

# Angelcare Monitors Inc.

# TEST REPORT

**SCOPE OF WORK**

FCC TESTING—AC327-P, AC320-P, AC337-P, AC520-P, AC527-P

**REPORT NUMBER**

181218031SZN-004

**ISSUE DATE**

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43

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**Angelcare Monitors Inc.**

Application  
For  
Certification

**FCC ID: N7TAC327R****Baby Monitor - Parent Unit****Model: AC327-P, AC320-P, AC337-P, AC520-P, AC527-P****Brand Name: Angelcare**

2.4GHz Transceiver

Report No.: 181218031SZN-004

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-17]

Prepared and Checked by:

Approved by:

*Rode Liu*  
Engineer

---

*Kidd Yang*  
Technical Supervisor  
Date: February 01, 2019

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## MEASUREMENT/TECHNICAL REPORT

Angelcare Monitors Inc.

Model: AC327-P

FCC ID: N7TAC327R

This report concerns (check one)      Original Grant       Class II Change

Equipment Type: DXX - Part 15 Low Power Communication Device Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes       No

If yes, defer until: \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?      Yes       No

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-17 Edition] provision.

Report prepared by:

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## List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
Test Report	Bandedge Plot	bandedge.pdf
Test Report	20dB BW Plot	bw.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

**EXHIBIT 1**

**GENERAL DESCRIPTION**

## 1.0 General Description

### 1.1 Product Description

The equipment under test (EUT) is a Baby Monitor-Parent Unit with 2.4GHz wireless control function operating in 2414-2468MHz and there are total 19 channels. The EUT is powered by 3.7V battery or by DC 5V via micro USB port which can be connected to adapter with 100-240VAC. The USB port only used for charging purpose. For more detail information pls. refer to the user manual.

Antenna Type: Integral antenna

Modulation Type: GFSK

Antenna Gain: 0dBi

The Models: AC320-P, AC337-P, AC520-P, AC527-P and AC327-P use the same PCB main board, same operating configuration except LCD size and with/without touch panel function. The models are difference in packaging and marketing purpose. Details as follow:

	AC527-P	AC520-P	AC327-P	AC337-P	AC320-P
5 inch LCD (touch panel)	●	●			
4.3 inch LCD(no touch panel)			●	●	●
Touch key on plastic front cover			●	●	●

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

### 1.2 Related Submittal(s) Grants

This is an application for certification of a transceiver for the Baby Monitor - Parent Unit which has 2.4G transmitting function, and the corresponding Baby unit associated with this EUT is subjected to FCC ID:N7TAC320T.

### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application.

### 1.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).



**EXHIBIT 2**

**SYSTEM TEST CONFIGURATION**

## 2.0 System Test Configuration

### 2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10 (2013).

The EUT is powered by a fully 3.7V rechargeable battery which was charged by adapter with 120V/60Hz input during the test, model:AC327-P and model:AC520-P are selected for representative testing, only the worst data was reported in this report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.

The rear of unit was flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

### 2.2 EUT Exercising Software

The EUT exercise program (provided by client) used during testing was designed to exercise the various system components in a manner similar to a typical use.

### 2.3 Special Accessories

No special accessories used.

### 2.4 Equipment Modification

Any modifications installed previous to testing by Angelcare Monitors Inc. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd Longhua Branch.

## 2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

## 2.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Adaptor (provided by Applicant)	Angelcare	K05S050060U Input: AC100-240V, 50/60Hz, 0.2A Output: DC5V,0.6A
/	/	/

**EXHIBIT 3**  
**EMISSION RESULTS**

### 3.0 Emission Results

Data is included worst-case configuration (the configuration which resulted in the highest emission levels).

## 3.1 Radiated Test Results

A sample calculation, configuration photographs and data tables of the emissions are included.

