



RF TEST REPORT

Applicant Emerson White-Rodgers

FCC ID 2A4JN-ST765470

Product Sensi Touch 2

Brand Sensi

Model 1F96U-42WFB; 1F96U-42WF; ST76; ST76W; ST76U;
ST76WU; 1F96U-42WFBC; 1F96U-42WFC; ST76C;
ST76WC

Report No. R2211A1116-R1V2

Issue Date January 6, 2023

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2022)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	January 4, 2023
Rev.1	Update description.	January 4, 2023
Rev.2	Update information.	January 6, 2023
Note: This revised report (Report No.: R2211A1116-R1V2) supersedes and replaces the previously issued report (Report No.: R2211A1116-R1V1). Please discard or destroy the previously issued report and dispose of it accordingly.		

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	Frequency Hopping System	15.247 (g), (h)	PASS
2	Output Power	15.247(b) (2)	PASS
3	Occupied Bandwidth (20dB)	15.247 (a) (1) (i)	PASS
4	Frequency Separation	15.247 (a) (1) (i)	PASS
5	Time of Occupancy (Dwell Time)	15.247 (a) (1) (i)	PASS
6	Band Edge Compliance	15.247(d)	PASS
7	Number of Hopping Frequency	15.247 (a) (1) (i)	PASS
8	Spurious RF Conducted Emissions	15.247(d)	PASS
9	Unwanted Emissions	15.247(d)	PASS
10	Conducted Emissions	15.207	PASS

Date of Testing: December 3, 2022 ~ December 16, 2022

Date of Sample Received: November 29, 2022

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City: Shanghai
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Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Applicant and Manufacturer Information

Applicant	Emerson White-Rodgers
Applicant address	8100 West Florissant Ave St. Louis, United States of America
Manufacturer	Emerson White-Rodgers
Manufacturer address	8100 West Florissant Ave St. Louis, United States of America

2.2 General information

EUT Description	
Model	1F96U-42WFB; 1F96U-42WF; ST76; ST76W; ST76U; ST76WU; 1F96U-42WFBC; 1F96U-42WFC; ST76C; ST76WC
SN	LSR305240-62
Hardware Version	0059-5470 REV.C
Software Version	0170-1640v01_02.hex
Power Supply	External power supply
Antenna Type	PCB Antenna
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)
Antenna Gain	0.41 dBi
Test Mode(s)	Model 900MHz
Modulation Type	FSK2
Total Channel Number	67
Channel Space	380 kHz
Max. Output Power	14.36 dBm
Operating Frequency Range(s)	902 ~ 928MHz
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. The main test model is ST76 in this report.	



Model Difference Table				
Model Number	Description	Color	Channel	Instructions
1F96U-42WFB	Sensi Touch 2	Black	Pro	English
1F96U-42WF	Sensi Touch 2	White	Pro	English
ST76	Sensi Touch 2	Black	Retail	English
ST76W	Sensi Touch 2	White	Retail	English
ST76U	Sensi Touch 2	Black	Utility	English
ST76WU	Sensi Touch 2	White	Utility	English
1F96U-42WFBC	Sensi Touch 2	Black	Pro	French / English
1F96U-42WFC	Sensi Touch 2	White	Pro	French / English
ST76C	Sensi Touch 2	Black	Retail	French / English
ST76WC	Sensi Touch 2	White	Retail	French / English
Note: The customer declares that the models have the same PCB assembly, the only difference is color, package and sale channels.				

3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 15C (2022) Radio Frequency Devices

ANSI C63.10-2013

Reference standard:

KDB 558074 D01 15.247 Meas Guidance v05r02



3.1 Test Configuration

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

4 Information about the FHSS characteristics

4.1 Frequency Hopping System Requirement

Standard requirement:

(g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

5 Test Case Results

5.1 Output Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the spectrum analyzer and 915MHz band test set via a power splitter with a known loss. The EUT is controlled by the 915MHz band test set to ensure max power transmission with proper modulation. The peak detector is used. RBW is set to 2 MHz; VBW is set to 6 MHz. These measurements have been tested at following channels: 0, 33 and 66.

Test Setup



Limits

Rule Part 15.247 (b) (2) specifies that " 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."

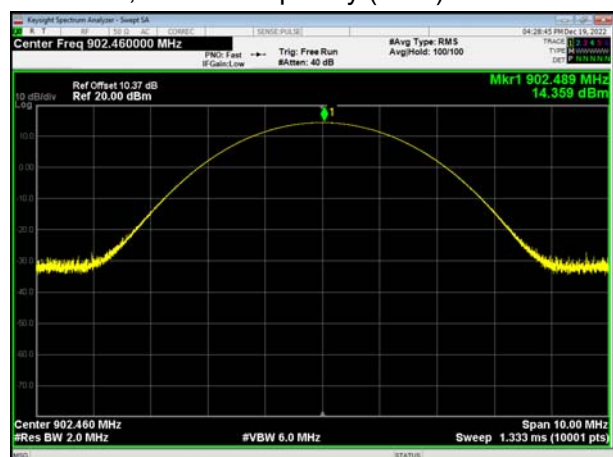
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=0.44$ dB.

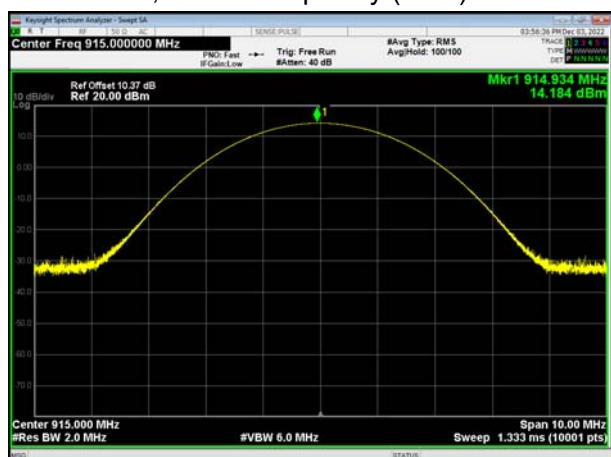
Test Results

Test Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Conclusion
Model 900MHz	0	902.46	14.360	30	PASS
	33	915	14.180	30	PASS
	66	927.54	14.110	30	PASS

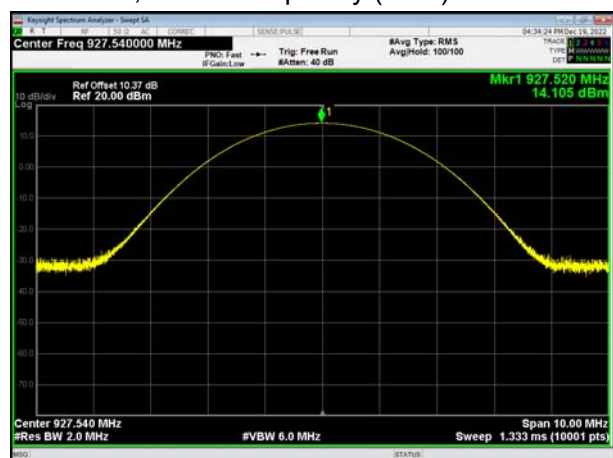
CH0, Carrier frequency (MHz): 902.46



Ch33, Carrier frequency (MHz): 915



Ch66, Carrier frequency (MHz): 927.54



5.2 Occupied Bandwidth (20dB)

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Model 900MHz test set via a power splitter with a known loss. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 30kHz and VBW is set to 100kHz on spectrum analyzer. -20dB occupied bandwidths are recorded.

Test Setup



Limits

No specific occupied bandwidth requirements in part 15.247(a) (1) (i).

