1 Cover Page

RF Exposure Evaluation Report

Application No.:	KSEM2104000630CR
FCC ID:	2AXVM-HM-TP7XXX
IC:	26572-HMTP7XXX
Applicant:	Hangzhou Microimage Software Co., Ltd.
Address of Applicant:	Room 313, Unit B, Building 2, 399 Danfeng Road, Xixing Subdistrict, Binjiang District, Hangzhou, Zhejiang
Manufacturer:	Hangzhou Microimage Software Co., Ltd.
Address of Manufacturer:	Room 313, Unit B, Building 2, 399 Danfeng Road, Xixing Subdistrict, Binjiang District, Hangzhou, Zhejiang
Factory:	Hangzhou Microimage Intelligent Technology Co., Ltd.
Address of Factory:	Floor 2, Building A1, 299 Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou City, Zhejiang Province
Equipment Under Test (EUT):	
EUT Name:	Handheld Thermography Camera
Model No.:	HM-TP76-25SVF/W-G60, HM-TP74-25SVF/W-G40, HM-TP73-15SQF/W-G30, HM-TP73-15SVF/W-G30
Trade mark:	HIKMICRO
Standard(s) :	FCC Rules 47 CFR §2.1093 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 Amendment 1 (February 2, 2021)
Date of Receipt:	2021-04-28
Date of Test:	2021-05-17 to 2021-05-26
Date of Issue:	2021-05-27
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Eric Lin
EMC Lab Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2021-05-27	/

Authorized for issue by:				
		Damon zhou		
		Damon Zhou / Project Engineer		
		Eric Lin		
		Eric Lin / Reviewer		

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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 3.6V By Rechargeable Li-ion Battery Model: INR18650-35E-1S2P Rated Capacity: 6.7Ah Energy: 24.12Wh Rated Voltage: 3.6V
Serial Number:	F66808429
Firmware Version:	V5.4.34 build 210311

3.2 Technical Specifications

BT

Antenna Gain:	5.66dBi(Provided by manufacturer)
Antenna Type:	PCB Antenna
Bluetooth Version:	V4.2 Classic
Channel Spacing:	1MHz
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channels:	79
Operation Frequency:	2402MHz to 2480MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)

BLE

Antenna Gain:	5.66dBi(Provided by manufacturer)
Antenna Type:	PCB Antenna
Bluetooth Version:	V4.2 LE
Data Rate:	1Mbps
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz

2.4GHz

Antenna Gain:	5.66dBi(Provided by manufacturer)
Antenna Type:	PCB Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Data Rate:	802.11b:1/2/5.5 /11Mbps 802.11g:6/9/12/18/24/36/48/54Mbps

	802.11n: MCS0-MCS7
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz

3.3 Test Location

All tests were performed at:
Compliance Certification Services (Kunshan) Inc.
No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.
Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.
Designation Number: CN1172.

• ISED (CAB Identifier: CN0072)

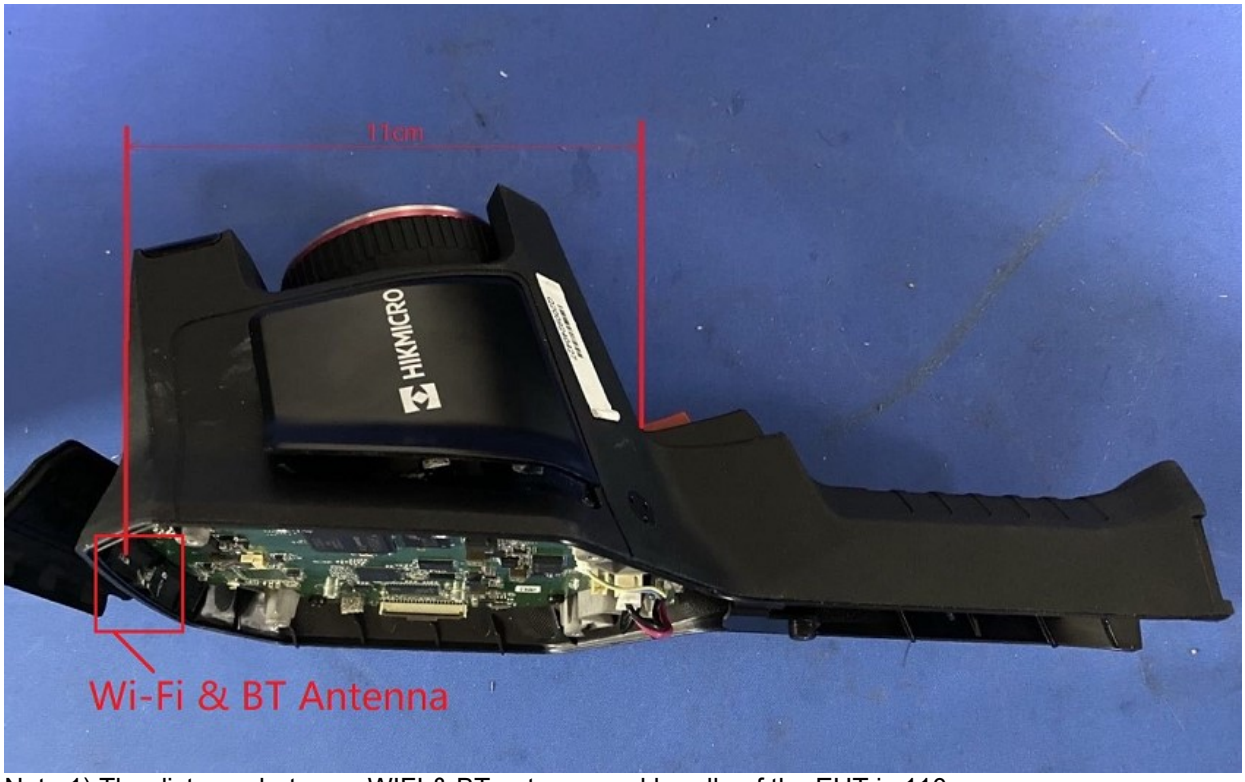
Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development (ISED) Canada as an accredited testing laboratory.
CAB Identifier: CN0072.

