FCC Radio Test Report

FCC IC: Y9E-IAD18007

Original Grant

Report No.	:	TB-FCC164440
Applicant	:	IAdea Corporation
Equipment Under Test (EUT)		
EUT Name	:	Smart Signboard (Tablet without battery)
Model No.	:	XDS-1588-H/IAD-18007
Serial Model No.	:	XDS-1588-A/IAD-18008, XDS-158Z-Y/IAD-18007, XDS-158Z-Y/IAD-18008(Note: Z is "0~9", and Y is "A~Z", represents the appearance color or customer models)
Brand Name	:	**IAdea**
Receipt Date	:	2019-05-27
Test Date	:	2019-05-27 to 2019-06-20
Issue Date	:	2019-06-26
Standards	:	FCC Part 15, Subpart C(15.225)
Test Method	:	ANSI C63.10: 2013
Conclusions	:	**PASS**

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

Test/Witness Engineer	:	Jason Xu
Engineer Supervisor	:	Ivan Su
Engineer Manager	:	Ray Lai

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Contents

Revision History

Report No.	Version	Description	Issued Date
TB-FCC164440	Rev.01	Initial issue of report	2019-06-26

1. General Information about EUT

1.1 Client Information

Applicant	:	IAdea Corporation
Address	:	3F, No. 21 Lane 168, Xingshan Road,Neihu Dist., Taipei, Taiwan
Manufacturer	:	IAdea Corporation
Address	:	3F, No. 21 Lane 168, Xingshan Road,Neihu Dist., Taipei, Taiwan

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Smart Signboard (Tablet without battery)	
Models No.	:	XDS-1588-H/IAD-18007, XDS-1588-A/IAD-18008, XDS-158Z-Y/IAD-18007, XDS-158Z-Y/IAD-18008(Note: Z is "0~9", and Y is "A~Z", represents the appearance color or customer models)	
Model Difference	:	All these models are the same PCB, layout and electrical circuit, the only different is appearance color or customer models.	
Product Description	:	Operation Frequency:	NFC: 13.56MHz
		Antenna:	PCB Antenna
Power Rating	:	AC Adapter(FJ-SW1202000N): Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12V, 2.0A	
Software Version	:	N/A	
Hardware Version	:	R35	
TX Power setting Parameters	:	DEF	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.3 Block Diagram Showing the Configuration of System Tested

Adapter + TX Mode

1.4 Description of Support Units

The EUT has been test as an independent unit.

1.5 Description of Test Mode

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

For Conducted Test	
Final Test Mode	**Description**
Mode 1	Adapter + TX Mode

For Radiated Test	
Final Test Mode	**Description**
Mode 2	Adapter + TX Mode

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.
According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:
TX Mode: Transmitting mode.

(2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.

(3) The EUT is considered a portable unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software Version	N/A
Frequency	13.56 MHz
NFC	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	 ±3.42 dB ±3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.

FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

2. Test Summary

FCC Part 15 Subpart C(15.225)/RSS 210 Issue 9				
Standard Section		Test Item	Judgment	Remark
FCC	IC			
15.207(a)	RSS-GEN 8.8	Conducted Emission	PASS	N/A
15.209(a)&15.225	RSS-Gen 8.9	Radiated emissions	PASS	N/A
15.225(a)	RSS 210 B.6	Fundamental field strength limit	PASS	N/A
15.225(e)	RSS 210 B.6	Fundamental frequency tolerance	PASS	N/A
15.225	RSS 210 B.6	Band edge compliance	PASS	N/A
15.215(c)	RSS Gen 4.6.1	Occupied bandwidth	PASS	N/A
Note: N/A is an abbreviation for Not Applicable.				

3. Test Equipment

Conducted Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 18, 2018	Jul. 17, 2019
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 18, 2018	Jul. 17, 2019
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 18, 2018	Jul. 17, 2019
LISN	Rohde & Schwarz	ENV216	101131	Jul. 18, 2018	Jul. 17, 2019
Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 18, 2018	Jul. 17, 2019
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 18, 2018	Jul. 17, 2019
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Jan. 27, 2019	Jan. 26, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Jan. 27, 2019	Jan. 26, 2020
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.03, 2019	Mar. 02, 2020
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar.03, 2019	Mar. 02, 2020
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 14, 2018	Jul.13, 2019
Pre-amplifier	Sonoma	310N	185903	Mar.04, 2019	Mar. 03, 2020
Pre-amplifier	HP	8449B	3008A00849	Mar.03, 2019	Mar. 02, 2020
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.03, 2019	Mar. 02, 2020
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted Emission					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 18, 2018	Jul. 17, 2019
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 18, 2018	Jul. 17, 2019
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Oct. 15, 2018	Sep. 14, 2019
Vector Signal Generator	Agilent	N5182A	MY50141294	Oct. 15, 2018	Sep. 14, 2019
Analog Signal Generator	Agilent	N5181A	MY50141953	Oct. 15, 2018	Sep. 14, 2019
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO26	Oct. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO29	Oct. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO31	Oct. 15, 2018	Sep. 14, 2019
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO33	Oct. 15, 2018	Sep. 14, 2019

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard

FCC Part 15.207
RSS-GEN 8.8

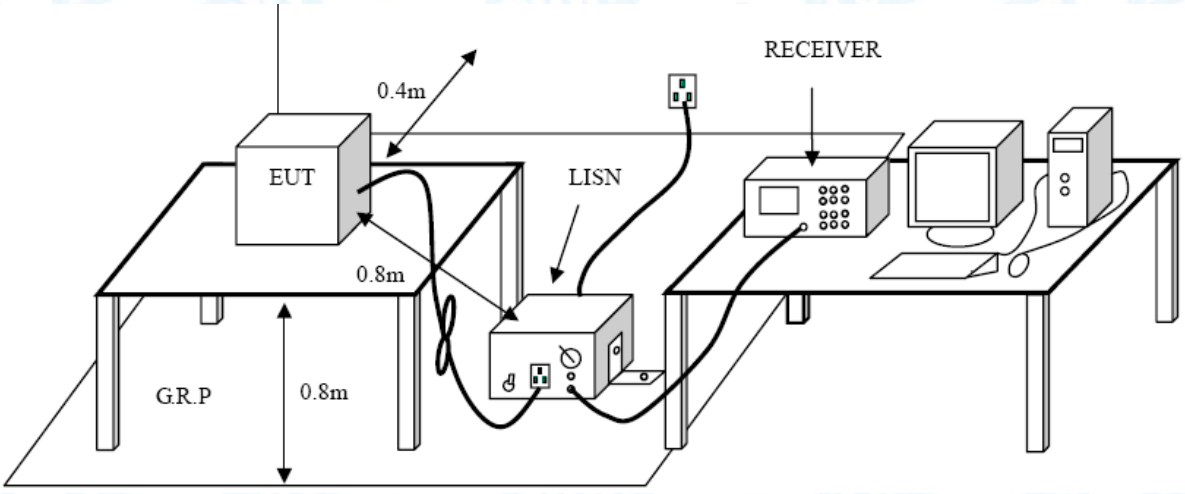
4.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:
(1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequencies.
(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back

and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9 kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Please refer to the Attachment A.

