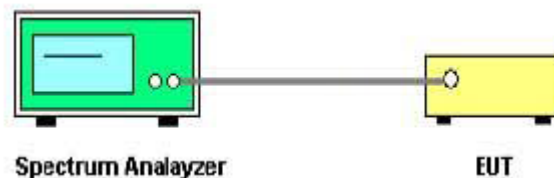
The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Resolution Bandwidth	10 kHz
Video Bandwidth	10 kHz
Frequency Span	2 MHz
Detector	Positive Peak
Sweep time	Auto

#### 3.2.3 TEST PROCEDURES

1. Connect the EUT to the spectrum analyser.
2. EUT have transmitted the maximum modulation signal and fixed channels.
3. Center the test frequency in the spectrum, then set spectrum parameters according to 3.2.2, and offset cable loss.
4. After the waveform is stabilized, use spectrum 99% OBW function and the left reading value T1 and right reading value T2.  $f$  is calculated as  $(T1 + T2) / 2$ ,  $f_c$  is declaring of channel frequency. Then the frequency error formula is  $(f_c - f) / f_c \times 10^6$  ppm and the limit is less than  $\pm 20$  ppm.

#### 3.2.4 TEST SETUP LAYOUT



#### 3.2.5 TEST DEVIATION

There is no deviation with the original standard.

#### 3.2.6 EUT OPERATION DURING TEST

The EUT was placed on the test table and programmed in modulation function.

#### 3.2.7 TEST RESULTS

Please refer to the Appendix B.

### 3.3 OCCUPIED BANDWIDTH

#### 3.3.1 LIMIT

Item	Limits
Occupied Bandwidth	$\leq (200 \times n)$ kHz

Note:

The "n" is a number of wireless channels, an integer between 1 and 5. In this report, n=4.

#### 3.3.2 MEASURING INSTRUMENTS AND SETTING

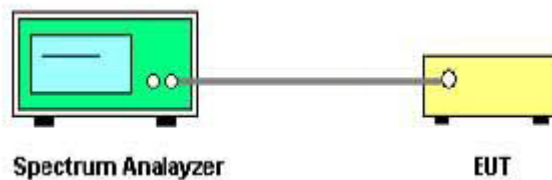
The following table is the setting of the spectrum.

Power Meter Parameter	Setting
Resolution Bandwidth	10 kHz
Video Bandwidth	10 kHz
Frequency Span	2 MHz
Sweep Time	Auto
Sweep Mode	Continuous Sweep
Detect Mode	Positive Peak
Trace Mode	Max Hold

#### 3.3.3 TEST PROCEDURES

1. Connect the EUT to the spectrum analyser.
2. EUT have transmitted the maximum modulation signal and fixed channels.
3. Center the test frequency in the spectrum, then set spectrum parameters according to 3.3.2, and offset cable loss.
4. After the waveform is stabilized, use spectrum 99% OBW function and the reading value is less than  $(200 \times n)$  kHz.

#### 3.3.4 TEST SETUP LAYOUT



#### 3.3.5 TEST DEVIATION

There is no deviation with the original standard.

#### 3.3.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

#### 3.3.7 TEST RESULTS

Please refer to the Appendix C.

### 3.4 ADJACENT CHANNEL LEAKAGE POWER

#### 3.4.1 LIMIT

Item	Limits
Adjacent Channel Leakage Power	Adjacent unit channels: 15dBm or less

#### 3.4.2 MEASURING INSTRUMENTS AND SETTING

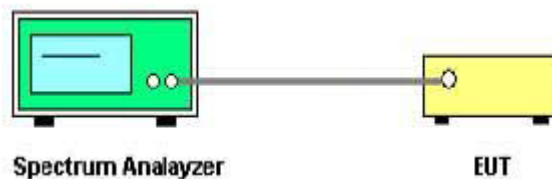
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Resolution Bandwidth	1 kHz
Video Bandwidth	3 kHz
Sweep Time	Auto
Sweep Mode	Continuous Sweep
Detect Mode	Peak
Trace Mode	Max Hold

#### 3.4.3 TEST PROCEDURES

1. Connect the EUT to the spectrum analyser.
2. EUT have transmitted the maximum modulation signal and fixed channels.
3. Center the test frequency in the spectrum, then set spectrum parameters according to 3.4.2, and offset cable loss.
4. After the waveform is stabilized, use spectrum ACP function and the reading value is less than -15dBm.

#### 3.4.4 TEST SETUP LAYOUT



#### 3.4.5 TEST DEVIATION

There is no deviation with the original standard.

#### 3.4.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

#### 3.4.7 TEST RESULTS

Please refer to the Appendix D.



### 3.5 UNWANTED EMISSION STRENGTH

#### 3.5.1 LIMIT

Frequency Band	Spurious emission / Unwanted Emission Intensity	Reference Bandwidth
$f \leq 710 \text{ MHz}$	-36 dBm	100 kHz
$710 \text{ MHz} < f \leq 900 \text{ MHz}$	-55 dBm	1 MHz
$900 \text{ MHz} < f \leq 915 \text{ MHz}$	-55 dBm	100 kHz
$915 \text{ MHz} < f \leq 930 \text{ MHz}$ (Note)	-36 dBm	100 kHz
$930 \text{ MHz} < f \leq 1000 \text{ MHz}$	-55 dBm	100 kHz
$1000 \text{ MHz} < f \leq 1,215 \text{ MHz}$	-45 dBm	1 MHz
$1,215 \text{ MHz} < f$	-30 dBm	1 MHz

Note: Except "200 + 100 x n kHz" from center frequency.

#### 3.5.2 MEASURING INSTRUMENTS AND SETTING

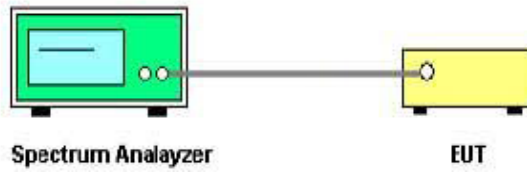
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Resolution Bandwidth	refer to 3.5.1 Reference Bandwidth
Video Bandwidth	= Resolution Bandwidth
Sweep Time	Auto
Sweep Mode	Continuous Sweep
Detect Mode	Peak
Trace Mode	Max Hold

#### 3.5.3 TEST PROCEDURES

1. Connect the EUT to the spectrum analyser.
2. Keep EUT fixed channel emitting continuously.
3. Set spectrum parameters according to 3.5.2, and offset cable loss.
4. After the waveform is stabilized, Mark function of spectrum is called. The highest point in each paragraph of Mark meets the limit in 3.5.1.
5. Setting of SA is following as 30MHz and stop frequency 710 MHz Then to mark peak reading value + cable loss shall be less than -36 dBm.
6. Setting of SA is following as 710 MHz and stop frequency 900 MHz Then to mark peak reading value + cable loss shall be less than -55 dBm.
7. SA adjusted to start frequency 900 MHz and stop frequency 915 MHz. Then to mark peak reading value + cable loss shall be less than -55 dBm.
8. SA adjusted to start frequency 915 MHz and stop frequency 930 MHz Then to mark peak reading value + cable loss shall be less than -36 dBm.
9. SA adjusted to start frequency 930 MHz and stop frequency 1000 MHz Then to mark peak reading value + cable loss shall be less than -55 dBm.
10. SA adjusted to start frequency 1000 MHz and stop frequency 1215 MHz Then to mark peak reading value + cable loss shall be less than -45 dBm.
11. SA adjusted to start frequency 1215 MHz and stop frequency 5 GHz Then to mark peak reading value + cable loss shall be less than -30 dBm.

