

Test Report

Applicant: Tyco Safety Products (Shanghai) Co., Ltd.

Product Name: IP CAMERA

Brand Name: TYCO

Model No.: ISV-X04N005SAF,ISA-X04N005SAF,ISV-X02N005SAF,
ISA-X02N005SAF,ISV-X02N004S,ISV-X02N003S,
ISV-X05N004S

Difference description: There are some differences in appearance, color, screen printing and structure between models, and the internal key hardware is consistent without affecting EMC.

Remark: Provision is made on the basis of the original report, MTE/AVJ/E18071390 basis; Changed applicant, manufacturer, trademark, product name and model.

Date of Receipt : Jul.20, 2018
Jul.01, 2020

Date of Test: Jul.23-25, 2018

Date of Report: Jul.02, 2020

Prepared by: Shenzhen Most Technology Service Co., Ltd.

The testing has been performed on the submitted samples and found in compliance with the council FCC Rules and Regulations Part 15 Subpart B.

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TEST REPORT VERIFICATION

Report Number	MTET20071039	
Applicant	Tyco Safety Products (Shanghai) Co., Ltd.	
	Zone B, Building 2, 88 Wansong Road, Shuyuan Town, Pudong New District, Shanghai, China	
Manufacturer	Tyco Safety Products (Shanghai) Co., Ltd.	
	Zone B, Building 2, 88 Wansong Road, Shuyuan Town, Pudong New District, Shanghai, China	
Product	Product Name	IP CAMERA
	Model No.	ISV-X04N005SAF
	Power Supply	DC 12 V by DC Source
Test Result	The EUT was found compliant with the requirement(s) of the standards.	
Standard	FCC Rules and Regulations Part 15 Subpart B Class B	
<p>*Note The above device has been tested by Shenzhen Most Technology Service Co., Ltd. To determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test record, data evaluation & Equipment Under Test (EUT) configurations represented are contained in this test report and Shenzhen Most Technology Service Co., Ltd. Is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the requirement of the above standards.</p> <p>This report applies to above tested sample only. This report shall not be reproduced except in full, without written approval of Shenzhen Most Technology Service Co., Ltd., this document may be altered or revised by Shenzhen Most Technology Service Co., Ltd., personal only, and shall be noted in the revision of the document.</p>		
Prepared by	<i>Lili Lu</i>	
	Lili Lu(Engineer)	
Reviewed by	<i>Sunny</i>	
	Sunny Deng(Engineer)	
Approved by	<i>Yvette</i>	
	Yvette Zhou(Manager)	

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	IP CAMERA
Model Number	:	ISV-X04N005SAF
Serial Number:	:	Used ISV-X04N005SAF does all tests.

1.2. Operational Mode(s) of EUT

Order Number	:	Test Mode(s)
1	:	Running

1.3. Test Voltage(s) of EUT

Order Number	:	Test Voltage(s)
1	:	DC 12 V by DC Source

2. LABORATORY INFORMATION

2.1. Laboratory Name

Shenzhen Most Technology Service Co., Ltd.

2.2. Location

No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China

2.3. Test facility

- 3m Anechoic Chamber : Nov. 28, 2012 File on Federal Communication Commission
Registration Number:490827
- Shielding Room : Nov. 28, 2012 File on Federal Communication Commission
Registration Number:490827
- EMC Lab. : Accredited by TUV Rheinland Shenzhen
Audit Report: UA 50149851
Mar. 12, 2009
- Accredited by Industry Canada
Registration Number: 7103A-1
Oct. 22, 2012
- Accredited by TIMCO
Registration Number: Q1460
March 28, 2010

2.4. Measurement Uncertainty

No.	Item	Uncertainty
1.	Uncertainty for Conducted Disturbance Test	1.25dB
2.	Uncertainty for Radiated Disturbance Test	3.15dB

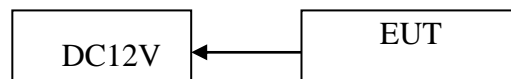
3. SUMMARY OF TEST RESULTS

EMISSION			
Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC Subpart 15 B Section 15.107	Class B	N/A
Radiated disturbance	FCC Subpart 15 B Section 15.109	Class B	PASS
N/A is an abbreviation for Not Applicable.			

4. BLOCK DIAGRAM OF TEST SETUP

The equipments are installed test to meet ANSI C63.4:2014 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. EUT was tested in normal configuration (Please See following Block diagrams)

4.1. Block Diagram of connection between EUT and simulation-EMI



(EUT: IP CAMERA)

5. TEST INSTRUMENT USED

5.1. For Conducted Disturbance at Mains Terminals Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	100492	Mar. 10, 18	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ENV216	100093	Mar. 10, 18	1 Year
3.	Coaxial Switch	Anritsu Corp	MP59B	6200283933	Mar. 10, 18	1 Year
4.	Terminator	Hubersuhner	50Ω	No.1	Mar. 10, 18	1 Year
5.	RF Cable	SchwarzBeck	N/A	No.1	Mar. 10, 18	1 Year

5.2. For Radiation Test (In Anechoic Chamber) (Below 1000MHz)

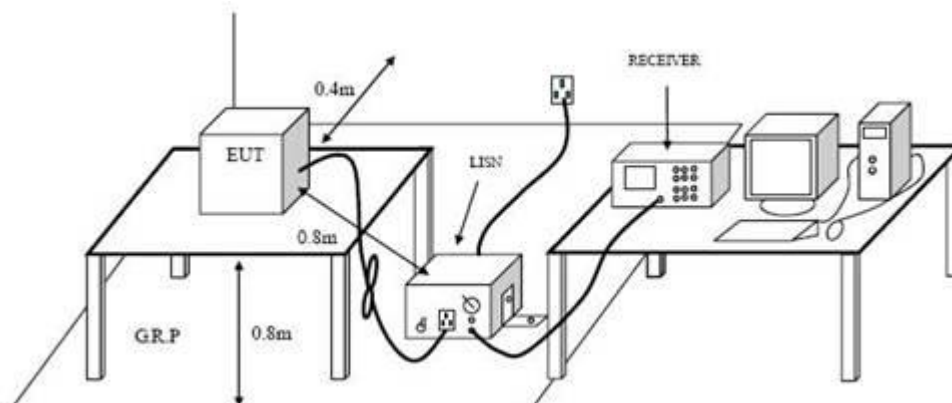
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESPI	101202	Mar. 10, 18	1 Year
2.	Bilog Antenna	Sunol	JB3	A121206	Mar. 10, 18	1 Year
3.	Cable	Resenberger	N/A	NO.1	Mar. 10, 18	1 Year
4.	Cable	SchwarzBeck	N/A	NO.2	Mar. 10, 18	1 Year
5.	Cable	SchwarzBeck	N/A	NO.3	Mar. 10, 18	1 Year
6.	DC Power Filter	DuoJi	DL2×30B	N/A	N/A	N/A
7.	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	N/A	N/A
8.	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	N/A	N/A