5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.225

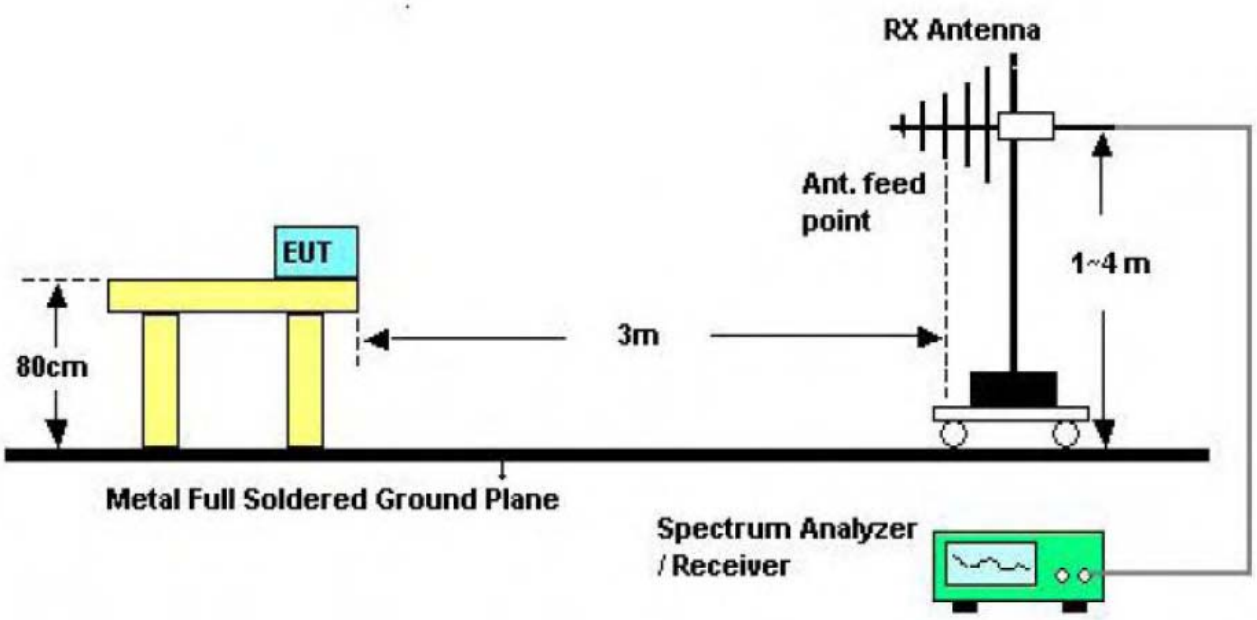
RSS-GEN 8.8

5.1.2 Test Limit

Radiated Emission Limits (30MHz~1000MHz)

Frequency Range (MHz)	E-field Strength Limit @ 3m (mV/m)	E-field Strength Limit @ 3m (dBμV/m)	E-field Strength Limit @ 10m (dBμV/m)
30-88	100	40	30
88-216	150	43.5	33.5
216-960	200	46	36
960-1000	500	54	44

5.2 Test Setup



Below 1000MHz Test Setup

5.3 Test Procedure

(1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
(2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
(3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
(4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
(5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
(6) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Data

Please refer to the Attachment B.

6. Electric Field Strength of Fundamental and Outside the Allocated bands

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC Part 15.225(a)
FCC Part 15.225
RSS 210 B.6

6.1.2 Test Limit

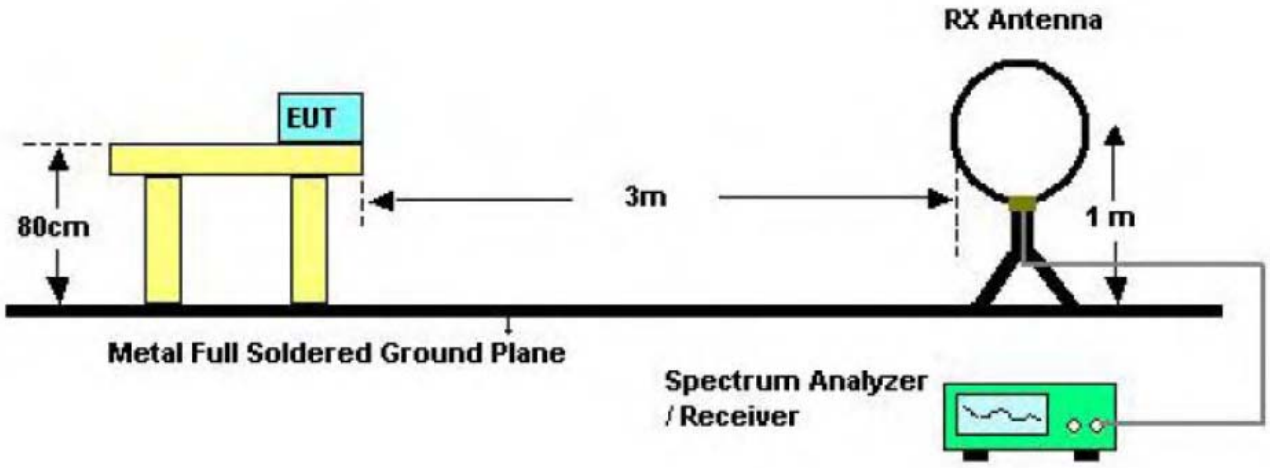
Electric Field Strength of Fundamental

Frequency Range (MHz)	E-field Strength Limit @ 30m (μV/m)	E-field Strength Limit @ 3m (dBμV/m)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70
Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula: $Extrapolation(dB) = 40\log_{10}(Measurement\ \ Distance/Specification\ \ Distance)$		

Outside the Allocated bands

Frequency Range (MHz)	E-field Strength Limit @ 30 m (μV/m)	E-field Strength Limit @ 3 m (dBμV/m)
13.560 ± 0.007	+15,848	124
13.410 to 13.553 13.567 to 13.710	+334	90
13.110 to 13.410 13.710 to 14.010	+106	81
Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula: $Extrapolation(dB) = 40\log_{10}(Measurement\ \ Distance/Specification\ \ Distance)$		

6.2 Test Setup



6.3 Test Procedure

The transmitter carrier output levels (E-Field) from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The E-field is measured with a shielded loop antenna connected to a measurement receiver. Detected E-field was maximized by rotating the EUT through 360° and adjusting the receiving antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes. The measurements were performed with the peak detector and if required, the quasi-peak detector.

