



Report No: FCC1512020-03 File reference No: 2015-12-16

Applicant: Above Link Co., Ltd.

Product: Network Camera with Smart Gateway

Model No: SG-AB-01, SG-AB-02, SG-AB-03, AB215, AB216, AB235,

AB236, WL215, WL235

Brand Name: AboveLink

Test Standards: FCC Part 15 Subpart C, Paragraph 15.249

It is herewith confirmed and found to comply with the Test result:

requirements set up by ANSI C63.4&FCC Part 15 Subpart C, 15.249 regulations for evaluation Paragraph the

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: December 16, 2015

Results appearing herein relate only to the sample tested The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timewaytech.com

Report No.: FCC1512020-03 Page 2 of 41

Date: 2015-12-16



Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

Date: 2015-12-16



Test Report Conclusion Content

| 1.0 | General Details | 4 |
|------|-------------------------------------|----|
| 1.1 | Test Lab Details. | 4 |
| 1.2 | Applicant Details | 4 |
| 1.3 | Description of EUT | 4 |
| 1.4 | Submitted Sample | 4 |
| 1.5 | Test Duration. | 5 |
| 1.6 | Test Uncertainty. | 5 |
| 1.7 | Test By | 5 |
| 2.0 | List of Measurement Equipment. | 6 |
| 3.0 | Technical Details | 7 |
| 3.1 | Summary of Test Results | 7 |
| 3.2 | Test Standards | 7 |
| 4.0 | EUT Modification. | 7 |
| 5.0 | Power Line Conducted Emission Test. | 8 |
| 5.1 | Schematics of the Test. | 8 |
| 5.2 | Test Method and Test Procedure. | 8 |
| 5.3 | Configuration of the EUT | 8 |
| 5.4 | EUT Operating Condition. | 9 |
| 5.5 | Conducted Emission Limit. | 9 |
| 5.6 | Test Result. | 9 |
| 6.0 | Radiated Emission test. | 12 |
| 6.1 | Test Method and Test Procedure. | 12 |
| 6.2 | Configuration of the EUT | 12 |
| 6.3 | EUT Operation Condition. | 12 |
| 6.4 | Radiated Emission Limit. | 13 |
| 6.5 | Test Result. | 14 |
| 7.0 | Band Edge | 18 |
| 7.1 | Test Method and Test Procedure. | 18 |
| 7.2 | Radiated Test Setup. | 18 |
| 7.3 | Configuration of the EUT | 18 |
| 7.4 | EUT Operating Condition. | 18 |
| 7.5 | Band Edge Limit. | 18 |
| 7.6 | Band Edge Test Result. | 19 |
| 8.0 | Antenna Requirement. | 21 |
| 9.0 | 20dB bandwidth measurement. | 22 |
| 10.0 | FCC ID Label. | 23 |
| 11.0 | Photo of Test Setup and EUT View | 24 |

Date: 2015-12-16



Page 4 of 41

1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Room 512-519,5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen,

Guangdong China

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Above Link Co., Ltd.

Address: Building D41, Suite 201,99 Jing Fifteen Road, Zhenjiang, Jiangsu, China 212009

Telephone: -Fax: --

1.3 Description of EUT

Product: Network Camera with Smart Gateway
Manufacturer: Above Link Technology Co., Ltd.

Address: Building D41, Suite 201,99 Jing Fifteen Road, Zhenjiang, Jiangsu, China 212009

Brand Name: AboveLink Model Number: SG-AB-01

Additional Model Name SG-AB-02, SG-AB-03, AB215, AB216, AB235, AB236, WL215, WL235

Additional Trade Name N/A
Input Voltage: DC5V, 2A

Modulation Type: FSK

Operation Frequency 908.42MHz

Antenna Designation Integral antenna with gain 2.0dBi

1.4 Submitted Sample

2 Sample

The report refers only to the sample tested and does not apply to the bulk.

Report No.: FCC1512020-03 Page 5 of 41

Date: 2015-12-16



1.5 Test Duration 2015-12-07 to 2015-12-15

1.6 Test Uncertainty Conducted Emissions Uncertainty =3.6dB Radiated Emissions Uncertainty =4.7dB

Test Engineer 1.7

The sample tested by

Print Name: Terry Tang

Page 6 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



| 2.0 Test Equipments | | | | | |
|------------------------|--------------|------------|-------------------|--------------|------------|
| Instrument Type | Manufacturer | Model | Serial No. | Date of Cal. | Due Date |
| ESPI Test Receiver | R&S | ESPI 3 | ESPI 3 100379 | | 2016-08-21 |
| TWO Line-V-NETW | R&S | EZH3-Z5 | 100294 | 2015-08-22 | 2016-08-21 |
| TWO Line-V-NETW | R&S | EZH3-Z5 | 100253 | 2015-08-22 | 2016-08-21 |
| Ultra Broadband ANT | R&S | HL562 | HL562 100157 | | 2016-08-22 |
| ESDV Test Receiver | R&S | ESDV | 100008 | 2015-08-22 | 2016-08-21 |
| Impuls-Begrenzer | R&S | ESH3-Z2 | 100281 | 2015-08-22 | 2016-08-21 |
| System Controller | CT | SC100 | - | | |
| Printer | EPSON | РНОТО ЕХЗ | CFNH234850 | | |
| Computer | IBM | 8434 | 1S8434KCE99BLXLO* | - | - |
| Loop Antenna | EMCO | 6502 | 00042960 | 2015-08-23 | 2016-08-22 |
| ESPI Test Receiver | R&S | ESI26 | 838786/013 | 2015-08-22 | 2016-08-21 |
| 3m OATS | | | N/A | 2015-08-24 | 2016-08-23 |
| Horn Antenna | R&S | BBHA 9170 | BBHA9170265 | 2015-08-24 | 2016-08-23 |
| Horn Antenna | R&S | BBHA 9120D | 9120D-631 | 2015-08-24 | 2016-08-23 |
| Power meter | Anritsu | ML2487A | 6K00003613 | 2015-08-22 | 2016-08-21 |
| Power sensor | Anritsu | MA2491A | 32263 | 2015-08-22 | 2016-08-21 |
| Bilog Antenna | Schwarebeck | VULB9163 | 9163/340 | 2015-08-23 | 2016-08-21 |
| LISN | AFJ | LS16C | 10010947251 | 2015-08-22 | 2016-08-21 |
| LISN (Three Phase) | Schwarebeck | NSLK 8126 | 8126453 | 2015-08-23 | 2016-08-22 |
| 9*6*6 Anechoic | | | N/A | 2015-08-24 | 2016-08-23 |
| EMI Test Receiver | RS | ESCS30 | 100139 | 2015-08-22 | 2016-08-21 |

Report No.: FCC1512020-03 Page 7 of 41

Date: 2015-12-16



3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

| Standard | Test Type | Result | Notes |
|---|-------------------------------------|--------|----------|
| FCC Part 15, Paragraph 15.207 | Conducted Emission Test | PASS | Complies |
| FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit | Field Strength of Fundamental | PASS | Complies |
| FCC Part 15, Paragraph 15.209 | Radiated Emission Test | PASS | Complies |
| FCC Part 15 Subpart C Paragraph 15.249(d) Limit | Band Edge Test | PASS | Complies |

3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.249

Remark: Test according to ANSI C63.4:2014 & ANSI C63.10:2013

4.0 EUT Modification

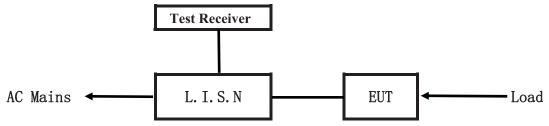
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

Date: 2015-12-16



5. Power Line Conducted Emission Test

5.1 Schematics of the test

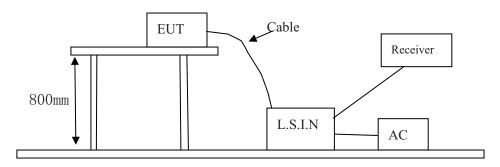


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2014. The Frequency spectrum From 0.15 MHz to 30MHz was investigated. The LISN used was 50 ohm/50 uH as specified by section 5.1 of ANSI C63.4 -2014.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2014. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

A. EUT

| Device | Manufacturer | Model | FCC ID |
|--------------------|----------------------|-------------------------|-----------------|
| | | SG-AB-01, SG-AB-02, | |
| Network Camera | Jiangsu Above Link | SG-AB-03, AB215, AB216, | 2 A ATCCC A DO1 |
| with Smart Gateway | Technology Co., Ltd. | AB235, AB236, WL215, | 2AATCSGAB01 |
| | | WL235 | |

B. Internal Device

The report refers only to the sample tested and does not apply to the bulk.

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Page 9 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



| Device | Manufacturer | Model | FCC ID/DOC |
|--------|--------------|-------|------------|
| N/A | | | |

C. Peripherals

| Device | Manufacturer | Model | FCC ID/DOC | Cable |
|--------|--------------|-------|------------|-------|
| N/A | | | | |

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2014

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.107 and 15.207

| Eraguanay/(MHz) | Class A Lir | nits (dB µ V) | Class B Limits (dB µ V) | | |
|-------------------|------------------|---------------|-------------------------|---------------|--|
| Frequency(MHz) | Quasi-peak Level | Average Level | Quasi-peak Level | Average Level | |
| $0.15 \sim 0.50$ | 79.0 | 66.0 | 66.0~56.0* | 56.0~46.0* | |
| $0.50 \sim 5.00$ | 73.0 | 60.0 | 56.0 | 46.0 | |
| $5.00 \sim 30.00$ | 73.0 | 60.0 | 60.0 | 50.0 | |

