

EMC Test Report

Report No.: AGC00552180502EE02

PRODUCT DESIGNATION : Smart Phone
BRAND NAME : CUBOT
MODEL NAME : P20
MANUFACTURER : Shenzhen Huafurui Technology Co., Ltd.
DATE OF ISSUE : Jun. 04, 2018
STANDARD(S) : EN 55032:2015/AC:2016
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 55035:2017
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 04, 2018	Valid	Initial release

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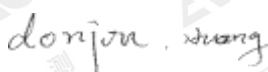
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1. VERIFICATION OF CONFORMITY

Manufacturer	Shenzhen Huafului Technology Co., Ltd.
Address	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen, P.R. China
Factory Name	Shenzhen Huafului Technology Co., Ltd.
Address	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen, P.R. China
Product Designation	Smart Phone
Brand Name	CUBOT
Test Model	P20
Hardware Version	HCT-S590MB-A2
Software Version	CUBOT_P20_8023C_V02_20180504
Date of test	May 18, 2018 to May 30, 2018
Deviation	None
Test Result	Pass
Report Template	AGCRT-EC-IT/AC

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in EU Directive and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements. The test results of this report relate only to the tested sample identified in this report.

Tested By



Donjon Huang(Huang Dongyang)

May 30, 2018

Reviewed By



Bart Xie(Xie Xiaobin)

Jun. 04, 2018

Approved By



 Forrest Lei(Lei Yonggang)
 Authorized Officer

Jun. 04, 2018

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2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION	
EMI TEST MODE	
Mode 1	Camera (By Adapter Charging)
Mode 2	Sound Recorder (By Adapter Charging)
Mode 3	Audio Play (By Adapter Charging)
Mode 4	Video Play (By Adapter Charging)
Mode 5	IDLE Mode (By Adapter Charging)
Mode 6	FM Mode (By Adapter Charging)
Mode 7	USB Mode (By PC data transferring)
EMS TEST MODE	
Mode 1	Camera (By Adapter Charging)
Mode 2	Sound Recorder (By Adapter Charging)
Mode 3	Audio Play (By Adapter Charging)
Mode 4	Video Play (By Adapter Charging)
Mode 5	IDLE Mode (By Adapter Charging)
Mode 6	FM Mode (By Adapter Charging)
Mode 7	USB Mode (By PC data transferring)
Note: 1. The above test modes in list items were carried out for all operation modes, only the worst test data recorded in the test report. 2.The EUT can be operated during charging via USB(adaptor or PC connection) 3. The USB port can be used for charging and also can be used to transfer data with PC.	

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by ISO.

- Uncertainty of Conducted Emission, $U_c = \pm 3.2\text{dB}$
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9\text{dB}$
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8\text{dB}$

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4. PRODUCT INFORMATION

Adapter Test Model Name	P20
Housing Type	Plastic
Power Supply	DC 5V, 2000mA

I/O Port Information (☒ Applicable ☐ Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
USB Port	1	0.8m, Unshielded	1
Earphone	1	-	-

Performance Criteria for EMS

All the test data has been collected, reduced, and analyzed within this report in accordance with Immunity requires the following as specific performance criteria:

- The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
- The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
- Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

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5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	B112-B113, Building 12, Baoan Building Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen, Guangdong, P.R.China
Description	There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The chamber and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	100694	June 29, 2017	June 28,2018
AMN/LISN	R&S	ESH2-Z5	100086	Aug.21,2017	Aug.20,2018
TEST SOFTWARE	FR	EZ-EMC	AGC-CON03 A	--	--

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	100694	June 29, 2017	June 28,2018
ANTENNA	SCHWARZBECK	VULB9168	D69250	Mar. 01, 2018	Feb. 28, 2020
POSITIONING CONTROLLER	MF	MF-7802	MF78020828 5	--	--
HORN ANTENNA	ETS LINDGREN	3117	00034609	Mar. 01, 2018	Feb. 28, 2020
TEST SOFTWARE	FR	EZ-EMC	Ver.RA-03A	--	--
CHAMBER	ETS	---	---	Mar. 01, 2018	Feb. 28, 2020

TEST EQUIPMENT OF POWER HARMONICS / VOLTAGE FLUCTUATION / FLICKER TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Aug.21,2017	Aug.20,2018
AC Source	Schaffner	NSG1007	56825	Aug.21,2017	Aug.20,2018

SURGE/EFT/DIPS

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Lightning Surge/EFT/DIPS Generator	Schaffner	Modula 6150	34437	Aug.21,2017	Aug.20,2018

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TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	Sep. 21, 2017	Sep. 20, 2018

TEST EQUIPMENT OF RS IMMUNITY TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Signal Generator	AGILENT	E8257D	MY45141029	Sep. 21, 2017	Sep. 20, 2018
ANTENNA	SCHWARZBECK	VULB9168	D69250	Mar. 01, 2018	Feb. 28, 2020
Power Probe	R&S	URV5-Z4	100124	June 29, 2017	June 28, 2018
POWER METER	R&S	NRVD	8323781027	June 29, 2017	June 28, 2018
POWER AMPLIFIER	KALMUS	7100LC	04-02/17-06-001	June 29, 2017	June 28, 2018
RF AMPLIFIER	Milmega	AS0104-55_55	1004793	June 29, 2017	June 28, 2018
HORN ANTENNA	ETS LINDGREN	3117	00034609	Mar. 01, 2018	Feb. 28, 2020
Power Amplifier	RF Light	NTWPAS-2560 100	2016051406	May. 13, 2018	May. 12, 2019

TEST EQUIPMENT OF CS IMMUNITY TEST

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Amplifier	AR	75A250	18464	June 29, 2017	June 28, 2018
CDN	Schaffner	M016	21264	Aug. 23, 2017	Aug. 22, 2018
6dB attenuator	JWF	50FHC-006-50	5N-20	Mar. 01, 2018	Feb. 28, 2019
Electromagnetic Injection Clamp	Luthi	EM101	35773	Aug. 21, 2017	Aug. 20, 2018
Power Probe	R&S	URV5-Z4	100124	June 29, 2017	June 28, 2018
POWER METER	R&S	NRVD	8323781027	June 29, 2017	June 28, 2018
Power Amplifier	KALMUS	7100LC	04-02/17-06-001	June 29, 2017	June 28, 2018
Signal Generator	R&S	SML01	104228	May. 26, 2017	May 25, 2018
Signal Generator	R&S	SML01	104228	May. 24, 2018	May 23, 2019

PFMF IMMUNITY TEST

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
PFMF Test apparatus	HTEC	HPFMF	161701	Dec. 08, 2017	Dec. 07, 2018
Magnetic field coil	HTEC	HPFMF	161701	Aug. 21, 2017	Aug. 20, 2018

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7. EN 55032 LINE CONDUCTED EMISSION TEST

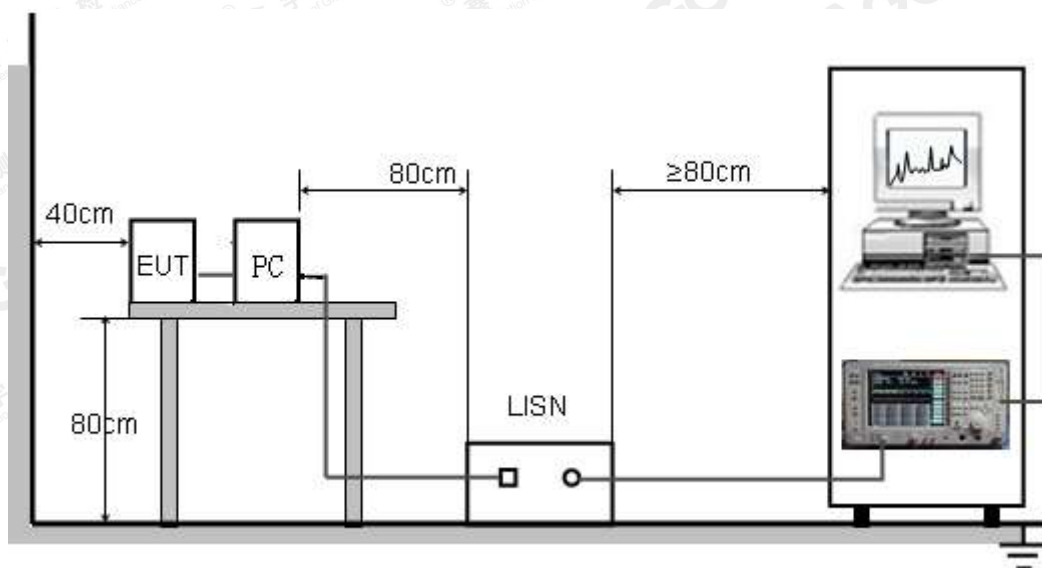
7.1. LIMITS OF LINE CONDUCTED EMISSION TEST

EN 55032 Table clause	Frequency range (MHz)	Coupling device	Detector type / bandwidth	Class B limits (dBuV)
A10.1	0.15 - 0.5	AMN/LISN	Quasi-peak / 9kHz	66 - 56
	0.5 - 5			56
	5 - 30.0			60
A10.1	0.15 - 0.5		Average / 9kHz	56 - 46
	0.5 - 5			46
	5 - 30.0			50

Note:

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

7.2. BLOCK DIAGRAM OF TEST SETUP



Note: 1. Support units were connected to second LISN/AMN.

2. The distance specified between EUT/AE and other metallic objects is ≥ 0.8 m in the measurement arrangement for table-top EUT.

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

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7.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

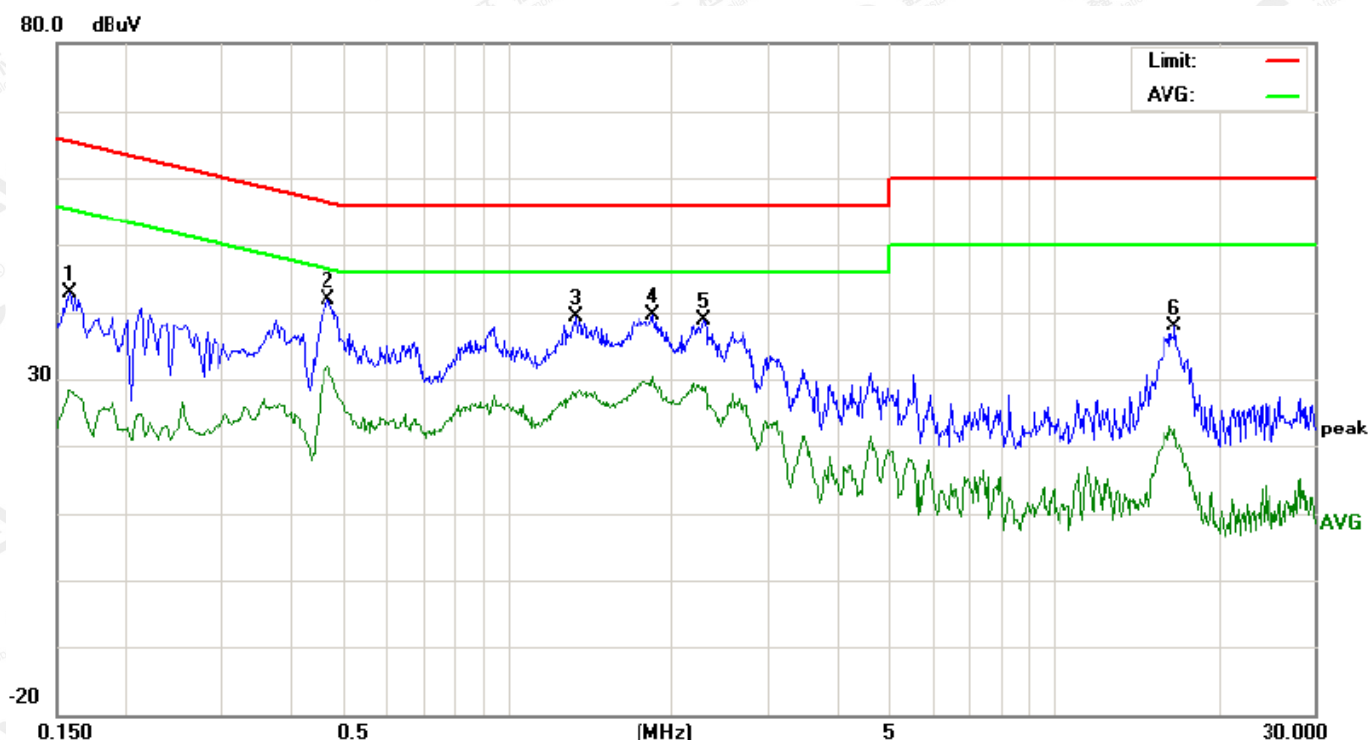
- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN55032.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN55032.
- (4) The EUT received AC230V/50Hz power through a Line Impedance Stabilization Network (LISN/AMN) which supplied power source and was grounded to the ground plane.
- (5) All support equipments received power from a second LISN supplying power of AC 230V/50Hz, if any.
- (6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- (7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
- (8) During the above scans, the emissions were maximized by cable manipulation.
- (9) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
- (10) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

Note: The test modes were carried out for all operation modes
The worst case (Mode 4) was showed as the follow:

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7.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

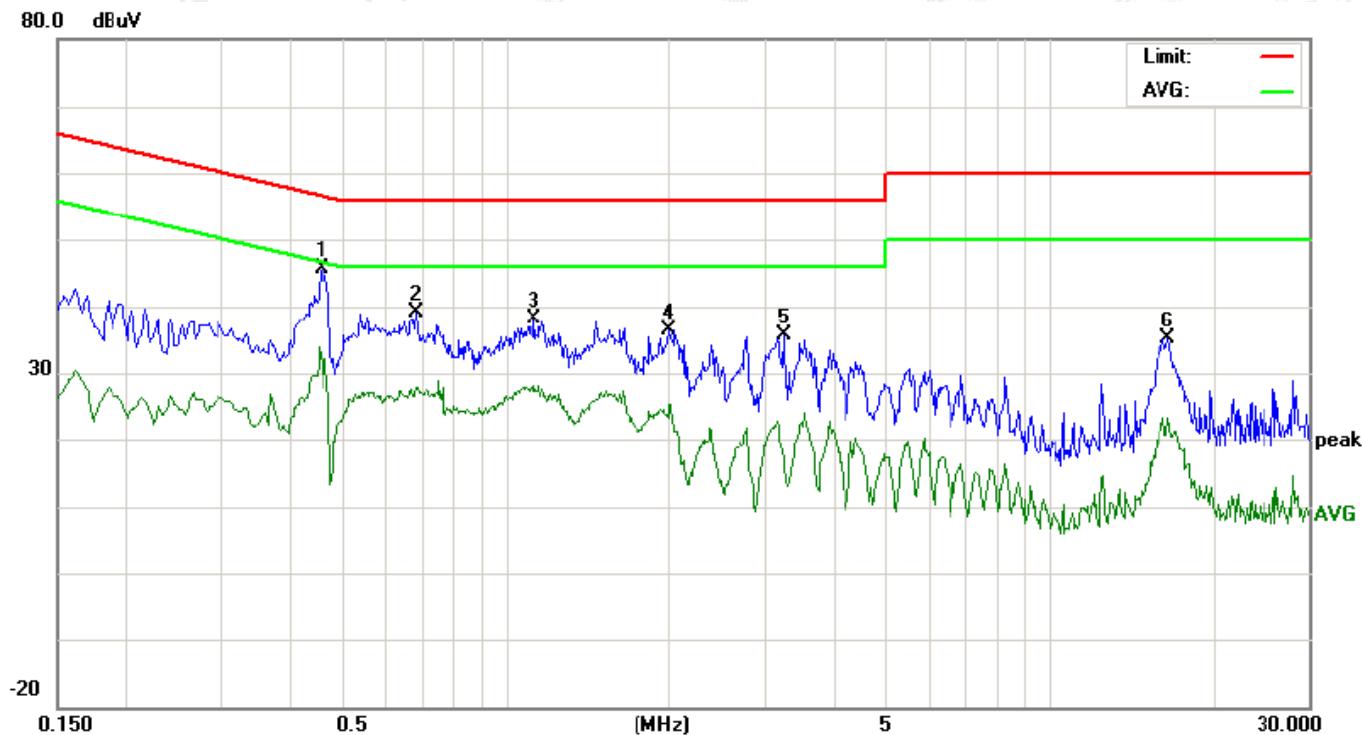
LINE CONDUCTED EMISSION TEST-L



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor (dB)	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1582	32.76		18.18	10.17	42.93		28.35	65.55	55.55	-22.62	-27.20	P	
2	0.4700	31.49		21.39	10.38	41.87		31.77	56.51	46.51	-14.64	-14.74	P	
3	1.3420	29.02		17.18	10.38	39.40		27.56	56.00	46.00	-16.60	-18.44	P	
4	1.8580	29.28		20.04	10.27	39.55		30.31	56.00	46.00	-16.45	-15.69	P	
5	2.2860	28.47		18.10	10.34	38.81		28.44	56.00	46.00	-17.19	-17.56	P	
6	16.7019	27.65		12.42	10.12	37.77		22.54	60.00	50.00	-22.23	-27.46	P	

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LINE CONDUCTED EMISSION TEST-N



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor (dB)	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.4587	35.28		21.27	10.37	45.65		31.64	56.72	46.72	-11.07	-15.08	P	
2	0.6860	28.70		17.56	10.34	39.04		27.90	56.00	46.00	-16.96	-18.10	P	
3	1.1340	27.78		17.79	10.37	38.15		28.16	56.00	46.00	-17.85	-17.84	P	
4	1.9940	26.23		13.16	10.22	36.45		23.38	56.00	46.00	-19.55	-22.62	P	
5	3.2420	25.11		6.81	10.53	35.64		17.34	56.00	46.00	-20.36	-28.66	P	
6	16.5539	25.01		13.28	10.12	35.13		23.40	60.00	50.00	-24.87	-26.60	P	

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8. EN 55032 RADIATED EMISSION TEST

8.1. LIMITS OF RADIATED DISTURBANCES

Radiated Emission at Frequencies up to 1GHz

For Class B Equipment SAC/OATS

EN 55032 Table clause	Frequency range (MHz)	Distance (m)	Detector type	Limits (dBuV/m)
A4.1	30 - 230	10	Quasi Peak	30
	230 - 1000			37
A4.2	30 - 230	3	Quasi Peak	40
	230 - 1000			47

Radiated Emission at Frequencies above 1GHz

For Class B Equipment FSOATS

EN 55032 Table clause	Frequency range (MHz)	Distance (m)	Detector type	Limits (dBuV/m)
A5.1	1000 - 3000	3	Average	50
	3000 - 6000			54
A5.2	1000 - 3000		Peak	70
	3000 - 6000			74

Note: The lower limit shall apply at the transition frequency.

Required highest frequency for radiated measurement

EN 55032 Table clause	Highest internal frequency (Fx)	Highest measured frequency
1	$F_x \leq 108 \text{ MHz}$	1 GHz
	$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
	$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
	$F_x > 1$	5 x Fx up to a maximum of 6 GHz

NOTE 1 For TV and FM broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

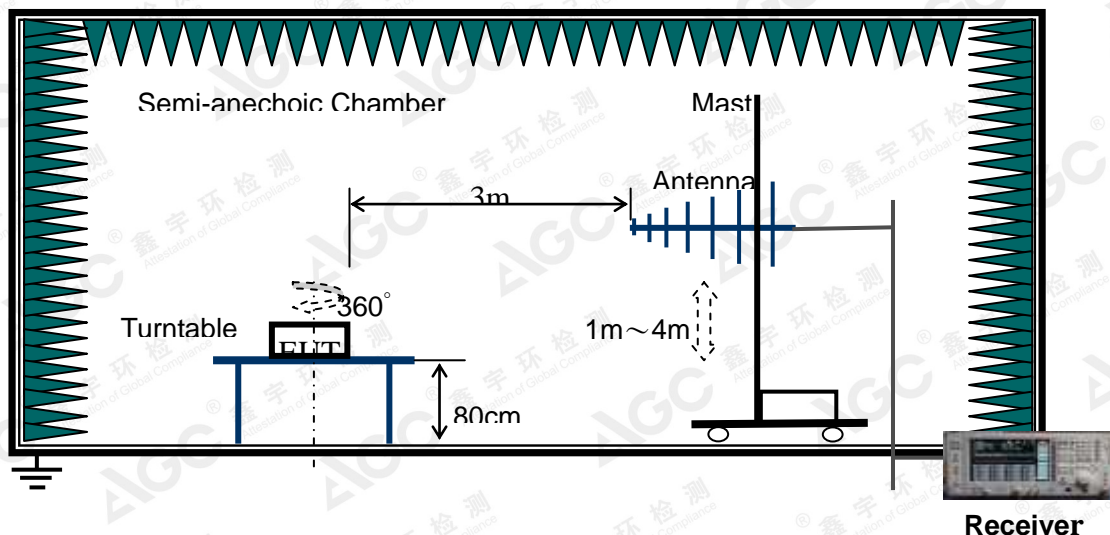
NOTE 2 Fx is highest fundamental frequency generated or used within the EUT or highest frequency at which it operates.

Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz.

