

Report No.: FR9D0531B



FCC RADIO TEST REPORT

FCC ID : XRAFB417

Equipment : wireless activity tracker

Brand Name : Fitbit Model Name : FB417

Applicant : FITBIT, INC.

199 FREMONT, 14TH FLOOR, SAN FRANCISCO, CA

Manufacturer : FITBIT, INC.

199 FREMONT, 14TH FLOOR, SAN FRANCISCO, CA

Standard : FCC Part 15 Subpart C §15.225

The product was received on Dec. 05, 2019 and testing was started from Dec. 16, 2019 and completed on Jan. 08, 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

Report Template No.: BU5-FR15CNFC Version 2.4

Report Version : 01

04

Table of Contents

Report No. : FR9D0531B

Histor	y of this test report	3
	pary of Test Result	
1. Gen	neral Description	5
1.1	Product Feature of Equipment Under Test	5
1.2	Modification of EUT	
1.3	Testing Location	5
1.4	Applicable Standards	5
2. Test	t Configuration of Equipment Under Test	
2.1	Descriptions of Test Mode	6
2.2	Connection Diagram of Test System	
2.3	Table for Supporting Units	7
2.4	EUT Operation Test Setup	7
3. Test	t Results	8
3.1	AC Power Line Conducted Emissions Measurement	8
3.2	20dB and 99% OBW Spectrum Bandwidth Measurement	10
3.3	Frequency Stability Measurement	11
3.4	Field Strength of Fundamental Emissions and Mask Measurement	12
3.5	Radiated Emissions Measurement	14
3.6	Antenna Requirements	17
4. List	of Measuring Equipment	
5. Unc	ertainty of Evaluation	19
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	
Appen	dix 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)

TEL: 886-3-327-3456 Page Number : 2 of 19 FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020 : 01

History of this test report

Report No. : FR9D0531B

Report No.	Version	Description	Issued Date
FR9D0531B	01	Initial issue of report	Jan. 22, 2020

TEL: 886-3-327-3456 Page Number : 3 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

Summary of Test Result

Report No.: FR9D0531B

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.207	AC Power Line Conducted Emissions	Pass	Under limit 21.62 dB at 4.123MHz
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 1:		Max level 15.32 dBµV/m at 13.560 MHz
3.5	3.5 15.225(d) Radiated Spurious Emissions Pass		Under limit 6.07 dB at 40.680MHz	
3.6	15.203	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: Cindy Liu

TEL: 886-3-327-3456 Page Number : 4 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

1. General Description

1.1 Product Feature of Equipment Under Test

Bluetooth, NFC, and GNSS.

Product Specification subjective to this standard		
Sample 1 EUT with Battery 1		
Sample 2	EUT with Battery 2	
Antenna Type	Bluetooth: Monopole Antenna GPS / Glonass: Monopole Antenna NFC: Loop Antenna	

Report No.: FR9D0531B

1.2 Modification of EUT

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

1.3 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	Loius Chung	Tom Lee	Stan Hsieh	
Temperature 22~24°C 22~25°C		21~23 ℃		
Relative Humidity	Humidity 53~55% 44~53% 60~62			

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

FCC designation No.: TW1190

1.4 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

TEL: 886-3-327-3456 Page Number : 5 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 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	

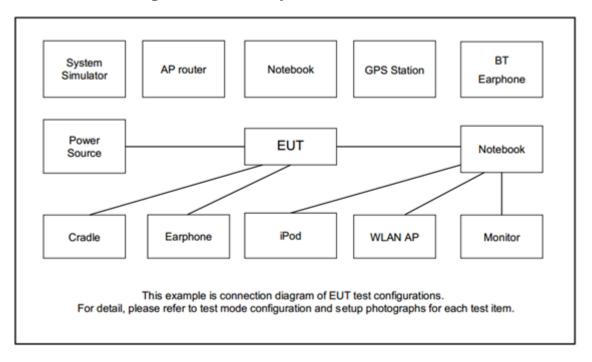
Report No.: FR9D0531B

The EUT pre-scanned in four NFC type, A, B. The worst type (type B 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	Conducted Mode 1: NFC Idle +Charging cable (Charging from Adapter) for Sample 1				
Emission					
Remark: For Radiated Test Cases, the tests were performed with sample 1.					

