

FCC TEST REPORT

FOR

Qingdao Hisense Intelligent Commercial System Co., Ltd.

Tablet POS

Test Model: HM518

Prepared for : Qingdao Hisense Intelligent Commercial System Co., Ltd.
Address : Bldg 3, 151 Zhuzhou Lu, Laoshan, Qingdao, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : August 10, 2015
Number of tested samples : 1
Sample number : 15080632
Date of Test : September 16, 2015 – September 29, 2015
Date of Report : September 29, 2015

FCC TEST REPORT
FCC CFR 47 PART 15 C (15.225)-2014**Report Reference No. : LCS1509140628E**

Date of Issue : September 29, 2015

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.Address : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure : Full application of Harmonised standards ☒Partial application of Harmonised standards ☐Other standard testing method ☐**Applicant's Name..... : Qingdao Hisense Intelligent Commercial System Co., Ltd.**

Address : Bldg 3, 151 Zhuzhou Lu, Laoshan, Qingdao, China

Test Specification

Standard : FCC CFR 47 PART 15 C(15.225)-2014

Test Report Form No..... : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description. : Tablet POSTrade Mark : **Hisense**

Test Model : HM518

Ratings : DC 7.4V by li-ion polymer battery(4000mAh)

Recharged Voltage: DC 12V/3.33A

Result : **Positive****Compiled by:**

Leo Lee/ File administrators

Supervised by:

Glin Lu/ Technique principal

Approved by:

Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS1509140628E	<u>September 29, 2015</u> Date of issue
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Test Model.....	: HM518
EUT.....	: Tablet POS
Applicant.....	: Qingdao Hisense Intelligent Commercial System Co., Ltd.
Address.....	: Bldg 3, 151 Zhuzhou Lu, Laoshan, Qingdao, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Qingdao Hisense Intelligent Commercial System Co., Ltd.
Address.....	: Bldg 3, 151 Zhuzhou Lu, Laoshan, Qingdao, China
Telephone.....	: /
Fax.....	: /
Factory.....	: Qingdao Hisense Intelligent Commercial System Co., Ltd.
Address.....	: Bldg 3, 151 Zhuzhou Lu, Laoshan, Qingdao, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	: Tablet POS
Test Model	: HM518
Hardware Version	: I1170D0P3V1.0
Software Version	: BIOS:BTPHS140.BIN
Power Supply	: DC 7.4V by li-ion polymer battery(4000mAh) Recharged Voltage: DC 12V/3.33A
EUT Support	: GSM/GPRS/EGPRS/WCDMA/HSUPA/HSDPA/WIFI/
Radios Application	Bluetooth/NFC
RFID Technology	:
Operating Frequency	: 13.56MHz
Channel Number	: 1
Modulation Technology	: ASK
Antenna Description	: Loop Antenna, 1.5dBi(Max.)

1.2 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
FSP GROUP INC.	Switching Power Adapter	FSP040-RHA N2	--	VOC
Qingdao Hisense Intelligent Commercial System Co., Ltd.	Docking Station	HM518	--	VOC

1.3 External I/O

I/O Port Description	Quantity	Cable
Micro-SD Card Slot	1	N/A
SIM Card Slot	1	N/A
IC Card Slot	1	N/A
USB Port	1	N/A
Headset Jack	1	N/A
DC 12V IN Port	1	N/A

1.4 Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

1.5 List Of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2015	June 17,2016
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2015	July 15,2016
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2015	June 17,2016
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2015	June 17,2016
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2015	June 17,2016
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2015	June 17,2016
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2015	June 17,2016
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHz	June 18,2015	June 17,2016
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2015	July 15,2016
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2015	July 15,2016
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2015	July 15,2016
MAX Signal Analyzer	Agilent	N9020A	MY50510140	20Hz~26.5GHz	Oct. 27, 2014	Oct. 26, 2015
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2015	June 17,2016
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2015	June 09,2016
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2015	June 09,2016
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2015	June 09,2016
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2015	June 17,2016
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2015	June 17,2016
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2015	June 17,2016
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2015	June 17,2016
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2015	June 17,2016
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2015	June 17,2016
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	June 18,2015	June 17,2016
DC power Source	GW	GPC-6030D	C671845	/	June 18,2015	June 17,2016
Temperature & Humidity Chamber	Wuhuan	HTP205	/	/	June 18,2015	June 17,2016

Note: All equipment through GREGT EST calibration

1.6 Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.7 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty :	9KHz~30MHz	3.10dB	(1)
	30MHz~200MHz	2.96dB	(1)
	200MHz~1000MHz	3.10dB	(1)
	1GHz~26.5GHz	3.80dB	(1)
	26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty :	150kHz~30MHz	1.63dB	(1)
Power disturbance :	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.8 Description Of Test Modes

There are three test configurations for the pre-testing:

There are two test configurations for the pre-testing:

Configuration 1: Configured with Switching Power Adapter (Used For Charging)

Configuration 2: Configured with Switching Power Adapter and Docking Station (Used For Charging)

For pre-testing, the input Voltage/Frequency AC 120V/60Hz and AC 240V/60Hz were used. We found that the Configuration 2(Input AC 120V/60Hz) was the worst case and used for the full test and recorded in this report.

The EUT was operated in the engineering mode. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in Y position.

1.9 Summary Of Test Result

Test Items	FCC Rules	Result
Line Conducted Emissions	15.207	PASS
Field Strength of Fundamental Emissions	15.225(a)(b)(c)	PASS
Radiated Emissions	15.225(d) & 15.209	PASS
20dB Bandwidth	2.1049	PASS
Frequency Stability	15.225(e)	PASS
Antenna Requirement	15.203	PASS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013, FCC CFR PART 15C 15.225.

2.1 EUT Configuration

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

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.225 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013

3. SYSTEM TEST CONFIGURATION

3.1 Justification

N/A.

3.2 EUT Exercise Software

N/A.

3.3 Special Accessories

N/A.

3.4 Block Diagram/Schematics

Please refer to the report.

3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

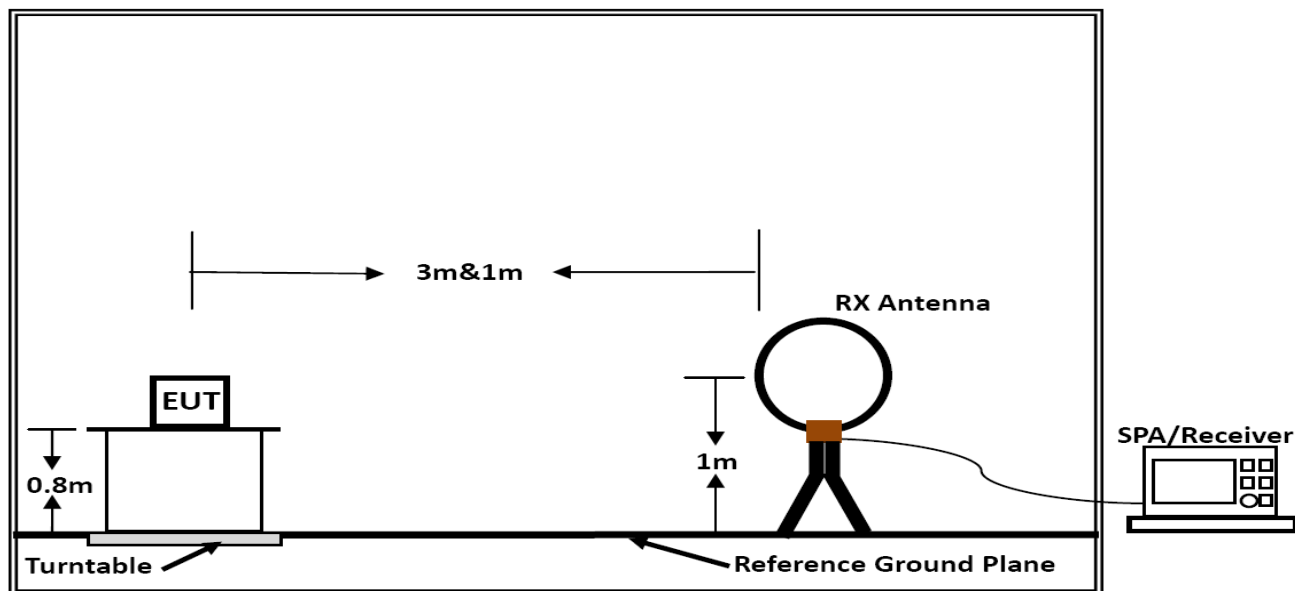
3.6 Test Setup

Please refer to the test setup photo.

