EMC Test Report

Report No.:	RM170109D01
Test Model:	IB8360-W
Received Date:	Dec. 15, 2016
Test Date:	Dec. 15, 2016 ~ Jan. 11, 2017
Issued Date:	Jan. 18, 2017
Applicant:	VIVOTEK INC.
Address:	6F, No.192, Lien-Cheng Rd., Chung-Ho , New Taipei City, 235, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RM170109D01	Original release.	Jan. 18, 2017

1 Certificate of Conformity

Product:	Network Camera
Brand:	VIVOTEK
Test Model:	IB8360-W
Sample Status:	Engineering sample
Applicant:	VIVOTEK INC.
Test Date:	Dec. 15, 2016 ~ Jan. 11, 2017
Standards:	**EN 301 489-1 V1.9.2 (2011-09)** **EN 301 489-17 V2.2.1 (2012-09)** EN 55022:2010 +AC:2011, Class B EN 61000-3-2:2014 EN 61000-3-3:2013 EN 61000-4-2:2009 EN 61000-4-3:2006 +A1:2008 +A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2014 EN 61000-4-6:2014 EN 61000-4-11:2004

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Jessica Cheng , **Date:** Jan. 18, 2017

Jessica Cheng / Senior Specialist

Approved by : Henry Lai , **Date:** Jan. 18, 2017

Henry Lai / Director

2 Summary of Test Results

EN 301 489-1 V1.9.2 (2011-09) / EN 301 489-17 V2.2.1 (2012-09), Emission					
Clause	Basic Standard	Phenomenon	Application	Result/Remarks	Verdict
8.2	EN 55022:2010 +AC:2011	Radiated emission 30-1000 MHz	Enclosure of ancillary equipment measured on a stand alone basis	Test not applicable because of not ancillary equipment.	N/A
		Radiated emission 1-6 GHz		Test not applicable because of not ancillary equipment.	N/A
8.3	EN 55022:2010 +AC:2011	Conducted emission 150 kHz - 30 MHz	DC power input/output ports (fixed)	Test not applicable because DC cable is not longer than 3 m.	N/A
		Conducted emission 150 kHz - 30 MHz	DC power input ports (vehicular)	Test not applicable because port does not exist.	N/A
8.4	EN 55022:2010 +AC:2011	Conducted emission 150 kHz - 30 MHz	AC mains input/output ports	Minimum passing Class B margin is -17.65 dB at 0.54844 MHz	Pass
8.5	EN 61000-3-2:2014	Harmonic current emissions	AC mains input port	The power consumption of EUT is less than 75W and no limits apply.	Pass
8.6	EN 61000-3-3:2013	Voltage fluctuations and flicker	AC mains input port	$P_{st} \leqq 1.0$ $d_{max} \leqq 4\%$ $P_{lt} \leqq 0.65$ $d_c \leqq 3.3\%$ $T_{max} \leqq 500ms$	Pass
8.7	EN 55022:2010 +AC:2011	Conducted disturbance 150 kHz - 30 MHz	Telecommunication ports	Without telecom port of the EUT	N/A

EN 301 489-1 V1.9.2 (2011-09) / EN 301 489-17 V2.2.1 (2012-09), Immunity					
Clause	Basic Standard	Phenomenon	Application	Result/Remarks	Verdict
9.2	EN 61000-4-3:2006 +A1:2008 +A2:2010	RF Electromagnetic Field (80 MHz to 1000 MHz and 1400 MHz to 2700 MHz) (RS)	Enclosure	Performance Criterion A	Pass
9.3	EN 61000-4-2:2009	Electrostatic Discharges (ESD)	Enclosure	Performance Criterion B	Pass
9.4	EN 61000-4-4:2012	Fast Transients Common Mode (EFT)	Signal, telecommunication and control ports, DC and AC power ports	Performance Criterion A	Pass
9.5	EN 61000-4-6:2014	RF Common Mode 150 kHz to 80 MHz (CS)	Signal, telecommunication and control ports, DC and AC power ports	Performance Criterion A	Pass
9.6	ISO 7637-2:2004	Transients and Surges	DC power input ports (Vehicular)	Test not applicable because not intend for vehicular use.	N/A
9.7	EN 61000-4-11:2004	Voltage Dips and Interruptions	AC mains power input ports	Voltage Dips: 1. 0% residual – 0.5 cycle Performance Criterion A 2. 0% residual – 1 cycle Performance Criterion A 3. 70% residual – 25 cycles Performance Criterion A Voltage Interruptions: 1. 0% residual – 250 cycles Performance Criterion B	Pass
9.8	EN 61000-4-5:2014	Surges	AC mains power input ports, line to line and line to ground Telecommunication ports, line to ground	Performance Criterion A	Pass

Note:
1. There is no deviation to the applied test methods and requirements covered by the scope of this report.
2. The above EN basic standards are applied with latest version if customer has no special requirement.
3. N/A: Not Applicable

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expended Uncertainty (k=2) (±)	Maximum allowable uncertainty (±)
Conducted disturbance at mains port using AMN, 150kHz ~ 30MHz	2.77 dB	3.4 dB (U_{cispr})

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Features of EUT

The tests reported herein were performed according to the method specified by VIVOTEK INC., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

3.2 General Description of EUT

Product	Network Camera
Brand	VIVOTEK
Model No.	IB8360-W
Sample Status	Engineering sample
Operating Software	N/A
Power Supply	Refer to table as below
Accessory Device	Adapter
Data Cable Supplied	N/A

Note:

1. The EUT is a Network Camera with built-in a wireless module.

2. The EUT uses following adapter.

Brand	Atech OEM Inc.,
Model	ADS018K-X120150
Input Power	100-240Vac, 50-60Hz, 0.5A
Output Power	12Vdc, 1.5A
Power Line	AC 2 Pin Non-Shielded DC cable (1.5m)

3.3 Operating Modes of EUT and Determination of Worst Case Operating Mode

1. Test modes are presented in the report as below.

Mode	Test Condition
Conducted emission test	
1	EUT with adapter + wireless function
Harmonics, Flicker, Immunity tests	
1	EUT with adapter + wireless function

3.4 Test Program Used and Operation Descriptions

a. Connected the EUT with AC adapter.
b. Turned on the power of all equipment.
c. EUT captured video signal.
d. EUT captured video signal to notebook (kept in a remote area) then it displayed messages on its screen simultaneously via Wireless Broadband Router.
e. Steps c-d were repeated.

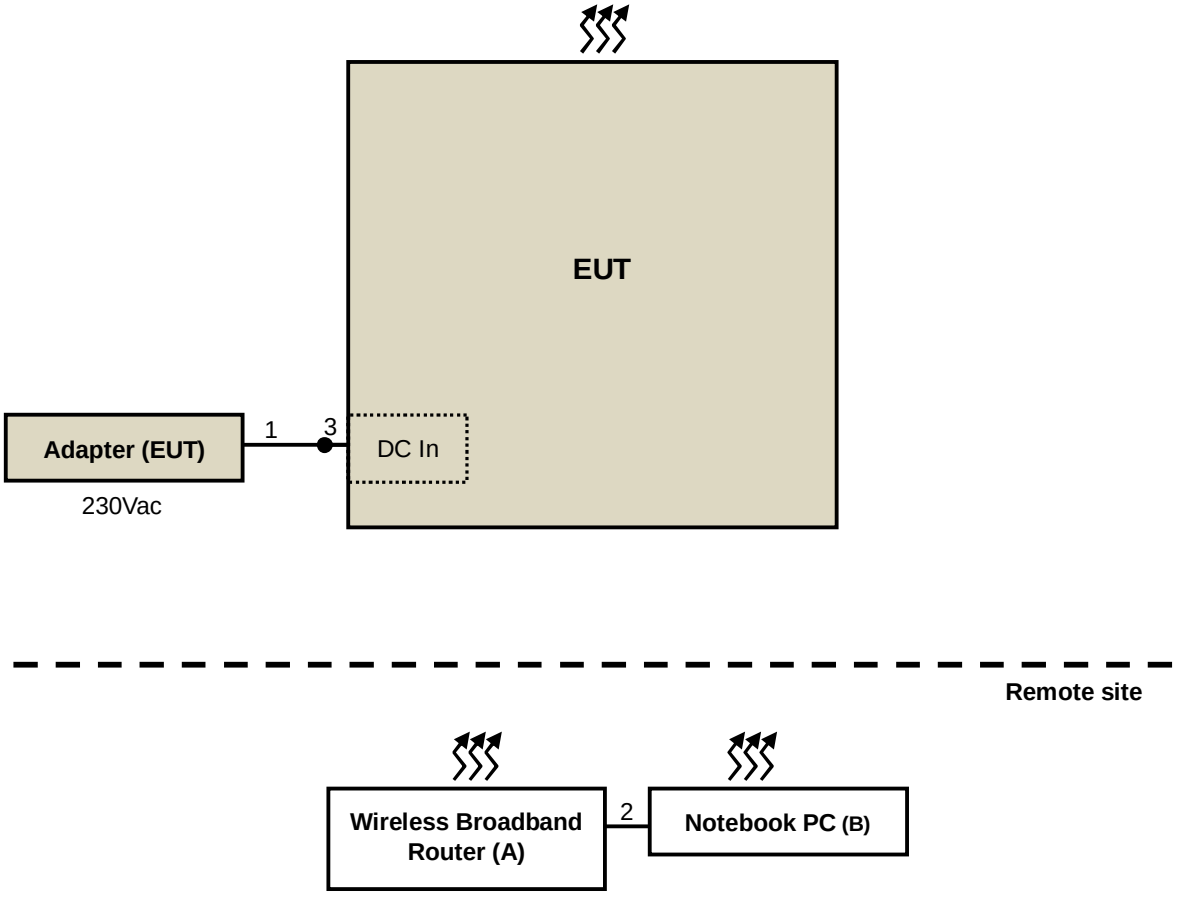
3.5 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 2500 MHz, provided by VIVOTEK INC., for detailed internal source, please refer to the manufacturer's specifications.

