# **Test Report**

Test Report No.: CQC-IVTS-2023-00312

Product Name Millimeter Wave Corner Radar Sensor

Model Number SRD3523/18
Huizhou Desay SV Automotive Co.,
Ltd.

Approval Types FCC ID: 2AEQT-DSRDT001

CQC Internet of Vehicles Technical Service (Shenzhen) Co., Ltd.

National Quality Inspection and Testing Center for Internet of Vehicles

Products



Report No.: CQC-IVTS-2023-00312

## **TEST REPORT DECLARATION**

Equipment under Test

Millimeter Wave Corner Radar Sensor

Model /Type

SRD3523/18

Listed Models

N/A

**Applicant** 

Huizhou Desay SV Automotive Co., Ltd.

Address

NO.103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou, Guangdong, P.R. China

Manufacturer

Huizhou Desay SV Automotive Co., Ltd.

Address

NO.103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou, Guangdong, P.R. China

The EUT described above is tested by CQC Internet of Vehicles Technical Service (Shenzhen) Co., Ltd. to determine the maximum emissions from the EUT. CQC Internet of Vehicles Technical Service (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy of the test results.

Project Engineer:	Yankun Wang 王炎坤)	Date: 2023-8-8
Checked by:	している。 (Haohao Li 李昊昊)	Date: 2023 - 8 - 8
Approved by:	<b>Vlewh</b> 'and へ (Wenliang Li 李文亮)	Date: 22 - J

8

### **Contents**

<b>Product De</b>	scription*	4
Modification		
Device Data		
Test Condit		5
Additional I		Ę
Test Location		Ę
	ies from Standard Conditions	Ę
	erdicts of The Results	5
RF EXPO	SURE ASSESSMENT REQUIREMENTS	<u></u>
FCC 47 CFF	R Part 1.1307 (b)(3) – Determine That They Qualify For An Exemption	6
	R Part 1.1310 – Radiofrequency Radiation Exposure Limits	e
	R Part 2.1091 – Radiofrequency Radiation Exposure Evaluation: Mobile Do	
FCC 47 CFF	R Part 2.1093 – Radiofrequency Radiation Exposure Evaluation: Portable	Devices
KDB447498	D04 Interim General RF Exposure Guidance v01	9
3.5.1.	TOLERANCES IN RF EXPOSURE TEST METHODOLOGIES	
2 5 2	1-MW TEST EXEMPTION FOR MULTIPLE SOURCES	
3.5.2.	SIMULTANEOUS TRANSMISSION WITH BOTH SAR-BASED AND MPE-B	RASED
3.5.3.		
3.5.3.	IPTIONS	
3.5.3. TEST EXEM	1PTIONS	
3.5.3. TEST EXEM	DSURE ASSESSMENT METHOD	
3.5.3. TEST EXEM  RF EXPO	DSURE ASSESSMENT METHOD	
3.5.3. TEST EXEM  RF EXPO  Standalone 4.1.1.	OSURE ASSESSMENT METHOD  RF Exposure Evaluation Method  CONVERSION OF OUTPUT POWER	1
3.5.3. TEST EXEM RF EXPO Standalone 4.1.1. 4.1.2.	PTIONS	1
3.5.3. TEST EXEM  RF EXPO  Standalone 4.1.1. 4.1.2. TOLERANC	PTIONS	
3.5.3. TEST EXEM  RF EXPO  Standalone 4.1.1. 4.1.2. TOLERANC Simultaneo	PTIONS	1
3.5.3. TEST EXEM  RF EXPO  Standalone 4.1.1. 4.1.2. TOLERANC Simultaneo 4.2.1.	RF Exposure Evaluation Method  CONVERSION OF OUTPUT POWER	
3.5.3. TEST EXEM  RF EXPO  Standalone 4.1.1. 4.1.2. TOLERANC Simultaneo 4.2.1.	PTIONS	1 1 MULTIP