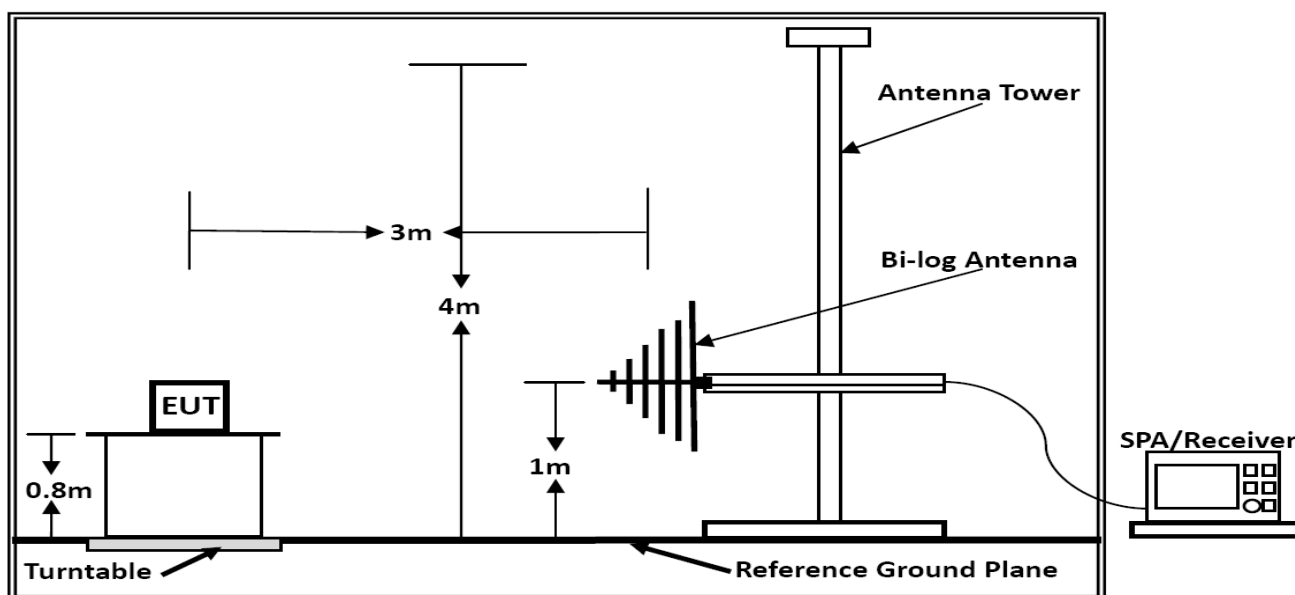
4. RADIATED MEASUREMENT

4.1 Radiated Emission

4.1.1 Block Diagram of Test Setup



Below 30MHz



Below 1GHz

4.1.2 Radiated Emission Limit

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

Part 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector.

According to Part 15.225 (a), the field strength of any emissions which appear outside of 13.553 ~ 13.567MHz band shall not exceed the general radiated emissions limits.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100**	3
88–216	150**	3
216–960	200**	3
Above 960	500	3

Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	3
0.490-1.705	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

4.1.3 Test Results

PASS.

The test data please refer to following page:

9KHz ~ 30MHz

Note: Only recorded the worst test result for the worst test configuration(Configuration 2(Input AC 120V/60Hz)).

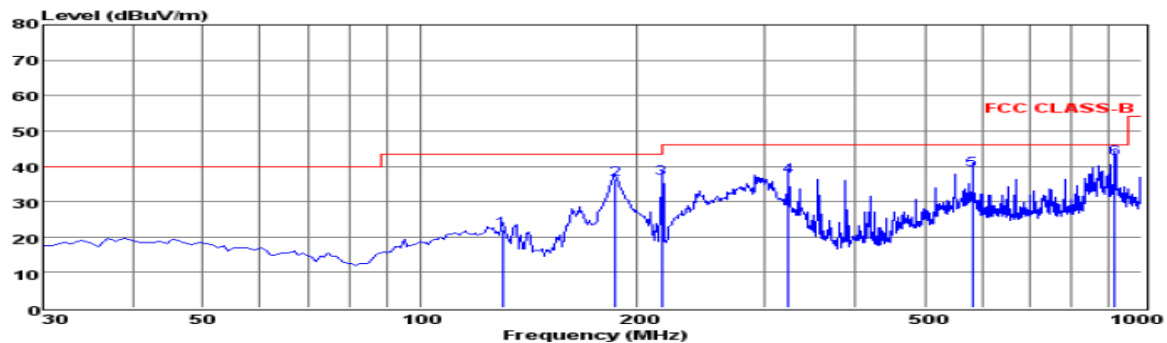
Freq. MHz	Antenna Pol.	Reading dBuV	Factor dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark
0.350	H	--	--	--	65	--	--
1.000	H	--	--	--	65	--	--
3.81	H	35.64	11.71	47.35	69.5	-22.15	Peak
9.59	H	18.53	11.04	29.57	69.5	-39.93	Peak
13.56	H	41.14	10.86	52.00	124	-72.00	Peak
15.67	H	13.87	10.54	24.41	69.5	-45.09	Peak
21.35	H	15.63	9.60	25.23	69.5	-44.27	Peak
27.52	H	10.94	8.91	19.85	69.5	-49.65	Peak
0.350	V	--	--	--	65	--	--
1.000	V	--	--	--	65	--	--
3.81	V	37.18	11.69	48.87	69.5	-20.63	Peak
9.59	V	18.41	11.01	29.42	69.5	-40.08	Peak
13.56	V	43.39	10.86	54.25	124	-69.75	Peak
15.67	V	14.56	10.57	25.13	69.5	-44.37	Peak
21.35	V	16.17	9.59	25.76	69.5	-43.74	Peak
27.52	V	11.88	8.93	20.81	69.5	-48.69	Peak

*Note: Factor= Antenna Gain + Cable Loss – Amplifier Gain;

“--” means noise floor.

30MHz ~ 1GHz

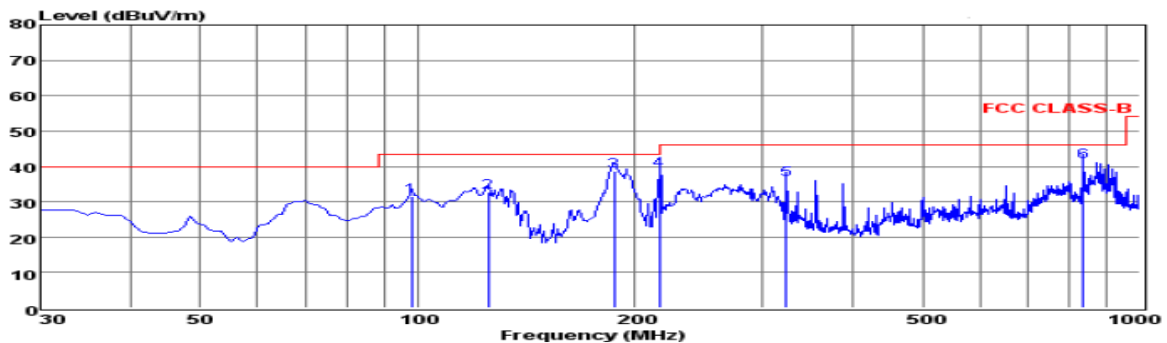
The Test Result For Configuration 1(Input AC 120V/60Hz): Configured with Switching Power Adapter (Used For Charging)



Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 120V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 1
 pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	129.91	12.27	0.76	8.94	21.97	43.50	-21.53	QP
2	186.17	24.95	0.98	10.22	36.15	43.50	-7.35	QP
3	216.24	24.76	0.88	11.08	36.72	46.00	-9.28	QP
4	323.91	22.61	1.10	13.48	37.19	46.00	-8.81	QP
5	582.90	19.34	1.54	18.13	39.01	46.00	-6.99	QP
6	917.55	19.32	1.85	21.20	42.37	46.00	-3.63	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that ate 20db blow the official limit are not reported

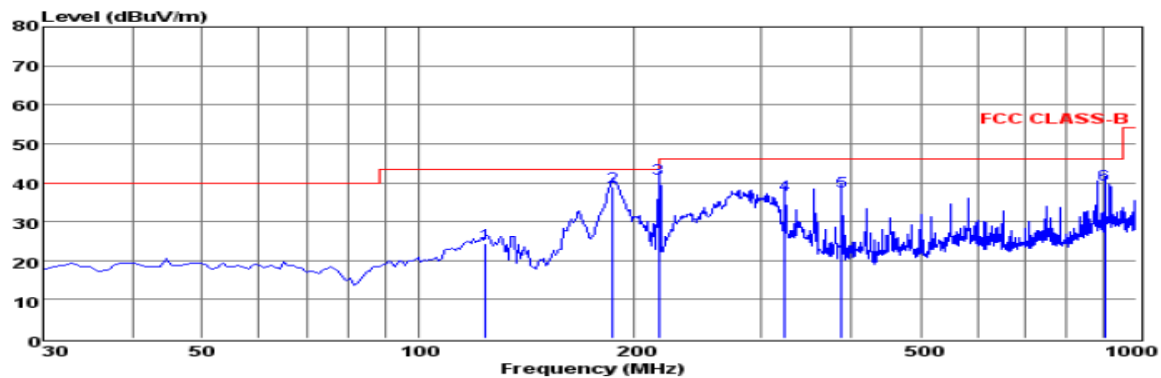


Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 120V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 1
 pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	97.90	17.98	0.61	13.03	31.62	43.50	-11.88	QP
2	125.06	22.35	0.71	9.70	32.76	43.50	-10.74	QP
3	187.14	27.50	0.98	10.31	38.79	43.50	-4.71	QP
4	216.24	27.04	0.88	11.08	39.00	46.00	-7.00	QP
5	323.91	21.70	1.10	13.48	36.28	46.00	-9.72	QP
6	834.13	19.24	1.81	20.41	41.46	46.00	-4.54	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that ate 20db blow the official limit are not reported