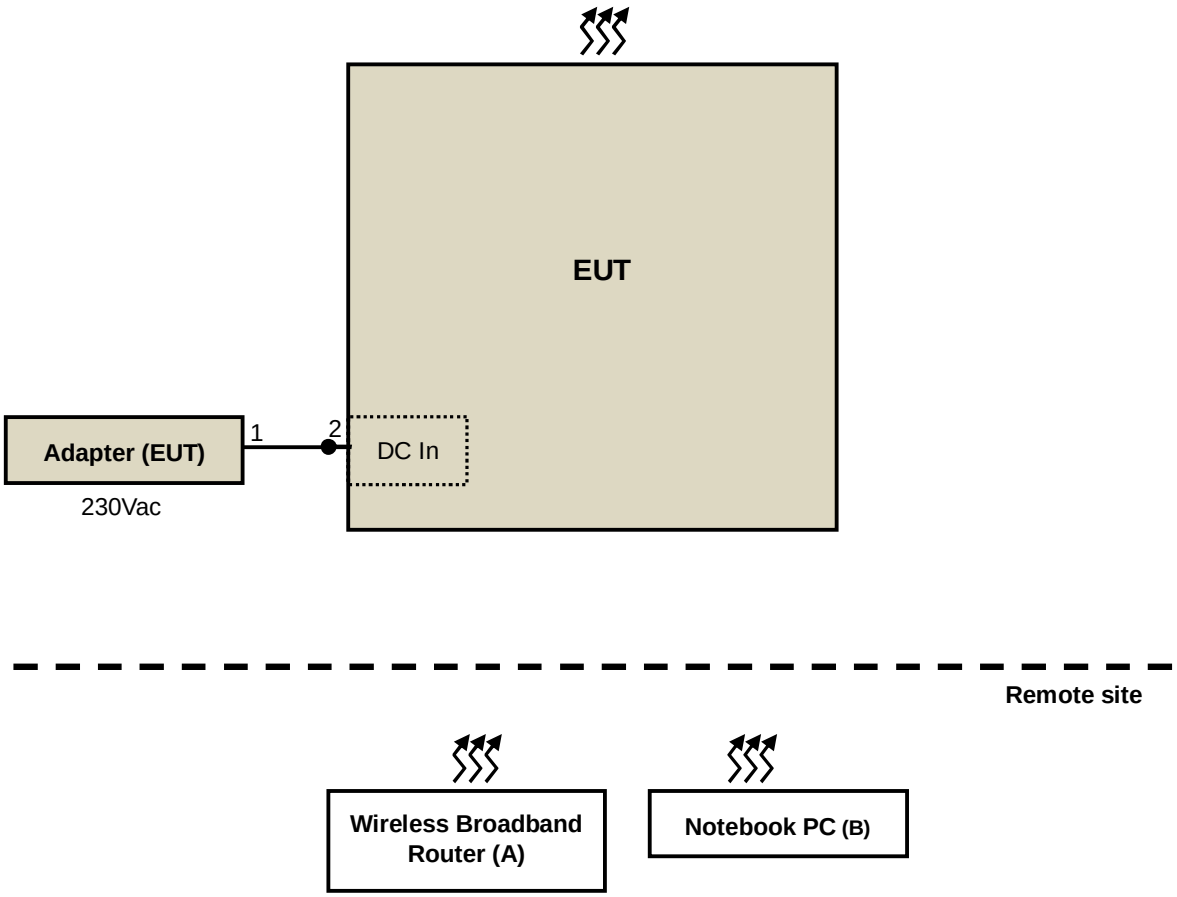
4 Configuration and Connections with EUT

4.1 Connection Diagram of EUT and Peripheral Devices

Emission tests (Harmonics & Flicker excluded):



Harmonics, Flicker, Immunity tests:



4.2 Configuration of Peripheral Devices and Cable Connections

Emission tests (Harmonics & Flicker excluded):

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Wireless Broadband Router	Netgear	D7000	4BC156B300005	N/A	Provided by Lab
B.	NOTEBOOK COMPUTER	DELL	PP04X	6C1VY1S	FCC DoC Approved	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A-B acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.5	N	0	Supplied by client
2.	LAN cable	1	1.8	N	0	Provided by Lab
3.	DC cable	1	0.3	N	0	EUT

Note: The core(s) is(are) originally attached to the cable(s).

Harmonics, Flicker, Immunity tests:

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Wireless Broadband Router	Netgear	D7000	4BC156B300005	N/A	Provided by Lab
B.	Notebook PC	LENOVO	TP00057A	R9-0JMLFS16/01	FCC DoC Approved	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A-B acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.5	N	0	Supplied by client
2.	DC cable	1	0.3	N	0	EUT

Note: The core(s) is(are) originally attached to the cable(s).

5 Conducted Disturbance at Mains Ports

5.1 Limits

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Notes: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS 30	100276	Apr. 12, 2016	Apr. 11, 2017
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ENV216	101197	May 04, 2016	May 03, 2017
LISN With Adapter (for EUT)	AD10	C10Ada-002	May 04, 2016	May 03, 2017
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 23, 2016	Nov. 22, 2017
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 04, 2016	May 03, 2017
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C10.01	Feb. 15, 2016	Feb. 14, 2017
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-011484	May 12, 2016	May 11, 2017
ROHDE & SCHWARZ Artificial Mains Network (For TV EUT)	ESH3-Z5	100220	Nov. 08, 2016	Nov. 07, 2017
LISN With Adapter (for TV EUT)	100220	N/A	Nov. 08, 2016	Nov. 07, 2017

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 10.
3. The VCCI Site Registration No. C-1852.
4. Tested Date: Jan. 9, 2017.

5.3 Test Arrangement

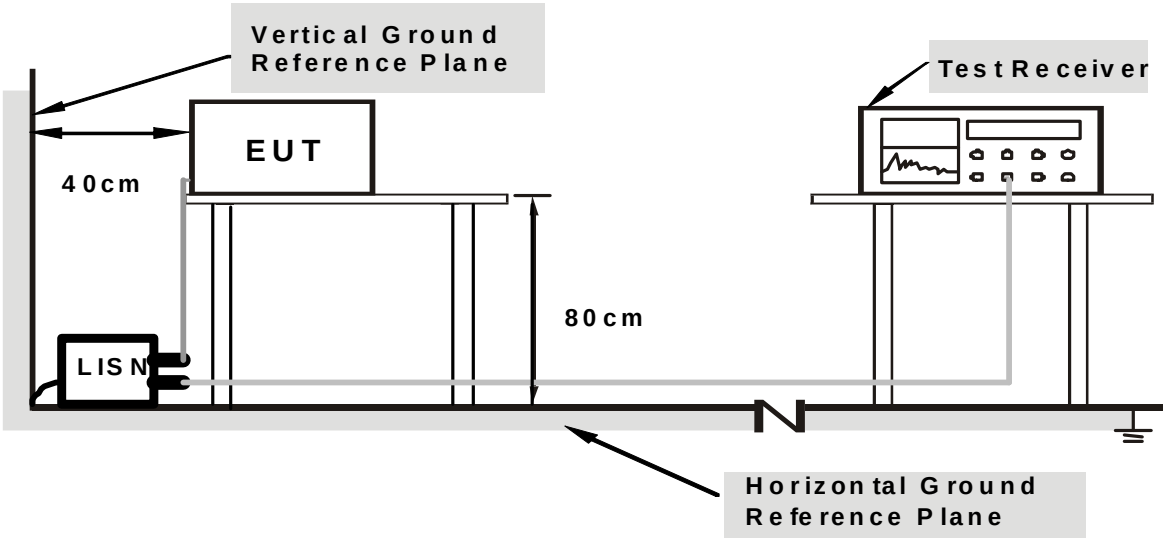
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The test results of conducted disturbance at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note:

The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.



Note: Support units were connected to second LISN.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

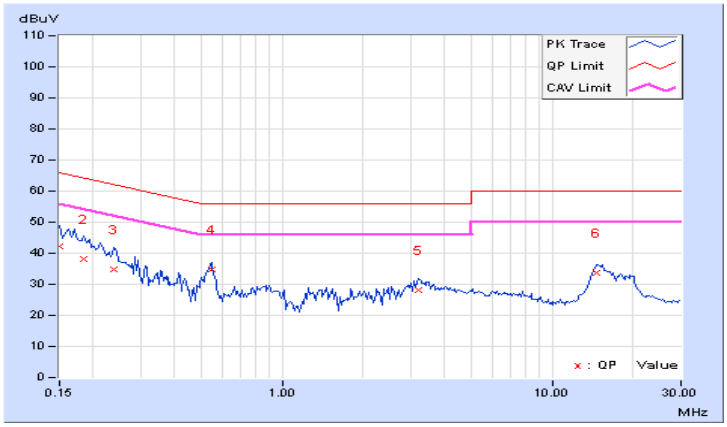
5.4 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	Environmental Conditions	23℃, 75%RH
Tested by	Vincent Lin		
Test Mode	Mode 1		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.70	32.51	18.23	42.21	27.93	66.00	56.00	-23.79	-28.07
2	0.18516	9.70	28.34	15.93	38.04	25.63	64.25	54.25	-26.21	-28.62
3	0.23984	9.71	25.15	17.18	34.86	26.89	62.10	52.10	-27.24	-25.21
4	**0.54844**	**9.75**	**25.20**	**18.60**	**34.95**	**28.35**	**56.00**	**46.00**	**-21.05**	**-17.65**
5	3.19531	10.00	18.00	9.00	28.00	19.00	56.00	46.00	-28.00	-27.00
6	14.53516	10.22	23.33	19.11	33.55	29.33	60.00	50.00	-26.45	-20.67

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

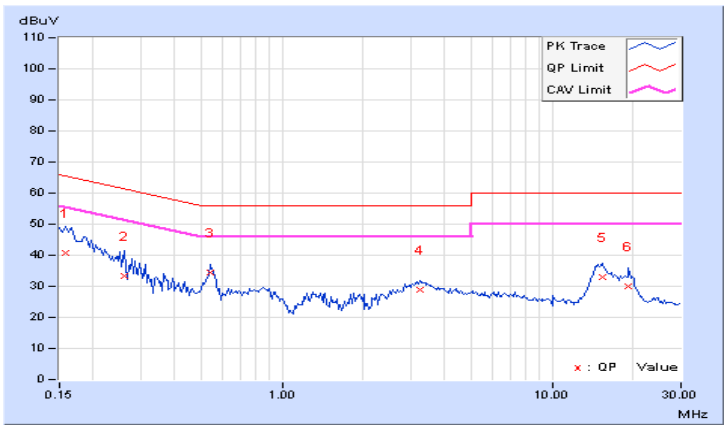


Frequency Range	150kHz ~ 30MHz	**Detector Function & Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	230Vac, 50Hz	**Environmental Conditions**	23℃, 75%RH
Tested by	Vincent Lin		
Test Mode	Mode 1		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15781	9.70	31.18	16.28	40.88	25.98	65.58	55.58	-24.70	-29.60
2	0.25938	9.70	23.62	15.66	33.32	25.36	61.45	51.45	-28.13	-26.09
3	0.54444	9.75	24.69	18.15	34.44	27.90	56.00	46.00	-21.56	-18.10
4	3.22266	10.03	18.82	10.34	28.85	20.37	56.00	46.00	-27.15	-25.63
5	15.31641	10.24	22.70	17.96	32.94	28.20	60.00	50.00	-27.06	-21.80
6	19.15625	10.26	19.57	14.26	29.83	24.52	60.00	50.00	-30.17	-25.48

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



6 Harmonics Current Measurement

6.1 Limits of Harmonics Current Measurement

Limits for Class A equipment		Limits for Class D equipment		
Harmonic Order n	Max. permissible harmonics current A	Harmonic Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
15≦n≦39	0.15x15/n	15≦n≦39	3.85/n	0.15x15/n
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
8≦n≦40	0.23x8/n			

Note: 1. Class A and Class D are classified according to section 5 of EN 61000-3-2.
2. According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

6.2 Classification of equipment

Class A	Class B	Class C	Class D
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.	Portable tools; Arc welding equipment which is not professional equipment.	Lighting equipment.	Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors; Television receivers; Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

6.3 Test Instruments

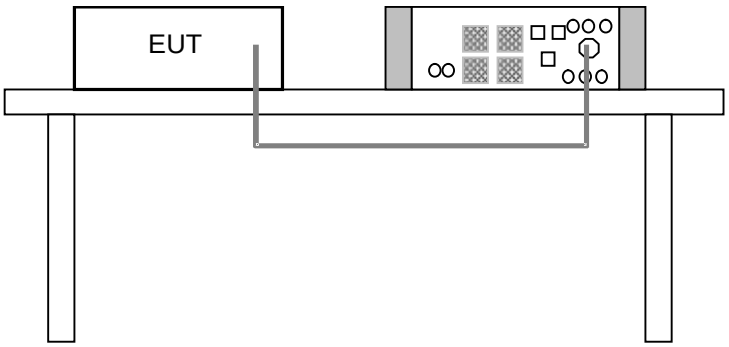
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Teseq Harmonics - Flicker Test System	Profline 2105	32A00983&1639A01863	Sep. 26, 2016	Sep. 25, 2017
Software	WIN2100	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. According to IEC 61000-4-7: 2002, the time window shall be synchronized with each group of 10 or 12 cycles (200 ms)for power frequency of 50 or 60Hz.
4. Tested Date: Jan. 11, 2017.

