

WGI Innovations, Ltd.

Digital Action Camera

Model: AC3

May 10, 2012

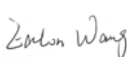


Report No.: 12020397-FCC-E1

(This report supersedes NONE)



Modifications made to the product : None

This Test Report is Issued Under the Authority of:

| | | |
|---|---|---|
|  |  |  |
| Eaton Wang Compliance Engineer | Alex Liu Technical Manager | |

This test report may be reproduced in full only.
Test result presented in this test report is applicable to the representative sample only.

EMC Test Report

To: FCC Part 15 Subpart B Class B: 2012, ANSI C63.4: 2009

SIEMIC, INC.
Accessing global markets



Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to [testing](#) and [certification](#), SIEMIC provides initial design reviews and [compliance management](#) through out a project. Our extensive experience with [China](#), [Asia Pacific](#), [North America](#), [European](#), and [international](#) compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the [global markets](#).

Accreditations for Conformity Assessment

| Country/Region | Accreditation Body | Scope |
|----------------|------------------------|------------------------------------|
| USA | FCC, A2LA | EMC , RF/Wireless , Telecom |
| Canada | IC, A2LA, NIST | EMC, RF/Wireless , Telecom |
| Taiwan | BSMI , NCC , NIST | EMC, RF, Telecom , Safety |
| Hong Kong | OFTA , NIST | RF/Wireless ,Telecom |
| Australia | NATA, NIST | EMC, RF, Telecom , Safety |
| Korea | KCC/RRA, NIST | EMI, EMS, RF , Telecom, Safety |
| Japan | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom |
| Mexico | NOM, COFETEL, Caniety | Safety, EMC , RF/Wireless, Telecom |
| Europe | A2LA, NIST | EMC, RF, Telecom , Safety |

Accreditations for Product Certifications

| Country/Region | Accreditation Body | Scope |
|----------------|--------------------|-----------------------|
| USA | FCC TCB, NIST | EMC , RF , Telecom |
| Canada | IC FCB , NIST | EMC , RF , Telecom |
| Singapore | iDA, NIST | EMC , RF , Telecom |
| EU | NB | EMC & R&TTE Directive |
| Japan | MIC, (RCB 208) | RF , Telecom |
| Hong Kong | OFTA (US002) | RF , Telecom |



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 3 of 33
www.siemic.com

This page has been left blank intentionally.



CONTENTS

| | | |
|----------|--|-----------|
| 1 | EXECUTIVE SUMMARY & EUT INFORMATION | 5 |
| 2 | TECHNICAL DETAILS..... | 6 |
| 3 | MODIFICATION..... | 7 |
| 4 | TEST SUMMARY..... | 8 |
| 5 | MEASUREMENTS, EXAMINATION AND DERIVED RESULTS..... | 9 |
| | ANNEX A. TEST INSTRUMENTATION & GENERAL PROCEDURES | 14 |
| | ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS | 18 |
| | ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT..... | 28 |
| | ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST | 32 |
| | ANNEX E. DECLARATION OF SIMILARITY | 33 |



1 EXECUTIVE SUMMARY & EUT INFORMATION

The purpose of this test programme was to demonstrate compliance of the WGI Innovations, Ltd., Digital Action Camera and Model: AC3 against the current Stipulated Standards. The Digital Action Camera has demonstrated compliance with the FCC Part 15 Subpart B Class B: 2012.

EUT Information

EUT Description : Digital Action Camera

Model : AC3

Input Power : Rating: DC 4.5V x 0.14A=0.63W

Classification Per Stipulated Test Standard : Class B Emission Product Per FCC Part 15 Subpart B Class B: 2012



2 TECHNICAL DETAILS

| | |
|---|---|
| Purpose | Compliance testing of Digital Action Camera with stipulated standards |
| Applicant / Client | WGI Innovations, Ltd. 602 Fountain Parkway Grand Prairie, TX 75050, U.S.A. |
| Manufacturer | Dongguan Southstar Electronics Ltd. F Building, 3 Chengtian Rd, Mintian, Shatian Town, Dongguan, Guangdong, China |
| Laboratory performing the tests | SIEMIC Nanjing (China) Laboratories NO.2-1, Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com |
| Test report reference number | 12020397-FCC-E1 |
| Date EUT received | May 08, 2012 |
| Standard applied | FCC Part 15 Subpart B Class B: 2012 |
| Dates of test (from – to) | May 09, 2012 |
| No of Units | #1 |
| Equipment Category | ITE |
| Trade Name | Wildgame Innovations |
| Highest Operated Frequency (ies) | N/A |
| Port/Connectors | USB |
| FCC ID | YTT-AC3 |



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 7 of 33
www.siemic.com

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

Class B Emission Product

Test Results Summary

| Emissions | | | |
|--|---------------------|---------------|-------------|
| Test Standard | Description | Product Class | Pass / Fail |
| FCC Part 15 Subpart B Class B: 2012 | Conducted Emissions | See Above | Pass |
| FCC Part 15 Subpart B Class B: 2012 | Radiated Emissions | See Above | Pass |

All measurement uncertainty is not taken into consideration for all presented test result.



5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Conducted Emissions Test Result

Note:

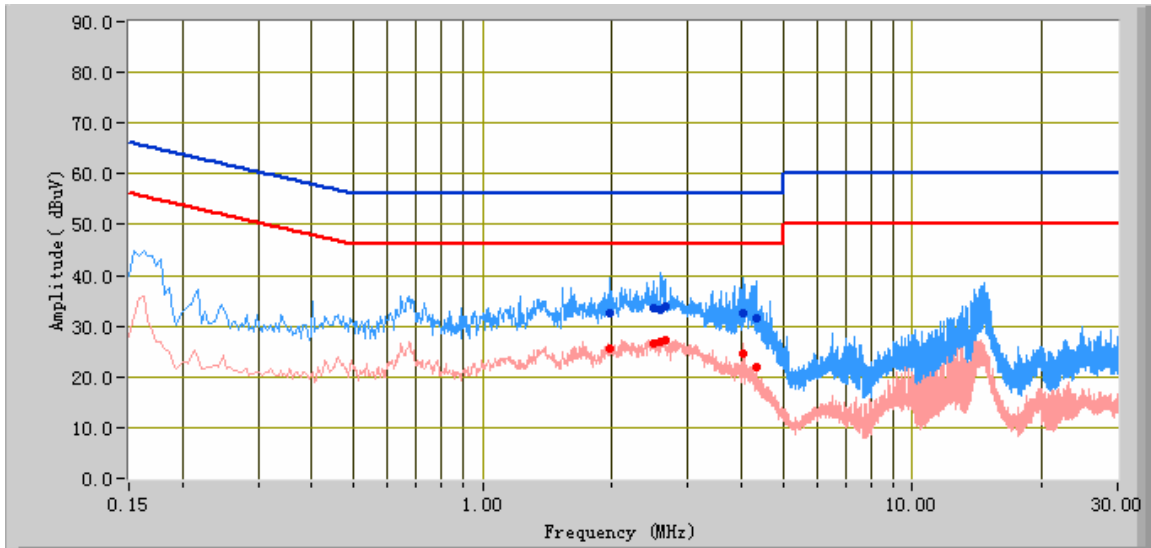
1. All possible modes of operation were investigated. Only the several worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is $\pm 3.86\text{dB}$.
4. Environmental Conditions

| | |
|----------------------|----------|
| Temperature | 25°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1009mbar |
5. Test date : May 09, 2012
Tested By : Eaton Wang

