RF TEST REPORT

Test Equipment	:	Xepton NX 900M TRX
Model Name	:	Xepton NX-900 TRX
Variant Model Name	:	Xepton NX 900M TX, Xepton NX 900M RX XN-900-TRX, XN-900-TX, XN-900-RX
FCC ID	:	YJH-NX-900TRX
Date of receipt	:	2023-08-04
Test Duration	:	2023-08-04 ~ 2023-09-04
Date of issue	:	2023-09-05

Applicant : Maytel Co., Ltd

#417 Doosan Venture Digm 126-1, Pyeongchon-dong
Dongan-gu, Anyang-si, Gyeonggi-do, Republic of Korea

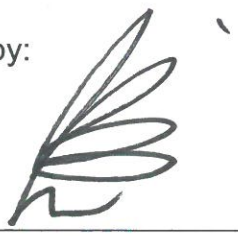
Test Laboratory : Lab-T, Inc.

2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si
Gyeonggi-do 17036, Korea(Republic of)

Test Specification	:	FCC Part 15 Subpart C 15.247
RF Output Power	:	10.19 dBm
Test Result	:	Pass

The above equipment was tested by Lab-T Testing Laboratory for compliance
with the requirements of FCC Rules and Regulations.
The test results presented in this test report are limited only to the sample supplied by applicant
and the use of this test report is inhibited other than its purpose.
This test report shall not be reproduced except in full, without the written approval of Lab-T, Inc
This test report is not related to KOLAS.

Tested by:



Engineer
NamHyoung Kwon

Reviewed by:

Technical Manager
SangHoon Yu

CONTENTS

1. Revision History

Test Report No.	Date	Description
TRRFCC23-0008	2023-09-05	Initial issue

2. Information

2.1 Applicant Information

Applicant Name	Maytel Co., Ltd
Address	#417 Doosan Venture Digm 126-1, Pyeongchon-dong, Dongan-gu, Anyang-si Gyeonggi-do, Republic of Korea
Telephone No.	+82-32-487-5508
Person in charge	Su Won, Bae / swmaytel@naver.com
Manufacturer	Maytel Co., Ltd
Address	#417 Doosan Venture Digm 126-1, Pyeongchon-dong, Dongan-gu, Anyang-si Gyeonggi-do, Republic of Korea

2.2 Test Laboratory Information

Corporate Name	Lab-T, Inc.
Representative	Duke (Jongyoung) Kim
Address	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea (Republic of)
Telephone	+82-31-322-6767
Fax	+82-31-322-6768
E-mail	info@lab-t.net
FCC Designation No.	KR0159
FCC Registration No.	133186
IC Site Registration No.	22000

2.3 Test Site

Test Site	Used	Address
Building L	☒	2182-40 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)
Building T	☒	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)
Building A	☐	2182-44 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Korea(Republic of)

3. Information about Test Equipment

3.1 Equipment Information

Equipment Type	Xepton NX 900M TRX
Model Name	Xepton NX-900 TRX
Variant Model Name	Xepton NX 900M TX, Xepton NX 900M RX, XN-900-TRX XN-900-TX, XN-900-RX
Frequency Range	902.5 MHz ~ 927.0 MHz (Number of channels : 50, Hopping channels : 50)
Modulation Type	FHSS
Power Supply	DC 3.7 V
H/W Version	001
S/W Version	002

Note 1 : The above EUT information was declared by the manufacturer.
Note 2 : Variant Model Names are used for each other different Buyers.

3.2 Antenna Information

Type	Model No.	Gain	Note.
PCB Antenna	0915AT43A0026	-1.0 dBi	-

3.3 Test Frequency

Test Mode	Test Frequency (MHz)		
	Lowest Frequency	Middle Frequency	Highest Frequency
FHSS	902.5	914.5	927.0

3.4 Tested Companion Device Information

Type	Manufacturer	Model	Note.
AC/DC Adapter	MEPOS	GPE053B-V050100-Z	Used AC conducted emission and radiated emission Input : AC 100 ~ 240 V Output : 5 V, 1000 mA

3.5 Equipment Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	902.5	18	911.0	35	919.5
2	903.0	19	911.5	36	920.0
3	903.5	20	912.0	37	920.5
4	904.0	21	912.5	38	921.0
5	904.5	22	913.0	39	921.5
6	905.0	23	913.5	40	922.0
7	905.5	24	914.0	41	922.5
8	906.0	25	914.5	42	923.0
9	906.5	26	915.0	43	923.5
10	907.0	27	915.5	44	924.0
11	907.5	28	916.0	45	924.5
12	908.0	29	916.5	46	925.0
13	908.5	30	917.0	47	925.5
14	909.0	31	917.5	48	926.0
15	909.5	32	918.0	49	926.5
16	910.0	33	918.5	50	927.0
17	910.5	34	919.0		

Note 1 : Test frequencies are the lowest channel: 1 channel(902.5 MHz), middle channel: 25 channel(914.5 MHz) and highest channel: 50 channel(927.0 MHz).

4. Test Report

4.1 Summary

FCC Part 15			
Reference	Parameter	Clause	Status
Transmitter Requirements			
15.203 15.247(c)	Antenna Requirement	4.3.1	C
15.247(a)(1)(i)	20 dB Channel Bandwidth	4.3.2	C
-	Occupied Bandwidth	4.3.2	C
15.247(a)(1)(i)	Number of Hopping Frequencies	4.3.3	C
15.247(a)(1)(i)	Average Time of Occupancy	4.3.4	C
15.247(a)(1)	Carrier Frequencies Separation	4.3.5	C
15.247(b)(2)	Peak Output Power	4.3.6	C
15.247(d) 15.205(a) 15.209(a)	Spurious Emission, Band Edge and Restricted Bands	4.3.7	C
15.207(a)	Conducted Emissions	4.3.8	C
Note 1: C = Comply N/C = Not Comply N/T = Not Tested N/A = Not Applicable			

* The general test methods used to test this device is ANSI C63.10:2020

4.2 Measurement Uncertainty

Mesurement Items	Expanded Uncertainty	
RF Output Power	0.76 dB	(The confidence level is about 95 %, *k*=2)
Occupied Channel Bandwidth	6.80 kHz	(The confidence level is about 95 %, *k*=2)
Conducted Spurious Emissions	0.71 dB	(The confidence level is about 95 %, *k*=2)
Radiated Spurious Emissions (1 GHz Under)	4.84 dB	(The confidence level is about 95 %, *k*=2)
Radiated Spurious Emissions (Above 1 GHz)	5.96 dB	(The confidence level is about 95 %, *k*=2)
Conducted Emission	2.52 dB	(The confidence level is about 95 %, *k*=2)

4.3 Transmitter Requirements

4.3.1 Antenna Requirement

4.3.1.1 Regulation

Accoding 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 use of a standard antenna jack or electrical connector is prohibited.

Accoding to §15.247(b)(4) e conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3.1.2 Result

Comply

(The transmitter has a Internal PCB Antenna. The directional peak gain of the antenna is -1.0 dBi.)

4.3.2 20 dB Bandwidth and Occupied Bandwidth

4.3.2.1 Regulation

Accoding to §15.247(a)(1)(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

20 dB and 99% emission bandwidth reporting only, measurement is also used to determine limits for other requirements of FHSS transmitters.

4.3.2.2 Measurement Procedure

ANSI C63.10 § 6.9.2 Occupied bandwidth 20dB relative procedure
ANSI C63.10 § 6.9.3 Occupied bandwidth 99% procedure

4.3.2.3 Result

Comply (Measurement data : Refer to the next page)

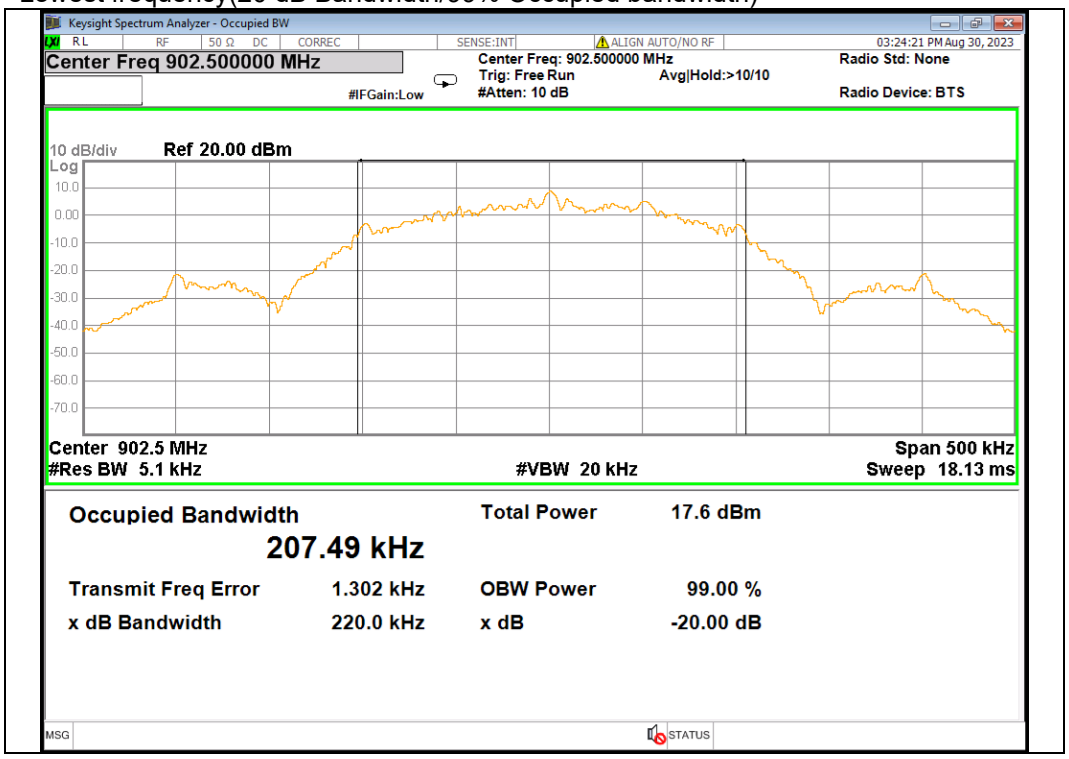
4.3.2.4 Measurement Data

Test mode: FHSS

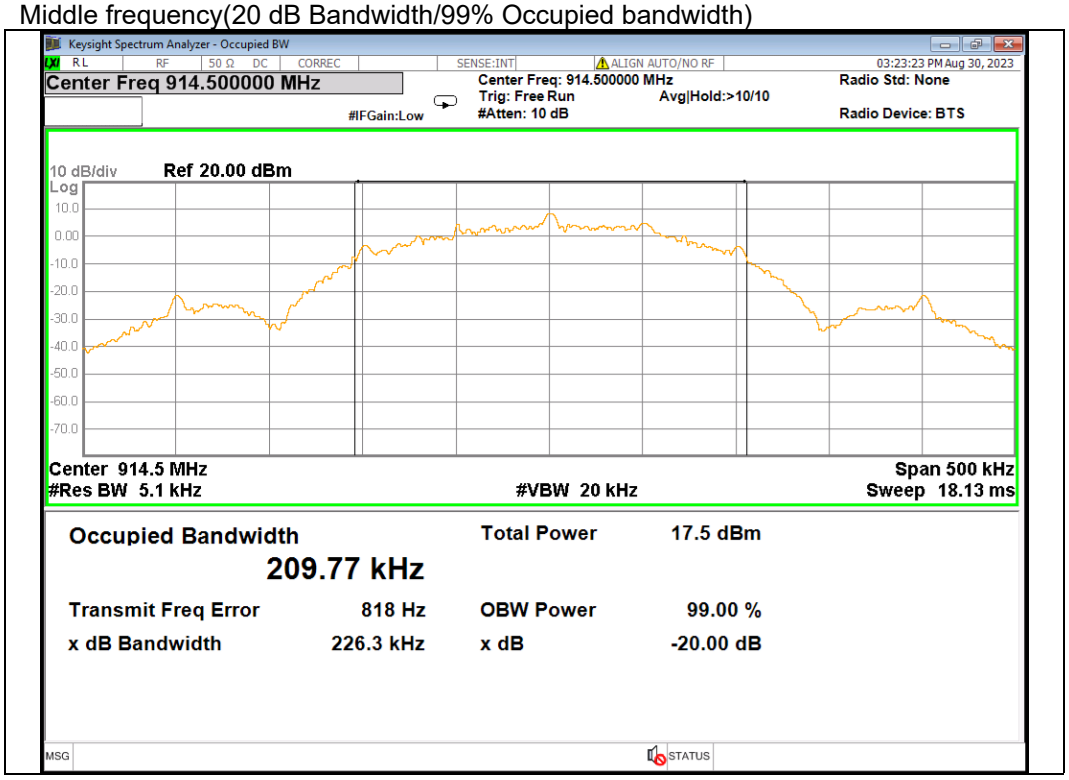
Frequency (MHz)	20 dB Bandwidth (MHz)	Max. Limit (MHz)	Occupied Bandwidth (99 % Bandwith) (MHz)
902.5	0.220	0.500	0.207
914.5	0.226	0.500	0.210
927.0	0.221	0.500	0.209

