



# **EMC TEST REPORT**

## **ETSI EN 301 489-1 V2.1.1 (2017-02)**

## **ETSI EN 301 489-17 V3.1.1 (2017-02)**

**Product :** IP Camera

**Trade Mark :** Sricam

**Model Name :** SP012

**Serial Model :** SP005, SP006, SP007, SP008, SP009,  
SP009B, SP009C, SP010, SP011, SP013,  
SP014, SP015, SP016, SP017, SP018,  
SP019, SP020, SP023, NVS001, NVS002.

**Report No. :** SER171225621003E

### **Prepared for**

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The 4th Floor of Building46, 5th Industrial Park of Huaide Cuigang, Fuyong  
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### **Prepared by**

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**TEST RESULT CERTIFICATION**

**Applicant's name** ..... : Shenzhen Sricctv Technology Co., Ltd  
**Address** ..... : The 4th Floor of Building46, 5th Industrial Park of Huaide  
Cuigang, Fuyong Street, Bao' an, Shenzhen, China  
**Manufacturer's Name** ..... : Shenzhen Sricctv Technology Co., Ltd  
**Address** ..... : The 4th Floor of Building46, 5th Industrial Park of Huaide  
Cuigang, Fuyong Street, Bao' an, Shenzhen, China

**Product description**

**Product name** ..... : IP Camera  
**Trademark** : N/A  
**Model and/or type reference** : SP012  
**Serial Model** : Refer to page 1  
**Standards**..... : ETSI EN 301 489-1 V2.1.1 (2017-02)  
ETSI EN 301 489-17 V3.1.1 (2017-02)

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the of article 3.1(b) of the Directive 2014/53/EU requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test** .....

**Date (s) of performance of tests**..... : 25 Dec. 2017 ~08 Mar. 2018

**Date of Issue** ..... : 08 Mar. 2018

**Test Result**..... : **Pass**

**Testing Engineer** : Lake Xie  
(Lake Xie)

**Technical Manager** : Jason Chen  
(Jason Chen)

**Authorized Signatory** : Sam Chen  
(Sam Chen)



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**Revision History**

Report No.	Version	Description	Issued Date
SER171225621003E	Rev.01	Initial issue of report	Mar 08, 2018

## 1. TEST SUMMARY

Test procedures according to the technical standards:

ETSI EN 301 489-1 V2.1.1 (2017-02)

ETSI EN 301 489-17 V3.1.1 (2017-02)

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
EN61000-3-2:2014	Harmonic Current Emission	Class A or D NOTE (2)	N/A	
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	-----	PASS	
EMC Immunity				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006+A1:2008+A2:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	PASS	
EN 61000-4-5:2006	Surges	B	PASS	
EN 61000-4-6:2009	Injected Current	A	PASS	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C / C NOTE (3)	PASS	

### NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

(2) The power consumption of EUT is less than 75W and no Limits apply.

(3) Voltage dip: 100% reduction – Performance Criteria **B**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage Interruption: 100% Interruption – Performance Criteria **C**

(4) For client's request and manual description, the test will not be executed.

### 1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao' an District, Shenzhen 518126 P.R. China

FCC Registered No.: 463705 IC Registered No.:9270A-1

CNAS Registered No.:L5516

### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95** %.

#### A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

#### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~6GHz	5.0	



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	IP Camera
Trade Mark	Sricam
Model Name	SP012
Serial Model	Refer to page 1
Model Difference	All the model are the same circuit and RF module, except the appearance.
Frequency Bands:	<input type="checkbox"/> BT: 2402~2480 MHz <input checked="" type="checkbox"/> WIFI: 802.11b/g/n(20MHz): 2412~2472MHz 802.11n(40MHz):2422~2462MHz <input type="checkbox"/> GPS: 1.57542GHz <input type="checkbox"/> FM Receiver
Modulation Mode:	<input type="checkbox"/> BT(1Mbps): GFSK <input type="checkbox"/> BT EDR(2Mbps): $\pi/4$ -DQPSK <input type="checkbox"/> BT EDR(3Mbps): 8-DPSK <input checked="" type="checkbox"/> IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) <input checked="" type="checkbox"/> IEEE 802.11g/n (HT20/HT40) : OFDM(64QAM, 16QAM, QPSK, BPSK)
Power Rating	DC 5V from Adapter AC 230V/50Hz
Adapter	Model:KA1503-0502000EUS Input: 100-240V~50/60Hz 0.35A Output: 5V---2000mA
Battery	N/A
Antenna:	External Antenna
Hard Ware Version	N/A
Soft Ware Version	N/A



## 2.1 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	WIFI
Mode 2	LAN
Mode 3	TF Playing

For Radiated Test	
Final Test Mode	Description
Mode 1	WIFI
Mode 2	LAN

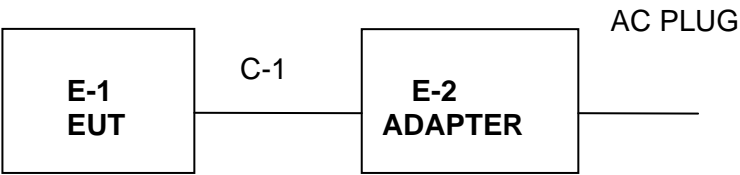
For Conducted Test	
Final Test Mode	Description
Mode 1	WIFI
Mode 2	LAN

For EMS Test	
Final Test Mode	Description
Mode 1	WIFI
Mode 2	LAN
Mode 3	TF Playing

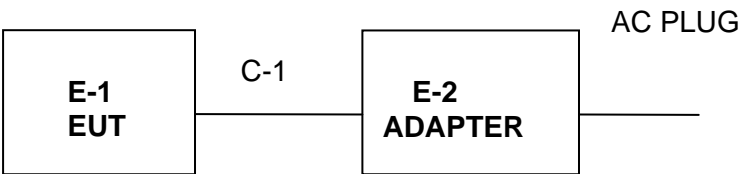
NOTE: The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

2.2 DESCRIPTION OF TEST SETUP

CE



RE



### 2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	IP Camera	Sricam	SP012	N/A	EUT
E-2	ADAPTER	N/A	KA1503-0502000EUS	N/A	

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	Power Cable	NO	NO	1.2m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



## 2.4 MEASUREMENT INSTRUMENTS LIST

## 2.4.1 CONDUCTED EMISSION

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101313	Apr. 19, 2017	Apr. 18, 2018	1 year
2	LISN	SCHWARZBECK	NNLK 8129	8129245	Jun. 06, 2017	Jun. 05, 2018	1 year
3	Pulse Limiter	SCHWARZBECK	VTSD 9561F	9716	Jun. 06, 2017	Jun. 05, 2018	1 year
4	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jul. 06, 2017	Jul. 05, 2018	1 year
5	Test Cable	N/A	C01	N/A	Apr. 21, 2017	Apr. 20, 2020	3 year
6	Test Cable	N/A	C02	N/A	Apr. 21, 2017	Apr. 20, 2020	3 year
7	Test Cable	N/A	C03	N/A	Apr. 21, 2017	Apr. 20, 2020	3 year
8	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2017	Jul. 05, 2018	1 year

## 2.4.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Apr. 09, 2017	Apr. 08, 2018	1 year
2	Test Cable	N/A	R-01	N/A	Apr. 21, 2017	Apr. 20, 2020	3 year
3	Test Cable	N/A	R-02	N/A	Apr. 21, 2017	Apr. 20, 2020	3 year
4	EMI Test Receiver	R&S	ESCI-7	101318	Jul. 06, 2017	Jul. 05, 2018	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jul. 06, 2017	Jul. 05, 2018	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06, 2017	Jul. 05, 2018	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Apr. 09, 2017	Apr. 08, 2018	1 year
10	Amplifier	EMC	EMC051835SE	980246	Aug. 09, 2017	Aug. 08, 2018	1 year

### 2.4.3 HARMONICS AND FILCK

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Harmonic & Flicker	EM TEST	DPA500	0303-04	Jul. 06, 2017	Jul. 05, 2018	1 year
2	AC Power Source	EM TEST	ACS500	0203-01	Jul. 06, 2017	Jul. 05, 2018	1 year

### 2.4.4 ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	ESD TEST GENERATOR	SCHAFFNER	NSG438	859	Jul. 06, 2017	Jul. 05, 2018	1 year

### 2.4.5 RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	Aug. 07, 2017	Aug. 06, 2018	1 year
2	Bilog Antenna	ETS	3142E(Frequency range 30MHz to 6 GHz)	00214344	Dec. 06, 2017	Dec. 05, 2018	1 year
3	Power Amplifier	rflight	NTWPA-00810200	17063153	Aug. 31, 2017	Aug. 30, 2018	1 year
4	Broadband Amplifier	AR	60S1G6	0350414	Dec. 10, 2017	Dec. 09, 2018	1 year
5	Power Amplifier	AR	25S1G4A	308598	Sep. 23, 2017	Sep. 22, 2018	1 year
6	Power Meter	Agilent	E4419B	MY45102538	Aug. 07, 2017	Aug. 06, 2018	1 year
7	Power Sensor	Agilent	E9301A	MY41495644	Aug. 07, 2017	Aug. 06, 2018	1 year
8	Power Sensor	Agilent	E9301A	US39212148	Aug. 07, 2017	Aug. 06, 2018	1 year

