TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID.....:	2AFX2VB608-C
Test Report No. .....:	TCT210525E007
Date of issue .....:	Jun. 10, 2021
Testing laboratory. .....:	SHENZHEN TONGCE TESTING LAB
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China
Applicant's name .....:	Shenzhen Feelstorm Technology Co., Ltd
Address .....:	5F, Block C, HUAWAN Industrial PARK, BaoAn DaDao No. 119, BaoAn District, Shenzhen China
Manufacturer's name. .....:	Shenzhen Feelstorm Technology Co., Ltd
Address .....:	5F, Block C, HUAWAN Industrial PARK, BaoAn DaDao No. 119, BaoAn District, Shenzhen China
Standard(s) .....:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 FCC KDB 558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10:2013
Test item description .....:	Video Baby Monitor
Trade Mark.....:	N/A
Model/Type reference .....:	VB608, VB608-C
Rating(s) .....:	Adapter Information: MODEL: ZD5C050100USW INPUT: AC 100-240V, 50/60Hz, 0.2A OUTPUT: DC 5.0V, 1000mA
Date of receipt of test item .....:	May 25, 2021
Date (s) of performance of test .....:	See dates for each test case
Tested by (+signature)....:	Rleo
Check by (+signature) ....:	Beryl Zhao
Approved by (+signature):	Tomsin

General disclaimer:

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TABLE OF CONTENTS

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. General Product Information

1.1. EUT description

Test item description .....:	Video Baby Monitor
Model/Type reference.....:	VB608
Sample Number.....:	TCT210525E007-0101
Operation Frequency.....:	2408MHz~2468MHz
Transfer Rate .....:	1 Mbits/s
Number of Channel .....:	16
Modulation Type .....:	GFSK
Modulation Technology .....:	FHSS
Antenna Type.....:	PCB Antenna
Antenna Gain.....:	2dBi
Rating(s).....:	Adapter Information: MODEL: ZD5C050100USW INPUT: AC 100-240V, 50/60Hz, 0.2A OUTPUT: DC 5.0V, 1000mA
Remark.....:	/

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

No.	Model No.	Tested with
1	VB608	☒
Other models	VB608-C	☐

Note: VB608 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of VB608 can represent the remaining models.

1.3. Operation Frequency

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2408MHz	4	2424MHz	8	2440MHz	12	2456MHz
1	2412MHz	5	2428MHz	9	2444MHz	13	2460MHz
2	2416MHz	6	2432MHz	10	2448MHz	14	2464MHz
3	2420MHz	7	2436MHz	11	2452MHz	15	2468MHz
Remark: Channel 0, 7 & 15 have been tested for GFSK modulation mode.							

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2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(1)	PASS
20dB Occupied Bandwidth	§15.247 (a)(1)	PASS
Carrier Frequencies Separation	§15.247 (a)(1)	PASS
Hopping Channel Number	§15.247 (a)(1)	PASS
Dwell Time	§15.247 (a)(1)	PASS
Radiated Emission	§15.205/§15.209	PASS
Band Edge	§15.247(d)	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. General Information

3.1. Test environment and mode

Operating Environment:		
Condition	Conducted Emission	Radiated Emission
Temperature:	25.0 °C	25.0 °C
Humidity:	55 % RH	55 % RH
Atmospheric Pressure:	1010 mbar	1010 mbar
Test Mode:		
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery	
The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.		

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

4. Facilities and Accreditations

4.1. Facilities

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

- FCC - Registration No.: 645098

  SHENZHEN TONGCE TESTING LAB

  Designation Number: CN1205

  The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

  SHENZHEN TONGCE TESTING LAB

  CAB identifier: CN0031

  The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB.

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB

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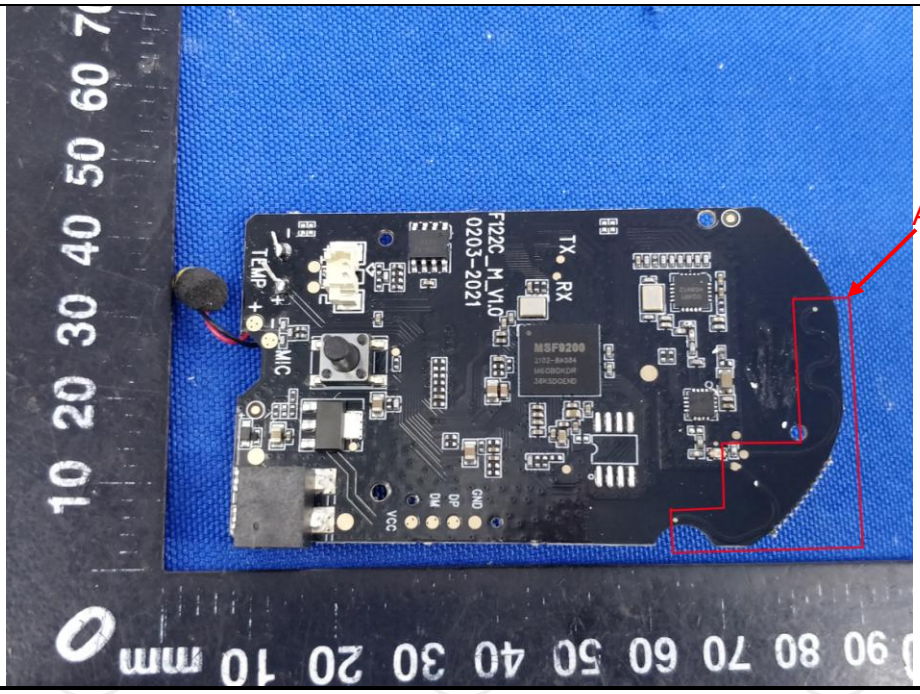
5. Test Results and Measurement Data

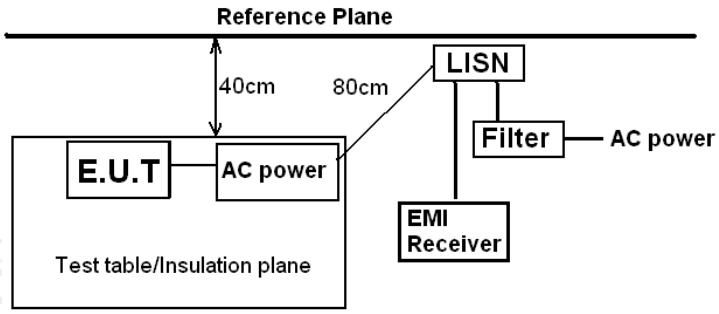
5.1. Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: 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, 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. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
E.U.T Antenna:	
The antenna is PCB antenna which permanently attached, and the best case gain of the antenna is 2dBi.	



5.2. Conducted Emission

5.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Frequency Range:	150 kHz to 30 MHz
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto
Limits:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50
Test Setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test Mode:	Refer to item 3.1
Test Procedure:	1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.
Test Result:	PASS

5.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	R&S	ESCI3	100898	Jul. 27, 2021
LISN-2	Schwarzbeck	NSLK 8126	8126453	Sep. 11, 2021
Line-5	TCT	CE-05	N/A	Sep. 02, 2021
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

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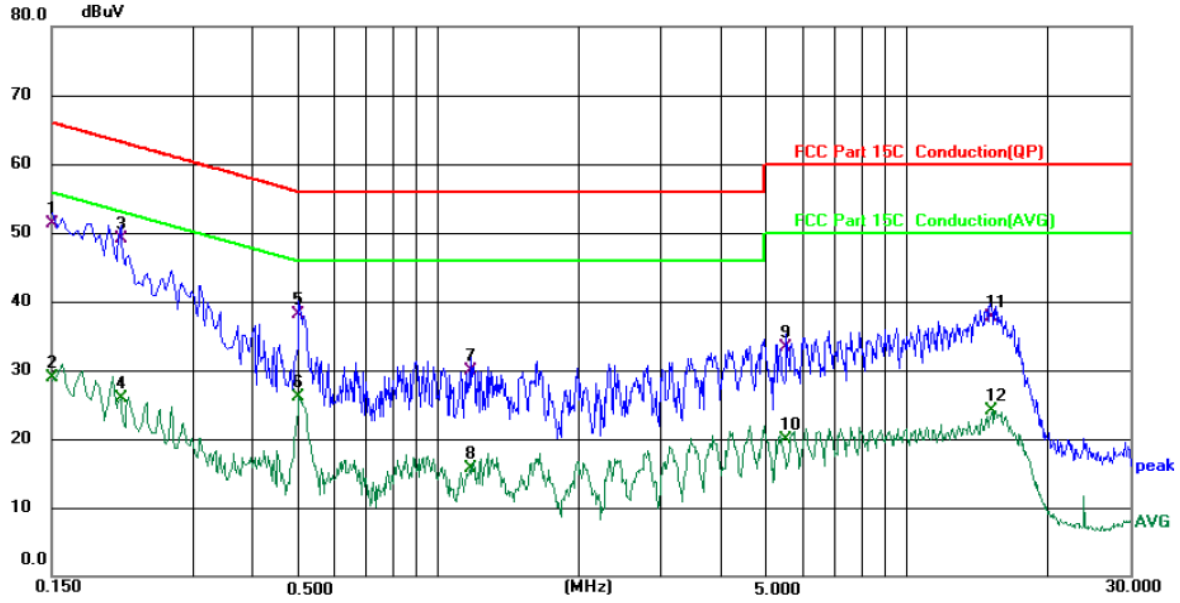
5.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site

Phase: *L1*

Temperature: 25.4 (℃)

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

Humidity: 42 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	41.70	9.60	51.30	66.00	-14.70	QP	
2		0.1500	19.30	9.60	28.90	56.00	-27.10	AVG	
3	*	0.2100	39.70	9.39	49.09	63.21	-14.12	QP	
4		0.2100	16.47	9.39	25.86	53.21	-27.35	AVG	
5		0.5060	28.80	9.25	38.05	56.00	-17.95	QP	
6		0.5060	16.86	9.25	26.11	46.00	-19.89	AVG	
7		1.1739	20.40	9.42	29.82	56.00	-26.18	QP	
8		1.1739	6.37	9.42	15.79	46.00	-30.21	AVG	
9		5.5460	23.70	9.64	33.34	60.00	-26.66	QP	
10		5.5460	10.27	9.64	19.91	50.00	-30.09	AVG	
11		15.0939	27.90	9.84	37.74	60.00	-22.26	QP	
12		15.0939	14.30	9.84	24.14	50.00	-25.86	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