### 3.5.4 TEST SETUP LAYOUT



### 3.5.5 TEST DEVIATION

There is no deviation with the original standard.

### 3.5.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

### 3.5.7 TEST RESULTS

Please refer to the Appendix E.

### 3.6 TRANSMISSION TIME RESTRICTION

#### 3.6.1 LIMIT

Item	Limits
Transmission On	Within 4 sec
Transmission Off	Over 0.05 sec

#### 3.6.2 MEASURING INSTRUMENTS AND SETTING

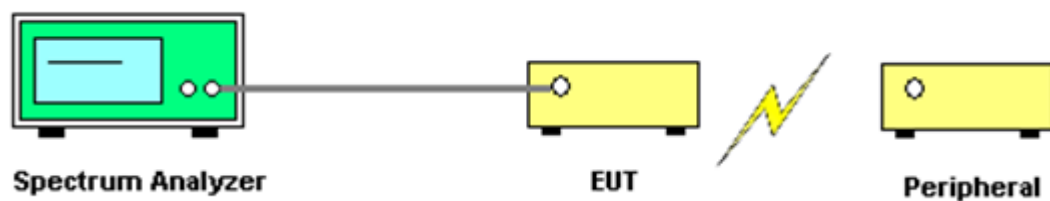
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Sweep time	2 s
Sweep Mode	Single Sweep
Detect Mode	Peak

#### 3.6.3 TEST PROCEDURES

1. Connect the EUT and test periphery to the spectrum analyser.
2. EUT and peripheral device fixed channel transmit normally.
3. In the spectrum, the test frequency is centered, and parameters are set in accordance with 3.6.2.  
After the spectrum scanning time is completed, mark-dettle function is used to mark transmission on and transmission Off.

#### 3.6.4 TEST SETUP LAYOUT



#### 3.6.5 TEST DEVIATION

There is no deviation with the original standard.

#### 3.6.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

#### 3.6.7 TEST RESULTS

Please refer to the Appendix F.

### 3.7 CARRIER SENSING FUNCTION

#### 3.7.1 LIMIT

Item	Limits
Carrie Sense	When the carrier sense level is more than -80dBm, radio equipment shall not emit any radio wave. (Note)
Judgment Time	5ms or more

Note: When antenna power=20mW or less, carrier sense level=-80dBm.

When antenna power=more than 20mW, carrier sense level=-80dBm-(Antenna power-20mW).

#### 3.7.2 MEASURING INSTRUMENTS AND SETTING

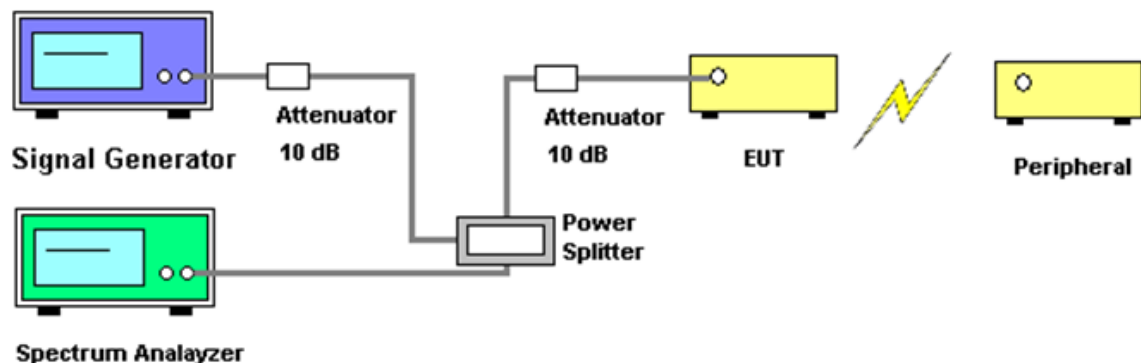
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Resolution Bandwidth	100 kHz
Video Bandwidth	300 kHz
Frequency Span	Zero
Sweep Time	1 s
Sweep Mode	Signal Mode
Detect Mode	Peak

#### 3.7.3 TEST PROCEDURES

- SSG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SSG and power level is -80 dBm. Then turn off the RF signal of SSG.
- EUT have transmitted the maximum modulation signal and fixed channelize.
- SSG RF Signal On.
- EUT shall be stop the transmitted any signal and SSG RF Signal Off. Then EUT will be continuous transmitted signal.

#### 3.7.4 TEST SETUP LAYOUT



**3.7.5 TEST DEVIATION**

There is no deviation with the original standard.

**3.7.6 EUT OPERATION DURING TEST**

The EUT was programmed to be in normal transmitting mode.

**3.7.7 TEST RESULTS**

Test Power	Normal Voltage
Test Mode	922.3 MHz
Test Result	Good

### 3.8 INTERFERENCE PREVENTION FUNCTION

#### 3.8.1 LIMIT

Item	Limits
Interference Prevention Function	The radio equipment shall automatically transmit/receive identification codes.

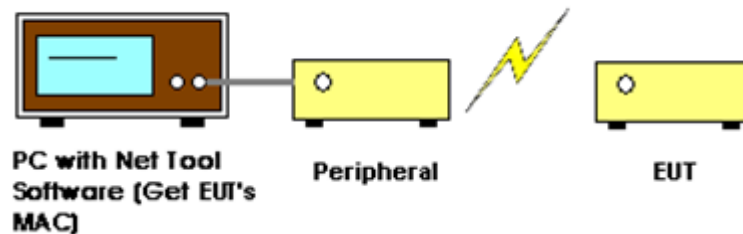
#### 3.8.2 MEASURING INSTRUMENTS AND SETTING

Set EUT under operating mode and link up with companion equipment.

#### 3.8.3 TEST PROCEDURES

1. Connect the EUT and test periphery.
2. EUT pairs with peripheral devices and transmits normally.
3. Get the EUT's MAC address or identifier through tools or software.

#### 3.8.4 TEST SETUP LAYOUT



#### 3.8.5 TEST DEVIATION

There is no deviation with the original standard.

#### 3.8.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal mode.

#### 3.8.7 TEST RESULTS

Test Power	Normal Voltage
Test Mode	922.3 MHz
Test Result	Good (identification code: [00-FF-00-24-B4-5F])

00-FF-00-24-B4-5F

### 3.9 SECONDARY RADIATED EMISSION STRENGTH

#### 3.9.1 LIMIT

Frequency Band	Spurious emission / Unwanted Emission Intensity	Reference Bandwidth
$f \leq 710 \text{ MHz}$	-54 dBm	100 kHz
$710 \text{ MHz} < f \leq 900 \text{ MHz}$	-55 dBm	1 MHz
$900 \text{ MHz} < f \leq 915 \text{ MHz}$	-55 dBm	100 kHz
$915 \text{ MHz} < f \leq 930 \text{ MHz}$	-54 dBm	100 kHz
$930 \text{ MHz} < f \leq 1000 \text{ MHz}$	-55 dBm	100 kHz
$1000\text{MHz} < f$	-47 dBm	1 MHz

#### 3.9.2 MEASURING INSTRUMENTS AND SETTING

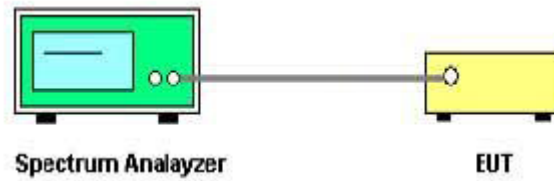
The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Resolution Bandwidth	refer to 3.5.1 Reference Bandwidth
Video Bandwidth	= Resolution Bandwidth
Sweep Time	Auto
Sweep Mode	Continuous Sweep
Detect Mode	Peak
Trace Mode	Max Hold

