EMCTESTREPORT

According to

EN 55022:2010 (Class A)
EN 61000-3-2:2006+A1:2009+ A2:2009
EN 61000-3-3:2008
AS/ NZS CISPR22: 2009 (Class A)

EN 50130-4:2011
IEC 61000-4-2:2008
IEC 61000-4-3:2006+A1:2007+A2:2010
IEC 61000-4-4:2004+A1:2010
IEC 61000-4-5:2005
IEC 61000-4-6:2008 IEC 61000-4-8:2009
IEC 61000-4-11:2004
Mains Supply Voltage Variations

Applicant	:	ERNITEC, INC
Address	:	Tempovej 39-41, 2750 Ballerup, Denmark
Equipment	:	Ernitec Orion SX802 series High Speed Dome Camera
Model No.	:	Orion SX802xx(x=0~9,A~Z or Space) x20Wx-Nx(x=0~9, A~Z or Space) x20Wx-Fx(x=0~9, A~Z or Space)
Trade Name	:	ERNITEC

- The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp. the test report shall not be reproduced except in full.
- This test report is only applicable to European Community.

Contents

History of this test report

☐ ORIGINAL.

■ Additional attachment as following record:

Attachment No.	Issue Date	Description
TECZ1205173	Jun. 15, 2012	Original.
TECZ1205173-A	Oct. 05, 2012	1. Additional model numbers. 2. Update photographs of EUT. 3. Perform Power Frequency Magnetic Immunity Test. Field
TECZ1205173-B	Jul. 10, 2013	1. Upgrade application standard version. 2. Additional model numbers.

CERTIFICATE OF COMPLIANCE

According to

EN 55022:2010 (Class A)
EN 61000-3-2:2006+A1:2009+ A2:2009
EN 61000-3-3:2008
AS/ NZS CISPR22: 2009 (Class A)

EN 50130-4:2011
IEC 61000-4-2:2008
IEC 61000-4-3:2006+A1:2007+A2:2010
IEC 61000-4-4:2004+A1:2010
IEC 61000-4-5:2005
IEC 61000-4-6:2008 IEC 61000-4-8:2009
IEC 61000-4-11:2004
Mains Supply Voltage Variations

Applicant : ERNITEC, INC

Address : Tempovej 39-41, 2750 Ballerup, Denmark

Equipment : Ernitec Orion SX802 series High Speed Dome Camera

Model No. :Orion SX802xx(x=0~9,A~Z or Space) x20Wx-Nx(x=0~9, A~Z or Space) x20Wx-Fx(x=0~9, A~Z or Space)

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in EUROPEAN COUNCIL DIRECTIVE 2004/108/EC.

The test was carried out on Jul. 08, 2013 at Cerpass Technology Corp.

Signature

Hill Chen
EMC/RF B.U. Assistant Manager

1. Summary of Test Procedure and Test Results

Test Item	Normative References	Test Result
Conducted Emission	EN 55022:2010 AS/ NZS CISPR22:2009	PASS
Radiated Emission	EN 55022:2010 AS/ NZS CISPR22:2009	PASS
Harmonics	EN 61000-3-2:2006+A1:2009+ A2:2009	PASS
Voltage Fluctuations	EN 61000-3-3:2008	PASS
Electrostatic Discharge Immunity Test (ESD)	IEC 61000-4-2:2008	PASS
Radio Frequency electromagnetic field immunity test (RS)	IEC 61000-4-3:2006+A1:2007+A2:2010	PASS
Electrical Fast Transient/ Burst Immunity Test (EFT)	IEC 61000-4-4:2004+A1:2010	PASS
Surge Immunity Test	IEC 61000-4-5:2005	PASS
Conduction Disturbances induced by Radio-Frequency Fields	IEC 61000-4-6:2008	PASS
Power Frequency Magnetic Field Immunity Test	IEC 61000-4-8:2009	PASS
Voltage Dips and Voltage Interruptions Immunity Test	IEC 61000-4-11:2004	PASS
Mains Supply Voltage Variations	EN 50130-4: 2011	PASS

2. Immunity Testing Performance Criteria Definition

A. Normal performance within limits specified by the manufacture, requestor or purchaser;

B. Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention;

C. Temporary loss of function or degradation of performance, the correction of which requires operation intervention;

D. Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data.

3. Test Configuration of Equipment under Test

3.1.Feature of Equipment under Test

Please refer to the user's manual.

3.2.Test Manner

a. During testing, the interface cables and equipment positions were varied according to Europe Standard EN55022 Class A.

b. The complete test system included remote workstation, Earphone and EUT for EMC test. The remote workstation included PoE, Notebook, and Test Fixture.

c. The result of conduction test as follow:
Test Mode 1. Live View, Power by AC 24V Source

d. The result of telecommunication port test as follow:
Test Mode 1. Live View, Power by AC 24V Source, ISN LAN 10Mbps
Test Mode 2. Live View, Power by AC 24V Source, ISN LAN 100Mbps
Test Mode 3. Live View, Power by PoE, ISN LAN 10Mbps
Test Mode 4. Live View, Power by PoE, ISN LAN 100Mbps

e. The result of radiation (30MHz ~ 1000MHz) test as follow:
Test Mode 1. Live View, Power by AC 24V Source
Test Mode 2. Live View, Power by PoE

f. The result of radiation (1000MHz ~ 6000MHz) test as follow:
Test Mode 1. Live View, Power by AC 24V Source
Test Mode 2. Live View, Power by PoE

g. The result of Flicker test as follow:
Test Mode 1. Power by Power by AC 24V Source

h. The result of EMS test as follow:
Test Mode 1. Live View, Power by AC 24V Source
Test Mode 2. Live View, Power by PoE
Test Mode 3. Live View, Power by AC 24V Source
Test Mode 4. Live View, Power by PoE
(Test Mode 3-4, for EFT and CS Alarm test only)

i. An executive program, "TFGEN.exe" under WIN 7 was executed to transmit and receive data to the remote workstation through LAN.

j. An executive program, "PING.EXE" under WIN 7 was executed to transmit and receive data to the remote workstation through LAN.

3.3.Description of Support Systems

EMI:

Device	Manufacturer	Model No.	Description
Earphone	MIC	MIC-4	Data Cable, Audio Unshielding 1.35m
Micro SD	SanDisk	1GB	N/A
Remote Workstation			
PoE	Power Dsine	S001G	N/A
Test Fixture	N/A	N/A	N/A

Use Cable:

Cable	Quantity	Description
RJ45	1	Shielding, 15.0m

EMS:

Device	Manufacturer	Model No.	Description
Earphone	MIC	MIC-4	Data Cable, Audio Unshielding 1.35m
Remote Workstation			
PoE	Power Dsine	S001G	N/A
Test Fixture	N/A	N/A	N/A

Use Cable:

Cable	Quantity	Description
RJ45	1	Shielding, 15.0m

3.4.General Information of Test

Test Site :	Cerpass Technology Corp. 2F-11, No. 3, Yuan Qu St., (Nankang Software Park), Taipei, Taiwan 115, R.O.C.
Test Site Location (OATS2-SD) :	No.68-1, Shihbachongsi, Shihding Township, Taipei City 223, Taiwan, R.O.C.
FCC Registration Number :	TW1049, TW1056, TW1061, 390316, 488071, 982971
IC Registration Number :	4934B-1, 4934D-1
VCCI Registration Number :	T-543 for Telecommunication Test C-3328 for Conducted emission test R-3428 for Radiated emission test G-97 for Radiated emission test above 1GHz
Frequency Range Investigated :	Conducted Emission Test: from 150kHz to 30 MHz Radiated Emission Test: from 30 MHz to 6,000 MHz

Test Distance :	The test distance of radiated emission below 1GHz from antenna to EUT is 10 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.

3.5.Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE / NEUTRAL	3.25 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	3.93 dB
	1,000 MHz ~ 18,000 MHz	Vertical / Horizontal	5.18 dB

4. Test of Conducted Emission

4.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55022. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 4.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

Table 1 Class A Line Conducted Emission Limits:

Frequency range (MHz)	Limits (dB μ V)	
	Quasi Peak	Average
0.15 to 0.50	79	66
0.50 to 30	73	60
Note : The lower limits shall apply at the transition frequencies.		

Table 2 - Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class A equipment.

Frequency range (MHz)	Voltage limits dB(μ V)		Current limits dB(μ A)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.5	97 to 87	84 to 74	53 to 43	40 to 30
0.5 to 30	87	74	43	30

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 to 0.5 MHz.

Note 2 : The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication under test (conversion factor is 20 $\log_{10}$ 150/1 = 44dB).

4.2. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.

b. Connect EUT to the power mains through a line impedance stabilization network (LISN).

c. All the support units are connecting to the other LISN.

d. The LISN provides 50 ohm coupling impedance for the measuring instrument.

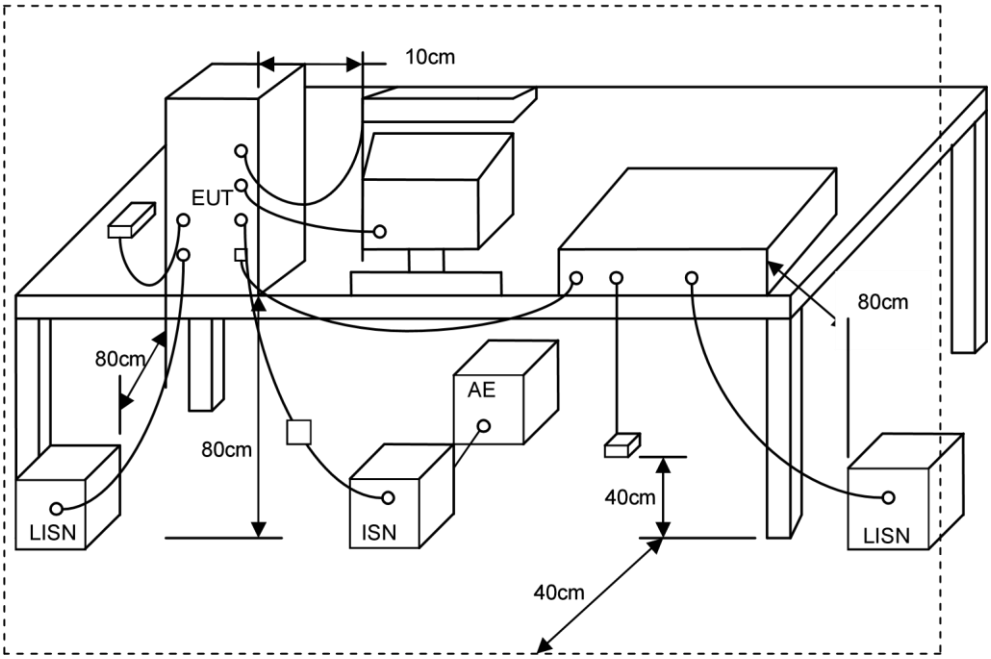
e. The CISPR states that a 50 ohm, 50 micro-Henry LISN should be used.

f. Both sides of AC line were checked for maximum conducted interference.

g. The frequency range from 150 kHz to 30 MHz was searched

h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

4.3. Typical Test Setup



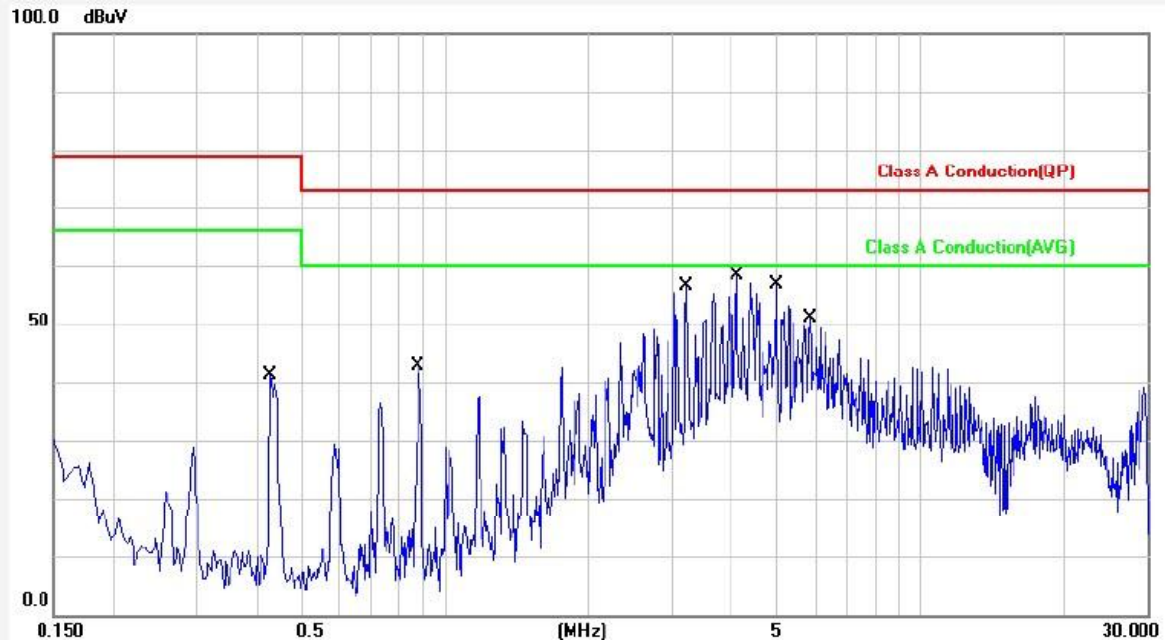
4.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI	100443	2012/01/12	2013/01/11
LISN	Schwarzbeck	NSLK 8127	8127-516	2012/03/08	2013/03/07
LISN	Schwarzbeck	NSLK 8127	8127-568	2011/08/24	2012/08/23
ISN	TESEQ GMBH	ISN T8	24315	2011/11/09	2012/11/08

4.5. Test Result and Data

4.5.1 Conducted Emission for Power Port Test Data

Power	:	AC 24V	Pol/Phase	:	LINE
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	22 °C
Test Date	:	2012/05/29	Humidity	:	63 %



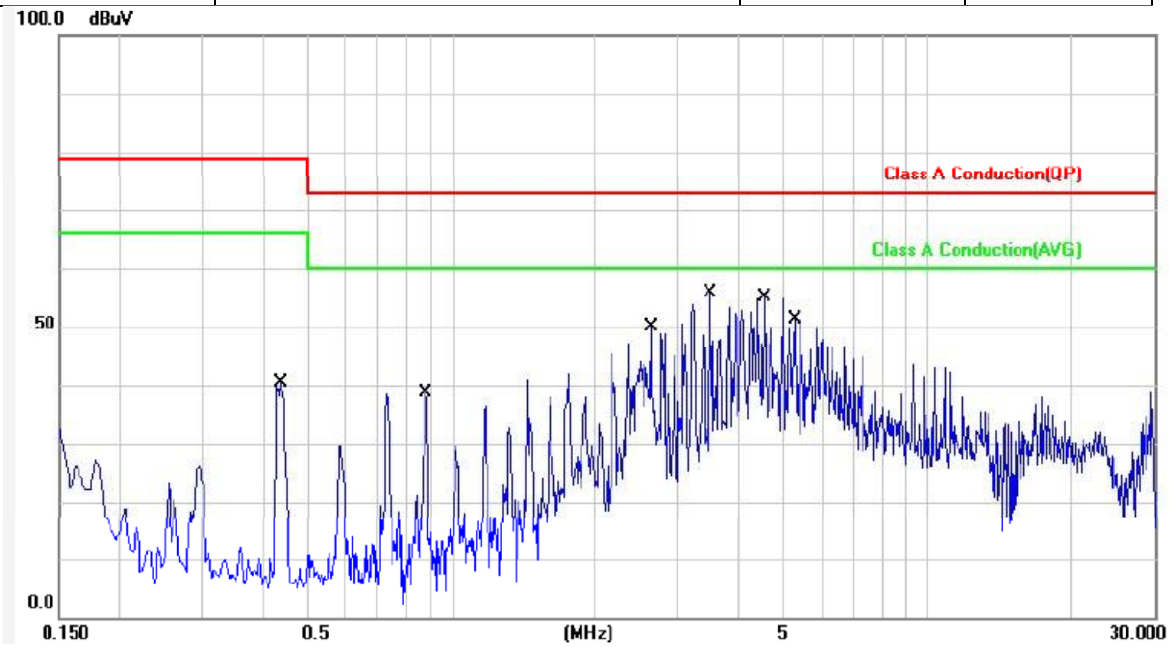
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.4300	0.10	30.70	30.80	79.00	-48.20	QP	P
2	0.4300	0.10	12.60	12.70	66.00	-53.30	AVG	P
3	0.8780	0.15	40.84	40.99	73.00	-32.01	QP	P
4	0.8780	0.15	32.94	33.09	60.00	-26.91	AVG	P
5	3.2139	0.26	51.76	52.02	73.00	-20.98	QP	P
6	3.2139	0.26	34.80	35.06	60.00	-24.94	AVG	P
7	4.0980	0.28	52.31	52.59	73.00	-20.41	QP	P
8	4.0980	0.28	36.91	37.19	60.00	-22.81	AVG	P
9	4.9780	0.31	52.99	53.30	73.00	-19.70	QP	P
10	4.9780	0.31	34.03	34.34	60.00	-25.66	AVG	P
11	5.8460	0.34	46.08	46.42	73.00	-26.58	QP	P
12	5.8460	0.34	31.27	31.61	60.00	-28.39	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	AC 24V	Pol/Phase	:	NEUTRAL

Test Mode 1 :	Live View, Power by AC 24V Source	Temperature :	22 °C
Test Date :	2012/05/29	Humidity :	63 %



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.4380	0.11	39.18	39.29	79.00	-39.71	QP	P
2	0.4380	0.11	31.75	31.86	66.00	-34.14	AVG	P
3	0.8820	0.16	37.51	37.67	73.00	-35.33	QP	P
4	0.8820	0.16	29.69	29.85	60.00	-30.15	AVG	P
5	2.6300	0.25	46.30	46.55	73.00	-26.45	QP	P
6	2.6300	0.25	31.61	31.86	60.00	-28.14	AVG	P
7	3.5020	0.28	52.99	53.27	73.00	-19.73	QP	P
8	3.5020	0.28	34.98	35.26	60.00	-24.74	AVG	P
9	4.5260	0.31	51.60	51.91	73.00	-21.09	QP	P
10	4.5260	0.31	32.96	33.27	60.00	-26.73	AVG	P
11	5.2660	0.33	49.22	49.55	73.00	-23.45	QP	P
12	5.2660	0.33	30.97	31.30	60.00	-28.70	AVG	P

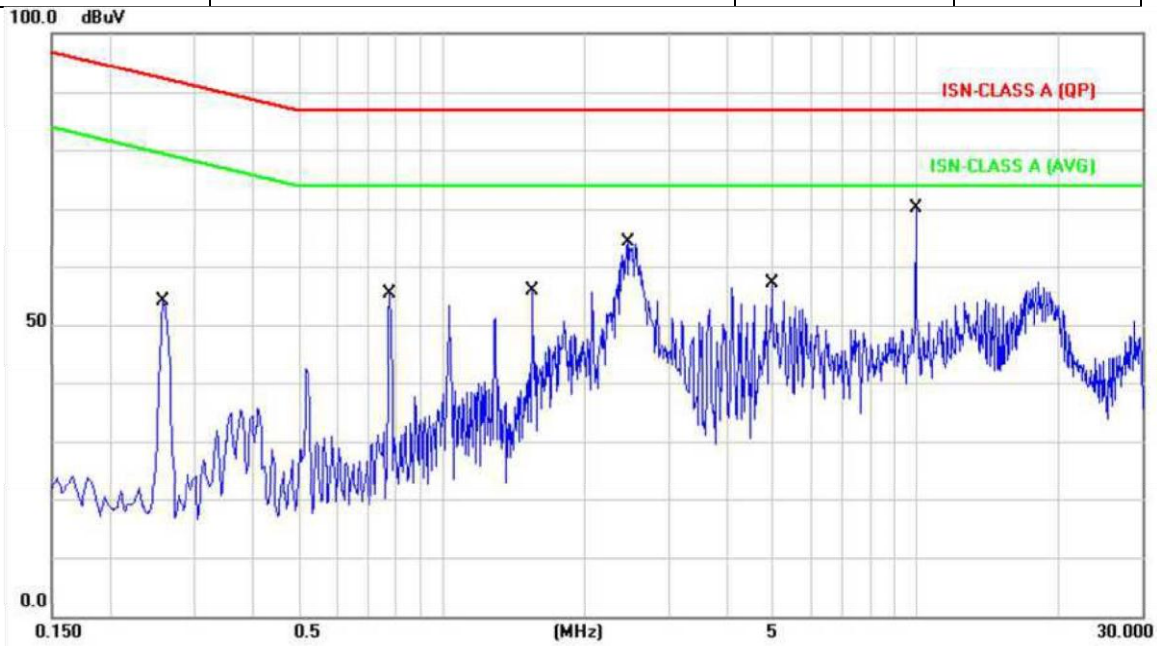
Note: Level = Reading + Factor Margin = Level – Limit

Test engineer: Steve

4.5.2 Conducted Emission for Telecommunication Port Test Data

Power :	AC 24V	Temperature :	22 °C

Test Mode 1 :	Live View, Power by AC 24V Source, ISN LAN10Mbps	Humidity :	63 %
Test Date :	2012/05/29		



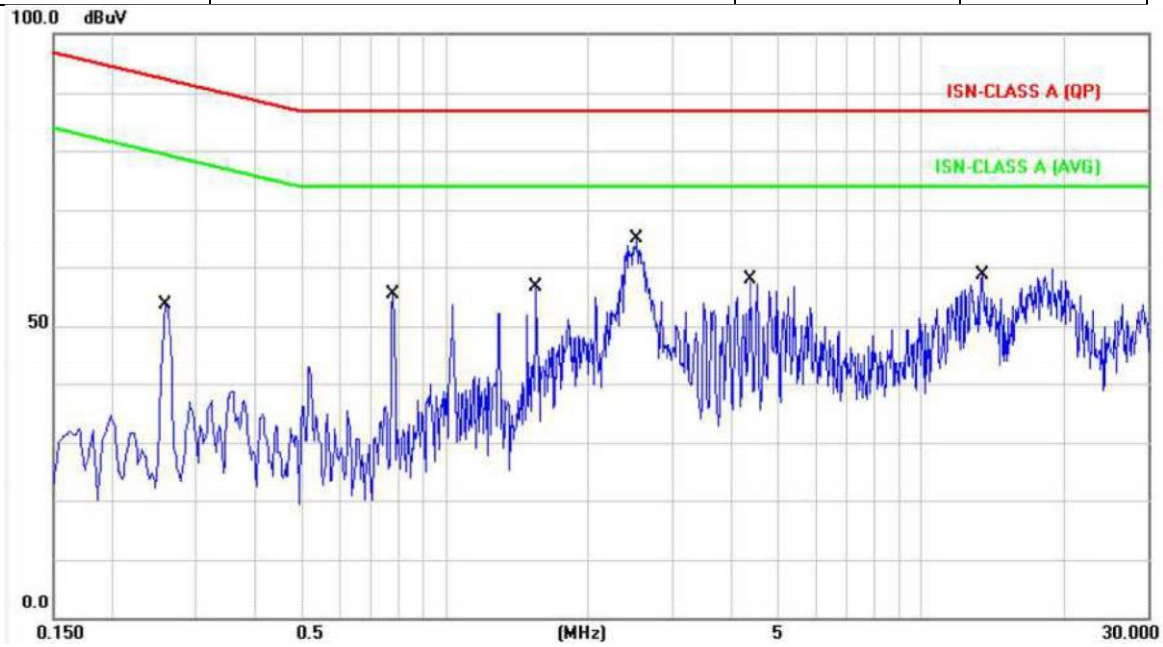
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2580	9.97	43.39	53.36	92.49	-39.13	QP	P
2	0.2580	9.97	42.92	52.89	79.49	-26.60	AVG	P
3	0.7780	10.09	44.42	54.51	87.00	-32.49	QP	P
4	0.7780	10.09	43.56	53.65	74.00	-20.35	AVG	P
5	1.5540	10.18	44.97	55.15	87.00	-31.85	QP	P
6	1.5540	10.18	44.15	54.33	74.00	-19.67	AVG	P
7	2.4700	10.24	52.74	62.98	87.00	-24.02	QP	P
8	2.4700	10.24	47.22	57.46	74.00	-16.54	AVG	P
9	4.9620	10.32	40.54	50.86	87.00	-36.14	QP	P
10	4.9620	10.32	23.75	34.07	74.00	-39.93	AVG	P
11	10.0000	10.53	67.08	77.61	87.00	-9.39	QP	P
12	10.0000	10.53	48.32	58.85	74.00	-15.15	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power :	AC 24V	Temperature :	22 °C
Test Mode 2 :	Live View, Power by AC 24V Source, ISN LAN100Mbps	Humidity :	63 %

