



Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-Mail: ctl@ctl-lab.com

RF Exposure evaluation

Report Reference No. : CTL2607152031-WFH

Compiled by:
(printed name+signature)

Andy Su

Reviewed by:
(printed name+signature)

Happy Guo

Approved by:
(printed name+signature)

Ivan Xie



Product Name..... : 16 ports reader

Model/Type reference : F5816-H

List Model(s)..... : N/A

Trade Mark..... : N/A

FCC ID..... : 2BXMCF5816-H

Applicant's name : SANRAY TECHNOLOGY CO.,LIMITED

Address of applicant..... : FLAT/RM 1405B 14/F THE BELGIAN BANK BUILDING
NOS.721-725 NATHAN ROAD MONGKOK KL

Test specification..... :

47CFR §1.1310

Standard : 47CFR §2.1091

KDB447498 D01 General RF Exposure Guidance v06

TRF Originator : Shenzhen CTL Testing Technology Co., Ltd.

Master TRF : Dated 2017-01

Date of receipt of test item : Jul 17, 2026

Date of Test : Jul 17, 2026-Aug 06, 2026

Date of Issue : Aug 07, 2026

Result..... : Pass

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TEST REPORT

Test Report No. :	CTL2607152031-WFH	Aug 07, 2026
		Date of issue

Product Name : 16 ports reader

Sample No : CTL260715203001, CTL260715203002, CTL260715203003

Model /Type : F5816-H

Listed Models : N/A

Applicant : **SANRAY TECHNOLOGY CO.,LIMITED**

Address : FLAT/RM 1405B 14/F THE BELGIAN BANK BUILDING
NOS.721-725 NATHAN ROAD MONGKOK KL

Manufacturer : **Shenzhen Sanray technology co.,ltd**

Address : Room 310, Building 2, Zhongliang Business Park, No.6
Liuxianer Road, Baoan District, Shenzhen City, Guangdong
Province, China.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

** Modified History **

[illegible]

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1 GENERAL INFORMATION

1.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	18-28°C
Relative Humidity:	30-60%
Air Pressure:	965-1030hPa

1.2 Product Description

Product Name:	16 ports reader
Model/Type reference:	F5816-H
Power supply:	DC 12V by AC-DC adapter
Adapter information:	MODEL: A361-1202000DI INPUT: 100-240V~50/60Hz 1.5A OUTPUT: 12.0V $\overline{=}$ 2.0A 24.0W
Test Voltage	DC 12V by AC-DC adapter
RFID	
Version:	Supported 902MHz-928MHz
Modulation:	GFSK
Operation frequency:	902.75MHz~927.25MHz
Channel number:	50
Channel separation:	500kHz
Antenna type:	External antenna
Antenna gain:	9 dBi provided by ☒ Applicant ☐ Manufacturer 12 dBi provided by ☒ Applicant ☐ Manufacturer

Note 1: For more details, refer to the user's manual of the EUT.

Note 2: Antenna gain and cable loss provided by the applicant.

1.3 Test Facility

Company Name:	Shenzhen CTL Testing Technology Co., Ltd.
Address 1:	Zone A.1/F..Warehouse 2.Baisha Technology Park, No.3011,Shahexi Road, Nanshan District,Shenzhen.518055,P.R.C.
Address 2:	Fl.A1, Bldg.A3, No.2533 GuanGuang Road, Fenghuang Community Fenghuang Street, Guangming District, Shenzhen, Guangdong, PR.C

1.3.2 Test location

All tests were performed at:

Company Name:	Shenzhen CTL Testing Technology Co., Ltd.
☐ Main location	Zone A.1/F..Warehouse 2.Baisha Technology Park, No.3011,Shahexi Road, Nanshan District,Shenzhen.518055,P.R.C.
☒ Satellite location	Fl.A1, Bldg.A3, No.2533 GuanGuang Road, Fenghuang Community Fenghuang Street, Guangming District, Shenzhen, Guangdong, PR.C

1.3.3 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC CAB identifier: CN0041

Main Company Number :9618B

Satellite Company Number:35187

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Main Company Number:9618B and Satellite Company Number:35187.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation No.: CN1216. Test Firm Registration 399832.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Maximum Conducted Output Power	± 1.18 dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2.0$.
- (2) Decision rule for Statement of Conformity: The measurement uncertainty is not taken into account but only measured result.

2 METHOD OF MEASUREMENT

2.1 Applicable Standard

[ANSI C95.1–2019](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices

2.2 Evaluation Method and Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3 Conducted Power Results

RFID 9dBi

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	902.75	7.09
	915.25	6.71
	927.25	6.99

RFID 12dBi

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	902.75	5.35
	915.25	5.02
	927.25	5.29

4 Manufacturing Tolerance

Tolerance $\pm$ (dB): 1.0

RFID 9dBi

Mode	Frequency (MHz)	Tune-up power (dBm)
GFSK	902.75	8
	915.25	8
	927.25	8

RFID 12dBi

Mode	Frequency (MHz)	Tune-up power (dBm)
GFSK	902.75	6
	915.25	6
	927.25	6

5 Evaluation Results

5.1 Standalone Evaluation

RFID 9dBi

Mode	f (GHz)	Antenna Distance (cm)	RF output power		G (Num.)	Result	Limit
			dBm	mW			
GFSK	927.25	20	8	6.31	7.9433	0.0100	0.6182

RFID 12dBi

Mode	f (GHz)	Antenna Distance (cm)	RF output power		G (Num.)	Result	Limit
			dBm	mW			
GFSK	927.25	20	6	3.98	15.8489	0.0126	0.6182

Remark:

1. Output power including tune up tolerance;
2. When the minimum test separation distance is ≥ 20 cm, In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091

6 Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB447498 D01 General RF Exposure Guidance v06, No SAR is required.

*****THE END*****