

FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

OF

ID SMART BOX CONTROL

MODEL No.: DQ7007A

Trademark: N/A

FCC ID: VYY-DQ7007A

REPORT NO: ES160120039E

ISSUE DATE: June 13, 2016

Prepared for

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TEST RESULT CERTIFICATION

Applicant:	NINGBO DOOYA MECHANIC & ELECTRONIC TECHNOLOGY CO., LTD. Loutou Industrial Area, Zhenhai, Ningbo, Zhejiang, China
Manufacturer:	NINGBO DOOYA MECHANIC & ELECTRONIC TECHNOLOGY CO., LTD. Loutou Industrial Area, Zhenhai, Ningbo, Zhejiang, China
Product Description:	ID SMART BOX CONTROL
Model Number:	DQ7007A
Serial Number:	N/A
File Number:	ES160120039E
Date of Test:	January 12, 2016 to June 13, 2016

Measurement Procedure Used:


APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C	PASS

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.231 REQUIREMENTS.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : January 12, 2016 to June 13, 2016

Prepared by : 
Joe Xia/Editor

Reviewer : 
Yaping Shen /Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager

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1 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Device Type:	Mobile Device
Modulation:	FSK
Operating Frequency Range(s):	433.97MHz
Number of Channels:	1 channel
Antenna Type :	Internal Antenna
Antenna Gain:	< 1.5dBi
Power supply:	<input type="checkbox"/> 3.7V internal rechargeable lithium battery <input type="checkbox"/> DC 5V from USB adapter <input type="checkbox"/> DC 5V from PC <input type="checkbox"/> DC 6V (CR2016*2) battery
	<input checked="" type="checkbox"/> Adapter supply: Input AC 100-240V 50/60Hz, Output DC 5V1.5A

Note: for more details, please refer to the User's manual of the EUT.

2 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.231(c)	Occupied Bandwidth	PASS	
15.231(d)	Frequency stability	PASS	
15.231(b)	Radiated Spurious Emissions	PASS	
15.231(b)	Transmission Requirement	PASS	
15.203	Antenna Requirement	PASS	
15.207(a)	Conducted Emission	PASS	
NOTE1: N/A (Not Applicable)			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: VYY-DQ7007A filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules

3 TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

3.2 MEASUREMENT EQUIPMENT USED

1.1.1. Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/15/2016	05/14/2017
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	05/15/2016	05/14/2017
50Ω Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	05/15/2016	05/14/2017
Voltage Probe	Rohde & Schwarz	TK9416	N/A	05/15/2016	05/14/2017
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	05/15/2016	05/14/2017

1.1.2. Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/15/2016	05/14/2017
Pre-Amplifier	HP	8447D	2944A07999	05/15/2016	05/14/2017
Bilog Antenna	Schwarzbeck	VULB9163	142	05/15/2016	05/14/2017
Loop Antenna	ARA	PLA-1030/B	1029	05/15/2016	05/14/2017
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/15/2016	05/14/2017
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/15/2016	05/14/2017
Cable	Schwarzbeck	AK9513	ACRX1	05/15/2016	05/14/2017
Cable	Rosenberger	N/A	FP2RX2	05/15/2016	05/14/2017
Cable	Schwarzbeck	AK9513	CRPX1	05/15/2016	05/14/2017
Cable	Schwarzbeck	AK9513	CRRX2	05/15/2016	05/14/2017

1.1.3. Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	ESCS30	828985/018	05/15/2016	05/14/2017
Power meter	Anritsu	ML2495A	0824006	05/15/2016	05/14/2017
Power sensor	Anritsu	MA2411B	0738172	05/15/2016	05/14/2017

Remark: Each piece of equipment is scheduled for calibration once a year.

3.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting mode is programmed.

Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	433.97		

Test Frequency and Channel list:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	433.97				

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

4.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2013.10.29
The certificate is valid until 2016.10.28
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2015.4
The Laboratory has been assessed according to the requirements
ISO/IEC 17025.

Accredited by FCC, April 17, 2013
The Certificate Registration Number is 709623.

Accredited by FCC, July 24, 2013
The Certificate Registration Number is 406365.

Accredited by Industry Canada, November 29, 2012
The Certificate Registration Number is 4480A.

Name of Firm

Site Location

: EMTEK (SHENZHEN) CO., LTD.
: Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

5 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

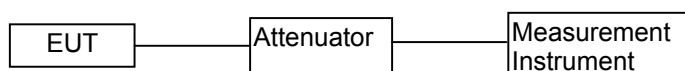
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

6 SETUP OF EQUIPMENT UNDER TEST

6.1 RADIO FREQUENCY TEST SETUP 1

The component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



6.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

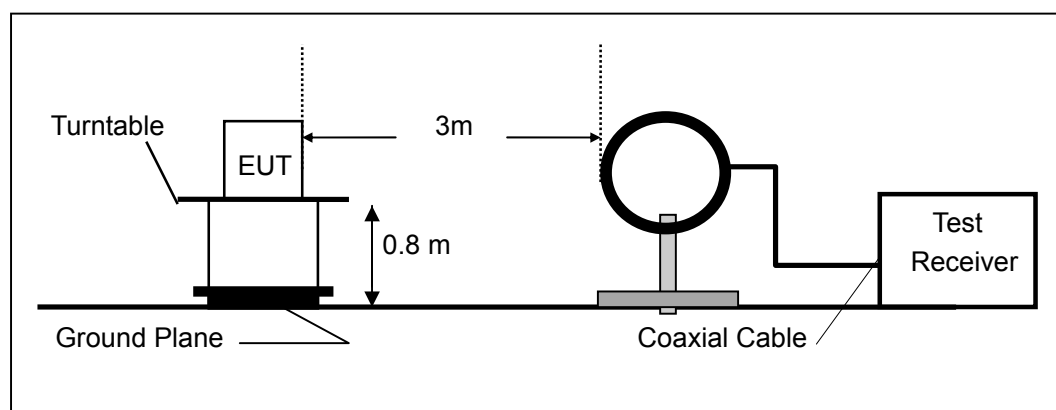
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

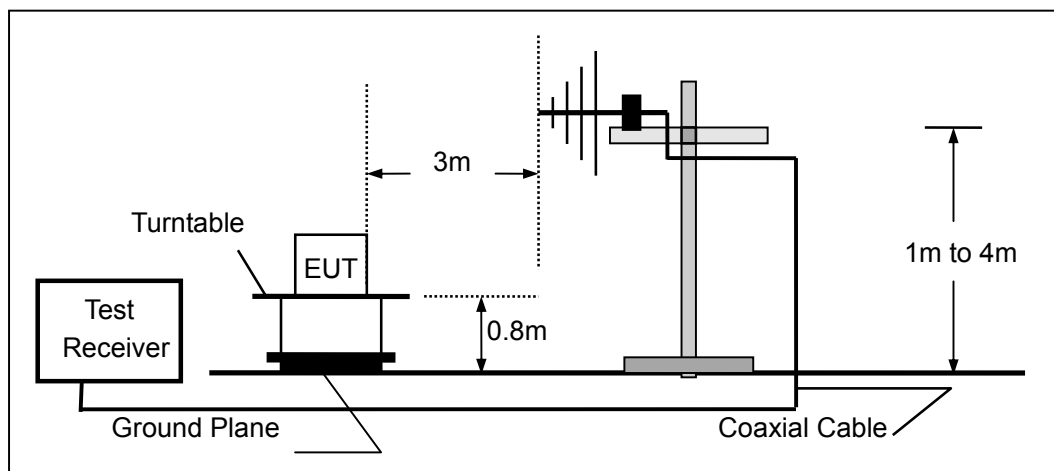
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

