Variant FCC RF Test Report

APPLICANT : Zebra Technologies Corporation
EQUIPMENT : Enterprise Digital Assistant (EDA)

BRAND NAME : Zebra

MODEL NAME : MC67NA

FCC ID : UZ7MC67NA

STANDARD : FCC Part 15 Subpart E §15.407

CLASSIFICATION: (NII) Unlicensed National Information Infrastructure

This is a variant report which is only valid together with the original test report. The product was received on Apr. 17, 2015 and testing was completed on May 08, 2015. We, SPORTON INTERNATIONAL INC., 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., the test report shall not be reproduced except in full.

Reviewed by: Louis Wu / Manager

Lunis Win

Approved by: Jones Tsai / Manager



No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 1 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

1190

Report No.: FR221518-16

TABLE OF CONTENTS

RE'	VISIO	N HISTORY	3
SU	MMAF	RY OF TEST RESULT	4
1	GENI	ERAL DESCRIPTION	5
	1.1 1.2 1.3 1.4 1.5 1.6 1.7	Applicant Manufacturer Feature of Equipment Under Test Product Specification of Equipment Under Test Modification of EUT Testing Location Applicable Standards	5 5 5 6
2	2.1 2.2 2.3 2.4 2.5 2.6	Carrier Frequency and Channel Pre-Scanned RF Power Test Mode Connection Diagram of Test System EUT Operation Test Setup Measurement Results Explanation Example	
3	TEST	RESULT	11
	3.1 3.2 3.3 3.4 3.5 3.6 3.7	6dB Bandwidth Measurement Maximum Conducted Output Power Measurement Power Spectral Density Measurement Unwanted Emissions Measurement Frequency Stability Measurement Automatically Discontinue Transmission Antenna Requirements	13 14 16 21
4	LIST	OF MEASURING EQUIPMENT	24
	PEND	ERTAINTY OF EVALUATIONIX A. CONDUCTED TEST RESULTS	25
AP	PEND	IX B. RADIATED TEST RESULTS	

APPENDIX C. SETUP PHOTOGRAPHS

Report No. : FR221518-16

REVISION HISTORY

Report No. : FR221518-16

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR221518-16	Rev. 01	Updating the standard FCC new rule. Because conducted power of U-NII band I is not increasing, tests are not performed for U-NII band I. In this report, tests are performed only for U-NII band IV.	May 8, 2015

 SPORTON INTERNATIONAL INC.
 Page Number
 : 3 of 25

 TEL: 886-3-327-3456
 Report Issued Date
 : May 8, 2015

 FAX: 886-3-328-4978
 Report Version
 : Rev. 01

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm/MHz &15.209(a)	Pass	Under limit 1.20 dB at 5724.840 MHz
3.5	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 4 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No. : FR221518-16

1 General Description

1.1 Applicant

Zebra Technologies Corporation

1 Zebra Plaza, Holtsville, NY 11742

1.2 Manufacturer

Zebra Technologies Corporation

1 Zebra Plaza, Holtsville, NY 11742

1.3 Feature of Equipment Under Test

Product Feature				
Equipment	Enterprise Digital Assistant (EDA)			
Brand Name	Zebra			
Model Name	MC67NA			
FCC ID	UZ7MC67NA			
	GSM/EGPRS/WCDMA/HSPA			
EUT supports Radios application	WLAN 11a/b/g/n HT20			
	Bluetooth v2.1 BR/EDR			
HW Version	MP			
SW Version	3.46.0039			
FW Version	X_2.01.0.0.078R			
EUT Stage	Identical Prototype			

Report No.: FR221518-16

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard				
Tx/Rx Channel Frequency Range 5725 MHz ~ 5850 MHz				
Maximum Output Power	802.11a : 14.69 dBm / 0.0294 W			
waximum Output Power	802.11n HT20 : 15.18 dBm / 0.0330 W			
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)			
Antenna Type	PIFA Antenna			
Antenna Gain	3.41 dBi			