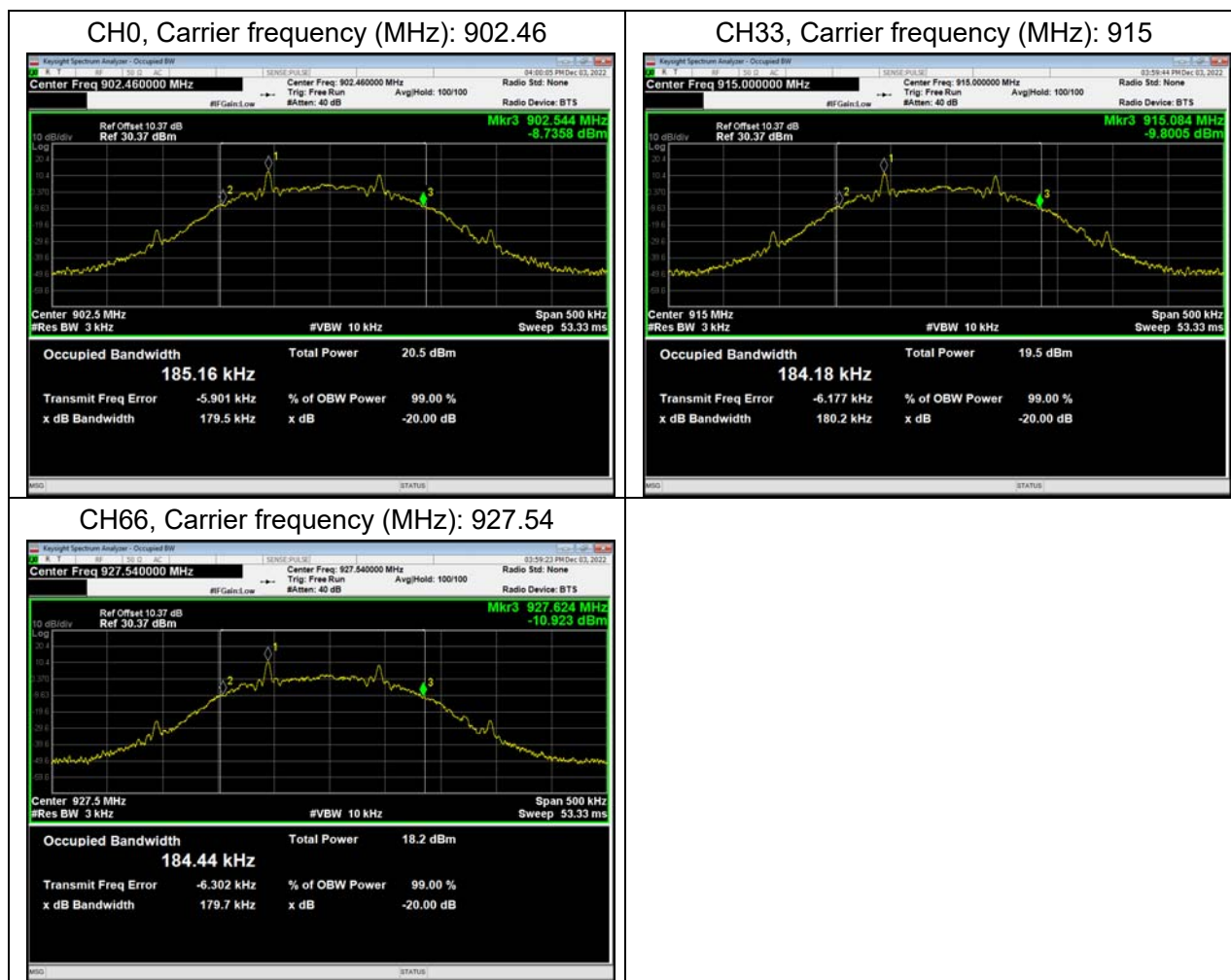
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period;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

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=936$ Hz.

Test Results

Test Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	20dB Bandwidth(MHz)
Model 900MHz	0	902.46	0.185	0.179
	33	915	0.184	0.180
	66	927.54	0.184	0.180



5.3 Frequency Separation

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Model 900MHz test set via a power splitter with a known loss. RBW is set to 30 kHz and VBW is set to 100 kHz on spectrum analyzer. Set EUT on Hopping on mode.

Test setup



Limits

Rule Part 15.247(a)(1) (i) specifies that “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. ”

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=936$ Hz.

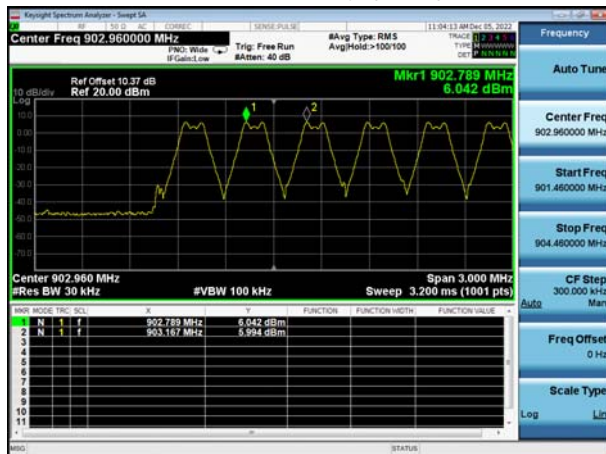


Test Results:

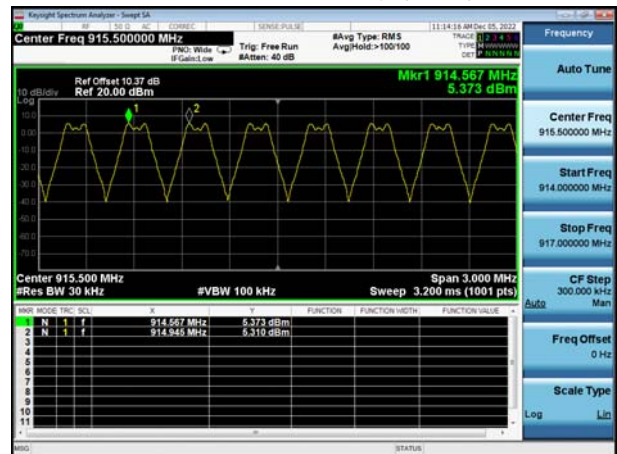
Test Mode	Carrier frequency (MHz)	Carrier frequency separation(MHz)	Limit (MHz)	Conclusion
Model 900MHz	902.46	0.378	0.179	PASS
	915	0.378	0.180	PASS
	927.54	0.378	0.180	PASS

Note: The limit is 20 dB bandwidth.

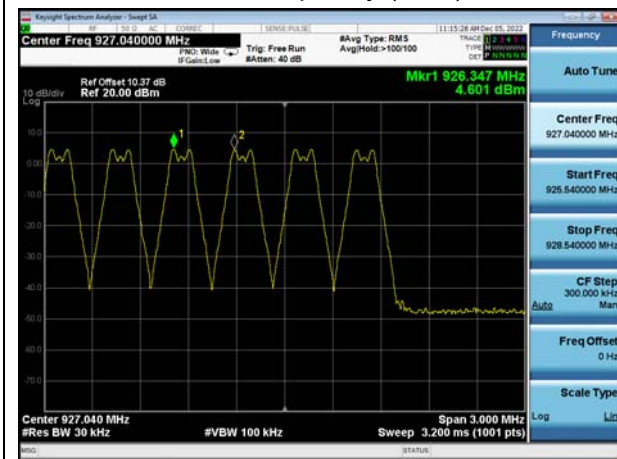
CH0, Carrier frequency (MHz): 902.46



CH33, Carrier frequency (MHz): 915



CH66, Carrier frequency (MHz): 927.54



5.4 Time of Occupancy (Dwell Time)

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT was connected to the spectrum analyzer and Model 900MHz test set via a power splitter with a known loss. RBW 100 KHz, VBW 300 KHz. The dwell time is calculated by:

Dwell time = Average Transmit Time/ Channel (ms)*Number of Hops in 20s

Test Setup



Limits

Rule Part15.247(a) (1) (i) specifies that " 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."

Dwell time	≤ 400ms
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$.

Requirements	Uncertainty
Dwell Time	$U=0.70\text{ms}$

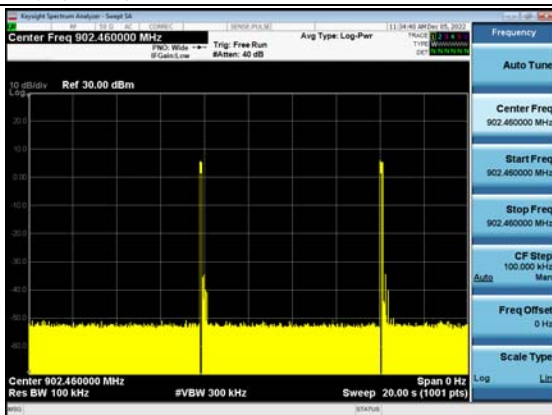
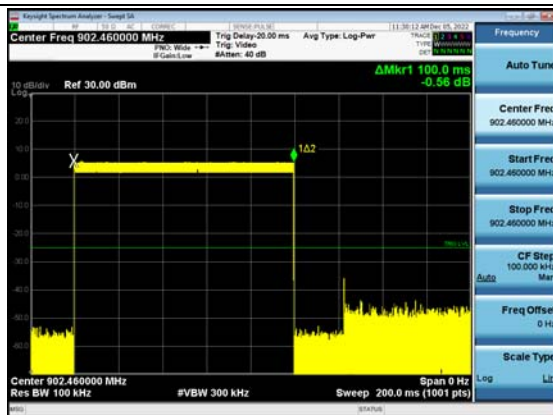


Test Results:

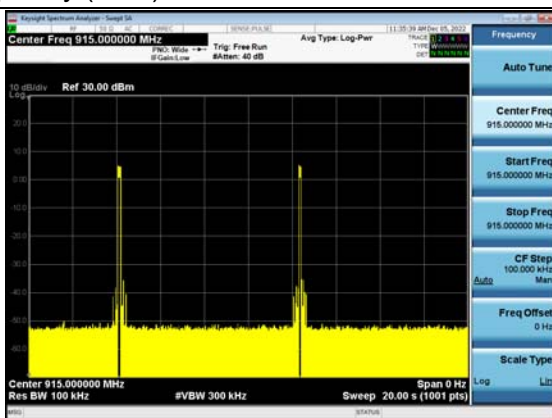
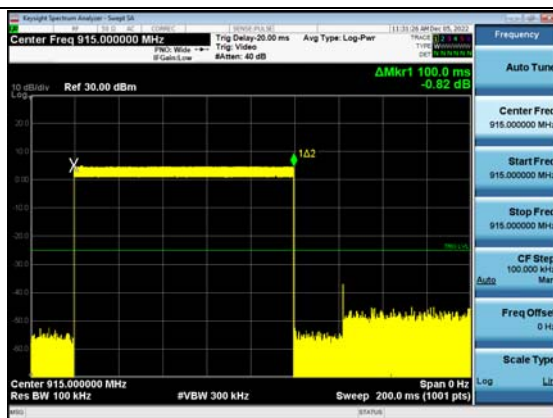
Test Mode	Channel	Average Transmit Time/ Channel (ms)	Number of Hops in 20s	Dwell time (ms)	Limit (ms)	Conclusion
Model 900MHz	0	100	2	200	400	PASS
	33	100	2	200	400	PASS
	66	100	2	200	400	PASS

Note: Dwell time = time slot length * hop rate * 0.4s

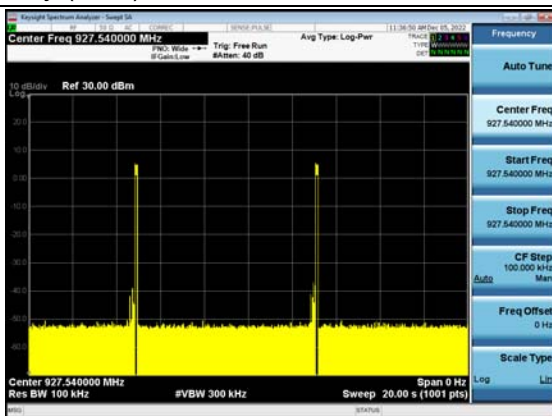
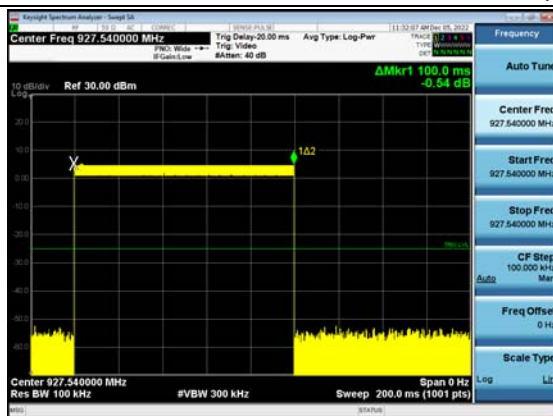
CH0, Carrier frequency (MHz): 902.46



CH33, Carrier frequency (MHz): 915



CH66, Carrier frequency (MHz): 927.54



5.5 Band Edge Compliance

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Model 900MHz test set via a power splitter with a known loss. The lowest and highest channels were measured. The peak detector is used. RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. EUT test for Hopping On mode and Hopping Off mode.

Test Setup



Limits

Rule Part 15.247(d) specifies that “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.”

Measurement Uncertainty

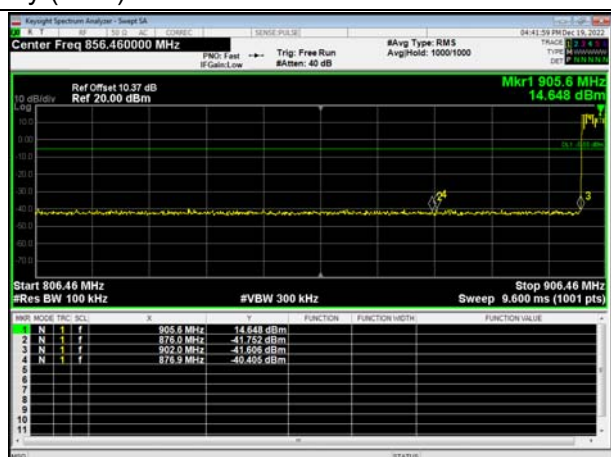
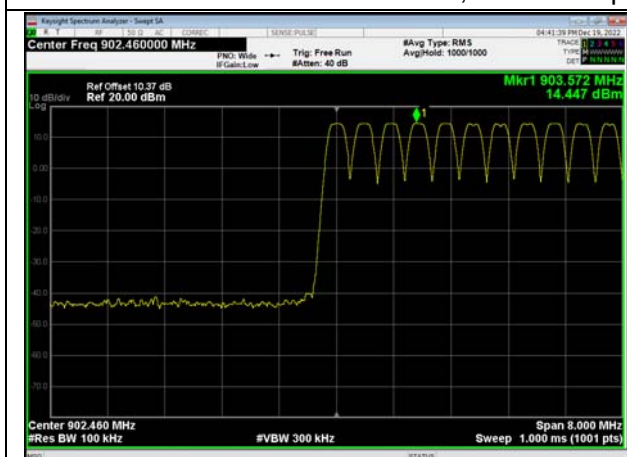
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

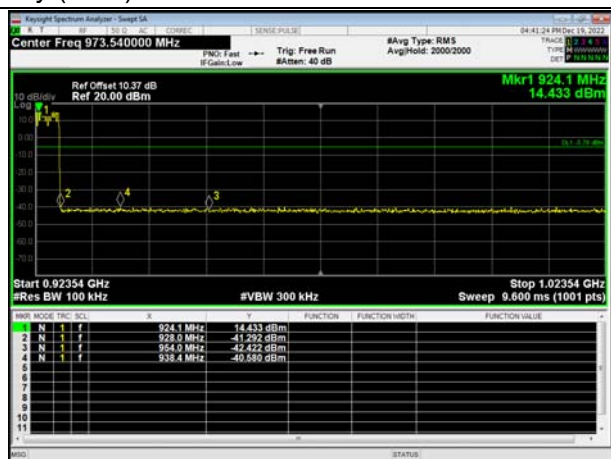
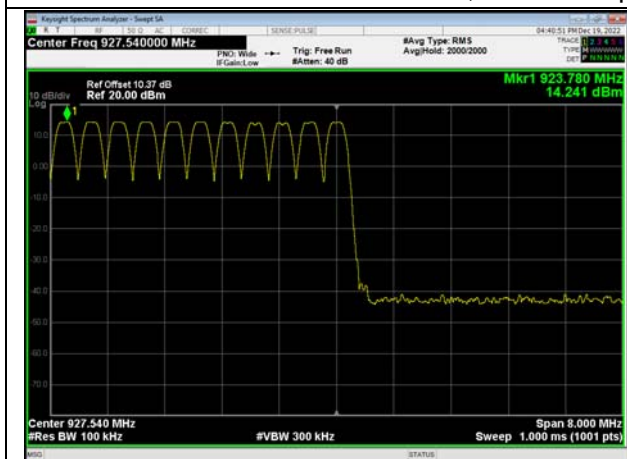
Test Results

Hopping On

CH0, Carrier frequency (MHz): 902.46



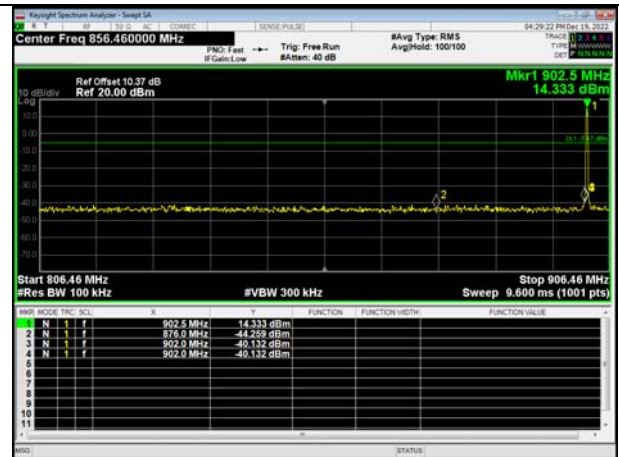
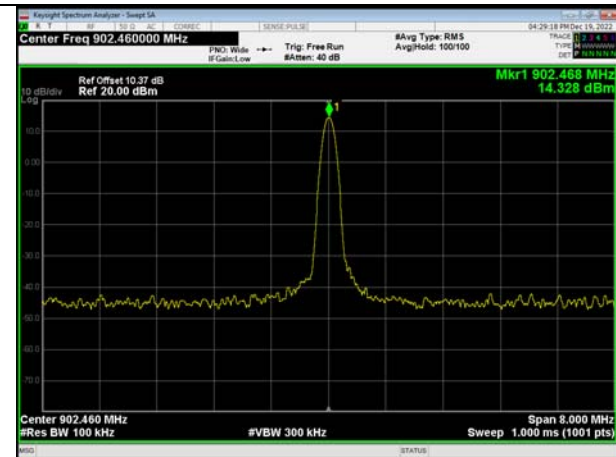
CH66, Carrier frequency (MHz): 927.54



