

Report No.: FR050617-01C



FCC RADIO TEST REPORT

FCC ID : UZ7CR6080PC

Equipment : HC Cradle

Brand Name : Zebra

Model Name : CR6080-PC

Applicant : Zebra Technologies Corporation

1 Zebra Plaza, Holtsville, NY 11742

Manufacturer : Zebra Technologies Corporation

1 Zebra Plaza, Holtsville, NY 11742

Standard : FCC Part 15 Subpart C §15.225

The product was received on May 15, 2020 and testing was started from May 27, 2020 and completed on Jul. 15, 2020. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Reviewed by: Louis Wu

Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

TEL: 886-3-327-3456 Page Number : 1 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

Report Template No.: BU5-FR15CNFC Version 2.4

Report Version : 01

Table of Contents

History	y of this test report	3
Summa	ary of Test Result	4
	eral Description	
1.1	Product Feature of Equipment Under Test	5
1.2	Product Specification of Equipment Under Test	5
1.3	Modification of EUT	6
1.4	Testing Location	6
1.5	Applicable Standards	6
2. Test	Configuration of Equipment Under Test	7
2.1	Descriptions of Test Mode	7
2.2	Connection Diagram of Test System	8
2.3	Table for Supporting Units	g
2.4	EUT Operation Test Setup	9
3. Test	Results	10
3.1	AC Power Line Conducted Emissions Measurement	10
3.2	20dB and 99% OBW Spectrum Bandwidth Measurement	12
3.3	Frequency Stability Measurement	13
3.4	Field Strength of Fundamental Emissions and Mask Measurement	14
3.5	Radiated Emissions Measurement	16
3.6	Antenna Requirements	19
	of Measuring Equipment	
5. Unce	ertainty of Evaluation	21
Appen	dix A. Test Results of Conducted Emission Test	
Appen	dix B. Test Results of Conducted Test Items	

- B1. Test Result of 20dB Spectrum Bandwidth
- B2. Test Result of Frequency Stability

Appendix C. Test Results of Radiated Test Items

- C1. Test Result of Field Strength of Fundamental Emissions
- C2. Results of Radiated Emissions (9 kHz~30MHz)
- C3. Results of Radiated Emissions (30MHz~1GHz)

Appendix D. Setup Photographs

TEL: 886-3-327-3456 : 2 of 21 Page Number FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

Report Template No.: BU5-FR15CNFC Version 2.4

Report Version : 01

Report No. : FR050617-01C

History of this test report

Report No. : FR050617-01C

Report No.	Version	Description	Issued Date
FR050617-01C	01	Initial issue of report	Aug. 17, 2020

TEL: 886-3-327-3456 Page Number : 3 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

Summary of Test Result

Report No. : FR050617-01C

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.207	AC Power Line Conducted Emissions	Pass	Under limit 6.88 dB at 0.536MHz
3.2	15.215(c)	20dB Spectrum Bandwidth	Pass	-
3.2	2.1049	99% OBW Spectrum Bandwidth	Reporting only	-
3.3	15.225(e)	Frequency Stability	Pass	-
3.4	15.225(a)(b)(c)	Field Strength of Fundamental Emissions	Pass	Max level 8.69 dBµV/m at 13.56 MHz
3.5	3.5 15.225(d) Radiated Spurious Emissions		Pass	Under limit 8.53 dB at 41.610MHz
3.6	15.203	Antenna Requirements	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang Report Producer: Ruby Zou

TEL: 886-3-327-3456 Page Number : 4 of 21 FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

1. General Description

1.1 Product Feature of Equipment Under Test

Product Feature			
Equipment	HC Cradle		
Brand Name	Zebra		
Model Name	CR6080-PC		
FCC ID	UZ7CR6080PC		
ELIT cumparts Dadies application	NFC/WPC/WPT		
EUT supports Radios application	Bluetooth BR/EDR/LE		
HW Version	EV2		
SW Version	N14		
MFD	29APR20		
EUT Stage	Engineering sample		

Report No. : FR050617-01C

Remark: The above EUT's information was declared by manufacturer.