### 2.4.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Surge Generator	EVERFINE	EMS61000-5A	1101002	Jul. 06, 2017	Jul. 05, 2018	1 year
2	DIPS Generator	EVERFINE	EMS61000-11K	1011002	Jul. 06, 2017	Jul. 05, 2018	1 year
3	EFT/B Generator	EVERFINE	EMS61000-4A-V2	1012005	Jul. 06, 2017	Jul. 05, 2018	1 year

## 2.4.7 INJECTION CURRENT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Signal Generator	IFR	2023A	202301/368	Mar. 23, 2017	Mar. 22, 2018	1 year
2	Power Amplifier	AR	75A250AM1	0320709	Sep. 23, 2017	Sep. 22, 2018	1 year
3	CDN	FCC	FCC-801-M2	06043	Jun. 02, 2017	Jun. 01, 2018	1 year
4	EM Clamp	FCC	F-203I-23MM	504	Jun. 09, 2017	Jun. 08, 2018	1 year
5	Wideband Radio Communication Tester Specifications	R&S	CMW500	148500	June .28,2017	June .27,2018	1 year



### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

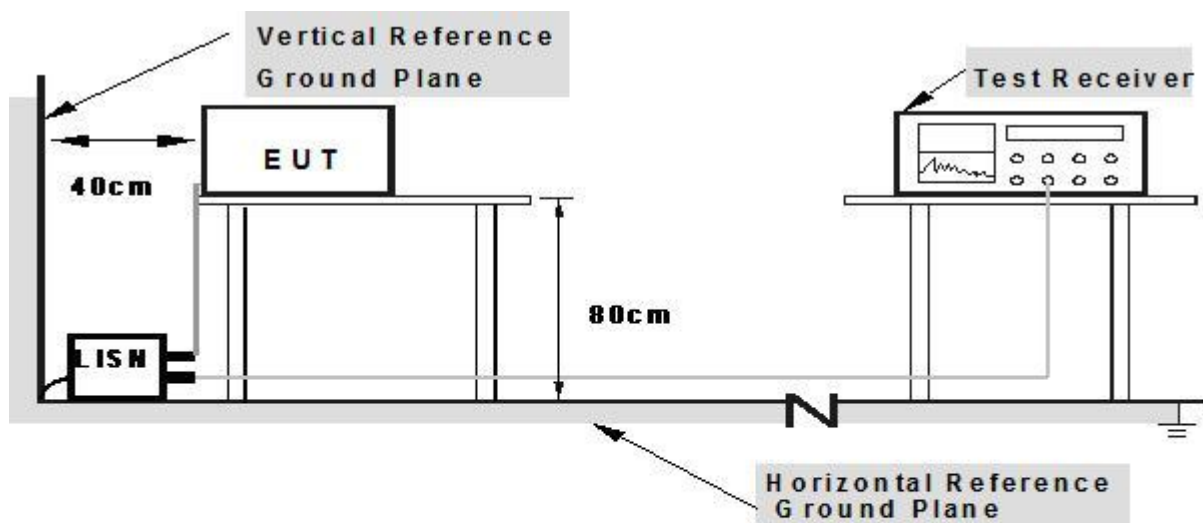
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

## 3.1.5 TEST RESULTS

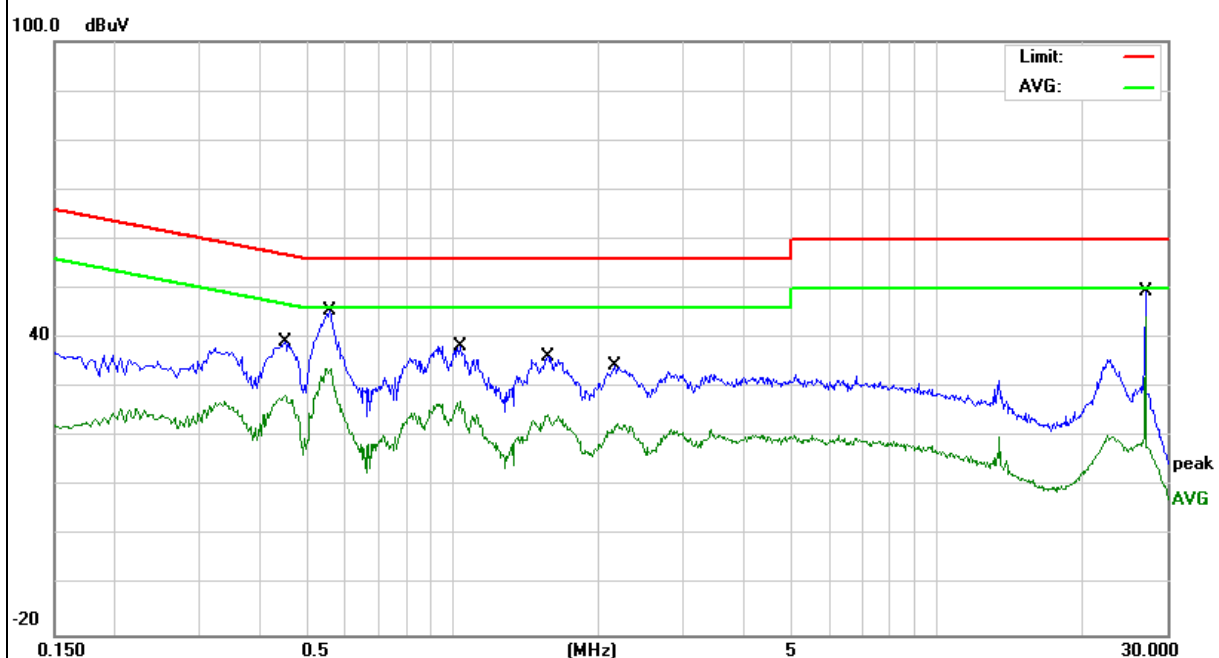
EUT :	IP Camera	Model Name. :	SP012
Temperature :	26 °C	Relative Humidity :	60%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from adapter AC 230V/50Hz	Test Mode :	Mode 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.4500	29.51	9.83	39.34	56.87	-17.53	QP
0.4500	18.21	9.83	28.04	46.87	-18.83	AVG
0.5580	35.70	9.83	45.53	56.00	-10.47	QP
0.5580	24.04	9.83	33.87	46.00	-12.13	AVG
1.0420	28.33	9.93	38.26	56.00	-17.74	QP
1.0420	17.28	9.93	27.21	46.00	-18.79	AVG
1.5700	26.38	9.88	36.26	56.00	-19.74	QP
1.5700	14.33	9.88	24.21	46.00	-21.79	AVG
2.1620	24.60	9.87	34.47	56.00	-21.53	QP
2.1620	11.89	9.87	21.76	46.00	-24.24	AVG
26.9980	39.20	10.32	49.52	60.00	-10.48	QP
26.9980	33.93	10.32	44.25	50.00	-5.75	AVG

## Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.