4.3.2.5 Test Plot

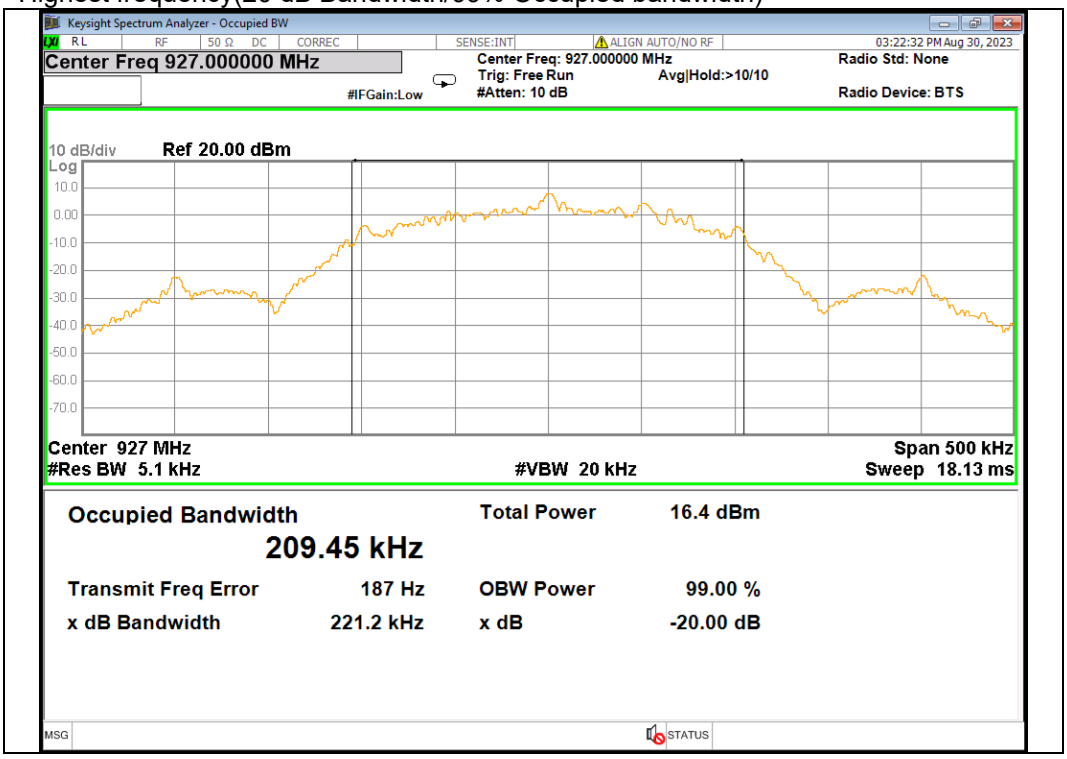
Lowest frequency(20 dB Bandwidth/99% Occupied bandwidth)



Middle frequency(20 dB Bandwidth/99% Occupied bandwidth)



Highest frequency(20 dB Bandwidth/99% Occupied bandwidth)



4.3.3 Number of Hopping Frequencies

4.3.3.1 Regulation

Accoding to §15.247(a)(1)(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

4.3.3.2 Measurement Procedure

ANSI C63.10 § 7.8.3 Number of hopping frequencies

4.3.3.3 Result

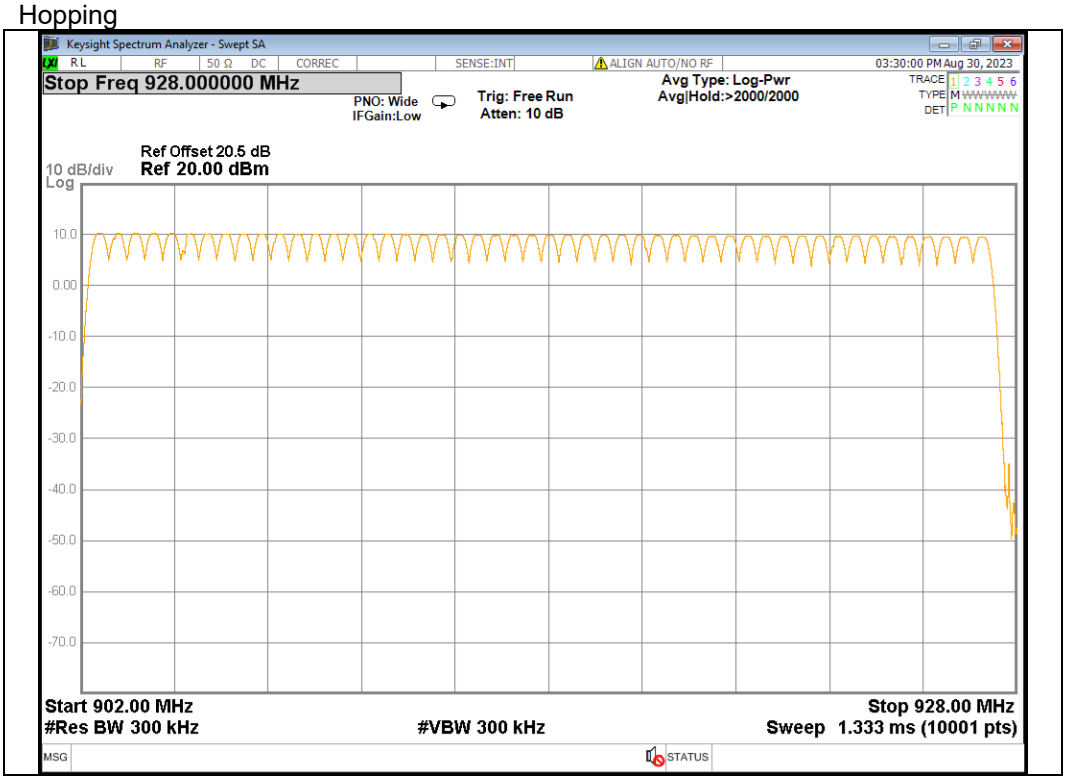
Comply (Measurement data : Refer to the next page)

4.3.3.4 Measurement Data

Test Result	Minimum Number of hopping channels
50	50

4.3.3.5 Test Plot

Hopping



4.3.4 Average Time of Occupancy

4.3.4.1 Regulation

Accoding to §15.247(a)(1)(i) and For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

4.3.4.2 Measurement Procedure

ANSI C63.10 § 7.8.4 Time of occupancy(dwell time)

4.3.4.3 Result

Comply (Measurement data : Refer to the next page)

4.3.4.4 Measurement Data

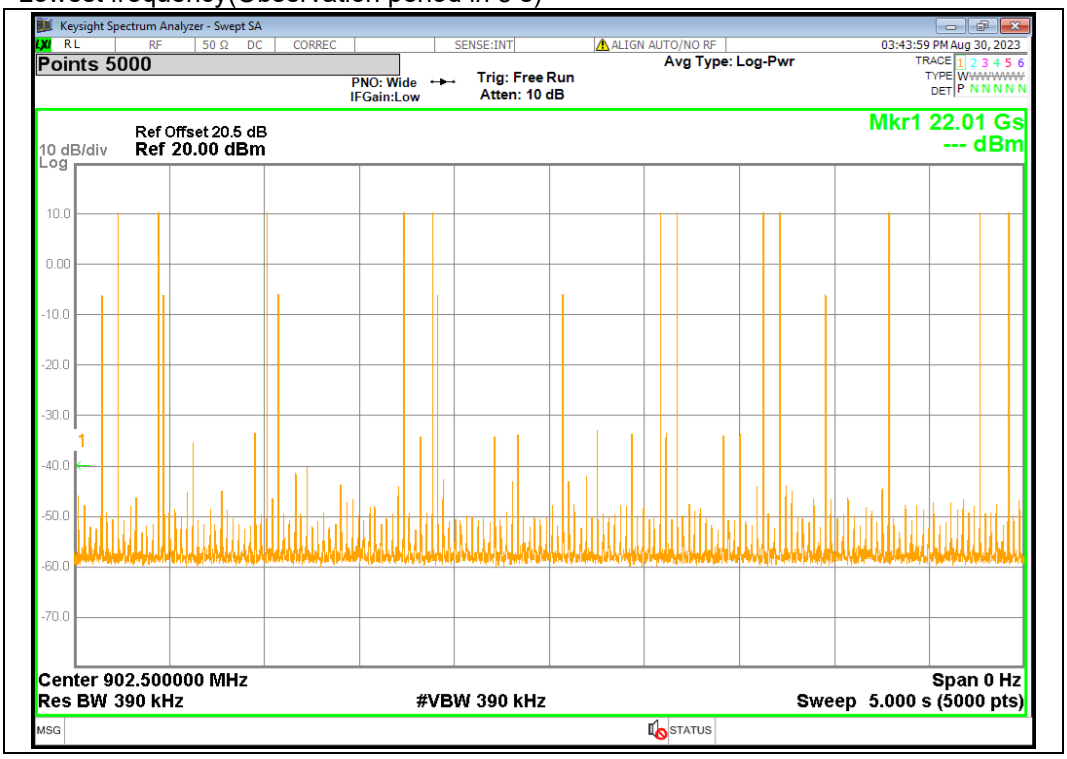
Test mode: FHSS

Average Time of occupancy					
Frequency (MHz)	Average Time of occupancy (ms)	Number of pulse in 5 seconds	Number of pulse in 20 seconds	Total (s)	Limit (s)
902.5	1.767	12	48	0.085	0.400
914.5	1.765	12	48	0.085	0.400
927.0	1.765	12	48	0.085	0.400

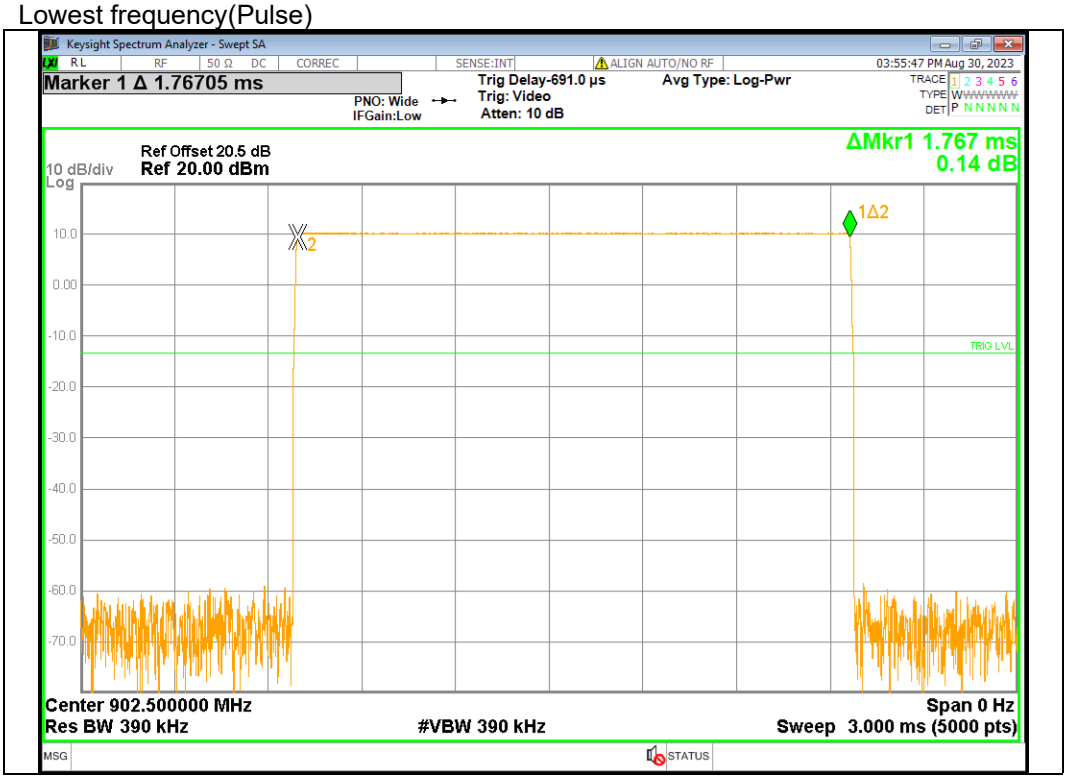
Note 1 : Total = (Average time of occupancy × Number of pulse in 20 seconds) × 10^{-3}