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Date: 2015-12-16



A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

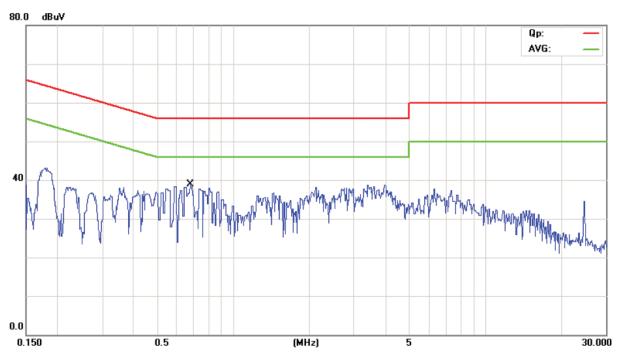
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Z-Wave Transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



| No. I | Mk. | Freq. | | | Measure- ment | Limit | Over | | |
|-------|-----|--------|-------|-------|------------------|-------|--------|----------|---------|
| | | MHz | dBuV | dB | dBu∀ | dBuV | dB | Detector | Comment |
| 1 | * | 0.6768 | 22.30 | 11.56 | 33.86 | 56.00 | -22.14 | QP | |
| 2 | | 0.6768 | 5.20 | 11.56 | 16.76 | 46.00 | -29.24 | AVG | |

Date: 2015-12-16



B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

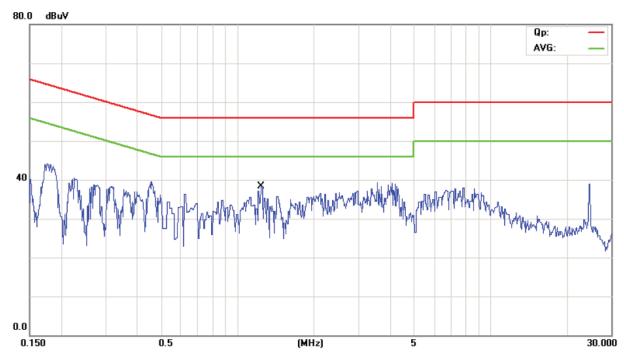
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Z-Wave Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



| No. Mk. | Freq. | Reading Level | | Measure- ment | Limit | Over | | |
|---------|--------|------------------|-------|------------------|-------|--------|----------|---------|
| | MHz | dBuV | dB | dBu∀ | dBuV | dB | Detector | Comment |
| 1 * | 1.2410 | 17.20 | 12.00 | 29.20 | 56.00 | -26.80 | QP | |
| 2 | 1.2410 | 0.70 | 12.00 | 12.70 | 46.00 | -33.30 | AVG | |

Report No.: FCC1512020-03 Page 12 of 41

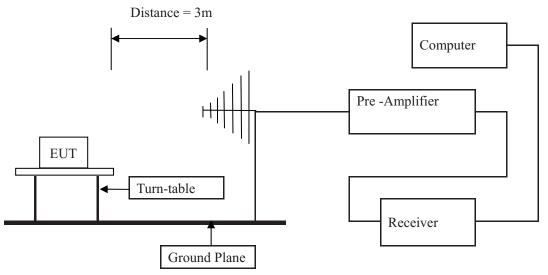
Date: 2015-12-16



6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup



- 6.2 Configuration of The EUT
 Same as section 5.3 of this report
- 6.3 EUT Operating Condition
 Same as section 5.4 of this report.

Report No.: FCC1512020-03 Page 13 of 41

Date: 2015-12-16



6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

| Fundamental Frequency | Field Strength of Fundamental (3m) | | | Field S | trength of Harmo | onics (3m) |
|-----------------------|------------------------------------|--------------|------------|---------|------------------|------------|
| (MHz) | mV/m | dBuV/m | | uV/m | dBu | V/m |
| 902-928 | 50 | 94 (Average) | 114 (Peak) | 500 | 54 (Average) | 74 (Peak) |

Note:

- 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

| Frequency Range (MHz) | Distance (m) | Field strength (dB µ V/m) |
|-----------------------|--------------|---------------------------|
| 30-88 | 3 | 40.0 |
| 88-216 | 3 | 43.5 |
| 216-960 | 3 | 46.0 |
| Above 960 | 3 | 54.0 |

Note:

- 1. RF Voltage $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4 All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-10G, the final emission level got using PK. For fundamental measurement, PK detector used.