8.2. BLOCK DIAGRAM OF TEST SETUP

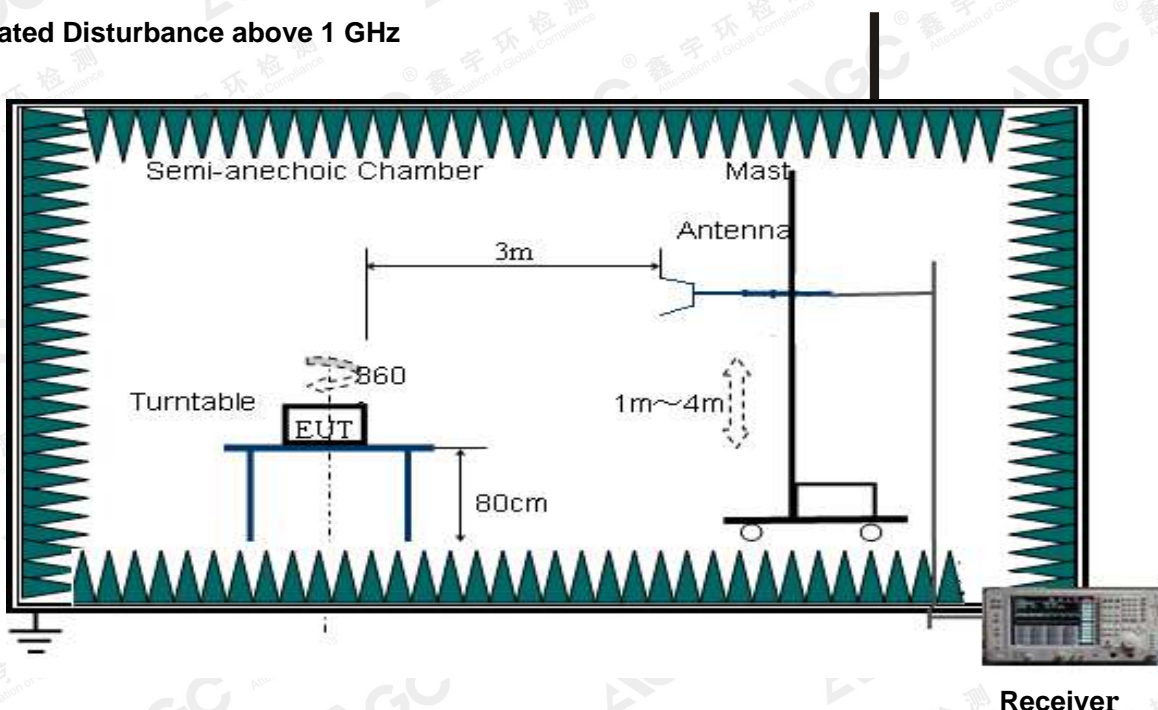
System Diagram of Connections between EUT and Simulators

Radiated Disturbance 30M to1 GHz



Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.

Radiated Disturbance above 1 GHz



Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.

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

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8.3. PROCEDURE OF RADIATED EMISSION TEST

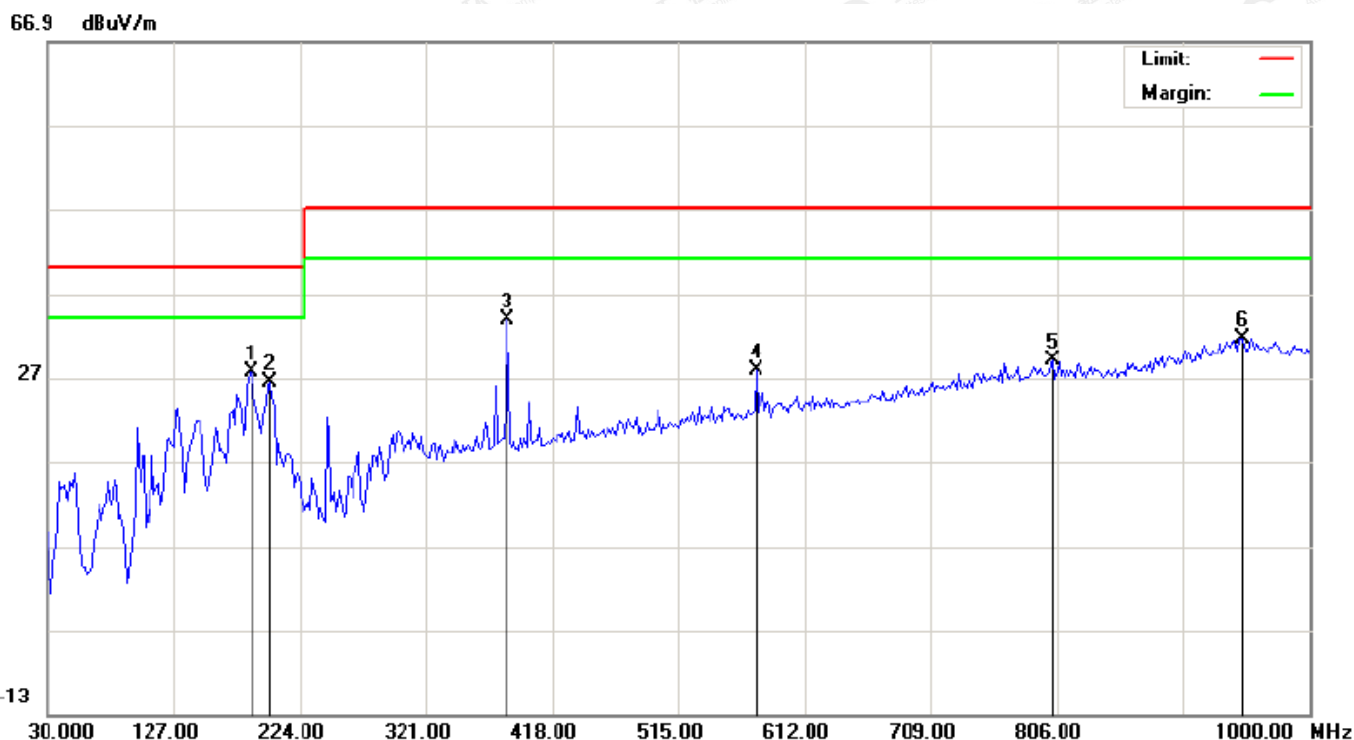
- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN 55032.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN 55032.
- (4) The EUT received AC230V/50Hz power through the outlet socket under the turntable. All support equipments received AC230V/50Hz power from socket under the turntable, if any.
- (5) The antenna was placed at 3 meter away from the EUT as stated in EN 55032. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- (6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (6) The Analyzer / Receiver quickly scanned from 1GHz to 6000MHz. The EUT test program was started.
- (7) The test mode(s) were scanned during the test:
- (8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

Note: The test modes were carried out for all operation modes
The worst case (Mode 4) was showed as the follow:

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8.4. TEST RESULT OF RADIATED EMISSION TEST

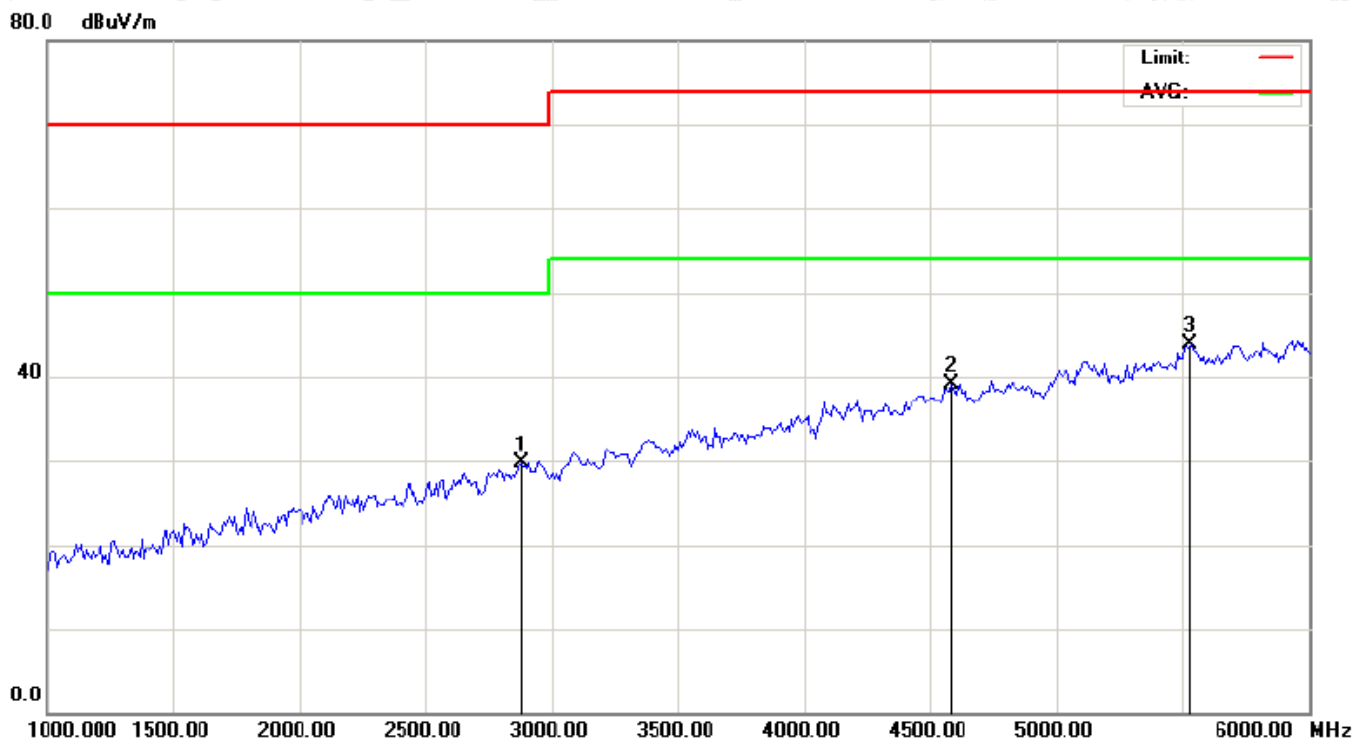
RADIATED EMISSION BELOW 1GHZ- HORIZONTAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	186.8167	16.23	11.39	27.62	40.00	-12.38	peak			
2		201.3667	14.55	11.86	26.41	40.00	-13.59	peak			
3		384.0500	14.92	18.96	33.88	47.00	-13.12	peak			
4		574.8167	4.66	23.10	27.76	47.00	-19.24	peak			
5		802.7667	1.62	27.32	28.94	47.00	-18.06	peak			
6		948.2667	1.71	29.95	31.66	47.00	-15.34	peak			