5.3 For Radiation Test (In Anechoic Chamber) (Above 1000MHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4408B	MY414400460	Mar. 10, 18	1 Year
2	Pre-Amplifier	DCS	PAP-0118	24001	Mar. 10, 18	1 Year
3	Horn Antenna	Schwarzback	BBHA9120 D	D69250	Mar. 10, 18	1 Year
4	RF Cable	Schwarzback	LL142-10	RF Cable No.1	Mar. 10, 18	1 Year
5	RF Cable	Schwarzback	LL142-0.05	RF Cable No.2	Mar. 10, 18	1 Year
6	DC Power Filter	DuoJi	DL2×30B	N/A	N/A	N/A
7	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	N/A	N/A
8	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	N/A	N/A

6. CONDUCTED DISTURBANCE AT MAINS TERMINALS TEST

6.1. Configuration of Test System



6.2. Test Standard

FCC Subpart 15 B Section 15.107

6.3. Power Line Conducted Disturbance at Mains Terminals Limit

Frequency (MHz)	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

6.4. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on conducted Disturbance test.

The bandwidth of test receiver is set at 9 kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 6.5.

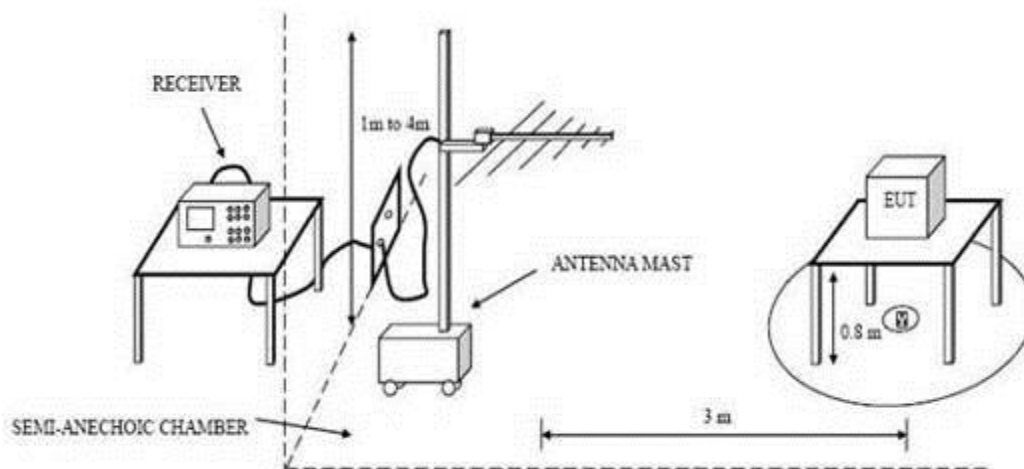
6.5. Conducted Disturbance at Mains Terminals Test Results

6.5.1. Test Results:

N/A

7. RADIATED DISTURBANCE TEST

7.1. Configuration of Test System



7.2. Test Standard

FCC Subpart 15 B Section 15.109

7.3. Radiated Disturbance Limit

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)	
30 ~ 88	3	40.0	
88~216	3	43.5	
216~960	3	46.0	
960 ~ 1000	3	54.0	
1000-18000	3	74(Peak)	54(AV)

Note: 1. Emission level (dB) μ V = 20 log Emission level μ V/m

2. The lower limit shall apply at the transition frequencies.

3. Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT.

7.4. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4:2014 on Radiated Disturbance test.

The bandwidth setting on the test receiver is 120 kHz (frequency range from 30MHz to 1000MHz) and 1MHz (frequency range from 1000MHz to 18000MHz).

The frequency range from 30MHz to 18000MHz is checked. The test result are reported on Section 7.5

