

EMF TEST REPORT

Test Report No. : OT-239-RWD-032
Reception No. : 2308002557
Applicant : Dnet. Co., Ltd
Address : 23, Hosan-ro 2-gil, Dalseogu, Daegu, South Korea
Manufacturer : Dnet. Co., Ltd
Address : 23, Hosan-ro 2-gil, Dalseogu, Daegu, South Korea
Type of Equipment : Microwave Radar Module
FCC ID : 2BCYL-DNS-010CX
Model Name : DNS-010CX
Multiple Model Name : N/A
Serial number : N/A
Total page of Report : 7 pages (including this page)
Date of Incoming : August 07, 2023
Date of Issuing : September 25, 2023

SUMMARY

The equipment complies with the regulation; **FCC CFR 47 PART 2.1091**

This test report contains only 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.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.



Tested by
Si-eon Lee / Sr. Engineer
ONETECH Corp.

Reviewed by
Tae-Ho, Kim / Chief Engineer
ONETECH Corp.

Approved by
Jae-Ho, Lee / Chief Engineer
ONETECH Corp.

CONTENTS

	Page
1. VERIFICATION OF COMPLIANCE	4
2. GENERAL INFORMATION.....	5
2.1 PRODUCT DESCRIPTION.....	5
2.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT.....	5
3. EUT MODIFICATIONS.....	5
4. MAXIMUM PERMISSIBLE EXPOSURE.....	6
4.1 RF EXPOSURE CALCULATION	6
4.2 EUT DESCRIPTION.....	6
4.3 CALCULATED MPE SAFE DISTANCE.....	7

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-239-RWD-032	September 25, 2023	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : Dnet. Co., Ltd
Address : 23, Hosan-ro 2-gil, Dalseogu, Daegu, South Korea
Contact Person : Jung ChulHwan / Director
Telephone No. : +82-53-584-3545
FCC ID : 2BCYL-DNS-010CX
Model Name : DNS-010CX
Brand Name : -
Serial Number : N/A
Date : September 25, 2023

DEVICE TYPE	FDS - Part 15 Field Disturbance Sensor
E.U.T. DESCRIPTION	Microwave Radar Module
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	KDB 447498 D01 General RF Exposure Guidance v06
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT	Certification
AUTHORIZATION REQUESTED	
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None

- 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 Dnet. Co., Ltd, Model DNS-010CX (referred to as the EUT in this report) is an Microwave Radar Module, Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Microwave Radar Module
OPERATING FREQUENCY	10.525 GHz
Field Strength of Fundamental	106.61 dB μ V/m
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	0 dBi

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	Microwave Radar Module
MAX. RF OUTPUT POWER	106.61 dB μ V/m
Device Category	<input type="checkbox"/> Portable (< 20 cm separation) <input checked="" type="checkbox"/> Mobile (> 20 cm separation) <input 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 above equation, the following result was obtained.

Operating Freq. Band (GHz)	Target Power W/tolerance (dBm)	Max tune up power		Safe Distance (cm)	Power Density (mW/cm ²) @ 20 cm Separation	Limit (mW/cm ²)
		(dBm)	(mW)			
10.525	11.41 ± 0.5	11.91	15.52	1.11	0.003 090	1.00

$$E.I.R.P(\text{dBm}) = 106.61 - 95.2 = 11.41 \text{ dBm}$$

According to above table, for 10.525 GHz, safe distance,

$$D = 0.282 * \sqrt{15.52/1.00} = 1.11 \text{ cm.}$$

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

$$S = P * G / (4\pi * R^2) = 15.52 / (4 * \pi * 20^2) = 0.003 090$$

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