RF Test Report

Issued Date: Dec. 09, 2021

Applicant	:	Chinotech International Limited
Product Type	:	Wireless LoRaWAN Gateway
Trade Name	:	Enlighten, ChinoINT
Model Number	:	EL-WGW-923, SECIHWLGE923
FCC ID	:	2A3GL-SECIHWLGE923
EUT Rated Voltage	:	DC 5V, 1000mA
Test Voltage	:	120 Vac / 60 Hz
Receive Date	:	Oct. 14, 2021
Test Period	:	Nov. 26, 2021
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Test Result	:	Complied

Testing Laboratory

Eurofins Wireless Testing Service (Shenzhen) Co., Ltd.
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http://www.atl-lab.com.tw/e-index.htm

ACCREDITED
Certificate #3464.02

American Association for Laboratory Accreditation number: 3464.02
Test Firm MRA designation number: CN1168

Approved By	:	Baret Wu	Tested By	:	Leo Zeng
(Manager)		(Baret Wu)	(Testing Engineer)		(Leo Zeng)

Revision History

Rev.	Issue Date	Revisions
00	Dec. 09, 2021	Initial Issue

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1 General Information

1.1. Summary of Test Result

FCC Standard	Item	Result	Remark
15.203	Antenna Requirement	PASS	-----
15.207	AC Power Conducted Emission	PASS	-----
15.247(b)(2)	Max. Output Power	PASS	-----
15.247(d)	Transmitter Radiated Emissions	PASS	-----
15.247(a)(1)	20dB RF Bandwidth	PASS	-----
15.247(a)(1)	Carrier Frequency Separation	PASS	-----
15.247(a)(1)(i)	Number of Hopping	PASS	-----
15.247(a)(1)(i)	Time of Occupancy (Dwell Time)	PASS	-----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	-----

Standard	Description
CFR47, Part 15, Subpart C §15.247	Intentional Radiators
ANSI C63. 10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63. 4: 2014	American National Standard for methods of measurement of radio – noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
KDB558074 D01 v05r02	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

Decision Rule

■ Uncertainty is not included.

□ Uncertainty is included.

A Test Lab Techno Corp. tested the above equipment under the requirements outlined in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. Based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

A Test Lab Techno Corp. will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

1.2. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conducted Emission	9kHz ~ 150KHz	2.7
	150kHz ~ 30MHz	2.7
Radiated Emission	9kHz ~ 30MHz	1.7
	30MHz ~ 1000MHz	5.7
	1000MHz ~ 18000MHz	5.5
	18000MHz ~ 26500MHz	4.8
	26500MHz ~ 40000MHz	4.8
Conducted Output Power	+0.27 dB / -0.28 dB	
RF Bandwidth	4.96%	
Power Spectral Density	+0.71 dB / -0.77 dB	

2 EUT Description

2.1. EUT description

Applicant	Chinotech International Limited D6B-1, 17/F, Block B, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK
Manufacturer	Enlighten Company Limited Rm 12, 12/F, Blk A, Profit Industrial Building, No.1-15 Kwai Fung Crescent, Kwai Chung, N.T. Hong Kong
Product	Wireless LoRaWAN Gateway
Trade Name	Enlighten, ChinoINT
Model Number	EL-WGW-923, SECIHWLGE923
Models different description	Due to market demand, the models are differ from each other in brand, the PCB layout, circuit, and schematic design are the same.
FCC ID	2A3GL-SECIHWLGE923
Frequency Range	915MHz-924.6 MHz
Modulation Type	CSS, FSK
Number of Channels	25 Channel
Antenna Type	External antenna
Antenna Gain	2.5 dBi
Operate Temp. Range	5~40 ℃

2.2. Channel numbers and channel list

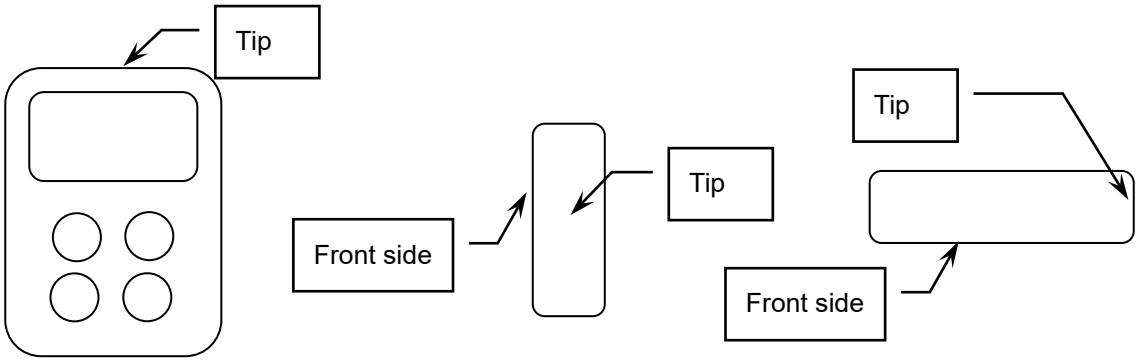
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	915.0	14	920.2
2	915.4	15	920.6
3	915.8	16	921.0
4	916.2	17	921.4
5	916.6	18	921.8
6	917.0	19	922.2
7	917.4	20	922.6
8	917.8	21	923.0
9	918.2	22	923.4
10	918.6	23	923.8
11	919.0	24	924.2
12	919.4	25	924.6
13	919.8		

3 Test Methodology

3.1. Mode of Operation

Test Mode	Note
Mode 1: Transmitter Mode	EUT works in normal mode
Mode 2: Continuous TX Mode	The manufacturer burn the firmware version in EUT in advance control the EUT to TX continuously, without test software and related power level setting parameter.

Then, the above highest fundamental level mode of the configuration of the EUT and antenna was chosen for all final test items. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

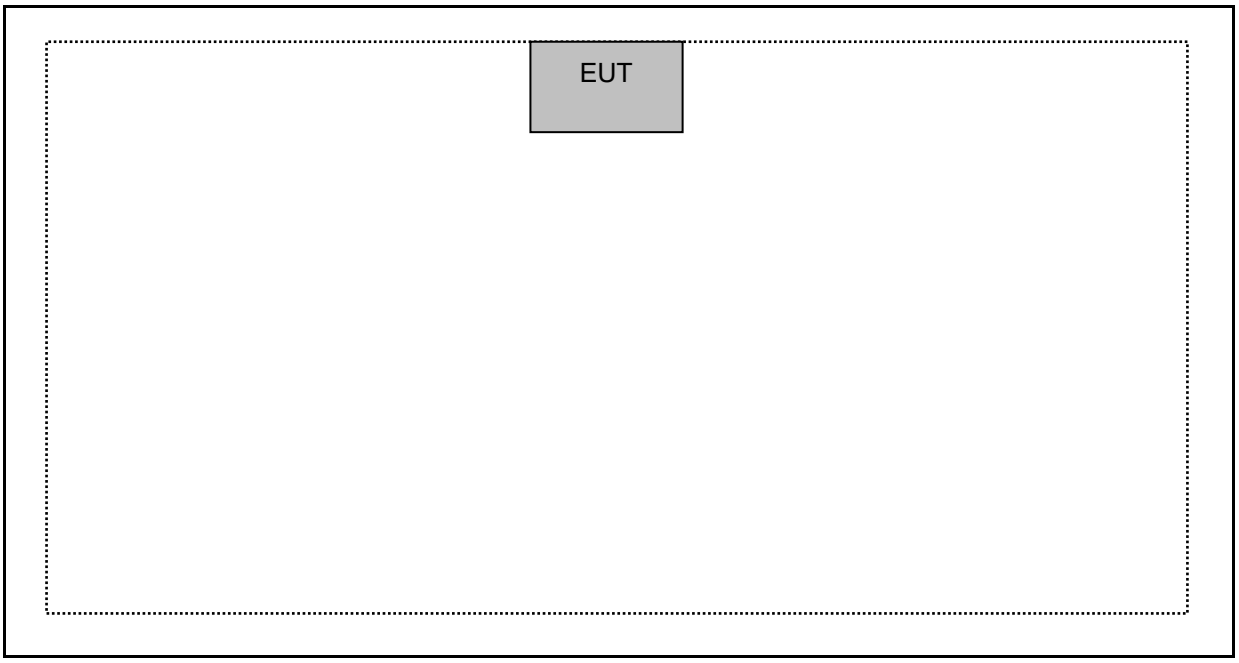


3.2. EUT Test Step

1	Setup the EUT and simulators as shown on 4.1 to 4.7.

Measurement Software			
No.	Description	Software	Version
1	Radiated Emission	EZ EMC	ATL-03A1-1

3.3. Configuration of Test System Details



3.4. Test Instruments

For Radiated Emissions

Test Period: Nov. 26, 2021

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Preamplifier (10 kHz~3 GHz)	EMCI	EMC001330	980300	09/01/2021	1 year
Preamplifier (0.1 GHz~26.5 GHz)	EMCI	EMC012645SE	980318	09/01/2021	1 year
Bilog Antenna (30 MHz~1.4 GHz)	Schwarzbeck	VULB 9168	672	10/17/2021	1 year
Horn Antenna (1 GHz~18 GHz)	ETS	3117	00204949	10/17/2021	1 year
Horn Antenna (18 GHz~26.5 GHz)	ETS	3160-09	00202549	10/17/2021	1 year
Receiver (3 Hz~26.5 GHz)	Keysight	N9038A	MY51210179	09/01/2021	1 year
Spectrum Analyzer (3 Hz~43 GHz)	Keysight	N9030A	MY55410268	09/01/2021	1 year
Cable (30 MHz~1 GHz)	EMCI	N/A	1066LFC	09/01/2021	1 year
Cable (1 GHz~18 GHz)	EMCI	N/A	160719	09/01/2021	1 year
Cable (1 GHz~18 GHz)	EMCI	N/A	160324	09/01/2021	1 year
Cable (1 GHz~18 GHz)	EMCI	N/A	160322	09/01/2021	1 year
Loop Antenna	EMCI	LPA600	272	09/01/2021	1 year
Test Site	OuHeng	MFAC3M	RE-026	02/23/2021	1 year

For Conducted

Test Period: Nov. 26, 2021

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Preamplifier	EMCI	EMC001330	980300	09/01/2021	1 year
Preamplifier	EMCI	EMC012645SE	980318	09/01/2021	1 year
Bilog Antenna	Schwarzbeck	VULB 9168	672	10/15/2021	1 year

Note: N.C.R. = No Calibration Request.