6.4 Test Arrangement

a. 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 for each successive harmonic component in turn.

b. 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.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

6.5 Test Results

Fundamental Voltage/Ampere	230.17Vrms/ 0.045Arms	Power Frequency	50.00Hz
Power Consumption	3.3W	Power Factor	0.326
Environmental Conditions	28°C, 67%RH	Tested by	Aga Lin
Test Mode	Mode 1		

Note: 1. Limits are not specified for equipment with a rated power of 75W or less (other than lighting equipment).
2. According to EN 61000-3-2 the manufacturer shall specify the power of the apparatus. This value shall be used for establishing limits. The specified power shall be within +/-10% of the measured power.

7 Voltage Fluctuations and Flicker Measurement

7.1 Limits

Test item	Limit	Note
P_{st}	1.0	P_{st}: short-term flicker severity.
P_{lt}	0.65	P_{lt}: long-term flicker severity.
T_{max} (ms)	500	T_{max}: maximum time duration during the observation period that the voltage deviation d(t) exceeds the limit for d_c .
d_{max} (%)	4	d_{max}: maximum absolute voltage change during an observation period.
d_c (%)	3.3	d_c: maximum steady state voltage change during an observation period.

7.2 Test instruments

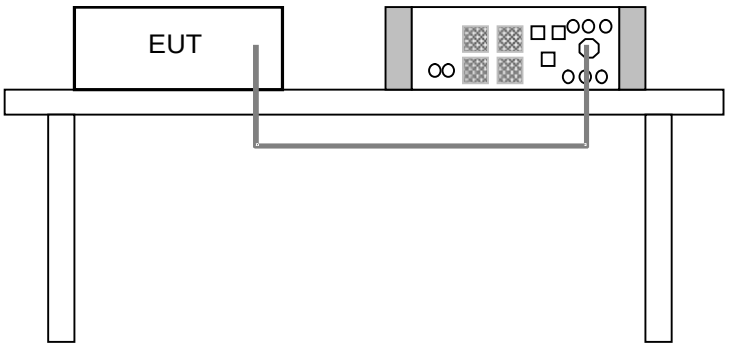
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Teseq Harmonics - Flicker Test System	Profline 2105	32A00983&1639A01863	Sep. 26, 2016	Sep. 25, 2017
Software	WIN2100	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. Tested Date: Jan. 11, 2017.

7.3 Test Arrangement

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.4 Test Results

Observation (T_p)	10 min.	Power Frequency	50.00Hz
Fundamental Voltage/Ampere	230.17Vrms/ 0.045Arms	Power Factor	0.326
Environmental conditions	28°C, 67%RH	Tested by	Aga Lin
Test Mode	Mode 1		

Test Parameter	Measurement Value	Limit	Remarks
P_{st}	0.064	1.00	Pass
P_{lt}	0.028	0.65	Pass
T_{max} (ms)	0	500	Pass
d_{max} (%)	0	4	Pass
d_c (%)	0	3.3	Pass

Note: (1) P_{st} means short-term flicker indicator.
(2) P_{lt} means long-term flicker indicator.
(3) T_{max} means accumulated time value of d(t) with a deviation exceeding 3.3 %.
(4) d_{max} means maximum relative voltage change.
(5) d_c means maximum relative steady-state voltage change.

8 General Immunity requirements

EN 301 489-1 V1.9.2 (2011-09) / EN 301 489-17 V2.2.1 (2012-09), Immunity requirements			
Clause	Reference standard	Test specification	Performance Criterion
9.3	EN 61000-4-2 ESD	Enclosure port: ±8kV Air discharge, ±4kV Contact discharge	B
9.2	EN 61000-4-3 RS	Enclosure port: 80% AM (1kHz) 80-1000 MHz, 3V/m, 1400-2700 MHz, 3V/m	A
9.4	EN 61000-4-4 EFT	Signal ports, telecommunication ports and control ports: ±0.5kV 5/50 T_r/T_h ns, 5kHz Input DC power ports: ±0.5kV, 5/50 T_r/T_h ns, 5kHz Input AC Power ports: ±1kV, 5/50 T_r/T_h ns, 5kHz	B
9.8	EN 61000-4-5 Surge	Telecommunication ports(directly connected to outdoor cables): telecommunication centres: ±0.5kV, 1.2/50 T_r/T_h μs others: ±1kV, 1.2/50 T_r/T_h μs Telecommunication ports(indoor cables, longer than 10 m): ±0.5kV, 1.2/50 T_r/T_h μs	B
		Input AC Power ports: telecommunication centres: line to line: ±0.5kV, 1.2/50 T_r/T_h μs line to ground: ±1kV, 1.2/50 T_r/T_h μs others: line to line: ±1kV, 1.2/50 T_r/T_h μs line to ground: ±2kV, 1.2/50 T_r/T_h μs	B
9.5	EN 61000-4-6 CS	Signal ports, telecommunication ports, control ports and DC power ports(if cables length > 3m): 0.15-80 MHz, 3V, 80% AM (1kHz) AC Power ports: 0.15-80 MHz, 3V, 80% AM (1kHz)	A
9.7	EN 61000-4-11 Dips & Interruptions	AC Power ports: Voltage Dips: 0% residual, 0.5 cycle 0% residual, 1 cycle 70% residual, 25 cycles (at 50Hz) Voltage Interruptions: 0% residual, 250 cycles (at 50 Hz) EUT with battery back-up EUT without battery back-up	 B B B B C

8.1 Performance Criteria

General Performance Criteria

- Performance criteria for continuous phenomena applied to transmitters and receivers (CT/CR)

During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data.

If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

- Performance criteria for transient phenomena applied to transmitters and receivers (TT/TR)

After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed.

If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

- Performance criteria for equipment which does not provide a continuous communication link

For radio equipment which does not provide a continuous communication link, the performance criteria described in CT/CR and TT/TR are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in CT/CR and TT/TR.

- Performance criteria for ancillary equipment tested on a stand alone basis

If ancillary equipment is intended to be tested on a stand alone basis, the performance criteria described in CT/CR and TT/TR are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in CT/CR and TT/TR.

Product Specific Performance Criteria

The particular performance criteria which are specified in the relevant part of EN 301 489 series dealing with the particular type of radio equipment, take precedence over the corresponding parts of the general performance criteria.

Where particular performance criteria for specific functions are not given, then the general performance criteria shall apply.

EN 301 489-17, Broadband Data Transmission Systems

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature (CT/CR);
- performance criteria B for immunity tests with phenomena of a transient nature (TT/TR);
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

Special conditions for EN 301489-17		
Criteria	During test	After test
A	Shall operate as intended. May show degradation of performance (see note1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 2). 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 1). No unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). 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 2).

Note 1: 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 2: 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.

Note: The WLAN linking mode is activated and monitoring communication status via notebook by ping command during and after tests.

9 Electrostatic Discharge Immunity Test (ESD)

9.1 Test Specification

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge : ±2, ±4, ±8kV (Direct) Contact Discharge : ±2, ±4kV (Direct/Indirect)
Number of Discharge:	Minimum 20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

9.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
KeyTek, ESD Simulator	MZ-15/EC	1203252	Jul. 28, 2016	Jul. 27, 2017

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ESD Room No. 2.
3. Tested Date: Dec. 15, 2016.

9.3 Test Arrangement

a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to the **H**orizontal **C**oupling **P**lane at points on each side of the EUT. The ESD generator was positioned at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP.**

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **V**ertical **C**oupling **P**lane in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

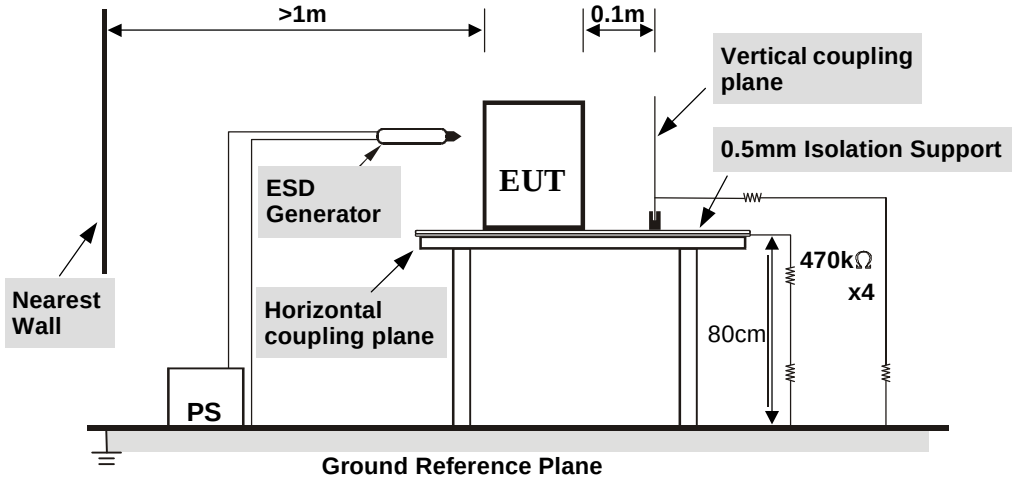


TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the **G**round **R**eference **P**lane. 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 **H**orizontal **C**oupling **P**lane (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of
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.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

9.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Environmental conditions	24 °C, 52% RH 1010mbar	Tested by	Michael Cheng

Test Results of Direct Application					
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge	Performance Criterion
2, 4	+/-	1, 2, 4, 5, 6, 7	NA	Note 1	A
8	+/-	1, 2, 7	NA	Note 1	A
8	+/-	4, 5, 6	NA	Note 2	B
2	+/-	3, 8	Note 1	NA	A
4	+/-	8	Note 1	NA	A
4	+/-	3	Note 3	NA	B

Description of test points of direct application: Please refer to following page for representative mark only.

