FCC RF Exposure Test Report

Report No.	:	**PSU-QSU2307030110SA01**
Applicant	:	**COHDA WIRELESS PTY LTD.**
Address	:	**27 GREENHILL ROAD WAYVILLE SA 5034 AUSTRALIA**
Product	:	**ON BOARD（TRANSCEIVER) UNIT FOR AUTOMOTIVE.**
FCC ID	:	**2AEGPMK6OBU**
Brand	:	**Cohda Wireless**
Model No.	:	**MK6 OBU**
Standards	:	**FCC Part 2 (Section 2.1091)** **KDB 447498 D01 General RF Exposure Guidance v06**
Sample Received Date	:	**Jul. 03, 2023**
Date of Testing	:	**Jul. 03, 2023 ~ Nov. 03, 2023**
ISSUED BY	:	**Huarui 7layers High Technology (Suzhou) Co., Ltd.**
ADDRESS	:	**Tower N, Innovation Center, 88 Zhuyi Road, High-tech District, Suzhou City, Anhui Province China**

CERTIFICATION: The above equipment have been tested by **Huarui 7Layers High Technology (Suzhou) Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by A2LA or any government agencies.

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(Chao Wu / Engineer)

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(Peibo Sun /Manager)

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/ and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Table of Contents

Release Control Record

Report No.	Reason for Change	Date Issued
PSU-QSU2307030110SA01	Initial release	Nov. 03, 2023

1. Description of Equipment Under Test

EUT Type*	On board (Transceiver) unit for Automotive.
FCC ID*	2AEGPMK6OBU
Brand Name*	Cohda Wireless
Model Name*	MK6 OBU
Frequency Bands (Unit: MHz)	1850.2MHz ~ 1909.8MHz (FOR GSM 1900) 1852.4MHz ~ 1907.6MHz(FOR WCDMA Band 2) 1712.4MHz ~ 1752.6MHz(FOR WCDMA Band 4) 826.4MHz ~ 846.6MHz (FOR WCDMA Band 5) 1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 824.7MHz ~ 848.3MHz (FOR LTE Band5) 2502.5MHz ~ 2567.5MHz (FOR LTE Band7) 699.7MHz ~ 715.3MHz (FOR LTE Band12) 706.5MHz ~ 713.5MHz (FOR LTE Band17) 1850.7MHz ~ 1914.3 MHz (FOR LTE Band25) DL:717MHz ~ 728MHz (FOR LTE Band29) DL:2307.5MHz ~ 2312.5MHz (FOR LTE Band30) 2498.5MHz~ 2687.5MHz (FOR LTE Band41) 1710.7MHz ~ 1779.3MHz (FOR LTE Band66) 665.5MHz ~695.5MHz (FOR LTE Band71) SA/NSA: N2 (1852.5MHz ~1907.5MHz) N5 (826.5MHz ~ 846.5MHz) N25 (1852.5MHz ~ 1912.5MHz) N66 (1712.5 ~ 1777.5MHz) N71 (665.5 ~ 695.5MHz) N77(Part27Q)(3460.02MHz ~ 3540MHz) N77(Part27O)(3710.01MHz ~ 3969.99MHz) n78(Part 27Q) (3460.02MHz ~ 3540MHz) n78(Part 27O) (3710.01MHz ~ 3789.99MHz) NSA： DC_2A-n77A(Part 27Q) (3460.02MHz ~ 3540MHz) DC_2A-n77A(Part 27O) (3710.01MHz ~ 3789.99MHz) DC_2A-n78A(Part 27Q) (3460.02MHz ~ 3540MHz) DC_2A-n78A(Part 27O) (3710.01MHz ~ 3789.99MHz) DC_5A-n78A(Part 27Q) (3460.02MHz ~ 3540MHz) DC_5A-n78A(Part 27O) (3710.01MHz ~ 3789.99MHz) DC_7A-n78A(Part 27Q) (3460.02MHz ~ 3540MHz) DC_7A-n78A(Part 27O) (3710.01MHz ~ 3789.99MHz) DC_12A-n78A(Part 27Q) (3460.02MHz ~ 3540MHz) DC_12A-n78A(Part 27O) (3710.01MHz ~ 3789.99MHz) DC_66A-n78A(Part 27Q) (3460.02MHz ~ 3540MHz) DC_66A-n78A(Part 27O) (3710.01MHz ~ 3789.99MHz) 2412 MHz ~ 2462 MHz, 5180 ~ 5240MHz, 5260 ~ 5320MHz, 5500 ~ 5700MHz, 5745 ~ 5825MHz (FOR WLAN) 5895 MHz – 5925 MHz (FOR DSRC)
Modulations*	BT_LE : GFSK BT : GFSK, π/4-DQPSK, 8DPSK WLAN : DSSS, OFDM GNSS : BPSK GSM : GMSK, 8PSK WCDMA : HSDPA/HSUPA/ HSUPA+/DC-HSDPA LTE : QPSK/16QAM/64QAM 5G NR : DFT-s-OFMA(Pi/2BPSK,QPSK,16QAM,64QAM,256QAM); CP-OFMA(QPSK,16QAM,64QAM,256QAM); DSRC : BPSK,QPSK,16QAM,64QAM
Antenna Type*	See note3 (List of Accessory)
EUT Stage*	Production Unit