### 3.1.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

Where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB
- PD = Pulse Desensitization in dB
- AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

RA = 62.0 dB $\mu$ V  
AF = 7.4 dB  
CF = 1.6 dB  
AG = 29.0 dB  
PD = 0 dB  
AV = -10 dB  
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dB $\mu$ V/m

Level in  $\mu$ V/m = Common Antilogarithm [(42 dB $\mu$ V/m)/20] = 125.9  $\mu$ V/m

### 3.1.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

### 3.1.3 Radiated Emissions

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission  
at  
168.01 MHz

Judgement: Passed by 3.6 dB

#### ***TEST PERSONNEL:***

*Sign on file*

Rode Liu, Engineer  
*Typed/Printed Name*

11 January 2019  
*Date*

Applicant: Angelcare Monitors Inc.

Date of Test: 11 January 2019

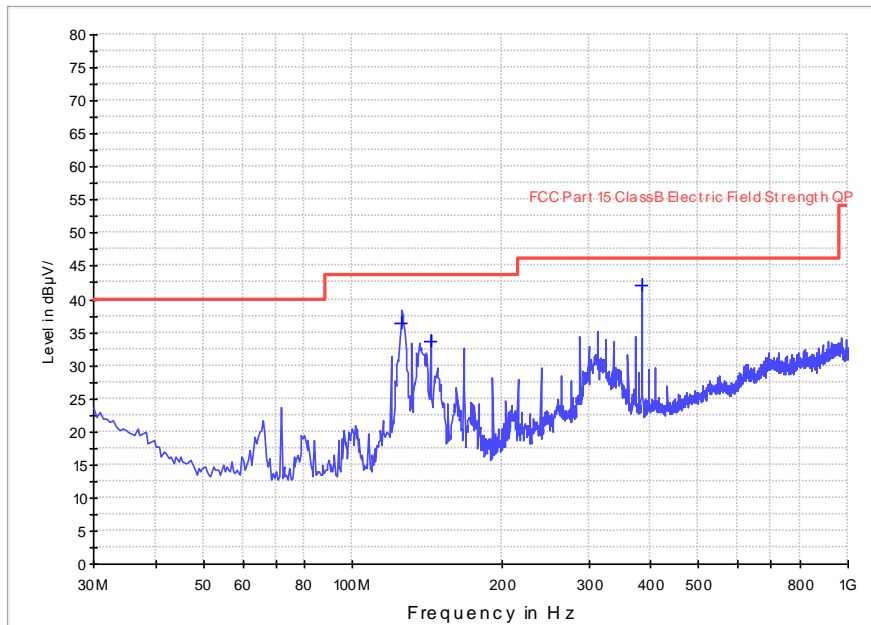
Worst Case Operating Mode:

Model: AC327-P

Transmitting(2414MHz)

