RF TEST REPORT

Report No.:	SET2021-01932
Product Name:	C66 UHF
FCC ID:	2AC6AC66UHF
Model No. :	C66
Applicant:	Shenzhen Chainway Information Technology Co.,Ltd.
Address：	9F Building2,Daqian Industrial Park,District 67, XingDong Community,Xin’an street,Bao’an District,Shenzhen,Guangdong, China
Dates of Testing:	01/21/2019 — 02/4/2021
Issued by:	CCIC Southern Testing Co., Ltd.
Lab Location:	Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China..
	Tel: 86 755 26627338 **Fax:** 86 755 26627238

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Test Report

Product Name........................:	C66 UHF
Brand Name...........................:	CHAINWAY
Trade Name............................:	CHAINWAY
Applicant................................:	Shenzhen Chainway Information Technology Co.,Ltd.
Applicant Address................:	9F Building2,Daqian Industrial Park,District 67, XingDong Community,Xin'an street,Bao'an District,Shenzhen,Guangdong,China
Manufacturer..........................:	Shenzhen Chainway Information Technology Co.,Ltd.
Manufacturer Address ....:	9F Building2,Daqian Industrial Park,District 67, XingDong Community,Xin'an street,Bao'an District,Shenzhen,Guangdong,China
Test Standards......................:	47 CFR Part 15 Subpart C：Radio Frequency Devices ANSI C63.10:2013：American National Standard for Testing Unlicensed Wireless Devices
Test Result.............................:	PASS
Tested by ....:	Vincent 2021.02.05 Vincent, Test Engineer
Reviewed by ....:	Chris You 2021.02.05 Chris You, Senior Engineer
Approved by ....:	Shuangwen Zhang 2021.02.05 Shuangwen Zhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2021.02.05	First edition

1. General Information

1.1. EUT Description

EUT Type	C66 UHF
Hardware Version	C66_MB_B
Software Version	C66_CNCommon_V1.00
Power Supply	DC 5V
Frequency Range	902MHz~928MHz
Operating Range	902.75MHz~927.25MHz
Number of channel	50
Modulation Type	DSB-ASK
Antenna Type	Internal Antenna
Antenna Gain	4dBi

1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (ISM band radiators) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2017	Radio Frequency Devices
2	ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Standard(s) Section	Description	Result
	FCC		
1	15.203	Antenna Requirement	PASS
2	15.247(a)	Number of Hopping Frequency	PASS
3	15.247(b)	Peak Output Power	PASS
4	15.247(a)	Bandwidth	PASS
5	15.247(a)	Carrier Frequency Separation	PASS
6	15.247(a)	Time of Occupancy (Dwell time)	PASS
7	15.247(d)	Conducted Spurious Emission	PASS
8	15.247(d)	Conducted Band Edge	PASS
9	15.207	Conducted Emission	PASS
10	15.209 15.247(c)	Radiated Band Edges and Spurious Emission	PASS
11	15.247(g)	Frequency hopping spread spectrum system requirement	PASS
12	15.247 (h)	FHSS Intelligence	Pass[Note2]

Note 1: The test of Radiated Emission was performed according to the method of measurements prescribed in ANSI C63.10 2013.

2. The EUT does not coordinate transmission with any other FHSS to avoid simultaneous occupation of hopping frequencies.

1.3. Description of Test Mode

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

Test channel: 1channel, 26 channel, 50channel

1.4. Facilities and Accreditations

1.4.1. Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a re port filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until June 30th,2021

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engi neering Bureau of Industry Canada for the performance of radiated measurements with Registrati on No. 11185A-1 on Aug. 04, 2016, valid time is until June 30th, 2021

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.4.2. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (℃):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 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.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.1.2. Antenna Information

Antenna Category: Internal Antenna

Antenna General Information:

No.	EUT	Ant. Type	Gain(dBi)
1	C66 UHF	Internal Antenna	4

2.1.3. Result: comply

The EUT has a permanent antenna. Please refer to the EUT internal photos.

2.2. Number of Hopping Frequency

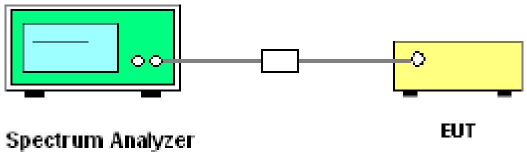
2.2.1. Limit of Number of Hopping Frequency

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

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedure

1. The testing follows ANSI C63.10-2013 Clause 7.8.3
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation;

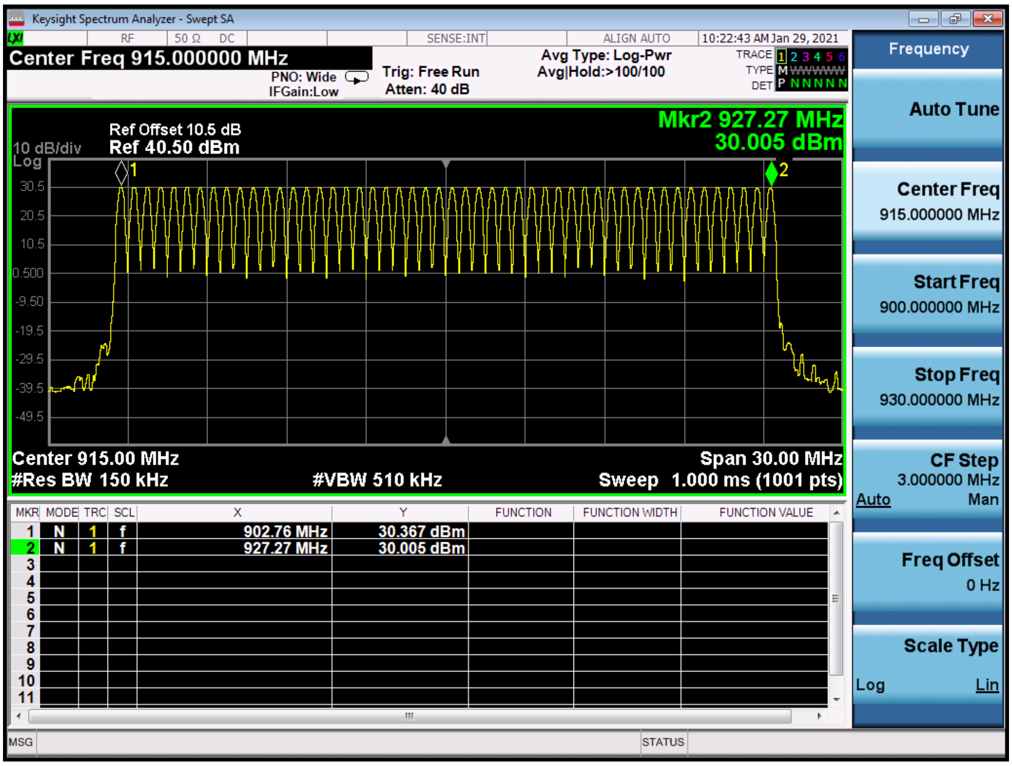
Set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller. VBW⩾RBW, Trace = max hold Sweep=auto, Detector function=peak.

6. The number of hopping frequency used is defined as the number of total channel.
7. Record the measurement data derived from spectrum analyzer.

2.2.5. Test Results of Number of Hopping Frequency

Frequency (MHz)	Measured Channel Numbers	Min. Limit	Verdict
902 - 928	50	50	PASS

2.2.6. Test Results (plots) of Number of Hopping Frequency



2.3. Peak Output Power

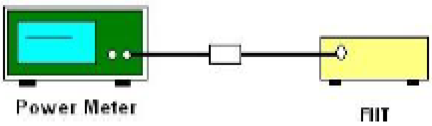
2.3.1. Limit of Peak Output Power

Section 15.247 (B)(2) For frequency hopping systems operating in the 902~928MHz band:1watt for systems employing at least 50 hopping channels.

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

1. The testing follows ANSI C63.10-2013 Clause 7.8.5
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power with cable loss and record the results in the test report.
5. Measure and record the results in the test report.

2.3.5. Test Result of Output Power

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Limit (dBm)	Verdict
1	902.75	28.23	30	PASS
26	915.25	28.72		PASS
50	927.25	28.85		PASS

2.4. Bandwidth

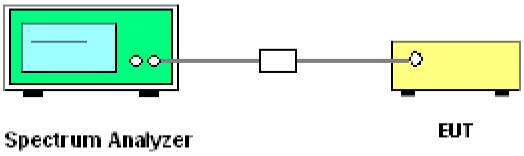
2.4.1. Definition

According to FCC §15.247(a)(1), the 20dB bandwidth is known as the 99% emission bandwidth, or 20dB bandwidth (10*log1% = 20dB) taking the total RF output power.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedure

1. The testing follows ANSI C63.10-2013 Clause 6.9.2
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.

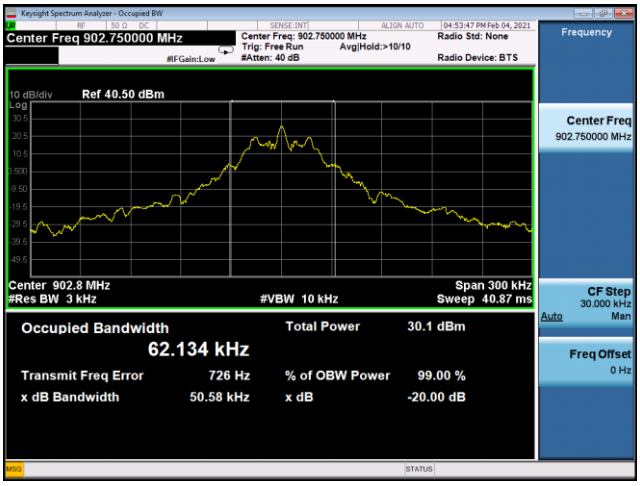
   Span = approximately 2 to 5 times the OBW, centered on a hopping channel;

   RBW⩾1% to 5% of the OBW; VBW shall be approximately three times RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Measure and record the results in the test report.