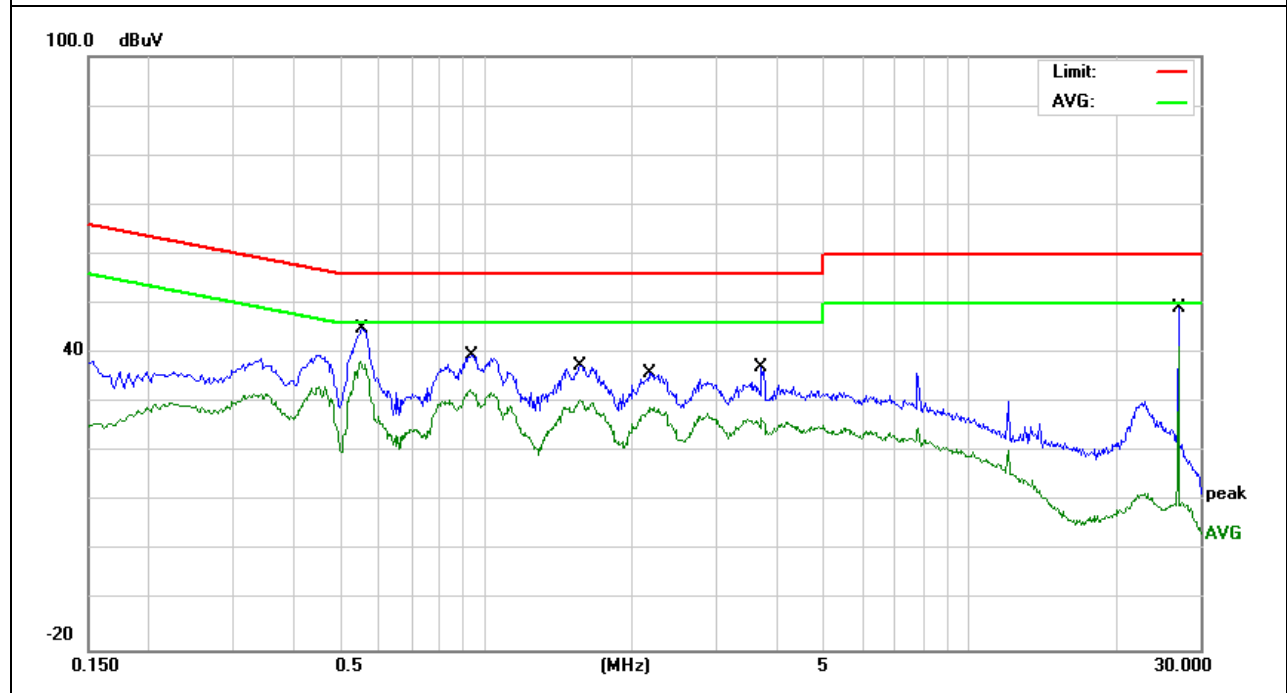


EUT :	IP Camera	Model Name. :	SP012
Temperature :	26 °C	Relative Humidity :	60%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from adapter AC 230V/50Hz	Test Mode :	Mode 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.5540	35.16	9.93	45.09	56.00	-10.91	QP
0.5540	28.45	9.93	38.38	46.00	-7.62	AVG
0.9380	29.77	9.93	39.70	56.00	-16.30	QP
0.9380	22.82	9.93	32.75	46.00	-13.25	AVG
1.5620	27.63	9.94	37.57	56.00	-18.43	QP
1.5620	20.48	9.94	30.42	46.00	-15.58	AVG
2.1779	26.14	9.94	36.08	56.00	-19.92	QP
2.1779	18.26	9.94	28.20	46.00	-17.80	AVG
3.7139	27.13	9.95	37.08	56.00	-18.92	QP
3.7139	16.90	9.95	26.85	46.00	-19.15	AVG
26.9980	38.66	10.40	49.06	60.00	-10.94	QP
26.9980	31.05	10.40	41.45	50.00	-8.55	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

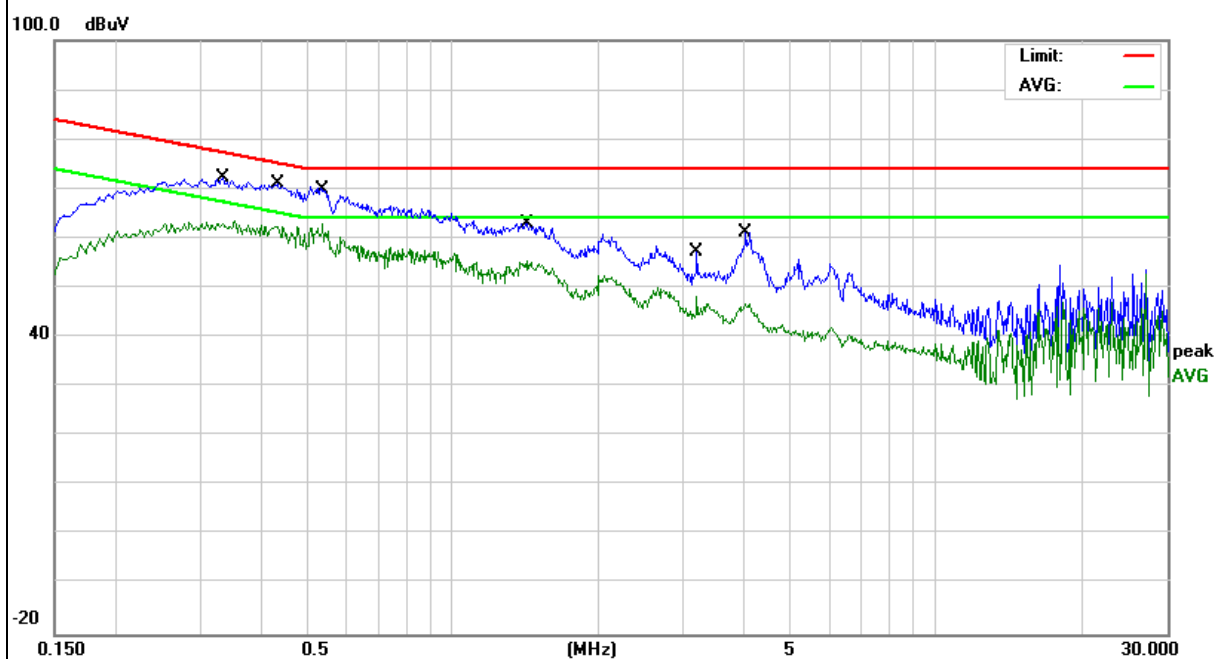


EUT :	IP Camera	Model Name. :	SP012
Temperature :	26 °C	Relative Humidity :	60%
Pressure :	1010hPa	Port:	RJ45
Test Voltage :	DC 5V from adapter AC 230V/50Hz	Test Mode :	Mode 2

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.3339	62.93	9.32	72.25	77.35	-5.10	QP
0.3339	54.21	9.32	63.53	67.35	-3.82	AVG
0.4340	61.56	9.43	70.99	75.18	-4.19	QP
0.4340	52.97	9.43	62.40	65.18	-2.78	AVG
0.5420	60.13	9.53	69.66	74.00	-4.34	QP
0.5420	51.55	9.53	61.08	64.00	-2.92	AVG
1.4260	53.25	9.76	63.01	74.00	-10.99	QP
1.4260	45.21	9.76	54.97	64.00	-9.03	AVG
3.1980	47.35	9.96	57.31	74.00	-16.69	QP
3.1980	38.35	9.96	48.31	64.00	-15.69	AVG
4.0379	51.16	9.99	61.15	74.00	-12.85	QP
4.0379	35.68	9.99	45.67	64.00	-18.33	AVG

## Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.

### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	Class A (at 3m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 – 230	50	40
230 – 1000	57	47

#### 3.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (at 3m) dBuV/m		Class B (at 3m) dBuV/m	
	Peak	Avg	Peak	Avg
1000-3000	76	56	70	50
3000-6000	80	60	74	54

Notes:

- (1) The limit for radiated test was performed according to as following:  
CISPR 32.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

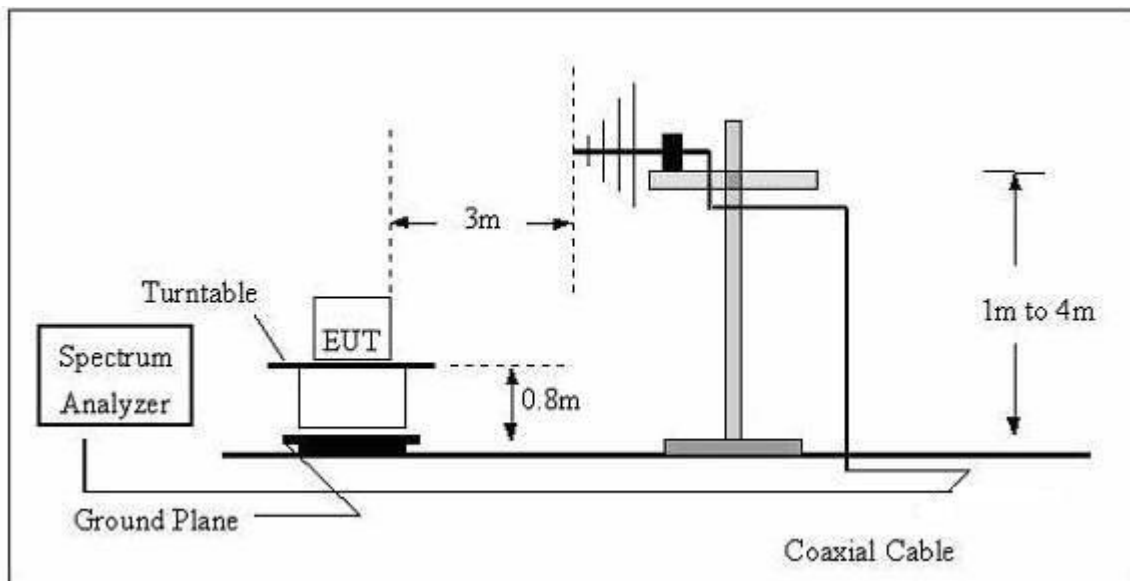
#### 3.2.3 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3M meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

