

FCC TEST REPORT

For

Solidremote Technologies Limited

Dual-Mode RF Transmitter

Model No.: TX134

Prepared For : Solidremote Technologies Limited
Address : 4th Floor, Building No.4, Huamei Industrial Park, Buji Town, Longgang
District, Shenzhen, Guangdong, China

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Date of Test : Jun. 21~Jul. 03, 2017
Date of Report : Jul. 03, 2017

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TEST REPORT

Applicant : Solidremote Technologies Limited
Manufacturer : Solidremote Technologies Limited
Product Name : Dual-Mode RF Transmitter
Model No. : TX134
Trade Mark : Solidremote
Rating(s) : DC 3V by "CR2032" Battery

Test Standard(s) : FCC Part15 Subpart C 2016, Section 15.231

Test Method(s) : ANSI C63.10: 2013

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 FCC Part 15 Subpart C 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 Test : Jun. 21~Jul. 03, 2017

Prepared by :



Winkey Wang

(Tested Engineer / Winkey Wang)

Reviewer :

Dolly mo

(Project Manager / Dolly Mo)

Approved & Authorized Signer :

Tom Chen

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	Solidremote Technologies Limited
Address	:	4th Floor, Building No.4, Huamei Industrial Park, Buji Town, Longgang District, Shenzhen, Guangdong, China
Manufacturer	:	Solidremote Technologies Limited
Address	:	4th Floor, Building No.4, Huamei Industrial Park, Buji Town, Longgang District, Shenzhen, Guangdong, China

1.2. Description of Device (EUT)

Product Name	:	Dual-Mode RF Transmitter	
Model No.	:	TX134	
Trade Mark	:	Solidremote	
Test Power Supply	:	DC 3V by “CR2032 ” Battery	
Product Description	:	Operation Frequency:	433.92MHz(OOK) 433.22MHz, 433.92MHz, 434.62MHz (FSK)
		Number of Channel:	1 Channels for OOK 3 Channels for FSK
		Modulation Type:	OOK, FSK
		Antenna Type:	PCB Antenna
		Antenna Gain(Peak):	0 dbi
Remark: 1)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

N/A	
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1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	433.92MHz(OOK)
Mode 2	433.22MHz (FSK)
Mode 3	433.92MHz (FSK)
Mode 4	434.62MHz (FSK)

For Radiated Emission	
Final Test Mode	Description
Mode 1	433.92MHz(OOK)
Mode 2	433.22MHz (FSK)
Mode 3	433.92MHz (FSK)
Mode 4	434.62MHz (FSK)

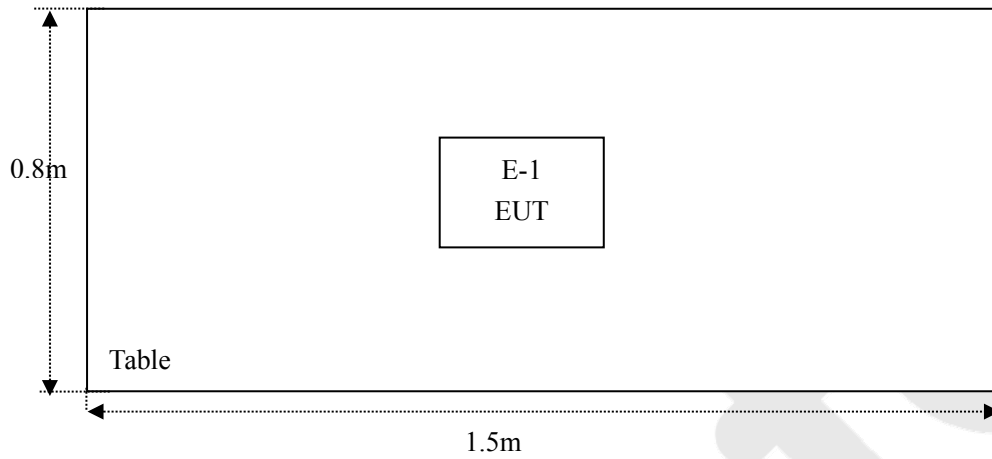
Note: During the test, the EUT was keeping continuous transmission.

1.5. List of channels

Channel	Freq. (MHz)	Note (Modulation Type)
01	433.92	OOK
02	433.22	FSK
03	433.92	FSK
04	434.62	FSK

1.6. Description Of Test Setup

RE



1.7. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Jul. 19, 2016	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Jun. 17, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Jun. 17, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Jul. 12, 2016	1 Year
5.	Preamplifier	Instruments corporation	EMC011830	980100	Jun. 17, 2017	1 Year
6.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Jun. 17, 2017	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	May 06, 2017	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 06, 2017	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519	012	May 11, 2017	1 Year
10.	Pre-amplifier	SONOMA	310N	186860	Jun. 17, 2017	1 Year
11.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
12.	Power Sensor	Agilent	KFSW150502	15I00041SN045	Jun. 17, 2017	1 Year
13.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Jun. 17, 2017	1 Year
14.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Jun. 17, 2017	1 Year
15.	Signal Generator	Agilent	E4421B	MY41000743	Jun. 17, 2017	1 Year
16.	DC Power supply	IV	IV-8080	YQSB0096	Jun. 17, 2017	1 Year
17.	TEMP&HUMI PROGRAMMABLE CHAMBER	Bell Group	BE-THK-150 M8	SE-0137	Jun. 17, 2017	1 Year

1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal)
		Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

1.9. Description of Test Facility

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

FCC-Registration No.: 752021

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 752021, July 06, 2016.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, June 13, 2016.

Test Location

All Emissions tests were performed at

Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

2. Summary of Test Results

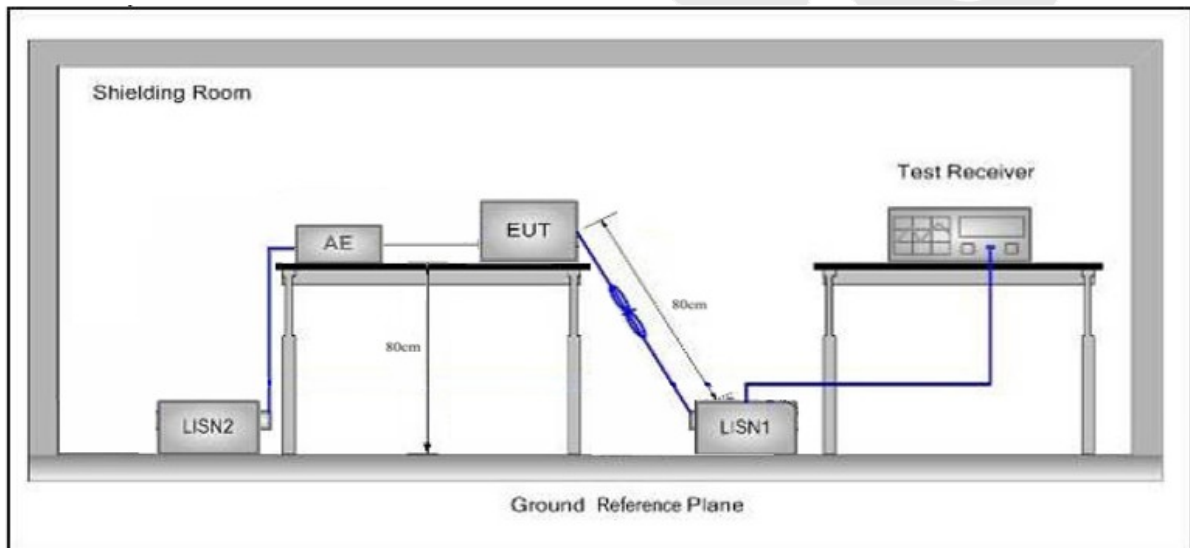
Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.205/15.209/15.231(b)	Spurious Emission	PASS
15.231(c)	20dB Occupied Bandwidth	PASS
15.231(a)	Dwell time	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

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 C63.10-2013 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

N/A

The EUT was power supplied by “CR2032” Battery (DC 3V).

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209, 15.205 and 15.231(b)				
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
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	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.

the formulas for calculating the maximum permitted fundamental field strengths are as follows:

for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$.