6.4 EUT Operating Condition

The measurement of EUT is carried out under the transmit state of NFC.

6.5 Test Data

Please refer to the Attachment C.

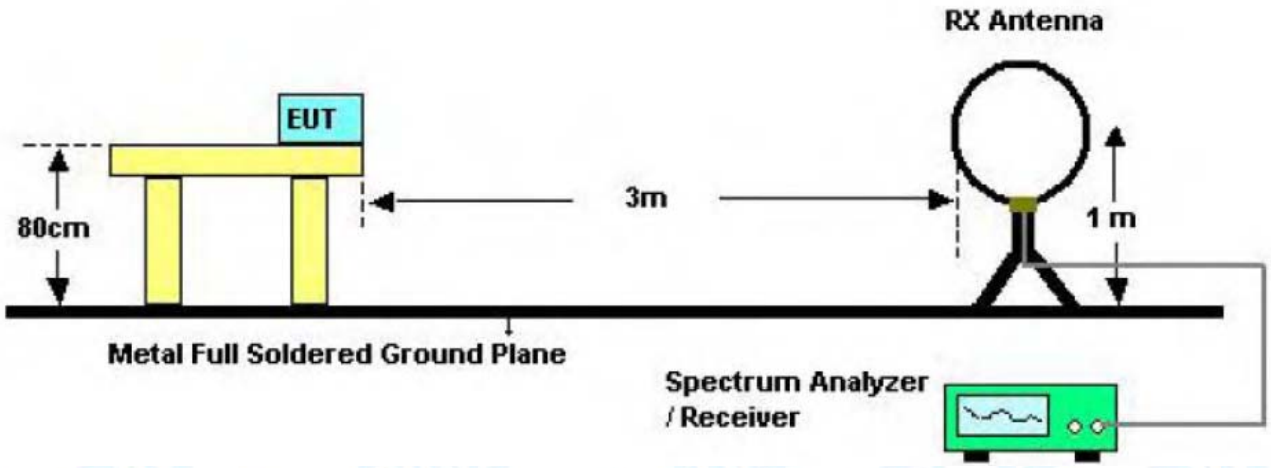
7. Occupied Bandwidth Test

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 15.215 (c)
RSS-Gen 4.6.1

7.2 Test Setup



7.3 Test Procedure

The EUT is turned ON and connected to measurement instrument; the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

1. RBW used in the range of 1% to 5% of the anticipated emission bandwidth
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = Max Hold.
5. Sweep = Auto couple.
6. Allow the trace to stabilize.
7. OBW 99% function of spectrum analyzer used

7.4 EUT Operating Condition

The measurement of EUT is carried out under the transmit state of NFC.

7.5 Test Data

Please refer to the Attachment D.

8. Fundamental Frequency Tolerance

8.1 Test Standard and Limit

8.1.1 Test Standard

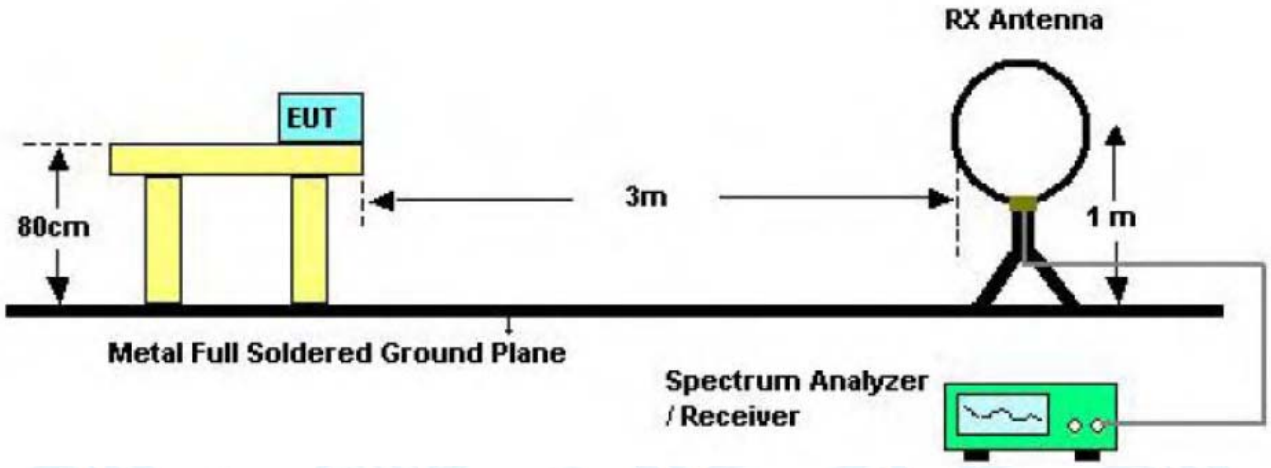
FCC Part 15.225 (e)

RSS 210 B.6

8.1.2 Test Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

8.2 Test Setup



8.3 Test Procedure

The transmitter output signal was picked up by coil antenna connected to the frequency counter. The center frequency was measured with 30Hz RBW and 1kHz span. During the test, the EUT was placed in a thermal chamber until thermal balance and lasting appropriate time.

