

EMF TEST REPORT

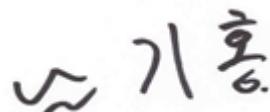
Test Report No. : OT-218-RWD-029
Reception No. : 2107003324
Applicant : FCUNWIRED
Address : #1110, 11F, Byucksan Digital Valley 6-cha, 219, Gasan Digital 1-ro, Geumcheon-gu, Seoul, Korea
Manufacturer : FCUNWIRED
Address : #1110, 11F, Byucksan Digital Valley 6-cha, 219, Gasan Digital 1-ro, Geumcheon-gu, Seoul, Korea
Type of Equipment : Fall prevention Transmitter
FCC ID. : 2A2N3-GCST900
Model Name : GCST900
Multiple Model Name : N/A
Serial number : N/A
Total page of Report : 7 pages (including this page)
Date of Incoming : July 20, 2021
Date of issue : August 12, 2021

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.


유수민
이하람

Tested by

/ Su-Min You / Assistant Manager
ONETECH Corp.

Reviewed by

/ Ha-Ram Lee / Manager
ONETECH Corp.

Approved by

/Ki-Hong, Nam / General Manager
ONETECH Corp.

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OTC-TRF-RF-001(0)

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-218-RWD-029	August 12, 2021	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : FCUNWIRED

Address : #1110, 11F, Byucksan Digital Valley 6-cha, 219, Gasan Digital 1-ro, Geumcheon-gu, Seoul, Korea

Contact Person : SEONHO NA / Engineering Manager

Telephone No. : 82-70-7825-0088

FCC ID : 2A2N3-GCST900

Model Name : GCST900

Brand Name : -

Serial Number : N/A

Date : August 12, 2021

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Fall prevention Transmitter
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 UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247 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 FCUNWIRED, Model GCST900 (referred to as the EUT in this report) is an Fall prevention Transmitter, Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Fall prevention Transmitter
Rated Supply Voltage	DC 3.0 V
OPERATING FREQUENCY	920.5 MHz ~ 923.5 MHz
MODULATION TYPE	CSS
RF OUTPUT POWER	17.16 dBm
NUMBER OF CHANNEL	3 Channel
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	3.61 dBi
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.

- 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

Kind of EUT	Fall prevention Transmitter
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

4.2 Calculated MPE Safe Distance for 900 MHz

According to above equation, the following result was obtained.

Operating Freq. (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm ²) @ 20 cm Separation	Limit (mW/cm ²)
			(dBm)	(mW)	Log	Linear			
920.5	900 MHz	17.16 ± 0.5	17.66	58.34	3.81	2.40	4.28	0.03	0.61

According to above table, for 920.5 MHz, safe distance,

$$D = 0.282 * \sqrt{(58.34 * 2.40) / 0.61} = 4.28 \text{ cm.}$$

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

$$S = P * G / (4\pi * R^2) = 58.34 * 2.40 / (4 * \pi * 20^2) = 0.03$$

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