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level

Emission Level (dBuV/m)=20log Emission Level($\mu\text{V/m}$)

The field strength of emission limits have been calculated in below table:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m)@3m
433.22	80.80 (AVG)
433.22	100.80 (Peak)
433.92	80.82 (AVG)
433.92	100.82 (Peak)
434.62	80.85 (AVG)
434.62	100.85 (Peak)

4.2. Test Setup

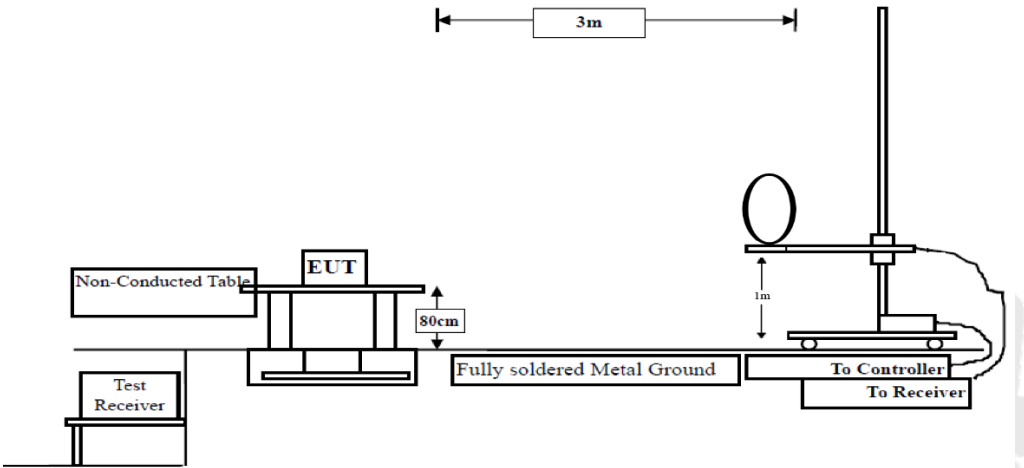


Figure 1. Below 30MHz

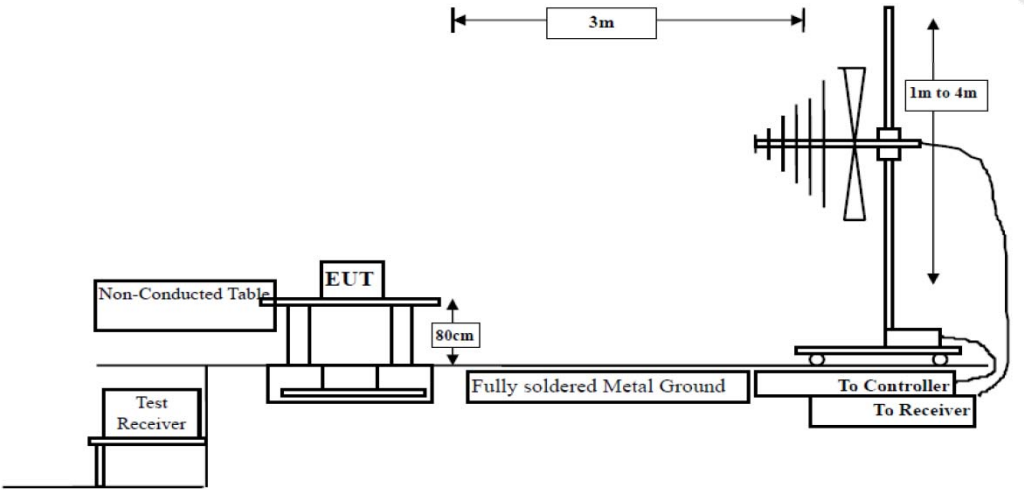


Figure 2. 30MHz to 1GHz

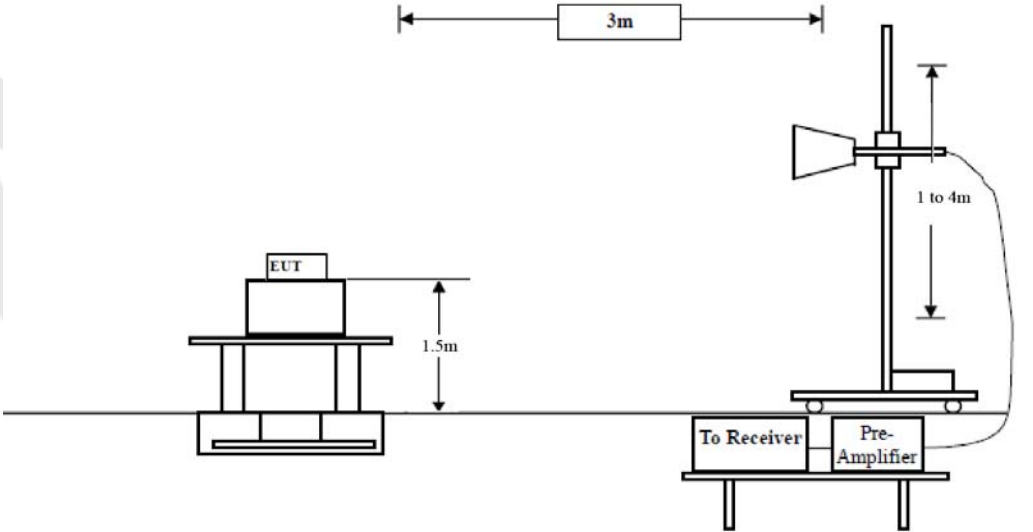


Figure 3. Above 1 GHz

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

RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

4.4. 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.

During the test, Pre-scan all of the OOK and FSK mode, the 433.92MHz of the OOK mode and 433.92MHz of FSK mode were the worst case and show the data in the report.

The test results of 9kHz-30MHz and above 18000MHz are attenuated more than 20dB below the permissible limits, so the results don't record in the report.

Test Results (Fundamental 433.92MHz OOK Mode)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Duty cycle Factor	Results	Limits	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	Mode
433.92	H	94.76	1.52	12.64	31.45	--	77.47	100.82	PK
433.92	H	94.76	1.52	12.64	31.45	-7.04	70.43	80.82	AV
433.92	V	97.21	1.52	12.64	31.45	--	79.92	100.82	PK
433.92	V	97.21	1.52	12.64	31.45	-7.04	72.88	80.82	AV

Remark :

1. Result = Reading + Cable Loss +Ant Factor –Amplifier + Duty cycle Factor
2. Pulse Desensitization Correction Factor
 Pulse Width (PW)= 1.667ms
 $2/PW=2/1.667=1.20\text{kHz}$
 $RBW(1000\text{kHz}) > 2/PW (1.20\text{Hz})$
 Therefore PDCF is not needed.

3. Duty Cycle Factor

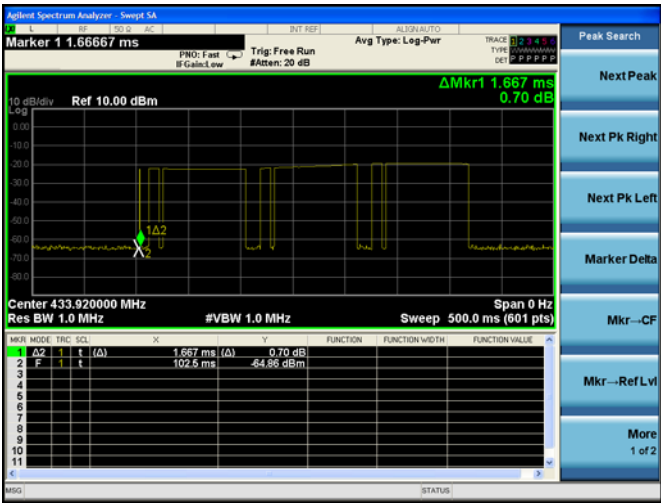
Calculate Formula:

AV=PEAK +Duty Cycle Factor
 Duty Cycle Factor= $20\log(\text{Duty Cycle})$
 Duty Cycle= on time/ period

