

Certificate

Issue Date: November 13, 2020
Ref. Report No. ISL-20LE888MEE

Product Name : SWITCHING POWER SUPPLY
Model Number(s) : HWU18A-120 N
Brand : poconex
Responsible Party : Poconex Electronics Corp.
Address : 9F-10, No.12, Fuxing 4th Rd., Qianzhen Dist., Kaohsiung City 806, Taiwan,

We, **International Standards Laboratory Corp.**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in EUROPEAN COUNCIL DIRECTIVE 93/42/EEC. And Our laboratories is the accredited laboratories and are approved according to ISO/IEC 17025. The device was passed the test performed according to :



Standards:

EN 55032:2015+ AC:2016, CISPR 32:2015+COR1:2016: Class B
AS/NZS CISPR 32:2015: Class B
EN 60601-1-2:2015, IEC 60601-1-2:2014
EN 61000-3-2:2014 and IEC 61000-3-2:2014
EN 61000-3-3: 2013 and IEC 61000-3-3: 2013

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The determination of the test results is determined by customer agreement, regulations or standard document specifications.

The Laboratory evaluates measurement inaccuracies based on regulatory or standard document specifications and is listed in the report for reference. The quantitative project part judges the conformity of the test results based on the evaluation results of the standard cited uncertainty, and the qualitative project does not temporarily evaluate the measurement uncertainty.

Angus Chu

Angus Chu / Director



International Standards Laboratory Corp.

LT Lab.:

No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan
Tel: 886-3-407-1718; Fax: 886-3-407-1738

CE MARK TECHNICAL FILE

AS/NZS EMC CONSTRUCTION FILE

of

Product Name

SWITCHING POWER SUPPLY

Model

HWU18A-120 N

Brand

poconex

Contains:

1. Declaration of Conformity
2. EN 55032/CISPR 32, AS/NZS CISPR 32 EMI test report
3. EN 60601-1-2, IEC 60601-1-2, EN 61000-3-2, IEC 61000-3-2, EN 61000-3-3 and IEC 61000-3-3 test report
4. Block Diagram and Schematics
5. Users' manual

Declaration of Conformity

Name of Responsible Party: Poconex Electronics Corp.
 Address of Responsible Party: 9F-10, No.12, Fuxing 4th Rd., Qianzhen Dist.,
 Kaohsiung City 806, Taiwan
 Declares that product: SWITCHING POWER SUPPLY
 Model: HWU18A-120 N
 Brand: poconex
 Assembled by: Same as above
 Address: Same as above

Conforms to the EMC Directive 93/42/EEC as attested by conformity with the following harmonized standards:

EN 55032:2015+AC:2016, CISPR 32: 2015+COR1:2016: Class B: Industrial, scientific and medical equipment Radio frequency disturbance characteristics Limits and methods of measurement.

AS/NZS CISPR 32:2015: Class B: Industrial, scientific and medical equipment– Radio-frequency disturbance characteristics-Limits and methods of measurement

EN 60601-1-2:2015, IEC 60601-1-2:2014: Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard:

Electromagnetic disturbances – Requirements and tests.

Standard	Description	Results	Criteria
EN 61000-4-2:2009 IEC 61000-4-2:2008	Electrostatic Discharge	Pass	Compliance
EN 61000-4-3:2006+A1:2008 +A2:2010 IEC 61000-4-3:2006+A1:2007+A2:2010	Radio-Frequency, Electromagnetic Field	Pass	Compliance
EN 61000-4-4:2012 IEC 61000-4-4:2012	Electrical Fast Transient/Burst	Pass	Compliance
EN 61000-4-5:2014+A1:2017 IEC 61000-4-5:2014+A1:2017	Surge	Pass	Compliance
EN 61000-4-6:2014+AC:2015 IEC 61000-4-6:2013	Conductive Disturbance	Pass	Compliance
EN 61000-4-8:2010 IEC 61000-4-8:2009	Power Frequency Magnetic Field	Pass	Compliance
EN 61000-4-11: 2004+A1:2017 IEC 61000-4-11: 2004+A1:2017	Voltage Dips / Short Interruption and Voltage Variation	Pass	Compliance

Standard	Description	Results
EN 61000-3-2: 2014 IEC 61000-3-2: 20014	Limits for harmonics current emissions	Pass
EN 61000-3-3: 2013 IEC 61000-3-3: 2013	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

<to be continued>

We, Poconex Electronics Corp., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the requirements.

Poconex Electronics Corp.

Date: November 13, 2020

Remarks: 1) The responsible party for Declaration of Conformity must be located within Europe, 2) The above is a sample of DoC, one should modify it to meet remark 1.

Declaration of Conformity

Name of Responsible Party: Poconex Electronics Corp.
Address of Responsible Party: 9F-10, No.12, Fuxing 4th Rd., Qianzhen Dist.,
Kaohsiung City 806, Taiwan
Declares that product: SWITCHING POWER SUPPLY
Model: HWU18A-120 N
Brand: poconex
Assembled by: Same as above
Address: Same as above

Conforms to the EMI part of RCM Mark requirements as attested by conformity with the following standards:

AS/NZS CISPR 32:2015: Class B: Electromagnetic compatibility of multimedia equipment- Emission requirements

We, Poconex Electronics Corp., hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the requirements.

Poconex Electronics Corp.

Date: November 13, 2020

CE TEST REPORT

of

EN 55032/CISPR 32 Class B
EN 60601-1-2 / IEC 60601-1-2
IMMUNITY
EN 61000-3-2 / IEC 61000-3-2
EN 61000-3-3 / IEC 61000-3-3

Product : **SWITCHING POWER SUPPLY**

Model(s): **HWU18A-120 N**

Brand: **poconex**

Applicant: **Poconex Electronics Corp.**

Address: **9F-10, No.12, Fuxing 4th Rd., Qianzhen Dist.,
Kaohsiung City 806, Taiwan**

Test Performed by:

International Standards Laboratory Corp.

<LT Lab.>

*Address:

No. 120, Lane 180, Hsin Ho Rd.,
Lung-Tan Dist., Tao Yuan City 325, Taiwan

*Tel: 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-20LE888MEE**

Issue Date : **November 13, 2020**

This report totally contains 59 pages including this cover page and contents page.

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

The uncertainty of the measurement does not include in consideration of the test result unless the customer required the determination of uncertainty via the agreement, regulation or standard document specification.

This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory Corp.

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1. General

1.1 Certification of Accuracy of Test Data

Standards: Please refer to 1.2

Equipment Tested: SWITCHING POWER SUPPLY

Model: HWU18A-120 N

Brand: poconex

Applicant: Poconex Electronics Corp.

Sample received Date: October 30, 2020

Final test Date: EMI: refer to the date of test data
EMS: November 12, 2020

Test Site: Chamber 12; Conduction 03; Immunity02

Test Distance: 10m (EMI test)

Temperature: refer to each site test data

Humidity: refer to each site test data

Atmospheric Pressure: 86 kPa to 106 kPa

Input power: Conduction input power: AC 230 V / 50 Hz
Radiation input power: AC 230 V / 50 Hz
Immunity input power: AC 230 V / 50 Hz

Test Result: **PASS**

Report Engineer: Cheryl Tung

Test Engineer:
Martin Lin
Martin PM Lin

Approved By:
Benson Chen
Benson Chen / Associate Director

1.2 Test Standards

The tests which this report describes were conducted by an independent electromagnetic compatibility consultant, International Standards Laboratory Corp. in accordance with the following

EN 55032:2015+AC:2016, CISPR 32: 2015+COR1:2016: Class B: Industrial, scientific and medical equipment Radio frequency disturbance characteristics Limits and methods of measurement.

AS/NZS CISPR 32:2015: Class B: Industrial, scientific and medical equipment– Radio-frequency disturbance characteristics-Limits and methods of measurement

EN 60601-1-2:2015, IEC 60601-1-2:2014: Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – Requirements and tests.

Standard	Description	Results	Criteria
EN 61000-4-2:2009 IEC 61000-4-2:2008	Electrostatic Discharge	Pass	Compliance
EN 61000-4-3:2006+A1:2008 +A2:2010 IEC 61000-4-3:2006+A1:2007+A2:2010	Radio-Frequency, Electromagnetic Field	Pass	Compliance
EN 61000-4-4:2012 IEC 61000-4-4:2012	Electrical Fast Transient/Burst	Pass	Compliance
EN 61000-4-5:2014+A1:2017 IEC 61000-4-5:2014+A1:2017	Surge	Pass	Compliance
EN 61000-4-6:2014+AC:2015 IEC 61000-4-6:2013	Conductive Disturbance	Pass	Compliance
EN 61000-4-8:2010 IEC 61000-4-8:2009	Power Frequency Magnetic Field	Pass	Compliance
EN 61000-4-11: 2004+A1:2017 IEC 61000-4-11: 2004+A1:2017	Voltage Dips / Short Interruption and Voltage Variation	Pass	Compliance

Standard	Description	Results
EN 61000-3-2: 2014 IEC 61000-3-2: 20014	Limits for harmonics current emissions	Pass
EN 61000-3-3: 2013 IEC 61000-3-3: 2013	Limits for voltage fluctuations and flicker in low-voltage supply systems.	Pass

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

1.2.1 Performance Criteria for Compliance EN 60601-1-2 (Annex I)

Examples of test failures:

- malfunction;
- non-operation when operation is required;
- unwanted operation when no operation is required;
- deviation from normal operation that poses an unacceptable RISK to the PATIENT or OPERATOR;
- component failures;
- change in programmable parameters;
- reset to factory defaults (MANUFACTURER's presets); – change of operating mode;
- a FALSE POSITIVE ALARM CONDITION;
- a FALSE NEGATIVE ALARM CONDITION (failure to alarm);
- cessation or interruption of any intended operation, even if accompanied by an ALARM SIGNAL;
- initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an ALARM SIGNAL;
- error of a displayed numerical value sufficiently large to affect diagnosis or treatment;
- noise on a waveform in which the noise would interfere with diagnosis, treatment or monitoring;
- artefact or distortion in an image in which the artefact would interfere with diagnosis, treatment or monitoring;
- failure of automatic diagnosis or treatment ME EQUIPMENT or ME SYSTEM to diagnose or treat, even if accompanied by an ALARM SIGNAL.

Example of performance during and after the applied testing stimulus required to pass the test:

- for a mammography system, the compression full release and associated command remains fully operational;
- for ULTRASOUND DIAGNOSTIC EQUIPMENT, the probe heating, dissipative power and temperature shall remain within specifications;
- safety-related functions perform as intended;
- false operation of alarms, “fail safe” modes and similar functions do not occur.
- NOTE This might require performing the test twice
- once to ensure the functions occur as expected and again to ensure they do not occur falsely.

Examples of acceptable degradation:

- an imaging system displays an image that could be altered, but in a way that would not affect the diagnosis or treatment;
- a heart rate monitor displays a heart rate that could be in error, but by an amount that is not clinically significant;
- a PATIENT monitor exhibits a small amount of noise or a transient on a waveform and the noise or transient would not affect diagnosis, treatment or monitoring.

Examples of ME EQUIPMENT and ME SYSTEMS with multiple functions:

- multi-parameter monitors;
- anaesthesia system with monitors; – ventilators with monitors;
- multiple instances of the same function (e.g. multiple invasive blood pressure sensors).