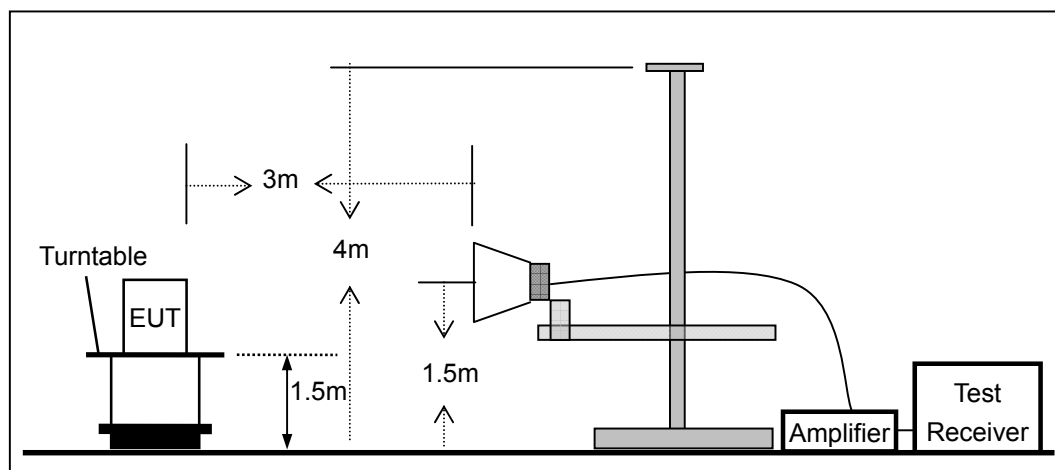
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

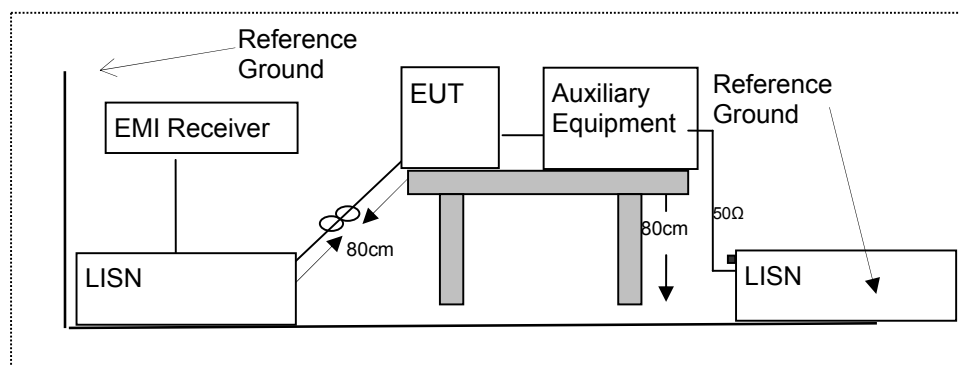


6.3 CONDUCTED EMISSION TEST SETUP

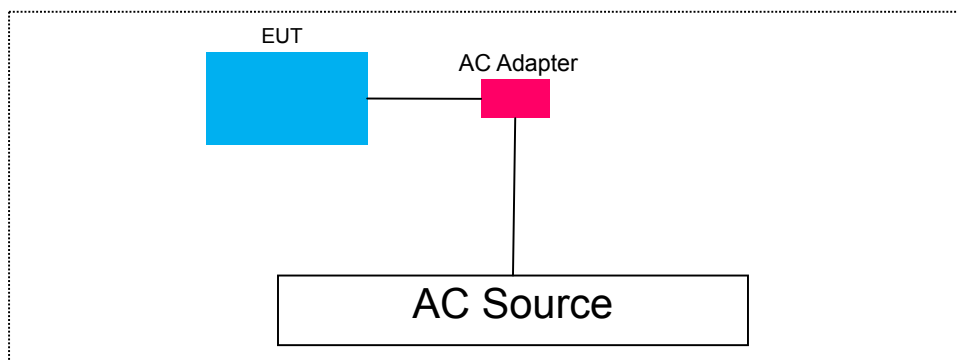
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8 m.

According to the requirements in ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



6.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



6.5 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
	Wireless router TP	LINK TL	WR742N	N/A	/
	AC/DC	ADAPTOR	N/A	N/A	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7 TEST REQUIREMENTS

7.1 OCCUPIED BANDWIDTH

7.1.1 Applicable Standard

According to FCC Part 2.1049 and part 15.231(c)

7.1.2 Conformance 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 900 MHz. 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.

7.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup 1

7.1.4 Test Procedure

The EUT was operating in transmit mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW =100 kHz.

Set the video bandwidth (VBW) =300 kHz.

Set Span= approximately 2 to 3 times the occupied bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the markerdelta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

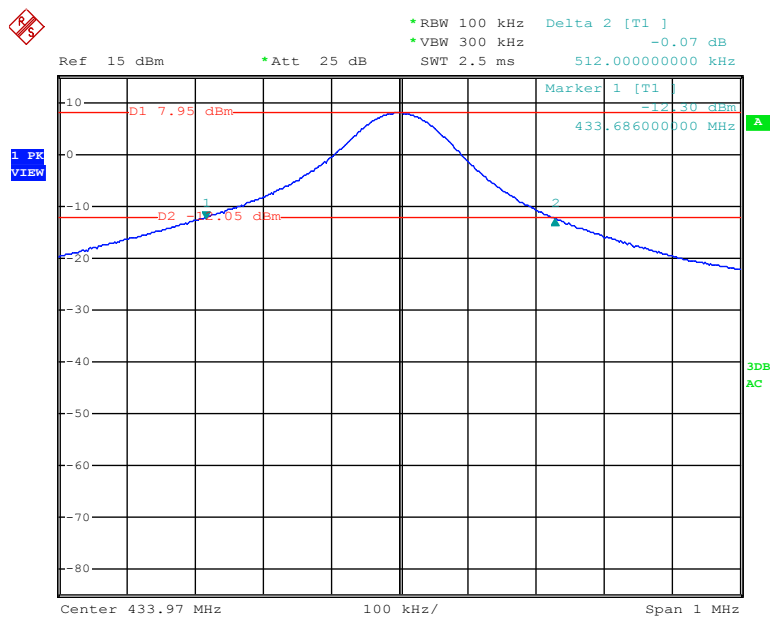
Measure and record the results in the test report.