8.4 EUT Operating Condition

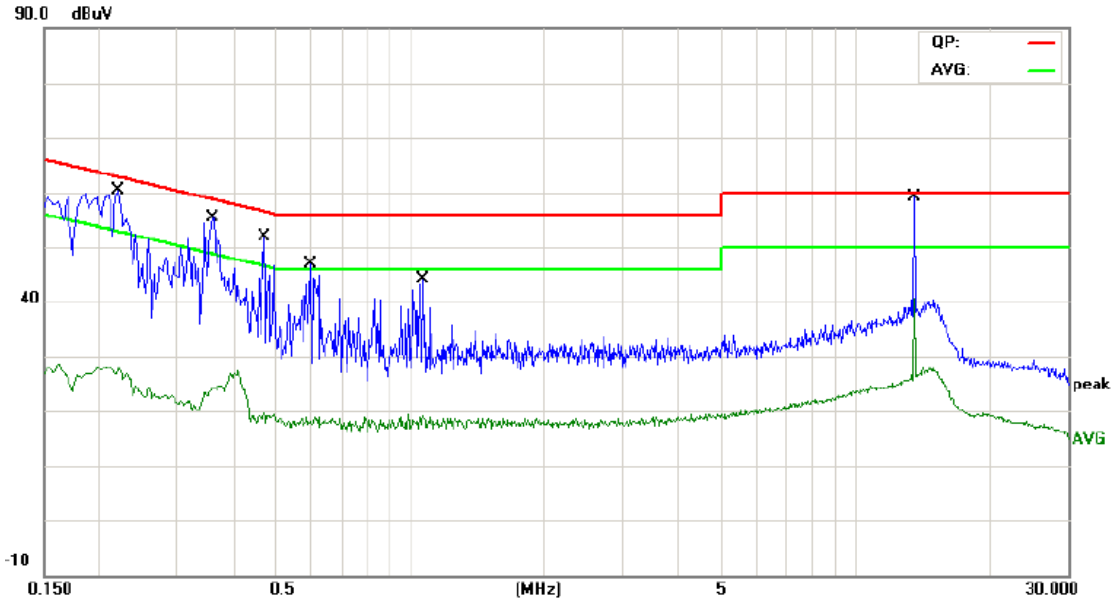
The EUT was set to continuously transmitting in the max power during the test.

8.5 Test Data

Please refer to the Attachment E.

Attachment A-- Conducted Emission Test Data

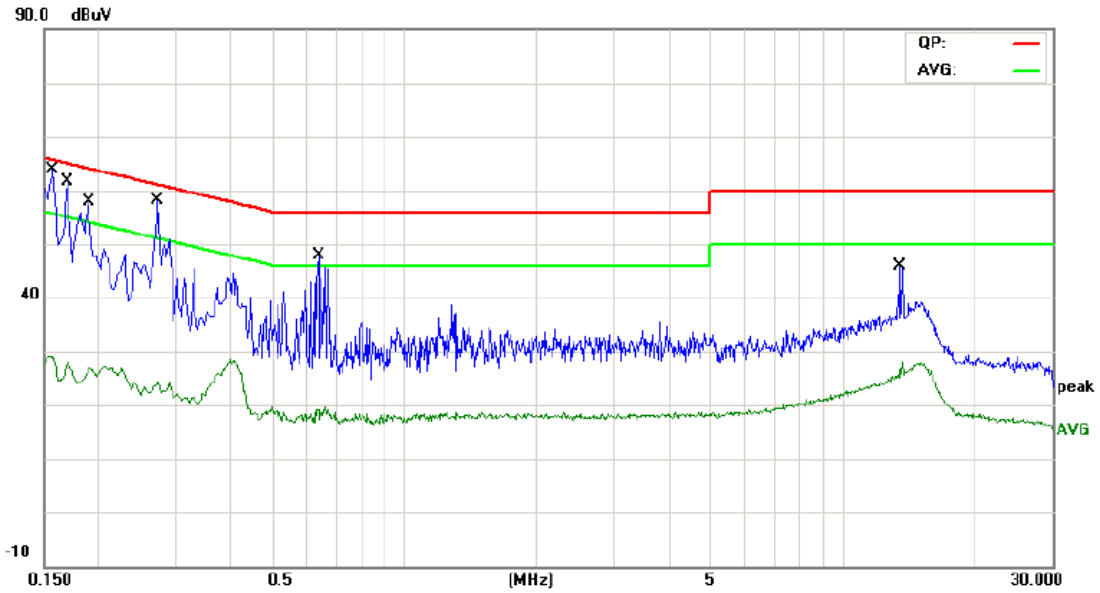
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60 Hz		
Terminal:	Line		
Test Mode:	NFC TX Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2220	34.41	9.72	44.13	62.74	-18.61	QP
2		0.2220	15.83	9.72	25.55	52.74	-27.19	AVG
3		0.3580	25.28	9.75	35.03	58.77	-23.74	QP
4		0.3580	12.54	9.75	22.29	48.77	-26.48	AVG
5		0.4700	22.38	9.78	32.16	56.51	-24.35	QP
6		0.4700	7.59	9.78	17.37	46.51	-29.14	AVG
7		0.5980	16.64	9.79	26.43	56.00	-29.57	QP
8		0.5980	6.87	9.79	16.66	46.00	-29.34	AVG
9		1.0660	15.71	9.85	25.56	56.00	-30.44	QP
10		1.0660	7.45	9.85	17.30	46.00	-28.70	AVG
11		13.5660	35.91	10.06	45.97	60.00	-14.03	QP
12	*	13.5660	30.61	10.06	40.67	50.00	-9.33	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120V/60 Hz		
Terminal:	Neutral		
Test Mode:	NFC TX Mode		
Remark:	Only worse case is reported		