1.3 Description of EUT

EUT

Description	SWITCHING POWER SUPPLY
Condition	Pre-Production
Model	HWU18A-120 N
Serial Number	N/A
Classification of equipment	Class B group 1 equipment
Environment	Home healthcare environment
Highest working frequency	<108MHz
The radiation test should be tested till 1GHz	

Output and input features:

Model Name	Input / Output
HWU18A-120 N	Input: 100-240 Vac, 50-60 Hz, 0.5A Output: 12Vdc, 1.5A

Test configurations:

Configuration	Model	Input voltage	Mode
1	HWU18A-120 N	AC 230V/50Hz	Full load

EMI Noise Source:

Refer to the photo	Factory	Model	Point
EUT-7	SUZHOU YANG-CHI ELECTRONICS CO., LTD. JET SIGNAL INDUSTRIES CO., LTD.	JS20SW217	T1

EMI Solution:

NA

1.4 Description of Support Equipment

No	Unit	Model/Serial No.	Brand	Power Cord	FCC ID
1	Load	N/A S/N : N/A	N/A	N/A	N/A

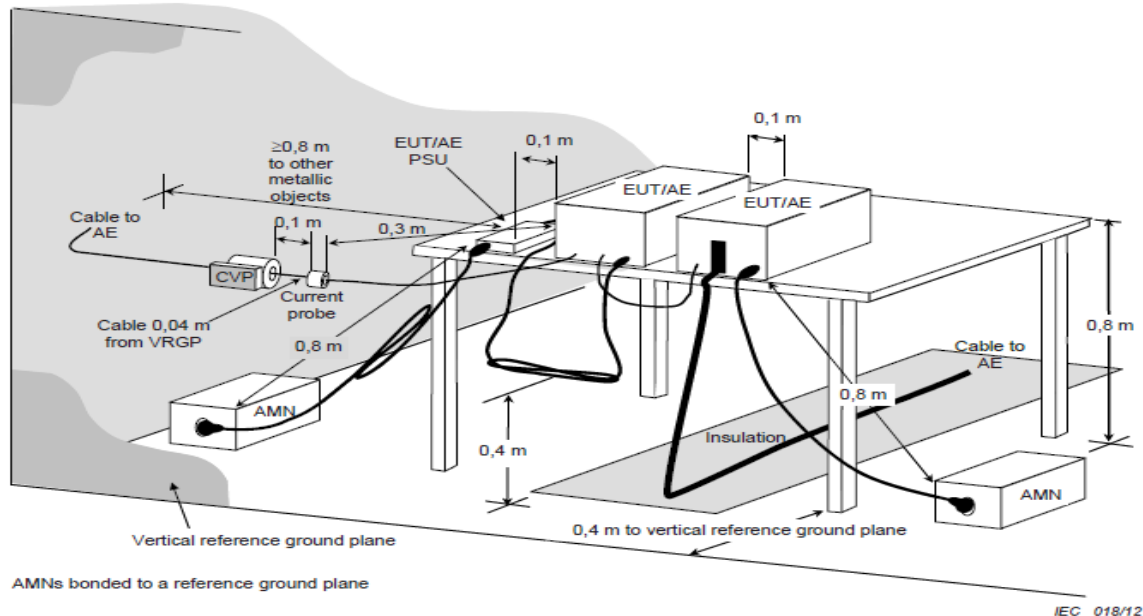
1.5 I/O Cable Condition of EUT and Support Units

Description	Path	Length	Shielding	Core	Remark
DC Power Cable	EUT DC output cable to load	1.2m	No	No	No

2. Power Main Port Conducted Emissions

2.1 Test Setup and Procedure

2.1.1 Test Setup



2.1.2 Test Procedure

The measurements are performed in a shielded room test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, live and neutral, were measured. All of the interface cables were manipulated according to EN 55032 requirements.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150kHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9kHz

2.1.4 Limit

Conducted emissions from the AC mains power ports of Class A equipment:

Frequency	QP	AV
MHz	dB(μ V)	dB(μ V)
0.15-0.50	79	66
0.50-30	73	60
Note: The lower limit shall apply at the transition frequencies		

Conducted emissions from the AC mains power ports of Class B equipment:

Frequency	QP	AV
MHz	dB(μ V)	dB(μ V)
0.15-0.50	66-56	56-46
0.50-5.0	56	46
5.0-30	60	50
Note: The lower limit shall apply at the transition frequencies		

2.2 Conduction Test Data: Configuration 1

-Live



No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.166	41.12	29.44	9.63	50.75	65.16	-14.41	39.07	55.16	-16.09
2	0.186	41.11	29.58	9.62	50.73	64.21	-13.48	39.20	54.21	-15.01
3	0.206	43.00	33.02	9.62	52.62	63.37	-10.75	42.64	53.37	-10.73
4	0.270	37.58	26.27	9.63	47.21	61.12	-13.91	35.90	51.12	-15.22
5	0.286	37.80	27.92	9.63	47.43	60.64	-13.21	37.55	50.64	-13.09
6	2.110	31.81	22.04	9.68	41.49	56.00	-14.51	31.72	46.00	-14.28
7	2.502	32.37	22.73	9.70	42.07	56.00	-13.93	32.43	46.00	-13.57
8	2.714	32.28	21.23	9.70	41.98	56.00	-14.02	30.93	46.00	-15.07
9	2.890	33.03	21.83	9.71	42.74	56.00	-13.26	31.54	46.00	-14.46
10	3.174	36.61	22.89	9.71	46.32	56.00	-9.68	32.60	46.00	-13.40
11	3.442	35.88	25.49	9.72	45.60	56.00	-10.40	35.21	46.00	-10.79
12	3.630	34.62	22.37	9.73	44.35	56.00	-11.65	32.10	46.00	-13.90
13	3.782	31.75	20.75	9.74	41.49	56.00	-14.51	30.49	46.00	-15.51
14	3.930	30.94	19.32	9.74	40.68	56.00	-15.32	29.06	46.00	-16.94

Note:

Margin = QP/AVG Emission - Limit

QP/AVG Emission = QP_R/AVG_R + Correct Factor

Correct Factor = LISN Loss + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

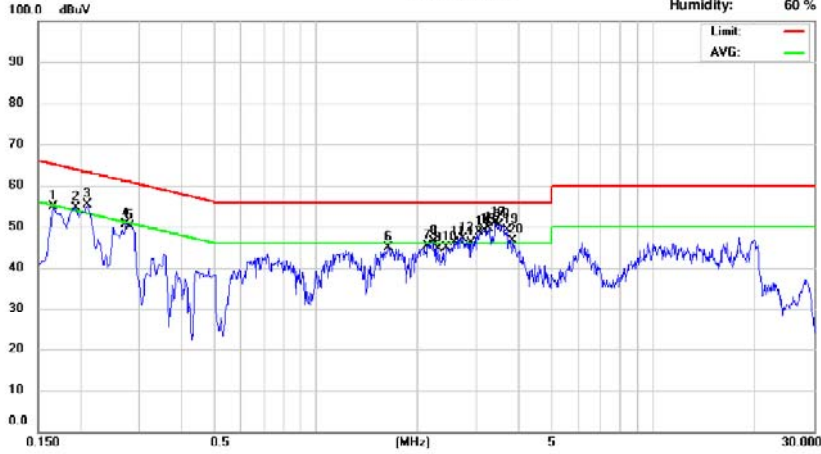
- Neutral



Address: No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel: 03-4071718

Conducted Emission Measurement
Date: 2020/11/3

operator: Martin Lin
Temperature: 26 °C
Humidity: 60 %



Site: Conduction 03

Phase: N

No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.166	41.04	28.59	9.65	50.69	65.16	-14.47	38.24	55.16	-16.92
2	0.194	42.94	33.59	9.64	52.58	63.86	-11.28	43.23	53.86	-10.63
3	0.210	43.18	34.60	9.64	52.82	63.21	-10.39	44.24	53.21	-8.97
4	0.274	38.57	28.79	9.65	48.22	61.00	-12.78	38.44	51.00	-12.56
5	0.286	38.65	27.99	9.65	48.30	60.64	-12.34	37.64	50.64	-13.00
6	1.658	32.84	22.09	9.69	42.53	56.00	-13.47	31.78	46.00	-14.22
7	2.142	34.01	22.48	9.71	43.72	56.00	-12.28	32.19	46.00	-13.81
8	2.238	31.36	19.82	9.71	41.07	56.00	-14.93	29.53	46.00	-16.47
9	2.306	31.38	18.22	9.72	41.10	56.00	-14.90	27.94	46.00	-18.06
10	2.446	31.81	21.17	9.72	41.53	56.00	-14.47	30.89	46.00	-15.11
11	2.582	34.25	23.97	9.73	43.98	56.00	-12.02	33.70	46.00	-12.30
12	2.726	34.30	21.80	9.73	44.03	56.00	-11.97	31.53	46.00	-14.47
13	2.894	33.31	21.71	9.74	43.05	56.00	-12.95	31.45	46.00	-14.55
14	3.018	35.56	25.19	9.74	45.30	56.00	-10.70	34.93	46.00	-11.07
15	3.162	36.81	23.07	9.74	46.55	56.00	-9.45	32.81	46.00	-13.19
16	3.274	35.81	24.43	9.75	45.56	56.00	-10.44	34.18	46.00	-11.82
17	3.402	36.04	24.93	9.75	45.79	56.00	-10.21	34.68	46.00	-11.32

Note:

Margin = QP/AVG Emission - Limit

QP/AVG Emission = QP_R/AVG_R + Correct Factor

Correct Factor = LISN Loss + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

Site: Conduction 03 Phase: N

No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
18	3.502	37.83	25.51	9.76	47.59	56.00	-8.41	35.27	46.00	-10.73
19	3.686	35.07	21.62	9.76	44.83	56.00	-11.17	31.38	46.00	-14.62
20	3.826	31.50	21.64	9.77	41.27	56.00	-14.73	31.41	46.00	-14.59

Note:

Margin = QP/AVG Emission - Limit

QP/AVG Emission = QP_R/AVG_R + Correct Factor

Correct Factor = LISN Loss + Cable Loss

A margin of -8dB means that the emission is 8dB below the limit

The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.