#### 3.9.3 TEST PROCEDURES

1. Connect the EUT to the spectrum analyser.
2. Keep EUT fixed channel emitting continuously.
3. Set spectrum parameters according to 3.9.2, and offset cable loss.
4. After the waveform is stabilized, Mark function of spectrum is called. The highest point in each paragraph of Mark meets the limit in 3.9.1.
  1. Setting of SA is following as 30MHz and stop frequency 710 MHz Then to mark peak reading value + cable loss shall be less than -54 dBm
  2. Setting of SA is following as 710 MHz and stop frequency 900 MHz Then to mark peak reading value + cable loss shall be less than -55 dBm.
  3. SA adjusted to start frequency 900 MHz and stop frequency 915 MHz. Then to mark peak reading value + cable loss shall be less than -55 dBm.
  4. SA adjusted to start frequency 915 MHz and stop frequency 930 MHz Then to mark peak reading value + cable loss shall be less than -54 dBm.
  5. SA adjusted to start frequency 930 MHz and stop frequency 1000 MHz Then to mark peak reading value + cable loss shall be less than -55 dBm.
  6. SA adjusted to start frequency 1000 MHz and stop frequency 5 GHz Then to mark peak reading value + cable loss shall be less than -47 dBm

#### **3.9.4 TEST SETUP LAYOUT**



#### **3.9.5 TEST DEVIATION**

There is no deviation with the original standard.

#### **3.9.6 EUT OPERATION DURING TEST**

The EUT was programmed to be in continuously receiving mode.

#### **3.9.7 TEST RESULTS**

Please refer to the Appendix G.



### 3.10 CONSTRUCTION PROTECTION CONFIRMATION METHOD

#### 3.10.1 LIMIT

(See Article 49-14, Item 6-a of the Ordinance Regulating Radio Equipment)

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

#### 3.10.2 CONFIRMATION METHOD

The RF and modulation portions are protected against illegal modification as following method:

Tick the appropriate box	
<input type="checkbox"/>	1. Sealed with special screws.
<input type="checkbox"/>	2. Plastic chassis is being welded using ultrasonic waves.
<input type="checkbox"/>	3. Chassis is glued using a special adhesive.
<input type="checkbox"/>	4. Metal covers are spot-fused.
<input type="checkbox"/>	5. Cover is specially interlocked.
<input type="checkbox"/>	6. RF and Modulation components are covered with shielding case and this shielding case is soldered.
<input type="checkbox"/>	7. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
<input type="checkbox"/>	8. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive
<input type="checkbox"/>	9. Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
<input checked="" type="checkbox"/>	10. RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable part on PCB or adjustable parts are not exposed.

#### 4. LIST OF MEASURING EQUIPMENTS

Kind of Equipment	Manufacturer	Model No.	Serial No.	Validity Date	Calibration Agency	Class Information
Spectrum Analyzer	R&S	FSP40	100185	Jul. 10, 2022	CHINA CEPREI LABORATORY	(c)
Signal Generator	R&S	SMR40	100504	Jan. 22, 2023	CEPREI Calibration and Testing Center	(c)
Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 07, 2022	CEPREI Calibration and Testing Center	(c)
*Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Jul. 25, 2023	CEPREI Calibration and Testing Center	-

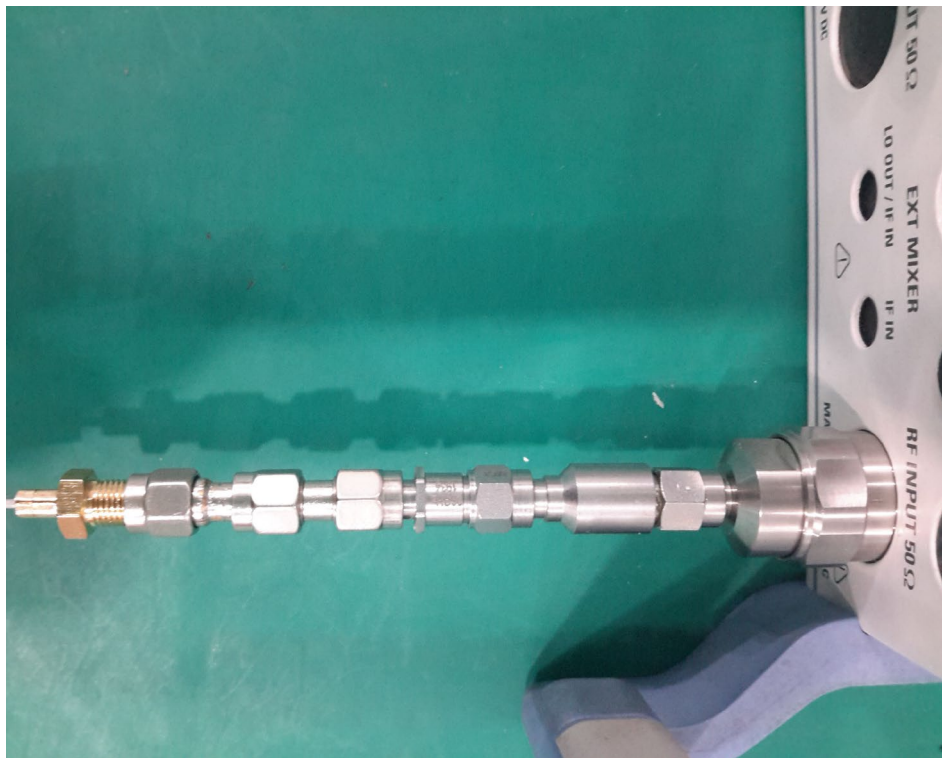
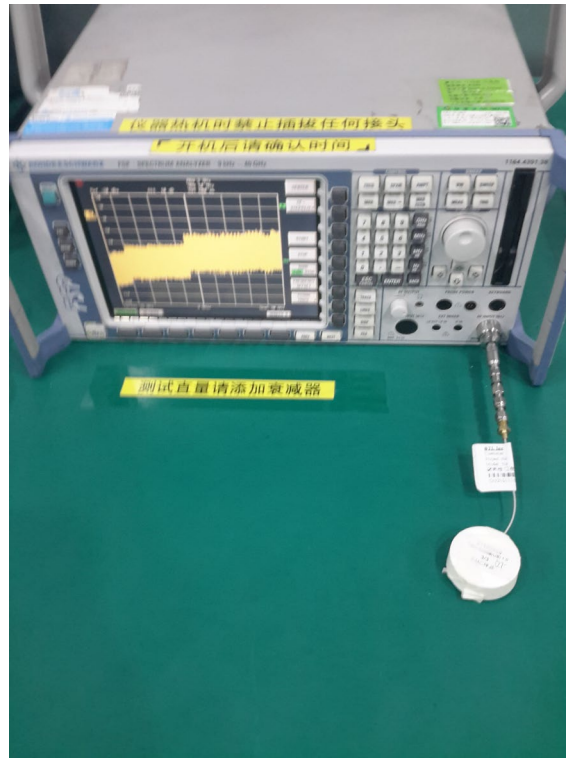
##### Remark:

- Calibration conducted by the National Institute of Information and Communications Technology (NITC) in Japan (hereinafter referred to as "NITC") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No.51 of 1992).
- Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation agency under Article 102-18 paragraph (1).
- Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No.3, which shall have been given any type of calibration, etc. listed above from (a) to (c). From JRL Article 24-2, paragraph 4, item 2.

##### Note:

- The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
- \*The calibration interval of the above test instruments is 36 months and the calibrations are traceable to NML/ROC and NIST/USA.

