



TEST REPORT

For

Applicant : Shenzhen Smiled Technology Co., Ltd

Address : Floor 3,D Building, the second Science & Technology
Zone, Dakan, Xili Lake, Shenzhen, China

Product Name : Baby Monitor

Model Name : UU24

Brand Name : UU Infant

FCC Number : FCC ID: 2AKN7UU24

Report No. : MTE/CEC/B17010022

Date of Issue : Jan.10, 2017

Issued by : Most Technology Service Co., Ltd.

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1. PRODUCT INFORMATION

Equipment Under Test: Baby Monitor
Brand Name: UU Infant
Model Number: UU24
FCC Number: FCC ID: 2AKN7UU24
Applicant: Shenzhen Smiled Technology Co., Ltd
 Floor 3,D Building, the second Science & Technology Zone, Dakan,
 Xili Lake, Shenzhen, China
Manufacturer: Shenzhen Smiled Technology Co., Ltd
 Floor 3,D Building, the second Science & Technology Zone, Dakan,
 Xili Lake, Shenzhen, China
Technical Standards: 47 CFR Part 15 Subpart C (Part 15.247 of the FCC Rules)
File Number: MTE/CEC/B17010022
Date of test: Jan.02-09,2017
Deviation: None
Condition of Test Sample: Normal
Test Result: PASS

The above equipment was tested by Most Technology Service Co., Ltd. for compliance with the requirements set forth in FCC rules and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by (+ signature):



 Chloe Cai (Engineer) Jan.02-09,2017

Review by (+ signature):


 John Lin (Engineer) Jan.10,2017



Approved by (+ signature):


 Yvette Zhou (Manager) Jan.10,2017

2. GENERAL INFORMATION

2.1 Product Information

Product	Baby Monitor
Brand Name	N/A
Model Number	UU24
Series Model Name:	N/A
Series Model Difference description:	N/A
Power Supply	DC 6V by Adapter
Frequency Range	2410.875MHz -2471.625MHz
Modulation Type:	GFSK
Modulation Technique	FHSS
Channel Number	19
Antenna Type	Internal Not Detachable Antenna, Antenna Gain :2.0 dBi
Temperature Range	0°C ~ +50°C

NOTE:

1. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 Channel List

Channel List for O-QPSK Mode					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH07	2410.875MHz	CH28	2434.500MHz	CH49	2458.125MHz
CH10	2414.250MHz	CH31	2447.875MHz	CH52	2461.500MHz
CH13	2417.625MHz	CH34	2441.250MHz	CH55	2464.875MHz
CH16	2421.000MHz	CH37	2444.625MHz	CH58	2468.250MHz
CH19	2424.375MHz	CH40	2448.000MHz	CH61	2471.625MHz
CH22	2427.750MHz	CH43	2451.375MHz		
CH25	2431.125MHz	CH46	2454.750MHz		

2.3 Objective

The objective of the report is to perform tests according to FCC Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices
2	ANSI C63.10: 2013	Test Procedure
3	DA00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

2.3 Test Standards and Results

No.	Section	Test Items	Result	Date of Test
1	FCC 15.203	Antenna Requirement	PASS	2017-01-06
2	FCC15.207 (a)	AC Power Line Conducted Emission	PASS	2017-01-05
3	FCC15.209, 15.247(d)	Radiated Emission	PASS	2017-01-04
4	FCC 15.247 (b)(1)	Conducted Peak Output Power	PASS	2017-01-06
5	FCC 15.247 (a)(1)	20dB Emission Bandwidth	PASS	2017-01-06
6	FCC 15.247 (a)(1)	Carrier Frequency Separation	PASS	2017-01-06
7	FCC 15.247 (a)(1)(iii)	Number of Hopping Channel	PASS	2017-01-06
8	FCC 15.247 (a)(1) (iii)	Dwell Time	PASS	2017-01-06
9	FCC15.247(d)	Band Edge and Conducted Spurious Emissions	PASS	2017-01-06
10	FCC15.247(d)	Restricted Frequency Bands	PASS	2017-01-04
Remark: N/A means not applicable				

Note: 1. The test result judgment is decided by the limit of measurement standard
 2. The information of measurement uncertainty is available upon the customer's request.

2.4 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

3. TEST METHODOLOGY

3.1 TEST FACILITY

Test Site:	Most Technology Service Co., Limited
Location:	No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China
Description:	There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10:2013 and CISPR 16 requirements. The FCC Registration Number is 490827 . The IC Registration Number is 7103A-1 .
Site Filing:	The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
Instrument	All measuring equipment is in accord with ANSI C63.10:2013 and CISPR 16
Tolerance:	requirements that meet industry regulatory agency and accreditation agency requirement.
Ground Plane:	Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna.

3.2 GENERAL TEST PROCEDURES

Radiated Emissions

The EUT is placed on a turn table, which is 1.5 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.5 of ANSI C63.10:2013.

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10:2013, Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

4. SETUP OF EQUIPMENT UNDER TEST

4.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

4.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at Most for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

No.	Equipment	Manufacturer	Model No.	S/N	Calibration date	Calibration Interval
1	Test Receiver	Rohde & Schwarz	ESCI	100492	2016/03/10	1 Year
2	Spectrum Analyzer	Agilent	E7405A	US44210471	2016/03/14	1 Year
3	L.I.S.N.	Rohde & Schwarz	ENV216	100093	2016/03/10	1 Year
4	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2016/03/07	1 Year
5	Terminator	Hubersuhner	50Ω	No.1	2016/03/07	1 Year
6	RF Cable	SchwarzBeck	N/A	No.1	2016/03/07	1 Year
7	Test Receiver	Rohde & Schwarz	ESPI	101202	2016/03/10	1 Year
8	Bilog Antenna	Sunol	JB3	A121206	2016/03/14	1 Year
9	Horn Antenna	SCHWARZBECK	BBHA9120D	756	2016/03/14	1 Year
10	Horn Antenna	Penn Engineering	9034	8376	2016/03/14	1 Year
11	Cable	Resenberger	N/A	NO.1	2016/03/07	1 Year
12	Cable	SchwarzBeck	N/A	NO.2	2016/03/07	1 Year
13	Cable	SchwarzBeck	N/A	NO.3	2016/03/07	1 Year
14	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	2016/03/07	1 Year
15	Test Receiver	Rohde & Schwarz	ESCI	100492	2016/03/10	1 Year
16	Loop antenna	ARA	PLA-1030/B	1039	2016/03/14	1 Year

NOTE: Equipments listed above have been calibrated and are in the period of validation.

5. 47 CFR Part 15 C Requirements

5.1 ANTENNA REQUIREMENT

5.1.1 Applicable Standard

According to FCC § 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, or §15.221. 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 Evaluation Criteria

(a) Antenna must be permanently attached to the unit.

(b) Antenna must use a unique type of connector to attach to the EUT.

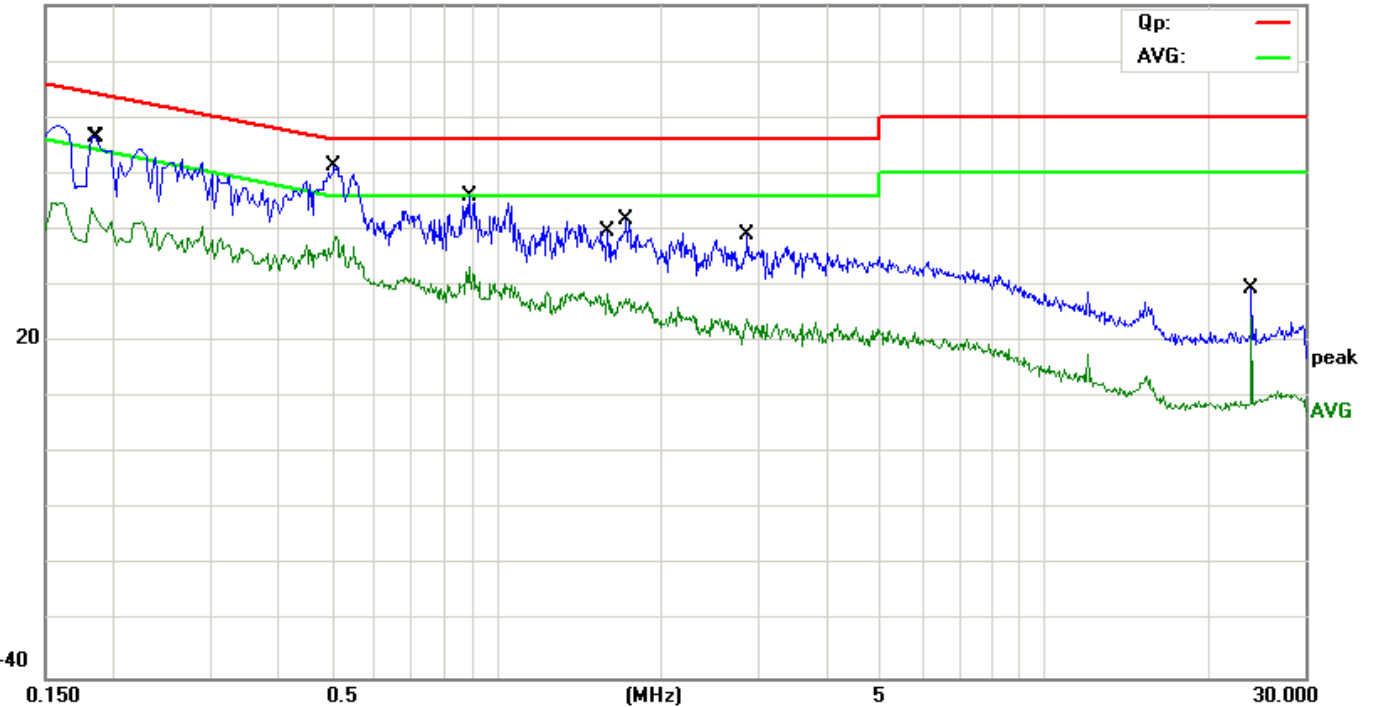
Unit must be professionally installed, Installer shall be responsible for verifying that the correct antenna is employed with the unit.

5.1.3 Result: Compliance.

The EUT has one integral antenna arrangement, which was permanently attached and the antenna gain is 2.0 dBi, fulfill the requirement of this section.

EUT:	Baby Monitor	M/N:	UU24
Mode:	Charging	Phase:	L1
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.4°C / 52.9%	Test date:	2017-01-05