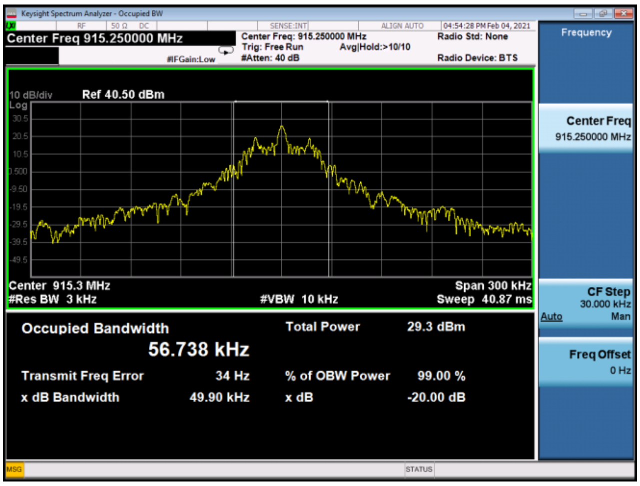
2.4.5. Test Results of 20dB Bandwidth

Channel	Frequency (MHz)	20dB Bandwidth (kHz)
1	902.75	50.58
26	915.25	49.90
50	927.25	49.91

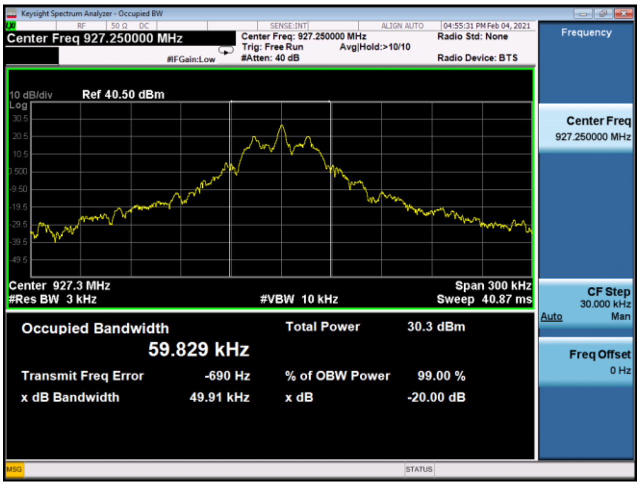
2.4.6. Test Results (plots) of Bandwidth



1 channel



26 channel



50 channel

2.5. Carried Frequency Separation

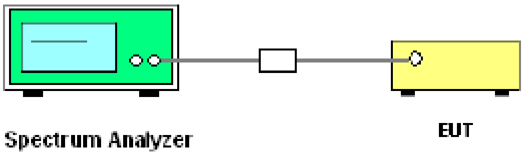
2.5.1. Limit of Carried Frequency Separation

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or 20dB bandwidth of the hopping channel, whichever is greater.

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedure

1. The testing follows ANSI C63.10-2013 Clause 7.8.2.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Enable the EUT hopping function.

5. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels; RBW: Start with the RBW set to approximately 30% of the channel spacing;

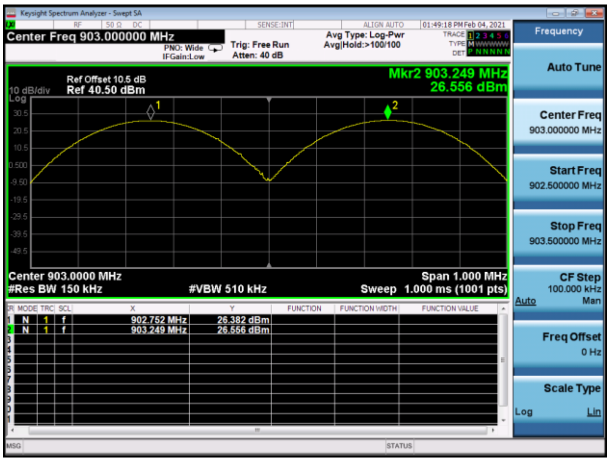
VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.

6. Measure and record the results in the test report.

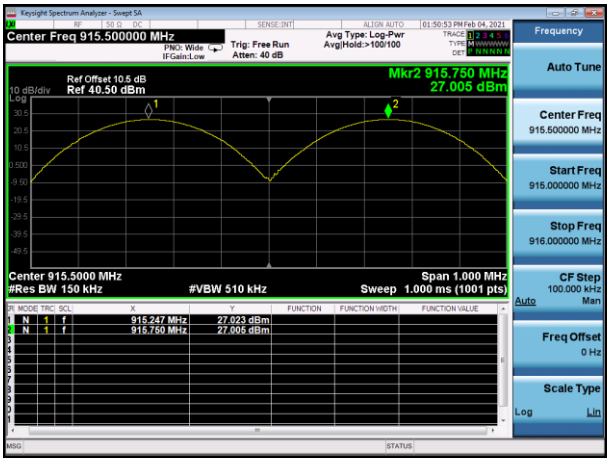
2.5.5. Test Results of Carried Frequency Separation

Frequency Separation(kHz)	(20dB BW) Limits (kHz)	Verdict
497	50.58	PASS
503	49.90	PASS
500	49.91	PASS

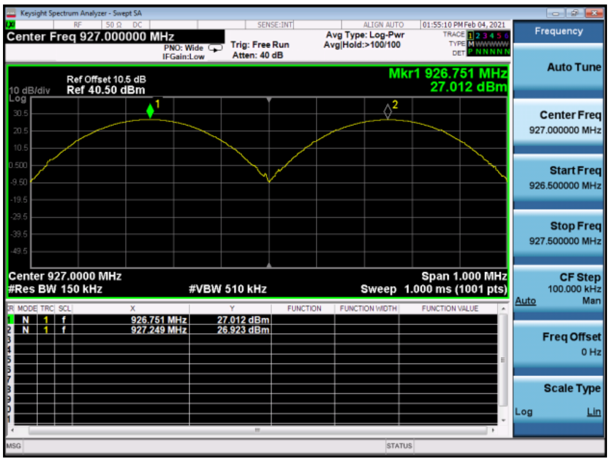
2.5.6. Test Results (plots) of Carried Frequency Separation



L channel



M channel



H channel

2.6. Dwell time

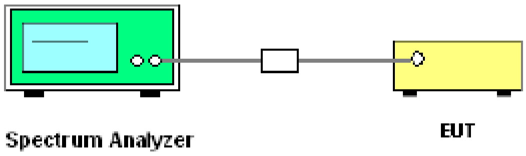
2.6.1. Limit of Dwell Time

the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period

2.6.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup



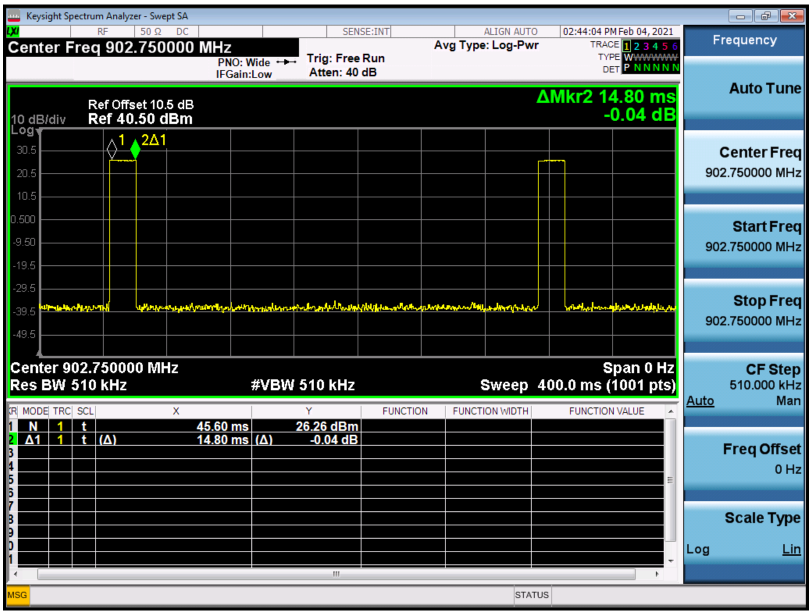
2.6.4. Test Procedure

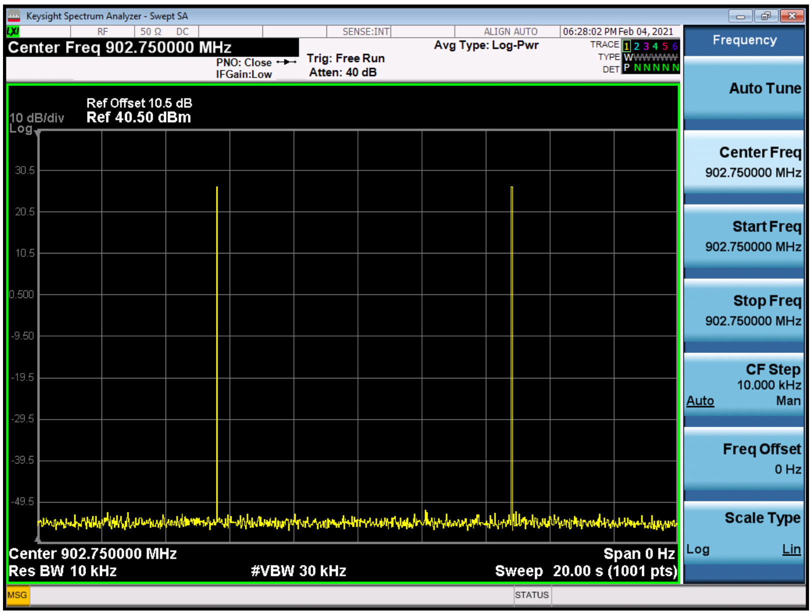
1. The testing follows ANSI C63.10-2013 Clause 7.8.4.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel; VBW⩾RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