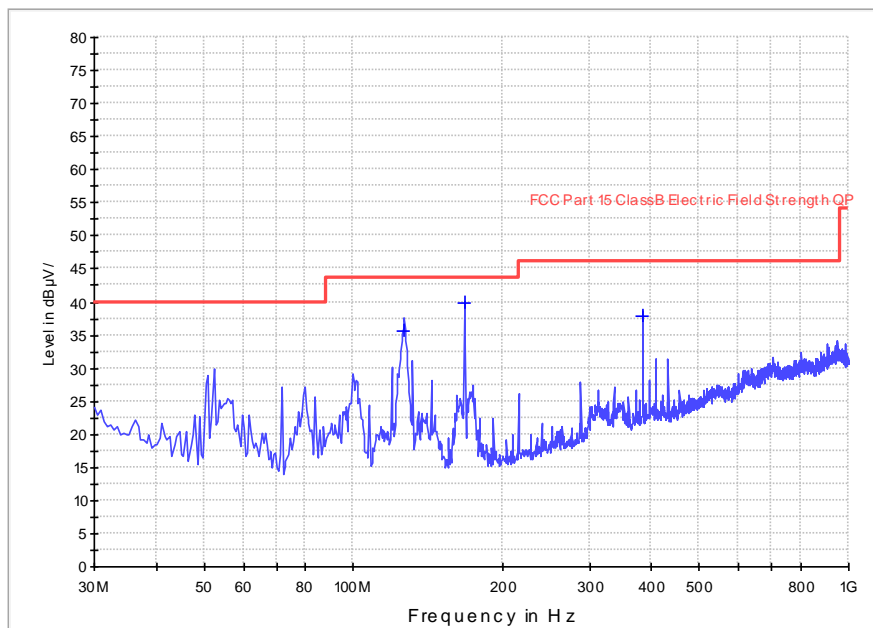
ANT Polarity: Horizontal

FCC Part 15



ANT Polarity: Vertical

FCC Part 15





Applicant: Angelcare Monitors Inc.  
 Date of Test: 11 January 2019  
 Worst Case Operating Mode:

Model: AC327-P  
 Transmitting(2414MHz)

Table 1

**Radiated Emissions**

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	126.03	46.9	20.0	9.4	36.3	43.5	-7.2
Horizontal	143.97	43.4	20.0	10.2	33.6	43.5	-9.9
Horizontal	384.00	44.0	20.0	18.0	42.0	46.0	-4.0
Vertical	127.00	46.2	20.0	9.4	35.6	43.5	-7.9
Vertical	168.01	49.0	20.0	10.9	39.9	43.5	-3.6
Vertical	383.98	39.8	20.0	18.0	37.8	46.0	-8.2

- NOTES:
1. Quasi-Peak detector is used except for others stated.
  2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
  3. Negative value in the margin column shows emission below limit.
  4. All emissions are below the QP limit.

### 3.1.4 Transmitter Spurious Emissions (Radiated)

Worst Case Radiated Emission  
at  
2468.000 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 5.9 dB

**TEST PERSONNEL:**

*Sign on file*

Rode Liu, Engineer  
*Typed/Printed Name*

11 January,2019  
*Date*

Applicant: Angelcare Monitors Inc.  
 Date of Test: 11 January,2019  
 Worst Case Operating Mode:

Model: AC327-P  
 Transmitting(2414MHz)

Table 2

**Radiated Emissions**

(2414MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2414.000	116.6	36.7	28.1	108.0	114.0	-6.0
Horizontal	4828.000	51.6	36.7	35.5	50.4	74.0	-23.6
Horizontal	7242.000	50.8	36.1	36.5	51.2	74.0	-22.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2414.000	116.6	36.7	28.1	25.9	82.1	94.0	-11.9
Horizontal	4828.000	51.6	36.7	35.5	25.9	24.5	54.0	-29.5
Horizontal	7242.000	50.8	36.1	36.5	25.9	25.3	54.0	-28.7

- NOTES: 1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Rode Liu

Applicant: Angelcare Monitors Inc.  
 Date of Test: 11 January,2019  
 Worst Case Operating Mode:

Model: AC327-P  
 Transmitting(2441MHz)

Table 3

**Radiated Emissions**

(2441MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2441.000	116.5	36.7	28.1	107.9	114.0	-6.1
Horizontal	4882.000	53.5	36.7	35.5	52.3	74.0	-21.7
Horizontal	7323.000	50.5	36.1	37.2	51.6	74.0	-22.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2441.000	116.5	36.7	28.1	25.9	82.0	94.0	-12.0
Horizontal	4882.000	53.5	36.7	35.5	25.9	26.4	54.0	-27.6
Horizontal	7323.000	50.5	36.1	37.2	25.9	25.7	54.0	-28.3

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Rode Liu

Applicant: Angelcare Monitors Inc.  
 Date of Test: 11 January,2019  
 Worst Case Operating Mode:

Model: AC327-P  
 Transmitting(2468MHz)

Table 4

**Radiated Emissions**

(2468MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2468.000	116.7	36.7	28.1	108.1	114.0	-5.9
Horizontal	4936.000	53.6	36.7	35.5	52.4	74.0	-21.6
Horizontal	7404.000	52.0	36.1	37.2	53.1	74.0	-20.9