7.5. Radiated Disturbance Test Results

7.5.1. Test Results: PASS

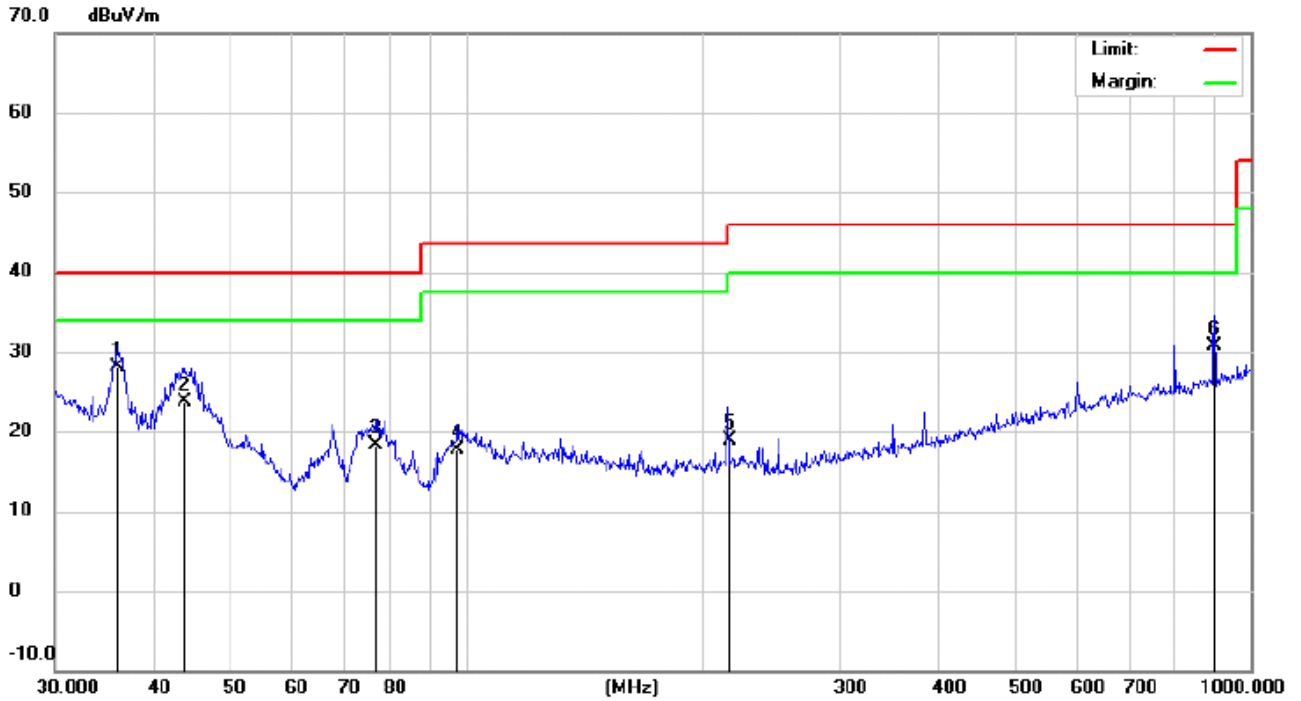
7.5.2. Emission Level= Correct Factor + Reading Level.

7.5.3. All reading are Quasi-Peak values.

7.5.4. The test data and the scanning waveform are attached within Appendix I.

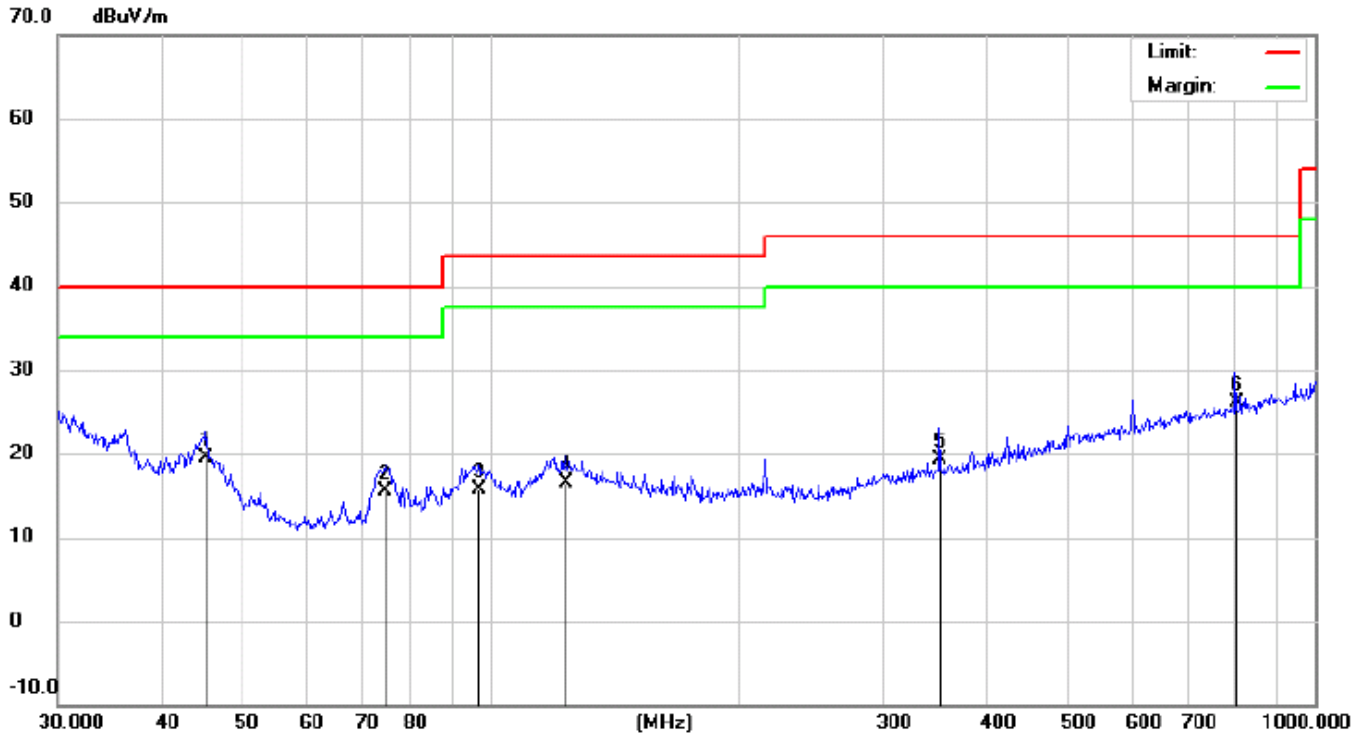
APPENDIX I

EUT:	IP CAMERA	M/N:	ISV-X04N005SAF
Mode:	Running	Polarization:	Vertical
Test by:	Joe	Power:	DC 12 V by DC Source
Temperature: / Humidity	24°C / 51%	Test date:	2018-07-25



