ATTESTATION OF CONFORMITY

Attestation Number :	AOCRDG190506004-02
Date of Issue:	2019-06-13
Product:	NEXTION HMI TOUCH SCREEN
Model(s):	NX8048P070-011R
Brand:	NEXTION
Manufacturer & Address:	Shenzhen Sonoff Technologies Co.,Ltd. Building 8, Room 1001, Lianhua industrial park, Longyuan Road, Hualian community, Longhua St, Longhua dist, Shenzhen, Guangdong, China.

Bay Area Compliance Laboratories Corp. (Dongguan) hereby declares that the submitted sample(s) of the above equipment has been tested for CE-marking and in accordance with the following European Directives and Standards:

EMC Directive 2014/30/EU

Harmonized Standards	Test Report Number
EN 55032:2015* EN 55035:2017* EN 61000-3-2:2014 EN 61000-3-3:2013	RDG190506004-01
* Note: Harmonized Standards not yet cited in OJ	

CE Mark is permitted only after all applicable requirements are met in accordance with the European Union Rules, including the manufacturer's issuance of a "Declaration of Conformity. The Declaration of Conformity is issued under sole responsibility of manufacturer. This attestation is specific to the standard(s) stated above and compliance with additional standards and/or European directives are applicable.

Attestation by: Jerry Zhang

Lab Manager

Jerry Zhang

Signature

COMPLIANCE TESTING AND VERIFICATION SERVICES BACL

Bay Area Compliance Laboratories Corp. (Dongguan)
No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China
Phone: +86-769-86858888 Fax: +86-769-86858891
www.baclcorp.com.cn

EN 55032:2015
EN 55035:2017
EN 61000-3-2:2014
EN 61000-3-3:2013

TEST REPORT

For

Shenzhen Sonoff Technologies Co.,Ltd.

Building 8, Room 1001, Lianhua industrial park, Longyuan Road, Hualian community, Longhua St, Longhua dist, Shenzhen, Guangdong, China.

Model:NX8048P070-011R

Report Type: Original Report	**Product Type:** NEXTION HMI TOUCH SCREEN
Report Number:	RDG190506004-01
Report Date:	2019-06-04
Reviewed By:	Ridick Zhang EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	NEXTION HMI TOUCH SCREEN
EUT Model:	NX8048P070-011R
Multiple Models:	N/A
Rated Input Voltage:	5V/1A
The Highest Operating Frequency:	200MHz
External Dimension:	181mm(L)*108mm(W)*9.3mm(H)
Serial Number:	190506004
EUT Received Date:	2019.05.06

Objective

This report is prepared on behalf of *Shenzhen Sonoff Technologies Co.,Ltd.* in accordance with EN 55032:2015 Electromagnetic compatibility of multimedia equipment — Emission Requirements; EN 55035:2017 Electromagnetic compatibility of multimedia equipment — Immunity Requirements; EN 61000-3-2:2014 Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase); EN 61000-3-3:2013 Electromagnetic compatibility (EMC)Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

The objective is to determine the compliance of EUT with:
EN 55032:2015
EN 55035:2017
EN 61000-3-2:2014
EN 61000-3-3:2013.

Test Methodology

All measurements contained in this report were conducted with EN 55032:2015 Electromagnetic compatibility of multimedia equipment — Emission Requirements; EN 55035:2017 Electromagnetic compatibility of multimedia equipment — Immunity Requirements; EN 61000-3-2:2014 Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase); EN 61000-3-3:2013 Electromagnetic compatibility (EMC)Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

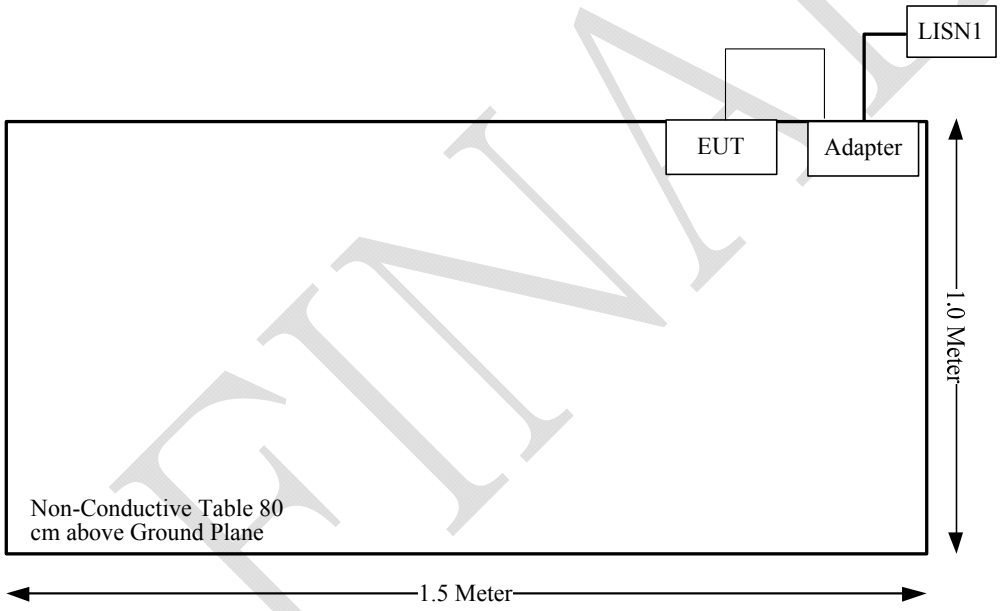
Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No EUT software was used for testing.

Block Diagram of Test Setup



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Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dongang	Adapter	DA-00051000EU001	N/A

Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2018-09-05	2019-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2018-12-10	2019-12-10
R&S	EMI Test Receiver	ESCI	101121	2019-03-23	2020-03-23
Radiated emissions below 1GHz					
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-3	2017-07-21	2019-07-21
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2018-09-24	2019-09-24
Sonoma	Amplifier	310N	185914	2018-10-13	2019-10-13
Radiated emissions above 1GHz					
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-01-04	2020-01-04
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2018-09-05	2019-09-05
Flicker & Harmonic					
ELGAR	AC Power Source	1751SX	5611	2018-09-10	2019-09-10
EM TEST	Harmonic & Flicker Analyzer	DPA 500	303278	2018-12-14	2019-12-14
CS					
Werlatone	Dual Directional Coupler	C5091-10	113192	2019-02-09	2020-02-09
HP	Power Meter	HP EPM-441A	GB37481494	2018-08-13	2019-08-13
Agilent	8482A Power sensor	8482A	US37296108	2018-08-13	2019-08-13
HP	Signal	8648A	3246A00831	2018-12-14	2019-12-14

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
	Generator				
R&S	Power Amplifier	15A250	12934	N/A	N/A
NARDA	Attenuator	769-6	2754	N/A	N/A
COM-POWER	CDN	M325E	521064	2018-12-14	2019-12-14
EFT & Surge & Dips					
EM TEST	Ultra Compact Generator	UCS500-M6	V6016101357	2019-01-04	2020-01-04
EM TEST	Auto Transformer	MV2616	0403-16	N/A	N/A
ESD					
SCHAFFNER	ESD Tester	NSG435	005 101	2018-07-27	2019-07-27
PFMF					
EM TEST	Current Transformer	MC2630	301873	N/A	N/A
EM TEST	Loop Antenna	MS100	303298	N/A	N/A
PAOFN	Transformer	AC250	250003	N/A	N/A
F.W.BELL	Gauss Meter	4190	0808 003	2018-09-14	2019-09-14
RS					
Sunol Sciences	Antenna	JB3	A060611-2	2017-08-25	2020-08-25
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
AR	Power Amplifier	100W1000M1	13410	N/A	N/A
AR	Power Amplifier	60S1G6	348711	N/A	N/A
Microwave	Directional Coupler	441490	488Z	2019-07-16	2020-07-16
Agilent	EPM Series Power Meter	E4419B	MY45103907	2019-04-11	2020-04-11
Agilent	E-Series Avg Power Sensor	E9301A	MY41497625	2019-04-11	2020-04-11
Agilent	E-Series Avg Power Sensor	E9301A	MY41497628	2019-04-11	2020-04-11

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Temperature:	24.3~28.1°C
Relative Humidity:	47~65%*
ATM Pressure:	100.7~ 101.1kPa
Tester:	Lily Xie, Neil Liao,Vito Chen, Lucy Lu
Test Date:	2019.05.08~2019.06.03

Note:
*The relative humidity of ESD test environment is 48%.

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SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 55032 Clause A.3	Conducted emissions	Compliance
2	EN 55032 Clause A.2	Radiated emissions	Compliance
3	EN 55035 Clause 4.2.1	Electrostatic discharges IEC 61000-4-2	Compliance
4	EN 55035 Clause 4.2.2.2	Continuous radiated disturbances IEC 61000-4-3	Compliance
5	EN 55035 Clause 4.2.2.3	Continuous conducted disturbances IEC 61000-4-6	Compliance
6	EN 55035 Clause 4.2.3	Power frequency magnetic fields IEC 61000-4-8	Compliance
7	EN 55035 Clause 4.2.4	Electrical fast transients/burst IEC 61000-4-4	Compliance
8	EN 55035 Clause 4.2.5	Surges IEC 61000-4-5	Compliance
9	EN 55035 Clause 4.2.6	Voltage dips and short interruptions IEC 61000-4-11	Compliance
10	EN 61000-3-2	Harmonic current emissions	Not applicable*
11	EN 61000-3-3	Voltage fluctuations and flicker	Compliance

Note:
Not applicable*: EUT power is less than 75W.

