

FCC Test Report

Applicant : Shenzhen Kaadas Intelligent Technology Co., Ltd.

Address : Floor 11, Building B2, Phase 2, Creative City,
Xiandong Road, Xili Community, Xili Street,
Nanshan District, Shenzhen, Guangdong,
518000, China

Product Name : Z-Wave Module

Report Date : 2025-05-12

Shenzhen Anbotek Compliance Laboratory Limited



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TEST REPORT

Applicant : Shenzhen Kaadas Intelligent Technology Co., Ltd.
Manufacturer : Shenzhen Kaadas Intelligent Technology Co., Ltd.
Product Name : Z-Wave Module
Model No. : ZWLR800
Trade Mark : Kaadas
Rating(s) : Input: DC 3.3V

Test Standard(s) : 47 CFR Part 15.247

Test Method(s) : ANSI C63.10: 2020, KDB 558074 D01 15.247 Meas Guidance v05r02

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the 47 CFR Part 15.247 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt 2024-07-29

Date of Test 2024-07-29 to 2025-05-09

Prepared By



(Lene Chen)

Approved & Authorized Signer



(Kingkong Jin)



Revision History

Report Version	Description	Issued Date
R00	Original Issue.	2025-05-12



1. General Information

1.1. Client Information

Applicant	:	Shenzhen Kaadas Intelligent Technology Co., Ltd.
Address	:	Floor 11, Building B2, Phase 2, Creative City, Xiandong Road, Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, 518000, China
Manufacturer	:	Shenzhen Kaadas Intelligent Technology Co., Ltd.
Address	:	Floor 11, Building B2, Phase 2, Creative City, Xiandong Road, Xili Community, Xili Street, Nanshan District, Shenzhen, Guangdong, 518000, China

1.2. Description of Device (EUT)

Product Name	:	Z-Wave Module
Model No.	:	ZWLR800
Trade Mark	:	Kaadas
Test Power Supply	:	DC 5V via PC from adapter input AC 120V/60Hz; DC 5V via PC
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Frequency	:	912MHz~920MHz
Number of Channel	:	2 Channels
Modulation Type	:	GFSK
Antenna Type	:	FPC Antenna
Antenna Gain(Peak)	:	-2.13dBi
Remark: 1) All of the RF specification are provided by customer. 2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		



1.3. Auxiliary Equipment Used During Test

Title	Manufacturer	Model No.	Serial No.
Lenovo Computer	Lenovo	R7-7730U	/
AC/DC ADAPTER	Delta Electronics, Inc.	ADLX65YDC3D	/

1.4. Description of Test Configuration

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	912						
2	920						

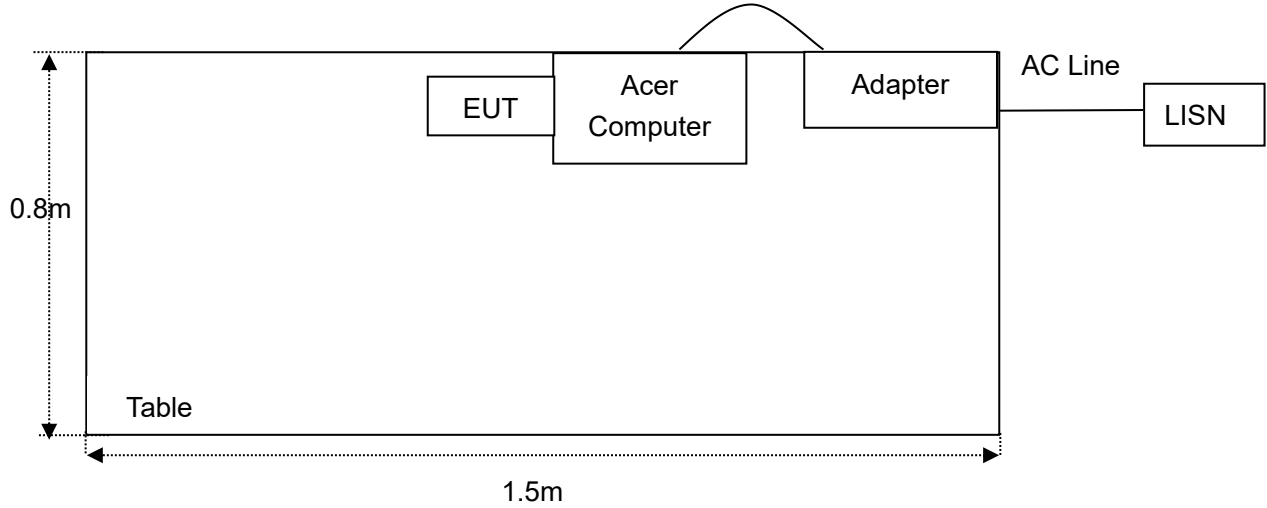
Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT was tested with Channel 1, 2.