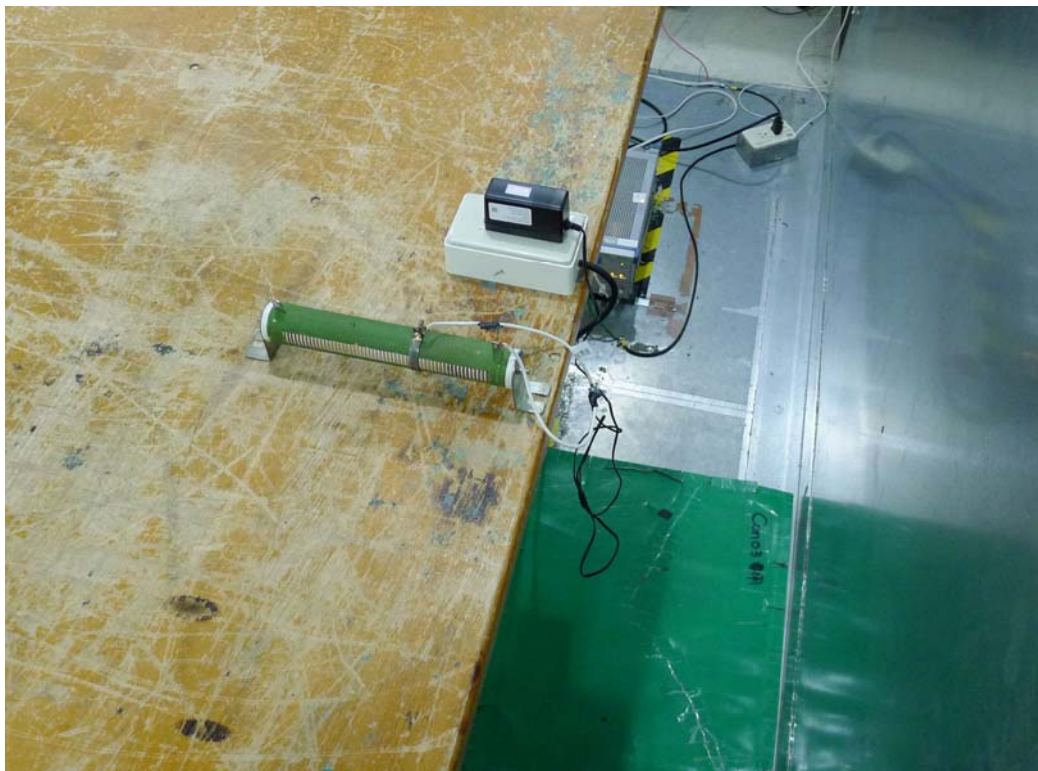
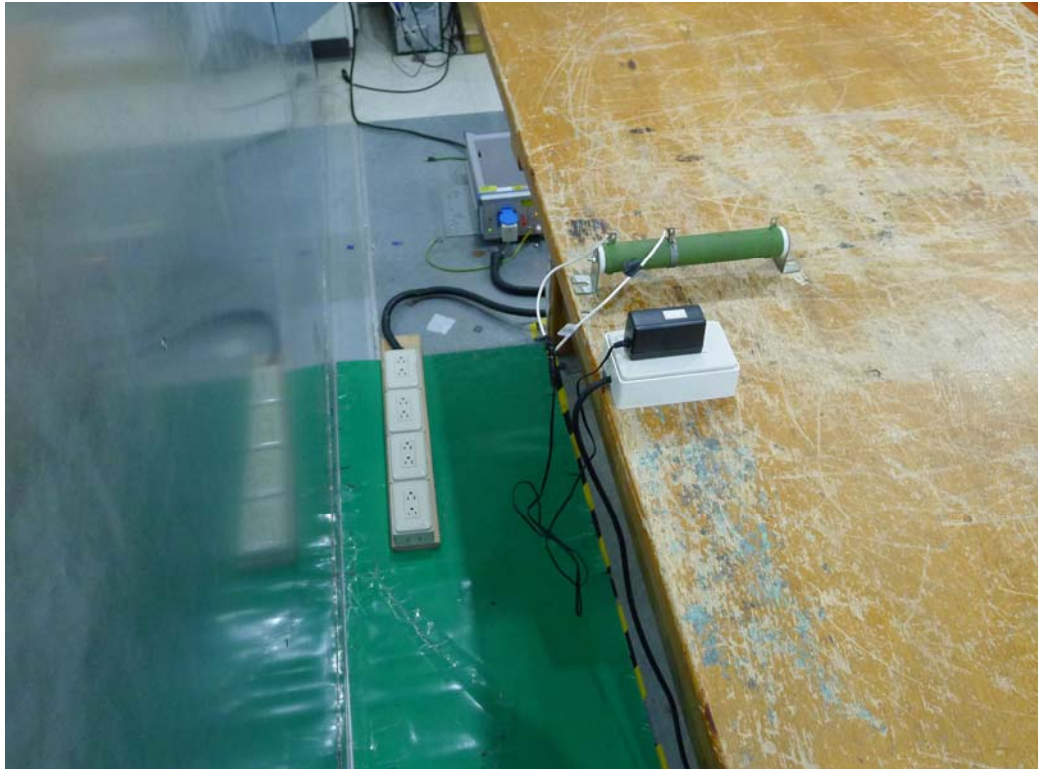
If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.

2.3 Test Setup Photo

Front View



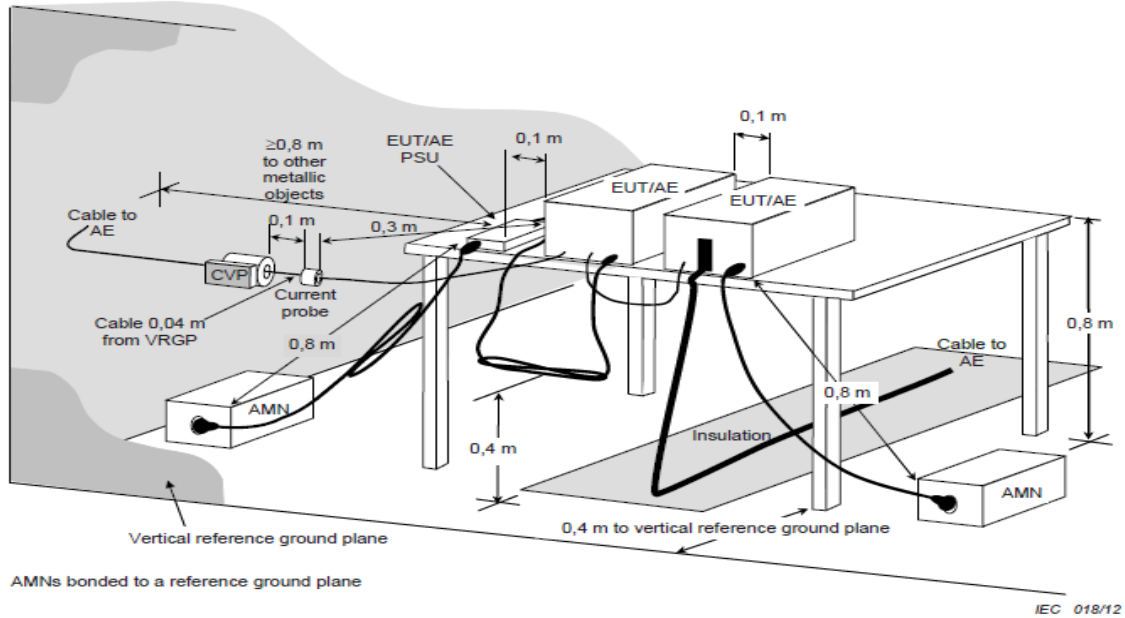
Back View



3. Telecommunication Port Conducted Emissions

3.1 Test Setup and Procedure

3.1.1 Test Setup



3.1.2 Test Procedure

The measurements are performed in a shielded room test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

The EUT, any support equipment, and any interconnecting cables were arranged and moved to get the maximum measurement. All of the interface cables were manipulated according to EN 55032 requirements.

The port of the EUT was connected to the support equipment through the ISN and linked in normal condition.

AC input power for the EUT & the support equipment power outlets were obtained from the same filtered source that provided input power to the LISN.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information could be useful in reducing their amplitude.

3.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150kHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9kHz

3.1.4 Limit

Asymmetric mode conducted emissions from Class_A equipment:

Applicable to

- 1. wired network ports.**
- 2. optical fibre ports with metallic shield or tension members.**
- 3. antenna ports.**

Frequency range MHz	Coupling device	Detector type / bandwidth	Class_A voltage limits dB(μV)	Class_A current limits dB(μA)
0.15-0.5	AAN	Quasi Peak / 9 kHz	97-87	n/a
0.5-30			87	
0.15-0.5	AAN	Average / 9 kHz	84-74	
0.5-30			74	
0.15-0.5	CVP and current probe	Quasi Peak / 9 kHz	97-87	53-43
0.5-30			87	43
0.15-0.5	CVP and current probe	Average / 9 kHz	84-74	40-30
0.5-30			74	30
0.15-0.5	Current Probe	Quasi Peak / 9 kHz	n/a	53-43
0.5-30				43
0.15-0.5	Current Probe	Average / 9 kHz		40-30
0.5-30				30

Asymmetric mode conducted emissions from Class_B equipment:

Applicable to:

- 1. wired network ports.**
- 2. optical fibre ports with metallic shield or tension members.**
- 3. broadcast receiver tuner ports.**
- 4. antenna ports.**

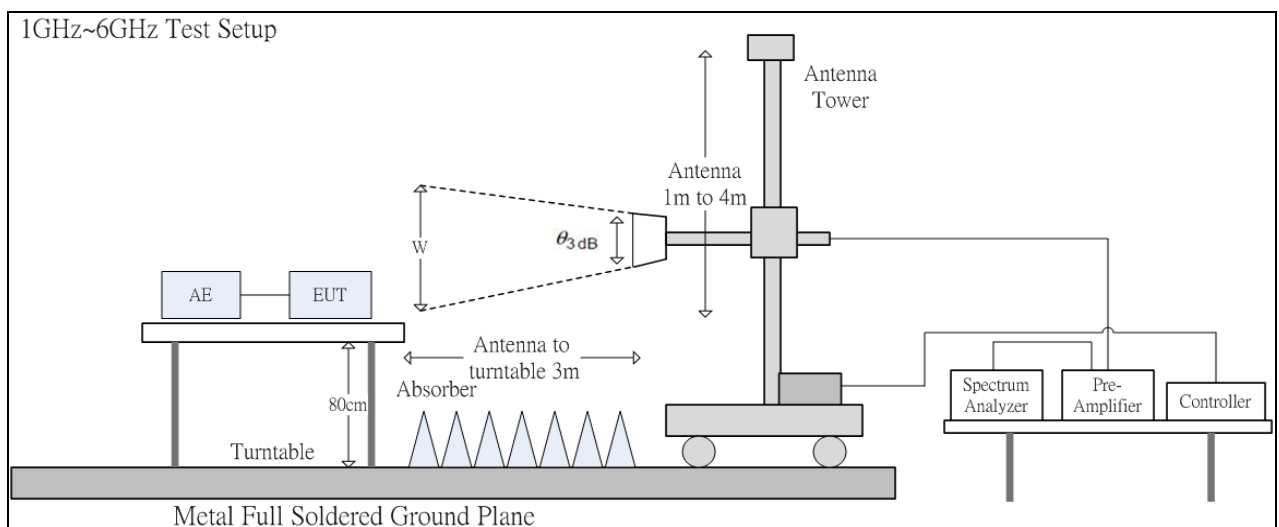
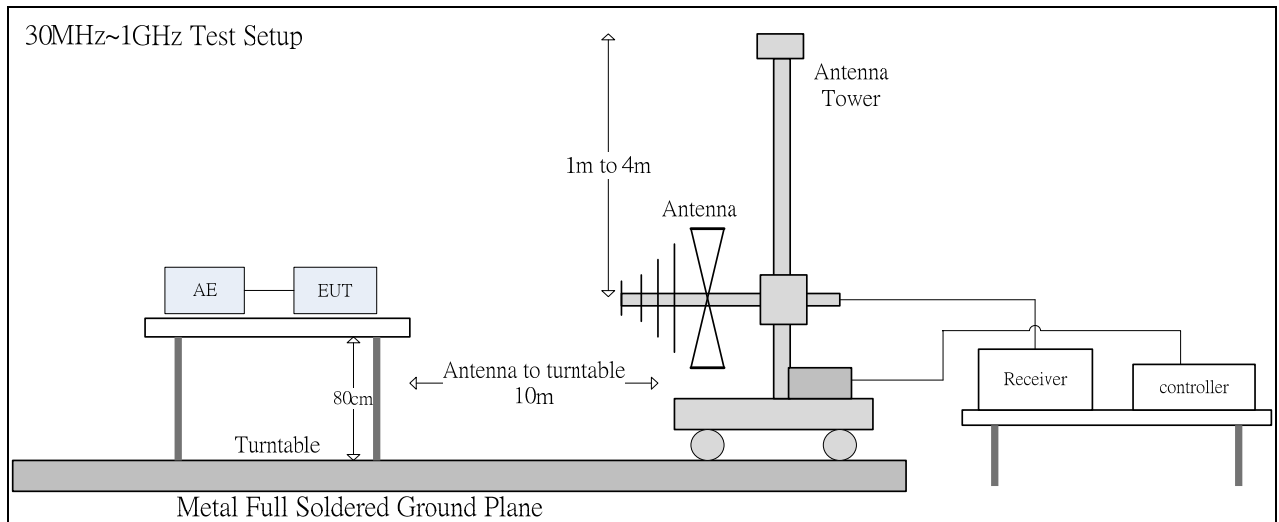
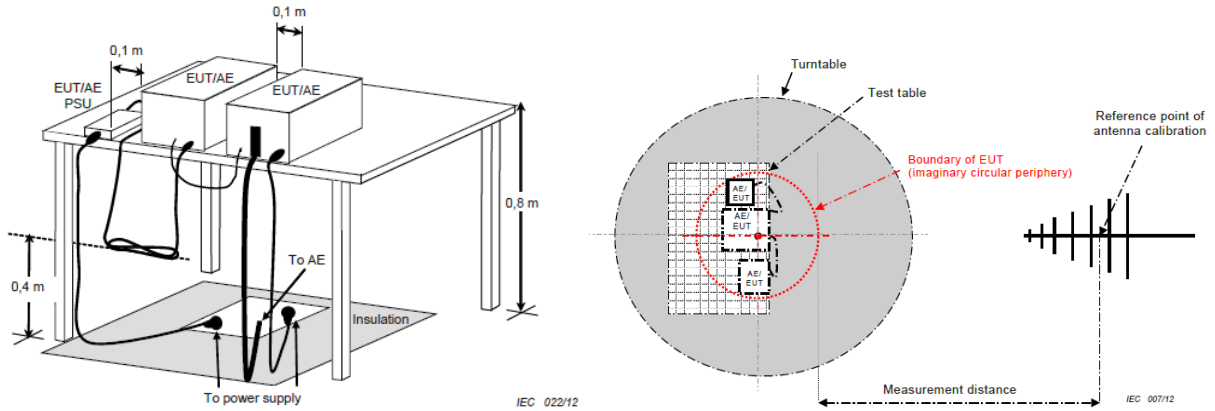
Frequency range MHz	Coupling device	Detector type / bandwidth	Class_B voltage limits dB(μV)	Class_B current limits dB(μA)
0.15-0.5	AAN	Quasi Peak / 9 kHz	84-74	n/a
0.5-30			74	
0.15-0.5	AAN	Average / 9 kHz	74-64	
0.5-30			64	
0.15-0.5	CVP and current probe	Quasi Peak / 9 kHz	84-74	40-30
0.5-30			74	30
0.15-0.5	CVP and current probe	Average / 9 kHz	74-64	30-20
0.5-30			64	20
0.15-0.5	Current Probe	Quasi Peak / 9 kHz	n/a	40-30
0.5-30				30
0.15-0.5	Current Probe	Average / 9 kHz		30-20
0.5-30				20