Specification of Accessories						
Adapter	Adapter Brand Name Zebra Part Number PWR-WUA5V6W0WW					
USB type C cable 1	Brand Name	Zebra	Part Number	CB-000722-01		
USB type C cable 2						

Supported Unit Used in Test Configuration and System				
Scanner	Brand Name	Zebra	Model Number	CS6080

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification			
Tx/Rx Frequency Range	13.553 ~ 13.567MHz		
Channel Number	1		
20dBW	2.64 KHz		
99%OBW	2.24 KHz		
Antenna Type	Loop Antenna		
Type of Modulation	ASK		

Remark: The above EUT's information was declared by manufacturer.

TEL: 886-3-327-3456 Page Number : 5 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory			
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978			
Test Site No.	Sporton Site No.			
rest site No.	TH03-HY	CO05-HY	03CH07-HY	
Test Engineer	Louis Chung	Howard Huang	Jesse Wang, Ken Wu	
Temperature	22~24°C 21~24°C 23~25°C			
Relative Humidity	53~55% 42~50% 56~62%			

Report No.: FR050617-01C

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190

1.5 Applicable Standards

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

- FCC Part 15 Subpart C §15.225
- FCC KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.
- 3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

TEL: 886-3-327-3456 Page Number : 6 of 21 FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

2. Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

Investigation has been done on all the possible configurations.

The following table is a list of the test modes shown in this test report.

Test Items				
AC Power Line Conducted Emissions	Field Strength of Fundamental Emissions			
20dB Spectrum Bandwidth	Frequency Stability			
Radiated Emissions 9kHz~30MHz	Radiated Emissions 30MHz~1GHz			

Report No.: FR050617-01C

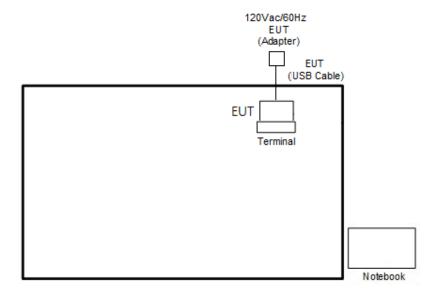
The EUT pre-scanned in three NFC type, A, B, F. The worst type (type F) was recorded in this report. Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (Z plane as worst plane) from all possible combinations.

	Test Cases						
AC Conducted Emission	Mode 1: Scanner (CS6080) + Bluetooth Idle + NFC Link + Wireless Charging + USB Cable (Charging from AC adapter)						
Remark: For Radiated Test Cases, the tests were performed with USB Cable 1							

TEL: 886-3-327-3456 Page Number : 7 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

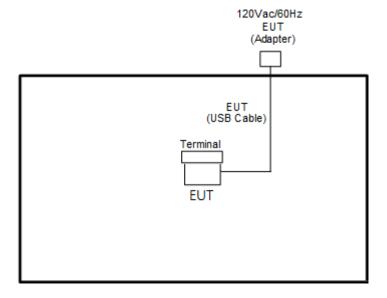
2.2 Connection Diagram of Test System

<AC Conducted Emission Mode>



Report No. : FR050617-01C

<Radiated Emission Mode>



TEL: 886-3-327-3456 Page Number : 8 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

2.3 Table for Supporting Units

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2m DC O/P: Shielded, 1.8m

Report No.: FR050617-01C

2.4 EUT Operation Test Setup

The RF test items, utility "ScannerSDK_SampleAPP" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

TEL: 886-3-327-3456 Page Number : 9 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3. Test Results

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 Limit of AC Conducted Emission

For equipment that 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 the limits in the following table.

Report No.: FR050617-01C

Frequency of Emission	Conducted Limit (dBµV)		
(MHz)	Quasi-Peak	Average	
0.15-0.5	66 to 56*	56 to 46*	
0.5-5	56	46	
5-30	60	50	

^{*}Decreases with the logarithm of the frequency.

3.1.2 Measuring Instruments

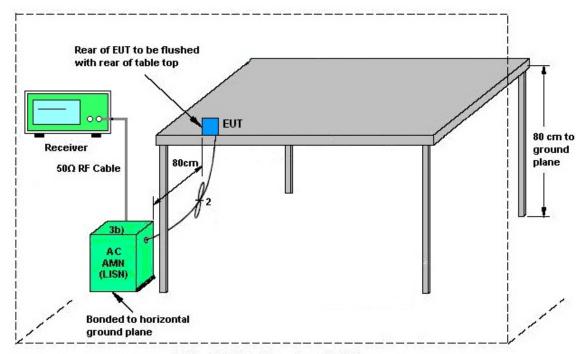
See list of measuring equipment of this test report.

