Report No: CCISE181205001

FCC REPORT

Applicant: Amcrest Industries LLC

Address of Applicant: 16727 Park Row Dr. Houston, TX 77084 USA

Equipment Under Test (EUT)

Product Name: Baby Monitor

Model No.: AC-2-M

FCC ID: 2AR53AC2M

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 12 Dec., 2018

Date of Test: 13 Dec., to 25 Dec., 2018

Date of report issued: 26 Dec., 2018

Test Result: PASS *

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

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	26 Dec., 2018	Original

Tested by: Date: 26 Dec., 2018

Test **E**ngineer

Reviewed by: Date: 26 Dec., 2018

Project Engineer



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4 Test Summary

Test Items	Section in CFR 47	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
Spurious Emission	15.205 & 15.209	Pass
Band Edge	15.247(d)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not Applicable.





5 General Information

5.1 Client Information

Applicant:	Amcrest Industries LLC
Address:	16727 Park Row Dr. Houston, TX 77084 USA
Manufacturer/Factory:	MeiZhou Guo Wei Electronics Co., Ltd.
Address:	AD1 Section, Economic Development Area, Dongsheng Industrial District, Meizhou, Guangdong, China.)

5.2 General Description of E.U.T.

3.2 General Description	0. 2.0.11
Product Name:	Baby Monitor
Model No.:	AC-2-M
Operation Frequency:	2410.875MHz~2471.625MHz
Transfer rate:	3 Mbits/s
Number of channel:	19
Modulation type:	GFSK
Modulation technology:	FHSS
Antenna Type:	Internal Antenna
Antenna gain:	2.0 dBi
Power supply:	Rechargeable Li-ion Battery DC3.7V-1800mAh
AC adapter:	Model: NBS05B059100VU Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.9V, 1.0A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

		C	peration Frequen	cy each of c	hannel		
Channel	Frequency	Channel	Frequency	Channel	Frequency	Chann el	Frequency
1	2410.875MHz	6	2427.750MHz	11	2444.625MHz	16	2461.500MHz
2	2414.250MHz	7	2431.125MHz	12	2448.000MHz	17	2464.875MHz
3	2417.625MHz	8	2434.500MHz	13	2451.375MHz	18	2468.250MHz
4	2421.000MHz	9	2437.875MHz	14	2454.750MHz	19	2471.625MHz
5	2424.375MHz	10	2441.250MHz	15	2458.125MHz		
Note: Cha	nnel 1, 9 & 19 se	lected as L	owest, Middle an	d Highest c	hannel for test.		

Report No: CCISE181205001

5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Modes:	
Non-hopping mode:	Keep the EUT in continuous transmitting mode with worst case data rate.
Hopping mode:	Keep the EUT in hopping mode.

The sample was placed 0.8m (below 1GHz)/1.5m (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 with a fresh battery, 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 are shown in Test Results of the following pages.

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

5.6 Laboratory Facility

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

• FCC - Registration No.: 727551

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366





5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-16-2018	03-15-2019
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2018	11-20-2019
EMI Test Software	AUDIX	E3	\	ersion: 6.110919	b
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019
RF Switch Unit	MWRFTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTEST	MTS8200		Version: 2.0.0.0	

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-07-2018	03-06-2019
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019
Cable	HP	10503A	N/A	03-07-2018	03-06-2019
EMI Test Software	AUDIX	E3	\	ersion: 6.110919	b



6 Test results and measurement data

6.1 Antenna Requirement

Standard requirement:

FCC Part 15 C Section 15.203 & 247(b)

15.203 requirement:

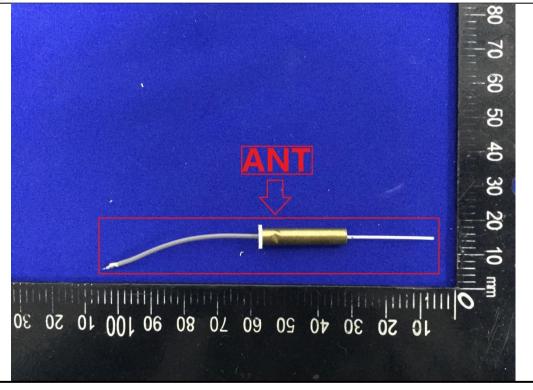
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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(b) (4) requirement:

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

E.U.T Antenna:

The antenna is an Internal antenna which permanently attached, and the best case gain of the antenna is 2.0 dBi.