****Remarks: It is not necessary to be tested on this item.**

4. Radiated Disturbance Emissions

4.1 Test Setup and Procedure

4.1.1 Test Setup



The 3dB beam width of the horn antenna used for the test is as shown in the table below.

Frequency (GHz)	E-plane	H-plane	$\theta_{3\text{dB}}(\text{min})$	d= 3 m
				w (m)
1	88°	147°	88°	5.79
2	68°	119°	68°	4.04
3	73°	92°	73°	4.44
4	70°	89°	70°	4.20
5	55°	60°	55°	3.12
6	63°	62°	62°	3.60

4.1.2 Test Procedure

The radiated emissions test will then be repeated on the chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter chamber. Desktop EUT are set up on a FRP stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 6 GHz were analyzed in details by operating the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. All of the interface cables were manipulated according to EN 55032 requirements.

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.

4.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range: 30MHz--1000MHz
 Detector Function: Quasi-Peak Mode
 Resolution Bandwidth: 120kHz

Frequency Range: Above 1 GHz to 6 GHz
 Detector Function: Peak/Average Mode
 Resolution Bandwidth: 1MHz

4.2 Limit

Radiated emissions at frequencies up to 1 GHz for Class_A equipment:

Frequency range MHz	Measurement		Class_A limits dB(μ V/m)
	Distance m	Detector type / bandwidth	OATS/SAC
30-230	10	Quasi Peak / 120 kHz	40
230-1000			47
30-230	3		50
230-1000			57

Radiated emissions at frequencies above 1 GHz for Class_A equipment:

Frequency range MHz	Measurement		Class_A limits dB(μ V/m)
	Distance m	Detector type / bandwidth	FSOATS
1000-3000	3	Average / 1MHz	56
3000-6000			60
1000-3000		Peak / 1MHz	76
3000-6000			80

Radiated emissions at frequencies up to 1 GHz for Class_B equipment:

Frequency range MHz	Measurement		Class_B limits dB(μ V/m)
	Distance m	Detector type / bandwidth	OATS/SAC
30-230	10	Quasi Peak / 120 kHz	30
230-1000			37
30-230	3		40
230-1000			47

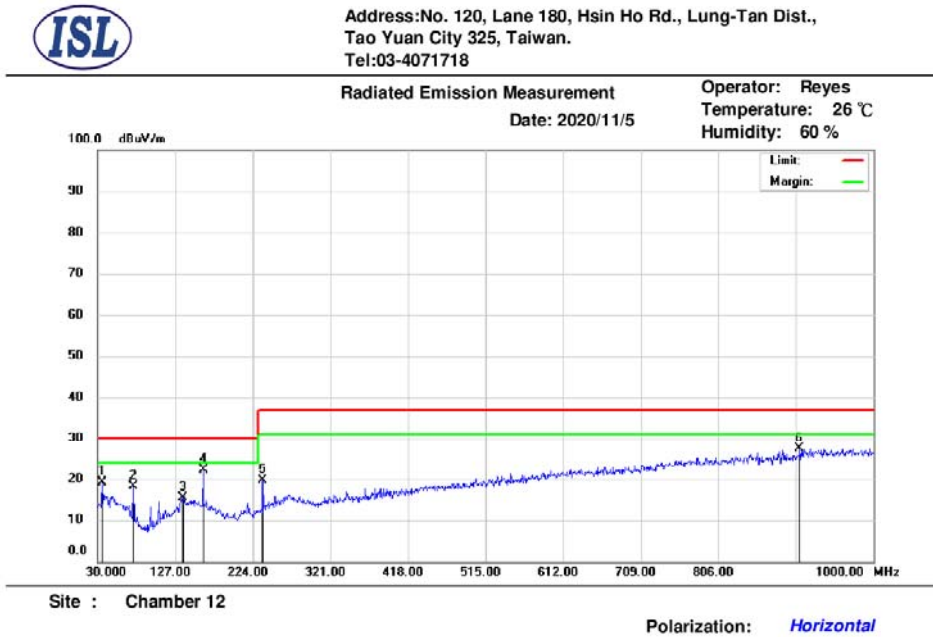
Radiated emissions at frequencies above 1 GHz for Class B equipment:

Frequency range MHz	Measurement		Class_B limits dB(μ V/m)
	Distance m	Detector type / bandwidth	FSOATS
1000-3000	3	Average / 1MHz	50
3000-6000			54
1000-3000		Peak / 1MHz	70
3000-6000			74

Radiated emissions from FM receivers:

Frequency range MHz	Measurement		Class_B limits dB(μ V/m)		
	Distance m	Detector type / bandwidth	Fundamental	Harmonics	
			OATS/SAC	OATS/SAC	
30-230	10	Quasi Peak / 120 kHz	50	42	
230-300				42	
300-1000				46	
30-230	3		Quasi Peak / 120 kHz	60	52
230-300					52
300-1000					56

4.3 Radiation Test Data: Configuration 1 - Radiated Emissions (Horizontal)



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor (dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	35.82	36.83	-17.58	19.25	30.00	-10.75	400	29	peak
2	74.62	37.53	-19.51	18.02	30.00	-11.98	300	182	peak
3	136.70	31.93	-16.67	15.26	30.00	-14.74	400	286	peak
4	161.92	37.74	-15.54	22.20	30.00	-7.80	300	184	peak
5	236.61	36.67	-16.99	19.68	37.00	-17.32	300	184	peak
6	907.85	30.42	-3.05	27.37	37.00	-9.63	300	69	peak

* Note:

Margin = Emission – Limit

Emission = Radiated Amplitude + Correct Factor

Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

Antenna Distance: 10 meters

Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.

- Radiated Emissions (Vertical)



Address: No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel: 03-4071718

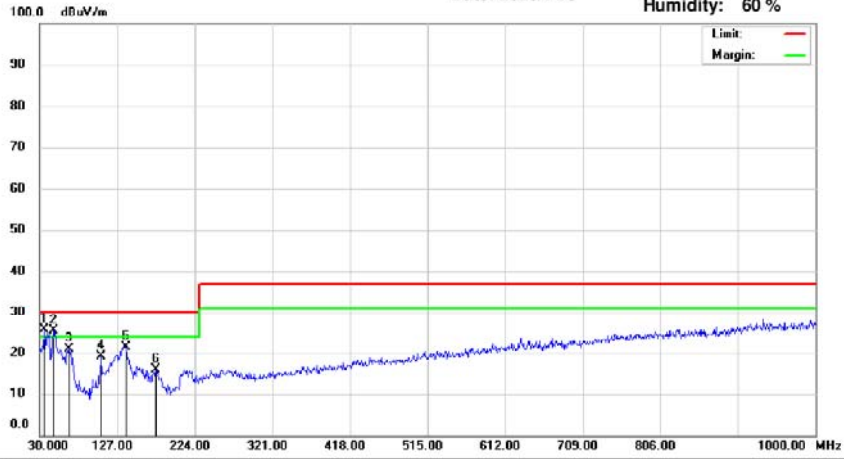
Radiated Emission Measurement

Date: 2020/11/5

Operator: Reyes

Temperature: 26 °C

Humidity: 60 %



Site : Chamber 12

Polarization: Vertical

Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor (dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	35.82	43.11	-17.58	25.53	30.00	-4.47	115	360	peak
2	47.46	42.03	-16.75	25.28	30.00	-4.72	100	285	peak
3	66.86	39.13	-18.22	20.91	30.00	-9.09	100	9	peak
4	106.63	39.31	-20.06	19.25	30.00	-10.75	200	341	peak
5	137.67	37.92	-16.56	21.36	30.00	-8.64	200	307	peak
6	175.50	32.04	-16.17	15.87	30.00	-14.13	100	197	peak

* Note:

Margin = Emission – Limit

Emission = Radiated Amplitude + Correct Factor

Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain

A margin of -8dB means that the emission is 8dB below the limit

Antenna Distance: 10 meters

Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement.

4.4 Test Setup Photo

Front View (30MHz~1GHz)



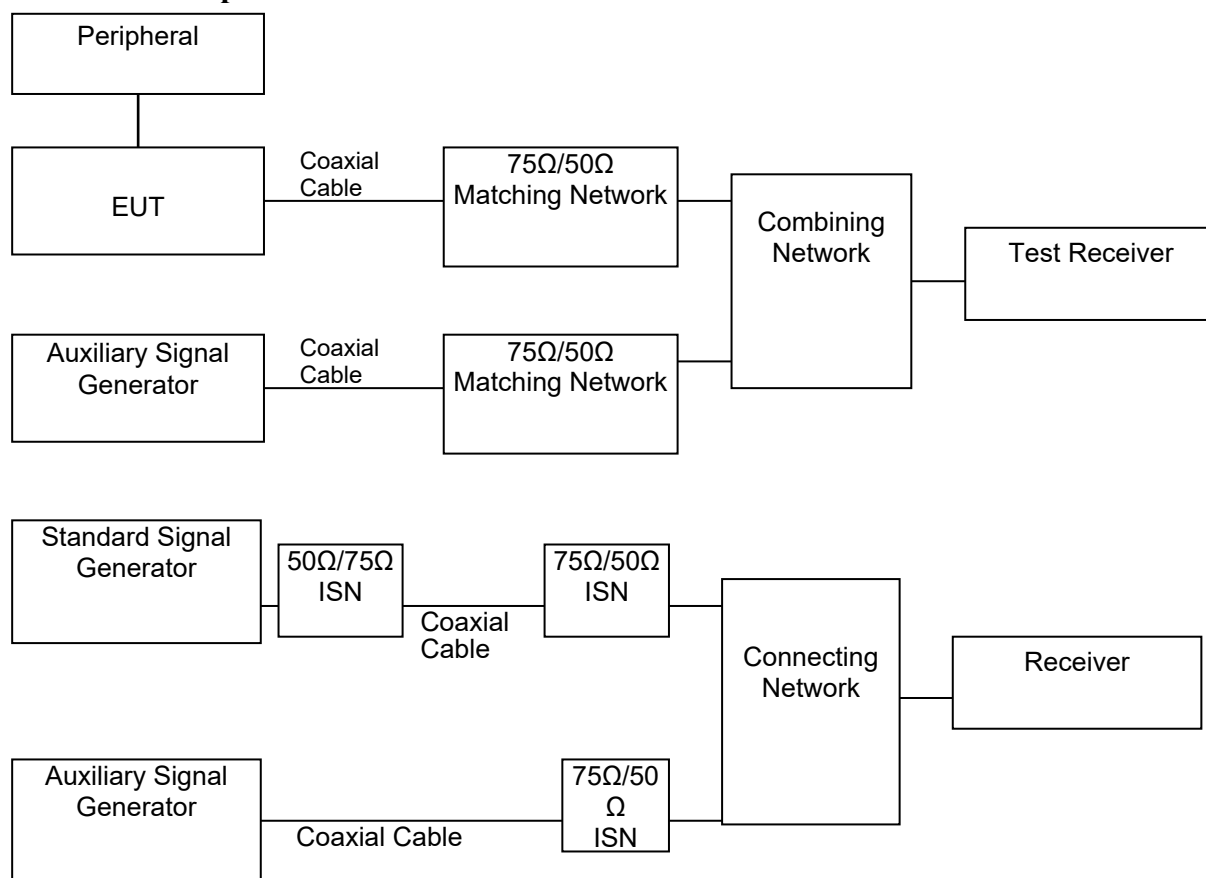
Back View (30MHz~1GHz)



5. Voltage Disturbance Emissions at Antenna Terminals

5.1 Test Setup and Procedure

5.1.1 Test Setup



5.1.2 Test Procedure

The output level of the auxiliary signal generator was set to 70dBuV at the EUT antenna terminal with 75 ohms impedance with an un-modulated carrier.