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1 – CONDUCTED EMISSIONS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

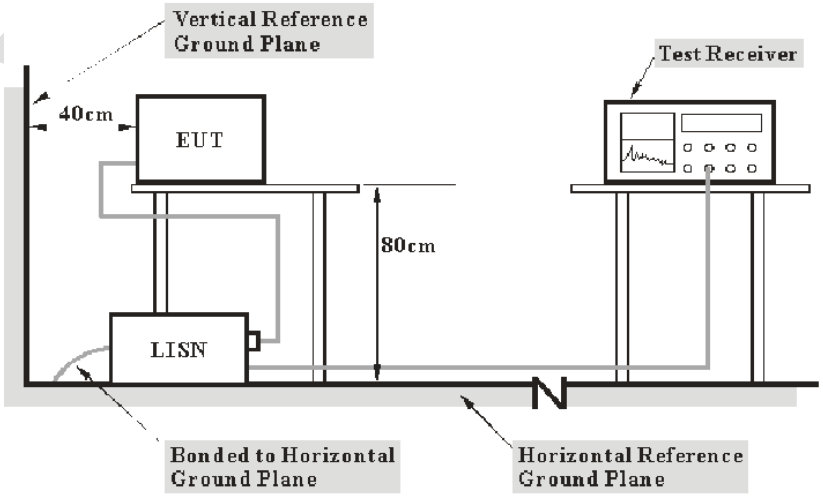
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz), and conducted disturbance at telecommunication port using AAN is 5.0 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (9 kHz to 150 kHz)	3.8 dB
(150 kHz to 30 MHz)	3.4 dB
Conducted disturbance at mains port using voltage probe (9 kHz to 30 MHz)	2.9 dB
Conducted disturbance at telecommunication port using AAN (150 kHz to 30 MHz)	5.0 dB
Conducted disturbance at telecommunication port using CVP (150 kHz to 30 MHz)	3.9 dB
Conducted disturbance at telecommunication port using CP (150 kHz to 30 MHz)	2.9 dB

Test System Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with CISPR 16-1-1:2010+A1:2010, CISPR 16-2-1:2008+A1:2010 measurement procedure. The specification used was the EN 55032 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 230V/50Hz AC line power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:
Corr. = Cable loss + Factor of coupling device

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

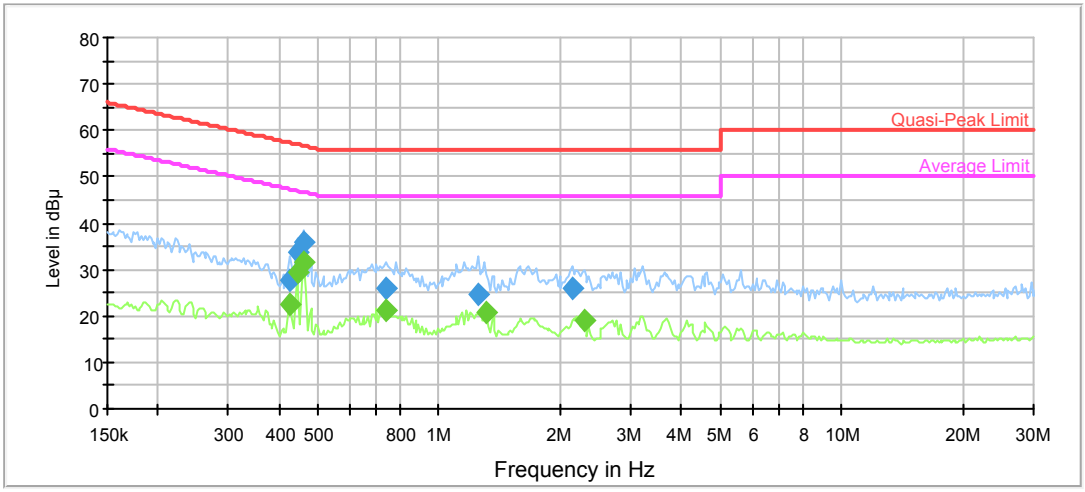
All data was recorded in the Quasi-peak and average detection mode.

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Test Data

Please refer to following table and plots:

Model Number:	NX8048P070-011R
Port:	L
Test Mode:	Normal Work
Power Source:	AC 230V/50Hz
Note:	



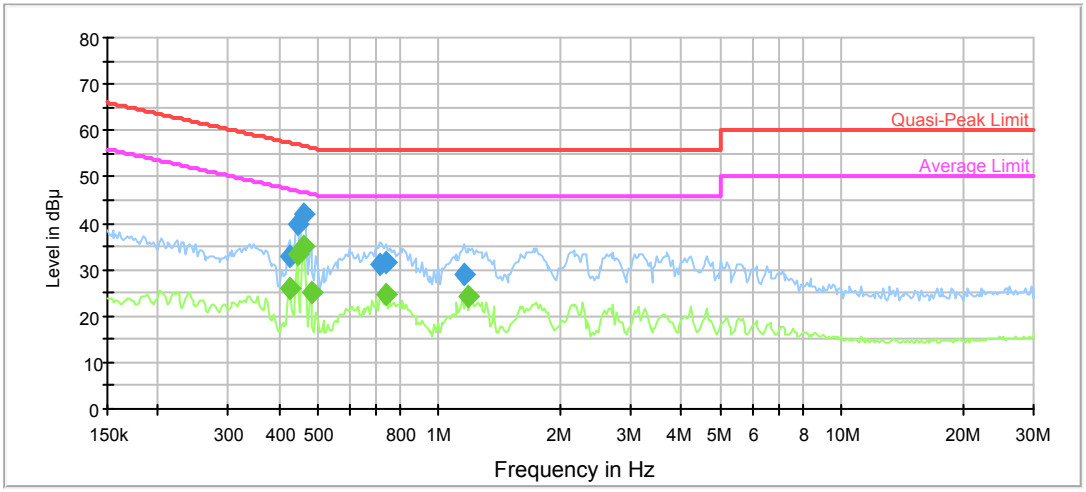
Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.426418	27.6	9.000	L1	9.9	29.7	57.3
0.443733	33.9	9.000	L1	9.9	23.1	57.0
0.461750	36.0	9.000	L1	9.9	20.7	56.7
0.737074	26.0	9.000	L1	9.8	30.0	56.0
1.248947	24.5	9.000	L1	9.8	31.5	56.0
2.137462	25.8	9.000	L1	9.7	30.2	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.426418	22.4	9.000	L1	9.9	24.9	47.3
0.443733	29.2	9.000	L1	9.9	17.8	47.0
0.461750	31.4	9.000	L1	9.9	15.3	46.7
0.737074	21.0	9.000	L1	9.8	25.0	46.0
1.312656	20.6	9.000	L1	9.8	25.4	46.0
2.291648	19.2	9.000	L1	9.8	26.8	46.0

Model Number:	NX8048P070-011R
Port:	N
Test Mode:	Normal Work
Power Source:	AC 230V/50Hz
Note:	



Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.426418	33.0	9.000	N	9.9	24.3	57.3
0.443733	39.6	9.000	N	9.9	17.4	57.0
0.461750	41.9	9.000	N	9.9	14.8	56.7
0.715397	31.3	9.000	N	9.8	24.7	56.0
0.737074	31.7	9.000	N	9.8	24.3	56.0
1.153382	29.1	9.000	N	9.8	26.9	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.426418	25.9	9.000	N	9.9	21.4	47.3
0.443733	33.1	9.000	N	9.9	13.9	47.0
0.461750	34.9	9.000	N	9.9	11.7	46.7
0.480499	25.0	9.000	N	9.9	21.4	46.3
0.737074	24.4	9.000	N	9.8	21.6	46.0
1.176565	24.3	9.000	N	9.8	21.7	46.0

2 – RADIATED EMISSIONS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

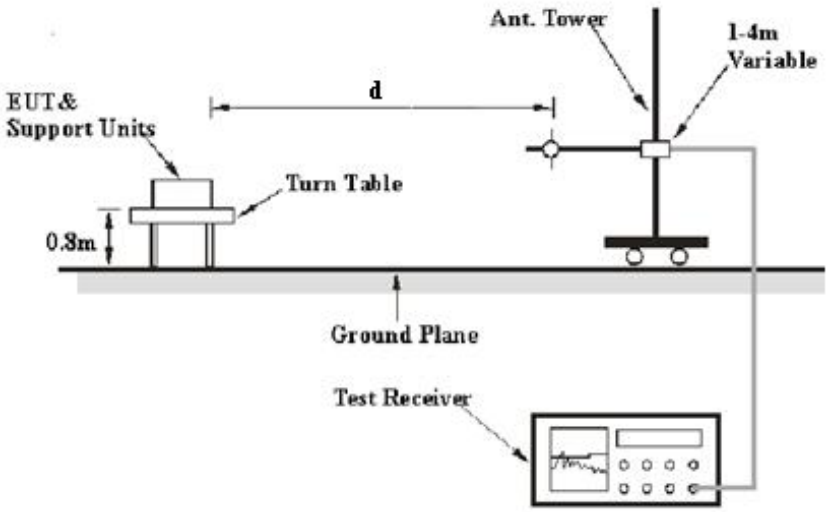
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB.