Test Date :	2012/05/29		

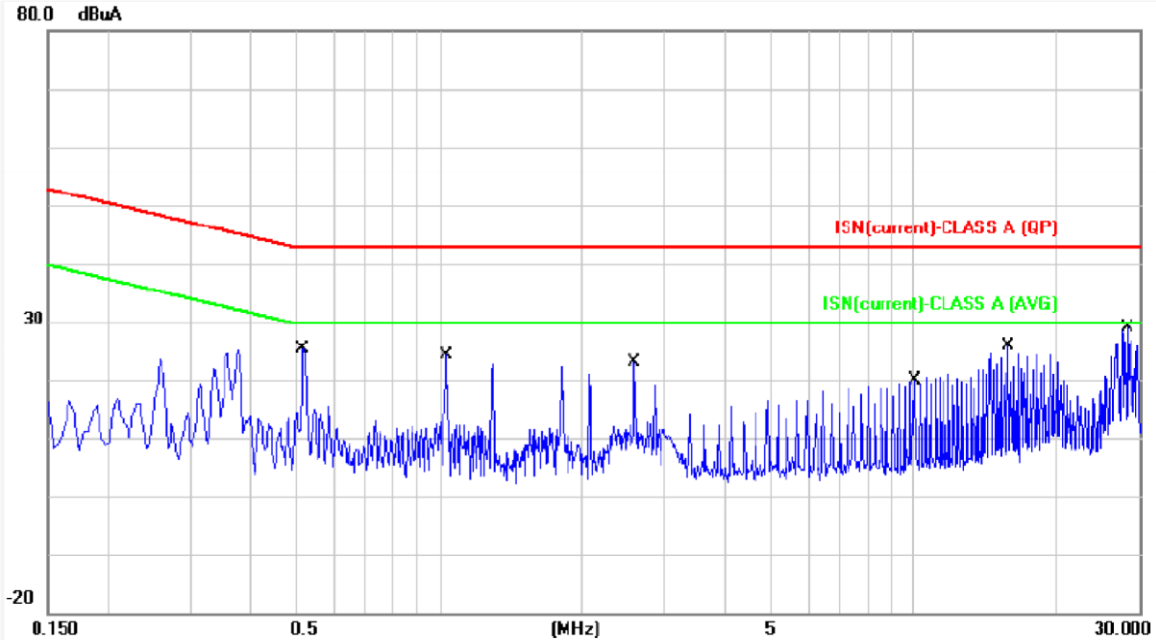


No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2580	9.97	43.30	53.27	92.49	-39.22	QP	P
2	0.2580	9.97	42.71	52.68	79.49	-26.81	AVG	P
3	0.7780	10.09	44.51	54.60	87.00	-32.40	QP	P
4	0.7780	10.09	43.39	53.48	74.00	-20.52	AVG	P
5	1.5540	10.18	44.97	55.15	87.00	-31.85	QP	P
6	1.5540	10.18	44.16	54.34	74.00	-19.66	AVG	P
7	2.5340	10.24	52.62	62.86	87.00	-24.14	QP	P
8	2.5340	10.24	46.96	57.20	74.00	-16.80	AVG	P
9	4.3740	10.30	42.44	52.74	87.00	-34.26	QP	P
10	4.3740	10.30	21.79	32.09	74.00	-41.91	AVG	P
11	13.4820	10.51	45.83	56.34	87.00	-30.66	QP	P
12	13.4820	10.51	41.83	52.34	74.00	-21.66	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power :	From PoE	Temperature :	22 °C
Test Mode 3 :	Live View, Power by PoE, ISN LAN10Mbps	Humidity :	63 %
Test Date :	2012/05/29		

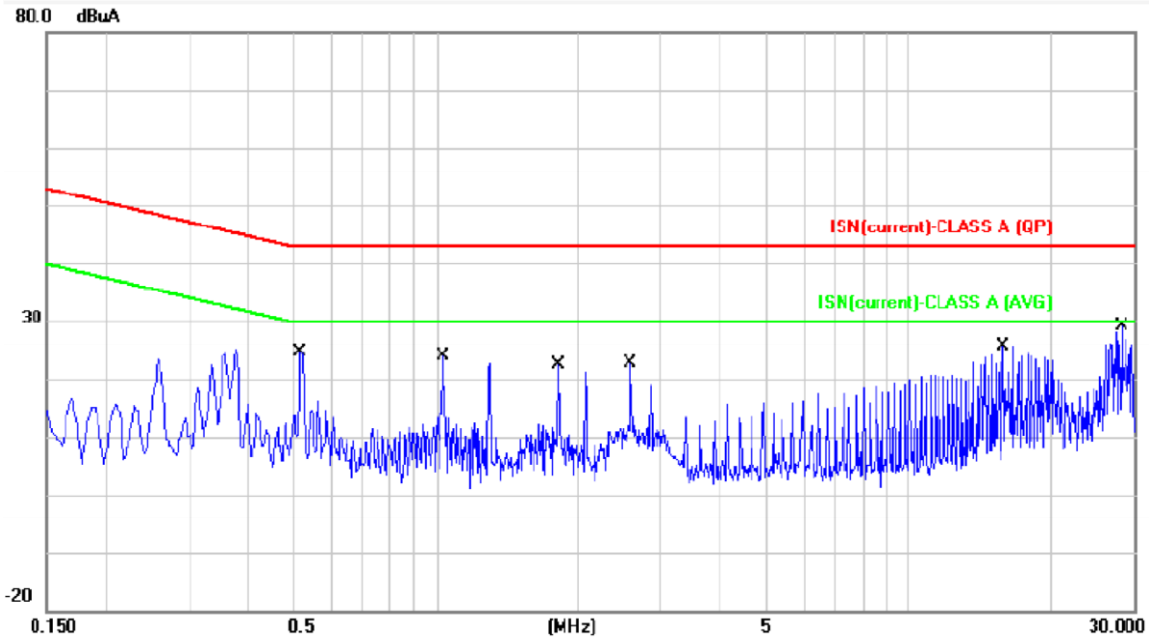


No.	Frequency (MHz)	Factor (dBuA)	Reading (dBuA)	Level (dBuA)	Limit (dBuA)	Margin (dB)	Detector	P/F
1	0.5180	33.95	-10.21	23.74	43.00	-19.26	QP	P
2	0.5180	33.95	-10.35	23.60	30.00	-6.40	AVG	P
3	1.0380	33.99	-11.19	22.80	43.00	-20.20	QP	P
4	1.0380	33.99	-11.12	22.87	30.00	-7.13	AVG	P
5	2.5940	34.07	-12.06	22.01	43.00	-20.99	QP	P
6	2.5940	34.07	-13.44	20.63	30.00	-9.37	AVG	P
7	10.0000	34.42	-1.11	33.31	43.00	-9.69	QP	P
8	10.0000	34.42	-19.18	15.24	30.00	-14.76	AVG	P
9	15.8140	34.97	-10.01	24.96	43.00	-18.04	QP	P
10	15.8140	34.97	-10.28	24.69	30.00	-5.31	AVG	P
11	28.2580	38.77	-10.51	28.26	43.00	-14.74	QP	P
12	28.2580	38.77	-11.85	26.92	30.00	-3.08	AVG	P

Note: Level = Reading + Factor

Margin = Level – Limit

Power	:	From PoE	Temperature	:	22 °C
Test Mode 4	:	Live View, Power by PoE, ISN LAN100Mbps	Humidity	:	63 %
Test Date	:	2012/05/29			



No.	Frequency (MHz)	Factor (dBuA)	Reading (dBuA)	Level (dBuA)	Limit (dBuA)	Margin (dB)	Detector	P/F
1	0.5180	33.95	-10.24	23.71	43.00	-19.29	QP	P
2	0.5180	33.95	-10.39	23.56	30.00	-6.44	AVG	P
3	1.0380	33.99	-11.19	22.80	43.00	-20.20	QP	P
4	1.0380	33.99	-11.12	22.87	30.00	-7.13	AVG	P
5	1.8140	34.04	-12.68	21.36	43.00	-21.64	QP	P
6	1.8140	34.04	-12.69	21.35	30.00	-8.65	AVG	P
7	2.5940	34.07	-12.09	21.98	43.00	-21.02	QP	P
8	2.5940	34.07	-13.41	20.66	30.00	-9.34	AVG	P
9	15.8140	34.97	-9.67	25.30	43.00	-17.70	QP	P
10	15.8140	34.97	-9.83	25.14	30.00	-4.86	AVG	P
11	28.2580	38.77	-10.54	28.23	43.00	-14.77	QP	P
12	28.2580	38.77	-11.81	26.96	30.00	-3.04	AVG	P

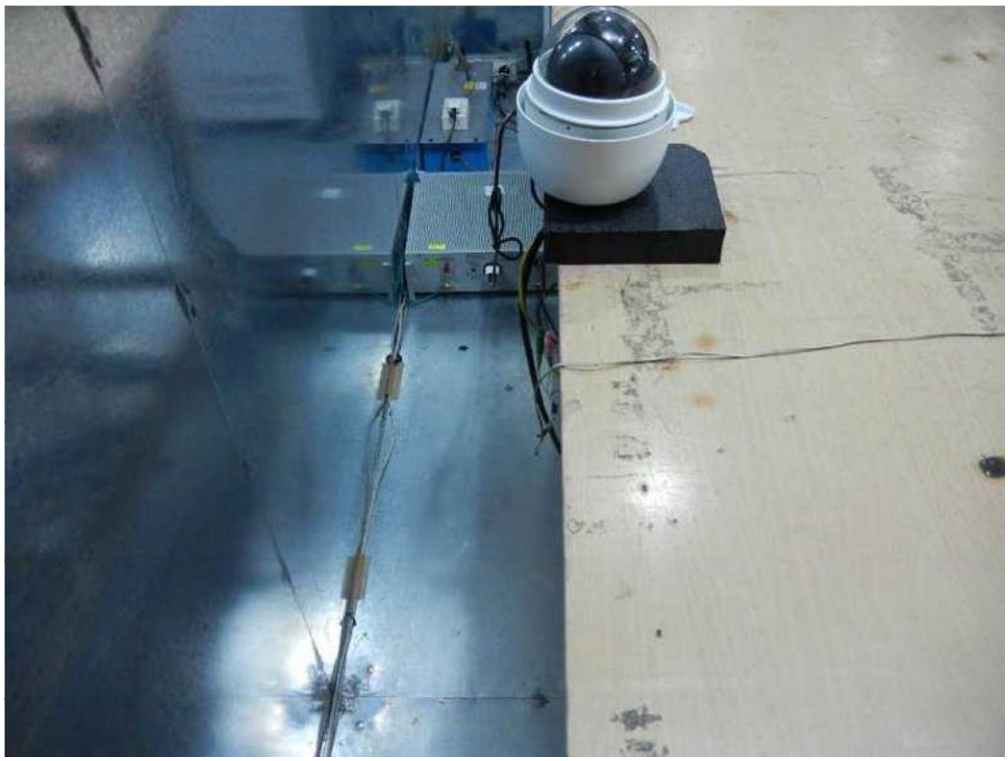
Note: Level = Reading + Factor Margin =
Level – Limit

Test engineer: Steve

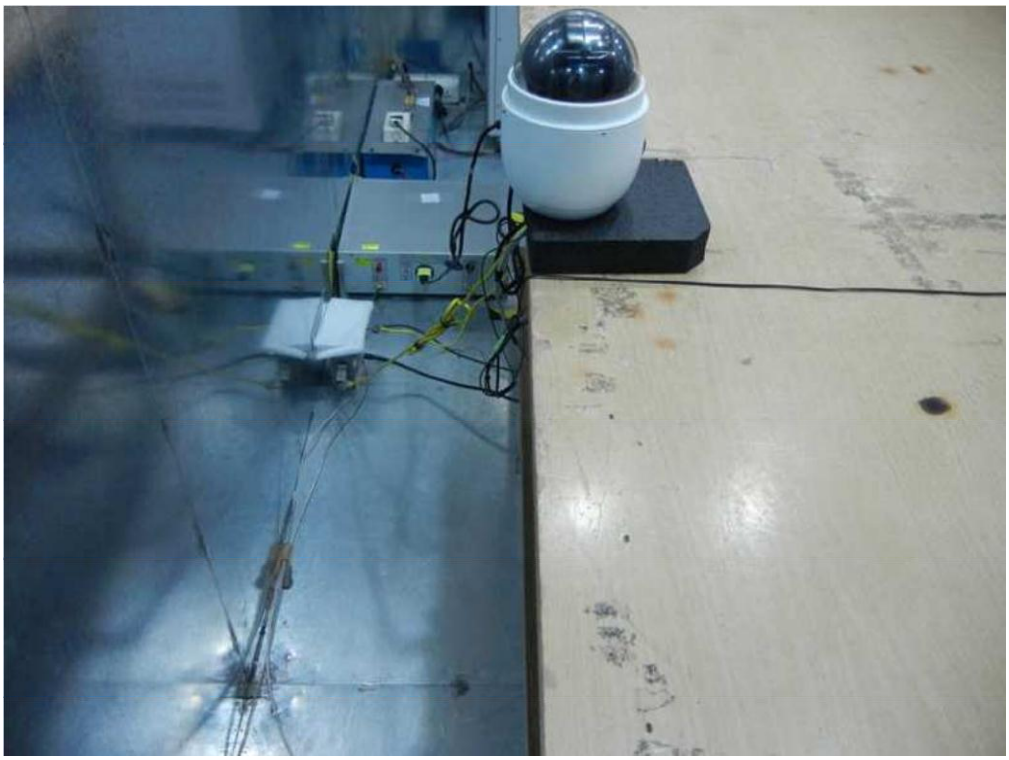
4.6. Test Photographs of Power Port

Front View

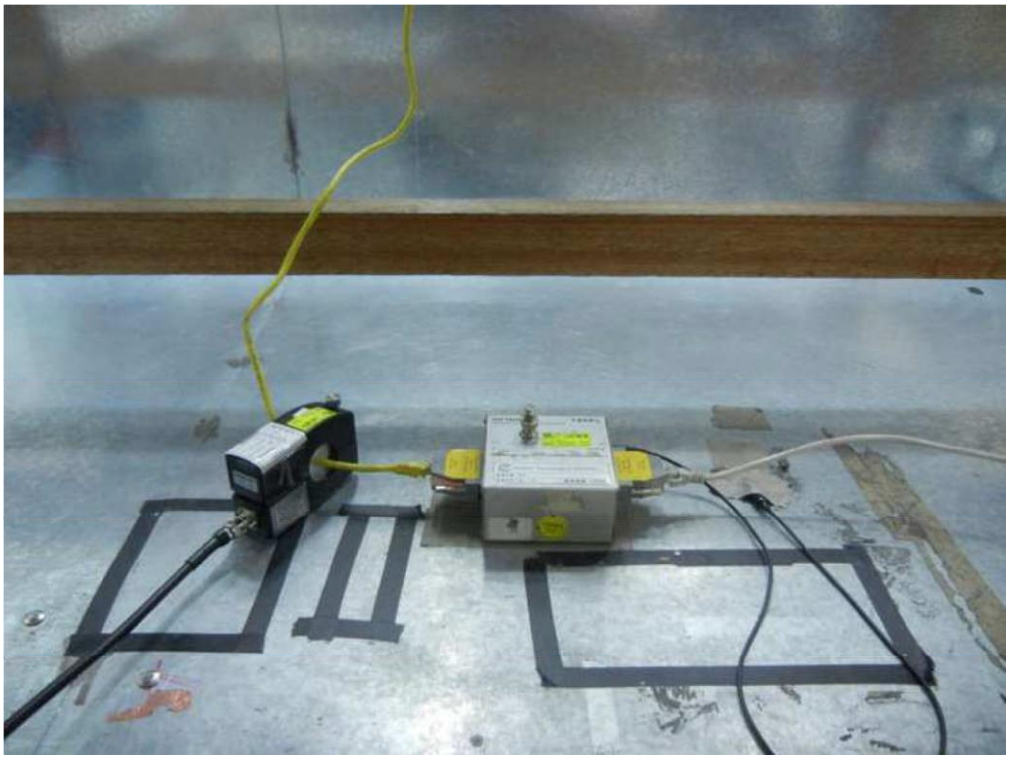
Rear View



4.7. Test Photographs of Telecommunication Port



Rear View (Test Mode1-2)



Rear View (Test Mode3-4)

5. Test of Radiated Emission

5.1. Test Limit

The EUT shall meet

the limits of below Table when measured at the measuring distance R in accordance with the methods described in European Standard EN 55022 Clause 10. If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the highest reading shall be recorded, with the exception of any brief isolated high reading, which shall be ignored.

Table – Limits for radiated disturbance of class A ITE at a measuring distance of 10 m

Frequency range MHz	Quasi-peak limits dB(μV/m)
30 to 230	40
230 to 1000	47
NOTE 1 The lower limit shall apply at the transition frequency. NOTE 2 Additional provisions may be required for cases where interference occurs.	

The EUT shall meet the limits of below Table when measured in accordance with the method described in European Standard EN 55022 Clause 10 and the conditional testing procedure described below.

Table – Limits for radiated disturbance of class A ITE at a measuring distance of 3 m

Frequency range GHz	Average limit dB(μV/m)	Peak limits dB(μV/m)
1 to 3	56	76
3 to 6	60	80
NOTE The lower limit applies at the transition frequency.		

.Conditional testing procedure:

The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes.

If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.

If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.

If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.

If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

5.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

c. The table was rotated 360 degrees to determine the position of the highest radiation.

d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

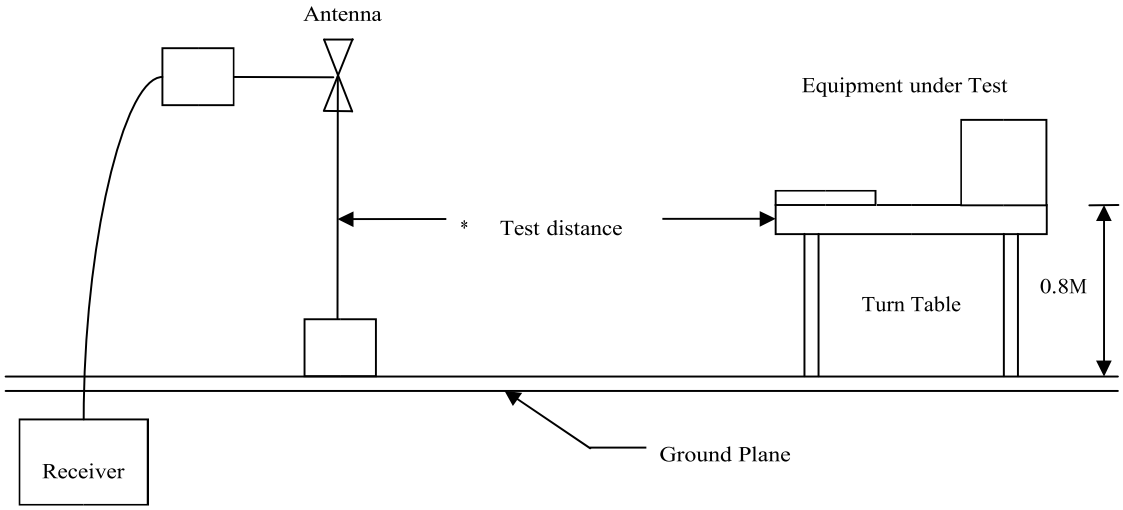
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

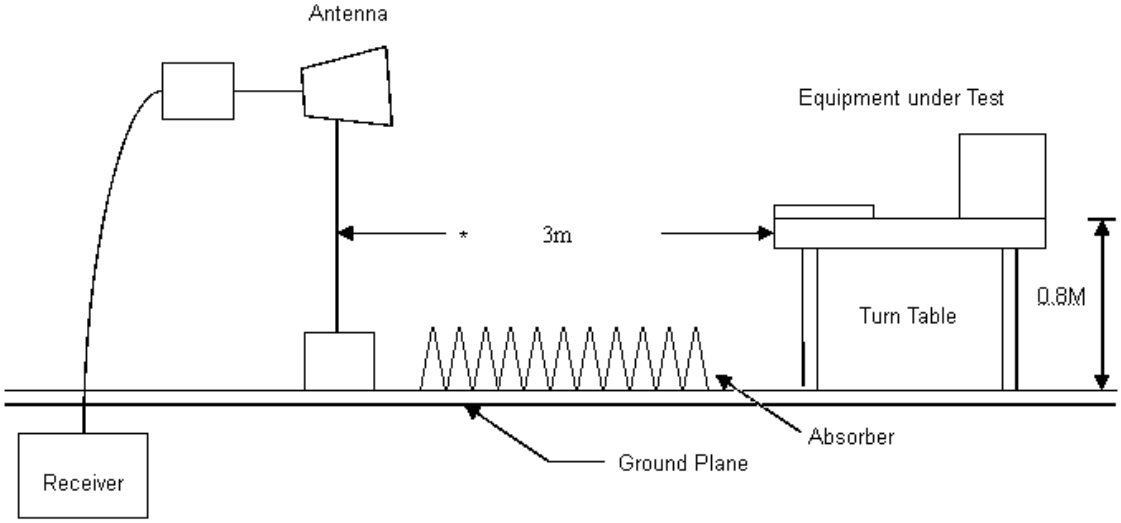
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