## 5. EUT TEST PHOTO



## **APPENDIX A - ANTENNA POWER AND ANTENNA POWER TOLERANCE AND EIRP**

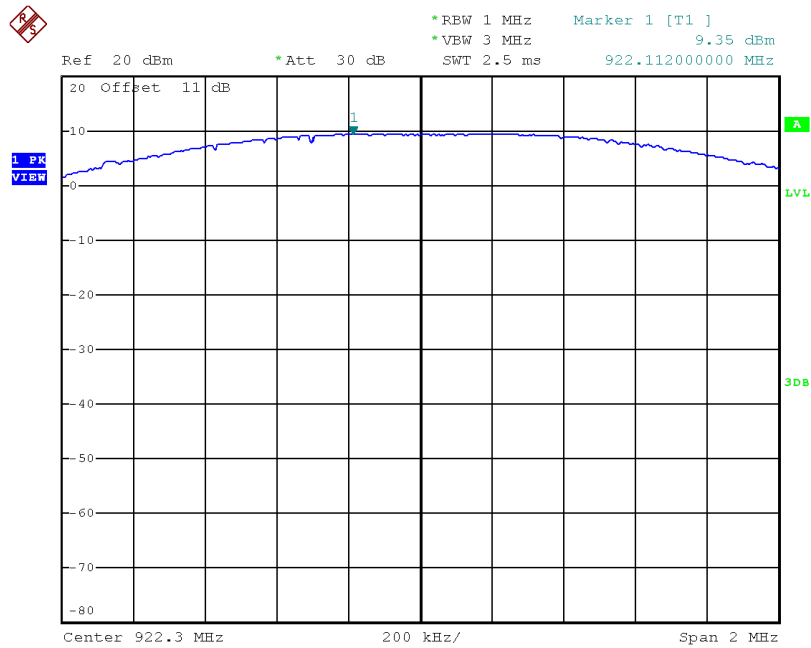
Test Mode:	TX Mode_922.3MHz
------------	------------------

Normal Voltage					
Test Frequency (MHz)	Conducted RF output power		Rated RF output power	Conducted RF output power Limit	Antenna Power Tolerance in Limit
	(dBm)	(mW)	(mW)	(mW)	(+20%, -80%)
922.3	9.35	8.6099	8.61	250	0.00 %

Test Frequency (MHz)	Radiated RF output power	Limit
	(dBm)	(dBm)
922.3	4.88	16

Note:

1. Antenna power tolerance = {(conducted power-rated power)/rated power}
2. Radiated RF output power (EIRP) = conducted RF output power + Max. Antenna gain

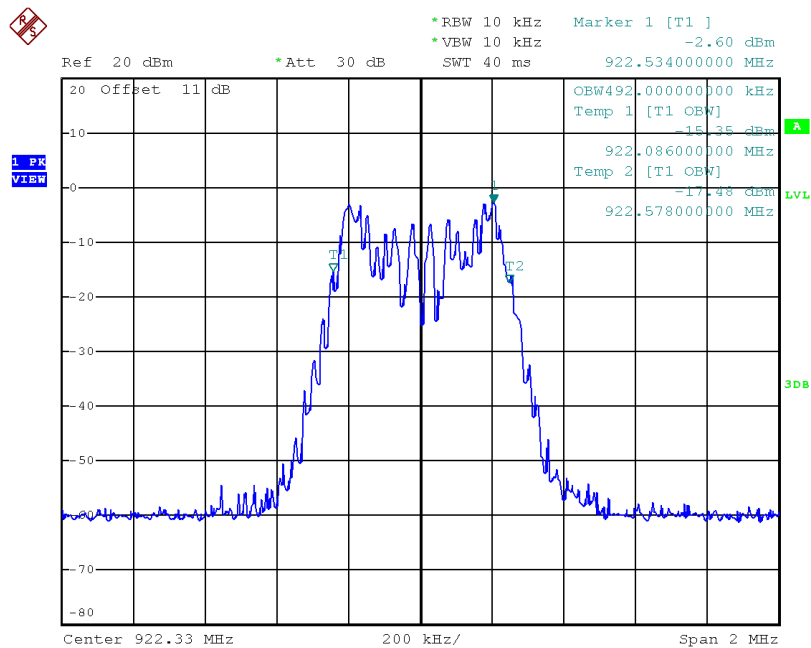


Date: 13.NOV.2021 13:58:22

## **APPENDIX B - FREQUENCY TOLERANCE**

Test Mode: TX Mode\_922.3MHz

Test Voltage	Low Voltage	Remarks
Test Frequency (MHz)	922.3	Low/Mid/High of test frequency range
Measured Frequency (MHz)	922.3320	-
Frequency Tolerance (ppm)	2.17	Limit $\leq \pm 20\text{ppm}$



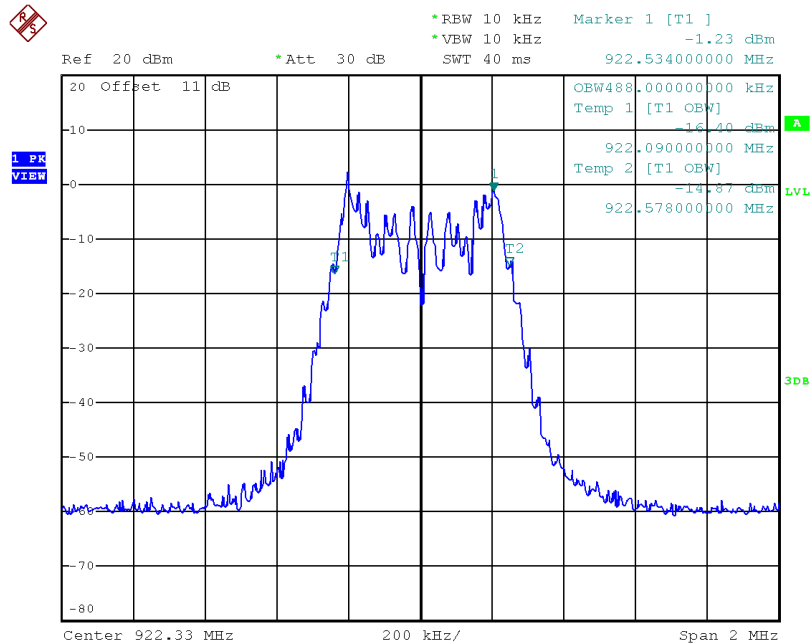
Date: 22.FEB.2022 19:47:59

## **APPENDIX C - OCCUPIED BANDWIDTH**



Test Mode:	TX Mode_922.3MHz
------------	------------------

Test Voltage	Normal Voltage	Remarks
Test Frequency (MHz)	922.3	Low/Mid/High of test frequency range
Occupied Bandwidth (MHz)	0.49	Limit $\leq$ 0.80 MHz