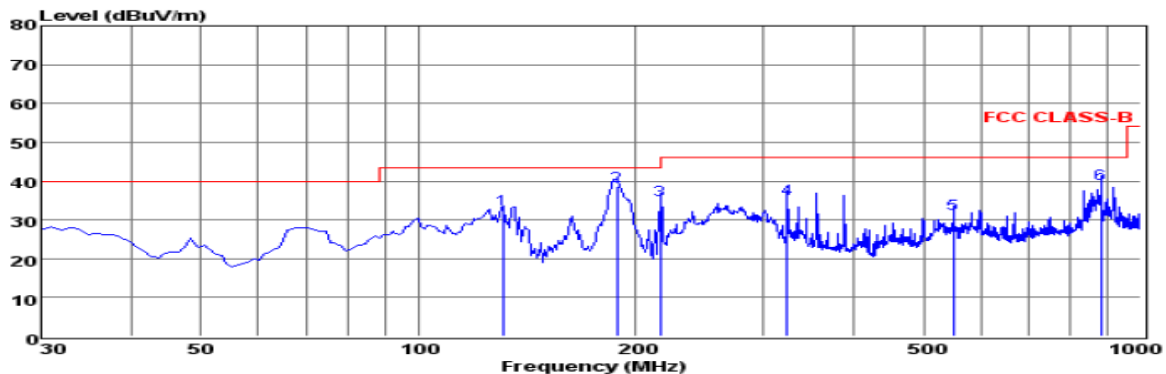
The Test Result For Configuration 1(Input AC 240V/60Hz): Configured with Switching Power Adapter (Used For Charging)



Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 240V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 1
 pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	124.09	13.91	0.71	9.85	24.47	43.50	-19.03	QP
2	186.17	27.83	0.98	10.22	39.03	43.50	-4.47	QP
3	216.24	28.96	0.88	11.08	40.92	46.00	-5.08	QP
4	323.91	22.25	1.10	13.48	36.83	46.00	-9.17	QP
5	388.90	21.78	1.17	14.80	37.75	46.00	-8.25	QP
6	903.00	16.63	1.87	21.11	39.61	46.00	-6.39	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

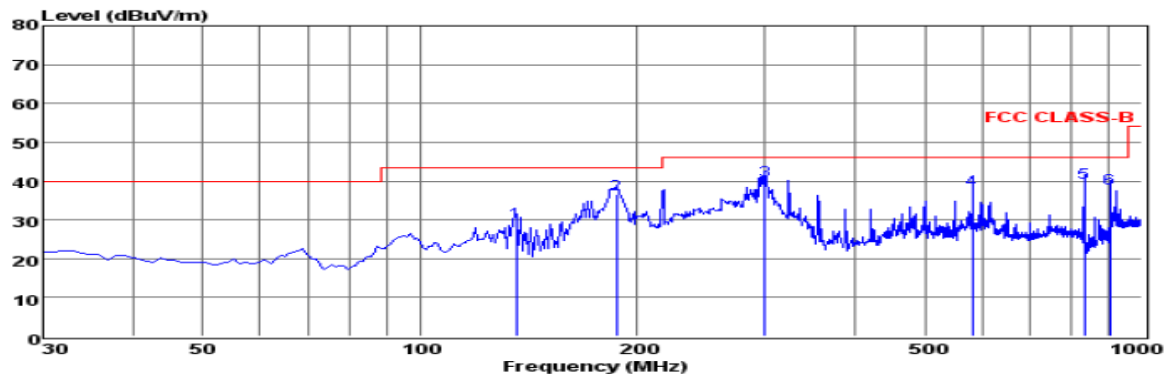


Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 240V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 1
 pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	130.88	22.97	0.76	8.86	32.59	43.50	-10.91	QP
2	188.11	27.23	0.98	10.39	38.60	43.50	-4.90	QP
3	216.24	23.00	0.88	11.08	34.96	46.00	-11.04	QP
4	323.91	20.79	1.10	13.48	35.37	46.00	-10.63	QP
5	550.89	12.71	1.39	17.53	31.63	46.00	-14.37	QP
6	880.69	16.54	1.88	20.89	39.31	46.00	-6.69	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

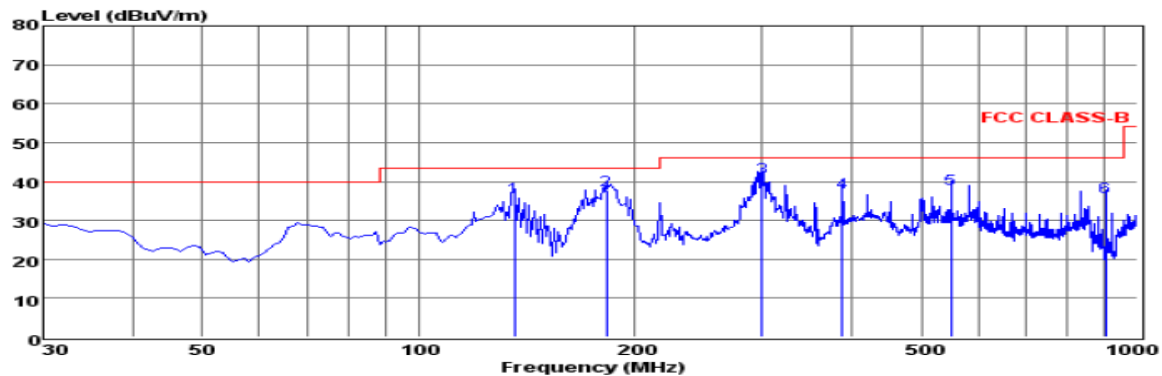
The Test Result For Configuration 2(Input AC 120V/60Hz): Configured with Switching Power Adapter and Docking Station (Used For Charging)



Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 120V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 2
 pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	135.73	20.26	0.70	8.51	29.47	43.50	-14.03	QP
2	187.14	25.19	0.98	10.31	36.48	43.50	-7.02	QP
3	300.63	25.90	1.13	13.07	40.10	46.00	-5.90	QP
4	582.90	18.21	1.54	18.13	37.88	46.00	-8.12	QP
5	832.19	17.38	1.86	20.39	39.63	46.00	-6.37	QP
6	903.00	15.07	1.87	21.11	38.05	46.00	-7.95	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

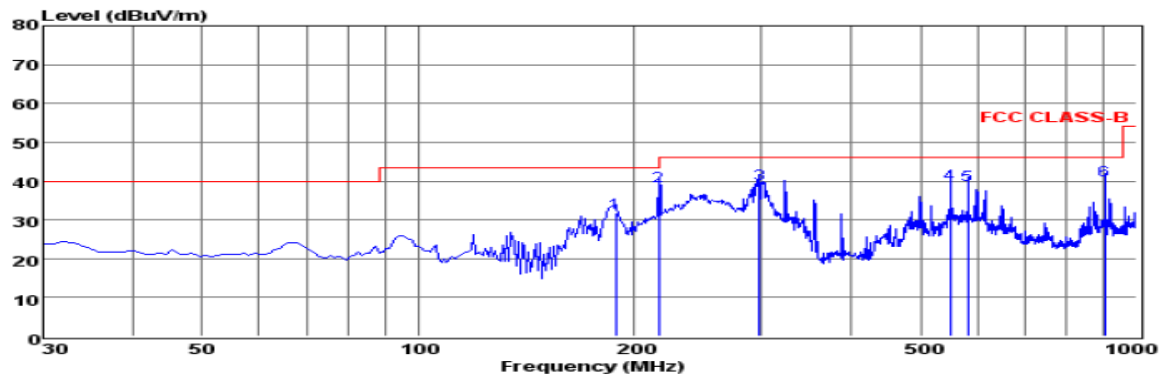


Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 120V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 2
 pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	135.73	26.85	0.70	8.51	36.06	43.50	-7.44	QP
2	182.29	27.08	0.89	9.88	37.85	43.50	-5.65	QP
3	300.63	26.89	1.13	13.07	41.09	46.00	-4.91	QP
4	388.90	21.25	1.17	14.80	37.22	46.00	-8.78	QP
5	550.89	19.15	1.39	17.53	38.07	46.00	-7.93	QP
6	903.00	12.91	1.87	21.11	35.89	46.00	-10.11	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