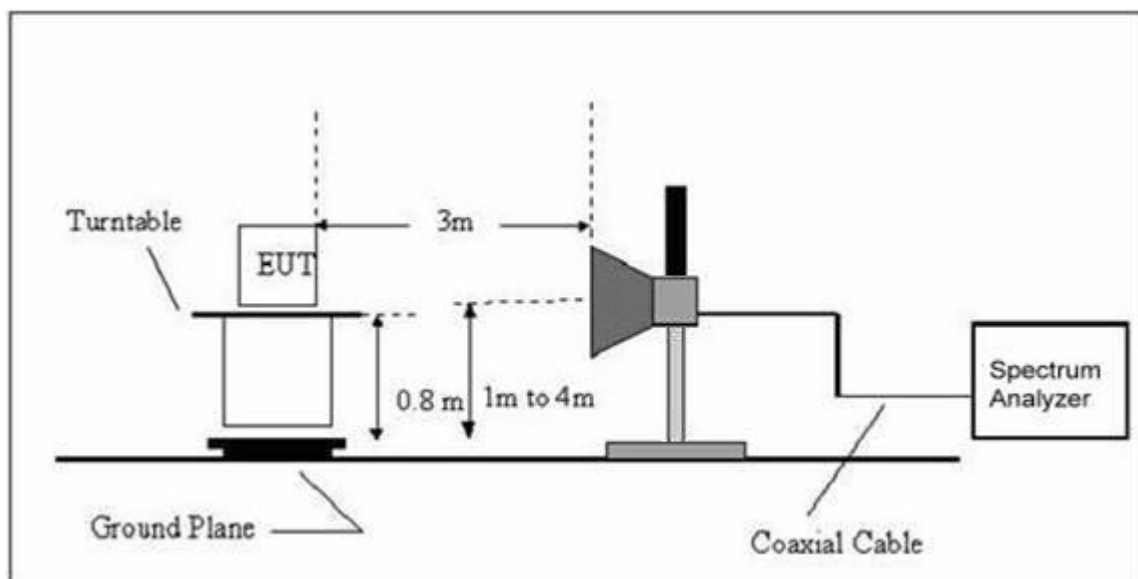


### 3.2.4 TEST SETUP

#### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



#### (B) Radiated Emission Test Set-Up Frequency Above 1GHz



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

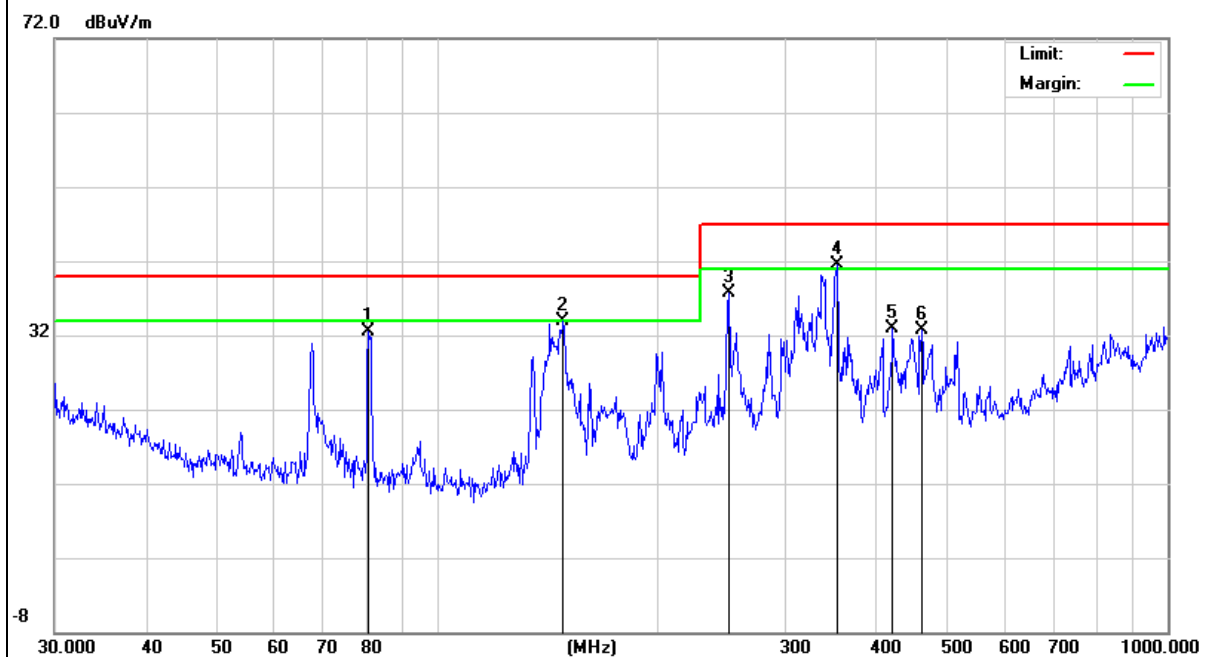
## 3.2.6 TEST RESULTS (30-1000MHz)

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	55%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Power :	DC 5V from adapter AC 230V/50Hz	Test Mode :	Mode 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
80.6442	21.11	11.34	32.45	40.00	-7.55	QP
148.9625	22.59	11.29	33.88	40.00	-6.12	QP
251.1804	25.59	12.20	37.79	47.00	-9.21	QP
352.9433	27.20	14.39	41.59	47.00	-5.41	QP
420.5803	16.19	16.74	32.93	47.00	-14.07	QP
460.7271	16.29	16.49	32.78	47.00	-14.22	QP

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

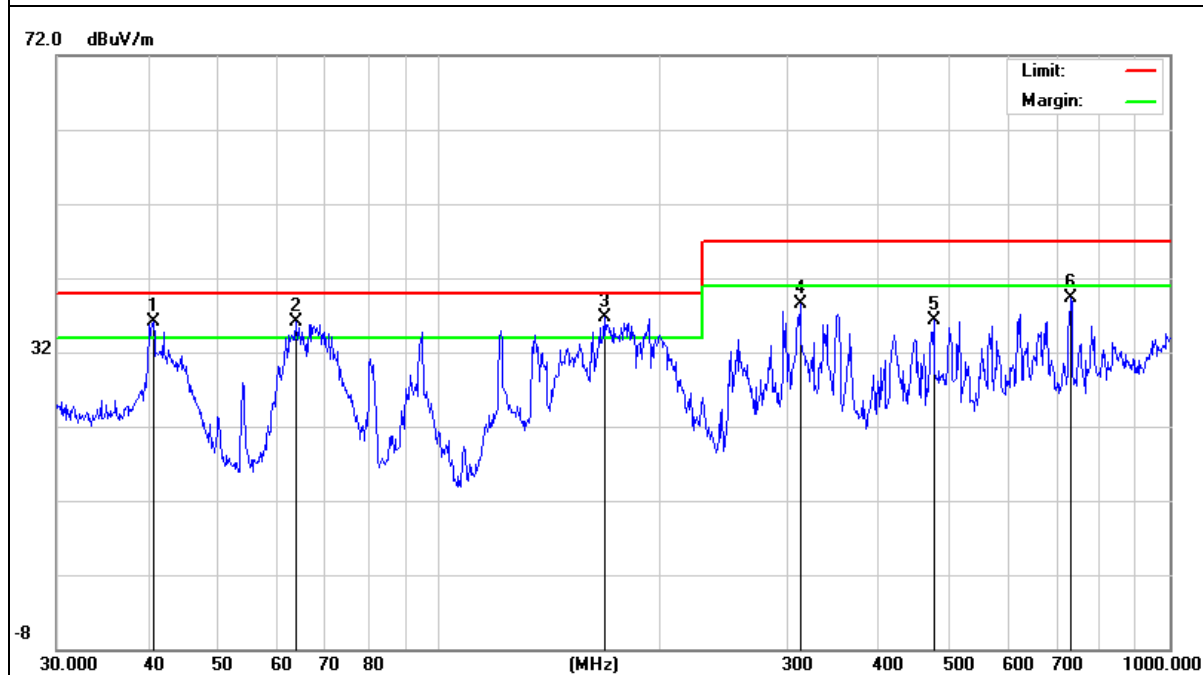


EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	55%
Pressure :	1010 hPa	Polarization :	Vertical
Test Power :	DC 5V from adapter AC 230V/50Hz	Test Mode :	Mode 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
40.7016	20.10	16.00	36.10	40.00	-3.90	QP
63.7588	27.13	8.89	36.02	40.00	-3.98	QP
168.4138	24.15	12.60	36.75	40.00	-3.25	QP
312.1793	25.28	13.29	38.57	47.00	-8.43	QP
475.4990	19.47	16.78	36.25	47.00	-10.75	QP
731.9202	16.90	22.33	39.23	47.00	-7.77	QP

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note: The test modes were carried out for all operation modes. The worst test mode for test data was showed in the report.