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2468.000	116.7	36.7	28.1	25.9	82.2	94.0	-11.8
Horizontal	4936.000	53.6	36.7	35.5	25.9	26.5	54.0	-27.5
Horizontal	7404.000	52.0	36.1	37.2	25.9	27.2	54.0	-26.8

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Rode Liu

## 3.2 Conducted Emission at Mains Terminal

### 3.2.1 Conducted Emissions Configuration Photograph

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

### 3.2.2 Conducted Emissions

Worst Case Conducted Configuration  
At

0.166 MHz

Judgement: Passed by 12.5 dB margin

#### ***TEST PERSONNEL:***

*Sign on file*

Rode Liu, Engineer  
*Typed/Printed Name*

11 January 2019  
*Date*

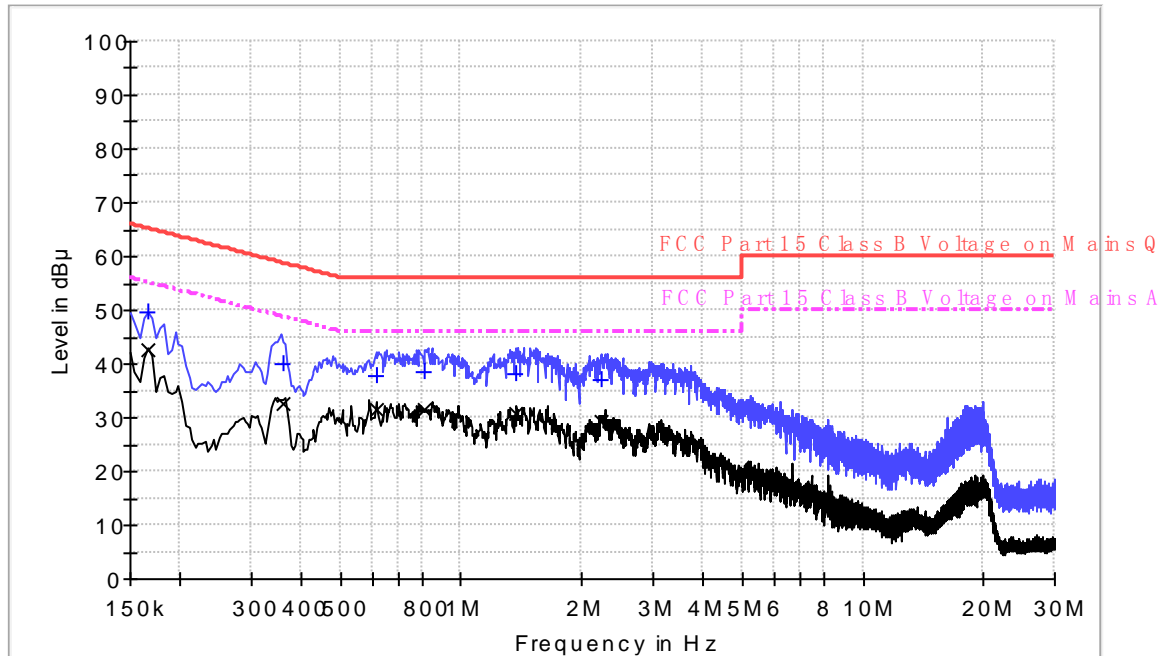
Applicant: Angelcare Monitors Inc.

Model: AC327-P

Operating Mode: Charging+2.4G Transmit

Phase: Live

## Conducted Emission Test - FCC



### Result Table QP

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	49.5	9.000	L1	9.6	15.7	65.2
0.362000	40.1	9.000	L1	9.6	18.6	58.7
0.614000	37.9	9.000	L1	9.7	18.1	56.0
0.814000	38.5	9.000	L1	9.7	17.5	56.0
1.374000	38.1	9.000	L1	9.7	17.9	56.0
2.238000	37.0	9.000	L1	9.7	19.0	56.0