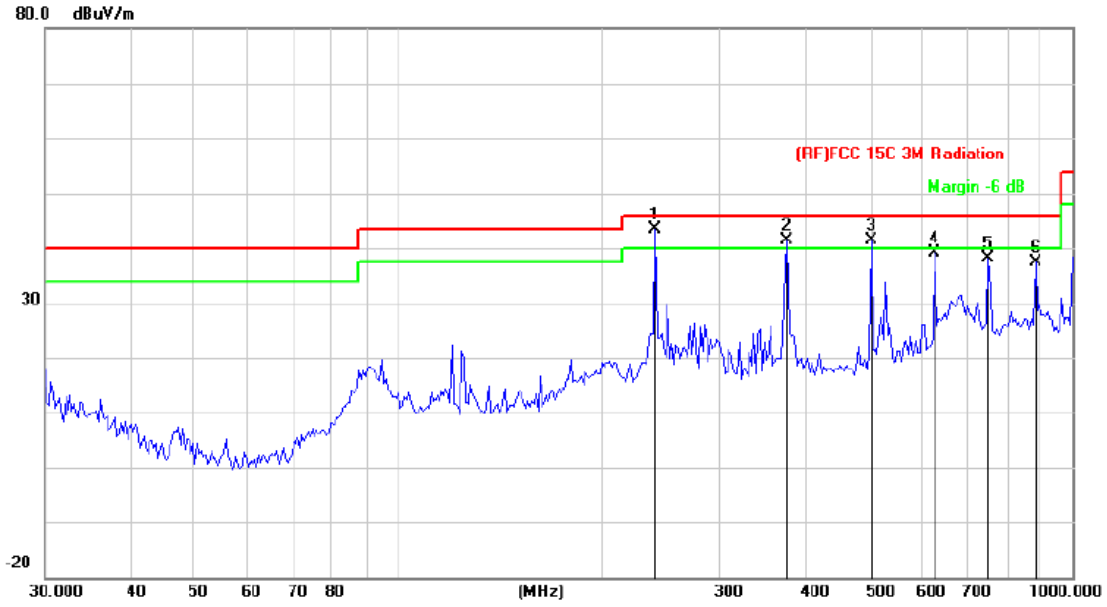
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1580	40.06	9.67	49.73	65.56	-15.83	QP
2		0.1580	15.84	9.67	25.51	55.56	-30.05	AVG
3		0.1700	37.10	9.68	46.78	64.96	-18.18	QP
4		0.1700	14.72	9.68	24.40	54.96	-30.56	AVG
5		0.1900	32.31	9.69	42.00	64.03	-22.03	QP
6		0.1900	14.61	9.69	24.30	54.03	-29.73	AVG
7		0.2740	24.37	9.70	34.07	60.99	-26.92	QP
8		0.2740	11.22	9.70	20.92	50.99	-30.07	AVG
9		0.6340	13.98	9.73	23.71	56.00	-32.29	QP
10		0.6340	7.26	9.73	16.99	46.00	-29.01	AVG
11		13.4940	22.06	9.94	32.00	60.00	-28.00	QP
12		13.4940	14.93	9.94	24.87	50.00	-25.13	AVG

Emission Level= Read Level+ Correct Factor

Attachment B-- Radiated Emission Test Data

30MHz~1GHz

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	NFC TX Mode		
Remark:	Only worse case is reported		

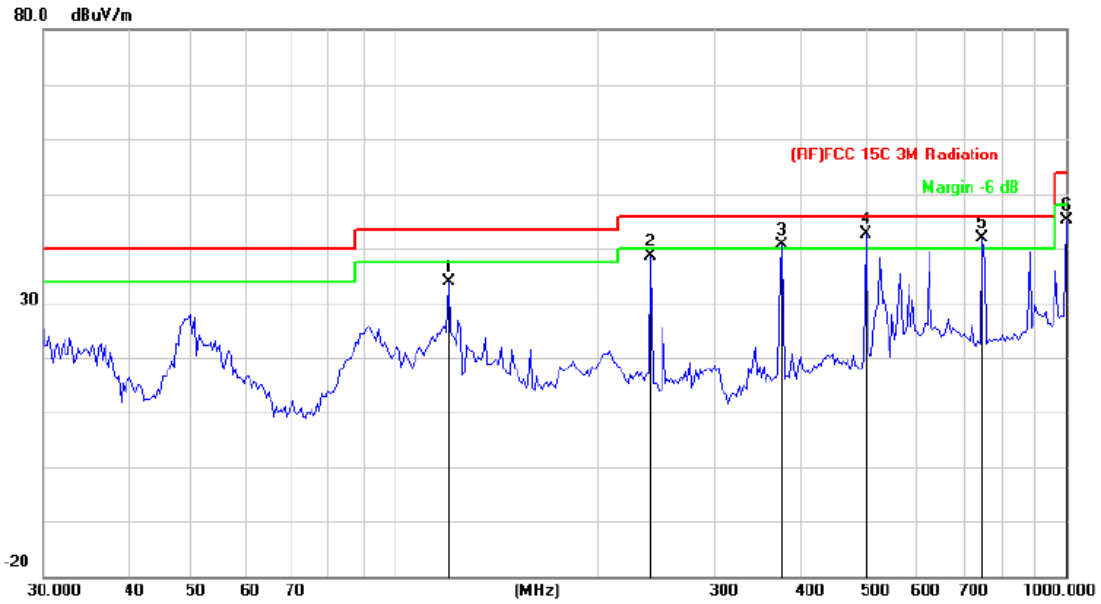


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	240.8302	60.96	-17.69	43.18	46.00	-2.82	QP
2	!	377.2590	54.80	-13.32	41.50	46.00	-4.50	QP
3	!	502.9395	51.94	-10.52	41.40	46.00	-4.60	QP
4		625.0778	47.34	-8.32	39.08	46.00	-6.92	QP
5		750.1082	44.65	-6.57	38.18	46.00	-7.82	QP
6		881.4067	41.68	-4.31	37.37	46.00	-8.63	QP

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

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Vertical		
Test Mode:	NFC TX Mode		
Remark:	Only worse case is reported		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		120.2766	56.22	-22.30	33.90	43.50	-9.60	QP
2		240.8304	56.29	-17.69	38.58	46.00	-7.42	QP
3	!	377.2591	53.92	-13.32	40.64	46.00	-5.46	QP
4	*	502.9395	53.25	-10.52	42.70	46.00	-3.30	QP
5	!	750.1083	48.40	-6.57	41.83	46.00	-4.17	QP
6		1000.0000	48.36	-3.16	45.20	54.00	-8.80	QP