5.3. Typical Test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup

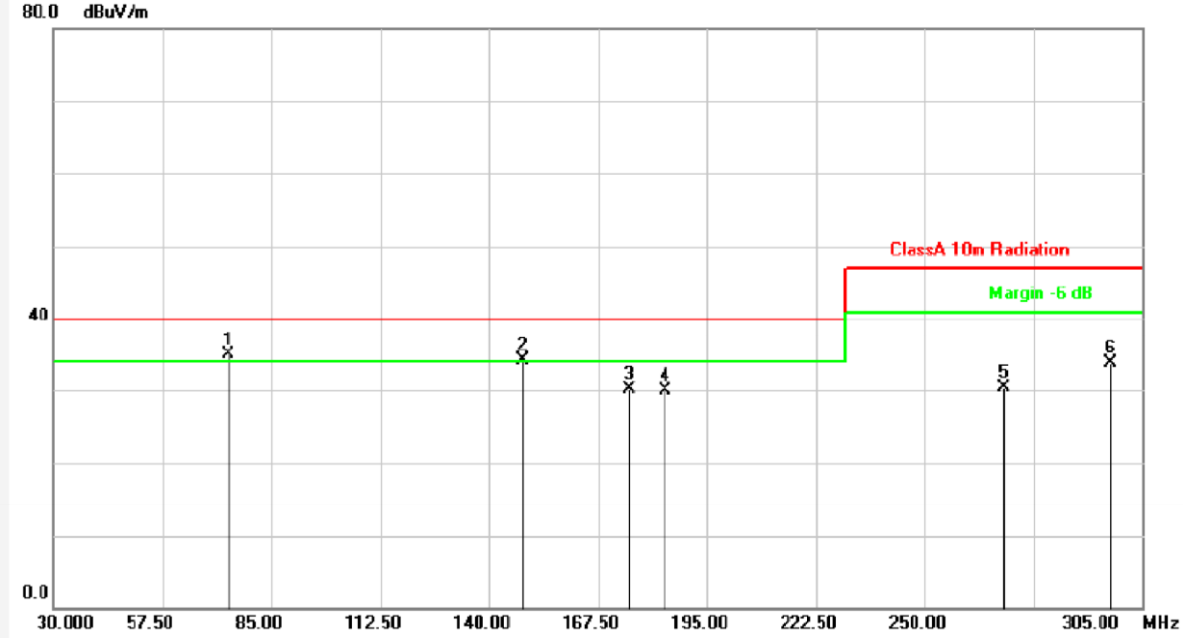


5.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Amplifier	Agilent	8447D	2944A10531	2012/01/13	2013/01/12
Bilog Antenna	Schaffner	CBL6112D	22242	2012/01/12	2013/01/11
EMI Receiver	R&S	ESCI	101200	2011/07/26	2012/07/25
Spectrum Analyzer	R&S	FSP40	100047	2012/03/01	2013/02/28
Horn Antenna	EMCO	3115	31589	2012/03/01	2013/02/28
Preamplifier	Agilent	8449B	3008A01954	2012/02/29	2013/02/28

5.5. Test Result and Data (30MHz ~ 1000MHz)

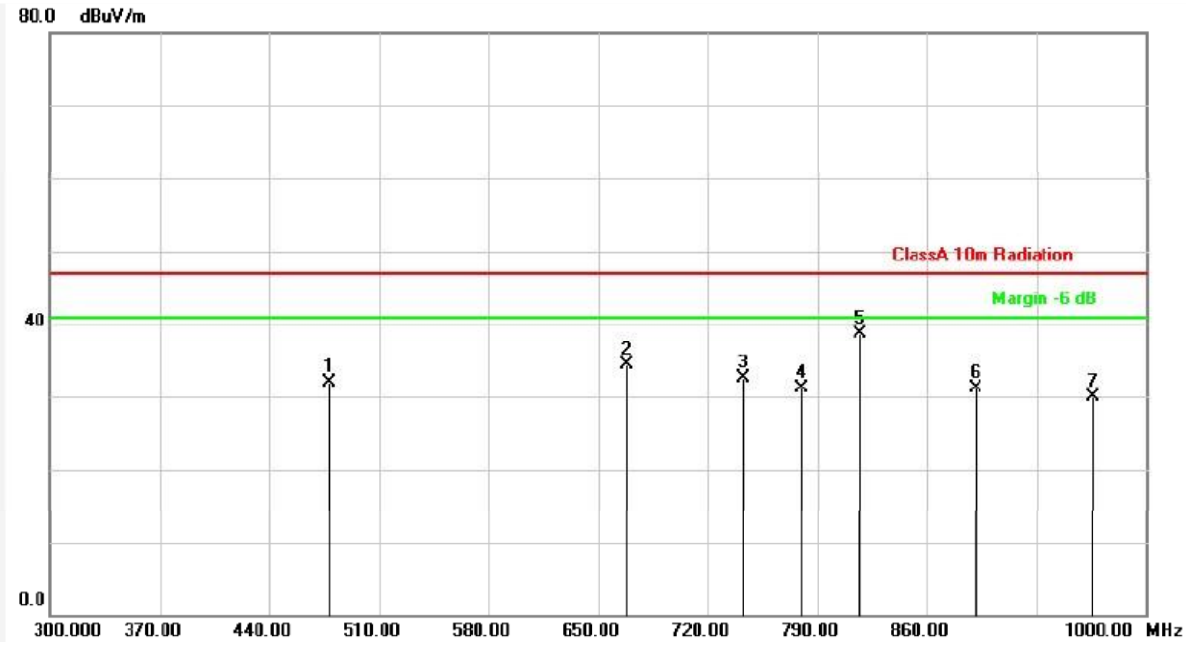
Power	:	AC 24V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	74.2750	-20.33	55.15	34.82	40.00	-5.18	QP	400	0	P
2	148.5000	-15.44	49.60	34.16	40.00	-5.84	QP	100	260	P
3	175.2000	-16.15	46.27	30.12	40.00	-9.88	QP	400	0	P
4	184.5500	-16.32	46.32	30.00	40.00	-10.00	QP	400	0	P
5	270.0750	-11.73	41.98	30.25	47.00	-16.75	QP	400	0	P
6	297.0250	-10.89	44.53	33.64	47.00	-13.36	QP	400	0	P

Note: Level = Reading + Factor
Margin = Level – Limit

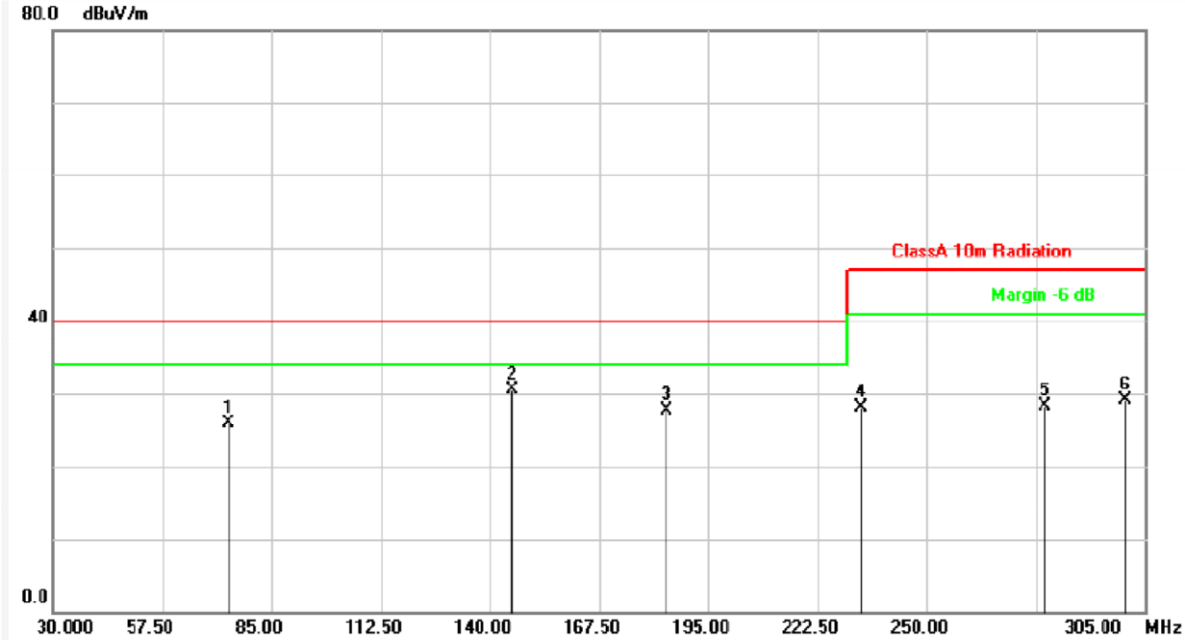
Power	:	AC 24V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ( )	P/F
1	478.5000	-6.83	38.70	31.87	47.00	-15.13	QP	100	0	P
2	668.2000	-3.64	38.03	34.39	47.00	-12.61	QP	100	0	P
3	743.1000	-2.35	34.92	32.57	47.00	-14.43	QP	100	0	P
4	780.2000	-1.57	32.72	31.15	47.00	-15.85	QP	100	0	P
5	817.3000	-0.89	39.67	38.78	47.00	-8.22	QP	100	0	P
6	891.5000	0.62	30.45	31.07	47.00	-15.93	QP	100	0	P
7	965.7000	1.85	28.14	29.99	47.00	-17.01	QP	100	0	P

Note: Level = Reading + Factor Margin =
Level – Limit

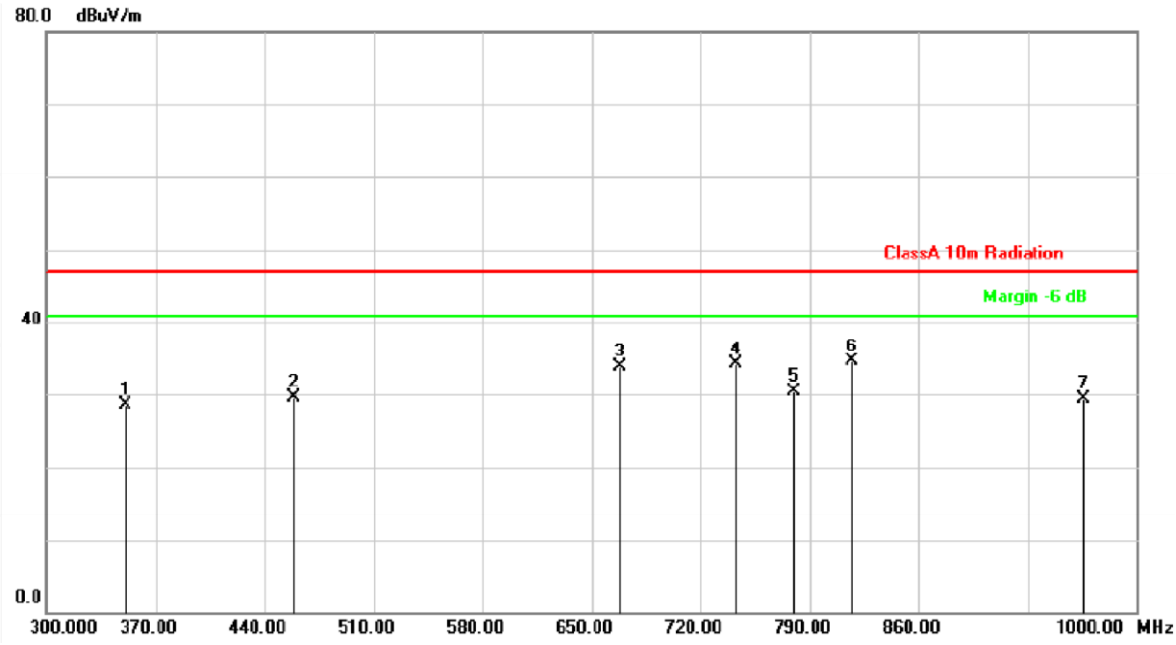
Power	:	AC 24V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	74.2750	-19.22	45.21	25.99	40.00	-14.01	QP	400	0	P
2	145.7750	-14.43	44.99	30.56	40.00	-9.44	QP	400	0	P
3	184.5500	-15.56	43.22	27.66	40.00	-12.34	QP	400	0	P
4	233.5000	-13.49	41.58	28.09	47.00	-18.91	QP	400	0	P
5	279.9750	-9.67	37.98	28.31	47.00	-18.69	QP	400	0	P
6	300.0500	-8.49	37.62	29.13	47.00	-17.87	QP	400	0	P

Note: Level = Reading + Factor Margin =
Level – Limit

Power	:	AC 24V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (-)	P/F
1	350.4000	-8.32	36.82	28.50	47.00	-18.50	QP	100	0	P
2	458.9000	-6.52	36.09	29.57	47.00	-17.43	QP	100	0	P
3	668.2000	-3.30	37.00	33.70	47.00	-13.30	QP	100	0	P
4	743.1000	-3.13	37.14	34.01	47.00	-12.99	QP	100	0	P
5	780.2000	-2.66	32.92	30.26	47.00	-16.74	QP	100	0	P
6	817.3000	-2.16	36.60	34.44	47.00	-12.56	QP	100	0	P
7	965.7000	0.66	28.63	29.29	47.00	-17.71	QP	100	0	P

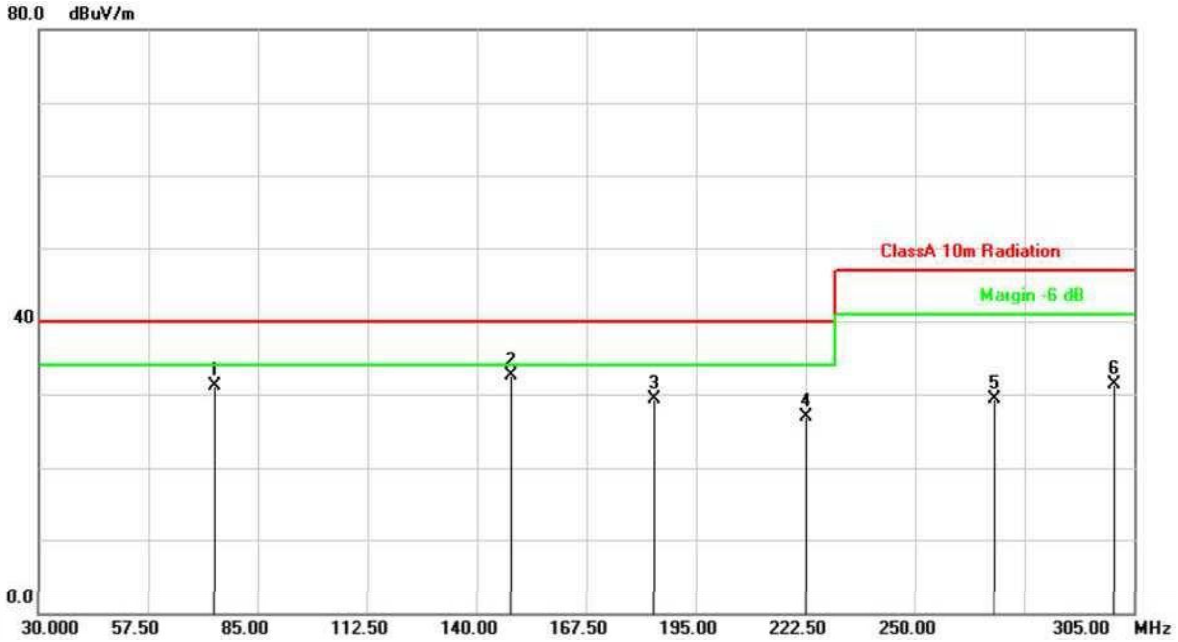
Note: Level = Reading + Factor Margin = Level – Limit

Power	:	From PoE	Pol/Phase	:	VERTICAL
Test Mode 2	:	Live View, Power by PoE	Temperature	:	22 ℃
Test Date	:	2012/05/22	Humidity	:	70 %

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	74.2750	-20.33	51.40	31.07	40.00	-8.93	QP	100	130	P
2	148.5000	-15.44	48.00	32.56	40.00	-7.44	QP	100	280	P
3	184.5500	-16.32	45.63	29.31	40.00	-10.69	QP	400	0	P
4	222.7750	-15.42	42.25	26.83	40.00	-13.17	QP	400	0	P
5	270.0750	-11.73	40.94	29.21	47.00	-17.79	QP	400	0	P
6	300.0500	-10.78	42.05	31.27	47.00	-15.73	QP	400	0	P

Note: Level = Reading + Factor Margin = Level – Limit

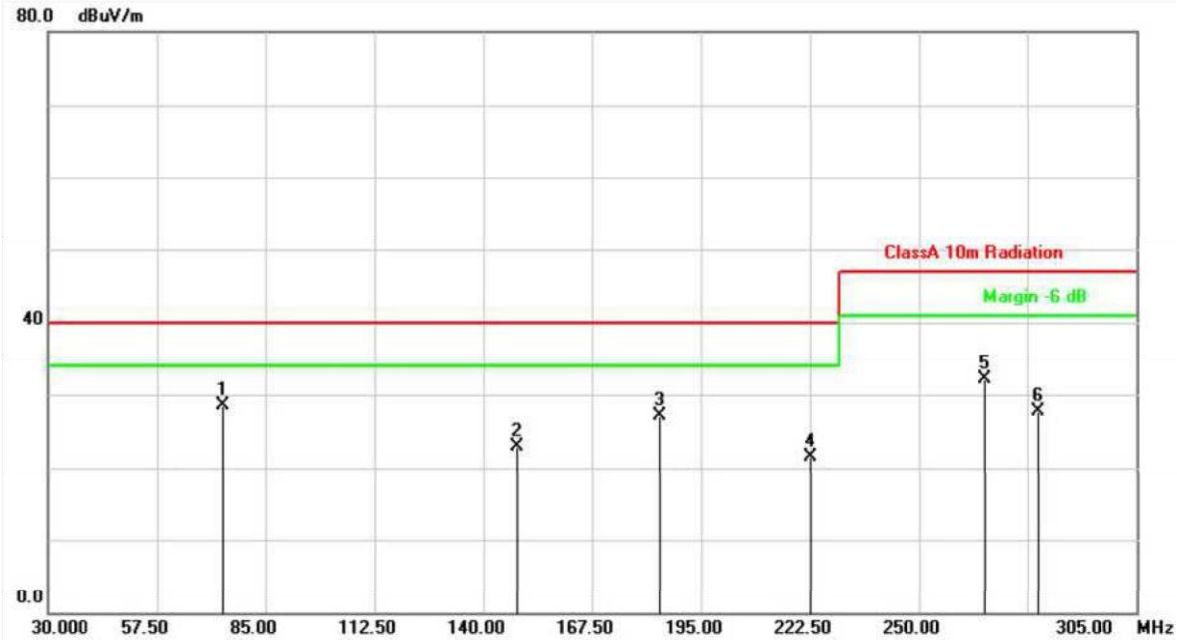
Power	:	From PoE	Pol/Phase	:	VERTICAL
Test Mode 2	:	Live View, Power by PoE	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	74.2750	-20.33	51.40	31.07	40.00	-8.93	QP	100	130	P
2	148.5000	-15.44	48.00	32.56	40.00	-7.44	QP	100	280	P
3	184.5500	-16.32	45.63	29.31	40.00	-10.69	QP	400	0	P
4	222.7750	-15.42	42.25	26.83	40.00	-13.17	QP	400	0	P
5	270.0750	-11.73	40.94	29.21	47.00	-17.79	QP	400	0	P
6	300.0500	-10.78	42.05	31.27	47.00	-15.73	QP	400	0	P

Note: Level = Reading + Factor Margin = Level – Limit

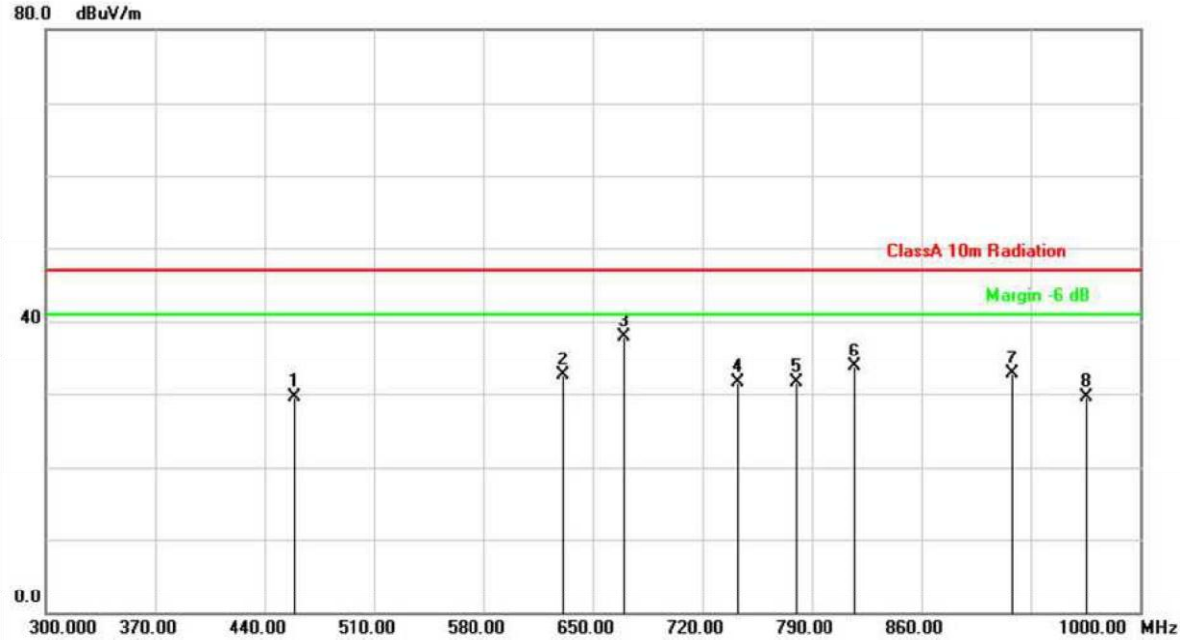
Power	:	From PoE	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Live View, Power by PoE	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	74.2750	-19.22	47.76	28.54	40.00	-11.46	QP	400	0	P
2	148.5000	-14.76	37.70	22.94	40.00	-17.06	QP	400	0	P
3	184.5500	-15.56	42.70	27.14	40.00	-12.86	QP	400	0	P
4	222.7750	-14.79	36.30	21.51	40.00	-18.49	QP	400	0	P
5	266.7750	-10.21	42.37	32.16	47.00	-14.84	QP	400	0	P
6	280.2500	-9.65	37.32	27.67	47.00	-19.33	QP	400	0	P

Note: Level = Reading + Factor Margin = Level – Limit

Power	:	From PoE	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Live View, Power by PoE	Temperature	:	22 °C
Test Date	:	2012/05/22	Humidity	:	70 %



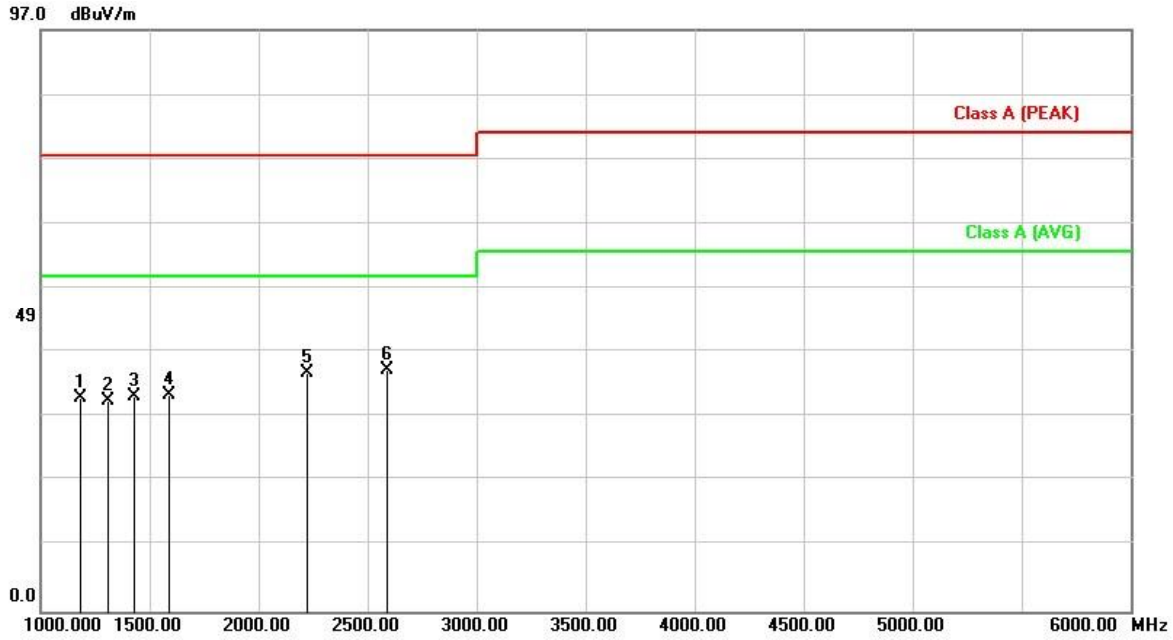
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	458.9000	-6.52	36.06	29.54	47.00	-17.46	QP	100	0	P
2	631.1000	-2.77	35.22	32.45	47.00	-14.55	QP	100	0	P
3	669.6000	-3.34	41.30	37.96	47.00	-9.04	QP	100	0	P
4	743.1000	-3.13	34.62	31.49	47.00	-15.51	QP	100	0	P
5	780.2000	-2.66	34.14	31.48	47.00	-15.52	QP	100	0	P
6	817.3000	-2.16	35.93	33.77	47.00	-13.23	QP	100	0	P
7	918.1000	-0.26	32.99	32.73	47.00	-14.27	QP	100	0	P
8	965.7000	0.66	28.86	29.52	47.00	-17.48	QP	100	0	P