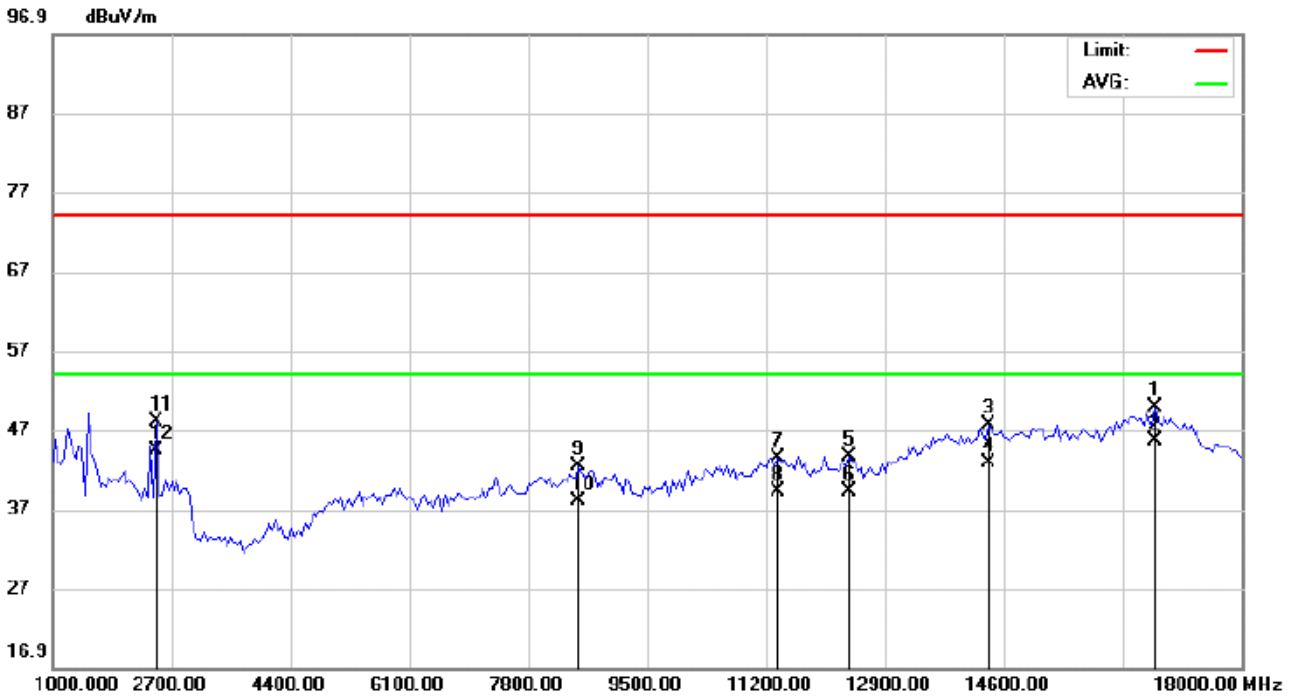
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	36.0007	11.30	16.76	28.06	40.00	-11.94	QP		
2		43.9658	12.50	11.18	23.68	40.00	-16.32	QP		
3		77.0505	10.10	8.16	18.26	40.00	-21.74	QP		
4		97.7983	8.40	9.23	17.63	43.50	-25.87	QP		
5		216.0240	6.90	12.07	18.97	46.00	-27.03	QP		
6		900.1474	8.80	22.00	30.80	46.00	-15.20	QP		

EUT:	IP CAMERA	M/N:	ISV-X04N005SAF
Mode:	Running	Polarization:	Horizontal
Test by:	Joe	Power:	DC 12 V by DC Source
Temperature: / Humidity	24°C / 51%	Test date:	2018-07-25



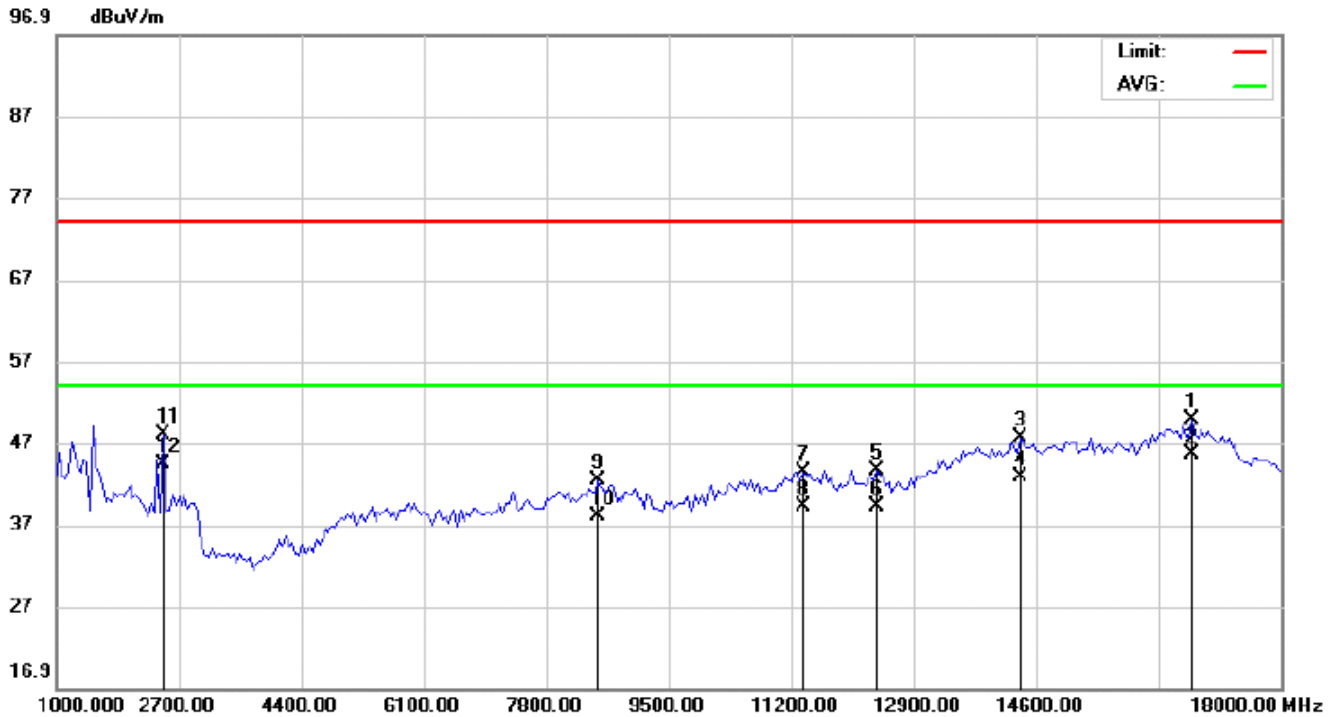
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		45.2166	9.20	10.40	19.60	40.00	-20.40	QP		
2		74.6568	7.30	8.21	15.51	40.00	-24.49	QP		
3		97.1148	6.60	9.11	15.71	43.50	-27.79	QP		
4		123.2654	2.50	13.93	16.43	43.50	-27.07	QP		
5		350.4767	4.80	14.46	19.26	46.00	-26.74	QP		
6	*	801.7863	5.20	20.92	26.12	46.00	-19.88	QP		