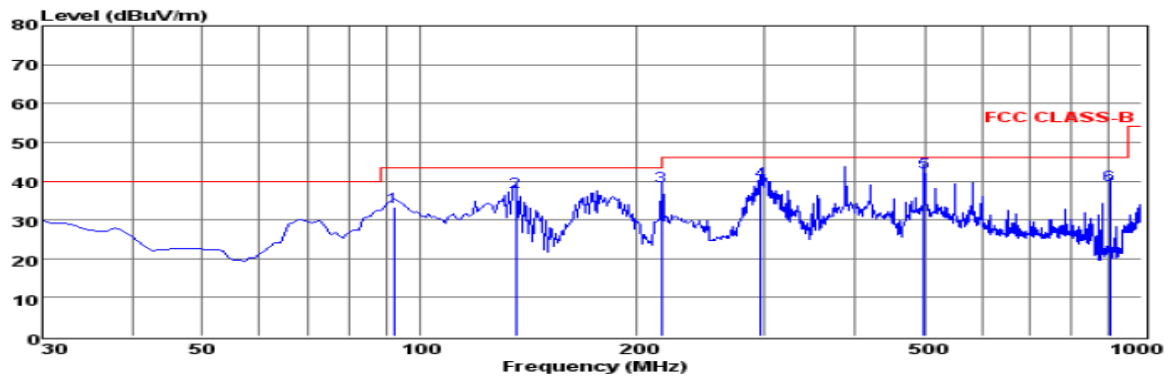
The Test Result For Configuration 2(Input AC 240V/60Hz): Configured with Switching Power Adapter and Docking Station (Used For Charging)



Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 240V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 2
 pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	188.11	20.54	0.98	10.39	31.91	43.50	-11.59	QP
2	216.24	26.65	0.88	11.08	38.61	46.00	-7.39	QP
3	298.69	25.06	1.12	13.03	39.21	46.00	-6.79	QP
4	550.89	20.30	1.39	17.53	39.22	46.00	-6.78	QP
5	582.90	19.36	1.54	18.13	39.03	46.00	-6.97	QP
6	903.00	17.03	1.87	21.11	40.01	46.00	-5.99	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported



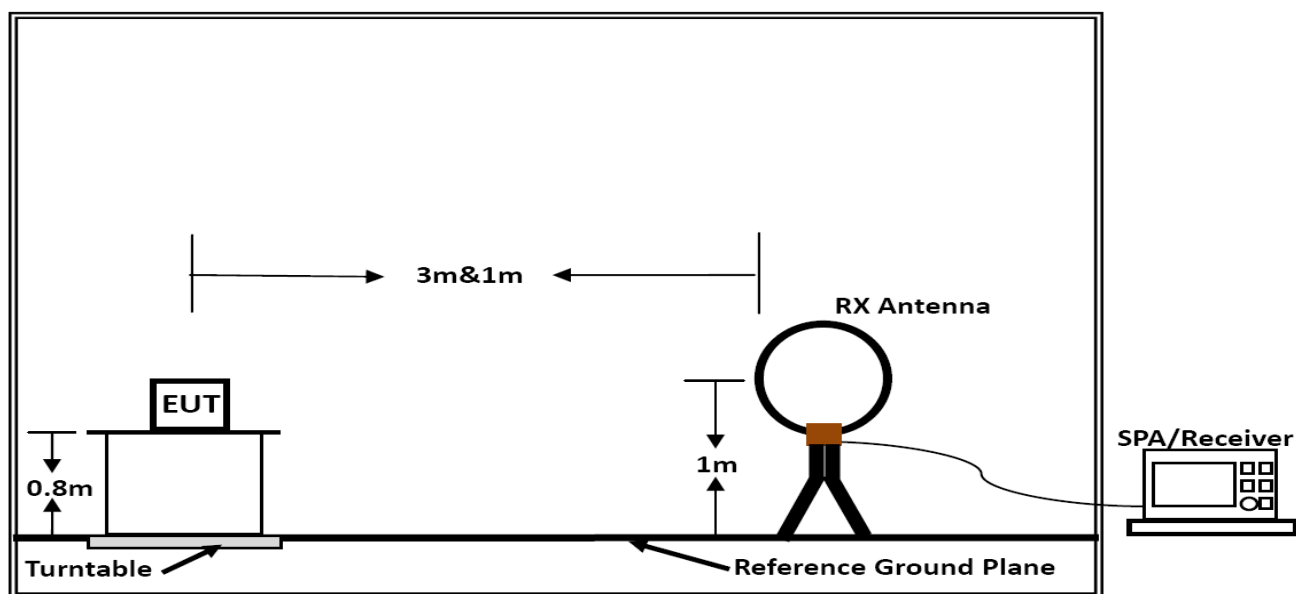
Env./Ins: 24°C/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 240V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 2
 pol: VERTICAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	92.08	20.44	0.56	12.29	33.29	43.50	-10.21	QP
2	135.73	27.99	0.70	8.51	37.20	43.50	-6.30	QP
3	216.24	26.84	0.88	11.08	38.80	46.00	-7.20	QP
4	296.75	25.62	1.12	13.00	39.74	46.00	-6.26	QP
5	499.48	24.29	1.34	16.57	42.20	46.00	-3.80	QP
6	903.00	15.91	1.87	21.11	38.89	46.00	-7.11	QP

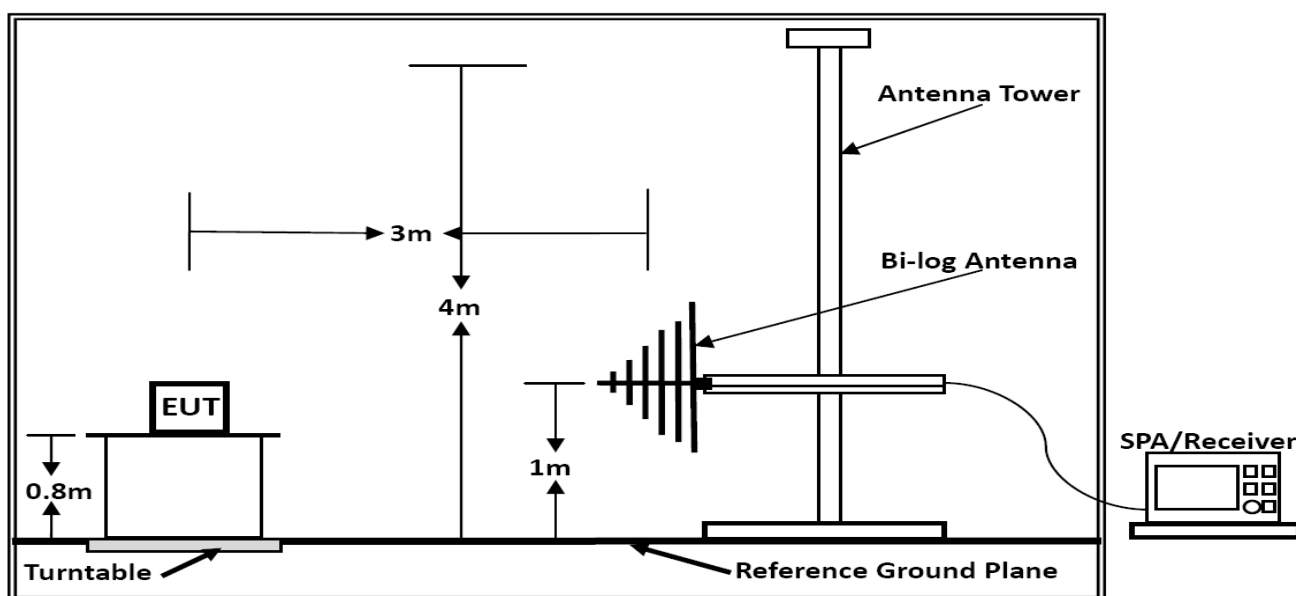
Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20dB below the official limit are not reported

4.2 Field Strength of Fundamental Emissions and Mask Measurement

4.2.1 Block Diagram of Test Setup



Below 30MHz



Below 1GHz

4.2.2 Field strength of fundamental emissions limit and Mask limit

The field strength of fundamental emissions shall not exceed 15848 microvolts/meter at 30 meters. The emissions limit in this paragraph is based on measurement instrumentation employing a QP detector.