80.0 dBuV

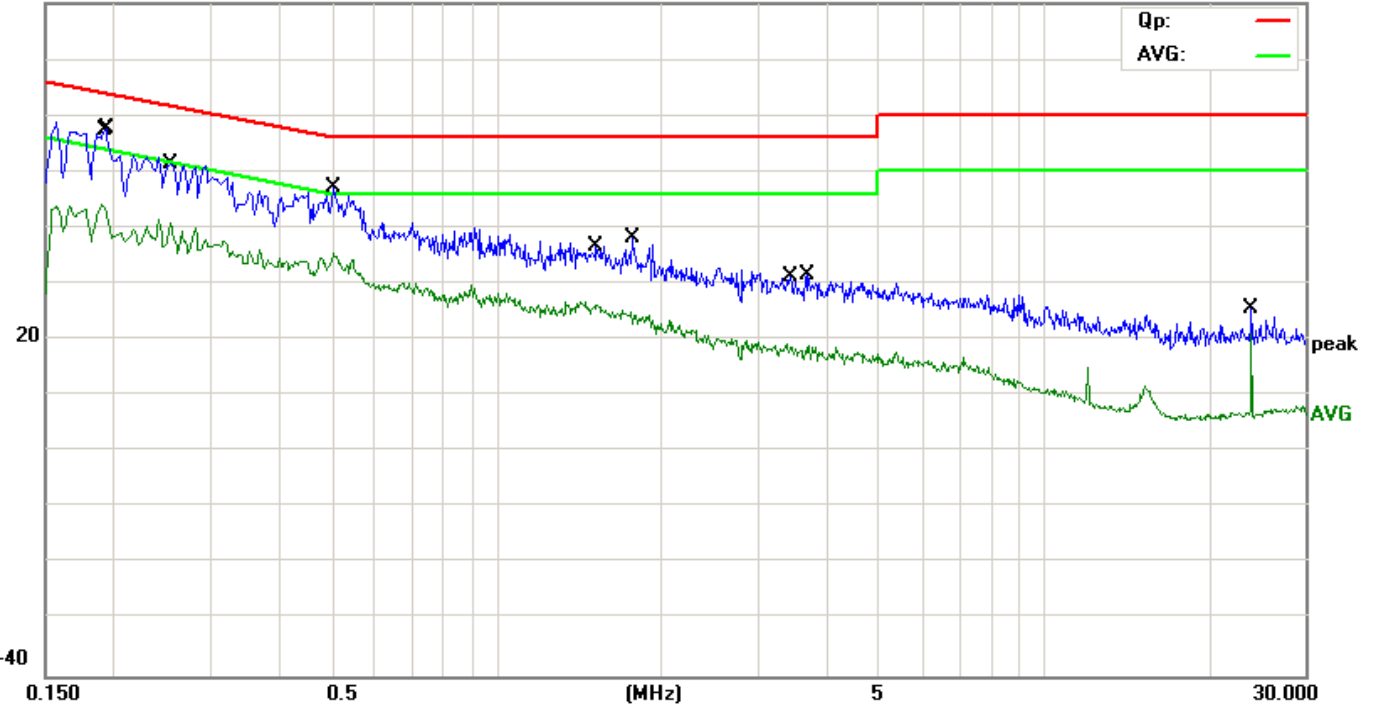


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1824	34.04	9.61	43.65	54.38	-10.73	AVG	
2		0.1860	46.98	9.60	56.58	64.21	-7.63	QP	
3	*	0.5060	41.69	9.59	51.28	56.00	-4.72	QP	
4		0.5100	29.11	9.59	38.70	46.00	-7.30	AVG	
5		0.8940	36.49	9.60	46.09	56.00	-9.91	QP	
6		0.8940	23.68	9.60	33.28	46.00	-12.72	AVG	
7		1.5980	18.92	9.60	28.52	46.00	-17.48	AVG	
8		1.7260	32.14	9.60	41.74	56.00	-14.26	QP	
9		2.8660	14.59	9.61	24.20	46.00	-21.80	AVG	
10		2.8740	29.33	9.61	38.94	56.00	-17.06	QP	
11		23.9980	19.73	9.75	29.48	60.00	-30.52	QP	
12		23.9980	14.53	9.75	24.28	50.00	-25.72	AVG	

*:Maximum data x:Over limit !:over margin

EUT:	Baby Monitor	M/N:	UU24
Mode:	Charging	Phase:	N
Tested by:	Sunny(Engineer)	Power:	DC 6 V by Adapter
Temperature: / Humidity	23.4°C / 52.9%	Test date:	2017-01-05

80.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1900	34.59	9.60	44.19	54.04	-9.85	AVG	
2	*	0.1940	48.16	9.60	57.76	63.86	-6.10	QP	
3		0.2540	41.85	9.60	51.45	61.63	-10.18	QP	
4		0.2540	31.28	9.60	40.88	51.63	-10.75	AVG	
5		0.5020	25.79	9.59	35.38	46.00	-10.62	AVG	
6		0.5060	37.46	9.59	47.05	56.00	-8.95	QP	
7		1.5260	16.58	9.60	26.18	46.00	-19.82	AVG	
8		1.7740	28.68	9.60	38.28	56.00	-17.72	QP	
9		3.3980	9.67	9.61	19.28	46.00	-26.72	AVG	
10		3.7020	22.00	9.62	31.62	56.00	-24.38	QP	
11		24.0020	15.95	9.75	25.70	60.00	-34.30	QP	
12		24.0020	11.26	9.75	21.01	50.00	-28.99	AVG	

*:Maximum data x:Over limit !:over margin

5.3 Radiated Emission

5.3.1 Requirement

According to FCC section 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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 ($\mu\text{V/m}$ at 3-meter)	Test Distance (m)	Field Strength ($\text{dB}\mu\text{V/m}$ at 3-meter)
0.009 - 0.490	$2400/F(\text{kHz})$	300	
0.490 - 1.705	$24000/F(\text{kHz})$	30	
1.705-30	30	30	
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Note:

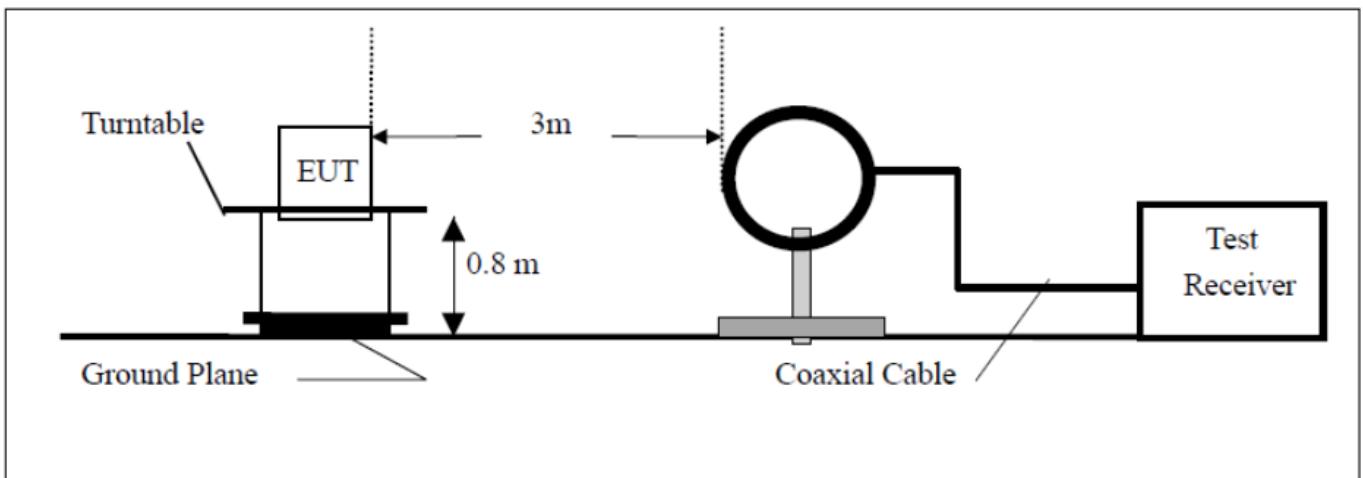
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

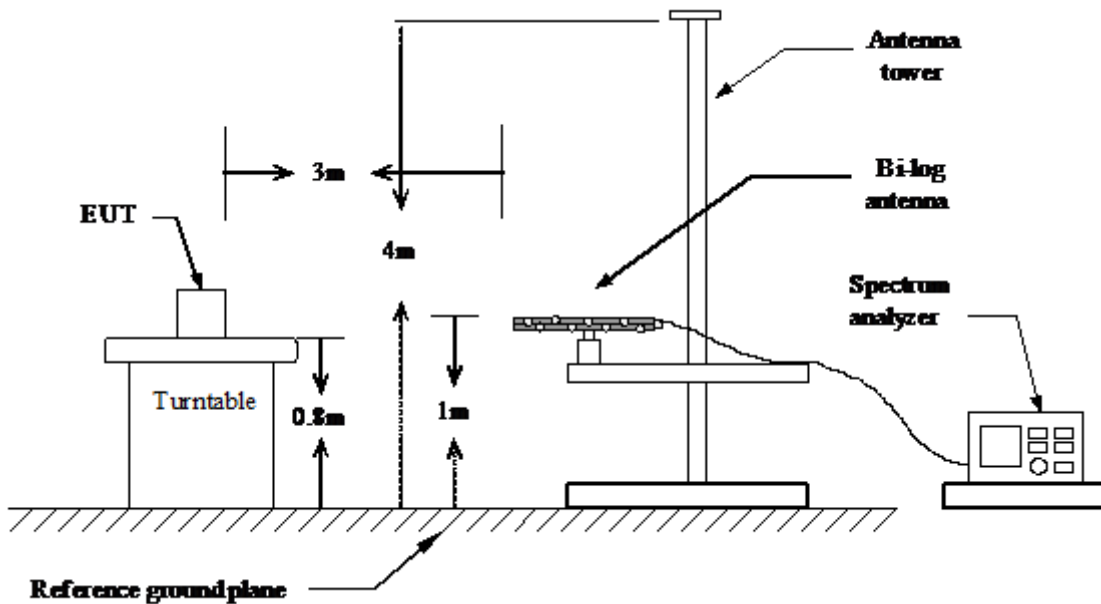
5.3.2 Test Configuration

Test Setup:

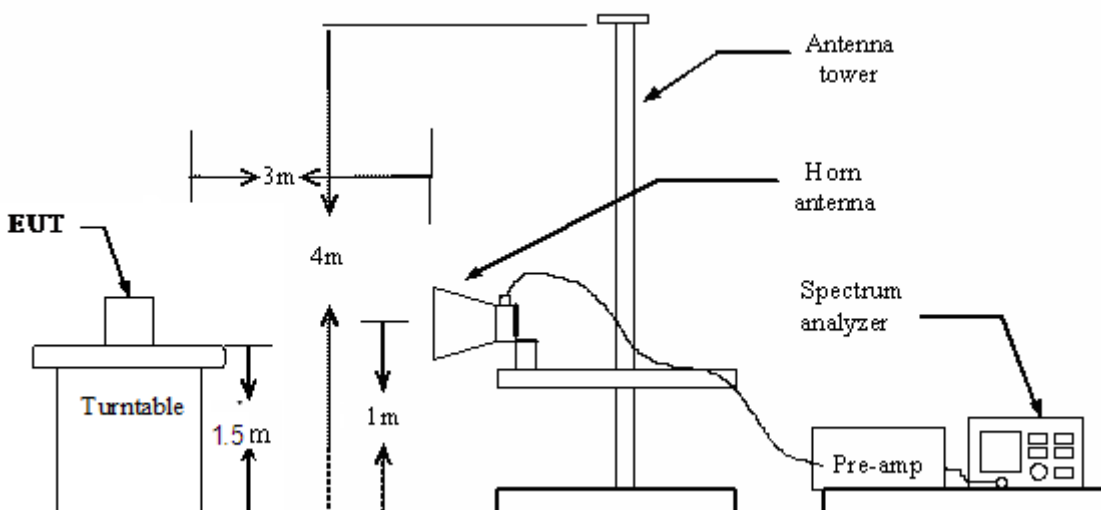
- 1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz

**5.3.3 Test Procedure:**

1. The EUT was placed on the top of a wooden table 0.8 meters (for measurement at frequency below 1GHz) and a wooden table 1.5 meters (for measurement at frequency above 1GHz) above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter, for the test frequency of above 1GHz, horn antenna opening in the test would have been facing the EUT when rise or fall) and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

6. Set the spectrum analyzer in the following setting as:

Below 1GHz: PEAK: RBW=100 kHz / VBW=300 kHz / Sweep=AUTO QP: RBW=120 kHz / Sweep=AUTO

Above 1GHz: (a)PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b)AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

7. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

5.3.4 Test Result

Pass

Remark:

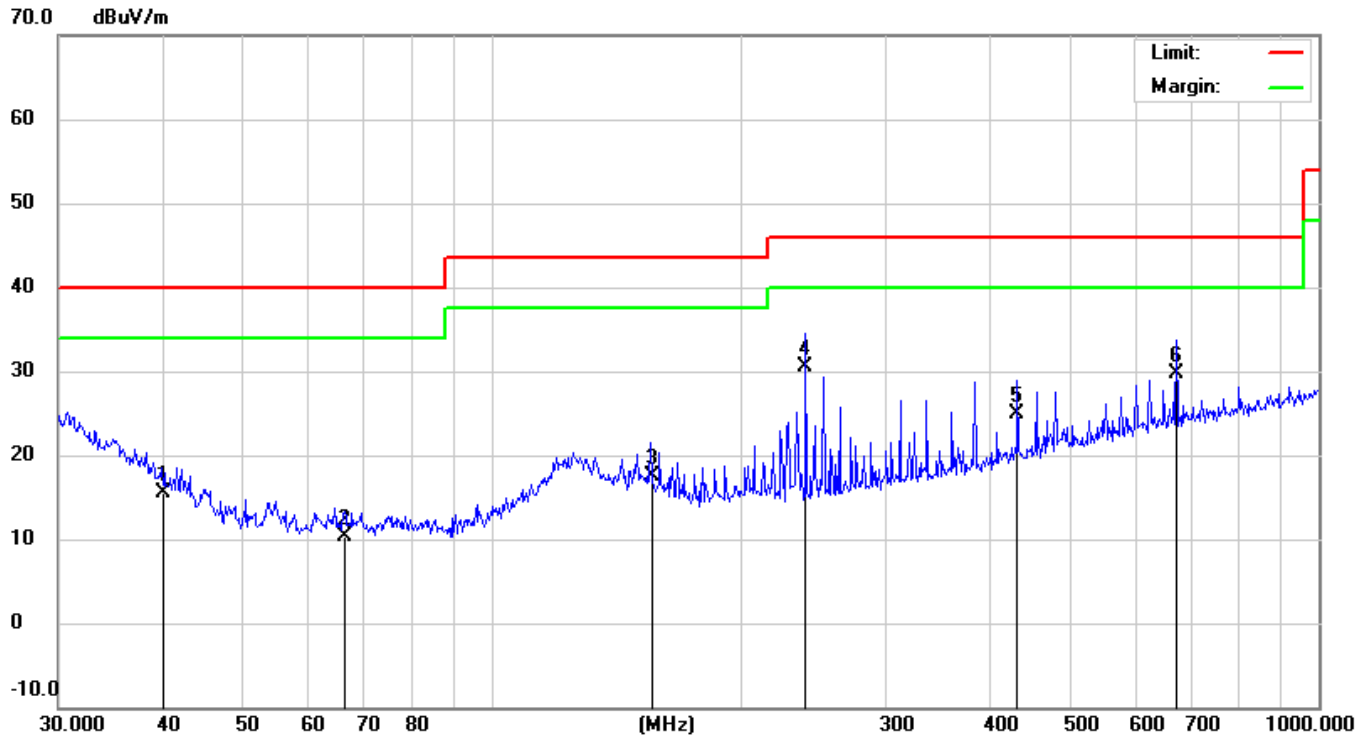
1. During the test, pre-scan the GFSK Mode, and found the GFSK modulation Low channel is worse case in above 1GHz and below 1GHz.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
3. For radiated emissions from 9kHz to 30MHz, Test results show that the margin of over -20db.

