
EMC Test Report

Report No.: AGC07922200302EE01

PRODUCT DESIGNATION : USB 2.0 active repeater extension cable

BRAND NAME : N/A

MODEL NAME : COM537/30M, COM537/5M, COM537/10M,
COM537/15M, COM537/20M, COM537/25M

APPLICANT : Full Strike Ltd.

DATE OF ISSUE : Apr. 01, 2020

STANDARD(S) : EN 55032:2015/AC:2016
EN61000-3-2:2019
EN61000-3-3:2013/A1:2019
EN 55035:2017

REPORT VERSION : V1.0

Attestation of Global Compliance(Shenzhen) Co., Ltd

CAUTION:

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline:400 089 2118

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 01, 2020	Valid	Initial release



TABLE OF CONTENTS

1 VERIFICATION OF CONFORMITY	5
2 SYSTEM DESCRIPTION	6
3 MEASUREMENT UNCERTAINTY	6
4 PRODUCT INFORMATION	7
5 SUPPORT EQUIPMENT	8
6 TEST FACILITY	9
7 TEST EQUIPMENT LIST	9
8 TESTSUMMARY LSIT	11
9 EN 55032 LINE CONDUCTED EMISSION TEST	12
9.1 LIMITS OF LINE CONDUCTED EMISSION TEST	12
9.2 BLOCK DIAGRAM OF TEST SETUP.....	12
9.3 PROCEDURE OF LINE CONDUCTED EMISSION TEST	13
9.4 TEST RESULT OF LINE CONDUCTED EMISSION TEST	14
10 EN 55032 RADIATED EMISSION TEST	16
10.1 LIMITS OF RADIATED DISTURBANCES.....	16
10.2 BLOCK DIAGRAM OF TEST SETUP.....	16
10.3 PROCEDURE OF RADIATED EMISSION TEST.....	17
10.4 TEST RESULT OF RADIATED EMISSION TEST	18
11 EN 61000-3-2 POWER HARMONICS TEST	20
11.1 BLOCK DIAGRAM OF TEST SETUP	20
11.2 RESULT	20
12 EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST	20
12.1 BLOCK DIAGRAM OF TEST SETUP.....	21
12.2 RESULT.....	22
13 EN 61000-4-2 ESD IMMUNITY TEST	23
13.1 BLOCK DIAGRAM OF TEST SETUP.....	23
13.2 TEST PROCEDURE	24
13.3 PERFORMANCE & RESULT	25
14 EN 61000-4-3 RS IMMUNITY TEST	26

14.1 BLOCK DIAGRAM OF TEST SETUP 26

14.2 TEST PROCEDURE 27

14.3 PERFORMANCE & RESULT 27

15 EN 61000-4-4 EFT IMMUNITY TEST 28

15.1 BLOCK DIAGRAM OF TEST SETUP 28

15.2 TEST PROCEDURE 29

15.3 PERFORMANCE & RESULT 29

16 EN 61000-4-5 SURGE IMMUNITY TEST 30

16.1 BLOCK DIAGRAM OF TEST SETUP 30

16.2 TEST PROCEDURE 31

16.3 PERFORMANCE & RESULT 32

17 EN 61000-4-6 CS IMMUNITY TEST 33

17.1 BLOCK DIAGRAM OF TEST SETUP 33

17.2 TEST PROCEDURE 34

17.3 PERFORMANCE & RESULT 34

18 EN 61000-4-11 DIPS IMMUNITY TEST 35

18.1 BLOCK DIAGRAM OF TEST SETUP 35

18.2 TEST PROCEDURE 36

18.3 INTERPRETATION 36

APPENDIX A: PHOTOGRAPHS OF TEST SETUP 37

APPENDIX B: PHOTOGRAPHS OF EUT 40

1 VERIFICATION OF CONFORMITY

Applicant	Full Strike Ltd.
Address	2801 International Technology Building, Shennan Road, Futian Dist., Shenzhen, 518033 PRC
Manufacturer	Full Strike Ltd.
Address	2801 International Technology Building, Shennan Road, Futian Dist., Shenzhen, 518033 PRC
Factory	Full Strike Ltd.
Address	2801 International Technology Building, Shennan Road, Futian Dist., Shenzhen, 518033 PRC
Product Designation	USB 2.0 active repeater extension cable
Brand Name	N/A
Test Model	COM537/30M
Series Model	COM537/5M, COM537/10M, COM537/15M, COM537/20M, COM537/25M
Difference description	All the same except for the model name.
Date of test	Mar. 24, 2020 to Apr. 01, 2020
Deviation	None any deviation from the test method.
Condition of Test Sample	Normal
Test Result	Pass

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in 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.

Prepared By Faler Yang
 Faler Yang(Yang Feiyue)
 Project Engineer Apr. 01, 2020

Reviewed By Zurk Yang
 Erik Yang(Yang Jianmin)
 Reviewer Apr. 01, 2020

Approved By Forrest Lei
 Forrest Lei(Lei Yonggang)
 Authorized Officer Apr. 01, 2020



2 SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Data Exchange	V
Note: 1. V means EMI worst mode.		

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, $U_c = \pm 3.1\text{dB}$
- Uncertainty of Radiated Emission, $U_c = \pm 4.0\text{dB}$
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 5.4\text{dB}$



4 PRODUCT INFORMATION

Housing Type	Plastic
EUT Input Rating	DC5V 500mA
EUT Output Rating	DC5V 500mA

I/O Port Information (Applicable Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
USB	2	30m Un-shielded	2



5 SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
PC	XIAOMI	--	--	--	--
Adapter	XIAOMI	MDY-08-ES	--	--	1.2m Unshielded
U-Disk	KINGSTON	DTSE9H	--	--	--



6 TEST FACILITY

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

7 TEST EQUIPMENT LIST

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESPI	101206	Jun. 12, 2019	Jun. 11, 2020
LISN	R&S	ESH2-Z5	100086	Aug. 26, 2019	Aug. 25, 2020
8-Wire ISN CAT 5	Schwarzbeck	CAT5 8158	#158	Dec. 12, 2019	Dec.11, 2020
8-Wire ISN CAT 6	Schwarzbeck	NTFM 8158	#131	Dec. 12, 2019	Dec.11, 2020
Test software	R&S	ES-K1 (Ver.V1.7.1)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Jun.12, 2019	Jun. 11, 2020
Antenna	SCHWARZBECK	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Dec. 12, 2019	Dec.11, 2020
Test software	FARA	EZ EMC (Ver.RA-03A)	N/A	N/A	N/A

TEST EQUIPMENT OF POWER HARMONICS / VOLTAGE FLUCTUATION / FLICKER

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Aug. 26, 2019	Aug. 25, 2020
AC Source	Schaffner	NSG1007	56825	Aug. 26, 2019	Aug. 25, 2020

TEST EQUIPMENT OF SURGE/EFT/DIPSTEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
EFT Surge Generator	Schaffner	Modula 6150	34437	Aug. 26, 2019	Aug. 25, 2020



TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	EM Test	dito	P1527160053	Oct. 24, 2019	Oct. 23, 2020

TEST EQUIPMENT OF RS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Jun. 12, 2019	Jun. 11, 2020
Power Sensor	R&S	URV5-Z4	100124	May 17, 2019	May 16, 2020
Power Meter	R&S	NRVD	8323781027	May 17, 2019	May 16, 2020
Power Amplifier	KALMUS	7100LC	04-02/17-06-00 1	Jun.12, 2019	Jun.11, 2020
Power Amplifier	Milmega	AS0104-55_55	1004793	Jun.12, 2019	Jun.11, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Antenna	SCHWARZBEC K	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021
Power Amplifier	rflight	NTWPA-256010 0	17063183	Oct.15, 2019	Oct.14, 2020
Broadband High Gain Horn Antenna	SCHWARZBEC K	BBHA 9120 J	00073	Sep.27, 2019	Sep.26, 2021

TEST EQUIPMENT OF CS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Amplifier	AR	75A250	18464	Jun. 12, 2019	Jun. 11, 2020
CDN	ZHINAN	ZN3751	15004	Sep. 09, 2019	Sep. 08, 2020
6dB attenuator	ZHINAN	E-002	N/A	Sep. 09, 2019	Sep. 08, 2020
Power Sensor	R&S	URV5-Z4	100124	May 17, 2019	May 16, 2020
Power Meter	R&S	NRVD	8323781027	May 17, 2019	May 16, 2020
Signal Generator	R&S	E4421B	MY43351603	Jun. 12, 2019	Jun. 11, 2020



8 TESTSUMMARY LSIT

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted emission	EN 55032	EN 55032	Class B	Pass
Radiated emission	EN 55032	EN 55032	Class B	Pass
Harmonic current emission	EN 61000-3-2	EN 61000-3-2	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3	EN 61000-3-3	§5 of EN 61000-3-3	Pass
Electrostatic Discharge Immunity	EN 55035	EN 61000-4-2	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)	Pass
Radiated RF Electromagnetic	EN 55035	EN 61000-4-3	3V/m with 80% AM. 1kHz Modulation.	Pass
Electrical fast transient/burst Immunity-AC Power port	EN 55035	EN 61000-4-4	+/- 1kV for Power Supply Lines	Pass
Electrical fast transient/burst Immunity-- Signal Port	EN 55035	EN 61000-4-4	+/- 0.5kV	Pass
Surge immunity-AC Power port	EN 55035	EN 61000-4-5	+/- 1kV (Line to Line) +/- 2kV (Line to Ground)	Pass
Surge immunity-Signal Port	EN 55035	EN 61000-4-5	+/- 0.5kV	Pass
Immunity to Conducted Disturbances Induced by RF fields-AC Power port	EN 55035	EN 61000-4-6	3V(0.15MHz-10MHz) 3V-1V(10MHz-30MHz) 1V(30MHz-80MHz) with 80% AM. 1 kHz Modulation	Pass
Immunity to Conducted Disturbances Induced by RF fields- Signal Port	EN 55035	EN 61000-4-6	3V(0.15MHz-10MHz) 3V-1V(10MHz-30MHz) 1V(30MHz-80MHz) with 80% AM. 1 kHz Modulation	Pass
Power frequency magnetic field	EN 55035	EN 61000-4-8	1A/m 50Hz or 60Hz	N/A
Voltage dips and short interruptions immunity	EN 55035	EN 61000-4-11	0degrees	Pass

Note :

1. N/A means not applicable.
2. Power frequency magnetic field: Applicable only to EUT containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamic microphones, magnetic field sensors, etc.