2.6.5. Test Results of Dwell Time

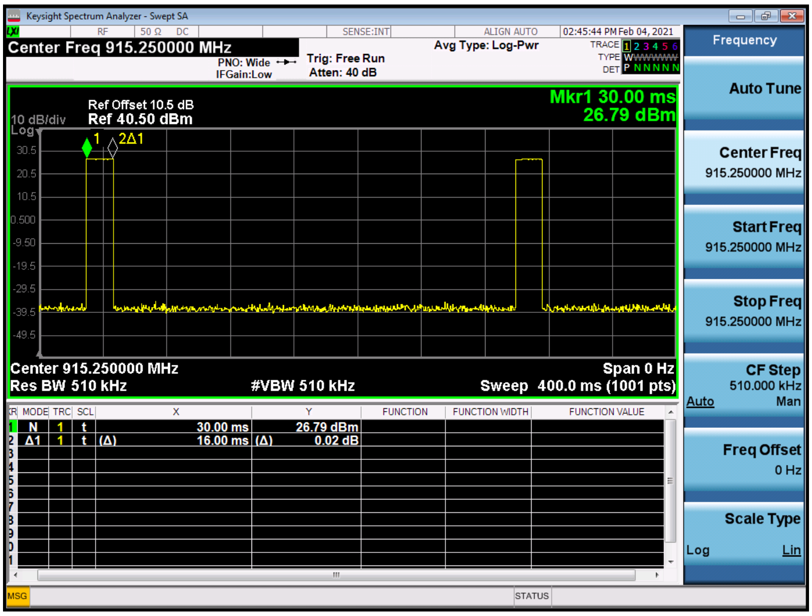
Frequency（MHz）	Length (ms)	Number	Dwell Time (ms)	Limit (ms)	Verdict
902.75	14.8	2	29.6	400	PASS
915.25	16	2	32		PASS
927.25	16	2	32		PASS

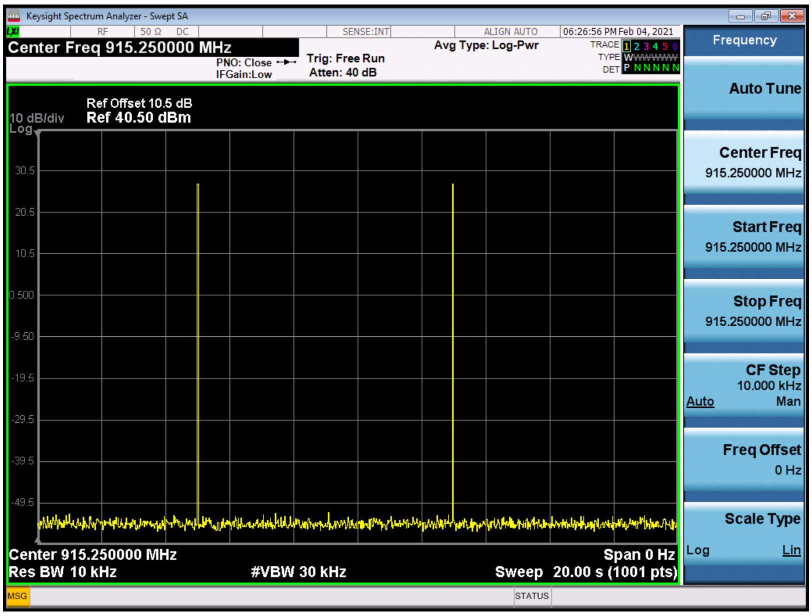
2.6.6. Test Results (plots) of Dwell Time



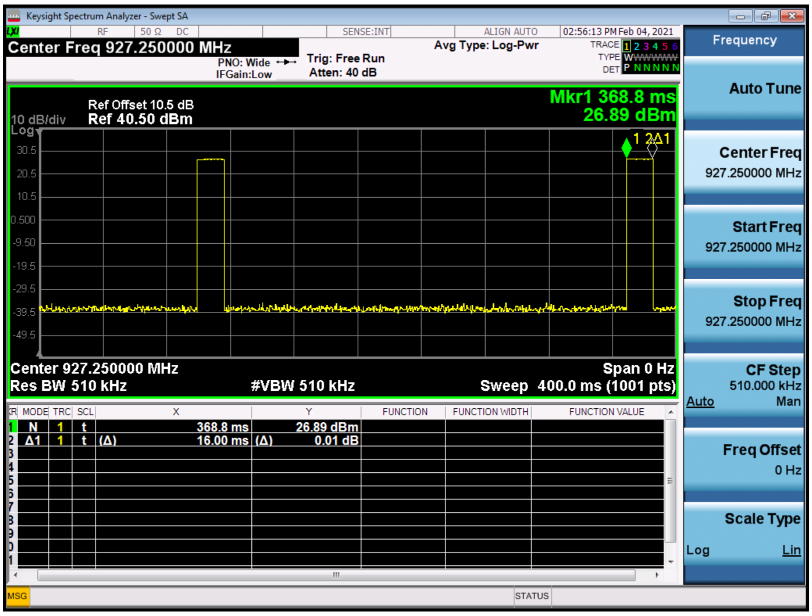


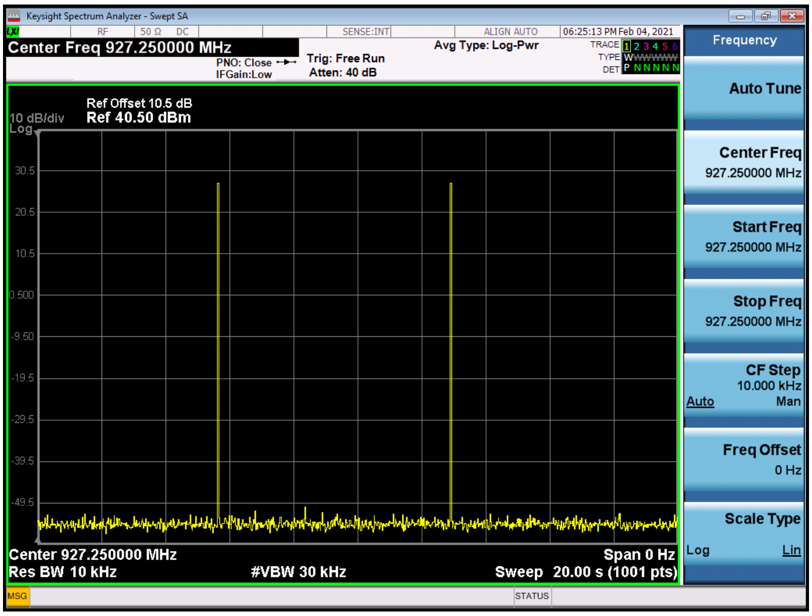
L channel


Keysight Spectrum Analyzer - Swept SA
Center Freq 915.250000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
02:45:44 PM Feb 04, 2021
Ref Offset 10.5 dB
10 dB/div
Ref 40.50 dBm
Mkr1 30.00 ms
26.79 dBm
Center 915.250000 MHz
Res BW 510 kHz
#VBW 510 kHz
Span 0 Hz
Sweep 400.0 ms (1001 pts)
N 1 t 30.00 ms 26.79 dBm
Δ1 1 t (Δ) 16.00 ms (Δ) 0.02 dB
Frequency
Auto Tune
Center Freq
915.250000 MHz
Start Freq
915.250000 MHz
Stop Freq
915.250000 MHz
CF Step
510.000 kHz
Freq Offset
0 Hz
Scale Type


Keysight Spectrum Analyzer - Swept SA
Center Freq 915.250000 MHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
06:26:56 PM Feb 04, 2021
Ref Offset 10.5 dB
10 dB/div
Ref 40.50 dBm
Center 915.250000 MHz
Res BW 10 kHz
#VBW 30 kHz
Span 0 Hz
Sweep 20.00 s (1001 pts)
Frequency
Auto Tune
Center Freq
915.250000 MHz
Start Freq
915.250000 MHz
Stop Freq
915.250000 MHz
CF Step
10.000 kHz
Freq Offset
0 Hz
Scale Type

