



STC Test Report

Date : 2012-09-21

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No. : HM167828

Applicant (CKT001):

CKICOM TECHNOLOGY LTD.

Flat F 4/F Universal Ind. Ctr. 19-21 Shan Mei St, Fotan,
Hong Kong.

Manufacturer:

CKICOM TECHNOLOGY LTD.

Flat F 4/F Universal Ind. Ctr. 19-21 Shan Mei St, Fotan,
Hong Kong.

Description of Sample(s):

Submitted sample(s) said to be

Product: 3 Beds Wetness Display

Brand Name: Carease

Model Number: R-138a

FCC ID: YQKCEIIPR-138A

Date Sample(s) Received: 2012-08-15

Date Tested: 2012-08-28 to 2012-09-03

Investigation Requested:

Perform ElectroMagnetic Interference measurement in
accordance with FCC 47CFR [Codes of Federal Regulations]
Part 15: 2011 and ANSI C63.4:2009 for FCC Certification.

Conclusion(s):

The submitted product COMPLIED with the requirements of
Federal Communications Commission [FCC] Rules and
Regulations Part 15. The tests were performed in accordance
with the standards described above and on Section 2.2 in this
Test Report.

Remark(s):

Dr. LEE Kam Chuen
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.

10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

CKICOM TECHNOLOGY LTD.
Flat F 4/F Universal Ind. Ctr. 19-21 Shan Mei St, Fotan, Hong Kong.

Manufacturer

CKICOM TECHNOLOGY LTD.
Flat F 4/F Universal Ind. Ctr. 19-21 Shan Mei St, Fotan, Hong Kong.

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1.3 Equipment Under Test [EUT]

Description of Sample

Submitted sample(s) said to be

Product: 3 Beds Wetness Display

Manufacturer: CKICOM TECHNOLOGY LTD.

Flat F 4/F Universal Ind. Ctr. 19-21 Shan Mei St, Fotan, Hong Kong.

Brand Name: Carease

Model Number: R-138a

Rating: 117V a.c.

The AC/DC Adaptor used for the tests was provided by the applicant with the following details: Two pins (Live / Neutral) only adaptor, Model Number: ALT-0500720U01-F, Input: 100-240V a.c. 50/60Hz 5.5W, Output: 5V d.c. 720mA max.

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a CKICOM TECHNOLOGY LTD., Wetness Care System. The EUT is a 433MHz transmitter, the LED indicators and the alarm of EUT will be triggered ON when RF signal is received, and when the buttons of EUT are pressed, a RF signal will be transmitted as a command to disable RF transmission.

1.4 Date of Order

2012-08-15

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2012-08-28 to 2012-09-03

1.7 Country of Origin

Hong Kong

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 2011 and ANSI C63.4:2009 for FCC Certification.

2.2 Test Standards and Results Summary Tables

| EMISSION Results Summary | | | | | |
|--|-------------------|-----------------|------------------|-------------------------------------|--------------------------|
| Test Condition | Test Requirement | Test Method | Class / Severity | | Test Result |
| | | | Pass | Failed | |
| Field Strength of Fundamental Emissions & Spurious Emissions | FCC 47CFR 15.231a | ANSI C63.4:2009 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Radiated Emissions, 30MHz to 1GHz | FCC 47CFR 15.209 | ANSI C63.4:2009 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

Test Requirement: FCC 47CFR 15.231a
Test Method: ANSI C63.4:2009
Test Date: 2012-08-29
Mode of Operation: Tx on mode / Rx on mode

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating 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.