9 EN 55032 LINE CONDUCTED EMISSION TEST

9.1 LIMITS OF LINE CONDUCTED EMISSION TEST

AT AC MAINS POWER PORT

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

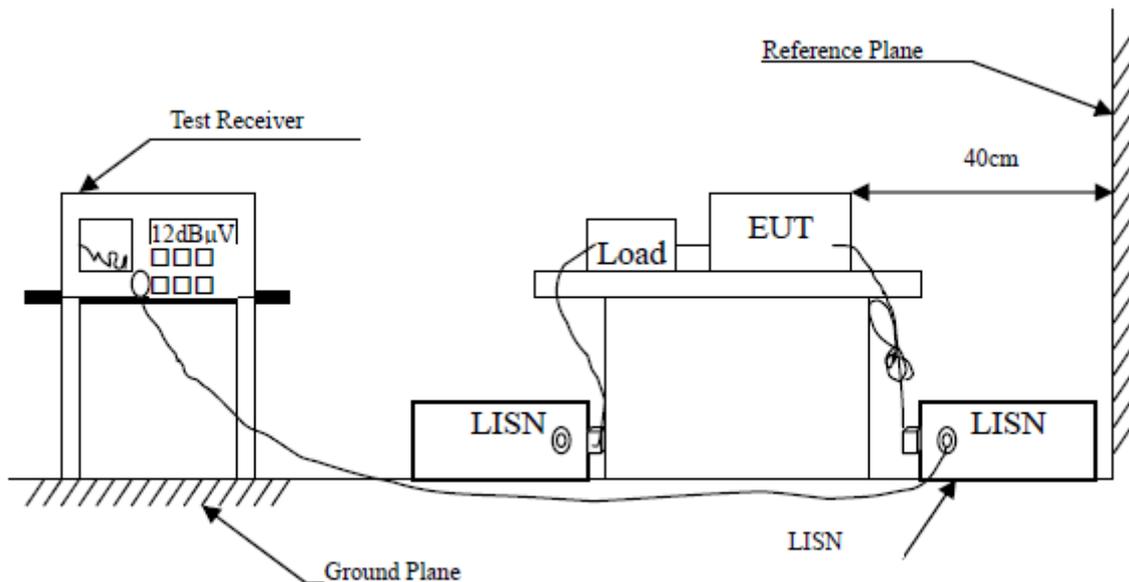
Note:

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.

AT telecommunication PORT

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	84-74	74-64
500kHz-30MHz	74	64

9.2 BLOCK DIAGRAM OF TEST SETUP



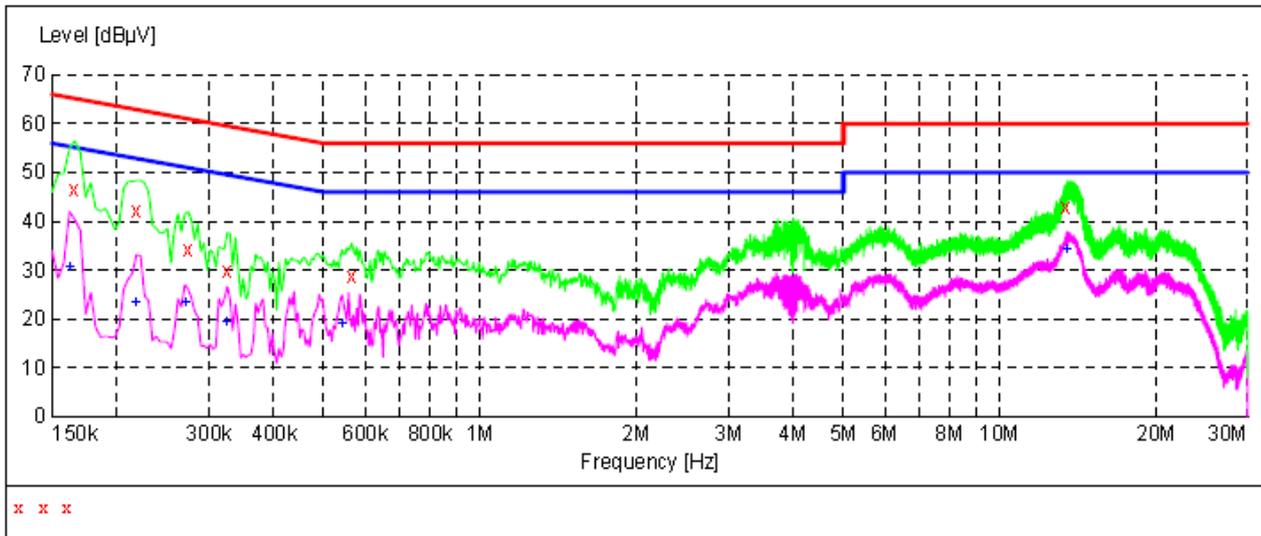
9.3 PROCEDURE OF LINE CONDUCTED EMISSION TEST

- (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 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 10cm 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 DC5V power from PC which received AC 230V/50Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- (5) All support equipments received power from a second LISN supplying power of AC230V and 110V/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 150kHz to 30MHz 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.



9.4 TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.166000	46.40	11.3	65	18.8	QP	L1	FLO
0.218000	42.10	11.3	63	20.8	QP	L1	FLO
0.274000	34.30	11.3	61	26.7	QP	L1	FLO
0.326000	29.70	11.3	60	29.9	QP	L1	FLO
0.566000	28.90	11.3	56	27.1	QP	L1	FLO
13.430000	42.80	11.8	60	17.2	QP	L1	FLO

MEASUREMENT RESULT:

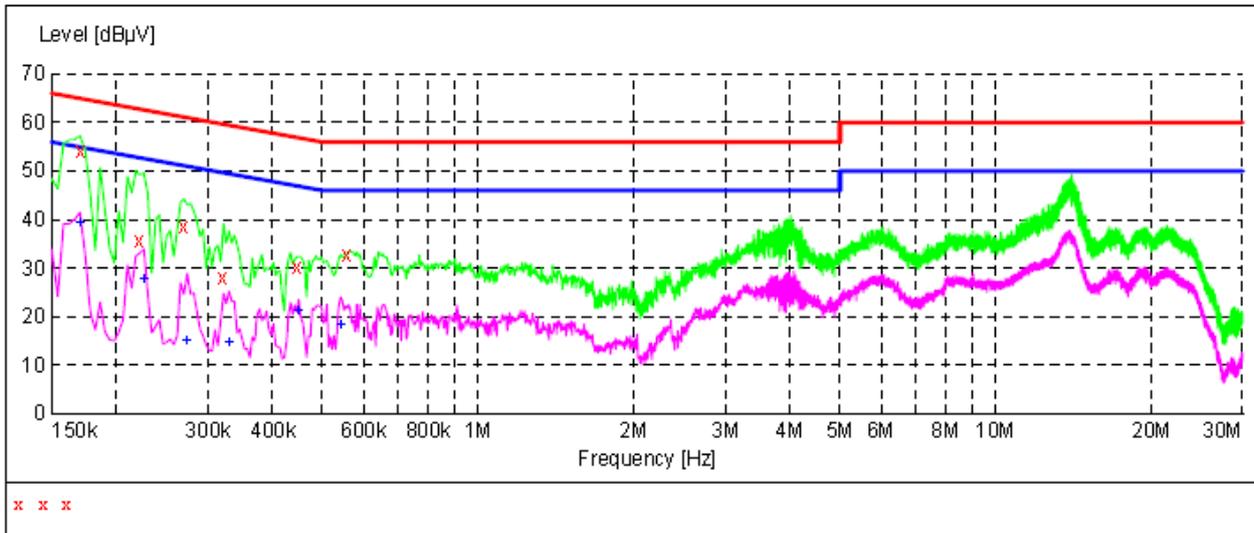
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.162000	30.50	11.3	55	24.9	AV	L1	FLO
0.218000	23.50	11.3	53	29.4	AV	L1	FLO
0.270000	23.50	11.3	51	27.6	AV	L1	FLO
0.326000	19.30	11.3	50	30.3	AV	L1	FLO
0.542000	18.80	11.3	46	27.2	AV	L1	FLO
13.414000	34.20	11.8	50	15.8	AV	L1	FLO

RESULT: PASS



Attestation of Global Compliance

LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	54.10	11.3	65	10.9	QP	N	FLO
0.222000	35.70	11.3	63	27.0	QP	N	FLO
0.270000	38.40	11.3	61	22.7	QP	N	FLO
0.322000	28.10	11.3	60	31.6	QP	N	FLO
0.446000	30.30	11.3	57	26.6	QP	N	FLO
0.558000	32.90	11.3	56	23.1	QP	N	FLO

MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.170000	39.10	11.3	55	15.9	AV	N	FLO
0.226000	27.50	11.3	53	25.1	AV	N	FLO
0.274000	14.90	11.3	51	36.1	AV	N	FLO
0.330000	14.80	11.3	50	34.7	AV	N	FLO
0.450000	21.20	11.3	47	25.7	AV	N	FLO
0.542000	18.10	11.3	46	27.9	AV	N	FLO

RESULT: PASS



Attestation of Global Compliance

10 EN 55032 RADIATED EMISSION TEST

10.1 LIMITS OF RADIATED DISTURBANCES

Limits for radiated disturbance 30M to1 GHz at a measurement distance of 3 m

Frequency range (MHz)	Quasi peak limits(dBuV/m), for Class B ITE, at 3m measurement distance
30 - 230	40
230 - 1000	47

Limits for radiated disturbance above 1 GHz at a measurement distance of 3 m

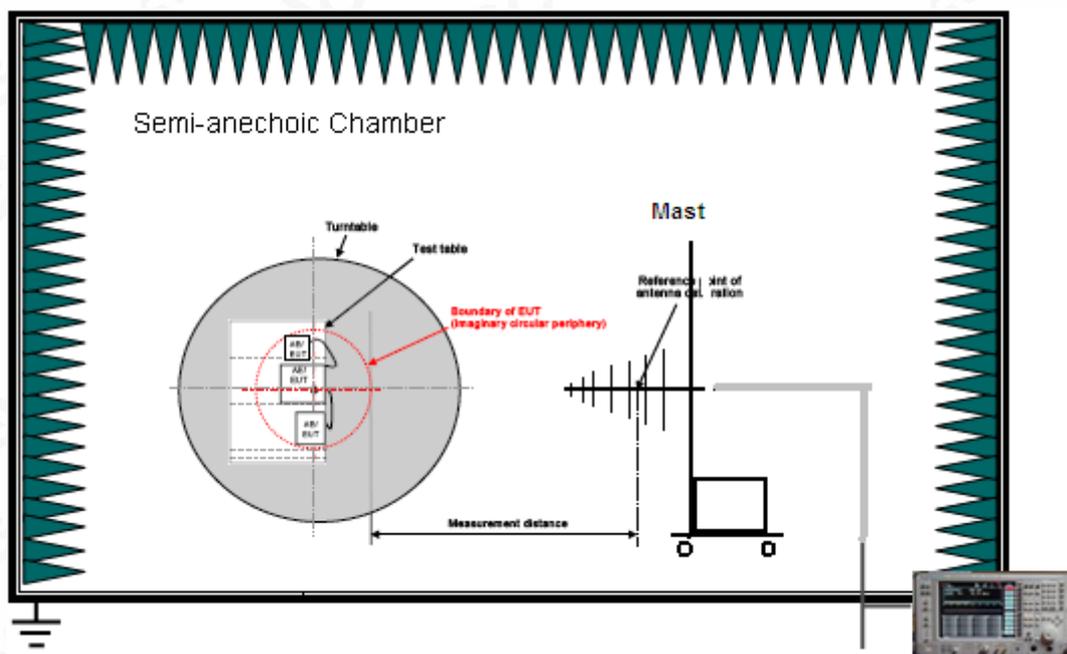
Frequency range (MHz)	Limits (dBuV/m), Class B ITE	
	Peak	Average
1000-3000	70	50
3000-6000	74	54

Notes:

1. The lower limit shall apply at the transition frequency.
2. Additional provisions may be required for cases where interference occurs.

10.2 BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



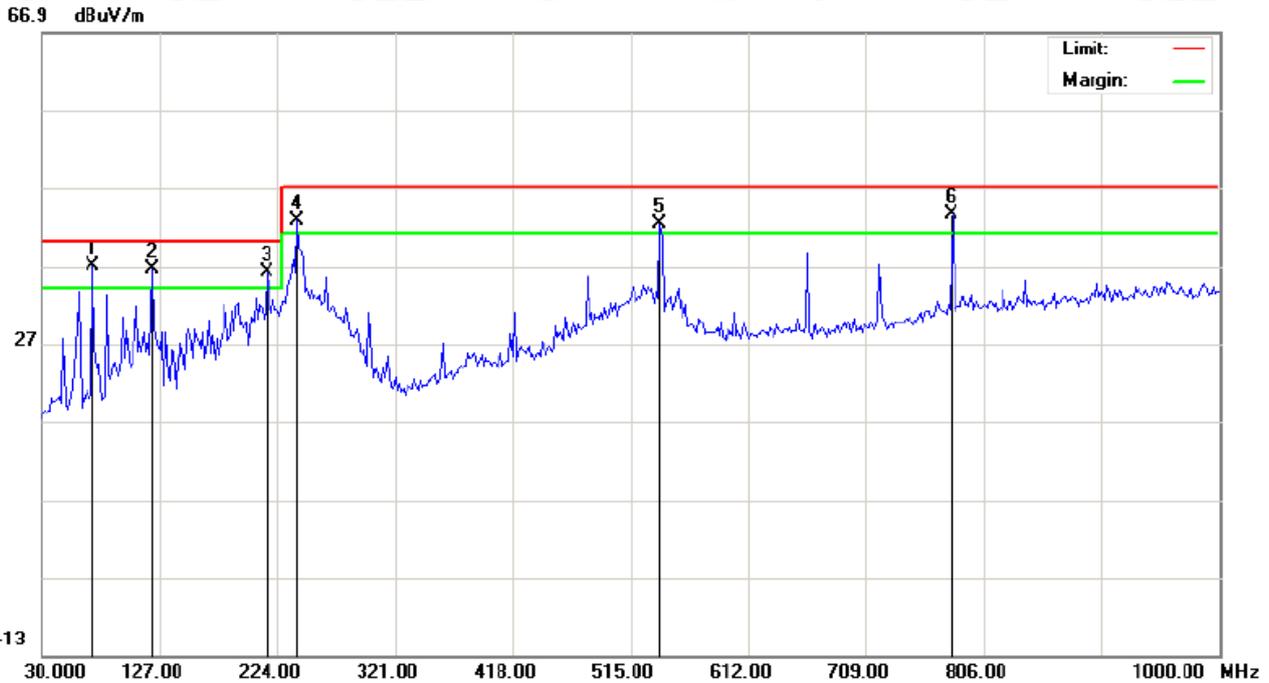
10.3 PROCEDURE OF RADIATED EMISSION TEST

- (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 10cm 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 was connected to PC and u-disk for data exchange .
- (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.
- (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.



10.4 TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-(30MHz-1000MHz)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	*	72.0333	20.25	18.67	36.92	40.00	-3.08	peak			
2	!	120.5333	18.66	18.00	36.66	40.00	-3.34	peak			
3	!	215.9167	19.16	17.00	36.16	40.00	-3.84	peak			
4	!	240.1667	24.09	18.66	42.75	47.00	-4.25	peak			
5	!	539.2500	16.66	25.76	42.42	47.00	-4.58	peak			
6	!	780.1332	13.68	29.96	43.64	47.00	-3.36	peak			

RESULT: PASS



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

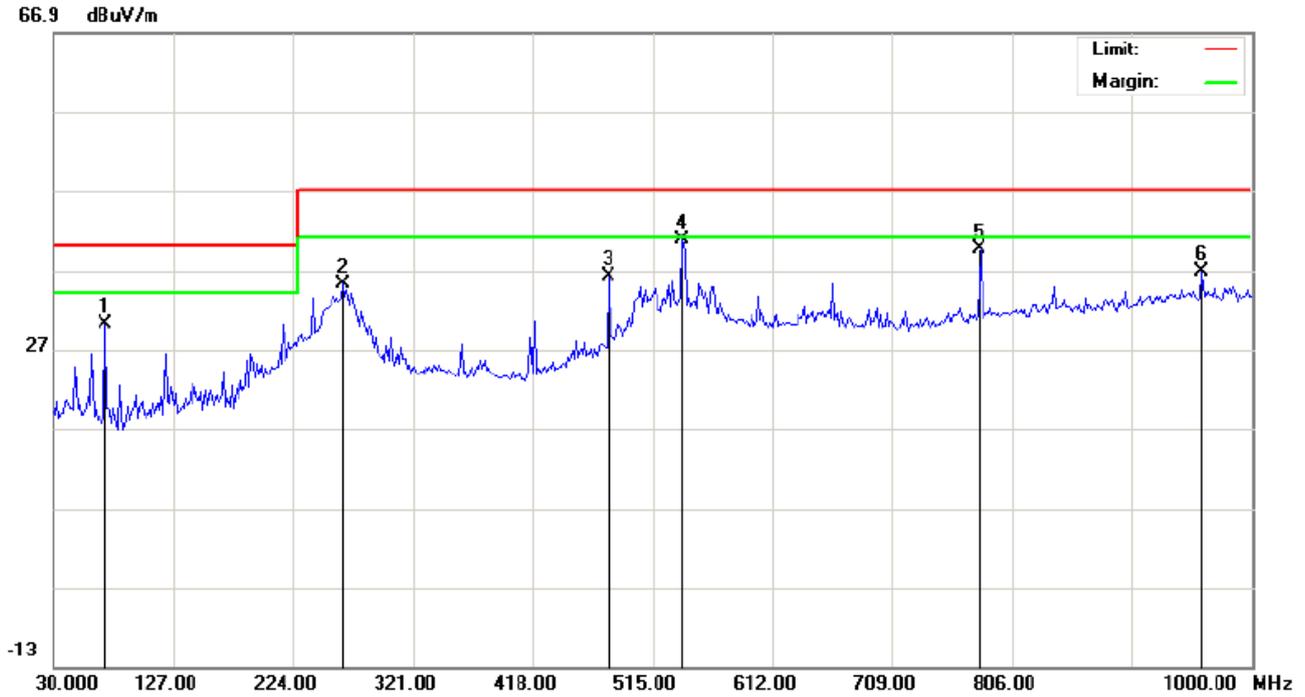
Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