Table 1 – Values of U_{cispr}

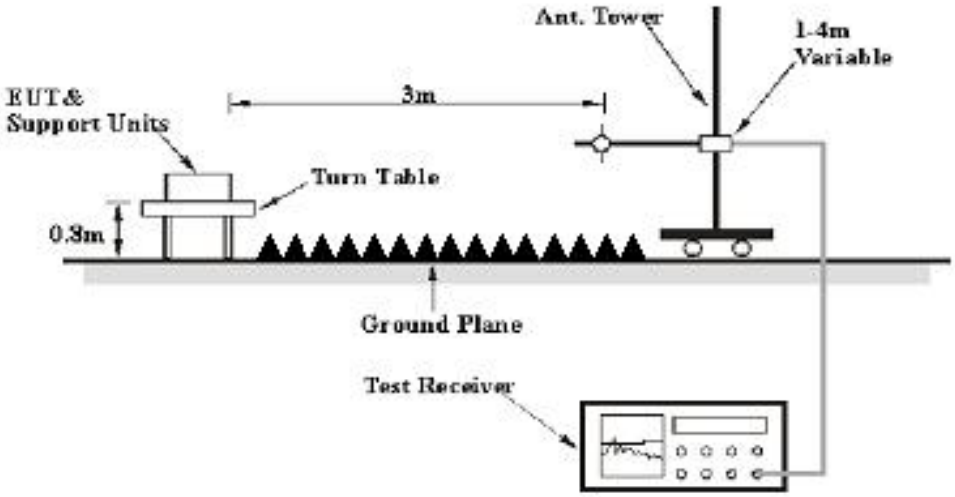
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

Test System Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests below 1GHz were performed in 10 meters, above 1GHz were performed in the 3 meters, using the setup accordance with the CISPR 16-1-1:2010+A1:2010, CISPR 16-1-4:2010, CISPR 16-2-3:2010. The specification used was EN 55032 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 6GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	10Hz	/	Peak

Test Procedure

During the radiated emissions, maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Note:
Corrected = Antenna Factor + Cable Loss - Amplifier Gain
or
Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit for Class B. The equation for margin calculation is as follows:

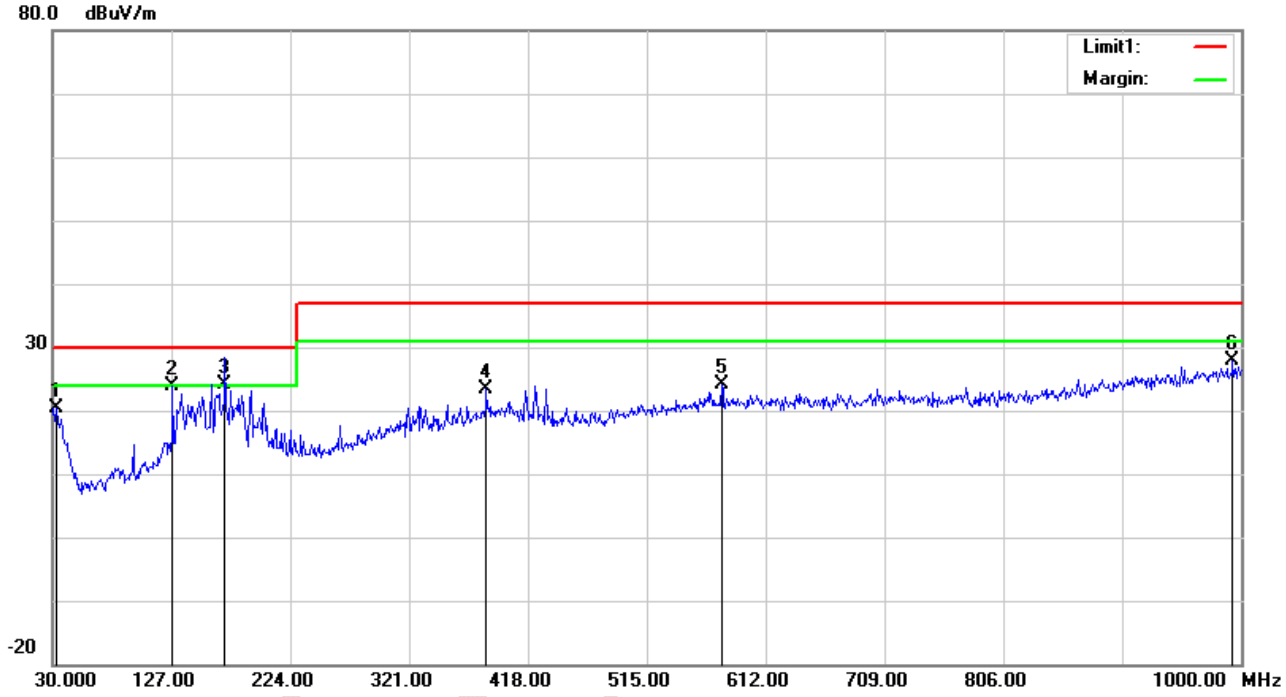
Margin = Limit – Result

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Test Data

Please refer to following table and plots:

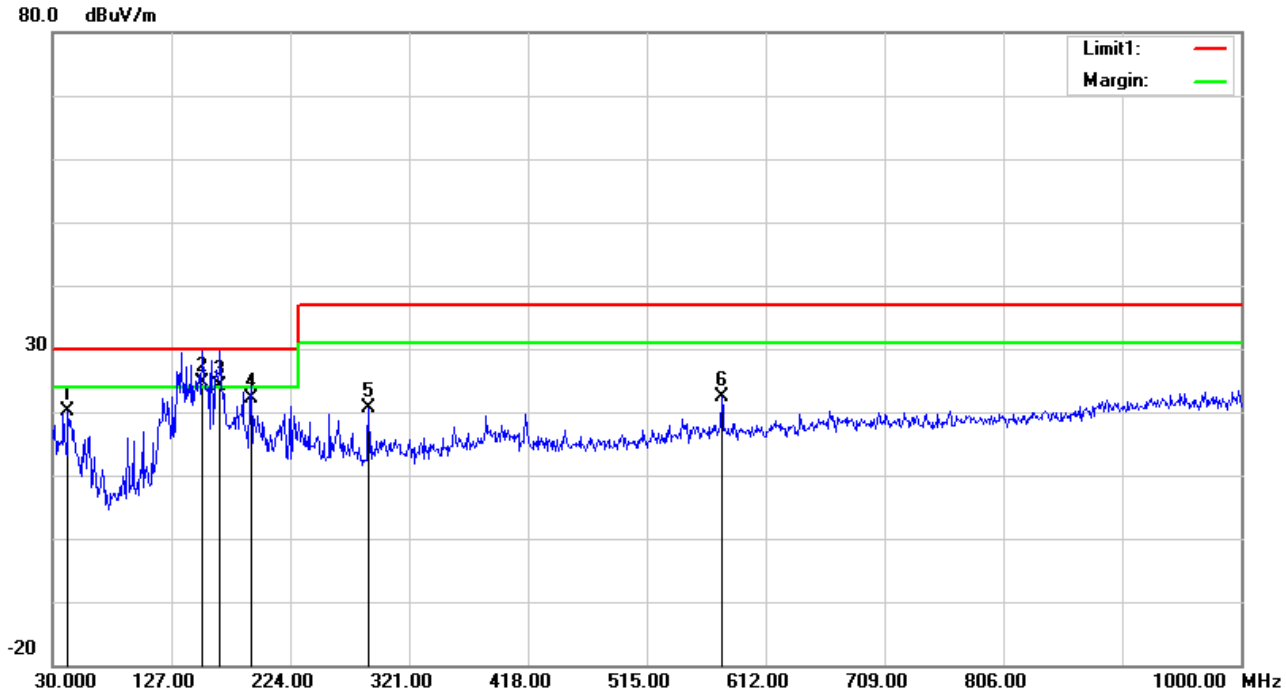
Condition:	EN 55032 Class B	**Polarization:**	Horizontal
EUT:	NEXTION HMI TOUCH SCREEN	**Power:**	DC 5V
Model:	NX8048P070-011R	**Distance:**	10m
Test Mode:	Normal Work		
Note:			



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	32.9100	29.77	peak	-9.36	20.41	30.00	9.59
2	127.9700	37.87	peak	-13.93	23.94	30.00	6.06
3	170.6500	37.12	QP	-12.92	24.20	30.00	5.80
4	384.0500	31.94	peak	-8.52	23.42	37.00	13.58
5	576.1100	27.77	peak	-3.53	24.24	37.00	12.76
6	993.2100	25.18	peak	2.66	27.84	37.00	9.16

Note: Since peak value is meeting the Limit requirement, so the QP value is not recorded.