Report No.: CQC-IVTS-2023-00312 Page 3 of 12

## 1. TEST STANDARDS

The tests were performed according to following standards: The equipment under test (EUT) has been tested at CQC-IVTS's (own or subcontracted) laboratories according to the leading reference documents giving table below:

No	Identify	Document Title	Version/Date
1	KDB 447498 D04	Interim General RF Exposure Guidance	V01
2	FCC 47 CFR Part 1.1307 (b)	Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared	07/13/2023
3	FCC 47 CFR Part 1.1310	Radiofrequency radiation exposure limits	07/13/2023
4	FCC 47 CFR Part 1.1091	Radiofrequency radiation exposure evaluation: mobile exposure	07/13/2023
5	FCC 47 CFR Part 1.1093	Radiofrequency radiation exposure evaluation: portable exposure	07/13/2023

Report No.: CQC-IVTS-2023-00312 Page 4 of 12

### 2. SUMMARY

#### 2.1. Product Description\*

Product Name:	Millimeter Wave Corner Radar Sensor
Trade Mark	DESAY SV
Model/Type reference:	SRD3523/18
FCC ID:	2AEQT-DSRDT001
Hardware Version:	0.0.1
Software Version:	00.00.03
Frequency Range:	76.00 – 78.00 GHz
Technology:	Radar
Modulation Type:	FMCW
Channel Bandwidth:	< 2 GHz
Channel Spacing:	N/A
Receiver Category:	N/A
Receiver Bandwidth:	N/A
Antenna:	Microstrip Antenna
Antenna Gain:	15.00 dBi
Specified Rated Output Power E.R.I.P.):	≤ 10.00 dBm
Power Supply:	DC 12V from vehicle battery
Exposure Category:	☐ General Population/Uncontrolled Exposure
Exposure Category.	Occupational/Controlled Exposure
Device Type:	☐ Portable Device ☐ Mobile Device
	☐ 0.0005 m to 0.20 m
Evaluation Distance	☑ 0.20 m to 0.40 m
	☐ > 0.40 m
Temperature Range:	-40°C to +85°C
Difference Declaration	n/a

<sup>\*:</sup> declared by the applicant. CQC-IVTS not responsible for accuary.

#### 2.2. Modifications

No modifications were implemented to meet testing criteria

#### 2.3. Device Data\*

Parameters declared by the manufacturer: The declared maximum output powers including tune-up tolerances are used with regard to the maximum antenna gains to find the maximum EIRP and ERP values.

Туре	Operation Mode	Bands / Frequency [GHz]	Maximum EIRP (average) including tune up tolerance [dBm]	
Radar	Front	76.00 – 78.00 GHz	10.00	

Measurements of power levels and declared antenna gains details in this report and were taken from the following RF module test report(s). EUT test information such as test equipments used, data of actual test, environmental conditions, measurement uncertainty and the persion who performed the original tests are referenced in the listed test report(s).

Туре	Test Report	Radio Standard	Issud by	Band(s) [GHz]	RF Output Power + Antenna Gain (average) [dBm]
Radar	CQC-IVTS-2023-00311	FCC Part 95M	CQC-IVTS	76.00 – 78.00	8.04

<sup>\*:</sup> declared by the applicant.

#### 2.4. Test Conditions\*

Temperature, [°C]		Voltage, [V]	
$T_nom$	+25.0	$V_{nom}$	DC 10.2 V
$T_{min}$	-40.0	$V_{min}$	DC 12.0 V
T <sub>max</sub>	+85.0	$V_{max}$	DC 13.8 V

<sup>\*:</sup> declared by the applicant

#### 2.5. Additional Information

Test items differences	None
Additional application considerations to test a component or sub-assembly	Laptop with test software