Test Result: Pass

| | |
|-------------------|----------------------|
| Test Mode: | Transfer Data |
|-------------------|----------------------|

Peak Detector  **Quasi Peak Limit** 
Average Detector  **Average Limit** 



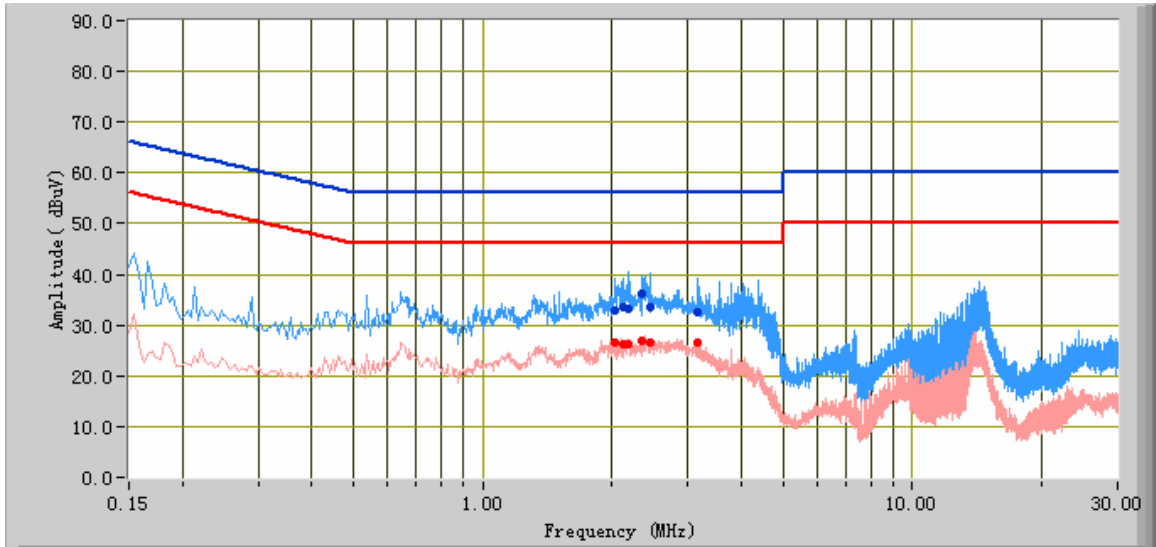
Test Data

Phase Neutral Plot at 120V AC, 60Hz

| Frequency (MHz) | Quasi Peak (dBµV) | Limit (dBµV) | Margin (dB) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Factors (dB) |
|-----------------|-------------------|--------------|-------------|----------------|--------------|-------------|--------------|
| 2.59 | 33.24 | 56.00 | -22.76 | 26.84 | 46.00 | -19.16 | 10.20 |
| 1.98 | 32.44 | 56.00 | -23.56 | 25.47 | 46.00 | -20.53 | 10.20 |
| 4.02 | 32.41 | 56.00 | -23.59 | 24.59 | 46.00 | -21.41 | 10.51 |
| 2.67 | 33.86 | 56.00 | -22.14 | 27.13 | 46.00 | -18.87 | 10.20 |
| 4.32 | 31.53 | 56.00 | -24.47 | 21.96 | 46.00 | -24.04 | 10.45 |
| 2.49 | 33.40 | 56.00 | -22.60 | 26.69 | 46.00 | -19.31 | 10.20 |

| | |
|-------------------|----------------------|
| Test Mode: | Transfer Data |
|-------------------|----------------------|

Peak Detector  **Quasi Peak Limit** 
Average Detector  **Average Limit** 





Test Data

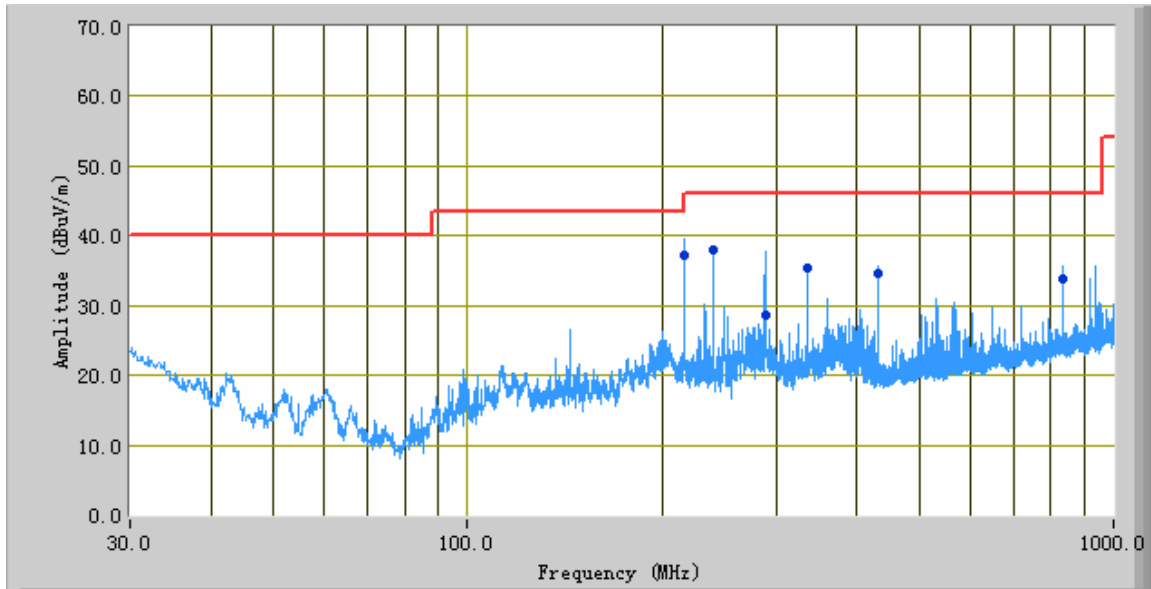
Phase Line Plot at 120V AC, 60Hz

| Frequency (MHz) | Quasi Peak (dBµV) | Limit (dBµV) | Margin (dB) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Factors (dB) |
|-----------------|-------------------|--------------|-------------|----------------|--------------|-------------|--------------|
| 2.19 | 33.18 | 56.00 | -22.82 | 26.30 | 46.00 | -19.70 | 10.20 |
| 2.44 | 33.48 | 56.00 | -22.52 | 26.71 | 46.00 | -19.29 | 10.20 |
| 2.35 | 36.25 | 56.00 | -19.75 | 26.83 | 46.00 | -19.17 | 10.20 |
| 2.11 | 33.67 | 56.00 | -22.33 | 26.33 | 46.00 | -19.67 | 10.20 |
| 3.15 | 32.40 | 56.00 | -23.60 | 26.60 | 46.00 | -19.40 | 10.25 |
| 2.03 | 33.04 | 56.00 | -22.96 | 26.53 | 46.00 | -19.47 | 10.20 |

| | |
|-------------------|----------------------|
| Test Mode: | Transfer Data |
|-------------------|----------------------|

