

RF Exposure Evaluation Report

APPLICANT : CASTLES TECHNOLOGY CO., LTD.
EQUIPMENT : POS Terminal
BRAND NAME : 
MODEL NAME : S1F3CT
FCC ID : WIYS1F3CT001
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

The product evaluation date was started from Jul. 22, 2025 and completed on Jul. 22, 2025. We, Sporton International Inc. (Kunshan), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.



Approved by: Si Zhang

Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA552101	Rev. 01	Initial issue of report	Jul. 25, 2025



1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-KS	CN1257	314309

Applicant	
Company Name	CASTLES TECHNOLOGY CO., LTD.
Address	6F, NO. 207-5, SEC. 3, BEIXIN RD., XINDIAN DISTRICT, NEW TAIPEI CITY 231030, TAIWAN (R.O.C.)

Manufacturer	
Company Name	CASTLES TECHNOLOGY CO., LTD.
Address	6F, NO. 207-5, SEC. 3, BEIXIN RD., XINDIAN DISTRICT, NEW TAIPEI CITY 231030, TAIWAN (R.O.C.)

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	POS Terminal
Brand Name	 CASTLES TECHNOLOGY
Model Name	S1F3CT
FCC ID	WIYS1F3CT001
Wireless Technology and Frequency Range	WCDMA Band II : 1850 MHz ~ 1910 MHz WCDMA Band IV : 1710 MHz ~ 1755 MHz WCDMA Band V : 824 MHz ~ 849 MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 17 : 704 MHz ~ 716 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 38 : 2570 MHz ~ 2620 MHz LTE Band 41 : 2535 MHz ~ 2655 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC:ASK
Antenna Gain	WCDMA Band II : -1.7 dBi WCDMA Band IV : -1.7 dBi WCDMA Band V : -2.3 dBi LTE Band 2 : -1.7 dBi LTE Band 4 : -1.7 dBi LTE Band 5 : -2.3 dBi LTE Band 7 : -2.7 dBi LTE Band 12 : -2.1 dBi LTE Band 17 : -2.1 dBi LTE Band 25 : -1.7 dBi LTE Band 26 : -2.1 dBi LTE Band 38 : -2.5 dBi LTE Band 41 : -2.5 dBi LTE Band 66: -1.6 dBi WLAN2.4GHz/Bluetooth: -3.7 dBi WLAN5.2GHz: -4.2 dBi WLAN5.3GHz: -4.5 dBi WLAN5.5GHz: -4.3 dBi WLAN5.8GHz: -4.4 dBi
Antenna Type	WWAN : PIFA Antenna WLAN/Bluetooth : Monopole Antenna NFC: Loop Antenna
EUT Stage	Identical Prototype
Remark: 1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

Comments and Explanations:

1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.

3. Maximum RF average output tune up power among production units

<WCDMA>

Mode		Maximum Average power(dBm)
WCDMA	Band II	25.00
	Band IV	25.00
	Band V	25.00

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	25.00
	Band 4	25.00
	Band 5	25.00
	Band 7	25.00
	Band 12	25.00
	Band 17	25.00
	Band 25	25.00
	Band 26	25.00
	Band 38	25.00
	Band 41	25.00
	Band 66	25.00

<2.4GHz WLAN>

Frequency	Mode	Maximum Average Power (dBm)
WLAN 2.4GHz	802.11b	17.00
	802.11g	17.00
	802.11n-HT20	16.00

<Bluetooth>

Frequency	Mode	Maximum Average Power (dBm)
Bluetooth	BR/EDR	11.00
	LE	0.00

**<5GHz WLAN>**

Frequency	Mode	Maximum Average Power (dBm)
WLAN 5.2GHz	802.11a	16.00
	802.11n-HT20	14.00
	802.11n-HT40	14.00
	802.11ac-VHT20	12.00
	802.11ac-VHT40	12.00
	802.11ac-VHT80	11.00
WLAN 5.3GHz	802.11a	16.00
	802.11n-HT20	14.00
	802.11n-HT40	14.00
	802.11ac-VHT20	12.00
	802.11ac-VHT40	12.00
	802.11ac-VHT80	11.00
WLAN 5.5GHz	802.11a	16.00
	802.11n-HT20	14.00
	802.11n-HT40	14.00
	802.11ac-VHT20	12.00
	802.11ac-VHT40	12.00
	802.11ac-VHT80	11.00
WLAN 5.8GHz	802.11a	16.00
	802.11n-HT20	14.00
	802.11n-HT40	14.00
	802.11ac-VHT20	12.00
	802.11ac-VHT40	12.00
	802.11ac-VHT80	11.00

