



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

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## **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



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### 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.

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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

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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

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### 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

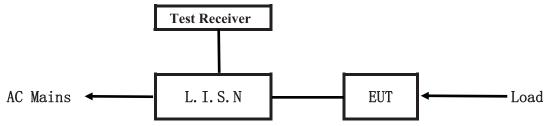
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

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### 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test

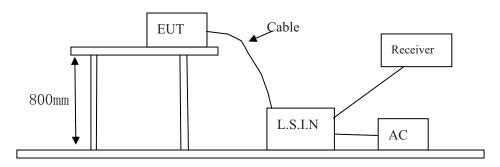


**EUT: Equipment Under Test** 

### 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

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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.

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

**EUT Operating Environment** 

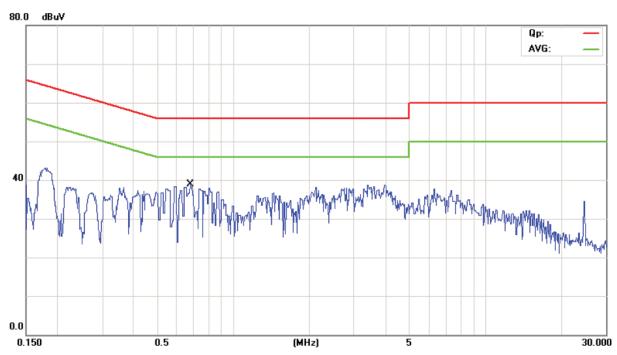
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**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	

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

**EUT Operating Environment** 

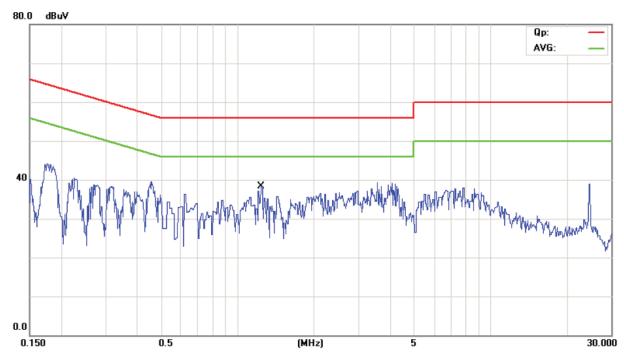
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**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	

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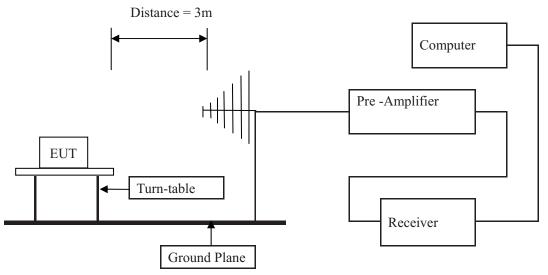
Date: 2015-12-16



### **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.

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#### 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.

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### 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:

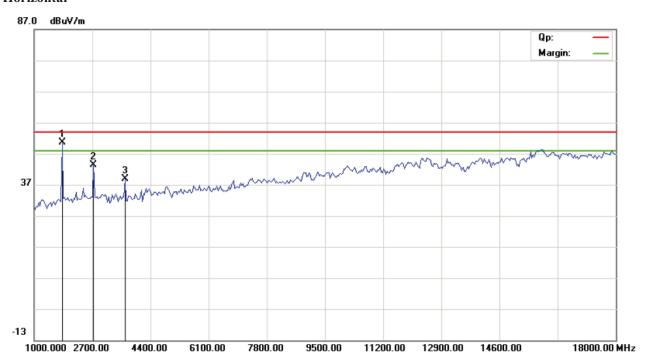
- (1) PK= Peak, AV= Average
- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss.
- (3)Margin=Emission-Limits
- (4)According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) The measured PK value less than the AV limit.

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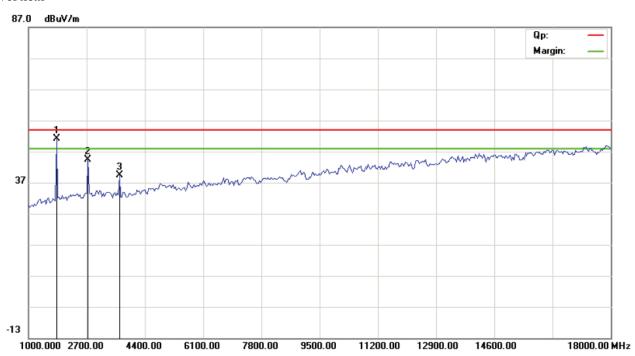


Please refer to the following test plots for details:

### Horizontal



### Vertical



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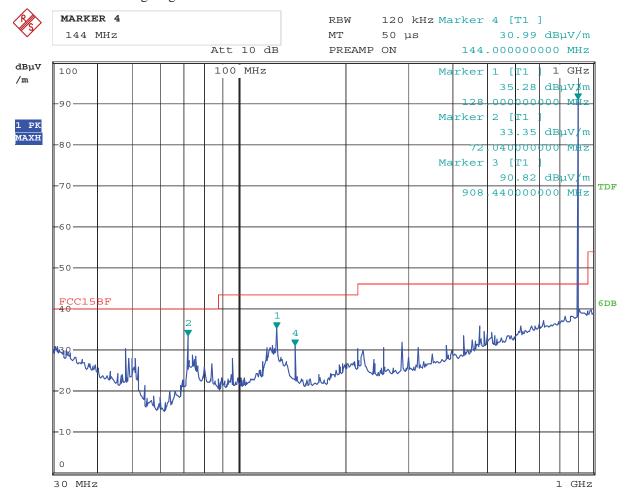


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

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		
ſ	72.040	33.35	Н	40.00		

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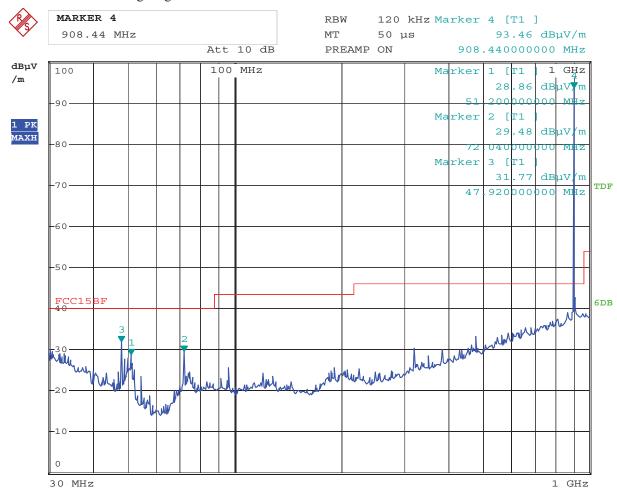


### Radiated Emission In Vertical (30MHz----1000MHz)

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	51.200 28.86		40.00		
72.040	29.48	V	40.00		
47.920	31.77	V	40.00		

Date: 2015-12-16

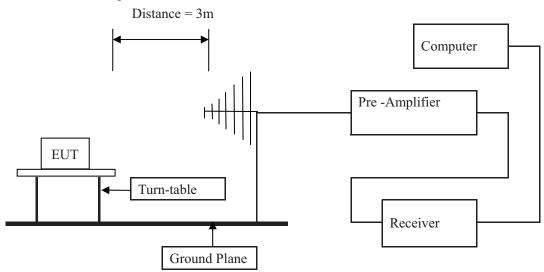


### 7. Band Edge

### 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.

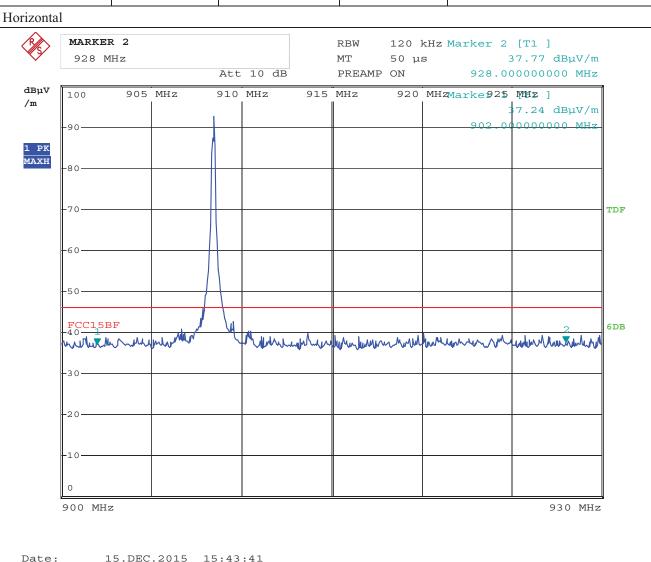
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### 7.6 Test Result

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



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Pr	oduct:		nera with Smart teway		Vertical
	Mode		Fransmitting	Test Voltage	120V~
	perature		leg. C,	Humidity	56% RH
	Result:		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				
<b>8/</b> \$>	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 <b>925 MHz</b> ] 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

15.DEC.2015 15:41:04

Date:

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### 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

