

TEST REPORT

Applicant: Eran Financial Services LLC

Address of Applicant: 3500 Boca Raton Blvd - Suite 717, Boca Raton, Florida 33431

Manufacturer/Factory: GUANGDONG WANJU LIGHTING TECHNOLOGY CO., LTD

Address of Manufacturer/Factory: No. 59 Lechuang Road, Lianfeng Community, Xiaolan Town, Zhongshan City, Guangdong Province, China

Equipment Under Test (EUT)

Product Name: Fan remote control

Model No.: ER-2D-S

Series NO. N/A

Trade Mark: N/A

FCC ID: 2BAPVERAN1818

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231

Date of sample receipt: Sept 09.2024

Date of Test: Sept 10.2024 to Oct 22.2024

Date of report issued: Oct 23.2024

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:


Robinson Luo

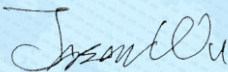
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	Oct 23.2024	Original

Prepared By:

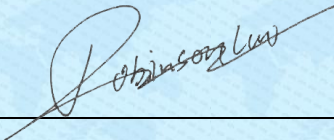


Date:

Oct 23.2024

Project Engineer

Check By:



Date:

Oct 23.2024

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
Conduction Emission	15.207	N/A
Field strength of the Fundamental Signal	15.231 (b)	Pass
Spurious Emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell Time	15.231 (a)(1)	Pass

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Fan remote control
Model No.:	ER-2D-S
Test Model No.:	ER-2D-S
Serial No.:	N/A
Test sample(s) ID:	GTSL2024100051-1
Sample(s) Status:	Engineer sample
Operation Frequency:	433.92MHz
Channel Number	1 Channel
Modulation technology:	ASK
Antenna Type:	PCB Antenna
Antenna gain:	1 dbi
Power supply:	Battery DC 3V

Remark:

1. Antenna gain information provided by the customer
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
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Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which only the worst case was shown in this test report and defined as follows:

433.92MHz	Axis	X	Y	Z
	Field Strength(dBuV/m)	86.71	85.33	83.22

5.3 Description of Support Units

None.

5.4 Test Facility

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

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen 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 files.

- **ISED —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.5 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Additional instructions

Software (Used for test) from client

Mode	Special test SW was built-in by manufacturer.
Power set	Default

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Jun. 22, 2024	Jun. 21, 2027
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Apr. 11, 2024	Apr. 10, 2025
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	Mar. 19, 2023	Mar. 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	Apr. 17, 2023	Apr. 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	Apr. 11, 2024	Apr. 10, 2025
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 13, 2023	Nov.12, 2024
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	Apr. 11, 2024	Apr. 10, 2025
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	Apr. 11, 2024	Apr. 10, 2025
11	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024
13	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	Mar. 12, 2024	Mar. 11, 2025
14	Amplifier	/	LNA-1000-30S	GTS650	Apr. 11, 2024	Apr. 10, 2025
15	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS692	Nov. 08, 2023	Nov. 07, 2024
16	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	Apr. 11, 2024	Apr. 10, 2025
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	Apr. 18, 2024	Apr. 17, 2025
18	RE cable 1	GTS	N/A	GTS675	Jul. 02, 2024	Jul. 01, 2025
19	RE cable 2	GTS	N/A	GTS676	Jul. 02, 2024	Jul. 01, 2025
20	RE cable 3	GTS	N/A	GTS677	Jul. 02, 2024	Jul. 01, 2025
21	RE cable 4	GTS	N/A	GTS678	Jul. 02, 2024	Jul. 01, 2025
22	RE cable 5	GTS	N/A	GTS679	Jul. 02, 2024	Jul. 01, 2025
23	RE cable 6	GTS	N/A	GTS680	Jul. 02, 2024	Jul. 01, 2025
24	RE cable 7	GTS	N/A	GTS681	Jul. 05, 2024	Jul. 04, 2025
25	RE cable 8	GTS	N/A	GTS682	Jul. 05, 2024	Jul. 04, 2025

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	Apr. 13, 2024	Apr. 12, 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	Apr. 13, 2024	Apr. 12, 2025
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	Apr. 13, 2024	Apr. 12, 2025
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	Apr. 13, 2024	Apr. 12, 2025
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	Apr. 13, 2024	Apr. 12, 2025
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	Apr. 13, 2024	Apr. 12, 2025
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	Apr. 13, 2024	Apr. 12, 2025
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	Apr. 13, 2024	Apr. 12, 2025
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	Apr. 18, 2024	Apr. 17, 2025

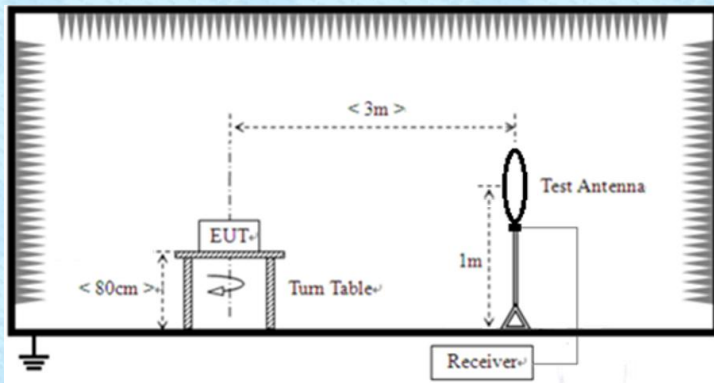
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	Apr. 18, 2024	Apr. 17, 2025