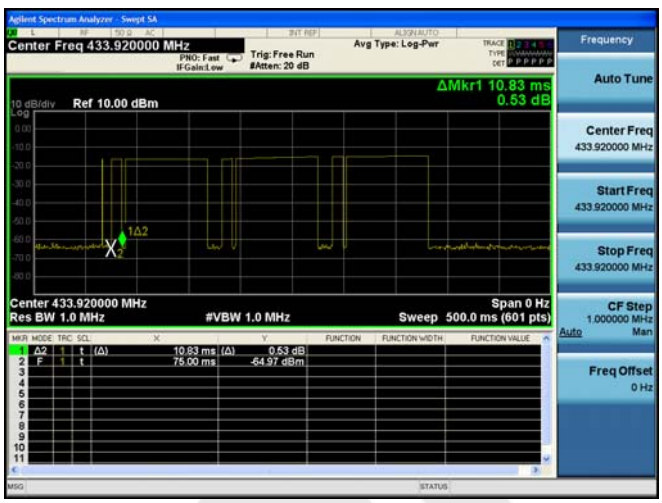
Test Data(OOK Mode):

T on time= $1.667\text{ms} \times 1 + 10.83\text{ms} \times 3 + 80\text{ms} \times 3 = 274.157 \text{ ms}$
 T period= 616.70ms
 Duty Cycle= 44.46%
 Duty Cycle Factor = $20\log(\text{Duty Cycle}) = -7.04$

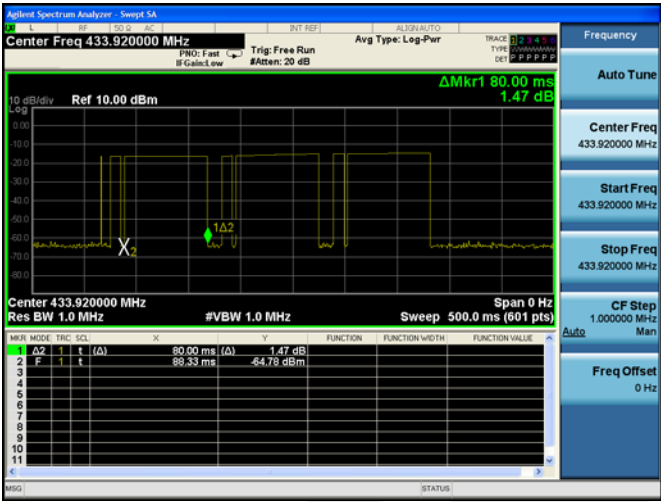
T on time slot-1



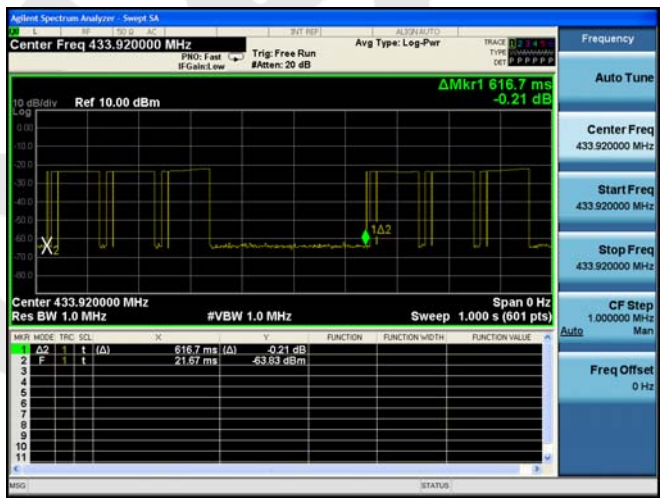
T on time slot-2



T on time slot-3



T period



Test Results (Harmonics Emissions)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Duty cycle Factor	Results	Limits	Det
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	Mode
867.84	H	74.36	1.92	12.71	31.72		57.27	80.82	PK
867.84	H	74.36	1.92	12.71	31.72	-7.04	50.23	60.82	AV
867.84	V	76.55	1.92	12.71	31.72		59.46	80.82	PK
867.84	V	76.55	1.92	12.71	31.72	-7.04	52.42	60.82	AV
1301.76	H	63.45	2.38	21.43	32.45		54.81	74.00	PK
1301.76	H	63.45	2.38	21.43	32.45	-7.04	47.77	54.00	AV
1301.76	V	65.49	2.38	18.56	32.45		53.98	74.00	PK
1301.76	V	65.49	2.38	18.56	32.45	-7.04	46.94	54.00	AV
1735.68	H	*						74.00	PK
1735.68	H	*						54.00	AV
1735.68	V	*						74.00	PK
1735.68	V	*						54.00	AV

Remark :

1. Result = Reading + Cable Loss +Ant Factor –Amplifier + Duty cycle Factor
2. Pulse Desensitization Correction Factor
 Pulse Width (PW)= 1.667ms
 $2/PW=2/1.667=1.20\text{kHz}$
 $RBW(1000\text{kHz}) > 2/PW (1.20\text{Hz})$
 Therefore PDCF is not needed.
3. Duty Cycle Factor=-7.04
4. “*”, means this data is the too weak instrument of signal is unable to test.

Test Results (Radiated Emission)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Results	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
54.27	H	58.34	1.03	11.15	40.74	29.78	40.00	-10.22	QP
127.42	H	54.42	1.24	12.24	40.48	27.42	43.50	-16.08	QP
732.45	H	58.23	1.67	13.75	41.27	32.38	46.00	-13.62	QP
54.27	V	61.26	1.03	11.15	40.74	32.70	40.00	-7.30	QP
127.42	V	55.37	1.24	12.24	40.48	28.37	43.50	-15.13	QP
732.45	V	61.29	1.67	13.75	41.27	35.44	46.00	-10.56	QP

Remark:

1. Results = Reading + Cable Loss +Ant Factor –Amplifier



Test Results (Fundamental 433.92MHz FSK Mode)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Duty cycle Factor	Results	Limits	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	Mode
433.92	H	92.78	1.52	12.64	31.45	--	75.49	100.82	PK
433.92	H	92.78	1.52	12.64	31.45	-6.35	69.14	80.82	AV
433.92	V	95.61	1.52	12.64	31.45	--	78.32	100.82	PK
433.92	V	95.61	1.52	12.64	31.45	-6.35	71.97	80.82	AV

Remark :

1. Result = Reading + Cable Loss +Ant Factor –Amplifier + Duty cycle Factor
2. Pulse Desensitization Correction Factor
 Pulse Width (PW)= 3.333ms
 $2/PW=2/1.667=0.6\text{kHz}$
 $RBW(1000\text{kHz}) > 2/PW (0.6\text{kHz})$
 Therefore PDCF is not needed.

3. Duty Cycle Factor

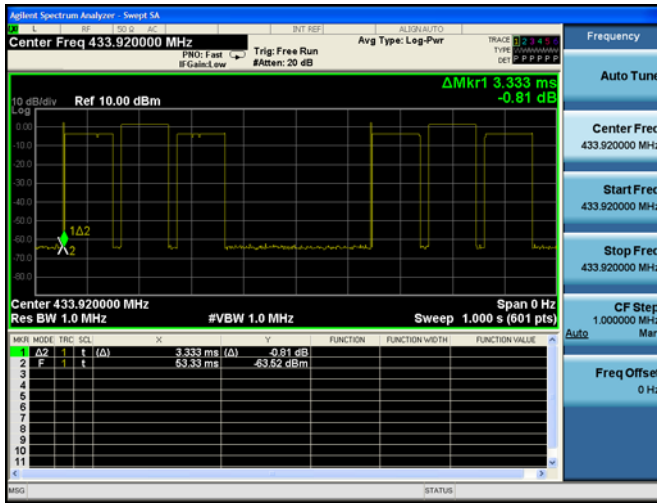
Calculate Formula:

AV=PEAK +Duty Cycle Factor
 Duty Cycle Factor= $20\log(\text{Duty Cycle})$
 Duty Cycle= on time/ period

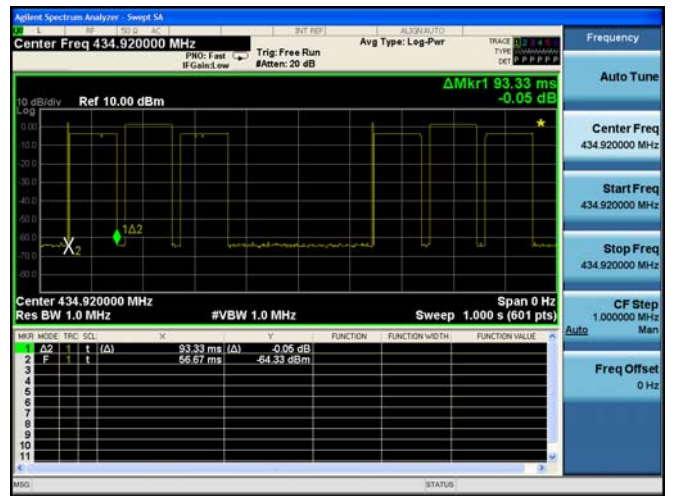
Test Data(FSK Mode):