1.5 Modification of EUT

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

 SPORTON INTERNATIONAL INC.
 Page Number
 : 5 of 25

 TEL: 886-3-327-3456
 Report Issued Date
 : May 8, 2015

 FAX: 886-3-328-4978
 Report Version
 : Rev. 01

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.				
	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park,				
Test Site Location	Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.				
rest Site Location	TEL: +886-3-327-3456				
	FAX: +886-3-328-4978				
Test Site No.	Sporton Site No.				
rest Site No.	TH02-HY	03CH07-HY			

Note: The test site complies with ANSI C63.4 2009 requirement.

1.7 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v01
- ANSI C63.10-2009

Remark:

- All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.

SPORTON INTERNATIONAL INC.
TEL: 886-3-327-3456

FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 6 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	149	5745	157	5785
5725-5850 MHz	151	5755	159	5795
Band 4 (U-NII-3)	153	5765	161	5805
(0 1411 0)	155	5775	165	5825

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 7 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables.

Report No. : FR221518-16

: 8 of 25

5GHz 802.11a mode									
Data Rate (MHz)									
Channel Frequency 6M bps 9M bps 12M bps 18M bps 24M bps 36M bp					36M bps	48M bps	54M bps		
CH 149	5745 MHz	<mark>14.69</mark>	14.67	14.59	14.66	14.68	14.67	14.65	14.64
CH 157	5785 MHz	14.36	14.29	14.30	14.33	14.27	14.35	14.31	14.24
CH 165	5825 MHz	14.28	14.27	14.27	14.25	14.24	14.25	14.26	14.24

5GHz 802.11n HT20 mode									
Channal	Data Rate (MHz)								
Channel	Frequency	MCS0 MCS1 MCS2 MCS3 MCS4 MCS5 MCS6 MC					MCS7		
CH 149	5745 MHz	14.61	14.44	14.48	14.57	14.59	14.59	14.57	14.54
CH 157	5785 MHz	<mark>15.01</mark>	14.83	14.79	14.93	14.95	15.00	14.92	14.94
CH 165	5825 MHz	14.74	14.54	14.56	14.46	14.59	14.71	14.69	14.68

SPORTON INTERNATIONAL INC. Page Number TEL: 886-3-327-3456 Report Issued Date: May 8, 2015 FAX: 886-3-328-4978

: Rev. 01 Report Version FCC ID: UZ7MC67NA Report Template No.: BU5-FR15EWLB4 AC MA Version 1.0

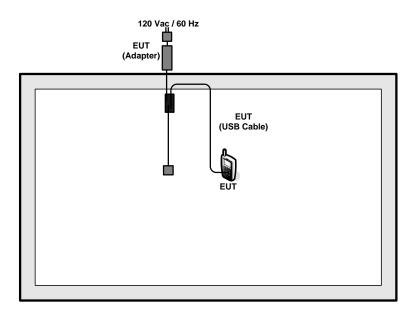
2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0

Ch. #		Band IV: 57	25-5850 MHz
		802.11a	802.11n HT20
L	Low	149	149
M	Middle	157	157
Н	High	165	165

2.4 Connection Diagram of Test System



2.5 EUT Operation Test Setup

The programmed RF utility "XW2DMT", is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 9 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$$

= 4.2 + 10 = 14.2 (dB)

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 10 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report Template No.: BU5-FR15EWLB4 AC MA Version 1.0

Report No.: FR221518-16

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Description of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
 Section C) Emission bandwidth for the band 5.725-5.85GHz
- 2. Set RBW = 100kHz.
- 3. Set the VBW \geq 3 x RBW.
- 4. Detector = Peak.
- 5. Trace mode = max hold
- 6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
- 7. Measure and record the results in the test report.