Frequencies (MHz)	Field Strength (microvolts/meter)	Field Strength (dB μ V/m) at 10m	Field Strength (dB μ V/m) at 3m
13.553 ~ 13.567MHz	15848 at 30m	103.08 (QP)	124 (QP)

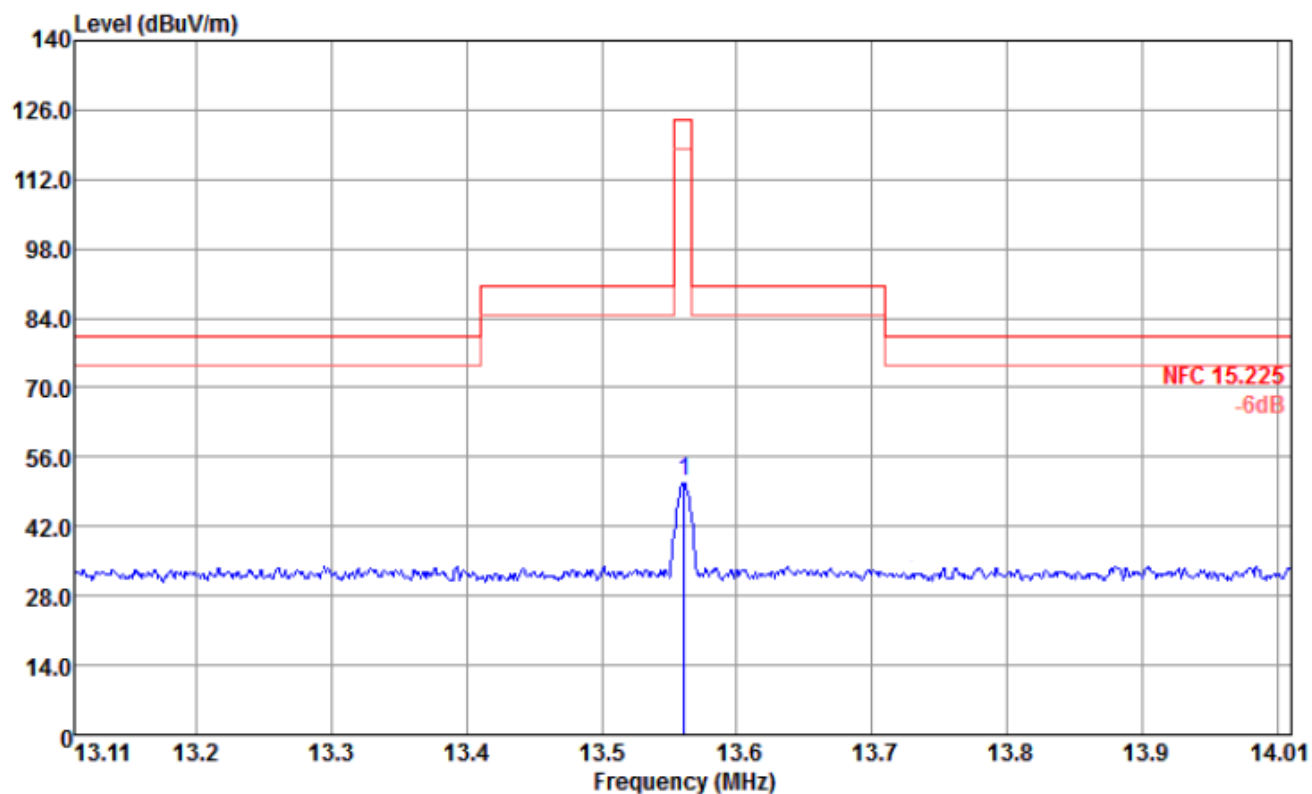
Mask Limit:

Frequency (MHz)	Limit (dB μ V/m)	Distance (m)
1.705-13.110	69.5	3
13.110-13.410	80.5	3
13.410-13.553	90.5	3
13.553-13.567	124.0	3
13.567-13.710	90.5	3
13.710-14.010	80.5	3
14.010-30.000	69.5	3

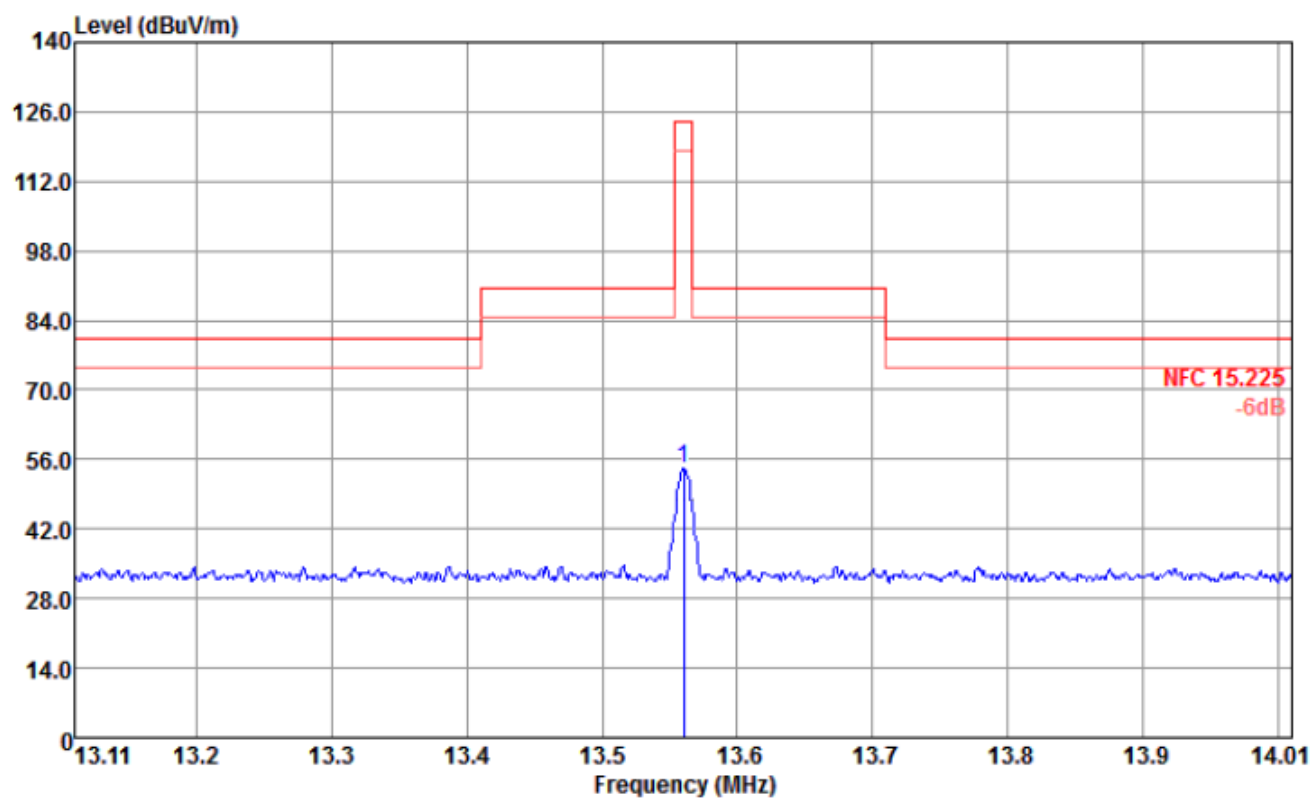
4.2.3 Test Results

PASS.

The test data please refer to following page:



	Freq.(MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Pol.	Remark
1	13.56	41.14	10.86	52.00	124	H	QP



	Freq.(MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Pol.	Remark
1	13.56	43.39	10.86	54.25	124	V	QP

*Note: Factor= Antenna Gain + Cable Loss – Amplifier Gain

Emission level (dB μ V/m) = 20 log Emission level (μ V/m).

Measured distance is 3m.

All emissions emit form non-NFC function of digital unintentional emissions. All NFC's spurious emissions are below 20dB of limits.

5. BANDWIDTH OF THE OPERATING FREQUENCY

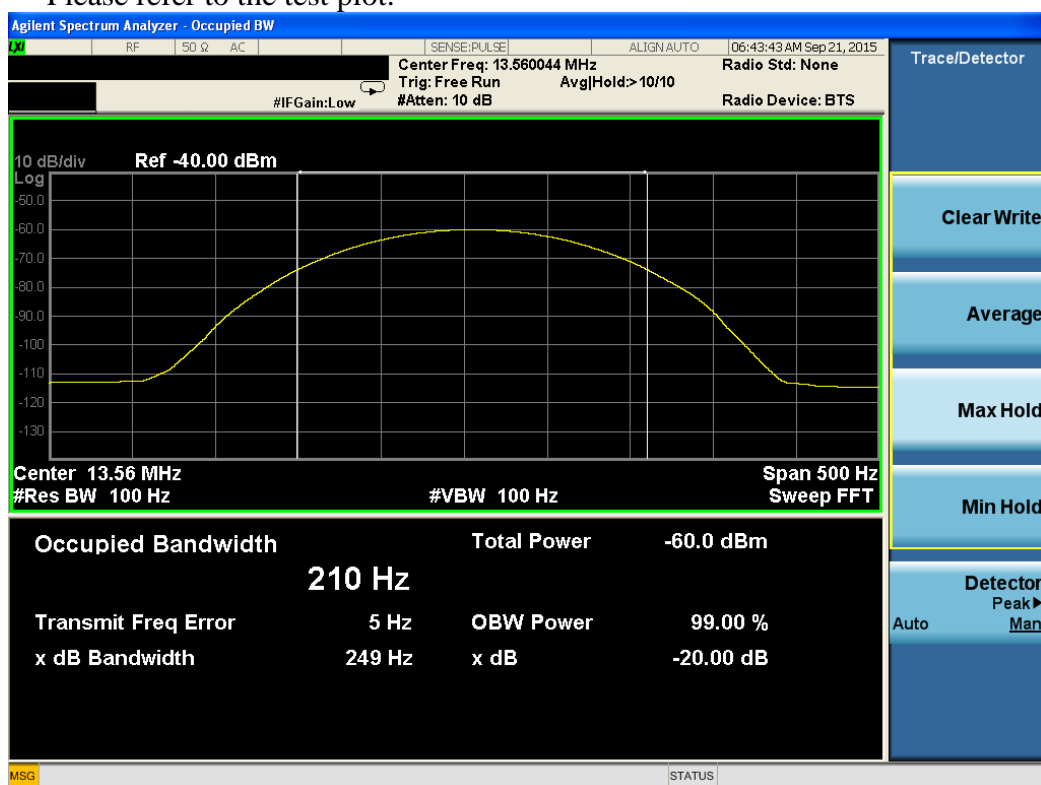
5.1 Standard Applicable

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 ~ 13.567MHz).