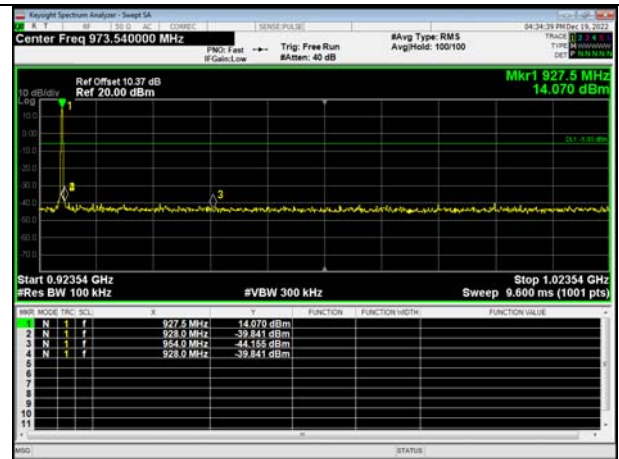
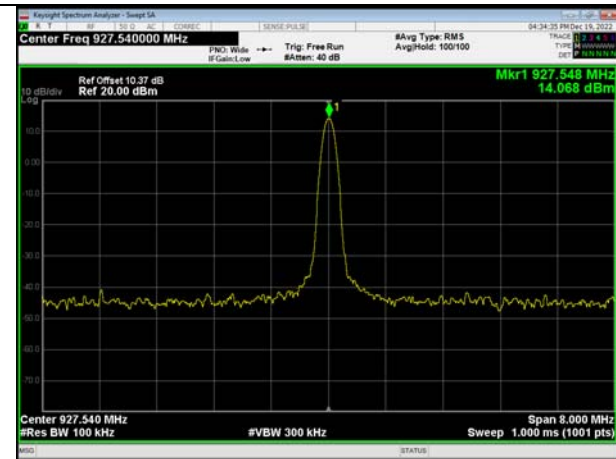


Hopping Off

CH0, Carrier frequency (MHz): 902.46



CH66, Carrier frequency (MHz): 927.54



5.6 Number of hopping Frequency

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Model 900MHz test set via a power splitter with a known loss. RBW is set to 100kHz and VBW is set to 300kHz on spectrum analyzer. Set EUT on Hopping on mode.

Test setup



Limits

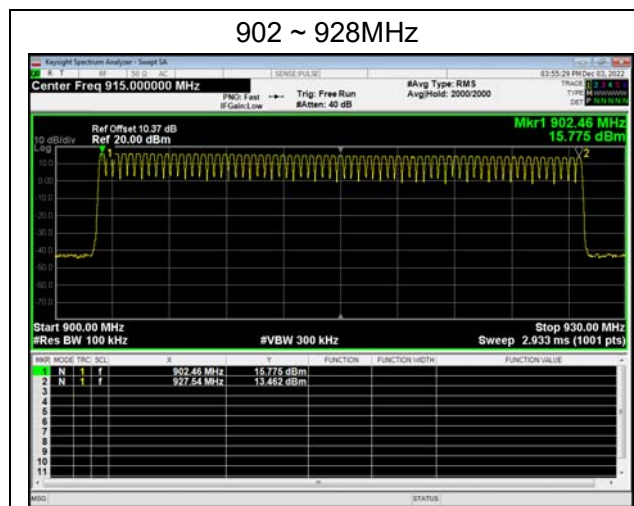
Rule Part 15.247(a) (1) (i)

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.

Frequency Band	20 dB Bandwidth of the hopping channel	Hopping Number
902 ~ 928	≤250 kHz	≥50 channels
	≥250 kHz	≥25 channels

Test Results:

Channel	Range (MHz)	Number of hopping channels	Limits	conclusion
Middle Channel	902 ~ 928	67	≥50 channels	PASS



5.7 Spurious RF Conducted Emissions

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Model 900MHz test set via a power splitter with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. Set RBW 100kHz and VBW 300 kHz, Sweep is set to ATUO.

The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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 Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
Model 900MHz	902.46	14.33	-5.67
	915	14.20	-5.80
	927.54	14.06	-5.94

Measurement Uncertainty

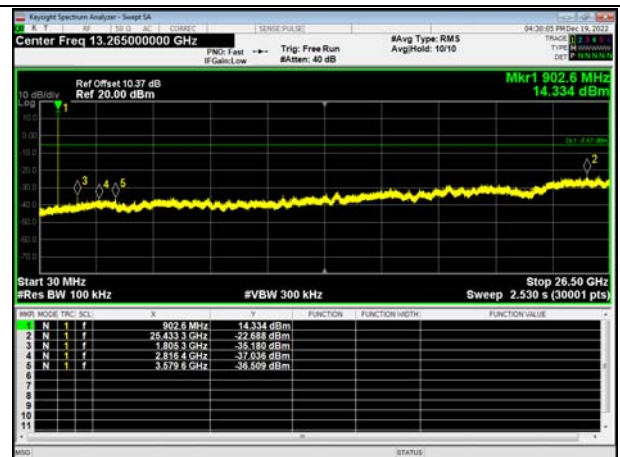
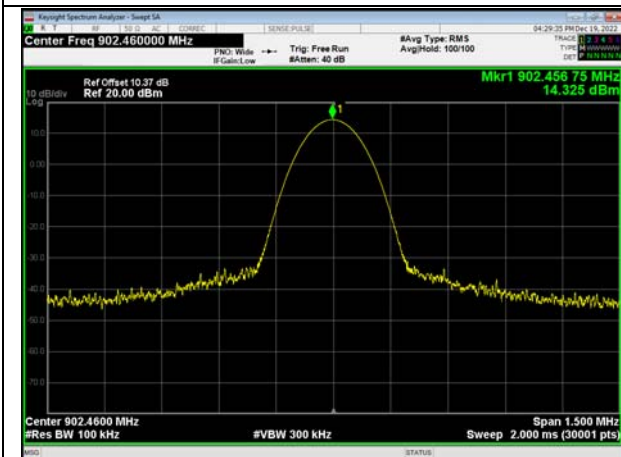
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

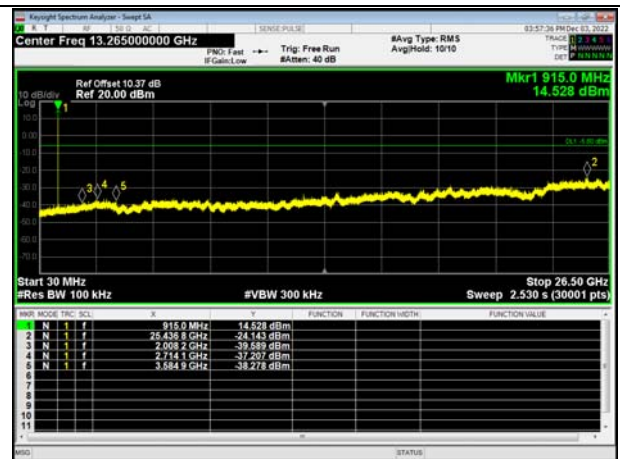
Test Results:

The signal beyond the limit is carrier.

