



MPE Test Report

Report No.: MTi20070916-5E3

Date of issue: May 13, 2021

Applicant: Shenzhen Hingin Tech Co., Ltd.

Product name: LaserPecker2

Model(s): L2, L2_2011

FCC ID: 2ATNE-L2

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>



Instructions

1. The report shall not be partially reproduced without the written consent of the laboratory;
2. The test results of this report are only responsible for the samples submitted;
3. This report is invalid without the seal and signature of the laboratory;
4. This report is invalid if transferred, altered or tampered with in any form without authorization;
5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.



Table of Contents

1	RF EXPOSURE EVALUATION.....	5
1.1	LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	5
1.2	MEASUREMENT RESULT	6



TEST RESULT CERTIFICATION	
Applicant's name.....	Shenzhen Hingin Tech Co., Ltd.
Address	Room 2901-1, Tower F of Galaxy World, No.1 Yabao Road, Bantian Street, Longgang District, Shenzhen City, Guangdong Province, China
Manufacturer's Name	Shenzhen Hingin Technology Co., Ltd.
Address	Room 2901-1, Tower F of Galaxy World, No.1 Yabao Road, Bantian Street, Longgang District, Shenzhen City, Guangdong Province, China
Product description	
Product name.....	LaserPecker2
Trademark	LaserPecker2
Model Name	L2
Serial Model	L2_2011
Standards.....	N/A
Test procedure	KDB 447498 D01 v06
Date of Test	
Date (s) of performance of tests... :	Dec. 09, 2020 ~ May 13, 2021
Test Result	Pass
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.	

Testing Engineer :

Danny Xu

(Danny Xu)

Technical Manager :

Leo Su

(Leo Su)

Authorized Signatory :

Tom Xue

(Tom Xue)



1 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)

1.1 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
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
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			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/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

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

P_d the limit of MPE, 1mW/cm². 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.



1.2 Measurement Result

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

Power density limited: 1mW/ cm²

Antenna Type: BT Antenna;

BT antenna gain: 2dBi

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(2.5/10)}=1.78$

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	3.578	4±1	5	3.162	2	1.58	0.0010	1
2441		3.793	4±1	5	3.162	2	1.58	0.0010	1
2480		4.928	4±1	5	3.162	2	1.58	0.0010	1
2402	$\pi/4$ -DQPSK	6.150	6±1	7	5.012	2	1.58	0.0016	1
2441		5.942	6±1	7	5.012	2	1.58	0.0016	1
2480		6.266	6±1	7	5.012	2	1.58	0.0016	1
2402	8DPSK	6.284	7±1	8	6.310	2	1.58	0.0020	1
2441		7.042	7±1	8	6.310	2	1.58	0.0020	1
2480		7.813	7±1	8	6.310	2	1.58	0.0020	1

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	3.990	4±1	5	3.162	2.00	1.58	0.0010	1
2440		4.204	4±1	5	3.162	2.00	1.58	0.0010	1
2480		4.807	4±1	5	3.162	2.00	1.58	0.0010	1

2Conclusion:

For the max result: BT: 0.002≤ 1.0, BLE: 0.001≤ 1.0for 1g SAR, No SAR is required.

----END OF REPORT----