

Report No.: SEWM2307000278RG02

Rev.: 01

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TEST REPORT

Application No.: SEWM2307000278RG
Applicant: Freetech Intelligent Systems Co., Ltd.
Address of Applicant: 16 Xingfa Road, Tongxiang City, Jiaxing City, Zhejiang Province, China
Manufacturer: Freetech Intelligent Systems Co., Ltd.
Address of Manufacturer: Building A Juguang Center, 459 Qianmo Rd, Binjiang District, Hangzhou, Zhejiang, P.R.C.
EUT Description: Long Range Radar
Model No.: FVR40
Trade Mark: Freetech
FCC ID: 2BB3404060203
Standards: 47 CFR Part 2.1091
 FCC KDB 447498 D01 v06
Date of Receipt: 2023/06/16
Date of Issue: 2023/07/26

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

Authorized Signature:

Well Wei
 Wireless Laboratory Manager



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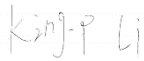
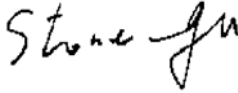
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/07/26		Original

Prepared By		 <hr/> (King-p Li) / Test Engineer
Checked By		 <hr/> (Stone Gu) / Reviewer



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2 General Information

2.1 Client Information

Applicant:	Freetech Intelligent Systems Co., Ltd.
Address of Applicant:	16 Xingfa Road, Tongxiang City, Jiaxing City, Zhejiang Province, China
Manufacturer:	Freetech Intelligent Systems Co., Ltd.
Address of Manufacturer:	Building A Juguang Center, 459 Qianmo Rd, Binjiang District, Hangzhou, Zhejiang, P.R.C.

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:	Long Range Radar
Model No.:	FVR40
Trade Mark:	Freetech
SN:	2304120000045
Frequency Band:	77.5GHz-78.5GHz
Modulation Type:	FMCW
Antenna Type:	Micro-strip array antenna
Firmware Version:	RC05(4.2.9 R23)
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

Output Power Into Antenna & RF Exposure Evaluation Distance:
 This confirmed that the device comply with MPE limit.

Test mode	Frequency (GHz)	dBuV/m @3m	EIRP (dBm)	EIRP (mW)	Tune up EIRP (dBm)	Tune up EIRP (mW)	Power Density at R = 20 cm (mW/cm ²)
mmWave	77.989	120.860	25.63	365.595	26.00	398.107	0.0792

Remark:

$E[dB\mu V/m] = EIRP[dBm] - 20 \log(d[meters]) + 104.77$, where E = field strength and d = distance at which field strength limit is specified in the rules

$EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$

---End of Report---



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