The highest emissions were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The power of EUT was switched off to make sure the emission was not contributed by the auxiliary signal generator. While doing so, the interconnecting cables and major parts of the system were moved around to maximize the emission.

5.1.3 EMI Receiver Configuration (for the frequencies tested)

Frequency Range:	30MHz-2150MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120kHz

5.1.4 Limit

Applicable to:

- 1. TV broadcast receiver tuner ports with an accessible connector.**
- 2. RF modulator output ports.**
- 3. FM broadcast receiver tuner ports with an accessible connector.**

Table clause	Frequency range MHz	Detector type/ bandwidth	Class B limits dB(μV) 75 Ω			Applicability
			Other	Local Oscillator Fundamental	Local Oscillator Harmonics	
A12.1	30 – 950	For frequencies ≤1 GHz	46	46	46	See a)
	950 – 2 150		46	54	54	
A12.2	950 – 2 150	Quasi Peak/ 120 kHz	46	54	54	See b)
A12.3	30 – 300		For frequencies ≥1 GHz	46	54	50
	300 – 1 000	52				
A12.4	30 – 300	Peak/ 1 MHz	46	66	59	See d)
	300 – 1 000				52	
A12.5	30 – 950	Peak/ 1 MHz	46	76	46	See e)
	950 – 2 150			n/a	54	

a) Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.

b) Tuner units (not the LNB) for satellite signal reception.

c) Frequency modulation audio receivers and PC tuner cards.

d) Frequency modulation car radios.

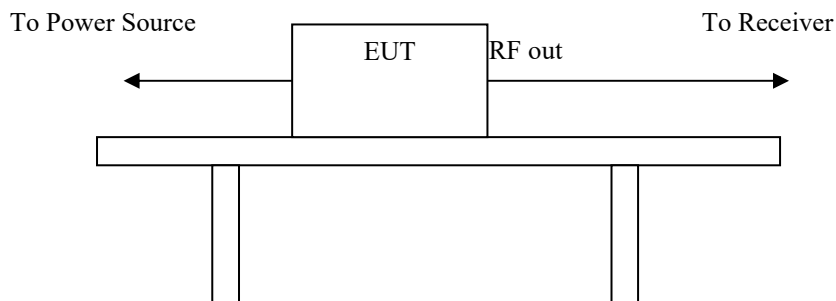
e) Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

****Remarks: It is not necessary to be tested on this item.**

6. Differential Voltage Emissions

6.1 Test Setup and Procedure

6.1.1 Test Setup



6.1.2 Test Procedure

The output level of the auxiliary signal generator was set to 70dBuV at the EUT antenna terminal with 75 ohms impedance with an un-modulated carrier.

The highest emissions were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The power of EUT was switched off to make sure the emission was not contributed by the auxiliary signal generator. While doing so, the interconnecting cables and major parts of the system were moved around to maximize the emission.

6.1.3 EMI Receiver Configuration (for the frequencies tested)

Frequency Range:	30MHz-2150MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120kHz

6.1.4 Limit

Applicable to:

- 1. TV broadcast receiver tuner ports with an accessible connector.**
- 2. RF modulator output ports.**
- 3. FM broadcast receiver tuner ports with an accessible connector.**

Table clause	Frequency range MHz	Detector type/ bandwidth	Class B limits dB(μV) 75 Ω			Applicability
			Other	Local Oscillator Fundamental	Local Oscillator Harmonics	
A12.1	30 – 950	For frequencies ≤1 GHz	46	46	46	See a)
	950 – 2 150		46	54	54	
A12.2	950 – 2 150	Quasi Peak/ 120 kHz	46	54	54	See b)
A12.3	30 – 300		46	54	50	See c)
	300 – 1 000		52			
A12.4	30 – 300	For frequencies ≥1 GHz	46	66	59	See d)
	300 – 1 000				52	
A12.5	30 – 950	Peak/ 1 MHz	46	76	46	See e)
	950 – 2 150			n/a	54	

a) Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.

b) Tuner units (not the LNB) for satellite signal reception.

c) Frequency modulation audio receivers and PC tuner cards.

d) Frequency modulation car radios.

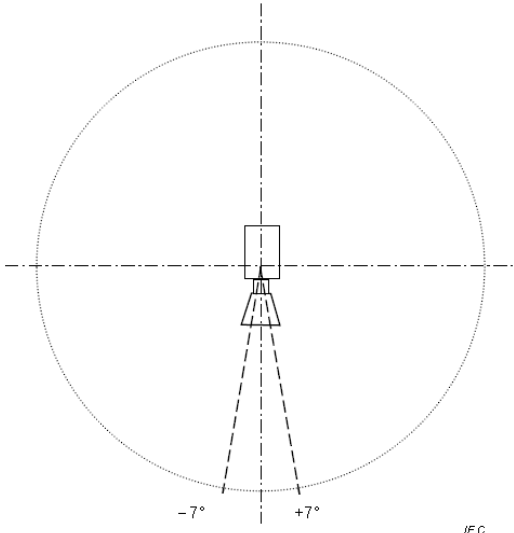
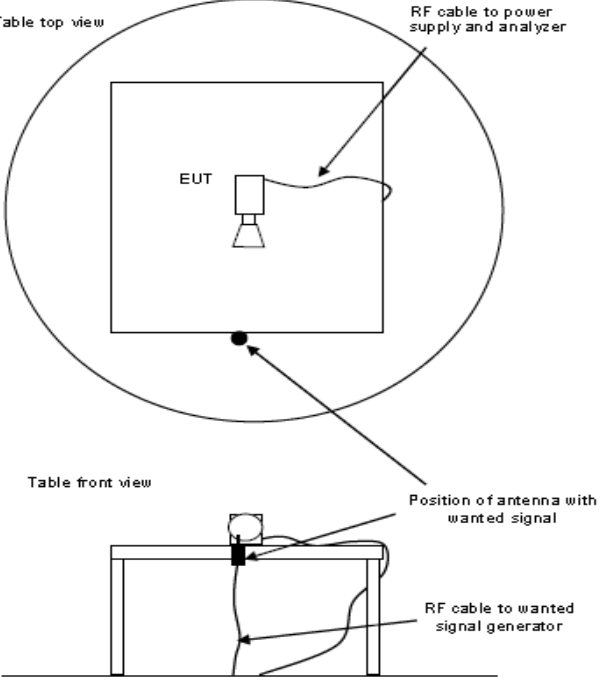
e) Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

****Remarks: It is not necessary to be tested on this item.**

7. Outdoor units of home satellite receiving systems

7.1 Test Setup and Procedure

7.1.1 Test Setup

	
<p>Description of $\pm 7^\circ$ of the main beam axis of the EUT</p>	<p>Measurement arrangements of transmit antenna for the wanted signal</p>

7.1.2 Test Procedure

The input signal shall be adjusted to get the maximum rated output level from the EUT. For the measurement in the frequency range from 30 MHz to 18 GHz the input signal shall be adjusted so that the output frequency is within this frequency range. For the measurement in the frequency range above 1 GHz, the frequency of the input signal shall be adjusted in such a way that the EUT is measured, as a minimum, at the lowest, middle and highest rated output frequency within the measured frequency range.

7.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range: 30MHz--1000MHz
 Detector Function: Quasi-Peak Mode
 Resolution Bandwidth: 120kHz

Frequency Range: Above 1000MHz
 Detector Function: Peak/Average Mode
 Resolution Bandwidth: 1MHz

7.1.4 Limit

Table Clause	Frequency Range MHz	Measurement			Class B Limits	Applicable to
		Facility (see Table A.1)	Distance m	Detector type / Bandwidth		
A7.1	30 to 1 000	SAC / OATS / FAR	See Table A.4	Quasi Peak / 120 kHz	See Table A.4	
A7.2	1 000 to 2 500	FSOATS	3	Average / 1 MHz	50 dB(μV/m)	LO leakage and spurious radiated emissions from the EUT, in the region outside ±7° of the main beam axis. See Figure H.1
	2 500 to 18 000				64 dB(μV/m)	
A7.3	1 000 to 18 000	FSOATS	3	Average / 1 MHz	37 dB(μV/m)	LO leakage from the EUT, in the region within ±7° of the main beam axis. See Figure H.1
A7.4	1 000 to 18 000	Conducted (Clause H.4)	n/a	Average / 1 MHz	30 dBpW	

For details of the EUT configuration, see Annex H.

For radiated emissions measurements at frequencies up to 1 GHz, the requirements defined in Table A.4 shall be satisfied.

Apply the appropriate limits across the entire frequency range.

Apply the limits defined in table Clause A7.1 and A7.2. Also apply the limits defined in either table Clause A7.3 or A7.4.

****Remarks: It is not necessary to be tested on this item.**

8. Electrostatic discharge (ESD) immunity

8.1 Test Specification and Setup

8.1.1 Test Specification

Port:	Enclosure
Basic Standard:	EN 61000-4-2/ IEC 61000-4-2 (details referred to Sec 1.2)
Test Level:	Air +/- 2 kV, +/- 4 kV, +/- 8 kV, +/- 15 kV Contact +/- 8 kV
Result:	Pass
Test Procedure	refer to ISL QA -T4-E-S7
Temperature:	22 °C
Humidity:	40%

Selected Test Point

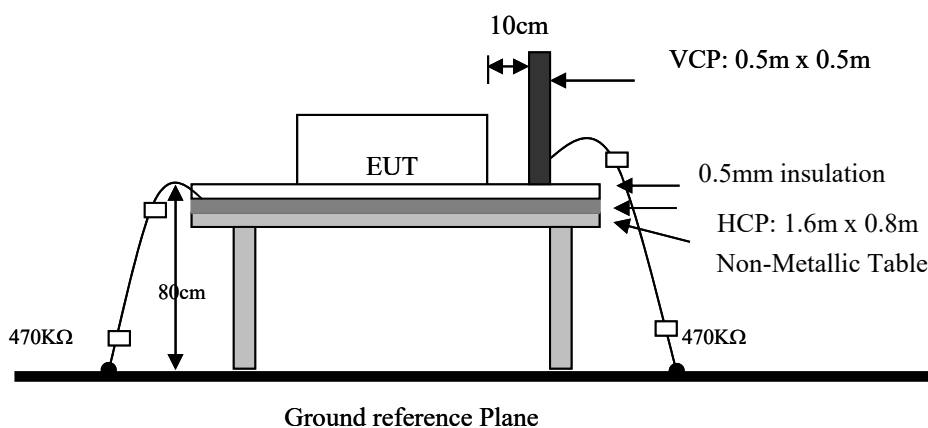
Air: discharges were applied to slots, aperture or insulating surfaces. 10 single air discharges were applied to each selected points.