4.3.4.5 Test Plot

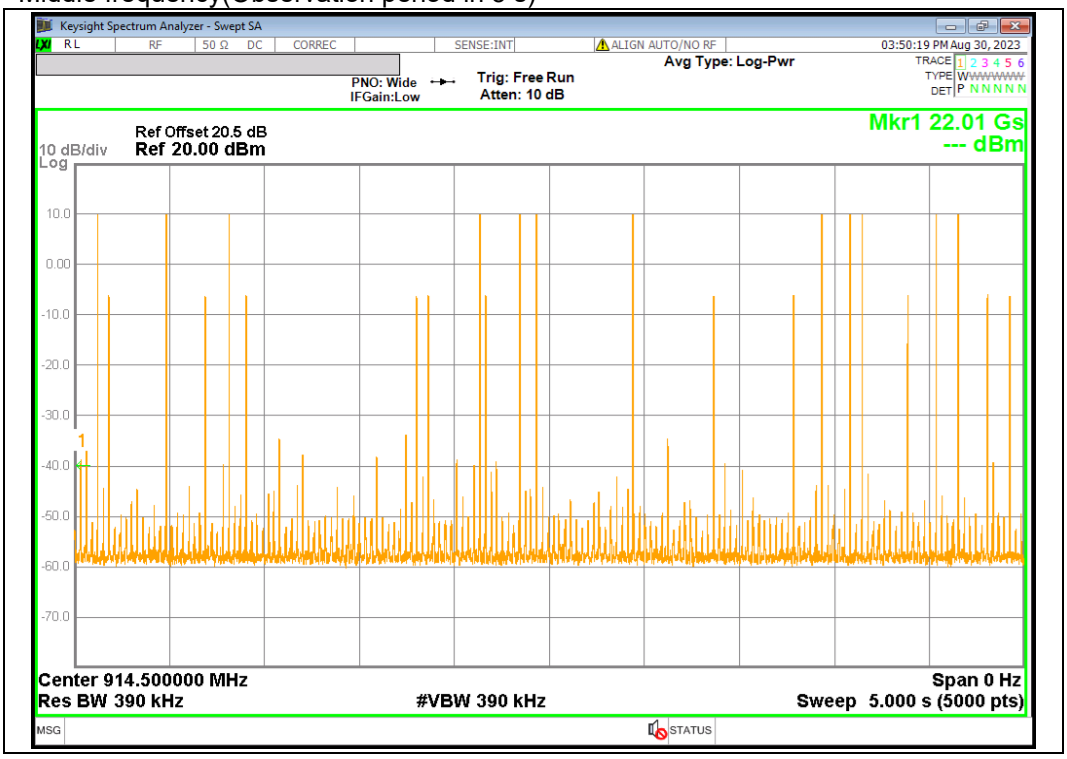
Lowest frequency(Observation period in 5 s)



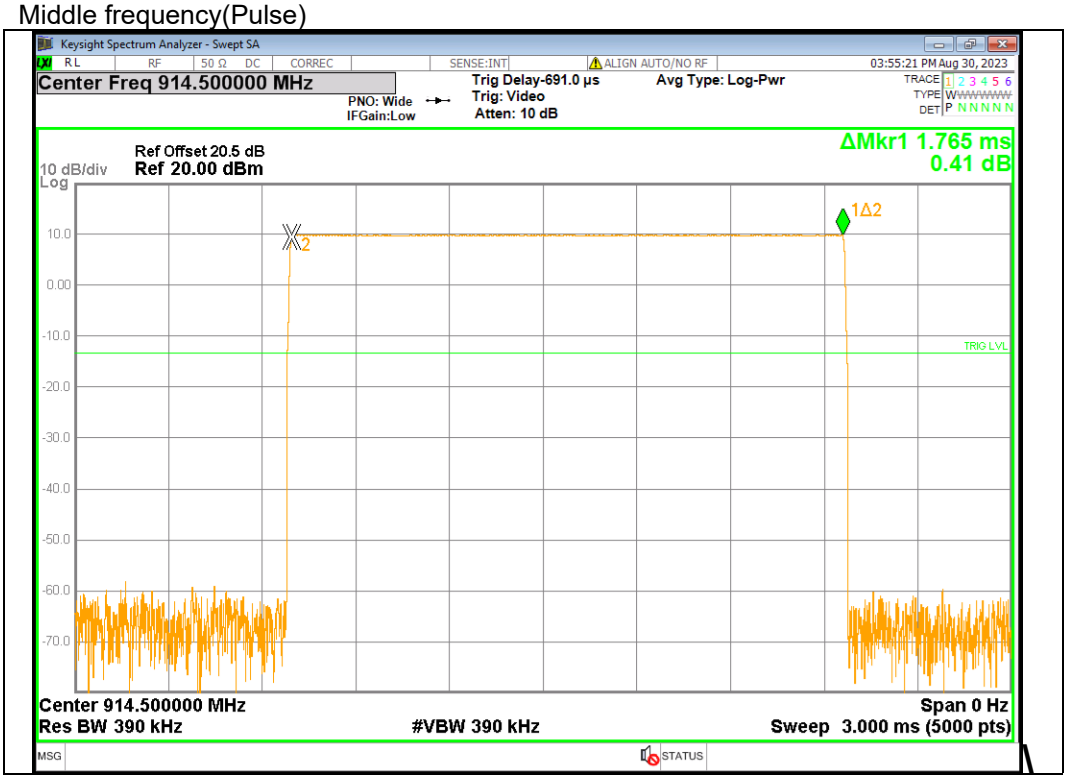
Lowest frequency(Pulse)



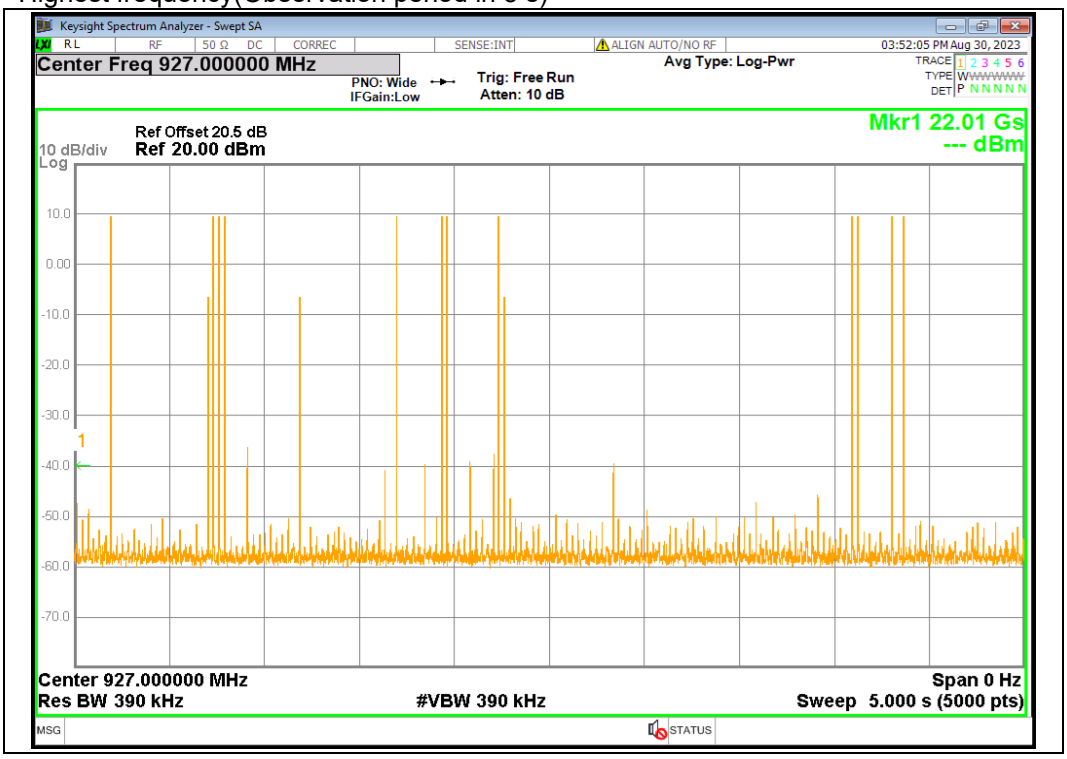
Middle frequency(Observation period in 5 s)



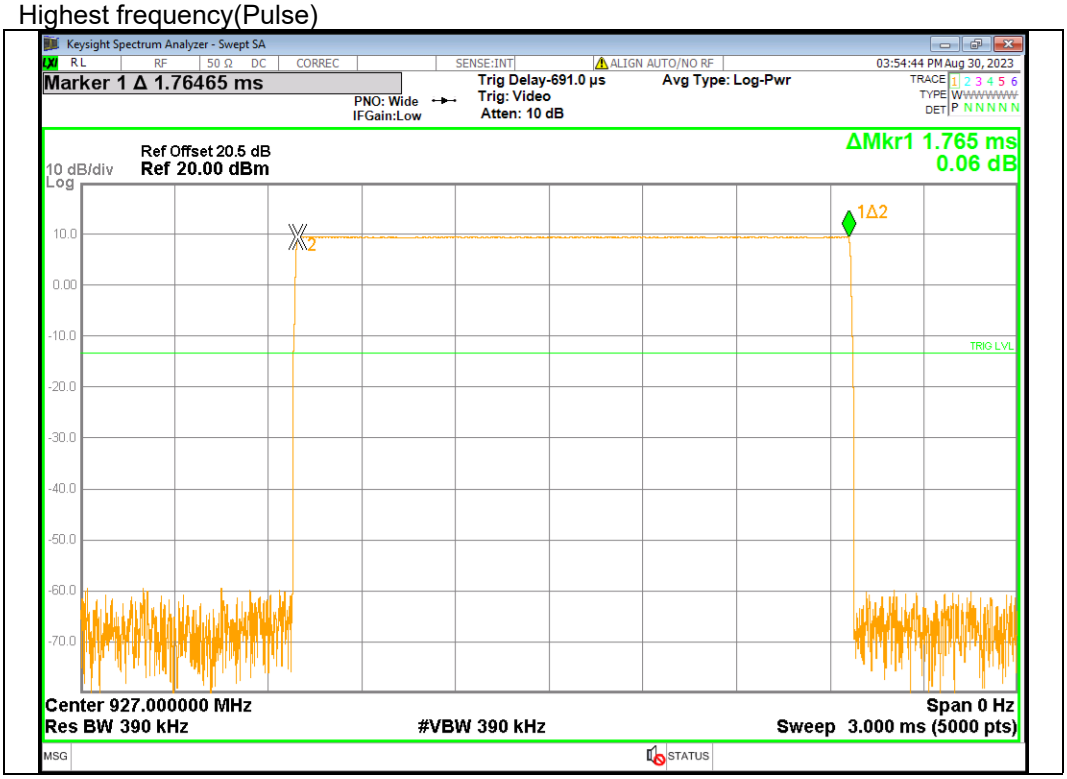
Middle frequency(Pulse)



Highest frequency(Observation period in 5 s)



Highest frequency(Pulse)



4.3.5 Carrier Frequencies Separation

4.3.5.1 Regulation

According to §15.247(a)(1) 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. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

4.3.5.2 Measurement Procedure

ANSI C63.10 § 7.8.2 Carrier frequency separation

4.3.5.3 Result

Comply (Measurement data : Refer to the next page)