TEL: 886-3-327-3456 Page Number : 6 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

2.2 Connection Diagram of Test System



Report No.: FR9D0531B

2.3 Table for Supporting Units

Ite	m Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Adapter	DVE	DSA-5PFM-05 FUS 050100	FCC DoC	N/A	N/A
2.	Adapter	SONY	EP800	N/A	N/A	N/A

2.4 EUT Operation Test Setup

The RF test items, utility "Tera Term" was installed in EUT 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 : 7 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 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.: FR9D0531B

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

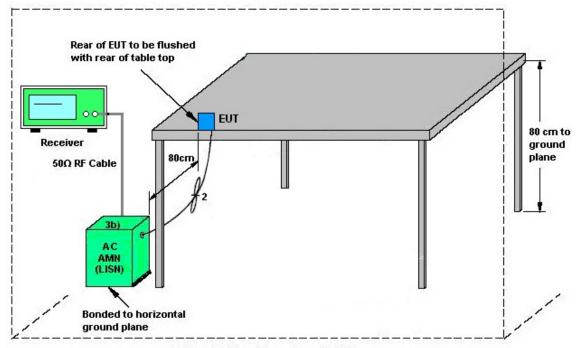
See list of measuring equipment of this test report.

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 : 8 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

3.1.4 Test setup



Report No.: FR9D0531B

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 : 9 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

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.: FR9D0531B

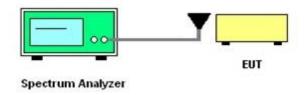
3.2.2 Measuring Instruments

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 : 10 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 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.: FR9D0531B

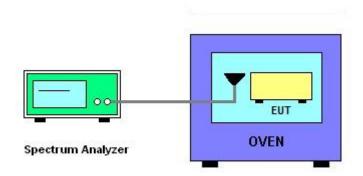
3.3.2 Measuring Instruments

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.
- 3. 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 : 11 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

3.4 Field Strength of Fundamental Emissions and Mask Measurement

Report No.: FR9D0531B

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.		
From of Francisco (MIII-)	Field Strength	Field Strength	Field Strength	Field Strength
Freq. of Emission (MHz)	(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	106	40.5	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.

3.4.3 Test Procedures

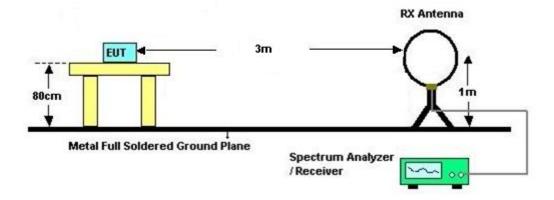
- Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable 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.
- 6. Compliance with the spectrum mask is tested with RBW set to 9kHz.

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

TEL: 886-3-327-3456 Page Number : 12 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

3.4.4 Test Setup

For radiated emissions below 30MHz



Report No.: FR9D0531B

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 : 13 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 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.: FR9D0531B

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 : 14 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 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.

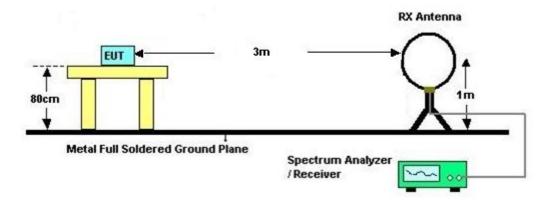
Report No.: FR9D0531B

- 2. 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.
- 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 : 15 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

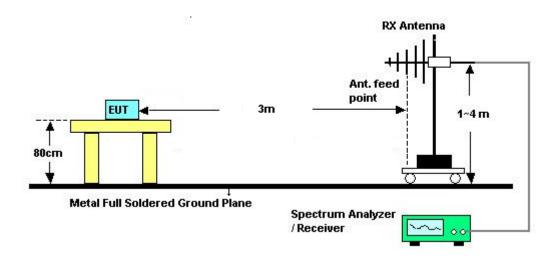
3.5.5 Test Setup

For radiated emissions below 30MHz



Report No.: FR9D0531B

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 : 16 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 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.: FR9D0531B

