

# Test Report

FCC ID: 2AF80-VBS108

Date of issue: Sept. 03, 2020

Report number: MTi20061102-5E2

Sample description: Varmilo Mechanical Keyboard

Model(s): VBS108, VBS104, VBS105, VBS109, VBS113

Applicant: ShenZhen ZhiHaiHe Tech Co., Ltd.

Address: Unit B, 2nd Floor, Block 3, 10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, Shen Zhen, China.

Date of test: July 21, 2020 to Sept. 03, 2020

Shenzhen Microtest Co., Ltd.  
<http://www.mtitest.com>

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# Test Result Certification

Applicant's name: ShenZhen ZhiHaiHe Tech Co., Ltd.

Address: Unit B, 2nd Floor, Block 3, 10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, Shen Zhen, China.

Manufacture's name: ShenZhen ZhiHaiHe Tech Co., Ltd.

Address: Unit B, 2nd Floor, Block 3, 10th Industrial Zone, Tian Liao Community, Gong Ming Area, Guang Ming New District, Shen Zhen, China.

Product name: Varmilo Mechanical Keyboard

Trademark: VARMILO

Model name: VBS108, VBS104, VBS105, VBS109, VBS113

Standards: FCC Part 15.249

Test procedure: ANSI C63.10-2013

This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:

Demi Mu

Sept. 03, 2020

Reviewed by:

Leo Su

Sept. 03, 2020

Approved by:

Tom Xue

Sept. 03, 2020

## 1 General description

### 1.1 Feature of equipment under test (EUT)

Equipment:	Varmilo Mechanical Keyboard
Trade Name:	VARMILO
Model Name:	VBS108
Serial Model:	VBS104, VBS105, VBS109, VBS113
Model Difference:	All the models are of the same circuit and RF module, except the color and model No..
Operation Frequency:	2410 - 2468 MHz
Modulation Type:	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Max. Field Strength:	111.54dBuV/m
Power Source:	DC 6V from battery
Battery:	DC 1.5V*4 cell "AA" alkaline battery
Hardware version:	V2.0(G)
Software version:	MAB45E_V21.hex

## 1.2 Operation channel list

Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2410	11	2430	21	2450
2	2412	12	2432	22	2452
3	2414	13	2434	23	2454
4	2416	14	2436	24	2456
5	2418	15	2438	25	2458
6	2420	16	2440	26	2460
7	2422	17	2442	27	2462
8	2424	18	2444	28	2464
9	2426	19	2446	29	2466
10	2428	20	2448	30	2468

## 1.3 Test Frequency Channel

Channel	Frequency(MHz)
Low	2410
Middle	2440
High	2468

## 1.4 EUT operation mode

During testing, RF test program provided by the manufacture to control the Tx operation followed the test requirement.

### 1.5 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
/	/	/	/
/	/	/	/

## 2 Summary of Test Result

Test procedures according to the technical standards:

Item	FCC Part No.	Description of Test	Result
1	FCC Part15.203	Antenna Requirement	Pass
2	FCC Part15.207	AC power line conducted emission	N/A
3	FCC Part15.249(a)	Field strength of fundamental and harmonic emissions	Pass
4	FCC Part 15.215	20dB and 99% Bandwidth	Pass
5	FCC Part15.249(d)	Radiated spurious emission	Pass

### 3 Test Facilities and Accreditations

#### 3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao' an District, Shenzhen, Guangdong, China.
FCC Registration No.	448573

#### 3.2 Environmental conditions

Temperature:	15°C~35°C
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

#### 3.3 Measurement uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %

RF frequency	$1 \times 10^{-7}$
RF power, conducted	$\pm 1$ dB
Conducted emission(150kHz~30MHz)	$\pm 2.5$ dB
Radiated emission(30MHz~1GHz)	$\pm 4.2$ dB
Radiated emission (above 1GHz)	$\pm 4.3$ dB
Temperature	$\pm 1$ degree
Humidity	$\pm 5$ %

#### 3.4 Test software

Software Name	Manufacturer	Model	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscond co.,ltd	JS1120-3	2.5.77.0418