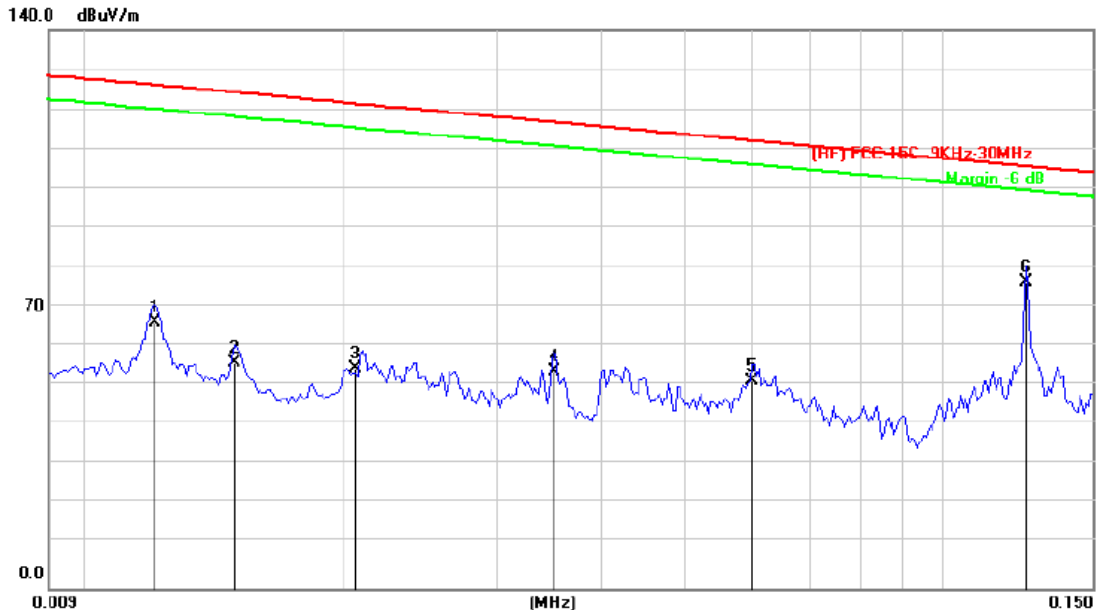
*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

Attachment C--Electric Field Strength of Fundamental and Outside the Allocated bands

(1) Electric Field Strength of Fundamental

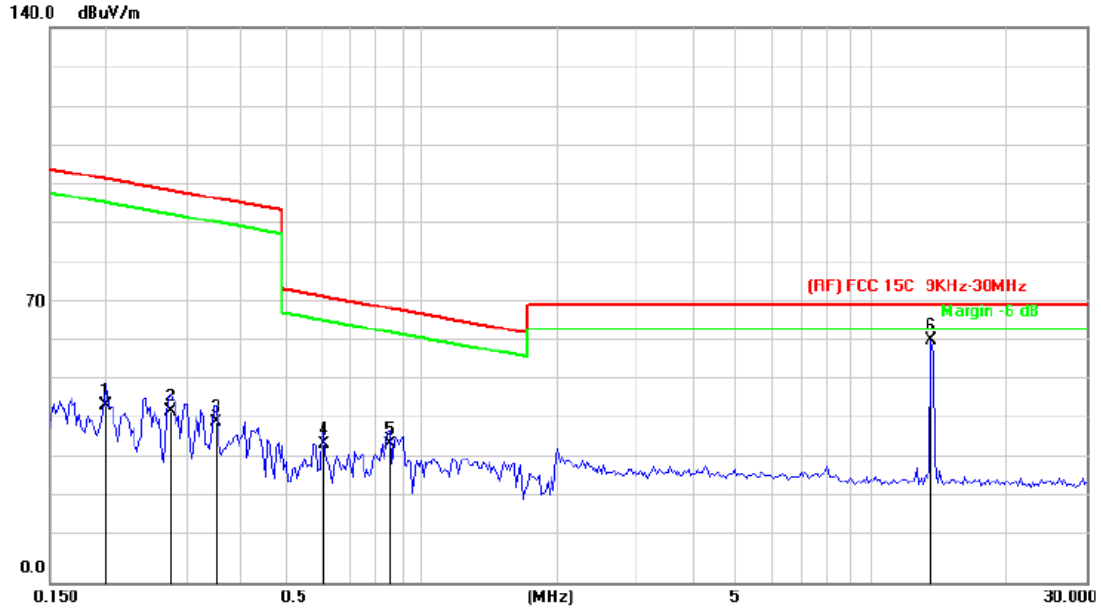
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 0°		
Test Mode:	NFC TX Mode		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		0.0120	77.17	-10.34	66.83	126.30	-59.47	AVG
2		0.0149	66.76	-10.39	56.37	124.41	-68.04	AVG
3		0.0206	65.38	-10.14	55.24	121.59	-66.35	AVG
4		0.0350	64.35	-9.97	54.38	116.98	-62.60	AVG
5		0.0599	62.14	-10.04	52.10	112.30	-60.20	AVG
6	*	0.1252	81.73	-4.89	76.84	105.88	-29.04	AVG

Emission Level= Read Level+ Correct Factor

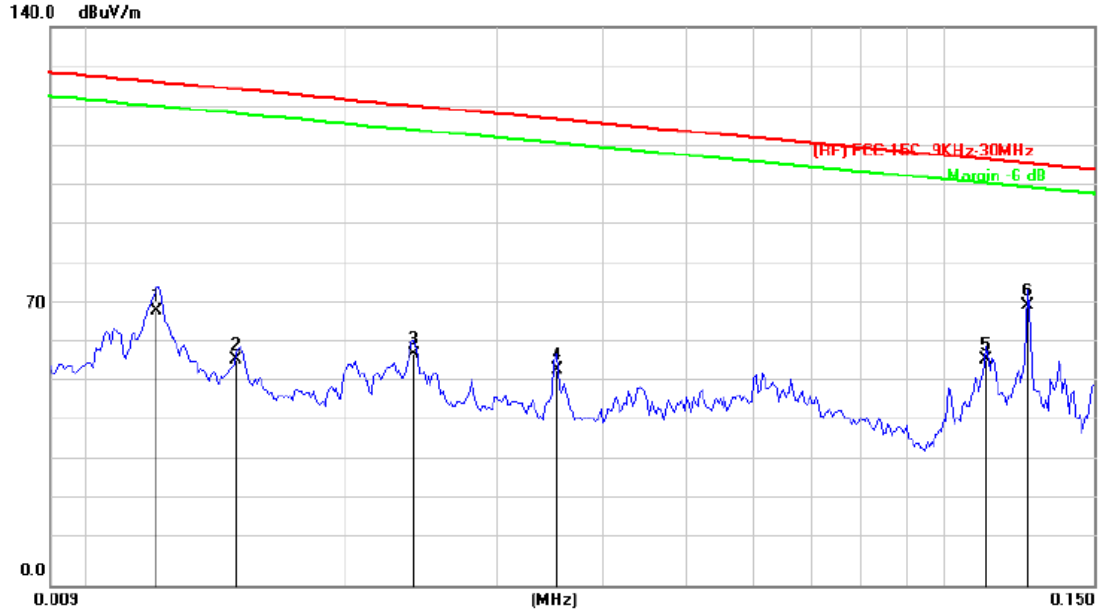
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 0°		
Test Mode:	NFC TX Mode		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		0.1995	52.30	-7.62	44.68	101.82	-57.14	AVG
2		0.2772	51.32	-8.20	43.12	98.96	-55.84	AVG
3		0.3502	48.96	-8.70	40.26	96.92	-56.66	AVG
4		0.6075	44.68	-9.85	34.83	72.10	-37.27	AVG
5		0.8528	44.85	-10.17	34.68	69.11	-34.43	AVG
6	*	13.5509	72.05	-11.11	60.94	70.00	-9.06	QP