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 : 17 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D 01N-06	35419 & 03	30MHz~1GHz	Apr. 30, 2019	Jan. 07, 2020~ Jan. 08, 2020	Apr. 29, 2020	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(M XE)	MY5329005 3	20Hz~26.5GHz	Jan. 23, 2019	Jan. 07, 2020~ Jan. 08, 2020	Jan. 22, 2020	Radiation (03CH07-HY)
Hygrometer	TECPEL	HTC-2	1	N/A	Jun. 17, 2019	Jan. 07, 2020~ Jan. 08, 2020	Jun. 16, 2020	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 11, 2019	Jan. 07, 2020~ Jan. 08, 2020	Jan. 10, 2020	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 20, 2019	Jan. 07, 2020~ Jan. 08, 2020	May 19, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLE X 104	MY24971/4, MY28655/4	9kHz~30MHz	Feb. 26, 2019	Jan. 07, 2020~ Jan. 08, 2020	Feb. 25, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLE X 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 26, 2019	Jan. 07, 2020~ Jan. 08, 2020	Feb. 25, 2020	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Jan. 07, 2020~ Jan. 08, 2020	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF7802083 68	Control Ant Mast	N/A	Jan. 07, 2020~ Jan. 08, 2020	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520B S	N/A	1m~4m	N/A	Jan. 07, 2020~ Jan. 08, 2020	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Jan. 07, 2020~ Jan. 08, 2020	N/A	Radiation (03CH07-HY)
AC Power Source	ChainTek	APC-1000 W	N/A	N/A	N/A	Jan. 08, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Jan. 08, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Mar. 19, 2019	Jan. 08, 2020	Mar. 18, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Jan. 08, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jan. 08, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Jan. 08, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Jan. 08, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 06, 2019	Dec. 16, 2019~ Dec. 17, 2019	Mar. 05, 2020	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Sep. 04, 2019	Dec. 16, 2019~ Dec. 17, 2019	Sep. 03, 2020	Conducted (TH03-HY)
Power Divider	Warison	WCOU-0.4 -26.5S-20	#A	N/A	Nov. 06, 2019	Dec. 16, 2019~ Dec. 17, 2019	Nov. 05, 2020	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Nov. 26, 2019	Dec. 16, 2019~ Dec. 17, 2019	Nov. 25, 2020	Conducted (TH03-HY)

Report No. : FR9D0531B

TEL: 886-3-327-3456 Page Number : 18 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

5. Uncertainty of Evaluation

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

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

Report No.: FR9D0531B

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

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

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

TEL: 886-3-327-3456 Page Number : 19 of 19
FAX: 886-3-328-4978 Issued Date : Jan. 22, 2020