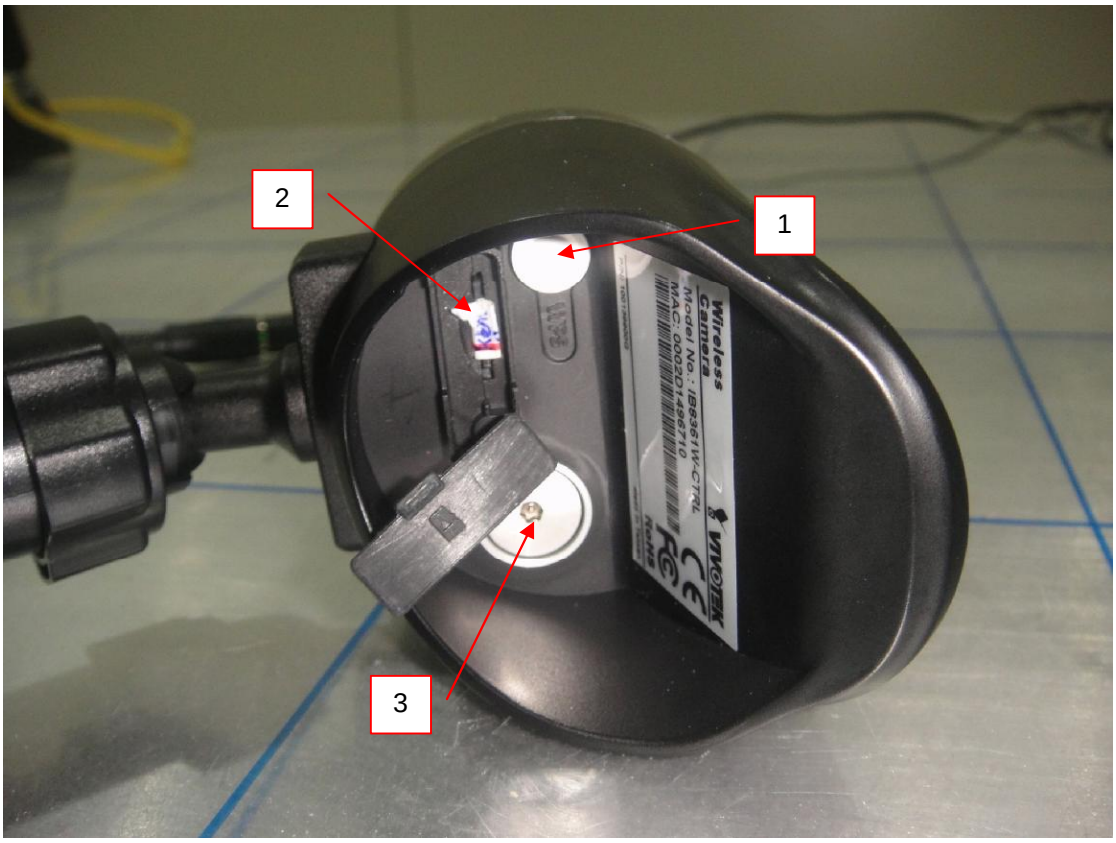
Test Results of Indirect Application					
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling Plane	Vertical Coupling Plane	Performance Criterion
2, 4	+/-	Four Sides	Note 1	Note 1	A

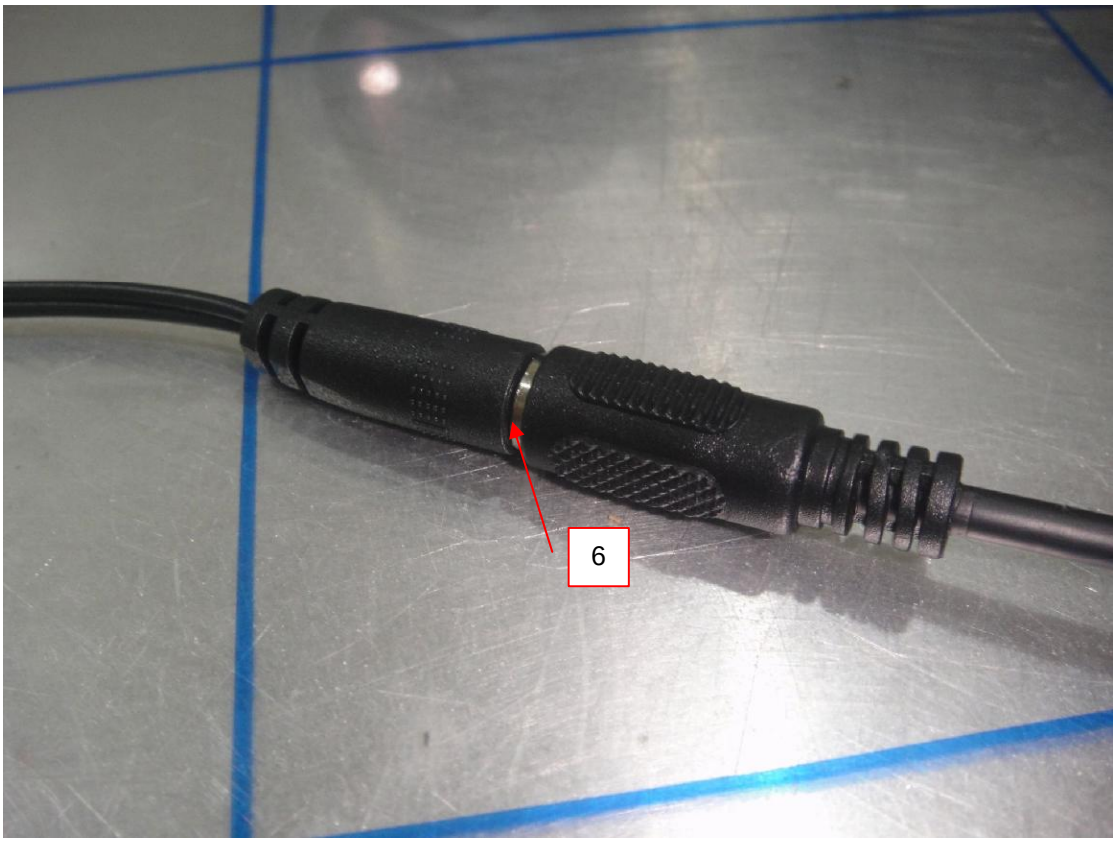
Description of test points of indirect application:

1. Front side 2. Rear side 3. Right side 4. Left side

Note: 1. The EUT function was correct during the test.
2. The EUT hang up during the test, after the test auto reset at 20 seconds
3. The EUT hang up during the test, after the test auto reset at 1 min..

Description of Test Points

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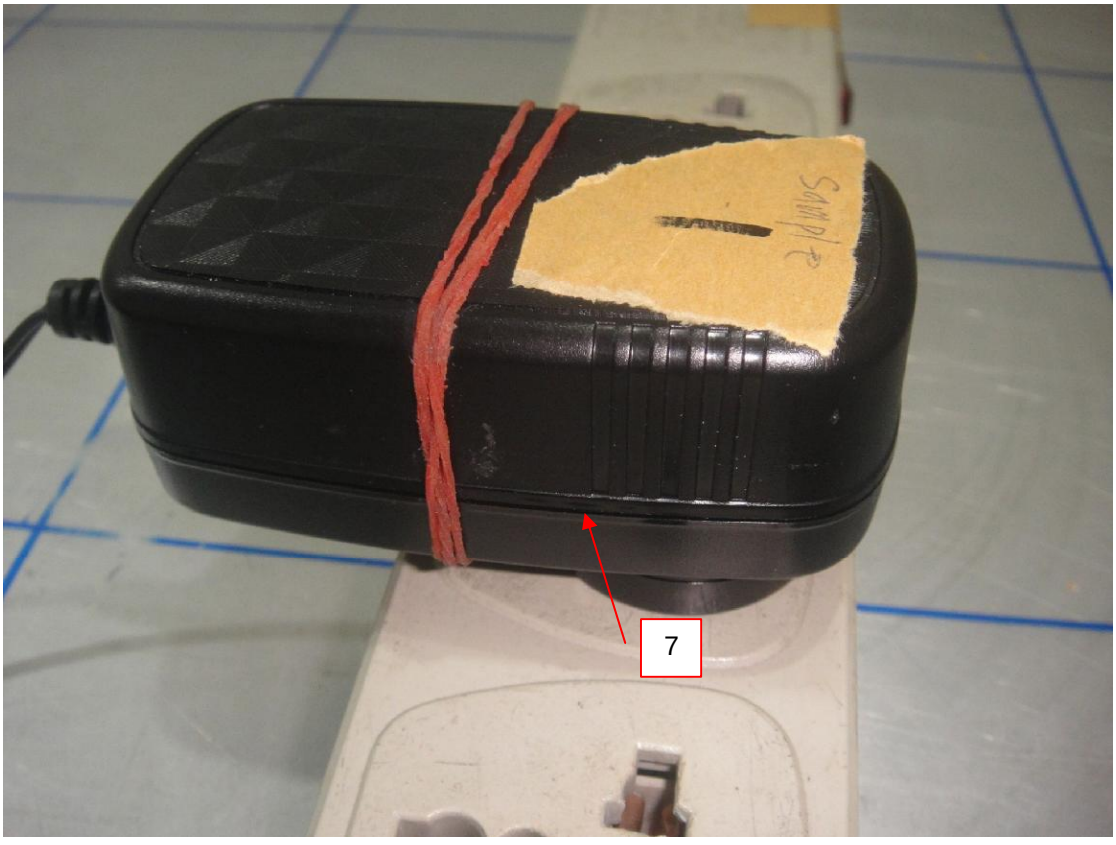
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10 Radiated, Radio-frequency, Electromagnetic Field Immunity Test (RS)

10.1 Test Specification

Basic Standard:	EN 61000-4-3
Frequency Range:	80 MHz ~ 1000 MHz, 1400 MHz ~ 2700 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5m
Dwell Time:	3 seconds

10.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Agilent Signal Generator	E8257D	MY48050465	Jul. 20, 2016	Jul. 19, 2017
PRANA RF Amplifier	AP32DP280	0811-894	NA	NA
TESEQ RF Amplifier	CBA1G-150	T44220	NA	NA
AR RF Amplifier	35S4G8AM4	0326094	NA	NA
AR RF Amplifier	100S1G4M3	0329249	NA	NA
AR Controller	SC1000M3	305910	NA	NA
Narda Broadband Field Meter	NBM-550	B-0872	Feb. 09, 2016	Feb. 08, 2018
BOONTON RF Voltage Meter	4232A	10180	Jun. 01, 2016	May 31, 2017
BOONTON Power Sensor	51013-4E	34870	Jun. 01, 2016	May 31, 2017
BOONTON Power Sensor	51013-4E	34873	Jun. 01, 2016	May 31, 2017
AR Log-Periodic Antenna	AT6080	0329465	NA	NA
EMCO BiconiLog Antenna	3141	1001	NA	NA
AR High Gain Antenna	AT4002A	306533	NA	NA
AR High Gain Horn Antenna	AT4010	0329800	NA	NA
CHANCE MOST Full Anechoic Chamber (9x5x3m)	Chance Most	RS-002	Feb. 05, 2016	Feb. 04, 2017
Software	RS_V7.6	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in RS Room No.2.
3. Tested Date: Dec. 27, 2016

10.3 Test Arrangement

The test procedure was in accordance with EN 61000-4-3.

a. The testing was performed in a modified semi-anechoic chamber.

b. The frequency range is swept from 80 MHz to 1000 MHz & from 1400 MHz to 2700 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave.

c. The field strength level was 3 V/m.

