

FCC PART 15 TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant : CUSTOM ACCESSORIES INC
Address : 5900 AMI DRIVE RICHMOND IL 60071
Manufacturer / Factory : DONGGUAN SHENGQIN ELECTRONIC TECHNOLOGY CO.LTD
Address : 2F, Building H, Lianyi Industrial Area, No.383, Wentang Village,
Dongcheng District, Dongguan City, Guangdong Province, China
E.U.T. : RF Remote Control
Brand Name : CUSTOM ACCESSORIES
Model No. : 92905
FCC ID : 2ADMQ-92905
Measurement Standard : FCC PART 15.231 : 2017
Date of Receiver : September 09, 2018
Date of Test : September 09, 2018 to October 16, 2018
Date of Report : October 16, 2018

This Test Report is Issued Under the Authority of :

Prepared by



Knight Wen / Engineer

Approved & Authorized Signer



Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1809208FV00	Initial Issue	2018-10-16

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

Product Name : RF Remote Control

Main Model No. : 92905

Additional Model No. : N/A

Model Difference Description : N/A

Brand Name : CUSTOM ACCESSORIES

Power Supply : DC 3V from CR2025 Button Cell

Test Voltage : DC 3V from CR2025 Button Cell

Remark : N/A

Technical Specification:

Frequency : 433.85MHz

Modulation Type : ASK

Number of Channel : 1

Antenna Type : PCB Antenna

Antenna Gain : -3 dBi (Declaration by manufacturer)

Hardware version : 1.0

Software version : 1.0

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2ADMQ-92905** filing to comply with Section 15.231 of the FCC Part 15 (2017), Subpart C Rule.

1.3 Test Methodology

The radiated emission measurement was performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

None

1.6 Test Facility and Location

Site Description

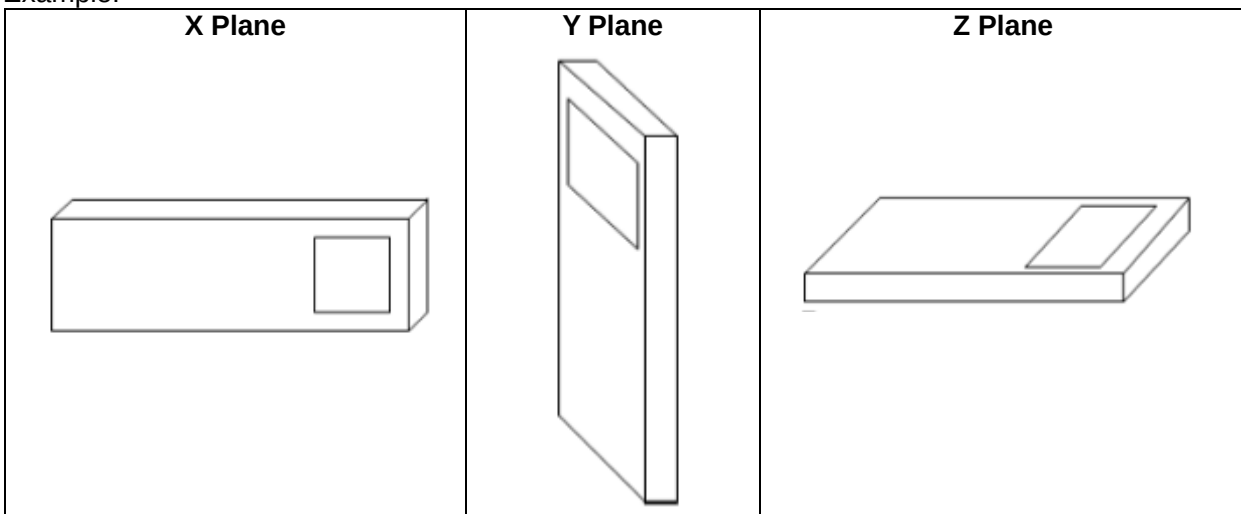
- EMC Lab : Listed by CNAS, August 13, 2018
The certificate is valid until August 13, 2024
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01
The Certificate Registration Number is L5795.
- Listed by A2LA, November 01, 2017
The certificate is valid until December 31, 2019
The Laboratory has been assessed and proved to be in compliance with ISO17025
The Certificate Registration Number is 4429.01
- Listed by FCC, November 06, 2017
The Designation Number is CN1214
Test Firm Registration Number: 907417
- Listed by Industry Canada, June 08, 2017
The Certificate Registration Number. Is 46405-9743
- Name of Firm : Dongguan Nore Testing Center Co., Ltd.
(Dongguan NTC Co., Ltd.)
- Site Location : Building D, Gaosheng Science & Technology Park,
Zhouxi Longxi Road, Nancheng District, Dongguan
City, Guangdong Province, China

1.7 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	AC Power Conducted Emission	N/A see note 2
§15.231&15.209	Radiated Emission	Compliant
§15.231(c)	Occupied bandwidth	Compliant
§15.231(a)	Transmission time	Compliant
§15.203	Antenna Requirement	Compliant

- Note: 1. The EUT has been tested as an independent unit. And Continual transmitting in maximum power (The new battery be used during test)
2. Due to this EUT is powered by battery only, the AC Power Conducted Emission is not applicable.
3. The EUT powered by battery and operating multiple positions, so the EUT shall be performed three orthogonal planes. The worst plane is Z.