Appendix A. Test Results of Conducted Emission Test

Test Engineer :		Temperature :	22~25 ℃
	Tom Lee	Relative Humidity :	44~53%

Report No. : FR9D0531B

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

EUT Information

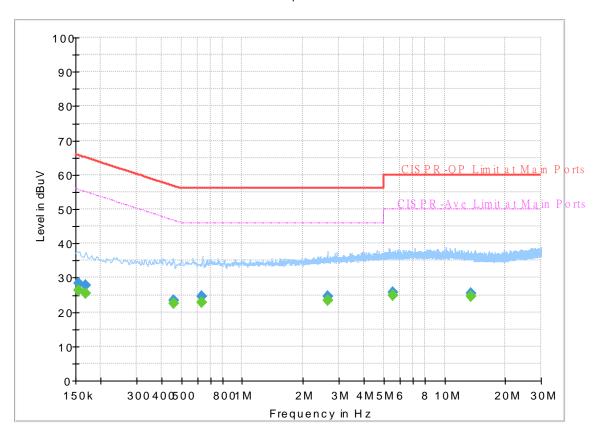
 Report NO :
 9D0531

 Test Mode :
 Mode 1

 Test Voltage :
 120Vac/60Hz

Phase: Line

FullSpectrum



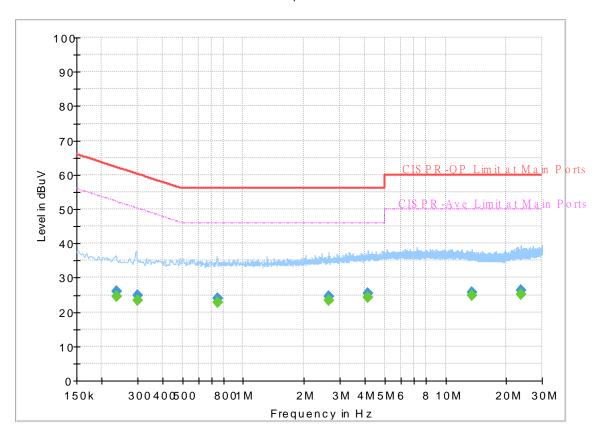
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
` '	,	, ,	,	` '	1.4	OFF	. ,
0.155670		26.26	55.69	29.43	L1	OFF	19.5
0.155670	28.38		65.69	37.31	L1	OFF	19.5
0.168090		25.49	55.05	29.56	L1	OFF	19.5
0.168090	27.70		65.05	37.35	L1	OFF	19.5
0.456180		22.46	46.76	24.30	L1	OFF	19.5
0.456180	23.41		56.76	33.35	L1	OFF	19.5
0.633750		22.91	46.00	23.09	L1	OFF	19.5
0.633750	24.55		56.00	31.45	L1	OFF	19.5
2.636880		23.48	46.00	22.52	L1	OFF	19.7
2.636880	24.44		56.00	31.56	L1	OFF	19.7
5.561070		24.83	50.00	25.17	L1	OFF	19.8
5.561070	25.79		60.00	34.21	L1	OFF	19.8
13.560000		24.51	50.00	25.49	L1	OFF	20.1
13.560000	25.55		60.00	34.45	L1	OFF	20.1

EUT Information

Report NO: 9D0531
Test Mode: Mode 1
Test Voltage: 120Vac/60Hz
Phase: Neutral

FullSpectrum

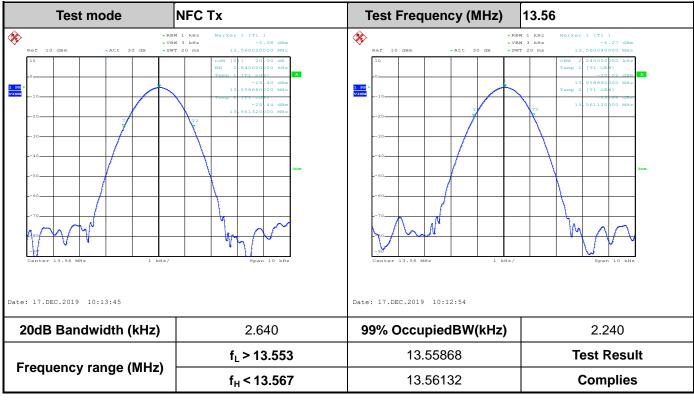


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
` '	, ,	` '	,			OFF	
0.237120	-	24.44	52.20	27.76	N	OFF	19.6
0.237120	26.07	-	62.20	36.13	N	OFF	19.6
0.299400		23.33	50.26	26.93	N	OFF	19.6
0.299400	24.91		60.26	35.35	N	OFF	19.6
0.744000		22.74	46.00	23.26	N	OFF	19.6
0.744000	24.07		56.00	31.93	N	OFF	19.6
2.657490		23.52	46.00	22.48	N	OFF	19.6
2.657490	24.53		56.00	31.47	N	OFF	19.6
4.122600		24.38	46.00	21.62	N	OFF	19.7
4.122600	25.34		56.00	30.66	N	OFF	19.7
13.560000	-	24.72	50.00	25.28	N	OFF	20.1
13.560000	25.76		60.00	34.24	N	OFF	20.1
23.696970		25.11	50.00	24.89	N	OFF	20.5
23.696970	26.24		60.00	33.76	N	OFF	20.5

Appendix B. Test Results of Conducted Test Items

B1.Test Result of 20dB Spectrum Bandwidth



Report No.: FR9D0531B

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	quency Stability	Temperature vs. Frequency Stability				
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (℃)	Time	Measurement Frequency (MHz)		
120	13.560000	-20	0	13.560060		
102	13.560000		2	13.560060		
138	13.559990		5	13.560100		
			10	13.560120		
		-10	0	13.560140		
			2	13.560100		
			5	13.560080		
			10	13.560060		
		0	0	13.560140		
			2	13.560090		
			5	13.560060		
			10	13.560060		
		10	0	13.560120		
			2	13.560060		
			5	13.560040		
			10	13.560020		
		20	0	13.560000		
			2	13.559990		
			5	13.559980		
			10	13.559990		
		30	0	13.560060		
			2	13.560020		
			5	13.560000		
			10	13.560000		
		40	0	13.560020		
			2	13.560000		
			5	13.560000		
			10	13.560000		