Note: All test modes are performed, only the worst case is recorded in this report.

Please refer the following pages

Below 1GHz:

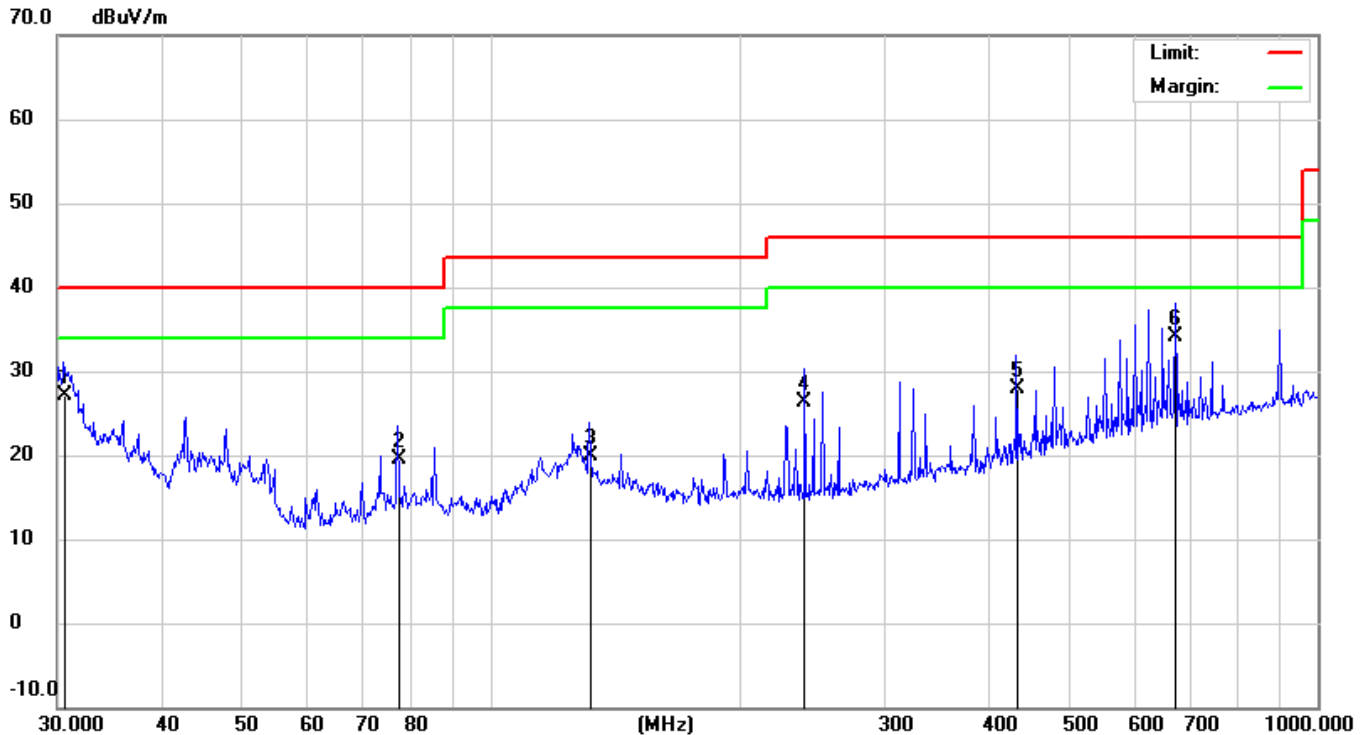
EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Horizontal
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.9°C / 53.6%	Test date:	2017-01-04



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		39.9942	1.76	13.80	15.56	40.00	-24.44	QP		
2		66.4989	2.21	8.05	10.26	40.00	-29.74	QP		
3		155.9101	5.10	12.46	17.56	43.50	-25.94	QP		
4	*	239.9873	18.56	11.88	30.44	46.00	-15.56	QP		
5		432.5456	8.68	16.15	24.83	46.00	-21.17	QP		
6		672.8444	9.95	19.75	29.70	46.00	-16.30	QP		

*:Maximum data x:Over limit !:over margin

EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Vertical
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.9°C / 53.6%	Test date:	2017-01-04

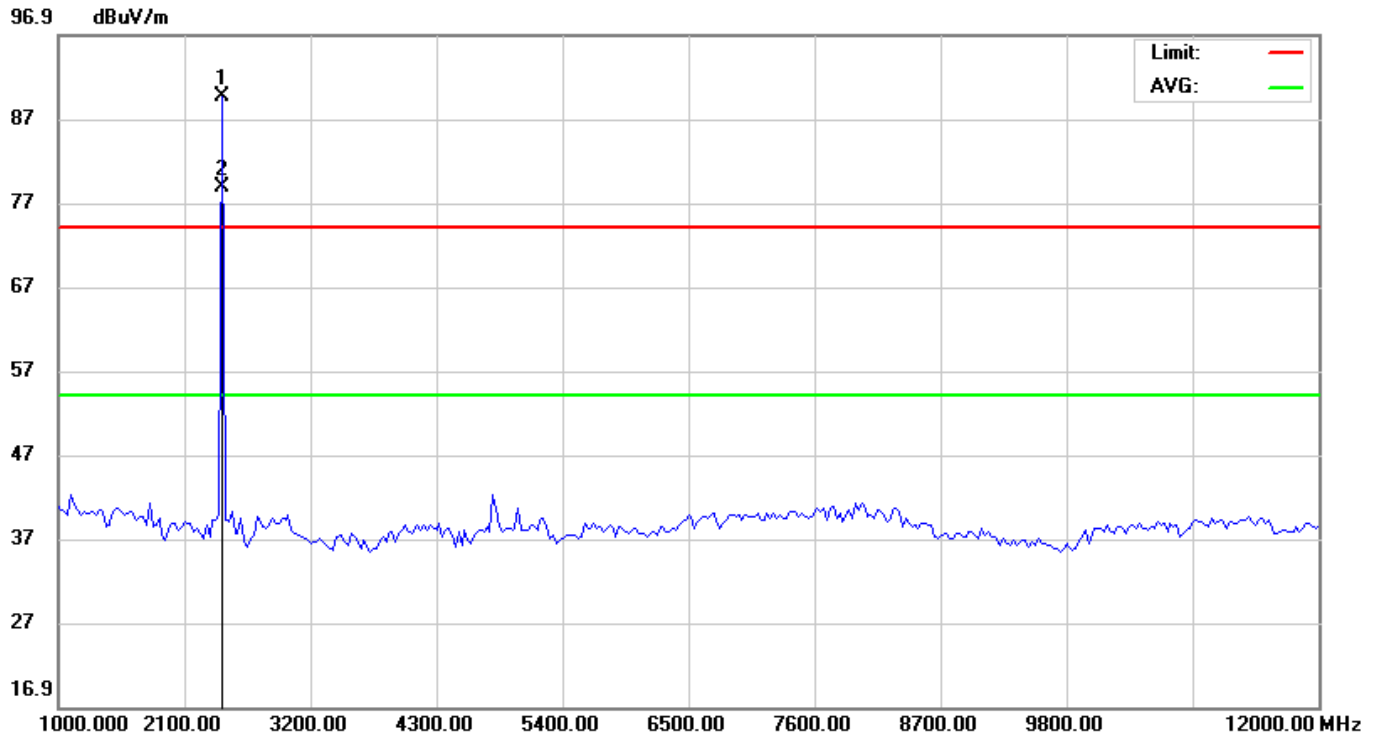


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		30.5306	6.49	20.54	27.03	40.00	-12.97	QP		
2		77.3212	11.31	8.15	19.46	40.00	-20.54	QP		
3		131.7577	6.18	13.73	19.91	43.50	-23.59	QP		
4		239.9873	14.49	11.88	26.37	46.00	-19.63	QP		
5		432.5457	11.68	16.15	27.83	46.00	-18.17	QP		
6	*	672.8444	14.44	19.75	34.19	46.00	-11.81	QP		

*:Maximum data x:Over limit !:over margin

Above 1GHz:

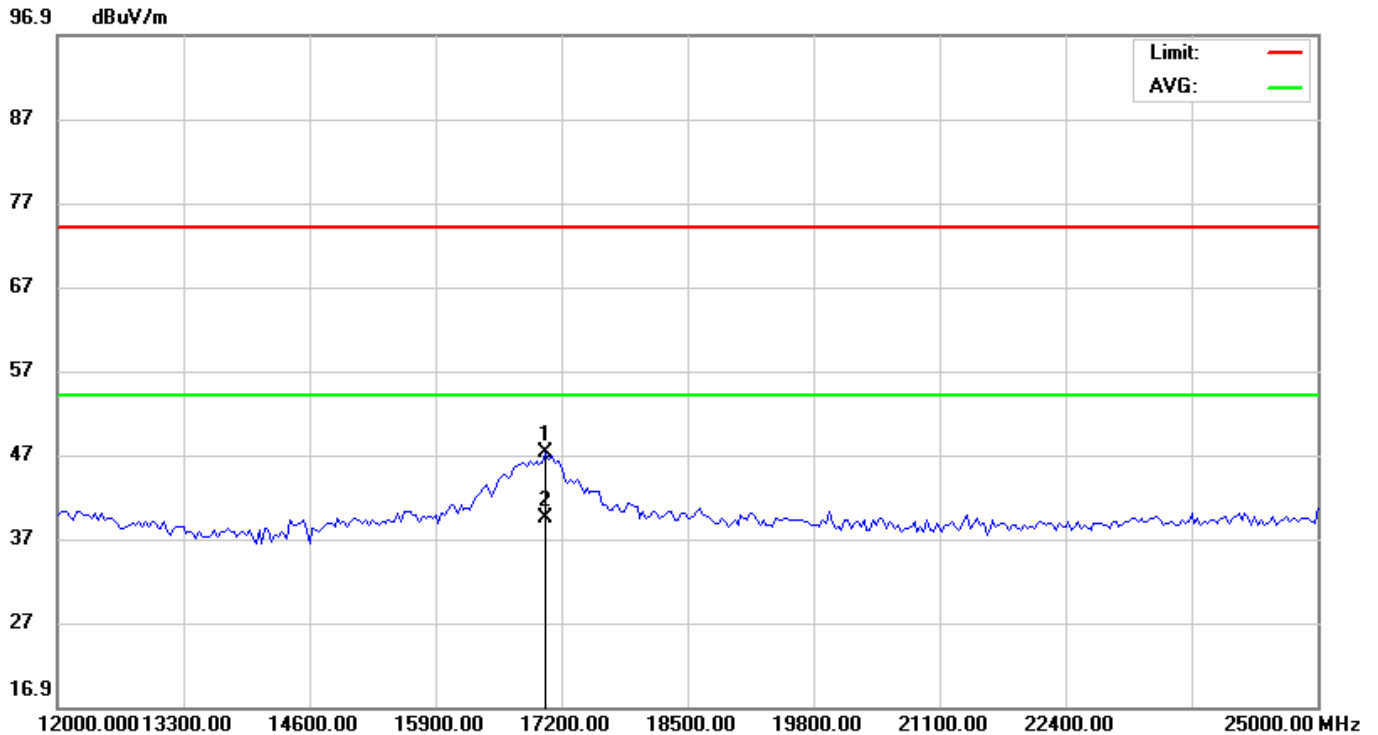
EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Horizontal
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	22.8°C / 53.5%	Test date:	2017-01-04



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	X	2410.875	98.04	-8.41	89.63	74.00	15.63			peak
2	*	2410.875	87.30	-8.41	78.89	54.00	24.89			AVG

*:Maximum data x:Over limit !:over margin

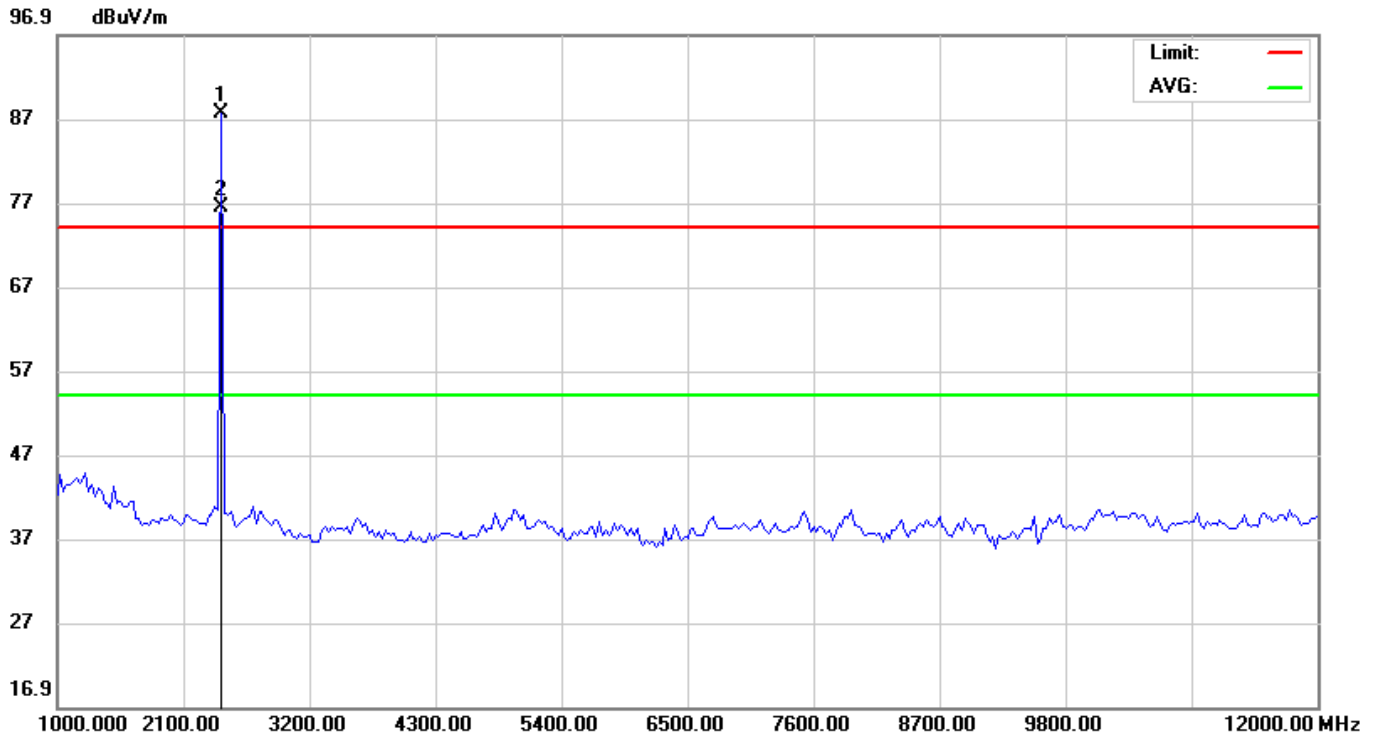
EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Horizontal
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	22.8°C / 53.5%	Test date:	2017-01-04



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		17037.50	40.54	6.73	47.27	74.00	-26.73	peak			
2	*	17037.50	32.70	6.73	39.43	54.00	-14.57	AVG			

*:Maximum data x:Over limit !:over margin

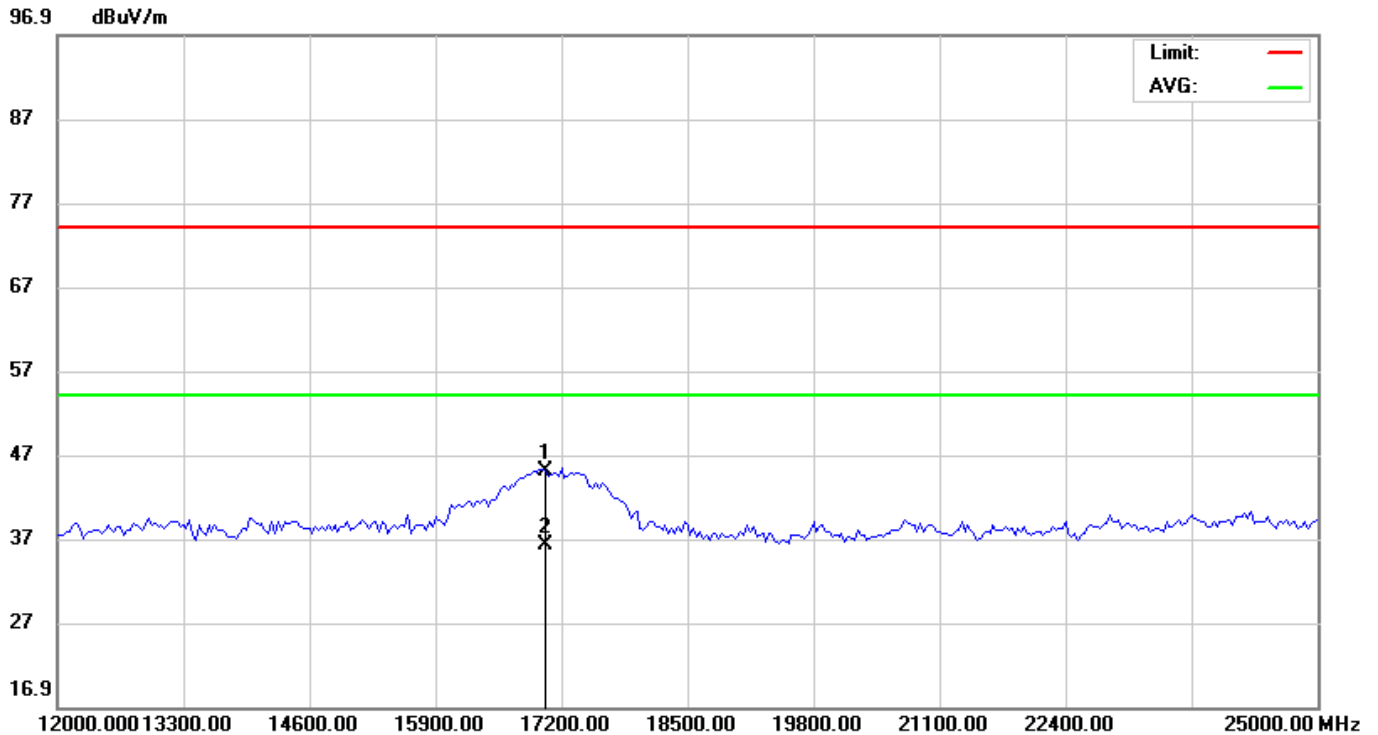
EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Vertical
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	22.8°C / 53.5%	Test date:	2017-01-04



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	X	2410.875	96.11	-8.41	87.70	74.00	13.70			peak
2	*	2410.875	84.90	-8.41	76.49	54.00	22.49			AVG

*:Maximum data x:Over limit !:over margin

EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Vertical
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	22.8°C / 53.5%	Test date:	2017-01-04



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		17037.50	38.31	6.73	45.04	74.00	-28.96	peak		
2	*	17037.50	29.50	6.73	36.23	54.00	-17.77	AVG		

*:Maximum data x:Over limit !:over margin

5.4 Conducted Peak Output Power

5.4.1 Requirement

According to FCC Section 15.247(b)(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

5.4.2 Block Diagram of Test Setup



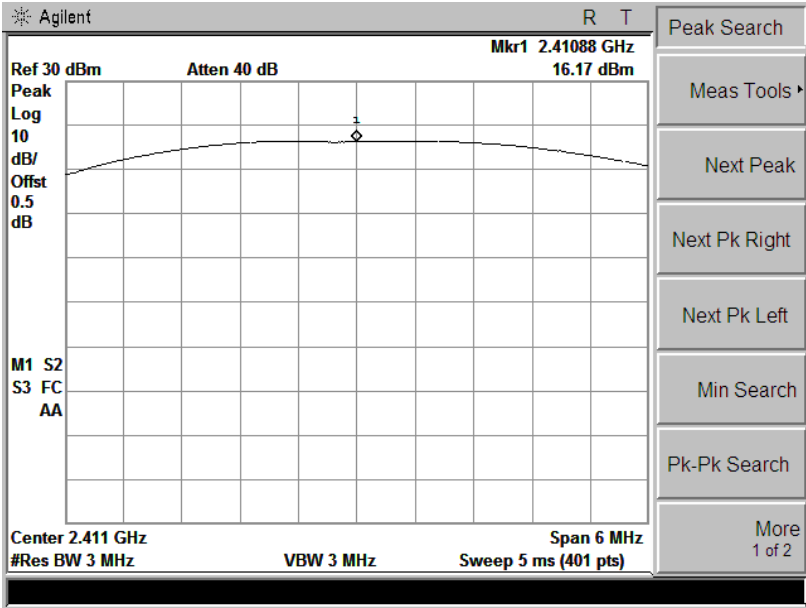
5.4.3 Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI test receiver.
3. Add a correction factor to the display.

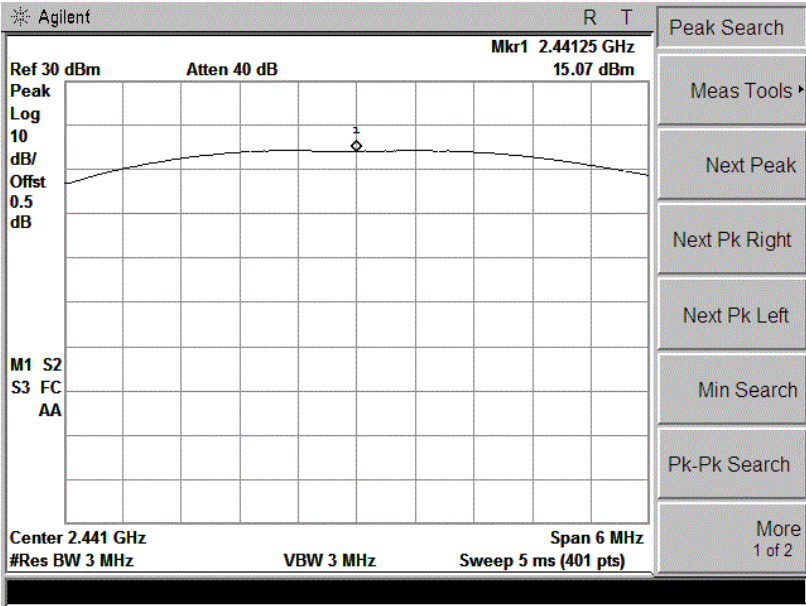
5.4.4 Test Result

Test Item:	Peak Output Power	Temperature :	21°C
Tested by:	Kang (Engineer)	Relative Humidity :	59%

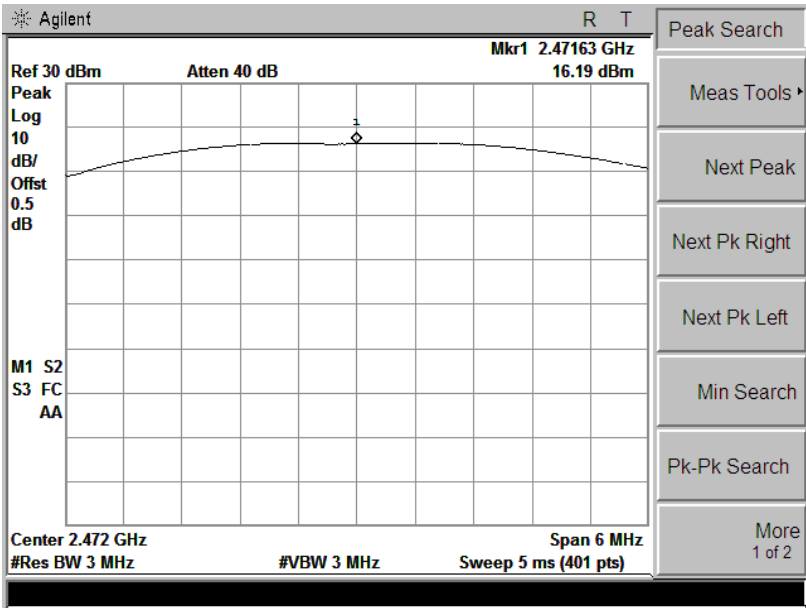
Mode	Channel	Frequency (MHz)	Peak Output Power(dBm)	Limit		Pass/Fail
				(mW)	(dBm)	
(GFSK)	Low	2410.875	16.17	125	20.97	Pass
	Middle	2441.250	15.07	125	20.97	Pass
	High	2471.625	16.19	125	20.97	Pass



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5.5 20dB Emission Bandwidth

5.5.1 Test Requirement

The bandwidth of a frequency hopping channel is the -20 dB emission bandwidth, measured with the hopping stopped.

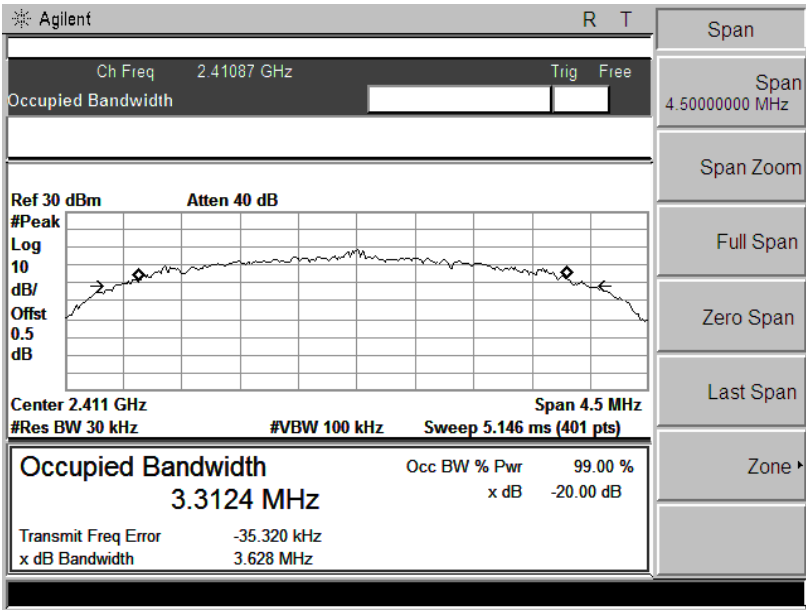
5.5.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

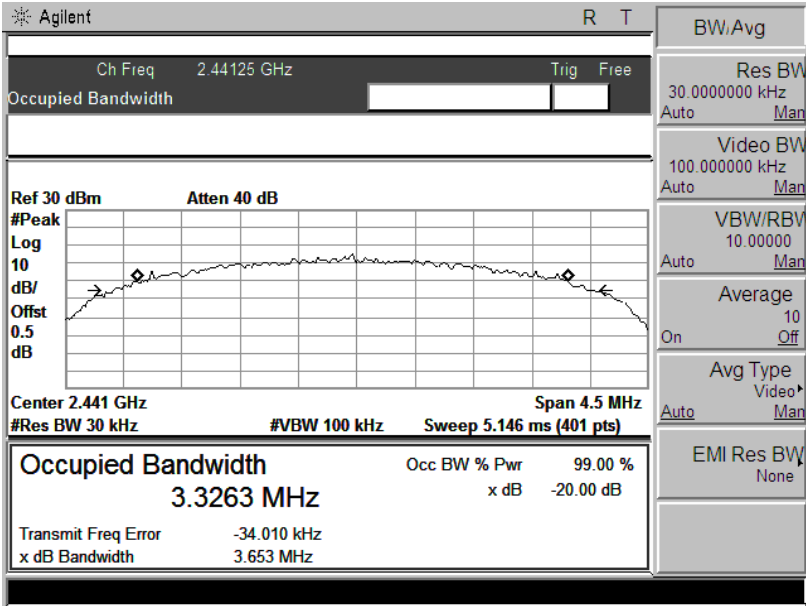
5.5.3 Test Result

Test Item:	20dB Emission Bandwidth	Temperature :	23°C
Tested by:	Kang (Engineer)	Relative Humidity :	65%

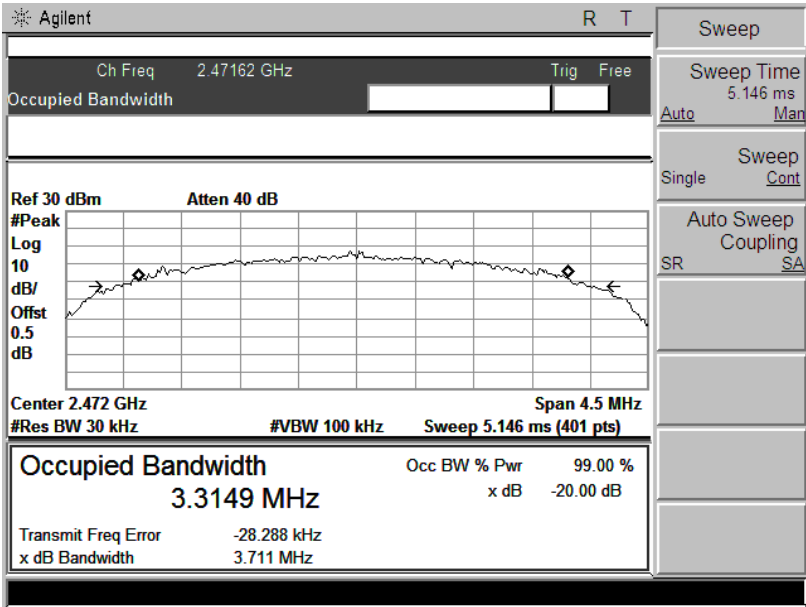
Mode	Channel	Frequency (MHz)	20dB Bandwidth(MHz)
(GFSK)	Low	2410.875	3.628
	Middle	2441.250	3.653
	High	2471.625	3.711



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5.6 Carrier Frequency Separation

5.6.1 Test Requirement

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.50 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

5.6.2 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span=wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq 1\%$ of the span

Video (or Average) Bandwidth (VBW) \leq RBW

Sweep=auto

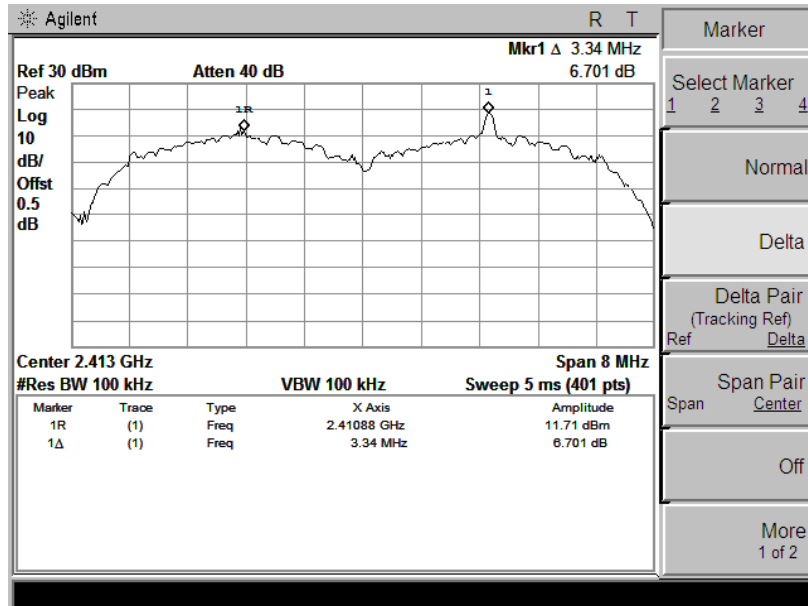
Detector function=peak

Trace=max hold

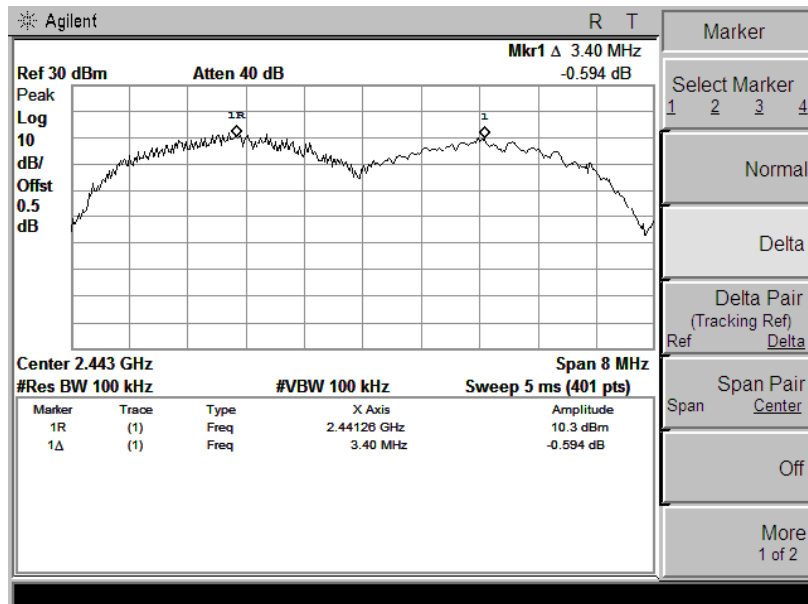
5.6.3 Test Result

Test Item:	Carrier Frequency Separation	Temperature :	23°C
Tested by:	Kang (Engineer)	Relative Humidity :	65%

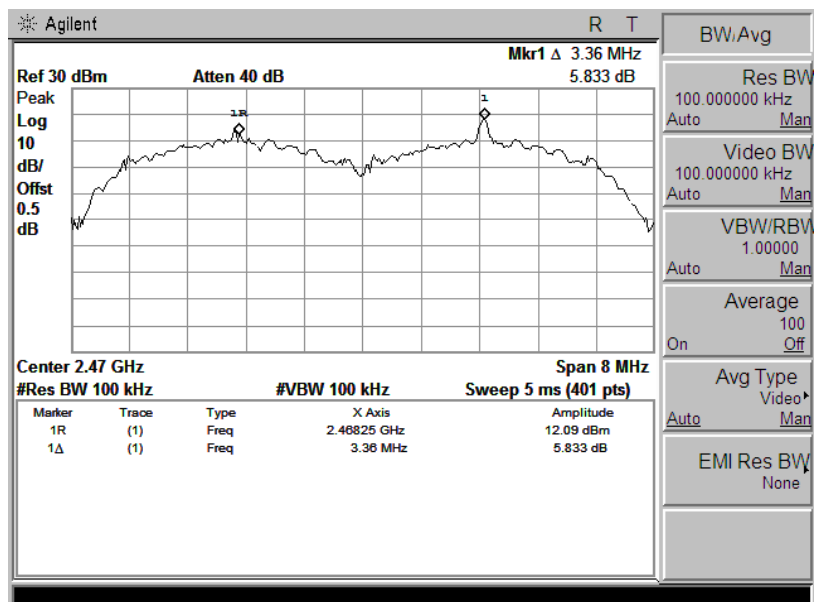
Mode	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)	Result
(GFSK)	Low	2410.875	3.34	2.419	Pass
	Middle	2441.250	3.40	2.435	Pass
	High	2471.625	3.36	2.474	Pass



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5.7 Number of Hopping Channel

5.7.1 Test Requirement

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

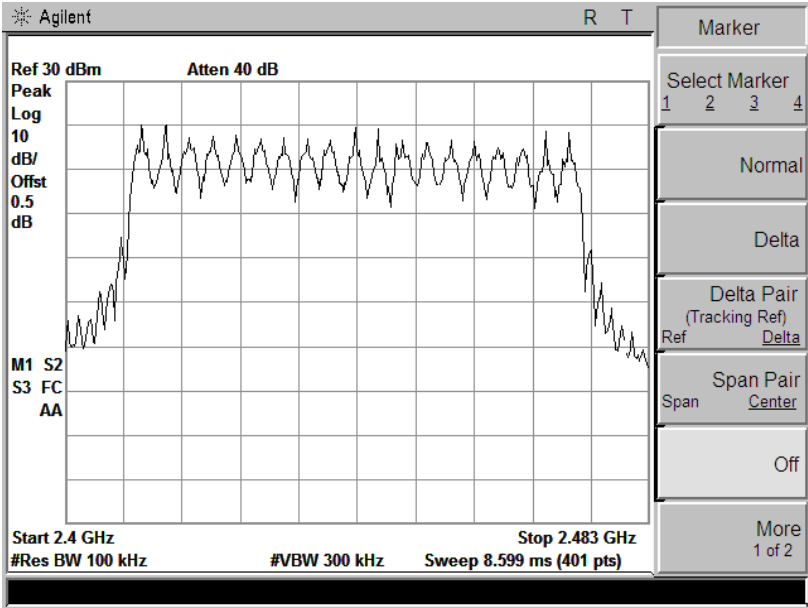
5.7.2 Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

5.7.3 Test Result

Test Item:	Number of Hopping Channel	Temperature :	23°C
Tested by:	Kang (Engineer)	Relative Humidity :	65%

Mode	Frequency Range (MHz)	Number of Hopping Channel	Limit
GFSK	2410.875-2471.625	19	≥15



GFSK Mode

5.8 Dwell Time

5.8.1 Test Requirement

15.247(a) (1) (iii) Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

5.8.2 Test Procedure

ANSI C63.10: Clause 7.7.4

1. Remove the antenna from the EUT and then connect a low attenuation RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Set RBW = 1 MHz and VBW = 1 MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.). Repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

5.8.3 Test Result

The test period: $T = 0.4 \text{ Second/Channel} \times 19 \text{ Channel} = 7.6 \text{ s}$

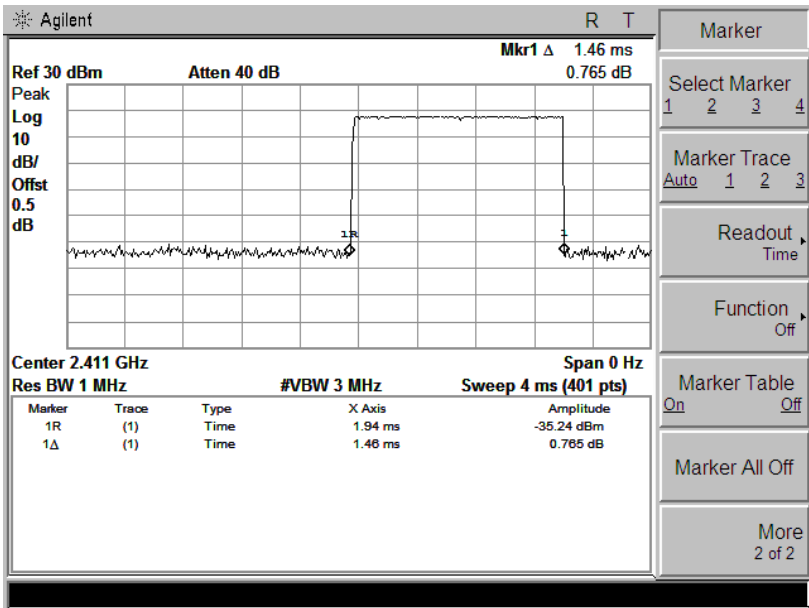
1. Channel 07: 2410.875 MHz					
time slot	=	1.460	(ms)	* 19 * (7.6/0.76)	= 277.400 ms
2. Channel 34: 2441.250 MHz					
time slot	=	1.440	(ms)	* 19 * (7.6/0.76)	= 276.600 ms
3. Channel 61: 2471.625 MHz					
time slot	=	1.440	(ms)	* 19 * (7.6/0.76)	= 276.600 ms

The average time of occupancy in the specified 7.6 second period is equal to pulse width*(# of pulse in observation period)*(test period / observation period)

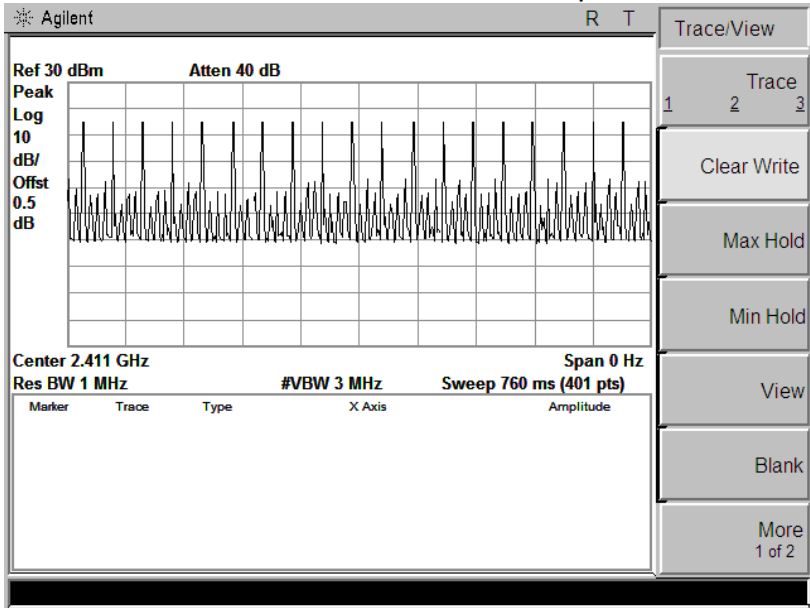
The results are not greater than 0.4 seconds.

The unit does meet the FCC requirements.

Please refer the graph as below:
1. Lowest channel

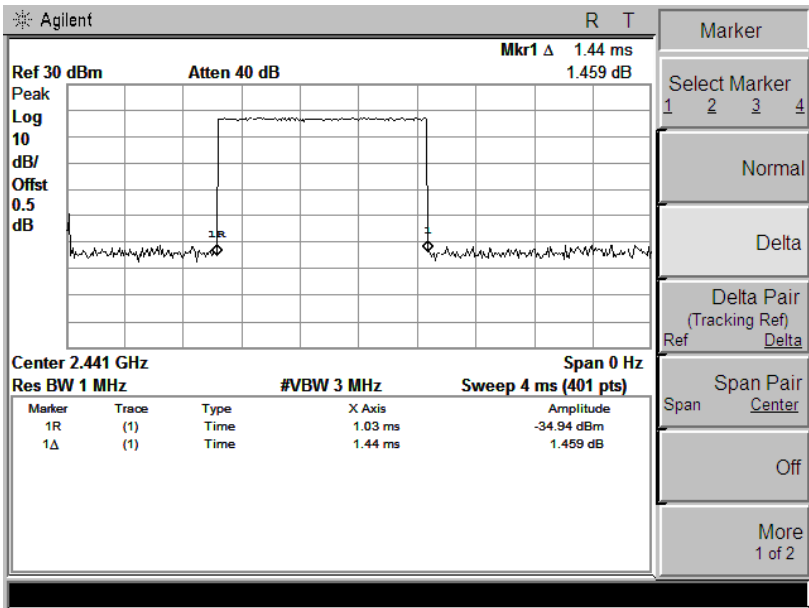


Number of Pulses in 3.16 S observation period:

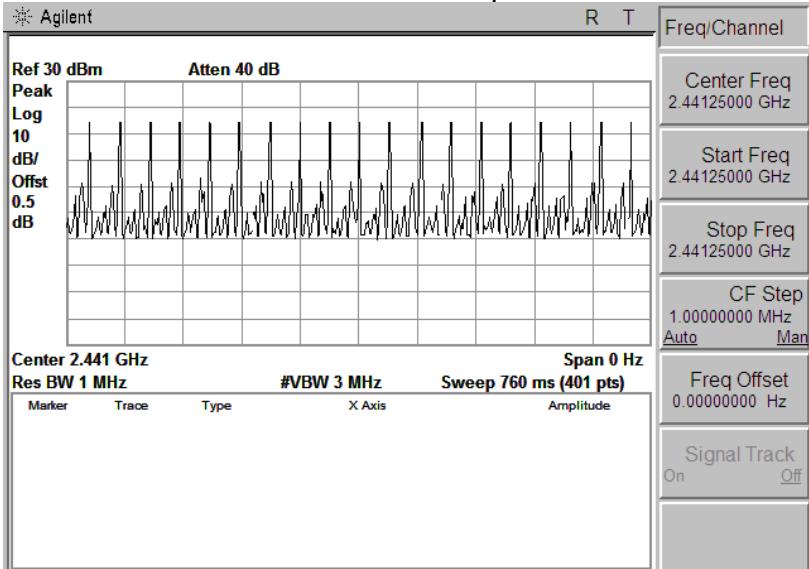


2. Middle Channel

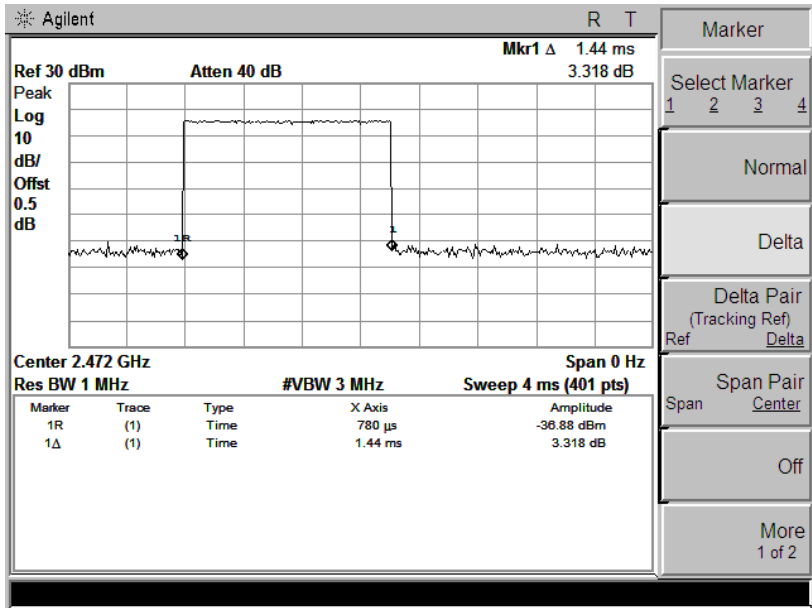
Pulse Width:



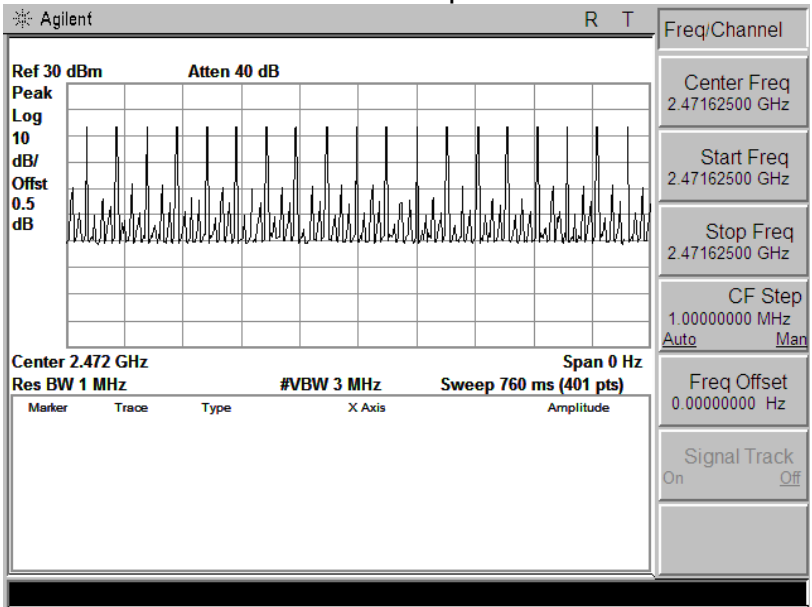
Number of Pulses in 3.16 S observation period:



3. Highest Channel
Pulse Width:



Number of Pulses in 3.16 S observation period:



5.9 Band Edge and Conducted Spurious Emissions

5.9.1 Test Requirement

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

5.9.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

5.9.3 Test Result

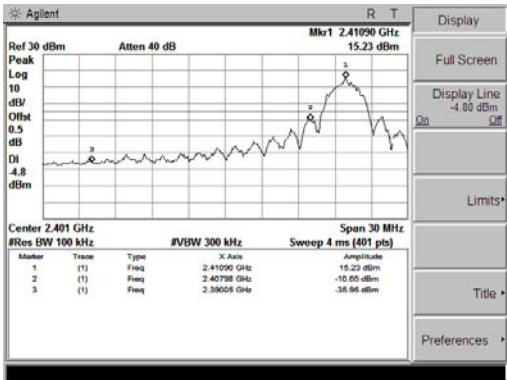
Pass

Remark:

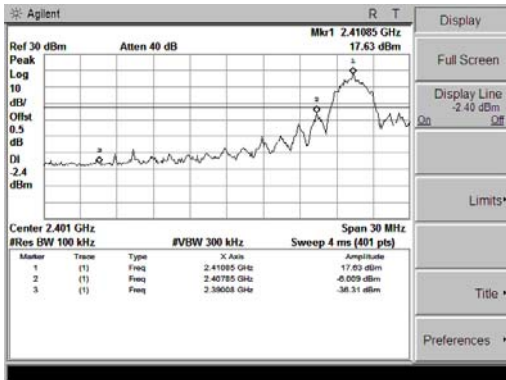
During the Conducted Spurious Emissions test, pre-scan the GFSK modulation.

Test Item:	Band Edge	Temperature :	23°C
Tested by:	Kang (Engineer)	Relative Humidity :	65%

Band Edge, Left Side

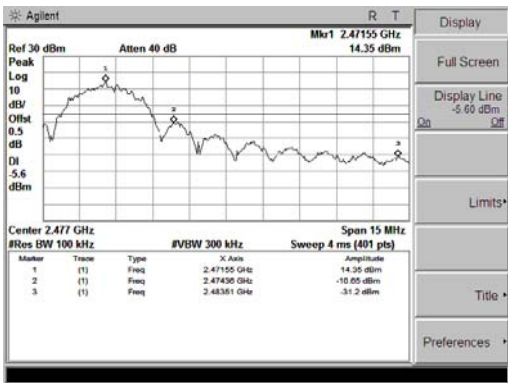


GFSK Mode, Non-Hopping

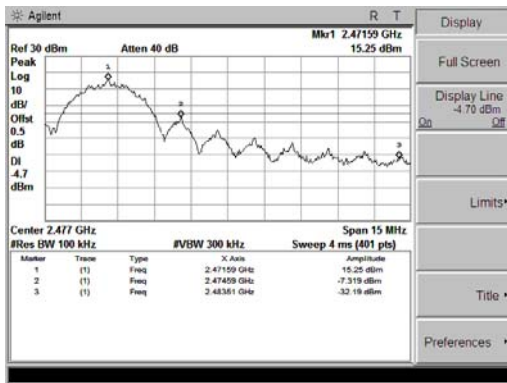


GFSK Mode, Hopping

Band Edge, Right Side

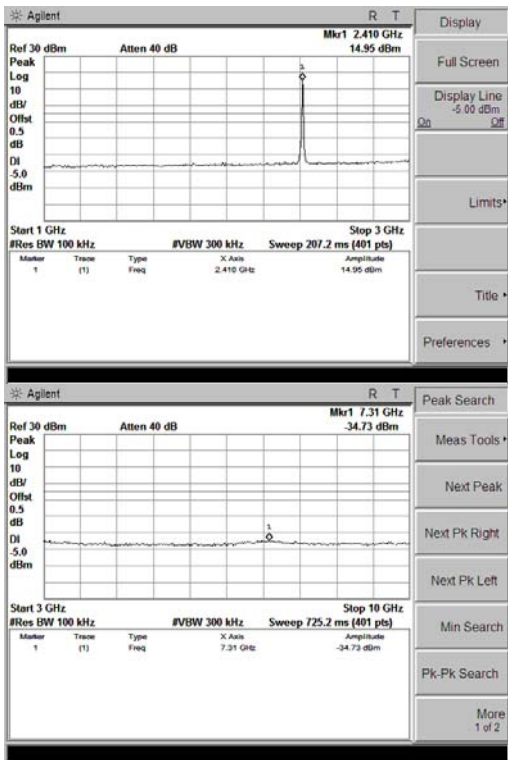
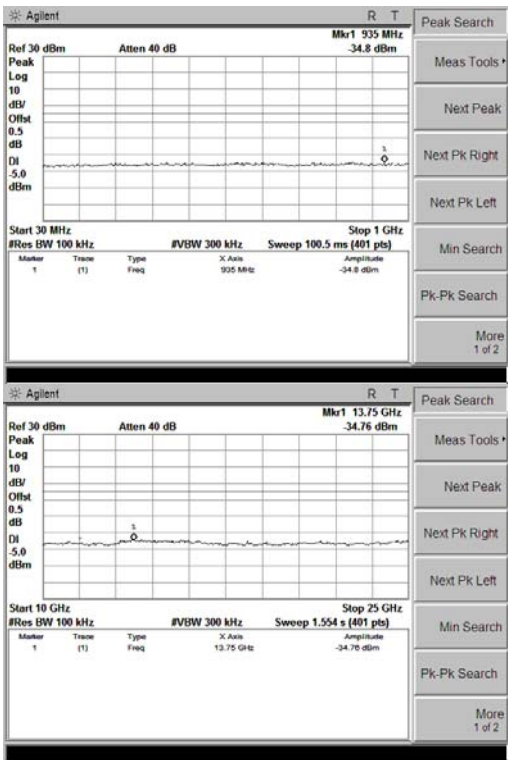


GFSK Mode, Non-Hopping

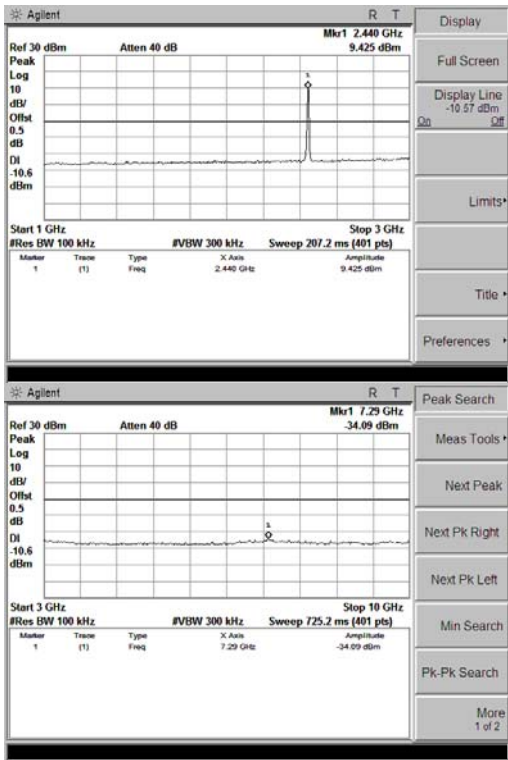
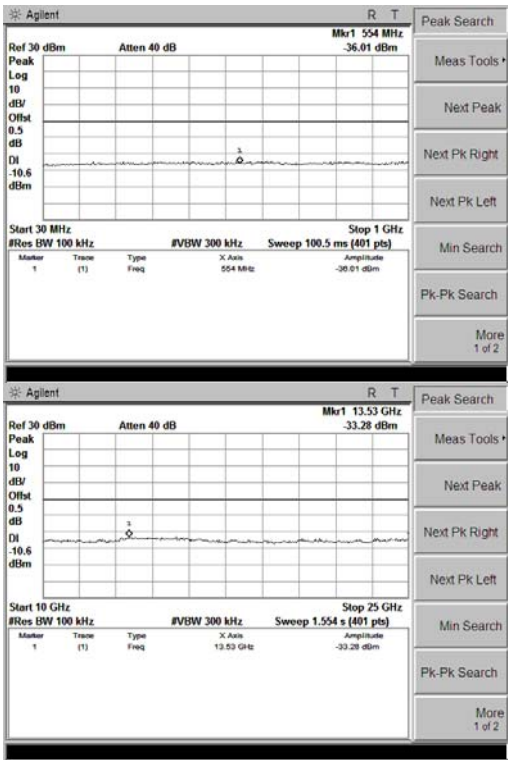


GFSK Mode, Hopping

Conducted Spurious Emissions



GFSK Mode, Ch07



GFSK Mode, Ch34

Conducted Spurious Emissions



GFSK Mode, Ch61

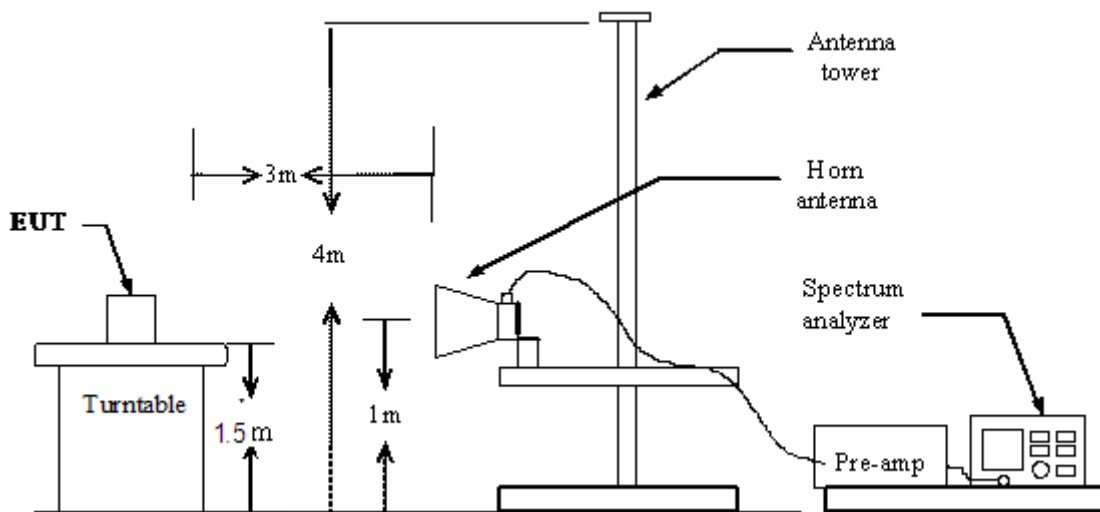
5.10 Restricted Frequency Bands

5.10.1 Test Requirement

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.10.2 Test Configuration

Test Setup:



5.10.3 Test Procedure:

1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

5.10.4 Test Result

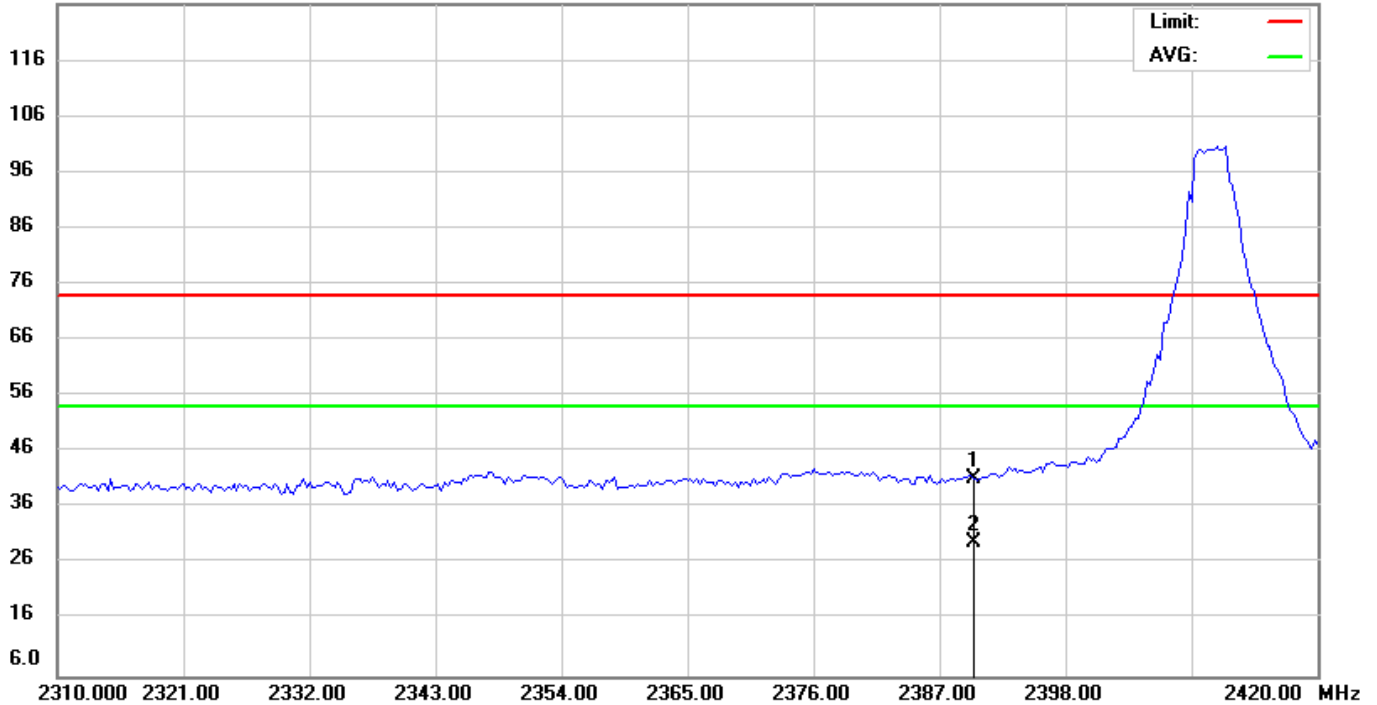
Pass

Note: All test modes are performed, only the worst case is recorded in this report.