6.2 Conducted Emissions

Test Requirement:	FCC Part 15 C Section 1	5.207	
Test Method:	ANSI C63.10:2013		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9 kHz, VBW=30 k	Hz, Sweep time=auto	
Limit:	Frequency range	Limit (dBuV)
	(MHz)	Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the log	arithm of the frequency.	
Test setup:	Reference	e Plane	
	AUX Equipment E.U.1 Test table/Insulation plane Remark E.U.T. Equipment Under Test LISN: Line Impedence Stabilization Net Test table height=0.8m	EMI Receiver	ower
Test procedure:	line impedance stabili 50ohm/50uH coupling 2. The peripheral device LISN that provides a stermination. (Please r photographs). 3. Both sides of A.C. line interference. In order positions of equipmen	tors are connected to the zation network (L.I.S.N.). If impedance for the measures are also connected to the soohm/50uH coupling impeder to the block diagram of the are checked for maximum to find the maximum emist and all of the interface cast.4: 2014 on conducted maximum conducte	This provides a uring equipment. e main power through a edance with 50ohm of the test setup and m conducted sion, the relative ables must be changed
Test Instruments:	Refer to section 5.8 for c	letails	
Test mode:	Hopping mode		
Test results:	Pass		
	•		



Measurement Data:

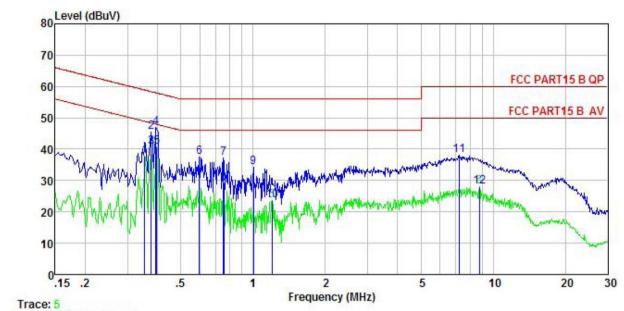
Product name:	Baby	Monitor			Product n	nodel:	AC-2-N	Л	
Test by:	Caffre	у			Test mod	e:	BT Tx n	node	
Test frequency:	150 kH	Hz ~ 30 MI	Нz		Phase:		Line		
Test voltage:	AC 12	0 V/60 Hz			Environm	ent:	Temp: 2	22.5℃	Huni: 55%
80 Level (dB	uV)								
80					100				
70									
60								FCC PAR	115 B QP
60									
50								FCC PART	15 B AV
40	2 113	6							
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10	* I V [N 1] I			Frequenc	cy (MHz)				20 30
0.15 .2	Freq	Read	LISN	Frequence		Limit	Over		20 30
0.15 .2	Freq	Read Level	LISN Factor	Frequence Cable Loss	Level	Limit Line	Over Limit		20 30
0.15 .2	Freq	Read	LISN	Frequence		Limit	Over		20 30
10 0.15 .2 Trace: 7		Read Level	LISN Factor	Frequence Cable Loss	Level ——dBuV	Limit Line ————————————————————————————————————	Over Limit ———————————————————————————————————	Remark	
10 0.15 .2 Trace: 7	MHz 0.190 0.262	Read Level dBuV 15.30 25.92	LISN Factor dB 0.16 0.14	Cable Loss dB 10.76	Level	Limit Line dBuV 54.02 61.38	Over Limit ———————————————————————————————————	Remark Average	·
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358	Read Level dBuV 15.30 25.92 24.56	LISN Factor dB 0.16 0.14 0.12	Cable Loss dB 10.76 10.75 10.73	Level dBuV 26.22 36.81 35.41	Limit Line dBuV 54.02 61.38 48.78	Over Limit ———————————————————————————————————	Remark Average QP Average	·
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398	Read Level dBuV 15.30 25.92 24.56 31.98	LISN Factor dB 0.16 0.14 0.12 0.12	Cable Loss dB 10.76 10.75 10.73 10.72	Level dBuV 26.22 36.81 35.41 42.82	Limit Line dBuV 54.02 61.38 48.78 57.90	Over Limit 	Remark Average QP Average QP	 :
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398 0.398	Read Level dBuV 15.30 25.92 24.56 31.98 27.89	LISN Factor ————————————————————————————————————	Cable Loss dB 10.76 10.75 10.73 10.72	Level dBuV 26.22 36.81 35.41 42.82 38.73	Limit Line dBuV 54.02 61.38 48.78 57.90 47.90	Over Limit 	Remark Average QP Average QP Average	 :
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398 0.398 0.614	Read Level dBuV 15.30 25.92 24.56 31.98 27.89 26.93	LISN Factor ————————————————————————————————————	Cable Loss dB 10.76 10.75 10.73 10.72 10.72 10.77	Level dBuV 26.22 36.81 35.41 42.82 38.73 37.83	Limit Line dBuV 54.02 61.38 48.78 57.90 47.90 56.00	Over Limit 	Remark Average QP Average QP Average QP	 : :
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398 0.398 0.614 0.614	Read Level 	LISN Factor ————————————————————————————————————	Cable Loss dB 10.76 10.75 10.73 10.72 10.72 10.77 10.77	Level dBuV 26. 22 36. 81 35. 41 42. 82 38. 73 37. 83 26. 97	Limit Line dBuV 54.02 61.38 48.78 57.90 47.90 56.00 46.00	Over Limit 	Remark Average QP Average QP Average QP Average	 : :
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398 0.398 0.614 0.614 1.037	Read Level 	LISN Factor dB 0.16 0.14 0.12 0.12 0.12 0.13 0.13 0.13	Cable Loss dB 10.76 10.75 10.73 10.72 10.72 10.77 10.77 10.87	Level 26.22 36.81 35.41 42.82 38.73 37.83 26.97 32.72	Limit Line dBuV 54.02 61.38 48.78 57.90 47.90 56.00 46.00 56.00	Over Limit 	Remark Average QP Average QP Average QP Average QP Average	······································
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398 0.398 0.614 0.614 1.037 1.135	Read Level ———————————————————————————————————	LISN Factor dB 0.16 0.14 0.12 0.12 0.12 0.13 0.13 0.13 0.13 0.13	Cable Loss dB 10.76 10.75 10.73 10.72 10.72 10.77 10.77 10.87 10.89	Level 26.22 36.81 35.41 42.82 38.73 37.83 26.97 32.72 23.57	Limit Line 	Over Limit 	Remark Average QP Average QP Average QP Average QP Average QP Average	······································
10 0.15 .2 Trace: 7	MHz 0.190 0.262 0.358 0.398 0.398 0.614 0.614 1.037	Read Level 	LISN Factor dB 0.16 0.14 0.12 0.12 0.12 0.13 0.13 0.13	Cable Loss dB 10.76 10.75 10.73 10.72 10.72 10.77 10.77 10.87	Level 26.22 36.81 35.41 42.82 38.73 37.83 26.97 32.72	Limit Line 	Over Limit 	Remark Average QP Average QP Average QP Average QP Average QP Average	 ; ;

