

HEALTH TEST REPORT

For

Shenzhen Wesion Technology Co., Ltd.

VIM3

Test Model: VIM3 Pro

List Model No.: VIM3 Basic, VIM3L

Prepared for : Shenzhen Wesion Technology Co., Ltd.
Address : A#511, Mingyou Purchasing Center, Baoyuan Rd., Xixiang St.,
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Date of receipt of test sample : Aug 15, 2019
Number of tested samples : 1
Serial number : Prototype
Date of Test : Aug 15, 2019~ Aug 23, 2019
Date of Report : Aug 27, 2019



HEALTH TEST REPORT**EN 62311: 2008**

Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

Report Reference No. : **LCS190814015AEH****Date of Issue** : Aug ,27 2019**Testing Laboratory Name** : **Shenzhen LCS Compliance Testing Laboratory Ltd.****Address** : 101, 601, Xingyuan Industrial Park, Gushu Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, ChinaFull application of Harmonised standards ☒**Testing Location/ Procedure** : Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name**..... : **Shenzhen Wesion Technology Co., Ltd.****Address** : A#511, Mingyou Purchasing Center, Baoyuan Rd., Xixiang St., Bao'an Dis., Shenzhen, China.**Test Specification****Standard** : EN 62311: 2008**Test Report Form No.** : LCSEMC-1.0**TRF Originator** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF** : Dated 2017-06**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

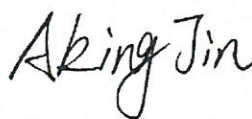
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Test Item Description. : **VIM3****Trade Mark**..... : Khadas**Model/ Type reference**..... : VIM3 Pro**Ratings** : Input:100-240V 0.7A

Output:5V-3A 9V-2.67A 12V-2A

Result : **Positive****Compiled by:**


Jack Liu / Administrators

Supervised by:


Aking Jin/ Administrators

Approved by:


Gavin Liang/ Manager

HEALTH --TEST REPORT**Test Report No. : LCS190814015AEH**Aug.27 2019

Date of issue

Test Model..... : VIM3

EUT..... : VIM3 Pro

Applicant..... : Shenzhen Wesion Technology Co., Ltd.Address..... : A#511, Mingyou Purchasing Center, Baoyuan Rd., Xixiang St.,
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Test Result**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
000	Aug ,27 2019	Initial Issue	Gavin Liang

1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT	: VIM3
Model No.	: VIM3 Pro, VIM3 Basic, VIM3L
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Test Model	: VIM3 Pro
Power Supply	: Input:100-240V 0.7A Output:5V-3A 9V-2.67A 12V-2A
Hardware Version	: V12
Software Version	: Android 9.0
Bluetooth	:
Frequency Range	: 2.402-2.480GHz
Channel Number	: 79 channels for Bluetooth V5.0 (BDR/EDR) 40 channels for Bluetooth V5.0 (BT LE)
Channel Spacing	: 1MHz for Bluetooth V5.0 (BDR/EDR) 2MHz for Bluetooth V5.0 (BT LE)
Modulation Type	: GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth V5.0 (BDR/EDR) GFSK for Bluetooth V5.0 (BT LE)
Bluetooth Version	: V5.0
Antenna Description	: PCB Antenna, 3.7dBi (Max.)
WIFI(2.4G Band)	:
Frequency Range	: 2412-2472MHz
Channel Spacing	: 5MHz
Channel Number	: 13 Channel for 20MHz bandwidth(2412~2472MHz)
Modulation Type	: 802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	: PCB Antenna, 3.7dBi (Max.)
WIFI(5.2G Band)	:
Frequency Range	: 5180-5240MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5180-5240MHz) 2 channels for 40MHz bandwidth(5190~5230MHz)
Modulation Type	: 802.11a/n: OFDM
Antenna Description	: PCB Antenna, 3.38dBi (Max.)
SRD(5.8G Band)	:
Frequency Range	: 5745-5825MHz
Channel Number	: 5 channels for 20MHz bandwidth(5745-5825MHz) 2 channels for 40MHz bandwidth(5755~5795MHz) 1 channels for 80MHz bandwidth(5775MHz)
Modulation Type	: IEEE 802.11a/n/ac: OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PCB Antenna, 3.38dBi (Max.)

1.2. Objective

According to its specifications, the EUT must comply with the requirements of the following standards:
EN 62311: 2008 –Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

1.3. Test Methodology

All measurements contained in this report were conducted with EN 62311: 2008.

1.4. Facilities

All measurement facilities used to collect the measurement data are located at 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.5. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
--	Adapter for EUT	AK24WG-1200200V	--	CE

1.6. External I/O Cable

I/O Port Description	Quantity	Cable
USB	1	N/A
DC IN	1	N/A
LINE OUT	1	N/A
AUX IN	1	N/A

1.7. Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

1.8. Laboratory Accreditations and Listings

Site Description

EMC Lab. : FCC Registration Number is 254912.
 Industry Canada Registration Number is 9642A-1.
 EMSD Registration Number is ARCB0108.
 UL Registration Number is 100571-492.
 TUV SUD Registration Number is SCN1081.
 TUV RH Registration Number is UA 50296516-001.
 NVLAP Accreditation Code is 600167-0.
 FCC Designation Number is CN5024.
 CAB identifier is CN0071.