T on time= $3.333\text{ms} \times 1 + 93.33\text{ms} \times 3 = 283.23 \text{ ms}$
 T period=588.3ms
 Duty Cycle=48.16%
 Duty Cycle Factor = $20\log(\text{Duty Cycle}) = -6.35$

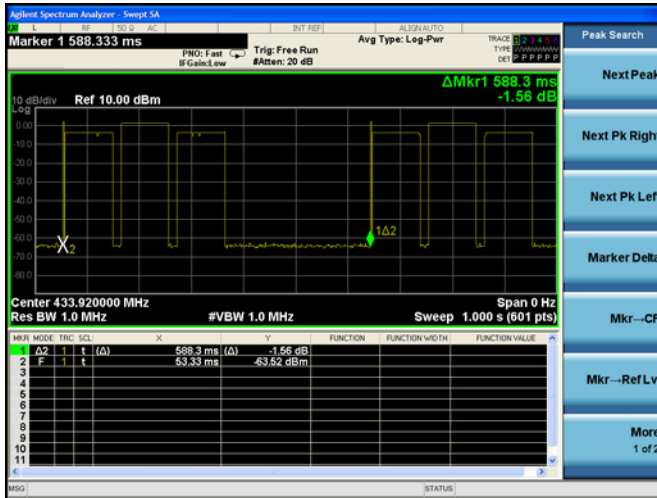
T on time slot-1



T on time slot-2



T period



Test Results (Harmonics Emissions)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Duty cycle Factor	Results	Limits	Det
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	Mode
867.84	H	71.42	1.92	12.71	31.72		54.33	80.82	PK
867.84	H	71.42	1.92	12.71	31.72	-6.35	47.98	60.82	AV
867.84	V	73.41	1.92	12.71	31.72		56.32	80.82	PK
867.84	V	73.41	1.92	12.71	31.72	-6.35	49.97	60.82	AV
1301.76	H	62.77	2.38	21.43	32.45		54.13	74.00	PK
1301.76	H	62.77	2.38	21.43	32.45	-6.35	47.78	54.00	AV
1301.76	V	64.45	2.38	18.56	32.45		52.94	74.00	PK
1301.76	V	64.45	2.38	18.56	32.45	-6.35	46.59	54.00	AV
1735.68	H	*						74.00	PK
1735.68	H	*						54.00	AV
1735.68	V	*						74.00	PK
1735.68	V	*						54.00	AV

Remark :

1. Result = Reading + Cable Loss +Ant Factor –Amplifier + Duty cycle Factor
2. Pulse Desensitization Correction Factor
 Pulse Width (PW)= 1.667ms
 $2/PW=2/1.667=1.20\text{kHz}$
 $RBW(1000\text{kHz}) > 2/PW (1.20\text{Hz})$
 Therefore PDCF is not needed.
3. Duty Cycle Factor=-7.04
4. “*”, means this data is the too weak instrument of signal is unable to test.

Test Results (Radiated Emission)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Results	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
54.27	H	57.41	1.03	11.15	40.74	28.85	40.00	-11.15	QP
127.42	H	56.48	1.24	12.24	40.48	29.48	43.50	-14.02	QP
732.45	H	61.20	1.67	13.75	41.27	35.35	46.00	-10.65	QP
54.27	V	62.44	1.03	11.15	40.74	33.88	40.00	-6.12	QP
127.42	V	53.37	1.24	12.24	40.48	26.37	43.50	-17.13	QP
732.45	V	58.29	1.67	13.75	41.27	32.44	46.00	-13.56	QP

Remark:

1. Results = Reading + Cable Loss +Ant Factor –Amplifier



5. 20DB Occupy Bandwidth Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.231 (c)								
Test Limit	<p>According to FCC Part 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. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier.</p> <p>So the emission bandwidth limits have been calculated in below table:</p> <table border="1"> <thead> <tr> <th>Fundamental Frequency</th> <th>Limit of 20dB Bandwidth</th> </tr> </thead> <tbody> <tr> <td>433.22 MHz</td> <td>$433220 \times 0.0025 = 1083.05$ kHz</td> </tr> <tr> <td>433.92 MHz</td> <td>$433920 \times 0.0025 = 1084.80$ kHz</td> </tr> <tr> <td>434.62 MHz</td> <td>$434620 \times 0.0025 = 1086.55$ kHz</td> </tr> </tbody> </table>	Fundamental Frequency	Limit of 20dB Bandwidth	433.22 MHz	$433220 \times 0.0025 = 1083.05$ kHz	433.92 MHz	$433920 \times 0.0025 = 1084.80$ kHz	434.62 MHz	$434620 \times 0.0025 = 1086.55$ kHz
Fundamental Frequency	Limit of 20dB Bandwidth								
433.22 MHz	$433220 \times 0.0025 = 1083.05$ kHz								
433.92 MHz	$433920 \times 0.0025 = 1084.80$ kHz								
434.62 MHz	$434620 \times 0.0025 = 1086.55$ kHz								

5.2. Test Setup



5.3. Test Procedure

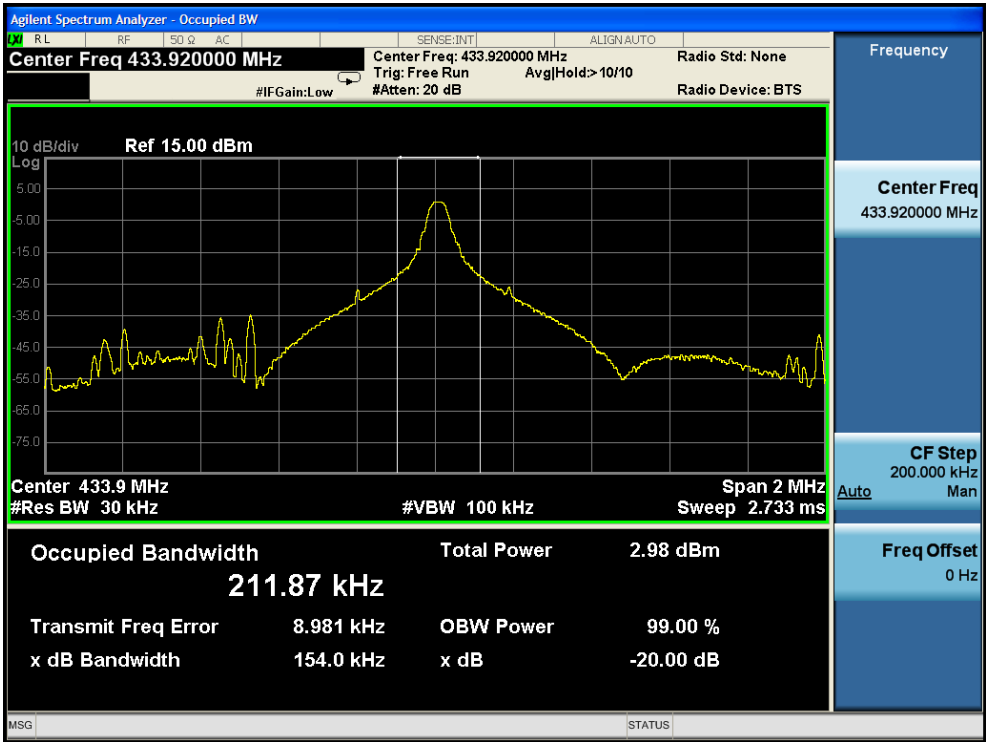
- Place the EUT on the table and set it in the continuously transmitting mode.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- Set the spectrum analyzer as:
 - RBW = 30kHz, VBW $\geq 3 \times$ RBW = 100kHz,
 - Span= 2MHz
 - Detector= Peak
 - Trace mode= Max hold.
 - Sweep- auto couple.
- Mark the peak frequency and -20dB (upper and lower) frequency.
- Repeat until all the rest channels are investigated.