Notes:

- 1. An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3. Final Level =Receiver Read level + LISN Factor + Cable Loss.



Product name:	Baby Monitor	Product model:	AC-2-M
Test by:	Caffrey	Test mode:	BT Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Huni: 55%



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
-	MHz	dBu∀	₫B		—dBu∀	dBu∀	<u>ab</u>	
1	0.354	26.04	0.97	10.73	37.74	48.87	-11.13	Average
2	0.377	33.87	0.97	10.72	45.56	58.34	-12.78	QP
3	0.377	29.18	0.97	10.72	40.87	48.34	-7.47	Average
4	0.393	35.21	0.97	10.72	46.90	57.99	-11.09	QP
1 2 3 4 5 6 7 8 9	0.398	29.04	0.97	10.72	40.73	47.90	-7.17	Average
6	0.598	25.71	0.97	10.77	37.45	56.00	-18.55	QP
7	0.751	25.42	0.97	10.79	37.18	56.00	-18.82	QP
8	0.755	17.36	0.97	10.79	29.12	46.00	-16.88	Average
9	1.005	22.40	0.97	10.87	34.24	56.00	-21.76	QP
10	1.197	11.61	0.97	10.89	23.47	46.00	-22.53	Average
11	7.213	26.10	1.02	10.81	37.93	60.00	-22.07	QP
12	8.776	16.01	1.02	10.89	27.92	50.00	-22.08	Average

Notes

- 1. An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3. Final Level =Receiver Read level + LISN Factor + Cable Loss.



6.3 Conducted Output Power

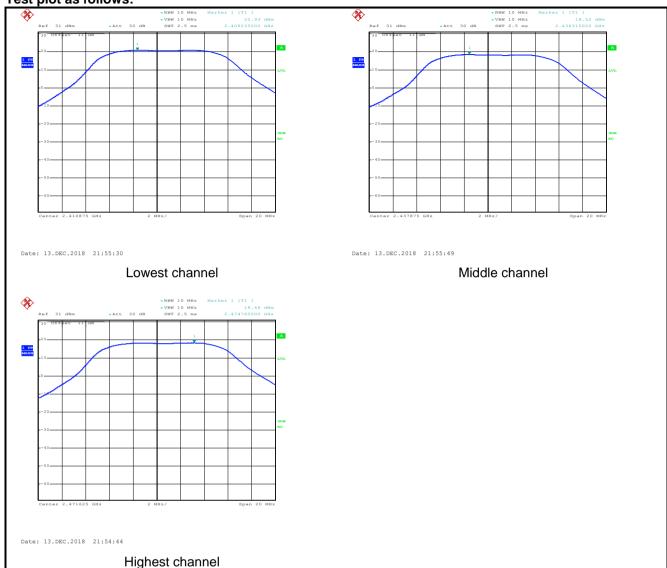
Test Requirement:	FCC Part 15 C Section 15.247 (b)(1)	
Test Method:	ANSI C63.10:2013 and KDB 558074	
Receiver setup:	RBW=10MHz, VBW=10MHz, Detector=Peak	
Limit:	21dBm	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Non-hopping mode	
Test results:	Pass	