Report No.: FCC1512020-03 Page 14 of 41

Date: 2015-12-16



6.5 Test result

A Fundamental & Harmonics Radiated Emission Data

| Product: | Network Camera with Smart | Test Mode: | Keep transmitting |
|---------------|-------------------------------|--------------|-------------------|
| | Gateway | | |
| Test Item: | Fundamental Radiated Emission | Temperature: | 25℃ |
| | Data | | |
| Test Voltage: | 120V~ | Humidity: | 56% |
| Test Result: | Pass | | |

| Frequency | Emission PK/AV | Horiz / | Limits PK/AV | Margin |
|-----------|----------------|---------|--------------|--------|
| (MHz) | (dBuV/m) | Vert | (dBuV/m) | (dB) |
| 908.42 | 90.82(PK) | Н | 114/94 | -23.18 |
| 908.42 | 93.46(PK) | V | 114/94 | -20.54 |
| 1816.84 | 50.73(PK) | Н | 74/54 | -3.27 |
| 1816.84 | 51.23(PK) | V | 74/54 | -2.77 |
| 2725.26 | 43.50(PK) | Н | 74/54 | -10.50 |
| 2725.26 | 44.50(PK) | V | 74/54 | -9.50 |
| 3633.68 | 38.96(PK) | Н | 74/54 | -15.04 |
| 3633.68 | 39.46(PK) | V | 74/54 | -14.54 |
| 4542.1 | | H/V | 74/54 | |
| 5450.52 | | H/V | 74/54 | |
| 6358.94 | | H/V | 74/54 | |
| 7267.36 | | H/V | 74/54 | |
| 8175.78 | | H/V | 74/54 | |
| 9084.2 | | H/V | 74/54 | |

Note:

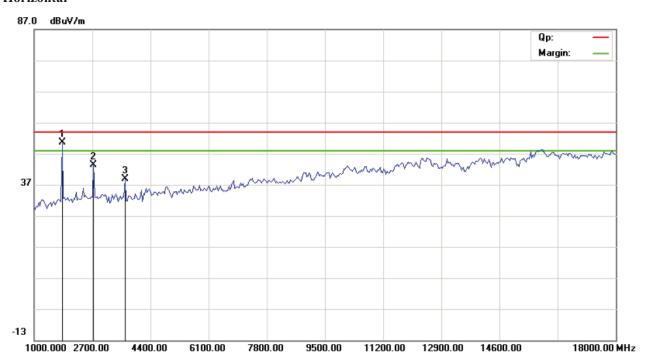
- (1) PK= Peak, AV= Average
- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss.
- (3)Margin=Emission-Limits
- (4)According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) The measured PK value less than the AV limit.

Date: 2015-12-16

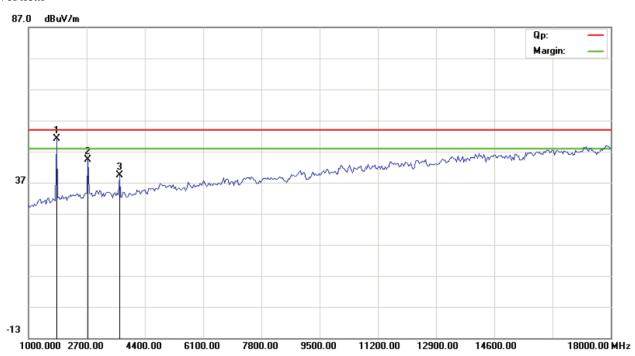


Please refer to the following test plots for details:

Horizontal



Vertical



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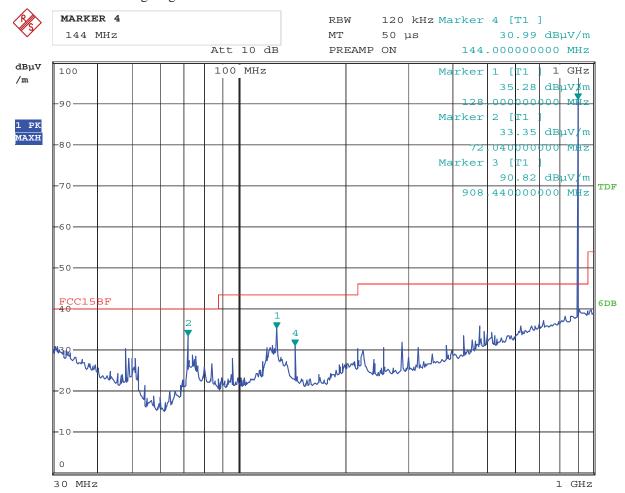


B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



Date: 15.DEC.2015 15:06:37

| Frequency (MHz) | Level@3m (dB \u03b4 V/m) | Antenna Polarity | Limit@3m (dB \u03b4 V/m) | | |
|-----------------|--------------------------|------------------|--------------------------|--|--|
| 144.000 | 30.99 | Н | 43.50 | | |
| 128.000 | 35.28 | Н | 43.50 | | |
| 72.040 | 33.35 | Н | 40.00 | | |

