



TEST REPORT

No. C20T00044-EMC01

For

**Client: Shanghai Wanway Digital Technology
Co.,Ltd.**

Production: GPS Tracker

Model Name: GS05

Brand Name: WANWAY

FCC ID: 2AWBA-GS05

Hardware Version: GS05-V1.0-20191202

Software Version: GS05_WW_V_1_1-20200610

Issued date: 2020-12-22

Industrial Internet Innovation Center (Shanghai) Co., Ltd.

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of Industrial Internet Innovation Center (Shanghai) Co., Ltd.
3. The measurement uncertainty is not taken into account when deciding conformity, and the results of measurement (or the average of measurement results) are directly used as the criterion for the stating conformity.

Test Laboratory:

Industrial Internet Innovation Center (Shanghai) Co., Ltd.

Add: Building 4, No.766, Jingang Road, Pudong New District, Shanghai, P. R. China

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Revision Version

Report Number	Revision	Date	Memo
C20T00044-EMC01	00	2020-12-22	Initial creation of test report

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1. Test Laboratory

1.1. Testing Location

Company Name:	Industrial Internet Innovation Center (Shanghai) Co., Ltd.
Address:	Building 4, No.766, Jingang Road, Pudong New District, Shanghai, P. R. China
Postal Code:	201206
Telephone:	+86 21 63843300
FCC registration No:	958356
FCC designation No:	CN1177

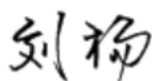
1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	30-60% RH
Supply Voltage	DC12V&24V

1.3. Project data

Project Leader:	Xu Yuting
Testing Start Date:	2020-11-27
Testing End Date:	2020-11-27

1.4. Signature



Liu Linfeng
(Prepared this test report)



Qin Yabin
(Reviewed this test report)



Song Kaihua
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name	Shanghai Wanway Digital Technology Co.,Ltd.
Address	Floor 23,Yibo Building,No.1999,Wenchuan Road Baoshan District,Shanghai
Telephone	18516719968
Postcode	/

2.2. Manufacturer Information

Company Name	Shanghai Wanway Digital Technology Co.,Ltd.
Address	Floor 23,Yibo Building,No.1999,Wenchuan Road Baoshan District,Shanghai
Telephone	18516719968
Postcode	/

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Product Name	GPS Tracker
Model name	GS05
GSM Frequency Band	GSM850/GSM900/GSM1800/GSM1900
UMTS Frequency Band	WCDMA Band I/II/V/VI
Additional Communication Function	GPS;BDS;

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N18	/	GS05-V1.0-20 191202	GS05_WW_V_1_1-2020 0610	2020-11-24

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN
AE1	USB Cable	TTL	/
AE2	Storage battery	6-QW-36(280)-LT1	/
AE3	Notebook PC	DELL E5250	/
AE4	DC Cable	/	Line Length is about 1.15m

*The AE1/AE4 was provided by the customer.

*The AE2/AE3 was provided by the lab.

4. Reference Documents

4.1 Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	2019/10/01
ANSI C63.4	Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

5. Test Results

5.1 Summary of Test Results

Items	Test List	Clause in FCC rules	Verdict
1	Radiated Emission	15.109(a)	Pass

5.2 Statements

The GS05, supporting GSM/WCDMA .etc, manufactured by Shanghai Wanway Digital Technology Co.,Ltd. is a new product for testing. 3IN only performed test cases which identified with Pass/Fail/Inc result in section 5.1.