* Semi-anechoic chamber located on the G/F of “The Hong Kong Standards and Testing Centre Ltd.” with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)

RBW: 10kHz
VBW: 30kHz
Sweep: Auto
Span: Fully capture the emissions being measured
Trace: Max. hold

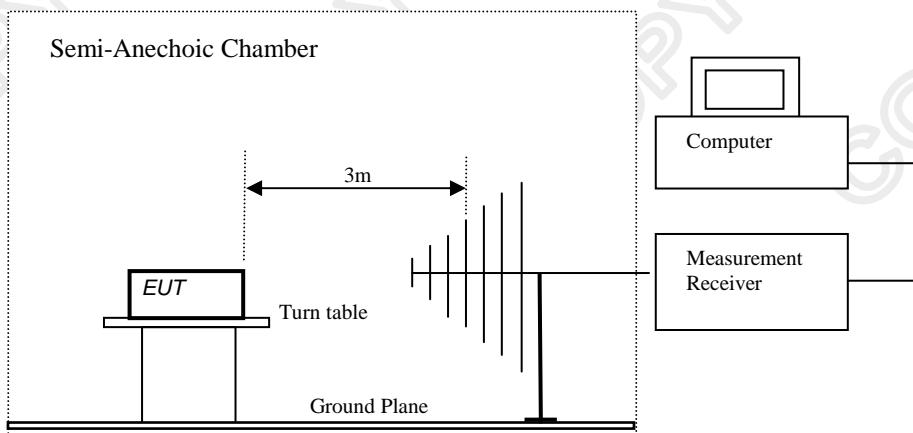
30MHz – 1GHz (QP)

RBW: 120kHz
VBW: 120kHz
Sweep: Auto
Span: Fully capture the emissions being measured
Trace: Max. hold

Above 1GHz (Pk & Av)

RBW: 3MHz
VBW: 3MHz
Sweep: Auto
Span: Fully capture the emissions being measured
Trace: Max. hold

Test Setup:



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.231a]:

| Frequency Range of Fundamental [MHz] | Field Strength of Fundamental Emission [Average] [μ V/m] | Field Strength of Spurious Emission [Average] [μ V/m] |
|---|---|--|
| 40.66-40.70 | 2,250 | 225 |
| 70-130 | 1,250 | 125 |
| 130-174 | 1,250 to 3,750 * | 125 to 375 * |
| 174-260 | 3,750 | 375 |
| 260-470 | 3,750 to 12,500 * | 375 to 1,250 * |
| Above 470 | 12,500 | 1,250 |

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, μ V/m at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, μ V/m at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

Results:

| Field Strength of Fundamental Emissions Peak Value | | | | | | |
|---|---------------------------------------|------------------------------|-----------------------------------|--------------------------------|---------------------------|---------------------|
| Frequency MHz | Measured Level @3m dB μ V/m | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit @3m μ V/m | E-Field Polarity |
| 433.97 | 70.7 | 19.0 | 89.7 | 30549.2 | 109,987.6 | Vertical |
| 867.94 | 21.5 | 26.6 | 48.1 | 254.1 | 10,998.8 | Vertical |

| Field Strength of Spurious Emissions Peak Value | | | | | | |
|--|---------------------------------------|------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency MHz | Measured Level @3m dB μ V/m | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit @3m μ V/m | E-Field Polarity |
| + 1301.91 | < 1.0 | 27.0 | < 28.0 | < 25.1 | 500.0 | Vertical |
| 1735.88 | < 1.0 | 32.2 | < 33.2 | < 45.7 | 10,998.8 | Vertical |
| 2169.85 | < 1.0 | 38.8 | < 39.8 | < 97.7 | 10,998.8 | Vertical |
| 2603.82 | < 1.0 | 17.4 | < 18.4 | < 8.3 | 10,998.8 | Vertical |
| 3037.79 | < 1.0 | 17.2 | < 18.2 | < 8.1 | 10,998.8 | Vertical |
| 3471.76 | < 1.0 | 18.8 | < 19.8 | < 9.8 | 10,998.8 | Vertical |
| + 3905.73 | < 1.0 | 19.7 | < 20.7 | < 10.8 | 5,000.0 | Vertical |
| + 4339.70 | < 1.0 | 20.6 | < 21.6 | < 12.0 | 5,000.0 | Vertical |