Note:

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity,

integrity and results of the data and information and/or the validity of the conclusion.

2. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

3. List of Accessory:

ACCESSORIES	MANUFACTURER	ANTENNA TYPE	MODEL
2x Antenna for LTE/2G/3G/CDMA	Taoglas	Monopole Antenna	TG.66.0723
1x Antenna for WLAN/BT	Taoglas	Monopole Antenna	GW.05.0E23
1x Antenna for WLAN	Taoglas	Monopole Antenna	GW.05.0E23
2x Antenna for C-V2X	MobileMark	DOM Antenna	MGWG-303
2x Antenna for DSRC	MobileMark	DOM Antenna	MGWG-303
1x Antenna for GNSS	MobileMark	DOM Antenna	MGWG-303

2. MPE(Maximum Permissible Exposure) Assessment

2.1 Introduction

According to 47 CFR §2.1091, 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 cm is normally maintained between the transmitting antenna 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. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 cm separation requirement. The limits to be used for MPE evaluation are specified in §1.1310. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

2.2 RF Radiation Exposure Limits

According to 47 CFR §1.1310, the criteria listed in below table shall be used to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093.

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (min)
(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 – 100000	-	-	5	6
(B) Limits for General Population / Uncontrolled Exposures				
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 – 100000	-	-	1.0	30

Limits for maximum permissible exposure (MPE)

Notes:

1. f = frequency in MHz
2. Occupational/controlled 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. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided they are made aware of the potential for exposure.
3. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that 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.

2.3 MPE Assessment Method

Calculations can be made to predict RF field strength and power density levels around typical RF sources. For example, in the case of a single radiating antenna, a prediction for power density in the far-field of the antenna can be made by use of the general Equations below. This equation is generally accurate in the far-field of an antenna but will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction.

$$\text{Power Density (S)} = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

Where
S = Power Density, unit in mW/cm^2
P = Power input to the antenna, unit in mW
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, unit in cm
EIRP = Effective isotropically radiated power

2.4 MPE Calculation for Standalone Operations

The manufacturer expects that the radiated component of this device will not close to the human body during normal usage and the warning statement was also stated in the user instruction. Since the transmitting antenna will be kept at least 20 cm away from the human body, the MPE level is calculated based on this condition and the result is listed in below table.