### Result Table AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	42.5	9.000	L1	9.6	12.7	55.2
0.362000	32.6	9.000	L1	9.6	16.1	48.7
0.614000	31.5	9.000	L1	9.7	14.5	46.0
0.814000	31.6	9.000	L1	9.7	14.4	46.0
1.374000	30.9	9.000	L1	9.7	15.1	46.0
2.238000	29.3	9.000	L1	9.7	16.7	46.0

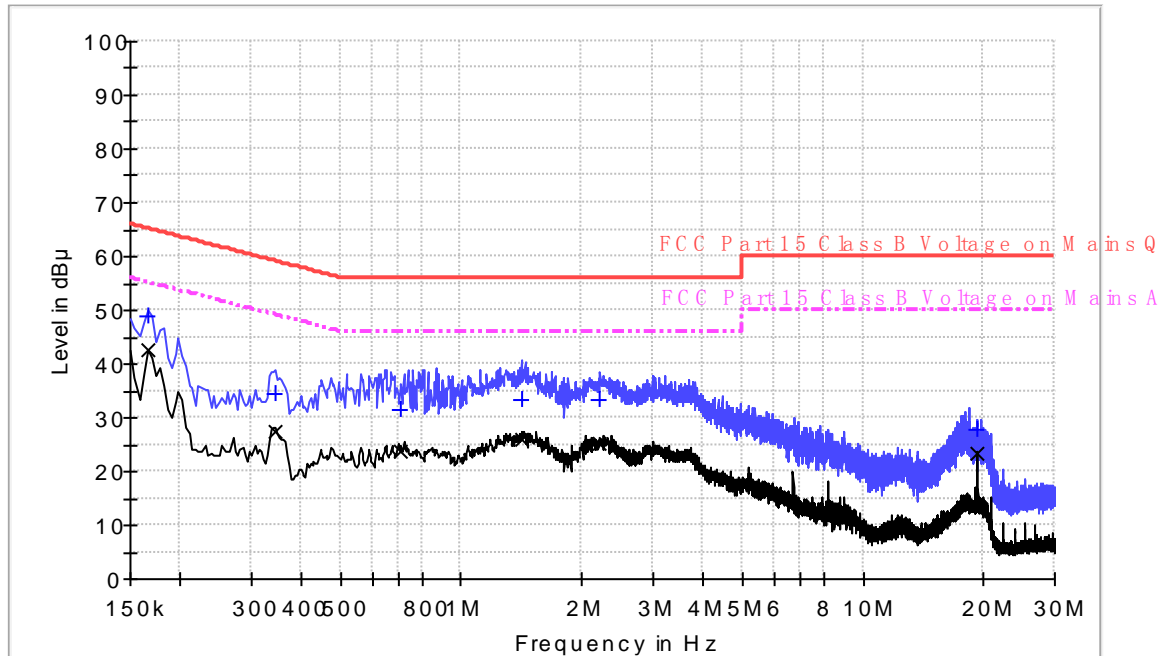
Applicant: Angelcare Monitors Inc.

Model: AC327-P

Operating Mode: Charging+2.4G Transmit

Phase: Neutral

## Conducted Emission Test - FCC



### Result Table QP

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	48.9	9.000	N	9.6	16.3	65.2
0.344000	34.4	9.000	N	9.6	24.7	59.1
0.710000	31.4	9.000	N	9.7	24.6	56.0
1.418000	33.5	9.000	N	9.7	22.5	56.0
2.218000	33.3	9.000	N	9.7	22.7	56.0
19.338000	27.6	9.000	N	10.2	32.4	60.0

### Result Table AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	42.7	9.000	N	9.6	12.5	55.2
0.344000	27.4	9.000	N	9.6	21.7	49.1
0.710000	23.7	9.000	N	9.7	22.3	46.0
1.418000	25.9	9.000	N	9.7	20.1	46.0
2.218000	25.1	9.000	N	9.7	20.9	46.0
19.338000	23.5	9.000	N	10.2	26.5	50.0



**EXHIBIT 4**  
**EQUIPMENT PHOTOGRAPHS**

## 4.0 Equipment Photographs

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

**EXHIBIT 5**  
**PRODUCT LABELLING**

## 5.0 Product Labelling

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

**EXHIBIT 6**

**TECHNICAL SPECIFICATIONS**

## 6.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

**EXHIBIT 7**  
**INSTRUCTION MANUAL**

## 7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.



**EXHIBIT 8**

**MISCELLANEOUS INFORMATION**

## 8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandedge, the test procedure and calculation of factor such as pulse desensitization.