3.1.3 Test Procedures

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

TEL: 886-3-327-3456 Page Number : 10 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.1.4 Test setup



AMN = Artificial mains network (LISN)

AE = Associated equipment

EUT = Equipment under test

ISN = Impedance stabilization network

3.1.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 11 of 21 FAX: 886-3-328-4978 Issued Date

Report Template No.: BU5-FR15CNFC Version 2.4

: Aug. 17, 2020

Report No. : FR050617-01C

Report Version : 01

3.2 20dB and 99% OBW Spectrum Bandwidth Measurement

3.2.1 Limit

Intentional radiators must be designed to ensure that the 20dB and 99% emission bandwidth in the specific band 13.553~13.567MHz.

Report No.: FR050617-01C

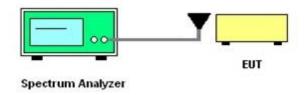
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

- The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
- 2. The resolution bandwidth of 1 kHz and the video bandwidth of 3 kHz were used.
- 3. Measured the spectrum width with power higher than 20dB below carrier.
- 4. Measured the 99% OBW.

3.2.4 Test Setup



3.2.5 Test Result of Conducted Test Items

Please refer to Appendix B.

TEL: 886-3-327-3456 Page Number : 12 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.3 Frequency Stability Measurement

3.3.1 Limit

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.

Report No.: FR050617-01C

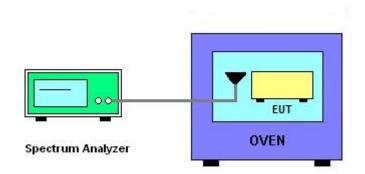
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

- 1. The spectrum analyzer connected via a receive antenna placed near the EUT.
- 2. EUT have transmitted signal and fixed channelize.
- Set the spectrum analyzer span to view the entire emissions bandwidth.
- 4. Set RBW = 1 kHz, VBW = 3 kHz with peak detector and maxhold settings.
- 5. The fc is declaring of channel frequency. Then the frequency error formula is $(fc-f)/fc \times 10^6$ ppm and the limit is less than ± 100 ppm.
- 6. Extreme temperature rule is -20°C~50°C.

3.3.4 Test Setup



3.3.5 Test Result of Conducted Test Items

Please refer to Appendix B.

TEL: 886-3-327-3456 Page Number : 13 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.4 Field Strength of Fundamental Emissions and Mask Measurement

Report No. : FR050617-01C

3.4.1 Limit

Rules and specifications	FCC CFR 47 Part 15 section 15.225								
Description	Compliance with th	Compliance with the spectrum mask is tested with RBW set to 9kHz.							
Freq. of Emission (MHz)	Field Strength	Field Strength	Field Strength	Field Strength					
	(µV/m) at 30m	(dBµV/m) at 30m	(dBµV/m) at 10m	(dBµV/m) at 3m					
1.705~13.110	30	29.5	48.58	69.5					
13.110~13.410	106	40.5	59.58	80.5					
13.410~13.553	334	50.5	69.58	90.5					
13.553~13.567	15848	84.0	103.08	124.0					
13.567~13.710	334	50.5	69.58	90.5					
13.710~14.010	13.710~14.010 106		59.58	80.5					
14.010~30.000	30	29.5	48.58	69.5					

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

TEL: 886-3-327-3456 Page Number : 14 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.4.3 Test Procedures

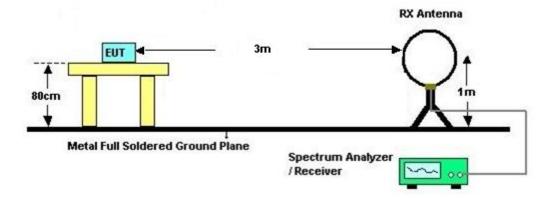
 Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.

Report No.: FR050617-01C

- Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
- 4. For Fundamental emissions, use the receiver to measure QP reading.
- 5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
- Compliance with the spectrum mask is tested with RBW set to 9kHz.
 Note: Emission level (dBμV/m) = 20 log Emission level (μV/m).

3.4.4 Test Setup

For radiated emissions below 30MHz



3.4.5 Test Result of Field Strength of Fundamental Emissions and Mask

Please refer to Appendix C.