Contact: 10 discharges minimum were to the selected contact points.

Indirect Contact Points: 10 discharges were applied to center of one edge of VCP and each EUT side of HCP with 10 cm away from EUT.

8.1.2 Test Setup

EUT is 1m from the wall and other metallic structure. When Battery test mode is needed, a cable with one 470K Ω resistor at two rare ends is connected from metallic part of EUT and screwed to HCP.



8.1.3 Test Result

Performance of EUT complies with the given specification

8.2 Test Point

Red arrow lines indicate the contact points, and blue arrow lines indicate the air points.
Figure 1 : Test Point Assignments Discharge:

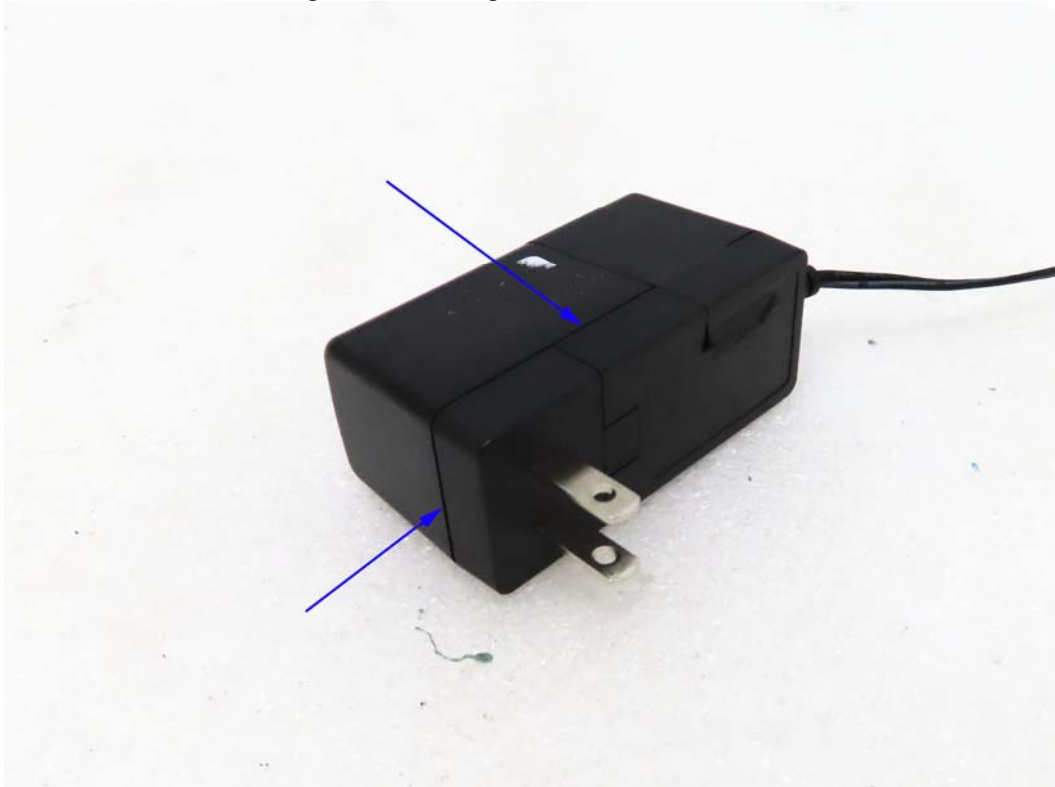
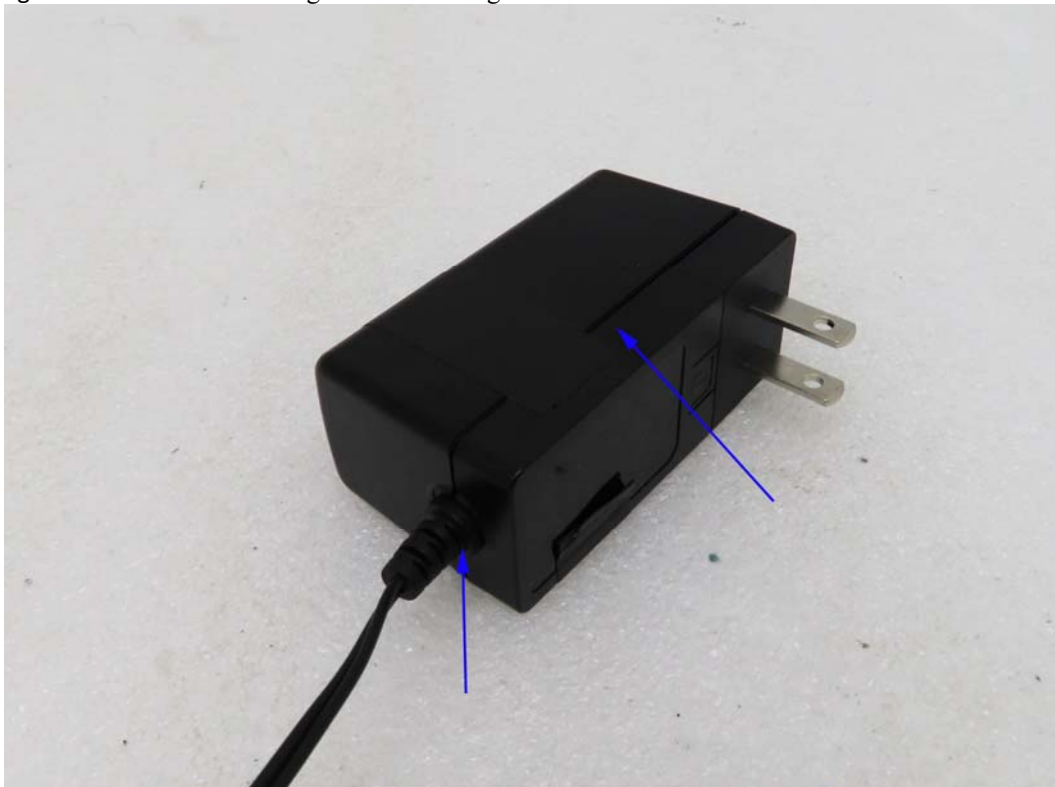


Figure 2 : Test Point Assignments Discharge:



8.3 Test Setup Photo



9. Radio-Frequency, Electromagnetic Field immunity

9.1 Test Specification and Setup

9.1.1 Test Specification

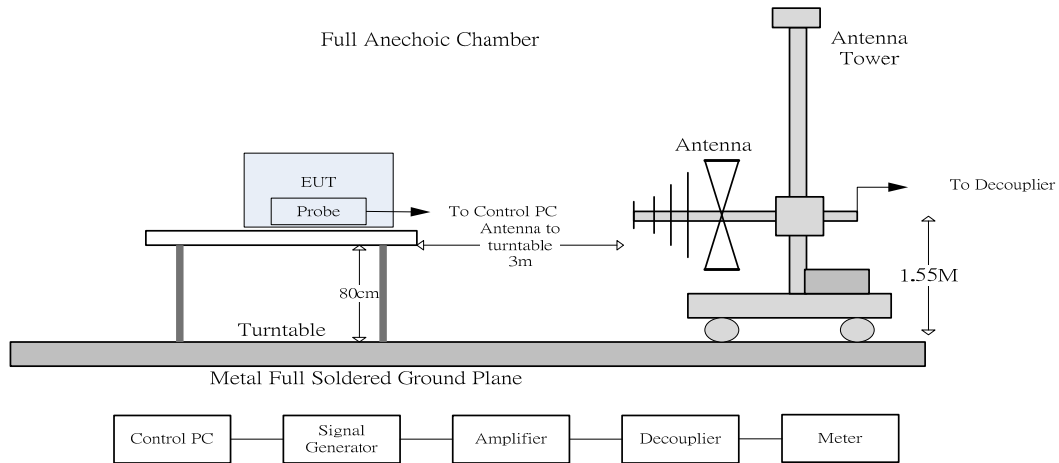
Port:	Enclosure
Basic Standard:	EN 61000-4-3/ IEC 61000-4-3 (details referred to Sec 1.2)
Test Level:	<input type="checkbox"/> 3 V/m (Professional healthcare facility environment) <input checked="" type="checkbox"/> 10 V/m (Home healthcare environment)
Modulation:	AM 1kHz 80%
Frequency range:	80 MHz~2.7 GHz
Frequency Step:	1% of last step frequency
Dwell time:	2s
Polarization:	Vertical and Horizontal
EUT Azimuth Angle	<input checked="" type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input checked="" type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°
Result:	Pass
Test Procedure	refer to ISL QA -T4-E-S8
Temperature:	22 °C
Humidity:	60%

Test Procedure

IMMUNITY to proximity fields from RF wireless communications equipment			
Basic Standard:	EN 61000-4-3/ IEC 61000-4-3(details referred to Sec 1.2)		
Test frequency (MHz)	Modulation (W)	Distance (m)	IMMUNITYTEST LEVEL (V/m)
385	Pulse modulation 18 Hz	0.3	27
450	FM 1 kHz sine		28
710	Pulse Modulation 217 Hz		9
745			
780			
810	Pulse Modulation 18 Hz		28
870			
930			
1720	Pulse Modulation 217 Hz		28
1845			
1970			
2450			
5240			
5500			
5785	9		
Polarization:	Vertical and Horizontal		
EUT Azimuth Angle	0° 90° 180° 270°		
Result:	Pass		
Test Procedure	refer to ISL QA -T4-E-S8		
Temperature:	22 °C		
Humidity:	60%		

9.1.2 Test Setup

The field sensor is placed at one calibration grid point to check the intensity of the established fields on both polarizations. EUT is adjusted to have each side of EUT face coincident with the calibration plane. A CCD camera and speakers are used to monitor the condition of EUT for the performance judgment.



9.1.3 Test Result

Performance of EUT complies with the given specification

9.2 Test Setup Photo



10. Electrical Fast transients/burst immunity

10.1 Test Specification and Setup

10.1.1 Test Specification

Port:	AC mains
Basic Standard:	EN 61000-4-4/ IEC 61000-4-4 (details referred to Sec 1.2)
Test Level:	AC/DC Power Port: +/- 2 kV
Rise Time:	5ns
Hold Time:	50ns
Burst Period:	300ms
Repetition Frequency:	100 kHz
Result:	Pass
Test Procedure	refer to ISL QA -T4-E-S9
Temperature:	24 °C
Humidity:	56%

Test Procedure

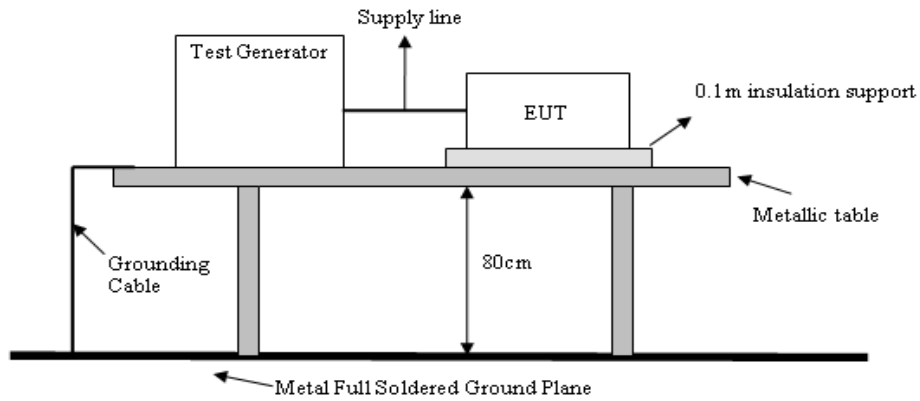
The EUT was setup on a nonconductive table 0.1 m above a reference ground plane.