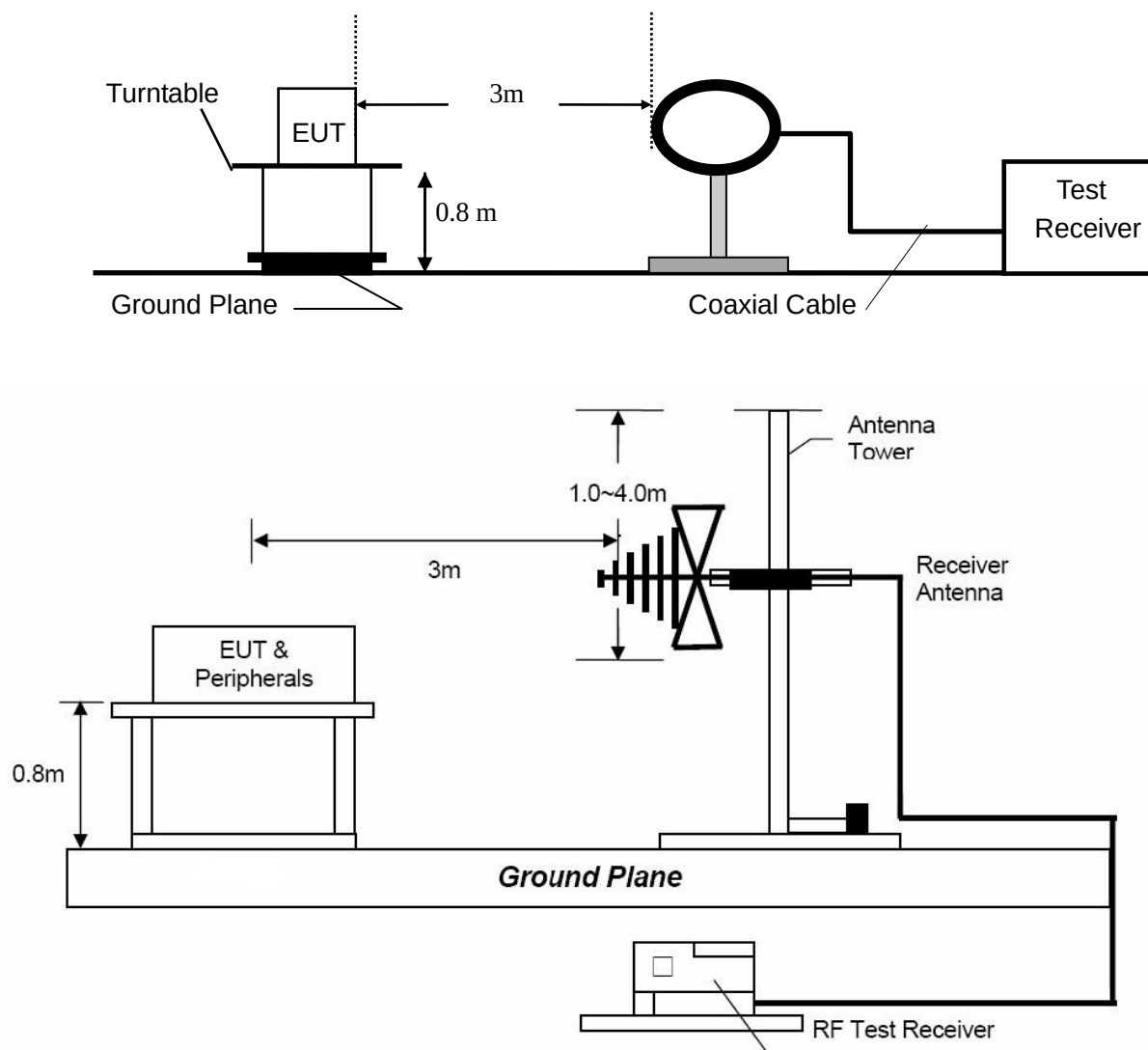
Example:



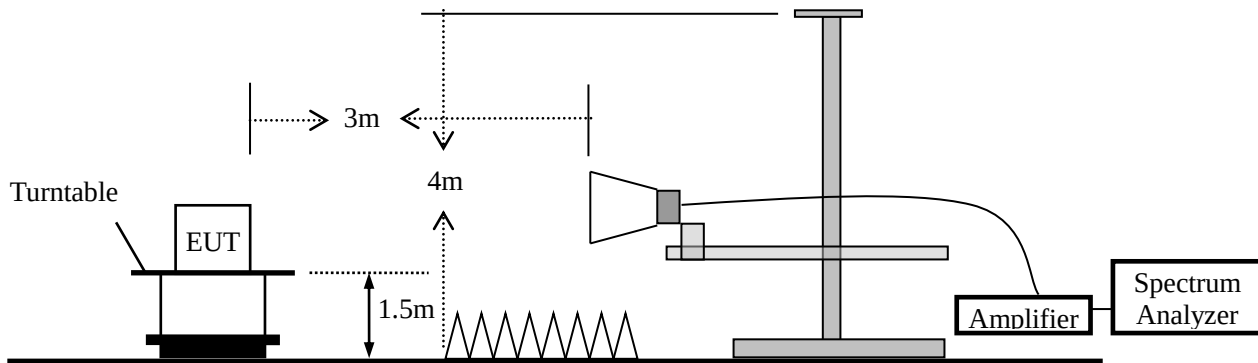
2. Radiated Emission Test

2.1 Test SET-UP (Block Diagram of Configuration)

(1) Radiated Emission Test Set-Up, Frequency Below 30MHz



(2) Radiated Emission Test Set-Up, Frequency above 1GHz



2.2 Measurement Procedure

- Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- For the radiated emission test above 1GHz:
The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna 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.
- 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	Peak+ AV Factor	

2.3 Limit

Table A [0.009MHz~1GHz]

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)
		$\mu\text{V/m}$
0.009 ~ 0.490	300	$2400/F(\text{kHz})$
0.490 ~ 1.705	30	$24000/F(\text{kHz})$
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

- Remark :
- (1) Emission level (dB) μV = 20 log Emission level $\mu\text{V/m}$
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
 - (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

Table B

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious Emissions	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
40.66-40.70	2250	67.04	225	47.04
70-130	1250	61.94	125	41.94
130-174	1250-3370**	61.9-70.55	125-375**	41.94-51.48
174-260	3750	71.48	375	51.48
260-470	3750-12500**	71.48-81.94	375-1250**	51.48-61.94
Above 470	12500	81.94	1250	61.94

**) Linear interpolations

2.4 Measurement Results



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Radiated Emission Measurement

File : 92905

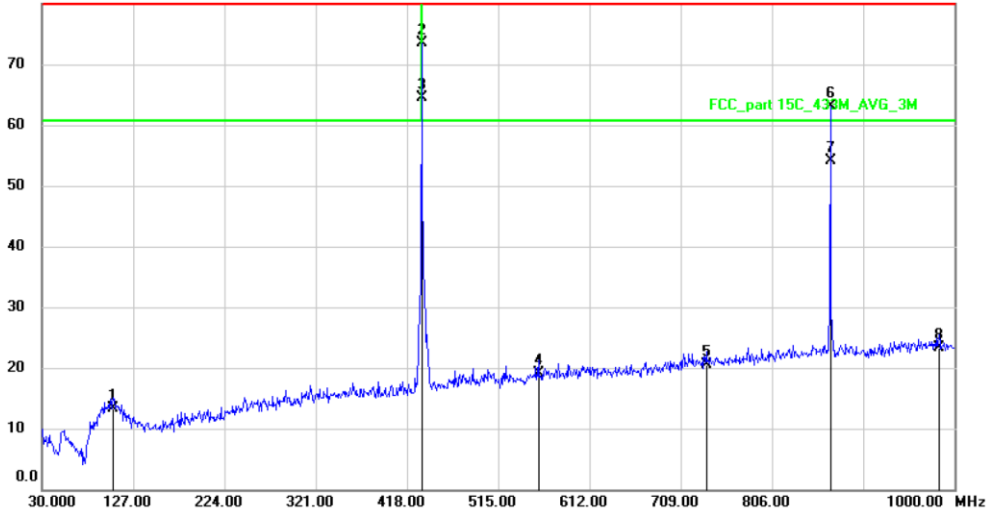
Data : #17

Date: 2018-9-27

Time: 10:22:53

80.0 dBuV/m

FCC_part 15C_433M_3M



Site: 3m Chamber

Polarization: **Horizontal**

Temperature: 26

Limit: FCC_part 15C_433M_3M

Power: DC3V

Humidity: 47 %

EUT: RF Remote Control

Distance: 3m

M/N: 92905

Mode: TX

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		105.6600	25.46	-12.16	13.30	80.80	-67.50	QP		
2		433.8500	81.94	-8.35	73.59	100.80	-27.21	peak		
3		433.8500	72.93	-8.35	64.58	80.80	-16.22	AVG		
4		557.6800	25.50	-6.30	19.20	80.80	-61.60	QP		
5		736.1599	23.51	-2.91	20.60	80.80	-60.20	QP		
6		867.7000	64.31	-1.12	63.19	80.80	-17.61	peak		
7	*	867.7000	55.30	-1.12	54.18	60.80	-6.62	AVG		
8		983.5100	23.68	-0.28	23.40	80.80	-57.40	QP		

