

FCC RF Exposure Report

Report No.: SABBGW-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.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

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**FCC Registration /
Designation Number:** 788550 / TW0003



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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 RF Exposure	5
2.1 Limits for Maximum Permissible Exposure (MPE).....	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
3 Calculation Result of Maximum Density Power	6

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: 

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.

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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

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

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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