## 3.2.7 TEST RESULTS(1000-6000MHz)

EUT :	IP Camera	Model Name :	SP012
Temperature :	26 °C	Relative Humidity :	42%
Pressure :	1010 hPa	Test Mode :	Mode 1
Test Power :	DC 5V from adapter AC 230V/50Hz		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
V	1018.079	55.42	-11.62	43.80	70.00	-26.20	peak
V	1212.500	53.33	-10.11	43.22	70.00	-26.78	peak
V	1450.329	47.90	-8.91	38.99	70.00	-31.01	peak
V	1750.000	47.56	-8.38	39.18	70.00	-30.82	peak
V	2350.000	43.42	-5.85	37.57	70.00	-32.43	peak
V	2987.500	42.87	-5.06	37.81	70.00	-32.19	peak
H	1012.500	56.61	-11.71	44.90	70.00	-25.10	peak
H	1164.509	49.10	-10.14	38.96	70.00	-31.04	peak
H	1750.000	48.00	-8.38	39.62	70.00	-30.38	peak
H	2350.000	43.14	-5.85	37.29	70.00	-32.71	peak
H	2987.500	42.40	-5.06	37.34	70.00	-32.66	peak
H	4850.000	36.87	4.64	41.51	74.00	-32.49	peak

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

### 3.3 HARMONICS CURRENT

#### 3.3.1 LIMITS OF HARMONICS CURRENT

Table 1 – Limits for Class A equipment

Harmonic order (n)	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.3
5	1.14
7	0.77
9	0.4
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 * (15/n)$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 * (8/n)$

Note: Reference standard of the table above: EN61000-3-2.

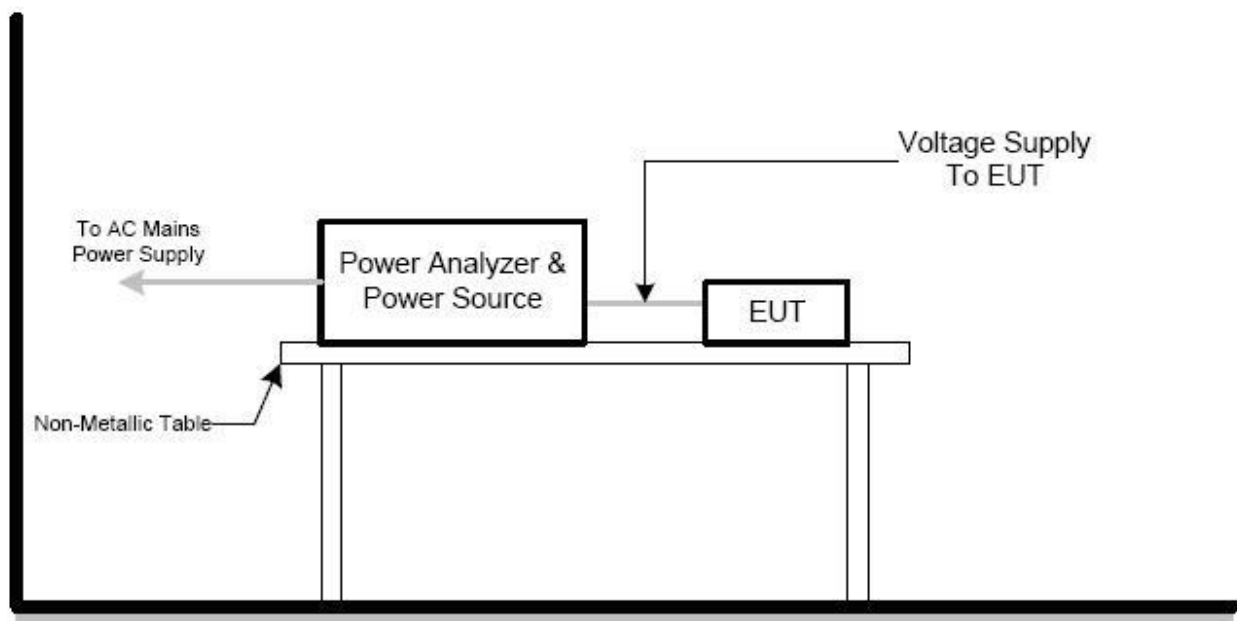
##### 3.3.1.1 TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:  
 Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.  
 Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.  
 Class C: Lighting equipment.  
 Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.
- The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.3.1.3 TEST SETUP





## 3.3.2 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	N/A
Test Power :	N/A		

Note: Not applicable

### 3.4 VOLTAGE FLUCTUATION AND FLICKERS

#### 3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Test items	Limits(EN61000-3-3)	Descriptions
$P_{st}$	$\leq 1.0$ , $T_p=10\text{min}$	short-term flicker indicator
$P_{lt}$	$\leq 0.65$ , $T_p=2\text{h}$	long-term flicker indicator
$d_c$	$\leq 3.3\%$	relative steady-state voltage change
$d_{max}$	$\leq 4\%$ (or $6\%$ <sup>Note(1)</sup> , $7\%$ <sup>Note(2)</sup> )	maximum relative voltage change:
$d_{(t)}$	$\leq 3.3\%$ , more than 500ms	relative voltage change characteristic

Note:

1. 6 % for equipment which is:
  - a. switched manually, or
  - b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
2. 7 % for equipment which is
  - a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
  - b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

#### 3.4.1.1 TEST PROCEDURE

##### a. Harmonic Current Test:

Test was performed according to the procedures specified in Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

##### b. Fluctuation and Flickers Test:

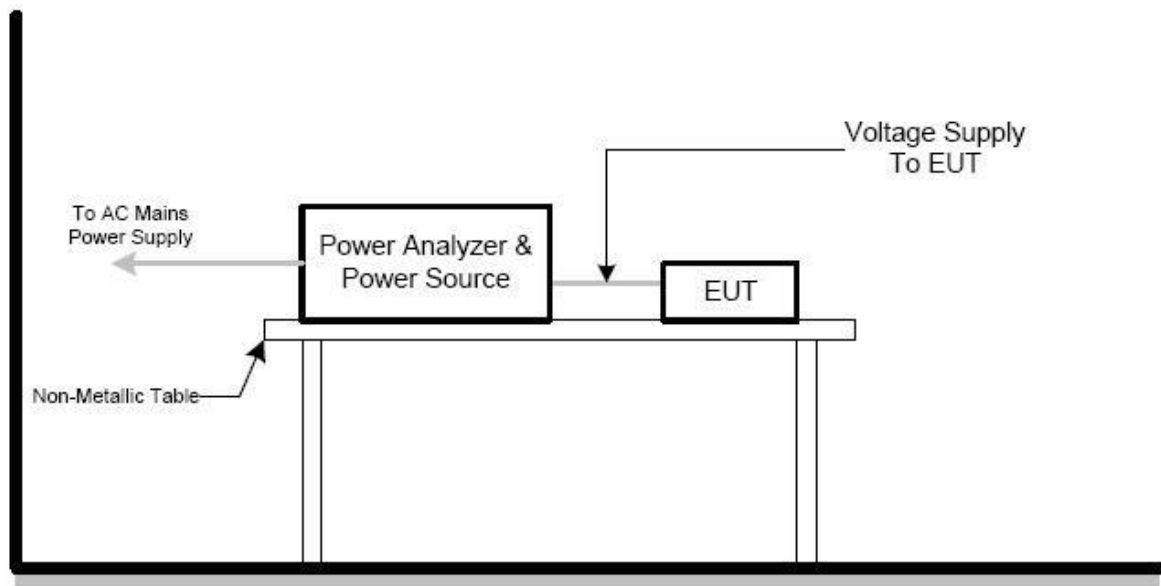
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

#### 3.4.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

## 3.4.1.3 TEST SETUP





## 3.4.2 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from adapter AC 230V/50Hz
Test Mode	Mode 1		

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.071	4.00	PASS
Tmax [s]	0.000	0.50	PASS

#### 4. EMC IMMUNITY TEST

##### 4.1 GENERAL PERFORMANCE CRITERIA

###### PERFORMANCE CRITERIA

According to **EN 301489 -17** standard, the general performance criteria as following:

Criteria	During the test	After the test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more)	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).

NOTE 1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

#### **PERFORMANCE FOR TT**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### **PERFORMANCE FOR TR**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### **PERFORMANCE FOR CT**

The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an Acknowledgement (ACK) or Not Acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### **PERFORMANCE FOR CR**

The performance criteria A shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### **4.2 GENERAL PERFORMANCE CRITERIA TEST SETUP**

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.