Measurement Data:

Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest channel	20.93	21.00	Pass
Middle channel	18.52	21.00	Pass
Highest channel	18.46	21.00	Pass



Test plot as follows:





6.4 20dB Occupy Bandwidth

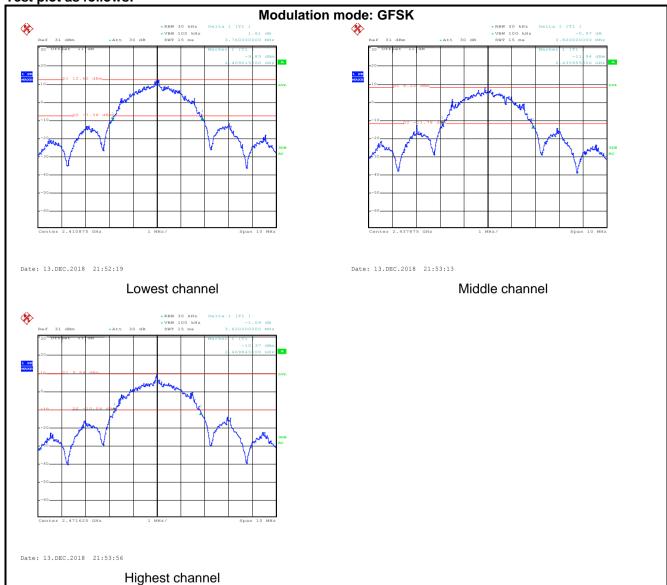
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2013 and KDB 558074	
Receiver setup:	RBW=30 kHz, VBW=100 kHz, detector=Peak	
Limit:	NA	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Non-hopping mode	
Test results:	Pass	

Measurement Data:

Test channel	20dB Occupy Bandwidth (MHz)
Lowest	3.76
Middle	3.82
Highest	3.62



Test plot as follows:





6.5 Carrier Frequencies Separation

0.5 Garrier Frequencies	, ooparation	
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2013 and KDB 558074	
Receiver setup:	RBW=100 kHz, VBW=300 kHz, detector=Peak	
Limit:	0.025MHz or two-thirds of the 20dB bandwidth (whichever is greater)	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Hopping mode	
Test results:	Pass	





Measurement Data:

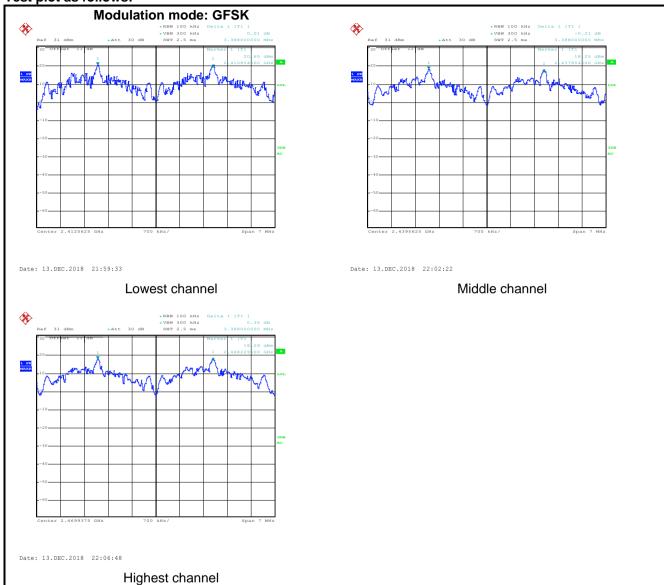
Test channel	Carrier Frequencies Separation (MHz)	Limit (MHz)	Result
Lowest	3.388	2.55	Pass
Middle	3.388	2.55	Pass
Highest	3.388	2.55	Pass

Note: According to section 6.4

Mode	20dB bandwidth (MHz) (worse case)	Limit (MHz) (Carrier Frequencies Separation)
GFSK	3.82	2.55



Test plot as follows:





6.6 Hopping Channel Number

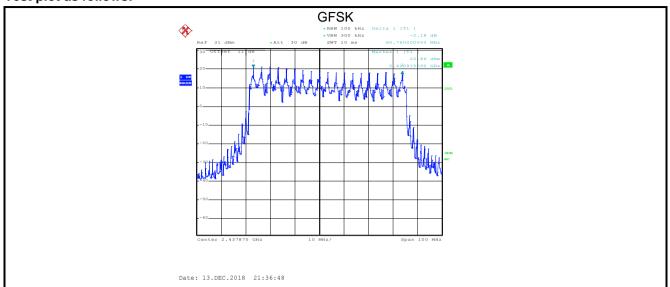
Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2013 and KDB 558074	
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak	
Limit:	15 channels	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Hopping mode	
Test results:	Pass	

Measurement Data:

Mode	Hopping channel numbers	Limit	Result
GFSK	19	15	Pass



Test plot as follows:





6.7 Dwell Time

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.10:2013 and KDB 558074	
Receiver setup:	RBW=1 MHz, VBW=1 MHz, Span=0 Hz, Detector=Peak	
Limit:	0.4 Second	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Hopping mode	
Test results:	Pass	

Measurement Data:

Mode	Dwell time (second)	Limit (second)	Result
GFSK	0.02112	0.4	Pass

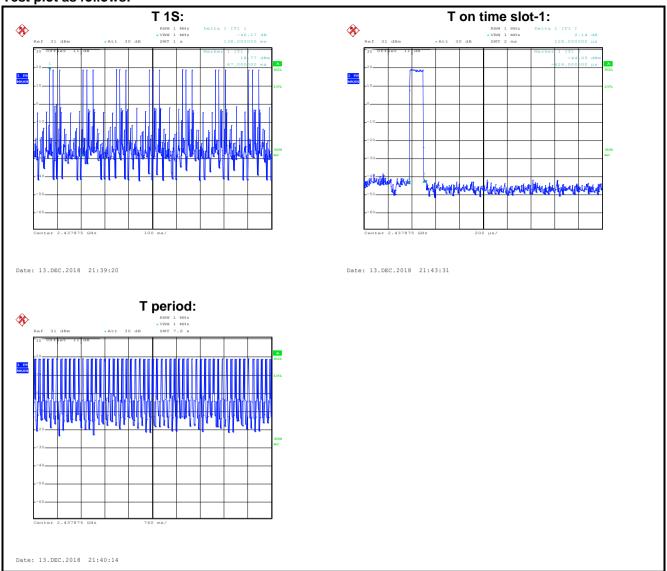
Note:

The test period = 0.4 Second/Channel x 19 Channel = 7.6 s

Dwell time = Ton time per hop * Hopping numbers * Period = (0.128 * 3)(ms) * 55 = 21.12(ms)



Test plot as follows:





6.8 Pseudorandom Frequency Hopping Sequence

Test Requirement: FCC Part 15 C Section 15.247 (a)(1) requirement:

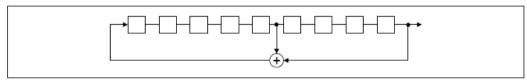
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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

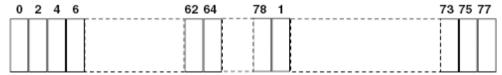
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- · Number of shift register stages: 9
- Length of pseudo-random sequence: 29-1 = 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.



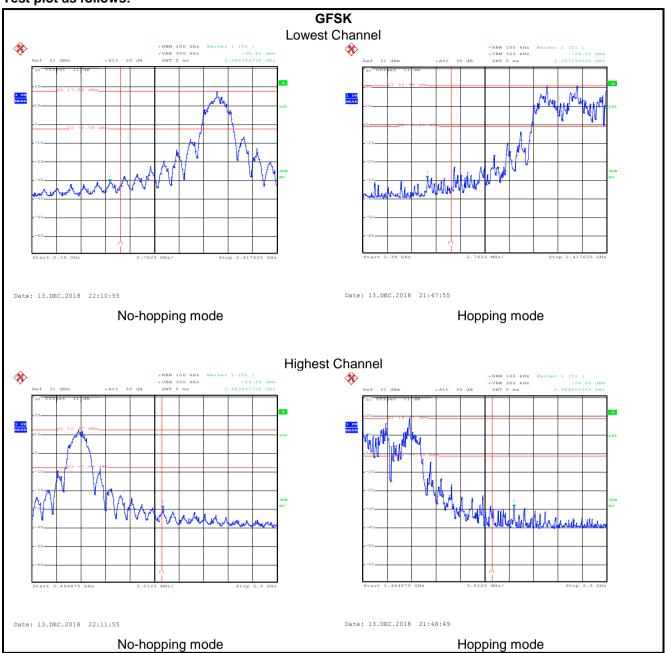
6.9 Band Edge

6.9.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB 558074
Receiver setup:	RBW=100 kHz, VBW=300 kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode and hopping mode
Test results:	Pass



Test plot as follows:





6.9.2 Radiated Emission Method

Test Requirement:		Section 1	5 200	and 15 205				
•		FCC Part 15 C Section 15.209 and 15.205						
Test Method:		ANSI C63.10: 2013						
Test Frequency Range:	2.3GHz to 2.50	HZ						
Test Distance:	3m			5514				
Receiver setup:	Frequency	Detect		RBW		BW	Remark	
	Above 1GHz	Peak		1MHz		ИHz	Peak Value	
		RMS		1MHz		ЛHz	Average Value	
Limit:	Frequen	су	Lim	it (dBuV/m @3	3m)		Remark	
	Above 10	SHz -		54.00			verage Value	
				74.00		l	Peak Value	
Test setup:	AE (To	Horn Antenna Tower AE EUT Ground Reference Plane Test Receiver Test Receiver Controller						
Test Procedure:	 The EUT was placed on the top of a rotating table 1.5meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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 							
Test Instruments:	Refer to sectio	-		d and then rep				
Test mode:	Non-hopping n	node						
Test results:	Passed							



GFSK Mode:

Produc	roduct Name: Baby Monitor			Р	roduct Mod	del:	AC-2-M			
Test By	y:	Caffrey			T	est mode:		DH1 Tx mode		
Test Cl	hannel:	Lowest ch	nannel		Р	olarization	ation: Vertical			
Test Vo	oltage:	AC 120/6	0Hz		E	nvironmen	t:	Temp: 24°	C Huni: 57%	
Le	evel (dBuV/m)									
110										
110									\mathcal{M}	
90										
30										
70								FCC	PART 15 (PK)	
							1,	man	DADT 45 (AVA	
50~	mann	month	400000	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	way wo	Carporate Anna	- North	FCC	PART 15 (AV)	
1.000							1			
30										
10										
023	310 2320		23	50		(41)	4		2417.625	
					uency (MHz	z)				
	Freq	ReadA Level	ntenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark	
	MHz	₫₿uѶ	dB/m		<u>dB</u>	$\overline{dBuV/m}$	$\overline{dBuV/m}$	<u>d</u> B		
	IIIIZ									
1	2390, 000	22.79	27.37	4.69	0.00	56.53	74.00	-17.47	Peak	

Remark

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



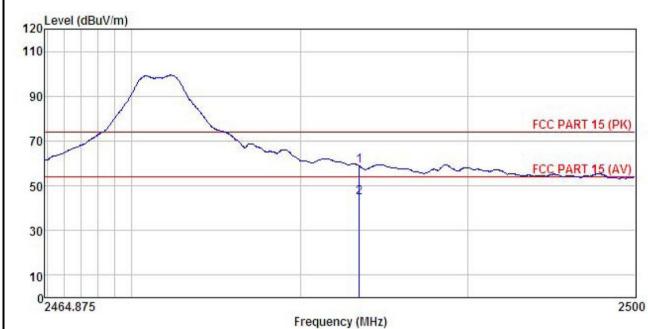
Product	Name:	Baby Mor	nitor		Product Model: AC-2-M					
Гest By:	st By:		Caffrey Te :					DH1 Tx mode		
Test Cha	nnel:	Lowest ch	annel		Po	olarization:		Horizontal		
Test Volt	age:	AC 120/60)Hz		Er	nvironment	:	Temp: 24°C	Huni: 57%	
120 Lev	el (dBuV/m)				,		1			
110										
90								500		
70									PART 15 (PK)	
50	mm.	~~~	- /	~~~	May	man	2	January	PART 13 (AV)	
30										
10										
231	0 2320		23		iency (MHz	z)	1		2417.625	
	Freq					Level			Remark	
	MHz	dBu₹	—dB/m	<u>d</u> B	dB	dBuV/m	dBuV/m	<u>d</u> B		
1 2	2390.000 2390.000	19.88 8.70	27.37 27.37	4.69 4.69		53.62 42.44			Peak Average	

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product Name:	Baby Monitor	Product Model:	AC-2-M
Test By:	Caffrey	Test mode:	DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%
	·		<u> </u>



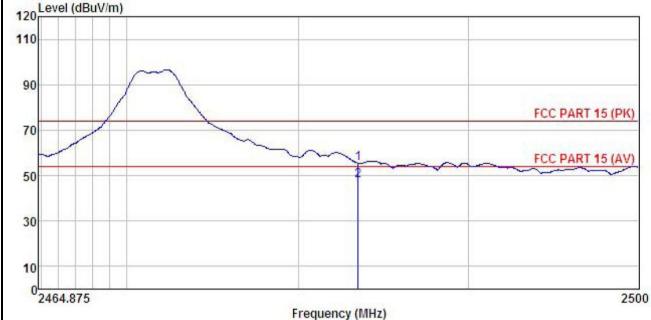
	Freq		Antenna Factor						
	MHz	dBu∜	<u>dB</u> /m	<u>dB</u>	<u>dB</u>	dBuV/m	dBuV/m	<u>dB</u>	
1 2	2483,500 2483,500								