*:Maximum data x:Over limit !:over margin

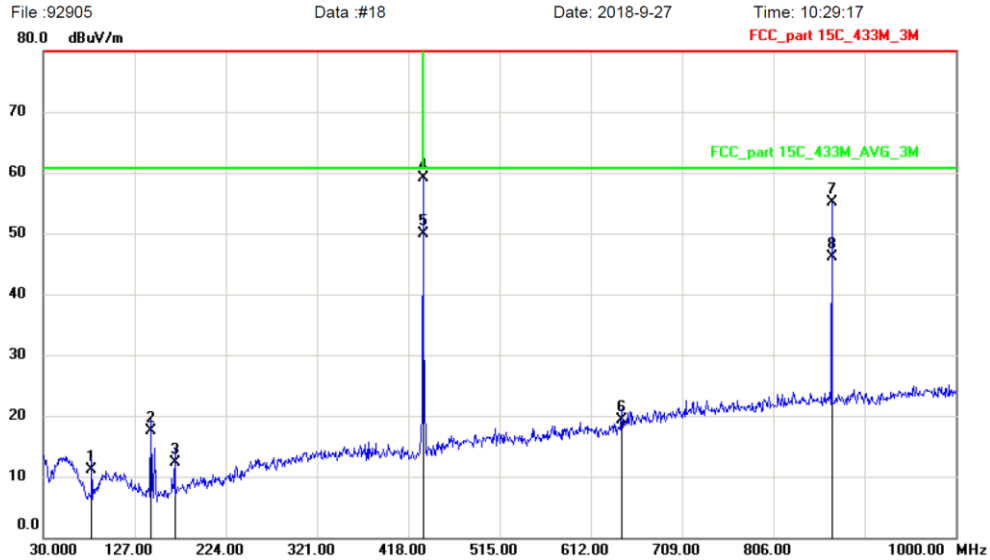
(Reference Only)

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.



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Web: <http://www.ntc-c.com>

Radiated Emission Measurement



Site: 3m Chamber
Limit: FCC_part 15C_433M_3M
EUT: RF Remote Control
M/N: 92905
Mode: TX
Note:

Polarization: **Vertical**
Power: DC3V
Distance: 3m
Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		81.4100	30.07	-18.87	11.20	80.80	-69.60	QP		
2		144.4600	36.10	-18.60	17.50	80.80	-63.30	QP		
3		169.6799	30.21	-17.81	12.40	80.80	-68.40	QP		
4		433.8500	70.36	-11.35	59.01	100.80	-41.79	peak		
5		433.8500	61.35	-11.35	50.00	80.80	-30.80	AVG		
6		644.9800	25.20	-5.90	19.30	80.80	-61.50	QP		
7		867.7000	56.29	-1.12	55.17	80.80	-25.63	peak		
8	*	867.7000	47.28	-1.12	46.16	60.80	-14.64	AVG		

*:Maximum data x:Over limit !:over margin

(Reference Only)

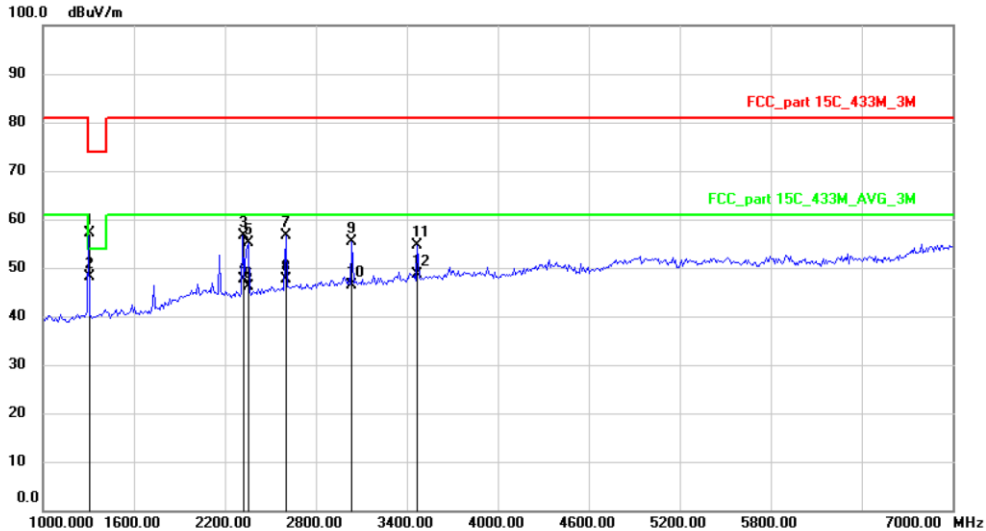
Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.



