ETSI EN 301 489-17 V2.2.1: 2012
ETSI EN 301 489-1 V1.9.2: 2011
TEST REPORT

for

IRISNotes™ Air 3

Model: XN690, IRISN690

Brand: IRIS

Test Report Number:
C161220Z02-RE

Issued for:

Image Recognition Integrated Systems S.A(I.R.I.S. S.A.)
Rue du Bosquet 10, 1348 Louvain-La-Neuve, Belgium

Issued by:

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.
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Issued Date: December 22, 2016

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CNAS L4818

ACCREDITED
TESTING CERT #2861.01

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	November 3, 2016	Initial Issue	ALL	Nancy Fu
01	December 22, 2016	Update	ALL	Amzula Chen

Rev 01: C161220Z02-RE

1. This report updated applicant, applicant address, manufacturer, manufacturer address, product name and added one model “IRISN690”and one brand “IRIS”. After reassessment, this change didn’t affect the test result.
2. The other information, please refer to the report No.: C161020Z03-RE and this report.

TABLE OF CONTENTS

1 TEST CERTIFICATION

Product	IRISNotes™ Air 3
Model	XN690, IRISN690
Brand	IRIS
Tested	October 20~ November 3, 2016
Applicant	**Image Recognition Integrated Systems S.A(I.R.I.S. S.A.)** Rue du Bosquet 10, 1348 Louvain-La-Neuve, Belgium
Manufacturer	**Image Recognition Integrated Systems S.A(I.R.I.S. S.A.)** Rue du Bosquet 10, 1348 Louvain-La-Neuve, Belgium

APPLICABLE STANDARDS		
STANDARD	**TEST RESULT**	
ETSI EN 301 489-17 V2.2.1: 2012	No non-compliance noted	
Applicable Standard	**Class/Limit/Criterion**	**Test Result**
ETSI EN 301 489-1 V1.9.2: 2011		
EN 55022: 2010+AC: 2011	Class B	No non-compliance noted
EN 61000-3-2: 2014	Class A / D	Not applicable, since the EUT received DC power from the notebook
EN 61000-3-3: 2013	Limit	Not applicable, since the EUT received DC power from the notebook
EN 61000-4-2: 2009	Criterion B	No non-compliance noted
EN 61000-4-3: 2006+A2: 2010	Criterion A	No non-compliance noted
EN 61000-4-4: 2012	Criterion B	No non-compliance noted
EN 61000-4-5: 2014	Criterion B	Not applicable, since the EUT received DC power from the notebook
EN 61000-4-6: 2014	Criterion A	Not applicable, since the EUT received DC power from the notebook
EN 61000-4-11: 2004	Criterion B/C/C	Not applicable, since the EUT received DC power from the notebook

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services (Shenzhen) Inc., for compliance with the requirements set forth in ETSI EN 301 489-17 **V2.2.1: 2012**. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Services (Shenzhen) Inc.

Reviewed by:

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Services (Shenzhen) Inc.

2 EUT DESCRIPTION

Product	IRISNotes™ Air 3
Model	XN690, IRISN690
Brand	IRIS
Model Discrepancy	The models are identical to each other except their model name.
Identify Number	C161220Z02-RE
Received Date	October 20, 2016
EUT Power Rating	DC5V supplied by notebook or DC 3.7V supplied by the battery
Battery Manufacturer /Model No.	AE291558P8H O/P:DC3.7V, 200mAh
Frequency Range	2402 ~ 2480 MHz
Transmit Power (mean EIRP)	-4.04dBm
Modulation Technique	GFSK for 1Mbps
Number of Channels	40 Channels
Antenna Specification	PCB Antenna with -1dBi gain(Max)
Temperature Range	0°C ~ +40°C
Hardware Version	XN690-V1.3
Software Version	XN690_V1.00

Remark: for more details, please refer to the User's manual of the EUT.

3 TEST METHODOLOGY

All tests were performed in accordance with the procedure documented in ETSI EN 301 489-1 V1.9.2: 2011 as referenced in ETSI EN 301 489-17 V2.2.1: 2012.

3.1. UNIT OF MEASUREMENT

Measurements of radiated interference are reported in terms of dB(μV/m) at a specified distance. The indicated readings on the Spectrum analyzers were converted to dB (μV/m) by use of appropriate conversion factors. Measurements of conducted interference are reported in terms of the Antenna Factor and Cable Factors and subtracting the Amplifier Gain from the measured reading. The following is a sample calculation: dB(μV).

The field strength is calculated by adding

FS = RA + AF + CF – AG

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

AG = Amplifier Gain

Assume a receiver reading of 52.5 dBμV is obtained. The Antenna Factor of 7.4dB/m and a Cable Factor of 1.1dB are added. The Amplifier Gain of 29 dB is subtracted, giving field strength of 32 dBμV/m. The 32-dBμV/m values was mathematically converted to its corresponding level in μV/m.

FS = 52.5 + 7.4 + 1.1 – 29 = 32 dBμV/m

Note: Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

3.2. ANTENNA

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 10 meters from the leading edge of the turntable.

3.3. DECISION OF FINAL TEST MODE

The following test mode was scanned during the preliminary test, and found to produce the highest emission level.

Pre-Test Mode		
Emission	Conducted Emission (Main Port)	**Mode 1:** Charge
	Radiated Emission (Below 1GHz)	**Mode 1:** Normal **Mode 2:** Charge
	Radiated Emission (Above 1GHz)	**Mode 1:** Normal **Mode 2:** Charge
	Harmonics Current (EN 61000-3-2)	**N/A**
	Voltage Fluctuation and Flicker (EN 61000-3-3)	**N/A**
Immunity	Immunity (ESD) (EN 61000-4-2)	**Mode 1:** Normal
	Immunity (RS) (EN 61000-4-3)	**Mode 1:** Normal
	Immunity (EFT) (EN 61000-4-4)	**Mode 1:** Normal
	Immunity (Surge) (EN 61000-4-5)	**N/A**
	Immunity (CS) (EN 61000-4-6)	**N/A**
	Immunity (DIP) (EN 61000-4-11)	**N/A**

After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Conducted Emission (Main Port)	**Mode 1**
	Radiated Emission (Below 1GHz)	**Mode 1**
	Radiated Emission (Above 1GHz)	**Mode 1**
	Harmonics Current (EN 61000-3-2)	**N/A**
	Voltage Fluctuation and Flicker (EN 61000-3-3)	**N/A**
Immunity	Immunity (ESD) (EN 61000-4-2)	**Mode 1**
	Immunity (RS) (EN 61000-4-3)	**Mode 1**
	Immunity (EFT) (EN 61000-4-4)	**Mode 1**
	Immunity (Surge) (EN 61000-4-5)	**N/A**
	Immunity (CS) (EN 61000-4-6)	**N/A**
	Immunity (DIP) (EN 61000-4-11)	**N/A**

Then, the EUT configuration and cable configuration of the above highest emission mode was chosen for all final test items.

4 SETUP OF EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF SUPPORT UNITS

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

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	Phone	N/A	N/A	DOC	SAMSUNG	N/A	N/A
2	Notebook	PP24L	R349CA00	DOC	DELL	N/A	Unshielded 1.50m (AC Cable) Unshielded 1.00m (DC Cable)
3	Digitla Pen	RDXN511	N/A	N/A	N/A	N/A	N/A

Note: Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2. CONFIGURATION OF SYSTEM UNDER TEST

Setup Diagram

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

4.3. TEST SETUP

The equipment under test was configured and operated in a manner to communicate with the receiver continuously. EUT tends to maximize its emission characteristics in a typical application for conducted and radiated emission measurement. The RF module plus ancillary (stand alone unit) was evaluated as per table 1 of clause 7.1 of ETSI EN 301 489-1 V1.9.2: 2011. The transmitter was active during the conducted and radiated emission measurements

Software Used During the Test	
Operating System	N/A
File Name	N/A
Program Sequence	1. Install the EUT and other external peripheral devices as usual. 2. Make sure the EUT work normally during the test.

Remark: During the test, no modification is made to the EUT to comply with Class B limit levels.

5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ **No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	FCC
Japan	VCCI (C-4815, R-4320, T-2317, G-10624)
Canada	INDUSTRY CANADA

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccssz.com

5.3. 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:

Measurement		Frequency	Uncertainty
Conducted Emissions		9kHz~30MHz	+/-3.2878dB
Radiated Emission (10m)	Test Site: 10m Chamber (Vertical)	30 MHz ~200 MHz	+/-3.8915dB
		200 MHz ~1000 MHz	+/-3.8908dB
	Test Site: 10m Chamber (Horizontal)	30 MHz ~200 MHz	+/-3.8992dB
		200 MHz ~1000 MHz	+/-3.9027dB
	Test Site: 966(2)	30 MHz ~200 MHz	+/-3.8928dB
		200 MHz ~1000 MHz	+/-3.8753dB
		1GHz ~8GHz	+/-5.3112dB
		8GHz~18GHz	+/-5.3493dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.

6 EMISSION TEST

6.1. CONDUCTED EMISSION MEASUREMENT

6.1.1. LIMITS

Please refer to ETSI EN 301 489-1 Clause 8.3.3 and EN 55022: 2010+AC: 2011 Clause 5, Table 2, Class B

FREQUENCY (MHz)	Class A (dBµV)		Class B (dBµV)	
	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

NOTE:
(1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.1.2. TEST INSTRUMENTS

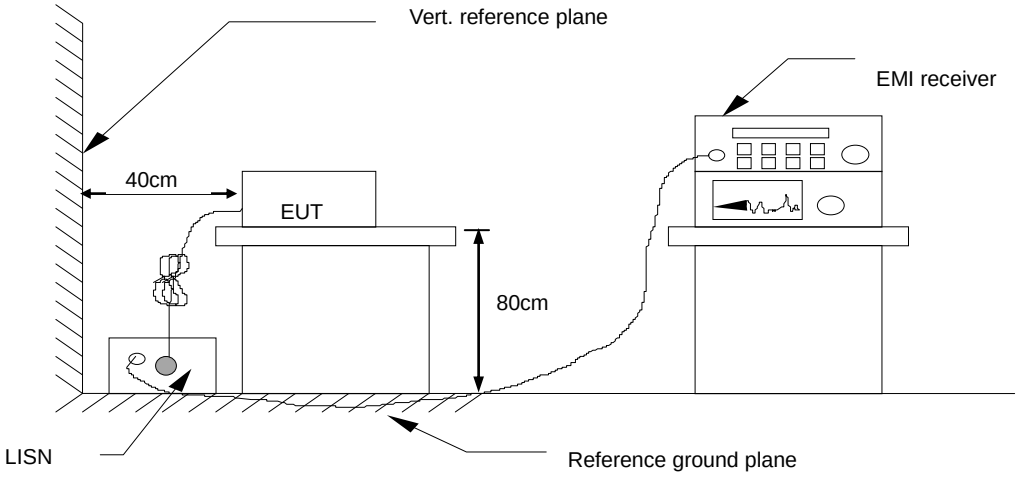
Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2016	02/20/2017
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	02/21/2016	02/20/2017
LISN	EMCO	3825/2	8901-1459	02/21/2016	02/20/2017
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

6.1.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-026)

Please refer to ETSI EN 301 489-1 Clause 8.3.3 and EN 55022: 2010+AC: 2011 Clause 5 for the measurement methods.

6.1.4. TEST SETUP



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

6.1.5. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBµV)	Average Reading (dBµV)	Correction Factor (dB)	QuasiPeak Result (dBµV)	Average Result (dBµV)	QuasiPeak Limit (dBµV)	Average Limit (dBµV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBµV) – Limit (dBµV)

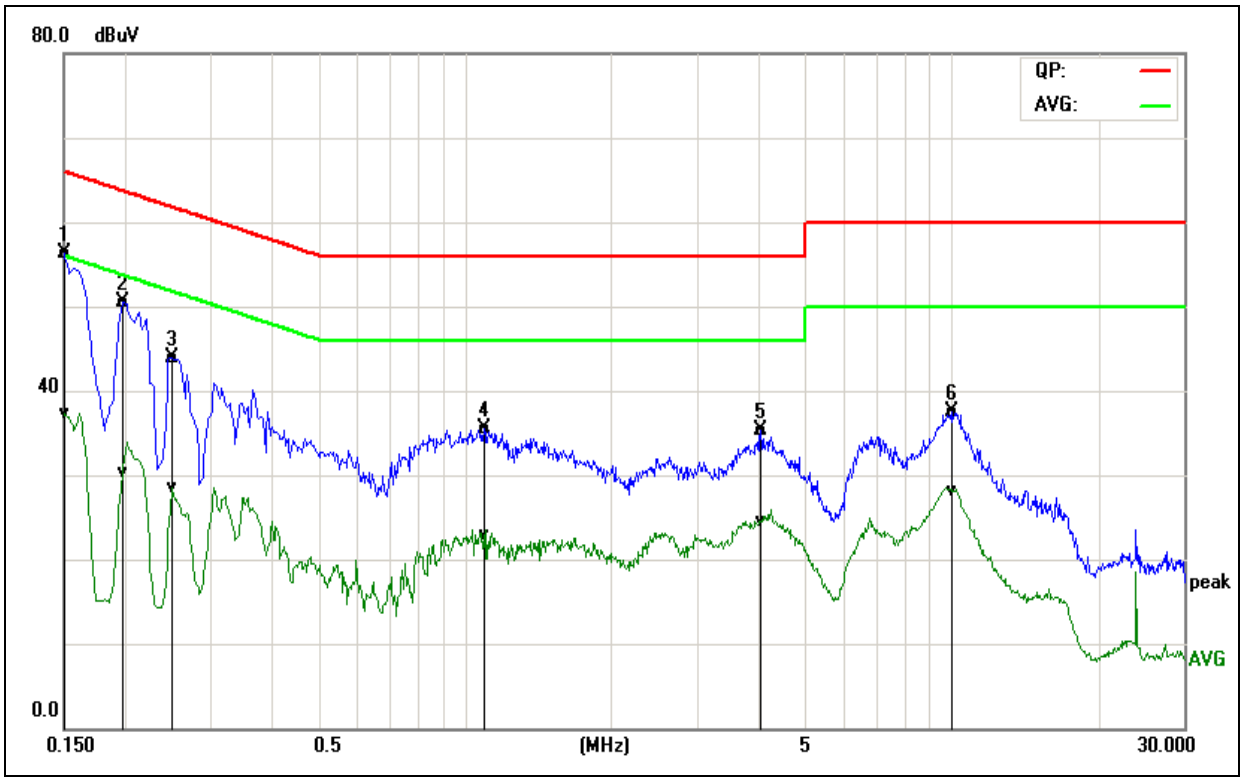
Calculation Formula

Margin (dB) = Result (dBµV) – Limit (dBµV)

6.1.6. TEST RESULTS

Model No.	XN690	RBW,VBW	9 kHz
Environmental Conditions	22°C, 45% RH	Test Mode	Mode 1
Tested by	Saber Huang	Line	L1
Test Date	2016/10/28		

(The chart below shows the highest readings taken from the final data.)

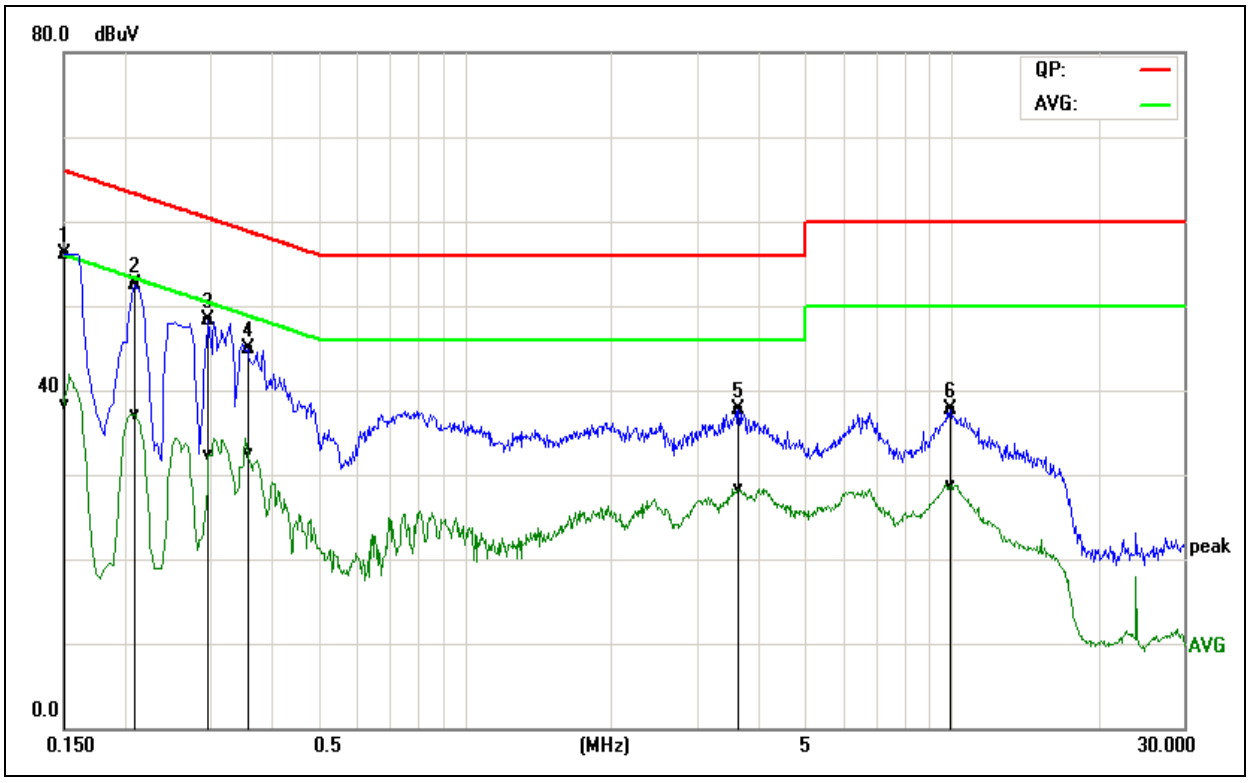


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1500	46.39	27.33	9.98	56.37	37.31	65.99	56.00	-9.62	-18.69	Pass
0.1980	40.57	20.37	9.99	50.56	30.36	63.69	53.69	-13.13	-23.33	Pass
0.2500	33.93	18.49	9.99	43.92	28.48	61.75	51.76	-17.83	-23.28	Pass
1.0940	25.41	12.90	10.01	35.42	22.91	56.00	46.00	-20.58	-23.09	Pass
4.0580	25.19	14.25	10.20	35.39	24.45	56.00	46.00	-20.61	-21.55	Pass
9.9700	27.28	17.77	10.27	37.55	28.04	60.00	50.00	-22.45	-21.96	Pass

REMARKS: *L1 = Line One (Live Line)*

Model No.	XN690	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Saber Huang	**Line**	L2
Test Date	2016/10/28		

(The chart below shows the highest readings taken from the final data.)



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1500	46.21	28.23	9.98	56.19	38.21	65.99	56.00	-9.80	-17.79	Pass
0.2100	42.42	27.13	9.99	52.41	37.12	63.20	53.21	-10.79	-16.09	Pass
0.2980	38.22	22.25	9.99	48.21	32.24	60.30	50.30	-12.09	-18.06	Pass
0.3580	34.93	22.59	9.98	44.91	32.57	58.77	48.77	-13.86	-16.20	Pass
3.6420	27.50	18.09	10.17	37.67	28.26	56.00	46.00	-18.33	-17.74	Pass
9.9220	27.45	18.36	10.27	37.72	28.63	60.00	50.00	-22.28	-21.37	Pass

REMARKS: *L2 = Line Two (Neutral Line)*

6.2. RADIATED EMISSION MEASUREMENT

6.2.1. LIMITS

Please refer to ETSI EN 301 489-1 Clause 8.2.3, Table 3 and EN 55022: 2010+AC: 2011 Clause 6, Table 6 Class B

FREQUENCY (MHz)	dBμV/m (At 10m)
	Class B
30 ~ 230	30
230 ~ 1000	37

NOTE:

(1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBμV/m) = 20 log Emission level (μV/m).

Table 8&9: Limits for radiated disturbance above 1 GHz at a measurement distance of 3 m

Frequency (GHZ)	Class A (dBμV/m)		Class B (dBμV/m)	
	Average	Peak	Average	Peak
1~3	56	76	50	70
3~6	60	80	54	74

Notes:

(1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBμV/m) = 20 log Emission level (μV/m).
(3) 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.
(4) 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
(5) 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.
(6) 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.

6.2.2. TEST INSTRUMENTS

Below 1GHz

Radiated Emission Test Site (10m Chamber)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100088	02/21/2016	02/20/2017
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100145	02/21/2016	02/20/2017
Amplifier	MITEQ	AM-1604-3000	1093583	02/28/2016	02/27/2017
Amplifier	Mini-Circuits	ZKL-1R5	6511600437	03/18/2016	03/17/2017
Bi-log Antenna	TESEQ	CBL6143A	26039	02/21/2016	02/20/2017
Bi-log Antenna	TESEQ	CBL6143A	32399	02/21/2016	02/20/2017
System-Controller	CCS	CC-C-F	N/A	N.C.R	N.C.R
System-Controller	CCS	CC-C-F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	EZ-EMC/ CCS-2Ant			

Above 1GHz

Radiated Emission Test Site 966(2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2016	02/20/2017
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2016	03/17/2017
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2016	02/20/2017
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2016	02/20/2017
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2016	02/27/2017
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2016	02/27/2017
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Signal Generator	Anritsu	MG3694A	#050125	02/28/2016	02/27/2017
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

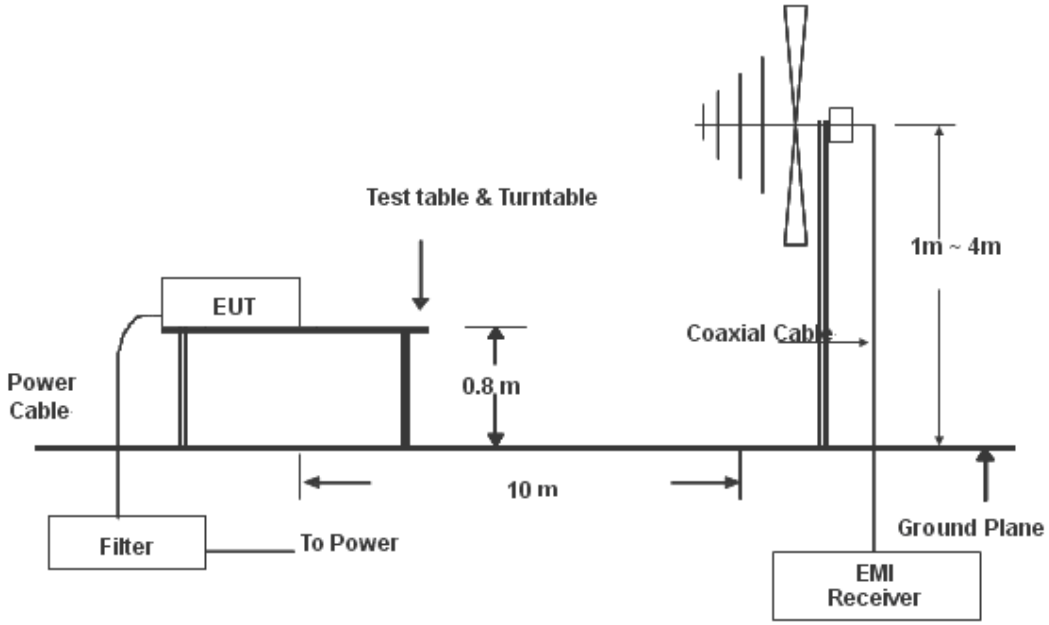
2. N.C.R = No Calibration Request.

6.2.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-023)

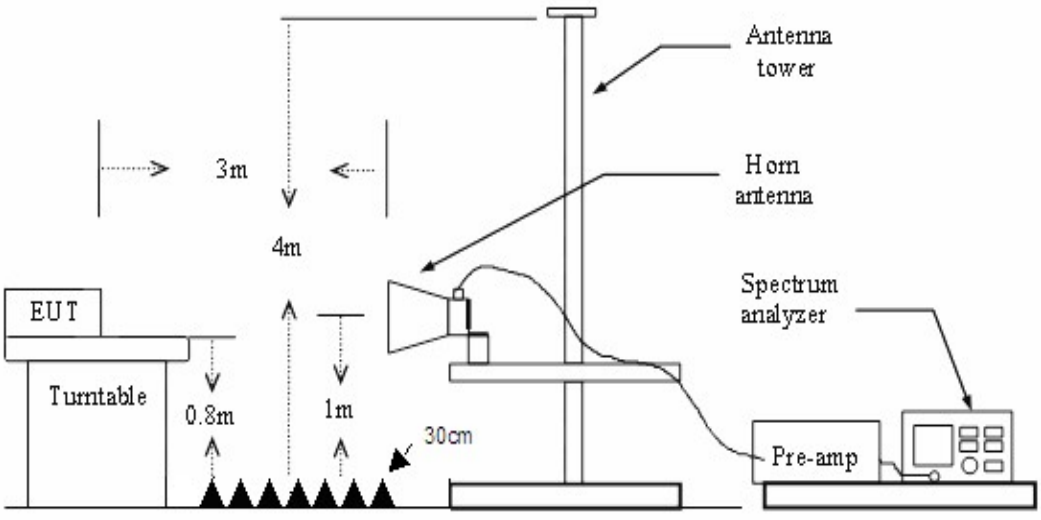
Please refer to ETSI EN 301 489-1 Clause 8.2.3 and EN 55022: 2010+AC: 2011 Clause 6 for the measurement methods.

6.2.4. TEST SETUP

Below 1 GHz



Above 1 GHz



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

6.2.5. DATA SAMPLE

Below 1GHz

Frequency (MHz)	Reading (dBµV)	Correct Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
XXX.XXXX	37.47	-16.41	21.06	30.00	-8.94	QP

Frequency (MHz) = Emission frequency in MHz
Reading (dBµV) = Uncorrected Analyzer / Receiver reading
Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBµV/m) = Reading (dBµV) + Corr. Factor (dB/m)
Limit (dBµV/m) = Limit stated in standard
Margin (dB) = Result (dBµV/m) – Limit (dBµV/m)
Peak = Peak Reading
Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
XXXX.XXXX	55.54	4.56	60.10	70.00	-9.90	Peak
XXXX.XXXX	49.78	4.56	38.36	50.00	-11.64	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBµV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBµV/m) = Reading (dBµV) + Corr. Factor (dB/m)
Limit (dBµV/m) = Limit stated in standard
Margin (dB) = Result (dBµV/m) – Limit (dBµV/m)
Peak = Peak Reading
AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBµV/m) – Limits (dBµV/m)
Result (dBµV/m) = Reading (dBµV) + Correction Factor (dB/m)

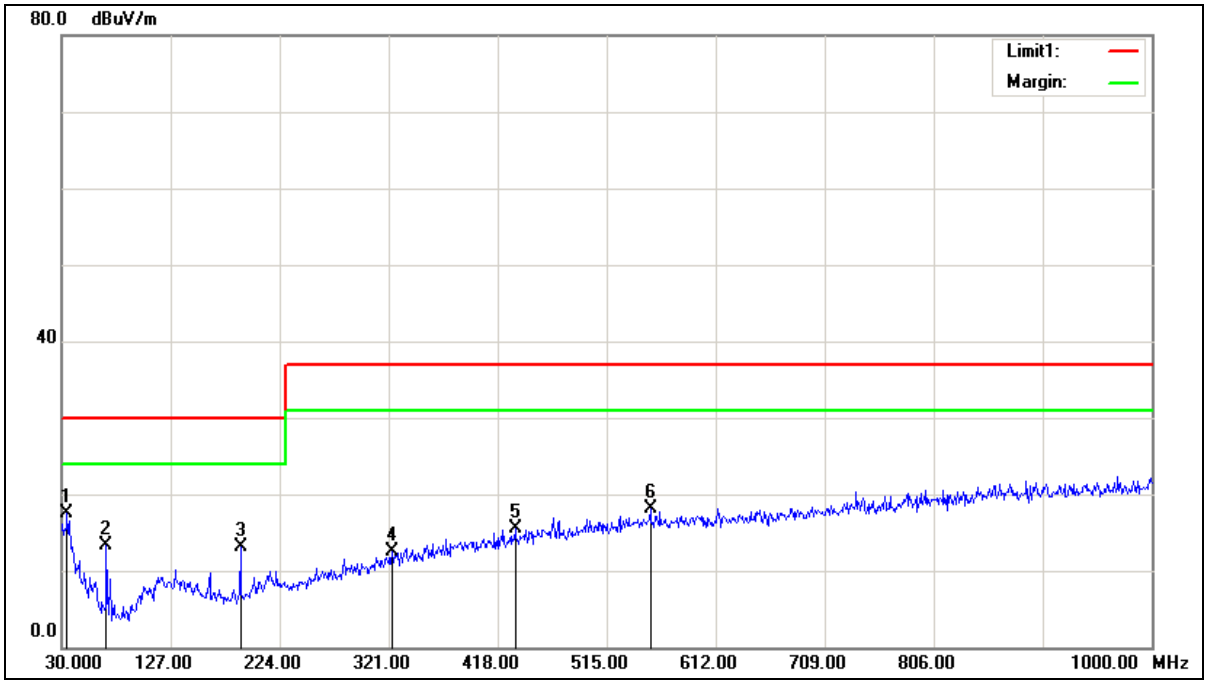
6.2.6. TEST RESULTS

No non-compliance noted

Test Data

Below 1GHz

Location: 10m chamber	**Tested by:** Saber Huang
Test Mode: Mode 1	**Test Distance:** 10m
Detector Function: Quasi-peak	**Test Results:** Pass
Test Date: October 31, 2016	

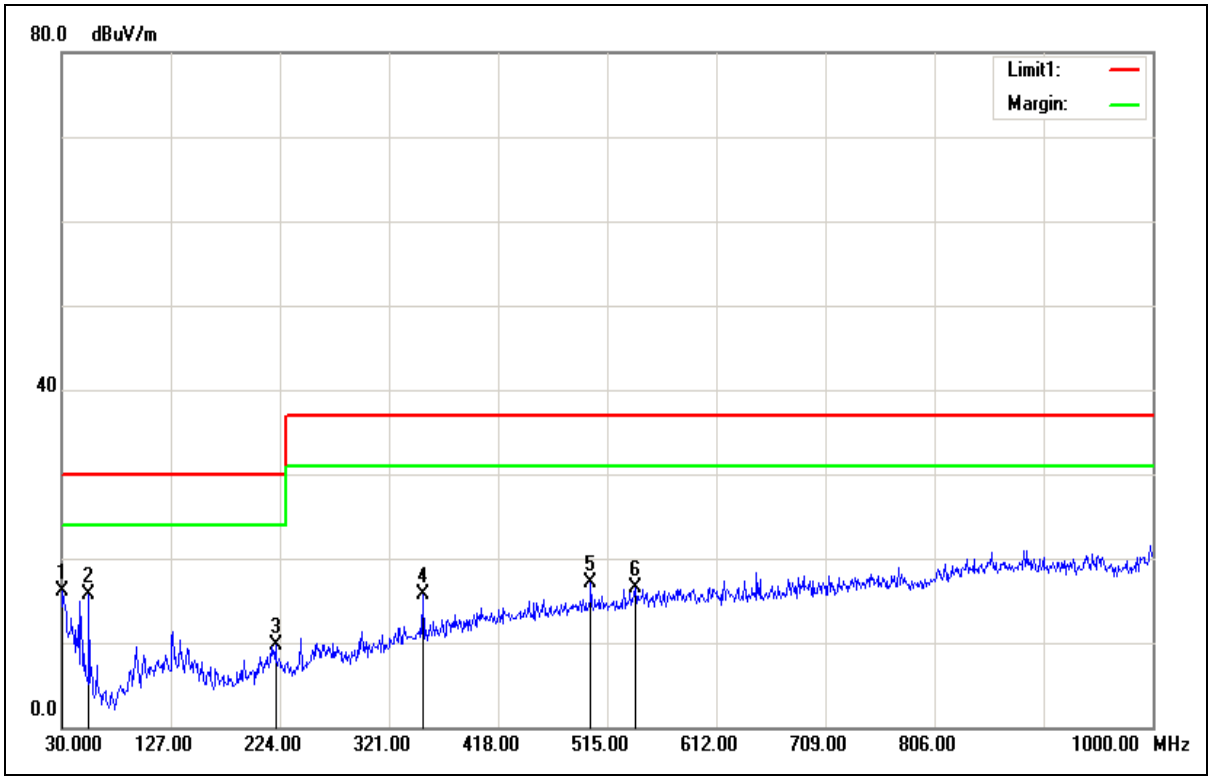


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
34.8500	37.92	-20.50	17.42	30.00	-12.58	V	QP
69.7700	44.71	-31.47	13.24	30.00	-16.76	V	QP
189.0800	40.99	-27.83	13.16	30.00	-16.84	V	QP
323.9100	36.54	-24.00	12.54	37.00	-24.46	V	QP
433.5200	36.43	-21.00	15.43	37.00	-21.57	V	QP
553.8000	36.56	-18.46	18.10	37.00	-18.90	V	QP

Remarks:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
4. Measurements above show only up to 6 maximum emissions noted.
5. The IF bandwidth of SPA 30MHz to 1GHz was 100kHz.

Location: 10m chamber	**Tested by:** Saber Huang
Test Mode: Mode 1	**Test Distance:** 10m
Detector Function: Quasi-peak	**Test Results:** Pass
Test Date: October 31, 2016	

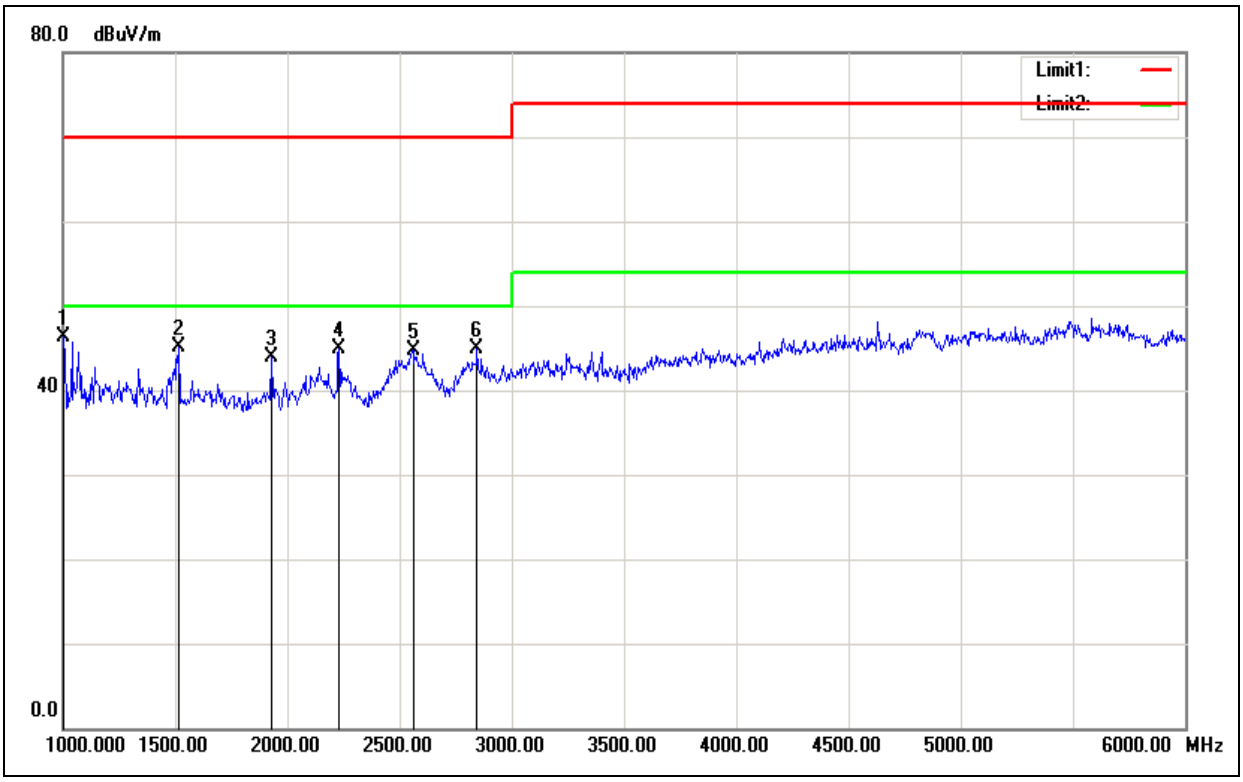


Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
30.9700	34.74	-18.72	16.02	30.00	-13.98	H	QP
54.2500	44.23	-28.62	15.61	30.00	-14.39	H	QP
220.1200	36.09	-26.42	9.67	30.00	-20.33	H	QP
351.0700	39.40	-23.75	15.65	37.00	-21.35	H	QP
500.4500	37.21	-20.20	17.01	37.00	-19.99	H	QP
540.2200	35.80	-19.26	16.54	37.00	-20.46	H	QP

Remarks:
1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
4. Measurements above show only up to 6 maximum emissions noted.
5. The IF bandwidth of SPA 30MHz to 1GHz was 100kHz.

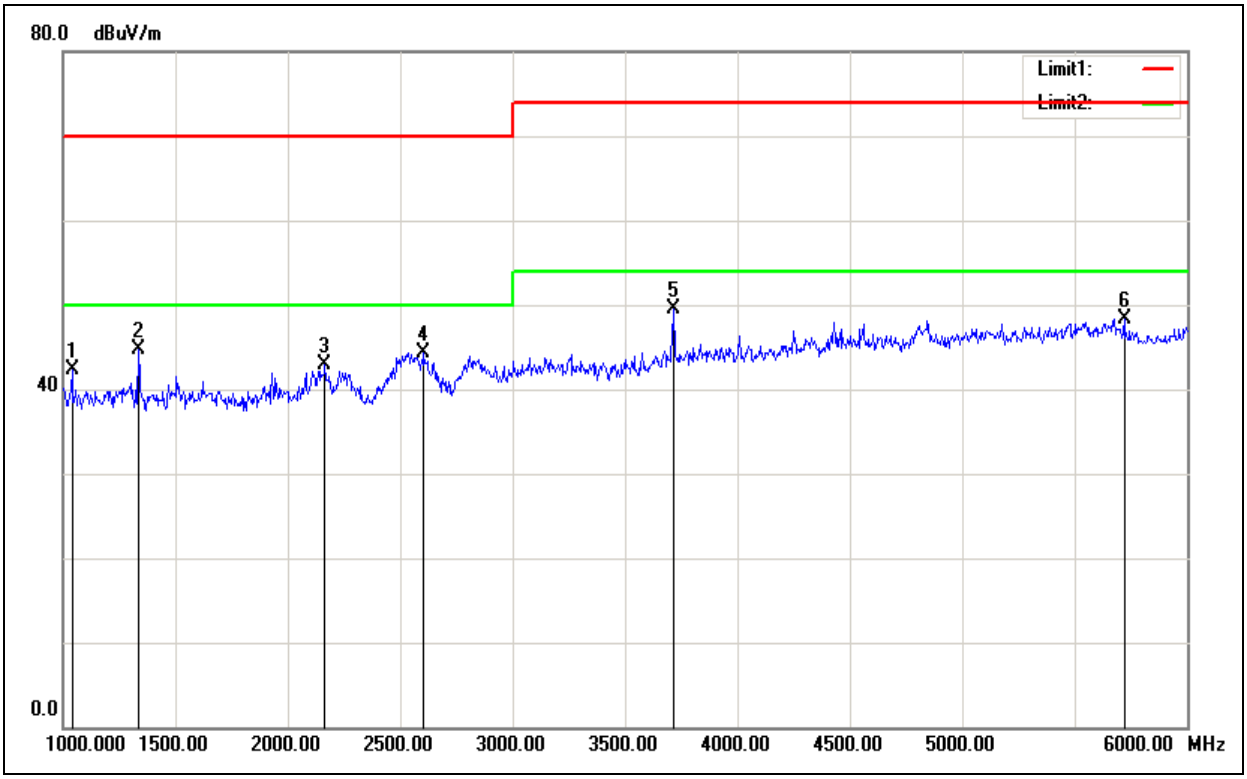
Above 1GHz

Location: 966 chamber	**Tested by:** Saber Huang
Test Mode: Mode 1	**Test Distance:** 3m
Detector Function: Peak	**Test Results:** Pass
Test Date: October 29, 2016	



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1005.000	54.77	-8.53	46.24	70.00	-23.76	V	Peak
1515.000	52.02	-6.85	45.17	70.00	-24.83	V	Peak
1930.000	49.41	-5.44	43.97	70.00	-26.03	V	Peak
2230.000	48.64	-3.74	44.90	70.00	-25.10	V	Peak
2560.000	46.90	-2.15	44.75	70.00	-25.25	V	Peak
2845.000	46.48	-1.64	44.84	70.00	-25.16	V	Peak

Location: 966 chamber	**Tested by:** Saber Huang
Test Mode: Mode 1	**Test Distance:** 3m
Detector Function: Peak	**Test Results:** Pass
Test Date: October 29, 2016	



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1040.000	50.61	-8.40	42.21	70.00	-27.79	H	Peak
1335.000	52.02	-7.30	44.72	70.00	-25.28	H	Peak
2165.000	46.93	-4.10	42.83	70.00	-27.17	H	Peak
2605.000	46.42	-2.07	44.35	70.00	-25.65	H	Peak
3715.000	49.15	0.39	49.54	74.00	-24.46	H	Peak
5720.000	42.41	5.96	48.37	74.00	-25.63	H	Peak

6.3. HARMONICS CURRENT MEASUREMENT

6.3.1. LIMITS OF HARMONICS CURRENT MEASUREMENT

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23x8/n

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

NOTE: 1. Class A and Class D are classified according to item 4.4.3.

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.

6.3.2. TEST INSTRUMENTS

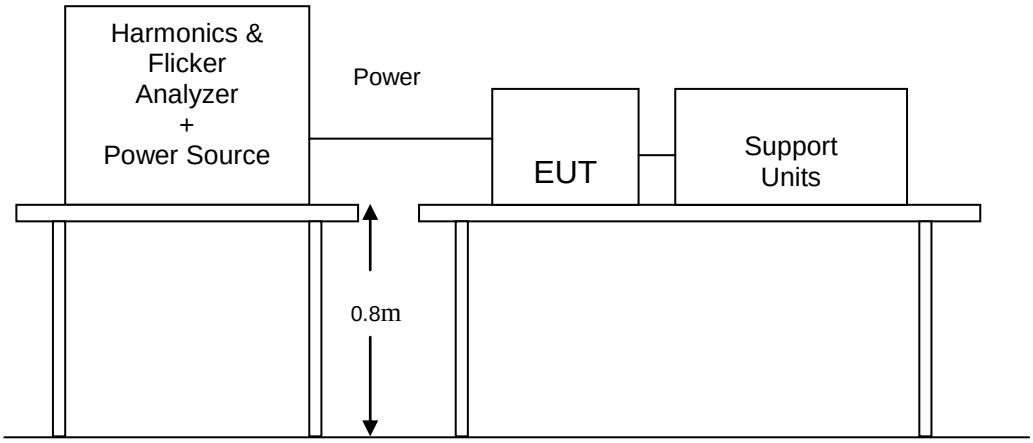
Harmonic Current Measurement (EN 61000-3-2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Power Source	SCHAFFNER	NSG1007	54789	02/21/2016	02/20/2017
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	02/21/2016	02/20/2017
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

6.3.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-029)

Please refer to ETSI EN 301 489-1 Clause 8.5 and EN 61000-3-2: 2014 for the measurement methods.

6.3.4. TEST SETUP



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

6.3.5. TEST RESULTS

Not applicable, since the EUT received DC power from the notebook.

6.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

6.4.1. LIMITS OF VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

TEST ITEM	LIMIT	REMARK
P_{st}	1.0	P_{st} means short-term flicker indicator.
P_{lt}	0.65	P_{lt} means long-term flicker indicator.
T_{dt} (ms)	500	T_{dt} means maximum time that dt exceeds 3.3 %.
d_{max} (%)	4%	d_{max} means maximum relative voltage change.
dc (%)	3.3%	dc means relative steady-state voltage change

6.4.2. TEST INSTRUMENTS

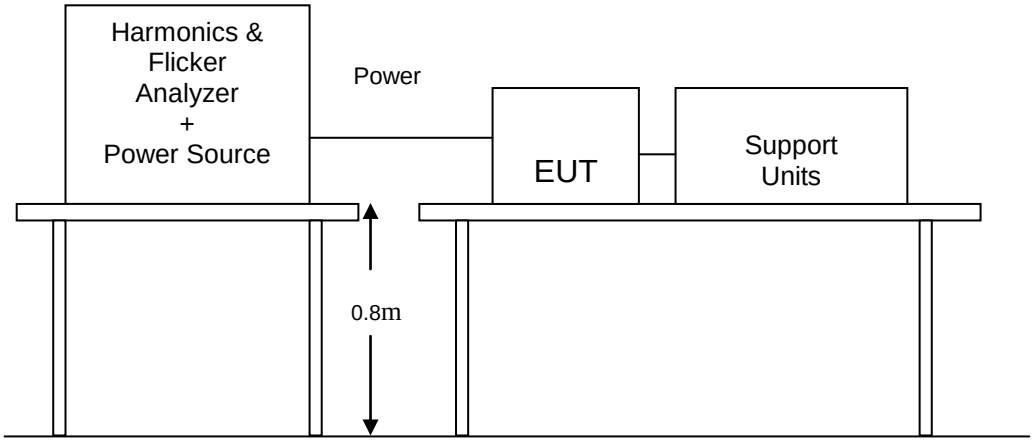
Voltage Fluctuation/Flicker Measurement (EN 61000-3-3)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Power Source	SCHAFFNER	NSG1007	54789	02/21/2016	02/20/2017
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	02/21/2016	02/20/2017
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

6.4.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-030)

Please refer to ETSI EN 301 489-1 Clause 8.6 and EN 61000-3-3: 2013 for the measurement methods.

6.4.4. TEST SETUP



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

6.4.5. TEST RESULTS

Not applicable, since the EUT received DC power from the notebook.

7 IMMUNITY TEST

7.1. GENERAL DESCRIPTION

Product Standard	ETSI EN 301 489-1	
	Test Type	**Minimum Requirement**
Basic Standard, Specification, and Performance Criterion required	EN 61000-4-2	Electrostatic Discharge – ESD: 8kV air discharge, 4kV Contact discharge, Performance Criterion B
	EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 ~1000MHz, 1400~2700 MHz, 3V/m, 80% AM(1kHz), Performance Criterion A
	EN 61000-4-4	Electrical Fast Transient/Burst - EFT, Power line: 1kV, Signal line: 0.5kV, Performance Criterion B
	EN 61000-4-5	Surge Immunity Test: 1.2/50 us Open Circuit Voltage, 8 /20 us Short Circuit Current, 1.2/50 us Signal and Telecommunication Power Port ~ Line to line: 1kV, Line to ground: 2kV Signal Port ~ Lines to ground : 1kV Performance Criterion B
	EN 61000-4-6	Conducted Radio Frequency Disturbances Test – CS: 0.15 ~ 80 MHz, 3Vrms, 80% AM, 1kHz, Performance Criterion A
	EN 61000-4-11	Voltage dip: 0 % residual voltage for 0,5 cycle Performance Criterion B Voltage dip: 0 % residual voltage for 1 cycle Performance Criterion B Voltage dip: 70 % residual voltage for 25 cycles Performance Criterion B Voltage interruption: 0 % residual voltage for 250 cycles Performance Criterion C

7.2. GENERAL PERFORMANCE CRITERIA DESCRIPTION

Performance table for EN 301 489-17		
Criteria	**During test**	**After test**
A	Shall operate as intended May show degradation of performance (see note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance (see note 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.

Performance criteria for Continuous phenomena applied to Transmitters (CT)

The performance criteria A shall apply.

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

Performance criteria for Transient phenomena applied to Transmitters (TT)

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

(NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Continuous phenomena applied to Receivers (CR)

The performance criteria A shall apply.

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

Performance criteria for Transient phenomena applied to Receivers (TR)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply.

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

7.3. ELECTROSTATIC DISCHARGE (ESD)

7.3.1. TEST SPECIFICATION

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 2 ; 4 ; 8 kV (Direct) Contact Discharge: 2 ; 4 kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge 1 second minimum

7.3.2. TEST INSTRUMENT

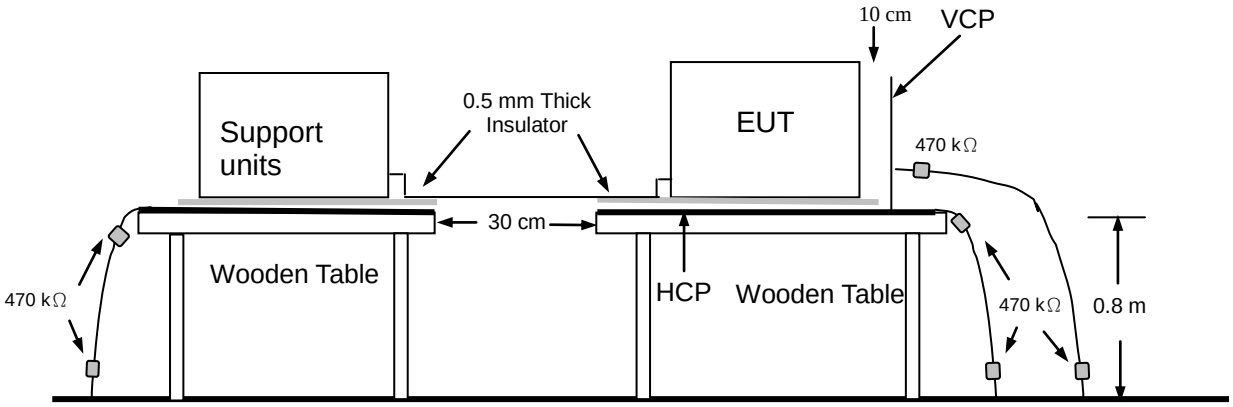
ESD test (EN 61000-4-2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Dito ESD Simulator	EM Test	dito	V0809103493	02/21/2016	02/20/2017
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/04/2016	03/03/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

7.3.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-022)

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

7.3.4. TEST SETUP



Ground Reference Plane

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

NOTE:

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 940k 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.

FLOOR-STANDING EQUIPMENT

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

7.3.5. TEST RESULTS

Temperature	25°C	**Humidity**	50% RH
Pressure	1002mbar	**Tested By**	Saber Huang
Test Date	October 31, 2016	**Required Passing Performance**	Criterion B

☒ Mode 1: Normal

Air Discharge							
Test Points	**Test Levels**			**Results**			
	± 2 kV	**± 4 kV**	**± 8 kV**	**Pass**	**Fail**	**Performance Criterion**	**Observation**
Front	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Back	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Left	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Right	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Top	☒	☒	☒	☒	☐	☐A ☒B	Note ☐1 ☒2 ☐3
Bottom	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3

Contact Discharge							
Test Points	**Test Levels**			**Results**			
	± 2 kV	**± 4 kV**	**± 8 kV**	**Pass**	**Fail**	**Performance Criterion**	**Observation**
Front	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Back	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2 ☐3
Left	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Right	☐	☐	☐	☐	☐	☐A ☐B	Note ☐1 ☐2 ☒3
Top	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2 ☐3
Bottom	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2 ☐3

Discharge To Horizontal Coupling Plane							
Side of EUT	**Test Levels**			**Results**			
	± 2 kV	**± 4 kV**	**± 8 kV**	**Pass**	**Fail**	**Performance Criterion**	**Observation**
Front	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2
Back	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2
Left	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2
Right	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2

Discharge To Vertical Coupling Plane							
Side of EUT	**Test Levels**			**Results**			
	± 2 kV	**± 4 kV**	**± 8 kV**	**Pass**	**Fail**	**Performance Criterion**	**Observation**
Front	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2
Back	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2
Left	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2
Right	☒	☒	☐	☒	☐	☐A ☒B	Note ☐1 ☒2

NOTE:

1. There was no change compared with initial operation during the test.

2. The EUT is interrupted momentarily during the test, but self-recoverable immediately after the test

3. Means that no discharge point had been occurred during that particular coupling method.

Remark: *The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.*

The Photo for Discharge Points of EUT

Red dot —Air Discharge points
Green dot —Contact Discharge Points

Red dot —Air Discharge points
Green dot —Contact Discharge Points

7.4. RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD (RS)

7.4.1. 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
Test Distance:	3 m
Antenna Height:	1.5m

7.4.2. TEST INSTRUMENT

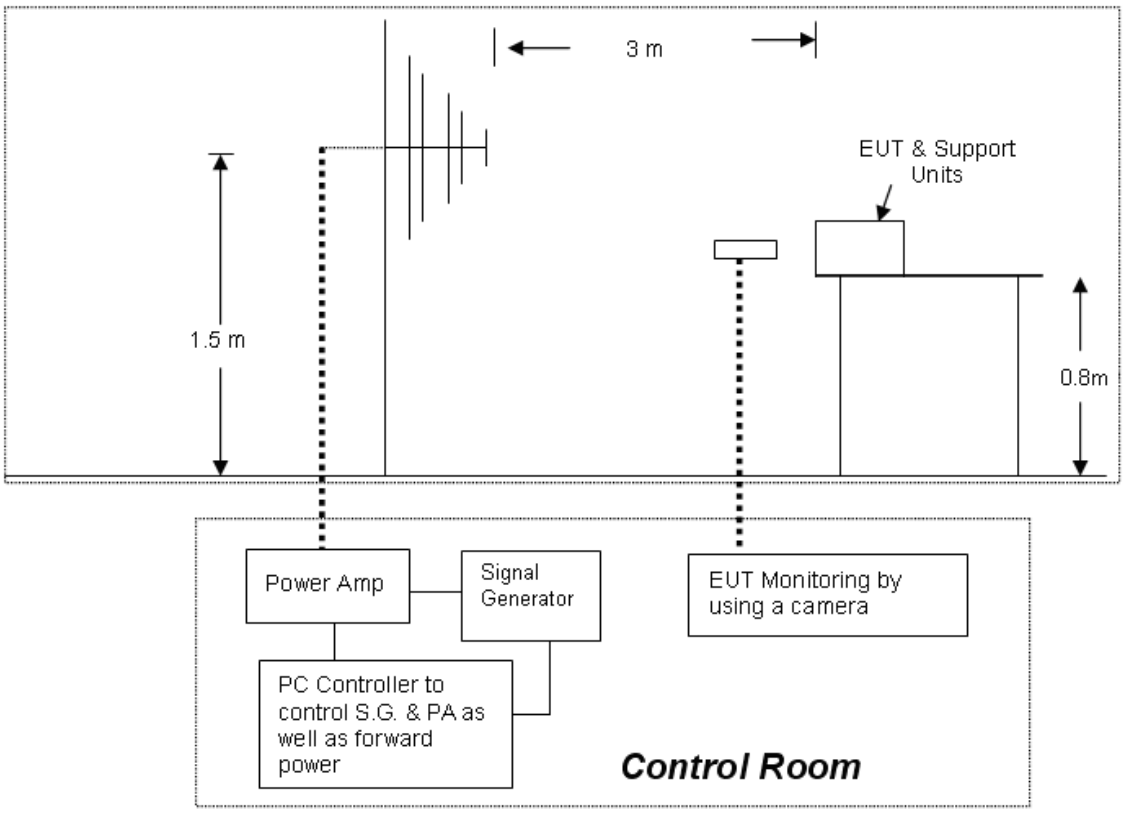
Radiated Electromagnetic Field immunity Measurement (EN 61000-4-3)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Signal Generator	ROHDE&SCHWARZ	SMA100A	100434	02/21/2016	02/20/2017
RF-Switch Network	TESEQ	RF-Switch Network	N/A	N/A	N/A
Power Amplifier	SCHAFFNER	CBA9433	3007	02/21/2016	02/20/2017
Power Amplifier	TESEQ	CBA 3G-050	T44161	02/21/2016	02/20/2017
Directional Coupler	AR	DC6180A	328212	N.C.R	N.C.R
Directional Coupler	AR	DC7144A	327057	N.C.R	N.C.R
Bilog Antenna	SCHAFFNER	CBL6143	5063	02/21/2016	02/20/2017
Stacked Double Log.-Per. Antenna	Schwarzbeck	STLP9149	9149-163	02/21/2016	02/20/2017
Power Meter	TESEQ	PM6006	72784	02/21/2016	02/20/2017
Power Meter	TESEQ	PM6006	72353	02/21/2016	02/20/2017
Electric Field Probe	EST-LINDGREN	HI-6005	00083480	02/28/2016	02/27/2017
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required

7.4.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-023)

Please refer to ETSI EN 301 489-1 Clause 9.2.2, ETSI EN 301 489-17 Clause 7.2.2 and EN 61000-4-3 for the measurement methods.

7.4.4. TEST SETUP



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

NOTE:

TABLETOP 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.

FLOOR STANDING EQUIPMENT

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

7.4.5. TEST RESULTS

Temperature	25°C	**Humidity**	50% RH
Pressure	1002mbar	**Dwell Time**	3 sec.
Tested By	Saber Huang	**Required Passing Performance**	Criterion A
Test Date	October 31, 2016		

☒**Description of Test (Mode 1)**

Frequency (MHz)	Polarity	Position	Field Strength (V/m)	Criteria meet	Result
80 ~1000, 1400~ 2700	V&H	Front	3	☒ A / ☐ B / ☐ C	PASS
80 ~1000, 1400~ 2700	V&H	Right	3	☒ A / ☐ B / ☐ C	PASS
80 ~1000, 1400~ 2700	V&H	Back	3	☒ A / ☐ B / ☐ C	PASS
80 ~1000, 1400~ 2700	V&H	Left	3	☒ A / ☐ B / ☐ C	PASS

NOTE: There was no change compared with the initial operation during the test.

Remark: The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.

7.5. ELECTRICAL FAST TRANSIENT (EFT)

7.5.1. TEST SPECIFICATION

Basic Standard:	EN 61000-4-4
Test Voltage:	Power Line: 1 kV Signal/Control Line: 0.5 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 or 100kHz
Impulse Wave-shape:	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

7.5.2. TEST INSTRUMENT

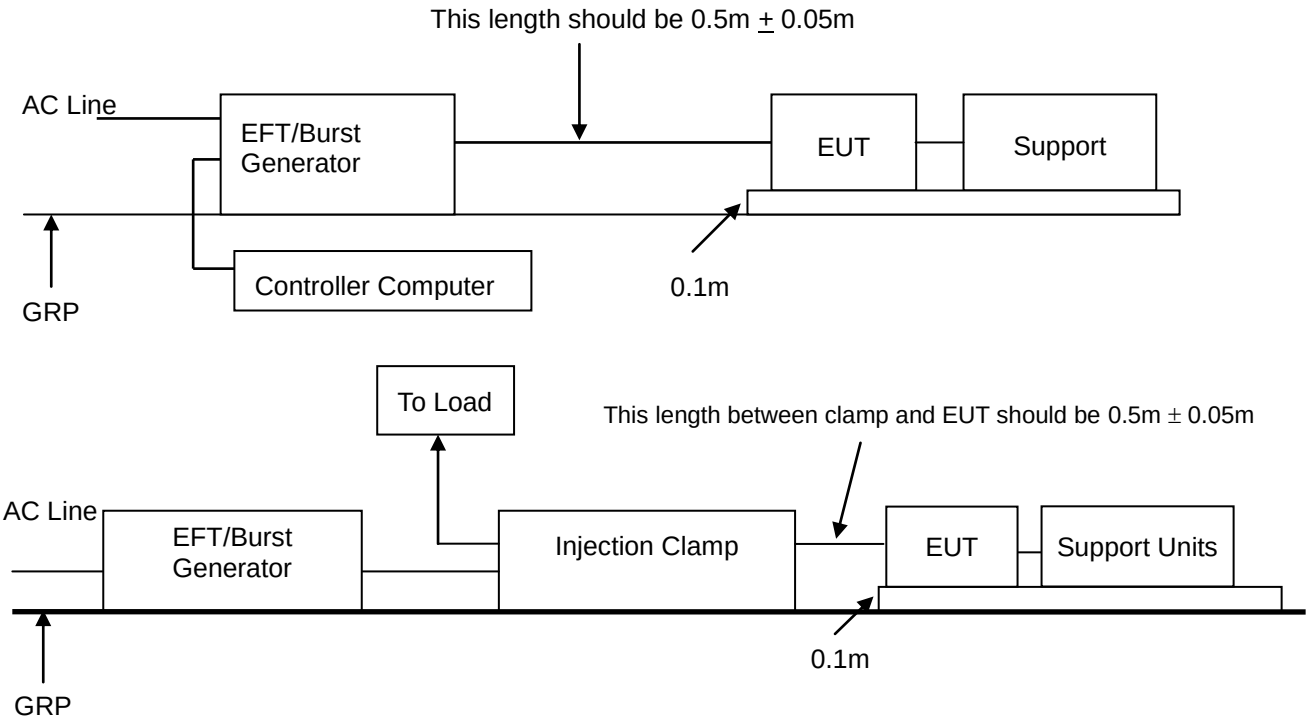
Fast Transients/Burst test (EN 61000-4-4)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Fast Transients/Burst Generator	TESEQ	NSG3025	26861	02/21/2016	02/20/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
fast Transients/Burt Generator CDN	TESEQ	CDN8014	26192	02/21/2016	02/20/2017

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. N.C.R.= No Calibration required

7.5.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-024)

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

7.5.4. TEST SETUP



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

NOTE:

TABLETOP EQUIPMENT

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

FLOOR STANDING EQUIPMENT

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

7.5.5. TEST RESULTS

Temperature	25°C	**Humidity**	50% RH
Pressure	1002mbar	**Tested By**	Saber Huang
Test Date	October 31, 2016	**Required Passing Performance**	Criterion B

☒ **Results of Final Tests (Mode 1)**

Test Point	Polarity	Test Level (kV)	Performance Criterion	Observation	Result
L	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
N	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
L - N	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
PE	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
L – PE	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
N – PE	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
L – N – PE	+/-	1	☐A ☒B	Note ☐1 ☒2	PASS
RJ45	+/-		☐A ☐B	Note ☐1 ☐2	N/A

NOTE: 1. There was no change compared with initial operation during the test.
2. The loss of function of the EUT during the test and it was recovered by itself operation after the test.

Remark: The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.

7.6. SURGE IMMUNITY TEST

7.6.1. 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 1.2/50μs Signal and Telecommunication
Test Voltage:	AC Power Port~ line to line: 1kV, line to ground: 2kV DC Power Port~ line to earth: 0.5kV Signal and Telecommunication Ports ~ line to ground: 1kV
Surge Input/Output:	Power Line: L-N / L-PE / N-PE Telecommunication line: T-Ground / R-Ground
Generator Source Impedance:	Power Line:2 ohm between networks 12 ohm between network and ground Telecommunication line: 25/100 ohm
Polarity:	Positive/Negative
Phase Angle:	0° / 90° / 180° / 270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

7.6.2. TEST INSTRUMENT

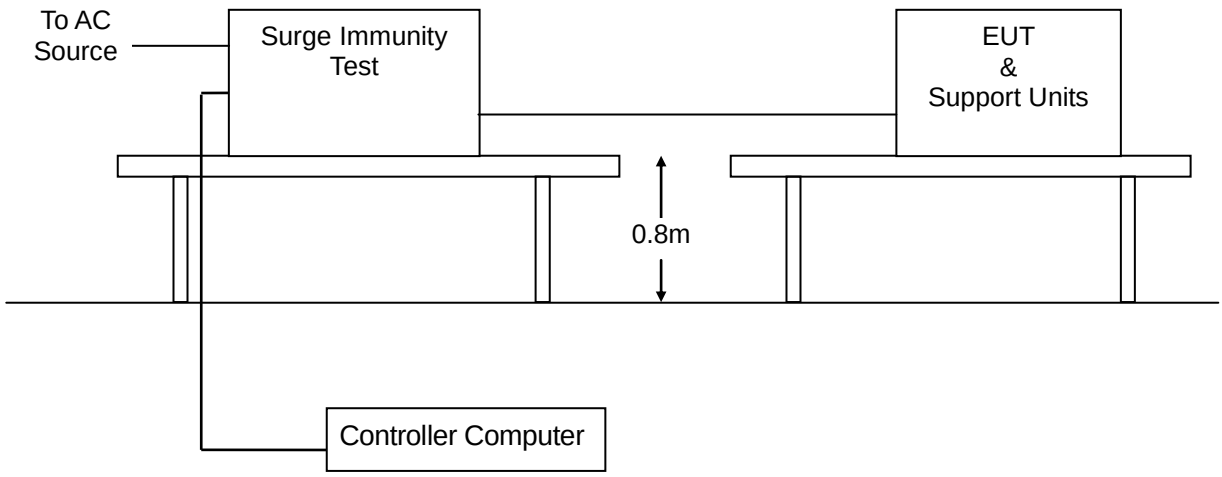
Surge(EN 61000-4-5)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Control Center	Thermo	E103	0605173	N.C.R	N.C.R
Coupler/Decoupler	Thermo	E4551KV	0605180	02/21/2016	02/20/2017
Telecom Wave	Thermo	E502B	0605178	02/21/2016	02/20/2017
Surge Network	Thermo	E510A	0605179	02/21/2016	02/20/2017
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017
CM-TELCD Telecom Coupler/Decoupler	Thermo	N/A	0604249	N.C.R	N.C.R
Surge Coupling Decoupling Network	TESEQ	CDN HSS-2	34274	02/21/2016	02/20/2017

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required

7.6.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-025)

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

7.6.4. TEST SETUP



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

7.6.5. TEST RESULTS

Not applicable, since the EUT received DC power from the notebook.

7.7. CONDUCTED RADIO FREQUENCY DISTURBANCES (CS)

7.7.1. TEST SPECIFICATION

Basic Standard:	EN 61000-4-6
Frequency Range:	0.15 MHz ~ 80 MHz
Field Strength:	3 Vrms
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Coupled cable:	Power Mains, Unshielded
Coupling device:	CDN-M3

7.7.2. TEST INSTRUMENT

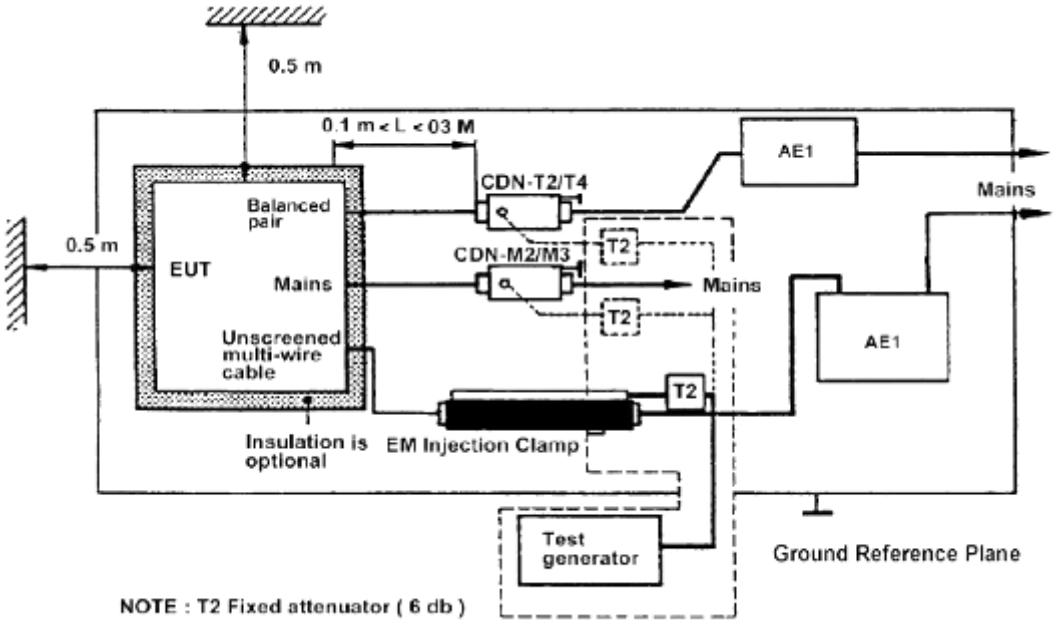
CS test (EN 61000-4-6)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Signal Generator	TESEQ	NSG4070	25807	02/21/2016	02/20/2017
Attenuator	TESEQ	ATN6075	25371	02/21/2016	02/20/2017
CDN	TESEQ	CDN M316	24517	02/21/2016	02/20/2017
CDN	TESEQ	CDN T400A	26022	02/21/2016	02/20/2017
CDN	TESEQ	CDN T800	34427	02/21/2016	02/20/2017
CDN	Luthi	CDN801-M1	1795	02/21/2016	02/20/2017
CDN	Luthi	CDN 801-M2	1897	02/21/2016	02/20/2017
CDN	Luthi	CDN801-M3	1882	02/21/2016	02/20/2017
Temp. / Humidity Mete	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017
EM-CLAMP	TESEQ	KEMZ801A	33441	02/21/2016	02/20/2017

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required

7.7.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-026)

Please refer to ETSIETSI EN 301 489-1 Clause 9.5.2, ETSI EN 301 489-17 Clause 7.2.2 and EN 61000-4-6 for the measurement methods.

7.7.4. TEST SETUP



Note: 1. The EUT is setup 0.1m above Ground Reference Plane
2. The CDNs and / or EM clamp used for real test depends on ports and cables configuration of EUT.

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

NOTE:

TABLE-TOP AND FLOOR-STANDING EQUIPMENT

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

7.7.5. TEST RESULTS

Not applicable, since the EUT received DC power from the notebook.

7.8. VOLTAGE DIP & VOLTAGE INTERRUPTIONS

7.8.1. TEST SPECIFICATION

Basic Standard:	EN 61000-4-11
Test duration time:	Minimum three test events in sequence
Interval between event:	Minimum 10 seconds
Phase Angle:	0^o / 45^o / 90^o / 135^o / 180^o / 225^o / 270^o / 315^o /360^o
Test cycle:	3 times

7.8.2. TEST INSTRUMENT

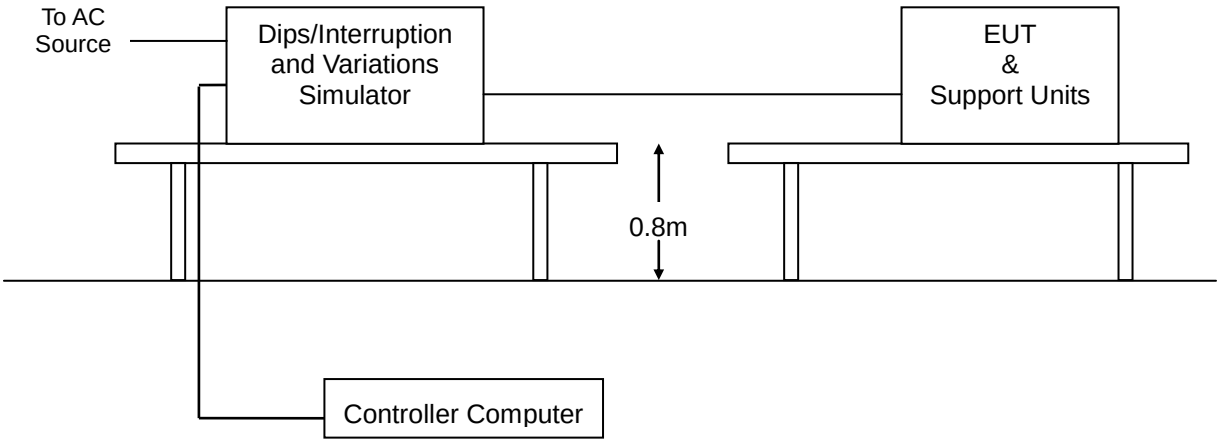
Voltage Dips &Interruptions(EN 61000-4-11)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
Power Source	SCHAFFNER	NSG1007	54789	02/21/2016	02/20/2017
Profline 2100 AC Switching Unit	TESEQ	NSG2200-1	A17820	02/21/2016	02/20/2017
Temp. / Humidity Mete	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Aneroid Barograph	Ningbo Yinzhou Glass Instrument	DYM3	11041305	03/11/2016	03/10/2017

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R.= No Calibration required

7.8.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-028)

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods.

7.8.4. TEST SETUP



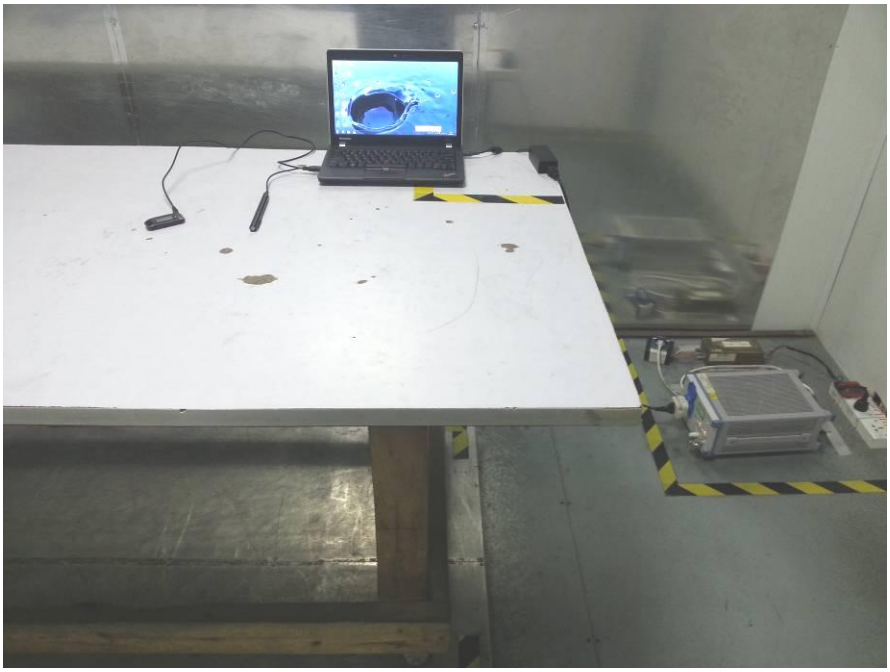
For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

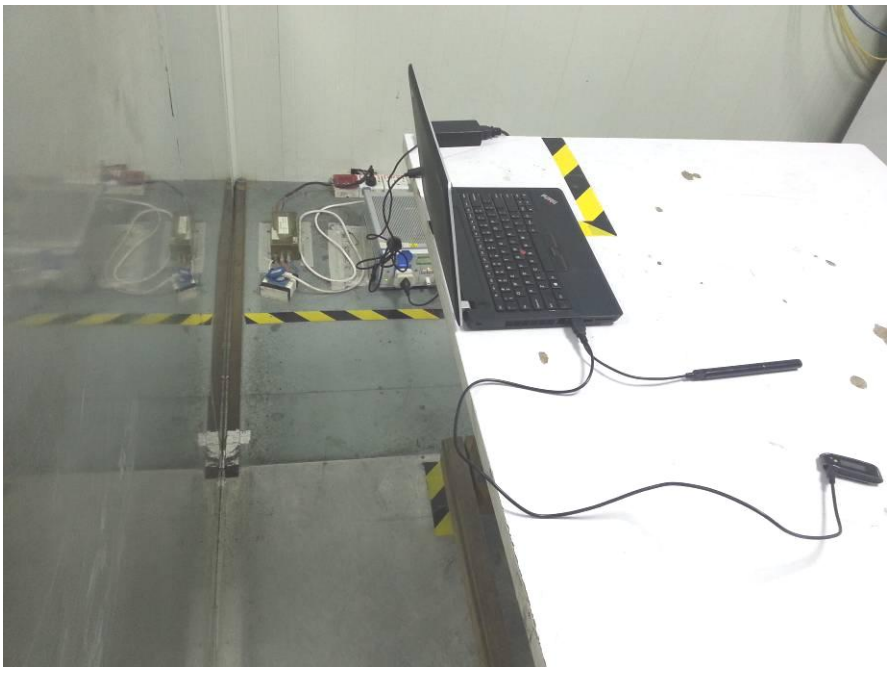
7.8.5. TEST RESULTS

Not applicable, since the EUT received DC power from the notebook.

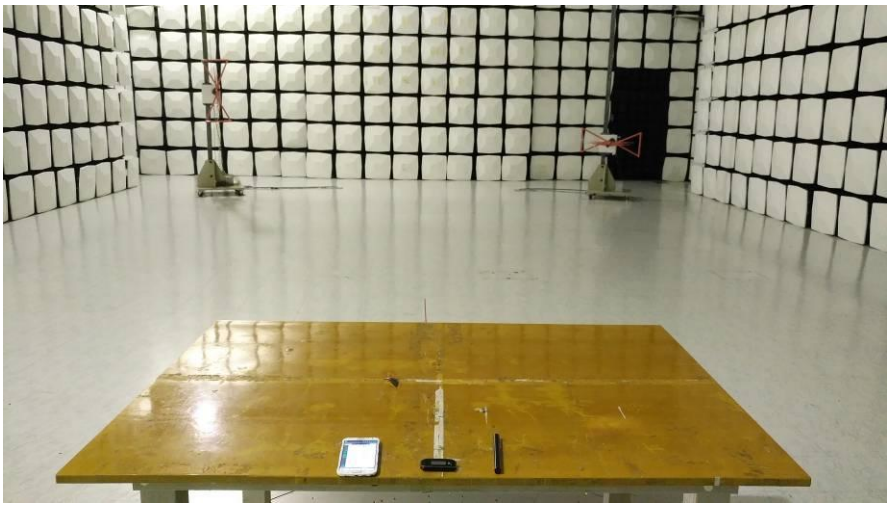
8 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

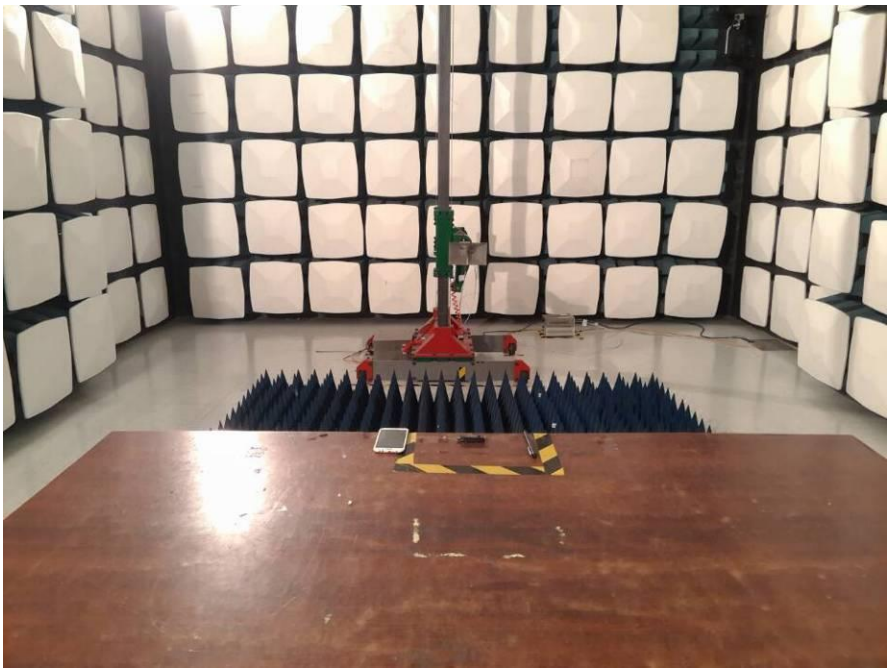


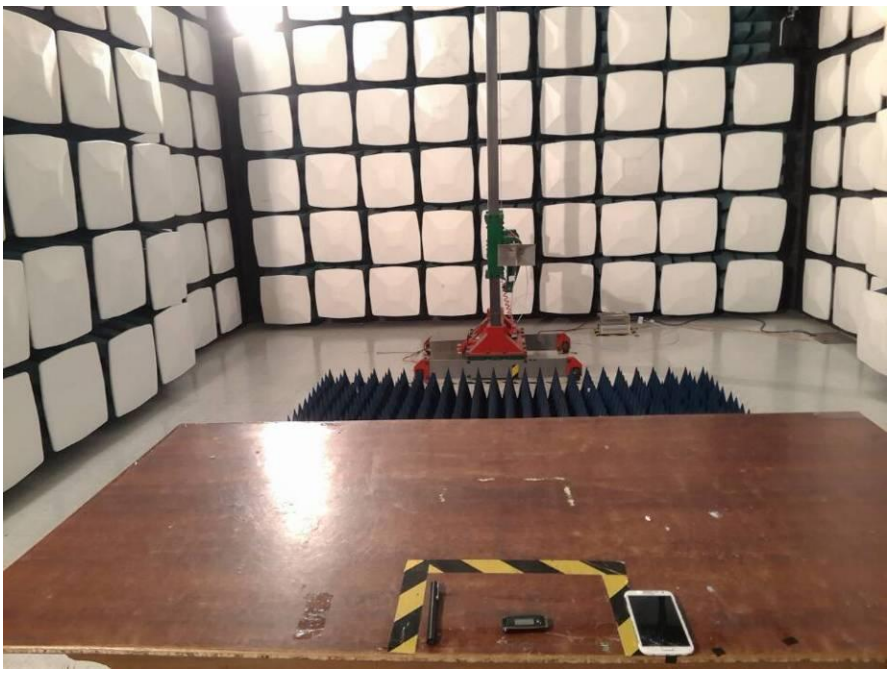


RADIATED EMISSION TEST
Below 1GHz

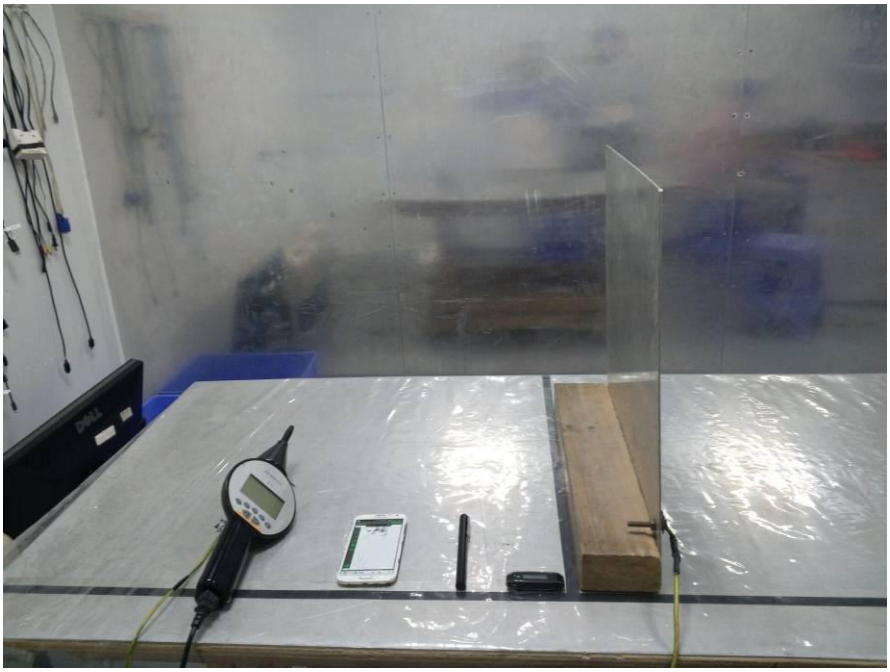


Above 1GHz





ESD TEST



RS TEST

EFT TEST