TEST REPORT

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1. Client

- Name : SUPREMA INC
- Address : 17F-5, Parkview officetower,, 248, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13554 Korea (Republic Of)
- Date of Receipt : 2022-07-26

2. Use of Report : Certification

3. Name of Product / Model : BioEntry W2 / BEW2-OAPB

4. Manufacturer / Country of Origin : SUPREMA INC / Korea

5. FCC ID : TKWBEW2-OAPB2

6. IC Certificate No. : 23080-BEW2OAPB2

7. Date of Test : 2022-08-22 to 2022-09-01

8. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing
(Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

9. Test method used : RSS-102 Issue 5 February 2021
SPR-002 Issue 1 Sep. 2016

10. Test Result : Refer to the test result in the test report

	Tested by	Technical Manager
Affirmation	Name : Eunseong Lim (Signature)	Name : Heesu Ahn (Signature)

2022-09-23

Eurofins KCTL Co.,Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2022-09-23	Originally issued	-

General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

CONTENTS

1. General information

Client	:	SUPREMA INC
Address	:	17F-5, Parkview officetower,, 248, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13554 Korea (Republic Of)
Manufacturer	:	SUPREMA INC
Address	:	17F-5, Parkview officetower,, 248, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13554 Korea (Republic Of)
Laboratory	:	Eurofins KCTL Co.,Ltd.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132
		VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
		CAB Identifier: KR0040, ISED Number: 8035A
		KOLAS No.: KT231

2. Device information

Equipment under test	:	BioEntry W2
Model	:	BEW2-OAPB
Derivative model	:	BEW2-ODPB, BEW2-OHPB, BC-LRE-BFI, HON-FIN4000AC-100K, ARD-FPBEW2-H2, ARD-FPBEW2-H3
Frequency range	:	13.56 ㎒ (NFC)
		125 ㎑ (RFID)
		2 402 ㎒ ~ 2 480 ㎒ (Bluetooth Low Energy)
Modulation technique	:	ASK (NFC,RFID), GFSK (Bluetooth Low Energy)
Number of channels	:	40 ch (Bluetooth Low Energy), 1 ch (NFC, RFID)
Power source	:	DC 12 ㅿ, PoE 48 ㅿ
Antenna specification	:	PCB Loop antenna (NFC)
		Coil antenna (RFID)
		PCB antenna (Bluetooth Low Energy)
Antenna gain	:	3 ㏈i (Bluetooth Low Energy)
Software version	:	V1.7
Hardware version	:	V1.2
Operation temperature	:	-20 ℃ ~ 50 ℃

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
N/A	-	-	-	-

2.2. Information about derivative model

The difference between basic model and derivative models is:

Basic model	Derivative model	Difference
BEW2-OAPB	BEW2-ODPB	Removed SAM IC
	BEW2-OHPB	Removed SAM IC, add HID s/w license.
	BC-LRE-BFI, HON-FIN4000AC-100K, ARD-FPBEW2-H2, ARD-FPBEW2-H3	BEW2-OAPB with customer's mark & label

All models are made up by same H/W, F/W and compared with basic mode, the difference described as above. Each models are the same functionality except for the SAM function. The SAM IC operation is activated / deactivated by registering the model name.

2.3. Frequency/channel operations

This device contains the following capabilities:
NFC, RFID(125 ㎑), Bluetooth Low Energy

Ch.	Frequency (㎑)
01	125

Table 2.3.1. RFID

2.4. Normal and extreme test conditions

- Ambient Conditions

	Temperature [℃]	Relative humidity [%]
Requirement for tests	15 to 35	20 to 75
Ambient Conditions	21	51

3. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.
All measurement uncertainty values are shown with a coverage factor of k=2 to indicated a 95 % level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (±)	
E-Field	3 ㎑ ~ 10 ㎒	1.0 %
H-Field	3 ㎑ ~ 10 ㎒	1.3 %

4. General Condition

4.1. RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

According to RSS-102 Issue 5, Paragraph "4. Exposure Limits", Industry of Canada has adopted the RF field strength limits stablished in Healths Canada's RF exposure guideline, Safety code 6:

Frequency Range (㎒)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10[21]	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ $f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ $f^{0.25}$	0.1540/ $f^{0.25}$	8.944/ $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 f 0.3417	0.008335 f 0.3417	0.02619f0.6834	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10^{-4} $f^{0.5}$	6.67 x 10^{-5} f	616000/ $f^{1.2}$

