

RADIO PERFORMANCE TEST REPORT

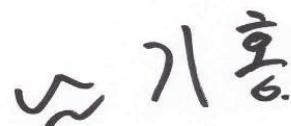
Test Report No. : OT-223-RWD-082
Reception No. : 2202000536
Applicant : PROCHIP
Address : #1112, Ace High-End Tower 1st, 5, Digital-Ro 26, Guro-Gu, Seoul, KOREA
Manufacturer : PROCHIP
Address : #1112, Ace High-End Tower 1st, 5, Digital-Ro 26, Guro-Gu, Seoul, KOREA
Type of Equipment : BLE module
FCC ID. : 2A5XQ-POT-NR232
Model Name : PoT-nR232
Multiple Model Name : N/A
Serial number : N/A
Total page of Report : 7 pages (including this page)
Date of Incoming : March 02, 2022
Date of issue : March 31, 2022

SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART C Section 15.247**

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.



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OTC-TRF-RF-001(0)

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-223-RWD-082	March 31, 2022	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : PROCHIP

Address : #1112, Ace High-End Tower 1st, 5, Digital-Ro 26, Guro-Gu, Seoul, KOREA

Contact Person : Son Oh Kyoung / Department Manager

Telephone No. : +82-10-6731-4994

FCC ID : 2A5XQ-POT-NR232

Model Name : PoT-nR232

Brand Name : N/A

Serial Number : N/A

Date : March 31, 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	Certification
AUTHORIZATION REQUESTED	
EQUIPMENT WILL BE OPERATED	FCC PART 15 SUBPART C Section 15.247
UNDER FCC RULES PART(S)	KDB 558074 D01 15.247 Meas Guidance v05r02
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 PROCHIP, Model PoT-nR232 (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
Temperature Range	-40 °C ~ +85 °C
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
MODULATION TYPE	GFSK for 1 Mbps
Number of Channels	40 Channels
RF OUTPUT POWER	-0.13 dBm
ANTENNA TYPE	Chip Antenna
ANTENNA GAIN	0.5 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32MHz

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

- None

3. EUT MODIFICATIONS

- None

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 $f/1500 \text{ mW/cm}^2$ for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm^2 for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm^2 exposure is calculated as follows:

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

Where

S = Power density in mW/cm^2 , Z = Impedance of free space, 377Ω

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

Combining 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 $P (\text{mW}) = P (\text{W}) / 1000$, $d (\text{cm}) = 0.01 * d (\text{m})$

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

Where

d = distance in cm , P = Power in mW , G = Numeric antenna gain, and S = Power density in mW/cm^2

4.2 EUT Description

Kind of EUT	BLE module
Device Category	<input type="checkbox"/> Portable (< 20 cm separation) <input type="checkbox"/> Mobile (> 20 cm separation) <input checked="" type="checkbox"/> Others
Exposure	<input checked="" type="checkbox"/> MPE
Evaluation Applied	<input type="checkbox"/> SAR <input type="checkbox"/> N/A

4.3 Calculated MPE Safe Distance

According to the procedure, KDB 447498 D01, the standalone SAR test exclusion threshold is

$$[(\text{Max. Power of channel, including tune-up tolerance, mW})/(\text{Min. test separation distance, mm})] \times [\sqrt{f(\text{GHz})}] < 3$$
$$= (1.22/5) \times \sqrt{2.402} = 0.378$$

Mode	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
Bluetooth LE	2.402.00	-0.13 ± 1.0	0.87	1.22	5	0.378

Conclusion:

SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.