3.5. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	990

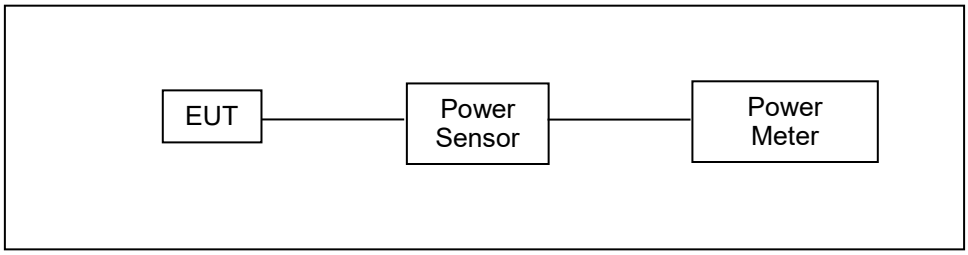
4 Measurement Procedure

4.1. Maximum Conducted Output Power Measurement

■ **Limit**

■ For fh systems operating in the 902-928 MHz band, systems using less than 50 fH channels but at least 25 fH channels < 0.25 watt.

■ **Test Setup**



■ **Test Procedure**

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

4.2. Radiated Emission Measurement

■ **Limit**

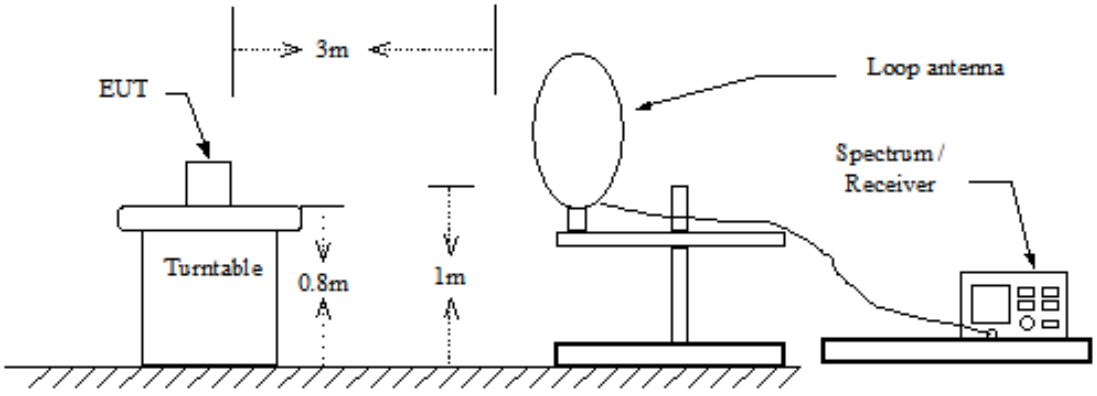
According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

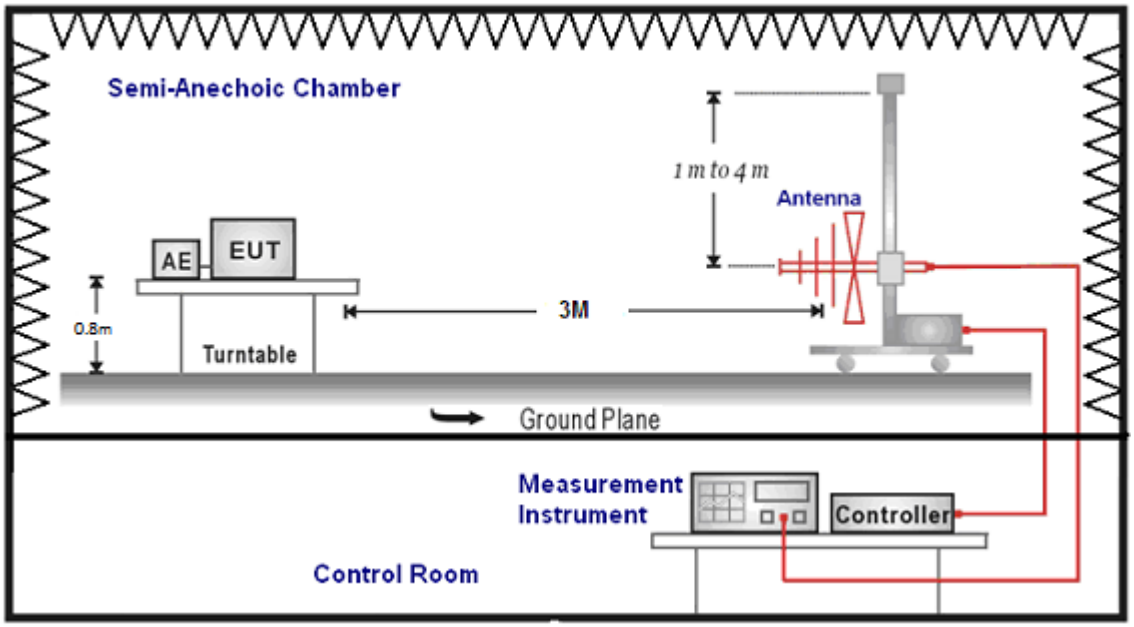
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

■ **Setup**

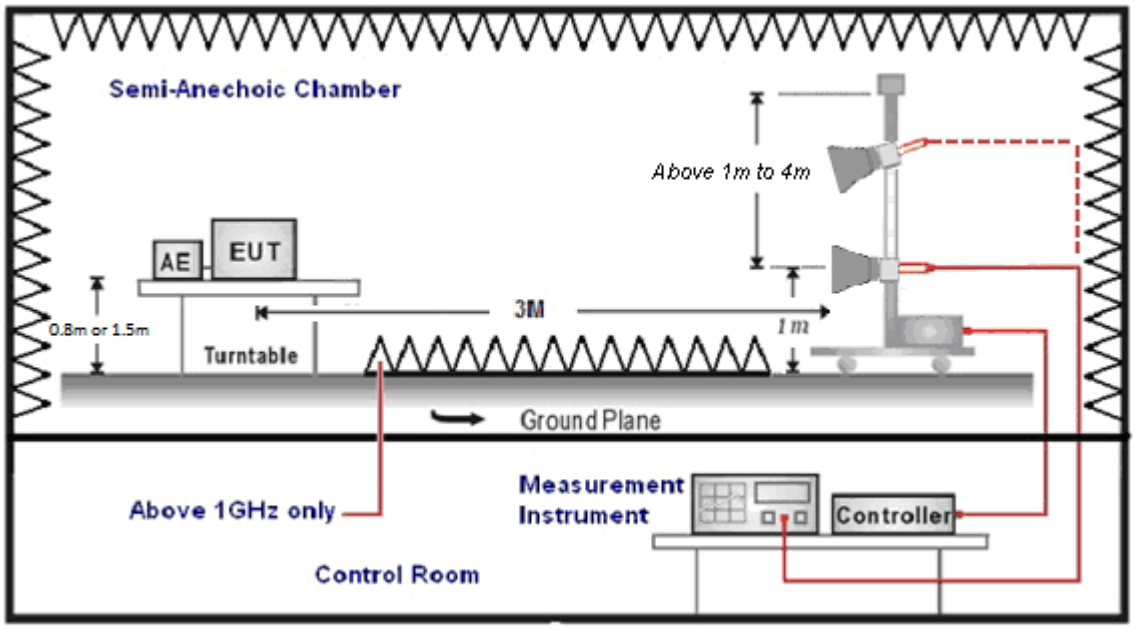
9kHz ~ 30MHz



Below 1GHz



Above 1GHz



■ **Test Procedure**

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 or 1.5 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

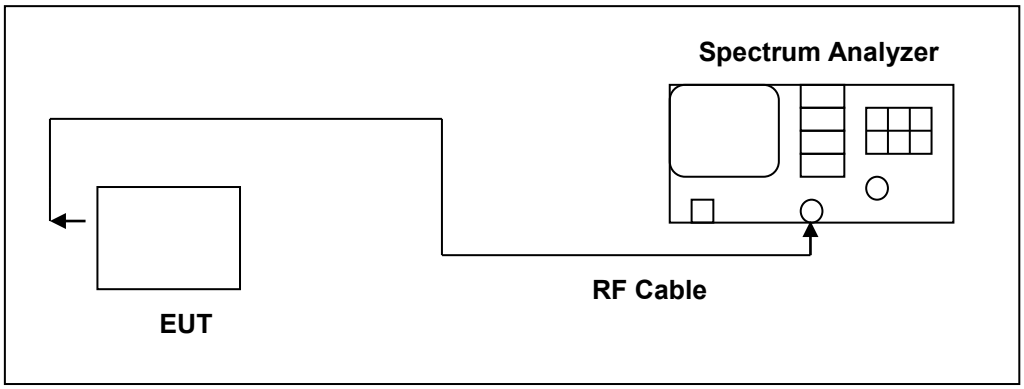
Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4.3. 20dB RF Bandwidth Measurement

■ **Limit**

N/A

■ **Test Setup**



■ **Test Procedure**

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW ≥ 1% of the 20dB span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

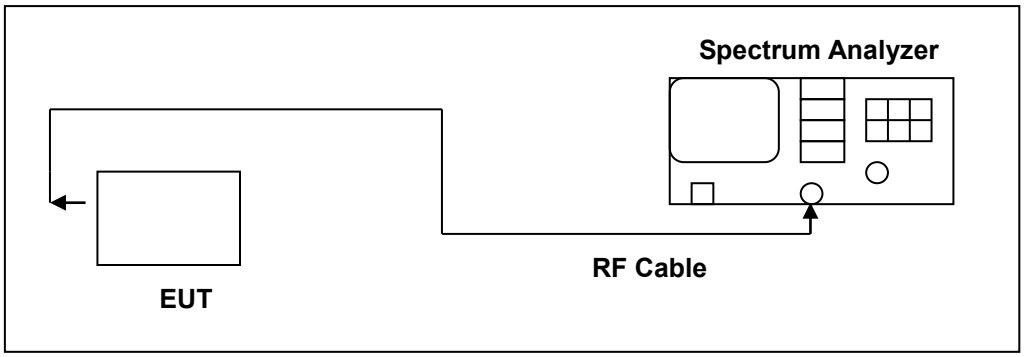
The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

4.4. Carrier Frequency Separation Measurement

■ **Limit**

Title 47 of the CFR, Part 15 Subpart (c) 15.247(a)(1) requires the measurement of the bandwidth of the transmission between the -20 dB points on the transmitted spectrum. The results of this test determine the limits for channel spacing. The channel spacing shall be a minimum of 25 kHz or the 20 dB bandwidth, 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.

