

RF Exposure Evaluation Report

Product	: Robosen Flagship Optimus Prime Trailer
Trade mark	: N/A
Model/Type reference	: CX30,CX40,CX30-SA,CX30-XA,CX40-SA,CX40-XA
Serial Number	: N/A
Report Number	: EED32O80616202
FCC ID	: 2ATNWCX3040
Date of Issue	: Jul. 26, 2022
Test Standards	: 47 CFR Part 1.1307 47 CFR Part 2.1093 KDB447498D01 General RF Exposure Guidance v06
Test result	: PASS

Prepared for:

Robosen Robotics (ShenZhen) Co., Ltd
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Jul. 26, 2022

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2 Version

Version No.	Date	Description
00	Jul. 26, 2022	Original

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4 General Information

4.1 Client Information

Applicant:	Robosen Robotics (ShenZhen) Co., Ltd
Address of Applicant:	A3703, Bldg 11, Shenzhen Bay ECO-Tech Park, No.16,Gaoxin South Science and Tech Rd., Nanshan Dist.,Shenzhen,Guangdong,China
Manufacturer:	Robosen Robotics (ShenZhen) Co., Ltd
Address of Manufacturer:	A3703, Bldg 11, Shenzhen Bay ECO-Tech Park, No.16,Gaoxin South Science and Tech Rd., Nanshan Dist.,Shenzhen,Guangdong,China
Factory:	Dongguan Wirear Electronics Limited.
Address of Factory:	No. 7, Yihong Road, Changtang Industrial Zone, Yantian Village, Fenggang Town, Dongguan City, Guangdong Province, China

4.2 General Description of EUT

Product Name:	Robosen Flagship Optimus Prime Trailer
Model No.:	CX30,CX40,CX30-SA,CX30-XA,CX40-SA,CX40-XA
Test Model No.:	CX40
Trade Mark:	N/A
EUT Supports Radios application:	BT Single module 2402MHz to 2480MHz

4.3 Product Specification subjective to this standard

Frequency Range:	BT Single module 2402MHz to 2480MHz;	
Modulation Type:	GFSK	
Test Power Grade:	Default	
Test Software of EUT:	Atmosic RF Tool	
Antenna Type:	PCB Antenna	
Antenna Gain:	-0.8dBi	
Power Supply:	Adapter1:	model: ZL-030CL1262000US01 input: 100~240V-50/60Hz,1.2A Max output: 12.6V,2000mA
	Adapter2:	model: GFD24-1262000U input: 100~240V-50/60Hz,1.0A Max output: 12.6V,2A
	Lithium battery:	DC 11.1V,2600mAh,28.86Wh
Max Conducted Peak Output Power:	-1.39dBm	
	The Max Conducted Peak Output Power data refer to the report EED32O80616201	
Sample Received Date:	May 05, 2022	
Sample tested Date:	May 05, 2022 to May 17, 2022	
Remark: Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified. Model No.: CX30,CX40,CX30-SA,CX30-XA,CX40-SA,CX40-XA Only the model CX40 was tested, only the model name is different between each model,representing different		

shell colors and customers. The circuit principle, safety structure and key comments are the same, and the differences do not affect product safety and electromagnetic performance.

4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

5.2 Maximum Permissible Exposure

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

BLE:

Test Mode	Antenna	Channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
					(dBm)	(mW)
BLE_1M	Ant1	2402	-1.65	-2 ± 1.00	-1.00	0.794
		2440	-1.56	-2 ± 1.00	-1.00	0.794
		2480	-1.39	-2 ± 1.00	-1.00	0.794
BLE_2M	Ant1	2402	-1.65	-2 ± 1.00	-1.00	0.794
		2440	-1.58	-2 ± 1.00	-1.00	0.794
		2480	-1.39	-2 ± 1.00	-1.00	0.794

Worst case:

Maximum tune-up Power(dBm)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
-1	0.794	0.832	20	0.0001	1

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***