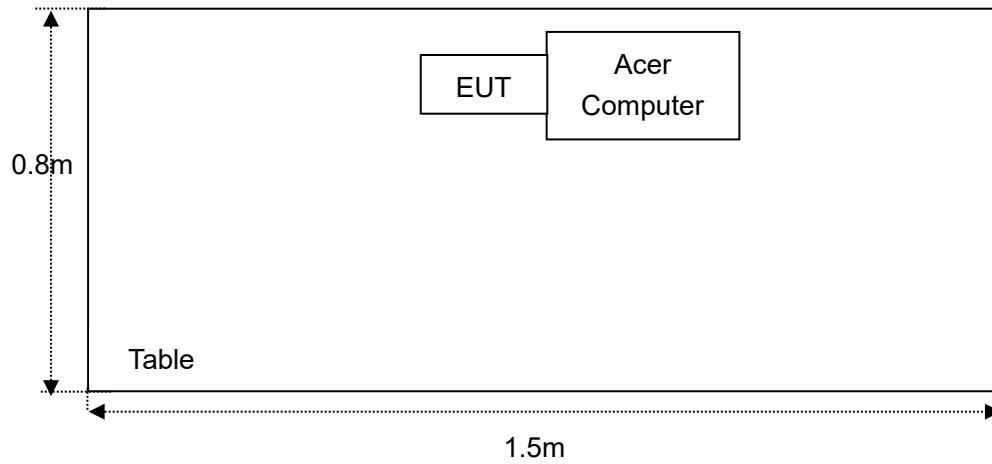


1.5. Description Of Test Setup

CE



RE



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	2024-01-18	1 Year
					2024-09-09	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT00 1	2024-01-17	1 Year
					2025-01-13	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	2024-01-17	1 Year
					2025-01-13	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	2024-01-23	1 Year
					2025-01-13	1 Year
5.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	2023-10-23	1 Year
					2024-09-09	1 Year
6.	EMI Preamplifier	SKET Electronic	LNPA-0118G- 45	SKET-PA-002	2024-01-17	1 Year
					2025-01-13	1 Year
7.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	2022-10-16	3 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	2022-10-23	3 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	2023-10-12	1 Year
					2024-09-12	1 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	2024-01-22	3 Year
11.	Pre-amplifier	SONOMA	310N	186860	2024-01-17	1 Year
					2025-01-14	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	2023-10-12	1 Year
					2024-09-09	1 Year
14.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	2024-02-04	1 Year
					2025-02-21	1 Year
15.	Signal Generator	Agilent	E4421B	MY41000743	2023-10-12	1 Year
					2024-10-10	1 Year
16.	DC Power Supply	IVYTECH	IV3605	1804D360510	2023-10-20	1 Year
					2024-09-09	1 Year
17.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	2023-10-16	1 Year
					2024-10-14	1 Year
18.	Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102150	2024-05-06	1 Year
					2025-04-25	1 Year



1.7. Measurement Uncertainty

Parameter	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	3.8dB
Occupied Bandwidth	925Hz
Conducted Output Power	0.76dB
Power Spectral Density	0.76dB
Conducted Spurious Emission	1.24dB
Duty Cycle	5%
Radiated spurious emissions (Below 30MHz)	3.53dB
Radiated spurious emissions (30MHz~1GHz)	Horizontal: 3.92dB; Vertical: 4.52dB
Radiated spurious emissions (above 1GHz)	1G-6GHz: 4.78dB; 6G-18GHz: 4.88dB 18G-40GHz: 5.68dB
The measurement uncertainty and decision risk evaluated according to AB/WI-RF-F-032. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

Sogood Industrial Zone Laboratory & 1/F. of Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China.



1.9. Disclaimer

1. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
2. The test report is invalid if there is any evidence and/or falsification.
3. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
4. This document may not be altered or revised in any way unless done so by Anbotek and all revisions are duly noted in the revisions section.
5. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
6. The authenticity of the information provided by the customer is the responsibility of the customer and the laboratory is not responsible for its authenticity.
7. The data in this report will be synchronized with the corresponding national market supervision and management departments and cross-border e-commerce platforms as required by regulatory agencies.

The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.



2. Summary of Test Results

Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.205/15.209	Spurious Emission	PASS
15.247(b)(3)	Conducted Peak Output Power	PASS
15.247(a)(2)	6dB Emission Bandwidth	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		



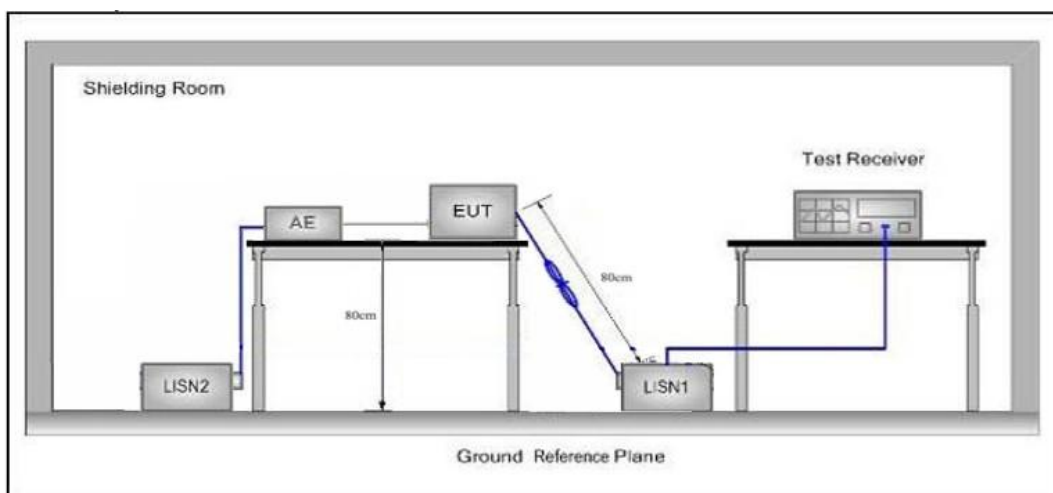
3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50

Remark: (1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequency.

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

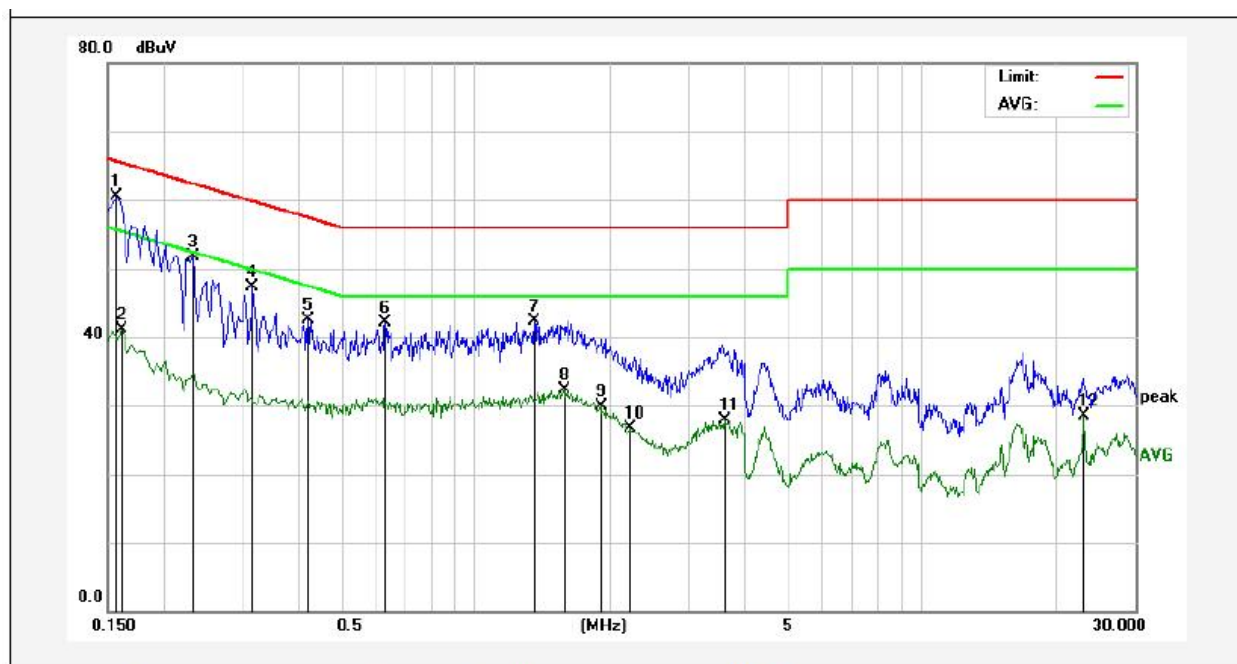
During the test, pre-scan all modes, only the worst case is recorded in the report.