■ **Test Setup**



■ **Test Procedure**

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
3. Video (or Average) Bandwidth (VBW) ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

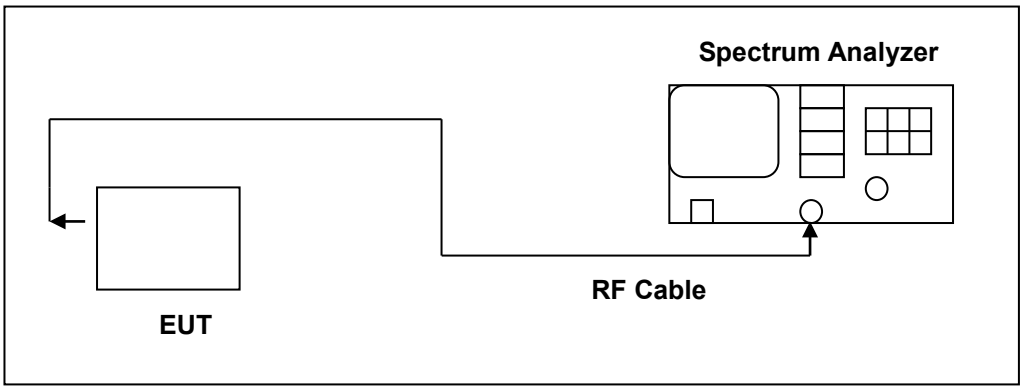
The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

4.5. Number of Hopping Measurement

■ **Limit**

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dBbandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50hopping frequencies and the average time of occupancy on any frequency shall not begreater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hoppingchannel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and theaverage time of occupancy on any frequency shall not be greater than 0.4 seconds within a10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500kHz.

■ **Test Setup**



■ **Test Procedure**

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = the frequency band of operation
2. RBW ≥ 1% of the span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

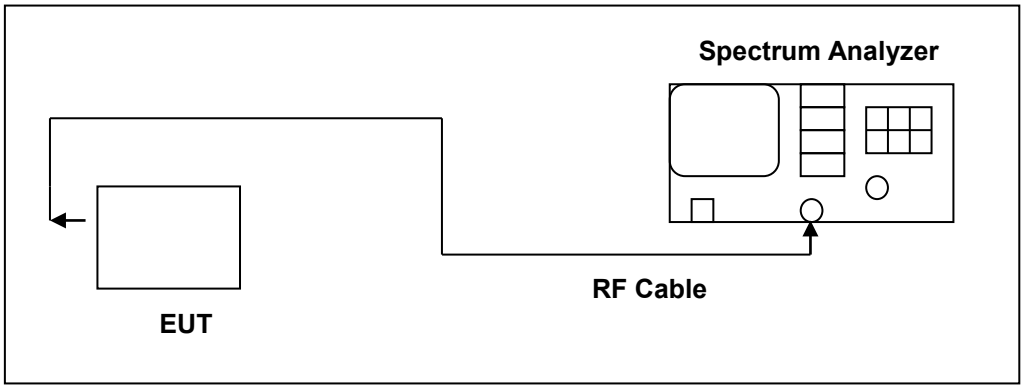
The trace was allowed to stabilize.

4.6. Time of Occupancy (Dwell Time) Measurement

■ **Limit**

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dBbandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50hopping frequencies and the average time of occupancy on any frequency shall not begreater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hoppingchannel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and theaverage time of occupancy on any frequency shall not be greater than 0.4 seconds within a10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500kHz

■ **Test Setup**



■ **Test Procedure**

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the spectrum through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW ≥ RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

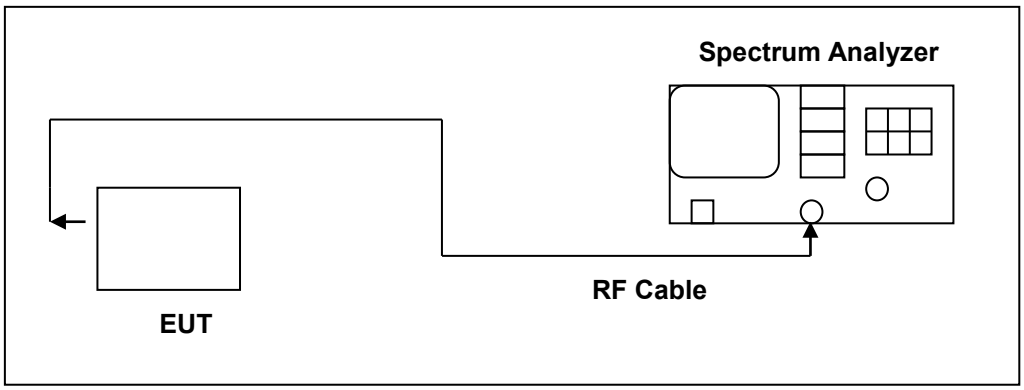
The marker-delta function was used to determine the dwell time.

4.7. Out of Band Conducted Emissions Measurement

■ **Limit**

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

■ **Test Setup**



■ **Test Procedure**

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 39, 78)

4.8. Antenna Measurement

■ **Limit**

For intentional device, 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.
And According to 15.247 (b)(4), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

■ **Antenna Connector Construction**

See section 2 – antenna information.
The external antenna is soldered on the product, so user can only use the antenna provided by the responsible party.

5 Test Results

Annex A. Conducted Test Results

Maximum Conducted Output Power Measurement

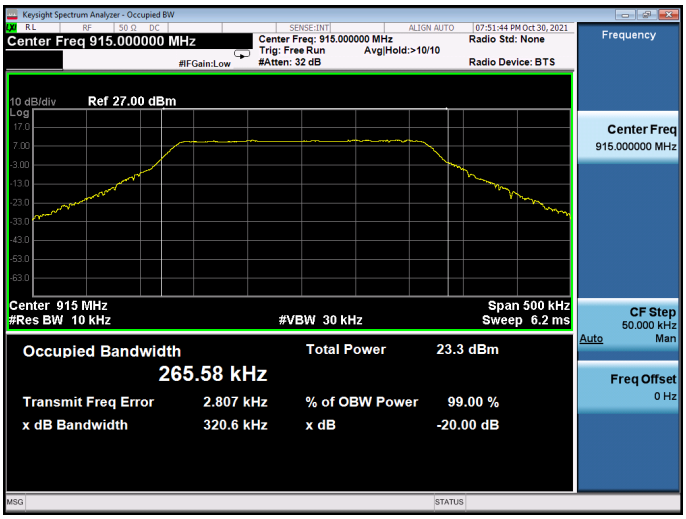
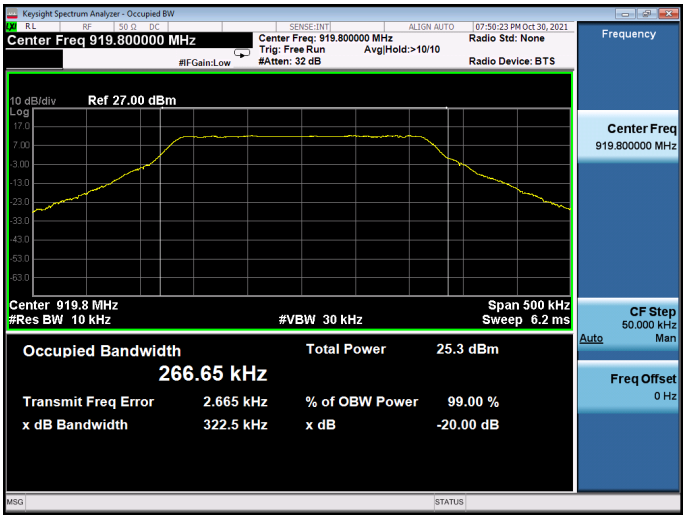
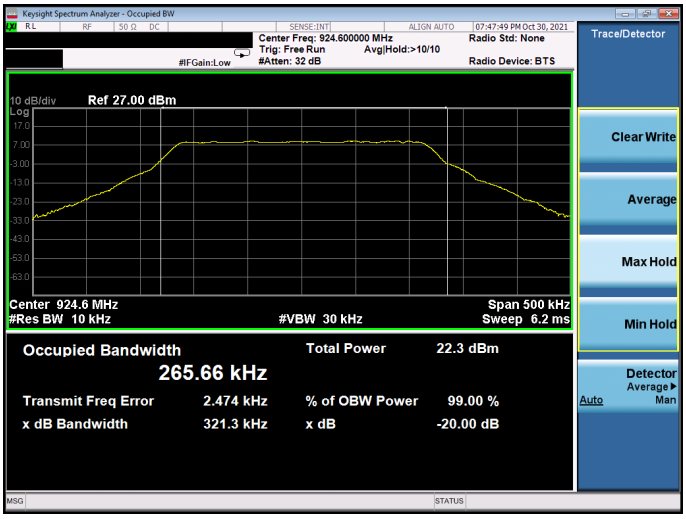
Test Mode	Frequency (MHz)	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
Mode 2	915.0	12.90	0.019	12.96	0.020	< 0.25
	919.8	15.42	0.035	15.96	0.039	< 0.25
	924.6	13.55	0.023	13.61	0.023	< 0.25

Note: The relevant measured result has the offset with cable loss already.