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Web: <http://www.ntc-c.com>

Radiated Emission Measurement

File : 92905 Data : #20 Date: 2018-9-27 Time: 11:10:24



Site: 3m Chamber
Limit: FCC_part 15C_433M_3M
EUT: RF Remote Control
M/N: 92905
Mode: TX
Note:

Polarization: **Horizontal**
Power: DC3V
Distance:
Temperature: 26
Humidity: 47 %

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1	1301.550	64.79	-7.61	57.18	74.00	-16.82	peak	
2 *	1301.550	55.78	-7.61	48.17	54.00	-5.83	AVG	
3	2317.308	56.63	-0.10	56.53	80.80	-24.27	peak	
4	2317.308	47.62	-0.10	47.52	60.80	-13.28	AVG	
5	2355.769	55.12	0.00	55.12	80.80	-25.68	peak	
6	2355.769	46.11	0.00	46.11	60.80	-14.69	AVG	
7	2603.100	55.84	0.76	56.60	80.80	-24.20	peak	
8	2605.769	46.82	0.77	47.59	60.80	-13.21	AVG	
9	3036.950	53.60	1.85	55.45	80.80	-25.35	peak	
10	3038.461	44.58	1.86	46.44	60.80	-14.36	AVG	
11	3470.800	52.06	2.68	54.74	80.80	-26.06	peak	
12	3470.800	46.05	2.68	48.73	60.80	-12.07	AVG	

*:Maximum data x:Over limit !:over margin

(Reference Only)



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Tel: +86-769-22022444 Fax: +86-769-22022799
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Radiated Emission Measurement

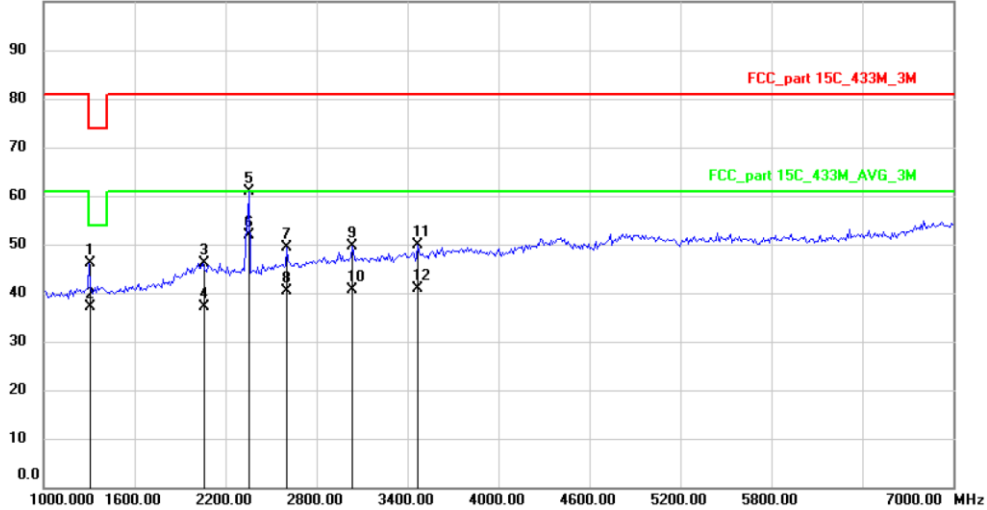
File : 92905

Data : #19

Date: 2018-9-27

Time: 11:17:02

100.0 dBuV/m



Site: 3m Chamber

Limit: FCC_part 15C_433M_3M

EUT: RF Remote Control

M/N: 92905

Mode: TX

Note:

Polarization: **Vertical**

Power: DC3V

Distance:

Temperature: 26

Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		1301.550	53.34	-7.09	46.25	74.00	-27.75	peak		
2		1301.550	44.33	-7.09	37.24	54.00	-16.76	AVG		
3		2048.077	47.00	-0.75	46.25	80.80	-34.55	peak		
4		2048.077	37.99	-0.75	37.24	60.80	-23.56	AVG		
5		2355.769	60.84	0.00	60.84	80.80	-19.96	peak		
6	*	2355.769	51.83	0.00	51.83	60.80	-8.97	AVG		
7		2603.100	48.55	0.76	49.31	80.80	-31.49	peak		
8		2603.100	39.54	0.76	40.30	60.80	-20.50	AVG		
9		3036.950	47.85	1.85	49.70	80.80	-31.10	peak		
10		3036.950	38.84	1.85	40.69	60.80	-20.11	AVG		
11		3470.800	47.10	2.68	49.78	80.80	-31.02	peak		
12		3470.800	38.09	2.68	40.77	60.80	-20.03	AVG		

*:Maximum data x:Over limit !:over margin

(Reference Only)

Other emissions are lower than 20dB below the allowable limit. And according to FCC rule, they had not recorded in the report.

Note:

- (1) Emission Level= Reading Level+Probe Factor +Cable Loss
- (2) Factor= Antenna Gain + Cable Loss – Amplifier Gain
- (3) Measurement uncertainty: $\pm 3.7\text{dB}$
- (4) Emission (the row indicated by bold) within the restricted band meets the requirement of FCC part 15 Section 15.205.
- (5) Horn antenna used for the emission over 1000MHz.

For Duty Cycle

Average should be determined by duty cycle factor.