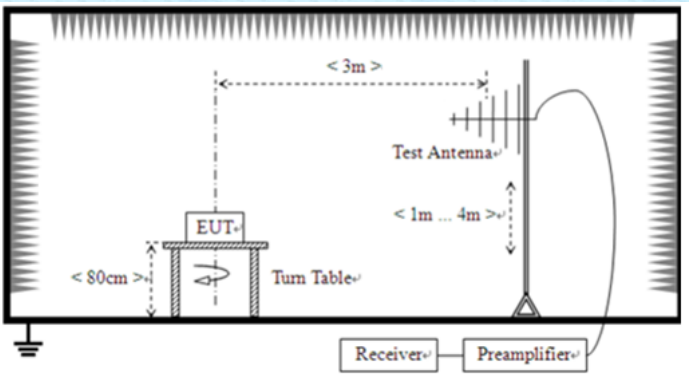
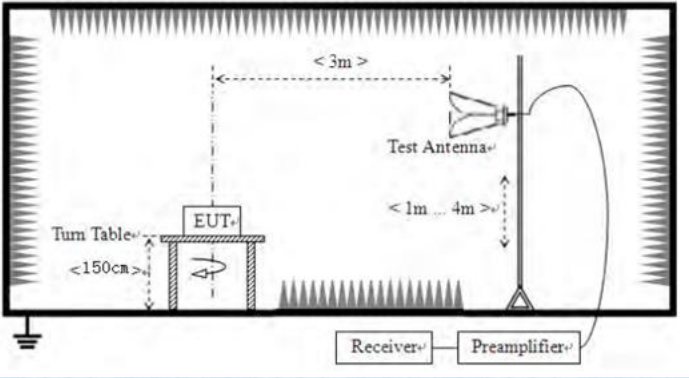
7 Test results and Measurement Data

7.1 Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203
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.	
EUT Antenna:	
The antenna is PCB antenna, reference to the appendix II for details.	

7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.231 (b)& Section 15.209					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	9kHz to 5000MHz					
Test site:	Measurement Distance: 3m					
Receiver setup:	Frequency	Detector	RBW	VBW	Value	
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak	
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak	
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak	
	Above 1GHz	Peak	1MHz	3MHz	Peak	
		Peak	1MHz	10Hz	Average	
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark		
	433.92MHz	100.83		Peak Value		
		80.83		Average Value		
Limit: (Spurious Emissions)	Fundamental Frequency (MHz)		Field Strength of fundamental (microvolts/meter)		Field Strength of Unwanted Emissions (microvolts/meter)	
	40.66-40.70		1,000		100	
	70-130		500		50	
	130-174		500 to 1,500**		50 to 1,50**	
	174-260		1,500		1,50	
	260-470		1,500 to 5,000**		1,50 to 5,00**	
	Above 470		5,000		5,00	
	Frequency (MHz)		Class B(dBuV/m @3m)			
			Peak		Average	
	Above 1000		74		54	
	Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.					
	Test setup:	Below 30MHz				
						
	Below 1GHz					

	 Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8 meters for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test environment:	Temp.: 25 °C Humid.: 50% Press.: 1 010mbar
Test voltage:	Battery DC 3V
Test results:	Pass

Measurement data:

7.2.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.92	63.27	21.55	1.89	0	86.71	100.83	-14.12	Horizontal
433.92	56.13	21.55	1.89	0	79.57	100.83	-21.26	Vertical

Average value:

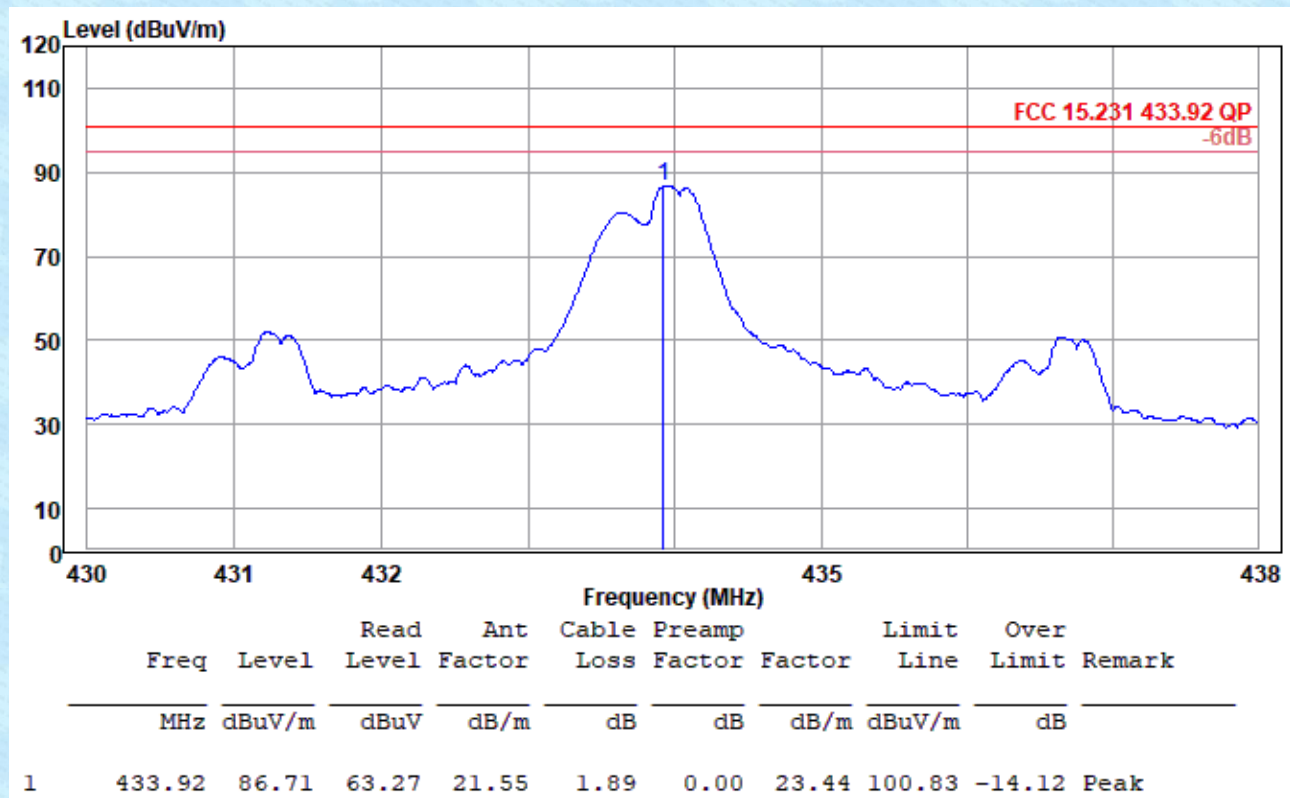
Frequency (MHz)	Peak Value (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	86.71	-9.61	77.10	80.83	-3.73	Horizontal
433.92	79.57	-9.61	69.96	80.83	-10.87	Vertical

Remarks:

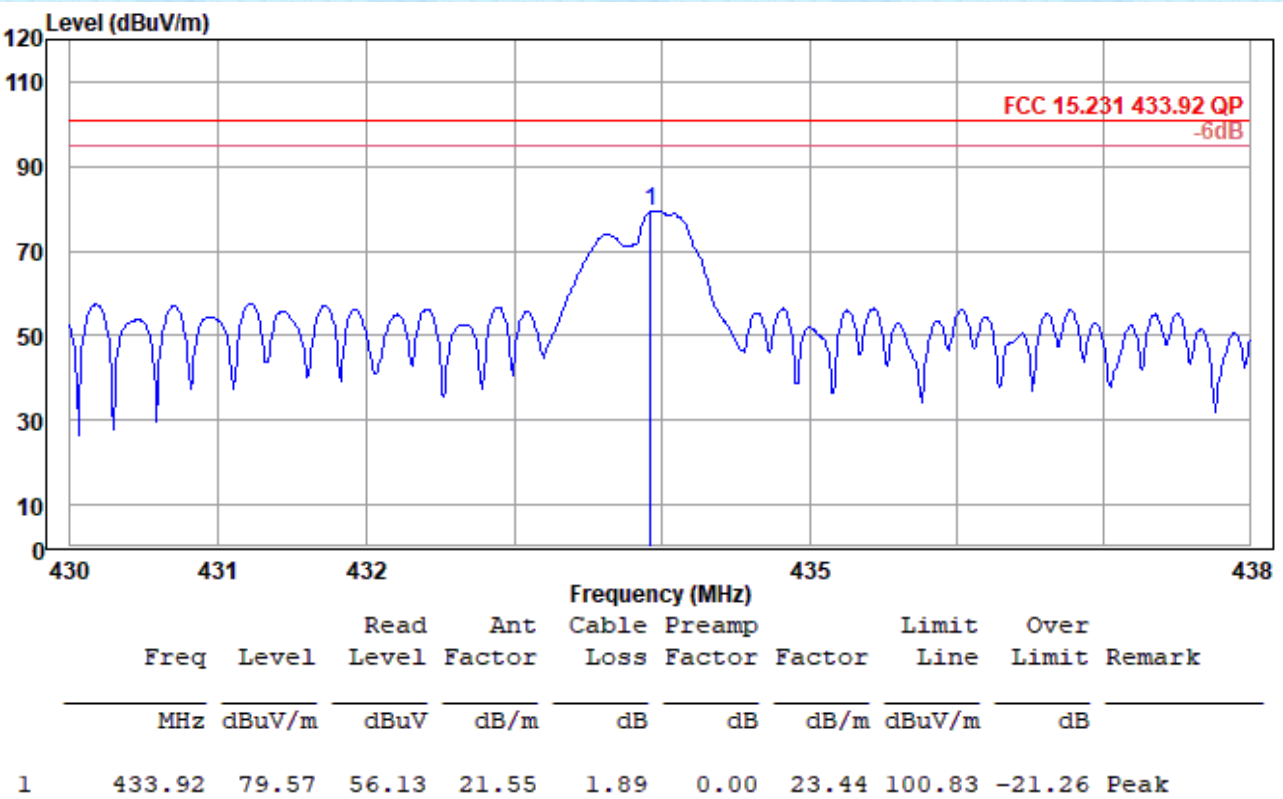
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. Average value = Peak value + Duty cycle factor