TEL: 886-3-327-3456 Page Number : 15 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.5 Radiated Emissions Measurement

3.5.1 Limit

The field strength of any emissions which appear outside of 13.110 ~14.010MHz band shall not exceed the general radiated emissions limits.

Report No.: FR050617-01C

Frequencies	Field Strength	Measurement Distance			
(MHz)	(μV/m)	(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			

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Measuring Instrument Setting

The following table is the setting of receiver:

Receiver Parameter	Setting
Attenuation	Auto
Frequency Range: 9kHz~150kHz	RBW 200Hz for QP
Frequency Range: 150kHz~30MHz	RBW 9kHz for QP
Frequency Range: 30MHz~1000MHz	RBW 120kHz for Peak

Note: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz and 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

TEL: 886-3-327-3456 Page Number : 16 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.5.4 Test Procedures

 Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

Report No.: FR050617-01C

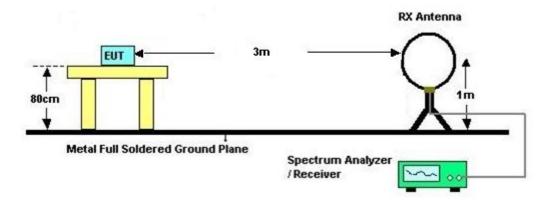
: 01

- Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
- 7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver.

TEL: 886-3-327-3456 Page Number : 17 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

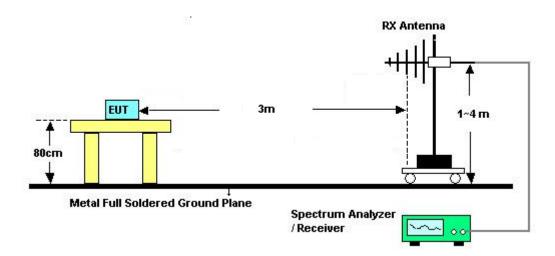
3.5.5 Test Setup

For radiated emissions below 30MHz



Report No.: FR050617-01C

For radiated emissions above 30MHz



3.5.6 Test Result of Radiated Emissions Measurement

Please refer to Appendix C.

Remark: There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

TEL: 886-3-327-3456 Page Number : 18 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

3.6 Antenna Requirements

3.6.1 Standard Applicable

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

Report No.: FR050617-01C

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 rule.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

TEL: 886-3-327-3456 Page Number : 19 of 21
FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	AC POWER	AFC-500W	F10407001 1	50Hz~60Hz	Apr. 09, 2020	Jun. 30, 2020~ Jul. 07, 2020	Apr. 08, 2021	Conducted (TH03-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 26, 2020	Jun. 30, 2020~ Jul. 07, 2020	Mar. 25, 2021	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Sep. 04, 2019	Jun. 30, 2020~ Jul. 07, 2020	Sep. 03, 2020	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Nov. 26, 2019	Jun. 30, 2020~ Jul. 07, 2020	Nov. 25, 2020	Conducted (TH03-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	May 27, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	May 27, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 07, 2019	May 27, 2020	Nov. 06, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	May 27, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 27, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	May 27, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	May 27, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	35419 & 03	30MHz~1GHz	Apr. 29, 2020	Jul. 11, 2020~ Jul. 15, 2020	Apr. 28, 2021	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Jul. 11, 2020~ Jul. 15, 2020	Dec. 25, 2020	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 19, 2020	Jul. 11, 2020~ Jul. 15, 2020	May 18, 2021	Radiation (03CH07-HY)
Filter	Wainwright	WHK20/1000 C7/40SS	SN3	20MHz High Pass Filter	Aug. 22, 2019	Jul. 11, 2020~ Jul. 15, 2020	Aug. 21, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/ 4, MY28655/ 4	9kHz~30MHz	Feb. 25, 2020	Jul. 11, 2020~ Jul. 15, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/ 4, MY24971/ 4, MY15682/ 4	30MHz~1GHz	Feb. 25, 2020	Jul. 11, 2020~ Jul. 15, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Jul. 11, 2020~ Jul. 15, 2020	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208 368	Control Ant Mast	N/A	Jul. 11, 2020~ Jul. 15, 2020	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Jul. 11, 2020~ Jul. 15, 2020	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Jul. 11, 2020~ Jul. 15, 2020	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB24 95	N/A	N/A	Jul. 11, 2020~ Jul. 15, 2020	N/A	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY532900 53	20Hz~26.5GHz	May 21, 2020	Jul. 11, 2020~ Jul. 15, 2020	May 20, 2021	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	805040046 56H	N/A	N/A	Jul. 11, 2020~ Jul. 15, 2020	N/A	Radiation (03CH07-HY)