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product Name:	Baby Monitor	Product Model:	AC-2-M	
Test By:	Caffrey	Test mode:	DH1 Tx mode	
Test Channel:	Highest channel	Polarization:	Horizontal	
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Huni: 57%	
120 Level (dBuV/m)				



						100			
	Freq		Antenna Factor						
	MHz	dBu∜	$-\overline{dB}/\overline{m}$	<u>d</u> B	<u>dB</u>	$\overline{dBuV/m}$	$\overline{dBuV/m}$	<u>d</u> B	
1 2	2483.500 2483.500								

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



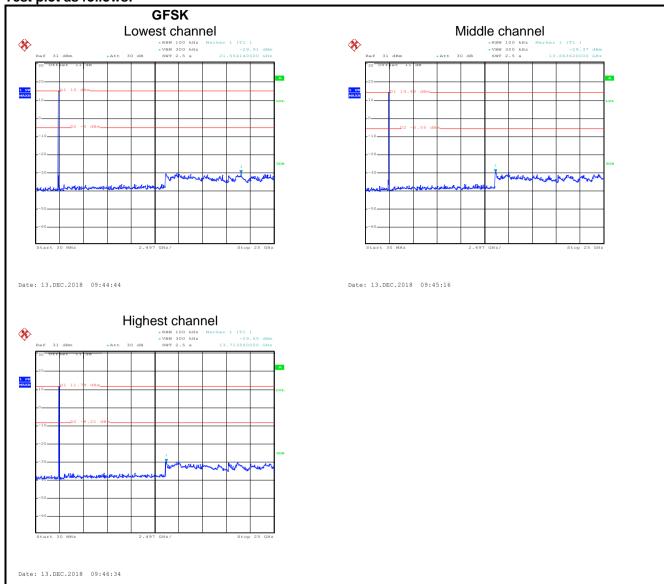
6.10 Spurious Emission

6.10.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)					
Test Method:	ANSI C63.10:2013 and KDB 558074					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.					
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane					
Test Instruments:	Refer to section 5.8 for details					
Test mode:	Non-hopping mode					
Test results:	Pass					



Test plot as follows:





6.10.2 Radiated Emission Method

Test Requirement:	guirement: FCC Part 15 C Section 15.209							
Test Method:	ANSI C63.10: 2013							
Test Frequency Range:	9 kHz to 25 GHz							
Test Distance:	3m							
Receiver setup:	Frequency Detector RBW VBW Remark							
	30MHz-1GHz	Quasi-pe		120kHz	300kl			
		Peak		1MHz	ЗМН			
	Above 1GHz	RMS	;	1MHz	ЗМН			
Limit:	Frequenc	l		it (dBuV/m @	⊉3m)	Remark		
	30MHz-88N	ИНz		40.0		Quasi-peak Value		
	88MHz-216	MHz		43.5		Quasi-peak Value		
	216MHz-960	MHz		46.0		Quasi-peak Value		
	960MHz-10	SHz		54.0		Quasi-peak Value		
	A1 401			54.0		Average Value		
	Above 1GI	HZ -		74.0		Peak Value		
Test setup:	Below 1GHz Antenna Tower Search Antenna							
	7/////	urm 0.8m	1	m		RF Test Receiver		
	Above 1GHz							
	Antenna Tower Ground Reference Plane Test Receiver Amplifer Controller							
Test Procedure:	/1.5m(above	1GHz) ab	ove t	the ground a	a 3 me	ole 0.8m(below 1GHz) eter chamber. The table on of the highest		

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No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366





	The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
	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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
	The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	6. 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.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Non-hopping mode
Test results:	Pass
Remark:	 Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.



Measurement Data (worst case):

Below 1GHz:

Product Name: Test By: Test Frequency: Test Voltage:		Baby Monitor			Pro	Product Model:		AC-2-M BT Tx mode		
		Caffrey 30 MHz ~ 1 GHz AC 120/60Hz				st mode:				
						Polarization: Environment:		Vertical		
								Temp: 24°C Huni: 57%		: 57%
70 60 50 40 30	I (dBuV/m)			3 4				FCC PAR	G Www.	
10 0 30	50	Why.	100	Frequ	200 Jency (MHz)		500		1000
	Freq		intenna Factor		Preamp Factor	Level	Limit Line		Remark	
2	MHz	dBu∜	dB/m			$\overline{dBuV/m}$	dBuV/m			
1 2 3 4 5 6	56.001 71.832 135.982 143.830 263.819 649.660	46.42 48.80 52.22 56.45 49.35 40.60	13.04 8.91 8.34 8.30 13.39 19.80	1.36 1.56 2.35 2.44 2.85 3.86	29. 79 29. 71 29. 29 29. 25 28. 51 28. 78	31.03 29.56 33.62 37.94 37.08 35.48	43.50 43.50 46.00	-10.44 -9.88 -5.56	QP QP QP QP	

