RF EXPOSURE EVALUATION REPORT

Application No.:	SZCR2404001478AT
Applicant:	FIH Co.,LTD
Address of Applicant:	No.4, Mingsheng St., Tu-Cheng Dist.,New Taipei City 23679, Taiwan
Manufacturer:	FIH Co.,LTD
Address of Manufacturer:	No.4, Mingsheng St., Tu-Cheng Dist.,New Taipei City 23679, Taiwan
Factory:	Futaijing Precision Electronics (Beijing)co., Ltd.
Address of Factory:	No.9 JinXiu Street, Beijing Economic & Technological Development Area, Beijing 100176, China
Equipment Under Test (EUT):	
EUT Name:	4G Module
Model No.:	31PHBM2000A
FCC ID:	RYQ31PHBM2000A
Standard(s) :	FCC Rules 47 CFR §2.1091
	KDB 447498 D04 interim General RF Exposure Guidance v01
Date of Receipt:	2024-04-23
Date of Evaluation:	2024-05-05 to 2024-05-29
Date of Issue:	2024-06-08
Evaluation Result:	**Pass***

* In the configuration evaluated, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编:518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2024-06-08		Original

Authorized for issue by:				
		Calvin Weng **Calvin Weng/Project Engineer**		
		Eric Fu **Eric Fu/Reviewer**		

2 Contents

3 General Information

3.1 General Description of E.U.T.

Product Type:	☐ Portable device
	☒ Mobile device
	☐ Fixed device

3.2 Details of E.U.T.

Power supply:	DC12V
For 2.4G WIFI:	
Cable Loss (for RF conducted test):	0.7dB
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Dipole Antenna
Antenna Gain:	2.5dBi
For 5G WIFI:	
Cable Loss (for RF conducted test):	1.5dB
Operation Frequency/Number of channels (20MHz):	U-NII-1: 5180-5240MHz (4 Channels); U-NII-3: 5745-5825MHz (5 Channels)
Operation Frequency/Number of channels/(40MHz):	U-NII-1: 5190-5230MHz (2 Channels); U-NII-3: 5755-5795MHz (2 Channels)
Operation Frequency/Number of channels (80MHz):	U-NII-1: 5210MHz (1 Channel); U-NII-3: 5775MHz (1 Channel)
Modulation Type:	OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	802.11a/n/ac 20: 20MHz; 802.11n/ac 40: 40MHz; 802.11ac 80: 80MHz
DFS Function:	Not support DFS
TPC Function:	Without TPC function
Antenna Type:	Dipole Antenna
Antenna Gain:	U-NII-1:-3.02dBi, U-NII-3:-2.37dBi

For 3G:	
Cable Loss (for RF conducted test):	Below 1GHz: 4.5dB, 1GHz~2.4GHz:4.7dB, Above 2.4GHz: 5.2dB
Sample Type:	Mobile production
Support Network:	RMC, HSDPA, HSUPA
Operation Frequency Band:	UMTS FDD Band II/VI/V
Modulation Type:	QPSK for WCDMA
Supported Channel Bandwidth:	5MHz for WCDMA
UMTS Power Class:	Level 3
Antenna Type:	Dipole Antenna
Antenna Gain:	WCDMA B2:4dBi; B4: 3dBi; B5:1.5dBi
For 4G:	
Cable Loss (for RF conducted test):	Below 1GHz: 4.5dB, 1GHz~2.4GHz:4.7dB, Above 2.4GHz: 5.2dB
Sample Type:	Mobile production
LTE Operation Frequency Band:	LTE B2/4/5/7/12/13/17/25/26/66/71
Modulation Type:	QPSK, 16QAM
LTE Power Class:	Level 3
Antenna Type:	Dipole Antenna
Antenna Gain:	LTE B2:4dBi; B4: 3dBi; B5:1.5dBi, B7:5.1dBi, B12:0.7dBi, B13:1.1dBi, B17: 1.3dBi, B25: 4dBi; B26:1.5dBi; B66:3.7dBi, B71:0.4dBi

Remark:The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

Note:
(1)The antenna gain value is provided by the customer. The test lab will not be responsible for wrong test result due to incorrect information about antenna gain values.

3.3 Separation Distance

Minimum test separation distance:	20cm
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.	

3.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

3.5 Test Facility

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

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

3.6 Deviation from Standards

None

3.7 Abnormalities from Standard Conditions

None

4 FCC Radiofrequency radiation exposure limits

According to§1.1310, the limit for general population/uncontrolled exposures

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging 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/f2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

5 Measurement and Calculation

MPE Calculation

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

1) P (mW)
2) R = distance to the center of radiation of antenna (in centimeter)
3) MPE limit = 1mW/cm²

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	Gain according to EIRP(ERP) (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
WCDMA Band II	1852.4	4	26.00	30.00	33.00	0.1989	1.0000	7.00	11.01	7.00	Pass
WCDMA Band IV	1712.4	3	26.00	29.00	30.00	0.1580	1.0000	4.00	11.01	4.00	Pass
WCDMA Band V	826.4	1.5	25.00	24.35	38.45	0.0889	0.5509	15.60	9.42	9.42	Pass
LTE Band 2	1850.7	4.00	25.00	29.00	33.00	0.1580	1.0000	8.00	12.01	8.00	Pass
LTE Band 4	1710.7	3.00	25.00	28.00	30.00	0.1255	1.0000	5.00	12.01	5.00	Pass
LTE Band 5	824.7	1.50	25.00	24.35	38.45	0.0889	0.5498	15.60	9.41	9.41	Pass
LTE Band 7	2502.5	5.10	25.00	30.10	33.00	0.2036	1.0000	8.00	12.01	8.00	Pass
LTE Band 12	699.7	0.70	25.00	23.55	34.77	0.0739	0.4665	11.92	8.70	8.70	Pass
LTE Band 13	779.5	1.10	25.00	23.95	34.77	0.0810	0.5197	11.92	9.16	9.16	Pass
LTE Band 17	706.5	1.30	25.00	24.15	34.77	0.0849	0.4710	11.92	8.74	8.74	Pass
LTE Band 25	1850.7	4.00	25.00	29.00	33.00	0.1580	1.0000	8.00	12.01	8.00	Pass
LTE Band 26(814-824)	814.7	1.50	25.00	NA	NA	0.0889	0.5431	NA	9.36	9.36	Pass
LTE Band 26(824-849)	824.7	1.50	25.00	24.35	38.45	0.0889	0.5498	15.60	9.41	9.41	Pass
LTE Band 66	1710.7	3.70	25.00	28.70	30.00	0.1475	1.0000	5.00	12.01	5.00	Pass
LTE Band 71	665.5	0.40	25.00	23.25	34.77	0.0690	0.4437	11.92	8.48	8.48	Pass
WLAN2.4GHz	2462.0	2.50	17.00	19.50	N/A	0.0177	1.0000	N/A	20.01	20.01	Pass
WLAN5GHz	5795.0	-2.37	17.00	14.63	N/A	0.0058	1.0000	N/A	20.01	20.01	Pass

In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unit.

The product also has multiple transmitters The Simultaneous Transmission Possibilities are as below:

Simultaneous Tx Combination	Configuration
1	WWAN + WiFi 2.4G
2	WWAN + WiFi 5G

No.	Mode	Total Ratio	Limit	Result
1	LTE Band 7+ WiFi 2.4G	0.2213	1.0000	Pass
	LTE Band 7 + WiFi 5G	0.2094		

-End of the Report-