M channel


Keysight Spectrum Analyzer - Swept SA
Center Freq 927.250000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
02:56:13 PM Feb 04, 2021
Frequency
Ref Offset 10.5 dB
10 dB/div Ref 40.50 dBm
Mkr1 368.8 ms
26.89 dBm
Center 927.250000 MHz
Res BW 510 kHz
#VBW 510 kHz
Span 0 Hz
Sweep 400.0 ms (1001 pts)
N 1 t 368.8 ms 26.89 dBm
Δ1 1 t (Δ) 16.00 ms (Δ) 0.01 dB
Auto Tune
Center Freq 927.250000 MHz
Start Freq 927.250000 MHz
Stop Freq 927.250000 MHz
CF Step 510.000 kHz
Freq Offset 0 Hz
Scale Type
Log Lin


Keysight Spectrum Analyzer - Swept SA
Center Freq 927.250000 MHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
06:25:13 PM Feb 04, 2021
Frequency
Ref Offset 10.5 dB
10 dB/div Ref 40.50 dBm
Center 927.250000 MHz
Res BW 10 kHz
#VBW 30 kHz
Span 0 Hz
Sweep 20.00 s (1001 pts)
Auto Tune
Center Freq 927.250000 MHz
Start Freq 927.250000 MHz
Stop Freq 927.250000 MHz
CF Step 10.000 kHz
Freq Offset 0 Hz
Scale Type
Log Lin

H channel

2.7. Conducted Spurious Emissions

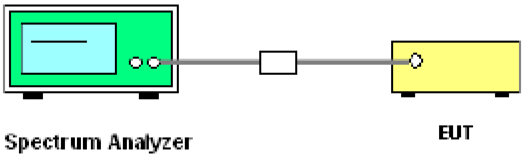
2.7.1. Limit of Spurious Emission

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

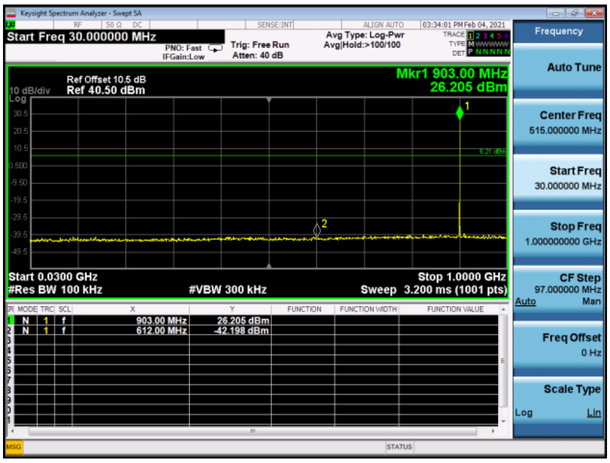
2.7.3. Test Setup

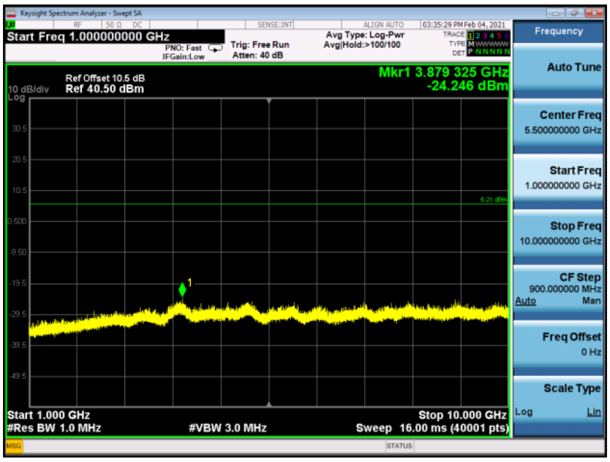


2.7.4. Test Procedure

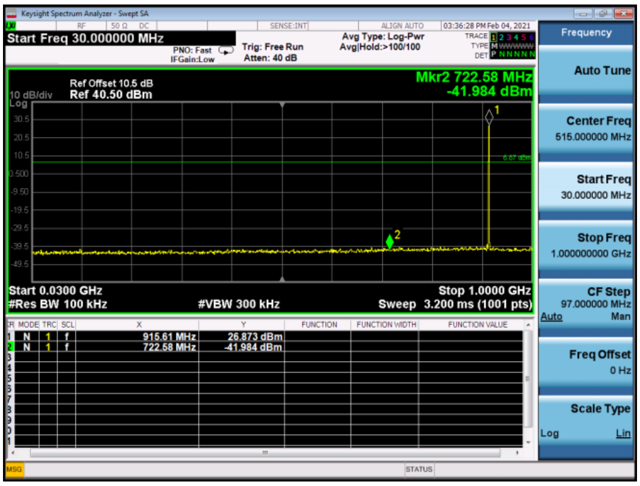
1. The testing follows ANSI C63.10-2013 Clause 7.8.8.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

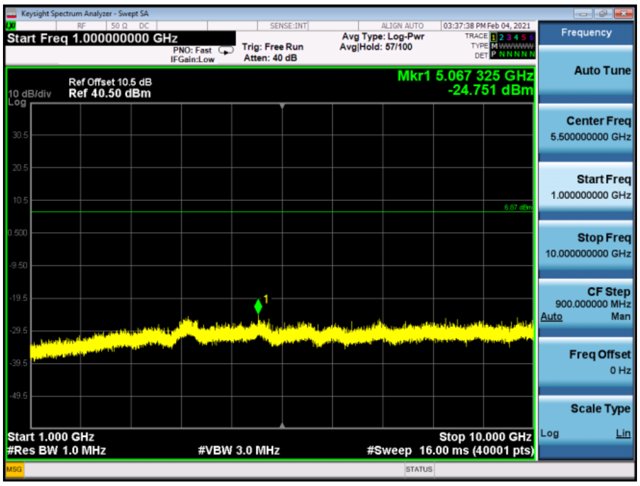
2.7.5. Test Results of Conducted Spurious Emissions



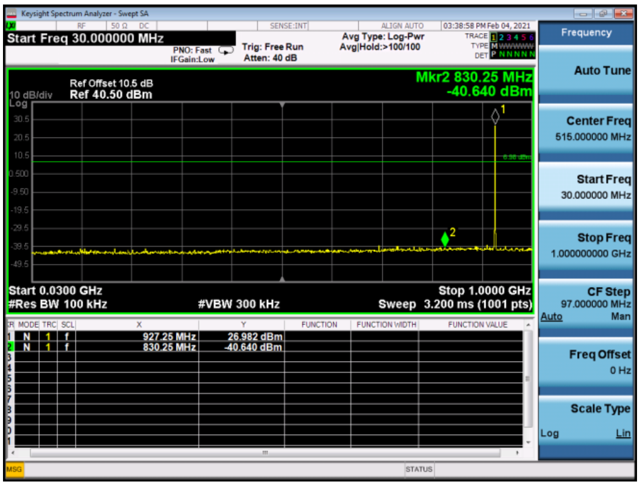


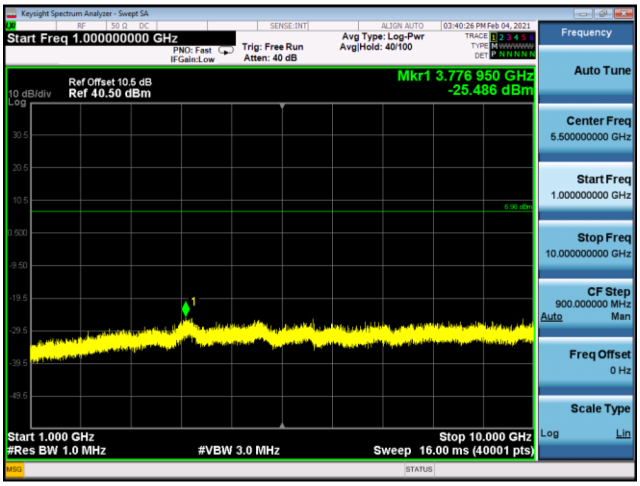
L channel





M channel





H channel

2.8. Conducted Band Edge

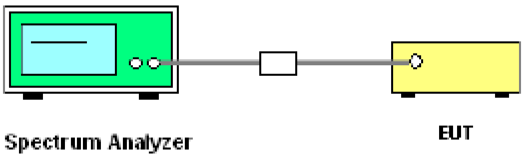
2.8.1. Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

2.8.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.8.3. Test Setup



2.8.1. Test Procedure

1. The testing follows ANSI C63.10-2013 Clause 7.8.6.

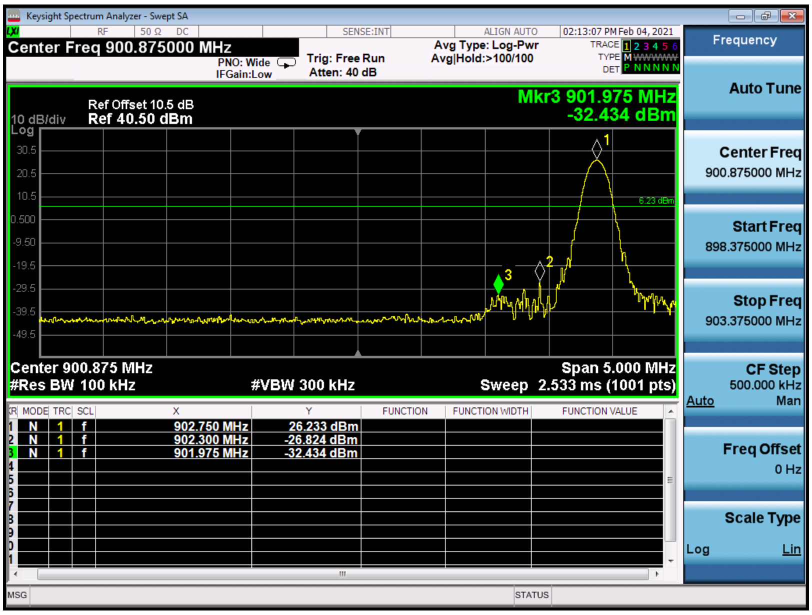
2. Set to the maximum power setting and enable the EUT transmit continuously.