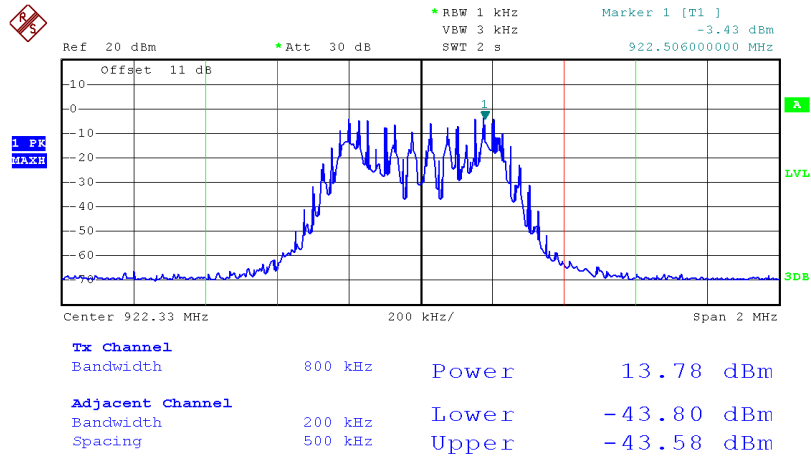


Date: 22.FEB.2022 19:50:27

## **APPENDIX D - ADJACENT CHANNEL LEAKAGE POWER**

Test Mode:	TX Mode_922.3MHz
------------	------------------

Test Voltage		Normal Voltage		Remarks
Test Frequency	MHz	922.3	-	Low/Mid/High of test frequency range
Adjacent Channel	-0.2	-43.80	dBm	Limit ≤ 15 dBm
Emitted Power	+0.2	-43.58	dBm	Limit ≤ 15 dBm

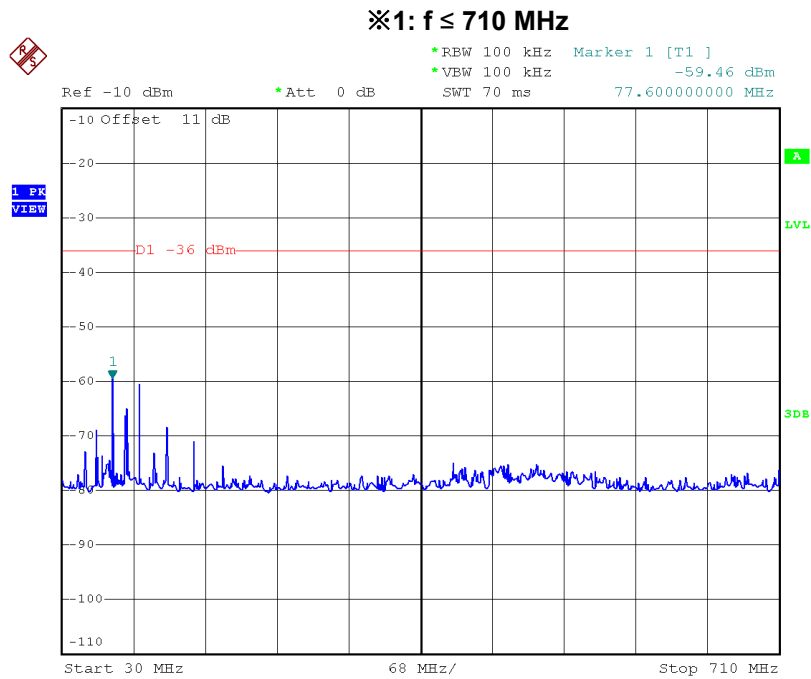


Date: 10.MAR.2022 15:27:37

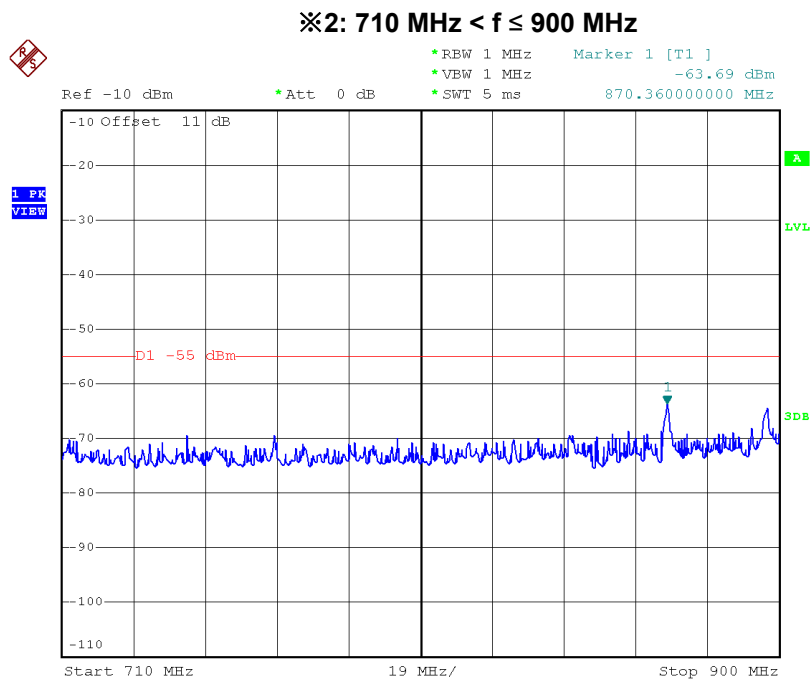
## **APPENDIX E - UNWANTED EMISSION STRENGTH**

Test Mode:	TX Mode_922.3MHz
------------	------------------

Test Voltage		Normal Voltage		Remarks
Test Frequency	MHz	922.3		Limit
Unwanted Emission Intensity (Power emission)	※1	dBm/100kHz	-59.46	-36 dBm/100kHz
	※2	dBm/1MHz	-63.69	-55 dBm/1MHz
	※3	dBm/100kHz	-73.33	-55 dBm/100kHz
	※4	dBm/100kHz	-45.75	-36 dBm/100kHz
	※5	dBm/100kHz	-49.05	-36 dBm/100kHz
	※6	dBm/100kHz	-67.17	-55 dBm/100kHz
	※7	dBm/1MHz	-66.54	-45 dBm/1MHz
	※8	dBm/1MHz	-65.48	-30 dBm/1MHz