20dB RF Bandwidth Measurement

Test Mode	Frequency (MHz)	Measurement Results (KHz)
Mode 2	915.0	320.6
	919.8	322.5
	924.6	321.3

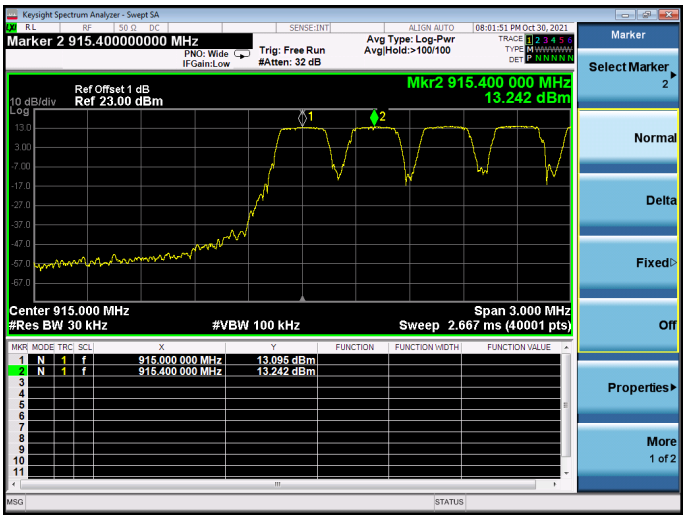
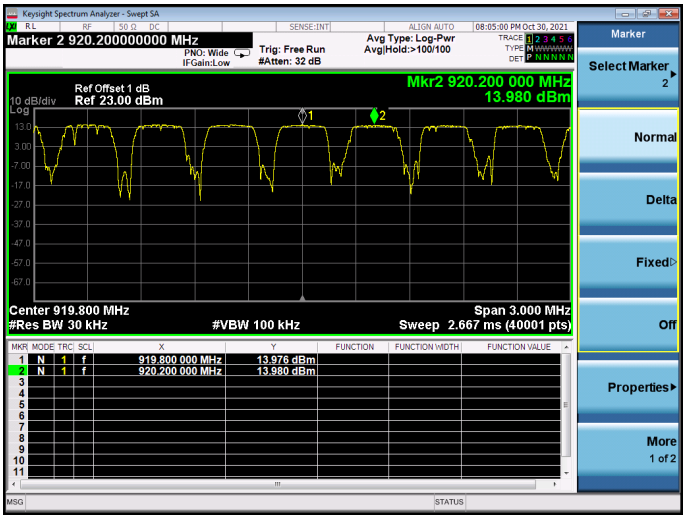
■ Test Graphs

Mode 2: Continuous TX mode	
915.0 MHz	
919.8 MHz	
924.6 MHz	

Carrier Frequency Separation Measurement

Test Mode	Frequency (MHz)	Measurement Results (KHz)	Limit (KHz)
Mode 2	915.0	400	> 320.6
	919.8	400	> 322.5
	924.6	400	> 321.3

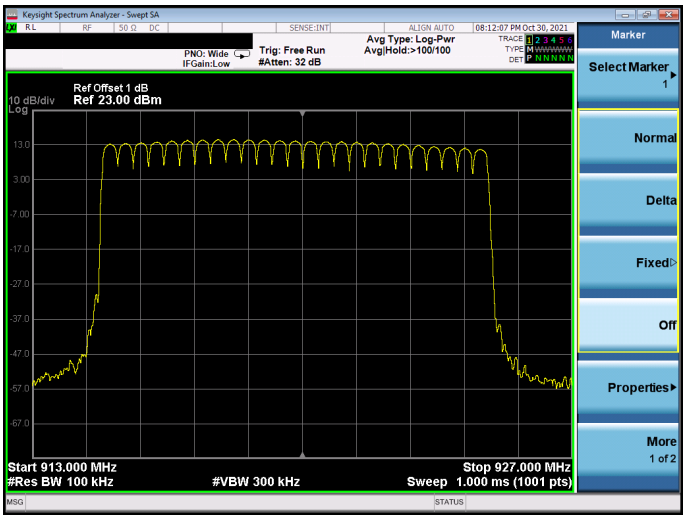
■ Test Graphs

Mode 2: Continuous TX mode	
915.0 MHz	
919.8 MHz	
924.6 MHz	

Number of Hopping Measurement

Test Mode	Frequency Range (MHz)	Measurement Results (Ch)
Mode 2	915-924.6	25

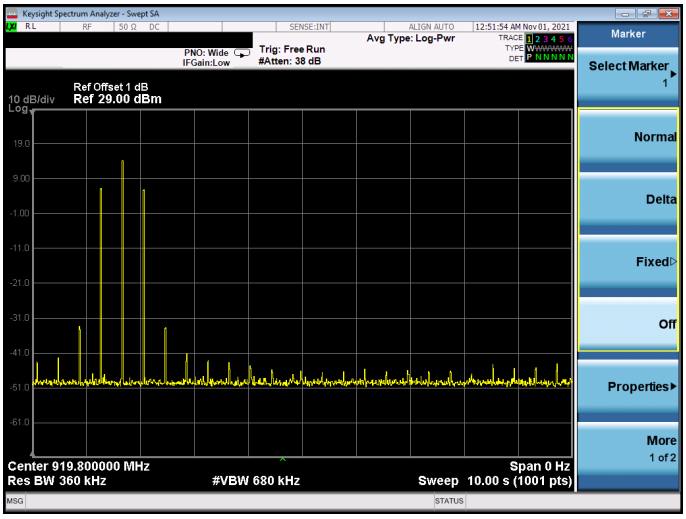
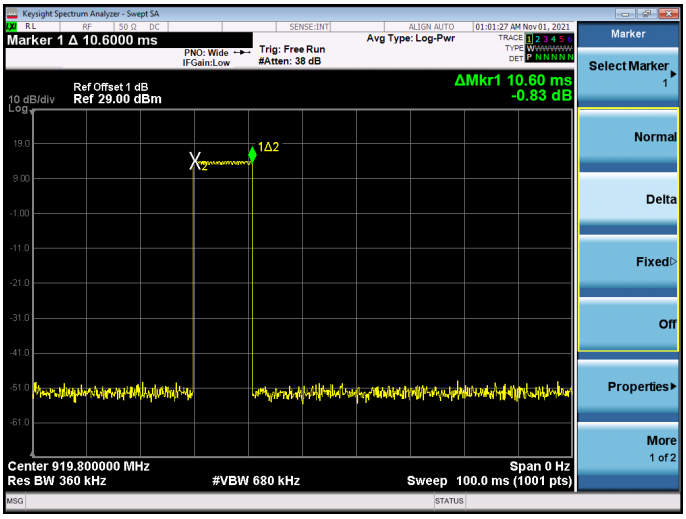
■ **Test Graphs**

Mode 2


Time of Occupancy (Dwell Time) Measurement

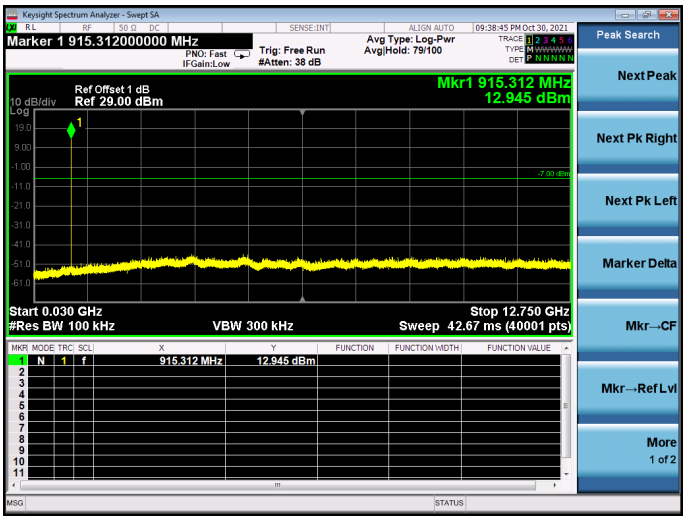
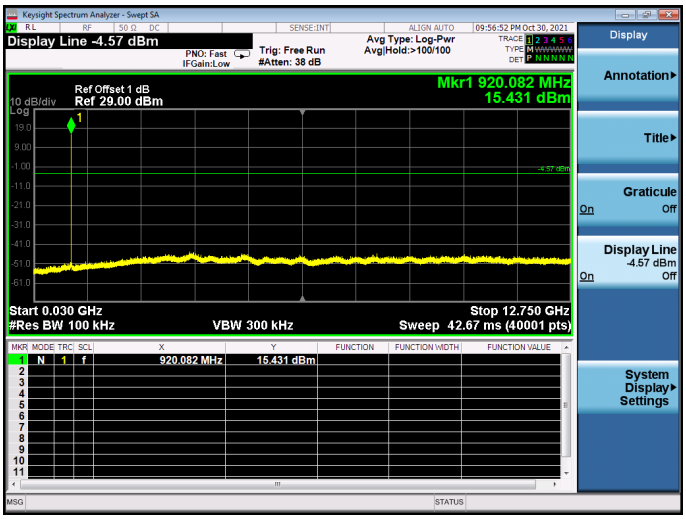
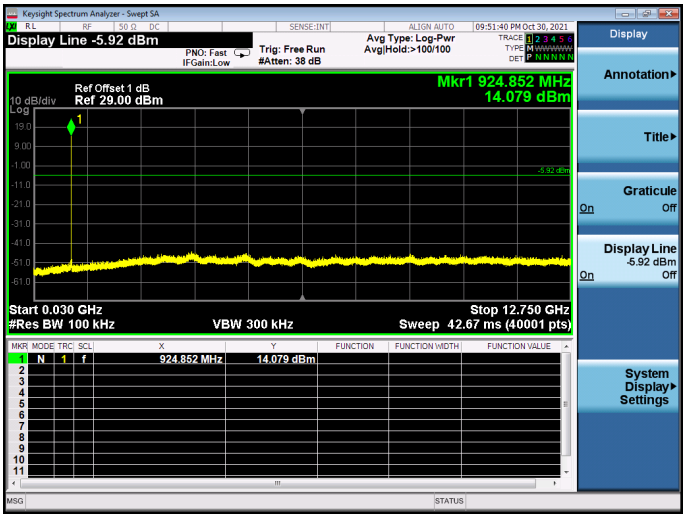
Mode 2: Continuous TX mode	
DH1	
The EUT Hopping Number per 10 Sec (1).	5 times/10 sec
Each Channel Dwell Times (2)	10.6 ms (sec)
Dwell Times on 10 Sec (1) * (2)	53 ms (sec)
LIMIT(msec)	< = 400