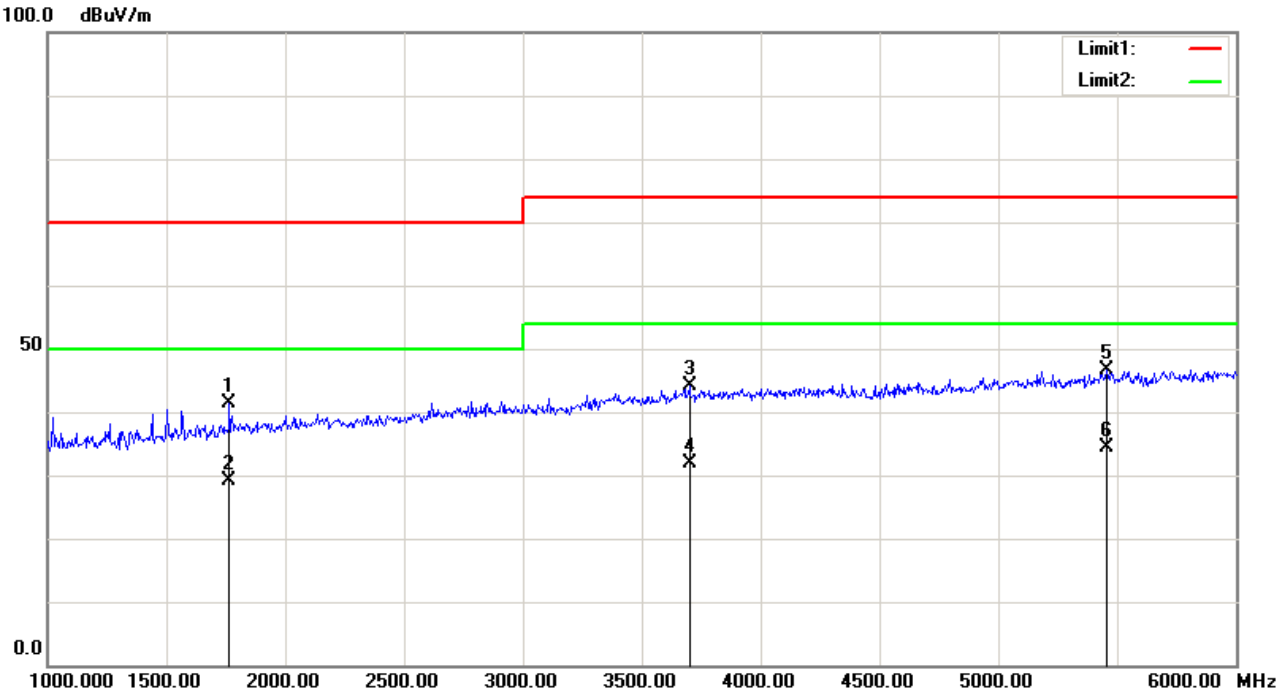
Condition:	EN 55032 Class B	**Polarization:**	Vertical
EUT:	NEXTION HMI TOUCH SCREEN	**Power:**	DC 5V
Model:	NX8048P070-011R	**Distance:**	10m
Test Mode:	Normal Work		
Note:			



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	42.6100	37.34	peak	-17.14	20.20	30.00	9.80
2	152.2200	40.32	QP	-15.72	24.60	30.00	5.40
3	166.7700	40.21	QP	-16.01	24.20	30.00	5.80
4	191.9900	38.39	QP	-16.29	22.10	30.00	7.90
5	288.0200	35.23	peak	-14.64	20.59	37.00	16.41
6	576.1100	30.59	peak	-8.30	22.29	37.00	14.71

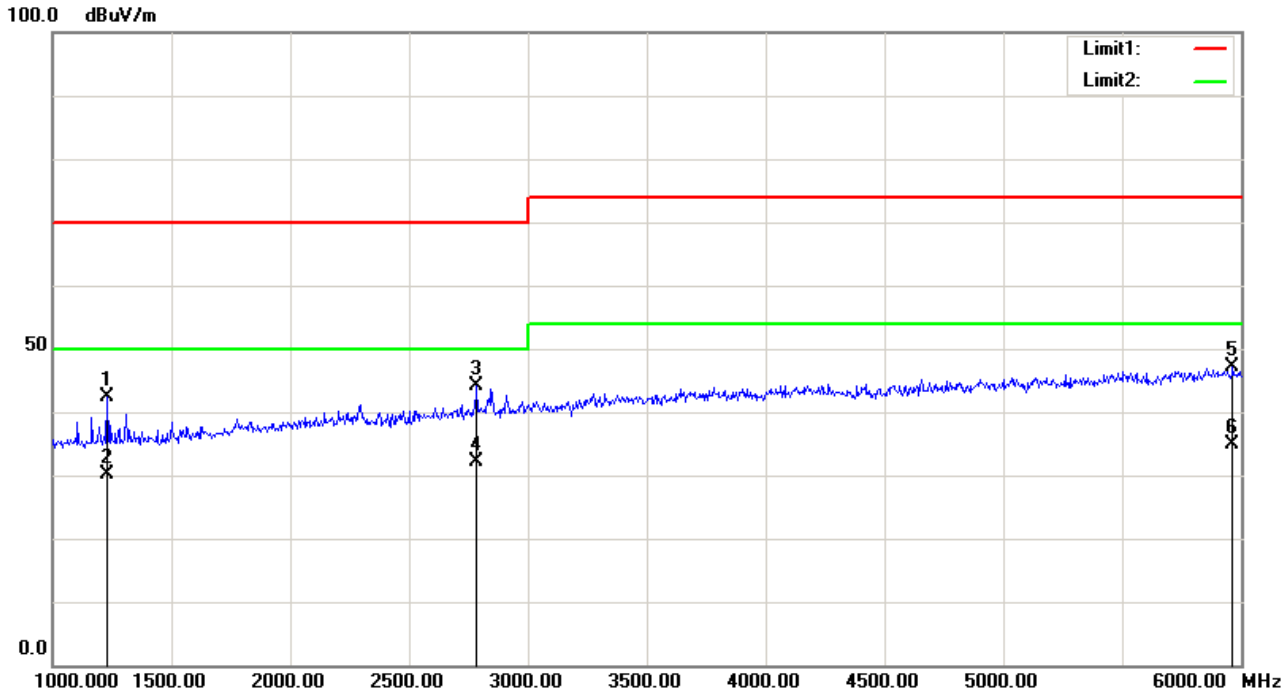
Note: Since peak value is meeting the Limit requirement, so the QP value is not recorded.

Condition:	EN 55032 Class B	**Polarization:**	Horizontal
EUT:	NEXTION HMI TOUCH SCREEN	**Power:**	DC 5V
Model:	NX8048P070-011R	**Distance:**	3m
Test Mode:	Normal Work		
Note:			



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	1767.500	49.29	peak	-8.00	41.29	70.00	28.71
2	1767.500	37.21	AVG	-8.00	29.21	50.00	20.79
3	3702.500	46.74	peak	-2.69	44.05	74.00	29.95
4	3702.500	34.55	AVG	-2.69	31.86	54.00	22.14
5	5457.500	46.35	peak	0.25	46.60	74.00	27.40
6	5457.500	34.15	AVG	0.25	34.40	54.00	19.60

Condition:	EN 55032 Class B	**Polarization:**	Vertical
EUT:	NEXTION HMI TOUCH SCREEN	**Power:**	DC 5V
Model:	NX8048P070-011R	**Distance:**	3m
Test Mode:	Normal Work		
Note:			



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	1232.500	52.19	peak	-9.93	42.26	70.00	27.74
2	1232.500	40.10	AVG	-9.93	30.17	50.00	19.83
3	2785.000	49.46	peak	-5.28	44.18	70.00	25.82
4	2785.000	37.51	AVG	-5.28	32.23	50.00	17.77
5	5967.500	46.25	peak	0.82	47.07	74.00	26.93
6	5967.500	34.11	AVG	0.82	34.93	54.00	19.07

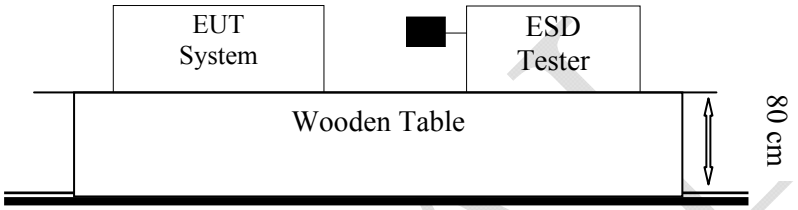
3 – ELECTROSTATIC DISCHARGES IEC 61000-4-2

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-2) please refer to the following:

Parameter	U_{EN}	U_{lab}
Rise time t_r	≤15%	15%
Peak current I_p	≤7%	6.30%
Current at 30 ns	≤7%	6.30%
Current at 60 ns	≤7%	6.30%

Test System Setup



Remark: ■ is the tip of the electrode

IEC 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by *0.5-millimeter* thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Standard

EN 55035:2017 (IEC 61000-4-2:2008)
Test level 3 for Air Discharge at ±8 kV
Test level 2 for Contact Discharge at ±4 kV

Test Level

Level	Test Voltage Contact Discharge (±kV)	Test Voltage Air Discharge (±kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Performance criteria: B

Test Procedure

Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Contact Discharge:

All the procedure shall be same as Section 8.3.1 of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane:

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1 m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane:

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m × 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

FINAL

Test Data

Please refer to following tables:

Test Mode: Normal Work
Note:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Surface	A	A	A	A	A	A	/	/
Screen	A	A	A	A	A	A	/	/
Seam	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/

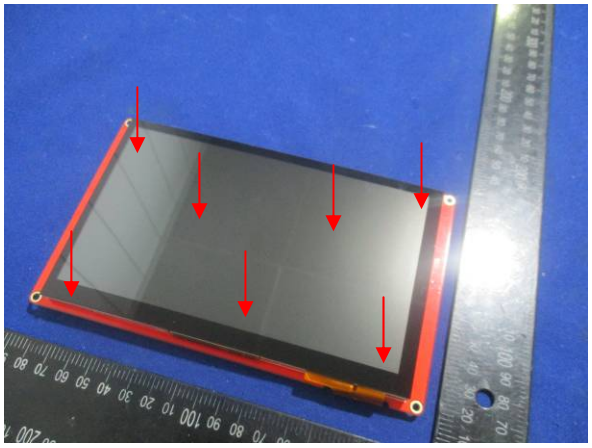
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