3. Set RBW = 100kHz (⩾1% span=5MHz), VBW = 300kHz (⩾RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.

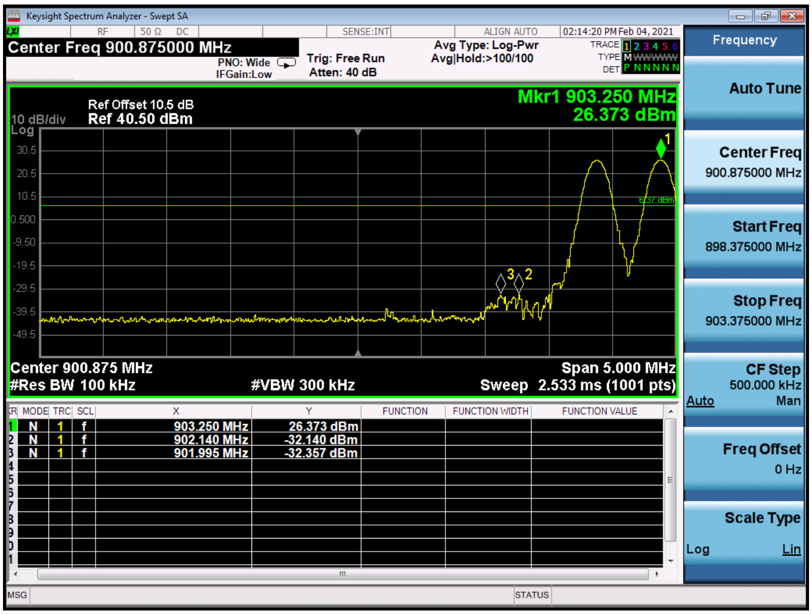
4. Enable hopping function of the EUT and then repeat step 2. and 3.

5. Measure and record the results in the test report.

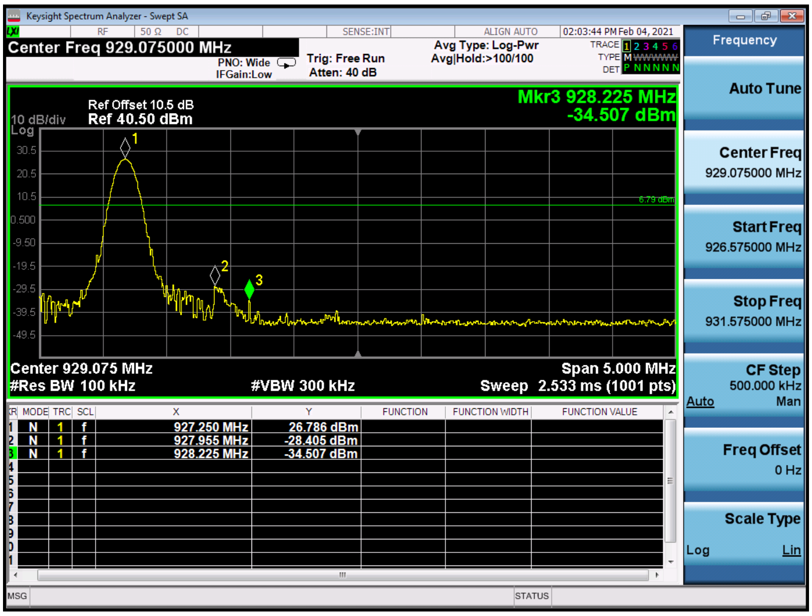
2.8.2. Test Results of Conducted Band Edge



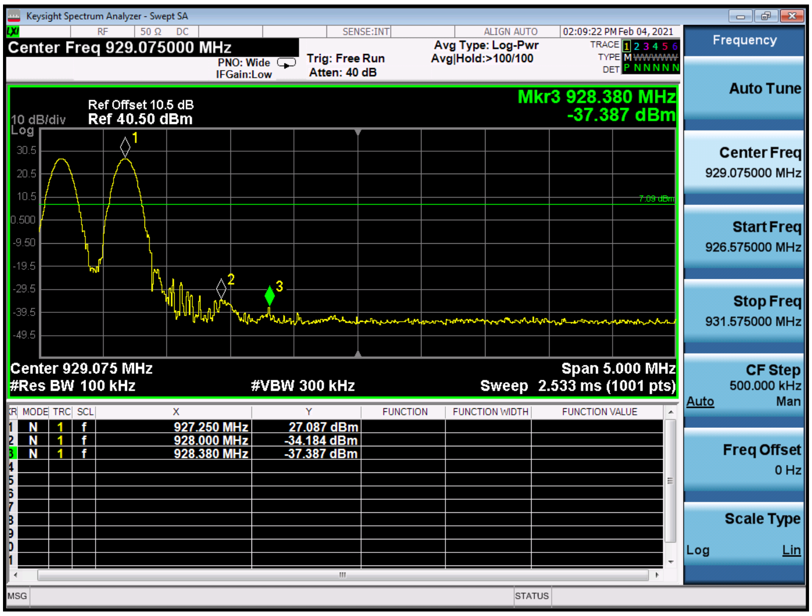
L channel



L channel Hopping Mode



H channel



H channel Hopping Mode

2.9. Conducted Emission

2.9.1. Limit of Conducted Emission

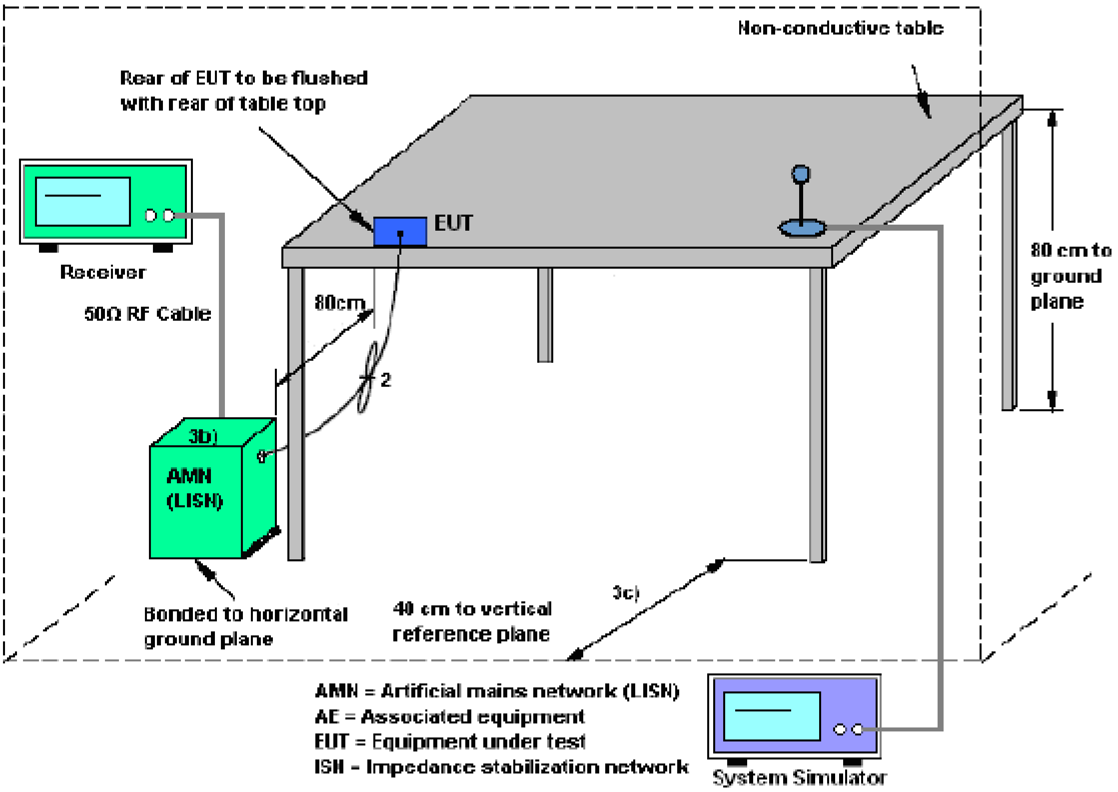
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

