



FCC RADIO EXPOSURE TEST REPORT

FCC ID : 2ADZRBEACON1-1
Equipment : Nokia WiFi Beacon 1.1
Brand Name : Nokia
Model Name : Beacon 1.1
Applicant : Nokia Shanghai Bell Co., Ltd.
No.388, Ningqiao Rd, Pilot Free Trade Zone
Shanghai, 201206 P.R. China
Manufacturer : Nokia Shanghai Bell Co., Ltd.
No.388, Ningqiao Rd, Pilot Free Trade Zone
Shanghai, 201206 P.R. China
Standard : 47 CFR Part 2.1091

The product was received on Aug. 31, 2020, and testing was started from Aug. 31, 2020 and completed on Oct. 20, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this variant 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.


Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 EUT General Information	5
1.2 Table for EUT information	5
1.3 Table for Multiple Listing	5
1.4 EUT Supports Function	6
1.5 Table for Class II Change.....	6
1.6 Testing Location	6
2 Maximum Permissible Exposure	7
2.1 Limit of Maximum Permissible Exposure	7
2.2 MPE Calculation Method.....	7
2.3 Calculated Result and Limit.....	8

Photographs of EUT v01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	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: Sam Chen

Report Producer: Vicky Huang

1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.2 Table for EUT information

The EUT has two set are identical to each other in all aspects except for the following table:

EUT	Description
EUT 1	Antenna set 1
EUT 2	Antenna set 2

1.3 Table for Multiple Listing

The EUT has two market sale set which are identical to each other in all aspects except for the following table:

Model Name	Unit	Part number	Adapter	RJ-45 cable
Beacon 1.1	KIT_Beacon 1.1	3FE 49234 XX,(XX (where,x, acharacters can be replaced by either alphanumeric character between A and Z) means that different customer markets have no difference in product hardware and have no impact on EMC	√	√
	EMA_Beacon 1.1	3FE 49236 XX,(XX (where,x, acharacters can be replaced by either alphanumeric character between A and Z) means that different customer markets have no difference in product hardware and have no impact on EMC	—	—



Note1: From the above table, model: Beacon 1.1 for unit: KIT_Beacon 1.1 was selected as representative model for the test and its data was recorded in this report.

Note2: The above information was declared by manufacturer.

1.4 EUT Supports Function

The EUT supports AP Router mode and mesh mode.

1.5 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA083105

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz) for this device, and it has the straddle channels (5690 MHz, 5710MHz, 5720 MHz).	MPE test.
2. Modify the design of shielded case mechanism. 3. Heat sink pad replace by heat sink paste. 4. Change the housing bracket color and add the hood of the LED.	Do not effect the test results.

Note: Maximum Permissible Exposure of 2.4GHz Band and 5GHz Band 1, 4 are based on original test report.

1.6 Testing Location

Testing Location		
<input type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.) TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*(100)	<6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1500	-	-	f/1500	<30
1500-100,000	-	-	1.0	<30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;G1D	4.11	28.87	32.98	0.50	33.48	2.22844	20	0.44333	1.00000
5.2G;D1D	6.13	27.50	33.63	0.50	34.13	2.58821	20	0.51491	1.00000
5.3G;D1D	6.13	23.30	29.43	0.50	29.93	0.98401	20	0.19576	1.00000
5.6G;D1D	6.12	23.06	29.18	0.50	29.68	0.92897	20	0.18481	1.00000
5.8G;D1D	6.09	27.54	33.63	0.50	34.13	2.58821	20	0.51491	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WLAN 5GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;G1D	4.11	28.87	32.98	0.50	33.48	2.22844	20	0.44333	1.00000	0.44333
5.2G;D1D	6.13	27.50	33.63	0.50	34.13	2.58821	20	0.51491	1.00000	0.51491
									Sum Ratio	0.95824
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————