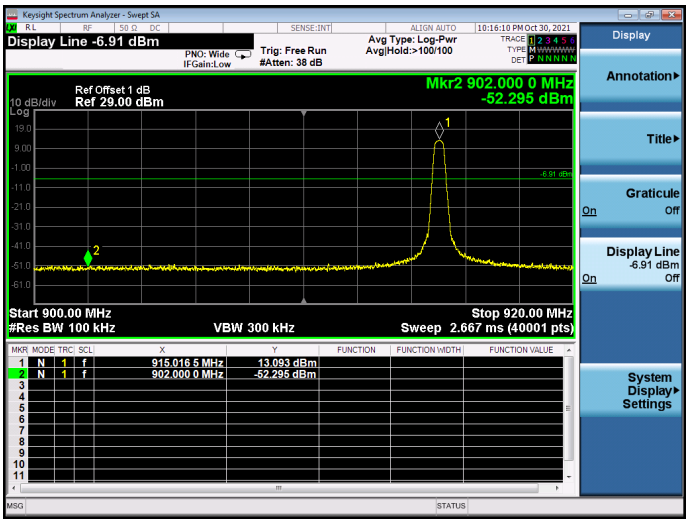
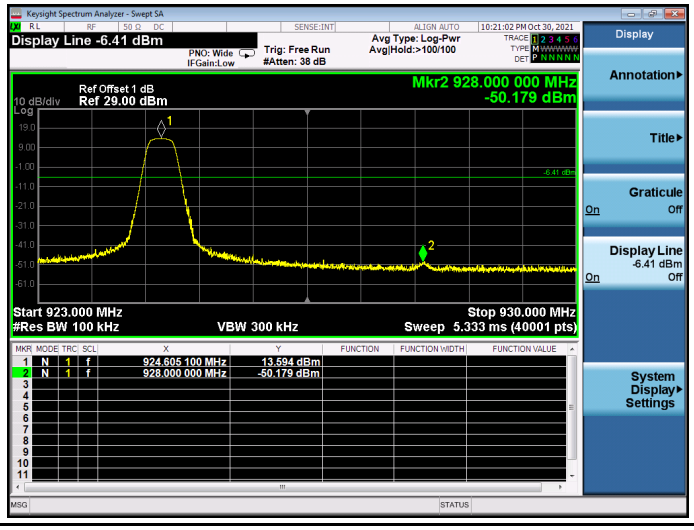
■ **Test Graphs**

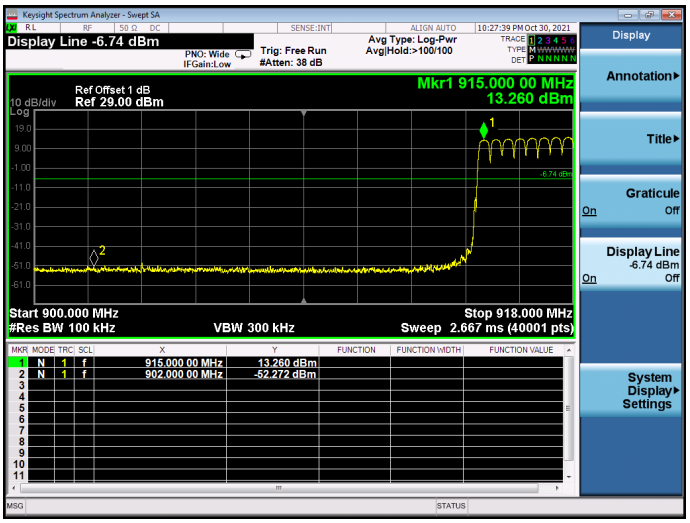
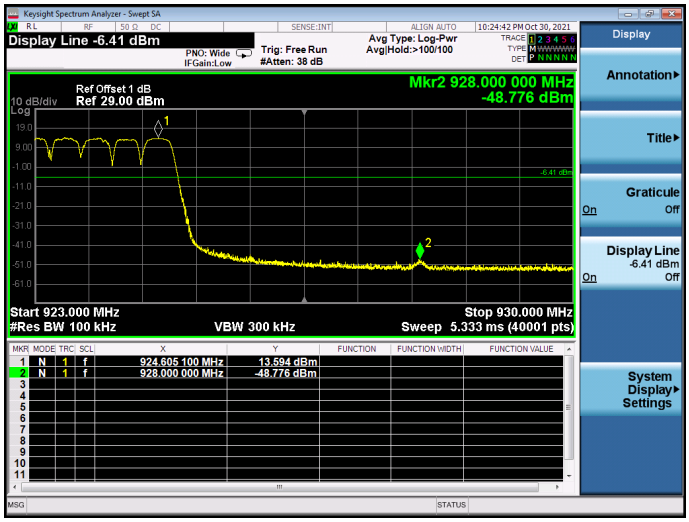
Mode 2: Continuous TX mode	
The EUT Hopping Number per 10 Sec	
Each Channel Dwell Times	

Out of Band Conducted Emissions Measurement

■ Test Graphs

Mode 2: Continuous TX mode	
915.0 MHz	
919.8 MHz	
924.6 MHz	

Mode 2: Continuous TX mode _ Un-hopping	
915.000 MHz	
924.600 MHz	

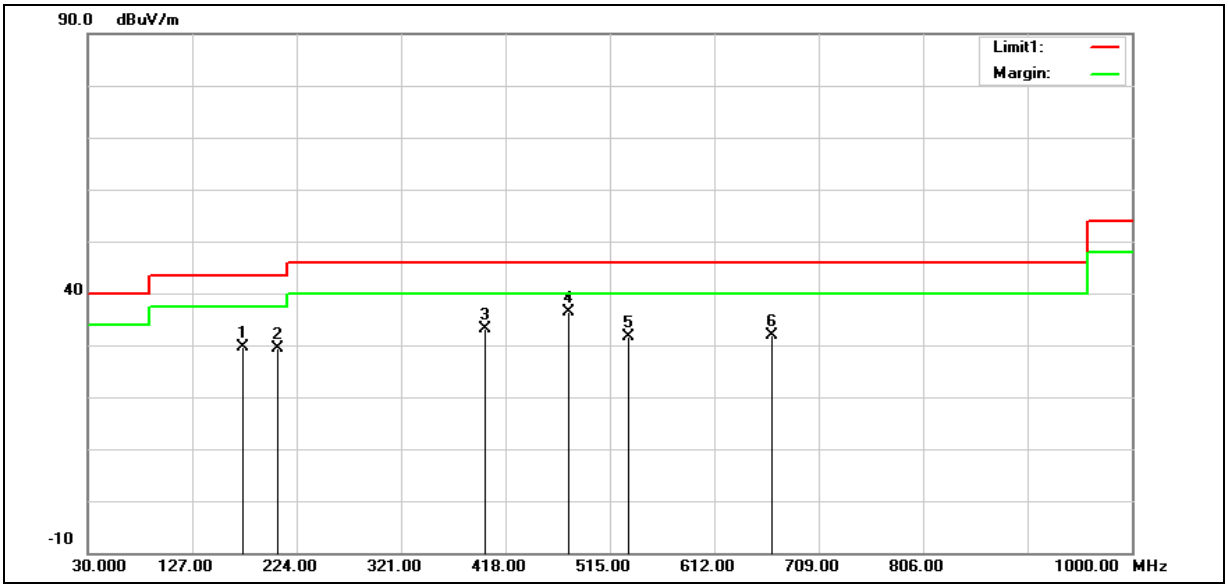
Mode 2: Continuous TX mode _ Hopping	
915.000 MHz	
924.600 MHz	

Annex B. Radiated Emission Measurement

Harmonic

Below 1GHz

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Mode:	Mode 1	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	174.5300	41.50	-11.98	29.52	43.50	-13.98	QP
2	206.5400	44.06	-14.61	29.45	43.50	-14.05	QP
3	398.6000	41.07	-7.99	33.08	46.00	-12.92	QP
4	476.2000	42.14	-5.82	36.32	46.00	-9.68	QP
5	532.4600	36.00	-4.40	31.60	46.00	-14.40	QP
6	665.3500	33.77	-1.95	31.82	46.00	-14.18	QP