Test Points	Polarity	Result	Comment
Line	+	N	60 sec
	-	N	60 sec
Neutral	+	N	60 sec
	-	N	60 sec
Line to Neutral	+	N	60 sec
	-	N	60 sec

Note: 'N' means normal, the EUT function is correct during the test.

10.1.2 Test Setup

EUT is at least 50cm from the conductive structure.



10.1.3 Test Result

Performance of EUT complies with the given specification

10.2 Test Setup Photo



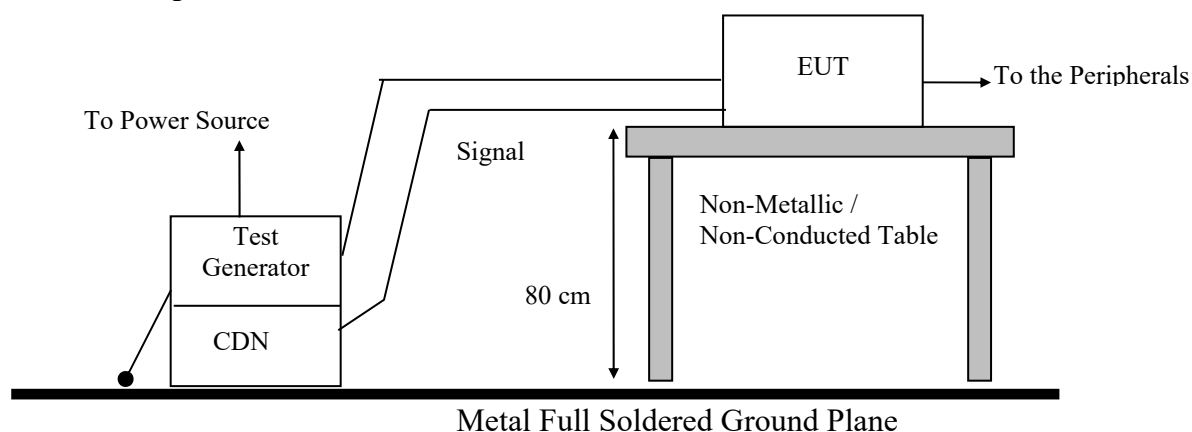
11. Surge Immunity

11.1 Test Specification and Setup

11.1.1 Test Specification

Port:	AC mains
Basic Standard:	EN 61000-4-5/ IEC 61000-4-5(details referred to Sec 1.2)
Test Level:	AC/DC PORT: Line to Line: +/- 0.5 kV, +/- 1 kV
Rise Time:	1.2us
Hold Time:	50us
Repetition Rate:	30 seconds
Angle:	<input checked="" type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input checked="" type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°
Result:	Pass
Test Procedure:	refer to ISL QA -T4-E-S10
Temperature:	25°C
Humidity:	56%

11.1.2 Test Setup



11.1.3 Test Result

Performance of EUT complies with the given specification

11.2 Test Setup Photo



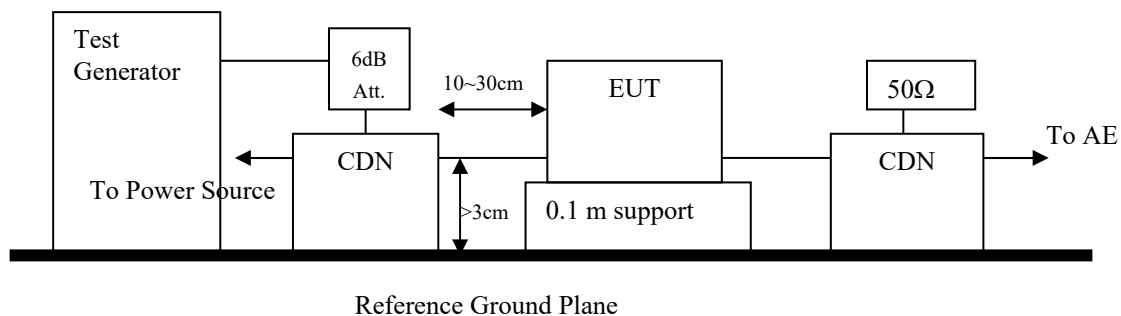
12. Immunity to Conductive Disturbance

12.1 Test Specification and Setup

12.1.1 Test Specification

Port:	AC mains; Twisted Pair LAN Port
Basic Standard:	EN 61000-4-6/ IEC 61000-4-6 (details referred to Sec 1.2)
Test Level:	<input checked="" type="checkbox"/> 3 Vrms <input type="checkbox"/> 6 Vrms for ISM bands (Professional healthcare facility environment) <input checked="" type="checkbox"/> 6 Vrms for ISM and amateur radio bands (Home healthcare environment)
Modulation:	AM 1kHz 80%
Frequency range:	0.15 MHz - 80MHz
Frequency Step:	1% of last Frequency
Dwell time:	2s
Result:	Pass
CDN Type:	CDN M2+M3
Test Procedure	refer to ISL QA -T4-E-S11
Temperature:	22°C
Humidity:	60%

12.1.2 Test Setup



12.1.3 Test Result

Performance of EUT complies with the given specification

12.2 Test Setup Photo



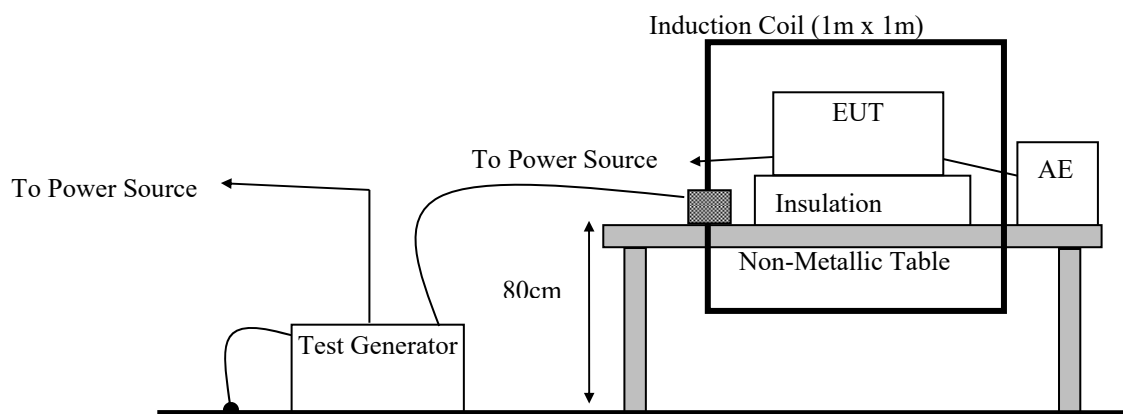
13. Power Frequency Magnetic Field immunity

13.1 Test Specification and Setup

13.1.1 Test Specification

Port:	Enclosure
Basic Standard:	EN 61000-4-8/ IEC 61000-4-8 (details referred to Sec 1.2)
Test Level:	30A/m, 50 Hz or 60 Hz
Polarization:	X, Y, Z
Result:	Pass
Test Procedure	refer to ISL QA -T4-E-S12
Temperature:	22°C
Humidity:	60%

13.1.2 Test Setup



13.1.3 Test Result

Performance of EUT complies with the given specification

13.2 Test Setup Photo



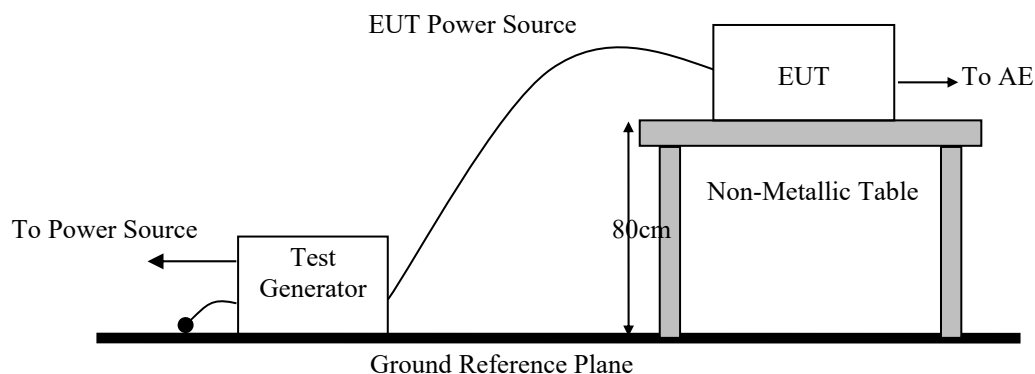
14. Voltage Dips, Short Interruption and Voltage Variation immunity

14.1 Test Specification and Setup

14.1.1 Test Specification

Port:	AC mains
Basic Standard:	EN 61000-4-11/ IEC 61000-4-11 (details referred to Sec 1.2)
Test Level:	0% in 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°
Test Level:	0 % in 1 cycle 70 % in 25/30 cycles Single phase: at 0°
Test Level:	0 % in 250/300 cycle at 0°
Result:	Pass
Test intervals:	3 times with 10s each
Test Procedure	refer to ISL QA -T4-E-S13
Temperature:	22°C
Humidity:	60%

14.1.2 Test Setup



14.1.3 Test Result

Performance of EUT complies with the given specification

14.2 Test Setup Photo



15. Harmonics

15.1 Test Specification and Setup

15.1.1 Test Specification

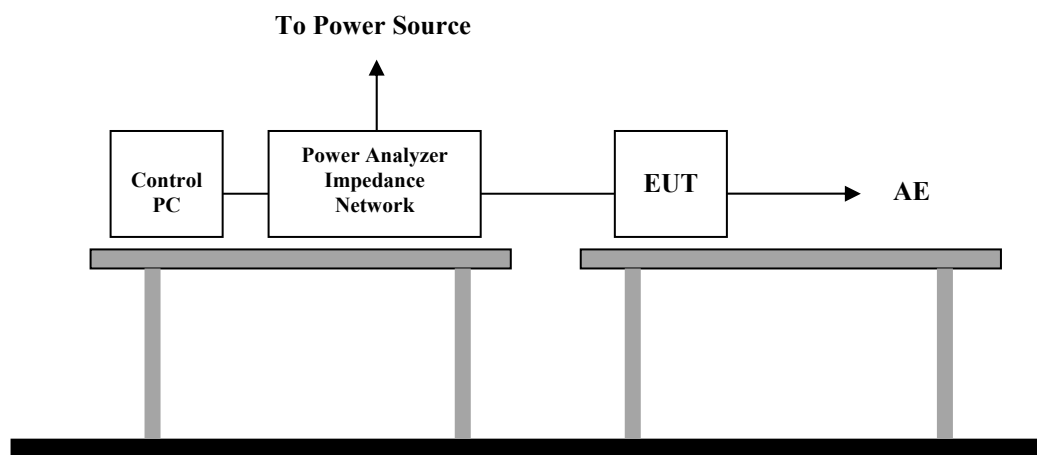
Port:	AC mains
Active Input Power:	<75W
Basic Standard:	EN 61000-3-2/IEC 61000-3-2 (details referred to Sec 1.2)
Test Duration:	2.5min
Class:	A
Test Procedure	refer to ISL QA -T4-E-S14
Temperature:	25°C
Humidity:	55%

Test Procedure

The EUT is supplied in series with shunts or current transformers from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the EUT. The EUT is configured to its rated current with additional resistive load when the testing is performed.

Equipment having more than one rated voltage shall be tested at the rated voltage producing the highest harmonics as compared with the limits.