4.3.5.4 Measurement Data

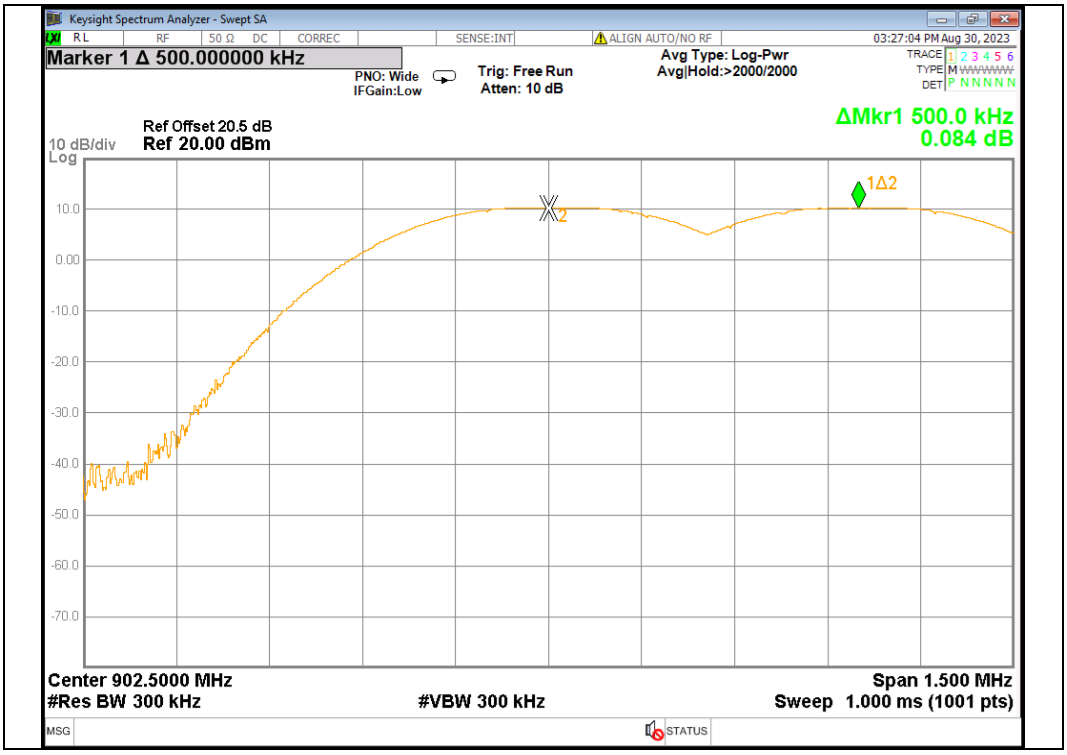
Test mode: FHSS

Carrier Frequency Separation		
Test Channel	Result (MHz)	Min. Limit (MHz)
Channel 1 to channel 2	0.500	0.220
Channel 25 to channel 26	0.500	0.226
Channel 49 to channel 50	0.500	0.221

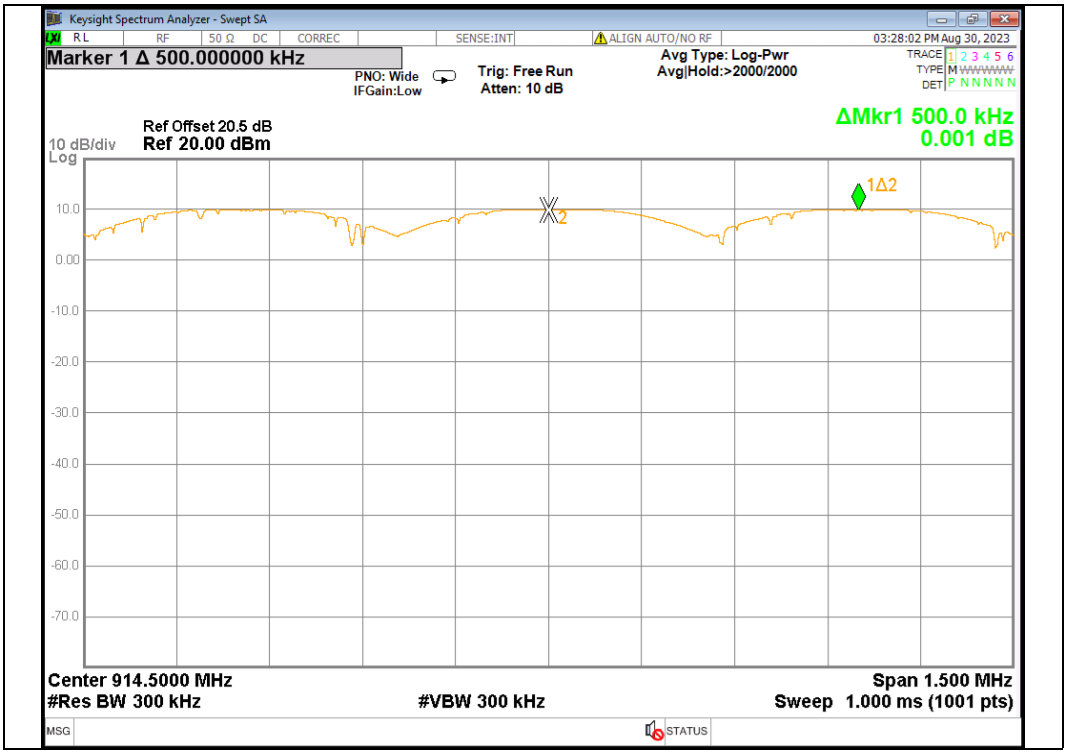
Note 1: Min limit(MHz): Result of 20 dB bandwidth

4.3.5.5 Test Plot

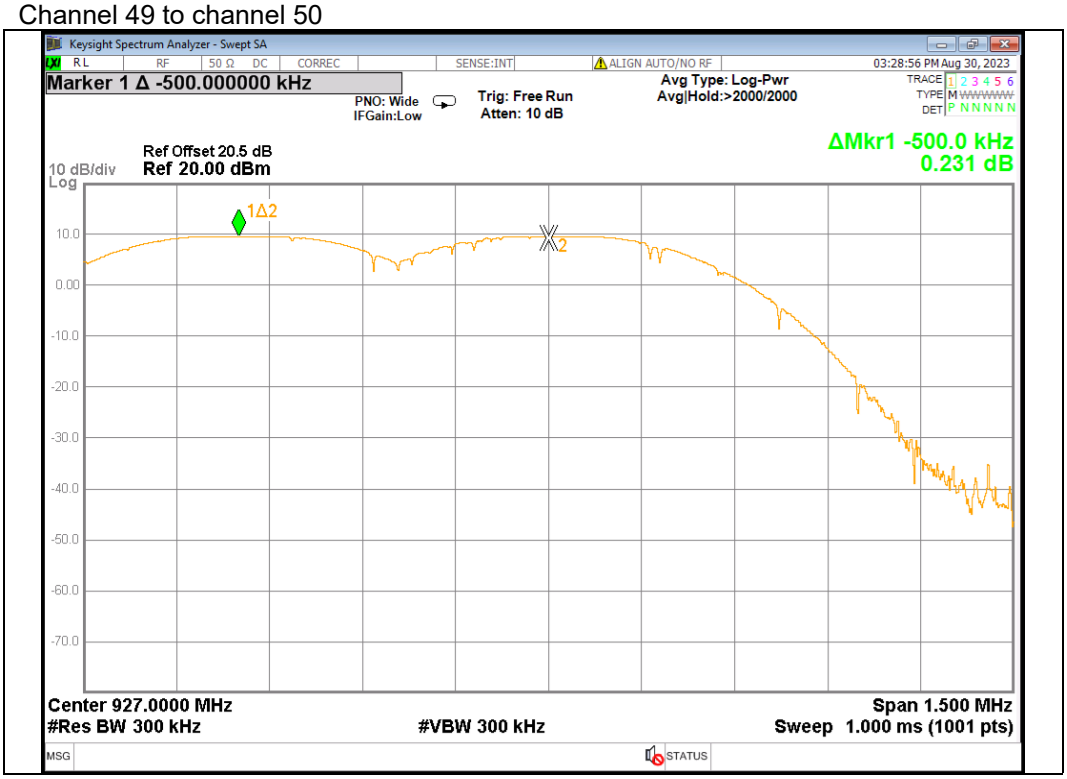
Channel 1 to channel 2



Channel 25 to channel 26



Channel 49 to channel 50



4.3.6 Peak Output Power

4.3.6.1 Regulation

According to §15.247(b)(1) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

4.3.6.2 Measurement Procedure

ANSI C63.10 § 7.8.5 Output power test procedure for FHSS

4.3.6.3 Result

Comply (Measurement data : Refer to the next page)

4.3.6.4 Measurement Data

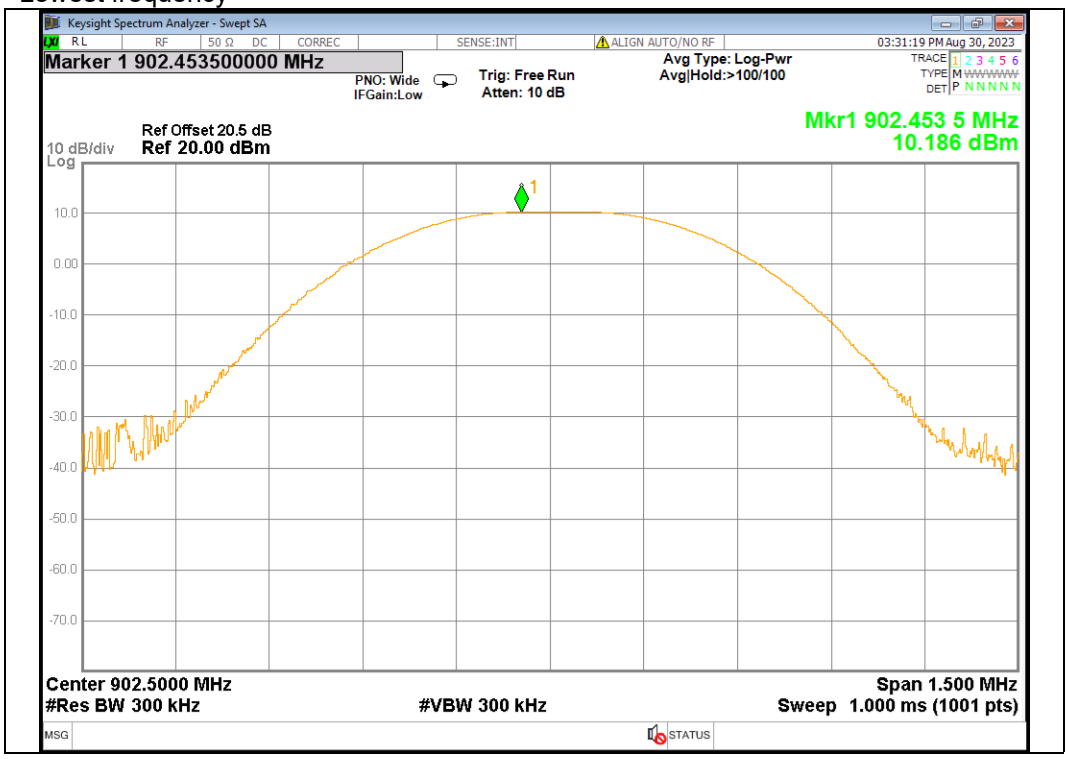
Test mode : FHSS

Frequency (MHz)	Peak Output Power Result (dBm)	Peak Output Power Result (mW)	Peak Output Power Limit (mW)
902.5	10.19	10.44	1 000.00
914.5	9.85	9.67	1 000.00
927.0	9.48	8.88	1 000.00

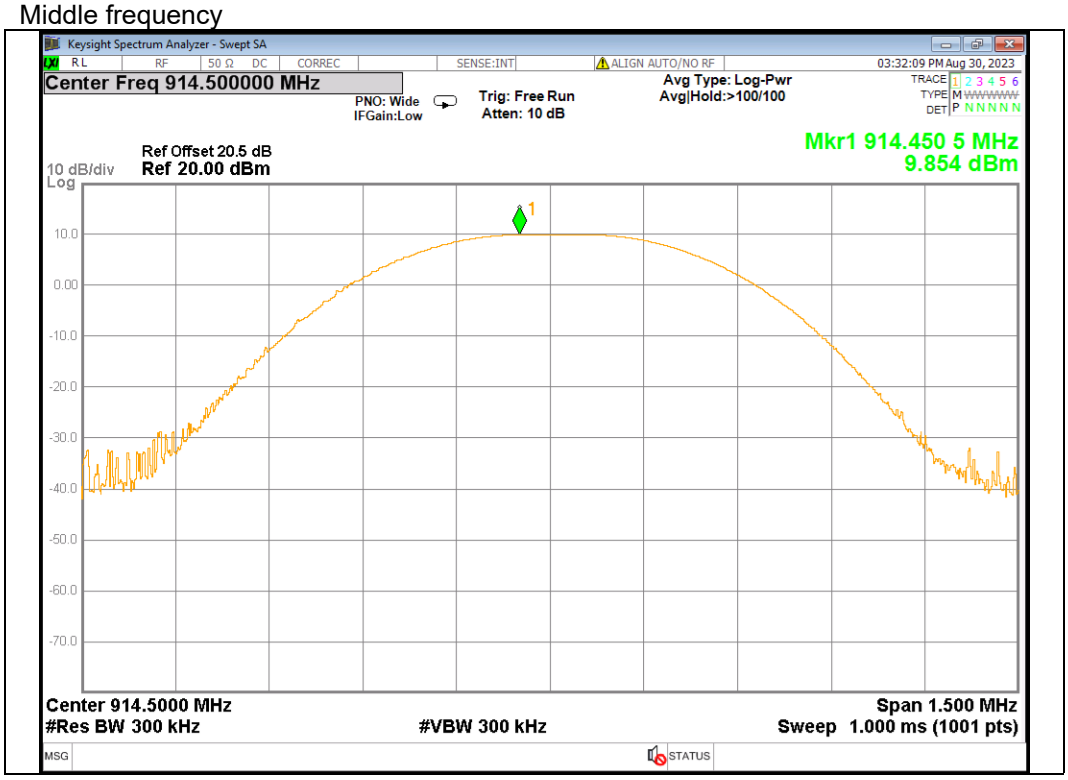
Note 1 : Refer to 4.3.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