Test Results

Temperature:	24 °C	Test Date:	May 03, 2016
Humidity:	53 %	Test By:	King Kong

Modulation Mode	Channel Number	Channel Frequency (MHz)	Measurement Bandwidth (kHz)	Limit (kHz)	Verdict
FSK	00	433.97	512.0	≤1084.8	PASS
Note: Limit=0.25% of the center frequency=433.92MHz * 0.25% = 1.0848MHz					

Test Model Occupied Bandwidth FSK Modulation
Channel 0: 433.97MHz



Date: 3.MAY.2016 09:39:06

7.2 RADIATED SPURIOUS EMISSION

7.2.1 Applicable Standard

According to FCC Part 15.231(b) and 15.209

7.2.2 Conformance Limit

According to FCC Part 15.231(e) the field strength Limited

Frequencies (MHz)	Field strength of fundamental @3m		Effective limit for 433.97MHz	
	(uV/m)	dB(uV/m)	(uV/m)	dB(uV/m)
40.66-40.70	1000	60		
70-130	500	54		
130-174	500 to 1500*	54 to 63.5*		
174-260	1500	63.5		
260-470	1500 to 5000*	63.5 to 74*	43986.7	92.87
Above 470	5000	74		

* Linear interpolation

Frequencies (MHz)	Field strength of Spurious emissions @3m		Effective limit for 433.97MHz	
	(uV/m)	dB(uV/m)	(uV/m)	dB(uV/m)
40.66-40.70	100	40		
70-130	50	34		
130-174	50 to 150*	34 to 43.5*		
174-260	150	43.5		
260-470	150 to 500*	51.4 to 54*	4398.67	72.87
Above 470	500	54		

* Linear interpolation

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu\text{V/m}$ at 3 meters = $22.72727(F) - 2454.545$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $16.6667(F) - 2833.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

FCC Part15 (15.231) , Subpart C		
Fundamental Frequency	Field Strength Of Fundamental	Field Strength of Spurious Emissions
433.97MHz	AV:72.87 dBuV/m at 3m distance	AV:52.87 dBuV/m at 3m distance
	PK:92.87dBuV/m at 3m distance	PK:72.87 dBuV/m at 3m distance

According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Field Strength (dB $\mu\text{V}/\text{m}$)	Measurement Distance
0.009~0.490	2400/F(KHz)	300	See the remark
0.490~1.705	2400/F(KHz)	30	
1.705~30.0	30	30	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remark :1. Emission level in dBuV/m=20 log ($\mu\text{V}/\text{m}$)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*Ig(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

7.2.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2

7.2.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for $f < 1$ GHz (30MHz to 1GHz), 200Hz for $f < 150$ KHz (9KHz to 150KHz), 9KHz for $f < 30$ MHz (150KHz to 30MHz), 1MHz for $f < 5$ GHz

VBW \geq RBW Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

- Calculation of Average factor

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The duty cycle is measured in 100ms or the repetition cycle period, whichever is a shorter time frame, the duty cycle is measured by placing the spectrum analyzer to set zero span at 100kHz resolution bandwidth.

Averaging factor in dB = $20\log(\text{duty cycle})$

Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log((4.62 + 0.72 \cdot 16 + 0.36 \cdot 30) / 63.2) = -7.41 \text{ dB}$$

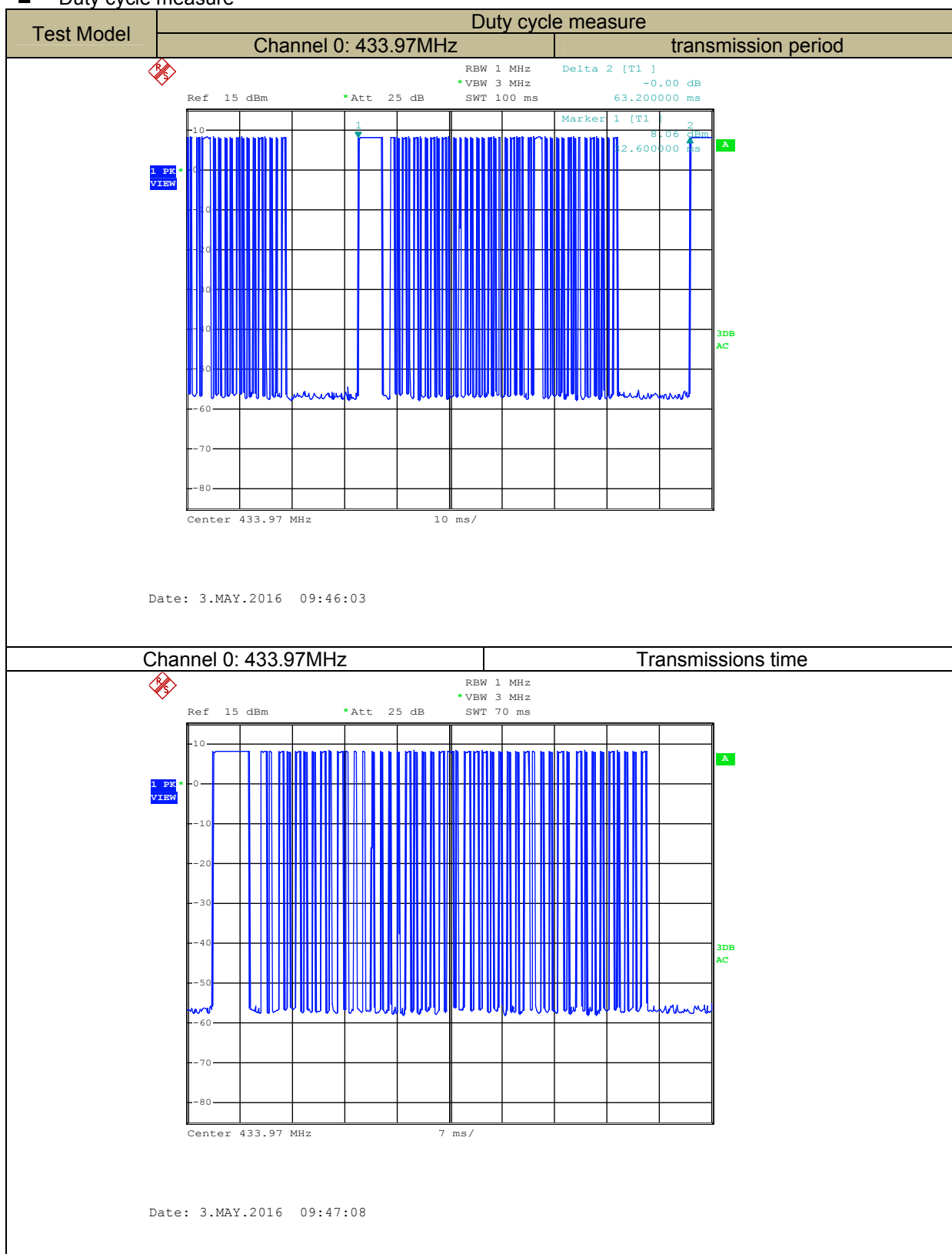
Therefore, the averaging factor is -7.41dB.