**4 List of test equipment**

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E043	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2020/06/04	2021/06/03
MTI-E044	TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-1338	2020/06/05	2021/06/04
MTI-E047	Amplifier	Hewlett-Packard	8447F	3113A06150	2020/06/04	2021/06/03
MTI-E089	ESG Vector Signal Generator	Agilent	N5182A	MY49060455	2020/06/03	2021/06/02
MTI-E058	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2020/07/03	2021/07/04
MTI-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2020/06/04	2021/06/03
MTI-E066	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2020/06/04	2021/06/03
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2020/06/04	2021/06/03
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2020/06/04	2021/06/03
MTI-E045	Double Ridged Broadband Horn Antenna	schwarzbeck	BBHA 9120D	9120D-2278	2020/06/05	2021/06/04
MTI-E021	EMI Test Receiver	Rohde&schwarz	ESCS30	100210	2020/06/04	2021/06/03
MTI-E022	Pulse Limiter	Schwarzbeck	VSTD 9561-F	00679	2020/06/03	2021/06/02
MTI-E023	Artificial mains network	Schwarzbeck	NSLK 8127	NSLK 8127 #841	2020/06/04	2021/06/03
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519B	00044	2020/06/05	2021/06/04
MTI-E048	Amplifier	Agilent	8449B	3008A02400	2020/07/03	2021/07/04
MTI-E072	Thermometer Clock Humidity Monitor	-	HTC-1	/	2020/06/07	2021/06/06

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



## **5 Test Result**

### **5.1 Antenna requirement**

#### **5.1.1 Standard requirement**

FCC PART 15.203;

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

#### **5.1.2 EUT Antenna**

The antenna is a PCB antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is 0dBi.

## 5.2 AC power line conducted emission

### 5.2.1 Limits

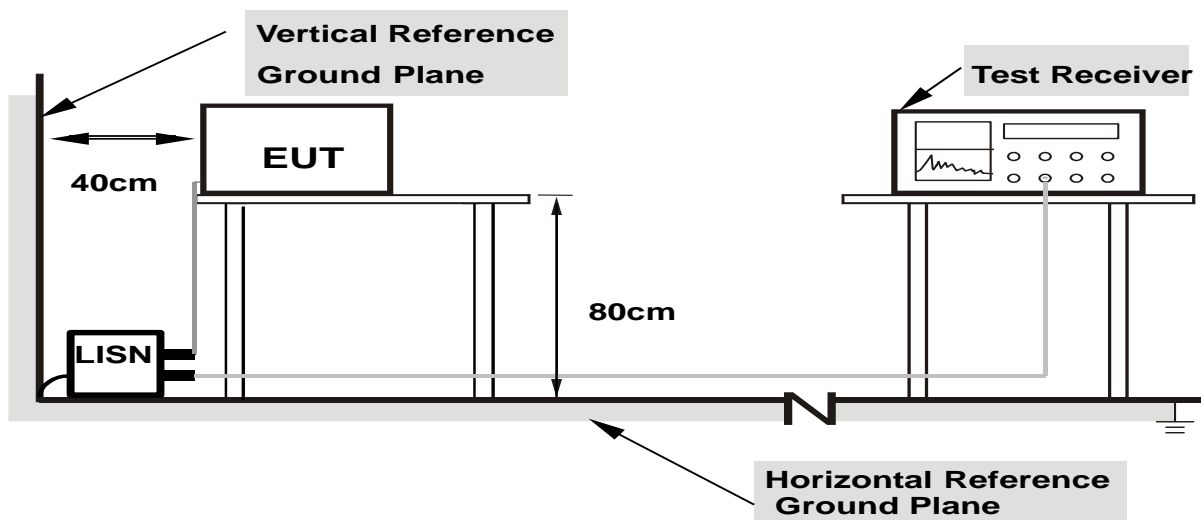
FCC §15.207;

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 <sup>note2</sup>	56 - 46 <sup>note2</sup>
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note1: The tighter limit applies at the band edges.  
 Note2: The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 5.2.2 Test setup



- Note: 1.Support units were connected to second LISN.**  
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 5.2.3 Test procedure

a. EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b. The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- c. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment's powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- d. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- f. LISN at least 80 cm from nearest part of EUT chassis.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 5.2.4 Test results

Note: This device is battery powered and does not apply to conducted emission.

### 5.3 Field strength of fundamental and harmonic emissions

#### 5.3.1 Limits

FCC §15.249(a);

The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.

The field strength limits shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector

Frequency	Field Strength(dBuv/m)	Detector
Fundamental	114	PK
Fundamental	94	AV
Harmonic emissions	74	PK
Harmonic emissions	54	AV

Note: 50mV/m=50000uv/m

$20 \cdot \log(50000\text{uV/m})=94\text{dBuv/m}$

PK limit reference 15.249(e)

#### 5.3.2 Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

3. Use the following spectrum analyser settings:

Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for  $f \geq 1\text{GHz}$ , 100 kHz for  $f < 1\text{GHz}$ , VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold

4. Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

5. The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

#### 5.3.3 Test Result



Transmitter channel: 2410MHz

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dB $\mu$ V/m	dB $\mu$ V/m		
2410	V	110.37	114	PK	
2410	H	111.54	114	PK	
2410	V	92.85	94	AV	
2410	H	91.68	94	AV	
4820	V	55.90	74	PK	
4820	H	56.42	74	PK	
4820	V	46.12	54	AV	
4820	H	45.37	54	AV	

Transmitter channel: 2440MHz

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dB $\mu$ V/m	dB $\mu$ V/m		
2440	V	111.23	114	PK	
2440	H	111.24	114	PK	
2440	V	91.61	94	AV	
2440	H	91.72	94	AV	
4880	V	55.98	74	PK	
4880	H	58.75	74	PK	
4880	V	47.21	54	AV	
4880	H	47.19	54	AV	

Transmitter channel: 2468MHz

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dB $\mu$ V/m	dB $\mu$ V/m		
2468	V	110.50	114	PK	
2468	H	110.88	114	PK	
2468	V	92.01	94	AV	
2468	H	90.78	94	AV	
4936	V	56.52	74	PK	
4936	H	57.50	74	PK	
4936	V	48.41	54	AV	
4936	H	46.98	54	AV	

## 5.4 20dB and 99% bandwidth

### 5.4.1 Limits

FCC §15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 5.4.2 Test method

Use the following spectrum analyzer settings:

#### For 20 dB bandwidth

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW  $\geq 1\%$  of the 20 dB bandwidth

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission

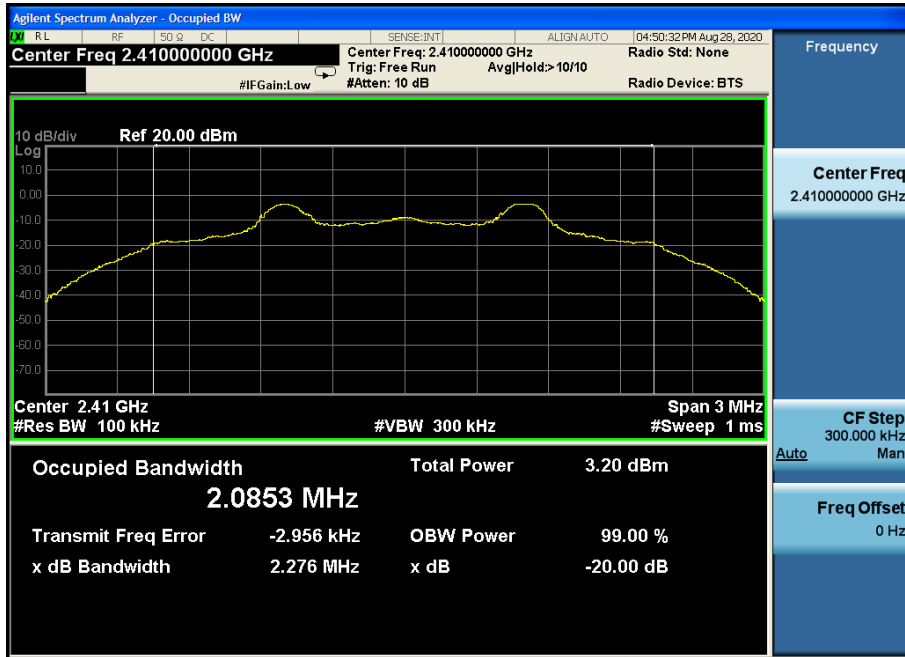
### 5.4.3 Test result

Frequency (MHz)	20dB bandwidth (MHz)
2410	2.276
2440	2.261
2468	2.262

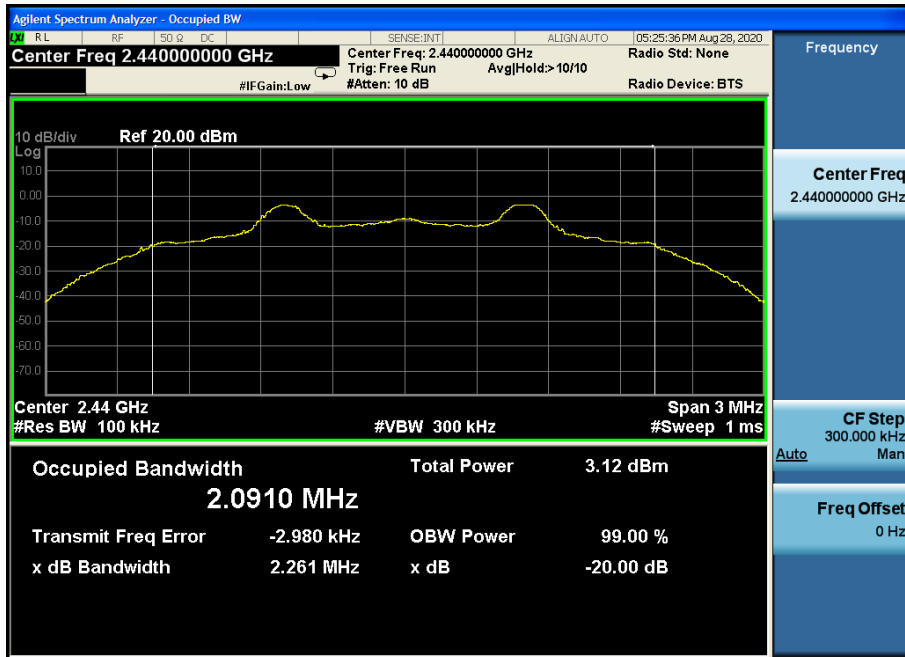
#### Test plots



2410MHz

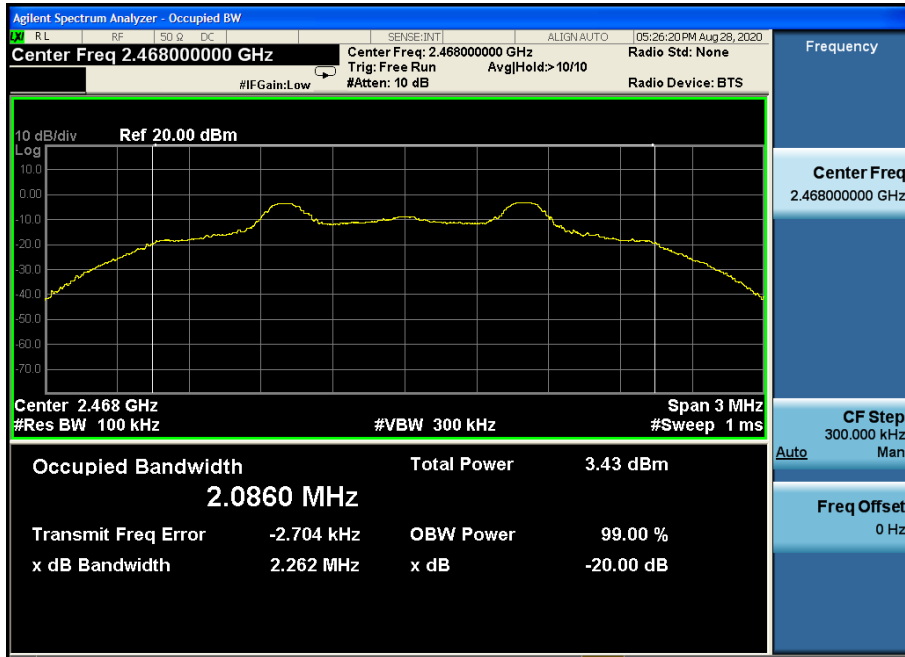


2440MHz





2468MHz





## 5.5 Radiated spurious emission

### 5.5.1 Limit

FCC PART 15.249(a);

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics ( $\mu\text{V/m}$ )
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ )	Measurement Distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

### 5.5.2 Test method

- a) The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.
- b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- c) Use the following spectrum analyser settings:
  - 1) Span = wide enough to fully capture the emission being measured
  - 2) RBW = 1 MHz for  $f \geq 1\text{GHz}$ , 100 kHz for  $f < 1\text{GHz}$
  - 3) VBW  $\geq$  RBW, Sweep = auto
  - 4) Detector function = peak
  - 5) Trace = max hold
- d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- e) The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

### 5.5.3 Test Result

Note: If the PK measured values lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

#### Below 30MHz

EUT:	Varmilo Mechanical Keyboard	Model name. :	VBS108
Pressure:	1010 hPa	Test voltage:	DC 6V from battery
Test mode:	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

**Note:**

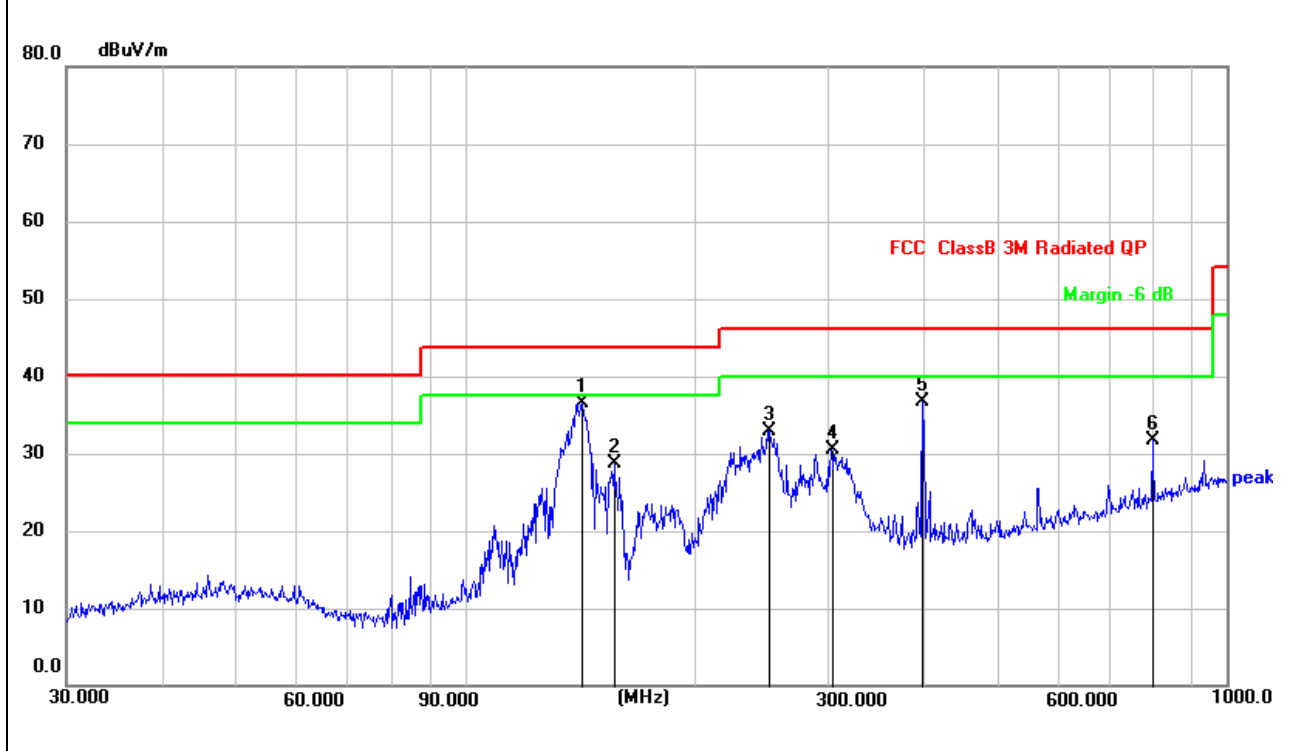
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

**Radiation (30MHz – 1GHz)**

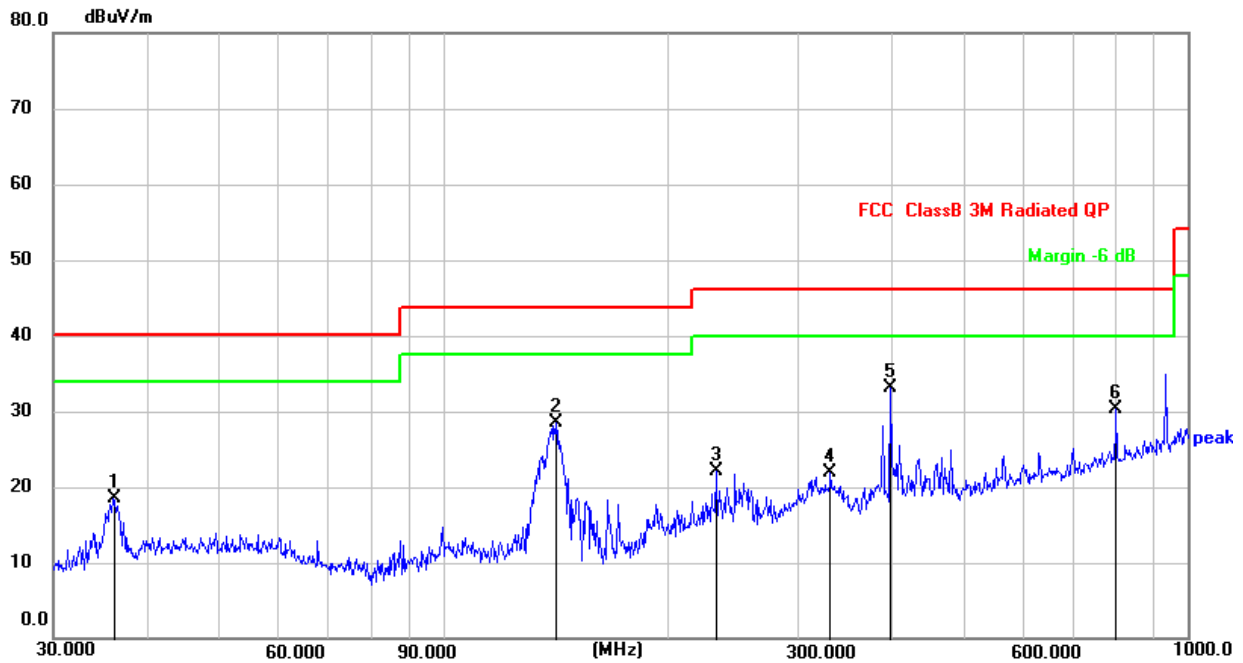
EUT:	Varmilo Mechanical Keyboard	Model name:	VBS108
Pressure:	1010hPa	Polarization:	H
Test voltage:	DC 6V from battery	Test mode:	TX



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	142.3243	54.17	-17.73	36.44	43.50	-7.06	QP
2	157.0074	45.76	-17.15	28.61	43.50	-14.89	QP
3	251.1804	45.38	-12.39	32.99	46.00	-13.01	QP
4	302.4812	41.22	-10.81	30.41	46.00	-15.59	QP
5	399.0302	46.29	-9.51	36.78	46.00	-9.22	QP
6	798.9797	34.37	-2.67	31.70	46.00	-14.30	QP



EUT:	Varmilo Mechanical Keyboard	Model name:	VBS108
Pressure:	1010hPa	Polarization:	V
Test voltage:	DC 6V from battery	Test mode:	TX



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.1272	34.17	-15.60	18.57	40.00	-21.43	QP
2	141.8262	46.17	-17.72	28.45	43.50	-15.05	QP
3	232.5318	35.10	-13.00	22.10	46.00	-23.90	QP
4	331.3546	32.23	-10.41	21.82	46.00	-24.18	QP
5 *	399.0302	42.65	-9.51	33.14	46.00	-12.86	QP
6	801.7863	33.02	-2.62	30.40	46.00	-15.60	QP

**1G-25GHz**

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
- (2) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
- (3) All other emissions more than 20dB below the limit.