Note: Level = Reading + Factor Margin =
Level – Limit

Test engineer: Ken

5.6. Test Result and Data (1000MHz ~ 6000MHz)

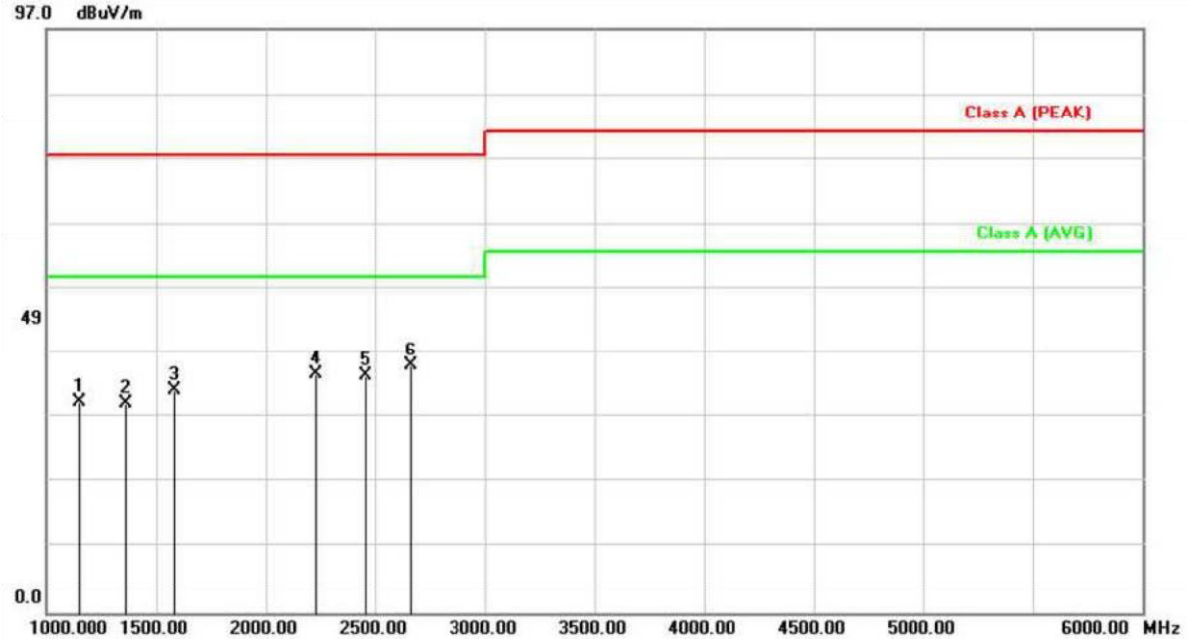
Power	:	AC 24V	Pol/Phase	:	VERTICAL
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	21 °C
Test Date	:	2012/05/31	Humidity	:	66 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	1185.000	-18.37	53.88	35.51	76.00	-40.49	peak	129	345	P
2	1310.000	-17.84	52.99	35.15	76.00	-40.85	peak	164	258	P
3	1430.000	-17.33	53.17	35.84	76.00	-40.16	peak	158	269	P
4	1590.000	-16.61	52.63	36.02	76.00	-39.98	peak	122	259	P
5	2225.000	-14.07	53.71	39.64	76.00	-36.36	peak	115	360	P
6	2590.000	-12.82	52.85	40.03	76.00	-35.97	peak	150	234	P

Note: Level = Reading + Factor
Margin = Level – Limit

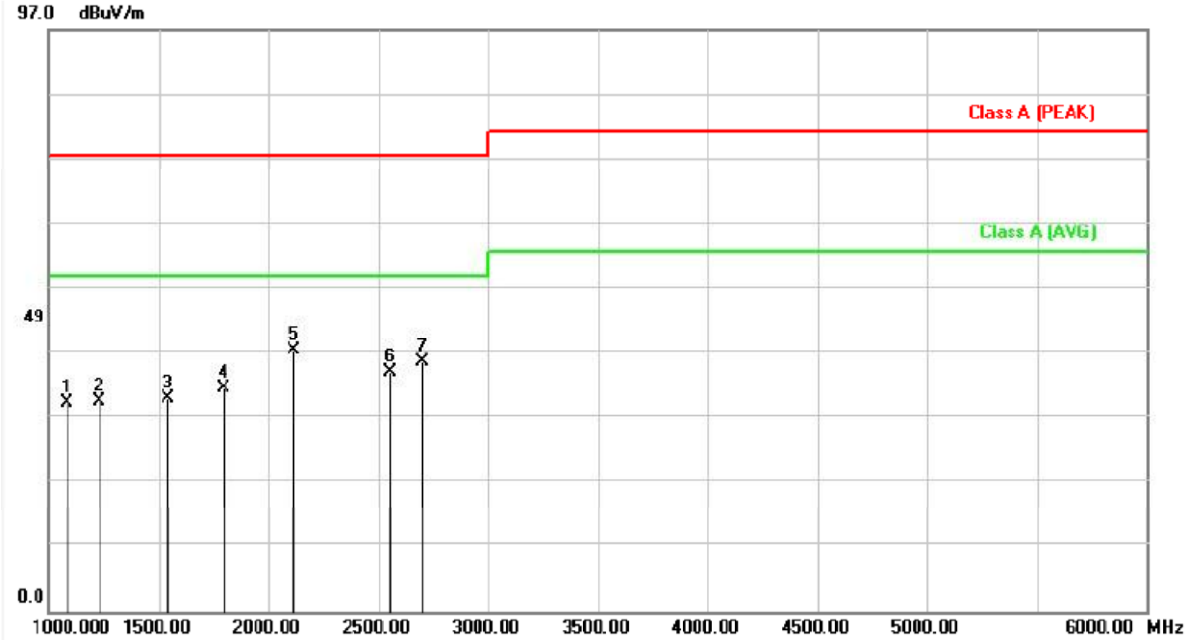
Power	:	AC 24V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	Live View, Power by AC 24V Source	Temperature	:	21 °C
Test Date	:	2012/05/31	Humidity	:	66 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	1150.000	-18.51	53.61	35.10	76.00	-40.90	peak	123	68	P
2	1365.000	-17.60	52.52	34.92	76.00	-41.08	peak	120	30	P
3	1585.000	-16.64	53.67	37.03	76.00	-38.97	peak	162	269	P
4	2230.000	-14.06	53.62	39.56	76.00	-36.44	peak	168	129	P
5	2455.000	-13.43	52.86	39.43	76.00	-36.57	peak	180	223	P
6	2665.000	-12.41	53.41	41.00	76.00	-35.00	peak	118	236	P

Note: Level = Reading + Factor Margin =
Level – Limit

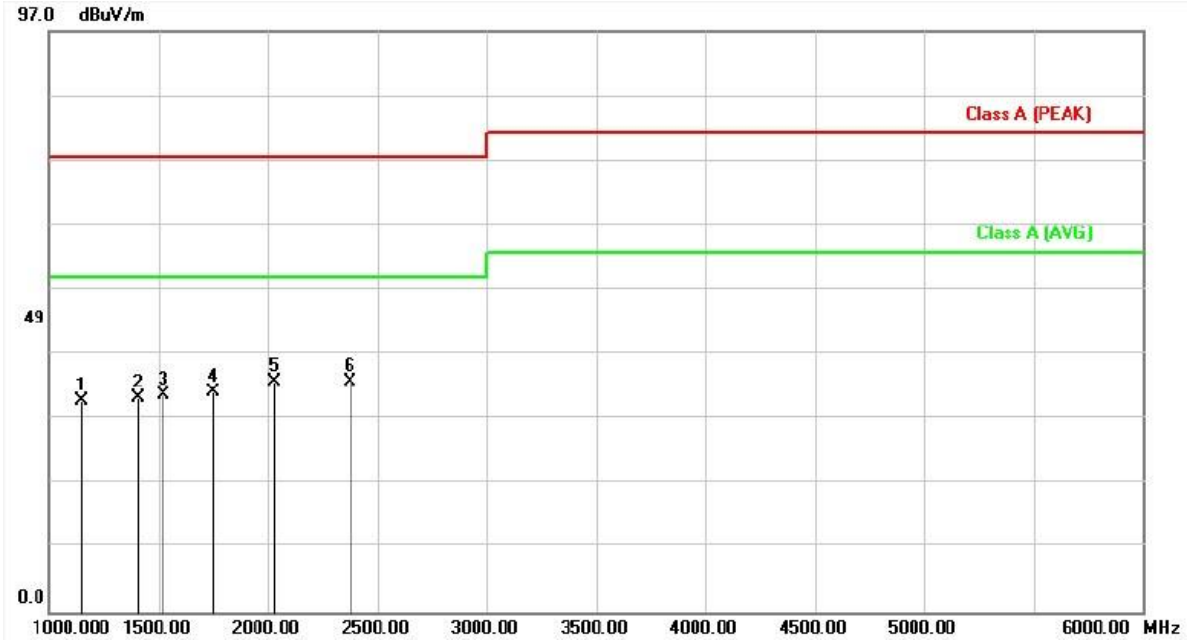
Power	:	From PoE	Pol/Phase	:	VERTICAL
Test Mode 2	:	Live View, Power by PoE	Temperature	:	21 °C
Test Date	:	2012/05/31	Humidity	:	66 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	1085.000	-18.80	53.71	34.91	76.00	-41.09	peak	100	352	P
2	1230.000	-18.18	53.13	34.95	76.00	-41.05	peak	190	129	P
3	1545.000	-16.82	52.31	35.49	76.00	-40.51	peak	148	189	P
4	1795.000	-15.66	52.98	37.32	76.00	-38.68	peak	189	122	P
5	2115.000	-14.38	57.84	43.46	76.00	-32.54	peak	125	249	P
6	2555.000	-13.01	53.02	40.01	76.00	-35.99	peak	126	136	P
7	2705.000	-12.20	53.71	41.51	76.00	-34.49	peak	120	259	P

Note: Level = Reading + Factor Margin =
Level – Limit

Power	:	From PoE	Pol/Phase	:	HORIZONTAL
Test Mode 2	:	Live View, Power by PoE	Temperature	:	21 °C
Test Date	:	2012/05/31	Humidity	:	66 %



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	P/F
1	1150.000	-18.51	53.81	35.30	76.00	-40.70	peak	156	298	P
2	1410.000	-17.41	53.19	35.78	76.00	-40.22	peak	159	24	P
3	1525.000	-16.90	53.24	36.34	76.00	-39.66	peak	150	278	P
4	1750.000	-15.87	52.66	36.79	76.00	-39.21	peak	126	36	P
5	2030.000	-14.62	53.00	38.38	76.00	-37.62	peak	111	159	P
6	2375.000	-13.65	52.13	38.48	76.00	-37.52	peak	187	93	P

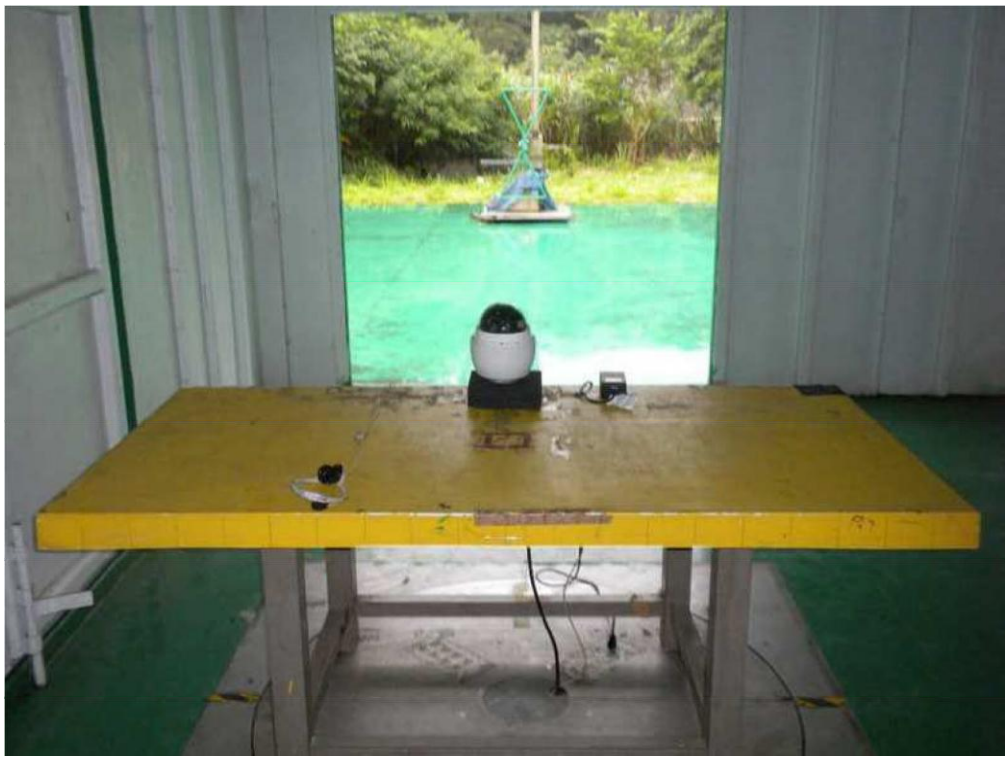
Note: Level = Reading + Factor Margin =
Level – Limit

Test engineer: Ken

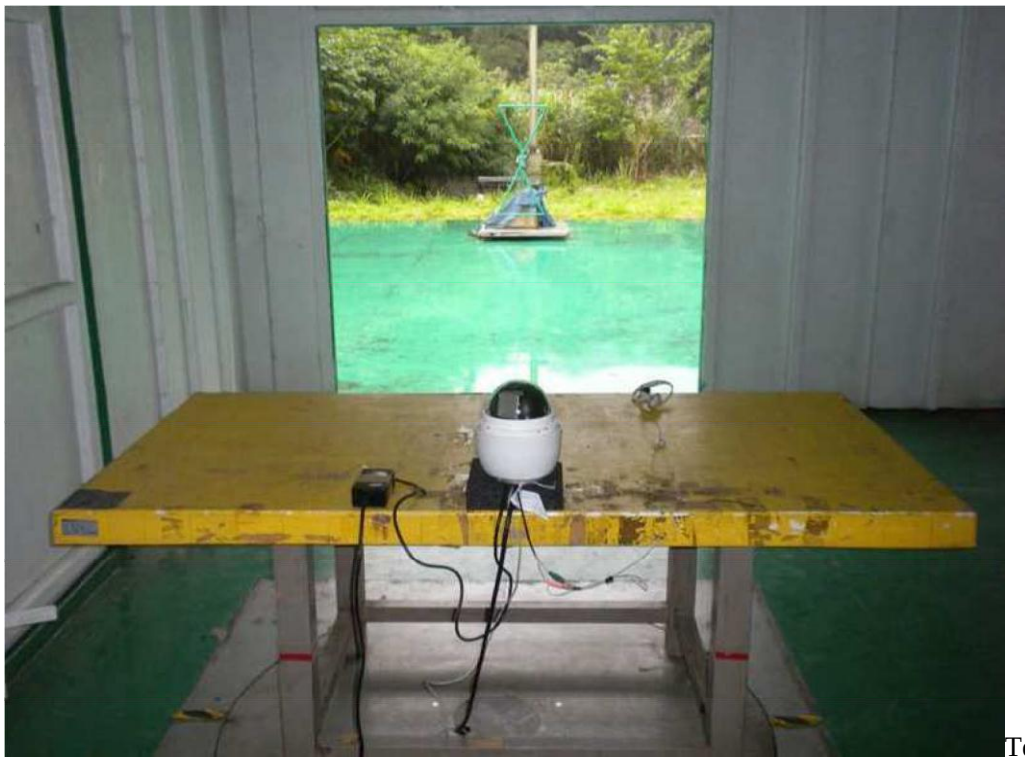
5.7. Test Photographs (30MHz ~ 1000MHz)

Test Mode1:

Front View



Rear View



Test Mode2:

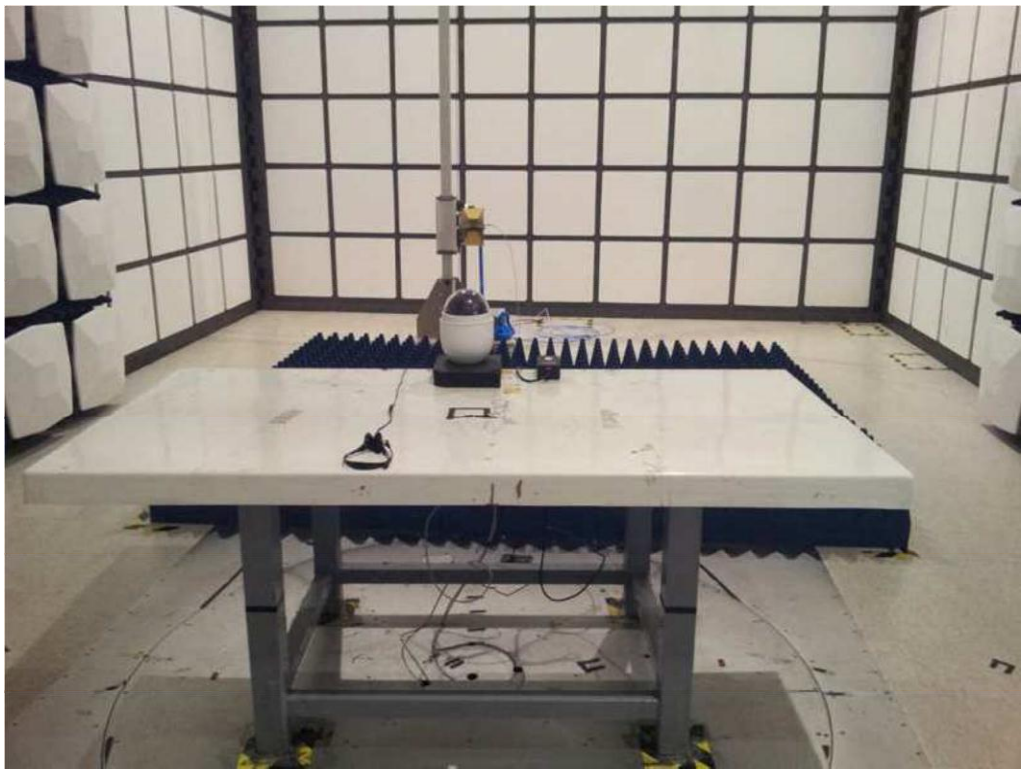
Front View

Rear View

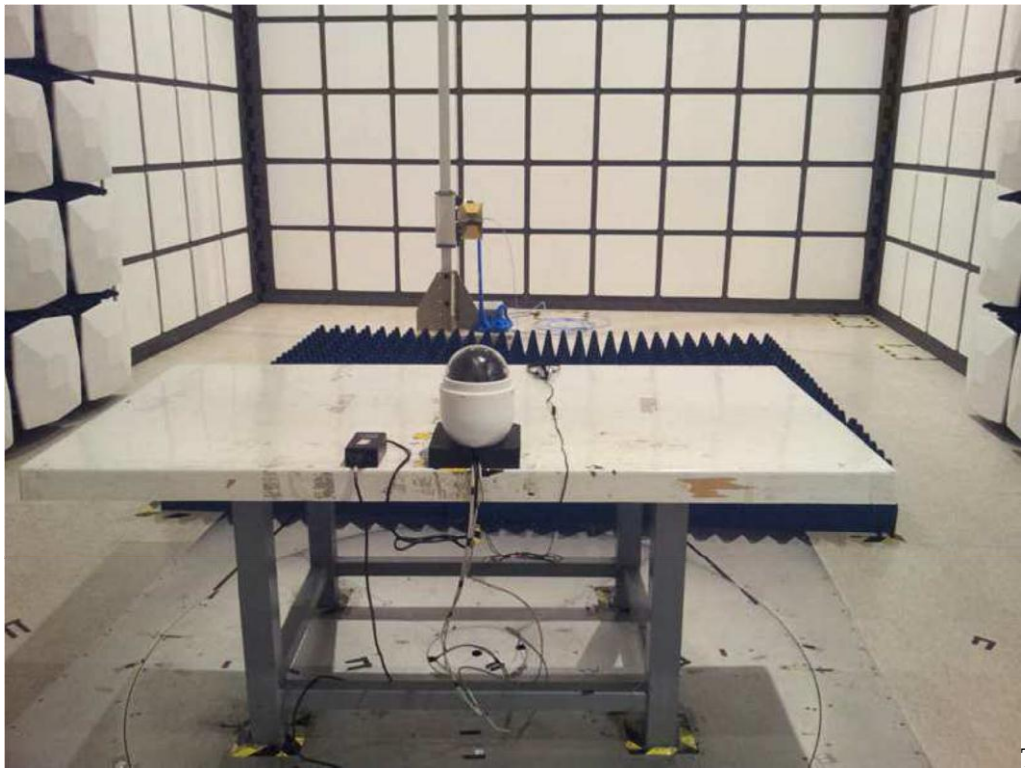
5.8. Test Photographs (1000MHz ~ 6000MHz)

Test Mode1:

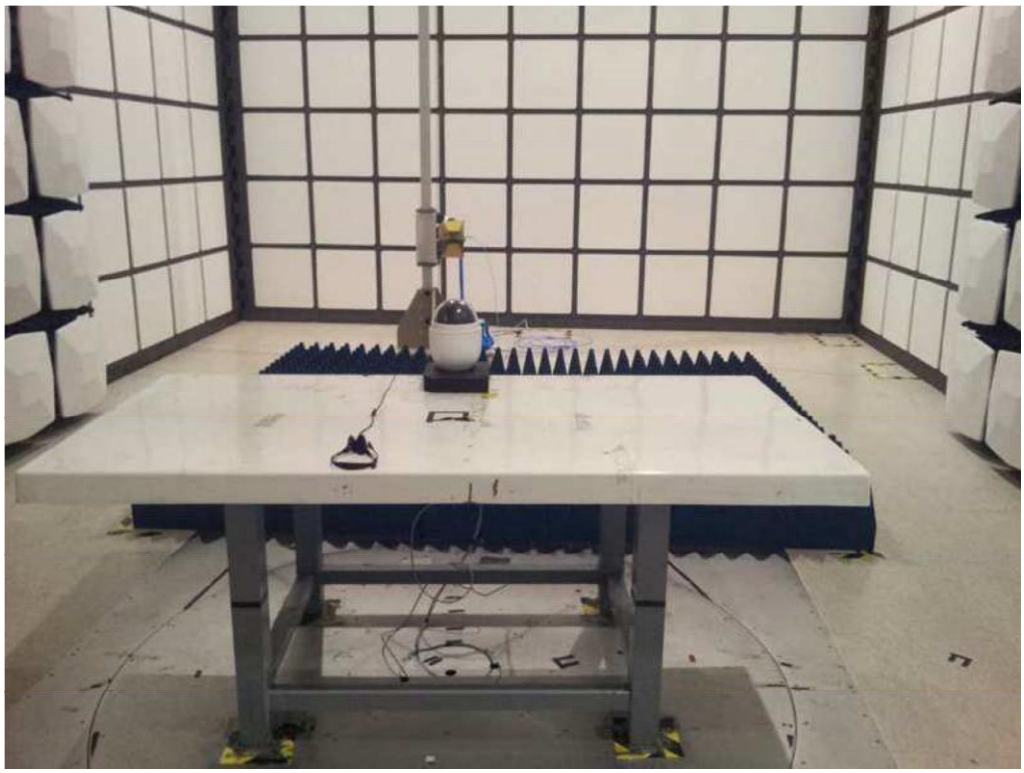
Front View



Rear View



Test Mode2:



Front View

Rear View

6. Harmonics Test

6.1. Limits of Harmonics Current Measurement

Limits for Class A equipment	Limits for Class D equipment

Harmonics Order n	Max. Permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15 × 15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23 × 8/n

Harmonics Order n	Max. Permissible harmonics current per watt mA/W	Max. Permissible harmonics current A
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15<=n<=39	3.85/n	0.15 x15/n

NOTE:

1. Class A and Class D are classified according to item section 5 of EN 61000-3-2:2006/A1:2009/ A2:2009.
2. According go section 7 of EN 61000-3-2: 2009, the above limits for all equipment except for lighting equipment are for all applications having a rated power > 75 W and no limits apply for equipment with a rated power up to and including 75 W.

