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# **TEST REPORT**

# Report Number: HK12071404-1

Application for

# Class II Permissive Change of 47 CFR Part 15 Certification Reassessment of RSS-210 Issue 8 Equipment Certification

900MHz Transcevier\_Baby Unit

# FCC ID: N7TAC401-T

# IC: 5786A-AC401T

Prepared and Checked by:

Approved by:

Koo Wai Ip Senior Lead Engineer Nip Ming Fung, Melvin Assistant Manager August 23, 2012

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.

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# **GENERAL INFORMATION**

Applicant Name:	Angelcare Monitors Inc.		
Applicant Address:	3980, Rue St-Ambroise,		
	Montreal, Quebec,		
	H4C 2C7 Canada		
FCC Specification Standard:	FCC Part 15, October 1, 2010 Edition		
FCC ID:	N7TAC401-T		
FCC Model(s):	AC401		
IC Specification Standard:	RSS-210 Issue 8, December 2010		
	RSS-Gen Issue 3, December 2010		
IC:	5786A-AC401T		
IC Model(s):	AC401		
Type of EUT:	Transceiver		
Description of EUT:	900MHz Transcevier_Baby Unit		
Serial Number:	N/A		
Sample Receipt Date:	July 31, 2012		
Date of Test:	August 3 - 15, 2012		
Report Date:	August 23, 2012		
Environmental Conditions:	Temperature: +10 to 40°C		
	Humidity: 10 to 90%		

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# EXHIBIT 1 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

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### 1.0 Test Results Summary & Statement of Compliance

#### 1.1 Summary of Test Results

Test Items	FCC Part 15 Section	RSS-210/ RSS-Gen <sup>#</sup> / RSS-310^ Section	Results	Details see section
Antenna Requirement	15.203	7.1.2 <sup>#</sup>	Pass	2.1
Radiated Emission Radiated Emission on the Bandedge	15.249(a), 209, & 109 15.249(d)	A2.9(a) A2.9(b)	Pass Pass	4.2 4.3
Radiated Emission in Restricted Bands	15.205	2.2	Pass	4.2
Radiated Emission from Receiver	N/A	2.3	Pass	N/A
AC Power Line Conducted Emission	15.207 & 15.107	7.2.4 <sup>#</sup>	Pass	4.4

- Note: 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 expected variations in temperature and supply voltage were considered.
- 1.2 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2010 Edition RSS-210 Issue 8, December 2010 RSS-Gen Issue 3, December 2010

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# EXHIBIT 2 GENERAL DESCRIPTION

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#### 2.0 General Description

2.1 Product Description

The AC401 is a 900MHz Transcevier\_Baby Unit. It operates at frequency range of 926.000MHz - 927.6MHz. The Baby Unit is powered by an adaptor 100-240VAC to 7VDC 0.5A and /or 4 x "AAA" size 1.5VDC batteries.

The antenna used in baby unit is integral, and the test sample is a prototype.

The circuit description is saved with filename: descri.pdf.

#### 2.2 Purpose of Change

The purpose of change is saved with filename: product change.pdf

#### 2.3 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

#### 2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data and conducted data are at Roof Top and 2<sup>nd</sup> Floor respectively of Intertek Testing Services Hong Kong Ltd., which is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC and the Industry Canada.

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# EXHIBIT 3 SYSTEM TEST CONFIGURATION

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



#### 3.0 System Test Configuration

#### 3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by a 100-240VAC to 7.5VDC 0.5A adaptor.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT attached to peripherals, they were connected and operational to simulate typical use.

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 1 MHz for frequencies above 1000 MHz.

For radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz.

Radiated emission measurement for transmitter was performed 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 to 40 GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209.

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#### 3.1 Justification - Cont'd

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.

Pulse desensitization is not applicable for this device. Since the transmitter transmits the RF signal continuously.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All relevant operation modes have been tested, and the worst case data is included in this report.

#### 3.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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3.3 Details of EUT and Description of Accessories

#### Details of EUT:

An AC adaptor and/or a battery (provided with the unit) were used to power the device. Their description is listed below.

- (1) An AC adaptor (100-240VAC to 7VDC 0.5A, Model: T07505U002) (Supplied by Client)
- (2) 4 x "AAA" size 1.5VDC battery (Supplied by Client)

Description of Accessories:

- (1) Sensor Pad (Supplied by Client)
- 3.4 Measurement Uncertainty

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

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

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# EXHIBIT 4 TEST RESULTS



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#### 4.0 **Test Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

Field Strength Calculation 4.1

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 reflects 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

#### Example

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 μV/m.