5.4. Test Data

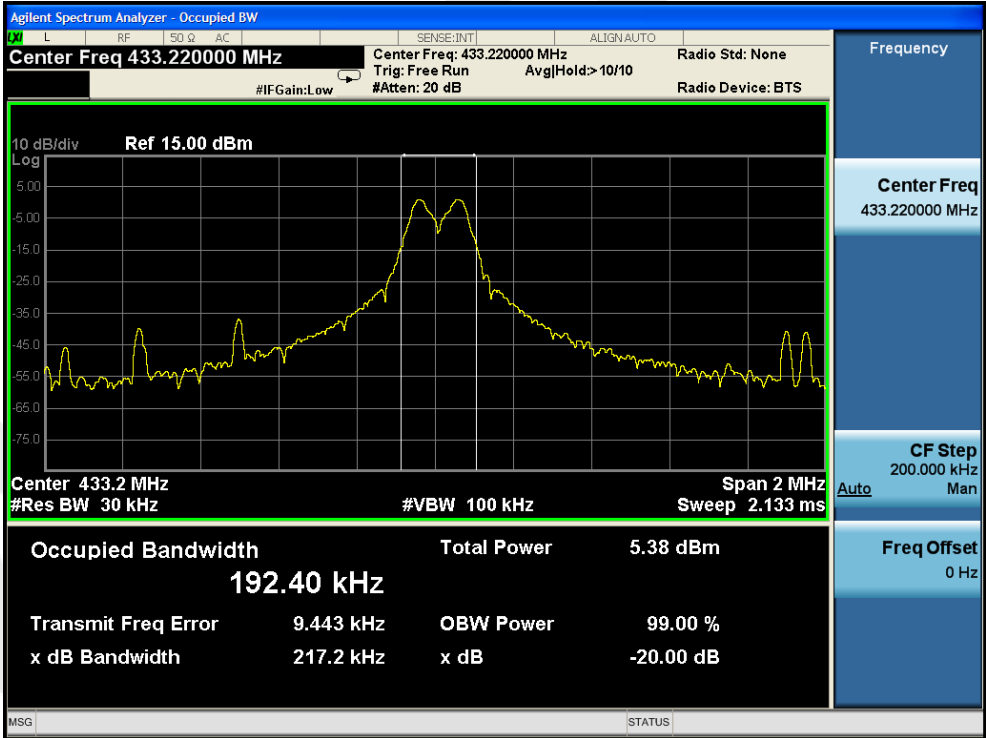
Test Item	: 20dB Bandwidth	Test Mode	: CH Low ~ CH High
Test Voltage	: DC 3V	Temperature	: 24°C
Test Result	: PASS	Humidity	: 55%RH

Freq. (MHz)	Modulation Type	Bandwidth (kHz)	Limit (kHz)	Results
433.92	OOK	154.0	<1084.80	PASS
433.22	FSK	217.2	<1083.05	PASS
433.92	FSK	233.3	<1084.80	PASS
434.62	FSK	220.6	<1086.55	PASS

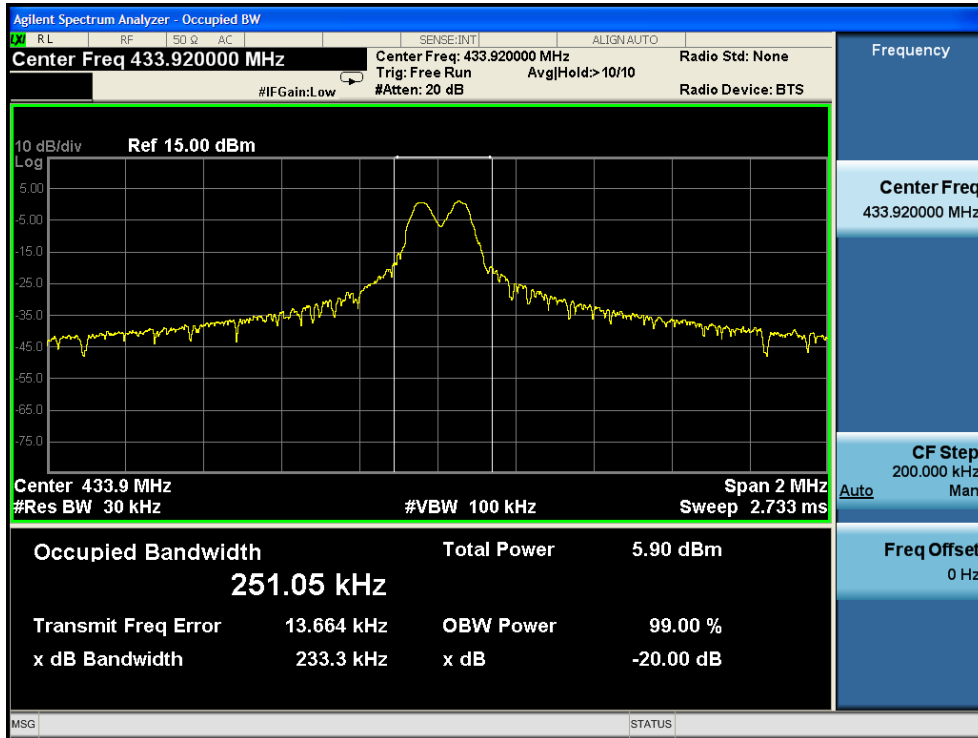




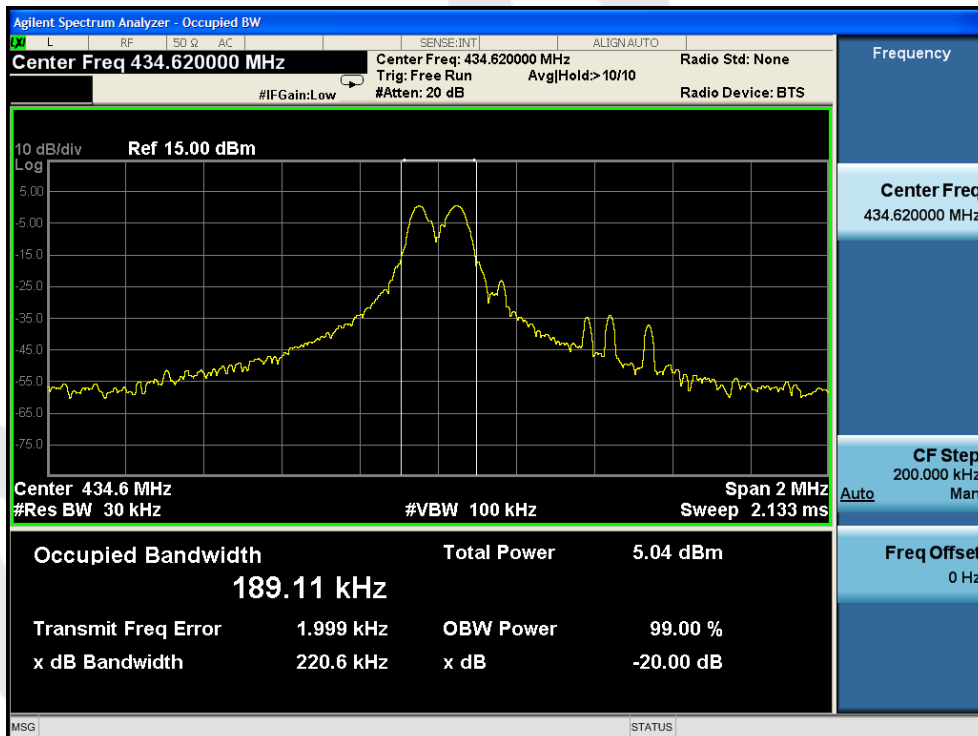
433.92MHz(OOK)



433.22MHz(FSK)



433.92MHz(FSK)



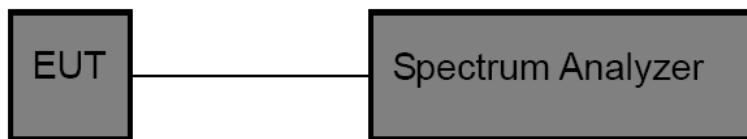
434.62MHz(FSK)

6. Dwell Time Test

6.1. Test Standard and Limit

Test Standard	FCC Part 15.231(a)(1)
Test Limit	According to FCC Part 15.231(a)(1), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released