Note: f is frequency in ㎒.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

4.2. Exemption Limits for Routine Evaluation – RF Exposure Evaluation

According to RSS-102 Issue 5 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 ㎝, except when the device operates as follows:

- Below 20 ㎒ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1W (adjusted for tune-up tolerance);
- At or above 20 ㎒ and below 48 ㎒ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 4.49/ $f^{0.5}$ W (adjusted for tune-up tolerance), where f is in ㎒;
- At or above 48 ㎒ and below 300 ㎒ and the source-bands, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- At or above 300 ㎒ and below 6 ㎓ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10^{-2} $f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in ㎒;
- At or above 6 ㎓ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance.)

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

4.3. Limb Exposure Considerations

The basic restrictions are based on internal induced electric field or SAR. The relationship between the induced field and that of the exposure area is proportional; thus, in cases where the limbs are the primary point of exposure, the induced field would be less than that induced in the trunk of the human body.

When assessing compliance at the compliance distance, where limb exposure is the primary exposed condition, the following table may be used for relaxation of the RSS-102 nerve stimulation RLs.

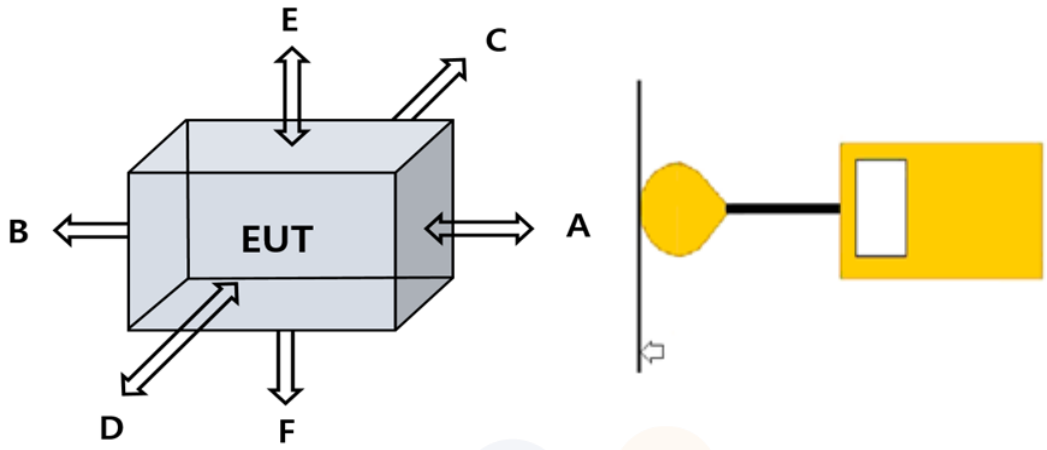
Exposure Condition	Relaxation Factor	Electric Field (V/m r.m.s.)	Magnetic Field (A/m r.m.s.)
Whole Body / Torso / Head	1.0	83	90
Leg	1.5	124.5	135
Arm	2.5	207.5	225
Hand / Foot	5.0	415	450

Note : The values of the electric field and the magnetic field in Table 2 are for indication purposes only and do not supersede the levels specified in RSS-102.

A second exposure evaluation must be taken at the distance at which the trunk of the body would rest in relation to the device under test.

5. Test results

5.1. Nerve Simulation (RFID)



*** Measurement Distance**

The measurement distance is the manufacturer's declared separation distance obtained via the information in the user manual. This shall be measured as the distance from the edge of the device to the edge of the measurement probe. The separation distance must be a logical distance based on normal usage conditions.

Notes:

1. The test setup is depended on product type described in the SPR-002.
2. As described in SPR-002, all of axis (top, right, left, bottom, rear and front) was investigated.
3. All of position is measured by 3 axis isotropic probe.
4. The Manufacturer declares proper distance 20 ㎝.
5. If the distance of the passive desk top device is complied with 10 ㎝ distance of SPR-002.

Test procedure

6.6.1 Direct Measurement Methods Against the RSS-102 Nerve Stimulation RLs

The following measurement procedures may be used for direct measurement against the RSS-102 nerve stimulation RLs. Measurements must be taken for both the E-field and H-field, since the measurement distance described in Section 6.4 will be in the near field where the relationship between the E- and H-fields is unknown.