Radiated Emission Test at 3m Distance-(30MHz-1000MHz)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		72.0333	13.54	16.67	30.21	40.00	-9.79	peak			
2		264.4166	16.52	18.67	35.19	47.00	-11.81	peak			
3		479.4333	11.57	24.58	36.15	47.00	-10.85	peak			
4	*	539.2500	15.07	25.76	40.83	47.00	-6.17	peak			
5		780.1332	9.57	29.96	39.53	47.00	-7.47	peak			
6		959.5833	4.60	32.21	36.81	47.00	-10.19	peak			

RESULT: PASS



Attestation of Global Compliance

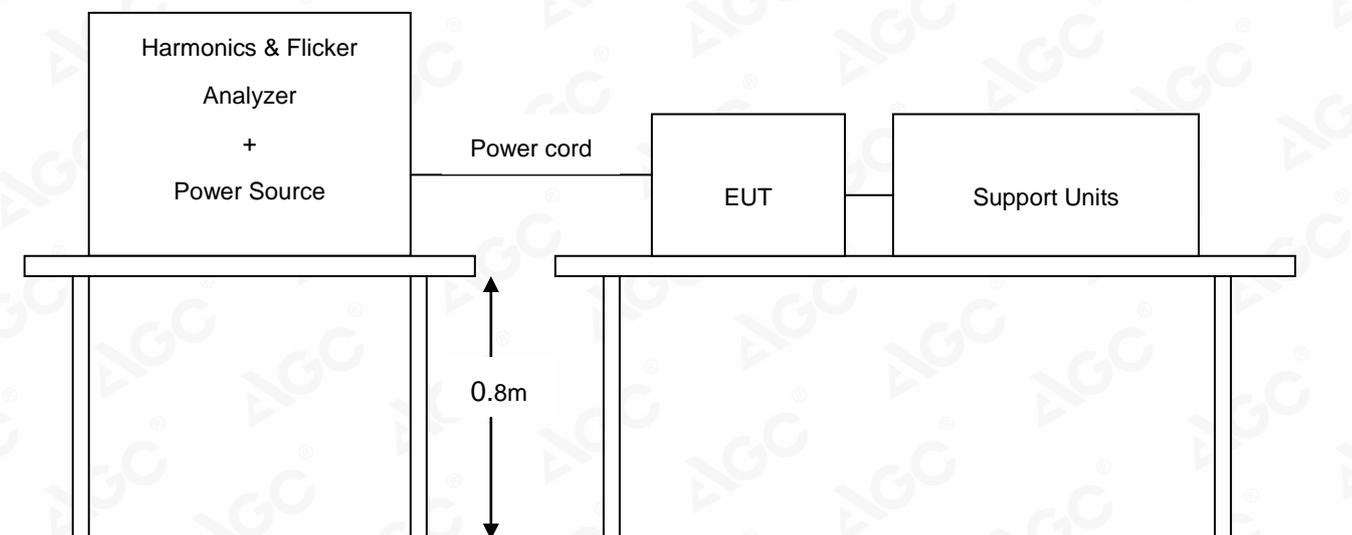
Attestation of Global Compliance(Shenzhen)Co.,Ltd.
Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China
Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Service Hotline:400 089 2118

11 EN 61000-3-2 POWER HARMONICS TEST

POWER HARMONICS MEASUREMENT

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

11.1 BLOCK DIAGRAM OF TEST SETUP



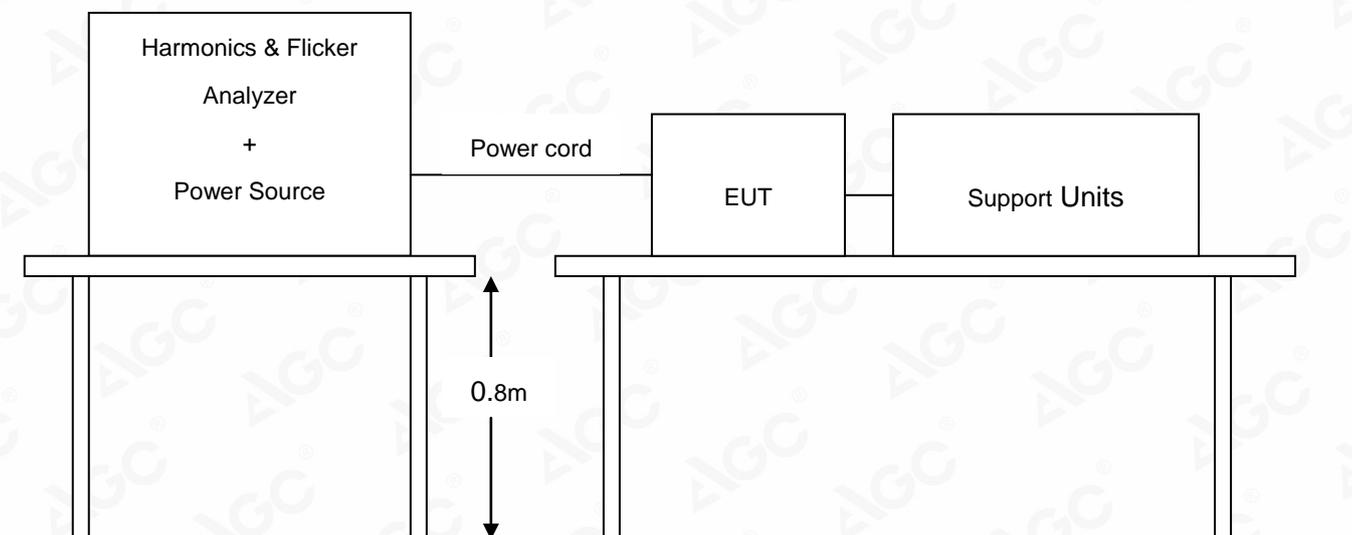
11.2 RESULT

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

12 EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST
VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port	AC mains
Basic Standard	EN 61000-3-3
Limits	§5 of EN 61000-3-3
Tester:	Faler
Temperature	23.6°C
Humidity	57.5%

12.1 BLOCK DIAGRAM OF TEST SETUP



12.2 RESULT

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: COM537/30M

Tested by: Faler

Test category: All parameters (European limits)

Test Margin: 100

Test date: 30/03/2020

Start time: 16:35:37

End time: 16:45:59

Test duration (min): 10

Data file name: F-001222.cts_data

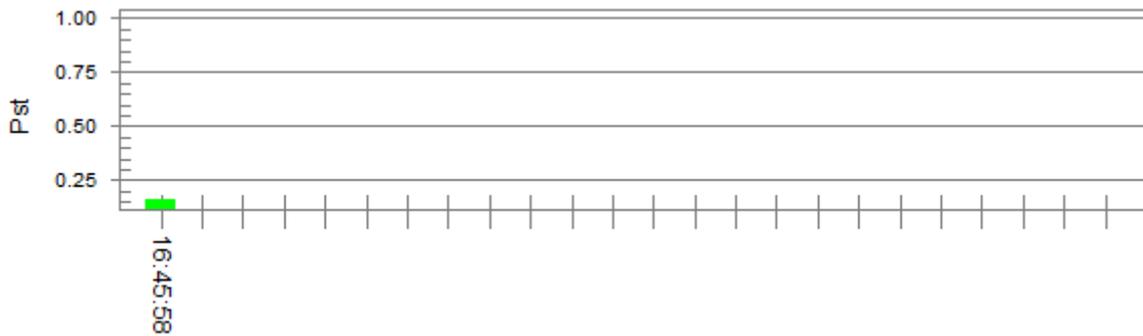
Comment: Normal operation

Customer: Full Strike Ltd.