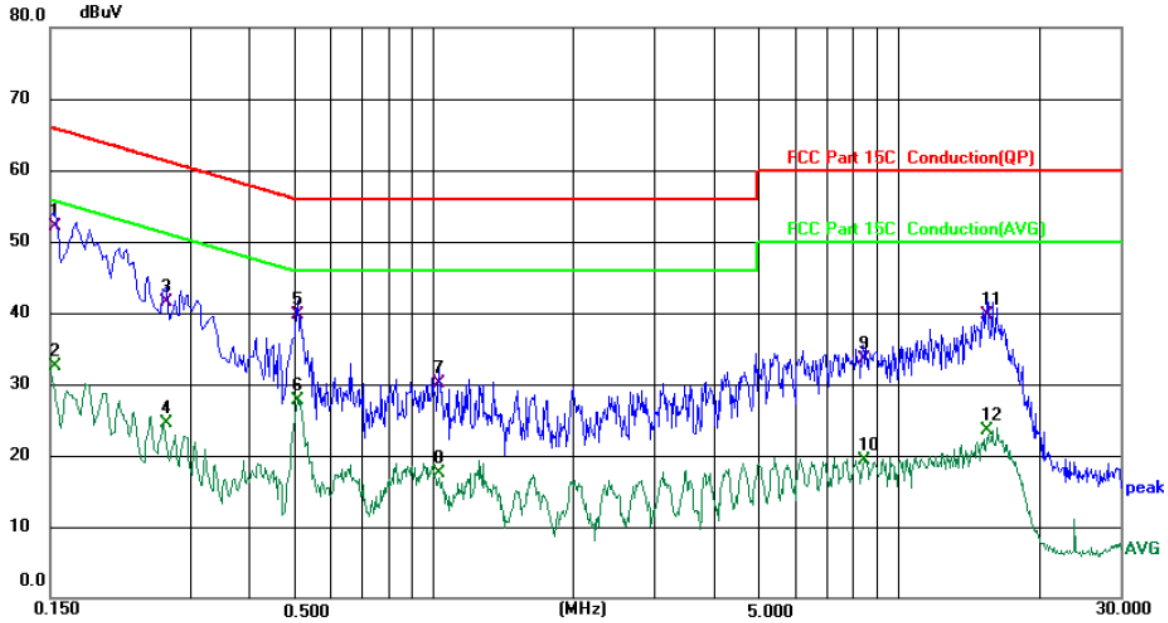
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site | Phase: N | Temperature: 25.4 (℃)

Limit: FCC Part 15C Conduction(QP) | Power: AC 120 V/60 Hz | Humidity: 42 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1539	42.50	9.61	52.11	65.79	-13.68	QP	
2		0.1539	22.89	9.61	32.50	55.79	-23.29	AVG	
3		0.2660	32.20	9.37	41.57	61.24	-19.67	QP	
4		0.2660	15.05	9.37	24.42	51.24	-26.82	AVG	
5		0.5100	30.40	9.27	39.67	56.00	-16.33	QP	
6		0.5100	18.43	9.27	27.70	46.00	-18.30	AVG	
7		1.0300	20.70	9.39	30.09	56.00	-25.91	QP	
8		1.0300	8.06	9.39	17.45	46.00	-28.55	AVG	
9		8.3819	23.80	9.64	33.44	60.00	-26.56	QP	
10		8.3819	9.70	9.64	19.34	50.00	-30.66	AVG	
11		15.5419	29.90	9.88	39.78	60.00	-20.22	QP	
12		15.5419	13.66	9.88	23.54	50.00	-26.46	AVG	

Note1:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

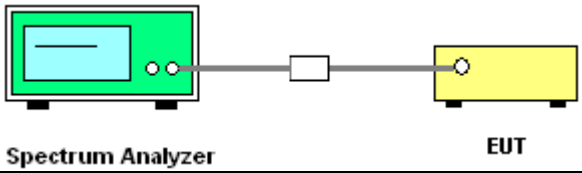
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

Note2:

Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Lowest channel) was submitted only.

5.3. Conducted Output Power

5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.
Test Result:	PASS

5.3.2. Test Instruments

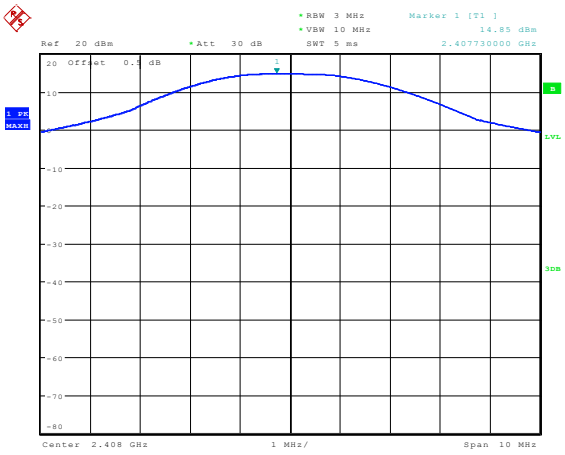
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

5.3.3. Test Data

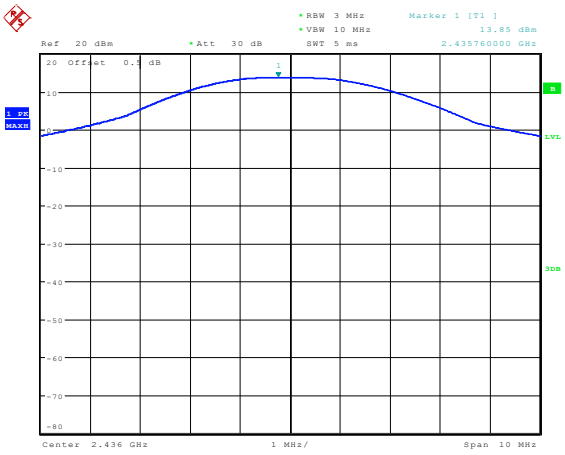
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	14.85	21.00	PASS
Middle	13.85	21.00	PASS
Highest	12.79	21.00	PASS

Test plots as follows:

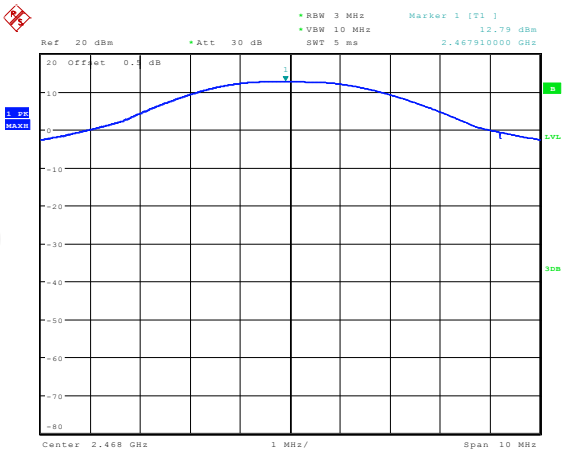
Lowest channel



Middle channel



Highest channel



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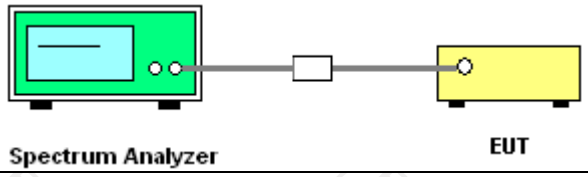
5.4. 20dB Occupy Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	N/A
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel; 1%≤RBW≤5% of the 20 dB bandwidth; VBW≥3RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test Result:	PASS

5.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

5.4.3. Test data

Test channel	20dB Occupy Bandwidth (kHz)	Conclusion
Lowest	2075	PASS
Middle	2085	PASS
Highest	2075	PASS

Test plots as follows:

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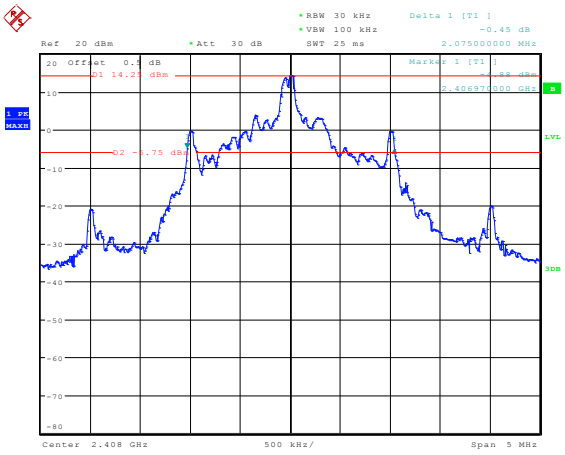
Lowest channel



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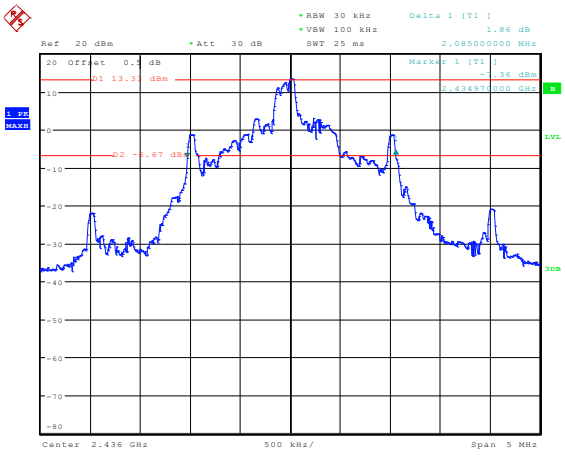
Middle channel