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Results:

| Field Strength of Fundamental Emissions | | | | | | |
|---|---------------------------------------|------------------------------|-----------------------------------|--------------------------------|---------------------------|---------------------|
| Average Value | | | | | | |
| Frequency MHz | Measured Level @3m dB μ V/m | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit @3m μ V/m | E-Field Polarity |
| * | 433.97 | 57.4 | 19.0 | 76.4 | 6606.9 | 10,998.8 |
| | 867.94 | 13.1 | 26.6 | 39.7 | 96.6 | 10,998.8 |

| Field Strength of Spurious Emissions | | | | | | |
|--------------------------------------|---------------------------------------|------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value | | | | | | |
| Frequency MHz | Measured Level @3m dB μ V/m | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit @3m μ V/m | E-Field Polarity |
| + | 1301.91 | < 21.1 | 27.0 | < 48.1 | < 254.1 | 500.0 |
| | 1735.88 | < 1.0 | 32.2 | < 33.2 | < 45.7 | 1,099.9 |
| | 2169.85 | < 1.0 | 38.8 | < 39.8 | < 97.7 | 1,099.9 |
| | 2603.82 | < 1.0 | 17.4 | < 18.4 | < 8.3 | 1,099.9 |
| | 3037.79 | < 1.0 | 17.2 | < 18.2 | < 8.1 | 1,099.9 |
| + | 3471.76 | < 1.0 | 18.8 | < 19.8 | < 9.8 | 500.0 |
| + | 3905.73 | < 1.0 | 19.7 | < 20.7 | < 10.8 | 500.0 |

Remarks:

*: Adjusted by Duty Cycle = -13.2dB

FCC Limit for Average Measurement = $41.6667(433.97\text{MHz})-7083.3333=10,998.8\mu\text{V/m}$

+: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB

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Limits for Radiated Emissions [FCC 47 CFR 15.209]:

| Frequency Range [MHz] | Field strength [microvolts/meter] | Measurement distance [meters] |
|--------------------------|--------------------------------------|----------------------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above960 | 500 | 3 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Tx on mode (9k – 30MHz): PASS

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Average Value | | | | | | |
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx on mode (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Quasi-Peak Value | | | | | | |
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx on mode (1000MHz): PASS

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Peak Value | | | | | | |
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx on mode (Above 1000MHz): PASS

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Average Value | | | | | | |
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB

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Limits for Radiated Emissions [FCC 47 CFR 15.209]:

| Frequency Range [MHz] | Field strength [microvolts/meter] | Measurement distance [meters] |
|--------------------------|--------------------------------------|----------------------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above960 | 500 | 3 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Rx on mode (9k – 30MHz): PASS

| Field Strength of Spurious Emissions Average Value | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Rx on mode (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions Quasi-Peak Value | | | | | | |
|--|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| 433.10 | 2.3 | 19.0 | 21.3 | 11.6 | 200.0 | Vertical |

Results of Rx on mode (1000MHz): PASS

| Field Strength of Spurious Emissions Peak Value | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Rx on mode (Above 1000MHz): PASS

| Field Strength of Spurious Emissions Average Value | | | | | | |
|---|---------------------------------|------------------------------|-----------------------------------|--------------------------------|--------------------|---------------------|
| Frequency MHz | Measured Level dB μ V | Correction Factor dB/m | Field Strength dB μ V/m | Field Strength μ V/m | Limit μ V/m | E-Field Polarity |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB

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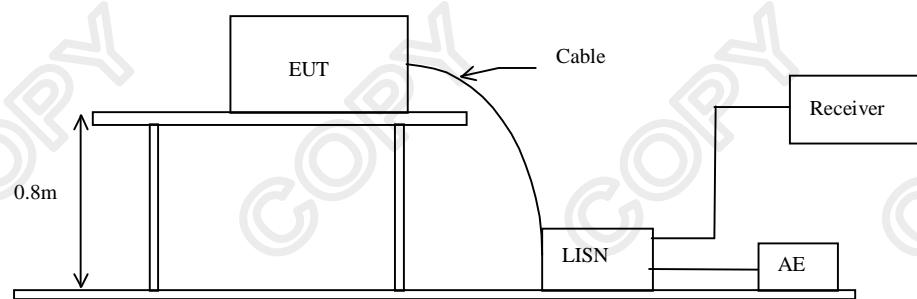
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

| | |
|--------------------|---------------------------|
| Test Requirement: | FCC 47CFR 15.207 |
| Test Method: | ANSI C63.4:2009 |
| Test Date: | 2012-08-29 |
| Rating: | 120V _{a.c.} 60Hz |
| Mode of Operation: | On mode |