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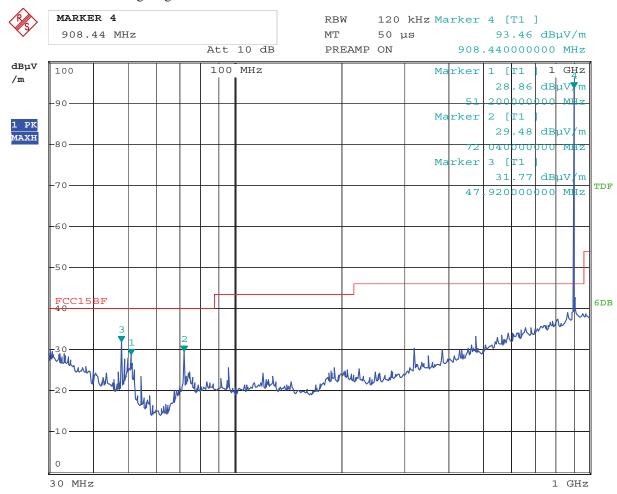


Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



Date: 15.DEC.2015 15:11:55

| Frequency (MHz) | Level@3m (dB \u03b4 V/m) | Antenna Polarity | Limit@3m (dB \mu V/m) | | |
|-----------------|--------------------------|------------------|-----------------------|--|--|
| 51.200 | 28.86 | V | 40.00 | | |
| 72.040 | 29.48 | V | 40.00 | | |
| 47.920 | 31.77 | V | 40.00 | | |

Date: 2015-12-16

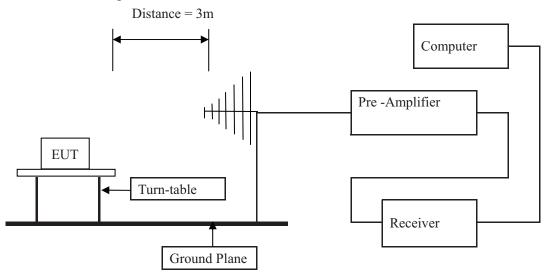


7. Band Edge

7.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) Set Spectrum as RBW=120kHz,VBW=300kHz and Peak detector used
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

7. 2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

7.3 Configuration of The EUT

Same as section 5.3 of this report

7.4 EUT Operating Condition

Same as section 5.4 of this report.

7.5 Band Edge Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

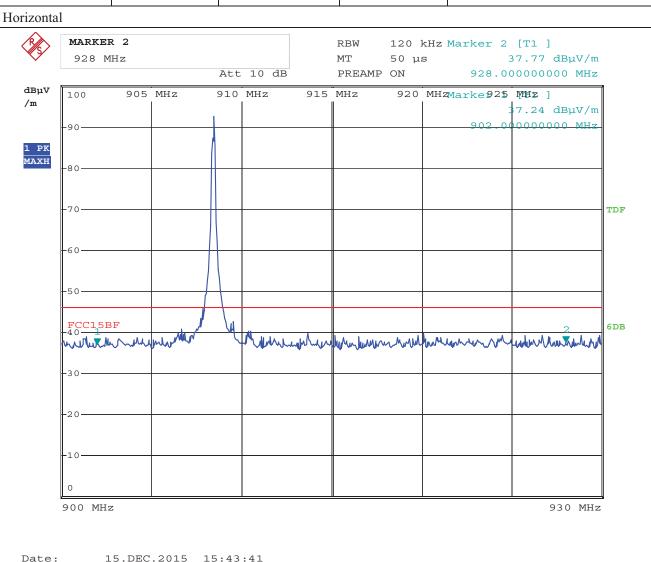
Report No.: FCC1512020-03 Page 19 of 41

Date: 2015-12-16



7.6 Test Result

| Product: | | nera with Smart teway | | Horizontal |
|--------------|-------------------|--------------------------|--------------|----------------|
| Mode | Keeping | Fransmitting | Test Voltage | 120V~V |
| Temperature | 24 deg. C, | | Humidity | 56% RH |
| Test Result: | Pass | | | - |
| 902MHz | QK (dBµV/m) | 37.24 | Limit | $46~dB\mu V/m$ |
| 928MHz | QK (dBμV/m) 37.77 | | Limit | $46~dB\mu V/m$ |



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Page 20 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



| Pr | oduct: | | nera with Smart teway | | Vertical | | |
|---------------|--|---|---|---------------------------------|---|--|--|
| | Mode | | Fransmitting | Test Voltage | 120V~ | | |
| | perature | | | Humidity | 56% RH | | |
| | Result: | 24 deg. C, Humidity 56% RH Pass | | | | | |
| | 2MHz | PK (dBμV/m) | 35.69 | Limit | 46(dBμV/m) | | |
| 92 | 8MHz | PK (dBμV/m) | 35.88 | Limit | $46(dB\mu V/m)$ | | |
| Vertica | 1 | | | | | | |
| 8/ \$> | MARKER 2 928 MHz | Ati | RBW MT t 10 dB PRE | 120 kHz Ma 100 ms EAMP ON | rker 2 [T1] 35.88 dBµV/m 928.000000000 MHz | | |
| lΒμV 'm | 100 9 | 910 MHz | MHz 915 MHz | 920 MHzMa | rke 925 MHz] 35.69 dBµV/m | | |
| 1 PK VIEW | -80 -70 -60 -50 -50 -50 -50 -30 | number 1 | ty the many types of the same | id-downther Men Strategic M | 6DB | | |
| · | 0 | | | | | | |
| ¥ | 900 MHz | | | | 930 MHz | | |