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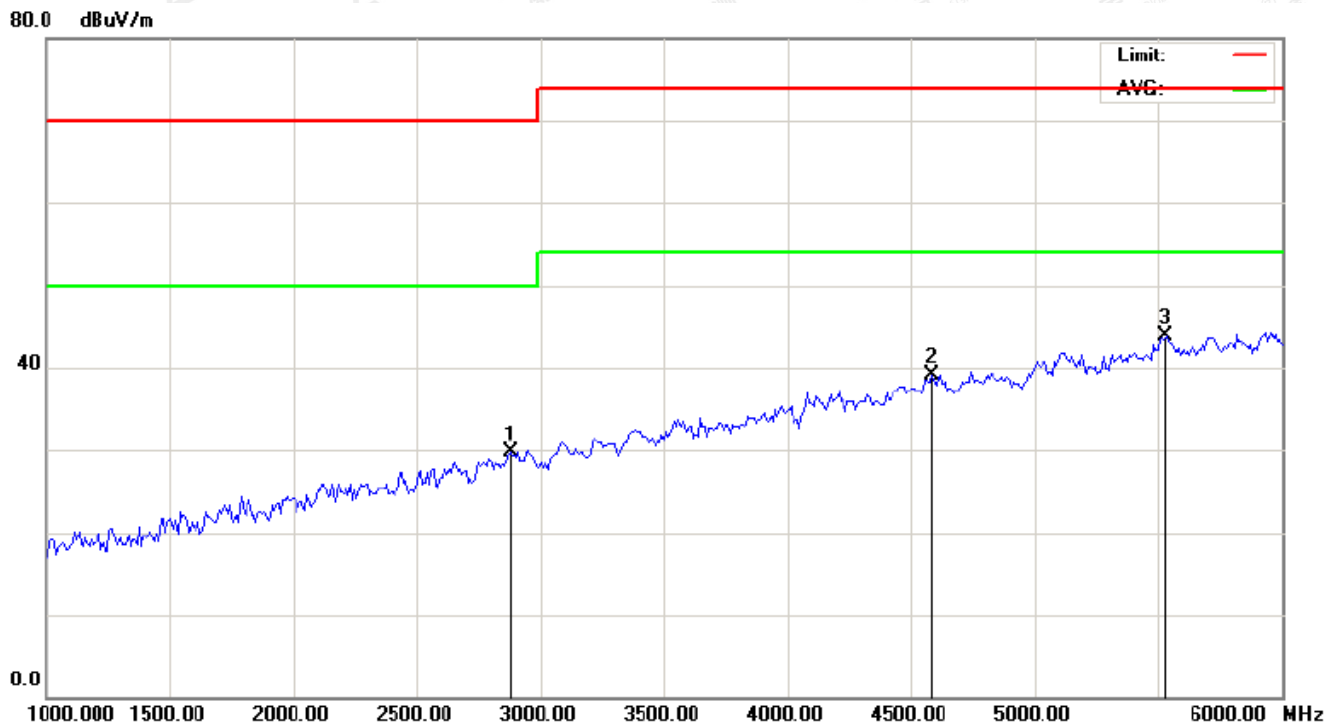
RADIATED EMISSION BELOW 1GHZ- VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	41.3167	25.98	8.81	34.79	40.00	-5.21	peak			
2	*	130.2332	25.36	11.13	36.49	40.00	-3.51	peak			
3	!	157.7167	20.57	15.32	35.89	40.00	-4.11	peak			
4		278.9667	15.58	14.77	30.35	47.00	-16.65	peak			
5		384.0500	13.78	18.96	32.74	47.00	-14.26	peak			
6		767.2000	6.72	26.87	33.59	47.00	-13.41	peak			

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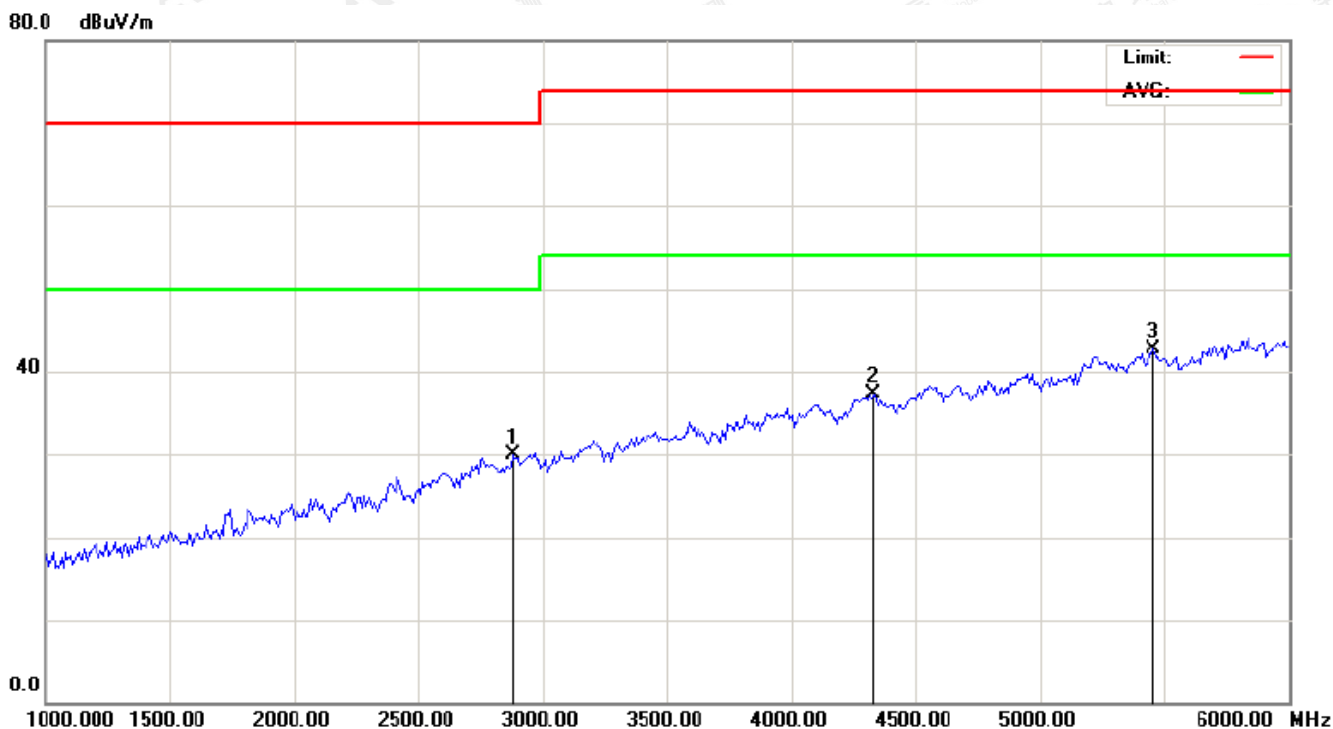
RADIATED EMISSION ABOVE 1GHZ – HORIZONTAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2883.333	13.55	16.14	29.69	70.00	-40.31	peak			
2		4583.333	23.95	15.20	39.15	74.00	-34.85	peak			
3	*	5533.333	28.12	15.85	43.97	74.00	-30.03	peak			

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RADIATED EMISSION ABOVE 1GHZ – VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2883.333	13.79	16.14	29.93	70.00	-40.07	peak			
2		4333.333	21.48	15.82	37.30	74.00	-36.70	peak			
3	*	5458.333	26.81	15.82	42.63	74.00	-31.37	peak			

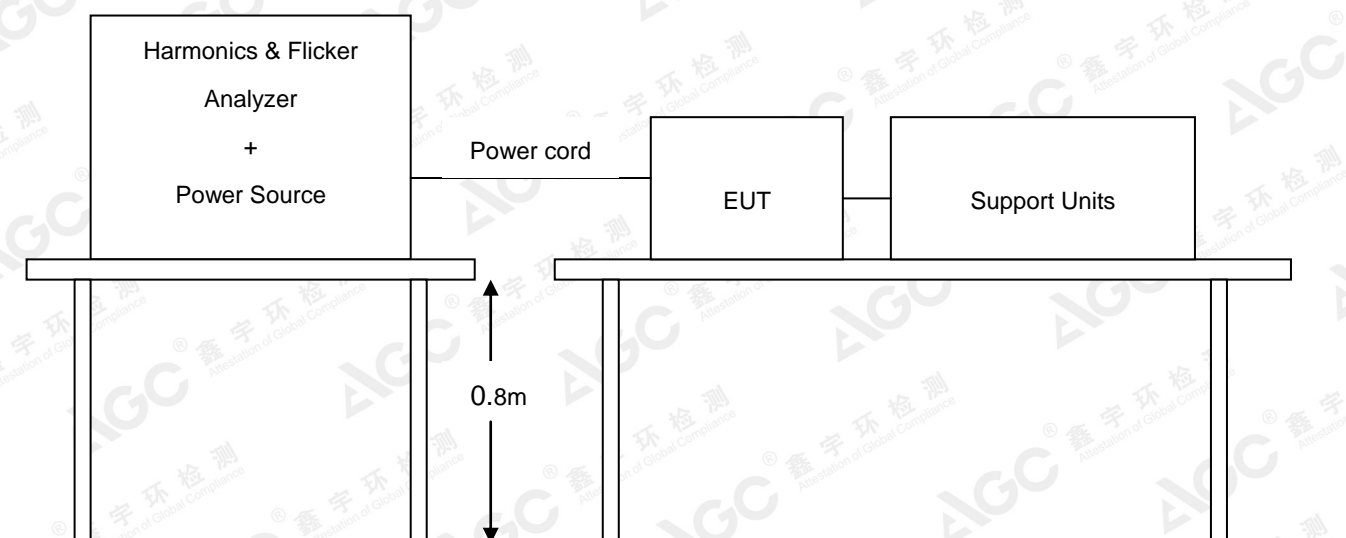
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9. EN 61000-3-2 POWER HARMONICS TEST

POWER HARMONICS MEASUREMENT

Port	AC mains
Basic Standard	EN 61000-3-2
Product Standard	EN 55035
Limits	<input checked="" type="checkbox"/> CLASS A ; <input type="checkbox"/> CLASS B ; <input type="checkbox"/> CLASS C; <input type="checkbox"/> CLASS D
Tester	Donjon
Temperature	25°C
Humidity	55%

9.1. BLOCK DIAGRAM OF TEST SETUP



9.2. RESULT

Note: Owing to the power of EUT is less than 75W, so test is not applicable.

10. EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port	AC mains
Basic Standard	EN 61000-3-3
Product Standard	EN 55035
Limits	§5 of EN 61000-3-3
Tester:	Donjon
Temperature	22.2°C
Humidity	56.8%

10.1. LIMITS OF VOLTAGE FLUCTUATION AND FLICKER

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax	≤ 4%	≤ 4%	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

10.2. TEST PROCEDURE

a. Harmonic Current Test:

Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

b. Fluctuation and Flickers Test:

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

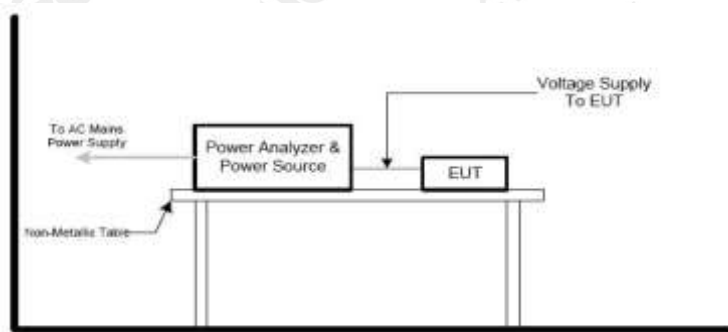
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

10.3. EUT OPERATING CONDITION

The EUT tested system was configured as the statements of 2.2 Unless otherwise a special operating condition is specified in the follows during the testing.

10.4. BLOCK DIAGRAM OF TEST SETUP



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10.5. THE RESULT

Note: The test modes were carried out for all operation modes

The worst case _ MODE 4(By Adapter Charging) was showed as the follow:

Flicker Test Summary per EN/EN 61000-3-3 (Run time)

EUT: Smart Phone

Tested by: Donjon

Test category: All parameters (European limits)

Test Margin: 100

Test date: May 25, 2018

Start time: 17:23:03

End time: 17:33:03

Test duration (min): 10

Data file name: unnamed

Comment: On

Customer: Shenzhen Huafurui Technology Co., Ltd.

Parameter values recorded during the test:

Test Parameter	Measurement Value	Limit	Remarks
P_{st}	0.05	1.0	Pass
P_{lt}	0.03	0.65	Pass
$T_{dt(s)}$	0.00	0.5	Pass
$d_{max}(\%)$	0.74%	4%	Pass
$d_c(\%)$	0.13%	3.3%	Pass

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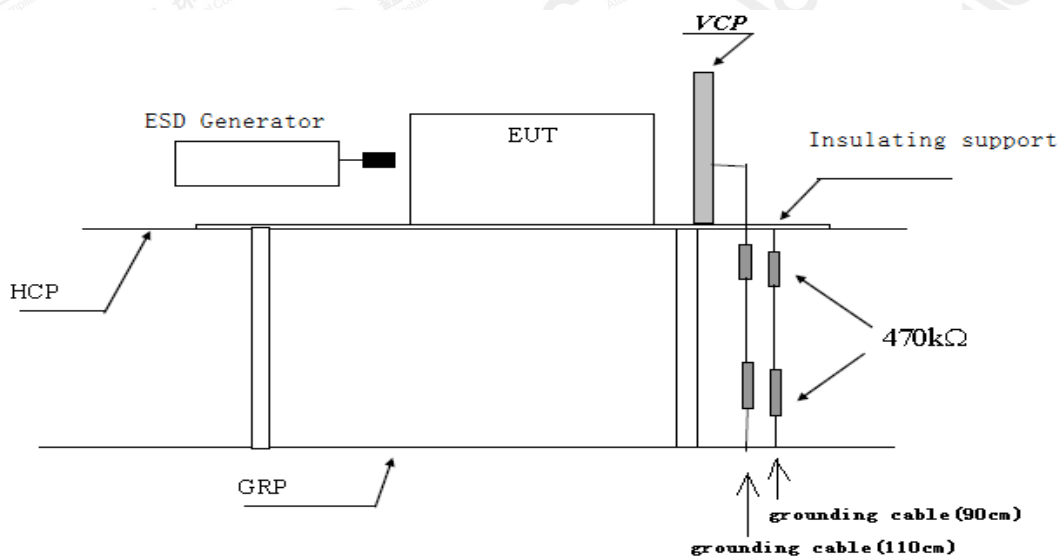
11. EN 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-2
Product Standard	EN 55035
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Tester	Donjon
Temperature	22.4°C
Humidity	56.3%

11.1. BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



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11.2. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.

The support units were located 1 m minimum away from the EUT.

EUT worked with resistance load, and make sure EUT worked normally.

Active the communication function if the EUT with such port(s).

As per the requirement of EN 55035; applying direct contact discharge at the sides other than front of EUT at minimum 50 discharges (25 positive and 25 negative) if applicable, can't be applied direct contact discharge side of EUT then the indirect discharge shall be applied. One of the test points shall be subjected to at least 50 indirect discharge (contact) to the front edge of horizontal coupling plane.

Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.

The application of ESD to the contact of open connectors is not required.

Note: As per the A2 to EN 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

TEST RESULT:

Note: The test modes were carried out for all operation modes

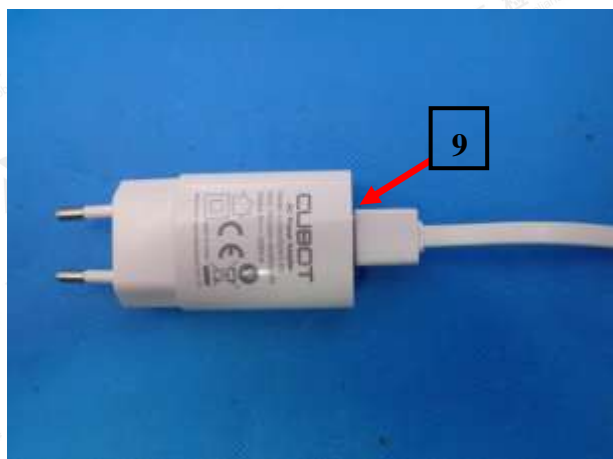
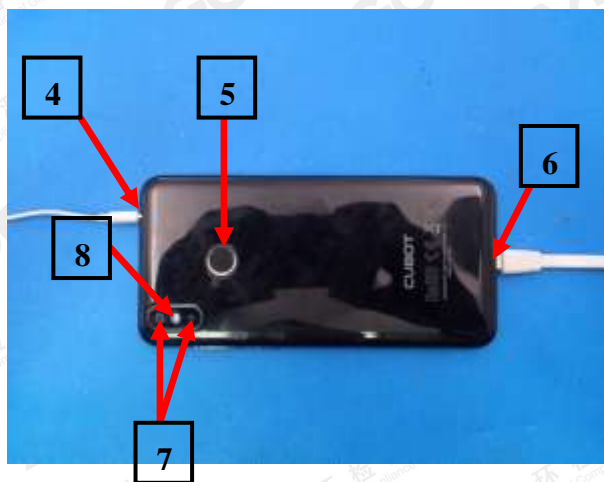
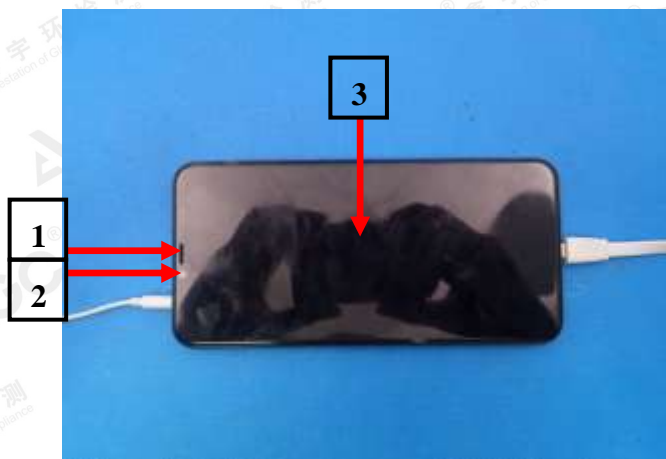
The worst case _Mode 2 (by adapter charging) was showed as the follow:

The electrostatic discharges were applied as follows:

Voltage	Coupling	Test Performance	Performance Result	Result (Pass/Fail)
±2kV; ±4kV	Contact Discharge	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge HCP (Front)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge HCP (Left)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge HCP (Back)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge HCP (Right)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge VCP (Front)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge VCP (Left)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge VCP (Back)	No function loss	A	Pass
±2kV; ±4kV	Indirect Discharge VCP (Right)	No function loss	A	Pass
±2kV; ±4kV; ±8kV	Air Discharge	No function loss	A	Pass

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Discharge points:



Note: The air discharge points are 1~3 and 7~8. The contact discharge points are 4~6 and 9.

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11.3. PERFORMANCE

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ **PASS**

☐ **FAIL**

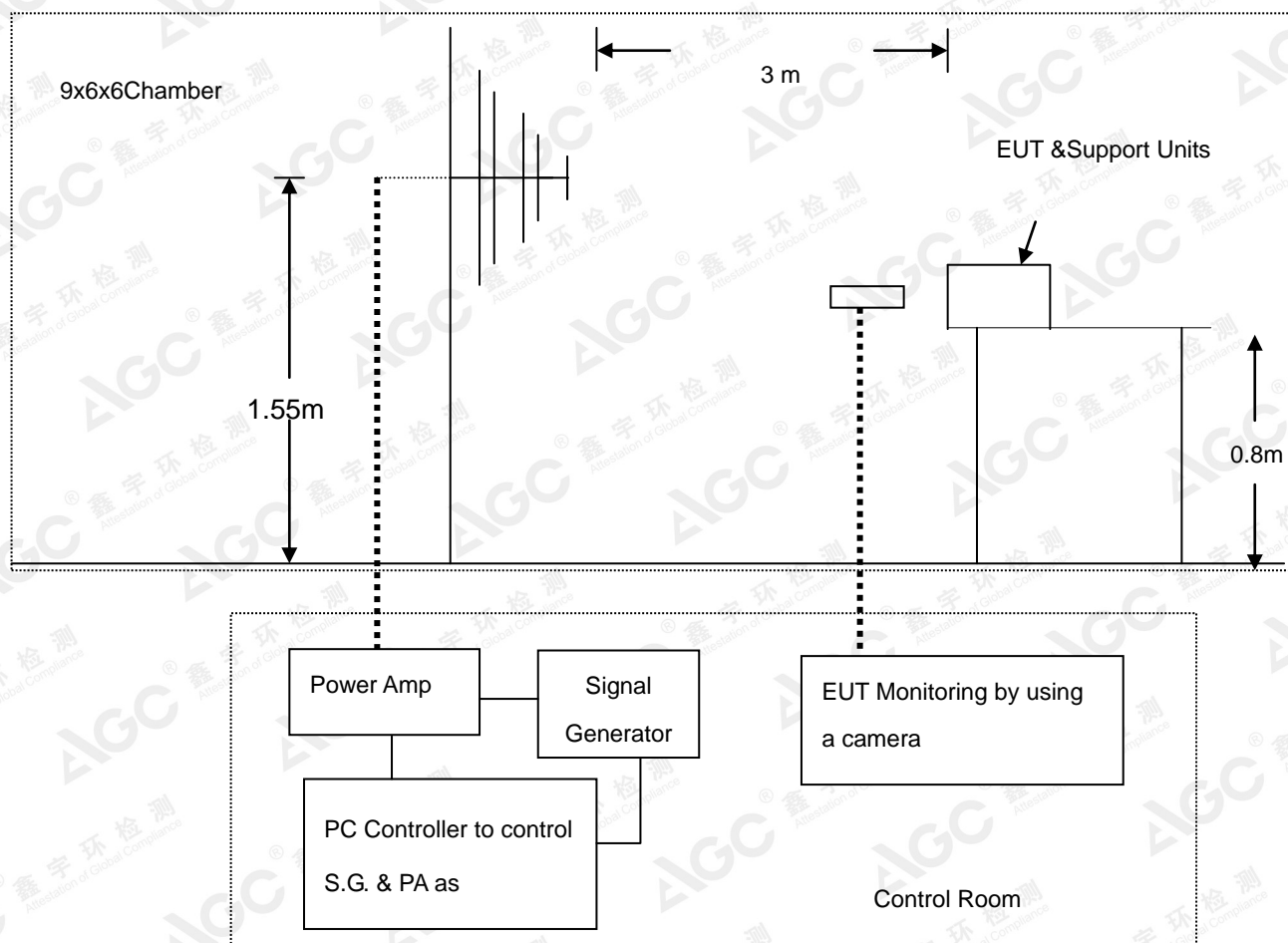
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12. EN 61000-4-3 RS IMMUNITY TEST

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-3
Product Standard	EN 55035
Test Level:	3V/m with 80% AM. 1kHz Modulation.
Standard require	A
Tester	Donjon
Temperature	23.1°C
Humidity	56.3%

12.1. BLOCK DIAGRAM OF TEST SETUP



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12.2. TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per EN 61000-4-3.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the testing parameters of RS test software per EN 61000-4-3.

Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz, 1,8 GHz, 2,6 GHz, 3,5 GHz, 5 GHz.

Recording the test result in following table.

EN 61000-4-3 Final test conditions:

Test level: 3V/m

Steps: 1 % of fundamental

Dwell Time: 1 sec

TEST RESULT:

Note: The test modes were carried out for all operation modes

The worst case _ Mode 4 (by adapter charging) was showed as the follow:

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Performance Result	Result (Pass/Fail)
80-1000	3V/m	AM	H	Front	No function loss	A	Pass
80-1000	3V/m	AM	H	Left	No function loss	A	Pass
80-1000	3V/m	AM	H	Back	No function loss	A	Pass
80-1000	3V/m	AM	H	Right	No function loss	A	Pass
80-1000	3V/m	AM	V	Front	No function loss	A	Pass
80-1000	3V/m	AM	V	Left	No function loss	A	Pass
80-1000	3V/m	AM	V	Back	No function loss	A	Pass
80-1000	3V/m	AM	V	Right	No function loss	A	Pass
1800	3V/m	AM	H	Front	No function loss	A	Pass
1800	3V/m	AM	H	Left	No function loss	A	Pass
1800	3V/m	AM	H	Back	No function loss	A	Pass
1800	3V/m	AM	H	Right	No function loss	A	Pass
1800	3V/m	AM	V	Front	No function loss	A	Pass
1800	3V/m	AM	V	Left	No function loss	A	Pass
1800	3V/m	AM	V	Back	No function loss	A	Pass
1800	3V/m	AM	V	Right	No function loss	A	Pass
2600	3V/m	AM	H	Front	No function loss	A	Pass

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2600	3V/m	AM	H	Left	No function loss	A	Pass
2600	3V/m	AM	H	Back	No function loss	A	Pass
2600	3V/m	AM	H	Right	No function loss	A	Pass
2600	3V/m	AM	V	Front	No function loss	A	Pass
2600	3V/m	AM	V	Left	No function loss	A	Pass
2600	3V/m	AM	V	Back	No function loss	A	Pass
2600	3V/m	AM	V	Right	No function loss	A	Pass
3500	3V/m	AM	H	Front	No function loss	A	Pass
3500	3V/m	AM	H	Left	No function loss	A	Pass
3500	3V/m	AM	H	Back	No function loss	A	Pass
3500	3V/m	AM	H	Right	No function loss	A	Pass
3500	3V/m	AM	V	Front	No function loss	A	Pass
3500	3V/m	AM	V	Left	No function loss	A	Pass
3500	3V/m	AM	V	Back	No function loss	A	Pass
3500	3V/m	AM	V	Right	No function loss	A	Pass
5000	3V/m	AM	H	Front	No function loss	A	Pass
5000	3V/m	AM	H	Left	No function loss	A	Pass
5000	3V/m	AM	H	Back	No function loss	A	Pass
5000	3V/m	AM	H	Right	No function loss	A	Pass
5000	3V/m	AM	V	Front	No function loss	A	Pass
5000	3V/m	AM	V	Left	No function loss	A	Pass
5000	3V/m	AM	V	Back	No function loss	A	Pass
5000	3V/m	AM	V	Right	No function loss	A	Pass

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12.3. PERFORMANCE

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ **PASS**

☐ **FAIL**

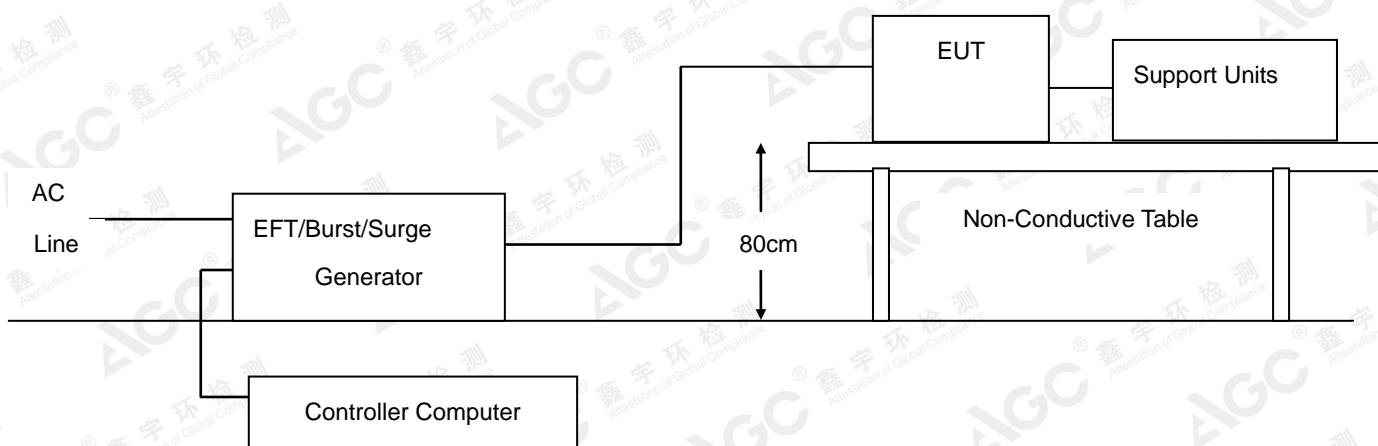
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13. EN 61000-4-4 EFT IMMUNITY TEST

ELECTRICAL FAST TRANSIENTS/BURST IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-4
Product Standard	EN 55035
Test Level	+/- 1kV for Power Supply Lines
Standard require	B
Tester	Donjon
Temperature	22.6°C
Humidity	56.1%

13.1. BLOCK DIAGRAM OF TEST SETUP



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13.2. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8m away from ground reference plane.
A 1.0 meter long power cord was attached to EUT during the test.
The length of communication cable between communication port and clamp was keeping within 1 meter.
EUT worked with resistance load, and make sure EUT worked normally.
Related peripherals work during the test.
Recording the test result as shown in following table.

Test conditions:

Impulse Frequency: 5 kHz
Tr/Th: 5/50ns
Burst Duration: 15ms
Burst Period: 300ms

TEST RESULT:

Note: The test modes were carried out for all operation modes
The worst case _ Mode 4(By Adapter Charging) was showed as the follow:

Inject Line	Voltage kV	Inject Method	Test Performance	Performance Result	Result (Pass/Fail)
L+N	+/- 1	Indirect	No function loss	A	Pass

13.3. PERFORMANCE

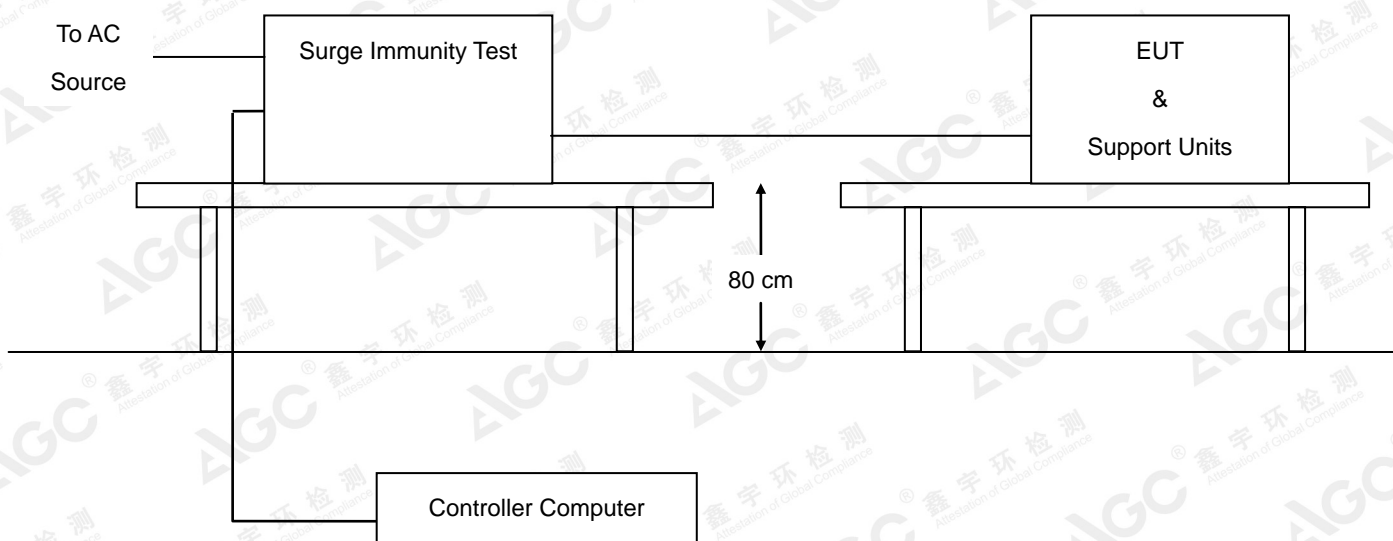
<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.
<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

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14. EN 61000-4-5 SURGE IMMUNITY TEST SURGE IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-5
Product Standard	EN 55035
Requirements	+/- 1kV (Line to Line)
Standard require	B
Tester	Donjon
Temperature	23.1°C
Humidity	55.3%

14.1. BLOCK DIAGRAM OF TEST SETUP



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14.2. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8 m away from ground floor.

EUT worked with resistance load, and make sure EUT worked normally.

Recording the test result as shown in following table.

