EMF TEST REPORT

Test Report No.	**: OT-224-RWD-033**
Reception No.	**: 2203001006**
Applicant	**: ONSEMIROTECH CO., LTD.**
Address	**: Rm920, Lead Smartsquare, Maehwasandan3gil 1, Siheung-si, Gyeonggi-do, 14931, South Korea**
Manufacturer	**: ONSEMIROTECH CO., LTD.**
Address	**: Rm920, Lead Smartsquare, Maehwasandan3gil 1, Siheung-si, Gyeonggi-do, 14931, South Korea**
Type of Equipment	**: BLE Module**
FCC ID.	**: 2A6YE-OSB-32**
Model Name	**: OSB-32**
Multiple Model Name	**: OSB-11, OSB-10, IOKEY**
Serial number	**: N/A**
Total page of Report	**: 7 pages (including this page)**
Date of Incoming	**: April 04, 2022**
Date of issue	**: April 27, 2022**

SUMMARY

The equipment complies with the regulation; ***FCC 47 CFR Part 1, 1.1310***

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Tested by	Reviewed by	Approved by
Su-Min, Yoo / Assistant Manager	Tae-Ho, Kim / General Manager	Ki-Hong, Nam / General Manager
ONETECH Corp.	ONETECH Corp.	ONETECH Corp.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-224-RWD-033	April 27, 2022	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant : ONSEMIROTECH CO., LTD.

Address : Rm920, Lead Smartsquare, Maehwasandan3gil 1, Siheung-si, Gyeonggi-do, 14931, South Korea

Contact Person : DONG-HOON, YOO / CEO

Telephone No. : +82-70-8796-9444

FCC ID : 2A6YE-OSB-32

Model Name : OSB-32

Brand Name : -

Serial Number : N/A

Date : April 27, 2022

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	BLE Module
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2020
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. GENERAL INFORMATION

2.1 Product Description

The ONSEMIROTECH CO., LTD., Model OSB-32 (referred to as the EUT in this report) is a BLE Module. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	BLE Module
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
MODULATION TYPE	GFSK
RF OUTPUT POWER	-4.13 dBm
NUMBER OF CHANNEL	40 Channel
ANTENNA TYPE	Chip Antenna
ANTENNA GAIN	2.3 dBi
Electrical Rating	DC 3.30 V
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32 MHz

2.2 Alternative type(s)/model(s); also covered by this test report.

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
OSB-32	Basic Model	☑
OSB-11, OSB-10, IOKEY	The model is identical to basic model except for the model name only.	☐

Note: 1. Applicant consigns only basic model to test. Therefore this test report just guarantees the units, which have been tested.

2. The Applicant/manufacturer is responsible for the compliance of all variants.

3. EUT MODIFICATIONS

-. None

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4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are f/1500 mW/cm² for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$E = \sqrt{(30 * P * G)} / d$, and $S = E^2 / Z = E^2 / 377$, because 1 mW/cm² = 10 W/m²

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric filed strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combing equations and rearranging the terms to express the distance as a function of the remaining variable

$d = \sqrt{(30 * P * G) / (377 * 10 S)}$

Changing to units of mW and cm, using P (mW) = P (W) / 1 000, d (cm) = 0.01 * d (m)

$d = 0.282 * \sqrt{(P * G) / S}$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

4.2 EUT Description

Kind of EUT	BLE Module
Device Category	☐ Portable (< 20 cm separation) ☐ Mobile (> 20 cm separation) ■ Others
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ SAR Test Exclusion Evaluation

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4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
			(dBm)	(mW)	Log	Linear			
2 402 ~ 2 480	1 Mbps	-4.13 ± 1.0	-3.13	0.49	2.30	1.70	0.26	0.000 16	1.00

According to above table, for 2 402 ~ 2 480 MHz Band(1 Mbps), safe distance,

D = 0.282 * √ (0.49 * 1.70)/1.00 = 0.26 cm.

For getting power density at 20 cm separation in above table, following formula was used.

$S = P * G / (4\pi * R^2) = 0.49 * 1.70 / (4 * \pi * 20\text{^}2) = 0.000\ 16$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna