

RF EXPOSURE EVALUATION REPORT

Product Name: Breathing and Video Monitor
Trade Mark: vtech
Model No.: VM5253 BU
Add. Model No.: VM5X53-ab BU
Report Number: 181214024RFC-3
Test Standards: FCC 47 CFR Part 1 Subpart I
FCC ID: EW780-1501-00
Module name: UWB device
Module No: X4M05V
Module FCC ID: EW7X4M05V
Joh no: HK18120034
Test Result: PASS
Date of Issue: July 8, 2019

Prepared for:

VTech Telecommunications Ltd.
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Version

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	VTech Telecommunications Ltd.
Address of Applicant:	23/F, Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong.
Manufacturer:	VTech (Dongguan) Telecommunications Limited.
Address of Manufacturer:	VTech Science Park, Xia Ling Bei Management Zone, Liaobu, Dongguan, Guangdong, China.

1.2 EUT INFORMATION

Product Name:	Breathing and Video Monitor	
Model No.:	VM5253 BU	
Add. Model No.:	VM5X53-ab BU	
Trade Mark:	vtech	
DUT Stage:	Production Unit	
EUT Supports Function:	2.405 – 2.475 MHz:	General 2.4GHz FHSS
	3.1GHz -10.6GHz:	7.29GHz UWB
Sample Received Date:	December 7, 2018	
Sample Tested Date:	December 7, 2018 to January 23, 2019	
Note: The Model(s): VM5X53-ab BU is the same as the Model: VM5253 BU in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure as declared by client. The only differences between these models are color and model number to be sold for marketing purpose as declared by client. Suffix (“a,b,x”) indicates different number of baby unit, different color of enclosure, and different type packaging as declared by client.		

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2405 MHz to 2475 MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK
Number of Channels:	17/32 (see note 1)
Channel Separation:	2 MHz
Hopping Channel Type:	Adaptive Frequency Hopping Systems
Antenna Type:	Integral Antenna
Antenna Gain:	0 dBi
Maximum Peak Power:	16.97 dBm

Note 1: According to declared of equipment manufacturer, this EUT operation frequency range is 2405 MHz to 2475 MHz, the number of channels available is 32, and channel separation is 2 MHz, but when the product is power on, only 17 of the 32 channels are chosen, and the channel spacing is greater than or equal to 2 MHz

UWB Frequency Band:	6 GHz to 8.5 GHz
Nominal Operating Frequency:	7.29 GHz
Number of Channels:	1
Antenna Type:	PCB Antenna

1.4 OTHER INFORMATION

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

1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC 47 CFR Part 1 Subpart I

All test items have been performed and recorded as per the above standards

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

2. EQUIPMENT LIST

Please refer to the RF test report.

3. MPE EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 1 Subpart I	PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
2	KDB 447498 D01 General RF Exposure Guidance v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES

3.2 MPE COMPLIANCE REQUIREMENT

3.2.1 Limits

3.2.1.1 FCC 47 CFR Part 1 Subpart I

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density.

3.2.2 Test Procedure

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

3.3 MPE CALCULATION METHOD

3.3.1 FCC 47 CFR Part 1 Subpart I

$$S = PG/4\pi R^2 = EIRP/4\pi R^2$$

S = power density (in appropriate units, e.g., mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

3.4 MPE CALCULATION RESULTS

Note: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.4.1 For RF function

For 2.4GHz FHSS function, operating at 2405MHz to 2475MHz.

For 7.29GHz UBW function, operating at 6GHz to 8.5GHz.

3.4.1.1 Results for 2.4G FHSS

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(mW)	(mW/cm ²)	
GFSK	2405-2475	18	2	0	20	100	1	0.0199

3.4.1.2 Results for UWB

Operating Mode	Freq.	Mximum EIRP	MPE Limit	MPE Value
	(MHz)	(dBm)	(mW/cm ²)	
UWB	6000-8500	-30.131	1	0.00000019

3.5 SIMULTANEOUS MULTI-BAND TRANSMISSION MPE ANALYSIS

3.5.1 List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Support/Not Support
1	2.4G_FHSS + UBW	Support

3.5.2 Results for transmit simultaneously

No.	Configurations	Maximum MPE Value			Limits
		2.4G_FHSS	UBW	Transmit simultaneously	
1	2.4G_FHSS + UBW	0.0199	0.00000019	0.01990019	1

Note 1: According to KDB 447498 D01 General RF Exposure Guidance v06, At the transmit simultaneously calculation method is as follows:

$$\text{Transmit simultaneously MPE} = \Sigma \text{ of MPE ratios}$$

$$\text{MPE ratios} = \text{Field strengths or power density} / \text{MPE limit at the test frequency}$$

APPENDIX 1 PHOTOS OF TEST SETUP

N/A

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal Photos.

*** End of Report ***

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