Test Method:

The test was performed in accordance with ANSI C63.4: 2009, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



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Limit for Conducted Emissions (FCC 47 CFR 15.207):

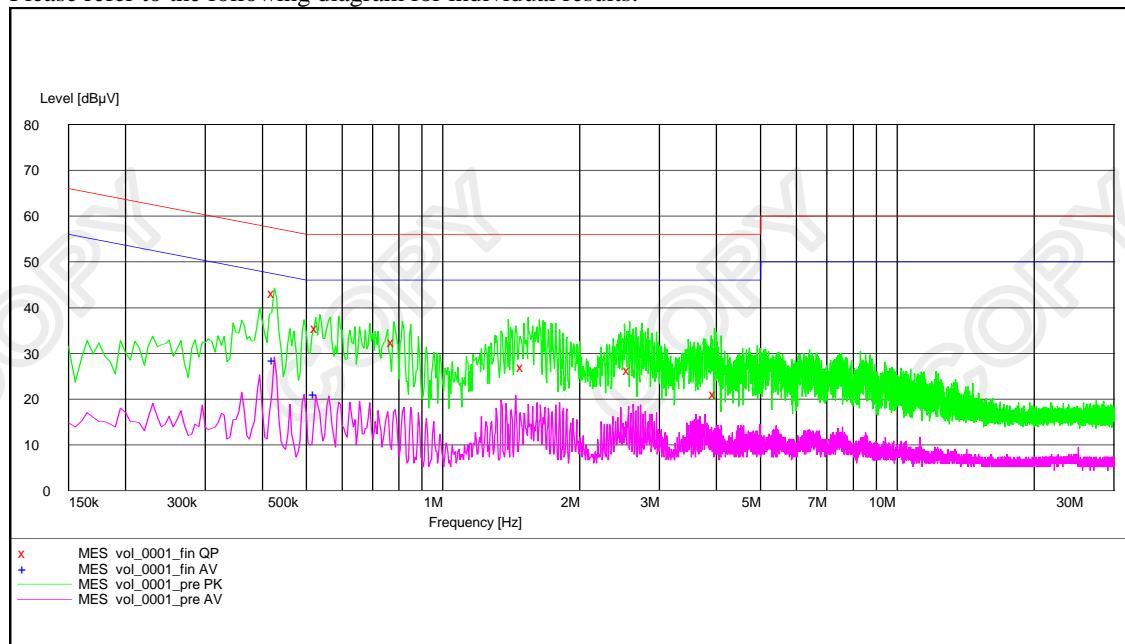
| Frequency Range [MHz] | Quasi-Peak Limits [dB μ V] | Average [dB μ V] |
|--------------------------|-----------------------------------|-------------------------|
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of On mode: Pass

Please refer to the following diagram for individual results.



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Results of On mode: Pass

| Conductor Live or Neutral | Frequency MHz | Quasi-peak | | Average | |
|------------------------------|------------------|---------------------|---------------------|---------------------|---------------------|
| | | Level dB μ V | Limit dB μ V | Level dB μ V | Limit dB μ V |
| Live | 0.425 | 43.1 | 57.0 | 28.6 | 47.0 |
| Live | 530.0 | 35.6 | 56.0 | -*- | -*- |
| Live | 0.780 | 32.5 | 56.0 | -*- | -*- |
| Live | 2.575 | 26.4 | 56.0 | -*- | -*- |
| Neutral | 0.525 | -*- | -*- | 21.2 | 46.0 |
| Neutral | 1.500 | 27.0 | 56.0 | -*- | -*- |
| Neutral | 3.990 | 21.1 | 56.0 | -*- | -*- |

Remarks:

Calculated measurement uncertainty : 3.97dB

-*- Emission(s) that is far below the corresponding limit line.

