

# MPE REPORT

FCC ID: 2AEVW- CM00053

Date of issue: Oct. 08, 2019

Report number: MTi19082101-4E3

Sample description: Cronus Zen

Model(s): CM00053

Applicant: Collective Minds Gaming Co., Ltd.

Address: 5000 Jean Talon West, Suite# 250, Montreal, Quebec H4P 1W9, Canada

Date of test: Aug. 24, 2019 to Oct. 08, 2019

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>



TEST RESULT CERTIFICATION	
Applicant's name:	Collective Minds Gaming Co., Ltd.
Address:	5000 Jean Talon West, Suite# 250, Montreal, Quebec H4P 1W9, Canada
Manufacture's name:	DongGuan KingSheng Electronics&Technology Co., Ltd
Address:	Building 39, Arising Sun Industrial City, LinCun Village, TangXia Town, DongGuan City, China
Product name:	Cronus Zen
Trademark:	N/A
Model and/or type reference .:	CM00053
Serial model .....	N/A
RF exposure procedures .....	KDB 447498 D01 v06

This device described above has been tested by Shenzhen Microtest Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:

Danny Xu

Oct. 08, 2019

Reviewed by:

Blue Zheng

Oct. 08, 2019

Approved by:

Smith Chen

Oct. 08, 2019



## RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
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
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz \* = Plane-wave equivalent power density

### MPE Calculation Method

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

$P_d$  = Power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = Numeric gain of the antenna relative to isotropic antenna

$\pi$  = 3.1415926

$R$  = distance between observation point and center of the radiator in cm(20cm)

$P_d$  the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Measurement Result

### WIFI:

Operation Frequency: BT: GFSK,  $\pi/4$ -DQPSK, 8DPSK : 2402-2480MHz

BLE: GFSK: 2402-2480MHz

Power density limited: 1mW/ cm<sup>2</sup>

Antenna Type: Antenna: PCB Antenna;

WIFI antenna gain: 3dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(3/10)}=2.00$

### BT:

Channel Freq. (MHz)	modulation	conducte d power	Tune- up power (dBm)	Max		Antenna		Evaluatio n result	Power density Limits
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric	(mW/cm2 )	(mW/cm2)
2402	GFSK	5.16	5±1	6	3.981	3.00	2.00	0.0016	1
2441		4.93	5±1	6	3.981	3.00	2.00	0.0016	1
2480		5.45	5±1	6	3.981	3.00	2.00	0.0016	1
2402	π/4- DQPS K	3.423	3±1	4	2.512	3.00	2.00	0.0010	1
2441		3.08	3±1	4	2.512	3.00	2.00	0.0010	1
2480		3.63	3±1	4	2.512	3.00	2.00	0.0010	1
2402	8DPSK	3.86	4±1	5	3.162	3.00	2.00	0.0013	1
2441		3.38	4±1	5	3.162	3.00	2.00	0.0013	1
2480		4	4±1	5	3.162	3.00	2.00	0.0013	1

### BLE:

Channel Freq. (MHz)	modulation	conduct ed power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2 )	(mW/cm2)
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	5.18	6±1	7	5.012	3	2.00	0.0020	1
2440		6.52	6±1	7	5.012	3	2.00	0.0020	1
2480		6.73	6±1	7	5.012	3	2.00	0.0020	1

### Conclusion:

For the max result: 0.0020≤ 1.0 for 1g SAR, No SAR is required.

----END OF REPORT----