

RF EXPOSURE REPORT

Applicant	Zhiwei Robotics Corp.
Address	Room 615,Building Y1,112 liangxiu road,Pudong,shanghai Municipality,China.

Manufacturer or Supplier	Zhiwei Robotics Corp.
Address	Room 615,Building Y1,112 liangxiu road,Pudong,shanghai Municipality,China.
Product	LattePanda Alpha
Brand Name	LattePanda
Model	DFR0546
Additional Model & Model Difference	DFR0545, DFR0547
Date of tests	Aug. 20, 2019 ~ Sep. 17, 2019

- ☒ FCC Part 2 (Section 2.1091)
- ☒ KDB 447498 D01
- ☒ IEEE C95.1

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Andy Zhu Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	
	Date: Oct. 21, 2019

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Test Report No.: FM190820N012

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FM190820N012	Original release	Oct. 21, 2019



Test Report No.: FM190820N012

1. CERTIFICATION

PRODUCT: LattePanda Alpha
BRAND NAME: LattePanda
MODEL NO.: DFR0546
ADDITIONAL MODEL: DFR0545, DFR0547
FCC ID: 2AIDMLPDF0546
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Zhiwei Robotics Corp.
TESTED DATES: Aug. 20, 2019 ~ Sep. 17, 2019
STANDARDS: FCC Part 2 (Section 2.1091)
KDB 447498 D01
IEEE C95.1

2. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

3. MPE CALCULATION FORMULA

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Frequency Band	Antenna Gain (dBi)	Antenna Type
Wi-Fi 2.4GHz	1.56	FPC Antenna
BT 2.4GHz	1.56	FPC Antenna
Wi-Fi 5GHz (5150-5250MHz)	0.61	FPC Antenna
Wi-Fi 5GHz (5250-5350MHz)	0.61	FPC Antenna
Wi-Fi 5GHz (5500-5725MHz)	0.61	FPC Antenna
Wi-Fi 5GHz (5725-5850MHz)	0.61	FPC Antenna

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

The tuned conducted Average Power (declared by client)

Mode	Frequency (MHz)	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
BT (GFSK)	2402-2480MHz	3	+2	1	5
BT (8DPSK)	2402-2480MHz	-1	+2	-3	1
BT-LE (GFSK)	2402-2480MHz	2	+2	0	4
802.11b	2412-2462MHz	12	+2	10	14
802.11g	2412-2462MHz	12	+2	10	14
802.11n HT20	2412-2462MHz	11	+2	9	13
802.11n HT40	2422-2452MHz	10	+2	8	12
Wi-Fi 5GHz(Band1)	5150-5250MHz	11	+2	9	13
Wi-Fi 5GHz(Band2)	5250-5350MHz	11	+2	9	13
Wi-Fi 5GHz(Band3)	5500-5725MHz	11	+2	9	13
Wi-Fi 5GHz(Band4)	5725-5850MHz	11	+2	9	13

The measured conducted Average Power

Mode	Frequency (MHz)	Averaged Power (dBm)
BT (GFSK)	2441	4.65
BT (8DPSK)	2441	-0.82
BT-LE (GFSK)	2440	3.03
802.11b	2462	13.56
802.11g	2462	13.53
802.11n HT20	2462	11.89
802.11n HT40	2422	10.67
Wi-Fi 5GHz(Band1)	5240	11.85
Wi-Fi 5GHz(Band2)	5240	11.21
Wi-Fi 5GHz(Band3)	5500	11.13
Wi-Fi 5GHz(Band4)	5745	11.44

FREQUENCY BAND (MHz)	MAX POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
BT	5	1.56	20	0.000901	1.0
Wi-Fi 2.4GHz	14	0.61	20	0.005751	1.0
Wi-Fi 5GHz	13	0.61	20	0.004568	1.0

CONCLUSION:

The WLAN 2.4GHz and 5GHz can not transmit simultaneously, but the BT and WLAN can transmit simultaneously, the formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

$$(0.000901/1)+(0.005751/1) = 0.006652 < 1, \text{ which is less than the "1" limit.}$$

--- END ---