Below 1GHz

Peak Detector 
 Quasi Peak Limit 



Test Data

Horizontal and Vertical Polarity Plot at 3m

| Frequency (MHz) | Quasi Peak (dBµV/m) | Azimuth | Polarity(H /V) | Height (cm) | Factors (dB) | Limit (dBµV/m) | Margin (dB) |
|-----------------|---------------------|---------|----------------|-------------|--------------|----------------|-------------|
| 216.43 | 37.27 | 271.00 | H | 121.00 | -33.59 | 46.00 | -8.73 |
| 240.00 | 38.05 | 295.00 | H | 130.00 | -33.05 | 46.00 | -7.95 |
| 288.56 | 28.70 | 53.00 | H | 150.00 | -31.52 | 46.00 | -17.30 |
| 335.99 | 35.42 | 302.00 | H | 102.00 | -30.95 | 46.00 | -10.58 |
| 432.86 | 34.67 | 180.00 | V | 108.00 | -29.19 | 46.00 | -11.33 |
| 833.35 | 33.94 | 0.00 | H | 124.00 | -20.03 | 46.00 | -12.06 |

Note 1: The above 1GHz testing is not necessary due to the operating frequency below 108MHz.

Annex A. TEST INSTRUMENTATION & GENERAL PROCEDURES

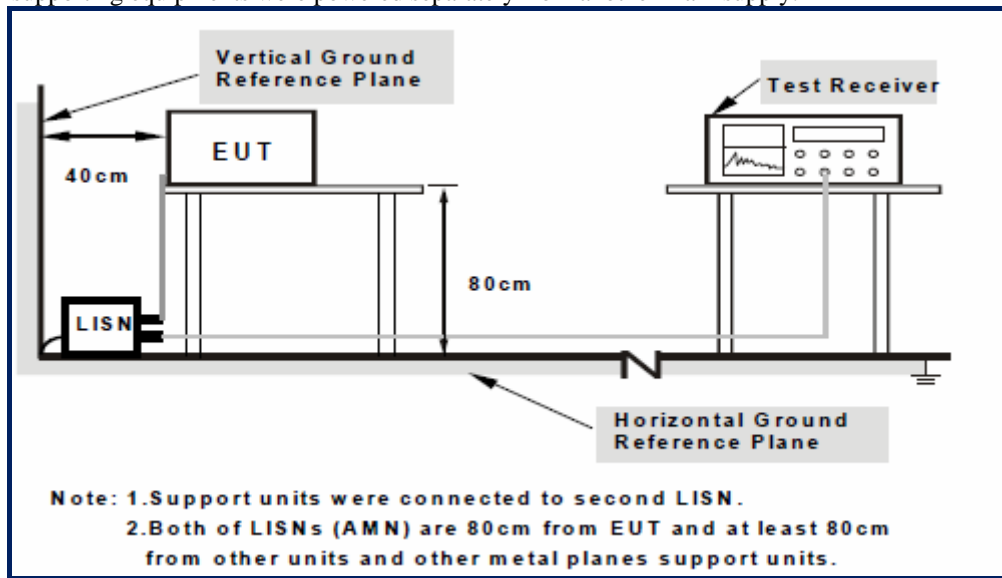
Annex A.i. TEST INSTRUMENTATION

| Instrument | Model | Serial # | Calibration Date | Calibration Due |
|--|---------|--------------------|------------------|-----------------|
| Conducted Emissions | | | | |
| R&S Receiver | ESPI 3 | 101216 | 08/24/2011 | 08/25/2012 |
| Com-Power LISN | LI 115 | 241090 | 05/24/2011 | 05/25/2012 |
| Com-Power LISN | LI 115 | 241091 | 05/24/2011 | 05/25/2012 |
| Com-Power LIMITER | LIT-153 | 531021 | 05/24/2011 | 05/25/2012 |
| Radiated Emissions | | | | |
| R&S Receiver | ESPI 3 | 101216 | 08/24/2011 | 08/25/2012 |
| Hp Spectrum Analyzer | N/A | 3821A09023 | 01/09/2012 | 01/10/2013 |
| HP Pre-amplifier | 8447F | 1937A01160 | 05/24/2011 | 05/25/2012 |
| Sunol Sciences, Inc. antenna (30MHz~6GHz) | JB6 | A121411 | 12/27/2011 | 12/28/2012 |
| A-INFOMW Horn Antenna (1~18GHz) | N/A | J203108112009 2 | 06/23/2011 | 06/24/2012 |
| ETS-Lindgren Horn Antenna (1~18GHz) | N/A | N/A | 10/02/2011 | 10/03/2012 |
| MITEQ Pre-Amplifier(0.1 ~ 18GHz) | N/A | 1451710 | 05/24/2011 | 05/25/2012 |

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipments were powered separately from another main supply.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration1

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Sample Calculation Example

| | |
|---|---------------------------------|
| At 20MHz | limit = 250μV = 47.96dBμV |
| Transducer factor of LISN, pulse limiter & cable loss at 20MHz = 11.20dB | |
| Q-P reading obtained directly from EMI Receiver = 40.00dBμV (Calibrated for system losses) | |
| Therefore, Q-P margin = 40.00-47.96 = -7.96 | i.e. 7.96 dB below limit |

Annex A. iii. RADIATED EMISSIONS TEST DESCRIPTION

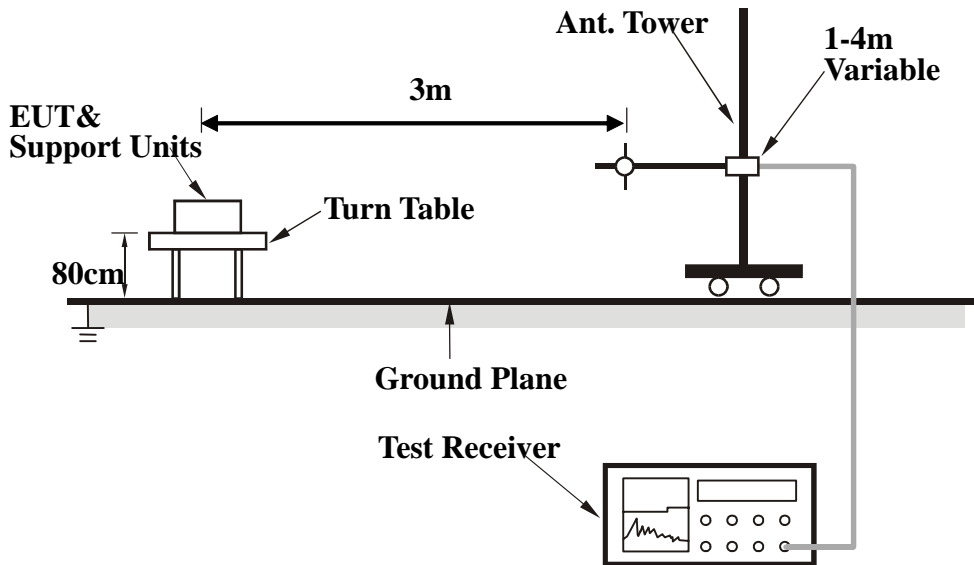
EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic, was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

The EUT was placed in the chamber, at a height of about 0.8 m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred; clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS) or 3m EMC chamber.