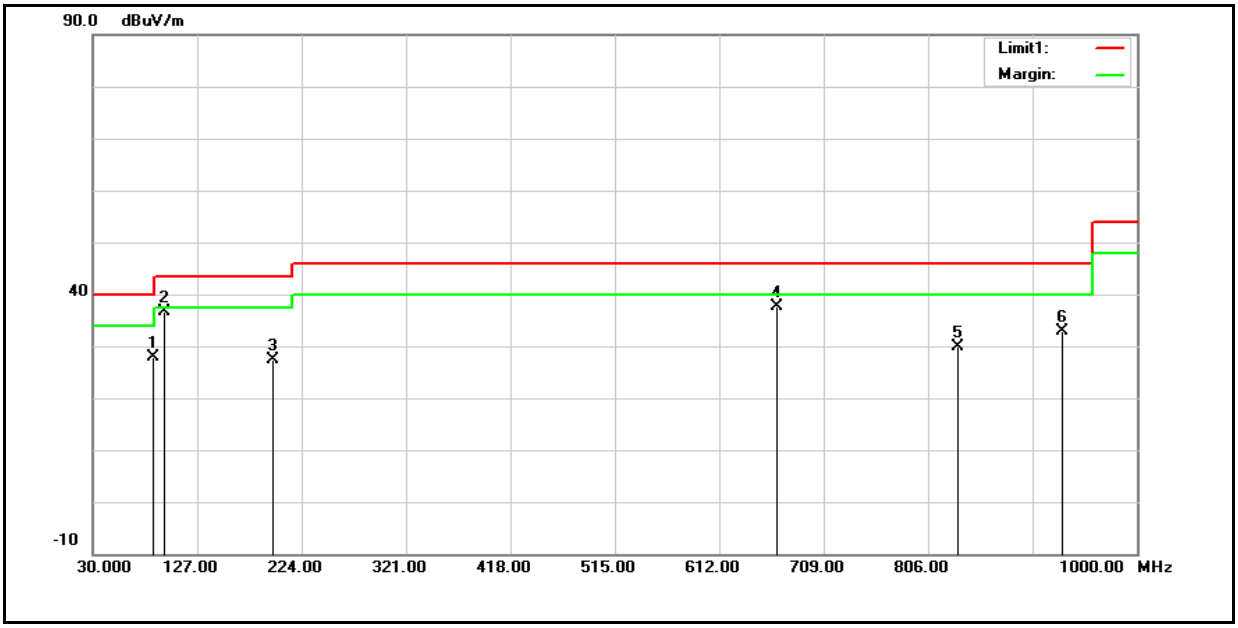
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

Example: 29.52=-11.98+41.50

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Mode:	Mode 1	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	86.2600	43.83	-16.03	27.80	40.00	-12.20	QP
2	95.9600	52.17	-15.54	36.63	43.50	-6.87	QP
3	197.8100	41.83	-14.36	27.47	43.50	-16.03	QP
4	665.3500	39.49	-1.95	37.54	46.00	-8.46	QP
5	833.1600	29.43	0.55	29.98	46.00	-16.02	QP
6	931.1300	31.68	1.31	32.99	46.00	-13.01	QP

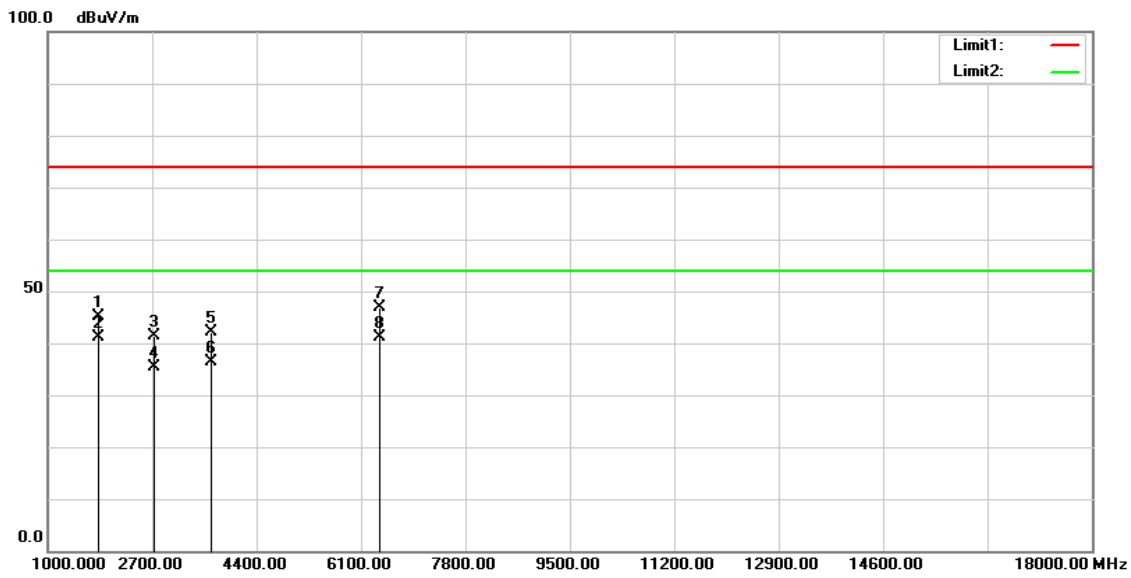
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Above 1GHz

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Frequency:	915.0 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Horizontal		



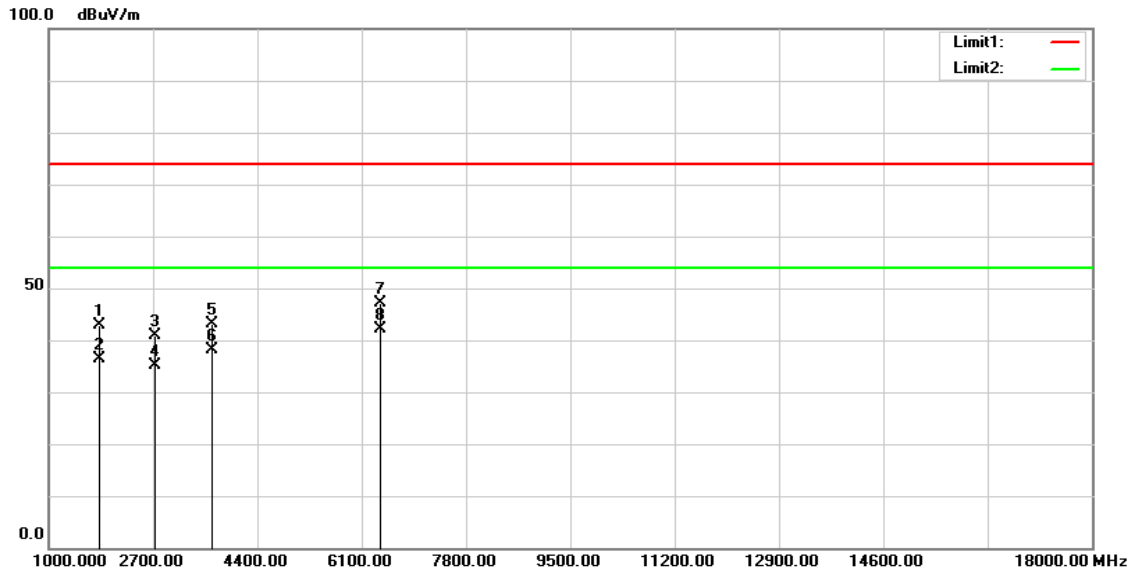
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1833.000	58.34	-13.10	45.24	74.00	-28.76	peak
2	1833.000	54.35	-13.10	41.25	54.00	-12.75	AVG
3	2745.000	51.00	-9.65	41.35	74.00	-32.65	peak
4	2745.000	44.91	-9.65	35.26	54.00	-18.74	AVG
5	3660.000	50.40	-8.18	42.22	74.00	-31.78	peak
6	3660.000	44.54	-8.18	36.36	54.00	-17.64	AVG
7	6405.000	49.20	-2.22	46.98	74.00	-27.02	peak
8	6405.000	43.47	-2.22	41.25	54.00	-12.75	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Frequency:	915.0 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Vertical		



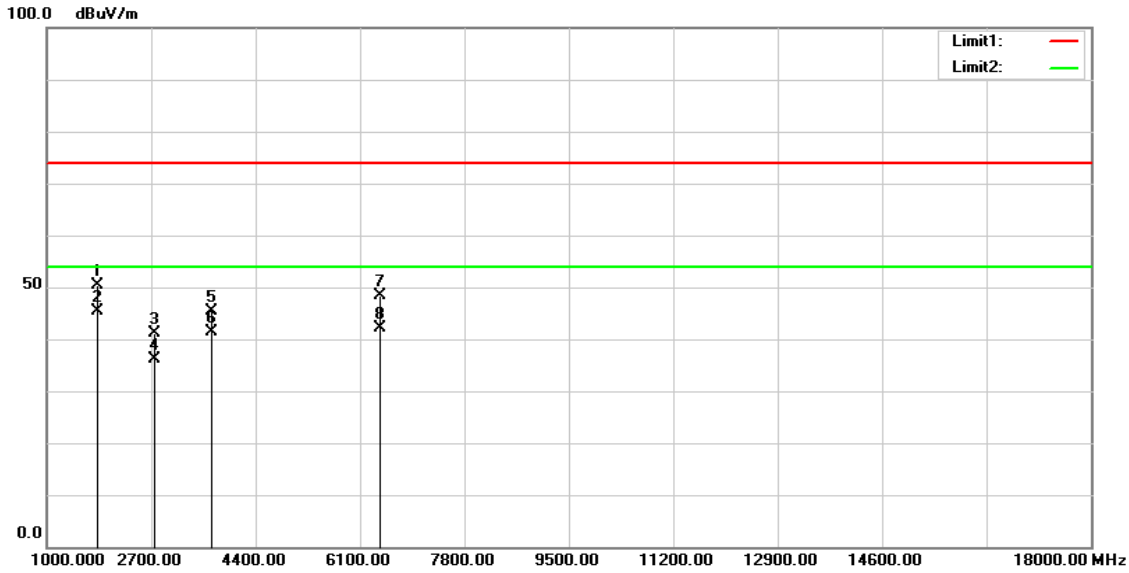
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1830.000	56.11	-13.12	42.99	74.00	-31.01	peak
2	1830.000	49.38	-13.12	36.26	54.00	-17.74	AVG
3	2745.000	50.48	-9.65	40.83	74.00	-33.17	peak
4	2745.000	44.88	-9.65	35.23	54.00	-18.77	AVG
5	3660.000	51.33	-8.18	43.15	74.00	-30.85	peak
6	3660.000	46.33	-8.18	38.15	54.00	-15.85	AVG
7	6405.000	49.23	-2.22	47.01	74.00	-26.99	peak
8	6405.000	44.38	-2.22	42.16	54.00	-11.84	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Frequency:	919.8 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Horizontal		