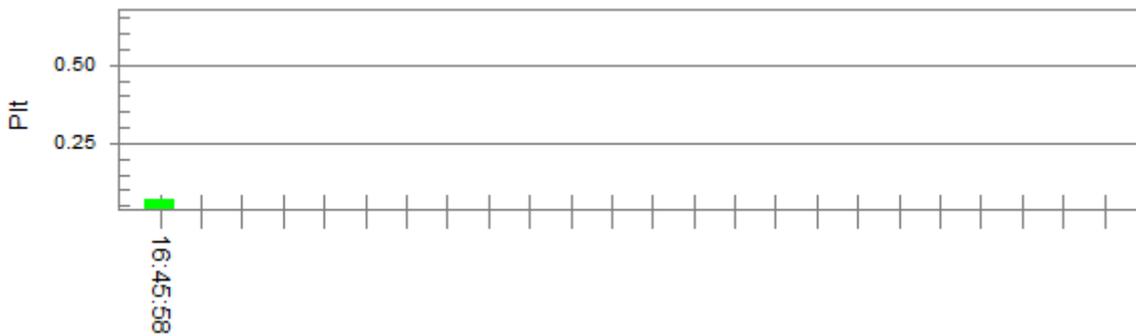
Test Result: Pass

Status: Test Completed

Pst and limit line



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.85			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Highest dt (mS):	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.160	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.070	Test limit:	0.650	Pass

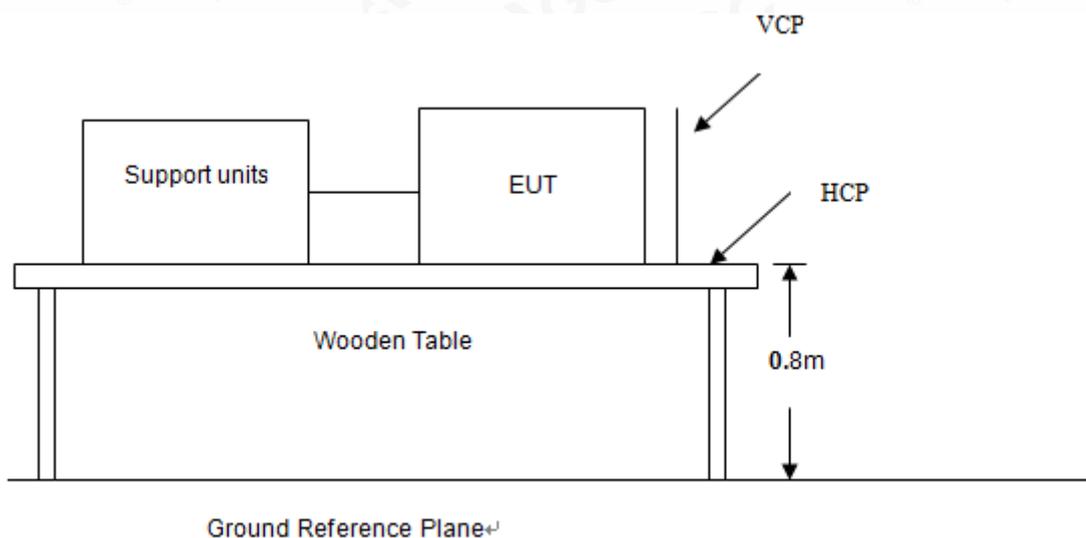
13 EN 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-2
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Tester	Faler
Temperature	23.1°C
Humidity	56.7%

13.1 BLOCK DIAGRAM OF TEST SETUP

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



13.2 TEST PROCEDURE

The test procedure shall be in accordance with EN 61000-4-2. Electrostatic discharges shall be applied only to points and surfaces of the EUT which are expected to be touched during normal operation, including user access operations specified in the user manual, for example cleaning or adding consumables when the EUT is powered. The application of discharges to the contacts of open connectors is not required.

The number of test points is EUT dependent. Sub clause 8.3.1 and Clause A.5 of EN 61000-4-2 shall be taken into consideration when selecting test points, paying particular attention to keyboards, dialling pads, power switches, mice, drive slots, card slots, the areas around communication ports, etc.

When applying direct discharges to a portable or handheld battery-powered EUT with a display screen, it may not be possible to observe the screen for a given EUT orientation. If observation of the screen is necessary during this test, the EUT may be mounted vertically using non-metallic supports.

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

The electrostatic discharges were applied as follows:

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



13.3 PERFORMANCE & RESULT

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.
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.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

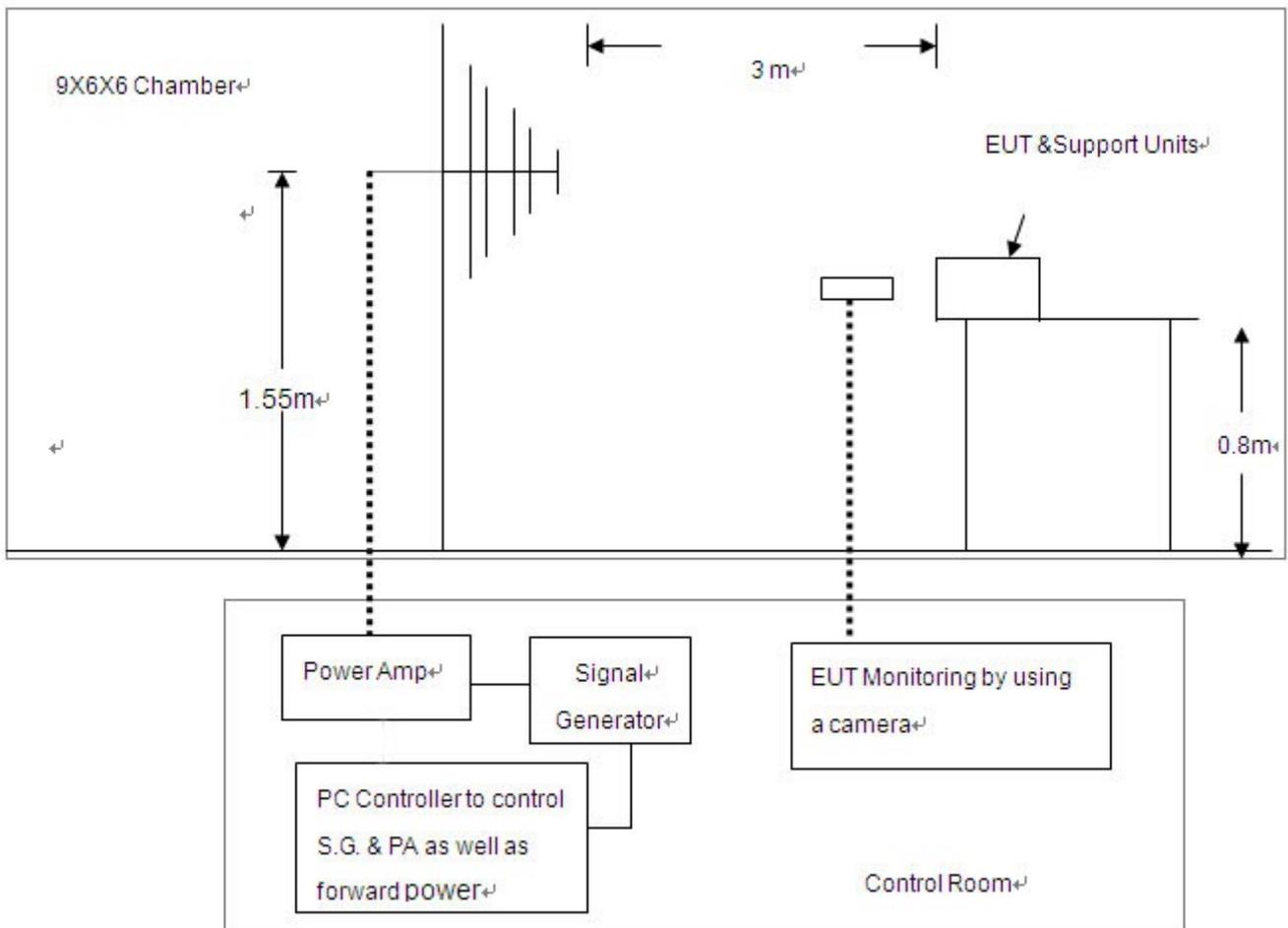
<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
---	--------------------------------------

14 EN 61000-4-3 RS IMMUNITY TEST

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-3
Test Level:	3V/m with 80% AM. 1kHz Modulation.
Standard require	A
Tester	Faler
Temperature	23.4°C
Humidity	58.0%

14.1 BLOCK DIAGRAM OF TEST SETUP



14.2 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

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

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Result
80-1000	3V/m	AM	H/V	Front	No function loss	A
80-1000	3V/m	AM	H/V	Left	No function loss	A
80-1000	3V/m	AM	H/V	Back	No function loss	A
80-1000	3V/m	AM	H/V	Right	No function loss	A
1800,2600,3500,5000	3V/m	AM	H/V	Front	No function loss	A
1800,2600,3500,5000	3V/m	AM	H/V	Left	No function loss	A
1800,2600,3500,5000	3V/m	AM	H/V	Back	No function loss	A
1800,2600,3500,5000	3V/m	AM	H/V	Right	No function loss	A

Frequency (± 1 %) for Spot test.