Please to see the following pages.



Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: 912MHz
Test Specification: DC 5V via PC from adapter input AC 120V/60Hz
Comment: Live Line
Temp.(°C)/Hum.(%RH): 22.1°C/50%RH



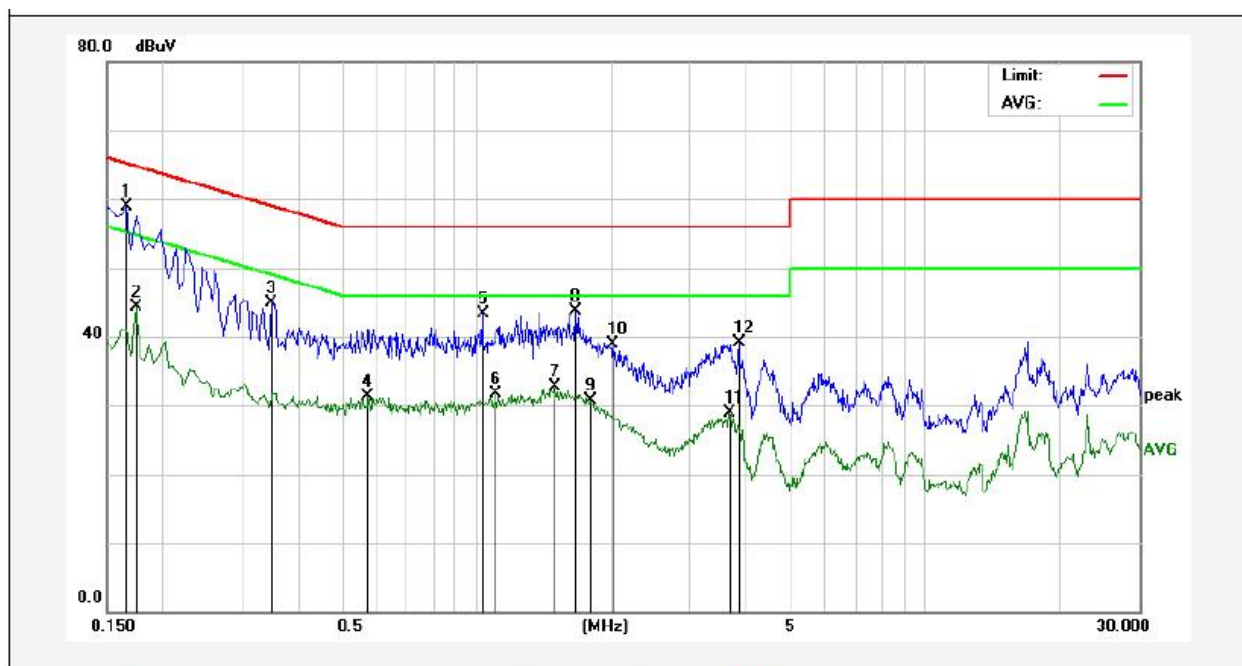
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1580	42.63	17.83	60.46	65.56	-5.10	QP	
2	0.1620	23.36	17.83	41.19	55.36	-14.17	AVG	
3	0.2340	33.80	17.83	51.63	62.30	-10.67	QP	
4	0.3180	29.49	17.83	47.32	59.76	-12.44	QP	
5	0.4220	24.67	17.82	42.49	57.41	-14.92	QP	
6	0.6300	24.26	17.86	42.12	56.00	-13.88	QP	
7	1.3580	24.48	17.84	42.32	56.00	-13.68	QP	
8	1.5820	14.46	17.84	32.30	46.00	-13.70	AVG	
9	1.9140	12.14	17.83	29.97	46.00	-16.03	AVG	
10	2.2300	8.91	17.83	26.74	46.00	-19.26	AVG	
11	3.6220	10.11	17.85	27.96	46.00	-18.04	AVG	
12	23.1299	9.67	18.82	28.49	50.00	-21.51	AVG	

Note: Result = Reading + Factor Over Limit = Result - Limit



Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: 912MHz
Test Specification: DC 5V via PC from adapter input AC 120V/60Hz
Comment: Neutral Line
Temp.(°C)/Hum.(%RH): 22.1°C/50%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1660	40.99	17.83	58.82	65.15	-6.33	QP	
2	0.1740	26.42	17.83	44.25	54.76	-10.51	AVG	
3	0.3500	27.17	17.82	44.99	58.96	-13.97	QP	
4	0.5740	13.47	17.86	31.33	46.00	-14.67	AVG	
5	1.0339	25.37	17.85	43.22	56.00	-12.78	QP	
6	1.1060	13.81	17.85	31.66	46.00	-14.34	AVG	
7	1.4900	14.93	17.84	32.77	46.00	-13.23	AVG	
8	1.6700	25.90	17.84	43.74	56.00	-12.26	QP	
9	1.7940	12.77	17.84	30.61	46.00	-15.39	AVG	
10	2.0220	21.14	17.83	38.97	56.00	-17.03	QP	
11	3.6460	11.01	17.85	28.86	46.00	-17.14	AVG	
12	3.8420	21.27	17.85	39.12	56.00	-16.88	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit

Remark: The EUT received input Voltage DC 3V from Debug board, and the Debug board received input Voltage DC 5V via PC.