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Report No.: FCC1512020-03 Page 21 of 41

Date: 2015-12-16



8.0 Antenna Requirement

Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has a integral antenna. The antenna gain is 2.0dBi. It fulfills the requirement of this section.

Test Result: Pass

Page 22 of 41 Report No.: FCC1512020-03

Date: 2015-12-16



| 0.0 20dB Bandwid | NT 4 | | :/1 0 | t C | | T- 43 | \ f - 1 | | IZ - 4 | | |
|---|---------------------------------|--------|----------|------------|---------------|-----------------------|-----------------------|-------|----------------------|----------|---------|
| Product: Network Camera with Smart Gateway Mode Keeping Transmitting | | | - | Test Mode: | | Keep transmitting | | | <u> </u> | | |
| | Keeping Transmitting 24 deg. C, | | | | - | Test Voltage Humidity | | 120V~ | | | |
| Temperature | | | | | | | | | 56% RH | | |
| Test Result: | | | Pass | | | Det | ector | PK | | | |
| 20dB Bandwidth | | | 168kHz | | | • | - | | • | | |
| r) | | Marker | 1 [T1 r | ndB] | RB | W | 30 k | Hz : | RF Att | 20 đ | .B |
| Ref Lvl | | ndB | | .00 dB | VB | W | 100 k | | | | |
| 10 dBm | | BW 168 | 3.336673 | 335 kHz | SW | Т | 5 m | s · | Unit | đ | .Bm |
| 10 | | | | | | | v ₁ | [T1] | -1 | 4.56 d | Bm |
| | | | | | | | | 9 | 908.4029 | 6593 M | A Hz |
| 0 | | | | | | | ndB | | 2 | 0.00 d | В |
| | | | | | | | BW | 1 | L68.3366 | 7335 k | Hz |
| -10 | | | | 1 | | | ∇_{T} | [T1] | -3 | 1 0 1 0 | Bm |
| | | | | Ż. | $\overline{}$ | | ∇ | | 908.3348 | | |
| -20 | | | | | $\overline{}$ | | $ abla_{\mathrm{T2}}$ | | -3 908.5031 | 4.48 d | |
| 1MAX | | | | | | | | 2 | 908.5031 | 6633 M. | 1MA |
| - 30 | | | | T/ | \ | [2 V | | | | | |
| -40 | | | المر | | | \ | | | | | |
| -50 | | مرمسمر | ~~~~ | | | | M. M. | Van | | | |
| -60 | m | w.m. | | | | | | | Warner of the second | mu | ^ |
| -70 | | | | | | | | | | | |
| -80 | | | | | | | | | | | |
| -90 Center 90 | 8 42 N | (Hz | | 100 | kHz/ | | | | gn | an 1 M | Hz |
| CCIICEI 90 | U. 72 N | 1112 | | 100 | / | | | | υĐ | ~11 ± 11 | |