14.3 PERFORMANCE & RESULT

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.
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.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS

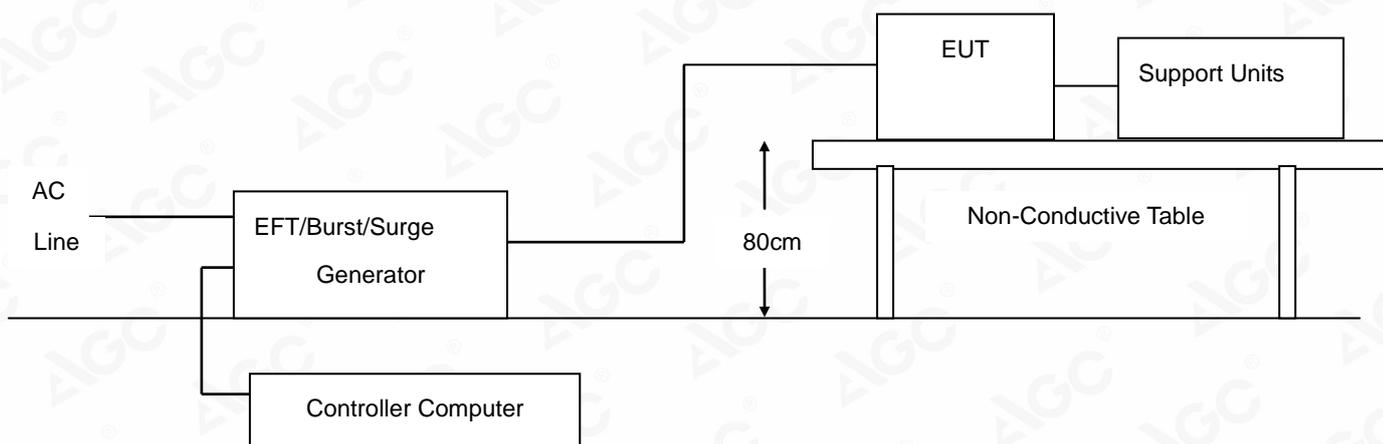
FAIL

15 EN 61000-4-4 EFT IMMUNITY TEST

ELECTRICAL FAST TRANSIENTS/BURST IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-4
Test Level	+/- 1kV for Power Supply Lines +/- 0.5kV for signal port
Standard require	B
Tester	Faler
Temperature	23.2°C
Humidity	58.0%

15.1 BLOCK DIAGRAM OF TEST SETUP



15.2 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: 5kHz
Tr/Th: 5/50ns
Burst Duration: 15ms
Burst Period: 300ms

Inject Line	Voltage kV	Inject Method	Test Performance	Result
L+N	+/- 1	Direct	No function loss	A
Signal	+/- 0.5	Coupling	No function loss	A

15.3 PERFORMANCE & RESULT

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.
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.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS

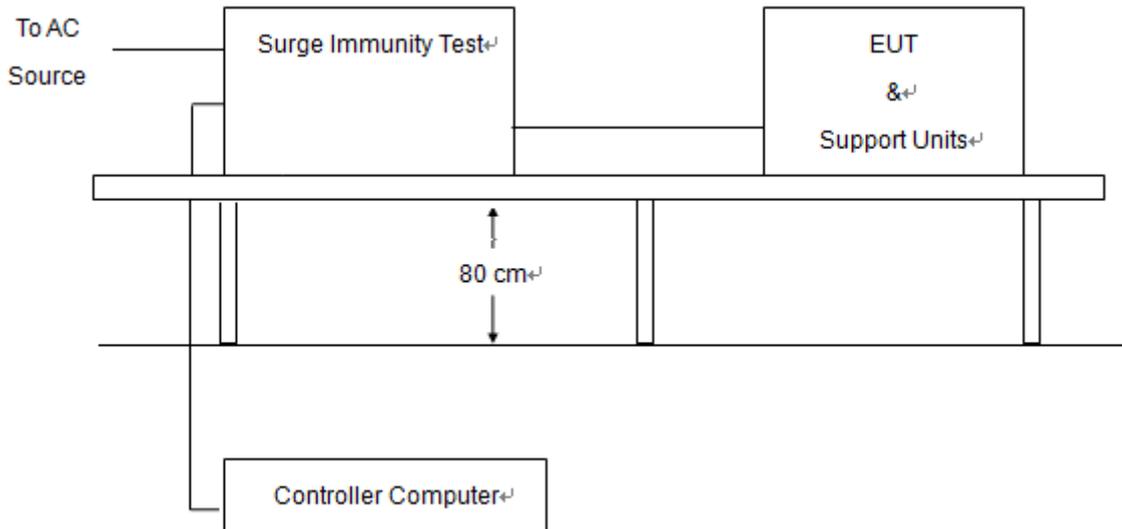
 FAIL

16 EN 61000-4-5 SURGE IMMUNITY TEST

SURGE IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-5
Requirements	+/- 1kV (Line to Line) +/- 0.5kV for signal port
Standard require	B
Tester	Faler
Temperature	23.2°C
Humidity	58.0%

16.1 BLOCK DIAGRAM OF TEST SETUP



16.2 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 <i>us</i>
Current Waveform	8/20 <i>us</i>
Polarity	Positive/Negative
Phase angle	90°, 270°
Number of Test	5

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

Test conditions for Signal port

Voltage Waveform	1.2/50 <i>us</i>
Current Waveform	8/20 <i>us</i>
Polarity	Positive/Negative
Phase angle	90°, 270°
Number of Test	5

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Test Performance	Result
Line to Line	0.5	Positive	Capacitive	No function loss	A
Line to Line	0.5	Negative	Capacitive	No function loss	A
Line to earth	0.5	Positive	Capacitive	No function loss	A
Line to earth	0.5	Negative	Capacitive	No function loss	A



16.3 PERFORMANCE & RESULT

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.
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.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

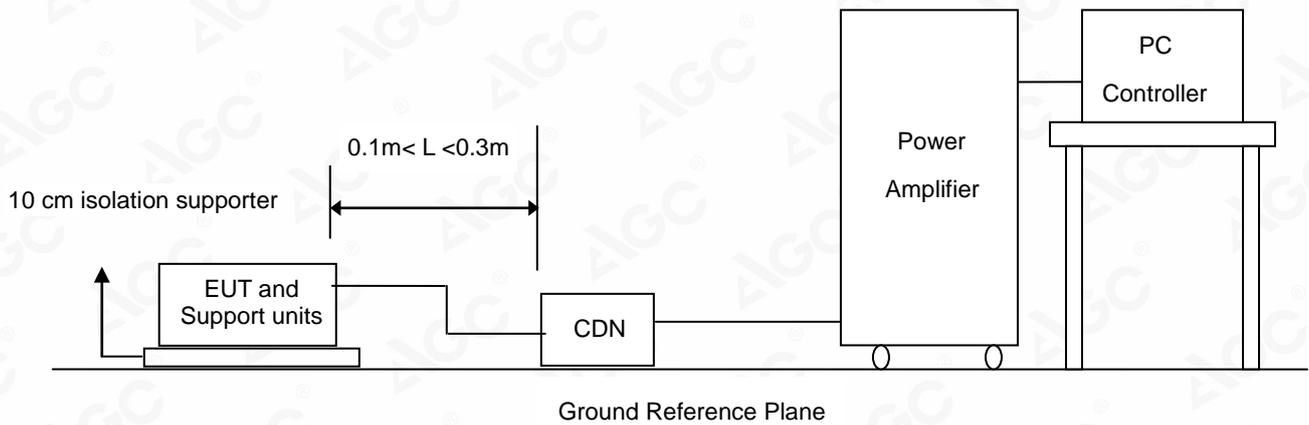
PASS

 FAIL

17 EN 61000-4-6 CS IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-6
Requirements	3V(0.15MHz-10MHz) 3V-1V(10MHz-30MHz) 1V(30MHz-80MHz) with 80% AM. 1 kHz Modulation
Standard require	A
Tester	Faler
Temperature	23.6°C
Humidity	57.4%

17.1 BLOCK DIAGRAM OF TEST SETUP



17.2 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 for AC power port and signal port:

Frequency Range	0.15MHz-80MHz
Frequency Step	1% of fundamental
Dwell Time	3 sec

Range (MHz)	Strength	Modulation	Result
0.15-10	3V	AM	A
10-30	3V-1V	AM	A
30-80	1V	AM	A

17.3 PERFORMANCE & RESULT

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.
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.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS

 FAIL

18 EN 61000-4-11 DIPS IMMUNITY TEST

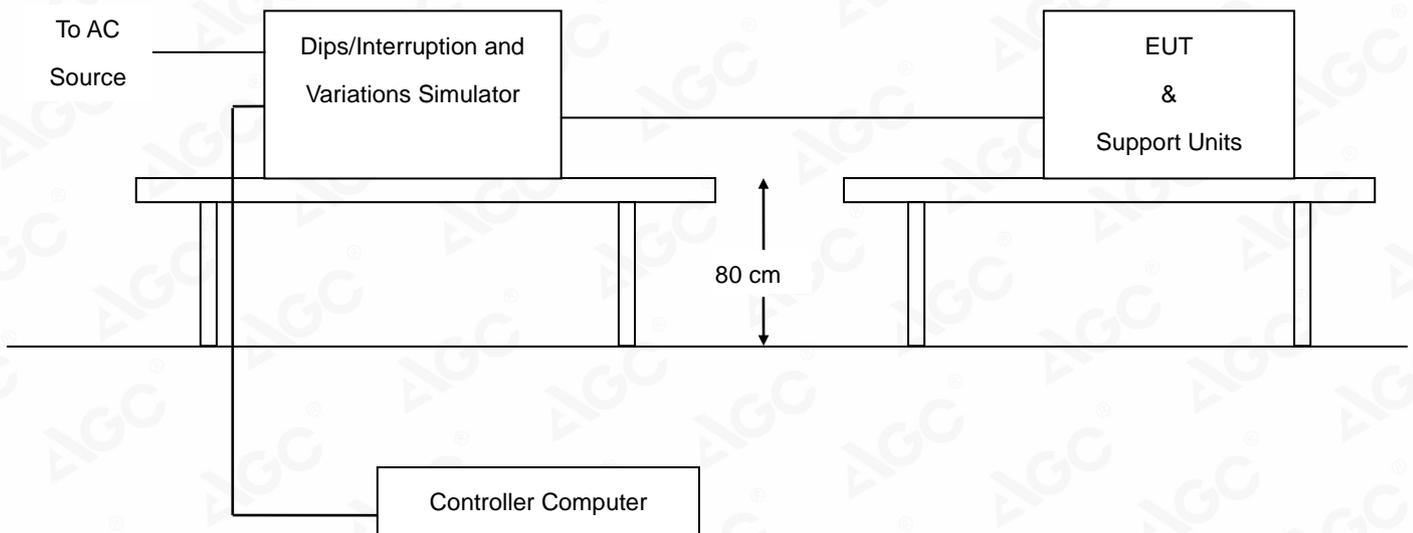
VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