### 2.6. Test Location

#### Location 1

Company:	CQC Internet of Vehicles Technical Service (Shenzhen) Co., Ltd.
Address:  Building G5, TCL International E City, Xili Street, Nanshan District, Shenzh China	
Contact Person:	Wenliang Li
Telephone:	+86-755-8618 9654
e-Mail:	liwenliang@cqc.com.cn

#### 2.7. Abnormalities from Standard Conditions

None

#### 2.8. Possible Verdicts of The Results

Test sample meets the requirements	P (PASS) ± the measured value is below the acceptance limit, AL = TL	
Test sample does not meet the	F (FAIL) ± the measured value is above the acceptance	
requirements	limit, $AL = TL$	
Test case does not apply to the test sample	N/A (Not applicable)	
Test case not performed	N/P (Not performed)	
Test case not available	N/V (Not availiable)	

Report No.: CQC-IVTS-2023-00312 Page 6 of 12

### 3. RF EXPOSURE ASSESSMENT REQUIREMENTS

#### 3.1. FCC 47 CFR Part 1.1307 (b)(3) - Determine That They Qualify For An Exemption

According to § 1.1307 (b) (3) (i) - For single RF sources (*i.e.*, any single fixed RF source, mobile device, or portable device, as defined in <u>paragraph (b)(2)</u> of this section): A single RF source is exempt if:

- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in <u>paragraph (b)(3)(ii)(A)</u> of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
- (B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 cm} (d/20 \text{ cm})^x & d \le 20 \text{ cm} \\ ERP_{20 cm} & 20 \text{ cm} < d \le 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right)$$
 and  $f$  is in GHz;

and

$$\mathit{ERP}_{20\;cm}\;(\mathrm{mW}) = \begin{cases} 2040f & 0.3\;\mathrm{GHz} \leq f < 1.5\;\mathrm{GHz} \\ \\ 3060 & 1.5\;\mathrm{GHz} \leq f \leq 6\;\mathrm{GHz} \end{cases}$$

d = the separation distance (cm);

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C)—Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency [MHz]	Threshold ERP [watts]	
0.3 – 1.34	1920R <sup>2</sup>	
1.34 – 30	3450R <sup>2</sup> /f <sup>2</sup>	
30 – 300	3.83R <sup>2</sup>	
300 – 1500	0.0128R <sup>2</sup> f	
1500 – 100000	19.2R <sup>2</sup>	

#### 3.2. FCC 47 CFR Part 1.1310 – Radiofrequency Radiation Exposure Limits

According to § 1.1310 (d) (2) - For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 in paragraph (e)(1) of this section, may be used instead of whole-body SAR limits as set forth in paragraphs (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in § 1.1307(b) of this part, except for portable devices as defined in § 2.1093 of this chapter as these evaluations shall be performed according to the SAR provisions in § 2.1093.

According to § 1.1310 (d) (3) - At operating frequencies above 6 GHz, the MPE limits listed in Table 1 in <u>paragraph (e)(1)</u> of this section shall be used in all cases to evaluate the environmental impact of human exposure to RF radiation as specified in § 1.1307(b) of this part.

According to § 1.1310 (d) (4) - Both the MPE limits listed in Table 1 in <u>paragraph (e)(1)</u> of this section and the SAR limits as set forth in <u>paragraphs (a)</u> through (c) of this section are for continuous exposure, that is, for indefinite time periods. Exposure levels higher than the limits are permitted for shorter exposure times, as long as the average exposure over a period not more than the specified averaging time in Table 1 in paragraph (e)(1) is less than (or equal to) the exposure limits. Detailed information on our policies regarding procedures for evaluating compliance with all of these exposure limits can be found in the most recent edition of FCC's *OET Bulletin 65*, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields," and its supplements, all available at the FCC's internet website: <a href="https://www.fcc.gov/general/oet-bulletins-line">https://www.fcc.gov/general/oet-bulletins-line</a>, and in the Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB) (https://www.fcc.gov/kdb).