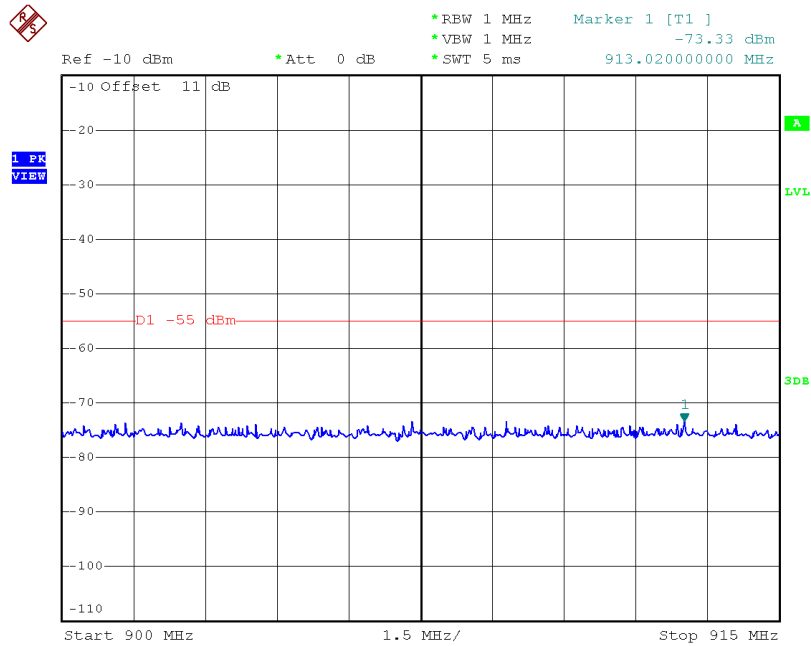


Date: 10.MAR.2022 16:38:01



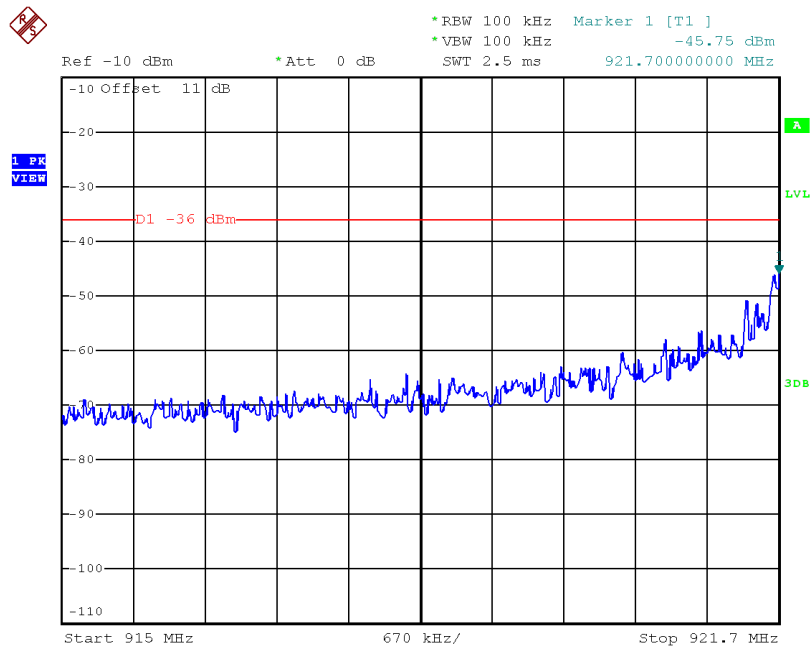
Date: 10.MAR.2022 16:39:48

### ※3: 900 MHz < f ≤ 915 MHz



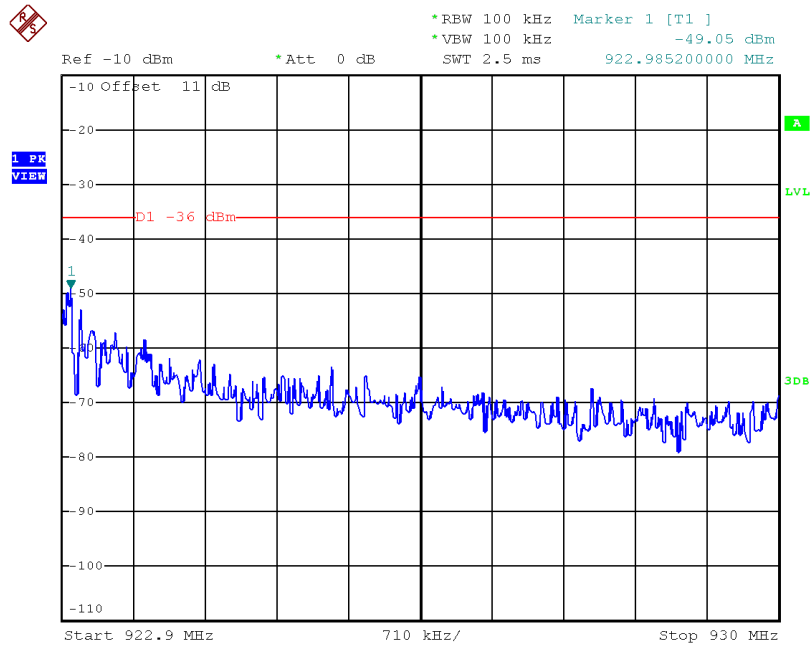
Date: 10.MAR.2022 16:40:50

### ※4: 915 MHz < f ≤ 921.7 MHz



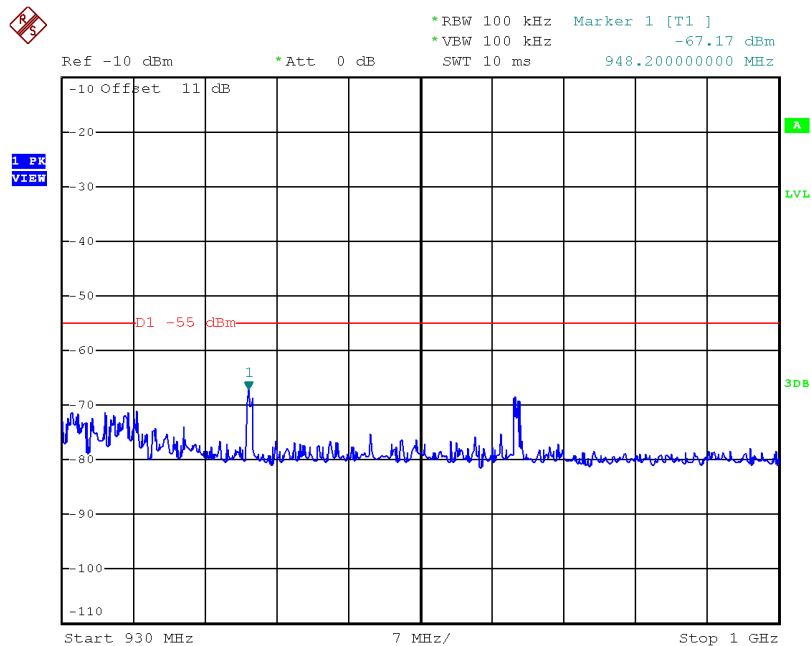
Date: 13.NOV.2021 15:02:07

## ※5: 922.9 MHz < f ≤ 930 MHz



Date: 13.NOV.2021 15:04:18

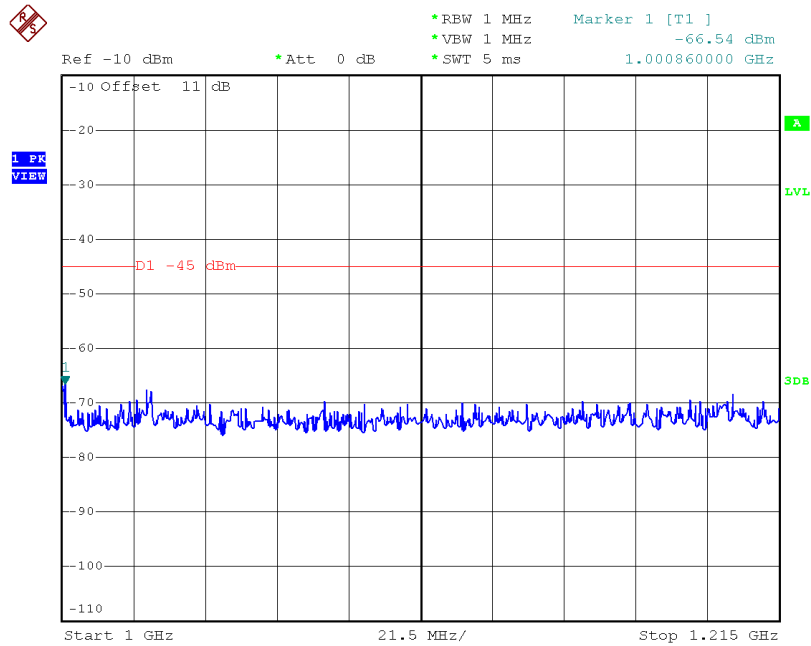
## ※6: 930 MHz < f ≤ 1000 MHz



Date: 13.NOV.2021 15:05:33

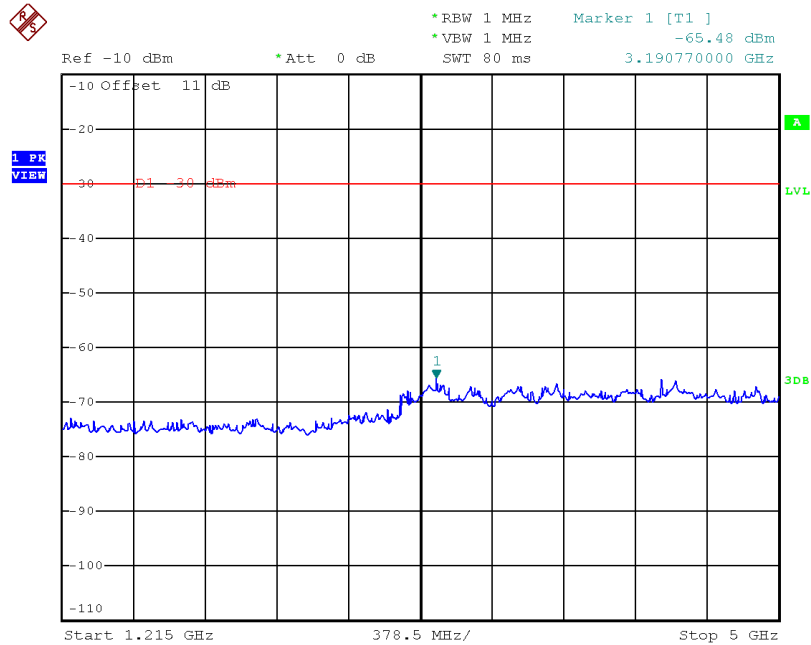


## ※7: 1 GHz < f ≤ 1.215 GHz



Date: 10.MAR.2022 16:42:50

## ※8: 1.215 GHz < f ≤ 5 GHz



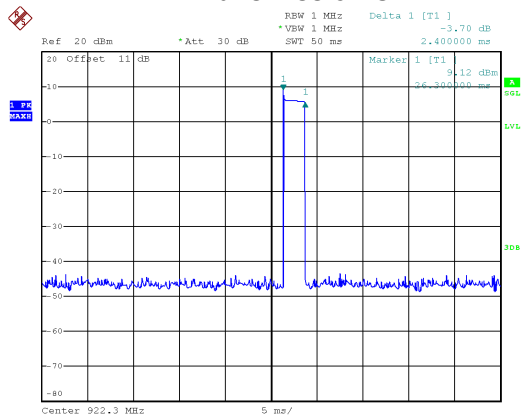
Date: 13.NOV.2021 15:06:44

## **APPENDIX F - TRANSMISSION TIME RESTRICTION**

Test Mode: TX Mode\_922.3MHz

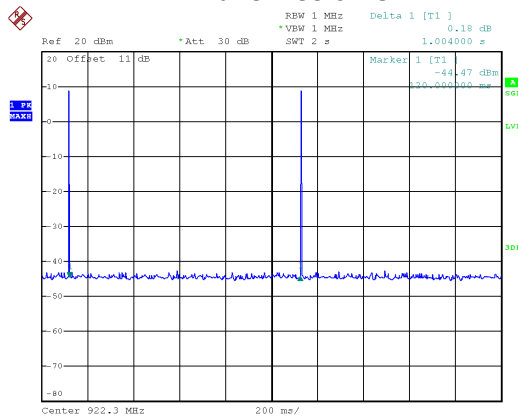