Port	On Power Supply Lines
Basic Standard	EN 61000-4-11
Requirements	PHASE ANGLE 0degrees
Test Interval	Min. 10 sec.
Tester	Faler
Temperature	23.2°C
Humidity	58.0%

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

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

18.1 BLOCK DIAGRAM OF TEST SETUP



18.2 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)

Voltage Dips:

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

Voltage Interruptions:

Test Level % U _T	Reduction (%)	Duration (periods)	Observation	Performance Result
<5	>95	250	The EUT stopped working during the test, but it can be recovered by operator after test.	C

18.3 INTERPRETATION

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.
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.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

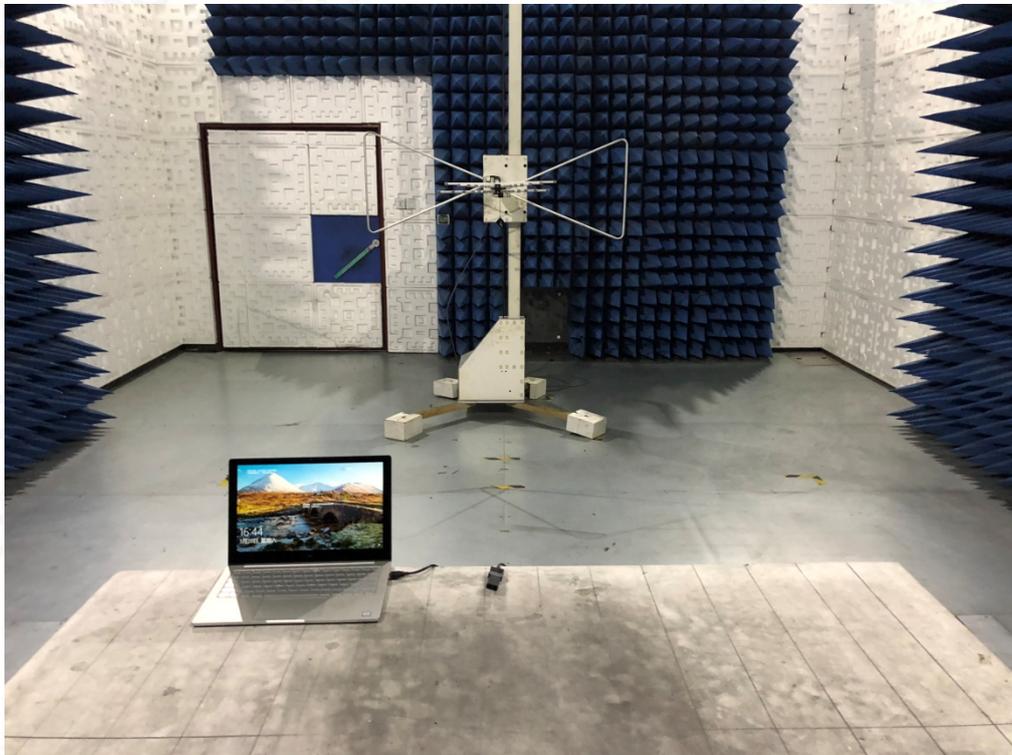
PASS

 FAIL

