DEKRA

Test report No: RF Exposure

TEST REPORT
Radio Spectrum Matters (RF)

Identification of item tested	Miko Mini Auotmatic Data Processing Unit
Trademark	**MIKO**
Model and /or type reference	EMK401
FCC/IC ID	2AS3S-EMK401
Features	Input rating: 5,0 V⎓; 3,0 A or 9,0 V⎓; 2,0 A or 12,0 V⎓; 1,5 A. Internal Li-ion battery (18650): 2400 mAh; 3,7 V⎓; 8,88 Wh.
Applicant´s name / address	RN Chidakashi Technologies Private Limited Flat No - 4, StambhTirth Building, Plot No 82, R.A. Kidwai Road Wadala, Mumbai, 400031, India
Test method requested, standard	KDB 447498 D01V06 FCC Part 1.1310
Verdict Summary	COMPLIANCE
Tested by (name & signature)	Jazz Liang
Approved by (name & signature)	Tim Yan
Date of issue	2023-11-13
Report template No	TRF_EMC 2017-06- FCC_Exposure

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GENERAL CONDITIONS

1.   This report is only referred to the item that has undergone the test.

2.   This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.

3.   This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.

4.   This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

5.   This report will not be used for social proof function in China market.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.	
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.	

Decimal separator used in this report	☒	Comma (,)	☐	Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	:	Equipment Under Test
QP	:	Quasi-Peak
CAV	:	CISPR Average
AV	:	Average
CDN	:	Coupling Decoupling Network
SAC	:	Semi-Anechoic Chamber
OATS	:	Open Area Test Site
BW	:	Bandwidth
AM	:	Amplitude Modulation
PM	:	Pulse Modulation
HCP	:	Horizontal Coupling Plane
VCP	:	Vertical Coupling Plane
U_N	:	Nominal voltage
Tx	:	Transmitter
Rx	:	Receiver
N/A	:	Not Applicable
N/M	:	Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
RF Exposure	2023-11-27	First release.

REMARKS AND COMMENTS

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item ....:	Miko Mini Auotmatic Data Processing Unit
Trademark.......................................:	**MIKO**
Model / Type number......................:	EMK401
FCC/IC ID ....:	2AS3S-EMK401
Ratings...:	Input rating: 5,0 V⎓; 3,0 A or 9,0 V⎓; 2,0 A or 12,0 V⎓; 1,5 A.
	Internal Li-ion battery (18650): 2400 mAh; 3,7 V⎓; 8,88 Wh.
Manufacturer..................................:	Same as applicant
Factory 1 ....:	Pacific Industries Zhongshan Limited
	Xincun Factory Area, Baishawan Industrial Park, Eastern District, 528400, Zhongshan, Guangdong, China.
Factory 2 ....:	Kaynes Electronics Manufacturing Private Limited
	26-27. Bandanguppe-kellamballi Industrial Area, State Code: 29 ,571313,Chamarajanagara,India

Rated power supply ....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☒	AC: 100-240 V, 50/60 Hz	☒	☐	☐	☒	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 5 V					
	☐	Battery:					
Mounting position.........................:	☒	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☒	Hand-held equipment					
	☐	Other:					

Wireless module Characteristic

Wireless module No........................	SKI.WB800DS2.1_800M
Operating frequency range(s) – Tx.:	2412 – 2462 MHz for 2.4G WIFI
	WLAN 5GHz Band: 5180 MHz ~ 5320 MHz, 5500 MHz ~ 5700 MHz, 5745 MHz ~ 5825 MHz;
	2402 – 2480 MHz for Bluetooth
Operating frequency range(s) – Rx :	2412 – 2462 MHz for 2.4G WIFI
	WLAN 5GHz Band: 5180 MHz ~ 5320 MHz, 5500 MHz ~ 5700 MHz, 5745 MHz ~ 5825 MHz;
	2402 – 2480 MHz for Bluetooth
Type of Modulation ....:	WLAN 2.4GHz : IEEE 802.11b: DSSS (CCK, QPSK, BPSK); IEEE 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM);

	IEEE 802.11n HT20/40: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ax (HE20/40): OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) WLAN 5GHz : IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac (VHT20/40): OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax (HE20/40): OFDMA (256QAM, 64QAM, 16QAM, QPSK, BPSK); Bluetooth LE:GFSK
Antenna type...................................:	FPC antenna
Antenna gain..................................:	2,3 dBi for 2.4GHz 2,48 dBi for 5GHz
Operation temperature range	-20 – 70 ℃

Antenna List

Antenna Model No.	LJF02-23062508-R0A						
Antenna Manufacturer	Shenzhen Lejin radio frequency technology Co., LTD						
Antenna Delivery	☒	1*TX+1*RX	☐	2*TX+2*RX		☐	3*TX+3*RX
Antenna Technology	☒	SISO					
	☐	MIMO	☐	Basic methodology			
			☐	Sectorized antenna systems			
			☐	Cross-polarized antennas			
			☐	Unequal antenna gains, with equal transmit powers			
			☐	Spatial Multiplexing			
			☐	Cyclic Delay Diversity (CDD)			
Antenna Type	FPC antenna						
Antenna Gain							