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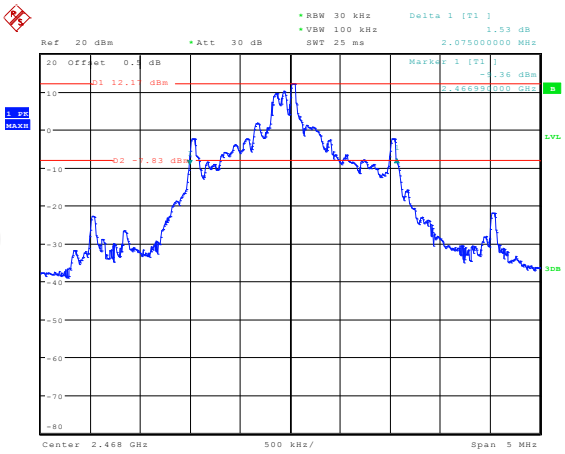
Highest channel



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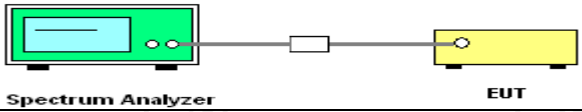
5.5. Carrier Frequencies Separation

5.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.
Test Setup:	
Test Mode:	Hopping mode
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels; RBW is set to approximately 30% of the channel spacing, adjust as necessary to best identify the center of each individual channel; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report.
Test Result:	PASS

5.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

5.5.3. Test data

Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	4045	1390	PASS
Middle	4000	1390	PASS
Highest	4020	1390	PASS

Note: According to section 5.4

Mode	*20dB bandwidth (kHz) (worse case)*	*Limit (kHz) (Carrier Frequencies Separation)*
GFSK	*2085*	*1390*

Test plots as follows:

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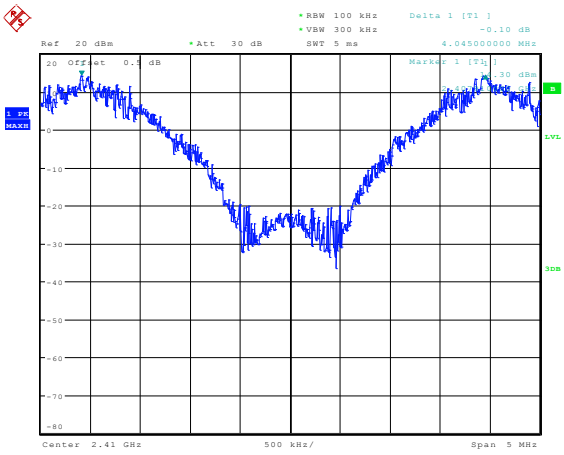
Lowest channel



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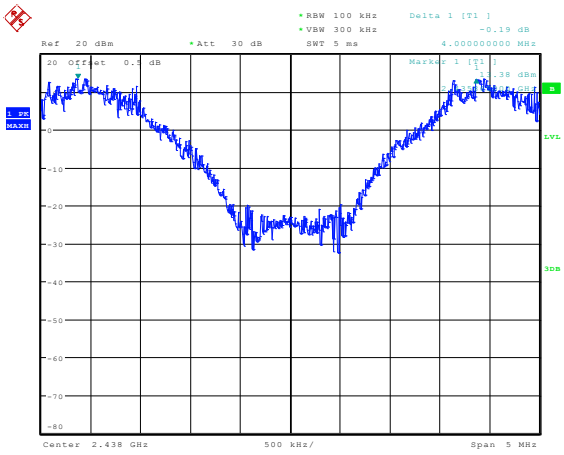
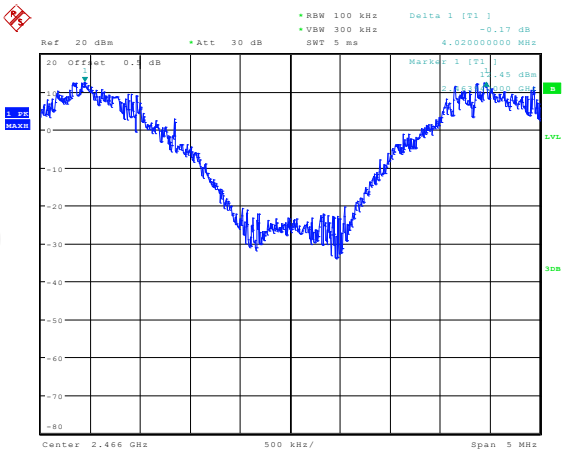
Middle channel



Date: 3.JUN.2021 11:20:33

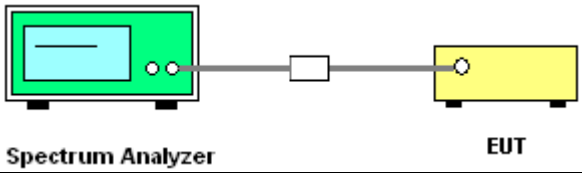
Highest channel



Date: 3.JUN.2021 11:18:08

5.6. Hopping Channel Number

5.6.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Setup:	
Test Mode:	Hopping mode
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 5. The number of hopping frequency used is defined as the number of total channel. 6. Record the measurement data in report.
Test Result:	PASS

5.6.2. Test Instruments

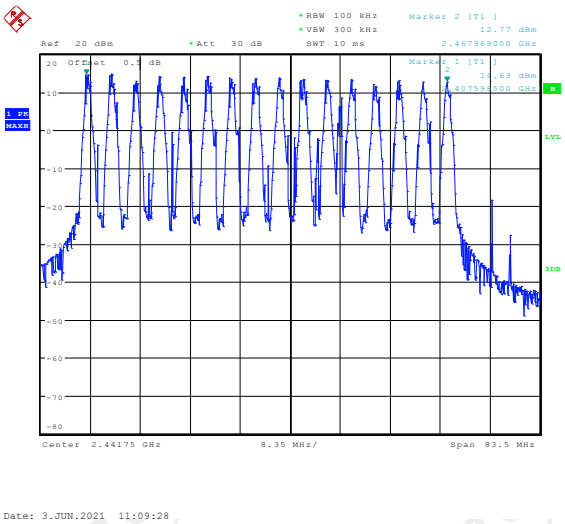
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

5.6.3. Test data

Mode	Hopping channel numbers	Limit	Result
GFSK	16	15	PASS

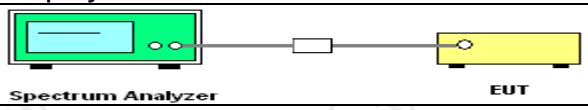
Test plots as follows:

GFSK



5.7. Dwell Time

5.7.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
Test Setup:	
Test Mode:	Hopping mode
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel; VBW≥RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = clear write. 5. Measure and record the results in the test report.
Test Result:	PASS

5.7.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

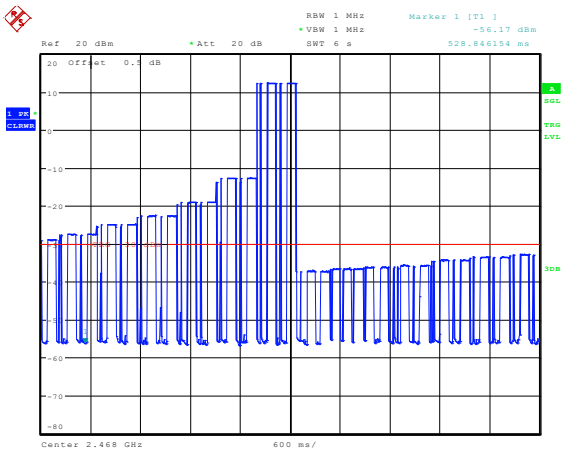
5.7.3. Test Data

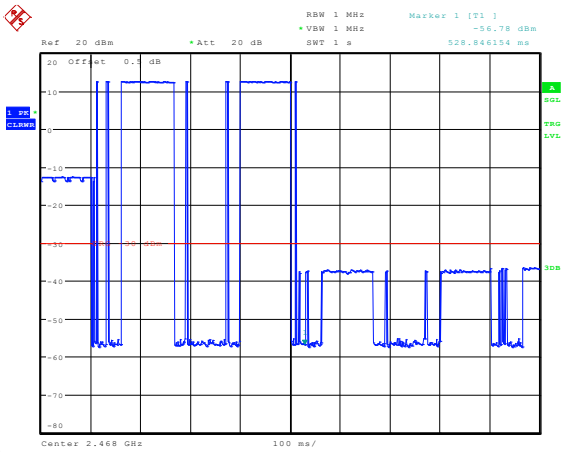
Mode	Package Transfer Time long pulse(ms)	Package Transfer Time short pulse (ms)	Dwell time (second)	Limit (second)	Result
GFSK	87.5	7.21	0.211	0.4	PASS

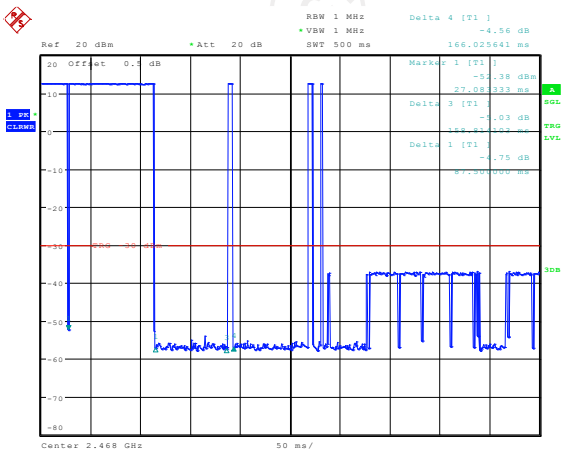
Note: *1. the period specified=0.4s* number of hops=0.4s*16=6s*

*2. Dwell Time(s) = package Transfer Time x number of hops=2*87.5ms+5*7.21ms=211.05ms*

Test plots as follows:






RBW 1 MHz
VBW 1 MHz
SWT 500 ms
Delta 4 [T1]
-4.56 dB
166.025641 ms
Ref 20 dBm
Att 20 dB
Offset 0.5 dB
Marker 1 [T1]
-52.38 dBm
27.083333 ms
Delta 3 [T1]
-5.03 dB
Delta 1 [T1]
-4.75 dB
Center 2.468 GHz
50 ms/
Date: 11.JUN.2021 17:02:47

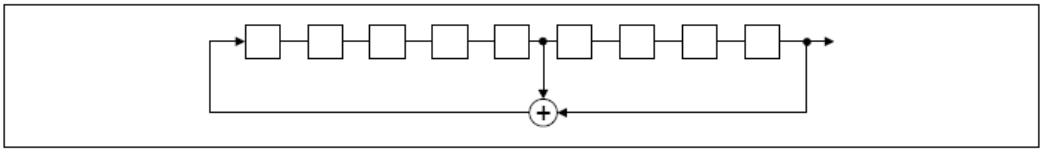
5.8. Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

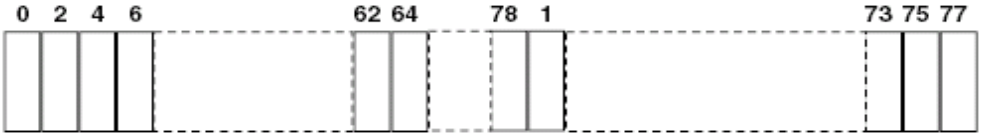
EUT Pseudorandom Frequency Hopping Sequence

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first one of 9 consecutive ones; i.e. the shift register is initialized with nine ones.
• Number of shift register stages: 9
• Length of pseudo-random sequence: 2^9 -1 = 511 bits
• Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.
The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

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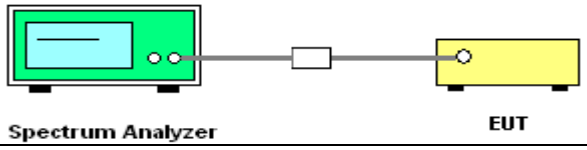
5.9. Conducted Band Edge Measurement

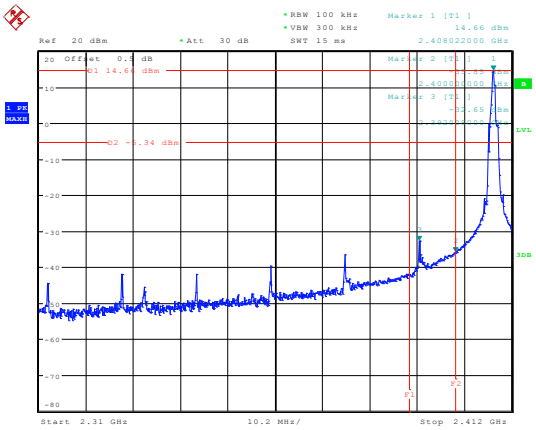
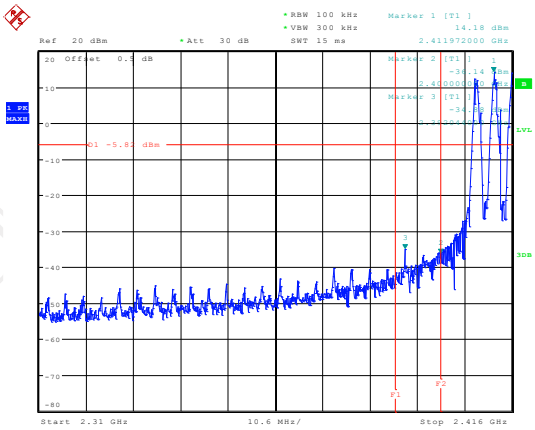
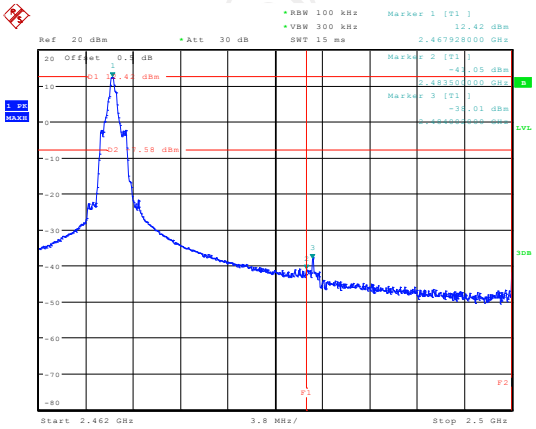
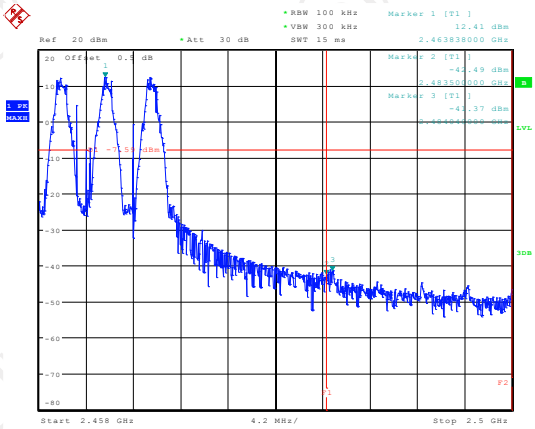
5.9.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB 558074 D01 v05r02
Limit:	In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. Set to the maximum power setting and enable the EUT transmit continuously. 2. Set RBW = 100 kHz (≥1% span=10MHz), VBW = 300 kHz (≥RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used. 3. Enable hopping function of the EUT and then repeat step 2 and 3. 4. Measure and record the results in the test report.
Test Result:	PASS

5.9.2. Test Instruments

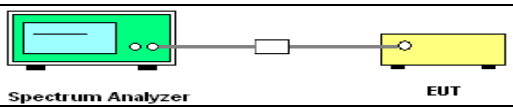
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

5.9.3. Test Data

Test channel:	Lowest channel
	
No-hopping mode	Hopping mode
Test channel:	Highest channel
	
No-hopping mode	Hopping mode

5.10. Conducted Spurious Emission Measurement

5.10.1. Test Specification

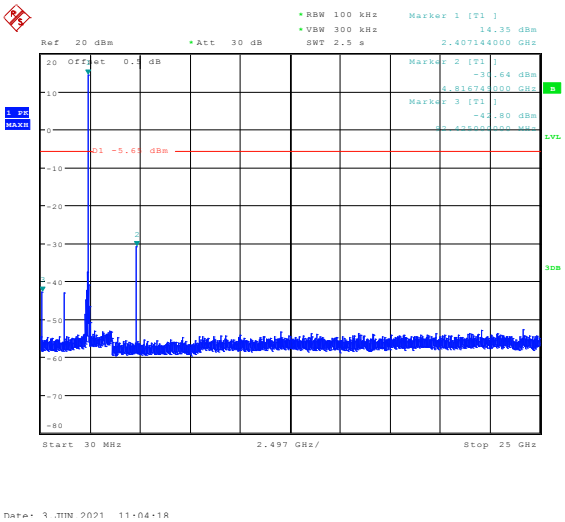
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB 558074 D01 v05r02
Limit:	In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. 4. Measure and record the results in the test report. 5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Test Result:	PASS

5.10.2. Test Instruments

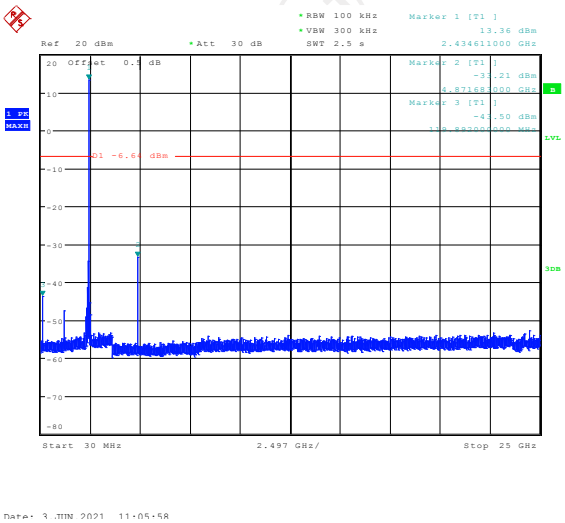
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSU	200054	Sep. 11, 2021
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ40	200061	Sep. 11, 2021
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Sep. 11, 2021
Antenna Connector	TCT	RFC-01	N/A	Sep. 11, 2021