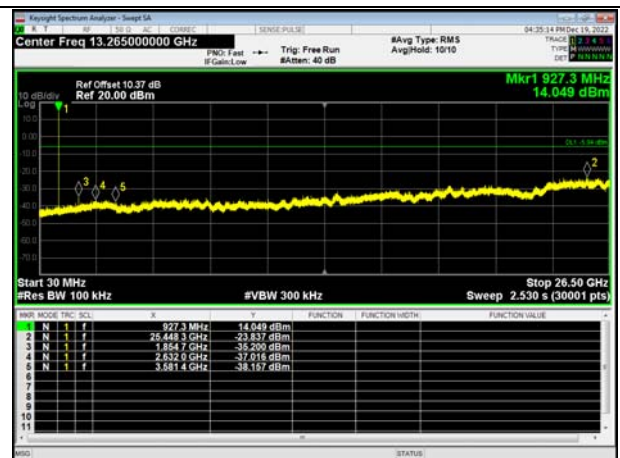
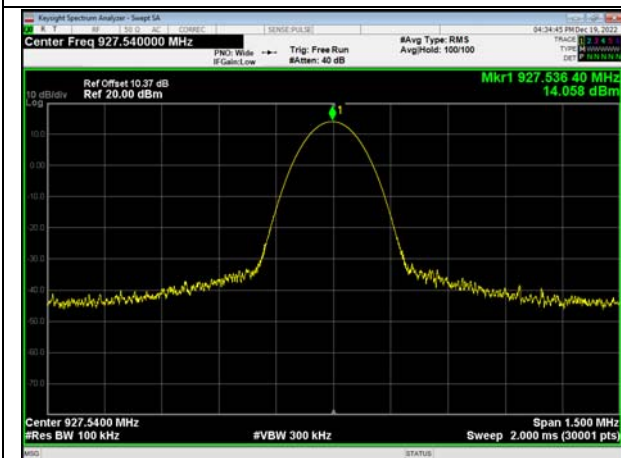
CH0 30MHz to 26.5GHz



CH33 30MHz to 26.5GHz



CH66 30MHz to 26.5GHz



5.8 Unwanted Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

9kHz~150 kHz

RBW=200Hz, VBW=1kHz/ Sweep=AUTO

150 kHz~30MHz

RBW=9KHz, VBW=30KHz,/ Sweep=AUTO

Below 1GHz

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz

(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

detector; The measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit.

If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak- average correction factor, derived form the appropriate duty cycle calculation.

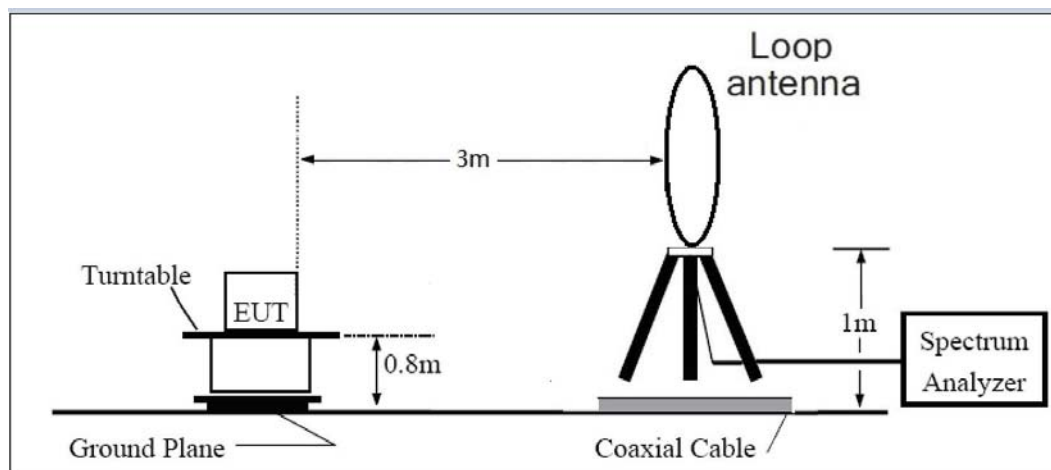
This setting method can refer to **KDB 558074 D01**.

This mode was measured in the following mode: EUT with cradle and EUT without cradle. The worst emission was found in EUT with cradle mode and the worst case was recorded.

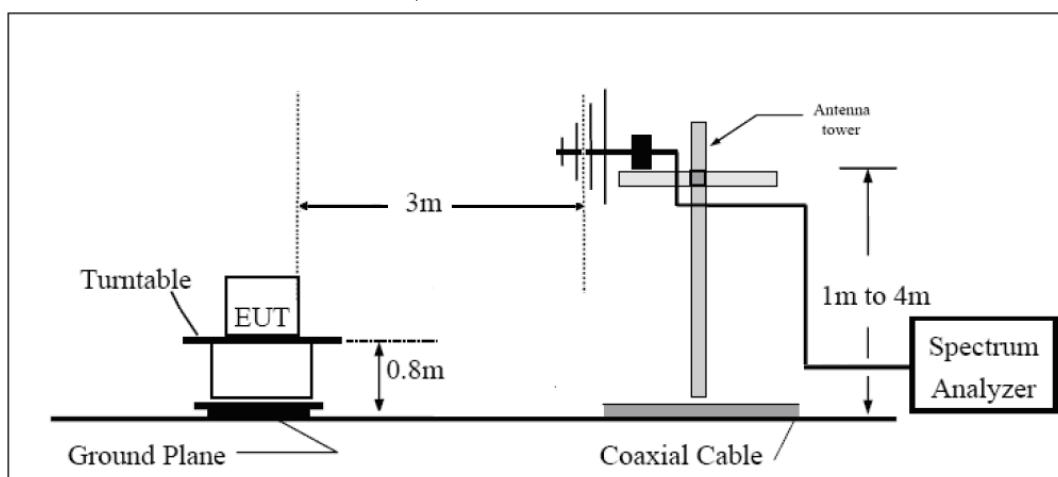
The test is in transmitting mode.

Test setup

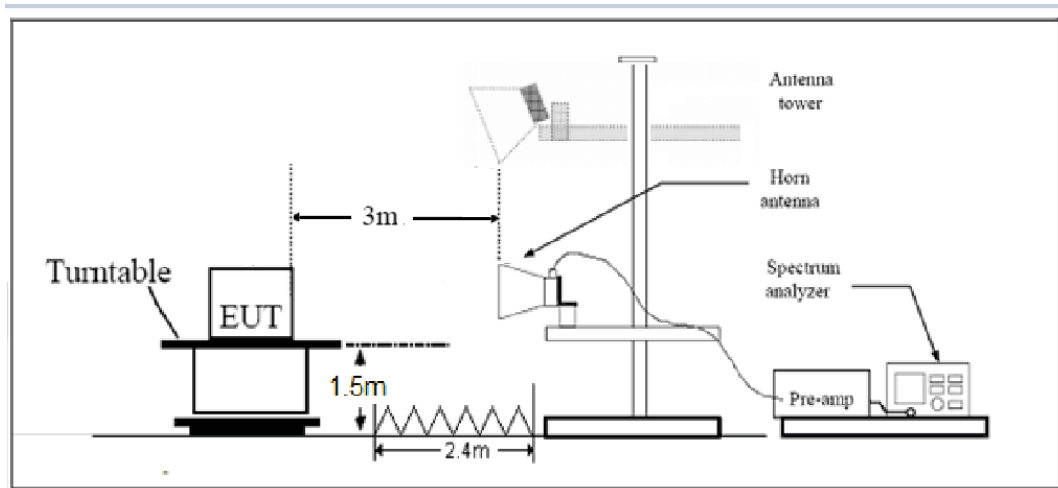
9kHz~ 30MHz



30MHz~ 1GHz



Above 1GHz



Limits

Rule Part 15.247(d) specifies that “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)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74dBuV/m

Average Limit=54dBuV/m



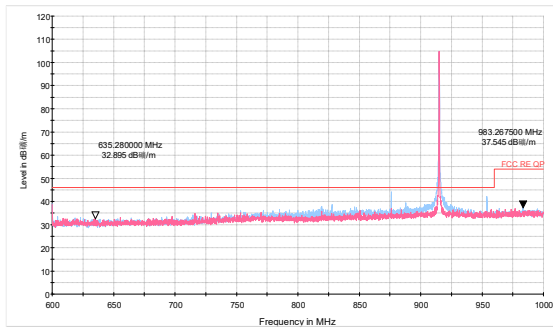
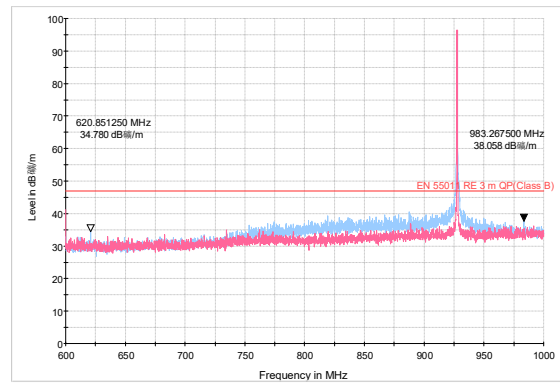
Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.17 dB
200MHz-1GHz	4.84 dB
1-18GHz	4.35 dB

**Test Results:****The signal beyond the limit is carrier.**A font (Level in dB μ V/m) in the test plot =(level in dB μ V/m)**915MHz: Peak + Average****927.54MHz: Peak + Average**