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5mX1.0mX0.8m high, non-metallic table.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration2

Test Method

The following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement

1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.
2. For emission frequencies measured below 1GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on an open test site. As the same purpose, for emission frequencies measured above 1GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1GHz, set the spectrum analyzer on a 100kHz and 1MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.
5. Repeat step 4 until all frequencies need to be measured was complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

| Frequency Band (MHz) | Function | Resolution bandwidth | Video Bandwidth |
|----------------------|----------|----------------------|-----------------|
| 30 to 1000 | Peak | 100kHz | 100kHz |
| Above 1000 | Peak | 1MHz | 1MHz |
| | Average | 1MHz | 10Hz |

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

$$\text{Peak} = \text{Reading} + \text{Corrected Factor}$$

where

$$\text{Corr. Factor} = \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain (if any)}$$

And the average value is

$$\text{Average} = \text{Peak Value} + \text{Duty Factor or}$$

$$\text{Set RBW} = 1\text{MHz, VBW} = 10\text{Hz.}$$

Note:

If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1GHz. And the measuring instrument is set to quasi peak detector function.



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 18 of 33
www.siemic.com

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Annex B.i. Photograph 1: EUT External Photo



EUT & USB Line - Front View



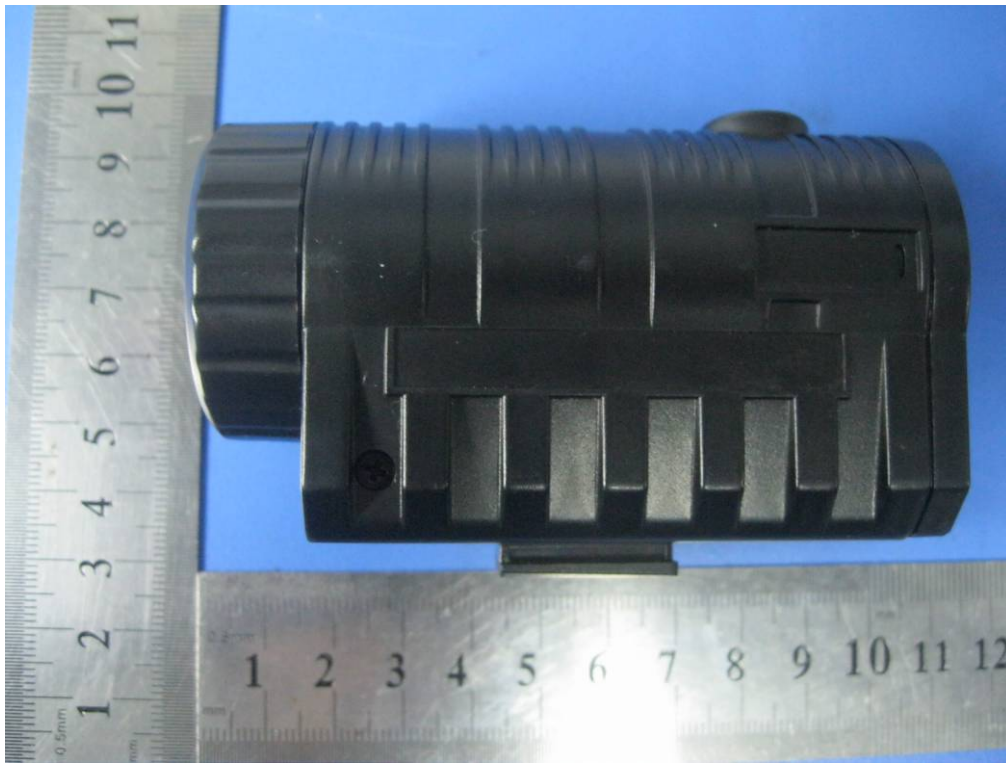
EUT - Front View



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 19 of 33
www.siemic.com



EUT – Rear View



EUT - Top View



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 20 of 33
www.siemic.com



EUT – Bottom View



EUT – Left Side View



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 21 of 33
www.siemic.com



EUT – Right Side View

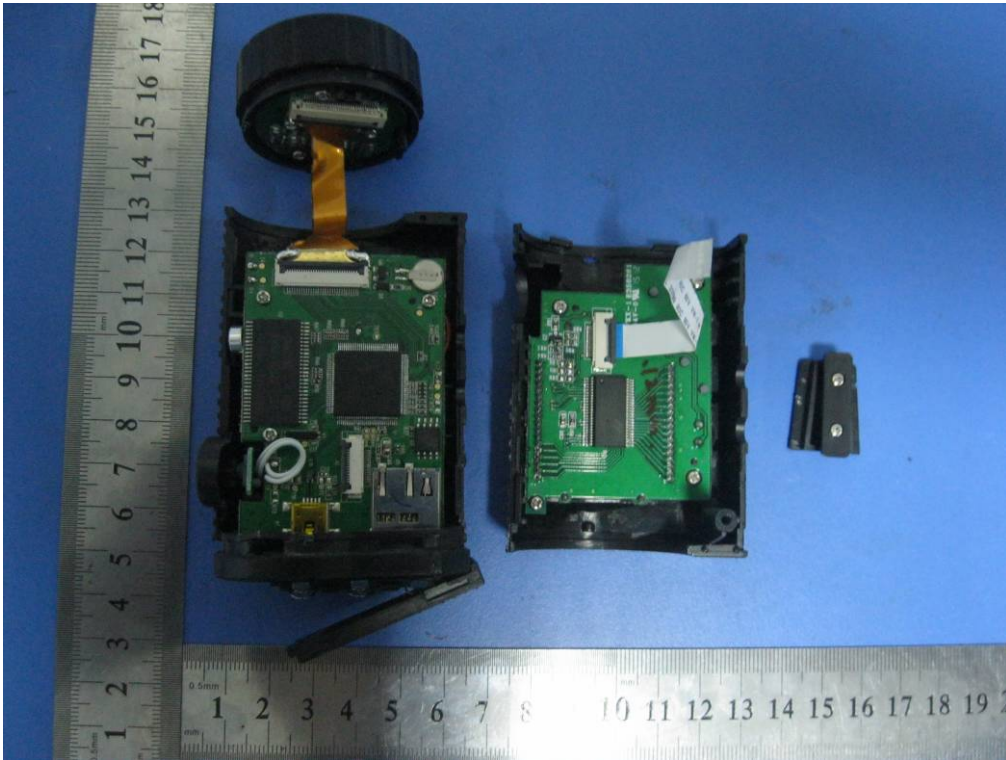


SIEMIC, INC.
Accessing global markets

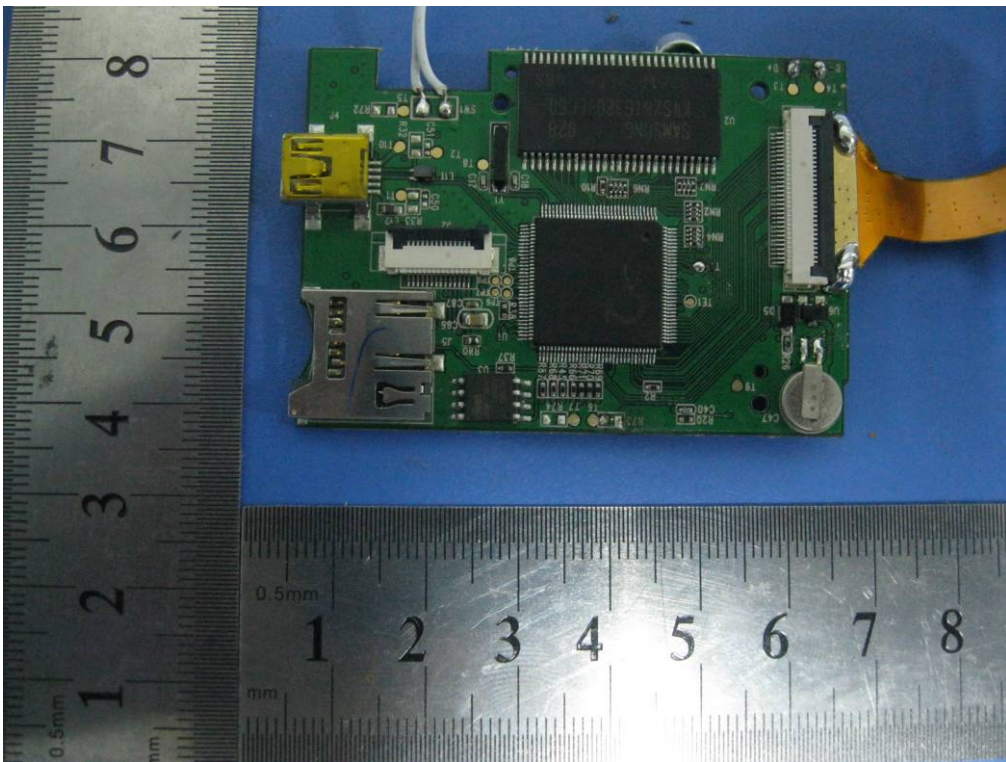
Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 22 of 33
www.siemic.com

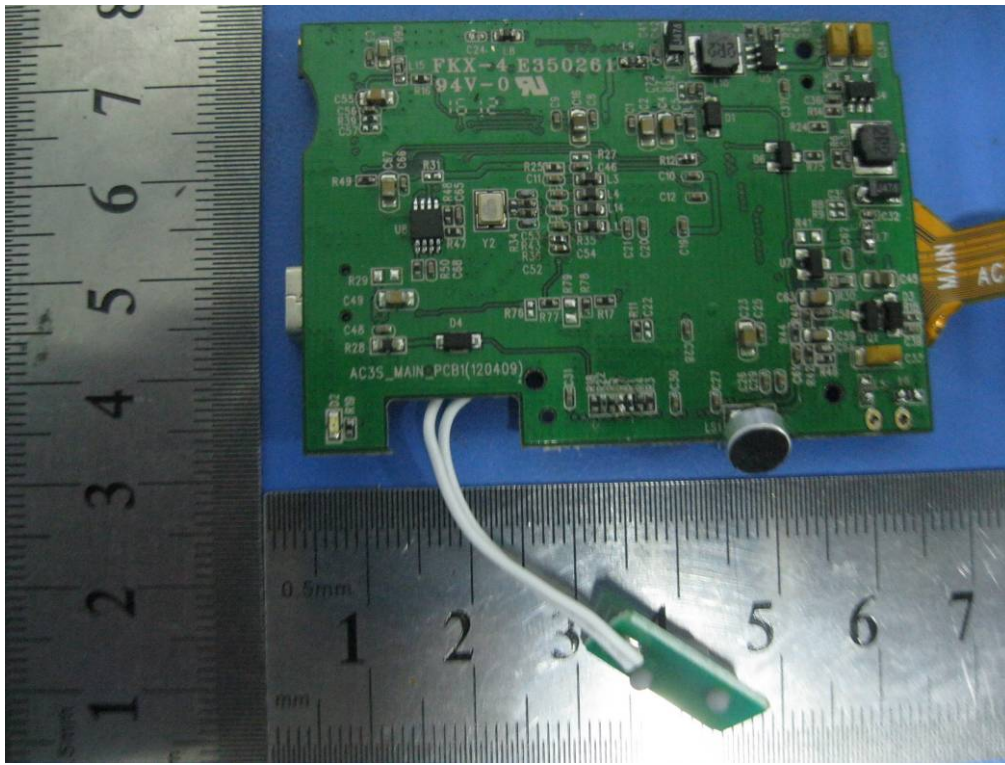
Annex B.ii. Photograph 2: EUT Internal Photo