3.1.4 Test Setup



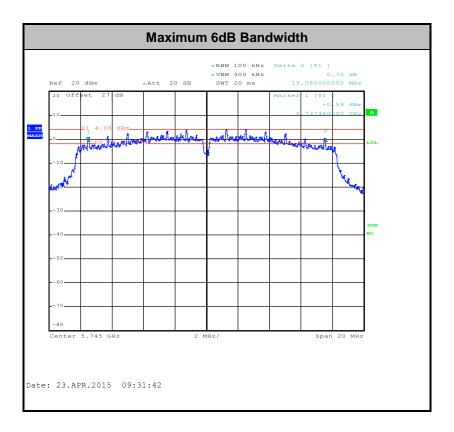
SPORTON INTERNATIONAL INC.
TEL: 886-3-327-3456

FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 11 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 12 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

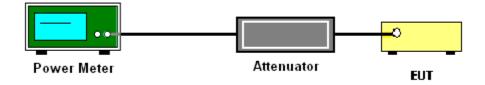
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

Method PM (Measurement using an RF average power meter):

- 1. Measurement is performed using a wideband RF power meter.
- 2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
- 3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 13 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

Report No.: FR221518-16

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01. Section F) Maximum power spectral density.

Method SA-2

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- 1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
 - Measure the duty cycle.
 - · Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300 kHz.
 - Set VBW ≥ 1 MHz.
 - Number of points in sweep ≥ 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add 10 log(500kHz/RBW) to the test result.
 - Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 14 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

- 2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
- 3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

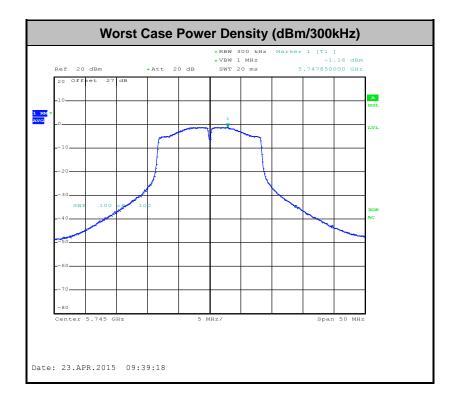
Report No.: FR221518-16

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 15 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

3.4 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

Report No.: FR221518-16

3.4.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5725-5850 MHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBμV/m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBμV/m).
- (2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(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

Note: The following formula is used to convert the EIRP to field strength.

$$E = \frac{1000000\sqrt{30P}}{3}$$
 µV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBµV/m)		
-17	78.3		
- 27	68.3		

(3) KDB789033 v01r03 H)2)c)(i) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

 SPORTON INTERNATIONAL INC.
 Page Number
 : 16 of 25

 TEL: 886-3-327-3456
 Report Issued Date
 : May 8, 2015

 FAX: 886-3-328-4978
 Report Version
 : Rev. 01

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
 Section G) Unwanted emissions measurement.

Report No.: FR221518-16

- (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
- (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW ≥ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
- (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11a	98.62	-	-	10Hz
1	802.11n HT20	98.37	-	-	10Hz

 SPORTON INTERNATIONAL INC.
 Page Number
 : 17 of 25

 TEL: 886-3-327-3456
 Report Issued Date
 : May 8, 2015

 FAX: 886-3-328-4978
 Report Version
 : Rev. 01



2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.

Report No.: FR221518-16

- 3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- 4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- 5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
- 6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
- 7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