CALCULATION FOR MAXIMUM E.I.R.P

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Average EIRP (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit	Result
GSM 1900	1850.2	4.2	29.00	263.027	0.052	1.000	0.052	Pass
WCDMA Band II	1852.4	4.2	23.50	588.844	0.117	1.000	0.117	Pass
WCDMA Band IV	1712.4	4.2	23.50	588.844	0.117	1.000	0.117	Pass
WCDMA Band V	826.4	2.4	23.50	389.045	0.077	0.549	0.140	Pass
LTE Band 2	1850.7	4.2	24.00	660.693	0.132	1.000	0.132	Pass
LTE Band 4	1710.7	4.2	24.00	660.693	0.132	1.000	0.132	Pass
LTE Band 5	824.7	2.4	24.00	436.516	0.087	0.549	0.158	Pass
LTE Band 7	2502.5	4.4	24.00	691.831	0.138	0.466	0.296	Pass
LTE Band 12	699.7	2.6	24.00	457.088	0.091	0.471	0.193	Pass
LTE Band 17	706.5	2.6	24.00	457.088	0.091	0.471	0.193	Pass
LTE Band 25	1850.7	4.2	24.00	660.693	0.132	1.000	0.132	Pass
LTE Band 41	2498.5	4.4	24.00	691.831	0.138	1.000	0.138	Pass
LTE Band 66	1710.7	4.2	24.00	660.693	0.132	1.000	0.132	Pass
LTE Band 71	665.5	1.9	24.00	389.045	0.077	0.443	0.174	Pass

NR n2	1852.5	4.2	24.00	389.045	0.132	1.000	0.132	Pass
NR n5	826.5	2.4	24.00	660.693	0.087	0.551	0.158	Pass
NR n25	1852.5	4.2	24.50	436.516	0.148	1.000	0.148	Pass
NR n66	1712.5	4.2	24.50	741.310	0.148	1.000	0.148	Pass
NR n71	665.5	1.9	24.50	741.310	0.087	0.443	0.196	Pass
NR n77 (Part 27Q)	3460.02	4.8	24.50	851.138	0.169	1.000	0.169	Pass
NR n77 (Part 27O)	3710.01	4.8	25	954.993	0.190	1.000	0.190	Pass
NR n78 (Part 27Q)	3460.02	4.8	25.50	436.516	0.213	1.000	0.213	Pass
NR n78 (Part 27O)	3710.01	4.8	24.50	1071.519	0.169	1.000	0.169	Pass
BT	2412	1.94	10.83	851.138	0.004	1.000	0.004	Pass
BT_LE	2412	1.94	10.80	18.923	0.004	1.000	0.004	Pass
2.4GHz WLAN	2412	1.94	29.41	18.793	0.272	1.000	0.272	Pass
5.2GHz WLAN	5180	1.45	19.54	1364.583	0.025	1.000	0.025	Pass
5.3GHz WLAN	5260	1.45	16.96	125.603	0.014	1.000	0.014	Pass
5.5GHz WLAN	5500	1.45	19.88	69.343	0.027	1.000	0.027	Pass
5.8GHz WLAN	5745	1.45	20.05	135.831	0.028	1.000	0.028	Pass
DSRC	5895	5.0	19.90	141.254	0.062	1.000	0.062	Pass

2.5 CONCLUSION OF SIMULTANEOUS TRANSMITTER

Both of the WLAN and WWAN can transmit simultaneously, the formula of calculated the MPE is:

CPD1/LPD1+CPD2/LPD2+……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Average EIRP (mW)	Power Density (mW/cm^2)	Power Density / Limit	Σ(Power Density / Limit)	Limit	Result
WWAN	4.8	25.50	436.516	0.213	0.213	0.547	1.000	PASS
WLAN	1.94	29.41	1364.583	0.272	0.272			
DSRC	5.0	19.90	309.030	0.062	0.062			

Summary:
Since the ERP (effective radiated power) operated at < 1.5 GHz is less than 1.5 watts and > 1.5 GHz is less than 3 watts, the routine environmental evaluation is not required, and the MPE result calculated for this device complies with the MPE limit as specified in 47 CFR §1.1310.

3. Information on the Testing Laboratories

We, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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