4.3.6.5 Test Plot

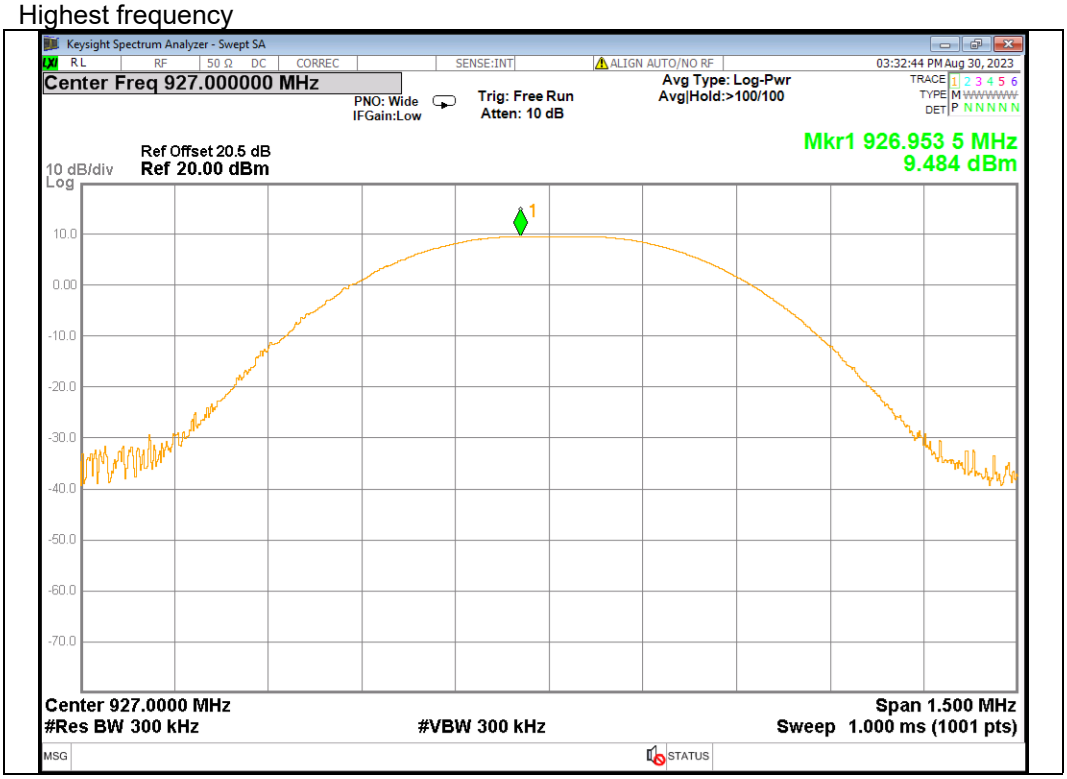
Lowest frequency



Middle frequency



Highest frequency



4.3.7 Spurious Emission, Band Edge, and Restricted Bands

4.3.7.1 Regulation

According to §15.247(d), 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)).

According to §15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall notexceed the field strength levels specified in the following table:

Frequency(MHz)	Field Strength(microvolts/meter)	Measurement Distance(meters)
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shallnot be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permItted under other sections of this part, e.g., §§15.231 and 15.241.

According to §15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.009 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.694 75 - 16.695 25	608 - 614	5.35 - 5.46
2.173 5 - 2.190 5	16.804 25 - 16.804 75	960 – 1 240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1 300 – 1 427	8.025 - 8.5
4.177 25 - 4.177 75	37.5 - 38.25	1 435 – 1 626.5	9.0 - 9.2
4.207 25 - 4.207 75	73 - 74.6	1 645.5 – 1 646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1 660 – 1 710	10.6 - 12.7
6.267 75 - 6.268 25	108 - 121.94	1 718.8 – 1 722.2	13.25 - 13.4
6.311 75 - 6.312 25	123 - 138	2 200 – 2 300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2 310 – 2 390	15.35 - 16.2
8.362 - 8.366	156.524 75 - 156.525 25	2 483.5 – 2 500	17.7 - 21.4
8.376 25 - 8.386 75	156.7 - 156.9	2 690 – 2 900	22.01 - 23.12
8.414 25 - 8.414 75	162.012 5 - 167.17	3 260 – 3 267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3 332 – 3 339	31.2 - 31.8
12.519 75 - 12.520 25	240 - 285	3 345.8 – 3 358	36.43 - 36.5
12.576 75 - 12.577 25	322 - 335.4	3 600 – 4 400	Above 38.6
13.36 - 13.41			

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurement

4.3.7.2 Measurement Procedure

ANSI C63.10 § 6.10.4 Authorized band-edge relative method (lower band-edge)
ANSI C63.10 § 7.8.7 Conducted spurious emissions test methodology
ANSI C63.10 § 7.8.8 Radiated emissions

4.3.7.2.1 Band-Edge Compliance of RF Conducted Emissions

Span	:	Wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
RBW	:	100 kHz
VBW	:	300 kHz
Sweep	:	Auto
Detector	:	Peak
Trace	:	Max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section. Submit this plot.

Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit. Submit this plot.

4.3.7.2.2 Conducted Spurious Emissions

Span	:	Wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
RBW	:	100 kHz
VBW	:	300 kHz
Sweep	:	Auto
Detector	:	Peak
Trace	:	Max hold

Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section. Submit these plots.

4.3.7.2.3 Radiated Spurious Emissions

1) The preliminary and final radiated measurements were performed to determine the frequency producing the maximum emissions in at a 10 m anechoic chamber. The EUT was tested at a distance 3 meters.
2) The EUT was placed on the top of the 0.8 m height or 1.5 m height non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°.
3) The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 9 kHz to 30 MHz using the loop antenna, and from 30 to 1 000 MHz using the TRILOG broadband antenna, and from 1 000 MHz to 26 500 MHz using the horn antenna.
4) Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

Follow the guidelines in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Note 1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1 GHz.
Note 2 : The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
Note 3 : The 0.8 m height is for below 1 GHz testing, and 1.5 m is for above 1 GHz testing

4.3.7.3 Note

-Below 1GHz

Note 1: Loss : Cable loss – Amp gain
Note 2 : Result : Reading + Ant factor + Loss
Note 3 : Peak measurement did not take place because it is more than 20 dB difference in the limit
Note 4 : Measured distance : 3 m

-Above 1GHz

Note 1: Factor : Ant factor + Cable loss - Amp gain + Distance factor
Note 2 : Peak result : Peak reading + Factor
Note 3 : Average result : Peak reading + Factor + DCCF
Note 4 : DCCF(Duty cycle correction factor): 20*log(Duty cycle)dB * Refer to 4.3.7.8
Note 5: Measured distance : 1 m, Distance factor = 20*log(1 / 3) = -9.54
Note 6 : Average measurement did not take place because the peak data did not exceed average limit
Note 7 : Not detected means that peak data does not exceed the average limit.

4.3.7.4 Result

Comply (Measurement data : Refer to the next page)

4.3.7.5 Measurement Data_Radiated Spurious Emissions

Test mode : Below 1 GHz_Lowest frequency

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Loss (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Below 1 GHz	Not Detected	-	-	-	-	-	-	-

Note 1 : Limit of excluding restricband(30 MHz ≤ f ≤ 1 000 MHz) : Reference(97.3 dBμV/m) -20 dB

Test mode : Below 1 GHz_Middle frequency

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Loss (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Below 1 GHz	Not Detected	-	-	-	-	-	-	-

Note 1 : Limit of excluding restricband(30 MHz ≤ f ≤ 1 000 MHz) : Reference(98.4 dBμV/m) -20 dB

Test mode : Below 1 GHz_Highest frequency

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Loss (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Below 1 GHz	Not Detected	-	-	-	-	-	-	-

Note 1 : Limit of excluding restricband(30 MHz ≤ f ≤ 1 000 MHz) : Reference(98.2 dBμV/m) -20 dB

Test mode : Above 1 GHz_Lowest frequency

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	DCCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 805.19	PK	V	60.50	-10.44	-	50.06	74.00	23.94
4 513.41	PK	V	51.10	-0.84	-	50.26	74.00	23.74

Test mode : Above 1 GHz_Middle frequency

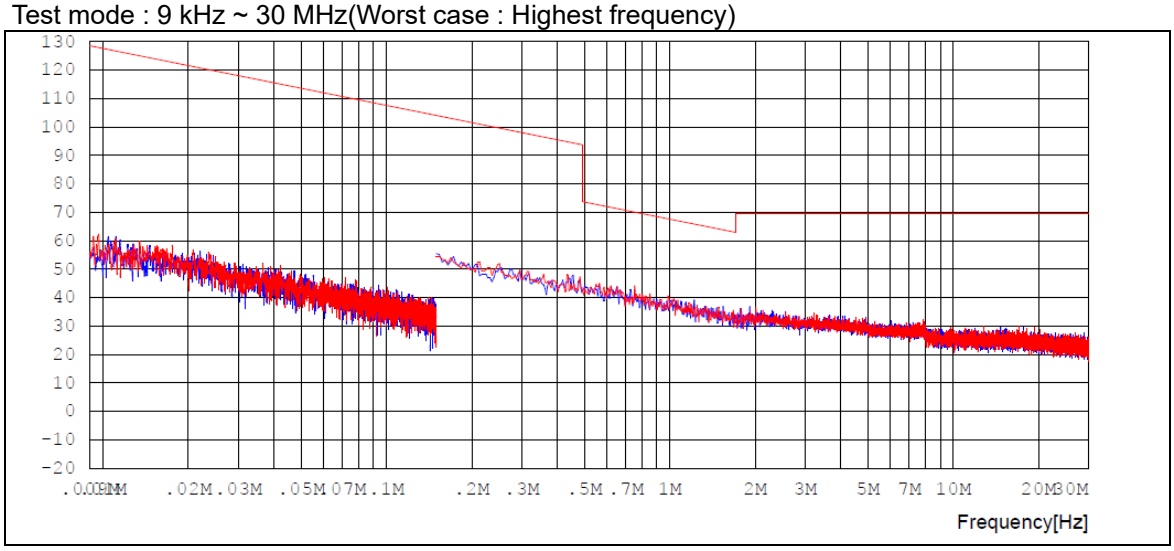
Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	DCCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1 828.91	PK	V	57.70	-10.34	-	47.36	74.00	26.64
4 572.90	PK	V	50.50	-0.54	-	49.96	74.00	24.04

Test mode : Above 1 GHz_Highest frequency

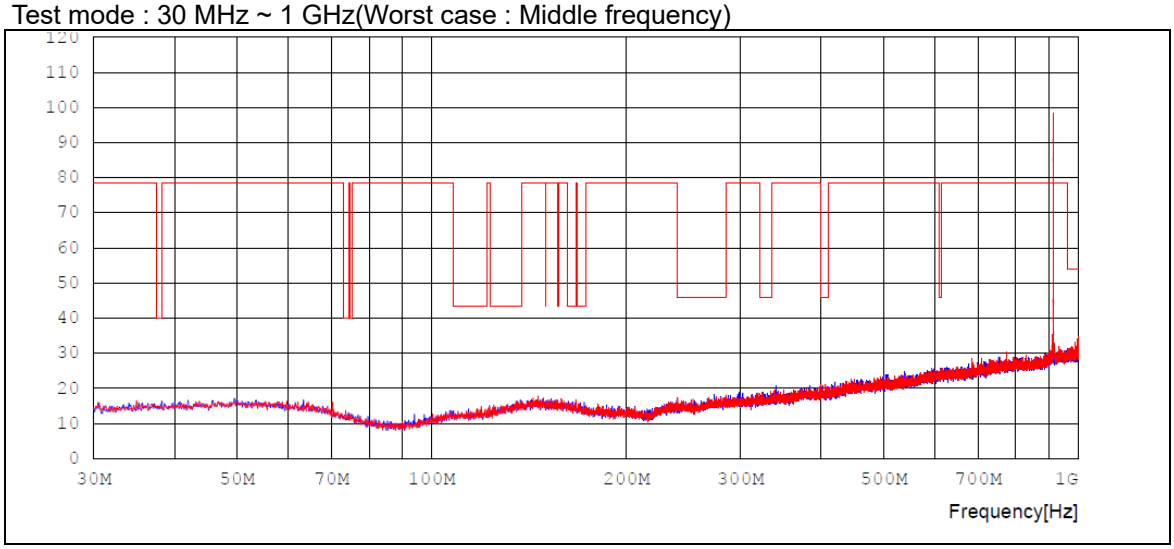
Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	DCCF (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3 708.30	PK	V	52.80	-2.94	-	49.86	74.00	24.14
4 635.61	PK	V	50.60	-0.34	-	50.26	74.00	23.74