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3.2 20dB Bandwidth of Fundamental Emission

| | |
|--------------------|----------------------------------|
| Test Requirement: | FCC 47 CFR 15.231a |
| Test Method: | ANSI C63.4:2009 (Section 13.1.7) |
| Test Date: | 2012-09-03 |
| Mode of Operation: | Tx on mode |

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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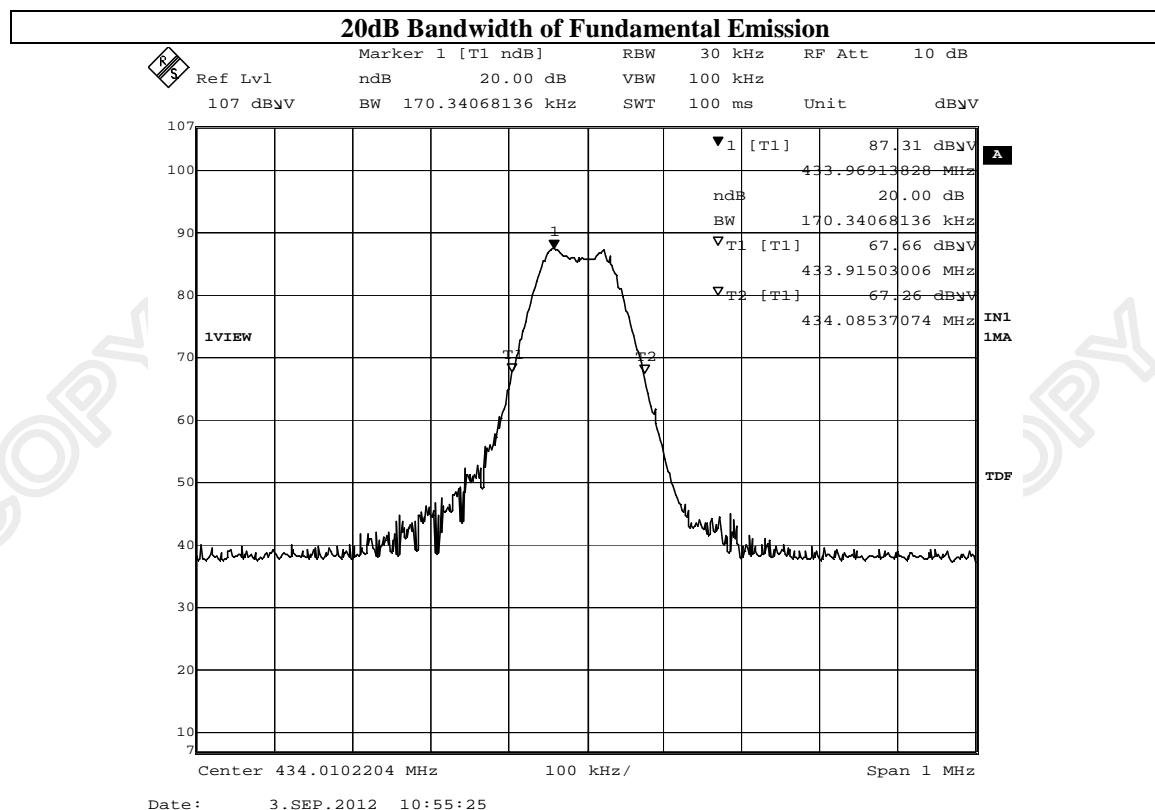
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Limits for 20 dB Bandwidth of Fundamental Emission:

| Frequency Range [MHz] | 20dB Bandwidth [kHz] | FCC Limits * [kHz] |
|--------------------------|-------------------------|-----------------------|
| 433.97 | 170.34 | 1084.9 |

$$\begin{aligned}
 *: \quad \text{FCC Limit for Bandwidth measurement} &= (0.25\%)(\text{Center Frequency}) \\
 &= (0.0025)(433.97) \\
 &= 1084.9\text{kHz}
 \end{aligned}$$



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List of Measurement Equipment