The duty cycle is simply the on time by divided by the period:

The duration of one cycle = 51.80ms < 100ms

Effective period of the cycle =

$\text{Ton1} * \text{Number} + \text{Ton2} * \text{Number} = 1.14 * 12 + 0.36 * 13 = 18.36\text{ms}$

Duty cycle = $18.36\text{ms} / 51.80\text{ms} = 0.3544$

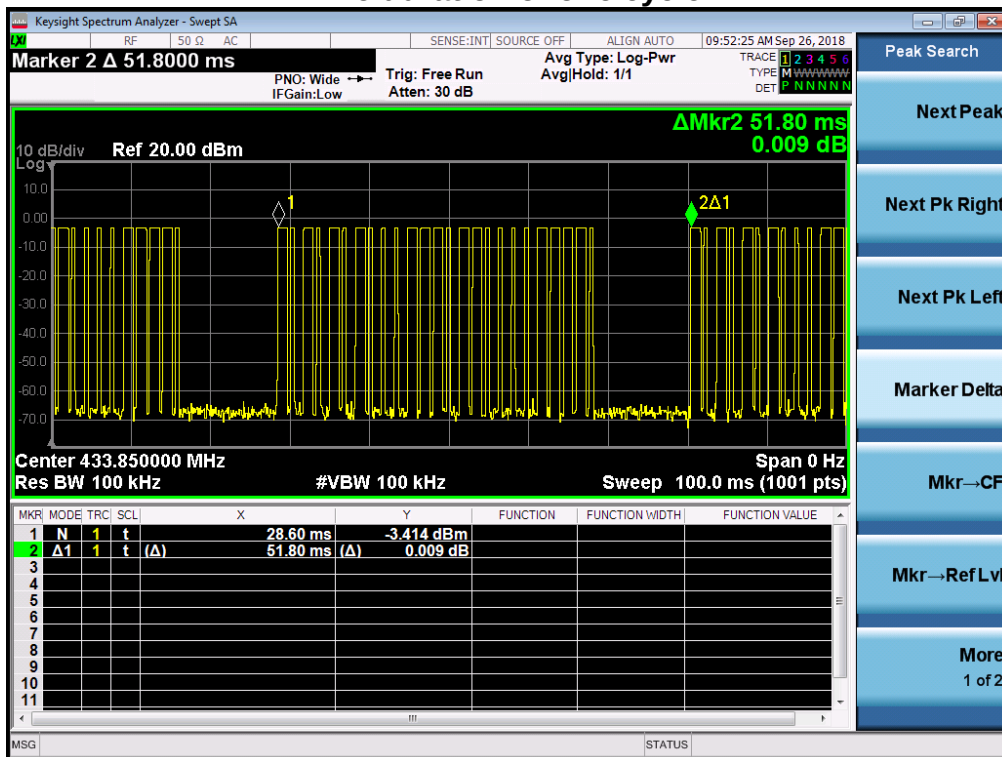
AV Factor = $20\log 0.3544 = -9.01$

The value of Average = The value of Peak + AV Factor.

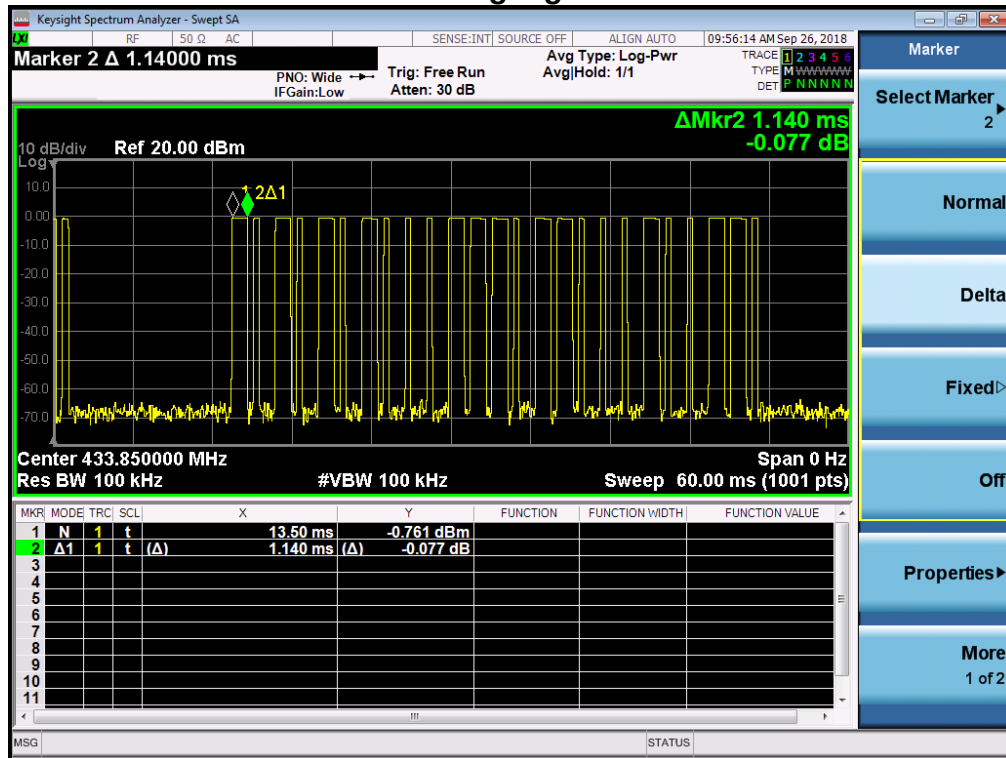
Example: For 433.85MHz, AV = $73.59(\text{Peak}) - 9.01(\text{AV factor}) = 64.58$.