### 4.3 ESD TESTING

#### 4.3.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge : 2kV/4kV/8kV Contact Discharge : 2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	A/C Discharge
Discharge Period:	1 second minimum

#### 4.3.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT. During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

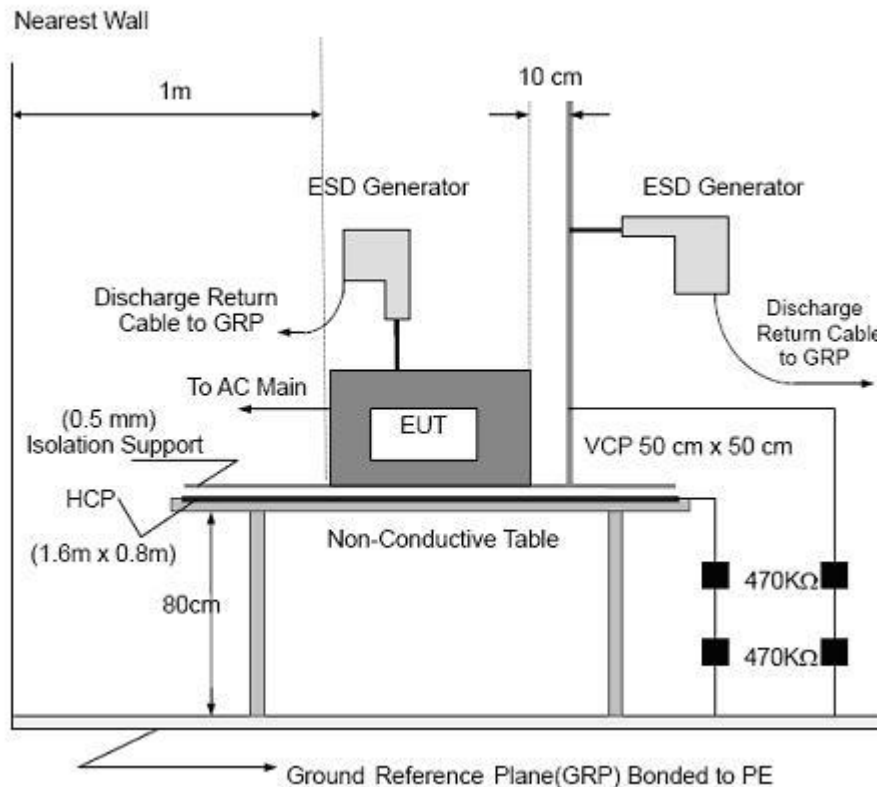
Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

- b. Air discharges at insulation surfaces of the EUT.  
It was at least ten single discharges with positive and negative at the same selected point.
- c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.3.3 TEST SETUP



Note:

##### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

##### FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

#### 4.3.4 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from Adapter AC 230V/50Hz
Test Mode	Mode1/2/3		

Mode	Contact Discharge (Indirect)							Criterion	Result		
Test level (kV)	Test Point	2		4		6					
Test Location		+	-	+	-	+	-				
HCP	Front	P	P	P	P			B	Complies		
	Rear	P	P	P	P						
	Left	P	P	P	P						
	Right	P	P	P	P						
VCP	Front	P	P	P	P						
	Rear	P	P	P	P						
	Left	P	P	P	P						
	Right	P	P	P	P						

#### MODE 1

Mode	Air Discharge								Contact Discharge								Observation	Criterion	Result
Test level (kV)	2		4		8		15		2		4		6		8				
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-			
A1	P	P	P	P	P	P											TT,TR	B	Complies
A2	P	P	P	P	P	P													
A3	P	P	P	P	P	P													
A4	P	P	P	P	P	P													
A5	P	P	P	P	P	P													
A6	P	P	P	P	P	P													
A7	P	P	P	P	P	P													
A8	P	P	P	P	P	P													
A9	P	P	P	P	P	P													
A10	P	P	P	P	P	P													
A11	P	P	P	P	P	P													
A12	P	P	P	P	P	P													
C1									P	P	P	P							

**MODE 2/3**

Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	2		4		8		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
A1	P	P	P	P	P	P											B	Complies
A2	P	P	P	P	P	P												
A3	P	P	P	P	P	P												
A4	P	P	P	P	P	P												
A5	P	P	P	P	P	P												
A6	P	P	P	P	P	P												
A7	P	P	P	P	P	P												
A8	P	P	P	P	P	P												
A9	P	P	P	P	P	P												
A10	P	P	P	P	P	P												
A11	P	P	P	P	P	P												
A12	P	P	P	P	P	P												
C1									P	P	P	P						

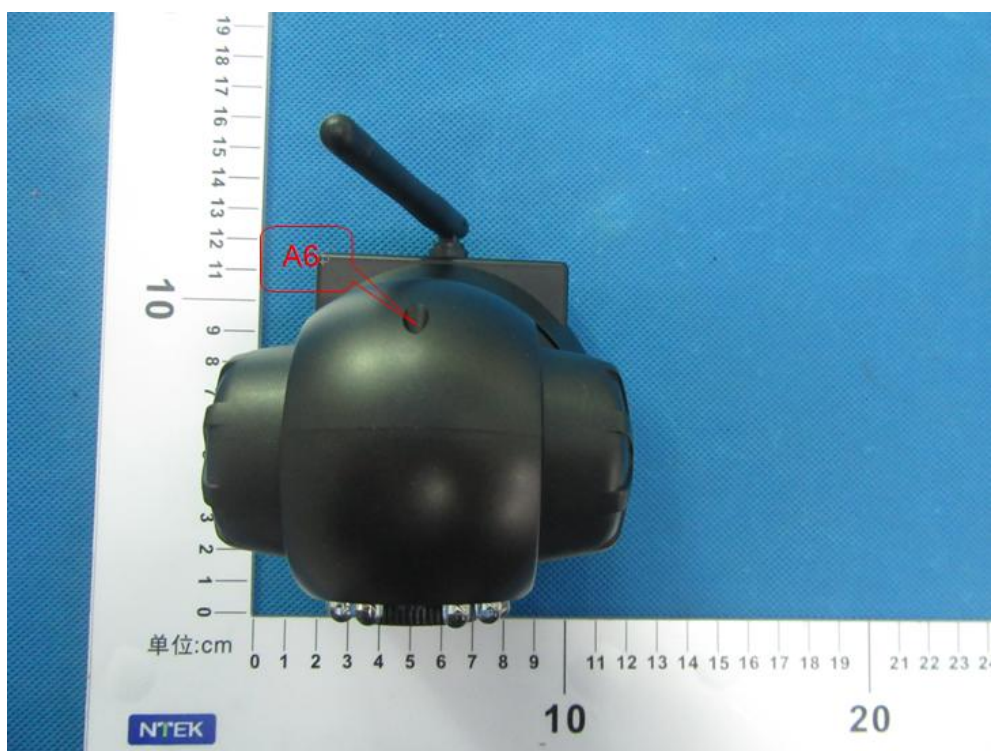
Note:

- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.



## 4.3.5 PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED









#### 4.3.6 RS TESTING

##### 4.3.7 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 6000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

##### 4.3.8 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

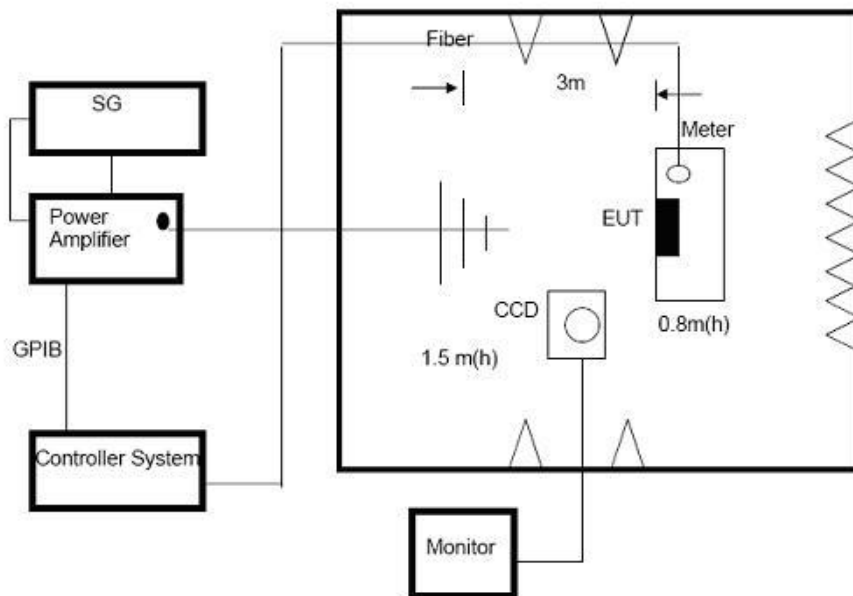
The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

- a. The field strength level was 3V/m.
- b. The frequency range is swept from 80 MHz to 6000MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.



#### 4.3.9 TEST SETUP



Note:

##### TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

##### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

## 4.3.10 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from adapter AC 230V/50Hz
Test Mode	Mode1/2/3		

## TEST RESULT

## MODE 1

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results
80~1000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	CT,CR	A	P
			Rear			
			Left			
			Right			

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results
1000~6000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	CT,CR	A	P
			Rear			
			Left			
			Right			

## Note:

1. The exclusion band has not been tested in 80MHz~6GHz.

The exclusion band for immunity testing of equipment operating in the 2,4 GHz band shall be: • lower limit of exclusion band = lowest allocated band edge frequency -120 MHz, i.e. 2 280 MHz; • upper limit of exclusion band = highest allocated band edge frequency +120 MHz, i.e. 2 603,5MHz.

2. "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**MODE 2/3**

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results
80~1000 1000~6000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	<b>A</b>	<b>P</b>
			Rear		
			Left		
			Right		

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

Note:

- 1) N/A - denotes test is not applicable in this test report.
- 2) There was not any unintentional transmission in standby mode
- 3) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.