Report No.: FR9D0531B

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

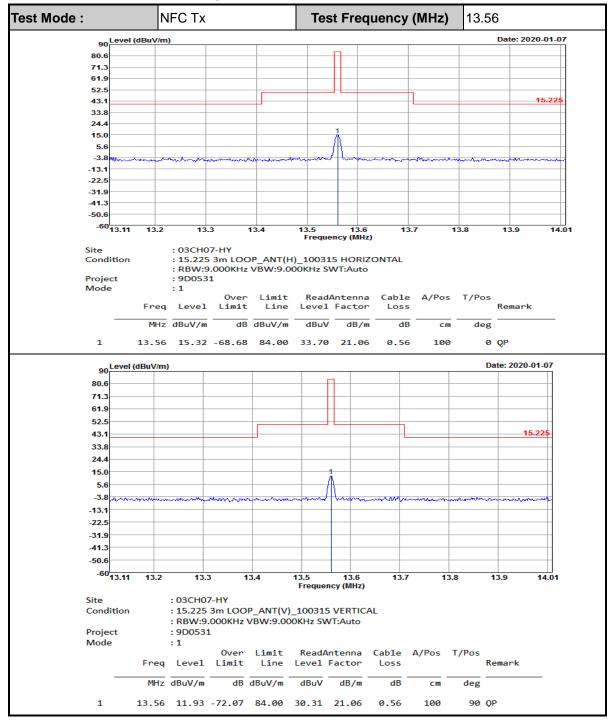
Voltage vs. Freque	ency Stability	Temperature vs. Frequency Stability			
Voltage (Vac)	Measurement Frequency (MHz)	Temperature (°C) Time		Measurement Frequency (MHz)	
		50	0	13.560000	
		2		13.560000	
			5	13.560000	
			10	13.560020	
Max.Deviation (MHz)	-0.000010	Max.Deviation	on (MHz)	0.000140	
Max.Deviation (ppm)	-0.7375	Max.Deviation	on (ppm)	10.3245	
Limit	FS < ±100 ppm	Limit		FS < ±100 ppm	
Test Result	PASS	Test Result		PASS	

Report No. : FR9D0531B

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

Appendix C. Test Results of Radiated Test Items

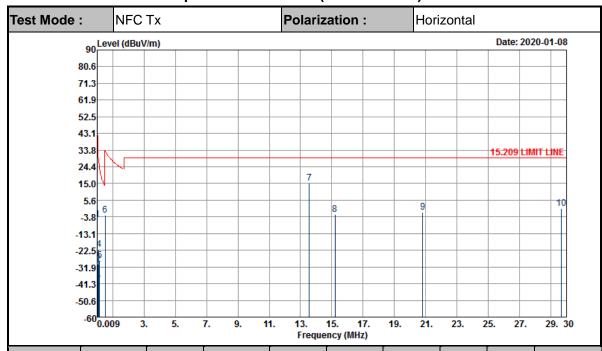
C1. Test Result of Field Strength of Fundamental Emissions



Report No.: FR9D0531B

TEL: 886-3-327-3456 Page Number : C1 of C5

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

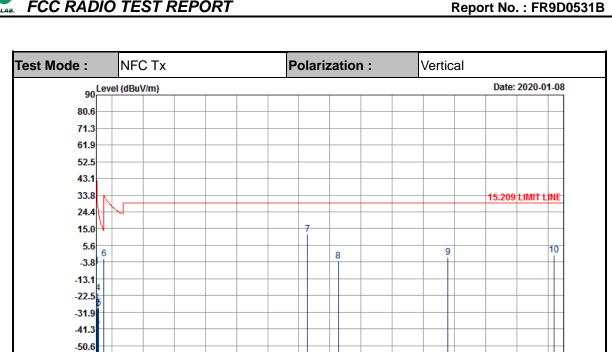


Report No.: FR9D0531B

Frequency	Level	Over	Limit	Read	Antenna	Cable	Ant	Table	Remark
		Limit	Line	Level	Factor	Loss	Pos	Pos	
(MHz)	$(dB\mu V/m)$	(dB)	(dBµV/m)	(dBµV)	(dB)	(dB)	(cm)	(deg)	
0.009	-5.26	-53.78	48.52	55.48	18.7	0.56	-	-	Average
0.0735	-30.35	-60.63	30.28	30.09	19	0.56	-	-	Average
0.09066	-39.6	-68.06	28.46	21.34	18.5	0.56	-	-	QP
0.12128	-22.17	-48.1	25.93	38.68	18.59	0.56	-	-	Average
0.15272	-28.26	-52.19	23.93	32.51	18.67	0.56	-	-	Average
0.51253	-2.73	-36.14	33.41	17.52	19.19	0.56	-	-	QP
13.56	15.32	-14.18	29.5	33.7	21.06	0.56	-	-	QP
15.216	-2.32	-31.82	29.5	15.9	21.22	0.56	-	-	QP
20.806	-1.13	-30.63	29.5	15.92	21.76	1.19	-	-	QP
29.68	0.91	-28.59	29.5	17.25	22.47	1.19	100	0	QP

TEL: 886-3-327-3456 Page Number : C2 of C5

-600.009



11.