6.6.1.1 Measurement Method When the RBW of the Measurement Probe is Greater Than the 99% OBW or When Using a Broadband Probe

When the RBW of the measurement probe is greater than the 99% OBW, or when using a broadband probe, use the following measurement method:

(a) Set the measurement frequency of the measurement probe to the fundamental frequency of the device under test.
(b) Set the span to encompass the entire emission bandwidth.
(c) Set the RBW greater than the 99% OBW of the fundamental emission.

Note: This step is not required for a broadband measurement probe that integrates the entire frequency range.

(d) Set the detector to Peak and trace display to Max-Hold.
(e) Allow the spectrum to fill; for pulsing devices this may require an increased monitoring period.
(f) Using a marker, set it to the maximum level of the spectral envelope.
(g) Repeat steps (b) to (f) while scanning a parallel plane at the measurement distance on each side of the device to find the peak level.
(h) Repeat steps (b) to (g) for any frequencies where the field value is greater than -20 dBc below the maximum level identified.
(i) If there are multiple frequencies transmitted by the device under test, use equations (2) and (3) to determine compliance.

Note: When scanning around the entire device, the location found to be the maximum for the E- field or H-field may not be the same location as the opposite field.

6.6.1.2 Measurement Method When the RBW of the Measurement Probe is Less Than the 99% OBW.

When the RBW of the measurement probe is less than the 99% OBW, use the following measurement method:

(a) Set the measurement frequency of the measurement probe to the fundamental frequency of the device under test.
(b) Set the span to encompass the entire emission bandwidth.
(c) Set the RBW to approximately equal to but greater than 1% of the 99% OBW of the fundamental emission.
(d) Set the detector to Peak and trace display to Max-Hold.
(e) Allow the spectrum to fill; for pulsing devices, this may require an increased monitoring period.
(f) Capture the trace and sum the spectrum levels (in voltage or current units) at intervals equal to the RBW, extending across the entire spectrum. Alternatively, this may be accomplished using an integration function on the measurement probe.
(g) Repeat steps (b) to (f) while scanning a parallel plane at the measurement distance on each side of the device to find the peak level.
(h) Repeat steps (b) to (g) for any frequencies where the field value is greater than -20 dBc below the maximum level identified.
(i) If there are multiple frequencies transmitted by the device under test, use equations (2) and (3) to determine compliance.

Note: When scanning around the entire device, the location found to be the maximum for the E- field or H-field may not be the same location as the opposite field.

6.6.1.3 Measurement Method for a Single-Axis Probe

For a single-axis probe, use the following measurement method:
(a) Use the appropriate measurement method from Section 6.6.1.1 or Section 6.6.1.2 (depending on the probe capabilities) at the fundamental frequency of the device under test (i.e. without the last step in either Section 6.6.1.1 or Section 6.6.1.2).
(b) Repeat step (a) for the remaining two axes.
(c) Using formula (4) or (5), sum the measurements from the three axes.
(d) Repeat steps (a) to (c) for any harmonic frequencies and any other fundamental frequency and its harmonics transmitted by the device under test.
(e) If there are multiple frequencies transmitted by the device under test, use equation (2) or (3) for determining compliance.

Test results

DC 12 V

E-field Measurements

Distance (㎝)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	Position F (V/m)	Limit (V/m)
0	7.241	6.654	4.058	5.415	12.266	0.962	83.00

H-field Measurements

Distance (㎝)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limit (A/m)
0	3.432	0.528	1.229	0.899	12.956	0.160	90.00

- Max. E-field : 12.266 V/m (E : Top), Max. H-field : 12.956 A/m (E : Top)

PoE 48 V

E-field Measurements

Distance (㎝)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	Position F (V/m)	Limit (V/m)
0	7.921	5.871	3.448	7.445	13.330	13.338	83.00

H-field Measurements

Distance (㎝)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limit (A/m)
0	3.485	0.872	0.964	0.439	12.471	12.163	90.00

- Max. E-field : 13.338 V/m (E : Top), Max. H-field : 12.417 A/m (E : Top)

6. Measurement Equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
E&H Field Probe	narda	EHP-200A	170WX81015	23.02.11
DC Power Supply	AGILENT	E3632A	MY40007371	23.05.02

End of test report