Mode: Transmitting mode

Polarization: Horizontal



Mode:	Transmitting mode	Polarization:	Vertical
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7.2.2 Spurious Emissions

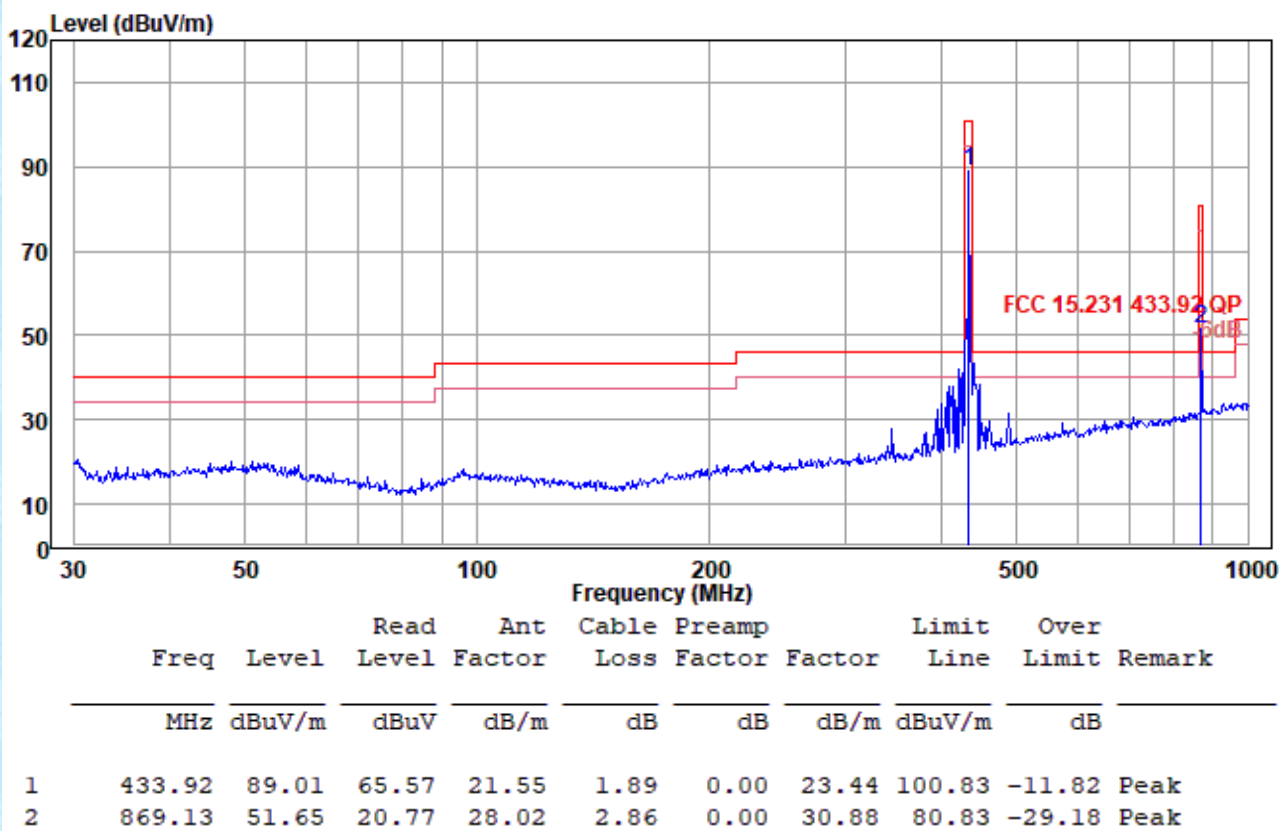
Measurement data:

9 kHz ~ 30 MHz

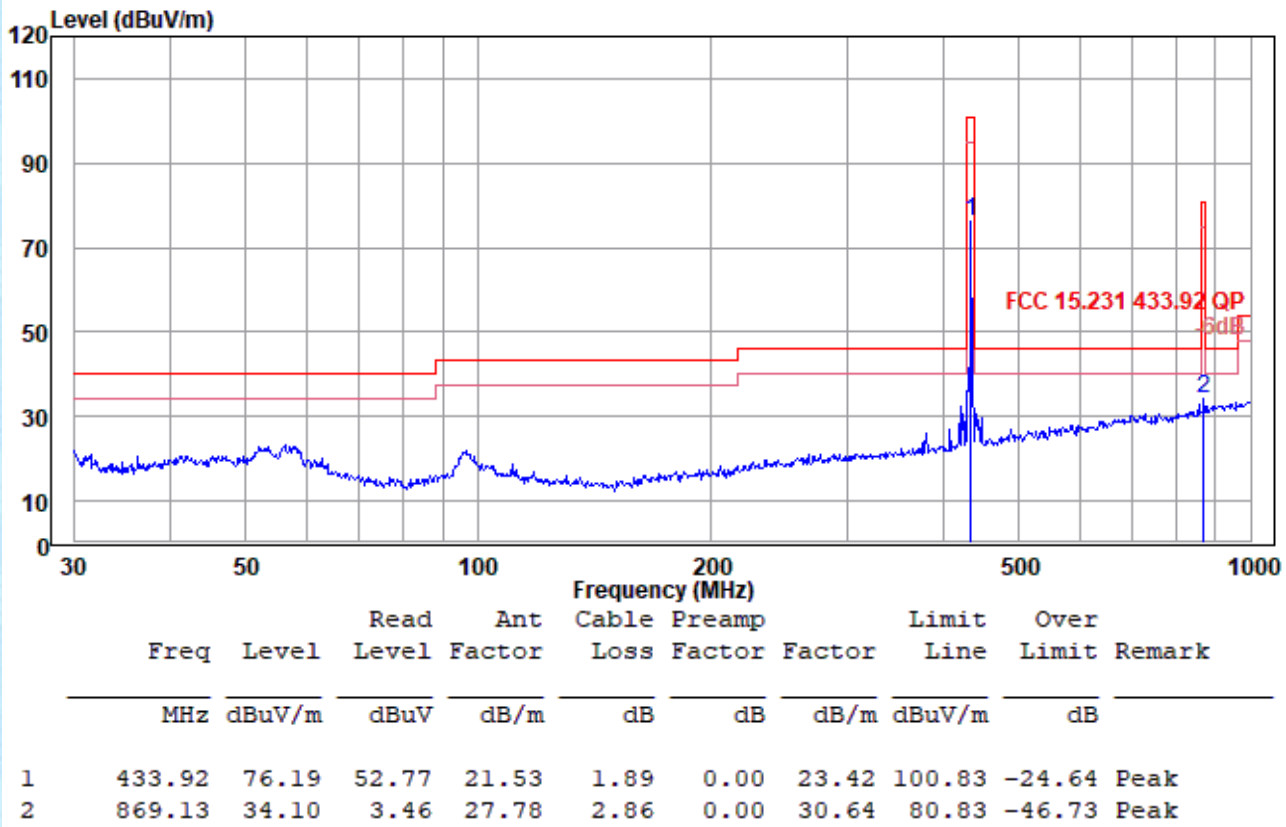
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Below 1GHz:

Horizontal

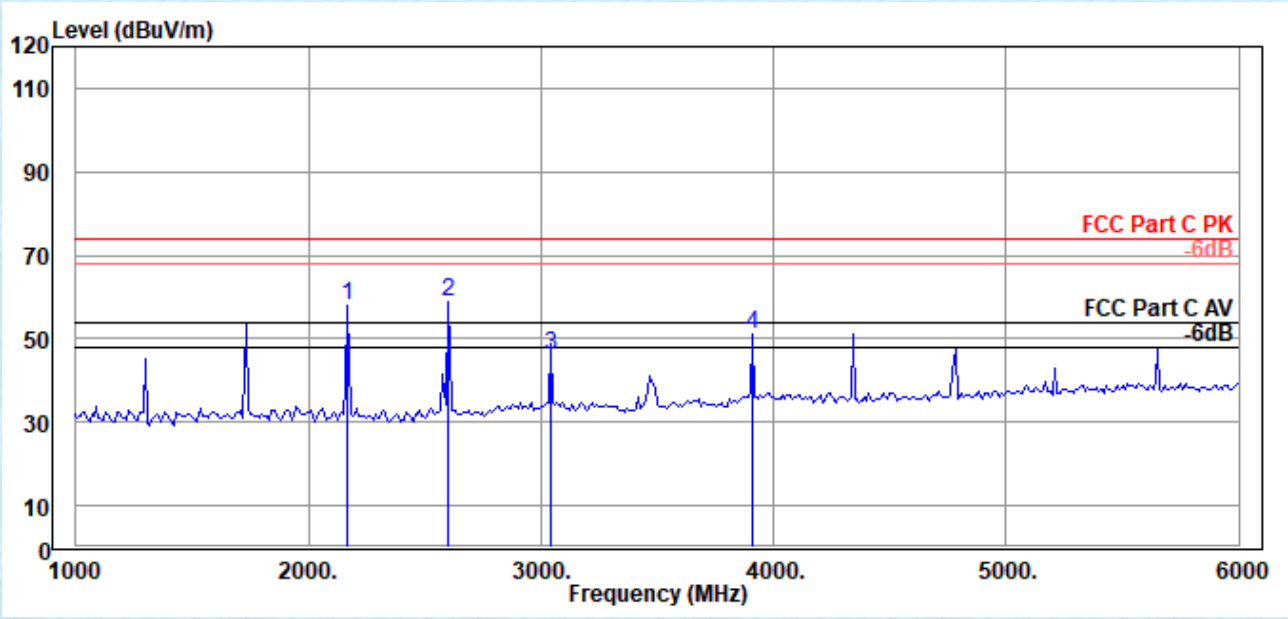


Vertical



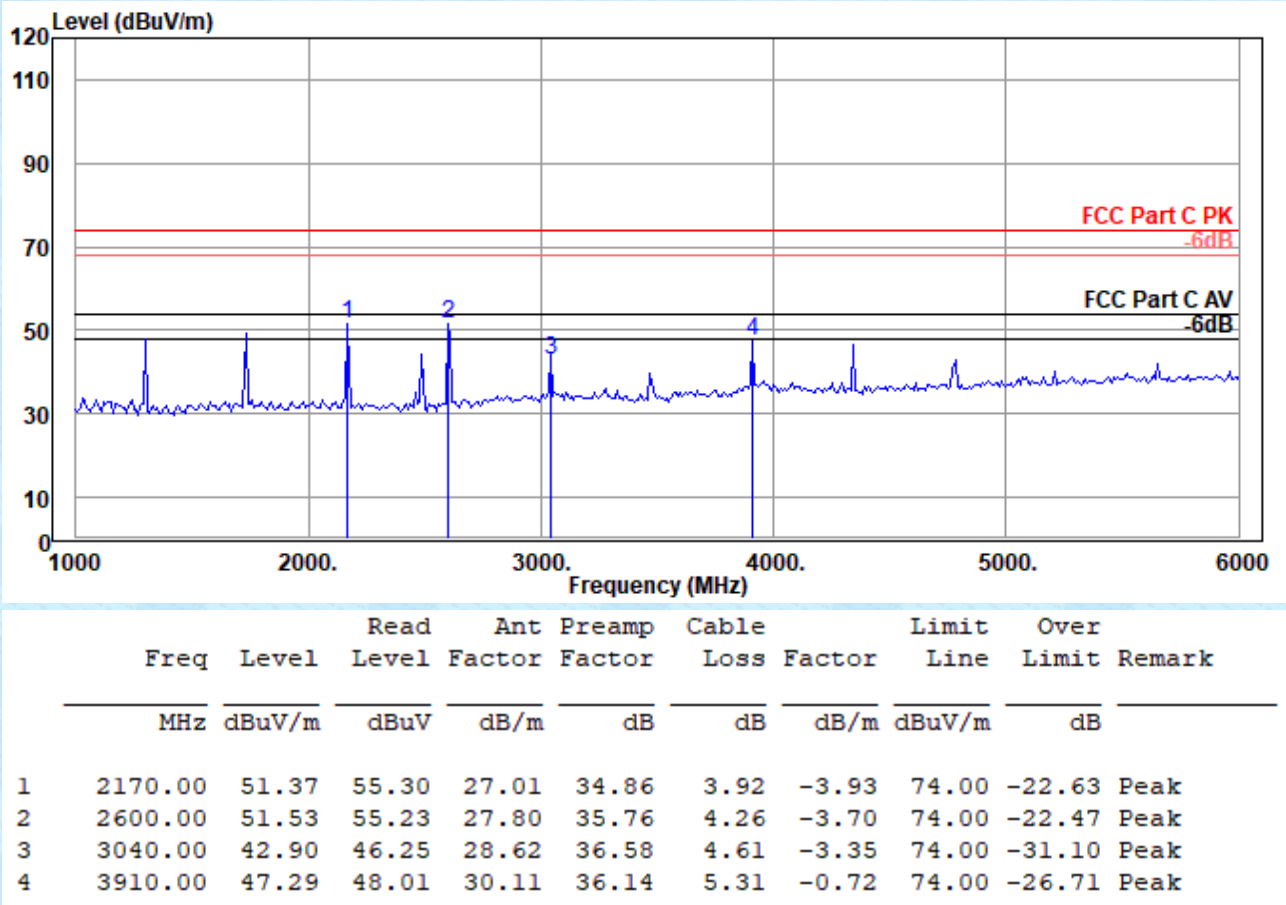
Above 1G:

Horizontal



	Freq	Level	Read	Ant	Preamp	Cable		Limit	Over	
	MHz	dBuV/m	Level	Factor	Factor	Loss	Factor	Line	Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dB	dB/m	dBuV/m	dB	
1	2170.00	58.09	62.02	27.01	34.86	3.92	-3.93	74.00	-15.91	Peak
2	2600.00	58.98	62.68	27.80	35.76	4.26	-3.70	74.00	-15.02	Peak
3	3040.00	46.24	49.59	28.62	36.58	4.61	-3.35	74.00	-27.76	Peak
4	3910.00	51.31	52.03	30.11	36.14	5.31	-0.72	74.00	-22.69	Peak

Vertical



Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2170	55.30	27.01	3.92	34.86	51.37	74	-22.63	Vertical
2600	55.23	27.80	4.26	35.76	51.53	74	-22.47	Vertical
3040	46.25	28.62	4.61	36.58	42.90	74	-31.10	Vertical
2170	62.02	27.01	3.92	34.86	58.09	74	-15.91	Horizontal
2600	62.68	27.80	4.26	35.76	58.98	74	-15.02	Horizontal
3040	49.59	28.62	4.61	36.58	46.24	74	-27.76	Horizontal

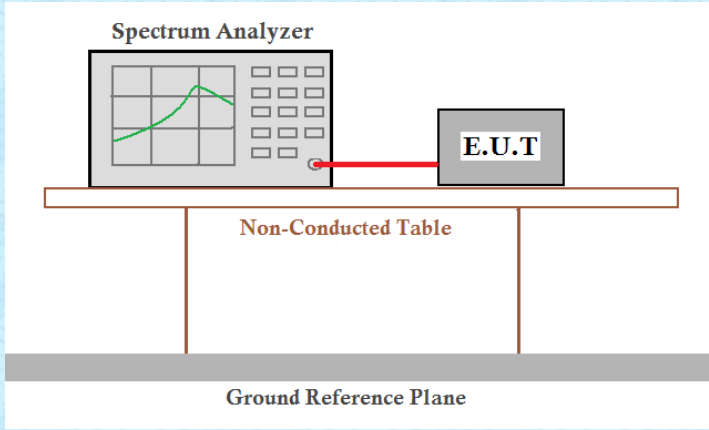
Average value:

Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2170	51.37	-9.61	41.76	54	-12.24	Vertical
2600	51.53	-9.61	41.92	54	-12.08	Vertical
3040	42.90	-9.61	33.29	54	-20.71	Vertical
2170	58.09	-9.61	48.48	54	-5.52	Horizontal
2600	58.98	-9.61	49.37	54	-4.63	Horizontal
3040	46.24	-9.61	36.63	54	-17.37	Horizontal

Remarks:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *Average value = Peak value + Duty cycle factor*

7.3 20dB Occupy Bandwidth

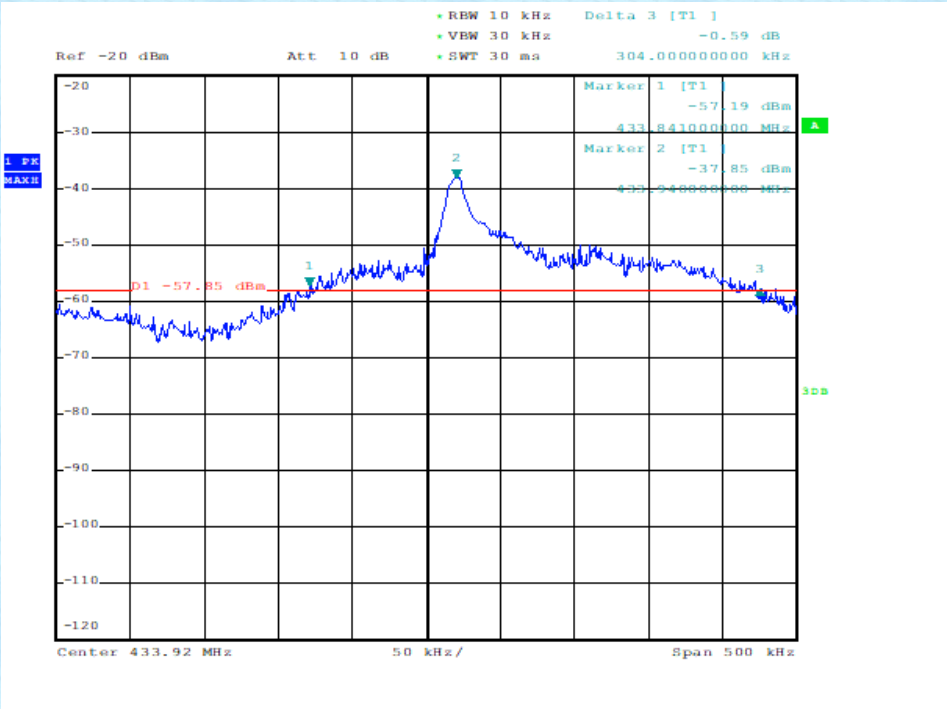
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.10:2013
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

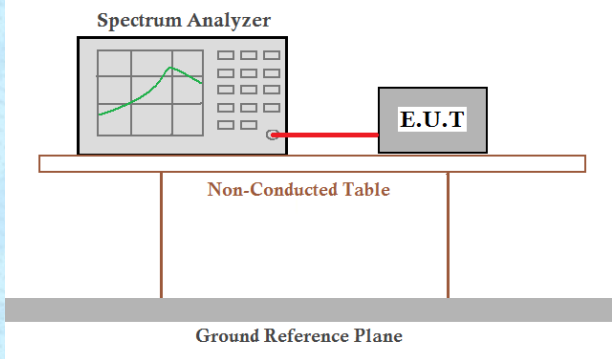
Test Frequency (MHz)	20dB bandwidth (KHz)	Limit (MHz)	Result
433.92	304	1.085	Pass

Note: Limit= Fundamental frequency×0.25%
 $433.92 \times 0.25\% = 1.085\text{MHz}$

Test plot as follows:



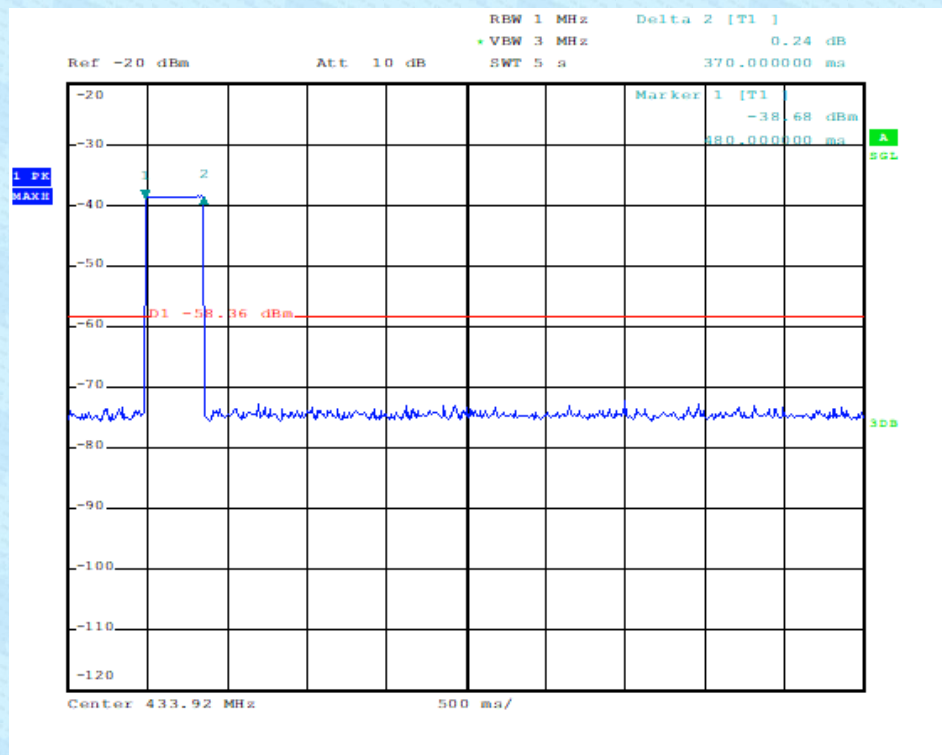
7.4 Dwell Time

Test Requirement:	FCC Part15 C Section 15.231 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