Result of RE

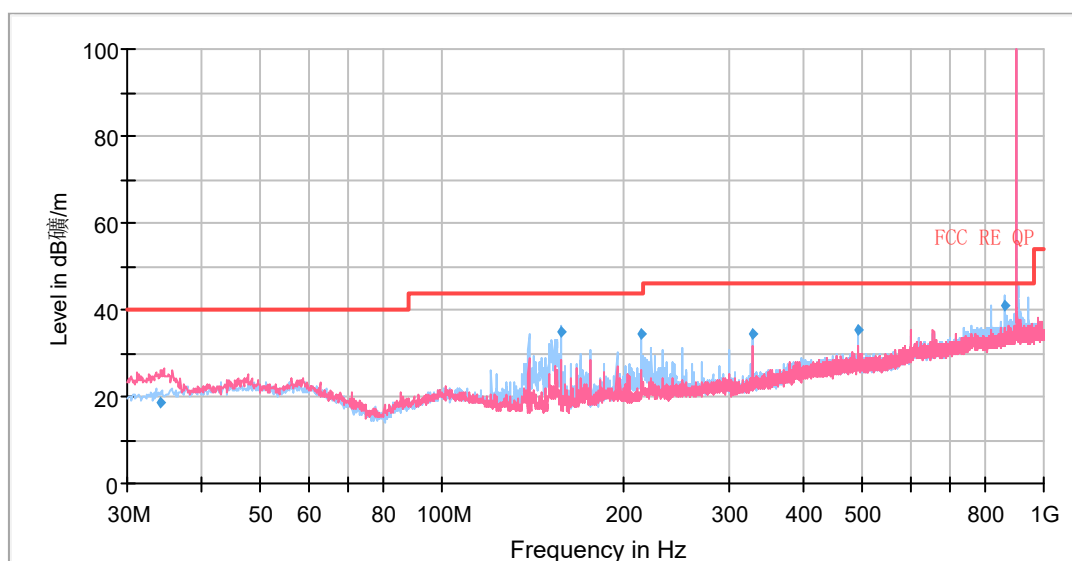
Test result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz are more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

A symbol ($\text{dB}\mu\text{V/m}$) in the test plot below means (dB $\mu\text{V/m}$)

902.46MHz



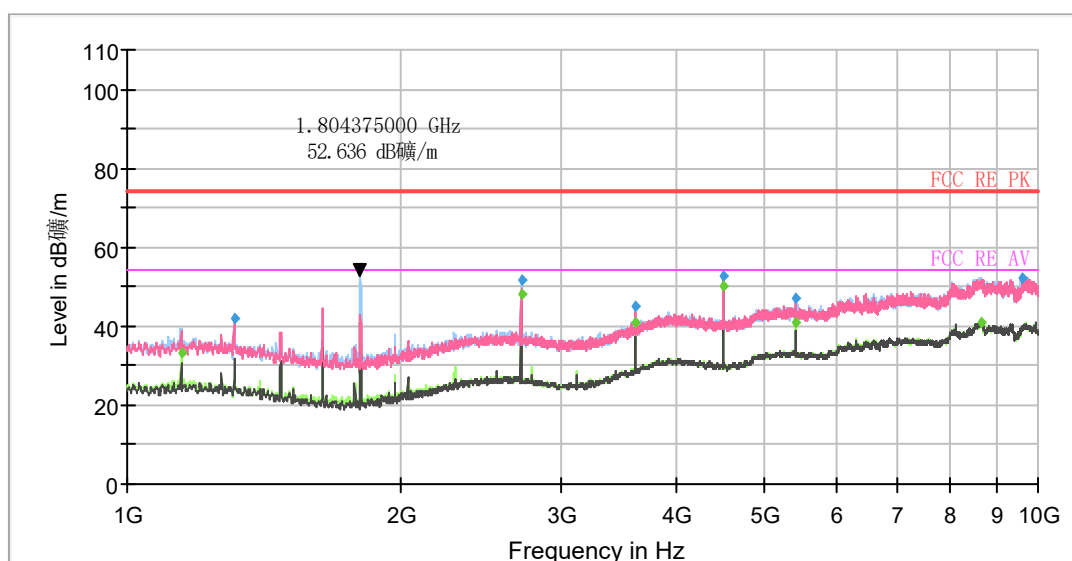
Radiates Emission from 30MHz to 1GHz

Note: The signal beyond the limit is carrier.

Frequency (MHz)	Quasi-Peak (dB $\mu\text{V/m}$)	Limit (dB $\mu\text{V/m}$)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
34.13	18.38	40.00	21.62	107.0	V	202.00	14
158.08	34.83	43.50	8.67	205.0	H	44.00	11
213.90	34.51	43.50	8.99	175.0	H	210.00	13
327.71	34.51	46.00	11.49	100.0	H	28.00	17
491.56	35.49	46.00	10.51	197.0	H	0.00	21
863.39	41.00	46.00	5.00	109.0	H	185.00	26

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)

2. Margin = Limit – Quasi-Peak

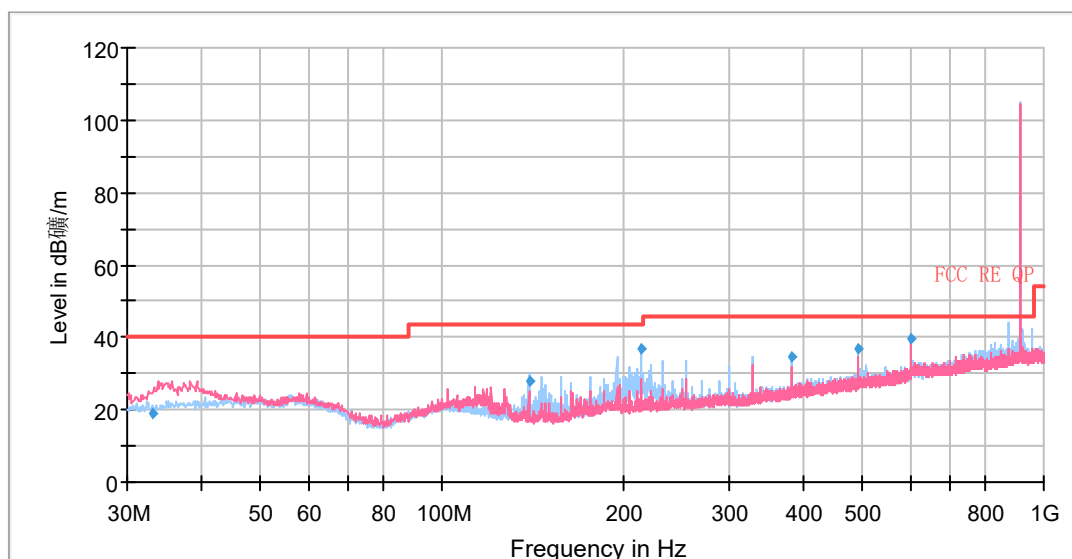


Radiates Emission from 1GHz to 10GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1146.25	---	33.22	54.00	20.78	500.00	100.0	H	18.00	-19
1310.50	41.83	---	74.00	32.17	500.00	100.0	V	104.00	-17
2706.63	---	47.85	54.00	6.15	500.00	100.0	H	320.00	-14
2706.63	51.46	---	74.00	22.54	500.00	100.0	H	320.00	-14
3610.00	45.17	---	74.00	28.83	500.00	100.0	H	49.00	-12
3610.00	---	40.91	54.00	13.09	500.00	100.0	H	49.00	-12
4512.25	52.69	---	74.00	21.31	500.00	200.0	V	10.00	-9
4512.25	---	50.30	54.00	3.70	500.00	200.0	V	10.00	-9
5414.50	---	40.99	54.00	13.01	500.00	100.0	H	2.00	-6
5415.63	46.97	---	74.00	27.03	500.00	100.0	H	13.00	-6
8651.13	---	40.87	54.00	13.13	500.00	200.0	H	0.00	1
9619.75	52.04	---	74.00	21.96	500.00	200.0	V	247.00	2

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)