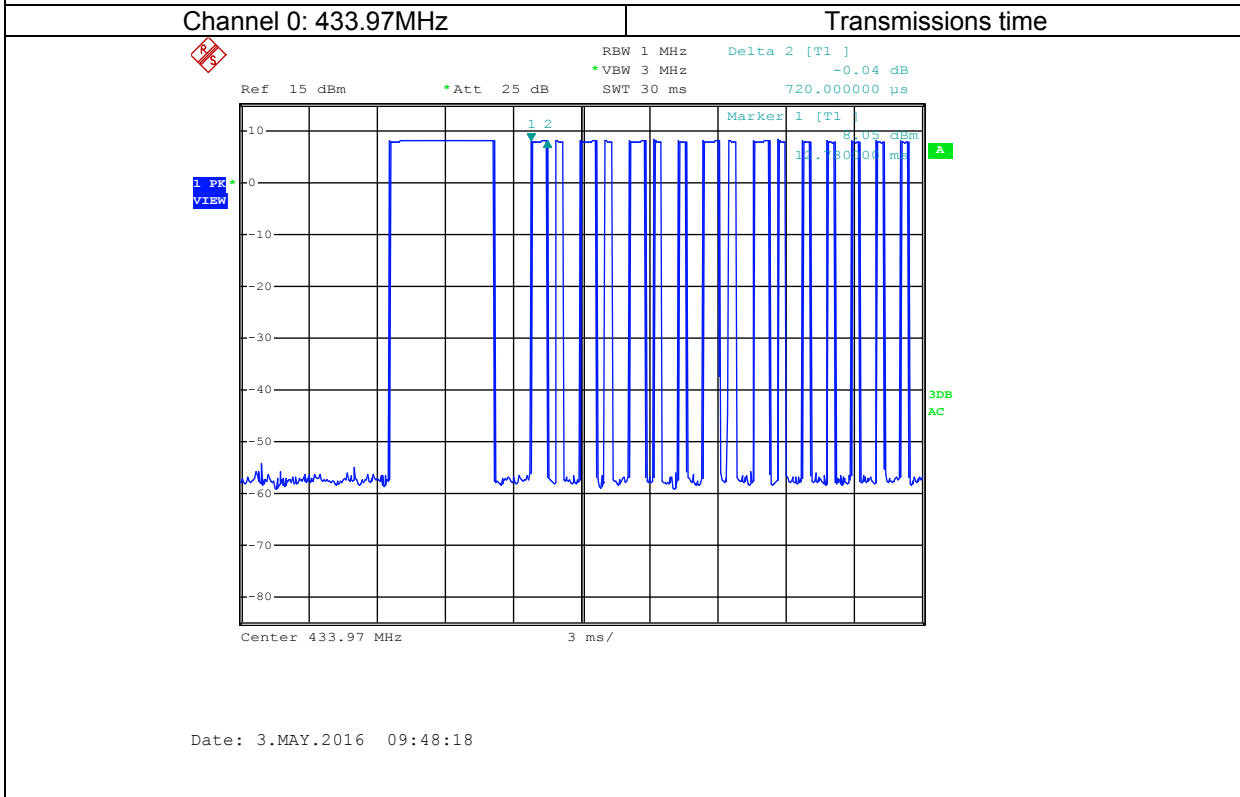
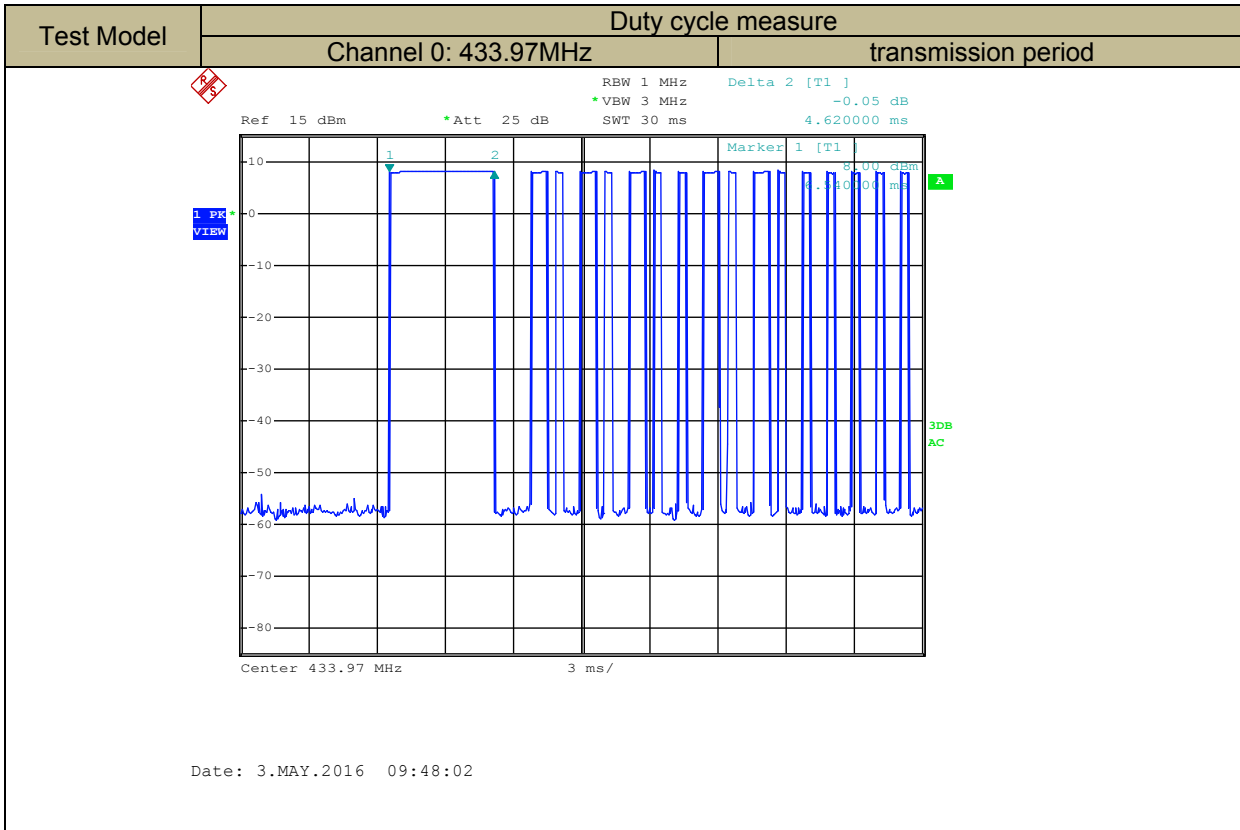
Pulse Width (PW) = 0.36, $2/PW = 2/0.36 = 5.56 \text{ KHz}$, $RBW = 100 \text{ KHz} > 5.56 \text{ KHz}$, Therefore PDCF is not needed.