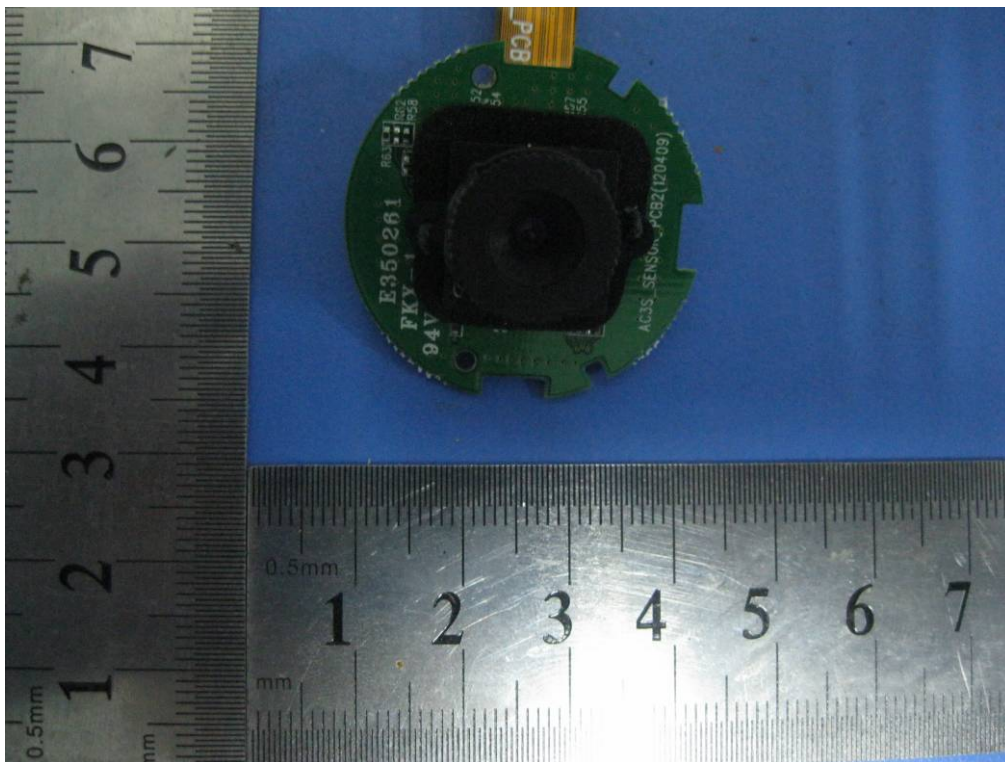
Cover Off – Front View



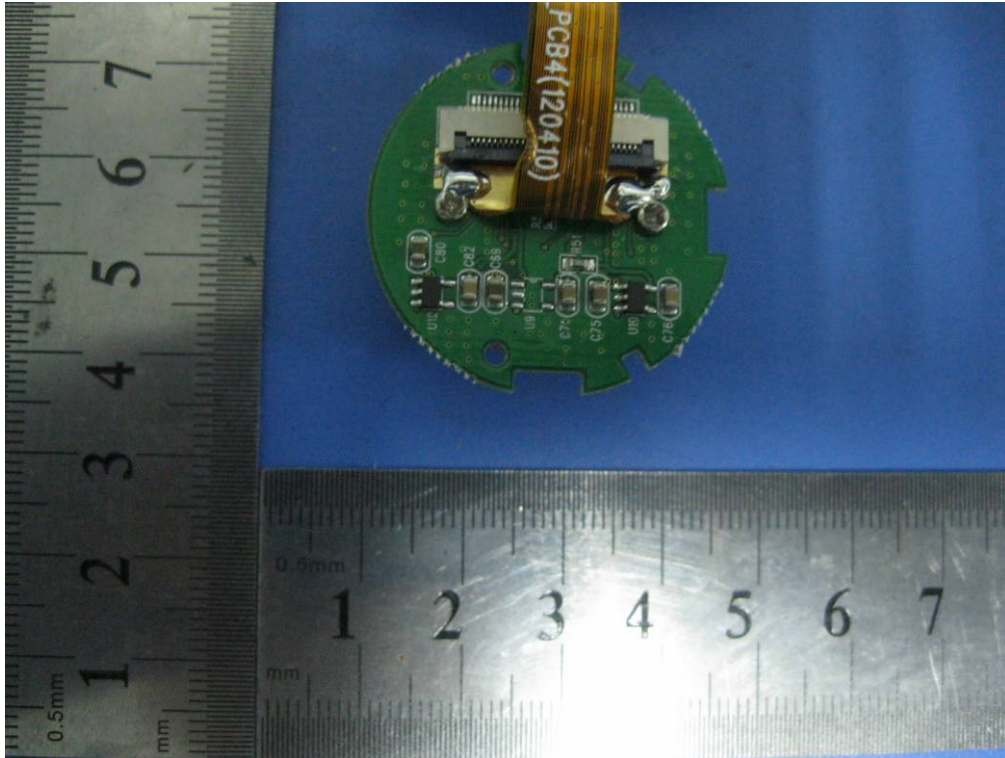
Main PCB – Front View



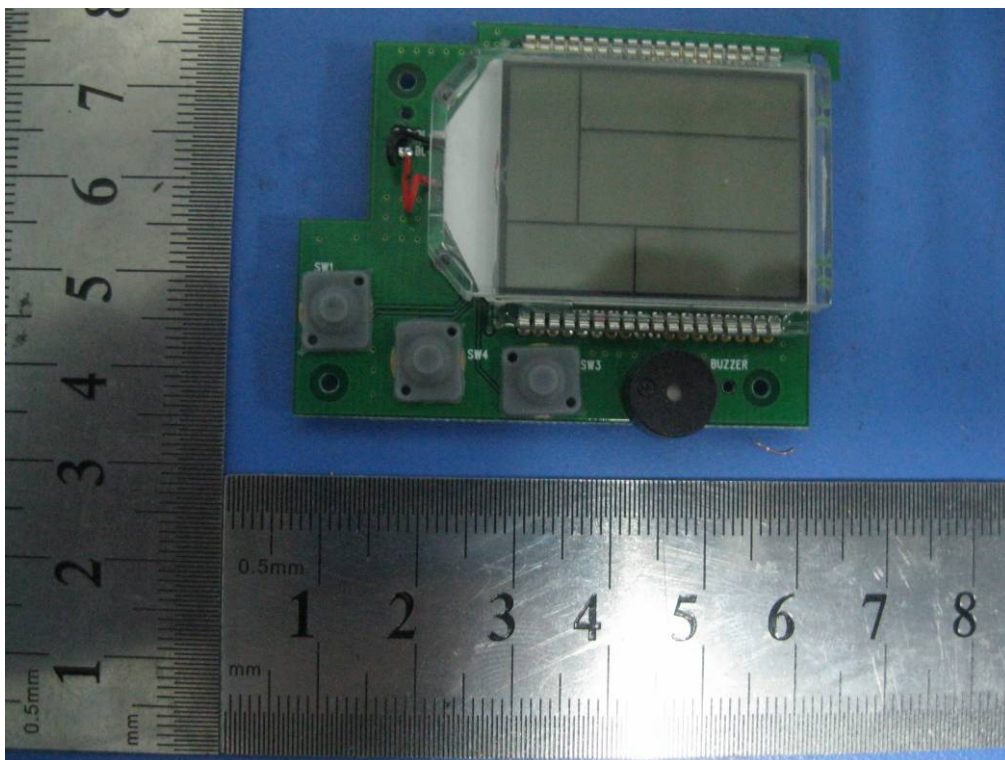
Main PCB – Rear View



Camera PCB – Front View



Camera PCB – Rear View



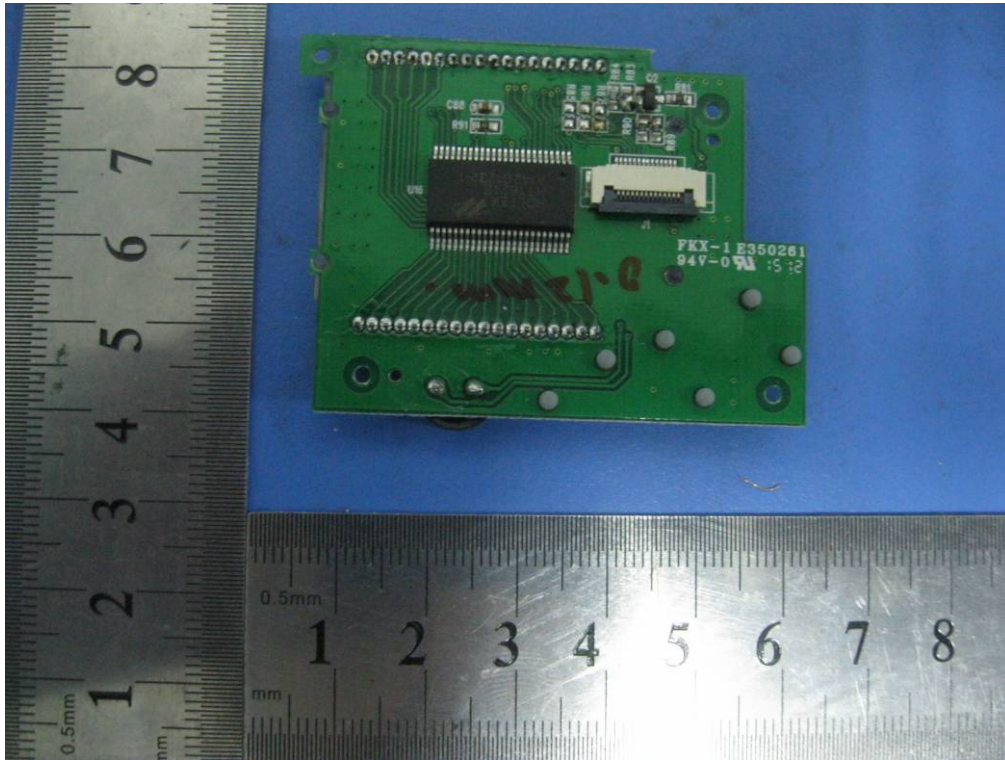
Screen PCB – Front View



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 25 of 33
www.siemic.com