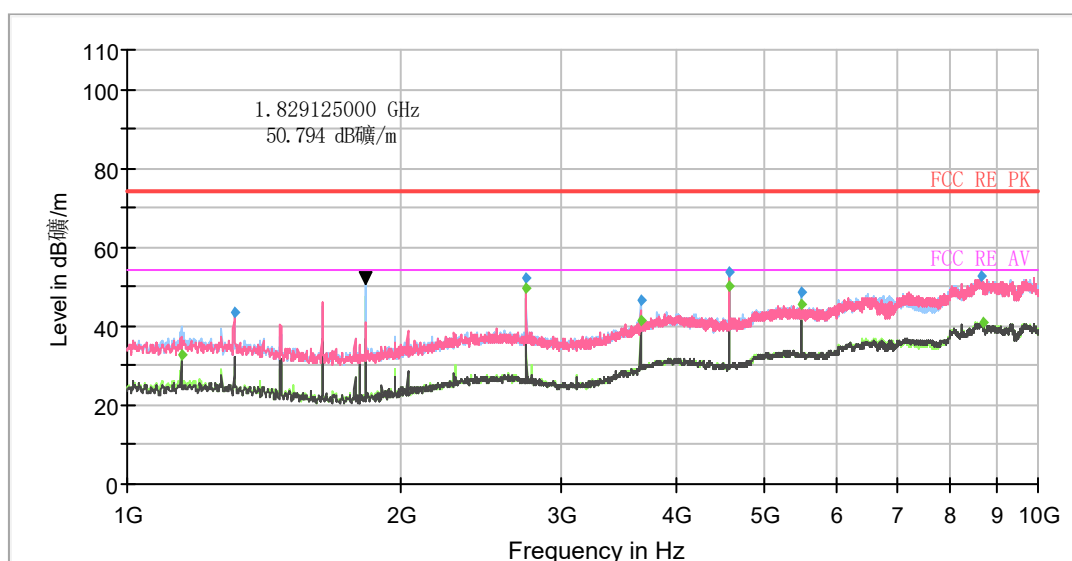
915MHz



Radiates Emission from 30MHz to 1GHz
Note: The signal beyond the limit is carrier.

Frequency (MHz)	Quasi-Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
33.16	19.21	40.00	20.79	103.0	V	152.00	14
139.49	28.14	43.50	15.36	175.0	H	12.00	10
213.90	36.91	43.50	6.59	123.0	H	2.00	13
381.18	34.80	46.00	11.20	100.0	H	135.00	18
491.56	36.77	46.00	9.23	198.0	H	318.00	21
600.00	39.79	46.00	6.21	123.0	H	41.00	23

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)
2. Margin = Limit – Quasi-Peak

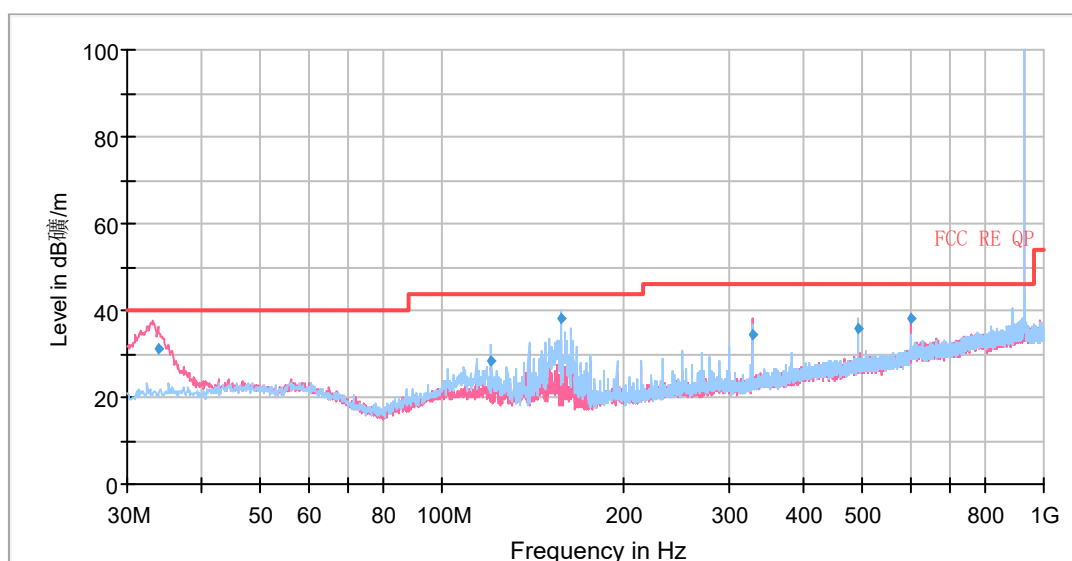


Radiates Emission from 1GHz to 10GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1146.25	---	32.88	54.00	21.12	500.00	100.0	H	1.00	-19
1310.50	43.65	---	74.00	30.35	500.00	100.0	V	100.00	-17
2744.88	---	49.59	54.00	4.41	500.00	100.0	H	320.00	-14
2744.88	52.00	---	74.00	22.00	500.00	100.0	H	320.00	-14
3659.50	---	41.44	54.00	12.56	500.00	100.0	H	62.00	-12
3659.50	46.36	---	74.00	27.64	500.00	100.0	H	62.00	-12
4575.25	53.49	---	74.00	20.51	500.00	100.0	H	52.00	-9
4575.25	---	49.91	54.00	4.09	500.00	100.0	H	52.00	-9
5489.88	48.79	---	74.00	25.21	500.00	200.0	H	33.00	-6
5489.88	---	45.57	54.00	8.43	500.00	200.0	H	33.00	-6
8680.38	52.62	---	74.00	21.38	500.00	100.0	H	338.00	1
8688.25	---	40.86	54.00	13.14	500.00	100.0	V	74.00	1

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)

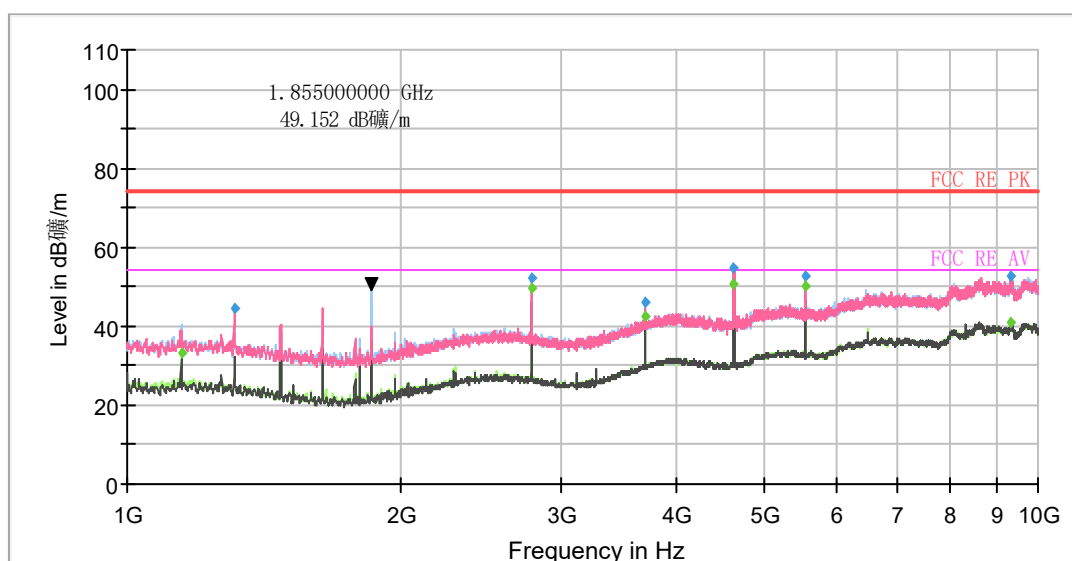
927.54MHz



Radiates Emission from 30MHz to 1GHz
Note: The signal beyond the limit is carrier.

Frequency (MHz)	Quasi-Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
33.75	31.24	40.00	8.76	101.0	V	116.00	14
120.90	28.55	43.50	14.95	222.0	H	52.00	12
158.08	38.07	43.50	5.43	207.0	H	236.00	11
327.71	34.24	46.00	11.76	179.0	V	153.00	17
491.56	35.78	46.00	10.22	199.0	H	264.00	21
600.00	37.99	46.00	8.01	106.0	V	82.00	23

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)
2. Margin = Limit – Quasi-Peak



Radiates Emission from 1GHz to 10GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1146.25	---	33.24	54.00	20.76	500.00	100.0	H	6.00	-19
1310.50	44.32	---	74.00	29.68	500.00	200.0	V	358.00	-17
2782.00	---	49.56	54.00	4.44	500.00	100.0	H	320.00	-13
2782.00	52.30	---	74.00	21.70	500.00	100.0	H	320.00	-13
3710.13	---	42.47	54.00	11.53	500.00	100.0	H	59.00	-12
3710.13	46.23	---	74.00	27.77	500.00	100.0	H	59.00	-12
4637.13	54.68	---	74.00	19.32	500.00	200.0	V	62.00	-8
4637.13	---	50.79	54.00	3.21	500.00	200.0	V	62.00	-8
5565.25	52.86	---	74.00	21.14	500.00	200.0	H	32.00	-6
5565.25	---	49.99	54.00	4.01	500.00	200.0	H	32.00	-6
9331.75	52.66	---	74.00	21.34	500.00	100.0	V	358.00	1
9339.63	---	40.75	54.00	13.25	500.00	100.0	H	235.00	1

