

Report No.: SEWA2204000009RG03

Rev.: 02

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TEST REPORT

Application No: SEWA2204000009RG
Applicant: Fibocom Auto Inc.
Address of Applicant: 13th Floor, Building A, Building 6, International Innovation Valley, Xili Street, Shenzhen
Manufacturer: Fibocom Auto Inc.
Address of Manufacturer: 13th Floor, Building A, Building 6, International Innovation Valley, Xili Street, Shenzhen
EUT Description: 5G Module
Model No.: AN958-NA
Trade Mark: Fibocom
FCC ID: 2A8RBAN958NA
Standards: 47 CFR Part 2.1091
FCC KDB 447498 D01 v06
Date of Receipt: 2022/08/30
Date of Issue: 2023/03/31

Test Result:	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Panta Sun

Panta Sun
Wireless Laboratory Manager



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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/01/03		Original
02		2023/03/31		Revised the Gain according to Pd of GSM850&GSM1900

This report supersedes our previous report SEWA2204000009RG03, issued on 2023/01/03, which is hereby deemed null and void.

Prepared By	
	(Nick Hu) / Test Engineer
Checked By	
	(Well Wei) / Reviewer



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2 General Information

2.1 Client Information

Applicant:	Fibocom Auto Inc.
Address of Applicant:	13th Floor, Building A, Building 6, International Innovation Valley,Xili Street, Shenzhen
Manufacturer:	Fibocom Auto Inc.
Address of Manufacturer:	13th Floor, Building A, Building 6, International Innovation Valley,Xili Street, Shenzhen

2.2 Test Facility

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

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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2.3 General Description of EUT

EUT Description:	5G Module			
Model No.:	AN958-NA			
Trade Mark:	Fibocom			
Hardware Version:	AN958-MAQC-NA-00			
Software Version:	AN958-GA-NA_R2.1_V.B.1.20			
Antenna Type:	Fixed External Antenna			
Antenna Gain:	GSM850:	2.20dBi	GSM1900:	1.00dBi
	WCDMA Band II:	2.31dBi	WCDMA Band IV:	2.33dBi
	WCDMA Band V:	2.20dBi		
	LTE Band 2:	2.31dBi	LTE Band 4:	2.33dBi
	LTE Band 5:	2.20dBi	LTE Band 7:	2.98dBi
	LTE Band 12:	2.20dBi	LTE Band 14:	2.20dBi
	LTE Band 17:	2.20dBi	LTE Band 25:	2.31dBi
	LTE Band 26:	2.20dBi	LTE Band 41:	2.98dBi
	LTE Band 42:	4.30dBi	LTE Band 66:	2.33dBi
	LTE Band 71:	2.20dBi		
	NR Band n2:	2.31dBi	NR Band n5:	2.20dBi
	NR Band n7:	2.98dBi	NR Band n12:	2.20dBi
	NR Band n14:	2.20dBi	NR Band n25:	2.31dBi
	NR Band n41:	2.98dBi	NR Band n48:	-3.00dBi
	NR Band n66:	2.33dBi	NR Band n71:	2.20dBi
	NR Band n77:	1.00dBi	NR Band n78:	1.00dBi
	ENDC: DC_5A_n2A; DC_12A_n2A; DC_66A_n2A; DC_71A_n2A; DC_2A_n5A; DC_7A_n5A; DC_66A_n5A; DC_5A_n7A; DC_12A_n7A; DC_66A_n7A; DC_2A_n41A; DC_25A_n41A; DC_26A_n41A; DC_66A_n41A; DC_2A_n48A; DC_66A_n48A; DC_2A_n66A; DC_5A_n66A; DC_12A_n66A; DC_2A_n71A; DC_7A_n71A; DC_66A_n71A; DC_2A_n78A; DC_5A_n78A; DC_7A_n78A; DC_12A_n78A; DC_66A_n78A			
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.			
	Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.			



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3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

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

F=frequency in MHz
 *=Plane-wave equivalent power density
 RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

Friis Formula

Friis transmission 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

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



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3.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually

3.1.3 EUT RF Exposure Evaluation

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.0 / 2.0 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

