

TEST REPORT

Application No.: HKEM2007000666AT
Applicant: VTECH TELECOMMUNICATIONS LTD
Address of Applicant: 23/F.,BLOCK 1, TAI PING INDUSTRIAL CENTRE,NO. 57 TING KOK ROAD,TAI PO,N.T.,Hong Kong
Equipment Under Test (EUT):
EUT Name: 2.4 GHz FHSS Video Baby Monitor (BU)
Model No.: VM5251 BU, VM5251-2 BU, VM5X51-ab BU, VM5212 BU, VM5212-ab BU, LM808-1W BU, LM808-ab BU
FCC ID: EW780-1323-08
IC: 1135B-80132308
HVIN: 35-201390BU
Standard(s) : 47 CFR Part 1.1307; 47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
RSS102 Issue 5 March 2015
Date of Receipt: 2020-07-03
Date of Test: 2020-07-03 to 2020-07-15
Date of Issue: 2020-07-16

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



Law Man Kit
EMC Manager

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-07-16		Original

Authorized for issue by:			
			
		Leo Xu /Project Engineer	Date: 2020-07-16
			
		Law Man Kit /Reviewer	Date: 2020-07-16

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
RF Exposure	47 CFR Part 1.1307, 47 CFR Part 2.1093, KDB 447498 D01	KDB447498D01	KDB447498D01	PASS
RF Exposure	RSS102 Issue 5	RSS-102 Section 2.5.1	RSS102 Issue 5	PASS

Declaration of EUT Family Grouping:

Item no.: VM5251 BU, VM5251-2 BU, VM5X51-ab BU, VM5212 BU, VM5212-ab BU, LM808-1W BU, LM808-ab BU

a = any alphanumeric character or blank is presenting number of baby unit.

b = any alphanumeric character or blank is presenting color of enclosure

x = any alphanumeric character is presenting different type packaging

According to the confirmation from the applicant, the above models are identical in all electrical aspects in relating to the circuit design, PCB layout, electrical components used, internal wiring and functions. The differences are only the color, cosmetic details and model number.

Therefore only the model VM5251 BU was tested in this report.

Abbreviation:

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

N/A: In this whole report not application.



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 DETAILS OF E.U.T.	5
4.2 DESCRIPTION OF SUPPORT UNITS	6
4.3 MEASUREMENT UNCERTAINTY	7
4.4 TEST LOCATION	8
4.5 TEST FACILITY	8
4.6 DEVIATION FROM STANDARDS	8
4.7 ABNORMALITIES FROM STANDARD CONDITIONS	8
5 RADIO SPECTRUM TECHNICAL REQUIREMENT	9
5.1 RF EXPOSURE	9
5.1.1 <i>Test Requirement:</i>	9
5.1.1 <i>IC Radiofrequency radiation</i>	10
5.1.2 <i>EUT RF Exposure Evaluation</i>	11
6 PHOTOGRAPHS	11

4 General Information

4.1 Details of E.U.T.

Power supply:	Adaptor Model 1: VT05EUS05100 Input: AC 100 V - 240 V, 50/60 Hz, 0.15 A Output: DC 5.0 V, 1.0 A Adaptor Model 2: S006AKU0500100 Input: 100 V - 240 V, 50/60 Hz, 0.2 A Output: DC 5.0 V, 1 A
Test voltage:	AC 110 V
Cable:	Adaptor Model 1: VT05EUS05100 Power Cable: 201.5 cm unshielded 2-wire DC cable Adaptor Model 2: S006AKU0500100 Power Cable: 185.5 cm unshielded 2-wire DC cable
Antenna Gain:	0dBi
Antenna Type:	PCB Antenna
Channel Spacing:	2 MHz
Modulation Type:	GFSK
Number of Channels:	16
Operation Frequency:	2405 MHz to 2475 MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Hardware Version:	35-201390
Firmware version	R0

Frequency List

FHSS:

Channel Number	TX Freq (MHz)	Channel Number	TX Freq (MHz)	Channel Number	TX Freq (MHz)
1	2405	12	2428	23	2454
2	2407	13	2430	24	2456
3	2409	14	2433	25	2458.5
4	2411	15	2435	26	2460.5
5	2413	16	2437	27	2462.5
6	2415	17	2439	28	2467
7	2418	18	2441	29	2469
8	2420	19	2444	30	2471
9	2422	20	2446	31	2473
10	2424	21	2450	32	2475
11	2426	22	2452		

Remark: 1. Operation channel is only 16 within total channel 32.
2. Testing Channels are highlighted in **bold**.