ESD Location Photo



Air Discharge: → Direct Contact: →

Test Setup Photo



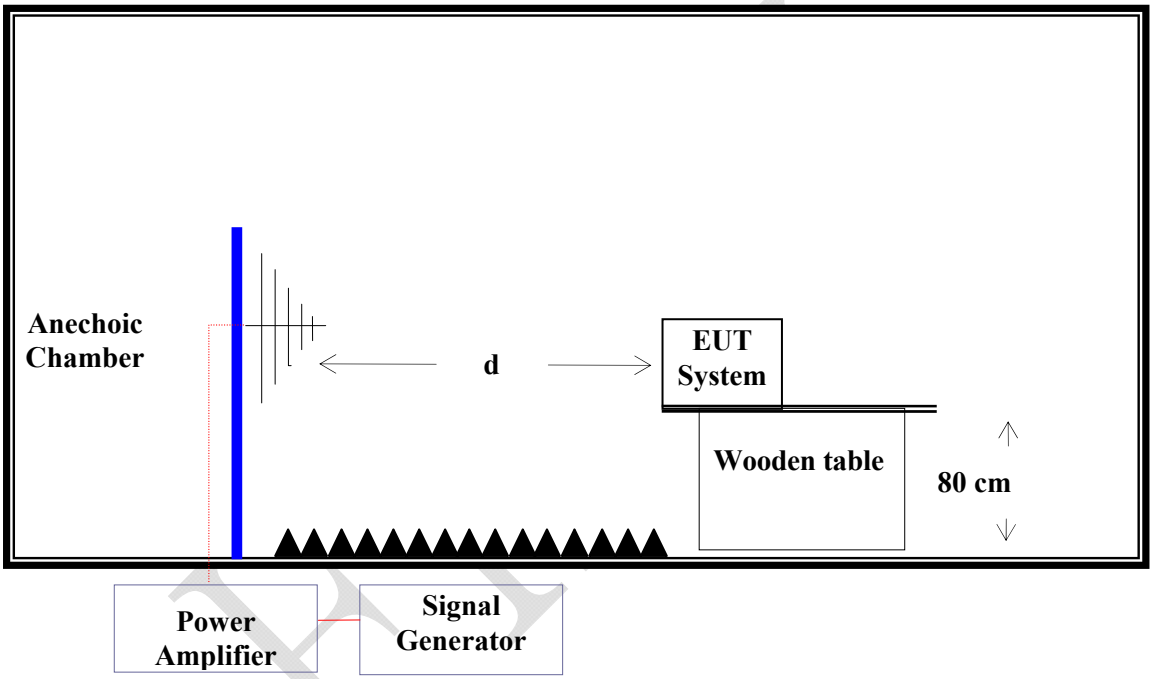
4 - CONTINUOUS RADIATED DISTURBANCES IEC 61000-4-3

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-3) please refer to the following:

Parameter	U_{EN}	U_{lab}
Calibration process	1.88 dB	1.88 dB
Level setting	2.19 dB	2.19 dB

Test System Setup



Note:d=3m(below 1G)/1m(above 1G);

Test Standard

EN 55035:2017 (IEC 61000-4-3:2006 + A1:2007 + A2:2010)

Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

Performance criteria: A

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.
In order to judge the EUT performance, a CCD camera is used to monitor the EUT.

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Test Data

Please refer to following tables:

Test Mode: Normal Work
Note:

Condition of Test	Remarks
Field Strength	3 V/m (Test Level 2)
RF Signal	1 kHz, 80% AM, sine wave
Sweep Frequency Step	1%, logarithmic
Dwell Time	1 Sec

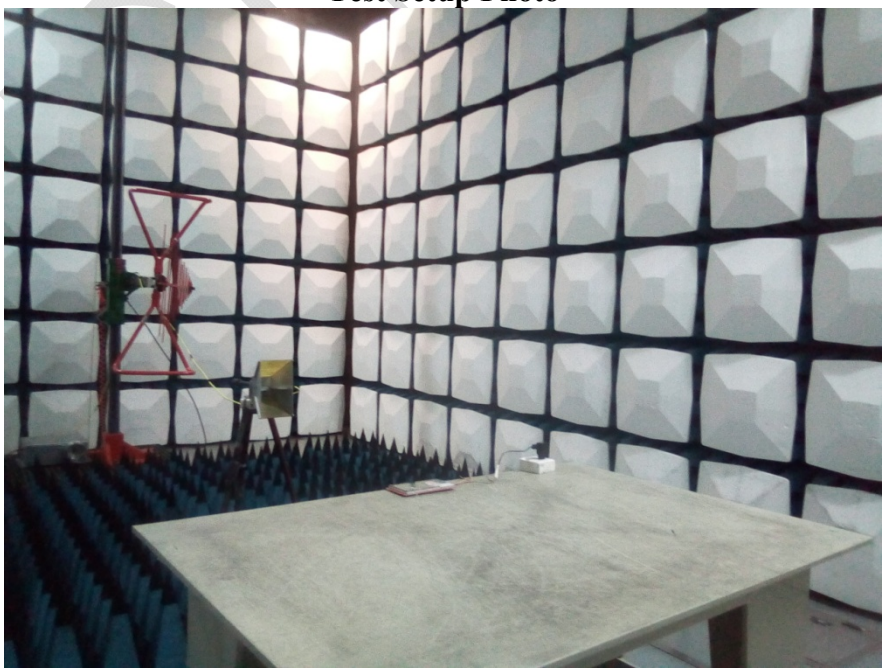
Table 1: Radiated RF-Electromagnetic Field Immunity

Frequency Range (MHz)	Front Side		Rear Side		Left Side		Right Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A

Table 2: Radiated RF-Electromagnetic Field Immunity

Spot Test (MHz)	Front Side		Rear Side		Left Side		Right Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
1800, 2600, 3500, 5000	A	A	A	A	A	A	A	A

Test Setup Photo



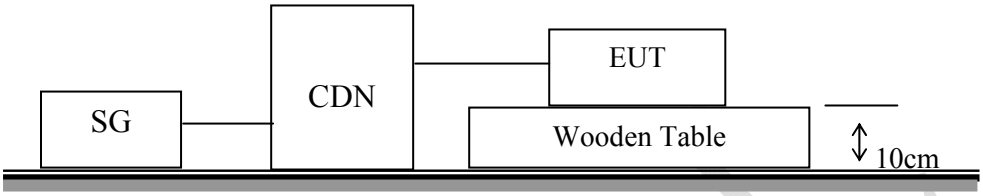
5 - CONTINUOUS CONDUCTED DISTURBANCES IEC 61000-4-6

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-6) please refer to the following:

Parameter	U_{EN}	U_{lab}
CDN calibration process	1.27 dB	1.27 dB
CDN test process	1.36 dB	1.36 dB

Test Setup



Test Standard

EN 55035:2017 (IEC 61000-4-6:2008)
Test level 2 at 3 V (r.m.s.), 0.15 MHz ~ 10 MHz,
Test level 3-1 V (r.m.s.), 10 MHz ~ 30 MHz,
Test level 1 at 1 V (r.m.s.), 30 MHz ~ 80 MHz,

Test Level

Level	Voltage Level (r.m.s.) (V)
1	1
2	3
3	10
X	Special

Performance criteria: A

FINAL

Test Procedure

1) Let the EUT work in test mode and test it.
2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
3) The disturbance signal described below is injected to EUT through CDN.
4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

FINAL

Test Data

Please refer to following tables:

Test Mode: Normal Work
Note:

Table 1: AC mains power input port
Frequency range: 150 kHz to 80 MHz
■Modulated: Amplitude 80%, 1kHz sine wave □ Unmodulated
Dwell Time 1 Sec

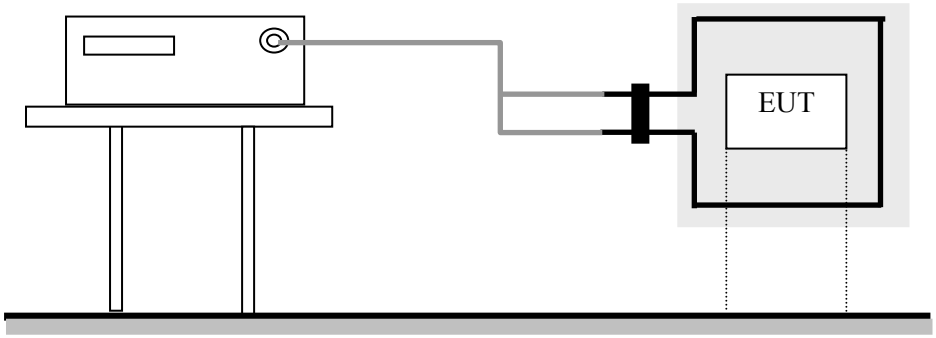
Frequency(MHz)	Voltage Level	Pass	Fail
0.15-10	3V	A	/
10-30	3V-1V		
30-80	1V		

AC Port Test Setup Photo



6 - POWER FREQUENCY MAGNETIC FIELDS IEC 61000-4-8

Test Setup



Test Standard

EN 55035:2017 (IEC 61000-4-8:2009)

Test Level

Level	Magnetic Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X.	Special

Performance criteria: A

Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1 m*1 m). The induction coil shall then be rotated by 90°in order to expose the EUT to the test field with different orientations.