6.2. Test Result and Data

As specified on clause 7 and figure Z1 of EN 61000-3-2:2006/A1:2009/A2:2009, the limits are not specified for equipment with a rated power of 75W or less.

The EUT meets the above condition, so it conforms to EN 61000-3-2

7. Voltage Fluctuations Test

7.1. Test Procedure

The equipment shall be tested under the conditions of Clause 5.

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and

tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of ±8% is achieved during the whole assessment procedure.

7.2. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Power & Harmonics Analyzer	TTI	HA1600	198226	2012/01/16	2013/01/15

7.3. Test Result and Data

Basic Standard	: EN 61000-3-3	Temperature	: 24 ℃
Final Test Result	: PASS	Relative Humidity	: 51 %
Test Data	: 2012/06/05		

```
Supply Voltage: 229.8 to 230.0 Vrms     327.0 Vpk    Frequency: 50.00 Hz
                THD:  0.6%     Crest Factor:  1.423   peak at:  88.9 deg

Load Power:       0.013 kW              0.022 kVA  Power Factor:  0.649

Load Current:    0.09 to  0.09 Arms     0.23 Apk   Crest Factor:  2.414

Voltage Variations
    Highest Half-cycle level: +0.81%
     Lowest Half-cycle level: -0.16%
                     d(max):  0.97%                        Pass

  Number of Change Intervals:     5
    Highest d(t) for  500 ms:  0.00%                       Pass
    Longest d(t) over  3.30%:  0.02 seconds

   'Steady State' definition:  >1000 ms below  0.32%
  Highest Steady State level: -0.05%
   Lowest Steady State level: -0.08%
   max d(c) between adjacent:  0.02%                       Pass
        max d(c) between any:  0.02%

Flicker
   Long-term Flicker indicator Plt :   0.00
  Short-term Flicker indicator Pst :
                      Plt Interval      Pst
                                1:     0.06
                                2:     0.06
                                3:     0.06
                                4:     0.06
                                5:     0.06
                                6:     0.06
                                7:     0.06
                                8:     0.06
                                9:     0.06
                               10:     0.06
                               11:     0.06
                               12:     0.06

  Pst  classifier:      Duration      Flicker
                          0.1%          0.02
                          0.7%          0.01
                          1.0%          0.01
                          1.5%          0.01
                          2.2%          0.01
                            3%          0.01
                            4%          0.01
                            6%          0.01
                            8%          0.01
                           10%          0.01
                           13%          0.01
                           17%          0.01
                           30%          0.00
                           50%          0.00
                           80%          0.00
```

Test engineer: Dora

7.4. Test Photographs

8. Electrostatic Discharge Immunity Test

8.1. Test Procedure

a. In the case of air discharge testing the climatic conditions shall be within the following ranges:

- ambient temperature: 15 to 35 ℃ ; relative humidity : 30
- to 60 % ; atmospheric pressure : 86 KPa (860
- mbar) to 106 KPa (1060 mbar).

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.

d. The test shall be performed with both air discharge and contact discharge. On reselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge. On reselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on contact discharge.

e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

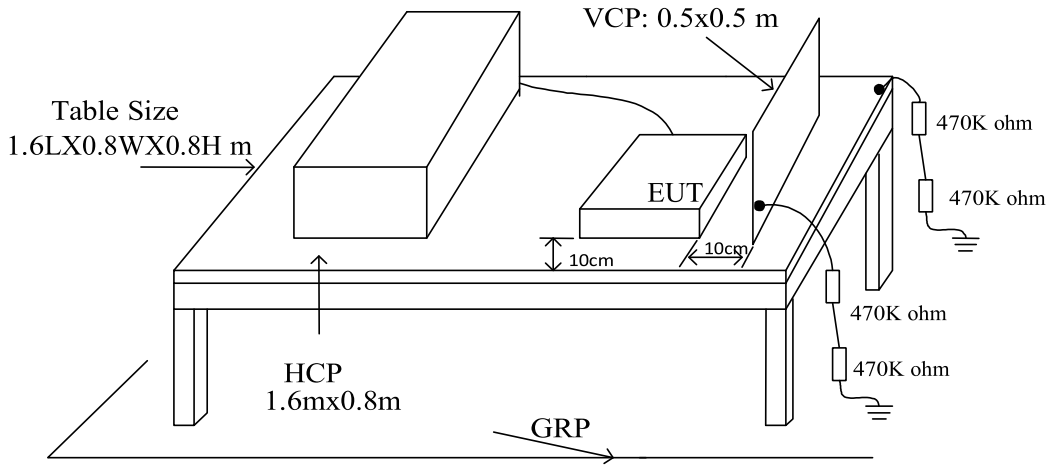
g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :

- If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
- Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
- The contact discharge test shall not be applied to such surfaces.

h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT .

After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

8.2. Test Setup for Tests Performed in Laboratory



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner :

a. Contact Discharge to the conductive surfaces and to coupling plane;
b. Air Discharge at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the Cerpass Technology Corp., we provided 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 2.5 m x 2.5 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resister located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.

8.3. Test Severity Levels

Contact Discharge		Air Discharge	
Level	Test Voltage (KV) of Contact discharge	Level	Test Voltage (KV) of Air Discharge
1	±2	1	±2

2	±4	2	±4
3	±6	3	±8
4	±8	4	±15
X	Specified	X	Specified
Remark: "X" is an open le ⁄el.			

8.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
ESD SIMULATOR	Schaffner	NSG438	878	2011/06/16	2012/06/15

8.5. Test Result and Data

Test Mode: Mode 1 ~ Mode 2

Final Test Result	:	PASS
Basic Standard	:	IEC 61000-4-2
Product Standard	:	EN 50130-4
Test Voltage	:	±2 / +4 / ± ±2 / +4 / ± 8 KV for air discharge, 6 KV for contact discharge
Temperature	:	29°C
Relative Humidity	:	48 %
Atmospheric Pressure	:	1012 hPa
Test Date	:	2012/05/25

	Contact Discharge						Air Discharge					
	10 times / each						10 times / each					
Voltage	2 KV		4 KV		6 KV		2 KV		4 KV		8 KV	
Point\Polarity	+	_	+	_	+	_	+	_	+	_	+	_
HCP	A	A	A	A	A*	A*	---	---	---	---	---	---
VCP	A	A	A	A	A*	A*	---	---	---	---	---	---
Case	---	---	---	---	---	---	A	A	A	A	A*	A*
Screw	A	A	A	A	A*	A*	---	---	---	---	---	---
RJ45	A	A	A	A	A*	A*	---	---	---	---	---	---
Alarm	---	---	---	---	---	---	A	A	A	A	A	A
Audio Port	---	---	---	---	---	---	A	A	A	A	A*	A*

Note:" A" means the EUT function is normal working during the test.

Test engineer: 

8.6. Test Photographs

Mode 1

Mode 2

9. Radio Frequency electromagnetic field immunity test

9.1. Test Procedure

a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.

b. The antenna which is enabling the complete frequency range of 80-2700 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.
c. The test is normally performed with the antenna facing the most sensitive side of the EUT. The polarization of the field generated by the bucolical antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The circular polarization of the field from the log-spiral antenna makes a change of position of the antenna unnecessary.
d. At each of the above conditions, the frequency range is swept 80-2700 MHz, pausing to adjustthe R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5*10-3 decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

9.2. Test Severity Levels

Frequency Band : 80-2700 MHz	
Level	Test field strength (V/m)
1	1
2	3
3	10
X	Specified
Remark: “X” is an open class.	

9.3. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Amplifiers 80-1000MHz/100W	SCHAFFNER	CBA9413B	43510	N/A	N/A
Amplifiers 80-3000MHz/20W	SCHAFFNER	CBA9428	43515	N/A	N/A
Antenna	SCHAFFNER	CBL6141A	4257	N/A	N/A
Power Meter	Boonton	4231A-01	115902	2012/09/26	2013/09/25
Field Probe	HOLADAY	HI-6105	00144727	2012/09/20	2013/09/19
Signal Generator	HP	8648C	3629U00612	2012/09/26	2013/09/25
Power Sensor	Boonton	51011-EMC	33312	2012/09/26	2013/09/25

9.4. Test Result and Data

Final Test Result : PASS
Basic Standard : IEC 61000-4-3
Product Standard : EN 50130-4
Frequency Range : 80~2700 MHz
Temperature : 24°C
Relative Humidity : 56 %

Atmospheric Pressure : 1012 hPa

Test Date : 2013/07/08

Mode1, Mode2:

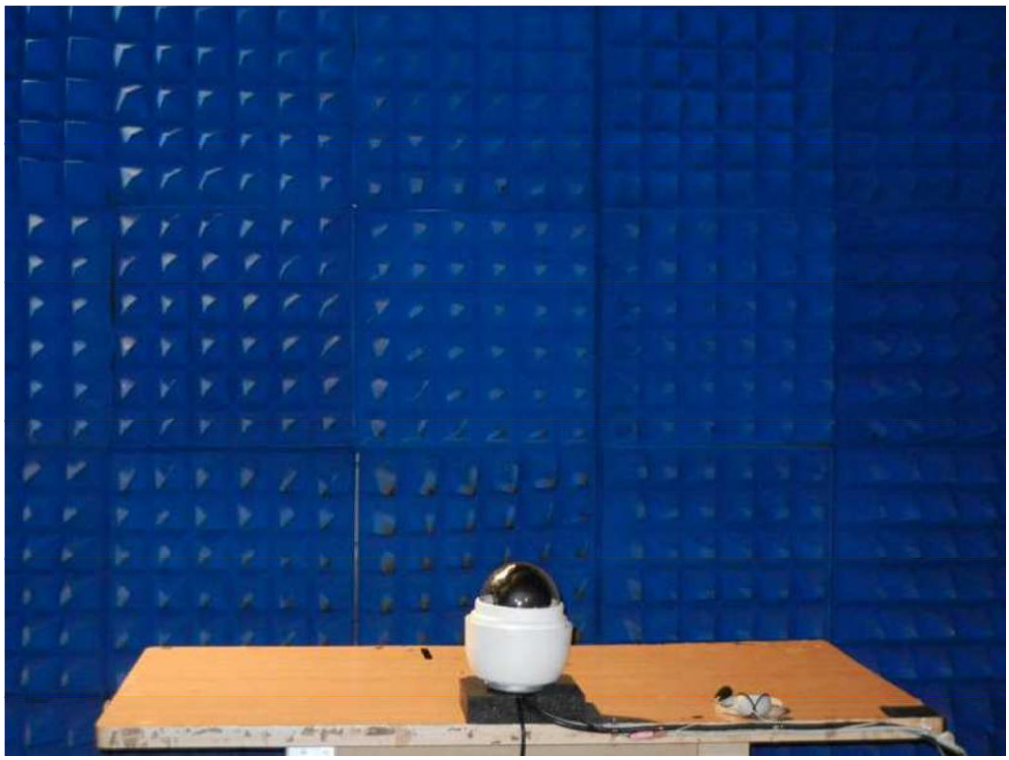
Modulation : AM 80% , 1KHz sine wave, Dwell time: 3 S Frequency Step Size : 1 % of preceding frequency value				
Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Vertical	Front	10 V/m	A
80~2700	Vertical	Rear	10 V/m	A
80~2700	Vertical	Left	10 V/m	A
80~2700	Vertical	Right	10 V/m	A
80~2700	Horizontal	Front	10 V/m	A
80~2700	Horizontal	Rear	10 V/m	A
80~2700	Horizontal	Left	10 V/m	A
80~2700	Horizontal	Right	10 V/m	A

Note: "A" means the EUT function is normal working during the test.

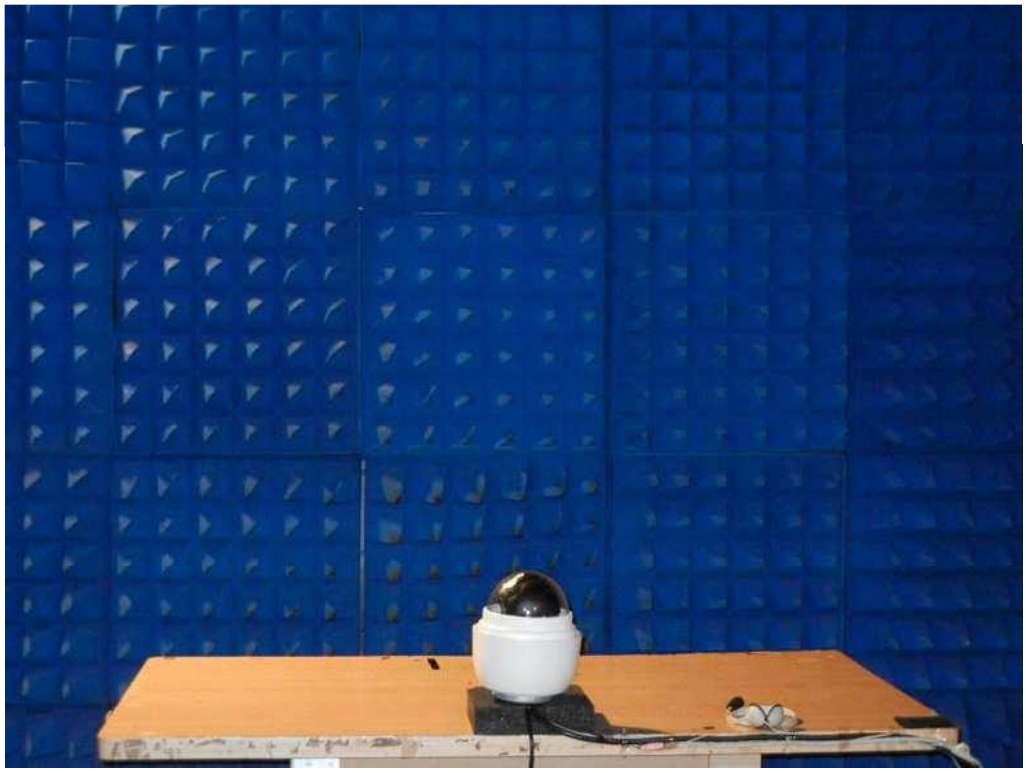
Test engineer: Dora

9.5. Test Photographs

Mode 1



Mode 2



10. Electrical Fast Transient/ Burst Immunity Test

10.1. Test Procedure

a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:

- ambient temperature: 15 to 35 ; ℃
- relative humidity : 45 to 75 ; % %
-

Atmospheric pressure: 86 Kpa (860 mbar) to 106 Kpa (1060 mbar).

b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.

c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.

d. Test on Power Line:

- The EFT/B-generator was located on the GRP.. The length from the EFT/B-generator to the EUT is not exceeding 1 m.
- The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

e. Test on Communication Lines

- The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP.
- The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

f. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :

- Normal performance within the specification limits.
- Temporary degradation or loss of function or performance which is self-recoverable.
- Temporary degradation or loss of function or performance which requires operator intervention or system reset.
- Degradation or loss of function which is not recoverable due to damage of equipment (components).

10.2. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test :

Open circuit output test voltage ± 10%		
Level	On Power Supply	On I/O signal, data and control line
1	0.5 KV	0.25 KV
2	1.0 KV	0.50 KV
3	2.0 KV	1.00 KV
4	4.0 KV	2.00 KV
X	Specified	Specified

Remark : " X " is an open level. The level is subject to negotiation between the user and manufacturer or is specified by the manufacturer.

10.3. Measurement Equipment

Test Mode 1-2

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
TESQ NSG3060	TESQ	NSG3060	1385	2011/11/28	2012/11/27

Test Mode 3-4

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
TESQ NSG3060	TESQ	NSG3060	1385	2013/04/11	2014/04/10

10.4. Test Result and Data

Test Mode: Mode 1 ~ Mode 2

Final Test Result	:	PASS
Basic Standard	:	IEC 61000-4-4
Product Standard	:	EN 50130-4
Test Voltage	:	On Power Port-- ± 1.0 KV, ±2.0 KV On Signal Port --1.0 KV
Temperature	:	24°C
Relative Humidity	:	55 %
Atmospheric Pressure	:	1012 hPa
Test Date	:	2012/05/28

Mode1

Pulse : 5/50 ns	Repetition Rate: 100 kHz
Burst : 15m/300ms	Test time : 1 min/each condition

Voltage/ Mode/ Polarity/ Result/ Phase		1.0 kV		2.0 kV	
		+	-	+	-
Power Line	L	A	A	A	A
	N	A	A	A	A
	L-N	A	A	A	A
	PE	A	A	A	A
	L-PE	A	A	A	A
	N-PE	A	A	A	A
	L-N-PE	A	A	A	A

Mode2

Pulse : 5/50 ns	Repetition Rate: 100 kHz
Burst : 15m/300ms	Test time : 1 min/each condition

Voltage/ Mode/ Polarity/ Result/ Phase		1.0 kV		--- kV	
		+	-	+	-
Signal Line	RJ45(10/100M)	A	A	---	---

Note: "A" Means the EUT function is normal working during the test.

Test engineer: 

Test Mode: Mode 3 ~ Mode4

Final Test Result	:	PASS
Basic Standard	:	IEC 61000-4-4

Product Standard	:	EN 50130-4
Test Voltage	:	On Signal Port -- ±1.0 KV
Temperature	:	24°C
Relative Humidity	:	55 %
Atmospheric Pressure	:	1012 hPa
Test Date	:	2013/07/08

Mode 3, Mode4

Pulse : 5/50 ns		Repetition Rate: 100 kHz			
Burst : 15m/300ms		Test time : 1 min/each condition			
Voltage/ Mode/ Polarity/ Result/ Phase		1.0 kV		--- kV	
		+	-	+	-
Signal Line	Alarm	A	A	---	---

Note: "A" Means the EUT function is normal working during the test.

Test engineer: Dora

10.5. Test Photographs

Mode 1

Main

Clamp

Mode 2

Clamp

Mode 3

Clamp  Mode

4 Clamp

11. Surge Immunity Test

11.1. Test Procedure

a. Climatic conditions
The climatic conditions shall comply with the following requirements :
- ambient temperature : 15 ℃ to
- 35 ℃relative humidity : 10 % to 75 %
- atmospheric pressure : 86 kPa to 106 kPa (860 mbar to 1060 mbar)

b. Electromagnetic conditions the electromagnetic environment of the laboratory shall not influence the test results.

c. The test shall be performed according the test plan that shall specify the test set-up with generator
- and other equipment utilized;
- test level (voltage/current); generator source impedance; internal or external
- generator trigger; number of tests : at least five positive and five negative at the
- selected points; repetition rate : maximum 1/min. inputs and outputs to be tested;
- representative operating conditions of the EUT; sequence of application of the
- surge to the circuit; phase angle in the case of AC. power supply; actual installation
- conditions, for example :
- AC : neutral earthed,
- DC : (+) or (-) earthed to simulated the actual earthing conditions.

d. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the AC. voltage wave (positive and negative).

e. The surges have to be applied line to line and line(s) and earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.

f. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan.

g. All lower levels including the selected test level shall be satisfied. For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.

h. If the actual operating signal sources are not available, that may be simulated. Under no circumstances may the test level exceed the product specification. The test shall be carried out according to a test plan.

i. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied. For acceptance test previously unstressed equipment shall be used to the protection devices shall be replaced.

11.2. Test Severity Level

Level	Open-circuit test voltage, ± 10%, KV
1	0.5
2	1.0
3	2.0
4	4.0
X	Specified
NOTE: “X” is an open class. This level can be specified in the product specification.	

11.3. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
TESQ NSG3060	TESQ	NSG3060	1385	2011/11/28	2012/11/27

11.4. Test Result and Data

Test Mode: Mode 1

Final Test Result : PASS

Basic Standard : IEC 61000-4-5

Product Standard : EN 50130-4

Test Voltage : Input AC Power Port L-N -- ± 0.5 kV, ± 1.0 kV
Input AC Power Port L-PE, N-PE -- ± 2.0 kV
Signal Port--- ± 1.0 kV

Temperature : 24°C

Relative Humidity : 55%

Atmospheric Pressure : 1012 hPa

Test Date : 2012/6/1

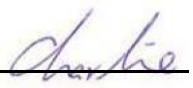
Power Port

Waveform : 1.2/50μs(8/20μs) Repetition rate : 60 sec Time : 5 time/each condition						
Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
0.5 kV 1.0kV	L-N	+	A	A	A	A
		−	A	A	A	A
2.0kV	L-PE, N-PE	+	A	A	A	A
		−	A	A	A	A

Signal Port

Waveform : 1.2/50μs(8/20μs) Repetition rate : 60 sec Time : 5 time/each condition		
Voltage	1.0kV	
Phase Voltage / Mode / Polarity / Result	+	−
RJ45 L-PE	A	A
Alarm L-PE	A	A
Audio L-PE	A	A

Note: "A" Means the EUT function is normal working during the test.

Test engineer: 

11.5. Test Photographs

Mode 1

Power Port

Signal Port (RJ45)
Signal Port (Alarm)

12. Conduction Disturbances induced by Radio-Frequency Fields

12.1. Test Procedure

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
b. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.
c. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
d. The frequency range is swept from 150 KHz to 100 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1KHz sign wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
e. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
f. An alternative test procedure may be adopted, wherein the frequency range is swept incrementally, with a step size not exceeding 4% of the start ad thereafter 4% of the preceding frequency value. The test level should be at least twice the value of the specified test level.
g. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.
h. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
i. The use of special exercising programs is recommended.
j. Testing shall be performed according to a Test Plan, which shall be included in the test report.
k. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.

12.2.Test Severity Levels

Level	Voltage Level (EMF)
1	1 V
2	3 V
3	10 V
x	Specified
NOTE - x is an open cl ass. This level can be specified in the product specification.	