RA = 62.0 dBuV  $AF = 7.4 \, dB$  $CF = 1.6 \, dB$ AG = 29 dB PD = 0 dBAV = -10 dB  $FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dB\mu V/m$ Level in  $\mu$ V/m = Common Antilogarithm [(32 dB $\mu$ V/m)/20] = 39.8  $\mu$ V/m

Test Report Number: HK12071404-1 FCC ID: N7TAC401-T IC: 5786A-AC401T

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#### 4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

# Worst Case Radiated Emission at

#### Baby Unit: 927.600 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in tables 1-3 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Baby Unit: Passed by 2.5 dB margin

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#### Mode: TX-Channel 00

#### Table 1, Baby Unit

#### **Radiated Emission Data**

			Pre-Amp	Antenna	Calculated	Average	
Polari-	Frequency	Reading	Gain	Factor	at 3m	Limit at 3m	Margin
zation	(MHz)	(dBµV)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
V	926.000	74.4	16	33.0	91.4	94.0	-2.6
V	1852.000	56.0	33	27.2	50.2	54.0	-3.8
V	2778.000	53.0	33	30.4	50.4	54.0	-3.6
V	3704.000	49.3	33	33.3	49.6	54.0	-4.4
V	4630.000	47.5	33	34.9	49.4	54.0	-4.6
V	5556.000	44.6	33	36.6	48.2	54.0	-5.8
V	6482.000	44.1	33	36.9	48.0	54.0	-6.0

NOTES: 1. Peak detector is used for the emission measurement.

- 2. All measurements were made at 3 meters. Radiated 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 radiated 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.
- 5. Emission (the row indicated by *bold italic*) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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#### Mode: TX-Channel 08

#### Table 2, Baby Unit

#### **Radiated Emission Data**

			Pre-Amp	Antenna	Calculated	Average	
Polari- zation	Frequency (MHz)	Reading (dBµV)	Gain (dB)	Factor (dB)	at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Zation	. ,	(uphv)	(ub)	(ub)	(uphyill)	(uph will)	(ub)
V	927.600	74.5	16	33.0	91.5	94.0	-2.5
V	1855.200	56.1	33	27.2	50.3	54.0	-3.7
V	2782.800	52.8	33	30.4	50.2	54.0	-3.8
V	3710.400	49.3	33	33.3	49.6	54.0	-4.4
V	4638.000	47.5	33	34.9	49.4	54.0	-4.6
V	5565.600	44.6	33	36.6	48.2	54.0	-5.8
V	6493.200	44.2	33	36.9	48.1	54.0	-5.9

NOTES: 1. Peak detector is used for the emission measurement.

- 2. All measurements were made at 3 meters. Radiated 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 radiated 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.
- 5. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Mode: Talk

#### Table 3, Baby Unit

#### **Radiated Emission Data**

			Pre-	Antenna	Net	Limit	
Polari-	Frequency	Reading	amp	Factor	at 3m	at 3m	Margin
zation	(MHz)	(dBµV)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
V	32.150	39.6	16	10.0	33.6	40.0	-6.4
V	64.300	40.4	16	9.0	33.4	40.0	-6.6
V	96.450	37.9	16	12.0	33.9	43.5	-9.6
Н	128.600	36.4	16	14.0	34.4	43.5	-9.1
Н	160.750	34.2	16	16.0	34.2	43.5	-9.3
H	192.900	33.5	16	16.0	33.5	43.5	-10.0

NOTES: 1. Peak detector is used for the emission measurement.

- 2. All measurements were made at 3 meters. Radiated 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 radiated 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. Emission (the row indicated by **bold italic**) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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#### 4.3 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (902MHz and 928MHz). In case of emissions up to two standard bandwidths away from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2009) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in FCC Part 15 Section 15.209 / Table 5 of RSS-Gen, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d) / RSS-210 A2.9(b).

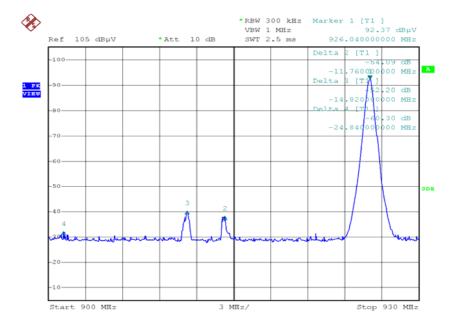
Plots of Radiated Emission on Bandedge are showing below.