According to § 1.1310 (e) (1) - Table 1 to § 1.1310(e)(1) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Table 1 to § 1.1310(e)(1) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Frequency Range [MHz]	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [mW/cm <sup>2]</sup>	Averaging Time [minutes]		
	(i) Limits for Oc	ccupational/Controlled Expo	sure			
0.3 - 3.0	614	1.63	*(100)	≤6		
3.0 – 30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6		
30 – 300	61.4	0.163	1.0	<6		
300 – 1500			f/300	<6		
1500 – 100000			5.0	<6		
	(ii) Limits for General Population/Uncontrolled Exposure					
0.3 - 3.0	614	1.63	*(100)	<30		
3.0 – 30	842/f	2.19/f	*(180/f <sup>2</sup> )	<30		
30 – 300	27.5	0.073	0.2	<30		
300 – 1500			f/1500	<30		
1500 – 100000			1.0	<30		
f = frequency in MHz. * = Plane-wave equivalent power density.						

According to § 1.1310 (e) (2) - Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. The phrase *fully aware* in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of *transient* persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. In situations when an untrained person is transient through a location where occupational/controlled limits apply, he or she must be made aware of the potential for exposure and be supervised by trained personnel pursuant to § 1.1307(b)(2) of this part where use of time averaging is required to ensure compliance with the general population exposure limit. The phrase *exercise control* means that an exposed person is allowed and also knows how to reduce or avoid exposure by administrative or engineering work practices, such as use of personal protective equipment or time averaging of exposure.

According to § 1.1310 (e) (3) - General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. For example, RF sources intended for consumer use shall be subject to the limits for general population/uncontrolled exposure in this section.

## 3.3. FCC 47 CFR Part 2.1091 – Radiofrequency Radiation Exposure Evaluation: Mobile Devices

According to § 2.1091 (a) - Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See <u>subpart I of part 1 of this chapter</u>, in particular § 1.1307(b).

According to § 2.1091 (b) - For purposes of this section, the definitions in § 1.1307(b)(2) of this chapter shall apply. A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location while transmitting. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal desktop computer, are considered to be mobile devices if they meet the 20-centimeter separation requirement.

According to § 2.1091 (c) (1) - Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for mobile devices with single RF sources having either more than an available maximum time-averaged power of 1 mW or more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), whichever is greater. For mobile devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 of this chapter is necessary if the ERP of the device is greater than ERP<sub>20cm</sub> in the formula below. If the ERP of a single RF source at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP) in comparison with the following formula only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

antenna gain is less than that of a half-wave dipole (1.64 linear value).  $P_{th}(\text{mW}) = ERP_{20~cm}~(\text{mW}) = \begin{cases} 2040f & 0.3~\text{GHz} \le f < 1.5~\text{GHz} \\ 3060 & 1.5~\text{GHz} \le f \le 6~\text{GHz} \end{cases}$ 

According to § 2.1091 (c) (2) - For multiple mobile or portable RF sources within a device operating in the same time averaging period, routine environmental evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1. According to § 2.1091 (c) (3) - Unless otherwise specified in this chapter, any other single mobile or multiple mobile and portable RF source(s) associated with a device is exempt from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in § 1.1307(c) and (d) of this chapter.

## 3.4. FCC 47 CFR Part 2.1093 – Radiofrequency Radiation Exposure Evaluation: Portable Devices

According to § 2.1093 (a) - Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See <u>subpart I of part 1 of this chapter</u>, in particular § 1.1307(b).

According to § 2.1093 (b) - For purposes of this section, the definitions in § 1.1307(b)(2) of this chapter shall apply. A portable device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that the RF source's radiating structure(s) is/are within 20 centimeters of the body of the user.