4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	Above 960MHz	500	54.0	Quasi-peak	3

Remark:

(1)The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

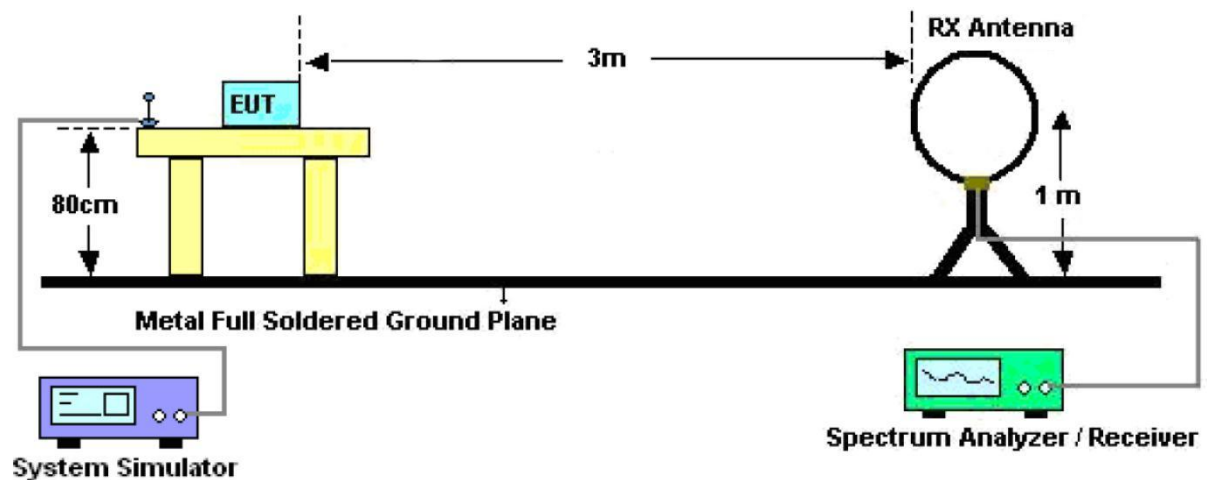


Figure 1. Below 30MHz



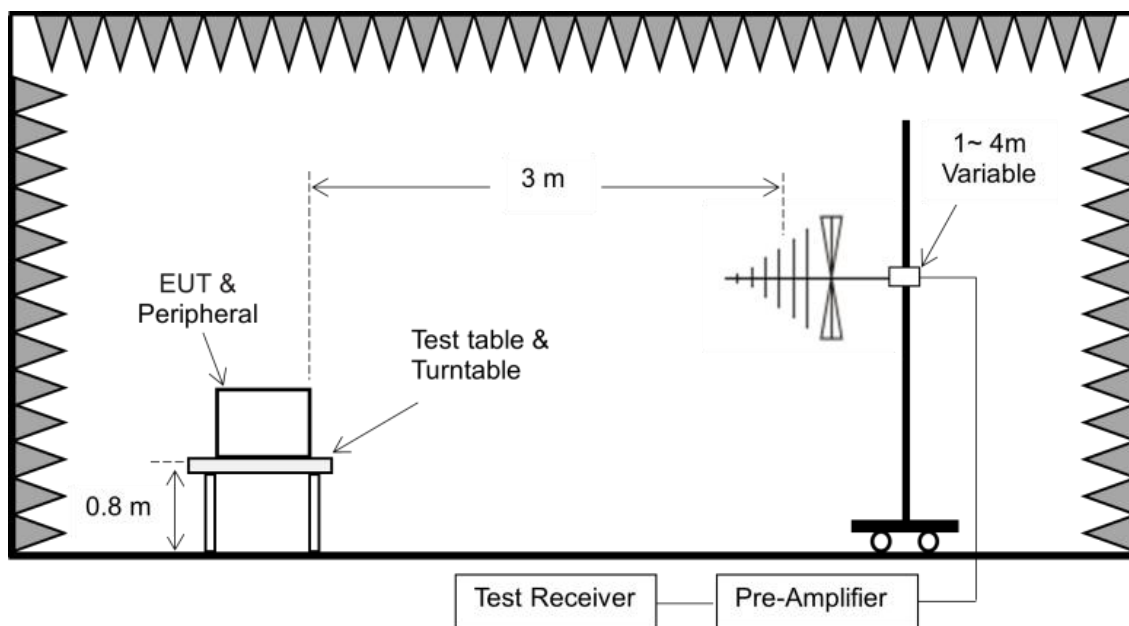


Figure 2. 30MHz to 1GHz

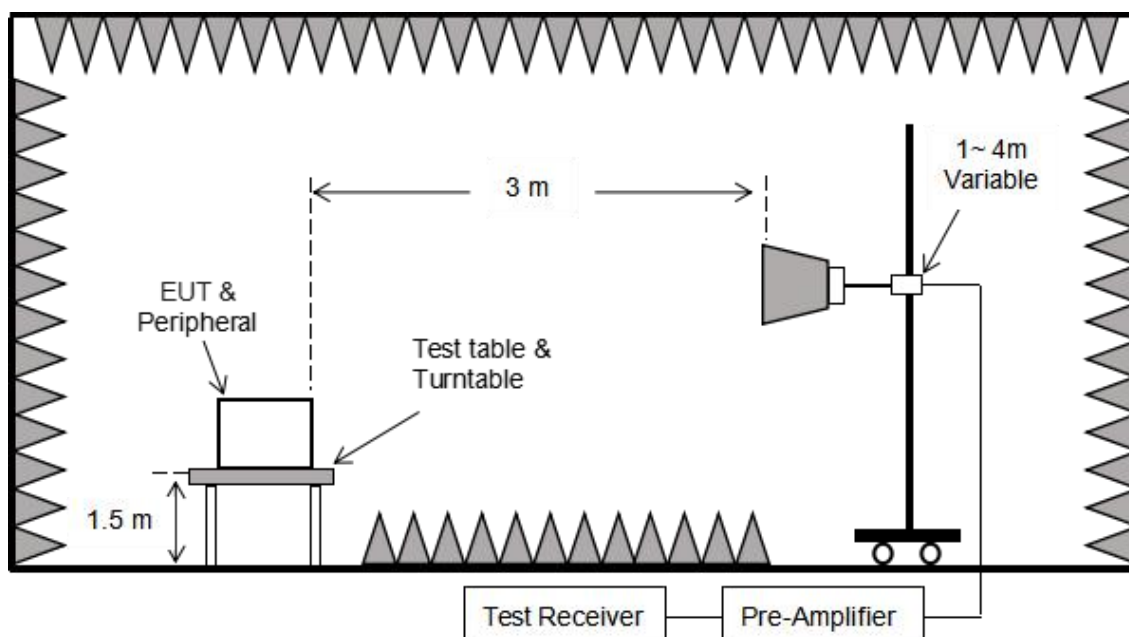


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.