EUT:	IP CAMERA	M/N:	ISV-X04N005SAF
Mode:	Running	Polarization:	Vertical
Test by:	Joe	Power:	DC 12 V by DC Source
Temperature: / Humidity	25°C/ 51%	Test date:	2018-07-25



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		4952.500	43.02	-4.36	38.66	74.00	-35.34			peak
2		4952.500	39.80	-4.36	35.44	54.00	-18.56			AVG
3		8607.500	43.05	-0.72	42.33	74.00	-31.67			peak
4		8607.500	39.80	-0.72	39.08	54.00	-14.92			AVG
5		9925.000	42.86	-2.27	40.59	74.00	-33.41			peak
6		9925.000	38.50	-2.27	36.23	54.00	-17.77			AVG
7		12305.00	43.39	0.61	44.00	74.00	-30.00			peak
8		12305.00	39.40	0.61	40.01	54.00	-13.99			AVG
9		14557.50	43.29	4.02	47.31	74.00	-26.69			peak
10	*	14557.50	38.90	4.02	42.92	54.00	-11.08			AVG
11		2487.500	50.02	-8.29	41.73	74.00	-32.27			peak
12		2487.500	46.60	-8.29	38.31	54.00	-15.69			AVG

EUT:	IP CAMERA	M/N:	ISV-X04N005SAF
Mode:	Running	Polarization:	Horizontal
Test by:	Joe	Power:	DC 12 V by DC Source
Temperature: / Humidity	25°C/ 51%	Test date:	2018-07-25



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		16767.50	43.60	6.16	49.76	74.00	-24.24	peak		
2	*	16767.50	39.50	6.16	45.66	54.00	-8.34	AVG		
3		14387.50	43.69	3.99	47.68	74.00	-26.32	peak		
4		14387.50	38.90	3.99	42.89	54.00	-11.11	AVG		
5		12390.00	42.81	0.84	43.65	74.00	-30.35	peak		
6		12390.00	38.40	0.84	39.24	54.00	-14.76	AVG		
7		11370.00	44.30	-0.94	43.36	74.00	-30.64	peak		
8		11370.00	40.10	-0.94	39.16	54.00	-14.84	AVG		
9		8522.500	42.96	-0.63	42.33	74.00	-31.67	peak		
10		8522.500	38.70	-0.63	38.07	54.00	-15.93	AVG		
11		2487.500	56.26	-8.29	47.97	74.00	-26.03	peak		
12		2487.500	52.60	-8.29	44.31	54.00	-9.69	AVG		

APPENDIX II
(Test Photos of the EUT)

Radiated Test Setup Photograph



APPENDIX III
(Photos of the EUT)