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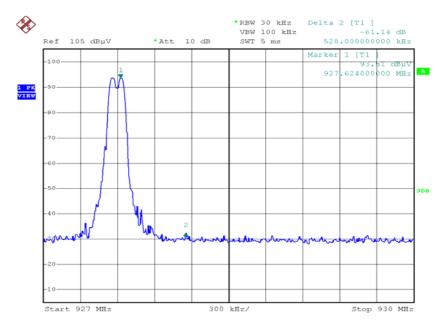


# Plots of Radiated Emission on Bandedge

# Baby unit, Lowest Channel



# **Baby unit, Highest Channel**



Test Report Number: HK12071404-1 FCC ID: N7TAC401-T IC: 5786A-AC401T

HKLAS 005

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- 4.4 AC Power Line Conducted Emission
  - [ ] Not applicable EUT is only powered by battery for operation.
  - [x] EUT connects to AC power line. Emission Data is listed in following pages.
  - [ ] Baby Unit connects to AC power line and has transmission. Parent Unit connects to AC power line but has no transmission. Emission Data of Baby Unit is listed in following pages.
- 4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration

The worst case line conducted configuration photographs are saved with filename: config photos.pdf

4.4.2 AC Power Line Conducted Emission Data

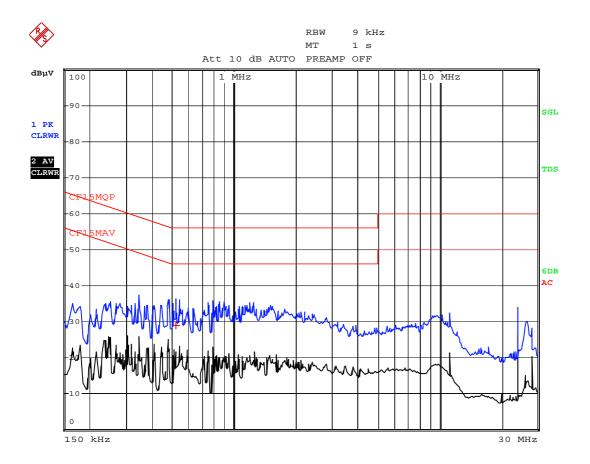
The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

More than 20 dB margin

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



## Worst Case: Emitting Alarm with Nightlight-On Mode



Date: 3.AUG.2012 15:49:46

Test Report Number: HK12071404-1 FCC ID: N7TAC401-T IC: 5786A-AC401T

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#### Worst Case: Emitting Alarm with Nightlight-On Mode

ED	IT PEAK LIST (Fina)	Measurement	Results)
Trace1:	CF15MQP		
Trace2:	CF15MAV		
Trace3:			
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	519 kHz	28.95 N	gnd -27.04

Date: 3.AUG.2012 15:49:12

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.



# EXHIBIT 5 EQUIPMENT LIST

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#### 5.0 Equipment List

#### 1) Radiated Emissions Test

Equipment	Biconical Antenna	Log Periodic Antenna	Double Ridged Guide
	20MHz to 200MHz		Abtenna
			(1GHz – 18GHz)
Registration No.	EW-2512	EW-0446	EW-1133
Manufacturer	EMCO	EMCO	EMCO
Model No.	3104C	3146	3115
Calibration Date	Nov. 15, 2011	Oct. 31, 2011	Mar. 02, 2011
Calibration Due Date	May. 13, 2013	Apr. 30, 2013	Sep. 02, 2012

Equipment	EMI Test Receiver	Spectrum Analyzer	Digital Multimeter
Registration No.	EW-2500	EW-2188	EW-1237
Manufacturer	ROHDESCHWARZ	AGILENTTECH	FLUKE
Model No.	ESCI	E4407B	179
Calibration Date	Feb. 24, 2012	Sep. 26, 2011	Sep. 05, 2011
Calibration Due Date	Feb. 24, 2013	Sep. 26, 2012	Oct. 01, 2012

#### 2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-2666	EW-0192	EW-0698
Manufacturer	ROHDESCHWARZ	R&S	R&S
Model No.	ESC17	ESH3-Z5	ESH3-Z2
Calibration Date	May. 21, 2012	Apr. 11, 2012	Apr. 06, 2012
Calibration Due Date	May. 21, 2013	Apr. 11, 2013	Apr. 06, 2013

#### 3) Conductive Measurement Test

Equipment	Spectrum Analyzer 40GHz
Registration No.	EW-2253
Manufacturer	ROHDESCHWARZ
Model No.	FSP40
Calibration Date	Jan. 12, 2012
Calibration Due Date	Jan. 12, 2013

#### END OF TEST REPORT