 SPORTON INTERNATIONAL INC.
 Page Number
 : 18 of 25

 TEL: 886-3-327-3456
 Report Issued Date
 : May 8, 2015

 FAX: 886-3-328-4978
 Report Version
 : Rev. 01

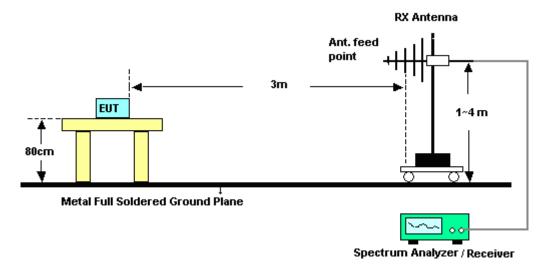
t Report No. : FR221518-16

3.4.4 Test Setup

For radiated emissions below 30MHz



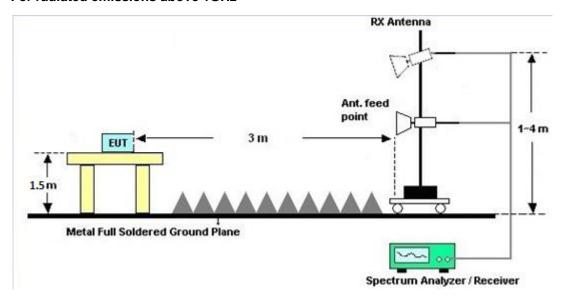
For radiated emissions from 30MHz to 1GHz



SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 19 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix B.

3.4.7 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 20 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

3.5 Frequency Stability Measurement

3.5.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

- To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- 2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
- The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.5.4 Test Setup



3.5.5 Test Result of Frequency Stability

Please refer to Appendix A.

FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 21 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No.: FR221518-16

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

Report No.: FR221518-16

3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 22 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

3.7 Antenna Requirements

3.7.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Report No.: FR221518-16

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna gain is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 23 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 09, 2014	Apr. 23, 2015 ~ May 07, 2015	Jun. 08, 2015	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 09, 2014	Apr. 23, 2015 ~ May 07, 2015	Aug. 08, 2015	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 09, 2014	Apr. 23, 2015 ~ May 07, 2015	Aug. 08, 2015	Conducted (TH02-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1000MH z	Mar. 12, 2015	Apr. 27, 2015~ May 08, 2015	Mar. 11, 2016	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 21, 2014	Apr. 27, 2015~ May 08, 2015	Oct. 20, 2015	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	159075	1GHz ~ 18GHz	Apr. 20, 2015	Apr. 27, 2015~ May 08, 2015	Apr. 19, 2016	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-1800400 0-33-8P	1840917	18GHz ~ 40GHz	Jun. 09, 2014	Apr. 27, 2015~ May 08, 2015	Jun. 08, 2015	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A	MY54130085	20Hz ~ 8.4GHz	Nov. 05, 2014	Apr. 27, 2015~ May 08, 2015	Nov. 04, 2015	Radiation (03CH07-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHZ	Oct. 14, 2014	Apr. 27, 2015~ May 08, 2015	Oct. 13, 2015	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jul. 28, 2014	Apr. 27, 2015~ May 08, 2015	Jul. 27, 2015	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D	35413	30MHz~1GHz	Oct. 24, 2014	Apr. 27, 2015~ May 08, 2015	Oct. 23, 2015	Radiation (03CH07-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Oct. 03, 2014	Apr. 27, 2015~ May 08, 2015	Oct. 02, 2015	Radiation (03CH07-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz- 40GHz	Nov. 03, 2014	Apr. 27, 2015~ May 08, 2015	Nov. 02, 2015	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 degree	N/A	Apr. 27, 2015~ May 08, 2015	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Apr. 27, 2015~ May 08, 2015	N/A	Radiation (03CH07-HY)

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 24 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report Template No.: BU5-FR15EWLB4 AC MA Version 1.0

Report No. : FR221518-16

5 Uncertainty of Evaluation

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

	<u> </u>
Measuring Uncertainty for a Level of	4.50
Confidence of 95% (U = 2Uc(y))	4.50

Report No. : FR221518-16

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : 25 of 25
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Appendix A. Conducted Test Results

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978 FCC ID: UZ7MC67NA Page Number : A1 of A1
Report Issued Date : May 8, 2015
Report Version : Rev. 01

Report No. : FR221518-16