Report No. : FR050617-01C

TEL: 886-3-327-3456 Page Number : 20 of 21 FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence	2.2
of 95% (U = 2Uc(y))	2.3

Report No. : FR050617-01C

Uncertainty of Radiated Emission Measurement (9 kHz ~ 30 MHz)

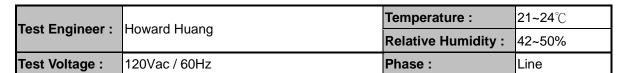
Measuring Uncertainty for a Level of Confidence	2.6
of 95% (U = 2Uc(y))	2.0

<u>Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)</u>

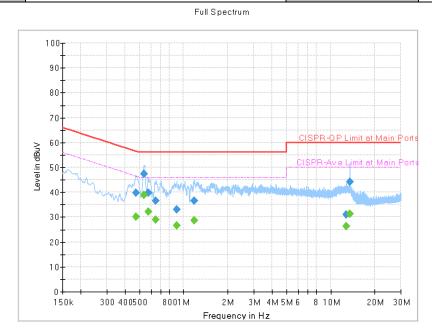
Measuring Uncertainty for a Level of Confidence	46
of 95% (U = 2Uc(y))	4.0

TEL: 886-3-327-3456 Page Number : 21 of 21 FAX: 886-3-328-4978 Issued Date : Aug. 17, 2020

Appendix A. Test Results of Conducted Emission Test



Report No. : FR050617-01C



Final Result:

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB)			(dB)
0.476250	-	30.04	46.40	16.36	L1	OFF	19.6
0.476250	39.77		56.40	16.63	L1	OFF	19.6
0.536010	-	38.91	46.00	7.09	L1	OFF	19.6
0.536010	47.29	-	56.00	8.71	L1	OFF	19.6
0.575250		32.17	46.00	13.83	L1	OFF	19.6
0.575250	39.78	I	56.00	16.22	L1	OFF	19.6
0.645000		28.87	46.00	17.13	L1	OFF	19.6
0.645000	36.47	-	56.00	19.53	L1	OFF	19.6
0.899430		26.48	46.00	19.52	L1	OFF	19.6
0.899430	32.92	-	56.00	23.08	L1	OFF	19.6
1.178520		28.71	46.00	17.29	L1	OFF	19.6
1.178520	36.56		56.00	19.44	L1	OFF	19.6
12.714000	1	26.30	50.00	23.70	L1	OFF	20.2
12.714000	30.96		60.00	29.04	L1	OFF	20.2
13.560000	1	31.33	50.00	18.67	L1	OFF	20.2
13.560000	44.02		60.00	15.98	L1	OFF	20.2

TEL: 886-3-327-3456 Page Number : A1 of A2

Test Engineer : Howard Huang

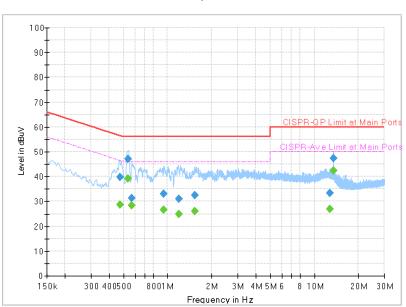
Temperature : 21~24°C

Relative Humidity : 42~50%

Report No.: FR050617-01C

Test Voltage: 120Vac / 60Hz Phase: Neutral





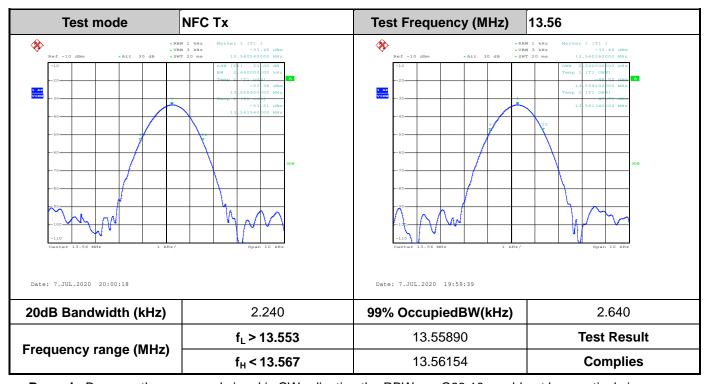
Final Result:

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB)			(dB)
0.474000	39.66		56.44	16.78	N	OFF	19.6
0.474000		28.71	46.44	17.73	N	OFF	19.6
0.536190	47.18	-	56.00	8.82	N	OFF	19.6
0.536190	-	39.12	46.00	6.88	N	OFF	19.6
0.567690	31.39		56.00	24.61	N	OFF	19.6
0.567690		28.29	46.00	17.71	N	OFF	19.6
0.939660	33.07	-	56.00	22.93	N	OFF	19.6
0.939660		26.71	46.00	19.29	N	OFF	19.6
1.189500	31.13		56.00	24.87	N	OFF	19.6
1.189500	-	24.86	46.00	21.14	N	OFF	19.6
1.532580	32.47	-	56.00	23.53	N	OFF	19.6
1.532580		26.09	46.00	19.91	N	OFF	19.6
12.705000	33.41	-	60.00	26.59	N	OFF	20.2
12.705000		26.83	50.00	23.17	N	OFF	20.2
13.560000	47.30		60.00	12.70	N	OFF	20.2
13.560000	-	42.42	50.00	7.58	N	OFF	20.2

TEL: 886-3-327-3456 Page Number : A2 of A2

Appendix B. Test Results of Conducted Test Items

B1. Test Result of 20dB Spectrum Bandwidth



Report No. : FR050617-01C

Remark: Because the measured signal is CW adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

TEL: 886-3-327-3456 Page Number: B1 of B3



B2. Test Result of Frequency Stability

Voltage vs. Fred	uency Stability	Temperature vs. Frequency Stability				
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (℃)	Time	Measurement Frequency (MHz)		
120	13.560220	-20	0	13.560260		
102	13.560220		2	13.560260		
138	13.560220		5	13.560260		
			10	13.560280		
		-10	0	13.560270		
			2	13.560270		
			5	13.560280		
			10	13.560280		
		0	0	13.560260		
			2	13.560280		
			5	13.560270		
			10	13.560270		
		10	0	13.560260		
			2	13.560260		
			5	13.560260		
			10	13.560260		
		20	0	13.560240		
			2	13.560240		
			5	13.560240		
			10	13.560240		
		30	0	13.560180		
			2	13.560180		
			5	13.560180		
			10	13.560180		
		40	0	13.560180		
			2	13.560180		
			5	13.560180		
			10	13.560180		

Report No. : FR050617-01C

TEL: 886-3-327-3456 Page Number : B2 of B3

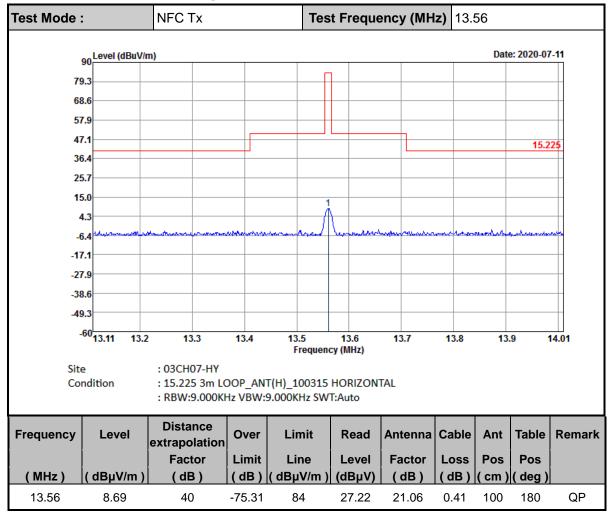
Voltage vs. Frequ	Voltage vs. Frequency Stability		Temperature vs. Frequency Stability				
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (°C) Time		Measurement Frequency (MHz)			
		50 0		13.560180			
		2		13.560180			
			5	13.560190			
			10	13.560190			
Max.Deviation (MHz)	0.000220	Max.Deviati	on (MHz)	0.000280			
Max.Deviation (ppm)	16.2242	Max.Deviation	on (ppm)	20.6490			
Limit	FS < ±100 ppm	Limi	FS < ±100 ppm				
Test Result	PASS	Test Re	PASS				