15.1.2 Test Setup



15.1.3 Limit

Limits of Class A Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current A	Harmonics Order n	Maximum Permissible harmonic current A
Odd harmonics		Even harmonics	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	$8 \leq n \leq 40$	$0.23 * 8/n$
11	0.33		
13	0.21		
$15 \leq n \leq 39$	$0.15 * 15/n$		

15.1.4 Test Result

Active input power under 75W, no limit apply, declare compliance

16. Voltage Fluctuations

16.1 Test Specification and Setup

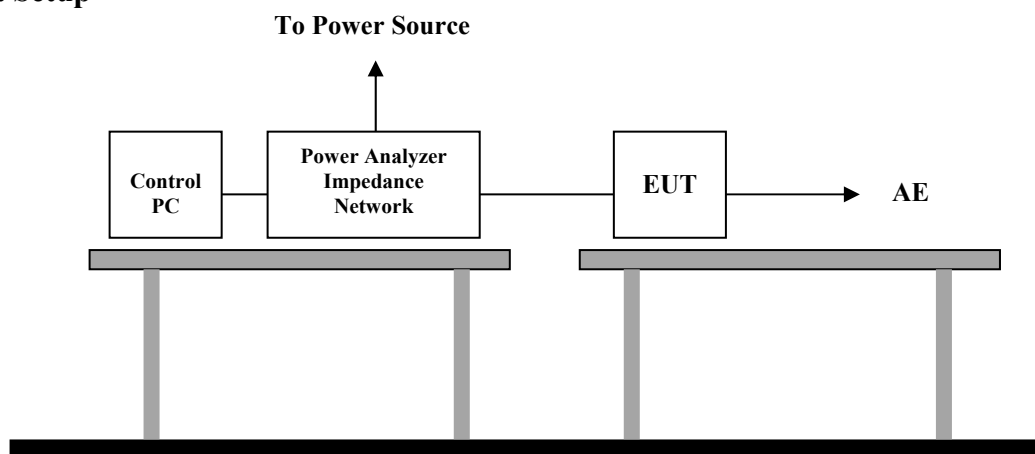
16.1.1 Test Specification

Port:	AC mains
Basic Standard:	EN 61000-3-3/IEC 61000-3-3 (details referred to Sec 1.2)
Test Procedure	refer to ISL QA -T4-E-S14
Observation period:	For Pst 10min
	For Plt 2 hours
Temperature:	25°C
Humidity:	55%

Test Procedure

The EUT is supplied in series with reference impedance from a power source with the voltage and frequency as the nominal supply voltage and frequency of the EUT.

16.1.2 Test Setup



16.1.3 Test Result

Performance of EUT complies with the given specification.

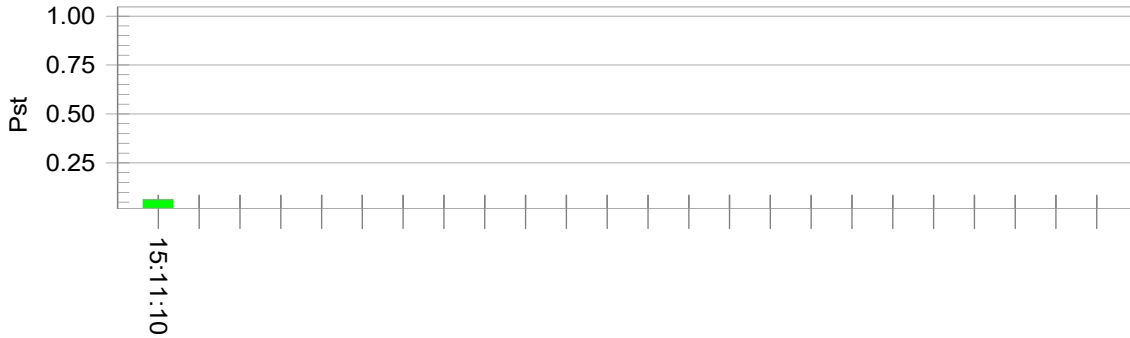
16.2 Test Data

Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

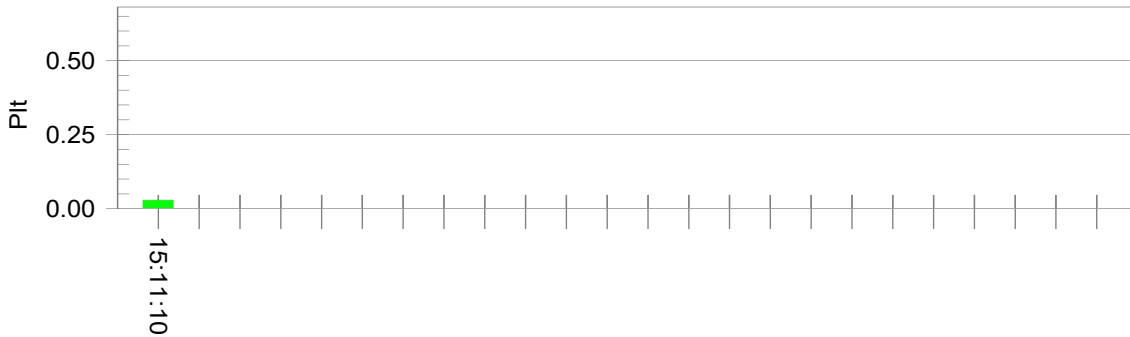
Test category: All parameters (European limits) Test Margin: 100
 Test duration (min): 10 Data file name: CTSMXL_F-000846.cts_data

Test Result: Pass Status: Test Completed

Pst_i and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.67		
T-max (mS):	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	-0.05	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

16.3 Test Setup Photo



17. Appendix

17.1 Appendix A: Test Equipment

17.1.1 Test Equipment List

Location Con03	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 03	EMI Receiver 15	ROHDE & SCHWARZ	ESCI	101166	07/29/2020	07/29/2021
Conduction 03	LISN 19	R&S	ENV216	101425	11/05/2019	11/05/2020
Conduction 03	LISN 22	R&S	ENV216	101478	08/10/2020	08/10/2021
Conduction 03	Conduction 04-3 Cable	WOKEN	CFD 300-NL	conduction 04-3	09/07/2020	09/07/2021

Location Chmb12	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation (Chamber12)	BILOG Antenna 18	Schwarzbeck	Schwarzbeck VULB 9168+EMCI-N -6-05	646	02/18/2020	02/18/2021
Radiation (Chamber12)	Preamplifier 26	EMCI	EMC9135	980297	02/21/2020	02/21/2021
Radiation (Chamber12)	Coaxial Cable Chmb 12-10M-01	PEWC	CFD400-NL	Chmb 12-10M-01	10/14/2020	10/14/2021
Radiation (Chamber12)	EMI Receiver 19	ROHDE & SCHWARZ	ESR 3	102460	08/04/2020	08/04/2021

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
EN61K-4-2	ESD Gun 9	EM TEST	Dito	V1018106503	04/28/2020	04/28/2021
EN61K-4-3	Broadband Log-Periodic Antenna	AR	AT1080	310698	N/A	N/A
EN61K-4-3	Horn Antenna RF-01	AR	ATS700M11 G	0335864	N/A	N/A
EN61K-4-3	Amplifier 80Mz~1GHz 250W	AR	250W1000A	312494	N/A	N/A
EN61K-4-3	Amplifier 800MHz~4.2GHz 50W	AR	50S1G4M1	312762	N/A	N/A
EN61K-4-3	Amplifier 4.0~8.0GHz 35W	AR	35S4G8AM1	0335752	N/A	N/A
EN61K-4-3	Broadband Coupler 80M~1GHz	Amplifier Research	DC6180A	0341805	N/A	N/A
EN61K-4-3	Coaxial Cable	INSULATED	NPS-4806-23 60-NP3	108599.003.01 .03	N/A	N/A
EN61K-4-3	Broadband Coupler 0.8G~4.26GHz	AR	DC7144A	0335226	N/A	N/A
EN61K-4-3	Broadband Coupler 4G~8GHz	AR	DC7350A	0335817	N/A	N/A
EN61K-4-3	Signal Generator 07	ROHDE& SCHWARZ	SMB100A	107780	12/04/2019	12/04/2020
EN61K-4-4	EFT and SURGE Test System	EM TEST	UCS-500 M6B	V0728102674	03/20/2020	03/20/2021
EN61K-4-5	CDN-UTP8 03	EMC-PARTNER	CDN-UTP8 ESD3	1546	04/01/2020	04/01/2021
EN61K-4-5	SURGE-TESTER 01	EMC Partner	MIG0603IN3	778	06/24/2020	06/24/2021
EN61K-4-6	CDN M2+M3 04	TESEQ	CDN M016	43257	09/03/2020	09/03/2021
EN61K-4-6	Coaxial Cable 4-6 02-1			4-6 02-1	N/A	N/A
EN61K-4-6	Conducted Immunity Test System 03	Frankonia	CIT-10-75	126B1151	01/15/2020	01/15/2021
EN61K-4-8	Magnetic Field Immunity Loop	FCC	F-1000-4-8-L-1M	01037	05/29/2020	05/29/2021
EN61K-4-8	Magnetic Field Test Generator	FCC	F-1000-4-8-G-125A	01038	05/29/2020	05/29/2021
EN61K-4-11	Voltage Dip and UP Simulator 01	NoiseKen	VDS-2002	VDS0640162	09/17/2020	09/17/2021
EN61K-3-2/3, EN61K-3-11-1 2	(Harmonic/Flicker) MX Series CTSH Compliance Test System	California Instruments	MX60T04GH 10400	72793	08/04/2020	08/04/2021

PS: N/A => The equipment does not need calibration.

****Software for Controlling Spectrum/Receiver and Calculating Test Data**

Test Item	Filename	Version
EN61000-3-2	California Instruments	CTSMXL V2.19.0
EN61000-3-3	California Instruments	CTSMXL V2.19.0
EN61000-4-2	N/A	2.0
EN61000-4-3	i2	4.130102k
EN61000-4-4	EMC TEST	4.10
EN61000-4-5	EMC Partner	1.69
EN61000-4-6	FRANKONIA CD-LAB	V5.221
EN61000-4-8	N/A	
EN61000-4-11	NOISE KEN	2.0

Site	Filename	Version	Issue Date
Conduction/Radiation	EZ EMC	ISL-03A2	3/6/2013

17.2 Appendix B: Uncertainty of Measurement

The laboratory measurement uncertainty accordance with refers to CISPR 16-4-2. If U_{lab} is less than or equal to U_{cispr} in Table 1, then the test report may either state the value of U_{lab} or state that U_{lab} is less than U_{cispr} .

The coverage factor $k = 2$ yields approximately a 95 % level of confidence.

<Conduction 03>

AMN: $\pm 2.90\text{dB}$

<Chamber 12 (10M)>

Horizontal

30MHz~200MHz: $\pm 4.14\text{dB}$

200MHz~1000MHz: $\pm 4.12\text{dB}$

Vertical

30MHz~200MHz: $\pm 4.30\text{dB}$

200MHz~1000MHz: $\pm 4.45\text{dB}$

<Immunity 02>

Test item	Uncertainty	Test item	Uncertainty
EN 61000-4-2 (ESD)		EN 61000-4-6 (CS)	
Rise time tr	$\leq 9.81\%$	CDN	$\pm 1.74\text{dB}$
Peak current Ip	$\leq 5.54\%$	EM Clamp	$\pm 3.36\text{dB}$
current at 30 ns	$\leq 5.55\%$	EN 61000-4-8 (Magnetic)	$\pm 6.53\%$
current at 60 ns	$\leq 5.55\%$	EN 61000-4-11 (Dips)	$\pm 2.41\%$
EN 61000-4-3 (RS)	$\pm 1.89\text{dB}$	EN 61000-3-2 (Harmonics)	$\pm 1.29\%$
EN 61000-4-4 (EFT)		EN 61000-3-3 (Fluctuations and Flicker)	$\pm 6.8\%$
voltage rise time (tr)	$\pm 5.1\%$		
peak voltage value (VP)	$\pm 6.39\%$		
voltage pulse width (tw)	$\pm 5.0\%$		
EN 61000-4-5 (Surge)			
open-circuit voltage front time	$\pm 13.5\%$		
open-circuit voltage peak value	$\pm 6.6\%$		
open-circuit voltage duration (Td)	$53.33\mu\text{s}$		

17.3 Appendix C: Photographs of EUT

Please refer to the File of **ISL-20LE888P**