2.9.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

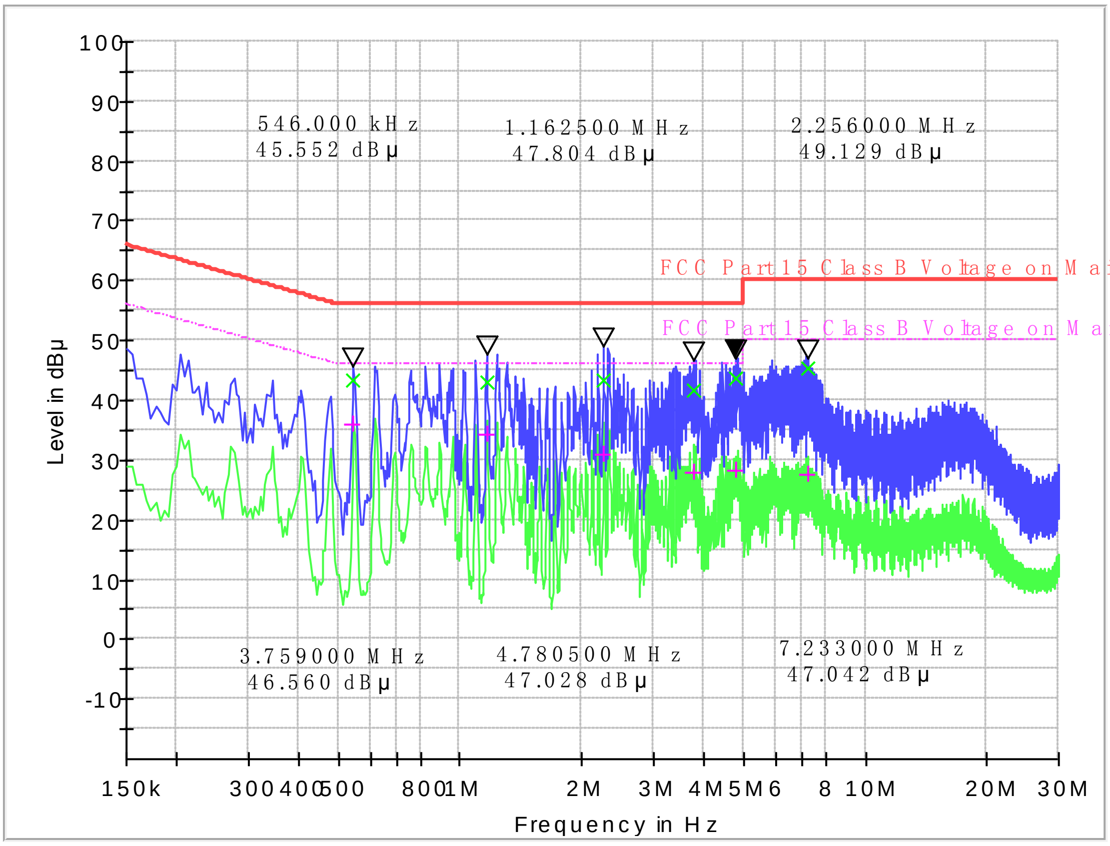
2.9.3. Test Setup



2.9.4. Test Procedures

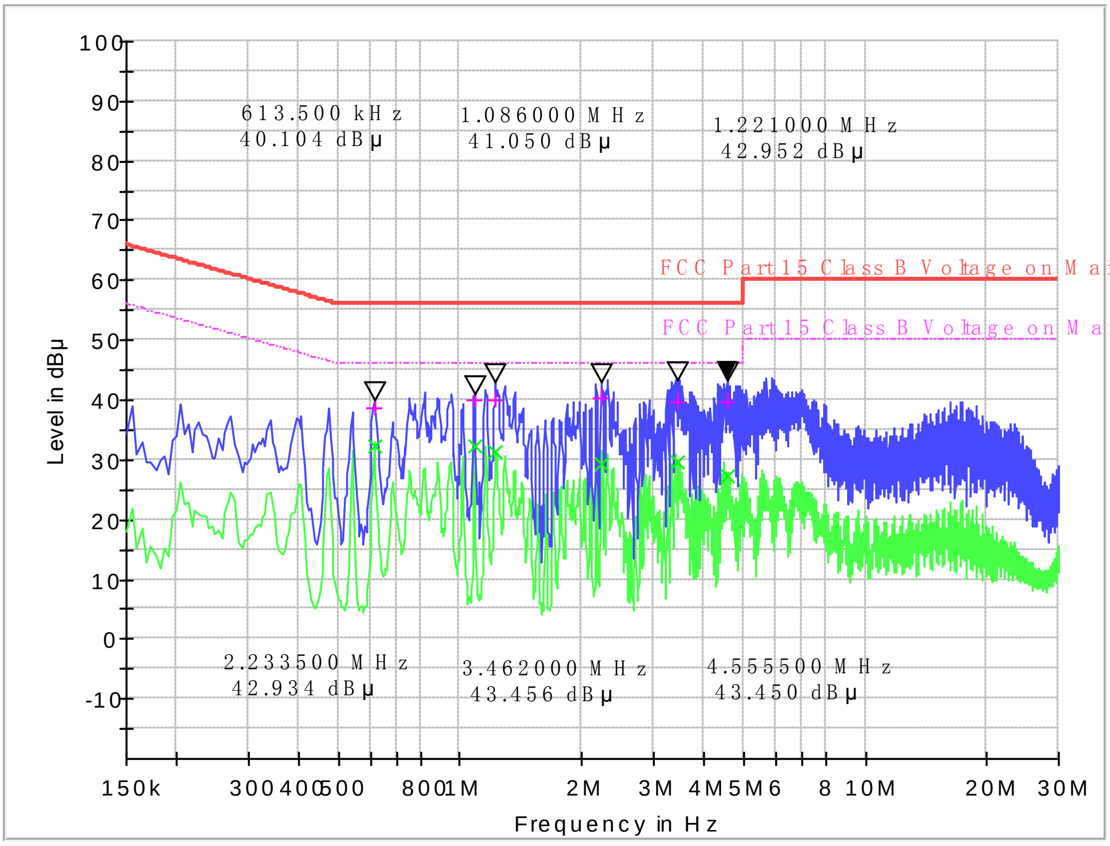
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 micrometry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

2.9.3. Test Results of Conducted Emission



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dB µ V)	CAverage (dB µ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB µ V)
0.546000	43.32	36.13	0.1	10.1	12.68	56.0	9.87	46.0
1.162500	43.00	34.46	0.1	10.1	13.00	56.0	11.54	46.0
2.256000	43.31	31.04	0.6	10.6	12.69	56.0	14.96	46.0
3.759000	41.77	27.92	0.6	10.6	14.23	56.0	18.08	46.0
4.780500	43.61	28.15	0.6	10.6	12.39	56.0	17.85	46.0
7.233000	45.36	27.63	0.7	10.7	14.64	60.0	22.37	50.0



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak (dB µ V)	CAverage (dB µ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB µ V)
0.613500	38.73	32.37	0.1	10.1	17.27	56.0	13.63	46.0
1.086000	39.92	32.44	0.1	10.1	16.08	56.0	13.56	46.0
1.221000	39.91	31.32	0.6	10.6	16.09	56.0	14.68	46.0
2.233500	40.26	29.26	0.6	10.6	15.74	56.0	16.74	46.0
3.462000	39.56	29.59	0.6	10.6	16.44	56.0	16.41	46.0
4.555500	39.63	27.34	0.7	10.7	16.37	56.0	18.66	46.0

Test Result: PASS

Note: Correction factor=Cabel loss+ attenuation factor

attenuation factor=10dB

2.10. Radiated Band Edges and Spurious Emission

2.10.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

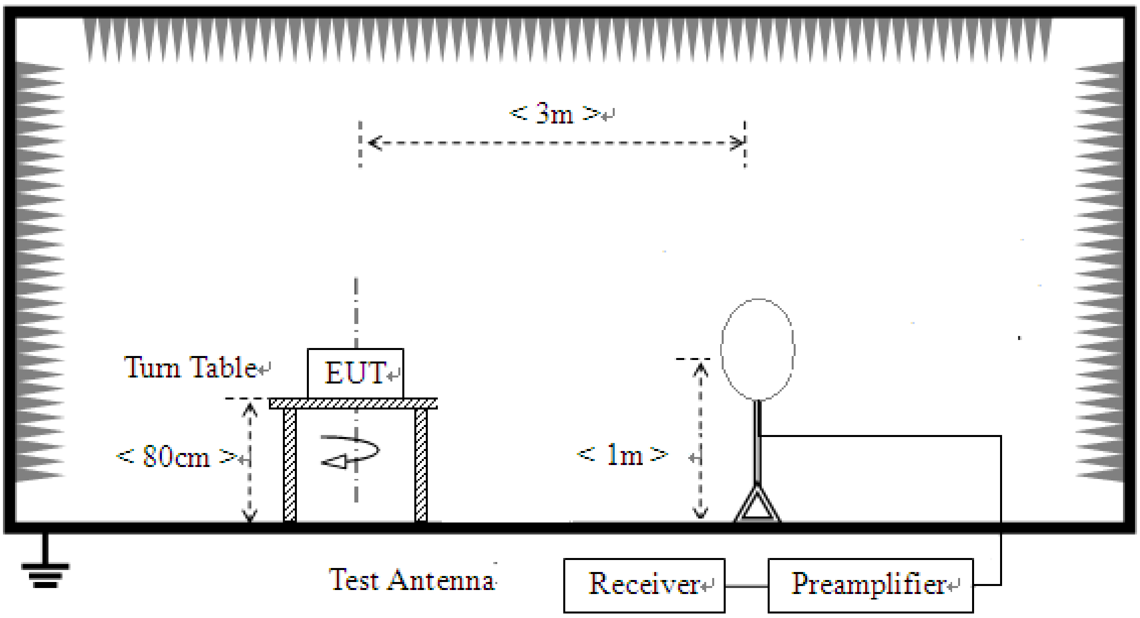
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.10.2. Measuring Instruments