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<b>0.0</b> 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 Detector			P	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							$\mathbf{v}_1$	[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			$\nabla_{\mathrm{T}}$	[T1]	-3	1 0 1 0	Bm
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Date: 2015-12-16



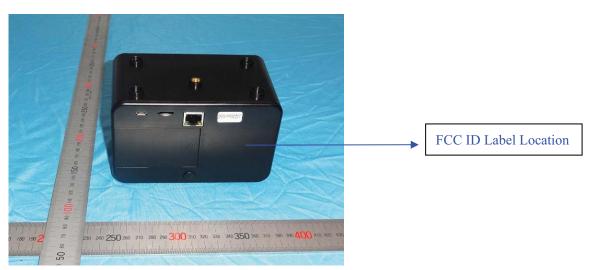
### 10.0 FCC ID Label

### 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:**



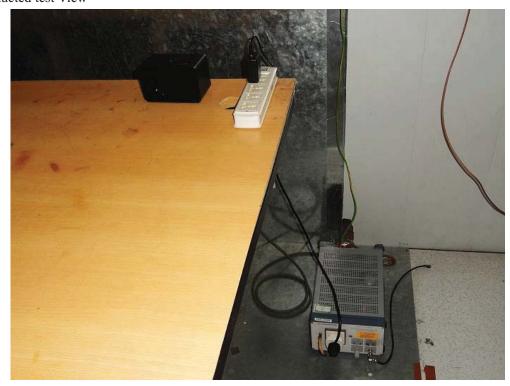
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### 11.0 Photo of testing

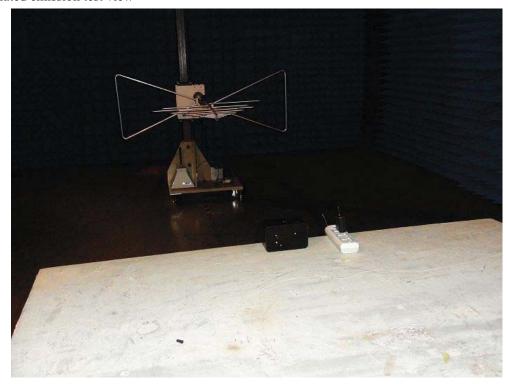
#### 11.1 Conducted test View--



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#### 11.2 Radiated emission test view