This confirmed that the device comply with MPE limit.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Average Output Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Gain according to EIRP(ERP) (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
GSM850	824.2	2.2	35.00	35.05	38.45	0.1258	0.5495	5.60	8.60	5.60	Pass
GSM1900	1850.2	1	32.00	33.00	33.00	0.0478	1.0000	1.00	14.20	1.00	Pass
WCDMA B2	1852.4	2.31	25.70	28.01	33.01	0.1258	1.0000	7.31	11.31	7.31	Pass
WCDMA B4	1712.4	2.33	25.70	28.03	33.00	0.1264	1.0000	4.30	11.31	4.30	Pass
WCDMA B5	826.4	2.2	25.70	25.75	38.45	0.1227	0.5509	14.90	8.72	8.72	Pass
LTE B2	1850.7	2.31	25.70	28.01	33.00	0.1258	1.0000	7.30	11.31	7.30	Pass
LTE B4	1710.7	2.33	25.70	28.03	33.00	0.1264	1.0000	4.30	11.31	4.30	Pass
LTE B5	824.7	2.20	25.70	25.75	38.45	0.1227	0.5498	14.90	8.71	8.71	Pass
LTE B7	2502.5	2.98	25.70	28.68	33.00	0.1468	1.0000	7.30	11.31	7.30	Pass
LTE B12	699.7	2.20	25.70	25.75	34.77	0.1227	0.4665	11.22	8.00	8.00	Pass
LTE B14	790.5	2.20	25.70	25.75	34.77	0.1227	0.5270	11.22	8.53	8.53	Pass
LTE B17	706.5	2.20	25.70	25.75	34.77	0.1227	0.4710	11.22	8.04	8.04	Pass
LTE B25	1850.7	2.31	25.70	28.01	33.00	0.1258	1.0000	7.30	11.31	7.30	Pass
LTE B26(B14-B24)	814.7	2.20	25.70	25.75	NA	0.1227	0.5431	NA	8.66	8.66	Pass
LTE B26(B24-B49)	824.7	2.20	25.70	25.75	38.45	0.1227	0.5498	14.90	8.71	8.71	Pass
LTE B41	2498.5	2.98	25.70	28.68	33.00	0.1468	1.0000	7.30	11.31	7.30	Pass
LTE B42	3452.5	4.30	25.70	30.00	30.00	0.1989	1.0000	4.30	11.31	4.30	Pass
LTE B66	1710.7	2.33	25.70	28.03	33.00	0.1264	1.0000	4.30	11.31	4.30	Pass
LTE B71	665.5	2.20	25.70	25.75	34.77	0.1227	0.4437	11.22	7.78	7.78	Pass
NR Band n2	1852.5	2.31	26.00	28.31	33.00	0.1348	1.0000	7.00	11.01	7.00	Pass
NR Band n5	826.5	2.20	26.00	26.05	38.45	0.1314	0.5510	14.60	8.42	8.42	Pass
NR Band n7	2502.5	2.98	26.00	28.98	33.00	0.1573	1.0000	7.00	11.01	7.00	Pass
NR Band n12	701.5	2.20	26.00	26.05	34.77	0.1314	0.4677	10.92	7.71	7.71	Pass
NR Band n14	790.5	2.20	26.00	26.05	37.77	0.1314	0.5270	13.92	8.23	8.23	Pass
NR Band n25	1852.5	2.31	26.00	28.31	33.00	0.1348	1.0000	7.00	11.01	7.00	Pass
NR Band n41	2506.0	2.98	29.00	31.98	33.00	0.3139	1.0000	4.00	8.01	4.00	Pass
NR Band n48(PC2)	3552.5	-3	26.00	23	23.00	0.0397	1.0000	-3.00	11.01	-3.00	Pass
NR Band n66	1712.5	2.33	26.00	28.33	30.00	0.1354	1.0000	4.00	11.01	4.00	Pass
NR Band n71	665.5	2.20	26.00	26.05	34.77	0.1314	0.4437	10.92	7.48	7.48	Pass
NR Band n77 (3450-3550)(PC2)	3460.0	1.00	29.00	30.00	30.00	0.1989	1.0000	1.00	8.01	1.00	Pass
NR Band n77 (3700-3980)(PC2)	3710.0	1.00	29.00	30.00	30.00	0.1989	1.0000	1.00	8.01	1.00	Pass
NR Band n78 (3450-3550)(PC2)	3460.0	1.00	29.00	30.00	30.00	0.1989	1.0000	1.00	8.01	1.00	Pass
NR Band n78 (3700-3800)(PC2)	3710.0	1.00	29.00	30.00	30.00	0.1989	1.0000	1.00	8.01	1.00	Pass



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Remark: Frame-average power=Burst power+ Division Factors (-9.19)

Due to the EUT support NR ENDC and CA

Both LTE and NR/LTE band can transmit simultaneously, the formula of the calculated the MPE is:

$$\sum_{i=1}^n \frac{S_{E_i}(\text{duty factor})}{MPE_{E_i}} < 1$$

NOTE The corresponding MEs must be expressed in terms of power density in the above summation
Therefore, the worst-case (DC_26A_n41A) situation is 0.2232+0.3139=0.5371, which is less than "1",
this confirmed that the device comply with MPE limit.

---End of Report---



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