Screen PCB – Rear View



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 26 of 33
www.siemic.com

Annex B.iii. Photograph 3: Test setup Photo



Conducted Emissions Setup Front View



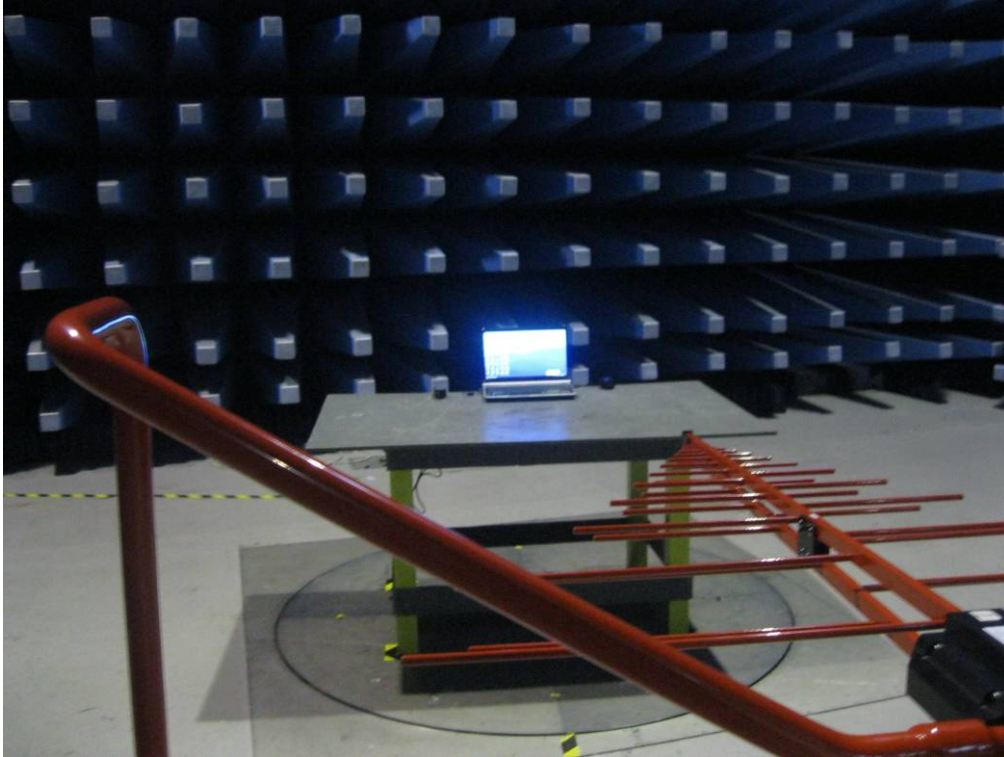
Conducted Emissions Setup Side View



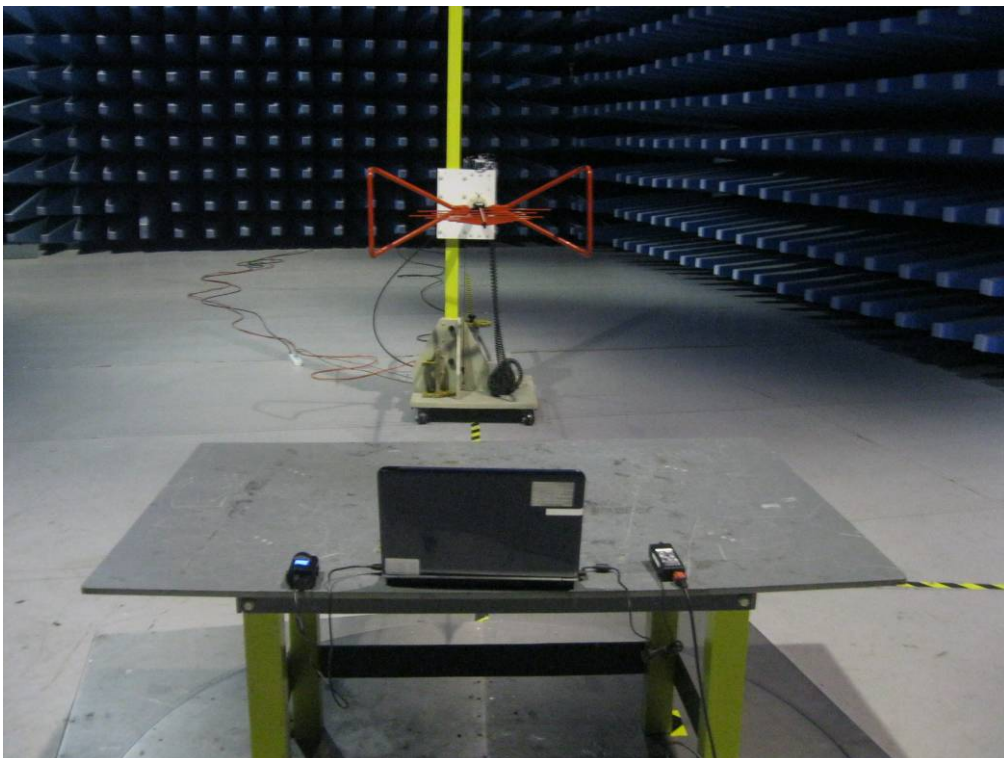
SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 27 of 33
www.siemmic.com