#### 4.4 EFT/BURST TESTING

##### 4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line : 1 kV DC/Signal/ wired network Line : 0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	For xDSL wired network ports: 100 kHz For DC/AC ports: 5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

##### 4.4.2 TEST PROCEDURE

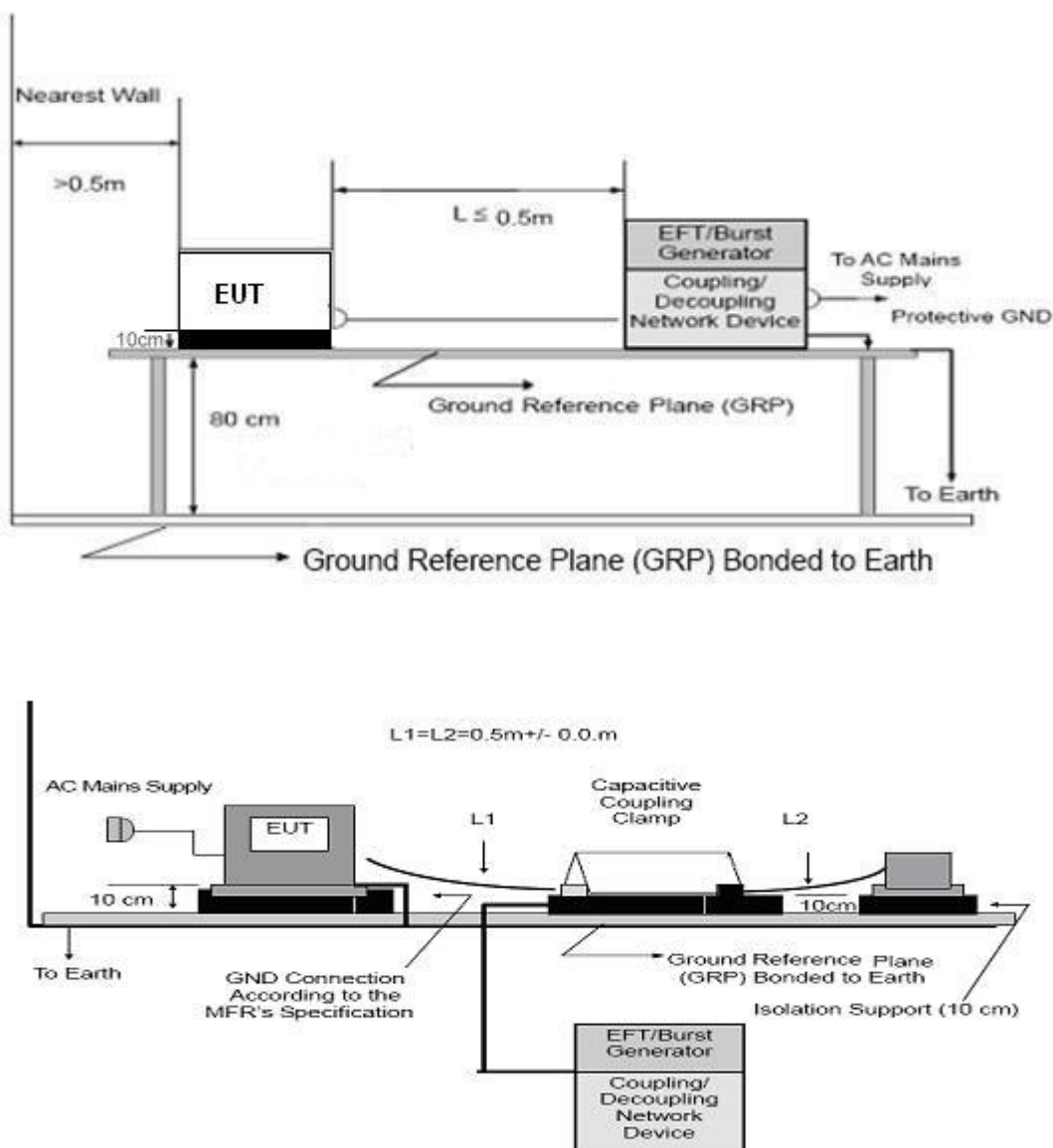
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute
- For the actual test configuration, please refer to the related Item –EUT Test Photos.



#### 4.4.3 TEST SETUP



Note:

##### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

##### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

#### 4.4.4 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from adapter AC 230V/50Hz
Test Mode	Mode1/2/3		

#### MODE 2/3

Coupling Line		Test level (kV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	P	P	P	P					B	Complies
	N	P	P	P	P						Complies
	PE										
	L+N	P	P	P	P						Complies
	L+PE										
	N+PE										
	L+N+PE										
DC Line											
Signal Line		P	P								Complies

**MODE 1**

Coupling Line		Test level (kV)								Observation	Criterion	Result
		0.5		1		2		4				
		+	-	+	-	+	-	+	-			
AC line	L	P	P	P	P					TT,TR	B	Complies
	N	P	P	P	P							Complies
	PE											
	L+N	P	P	P	P							Complies
	L+PE											
	N+PE											
	L+N+PE											
DC Line												
Signal Line												

Note:

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.

## 4.5 SURGE TESTING

### 4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line : 0.5 kV, 1 kV
Surge Input/Output:	L-N
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

### 4.5.2 TEST PROCEDURE

#### a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

#### b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

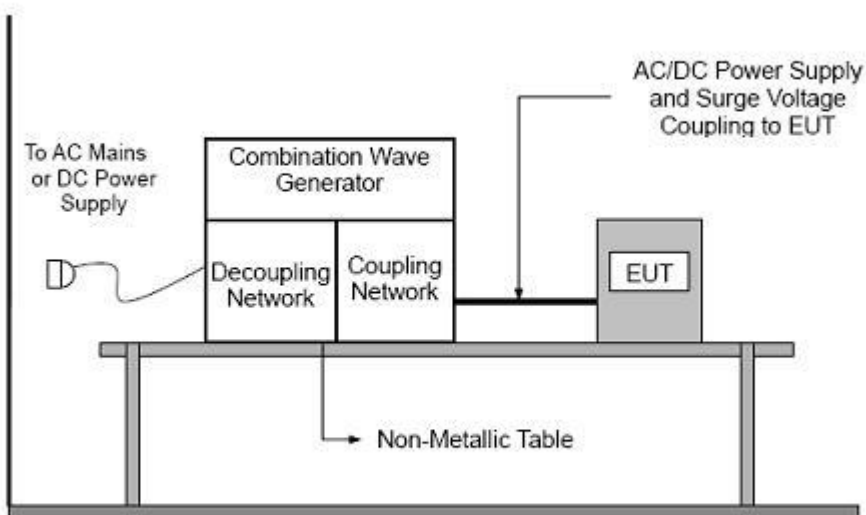
#### c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

#### d. For the actual test configuration, please refer to the related Item –EUT Test Photos.



## 4.5.3 TEST SETUP



#### 4.5.4 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from adapter AC 230V/50Hz
Test Mode	Mode1/2/3		

#### MODE 2/3

Coupling Line			Test level								Criterion	Result
			0.5 kV		1 kV		2 kV		4 kV			
			+	-	+	-	+	-	+	-		
AC line	L-N	0°	P	P	P	P					B	Complies
		90°	P	P	P	P						
		180°	P	P	P	P						
		270°	P	P	P	P						
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC Line												
Signal Line			P	P	P	P						Complies

**MODE 1**

Coupling Line			Test level								Observation	Criterion	Result
			0.5 kV		1 kV		2 kV		4 kV				
			+	-	+	-	+	-	+	-			
AC line	L-N	0°	P	P	P	P					TT,TR	B	Complies
		90°	P	P	P	P							
		180°	P	P	P	P							
		270°	P	P	P	P							
	L-PE	0°											
		90°											
		180°											
		270°											
	N-PE	0°											
		90°											
		180°											
		270°											
DC Line													
Signal Line													

Note:

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.

## 4.6 INJECTION CURRENT TESTING

### 4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

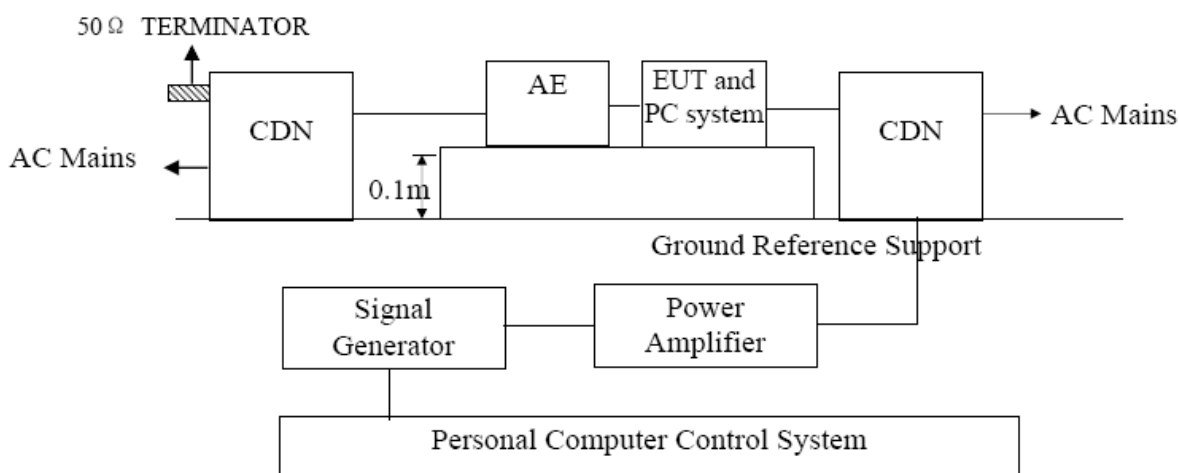
### 4.6.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