5.2 Test Result

EUT	Tablet POS
RBW	100Hz
VBW	100Hz
SPAN	500Hz
Carrier Freq. (MHz)	20dB Bandwidth (KHz)
13.56	0.249

Please refer to the test plot:



6. FREQUENCY STABILITY MEASUREMENT

6.1 Standard Applicable

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

6.2 Test Result

Voltage vs. Frequency Stability

Voltage(V)	Measurement Frequency (MHz)
DC 6.3V	13.56046
DC 7.4V	13.56043
DC 8.5V	13.56048
Max. Deviation (MHz)	0.00048
Max. Deviation (ppm)	35.3982

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)
-20	13.56051
-10	13.56050
0	13.56047
10	13.56043
20	13.56044
30	13.56047
40	13.56049
50	13.56053
Max. Deviation (MHz)	0.00053
Max. Deviation (ppm)	39.0855

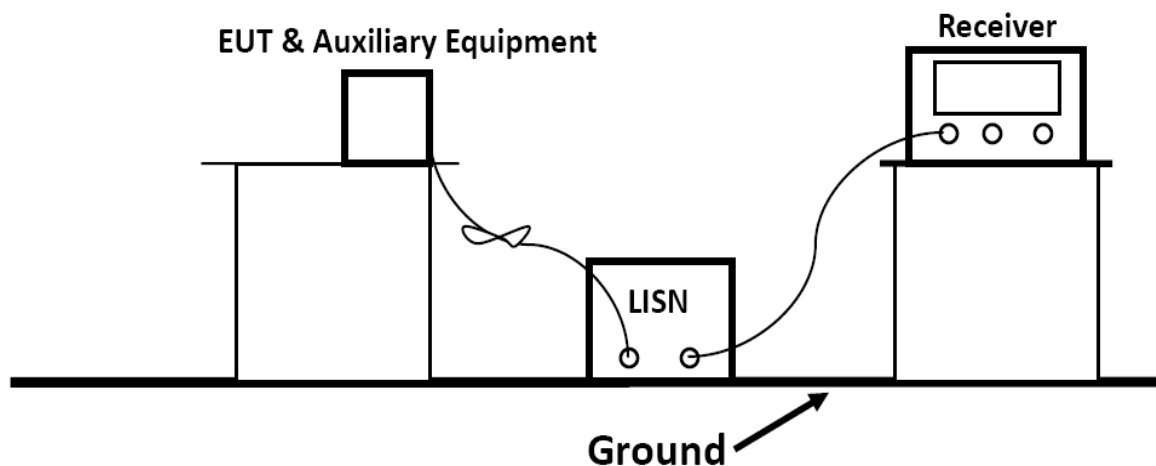
7. LINE CONDUCTED EMISSIONS

7.1 Standard Applicable

According to §15.207 (a) or RSS-GEN: For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range(MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

7.2 Block Diagram of Test Setup

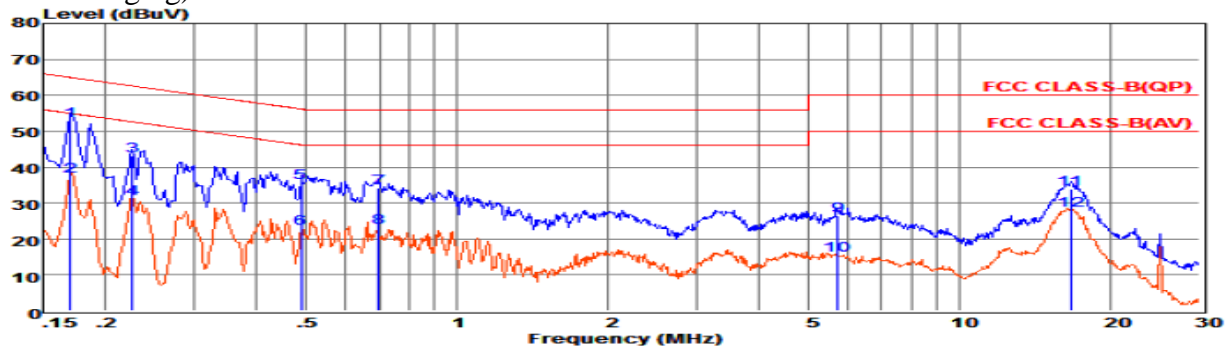


7.3 Test Results

PASS.

The test data please refer to following page.

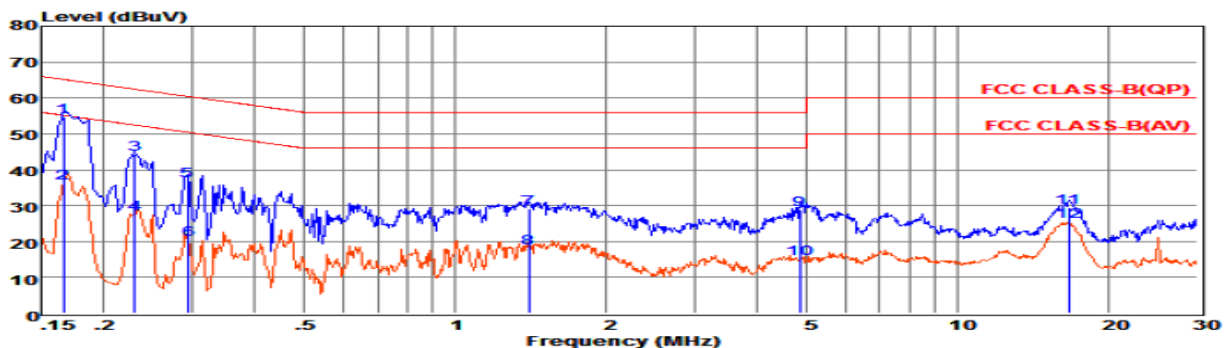
The Test Result For Configuration 1(Input AC 120V/60Hz): Configured with Switching Power Adapter
(Used For Charging)



Env. Ins: 24*/56%
EUT: Tablet POS
M/N: HM518
Power Rating: AC 120V/60Hz
Test Mode: TX-NFC
Operator: Leo
Memo: Configuration 1
Pol: LINE

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.17034	33.42	9.60	0.02	10.00	53.04	64.94	-11.90	QP
2	0.17044	17.73	9.60	0.02	10.00	37.35	54.94	-17.59	Average
3	0.22556	23.33	9.63	0.03	10.00	42.99	62.61	-19.62	QP
4	0.22566	11.52	9.63	0.03	10.00	31.18	52.61	-21.43	Average
5	0.48890	16.15	9.62	0.04	10.00	35.81	56.19	-20.38	QP
6	0.48900	3.24	9.62	0.04	10.00	22.90	46.18	-23.28	Average
7	0.69725	14.50	9.64	0.04	10.00	34.18	56.00	-21.82	QP
8	0.69735	3.57	9.64	0.04	10.00	23.25	46.00	-22.75	Average
9	5.71346	6.79	9.66	0.06	10.00	26.51	60.00	-33.49	QP
10	5.71446	-4.17	9.66	0.06	10.00	15.55	50.00	-34.45	Average
11	116.66122	14.05	9.73	0.11	10.00	33.89	60.00	-26.11	QP
12	116.66222	8.19	9.73	0.11	10.00	28.03	50.00	-21.97	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