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)

2. Margin = Limit –MAX Peak/ Average

5.9 Conducted Emission

Ambient condition

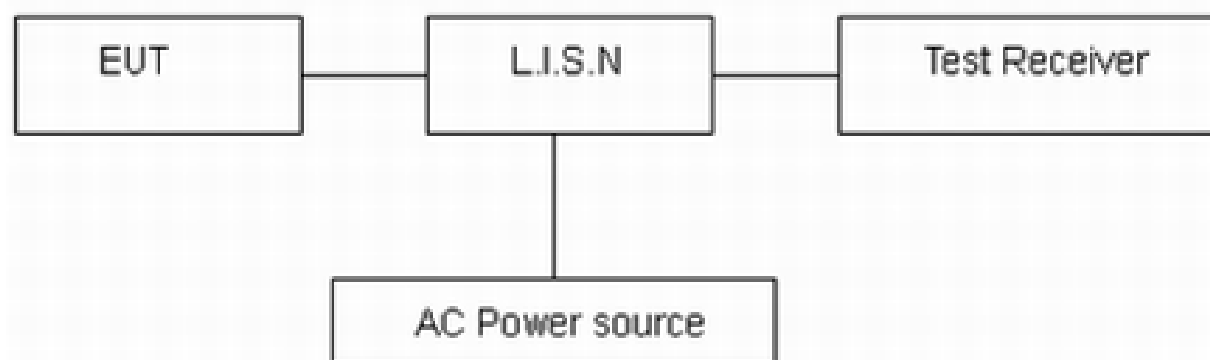
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

The test is in transmitting mode.

Test Setup



Note: AC Power source is used to 120V/60Hz.

Limits

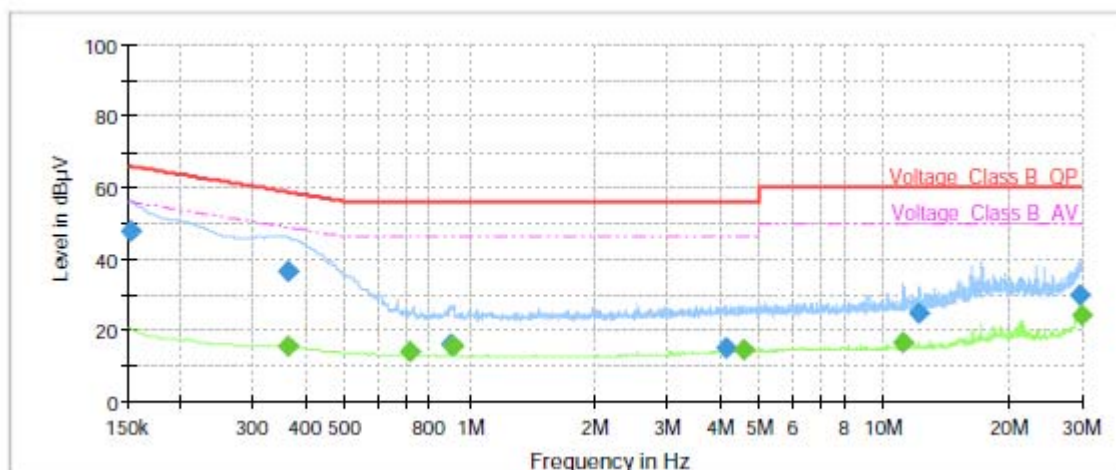
Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=2.69$ dB.

Test Results:

Following plots, Blue trace uses the peak detection, Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes with all channels, 927.54MHz are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

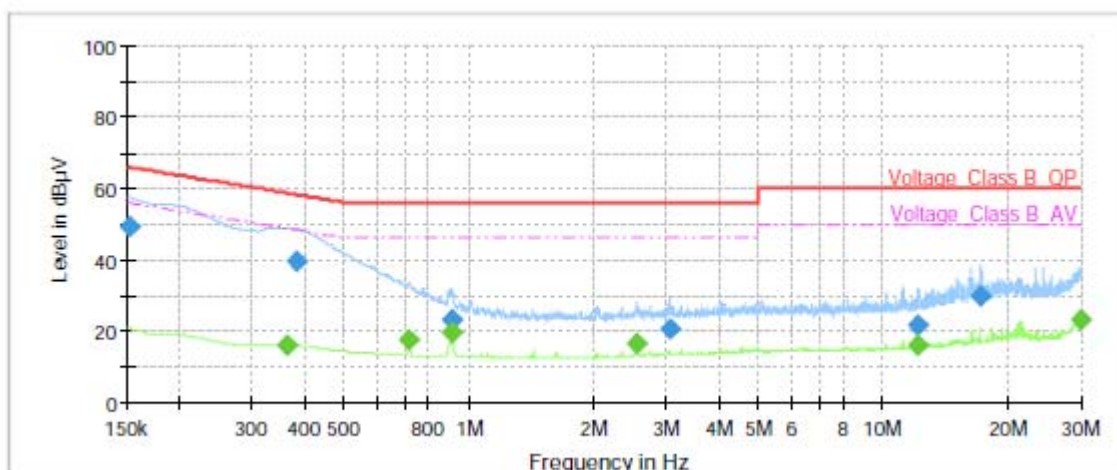


Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.152250	47.75	---	65.88	18.13	1000.0	9.000	L1	ON	20.9
0.361500	---	15.25	48.69	33.45	1000.0	9.000	L1	ON	20.8
0.363750	36.52	---	58.64	22.13	1000.0	9.000	L1	ON	20.8
0.717000	---	13.80	46.00	32.20	1000.0	9.000	L1	ON	20.4
0.897000	15.85	---	56.00	40.15	1000.0	9.000	L1	ON	20.0
0.912750	---	15.48	46.00	30.52	1000.0	9.000	L1	ON	20.0
4.159500	14.79	---	56.00	41.21	1000.0	9.000	L1	ON	19.2
4.560000	---	14.31	46.00	31.69	1000.0	9.000	L1	ON	19.2
11.157000	---	16.66	50.00	33.34	1000.0	9.000	L1	ON	19.3
12.171750	24.51	---	60.00	35.49	1000.0	9.000	L1	ON	19.3
29.663250	29.63	---	60.00	30.37	1000.0	9.000	L1	ON	20.1
30.000000	---	24.11	50.00	25.89	1000.0	9.000	L1	ON	20.1

Remark: Correct factor=cable loss + LISN factor

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.152250	49.32	---	65.88	16.56	1000.0	9.000	N	ON	20.9
0.361500	---	16.08	48.69	32.61	1000.0	9.000	N	ON	20.9
0.384000	39.66	---	58.19	18.53	1000.0	9.000	N	ON	20.8
0.717000	---	17.32	46.00	28.68	1000.0	9.000	N	ON	20.4
0.910500	23.26	---	56.00	32.74	1000.0	9.000	N	ON	20.1
0.912750	---	19.66	46.00	26.34	1000.0	9.000	N	ON	20.1
2.544000	---	16.19	46.00	29.81	1000.0	9.000	N	ON	19.3
3.045750	20.41	---	56.00	35.59	1000.0	9.000	N	ON	19.3
12.180750	21.31	---	60.00	38.69	1000.0	9.000	N	ON	19.4
12.180750	---	15.89	50.00	34.11	1000.0	9.000	N	ON	19.4
17.254500	29.78	---	60.00	30.22	1000.0	9.000	N	ON	19.6
29.980500	---	22.82	50.00	27.18	1000.0	9.000	N	ON	20.3

Remark: Correct factor=cable loss + LISN factor

N line

Conducted Emission from 150 KHz to 30 MHz

6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Power Sensor	R&S	OSP-B157W8	100924	2021-12-12	2022-12-11
				2022-12-10	2023-12-09
Spectrum Analyzer	KEYSIGHT	N9020A	MY54420163	2021-12-12	2022-12-11
				2022-12-10	2023-12-09
Artificial main network	R&S	ENV216	102191	2020-12-13	2022-12-12
				2022-12-13	2024-12-09
EMI Test Receiver	R&S	ESR	101667	2022-05-25	2023-05-24
Software	R&S	EMC32	10.35.10	/	/
EMI Test Receiver	R&S	ESCI3	100948	2022-05-25	2023-05-24
Spectrum Analyzer	R&S	FSV40	101186	2022-05-14	2023-05-13
Spectrum Analyzer	R&S	FSV40	101298	2022-05-14	2023-05-13
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	01111	2022-10-25	2025-10-24
Horn Antenna	Schwarzbeck	BBHA 9120D	430	2021-07-26	2024-07-25
Software	R&S	EMC32	9.26.0	/	/

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

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.