4.3.7.6 Measurement Plot_Radiated Spurious Emissions

Test mode : 9 kHz ~ 30 MHz(Worst case : Highest frequency)

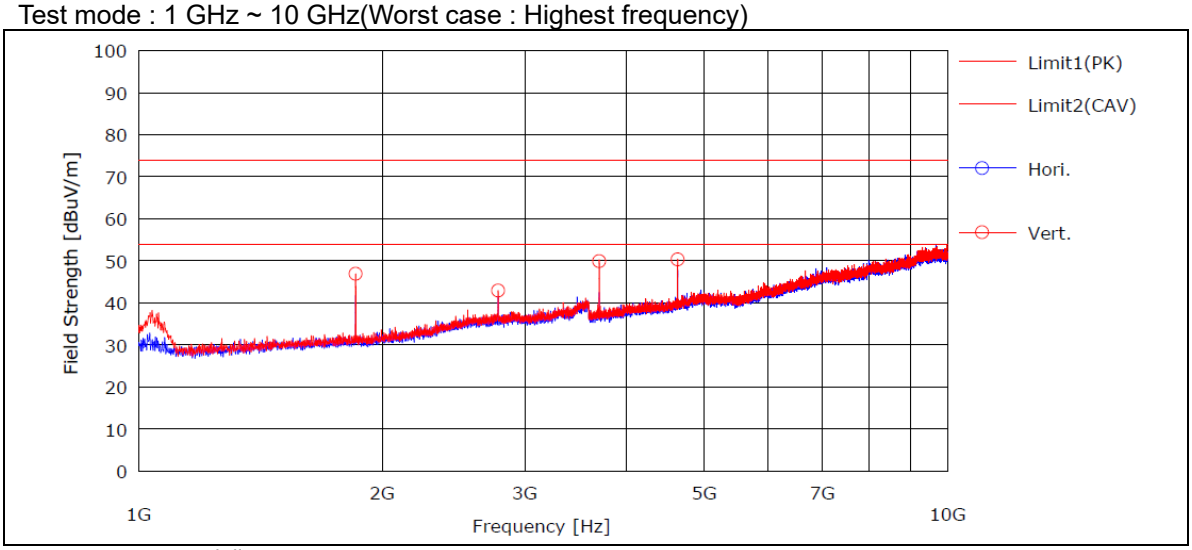


Test mode : 30 MHz ~ 1 GHz(Worst case : Middle frequency)



Note 1 : 914.5 MHz = Reference(98.4 dBµV/m)

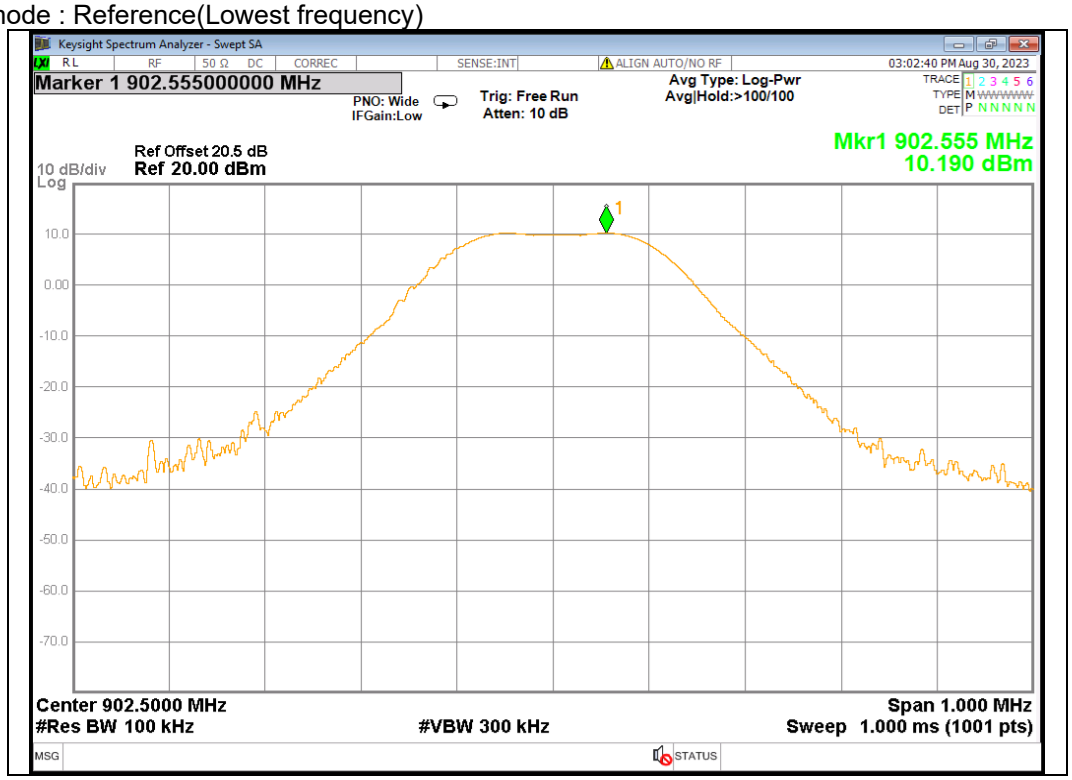
Test mode : 1 GHz ~ 10 GHz(Worst case : Highest frequency)



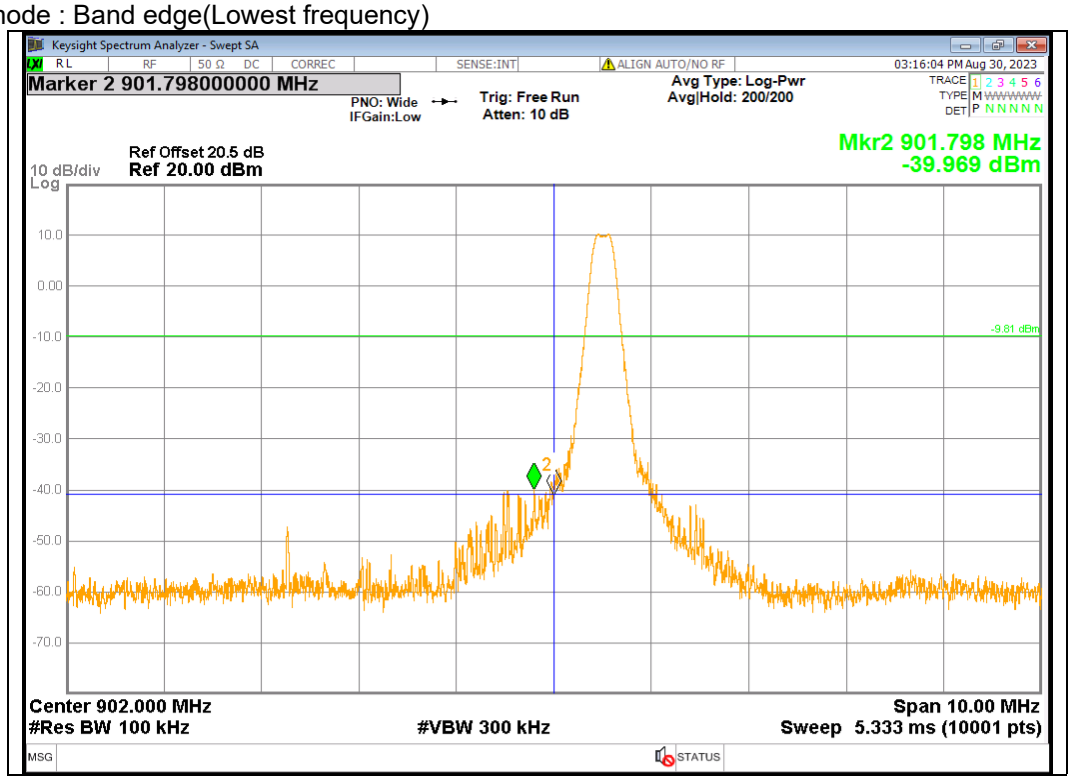
Note 1 : Measured distance : 1 m

4.3.7.7 Measurement Data_Conducted Spurious Emissions

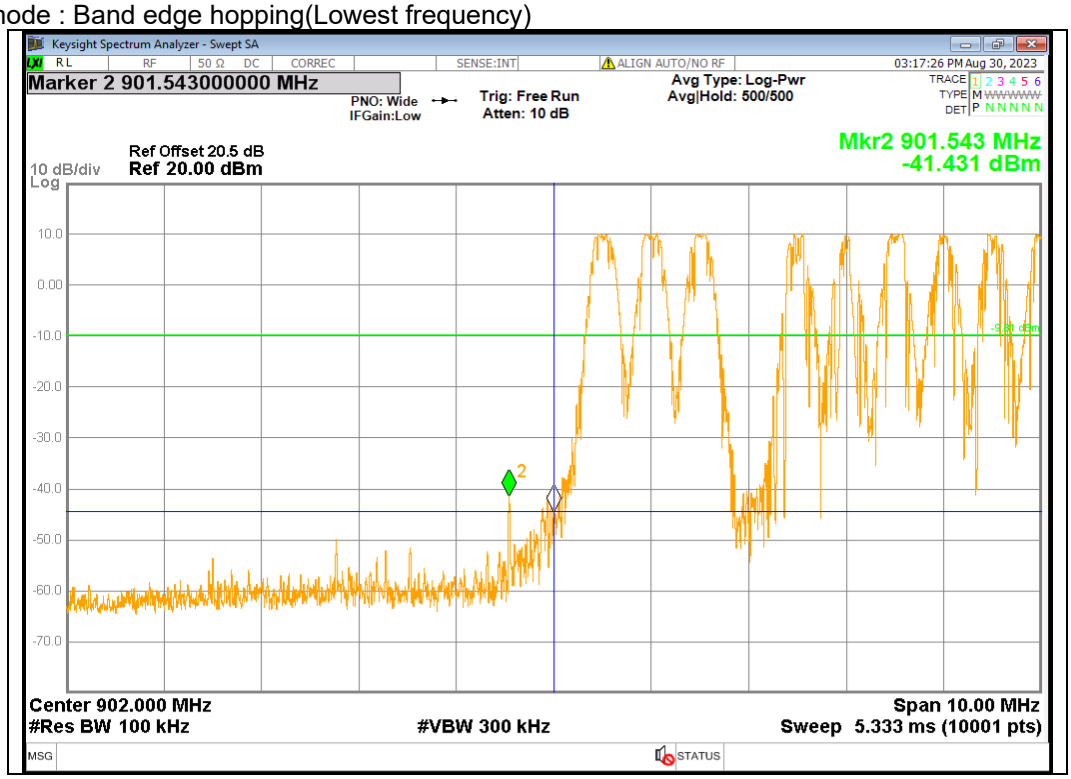
Test mode : Reference(Lowest frequency)