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) 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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WCDMA Band 2	1850.0	-1.70	25.00	23.300	213.796	0.043	1.000	0.043
WCDMA Band 4	1710.0	-1.70	25.00	23.300	213.796	0.043	1.000	0.043
WCDMA Band 5	824.0	-2.30	25.00	22.700	186.209	0.037	0.549	0.067
LTE Band 2	1850.0	-1.70	25.00	23.300	213.796	0.043	1.000	0.043
LTE Band 4	1710.0	-1.70	25.00	23.300	213.796	0.043	1.000	0.043
LTE Band 5	824.0	-2.30	25.00	22.700	186.209	0.037	0.549	0.067
LTE Band 7	2500.0	-2.70	25.00	22.300	169.824	0.034	1.000	0.034
LTE Band 12	699.0	-2.10	25.00	22.900	194.984	0.039	0.466	0.083
LTE Band 17	704.0	-2.10	25.00	22.900	194.984	0.039	0.469	0.083
LTE Band 26	814.0	-2.10	25.00	22.900	194.984	0.039	0.543	0.072
LTE Band 25	1850.0	-1.70	25.00	23.300	213.796	0.043	1.000	0.043
LTE Band 38	2570.0	-2.50	25.00	22.500	177.828	0.035	1.000	0.035
LTE Band 41	2535.0	-2.50	25.00	22.500	177.828	0.035	1.000	0.035
LTE Band 66	1710.0	-1.60	25.00	23.400	218.776	0.044	1.000	0.044
Bluetooth	2402.0	-3.70	11.00	7.300	5.370	0.001	1.000	0.001
2.4GHz WLAN	2412.0	-3.70	17.00	13.300	21.380	0.004	1.000	0.004
5.2GHz WLAN	5180.0	-4.20	16.00	11.800	15.136	0.003	1.000	0.003
5.3GHz WLAN	5260.0	-4.50	16.00	11.500	14.125	0.003	1.000	0.003
5.5GHz WLAN	5500.0	-4.30	16.00	11.700	14.791	0.003	1.000	0.003
5.8GHz WLAN	5745.0	-4.40	16.00	11.600	14.454	0.003	1.000	0.003
NFC	13.6			-7.690	0.170	0.00003	0.979	0.00003

Note:

- For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
- Chose the maximum power to do MPE analysis.
- NFC maximum EIRP power calculate from NFC E-Field level from RF test report which can be referred to Sproton No: FR552101D.
 - This device maximum E-Field level is 87.54dBuV/m at 3m, so the EIRP power is -7.69dBm(0.170mW).
 - Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) - 95.23 (dB)

**5.2. Collocated Power Density Calculation**

WWAN Power Density / Limit	WLAN2.4 GHz Power Density / Limit	NFC Power Density / Limit	Σ (Power Density / Limit) of WWAN+ WLAN 2.4GHz + NFC
0.083	0.004	0.00003	0.087

WWAN Power Density / Limit	WLAN5GHz Power Density / Limit	NFC Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN 5GHz + NFC
0.083	0.003	0.00003	0.086

WWAN Power Density / Limit	Bluetooth Power Density / Limit	NFC Power Density / Limit	Σ (Power Density / Limit) of WWAN + Bluetooth + NFC
0.083	0.001	0.00003	0.084

Note:

1. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
2. According to the EUT characteristic, WLAN 5GHz and Bluetooth can't transmit simultaneously.
3. According to the EUT characteristic, WLAN 2.4GHz and WLAN 5GHz can't transmit simultaneously.
4. According to the EUT characteristic, NFC and WLAN 2.4/5GHz/Bluetooth can transmit simultaneously.
5. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN/Bluetooth+NFC.
6. Considering all transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of collocated transmitters is compliant.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

-----THE END-----