4.2 Description of Support Units

Description	Manufacturer	Model No.	SN/Certificate NO
UART Test board	SGS HK Limited	MX3232	N/A
Test Software	MicroRidge System	Version 3.0.0.108	N/A
NoteBook (EMC4)	Dell	P75F	N/A

4.3 Measurement Uncertainty

EMI

No.	Item	Measurement Uncertainty
1	Conduction emission	2.5dB (9kHz to 150kHz)
		2.6dB (150kHz to 30MHz)
2	Radiated emission	5.1dB (30MHz-1GHz)
		4.9dB (1GHz-6GHz)
		4.7dB (6GHz-18GHz)
		5.6dB (18GHz-40GHz)

RF

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power (30MHz-40GHz)	1.5dB
5	RF power density	1.5dB
6	Conducted Spurious emissions	1.5dB
7	RF Radiated power	5.1dB (below 1GHz)
		5.3dB (above 1GHz)
8	Radiated Spurious emission test	5.1dB (below 1GHz)
		5.3dB (above 1GHz)
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cispr} (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

According to decision rule based on Clause 4.2 of CISPR 16-4-2, the EUT complied with the standards specified above.

4.4 Test Location

All tests were performed at:

SGS Hong Kong Limited
Unit 2 and 3, G/F, Block A, Po Lung Centre,
11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong
Tel: +852 2305 2570 Fax: +852 2756 4480

No tests were sub-contracted.

4.5 Test Facility

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

• **HOKLAS (Lab Code: 009)**

SGS Hong Kong Limited has been accepted by HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a HOKLAS Accredited Laboratory, this laboratory meets the requirements of ISO/IEC 17025:2017 and it has been accredited for performing specific test as listed in the scope of accreditation within the test category of Electrical and Electronic Products.

• **IAS Accreditation (Lab Code: TL-187)**

SGS Hong Kong Limited has met the requirements of AC89, IAS Accreditation Criteria for Testing Laboratories, and has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website (www.iasonline.org).

The report must not be used by the client to claim product certification, approval, or endorsement by IAS, NIST, or any agency of the Federal Government.

• **FCC Recognized Accredited Test Firm (CAB Registration No.: 514599)**

SGS Hong Kong Limited has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: HK0015, Test Firm Registration Number: 514599.

• **Industry Canada (Site Registration No.: 26103; CAB Identifier No.: HK0015)**

SGS Hong Kong Limited has been recognized by Department of Innovation, Science and Economic Development (ISED) Canada as a wireless testing laboratory. The acceptance letter from the ISED is maintained in our files. CAB Identifier No: HK0015, Site Registration Number: 26103.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Radio Spectrum Technical Requirement

5.1 RF Exposure

5.1.1 Test Requirement:

CFR 47 Part 1.1310

Limit:

According to FCC Part1.1310: 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 Part1.1307(b)

TABLE 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

According to IEEE C95.3:2002 section 5.5.1.1, The power density S at a point on the axis at a distance d from a transmitting antenna is given by the Friis free-space transmission formula

$$S = \frac{PG}{4\pi d^2}$$

S = power density (mW/cm²)
P = the net power delivered to the antenna (mW)
G = gain of the antenna in linear scale
d = distance between observation point and center of the radiator (cm)

5.1.1 IC Radiofrequency radiation

According to RSS-102 Issue 5, section 2.5.2 Exemption.

RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $22.48/f^{0.5} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz;

- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz;

- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).



5.1.2 EUT RF Exposure Evaluation

Antenna Gain: 0 dBi

The maximum Gain measured in fully anechoic chamber is 1 ()

Output Power Into Antenna & RF Exposure Evaluation Distance:

For FCC;

FHSS:

Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	Conduct powe (mW)	Power Density at R = 20 cm (mW/cm2)	Limit	MPE Ratios	Result
Low	2405	16.8	47.863	0.00952	1	0.00952	PASS
Middle	2439	16.1	40.738	0.00810	1	0.00810	PASS
High	2475	15.9	38.905	0.00774	1	0.00774	PASS

For IC:

FHSS:

Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	E.I.R.P (dBm)	E.I.R.P (W)	Limit (W)	Result
Low	2405	16.8	16.8	0.047863	2.7	PASS
Middle	2439	16.1	16.1	0.040738	2.7	PASS
High	2475	15.9	15.9	0.038905	2.7	PASS

Note: 1. Refer to report No. HKEM200700066602 for EUT test conducted power value. The distancer (5th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

6 Photographs

Remark: Photos refer to Appendix A, Appendix B and Appendix C of HKEM2007000666AT.

- End of the Report -