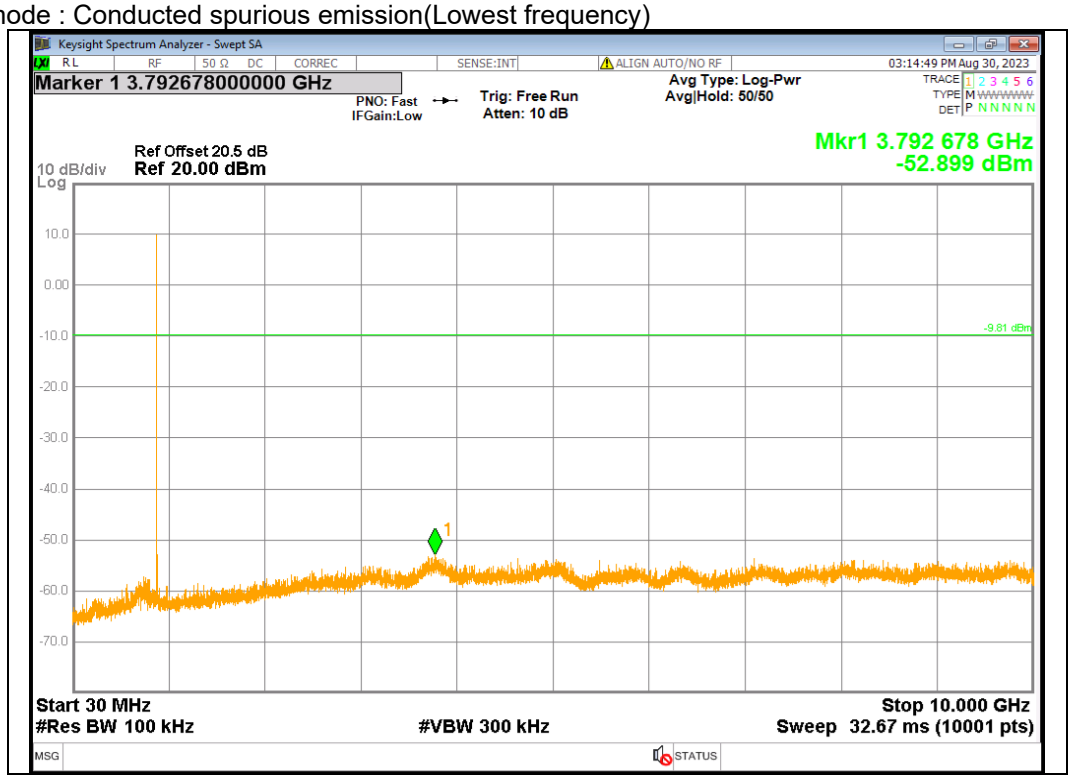
Test mode : Band edge(Lowest frequency)



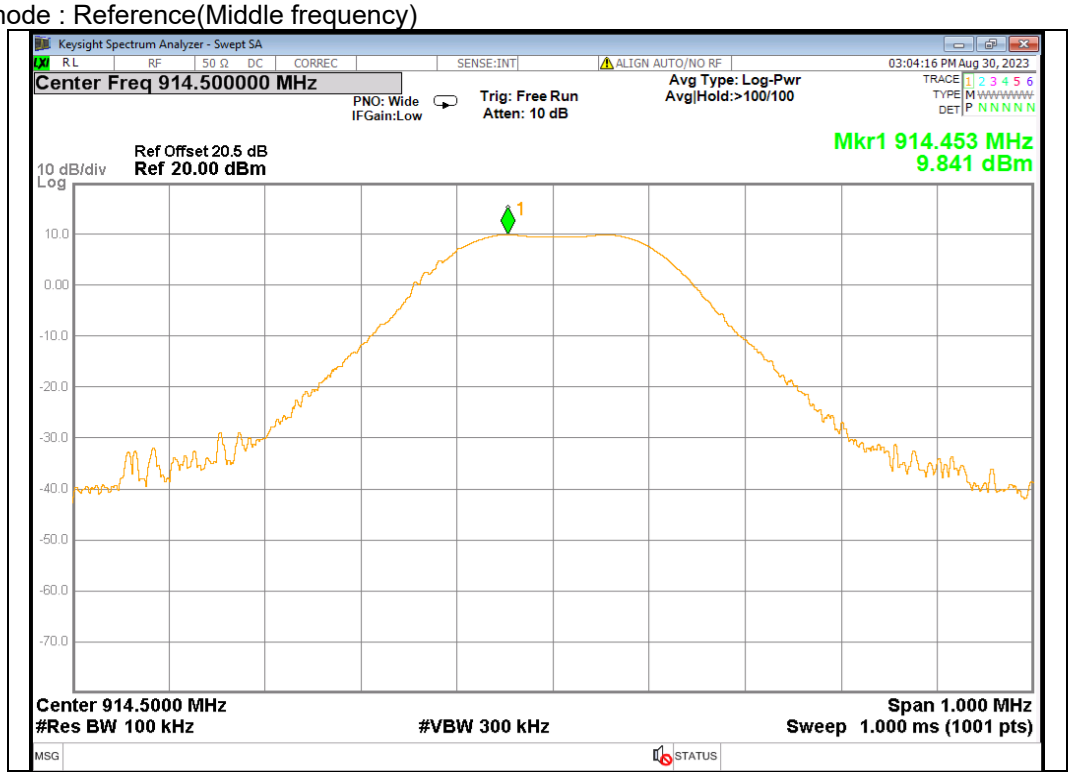
Test mode : Band edge hopping(Lowest frequency)



Test mode : Conducted spurious emission(Lowest frequency)

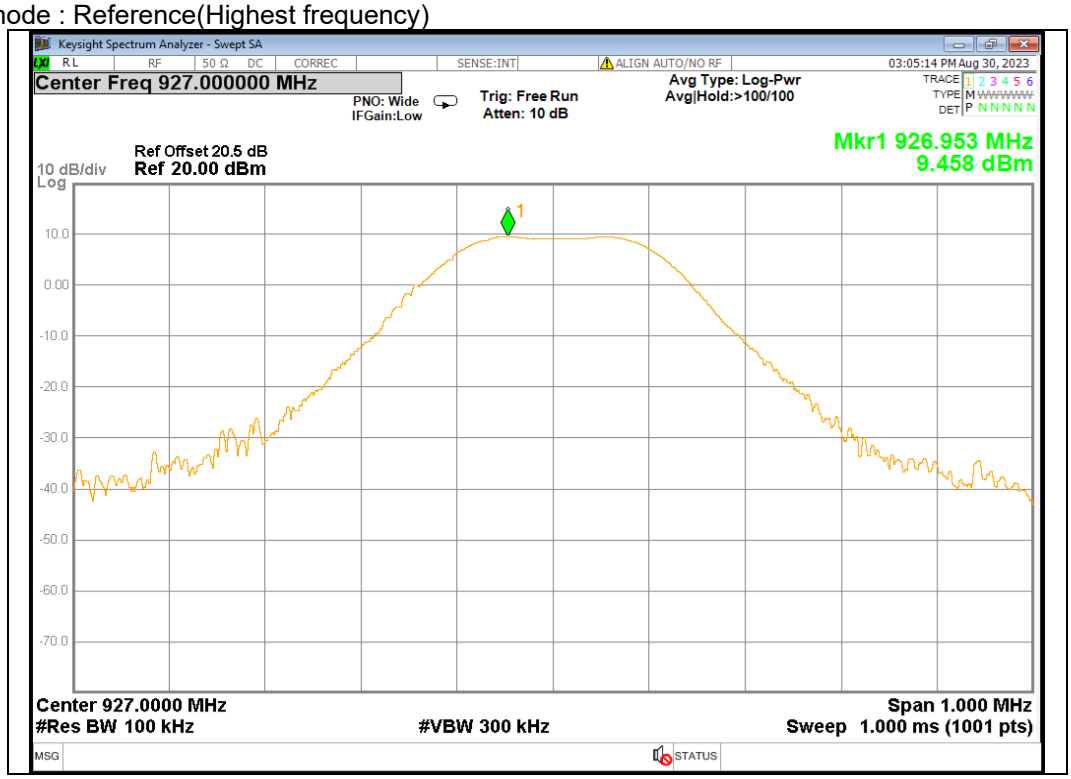


Test mode : Reference(Middle frequency)

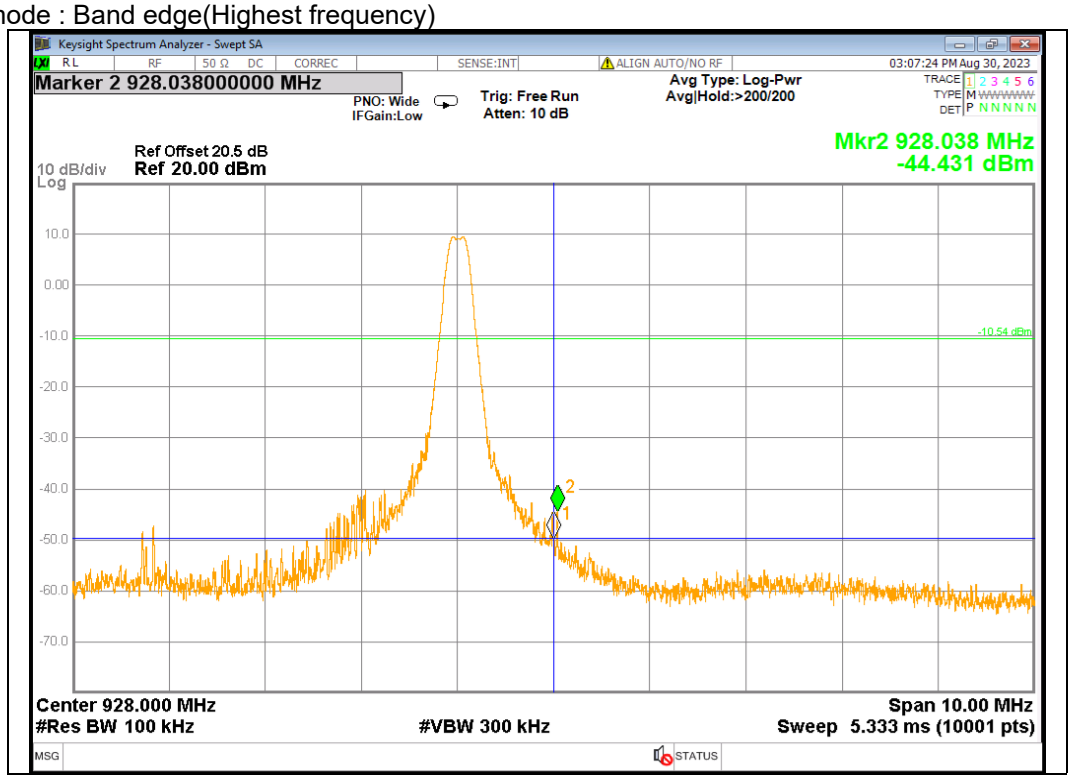


Test mode : Conducted spurious emission(Middle frequency)

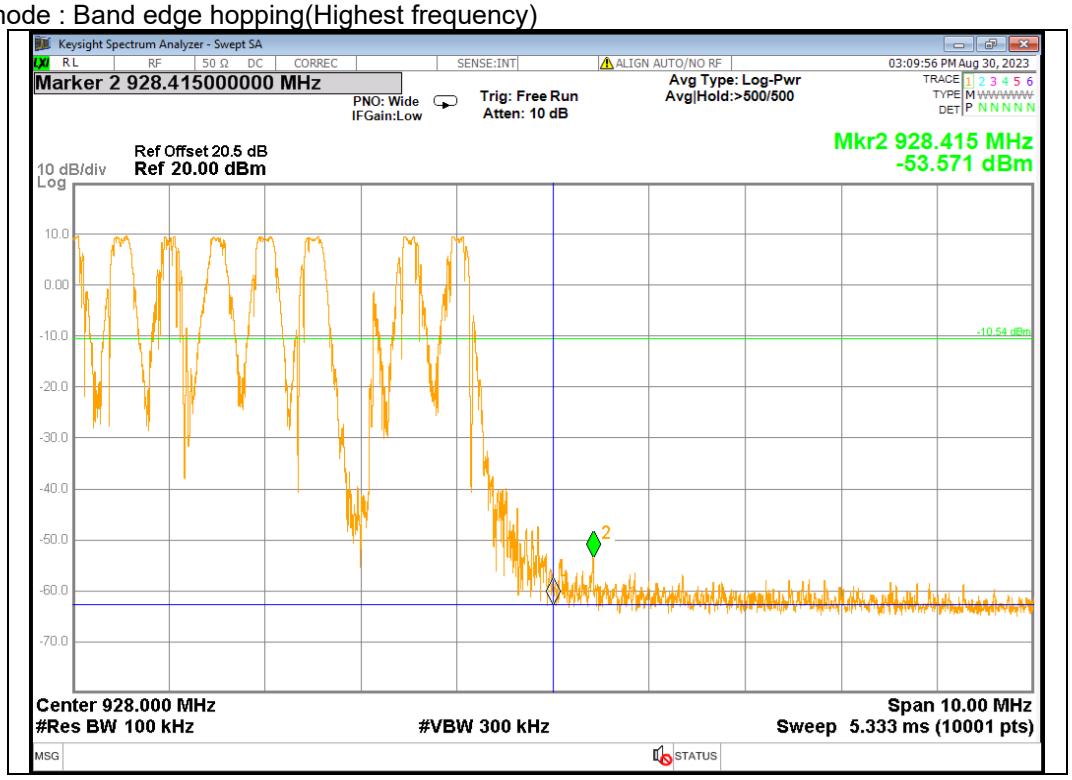
Test mode : Reference(Highest frequency)