12.3. Measurement Equipment

Test Mode1-2

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
CS GENERATOR	Schaffner	NSG 2070	1059	2011/10/04	2012/10/03
CDN (M2+M3)	Schaffner	M016	20056	2011/10/07	2012/10/06
CDN	Schaffner	T400	19818	2011/10/07	2012/10/06

EM-CLAMP	Schaffner	KEMZ 801	19793	2011/10/11	2012/10/10

Test Mode3-4

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
CS GENERATOR	Schaffner	NSG 2070	1059	2012/09/26	2013/09/25
CDN (M2+M3)	Schaffner	M016	20056	2012/09/26	2013/09/25
CDN	Schaffner	T400	19818	2012/09/26	2013/09/25
EM-CLAMP	Schaffner	KEMZ 801	19793	2012/09/26	2013/09/25

12.4. Test Result and Data

Test Mode: Mode 1 ~ Mode 2

Final Test Result	:	PASS
Basic Standard	:	IEC 61000-4-6
Product Standard	:	EN 50130-4
Coupling mode	:	CDN-(M3) for AC power ports CDN-T400 for Signal Ports
Temperature	:	22°C
Relative Humidity	:	57 %
Atmospheric Pressure	:	1012 hPa
Test Date	:	2012/05/28

Mode 1:

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3s
Frequency Step Size : 1 % of preceding frequency value

Frequency	Test Mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M3)	10	A*
0.15 ~ 100MHz	RJ45 LAN(10/100M)	10	A*

Mode 2:

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3s
Frequency Step Size : 1 % of preceding frequency value

Frequency	Test Mode	Voltage(V)	Result
0.15 ~ 100MHz	CLAMP (PoE)	10	A*

Remark: "A*" Means the EUT function is affect during the test, but it can be recover automatically, after a while.

Test engineer: Charlie

Test Mode: Mode 3 ~ Mode 4

Final Test Result	:	PASS
Basic Standard	:	IEC 61000-4-6
Product Standard	:	EN 50130-4
Coupling mode	:	EM-CLAMP for Signal Ports
Temperature	:	24°C
Relative Humidity	:	56 %
Atmospheric Pressure	:	1012 hPa
Test Date	:	2013/07/28

Mode 3, Mode4:

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3s
Frequency Step Size : 1 % of preceding frequency value

Frequency	Test Mode	Voltage(V)	Result
0.15 ~ 100MHz	CLAMP(Alarm)	10	A

Remark: "A" Means the EUT function is affect during the test, but it can be recover automatically, after a while.

Test engineer: Dora

12.5. Test Photographs

Mode 1

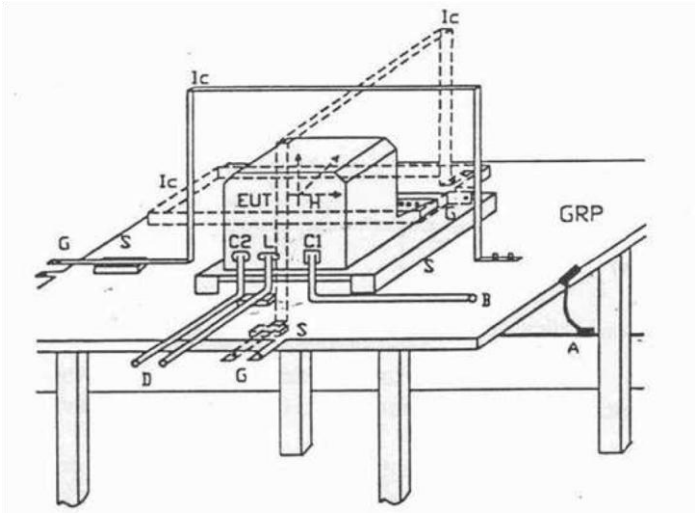
Mode 2

Mode 3

Mode 4

13. Power Frequency Magnetic Field Immunity Test

13.1. Test Setup



GPR	:	Ground plane	C1	:	Power supply circuit
A	:	Safety earth	C2	:	Signal circuit
S	:	Insulating support	L	:	Communication line
EUT	:	Equipment under test	B	:	To power supply source
Lc	:	Induction coil	D	:	To signal source, simulator
E	:	Earth terminal	G	:	To the test generator

13.2. Test Severity Levels

Level	Magnetic field strength A/m
1	1
2	3
3	10
4	30
5	100
X1)	special
NOTE 1 "X" is an open level. This level can be given in the product specification.	

13.3. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
MAGNETIC FIELD GENERATOR	KeyTek	F-1000-4-8-G -125A	N/A	2011/10/05	2012/10/04

13.4. Test Result and Data

Final Test Result :PASS
Pass performance criteria :A
Required performance criteria : A
Basic Standard :IEC 61000-4-8
Product Standard :EN 50130-4
Temperature :24°C
Relative Humidity :44 %
Atmospheric Pressure :1013 hPa
Test Date :Oct. 04, 2012

Test Mode: The test result of all test modes are the same

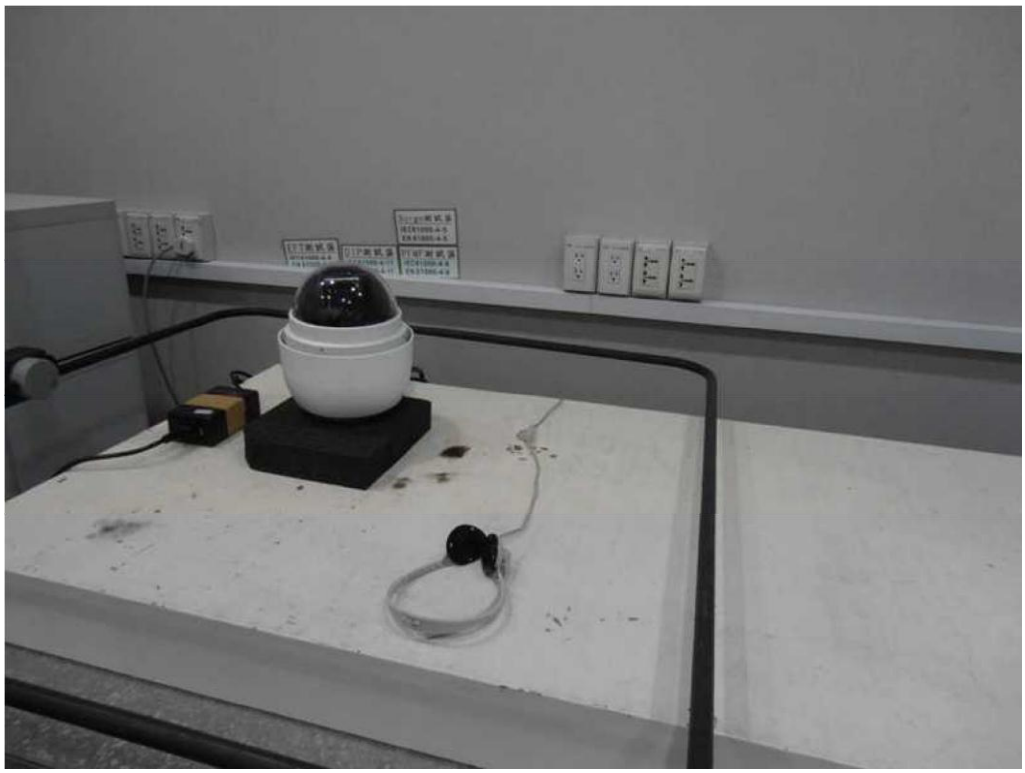
Power Frequency Magnetic Field : 50 Hz, 1 A/m		
Coil Orientation	Testing duration	Results
X-axis	1.0 Min	A
Y-axis	1.0 Min	A
Z-axis	1.0 Min	A

Note: "A" Mean the EUT function is normal working during the test.

Test engineer: Dora

13.5. Test Photographs

Mode 1



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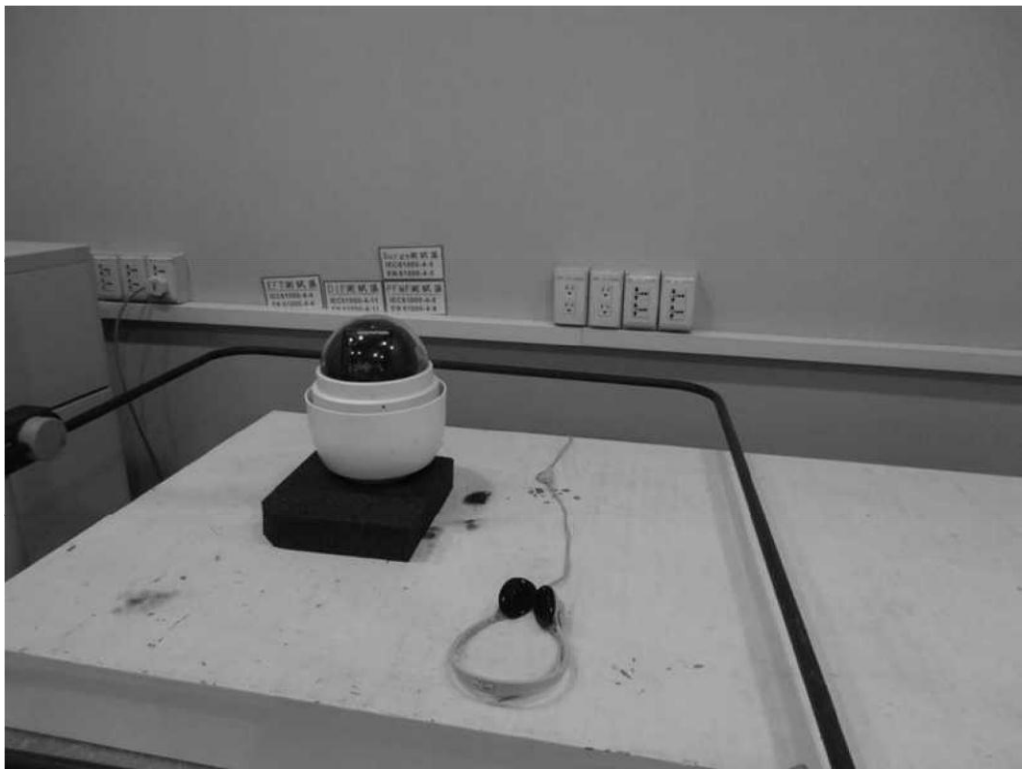


14. Voltage Dips and Voltage Interruptions Immunity Test Setup

14.1. Test Conditions

1. Source voltage and frequency : 100V/230V/240V, 50Hz, Single phase.
2. Test of interval : 10 sec.
3. Level and duration : Sequence of 3 dips/interrupts.
4. Voltage rise (and fall) time : 1 ~ 5 μs.
5. Test severity :

Test level Residual%	Durations (period)
>100%	250
20%	250
30%	25
60%	10

14.2. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
TESQ NSG3060	TESQ	NSG3060	1385	2012/10/25	2013/10/24

14.3. Test Result and Data

Test Mode: Mode 1

Final Test Result : PASS
Basic Standard : IEC 61000-4-11
Product Standard : EN 50130-4
Temperature : 24°C
Relative Humidity : 56 %
Atmospheric Pressure : 1012 hPa
Test Date : 2013/07/08

Mode 1:

Voltage(UT): AC 100/230/240 V 50 Hz Interval(s) : 10s Times : 3

Test mode	Test level Residual%	Durations (period)	Phase / Result	
			0°	180°
Voltage interruptions	>100%	250	A	A
Voltage dips	20%	250	A	A
	30%	25	A	A
	60%	10	A	A

Note: "A" Means the EUT function is normal working during the test.

It is permitted to use ancillary equipment (e.g. A UPS) to meet the requirement of the clause.

Test engineer: Dora

14.4. Test Photographs

Mode 1

15. Mains Supply Voltage Variations Test

15.1. Test Conditions

1. Source voltage and frequency : 230V, 50Hz, Single phase.
2. Test severity :

Test level UT %	Durations
+10%	10min
-15%	10min

15.2. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
TESQ NSG3060	TESQ	NSG3060	1385	2011/11/28	2012/11/27

15.3. Test Result and Data

Test Mode: Mode 1

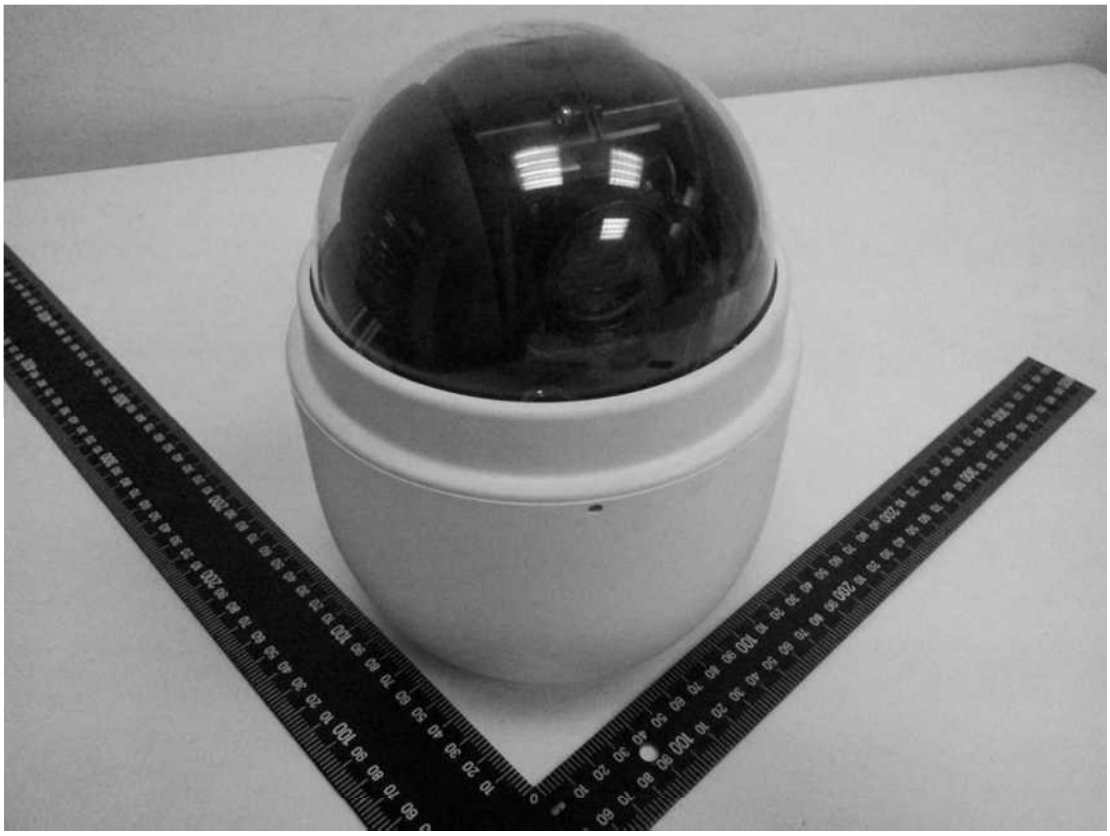
Final Test Result	:	PASS
Basic Standard	:	Mains Supply Voltage Variations
Product Standard	:	EN 50130-4
Atmospheric Pressure	:	24°C
Temperature	:	55 %
Relative Humidity	:	1012 hPa
Test Date	:	2012/6/1

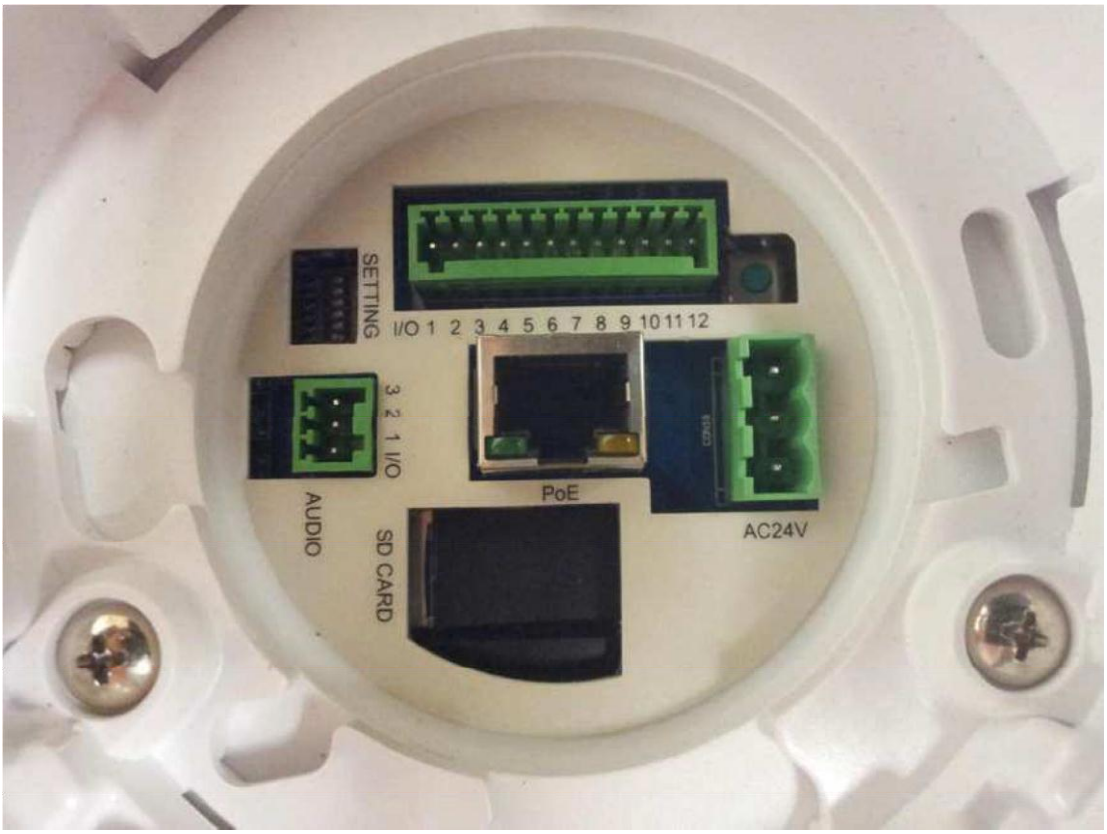
Voltage(UT): AC 230 V 50 Hz			
Test mode	Test level UT %	Durations	Result
Voltage	+10%	10min	A
	-15%	10min	A

Note: "A" Means the EUT function is normal working during the test.

Test engineer: 