Radiated Emissions Setup Front View



Radiated Emissions Setup Rear View



Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

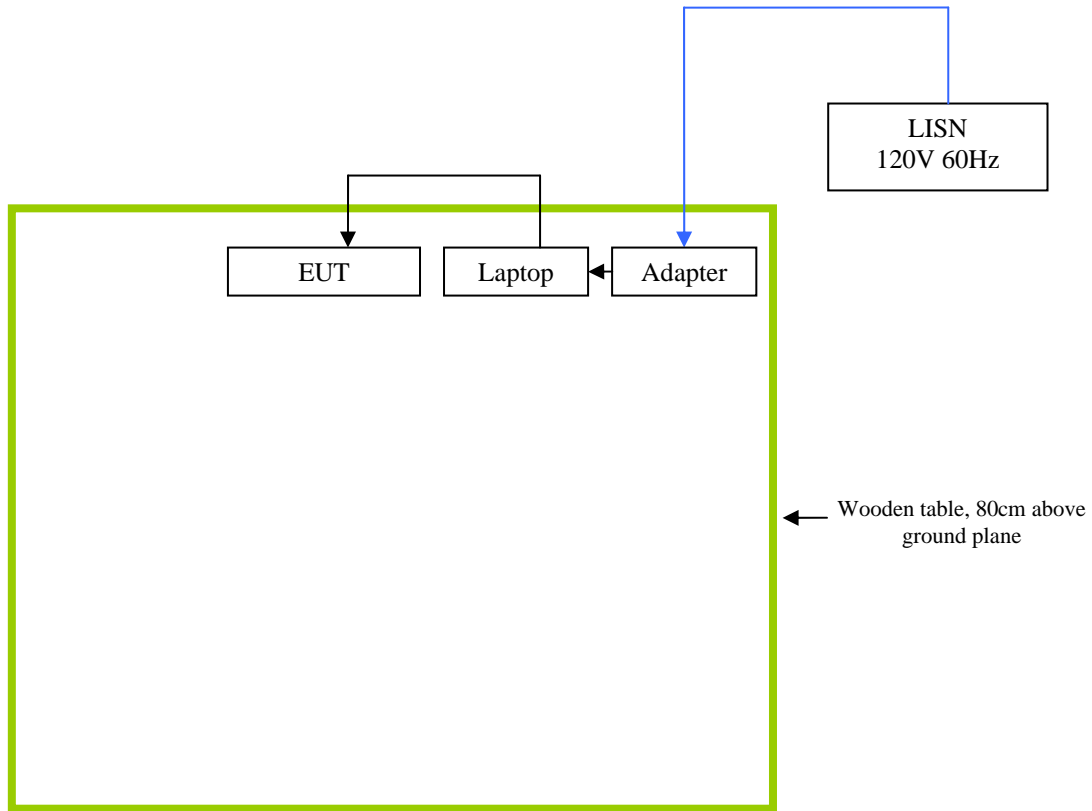
Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

| Equipment Description (Including Brand Name) | Model & Serial Number | Cable Description (List Length, Type & Purpose) |
|---|------------------------------------|--|
| Gateway Laptop | MS2288 & LXWHF02013951C3CA92200 | N/A |

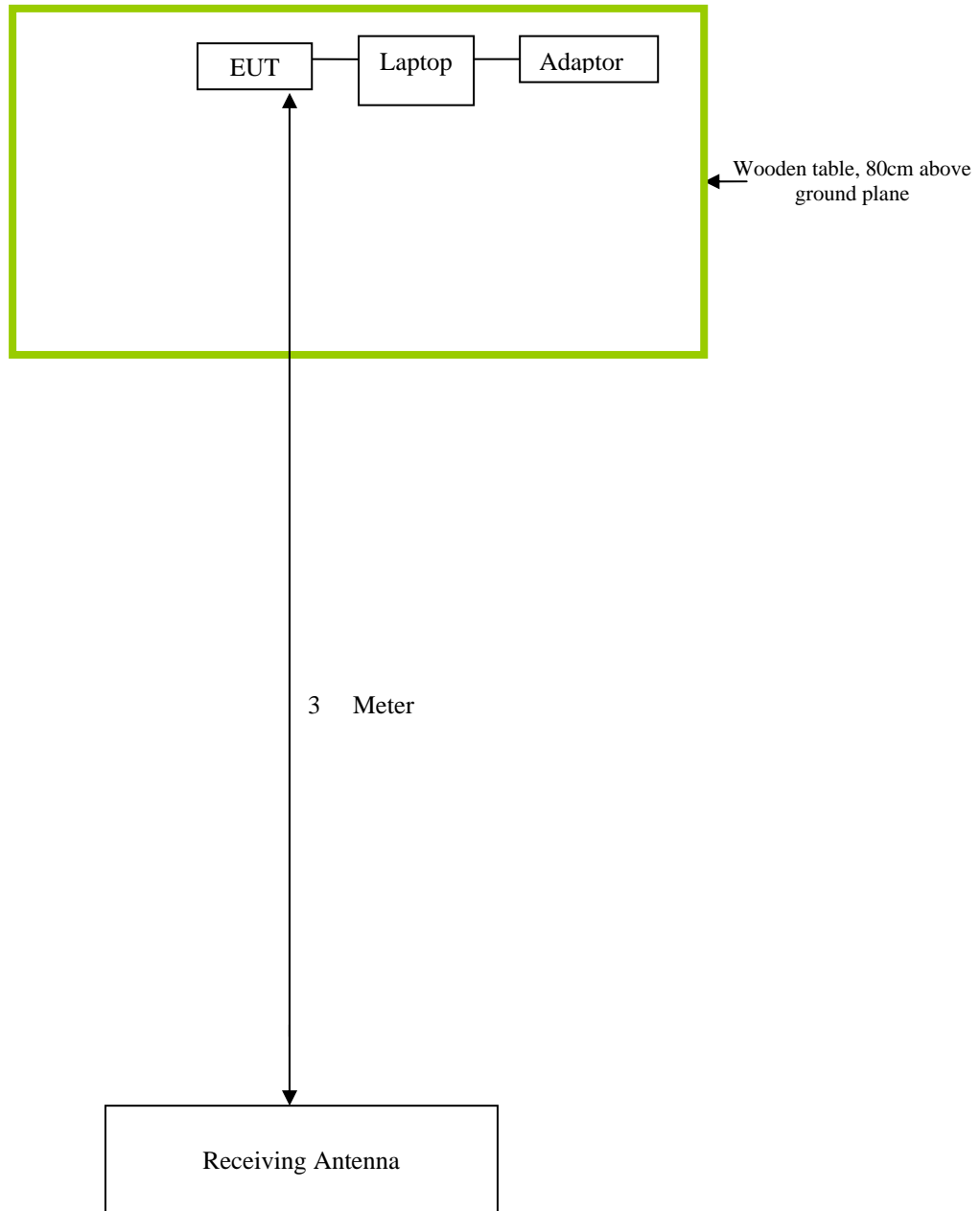


Block Configuration Diagram for Conducted Emissions





Block Configuration Diagram for Radiated Emissions





Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

| Test | Description Of Operation |
|------------------|---------------------------------|
| Emissions | Transfer Data |



SIEMIC, INC.

Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 32 of 33
www.siemic.com

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment



SIEMIC, INC.
Accessing global markets

Title: EMC Test Report for Digital Action Camera
Model: AC3
To: FCC Part 15 Subpart B Class B: 2012 , ANSI C63.4:2009

Report No.: 12020397-FCC-E1
Issue Date: May 10, 2012
Page: 33 of 33
www.siemic.com

Annex E. DECLARATION OF SIMILARITY

Please see attachment