Figure 1
General Appearance of the EUT

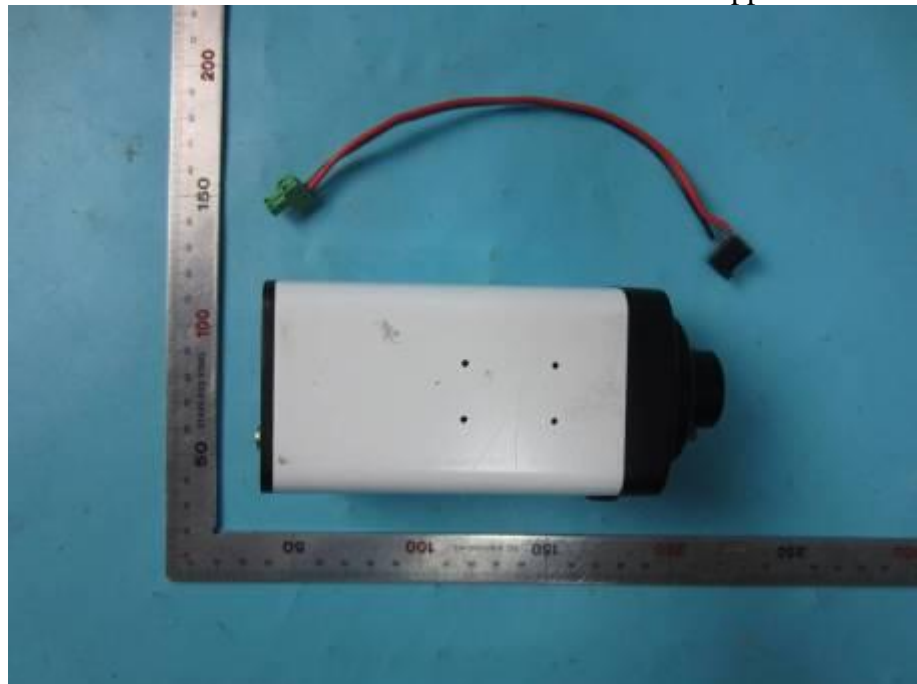


Figure 2
General Appearance of the EUT



Figure 3
General Appearance of the EUT



Figure 4
General Appearance of the EUT

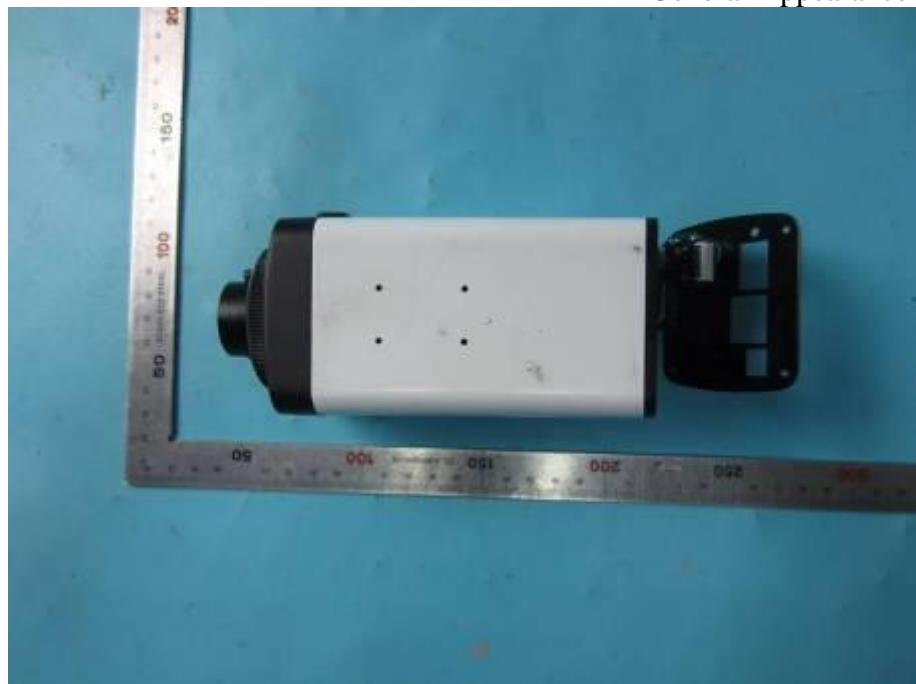


Figure 5
Inside of the EUT

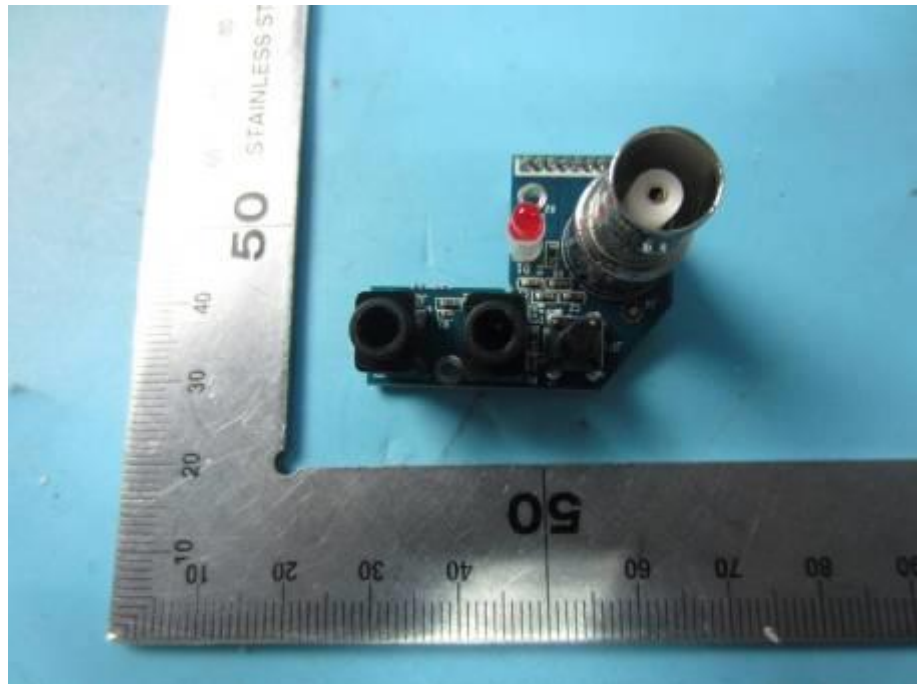