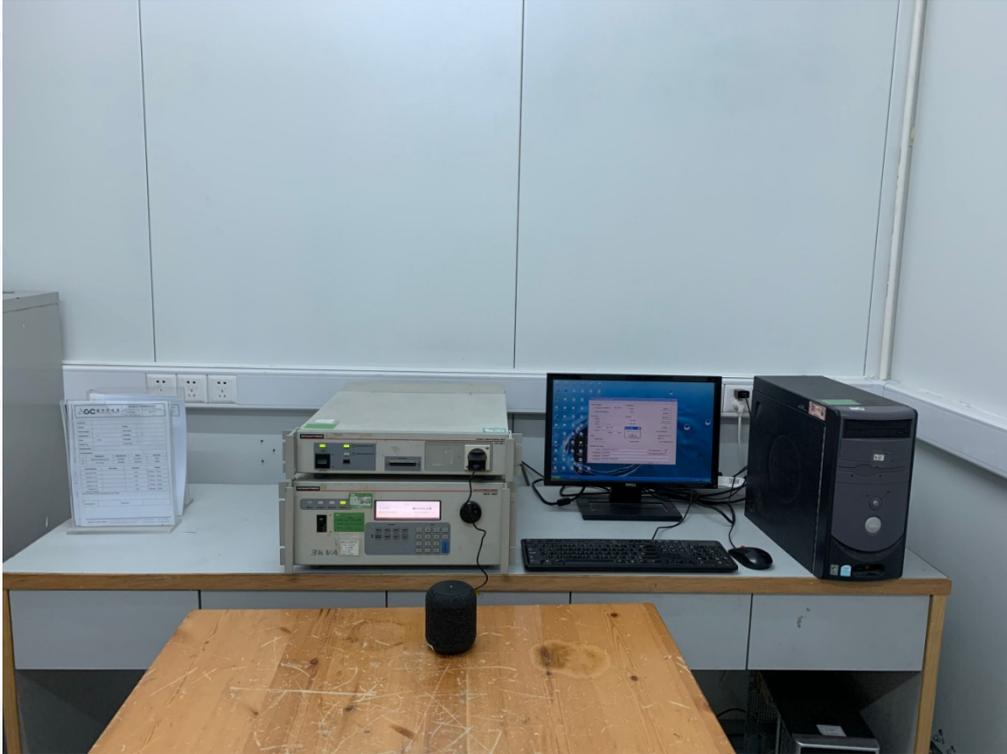
APPENDIX A: PHOTOGRAPHS OF TEST SETUP
EN 55032 CONDUCTED EMISSION TEST SETUP



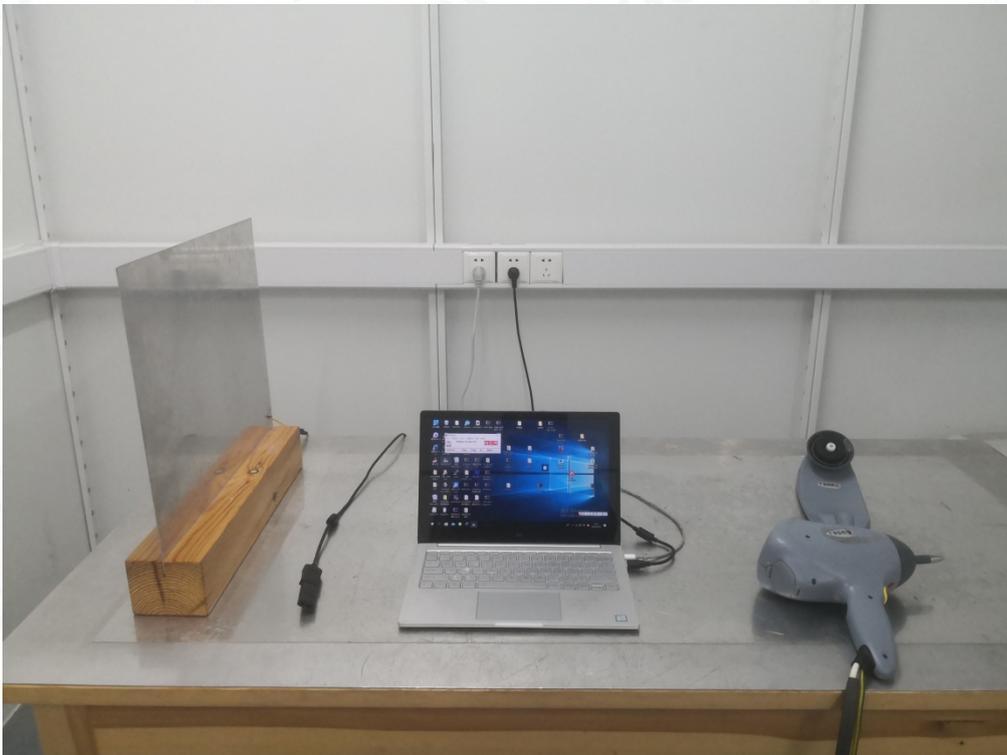
EN 55032 RADIATED EMISSION TEST SETUP



EN 61000-3-3 VOLTAGE HARMONICS/FLUCTUATION / FLICKER TEST



EN 61000-4-2 ESD IMMUNITY TEST SETUP



EN 61000-4-3 RS IMMUNITY TEST SETUP



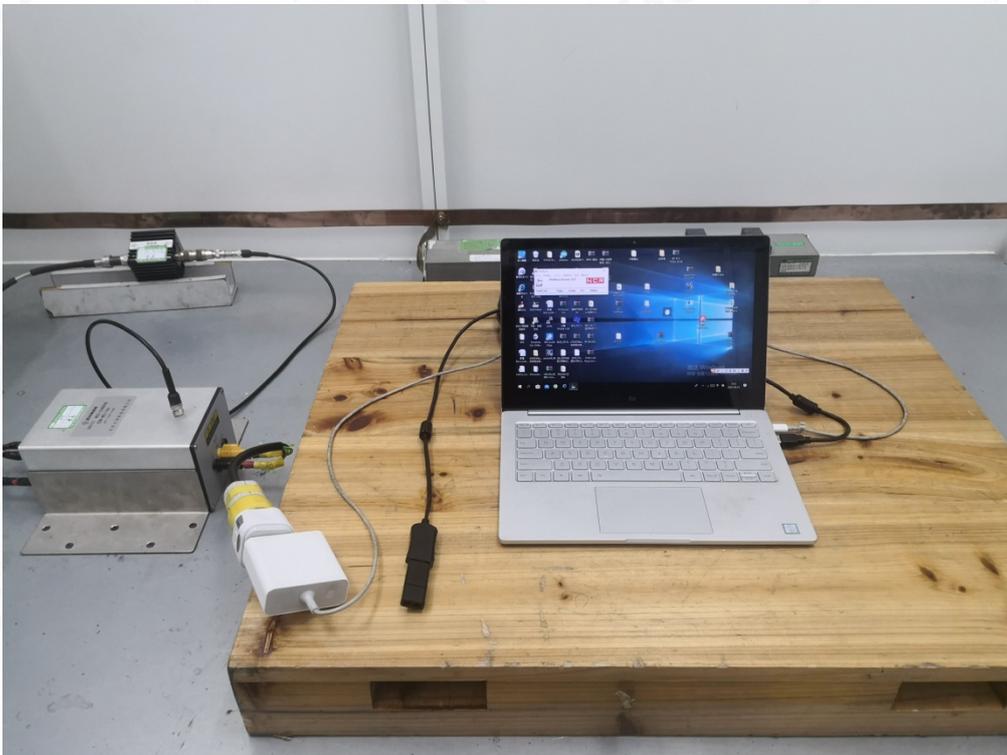
EFT SURGE and DIPS IMMUNITY TEST SETUP-AC POWER PORT



EFT&SURGE IMMUNITY TEST SETUP- SIGNAL PORT



EN 61000-4-6 CS IMMUNITY TEST SETUP-AC POWER PORT



EN 61000-4-6 CS IMMUNITY TEST SETUP- SIGNAL PORT



APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT



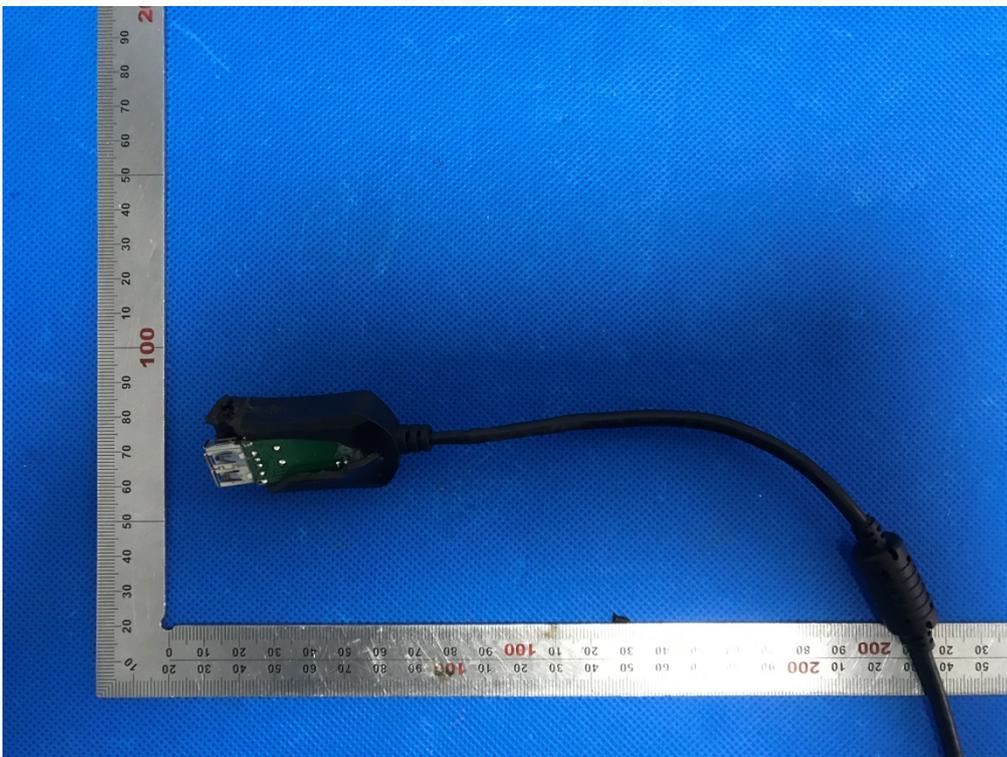
PART VIEW OF EUT-1



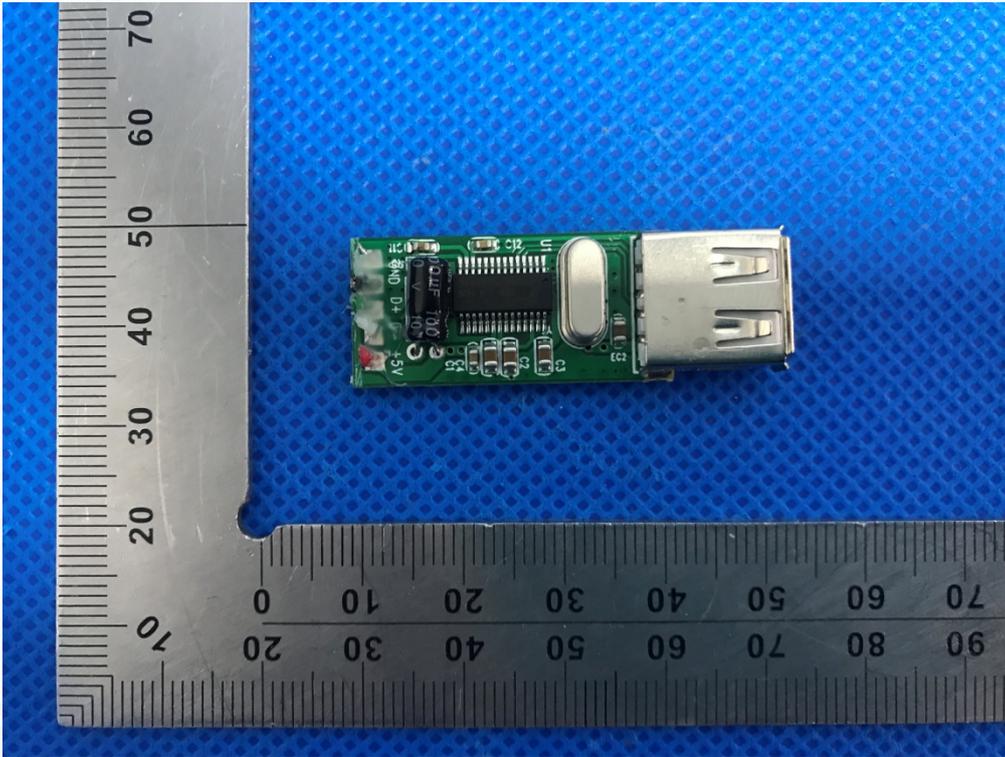
FRONT VIEW OF EUT-2



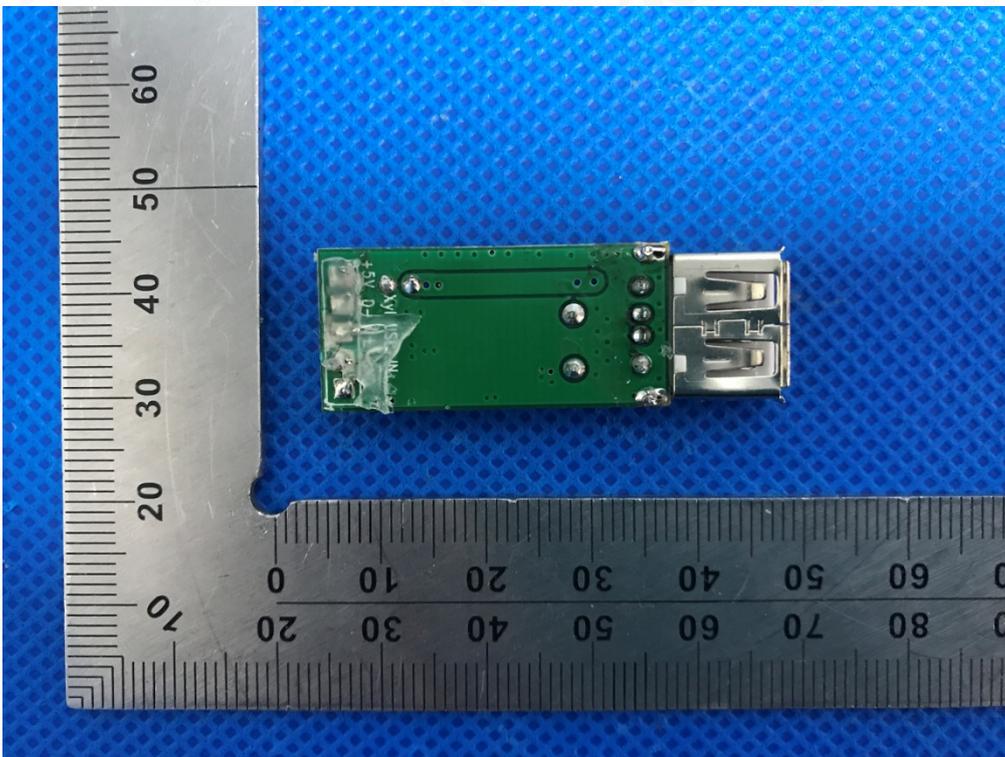
OPEN VIEW OF EUT



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----