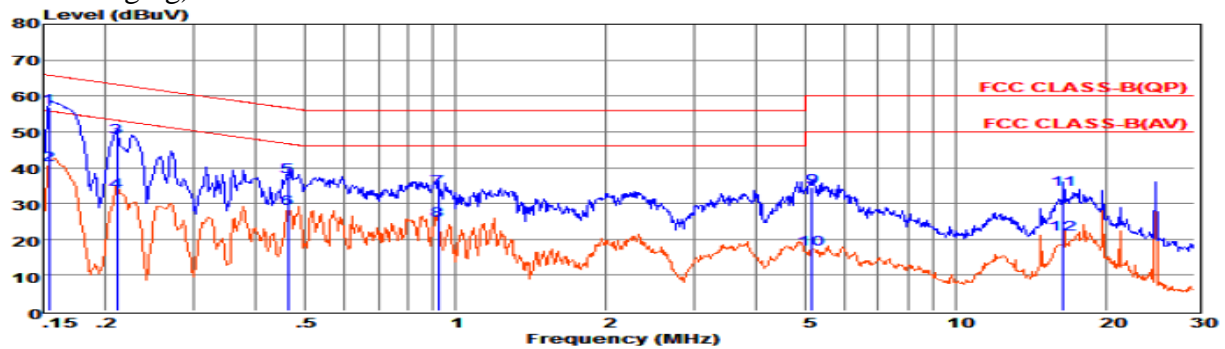


Env. Ins: 24*/56%
EUT: Tablet POS
M/N: HM518
Power Rating: AC 120V/60Hz
Test Mode: TX-NFC
Operator: Leo
Memo: Configuration 1
Pol: NEUTRAL

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.16589	35.02	9.66	0.02	10.00	54.70	65.16	-10.46	QP
2	0.16599	16.71	9.66	0.02	10.00	36.39	55.16	-18.77	Average
3	0.23040	24.55	9.59	0.03	10.00	44.17	62.44	-18.27	QP
4	0.23050	7.91	9.59	0.03	10.00	27.53	52.43	-24.90	Average
5	0.29398	17.12	9.60	0.03	10.00	36.75	60.41	-23.66	QP
6	0.29408	0.99	9.60	0.03	10.00	20.62	50.41	-29.79	Average
7	1.40322	9.32	9.63	0.05	10.00	29.00	56.00	-27.00	QP
8	1.40422	-1.64	9.63	0.05	10.00	18.04	46.00	-27.96	Average
9	4.84805	9.08	9.66	0.06	10.00	28.80	56.00	-27.20	QP
10	4.84905	-4.43	9.66	0.06	10.00	15.29	46.00	-30.71	Average
11	116.66122	9.59	9.76	0.11	10.00	29.46	60.00	-30.54	QP
12	116.66222	5.62	9.76	0.11	10.00	25.49	50.00	-24.51	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

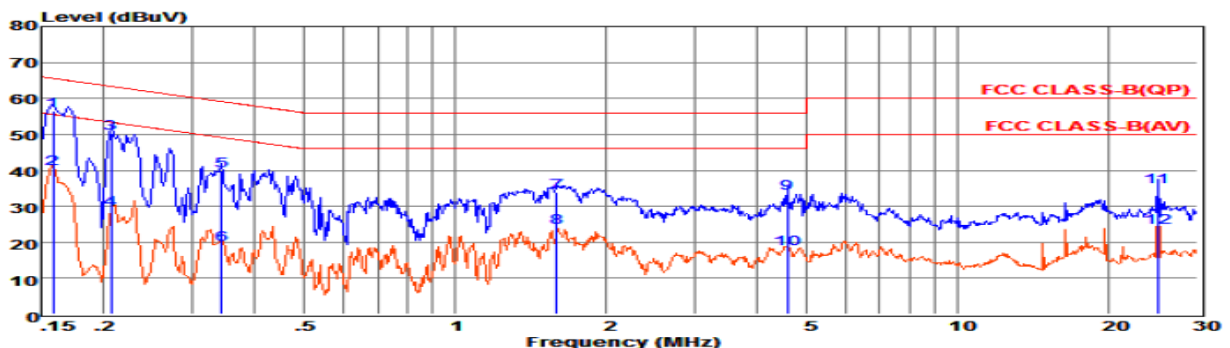
The Test Result For Configuration 1(Input AC 240V/60Hz): Configured with Switching Power Adapter (Used For Charging)



Env. Ins: 24*/56%
EUT: Tablet POS
M/N: HM518
Power Rating: AC 240V/60Hz
Test Mode: TX-NFC
Operator: Leo
Memo: Configuration 1
Pol: LINE

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15403	37.16	9.58	0.02	10.00	56.76	65.78	-9.02	QP
2	0.15413	21.25	9.58	0.02	10.00	40.85	55.77	-14.92	Average
3	0.21055	28.83	9.63	0.03	10.00	48.49	63.18	-14.69	QP
4	0.21065	13.74	9.63	0.03	10.00	33.40	53.18	-19.78	Average
5	0.46122	17.85	9.62	0.04	10.00	37.51	56.67	-19.16	QP
6	0.46132	8.93	9.62	0.04	10.00	28.59	46.67	-18.08	Average
7	0.92330	14.59	9.63	0.05	10.00	34.27	56.00	-21.73	QP
8	0.92340	5.59	9.63	0.05	10.00	25.27	46.00	-20.73	Average
9	5.16630	14.71	9.65	0.06	10.00	34.42	60.00	-25.58	QP
10	5.16730	-2.55	9.65	0.06	10.00	17.16	50.00	-32.84	Average
11	116.39849	14.09	9.72	0.11	10.00	33.92	60.00	-26.08	QP
12	116.39949	1.70	9.72	0.11	10.00	21.53	50.00	-28.47	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

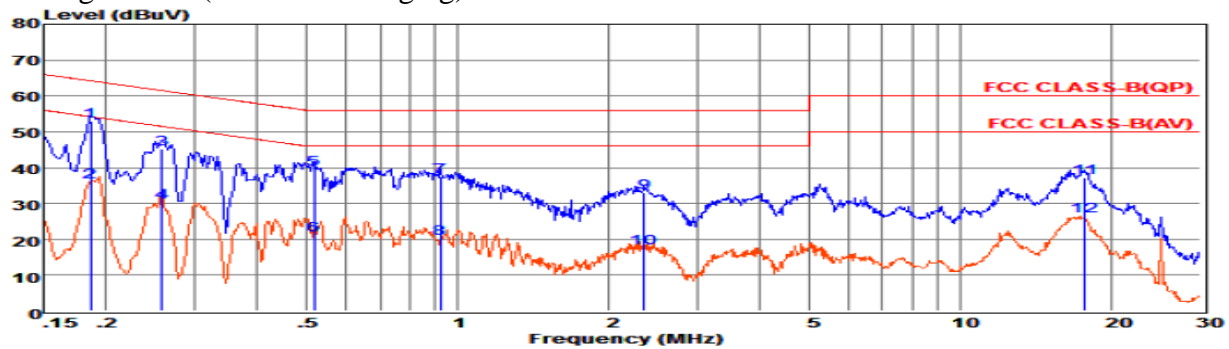


Env. Ins: 24*/56%
EUT: Tablet POS
M/N: HM518
Power Rating: AC 240V/60Hz
Test Mode: TX-NFC
Operator: Leo
Memo: Configuration 1
Pol: NEUTRAL

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15816	36.76	9.68	0.02	10.00	56.46	65.56	-9.10	QP
2	0.15826	20.64	9.68	0.02	10.00	40.34	55.55	-15.21	Average
3	0.20614	30.70	9.59	0.03	10.00	50.32	63.36	-13.04	QP
4	0.20624	9.62	9.59	0.03	10.00	29.24	53.36	-24.12	Average
5	0.34281	20.18	9.61	0.03	10.00	39.82	59.13	-19.31	QP
6	0.34291	-0.24	9.61	0.03	10.00	19.40	49.13	-29.73	Average
7	1.59350	14.08	9.63	0.05	10.00	33.76	56.00	-22.24	QP
8	1.59450	4.39	9.63	0.05	10.00	24.07	46.00	-21.93	Average
9	4.57357	13.75	9.66	0.06	10.00	33.47	56.00	-22.53	QP
10	4.57457	-1.63	9.66	0.06	10.00	18.09	46.00	-27.91	Average
11	125.05453	15.45	9.83	0.13	10.00	35.41	60.00	-24.59	QP
12	125.05553	4.19	9.83	0.13	10.00	24.15	50.00	-25.85	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

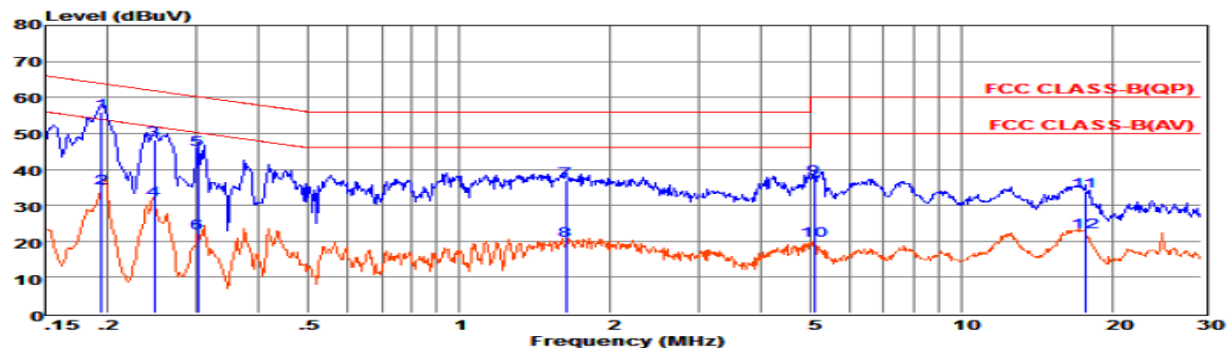
The Test Result For Configuration 2(Input AC 120V/60Hz): Configured with Switching Power Adapter and Docking Station (Used For Charging)