Figure 6
Components Side of the PCB

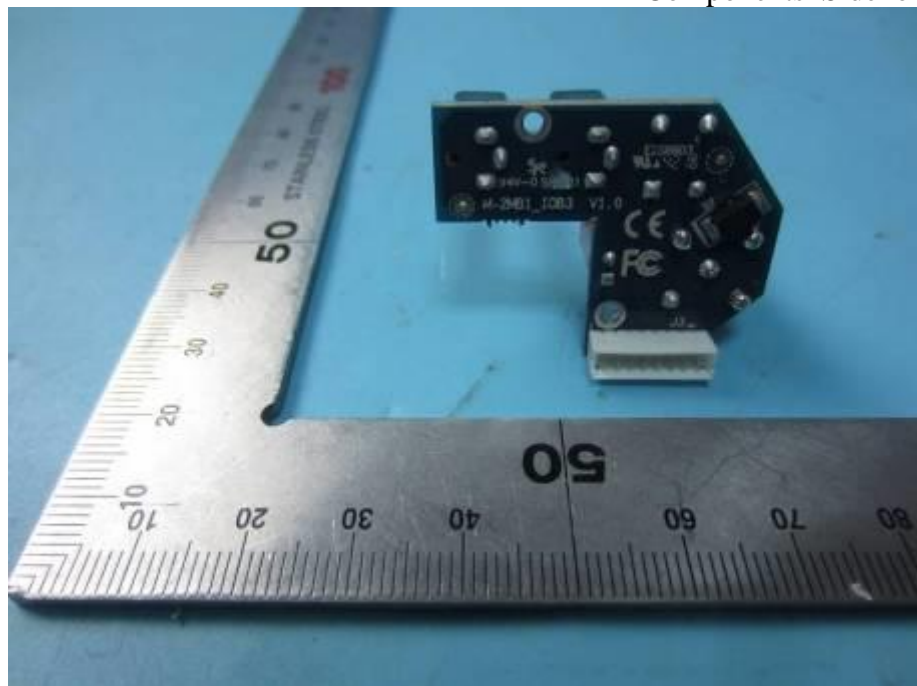


Figure 7
Components Side of the PCB

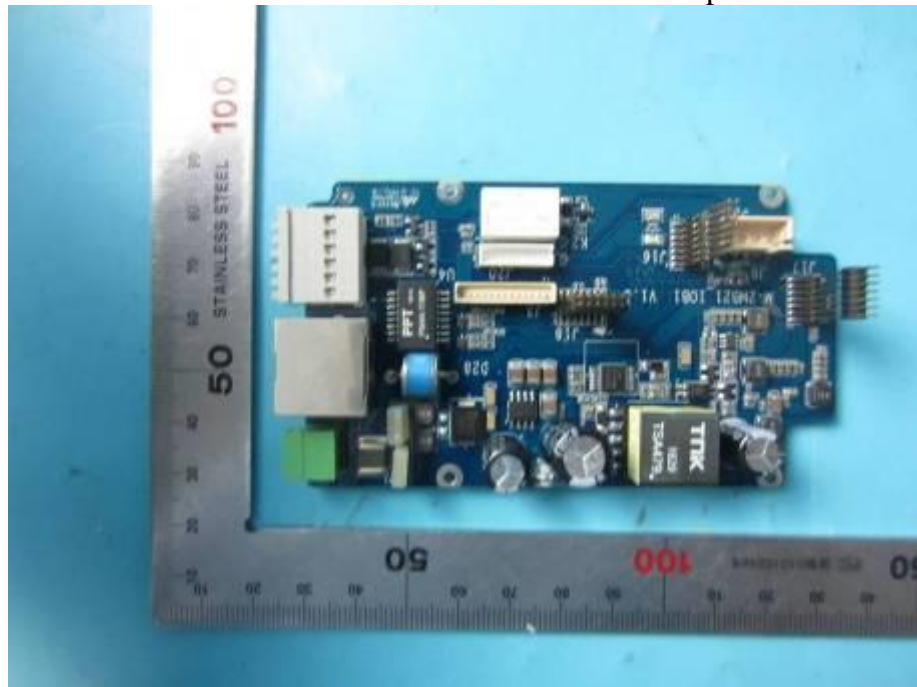


Figure 8
Components Side of the PCB

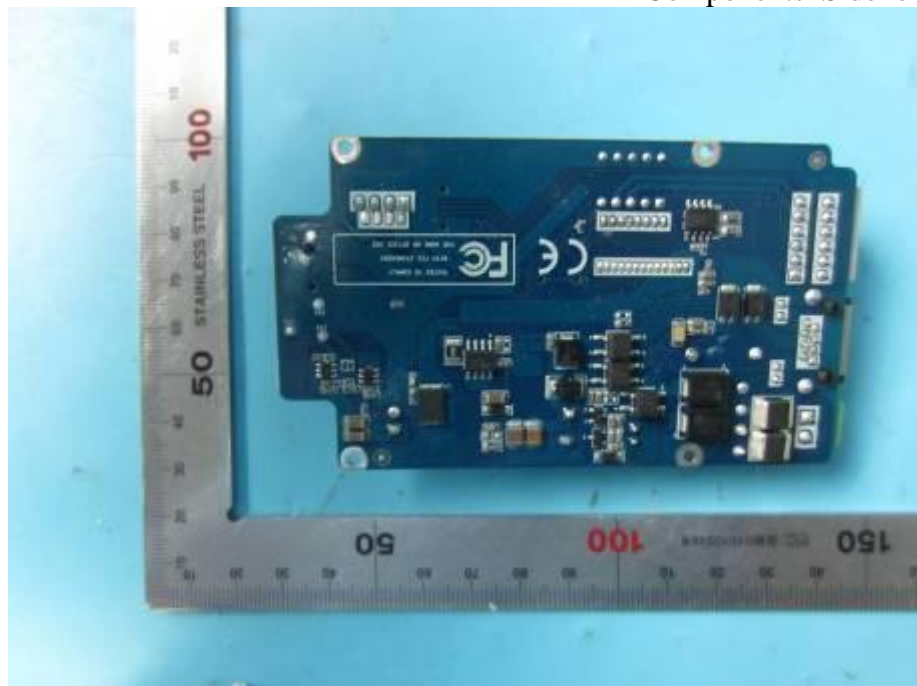


Figure 9
Components Side of the PCB

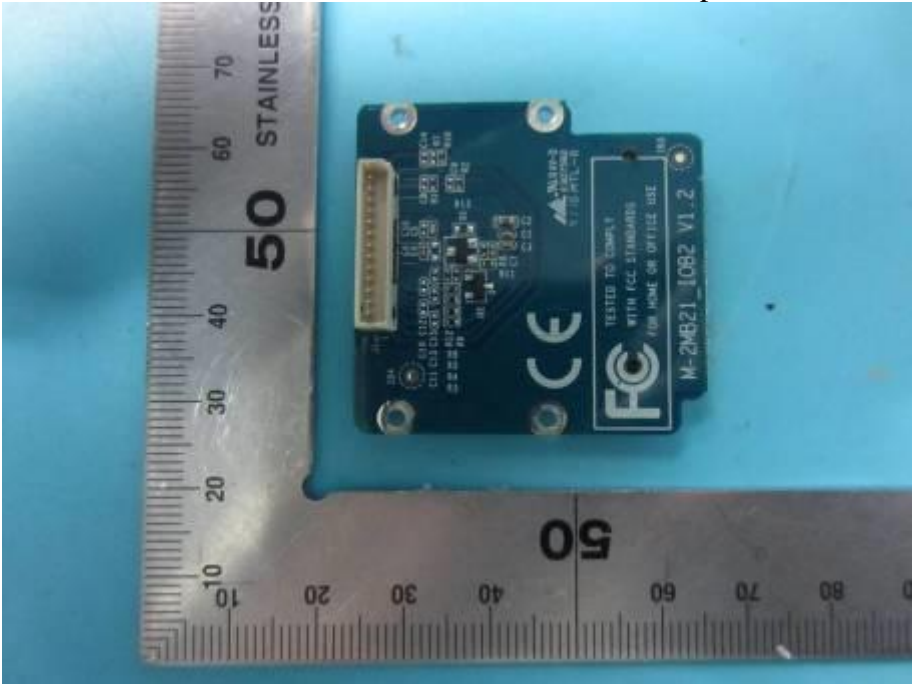