5.10.3. Test Data

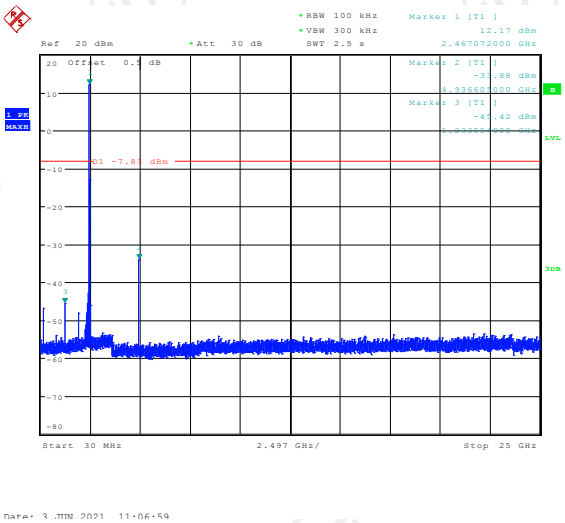
Lowest Channel



Middle Channel

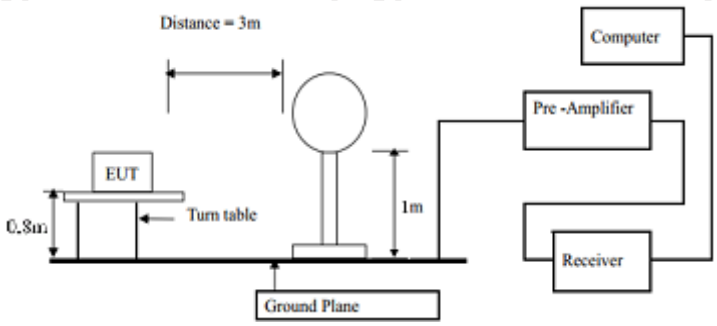


Highest Channel

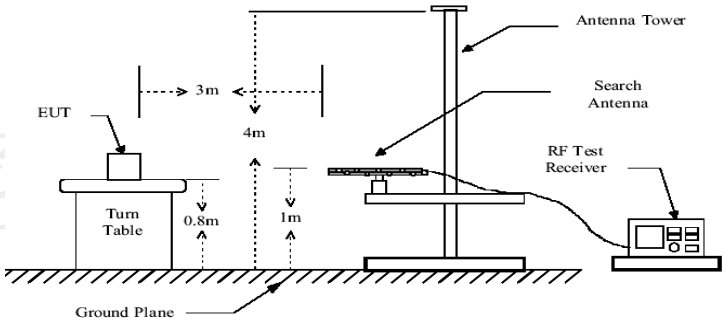


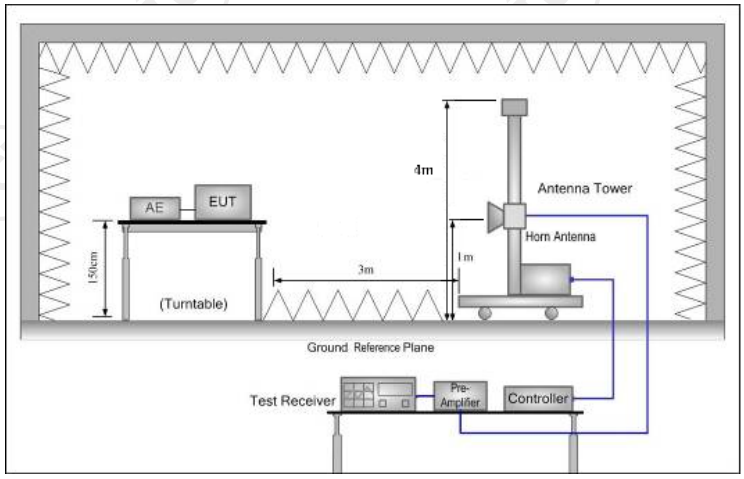
5.11. Radiated Spurious Emission Measurement

5.11.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td><td>Detector</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>500</td><td>3</td><td>Average</td></tr>
<tr><td>5000</td><td>3</td><td>Peak</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 

30MHz to 1GHz</td></tr>
</table>

<table>
<tr><td></td><td>


Above 1GHz


</td></tr>
<tr><td>Test Mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Test Procedure:</td><td>1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10:2013 Measurement Guidelines.
2. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission</td></tr>
</table>

	and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=120 kHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak (3) For average measurement: use duty cycle correction factor method per 15.35(c). Duty cycle = On time/100 milliseconds On time =N1*L1+N2*L2+...+Nn-1*LNn-1+Nn*Ln Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + 20*log(Duty cycle) Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
Test results:	PASS

5.11.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	ROHDE&SCHWARZ	ESIB7	100197	Jul. 27, 2021
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ40	200061	Sep. 11, 2021
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 02, 2021
Pre-amplifier	HP	8447D	2727A05017	Sep. 02, 2021
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	A-INFO	LB-180400-KF	J211020657	Sep. 04, 2022
Antenna Mast	Keleto	RE-AM	N/A	N/A
Line-4	TCT	RE-high-04	N/A	Sep. 02, 2021
Line-8	TCT	RE-01	N/A	Jul. 27, 2021
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

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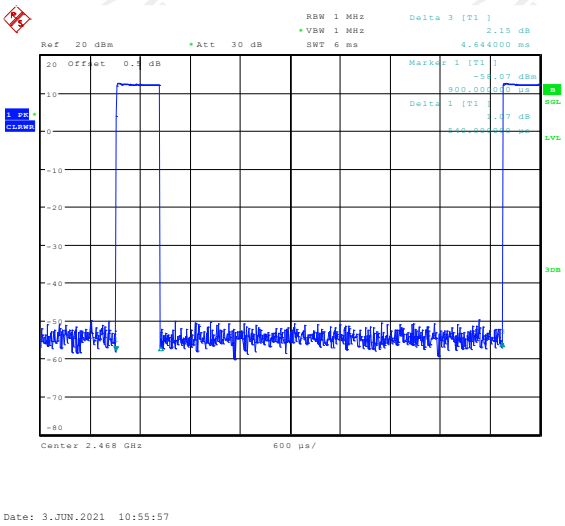
5.11.3. Test Data

Duty cycle correction factor for average measurement



Note:

1. Worst case Duty cycle = on time/cycle milliseconds = 0.540/4.644 =0.1163

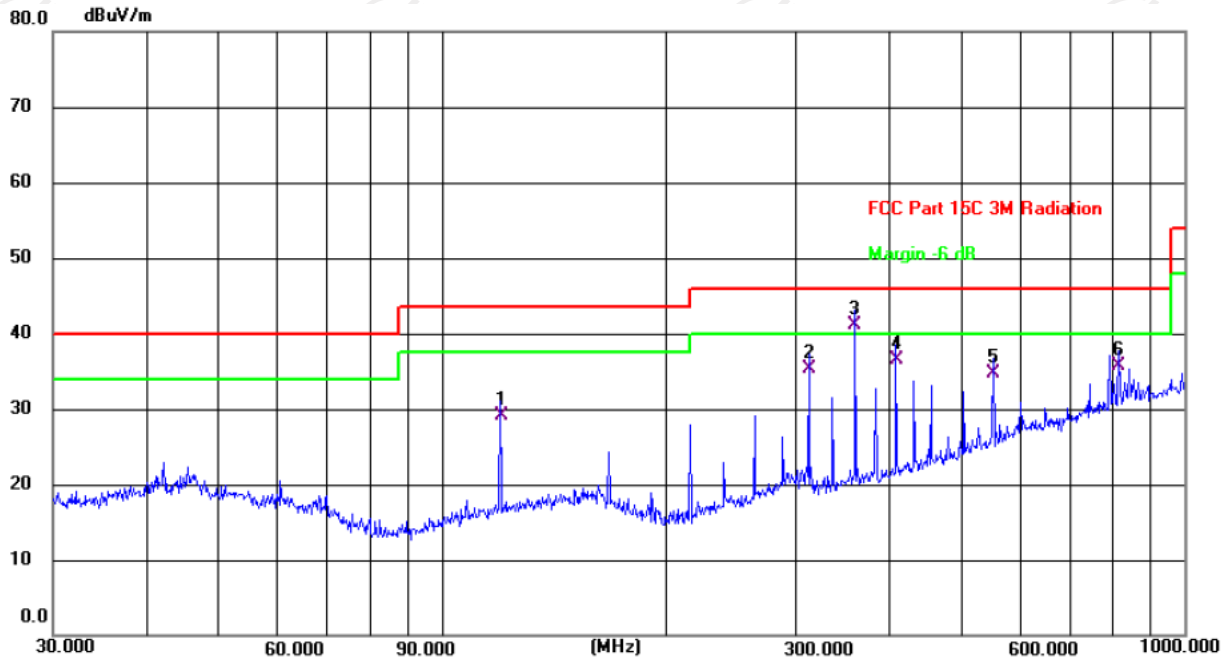
*2. Worst case Duty cycle correction factor = 20*log (Duty cycle) = -18.69dB*

3. The average levels were calculated from the peak level corrected with duty cycle correction factor (-18.69dB) derived from 20log (dwell time/ cycle). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

Please refer to following diagram for individual

Below 1GHz

Horizontal:



Site

Polarization: *Horizontal*

Temperature: 23.9(C)

Limit: FCC Part 15C 3M Radiation

Power: AC 120 V/60 Hz

Humidity: 57 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	119.8556	16.94	12.12	29.06	43.50	-14.44	QP	P	
2	312.1794	21.03	14.32	35.35	46.00	-10.65	QP	P	
3 *	360.4476	25.59	15.56	41.15	46.00	-4.85	QP	P	
4	408.9460	19.73	16.80	36.53	46.00	-9.47	QP	P	
5	552.8832	14.45	20.28	34.73	46.00	-11.27	QP	P	
6	815.9678	11.22	24.45	35.67	46.00	-10.33	QP	P	

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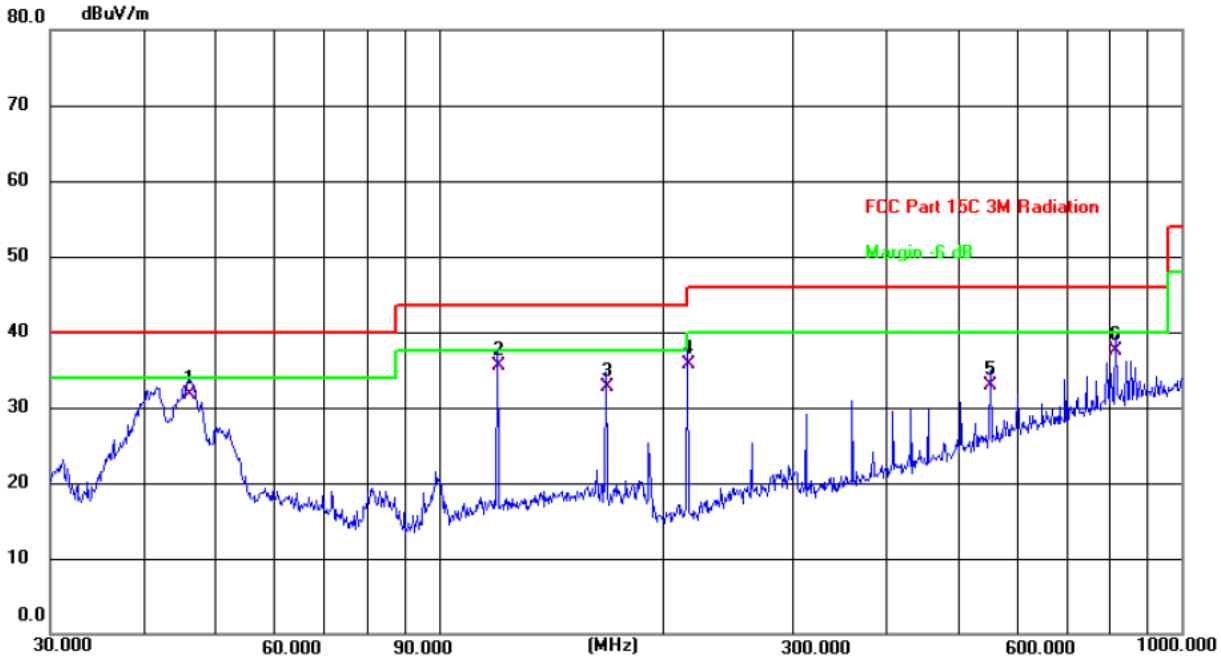
Vertical:



Site

Limit: FCC Part 15C 3M Radiation

Polarization: *Vertical*

Power: AC 120 V/60 Hz

Temperature: 23.9(C)

Humidity: 57 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	46.0164	17.93	13.85	31.78	40.00	-8.22	QP	P	
2 *	119.8556	23.29	12.12	35.41	43.50	-8.09	QP	P	
3	167.8243	19.65	13.13	32.78	43.50	-10.72	QP	P	
4	216.0240	24.42	11.24	35.66	46.00	-10.34	QP	P	
5	552.8832	12.54	20.28	32.82	46.00	-13.18	QP	P	
6	815.9678	13.11	24.45	37.56	46.00	-8.44	QP	P	

Note: *1.The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported*

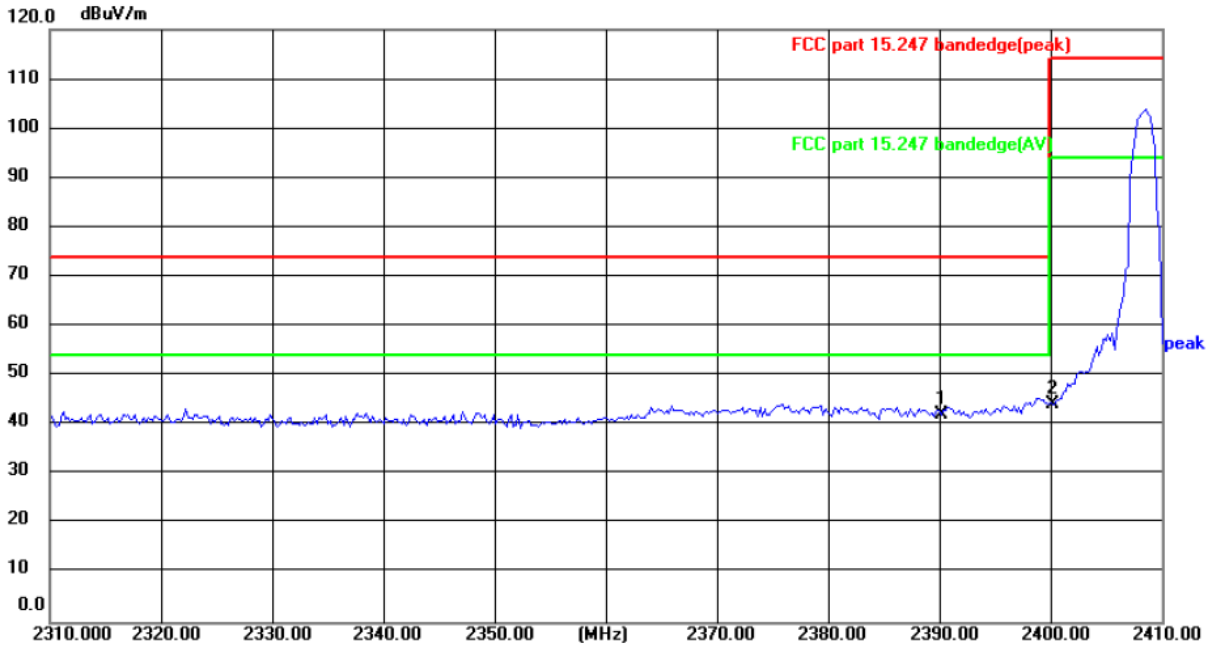
2. Measurements were conducted in all three channels (high, middle, low) and the worst case Mode (Lowest channel) was submitted only.

3. Freq. = Emission frequency in MHz
Measurement (dBμV/m) = Reading level (dBμV) + Corr. Factor (dB)
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Limit (dBμV/m) = Limit stated in standard
Margin (dB) = Measurement (dBμV/m) – Limits (dBμV/m)
** is meaning the worst frequency has been tested in the test frequency range*

Test Result of Radiated Spurious at Band edges

Lowest channel 2408:

Horizontal:



Site

Limit: FCC part 15.247 bandedge(peak)

Polarization: *Horizontal*

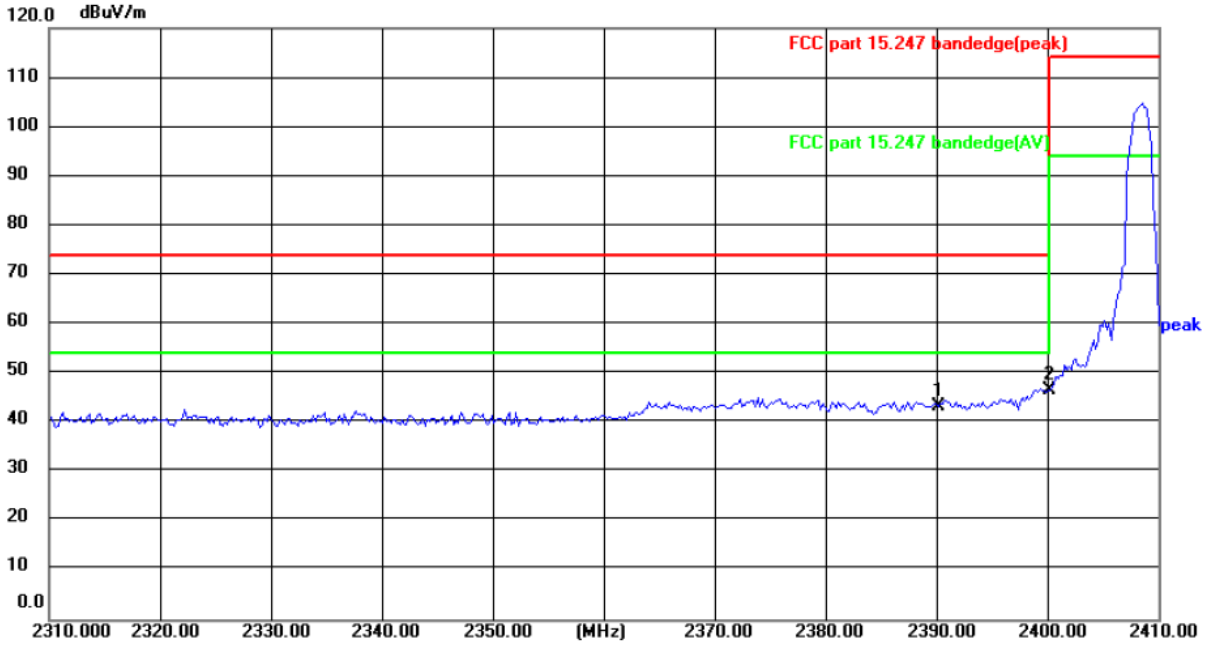
Power: AC120V60Hz

Temperature: 25(℃)

Humidity: 55 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	11.37	30.89	42.26	74.00	-31.74	peak
2 *	2400.000	13.35	30.93	44.28	74.00	-29.72	peak

Vertical:



Site
Limit: FCC part 15.247 bandedge(peak)

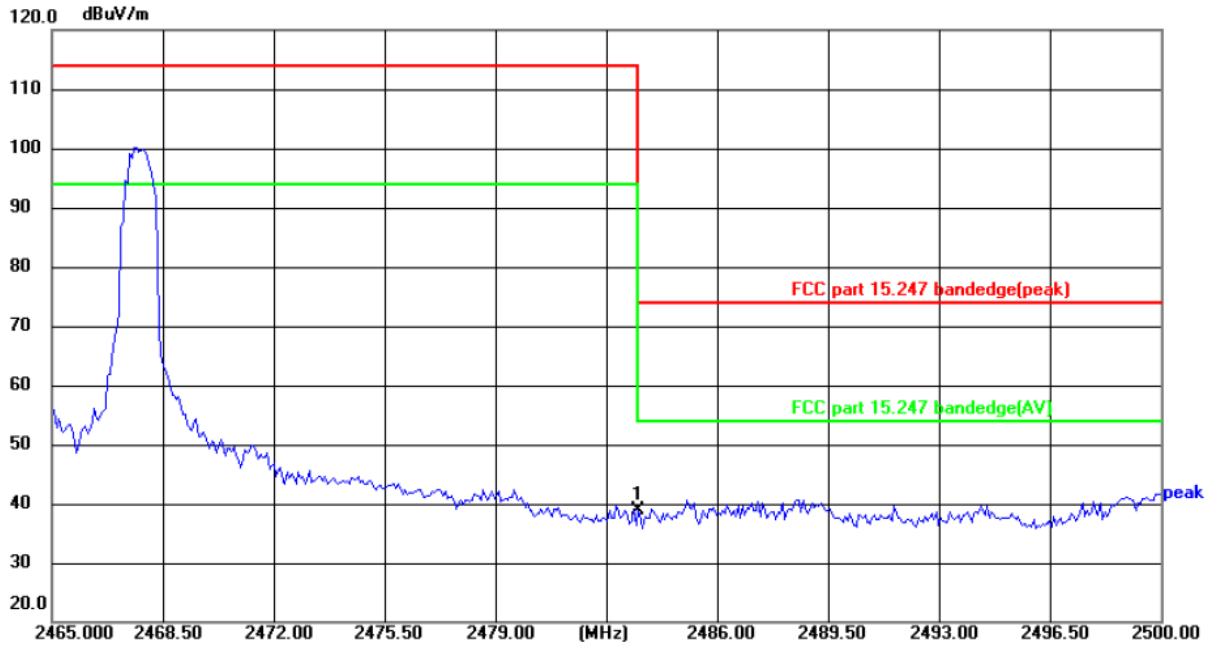
Polarization: *Vertical*
Power: AC120V60Hz

Temperature: 25(℃)
Humidity: 55 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	12.37	30.89	43.26	74.00	-30.74	peak
2 *	2400.000	15.85	30.93	46.78	74.00	-27.22	peak

Highest channel 2468:

Horizontal:



Site

Limit: FCC part 15.247 bandedge(peak)

Polarization: *Horizontal*

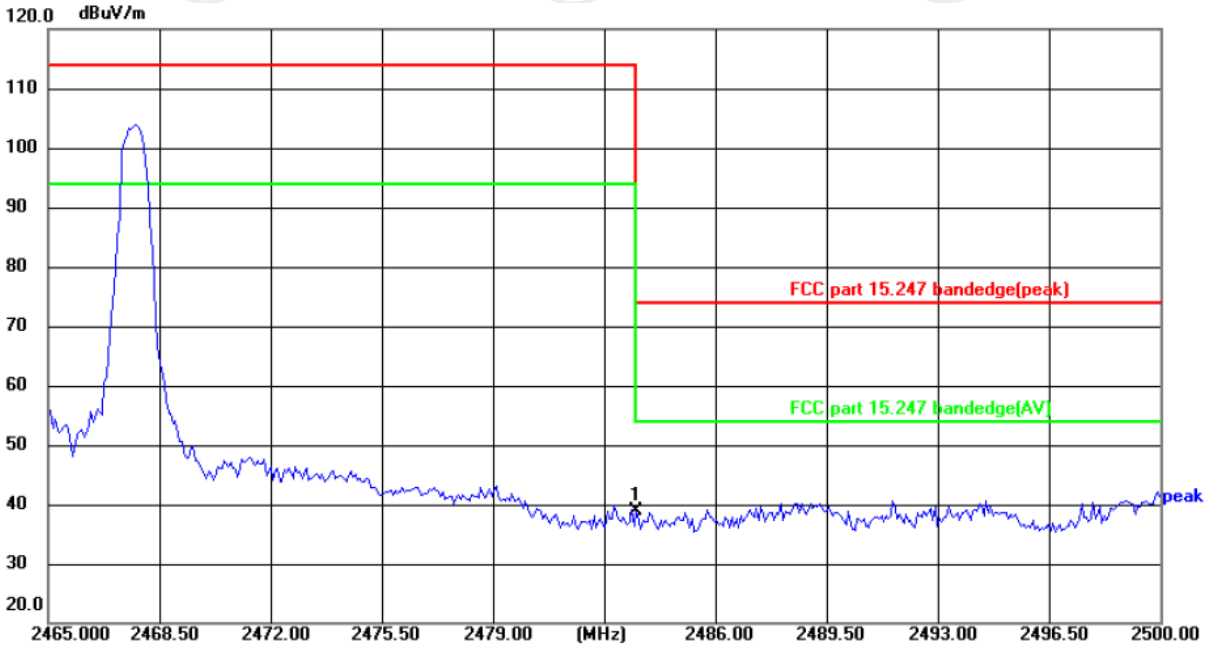
Power: AC120V60Hz

Temperature: 25(℃)

Humidity: 55 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	2483.500	7.59	31.27	38.86	74.00	-35.14	peak

Vertical:



Site
Limit: FCC part 15.247 bandedge(peak)
Polarization: *Vertical*
Power: AC120V60Hz
Temperature: 25(℃)
Humidity: 55 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	2483.500	7.59	31.27	38.86	74.00	-35.14	peak

Above 1GHz

Modulation Type: GFSK									
Low channel: 2408 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
4816	H	44.52	---	0.66	45.18	---	74	54	-8.82
7224	H	34.09	---	9.50	43.59	---	74	54	-10.41
---	H	---	---	---	---	---	---	---	---
4816	V	42.17	---	0.66	42.83	---	74	54	-11.17
7224	V	35.58	---	9.50	45.08	---	74	54	-8.92
---	V	---	---	---	---	---	---	---	---

Middle channel: 2436 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
4872	H	45.63	---	0.99	46.62	---	74	54	-7.38
7308	H	36.35	---	9.87	46.22	---	74	54	-7.78
---	H	---	---	---	---	---	---	---	---
4872	V	44.02	---	0.99	45.01	---	74	54	-8.99
7308	V	36.21	---	9.87	46.08	---	74	54	-7.92
---	V	---	---	---	---	----	---	---	---

High channel: 2468 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
4936	H	45.14	---	1.33	46.47	---	74	54	-7.53
7404	H	34.89	---	10.22	45.11	---	74	54	-8.89
---	H	---	---	---	---	---	---	---	---
4936	V	45.09	---	1.33	46.42	---	74	54	-7.58
7404	V	35.26	---	10.22	45.48	---	74	54	-8.52
---	V	---	---	---	---	---	---	---	---

Note:

1. *Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*
2. *Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.*
5. *Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*
6. *All the restriction bands are compliance with the limit of 15.209.*

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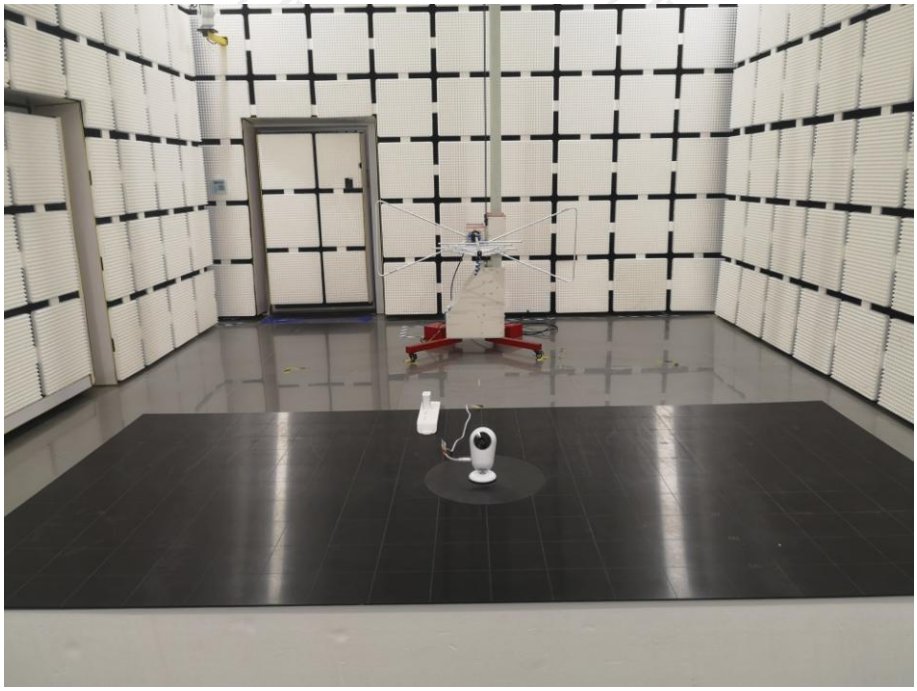
Appendix A: Photographs of Test Setup

Product: Video Baby Monitor
Model: VB608
Radiated Emission



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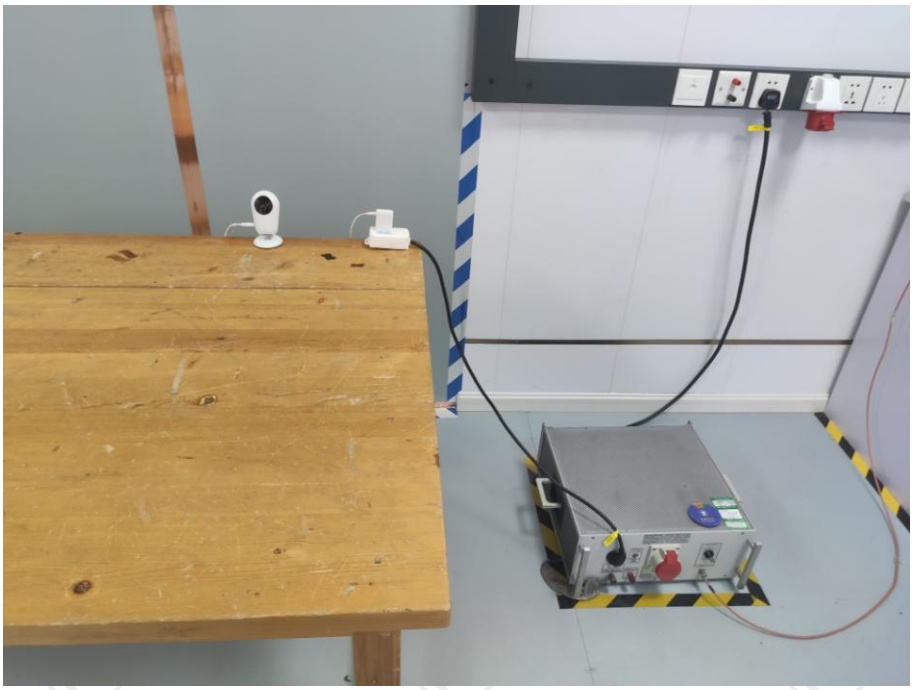
Conducted Emission



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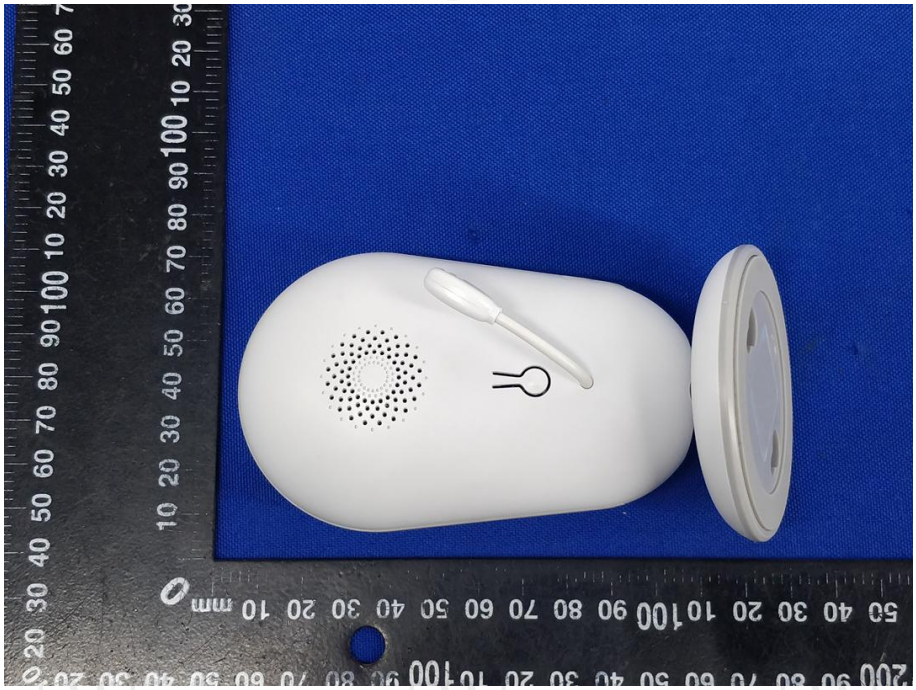
Appendix B: Photographs of EUT

