FCC RF Exposure Report

Report No.:	SABBGM-WTW-P21116011-1
FCC ID:	WIYUPT1000-LTE
Test Model:	UPT1000F
Received Date:	Dec. 01, 2021
Test Date:	Dec. 15, 2021
Issued Date:	Jan. 04, 2022
Applicant:	CASTLES TECHNOLOGY CO., LTD.
Address:	6F, NO. 207-5, SEC. 3, BEIXIN RD., XINDIAN DISTRICT, NEW TAIPEI CITY 23143, TAIWAN (R. O. C.)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
SABBGM-WTW-P21116011-1	Original release	Jan. 04, 2022

1 Certificate of Conformity

Product:	POS Terminal
Brand:	CASTLES TECHNOLOGY
Test Model:	UPT1000F
Sample Status:	Identical Prototype
Applicant:	CASTLES TECHNOLOGY CO., LTD.
Test Date:	Dec. 15, 2021
Standards:	FCC Part 2 (Section 2.1091)
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Jan. 04, 2022

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jan. 04, 2022

Jeremy Lin / Project Engineer

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

pi = 3.1416

r = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Calculation Result of Maximum Density Power

Function	Frequency Band (MHz)	Max AV Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Bluetooth EDR	2402-2480	4.04	2	20	0.001	1.00

Mode	Electric field (dBuV/m) @3m	Max Power (dBm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
NFC	76.17	-19.06	0.0000025	0.978

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible

Function	Frequency Band (MHz)	EIRP (dBm)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 2	1850.7-1909.3	22.84	20	0.038	1
WCDMA Band 4	1710.7-1754.3	23.53	20	0.045	1
LTE Band 2	1850.7-1909.3	23.07	20	0.040	1
LTE Band 4	1710.7-1754.3	22.76	20	0.038	1
LTE Band 66	1710.7-1779.3	24.08	20	0.051	1

Function	Frequency Band (MHz)	ERP (dBm)	EIRP (dBm)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WCDMA Band 5	826.4-846.6	21.88	24.03	20	0.050	0.551
LTE Band 5	824.7-848.3	21.80	23.95	20	0.049	0.550
LTE Band 12	699.7-715.3	23.54	25.69	20	0.074	0.466
LTE Band 13	779.5-784.5	23.63	25.78	20	0.075	0.520
LTE Band 14	790.5-795.5	22.49	24.64	20	0.058	0.527

*EIRP = ERP + 2.15dB

*Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

BT + LTE + NFC = 0.001 / 1 + 0.074 / 0.466 + 0.0000025 / 0.978 = 0.159

Therefore the maximum calculations of above situations are less than the “1” limit.

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