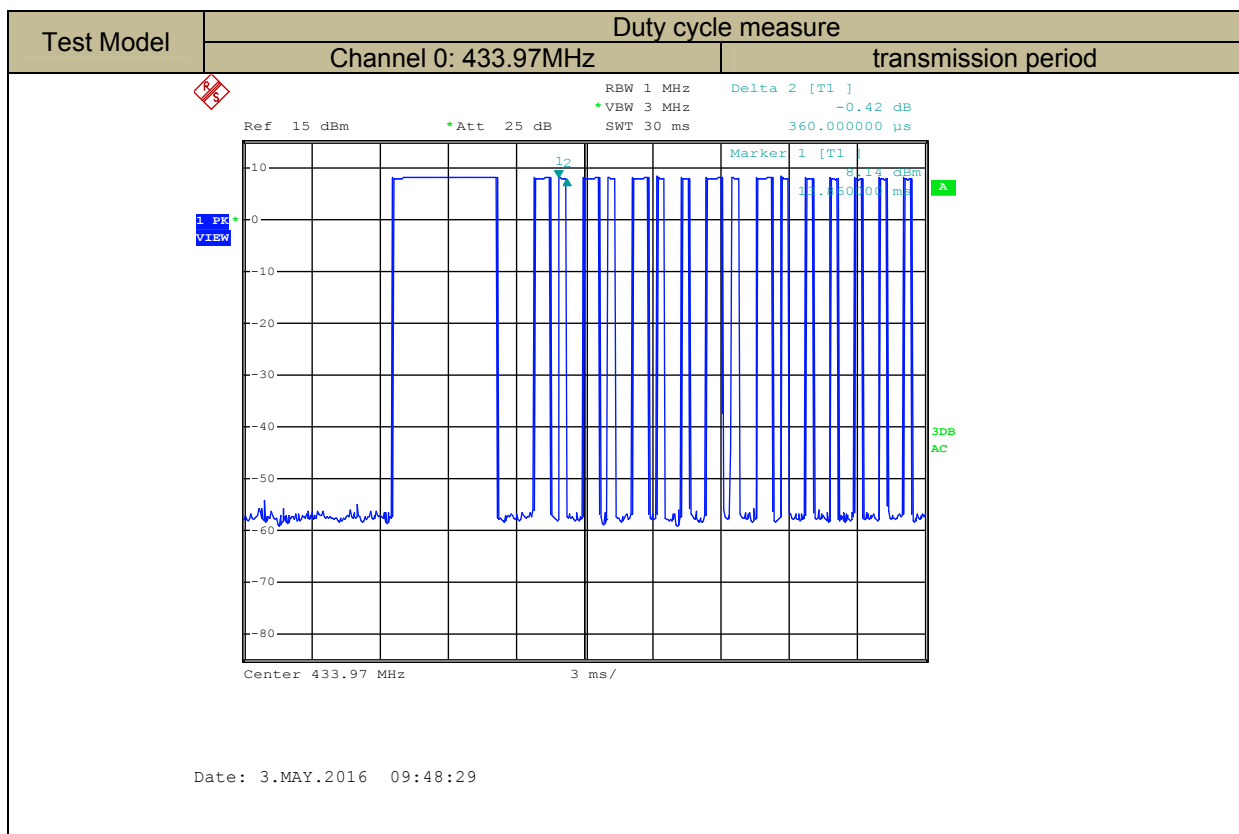
Please see the diagrams below:

7.2.5 Test Results

■ Duty cycle measure







■ Fundamental emission

Antenna polarization: Horizontal

Freq. (MHz)	Reading Level(dBuV)	Correct Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark
433.97	94.17	-16.78	77.39	92.87	-15.48	Peak
433.97	77.39	-7.41	69.98	72.87	-2.89	Average

Antenna polarization: Vertical

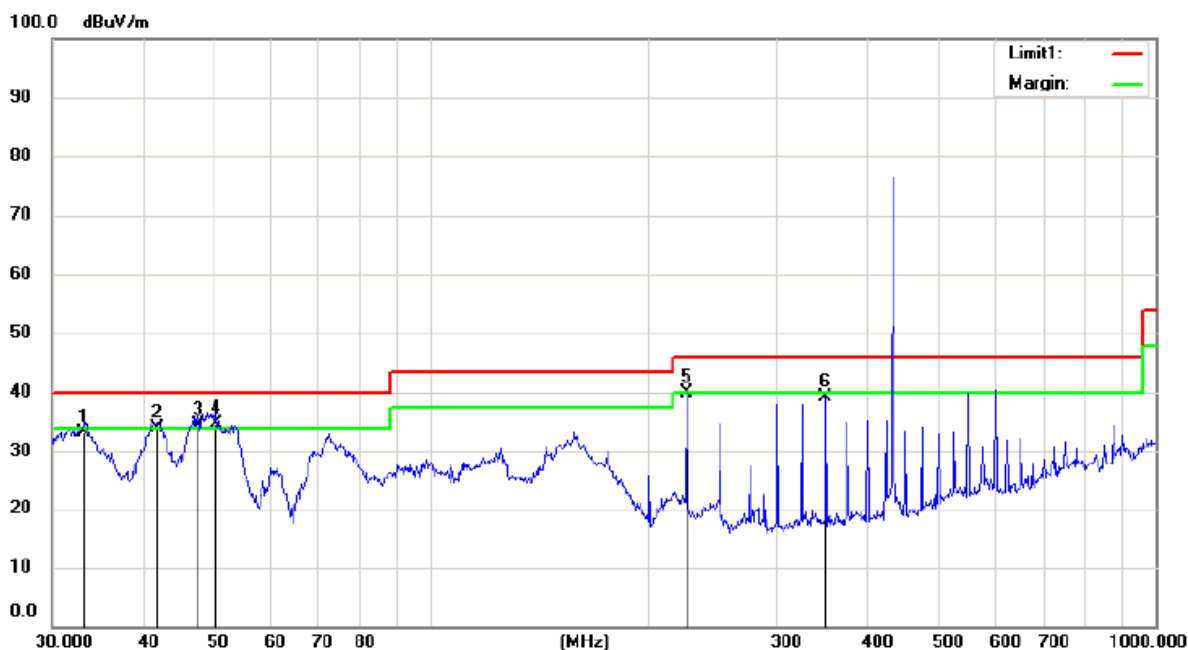
Freq. (MHz)	Reading Level(dBuV)	Correct Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark
433.97	93.21	-16.78	76.43	92.87	-16.44	Peak
433.97	76.43	-7.41	69.02	72.87	-3.85	Average

■ Other emissions

The receiver was scanned from the lowest frequency generated within the EUT to 4.5 GHz. The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:
 Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Peramplifier Factor.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

The following test results were performed on the EUT.



Site site #1 Polarization: **Vertical** Temperature: 20 C

Limit: FCC Part15 Class B 3M Radiation

Power: AC 120V/60Hz

Humidity: 52 %

EUT: ID SMATR BOX CONTROL

M/N: DQ7007A

Mode:ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		33.2111	55.81	-22.71	33.10	40.00	-6.90			QP
2		41.8594	54.19	-20.29	33.90	40.00	-6.10			QP
3	!	47.8260	54.26	-19.86	34.40	40.00	-5.60			QP
4	*	50.4090	53.94	-19.34	34.60	40.00	-5.40			QP
5		225.3080	61.75	-21.95	39.80	46.00	-6.20			QP
6		350.4766	57.49	-18.29	39.20	46.00	-6.80			QP

Above 1G

Horizontal:

Freq. (MHz)	Reading Level(dBuV)	Correct Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark
1735.000	72.35	-23.7	48.65	72.87	-24.22	Peak
1735.000	48.65	-7.41	41.24	52.87	-11.63	Average
2169.000	70.67	-22.64	48.03	72.87	-24.84	Peak
2169.000	48.03	-7.41	40.62	52.87	-12.25	Average
2463.000	67.11	-21.89	45.22	72.87	-27.65	Peak
2463.000	45.22	-7.41	37.81	52.87	-15.06	Average
3471.000	74.52	-20.62	53.9	72.87	-18.97	Peak
3471.000	53.9	-7.41	46.49	52.87	-6.38	Average
3821.000	72.83	-19.27	53.56	74.00	-20.44	Peak
3821.000	53.56	-7.41	46.15	54.00	-7.85	Average
3908.500	71.36	-18.93	52.43	74.00	-21.57	Peak
3908.500	52.43	-7.41	45.02	54.00	-8.98	Average