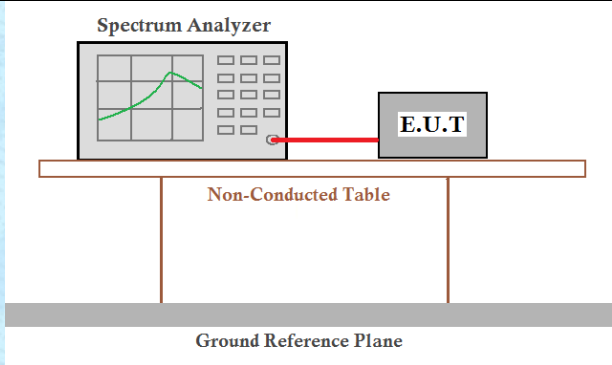
Measurement data:

Frequency (MHz)	Duration of each TX (second)	Limit (second)	Result
433.92	0.370	<5.0	Pass

Test plot as follows:



7.5 Duty Cycle

Test Requirement:	FCC Part15 C Section 15.231
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	No dedicated limit specified in the Rules.
Test Procedure:	1. Place the EUT on the table and set it in 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 centre frequency of spectrum analyzer=operating frequency. 4. Set the spectrum analyzer as RBW=100kHz, VBW=100KHz, Span=0Hz, Adjust Sweep=100ms to obtain the “worst-case” pulse on time 5. Repeat above procedures until all frequency measured was complete.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

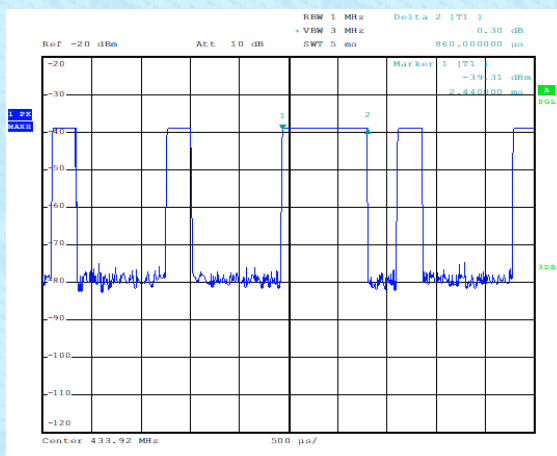
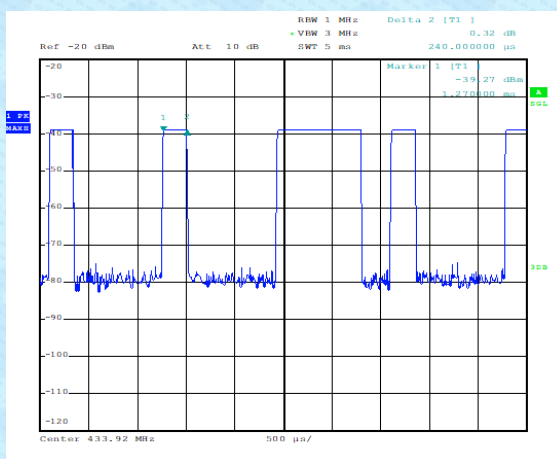
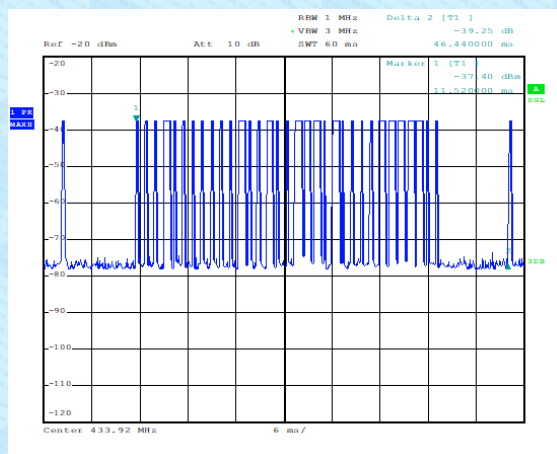
Measurement data:

Calculate Formula: Duty cycle factor = $20 \log(\text{Duty cycle})$
Duty cycle = on time / 0.1 seconds or period, whichever is less

Test data:

$T_{\text{on time}} = 0.86 \times 12 + 0.24 \times 21 = 15.36(\text{ms})$
 $T_{\text{period}} = 46.44(\text{ms})$
Duty cycle = on time / period = $15.36 / 46.44 = 33.07\%$
Duty cycle factor = $20 \log(0.3307) = -9.61$

Test plot as follows:



8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----