All the modulation modes have been tested, and the worst result was report as below:

Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Remark	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
Low Channel (2410 MHz)-Above 1G									
4804.338	63.05	4.36	32.92	45.53	54.80	74.00	-19.20	Pk	Vertical
4804.338	42.03	4.36	32.92	45.53	33.78	54.00	-20.22	AV	Vertical
7206.107	61.70	5.02	37.63	45.56	58.79	74.00	-15.21	Pk	Vertical
7206.107	42.42	5.02	37.63	45.56	39.51	54.00	-14.49	AV	Vertical
4804.169	62.84	4.36	32.92	45.53	54.59	74.00	-19.41	Pk	Horizontal
4804.169	42.10	4.36	32.92	45.53	33.85	54.00	-20.15	AV	Horizontal
7206.214	62.27	5.02	37.63	45.56	59.36	74.00	-14.64	Pk	Horizontal
7206.214	42.20	5.02	37.63	45.56	39.29	54.00	-14.71	AV	Horizontal
Mid Channel (2440 MHz)-Above 1G									
4880.473	64.04	4.41	33.01	45.76	55.70	74.00	-18.30	Pk	Vertical
4880.473	44.12	4.41	33.01	45.76	35.78	54.00	-18.22	AV	Vertical
7320.265	64.58	5.02	37.68	45.59	61.69	74.00	-12.31	Pk	Vertical
7320.265	40.76	5.02	37.68	45.59	37.87	54.00	-16.13	AV	Vertical
4880.366	63.80	4.41	33.01	45.76	55.46	74.00	-18.54	Pk	Horizontal
4880.366	41.56	4.41	33.01	45.76	33.22	54.00	-20.78	AV	Horizontal
7320.234	59.86	5.02	37.68	45.59	56.97	74.00	-17.03	Pk	Horizontal
7320.234	45.24	5.02	37.68	45.59	42.35	54.00	-11.65	AV	Horizontal
High Channel (2468 MHz)- Above 1G									
4960.482	63.48	4.50	33.26	46.07	55.17	74.00	-18.83	Pk	Vertical
4960.482	42.48	4.50	33.26	46.07	34.17	54.00	-19.83	AV	Vertical
7440.131	64.71	5.02	37.78	45.77	61.74	74.00	-12.26	Pk	Vertical
7440.131	49.08	5.02	37.78	45.77	46.11	54.00	-7.89	AV	Vertical
4960.326	63.26	4.50	33.26	46.07	54.95	74.00	-19.05	Pk	Horizontal
4960.326	45.28	4.50	33.26	46.07	36.97	54.00	-17.03	AV	Horizontal
7440.199	64.97	5.02	37.78	45.77	62.00	74.00	-12.00	Pk	Horizontal
7440.199	45.95	5.02	37.78	45.77	42.98	54.00	-11.02	AV	Horizontal

#### 5.5.4 Band edge-radiated

Note:

- (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
- (2) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
- (3) All other emissions more than 20dB below the limit.

All the modulation modes have been tested, and the worst result was report as below:

Frequency	Meter Reading	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dB $\mu$ V)	(dB)	dB/m	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	Type	
GFSK									
2310.00	62.39	2.40	27.70	40.40	52.09	74	-21.91	Pk	Horizontal
2310.00	42.53	2.40	27.70	40.40	32.23	54	-21.77	AV	Horizontal
2310.00	61.63	2.40	27.70	40.40	51.33	74	-22.67	Pk	Vertical
2310.00	42.77	2.40	27.70	40.40	32.47	54	-21.53	AV	Vertical
2390.00	64.17	2.44	28.30	40.10	54.81	74	-19.19	Pk	Vertical
2390.00	44.08	2.44	28.30	40.10	34.72	54	-19.28	AV	Vertical
2390.00	63.42	2.44	28.30	40.10	54.06	74	-19.94	Pk	Horizontal
2390.00	42.54	2.44	28.30	40.10	33.18	54	-20.82	AV	Horizontal
2483.50	63.18	2.48	28.70	39.80	54.56	74	-19.44	Pk	Vertical
2483.50	43.72	2.48	28.70	39.80	35.10	54	-18.90	AV	Vertical
2483.50	64.94	2.48	28.70	39.80	56.32	74	-17.68	Pk	Horizontal
2483.50	43.78	2.48	28.70	39.80	35.16	54	-18.84	AV	Horizontal