d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

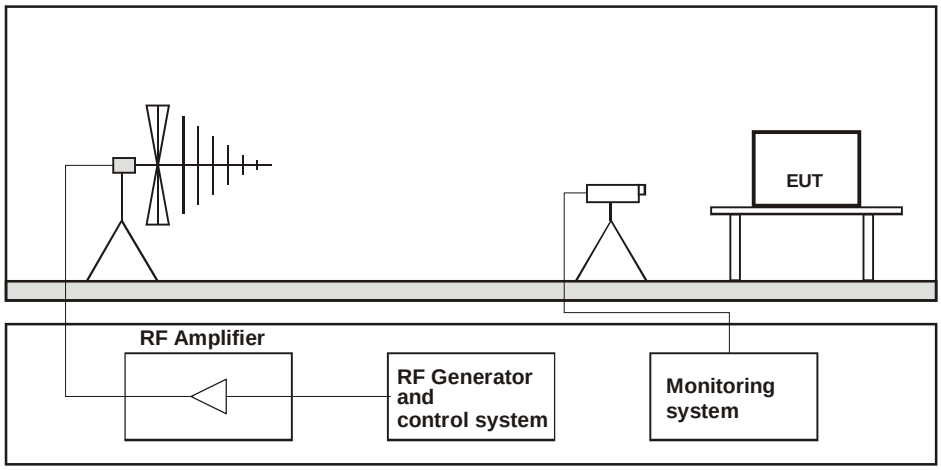


Table-top Equipment

The EUT installed in a representative system as described in section 7 of 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.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

10.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Environmental conditions	24°C, 68% RH	Tested by	Aga Lin

Frequency (MHz)	Polarity	Azimuth(°)	Applied Field Strength		Observation	Remarks	Performance Criterion
			(V/m)	Modulation			
80 - 1000	V&H	0, 90, 180, 270	3	80% AM (1kHz)	Note	-	A
1400 - 2700	V&H	0, 90, 180, 270	3	80% AM (1kHz)	Note*	-	A

Note: The EUT function was correct during the test.
*The exclusion band for the transmitter and / or receiver part of the 2.45GHz RLAN equipment under test shall extend from 2280MHz to 2607.675MHz.

11 Electrical Fast Transient/Burst Immunity Test (EFT)

11.1 Test Specification

Basic Standard:	EN 61000-4-4
Test Voltage:	Signal ports, telecommunication and control ports: N/A Input DC power port: N/A Input AC Power ports: ±1kV
Impulse Repetition Frequency:	5kHz
Impulse Wave shape :	5/50 T_r/T_h ns
Burst Duration:	15 ms for 5kHz Repetition Frequency
Burst Period:	300 ms
Test Duration:	1 min.

11.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Haefely, EFT Generator	PEFT 4010	154954	Apr. 20, 2016	Apr. 19, 2017
Haefely,Capacitive Clamp	IP4A	155173	Apr. 20, 2016	Apr. 19, 2017

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EFT Room.
3. Tested Date: Dec. 29, 2016.

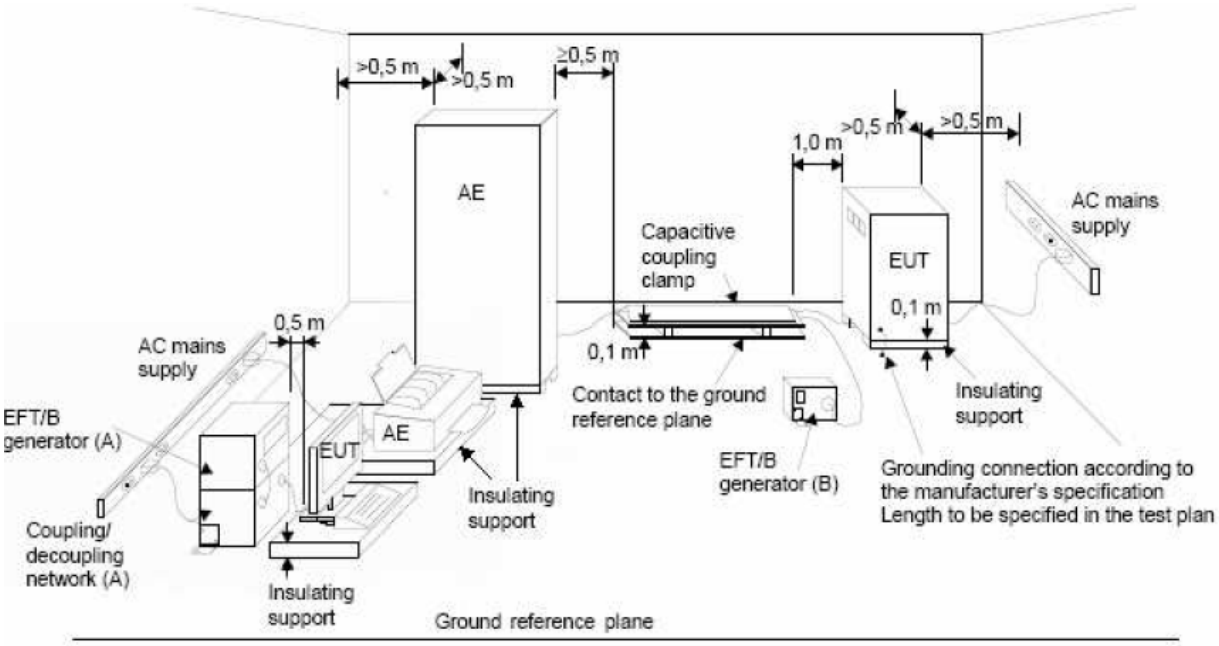
11.3 Test Arrangement

a. Both positive and negative polarity discharges were applied.

b. The distance between any coupling devices and the EUT should be 0.5 m for table-top equipment testing, and 1.0 m for floor standing equipment.

c. The duration time of each test sequential was 1 minute.

d. The transient/burst waveform was in accordance with EN 61000-4-4, 5/50 ns.



NOTE:
(A) location for supply line coupling
(B) location for signal lines coupling

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

11.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Environmental conditions	21 °C, 60% RH	Tested by	Todd Chang

Input AC power port

Voltage (kV)	Test Point	Polarity (+/-)	Observation	Performance Criterion
1	L1	+/-	Note	A
1	L2	+/-	Note	A
1	L1-L2	+/-	Note	A

Note: The EUT function was correct during the test.

12 Surge Immunity Test

12.1 Test Specification

Basic Standard:	EN 61000-4-5
Wave-Shape:	Combination Wave 1.2/50 μs Open Circuit Voltage 8 /20 μs Short Circuit Current
Test Voltage:	Telecommunication ports(directly connected to outdoor cables): Telecommunication centres: N/A, Others: N/A, Telecommunication ports(indoor cables, longer than 10 m): N/A, Input AC Power ports: Telecommunication centres: Line to line: N/A, Line to ground: N/A Others: Line to line: ±0.5kV, ±1kV, Line to ground: N/A
AC Phase Angle (degree):	0°, 90°, 180°, 270°
Pulse Repetition Rate:	1 time / 20 sec.
Number of Tests:	5 positive and 5 negative at selected points

12.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
KeyTek, Surge Simulator	EMC Pro	9902207	May 12, 2016	May 11, 2017
Coupling Decoupling Network	CDN-UTP8	028	Aug. 22, 2016	Aug. 21, 2017
Software	CEWare32	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. Tested Date: Dec. 15, 2016.

12.3 Test Arrangement

a. Input AC/DC Power ports:

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 2 meters in length (or shorter).

For double-insulated products without PE or external earth connections, the test shall be done in a similar way as for grounded products but without adding any additional external grounded connections. If there are no other possible connections to earth, line-to-ground tests may be omitted.

b. Signal and telecommunication ports,

I Unshielded unsymmetrical interconnection lines:

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.

I Unshielded symmetrical interconnections communication lines:

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.

I High speed communications lines

Prior to the test, the correct operation of the port shall be verified; the external connection shall then be removed and the surge applied directly to the port's terminals with no coupling /decoupling network. After the surge, the correct operation of the port shall again be verified.

I Shielded lines:

- Direct application,

The EUT is isolated from ground and the surge is applied to its metallic enclosure; the termination (or auxiliary equipment) at the port(s) under test is grounded. This test applies to equipment with single or multiple shielded cables.

Rules for application of the surge to shielded lines:

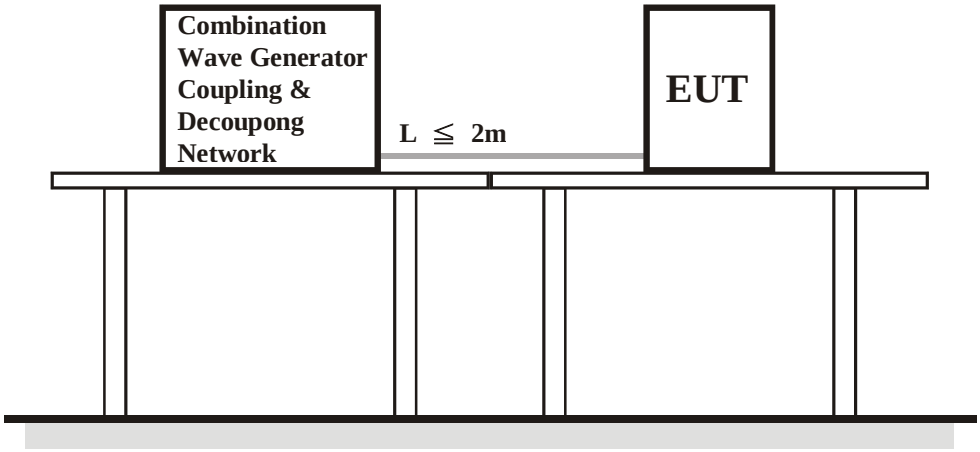
a) Shields grounded at both ends
> The surge injection on the shield.

b) Shields grounded at one end
> If in the installation the shield is connected only at the auxiliary equipment, test shall be done in that configuration but with the generator still connected to the EUT side. If cable lengths allow, the cables shall be on insulated supports 0,1 m above the ground plane or cable tray.

For products which do not have metallic enclosures, the surge is applied directly to the shielded cable.

- Alternative coupling method for testing single cables in a multi-shield configuration,

Surges are applied in close proximity to the interconnection cable under test by a wire. The length of the cable between the port(s) under test and the device attached to the other end of the cable shall be the lesser of: the maximum length permitted by the EUT's specification, or 20 m. Where the length exceeds 1 m, excess lengths of cables shall be bundled at the approximate centre of the cables with the bundles 30 cm to 40 cm in length.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

12.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Environmental conditions	24 °C, 62% RH	Tested by	Michael Cheng

Input AC power port

Voltage (kV)	Test Point	Polarity (+/-)	Observation	Performance Criterion
0.5, 1	L1-L2	+/-	Note	A

Note: The EUT function was correct during the test.