For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW = 1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9KHz, VBW = 30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW = 300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz, Set the spectrum analyzer as:

RBW = 1MHz, VBW = 3MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

For average measurement:

–VBW=3*RBW, Detector= RMS, When duty cycle is no less than 98 percent

–VBW=3*RBW, Detector= RMS, When duty cycle is less than 98 percent and dutycycle is constant, average=peak level+correction factor($20\log(\text{duty cycle})$).

–VBW $\geq 1/T$, when duty cycle is less than 98 percent and dutycycle is not constant, where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation, so refer to this clause 5.4 duty cycle.

4.3. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all the modes, only the worst case is recorded in the report.



Test Results (30~1000MHz)

Test Mode: 912MHz
Power Source: DC 5V via PC
Polarization: Horizontal
Temp.(°C)/Hum.(%RH): 25.1°C/54%RH
Fundamental



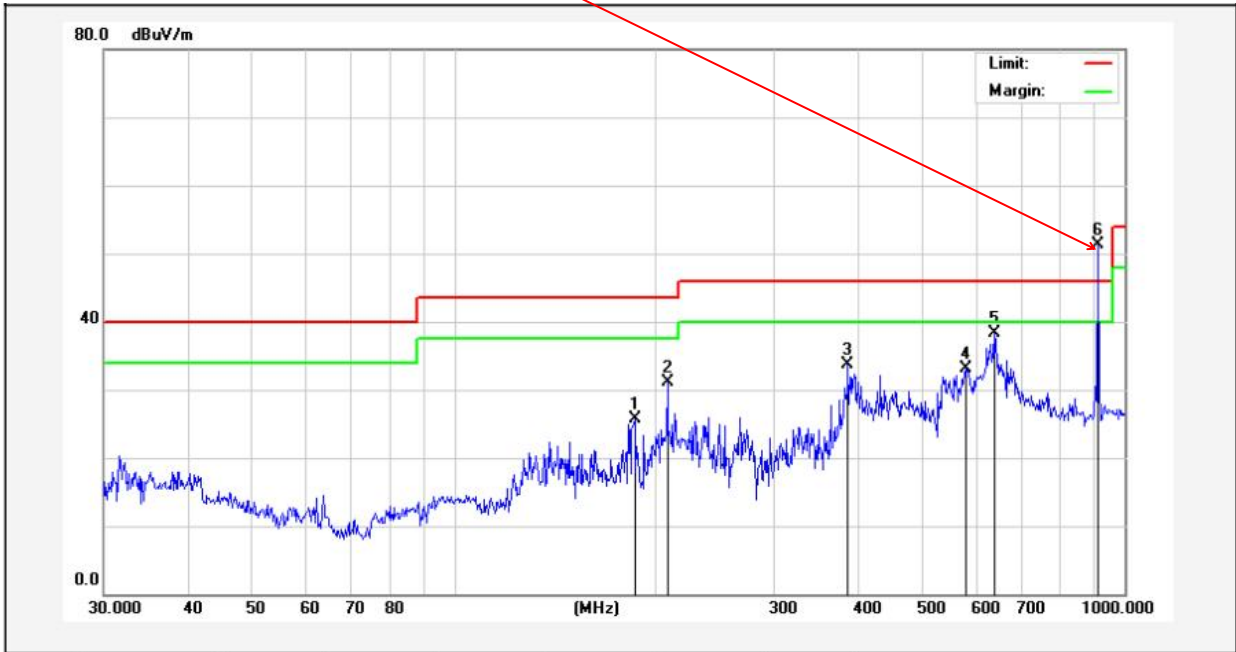
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Remark
1	142.3240	48.34	-22.42	25.92	43.50	-17.58	QP	
2	184.4898	54.63	-20.61	34.02	43.50	-9.48	QP	
3	191.7450	54.29	-20.20	34.09	43.50	-9.41	QP	
4	210.7860	52.74	-19.34	33.40	43.50	-10.10	QP	
5	392.0951	50.70	-13.60	37.10	46.00	-8.90	QP	
6	912.0000	57.43	-6.11	51.32				

Note: Result = Reading + Factor Over Limit = Result - Limit



Test Results (30~1000MHz)

Test Mode: 912MHz
Power Source: DC 5V via PC
Polarization: Vertical
Temp.(°C)/Hum.(%RH): 25.1°C/54%RH
Fundamental



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Remark
1	185.7880	46.11	-20.32	25.79	43.50	-17.71	QP	
2	207.8497	50.52	-19.40	31.12	43.50	-12.38	QP	
3	386.6338	47.30	-13.52	33.78	46.00	-12.22	QP	
4	578.6698	43.41	-10.31	33.10	46.00	-12.90	QP	
5	638.3686	47.14	-8.87	38.27	46.00	-7.73	QP	
6	912.0000	57.44	-6.08	51.36				

Note: Result = Reading + Factor Over Limit = Result - Limit

Remark: The EUT received input Voltage DC 3V from Debug board, and the Debug board received input Voltage DC 5V via PC.



Test Results (1GHz-25GHz)

Test channel: Lowest						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
1824.00	28.45	17.67	46.12	74.00	-27.88	Vertical
2736.00	28.51	20.94	49.45	74.00	-24.55	Vertical
3648.00	29.36	22.51	51.87	74.00	-22.13	Vertical
4560.00	*			74.00		Vertical
5472.00	*			74.00		Vertical
1824.00	28.12	17.67	45.79	74.00	-28.21	Horizontal
2736.00	29.03	20.94	49.97	74.00	-24.03	Horizontal
3648.00	28.11	22.51	50.62	74.00	-23.38	Horizontal
4560.00	*			74.00		Horizontal
5472.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
1824.00	16.72	17.67	34.39	54.00	-19.61	Vertical
2736.00	17.56	20.94	38.50	54.00	-15.50	Vertical
3648.00	18.83	22.51	41.34	54.00	-12.66	Vertical
4560.00	*			54.00		Vertical
5472.00	*			54.00		Vertical
1824.00	16.45	17.67	34.12	54.00	-19.88	Horizontal
2736.00	18.06	20.94	39.00	54.00	-15.00	Horizontal
3648.00	17.62	22.51	40.13	54.00	-13.87	Horizontal
4560.00	*			54.00		Horizontal
5472.00	*			54.00		Horizontal



Test Results (1GHz-25GHz)

Test channel: Highest						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
1840.00	28.00	17.70	45.70	74.00	-28.30	Vertical
2760.00	28.48	20.97	49.45	74.00	-24.55	Vertical
3680.00	28.86	22.51	51.37	74.00	-22.63	Vertical
4600.00	*			74.00		Vertical
5520.00	*			74.00		Vertical
1840.00	27.93	17.70	45.63	74.00	-28.37	Horizontal
2760.00	28.90	20.97	49.87	74.00	-24.13	Horizontal
3680.00	27.83	22.51	50.34	74.00	-23.66	Horizontal
4600.00	*			74.00		Horizontal
5520.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
1840.00	16.81	17.70	34.51	54.00	-19.49	Vertical
2760.00	17.42	20.97	38.39	54.00	-15.61	Vertical
3680.00	18.68	22.51	41.19	54.00	-12.81	Vertical
4600.00	*			54.00		Vertical
5520.00	*			54.00		Vertical
1840.00	16.56	17.70	34.26	54.00	-19.74	Horizontal
2760.00	18.41	20.97	39.38	54.00	-14.62	Horizontal
3680.00	17.92	22.51	40.43	54.00	-13.57	Horizontal
4600.00	*			54.00		Horizontal
5520.00	*			54.00		Horizontal

Remark:

1. Result = Reading + Factor
2. Test frequency are from 1GHz to 25GHz, "*" means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.



Radiated Band Edge:

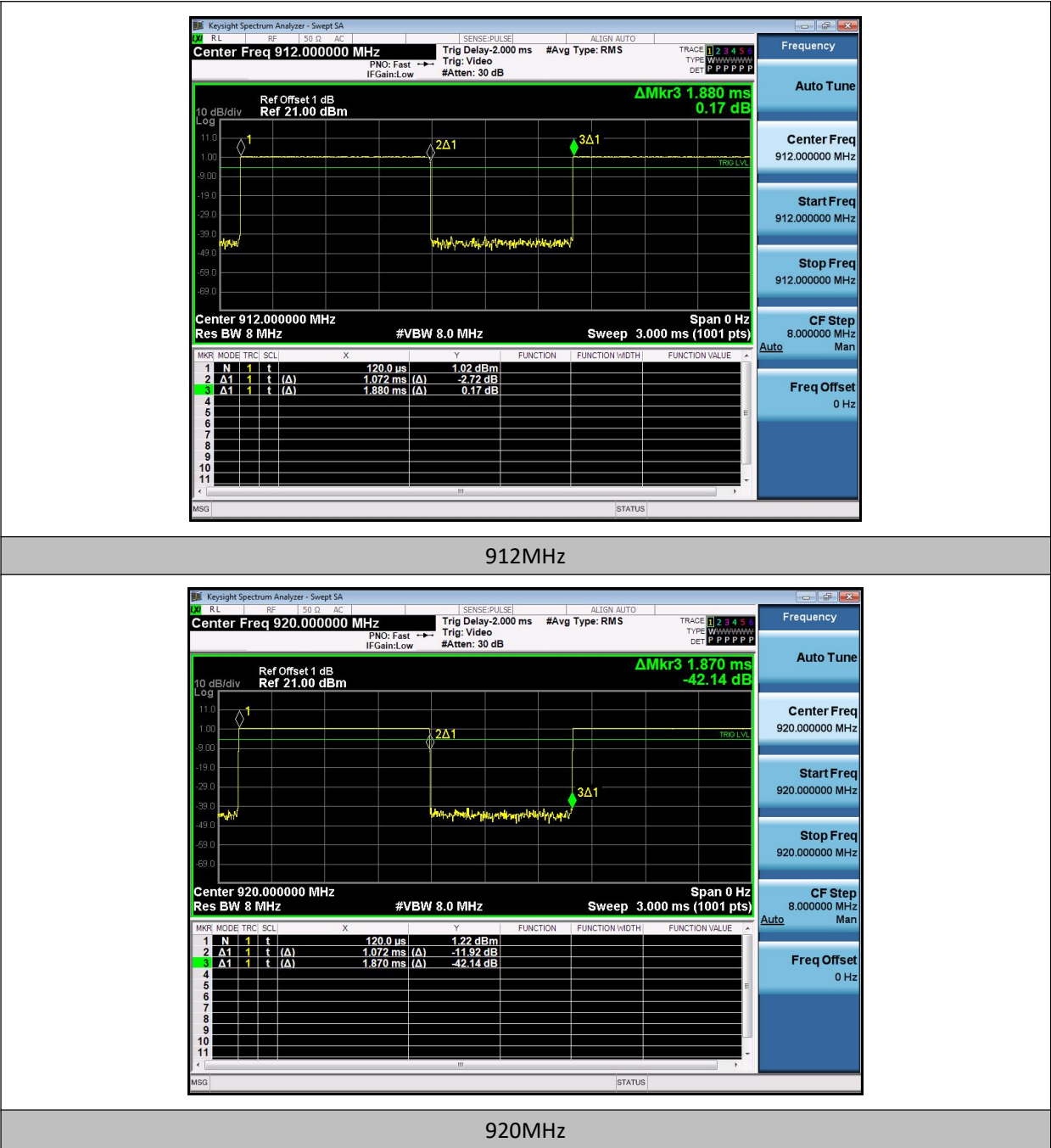


Note: When the PK measure result value is less than the AVG limit value, the AV measure result values test not applicable.



Test for Duty Cycle.

Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
912	1.072	1.880	57.02	2.44
920	1.072	1.870	57.32	2.42

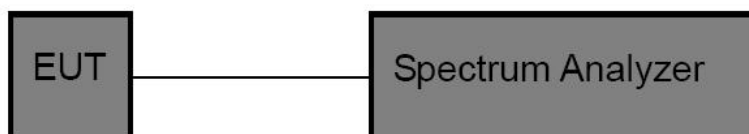


5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(3)
Test Limit	1W (30dBm)

5.2. Test Setup



5.3. Test Procedure

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

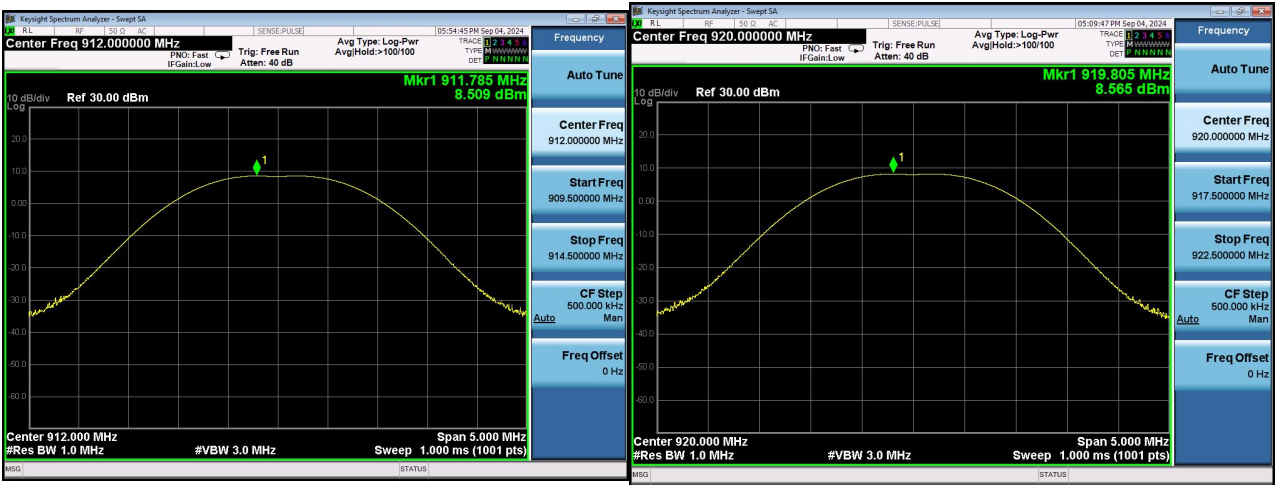
1. Set the RBW $\geq$ DTS bandwidth.
2. Set the VBW $\geq 3 \times$ RBW.
3. Set the span $\geq 3 \times$ RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.



5.4. Test Data

Test Item	:	Max. peak output power	Test Mode	:	CH Low ~ CH High
Test Voltage	:	DC 3V	Temperature	:	24℃
Test Result	:	PASS	Humidity	:	52 %

Test Channel	Peak Power output (dBm)	Limit (dBm)	Results
Low	8.509	30	PASS
High	8.565	30	PASS



Low Channel

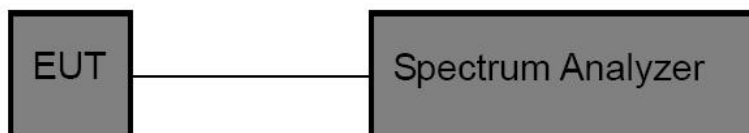
High Channel

6. 6dB Bandwidth Test

6.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(2)
Test Limit	≥500kHz

6.2. Test Setup



6.3. Test Procedure

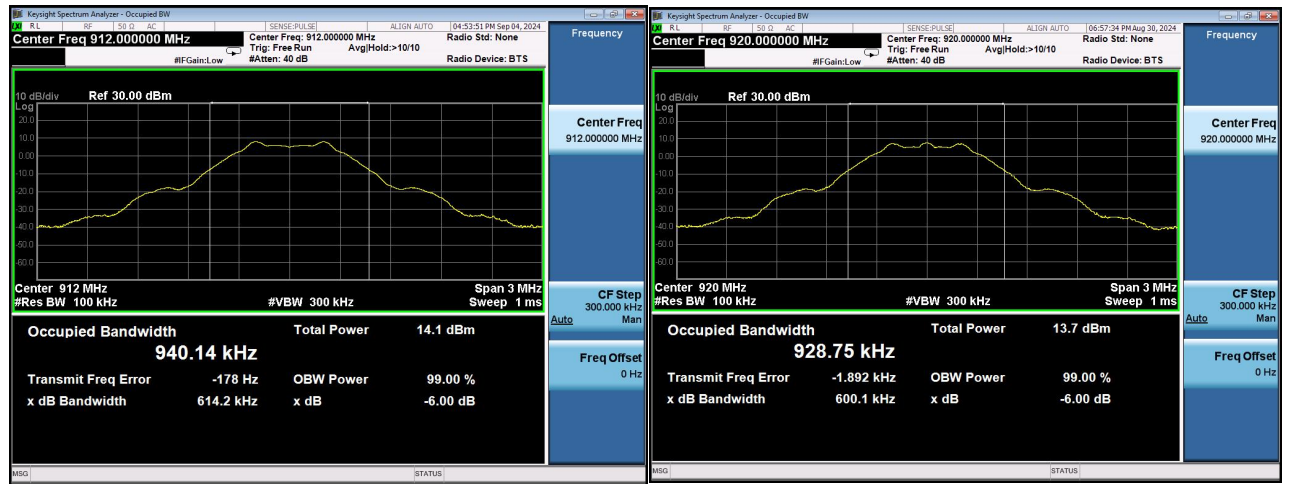
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
6dB Bandwidth:
 - a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
 - b) Set the VBW $\geq [3 \times \text{RBW}]$.
 - c) Detector = peak.
 - d) Trace mode = max-hold.
 - e) Sweep = No faster than coupled (auto) time.
 - f) Allow the trace to stabilize.
 - g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-6 dB down amplitude”. If a marker is below this “-6 dB down amplitude” value, then it shall be as close as possible to this value.