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-11600, C-11707, T-11499, G-10216 respectively.

4 Test Standards and Limits

4.1 DUT Antenna Locations



Note 1) The distance between WIFI & BT antenna and handle of the EUT is 110mm.
2) Only the handle is in contact with human hand in practical use condition.

4.2 FCC Radiofrequency radiation exposure limits:

a) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max power of channel)/(min test separation distance)]*[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):32

1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm) • (f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

2){[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50mm) • 10]} mW, for > 1500 MHz and ≤ 6 GHz

The practical use condition for this device is as a limb-worn and head accessories. So the applicable limit are both 10-g and 1-g SAR.

The practical use condition for this device is as a limb accessories. So the applicable limit is

P_{max}≤7.5*D_{min})/$\sqrt{f}$=7.5*50/$\sqrt{2.480}$+(110-50)*10=838.12mW

4.3 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.1, SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation - Exemption limits for routine evaluation based on frequency and separation distance [4, 5]

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥ 50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

The practical use condition for this device is as a limb accessories. So the applicable limit is 309*2.5=772.5mW

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report KSEM210400063001 & KSEM210400063002& KSEM210400063003.

BT

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
GFSK	2402	4.37	2.74
	2441	4.53	**2.84**
	2480	4.47	2.80
π/4DQPSK	2402	1.78	1.51
	2441	1.95	1.57
	2480	1.29	1.35
8DPSK	2402	2.04	1.60
	2441	2.22	1.67
	2480	1.54	1.43

BLE

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
1M	2402	2.94	**1.97**
	2442	0.73	1.18
	2480	0.16	1.04

2.4GHz

Test Mode	Test Channel	Ant	Power [dBm]	Power [mW]
11B	2412	Ant1	12.00	15.85
11B	2437	Ant1	12.71	**18.66**
11B	2462	Ant1	12.62	18.28
11G	2412	Ant1	12.02	15.92
11G	2437	Ant1	12.02	15.92
11G	2462	Ant1	12.20	16.60
11N20SISO	2412	Ant1	11.66	14.66
11N20SISO	2437	Ant1	12.33	17.10
11N20SISO	2462	Ant1	12.12	16.29
11N40SISO	2422	Ant1	12.60	18.20
11N40SISO	2437	Ant1	12.16	16.44
11N40SISO	2452	Ant1	12.03	15.96

5.2 MPE Calculation

The Max Conducted Peak Output Power is 18.66mW. The best case gain of the antenna is 5.66dBi. 5.66dBi logarithmic terms convert to numeric result is nearly 3.68

For 2.4GHz WiFi mode:

E.I.R.P.= P*G=18.66×3.68=68.69mW < 772.5mW< 838.12mW

For BT mode:

E.I.R.P.= P*G=2.84×3.68=10.45mW < 772.5mW< 838.12mW

For BLE mode:

E.I.R.P.= P*G=1.97×3.68=7.25mW < 772.5mW< 838.12mW

Wi-Fi and Bluetooth share the same Tx antenna and can’t transmit simultaneously. So the SAR report is not required.

--End of the Report--