Report No.: FCC1512020-03 Page 23 of 41

Date: 2015-12-16



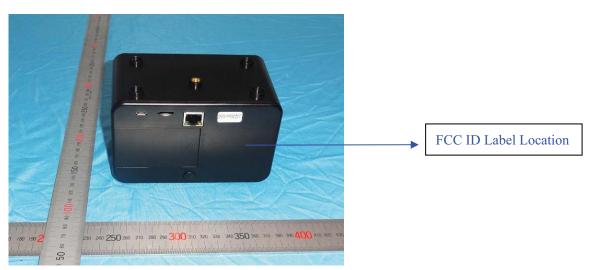
10.0 FCC ID Label

FCC ID: 2AATCSGAB01

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



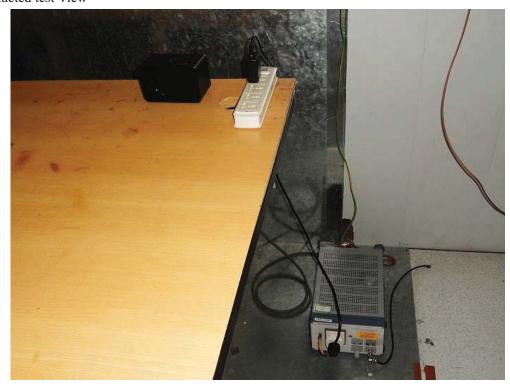
Report No.: FCC1512020-03 Page 24 of 41

Date: 2015-12-16



11.0 Photo of testing

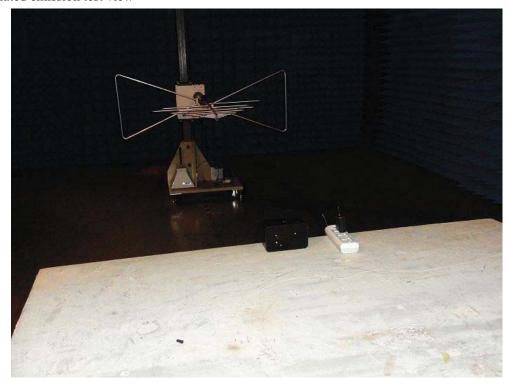
11.1 Conducted test View--



Date: 2015-12-16



11.2 Radiated emission test view





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11.3 Photographs - EUT

Outside view





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Page 27 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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Page 28 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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Page 29 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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Page 30 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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Page 31 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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Page 32 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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Page 33 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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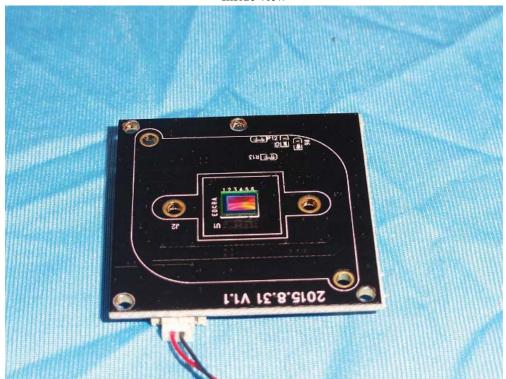
Page 34 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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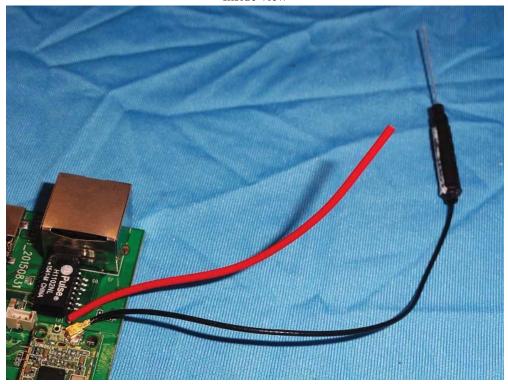
Page 35 of 41

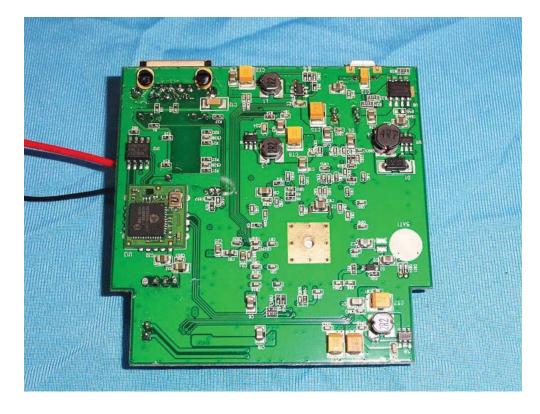
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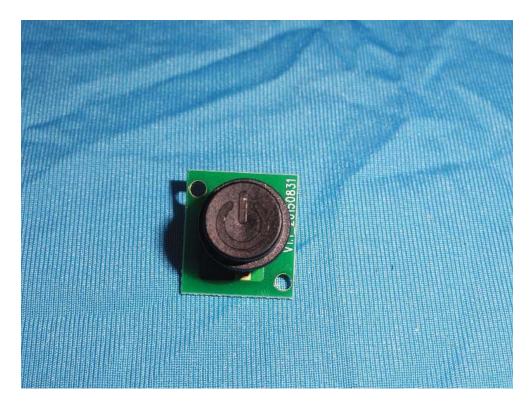
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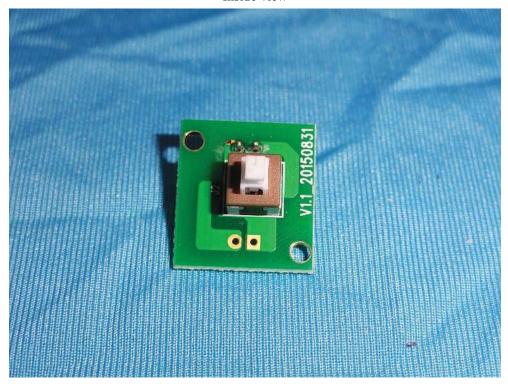
Page 37 of 41