Figure 10
Components Side of the PCB

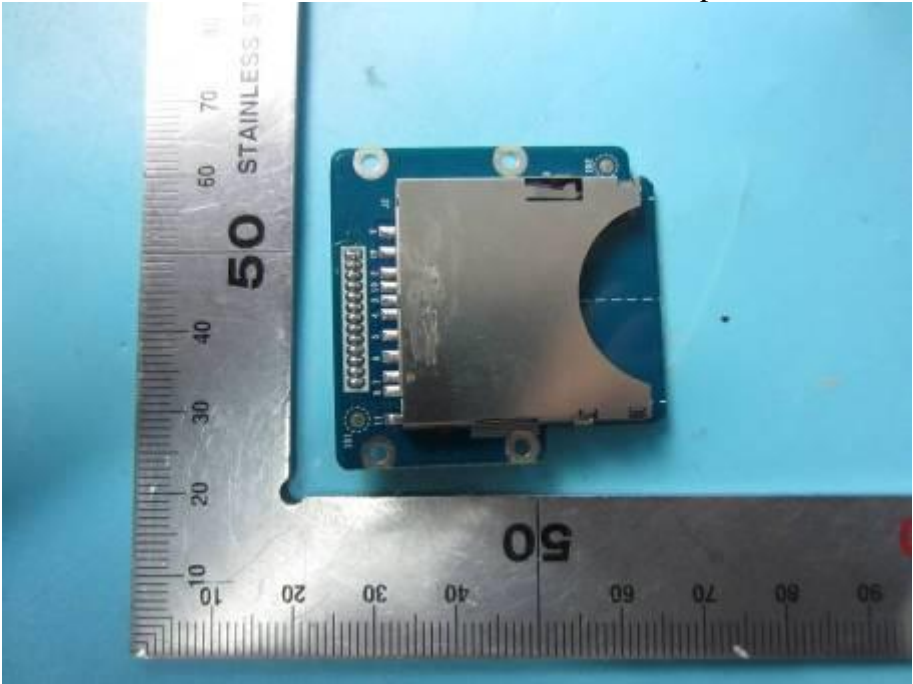


Figure 11
Components Side of the PCB



Figure 12
Components Side of the PCB

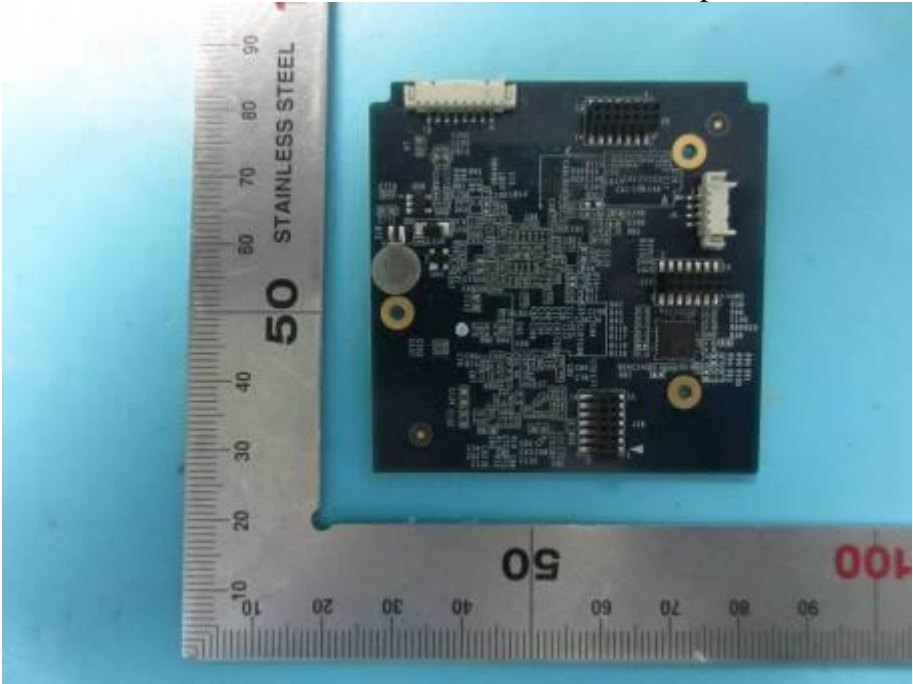


Figure 13
Components Side of the PCB

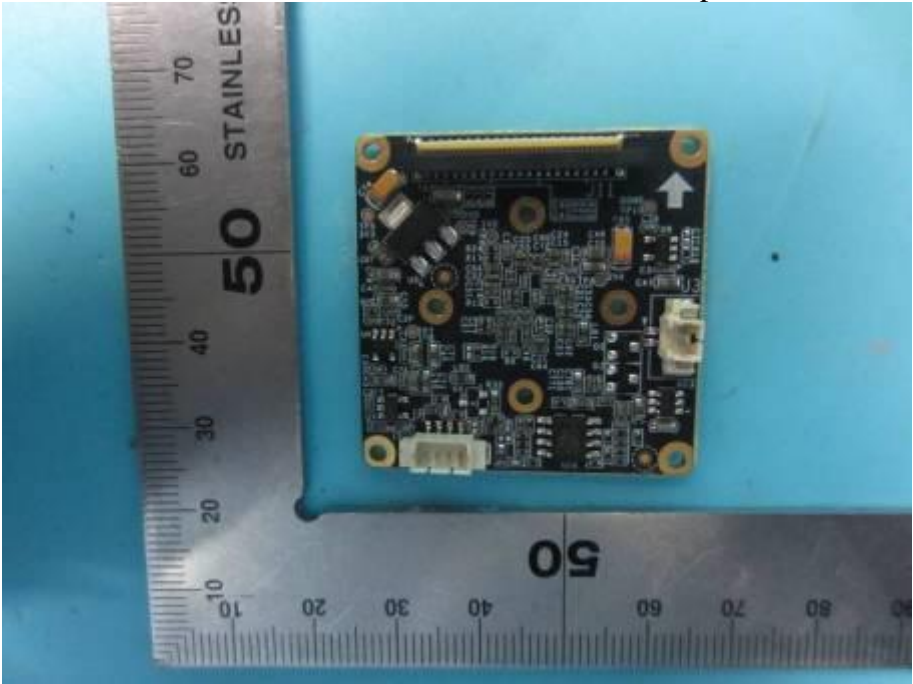


Figure 14
Components Side of the PCB