6.2. Test Setup



6.3. Test Procedure

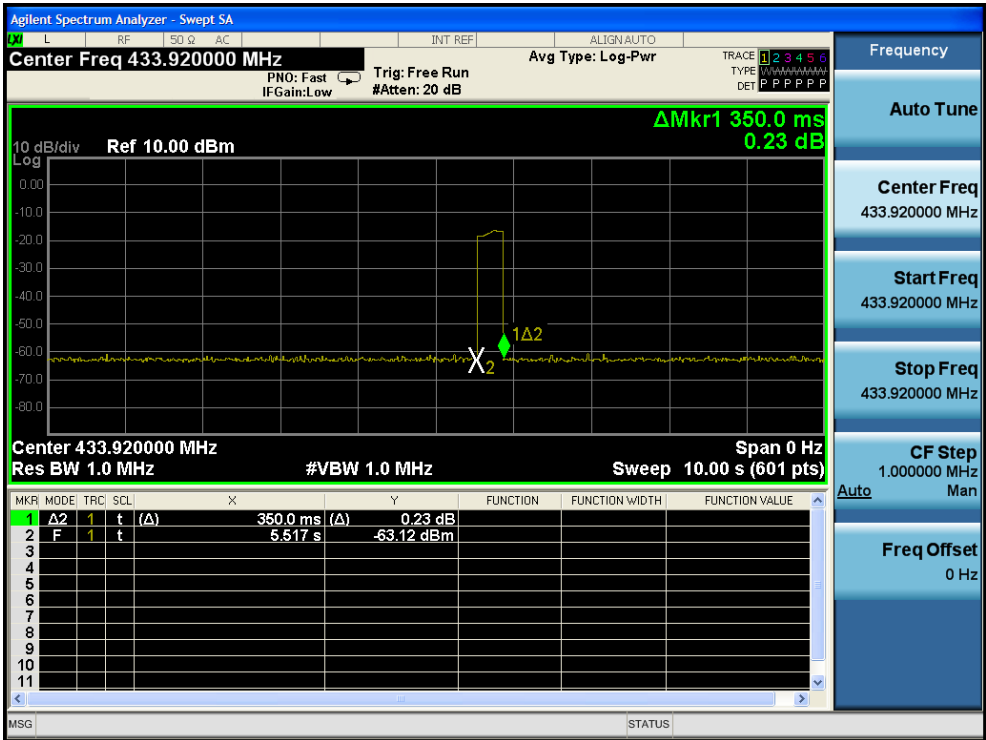
1. Place the EUT on the table and set it in continuously transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as
RBW=1000kHz, VBW= 1000 kHz, Span= 0Hz, Sweep Time= 4 Seconds.
3. Record the Delta mark time.

6.4. Test Data

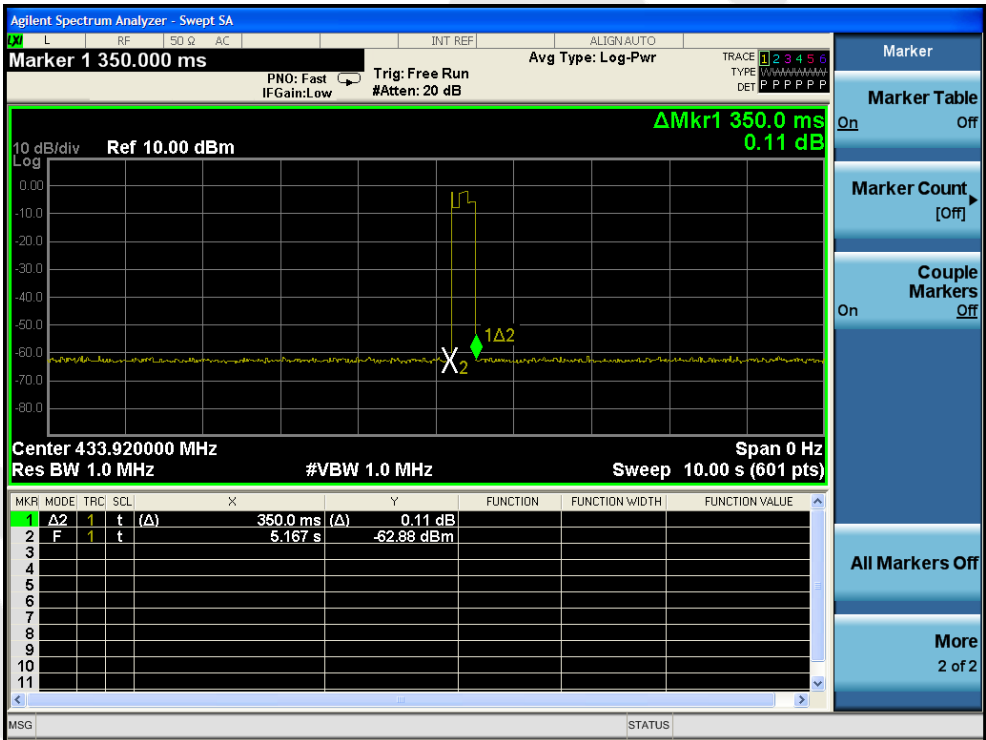
Test Item	: Dwell Time	Test Mode	: Continuously transmitting
Test Voltage	: DC 3V	Temperature	: 24°C
Test Result	: PASS	Humidity	: 55%RH

Test Mode	Transmitting time(s)	Limit(s)	Result
OOK mode	0.350	≤5	PASS
FSK mode	0.350	≤5	PASS

Please refer the following plot.



Dwell Time(OOK)



Dwell Time(FSK)

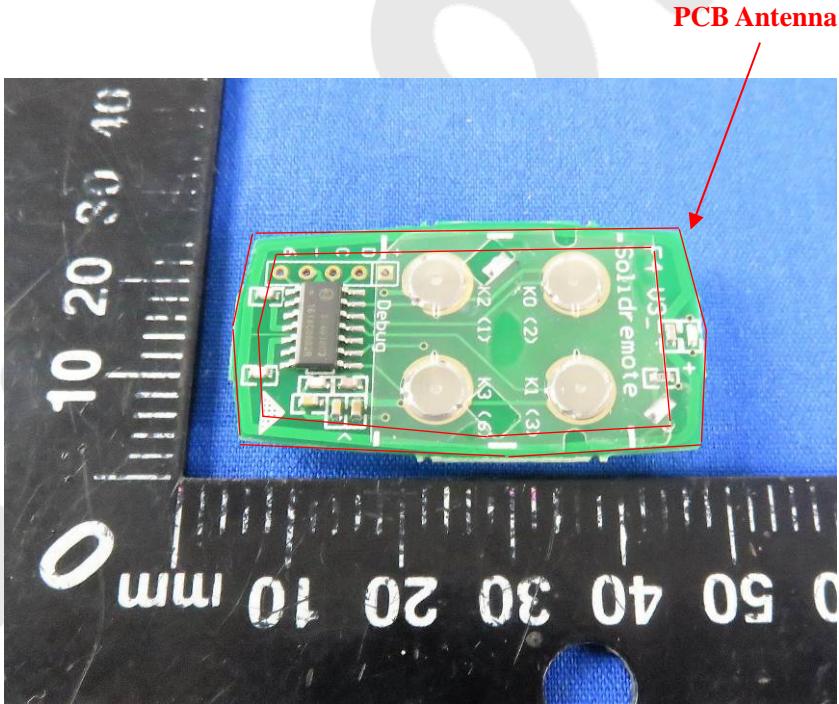
7. Antenna Requirement

7.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	<p>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.</p> <p>Antenna requirement must meet at least one of the following:</p> <ol style="list-style-type: none"> 1) Antenna must be permanently attached to device. 2) The antenna must use a unique type of connector to attach to the device. 3) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.