Radiated Emission

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL |
|---------|--------------------------------------|--------------|-----------|------------|------------|------------|
| EM299 | DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA | ETS-LINDGREN | 3115 | 00114120 | 2012/01/25 | 2014/01/25 |
| EM215 | MULTIDEVICE CONTROLLER | EMCO | 2090 | 00024676 | N/A | N/A |
| EM216 | MINI MAST SYSTEM | EMCO | 2075 | 00026842 | N/A | N/A |
| EM217 | ELECTRIC POWERED TURNTABLE | EMCO | 2088 | 00029144 | N/A | N/A |
| EM218 | ANECHOIC CHAMBER | ETS-LINDGREN | FACT-3 | -- | 2011/10/25 | 2012/10/25 |
| EM194 | BICONILOG ANTENNA | EMCO | 3142B | 1795 | 2010/10/06 | 2012/10/06 |
| EM229 | EMI TEST RECEIVER | R&S | ESIB40 | 100248 | 2012/05/03 | 2013/05/03 |
| EM022 | LOOP ANTENNA | EMCO | 6502 | 1189-2424 | 2011/09/14 | 2013/09/14 |

Line Conducted

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL |
|---------|-------------------|-------------------------------------|-----------|-----------------|------------|------------|
| EM197 | LISN | EMCO | 4825/2 | 1193 | 2012/05/16 | 2013/05/16 |
| EM181 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESIB7 | 100072 | 2012/05/03 | 2013/05/03 |
| EM179 | IMPULSE LIMITER | ROHDE & SCHWARZ | ESH3-Z2 | 357-8810.52/54 | 2012/01/27 | 2013/01/27 |
| EM154 | SHIELDING ROOM | SIEMENS MATSUSHITA COMPONENTS | N/A | 803-740-057-99A | 2012/01/27 | 2013/01/27 |

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

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Appendix B

Duty Cycle Correction During 100msec [FCC 47CFR 15.231(a)]

The transmitter periodically sends a different series of characters. There are 6 pulses (pulse duration 3.61msec) within 100ms. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $(6 \times 3.61)/100 \times 100\% = 21.66\%$ duty cycle. Figure A shows the characteristics of the pulses train for one of these functions.

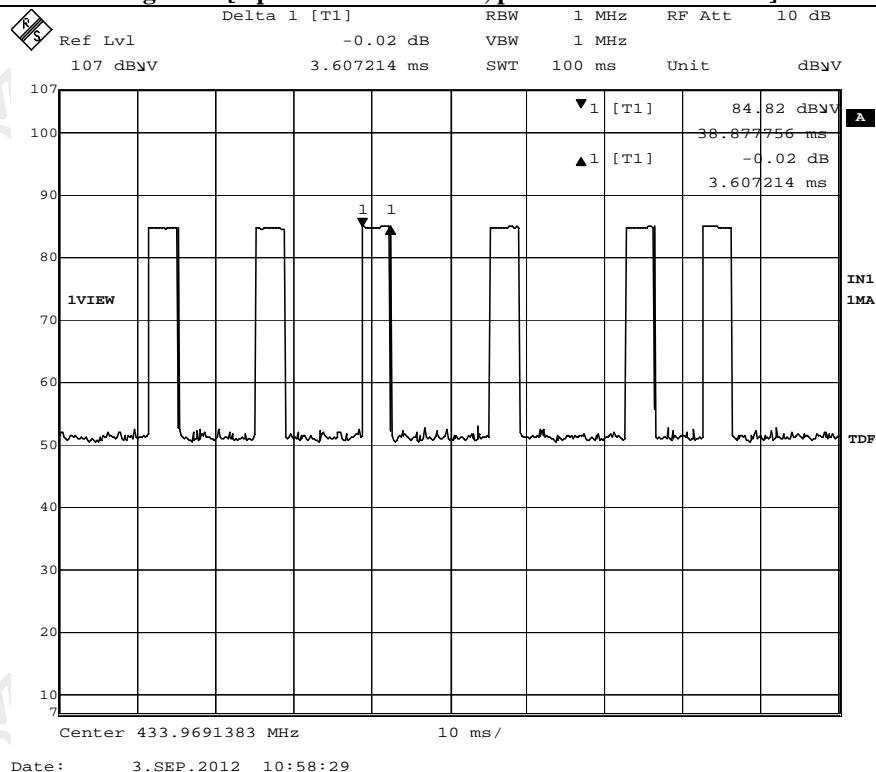
Remarks:

Duty Cycle Correction = $20 \log (0.2166) = -13.28\text{dB}$

Duty Cycle Correction = -20dB, if the calculation duty cycle correction >-20dB

The following figures [Figure A] showed the characteristics of the pulse train for one of these functions.