Appendix A. Photographs of EUT




SETTING
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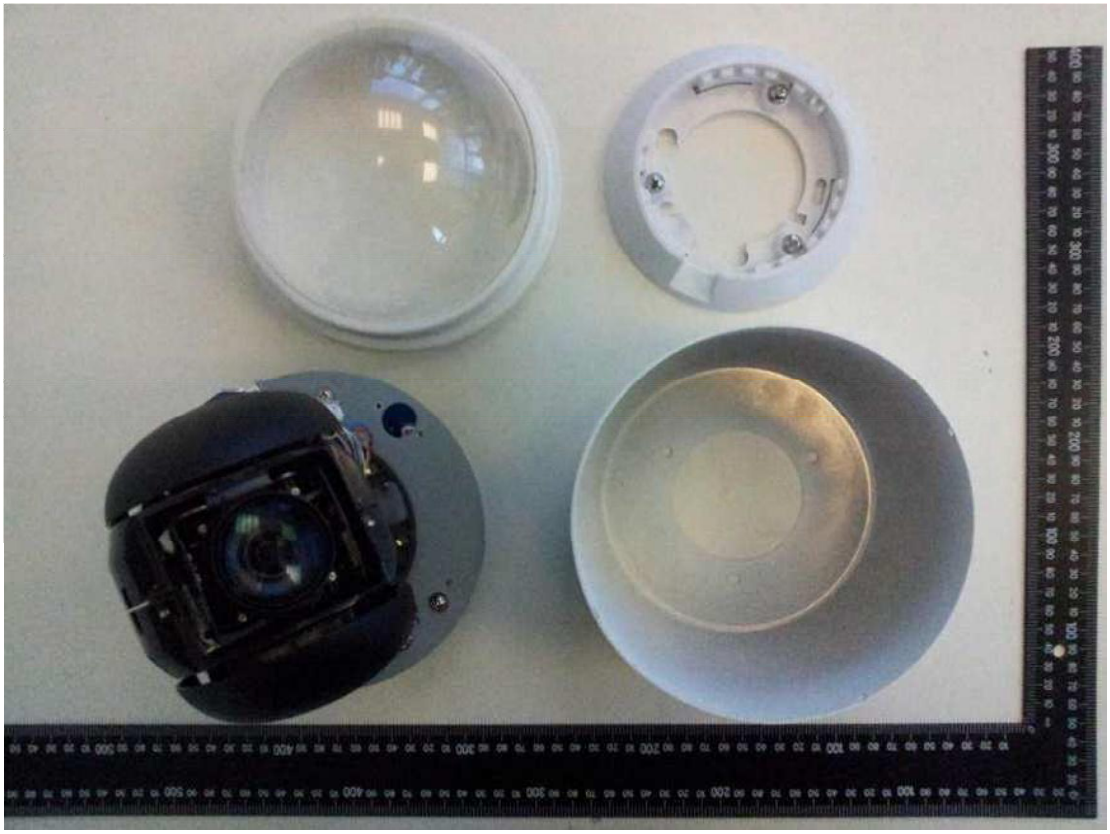
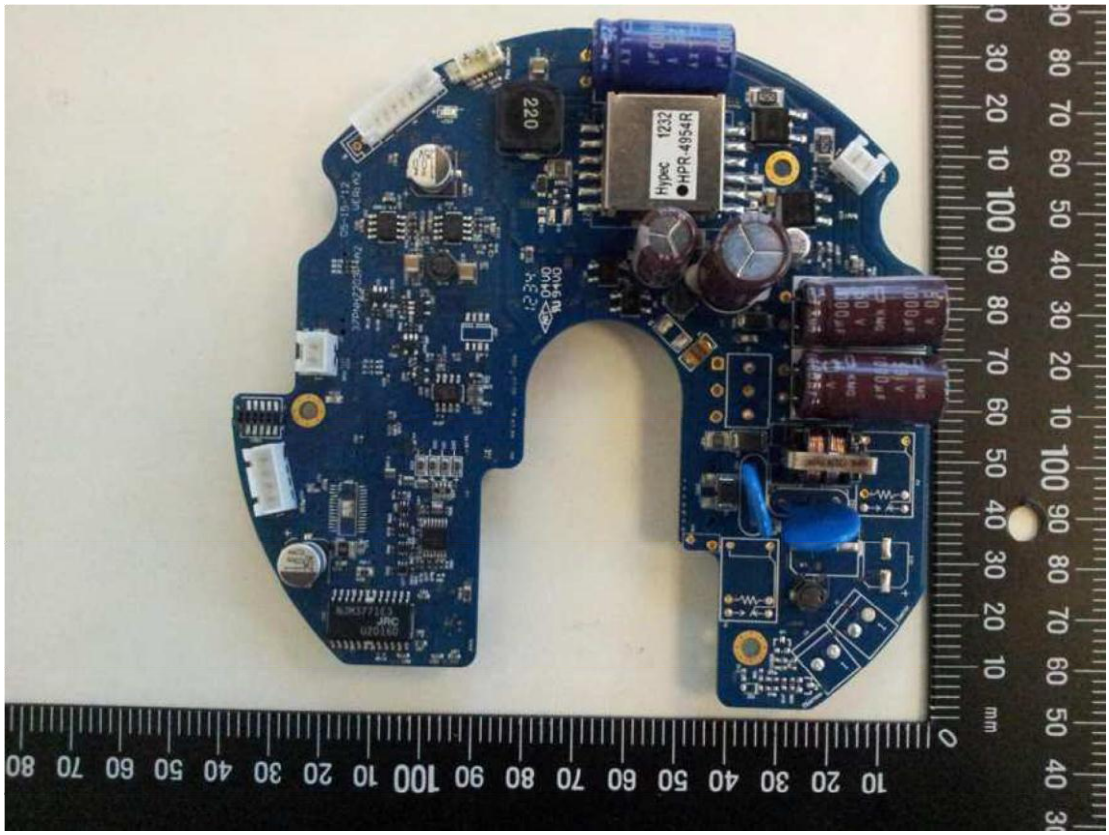
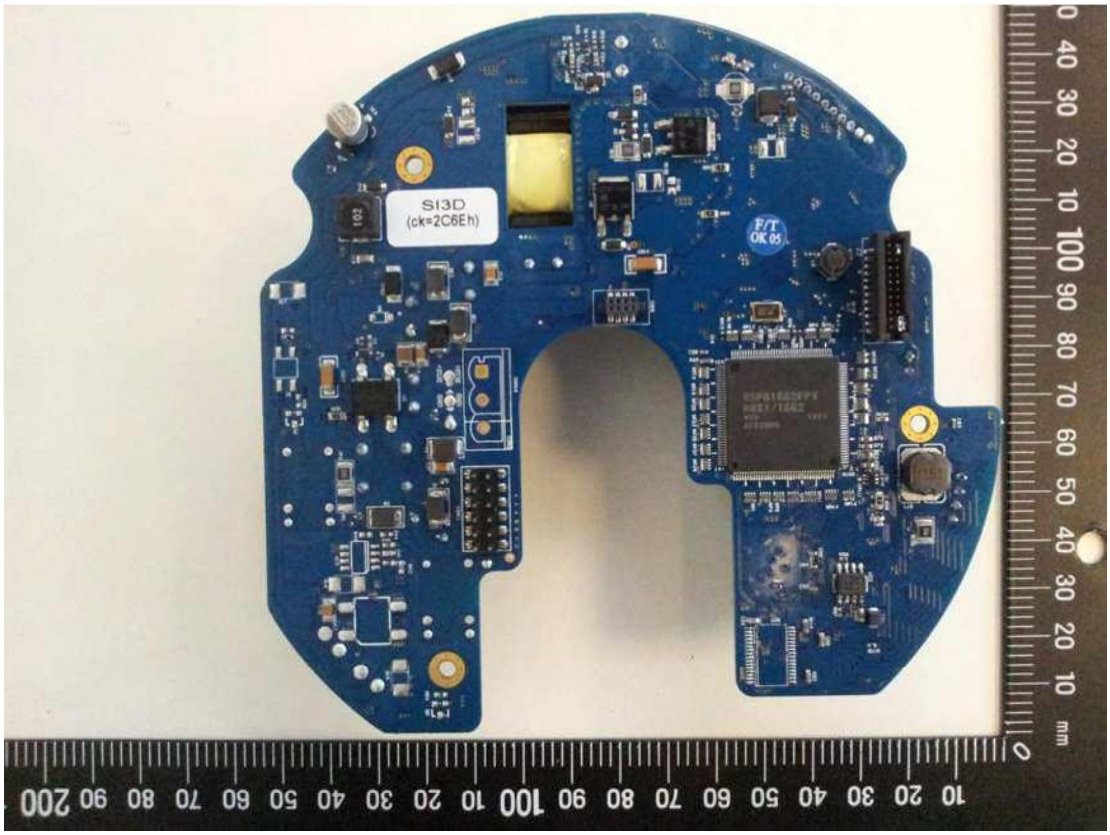
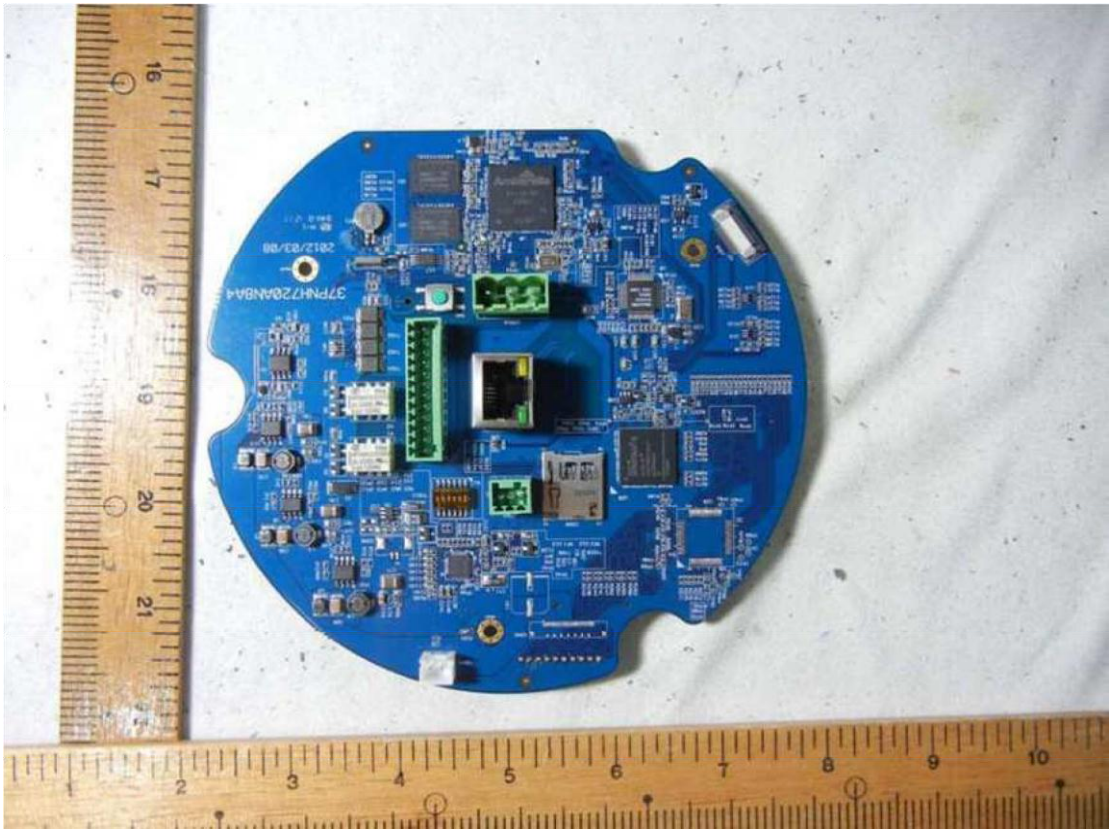
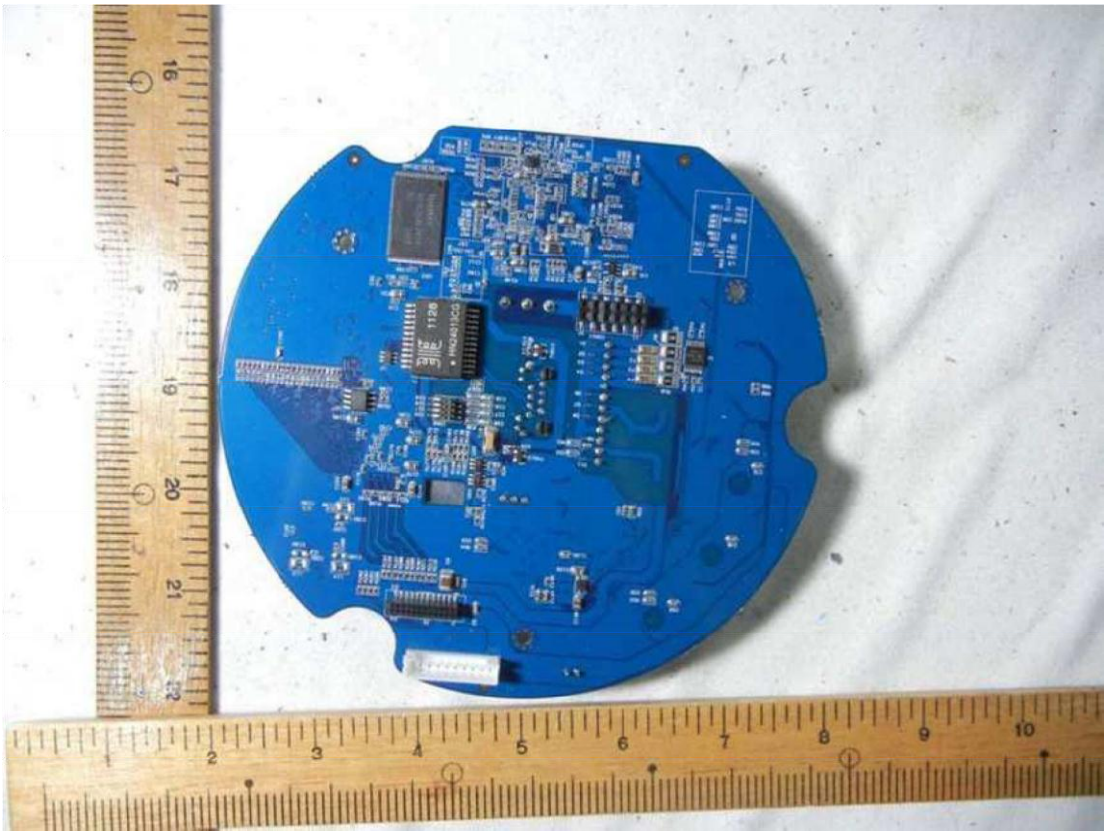
3 2 1 I/O
AUDIO
SD CARD
PoE
AC24V