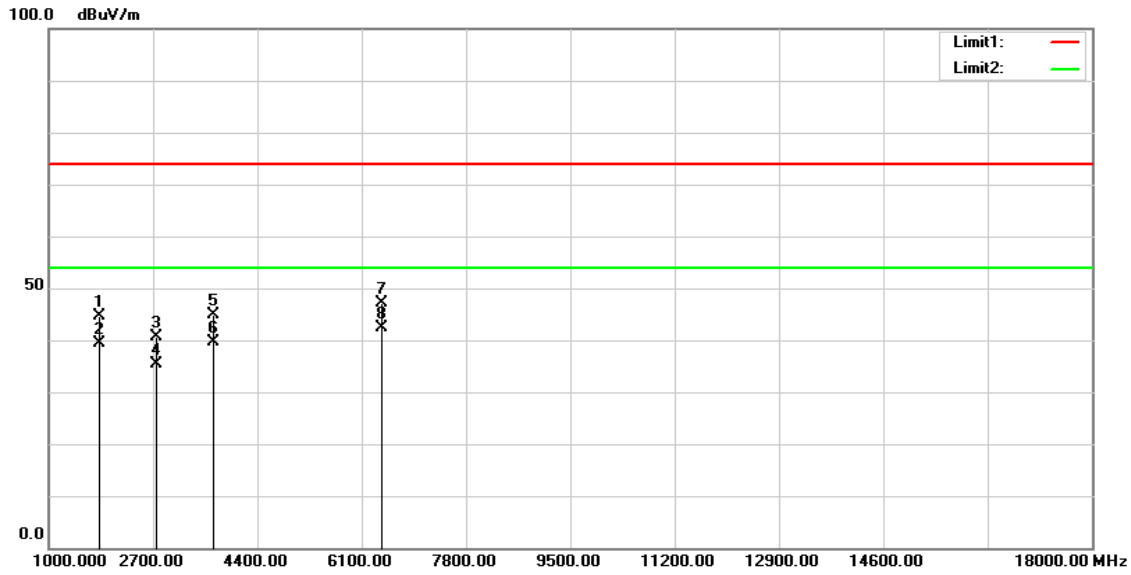
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1833.000	63.48	-13.10	50.38	74.00	-23.62	peak
2	1833.000	58.46	-13.10	45.36	54.00	-8.64	AVG
3	2759.400	50.82	-9.59	41.23	74.00	-32.77	peak
4	2759.400	45.84	-9.59	36.25	54.00	-17.75	AVG
5	3679.200	53.50	-8.13	45.37	74.00	-28.63	peak
6	3679.200	49.49	-8.13	41.36	54.00	-12.64	AVG
7	6438.600	50.45	-2.19	48.26	74.00	-25.74	peak
8	6438.600	44.34	-2.19	42.15	54.00	-11.85	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Frequency:	919.8 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Vertical		



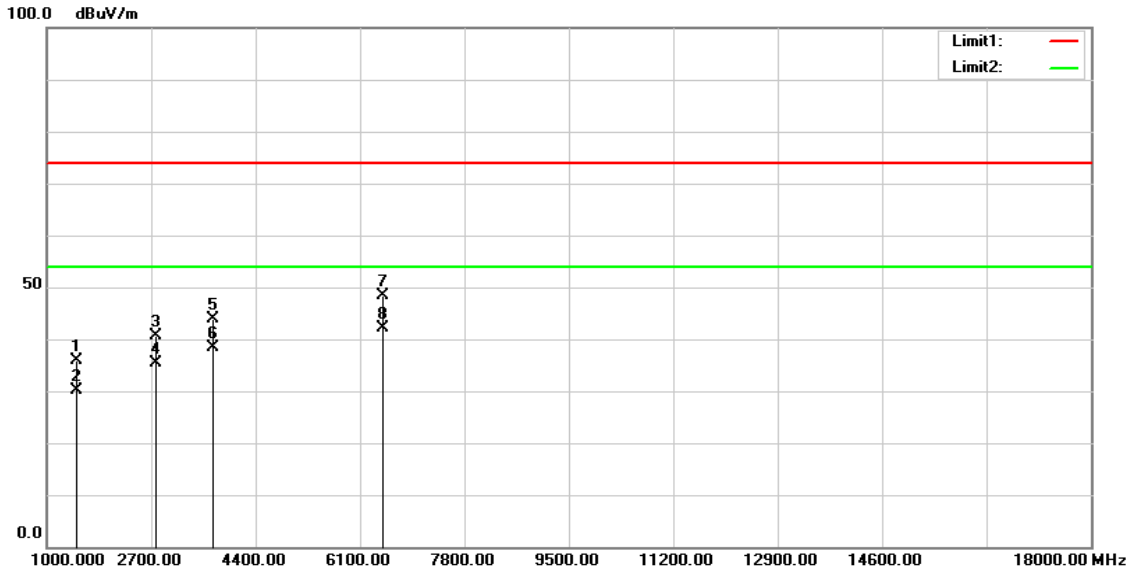
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1833.000	57.74	-13.10	44.64	74.00	-29.36	peak
2	1833.000	52.46	-13.10	39.36	54.00	-14.64	AVG
3	2759.400	50.19	-9.59	40.60	74.00	-33.40	peak
4	2759.400	44.85	-9.59	35.26	54.00	-18.74	AVG
5	3679.200	52.97	-8.13	44.84	74.00	-29.16	peak
6	3679.200	47.67	-8.13	39.54	54.00	-14.46	AVG
7	6438.600	49.38	-2.19	47.19	74.00	-26.81	peak
8	6438.600	44.55	-2.19	42.36	54.00	-11.64	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Frequency:	924.6 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Horizontal		



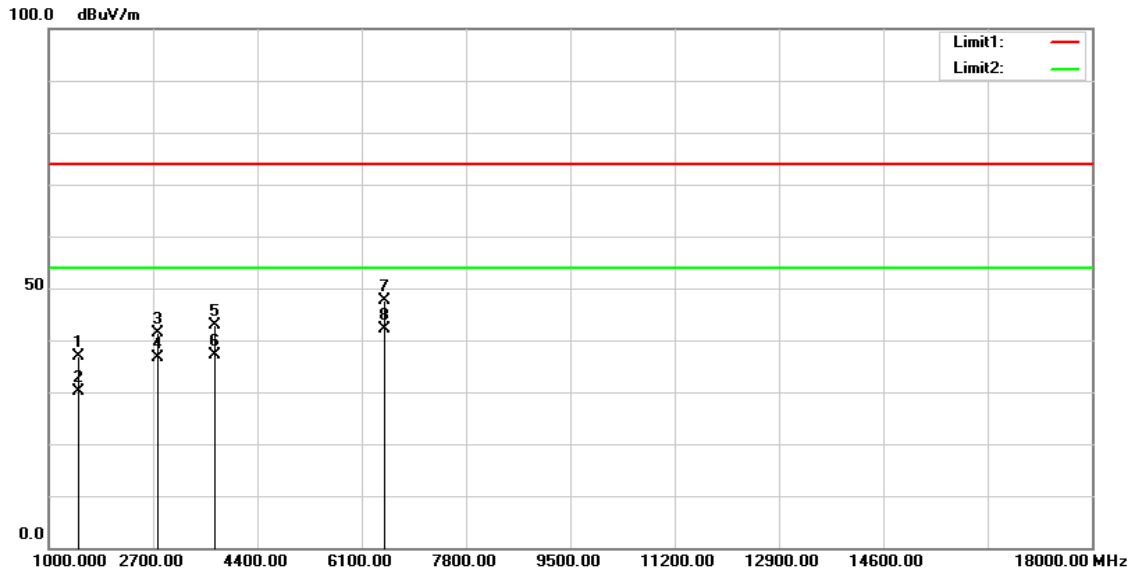
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1489.200	51.86	-16.02	35.84	74.00	-38.16	peak
2	1489.200	46.27	-16.02	30.25	54.00	-23.75	AVG
3	2773.800	50.17	-9.53	40.64	74.00	-33.36	peak
4	2773.800	44.79	-9.53	35.26	54.00	-18.74	AVG
5	3698.400	51.94	-8.09	43.85	74.00	-30.15	peak
6	3698.400	46.54	-8.09	38.45	54.00	-15.55	AVG
7	6472.200	50.57	-2.16	48.41	74.00	-25.59	peak
8	6472.200	44.32	-2.16	42.16	54.00	-11.84	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Radiated Emission	Power:	DC 5 V
Frequency:	924.6 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1489.200	52.78	-16.02	36.76	74.00	-37.24	peak
2	1489.200	46.25	-16.02	30.23	54.00	-23.77	AVG
3	2773.800	50.95	-9.53	41.42	74.00	-32.58	peak
4	2773.800	46.09	-9.53	36.56	54.00	-17.44	AVG
5	3698.400	50.95	-8.09	42.86	74.00	-31.14	peak
6	3698.400	45.24	-8.09	37.15	54.00	-16.85	AVG
7	6472.200	49.67	-2.16	47.51	74.00	-26.49	peak
8	6472.200	44.29	-2.16	42.13	54.00	-11.87	AVG