Emission Level= Read Level+ Correct Factor

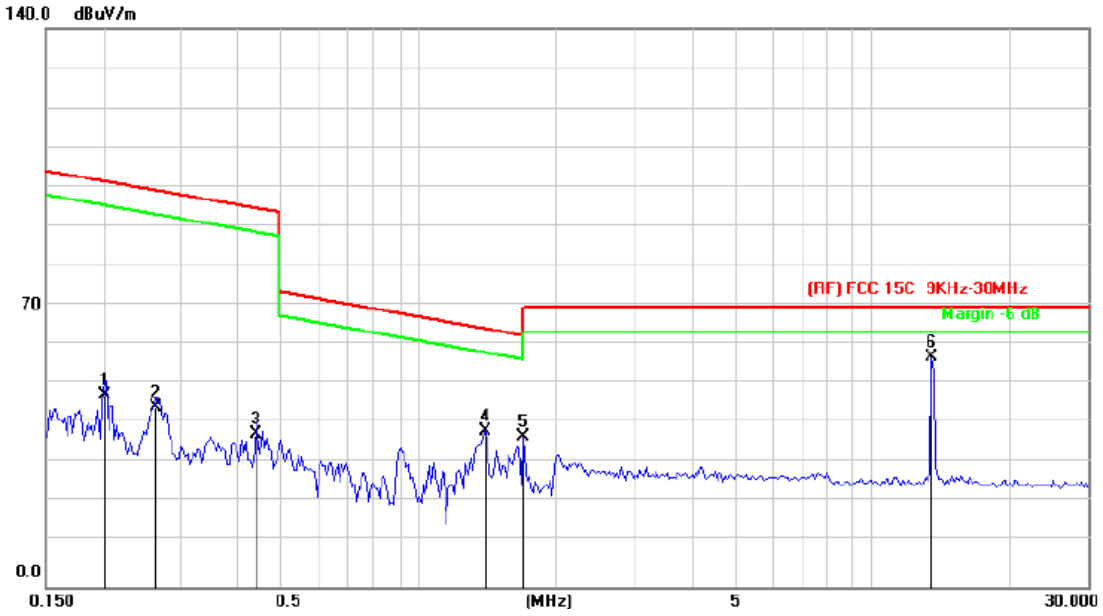
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 90°		
Test Mode:	NFC TX Mode		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		0.0120	79.09	-10.34	68.75	126.30	-57.55	AVG
2		0.0149	66.76	-10.39	56.37	124.41	-68.04	AVG
3		0.0240	68.03	-10.09	57.94	120.26	-62.32	AVG
4		0.0352	64.23	-9.99	54.24	116.93	-62.69	AVG
5		0.1117	60.99	-4.37	56.62	106.87	-50.25	AVG
6	*	0.1252	75.07	-4.89	70.18	105.88	-35.70	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Ant. 90°		
Test Mode:	NFC TX Mode		
Remark:	N/A		

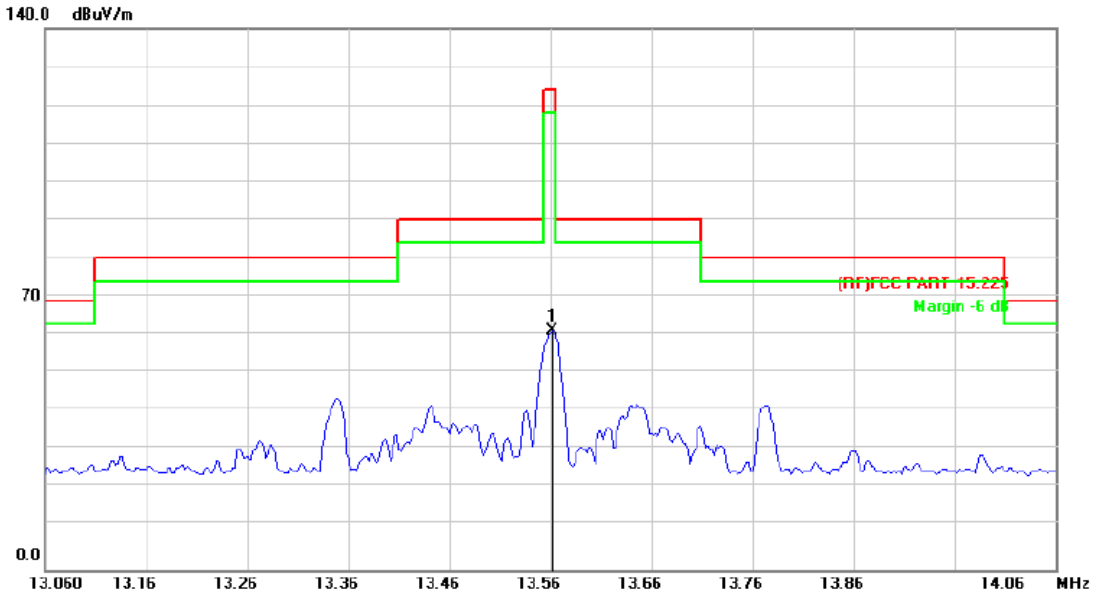


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		0.2017	55.89	-7.65	48.24	101.73	-53.49	AVG
2		0.2630	53.06	-8.11	44.95	99.42	-54.47	AVG
3		0.4374	47.43	-9.27	38.16	94.99	-56.83	AVG
4		1.4032	49.36	-10.33	39.03	64.72	-25.69	QP
5		1.6979	48.05	-10.36	37.69	63.04	-25.35	QP
6	*	13.5509	68.62	-11.11	57.51	70.00	-12.49	QP