13 Immunity to Conducted Disturbances Induced by RF Fields (CS)

13.1 Test Specification

Basic Standard:	EN 61000-4-6
Frequency Range:	0.15 MHz - 80 MHz
Voltage Level:	3 V
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Dwell Time	3 seconds

13.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ Signal Generator	SML03	101801	Jan. 07, 2016	Jan. 06, 2017
Digital Sweep Function Generator	8120	984801	NA	NA
AR Power Amplifier	75A250AM1	306331	NA	NA
FCC Coupling Decoupling Network	FCC-801-M3-25A	48	Jun. 23, 2016	Jun. 22, 2017
FCC Coupling Decoupling Network	FCC-801-M2-16A	01047	Jun. 23, 2016	Jun. 22, 2017
FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp	F-203I-23mm	455	NA	NA
FISCHER CUSTOM COMMUNICATIONS Current Injection Clamp	F-120-9A	361	Feb. 15, 2016	Feb. 14, 2017
B&K Ear Simulator	4185	2553594	NA	NA
EM TEST Coupling Decoupling Network	CDN M1/32A	306508	Jun. 23, 2016	Jun. 22, 2017
TESEQ Coupling Decoupling Network	CDN T800	34428	Jun. 23, 2016	Jun. 22, 2017
FCC Coupling Decoupling Network	FCC-801-T4	02031	Jun. 23, 2016	Jun. 22, 2017
EM TEST Coupling Decoupling Network	CDN T2	306509	Jun. 23, 2016	Jun. 22, 2017
R&S Power Sensor	NRV-Z5	837878/039	Oct. 27, 2016	Oct. 26, 2017
R&S Power Meter	NRVD	837794/040	Oct. 27, 2016	Oct. 26, 2017
TESEQ Coupling Decoupling Network	CDN M232	37702	Aug. 16, 2016	Aug. 15, 2017
TESEQ Coupling Decoupling Network	CDN M332	41258	Aug. 16, 2016	Aug. 15, 2017
TESEQ Coupling Decoupling Network	CDN M332	41256	Aug. 11, 2016	Aug. 10, 2017
TESEQ Coupling Decoupling Network	CDN T400A	28569	Aug. 11, 2016	Aug. 10, 2017
TESEQ Coupling Decoupling Network	CDN T8-10	40376	Aug. 11, 2016	Aug. 10, 2017
Software	CS_V7.4.2	NA	NA	NA

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in CS Room No. 1.
3. Tested Date: Dec. 27, 2016.

13.3 Test Arrangement

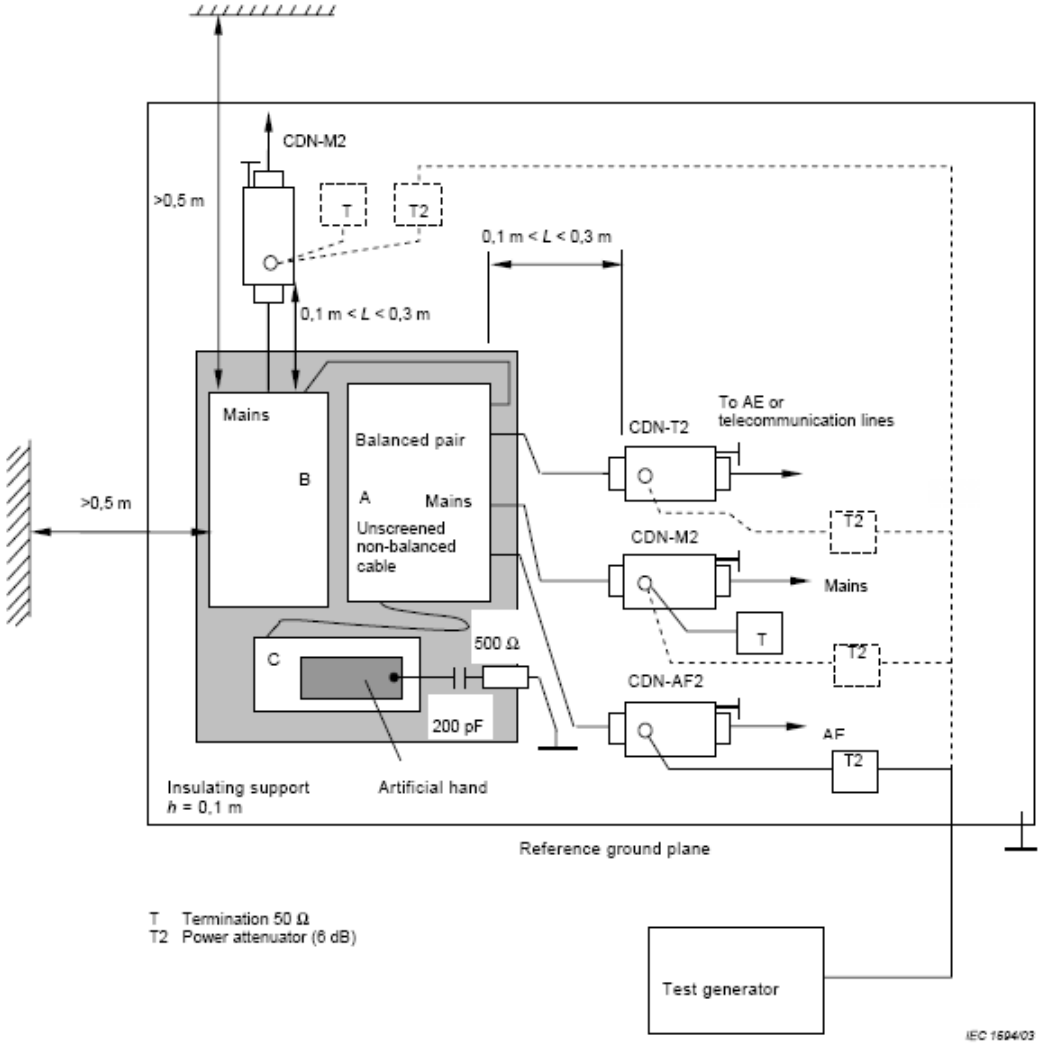
a. The EUT shall be tested within its intended operating and climatic conditions.

b. An artificial hand was placed on the hand-held accessory and connected to the ground reference plane.

c. One of the CDNs not used for injection was terminated with 50 ohm, providing only one return path. All other CDNs were coupled as decoupling networks.

d. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value.

e. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.



Note: 1.The EUT clearance from any metallic obstacles shall be at least 0,5 m.
2. Interconnecting cables (≦1 m) belonging to the EUT shall remain on the insulating support.
3. 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.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

13.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz
Environmental conditions	22°C, 67% RH	Tested by	Aga Lin

Frequency (MHz)	Level (Vrms)	Tested Line	Injection Method	Return Path	Observation	Performance Criterion
0.15 – 80	3	AC Power	CDN-M2	N/A	Note	A

Note: The EUT function was correct during the test.

14 Voltage Dips and Interruptions

14.1 Test Specification

Basic Standard:	EN 61000-4-11
Test levels:	Voltage Dips: 0% residual voltage for 0.5 cycle 0% residual voltage for 1 cycle 70% residual voltage for 25 cycles Voltage Interruptions: 0% residual voltage for 250 cycles
Interval between Event:	10 seconds
Sync Angle (degrees):	0° / 180°
Test Cycle:	3 times

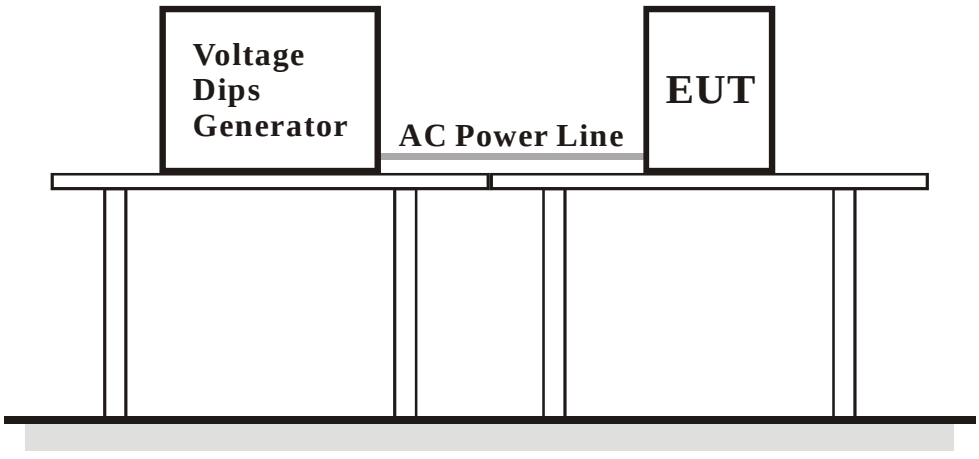
14.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
KeyTek, PQF Generator	EMC Pro	9902207	May 12, 2016	May 11, 2017

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in EMS Room No. 1.
3. Tested Date: Dec. 28, 2016

14.3 Test Arrangement

The EUT was tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10s 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.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

14.4 Test Results

Test mode	Mode 1	Input Power	230 Vac, 50 Hz, 240 Vac, 50 Hz, 100 Vac, 50 Hz
Environmental conditions	21 °C, 63% RH	Tested by	Todd Chang

Input Power for testing: 230Vac, 50 Hz (Nominal input Voltage)					
Voltage Residual (%)	Duration (cycles)	Interval (sec)	Times	Observation	Performance Criterion
0	0.5	10	3	Note 1	A
0	1	10	3	Note 1	A
70	25	10	3	Note 1	A
0	250	10	3	Note 2	B

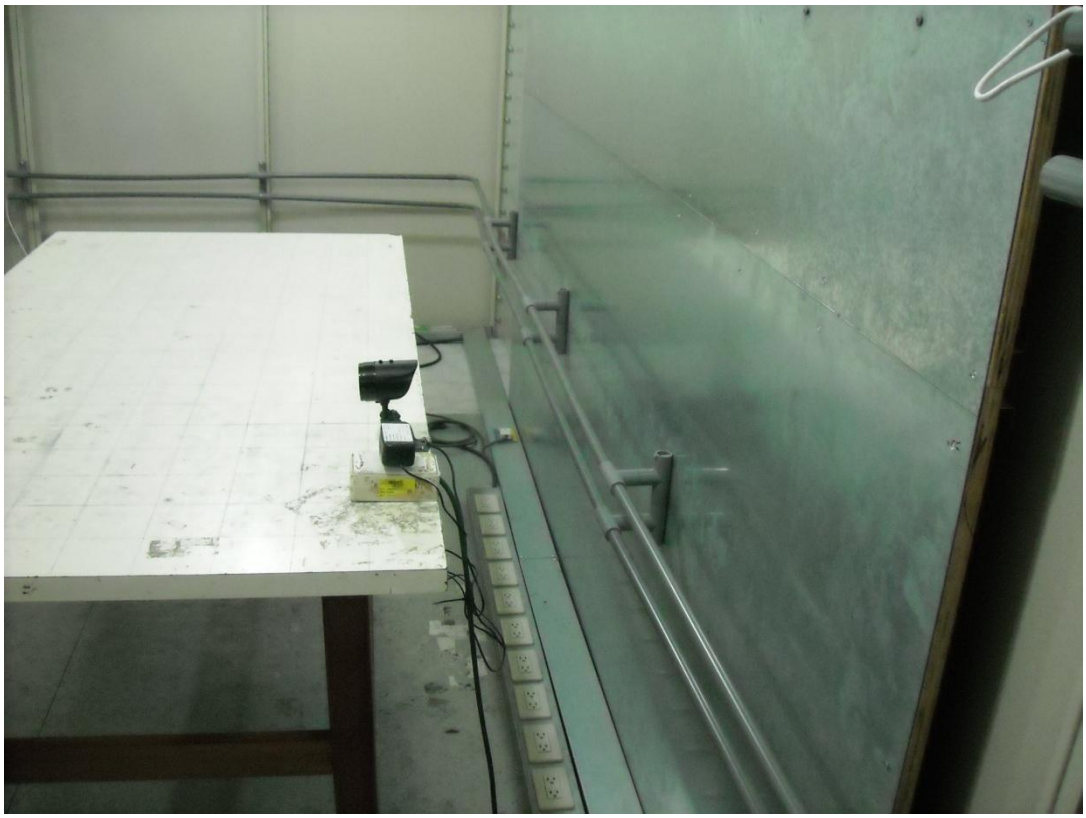
Input Power for testing: 240Vac, 50 Hz (Maximum rated input voltage)					
Voltage Residual (%)	Duration (cycles)	Interval (sec)	Times	Observation	Performance Criterion
0	0.5	10	3	Note 1	A
0	1	10	3	Note 1	A
70	25	10	3	Note 1	A
0	250	10	3	Note 2	B

Input Power for testing: 100Vac, 50 Hz (Minimum rated input voltage)					
Voltage Residual (%)	Duration (cycles)	Interval (sec)	Times	Observation	Performance Criterion
0	0.5	10	3	Note 1	A
0	1	10	3	Note 1	A
70	25	10	3	Note 1	A
0	250	10	3	Note 2	B

Note: 1. The EUT function was correct during the test.
2. The EUT reset during the test.