Details please see the following plots.

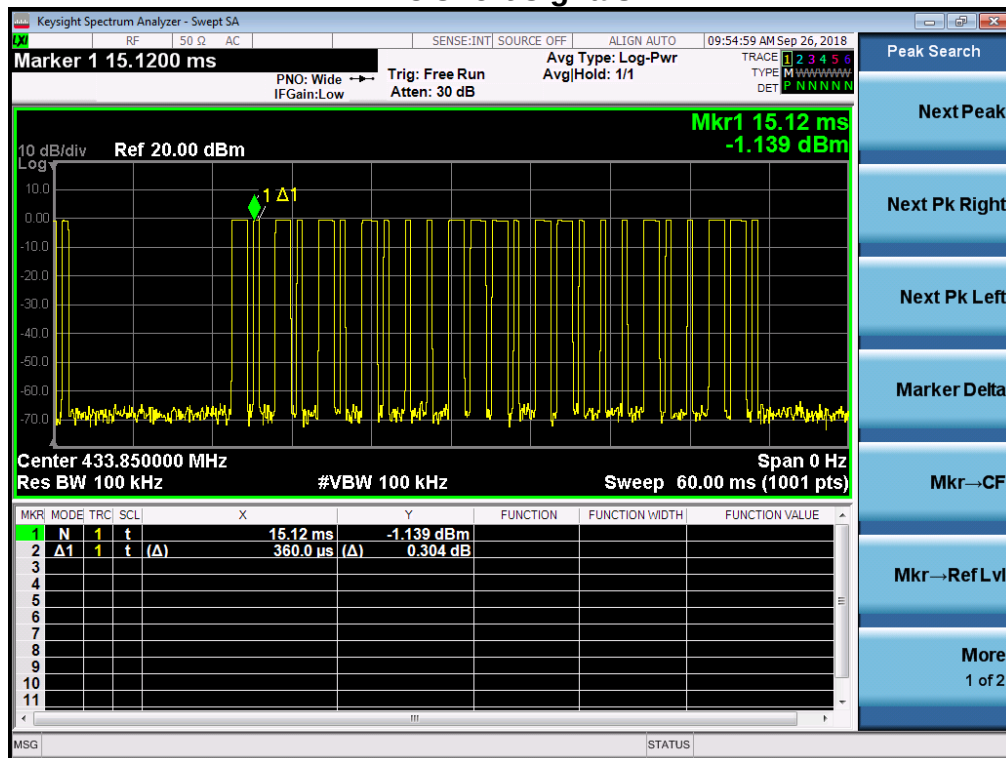
The duration of one cycle



12 long signals



13 short signals



3. Occupied Bandwidth

3.1 Measurement Procedure

Same as section 2.2.

3.2 Test SET-UP (Block Diagram of Configuration)

Same as section 2.1.

3.3 Limit

Please refer section 15.231

According to 15.231(C), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

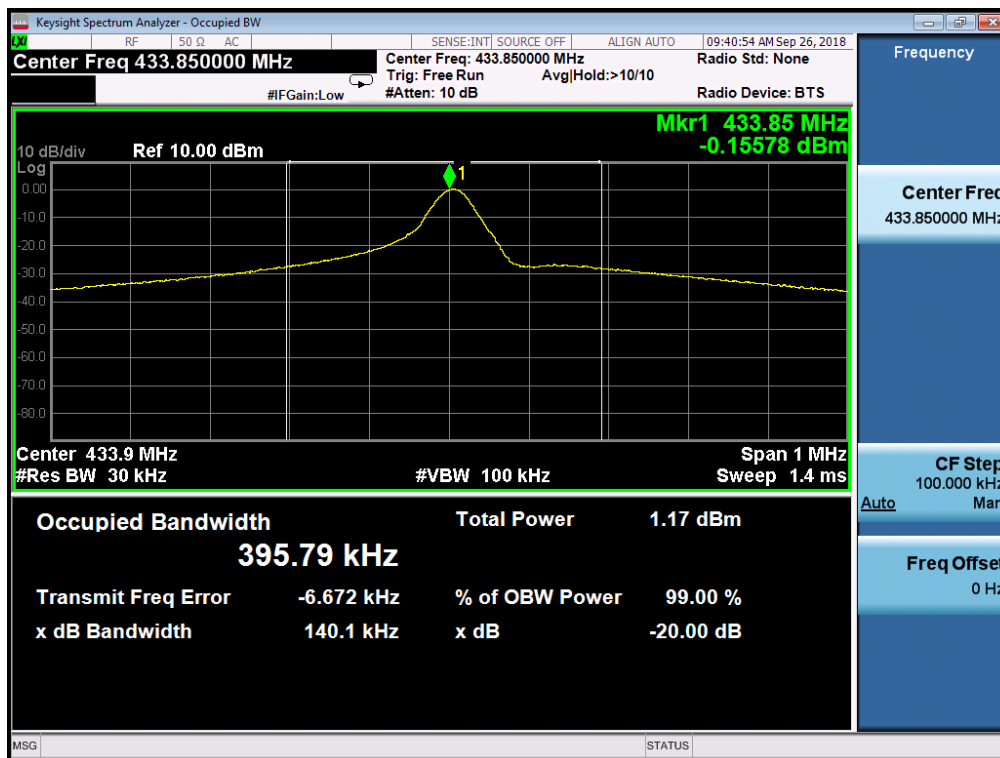
$$\text{Limit} = 433.85 \times 0.25\% = 1.08\text{MHz}$$