Emission Level= Read Level+ Correct Factor

(2) Test Fundamental and Outside the Allocated bands

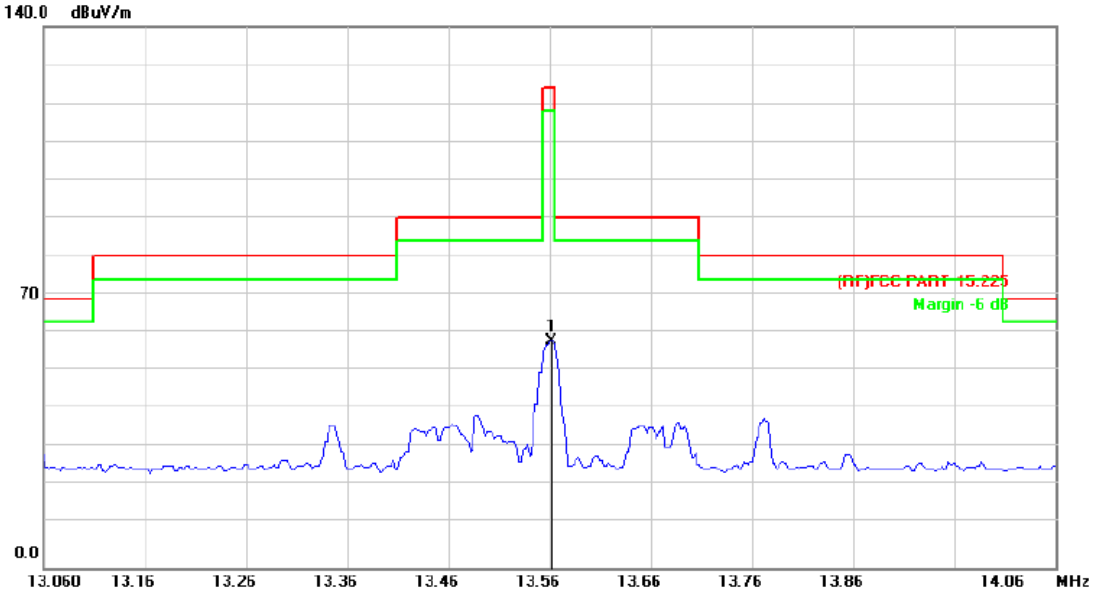
Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	NFC TX Mode		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	13.5620	72.72	-11.11	61.61	124.00	-62.39	peak

Emission Level= Read Level+ Correct Factor

Temperature:	25℃	**Relative Humidity:**	55%
Test Voltage:	AC 120/60Hz		
Ant. Pol.	Vertical		
Test Mode:	NFC TX Mode		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	13.5620	69.85	-11.11	58.74	124.00	-65.26	peak

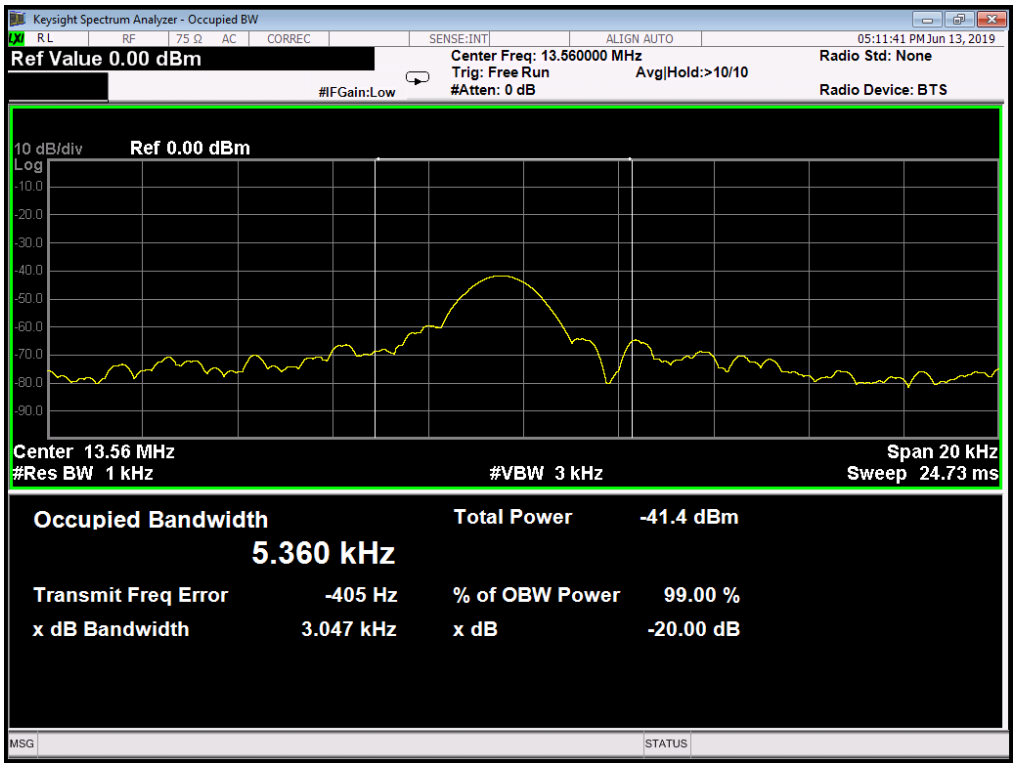
Emission Level= Read Level+ Correct Factor

Attachment D-- Bandwidth Test Data

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	NFC TX Mode		

Channel Frequency(MHz)	99% Bandwidth(KHz)
13.56	5.360

13.56 MHz



Attachment E--Fundamental Frequency Tolerance

Frequency Stability Versus Temperature			
Temperature(℃)	Power Supply(V)	Measured Frequency (MHz)	Frequency Drift %
50	AC 120	13.545850	-0.10435
40		13.545950	-0.10361
30		13.545950	-0.10361
20		13.545950	-0.10361
10		13.545850	-0.10435
0		13.545790	-0.10479
-10		13.545780	-0.10487
-20		13.545870	-0.10420
Frequency Stability Versus Temperature			
Temperature(℃)	Power Supply(V)	Measured Frequency (MHz)	Frequency Drift %
20	AC 100	13.554535	-0.0403
	AC 120	13.554530	-0.04034
	AC 240	13.554535	-0.04030

-----END OF REPORT------