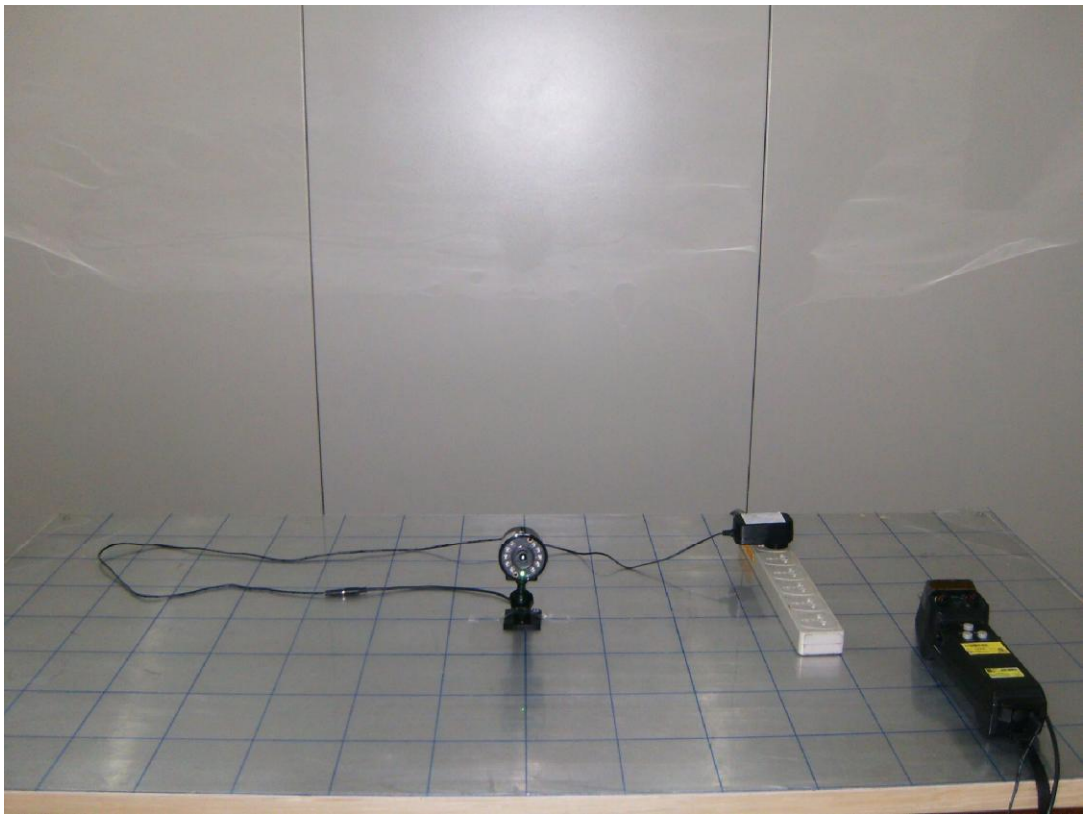
15 Pictures of Test Arrangements

15.1 Conducted Disturbance at Mains Ports

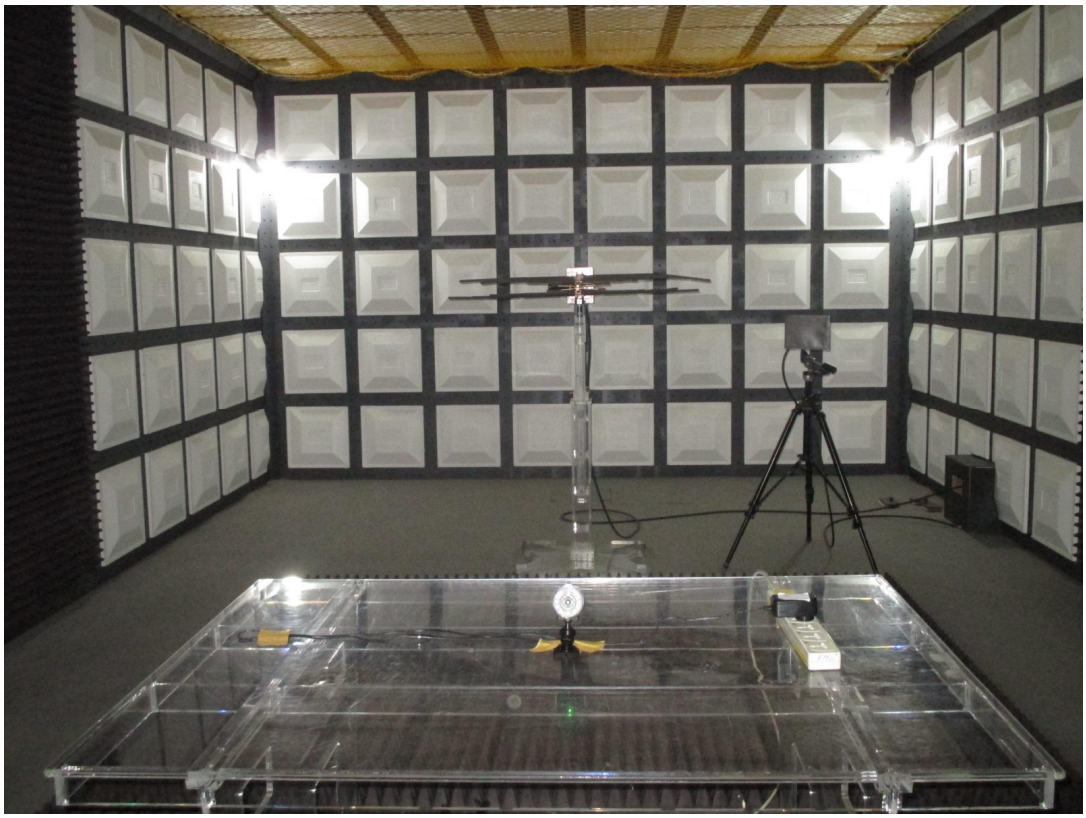


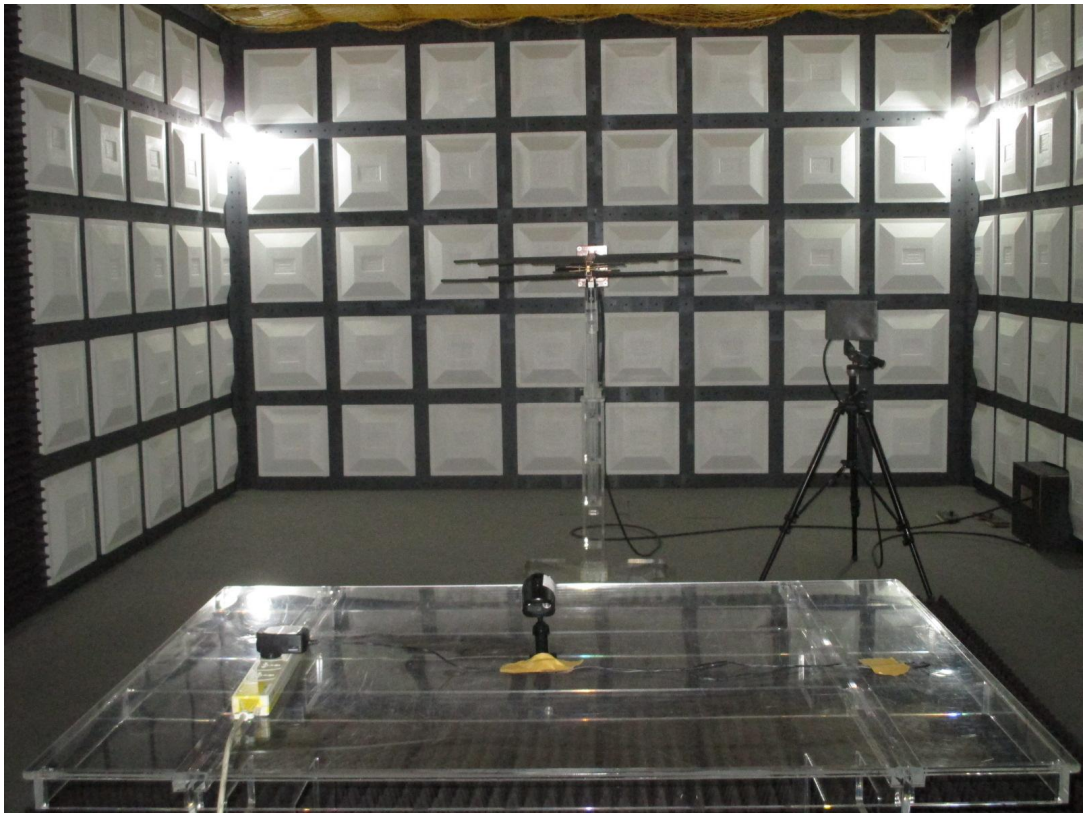
15.2 Harmonics Current, Voltage Fluctuations and Flicker Measurement