1.9. Measurement Uncertainty

Test Item	Uncertainty
Radio Frequency	: 0.9×10^{-4}
Total RF Power, Conducted	: 1.0 dB
RF Power Density, Conducted	: 1.8 dB
Spurious Emissions, Conducted	: 1.8 dB
All Emissions, Radiated	: 3.1 dB
Temperature	: 0.5°C
Humidity	: 1 %
DC And Low Frequency Voltages	: 1 %

2. HUMAN EXPOSURE TO THE ELECTROMAGNETIC FIELDS

2.1 Basic Restrictions Reference levels

Council Recommendation 1999/519/EC Annex II

Basic restrictions for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	Magnetic flux density (mT)	Current density (Ma/m2) (rms)	Whole body average SAR (W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density (W/m2)
0Hz	40	-	-	-	-	-
>0-1Hz	-	8	-	-	-	-
1-4Hz	-	8/f	-	-	-	-
4-1000Hz	-	2	-	-	-	-
1000Hz-100kHz	-	f/500	-	-	-	-
100kHz-10MHz	-	f/500	0.08	2	4	-
10MHz-10GHz	-	-	0.08	2	4	-
10-300GHz	-	-	-	-	-	10

Note:

1. f is the frequency in Hz.
2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.
3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1cm² perpendicular to the current direction.
4. For frequencies up to 100 kHz, peak current density values can be obtained by multiplying the rms value by $\sqrt{2}$ (=1.414). For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as $f=1/(2tp)$
5. For frequencies up to 100kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
6. All SAR values are to be averaged over any six-minute period.
7. Localised SAR averaging mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservation values relative to the exposure guidelines.
8. For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as $f=1/(2tp)$. Additionally, for pulsed exposures, in the frequency range 0.3 to 10GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that SA should not exceed 2mJ kg⁻¹ averaged over 10g of tissue.

2.2 Reference Levels

Council Recommendation 1999/519/EC Annex III

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m ²)
0-1Hz	-	$3,2 \times 10^4$	4×10^4	-
1-8Hz	1000	$3,2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	-
8-25Hz	1000	$4000 / f$	$5000 / f$	-
0.025Hz-0,8kHz	$250 / f$	$4 / f$	$5 / f, 25$	-
0,8-3kHz	$250 / f$	5	6,25	-
3-150kHz	87	5	6,25	-
0,15-1MHz	87	$0.73 / f$	$0.92 / f$	-
1-10MHz	$87 / f^{1/2}$	$0.73 / f$	$0.92 / f$	-
10-400MHz	28	0.073	0,092	2
400-2000MHz	$1,375 f^{1/2}$	$0,0037 f^{1/2}$	$0,0046 f^{1/2}$	$f / 200$
2-300GHz	61	0,16	0,20	10

Note:

1. As indicated in the frequency range column.
2. For frequencies between 100kHz and 10GHz, Seq, E2, H2 and B2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10GHz, Seq, E2, H2 and B2 are to be averaged over any 68/.1.05-minute period (.in GHz).
4. No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.

2.3. Test Results

Exposure evaluation	
Given $E = \frac{\sqrt{30 \times G \times TP}}{D}$	Where <i>G: numerical gain of transmitting antenna;</i> <i>TP: Transmitted power in watt;</i> <i>D: distance from the transmitting antenna in meter (Declared by manufacturer).</i>
Antenna gain (G)	3.7dBi (Numeric gain:1.0)
Minimum distance in meter (D) (from transmitting structure to the human body)	0.2m

Test Mode	Test Frequency (MHz)	Max. EIRP (dBm)	Max. TP(dBm)	Limit (V/m)	Antenna Gain (dBi)	Distance (m)	Exposure evaluation (V/m)
BT	2402	0.48	0.48	61.00	3.70	0.2	1.401
	2441	0.24	0.24	61.00	3.70	0.2	1.363
	2480	0.63	0.63	61.00	3.70	0.2	1.426
BLE	2402	-0.17	-0.17	61.00	3.70	0.2	1.300
	2440	1.56	1.56	61.00	3.70	0.2	1.587
	2480	1.42	1.42	61.00	3.70	0.2	1.561
2.4G WIFI	2412	12.61	12.61	61.00	3.70	0.2	5.663
	2442	11.95	11.95	61.00	3.70	0.2	5.248
	2472	11.38	11.38	61.00	3.70	0.2	4.915
5.2G WIFI	5180	9.73	9.73	61.00	3.70	0.2	4.065
	5220	9.68	9.68	61.00	3.70	0.2	4.041
	5240	9.77	9.77	61.00	3.70	0.2	4.083
5.8G WIFI	5745	9.82	9.82	61.00	3.70	0.2	4.107
	5785	9.66	9.66	61.00	3.70	0.2	4.032
	5825	9.68	9.68	61.00	3.70	0.2	4.041

Note: 1. The Minimum distance declared the manufacture;

-----THE END OF REPORT-----