Env. Ins: 24*/56%
EUT: Tablet POS
M/N: HM518
Power Rating: AC 120V/60Hz
Test Mode: TX-NFC
Operator: Leo
Memo: Configuration 2
Pol: LINE

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.18639	33.40	9.62	0.02	10.00	53.04	64.20	-11.16	QP
2	0.18649	16.23	9.62	0.02	10.00	35.87	54.19	-18.32	Average
3	0.25751	25.60	9.63	0.03	10.00	45.26	61.51	-16.25	QP
4	0.25761	10.73	9.63	0.03	10.00	30.39	51.51	-21.12	Average
5	0.51824	19.90	9.62	0.04	10.00	39.56	56.00	-16.44	QP
6	0.51834	1.60	9.62	0.04	10.00	21.26	46.00	-24.74	Average
7	0.92330	17.83	9.63	0.05	10.00	37.51	56.00	-18.49	QP
8	0.92340	0.46	9.63	0.05	10.00	20.14	46.00	-25.86	Average
9	2.34599	13.31	9.64	0.05	10.00	33.00	56.00	-23.00	QP
10	2.34699	-2.11	9.64	0.05	10.00	17.58	46.00	-28.42	Average
11	17.66112	17.38	9.74	0.11	10.00	37.23	60.00	-22.77	QP
12	17.66212	6.65	9.74	0.11	10.00	26.50	50.00	-23.50	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

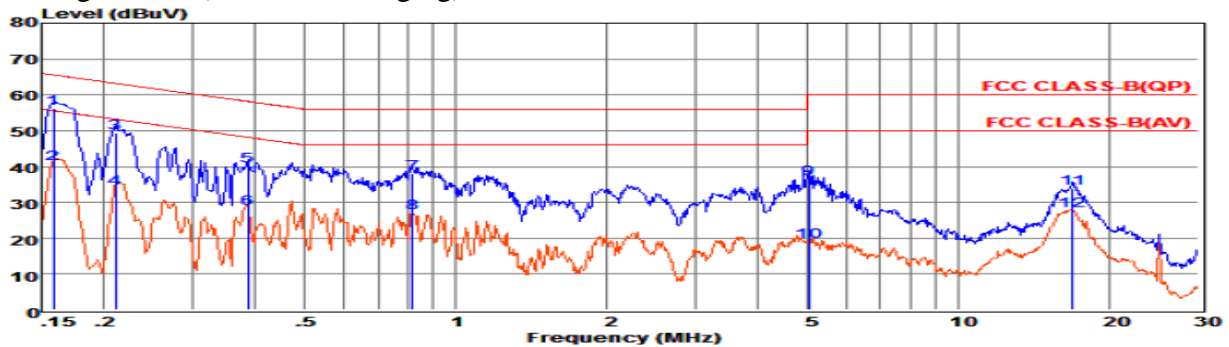


Env. Ins: 24*/56%
EUT: Tablet POS
M/N: HM518
Power Rating: AC 120V/60Hz
Test Mode: TX-NFC
Operator: Leo
Memo: Configuration 2
Pol: NEUTRAL

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.19447	36.44	9.60	0.02	10.00	56.06	63.84	-7.78	QP
2	0.19457	15.26	9.60	0.02	10.00	34.88	53.84	-18.96	Average
3	0.24682	28.52	9.60	0.03	10.00	48.15	61.86	-13.71	QP
4	0.24692	11.86	9.60	0.03	10.00	31.49	51.86	-20.37	Average
5	0.30188	25.82	9.60	0.03	10.00	45.45	60.19	-14.74	QP
6	0.30198	2.71	9.60	0.03	10.00	22.34	50.19	-27.85	Average
7	1.62763	17.34	9.63	0.05	10.00	37.02	56.00	-18.98	QP
8	1.62863	0.54	9.63	0.05	10.00	20.22	46.00	-25.78	Average
9	5.08483	17.61	9.66	0.06	10.00	37.33	60.00	-22.67	QP
10	5.08583	0.48	9.66	0.06	10.00	20.20	50.00	-29.80	Average
11	17.56779	13.87	9.79	0.11	10.00	33.77	60.00	-26.23	QP
12	17.56879	2.81	9.79	0.11	10.00	22.71	50.00	-27.29	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
2. The emission levels that are 20dB below the official limit are not reported.

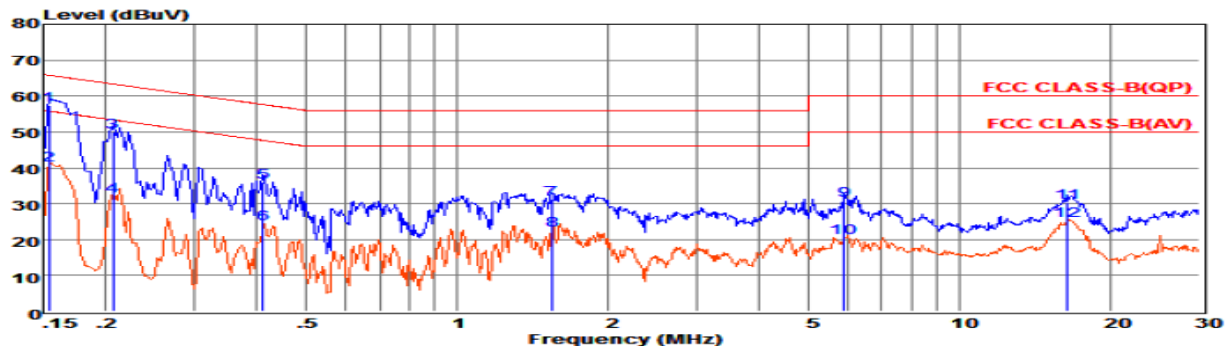
The Test Result For Configuration 2(Input AC 240V/60Hz): Configured with Switching Power Adapter and Docking Station (Used For Charging)



Env. Ins: 24*/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 240V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 2
 Pol: LINE

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15816	36.56	9.58	0.02	10.00	56.16	65.56	-9.40	QP
2	0.15826	21.25	9.58	0.02	10.00	40.85	55.55	-14.70	Average
3	0.21055	29.83	9.63	0.03	10.00	49.49	63.18	-13.69	QP
4	0.21065	14.20	9.63	0.03	10.00	33.86	53.18	-19.32	Average
5	0.38519	20.40	9.62	0.04	10.00	40.06	58.17	-18.11	QP
6	0.38529	8.48	9.62	0.04	10.00	28.14	48.16	-20.02	Average
7	0.82172	18.41	9.64	0.04	10.00	38.09	56.00	-17.91	QP
8	0.82182	7.26	9.64	0.04	10.00	26.94	46.00	-19.06	Average
9	5.03123	16.96	9.65	0.06	10.00	36.67	60.00	-23.33	QP
10	5.03223	-0.79	9.65	0.06	10.00	18.92	50.00	-31.08	Average
11	116.83872	13.93	9.73	0.11	10.00	33.77	60.00	-26.23	QP
12	116.83972	7.81	9.73	0.11	10.00	27.65	50.00	-22.35	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
 2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24*/56%
 EUT: Tablet POS
 M/N: HM518
 Power Rating: AC 240V/60Hz
 Test Mode: TX-NFC
 Operator: Leo
 Memo: Configuration 2
 Pol: NEUTRAL

	Freq	Reading	LisnFac	CabLos	Atten_Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.15403	37.66	9.69	0.02	10.00	57.37	65.78	-8.41	QP
2	0.15413	21.10	9.69	0.02	10.00	40.81	55.77	-14.96	Average
3	0.20614	30.42	9.59	0.03	10.00	50.04	63.36	-13.32	QP
4	0.20624	12.50	9.59	0.03	10.00	32.12	53.36	-21.24	Average
5	0.41048	16.40	9.61	0.04	10.00	36.05	57.64	-21.59	QP
6	0.41058	4.83	9.61	0.04	10.00	24.48	47.64	-23.16	Average
7	1.54363	11.44	9.63	0.05	10.00	31.12	56.00	-24.88	QP
8	1.54463	2.83	9.63	0.05	10.00	22.51	46.00	-23.49	Average
9	5.89800	11.08	9.67	0.06	10.00	30.81	60.00	-29.19	QP
10	5.89900	0.75	9.67	0.06	10.00	20.48	50.00	-29.52	Average
11	116.39849	10.56	9.75	0.11	10.00	30.42	60.00	-29.58	QP
12	116.39949	5.37	9.75	0.11	10.00	25.23	50.00	-24.77	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss+Atten_Fac.
 2. The emission levels that are 20dB below the official limit are not reported.

8. ANTENNA REQUIREMENT

8.1 Standard Applicable

According to § 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.

8.2 Antenna Connected Construction

The antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.

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