15.3 Electrostatic Discharge Immunity Test (ESD)



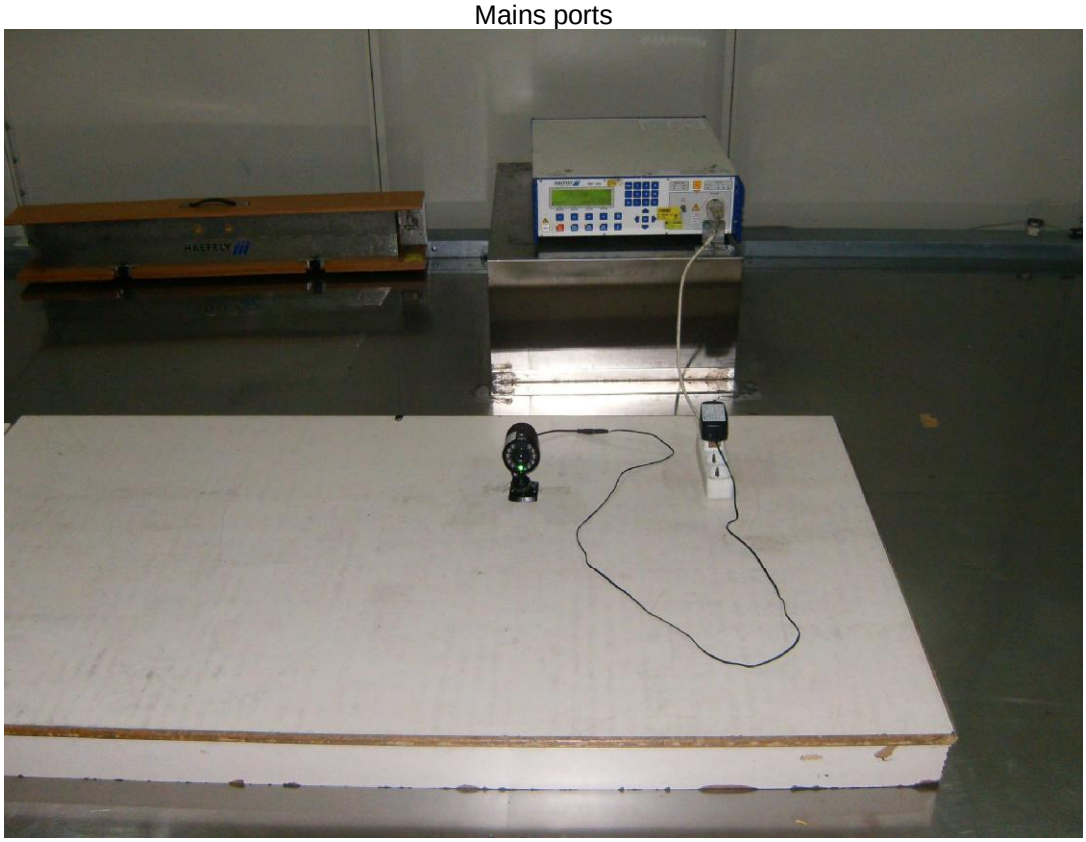
15.4 Radio-frequency, Electromagnetic Field Immunity Test (RS)





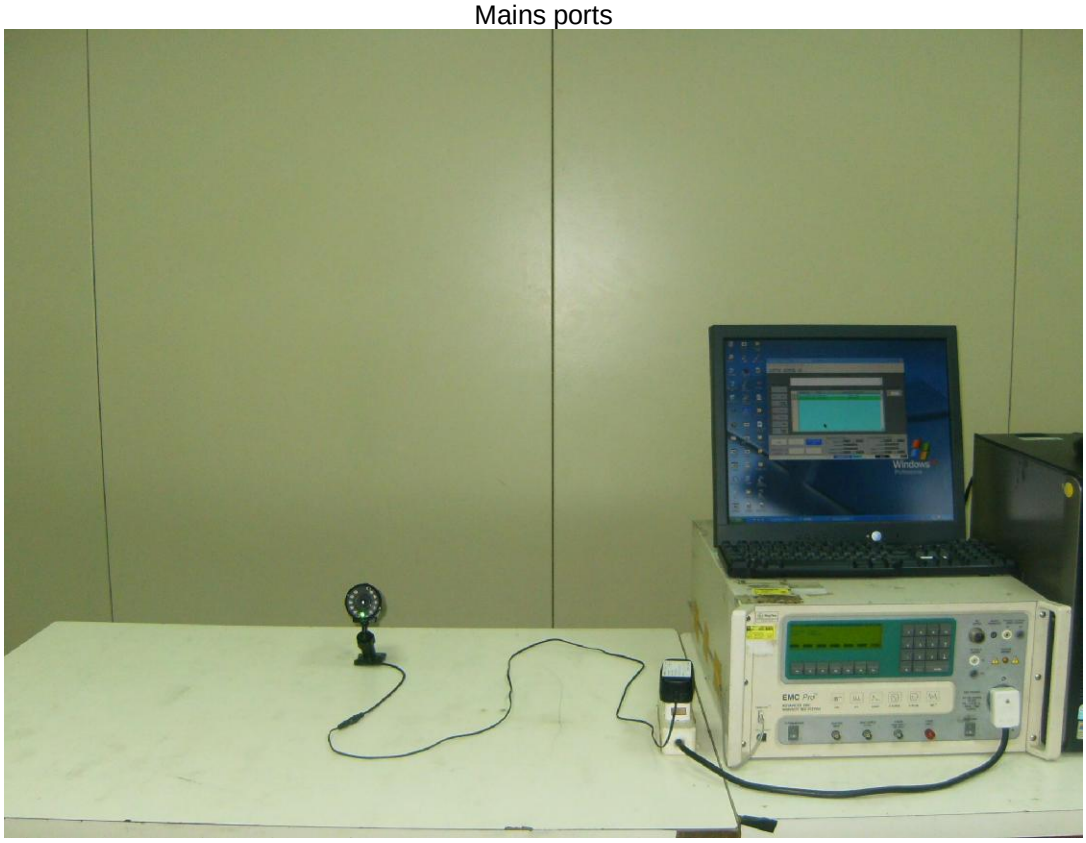
15.5 Electrical Fast Transient/Burst Immunity Test (EFT)

Mains ports



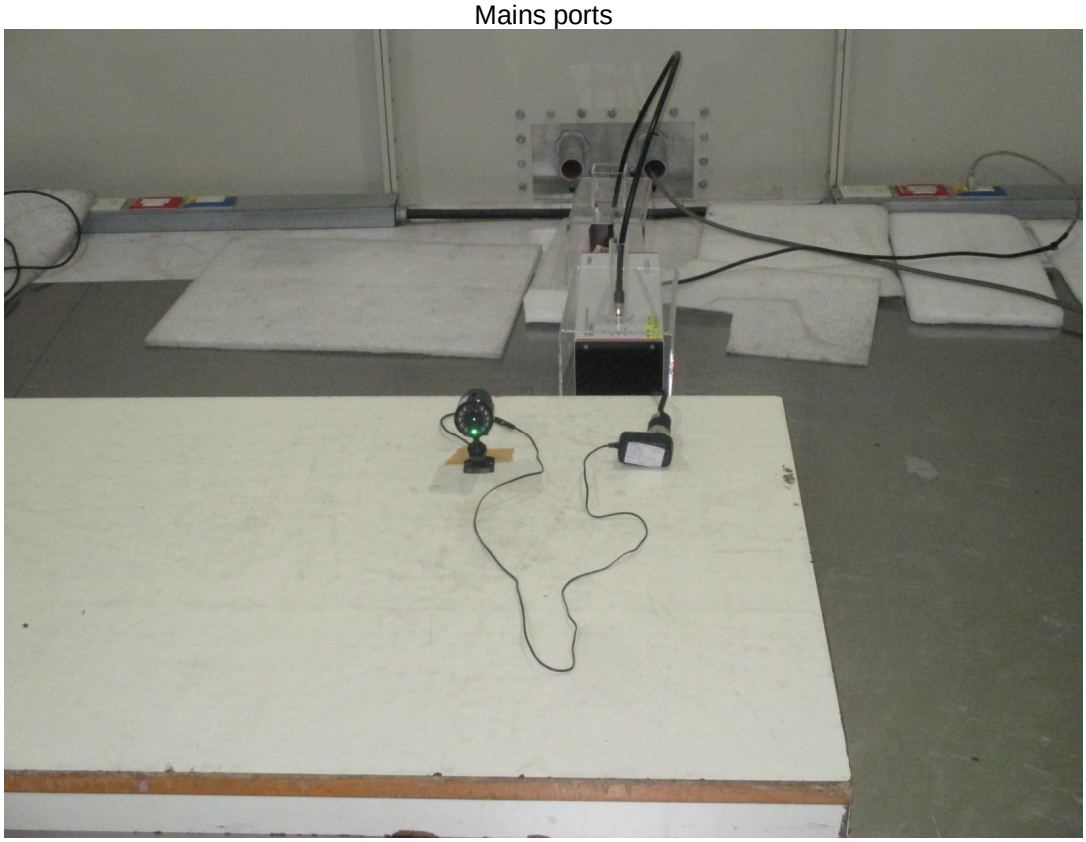
15.6 Surge Immunity Test

Mains ports

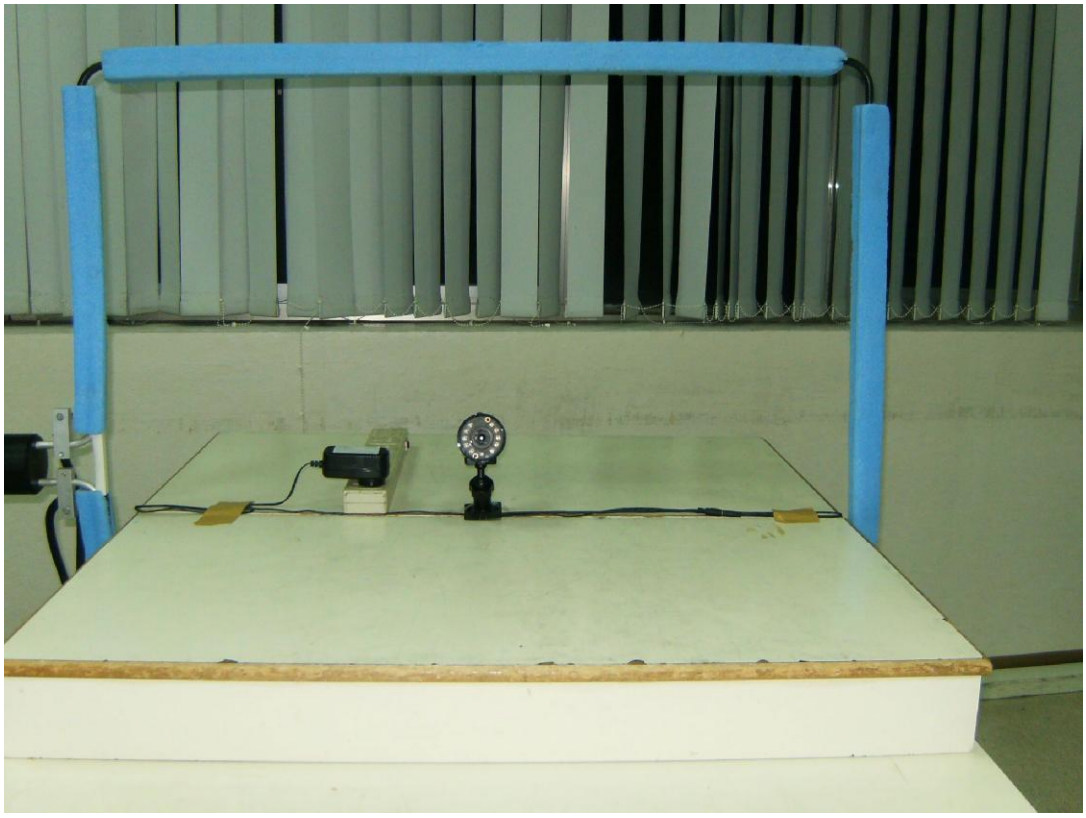


15.7 Conducted Disturbances Induced by RF Fields (CS)

Mains ports



15.8 Voltage Dips and Interruptions



Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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