Vertical:

Freq. (MHz)	Reading Level(dBuV)	Correct Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark
1910.000	78.57	-23.37	55.2	72.87	-17.67	Peak
1910.000	55.2	-7.41	47.79	52.87	-5.08	Average
2169.000	80.12	-22.64	57.48	72.87	-15.39	Peak
2169.000	57.48	-7.41	50.07	52.87	-2.80	Average
3037.000	75.39	-21.55	53.84	72.87	-19.03	Peak
3037.000	53.84	-7.41	46.43	52.87	-6.44	Average
3471.000	76.22	-20.62	55.60	72.87	-17.27	Peak
3471.000	55.6	-7.41	48.19	52.87	-4.68	Average
3821.000	73.9	-19.27	54.63	74.00	-19.37	Peak
3821.000	54.63	-7.41	47.22	54.00	-6.78	Average
3908.500	73.52	-18.93	54.59	74.00	-19.41	Peak
3908.500	54.59	-7.41	47.18	54.00	-6.82	Average

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

7.3 TRANSMISSION REQUIREMENT

7.3.1 Applicable Standard

According to FCC Part 15.231(e)

7.3.2 Conformance Limit

According to FCC Part 15.231(e) :In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

7.3.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2

7.3.4 Test Procedure

The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
Span Frequency	0Hz
RBW	100KHz
VBW	300KHz
Detector	Peak
Trace	Max hold
Sweep Time	30S

- The transmitter output (antenna port) was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100KHz and VBW to 300KHz, Set Detector to Peak, Trace to Max Hold.
- Set the span to 0Hz and the sweep time to 30s and record the value.

7.3.5 Test Results

TX on=0.166S

Tp=16.92s

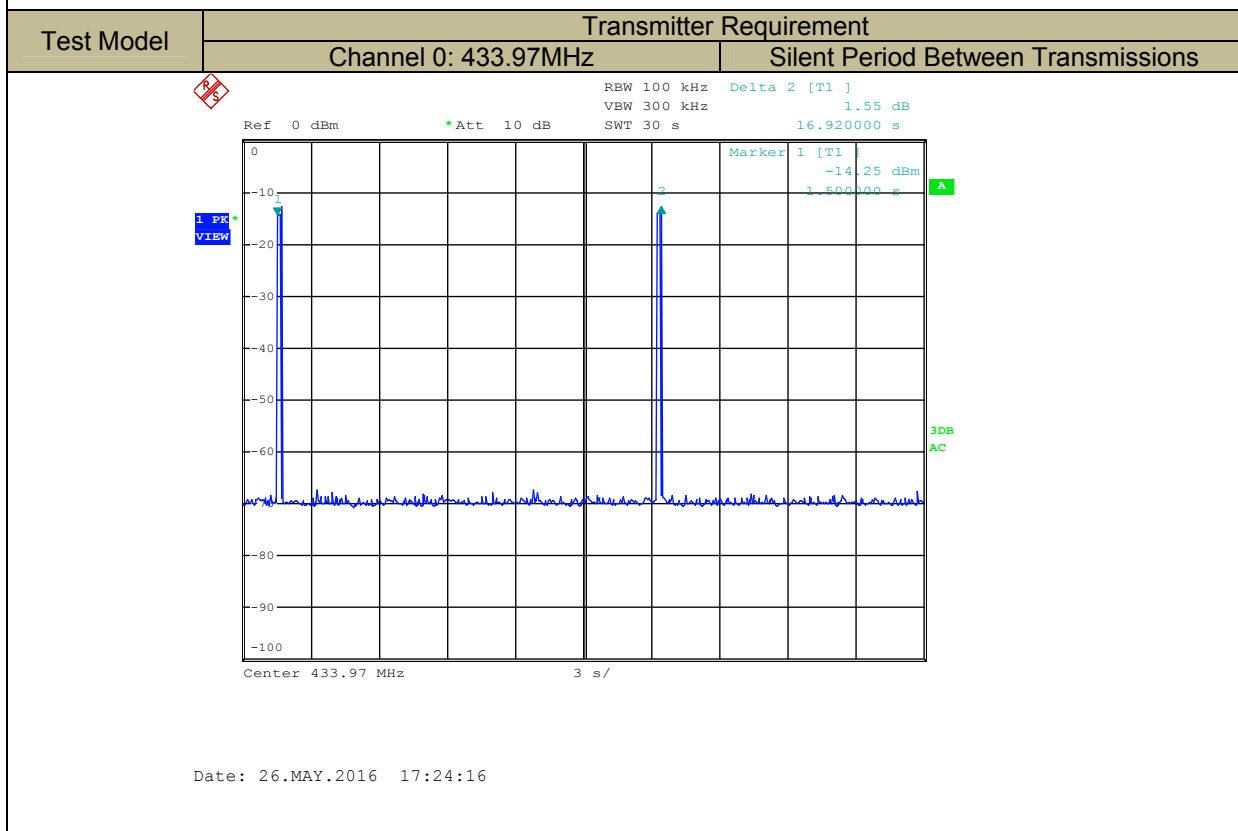
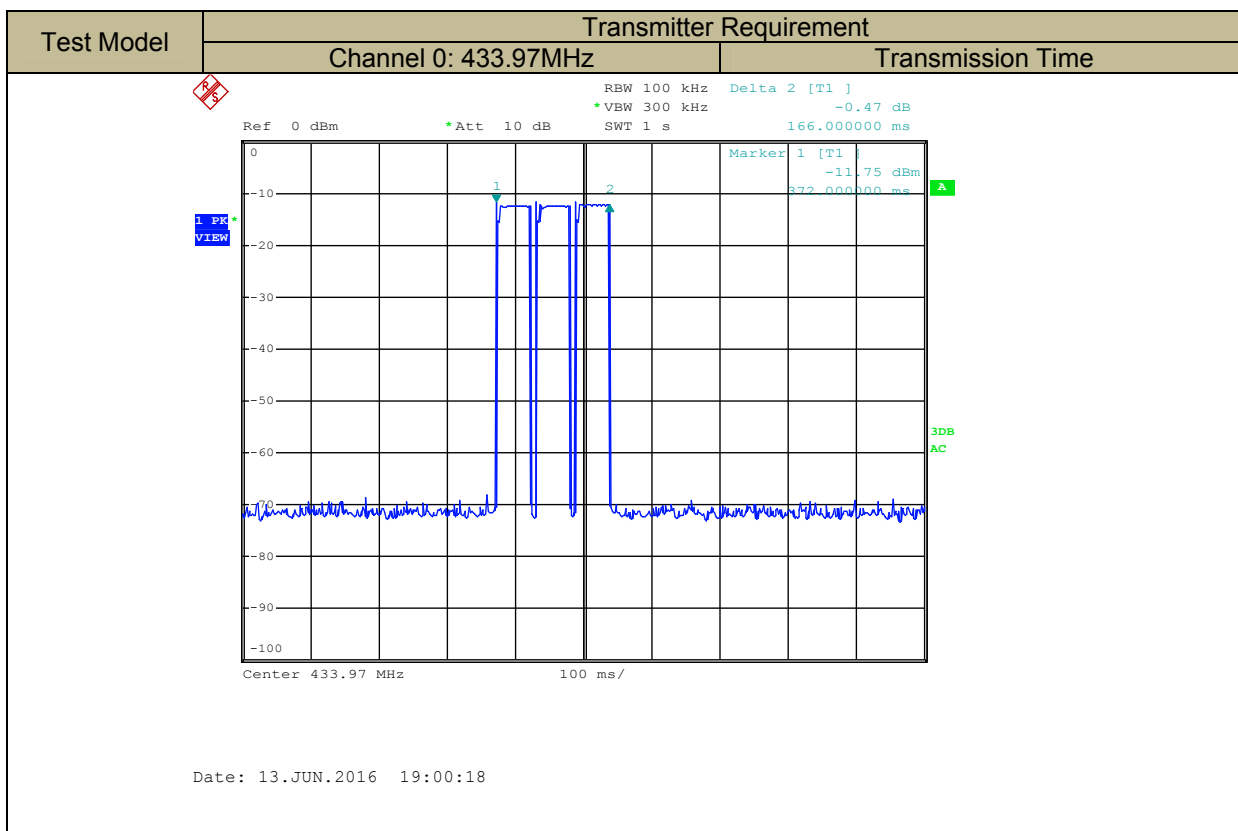
Silent period no less than 10 seconds or $0.166 \times 30 = 4.98s$