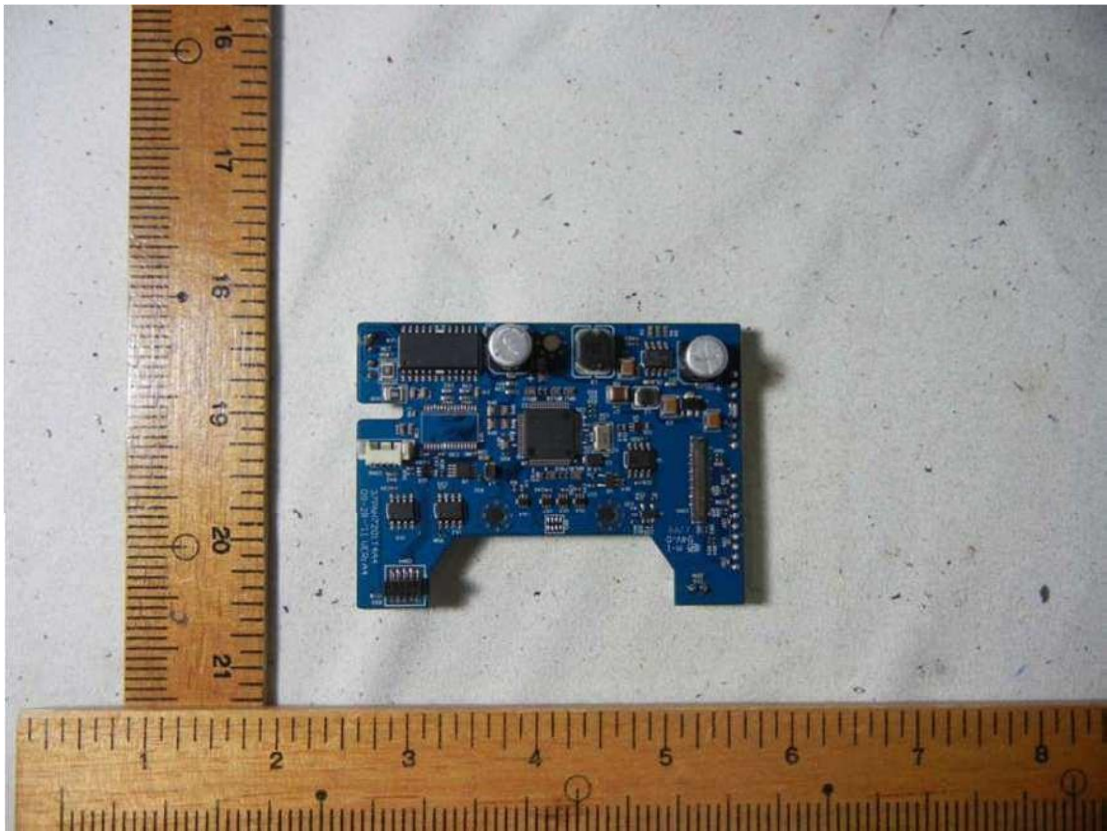


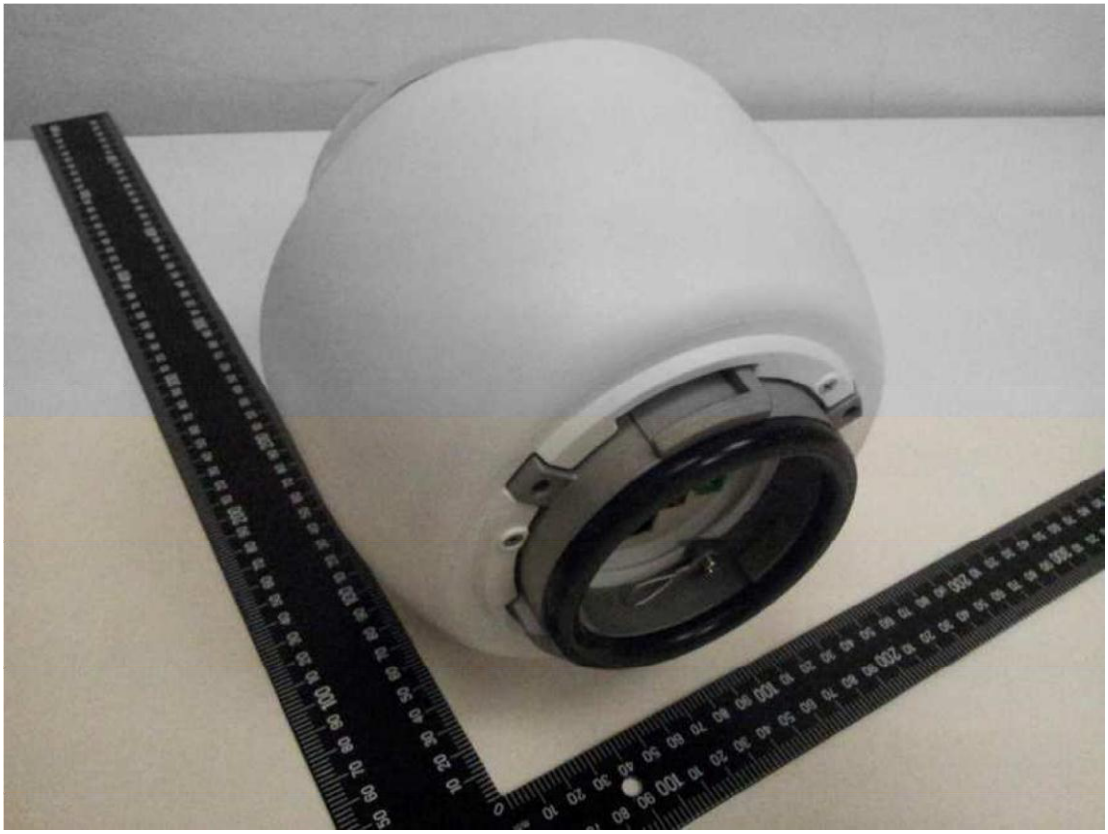

220
Hypec 1232
HPR-4954R

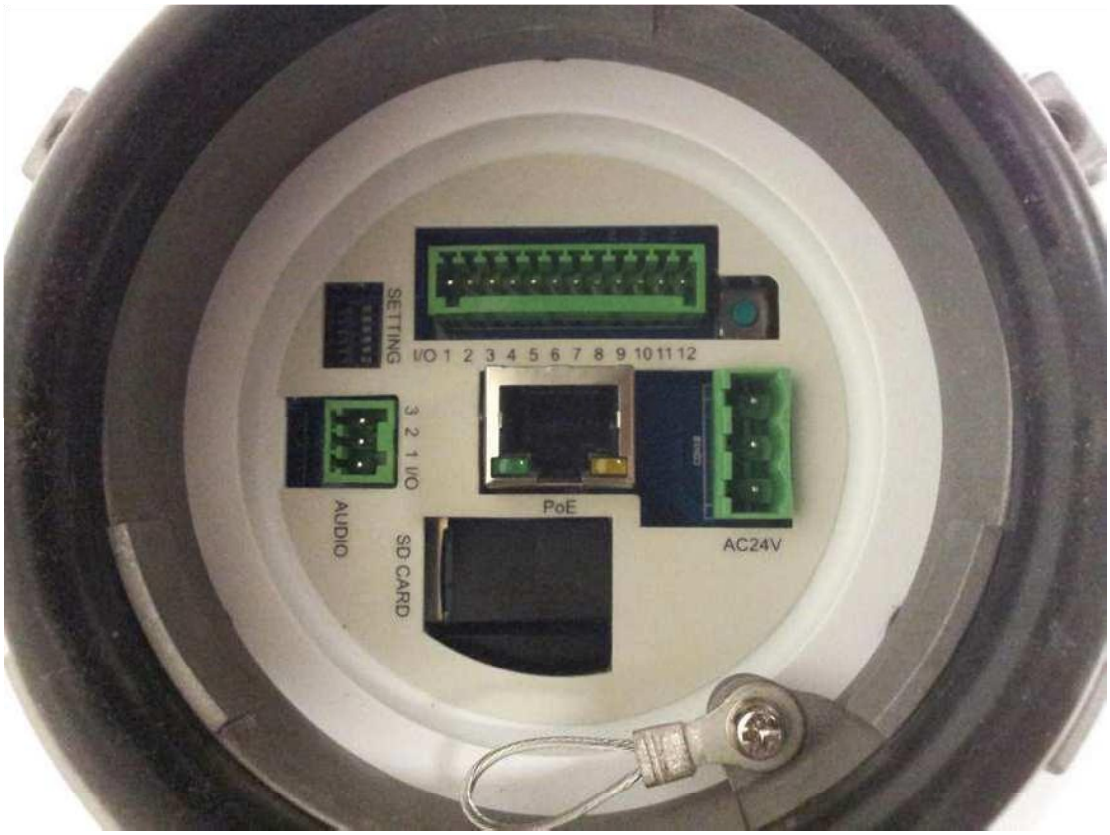

SI3D
(ck=2C6Eh)
F/T
OK 05

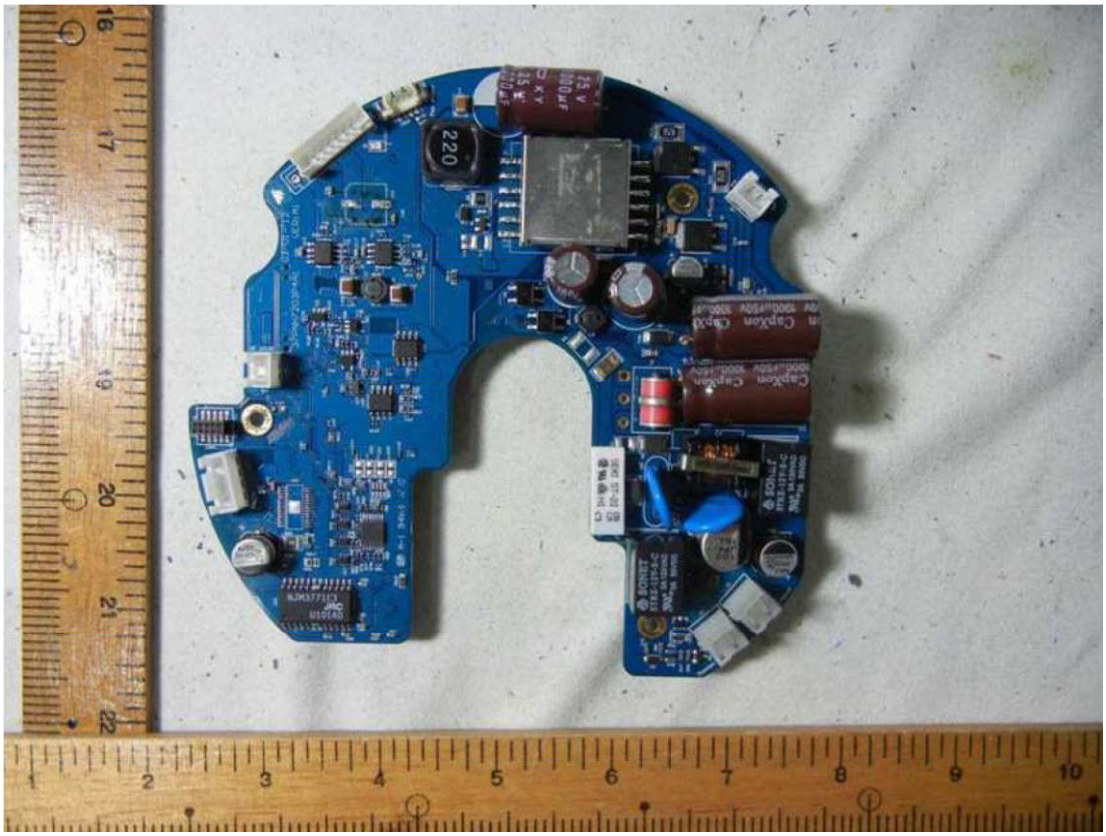


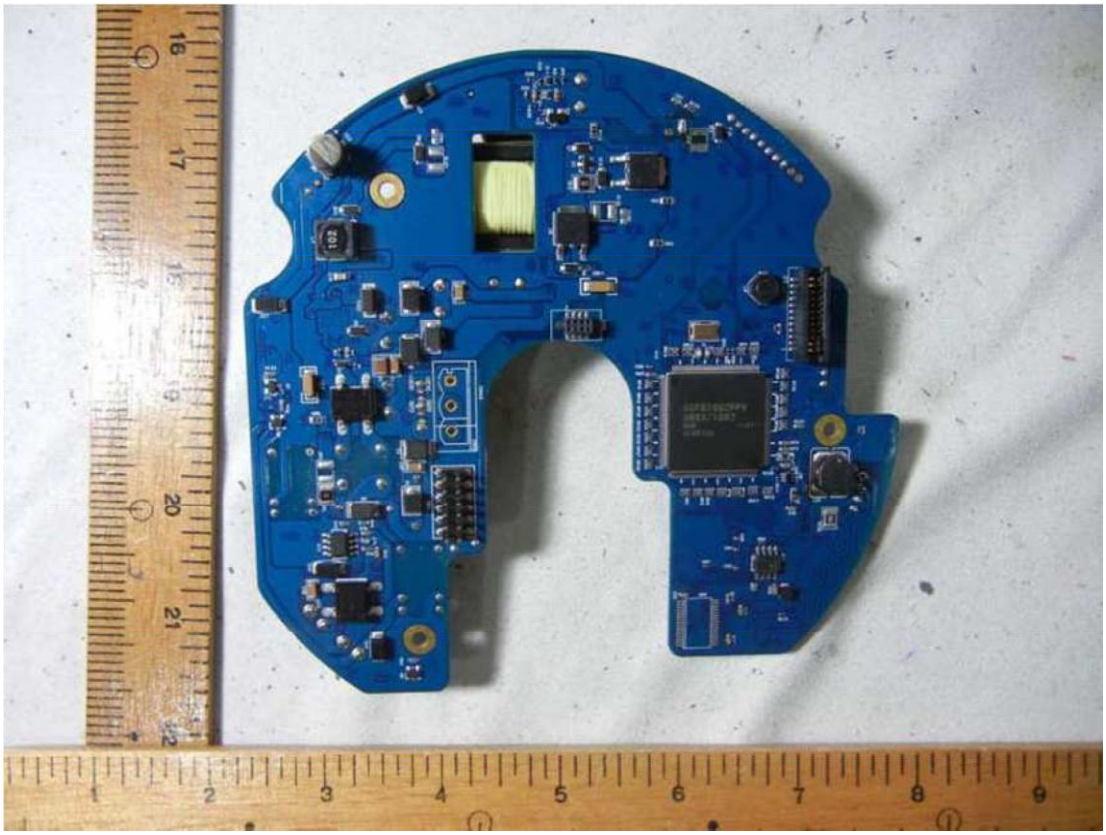


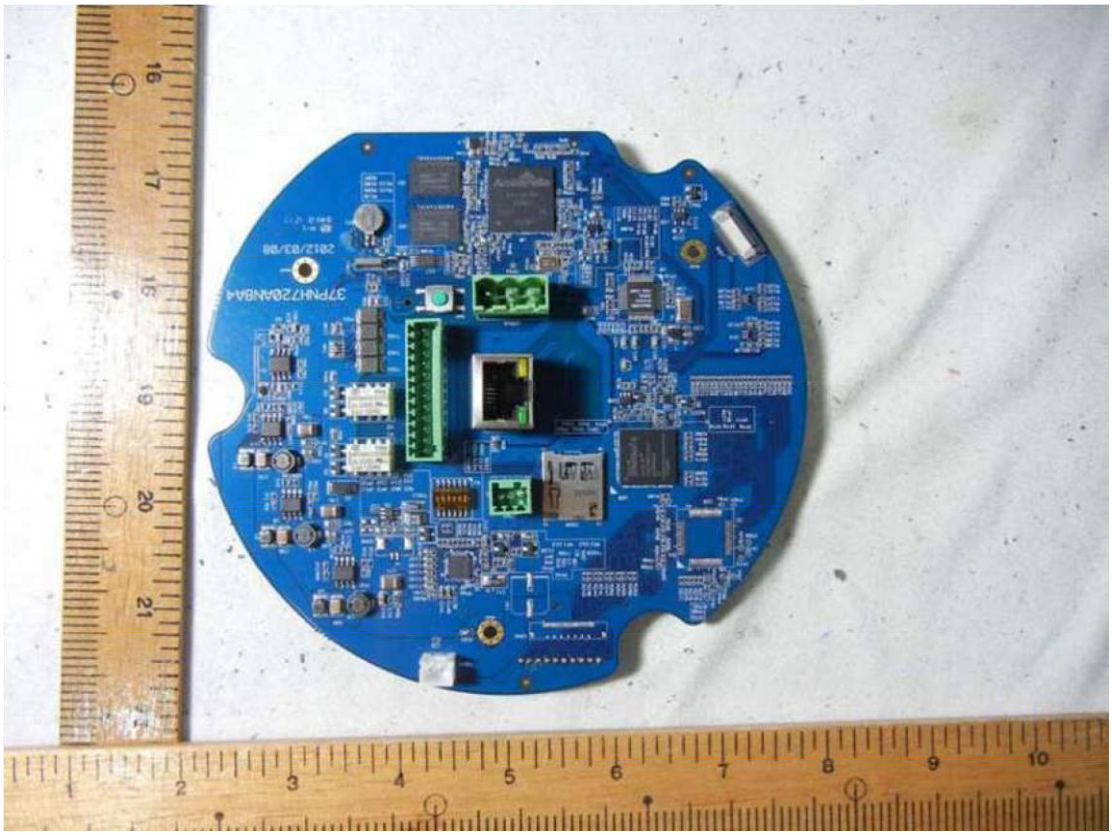


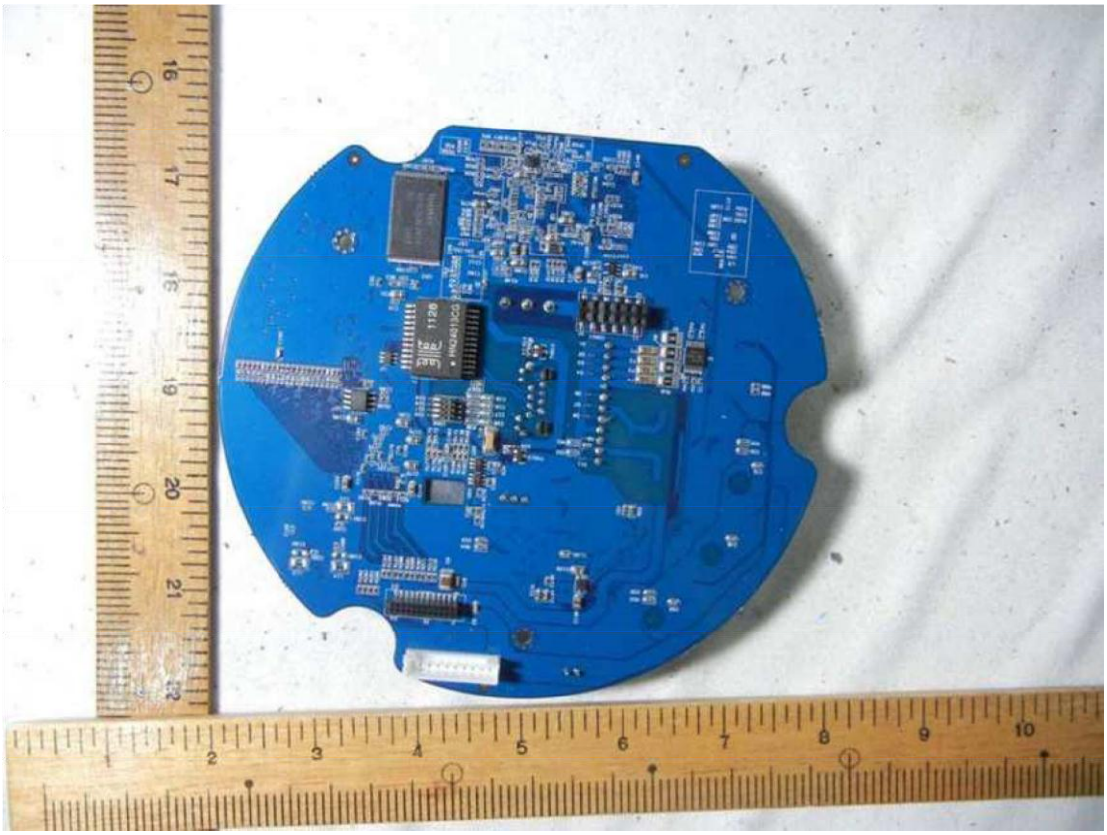


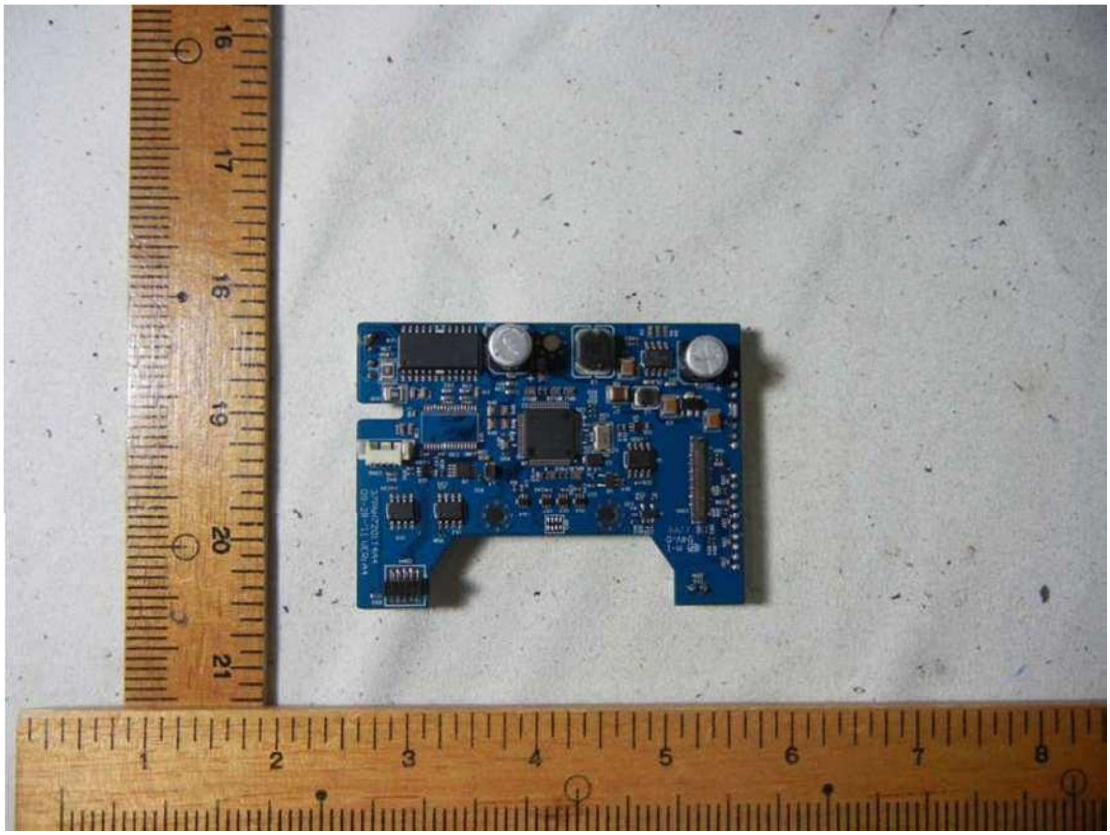

SETTING
I/O 1 2 3 4 5 6 7 8 9 10 11 12
3 2 1 I/O
AUDIO
SD CARD
PoE
AC24V

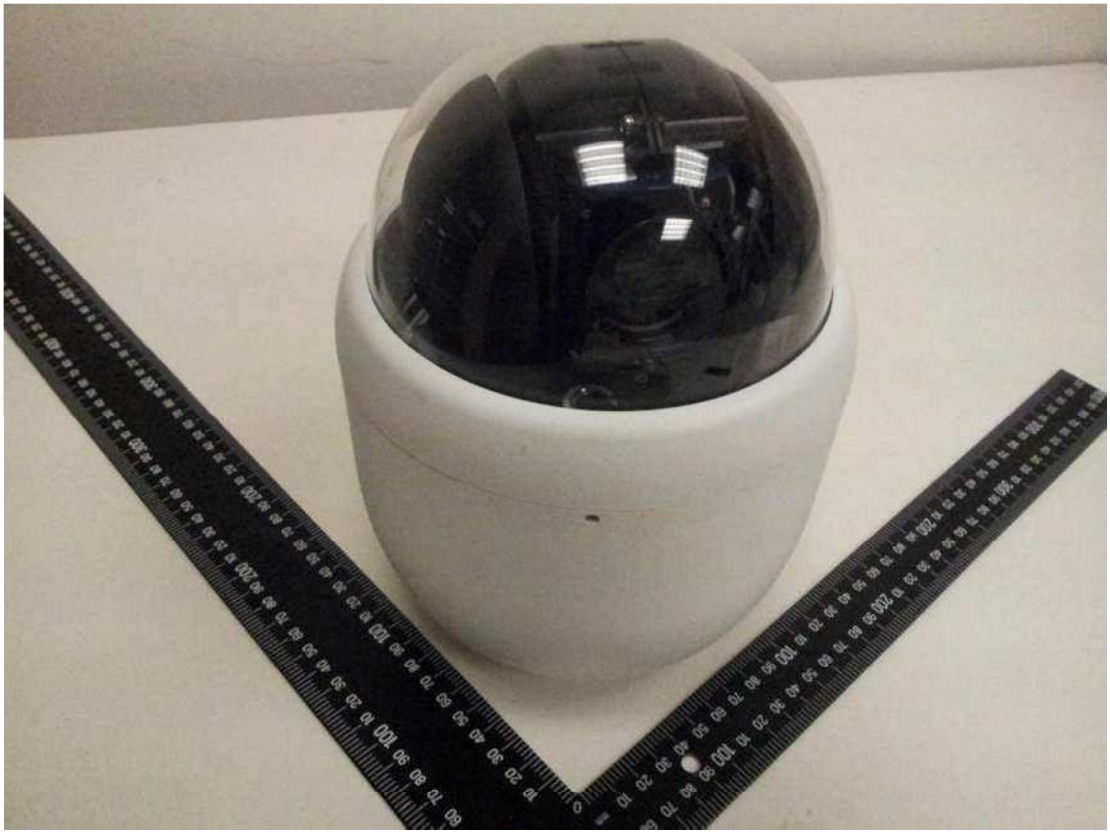


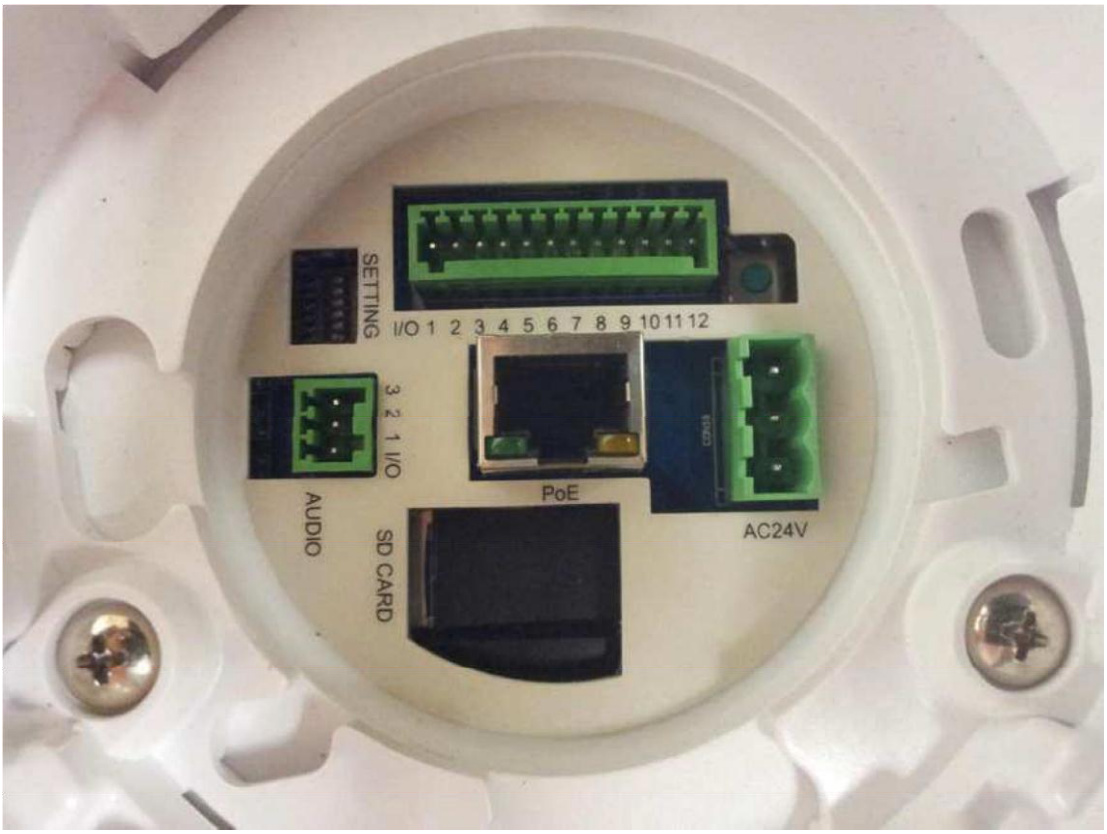


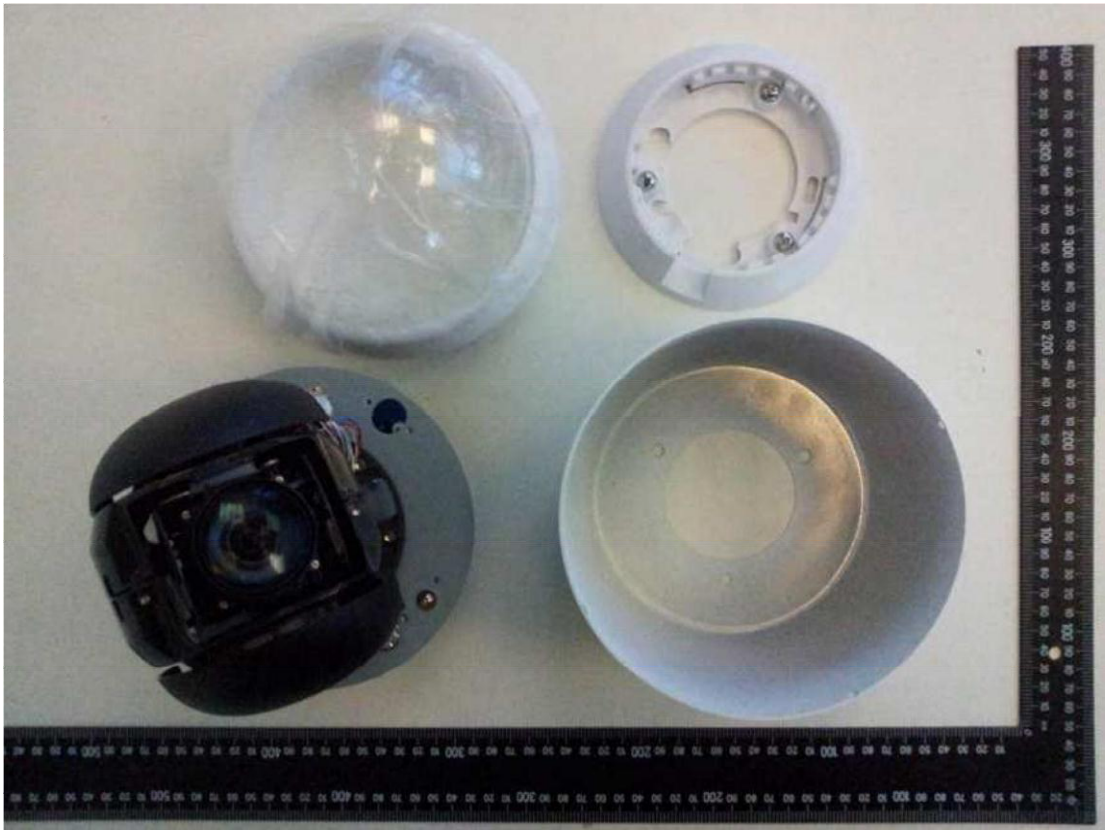


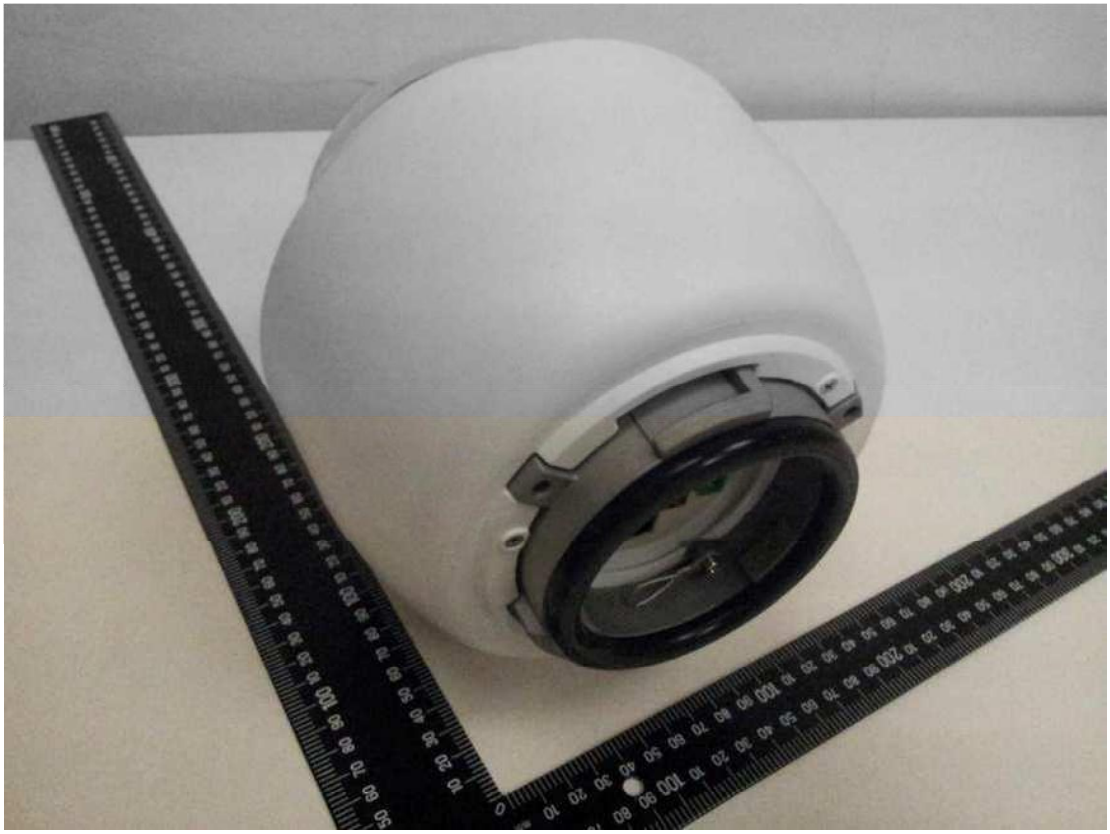


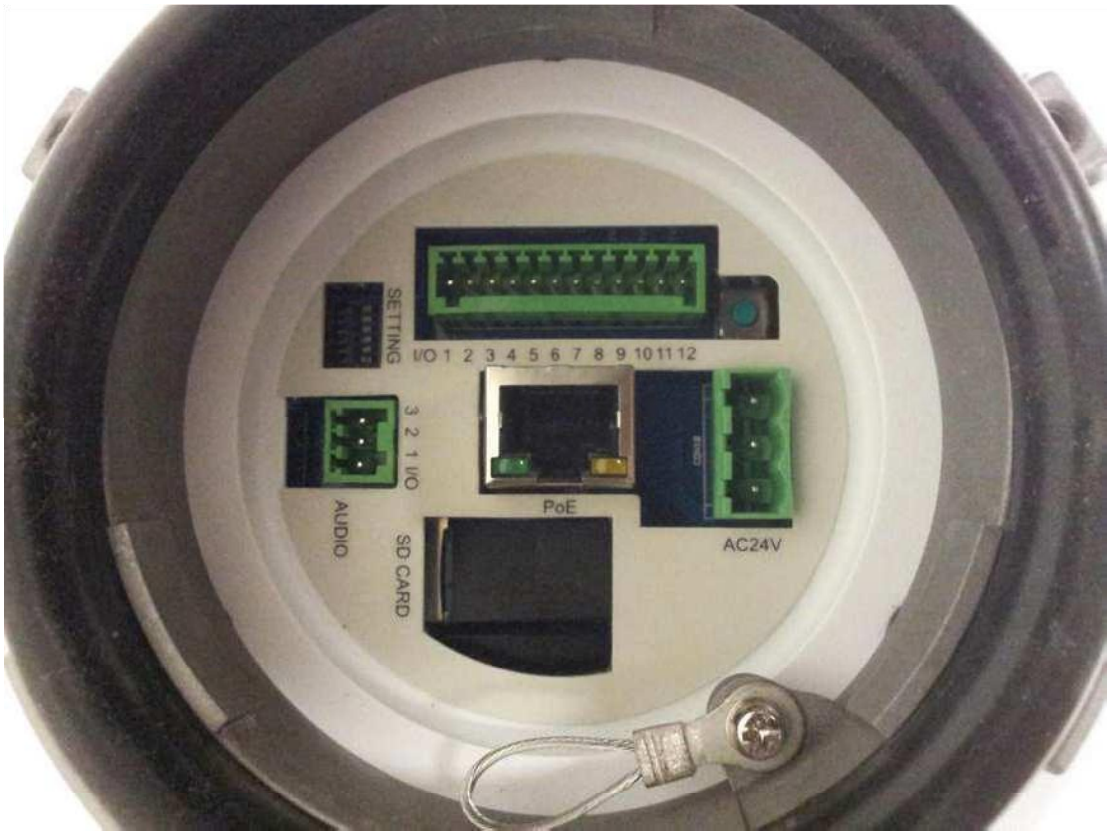





SETTING
I/O 1 2 3 4 5 6 7 8 9 10 11 12
3 2 1 I/O
AUDIO
PoE
SD CARD
AC24V






SETTING
I/O 1 2 3 4 5 6 7 8 9 10 11 12
3 2 1 I/O
AUDIO
PoE
SD CARD
AC24V