FINAL

Test Data

Please refer to following tables:

Test Mode: Normal Work
Note:

Severity Level: 1 A/m(r. m. s)

Level	Magnetic Field Strength A/M	X (Horizontal)	Y (Vertical)	Z (Special)
1	1	A	A	A
2	3	/	/	/
3	10	/	/	/
4	30	/	/	/
5	100	/	/	/
X	Special	/	/	/

Test Setup Photo



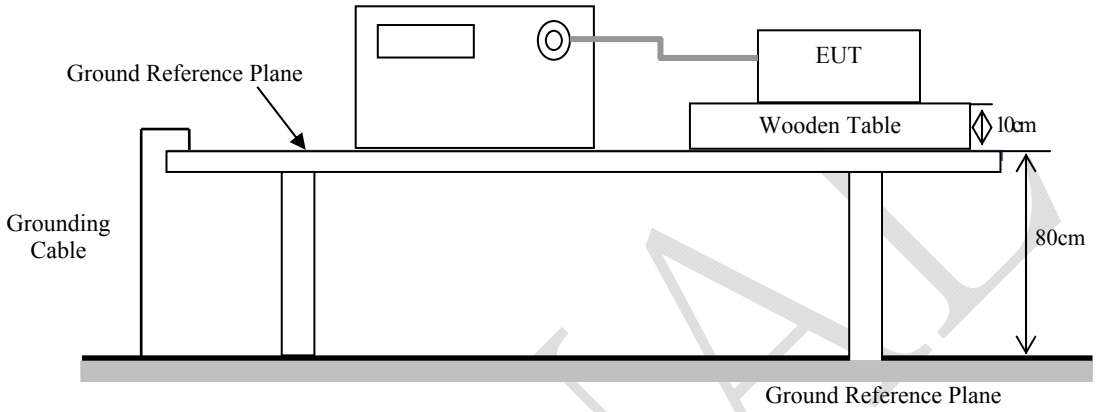
7 - ELECTRICAL FAST TRANSIENTS/BURST IEC 61000-4-4

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-4) please refer to the following:

Parameter	U_{EN}	U_{lab}
Rise time t_r	6.20%	6.20%
Peak voltage value V_p	8.60%	8.60%
Voltage pulse width t_w	5.90%	5.90%

Test System Setup



Test Standard

EN 55035:2017 (IEC 61000-4-4:2012)
AC mains: Test level 2 at 1 kV

FINAL

Test Level

Open Circuit Output Test Voltage ±10%		
Level	**On Power Supply Lines**	**On I/O (Input/Output) Signal data and control lines**
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

Performance criteria: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

FINAL

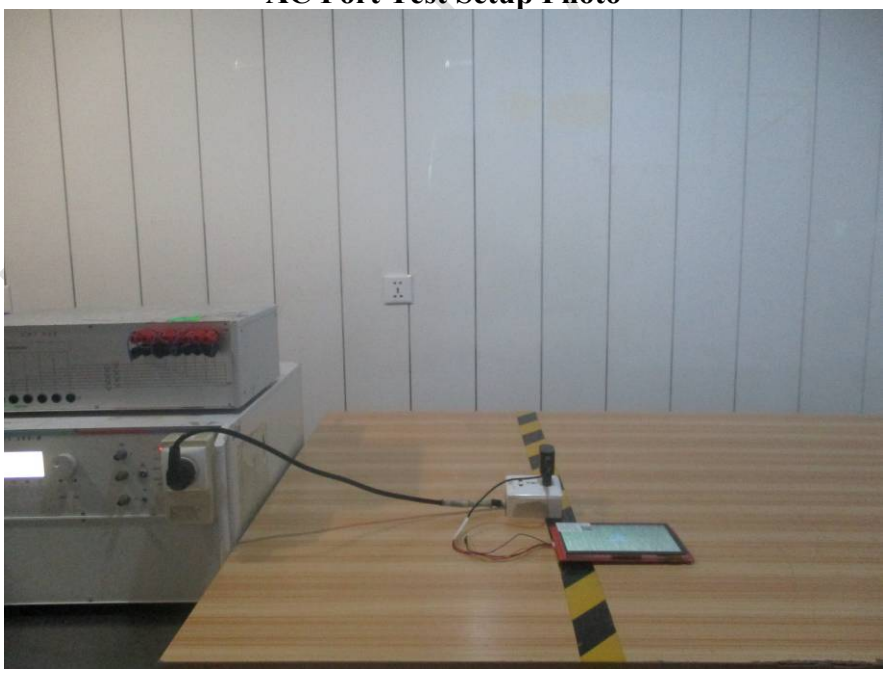
Test Data

Please refer to following tables:

Test Mode: Normal Work
Note:

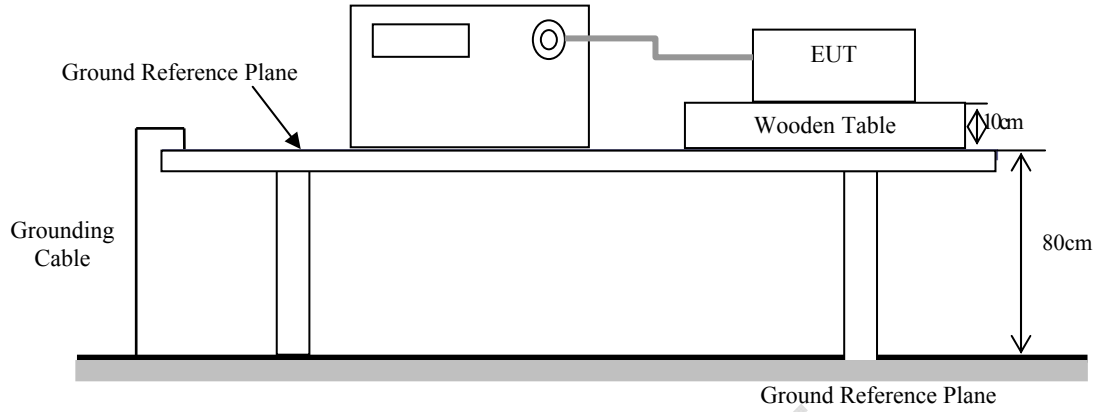
Test Points		Test Level (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC mains power input ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	Earth	/	/	/	/	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L + Earth	/	/	/	/	/	/	/	/
	N + Earth	/	/	/	/	/	/	/	/
	L+N+Earth	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	/

AC Port Test Setup Photo



8 - SURGES IEC 61000-4-5

Test System Setup



Test Standard

EN 55035:2017 (IEC 61000-4-5:2005)
AC Mains: L-N: Test level 2 at 1 kV

Test Level

Level	Open Circuit Output Test Voltage ±10%
1	0.5 kV
2	1 kV
3	2 kV
4	4 kV
X	Special

Performance criteria: B

Test Procedure

1) Provide disturbance signal described below is injected to EUT.
2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
3) Different phase angles are done individually.
4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

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Test Data

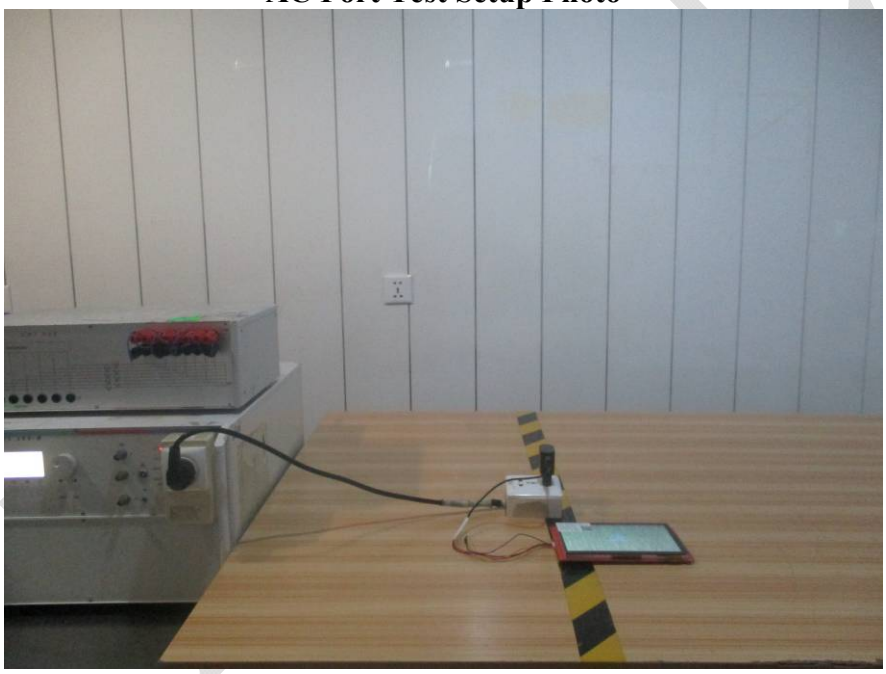
Please refer to following tables:

Test Mode: Normal Work
Note:

Table 1: AC mains power input port

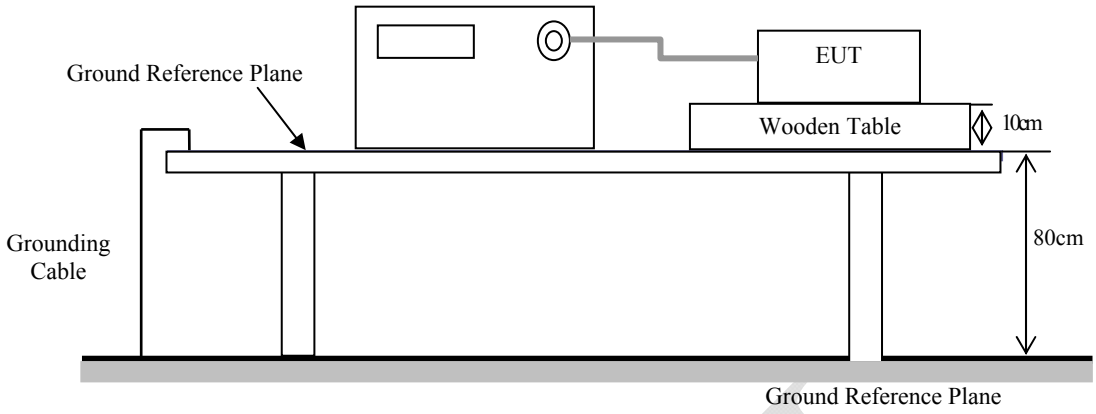
Level	Voltage	Poll	Path	Phase Angle	Pass	Fail
1	0.5kV	+	Line- neutral	90	A	/
1	0.5kV	-	Line- neutral	270	A	/
2	1kV	+	Line- neutral	90	A	/
2	1kV	-	Line- neutral	270	A	/

AC Port Test Setup Photo



9 - VOLTAGE DIPS AND SHORT INTERRUPTIONS IEC 61000-4-11

Test Setup



Test Standard

EN 55035:2017 (IEC 61000-4-11:2004)
Test levels and Performance Criterion

Test Level

Test Level	U2 (% Reduction)	Duration (Periods)	Performance Criteria
1	>95	0.5	B
2	30	25	C
3	>95	250	C

Test Procedure

1)The interruption is introduced at selected phase angles with specified duration.
2)Record any degradation of performance.

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Test Data

Please refer to following tables:

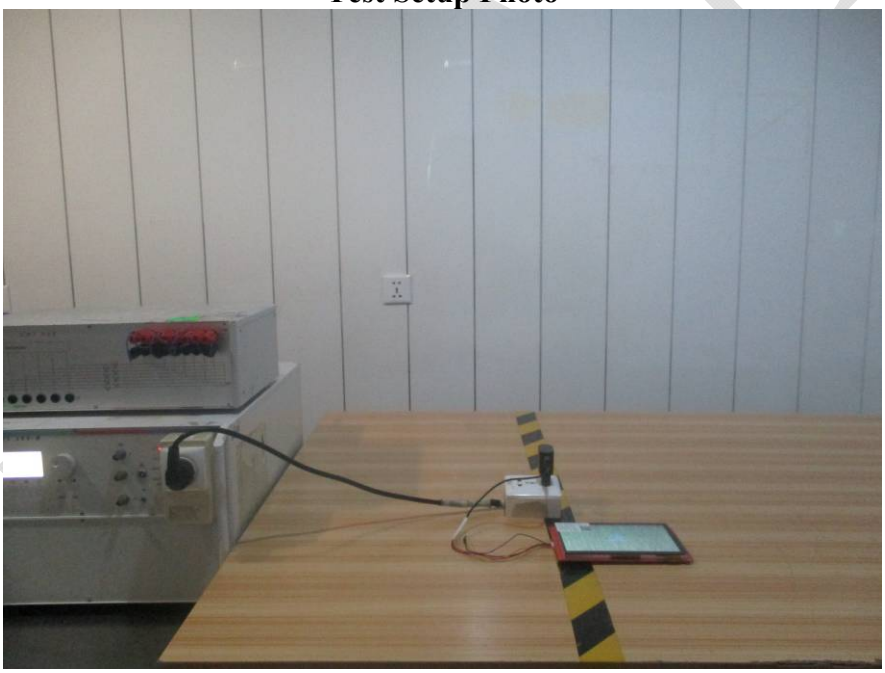
Test Mode: Normal Work

Note: B indicates that the EUT was power off when it was tested,but it could recover normal use after test be finished

Table 1: Voltage Dips/Interruptions Test

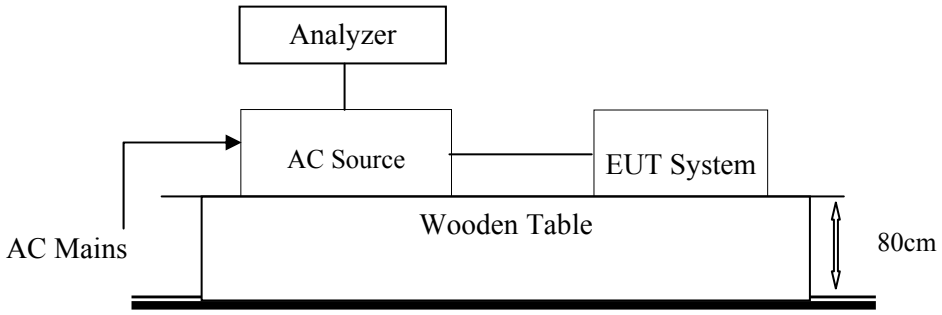
U2 (% Reduction)	Td (Periods)	Phase Angle	N	Result
>95	0.5P	0/90/180/270	3	A
30	25P	0/90/180/270	3	A
>95	250P	0/90/180/270	3	B

Test Setup Photo



11 - VOLTAGE FLUCTUATIONS AND FLICKER

Test System Setup



Test Standard

EN 61000-3-3:2013

Flicker Test Limits :

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.
The following limits apply:
– the value of Pst shall not be greater than 1,0;
– the value of Plt shall not be greater than 0,65;
– the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
– the relative steady-state voltage change, dc, shall not exceed 3,3 %;
– the maximum relative voltage change dmax, shall not exceed
a) 4 % without additional conditions;
b) 6 % for equipment which is:

– switched manually, or
– switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

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

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate

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of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data

Please refer to following tables:

Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Test Mode:	Normal Work
Power Source:	AC 230V/50Hz
Test Result	PASS

Maximum Flicker results

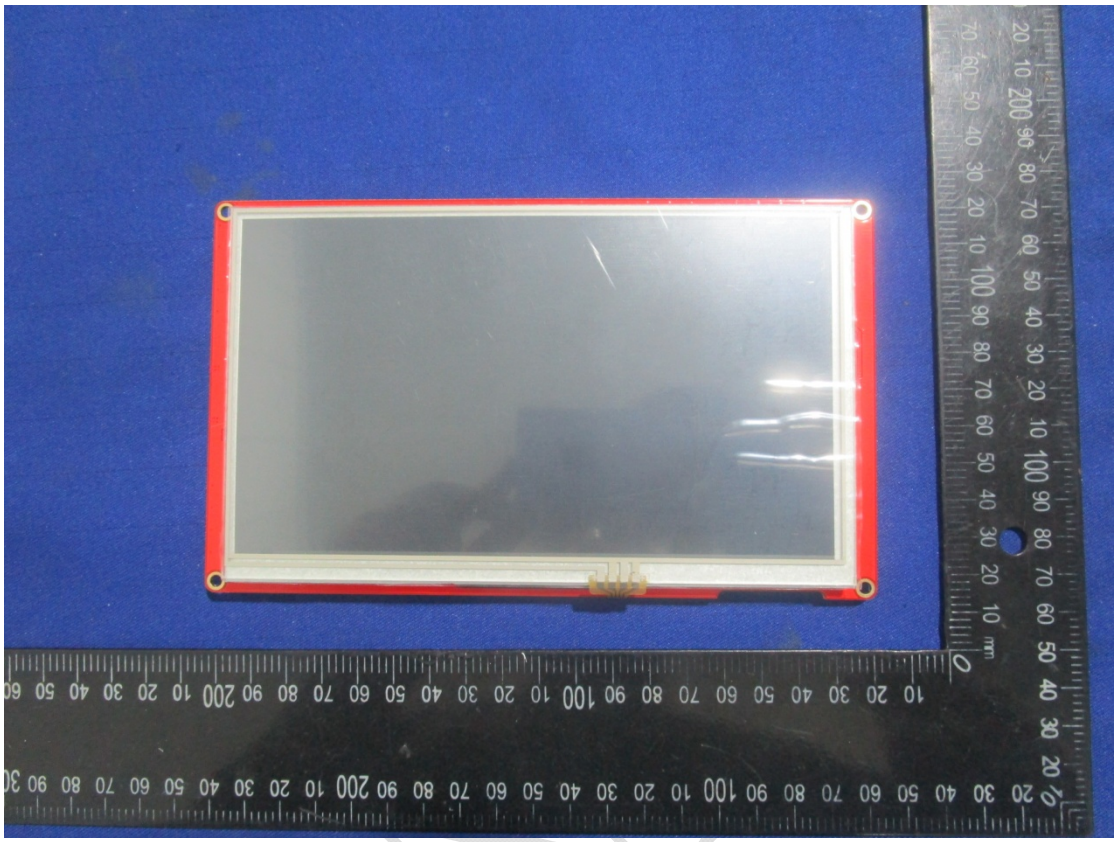
	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.005	3.30	PASS
dmax [%]	0.157	4.00	PASS
dt [s]	0.000	0.50	PASS