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product Name: Test By: Test Frequency: Test Voltage:		Baby Monitor Caffrey 30 MHz ~ 1 GHz AC 120/60Hz				Product Model:		AC-2-M		
						st mode:		BT Tx mode		
						Polarization: Environment:		Horizontal		
								Temp: 24℃ Huni: 579		ıni: 57%
Lovel	I (dDu\I/m)									
80 Level	(dBuV/m)									
70										
60								FCC PAR	T15 CLA	SSB
50										
V						5				
40				7		4				
30				1 3		4	6		111 111	talahi
30				1 3		4		1 haberton		Medul
V. 30.	January.		امرز	1 3			Millian			MALLA
30	Marketon and State of the State	handle and live	and the second				Mille	Land make		
30 20 10 W	Market Same and Same	made and one	and when here				Mille	had makedon		
30 20	50	My delan wales	100	Frequency	200 Jency (MHz		Malla	500		1000
30 20 10 W	50		int enna	Cable	iency (MHz Preamp		Limit	Over		1000
30 20 10 W	50 Freq			Cable	iency (MHz) Level	Limit Line	Over	Remar	
30 20 10 W			int enna	Cable	iency (MHz Preamp	Level		Over Limit	Remar	
30 20 10 m/	Freq MHz	Level dBuV	Antenna Factor ——dB/m	Cable Loss dB	ency (MHz Preamp Factor dB	Level	Line dBuV/m	Over Limit ———————————————————————————————————		
30 20 10 m/	Freq MHz 135.982 143.830	dBuV 46.29 54.32	antenna Factor dB/m 8.34 8.30	Cable Loss dB 2.35 2.44	Preamp Factor dB 29.29 29.25	Level dBuV/m 27.69 35.81	Line dBuV/m 43.50 43.50	Over Limit dB -15.81 -7.69	QP QP	
30 20 10 m/	Freq MHz 135.982 143.830 152.130	dBuV 46.29 54.32 47.56	Mntenna Factor dB/m 8.34 8.30 8.71	Cable Loss dB 2.35 2.44 2.53	Preamp Factor dB 29.29 29.25 29.20	Level dBuV/m 27.69 35.81 29.60	Line dBuV/m 43.50 43.50 43.50	Over Limit 	QP QP QP	
30 20 10 W	Freq MHz 135.982 143.830	dBuV 46.29 54.32	antenna Factor dB/m 8.34 8.30	Cable Loss dB 2.35 2.44	Preamp Factor dB 29.29 29.25	Level dBuV/m 27.69 35.81	Line dBuV/m 43.50 43.50 43.50	Over Limit 	QP QP QP QP QP	

Remark.

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



Above 1GHz:

Above 1GHz	:								
			Test ch	annel: Lowe	est channel				
			De	tector: Peak	Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
4821.75	47.24	30.85	6.80	41.81	43.08	74.00	-30.92	Vertical	
4821.75	48.17	30.85	6.80	41.81	44.01	74.00	-29.99	Horizontal	
			Dete	ctor: Averaç	ge Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
4821.75	37.03	30.85	6.80	41.81	32.87	54.00	-21.13	Vertical	
4821.75	38.67	30.85	6.80	41.81	34.51	54.00	-19.49	Horizontal	
			Test ch	annel: Mido	lle channel				
			De	tector: Peak	Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
4875.75	48.21	31.20	6.86	41.84	44.43	74.00	-29.57	Vertical	
4875.75	48.73	31.20	6.86	41.84	44.95	74.00	-29.05	Horizontal	
			Dete	ctor: Averag	ge Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
4875.75	37.62	31.20	6.86	41.84	33.84	54.00	-20.16	Vertical	
4875.75	38.26	31.20	6.86	41.84	34.48	54.00	-19.52	Horizontal	
				annel: Highe					
		ı	De	tector: Peak	Value		T		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
4943.25	48.62	31.63	6.91	41.87	45.29	74.00	-28.71	Vertical	
4943.25	48.15	31.63	6.91	41.87	44.82	74.00	-29.18	Horizontal	
			Dete	ctor: Averaç	ge Value				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
4943.25	37.96	31.63	6.91	41.87	34.63	54.00	-19.37	Vertical	

Remark:

4943.25

38.63

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

6.91

2. The emission levels of other frequencies are very lower than the limit and not show in test report.

41.87

35.30

54.00

-18.70

31.63

Project No.: CCISE1812050

Horizontal