RF Exposure evaluation

Product Name	:	Carplay
Brand Name	:	N/A
Model	:	C03
Series Model	:	D01, D02, D03, D04, D05, D06, D07, D08
FCCID	:	2BPFF-C03
Applicant	:	**Shenzhen Xinwang Optoelectronic Display Technology Co., Ltd.**
Address	:	Room 502, Jintian bldg., Kaitian STP, Pinghu SD, Longgang District, Shenzhen, China
Manufacturer	:	**Shenzhen Xinwang Optoelectronic Display Technology Co., Ltd.**
Address	:	Room 502, Jintian bldg., Kaitian STP, Pinghu SD, Longgang District, Shenzhen, China
Standard(s)	:	47CFR §1.1310,47CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt	:	May 07, 2025
Date of Test	:	May 07, 2025~May 12, 2025
Issued Date	:	May 13, 2025

Issued By: **Dongguan Yaxu (AiT) Technology Limited**
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Reviewed by: Emiya Lin
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Approved by: Simba Huang
Simba Huang

Report Revise Record

Report Version	Issued Date	Notes
V1.0	May 13, 2025	Initial Release

Contents

1 GENERAL INFORMATION

1.1 Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

1.2 General Descriptionof EUT

<table>
<tr><td>Product Name:</td><td>Carplay</td></tr>
<tr><td>Model/Type reference:</td><td>C03</td></tr>
<tr><td>Serial Model:</td><td>D01, D02, D03, D04, D05, D06, D07, D08</td></tr>
<tr><td>Power Supply:</td><td>DC 5.0V from external circuit</td></tr>
<tr><td>Hardware version.:</td><td>N/A</td></tr>
<tr><td>Software version.:</td><td>N/A</td></tr>
<tr><td>Test sample(s) ID:</td><td>AiTDG-250507002-1</td></tr>
<tr><td colspan="2">BT:</td></tr>
<tr><td>Operation frequency:</td><td>2402MHz-2480MHz</td></tr>
<tr><td>Channel Number:</td><td>BR/EDR:79 Channels</td></tr>
<tr><td>Channel separation:</td><td>BR/EDR:1MHz</td></tr>
<tr><td>Modulation Technology:</td><td>GFSK, π/4-DQPSK, 8-DPSK</td></tr>
<tr><td>Antenna Type:</td><td>PCB Antenna</td></tr>
<tr><td>Antenna gain:</td><td>0dBi</td></tr>
<tr><td colspan="2">5G WIFI:</td></tr>
<tr><td>Modulation:</td><td>IEEE 802.11a/n: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)</td></tr>
<tr><td>Operation frequency:</td><td>
<table>
<tr><td>Band</td><td>Mode</td><td>Frequency Range(MHz)</td><td>Number of channels</td></tr>
<tr><td rowspan="4">U-NII Band I</td><td>IEEE 802.11a</td><td>5180-5240</td><td>4</td></tr>
<tr><td>IEEE 802.11n 20MHz</td><td>5180-5240</td><td>4</td></tr>
<tr><td>IEEE 802.11n 40MHz</td><td>5190-5230</td><td>2</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Antenna type:</td><td>PCB Antenna</td></tr>
<tr><td>Antenna gain:</td><td>0dBi</td></tr>
<tr><td colspan="2">Remark: The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.</td></tr>
</table>

1.3 Test Facility

TestLaboratory:
Dongguan Yaxu (AiT) Technology Limited
No.22, Jinqianling 3rd Street, Jitigang, Huangjiang, Dongguan, Guangdong, China

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

CNAS- Registration No: L6177
Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on April 18, 2022

FCC-Registration No.: 703111 Designation Number: CN1313
Dongguan Yaxu (AiT) Technology Limited 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.

IC —Registration No.: 6819A CAB identifier: CN0122
The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

A2LA-Lab Cert. No.: 6317.01
Dongguan Yaxu (AiT) Technology Limited 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.

1.4 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 according 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 Dongguan Yaxu (AiT) Technology Limited’squality system according 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 Yaxu (AiT) laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	150KHz~30MHz ±1.20dB	(1)
Radiated Emission	9KHz~30Hz±3.10dB	(1)
Radiated Emission	9KHz~1GHz ±3.75dB	(1)
Radiated Emission	1GHz~18GHz ±3.88dB	(1)
Radiated Emission	18GHz-40GHz ±3.88dB	(1)

The report uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

2 Method of measurement

2.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this 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.

According to §1.1310 and §2.1091 RF exposure is calculated.

FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures

2.2 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)*	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)*	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

2.3 MPE Calculation Method

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

2.4 Manufacturing Tolerance

BR_EDR (Conducted)

Frequency (MHz)	BR_EDR_GFSK		
	2402	2441	2480
Target (dBm)	3.0	3.0	3.0
Tolerance ± (dB)	1.0	1.0	1.0
Frequency (MHz)	BR_EDR_π/4-DQPSK		
	2402	2441	2480
Target (dBm)	3.0	3.0	3.0
Tolerance ± (dB)	1.0	1.0	1.0
Frequency (MHz)	BR_EDR_8-DPSK		
	2402	2441	2480
Target (dBm)	3.0	3.0	3.0
Tolerance ± (dB)	1.0	1.0	1.0

5.2G WIFI (Conducted)

Frequency (MHz)	IEEE 802.11a(AV)		
	5180	5200	5240
Target (dBm)	14.0	14.0	14.0
Tolerance ± (dB)	1.0	1.0	1.0
Frequency (MHz)	IEEE 802.11n20(AV)		
	5180	5200	5240
Target (dBm)	14.0	14.0	14.0
Tolerance ± (dB)	1.0	1.0	1.0
Frequency (MHz)	IEEE 802.11n40(AV)		
	5190		5230
Target (dBm)	14.0		14.0
Tolerance ± (dB)	1.0		1.0

2.5 Standalone MPE Result

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna is refer to section 4, the RF power density can be obtained.

Modulation Type	Output power with tune_up		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW				
BR_EDR	4.0	2.512	0	1.0	0.00050	1.0000
5.2G WIFI	15.0	31.623	0	1.0	0.00629	1.0000

Remark:
1. Output power (Peak) including turn-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.
3.WIFI and BT do not support simultaneous transmission .

2.6 Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

*************************End of Report*************************