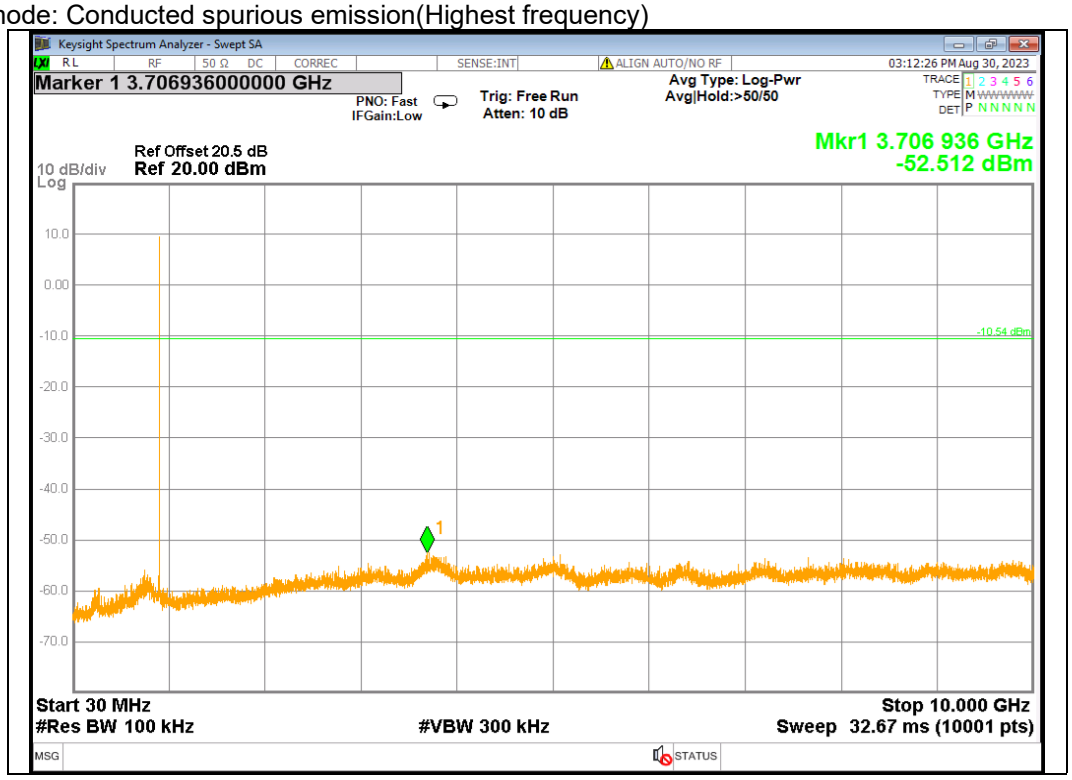
Test mode : Band edge(Highest frequency)



Test mode : Band edge hopping(Highest frequency)

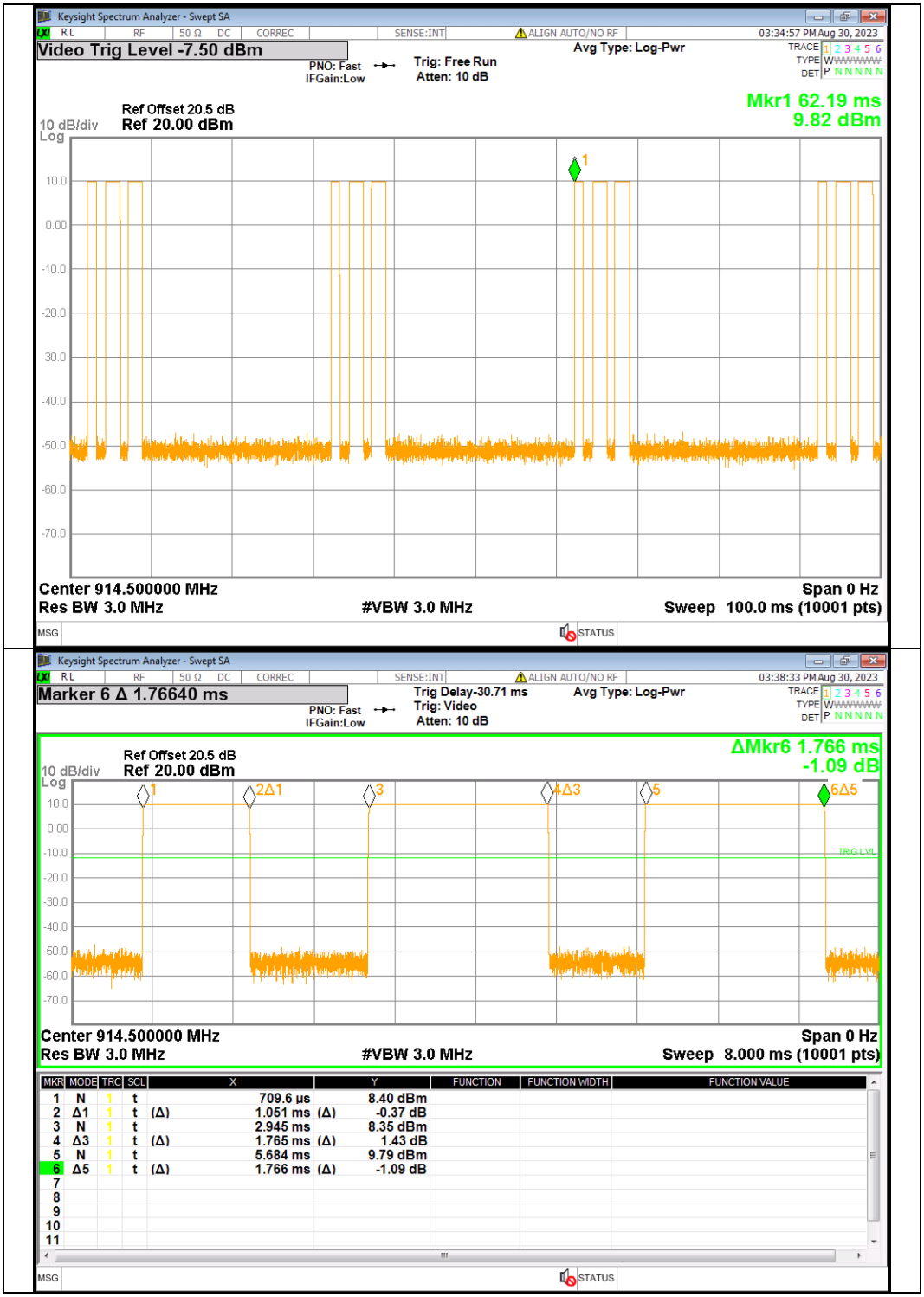


Test mode: Conducted spurious emission(Highest frequency)



4.3.7.8 Measurement Data_Duty Cycle

Test mode: FHSS



Note 1: Duty cycle : (4.204+7.060+7.064) / 100 = 0.183
DCCF(Duty cycle correction factor) : 20*log(Duty cycle) = 20*log(0.183) = -14.74 dB

4.3.8 Conducted Emission

4.3.8.1 Regulation

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN).
Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Qausi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

4.3.8.2 Measurement Procedure

1) The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5 m away from the side wall of the shielded room.

2) Each current-carrying conductor of the EUT power cord was individually connected through a 50 Ω/50 μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.

3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.

4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.

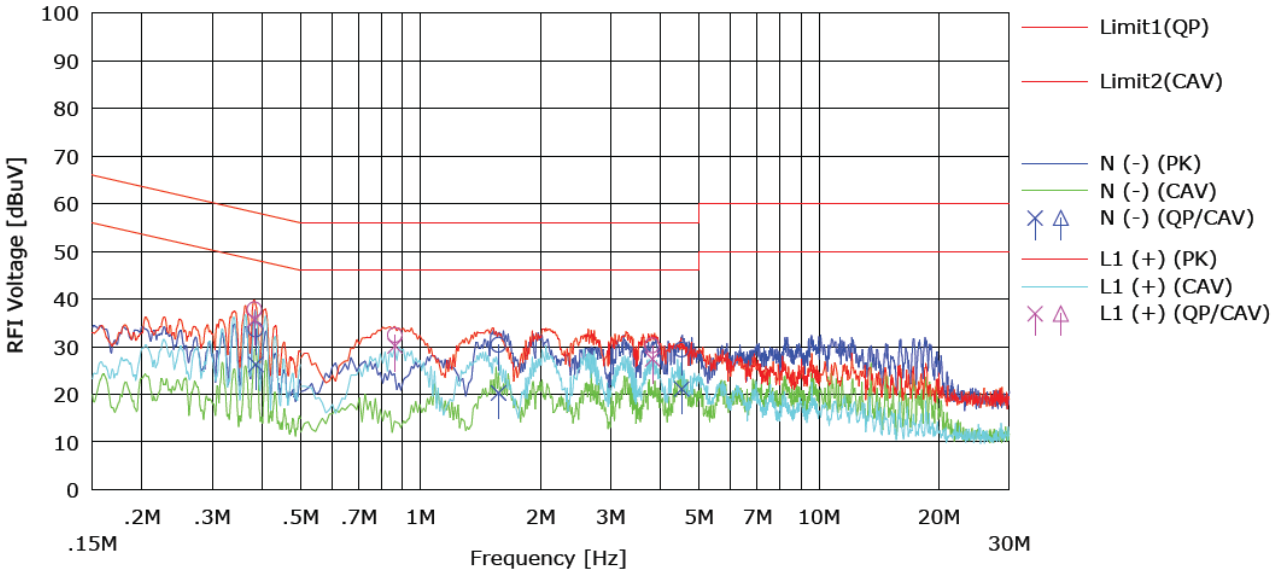
5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASIPEAK and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

4.3.8.3 Result

Comply (Measurement data : Refer to the next page)

4.3.8.4 Measurement Data

Test mode : FHSS(Worst case : Highest frequency)



NO	FREQ	READING QP	READING CAV	C.FACTOR	RESULT QP	RESULT CAV	LIMIT QP	LIMIT CAV	MARGIN QP	MARGIN CAV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.38564	13.4	6.1	20.1	33.6	26.3	58.2	48.2	24.6	21.9	N (-)
2	1.56939	10.3	0.2	20.0	30.4	20.2	56.0	46.0	25.6	25.8	N (-)
3	4.52154	9.3	1.0	20.1	29.3	21.1	56.0	46.0	26.7	24.9	N (-)
4	0.38332	17.6	15.4	20.1	37.8	35.6	58.2	48.2	20.4	12.6	L1 (+)
5	0.86263	12.3	10.0	20.1	32.4	30.1	56.0	46.0	23.6	15.9	L1 (+)
6	3.81977	10.2	7.3	20.1	30.2	27.4	56.0	46.0	25.8	18.6	L1 (+)

APPENDIX I

TEST EQUIPMENT USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

Equipment	Manufacturer	Model	Serial No.	Cal. Date (yy.mm.dd)	Next Cal.Date (yy.mm.dd)
PXA Signal Analyzer	KEYSIGHT	N9030A	MY54410264	2023-01-09	2024-01-09
ATTENUATOR	INMET	26A-20	TR011	2022-10-11	2023-10-11
Dynamic Measurement DC Source	HP	66332A	US37471465	2023-01-10	2024-01-10
Digital MultiMeter	HP	34401A	US36025428	2023-01-10	2024-01-10
Signal Generator	ROHDE&SCHWARZ	SMB100A	178384	2022-10-11	2023-10-11
EMI Test Receiver	ROHDE&SCHWARZ	ESU40	100445	2022-09-05	2023-09-05
BiLog Antenna	Schwarzbeck	VULB9168	00821	2023-03-29	2024-03-29
ATTENUATOR	JFW	50F-006	6 dB-3	2023-04-13	2024-04-13
Preamplifier	TSJ	MLA-10k01-b01-27	1870367	2023-04-13	2024-04-13
Antenna Mast(10 m)	TOKIN	5977	-	-	-
Antenna Mast(10 m)	Innco	MA4640-XPET-0800	578	-	-
Controller(10 m)	TOKIN	5909L	141909L-1	-	-
Controller(10 m)	Innco	CO3000	40040217	-	-
Turn Table(10 m)	TOKIN	5983-1.5	-	-	-
Active Loop H-Field	ETS	6502	00150598	2023-06-27	2025-06-27
Double Ridege Horn Antenna	ETS	3117	00168719	2023-08-10	2024-08-10
PREAMPLIFIER	Agilent	8449B	3008A02110	2023-01-09	2024-01-09
High pass filter	Wainwright Instruments GmbH	WHK10-1290-1500-10000-60SS	1	2023-08-16	2024-08-16
EMI Test Receiver	ROHDE&SCHWARZ	ESR7	101440	2022-09-05	2023-09-05
LISN	ROHDE&SCHWARZ	ENV216	101883	2023-04-12	2024-04-12
Pulse Limiter	Schwarzbeck	VTSD 9561-F	00189	2023-04-12	2024-04-12