TX Silent period=16.92s

Frequency (MHz)	TX Silent period (Second)	Limit (Second)	Result
433.97	16.92	no less than 10 seconds	PASS

Frequency (MHz)	Max transmission (Second)	Limit (Second)	Result
433.97	0.166	not be greater than one second	PASS

Frequency (MHz)	TX Silent period (Second)	Limit (Second)	Result
433.97	16.92	Least 30 times the duration of the transmission (4.98S)	PASS



7.4 CONDUCTED EMISSION TEST

7.4.1 Applicable Standard

According to FCC Part 15.207(a)

7.4.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

7.4.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

7.4.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
 Maximum procedure was performed on the highest emissions to ensure EUT compliance.
 Repeat above procedures until all frequency measured were complete.

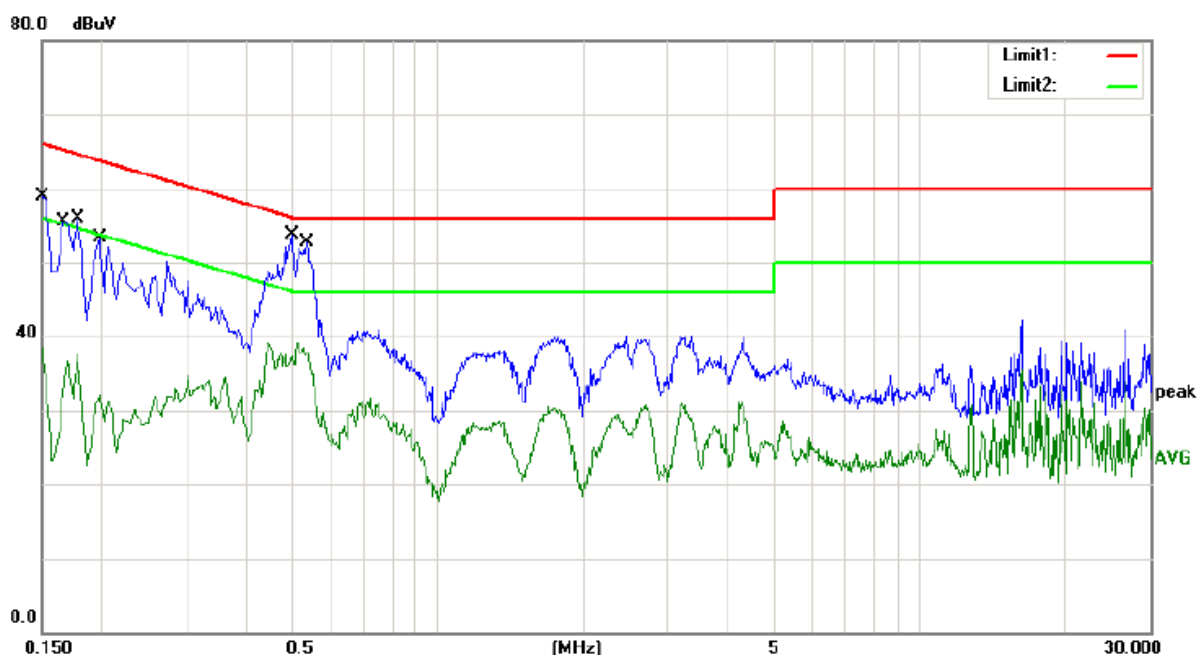
7.4.5 Test Results

120V 60Hz



Site site #1 Phase: **N** Temperature: 22
 Limit: (CE)FCC PART 15 class B_QP Power: AC 120V/60Hz Humidity: 50 %
 EUT: ID SMART BOX CONTROL
 M/N: DQ7007A
 Mode: ON
 Note:

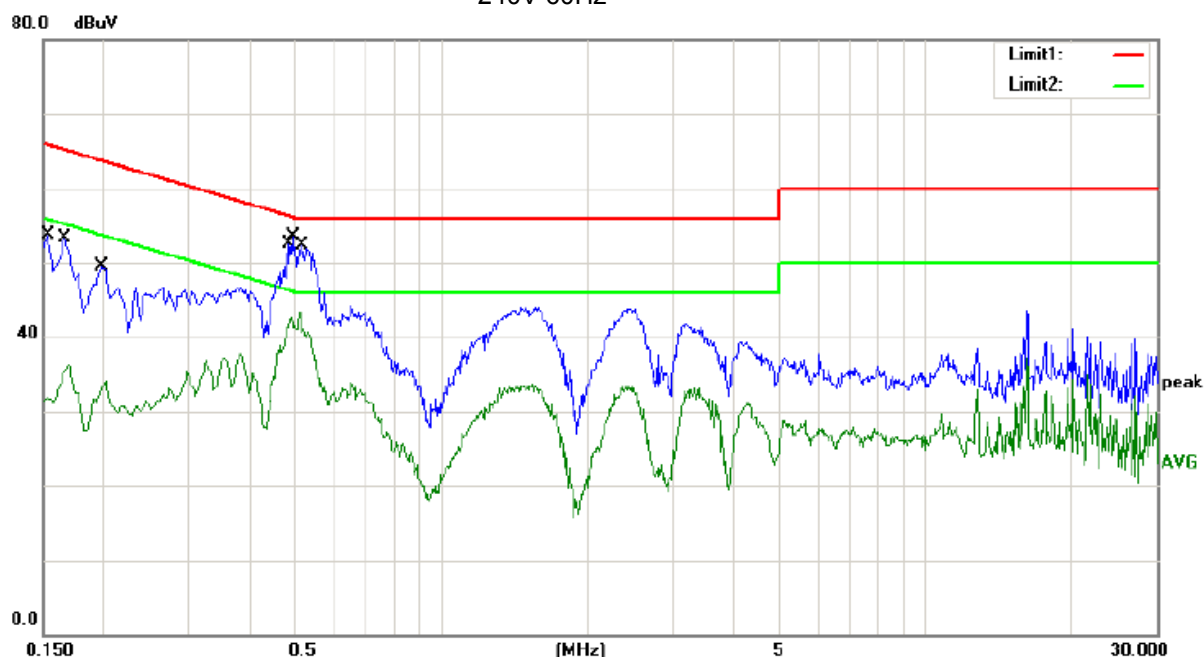
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1580	42.50	11.00	53.50	65.57	-12.07	QP	
2	0.1580	25.10	11.00	36.10	55.57	-19.47	AVG	
3	0.1740	42.20	11.00	53.20	64.77	-11.57	QP	
4	0.1740	27.30	11.00	38.30	54.77	-16.47	AVG	
5	0.1900	37.60	11.00	48.60	64.04	-15.44	QP	
6	0.1900	20.60	11.00	31.60	54.04	-22.44	AVG	
7	0.1986	38.90	11.00	49.90	63.67	-13.77	QP	
8	0.1986	24.60	11.00	35.60	53.67	-18.07	AVG	
9 *	0.4940	41.80	11.00	52.80	56.10	-3.30	QP	
10	0.4940	25.60	11.00	36.60	46.10	-9.50	AVG	
11	0.5300	37.10	11.00	48.10	56.00	-7.90	QP	
12	0.5300	26.60	11.00	37.60	46.00	-8.40	AVG	