3IN has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipment Utilized

6.1 Radiated Emission Equipment list

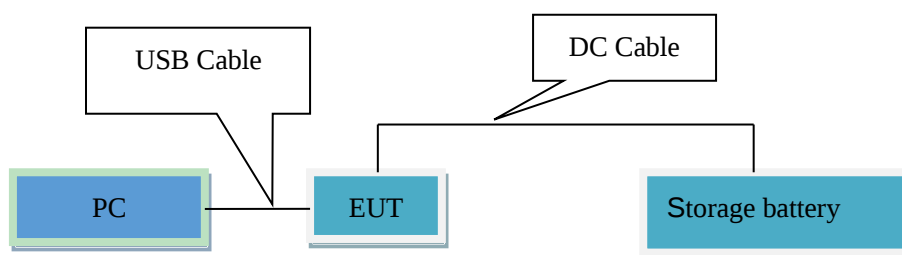
Item	Instrument Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMU200	123126	R&S	2020-05-10	1 year
2	Universal Radio Communication Tester	CMW500	104178	R&S	2020-05-10	1 year
3	Test Receiver	ESU40	100307	R&S	2020-05-10	1 year
4	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2020-02-28	2 years
5	Double Ridged Guide	ETS-3117	00135890	ETS	2020-02-28	2 years
6	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA
7	Vector Signal Generator	SMBV100 A	257904	R&S	2020-03-05	1 year

7. System Configuration during Test

7.1 Test Mode

Test Item	Function Type
Radiated Emission	Mode 1: G850 receiver mode+ DC12V <Figure 1> Mode 2: GPS mode+ DC12V <Figure 1> Mode 3: BDS mode+ DC12V <Figure 1> Mode 4: G850 receiver mode+ DC24V <Figure 1>
Remark: 1. All test modes are performed, only the worst cases test data are recorded in this report. 2. After laboratory verification, GSM850 is the worst mode among all receiving modes of 2G/3G and is recorded in the report. 3. EUT and Vector signal generator (SMBV100A) connection is established. 4. The worst case of radiated emission for 30MHz-1GHz is mode 1&1GHz-18GHz is mode 1.	

7.2 Connection Diagram of Test System



<Figure 1> Mode 1-4

8. Measurement Results

Only the worst test result was shown in this report.

8.1 Radiated Emission 30MHz-18GHz

Method of Measurement

For 30MHz -1000MHz, the EUT was placed on the top of a rotating 0.8m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000MHz-18000MHz, The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degree to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement.

Limits for Radiated Emission at a measuring distance of 3m

Frequency Range (MHz)	Quasi-Peak (dBuV/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Frequency Range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

Test conditions

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
30-1000	120kHz/300kHz	Auto
1000-18000	1MHz/3MHz	Auto

Uncertainty Measurement

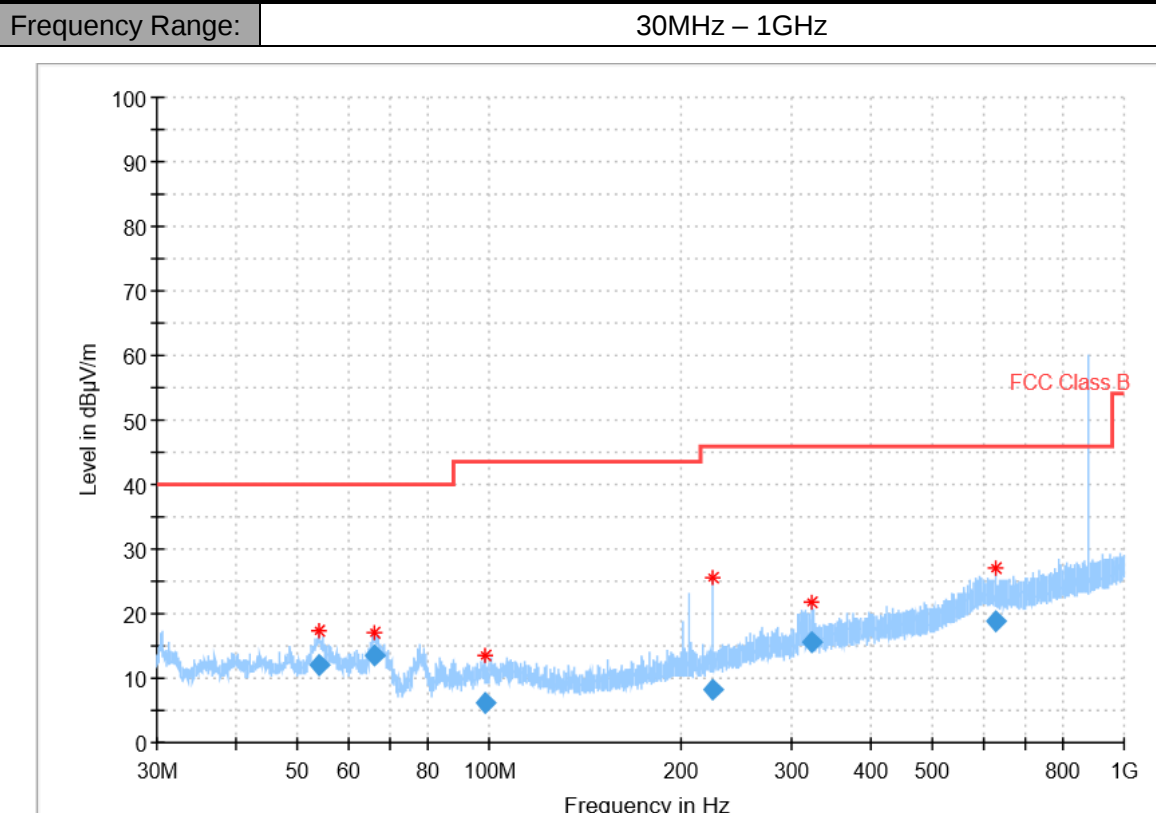
The measurement uncertainty (30MHz-1000MHz) is 4.82 dB (k=2).