3.4 Measurement Results

20dB Bandwidth	Limit
140.10KHz	1.08MHz

Please refer to the following plot.

20dB Bandwidth



4 Transmission Time

4.1 Measurement Procedure

Same as section 2.2.

4.2 Test SET-UP (Block Diagram of Configuration)

Same as section 2.1.

4.3 Limit

According to 15.231(a)(2), A transmitter activated automatically shall cease transmission within 5 seconds after activation.

4.4 Measurement Results

Transmission Time	Limit
4.80s	5s

Please refer to the following plot.

Transmission Time



5 Antenna Application

5.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

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.

5.2 Measurement Results

The antenna is PCB Antenna and no consideration of replacement, and the best case gain of the antenna is -3 dBi. So, the antenna is consider meet the requirement.

6 Test Equipment List

No.	Equipment	Manufacturer	Model No.	Serial No.	Characteristics	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	9KHz~7GHz	Mar. 14, 2018	Mar. 13, 2019
2.	Antenna	Schwarzbeck	VULB9162	VULB9162-010	30MHz~7GHz	Mar. 23, 2018	Mar. 22, 2019
3.	Spectrum Analyzer	Rohde & Schwarz	FSU26	200409	20Hz~26.5GHz	Mar. 14, 2018	Mar. 13, 2019
4.	Spectrum Analyzer	Keysight	N9020A	MY54200831	20Hz~26.5GHz	Apr. 24 2018	Apr. 23, 2019
5.	Spectrum Analyzer	Rohde & Schwarz	FSV40	101003	10Hz~40GHz	Apr. 24, 2018	Apr. 23, 2019
6.	Horn Antenna	Schwarzbeck	BBHA9170	9170-372	15GHz~40GHz	Mar. 23, 2018	Mar. 22, 2019
7.	Pre-Amplifier	EMCI	EMC 184045	980102	18GHz~40GHz	Apr. 24, 2018	Apr. 23, 2019
8.	Power Sensor	DARE	RPR3006W	15100041SN064	100MHz~6GHz	Mar. 14, 2018	Mar. 13, 2019
9.	Communication Tester	Rohde & Schwarz	CMW500	149004	70MHz~6GHz	Mar. 14, 2018	Mar. 13, 2019
10.	Horn Antenna	COM-Power	AH-118	071078	500MHz~18GHz	Mar. 23, 2018	Mar. 22, 2019
11.	Pre-Amplifier	HP	HP 8449B	3008A00964	1GHz~26.5GHz	Mar. 14, 2018	Mar. 13, 2019
12.	Pre-Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Mar. 14, 2018	Mar. 13, 2019
13.	Loop Antenna	Schwarzbeck	FMZB 1513	1513#272	9KHz~30MHz	Apr. 24, 2018	Apr. 23, 2019
14.	Temperature & Humidity Chamber	REMAFEE	SYHR-225L	N/A	-40~150℃	Apr. 25, 2018	Apr. 23, 2019
15.	DC Source	MY	MY8811	N/A	0~30V	Mar. 23, 2018	Mar. 22, 2019
16.	Temporary antenna connector	TESCOM	SS402	N/A	9KHz~25GHz	N/A	N/A
17.	Power Meter	Anritsu	ML2495A	1139001	100k-65GHz	Apr. 24, 2018	Apr. 23, 2019
18.	Power Sensor	Anritsu	MA2411B	100345	300M-40GHz	Apr. 24, 2018	Apr. 23, 2019
19.	Test Receiver	Rohde & Schwarz	ESCI	101152	9KHz~3GHz	Mar. 14, 2018	Mar. 13, 2019
20.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	N/A	Mar. 14, 2018	Mar. 13, 2019
21.	L.I.S.N	Schwarzbeck	NNLK8129	8129212	N/A	Mar. 07, 2018	Mar. 06, 2019
22.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	N/A	Mar. 14, 2018	Mar. 13, 2019
23.	Test Software	EZ	EZ_EMCC	N/A	N/A	N/A	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.