Antenna Technology			Ant Gain(eth1) (dBi)
☒	SISO	☒ Ant1	2,3 dBi for 2.4GHz 2,48 dBi for 5GHz
		☐ Ant2	-

The WIFI mode operating channels are:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2412	7	2447
1	2417	8	2452
2	2422	9	2457
3	2427	10	2462
4	2432	-	-
5	2437	-	-
6	2442	-	-

802.11a/n/ac/ax(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz
52	5260 MHz	56	5280 MHz	60	5300 MHz	64	5320 MHz
100	5500 MHz	104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz	149	5745 MHz
153	5765 MHz	157	5785 MHz	161	5805 MHz	165	5825 MHz
802.11n/ac/ax(40MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz	62	5310 MHz
102	5510 MHz	110	5550 MHz	118	5590 MHz	126	5630 MHz
134	5670 MHz	151	5755 MHz	159	5795 MHz	N/A	N/A

The radio module (Bluetooth) operating channels are:

BLE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	14	2430	28	2458
1	2404	15	2432	29	2460
2	2406	16	2434	30	2462
3	2408	17	2436	31	2464
4	2410	18	2438	32	2466
5	2412	19	2440	33	2468
6	2414	20	2442	34	2470
7	2416	21	2444	35	2472
8	2418	22	2446	36	2474
9	2420	23	2448	37	2476

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![DEKRA logo]

10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454	-	-
13	2428	27	2456	-	-

Intended use of the Equipment Under Test (EUT)
The apparatus as supplied for the test is Miko Mini Auotmatic Data Processing Unit which intended for residential use, the product contains electronic circuitry and with earth connection. It contains a Wireless module, so it would be controlled by other Wi-Fi devices through APPs. Hence, model EMK401 which contains this certified module SKI.WB800DS2.1_800M was chosen for full test.

Copy of marking plate:
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Designed By

MIKO

Input Rating: 5.0V ⎓ 3.0A / 9.0V ⎓ 2.0A / 12.0V ⎓ 1.5A
Model : EMK401
S/N :
P/N :
FCC ID: 2AS3S-EMK401
This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions :
(1) this device may not cause harmful interference, &
(2) this device must accept any interference received, including interference that may cause undesired operation.

CE [RCM] UKCA FC RoHS [WEEE]

Designed in India. Made in China.

Remark:

1.The CE marking must have substantially the same vertical dimension, which shall not be less than 5 mm.

2.The symbol combination of WEEE logo shall have a minimum height of 7 mm.

3.The EU/EFTA importer (and manufacture, if it is different)'s ①company name, ②registered trade name or registered trademark and③the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

1.2   Test data

Test Location	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China FCC Designation Number: CN1324;
Date of receipt of test item	2023-09-12
Date (s) of performance of tests	2023-09-12 to 2023-11-13
Test sample	Normal sample: EMK401 (lab no.4909379-1) RF conducted sample: EMK401 (lab no.4909379-1) RF radiated sample: EMK401 (lab no.4909379-1)

1.3   The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

☒	Residential (domestic) environment.
☐	Commercial and light-industrial environment.
☐	Industrial environment.

2   DESCRIPTION OF TEST SETUP

2.1   Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for methos	
		Conducted	Radiated
1	Transmitting at BLE mode	☒	☐
2	Transmitting at WIFI mode	☒	☐
3		☐	☐
Supplemental information: ---			

2.2   Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
Laptop	Latitude 5488	DELL	DEKRA
SecureCRT (soft ware)	-	-	Client
Adaptor	-	HUAWEI	DEKRA
Supplemental information: ---			

2.3   Test Configuration / Block diagram used for tests

Refer to Annex 3.

3   RF EXPOSURE EVALUATION

3.1   Limits

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)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			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/f²)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Power Density: $Pd(W/m^2)=E^2/377$

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

E=Electric Field (V/m)

Pd is the limit of MPE, 1 mW/cm2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

3.2　　　**Test Procedure**

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18℃and 78％ RH.

3.3　　　**Test Result**

Test Mode	Frequency Band (MHz)	Conducted RF Power Output (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	Maximum Power (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit of Power Density S(mW/cm^2)
BLE	2400 ~ 2480	4.49	2.3	6.79	4.8	0.001	1
2.4GWIFI	2412 ~ 2472	14.76	2.3	17.06	50.8	0.01	1
5GWIFI	5180 ~ 5825	10.86	2.86	13.72	23.6	0.004	1

Friis transmission formula: Pd = (Pout*G)/(4*pi*r^2)

For example,: EIRP=Pout*G= 4.8 mW

$\qquad$ E=4.8/(4*pi*20^2)=0.001 mW/cm^2

The formula of calculate the simultaneously transmission is

$$\sum(\text{All mode Power Desity})/\text{Limit} \leqslant 1$$

Calculated:

$$0.001/1+0.01/1+0.004/1=0.015\leqslant1$$

--- END ---