Report No. : FR050617-01C

TEL: 886-3-327-3456 Page Number : B3 of B3

Appendix C. Test Results of Radiated Test Items

C1. Test Result of Field Strength of Fundamental Emissions



Report No.: FR050617-01C

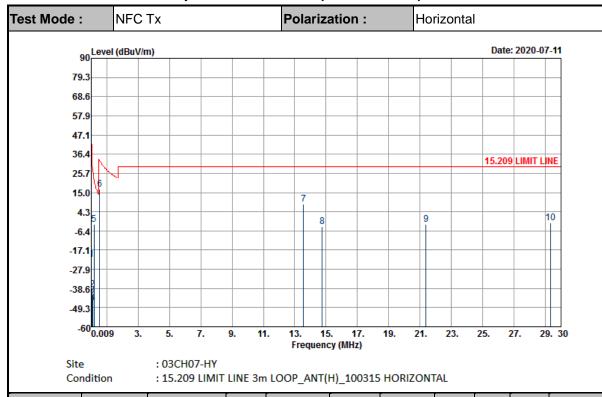
TEL: 886-3-327-3456 Page Number: C1 of C6



Report No. : FR050617-01C

TEL: 886-3-327-3456 Page Number : C2 of C6

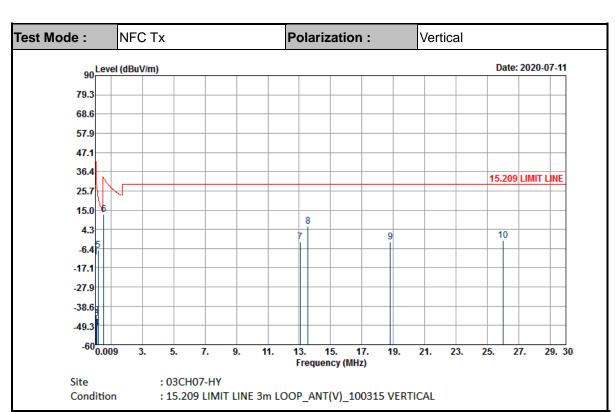
C2. Results of Radiated Spurious Emissions (9 kHz~30MHz)



Report No. : FR050617-01C

Frequency	Level	Distance extrapolation	Over	Limit	Read	Antenna	Cable	Ant	Table	Remark
		Factor	Limit	Line	Level	Factor	Loss	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	(dB)	$(dB\mu V/m)$	(dBµV)	(dB)	(dB)	(cm)	(deg)	
0.00971	-22.27	80	-70.13	47.86	38.92	18.7	0.11	-	-	Average
0.06006	-39.2	80	-71.23	32.03	21.65	19	0.15	-	-	Average
0.09038	-42.58	80	-71.06	28.48	18.76	18.5	0.16	-	-	QP
0.1184	-46.55	80	-72.69	26.14	14.68	18.59	0.18	-	-	Average
0.17822	-2.69	80	-25.28	22.59	58.33	18.76	0.22	-	-	Average
0.53506	16.97	40	-16.07	33.04	37.46	19.18	0.33	100	0	QP
13.56	8.69	40	-20.81	29.5	27.22	21.06	0.41	-	-	QP
14.76	-4.03	40	-33.53	29.5	14.37	21.18	0.42	-	-	QP
21.373	-2.68	40	-32.18	29.5	15.12	21.81	0.39	-	-	QP
29.34	-1.89	40	-31.39	29.5	14.8	22.45	0.86	-	-	QP

