TEST REPORT

Application No.:	HKEM2005000397AT
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
Manufacturer:	VTech Telecommunications Ltd
Address of Manufacturer:	23/F, Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong
Equipment Under Test (EUT):	
EUT Name:	2.4 GHz WiFi & FHSS Baby Monitor
Model No.:	VM905HD BU, VM905-2HD BU, VM905-1WHD BU, VM905-0HD BU, VM905-abHD BU, VM909HD BU, VM909-2HD BU, VM909-1WHD BU, VM909-0HD BU, VM909-abHD BU
Additional model:	Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
FCC ID:	EW780-2128-02
IC:	1135B-80212802
HVIN:	35-400270BU
Trade mark:	VTech
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:	2020-05-11
Date of Test:	2020-05-14 to 2020-05-29
Date of Issue:	2020-06-05
Test Result:	**Pass***

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

Law Man Kit
EMC Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		*2020-06-05*		*Original*

Authorized for issue by:				
				
		Leo Xu **/Project Engineer**		Date: 2020-06-05
				
		Law Man Kit **/Reviewer**		Date: 2020-06-05

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.: VM905HD BU, VM905-2HD BU, VM905-1WHD BU, VM905-1WHD BU, VM905-abHD BU, VM909HD BU, VM909-2HD BU, VM909-1WHD BU, VM909-0HD BU, VM909-abHD BU

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

b = any alphanumeric character or blank is presenting color option

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 model/item No.

Therefore only the model VM905HD 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

4 General Information

4.1 Details of E.U.T.

Power supply:	Adaptor 1 AC 100-240V ~ 50/60Hz 400mA to DC 5.0V 1500 mA Model no: S012CDU0500150
Test voltage:	AC 120V
Cable:	180cm unshielded 2wires DC cable
Antenna Gain:	FHSS: 0dBi Wi-Fi: 1dBi
Antenna Type:	PCB Antenna
Channel Spacing:	FHSS: 4MHz Wifi 2.4GHz: 5MHz
Modulation Type:	FHSS: GFSK 802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	FHSS: 24 802.11b/g/n(HT20):11
Operation Frequency:	FHSS: 2406MHz to 2475MHz 802.11b/g/n(HT20): 2412MHz to 2462MHz
Hardware Version:	V001
Software Version:	V0101

Frequency List

FHSS:

Channel Number	TX Freq (MHz)	Channel Number	TX Freq (MHz)
1	**2405**	**13**	**2442**
2	2409	14	2445
3	2412	15	2448
4	2415	16	2451
5	2418	17	2454
6	2421	18	2457
7	2424	19	2460
8	2427	20	2463
9	2430	21	2466
10	2433	22	2469
11	2436	23	2472
12	2439	**24**	**2475**

Remark: 1. Operation channel is only 16 within total channel 24.

2. Testing Channels are highlighted in **bold**.

Wifi:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**2412**	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	**7**	**2442**	**11**	**2462**
4	2427	8	2447		

Remark: 1. Testing Channels are highlighted in **bold**.

4.2 Description of Support Units

The EUT has been tested with corresponding accessories as below:

Supplied by client

Description	Manufacturer	Model No.	SN/Certificate NO
UART Test board	N/A	MX3232	N/A
Test Software	MicroRidge System	Version 3.0.0.108	N/A

Supplied by SGS:

Description	Manufacturer	Model No.	SN/Certificate NO
NoteBook (EMC4)	Dell	P75F	N/A

4.3 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.

4.4 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 an 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.

4.5 Deviation from Standards

None

4.6 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/cm^2)
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 Radiofrequncy 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/f0.5W (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 x 10-2 f0.6834 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 (); 1.259 () in linear scale.

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	2442	15.6	36.308	0.00722	1	0.00722	PASS
High	2475	14.3	26.915	0.00535	1	0.00535	PASS

WiFi:

Operation mode	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
802.11b	Low	2412	14.4	27.542	0.00690	1	0.00690	PASS
802.11b	Middle	2442	15.7	37.154	0.00931	1	0.00931	PASS
802.11b	High	2462	14.8	30.200	0.00756	1	0.00756	PASS
802.11g	Low	2412	14.2	26.303	0.00659	1	0.00659	PASS
802.11g	Middle	2442	13.9	24.547	0.00615	1	0.00615	PASS
802.11g	High	2462	16.4	43.652	0.01093	1	0.01093	PASS
802.11n20	Low	2412	12.9	19.498	0.00488	1	0.00488	PASS
802.11n20	Middle	2442	13.4	21.878	0.00548	1	0.00548	PASS
802.11n20	High	2462	15.1	32.359	0.00810	1	0.00810	PASS

Σ rations of simultaneous transmitting evaluation for FHSS, Wi-Fi 2.4GHz were as follow:

Ratio for FHSS (E Field Strength/Limit)^2	Ratio for Wi-Fi 2.4GHz (E Field Strength/Limit)^2	Σ rations	Limit	Result
0.000091	0.000119	0.000210	1	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	2442	15.6	15.6	0.036308	2.7	PASS
High	2475	14.3	14.3	0.026915	2.7	PASS

WiFi:

Operation mode	Channel	Frequency (MHz)	Conduct power (including Tune-up tolerance) (dBm)	E.I.R.P (dBm)	E.I.R.P (W)	Limit (W)	Result
802.11b	Low	2412	14.4	15.4	0.034674	2.7	PASS
802.11b	Middle	2442	15.7	16.7	0.046774	2.7	PASS
802.11b	High	2462	14.8	15.8	0.038019	2.7	PASS
802.11g	Low	2412	14.2	15.2	0.033113	2.7	PASS
802.11g	Middle	2442	13.9	14.9	0.030903	2.7	PASS
802.11g	High	2462	16.4	17.4	0.054954	2.7	PASS
802.11n20	Low	2412	12.9	13.9	0.024547	2.7	PASS
802.11n20	Middle	2442	13.4	14.4	0.027542	2.7	PASS
802.11n20	High	2462	15.1	16.1	0.040738	2.7	PASS

Σ rations of simultaneous transmitting evaluation for FHSS, Wi-Fi 2.4GHz were as follow:

Ratio for FHSS (E.I.R.P /Limit)^2	Ratio for Wi-Fi 2.4GHz (E.I.R.P /Limit)^2	Σ rations	Limit	Result
0.017727	0.020353	0.03808	1	Pass

Note: 1. Refer to report No. HKEM200500039702 and . HKEM200500039703 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 HKEM2005000397AT.

- End of the Report -