13.

15.

Frequency (MHz)

17.

7.

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Ant Pos	Table Pos	Remark
(MHz)	(dBµV/m)		(dBµV/m)	(dBµV)	(dB)	(dB)	(cm)	(deg)	
0.00925	-6.27	-54.55	48.28	54.47	18.7	0.56	-	-	Average
0.07188	-30.11	-60.58	30.47	30.33	19	0.56	-	-	Average
0.0911	-39.98	-68.39	28.41	20.96	18.5	0.56	-	-	QP
0.11016	-21.11	-47.87	26.76	39.83	18.5	0.56	-	-	Average
0.15272	-29.59	-53.52	23.93	31.18	18.67	0.56	-	-	Average
0.50502	-1.75	-35.29	33.54	18.5	19.19	0.56	-	-	QP
13.56	11.93	-17.57	29.5	30.31	21.06	0.56	-	-	QP
15.544	-3.04	-32.54	29.5	15.15	21.25	0.56	-	-	QP
22.57	-1.03	-30.53	29.5	15.88	21.9	1.19	-	-	QP
29.37	0.28	-29.22	29.5	16.64	22.45	1.19	100	0	QP

19.

21.

23.

25.

27.

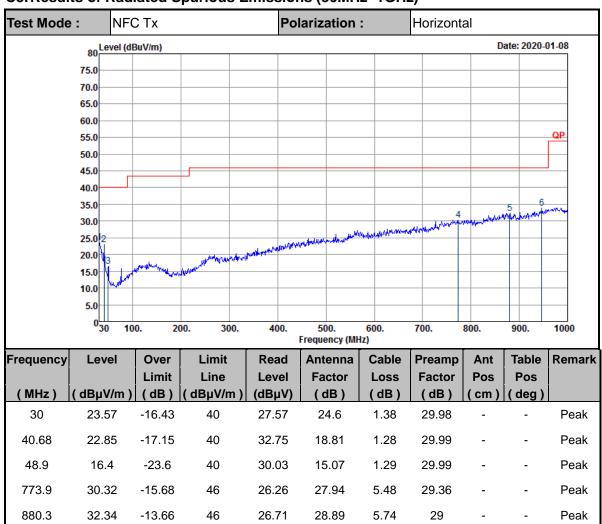
29. 30

Note:

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

TEL: 886-3-327-3456 Page Number : C3 of C5

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



25.84

30.13

6.56

100

28.59

0

Peak

Report No.: FR9D0531B

TEL: 886-3-327-3456 Page Number : C4 of C5

FAX: 886-3-328-4978

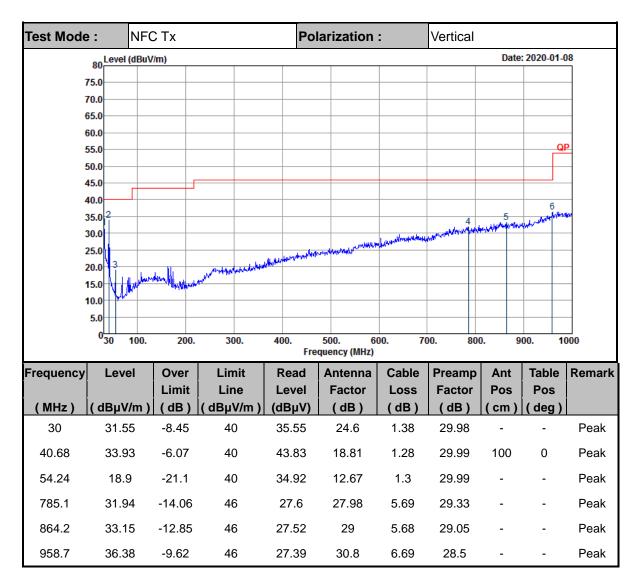
946.1

33.94

-12.06

46





Report No.: FR9D0531B

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 : C5 of C5