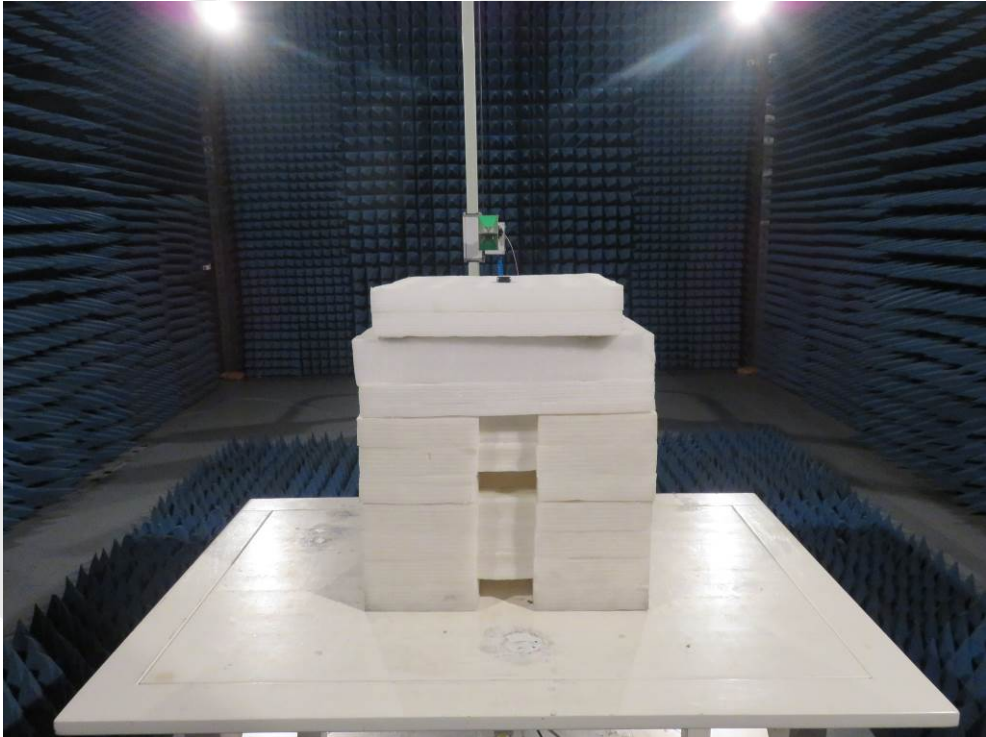
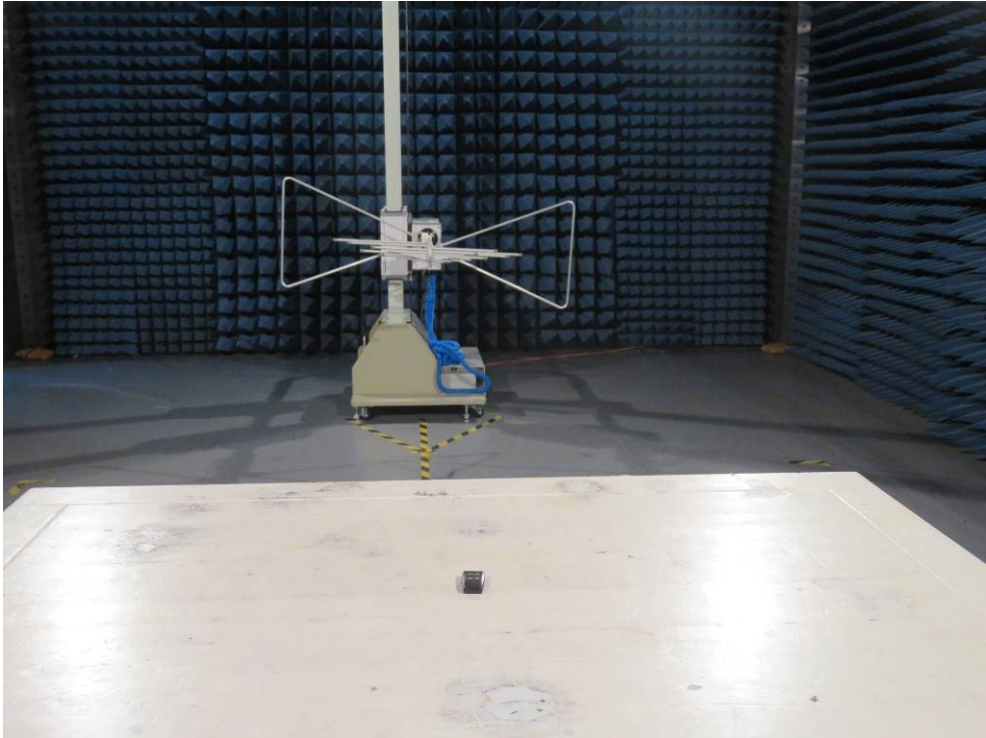
9.2. Antenna Connected Construction

The RF antenna is a PCB antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

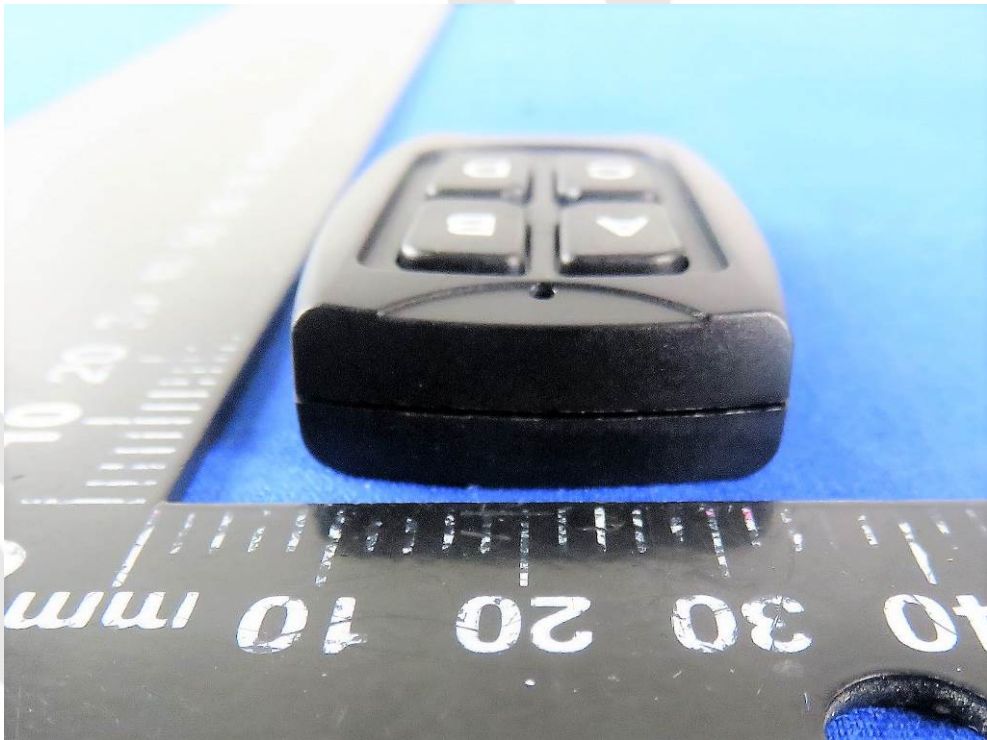
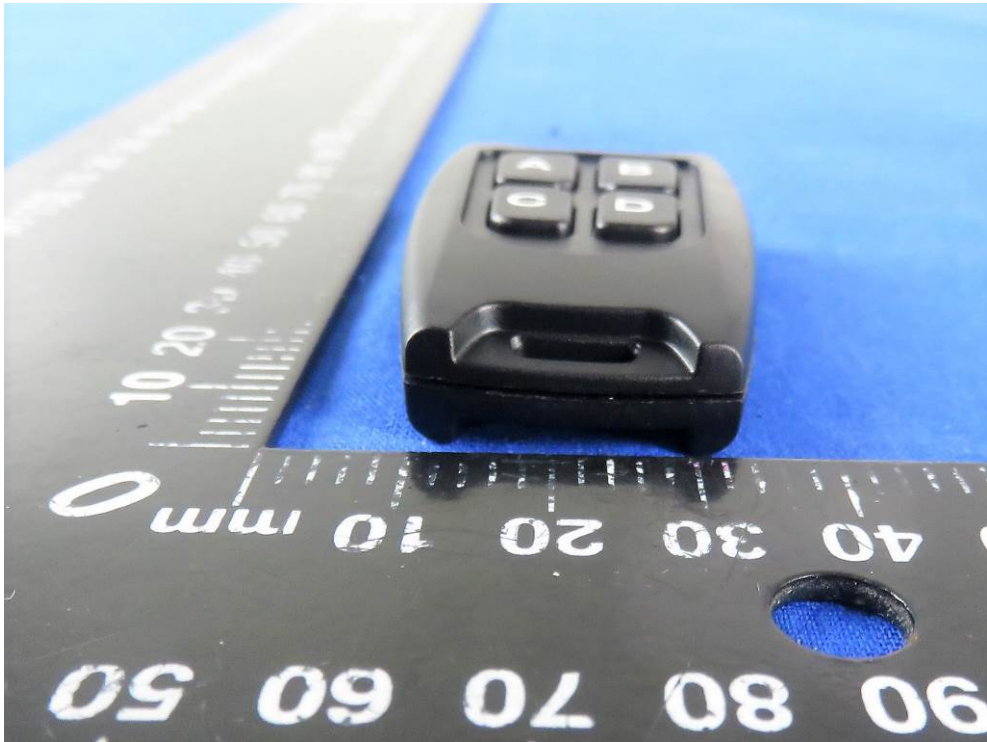
Photo of Radiation Emission Test