Product: Video Baby Monitor

Model: VB608

External Photos

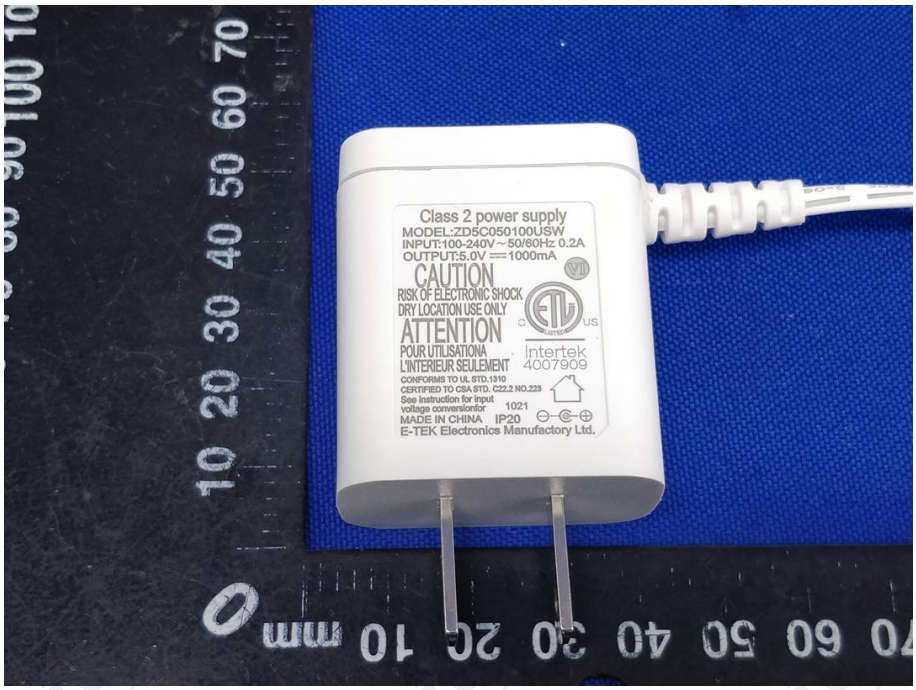



BOSI
BS181360

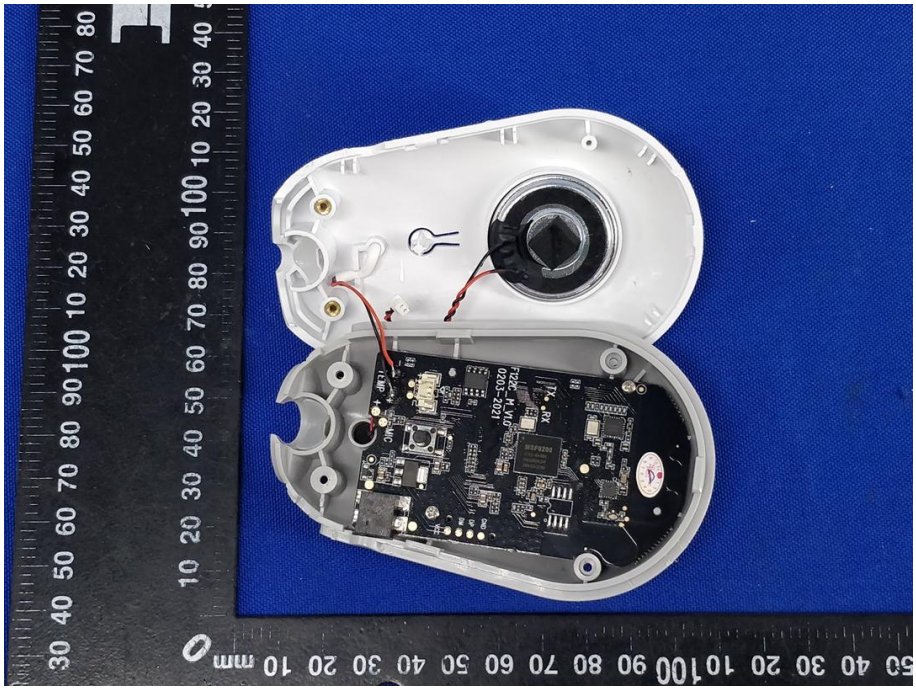

BOSI
BS181360

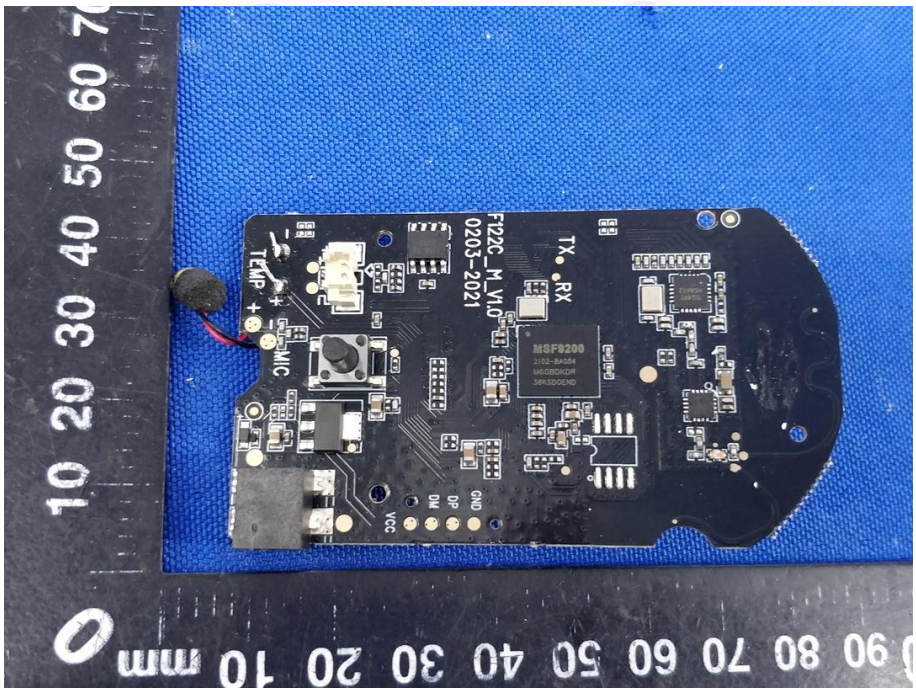

BOSI
BS181360


BOSI
BS181360


Class 2 power supply
MODEL:ZD5C050100USW
INPUT:100-240V~50/60Hz 0.2A
OUTPUT:5.0V ⎓1000mA
CAUTION
RISK OF ELECTRONIC SHOCK
DRY LOCATION USE ONLY
ATTENTION
POUR UTILISATIONA
L'INTERIEUR SEULEMENT
CONFORMS TO UL STD.1310
CERTIFIED TO CSA STD. C22.2 NO.223
See instruction for input voltage conversionfor
MADE IN CHINA
IP20
E-TEK Electronics Manufactory Ltd.
Intertek
4007909
1021

Product: Video Baby Monitor
Model: VB608
Internal Photos





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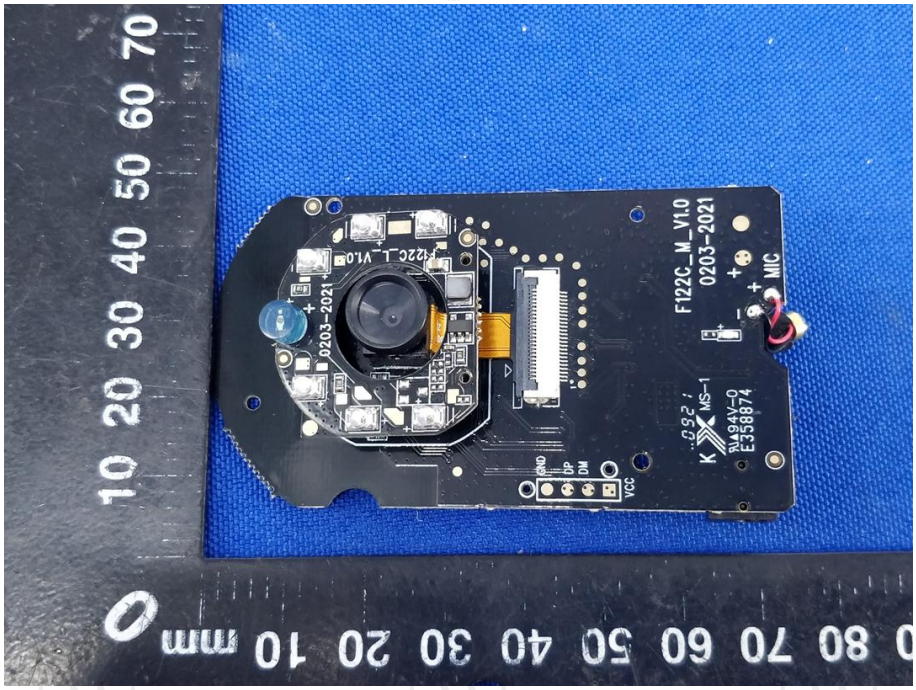

*****END OF REPORT*****

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