According to § 2.1093 (c) (1) - Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for portable devices having single RF sources with more than an available maximum time-averaged power of 1 mW, more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)( $\overline{C}$ ), or more than the  $P_{th}$  in the following formula, whichever is greater. The following formula shall only be used in conjunction with portable devices not exempt by § 1.1307(b)(3)(i)( $\overline{C}$ ) at distances from 0.5 centimeters to 20 centimeters and frequencies from 0.3 GHz to 6 GHz.

at distances from 0.5 centimeters to 20 centimeters and frequencies from 0.3 GHz to 6 GHz. 
$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^x & d \leq 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \leq 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right)$$
 and f is in GHz;

$$ERP_{20\;cm}\;(\text{mW}) = \begin{cases} 2040f & 0.3\;\text{GHz} \le f < 1.5\;\text{GHz} \\ \\ 3060 & 1.5\;\text{GHz} \le f \le 6\;\text{GHz} \end{cases}$$

d = the minimum separation distance (cm) in any direction from any part of the device antenna(s) or radiating structure(s) to the body of the device user.

According to § 2.1093 (c) (2) - For multiple mobile or portable RF sources within a device operating in the same time averaging period, evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1.

According to § 2.1093 (c) (3) - Unless otherwise specified in this chapter, any other single portable or multiple mobile and portable RF source(s) associated with a device is exempt from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in § 1.1307(c) and (d) of this chapter.

#### 3.5. KDB447498 D04 Interim General RF Exposure Guidance v01

#### 3.5.1. TOLERANCES IN RF EXPOSURE TEST METHODOLOGIES

Device samples used for compliance testing must have the same physical, mechanical, and thermal characteristics, and operational tolerances as for production units.

All devices must be tested within the tune- up tolerance specification range. More specifically, each device must be evaluated for SAR or MPE compliance in the required operating modes and test configurations, at the maximum rated output power, and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit.

#### 3.5.2. 1-MW TEST EXEMPTION FOR MULTIPLE SOURCES

As discussed in § 1.1307(b)(3)(ii)(A), the 1-mW exemption intended for single transmitters may be also applied to simultaneous transmission conditions, within the same host device, according one of the following criteria:

- (a) When maximum available power each individual transmitting antenna within the same time averaging period is ≤ 1 mW, and the nearest parts of the antenna structures of the simultaneously operating transmitters are separated by at least 2 cm.
- (b) When the aggregate maximum available power of all transmitting antennas is ≤ 1 mW in the same timeaveraging period.

This exemption may not be combined with any other exemption.

## 3.5.3. SIMULTANEOUS TRANSMISSION WITH BOTH SAR-BASED AND MPE-BASED TEST EXEMPTIONS

This case is described in detail in § 1.1307(b)(3)(ii)(B) and covers the situations where both SAR-based and MPE-based exemption may be considered for test exemption in fixed, mobile, or portable device exposure conditions. For these cases, a device with multiple RF sources transmitting simultaneously will be considered an RF exempt device if the condition of Formula (1) is satisfied.

an RF exempt device if the condition of Formula (1) is satisfied. 
$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \le 1 \tag{1}$$

Appendix C provides additional details.

For these test exemptions to apply, the maximum output power, duty factor, and other applicable parameters used in the standalone ERP determination tests, must be the same, or corresponding to a more conservative choice, than those required for simultaneous transmission.

The power level of the standalone SAR used to qualify for SAR test exemption, or additional test exemption, must be clearly explained in the SAR report. When simultaneous transmission SAR-based test exemptions, or when the SPLSR test exemption [Section 2.2.3] cannot be applied, enlarged zoom scan SAR measurements must be performed at the maximum output power required for the applicable simultaneous transmission scenarios. This power level shall account for the *tune-up tolerance* requirements of all transmitters, but not more than 2 dB lower than the maximum tune-up tolerance limit.