6.4. Test Data

Test Item	: 6dB Bandwidth	Test Mode	: CH Low ~ CH High
Test Voltage	: DC 3V	Temperature	: 24℃
Test Result	: PASS	Humidity	: 52 %

Channel	Bandwidth (kHz)	Limit (kHz)	Results
Low	614.2	>500	PASS
High	600.1	>500	PASS

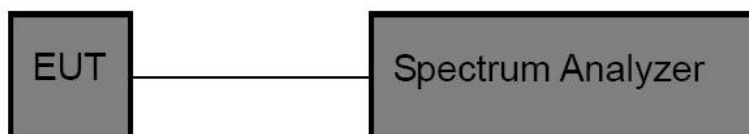


7. Power Spectral Density Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (e)
Test Limit	8dBm/3KHz

7.2. Test Setup



7.3. Test Procedure

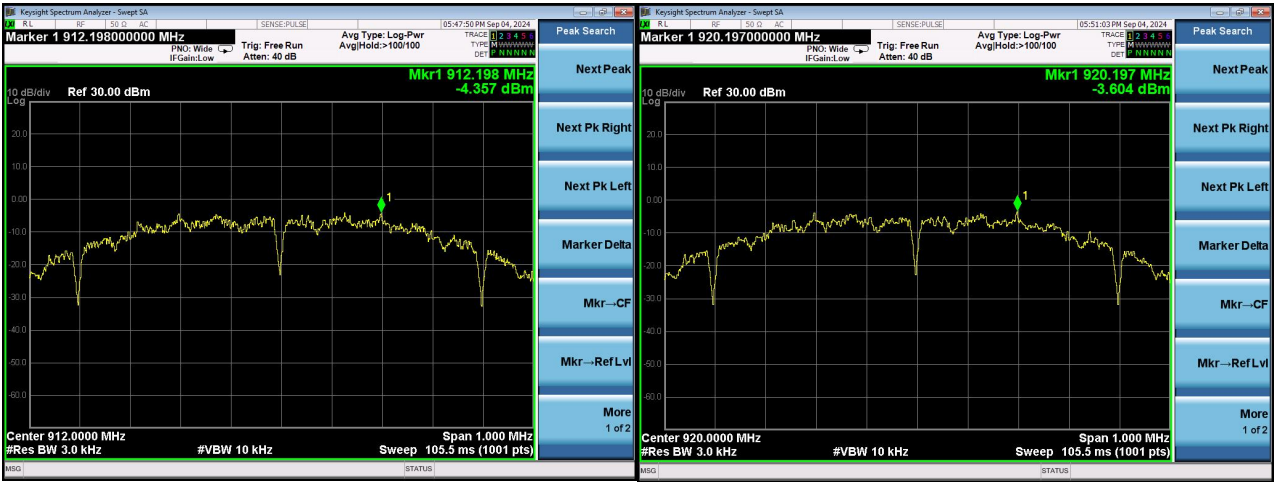
1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 30kHz, VBW $\geq$ 3*RBW, Span = 1.5xDTS BW
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.



7.4. Test Data

Test Item	: Power Spectral Density	Test Mode	: CH Low ~ CH High
Test Voltage	: DC 3V	Temperature	: 24℃
Test Result	: PASS	Humidity	: 52 %

Channel	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Results
Low	-4.357	8.00	PASS
High	-3.604	8.00	PASS



Low Channel

High Channel

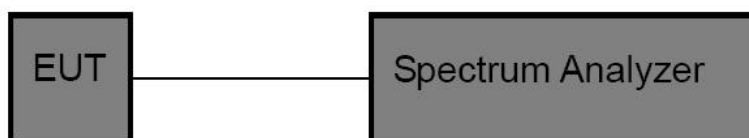


8. Conducted Spurious Emission and Band Edge Test

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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).

8.2. Test Setup



8.3. Test Procedure

Using the following spectrum analyzer setting:

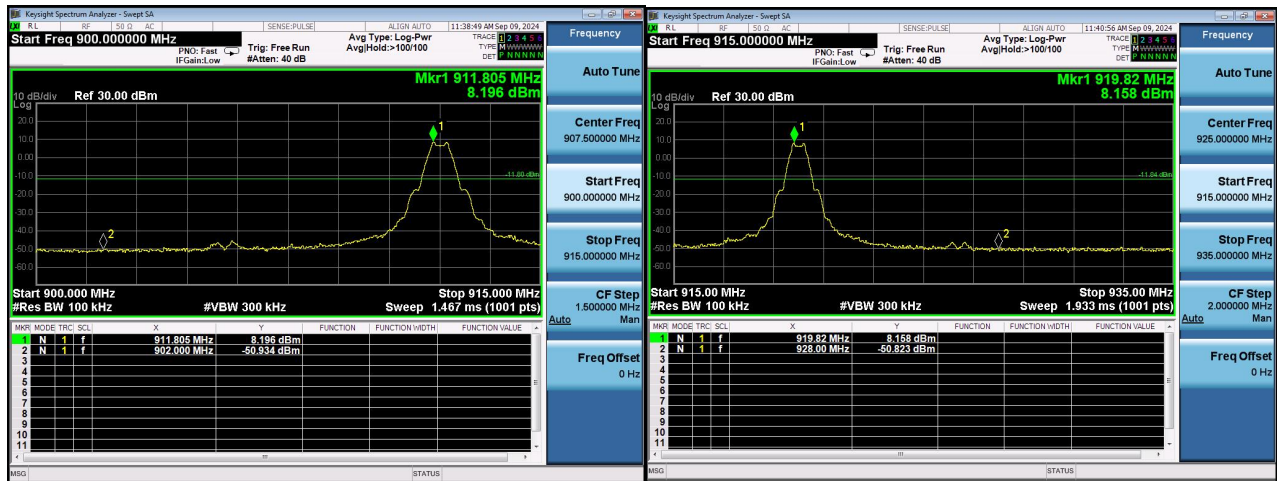
1. Set the RBW = 100KHz.
2. Set the VBW = 300KHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.



8.4. Test Data

Test Item	:	Band edge	Test Mode	:	CH Low ~ CH High
Test Voltage	:	DC 3V	Temperature	:	24℃
Test Result	:	PASS	Humidity	:	52 %

Band edge measurements



Conducted Emission Method



9. Antenna Requirement

9.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

9.2. Antenna Connected Construction

The antenna is a **FPC antenna** which permanently attached, and the best case gain of the antenna is -2.13dBi . It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_RF

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

----- End of Report -----