The other condition as following manner:

- The field strength level was 3V.
- The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.6.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### NOTE:

#### FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



## 4.6.4 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from adapter AC 230V/50Hz
Test Mode	Mode1/2/3		

## TEST RESULT

**MODE 1**

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Observation	Perform. Criteria	Results
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	<b>CT, CR</b>	<b>A</b>	<b>P</b>
Input/ Output DC. Power Port	0.15 --- 80		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Signal Line	0.15 --- 80		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**MODE 2/3**

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	<b>A</b>	<b>P</b>
Input/ Output DC. Power Port	0.15 --- 80		<b>N/A</b>	<b>N/A</b>
Signal Line	0.15 --- 80		<b>A</b>	<b>P</b>

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

## 4.7 VOLTAGE INTERRUPTION/DIPS TESTING

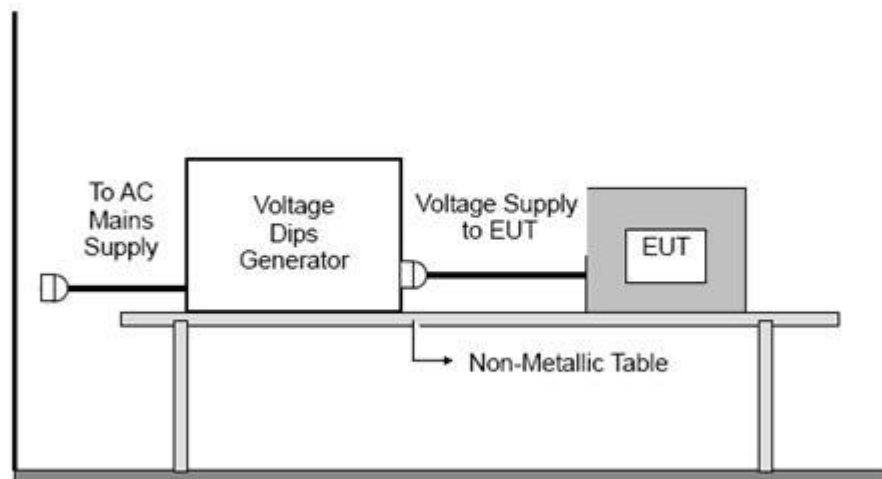
### 4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance	100% reduction, 0.5 Cycle 100% reduction, 1.0 Cycle 30% reduction, 25 Cycles
Voltage Interruptions:	100% reduction, 250 Cycles
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

### 4.7.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

### 4.7.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

## 4.7.4 TEST RESULTS

EUT :	IP Camera	Model Name :	SP012
Temperature :	25 °C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Power :	DC 5V from Adapter AC 230V/50Hz
Test Mode	Mode1/2/3		

**MODE2/3**

Voltage Reduction	Duration (ms)	Perform Criteria	Results
Voltage dip: 0%	10	<b>B</b>	<b>P</b>
Voltage dip: 0%	20	<b>B</b>	<b>P</b>
Voltage dip: 70%	500	<b>C</b>	<b>P</b>
Voltage interruptions: 0%	5000	<b>C</b>	<b>P</b>

**MODE 1**

Voltage Reduction	Duration (ms)	Observation	Perform Criteria	Results
Voltage dip: 0%	10	<b>TT, TR</b>	<b>B</b>	<b>P</b>
Voltage dip: 0%	20	<b>TT, TR</b>	<b>B</b>	<b>P</b>
Voltage dip: 70%	500	<b>TT, TR</b>	<b>C</b>	<b>P</b>
Voltage interruptions: 0%	5000	<b>TT, TR</b>	<b>C</b>	<b>P</b>

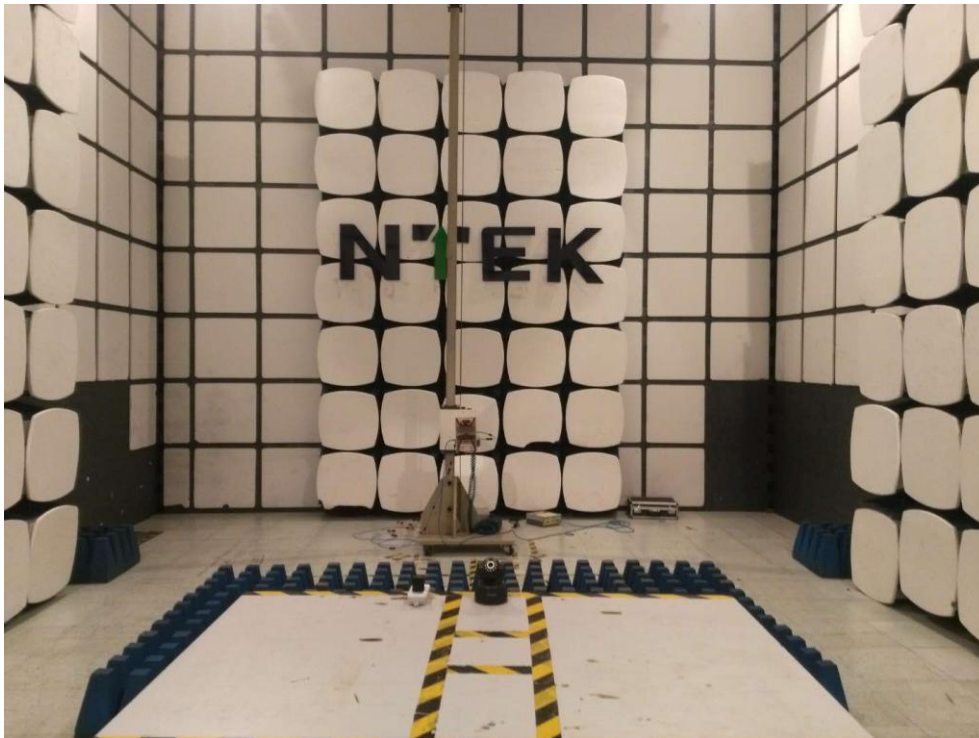
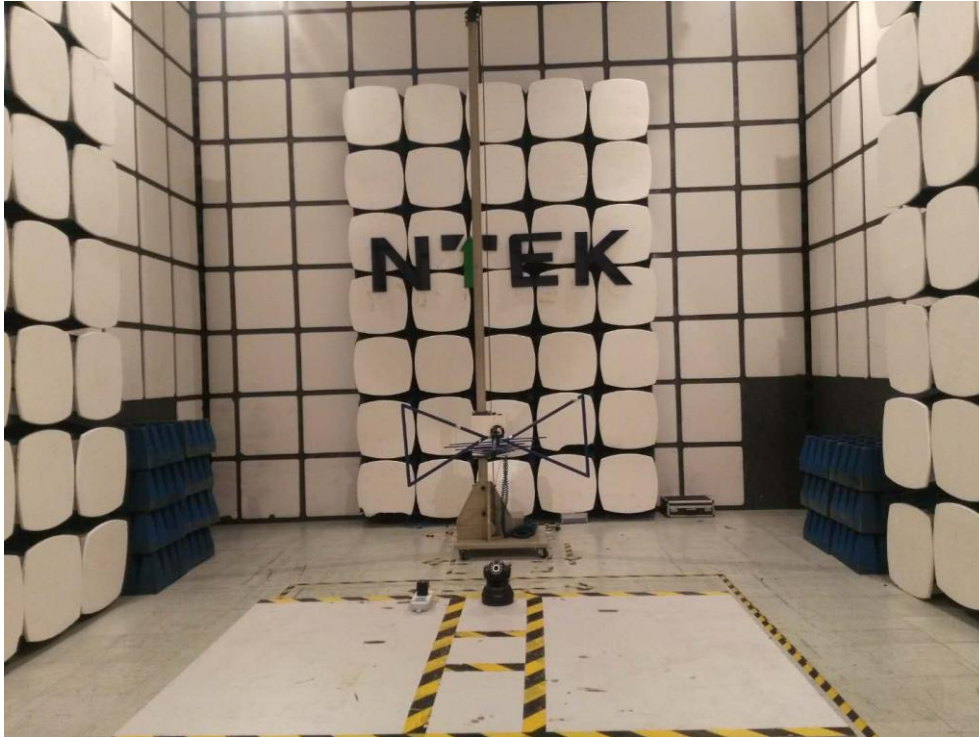
Note:

- 1) There was not any unintentional transmission in standby mode
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.



## 5. EUT TEST PHOTO

Radiated Measurement Photo





**Conducted Measurement Photo**