Test Voltage		Normal Voltage	Remarks
Test Frequency	MHz	922.3	Low/Mid/High of test frequency range
Transmission On	msec	2.40	Limit ≤ 4 sec
Transmission Off	msec	1004.00	Limit ≥ 50 msec

Transmission On



Date: 22.FEB.2022 16:36:41

Transmission Off

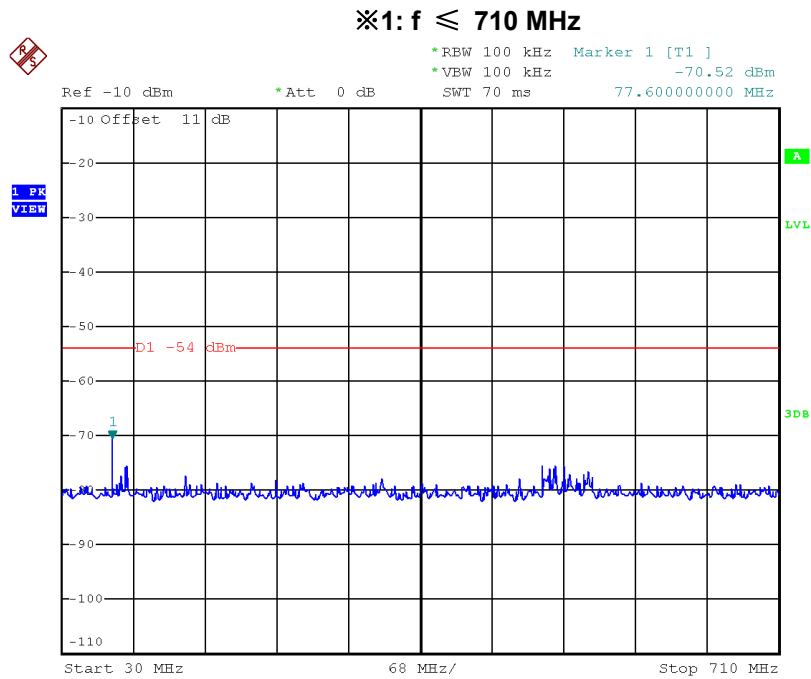


Date: 22.FEB.2022 16:37:45

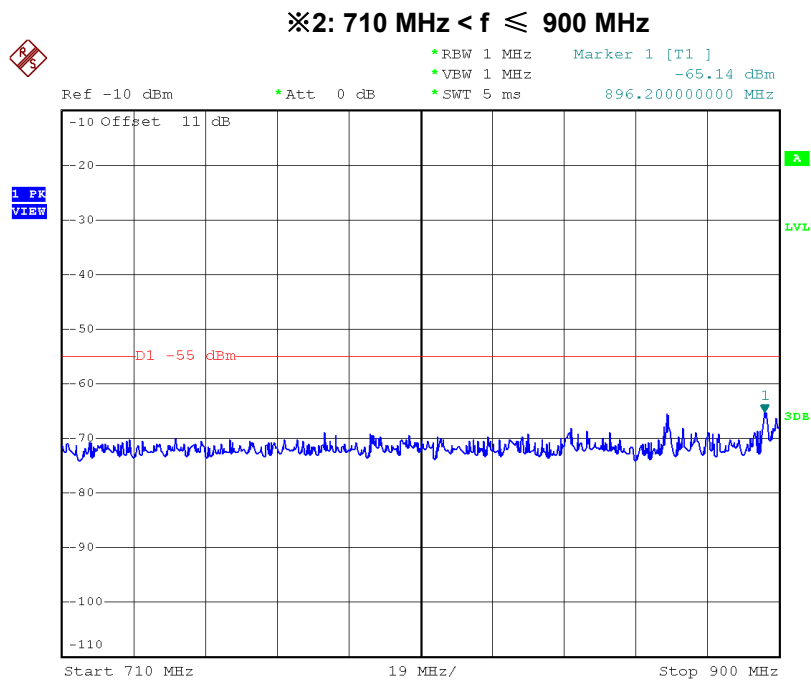
## **APPENDIX G - SECONDARY RADIATED EMISSION STRENGTH**

Test Mode:	RX Mode_922.3MHz
------------	------------------

Test Voltage		Normal Voltage		Remarks
Test Frequency	MHz	922.3		Limit
Unwanted Emission Intensity (Power emission)	※1	dBm/100kHz	-70.52	-54 dBm/100kHz
	※2	dBm/1MHz	-65.14	-55 dBm/1MHz
	※3	dBm/100kHz	-68.88	-55 dBm/100kHz
	※4	dBm/100kHz	-77.81	-54 dBm/100kHz
	※5	dBm/100kHz	-77.50	-55 dBm/100kHz
	※6	dBm/1MHz	-76.42	-47 dBm/1MHz