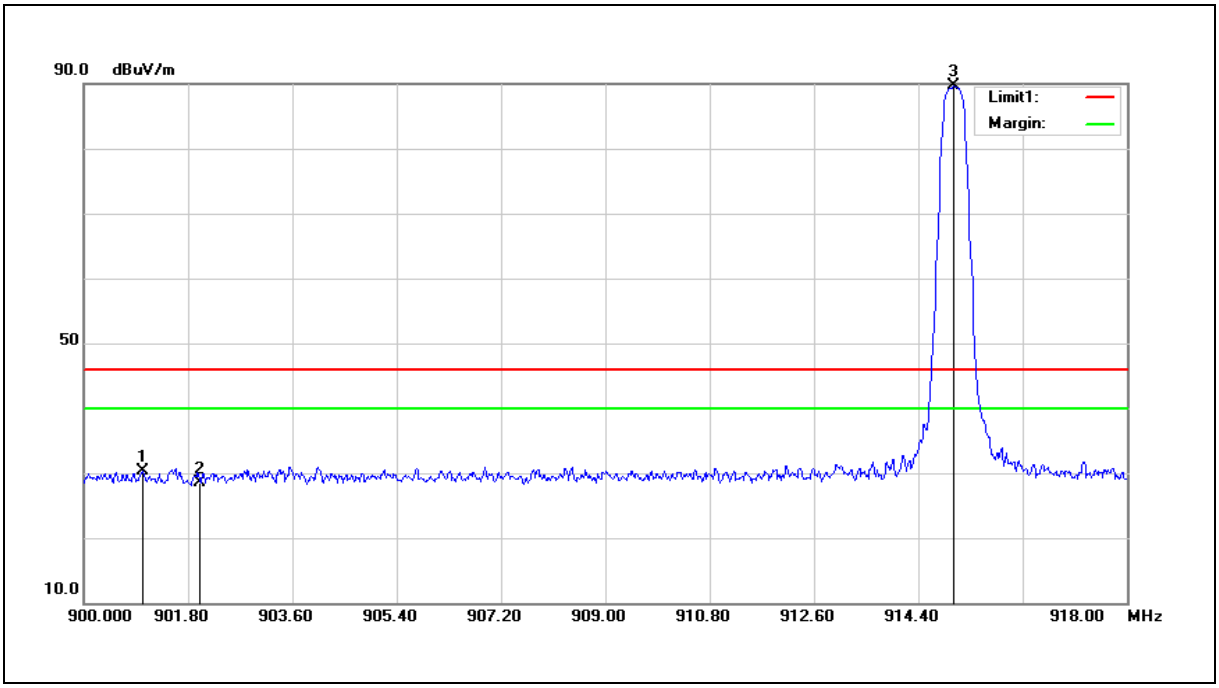
Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Band Edge

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Band edge	Power:	DC 5 V
Frequency:	915.0 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Horizontal		



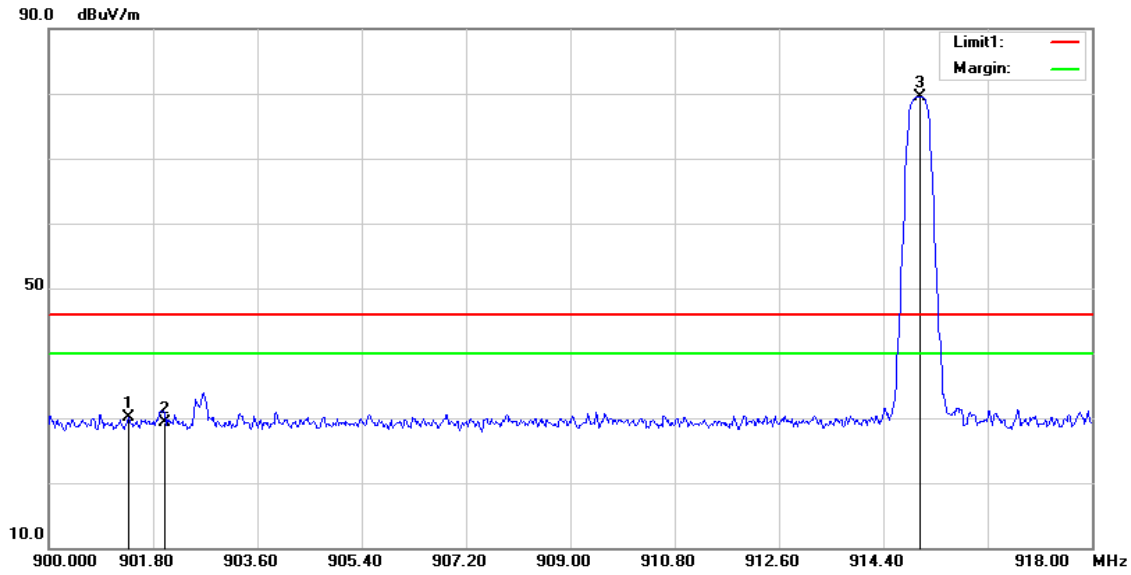
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	901.0260	29.32	1.03	30.35	46.00	-15.65	peak
2	902.0000	27.48	1.04	28.52	46.00	-17.48	peak
3	915.0120	88.47	1.16	89.63	---	---	----

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Band edge	Power:	DC 5 V
Frequency:	915.0 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Vertical		



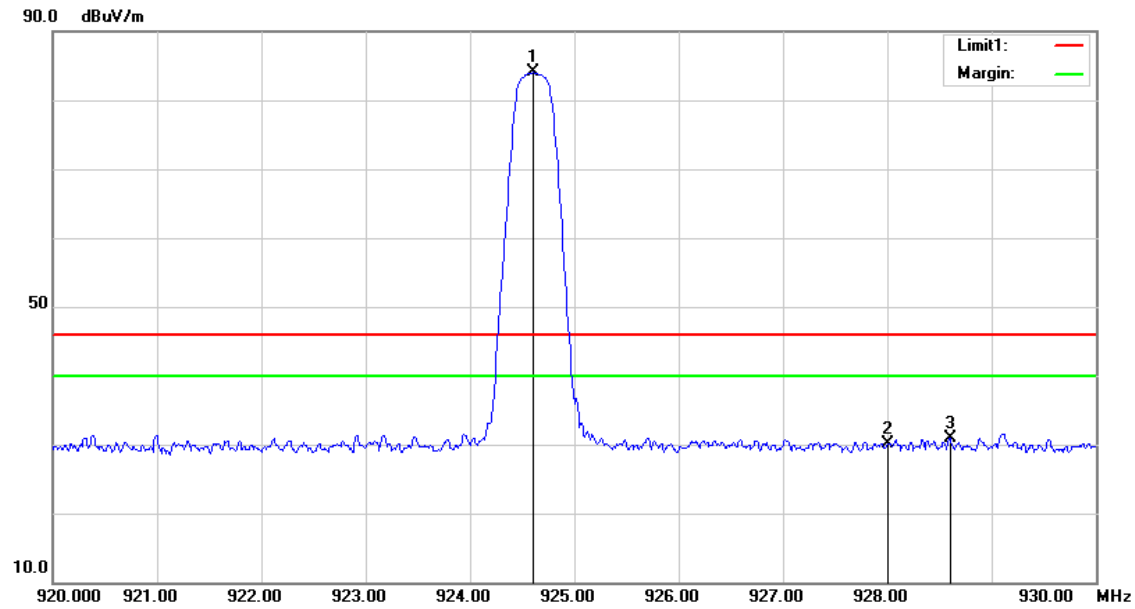
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	901.3860	29.04	1.03	30.07	46.00	-15.93	peak
2	902.0000	28.23	1.04	29.27	46.00	-16.73	peak
3	915.0300	78.43	1.16	79.59	---	---	----

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Band edge	Power:	DC 5 V
Frequency:	924.6 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Horizontal		



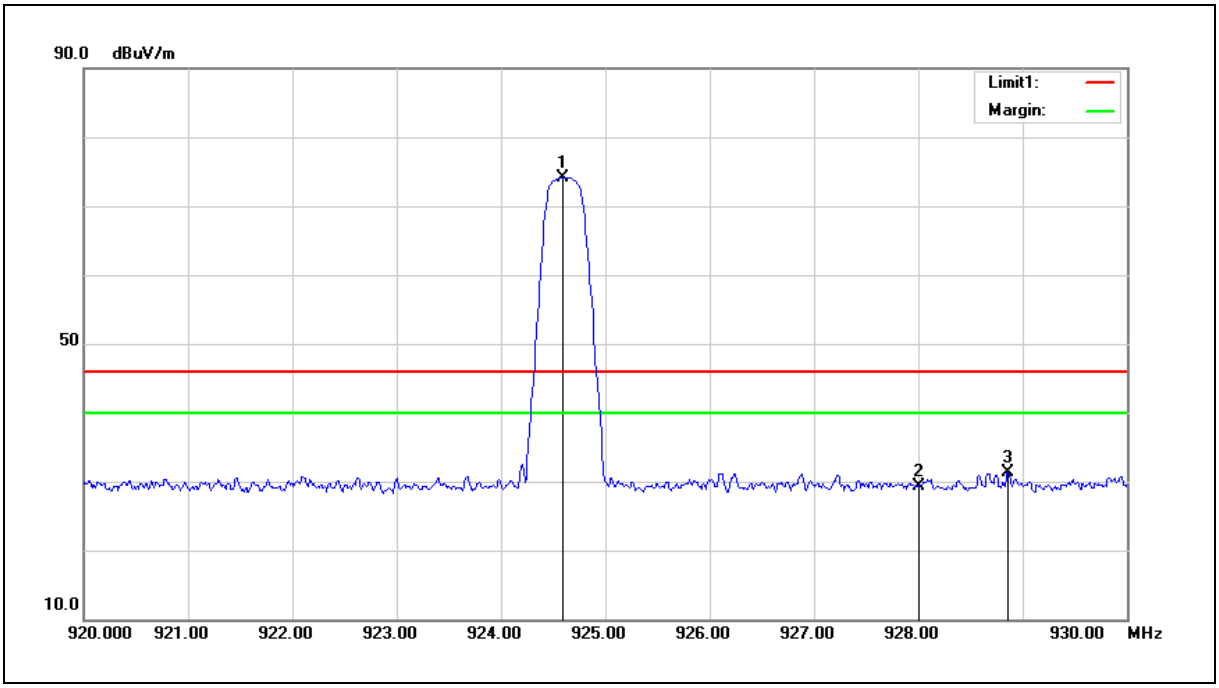
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	924.6100	82.76	1.25	84.01	---	---	---
2	928.0000	28.79	1.28	30.07	46.00	-15.93	peak
3	928.6000	29.62	1.29	30.91	46.00	-15.09	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.247	Test Distance:	3 m
Test item:	Band edge	Power:	DC 5 V
Frequency:	924.6 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60 %RH
Mode:	Mode 2		
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	924.5900	72.95	1.25	74.20	---	---	---
2	928.0000	28.00	1.28	29.28	46.00	-16.72	peak
3	928.8600	30.07	1.29	31.36	46.00	-14.64	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3. When the peak results are less than average limit, so not need to evaluate the average.

4.The test mode was worst case.

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