Figure A [6 pulses within 100ms, pulse duration = 3.61ms]



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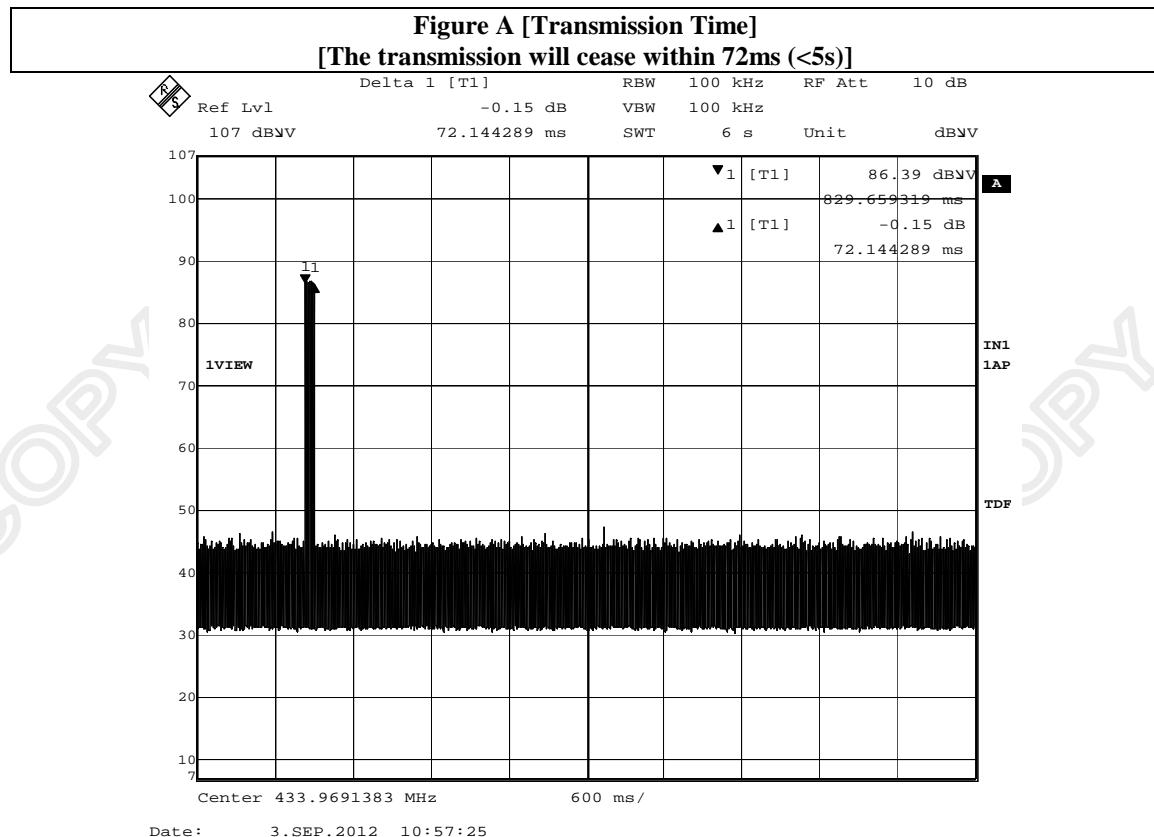
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Appendix C

Manual Operation [FCC 47CFR 15.231(a)]

The EUT ceases transmission almost immediately upon being released and appears to finish the current packet being transmitted. Therefore the longest period of time the transmitter should take to deactivate is a packet length.