**5.5.5 Spurious Emission in Restricted Band 3260MHz-18000MHz**

All the modulation modes have been tested, and the worst result was report as below:

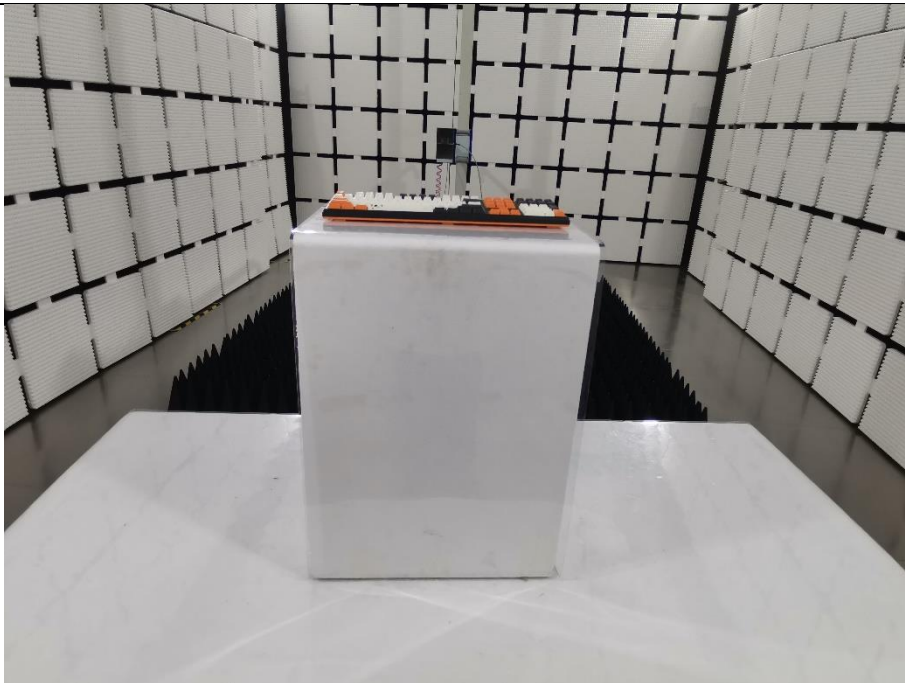
Frequency	Reading Level	Cable Loss	Antenna Factor	Preamplifier Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dB $\mu$ V)	(dB)	dB/m	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	Type	
3260	61.52	3.27	30.02	38.05	56.76	74	-17.24	Pk	Vertical
3260	40.41	3.27	30.02	38.05	35.65	54	-18.35	AV	Vertical
3260	64.53	3.27	30.02	38.05	59.77	74	-14.23	Pk	Horizontal
3260	42.94	3.27	30.02	38.05	38.18	54	-15.82	AV	Horizontal
3332	63.41	3.31	30.00	37.91	58.81	74	-15.19	Pk	Vertical
3332	42.51	3.31	30.00	37.91	37.91	54	-16.09	AV	Vertical
3332	64.10	3.31	30.00	37.91	59.50	74	-14.50	Pk	Horizontal
3332	41.88	3.31	30.00	37.91	37.28	54	-16.72	AV	Horizontal
17797	43.76	8.63	44.23	39.60	57.02	74	-16.98	Pk	Vertical
17797	31.06	8.63	44.23	39.60	44.32	54	-9.68	AV	Vertical
17788	43.36	8.63	44.23	39.60	56.62	74	-17.38	Pk	Horizontal
17788	31.00	8.63	44.23	39.60	44.26	54	-9.74	AV	Horizontal

## Photographs of the Test Setup

Radiated emission – below 1GHz



Radiated emission – above 1GHz







## Photographs of the EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi20061102-5E1-1.

**----END OF REPORT----**