Please refer the following plots.

EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Horizontal
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.7°C / 52.9%	Test date:	2017-01-04

126.0 dBuV/m

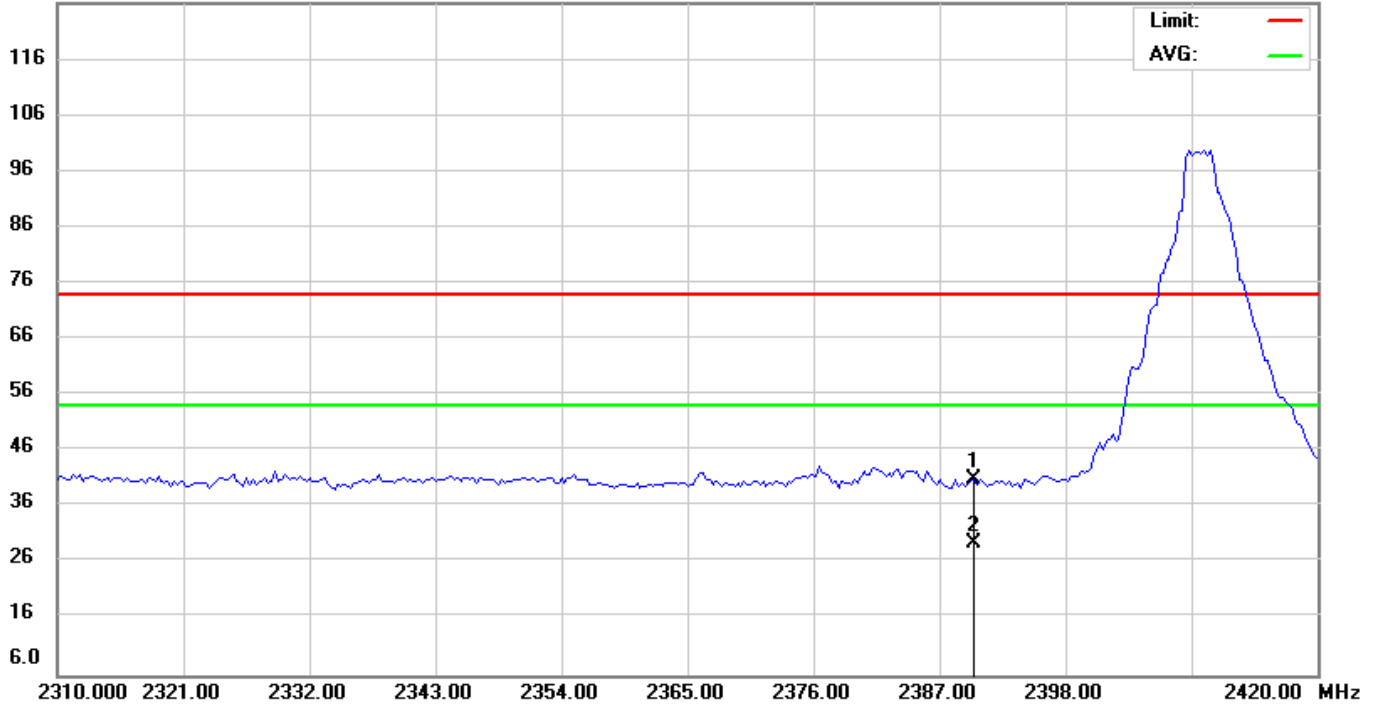


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		2390.000	49.61	-8.43	41.18	74.00	-32.82	peak		
2	*	2390.000	38.42	-8.43	29.99	54.00	-24.01	AVG		

*:Maximum data x:Over limit !:over margin

EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH07	Polarization:	Vertical
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.7°C / 52.9%	Test date:	2017-01-04

126.0 dBuV/m

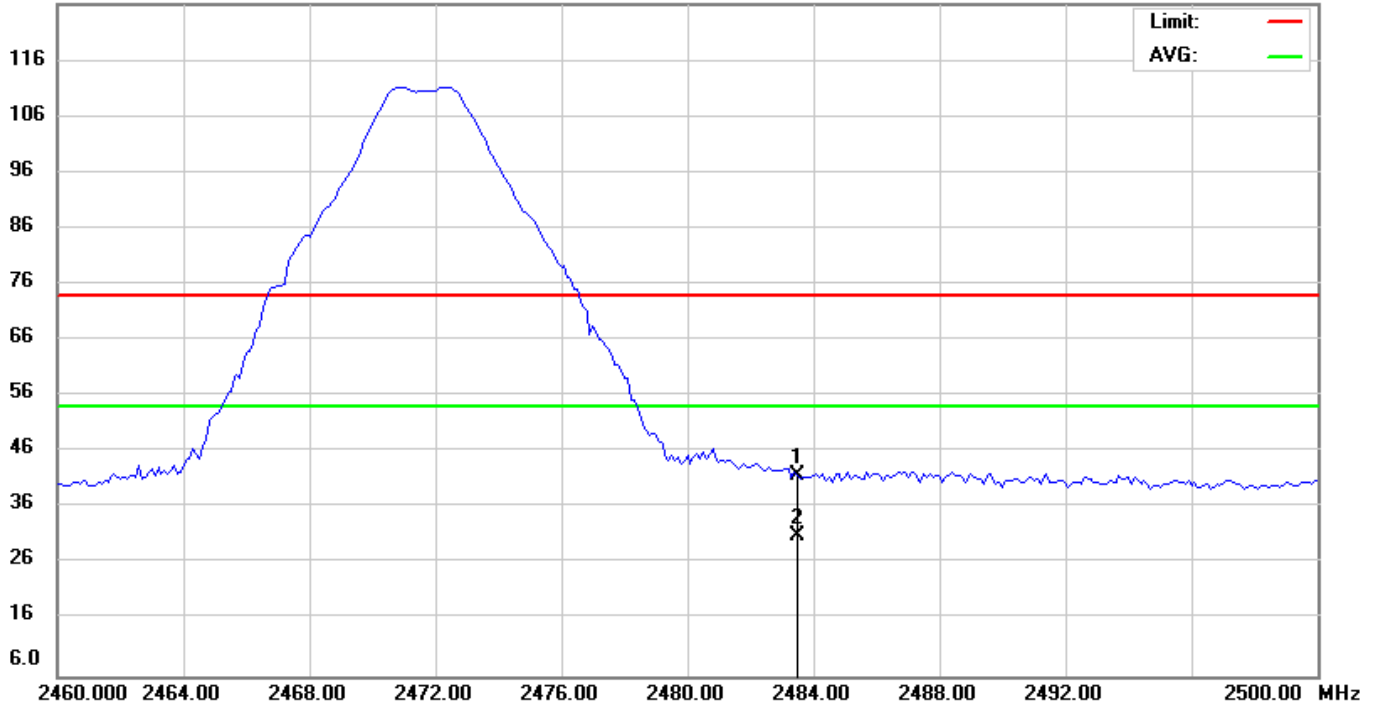


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		2390.000	49.43	-8.43	41.00	74.00	-33.00	peak			
2	*	2390.000	37.89	-8.43	29.46	54.00	-24.54	AVG			

*:Maximum data x:Over limit !:over margin

EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH61	Polarization:	Horizontal
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.7°C / 52.9%	Test date:	2017-01-04

126.0 dBuV/m

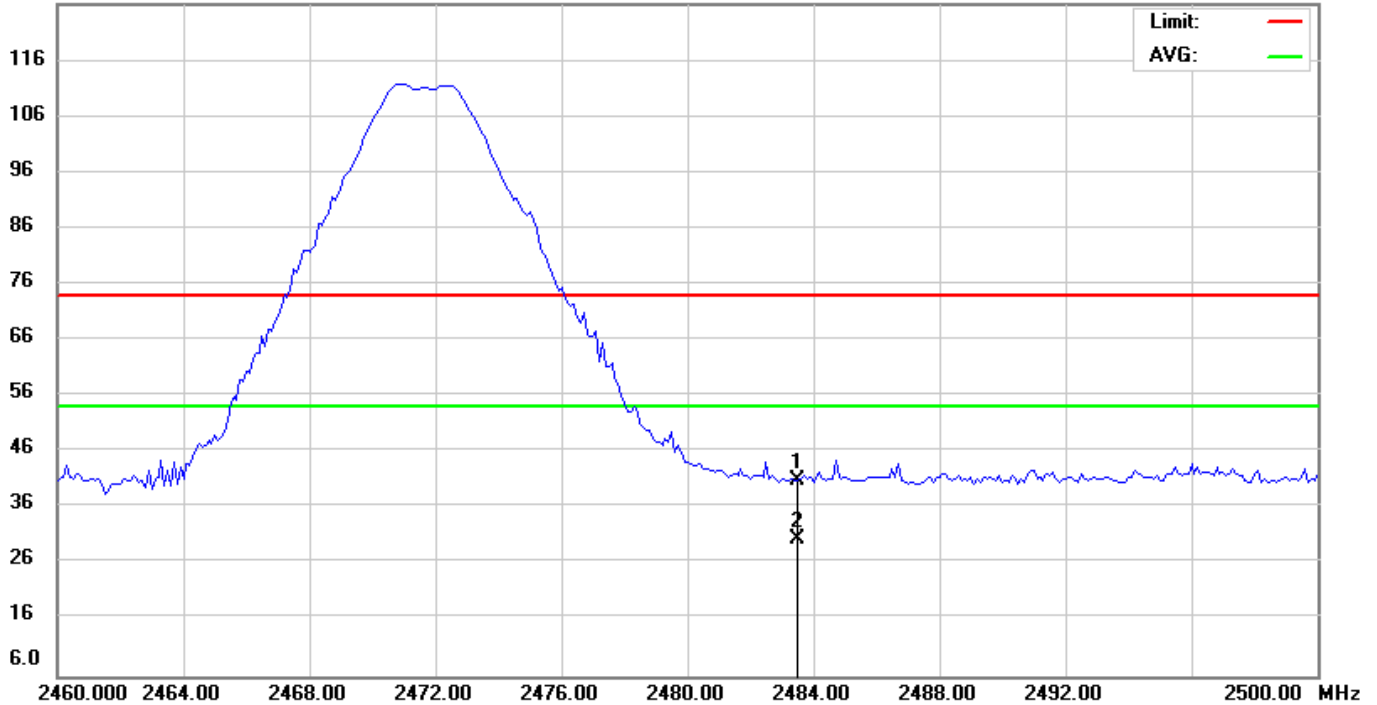


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		2483.500	50.00	-8.29	41.71	74.00	-32.29	peak			
2	*	2483.500	39.45	-8.29	31.16	54.00	-22.84	AVG			

*:Maximum data x:Over limit !:over margin

EUT:	Baby Monitor	M/N:	UU24
Mode:	GFSK-CH61	Polarization:	Vertical
Tested by:	Sunny(Engineer)	Power:	DC 6V by Adapter
Temperature: / Humidity	23.7°C / 52.9%	Test date:	2017-01-04

126.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		2483.500	49.34	-8.29	41.05	74.00	-32.95	peak			
2	*	2483.500	38.75	-8.29	30.46	54.00	-23.54	AVG			

*:Maximum data x:Over limit !:over margin

End of the Report