TEL: 886-3-327-3456 Page Number : C3 of C6



Report No.: FR050617-01C

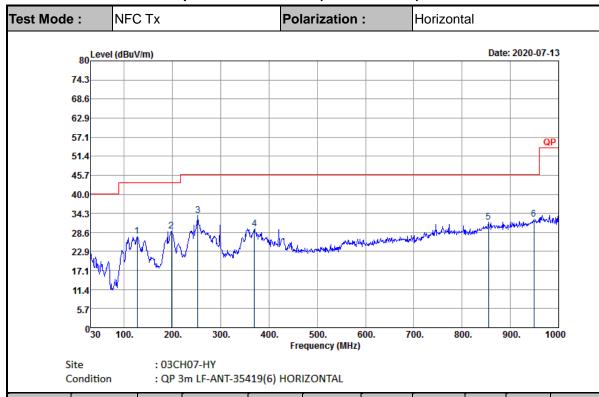
Frequency	Level	Distance extrapolation	Over	Limit	Read	Antenna	Cable	Ant	Table	Remark
		Factor	Limit	Line	Level	Factor	Loss	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(cm)	(deg)	
0.0113	-11.29	80	-57.84	46.55	49.89	18.7	0.12	-	-	Average
0.06837	-43.89	80	-74.8	30.91	16.96	19	0.15	-	-	Average
0.09034	-45.46	80	-73.95	28.49	15.88	18.5	0.16	-	-	QP
0.12644	-50.98	80	-76.55	25.57	10.24	18.59	0.19	-	-	Average
0.17822	-7.38	80	-29.97	22.59	53.64	18.76	0.22	-	-	Average
0.53506	12.53	40	-20.51	33.04	33.02	19.18	0.33	100	0	QP
13.072	-2.56	40	-32.06	29.5	16.02	21.01	0.41	-	-	QP
13.56	5.94	40	-23.56	29.5	24.47	21.06	0.41	-	-	QP
18.808	-2.77	40	-32.27	29.5	15.26	21.58	0.39	-	-	QP
26	-1.87	40	-31.37	29.5	15.42	22.18	0.53	-	-	QP

Note:

- 1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 2. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
- 3. Limit line = specific limits ($dB\mu V$) + distance extrapolation factor
- 4. 13.56 MHz is fundamental signal which can be ignored

TEL: 886-3-327-3456 Page Number : C4 of C6

C3. Results of Radiated Spurious Emissions (30MHz~1GHz)

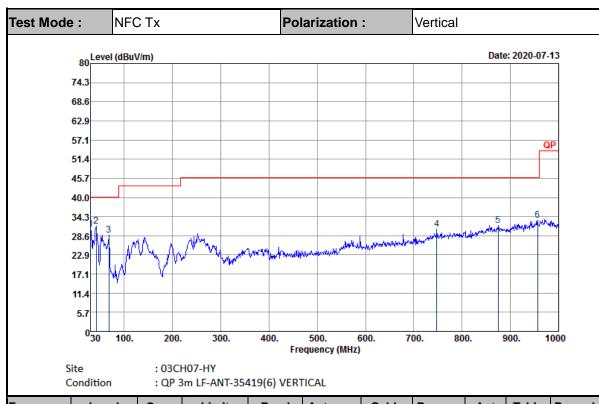


Report No. : FR050617-01C

l	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
ı			Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
	(MHz)	($dB\mu V/m$)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
	126.66	27.39	-16.11	43.5	37.83	17.63	1.89	-	-	Peak	126.66
	197.67	28.89	-14.61	43.5	41.52	14.94	2.36	-	-	Peak	197.67
	252.21	33.55	-12.45	46	42.33	18.46	2.67	100	0	Peak	252.21
	370	29.72	-16.28	46	35.6	20.76	3.25	-	-	Peak	370
	854.4	31.61	-14.39	46	27.01	28.83	4.97	-	-	Peak	854.4
	948.9	32.58	-13.42	46	25.91	30.12	5.26	-	-	Peak	948.9

TEL: 886-3-327-3456 Page Number : C5 of C6





Report No.: FR050617-01C

Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(dB)	(cm)	(deg)	
30	30.58	-9.42	40	35.34	24.32	0.93	-	-	Peak	30
41.61	31.47	-8.53	40	41.94	18.44	1.09	100	0	Peak	41.61
67.8	28.71	-11.29	40	45.25	12.06	1.38	-	-	Peak	67.8
747.3	30.46	-15.54	46	27.62	27.78	4.63	-	-	Peak	747.3
874.7	31.66	-14.34	46	26.91	28.82	5.04	-	-	Peak	874.7
956.6	33.12	-12.88	46	26	30.5	5.28	-	-	Peak	956.6

Note:

- 1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 2. Emission level (dB μ V/m) = 20 log Emission level (μ V/m).
- 3. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor= Level.

TEL: 886-3-327-3456 Page Number : C6 of C6