Report No.: CQC-IVTS-2023-00312 Page 10 of 12

### 4. RF EXPOSURE ASSESSMENT METHOD

### 4.1. Standalone RF Exposure Evaluation Method

#### 4.1.1. CONVERSION OF OUTPUT POWER

$P(mW) = 10^{(\frac{Lp(dBm)}{10})} \times 1mW$						
E:	E-Filed Strength [V/m]					
P:	Power Input to Antenna [W]					
G:	Gain to the antenna in the direction of interest relative to an isotropic radiator [dBi]					
PG:	EIRP (effective isotropic radiated power) [W]					
r:	r: Distance [m]					
$E = \frac{\sqrt{30PG}}{}$						
	r					
S:	Power Density [W/m <sup>2</sup> ]					
P:	Power Input to Antenna [W]					
G:	Gain to the antenna in the direction of interest relative to an isotropic radiator [dBi]					
PG:	PG: EIRP (effective isotropic radiated power) [W]					
r:	Distance [m]					
$S = \frac{PG}{4\pi r^2}$						

Type	Band [GHz]	Maximum EIRP [dBm]	Maximum EIRP [W]	Power Density [W/m²]	Power Density [mW/cm <sup>2</sup> ]	FCC Limits [mW/cm <sup>2</sup> ]	FCC Verdict	FCC Exemption [W]	FCC Exemption Fullfilled
Radar	78.00	10.00	0.0100	0.01990	0.00199	N/A	N/A	0.768	Yes

## 4.1.2. KDB447498 D04 INTERIM GENERAL RF EXPOSURE GUIDANCE V01 - TOLERANCES IN RF EXPOSURE TEST METHODOLOGIES

Verdict:	□ PASS   □ FAIL   □ N/A
Additional	☑ Values for MPE compliance in the required operating modes and test configurations, at the maximum rated output power, are not within 2 dB lower than the maximum turn-up tolerance limit.

Report No.: CQC-IVTS-2023-00312 Page 11 of 12

#### 4.2. Simultaneous Transmission Evaluation Method

## 4.2.1. FCC 47 CFR PART 1.1307 (3) – DETERMINE OF EXEMPTION / (II) FOR MULTIPLE RF SOURCES

According to § 1.1307 (ii) (A) - The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

According to § 1.1307 (ii) (B) - in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \le 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using <u>paragraph (b)(3)(i)(B)</u> of this section for  $P_{th}$ , including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using <u>paragraph (b)(3)(i)(C)</u> of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

 $P_i$  = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

 $P_{th,i}$  = the exemption threshold power ( $P_{th}$ ) according to <u>paragraph (b)(3)(i)(B)</u> of this section for fixed, mobile, or portable RF source *i*.

 $ERP_j$  = the ERP of fixed, mobile, or portable RF source j.

 $ERP_{th,j}$  = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least  $\lambda/2\pi$  according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

 $Evaluated_k$  = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure  $Limit_k$  = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.

#### 4.2.2. SIMULTANEOUS TRANSMISSION EVALUATION RESULTS

Verdict:	□ PASS □ FAIL □ N/A
	☐ The device without any Simultaneous Transmission Transmitters
Additional	☐ The device with Simultaneous Transmission Transmitters
	Refer to following Simultaneous Transmission Evaluation Table

#### 4.3. RF Exposure Assessment Conclusion

Verdict: with th	e RF exposure assessment evaluation results does compliance the requirement exposure assessment evaluation results does not be ance with the requirement
Соттрі	ance with the requirement

Report No.: CQC-IVTS-2023-00312

### Page 12 of 12

## **Revision History**

Revision	Issue Date	Revisions	Revised By
1.0	2023-08-04	Original Issue	Wenliang Li
1.1	2023-08-08	a. Update trade mark	Wenliang Li

## **DECLARATION**

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.

If you have any questions on this report, please contact us within 15 days after issue this report.

#### CQC Internet of Vehicles Technical Service (Shenzhen) Co., Ltd.

Building G5, TCL International E City, Xili Street, Nanshan District, Shenzhen, China

Post: 518055

Phone: 0755-86189710 Fax: 0755-86189710

E-Mail: <a href="mailto:cvts-js@cqc.com.cn">cvts-js@cqc.com.cn</a>