Test conditions:

Voltage Waveform	1.2/50 μ s
Current Waveform	8/20 μ s
Polarity	Positive/Negative
Phase angle	0°, 180°, 90°, 270°
Number of Test	5

TEST RESULT:

Note: The test modes were carried out for all operation modes

The worst case _ Mode 4(By Adapter Charging) was showed as the follow:

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Test Performance	Performance Result	Result (Pass/Fail)
L1-N	1	Positive	Capacitive	No function loss	A	Pass
L1-N	1	Negative	Capacitive	No function loss	A	Pass

14.3. PERFORMANCE

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

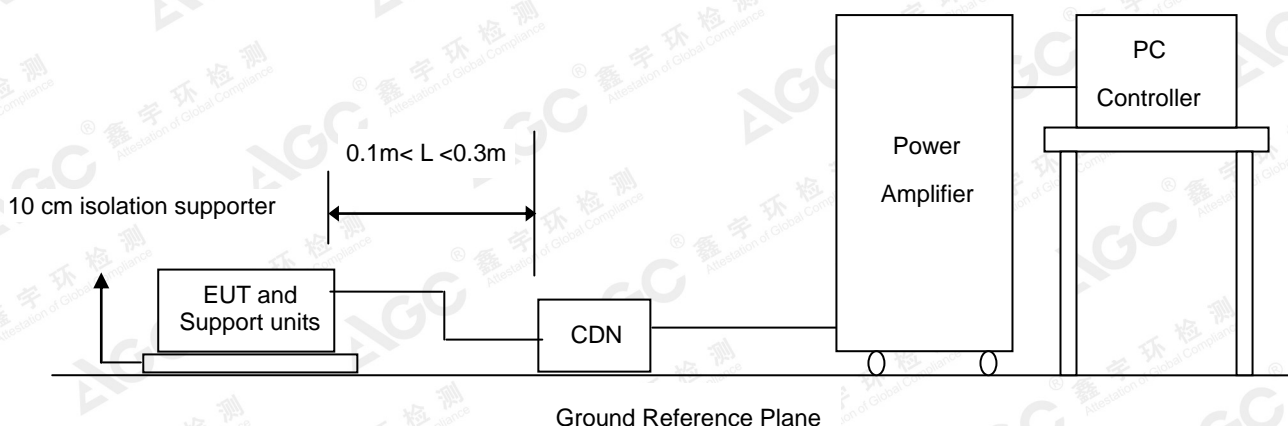
<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
---	--------------------------------------

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15. EN 61000-4-6 CS IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-6
Product Standard	EN 55035
Requirements	0.15 MHz ~10MHz 3V with 80% AM. 1 kHz Modulation 10 MHz ~30MHz 3V to 1V with 80% AM. 1 kHz Modulation 30 MHz ~80MHz 1V with 80% AM. 1 kHz Modulation
Standard require	A
Tester	Donjon
Temperature	22.5°C
Humidity	55.7%

15.1. BLOCK DIAGRAM OF TEST SETUP



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15.2. TEST PROCEDURE

The EUT and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.

EUT worked with resistance load, and make sure EUT worked normally.

Related peripherals work during the test.

Setting the testing parameters of CS test software per EN 61000-4-6.

Recording the test result in following table.

Test conditions:

Frequency Range	0.15MHz-80MHz
Frequency Step	1% of fundamental
Dwell Time	1 sec

TEST RESULT:

Note: The test modes were carried out for all operation modes

The worst case _ MODE 4(By Adapter Charging) was showed as the follow:

Range (MHz)	Strength	Modulation	Performance Result	Result (Pass/Fail)
0.15-10	3V	AM	A	Pass
10-30	3V to 1V	AM	A	Pass
30-80	1V	AM	A	Pass

15.3. PERFORMANCE

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

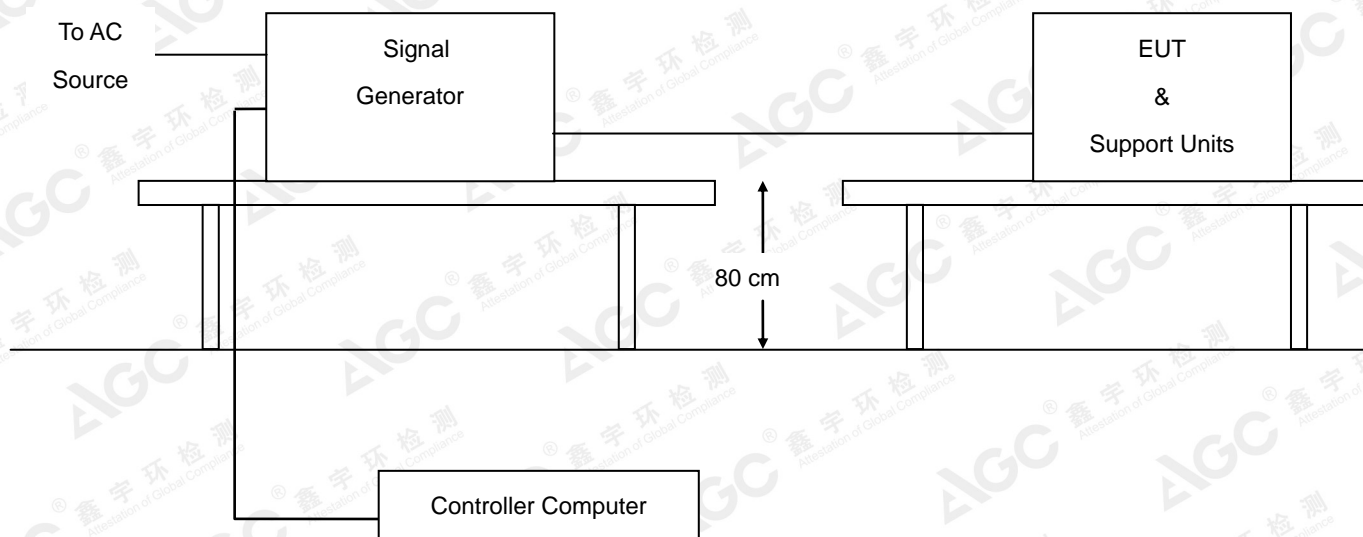
☒ **PASS**
☐ **FAIL**

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16. EN 61000-4-8 PFMF TEST

Port	Enclosure
Basic Standard	EN 61000-4-8
Product Standard	EN 55035
Requirements	50/60 Hz, 1A/m
Standard require	A
Tester	Donjon
Temperature	25 °C
Humidity	55%

16.1. BLOCK DIAGRAM OF TEST SETUP



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16.2. TEST PROCEDURE

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

Test Conditions:

Frequency	Polarity	Level	Test Performance	Performance Result	Result (Pass/Fail)
50 Hz	X	1 A/m	No function loss	A	Pass
50 Hz	Y	1 A/m	No function loss	A	Pass
50 Hz	Z	1 A/m	No function loss	A	Pass

TEST RESULT:

Note: The test modes were carried out for all operation modes

The worst case _ MODE 4(By Adapter Charging) was showed as the follow:

16.3. PERFORMANCE & RESULT

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ **PASS**
☐ **FAIL**

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17. EN 61000-4-11 DIPS IMMUNITY TEST

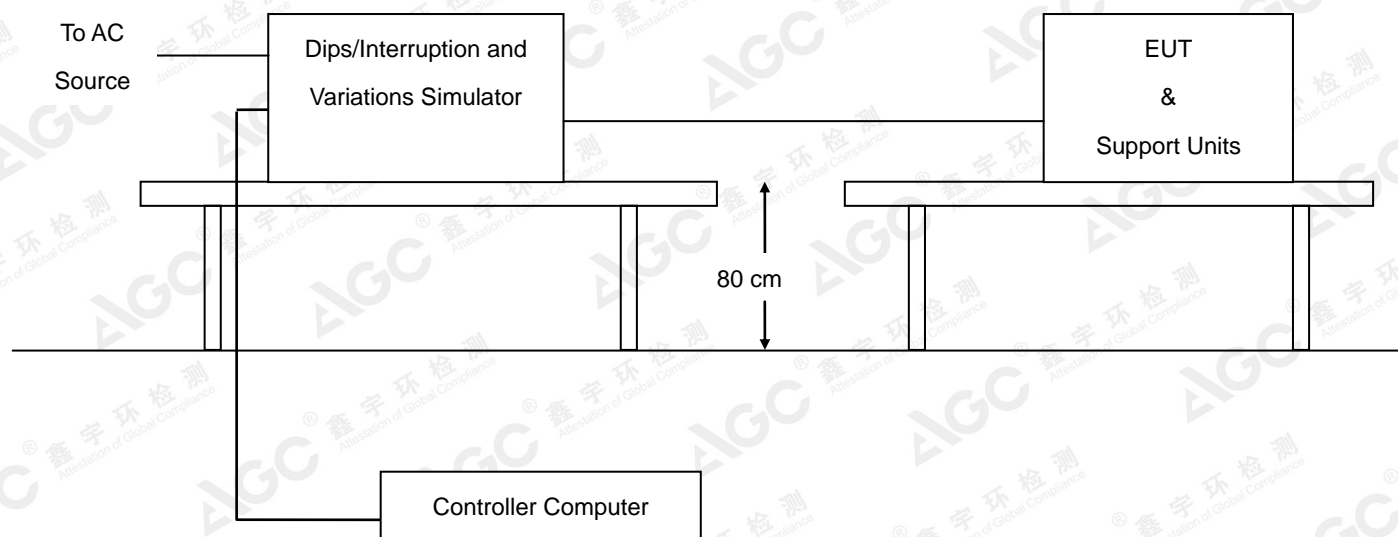
VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-11
Product Standard	EN 55035
Requirements	0, 45, 90, 135, 180, 225, 270, 315 degrees
Test Interval	Min. 10 sec.
Tester	Donjon
Temperature	22.8°C
Humidity	54.2%

Voltage Dips	Test Level % U _T	Reduction (%)	Duration (periods)	Performance Criteria
	<5	>95	0.5	B
	70	30	25	C

Voltage Interruptions	Test Level % U _T	Reduction (%)	Duration (periods)	Performance Criteria
	<5	>95	250	C

17.1. BLOCK DIAGRAM OF TEST SETUP



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17.2. TEST PROCEDURE

The EUT and support units were located on a wooden table, 0.8 m away from ground floor.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the parameter of tests and then perform the test software of test simulator.

Conditions changes to occur at 0 degree crossover point of the voltage waveform.

Recording the test result in test record form.