The measurement uncertainty (1000MHz-18000MHz) is 5.08 dB (k=2).

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz-40GHz is more than 20dB below the limit are not report.

Mode 1: G850 receiver mode+ DC12V <Figure 1>



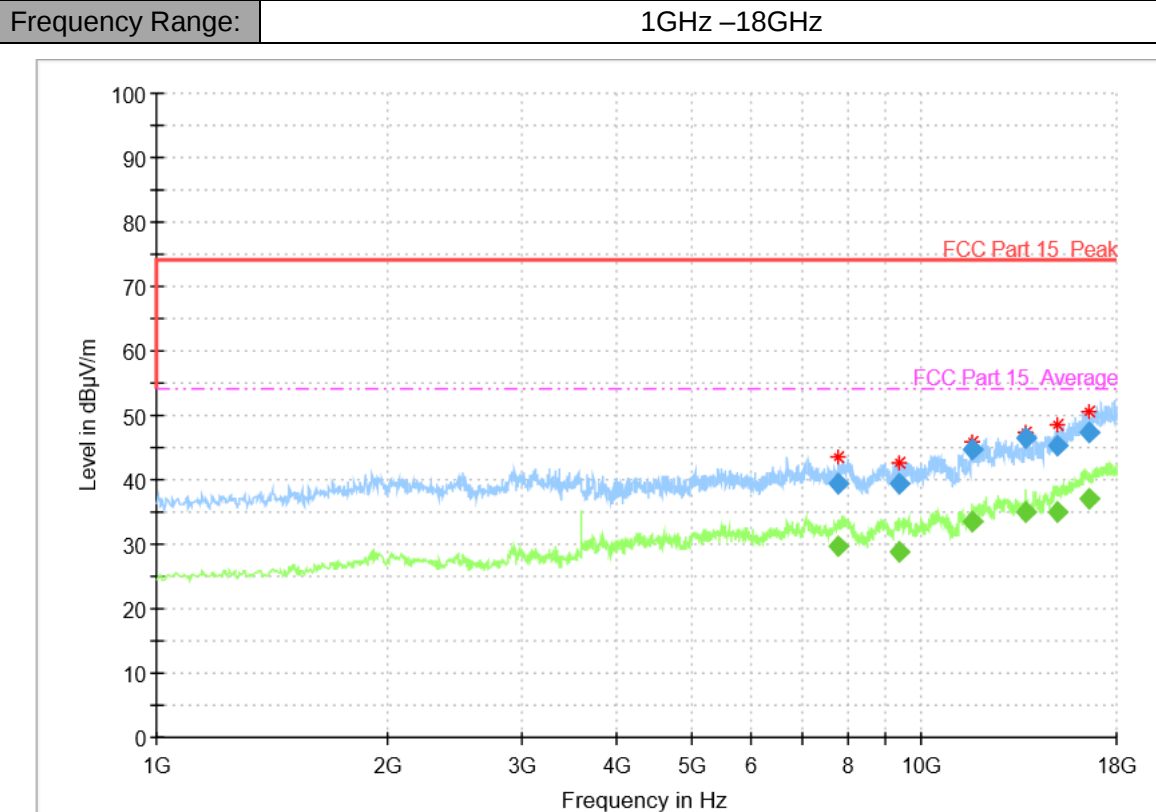
Note: The frequency over the limits is the main signal frequency.