## 8.1 Bandedge Plot

For electronic filing, the plot shows the fundamental emission when modulated is saved with filename: bandedge.pdf. From the plot, the field strength of any emissions outside of the specified frequency band are attenuated to the general radiated emission limits in section 15.209. It fulfils the requirement of 15.249(d).

### Peak Measurement

Restricted-band band-edge tests shall be performed as radiated measurements, i.e (Band-edge Plot).

#### (i) Lower channel 2414MHz:

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	2400.000	69.8	36.7	28.1	61.2	74.0	-12.8

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	2400.000	54.9	36.7	28.1	46.3	54.0	-7.7

#### (ii) Upper channel 2468MHz:

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	2483.500	66.9	36.8	29.1	59.2	74.0	-14.8

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	2483.500	54.0	36.8	29.1	46.3	54.0	-7.7

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74dB $\mu$ v/m (Peak Limit) and 54dB $\mu$ v/m (Average Limit).

## 8.1 Bandedge Plot (cont'd)

Pursuant to FCC part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Figure 8.1 Bandwidth

## 8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period ( $T_{\text{eff}}$ ) is approximately 5.072 ms for a digital "1" bit. With a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

### 8.3 Transmitter Duty Cycle Calculation, FCC Rule 15.35 (b, c)

Averaging factor in dB =  $20 \log$  (duty cycle)

The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation. The duty cycle is measured by placing the spectrum analyzer in zero scan (receiver mode) and linear mode at maximum bandwidth (3 MHz at 3 dB down) and viewing the resulting time domain signal output from the analyzer on a Tektronix oscilloscope. The oscilloscope is used because of its superior time base and triggering facilities.

A plot of the worst-case duty cycle as detected in this manner are saved with filename: af.pdf

The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 100ms

Effective period of the cycle = 5.072ms

DC =  $5.072\text{ms} / 100\text{ms} = 0.05072$  or 5.072%

Therefore, the averaging factor is found by  $20 \log_{10} (0.05072) = -25.9\text{dB}$

## 8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.10 - 2013.

The transmitting equipment under test (EUT) is placed on a styrene turntable which is four feet in diameter and approximately 0.8 meter up to 1GHz and 1.5 meter above 1GHz in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

Detector function for conducted emissions is in QP & AV mode and IFBW setting is 9 kHz from the frequency band 150 kHz to 30MHz.

#### 8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.10 - 2013.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used (RBW 10MHz used for fundamental emission).

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.



**EXHIBIT 9**  
**CONFIDENTIALITY REQUEST**

## 9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

**EXHIBIT 10  
TEST EQUIPMENT LIST**

## 10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	14-Sep-2018	14-Sep-2019
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Jan-2018	26-Feb-2019
SZ061-08	Horn Antenna	ETS	3115	00092346	14-Sep-2018	14-Sep-2019
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	11-May-2018	11-May-2019
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	5-Jun-2018	5-Jun-2019
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	24-Jan-2018	26-Feb-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	16-Jan-2017	26-Feb-2019
SZ062-02	RF Cable	RADIALL	RG 213U	--	12-Jul-2018	28-Feb-2019
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	31-Aug-2018	28-Feb-2019
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	31-Aug-2018	28-Feb-2019
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	5-Jun-2018	5-Jun-2019
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	26-Oct-2018	26-Oct-2019
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	26-Oct-2018	26-Oct-2019
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	28-Feb-2019
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	29-Oct-2018	29-Oct-2019

\*\*\*\*\* End of Report \*\*\*\*\*