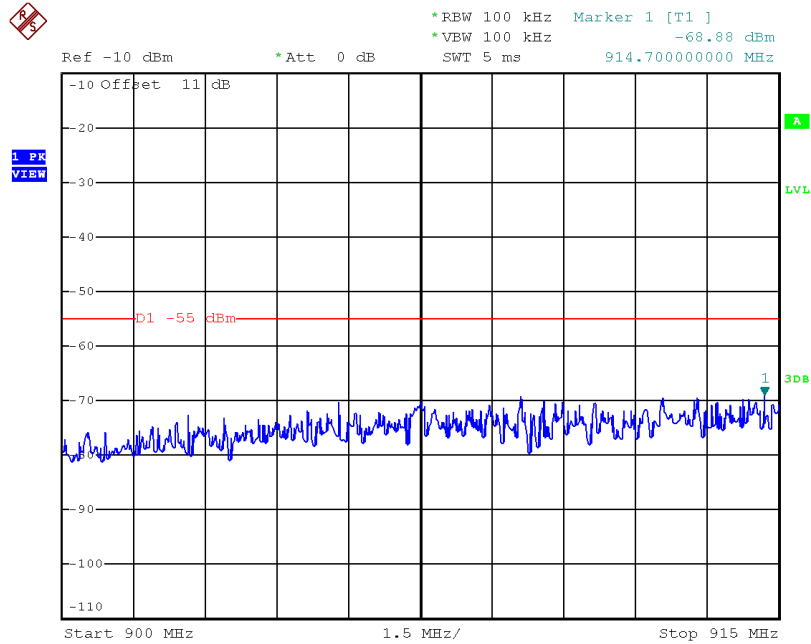


Date: 13.NOV.2021 15:07:47



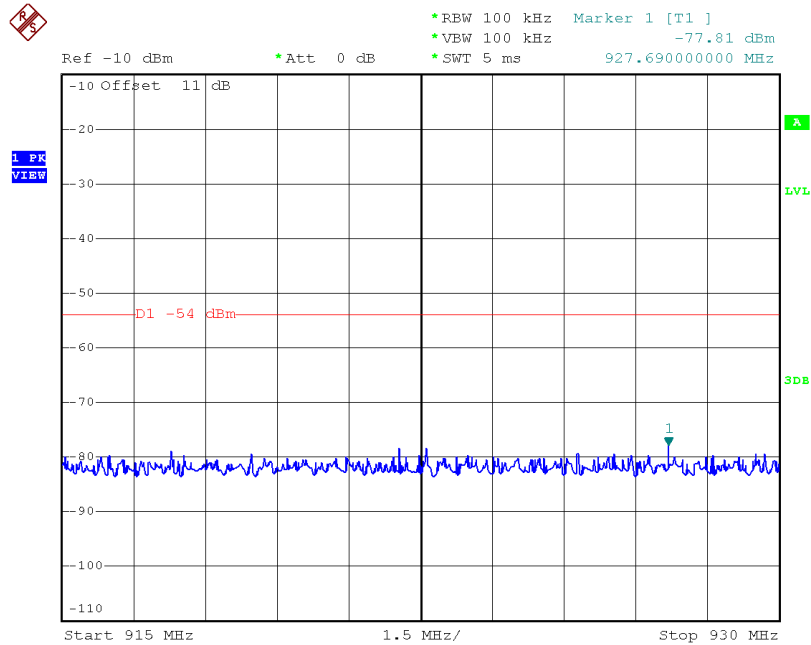
Date: 10.MAR.2022 15:38:09

### ※3: 900 MHz < f ≤ 915 MHz



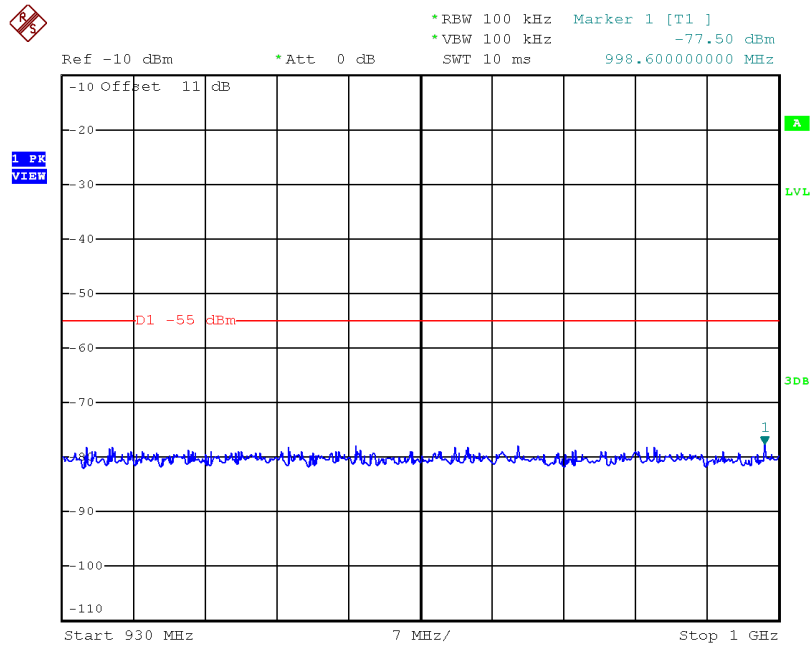
Date: 13.NOV.2021 15:09:31

### ※4: 915 MHz < f ≤ 930 MHz



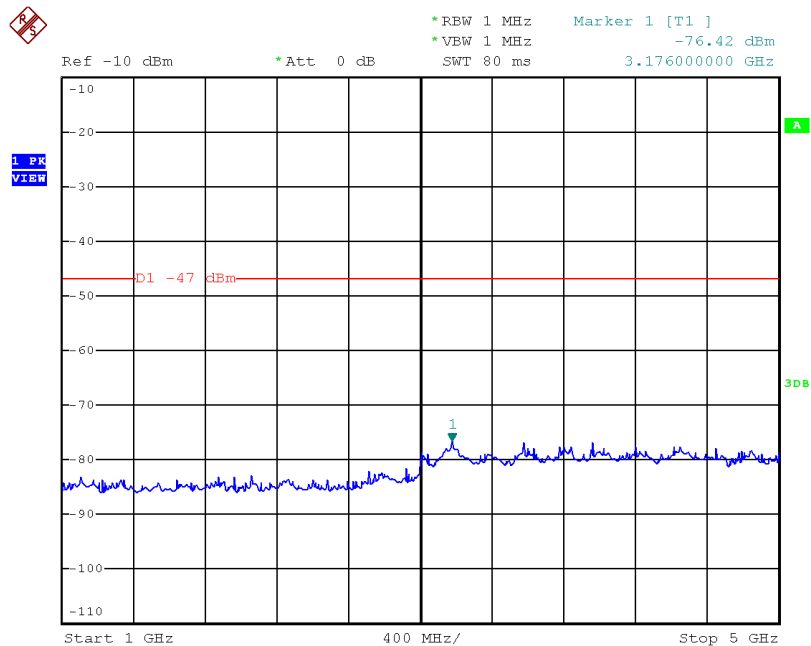
Date: 10.MAR.2022 15:39:45

## ※5: 930 MHz < f ≤ 1000 MHz



Date: 13.NOV.2021 15:11:54

## ※6: 1000MHz < f



Date: 13.NOV.2021 15:16:37

End of Test Report