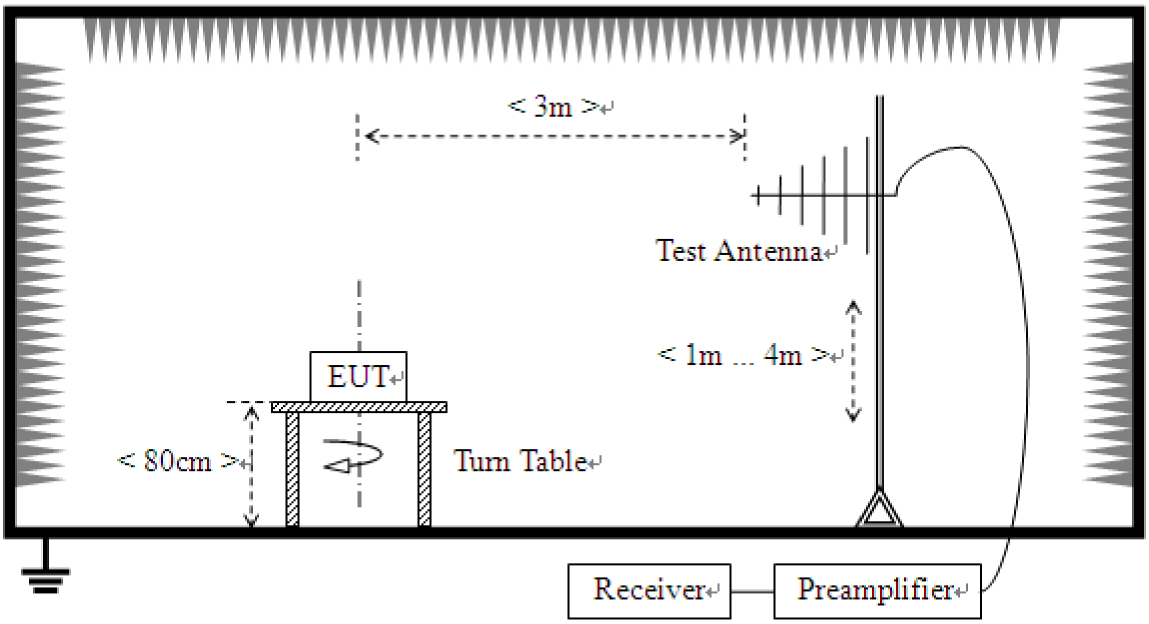
The measuring equipment is listed in the section 3 of this test report.

2.10.3. Test Setup

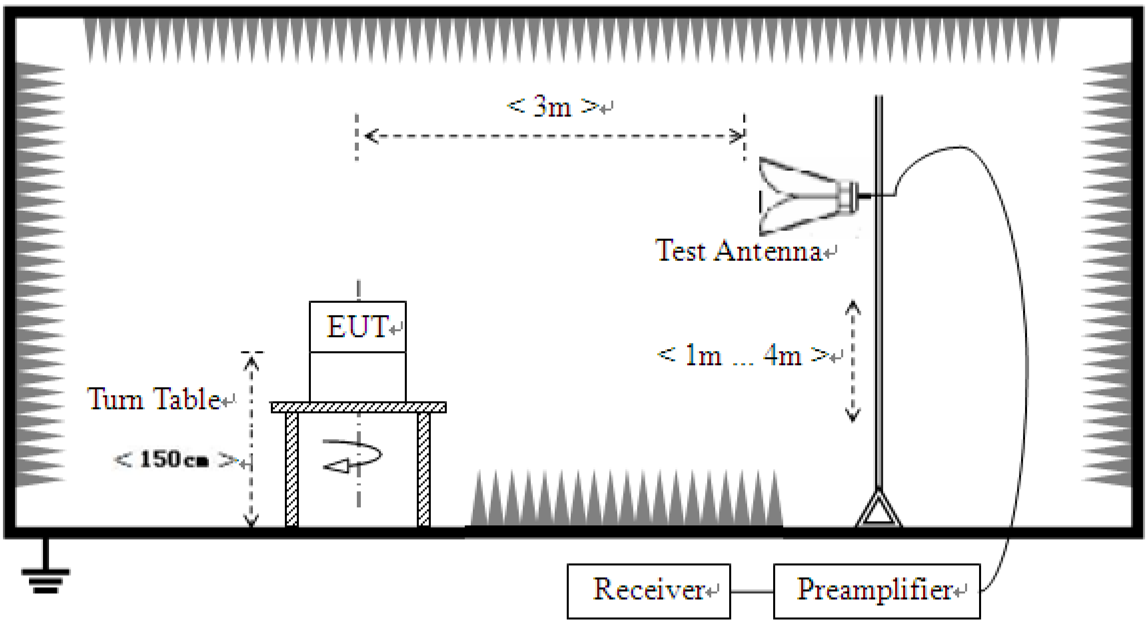
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



2.10.4. Test Procedure

1. The EUT was placed on a turntable with 0.8m below 1GHz 1.5m above 1GHz above the ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:

(1) Span shall wide enough to fully capture the emission being measured;

(2) Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak

(3) For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds

On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+Nn*Ln$

Where N_1 is number of type 1 pulses, L1 is length of type 1 pulses, etc.

Average Emission Level = Peak Emission Level + 20*log(Duty cycle)

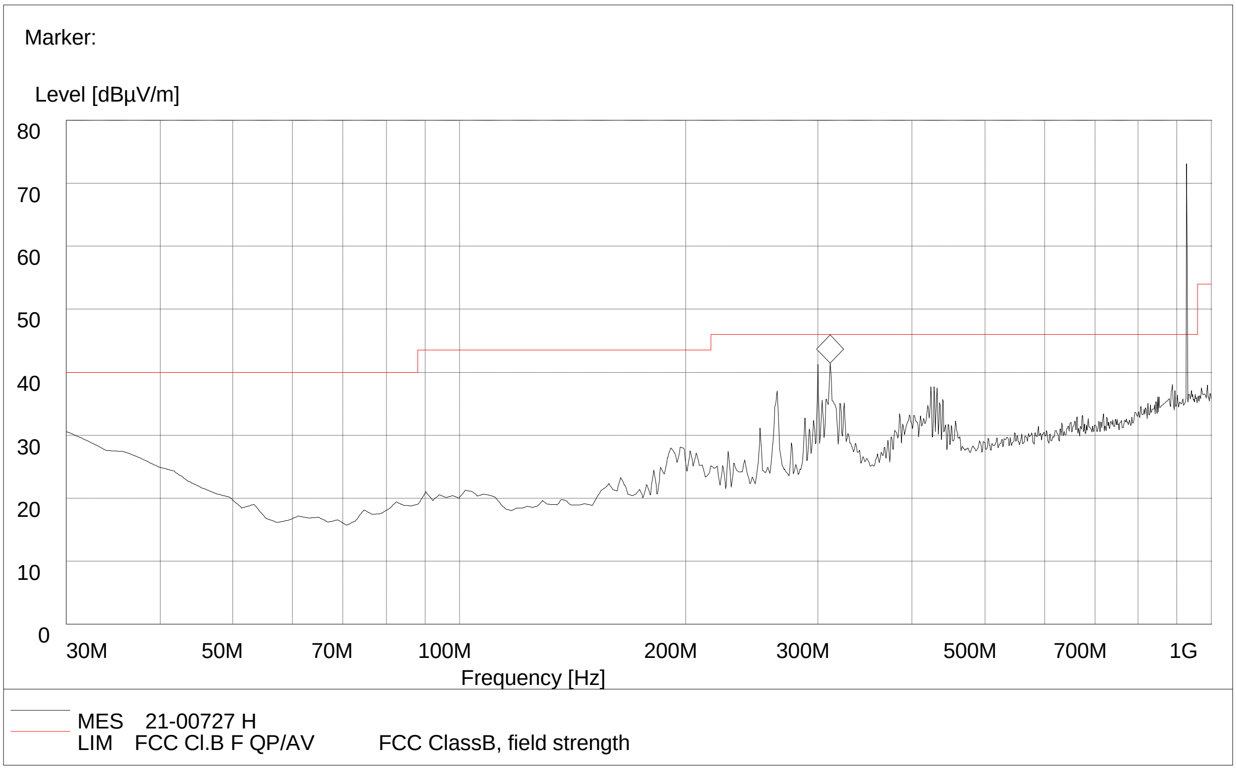
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. Device under transmit mode and filter the fundamental .

