Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road,
Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

RF Exposure evaluation

Report Reference No. ..... :	**GTS20200331005-1-9**
FCC ID. ..... :	**2AV8I-CARPLAYPLUSA**
Compiled by (position+printed name+signature)..:	File administrators Tracy Hu
Supervised by (position+printed name+signature)..:	Test Engineer Moon Tan
Approved by (position+printed name+signature)..:	Manager Simon Hu
Date of issue.....:	May. 21, 2020

Representative Laboratory Name :	**Shenzhen Global Test Service Co.,Ltd.**
Address.....:	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China

Applicant's name.....:	**Pacific Time Trading(Shenzhen)Limited**
Address.....:	Unit 607, block A, Rong Chaoying Long building, 5 longfuRoad, Longcheng street, Longgang District, Shenzhen

Test specification ..... **:**	
Standard .....:	**47CFR §1.1310** **47CFR §2.1093** **KDB447498 v06**
TRF Originator.....:	Shenzhen Global Test Service Co.,Ltd.
Master TRF.....:	Dated 2014-12

Test item description ..... :	**CARPLAY**
Trade Mark .....:	N/A
Manufacturer.....:	TFVC SHANGHAI CO.,LTD.
Model/Type reference.....:	CARPLAY PLUS A
Listed Models .....:	CARPLAY PLUS D, CARPLAY PLUS S, CARPLAY WIRELESS A, CARPLAY WIRELESS D, CARPLAY WIRELESS S
Exposure category.....:	General population/uncontrolled environment
EUT Type.....:	Production Unit
Hardware Version .....:	V1.0
Software Version .....:	V1.0
Rating .....:	DC 12V
Result.....:	**PASS**

T E S T R E P O R T

Test Report No. :	**GTS20200331005-1-9**	May. 21, 2020 Date of issue

Equipment under Test	:	CARPLAY
Model /Type	:	CARPLAY PLUS A
Listed Models	:	CARPLAY PLUS D, CARPLAY PLUS S, CARPLAY WIRELESS A, CARPLAY WIRELESS D, CARPLAY WIRELESS S
Applicant	:	**Pacific Time Trading(Shenzhen)Limited**
Address	:	Unit 607, block A, Rong Chaoying Long building, 5 longfuRoad, Longcheng street, Longgang District, Shenzhen
Manufacturer	:	TFVC SHANGHAI CO.,LTD.
Address	:	Rm 103, No.1 Lane 666 Xinhua Road, Changning District, Shanghai

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1 . SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

●	Adapter	Length (m) :	1.5m
		Shield :	Non-Shielded
		Detachable :	Non- Detachable

1.2. Product Description

Product Name:	CARPLAY
Trade Mark:	N/A
Model/Type reference:	CARPLAY PLUS A
List Model:	CARPLAY PLUS D, CARPLAY PLUS S, CARPLAY WIRELESS A, CARPLAY WIRELESS D, CARPLAY WIRELESS S
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power supply:	DC 12V
Sample ID	GTS20200331005-1-1#
BT	
Operation frequency	2402-2480MHz
Channel Number	79 channels for Bluetooth (DSS)
Channel Spacing	1MHz for Bluetooth (DSS)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK for Bluetooth (DSS)
Antenna Description	FPC Antenna, 2.7dBi(Max.)
WIFI(2.4G Band)	
Frequency Range	2412MHz ~ 2462MHz
Channel Spacing	5MHz
Channel Number	11 Channel for 20MHz bandwidth(2412~2462MHz) 7 channels for 40MHz bandwidth(2422~2452MHz)
Modulation Type	802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	FPC Antenna, 2.7dBi(Max.)
FM Transmitter	
Frequency Range	88 MHz~108 MHz
Channel Spacing	100KHz
Channel Number	199 Channel
Modulation Type	FM
Antenna Description	FPC Antenna , 0.0dBi(Max.)

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China

2.2. Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

2.3. Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4. Statement of the 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 acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. 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 Shenzhen GTS laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Method of measurement

3.1. Applicable Standard

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
FCC KDB publication 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.
FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.
FCC CFR 47 part2 2.1093: Radiofrequency radiation exposure evaluation: portable devices

3.2. Evaluation Method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The 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 (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."
[(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm)] · [√f (GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

a) The [∑ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg] + [∑ of MPE ratios] is ≤ 1.0.

The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04, and the [∑ of MPE ratios] is ≤ 1.0.

4. Conducted Power Results

Bluetooth

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	4.40
	39	2441	3.73
	78	2480	0.73
π/4DQPSK	0	2402	3.37
	39	2441	2.90
	78	2480	0.04
8DPSK	0	2402	3.71
	39	2440	3.23
	78	2480	0.23

2.4GWLAN

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
802.11b	01	2412	9.15
	06	2437	9.31
	11	2462	9.31
802.11g	01	2412	9.45
	06	2437	9.08
	11	2462	9.03
802.11n(HT20)	01	2412	9.28
	06	2437	9.27
	11	2462	9.22
802.11n(HT40)	03	2422	9.08
	06	2437	9.02
	09	2452	9.11

5. Manufacturing Tolerance

Bluetooth

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	4.0	3.0	0.0
Tolerance ±(dB)	1.0	1.0	1.0
π/4DQPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	3.0	2.0	0.0
Tolerance ±(dB)	1.0	1.0	1.0
8DPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	3.0	3.0	0.0
Tolerance ±(dB)	1.0	1.0	1.0

2.4GWLAN

IEEE 802.11b (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	9.0	9.0	9.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	9.0	9.0	9.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	9.0	9.0	9.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	9.0	9.0	9.0
Tolerance ±(dB)	1.0	1.0	1.0

6. Evaluation Results

6.1 Standalone Evaluation

Bluetooth

Band/Mode	f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
			dBm	mW		
GFSK	2.480	25	5.00	3.1623	0.20 < 3.0	Yes
π/4DQPSK	2.480	25	4.00	2.5119	0.16 < 3.0	Yes
8DPSK	2.480	25	4.00	2.5119	0.16 < 3.0	Yes

2.4GWLAN

Band/Mode	f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
			dBm	mW		
IEEE 802.11b	2.462	25	10.00	10.0000	0.62 < 3.0	Yes
IEEE 802.11g	2.462	25	10.00	10.0000	0.62 < 3.0	Yes
IEEE 802.11n HT20	2.462	25	10.00	10.0000	0.62 < 3.0	Yes
IEEE 802.11n HT40	2.462	25	10.00	10.0000	0.62 < 3.0	Yes

Remark:
1. Output power including tune up tolerance;
2. When the minimum test separation distance is < 25 mm, a distance of 25 mm according to f) in section 4.1 of KDB447498 is applied to determine SAR test exclusion.

6.2 Simultaneous Transmission for SAR Exclusion

The sample support one BT modular and one WLAN modular, they supports difference antenna, need consider simultaneous transmission;
$\sum$ of (the highest measured or estimated SAR_{BT}+SAR_{WLAN})/1.6 = (0.0267+0.0843)/1.6 = 0.1 < 1.0;

7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06, No SAR is required.

.....End of Report.....