ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

Test Report No.	: OT-20N-RWD-002
Reception No.	: 2009003840
Applicant	: Samsung Electronics Co Ltd
Address	: 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States
Manufacturer	: Samsung Electronics Co Ltd
Address	: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do 16677, Korea
Type of Equipment	: Wall Cableless_Tx
FCC ID.	: A3LCTTAK3I01
Model Name	: CTTAK3I01
Serial number	: N/A
Total page of Report	: 7 pages (including this page)
Date of Incoming	: September 18, 2020
Date of issue	: November 02, 2020

SUMMARY

The equipment complies with the regulation; *FCC CFR 47 PART 15 SUBPART C Section 15.255*

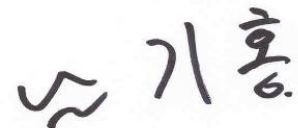This test report only contains the result of a single test of the sample supplied for the examination.

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

Tested by	Reviewed by	Approved by
Ju Yun Park / Assistant Manager	Tae-Ho, Kim / Senior Manager	Ki-Hong, Nam / General Manager
ONETECH Corp.	ONETECH Corp.	ONETECH Corp.

CONTENTS

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-20N-RWD-002	November 02, 2020	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant   : Samsung Electronics Co Ltd

Address   : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States

Contact Person : Youngjoong Noh / Principal Engineer

Telephone No.   : +82-31-277-0598

FCC ID   : A3LCTTAK3I01

Model Name   : CTTAK3I01

Brand Name   :

Serial Number   : N/A

Date   : November 02, 2020

DEVICE TYPE	DXT – Part 15 Low Power Transceiver, Rx Verified
E.U.T. DESCRIPTION	Wall Cableless_Tx
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC CFR47 Part 15 Subpart C Section 15.255
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.

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

2. GENERAL INFORMATION

2.1 Product Description

The Samsung Electronics Co Ltd, Model CTTAK3I01 (referred to as the EUT in this report) is an Wall Cableless_Tx,

Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Motion Detection Sensor Module
TRANSMITTING FREQUENCY	57 GHz ~ 64 GHz
ANTENNA TYPE	Chip Antenna
ANTENNA Gain	5.30 dBi

2.2 Model Differences:

-. None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

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 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:

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

Where

S = Power density in mW/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	Wall Cableless_Tx
Device Category	☐ Portable (< 20 cm separation) ☐ Mobile (> 20 cm separation) ■ Others
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ N/A

4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. Band (GHz)	Average Power (dBm)	Average Power (mW)	Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
			Log	Linear			
57 ~ 64	-9.59	0.11	5.30	3.39	0.17	0.000 1	1.0

According to above table, for safe distance,

$D = 0.282 * \sqrt{(0.11 * 3.39)/1.00} = 0.17$ cm.

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

$$S = P * G / (4\pi * R^2) = 0.11 * 3.39 / (4 * \pi * 20^2) = 0.000\ 1$$

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

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