2.10.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 KHz to 30MHz

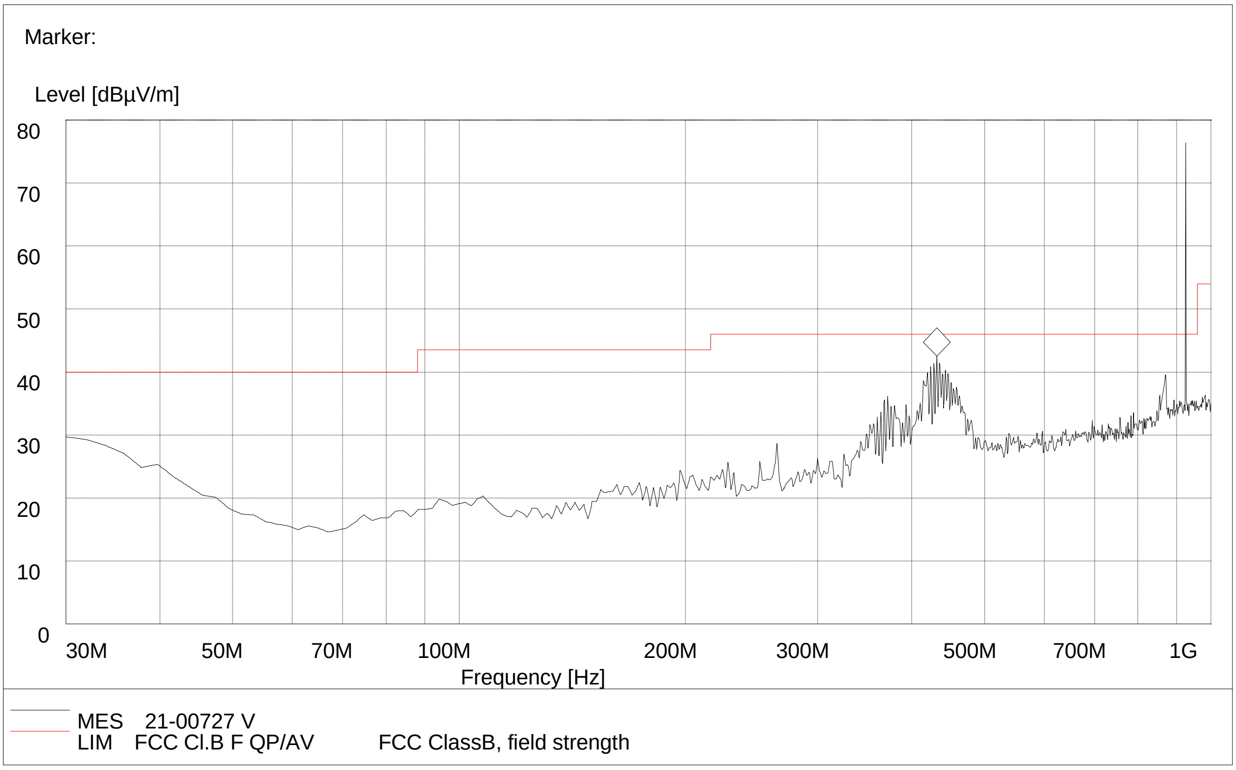
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000MHz



Plot A: 30MHz to 1GHz, Antenna Horizontal

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Corr. Factor (dB/m)	Antenna height (cm)	Limit (dBµV/m)	Margin	Antenna	Verdict
191.0200	27.98	120.000	10.3	100.0	43.5	15.52	Horizontal	Pass
251.1600	31.13	120.000	11.6	100.0	46.0	14.87	Horizontal	Pass
264.7400	37.01	120.000	11.9	100.0	46.0	8.99	Horizontal	Pass
299.6600	41.22	120.000	13.1	100.0	46.0	4.78	Horizontal	Pass
311.3000	41.43	120.000	13.1	100.0	46.0	4.57	Horizontal	Pass
396.6600	33.22	120.000	17.5	100.0	46.0	12.78	Horizontal	Pass



Plot B: 30MHz to 1GHz, Antenna Vertical

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Corr. Factor (dBμV/m)	Antenna height (cm)	Limit (dBμV/m)	Margin	Antenna	Verdict
264.740000	28.66	120.000	11.9	100.0	46.0	17.34	Vertical	Pass
359.800000	32.83	120.000	15.8	100.0	46.0	13.17	Vertical	Pass
371.440000	36.16	120.000	15.8	100.0	46.0	9.84	Vertical	Pass
419.940000	39.88	120.000	17.5	100.0	46.0	6.12	Vertical	Pass
431.580000	42.49	120.000	18.5	100.0	46.0	3.51	Vertical	Pass
870.020000	39.59	120.000	23.9	100.0	46.0	6.41	Vertical	Pass

(30MHz to 1GHz, Antenna Vertical)

Above 1GHz Data:

Suspected List									
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	902.00	39.99	26.54	54.00	14.01	AV	150	78	Horizontal
2	902.00	47.66	26.54	74.00	26.34	PK	150	102	Horizontal
3	1805.9	34.63	-11.15	74.00	39.37	PK	100	30	Horizontal
4	1809.3	27.28	-11.11	54.00	26.72	AV	100	20	Horizontal
5	2710.5	31.16	-6.30	54.00	22.84	AV	100	20	Horizontal
6	2710.5	38.78	-6.30	74.00	35.22	PK	100	20	Horizontal
7	3611.7	42.99	-1.82	74.00	31.01	PK	100	30	Horizontal
8	3611.7	35.21	-1.82	54.00	18.79	AV	100	20	Horizontal

Suspected List									
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	902.00	40.00	26.54	54.00	14.00	AV	150	49	Vertical
2	902.00	48.31	26.54	74.00	25.69	PK	150	156	Vertical
3	1805.9	27.17	-11.15	54.00	26.83	AV	100	120	Vertical
4	1809.3	36.09	-11.11	74.00	37.91	PK	100	130	Vertical
5	2710.5	40.60	-6.30	74.00	33.40	PK	100	100	Vertical
6	2710.5	32.88	-6.30	54.00	21.12	AV	100	120	Vertical
7	3611.7	35.68	-1.82	54.00	18.32	AV	100	70	Vertical
8	3611.7	43.70	-1.82	74.00	30.30	PK	100	150	Vertical

CH26 915.25MHz

Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1833.1	36.02	-10.83	74.00	37.98	PK	100	10	Horizontal
2	1833.1	28.01	-10.83	54.00	25.99	AV	100	10	Horizontal
3	2747.9	32.08	-6.12	54.00	21.92	AV	100	20	Horizontal
4	2751.3	38.41	-6.11	74.00	35.59	PK	100	20	Horizontal
5	3662.7	42.63	-1.51	74.00	31.37	PK	100	40	Horizontal
6	3662.7	35.73	-1.51	54.00	18.27	AV	100	30	Horizontal

Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1833.1	34.26	-10.83	74.00	39.74	PK	100	20	Vertical
2	1833.1	28.09	-10.83	54.00	25.91	AV	100	10	Vertical
3	2747.9	31.21	-6.12	54.00	22.79	AV	100	20	Vertical
4	2751.3	39.23	-6.11	74.00	34.77	PK	100	20	Vertical
5	3662.7	43.82	-1.51	74.00	30.18	PK	100	30	Vertical
6	3662.7	36.13	-1.51	54.00	17.87	AV	100	30	Vertical

CH50 927.25MHz

Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	928.00	47.98	26.88	74.00	26.02	PK	150	357	Horizontal
2	928.00	40.15	26.88	54.00	13.85	AV	150	357	Horizontal
3	1856.9	33.59	-10.55	74.00	40.41	PK	100	20	Horizontal
4	1860.3	27.47	-10.51	54.00	26.53	AV	100	40	Horizontal
5	2781.9	31.82	-5.96	54.00	22.18	AV	100	30	Horizontal
6	2785.3	38.93	-5.95	74.00	35.07	PK	100	40	Horizontal
7	3710.3	43.16	-1.26	74.00	30.84	PK	100	30	Horizontal
8	3713.7	35.46	-1.25	54.00	18.54	AV	100	30	Horizontal

Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	928.00	48.04	26.88	74.00	25.96	PK	150	225	Vertical
2	928.00	40.43	26.88	54.00	13.57	AV	150	337	Vertical
3	1856.9	34.28	-10.55	74.00	39.72	PK	100	30	Vertical
4	1860.3	27.26	-10.51	54.00	26.74	AV	100	20	Vertical
5	2781.9	30.93	-5.96	54.00	23.07	AV	100	20	Vertical
6	2785.3	38.01	-5.95	74.00	35.99	PK	100	30	Vertical
7	3710.3	44.50	-1.26	74.00	29.50	PK	100	20	Vertical
8	3713.7	36.69	-1.25	54.00	17.31	AV	100	10	Vertical

REMARKS:
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI TEST RECEIVER	R&S	ESU8	A0805559	2020.04.03	2021.04.02
2	Power Meter	R&S	NRP-Z31	102872	2020.05.18	2021.05.17
3	TURNTABLE	ETS	2088	2149	N/A	N/A
4	ANTENNA MAST	ETS	2075	2346	N/A	N/A
5	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
6	Horn antenna (18GHz~26.5GHz)	AR	AT4003A	325306	2020.09.16	2022.09.15
7	Amplifier 30M~1GHz	MILMEGA	80RF1000-10004	A140101634	2020.03.24	2021.03.23
8	Amplifier 1G~18GHz	MILMEGA	AS0104R-800/400	A160302517	2020.03.24	2021.03.23
9	High pass filter	Compliance Direction systems	BSU-6	34202	2020.11.10	2021.11.09
10	Horn Antenna	R&S	HF906	A0304225	2019.04.17	2022.04.16
11	Horn Antenna	R&S	ESIB7	A0501375	2020.06.24	2021.06.23
12	ULTRA-BROADBAND ANTENNA	SCHWARZBECK	VULB9160	A0805560	2019.05.24	2022.05.23
13	Passive Loop Antenna	R&S	HFH2-Z2	100047	2019.04.26	2022.04.25
14	Temperature chamber	XSM	DNF810C	A0501375	2020.05.26	2021.05.25
15	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2020.05.18	2021.05.17
16	Power Supply	R&S	ESIB26	A0304218	2020.04.29	2021.04.28
17	LISN	ROHDE&SCHWARZ	ESH2-Z5	A0304221	2020.04.03	2021.04.02

** END OF REPORT **