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#### 11.3 Photographs - EUT

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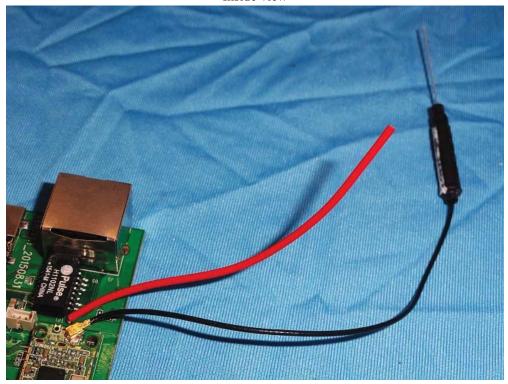
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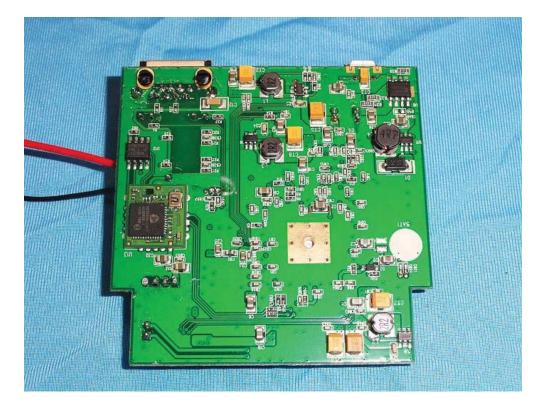
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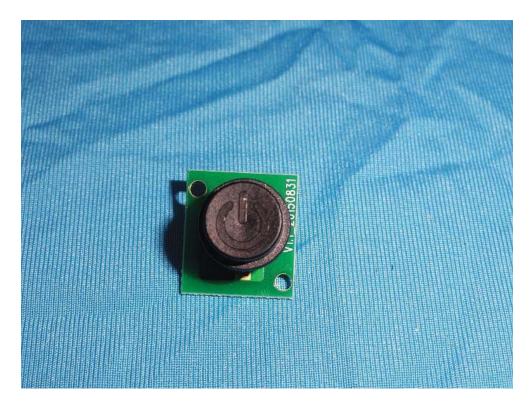
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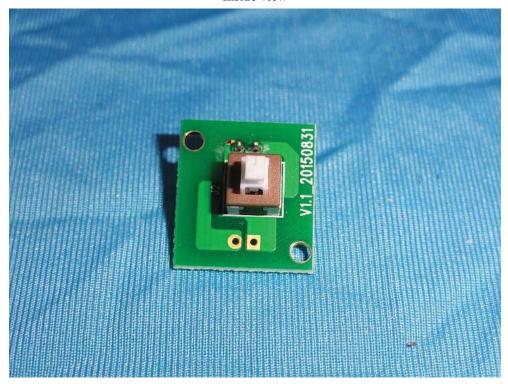
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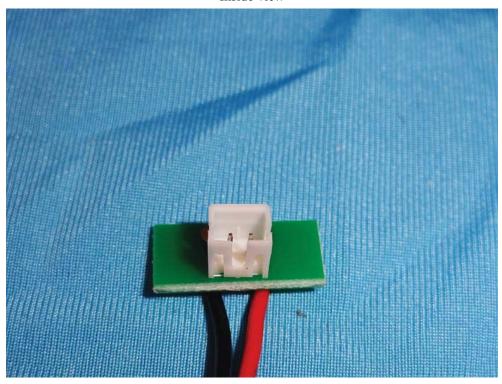
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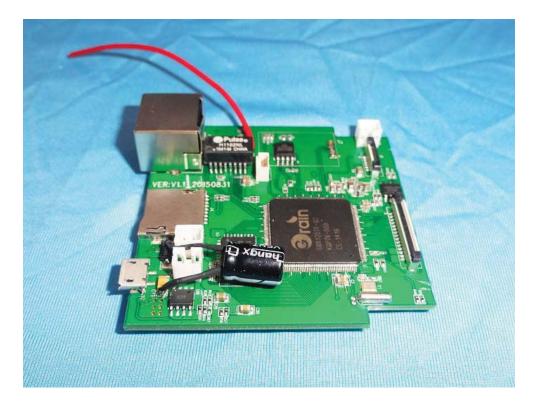
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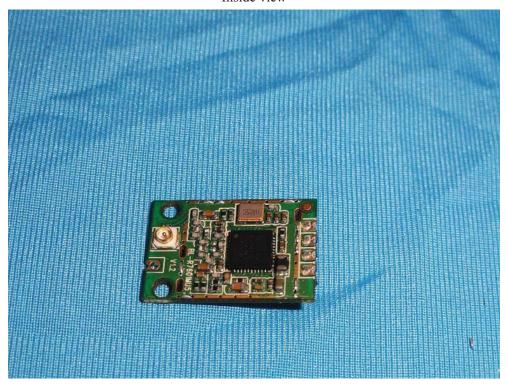
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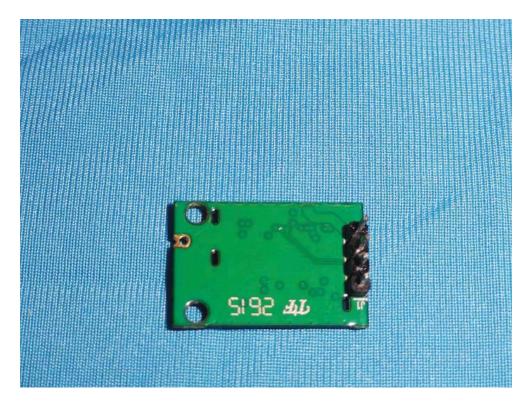
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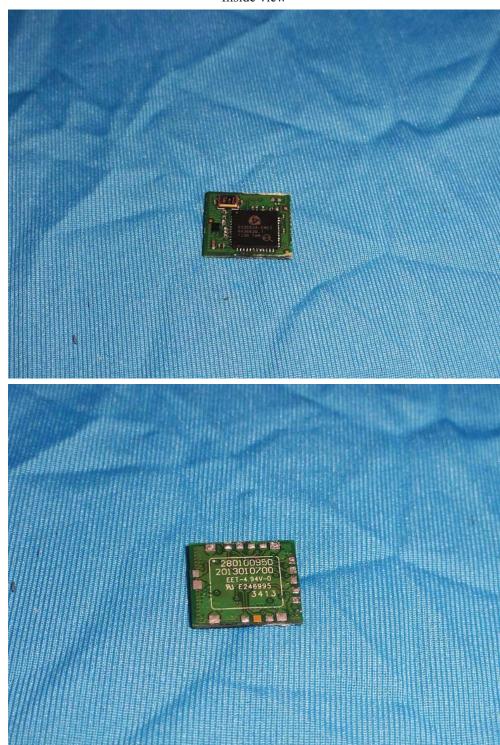
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