Site site #1 Phase: **L1** Temperature: 22
 Limit: (CE)FCC PART 15 class B_QP Power: AC 120V/60Hz Humidity: 50 %
 EUT: ID SMART BOX CONTROL
 M/N: DQ7007A
 Mode: ON
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	45.80	11.00	56.80	66.00	-9.20	QP	
2		0.1500	26.50	11.00	37.50	56.00	-18.50	AVG	
3		0.1660	41.10	11.00	52.10	65.16	-13.06	QP	
4		0.1660	20.20	11.00	31.20	55.16	-23.96	AVG	
5		0.1780	41.50	11.00	52.50	64.58	-12.08	QP	
6		0.1780	23.50	11.00	34.50	54.58	-20.08	AVG	
7		0.1980	38.90	11.00	49.90	63.69	-13.79	QP	
8		0.1980	21.10	11.00	32.10	53.69	-21.59	AVG	
9	*	0.4980	40.10	11.00	51.10	56.03	-4.93	QP	
10		0.4980	25.30	11.00	36.30	46.03	-9.73	AVG	
11		0.5340	36.50	11.00	47.50	56.00	-8.50	QP	
12		0.5340	26.60	11.00	37.60	46.00	-8.40	AVG	

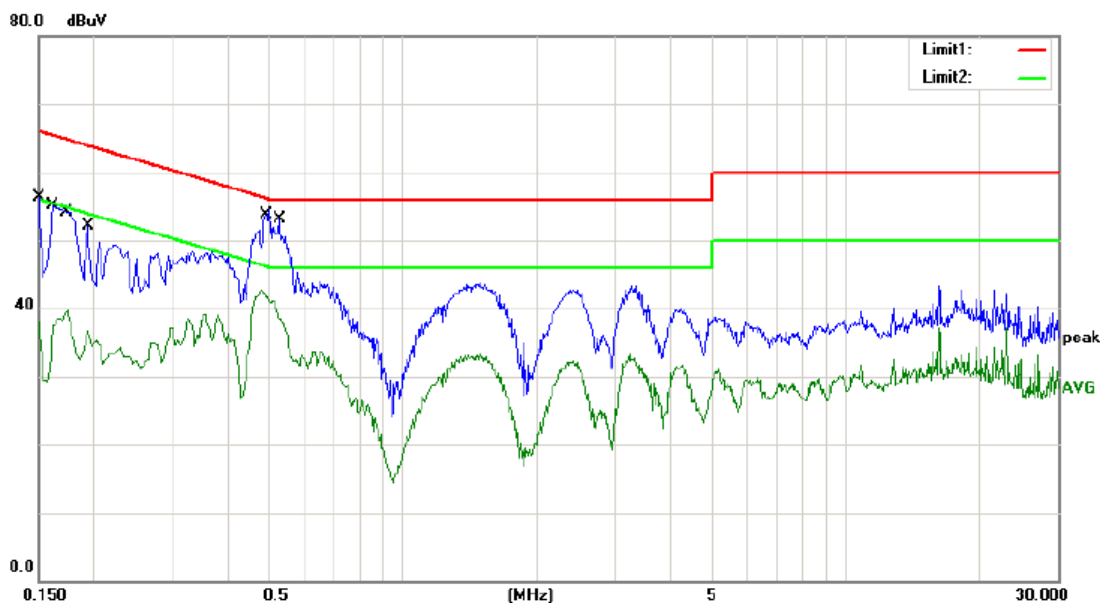
240V 60Hz



Site site #1
 Limit: (CE)FCC PART 15 class B_QP
 EUT: ID SMART BOX CONTROL
 M/N: DQ7007A
 Mode: ON
 Note:

Phase: **L1** Temperature: 22
 Power: AC 240V/60Hz Humidity: 50 %

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1540	35.80	11.00	46.80	65.78	-18.98	QP	
2	0.1540	15.90	11.00	26.90	55.78	-28.88	AVG	
3	0.1660	38.30	11.00	49.30	65.16	-15.86	QP	
4	0.1660	22.50	11.00	33.50	55.16	-21.66	AVG	
5	0.1980	34.40	11.00	45.40	63.69	-18.29	QP	
6	0.1980	20.20	11.00	31.20	53.69	-22.49	AVG	
7	0.4820	41.50	11.00	52.50	56.30	-3.80	QP	
8	0.4860	30.20	11.00	41.20	46.24	-5.04	AVG	
9 *	0.4940	41.40	11.00	52.40	56.10	-3.70	QP	
10	0.4940	30.30	11.00	41.30	46.10	-4.80	AVG	
11	0.5180	41.20	11.00	52.20	56.00	-3.80	QP	
12	0.5180	29.70	11.00	40.70	46.00	-5.30	AVG	



Site site #1 Phase: **N** Temperature: 22
 Limit: (CE)FCC PART 15 class B_QP Power: AC 240V/60Hz Humidity: 50 %
 EUT: ID SMART BOX CONTROL
 M/N: DQ7007A
 Mode: ON
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	40.80	11.00	51.80	66.00	-14.20	QP	
2		0.1500	25.20	11.00	36.20	56.00	-19.80	AVG	
3		0.1620	39.10	11.00	50.10	65.36	-15.26	QP	
4		0.1620	24.50	11.00	35.50	55.36	-19.86	AVG	
5		0.1750	38.70	11.00	49.70	64.72	-15.02	QP	
6		0.1750	26.10	11.00	37.10	54.72	-17.62	AVG	
7		0.1940	36.60	11.00	47.60	63.86	-16.26	QP	
8		0.1940	24.70	11.00	35.70	53.86	-18.16	AVG	
9		0.4900	40.30	11.00	51.30	56.17	-4.87	QP	
10	*	0.4900	30.60	11.00	41.60	46.17	-4.57	AVG	
11		0.5260	35.90	11.00	46.90	56.00	-9.10	QP	
12		0.5260	27.90	11.00	38.90	46.00	-7.10	AVG	

7.5 Antenna Application

7.5.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, 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.

7.5.2 Result

The EUT's antenna is PCB antenna, using a permanently attached antenna which is not replaceable. The antenna's gain is less than 1dBi and meets the requirement..

END OF REPORT