Test Setup Photo



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EXHIBIT A – EUT PHOTOGRAPHS



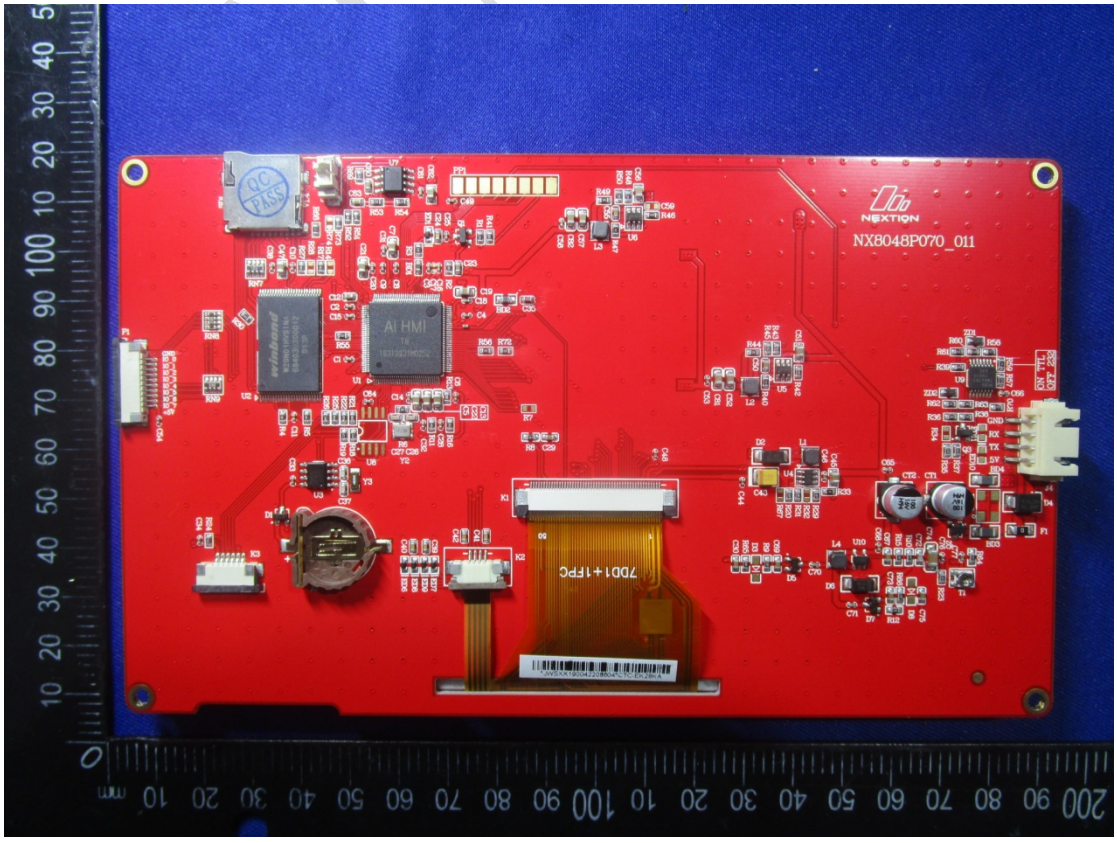


EXHIBIT B – TEST SETUP PHOTOGRAPHS

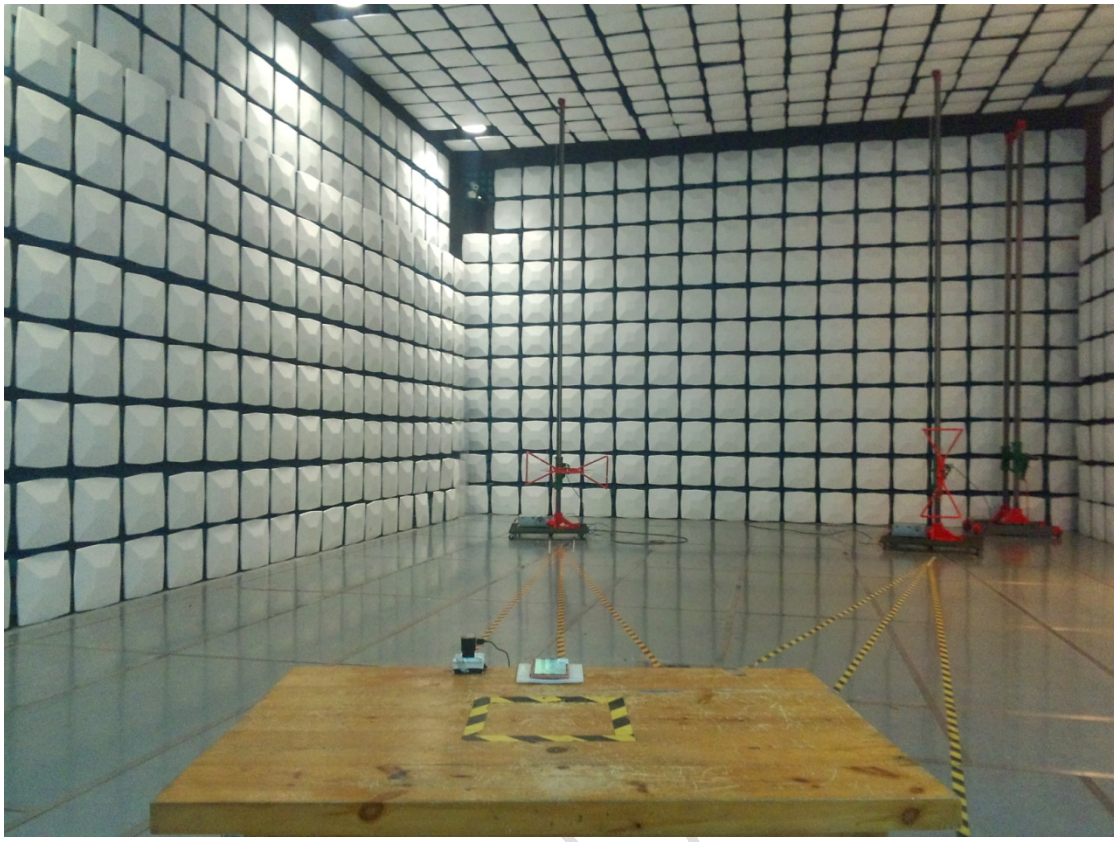
CE front View



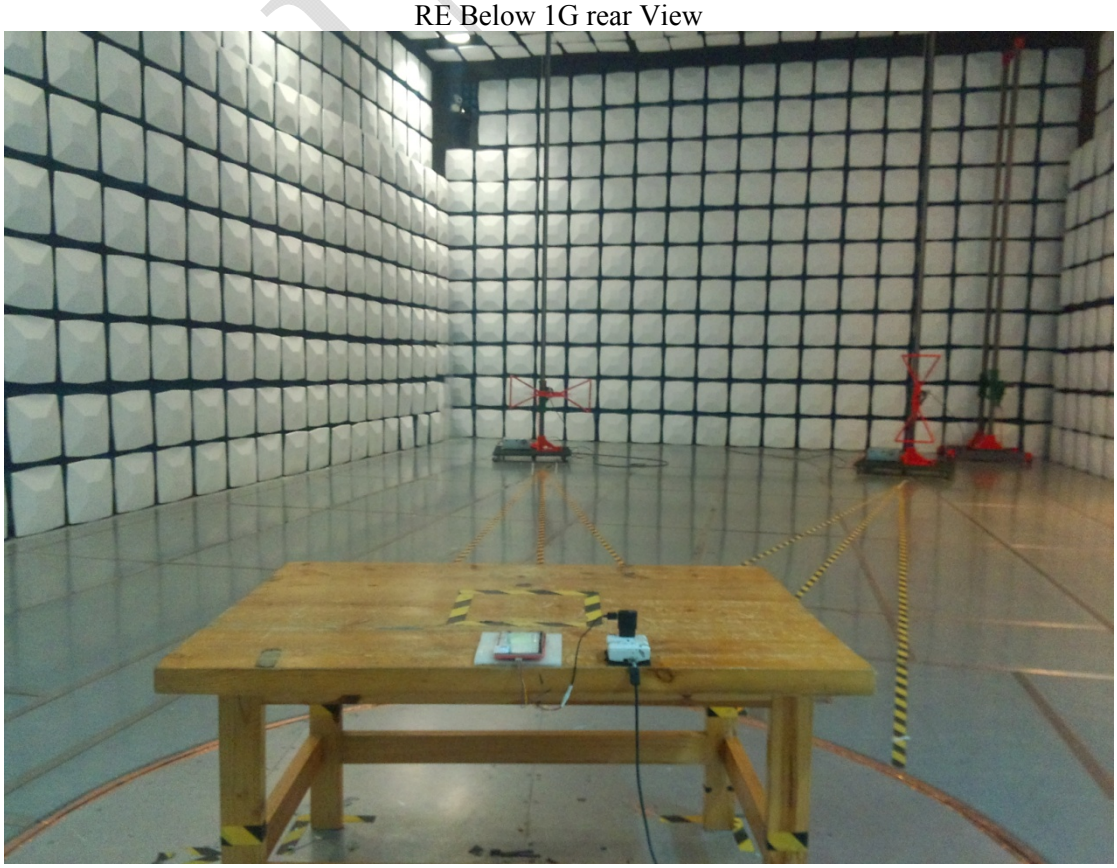
CE side View



RE Below 1G front View



RE Below 1G rear View



RE Above 1G front View



RE Above 1G rear View



*******END OF REPORT*******