Figure A



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Appendix D

Photographs of EUT

Front View of the product



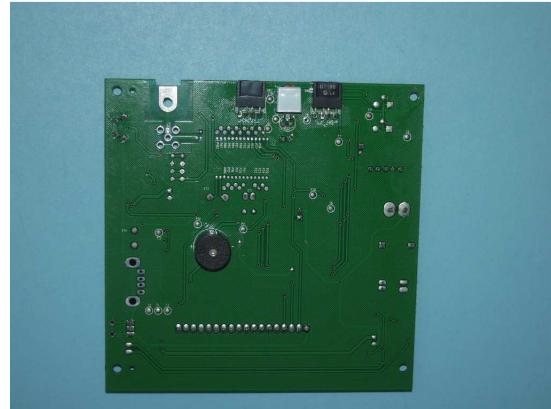
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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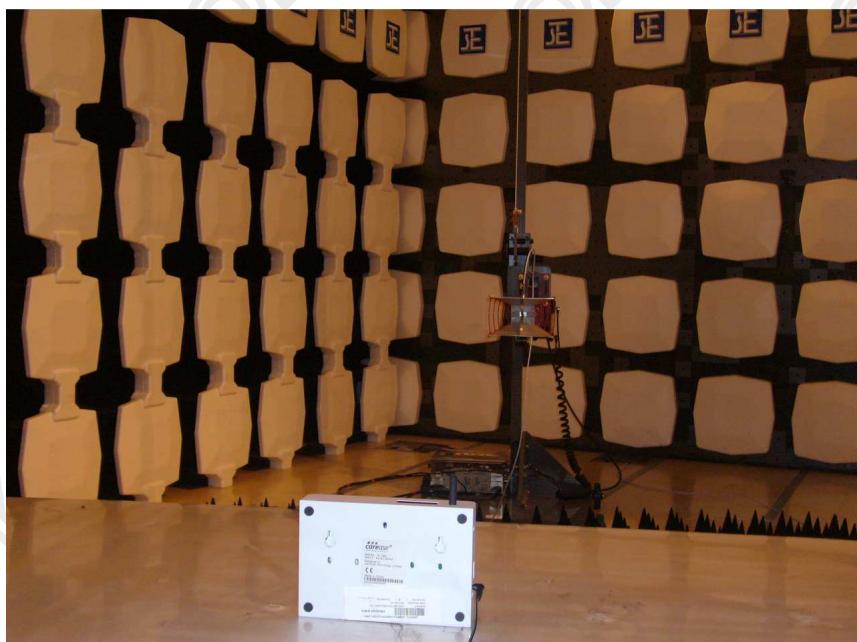
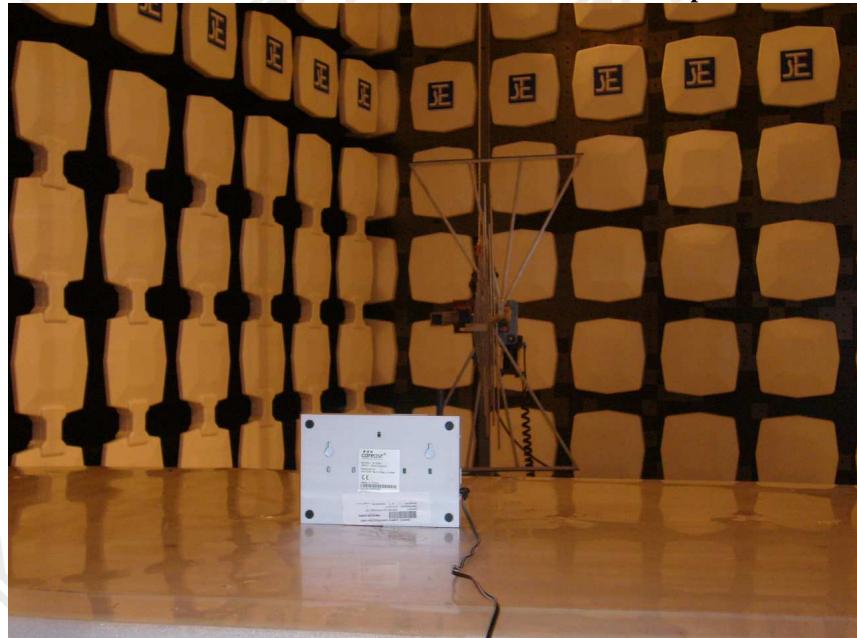
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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Measurement of Conducted Emission Test Set Up



***** End of Test Report *****

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