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
53.986357	12.03	40.00	27.97	1000.0	120.000	100.0	V	211.0	-15.4
65.991704	13.48	40.00	26.52	1000.0	120.000	225.0	V	275.0	-17.4
98.297317	6.15	43.50	37.35	1000.0	120.000	201.0	V	349.0	-16.0
224.980555	8.38	46.00	37.62	1000.0	120.000	125.0	H	183.0	-14.1
323.117067	15.62	46.00	30.38	1000.0	120.000	100.0	H	211.0	-10.6
629.328387	18.78	46.00	27.22	1000.0	120.000	225.0	H	171.0	-3.4

Note:

- 1.Emission level(QP)=Raw value by receiver + Corr(Antenna factor + cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.

Mode 1: G850 receiver mode+ DC12V <Figure 1>

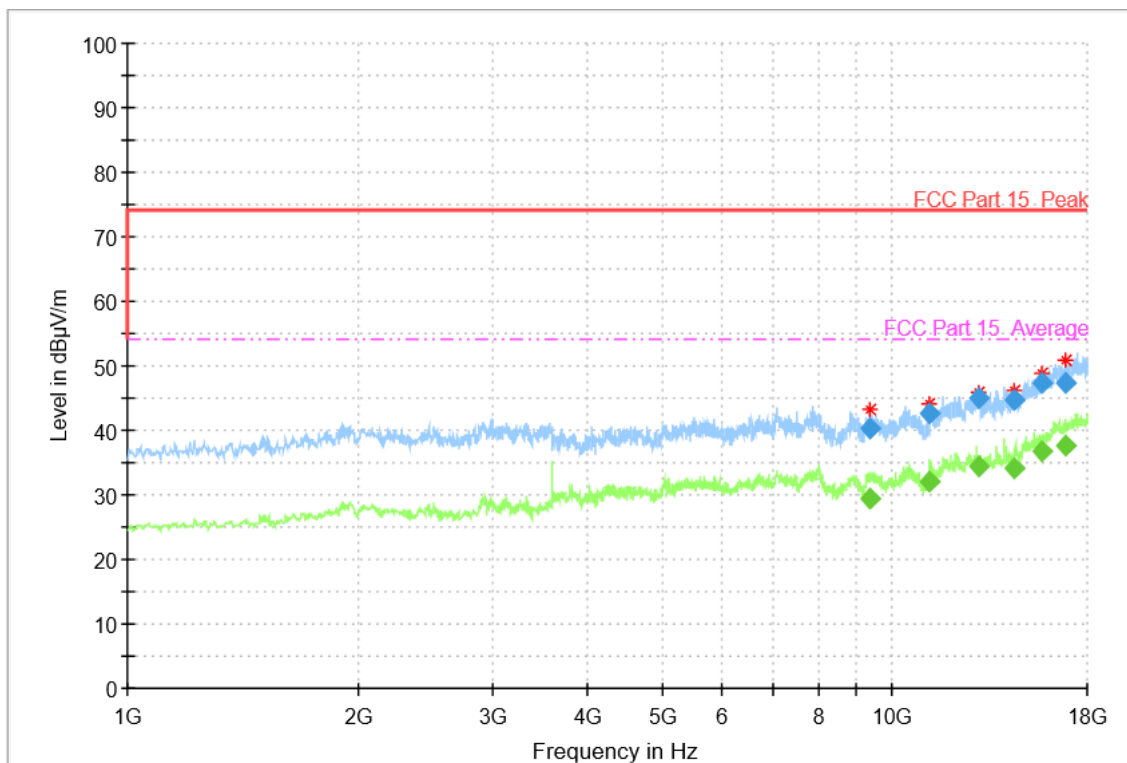


Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Band width	Height	Po l	Azimu th	Corr. (dB)
7793.200000	39.47	---	74.00	34.53	1.0	1000.	100.1	H	148.0	4.8
7793.200000	---	29.77	54.00	24.23	1.0	1000.	100.1	H	148.0	4.8
9340.600000	---	28.88	54.00	25.12	1.0	1000.	100.1	H	30.0	6.2
9340.600000	39.36	---	74.00	34.64	1.0	1000.	100.1	H	30.0	6.2
11638.000000	---	33.51	54.00	20.49	1.0	1000.	100.1	H	6.0	10.3
11638.000000	44.56	---	74.00	29.44	1.0	1000.	100.1	H	6.0	10.3
13702.000000	---	35.04	54.00	18.96	1.0	1000.	199.9	H	163.0	12.1
13702.000000	46.36	---	74.00	27.64	1.0	1000.	199.9	H	163.0	12.1
15048.200000	---	35.03	54.00	18.97	1.0	1000.	199.9	H	132.0	14.5
15048.200000	45.20	---	74.00	28.80	1.0	1000.	199.9	H	132.0	14.5
16530.200000	47.43	---	74.00	26.57	1.0	1000.	100.1	H	148.0	17.9
16530.200000	---	36.99	54.00	17.01	1.0	1000.	100.1	H	148.0	17.9