Test conditions:

The duration with a sequence of three dips/interruptions with interval of 10 s minimum
 (Between each test event)

TEST RESULT:

Note: The test modes were carried out for all operation modes

The worst case _ MODE 4(By Adapter Charging) was showed as the follow:

Voltage Dips:

Test Level % U _T	Reduction (%)	Duration (periods)	Observation	Performance Result	Result (Pass/Fail)
<5	>95	0.5	Normal	A	Pass
70	30	25	Normal	A	Pass

Voltage Interruptions:

Test Level % U _T	Reduction (%)	Duration (periods)	Observation	Performance Result	Result (Pass/Fail)
<5	>95	250	Stop charging	B	Pass

17.3. INTERPRETATION

<input checked="" type="checkbox"/> Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<input checked="" type="checkbox"/> Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
<input type="checkbox"/> Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ **PASS**
☐ **FAIL**

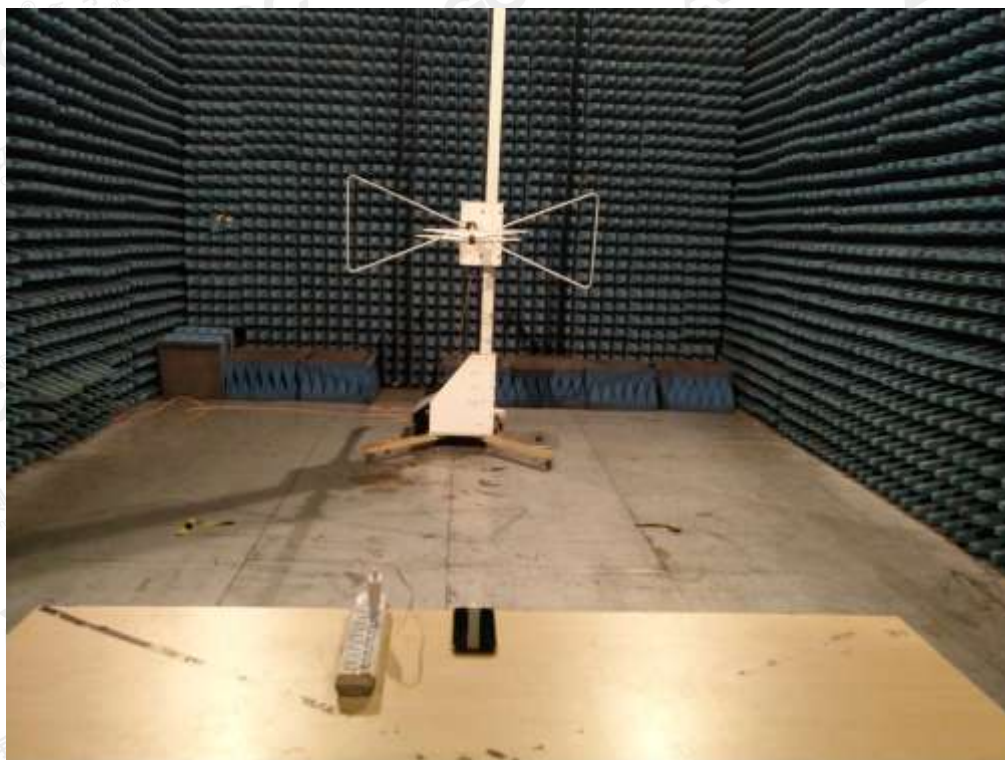
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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

EN 55032 CONDUCTED EMISSION TEST SETUP

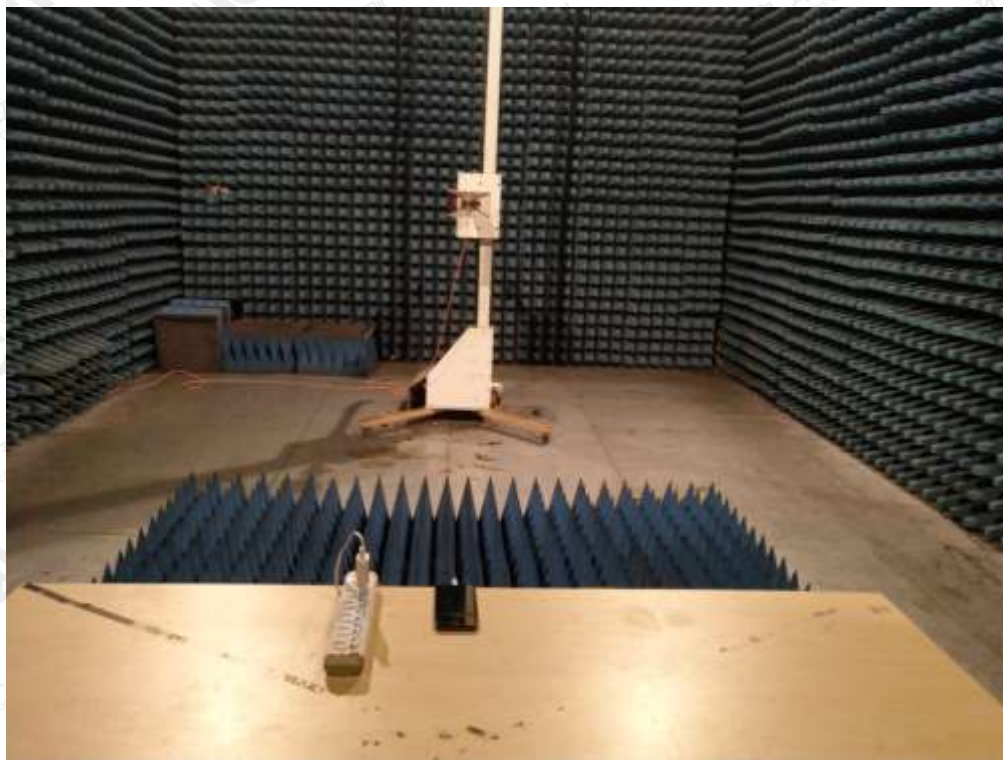


EN 55032 RADIATED EMISSION TEST SETUP



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EN 55032 RADIATED EMISSION-ABOVE 1G TEST SETUP



EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST

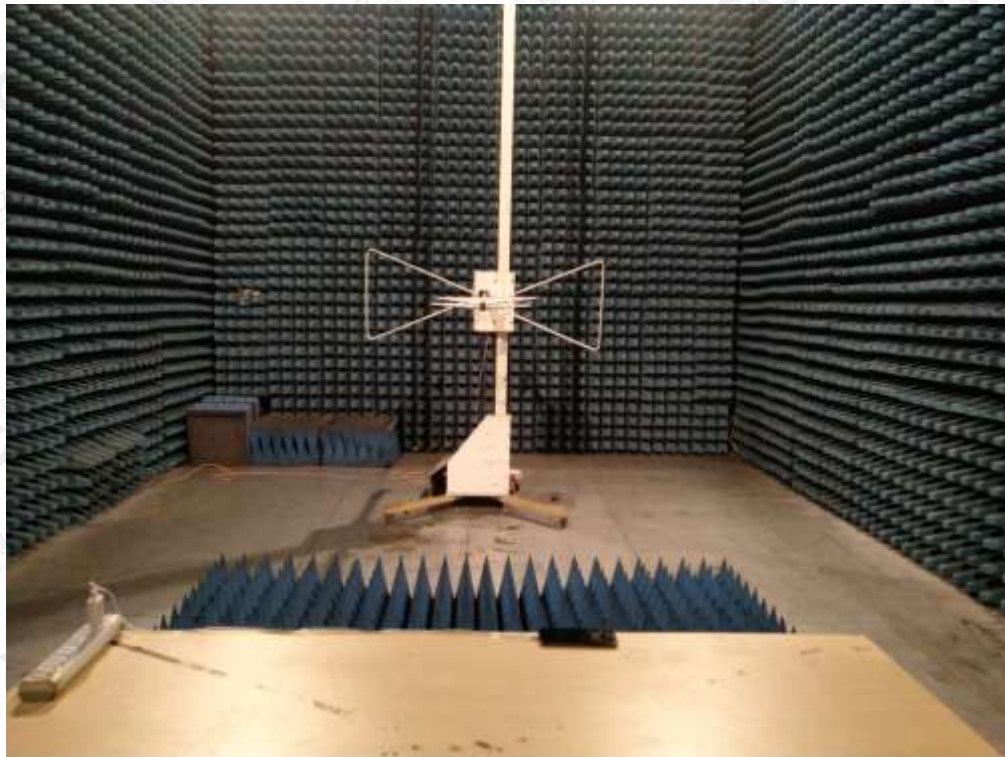


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EN 61000-4-2 ESD IMMUNITY TEST SETUP

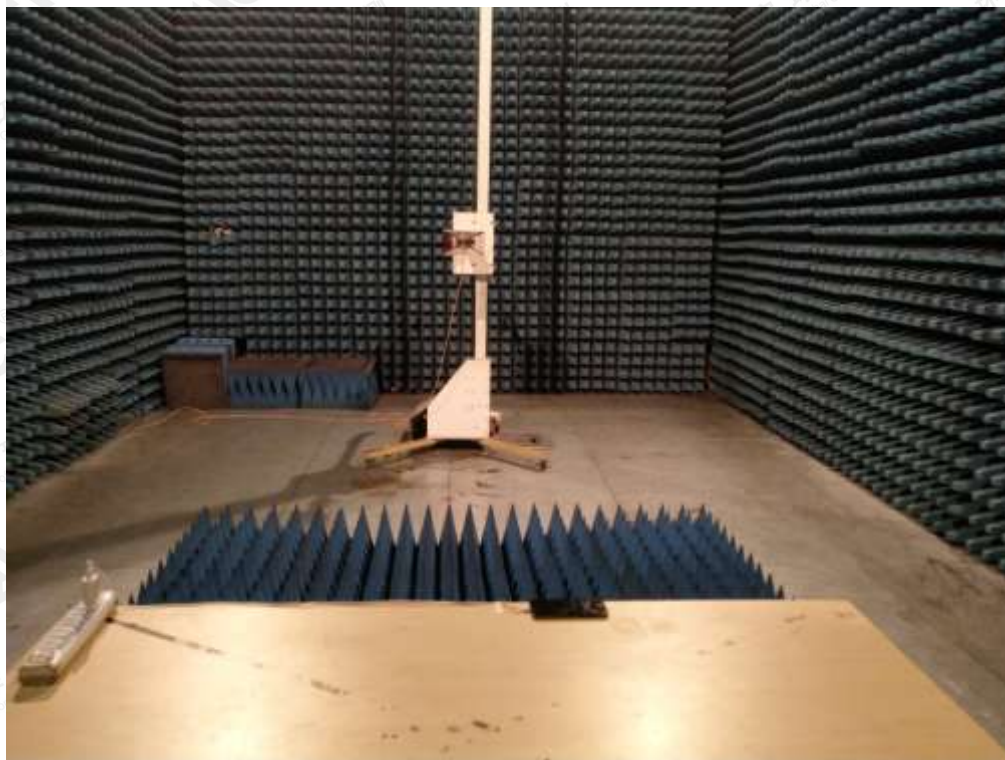


EN 61000-4-3 RS IMMUNITY TEST SETUP



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EN 61000-4-3 RS IMMUNITY-ABOVE 1G TEST SETUP



EFT SURGE and DIPS IMMUNITY TEST SETUP



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EN 61000-4-6 CS IMMUNITY TSET SETUP



EN 61000-4-8 PFM IMMUNITY TSET SETUP



----END OF REPORT----

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