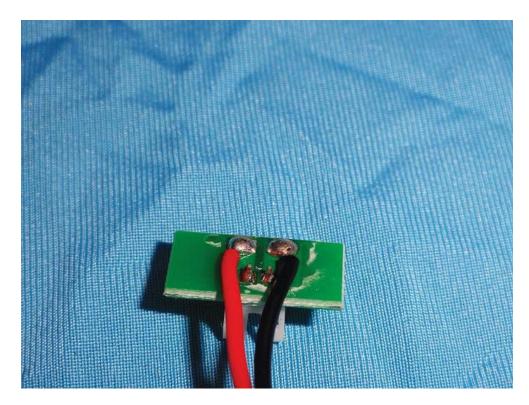
Report No.: FCC1512020-03

Date: 2015-12-16



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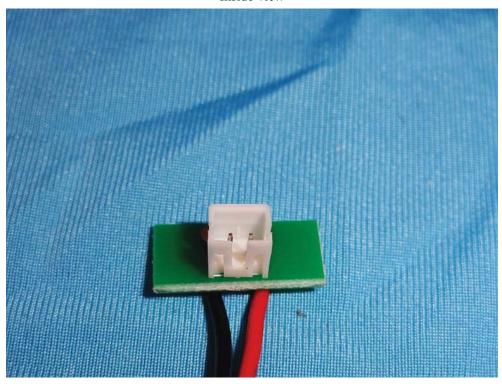
Page 38 of 41

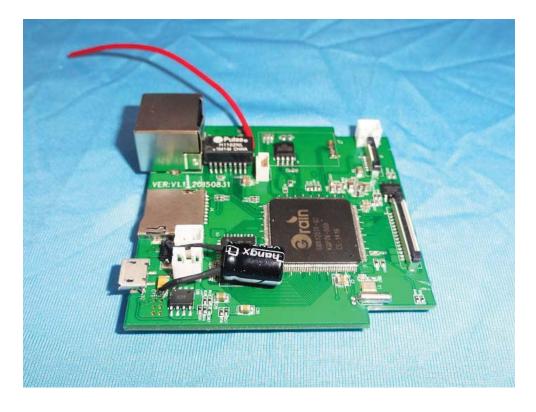
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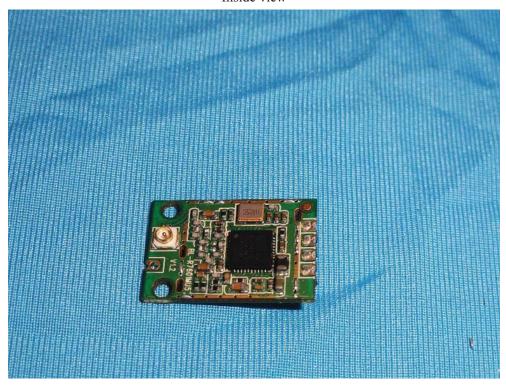
Page 39 of 41

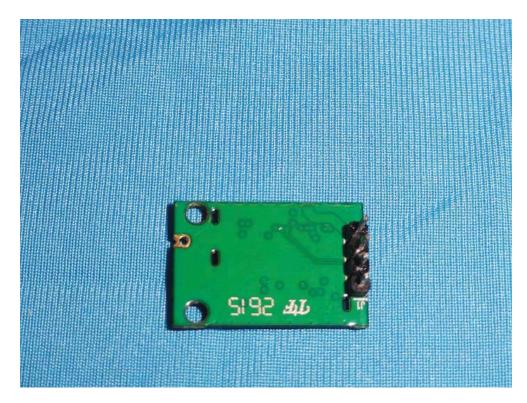
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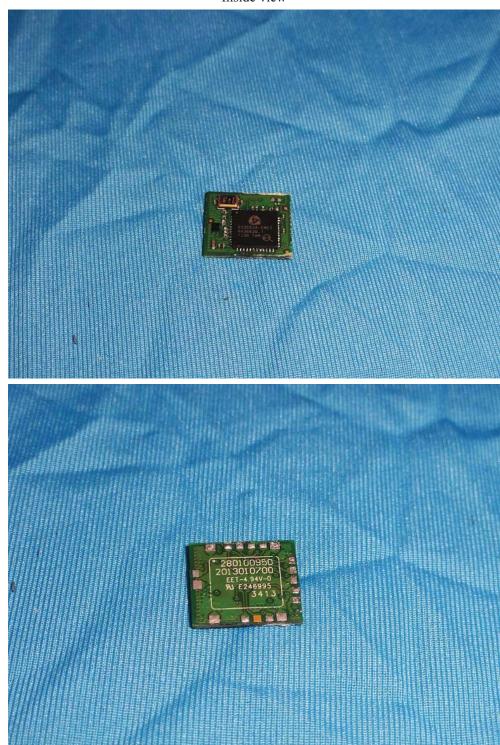
Page 40 of 41

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Date: 2015-12-16



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Page 41 of 41

Report No.: FCC1512020-03

Date: 2015-12-16



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