Note:

- 1.Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time	Bandwidth	Height	Polarization	Azimuth	Corr. (dB)
9370.200000	---	29.40	54.00	24.60	1.0	1000.00	199.9	V	320.0	6.5
9370.200000	40.17	---	74.00	33.83	1.0	1000.00	199.9	V	320.0	6.5
11213.600000	42.54	---	74.00	31.46	1.0	1000.00	100.1	V	156.0	8.4
11213.600000	---	32.07	54.00	21.93	1.0	1000.00	100.1	V	156.0	8.4
12943.800000	---	34.36	54.00	19.64	1.0	1000.00	199.9	V	160.0	12.0
12943.800000	45.12	---	74.00	28.88	1.0	1000.00	199.9	V	160.0	12.0
14458.200000	---	34.16	54.00	19.84	1.0	1000.00	100.1	V	156.0	13.0
14458.200000	44.56	---	74.00	29.44	1.0	1000.00	100.1	V	156.0	13.0
15712.200000	---	36.62	54.00	17.38	1.0	1000.00	199.9	V	272.0	15.8
15712.200000	47.46	---	74.00	26.54	1.0	1000.00	199.9	V	272.0	15.8
16907.600000	47.39	---	74.00	26.61	1.0	1000.00	199.9	V	178.0	18.3
16907.600000	---	37.54	54.00	16.46	1.0	1000.00	199.9	V	178.0	18.3

Note:

- 1.Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.

Annex A Accreditation Certificate



Accredited Laboratory

A2LA has accredited

3IN (Industrial Internet Innovation Center (Shanghai) Co., Ltd.)
Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This laboratory also meets the requirements of any additional program requirements in the «field» field. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 6th day of May 2019.



Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical«field» Scope of Accreditation.

*****END OF REPORT*****