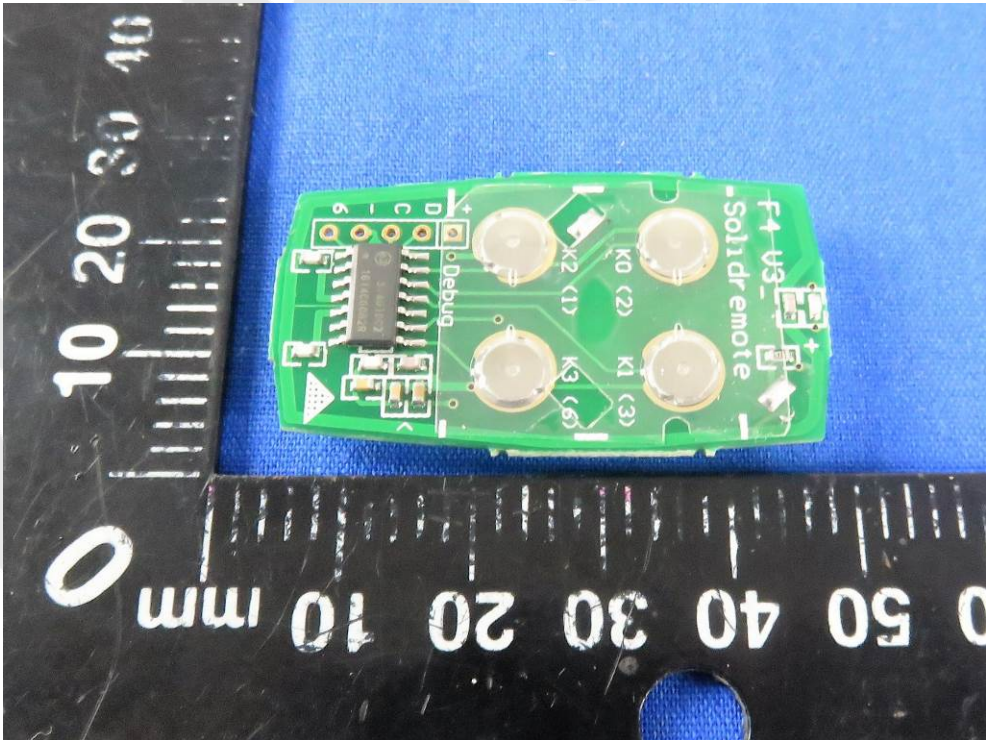
APPENDIX II -- EXTERNAL PHOTOGRAPH

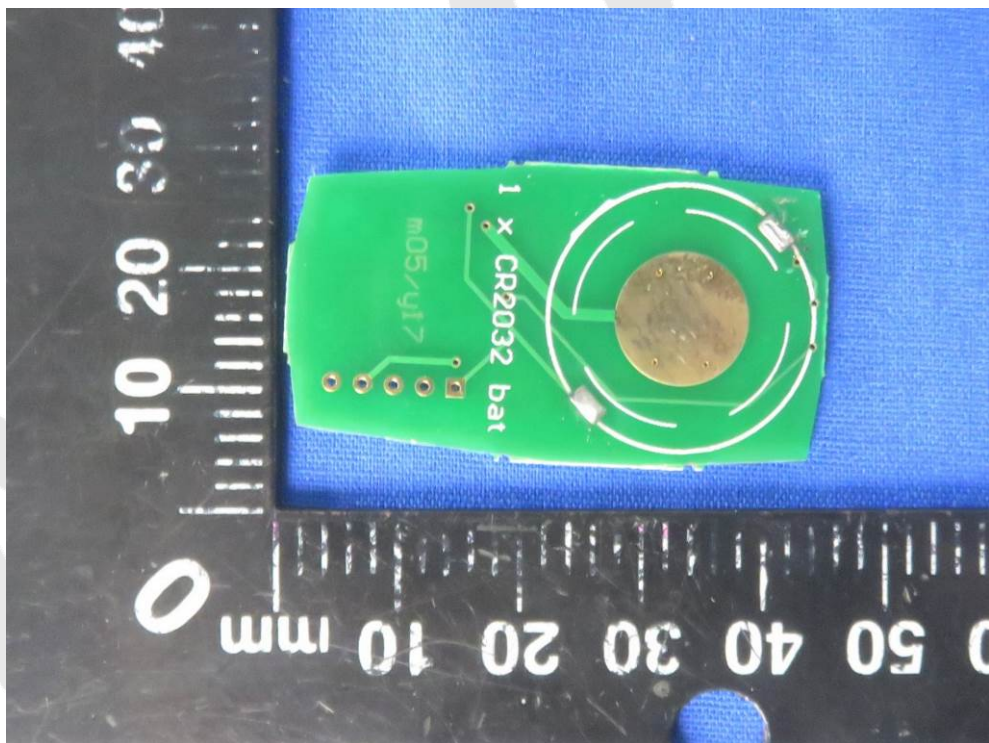
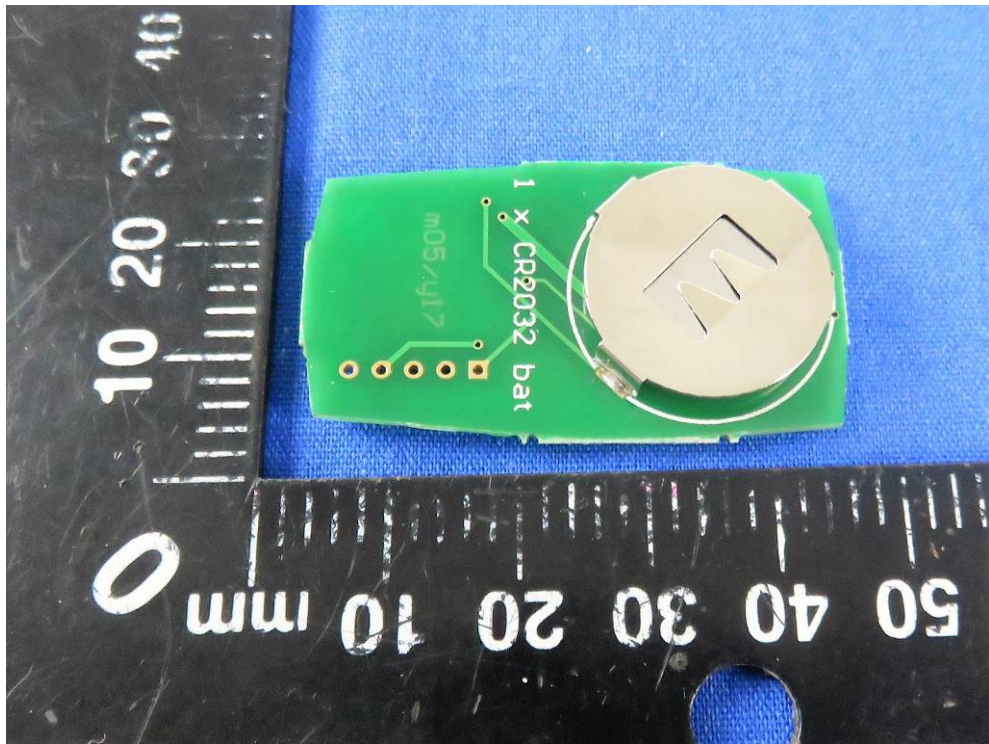






APPENDIX III -- INTERNAL PHOTOGRAPH







Anbotek